COMISION NACIONAL DEL AGUA

SUBDIRECCION GENERAL DE ADMINISTRACION DEL AGUA
GERENCIA DE AGUAS SUBTERRANEAS

SUBGERENCIA DE EXPLORACION GEOHIDROLOGICA

ESTUDIO DE CARACTERIZACION HIDROGEOQUIMICA DE SEIS DE LOS PRINCIPALES ACUIFEROS DEL PAIS

CONTRATO No. SGAA-93-20

2058

(VALLE DE AGUASCALIENTES)

(ANEXOS)

MARZO, 1994 **EXYCO, S.A.**

ACUIFERO

DE

AGUASCALIENTES

CONTENIDO

ANALISIS QUIMICOS HISTORICOS

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AÑOS:

1971
1993

1971

Project : HIDROGEOQUIMICA
Organization : CNA

AGUASCALIENTES

Seq. No	Sample Identification	Ca [ppm]	Ca [epm]	Mg [ppm]	Mg [epm]	Na [ppm]	Na [epm]	HCO3 [ppm]	HCO3 [epm]	SO4 [ppm]	SO4 [epm]	Cl [ppm]	Cl [epm]	Cations [epm]	Anions [epm]	SAR
1	P69-25	65	3.24	1	0.06	175	7.61	570	9.34	61	1.28	26	0.73	10.92	11.35	5.92
2	P50-45	44	2.19	5	0.42	63	2.74	286	4.69	42	0.87	12	0.34	5.35	5.90	2.40
3	P70-03	49	2.44	2	0.13	55	2.39	296	4.85	12	0.24	12	0.34	4.96	5.43	2.11
4	P52-31	54	2.69	8	0.65	122	5.33	426	6.97	75	1.56	32	0.90	8.67	9.44	4.12
5	P62-04	34	1.68	4	0.32	49	2.15	226	3.70	35	0.73	12	0.34	4.15	4.77	2.15
6	P53-05	34	1.68	3	0.27	50	2.17	197	3.23	42	0.87	2	0.06	4.13	4.16	2.20
7	P78-05	50	2.48	3	0.21	42	1.83	262	4.30	8	0.17	12	0.34	4.52	4.81	1.57
8	P60-16	41	2.06	5	0.39	48	2.11	236	3.86	40	0.82	14	0.39	4.56	5.08	1.91
9	P51-69	49	2.44	4	0.29	49	2.13	241	3.95	35	0.73	30	0.85	4.86	5.53	1.82
10	P59-82	89	4.43	1	0.10	142	6.20	621	10.18	89	1.86	10	0.28	10.73	12.32	4.12
11	P51-138	90	4.50	7	0.60	90	3.91	514	8.43	38	0.80	24	0.68	9.01	9.90	2.45
12	72-1	...	...	...	...	9	0.37	116	1.90	1	0.02	34	0.96	0.37	2.88	...
13	72-2	...	...	...	...	8	0.35	134	2.20	0	0.01	30	0.86	0.35	3.07	...
14	72-3	...	...	...	...	9	0.37	128	2.10	1	0.02	29	0.83	0.37	2.95	...
15	72-4	...	...	...	...	8	0.36	128	2.10	1	0.02	29	0.83	0.36	2.95	...
16	72-5	...	...	...	...	9	0.37	128	2.10	0	0.01	35	1.00	0.37	3.11	...
17	72-6	...	...	...	...	8	0.36	113	1.85	0	0.01	35	1.00	0.36	2.86	...
18	72-7	...	...	...	...	9	0.38	134	2.20	0	0.01	35	1.00	0.38	3.21	...
19	72-8	...	...	...	...	9	0.38	128	2.10	1	0.02	39	1.10	0.38	3.22	...
20	72-9	...	...	...	...	8	0.33	88	1.45	...	...	24	0.69	0.33	2.14	...
21	72-10	...	...	...	...	8	0.36	85	1.40	1	0.02	23	0.65	0.36	2.07	...
22	72-11	...	...	...	...	8	0.35	79	1.30	0	0.01	21	0.59	0.35	1.90	...
23	72-12	...	...	...	...	9	0.37	98	1.60	0	0.01	20	0.56	0.37	2.17	...
24	72-13	...	...	...	...	9	0.37	110	1.80	0	0.01	25	0.71	0.37	2.52	...
25	72-14	...	...	...	...	7	0.29	110	1.80	0	0.01	24	0.67	0.29	2.48	...
26	72-15	...	...	...	...	6	0.27	110	1.80	0	0.01	26	0.73	0.27	2.54	...
27	72-16	...	...	...	...	9	0.39	116	1.90	0	0.01	25	0.71	0.39	2.62	...
28	72-17	...	...	...	...	8	0.33	101	1.65	...	...	26	0.72	0.33	2.37	...
29	72-18	...	...	...	...	8	0.34	92	1.50	1	0.02	27	0.75	0.34	2.27	...
30	72-VENADEROS	29	1.43	4	0.36	36	1.55	188	3.09	8	0.17	17	0.48	3.35	3.74	1.64
31	72-FORTUNATO	88	4.38	...	...	108	4.71	481	7.88	53	1.10	46	1.29	9.09	10.27	...
32	72-LORETITO	60	2.99	9	0.76	61	2.65	333	5.46	29	0.60	37	1.05	6.40	7.11	1.93
33	72-COTORRA	55	2.77	17	1.43	76	3.33	405	6.64	29	0.60	32	0.91	7.53	8.15	2.30
34	72-CANTERA	86	4.29	3	0.27	169	7.37	635	10.40	69	1.44	32	0.91	11.94	12.75	4.88
35	72-JESUS	49	2.46	6	0.49	47	2.04	251	4.12	33	0.68	32	0.91	4.99	5.71	1.68
36	72-VALLADOLID-	75	3.76	...	...	168	7.31	619	10.14	46	0.95	32	0.91	11.07	12.00	...
37	85-MARAVILLAS	90	4.48	14	1.16	76	3.29	491	8.04	26	0.54	12	0.34	8.93	8.92	1.96
38	85-VALLADOLID	44	2.22	10	0.86	80	3.47	369	6.04	17	0.35	6	0.16	6.55	6.55	2.80
39	58-SAN FCO.ROM	51	2.56	11	0.88	76	3.30	370	6.06	22	0.46	8	0.22	6.74	6.74	2.52
40	85-RINCON ROMO	44	2.20	9	0.78	77	3.36	366	6.00	19	0.40	8	0.22	6.34	6.62	2.75
41	85-COSIO	28	1.42	12	1.00	77	3.35	305	5.00	27	0.56	8	0.23	5.77	5.79	3.04
42	85-LAS DELICIA	45	2.24	13	1.04	95	4.13	393	6.44	22	0.46	18	0.51	7.41	7.41	3.23
43	85-SAN ANTONIO	46	2.28	12	1.00	44	1.90	271	4.44	27	0.56	24	0.69	5.18	5.69	1.48
44	85-PABELLON	35	1.74	10	0.82	73	3.16	303	4.96	26	0.54	8	0.22	5.72	5.72	2.79
45	85-ENRIQUE	52	2.62	8	0.68	60	2.62	318	5.22	19	0.40	11	0.30	5.92	5.92	2.04
46	85-PRIMAVERA/C	63	3.16	10	0.82	77	3.36	364	5.96	36	0.75	22	0.63	7.34	7.34	2.38
47	85-COL.SAN PED	48	2.42	9	0.70	62	2.71	295	4.84	24	0.50	17	0.49	5.83	5.83	2.17
48	85-RCHO.EL POZ	76	3.78	12	0.98	54	2.36	389	6.38	25	0.52	17	0.49	7.12	7.39	1.53
49	85-LAS PALOMAS	81	4.02	11	0.90	92	4.00	476	7.80	34	0.71	15	0.42	8.92	8.93	2.55
50	85-MOLINITO	79	3.96	18	1.48	203	8.82	787	12.90	39	0.81	19	0.55	14.26	14.26	5.35

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51	85-DURAZNILLO	35	1.76	7	0.60	35	1.54	210	3.44	12	0.25	7	0.21	3.90	3.90	1.42
52	85-CALVILLITO	27	1.36	7	0.60	76	3.29	278	4.56	13	0.27	15	0.42	5.25	5.25	3.32
53	85-RCHO MONTOY	54	2.68	11	0.92	59	2.58	332	5.44	6	0.13	22	0.62	6.18	6.19	1.92
54	85-MA.GALLARDO	65	3.22	10	0.84	51	2.23	289	4.74	43	0.90	23	0.66	6.29	6.30	1.57
55	85-JUAREZ	45	2.24	9	0.72	63	2.73	278	4.56	29	0.60	19	0.53	5.69	5.69	2.24
56	85-HERMENEGILD	54	2.70	11	0.88	44	1.91	260	4.26	39	0.81	15	0.42	5.49	5.49	1.43
57	85-SAN GIL	55	2.74	12	1.00	27	1.18	218	3.58	49	1.02	11	0.32	4.92	4.92	0.86
58	85-TEPEZALA	62	3.10	13	1.04	31	1.35	267	4.38	37	0.77	13	0.37	5.48	5.51	0.94
59	85-VENADERO	19	0.96	11	0.90	41	1.77	190	3.12	19	0.40	4	0.11	3.63	3.63	1.84
60	85-EL CONEJO	23	1.16	11	0.92	70	3.05	248	4.06	40	0.83	9	0.24	5.13	5.13	2.99
61	85-FATIMA	20	0.98	9	0.76	69	3.02	254	4.16	22	0.46	5	0.15	4.76	4.77	3.24
62	85-TAPIAS VIEJ	30	1.52	11	0.90	46	1.98	228	3.74	25	0.52	5	0.14	4.40	4.40	1.80
63	85-BOQUILLA	25	1.24	10	0.86	55	2.39	250	4.10	13	0.27	4	0.12	4.49	4.49	2.33
64	85-JARALITO	18	0.90	9	0.76	76	3.41	245	4.02	38	0.79	9	0.26	5.07	5.07	3.74
65	85-TADEO	19	0.96	14	1.16	41	1.78	193	3.16	30	0.63	4	0.12	3.90	3.91	1.73
66	85-CALVILLO	34	1.72	9	0.72	35	1.53	184	3.02	23	0.48	17	0.47	3.97	3.97	1.38
67	85-SALITRE	26	1.30	7	0.60	35	1.52	182	2.98	14	0.29	5	0.15	3.42	3.42	1.56
68	85-OJO DE AGUA	23	1.16	16	1.32	26	1.12	189	3.10	19	0.40	4	0.10	3.60	3.60	1.01
69	85-JALTICHE	20	0.98	6	0.48	52	2.25	185	3.04	23	0.48	7	0.19	3.71	3.71	2.63
70	86-MARAVILLAS	96	4.78	10	0.80	66	2.85	481	7.88	13	0.27	10	0.28	8.43	8.43	1.71
71	66-VALLADOLID	54	2.68	9	0.74	57	2.48	333	5.46	11	0.23	7	0.21	5.90	5.90	1.90
72	86-SAN FCO.ROM	53	2.66	11	0.94	41	1.77	290	4.76	18	0.38	9	0.24	5.37	5.38	1.32
73	86-RINCON ROMO	44	2.18	11	0.88	55	2.41	304	4.98	15	0.31	6	0.18	5.47	5.47	1.95
74	86-COSIO	33	1.64	12	0.96	36	1.55	220	3.60	15	0.31	8	0.23	4.15	4.14	1.36
75	86-DELICIAS	42	2.12	11	0.92	50	2.17	272	4.46	22	0.46	11	0.30	5.21	5.22	1.76
76	86-TEPEZALA	56	2.80	12	1.02	43	1.86	265	4.34	36	0.75	21	0.59	5.68	5.68	1.35
77	86-PABELLON	54	2.68	9	0.78	48	2.09	286	4.68	27	0.56	11	0.31	5.55	5.55	1.59
78	86-ENRIQUE	50	2.50	9	0.72	34	1.47	260	4.26	9	0.19	9	0.24	4.69	4.69	1.16
79	86-PRIMAVERA Y	69	3.46	9	0.74	29	1.26	265	4.34	24	0.50	22	0.62	5.46	5.46	0.87
80	86-SAN PEDRO	55	2.72	10	0.80	41	1.79	284	4.66	13	0.27	13	0.38	5.31	5.31	1.35
81	86-RCHO.POZO	86	4.30	11	0.94	77	3.36	461	7.56	20	0.42	22	0.62	8.60	8.60	2.08
82	86-PALOMAS	88	4.38	9	0.74	71	3.09	447	7.32	20	0.42	17	0.47	8.21	8.21	1.93
83	86-MOLINITO	93	4.62	12	0.96	100	4.33	550	9.02	22	0.46	1524	42.98	9.91	52.46	2.59
84	86-DURAZNILLO	28	1.38	6	0.52	51	2.20	222	3.64	9	0.19	10	0.27	4.10	4.10	2.26
85	86-CALVILLITO	29	1.46	7	0.56	109	4.76	361	5.92	17	0.35	18	0.50	6.78	6.77	4.74
86	86-MONTOYA	48	2.38	11	0.88	22	0.95	218	3.58	10	0.21	15	0.42	4.21	4.21	0.74
87	86-GALLARDO	66	3.30	13	1.08	39	1.70	303	4.96	25	0.52	21	0.60	6.08	6.08	1.15
88	86-JUAREZ	92	4.60	12	1.00	...	...	245	4.02	15	0.31	25	0.70	5.60	5.03	...
89	86-HERMENEGILD	47	2.36	11	0.90	60	2.61	260	4.26	47	0.98	22	0.63	5.87	5.87	2.04
90	86-GIL	56	2.78	16	1.28	46	2.01	232	3.80	46	0.96	42	1.18	6.07	5.94	1.41
91	86-TEPEZALA	91	4.54	8	0.66	6	0.24	262	4.30	42	0.88	9	0.26	5.44	5.44	0.15
92	86-VENADERO	25	1.24	8	0.64	22	0.95	164	2.68	2	0.04	4	0.11	2.83	2.83	0.98
93	86-CONEJO	22	1.12	9	0.72	36	1.58	199	3.26	3	0.06	4	0.10	3.42	3.42	1.65
94	86-FATIMA	29	1.44	8	0.62	31	1.34	189	3.10	6	0.13	6	0.18	3.40	3.41	1.32
95	86-TAPIAS VIEJ	32	1.60	9	0.76	31	1.35	211	3.46	5	0.10	5	0.15	3.71	3.71	1.24
96	86-BOQUILLA	28	1.40	9	0.70	33	1.42	199	3.26	6	0.13	5	0.13	3.52	3.52	1.39
97	86-JARALITO	18	0.88	9	0.74	81	3.52	262	4.30	22	0.46	14	0.39	5.14	5.15	3.91
98	86-TADEO	24	1.18	10	0.82	10	0.42	134	2.20	2	0.04	6	0.17	2.42	2.41	0.42
99	66-CALVILLO	36	1.80	10	0.82	23	0.98	195	3.20	5	0.10	11	0.30	3.60	3.60	0.86
100	86-SALITRE	33	1.66	8	0.68	11	0.46	159	2.60	3	0.06	5	0.14	2.80	2.80	0.43

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101	86-OJO DE AGUA	34	1.70	8	0.64	25	1.09	199	3.26	3	0.06	4	0.11	3.43	3.43	1.01
102	86-JALTICHE	29	1.44	10	0.84	29	1.25	198	3.24	4	0.08	7	0.21	3.53	3.53	1.17
103	87-MARAVILLAS	99	4.96	10	0.86	84	3.67	502	8.22	44	0.92	12	0.35	9.49	9.49	2.15
104	87-VALLADOLID	57	2.82	12	0.98	44	1.92	311	5.10	19	0.40	8	0.22	5.72	5.72	1.39
105	87-FCO.ROMO	55	2.74	12	1.00	39	1.69	338	5.54	31	0.65	9	0.24	5.43	6.43	1.24
106	87-RINCON ROMO	46	2.32	13	1.04	47	2.05	281	4.60	31	0.65	6	0.18	5.41	5.43	1.56
107	87-COSIO	33	1.66	13	1.08	34	1.47	207	3.40	28	0.58	8	0.23	4.21	4.21	1.26
108	87-DELICIAS	36	1.82	14	1.16	56	2.45	254	4.16	48	1.00	10	0.27	5.43	5.43	2.01
109	87-TEPEZALA	63	3.14	17	1.36	33	1.43	236	3.86	66	1.38	25	0.70	5.93	5.94	0.95
110	87-PABELLON	45	2.26	14	1.18	42	1.81	248	4.06	46	0.96	8	0.23	5.25	5.25	1.38
111	87-ENRIQUE	51	2.56	13	1.04	35	1.54	257	4.22	30	0.63	11	0.30	5.14	5.15	1.15
112	87-PRIMAVERA	71	3.54	9	0.74	56	2.42	297	4.86	53	1.10	26	0.73	6.70	6.69	1.65
113	87-SAN PEDRO	53	2.64	14	1.18	40	1.74	276	4.52	32	0.67	13	0.38	5.56	5.57	1.26
114	87-POZO	97	4.84	14	1.12	68	2.95	441	7.22	47	0.98	26	0.72	8.91	8.92	1.71
115	87-LAS PALOMAS	82	4.08	8	0.68	84	3.64	427	7.00	41	0.85	19	0.54	8.40	8.39	2.36
116	87-MOLINITO	98	4.90	9	0.76	113	4.93	549	9.00	56	1.17	15	0.43	10.59	10.60	2.93
117	87-DURAZNILLO	33	1.64	9	0.72	17	0.73	171	2.80	4	0.08	7	0.21	3.09	3.09	0.67
118	87-CALVILLITO	49	2.46	8	0.68	7	0.32	194	3.18	4	0.08	7	0.19	3.46	3.45	0.26
119	87-MONTOYA	49	2.46	15	1.24	23	0.99	222	3.64	33	0.69	13	0.36	4.69	4.69	0.73
120	87-GALLARDO	55	2.76	21	1.74	44	1.92	295	4.84	48	1.00	21	0.58	6.42	6.42	1.28
121	87-JUAREZ	59	2.92	9	0.76	49	2.12	255	4.18	45	0.94	24	0.68	5.80	5.80	1.56
122	87-HERMENEGILD	56	2.78	11	0.88	71	3.11	271	4.44	82	1.71	22	0.62	6.77	6.77	2.30
123	87-GIL	66	3.28	13	1.10	65	2.82	216	3.54	145	3.02	23	0.64	7.20	7.20	1.91
124	87-TEPEZALA	105	5.24	9	0.70	11	0.47	260	4.26	87	1.81	12	0.34	6.41	6.41	0.27
125	87-VENADERO	24	1.18	9	0.70	25	1.10	161	2.64	10	0.21	5	0.13	2.98	2.98	1.13
126	87-CONEJO	25	1.24	9	0.76	28	1.22	176	2.88	10	0.21	5	0.13	3.22	3.22	1.22
127	87-FATIMA	29	1.44	9	0.74	28	1.21	183	3.00	12	0.25	5	0.14	3.39	3.39	1.16
128	87-TAPIAS	37	1.84	9	0.74	23	1.00	201	3.30	6	0.13	5	0.15	3.58	3.58	0.88
129	87-BOQUILLA	32	1.58	10	0.80	31	1.35	196	3.22	17	0.35	6	0.16	3.73	3.73	1.24
130	87-JARALITO	16	0.82	9	0.74	88	3.84	251	4.12	42	0.88	14	0.40	5.40	5.40	4.35
131	87-SAN TADEO	25	1.24	8	0.66	14	0.60	134	2.20	5	0.10	7	0.20	2.50	2.50	0.62
132	87-CALVILLO	36	1.82	9	0.78	16	0.80	182	2.98	8	0.17	9	0.26	3.40	3.41	0.70
133	87-SALITRE	27	1.34	11	0.92	11	0.46	149	2.44	5	0.10	6	0.18	2.72	2.72	0.43
134	87-OJO DE AGUA	22	1.12	15	1.26	22	0.95	184	3.02	7	0.15	6	0.17	3.33	3.34	0.87
135	87-JALTICHE	30	1.48	12	0.98	21	0.92	183	3.00	7	0.15	8	0.23	3.38	3.38	0.83
136	88-MARAVILLAS	96	4.80	9	0.74	77	3.35	448	7.34	57	1.19	13	0.36	8.89	8.89	2.01
137	88-VALLADOLID	52	2.62	22	1.78	120	5.23	466	7.64	78	1.63	13	0.37	9.63	9.64	3.53
138	88-FCO.ROMO	55	2.72	6	0.50	59	2.56	287	4.70	39	0.81	10	0.27	5.78	5.78	2.02
139	88-RINCON ROMO	46	2.32	6	0.50	67	2.93	288	4.72	39	0.81	8	0.22	5.75	5.75	2.47
140	88-COSIO	35	1.76	7	0.54	57	2.50	238	3.90	33	0.69	7	0.21	4.80	4.80	2.33
141	88-DELICIAS	38	1.92	7	0.56	78	3.38	277	4.54	52	1.08	9	0.24	5.86	5.86	3.04
142	88-TEPEZALA	51	2.54	14	1.18	60	2.59	239	3.92	85	1.77	26	0.72	6.31	6.41	1.90
143	88-PABELLON	49	2.44	10	0.82	72	3.14	298	4.88	62	1.29	8	0.23	6.40	6.40	2.46
144	88-ENRIQUE	48	2.40	8	0.62	43	1.88	244	4.00	33	0.69	8	0.22	4.90	4.91	1.53
145	88-PRIMAVERA Y	72	3.60	5	0.38	84	3.67	375	6.14	58	1.21	11	0.30	7.65	7.65	2.60
146	88-SAN PEDRO	56	2.80	4	0.36	57	2.50	277	4.54	36	0.75	13	0.37	5.66	5.66	1.99
147	88-EL POZO	57	2.84	6	0.52	110	4.77	389	6.38	55	1.15	22	0.61	8.13	8.14	3.68
148	88-PALOMAS	79	3.96	4	0.30	57	2.48	317	5.20	46	0.96	21	0.58	6.74	6.74	1.70
149	88-MOLINITO	75	3.74	25	2.06	109	4.76	531	8.70	71	1.48	13	0.38	10.56	10.56	2.80
150	88-DURAZNILLO	36	1.82	2	0.14	28	1.22	178	2.92	6	0.13	5	0.13	3.18	3.18	1.23

Project : HIDROGEOQUIMICA
Organization : CNA

AGUASCALIENTES

Seq. No	Sample Identification	Ca [ppm]	Ca [epm]	Mg [ppm]	Mg [epm]	Na [ppm]	Na [epm]	HCO3 [ppm]	HCO3 [epm]	SO4 [ppm]	SO4 [epm]	Cl [ppm]	Cl [epm]	Cations [epm]	Anions [epm]	SAR
151	88-CALVILLO	43	2.16	5	0.38	24	1.06	203	3.32	6	0.13	6	0.16	3.60	3.61	0.94
152	88-MONTOYA	49	2.44	6	0.50	37	1.60	222	3.64	23	0.48	15	0.42	4.54	4.54	1.32
153	88-GALLARDO	70	3.48	7	0.54	74	3.23	311	5.10	71	1.48	24	0.67	7.25	7.25	2.28
154	88-JUAREZ	56	2.80	6	0.50	69	3.00	272	4.46	51	1.06	27	0.76	6.30	6.28	2.34
155	88-HERMENEGILD	42	2.08	1	0.12	79	3.43	226	3.70	70	1.46	17	0.47	5.63	5.63	3.27
156	88-GIL	61	3.02	11	0.88	77	3.37	226	3.70	143	2.98	21	0.59	7.27	7.27	2.41
157	88-TEPEZALA	11	0.54	2	0.20	36	1.58	276	4.52	102	2.13	8	0.22	2.32	6.87	2.60
158	88-VENADERO	22	1.12	3	0.28	41	1.79	171	2.80	12	0.25	5	0.14	3.19	3.19	2.14
159	88-CONEJO	12	0.62	5	0.44	49	2.11	173	2.84	11	0.23	4	0.10	3.17	3.17	2.90
160	88-FATIMA	24	1.20	4	0.30	29	1.26	145	2.38	12	0.25	5	0.13	2.76	2.76	1.46
161	88-TAPIAS	35	1.76	4	0.32	44	1.91	220	3.60	9	0.19	7	0.21	3.99	4.00	1.87
162	88-BOQUILLA	29	1.44	3	0.26	53	2.29	215	3.52	16	0.33	5	0.13	3.99	3.98	2.48
163	88-JARALITO	15	0.74	3	0.28	113	4.92	270	4.42	56	1.17	12	0.35	5.94	5.94	6.89
164	88-SAN TADEO	23	1.16	4	0.34	27	1.19	142	2.32	8	0.17	7	0.21	2.69	2.70	1.37
165	88-CALVILLO	30	1.52	7	0.56	39	1.68	198	3.24	14	0.29	8	0.23	3.76	3.76	1.65
166	88-SALITRE	32	1.58	3	0.28	29	1.24	166	2.72	10	0.21	6	0.17	3.10	3.10	1.29
167	88-OJO DE AGUA	32	1.60	4	0.30	41	1.77	200	3.28	12	0.25	5	0.14	3.67	3.67	1.82
168	88-JALTICHE	34	1.68	4	0.36	39	1.69	204	3.34	10	0.21	7	0.19	3.73	3.74	1.67
169	89-MARAVILLAS	16	0.80	50	4.11	194	8.46	57	0.94	17	0.35	12	0.35	13.37	1.64	5.40
170	89-VALLADOLID	11	0.56	84	6.91	217	9.44	102	1.67	21	0.44	16	0.44	16.91	2.55	4.88
171	89-FCO.ROMO	11	0.56	29	2.37	107	4.64	38	0.63	15	0.31	11	0.31	7.57	1.25	3.83
172	89-RINCON ROMO	14	0.68	33	2.68	109	4.76	42	0.69	10	0.20	7	0.20	8.12	1.09	3.67
173	89-COSIO	15	0.76	24	1.95	81	3.52	35	0.58	12	0.25	9	0.25	6.23	1.08	3.02
174	89-DELICIAS	17	0.86	36	2.93	105	4.56	71	1.17	17	0.36	13	0.36	8.35	1.89	3.31
175	89-TEPEZALA	16	0.80	29	2.41	94	4.08	101	1.65	35	0.72	26	0.72	7.29	3.09	3.22
176	89-PABELLON	13	0.66	28	2.30	97	4.24	55	0.90	12	0.26	9	0.26	7.20	1.42	3.49
177	89-ENRIQUE	12	0.60	21	1.70	94	4.08	27	0.44	13	0.28	10	0.28	6.38	1.00	3.81
178	89-PRIMAVERA	20	1.00	39	3.20	131	5.68	70	1.15	29	0.60	21	0.60	9.88	2.35	3.92
179	89-SAN PEDRO	13	0.66	36	2.94	118	5.14	45	0.73	17	0.35	12	0.35	8.74	1.43	3.83
180	89-EL POZO	10	0.50	65	5.34	174	7.58	66	1.08	32	0.67	24	0.67	13.42	2.42	4.44
181	89-LAS PALOMAS	12	0.58	46	3.77	147	6.38	47	0.77	33	0.68	24	0.68	10.73	2.13	4.33
182	89-MOLINITO	17	0.84	65	5.37	206	8.98	77	1.27	20	0.42	15	0.42	15.19	2.11	5.10
183	89-DURAZNILLO	6	0.30	10	0.80	60	2.62	5	0.08	7	0.15	5	0.15	3.72	0.38	3.53
184	89-CALVILLO	6	0.30	36	2.98	97	4.20	21	0.35	21	0.43	15	0.43	7.48	1.21	3.28
185	89-MONTOYA	13	0.64	17	1.40	78	3.38	37	0.60	18	0.37	13	0.37	5.42	1.34	3.35
186	89-GALLARDO	35	1.74	35	2.85	112	4.88	89	1.46	28	0.59	21	0.59	9.47	2.64	3.22
187	89-JUAREZ	9	0.46	29	2.41	98	4.26	57	0.94	38	0.80	28	0.80	7.13	2.54	3.56
188	89-HERMENEGILD	10	0.50	40	3.27	93	4.04	108	1.77	28	0.59	21	0.59	7.81	2.95	2.94
189	89-GIL	14	0.70	35	2.87	80	3.50	184	3.02	22	0.45	16	0.45	7.07	3.92	2.62
190	89-TEPEZALA	10	0.48	10	0.83	89	3.88	99	1.63	10	0.21	7	0.21	5.19	2.05	4.79
191	89-VENADERO	8	0.38	19	1.60	64	2.78	13	0.21	5	0.11	4	0.11	4.76	0.43	2.79
192	89-CONEJO	8	0.42	22	1.85	69	2.98	12	0.19	6	0.12	4	0.12	5.25	0.43	2.80
193	89-FATIMA	9	0.44	17	1.40	68	2.96	10	0.17	6	0.12	4	0.11	4.80	0.41	3.09
194	89-TAPIAS	10	0.48	18	1.47	76	3.32	6	0.10	6	0.13	5	0.13	5.27	0.36	3.36
195	89-BOQUILLA	8	0.40	22	1.83	75	3.28	19	0.31	7	0.14	5	0.14	5.51	0.59	3.11
196	89-JARALITO	6	0.32	54	4.44	92	4.02	66	1.08	18	0.38	13	0.38	8.78	1.84	2.61
197	89-SAN TADEO	8	0.38	11	0.92	50	2.18	6	0.10	11	0.23	8	0.23	3.48	0.56	2.70
198	89-CALVILLO	7	0.36	14	1.18	63	2.74	16	0.27	10	0.21	7	0.21	4.28	0.69	3.12
199	89-SALITRE	7	0.36	18	1.50	72	3.12	9	0.15	5	0.11	4	0.11	4.98	0.37	3.24
200	89-OJO DE AGUA	6	0.32	17	1.42	69	3.02	12	0.19	7	0.15	5	0.15	4.76	0.49	3.24
201	89-JALTICHE	8	0.40	17	1.36	74	3.20	10	0.17	8	0.17	6	0.17	4.96	0.51	3.41

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Project : HIDROGEOQUIMICA
Organization : CNA/GAS/SEG

AGUASCALIENTES

Seq. No	Sample Identification	Ca [ppm]	Ca [epm]	Mg [ppm]	Mg [epm]	Na [ppm]	Na [epm]	K [ppm]	K [epm]	HCO3 [ppm]	HCO3 [epm]	SO4 [ppm]	SO4 [epm]	Cl [ppm]	Cl [epm]	NO3 [ppm]	NO3 [epm]	Hardness	Alkal.	Conduct.	pH	Cations [epm]	Anions [epm]	SAR
1	6	51	2.55	1	0.12	62	2.69	12	0.32	281	4.60	27	0.56	6	0.16	8	0.14	134.00	230.00	650	7.36	5.69	5.46	2.33
2	7	50	2.51	18	1.46	125	5.44	31	0.79	464	7.60	87	1.81	7	0.21	5	0.09	200.00	380.00	1247	6.52	10.20	9.71	3.86
3	8	66	3.27	24	1.97	121	5.27	33	0.85	561	9.20	82	1.71	4	0.12	7	0.12	264.00	460.00	1302	6.87	11.36	11.15	3.25
4	9	50	2.51	21	1.74	108	4.68	30	0.77	464	7.60	77	1.60	7	0.21	6	0.10	214.00	380.00	1265	6.71	9.70	9.51	3.21
5	10	104	5.19	12	0.95	89	3.88	32	0.82	515	8.44	70	1.46	11	0.32	10	0.16	308.00	422.00	1160	6.95	10.84	10.38	2.22
6	11	36	1.80	8	0.63	100	4.35	28	0.71	394	6.46	8	0.17	10	0.28	5	0.09	122.00	323.00	1020	7.07	7.48	7.00	3.95
7	12	102	5.07	8	0.67	123	5.35	27	0.70	564	9.24	62	1.29	7	0.20	7	0.12	288.00	462.00	1208	7.06	11.79	10.85	3.16
8	13	37	1.84	12	1.01	67	2.94	15	0.39	293	4.80	34	0.71	7	0.19	7	0.12	143.00	240.00	620	6.64	6.17	5.82	2.46
9	14	57	2.83	12	0.99	86	3.75	18	0.45	382	6.26	53	1.10	7	0.19	7	0.12	192.00	313.00	744	7.00	8.02	7.67	2.71
10	15	30	1.50	12	1.01	91	3.96	22	0.56	334	5.48	42	0.87	8	0.24	4	0.07	126.00	274.00	819	6.95	7.03	6.66	3.54
11	16	28	1.40	8	0.65	49	2.13	42	1.08	234	3.84	36	0.75	7	0.19	13	0.21	103.00	192.00	568	7.16	5.26	4.98	2.10
12	17	28	1.42	14	1.14	71	3.08	30	0.76	301	4.94	36	0.75	8	0.24	11	0.17	129.00	247.00	700	7.34	6.40	6.10	2.72
13	18	29	1.44	11	0.89	74	3.23	23	0.60	299	4.90	40	0.83	8	0.21	10	0.16	117.00	245.00	728	7.08	6.15	6.10	2.99
14	19	25	1.24	11	0.93	54	2.36	11	0.28	266	4.36	7	0.15	5	0.14	8	0.13	109.00	218.00	575	7.25	4.81	4.77	2.27
15	20	58	2.87	7	0.57	75	3.26	24	0.62	349	5.72	36	0.75	8	0.23	12	0.20	173.00	286.00	699	7.23	7.33	6.90	2.49
16	21	45	2.24	1	0.08	90	3.91	18	0.45	355	5.82	14	0.29	4	0.11	5	0.09	116.00	291.00	685	6.59	6.68	6.30	3.64
17	22	50	2.48	5	0.39	72	3.12	26	0.68	317	5.20	40	0.83	7	0.19	9	0.14	144.00	260.00	663	7.45	6.67	6.36	2.60
18	23	51	2.55	10	0.79	78	3.41	26	0.68	350	5.74	37	0.77	9	0.24	8	0.14	168.00	278.00	706	7.33	7.43	6.89	2.63
19	24	29	1.45	4	0.31	20	0.87	16	0.41	140	2.29	18	0.37	5	0.13	10	0.16	88.00	115.00	258	7.10	3.04	2.96	0.93
20	25	42	2.08	3	0.24	52	2.27	20	0.51	244	4.00	33	0.69	7	0.19	8	0.14	116.00	200.00	516	7.17	5.09	5.01	2.11
21	26	42	2.08	4	0.32	44	1.91	30	0.77	250	4.10	29	0.60	6	0.18	9	0.14	120.00	205.00	563	7.09	5.07	5.03	1.75
22	27	57	2.83	8	0.67	77	3.37	27	0.70	354	5.80	38	0.79	9	0.25	10	0.16	176.00	290.00	735	7.19	7.58	7.00	2.55
23	28	81	4.03	6	0.51	89	3.88	33	0.86	439	7.20	54	1.12	12	0.33	12	0.20	228.00	360.00	1005	7.05	9.28	8.85	2.57
24	29	92	4.59	8	0.67	119	5.19	35	0.89	536	8.78	74	1.54	12	0.34	11	0.18	264.00	439.00	1287	6.73	11.33	10.83	3.20
25	30	52	2.59	7	0.55	70	3.04	25	0.65	306	5.02	58	1.21	9	0.26	7	0.11	158.00	251.00	772	7.31	6.84	6.60	2.43
26	31	49	2.46	8	0.63	73	3.19	20	0.51	299	4.90	62	1.29	11	0.30	8	0.13	155.00	245.00	631	7.10	6.79	6.62	2.57
27	32	46	2.32	6	0.47	39	1.70	12	0.31	232	3.80	16	0.33	11	0.30	12	0.20	140.00	190.00	372	7.38	4.80	4.63	1.44
28	33	70	3.47	4	0.32	48	2.10	19	0.49	320	5.24	18	0.37	13	0.37	9	0.15	190.00	262.00	477	7.13	6.38	6.13	1.53
29	34	68	3.39	4	0.32	53	2.30	18	0.46	317	5.20	28	0.58	12	0.33	9	0.14	186.00	260.00	482	7.17	6.47	6.25	1.69
30	35	106	5.27	0	0.04	85	3.71	31	0.80	396	6.50	54	1.12	56	1.57	27	0.44	266.00	325.00	781	7.16	9.82	9.64	2.28
31	36	93	4.63	0	0.04	65	2.83	25	0.65	409	6.70	3	0.06	40	1.13	4	0.07	234.00	335.00	688	7.08	8.14	7.96	1.85
32	37	53	2.63	5	0.39	58	2.52	17	0.43	293	4.80	28	0.58	11	0.30	9	0.14	152.00	240.00	440	7.24	5.98	5.83	2.05
33	38	18	0.87	1	0.04	187	8.16	4	0,10	414	6.78	42	0.87	23	0.65	7	0.12	46.00	339.00	678	7.54	9.18	8.42	12.04
34	39	47	2.36	2	0.16	38	1.65	12	0.31	255	4.18	3	0.06	2	0.06	5	0.09	126.20	209.00	336	6.80	4.47	4.38	1.48
35	40	24	1.19	3	0.28	40	1.74	14	0.35	187	3.07	3	0.06	4	0.13	11	0.18	74.00	153.60	271	7.23	3.56	3.44	2.03
36	41	34	1.68	5	0.39	33	1.44	10	0.26	211	3.46	2	0.04	3	0.07	8	0.13	104.00	173.00	291	7.69	3.77	3.70	1.41
37	42	47	2.36	1	0.08	86	3.75	18	0.46	328	5.38	29	0.60	5	0.16	8	0.13	122.00	269.00	478	7.19	6.63	6.27	3.39
38	43	55	2.75	5	0.39	66	2.88	24	0.62	303	4.96	32	0.67	22	0.62	17	0.27	158.00	248.00	486	7.29	6.65	6.51	2.30
39	44	81	4.03	0	0.04	144	6.27	37	0.94	516	8.46	110	2.29	12	0.34	7	0.11	204.00	423.00	832	7.30	11.29	11.20	4.40
40	45	54	2.71	3	0.28	69	2.99	21	0.54	321	5.26	39	0.81	9	0.25	5	0.08	150.00	263.00	461	7.23	6.52	6.41	2.45
41	46	61	3.03	8	0.63	82	3.58	31	0.80	409	6.70	40	0.83	8	0.23	8	0.13	184.00	335.00	668	6.50	8.05	7.90	2.64
42	47	78	3.91	7	0.55	96	4.16	44	1.12	459	7.52	62	1.29	16	0.45	18	0.29	224.00	376.00	521	7.14	9.74	9.55	2.78
43	48	48	2.40	5	0.43	66	2.85	23	0.58	299	4.90	29	0.60	8	0.23	11	0.18	142.00	245.00	439	7.30	6.26	5.92	2.40
44	49	51	2.55	7	0.59	88	3.85	19	0.49	322	5.28	58	1.21	15	0.43	17	0.28	158.00	264.00	521	7.29	7.48	7.19	3.07
45	50	50	2.51	7	0.59	83	3.61	24	0.61	339	5.56	46	0.96	11	0.31	7	0.12	156.00	278.00	519	7.32	7.33	6.94	2.90
46	51	60	2.99	8	0.63	83	3.61	26	0.67	349	5.72	67	1.39	11	0.32	7	0.11	182.00	286.00	557	7.16	7.91	7.55	2.68
47	52	56	2.79	8	0.67	77	3.34	21	0.53	335	5.50	46	0.96	11	0.32	9	0.14	174.00	275.00	514	7.28	7.33	6.92	2.53
48	53	58	2.87	3	0.24	63	2.74	24	0.62	287	4.70	55	1.15	10	0.29	8	0.13	156.00	235.00	496	7.38	6.47	6.27	2.20
49	54	45	2.24	11	0.87	55	2.39	23	0.60	266	4.36	45	0.94	10	0.27	808	13.03	156.00	218.00	444	7.40	6.10	18.60	1.92
50	55	48	2.40	9	0.75	54	2.36	21	0.54	268	4.40	41	0.85	11	0.30	10	0.15	158.00	220.00	442	7.38	6.05	5.71	1.88
51	56	47	2.36	10	0.83	53	2.30	23	0.59	277	4.54	36	0.75	10	0.28	8	0.13	160.00	227.00	435	7.30	6.08	5.70	1.82
52	57	76	3.79	9	0.75	81	3.55	27	0.69	415	6.80	52	1.08	10	0.28	11	0.18	228.00	340.00	614	7.05	8.78	8.34	2.35
53	58	58	2.87	7	0.59	86	3.76	14	0.35	359	5.88	37	0.77	13	0.38	8	0.14	174.00	294.00	592	6.36	7.58	7.16	2.86
54	59	39	1.96	10	0.79	25	1.07	14	0.36	229	3.76	2	0.04	4	0.10	13	0.21	138.00	188.00	332	7.50	4.17	4.12	0.91
55	60	38	1.88	8	0.67	42	1.81	5	0.14	227	3.72	1	0.02	7	0.21	11	0.17	128.00	186.00	334	7.75	4.50	4.12	1.61
56	61	45	2.24	12	0.99	40	1.74	12	0.30	254	4.16	1	0.02	7	0.21	14	0.22	162.00	208.00	400	7.33	5.26	4.61	1.37
57	1	60	2.99	1	0.08	113	4.94	14	0.37	390	6.40	58	1.21	15	0.41	8	0.13	154.00	320.00	980	6.65	8.38	8.15	3.98
58	2	38	1.88	5	0.39	47	2.04	10	0.26	244	4.00	0	0.00	6	0.17	10	0.16	114.00	200.00	503	7.70	4.57	4.33	1.92
59	3	55	2.73	6	0.48	62	2.72	27	0.69	327	5.36	32	0.67	10	0.29	8	0.14	170.00	268.00	756	7.19	6.62	6.45	2.15
60	4	20	1.00	3	0.28	28	1.24	21	0.53	115	1.88	25	0.52	7	0.19	17	0.27	64.00	94.00	379	6.74	3.04	2.86	1.55
61	5	49	2.44	4	0.31	45	1.96	10	0.26	254	4.16	0	0.00	4	0.11	10	0.16	138.00	208.00	500	7.30	4.96	4.44	1.67

1972

PARAMETROS ESTADISTICOS DE LOS RESULTADOS QUIMICOS DE LAS MUESTRAS DEL ACUIFERO DEL VALLE DE AGUASCALIENTES, AGS. EN 1972.

CATIONES			
Variable	Ca	Mg	Na
Tamaño de la muestra	7.0	7.0	7.0
Promedio	63.2	5.8	95.1
Mediana	60.0	4.4	76.5
Moda	55.5	0.0	60.9
Media Geométrica	59.6	1.0	81.6
Varianza	454.1	36.9	3066.8
Desviación Estandar	21.3	6.1	55.4
Error Estandar	8.1	2.3	20.9
Valor Mínimo	28.7	0.0	35.7
Valor Máximo	87.8	17.4	169.5
Rango	59.1	17.4	133.8
Coef. Var. (%)	33.7	105.3	58.2

ANIONES			
Variable	HCO_3	Cl	SO_4
Tamaño de la muestra	7.0	7.0	7.0
Promedio	416.0	32.7	38.0
Mediana	405.2	32.2	32.6
Moda	333.0	32.2	28.7
Media Geométrica	382.9	31.6	32.4
Varianza	29829.2	73.4	389.6
Desviación Estandar	172.7	8.6	19.7
Error Estandar	65.3	3.2	7.5
Valor Mínimo	188.5	17.0	8.3
Valor Máximo	634.6	45.8	69.2
Rango	446.1	28.8	60.9
Coef. Var. (%)	41.5	26.1	51.9

1984

PARAMETROS ESTADISTICOS DE LOS RESULTADOS QUIMICOS DE LAS MUESTRAS DEL ACUIFERO DEL VALLE DE AGUASCALIENTES, AGS. EN 1984.

CATIONES			
Variable	Ca	Mg	Na
Tamaño de la muestra	33.0	33.0	33.0
Promedio	48.6	13.9	50.5
Mediana	48.9	13.6	47.1
Moda	22.8	13.1	43.5
Media Geométrica	44.2	13.7	42.6
Varianza	437.6	5.5	1103.3
Desviación Estandar	20.9	2.4	33.2
Error Estandar	3.6	0.4	5.8
Valor Mínimo	22.0	9.9	13.8
Valor Máximo	90.6	18.9	173.8
Rango	68.6	8.9	160.0
Coef. Var. (%)	43.0	16.9	65.8
ANIONES			
Variable	HCO_3	Cl	SO_4
Tamaño de la muestra	33.0	33.0	33.0
Promedio	277.3	13.4	41.6
Mediana	255.0	12.4	37.9
Moda	286.8	4.9	14.3
Media Geométrica	263.4	11.7	33.7
Varianza	10194.7	43.1	698.1
Desviación Estandar	100.9	6.6	26.4
Error Estandar	17.6	1.1	4.6
Valor Mínimo	167.2	4.6	9.4
Valor Máximo	636.9	25.5	106.0
Rango	469.8	20.9	96.7
Coef. Var. (%)	36.4	48.9	63.4

1985

PARAMETROS ESTADISTICOS DE LOS RESULTADOS QUIMICOS DE LAS MUESTRAS DEL ACUIFERO DEL VALLE DE AGUASCALIENTES, AGS. EN 1985.

CATIONES

Variable	Ca	Mg	Na
Tamaño de la muestra	33.0	33.0	33.0
Promedio	43.6	10.7	63.1
Mediana	44.5	10.7	60.2
Moda	19.2	7.3	77.2
Media Geométrica	39.2	10.4	57.6
Varianza	402.6	6.4	989.6
Desviación Estandar	20.1	2.5	31.5
Error Estandar	3.5	0.4	5.5
Valor Mínimo	18.0	5.8	25.8
Valor Máximo	89.8	17.9	202.8
Rango	71.8	12.1	177.0
Coef. Var. (%)	46.0	23.6	49.8

ANIONES

Variable	HCO_3	Cl	SO_4
Tamaño de la muestra	33.0	33.0	33.0
Promedio	302.4	11.9	26.7
Mediana	278.2	10.6	25.6
Moda	278.2	7.8	19.7
Media Geométrica	285.4	10.2	24.6
Varianza	14107.6	41.0	105.9
Desviación Estandar	118.8	6.4	10.3
Error Estandar	20.7	1.1	1.8
Valor Mínimo	181.8	3.5	6.4
Valor Máximo	787.1	24.5	50.3
Rango	605.3	20.9	43.9
Coef. Var. (%)	39.2	53.8	38.5

1986

PARAMETROS ESTADISTICOS DE LOS RESULTADOS QUIMICOS DE LAS MUESTRAS DEL ACUIFERO DEL VALLE DE AGUASCALIENTES, AGS. EN 1986.

CATIONES			
Variable	Ca	Mg	Na
Tamaño de la muestra	33.0	33.0	33.0
Promedio	49.7	9.9	42.6
Mediana	47.3	9.7	39.1
Moda	53.7	9.0	21.8
Media Geométrica	44.6	9.7	
Varianza	554.9	3.8	635.6
Desviación Estandar	23.6	1.9	25.2
Error Estandar	4.1	0.3	4.4
Valor Mínimo	17.6	6.3	0.0
Valor Máximo	95.8	15.6	109.4
Rango	78.2	9.2	109.4
Coef. Var. (%)	47.4	19.6	59.1
ANIONES			
Variable	HCO_3	Cl	SO_4
Tamaño de la muestra	33.0	33.0	33.0
Promedio	270.6	12.5	16.7
Mediana	259.9	9.9	15.3
Moda	198.9	6.4	2.9
Media Geométrica	256.7	10.4	11.8
Varianza	9195.6	67.2	166.4
Desviación Estandar	95.9	8.2	12.9
Error Estandar	16.7	1.4	2.2
Valor Mínimo	134.2	3.5	1.9
Valor Máximo	550.3	41.8	48.3
Rango	416.1	38.3	46.4
Coef. Var. (%)	35.4	65.5	77.1

1987

PARAMETROS ESTADISTICOS DE LOS RESULTADOS QUIMICOS DE LAS MUESTRAS DEL ACUIFERO DEL VALLE DE AGUASCALIENTES, AGS. EN 1987.

CATIONES			
Variable	Ca	Mg	Na
Tamaño de la muestra	33.0	33.0	33.0
Promedio	50.4	11.4	41.6
Mediana	49.3	10.7	35.4
Moda	24.8	9.0	44.1
Media Geométrica	45.1	11.1	34.2
Varianza	587.2	9.1	656.6
Desviación Estandar	24.2	3.0	25.6
Error Estandar	4.2	0.5	4.5
Valor Mínimo	16.4	8.0	7.4
Valor Máximo	105.0	21.2	113.3
Rango	88.6	13.1	105.9
Coef. Var. (%)	48.1	26.3	61.6
ANIONES			
Variable	HCO_3	Cl	SO_4
Tamaño de la muestra	33.0	33.0	33.0
Promedio	257.8	12.1	35.8
Mediana	247.7	9.2	32.1
Moda	183.0	8.2	4.9
Media Geométrica	242.9	10.4	23.8
Varianza	9684.8	48.3	954.8
Desviación Estandar	98.4	6.9	30.9
Error Estandar	17.1	1.2	5.4
Valor Mínimo	134.2	4.6	3.9
Valor Máximo	549.1	25.9	148.9
Rango	414.9	21.3	144.9
Coef. Var. (%)	38.2	57.3	86.3

1988

PARAMETROS ESTADISTICOS DE LOS RESULTADOS QUIMICOS DE LAS MUESTRAS DEL ACUIFERO DEL VALLE DE AGUASCALIENTES, AGS. EN 1988.

CATIONES			
Variable	Ca	Mg	Na
Tamaño de la muestra	33.0	33.0	33.0
Promedio	47.2	6.6	59.9
Mediana	46.5	5.4	57.5
Moda	35.3	6.1	57.5
Media Geométrica	42.5	5.4	54.6
Varianza	456.8	25.9	702.8
Desviación Estandar	21.4	5.1	26.5
Error Estandar	3.7	0.9	4.6
Valor Mínimo	12.4	1.5	24.4
Valor Máximo	101.8	25.0	120.2
Rango	89.4	23.6	95.9
Coef. Var. (%)	45.2	77.6	44.2
ANIONES			
Variable	HCO_3	Cl	SO_4
Tamaño de la muestra	33.0	33.0	33.0
Promedio	263.3	11.3	43.2
Mediana	239.2	8.2	39.9
Moda	277.0	4.6	12.3
Media Geométrica	249.8	9.7	30.6
Varianza	8477.0	44.4	1103.0
Desviación Estandar	92.1	6.7	33.2
Error Estandar	16.0	1.2	5.8
Valor Mínimo	141.6	3.5	6.4
Valor Máximo	530.8	27.3	146.9
Rango	389.3	23.8	140.5
Coef. Var. (%)	34.9	59.0	76.9

1989

PARAMETROS ESTADISTICOS DE LOS RESULTADOS QUIMICOS DE LAS MUESTRAS DEL ACUIFERO DEL VALLE DE AGUASCALIENTES, AGS. EN 1989.

CATIONES			
Variable	Ca	Mg	Na
Tamaño de la muestra	33.0	33.0	33.0
Promedio	48.6	7.1	58.8
Mediana	46.5	6.1	54.5
Moda	52.9	4.6	55.4
Media Geométrica	44.1	6.5	51.1
Varianza	457.3	11.4	1076.1
Desviación Estandar	21.4	3.4	32.8
Error Estandar	3.7	0.6	5.7
Valor Mínimo	14.4	3.7	18.4
Valor Máximo	97.0	21.2	158.9
Rango	82.6	17.5	140.5
Coef. Var. (%)	43.9	47.6	55.8
ANIONES			
Variable	HCO_3	Cl	SO_4
Tamaño de la muestra	33.0	33.0	33.0
Promedio	269.8	12.2	39.5
Mediana	246.5	10.9	34.0
Moda	248.9	4.3	8.4
Media Geométrica	251.8	10.3	26.7
Varianza	12556.6	50.4	1060.3
Desviación Estandar	112.1	7.1	32.6
Error Estandar	19.5	1.2	5.7
Valor Mínimo	133.0	3.9	3.9
Valor Máximo	575.9	28.4	148.9
Rango	442.9	24.5	144.9
Coef. Var. (%)	41.5	58.2	82.3

1993

PARAMETROS ESTADISTICOS DE LOS RESULTADOS QUIMICOS DE LAS MUESTRAS DEL ACUIFERO DEL VALLE DE AGUASCALIENTES, AGS. EN 1993.

CATIONES			
Variable	Ca	Mg	Na
Tamaño de la muestra	61.0	61.0	61.0
Promedio	52.7	7.0	73.2
Mediana	50.4	7.0	70.8
Moda	47.2	3.8	52.9
Media Geométrica	49.2	5.2	67.3
Varianza	395.7	22.5	920.2
Desviación Estandar	19.9	4.7	30.3
Error Estandar	2.5	0.6	3.9
Valor Mínimo	17.5	0.5	20.4
Valor Máximo	105.6	24.0	187.5
Rango	88.1	23.5	167.1
Coef. Var. (%)	37.7	67.5	41.4

ANIONES			
Variable	HCO_3	Cl	SO_4
Tamaño de la muestra	61.0	61.0	61.0
Promedio	331.8	10.3	37.6
Mediana	319.6	8.6	37.0
Moda	298.9	10.6	36.0
Media Geométrica	317.9	8.7	
Varianza	9116.2	66.0	584.2
Desviación Estandar	95.5	8.1	24.2
Error Estandar	12.2	1.0	3.1
Valor Mínimo	114.7	2.5	0.0
Valor Máximo	563.6	55.8	110.0
Rango	448.9	53.3	110.0
Coef. Var. (%)	28.8	78.9	64.3

PARAMETROS ESTADISTICOS

PARAMETROS ESTADISTICOS

AÑOS:

1972
1984
1985
1986
1987
1988
1989
1993

DIAGRAMAS

DE

PIPER

DIAGRAMAS DE PIPER

AÑOS:

1971
1972
1985
1986
1987
1988
1993

1971

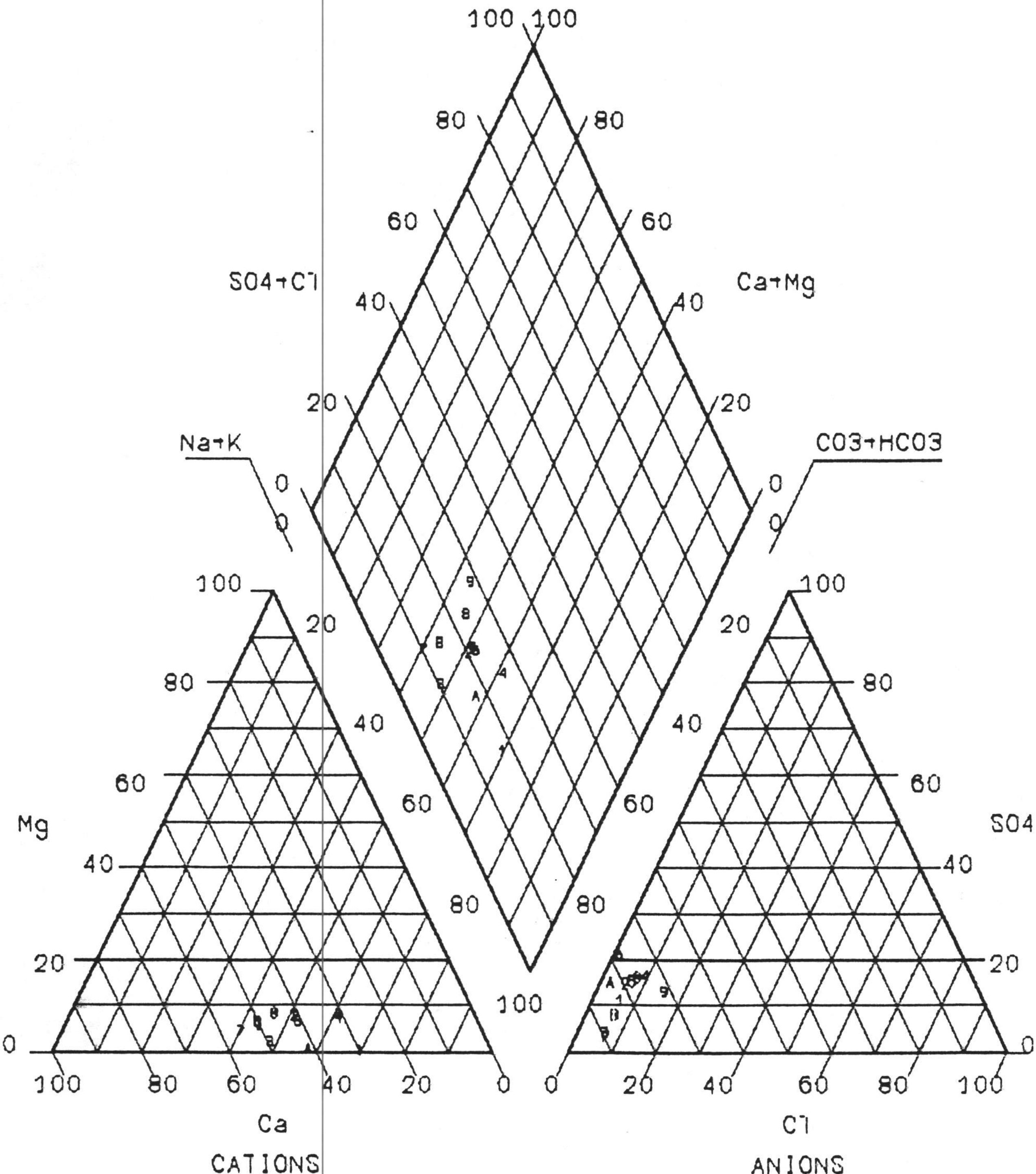
Project : HIDROGEOQUIMICA
Organization : CNA

Label	Seq.No	Sample Identification
1	1	P69-25
2	2	P50-45
3	3	P78-03
4	4	P52-31
5	5	P62-04
6	6	P53-05
7	7	P78-05
8	8	P60-16
9	9	P51-69
A	10	P59-82
B	11	P51-138

ACUIFERO: AGUASCALIENTES, AGS. (071)

Project : HIDROGEOQUIMICA
Organization : CNA

ACUIFERO: AGUASCALIENTES, AGS. (1971)



ACUIFERO: AGUASCALIENTES, AGS. (1971)

1972

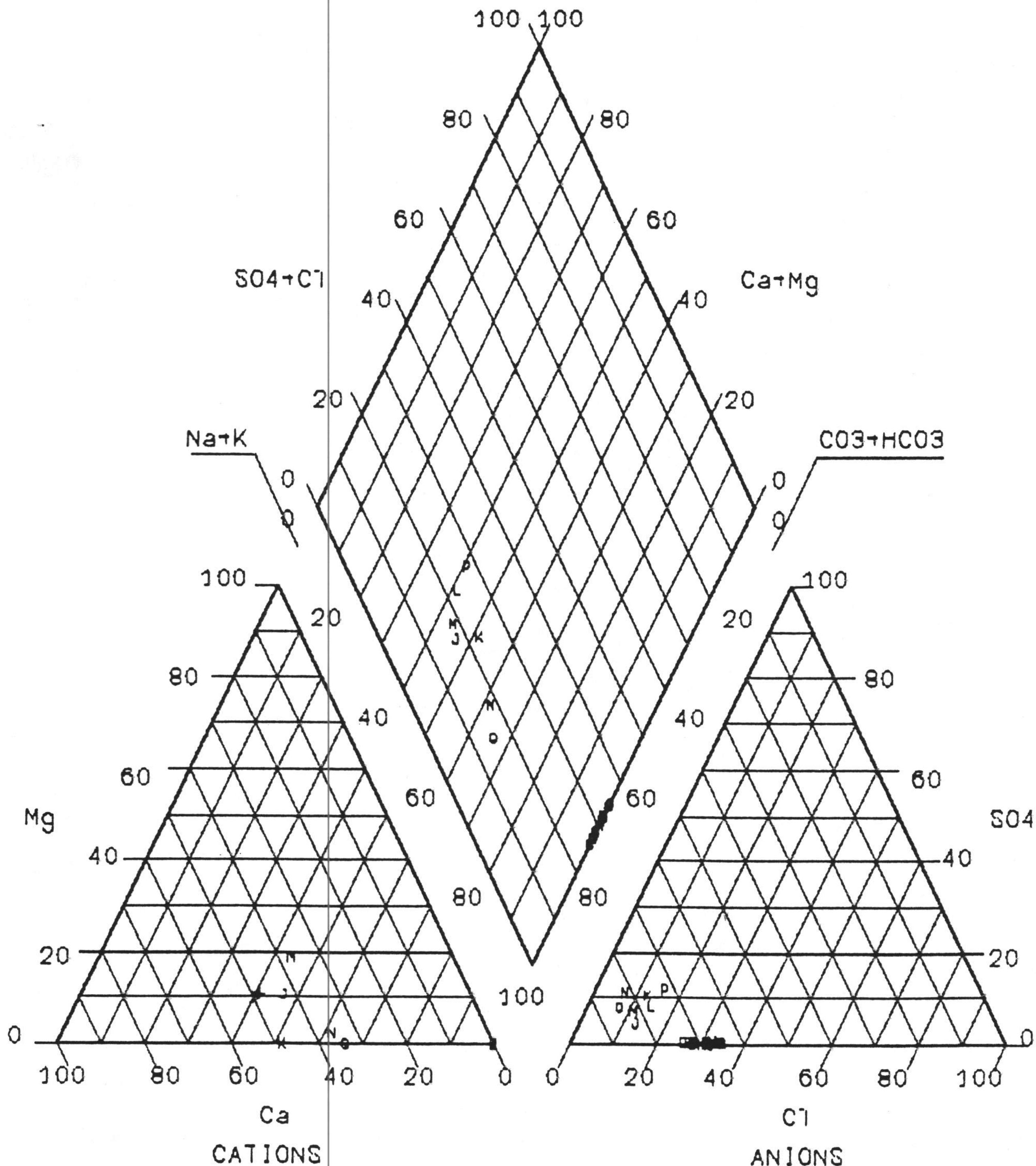
Project : HIDROGEOQUIMICA
Organization : CNA

Label	Seq.No	Sample Identification
1	12	72-1
2	13	72-2
3	14	72-3
4	15	72-4
5	16	72-5
6	17	72-6
7	18	72-7
8	19	72-8
9	20	72-9
A	21	72-10
B	22	72-11
C	23	72-12
D	24	72-13
E	25	72-14
F	26	72-15
G	27	72-16
H	28	72-17
I	29	72-18
J	30	72-VENADEROS
K	31	72-FORTUNATO
L	32	72-LORETITO
M	33	72-COTORRA
N	34	72-CANTERA
P	35	72-JESUS
Q	36	72-VALLADOLID-30

ACUIFERO: AGUASCALIENTES, AGS. (1972)

Project : HIDROGEOQUIMICA
Organization : CNA

ACUIFERO: AGUASCALIENTES, AGS. (1972)



ACUIFERO: AGUASCALIENTES, AGS. (1972)

1985

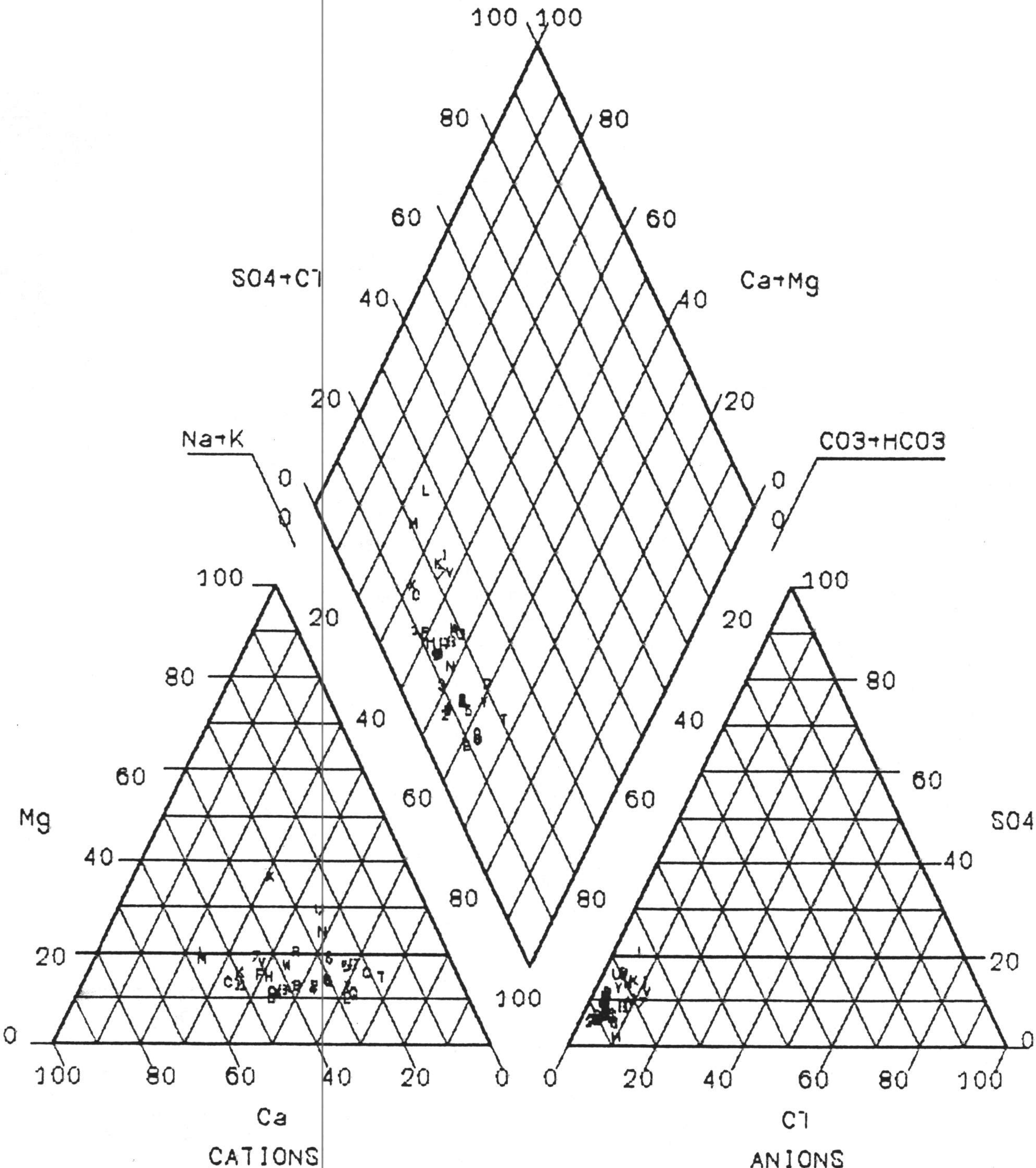
Project : HIDROGEOQUIMICA
Organization : CNA

Label	Seq.No	Sample Identification
1	37	85-MARAVILLAS
2	38	85-VALLADOLID
3	39	58-SAN FCO.ROMO
4	40	85-RINCON ROMOS
5	41	85-COSIO
6	42	85-LAS DELICIAS
7	43	85-SAN ANTONIO TEPEZALA
8	44	85-PABELLON
9	45	85-ENRIQUE
A	46	85-PRIMAVERA/CIR.
B	47	85-COL.SAN PEDRO
C	48	85-RCHO.EL POZO
D	49	85-LAS PALOMAS
E	50	85-MOLINITO
F	51	85-DURAZNILLO
G	52	85-CALVILLITO
H	53	85-RCHO MONTOYA
I	54	85-MA.GALLARDO
J	55	85-JUAREZ
K	56	85-HERMENEGILDO
L	57	85-SAN GIL
M	58	85-TEPEZALA
N	59	85-VENADERO
P	60	85-EL CONEJO
Q	61	85-FATIMA
R	62	85-TAPIAS VIEJAS
S	63	85-BOQUILLA
T	64	85-JARALITO
U	65	85-TADEO
V	66	85-CALVILLO
W	67	85-SALITRE
X	68	85-OJO DE AGUA
Y	69	85-JALTICHE

ACUIFERO: AGUASCALIENTES, AGS. (1985)

Project : HIDROGEOQUIMICA
Organization : CNA

ACUIFERO: AGUASCALIENTES, AGS. (1985)



ACUIFERO: AGUASCALIENTES, AGS. (1985)

1986

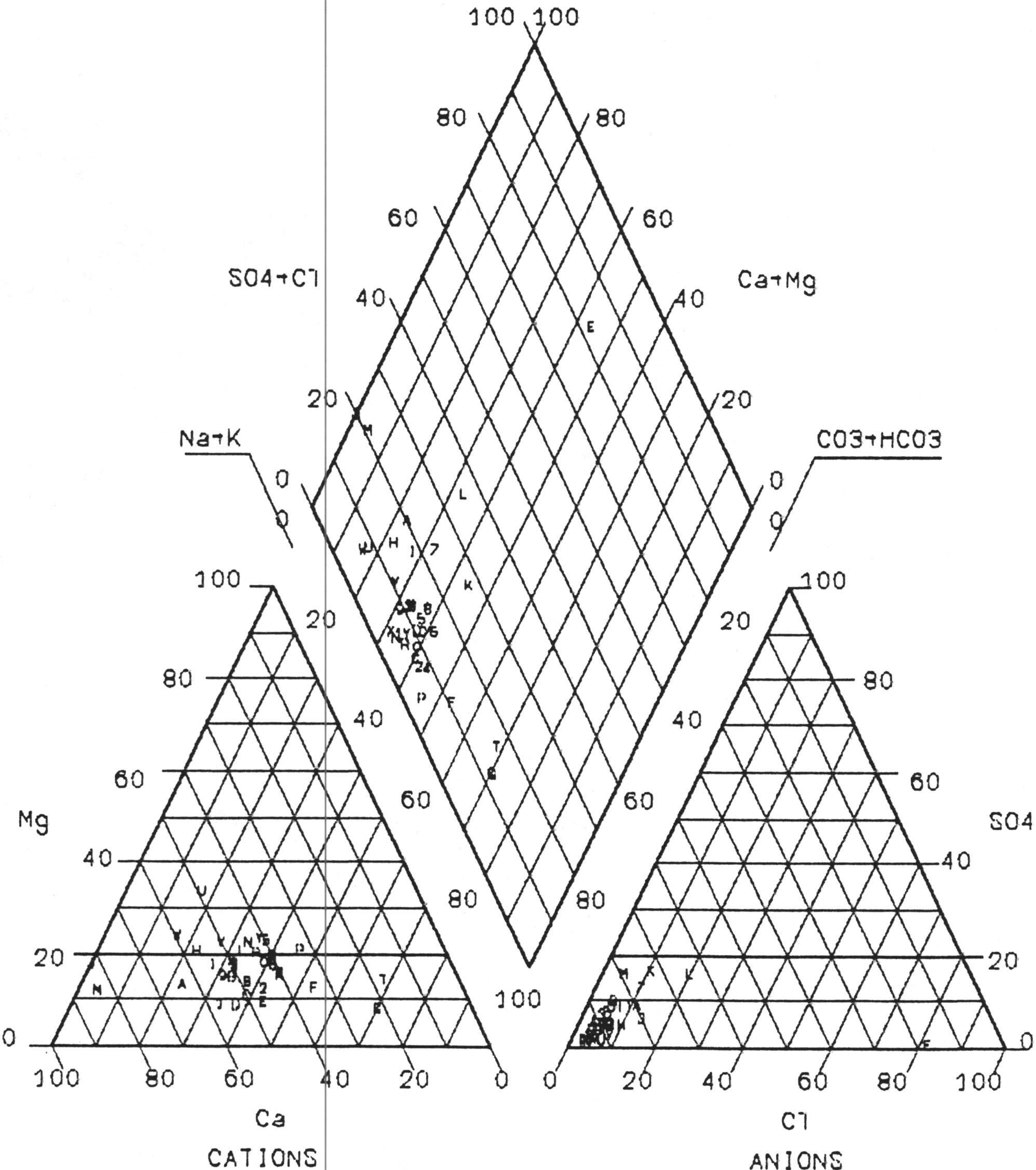
Project : HIDROGEOQUIMICA
Organization : CNA

Label	Seq.No	Sample Identification
1	70	86-MARAVILLAS
2	71	86-VALLADOLID
3	72	86-SAN FCO.ROMO
4	73	86-RINCON ROMOS
5	74	86-COSIO
6	75	86-DELICIAS
7	76	86-TEPEZALA
8	77	86-PABELLON
9	78	86-ENRIQUE
A	79	86-PRIMAVERA Y CIR.
B	80	86-SAN PEDRO
C	81	86-RCHO.POZO
D	82	86-PALOMAS
E	83	86-MOLINITO
F	84	86-DURAZNILLO
G	85	86-CALVILLITO
H	86	86-MONTOYA
I	87	86-GALLARDO
J	88	86-JUAREZ
K	89	86-HERMENEGILDO
L	90	86-GIL
M	91	86-TEPEZALA
N	92	86-VENADERO
P	93	86-CONEJO
Q	94	86-FATIMA
R	95	86-TAPIAS VIEJAS
S	96	86-BOQUILLA
T	97	86-JARALITO
U	98	86-TADEO
V	99	86-CALVILLO
W	100	86-SALITRE
X	101	86-OJO DE AGUA
Y	102	86-JALTICHE

ACUIFERO: AGUASCALIENTES, AGS. (1986)

Project : HIDROGEOQUIMICA
Organization : CNA

ACUIFERO: AGUASCALIENTES, AGS. (1986)



ACUIFERO: AGUASCALIENTES, AGS. (1986)

1987

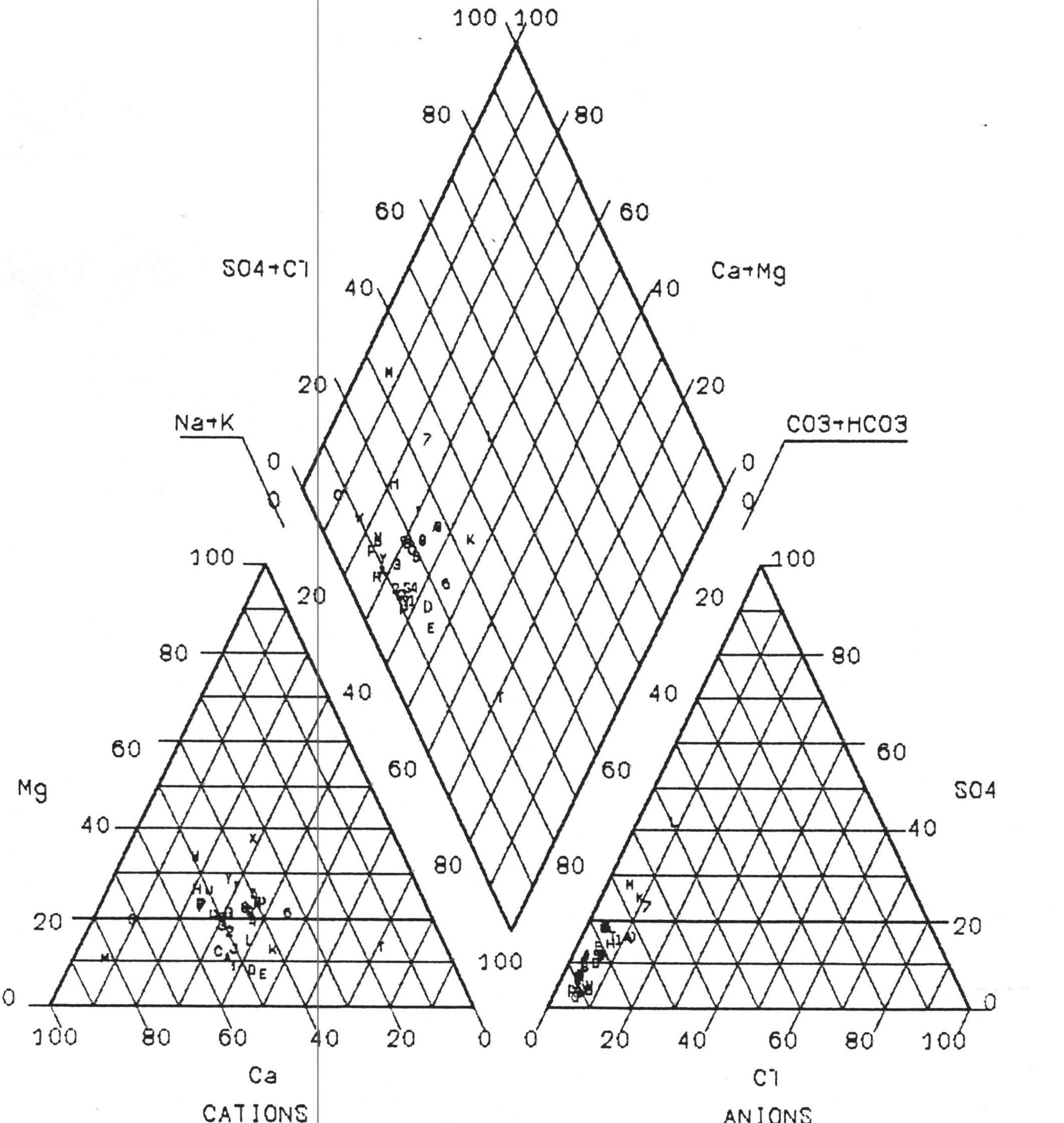
Project : HIDROGEOQUIMICA
Organization : CNA

Label	Seq.No	Sample Identification
1	103	87-MARAVILLAS
2	104	87-VALLADOLID
3	105	87-PCO.ROMO
4	106	87-RINCON ROMOS
5	107	87-COSIO
6	108	87-DELICIAS
7	109	87-TEPEZALA
8	110	87-PABELLON
9	111	87-ENRIQUE
A	112	87-PRIMAVERA
B	113	87-SAN PEDRO
C	114	87-POZO
D	115	87-LAS PALOMAS
E	116	87-MOLINITO
F	117	87-DURAZNILLO
G	118	87-CALVILLITO
H	119	87-MONTOYA
I	120	87-GALLARDO
J	121	87-JUAREZ
K	122	87-HERMENEGILDO
L	123	87-GIL
M	124	87-TEPEZALA
N	125	87-VENADERO
P	126	87-CONEJO
Q	127	87-FATIMA
R	128	87-TAPIAS
S	129	87-BOQUILLA
T	130	87-JARALITO
U	131	87-SAN TADEO
V	132	87-CALVILLO
W	133	87-SALITRE
X	134	87-OJO DE AGUA
Y	135	87-JALTICHE

ACUIFERO: AGUASCALIENTES, AGS. (1987)

Project : HIDROGEOQUIMICA
Organization : CNA

ACUIFERO: AGUASCALIENTES, AGS. (1987)



ACUIFERO: AGUASCALIENTES, AGS. (1987)

1988

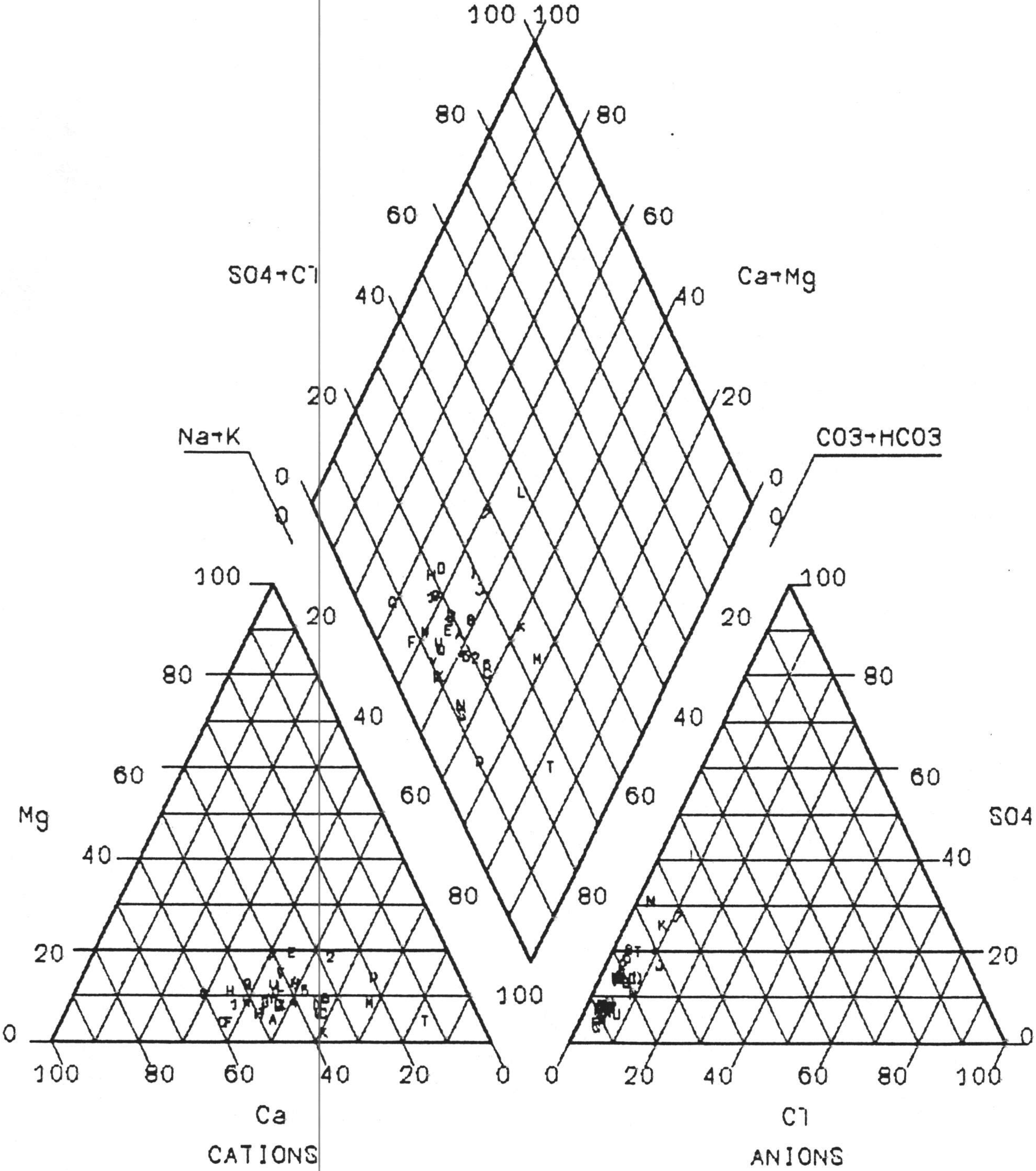
Project : HIDROGEOQUIMICA
Organization : CNA

Label	Seq.No	Sample Identification
1	136	88-MARAVILLAS
2	137	88-VALLADOLID
3	138	88-FCO.ROMO
4	139	88-RINCON ROMOS
5	140	88-COSIO
6	141	88-DELICIAS
7	142	88-TEPEZALA
8	143	88-PABELLON
9	144	88-ENRIQUE
A	145	88-PRIMAVERA Y CIR
B	146	88-SAN PEDRO
C	147	88-EL POZO
D	148	88-PALOMAS
E	149	88-MOLINITO
F	150	88-DURAZNILLO
G	151	88-CALVILLO
H	152	88-MONTOYA
I	153	88-GALLARDO
J	154	88-JUAREZ
K	155	88-HERMENEGILDO
L	156	88-GIL
M	157	88-TEPEZALA
N	158	88-VENADERO
P	159	88-CONEJO
Q	160	88-FATIMA
R	161	88-TAPIAS
S	162	88-BOQUILLA
T	163	88-JARALITO
U	164	88-SAN TADEO
V	165	88-CALVILLO
W	166	88-SALITRE
X	167	88-OJO DE AGUA
Y	168	88-JALTICHE

ACUIFERO: AGUASCALIENTES, AGS. (1988)

Project : HIDROGEOQUIMICA
Organization : CNA

ACUIFERO: AGUASCALIENTES, AGS. (1988)



ACUIFERO: AGUASCALIENTES, AGS. (1988)

1993

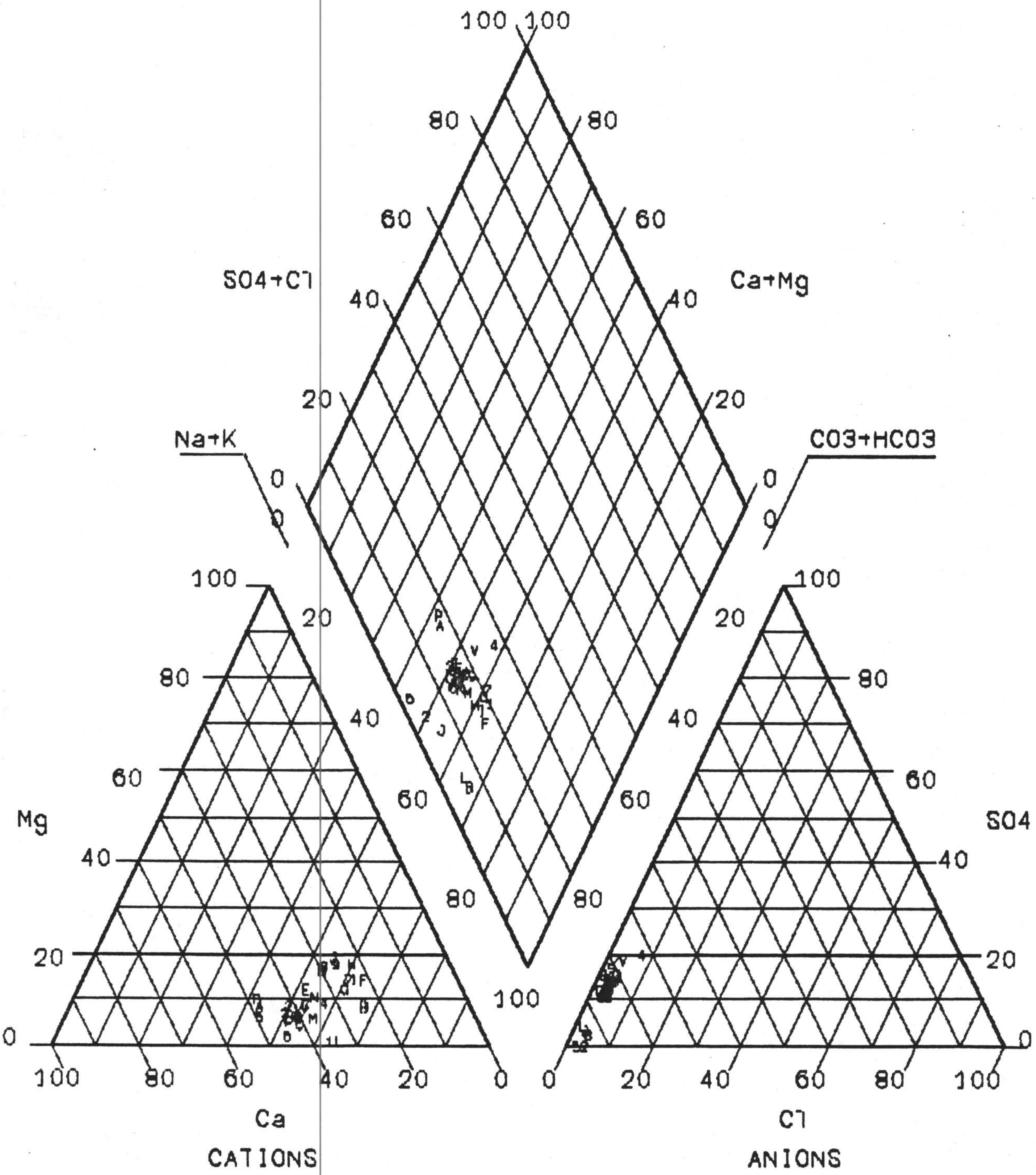
Project : HIDROGEOQUIMICA
Organization : CNA/GAS/SEG

Label	Seq.No	Sample Identification
1	56	1
2	57	2
3	58	3
4	59	4
5	60	5
6	1	6
7	2	7
8	3	8
9	4	9
A	5	10
B	6	11
C	7	12
D	8	13
E	9	14
F	10	15
G	11	16
H	12	17
I	13	18
J	14	19
K	15	20
L	16	21
M	17	22
N	18	23
P	19	24
Q	20	25
R	21	26
S	22	27
T	23	28
U	24	29
V	25	30

ACUIFERO: V. DE AGUASCALIENTES (1993)

1-30

ACUIFERO:V. DE AGUASCALIENTES (1993)



ACUIFERO:V. DE AGUASCALIENTES (1993)

Project : HIDROGEOQUIMICA
Organization : CNA/GAS/SEG

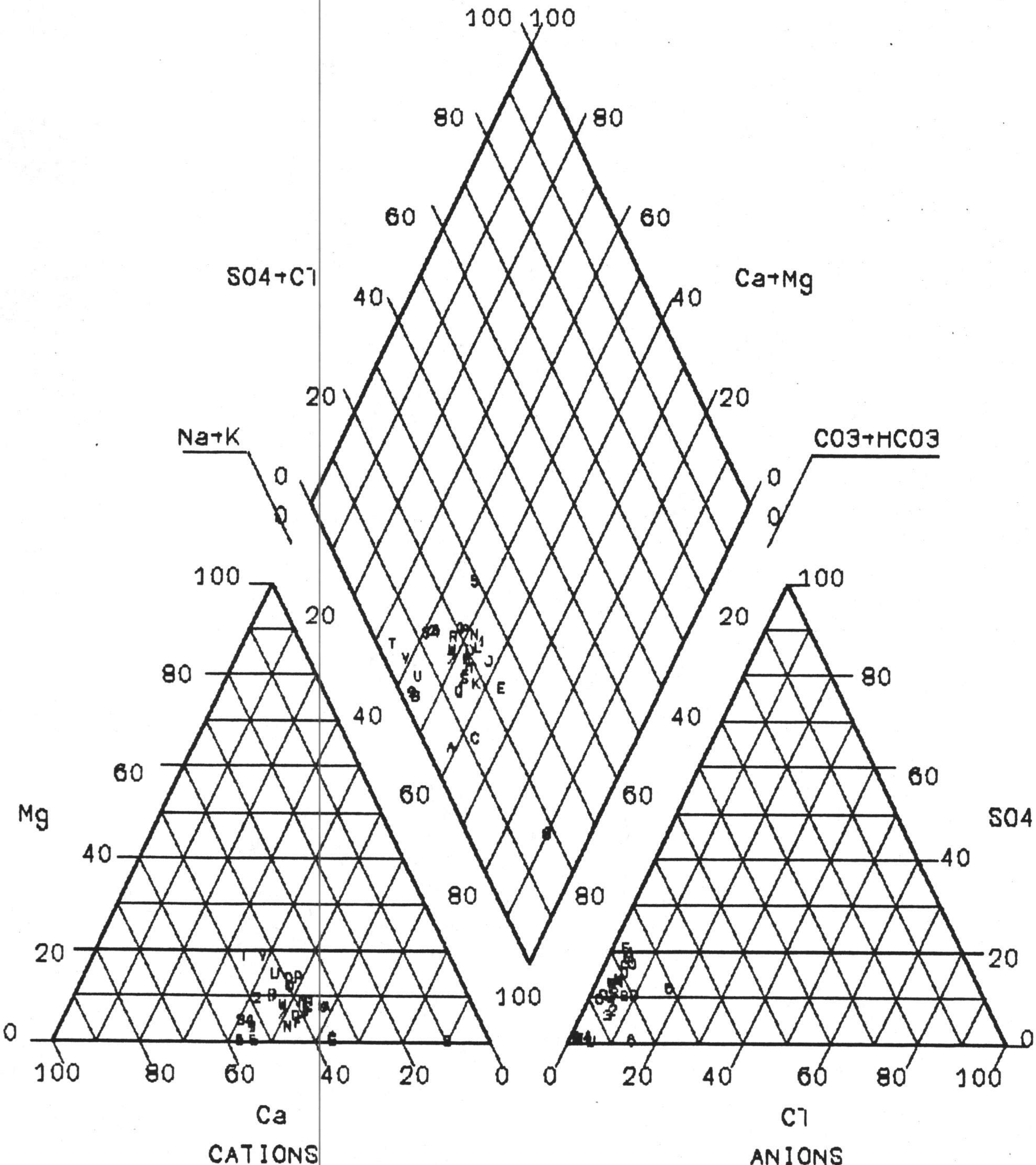
Label	Seq.No	Sample Identification
1	26	31
2	27	32
3	28	33
4	29	34
5	30	35
6	31	36
7	32	37
8	33	38
9	34	39
A	35	40
B	36	41
C	37	42
D	38	43
E	39	44
F	40	45
G	41	46
H	42	47
I	43	48
J	44	49
K	45	50
L	46	51
M	47	52
N	48	53
P	49	54
Q	50	55
R	51	56
S	52	58
T	53	59
U	54	60
V	55	61
W	61	57

ACUIFERO: V. DE AGUASCALIENTES (1993)

Project : HIDROGEOQUIMICA
Organization : CNA/GAS/SEG

31-61

ACUIFERO: V. DE AGUASCALIENTES (1993)



ACUIFERO: V. DE AGUASCALIENTES (1993)

DIAGRAMAS

DE

WILCOX

DIAGRAMAS DE WILCOX

AÑOS:

1993

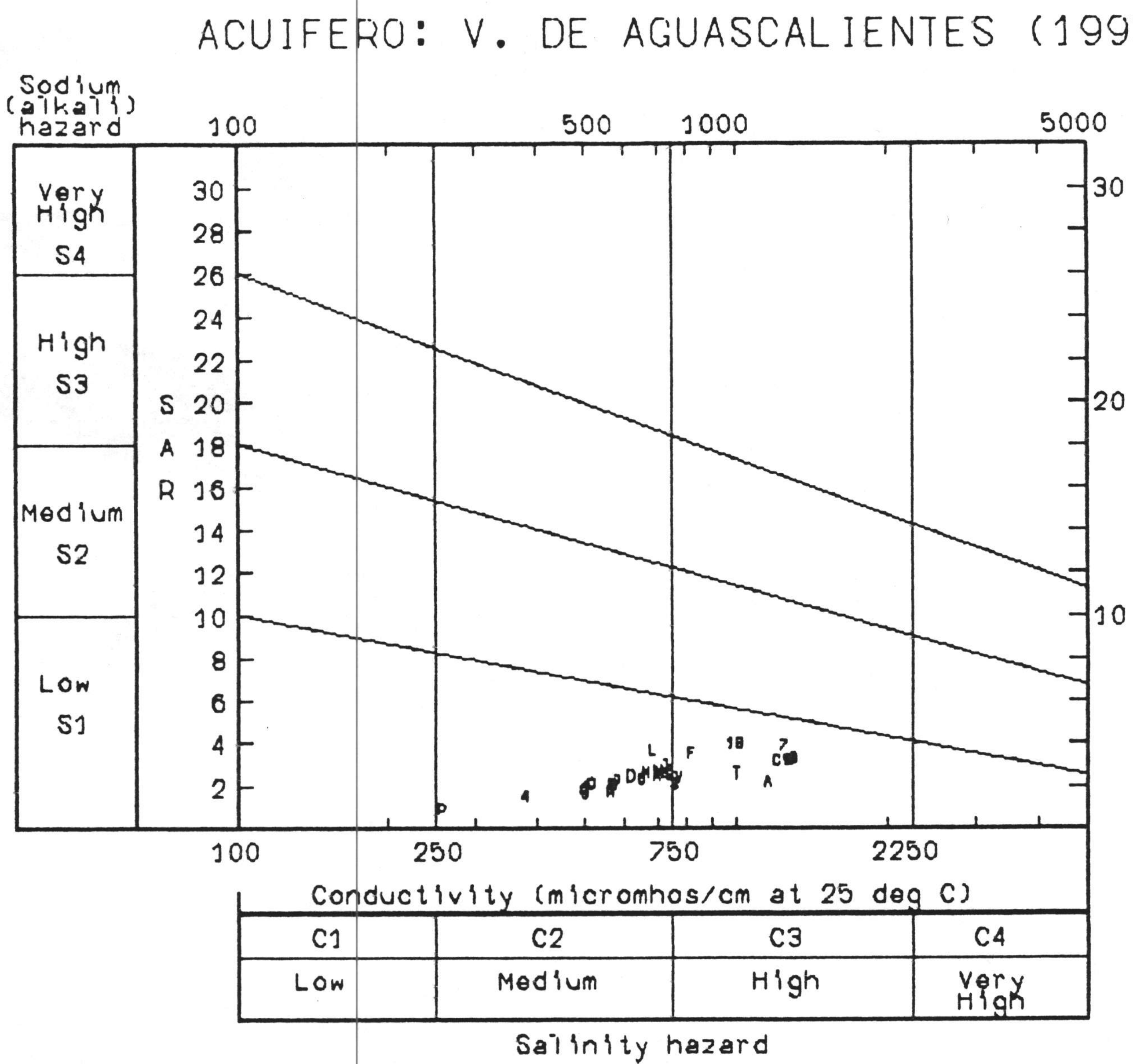
1993

Project : HIDROGEOQUIMICA
Organization : CNA/GAS/SEG

Label	Seq.No	Sample Identification
1	56	1
2	57	2
3	58	3
4	59	4
5	60	5
6	1	6
7	2	7
8	3	8
9	4	9
A	5	10
B	6	11
C	7	12
D	8	13
E	9	14
F	10	15
G	11	16
H	12	17
I	13	18
J	14	19
K	15	20
L	16	21
M	17	22
N	18	23
P	19	24
Q	20	25
R	21	26
S	22	27
T	23	28
U	24	29
V	25	30

ACUIFERO: V. DE AGUASCALIENTES (1993)

1-20



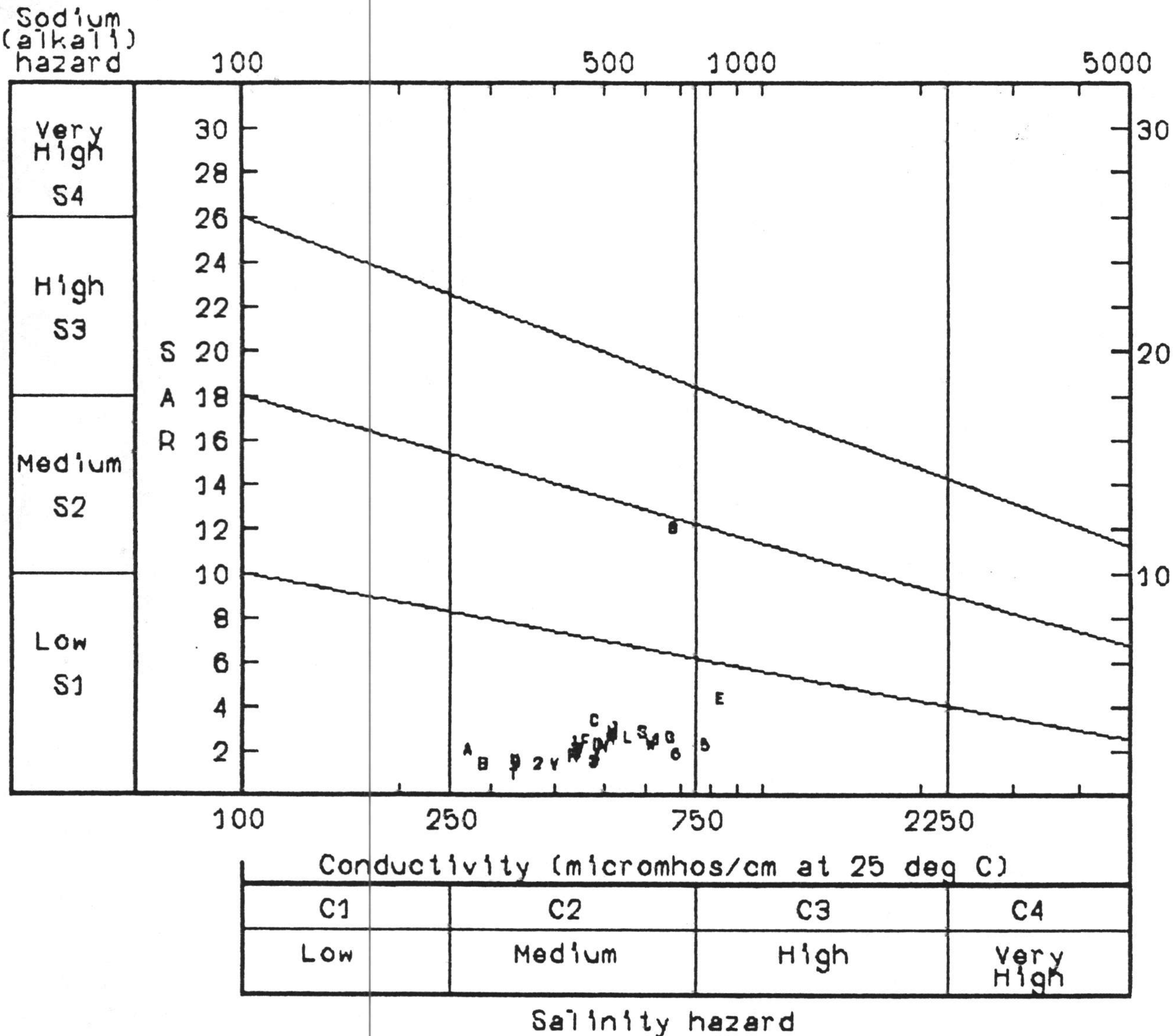
ACUIFERO: V. DE AGUASCALIENTES (1993)

Project : HIDROGEOQUIMICA
Organization : CNA/GAS/SEG

Label	Seq.No	Sample Identification
1	26	31
2	27	32
3	28	33
4	29	34
5	30	35
6	31	36
7	32	37
8	33	38
9	34	39
A	35	40
B	36	41
C	37	42
D	38	43
E	39	44
F	40	45
G	41	46
H	42	47
I	43	48
J	44	49
K	45	50
L	46	51
M	47	52
N	48	53
P	49	54
Q	50	55
R	51	56
S	52	58
T	53	59
U	54	60
V	55	61
W	61	57

ACUIFERO: V. DE AGUASCALIENTES (1993)

ACUIFERO: V. DE AGUASCALIENTES (199



ACUIFERO: V. DE AGUASCALIENTES (1993)

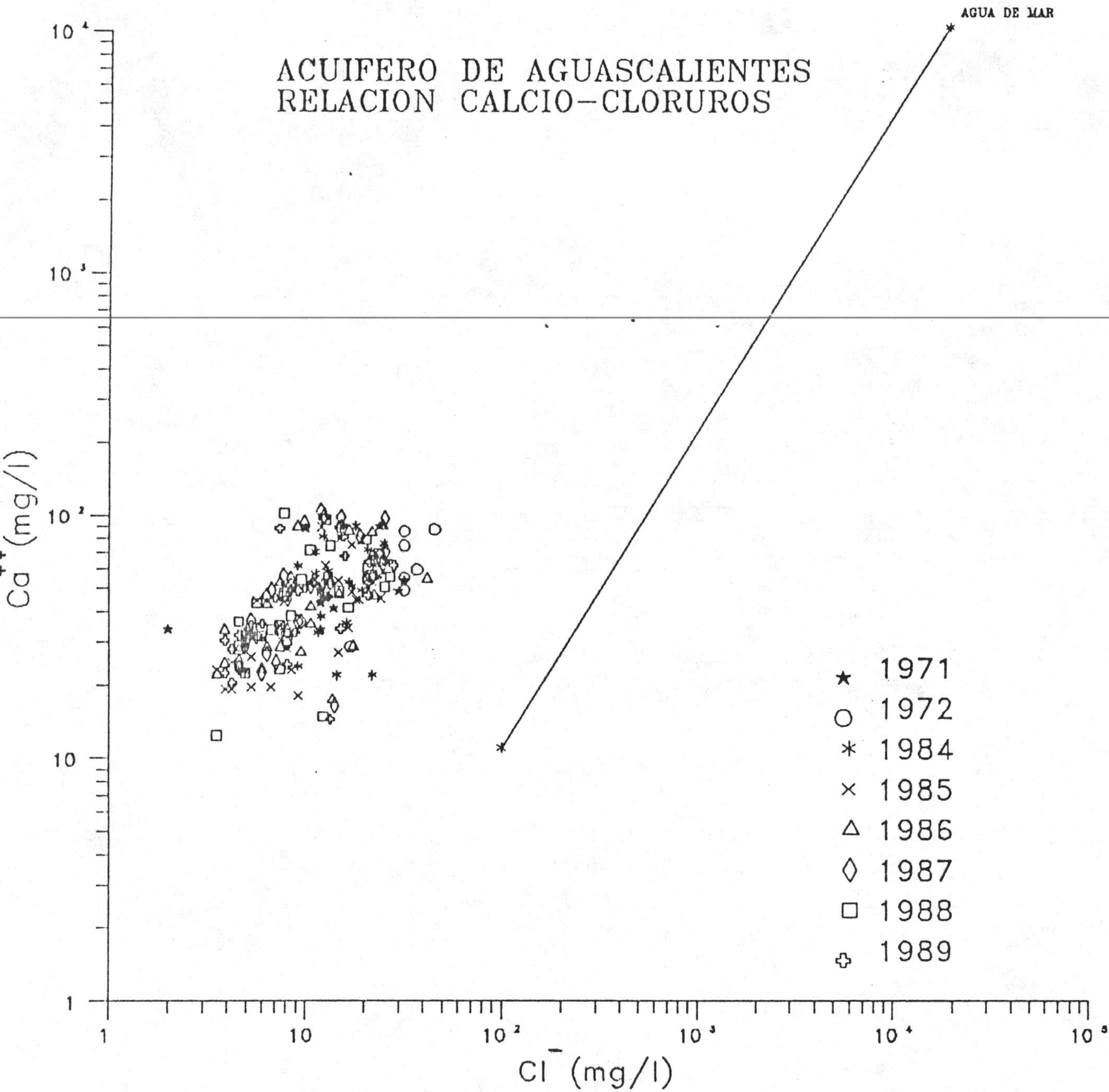
GRAFICAS DE

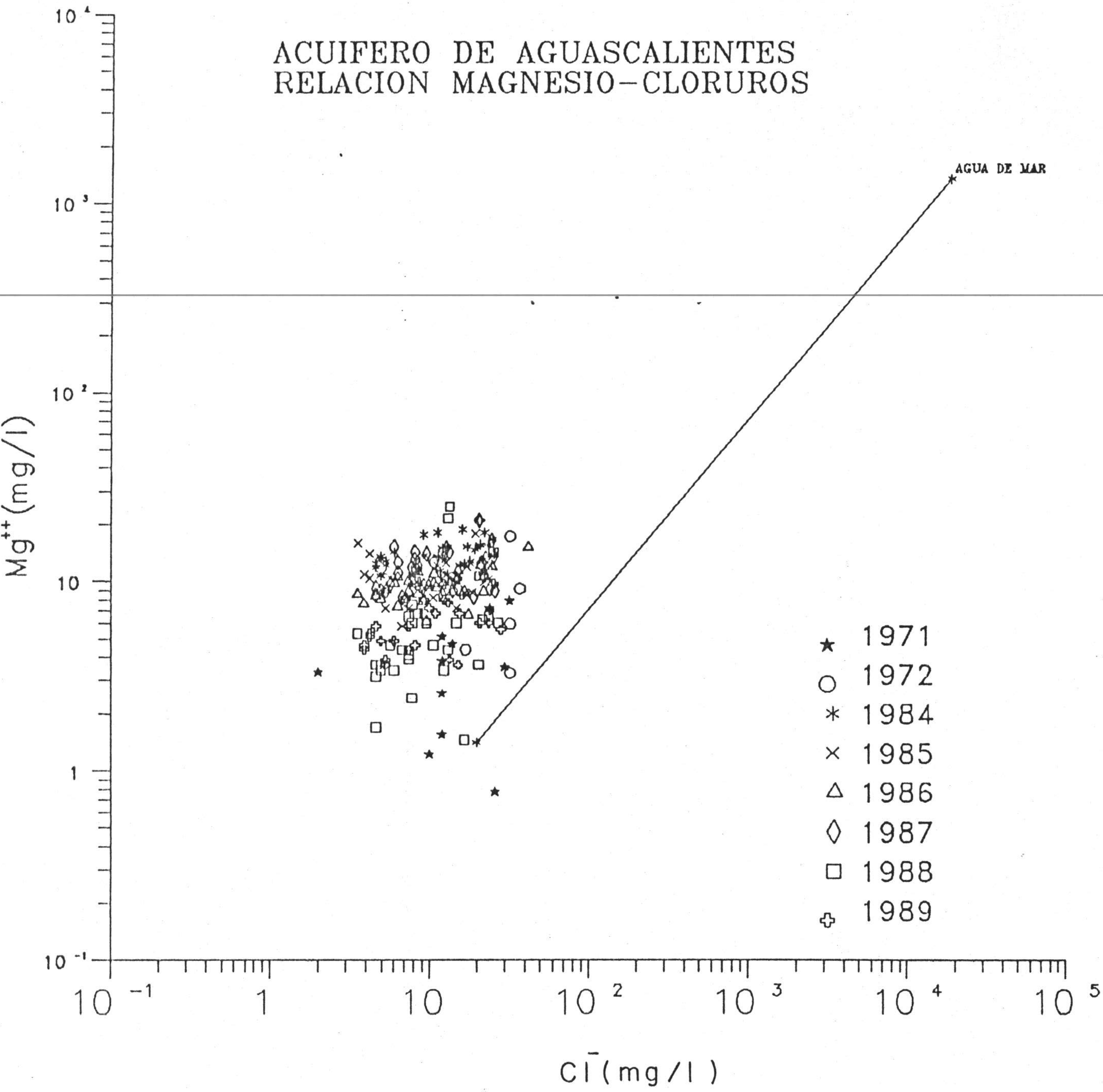
IONES PRINCIPALES
VS.
CLORUROS

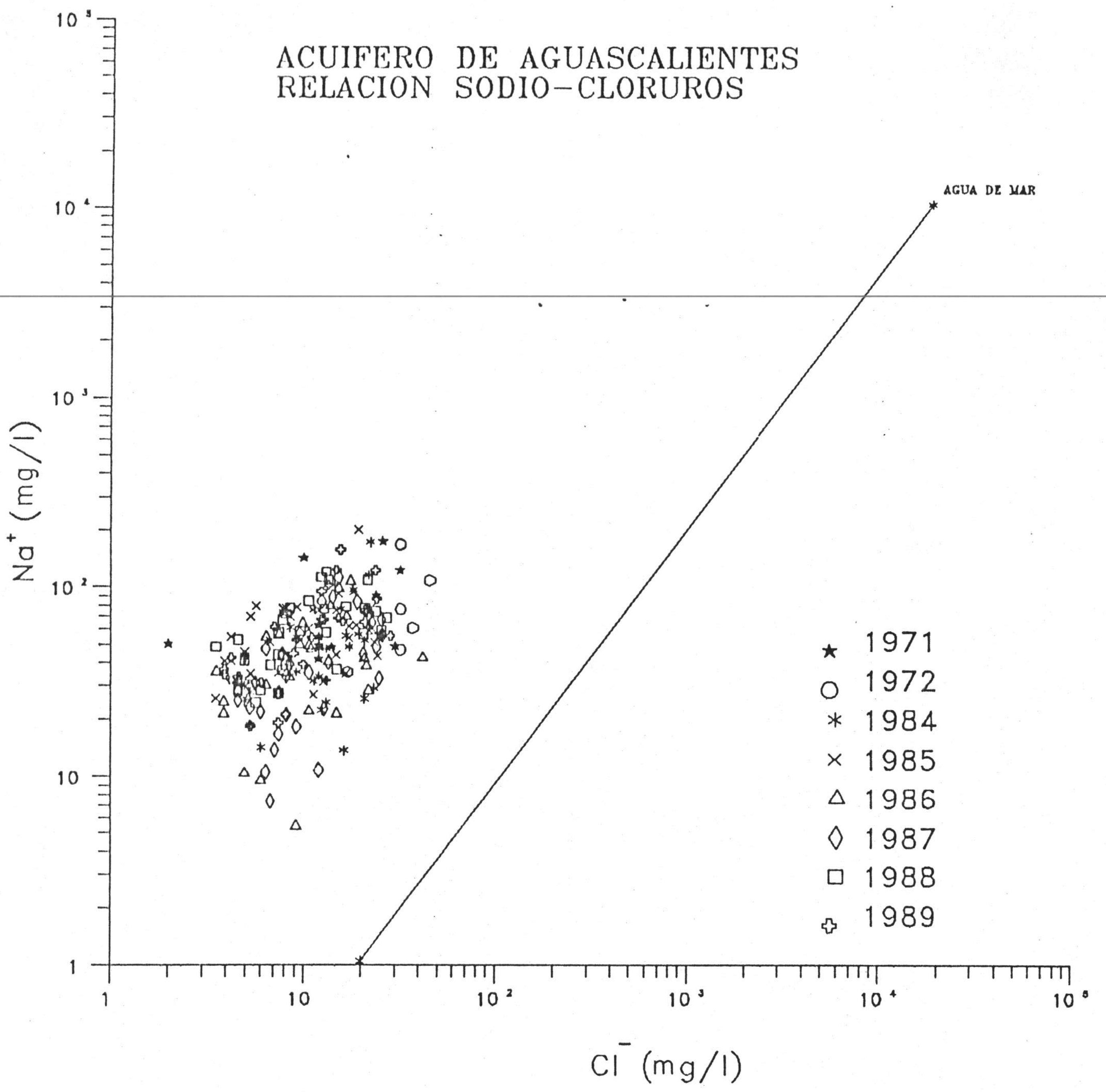
GRAFICAS DE RELACIONES IONICAS

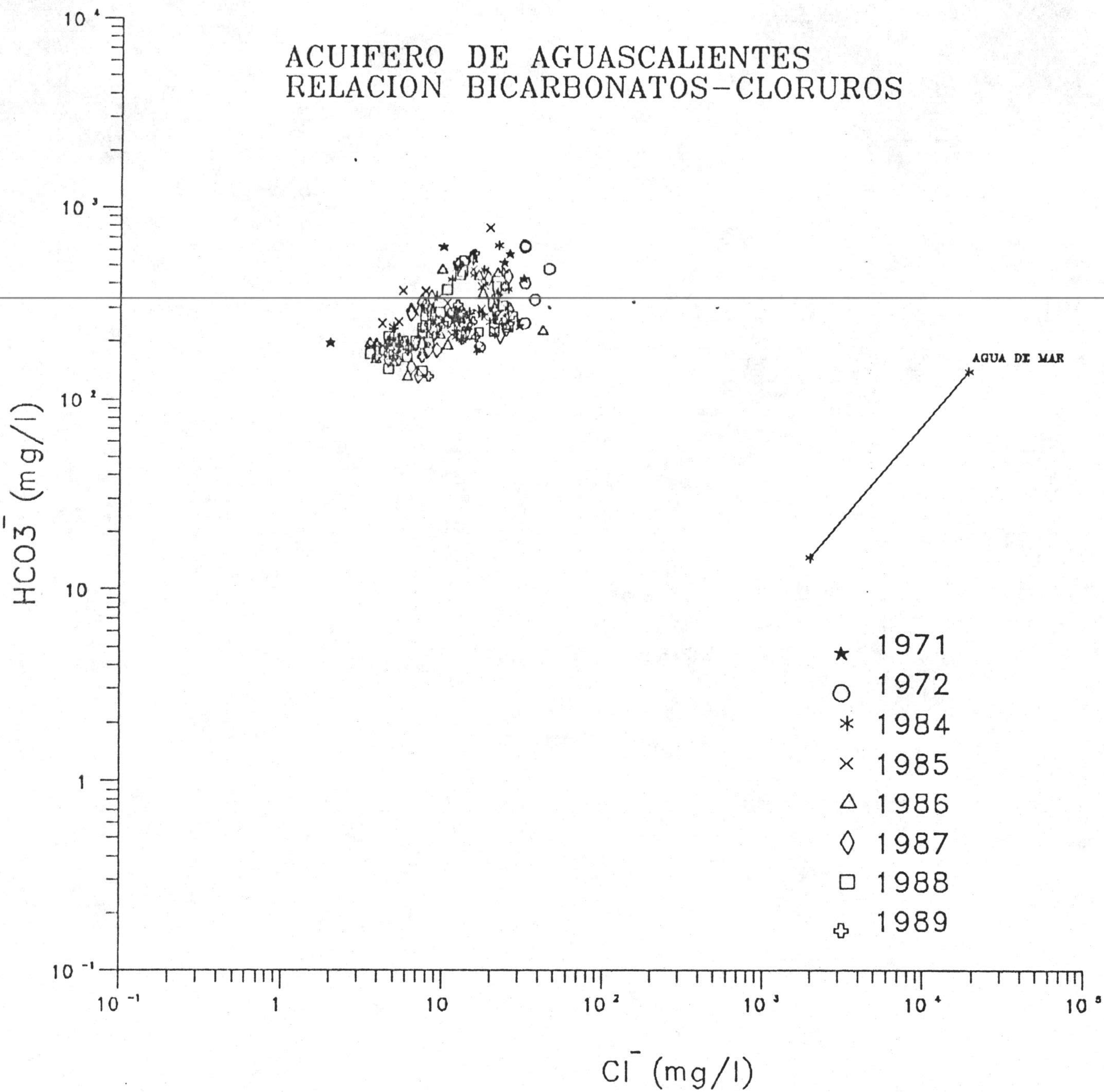
AÑOS:

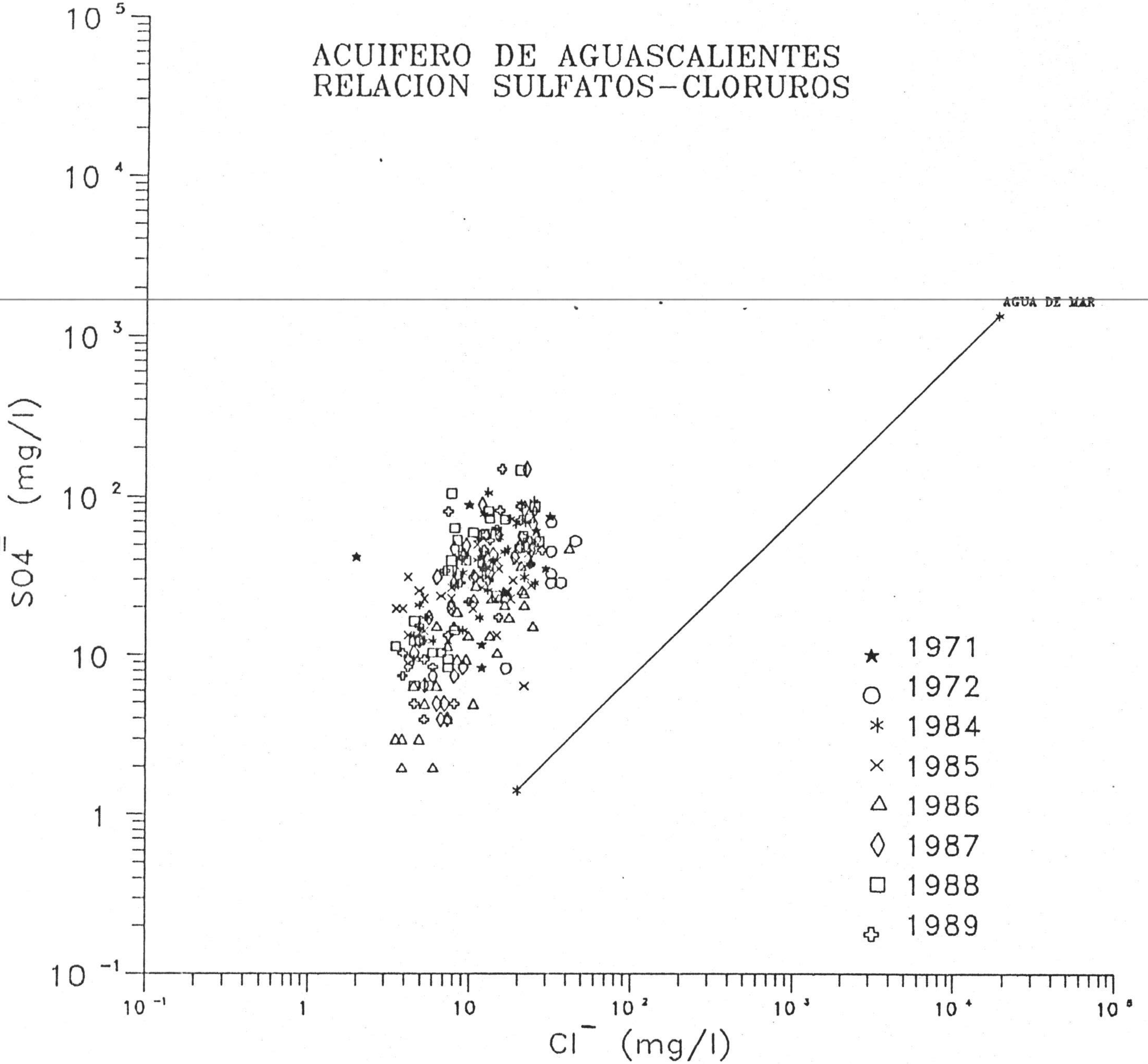
1971
1972
1984
1985
1986
1987
1988
1989
1993


ACUIFERO DE AGUASCALIENTES
RELACION CALCIO-CLORUROS
AGUA DE MAR
Ca^{++} (mg/l)
10^4
10^3
10^2
10
1
1
10
10^2
10^3
10^4
10^5
Cl^- (mg/l)
1971
1972
1984
1985
1986
1987
1988
1989

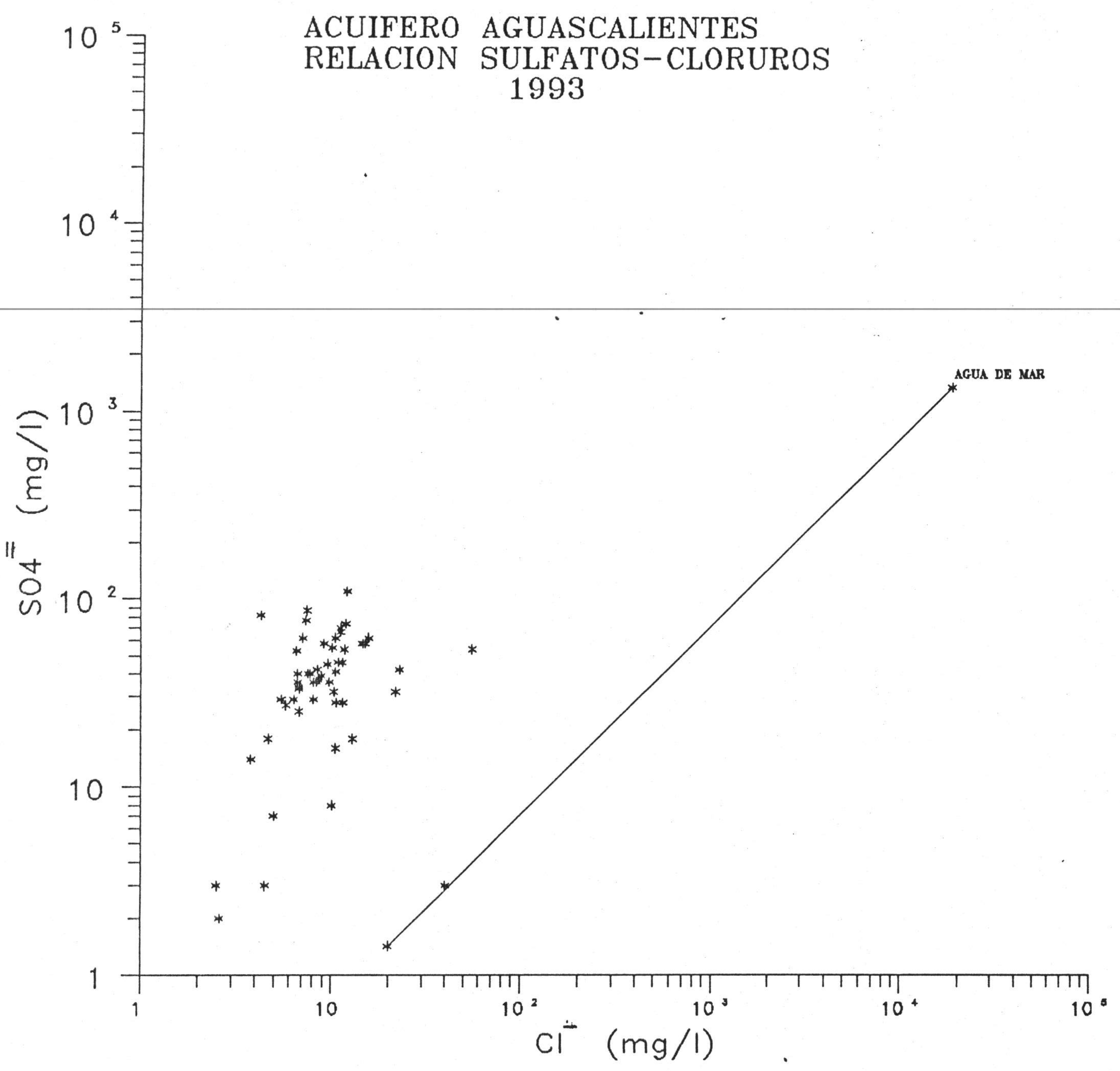

ACUIFERO DE AGUASCALIENTES
RELACION MAGNESIO-CLORUROS
AGUA DE MAR
Mg^{++}(mg/l)
Cl^{-}(mg/l)
1971
1972
1984
1985
1986
1987
1988
1989
10^{-1}
1
10
10^{2}
10^{3}
10^{4}
10^{5}


ACUIFERO DE AGUASCALIENTES
RELACION SODIO-CLORUROS
AGUA DE MAR
1971
1972
1984
1985
1986
1987
1988
1989
Na^+ (mg/l)
Cl^- (mg/l)
1
10
10^2
10^3
10^4
10^5


ACUIFERO DE AGUASCALIENTES
RELACION BICARBONATOS-CLORUROS
AGUA DE MAR
1971
1972
1984
1985
1986
1987
1988
1989
HCO_3^- (mg/l)
Cl^- (mg/l)
10^{-1}
1
10
10^2
10^3
10^4
10^5

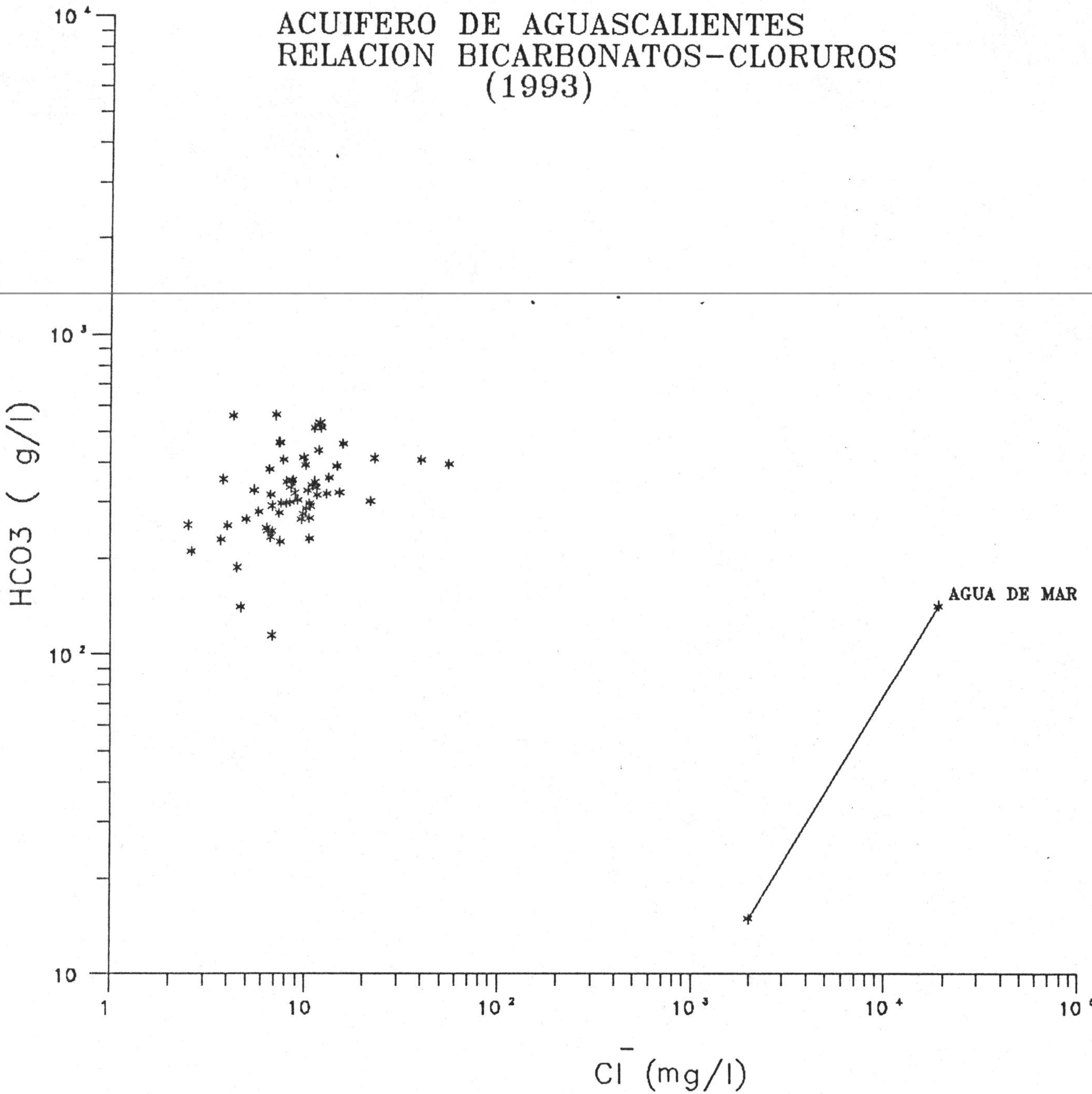

ACUIFERO DE AGUASCALIENTES
RELACION SULFATOS-CLORUROS
AGUA DE MAR
1971
1972
1984
1985
1986
1987
1988
1989
$SO_4^{=}$ (mg/l)
Cl^{-} (mg/l)
10^{-1}
1
10
10^2
10^3
10^4
10^5

1993

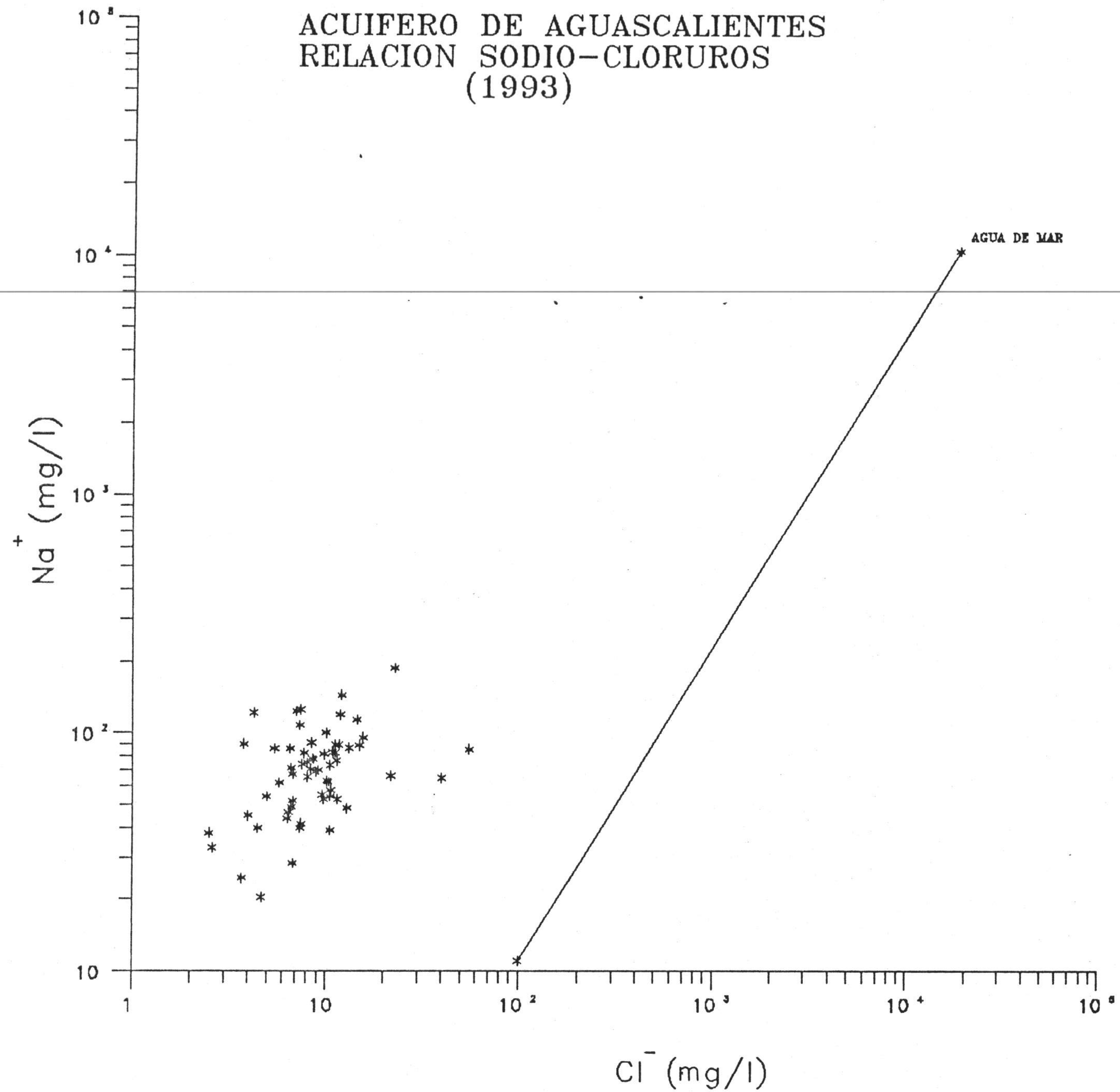


ACUIFERO AGUASCALIENTES
RELACION SULFATOS-CLORUROS
1993
AGUA DE MAR
SO4= (mg/l)
Cl- (mg/l)
1
10
10 2
10 3
10 4
10 5

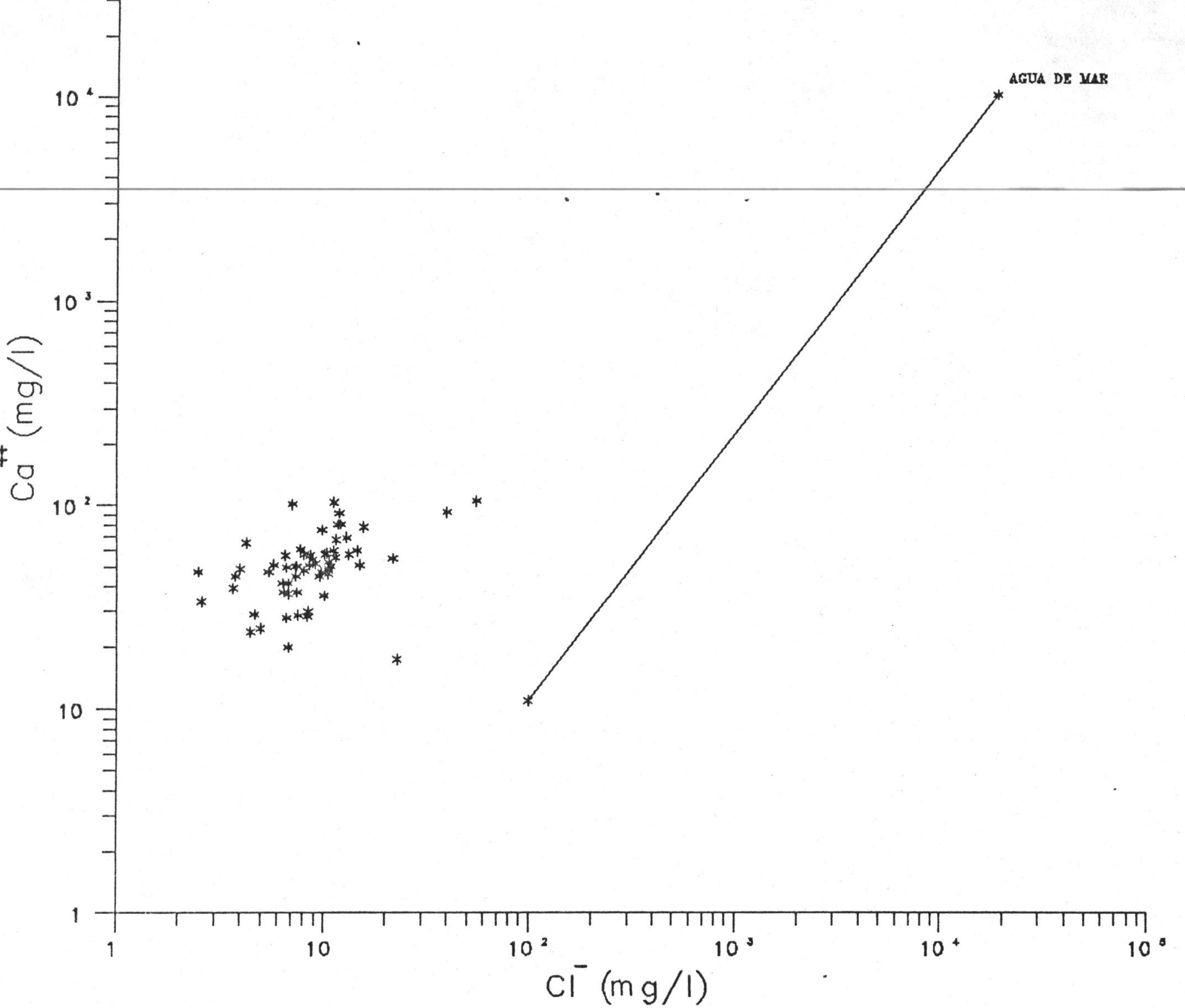
ACUIFERO DE AGUASCALIENTES
RELACION BICARBONATOS-CLORUROS
(1993)



ACUIFERO DE AGUASCALIENTES
RELACION SODIO-CLORUROS
(1993)



ACUIFERO DE AGUASCALIENTES
RELACION CALCIO-CLORUROS
(1993)



TECNICAS DE LABORATORIO

METODOS DE ANALISIS QUIMICOS DE AGUA PARA IONES MAYORITARIOS

METODOS DE ANALISIS QUIMICOS DE AGUA PARA IONES MAYORITARIOS

TEMPERATURA

Fundamento: es un parámetro que nos permite determinar si la corriente de agua subterránea pasa a través de medios que modifiquen la cantidad de iones presentes en el agua, esto debido a que en las zonas con alta actividad volcánica o en donde se presentan fallas fuertes en el terreno, la temperatura se incrementa y aumenta la solubilidad de los minerales.

Reactivos y Aparatos:

Se utiliza un termómetro digital o de mercurio con escala de 20 a 150 ^{o}C y división mínima de 1 ^{o}C.

Técnica

Esta prueba se hace in situ debido a que la temperatura se afecta muy rápidamente por las condiciones del medio ambiente.

Se introduce el termómetro inmediatamente en el barril de muestreo y se toma la lectura en cuanto se estabiliza con una diferencia de ± 1 ^{o}C.

CONDUCTIVIDAD

Fundamento: su valor se reporta en mohs/cm y en el caso del agua, cuya conductividad es normalmente muy baja, se reporta en micromohs/cm. La conductividad es el recíproco de la resistencia y nos indica la movilidad o facilidad que tiene la corriente eléctrica de circular a través de un medio. En el caso de las soluciones depende de la concentración total de las substancias ionizadas, de su naturaleza y de la temperatura.

Aparatos y reactivos

Un conductivímetro

Un electrodo de temperatura

Una celda de conductividad

Técnica

En una muestra de 100 ml se introduce una barra magnética y se lleva a un agitador magnético, se introduce la celda de conductividad y el electrodo de temperatura, cuando se estabiliza la lectura de conductividad se anota el valor desplegado. En el caso de no contar con un conductivímetro que corrija el valor de conductividad respecto a la temperatura se deberá registrar el valor obtenido de temperatura de la muestra y calcular el valor correspondiente al factor para corregir el valor de conductividad registrada.

POTENCIAL HIDROGENO (pH)

Fundamento: al poner en contacto 2 soluciones de diferente concentración de iones hidrógeno, se establece una fuerza electromotriz; si una de las soluciones tiene una concentración de iones conocida, por medio de la fuerza electromotriz producida se puede conocer el pH de otra solución (solución - problema), ya que esta fuerza electromotriz es proporcional al pH de la solución problema.

Aparatos y reactivos

Un potenciómetro o pH metro

Un electrodo de referencia // vidrio

Un censor de temperatura

Solución standard de pH 4

Solución standard de pH 7

Técnica

A) Calibración: sumergir el electrodo de referencia de vidrio, en la solución standard de pH 7 y ajustar que el pH metro para que despliegue ese valor.

B) Sumergir el electrodo de referencia de vidrio previamente enjuagado con agua destilada, en la solución de pH 4 y hacer el ajuste de pendiente (slope) en el pH metro para que muestre el valor de pH de la solución standard.

C) Repetir paso 1 y 2 hasta que no exista variación en las lecturas de pH metro.

Determinación de pH en la muestra

1) Tomar una muestra de 100 ml, agregar una barra magnética y llevarla a un agitador.

2) Introducir el electrodo de referencia de vidrio y censor de temperatura.

3) Esperar a que el electrodo alcance el equilibrio (de 30 a 60 seg.) y tomar la lectura.

4) Sacar el electrodo y enjuagar con agua destilada.

ALCALINIDAD

Fundamento: se basa en medir la diferencia de potencial de los electrodos que se sumergen en una solución como pH. Se utiliza un electrodo de vidrio como electrodo indicador, ya que su potencial varia dependiendo del pH de la solución y otro electrodo de calomen usado como referencia; este último electrodo no varia su potencial. La diferencia de potencial de estos electrodos es una función lineal del pH de la solución.

Aparatos y reactivos

Potenciómetro

Agitador magnético

Termómetro

Solución de ácido sulfúrico 0.02 normal

Una bureta

Vasos de precipitado

Técnica

Transferir 100 ml de la muestra a un vaso de precipitado, sumergir los electrodos y la barra magnética en la muestra. Indicar la agitación y añadir una solución valorada de ácido sulfúrico 0.02 normal con la bureta. Tomar la lectura del volumen utilizado para llegar a un pH de 8.3, si es que la muestra tiene un pH mayor a este valor, y un pH de 4.5.

Para calcular la alcalinidad como carbonato de calcio en ml. por litro se usa la siguiente fórmula:

$$\text{Alcalinidad total} = \frac{Vi \times Ni \times 50 \times 1000}{100}$$

Donde:

Vi = volumen de ácido sulfúrico para llegar a un pH de 4.5 y pH de 8.3
(tomados por separado)

Ni = normalidad de ácido sulfúrico

50 = peso equivalente de $CaCO_3$

1000 = conversión a miligramos/litro

100 = volumen de muestra

DUREZA

Fundamento : la dureza del agua se debe principalmente a la presencia de iones de calcio y magnesio. Este tipo de agua presenta dificultades para hacer espuma y representa ciertos riesgos a la industria, ya que pueden formarse sedimentos que obstruyen tuberías en equipos que manejan alta presión. La determinación de la dureza se efectúa mediante la valoración volumétrica tanto del calcio como del magnesio y la suma de ambos constituyen la dureza total.

Aparatos y reactivos

Un potenciómetro
Un agitador magnético
Un matraz Erlenmeyer
Solución valorada de EDTA
Murexide
Solución amortiguadora de pH 10
Indicador eriocromo negro T
Solución de NaOH 1 normal

Técnica

Dureza de Calcio

1) En un matraz Erlenmeyer colocar 50 ml de muestra.

2) Agregar 2 ml de NaOH 1 normal.

3) Agregar una pizca de murexide.

4) Agitar y titular con EDTA valorado, hasta alcanzar un vire de rosa a violeta claro.

5) Calcular la dureza de calcio de acuerdo con la siguiente fórmula:

$$\text{Dureza de calcio} = \frac{V \times 1000 \times F}{\text{ml de muestra}}$$

Donde:

V = volumen de EDTA utilizado
F = concentración de EDTA miligramos de $CaCO_3$/mililitro de titulador
1000 = conversión a ml por litro

Dureza total

1) En un matraz Erlenmeyer se coloca 50 ml de muestra.

2) Se agrega 2 ml de solución amortiguadora de pH de 10.

3) Agregar un poco de eriocromo negro T.

4) Agitar y titular con EDTA valorado hasta alcanzar un vire azul.

5) Calcular la dureza total de acuerdo a la siguiente fórmula:

$$\text{Dureza total} = \frac{V \times 1000 \times F}{\text{ml de muestra}}$$

CLORUROS

Fundamento : su determinación se basa en la formación de un complejo color violáceo del nitrato de mercurio con la difenil carbazona. Con una solución valorada de nitrato mercúrico se determina la cantidad necesaria para capturar todos los cloruros e inmediatamente se observa la formación del complejo color violáceo. En ese momento se anota el volumen utilizado de solución de nitrato mercúrico y se calcula la concentración de cloruros en el agua.

Aparatos y reactivos

Una bureta

Un potenciómetro

Agitador magnético

Solución valorada de nitrato de mercurio

Difenil carbazona

Técnica

1) Tomar una muestra de 100 ml de una alicuota diluida a 100 ml.

2) Agregar 0.5 gr de difenil carbazona.

3) Valorar con una solución de nitrato de mercurio hasta el vire de amarillo paja a rosa pálido.

4) Calcular la concentración de cloruros bajo la siguiente fórmula:

$$\text{ml de } Cl^- = \frac{\text{Volumen 1} \times \text{Normalidad 1} \times 35.45 \times 1000}{\text{Volumen de muestra}}$$

Donde:

Volumen 1 = volumen de solución de nitrato de mercurio empleado

Normalidad 1 = normalidad del nitrato mercúrico

35.45 = peso equivalente del cloro

1000 = conversión de miligramos a litro

SULFATOS

Fundamento (método turbidimétrico) : este método se utiliza para concentraciones de hasta 60 ml por litro de sulfatos. El ion sulfato se precipita en medio ácido con cloruros de bario, para formar cristales de sulfato de bario en una suspensión, cuya absorbencia es proporcional a la concentración del mismo en la solución, esta concentración se determina comparándola con una curva de calibración.

Aparatos y reactivos

Agitador magnético
Papel filtro del No. 40
Espectrofótometro
Bureta
Matraz Elenmeyer de 250 ml
Embudos de filtración
Pipetas volumétricas de 5 ml
Pipetas volumétricas de 10 ml
Pipetas volumétricas de 20 ml
Pipetas volumétricas de 25 ml
Pipetas volumétricas de 50 ml
Matraz aforado de 100 ml
Matraz aforado de 1000 ml
Vasos de precipitados de 150 ml
Probeta de 500 ml
Espátula
Solución patrón de sulfato de sodio

Técnica

1) Si la muestra es colorida o turbia, filtrar con carbón activado a través de papel filtro hasta obtener 110 ml de muestra.

2) Colocar en matraces aforados de 100 ml, 0, 5, 10, 15, 20, 25, 30, 35, y 40 ml de solución patrón de sulfatos y aforar a 100 ml con agua destilada y en otro matraz 100 ml de muestra clara o alicuota aforada a 100 ml.

3) Pasar el contenido del matraz aforado que contiene cero ml de solución patrón de sulfatos (blanco) a un matraz Erlenmeyer de 250 ml. Adicionar 5 ml de solución acondicionador y agitar con el agitador magnético, añadir un poco de cloruro de bario y agitar exactamente un minuto.

4) Fijar el cero de absorbencia a 420 nm con esta muestra. Repetir el paso 3 con los siguientes matraces tomando la lectura máxima que ocurra en el período de 4 minutos.

5) Graficar la curva de calibración de las absorbencias y calibraciones de los patrones, obteniendo la concentración de la muestra directamente de la curva.

6) Calcular miligramos de sulfato/litro con la siguiente fórmula:

$$\text{mg } SO_4/\text{l} = \frac{\text{mg } SO_4 \text{ leidos en curva} \times 1000}{\text{ml de muestra}}$$

SODIO

Flamometría: este método se basa en la capacidad de las sales de sodio de producir una emisión luminosa cuya intensidad es acorde al número de átomos excitados y cuyo grado de luminosidad depende de las concentraciones de dichas sales en una solución. La muestra se rocía en una flama de gas y la excitación de los átomos produce una emisión de luz amarilla brillante característica que le permite ser cuantificable y reconocible en presencia de otros elementos.

Aparatos y reactivos

Flamofotómetro
Matraces Erlenmeyer de 250 ml
Matraces aforados de 50, 100, y 1000 ml
Embudos de filtración de tallo corto
Papel aluminio
Pipetas volumétricas de 1, 5, 10 y 20 ml
Pipeta graduado de 5 ml
Vasos de precipitado de 100 ml
Papel filtro
Solución de sulfato de sodio para calibración
Solución madre de sodio 1 ml = 1 mg de sodio
Solución patrón de sodio 1 ml = 0.1 mg de sodio
Solución de ácido perclórico 3.6 %

Técnica

1) Colocar en un matraz aforado 100 ml 10, 20, 25, 50, y 70 ml de solución patrón de sodio.

2) Añadir a cada matraz 10 ml de solución diluida de ácido perclórico y aforar a 100 ml con agua destilada.

3) Preparar el flamofotómetro para la realización de las lecturas siguiendo las instrucciones generales y particulares que provee el fabricante.

4) Realizar las lecturas de los patrones y de la muestra. Construir la curva de calibración con las transmitancias y las concentraciones de los patrones y determinar la concentración de las muestras directamente de la curva.

5) Calcular mg por litro sodio con la siguiente fórmula:

$$mg\ Na\ /l = \frac{mg\ Na\ leidos\ en\ curva \times 1000}{ml\ de\ muestra}$$

POTASIO

Flamometría: este método se basa en la capacidad de las sales de potasio de producir una emisión luminosa cuya intensidad es acorde al número de átomos excitados y cuyo grado de luminosidad depende de las concentraciones de dichas sales en una solución. La muestra se rocía en una flama de gas y la excitación de los átomos produce una emisión de luz violeta característica que le permite ser cuantificable y reconocible en presencia de otros elementos.

Aparatos y reactivos

Flamofotómetro

Matraces Erlenmeyer de 250 ml

Matraces aforados de 50, 100, y 1000 ml

Embudos de filtración de tallo corto

Papel aluminio

Pipetas volumétricas de 1, 5, 10 y 20 ml

Pipeta graduado de 5 ml

Vasos de precipitado de 100 ml

Papel filtro

Solución de sulfato de potasio para calibración

Solución madre de potasio 1 ml = 1 mg de potasio

Solución patrón de potasio 1 ml = 0.1 mg de potasio

Solución de ácido perclórico diluido al 3.6 %

Técnica

1) Colocar en un matraz aforado 100 ml 1, 5, 10, y 20 ml de solución patrón de potasio.

2) Añadir a cada matraz 10 ml de solución diluida de ácido perclórico y aforar a 100 ml con agua destilada.

3) Preparar el flamofotómetro para la realización de las lecturas siguiendo las instrucciones generales y particulares que provee el fabricante.

4) Realizar las lecturas de los patrones y de la muestra. Construir la curva de calibración con las transmitancias y las concentraciones de los patrones y determinar la concentración de las muestras directamente de la curva.

5) Calcular mg por litro de potasio con la siguiente fórmula:

$$\text{mg K /l} = \frac{\text{mg K leidos en curva} \times 1000}{\text{ml de muestra}}$$

NITRATOS

Fundamento: este método se utiliza para concentraciones de 0.1 a 2.0 mg de nitratos por litro. En caso de tener concentraciones mayores, se harán diluciones para caer en el ámbito del método.

La reacción entre los nitratos y la brucina produce un color amarillo, que es proporcional a la concentración de los nitratos. La velocidad de la reacción depende directamente del calor generado durante la prueba, por lo que éste se controla mediante la secuencia de adición de los reactivos y la incubación de la mezcla de reacción, durante un intervalo de tiempo preciso y a una temperatura conocida.

Aparatos y reactivos

Espectrofotómetro
Gradillas de Alambre
Microbureta de 10 ml
Papel Filtro No. 40, de diámetro 11
Matraces volumétricos de 1000 ml
Matraces Erlenmeyer de 250 ml
Tubos de vidrio de 2.5 x 15.0 cm, con tapón
Embudos de Talle Corto
Pipetas Volumétricas de 1 ml
Pipetas Volumétricas de 2 ml
Pipetas Volumétricas de 5 ml
Pipetas Volumétricas de 10 ml
Solución Madre de Nitratos, 1 ml = 0.1 mg de N (721.8 mg de KNO_3 x litro)
Solución Patrón de Nitratos, 1 ml = 1.0 mg de N (10 ml de sol. madre x lt)

Baño de agua fría, para mantener la temperatura por lo menos a 95 ^{o}C , cuando se introducen las muestras enfriadas.

Técnica

1) Si la muestra es negra o turbia filtrar con suspensión de hidróxido de aluminio, a través de papel filtro (2 ml de hidróxido para 50 ml de muestra).

2) Si la muestra contiene cloro residual, añadir una gota de solución de arsenito de sodio por cada 0.1 mg de cloro y mezclar.

3) Diluir 1, 2, 4, 7 y 10 ml de la solución patrón de nitratos a 10 ml con agua destilada

4) Colocar en un tubo 10 ml de muestra clara o alícuota, aforada a 10 ml con agua destilada. Preparar otro tubo de 10 ml de agua destilada unicamente.

5) Agregar 2 ml de solución de NaCl y 10 ml de ácido sulfúrico concentrado. Mezclar manualmente y dejar enfriar en baño de agua fría.

6) Añadir 0.5 ml de reactivo de brucina-ácido sulfanílico a cada tubo, mezclar manualmente y calentar en baño de agua caliente (95 ^{o}C).

7) En 20 minutos, sacar los tubos y sumergirlos en agua fría, leer el testigo de reactivo a 410 nm .

8) Si después de adicionar la solución de ácido sulfúrico se desarrollo turbiedad o color, secar los tubos y leerlos (testigos de muestra) contra el testigo de reactivos a 410 nm. Posteriormente, adicionar el testigo de brucina y continuar todo el proceso.

9) Graficar la curva de calibración con los valores de absorbencia de los patrones. Despues, obtener las concentraciones de nitratos directamente de la curva de calibración

Cálculos

$$mg / 1\ NO_3 = mg / 1\ N\text{-}NO_3 * 4.43$$

CALCIO

Fundamento: Este método se basa en la capacidad de las sales de calcio para producir una emisión luminosa, cuya intensidad es acorde al número de átomos excitados y cuyo grado de luminosidad depende de la concentración de dichas sales, comparada con la intensidad luminosa de la Lámpara de Cátodo Hueco, en el Espectrofotómetro de Absorción Atómica.

Aparatos y reactivos

Espectrofotómetro de Absorción Atómica

Lámpara de Cátodo Hueco para calcio

Técnica

Se toma una muestra previamente filtrada y se introduce por el capilar hacia el quemador, la lectura registrada será la concentración directa del ion analizado.

MAGNESIO

Fundamento: Este método se basa en la capacidad de las sales de magnesio para producir una emisión luminosa, cuya intensidad es acorde al número de átomos excitados y cuyo grado de luminosidad depende de la concentración de dichas sales, comparada con la intensidad luminosa de la Lámpara de Cátodo Hueco, en el Espectrofotómetro de Absorción Atómica.

Aparatos y reactivos

Espectrofotómetro de Absorción Atómica

Lámpara de Cátodo Hueco para magnesio

Técnica

Se toma una muestra previamente filtrada y se introduce por el capilar hacia el quemador, la lectura registrada será la concentración directa del ión analizado.

CARBONATOS

Fundamento: Titulación de carbonatos y bicarbonatos disueltos con ácido sulfúrico

Técnica

Calcular a partir de los datos de titulación de alcalinidad con las siguientes consideraciones:

RESULTADOS DE TITULACION	OH	CO_3	HCO_3
$Vf = 0$	0	0	$\frac{Vf}{Vm} * N * \frac{1000}{61}$
$Vf < 1/2\ Vt$	0	$\frac{2Vf}{Vm} * N * \frac{1000}{60}$	$\frac{(Vt-2Vf)}{Vm} * N * \frac{1000}{61}$
$Vf = 1/2\ Vt$	0	$\frac{2Vf}{Vm} * N * \frac{1000}{60}$	0
$Vf > 1/2\ Vt$	$\frac{(2Vf-Vt)}{Vm} * N * \frac{1000}{17}$	$\frac{2(Vt-Vf)}{Vm} * N * \frac{1000}{60}$	0
$Vf = Vt$	$\frac{Vt}{Vm} * N * \frac{1000}{17}$	0	0

Donde:

$Vt = Vf + Va$

Vt = Volumen requerido para titular alcalinidad total

Vf = Volumen requerido para titular, hasta $pH = 8.3$

Va = Volumen requerido para titular. $4.5 = pH < 8.3$

Vm = Volumen de muestra de agua usado en la titulación de alcalinidad

(volumen recomendable = 50 ml)

FLUOR

Fundamento: La determinación de este ion se lleva a cabo usando un electrodo de ion selectivo, el cual permite el transporte unicamente de iones fluoruro presentes en una solución, generando una diferencia de potencial, la cual puede ser medida y comparada en una curva de calibración para diferentes concentraciones de éste ion.

Aparatos y reactivos

Electrodo con cristal de fluoruro de lantano

Electrodo de referencia

Potenciometro

Agitador y barras magnéticas

Vasos de precipitados de 50 ml (de plástico)

Soluciones estandar de flúor, de 0.01 a 10.0 mg/l de flúor

Reactivos Buffer (TISAB)

Técnica

1) Preparar la curva de calibración usando las soluciones estandard de flúor.

   1.1 Tomar 25 ml de la solución estandar en un vaso de precipitados.
   1.2 Agregar 1.5 gr del Reactivo Buffer.
   1.3 Introducir una barra magnética en el vaso y agitar lentamente.
   1.4 Colocar los electrodos (ion específico/referencia) dentro del vaso.
   1.5 Cuando se tenga una lectura estable registrar el potencial, leído en el potenciómetro.
   1.6 Repetir los pasos anteriores con las demás soluciones estandard para trazar la curva de calibración, graficando potenciales contra concentraciones de flúor en papel semilogarítmico.

2) Medir la muestra siguiendo los pasos 1.1 a 1.5.

3) Interpolar el valor obtenido de la muestra en la curva de calibración.

ANALISIS ESPECIALES

ANALISIS ESPECIALES

DETERMINACION DE GRASAS Y ACEITES CONTENIDOS EN AGUA

A) Objetivo y Campo de Aplicación

Esta norma oficial establece el método para determinar el contenido de grasas y aceites en aguas potables, superficiales o subterráneas, de desechos domésticos o industriales y salinas. El método es recomendable dentro de un intervalo de 5 a 1000 mg/dm^3 (mg/l) de materia extractable.

B) Referencias

La presente norma se complementa con las siguientes normas oficiales mexicanas en vigor:

NOM-Z-1. "Sistema general en unidades de medida.- Sistema (SI) de unidades".

NOM-BB-14. "Clasificación y tamaños nominales para utensilios de vidrio usados en el laboratorio".

NOM-AA-3. "Aguas residuales.-Muestreo".

C) Resumen del Método

El método consiste en acidificar una muestra para extraer las grasas y aceites en solución, la grasa es entonces separada por filtración y extraída con un solvente con ayuda del aparato Soxhlet, posteriormente se evapora el solvente y se cuantifica gravimétricamente el material extraído.

D) Definiciones

Agua residual

Es el líquido de composición variada proveniente de usos municipal, industrial, comercial, agrícola, pecuario o de cualquier otra índole, ya sea pública o privada, y que por tal motivo haya sufrido degradación o alteración en su calidad original.

E) Aparatos y Equipo

E.1 Aparato de extracción Soxhlet.

E.2 Placa de calentamiento, con control de temperatura.

E.3 Bomba de vacío u otra fuente de vacío.

E.4 Estufa electrolítica, capaz de mantener 376°K(103°C)

E.5 Balanza analítica con precisión de 0.1 mg.

E.6 Estufa de vacío con intervalo de 380 a 500 mm de Hg y control de temperatura.

E.7 Embudo Buchner de 12 cm. de diámetro.

E.8 Material común de laboratorio.

F) Reactivos y Materiales

Los reactivos que se mencionan, deben ser grado analítico. Cuando se hable de agua se debe entender agua destilada.

F.1 Acido clorhídrico concentrado o sulfúrico.

F.2 Suspensión de tierra de diatomáceas-sílice (Hyflo-supercal o equivalente); 10 g/dm^3 (g/l) de agua.

F.3 Hexano normal con punto de ebullición de 342°K (69°C) o freón (1,1,2 tricloro -1,2,2trifluoretano) de punto de ebullición de 320.5°K(47.5°C).

F.4 Cartuchos de extracción (thimbles).

F.5 Papel filtro de poro medio y de 11 cm de diámetro.

F.6 Discos de tela de muselina de 11 cm de diámetro.

G) Muestreo y Almacenamiento

G.1 Es muy importante cuidar que la muestra sea representativa, ya que las características de las grasas y aceites es agruparse en la superficie de los cuerpos de agua, formando natas en determinadas zonas. El muestreo se hace con frascos de vidrio de boca ancha, de un litro de capacidad, es conveniente llenar bien el frasco.

En caso de grasas y aceites flotantes, la muestra se toma únicamente de la película superficial de agua.

En caso de aceites emulsionados, la muestra se toma de 20 a 30 cm de profundidad, cuando no haya mucha turbulencia para asegurar una mayor representatividad.

G.2 Mantener preservada la muestra a un pH de 2 o menor con la adición de 5 cm^3 (ml) de HCl concentrado y en refrigeración a 277°K(4°C), se recomienda no almacenar más de 24 horas.

H) Procedimiento

H.1 Si la muestra no viene preservada, acidificar como se indica en el inciso G.2)

H.2 Preparar un filtro con el disco de tela de muselina sobreponiéndole el disco de papel filtro, colocar en el embudo Buchner, humedecer la tela y el papel.

H.3 Con ayuda del vacío, pasar aproximadamente 100 cm^3 (ml) de la suspensión de tierras de diatomáceas (hasta la saturación de los poros); se lava con un dm^3 (litro) o menos de agua y aplicar el vacío hasta que toda el agua haya sido filtrada.

H.4 Pasar la muestra acidificada a través del filtro preparado. Aplicar el vacío hasta que toda el agua haya sido filtrada, recibiéndose en un matraz Kitazato de 2 dm^3.

H.5 Con una pinza transferir a un cartucho de extracción el papel filtro y el material adherido al disco de tela. Limpiar las caras y el fondo del recipiente colector, la tapa, y el embudo Buchner con pedazos de papel filtro remojado en el solvente que se va usar, teniendo cuidado de transferir todas las capas de grasas formadas, y de recoger todo el material sólido, agregando los pedazos de papel filtro dentro del cartucho de extracción, evitando el manejo manual.

H.6 El filtrado del Kitazato es medido con una probeta para cuantificar el volumen de muestra.

H.7 Colocar los cartuchos de extracción en vasos de precipitados, llevar a sequedad en una estufa eléctrica a 376°K (103°C) durante 30 minutos, colocar el cartucho en el aparato de extracción Soxhlet, con el matraz al cual previamente se ha determinado su masa.

Nota: Identificar el número de muestra en el vaso de precipitados pero nunca marcar el cartucho.

H.8 Adicionar solvente al matraz hasta la mitad de su capacidad. Colocar 1 cm de altura de algodón en la parte superior del refrigerante. Dejar en reflujo durante 4 horas a partir del primer ciclo de recirculación, controlando las condiciones de temperatura, hasta que de un ciclo cada 3 minutos aproximadamente. Una vez terminado el tiempo de reflujo vaciar y escurrir el solvente que queda en el extractor al matraz.

H.9 Evaporar el solvente en baño maría a 358°K (85°C) y pasar el matraz a la estufa de vacío a una temperatura de 333 K (60°C) durante 30 minutos.

H.10 Dejar enfriar el matraz en un desecador durante un período de 30 minutos y determinar su masa.

H.11 Correr una prueba testigo en las mismas condiciones que se mencionan para una muestra, en los incisos del H.1 al H.10

I) Cálculos y Resultados

I.1 La cantidad de grasas y aceites se calcula por medio de la siguiente fórmula:

$$mg/dm^3\ (mg/l)\ \text{de grasas y aceites} = \frac{(M2 - M1) \times 1000}{V}$$

Donde:

M1 = masa del matraz vacío a masa constante, en g
M2 = masa del matraz con muestra, en g
V = volumen de muestra en cm^3 (ml)

Nota: Si la prueba testigo muestra residuo, deberá restarse a la masa de grasa y aceite obtenido.

APENDICE

Observaciones:

- Las muestras no deben preservarse con cloroformo o benzonato de sodio cuando se vayan a hacer determinaciones de grasas.

- Es preferible usar el triclorotrifluoretano en virtud de que no es inflamable.

- Se recomienda no usar muestras compuestas para la determinación.

DETERMINACION DE CROMO HEXAVALENTE- Método del Colorímetro

A) Objetivo y Campo de Aplicación

Esta norma oficial establece el método colorimétrico con difenilcarbazida, para determinar el contenido de cromo hexavalente en aguas naturales, residuales e industriales.

B) Fundamento

El cromo hexavalente reacciona con la difenilcarbazida en medio ácido para dar un complejo de color violeta de composición desconocida, el cual se cuantifica a 540 nm.

C) Referencias

La presente norma se complementa con las siguientes normas oficiales mexicanas en vigor:

NOM-Z-1. "Sistema general en unidades de medida.- Sistema (SI) de unidades".

NOM-BB-14. "Clasificación y tamaños nominales para utensilios de vidrio usados en el laboratorio".

NOM-AA-3. "Aguas residuales.-Muestreo".

NOM-AA-8. "Análisis de agua. - Determinación del pH."

NOM-AA-14. "Cuerpos receptores. - Muestreo"

D) Reactivos y Materiales

Los reactivos que a continuación se mencionan deben ser grado analítico, cuando se habla de agua, se debe entender agua destilada y/o desionizada.

D.1 Solución madre de cromo

Disolver 141.4 mg de dicromato de potasio anhidro ($K_2Cr_2O_7$) en agua y diluir a 1 dm^3 (litro). Un cm^3 (ml) de esta solución equivale a 50 g de Cr^{+6}.

D.2 Solución patrón de cromo

Diluir 10.0 cm^3 de una solución madre de cromo a 100 cm^3 de agua. Un cm^3 de esta solución equivale a 5 g de Cr^{+6}.

D.3 Acido sulfúrico (H_2SO_4)

D.4 Acido fosfórico al 35 % (H_3PO_4)

D.5 Acetona

D.6 Solución de difenilcarbazida.

Disolver 0.25 g de 1.5 difenilcarbazida en 50 cm^3 de acetona. Almacenar en frascos ámbar y eliminar cuando la solución se muestre decolorada.

D.7 Acido nítrico (HNO_3).

D.8 Membrana de 0.45 micras.

D.9 Material común de laboratorio.

E) Aparatos y Equipo

Espectrofotómetro para usarse a 540 nm provisto de un paso de luz de 1 cm.

F) Preparación y conservación de la muestra

F.1 La alícuota necesaria para hacerse el análisis de la muestra debe estar lo más clara posible, por lo que antes de empezar el método debe filtrarse a través de una membrana de 0.45 micras.

F.2 Se recomienda que el análisis de las muestras se hagan lo más pronto posible, en caso contrario, acidificar la muestra con ácido nítrico concentrado y mantenerla en refrigeración a 277°K(4°C).

G) Interferencias

G.1 El molibdeno hexavalente y las sales de mercurio reaccionan dando color con la difenilcarbazida, pero las bimodalidades son mucho menores que las del cromo; concentraciones de molibdeno y mercurio menores de 200 mg/dm^3 (mg/l) pueden tolerarse.

G.2 El vanadio interfiere en mayor grado, aunque se puede encontrar presente en concentraciones hasta 10 veces superiores al cromo sin causar molestias.

G.3 El ion férrico forma compuestos amarillentos o cafés amarillentos que pueden interferir.

H) Procedimiento

H.1 Preparación de la Curva de Calibración

Medir volúmenes de la solución patrón de cromo (5.2) en el ámbito de 2.0-20 cm^3 y pasarlos a matraces aforados de 100 cm^3, agregar 2.0 cm^3 de H_2SO_4 (1+1) y 5 gotas de H_3PO_4 y diluir a 100 cm^3. Agregar 2.0cm^3 de la solución de difenilcarbazida, mezclar y dejar reposar 10 minutos para que se desarrolle totalmente el color. Medir la absorbancia a 540 nm utilizando una celda de 1 cm. Correr un testigo usando agua y corregir las lecturas de absorbancia de los patrones, restando la absorbancia del testigo. Para construir la curva de calibración se gráfica la absorbancia contra g de Cr^{+6}.

Nota: Se debe construir una nueva curva de calibración cada vez que se usen nuevos reactivos.

H.2 Análisis de la muestra

H.2.1 Filtrar la muestra y tomar la alícuota dependiendo de las claras sea de 90 cm^3, que es la máxima alícuota que se debe tomar.

H.2.2 Agregar 2.0 cm^3 de H_2SO_4 (1+1) y 5 gotas de H_3PO_4, pasar la solución a un matraz volumétrico de 100 cm^3 y aforar. Añadir 2.0 cm^3 de la solución de difenilcarbazida, mezclar y dejar reposar 10 minutos, para el completo desarrollo del color.

H.2.3 Medir la absorbancia a 540 nm utilizando una celda de 1 cm, corregir la lectura restando la absorbancia de un testigo hecho con agua.

Nota: Si la solución es turbia después de diluir a 100 cm^3 tomar la absorbancia antes de la adición del reactivo de la solución de difenilcarbazida y corregir la absorbancia de la solución colorida final, restando la absorbancia medida previamente.

I) Cálculos

La concentración de cromo hexavalente se calcula por medio de la siguiente formula:

$$mg/dm^3 \text{ de } Cr^{+6} = \frac{A}{V}$$

Donde:

A = micro g de Cr^{+6} leidos en la curva

V = volumen de la muestra en cm^3

APENDICE

Se recomienda el uso de celdas perfectamente limpias libres de rayaduras y previamente enjuagadas con la muestra antes de efectuar el análisis.

DETERMINACION DE MERCURIO - Método Colorimétrico de la Ditizona

A) Objetivo y Campo de Aplicación

Esta norma oficial establece el método colorimétrico para determinar el contenido de mercurio en aguas naturales y residuales, para un límite mínimo de detección de 0.002 mg/l.

B) Fundamento

Este método se basa en la reacción del mercurio presente en el agua con la ditizona para dar un complejo de ditizonato mercúrico de color naranja, el cual se extrae con cloroformo en un medio ácido cuya intensidad se cuantifica colorimétricamente a una longitud de onda de 100 nm.

Reacción:

$$Hg + NH_2OH.\ HCl + C_{13}H_{12}N_4S \text{ ----------> } C_{13}H_{10}HgN_4S + NH_4OH + HCl$$

C) Referencias

La presente norma se complementa con las siguientes normas oficiales mexicanas en vigor:

NOM-Z-1. "Sistema general en unidades de medida.- Sistema (SI) de unidades".

NOM-BB-14. "Clasificación y tamaños nominales para utensilios de vidrio usados en el laboratorio".

NOM-AA-3. "Aguas residuales.-Muestreo"

NOM-AA-14. "Cuerpos receptores. - Muestreo"

D) REACTIVOS Y MATERIALES

Los reactivos que a continuación se mencionan deben ser grado analítico, cuando se habla de agua, se debe entender agua destilada y/o desionizada

D.1 Acido sulfúrico (H_2SO_4) concentrado

D.2 Sulfato de sodio anhidro (Na_2SO_4)

D.3 Cloroformo ($CHCl_3$).

D.4 Solución de permanganato de potasio ($KMnO_4$).
Disolver 5 g de permanganato de potasio en 100 cm^3 de agua.

D.5 Solución de persulfato de potasio ($K_2S_2O_8$)
Disolver 5 g de persulfato de potasio en 100 cm^3 de agua.

D.6 Solución de clorhidrato de hidroxilamina ($NH_2OH.\ HCl$)
Disolver 50 g de clorhidrato de hidroxilamina en 100 cm^3 de agua.

D.7 Solución de bromuro de potasio (KBr).
Disolver 40 g de bromuro de potasio en 100 cm^3 de agua.

D.8 Solución de ditizona ($C_{13}H_{12}N_4S$)
Disolver 6 mg de ditizona en 1000 cm^3 de cloroformo.

D.9 Solución amortiguador (buffer) de fosfato - carbonato.
Disolver 150 g de fosfato ácido disodico dodecahidratado (Na_2HPO_4 $12H_2O$), y 38 g de carbonato de potasio anhidro (K_2CO_3) en 1000 cm^3 de agua. Hacer extracciones en porciones de 10 cm^3 de ditizona hasta que la última porción permanezca de color azul. Lavar con cloroformo para remover el exceso de ditizona.

D.10 Solución de Acido sulfúrico (H_2SO_4) 0.25 N
Medir 7 cm^3 de Acido sulfúrico al 90 % y aforar a 1000 cm^3 con agua.

D.11. Solución Patrón de Mercurio

D.11.1 Solución patrón de mercurio concentrado.

Disolver 135.4 mg de cloruro de mercurio ($HgCl_2$) en aproximadamente 700 cm^3 de agua, añadir 1.5 cm^3 de ácido nítrico concentrado y llevar a 1000 cm^3 con agua: 1 cm^3 de esta solución equivale a 100 g de Hg.

D.11.2 Solución patrón de mercurio diluida

Medir 10 cm^3 de la solución D.11.2 y aforar a 1000 cm^3 con agua: 1.00 cm^3 de esta solución equivale a 1 g de Hg.

NOTA Preparar esta solución cada vez que se vaya a usar.

E) MATERIAL Y EQUIPO

E.1 Material común de laboratorio.

E.2 Equipo colorimétrico, se necesita uno de los siguientes:

E.2.1 Espectrofotómetro para usarse a una longitud de onda de 490 nm provisto de un paso de luz de 1 cm, con sus celdas correspondientes.

E.2.2 Fotómetro de filtro, provisto de un paso de luz de 1 cm o mayor, equipado con un filtro para 490 nm y sus celdas correspondientes.

F MUESTREO Y CONSERVACION DE MUESTRAS

F.1 La muestra debe tomarse en frascos de plásticos.

F.2 Si el análisis no se efectúa inmediatamente, la muestra puede conservarse mediante la adición de 1.5 cm^3 de ácido nítrico concentrado por litro de muestra.

G) INTERFERENCIAS

El cobre, oro, paladio, platino divalente y plata reaccionan con la ditizona en solución ácida. El cobre es separado durante el procedimiento en la fase orgánica, mientras que el mercurio es transferido a la fase acuosa. Los otros interferentes normalmente no se presentan.

La determinación se debe llevar a cabo rápidamente, debido a que el ditizonato mercúrico es fotosensible.

H) PROCEDIMIENTO

H.1 Preparación de la curva de calibración.

H.1.1 Colocar en una serie de vasos de precipitados, los volúmenes de solución patrón de mercurio, indicados en la tabla 1. Agregar a cada vaso de precipitados 500 cm^3 de agua como en H.3.2.

H.1.2 Elaborar una gráfica colocando como abscisas los g de Hg y como ordenadas las lecturas.

TABLA 1
VOLUMENES PARA LA CURVA DE CALIBRACION

Solución patrón diluida de mercurio de 1 g Hg/cm^3 (cm^3)	Contenido de mercurio (mg)
0.0	0.0000
2.0	0.0020
4.0	0.0040
6.0	0.0060
8.0	0.0080
10.0	0.0100

H.2 Prueba testigo.

Preparar un testigo con 500 cm^3 y proceder como se indica en H.3.2.

H.3 Determinación

H.3.1 Tomar una alícuota de 500 cm^3 de la muestra de análisis.

H.3.2 Transferir la alícuota a un vaso de precipitados, agregar 1 cm^3 de solución de permanganato de potasio y 10 cm^3 de ácido sulfúrico concentrado. Agitar y llevar a ebullición. Si es necesario agregar más solución de permanganato de potasio, hasta que persista un color rosa.

H.3.3 Añadir con cuidado 5 cm^3 de solución de persulfato de potasio y dejar enfriar durante 30 minutos. Agregar una o más gotas de solución de clorhidrato de hidroxilamina hasta eliminar el color rosa.

H.3.4 Cuando se haya enfriado, transferir la solución a un embudo de separación de 1 litro y agregar 25 cm^3 de solución de ditizona. Agitar el embudo vigorosamente y transferir la capa orgánica a un embudo de separación de 250 cm^3. Repetir esta extracción por lo menos 3 veces, hasta que la coloración en la última capa de ditizona sea de azul intenso como el de la solución original de ditizona.

H.3.5 Lavar los extractos acumulados de ditizona en el embudo de separación de 250 cm^3, con 50 cm^3 de ácido sulfúrico 0.25 N y agitar. Transferir la fase orgánica a otro embudo de separación de 250 cm^3.

H.3.6 Agregar 50 cm^3 de ácido sulfúrico 0.25 N y 10 cm^3 de solución de bromuro de potasio. Agitar vigorosamente para transferir el ditizonato mercúrico de la capa orgánica a la acuosa y desechar la capa inferior de la ditizona.

H.3.7 Lavar la capa acuosa con un volumen pequeño de cloroformo y desechar la fase inferior. Agregar 20 cm^3 de solución buffer y 10 cm^3 de solución de ditizona. Agitar fuertemente y después de la separación de las fases transferir la fase orgánica que contiene el ditizoato mercúrico a un vaso de precipitados.

H.3.8 Agregar a la fase orgánica de 1 a 2 g de sulfato de sodio anhidro y decantar en la celda de 1 cm de paso de luz. Medir la absorbancia a 490 nm. Ajustando el espectrofotómetro o el fotocolorímetro a cero de lectura con ese testigo (H.2.).

I) CALCULOS

La concentración de mercurio se calcula por la siguiente formula:

$$mg\ Hg/l = \frac{m}{V}$$

Donde:

m = masa leida en la curva de calibración, en microgramos de Hg.

V = volumen de la alícuota en cm^3

J) APENDICE

J.1 Las muestras que contienen 1.5 cm^3 de ácido nítrico concentrado por litro, normalmente no afectan a la ditizona, sin embargo concentraciones mayores de ácido nítrico oxidan a la ditizona.

J.2 Filtrar si es necesario la muestra a través de lana de vidrio después del paso de oxidación.

J.3 La adición de sulfato de sodio anhidro es con el fin de eliminar humedad, pues ésta enturbia la solución problema.

DETERMINACION DE COBRE - Método Coloriméttrico de la Neucoproina

A) OBJETIVO Y CAMPO DE APLICACION

Esta norma oficial establece el método colorimétrico para determinar el contenido de cobre en aguas naturales y residuales, para un limite mínimo de detección de 0.003 mg de cobre para un paso de luz de 1 cm.

B) FUNDAMENTO

En soluciones neutras o ligeramente ácidas los iones cuprosos reaccionan con la neucuproina (2.9-dimetil-1,10-fenantrolina) para dar un complejo de cobre-neocuproina de color amarillo, el cual se extrae con cloroformo y se cuantifica espectrofotométricamente a una longitud de onda de 475 nm.

C) REFERENCIAS

La presente norma se complementa con las siguientes normas oficiales Mexicanas en vigor:

NOM-Z-1. "Sistema general en unidades de medida.- Sistema (SI) de unidades".

NOM-BB-14. "Clasificación y tamaños nominales para utensilios de vidrio usados en el laboratorio".

NOM-AA-3. "Aguas residuales.-Muestreo"

NOM-AA-14. "Cuerpos receptores. - Muestreo"

NOM-AA-51. "Análisis de agua- Determinación de metales- Método espectrofotométrico de absorción atómica.

D) REACTIVOS

Los reactivos que a continuación se mencionan deben ser grado analítico, al menos que se indique otra cosa y cuando se habla de agua, se debe entender agua bidestilada y/o desionizada y exenta de cobre. Las soluciones preparadas para este análisis, deben almacenarse en recipientes de polietileno o de vidrio libre de cobre.

D.1 Cloroformo ($CHCl_3$)

D.2 Alcohol metílico (CH_3OH)

D.3 Acido nítrico (HNO_3) concentrado

D.4 Acido nítrico (HNO_3) 1:1

D.5 Acido sulfúrico (H_2SO_4) concentrado

D.6 Hidróxido de amonio (NH_4OH) concentrado

D.7 Hidróxido de amonio (NH_4OH) 5 N

Aforar 330 ml de Hidróxido de amonio concentrado a 1 litro con agua

D.8 Reactivo de neocuproina

Disolver 0.10 g de neocuproina semihidratada en 100 ml de alcohol metílico.

NOTA: En las condiciones ordinarias de almacenamiento esta solución es estable por un mes.

D.9 Solución de clorhidrato de hidroxilamina ($NH_2OH.HCl$

Disolver 50 g de clorhidrato de hidroxilamina en 450 ml de agua.

D.10 Solución de citrato de sodio ($Na_3C_6H_5O_7 \ .2H_2O$)

Disolver 150 g de citrato de sodio en 400 ml de agua, agregar 5 ml de clorhidrato de hidroxilamina y 10 ml de neocuproina; extraer con 50 ml de cloroformo la impureza de cobre de la solución y desechar la capa de cloroformo.

D.11 Solución patrón concentrada de cobre:

D.11.1 Pesar 0.20 g de cobre electrolítico pulido y pasarlo a un matraz Erlenmeyer de 250 ml.

D.11.2 Agregar 10 ml de agua y 5 ml de ácido nítrico concentrado y después que se estabiliza la reacción, calentar suavemente para completar la disolución del cobre y hervir hasta el total desprendimiento de los óxidos de nitrógeno.

D.11.3 Enfriar la solución y agregar 50 ml de agua.

D.11.4 Transferir el contenido a un matraz volumétrico de un litro y aforar con agua; 1.0 ml de esta solución equivale a 0.20 mg de cobre.

D.12 Solución patrón diluida de cobre.

Transferir 50 ml de la solución patrón concentrada de cobre a un matraz volumétrico de 500 ml y aforar con agua; 1.0 ml de esta solución equivale a 0.020 mg de cobre.

F) MATERIAL Y EQUIPO

F.1 Material de laboratorio

NOTA: Todo material de vidrio y polietileno empleado en este método debe enjuagarse con ácido nítrico 1:1 y enseguida con agua.

F.2 Equipo colorimétrico; se necesita uno de los siguientes:

F.2.1 Espectrofotómetro para usarse a una longitud de onda de 457 nm, provisto de un paso de luz de 1 cm con sus celdas correspondientes.

F.2.2 Fotómetro de filtro provisto de un paso de luz de 1 cm o mayor, equipado con un filtro violeta de banda restringida, que tenga una transmitancia máxima de 450 a 4 60 nm, con sus celdas correspondientes.

F.3 Papel indicador para pH con ámbito de 4 a 6.

G) MUESTREO Y CONSERVACION DE LA MUESTRA

Las muestras se deben colectar en frascos de polietileno, preservarse añadiendo 5 ml de ácido nítrico concentrado por litro de muestra colectada y refrigerandose a 4 o 5 ^{o}C.

H) INTERFERENCIAS

H.1 La determinación del cobre por el procedimiento que se recomienda, se encuentra virtualmente libre de interferencias por otros iones metálicos.

H.2 La interferencia de cromo se puede evitar por la adición de ácido sulfuroso para reducir los cromatos y el ion crómico complejo.

H.3 En presencia de estaño y de cantidades excesiva de otros iones oxidantes se debe emplear un volumen adicional de clorhidrato de hidroxilamina no mayor de 20 ml.

H.4 Las interferencias producidas por el cianuro y el sulfuro se eliminan durante el proceso de digestión.

I) PROCEDIMIENTO

I.1 Preparación de la curva de calibración.

I.1.1 Preparar un blanco de referencia, colocando 50 ml de agua, 1 ml de ácido sulfúrico concentrado en un embudo de separación de 125 ml y proceder como se indica en H.3.2.

I.1.2 Colocar en una serie de embudos de separación de 125 ml los volúmenes de solución patrón diluida de cobre indicados en la tabla 2.

TABLA 2
VOLUMENES PARA LA CURVA DE CALIBRACION

Solución patrón diluida de cobre (cm^3)	Contenido de cobre (mg)
0.5	0.010
1.0	0.020
2.0	0.040
4.0	0.080
6.0	0.120
8.0	0.160
10.0	0.200

I.1.3 Diluir a 50 ml con agua, agregando 1 ml de ácido sulfúrico concentrado y proceder como se indica del inciso I.3.2al I.3.8.

I.1.4 Graficar las lecturas de absorbancia obtendías contra los mg de cobre.

I.2 Tratamiento de la muestra

I.2.1 Digestión de ácido nítrico - ácido sulfúrico (para muestras con materia orgánica fácilmente oxidables).

I.2.1.1 Transferir 100 ml de muestra a un vaso de precipitación de 250 ml, agregar 1 ml de ácido sulfúrico concentrado y 5 ml de ácido nítrico concentrado.

I.2.1.2 Evaporar en una parrilla hasta que aparezcan humos blancos densos de anhídrido sulfúrico en el vaso de precipitados y no calentar más allá de este punto.

I.2.1.3 Si la solución permanece colorida, enfriar y agregar 5 ml de ácido nítrico concentrado y repetir la evaporación hasta la aparición de humos blancos de anhídrido sulfúrico, si fuera necesario repetir esta operación hasta que la solución se presente incolora.

I.2.1.4 Enfriar la solución a temperatura ambiente y diluir con agua cuidadosamente hasta tener un volumen de 80 ml.

I.2.1.5 Calentar en placa de calentamiento a ebullición para disolver las sales solubles y enfriar.

I.2.1.6 Filtrar con crisol de vidrio poroso y transferir el filtrado a un matraz volumétrico de 100 ml, enjuagar y aforar con agua.

I.2.1.7 Proceder la determinación de cobre como se indica en el punto I.3.

I.3 Determinación de cobre en la muestra

I.3.1 Tomar exactamente 50 ml o una porción adecuada de la muestra digerida que contenga de 0.004 a 0.2 mg de cobre y transferirla a un embudo de separación de 125 ml. Si ha sido usado un volumen pequeño, diluir a 50 ml con agua.

I.3.2 Agregar 5 ml de solución de clorhidrato de hidroxilamina y 10 ml de solución de citrato de sodio y mezclar bien.

I.3.3 Ajustar el pH de la muestra aproximadamente a 4, adicionando incrementos de 1 ml de hidróxido de amonio 5N.

I.3.4 Agregar 10 ml de reactivo de neocuproina y 10 ml de cloroformo y agitar vigorosamente durante 30 segundos para extraer el complejo cobre-neocuproina en el cloroformo.

I.3.5 Dejar que la mezcla se separe en dos capas.

I.3.6 Repetir la extracción de la capa acuosa con una porción adicional de 10 ml de cloroformo y agregar este extracto al anterior.

I.3.7 Diluir los extractos combinados con alcohol metílico y aforar a 25 ml, tapar y mezclar cuidadosamente.

I.3.8 Transferir una porción apropiada de una solución orgánica final a la celda de absorción.

I.3.9 Leer en el espectrofotómetro la absorción de esta solución a una longitud de onda de 457 nm usando el blanco como líquido de referencia.

J) CALCULOS

La concentración de cobre se calcula por las siguientes fórmulas

a) Calculo directo

$$\text{mg/l de cobre} = \frac{A \times 1000}{B}$$

b) Calculo por dilución

$$\text{mg/l de cobre} = \frac{A \times 1000}{B} \; \frac{100}{C}$$

Donde:

A = contenido de cobre en mg leídos en la curva de calibración
B = volumen en ml de muestra original
C = volumen en ml de la alícuota

K) APENDICE

K.1 Este calentamiento debe realizarse bajo campana de extracción debido a que los vapores que se producen son tóxicos.

K.2 Se debe tener la seguridad de la eliminación total del ácido nítrico, según se indique por la claridad de la solución y por la ausencia de humos rojizos en el matraz.

K.3 Si se ha efectuado la digestión en ácido sulfúrico, se necesitan 5 ml de hidróxido de amonio 5N por cada 10 ml de muestra.

K.4 Se debe tener cuidado que los extractos no arrastren gotas de agua.

DETERMINACION DE PLOMO - Método de la Ditizona

A) OBJETIVO Y CAMPO DE APLICACION

Esta norma oficial establece el método colorimétrico de la ditizona para determinar el contenido de plomo en aguas naturales y residuales, para un intervalo de concentración de 0.02a 0.4 mg/l.

B) FUNDAMENTO

Este método se basa en la reacción del plomo presente en el agua con la ditizona disuelta en tetracloruro de carbono para dar un complejo de ditizonato de plomo de color rosa, cuya intensidad se cuantifica colorimétricamente es proporcional al contenido de plomo.

C) REFERENCIAS

La presente norma se complementa con las siguientes normas oficiales Mexicanas en vigor:

NOM-Z-1. "Sistema general en unidades de medida.- Sistema (SI) de unidades".

NOM-BB-14. "Clasificación y tamaños nominales para utensilios de vidrio usados en el laboratorio".

NOM-AA-3. "Aguas residuales.-Muestreo"

NOM-AA-14. "Cuerpos receptores. - Muestreo"

D) REACTIVOS

Los reactivos que a continuación se mencionan deben ser grado analítico, al menos que se indique otra cosa y cuando se habla de agua, se debe entender agua destilada y/o desionizada y exenta de plomo. Las soluciones preparadas para este análisis, deben almacenarse en recipientes de polietileno o de vidrio libre de plomo.

D.1 Nitrato de plomo ($PbNO_3$)

D.2 Alcohol etílico (C_2H_5OH) o alcohol isopropílico $(CH_3)_2CHOH$

D.3 Cloroformo ($CHCl_3$)

D.4 Hidróxido de amonio (NH_4OH) concentrado

D.5 Hidróxido de amonio (NH_4OH) 1:1

D.6 Hidróxido de amonio (NH_4OH) 1:99

D.7 Tetracloruro de carbono (CCL_4)

D.8 Acido acético glacial (CH_3COOH)

D.9 Hidróxido de sodio (NaOH) 0.2N

D.10 Peroxido de hidrogeno (H_4O_2) al 30 %

D.11 Cianuro de potasio (KCN)

D.12 Acido nítrico (HNO_3) concentrado

D.13 Hidrato de hidracina ($N_2H_4.HOH$) al 64 % y exenta de plomo

D.14 Acido sulfúrico (H_2SO_4) concentrado

D.15 Acido clorhídrico (HCl

D.16 Solución indicadora de fenolftaleina ($C_{20}H_{14}O_4$) :

Disolver 0.5 g de fenolftaleina en 50 ml de alcohol etílico o isopropílico, y agregar gota a gota solución de hidróxido de sodio 0.2 N, hasta la aparición de un ligero color rosa.

D.17 Solución indicadora de azul de timol ($C_{27}H_{30}O_5S$)

Disolver 0.4 g del indicador en 100 ml de agua.

D.18 Solución de ácido tartárico ($C_4H_6O_6$)

Disolver 50 g de ácido tartárico en 100 ml de agua.

D.19 Solución I de ditizona ($C_{13}H_{12}N_4S$)

D.19.1 Disolver 250 mg de cristales de ditizona en 50 ml de cloroformo.

D.19.2 Filtrar a través de un papel filtro y lavar el papel con varias porciones pequeñas de cloroformo.

D.19.3 Transferir el filtrado a un embudo de separación y extraer con porciones de hidróxido de amonio 1 : 99, hasta que la capa de cloroformo se encuentre casi desprovista de color verde.

D.19.4 Desechar la capa de cloroformo y lavar los extractos combinados con cuatro porciones de 15 ml de cloroformo.

D.19.5 Desechar los extractos de cloroformo.

D.19.6 Precipitar la ditizona añadiendo 2.0 ml de HCl concentrado y agitar para neutralizar completamente el amoníaco.

D.19.7 Extraer la ditizona precipitada con porciones de 25 ml de cloroformo.

D.19.8 Transferir los extractos combinados a un matraz volumétrico de 250 ml y aforar con cloroformo.

D.20 Solución de ditizona.

D.20.1 Disolver 125 mg de cristales de ditizona en 50 ml de cloroformo.

D.20.2 Filtrar a través de un papel filtro y lavar con pequeñas porciones de cloroformo y combinar el lavado con el filtrado.

D.20.3 Extraer los filtrados con hidróxido de amonio 1:99, Hasta que la capa de cloroformo se encuentre casi desprovista de color verde.

D.20.4 Lavar la capa acuosa con tetracloruro de carbono para eliminar las trazas de cloroformo y de difeniltiocarbodiazona.

D.20.5 Desechar los extractos de tetracloruro de carbono.

D.20.6 Neutralizar el hidróxido de amonio con 2.0 ml de ácido clorhídrico y agitar vigorosamente.

D.20.7 Extraer la ditizona precipitada con tetracloruro de carbono.

D.20.8 Transferir los extractos a un matraz volumétrico de 500 ml y aforar con tetracloruro de carbono.

D.21 Solución de tartrato de sodio.

D.21.1 Disolver 10 g de tartrato de sodio en 100 ml de agua.

D.21.2 Para purificar la solución, agregar solución II de ditizona y agitar vigorosamente hasta que la capa de disolvente orgánico tenga un color verde.

D.21.3 Lavar las trazas de ditizona en la solución, extrayendo con cloroformo hasta que la solución sea incolora.

D.21.4 Extraer dos veces con porciones de 20 a 30 ml de tetracloruro de carbono.

D.22 Solución de sulfito de sodio.

D.22.1 Disolver 10 g de sulfito de sodio en 100 ml de agua.

D.22.2 Extraer con solución I de ditizona hasta que se mantenga el color verde del disolvente orgánico para eliminar el posible plomo que tenga este compuesto.

D.22.3 Eliminar las trazas de cloroformo con 4 o 5 extracciones de 20 ml de tetracloruro de carbono.

D.23 Solución de cianuro de potasio.

Disolver 10 g de cianuro de potasio en 100 ml de agua.

D.24 Solución alcalina de cianuro de potasio.

A 175 ml de hidróxido de amonio concentrado, agregar 15 ml de solución de cianuro de potasio, 7.5 ml de solución de sulfito de sodio y diluir a 500 ml con agua.

D.25 Solución de acetato de hidracina.

Mezclar 15 ml de hidrato de hidracina con 50 ml de ácido acético glacial y diluir 100 ml con agua.

D.26 Solución de clorhidrato de hidroxilamina.

Disolver 20 g de clorhidrato de hidroxilamina en agua y diluir a 100 ml.

D.27 Solución concentrada de plomo.

Determinar la masa de 1.599 g de nitrato de plomo anhidro en agua que contenga 1 ml de ácido nítrico, diluir a 1000 ml. Esta solución contiene 1 mg de plomo por 1 ml.

D.27.1 Solución intermedia de plomo.

Diluir 10 ml de la solución concentrada de plomo a 200 ml con agua, en donde 1 ml= 50 micro g de plomo. Preparar esta solución inmediatamente antes de usarla.

D.27.2 Solución estandard de plomo

Diluir 10 ml de la solución intermedia de plomo a 250 ml con agua, en donde 1 ml= 2 micro g de plomo. Preparar esta solución inmediatamente antes de usarla.

E) MATERIAL Y EQUIPO

E.1 Material común de laboratorio.

E.2 Equipo colorimétrico, se necesita uno de los siguientes:

E.2.1 Espectrofotómetro para usarse a una longitud de onda de 520 nm provisto de un paso de luz de 1 cm, con sus celdas correspondientes.

E.2.2 Fotómetro de filtro, provisto de un paso de luz de 1 cm o mayor, equipado con un filtro para 520 nm y sus celdas correspondientes.

E.3 Potenciómetro y/o indicador de pH.

F) MUESTREO Y CONSERVACION DE MUESTRAS

F.1 La muestra debe tomarse en frascos de polietileno.

F.2 Si el análisis no se efectúa inmediatamente, la muestra puede conservarse añadiendole mediante la adición de ácido nítrico concentrado hasta obtener un pH de 2 a 2.5.

G) INTERFERENCIAS

Los elementos que interfieren en la extracción de plomo a un pH de 8.5 a 9 en presencia de cianuro son; estaño, bismuto y talio.

H) PREPARACION DE LA CURVA DE CALIBRACION

Colocar una serie de embudos de separación de 250 ml, los volúmenes de solución patrón de plomo indicados en la tabla 3

TABLA 3

VOLUMENES PARA LA CURVA DE CALIBRACION

Solución patrón diluida de mercurio de 1 g Hg/cm^3 (cm^3)	Contenido de mercurio (mg)
0.0	0.0000
2.0	0.0020
4.0	0.0040
6.0	0.0060
8.0	0.0080
10.0	0.0100

G.2 Diluir a 100 ml con agua y proceder como se indica en el punto H.2.

G.3 Gráfica las lecturas de absorbencia obtendías contra los mg de plomo.

H) PROCEDIMIENTO

H.1 Digestión de la muestra

H.1.1 Tomar un volumen de la muestra necesaria, acidular al anaranjado de metilo a un pH de 4.2 con ácido sulfúrico y agregar a continuación 5 ml de ácido nítrico y 2 ml de peróxido de hidrogeno.

H.1.2 Evaporar en baño maría hasta tener un volumen aproximado de 15 a 20 ml y cubrir la capsula con un vidrio de reloj.

H.1.3 Transferir completamente el contenido de la cápsula a un matraz Erlenmeyer de 250 ml.

H.1.4 Agregar unas perlas de vidrio, 5 ml de ácido nítrico y 10 ml de ácido sulfúrico y lavar con 2 o 3 porciones de agua.

H.1.5 Evaporar en una parrilla hasta que aparezca humos densos blancos de anhídrido sulfúricos en el matraz. Si no se ha clarificado la solución, agregar 10 ml más de ácido nítrico y repetir la evaporación.

H.1.6 Enfriar la solución a la temperatura ambiente y diluir cuidadosamente con 50 ml de agua.

H.1.7 Calentar casi a ebullición para disolver las sales y filtrar a través de un crisol Gooch provisto de un disco de fibra de vidrio de fondo poroso, agregar 50 ml de solución de acetato de amonio caliente al crisol de Gooch para disolver el posible precipitado de sulfato de plomo formado y recibir los filtrados de un matraz Kitazato.

H.1.8 Transferir el filtrado a un vaso de precipitados de 250 ml y ajustar el volumen a 100 ml de agua y proceder a la determinación de plomo como se indica en el punto H.2.

H.2 Determinación del plomo de la muestra:

H.2.1 Agregar de 10 a 15 gotas de fenolftaleina y neutralizar con hidróxido de amonio 1:1.

H.2.2 Agregar 20 ml de solución de acetato de hidracina o solución de clorhidrato de hidroxalamina, calentar en baño maría a 363 ^{o}K - 368 ^{o}K (90-95 ^{o}C) durante 10 minutos y dejar enfriar.

H.2.3 Agregar 20 ml de solución de tartrato de sodio y ajustar el pH de la solución aproximadamente a 2.5 con solución de ácido tartárico utilizando potenciómetro.

H.2.4 Transferir la solución a un embudo de separación, con porciones de 3 ml de solución I de ditizona hasta que la capa orgánica tenga un color verde; agitar bien en cada ocasión y separar la capa de cloroformo, la cual se desecha.

H.2.5 Extraer la solución con 2 porciones de 5 ml de cloroformo para eliminar la ditizona retenida y desechar las porciones de cloroformo.

H.2.6 Eliminar los residuos de cloroformo extrayendo con una porción de 5 ml de tetracloruro de carbono y desechar esta capa.

H.2.7 Agregar 10 ml de solución de tartrato de sodio y 5 gotas del indicador de azul de timol y 10 ml de solución de cianuro de potasio.

H.2.8 Ajustar el pH a 8.5 adicionando hidróxido de amonio 1:1 ó solución de ácido tartárico hasta el indicador vire al verde.

H.2.9 Agregar 5 ml de solución II de ditizona, agitar bien y pasar cuidadosamente la capa de ditizona a un segundo embudo de separación.

H.2.10 Hacer extracciones sucesivas en la fase acuosa con porciones de 2 ml de solución II de ditizona hasta que el color verde persista en la fase acuosa por lo menos en 2 extracciones.

H.2.11. Combinar todos los extractos en el segundo embudo de separación.

H.2.12 Agregar 5 ml de tetracloruro de carbono puro al primer embudo de separación y el extracto se recibe en el segundo embudo.

H.2.13 A los extractos combinados de tetracloruro de carbono, agregar 20 ml de la solución alcalina de cianuro de potasio y agitar.

H.2.14. Pasar la capa de tetracloruro de carbono a un matraz volumétrico de 50 ml.

H.2.15. Extraer con porciones de 2 ml de tetracloruro de carbono y combinar todos los extractos en el matraz de 50 ml y aforar hasta la marca con tetracloruro de carbono y agitar.

H.2.16 Leer la absorbancia de esta solución con tetracloruro de carbono puro como líquido de referencia, en el espectrofotómetro a una longitud de onda de 520 nm.

I) CALCULOS

La concentración de plomo se calcula con las siguientes fórmulas:

a) Cálculo directo:

$$\text{mg de plomo} / \text{l} = \frac{A}{B} \times 100$$

b) Cálculo de dilución:

$$\text{mg de plomo} / \text{l} = \frac{A}{B} \times \frac{1000 \times 100}{C}$$

Donde:

A = contenido de plomo leido en la curva de calibración en mg
B = volumen de muestra en ml
C = volumen de la alícuota en ml

J) APENDICE

J.1 Cuando se tienen las soluciones I y II de ditizona ya preparadas se omitirán los incisos D.19.1. a D.19.8. y D.19.20.1 a D.20.8. respectivamente, en caso contrario se tendrán que seguir los pasos correspondientes de tales incisos, los cuales tienen como objetivos, eliminar la difeniltiocarbodiazona, impureza que presenta la ditizona. Se recomienda preparar esta solución cada vez que se vaya a usar y no emplearla después de 24 horas de su preparación. Estas soluciones deben conservarse en la obscuridad y en refrigeración.

J.2 Este calentamiento debe realizarse en campanas de extracción debido a que los vapores que se producen son tóxicos.

J.3 Se debe tener la seguridad de la eliminación total de ácido nítrico indicada por la claridad de la solución y por la ausencia de humos rojizos en el matraz.

J.4 Si se tiene la seguridad de que los elementos (estaño, bismuto y talio) no están presentes en la muestra, puede omitirse los puntos H.2.3.a H.2.6.

J.5 Si es necesario, agregar hidróxido de amonio concentrado para hacer que el indicador vire al azul.

J.6 Al analizar varias muestras, debe tenerse cuidado de hacer el mismo número de extracciones, debido a que varía la intensidad de color del testigo al aumentar el número de extracciones.

J.7 La coloración verde de la ditizona cambia a la coloración rosa del ditizonato de plomo, y la solución alcalina acuosa se torna amarillenta, por la formación de sal de ditizona.

J.8 Se debe tener mucho cuidado de que los extractos no arrastren gotas de agua.

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EQUILIBRIO QUIMICO

EQUILIBRIO QUIMICO

Las substancias contenidas en una reacción química normalmente no están del todo convertidas en productos o elementos químicos, pero de todas maneras una conjunción de varios elementos pueden aproximarse al equilibrio si tales elementos son liberados en el sitio de la reacción, a pesar de que las substancias participantes sean inestables.

La reacción hipotética en la cual la substancia **A** reacciona con la substancia **B** para formar las nuevas especies **C y D**, puede expresarse como:

$$\mathbf{aA + bB = cC + dD}$$

Donde las letras minúsculas representan los índices de los reactantes necesarios para el balance de la ecuación. Si la reacción es permitida para el proceso de un ciclo cerrado, esto es, ni **C D** escapan y tampoco a la inversa; se establece un equilibrio iónico después de cierto tiempo durante el cual **C** se combina con **D** para formar **A B**; los índices de cambio (a y b) y de reacción inversa (c y d), a la larga serán iguales y el sistema reactivo, por tanto, puede decirse que ha alcanzado un estado de equilibrio químico.

La ley de acción de masas, propuesta hace más de 100 años por Guldberg y Waage, específica que el equilibrio de la siguiente reacción será:

$$\mathbf{(C)^c\ (D)^d / (A)^a\ (B)^b = K}$$

Las variables entre paréntesis representan las concentraciones molares de los reactores y sus exponentes respectivos los productos, y **K** es la constante de equilibrio. Resultando un valor característico para cualquiera de reactores y productos. Aunque esa **K** no fue desarrollada a la vez con el principal objetivo de la ley, las soluciones químicas pronto manifestaron que **K** no era la misma constante para todas las concentraciones cuando los valores fueron analíticamente usados.

La ley de acción de masas, sin embargo, se aplica rigurosamente para resolver concentraciones reales, solo si ellas son expresadas o pueden ser traducidas a "concentraciones efectivas" requeridas por la ley de masas.

La concentración efectiva también es comúnmente llamada como "actividad iónica" o "concentración termodinámica" y es expresada en moles por litro para líquidos o en atmósferas de presión para gases. Para reacciones en solución diluida, como el agua, los reactivos del solvente y algunos sólidos que están presentes les son asignados un valor de unidad. La reacción del sistema es influenciada por la temperatura y la presión, de ahí la importancia de las mediciones "in situ". Las condiciones estandard en las cuales las constantes de equilibrio están referidas son a 25 ^{o}C y una atmósfera de presión.

La fuga de partículas disueltas en reacciones químicas de comportamiento "ideal" (concentración = actividad) es casi totalmente atribuible a efectos electrostáticos, por el transporte de iones con cargas repelentes unas de otras y sin elementos con cargas atrayentes entre sí. La fuerza de los campos alrededor de los iones es función de la dieléctrica o propiedades aislantes del solvente. La movilidad de los iones también es influenciada por sus dimensiones físicas tanto como por la concentración de particulas de carga.

A continuación se describen algunas técnicas de medición para determinar directamente la actividad de los iones. Mediante electrodos sensitivos a iones, por ejemplo, para medir los potenciales eléctricos, mismos que guardan una proporción directa con la actividad iónica de una solución en particular. El primer instrumento en ser desarrollado y el más conocidos de todos ellos es el cristal electródico el cual ha sido usado durante muchos años para determinar la actividad iónica del hidrógeno o potencial hidrógeno (pH) de las soluciones.

En la actualidad existen otros electrodos más modernos, disponibles en el mercado que pueden determinar la actividad iónica de un considerable número de cationes y aniones de interés para el estudio del agua.

Si una medición directa no fuera posible, entonces hay métodos para calcular un parámetro aplicado a un factor de corrección. El coeficiente de actividad multiplicado por la concentración determina la especie o especies de la actividad iónica. Para soluciones diluidas los coeficientes de actividad de algunos iones en particular pueden ser calculados por medio de la ecuación de Debye - Hückel. Existen muchas formas para esta ecuación pero todas están basadas en el supuesto de que los iones se conducen como partículas de tamaños finitos cargadas en un campo electrostático de intensidad uniforme. Muchos de los parámetros de la ecuación han sido determinados en forma empírica, pero generalmente son muy parecidos y acordes con los trabajos iniciales de la ecuación para soluciones donde la concentración total es menor de 0.10 moles por litro de sales univalentes. Esto es equivalente a una concentración de alrededor de 5800 miligramos por litro de iones disueltos totales de cloruro de sodio; los iones con cargas mayores de un mol por litro tienen un mayor efecto de intensidad y la concentración máxima permisible es un tanto baja.

La fórmula de la ecuación de Debye - Hückel es:

$$-\log \ i = \frac{AZi \quad I}{1+Ba \ I}$$

Donde:

i = coeficiente de actividad del ion

A = constante relativa al solvente (para el agua a 25 ^{o}C es de 0.5085)

Zi = carga iónica

B = constante relativa al solvente (para el agua a 25 ^{o}C es de 0.3281)

ai = constante relativa al diámetro efectivo del ion en la solución

I = fuerza iónica de la solución

Los valores de **ai** para varios iones de interés se muestran en el siguiente cuadro:

ai	**ion**
11	Th^{+4}, Sn^{+4},
9	Al^{+3}, Fe^{+3}, Cr^{+3}, H^{+}
8	Mg^{+2}, Be^{+2}
6	Ca^{+2}, Cu^{+2}, Zn^{+2}, Sn^{+2}, Mn^{+2}, Fe^{+2}, Ni^{+2}, Co^{+3}, Li^{+}
5	$Fe(CN)_6^{-4}$, Sr^{+2}, Ba^{+2}, Cd^{+2}, Hg^{+2}, S^{-2}, Pb^{+2}, CO_3^{-2}, SO_3^{-2} MoO_4^{-2}
4	PO_4^{-3}, $Fe(CN)_6^{-3}$, Hg_2^{-2}, SO_4^{-2}, SeO_4^{-2}, CrO_4^{-2}, HPO_4^{-2}, Na^{+}, HCO_3^{-}, $H_2PO_4^{-}$
3	OH^{-}, F^{-}, CNS^{-}, HS^{-}, CLO_4^{-}, K^{+}, Cl^{-}, Br^{-}, I^{-}, CN^{-}, NO_3^{-}, NO_2^{-}, Rb^{+}, Cs^{+}, NH_4^{+}, Ag^{+}

La fuerza iónica de una solución es una medida de la fuerza del campo electrostático originado por los iones. Se calcula con la siguiente fórmula:

$$I = \frac{mi \times zi^2}{2}$$

Donde:

m = es la concentración de un ion dado en moles por litro

z = carga del ion

Los términos de la semisuma deben incluir todas las especies iónicas presentes en la solución.

Previos a los análisis de laboratorio, los valores pueden ser usados para calcular una constante comparativa y puede ser convertida a actividad. Algunos profesionales de la química han propuesto hacer experimentos de solubilidad considerando esa constante y preferentemente con altas concentraciones de iones inertes. Las constantes de equilibrio resultantes son aplicadas sólo a la fuerza iónica del sistema que este siendo investigado. Para rangos de concentraciones de los principales iones de interés en la química del agua, la ecuación de Debye - Hückel y las constantes de equilibrio proporcionan una mayor precisión y fueron las que se utilizaron en el presente estudio.

PROGRAMA WATEQF-4

Para analizar el equilibrio químico de las muestras de agua recopiladas en los seis acuíferos de nuestro particular interés, colectadas durante diciembre de 1993 y enero de 1994, se aplicó el programa WATEQ-F (water equilibrium fortran por sus siglas en ingles) el cual fue desarrollado por Truesdell and Jones del consorcio NIEL PLUMMER de los EUA en 1972; está escrito en lenguaje fortran, versión IV, para macrocomputadoras de tarjetas, sin embargo ha sido adaptado también para computadoras personales. En seguida se hace una descripción de los datos que requiere el programa, así como de los resultados que se solicitan del mismo.

En la primera tarjeta (linea en nuestro caso) el programa solicita el número de aprovechamiento, su nombre y la conductividad eléctrica de campo; la segunda tarjeta pide la temperatura y el pH, también de campo además de otras variables opcionales como son equivalencia de hidrógeno, densidad de la solución y oxígeno disuelto, en esta misma tarjeta se dan las indicaciones de las unidades en que se ingresarán los datos que alimentan al programa así como especificar los cálculos solicitados y la forma en que se quieren los resultados (datos termoquímicos, balance de masas, relaciones iónicas y saturación de minerales, coeficientes de actividad calculados con la fórmula de Debye - Hückel, número de especies, molaridad, actividad, etc., de todas las especies posibles que intervienen en el sistema).

En la tarjeta de datos numero 3 se proporciona el programa de las concentraciones de calcio, magnesio, sodio, potasio, cloruros y sulfatos.

En la tarjeta 4 los bicarbonatos y otros iones si es que fueron determinados en laboratorio tales como sílice, hierro, fosfatos, estroncio y flúor.

La tarjeta 5 se pone en blanco para indicar al programa el final de datos para un análisis (muestra) de agua en particular. No obstante, entre las tarjetas 4 y 5 pueden ir tarjetas opcionales de tipo 1 o del 2. Las primeras indican el numero de especies y su saturación iónica que se desea sean desplegadas o impresas por el programa, mientras que las opcionales del tipo 2 son para indicar las unidades en que se quieren expresar los valores de las especies.

El programa tiene una pequeña limitante: como máximo puede computar un grupo de hasta diez muestras a la vez, por lo que para no truncar la ejecución del mismo se repiten los datos de la muestra diez en cada grupo y con esta acción solo se establece una pausa en el programa y luego se reitera la operación las veces que sean necesario.

Los resultados del programa se presentan en tres hojas por muestra analizada; en la fracción "initial solution" de la primera hoja se exhiben los datos de entrada y un equilibrio analítico del total de aniones y cationes, expresado en equivalentes por millar (miliequivalentes por litro), que en teoría deben ser igual pero en la práctica nos permite conocer el margen de error o la precisión al determinar en el laboratorio los aniones y cationes en cada una de las muestras; en la parte "DESCRIPTION OF SOLUTION", el programa muestra en la columna de la izquierda otra vez el equilibrio analítico ademas del calculado de los aniones y cationes de la muestra, el potencial eléctrico (PE), calculado en forma de azufre, oxígeno disuelto y oxígeno disuelto saturado, la alcalinidad y la electricidad total en miliequivalentes por kilogramo de agua; en la columna central comparece el potencial hidrógeno, la temperatura y la fuerza iónica del espécimen de agua analizado; en la columna de la derecha se indica la actividad del agua, su concentración de bióxido de carbono, contenido de oxígeno y que por ser gases se expresan en atmósferas de presión (PCO_2, PO_2 Y PCH_4), luego ya viene el bióxido de carbono total, la densidad que dado su baja conductividad es igual a la unidad, los sólidos totales disueltos (TDS) y la alcalinidad de carbonato de calcio. La primera hoja concluye especificando el potencial eléctrico de cálculo en la distribución de especies y su hidrógeno equivalente EH expresado en volts.

En la primera parte de la segunda hoja de resultados, "DISTRIBUTION OF SPECIES", se exponen las especies solicitadas en la tarjeta opcional tipo 1 y relacionadas todas ellas con los datos de entrada, mismas que se pueden ver en la primera columna; en la segunda columna aparece el símbolo o la fórmula de la especie correspondiente; en la tercera columna se señala su valencia o carga eléctrica y las columnas restantes indican las unidades, la actividad iónica y sus coeficientes de actividad. En la otra parte de la hoja se presentan las relaciones de especies más importantes.

Finalmente en la tercera hoja de resultados, se exhibe el análisis completo de equilibrio químico que en sus diferentes fases como anhidrita, aragonita, etc., con su producto de actividad iónica (IAP), su constante de equilibrio (KT), el índice de saturación (IAP/KT) y la energía libre o de Gibbs (DELGR) todas ellas de sumo interés, pero las fases que consideramos para un análisis geográfico de las mismas serán los índices de saturación de calcita (SIC), de dolomita (SID) y de yeso (SIV).

En el anexo respectivo pueden verse muestra por muestra de cada acuífero, los resultados del cálculo de equilibrio químico. Sin embargo, para el mejor manejo de los resultados en las tablas resumen se presenta un extracto de los principales resultados del citado equilibrio químico, como son la conductividad eléctrica, el potencial de hidrógeno, fuerza iónica, la presión del bióxido de carbono y los índices de saturación de calcita, dolomita y yeso.

RESULTADOS DEL WATEQF-4

S/N COL. OJO CALIENTE,AGS CE CAMPO=900.0 MMHOS

INITIAL SOLUTION

TEMPERATURE = 32.40 DEGREES C   PH = 6.560   ANALYTICAL EPMCAT = 8.384   ANALYTICAL EPMAN = 7.936

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.49798E-03	-2.8245	6.00000E+01
MG	2	4.11586E-05	-4.3855	1.00000E+00
NA	1	4.94017E-03	-2.3063	1.13500E+02
K	1	3.71065E-04	-3.4305	1.45000E+01
CL	-1	4.14902E-04	-3.3821	1.47000E+01
SO4	-2	6.04170E-04	-3.2188	5.80000E+01
HCO3	-1	6.31820E-03	-2.1994	3.85270E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED	PH
EPMCAT	8.384	8.141	6.560
EPMAN	7.936	7.693	

TEMPERATURE 32.40 DEG C

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 6.317886E+00 MEQ/KG H2O
ELECT = 4.481013E-01 MEQ/KG H2O

IONIC STRENGTH 9.839557E-03

ACTIVITY H2O = .9997
PCO2 = 1.132490E-01
LOG PCO2 = -.9460
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 9.524023E-03
DENSITY = 1.0000
TDS = 647.0MG/L
CARBONATE ALK = 6.318129E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000   EQUIVALENT EH = 6.063VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	5.42640E+01	1.35477E-03	-2.8681	9.05872E-04	-3.0429	6.68654E-01	-.1748
2	MG	2	9.08234E-01	3.73816E-05	-4.4273	2.51565E-05	-4.5994	6.72964E-01	-.1720
3	NA	1	1.12959E+02	4.91661E-03	-2.3083	4.43631E-03	-2.3530	9.02312E-01	-.0446
4	K	1	1.44600E+01	3.70041E-04	-3.4318	3.32928E-04	-3.4777	8.99705E-01	-.0459
64	H	1	3.03967E-04	3.01750E-07	-6.5204	2.75423E-07	-6.5600	9.12753E-01	-.0396
5	CL	-1	1.47000E+01	4.14902E-04	-3.3821	3.73289E-04	-3.4280	8.99705E-01	-.0459
6	SO4	-2	5.02737E+01	5.23687E-04	-3.2809	3.48543E-04	-3.4577	6.65556E-01	-.1768
7	HCO3	-1	3.79405E+02	6.22202E-03	-2.2061	5.62751E-03	-2.2497	9.04451E-01	-.0436
18	CO3	-2	9.83671E-02	1.64026E-06	-5.7851	1.09762E-06	-5.9595	6.69176E-01	-.1745
86	H2CO3	0	1.98936E+02	3.20941E-03	-2.4936	3.21686E-03	-2.4926	1.00232E+00	.0010
27	OH	-1	1.18896E-03	6.99539E-08	-7.1552	6.29165E-08	-7.2012	8.99399E-01	-.0460
19	MGOH	1	1.28522E-05	3.11247E-10	-9.5069	2.82348E-10	-9.5492	9.07151E-01	-.0423
23	MGSO4 AQ	0	2.19699E-01	1.82633E-06	-5.7384	1.83047E-06	-5.7374	1.00227E+00	.0010
22	MGHCO3	1	1.63522E-01	1.91761E-06	-5.7172	1.72734E-06	-5.7626	9.00780E-01	-.0454
21	MGCO3 AQ	0	2.48233E-03	2.94580E-08	-7.5308	2.95248E-08	-7.5298	1.00227E+00	.0010
29	CAOH	1	9.46486E-05	1.65903E-09	-8.7801	1.50299E-09	-8.8230	9.05943E-01	-.0429
32	CASO4 AQ	0	9.28274E+00	6.82286E-05	-4.1660	6.83834E-05	-4.1650	1.00227E+00	.0010
30	CAHCO3	1	7.39076E+00	7.31528E-05	-4.1358	6.62722E-05	-4.1787	9.05943E-01	-.0429
31	CACO3 AQ	0	1.70118E-01	1.70077E-06	-5.7694	1.70463E-06	-5.7684	1.00227E+00	.0010
44	NASO4	-1	1.11745E+00	9.39237E-06	-5.0272	8.49494E-06	-5.0708	9.04451E-01	-.0436
43	NAHCO3	0	1.17573E+00	1.40073E-05	-4.8536	1.40391E-05	-4.8527	1.00227E+00	.0010
42	NACO3	-1	1.19142E-02	1.43639E-07	-6.8427	1.29914E-07	-6.8863	9.04451E-01	-.0436
94	NACL	0	9.65014E-32	1.65228E-36	-35.7819	1.65603E-36	-35.7809	1.00227E+00	.0010
63	HSO4	-1	1.23401E-03	1.27209E-08	-7.8955	1.14758E-08	-7.9402	9.02123E-01	-.0447
96	H2SO4	0	2.58560E-42	2.63799E-47	-46.5787	2.64397E-47	-46.5777	1.00227E+00	.0010
93	HCL	0	3.73774E-36	1.02580E-40	-39.9889	1.02812E-40	-39.9880	1.00227E+00	.0010

MOLE RATIOS FROM ANALYTICAL MOLALITY		MOLE RATIOS FROM COMPUTED MOLALITY		LOG ACTIVITY RATIOS	
CL/CA =	2.7698E-01	CL/CA =	3.0625E-01	LOG CA/H2 =	10.0771
CL/MG =	1.0081E+01	CL/MG =	1.1099E+01	LOG MG/H2 =	8.5206
CL/NA =	8.3985E-02	CL/NA =	8.4388E-02	LOG NA/H1 =	4.2070
CL/K =	1.1181E+00	CL/K =	1.1212E+00	LOG K/H1 =	3.0823
CL/AL =	4.1490E+26	CL/AL =	4.1490E+26	LOG AL/H3 =	-10.3200
CL/FE =	4.1490E+26	CL/FE =	4.1490E+26	LOG FE/H2 =	-16.8800
CL/SO4 =	6.8673E-01	CL/SO4 =	7.9227E-01	LOG CA/MG =	1.5564
CL/HCO3 =	6.5668E-02	CL/HCO3 =	6.6683E-02	LOG NA/K =	1.1247
CA/MG =	3.6395E+01	CA/MG =	3.6242E+01		
NA/K =	1.3313E+01	NA/K =	1.3287E+01		

S/N COL. OJO CALIENTE,AGS CE CAMPO=900.0 MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	3.1574E-07	2.4271E-05	-6.5007	-4.6149	1.3009E-02	-1.88577	-2.63658
22	ARAGONIT	9.9430E-10	5.4010E-09	-9.0025	-8.2675	1.8410E-01	-.73496	-1.02757
151	ARTIN	2.7473E-30	3.6923E-19	-29.5611	-18.4327	7.4404E-12	-11.12840	-15.55910
20	BRUCITE	9.9581E-20	4.0280E-12	-19.0018	-11.3949	2.4722E-08	-7.60691	-10.63555
13	CALCITE	9.9430E-10	2.9649E-09	-9.0025	-8.5280	3.3536E-01	-.47449	-.66340
12	DOLOMITE	2.7455E-20	6.8052E-18	-19.5614	-17.1672	4.0344E-03	-2.39422	-3.34746
19	GYPSUM	3.1555E-07	1.7605E-05	-6.5009	-4.7544	1.7924E-02	-1.74656	-2.44195
65	HALITE	1.6560E-06	3.9655E+01	-5.7809	1.5983	4.1761E-08	-7.37923	-10.31722
118	HUNTITE	2.0933E-41	1.0783E-31	-40.6792	-30.9673	1.9413E-10	-9.71190	-13.57863
39	HYDMAG	5.7820E-62	5.3332E-39	-61.2379	-38.2730	1.0842E-23	-22.96491	-32.10823
11	MAGNESIT	2.7612E-11	4.4719E-09	-10.5589	-8.3495	6.1746E-03	-2.20939	-3.08904
67	MIRABI	6.8396E-09	1.6751E-01	-8.1650	-.7760	4.0830E-08	-7.38902	-10.33090
59	NAHCOL	2.4965E-05	3.2964E-01	-4.6027	-.4820	7.5736E-05	-4.12070	-5.76132
61	NATRON	2.1539E-11	9.3003E-02	-10.6668	-1.0315	2.3160E-10	-9.63527	-13.47149
150	NESQUE	2.7588E-11	4.8555E-06	-10.5593	-5.3138	5.6818E-06	-5.24552	-7.33398
66	THENAR	6.8596E-09	6.4691E-01	-8.1637	-.1892	1.0604E-08	-7.97455	-11.14956
62	THRNAT	2.1596E-11	1.1892E+00	-10.6656	.0753	1.8160E-11	-10.74089	-15.01730
60	TRONA	5.3899E-16	7.6820E-02	-15.2684	-1.1145	7.0162E-15	-14.15390	-19.78917

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S/N SN ANTONIO PEË.,AGS CE CAMPO=364.00 MMHOS

INITIAL SOLUTION

TEMPERATURE = 20.00 DEGREES C PH = 6.780 ANALYTICAL EPMCAT = 4.548 ANALYTICAL EPMAN = 2.181

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	9.38337E-04	-3.0276	3.76000E+01
MG	2	1.97478E-04	-3.7045	4.80000E+00
NA	1	2.03180E-03	-2.6921	4.67000E+01
K	1	2.45568E-04	-3.6098	9.60000E+00
CL	-1	1.83383E-04	-3.7366	6.50000E+00
HCO3	-1	1.99858E-03	-2.6993	1.21920E+02

WARNING---CHECK INPUT PH AND/OR CATION-ANION BALANCE ...CALCULATION TERMINATED

S/N TANQUE JIMENES,AGS CE CAMPO=774.00MMHOS

INITIAL SOLUTION

TEMPERATURE = 19.00 DEGREES C PH = 6.750 ANALYTICAL EPMCAT = 6.795 ANALYTICAL EPMAN = 5.355

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.45776E-03	-2.8363	5.84000E+01
MG	2	2.38676E-04	-3.6222	5.80000E+00
NA	1	2.71986E-03	-2.5655	6.25000E+01
K	1	6.85705E-04	-3.1639	2.68000E+01
CL	-1	2.93482E-04	-3.5324	1.04000E+01
SO4	-2	3.33274E-04	-3.4772	3.20000E+01
HCO3	-1	4.39784E-03	-2.3568	2.68220E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED	PH
EPMCAT	6.795	6.656	6.750
EPMAN	5.355	5.216	

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 4.397649E+00 MEQ/KG H2O
ELECT = 1.440658E+00 MEQ/KG H2O

TEMPERATURE
19.00 DEG C

IONIC STRENGTH
7.836205E-03

ACTIVITY H2O = .9998
PCO2 = 4.275287E-02
LOG PCO2 = -1.3690
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 6.121351E-03
DENSITY = 1.0000
TDS = 464.1MG/L
CARBONATE ALK = 4.397805E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.797VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	5.54039E+01	1.38298E-03	-2.8592	9.67578E-04	-3.0143	6.99635E-01	-.1551
2	MG	2	5.49366E+00	2.26070E-04	-3.6458	1.58981E-04	-3.7987	7.03238E-01	-.1529
3	NA	1	6.23093E+01	2.71156E-03	-2.5668	2.47563E-03	-2.6063	9.12990E-01	-.0395
4	K	1	2.67662E+01	6.84841E-04	-3.1644	6.23817E-04	-3.2049	9.10893E-01	-.0405
64	H	1	1.94431E-04	1.92978E-07	-6.7145	1.77828E-07	-6.7500	9.21495E-01	-.0355
5	CL	-1	1.04000E+01	2.93482E-04	-3.5324	2.67331E-04	-3.5730	9.10893E-01	-.0405
6	SO4	-2	2.76089E+01	2.87542E-04	-3.5413	2.00432E-04	-3.6980	6.97052E-01	-.1567
7	HCO3	-1	2.64884E+02	4.34314E-03	-2.3622	3.97275E-03	-2.4009	9.14717E-01	-.0387
18	CO3	-2	7.85646E-02	1.30981E-06	-5.8828	9.16974E-07	-6.0376	7.00080E-01	-.1549
86	H2CO3	0	1.07014E+02	1.72613E-03	-2.7629	1.72953E-03	-2.7621	1.00197E+00	.0009
27	OH	-1	6.63921E-04	3.90553E-08	-7.4083	3.55656E-08	-7.4490	9.10646E-01	-.0407
19	MGOH	1	3.87825E-05	9.39037E-10	-9.0273	8.61012E-10	-9.0650	9.16909E-01	-.0377
23	MGSO4 AQ	0	5.64433E-01	4.69119E-06	-5.3287	4.69966E-06	-5.3279	1.00181E+00	.0008
22	MGHCO3	1	6.63667E-01	7.78132E-06	-5.1089	7.09466E-06	-5.1491	9.11755E-01	-.0401
21	MGCO3 AQ	0	1.06748E-02	1.26656E-07	-6.8974	1.26885E-07	-6.8966	1.00181E+00	.0008
29	CAOH	1	5.16750E-05	9.05611E-10	-9.0431	8.29473E-10	-9.0812	9.15927E-01	-.0381
32	CASO4 AQ	0	5.09423E+00	3.74360E-05	-4.4267	3.75036E-05	-4.4259	1.00181E+00	.0008
30	CAHCO3	1	3.65748E+00	3.61946E-05	-4.4414	3.31516E-05	-4.4795	9.15927E-01	-.0381
31	CACO3 AQ	0	1.11275E-01	1.11228E-06	-5.9538	1.11428E-06	-5.9530	1.00181E+00	.0008
44	NASO4	-1	3.25865E-01	2.73845E-06	-5.5625	2.50491E-06	-5.6012	9.14717E-01	-.0387
43	NAHCO3	0	4.63472E-01	5.52068E-06	-5.2580	5.53065E-06	-5.2572	1.00181E+00	.0008
42	NACO3	-1	2.80214E-03	3.37767E-08	-7.4714	3.08961E-08	-7.5101	9.14717E-01	-.0387
94	NACL	0	3.85905E-32	6.60619E-37	-36.1800	6.61812E-37	-36.1793	1.00181E+00	.0008
63	HSO4	-1	3.11783E-04	3.21344E-09	-8.4930	2.93335E-09	-8.5326	9.12836E-01	-.0396
96	H2SO4	0	6.20227E-43	6.32678E-48	-47.1988	6.33821E-48	-47.1980	1.00181E+00	.0008
93	HCL	0	1.72939E-36	4.74532E-41	-40.3237	4.75389E-41	-40.3230	1.00181E+00	.0008

MOLE RATIOS FROM ANALYTICAL MOLALITY			MOLE RATIOS FROM COMPUTED MOLALITY			LOG ACTIVITY RATIOS		
CL/CA	=	2.0132E-01	CL/CA	=	2.1221E-01	LOG CA/H2	=	10.4857
CL/MG	=	1.2296E+00	CL/MG	=	1.2982E+00	LOG MG/H2	=	9.7013
CL/NA	=	1.0790E-01	CL/NA	=	1.0823E-01	LOG NA/H1	=	4.1437
CL/K	=	4.2800E-01	CL/K	=	4.2854E-01	LOG K/H1	=	3.5451
CL/AL	=	2.9348E+26	CL/AL	=	2.9348E+26	LOG AL/H3	=	-9.7500
CL/FE	=	2.9348E+26	CL/FE	=	2.9348E+26	LOG FE/H2	=	-16.5000
CL/SO4	=	8.8060E-01	CL/SO4	=	1.0207E+00	LOG CA/MG	=	.7843
CL/HCO3	=	6.6733E-02	CL/HCO3	=	6.7574E-02	LOG NA/K	=	.5986
CA/MG	=	6.1077E+00	CA/MG	=	6.1175E+00			
NA/K	=	3.9665E+00	NA/K	=	3.9594E+00			

S/N TANQUE JIMENES,AGS CE CAMPO=774.00MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	1.9393E-07	3.2265E-05	-6.7123	-4.4913	6.0106E-03	-2.22108	-2.96921
22	ARAGONIT	8.8724E-10	6.7537E-09	-9.0520	-8.1705	1.3137E-01	-.88150	-1.17841
151	ARTIN	2.9298E-29	4.2435E-19	-28.5332	-18.3723	6.9043E-11	-10.16088	-13.58336
20	BRUCITE	2.0110E-19	3.7775E-12	-18.6966	-11.4228	5.3235E-08	-7.27380	-9.72383
13	CALCITE	8.8724E-10	3.6227E-09	-9.0520	-8.4410	2.4491E-01	-.61100	-.81680
12	DOLOMITE	1.2934E-19	1.2729E-17	-18.8883	-16.8952	1.0161E-02	-1.99305	-2.66436
19	GYPSUM	1.9386E-07	1.7261E-05	-6.7125	-4.7629	1.1231E-02	-1.94959	-2.60627
65	HALITE	6.6181E-07	3.6998E+01	-6.1793	1.5682	1.7888E-08	-7.74745	-10.35701
118	HUNTITE	2.7488E-39	7.5469E-31	-38.5609	-30.1222	3.6423E-09	-8.43862	-11.28099
39	HYDMAG	9.0753E-59	3.6657E-38	-58.0421	-37.4358	2.4758E-21	-20.60629	-27.54709
11	MAGNESIT	1.4578E-10	7.1263E-09	-9.8363	-8.1471	2.0457E-02	-1.68916	-2.25812
67	MIRABI	1.2259E-09	3.9920E-02	-8.9115	-1.3988	3.0710E-08	-7.51272	-10.04322
59	NAHCOL	9.8350E-06	2.4889E-01	-5.0072	-.6040	3.9516E-05	-4.40323	-5.88636
61	NATRON	5.6087E-12	2.8313E-02	-11.2511	-1.5480	1.9809E-10	-9.70313	-12.97142
150	NESQUE	1.4569E-10	7.5187E-06	-9.8366	-5.1239	1.9378E-05	-4.71270	-6.30008
66	THENAR	1.2284E-09	6.7548E-01	-8.9107	-.1704	1.8186E-09	-8.74027	-11.68425
62	THRNAT	5.6188E-12	1.4695E+00	-11.2504	.1672	3.8235E-12	-11.41754	-15.26330
60	TRONA	5.5250E-17	2.9920E-01	-16.2577	-.5240	1.8466E-16	-15.73363	-21.03317

PEÜELOS PEÜELOS,AGS CE CAMPO=361.00 MMHOS

INITIAL SOLUTION

TEMPERATURE = 17.00 DEGREES C PH = 6.730 ANALYTICAL EPMCAT = 3.044 ANALYTICAL EPMAN = 2.710

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	4.99115E-04	-3.3018	2.00000E+01
MG	2	1.39880E-04	-3.8542	3.40000E+00
NA	1	1.23996E-03	-2.9066	2.85000E+01
K	1	5.26946E-04	-3.2782	2.06000E+01
CL	-1	1.91847E-04	-3.7170	6.80000E+00
SO4	-2	2.60309E-04	-3.5845	2.50000E+01
HCO3	-1	1.99857E-03	-2.6993	1.21920E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	3.044	3.001
EPMAN	2.710	2.667

PH 6.730

TEMPERATURE 17.00 DEG C

IONIC STRENGTH 3.679314E-03

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 1.998374E+00 MEQ/KG H2O
ELECT = 3.341420E-01 MEQ/KG H2O

ACTIVITY H2O = .9999
PCO2 = 2.049138E-02
LOG PCO2 = -1.6884
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 2.876611E-03
DENSITY = 1.0000
TDS = 226.2MG/L
CARBONATE ALK = 1.998543E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.757VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	1.92234E+01	4.79735E-04	-3.3190	3.71809E-04	-3.4297	7.75029E-01	-.1107
2	MG	2	3.27633E+00	1.34793E-04	-3.8703	1.04739E-04	-3.9799	7.77040E-01	-.1096
3	NA	1	2.84454E+01	1.23759E-03	-2.9074	1.16016E-03	-2.9355	9.37437E-01	-.0281
4	K	1	2.05766E+01	5.26348E-04	-3.2787	4.92868E-04	-3.3073	9.36393E-01	-.0285
64	H	1	1.99209E-04	1.97673E-07	-6.7041	1.86209E-07	-6.7300	9.42004E-01	-.0259
5	CL	-1	6.80000E+00	1.91847E-04	-3.7170	1.79644E-04	-3.7456	9.36393E-01	-.0285
6	SO4	-2	2.32957E+01	2.42563E-04	-3.6152	1.87667E-04	-3.7266	7.73685E-01	-.1114
7	HCO3	-1	1.21249E+02	1.98757E-03	-2.7017	1.86509E-03	-2.7293	9.38377E-01	-.0276
18	CO3	-2	3.03168E-02	5.05316E-07	-6.2964	3.91807E-07	-6.4069	7.75371E-01	-.1105
86	H2CO3	0	5.44949E+01	8.78791E-04	-3.0561	8.79613E-04	-3.0557	1.00094E+00	.0004
27	OH	-1	5.26506E-04	3.09645E-08	-7.5091	2.89912E-08	-7.5377	9.36274E-01	-.0286
19	MGOH	1	1.98561E-05	4.80661E-10	-9.3182	4.51597E-10	-9.3452	9.39533E-01	-.0271
23	MGSO4 AQ	0	3.30066E-01	2.74263E-06	-5.5618	2.74495E-06	-5.5615	1.00085E+00	.0004
22	MGHCO3	1	1.97691E-01	2.31733E-06	-5.6350	2.17097E-06	-5.6633	9.36841E-01	-.0283
21	MGCO3 AQ	0	2.91756E-03	3.46083E-08	-7.4608	3.46377E-08	-7.4605	1.00085E+00	.0004
29	CAOH	1	1.55707E-05	2.72813E-10	-9.5641	2.56175E-10	-9.5915	9.39013E-01	-.0273
32	CASO4 AQ	0	1.80268E+00	1.32442E-05	-4.8780	1.32554E-05	-4.8776	1.00085E+00	.0004
30	CAHCO3	1	6.05505E-01	5.99069E-06	-5.2225	5.62533E-06	-5.2499	9.39013E-01	-.0273
31	CACO3 AQ	0	1.76597E-02	1.76480E-07	-6.7533	1.76630E-07	-6.7529	1.00085E+00	.0004
44	NASO4	-1	1.37572E-01	1.15583E-06	-5.9371	1.08460E-06	-5.9647	9.38377E-01	-.0276
43	NAHCO3	0	1.02090E-01	1.21577E-06	-5.9151	1.21680E-06	-5.9148	1.00085E+00	.0004
42	NACO3	-1	4.92158E-04	5.93101E-09	-8.2269	5.56552E-09	-8.2545	9.38377E-01	-.0276
94	NACL	0	1.21673E-32	2.08239E-37	-36.6814	2.08415E-37	-36.6811	1.00085E+00	.0004
63	HSO4	-1	2.82040E-04	2.90620E-09	-8.5367	2.72427E-09	-8.5648	9.37398E-01	-.0281
96	H2SO4	0	6.37516E-43	6.50160E-48	-47.1870	6.50711E-48	-47.1866	1.00085E+00	.0004
93	HCL	0	1.21836E-36	3.34229E-41	-40.4760	3.34512E-41	-40.4756	1.00085E+00	.0004

MOLE RATIOS FROM ANALYTICAL MOLALITY		MOLE RATIOS FROM COMPUTED MOLALITY		LOG ACTIVITY RATIOS	
CL/CA =	3.8437E-01	CL/CA =	3.9990E-01	LOG CA/H2 =	10.0303
CL/MG =	1.3715E+00	CL/MG =	1.4233E+00	LOG MG/H2 =	9.4801
CL/NA =	1.5472E-01	CL/NA =	1.5502E-01	LOG NA/H1 =	3.7945
CL/K =	3.6407E-01	CL/K =	3.6449E-01	LOG K/H1 =	3.4227
CL/AL =	1.9185E+26	CL/AL =	1.9185E+26	LOG AL/H3 =	-9.8100
CL/FE =	1.9185E+26	CL/FE =	1.9185E+26	LOG FE/H2 =	-16.5400
CL/SO4 =	7.3700E-01	CL/SO4 =	7.9092E-01	LOG CA/MG =	.5502
CL/HCO3 =	9.5992E-02	CL/HCO3 =	9.6523E-02	LOG NA/K =	.3718
CA/MG =	3.5682E+00	CA/MG =	3.5591E+00		
NA/K =	2.3531E+00	NA/K =	2.3513E+00		

PEËUELOS PEËUELOS,AGS   CE CAMPO=361.00 MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	6.9776E-08	3.3742E-05	-7.1563	-4.4718	2.0679E-03	-2.68446	-3.56410
22	ARAGONIT	1.4568E-10	6.9952E-09	-9.8366	-8.1552	2.0825E-02	-1.68141	-2.23237
151	ARTIN	3.6116E-30	4.3374E-19	-29.4423	-18.3628	8.3267E-12	-11.07953	-14.71004
20	BRUCITE	8.8032E-20	3.7396E-12	-19.0554	-11.4272	2.3541E-08	-7.62818	-10.12776
13	CALCITE	1.4568E-10	3.7022E-09	-9.8366	-8.4315	3.9349E-02	-1.40507	-1.86548
12	DOLOMITE	5.9782E-21	1.4045E-17	-20.2234	-16.8525	4.2564E-04	-3.37096	-4.47555
19	GYPSUM	6.9763E-08	1.7208E-05	-7.1564	-4.7643	4.0541E-03	-2.39210	-3.17594
65	HALITE	2.0842E-07	3.6597E+01	-6.6811	1.5634	5.6948E-09	-8.24452	-10.94606
118	HUNTITE	1.0068E-41	1.0247E-30	-40.9971	-29.9894	9.8254E-12	-11.00765	-14.61461
39	HYDMAG	2.4957E-61	4.9629E-38	-60.6028	-37.3043	5.0288E-24	-23.29854	-30.93295
11	MAGNESIT	4.1038E-11	7.6678E-09	-10.3868	-8.1153	5.3519E-03	-2.27149	-3.01581
67	MIRABI	2.5235E-10	3.1863E-02	-9.5980	-1.4967	7.9198E-09	-8.10129	-10.75590
59	NAHCOL	2.1638E-06	2.3813E-01	-5.6648	-.6232	9.0865E-06	-5.04160	-6.69362
61	NATRON	5.2685E-13	2.3486E-02	-12.2783	-1.6292	2.2433E-11	-10.64912	-14.13860
150	NESQUE	4.1026E-11	8.0536E-06	-10.3869	-5.0940	5.0941E-06	-5.29294	-7.02731
66	THENAR	2.5259E-10	6.8008E-01	-9.5976	-.1674	3.7142E-10	-9.43014	-12.52018
62	THRNAT	5.2731E-13	1.5192E+00	-12.2779	.1816	3.4709E-13	-12.45956	-16.54228
60	TRONA	1.1409E-18	3.7048E-01	-17.9428	-.4312	3.0795E-18	-17.51152	-23.24966

S/N RUSTICO CALPULLI,AGS CE CAMPO=544.0 MMHOS

INITIAL SOLUTION

TEMPERATURE = 23.00 DEGREES C PH = 7.350 ANALYTICAL EPMCAT = 4.956 ANALYTICAL EPMAN = 3.709

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.21797E-03	-2.9144	4.88000E+01
MG	2	1.56353E-04	-3.8059	3.80000E+00
NA	1	1.95804E-03	-2.7082	4.50000E+01
K	1	2.50710E-04	-3.6008	9.80000E+00
CL	-1	1.12863E-04	-3.9474	4.00000E+00
HCO3	-1	3.59771E-03	-2.4440	2.19450E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	4.956	4.909
EPMAN	3.709	3.663

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 3.597672E+00 MEQ/KG H2O
ELECT = 1.246895E+00 MEQ/KG H2O

PH
7.350

TEMPERATURE
23.00 DEG C

IONIC STRENGTH
5.620615E-03

ACTIVITY H2O = .9999
PCO2 = 9.341547E-03
LOG PCO2 = -2.0296
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 3.925615E-03
DENSITY = 1.0000
TDS = 330.9MG/L
CARBONATE ALK = 3.597502E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.876VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	4.74456E+01	1.18417E-03	-2.9266	8.67739E-04	-3.0616	7.32786E-01	-.1350
2	MG	2	3.68124E+00	1.51467E-04	-3.8197	1.11420E-04	-3.9530	7.35610E-01	-.1334
3	NA	1	4.49212E+01	1.95461E-03	-2.7089	1.80606E-03	-2.7433	9.24001E-01	-.0343
4	K	1	9.80000E+00	2.50710E-04	-3.6008	2.31266E-04	-3.6359	9.22447E-01	-.0351
64	H	1	4.83688E-05	4.80008E-08	-7.3188	4.46684E-08	-7.3500	9.30576E-01	-.0312
5	CL	-1	4.00000E+00	1.12863E-04	-3.9474	1.04110E-04	-3.9825	9.22447E-01	-.0351
6	SO4	-2	.00000E+00	.00000E+00	.0000	.00000E+00	-3.7266	7.30844E-01	-.1114
7	HCO3	-1	2.16055E+02	3.54205E-03	-2.4507	3.27765E-03	-2.4844	9.25354E-01	-.0337
18	CO3	-2	2.69580E-01	4.49378E-06	-5.3474	3.29490E-06	-5.4822	7.33215E-01	-.1348
86	H2CO3	0	2.08917E+01	3.36936E-04	-3.4725	3.37403E-04	-3.4719	1.00138E+00	.0006
27	OH	-1	3.56061E-03	2.09426E-07	-6.6790	1.93147E-07	-6.7141	9.22268E-01	-.0351
19	MGOH	1	1.53080E-04	3.70603E-09	-8.4311	3.43560E-09	-8.4640	9.27031E-01	-.0329
23	MGSO4 AQ	0	.00000E+00	.00000E+00	.0000	.00000E+00	-5.5615	1.00130E+00	.0004
22	MGHCO3	1	3.87778E-01	4.54600E-06	-5.3424	4.19643E-06	-5.3771	9.23104E-01	-.0347
21	MGCO3 AQ	0	2.86039E-02	3.39337E-07	-6.4694	3.39777E-07	-6.4688	1.00130E+00	.0006
29	CAOH	1	2.55882E-04	4.48378E-09	-8.3484	4.15322E-09	-8.3816	9.26278E-01	-.0333
32	CASO4 AQ	0	.00000E+00	.00000E+00	.0000	.00000E+00	-4.8776	1.00130E+00	.0004
30	CAHCO3	1	3.02506E+00	2.99322E-05	-4.5239	2.77255E-05	-4.5571	9.26278E-01	-.0333
31	CACO3 AQ	0	3.88473E-01	3.88256E-06	-5.4109	3.88758E-06	-5.4103	1.00130E+00	.0006
44	NASO4	-1	.00000E+00	.00000E+00	.0000	.00000E+00	-5.9647	9.25354E-01	-.0276
43	NAHCO3	0	2.79139E-01	3.32455E-06	-5.4783	3.32885E-06	-5.4777	1.00130E+00	.0006
42	NACO3	-1	8.93486E-03	1.07686E-07	-6.9678	9.96473E-08	-7.0015	9.25354E-01	-.0337
94	NACL	0	1.09711E-32	1.87785E-37	-36.7263	1.88029E-37	-36.7258	1.00130E+00	.0006
63	HSO4	-1	.00000E+00	.00000E+00	.0000	.00000E+00	-8.5648	9.23923E-01	-.0281
96	H2SO4	0	.00000E+00	.00000E+00	.0000	.00000E+00	-47.1866	1.00130E+00	.0004
93	HCL	0	1.69284E-37	4.64440E-42	-41.3331	4.65042E-42	-41.3325	1.00130E+00	.0006

MOLE RATIOS FROM ANALYTICAL MOLALITY		MOLE RATIOS FROM COMPUTED MOLALITY		LOG ACTIVITY RATIOS	
CL/CA =	9.2665E-02	CL/CA =	9.5310E-02	LOG CA/H2 =	11.6384
CL/MG =	7.2185E-01	CL/MG =	7.4513E-01	LOG MG/H2 =	10.7470
CL/NA =	5.7641E-02	CL/NA =	5.7742E-02	LOG NA/H1 =	4.6067
CL/K =	4.5017E-01	CL/K =	4.5017E-01	LOG K/H1 =	3.7141
CL/AL =	1.1286E+26	CL/AL =	1.1286E+26	LOG AL/H3 =	-7.9500
CL/FE =	1.1286E+26	CL/FE =	1.1286E+26	LOG FE/H2 =	-15.3000
CL/SO4 =	1.1286E+26	CL/SO4 =	1.1286E+26	LOG CA/MG =	.8914
CL/HCO3 =	3.1371E-02	CL/HCO3 =	3.1864E-02	LOG NA/K =	.8926
CA/MG =	7.7899E+00	CA/MG =	7.8180E+00		
NA/K =	7.8100E+00	NA/K =	7.7963E+00		

S/N RUSTICO CALPULLI,AGS CE CAMPO=544.0 MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
22	ARAGONIT	2.8591E-09	6.3044E-09	-8.5438	-8.2004	4.5351E-01	-.34342	-.46537
151	ARTIN	1.5254E-27	4.0655E-19	-26.8166	-18.3909	3.7520E-09	-8.42574	-11.41799
20	BRUCITE	4.1566E-18	3.8529E-12	-17.3813	-11.4142	1.0788E-06	-5.96705	-8.08614
13	CALCITE	2.8591E-09	3.4461E-09	-8.5438	-8.4627	8.2967E-01	-.08109	-.10989
12	DOLOMITE	1.0496E-18	1.0496E-17	-17.9790	-16.9790	1.0000E-01	-1.00000	-1.35513
65	HALITE	1.8803E-07	3.7797E+01	-6.7258	1.5775	4.9747E-09	-8.30323	-11.25197
118	HUNTITE	1.4147E-37	4.1449E-31	-36.8493	-30.3825	3.4130E-07	-6.46686	-8.76344
39	HYDMAG	7.5464E-56	2.0245E-38	-55.1223	-37.6937	3.7275E-18	-17.42858	-23.61802
11	MAGNESIT	3.6712E-10	6.1736E-09	-9.4352	-8.2095	5.9466E-02	-1.22573	-1.66102
59	NAHCOL	5.9196E-06	2.7139E-01	-5.2277	-.5664	2.1813E-05	-4.66129	-6.31666
61	NATRON	1.0734E-11	4.0838E-02	-10.9693	-1.3889	2.6284E-10	-9.58032	-12.98259
150	NESQUE	3.6698E-10	6.5714E-06	-9.4354	-5.1823	5.5845E-05	-4.25302	-5.76340
62	THRNAT	1.0746E-11	1.3768E+00	-10.9687	.1389	7.8051E-12	-11.10762	-15.05229
60	TRONA	6.3605E-17	1.9683E-01	-16.1965	-.7059	3.2314E-16	-15.49061	-20.99182

S/N RANCHO LA COTORRA,AGS CE CAMPO=669.00 MMHOS

INITIAL SOLUTION

TEMPERATURE = 26.00 DEGREES C   PH = 7.130   ANALYTICAL EPMCAT = 5.682   ANALYTICAL EPMAN = 4.722

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.27796E-03	-2.8935	5.12000E+01
MG	2	5.76080E-05	-4.2395	1.40000E+00
NA	1	2.69359E-03	-2.5697	6.19000E+01
K	1	3.19806E-04	-3.4951	1.25000E+01
CL	-1	1.63663E-04	-3.7860	5.80000E+00
SO4	-2	2.81183E-04	-3.5510	2.70000E+01
HCO3	-1	3.99786E-03	-2.3982	2.43840E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	5.682	5.566
EPMAN	4.722	4.605

PH 7.130
TEMPERATURE 26.00 DEG C
IONIC STRENGTH 6.598801E-03

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 3.997780E+00 MEQ/KG H2O
ELECT = 9.606507E-01 MEQ/KG H2O

ACTIVITY H2O = .9998
PCO2 = 1.787629E-02
LOG PCO2 = -1.7477
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 4.586027E-03
DENSITY = 1.0000
TDS = 403.6MG/L
CARBONATE ALK = 3.997698E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000   EQUIVALENT EH = 5.936VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	4.83806E+01	1.20759E-03	-2.9181	8.63633E-04	-3.0637	7.15172E-01	-.1456
2	MG	2	1.32422E+00	5.44896E-05	-4.2637	3.91438E-05	-4.4073	7.18372E-01	-.1437
3	NA	1	6.17247E+01	2.68596E-03	-2.5709	2.46626E-03	-2.6080	9.18207E-01	-.0371
4	K	1	1.24844E+01	3.19406E-04	-3.4957	2.92705E-04	-3.5336	9.16402E-01	-.0379
64	H	1	8.06856E-05	8.00776E-08	-7.0965	7.41310E-08	-7.1300	9.25740E-01	-.0335
5	CL	-1	5.80000E+00	1.63663E-04	-3.7860	1.49981E-04	-3.8240	9.16402E-01	-.0379
6	SO4	-2	2.36226E+01	2.46011E-04	-3.6090	1.75393E-04	-3.7560	7.12948E-01	-.1469
7	HCO3	-1	2.40416E+02	3.94172E-03	-2.4043	3.62542E-03	-2.4406	9.19756E-01	-.0363
18	CO3	-2	1.95838E-01	3.26477E-06	-5.4861	2.33639E-06	-5.6315	7.15634E-01	-.1453
86	H2CO3	0	3.68737E+01	5.94734E-04	-3.2257	5.95687E-04	-3.2250	1.00160E+00	.0007
27	OH	-1	2.71084E-03	1.59456E-07	-6.7974	1.46093E-07	-6.8354	9.16193E-01	-.0380
19	MGOH	1	4.23867E-05	1.02625E-09	-8.9887	9.45874E-10	-9.0242	9.21684E-01	-.0354
23	MGSO4 AQ	0	1.46434E-01	1.21699E-06	-5.9147	1.21884E-06	-5.9141	1.00152E+00	.0007
22	MGHCO3	1	1.54429E-01	1.81053E-06	-5.7422	1.66054E-06	-5.7797	9.17161E-01	-.0376
21	MGCO3 AQ	0	7.45946E-03	8.85004E-08	-7.0531	8.86349E-08	-7.0524	1.00152E+00	.0007
29	CAOH	1	1.97726E-04	3.46497E-09	-8.4603	3.19061E-09	-8.4961	9.20820E-01	-.0358
32	CASO4 AQ	0	4.22836E+00	3.10711E-05	-4.5076	3.11183E-05	-4.5070	1.00152E+00	.0007
30	CAHCO3	1	3.67202E+00	3.63364E-05	-4.4397	3.34592E-05	-4.4755	9.20820E-01	-.0358
31	CACO3 AQ	0	2.93144E-01	2.93002E-06	-5.5331	2.93448E-06	-5.5325	1.00152E+00	.0007
44	NASO4	-1	2.95584E-01	2.48383E-06	-5.6049	2.28452E-06	-5.6412	9.19756E-01	-.0363
43	NAHCO3	0	4.21497E-01	5.02040E-06	-5.2993	5.02803E-06	-5.2986	1.00152E+00	.0007
42	NACO3	-1	1.01308E-02	1.22108E-07	-6.9133	1.12310E-07	-6.9496	9.19756E-01	-.0363
94	NACL	0	2.15760E-32	3.69331E-37	-36.4326	3.69893E-37	-36.4319	1.00152E+00	.0007
63	HSO4	-1	1.37146E-04	1.41343E-09	-8.8497	1.29768E-09	-8.8868	9.18107E-01	-.0371
96	H2SO4	0	9.43508E-44	9.62391E-49	-48.0166	9.63854E-49	-48.0160	1.00152E+00	.0007
93	HCL	0	4.04603E-37	1.11014E-41	-40.9546	1.11182E-41	-40.9540	1.00152E+00	.0007

MOLE RATIOS FROM ANALYTICAL MOLALITY			MOLE RATIOS FROM COMPUTED MOLALITY			LOG ACTIVITY RATIOS		
CL/CA	=	1.2807E-01	CL/CA	=	1.3553E-01	LOG CA/H2	=	11.1963
CL/MG	=	2.8410E+00	CL/MG	=	3.0036E+00	LOG MG/H2	=	9.8527
CL/NA	=	6.0760E-02	CL/NA	=	6.0933E-02	LOG NA/H1	=	4.5220
CL/K	=	5.1176E-01	CL/K	=	5.1240E-01	LOG K/H1	=	3.5964
CL/AL	=	1.6366E+26	CL/AL	=	1.6366E+26	LOG AL/H3	=	-8.6100
CL/FE	=	1.6366E+26	CL/FE	=	1.6366E+26	LOG FE/H2	=	-15.7400
CL/SO4	=	5.8205E-01	CL/SO4	=	6.6527E-01	LOG CA/MG	=	1.3437
CL/HCO3	=	4.0938E-02	CL/HCO3	=	4.1521E-02	LOG NA/K	=	.9256
CA/MG	=	2.2184E+01	CA/MG	=	2.2162E+01			
NA/K	=	8.4226E+00	NA/K	=	8.4092E+00			

S/N RANCHO LA COTORRA,AGS CE CAMPO=669.00 MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	1.5148E-07	2.7718E-05	-6.8197	-4.5572	5.4648E-03	-2.26242	-3.09694
22	ARAGONIT	2.0178E-09	5.9945E-09	-8.6951	-8.2222	3.3661E-01	-.47288	-.64730
151	ARTIN	7.6370E-29	3.9399E-19	-28.1171	-18.4045	1.9384E-10	-9.71256	-13.29513
20	BRUCITE	8.3545E-19	3.9092E-12	-18.0781	-11.4079	2.1372E-07	-6.67016	-9.13051
13	CALCITE	2.0178E-09	3.3007E-09	-8.6951	-8.4814	6.1132E-01	-.21373	-.29257
12	DOLOMITE	1.8454E-19	9.1136E-18	-18.7339	-17.0403	2.0249E-02	-1.69361	-2.31831
19	GYPSUM	1.5143E-07	1.7444E-05	-6.8198	-4.7584	8.6809E-03	-2.06144	-2.82181
65	HALITE	3.6989E-07	3.8393E+01	-6.4319	1.5842	9.6344E-09	-8.01617	-10.97301
118	HUNTITE	1.5435E-39	2.6723E-31	-38.8115	-30.5731	5.7758E-09	-8.23839	-11.27719
39	HYDMAG	5.8409E-59	1.3106E-38	-58.2335	-37.8825	4.4566E-21	-20.35100	-27.85764
11	MAGNESIT	9.1455E-11	5.5576E-09	-10.0388	-8.2551	1.6456E-02	-1.78368	-2.44160
67	MIRABI	1.0651E-09	8.5807E-02	-8.9726	-1.0665	1.2413E-08	-7.90612	-10.82236
59	NAHCOL	8.9412E-06	2.8914E-01	-5.0486	-.5389	3.0923E-05	-4.50972	-6.17316
61	NATRON	1.4189E-11	5.3404E-02	-10.8481	-1.2724	2.6568E-10	-9.57564	-13.10770
150	NESQUE	9.1412E-11	5.9541E-06	-10.0390	-5.2252	1.5353E-05	-4.81381	-6.58943
66	THENAR	1.0668E-09	6.6008E-01	-8.9719	-.1804	1.6162E-09	-8.79151	-12.03433
62	THRNAT	1.4209E-11	1.3126E+00	-10.8474	.1181	1.0825E-11	-10.96558	-15.01033
60	TRONA	1.2702E-16	1.4484E-01	-15.8961	-.8391	8.7697E-16	-15.05701	-20.61092

S/N JESUS MARIA,AGS   CE CAMPO=1460.0MMHOS

INITIAL SOLUTION

TEMPERATURE = 30.60 DEGREES C   PH = 6.430   ANALYTICAL EPMCAT = 10.204   ANALYTICAL EPMAN = 9.216

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.25844E-03	-2.9002	5.04000E+01
MG	2	7.32704E-04	-3.1351	1.78000E+01
NA	1	5.44132E-03	-2.2643	1.25000E+02
K	1	7.88281E-04	-3.1033	3.08000E+01
CL	-1	2.11708E-04	-3.6743	7.50000E+00
SO4	-2	9.06355E-04	-3.0427	8.70000E+01
HCO3	-1	7.19882E-03	-2.1427	4.38920E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	10.204	9.830
EPMAN	9.216	8.842

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 7.198392E+00 MEQ/KG H2O
ELECT = 9.884254E-01 MEQ/KG H2O

PH
6.430

TEMPERATURE
30.60 DEG C

IONIC STRENGTH
1.188529E-02

ACTIVITY H2O = .9996
PCO2 = 1.677453E-01
LOG PCO2 = -.7753
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 1.215735E-02
DENSITY = 1.0000
TDS = 757.4MG/L
CARBONATE ALK = 7.198776E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000   EQUIVALENT EH = 6.027VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	4.47700E+01	1.11786E-03	-2.9516	7.23922E-04	-3.1403	6.47595E-01	-.1887
2	MG	2	1.58771E+01	6.53549E-04	-3.1847	4.26439E-04	-3.3701	6.52497E-01	-.1854
3	NA	1	1.24266E+02	5.40938E-03	-2.2669	4.84036E-03	-2.3151	8.94808E-01	-.0483
4	K	1	3.06828E+01	7.85280E-04	-3.1050	7.00256E-04	-3.1547	8.91728E-01	-.0498
64	H	1	4.12686E-04	4.09722E-07	-6.3875	3.71535E-07	-6.4300	9.06800E-01	-.0425
5	CL	-1	7.50000E+00	2.11708E-04	-3.6743	1.88786E-04	-3.7240	8.91728E-01	-.0498
6	SO4	-2	7.39363E+01	7.70259E-04	-3.1134	4.96025E-04	-3.3045	6.43972E-01	-.1911
7	HCO3	-1	4.31445E+02	7.07623E-03	-2.1502	6.34908E-03	-2.1973	8.97241E-01	-.0471
18	CO3	-2	8.23447E-02	1.37324E-06	-5.8623	8.89984E-07	-6.0506	6.48092E-01	-.1884
86	H2CO3	0	3.07506E+02	4.96151E-03	-2.3044	4.97553E-03	-2.3032	1.00283E+00	.0012
27	OH	-1	7.80602E-04	4.59325E-08	-7.3379	4.09425E-08	-7.3878	8.91362E-01	-.0499
19	MGOH	1	1.39822E-04	3.38650E-09	-8.4702	3.04908E-09	-8.5158	9.00363E-01	-.0456
23	MGSO4 AQ	0	5.06447E+00	4.21049E-05	-4.3757	4.22202E-05	-4.3745	1.00274E+00	.0012
22	MGHCO3	1	3.11607E+00	3.65458E-05	-4.4372	3.26344E-05	-4.4863	8.92973E-01	-.0492
21	MGCO3 AQ	0	3.31695E-02	3.93668E-07	-6.4049	3.94747E-07	-6.4037	1.00274E+00	.0012
29	CAOH	1	4.90246E-05	8.59416E-10	-9.0658	7.72587E-10	-9.1121	8.98968E-01	-.0463
32	CASO4 AQ	0	1.03977E+01	7.64322E-05	-4.1167	7.66416E-05	-4.1155	1.00274E+00	.0012
30	CAHCO3	1	6.35443E+00	6.29023E-05	-4.2013	5.65471E-05	-4.2476	8.98968E-01	-.0463
31	CACO3 AQ	0	1.04889E-01	1.04875E-06	-5.9793	1.05162E-06	-5.9781	1.00274E+00	.0012
44	NASO4	-1	1.72986E+00	1.45414E-05	-4.8374	1.30471E-05	-4.8845	8.97241E-01	-.0471
43	NAHCO3	0	1.44645E+00	1.72345E-05	-4.7636	1.72818E-05	-4.7624	1.00274E+00	.0012
42	NACO3	-1	9.73890E-03	1.17426E-07	-6.9302	1.05360E-07	-6.9773	8.97241E-01	-.0471
94	NACL	0	5.32182E-32	9.11294E-37	-36.0403	9.13791E-37	-36.0392	1.00274E+00	.0012
63	HSO4	-1	2.26974E-03	2.34004E-08	-7.6308	2.09325E-08	-7.6792	8.94537E-01	-.0484
96	H2SO4	0	6.69200E-42	6.82834E-47	-46.1657	6.84706E-47	-46.1645	1.00274E+00	.0012
93	HCL	0	2.54848E-36	6.99489E-41	-40.1552	7.01406E-41	-40.1540	1.00274E+00	.0012

MOLE RATIOS FROM ANALYTICAL MOLALITY		MOLE RATIOS FROM COMPUTED MOLALITY		LOG ACTIVITY RATIOS	
CL/CA =	1.6823E-01	CL/CA =	1.8939E-01	LOG CA/H2 =	9.7197
CL/MG =	2.8894E-01	CL/MG =	3.2394E-01	LOG MG/H2 =	9.4899
CL/NA =	3.8908E-02	CL/NA =	3.9137E-02	LOG NA/H1 =	4.1149
CL/K =	2.6857E-01	CL/K =	2.6960E-01	LOG K/H1 =	3.2753
CL/AL =	2.1171E+26	CL/AL =	2.1171E+26	LOG AL/H3 =	-10.7100
CL/FE =	2.1171E+26	CL/FE =	2.1171E+26	LOG FE/H2 =	-17.1400
CL/SO4 =	2.3358E-01	CL/SO4 =	2.7485E-01	LOG CA/MG =	.2298
CL/HCO3 =	2.9409E-02	CL/HCO3 =	2.9918E-02	LOG NA/K =	.8396
CA/MG =	1.7175E+00	CA/MG =	1.7104E+00		
NA/K =	6.9028E+00	NA/K =	6.8885E+00		

S/N JESUS MARIA,AGS CE CAMPO=1460.0MMHOS

PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18 ANHYDRIT	3.5908E-07	2.5181E-05	-6.4448	-4.5989	1.4260E-02	-1.84587	-2.56559
22 ARAGONIT	6.4428E-10	5.5592E-09	-9.1909	-8.2550	1.1589E-01	-.93594	-1.30087
151 ARTIN	2.7100E-28	3.7593E-19	-27.5670	-18.4249	7.2088E-10	-9.14213	-12.70671
20 BRUCITE	7.1484E-19	3.9947E-12	-18.1458	-11.3985	1.7895E-07	-6.74728	-9.37809
13 CALCITE	6.4428E-10	3.0620E-09	-9.1909	-8.5140	2.1041E-01	-.67693	-.94087
12 DOLOMITE	2.4452E-19	7.3787E-18	-18.6117	-17.1320	3.3139E-02	-1.47966	-2.05660
19 GYPSUM	3.5882E-07	1.7560E-05	-6.4451	-4.7555	2.0434E-02	-1.68965	-2.34845
65 HALITE	9.1379E-07	3.9301E+01	-6.0392	1.5944	2.3251E-08	-7.63356	-10.60993
118 HUNTITE	3.5220E-38	1.3864E-31	-37.4532	-30.8581	2.5403E-07	-6.59511	-9.16659
39 HYDMAG	1.4809E-56	6.8414E-39	-55.8295	-38.1649	2.1647E-18	-17.66461	-24.55216
11 MAGNESIT	3.7952E-10	4.7494E-09	-9.4208	-8.3234	7.9910E-02	-1.09740	-1.52528
67 MIRABI	1.1579E-08	1.3918E-01	-7.9363	-.8564	8.3199E-08	-7.07988	-9.84038
59 NAHCOL	3.0732E-05	3.1788E-01	-4.5124	-.4977	9.6676E-05	-4.01468	-5.58003
61 NATRON	2.0776E-11	7.9756E-02	-10.6824	-1.0982	2.6050E-10	-9.58420	-13.32114
150 NESQUE	3.7911E-10	5.1378E-06	-9.4212	-5.2892	7.3790E-05	-4.13200	-5.74310
66 THENAR	1.1621E-08	6.5053E-01	-7.9347	-.1867	1.7864E-08	-7.74801	-10.76901
62 THRNAT	2.0844E-11	1.2222E+00	-10.6810	.0871	1.7055E-11	-10.76816	-14.96673
60 TRONA	6.4034E-16	9.1573E-02	-15.1936	-1.0382	6.9927E-15	-14.15535	-19.67462

S/N POSITOS (COYOTES),AGS CE CAMPO=1222.0 MMHOS

INITIAL SOLUTION

TEMPERATURE = 22.40 DEGREES C PH = 6.560 ANALYTICAL EPMCAT = 11.362 ANALYTICAL EPMAN = 10.620

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.63815E-03	-2.7856	6.56000E+01
MG	2	9.88023E-04	-3.0052	2.40000E+01
NA	1	5.27212E-03	-2.2780	1.21100E+02
K	1	8.47238E-04	-3.0720	3.31000E+01
CL	-1	1.21393E-04	-3.9158	4.30000E+00
SO4	-2	8.54359E-04	-3.0684	8.20000E+01
HCO3	-1	8.79939E-03	-2.0555	5.36450E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	11.362	10.938
EPMAN	10.620	10.197

PH 6.560

TEMPERATURE 22.40 DEG C

IONIC STRENGTH 1.365662E-02

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 8.799080E+00 MEQ/KG H2O
ELECT = 7.417601E-01 MEQ/KG H2O

ACTIVITY H2O = .9996
PCO2 = 1.344125E-01
LOG PCO2 = -.8716
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 1.371437E-02
DENSITY = 1.0000
TDS = 866.5MG/L
CARBONATE ALK = 8.799360E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.865VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	5.90765E+01	1.47524E-03	-2.8311	9.36738E-04	-3.0284	6.34973E-01	-.1972
2	MG	2	2.16019E+01	8.89299E-04	-3.0510	5.69430E-04	-3.2446	6.40313E-01	-.1936
3	NA	1	1.20354E+02	5.23966E-03	-2.2807	4.66438E-03	-2.3312	8.90207E-01	-.0505
4	K	1	3.30006E+01	8.44694E-04	-3.0733	7.49031E-04	-3.1255	8.86748E-01	-.0522
64	H	1	3.07093E-04	3.04920E-07	-6.5158	2.75423E-07	-6.5600	9.03263E-01	-.0442
5	CL	-1	4.30000E+00	1.21393E-04	-3.9158	1.07645E-04	-3.9680	8.86748E-01	-.0522
6	SO4	-2	6.85730E+01	7.14463E-04	-3.1460	4.50749E-04	-3.3461	6.30892E-01	-.2000
7	HCO3	-1	5.26537E+02	8.63680E-03	-2.0636	7.71102E-03	-2.1129	8.92811E-01	-.0492
18	CO3	-2	1.17105E-01	1.95314E-06	-5.7093	1.24100E-06	-5.9062	6.35386E-01	-.1970
86	H2CO3	0	3.04855E+02	4.91927E-03	-2.3081	4.93588E-03	-2.3066	1.00338E+00	.0015
27	OH	-1	5.73386E-04	3.37431E-08	-7.4718	2.99075E-08	-7.5242	8.86330E-01	-.0524
19	MGOH	1	1.24352E-04	3.01214E-09	-8.5211	2.69959E-09	-8.5687	8.96236E-01	-.0476
23	MGSO4 AQ	0	4.97169E+00	4.13379E-05	-4.3837	4.14681E-05	-4.3823	1.00315E+00	.0014
22	MGHCO3	1	4.82653E+00	5.66126E-05	-4.2471	5.02782E-05	-4.2986	8.88110E-01	-.0515
21	MGCO3 AQ	0	5.44242E-02	6.45998E-07	-6.1898	6.48033E-07	-6.1884	1.00315E+00	.0014
29	CAOH	1	4.40768E-05	7.72763E-10	-9.1120	6.91396E-10	-9.1603	8.94706E-01	-.0483
30	CAHCO3	1	7.80478E+00	7.72676E-05	-4.1120	6.91319E-05	-4.1603	8.94706E-01	-.0483
31	CACO3 AQ	0	1.55589E-01	1.55586E-06	-5.8080	1.56076E-06	-5.8067	1.00315E+00	.0014
44	NASO4	-1	1.44579E+00	1.21548E-05	-4.9153	1.08519E-05	-4.9645	8.92811E-01	-.0492
43	NAHCO3	0	1.69198E+00	2.01623E-05	-4.6955	2.02258E-05	-4.6941	1.00315E+00	.0014
42	NACO3	-1	8.73063E-03	1.05281E-07	-6.9777	9.39956E-08	-7.0269	8.92811E-01	-.0492
94	NACL	0	2.92264E-32	5.00519E-37	-36.3006	5.02096E-37	-36.2992	1.00315E+00	.0014
63	HSO4	-1	1.22222E-03	1.26021E-08	-7.8996	1.12138E-08	-7.9502	8.89835E-01	-.0507
96	H2SO4	0	3.34012E-42	3.40855E-47	-46.4674	3.41928E-47	-46.4661	1.00315E+00	.0014
93	HCL	0	1.07666E-36	2.95547E-41	-40.5294	2.96478E-41	-40.5280	1.00315E+00	.0014

MOLE RATIOS FROM ANALYTICAL MOLALITY			MOLE RATIOS FROM COMPUTED MOLALITY			LOG ACTIVITY RATIOS		
CL/CA	=	7.4104E-02	CL/CA	=	8.2287E-02	LOG CA/H2	=	10.0916
CL/MG	=	1.2286E-01	CL/MG	=	1.3650E-01	LOG MG/H2	=	9.8754
CL/NA	=	2.3025E-02	CL/NA	=	2.3168E-02	LOG NA/H1	=	4.2288
CL/K	=	1.4328E-01	CL/K	=	1.4371E-01	LOG K/H1	=	3.4345
CL/AL	=	1.2139E+26	CL/AL	=	1.2139E+26	LOG AL/H3	=	-10.3200
CL/FE	=	1.2139E+26	CL/FE	=	1.2139E+26	LOG FE/H2	=	-16.8800
CL/SO4	=	1.4209E-01	CL/SO4	=	1.6991E-01	LOG CA/MG	=	.2162
CL/HCO3	=	1.3796E-02	CL/HCO3	=	1.4055E-02	LOG NA/K	=	.7943
CA/MG	=	1.6580E+00	CA/MG	=	1.6589E+00			
NA/K	=	6.2227E+00	NA/K	=	6.2030E+00			

S/N POSITOS (COYOTES),AGS CE CAMPO=1222.0 MMHOS

PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18 ANHYDRIT	4.2223E-07	2.9943E-05	-6.3744	-4.5237	1.4101E-02	-1.85075	-2.50293
22 ARAGONIT	1.1625E-09	6.3691E-09	-8.9346	-8.1959	1.8252E-01	-.73869	-.99899
151 ARTIN	3.5950E-28	4.0914E-19	-27.4443	-18.3881	8.7867E-10	-9.05618	-12.24745
20 BRUCITE	5.0933E-19	3.8417E-12	-18.2930	-11.4155	1.3258E-07	-6.87752	-9.30106
13 CALCITE	1.1625E-09	3.4739E-09	-8.9346	-8.4592	3.3463E-01	-.47543	-.64297
12 DOLOMITE	8.2149E-19	1.0801E-17	-18.0854	-16.9665	7.6058E-02	-1.11885	-1.51312
19 GYPSUM	4.2190E-07	1.7351E-05	-6.3748	-4.7607	2.4316E-02	-1.61411	-2.18289
65 HALITE	5.0210E-07	3.7677E+01	-6.2992	1.5761	1.3326E-08	-7.87529	-10.65044
118 HUNTITE	4.1023E-37	4.5300E-31	-36.3870	-30.3439	9.0557E-07	-6.04308	-8.17257
39 HYDMAG	1.2681E-55	2.2108E-38	-54.8968	-37.6554	5.7360E-18	-17.24139	-23.31702
11 MAGNESIT	7.0666E-10	6.3063E-09	-9.1508	-8.2002	1.1206E-01	-.95057	-1.28553
67 MIRABI	9.7682E-09	5.8153E-02	-8.0102	-1.2354	1.6797E-07	-6.77476	-9.16209
59 NAHCOL	3.5967E-05	2.6793E-01	-4.4441	-.5720	1.3424E-04	-3.87211	-5.23658
61 NATRON	2.6894E-11	3.8679E-02	-10.5703	-1.4125	6.9530E-10	-9.15783	-12.38492
150 NESQUE	7.0583E-10	6.7039E-06	-9.1513	-5.1737	1.0529E-04	-3.97763	-5.37929
66 THENAR	9.8067E-09	6.6786E-01	-8.0085	-.1753	1.4684E-08	-7.83317	-10.59346
62 THRNAT	2.6989E-11	1.3902E+00	-10.5688	.1431	1.9414E-11	-10.71188	-14.48660
60 TRONA	9.7034E-16	2.0944E-01	-15.0131	-.6789	4.6330E-15	-14.33414	-19.38529

S/N VIË.AGUASCALIENTES CE CAMPO=1413.0 MMHOS

INITIAL SOLUTION

TEMPERATURE = 29.00 DEGREES C PH = 6.700 ANALYTICAL EPMCAT = 9.703 ANALYTICAL EPMAN = 9.405

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.25844E-03	-2.9002	5.04000E+01
MG	2	8.68542E-04	-3.0612	2.11000E+01
NA	1	4.68823E-03	-2.3290	1.07700E+02
K	1	7.67805E-04	-3.1147	3.00000E+01
CL	-1	2.08885E-04	-3.6801	7.40000E+00
SO4	-2	8.02176E-04	-3.0957	7.70000E+01
HCO3	-1	7.59868E-03	-2.1193	4.63300E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	9.703	9.338
EPMAN	9.405	9.041

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 7.598457E+00 MEQ/KG H2O
ELECT = 2.977154E-01 MEQ/KG H2O

PH
6.700

TEMPERATURE
29.00 DEG C

IONIC STRENGTH
1.178153E-02

ACTIVITY H2O = .9997
PCO2 = 9.284294E-02
LOG PCO2 = -1.0323
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 1.044980E-02
DENSITY = 1.0000
TDS = 756.9MG/L
CARBONATE ALK = 7.598604E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.996VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	4.50675E+01	1.12529E-03	-2.9487	7.30737E-04	-3.1362	6.49376E-01	-.1875
2	MG	2	1.89306E+01	7.79242E-04	-3.1083	5.09812E-04	-3.2926	6.54241E-01	-.1843
3	NA	1	1.07083E+02	4.66138E-03	-2.3315	4.17402E-03	-2.3794	8.95449E-01	-.0480
4	K	1	2.99017E+01	7.65291E-04	-3.1162	6.82943E-04	-3.1656	8.92397E-01	-.0494
64	H	1	2.21499E-04	2.19907E-07	-6.6578	1.99526E-07	-6.7000	9.07321E-01	-.0422
5	CL	-1	7.40000E+00	2.08885E-04	-3.6801	1.86408E-04	-3.7295	8.92397E-01	-.0494
6	SO4	-2	6.51469E+01	6.78692E-04	-3.1683	4.38282E-04	-3.3582	6.45775E-01	-.1899
7	HCO3	-1	4.54988E+02	7.46236E-03	-2.1271	6.70010E-03	-2.1739	8.97854E-01	-.0468
18	CO3	-2	1.56780E-01	2.61456E-06	-5.5826	1.69911E-06	-5.7698	6.49864E-01	-.1872
86	H2CO3	0	1.77060E+02	2.85680E-03	-2.5441	2.86486E-03	-2.5429	1.00282E+00	.0012
27	OH	-1	1.29205E-03	7.60274E-08	-7.1190	6.78190E-08	-7.1686	8.92034E-01	-.0496
19	MGOH	1	2.71531E-04	6.57648E-09	-8.1820	5.92505E-09	-8.2273	9.00945E-01	-.0453
23	MGSO4 AQ	0	5.13834E+00	4.27190E-05	-4.3694	4.28350E-05	-4.3682	1.00272E+00	.0012
22	MGHCO3	1	3.88706E+00	4.55882E-05	-4.3411	4.07389E-05	-4.3900	8.93629E-01	-.0488
21	MGCO3 AQ	0	7.38703E-02	8.76720E-07	-6.0571	8.79101E-07	-6.0560	1.00272E+00	.0012
29	CAOH	1	8.10661E-05	1.42111E-09	-8.8474	1.27838E-09	-8.8933	8.99564E-01	-.0460
32	CASO4 AQ	0	9.15279E+00	6.72808E-05	-4.1721	6.74636E-05	-4.1709	1.00272E+00	.0012
30	CAHCO3	1	6.44094E+00	6.37586E-05	-4.1955	5.73549E-05	-4.2414	8.99564E-01	-.0460
31	CACO3 AQ	0	1.93862E-01	1.93837E-06	-5.7126	1.94363E-06	-5.7114	1.00272E+00	.0012
44	NASO4	-1	1.30430E+00	1.09640E-05	-4.9600	9.84411E-06	-5.0068	8.97854E-01	-.0468
43	NAHCO3	0	1.31632E+00	1.56841E-05	-4.8045	1.57267E-05	-4.8034	1.00272E+00	.0012
42	NACO3	-1	1.48177E-02	1.78664E-07	-6.7480	1.60414E-07	-6.7948	8.97854E-01	-.0468
94	NACL	0	4.53153E-32	7.75965E-37	-36.1102	7.78073E-37	-36.1090	1.00272E+00	.0012
63	HSO4	-1	1.02869E-03	1.06055E-08	-7.9745	9.49379E-09	-8.0226	8.95177E-01	-.0481
96	H2SO4	0	1.70536E-42	1.74011E-47	-46.7594	1.74483E-47	-46.7582	1.00272E+00	.0012
93	HCL	0	1.35141E-36	3.70926E-41	-40.4307	3.71934E-41	-40.4295	1.00272E+00	.0012

MOLE RATIOS FROM ANALYTICAL MOLALITY		MOLE RATIOS FROM COMPUTED MOLALITY		LOG ACTIVITY RATIOS	
CL/CA =	1.6599E-01	CL/CA =	1.8563E-01	LOG CA/H2 =	10.2638
CL/MG =	2.4050E-01	CL/MG =	2.6806E-01	LOG MG/H2 =	10.1074
CL/NA =	4.4555E-02	CL/NA =	4.4812E-02	LOG NA/H1 =	4.3206
CL/K =	2.7205E-01	CL/K =	2.7295E-01	LOG K/H1 =	3.5344
CL/AL =	2.0889E+26	CL/AL =	2.0889E+26	LOG AL/H3 =	-9.9000
CL/FE =	2.0889E+26	CL/FE =	2.0889E+26	LOG FE/H2 =	-16.6000
CL/SO4 =	2.6040E-01	CL/SO4 =	3.0778E-01	LOG CA/MG =	.1564
CL/HCO3 =	2.7490E-02	CL/HCO3 =	2.7992E-02	LOG NA/K =	.7862
CA/MG =	1.4489E+00	CA/MG =	1.4441E+00		
NA/K =	6.1060E+00	NA/K =	6.0910E+00		

S/N VIË.AGUASCALIENTES CE CAMPO=1413.0 MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	3.2027E-07	2.6027E-05	-6.4945	-4.5846	1.2305E-02	-1.90991	-2.64062
22	ARAGONIT	1.2416E-09	5.7054E-09	-8.9060	-8.2437	2.1762E-01	-.66231	-.91569
151	ARTIN	2.0292E-27	3.8206E-19	-26.6927	-18.4179	5.3113E-09	-8.27480	-11.44062
20	BRUCITE	2.3448E-18	3.9650E-12	-17.6299	-11.4018	5.9138E-07	-6.22814	-8.61093
13	CALCITE	1.2416E-09	3.1468E-09	-8.9060	-8.5021	3.9456E-01	-.40389	-.55841
12	DOLOMITE	1.0755E-18	7.9352E-18	-17.9684	-17.1004	1.3554E-01	-.86795	-1.20001
19	GYPSUM	3.2006E-07	1.7520E-05	-6.4948	-4.7565	1.8269E-02	-1.73830	-2.40334
65	HALITE	7.7807E-07	3.8986E+01	-6.1090	1.5909	1.9958E-08	-7.69989	-10.64575
118	HUNTITE	8.0701E-37	1.7380E-31	-36.0931	-30.7600	4.6434E-06	-5.33317	-7.37356
39	HYDMAG	1.3185E-54	8.5580E-39	-53.8799	-38.0676	1.5407E-16	-15.81229	-21.86184
11	MAGNESIT	8.6623E-10	5.0135E-09	-9.0624	-8.2999	1.7278E-01	-.76251	-1.05423
67	MIRABI	7.6116E-09	1.1782E-01	-8.1185	-.9288	6.4601E-08	-7.18976	-9.94046
59	NAHCOL	2.7966E-05	3.0768E-01	-4.5534	-.5119	9.0895E-05	-4.04146	-5.58766
61	NATRON	2.9508E-11	6.9467E-02	-10.5301	-1.1582	4.2478E-10	-9.37183	-12.95737
150	NESQUE	8.6540E-10	5.4054E-06	-9.0628	-5.2672	1.6010E-04	-3.79561	-5.24776
66	THENAR	7.6360E-09	6.5381E-01	-8.1171	-.1846	1.1679E-08	-7.93259	-10.96748
62	THRNAT	2.9593E-11	1.2526E+00	-10.5288	.0978	2.3626E-11	-10.62662	-14.69221
60	TRONA	8.2735E-16	1.0724E-01	-15.0823	-.9697	7.7152E-15	-14.11265	-19.51195

S/N SN JOSE DEL RIO,AGS   CE CAMPO=1266.0 MMHOS

INITIAL SOLUTION

TEMPERATURE = 24.20 DEGREES C   PH = 6.900   ANALYTICAL EPMCAT = 10.841   ANALYTICAL EPMAN = 7.770

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	2.59659E-03	-2.5856	1.04000E+02
MG	2	4.73341E-04	-3.3248	1.15000E+01
NA	1	3.88699E-03	-2.4104	8.93000E+01
K	1	8.21492E-04	-3.0854	3.21000E+01
CL	-1	3.18950E-04	-3.4963	1.13000E+01
SO4	-2	7.29198E-04	-3.1372	7.00000E+01
HCO3	-1	5.99847E-03	-2.2220	3.65760E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	10.841	10.431
EPMAN	7.770	7.361

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 5.998332E+00 MEQ/KG H2O
ELECT = 3.071849E+00 MEQ/KG H2O

PH 6.900
TEMPERATURE 24.20 DEG C
IONIC STRENGTH 1.230737E-02

ACTIVITY H2O = .9997
PCO2 = 4.293054E-02
LOG PCO2 = -1.3672
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 7.486868E-03
DENSITY = 1.0000
TDS = 684.0MG/L
CARBONATE ALK = 5.998384E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000   EQUIVALENT EH = 5.900VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	9.54890E+01	2.38409E-03	-2.6227	1.54122E-03	-2.8121	6.46460E-01	-.1895
2	MG	2	1.05788E+01	4.35425E-04	-3.3611	2.83656E-04	-3.5472	6.51447E-01	-.1861
3	NA	1	8.88881E+01	3.86906E-03	-2.4124	3.46046E-03	-2.4609	8.94392E-01	-.0485
4	K	1	3.20170E+01	8.19367E-04	-3.0865	7.30247E-04	-3.1365	8.91233E-01	-.0500
64	H	1	1.39888E-04	1.38873E-07	-6.8574	1.25893E-07	-6.9000	9.06531E-01	-.0426
5	CL	-1	1.13000E+01	3.18950E-04	-3.4963	2.84259E-04	-3.5463	8.91233E-01	-.0500
6	SO4	-2	5.61245E+01	5.84656E-04	-3.2331	3.75767E-04	-3.4251	6.42715E-01	-.1920
7	HCO3	-1	3.57449E+02	5.86216E-03	-2.2319	5.25737E-03	-2.2792	8.96831E-01	-.0473
18	CO3	-2	1.78290E-01	2.97307E-06	-5.5268	1.92331E-06	-5.7160	6.46909E-01	-.1892
86	H2CO3	0	9.27405E+01	1.49623E-03	-2.8250	1.50074E-03	-2.8237	1.00302E+00	.0013
27	OH	-1	1.43252E-03	8.42867E-08	-7.0742	7.50871E-08	-7.1244	8.90854E-01	-.0502
19	MGOH	1	1.58227E-04	3.83198E-09	-8.4166	3.44879E-09	-8.4623	9.00002E-01	-.0458
23	MGSO4 AQ	0	2.16592E+00	1.80057E-05	-4.7446	1.80568E-05	-4.7434	1.00284E+00	.0012
22	MGHCO3	1	1.64896E+00	1.93379E-05	-4.7136	1.72590E-05	-4.7630	8.92493E-01	-.0494
21	MGCO3 AQ	0	4.32158E-02	5.12864E-07	-6.2900	5.14319E-07	-6.2888	1.00284E+00	.0012
29	CAOH	1	1.83556E-04	3.21754E-09	-8.4925	2.89124E-09	-8.5389	8.98585E-01	-.0464
32	CASO4 AQ	0	1.58960E+01	1.16841E-04	-3.9324	1.17172E-04	-3.9312	1.00284E+00	.0012
30	CAHCO3	1	9.21306E+00	9.11930E-05	-4.0400	8.19447E-05	-4.0865	8.98585E-01	-.0464
31	CACO3 AQ	0	4.12635E-01	4.12550E-06	-5.3845	4.13721E-06	-5.3833	1.00284E+00	.0012
44	NASO4	-1	9.00679E-01	7.57064E-06	-5.1209	6.78959E-06	-5.1682	8.96831E-01	-.0473
43	NAHCO3	0	8.56262E-01	1.02017E-05	-4.9913	1.02306E-05	-4.9901	1.00284E+00	.0012
42	NACO3	-1	1.09566E-02	1.32099E-07	-6.8791	1.18471E-07	-6.9264	8.96831E-01	-.0473
94	NACL	0	5.72863E-32	9.80882E-37	-36.0084	9.83665E-37	-36.0072	1.00284E+00	.0012
63	HSO4	-1	4.87241E-04	5.02293E-09	-8.2990	4.49092E-09	-8.3477	8.94084E-01	-.0486
96	H2SO4	0	5.82049E-43	5.93865E-48	-47.2263	5.95550E-48	-47.2251	1.00284E+00	.0012
93	HCL	0	1.30021E-36	3.56848E-41	-40.4475	3.57860E-41	-40.4463	1.00284E+00	.0012

MOLE RATIOS FROM ANALYTICAL MOLALITY		MOLE RATIOS FROM COMPUTED MOLALITY		LOG ACTIVITY RATIOS	
CL/CA =	1.2283E-01	CL/CA =	1.3378E-01	LOG CA/H2 =	10.9879
CL/MG =	6.7383E-01	CL/MG =	7.3250E-01	LOG MG/H2 =	10.2528
CL/NA =	8.2056E-02	CL/NA =	8.2436E-02	LOG NA/H1 =	4.4391
CL/K =	3.8826E-01	CL/K =	3.8926E-01	LOG K/H1 =	3.7635
CL/AL =	3.1895E+26	CL/AL =	3.1895E+26	LOG AL/H3 =	-9.3000
CL/FE =	3.1895E+26	CL/FE =	3.1895E+26	LOG FE/H2 =	-16.2000
CL/SO4 =	4.3740E-01	CL/SO4 =	5.4553E-01	LOG CA/MG =	.7351
CL/HCO3 =	5.3172E-02	CL/HCO3 =	5.4408E-02	LOG NA/K =	.6757
CA/MG =	5.4857E+00	CA/MG =	5.4753E+00		
NA/K =	4.7316E+00	NA/K =	4.7220E+00		

S/N SN JOSE DEL RIO,AGS   CE CAMPO=1266.0 MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	5.7914E-07	2.8803E-05	-6.2372	-4.5406	2.0107E-02	-1.69665	-2.30850
22	ARAGONIT	2.9642E-09	6.1778E-09	-8.5281	-8.2092	4.7982E-01	-.31892	-.43393
151	ARTIN	8.7179E-28	4.0145E-19	-27.0596	-18.3964	2.1716E-09	-8.66322	-11.78737
20	BRUCITE	1.5993E-18	3.8755E-12	-17.7961	-11.4117	4.1267E-07	-6.38440	-8.68676
13	CALCITE	2.9642E-09	3.3891E-09	-8.5281	-8.4699	8.7464E-01	-.05817	-.07915
12	DOLOMITE	1.6172E-18	9.9163E-18	-17.7912	-17.0037	1.6308E-01	-.78759	-1.07162
19	GYPSUM	5.7882E-07	1.7397E-05	-6.2375	-4.7595	3.3271E-02	-1.47794	-2.01092
65	HALITE	9.8367E-07	3.8036E+01	-6.0072	1.5802	2.5862E-08	-7.58734	-10.32351
118	HUNTITE	4.8132E-37	3.4737E-31	-36.3176	-30.4592	1.3856E-06	-5.85836	-7.97102
39	HYDMAG	1.4152E-55	1.6995E-38	-54.8492	-37.7697	8.3271E-18	-17.07951	-23.23876
11	MAGNESIT	5.4556E-10	5.9179E-09	-9.2632	-8.2278	9.2188E-02	-1.03532	-1.40868
67	MIRABI	4.4875E-09	7.0723E-02	-8.3480	-1.1504	6.3452E-08	-7.19756	-9.79316
59	NAHCOL	1.8193E-05	2.7840E-01	-4.7401	-.5553	6.5349E-05	-4.18476	-5.69388
61	NATRON	2.2968E-11	4.5494E-02	-10.6389	-1.3420	5.0487E-10	-9.29682	-12.64946
150	NESQUE	5.4511E-10	6.3156E-06	-9.2635	-5.1996	8.6312E-05	-4.06393	-5.52947
66	THENAR	4.4997E-09	6.6394E-01	-8.3468	-.1779	6.7773E-09	-8.16894	-11.11485
62	THRNAT	2.3025E-11	1.3506E+00	-10.6378	.1305	1.7048E-11	-10.76833	-14.65163
60	TRONA	4.1878E-16	1.7398E-01	-15.3780	-.7595	2.4071E-15	-14.61851	-19.89028

S/N RCHO ARBOLITOS,AGS CE CAMPO=1110.0MMHOS

INITIAL SOLUTION

TEMPERATURE = 17.70 DEGREES C PH = 7.190 ANALYTICAL EPMCAT = 7.485 ANALYTICAL EPMAN = 6.446

***** OXIDATION - REDUCTION *****

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DISSOLVED OXYGEN =    .000 MG/L
EH MEASURED WITH CALOMEL =    .0000 VOLTS                          FLAG     CORALK  PECALC  IDAVES
MEASURED EH OF ZOBELL SOLUTION =    .0000 VOLTS                      2         0       0       0
CORRECTED EH =    .0000 VOLTS
PE COMPUTED FROM CORRECTED EH =    .000
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*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	8.98703E-04	-3.0464	3.60000E+01
MG	2	3.16892E-04	-3.4991	7.70000E+00
NA	1	4.35217E-03	-2.3613	1.00000E+02
K	1	7.06238E-04	-3.1510	2.76000E+01
CL	-1	2.85042E-04	-3.5451	1.01000E+01
SO4	-2	8.33262E-05	-4.0792	8.00000E+00
HCO3	-1	5.99770E-03	-2.2220	3.65760E+02

****DESCRIPTION OF SOLUTION ****

```
        ANALYTICAL  COMPUTED            PH               ACTIVITY H2O =    .9998
EPMCAT    7.485       7.408           7.190              PCO2 =  2.080825E-02
EPMAN     6.446       6.368                              LOG PCO2 =  -1.6818
                                   TEMPERATURE           PO2 =    .000000E+00
EH =  .0000  PE = 100.000           17.70 DEG C          PCH4 =    .000000E+00
PE CALC S =  1.000000E+02                                CO2 TOT =  6.862469E-03
PE CALC DOX= 1.000000E+02         IONIC STRENGTH         DENSITY =    1.0000
PE SATO DOX= 1.000000E+02          8.114075E-03          TDS =      555.2MG/L
TOT ALK =  5.997628E+00 MEQ/KG H2O                       CARBONATE ALK =  5.997597E+00 MEQ/KG H2O
ELECT   =  1.040374E+00 MEQ/KG H2O
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IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.771VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	3.44882E+01	8.60962E-04	-3.0650	5.99547E-04	-3.2222	6.96368E-01	-.1572
2	MG	2	7.30875E+00	3.00790E-04	-3.5217	2.10571E-04	-3.6766	7.00059E-01	-.1549
3	NA	1	9.96940E+01	4.33885E-03	-2.3626	3.95652E-03	-2.4027	9.11881E-01	-.0401
4	K	1	2.75913E+01	7.06015E-04	-3.1512	6.42275E-04	-3.1923	9.09719E-01	-.0411
64	H	1	7.06561E-05	7.01342E-08	-7.1541	6.45654E-08	-7.1900	9.20598E-01	-.0359
5	CL	-1	1.01000E+01	2.85042E-04	-3.5451	2.59309E-04	-3.5862	9.09719E-01	-.0411
6	SO4	-2	7.15461E+00	7.45207E-05	-4.1277	5.16955E-05	-4.2865	6.93706E-01	-.1588
7	HCO3	-1	3.61397E+02	5.92616E-03	-2.2272	5.41442E-03	-2.2664	9.13647E-01	-.0392
18	CO3	-2	2.87216E-01	4.78884E-06	-5.3198	3.33690E-06	-5.4767	6.96808E-01	-.1569
86	H2CO3	0	5.41114E+01	8.72893E-04	-3.0590	8.74688E-04	-3.0581	1.00206E+00	.0009
27	OH	-1	1.65200E-03	9.71884E-08	-7.0124	8.83894E-08	-7.0536	9.09464E-01	-.0412
19	MGOH	1	1.25843E-04	3.04731E-09	-8.5161	2.79102E-09	-8.5542	9.15896E-01	-.0382
23	MGSO4 AQ	0	1.86083E-01	1.54673E-06	-5.8106	1.54963E-06	-5.8098	1.00187E+00	.0008
22	MGHCO3	1	1.19104E+00	1.39660E-05	-4.8549	1.27175E-05	-4.8956	9.10604E-01	-.0407
21	MGCO3 AQ	0	5.04270E-02	5.98365E-07	-6.2230	5.99484E-07	-6.2222	1.00187E+00	.0008
29	CAOH	1	7.89334E-05	1.38344E-09	-8.8590	1.26570E-09	-8.8977	9.14889E-01	-.0386
32	CASO4 AQ	0	8.04672E-01	5.91384E-06	-5.2281	5.92490E-06	-5.2273	1.00187E+00	.0008
30	CAHCO3	1	2.97127E+00	2.94066E-05	-4.5316	2.69037E-05	-4.5702	9.14889E-01	-.0386
31	CACO3 AQ	0	2.45114E-01	2.45032E-06	-5.6108	2.45491E-06	-5.6100	1.00187E+00	.0008
44	NASO4	-1	1.33314E-01	1.12043E-06	-5.9506	1.02367E-06	-5.9898	9.13647E-01	-.0392
43	NAHCO3	0	1.00936E+00	1.20241E-05	-4.9199	1.20466E-05	-4.9191	1.00187E+00	.0008
42	NACO3	-1	1.52328E-02	1.83631E-07	-6.7361	1.67774E-07	-6.7753	9.13647E-01	-.0392
94	NACL	0	5.98147E-32	1.02404E-36	-35.9897	1.02596E-36	-35.9889	1.00187E+00	.0008
63	HSO4	-1	2.82172E-05	2.90852E-10	-9.5363	2.65174E-10	-9.5765	9.11715E-01	-.0401
96	H2SO4	0	2.10848E-44	2.15100E-49	-48.6674	2.15503E-49	-48.6665	1.00187E+00	.0008
93	HCL	0	6.08966E-37	1.67111E-41	-40.7770	1.67424E-41	-40.7762	1.00187E+00	.0008

MOLE RATIOS FROM ANALYTICAL MOLALITY			MOLE RATIOS FROM COMPUTED MOLALITY			LOG ACTIVITY RATIOS		
CL/CA	=	3.1717E-01	CL/CA	=	3.3107E-01	LOG CA/H2	=	11.1578
CL/MG	=	8.9949E-01	CL/MG	=	9.4765E-01	LOG MG/H2	=	10.7034
CL/NA	=	6.5494E-02	CL/NA	=	6.5695E-02	LOG NA/H1	=	4.7873
CL/K	=	4.0361E-01	CL/K	=	4.0373E-01	LOG K/H1	=	3.9977
CL/AL	=	2.8504E+26	CL/AL	=	2.8504E+26	LOG AL/H3	=	-8.4300
CL/FE	=	2.8504E+26	CL/FE	=	2.8504E+26	LOG FE/H2	=	-15.6200
CL/SO4	=	3.4208E+00	CL/SO4	=	3.8250E+00	LOG CA/MG	=	.4544
CL/HCO3	=	4.7525E-02	CL/HCO3	=	4.8099E-02	LOG NA/K	=	.7896
CA/MG	=	2.8360E+00	CA/MG	=	2.8623E+00			
NA/K	=	6.1625E+00	NA/K	=	6.1456E+00			

S/N RCHO ARBOLITOS,AGS   CE CAMPO=1110.0MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	3.0994E-08	3.3215E-05	-7.5087	-4.4787	9.3312E-04	-3.03006	-4.03265
22	ARAGONIT	2.0006E-09	6.9093E-09	-8.6988	-8.1606	2.8955E-01	-.53827	-.71637
151	ARTIN	1.1552E-27	4.3041E-19	-26.9374	-18.3661	2.6838E-09	-8.57124	-11.40730
20	BRUCITE	1.6451E-18	3.7529E-12	-17.7838	-11.4256	4.3836E-07	-6.35816	-8.46196
13	CALCITE	2.0006E-09	3.6751E-09	-8.6988	-8.4347	5.4437E-01	-.26411	-.35150
12	DOLOMITE	1.4057E-18	1.3568E-17	-17.8521	-16.8675	1.0361E-01	-.98460	-1.31038
19	GYPSUM	3.0980E-08	1.7227E-05	-7.5089	-4.7638	1.7984E-03	-2.74512	-3.65343
65	HALITE	1.0260E-06	3.6738E+01	-5.9889	1.5651	2.7927E-08	-7.55398	-10.05345
118	HUNTITE	6.9405E-37	9.2022E-31	-36.1586	-30.0361	7.5422E-07	-6.12250	-8.14832
39	HYDMAG	4.0065E-55	4.4615E-38	-54.3972	-37.3505	8.9803E-18	-17.04671	-22.68713
11	MAGNESIT	7.0265E-10	7.4729E-09	-9.1533	-8.1265	9.4027E-02	-1.02675	-1.36648
67	MIRABI	8.0740E-10	3.4491E-02	-9.0929	-1.4623	2.3409E-08	-7.63062	-10.15544
59	NAHCOL	2.1422E-05	2.4186E-01	-4.6691	-.6164	8.8573E-05	-4.05270	-5.39366
61	NATRON	5.2117E-11	2.5081E-02	-10.2830	-1.6007	2.0779E-09	-8.68237	-11.55520
150	NESQUE	7.0217E-10	7.8613E-06	-9.1536	-5.1045	8.9320E-05	-4.04905	-5.38881
66	THENAR	8.0924E-10	6.7846E-01	-9.0919	-.1685	1.1928E-09	-8.92344	-11.87604
62	THRNAT	5.2224E-11	1.5016E+00	-10.2821	.1765	3.4779E-11	-10.45868	-13.91925
60	TRONA	1.1185E-15	3.4367E-01	-14.9514	-.4639	3.2546E-15	-14.48750	-19.28113

53 SAN IGNACIO,AGS CE CAMPO=1340.0 MMHOS

INITIAL SOLUTION

TEMPERATURE = 24.80 DEGREES C PH = 7.080 ANALYTICAL EPMCAT = 11.795 ANALYTICAL EPMAN = 8.676

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	2.53688E-03	-2.5957	1.01600E+02
MG	2	3.37541E-04	-3.4717	8.20000E+00
NA	1	5.35866E-03	-2.2709	1.23100E+02
K	1	6.96151E-04	-3.1573	2.72000E+01
CL	-1	2.00419E-04	-3.6981	7.10000E+00
SO4	-2	6.45915E-04	-3.1898	6.20000E+01
HCO3	-1	7.19070E-03	-2.1432	4.38420E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	11.795	11.404
EPMAN	8.676	8.286

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 7.190609E+00 MEQ/KG H2O
ELECT = 3.120149E+00 MEQ/KG H2O

PH
7.080

TEMPERATURE
24.80 DEG C

IONIC STRENGTH
1.301085E-02

ACTIVITY H2O = .9997
PCO2 = 3.417101E-02
LOG PCO2 = -1.4663
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 8.348388E-03
DENSITY = 1.0000
TDS = 767.6MG/L
CARBONATE ALK = 7.190561E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.912VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	9.29872E+01	2.32182E-03	-2.6342	1.48509E-03	-2.8282	6.39624E-01	-.1941
2	MG	2	7.50948E+00	3.09117E-04	-3.5099	1.99320E-04	-3.7004	6.44806E-01	-.1906
3	NA	1	1.22494E+02	5.33227E-03	-2.2731	4.75590E-03	-2.3228	8.91911E-01	-.0497
4	K	1	2.71371E+01	6.94540E-04	-3.1583	6.17161E-04	-3.2096	8.88590E-01	-.0513
64	H	1	9.26153E-05	9.19509E-08	-7.0364	8.31764E-08	-7.0800	9.04574E-01	-.0436
5	CL	-1	7.10000E+00	2.00419E-04	-3.6981	1.78090E-04	-3.7494	8.88590E-01	-.0513
6	SO4	-2	5.02453E+01	5.23454E-04	-3.2811	3.32764E-04	-3.4779	6.35708E-01	-.1967
7	HCO3	-1	4.28165E+02	7.02249E-03	-2.1535	6.28127E-03	-2.2020	8.94450E-01	-.0484
18	CO3	-2	3.29890E-01	5.50153E-06	-5.2595	3.52134E-06	-5.4533	6.40066E-01	-.1938
86	H2CO3	0	7.26200E+01	1.17171E-03	-2.9312	1.17544E-03	-2.9298	1.00318E+00	.0014
27	OH	-1	2.27562E-03	1.33905E-07	-6.8732	1.18933E-07	-6.9247	8.88191E-01	-.0515
19	MGOH	1	1.77787E-04	4.30604E-09	-8.3659	3.86581E-09	-8.4128	8.97764E-01	-.0468
23	MGSO4 AQ	0	1.36874E+00	1.13795E-05	-4.9439	1.14137E-05	-4.9426	1.00300E+00	.0013
22	MGHCO3	1	1.39331E+00	1.63411E-05	-4.7867	1.45421E-05	-4.8374	8.89909E-01	-.0507
21	MGCO3 AQ	0	5.60992E-02	6.65813E-07	-6.1766	6.67811E-07	-6.1753	1.00300E+00	.0013
29	CAOH	1	2.81989E-04	4.94340E-09	-8.3060	4.43069E-09	-8.3535	8.96284E-01	-.0476
32	CASO4 AQ	0	1.36304E+01	1.00196E-04	-3.9991	1.00497E-04	-3.9978	1.00300E+00	.0013
30	CAHCO3	1	1.08300E+01	1.07207E-04	-3.9698	9.60880E-05	-4.0173	8.96284E-01	-.0476
31	CACO3 AQ	0	7.37650E-01	7.37560E-06	-5.1322	7.39773E-06	-5.1309	1.00300E+00	.0013
44	NASO4	-1	1.10322E+00	9.27390E-06	-5.0327	8.29504E-06	-5.0812	8.94450E-01	-.0484
43	NAHCO3	0	1.40565E+00	1.67486E-05	-4.7760	1.67989E-05	-4.7747	1.00300E+00	.0013
42	NACO3	-1	2.84932E-02	3.43559E-07	-6.4640	3.07296E-07	-6.5124	8.94450E-01	-.0484
94	NACL	0	4.93140E-32	8.44447E-37	-36.0734	8.46981E-37	-36.0721	1.00300E+00	.0013
63	HSO4	-1	2.90654E-04	2.99659E-09	-8.5234	2.67168E-09	-8.5732	8.91575E-01	-.0498
96	H2SO4	0	2.24942E-43	2.29528E-48	-47.6392	2.30217E-48	-47.6379	1.00300E+00	.0013
93	HCL	0	5.38064E-37	1.47686E-41	-40.8307	1.48129E-41	-40.8294	1.00300E+00	.0013

MOLE RATIOS FROM ANALYTICAL MOLALITY		MOLE RATIOS FROM COMPUTED MOLALITY		LOG ACTIVITY RATIOS	
CL/CA =	7.9002E-02	CL/CA =	8.6320E-02	LOG CA/H2 =	11.3318
CL/MG =	5.9376E-01	CL/MG =	6.4836E-01	LOG MG/H2 =	10.4596
CL/NA =	3.7401E-02	CL/NA =	3.7586E-02	LOG NA/H1 =	4.7572
CL/K =	2.8790E-01	CL/K =	2.8856E-01	LOG K/H1 =	3.8704
CL/AL =	2.0042E+26	CL/AL =	2.0042E+26	LOG AL/H3 =	-8.7600
CL/FE =	2.0042E+26	CL/FE =	2.0042E+26	LOG FE/H2 =	-15.8400
CL/SO4 =	3.1029E-01	CL/SO4 =	3.8288E-01	LOG CA/MG =	.8722
CL/HCO3 =	2.7872E-02	CL/HCO3 =	2.8540E-02	LOG NA/K =	.8868
CA/MG =	7.5158E+00	CA/MG =	7.5111E+00		
NA/K =	7.6976E+00	NA/K =	7.6774E+00		

53 SAN IGNACIO,AGS CE CAMPO=1340.0 MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	4.9419E-07	2.8435E-05	-6.3061	-4.5461	1.7379E-02	-1.75996	-2.39948
22	ARAGONIT	5.2295E-09	6.1158E-09	-8.2815	-8.2135	8.5508E-01	-.06799	-.09270
151	ARTIN	1.9771E-27	3.9894E-19	-26.7040	-18.3991	4.9558E-09	-8.30488	-11.32261
20	BRUCITE	2.8194E-18	3.8867E-12	-17.5498	-11.4104	7.2540E-07	-6.13943	-8.37030
13	CALCITE	5.2295E-09	3.3600E-09	-8.2815	-8.4737	1.5564E+00	.19212	.26194
12	DOLOMITE	3.6705E-18	9.6400E-18	-17.4353	-17.0159	3.8075E-01	-.41936	-.57174
19	GYPSUM	4.9389E-07	1.7413E-05	-6.3064	-4.7591	2.8363E-02	-1.54724	-2.10946
65	HALITE	8.4698E-07	3.8155E+01	-6.0721	1.5815	2.2199E-08	-7.65368	-10.43477
118	HUNTITE	1.8082E-36	3.1818E-31	-35.7428	-30.4973	5.6829E-06	-5.24543	-7.15145
39	HYDMAG	6.8339E-55	1.5580E-38	-54.1653	-37.8074	4.3865E-17	-16.35789	-22.30182
11	MAGNESIT	7.0188E-10	5.7948E-09	-9.1537	-8.2370	1.2112E-01	-.91678	-1.24990
67	MIRABI	7.5039E-09	7.5450E-02	-8.1247	-1.1223	9.9455E-08	-7.00237	-9.54681
59	NAHCOL	2.9873E-05	2.8195E-01	-4.5247	-.5498	1.0595E-04	-3.97489	-5.41924
61	NATRON	7.9407E-11	4.8001E-02	-10.1001	-1.3187	1.6543E-09	-8.78140	-11.97227
150	NESQUE	7.0124E-10	6.1922E-06	-9.1541	-5.2082	1.1324E-04	-3.94598	-5.37983
66	THENAR	7.5267E-09	6.6265E-01	-8.1234	-.1787	1.1359E-08	-7.94468	-10.83152
62	THRNAT	7.9624E-11	1.3378E+00	-10.0990	.1264	5.9520E-11	-10.22534	-13.94090
60	TRONA	2.3779E-15	1.6363E-01	-14.6238	-.7861	1.4532E-14	-13.83766	-18.86583

10 LA PUNTA,AGS CE CAMPO=660.00MMHOS

INITIAL SOLUTION

TEMPERATURE = 21.00 DEGREES C PH = 6.630 ANALYTICAL EPMCAT = 6.165 ANALYTICAL EPMAN = 4.896

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	9.18546E-04	-3.0369	3.68000E+01
MG	2	5.02019E-04	-3.2993	1.22000E+01
NA	1	2.93731E-03	-2.5321	6.75000E+01
K	1	3.88889E-04	-3.4102	1.52000E+01
CL	-1	1.91883E-04	-3.7170	6.80000E+00
SO4	-2	3.54087E-04	-3.4509	3.40000E+01
HCO3	-1	3.99791E-03	-2.3982	2.43840E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED	PH
EPMCAT	6.165	6.040	6.630
EPMAN	4.896	4.771	

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 3.997652E+00 MEQ/KG H2O
ELECT = 1.269532E+00 MEQ/KG H2O

TEMPERATURE
21.00 DEG C

IONIC STRENGTH
7.064266E-03

ACTIVITY H2O = .9998
PCO2 = 5.282428E-02
LOG PCO2 = -1.2772
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 6.010093E-03
DENSITY = 1.0000
TDS = 416.3MG/L
CARBONATE ALK = 3.997874E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.837VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	3.48116E+01	8.68913E-04	-3.0610	6.16880E-04	-3.2098	7.09944E-01	-.1488
2	MG	2	1.15418E+01	4.74935E-04	-3.3234	3.38766E-04	-3.4701	7.13290E-01	-.1467
3	NA	1	6.72978E+01	2.92851E-03	-2.5334	2.68386E-03	-2.5712	9.16460E-01	-.0379
4	K	1	1.51781E+01	3.88329E-04	-3.4108	3.55146E-04	-3.4496	9.14549E-01	-.0388
64	H	1	2.55536E-04	2.53614E-07	-6.5958	2.34423E-07	-6.6300	9.24329E-01	-.0342
5	CL	-1	6.80000E+00	1.91883E-04	-3.7170	1.75486E-04	-3.7558	9.14549E-01	-.0388
6	SO4	-2	2.99453E+01	3.11860E-04	-3.5060	2.20666E-04	-3.6563	7.07581E-01	-.1502
7	HCO3	-1	2.41005E+02	3.95143E-03	-2.4032	3.62768E-03	-2.4404	9.18067E-01	-.0371
18	CO3	-2	5.61563E-02	9.36181E-07	-6.0286	6.65055E-07	-6.1771	7.10392E-01	-.1485
86	H2CO3	0	1.24862E+02	2.01392E-03	-2.6960	2.01746E-03	-2.6952	1.00176E+00	.0008
27	OH	-1	5.86491E-04	3.44988E-08	-7.4622	3.15432E-08	-7.5011	9.14326E-01	-.0389
19	MGOH	1	7.47900E-05	1.81080E-09	-8.7421	1.66609E-09	-8.7783	9.20088E-01	-.0362
23	MGSO4 AQ	0	1.39775E+00	1.16166E-05	-4.9349	1.16355E-05	-4.9342	1.00163E+00	.0007
22	MGHCO3	1	1.30075E+00	1.52503E-05	-4.8167	1.39592E-05	-4.8551	9.15343E-01	-.0384
21	MGCO3 AQ	0	1.70159E-02	2.01883E-07	-6.6949	2.02211E-07	-6.6942	1.00163E+00	.0007
29	CAOH	1	2.95259E-05	5.17421E-10	-9.2862	4.75604E-10	-9.3228	9.19182E-01	-.0366
32	CASO4 AQ	0	3.63989E+00	2.67472E-05	-4.5727	2.67908E-05	-4.5720	1.00163E+00	.0007
30	CAHCO3	1	2.25587E+00	2.23232E-05	-4.6512	2.05191E-05	-4.6878	9.19182E-01	-.0366
31	CACO3 AQ	0	5.34702E-02	5.34449E-07	-6.2721	5.35319E-07	-6.2714	1.00163E+00	.0007
44	NASO4	-1	3.92655E-01	3.29957E-06	-5.4815	3.02923E-06	-5.5187	9.18067E-01	-.0371
43	NAHCO3	0	4.58917E-01	5.46616E-06	-5.2623	5.47506E-06	-5.2616	1.00163E+00	.0007
42	NACO3	-1	2.43680E-03	2.93715E-08	-7.5321	2.69650E-08	-7.5692	9.18067E-01	-.0371
94	NACL	0	2.74693E-32	4.70216E-37	-36.3277	4.70981E-37	-36.3270	1.00163E+00	.0007
63	HSO4	-1	4.76095E-04	4.90672E-09	-8.3092	4.49621E-09	-8.3472	9.16336E-01	-.0379
96	H2SO4	0	1.18691E-42	1.21068E-47	-46.9170	1.21265E-47	-46.9163	1.00163E+00	.0007
93	HCL	0	1.49687E-36	4.10712E-41	-40.3865	4.11380E-41	-40.3858	1.00163E+00	.0007

MOLE RATIOS FROM ANALYTICAL MOLALITY			MOLE RATIOS FROM COMPUTED MOLALITY			LOG ACTIVITY RATIOS		
CL/CA	=	2.0890E-01	CL/CA	=	2.2083E-01	LOG CA/H2	=	10.0502
CL/MG	=	3.8222E-01	CL/MG	=	4.0402E-01	LOG MG/H2	=	9.7899
CL/NA	=	6.5326E-02	CL/NA	=	6.5522E-02	LOG NA/H1	=	4.0588
CL/K	=	4.9341E-01	CL/K	=	4.9412E-01	LOG K/H1	=	3.1804
CL/AL	=	1.9188E+26	CL/AL	=	1.9188E+26	LOG AL/H3	=	-10.1100
CL/FE	=	1.9188E+26	CL/FE	=	1.9188E+26	LOG FE/H2	=	-16.7400
CL/SO4	=	5.4191E-01	CL/SO4	=	6.1529E-01	LOG CA/MG	=	.2603
CL/HCO3	=	4.7996E-02	CL/HCO3	=	4.8560E-02	LOG NA/K	=	.8784
CA/MG	=	1.8297E+00	CA/MG	=	1.8295E+00			
NA/K	=	7.5531E+00	NA/K	=	7.5413E+00			

10 LA PUNTA,AGS CE CAMPO=660.00MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	1.3612E-07	3.0872E-05	-6.8661	-4.5104	4.4093E-03	-2.35563	-3.17063
22	ARAGONIT	4.1026E-10	6.5237E-09	-9.3869	-8.1855	6.2888E-02	-1.20143	-1.61711
151	ARTIN	7.5896E-29	4.1530E-19	-28.1198	-18.3816	1.8275E-10	-9.73814	-13.10734
20	BRUCITE	3.3706E-19	3.8153E-12	-18.4723	-11.4185	8.8345E-08	-7.05382	-9.49430
13	CALCITE	4.1026E-10	3.5371E-09	-9.3869	-8.4513	1.1599E-01	-.93559	-1.25929
12	DOLOMITE	9.2431E-20	1.1551E-17	-19.0342	-16.9374	8.0018E-03	-2.09681	-2.82227
19	GYPSUM	1.3607E-07	1.7314E-05	-6.8662	-4.7616	7.8591E-03	-2.10463	-2.83279
65	HALITE	4.7098E-07	3.7398E+01	-6.3270	1.5729	1.2594E-08	-7.89985	-10.63304
118	HUNTITE	4.6917E-39	5.5815E-31	-38.3287	-30.2532	8.4058E-09	-8.07542	-10.86936
39	HYDMAG	8.6779E-58	2.7187E-38	-57.0616	-37.5656	3.1919E-20	-19.49595	-26.24116
11	MAGNESIT	2.2530E-10	6.6296E-09	-9.6472	-8.1785	3.3984E-02	-1.46873	-1.97688
67	MIRABI	1.5865E-09	4.9860E-02	-8.7996	-1.3022	3.1818E-08	-7.49733	-10.09125
59	NAHCOL	9.7362E-06	2.5997E-01	-5.0116	-.5851	3.7451E-05	-4.42653	-5.95803
61	NATRON	4.7813E-12	3.4046E-02	-11.3205	-1.4679	1.4044E-10	-9.85252	-13.26129
150	NESQUE	2.2517E-10	7.0259E-06	-9.6475	-5.1533	3.2049E-05	-4.49419	-6.04909
66	THENAR	1.5895E-09	6.7097E-01	-8.7987	-.1733	2.3689E-09	-8.62545	-11.60968
62	THRNAT	4.7896E-12	1.4221E+00	-11.3197	.1529	3.3680E-12	-11.47263	-15.44194
60	TRONA	4.6623E-17	2.4233E-01	-16.3314	-.6156	1.9239E-16	-15.71581	-21.15317

85 S/N,AGS CE CAMPO=780.00 MMHOS

INITIAL SOLUTION

TEMPERATURE = 16.50 DEGREES C PH = 7.250 ANALYTICAL EPMCAT = 8.017 ANALYTICAL EPMAN = 5.685

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.41788E-03	-2.8484	5.68000E+01
MG	2	4.93830E-04	-3.3064	1.20000E+01
NA	1	3.74701E-03	-2.4263	8.61000E+01
K	1	4.50330E-04	-3.3465	1.76000E+01
CL	-1	1.86255E-04	-3.7299	6.60000E+00
SO4	-2	5.52005E-04	-3.2581	5.30000E+01
HCO3	-1	4.39800E-03	-2.3567	2.68220E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED	PH
EPMCAT	8.017	7.808	7.250
EPMAN	5.685	5.477	

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 4.397946E+00 MEQ/KG H2O
ELECT = 2.332308E+00 MEQ/KG H2O

TEMPERATURE
16.50 DEG C

IONIC STRENGTH
8.915038E-03

ACTIVITY H2O = .9998
PCO2 = 1.299257E-02
LOG PCO2 = -1.8863
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 4.955078E-03
DENSITY = 1.0000
TDS = 500.3MG/L
CARBONATE ALK = 4.397900E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.747VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	5.31799E+01	1.32751E-03	-2.8770	9.11367E-04	-3.0403	6.86524E-01	-.1633
2	MG	2	1.12603E+01	4.63390E-04	-3.3341	3.19957E-04	-3.4949	6.90470E-01	-.1609
3	NA	1	8.57866E+01	3.73338E-03	-2.4279	3.39182E-03	-2.4696	9.08514E-01	-.0417
4	K	1	1.75657E+01	4.49453E-04	-3.3473	4.07277E-04	-3.3901	9.06163E-01	-.0428
64	H	1	6.17251E-05	6.12659E-08	-7.2128	5.62341E-08	-7.2500	9.17871E-01	-.0372
5	CL	-1	6.60000E+00	1.86255E-04	-3.7299	1.68778E-04	-3.7727	9.06163E-01	-.0428
6	SO4	-2	4.56051E+01	4.74987E-04	-3.3233	3.24721E-04	-3.4885	6.83642E-01	-.1652
7	HCO3	-1	2.63953E+02	4.32804E-03	-2.3637	3.94025E-03	-2.4045	9.10401E-01	-.0408
18	CO3	-2	2.36371E-01	3.94088E-06	-5.4044	2.70722E-06	-5.5675	6.86959E-01	-.1631
86	H2CO3	0	3.50220E+01	5.64923E-04	-3.2480	5.66209E-04	-3.2470	1.00228E+00	.0010
27	OH	-1	1.73069E-03	1.01812E-07	-6.9922	9.22301E-08	-7.0351	9.05884E-01	-.0429
19	MGOH	1	1.97390E-04	4.77957E-09	-8.3206	4.36291E-09	-8.3602	9.12824E-01	-.0396
23	MGSO4 AQ	0	1.71823E+00	1.42813E-05	-4.8452	1.43106E-05	-4.8443	1.00205E+00	.0009
22	MGHCO3	1	1.31384E+00	1.54050E-05	-4.8123	1.39741E-05	-4.8547	9.07116E-01	-.0423
21	MGCO3 AQ	0	6.10207E-02	7.24030E-07	-6.1402	7.25518E-07	-6.1394	1.00205E+00	.0009
29	CAOH	1	1.24573E-04	2.18323E-09	-8.6609	1.99054E-09	-8.7010	9.11739E-01	-.0401
32	CASO4 AQ	0	7.60013E+00	5.58531E-05	-4.2530	5.59679E-05	-4.2521	1.00205E+00	.0009
30	CAHCO3	1	3.17941E+00	3.14648E-05	-4.5022	2.86877E-05	-4.5423	9.11739E-01	-.0401
31	CACO3 AQ	0	2.96180E-01	2.96065E-06	-5.5286	2.96674E-06	-5.5277	1.00205E+00	.0009
44	NASO4	-1	7.14722E-01	6.00648E-06	-5.2214	5.46831E-06	-5.2621	9.10401E-01	-.0408
43	NAHCO3	0	6.29623E-01	7.50008E-06	-5.1249	7.51549E-06	-5.1240	1.00205E+00	.0009
42	NACO3	-1	9.97498E-03	1.20242E-07	-6.9199	1.09468E-07	-6.9607	9.10401E-01	-.0408
94	NACL	0	3.33711E-32	5.71290E-37	-36.2431	5.72464E-37	-36.2423	1.00205E+00	.0009
63	HSO4	-1	1.50018E-04	1.54625E-09	-8.8107	1.40448E-09	-8.8525	9.08317E-01	-.0418
96	H2SO4	0	1.00455E-43	1.02475E-48	-47.9894	1.02686E-48	-47.9885	1.00205E+00	.0009
93	HCL	0	3.45171E-37	9.47159E-42	-41.0236	9.49106E-42	-41.0227	1.00205E+00	.0009

MOLE RATIOS FROM ANALYTICAL MOLALITY	MOLE RATIOS FROM COMPUTED MOLALITY	LOG ACTIVITY RATIOS
CL/CA = 1.3136E-01	CL/CA = 1.4030E-01	LOG CA/H2 = 11.4597
CL/MG = 3.7716E-01	CL/MG = 4.0194E-01	LOG MG/H2 = 11.0051
CL/NA = 4.9708E-02	CL/NA = 4.9889E-02	LOG NA/H1 = 4.7804
CL/K = 4.1360E-01	CL/K = 4.1440E-01	LOG K/H1 = 3.8599
CL/AL = 1.8626E+26	CL/AL = 1.8626E+26	LOG AL/H3 = -8.2500
CL/FE = 1.8626E+26	CL/FE = 1.8626E+26	LOG FE/H2 = -15.5000
CL/SO4 = 3.3742E-01	CL/SO4 = 3.9213E-01	LOG CA/MG = .4546
CL/HCO3 = 4.2350E-02	CL/HCO3 = 4.3035E-02	LOG NA/K = .9205
CA/MG = 2.8712E+00	CA/MG = 2.8648E+00	
NA/K = 8.3206E+00	NA/K = 8.3065E+00	

85 S/N,AGS CE CAMPO=780.00 MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	2.9594E-07	3.4125E-05	-6.5288	-4.4669	8.6723E-03	-2.06187	-2.73278
22	ARAGONIT	2.4673E-09	7.0574E-09	-8.6078	-8.1514	3.4960E-01	-.45643	-.60495
151	ARTIN	2.3561E-27	4.3613E-19	-26.6278	-18.3604	5.4022E-09	-8.26743	-10.95756
20	BRUCITE	2.7217E-18	3.7301E-12	-17.5652	-11.4283	7.2966E-07	-6.13688	-8.13376
13	CALCITE	2.4673E-09	3.7210E-09	-8.6078	-8.4293	6.6306E-01	-.17845	-.23651
12	DOLOMITE	2.1371E-18	1.4398E-17	-17.6702	-16.8417	1.4843E-01	-.82848	-1.09806
19	GYPSUM	2.9582E-07	1.7194E-05	-6.5290	-4.7646	1.7205E-02	-1.76436	-2.33846
65	HALITE	5.7246E-07	3.6497E+01	-6.2423	1.5623	1.5685E-08	-7.80451	-10.34401
118	HUNTITE	1.6035E-36	1.1068E-30	-35.7949	-29.9559	1.4487E-06	-5.83901	-7.73897
39	HYDMAG	1.5309E-54	5.3569E-38	-53.8150	-37.2711	2.8579E-17	-16.54396	-21.92720
11	MAGNESIT	8.6620E-10	7.8107E-09	-9.0624	-8.1073	1.1090E-01	-.95507	-1.26585
67	MIRABI	3.7283E-09	3.0103E-02	-8.4285	-1.5214	1.2385E-07	-6.90709	-9.15458
59	NAHCOL	1.3365E-05	2.3550E-01	-4.8740	-.6280	5.6751E-05	-4.24603	-5.62764
61	NATRON	3.1083E-11	2.2405E-02	-10.5075	-1.6497	1.3874E-09	-8.85781	-11.74005
150	NESQUE	8.6568E-10	8.1944E-06	-9.0626	-5.0865	1.0564E-04	-3.97616	-5.26996
66	THENAR	3.7357E-09	6.8124E-01	-8.4276	-.1667	5.4837E-09	-8.26093	-10.94895
62	THRNAT	3.1139E-11	1.5320E+00	-10.5067	.1853	2.0325E-11	-10.69196	-14.17102
60	TRONA	4.1608E-16	3.9099E-01	-15.3808	-.4078	1.0642E-15	-14.97299	-19.84505

S/N EL SAUCILLO,AGS CE CAMPO=885.0 MMHOS

INITIAL SOLUTION

TEMPERATURE = 17.20 DEGREES C PH = 6.970 ANALYTICAL EPMCAT = 7.026 ANALYTICAL EPMAN = 5.910

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	7.48876E-04	-3.1256	3.00000E+01
MG	2	5.02060E-04	-3.2992	1.22000E+01
NA	1	3.96460E-03	-2.4018	9.11000E+01
K	1	5.62912E-04	-3.2496	2.20000E+01
CL	-1	2.39874E-04	-3.6200	8.50000E+00
SO4	-2	4.37437E-04	-3.3591	4.20000E+01
HCO3	-1	4.79792E-03	-2.3189	2.92610E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED	PH
EPMCAT	7.026	6.895	6.970
EPMAN	5.910	5.779	

TEMPERATURE
17.20 DEG C

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 4.797801E+00 MEQ/KG H2O
ELECT = 1.116753E+00 MEQ/KG H2O

IONIC STRENGTH
7.909731E-03

ACTIVITY H2O = .9998
PCO2 = 2.750617E-02
LOG PCO2 = -1.5606
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 5.965410E-03
DENSITY = 1.0000
TDS = 498.4MG/L
CARBONATE ALK = 4.797860E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.761VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	2.81744E+01	7.03306E-04	-3.1529	4.91838E-04	-3.3082	6.99323E-01	-.1553
2	MG	2	1.14535E+01	4.71340E-04	-3.3267	3.31325E-04	-3.4797	7.02944E-01	-.1531
3	NA	1	9.07725E+01	3.95035E-03	-2.4034	3.60621E-03	-2.4429	9.12883E-01	-.0396
4	K	1	2.19634E+01	5.61975E-04	-3.2503	5.11831E-04	-3.2909	9.10772E-01	-.0406
64	H	1	1.17162E-04	1.16290E-07	-6.9345	1.07152E-07	-6.9700	9.21419E-01	-.0355
5	CL	-1	8.50000E+00	2.39874E-04	-3.6200	2.18470E-04	-3.6606	9.10772E-01	-.0406
6	SO4	-2	3.77174E+01	3.92834E-04	-3.4058	2.73694E-04	-3.5627	6.96717E-01	-.1569
7	HCO3	-1	2.89383E+02	4.74501E-03	-2.3238	4.33984E-03	-2.3625	9.14613E-01	-.0388
18	CO3	-2	1.36468E-01	2.27524E-06	-5.6430	1.59213E-06	-5.7980	6.99760E-01	-.1551
86	H2CO3	0	7.26140E+01	1.17130E-03	-2.9313	1.17365E-03	-2.9305	1.00201E+00	.0009
27	OH	-1	9.55590E-04	5.62147E-08	-7.2501	5.11848E-08	-7.2909	9.10523E-01	-.0407
19	MGOH	1	1.13882E-04	2.75751E-09	-8.5595	2.52812E-09	-8.5972	9.16814E-01	-.0377
23	MGSO4 AQ	0	1.52921E+00	1.27102E-05	-4.8958	1.27334E-05	-4.8951	1.00182E+00	.0008
22	MGHCO3	1	1.49654E+00	1.75472E-05	-4.7558	1.59966E-05	-4.7960	9.11637E-01	-.0402
21	MGCO3 AQ	0	3.75719E-02	4.45802E-07	-6.3509	4.46615E-07	-6.3501	1.00182E+00	.0008
29	CAOH	1	3.73286E-05	6.54211E-10	-9.1843	5.99145E-10	-9.2225	9.15828E-01	-.0382
32	CASO4 AQ	0	3.47965E+00	2.55718E-05	-4.5922	2.56184E-05	-4.5914	1.00182E+00	.0008
30	CAHCO3	1	1.92218E+00	1.90226E-05	-4.7207	1.74214E-05	-4.7589	9.15828E-01	-.0382
31	CACO3 AQ	0	9.51302E-02	9.50930E-07	-6.0219	9.52664E-07	-6.0211	1.00182E+00	.0008
44	NASO4	-1	6.40536E-01	5.38302E-06	-5.2690	4.92338E-06	-5.3077	9.14613E-01	-.0388
43	NAHCO3	0	7.37479E-01	8.78484E-06	-5.0563	8.80086E-06	-5.0555	1.00182E+00	.0008
42	NACO3	-1	6.44447E-03	7.76837E-08	-7.1097	7.10506E-08	-7.1484	9.14613E-01	-.0388
94	NACL	0	4.59374E-32	7.86415E-37	-36.1043	7.87849E-37	-36.1036	1.00182E+00	.0008
63	HSO4	-1	2.44343E-04	2.51845E-09	-8.5989	2.29865E-09	-8.6385	9.12723E-01	-.0397
96	H2SO4	0	3.07488E-43	3.13671E-48	-47.5035	3.14243E-48	-47.5027	1.00182E+00	.0008
93	HCL	0	8.51556E-37	2.33669E-41	-40.6314	2.34095E-41	-40.6306	1.00182E+00	.0008

MOLE RATIOS FROM ANALYTICAL MOLALITY

CL/CA	=	3.2031E-01
CL/MG	=	4.7778E-01
CL/NA	=	6.0504E-02
CL/K	=	4.2613E-01
CL/AL	=	2.3987E+26
CL/FE	=	2.3987E+26
CL/SO4	=	5.4836E-01
CL/HCO3	=	4.9995E-02
CA/MG	=	1.4916E+00
NA/K	=	7.0430E+00

MOLE RATIOS FROM COMPUTED MOLALITY

CL/CA	=	3.4107E-01
CL/MG	=	5.0892E-01
CL/NA	=	6.0722E-02
CL/K	=	4.2684E-01
CL/AL	=	2.3987E+26
CL/FE	=	2.3987E+26
CL/SO4	=	6.1062E-01
CL/HCO3	=	5.0553E-02
CA/MG	=	1.4921E+00
NA/K	=	7.0294E+00

LOG ACTIVITY RATIOS

LOG CA/H2	=	10.6318
LOG MG/H2	=	10.4603
LOG NA/H1	=	4.5271
LOG K/H1	=	3.6791
LOG AL/H3	=	-9.0900
LOG FE/H2	=	-16.0600
LOG CA/MG	=	.1716
LOG NA/K	=	.8479

S/N EL SAUCILLO,AGS   CE CAMPO=885.0 MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	1.3461E-07	3.3590E-05	-6.8709	-4.4738	4.0075E-03	-2.39713	-3.18480
22	ARAGONIT	7.8307E-10	6.9705E-09	-9.1062	-8.1567	1.1234E-01	-.94946	-1.26145
151	ARTIN	4.5761E-28	4.3278E-19	-27.3395	-18.3637	1.0574E-09	-8.97577	-11.92515
20	BRUCITE	8.6803E-19	3.7434E-12	-18.0615	-11.4267	2.3189E-07	-6.63473	-8.81485
13	CALCITE	7.8307E-10	3.6946E-09	-9.1062	-8.4324	2.1195E-01	-.67376	-.89516
12	DOLOMITE	4.1308E-19	1.3907E-17	-18.3840	-16.8568	2.9703E-02	-1.52720	-2.02903
19	GYPSUM	1.3456E-07	1.7213E-05	-6.8711	-4.7641	7.8171E-03	-2.10696	-2.79929
65	HALITE	7.8785E-07	3.6637E+01	-6.1036	1.5639	2.1504E-08	-7.66748	-10.18696
118	HUNTITE	1.1495E-37	9.9363E-31	-36.9395	-30.0028	1.1568E-07	-6.93673	-9.21609
39	HYDMAG	6.7159E-56	4.8139E-38	-55.1729	-37.3175	1.3951E-18	-17.85540	-23.72255
11	MAGNESIT	5.2751E-10	7.6115E-09	-9.2778	-8.1185	6.9305E-02	-1.15924	-1.54015
67	MIRABI	3.5519E-09	3.2594E-02	-8.4495	-1.4869	1.0897E-07	-6.96268	-9.25057
59	NAHCOL	1.5650E-05	2.3919E-01	-4.8055	-.6212	6.5429E-05	-4.18423	-5.55913
61	NATRON	2.0662E-11	2.3932E-02	-10.6848	-1.6210	8.6336E-10	-9.06381	-12.04211
150	NESQUE	5.2718E-10	7.9981E-06	-9.2780	-5.0970	6.5913E-05	-4.18103	-5.55488
66	THENAR	3.5593E-09	6.7961E-01	-8.4486	-.1677	5.2373E-09	-8.28090	-11.00194
62	THRNAT	2.0701E-11	1.5142E+00	-10.6840	.1802	1.3671E-11	-10.86418	-14.43408
60	TRONA	3.2391E-16	3.6260E-01	-15.4896	-.4406	8.9330E-16	-15.04900	-19.99400

S/N EL BAJIO,AGS   CE CAMPO=595.00 MMHOS

INITIAL SOLUTION

TEMPERATURE = 20.30 DEGREES C   PH = 7.400   ANALYTICAL EPMCAT = 5.258   ANALYTICAL EPMAN = 4.935

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	6.98892E-04	-3.1556	2.80000E+01
MG	2	3.25077E-04	-3.4880	7.90000E+00
NA	1	2.12791E-03	-2.6720	4.89000E+01
K	1	1.08479E-03	-2.9647	4.24000E+01
CL	-1	1.89061E-04	-3.7234	6.70000E+00
SO4	-2	3.74915E-04	-3.4261	3.60000E+01
HCO3	-1	3.99790E-03	-2.3982	2.43840E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	5.258	5.155
EPMAN	4.935	4.831

PH 7.400

TEMPERATURE 20.30 DEG C

IONIC STRENGTH 6.303548E-03

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 3.997863E+00 MEQ/KG H2O
ELECT = 3.238322E-01 MEQ/KG H2O

ACTIVITY H2O = .9998
PCO2 = 8.922580E-03
LOG PCO2 = -2.0495
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 4.336200E-03
DENSITY = 1.0000
TDS = 413.7MG/L
CARBONATE ALK = 3.997707E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000   EQUIVALENT EH = 5.823VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	2.63237E+01	6.57051E-04	-3.1824	4.74461E-04	-3.3238	7.22107E-01	-.1414
2	MG	2	7.43827E+00	3.06077E-04	-3.5142	2.21960E-04	-3.6537	7.25178E-01	-.1396
3	NA	1	4.87449E+01	2.12116E-03	-2.6734	1.95253E-03	-2.7094	9.20500E-01	-.0360
4	K	1	4.23333E+01	1.08308E-03	-2.9653	9.95114E-04	-3.0021	9.18778E-01	-.0368
64	H	1	4.32400E-05	4.29146E-08	-7.3674	3.98107E-08	-7.4000	9.27673E-01	-.0326
5	CL	-1	6.70000E+00	1.89061E-04	-3.7234	1.73705E-04	-3.7602	9.18778E-01	-.0368
6	SO4	-2	3.26120E+01	3.39631E-04	-3.4690	2.44521E-04	-3.6117	7.19962E-01	-.1427
7	HCO3	-1	2.40905E+02	3.94978E-03	-2.4034	3.64157E-03	-2.4387	9.21967E-01	-.0353
18	CO3	-2	3.21227E-01	5.35516E-06	-5.2712	3.86932E-06	-5.4124	7.22541E-01	-.1411
86	H2CO3	0	2.15193E+01	3.47088E-04	-3.4596	3.47635E-04	-3.4589	1.00158E+00	.0007
27	OH	-1	3.25547E-03	1.91494E-07	-6.7178	1.75902E-07	-6.7547	9.18578E-01	-.0369
19	MGOH	1	2.69926E-04	6.53537E-09	-8.1847	6.03740E-09	-8.2192	9.23804E-01	-.0344
23	MGSO4 AQ	0	9.96121E-01	8.27867E-06	-5.0820	8.29070E-06	-5.0814	1.00145E+00	.0006
22	MGHCO3	1	8.48301E-01	9.94561E-06	-5.0024	9.14497E-06	-5.0388	9.19498E-01	-.0364
21	MGCO3 AQ	0	6.41824E-02	7.61479E-07	-6.1183	7.62585E-07	-6.1177	1.00145E+00	.0006
29	CAOH	1	1.25508E-04	2.19943E-09	-8.6577	2.03003E-09	-8.6925	9.22980E-01	-.0348
32	CASO4 AQ	0	3.08382E+00	2.26610E-05	-4.6447	2.26939E-05	-4.6441	1.00145E+00	.0006
30	CAHCO3	1	1.69775E+00	1.68002E-05	-4.7747	1.55062E-05	-4.8095	9.22980E-01	-.0348
31	CACO3 AQ	0	2.36052E-01	2.35939E-06	-5.6272	2.36282E-06	-5.6266	1.00145E+00	.0006
44	NASO4	-1	3.13765E-01	2.63664E-06	-5.5789	2.43089E-06	-5.6142	9.21967E-01	-.0353
43	NAHCO3	0	3.35202E-01	3.99259E-06	-5.3987	3.99839E-06	-5.3981	1.00145E+00	.0006
42	NACO3	-1	9.90378E-03	1.19373E-07	-6.9231	1.10058E-07	-6.9584	9.21967E-01	-.0353
94	NACL	0	1.97847E-32	3.38671E-37	-36.4702	3.39163E-37	-36.4696	1.00145E+00	.0006
63	HSO4	-1	8.75056E-05	9.01846E-10	-9.0449	8.30057E-10	-9.0809	9.20398E-01	-.0360
96	H2SO4	0	3.79381E-44	3.86978E-49	-48.4123	3.87540E-49	-48.4117	1.00145E+00	.0006
93	HCL	0	2.51669E-37	6.90528E-42	-41.1608	6.91531E-42	-41.1602	1.00145E+00	.0006

MOLE RATIOS FROM ANALYTICAL MOLALITY			MOLE RATIOS FROM COMPUTED MOLALITY			LOG ACTIVITY RATIOS		
CL/CA	=	2.7052E-01	CL/CA	=	2.8774E-01	LOG CA/H2	=	11.4762
CL/MG	=	5.8159E-01	CL/MG	=	6.1769E-01	LOG MG/H2	=	11.1463
CL/NA	=	8.8848E-02	CL/NA	=	8.9131E-02	LOG NA/H1	=	4.6906
CL/K	=	1.7428E-01	CL/K	=	1.7456E-01	LOG K/H1	=	4.3979
CL/AL	=	1.8906E+26	CL/AL	=	1.8906E+26	LOG AL/H3	=	-7.8000
CL/FE	=	1.8906E+26	CL/FE	=	1.8906E+26	LOG FE/H2	=	-15.2000
CL/SO4	=	5.0428E-01	CL/SO4	=	5.5667E-01	LOG CA/MG	=	.3299
CL/HCO3	=	4.7290E-02	CL/HCO3	=	4.7866E-02	LOG NA/K	=	.2927
CA/MG	=	2.1499E+00	CA/MG	=	2.1467E+00			
NA/K	=	1.9616E+00	NA/K	=	1.9584E+00			

S/N EL BAJIO,AGS CE CAMPO=595.00 MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	1.1602E-07	3.1351E-05	-6.9355	-4.5038	3.7006E-03	-2.43173	-3.26527
22	ARAGONIT	1.8358E-09	6.6029E-09	-8.7362	-8.1803	2.7803E-01	-.55590	-.74645
151	ARTIN	5.8956E-27	4.1843E-19	-26.2295	-18.3784	1.4090E-08	-7.85110	-10.54227
20	BRUCITE	6.8678E-18	3.8021E-12	-17.1632	-11.4200	1.8063E-06	-5.74320	-7.71184
13	CALCITE	1.8358E-09	3.5678E-09	-8.7362	-8.4476	5.1456E-01	-.28856	-.38747
12	DOLOMITE	1.5767E-18	1.1949E-17	-17.8023	-16.9227	1.3196E-01	-.87957	-1.18107
19	GYPSUM	1.1598E-07	1.7296E-05	-6.9356	-4.7621	6.7058E-03	-2.17355	-2.91860
65	HALITE	3.3916E-07	3.7258E+01	-6.4696	1.5712	9.1030E-09	-8.04081	-10.79702
118	HUNTITE	1.1630E-36	6.2002E-31	-35.9344	-30.2076	1.8757E-06	-5.72684	-7.68987
39	HYDMAG	3.7341E-54	3.0171E-38	-53.4278	-37.5204	1.2377E-16	-15.90740	-21.36009
11	MAGNESIT	8.5884E-10	6.7986E-09	-9.0661	-8.1676	1.2633E-01	-.89851	-1.20650
67	MIRABI	9.3077E-10	4.6143E-02	-9.0312	-1.3359	2.0171E-08	-7.69526	-10.33302
59	NAHCOL	7.1103E-06	2.5605E-01	-5.1481	-.5917	2.7769E-05	-4.55644	-6.11829
61	NATRON	1.4729E-11	3.1927E-02	-10.8318	-1.4958	4.6131E-10	-9.33600	-12.53617
150	NESQUE	8.5844E-10	7.1938E-06	-9.0663	-5.1430	1.1933E-04	-3.92325	-5.26805
66	THENAR	9.3220E-10	6.7254E-01	-9.0305	-.1723	1.3861E-09	-8.85820	-11.89460
62	THRNAT	1.4749E-11	1.4384E+00	-10.8312	.1579	1.0253E-11	-10.98913	-14.75596
60	TRONA	1.0485E-16	2.6080E-01	-15.9794	-.5837	4.0204E-16	-15.39573	-20.67304

20 RINCON DE ROMOS,AGS   CE CAMPO=757.00MMHOS

INITIAL SOLUTION

TEMPERATURE = 21.70 DEGREES C   PH = 7.630   ANALYTICAL EPMCAT = 6.397   ANALYTICAL EPMAN = 5.382

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	7.08906E-04	-3.1494	2.84000E+01
MG	2	5.71995E-04	-3.2426	1.39000E+01
NA	1	3.08103E-03	-2.5113	7.08000E+01
K	1	7.57339E-04	-3.1207	2.96000E+01
CL	-1	2.37041E-04	-3.6252	8.40000E+00
SO4	-2	3.74930E-04	-3.4260	3.60000E+01
HCO3	-1	4.39780E-03	-2.3568	2.68220E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	6.397	6.262
EPMAN	5.382	5.247

PH
7.630

TEMPERATURE
21.70 DEG C

IONIC STRENGTH
7.301707E-03

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 4.397805E+00 MEQ/KG H2O
ELECT = 1.015381E+00 MEQ/KG H2O

ACTIVITY H2O = .9998
PCO2 = 5.818255E-03
LOG PCO2 = -2.2352
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 4.597025E-03
DENSITY = 1.0000
TDS = 455.3MG/L
CARBONATE ALK = 4.397440E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000   EQUIVALENT EH = 5.851VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	2.65852E+01	6.63605E-04	-3.1781	4.68612E-04	-3.3292	7.06161E-01	-.1511
2	MG	2	1.30361E+01	5.36445E-04	-3.2705	3.80657E-04	-3.4195	7.09593E-01	-.1490
3	NA	1	7.05632E+01	3.07072E-03	-2.5128	2.81030E-03	-2.5512	9.15192E-01	-.0385
4	K	1	2.95541E+01	7.56164E-04	-3.1214	6.90545E-04	-3.1608	9.13221E-01	-.0394
64	H	1	2.55816E-05	2.53902E-08	-7.5953	2.34423E-08	-7.6300	9.23282E-01	-.0347
5	CL	-1	8.40000E+00	2.37041E-04	-3.6252	2.16471E-04	-3.6646	9.13221E-01	-.0394
6	SO4	-2	3.20798E+01	3.34103E-04	-3.4761	2.35118E-04	-3.6287	7.03731E-01	-.1526
7	HCO3	-1	2.63333E+02	4.31768E-03	-2.3647	3.95864E-03	-2.4025	9.16844E-01	-.0377
18	CO3	-2	6.25727E-01	1.04319E-05	-4.9816	7.37133E-06	-5.1325	7.06614E-01	-.1508
86	H2CO3	0	1.34828E+01	2.17475E-04	-3.6626	2.17869E-04	-3.6618	1.00181E+00	.0008
27	OH	-1	6.20046E-03	3.64740E-07	-6.4380	3.33005E-07	-6.4775	9.12991E-01	-.0395
19	MGOH	1	8.95666E-04	2.16865E-08	-7.6638	1.99282E-08	-7.7005	9.18923E-01	-.0367
23	MGSO4 AQ	0	1.70486E+00	1.41695E-05	-4.8486	1.41934E-05	-4.8479	1.00168E+00	.0007
22	MGHCO3	1	1.60356E+00	1.88011E-05	-4.7258	1.71850E-05	-4.7649	9.14039E-01	-.0390
21	MGCO3 AQ	0	2.14193E-01	2.54136E-06	-5.5949	2.54564E-06	-5.5942	1.00168E+00	.0007
29	CAOH	1	2.38235E-04	4.17506E-09	-8.3793	3.83267E-09	-8.4165	9.17991E-01	-.0372
32	CASO4 AQ	0	2.96386E+00	2.17803E-05	-4.6619	2.18170E-05	-4.6612	1.00168E+00	.0007
30	CAHCO3	1	1.91294E+00	1.89304E-05	-4.7228	1.73779E-05	-4.7600	9.17991E-01	-.0372
31	CACO3 AQ	0	4.56550E-01	4.56352E-06	-5.3407	4.57120E-06	-5.3400	1.00168E+00	.0007
44	NASO4	-1	4.40649E-01	3.70302E-06	-5.4314	3.39510E-06	-5.4691	9.16844E-01	-.0377
43	NAHCO3	0	5.24329E-01	6.24553E-06	-5.2044	6.25604E-06	-5.2037	1.00168E+00	.0007
42	NACO3	-1	2.93616E-02	3.53918E-07	-6.4511	3.24488E-07	-6.4888	9.16844E-01	-.0377
94	NACL	0	3.54778E-32	6.07327E-37	-36.2166	6.08349E-37	-36.2158	1.00168E+00	.0007
63	HSO4	-1	5.17815E-05	5.33690E-10	-9.2727	4.88360E-10	-9.3113	9.15062E-01	-.0385
96	H2SO4	0	1.26453E-44	1.28990E-49	-48.8894	1.29207E-49	-48.8887	1.00168E+00	.0007
93	HCL	0	1.84629E-37	5.06605E-42	-41.2953	5.07458E-42	-41.2946	1.00168E+00	.0007

MOLE RATIOS FROM ANALYTICAL MOLALITY		MOLE RATIOS FROM COMPUTED MOLALITY		LOG ACTIVITY RATIOS	
CL/CA =	3.3438E-01	CL/CA =	3.5720E-01	LOG CA/H2 =	11.9308
CL/MG =	4.1441E-01	CL/MG =	4.4187E-01	LOG MG/H2 =	11.8405
CL/NA =	7.6936E-02	CL/NA =	7.7194E-02	LOG NA/H1 =	5.0788
CL/K =	3.1299E-01	CL/K =	3.1348E-01	LOG K/H1 =	4.4692
CL/AL =	2.3704E+26	CL/AL =	2.3704E+26	LOG AL/H3 =	-7.1100
CL/FE =	2.3704E+26	CL/FE =	2.3704E+26	LOG FE/H2 =	-14.7400
CL/SO4 =	6.3223E-01	CL/SO4 =	7.0949E-01	LOG CA/MG =	.0903
CL/HCO3 =	5.3900E-02	CL/HCO3 =	5.4900E-02	LOG NA/K =	.6096
CA/MG =	1.2394E+00	CA/MG =	1.2370E+00		
NA/K =	4.0682E+00	NA/K =	4.0609E+00		

20 RINCON DE ROMOS,AGS CE CAMPO=757.00MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	1.1018E-07	3.0403E-05	-6.9579	-4.5171	3.6239E-03	-2.44082	-3.29311
22	ARAGONIT	3.4543E-09	6.4458E-09	-8.4616	-8.1907	5.3590E-01	-.27091	-.36551
151	ARTIN	1.1838E-25	4.1220E-19	-24.9267	-18.3849	2.8720E-07	-6.54182	-8.82612
20	BRUCITE	4.2212E-17	3.8285E-12	-16.3746	-11.4170	1.1026E-05	-4.95759	-6.68870
13	CALCITE	3.4543E-09	3.5059E-09	-8.4616	-8.4552	9.8529E-01	-.00643	-.00868
12	DOLOMITE	9.6926E-18	1.1169E-17	-17.0136	-16.9520	8.6783E-01	-.06157	-.08307
19	GYPSUM	1.1014E-07	1.7332E-05	-6.9581	-4.7611	6.3546E-03	-2.19691	-2.96403
65	HALITE	6.0835E-07	3.7538E+01	-6.2158	1.5745	1.6206E-08	-7.79032	-10.51056
118	HUNTITE	7.6313E-35	5.0271E-31	-34.1174	-30.2987	1.5180E-04	-3.81872	-5.15215
39	HYDMAG	2.6149E-51	2.4510E-38	-50.5825	-37.6106	1.0668E-13	-12.97190	-17.50147
11	MAGNESIT	2.8060E-09	6.4656E-09	-8.5519	-8.1894	4.3398E-01	-.36253	-.48911
67	MIRABI	1.8537E-09	5.3857E-02	-8.7320	-1.2688	3.4419E-08	-7.46321	-10.06923
59	NAHCOL	1.1125E-05	2.6393E-01	-4.9537	-.5785	4.2152E-05	-4.37518	-5.90293
61	NATRON	5.8116E-11	3.6294E-02	-10.2357	-1.4402	1.6012E-09	-8.79554	-11.86680
150	NESQUE	2.8045E-09	6.8626E-06	-8.5521	-5.1635	4.0866E-04	-3.38864	-4.57189
66	THENAR	1.8569E-09	6.6941E-01	-8.7312	-.1743	2.7740E-09	-8.55690	-11.54483
62	THRNAT	5.8207E-11	1.4060E+00	-10.2350	.1480	4.1399E-11	-10.38301	-14.00858
60	TRONA	6.4744E-16	2.2525E-01	-15.1888	-.6473	2.8743E-15	-14.54146	-19.61910

23 RINCON DE ROMOS,AGS CE CAMPO=805.00 MMHOS

INITIAL SOLUTION

TEMPERATURE = 23.50 DEGREES C PH = 7.470 ANALYTICAL EPMCAT = 6.152 ANALYTICAL EPMAN = 6.242

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	7.18924E-04	-3.1433	2.88000E+01
MG	2	4.44448E-04	-3.3522	1.08000E+01
NA	1	3.22914E-03	-2.4909	7.42000E+01
K	1	5.98735E-04	-3.2228	2.34000E+01
CL	-1	2.14476E-04	-3.6686	7.60000E+00
SO4	-2	4.16609E-04	-3.3803	4.00000E+01
HCO3	-1	5.19786E-03	-2.2842	3.17000E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	6.152	6.011
EPMAN	6.242	6.102

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 5.197835E+00 MEQ/KG H2O
ELECT = -9.099802E-02 MEQ/KG H2O

PH
7.470

TEMPERATURE
23.50 DEG C

IONIC STRENGTH
7.521944E-03

ACTIVITY H2O = .9998
PCO2 = 1.020211E-02
LOG PCO2 = -1.9913
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 5.545357E-03
DENSITY = 1.0000
TDS = 501.8MG/L
CARBONATE ALK = 5.197566E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.886VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	2.67032E+01	6.66582E-04	-3.1761	4.68118E-04	-3.3296	7.02267E-01	-.1535
2	MG	2	1.00314E+01	4.12816E-04	-3.3842	2.91358E-04	-3.5356	7.05782E-01	-.1513
3	NA	1	7.39139E+01	3.21669E-03	-2.4926	2.93967E-03	-2.5317	9.13882E-01	-.0391
4	K	1	2.33583E+01	5.97668E-04	-3.2235	5.44986E-04	-3.2636	9.11854E-01	-.0401
64	H	1	3.70185E-05	3.67432E-08	-7.4348	3.38844E-08	-7.4700	9.22196E-01	-.0352
5	CL	-1	7.60000E+00	2.14476E-04	-3.6686	1.95571E-04	-3.7087	9.11854E-01	-.0401
6	SO4	-2	3.59018E+01	3.73924E-04	-3.4272	2.61664E-04	-3.5823	6.99778E-01	-.1550
7	HCO3	-1	3.12183E+02	5.11887E-03	-2.2908	4.68675E-03	-2.3291	9.15582E-01	-.0383
18	CO3	-2	5.35779E-01	8.93274E-06	-5.0490	6.27731E-06	-5.2022	7.02731E-01	-.1532
86	H2CO3	0	2.24918E+01	3.62805E-04	-3.4403	3.63475E-04	-3.4395	1.00185E+00	.0008
27	OH	-1	4.93249E-03	2.90166E-07	-6.5374	2.64520E-07	-6.5775	9.11617E-01	-.0402
19	MGOH	1	5.56968E-04	1.34863E-08	-7.8701	1.23767E-08	-7.9074	9.17719E-01	-.0373
23	MGSO4 AQ	0	1.52295E+00	1.26582E-05	-4.8976	1.26801E-05	-4.8969	1.00173E+00	.0008
22	MGHCO3	1	1.47059E+00	1.72429E-05	-4.7634	1.57375E-05	-4.8031	9.12696E-01	-.0397
21	MGCO3 AQ	0	1.43513E-01	1.70283E-06	-5.7688	1.70578E-06	-5.7681	1.00173E+00	.0008
29	CAOH	1	1.91633E-04	3.35852E-09	-8.4739	3.07896E-09	-8.5116	9.16761E-01	-.0377
30	CAHCO3	1	2.39370E+00	2.36891E-05	-4.6255	2.17173E-05	-4.6632	9.16761E-01	-.0377
31	CACO3 AQ	0	4.03335E-01	4.03179E-06	-5.3945	4.03878E-06	-5.3938	1.00173E+00	.0008
44	NASO4	-1	5.19651E-01	4.36712E-06	-5.3598	3.99845E-06	-5.3981	9.15582E-01	-.0383
43	NAHCO3	0	6.49281E-01	7.73425E-06	-5.1116	7.74766E-06	-5.1108	1.00173E+00	.0008
42	NACO3	-1	2.87214E-02	3.46218E-07	-6.4607	3.16991E-07	-6.4990	9.15582E-01	-.0383
94	NACL	0	3.35246E-32	5.73919E-37	-36.2411	5.74914E-37	-36.2404	1.00173E+00	.0008
63	HSO4	-1	8.76563E-05	9.03478E-10	-9.0441	8.25553E-10	-9.0833	9.13749E-01	-.0392
96	H2SO4	0	2.93998E-44	2.99911E-49	-48.5230	3.00431E-49	-48.5223	1.00173E+00	.0008
93	HCL	0	2.41081E-37	6.61533E-42	-41.1794	6.62680E-42	-41.1787	1.00173E+00	.0008

MOLE RATIOS FROM ANALYTICAL MOLALITY

CL/CA	=	2.9833E-01
CL/MG	=	4.8257E-01
CL/NA	=	6.6419E-02
CL/K	=	3.5821E-01
CL/AL	=	2.1448E+26
CL/FE	=	2.1448E+26
CL/SO4	=	5.1481E-01
CL/HCO3	=	4.1262E-02
CA/MG	=	1.6176E+00
NA/K	=	5.3933E+00

MOLE RATIOS FROM COMPUTED MOLALITY

CL/CA	=	3.2175E-01
CL/MG	=	5.1954E-01
CL/NA	=	6.6676E-02
CL/K	=	3.5885E-01
CL/AL	=	2.1448E+26
CL/FE	=	2.1448E+26
CL/SO4	=	5.7358E-01
CL/HCO3	=	4.1899E-02
CA/MG	=	1.6147E+00
NA/K	=	5.3821E+00

LOG ACTIVITY RATIOS

LOG CA/H2	=	11.6104
LOG MG/H2	=	11.4044
LOG NA/H1	=	4.9383
LOG K/H1	=	4.2064
LOG AL/H3	=	-7.5900
LOG FE/H2	=	-15.0600
LOG CA/MG	=	.2059
LOG NA/K	=	.7319

23 RINCON DE ROMOS,AGS   CE CAMPO=805.00 MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	1.2249E-07	2.9239E-05	-6.9119	-4.5340	4.1892E-03	-2.37787	-3.22777
22	ARAGONIT	2.9385E-09	6.2512E-09	-8.5319	-8.2040	4.7007E-01	-.32784	-.44501
151	ARTIN	3.7265E-26	4.0441E-19	-25.4287	-18.3932	9.2146E-08	-7.03553	-9.55016
20	BRUCITE	2.0387E-17	3.8623E-12	-16.6907	-11.4132	5.2783E-06	-5.27750	-7.16379
13	CALCITE	2.9385E-09	3.4225E-09	-8.5319	-8.4657	8.5858E-01	-.06622	-.08989
12	DOLOMITE	5.3744E-18	1.0250E-17	-17.2697	-16.9893	5.2433E-01	-.28039	-.38061
19	GYPSUM	1.2244E-07	1.7379E-05	-6.9121	-4.7600	7.0454E-03	-2.15210	-2.92130
65	HALITE	5.7491E-07	3.7896E+01	-6.2404	1.5786	1.5171E-08	-7.81899	-10.61366
118	HUNTITE	1.7978E-35	3.8501E-31	-34.7453	-30.4145	4.6694E-05	-4.33074	-5.87863
39	HYDMAG	2.2794E-52	1.8818E-38	-51.6422	-37.7254	1.2113E-14	-13.91676	-18.89088
11	MAGNESIT	1.8289E-09	6.0655E-09	-8.7378	-8.2171	3.0153E-01	-.52066	-.70676
67	MIRABI	2.2570E-09	6.5559E-02	-8.6465	-1.1834	3.4427E-08	-7.46311	-10.13057
59	NAHCOL	1.3778E-05	2.7429E-01	-4.8608	-.5618	5.0229E-05	-4.29904	-5.83560
61	NATRON	5.4144E-11	4.2721E-02	-10.2664	-1.3694	1.2674E-09	-8.89709	-12.07709
150	NESQUE	1.8279E-09	6.4633E-06	-8.7380	-5.1895	2.8281E-04	-3.54850	-4.81680
66	THENAR	2.2612E-09	6.6546E-01	-8.6457	-.1769	3.3980E-09	-8.46878	-11.49568
62	THRNAT	5.4236E-11	1.3658E+00	-10.2657	.1354	3.9710E-11	-10.40110	-14.11865
60	TRONA	7.4710E-16	1.8694E-01	-15.1266	-.7283	3.9964E-15	-14.39833	-19.54458

149 RCHO EL MOSCO,AGS CE CAMPO=950.00 MMHOS

INITIAL SOLUTION

TEMPERATURE = 26.20 DEGREES C PH = 7.300 ANALYTICAL EPMCAT = 4.810 ANALYTICAL EPMAN = 4.283

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	6.18984E-04	-3.2083	2.48000E+01
MG	2	4.64957E-04	-3.3326	1.13000E+01
NA	1	2.36276E-03	-2.6266	5.43000E+01
K	1	2.81416E-04	-3.5507	1.10000E+01
CL	-1	1.41082E-04	-3.8505	5.00000E+00
SO4	-2	7.28959E-05	-4.1373	7.00000E+00
HCO3	-1	3.99767E-03	-2.3982	2.43840E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	4.810	4.751
EPMAN	4.283	4.223

PH 7.300
TEMPERATURE 26.20 DEG C
IONIC STRENGTH 5.584915E-03

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 3.997633E+00 MEQ/KG H2O
ELECT = 5.276307E-01 MEQ/KG H2O

ACTIVITY H2O = .9999
PCO2 = 1.219516E-02
LOG PCO2 = -1.9138
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 4.392886E-03
DENSITY = 1.0000
TDS = 357.2MG/L
CARBONATE ALK = 3.997433E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.940VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	2.38033E+01	5.94107E-04	-3.2261	4.35028E-04	-3.3615	7.32238E-01	-.1353
2	MG	2	1.08367E+01	4.45892E-04	-3.3508	3.27757E-04	-3.4844	7.35060E-01	-.1337
3	NA	1	5.41802E+01	2.35755E-03	-2.6275	2.17796E-03	-2.6619	9.23824E-01	-.0344
4	K	1	1.09963E+01	2.81320E-04	-3.5508	2.59455E-04	-3.5859	9.22274E-01	-.0351
64	H	1	5.42788E-05	5.38673E-08	-7.2687	5.01187E-08	-7.3000	9.30411E-01	-.0313
5	CL	-1	5.00000E+00	1.41082E-04	-3.8505	1.30116E-04	-3.8857	9.22274E-01	-.0351
6	SO4	-2	6.25828E+00	6.51719E-05	-4.1859	4.75957E-05	-4.3224	7.30310E-01	-.1365
7	HCO3	-1	2.40497E+02	3.94286E-03	-2.4042	3.64788E-03	-2.4380	9.25184E-01	-.0338
18	CO3	-2	2.85825E-01	4.76471E-06	-5.3220	3.49100E-06	-5.4571	7.32678E-01	-.1351
86	H2CO3	0	2.50310E+01	4.03706E-04	-3.3939	4.04253E-04	-3.3933	1.00135E+00	.0006
27	OH	-1	4.04442E-03	2.37888E-07	-6.6236	2.19356E-07	-6.6589	9.22097E-01	-.0352
19	MGOH	1	5.31192E-04	1.28603E-08	-7.8907	1.19198E-08	-7.9237	9.26863E-01	-.0330
23	MGSO4 AQ	0	3.34544E-01	2.78021E-06	-5.5559	2.78379E-06	-5.5554	1.00129E+00	.0006
22	MGHCO3	1	1.29459E+00	1.51772E-05	-4.8188	1.40075E-05	-4.8536	9.22934E-01	-.0348
21	MGCO3 AQ	0	9.36391E-02	1.11090E-06	-5.9543	1.11233E-06	-5.9538	1.00129E+00	.0006
29	CAOH	1	1.48897E-04	2.60916E-09	-8.5835	2.41636E-09	-8.6168	9.26109E-01	-.0333
32	CASO4 AQ	0	5.79121E-01	4.25533E-06	-5.3711	4.26081E-06	-5.3705	1.00129E+00	.0006
30	CAHCO3	1	1.86195E+00	1.84239E-05	-4.7346	1.70626E-05	-4.7680	9.26109E-01	-.0333
31	CACO3 AQ	0	2.21739E-01	2.21621E-06	-5.6544	2.21906E-06	-5.6538	1.00129E+00	.0006
44	NASO4	-1	7.05114E-02	5.92489E-07	-6.2273	5.48161E-07	-6.2611	9.25184E-01	-.0338
43	NAHCO3	0	3.74635E-01	4.46202E-06	-5.3505	4.46776E-06	-5.3499	1.00129E+00	.0006
42	NACO3	-1	1.34237E-02	1.61791E-07	-6.7910	1.49686E-07	-6.8248	9.25184E-01	-.0338
94	NACL	0	1.65348E-32	2.83024E-37	-36.5482	2.83389E-37	-36.5476	1.00129E+00	.0006
63	HSO4	-1	2.51489E-05	2.59174E-10	-9.5864	2.39413E-10	-9.6209	9.23753E-01	-.0344
96	H2SO4	0	1.17064E-44	1.19401E-49	-48.9230	1.19555E-49	-48.9224	1.00129E+00	.0006
93	HCL	0	2.37382E-37	6.51289E-42	-41.1862	6.52127E-42	-41.1857	1.00129E+00	.0006

MOLE RATIOS FROM ANALYTICAL MOLALITY		
CL/CA	=	2.2793E-01
CL/MG	=	3.0343E-01
CL/NA	=	5.9711E-02
CL/K	=	5.0133E-01
CL/AL	=	1.4108E+26
CL/FE	=	1.4108E+26
CL/SO4	=	1.9354E+00
CL/HCO3	=	3.5291E-02
CA/MG	=	1.3313E+00
NA/K	=	8.3960E+00

MOLE RATIOS FROM COMPUTED MOLALITY		
CL/CA	=	2.3747E-01
CL/MG	=	3.1640E-01
CL/NA	=	5.9843E-02
CL/K	=	5.0150E-01
CL/AL	=	1.4108E+26
CL/FE	=	1.4108E+26
CL/SO4	=	2.1648E+00
CL/HCO3	=	3.5782E-02
CA/MG	=	1.3324E+00
NA/K	=	8.3803E+00

LOG ACTIVITY RATIOS		
LOG CA/H2	=	11.2385
LOG MG/H2	=	11.1156
LOG NA/H1	=	4.6381
LOG K/H1	=	3.7141
LOG AL/H3	=	-8.1000
LOG FE/H2	=	-15.4000
LOG CA/MG	=	.1230
LOG NA/K	=	.9240

149 RCHO EL MOSCO,AGS CE CAMPO=950.00 MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	2.0705E-08	2.7601E-05	-7.6839	-4.5591	7.5017E-04	-3.12484	-4.28033
22	ARAGONIT	1.5187E-09	5.9746E-09	-8.8185	-8.2237	2.5419E-01	-.59484	-.81480
151	ARTIN	1.8037E-26	3.9318E-19	-25.7438	-18.4054	4.5876E-08	-7.33842	-10.05197
20	BRUCITE	1.5771E-17	3.9129E-12	-16.8021	-11.4075	4.0305E-06	-5.39465	-7.38945
13	CALCITE	1.5187E-09	3.2907E-09	-8.8185	-8.4827	4.6151E-01	-.33582	-.46000
12	DOLOMITE	1.7377E-18	9.0291E-18	-17.7600	-17.0444	1.9245E-01	-.71567	-.98031
19	GYPSUM	2.0700E-08	1.7449E-05	-7.6840	-4.7582	1.1863E-03	-2.92580	-4.00769
65	HALITE	2.8339E-07	3.8432E+01	-6.5476	1.5847	7.3737E-09	-8.13231	-11.13943
118	HUNTITE	2.2750E-36	2.5960E-31	-35.6430	-30.5857	8.7632E-06	-5.05734	-6.92741
39	HYDMAG	2.7016E-53	1.2736E-38	-52.5684	-37.8950	2.1213E-15	-14.67340	-20.09924
11	MAGNESIT	1.1442E-09	5.5192E-09	-8.9415	-8.2581	2.0731E-01	-.68337	-.93607
67	MIRABI	2.2545E-10	8.7657E-02	-9.6469	-1.0572	2.5720E-09	-8.58973	-11.76599
59	NAHCOL	7.9449E-06	2.9036E-01	-5.0999	-.5371	2.7363E-05	-4.56284	-6.25006
61	NATRON	1.6536E-11	5.4358E-02	-10.7816	-1.2647	3.0421E-10	-9.51682	-13.03590
150	NESQUE	1.1437E-09	5.9155E-06	-8.9417	-5.2280	1.9334E-04	-3.71367	-5.08689
66	THENAR	2.2577E-10	6.5966E-01	-9.6463	-.1807	3.4225E-10	-9.46565	-12.96580
62	THRNAT	1.6557E-11	1.3085E+00	-10.7810	.1168	1.2654E-11	-10.89778	-14.92749
60	TRONA	1.3153E-16	1.4194E-01	-15.8810	-.8479	9.2663E-16	-15.03309	-20.59194

28 RCHO CAROLINA CE CAMPO=775.00 MMHOS

INITIAL SOLUTION

TEMPERATURE = 22.30 DEGREES C PH = 7.250 ANALYTICAL EPMCAT = 7.329 ANALYTICAL EPMAN = 6.173

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.43788E-03	-2.8423	5.76000E+01
MG	2	2.88075E-04	-3.5405	7.00000E+00
NA	1	3.26403E-03	-2.4862	7.50000E+01
K	1	6.16660E-04	-3.2100	2.41000E+01
CL	-1	2.28591E-04	-3.6409	8.10000E+00
SO4	-2	3.74956E-04	-3.4260	3.60000E+01
HCO3	-1	5.19798E-03	-2.2842	3.17000E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	7.329	7.155
EPMAN	6.173	5.999

PH
7.250

TEMPERATURE
22.30 DEG C

IONIC STRENGTH
8.525413E-03

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 5.197922E+00 MEQ/KG H2O
ELECT = 1.156035E+00 MEQ/KG H2O

ACTIVITY H2O = .9998
PCO2 = 1.655863E-02
LOG PCO2 = -1.7810
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 5.795606E-03
DENSITY = 1.0000
TDS = 524.8MG/L
CARBONATE ALK = 5.197815E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.863VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	5.39669E+01	1.34719E-03	-2.8706	9.28378E-04	-3.0323	6.89123E-01	-.1617
2	MG	2	6.55582E+00	2.69795E-04	-3.5690	1.86960E-04	-3.7283	6.92969E-01	-.1593
3	NA	1	7.47325E+01	3.25239E-03	-2.4878	2.95775E-03	-2.5290	9.09410E-01	-.0412
4	K	1	2.40644E+01	6.15749E-04	-3.2106	5.58571E-04	-3.2529	9.07140E-01	-.0423
64	H	1	6.16774E-05	6.12200E-08	-7.2131	5.62341E-08	-7.2500	9.18558E-01	-.0369
5	CL	-1	8.10000E+00	2.28591E-04	-3.6409	2.07365E-04	-3.6833	9.07140E-01	-.0423
6	SO4	-2	3.09935E+01	3.22812E-04	-3.4911	2.21564E-04	-3.6545	6.86356E-01	-.1635
7	HCO3	-1	3.11788E+02	5.11252E-03	-2.2914	4.65889E-03	-2.3317	9.11271E-01	-.0404
18	CO3	-2	3.18712E-01	5.31383E-06	-5.2746	3.66435E-06	-5.4360	6.89588E-01	-.1614
86	H2CO3	0	3.77208E+01	6.08472E-04	-3.2158	6.09754E-04	-3.2148	1.00211E+00	.0009
27	OH	-1	2.72513E-03	1.60316E-07	-6.7950	1.45387E-07	-6.8375	9.06873E-01	-.0425
19	MGOH	1	1.94531E-04	4.71046E-09	-8.3269	4.30363E-09	-8.3662	9.13632E-01	-.0392
23	MGSO4 AQ	0	8.01466E-01	6.66165E-06	-5.1764	6.67474E-06	-5.1756	1.00196E+00	.0009
22	MGHCO3	1	9.36171E-01	1.09770E-05	-4.9595	9.96794E-06	-5.0014	9.08072E-01	-.0419
21	MGCO3 AQ	0	5.27619E-02	6.26053E-07	-6.2034	6.27283E-07	-6.2025	1.00196E+00	.0009
29	CAOH	1	2.08124E-04	3.64762E-09	-8.4380	3.32873E-09	-8.4777	9.12574E-01	-.0397
32	CASO4 AQ	0	5.56014E+00	4.08623E-05	-4.3887	4.09426E-05	-4.3878	1.00196E+00	.0009
30	CAHCO3	1	4.56950E+00	4.52227E-05	-4.3446	4.12691E-05	-4.3844	9.12574E-01	-.0397
31	CACO3 AQ	0	4.55059E-01	4.54893E-06	-5.3421	4.55787E-06	-5.3412	1.00196E+00	.0009
44	NASO4	-1	4.41385E-01	3.70946E-06	-5.4307	3.38032E-06	-5.4710	9.11271E-01	-.0404
43	NAHCO3	0	6.49226E-01	7.73378E-06	-5.1116	7.74898E-06	-5.1108	1.00196E+00	.0009
42	NACO3	-1	1.59393E-02	1.92143E-07	-6.7164	1.75094E-07	-6.7567	9.11271E-01	-.0404
94	NACL	0	3.57559E-32	6.12131E-37	-36.2132	6.13333E-37	-36.2123	1.00196E+00	.0009
63	HSO4	-1	1.19755E-04	1.23435E-09	-8.9086	1.12232E-09	-8.9499	9.09241E-01	-.0413
96	H2SO4	0	6.85468E-44	6.99271E-49	-48.1554	7.00645E-49	-48.1545	1.00196E+00	.0009
93	HCL	0	4.24114E-37	1.16381E-41	-40.9341	1.16610E-41	-40.9333	1.00196E+00	.0009

MOLE RATIOS FROM ANALYTICAL MOLALITY		MOLE RATIOS FROM COMPUTED MOLALITY		LOG ACTIVITY RATIOS	
CL/CA =	1.5898E-01	CL/CA =	1.6968E-01	LOG CA/H2 =	11.4677
CL/MG =	7.9351E-01	CL/MG =	8.4728E-01	LOG MG/H2 =	10.7717
CL/NA =	7.0034E-02	CL/NA =	7.0284E-02	LOG NA/H1 =	4.7210
CL/K =	3.7069E-01	CL/K =	3.7124E-01	LOG K/H1 =	3.9971
CL/AL =	2.2859E+26	CL/AL =	2.2859E+26	LOG AL/H3 =	-8.2500
CL/FE =	2.2859E+26	CL/FE =	2.2859E+26	LOG FE/H2 =	-15.5000
CL/SO4 =	6.0965E-01	CL/SO4 =	7.0813E-01	LOG CA/MG =	.6960
CL/HCO3 =	4.3977E-02	CL/HCO3 =	4.4712E-02	LOG NA/K =	.7239
CA/MG =	4.9913E+00	CA/MG =	4.9934E+00		
NA/K =	5.2931E+00	NA/K =	5.2820E+00		

28 RCHO CAROLINA CE CAMPO=775.00 MMHOS

PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18 ANHYDRIT	2.0569E-07	3.0009E-05	-6.6868	-4.5228	6.8545E-03	-2.16402	-2.92560
22 ARAGONIT	3.4019E-09	6.3800E-09	-8.4683	-8.1952	5.3321E-01	-.27310	-.36921
151 ARTIN	2.7057E-27	4.0958E-19	-26.5677	-18.3877	6.6060E-09	-8.18006	-11.05886
20 BRUCITE	3.9518E-18	3.8398E-12	-17.4032	-11.4157	1.0292E-06	-5.98751	-8.09469
13 CALCITE	3.4019E-09	3.4785E-09	-8.4683	-8.4586	9.7797E-01	-.00967	-.01308
12 DOLOMITE	2.3306E-18	1.0852E-17	-17.6325	-16.9645	2.1475E-01	-.66806	-.90317
19 GYPSUM	2.0561E-07	1.7348E-05	-6.6870	-4.7607	1.1852E-02	-1.92620	-2.60409
65 HALITE	6.1333E-07	3.7657E+01	-6.2123	1.5759	1.6287E-08	-7.78815	-10.52903
118 HUNTITE	1.0938E-36	4.5978E-31	-35.9610	-30.3375	2.3791E-06	-5.62359	-7.60269
39 HYDMAG	8.6981E-55	2.2436E-38	-54.0606	-37.6491	3.8769E-17	-16.41151	-22.18719
11 MAGNESIT	6.8509E-10	6.3288E-09	-9.1643	-8.1987	1.0825E-01	-.96558	-1.30539
67 MIRABI	1.9344E-09	5.7520E-02	-8.7135	-1.2402	3.3630E-08	-7.47328	-10.10334
59 NAHCOL	1.3780E-05	2.6735E-01	-4.8608	-.5729	5.1542E-05	-4.28784	-5.79685
61 NATRON	3.1992E-11	3.8330E-02	-10.4950	-1.4165	8.3466E-10	-9.07849	-12.27347
150 NESQUE	6.8467E-10	6.7263E-06	-9.1645	-5.1722	1.0179E-04	-3.99229	-5.39730
66 THENAR	1.9383E-09	6.6808E-01	-8.7126	-.1752	2.9013E-09	-8.53741	-11.54197
62 THRNAT	3.2050E-11	1.3924E+00	-10.4942	.1438	2.3018E-11	-10.63793	-14.38173
60 TRONA	4.4156E-16	2.1163E-01	-15.3550	-.6744	2.0865E-15	-14.68058	-19.84710

12-A VIËEDOS SN JUAN,AGS   CE CAMPO=797.00MMHOS

INITIAL SOLUTION

TEMPERATURE = 32.70 DEGREES C   PH = 7.070   ANALYTICAL EPMCAT = 6.683   ANALYTICAL EPMAN = 5.594

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.11831E-03	-2.9514	4.48000E+01
MG	2	4.11520E-05	-4.3856	1.00000E+00
NA	1	3.91669E-03	-2.4071	9.00000E+01
K	1	4.50325E-04	-3.3465	1.76000E+01
CL	-1	1.07237E-04	-3.9697	3.80000E+00
SO4	-2	1.45811E-04	-3.8362	1.40000E+01
HCO3	-1	5.19779E-03	-2.2842	3.17000E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	6.683	6.582
EPMAN	5.594	5.493

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 5.197697E+00 MEQ/KG H2O
ELECT = 1.089353E+00 MEQ/KG H2O

PH
7.070

TEMPERATURE
32.70 DEG C

IONIC STRENGTH
7.262931E-03

ACTIVITY H2O = .9998
PCO2 = 2.928745E-02
LOG PCO2 = -1.5333
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 6.013765E-03
DENSITY = 1.0000
TDS = 488.2MG/L
CARBONATE ALK = 5.197557E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000   EQUIVALENT EH = 6.069VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	4.20879E+01	1.05061E-03	-2.9786	7.37780E-04	-3.1321	7.02239E-01	-.1535
2	MG	2	9.43442E-01	3.88246E-05	-4.4109	2.73987E-05	-4.5623	7.05704E-01	-.1514
3	NA	1	8.97325E+01	3.90505E-03	-2.4084	3.56875E-03	-2.4475	9.13880E-01	-.0391
4	K	1	1.75874E+01	4.50001E-04	-3.3468	4.10355E-04	-3.3868	9.11897E-01	-.0401
64	H	1	9.29941E-05	9.23012E-08	-7.0348	8.51138E-08	-7.0700	9.22131E-01	-.0352
5	CL	-1	3.80000E+00	1.07237E-04	-3.9697	9.77886E-05	-4.0097	9.11897E-01	-.0401
6	SO4	-2	1.23514E+01	1.28641E-04	-3.8906	9.00276E-05	-4.0456	6.99836E-01	-.1550
7	HCO3	-1	3.12263E+02	5.12011E-03	-2.2907	4.68790E-03	-2.3290	9.15586E-01	-.0383
18	CO3	-2	2.53807E-01	4.23152E-06	-5.3735	2.97368E-06	-5.5267	7.02744E-01	-.1532
86	H2CO3	0	5.11228E+01	8.24627E-04	-3.0837	8.26038E-04	-3.0830	1.00171E+00	.0007
27	OH	-1	3.87932E-03	2.28208E-07	-6.6417	2.08050E-07	-6.6818	9.11668E-01	-.0402
19	MGOH	1	4.59247E-05	1.11200E-09	-8.9539	1.02048E-09	-8.9912	9.17700E-01	-.0373
23	MGSO4 AQ	0	6.23133E-02	5.17919E-07	-6.2857	5.18786E-07	-6.2850	1.00167E+00	.0007
22	MGHCO3	1	1.46744E-01	1.72058E-06	-5.7643	1.57043E-06	-5.8040	9.12734E-01	-.0397
21	MGCO3 AQ	0	7.36391E-03	8.73741E-08	-7.0586	8.75203E-08	-7.0579	1.00167E+00	.0007
29	CAOH	1	2.52423E-04	4.42385E-09	-8.3542	4.05558E-09	-8.3919	9.16752E-01	-.0377
32	CASO4 AQ	0	1.95900E+00	1.43964E-05	-4.8417	1.44205E-05	-4.8410	1.00167E+00	.0007
30	CAHCO3	1	5.00171E+00	4.94984E-05	-4.3054	4.53777E-05	-4.3432	9.16752E-01	-.0377
31	CACO3 AQ	0	3.78812E-01	3.78660E-06	-5.4218	3.79294E-06	-5.4210	1.00167E+00	.0007
44	NASO4	-1	2.29817E-01	1.93134E-06	-5.7141	1.76831E-06	-5.7524	9.15586E-01	-.0383
43	NAHCO3	0	7.88475E-01	9.39221E-06	-5.0272	9.40793E-06	-5.0265	1.00167E+00	.0007
42	NACO3	-1	2.60259E-02	3.13721E-07	-6.5035	2.87239E-07	-6.5418	9.15586E-01	-.0383
94	NACL	0	2.03515E-32	3.48400E-37	-36.4579	3.48983E-37	-36.4572	1.00167E+00	.0007
63	HSO4	-1	9.80949E-05	1.01106E-09	-8.9952	9.23877E-10	-9.0344	9.13775E-01	-.0392
96	H2SO4	0	6.38273E-44	6.51102E-49	-48.1864	6.52192E-49	-48.1856	1.00167E+00	.0007
93	HCL	0	3.02816E-37	8.30925E-42	-41.0804	8.32316E-42	-41.0797	1.00167E+00	.0007

MOLE RATIOS FROM ANALYTICAL MOLALITY		MOLE RATIOS FROM COMPUTED MOLALITY		LOG ACTIVITY RATIOS	
CL/CA =	9.5892E-02	CL/CA =	1.0207E-01	LOG CA/H2 =	11.0079
CL/MG =	2.6059E+00	CL/MG =	2.7621E+00	LOG MG/H2 =	9.5777
CL/NA =	2.7379E-02	CL/NA =	2.7461E-02	LOG NA/H1 =	4.6225
CL/K =	2.3813E-01	CL/K =	2.3830E-01	LOG K/H1 =	3.6832
CL/AL =	1.0724E+26	CL/AL =	1.0724E+26	LOG AL/H3 =	-8.7900
CL/FE =	1.0724E+26	CL/FE =	1.0724E+26	LOG FE/H2 =	-15.8600
CL/SO4 =	7.3545E-01	CL/SO4 =	8.3361E-01	LOG CA/MG =	1.4302
CL/HCO3 =	2.0631E-02	CL/HCO3 =	2.0944E-02	LOG NA/K =	.9394
CA/MG =	2.7175E+01	CA/MG =	2.7060E+01		
NA/K =	8.6975E+00	NA/K =	8.6779E+00		

12-A VIËEDOS SN JUAN,AGS   CE CAMPO=797.00MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	6.6421E-08	2.4124E-05	-7.1777	-4.6175	2.7533E-03	-2.56015	-3.58297
22	ARAGONIT	2.1939E-09	5.3752E-09	-8.6588	-8.2696	4.0815E-01	-.38918	-.54466
151	ARTIN	9.6567E-29	3.6814E-19	-28.0152	-18.4340	2.6231E-10	-9.58118	-13.40902
20	BRUCITE	1.1859E-18	4.0335E-12	-17.9259	-11.3943	2.9402E-07	-6.53162	-9.14111
13	CALCITE	2.1939E-09	2.9485E-09	-8.6588	-8.5304	7.4407E-01	-.12838	-.17968
12	DOLOMITE	1.7875E-19	6.7147E-18	-18.7478	-17.1730	2.6621E-02	-1.57478	-2.20393
19	GYPSUM	6.6394E-08	1.7612E-05	-7.1779	-4.7542	3.7698E-03	-2.42369	-3.39199
65	HALITE	3.4898E-07	3.9714E+01	-6.4572	1.5989	8.7875E-09	-8.05614	-11.27469
118	HUNTITE	1.1866E-39	1.0343E-31	-38.9257	-30.9853	1.1472E-08	-7.94037	-11.11267
39	HYDMAG	5.2217E-59	5.1178E-39	-58.2822	-38.2909	1.0203E-20	-19.99128	-27.97810
11	MAGNESIT	8.1475E-11	4.4276E-09	-10.0890	-8.3538	1.8402E-02	-1.73514	-2.42836
67	MIRABI	1.1443E-09	1.7273E-01	-8.9415	-.7626	6.6249E-09	-8.17882	-11.44639
59	NAHCOL	1.6730E-05	3.3162E-01	-4.7765	-.4794	5.0449E-05	-4.29715	-6.01393
61	NATRON	3.7797E-11	9.5398E-02	-10.4225	-1.0205	3.9621E-10	-9.40208	-13.15836
150	NESQUE	8.1426E-11	4.8103E-06	-10.0892	-5.3178	1.6927E-05	-4.77141	-6.67767
66	THENAR	1.1466E-09	6.4632E-01	-8.9406	-.1896	1.7740E-09	-8.75104	-12.24721
62	THRNAT	3.7865E-11	1.1838E+00	-10.4218	.0733	3.1985E-11	-10.49506	-14.68800
60	TRONA	6.3335E-16	7.4619E-02	-15.1984	-1.1272	8.4879E-15	-14.07120	-19.69287

165 PABELLON HIDALGO,AGS   CE CAMPO=756.00 MMHOS

INITIAL SOLUTION

TEMPERATURE = 17.00 DEGREES C   PH = 7.640   ANALYTICAL EPMCAT = 6.666   ANALYTICAL EPMAN = 6.217

***** OXIDATION - REDUCTION *****

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DISSOLVED OXYGEN =    .000 MG/L
EH MEASURED WITH CALOMEL =    .0000 VOLTS                        FLAG    CORALK  PECALC  IDAVES
MEASURED EH OF ZOBELL SOLUTION =    .0000 VOLTS                    2        0       0       0
CORRECTED EH =   .0000 VOLTS
PE COMPUTED FROM CORRECTED EH =     .000
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*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.23816E-03	-2.9072	4.96000E+01
MG	2	1.97535E-04	-3.7044	4.80000E+00
NA	1	3.12039E-03	-2.5058	7.17000E+01
K	1	6.78065E-04	-3.1687	2.65000E+01
CL	-1	1.89080E-04	-3.7234	6.70000E+00
SO4	-2	4.16615E-04	-3.3803	4.00000E+01
HCO3	-1	5.19793E-03	-2.2842	3.17000E+02

****DESCRIPTION OF SOLUTION ****

```
          ANALYTICAL  COMPUTED          PH              ACTIVITY H2O =    .9998
EPMCAT      6.666       6.508          7.640            PCO2 =  6.312726E-03
EPMAN       6.217       6.059                           LOG PCO2 =  -2.1998
                                     TEMPERATURE        PO2 =    .000000E+00
EH =  .0000  PE = 100.000            17.00 DEG C        PCH4 =    .000000E+00
PE CALC S =  1.000000E+02                               CO2 TOT =  5.447712E-03
PE CALC DOX= 1.000000E+02           IONIC STRENGTH      DENSITY =    1.0000
PE SATO DOX= 1.000000E+02            8.008005E-03       TDS =      516.3MG/L
TOT ALK =  5.197917E+00 MEQ/KG H2O                      CARBONATE ALK =  5.197673E+00 MEQ/KG H2O
ELECT   =  4.495123E-01 MEQ/KG H2O
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IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000   EQUIVALENT EH = 5.757VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	4.63756E+01	1.15767E-03	-2.9364	8.08132E-04	-3.0925	6.98065E-01	-.1561
2	MG	2	4.48697E+00	1.84653E-04	-3.7336	1.29574E-04	-3.8875	7.01718E-01	-.1538
3	NA	1	7.14312E+01	3.10869E-03	-2.5074	2.83654E-03	-2.5472	9.12457E-01	-.0398
4	K	1	2.64589E+01	6.77014E-04	-3.1694	6.16301E-04	-3.2102	9.10322E-01	-.0408
64	H	1	2.50578E-05	2.48718E-08	-7.6043	2.29087E-08	-7.6400	9.21072E-01	-.0357
5	CL	-1	6.70000E+00	1.89080E-04	-3.7234	1.72124E-04	-3.7642	9.10322E-01	-.0408
6	SO4	-2	3.53128E+01	3.67796E-04	-3.4344	2.55777E-04	-3.5921	6.95432E-01	-.1577
7	HCO3	-1	3.11554E+02	5.10863E-03	-2.2917	4.67032E-03	-2.3307	9.14201E-01	-.0390
18	CO3	-2	6.84771E-01	1.14170E-05	-4.9424	7.97476E-06	-5.0983	6.98502E-01	-.1558
86	H2CO3	0	1.67648E+01	2.70429E-04	-3.5679	2.70980E-04	-3.5671	1.00204E+00	.0009
27	OH	-1	4.40114E-03	2.58911E-07	-6.5868	2.35628E-07	-6.6278	9.10070E-01	-.0409
19	MGOH	1	2.04623E-04	4.95478E-09	-8.3050	4.54068E-09	-8.3429	9.16424E-01	-.0379
23	MGSO4 AQ	0	5.55808E-01	4.61974E-06	-5.3354	4.62827E-06	-5.3346	1.00185E+00	.0008
22	MGHCO3	1	6.29464E-01	7.38069E-06	-5.1319	6.72525E-06	-5.1723	9.11196E-01	-.0404
21	MGCO3 AQ	0	7.33697E-02	8.70569E-07	-6.0602	8.72176E-07	-6.0594	1.00185E+00	.0008
29	CAOH	1	2.82066E-04	4.94351E-09	-8.3060	4.52543E-09	-8.3443	9.15428E-01	-.0384
32	CASO4 AQ	0	5.33330E+00	3.91949E-05	-4.4068	3.92672E-05	-4.4060	1.00185E+00	.0008
30	CAHCO3	1	3.37946E+00	3.34451E-05	-4.4757	3.06166E-05	-4.5140	9.15428E-01	-.0384
31	CACO3 AQ	0	7.80250E-01	7.79959E-06	-5.1079	7.81398E-06	-5.1071	1.00185E+00	.0008
44	NASO4	-1	4.70419E-01	3.95344E-06	-5.4030	3.61424E-06	-5.4420	9.14201E-01	-.0390
43	NAHCO3	0	6.24228E-01	7.43592E-06	-5.1287	7.44965E-06	-5.1279	1.00185E+00	.0008
42	NACO3	-1	2.51322E-02	3.02957E-07	-6.5186	2.76964E-07	-6.5576	9.14201E-01	-.0390
94	NACL	0	2.84666E-32	4.87337E-37	-36.3122	4.88237E-37	-36.3114	1.00185E+00	.0008
63	HSO4	-1	4.85789E-05	5.00713E-10	-9.3004	4.56797E-10	-9.3403	9.12293E-01	-.0399
96	H2SO4	0	1.31343E-44	1.33987E-49	-48.8729	1.34234E-49	-48.8721	1.00185E+00	.0008
93	HCL	0	1.43432E-37	3.93587E-42	-41.4050	3.94313E-42	-41.4042	1.00185E+00	.0008

MOLE RATIOS FROM ANALYTICAL MOLALITY		MOLE RATIOS FROM COMPUTED MOLALITY		LOG ACTIVITY RATIOS	
CL/CA =	1.5271E-01	CL/CA =	1.6333E-01	LOG CA/H2 =	12.1875
CL/MG =	9.5720E-01	CL/MG =	1.0240E+00	LOG MG/H2 =	11.3925
CL/NA =	6.0595E-02	CL/NA =	6.0823E-02	LOG NA/H1 =	5.0928
CL/K =	2.7885E-01	CL/K =	2.7929E-01	LOG K/H1 =	4.4298
CL/AL =	1.8908E+26	CL/AL =	1.8908E+26	LOG AL/H3 =	-7.0800
CL/FE =	1.8908E+26	CL/FE =	1.8908E+26	LOG FE/H2 =	-14.7200
CL/SO4 =	4.5385E-01	CL/SO4 =	5.1409E-01	LOG CA/MG =	.7950
CL/HCO3 =	3.6376E-02	CL/HCO3 =	3.7012E-02	LOG NA/K =	.6630
CA/MG =	6.2681E+00	CA/MG =	6.2695E+00		
NA/K =	4.6019E+00	NA/K =	4.5918E+00		

165 PABELLON HIDALGO,AGS CE CAMPO=756.00 MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	2.0670E-07	3.3742E-05	-6.6847	-4.4718	6.1260E-03	-2.21282	-2.93792
22	ARAGONIT	6.4447E-09	6.9952E-09	-8.1908	-8.1552	9.2130E-01	-.03560	-.04726
151	ARTIN	7.4295E-27	4.3374E-19	-26.1290	-18.3628	1.7129E-08	-7.76626	-10.31110
20	BRUCITE	7.1940E-18	3.7396E-12	-17.1430	-11.4272	1.9238E-06	-5.71585	-7.58881
13	CALCITE	6.4447E-09	3.7022E-09	-8.1908	-8.4315	1.7408E+00	.24074	.31962
12	DOLOMITE	6.6594E-18	1.4045E-17	-17.1766	-16.8525	4.7414E-01	-.32410	-.43030
19	GYPSUM	2.0662E-07	1.7208E-05	-6.6848	-4.7643	1.2008E-02	-1.92055	-2.54987
65	HALITE	4.8824E-07	3.6597E+01	-6.3114	1.5634	1.3341E-08	-7.87482	-10.45522
118	HUNTITE	7.1107E-36	1.0247E-30	-35.1481	-29.9894	6.9394E-06	-5.15868	-6.84906
39	HYDMAG	8.1958E-54	4.9629E-38	-53.0864	-37.3043	1.6514E-16	-15.78215	-20.95361
11	MAGNESIT	1.0333E-09	7.6678E-09	-8.9858	-8.1153	1.3476E-01	-.87043	-1.15565
67	MIRABI	2.0541E-09	3.1863E-02	-8.6874	-1.4967	6.4465E-08	-7.19067	-9.54690
59	NAHCOL	1.3248E-05	2.3813E-01	-4.8779	-.6232	5.5631E-05	-4.25469	-5.64885
61	NATRON	6.4043E-11	2.3486E-02	-10.1935	-1.6292	2.7269E-09	-8.56434	-11.37068
150	NESQUE	1.0327E-09	8.0536E-06	-8.9860	-5.0940	1.2823E-04	-3.89200	-5.16732
66	THENAR	2.0580E-09	6.8008E-01	-8.6866	-.1674	3.0261E-09	-8.51912	-11.31064
62	THRNAT	6.4153E-11	1.5192E+00	-10.1928	.1816	4.2227E-11	-10.37441	-13.77388
60	TRONA	8.4970E-16	3.7048E-01	-15.0707	-.4312	2.2935E-15	-14.63950	-19.43653

28-A PABELLON ARTEAGA,AGS CE CAMPO=815.00MMHOS

INITIAL SOLUTION

TEMPERATURE = 22.30 DEGREES C PH = 7.140 ANALYTICAL EPMCAT = 7.428 ANALYTICAL EPMAN = 6.208

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.27812E-03	-2.8934	5.12000E+01
MG	2	3.95075E-04	-3.4033	9.60000E+00
NA	1	3.40766E-03	-2.4675	7.83000E+01
K	1	6.78073E-04	-3.1687	2.65000E+01
CL	-1	2.42703E-04	-3.6149	8.60000E+00
SO4	-2	3.85373E-04	-3.4141	3.70000E+01
HCO3	-1	5.19799E-03	-2.2842	3.17000E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	7.428	7.258
EPMAN	6.208	6.038

PH 7.140

TEMPERATURE 22.30 DEG C

IONIC STRENGTH 8.556526E-03

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 5.197921E+00 MEQ/KG H2O
ELECT = 1.220618E+00 MEQ/KG H2O

ACTIVITY H2O = .9998
PCO2 = 2.135280E-02
LOG PCO2 = -1.6705
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 5.974411E-03
DENSITY = 1.0000
TDS = 528.2MG/L
CARBONATE ALK = 5.197869E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.863VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	4.79604E+01	1.19725E-03	-2.9218	8.24572E-04	-3.0838	6.88722E-01	-.1620
2	MG	2	8.98843E+00	3.69907E-04	-3.4319	2.56190E-04	-3.5914	6.92578E-01	-.1595
3	NA	1	7.80187E+01	3.39542E-03	-2.4691	3.08736E-03	-2.5104	9.09272E-01	-.0413
4	K	1	2.64596E+01	6.77039E-04	-3.1694	6.14071E-04	-3.2118	9.06995E-01	-.0424
64	H	1	7.94653E-05	7.88763E-08	-7.1031	7.24436E-08	-7.1400	9.18446E-01	-.0369
5	CL	-1	8.60000E+00	2.42703E-04	-3.6149	2.20130E-04	-3.6573	9.06995E-01	-.0424
6	SO4	-2	3.20148E+01	3.33450E-04	-3.4770	2.28729E-04	-3.6407	6.85946E-01	-.1637
7	HCO3	-1	3.12142E+02	5.11833E-03	-2.2909	4.66351E-03	-2.3313	9.11138E-01	-.0404
18	CO3	-2	2.47788E-01	4.13133E-06	-5.3839	2.84726E-06	-5.5456	6.89186E-01	-.1617
86	H2CO3	0	4.86415E+01	7.84634E-04	-3.1053	7.86295E-04	-3.1044	1.00212E+00	.0009
27	OH	-1	2.11570E-03	1.24464E-07	-6.9050	1.12855E-07	-6.9475	9.06727E-01	-.0425
19	MGOH	1	2.06947E-04	5.01111E-09	-8.3001	4.57768E-09	-8.3394	9.13506E-01	-.0393
23	MGSO4 AQ	0	1.13375E+00	9.42355E-06	-5.0258	9.44214E-06	-5.0249	1.00197E+00	.0009
22	MGHCO3	1	1.28430E+00	1.50590E-05	-4.8222	1.36725E-05	-4.8642	9.07930E-01	-.0419
21	MGCO3 AQ	0	5.61771E-02	6.66578E-07	-6.1761	6.67893E-07	-6.1753	1.00197E+00	.0009
29	CAOH	1	1.43510E-04	2.51520E-09	-8.5994	2.29498E-09	-8.6392	9.12446E-01	-.0398
32	CASO4 AQ	0	5.09810E+00	3.74668E-05	-4.4264	3.75407E-05	-4.4255	1.00197E+00	.0009
30	CAHCO3	1	4.06315E+00	4.02117E-05	-4.3956	3.66910E-05	-4.4354	9.12446E-01	-.0398
31	CACO3 AQ	0	3.14049E-01	3.13935E-06	-5.5032	3.14554E-06	-5.5023	1.00197E+00	.0009
44	NASO4	-1	4.75693E-01	3.99781E-06	-5.3982	3.64255E-06	-5.4386	9.11138E-01	-.0404
43	NAHCO3	0	6.78339E-01	8.08061E-06	-5.0926	8.09655E-06	-5.0917	1.00197E+00	.0009
42	NACO3	-1	1.29296E-02	1.55863E-07	-6.8073	1.42012E-07	-6.8477	9.11138E-01	-.0404
94	NACL	0	3.96199E-32	6.78284E-37	-36.1686	6.79622E-37	-36.1677	1.00197E+00	.0009
63	HSO4	-1	1.59288E-04	1.64183E-09	-8.7847	1.49259E-09	-8.8261	9.09102E-01	-.0414
96	H2SO4	0	1.17437E-43	1.19802E-48	-47.9215	1.20039E-48	-47.9207	1.00197E+00	.0009
93	HCL	0	5.79994E-37	1.59157E-41	-40.7982	1.59470E-41	-40.7973	1.00197E+00	.0009

MOLE RATIOS FROM ANALYTICAL MOLALITY		MOLE RATIOS FROM COMPUTED MOLALITY		LOG ACTIVITY RATIOS	
CL/CA =	1.8989E-01	CL/CA =	2.0272E-01	LOG CA/H2 =	11.1962
CL/MG =	6.1432E-01	CL/MG =	6.5612E-01	LOG MG/H2 =	10.6886
CL/NA =	7.1223E-02	CL/NA =	7.1480E-02	LOG NA/H1 =	4.6296
CL/K =	3.5793E-01	CL/K =	3.5848E-01	LOG K/H1 =	3.9282
CL/AL =	2.4270E+26	CL/AL =	2.4270E+26	LOG AL/H3 =	-8.5800
CL/FE =	2.4270E+26	CL/FE =	2.4270E+26	LOG FE/H2 =	-15.7200
CL/SO4 =	6.2979E-01	CL/SO4 =	7.2785E-01	LOG CA/MG =	.5077
CL/HCO3 =	4.6692E-02	CL/HCO3 =	4.7418E-02	LOG NA/K =	.7014
CA/MG =	3.2351E+00	CA/MG =	3.2366E+00		
NA/K =	5.0255E+00	NA/K =	5.0151E+00		

28-A PABELLON ARTEAGA,AGS CE CAMPO=815.00MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	1.8860E-07	3.0009E-05	-6.7245	-4.5228	6.2850E-03	-2.20170	-2.97654
22	ARAGONIT	2.3478E-09	6.3800E-09	-8.6293	-8.1952	3.6799E-01	-.43416	-.58696
151	ARTIN	2.3786E-27	4.0958E-19	-26.6237	-18.3877	5.8074E-09	-8.23602	-11.13451
20	BRUCITE	3.2629E-18	3.8398E-12	-17.4864	-11.4157	8.4976E-07	-6.07070	-8.20716
13	CALCITE	2.3478E-09	3.4785E-09	-8.6293	-8.4586	6.7493E-01	-.17074	-.23083
12	DOLOMITE	1.7126E-18	1.0852E-17	-17.7664	-16.9645	1.5780E-01	-.80188	-1.08409
19	GYPSUM	1.8852E-07	1.7348E-05	-6.7246	-4.7607	1.0867E-02	-1.96388	-2.65503
65	HALITE	6.7962E-07	3.7657E+01	-6.1677	1.5759	1.8047E-08	-7.74358	-10.46877
118	HUNTITE	9.1122E-37	4.5978E-31	-36.0404	-30.3375	1.9819E-06	-5.70293	-7.70995
39	HYDMAG	9.2299E-55	2.2436E-38	-54.0348	-37.6491	4.1139E-17	-16.38574	-22.15236
11	MAGNESIT	7.2944E-10	6.3288E-09	-9.1370	-8.1987	1.1526E-01	-.93833	-1.26856
67	MIRABI	2.1757E-09	5.7520E-02	-8.6624	-1.2402	3.7824E-08	-7.42223	-10.03432
59	NAHCOL	1.4398E-05	2.6735E-01	-4.8417	-.5729	5.3854E-05	-4.26878	-5.77109
61	NATRON	2.7083E-11	3.8330E-02	-10.5673	-1.4165	7.0658E-10	-9.15084	-12.37128
150	NESQUE	7.2898E-10	6.7263E-06	-9.1373	-5.1722	1.0838E-04	-3.96506	-5.36048
66	THENAR	2.1802E-09	6.6808E-01	-8.6615	-.1752	3.2634E-09	-8.48634	-11.47292
62	THRNAT	2.7134E-11	1.3924E+00	-10.5665	.1438	1.9487E-11	-10.71026	-14.47950
60	TRONA	3.9059E-16	2.1163E-01	-15.4083	-.6744	1.8457E-15	-14.73385	-19.91911

S/N S/N,AGS CE CAMPO=287.00 MMHOS

INITIAL SOLUTION

TEMPERATURE = 17.90 DEGREES C PH = 6.970 ANALYTICAL EPMCAT = 3.056 ANALYTICAL EPMAN = 2.505

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	7.26203E-04	-3.1389	2.91000E+01
MG	2	1.56335E-04	-3.8059	3.80000E+00
NA	1	8.87540E-04	-3.0518	2.04000E+01
K	1	4.04158E-04	-3.3934	1.58000E+01
CL	-1	1.32598E-04	-3.8775	4.70000E+00
SO4	-2	1.87420E-04	-3.7272	1.80000E+01
HCO3	-1	1.99855E-03	-2.6993	1.21920E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	3.056	3.010
EPMAN	2.505	2.459

PH
6.970

TEMPERATURE
17.90 DEG C

IONIC STRENGTH
3.746977E-03

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 1.998435E+00 MEQ/KG H2O
ELECT = 5.509834E-01 MEQ/KG H2O

ACTIVITY H2O = .9999
PCO2 = 1.189185E-02
LOG PCO2 = -1.9248
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 2.493498E-03
DENSITY = 1.0000
TDS = 213.7MG/L
CARBONATE ALK = 1.998491E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.775VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	2.81740E+01	7.03095E-04	-3.1530	5.43578E-04	-3.2647	7.73121E-01	-.1118
2	MG	2	3.68140E+00	1.51456E-04	-3.8197	1.17403E-04	-3.9303	7.75163E-01	-.1106
3	NA	1	2.03665E+01	8.86082E-04	-3.0525	8.30120E-04	-3.0809	9.36843E-01	-.0283
4	K	1	1.57872E+01	4.03830E-04	-3.3938	3.77896E-04	-3.4226	9.35781E-01	-.0288
64	H	1	1.14697E-04	1.13811E-07	-6.9438	1.07152E-07	-6.9700	9.41490E-01	-.0262
5	CL	-1	4.70000E+00	1.32598E-04	-3.8775	1.24083E-04	-3.9063	9.35781E-01	-.0288
6	SO4	-2	1.63848E+01	1.70602E-04	-3.7680	1.31663E-04	-3.8805	7.71755E-01	-.1125
7	HCO3	-1	1.20981E+02	1.98316E-03	-2.7026	1.85981E-03	-2.7305	9.37801E-01	-.0279
18	CO3	-2	5.38322E-02	8.97255E-07	-6.0471	6.93998E-07	-6.1586	7.73468E-01	-.1116
86	H2CO3	0	3.07856E+01	4.96446E-04	-3.3041	4.96917E-04	-3.3037	1.00095E+00	.0004
27	OH	-1	9.83512E-04	5.78409E-08	-7.2378	5.41193E-08	-7.2666	9.35659E-01	-.0289
19	MGOH	1	4.20174E-05	1.01711E-09	-8.9926	9.55043E-10	-9.0200	9.38977E-01	-.0273
23	MGSO4 AQ	0	2.66045E-01	2.21064E-06	-5.6555	2.21254E-06	-5.6551	1.00086E+00	.0004
22	MGHCO3	1	2.22167E-01	2.60420E-06	-5.5843	2.43815E-06	-5.6129	9.36237E-01	-.0286
21	MGCO3 AQ	0	5.87323E-03	6.96678E-08	-7.1570	6.97280E-08	-7.1566	1.00086E+00	.0004
29	CAOH	1	4.27931E-05	7.49767E-10	-9.1251	7.03617E-10	-9.1527	9.38448E-01	-.0276
32	CASO4 AQ	0	1.86392E+00	1.36940E-05	-4.8635	1.37058E-05	-4.8631	1.00086E+00	.0004
30	CAHCO3	1	9.07955E-01	8.98292E-06	-5.0466	8.43000E-06	-5.0742	9.38448E-01	-.0276
31	CACO3 AQ	0	4.64432E-02	4.64119E-07	-6.3334	4.64519E-07	-6.3330	1.00086E+00	.0004
44	NASO4	-1	6.95198E-02	5.84072E-07	-6.2335	5.47744E-07	-6.2614	9.37801E-01	-.0279
43	NAHCO3	0	7.28406E-02	8.67429E-07	-6.0618	8.68178E-07	-6.0614	1.00086E+00	.0004
42	NACO3	-1	6.54696E-04	7.88966E-09	-8.1029	7.39893E-09	-8.1308	9.37801E-01	-.0279
94	NACL	0	6.01334E-33	1.02915E-37	-36.9875	1.03004E-37	-36.9871	1.00086E+00	.0004
63	HSO4	-1	1.16744E-04	1.20294E-09	-8.9198	1.12692E-09	-8.9481	9.36804E-01	-.0284
96	H2SO4	0	1.48103E-43	1.51039E-48	-47.8209	1.51169E-48	-47.8205	1.00086E+00	.0004
93	HCL	0	4.84254E-37	1.32843E-41	-40.8767	1.32957E-41	-40.8763	1.00086E+00	.0004

MOLE RATIOS FROM ANALYTICAL MOLALITY

CL/CA	=	1.8259E-01
CL/MG	=	8.4817E-01
CL/NA	=	1.4940E-01
CL/K	=	3.2809E-01
CL/AL	=	1.3260E+26
CL/FE	=	1.3260E+26
CL/SO4	=	7.0749E-01
CL/HCO3	=	6.6347E-02
CA/MG	=	4.6452E+00
NA/K	=	2.1960E+00

MOLE RATIOS FROM COMPUTED MOLALITY

CL/CA	=	1.8859E-01
CL/MG	=	8.7549E-01
CL/NA	=	1.4965E-01
CL/K	=	3.2835E-01
CL/AL	=	1.3260E+26
CL/FE	=	1.3260E+26
CL/SO4	=	7.7724E-01
CL/HCO3	=	6.6862E-02
CA/MG	=	4.6423E+00
NA/K	=	2.1942E+00

LOG ACTIVITY RATIOS

LOG CA/H2	=	10.6753
LOG MG/H2	=	10.0097
LOG NA/H1	=	3.8891
LOG K/H1	=	3.5474
LOG AL/H3	=	-9.0900
LOG FE/H2	=	-16.0600
LOG CA/MG	=	.6656
LOG NA/K	=	.3418

S/N S/N,AGS CE CAMPO=287.00 MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	7.1569E-08	3.3067E-05	-7.1453	-4.4806	2.1644E-03	-2.66467	-3.54879
22	ARAGONIT	3.7724E-10	6.8851E-09	-9.4234	-8.1621	5.4791E-02	-1.26129	-1.67978
151	ARTIN	2.8010E-29	4.2947E-19	-28.5527	-18.3671	6.5219E-11	-10.18562	-13.56517
20	BRUCITE	3.4386E-19	3.7567E-12	-18.4636	-11.4252	9.1534E-08	-7.03842	-9.37374
13	CALCITE	3.7724E-10	3.6673E-09	-9.4234	-8.4357	1.0287E-01	-.98772	-1.31544
12	DOLOMITE	3.0737E-20	1.3435E-17	-19.5123	-16.8718	2.2879E-03	-2.64057	-3.51670
19	GYPSUM	7.1557E-08	1.7232E-05	-7.1453	-4.7637	4.1526E-03	-2.38168	-3.17191
65	HALITE	1.0300E-07	3.6778E+01	-6.9871	1.5656	2.8007E-09	-8.55273	-11.39049
118	HUNTITE	2.0405E-40	8.9247E-31	-39.6903	-30.0494	2.2863E-10	-9.64086	-12.83966
39	HYDMAG	1.5149E-59	4.3281E-38	-58.8196	-37.3637	3.5001E-22	-21.45592	-28.57490
11	MAGNESIT	8.1477E-11	7.4183E-09	-10.0890	-8.1297	1.0983E-02	-1.95927	-2.60934
67	MIRABI	9.0652E-11	3.5278E-02	-10.0426	-1.4525	2.5696E-09	-8.59013	-11.44030
59	NAHCOL	1.5439E-06	2.4293E-01	-5.8114	-.6145	6.3551E-06	-5.19688	-6.92118
61	NATRON	4.7783E-13	2.5555E-02	-12.3207	-1.5925	1.8698E-11	-10.72820	-14.28778
150	NESQUE	8.1457E-11	7.8074E-06	-10.0891	-5.1075	1.0433E-05	-4.98158	-6.63445
66	THENAR	9.0729E-11	6.7800E-01	-10.0423	-.1688	1.3382E-10	-9.87348	-13.14946
62	THRNAT	4.7819E-13	1.4966E+00	-12.3204	.1751	3.1952E-13	-12.49550	-16.64145
60	TRONA	7.3820E-19	3.3639E-01	-18.1318	-.4732	2.1945E-18	-17.65867	-23.51774

192 SANTIAGO,AGS CE CAMPO=604.0 MMHOS

INITIAL SOLUTION

TEMPERATURE = 21.90 DEGREES C PH = 7.020 ANALYTICAL EPMCAT = 5.087 ANALYTICAL EPMAN = 4.475

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.03831E-03	-2.9837	4.16000E+01
MG	2	1.19327E-04	-3.9233	2.90000E+00
NA	1	2.26707E-03	-2.6445	5.21000E+01
K	1	5.06558E-04	-3.2954	1.98000E+01
CL	-1	1.91875E-04	-3.7170	6.80000E+00
SO4	-2	3.43659E-04	-3.4639	3.30000E+01
HCO3	-1	3.59787E-03	-2.4440	2.19450E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	5.087	4.981
EPMAN	4.475	4.370

PH 7.020

TEMPERATURE 21.90 DEG C

IONIC STRENGTH 6.080301E-03

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 3.597771E+00 MEQ/KG H2O
ELECT = 6.118873E-01 MEQ/KG H2O

ACTIVITY H2O = .9999
PCO2 = 1.972267E-02
LOG PCO2 = -1.7050
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 4.327415E-03
DENSITY = 1.0000
TDS = 375.6MG/L
CARBONATE ALK = 3.597782E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.855VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	3.93345E+01	9.81770E-04	-3.0080	7.11995E-04	-3.1475	7.25216E-01	-.1395
2	MG	2	2.74523E+00	1.12959E-04	-3.9471	8.22580E-05	-4.0848	7.28210E-01	-.1377
3	NA	1	5.19513E+01	2.26060E-03	-2.6458	2.08320E-03	-2.6813	9.21524E-01	-.0355
4	K	1	1.97709E+01	5.05815E-04	-3.2960	4.65277E-04	-3.3323	9.19855E-01	-.0363
64	H	1	1.03635E-04	1.02852E-07	-6.9878	9.54993E-08	-7.0200	9.28515E-01	-.0322
5	CL	-1	6.80000E+00	1.91875E-04	-3.7170	1.76498E-04	-3.7533	9.19855E-01	-.0363
6	SO4	-2	2.94043E+01	3.06213E-04	-3.5140	2.21434E-04	-3.6548	7.23138E-01	-.1408
7	HCO3	-1	2.17103E+02	3.55939E-03	-2.4486	3.28517E-03	-2.4834	9.22958E-01	-.0348
18	CO3	-2	1.24681E-01	2.07847E-06	-5.6823	1.50824E-06	-5.8215	7.25651E-01	-.1393
86	H2CO3	0	4.54662E+01	7.33303E-04	-3.1347	7.34408E-04	-3.1341	1.00151E+00	.0007
27	OH	-1	1.53466E-03	9.02687E-08	-7.0445	8.30168E-08	-7.0808	9.19662E-01	-.0364
19	MGOH	1	4.80643E-05	1.16368E-09	-8.9342	1.07610E-09	-8.9681	9.24746E-01	-.0340
23	MGSO4 AQ	0	3.48946E-01	2.89995E-06	-5.5376	2.90401E-06	-5.5370	1.00140E+00	.0006
22	MGHCO3	1	2.85883E-01	3.35161E-06	-5.4747	3.08535E-06	-5.5107	9.20557E-01	-.0359
21	MGCO3 AQ	0	9.50311E-03	1.12743E-07	-6.9479	1.12901E-07	-6.9473	1.00140E+00	.0006
29	CAOH	1	8.97864E-05	1.57338E-09	-8.8032	1.45371E-09	-8.8375	9.23944E-01	-.0344
32	CASO4 AQ	0	4.25001E+00	3.12293E-05	-4.5054	3.12731E-05	-4.5048	1.00140E+00	.0006
30	CAHCO3	1	2.41137E+00	2.38609E-05	-4.6223	2.20461E-05	-4.6567	9.23944E-01	-.0344
31	CACO3 AQ	0	1.42564E-01	1.42491E-06	-5.8462	1.42691E-06	-5.8456	1.00140E+00	.0006
44	NASO4	-1	3.06013E-01	2.57139E-06	-5.5898	2.37329E-06	-5.6246	9.22958E-01	-.0348
43	NAHCO3	0	3.22663E-01	3.84308E-06	-5.4153	3.84847E-06	-5.4147	1.00140E+00	.0006
42	NACO3	-1	4.46999E-03	5.38761E-08	-7.2686	4.97254E-08	-7.3034	9.22958E-01	-.0348
94	NACL	0	2.14501E-32	3.67165E-37	-36.4351	3.67680E-37	-36.4345	1.00140E+00	.0006
63	HSO4	-1	1.98400E-04	2.04467E-09	-8.6894	1.88402E-09	-8.7249	9.21431E-01	-.0355
96	H2SO4	0	1.97717E-43	2.01668E-48	-47.6954	2.01950E-48	-47.6948	1.00140E+00	.0006
93	HCL	0	6.13474E-37	1.68318E-41	-40.7739	1.68554E-41	-40.7733	1.00140E+00	.0006

MOLE RATIOS FROM ANALYTICAL MOLALITY		MOLE RATIOS FROM COMPUTED MOLALITY		LOG ACTIVITY RATIOS	
CL/CA =	1.8480E-01	CL/CA =	1.9544E-01	LOG CA/H2 =	10.8925
CL/MG =	1.6080E+00	CL/MG =	1.6986E+00	LOG MG/H2 =	9.9552
CL/NA =	8.4636E-02	CL/NA =	8.4878E-02	LOG NA/H1 =	4.3387
CL/K =	3.7878E-01	CL/K =	3.7934E-01	LOG K/H1 =	3.6877
CL/AL =	1.9188E+26	CL/AL =	1.9188E+26	LOG AL/H3 =	-8.9400
CL/FE =	1.9188E+26	CL/FE =	1.9188E+26	LOG FE/H2 =	-15.9600
CL/SO4 =	5.5833E-01	CL/SO4 =	6.2661E-01	LOG CA/MG =	.9373
CL/HCO3 =	5.3330E-02	CL/HCO3 =	5.3907E-02	LOG NA/K =	.6510
CA/MG =	8.7014E+00	CA/MG =	8.6914E+00		
NA/K =	4.4754E+00	NA/K =	4.4692E+00		

192 SANTIAGO,AGS CE CAMPO=604.0 MMHOS

PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18 ANHYDRIT	1.5766E-07	3.0271E-05	-6.8023	-4.5190	5.2083E-03	-2.28330	-3.08268
22 ARAGONIT	1.0739E-09	6.4237E-09	-8.9691	-8.1922	1.6717E-01	-.77684	-1.04881
151 ARTIN	7.0302E-29	4.1133E-19	-28.1530	-18.3858	1.7091E-10	-9.76722	-13.18671
20 BRUCITE	5.6690E-19	3.8323E-12	-18.2465	-11.4165	1.4793E-07	-6.82994	-9.22110
13 CALCITE	1.0739E-09	3.4968E-09	-8.9691	-8.4563	3.0710E-01	-.51272	-.69223
12 DOLOMITE	1.3323E-19	1.1062E-17	-18.8754	-16.9562	1.2044E-02	-1.91924	-2.59117
19 GYPSUM	1.5761E-07	1.7338E-05	-6.8024	-4.7610	9.0908E-03	-2.04140	-2.75609
65 HALITE	3.6768E-07	3.7578E+01	-6.4345	1.5749	9.7845E-09	-8.00946	-10.81356
118 HUNTITE	2.0507E-39	4.8795E-31	-38.6881	-30.3116	4.2026E-09	-8.37648	-11.30908
39 HYDMAG	1.3423E-58	2.3797E-38	-57.8722	-37.6235	5.6405E-21	-20.24868	-27.33771
11 MAGNESIT	1.2406E-10	6.4196E-09	-9.9064	-8.1925	1.9326E-02	-1.71386	-2.31388
67 MIRABI	9.5954E-10	5.5053E-02	-9.0179	-1.2592	1.7429E-08	-7.75872	-10.47503
59 NAHCOL	6.8437E-06	2.6506E-01	-5.1647	-.5766	2.5819E-05	-4.58806	-6.19434
61 NATRON	6.5356E-12	3.6961E-02	-11.1847	-1.4323	1.7682E-10	-9.75246	-13.16678
150 NESQUE	1.2401E-10	6.8168E-06	-9.9065	-5.1664	1.8192E-05	-4.74013	-6.39964
66 THENAR	9.6096E-10	6.6897E-01	-9.0173	-.1746	1.4365E-09	-8.84270	-11.93851
62 THRNAT	6.5444E-12	1.4015E+00	-11.1841	.1466	4.6697E-12	-11.33071	-15.29757
60 TRONA	4.4781E-17	2.2061E-01	-16.3489	-.6564	2.0299E-16	-15.69253	-21.18645

68 EMILIANO ZAPATA,AGS CE CAMPO=623.00 MMHOS

INITIAL SOLUTION

TEMPERATURE = 23.00 DEGREES C PH = 7.120 ANALYTICAL EPMCAT = 5.068 ANALYTICAL EPMAN = 3.981

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.03829E-03	-2.9837	4.16000E+01
MG	2	1.56356E-04	-3.8059	3.80000E+00
NA	1	1.91021E-03	-2.7189	4.39000E+01
K	1	7.70051E-04	-3.1135	3.01000E+01
CL	-1	1.80584E-04	-3.7433	6.40000E+00
SO4	-2	3.01995E-04	-3.5200	2.90000E+01
HCO3	-1	3.19808E-03	-2.4951	1.95070E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	5.068	4.969
EPMAN	3.981	3.883

PH
7.120

TEMPERATURE
23.00 DEG C

IONIC STRENGTH
5.832715E-03

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 3.198002E+00 MEQ/KG H2O
ELECT = 1.086915E+00 MEQ/KG H2O

ACTIVITY H2O = .9999
PCO2 = 1.413681E-02
LOG PCO2 = -1.8496
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 3.703538E-03
DENSITY = 1.0000
TDS = 349.9MG/L
CARBONATE ALK = 3.197958E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.876VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	3.95234E+01	9.86457E-04	-3.0059	7.19170E-04	-3.1432	7.29044E-01	-.1372
2	MG	2	3.61492E+00	1.48741E-04	-3.8276	1.08871E-04	-3.9631	7.31949E-01	-.1355
3	NA	1	4.37883E+01	1.90535E-03	-2.7200	1.75822E-03	-2.7549	9.22779E-01	-.0349
4	K	1	3.00604E+01	7.69038E-04	-3.1141	7.08416E-04	-3.1497	9.21172E-01	-.0357
64	H	1	8.22306E-05	8.16065E-08	-7.0883	7.58578E-08	-7.1200	9.29556E-01	-.0317
5	CL	-1	6.40000E+00	1.80584E-04	-3.7433	1.66349E-04	-3.7790	9.21172E-01	-.0357
6	SO4	-2	2.56980E+01	2.67609E-04	-3.5725	1.94563E-04	-3.7109	7.27039E-01	-.1384
7	HCO3	-1	1.92772E+02	3.16040E-03	-2.5003	2.92076E-03	-2.5345	9.24173E-01	-.0342
18	CO3	-2	1.42177E-01	2.37008E-06	-5.6252	1.72892E-06	-5.7622	7.29478E-01	-.1370
86	H2CO3	0	3.16137E+01	5.09868E-04	-3.2925	5.10601E-04	-3.2919	1.00144E+00	.0006
27	OH	-1	2.09951E-03	1.23490E-07	-6.9084	1.13732E-07	-6.9441	9.20986E-01	-.0357
19	MGOH	1	8.81829E-05	2.13492E-09	-8.6706	1.97673E-09	-8.7041	9.25903E-01	-.0334
23	MGSO4 AQ	0	4.17827E-01	3.47230E-06	-5.4594	3.47697E-06	-5.4588	1.00134E+00	.0006
22	MGHCO3	1	3.38100E-01	3.96368E-06	-5.4019	3.65392E-06	-5.4372	9.21850E-01	-.0353
21	MGCO3 AQ	0	1.46648E-02	1.73976E-07	-6.7595	1.74210E-07	-6.7589	1.00134E+00	.0006
29	CAOH	1	1.25030E-04	2.19091E-09	-8.6594	2.02687E-09	-8.6932	9.25126E-01	-.0338
32	CASO4 AQ	0	3.80822E+00	2.79823E-05	-4.5531	2.80199E-05	-4.5525	1.00134E+00	.0006
30	CAHCO3	1	2.23687E+00	2.21337E-05	-4.6549	2.04765E-05	-4.6887	9.25126E-01	-.0338
31	CACO3 AQ	0	1.68930E-01	1.68838E-06	-5.7725	1.69065E-06	-5.7719	1.00134E+00	.0006
44	NASO4	-1	2.28254E-01	1.91794E-06	-5.7172	1.77251E-06	-5.7514	9.24173E-01	-.0342
43	NAHCO3	0	2.42139E-01	2.88393E-06	-5.5400	2.88781E-06	-5.5394	1.00134E+00	.0006
42	NACO3	-1	4.56991E-03	5.50790E-08	-7.2590	5.09025E-08	-7.2933	9.24173E-01	-.0342
94	NACL	0	1.70643E-32	2.92085E-37	-36.5345	2.92478E-37	-36.5339	1.00134E+00	.0006
63	HSO4	-1	1.42539E-04	1.46893E-09	-8.8330	1.35538E-09	-8.8679	9.22696E-01	-.0349
96	H2SO4	0	1.09621E-43	1.11809E-48	-47.9515	1.11959E-48	-47.9509	1.00134E+00	.0006
93	HCL	0	4.59317E-37	1.26019E-41	-40.8996	1.26188E-41	-40.8990	1.00134E+00	.0006

MOLE RATIOS FROM ANALYTICAL MOLALITY		MOLE RATIOS FROM COMPUTED MOLALITY		LOG ACTIVITY RATIOS	
CL/CA =	1.7392E-01	CL/CA =	1.8306E-01	LOG CA/H2 =	11.0968
CL/MG =	1.1550E+00	CL/MG =	1.2141E+00	LOG MG/H2 =	10.2769
CL/NA =	9.4536E-02	CL/NA =	9.4777E-02	LOG NA/H1 =	4.3651
CL/K =	2.3451E-01	CL/K =	2.3482E-01	LOG K/H1 =	3.9703
CL/AL =	1.8058E+26	CL/AL =	1.8058E+26	LOG AL/H3 =	-8.6400
CL/FE =	1.8058E+26	CL/FE =	1.8058E+26	LOG FE/H2 =	-15.7600
CL/SO4 =	5.9797E-01	CL/SO4 =	6.7480E-01	LOG CA/MG =	.8199
CL/HCO3 =	5.6466E-02	CL/HCO3 =	5.7140E-02	LOG NA/K =	.3948
CA/MG =	6.6405E+00	CA/MG =	6.6321E+00		
NA/K =	2.4806E+00	NA/K =	2.4776E+00		

68 EMILIANO ZAPATA,AGS   CE CAMPO=623.00 MMHOS

PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18 ANHYDRIT	1.3992E-07	2.9557E-05	-6.8541	-4.5293	4.7341E-03	-2.32477	-3.15036
22 ARAGONIT	1.2434E-09	6.3044E-09	-8.9054	-8.2004	1.9722E-01	-.70504	-.95542
151 ARTIN	2.6496E-28	4.0655E-19	-27.5768	-18.3909	6.5173E-10	-9.18593	-12.44814
20 BRUCITE	1.4082E-18	3.8529E-12	-17.8513	-11.4142	3.6550E-07	-6.43711	-8.72314
13 CALCITE	1.2434E-09	3.4461E-09	-8.9054	-8.4627	3.6081E-01	-.44272	-.59994
12 DOLOMITE	2.3404E-19	1.0496E-17	-18.6307	-16.9790	2.2298E-02	-1.65174	-2.23833
19 GYPSUM	1.3989E-07	1.7366E-05	-6.8542	-4.7603	8.0550E-03	-2.09394	-2.83756
65 HALITE	2.9248E-07	3.7797E+01	-6.5339	1.5775	7.7381E-09	-8.11136	-10.99197
118 HUNTITE	8.2921E-39	4.1449E-31	-38.0813	-30.3825	2.0006E-08	-7.69885	-10.43295
39 HYDMAG	1.7668E-57	2.0245E-38	-56.7528	-37.6937	8.7270E-20	-19.05914	-25.82764
11 MAGNESIT	1.8823E-10	6.1736E-09	-9.7253	-8.2095	3.0489E-02	-1.51585	-2.05418
67 MIRABI	6.0064E-10	6.2089E-02	-9.2214	-1.2070	9.6738E-09	-8.01440	-10.86057
59 NAHCOL	5.1353E-06	2.7139E-01	-5.2894	-.5664	1.8923E-05	-4.72302	-6.40031
61 NATRON	5.3374E-12	4.0838E-02	-11.2727	-1.3889	1.3070E-10	-9.88373	-13.39376
150 NESQUE	1.8815E-10	6.5714E-06	-9.7255	-5.1823	2.8632E-05	-4.54315	-6.15656
66 THENAR	6.0146E-10	6.6655E-01	-9.2208	-.1762	9.0235E-10	-9.04463	-12.25666
62 THRNAT	5.3439E-12	1.3768E+00	-11.2721	.1389	3.8814E-12	-11.41101	-15.46342
60 TRONA	2.7439E-17	1.9683E-01	-16.5616	-.7059	1.3940E-16	-15.85573	-21.48660

193 LA CONCHA,AGS CE CAMPO=752.00MMHOS

INITIAL SOLUTION

TEMPERATURE = 22.40 DEGREES C PH = 7.330 ANALYTICAL EPMCAT = 7.581 ANALYTICAL EPMAN = 5.832

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.41789E-03	-2.8484	5.68000E+01
MG	2	3.37454E-04	-3.4718	8.20000E+00
NA	1	3.37278E-03	-2.4720	7.75000E+01
K	1	7.01088E-04	-3.1542	2.74000E+01
CL	-1	2.45520E-04	-3.6099	8.70000E+00
SO4	-2	3.95781E-04	-3.4025	3.80000E+01
HCO3	-1	4.79797E-03	-2.3189	2.92610E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	7.581	7.402
EPMAN	5.832	5.653

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 4.797928E+00 MEQ/KG H2O
ELECT = 1.749387E+00 MEQ/KG H2O

PH
7.330

TEMPERATURE
22.40 DEG C

IONIC STRENGTH
8.522097E-03

ACTIVITY H2O = .9998
PCO2 = 1.271479E-02
LOG PCO2 = -1.8957
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 5.251767E-03
DENSITY = 1.0000
TDS = 509.2MG/L
CARBONATE ALK = 4.797775E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.865VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	5.32426E+01	1.32908E-03	-2.8764	9.15905E-04	-3.0381	6.89125E-01	-.1617
2	MG	2	7.69055E+00	3.16488E-04	-3.4996	2.19317E-04	-3.6589	6.92970E-01	-.1593
3	NA	1	7.72326E+01	3.36114E-03	-2.4735	3.05666E-03	-2.5148	9.09411E-01	-.0412
4	K	1	2.73573E+01	6.99996E-04	-3.1549	6.34995E-04	-3.1972	9.07142E-01	-.0423
64	H	1	5.13018E-05	5.09206E-08	-7.2931	4.67735E-08	-7.3300	9.18558E-01	-.0369
5	CL	-1	8.70000E+00	2.45520E-04	-3.6099	2.22722E-04	-3.6522	9.07142E-01	-.0423
6	SO4	-2	3.26360E+01	3.39913E-04	-3.4686	2.33302E-04	-3.6321	6.86359E-01	-.1634
7	HCO3	-1	2.87452E+02	4.71340E-03	-2.3267	4.29518E-03	-2.3670	9.11271E-01	-.0404
18	CO3	-2	3.54036E-01	5.90269E-06	-5.2290	4.07044E-06	-5.3904	6.89590E-01	-.1614
86	H2CO3	0	2.88847E+01	4.65929E-04	-3.3317	4.66911E-04	-3.3308	1.00211E+00	.0009
27	OH	-1	3.30168E-03	1.94231E-07	-6.7117	1.76143E-07	-6.7541	9.06875E-01	-.0425
19	MGOH	1	2.76806E-04	6.70259E-09	-8.1738	6.12370E-09	-8.2130	9.13632E-01	-.0392
23	MGSO4 AQ	0	9.92632E-01	8.25046E-06	-5.0835	8.26667E-06	-5.0827	1.00196E+00	.0009
22	MGHCO3	1	1.01307E+00	1.18785E-05	-4.9252	1.07865E-05	-4.9671	9.08073E-01	-.0419
21	MGCO3 AQ	0	6.88593E-02	8.17046E-07	-6.0878	8.18650E-07	-6.0869	1.00196E+00	.0009
29	CAOH	1	2.48940E-04	4.36290E-09	-8.3602	3.98147E-09	-8.4000	9.12575E-01	-.0397
32	CASO4 AQ	0	5.78116E+00	4.24859E-05	-4.3718	4.25694E-05	-4.3709	1.00196E+00	.0009
30	CAHCO3	1	4.16898E+00	4.12583E-05	-4.3845	3.76513E-05	-4.4242	9.12575E-01	-.0397
31	CACO3 AQ	0	4.99747E-01	4.99557E-06	-5.3014	5.00538E-06	-5.3006	1.00196E+00	.0009
44	NASO4	-1	4.80629E-01	4.03921E-06	-5.3937	3.68082E-06	-5.4341	9.11271E-01	-.0404
43	NAHCO3	0	6.18568E-01	7.36845E-06	-5.1326	7.38293E-06	-5.1318	1.00196E+00	.0009
42	NACO3	-1	1.83922E-02	2.21708E-07	-6.6542	2.02037E-07	-6.6946	9.11271E-01	-.0404
94	NACL	0	3.96887E-32	6.79450E-37	-36.1678	6.80784E-37	-36.1670	1.00196E+00	.0009
63	HSO4	-1	1.05176E-04	1.08407E-09	-8.9649	9.85677E-10	-9.0063	9.09242E-01	-.0413
96	H2SO4	0	4.99361E-44	5.09409E-49	-48.2929	5.10410E-49	-48.2921	1.00196E+00	.0009
93	HCL	0	3.78894E-37	1.03971E-41	-40.9831	1.04175E-41	-40.9822	1.00196E+00	.0009

MOLE RATIOS FROM ANALYTICAL MOLALITY		MOLE RATIOS FROM COMPUTED MOLALITY		LOG ACTIVITY RATIOS	
CL/CA =	1.7316E-01	CL/CA =	1.8473E-01	LOG CA/H2 =	11.6219
CL/MG =	7.2757E-01	CL/MG =	7.7576E-01	LOG MG/H2 =	11.0011
CL/NA =	7.2795E-02	CL/NA =	7.3047E-02	LOG NA/H1 =	4.8152
CL/K =	3.5020E-01	CL/K =	3.5075E-01	LOG K/H1 =	4.1328
CL/AL =	2.4552E+26	CL/AL =	2.4552E+26	LOG AL/H3 =	-8.0100
CL/FE =	2.4552E+26	CL/FE =	2.4552E+26	LOG FE/H2 =	-15.3400
CL/SO4 =	6.2034E-01	CL/SO4 =	7.2230E-01	LOG CA/MG =	.6208
CL/HCO3 =	5.1172E-02	CL/HCO3 =	5.2090E-02	LOG NA/K =	.6825
CA/MG =	4.2017E+00	CA/MG =	4.1995E+00		
NA/K =	4.8108E+00	NA/K =	4.8017E+00		

193 LA CONCHA,AGS CE CAMPO=752.00MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	2.1368E-07	2.9943E-05	-6.6702	-4.5237	7.1362E-03	-2.14653	-2.90294
22	ARAGONIT	3.7281E-09	6.3691E-09	-8.4285	-8.1959	5.8534E-01	-.23259	-.31455
151	ARTIN	6.0710E-27	4.0914E-19	-26.2167	-18.3881	1.4838E-08	-7.82862	-10.58731
20	BRUCITE	6.8046E-18	3.8417E-12	-17.1672	-11.4155	1.7713E-06	-5.75171	-7.77854
13	CALCITE	3.7281E-09	3.4739E-09	-8.4285	-8.4592	1.0732E+00	.03067	.04148
12	DOLOMITE	3.3282E-18	1.0801E-17	-17.4778	-16.9665	3.0814E-01	-.51125	-.69141
19	GYPSUM	2.1360E-07	1.7351E-05	-6.6704	-4.7607	1.2311E-02	-1.90972	-2.58268
65	HALITE	6.8078E-07	3.7677E+01	-6.1670	1.5761	1.8069E-08	-7.74307	-10.47162
118	HUNTITE	2.6524E-36	4.5300E-31	-35.5764	-30.3439	5.8551E-06	-5.23247	-7.07632
39	HYDMAG	4.3183E-54	2.2108E-38	-53.3647	-37.6554	1.9533E-16	-15.70924	-21.24496
11	MAGNESIT	8.9272E-10	6.3063E-09	-9.0493	-8.2002	1.4156E-01	-.84906	-1.14826
67	MIRABI	2.1755E-09	5.8153E-02	-8.6624	-1.2354	3.7410E-08	-7.42702	-10.04419
59	NAHCOL	1.3129E-05	2.6793E-01	-4.8818	-.5720	4.9002E-05	-4.30978	-5.82849
61	NATRON	3.7956E-11	3.8679E-02	-10.4207	-1.4125	9.8130E-10	-9.00820	-12.18256
150	NESQUE	8.9219E-10	6.7039E-06	-9.0495	-5.1737	1.3308E-04	-3.87587	-5.24167
66	THENAR	2.1798E-09	6.6786E-01	-8.6616	-.1753	3.2638E-09	-8.48628	-11.47672
62	THRNAT	3.8023E-11	1.3902E+00	-10.4200	.1431	2.7352E-11	-10.56302	-14.28528
60	TRONA	4.9911E-16	2.0944E-01	-15.3018	-.6789	2.3830E-15	-14.62287	-19.77577

40 VALLADOLID,AGS CE CAMPO=1080.0 MMHOS

INITIAL SOLUTION

TEMPERATURE = 22.90 DEGREES C PH = 6.980 ANALYTICAL EPMCAT = 9.279 ANALYTICAL EPMAN = 7.451

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	2.01726E-03	-2.6952	8.08000E+01
MG	2	2.55182E-04	-3.5932	6.20000E+00
NA	1	3.88247E-03	-2.4109	8.92000E+01
K	1	8.57283E-04	-3.0669	3.35000E+01
CL	-1	3.33049E-04	-3.4775	1.18000E+01
SO4	-2	5.62500E-04	-3.2499	5.40000E+01
HCO3	-1	5.99821E-03	-2.2220	3.65760E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED	PH
EPMCAT	9.279	9.001	6.980
EPMAN	7.451	7.174	

TEMPERATURE 22.90 DEG C

IONIC STRENGTH 1.066740E-02

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 5.998099E+00 MEQ/KG H2O
ELECT = 1.828127E+00 MEQ/KG H2O

ACTIVITY H2O = .9997
PCO2 = 3.548147E-02
LOG PCO2 = -1.4500
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 7.272101E-03
DENSITY = 1.0000
TDS = 641.3MG/L
CARBONATE ALK = 5.998121E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.874VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	7.47351E+01	1.86584E-03	-2.7291	1.23827E-03	-2.9072	6.63652E-01	-.1781
2	MG	2	5.73683E+00	2.36118E-04	-3.6269	1.57766E-04	-3.8020	6.68164E-01	-.1751
3	NA	1	8.88154E+01	3.86573E-03	-2.4128	3.48124E-03	-2.4583	9.00539E-01	-.0455
4	K	1	3.34300E+01	8.55493E-04	-3.0678	7.68029E-04	-3.1146	8.97762E-01	-.0468
64	H	1	1.15735E-04	1.14890E-07	-6.9397	1.04713E-07	-6.9800	9.11416E-01	-.0403
5	CL	-1	1.18000E+01	3.33049E-04	-3.4775	2.98998E-04	-3.5243	8.97762E-01	-.0468
6	SO4	-2	4.51051E+01	4.69844E-04	-3.3280	3.10247E-04	-3.5083	6.60318E-01	-.1802
7	HCO3	-1	3.59211E+02	5.89081E-03	-2.2298	5.31785E-03	-2.2743	9.02735E-01	-.0444
18	CO3	-2	2.05487E-01	3.42644E-06	-5.4652	2.27554E-06	-5.6429	6.64113E-01	-.1778
86	H2CO3	0	7.94467E+01	1.28170E-03	-2.8922	1.28507E-03	-2.8911	1.00263E+00	.0011
27	OH	-1	1.54833E-03	9.10972E-08	-7.0405	8.17535E-08	-7.0875	8.97431E-01	-.0470
19	MGOH	1	9.37813E-05	2.27112E-09	-8.6438	2.05664E-09	-8.6868	9.05563E-01	-.0431
23	MGSO4 AQ	0	9.61590E-01	7.99351E-06	-5.0973	8.01316E-06	-5.0962	1.00246E+00	.0011
22	MGHCO3	1	9.14036E-01	1.07187E-05	-4.9699	9.63488E-06	-5.0162	8.98882E-01	-.0463
21	MGCO3 AQ	0	2.78875E-02	3.30941E-07	-6.4802	3.31755E-07	-6.4792	1.00246E+00	.0011
29	CAOH	1	1.58156E-04	2.77219E-09	-8.5572	2.50689E-09	-8.6009	9.04298E-01	-.0437
30	CAHCO3	1	7.14988E+00	7.07681E-05	-4.1502	6.39955E-05	-4.1939	9.04298E-01	-.0437
31	CACO3 AQ	0	3.81473E-01	3.81379E-06	-5.4186	3.82317E-06	-5.4176	1.00246E+00	.0011
44	NASO4	-1	7.37079E-01	6.19524E-06	-5.2079	5.59266E-06	-5.2524	9.02735E-01	-.0444
43	NAHCO3	0	8.71680E-01	1.03849E-05	-4.9836	1.04105E-05	-4.9825	1.00246E+00	.0011
42	NACO3	-1	1.21262E-02	1.46194E-07	-6.8351	1.31974E-07	-6.8795	9.02735E-01	-.0444
94	NACL	0	6.06441E-32	1.03833E-36	-35.9837	1.04089E-36	-35.9826	1.00246E+00	.0011
63	HSO4	-1	3.20576E-04	3.30466E-09	-8.4809	2.97516E-09	-8.5265	9.00293E-01	-.0456
96	H2SO4	0	3.32607E-43	3.39344E-48	-47.4694	3.40179E-48	-47.4683	1.00246E+00	.0011
93	HCL	0	1.13803E-36	3.12321E-41	-40.5054	3.13090E-41	-40.5043	1.00246E+00	.0011

MOLE RATIOS FROM ANALYTICAL MOLALITY

CL/CA	=	1.6510E-01
CL/MG	=	1.3051E+00
CL/NA	=	8.5783E-02
CL/K	=	3.8849E-01
CL/AL	=	3.3305E+26
CL/FE	=	3.3305E+26
CL/SO4	=	5.9209E-01
CL/HCO3	=	5.5525E-02
CA/MG	=	7.9052E+00
NA/K	=	4.5288E+00

MOLE RATIOS FROM COMPUTED MOLALITY

CL/CA	=	1.7850E-01
CL/MG	=	1.4105E+00
CL/NA	=	8.6154E-02
CL/K	=	3.8931E-01
CL/AL	=	3.3305E+26
CL/FE	=	3.3305E+26
CL/SO4	=	7.0885E-01
CL/HCO3	=	5.6537E-02
CA/MG	=	7.9022E+00
NA/K	=	4.5187E+00

LOG ACTIVITY RATIOS

LOG CA/H2	=	11.0528
LOG MG/H2	=	10.1580
LOG NA/H1	=	4.5217
LOG K/H1	=	3.8654
LOG AL/H3	=	-9.0600
LOG FE/H2	=	-16.0400
LOG CA/MG	=	.8948
LOG NA/K	=	.6564

40 VALLADOLID,AGS   CE CAMPO=1080.0 MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	3.8417E-07	2.9621E-05	-6.4155	-4.5284	1.2970E-02	-1.88707	-2.55637
22	ARAGONIT	2.8177E-09	6.3152E-09	-8.5501	-8.1996	4.4619E-01	-.35048	-.47479
151	ARTIN	3.7826E-28	4.0698E-19	-27.4222	-18.3904	9.2942E-10	-9.03179	-12.23513
20	BRUCITE	1.0544E-18	3.8511E-12	-17.9770	-11.4144	2.7381E-07	-6.56256	-8.89012
13	CALCITE	2.8177E-09	3.4507E-09	-8.5501	-8.4621	8.1656E-01	-.08801	-.11923
12	DOLOMITE	1.0116E-18	1.0546E-17	-17.9950	-16.9769	9.5917E-02	-1.01810	-1.37920
19	GYPSUM	3.8397E-07	1.7364E-05	-6.4157	-4.7604	2.2114E-02	-1.65534	-2.24245
65	HALITE	1.0409E-06	3.7777E+01	-5.9826	1.5772	2.7553E-08	-7.55982	-10.24110
118	HUNTITE	1.3037E-37	4.2066E-31	-36.8848	-30.3761	3.0993E-07	-6.50874	-8.81722
39	HYDMAG	1.7497E-56	2.0544E-38	-55.7570	-37.6873	8.5170E-19	-18.06971	-24.47857
11	MAGNESIT	3.5900E-10	6.1955E-09	-9.4449	-8.2079	5.7946E-02	-1.23698	-1.67570
67	MIRABI	3.7503E-09	6.1416E-02	-8.4259	-1.2117	6.1064E-08	-7.21421	-9.77291
59	NAHCOL	1.8513E-05	2.7081E-01	-4.7325	-.5673	6.8361E-05	-4.16519	-5.64247
61	NATRON	2.7507E-11	4.0471E-02	-10.5606	-1.3929	6.7968E-10	-9.16769	-12.41924
150	NESQUE	3.5873E-10	6.5932E-06	-9.4452	-5.1809	5.4409E-05	-4.26433	-5.77678
66	THENAR	3.7599E-09	6.6677E-01	-8.4248	-.1760	5.6390E-09	-8.24880	-11.17443
62	THRNAT	2.7570E-11	1.3790E+00	-10.5596	.1396	1.9993E-11	-10.69913	-14.49383
60	TRONA	5.1027E-16	1.9888E-01	-15.2922	-.7014	2.5658E-15	-14.59078	-19.76576

41-A SN ANTONIO ORCO,AGS CE CAMPO=1182.0 MMHOS

INITIAL SOLUTION

TEMPERATURE = 22.30 DEGREES C PH = 6.760 ANALYTICAL EPMCAT = 11.338 ANALYTICAL EPMAN = 7.874

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	2.29703E-03	-2.6388	9.20000E+01
MG	2	3.37520E-04	-3.4717	8.20000E+00
NA	1	5.18857E-03	-2.2850	1.19200E+02
K	1	8.88049E-04	-3.0516	3.47000E+01
CL	-1	3.38715E-04	-3.4702	1.20000E+01
SO4	-2	7.70883E-04	-3.1130	7.40000E+01
HCO3	-1	5.99860E-03	-2.2220	3.65760E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	11.338	10.967
EPMAN	7.874	7.504

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 5.998405E+00 MEQ/KG H2O
ELECT = 3.466163E+00 MEQ/KG H2O

PH
6.760

TEMPERATURE
22.30 DEG C

IONIC STRENGTH
1.229418E-02

ACTIVITY H2O = .9997
PCO2 = 5.799055E-02
LOG PCO2 = -1.2366
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 8.122631E-03
DENSITY = 1.0000
TDS = 705.9MG/L
CARBONATE ALK = 5.998548E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.863VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	8.44027E+01	2.10734E-03	-2.6763	1.36438E-03	-2.8651	6.47442E-01	-.1888
2	MG	2	7.53782E+00	3.10264E-04	-3.5083	2.02421E-04	-3.6937	6.52415E-01	-.1855
3	NA	1	1.18633E+02	5.16391E-03	-2.2870	4.62038E-03	-2.3353	8.94745E-01	-.0483
4	K	1	3.46058E+01	8.85638E-04	-3.0527	7.89630E-04	-3.1026	8.91594E-01	-.0498
64	H	1	1.93032E-04	1.91635E-07	-6.7175	1.73780E-07	-6.7600	9.06827E-01	-.0425
5	CL	-1	1.20000E+01	3.38715E-04	-3.4702	3.01997E-04	-3.5200	8.91594E-01	-.0498
6	SO4	-2	6.08473E+01	6.33867E-04	-3.1980	4.08017E-04	-3.3893	6.43695E-01	-.1913
7	HCO3	-1	3.58830E+02	5.88494E-03	-2.2303	5.27978E-03	-2.2774	8.97167E-01	-.0471
18	CO3	-2	1.24380E-01	2.07413E-06	-5.6832	1.34379E-06	-5.8717	6.47879E-01	-.1885
86	H2CO3	0	1.31957E+02	2.12897E-03	-2.6718	2.13544E-03	-2.6705	1.00304E+00	.0013
27	OH	-1	8.97077E-04	5.27835E-08	-7.2775	4.70415E-08	-7.3275	8.91216E-01	-.0500
19	MGOH	1	6.91431E-05	1.67456E-09	-8.7761	1.50765E-09	-8.8217	9.00325E-01	-.0456
23	MGSO4 AQ	0	1.59631E+00	1.32707E-05	-4.8771	1.33083E-05	-4.8759	1.00283E+00	.0012
22	MGHCO3	1	1.16805E+00	1.36984E-05	-4.8633	1.22306E-05	-4.9126	8.92848E-01	-.0492
21	MGCO3 AQ	0	2.09270E-02	2.48356E-07	-6.6049	2.49060E-07	-6.6037	1.00283E+00	.0012
29	CAOH	1	1.00453E-04	1.76088E-09	-8.7543	1.58288E-09	-8.8006	8.98914E-01	-.0463
32	CASO4 AQ	0	1.50321E+01	1.10494E-04	-3.9567	1.10807E-04	-3.9554	1.00283E+00	.0012
30	CAHCO3	1	7.72474E+00	7.64629E-05	-4.1165	6.87336E-05	-4.1628	8.98914E-01	-.0463
31	CACO3 AQ	0	2.44994E-01	2.44949E-06	-5.6109	2.45644E-06	-5.6097	1.00283E+00	.0012
44	NASO4	-1	1.28946E+00	1.08388E-05	-4.9650	9.72420E-06	-5.0121	8.97167E-01	-.0471
43	NAHCO3	0	1.14813E+00	1.36793E-05	-4.8639	1.37181E-05	-4.8627	1.00283E+00	.0012
42	NACO3	-1	9.27287E-03	1.11801E-07	-6.9516	1.00304E-07	-6.9987	8.97167E-01	-.0471
94	NACL	0	8.12597E-32	1.39140E-36	-35.8565	1.39534E-36	-35.8553	1.00283E+00	.0012
63	HSO4	-1	6.92671E-04	7.14086E-09	-8.1462	6.38701E-09	-8.1947	8.94431E-01	-.0485
96	H2SO4	0	1.20423E-42	1.22871E-47	-46.9106	1.23219E-47	-46.9093	1.00283E+00	.0012
93	HCL	0	1.90675E-36	5.23326E-41	-40.2812	5.24810E-41	-40.2800	1.00283E+00	.0012

MOLE RATIOS FROM ANALYTICAL MOLALITY		MOLE RATIOS FROM COMPUTED MOLALITY		LOG ACTIVITY RATIOS	
CL/CA =	1.4746E-01	CL/CA =	1.6073E-01	LOG CA/H2 =	10.6549
CL/MG =	1.0035E+00	CL/MG =	1.0917E+00	LOG MG/H2 =	9.8263
CL/NA =	6.5281E-02	CL/NA =	6.5593E-02	LOG NA/H1 =	4.4247
CL/K =	3.8141E-01	CL/K =	3.8245E-01	LOG K/H1 =	3.6574
CL/AL =	3.3872E+26	CL/AL =	3.3872E+26	LOG AL/H3 =	-9.7200
CL/FE =	3.3872E+26	CL/FE =	3.3872E+26	LOG FE/H2 =	-16.4800
CL/SO4 =	4.3939E-01	CL/SO4 =	5.3436E-01	LOG CA/MG =	.8287
CL/HCO3 =	5.6466E-02	CL/HCO3 =	5.7556E-02	LOG NA/K =	.7673
CA/MG =	6.8056E+00	CA/MG =	6.7921E+00		
NA/K =	5.8427E+00	NA/K =	5.8307E+00		

41-A SN ANTONIO ORCO,AGS CE CAMPO=1182.0 MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	5.5669E-07	3.0009E-05	-6.2544	-4.5228	1.8551E-02	-1.73163	-2.34104
22	ARAGONIT	1.8334E-09	6.3800E-09	-8.7367	-8.1952	2.8737E-01	-.54155	-.73214
151	ARTIN	1.2173E-28	4.0958E-19	-27.9146	-18.3877	2.9722E-10	-9.52693	-12.87972
20	BRUCITE	4.4794E-19	3.8398E-12	-18.3488	-11.4157	1.1666E-07	-6.93309	-9.37304
13	CALCITE	1.8334E-09	3.4785E-09	-8.7367	-8.4586	5.2707E-01	-.27813	-.37601
12	DOLOMITE	4.9871E-19	1.0852E-17	-18.3021	-16.9645	4.5954E-02	-1.33768	-1.80844
19	GYPSUM	5.5636E-07	1.7348E-05	-6.2546	-4.7607	3.2070E-02	-1.49390	-2.01965
65	HALITE	1.3953E-06	3.7657E+01	-5.8553	1.5759	3.7054E-08	-7.43117	-10.04641
118	HUNTITE	3.6900E-38	4.5978E-31	-37.4330	-30.3375	8.0256E-08	-7.09552	-9.59264
39	HYDMAG	2.4493E-57	2.2436E-38	-56.6110	-37.6491	1.0917E-19	-18.96190	-25.63513
11	MAGNESIT	2.7201E-10	6.3288E-09	-9.5654	-8.1987	4.2980E-02	-1.36674	-1.84773
67	MIRABI	8.6841E-09	5.7520E-02	-8.0613	-1.2402	1.5098E-07	-6.82109	-9.22163
59	NAHCOL	2.4395E-05	2.6735E-01	-4.6127	-.5729	9.1245E-05	-4.03979	-5.46151
61	NATRON	2.8601E-11	3.8330E-02	-10.5436	-1.4165	7.4618E-10	-9.12716	-12.33927
150	NESQUE	2.7177E-10	6.7263E-06	-9.5658	-5.1722	4.0403E-05	-4.39358	-5.93981
66	THENAR	8.7103E-09	6.6808E-01	-8.0600	-.1752	1.3038E-08	-7.88480	-10.65968
62	THRNAT	2.8678E-11	1.3924E+00	-10.5424	.1438	2.0596E-11	-10.68621	-14.44700
60	TRONA	6.9939E-16	2.1163E-01	-15.1553	-.6744	3.3048E-15	-14.48085	-19.57708

36 EL TIRON,AGS CE CAMPO=746.00 MMHOS

INITIAL SOLUTION

TEMPERATURE = 24.00 DEGREES C PH = 7.540 ANALYTICAL EPMCAT = 6.838 ANALYTICAL EPMAN = 5.863

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.29804E-03	-2.8867	5.20000E+01
MG	2	2.75719E-04	-3.5595	6.70000E+00
NA	1	3.04632E-03	-2.5162	7.00000E+01
K	1	6.47343E-04	-3.1889	2.53000E+01
CL	-1	2.59626E-04	-3.5857	9.20000E+00
SO4	-2	6.04075E-04	-3.2189	5.80000E+01
HCO3	-1	4.39795E-03	-2.3567	2.68220E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	6.838	6.620
EPMAN	5.863	5.645

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 4.397940E+00 MEQ/KG H2O
ELECT = 9.752206E-01 MEQ/KG H2O

PH
7.540

TEMPERATURE
24.00 DEG C

IONIC STRENGTH
8.118576E-03

ACTIVITY H2O = .9998
PCO2 = 7.342033E-03
LOG PCO2 = -2.1342
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 4.637551E-03
DENSITY = 1.0000
TDS = 489.4MG/L
CARBONATE ALK = 4.397600E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.896VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	4.78421E+01	1.19425E-03	-2.9229	8.28559E-04	-3.0817	6.93791E-01	-.1588
2	MG	2	6.19408E+00	2.54899E-04	-3.5936	1.77795E-04	-3.7501	6.97511E-01	-.1564
3	NA	1	6.97201E+01	3.03414E-03	-2.5180	2.76412E-03	-2.5584	9.11007E-01	-.0405
4	K	1	2.52369E+01	6.45729E-04	-3.1899	5.86859E-04	-3.2315	9.08832E-01	-.0415
64	H	1	3.15888E-05	3.13535E-08	-7.5037	2.88403E-08	-7.5400	9.19845E-01	-.0363
5	CL	-1	9.20000E+00	2.59626E-04	-3.5857	2.35956E-04	-3.6272	9.08832E-01	-.0415
6	SO4	-2	5.04304E+01	5.25237E-04	-3.2796	3.63011E-04	-3.4401	6.91138E-01	-.1604
7	HCO3	-1	2.62952E+02	4.31157E-03	-2.3654	3.93565E-03	-2.4050	9.12811E-01	-.0396
18	CO3	-2	5.40715E-01	9.01492E-06	-5.0450	6.25872E-06	-5.2035	6.94262E-01	-.1585
86	H2CO3	0	1.59660E+01	2.57536E-04	-3.5892	2.58049E-04	-3.5883	1.00199E+00	.0009
27	OH	-1	6.04042E-03	3.55338E-07	-6.4494	3.22853E-07	-6.4910	9.08578E-01	-.0416
19	MGOH	1	4.18490E-04	1.01331E-08	-7.9943	9.27270E-09	-8.0328	9.15088E-01	-.0385
23	MGSO4 AQ	0	1.30617E+00	1.08563E-05	-4.9643	1.08766E-05	-4.9635	1.00187E+00	.0008
22	MGHCO3	1	7.58300E-01	8.89110E-06	-5.0510	8.08851E-06	-5.0921	9.09731E-01	-.0411
21	MGCO3 AQ	0	8.79783E-02	1.04388E-06	-5.9813	1.04583E-06	-5.9805	1.00187E+00	.0008
29	CAOH	1	4.16622E-04	7.30154E-09	-8.1366	6.67410E-09	-8.1756	9.14068E-01	-.0390
32	CASO4 AQ	0	8.25107E+00	6.06362E-05	-4.2173	6.07497E-05	-4.2165	1.00187E+00	.0008
30	CAHCO3	1	3.62341E+00	3.58583E-05	-4.4454	3.27769E-05	-4.4844	9.14068E-01	-.0390
31	CACO3 AQ	0	7.19520E-01	7.19232E-06	-5.1431	7.20578E-06	-5.1423	1.00187E+00	.0008
44	NASO4	-1	6.82112E-01	5.73236E-06	-5.2417	5.23256E-06	-5.2813	9.12811E-01	-.0396
43	NAHCO3	0	5.12604E-01	6.10607E-06	-5.2142	6.11750E-06	-5.2134	1.00187E+00	.0008
42	NACO3	-1	2.77040E-02	3.33950E-07	-6.4763	3.04833E-07	-6.5159	9.12811E-01	-.0396
94	NACL	0	3.80272E-32	6.50993E-37	-36.1864	6.52211E-37	-36.1856	1.00187E+00	.0008
63	HSO4	-1	1.05281E-04	1.08513E-09	-8.9645	9.88395E-10	-9.0051	9.10856E-01	-.0406
96	H2SO4	0	2.95437E-44	3.01376E-49	-48.5209	3.01940E-49	-48.5201	1.00187E+00	.0008
93	HCL	0	2.47534E-37	6.79234E-42	-41.1680	6.80505E-42	-41.1672	1.00187E+00	.0008

MOLE RATIOS FROM ANALYTICAL MOLALITY		MOLE RATIOS FROM COMPUTED MOLALITY		LOG ACTIVITY RATIOS	
CL/CA =	2.0001E-01	CL/CA =	2.1740E-01	LOG CA/H2 =	11.9983
CL/MG =	9.4163E-01	CL/MG =	1.0185E+00	LOG MG/H2 =	11.3299
CL/NA =	8.5226E-02	CL/NA =	8.5568E-02	LOG NA/H1 =	4.9816
CL/K =	4.0106E-01	CL/K =	4.0207E-01	LOG K/H1 =	4.3085
CL/AL =	2.5963E+26	CL/AL =	2.5963E+26	LOG AL/H3 =	-7.3800
CL/FE =	2.5963E+26	CL/FE =	2.5963E+26	LOG FE/H2 =	-14.9200
CL/SO4 =	4.2979E-01	CL/SO4 =	4.9430E-01	LOG CA/MG =	.6684
CL/HCO3 =	5.9033E-02	CL/HCO3 =	6.0216E-02	LOG NA/K =	.6730
CA/MG =	4.7078E+00	CA/MG =	4.6852E+00		
NA/K =	4.7059E+00	NA/K =	4.6988E+00		

36 EL TIRON,AGS CE CAMPO=746.00 MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	3.0078E-07	2.8927E-05	-6.5218	-4.5387	1.0398E-02	-1.98305	-2.69637
22	ARAGONIT	5.1857E-09	6.1987E-09	-8.2852	-8.2077	8.3659E-01	-.07749	-.10536
151	ARTIN	2.0611E-26	4.0229E-19	-25.6859	-18.3955	5.1233E-08	-7.29045	-9.91287
20	BRUCITE	1.8532E-17	3.8717E-12	-16.7321	-11.4121	4.7866E-06	-5.31998	-7.23361
13	CALCITE	5.1857E-09	3.3987E-09	-8.2852	-8.4687	1.5258E+00	.18350	.24950
12	DOLOMITE	5.7705E-18	1.0010E-17	-17.2388	-16.9996	5.7646E-01	-.23923	-.32529
19	GYPSUM	3.0067E-07	1.7392E-05	-6.5219	-4.7596	1.7287E-02	-1.76227	-2.39617
65	HALITE	6.5221E-07	3.7996E+01	-6.1856	1.5797	1.7165E-08	-7.76535	-10.55860
118	HUNTITE	7.1454E-36	3.5772E-31	-35.1460	-30.4465	1.9975E-05	-4.69952	-6.38997
39	HYDMAG	2.8394E-53	1.7496E-38	-52.5468	-37.7571	1.6229E-15	-14.78971	-20.10968
11	MAGNESIT	1.1128E-09	5.9596E-09	-8.9536	-8.2248	1.8672E-01	-.72881	-.99097
67	MIRABI	2.7685E-09	6.9210E-02	-8.5578	-1.1598	4.0002E-08	-7.39792	-10.05900
59	NAHCOL	1.0879E-05	2.7722E-01	-4.9634	-.5572	3.9242E-05	-4.40625	-5.99121
61	NATRON	4.7733E-11	4.4685E-02	-10.3212	-1.3498	1.0682E-09	-8.97135	-12.19841
150	NESQUE	1.1122E-09	6.3574E-06	-8.9538	-5.1967	1.7494E-04	-3.75711	-5.10857
66	THENAR	2.7735E-09	6.6437E-01	-8.5570	-.1776	4.1747E-09	-8.37938	-11.39350
62	THRNAT	4.7810E-11	1.3549E+00	-10.3205	.1319	3.5287E-11	-10.45239	-14.21219
60	TRONA	5.2002E-16	1.7758E-01	-15.2840	-.7506	2.9283E-15	-14.53338	-19.76115

25 S/N,AGS CE CAMPO=778.00MMHOS

INITIAL SOLUTION

TEMPERATURE = 25.30 DEGREES C PH = 7.550 ANALYTICAL EPMCAT = 6.788 ANALYTICAL EPMAN = 5.986

***** OXIDATION - REDUCTION *****

```
DISSOLVED OXYGEN =    .000 MG/L
EH MEASURED WITH CALOMEL =    .0000 VOLTS                        FLAG     CORALK  PECALC  IDAVES
MEASURED EH OF ZOBELL SOLUTION =   .0000 VOLTS                     2         0       0       0
CORRECTED EH =   .0000 VOLTS
PE COMPUTED FROM CORRECTED EH =    .000
```

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.22815E-03	-2.9107	4.92000E+01
MG	2	3.16872E-04	-3.4991	7.70000E+00
NA	1	3.18994E-03	-2.4962	7.33000E+01
K	1	5.11734E-04	-3.2910	2.00000E+01
CL	-1	2.99134E-04	-3.5241	1.06000E+01
SO4	-2	6.45736E-04	-3.1899	6.20000E+01
HCO3	-1	4.39796E-03	-2.3567	2.68220E+02

****DESCRIPTION OF SOLUTION ****

```
          ANALYTICAL  COMPUTED         PH              ACTIVITY H2O =   .9998
EPMCAT      6.788       6.560         7.550            PCO2 =  7.298754E-03
EPMAN       5.986       5.758                          LOG PCO2 =  -2.1368
                                    TEMPERATURE        PO2 =   .000000E+00
EH =  .0000  PE = 100.000           25.30 DEG C        PCH4 =    .000000E+00
PE CALC S =  1.000000E+02                              CO2 TOT =  4.626358E-03
PE CALC DOX= 1.000000E+02          IONIC STRENGTH      DENSITY =    1.0000
PE SATO DOX= 1.000000E+02          8.149656E-03        TDS =      491.0MG/L
TOT ALK =  4.397951E+00 MEQ/KG H2O                     CARBONATE ALK =  4.397560E+00 MEQ/KG H2O
ELECT   =  8.028861E-01 MEQ/KG H2O
```

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.922VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	4.50296E+01	1.12405E-03	-2.9492	7.78781E-04	-3.1086	6.92838E-01	-.1594
2	MG	2	7.08596E+00	2.91603E-04	-3.5352	2.03123E-04	-3.6922	6.96573E-01	-.1570
3	NA	1	7.29953E+01	3.17668E-03	-2.4980	2.89295E-03	-2.5387	9.10683E-01	-.0406
4	K	1	1.99455E+01	5.10339E-04	-3.2921	4.63641E-04	-3.3338	9.08498E-01	-.0417
64	H	1	3.08789E-05	3.06489E-08	-7.5136	2.81838E-08	-7.5500	9.19571E-01	-.0364
5	CL	-1	1.06000E+01	2.99134E-04	-3.5241	2.71763E-04	-3.5658	9.08498E-01	-.0417
6	SO4	-2	5.40097E+01	5.62516E-04	-3.2499	3.88236E-04	-3.4109	6.90177E-01	-.1610
7	HCO3	-1	2.62793E+02	4.30898E-03	-2.3656	3.93194E-03	-2.4054	9.12500E-01	-.0398
18	CO3	-2	5.68547E-01	9.47896E-06	-5.0232	6.57191E-06	-5.1823	6.93315E-01	-.1591
86	H2CO3	0	1.53286E+01	2.47256E-04	-3.6069	2.47747E-04	-3.6060	1.00199E+00	.0009
27	OH	-1	6.82302E-03	4.01376E-07	-6.3964	3.64547E-07	-6.4382	9.08242E-01	-.0418
19	MGOH	1	5.48381E-04	1.32783E-08	-7.8769	1.21468E-08	-7.9155	9.14789E-01	-.0387
23	MGSO4 AQ	0	1.65100E+00	1.37223E-05	-4.8626	1.37481E-05	-4.8618	1.00188E+00	.0008
22	MGHCO3	1	8.72665E-01	1.02321E-05	-4.9900	9.30505E-06	-5.0313	9.09402E-01	-.0412
21	MGCO3 AQ	0	1.07668E-01	1.27751E-06	-5.8936	1.27990E-06	-5.8928	1.00188E+00	.0008
29	CAOH	1	4.46210E-04	7.82010E-09	-8.1068	7.14572E-09	-8.1460	9.13763E-01	-.0392
32	CASO4 AQ	0	8.38646E+00	6.16313E-05	-4.2102	6.17470E-05	-4.2094	1.00188E+00	.0008
30	CAHCO3	1	3.54187E+00	3.50515E-05	-4.4553	3.20287E-05	-4.4945	9.13763E-01	-.0392
31	CACO3 AQ	0	7.31232E-01	7.30941E-06	-5.1361	7.32314E-06	-5.1353	1.00188E+00	.0008
44	NASO4	-1	7.70104E-01	6.47185E-06	-5.1890	5.90556E-06	-5.2287	9.12500E-01	-.0398
43	NAHCO3	0	5.35983E-01	6.38457E-06	-5.1949	6.39657E-06	-5.1941	1.00188E+00	.0008
42	NACO3	-1	3.25256E-02	3.92071E-07	-6.4066	3.57764E-07	-6.4464	9.12500E-01	-.0398
94	NACL	0	4.58388E-32	7.84721E-37	-36.1053	7.86195E-37	-36.1045	1.00188E+00	.0008
63	HSO4	-1	1.14118E-04	1.17621E-09	-8.9295	1.07098E-09	-8.9702	9.10533E-01	-.0407
96	H2SO4	0	3.01742E-44	3.07808E-49	-48.5117	3.08386E-49	-48.5109	1.00188E+00	.0008
93	HCL	0	2.78606E-37	7.64495E-42	-41.1166	7.65931E-42	-41.1158	1.00188E+00	.0008

MOLE RATIOS FROM ANALYTICAL MOLALITY

CL/CA	=	2.4357E-01
CL/MG	=	9.4402E-01
CL/NA	=	9.3774E-02
CL/K	=	5.8455E-01
CL/AL	=	2.9913E+26
CL/FE	=	2.9913E+26
CL/SO4	=	4.6325E-01
CL/HCO3	=	6.8017E-02
CA/MG	=	3.8759E+00
NA/K	=	6.2336E+00

MOLE RATIOS FROM COMPUTED MOLALITY

CL/CA	=	2.6612E-01
CL/MG	=	1.0258E+00
CL/NA	=	9.4166E-02
CL/K	=	5.8615E-01
CL/AL	=	2.9913E+26
CL/FE	=	2.9913E+26
CL/SO4	=	5.3178E-01
CL/HCO3	=	6.9421E-02
CA/MG	=	3.8547E+00
NA/K	=	6.2246E+00

LOG ACTIVITY RATIOS

LOG CA/H2	=	11.9914
LOG MG/H2	=	11.4078
LOG NA/H1	=	5.0113
LOG K/H1	=	4.2162
LOG AL/H3	=	-7.3500
LOG FE/H2	=	-14.9000
LOG CA/MG	=	.5837
LOG NA/K	=	.7952

25 S/N,AGS CE CAMPO=778.00MMHOS

PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18 ANHYDRIT	3.0235E-07	2.8133E-05	-6.5195	-4.5508	1.0747E-02	-1.96871	-2.68858
22 ARAGONIT	5.1181E-09	6.0648E-09	-8.2909	-8.2172	8.4389E-01	-.07371	-.10067
151 ARTIN	3.6015E-26	3.9687E-19	-25.4435	-18.4014	9.0748E-08	-7.04216	-9.61717
20 BRUCITE	2.6994E-17	3.8961E-12	-16.5687	-11.4094	6.9285E-06	-5.15936	-7.04591
13 CALCITE	5.1181E-09	3.3355E-09	-8.2909	-8.4768	1.5344E+00	.18595	.25394
12 DOLOMITE	6.8321E-18	9.4166E-18	-17.1654	-17.0261	7.2554E-01	-.13934	-.19029
19 GYPSUM	3.0224E-07	1.7426E-05	-6.5196	-4.7588	1.7344E-02	-1.76084	-2.40470
65 HALITE	7.8619E-07	3.8254E+01	-6.1045	1.5827	2.0552E-08	-7.68715	-10.49800
118 HUNTITE	1.2175E-35	2.9582E-31	-34.9145	-30.5290	4.1156E-05	-4.38557	-5.98917
39 HYDMAG	8.5654E-53	1.4494E-38	-52.0673	-37.8388	5.9095E-15	-14.22845	-19.43116
11 MAGNESIT	1.3349E-09	5.6945E-09	-8.8746	-8.2445	2.3442E-01	-.63001	-.86037
67 MIRABI	3.2433E-09	7.9614E-02	-8.4890	-1.0990	4.0738E-08	-7.39000	-10.09220
59 NAHCOL	1.1375E-05	2.8493E-01	-4.9441	-.5453	3.9921E-05	-4.39879	-6.00724
61 NATRON	5.4901E-11	5.0188E-02	-10.2604	-1.2994	1.0939E-09	-8.96102	-12.23766
150 NESQUE	1.3342E-09	6.0916E-06	-8.8748	-5.2153	2.1902E-04	-3.65952	-4.99765
66 THENAR	3.2492E-09	6.6157E-01	-8.4882	-.1794	4.9113E-09	-8.30880	-11.34696
62 THRNAT	5.4991E-11	1.3272E+00	-10.2597	.1229	4.1434E-11	-10.38264	-14.17912
60 TRONA	6.2540E-16	1.5550E-01	-15.2038	-.8083	4.0218E-15	-14.39558	-19.65940

164 CTRO AGROPECUARIO,AGS CE CAMPO=563.00 MMHOS

INITIAL SOLUTION

TEMPERATURE = 21.00 DEGREES C PH = 7.700 ANALYTICAL EPMCAT = 4.803 ANALYTICAL EPMAN = 4.229

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.15809E-03	-2.9363	4.64000E+01
MG	2	2.38649E-04	-3.6222	5.80000E+00
NA	1	1.69700E-03	-2.7703	3.90000E+01
K	1	3.14672E-04	-3.5021	1.23000E+01
CL	-1	2.99092E-04	-3.5242	1.06000E+01
SO4	-2	1.66618E-04	-3.7783	1.60000E+01
HCO3	-1	3.59778E-03	-2.4440	2.19450E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	4.803	4.711
EPMAN	4.229	4.136

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 3.597775E+00 MEQ/KG H2O
ELECT = 5.750091E-01 MEQ/KG H2O

PH
7.700

TEMPERATURE
21.00 DEG C

IONIC STRENGTH
5.916289E-03

ACTIVITY H2O = .9999
PCO2 = 4.036906E-03
LOG PCO2 = -2.3940
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 3.733095E-03
DENSITY = 1.0000
TDS = 349.5MG/L
CARBONATE ALK = 3.597376E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.837VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	4.43863E+01	1.10783E-03	-2.9555	8.06873E-04	-3.0932	7.28337E-01	-.1377
2	MG	2	5.54462E+00	2.28141E-04	-3.6418	1.66832E-04	-3.7777	7.31266E-01	-.1359
3	NA	1	3.89091E+01	1.69304E-03	-2.7713	1.56191E-03	-2.8063	9.22547E-01	-.0350
4	K	1	1.22915E+01	3.14454E-04	-3.5024	2.89588E-04	-3.5382	9.20921E-01	-.0358
64	H	1	2.16331E-05	2.14689E-08	-7.6682	1.99526E-08	-7.7000	9.29372E-01	-.0318
5	CL	-1	1.06000E+01	2.99092E-04	-3.5242	2.75440E-04	-3.5600	9.20921E-01	-.0358
6	SO4	-2	1.40131E+01	1.45927E-04	-3.8359	1.05988E-04	-3.9747	7.26306E-01	-.1389
7	HCO3	-1	2.15029E+02	3.52530E-03	-2.4528	3.25719E-03	-2.4872	9.23947E-01	-.0344
18	CO3	-2	5.77500E-01	9.62686E-06	-5.0165	7.01572E-06	-5.1539	7.28765E-01	-.1374
86	H2CO3	0	9.54550E+00	1.53951E-04	-3.8126	1.54177E-04	-3.8120	1.00147E+00	.0006
27	OH	-1	6.84360E-03	4.02530E-07	-6.3952	3.70623E-07	-6.4311	9.20733E-01	-.0359
19	MGOH	1	4.30170E-04	1.04145E-08	-7.9824	9.64060E-09	-8.0159	9.25691E-01	-.0335
23	MGSO4 AQ	0	3.30730E-01	2.74849E-06	-5.5609	2.75223E-06	-5.5603	1.00136E+00	.0006
22	MGHCO3	1	5.71289E-01	6.69745E-06	-5.1741	6.17240E-06	-5.2095	9.21605E-01	-.0355
21	MGCO3 AQ	0	8.84284E-02	1.04907E-06	-5.9792	1.05050E-06	-5.9786	1.00136E+00	.0006
29	CAOH	1	4.50989E-04	7.90274E-09	-8.1022	7.30931E-09	-8.1361	9.24908E-01	-.0339
32	CASO4 AQ	0	2.28748E+00	1.68081E-05	-4.7745	1.68310E-05	-4.7739	1.00136E+00	.0006
30	CAHCO3	1	2.63309E+00	2.60542E-05	-4.5841	2.40978E-05	-4.6180	9.24908E-01	-.0339
31	CACO3 AQ	0	7.38031E-01	7.37632E-06	-5.1322	7.38638E-06	-5.1316	1.00136E+00	.0006
44	NASO4	-1	1.09065E-01	9.16437E-07	-6.0379	8.46739E-07	-6.0723	9.23947E-01	-.0344
43	NAHCO3	0	2.39877E-01	2.85699E-06	-5.5441	2.86088E-06	-5.5435	1.00136E+00	.0006
42	NACO3	-1	1.48657E-02	1.79170E-07	-6.7467	1.65543E-07	-6.7811	9.23947E-01	-.0344
94	NACL	0	2.50999E-32	4.29628E-37	-36.3669	4.30213E-37	-36.3663	1.00136E+00	.0006
63	HSO4	-1	1.93354E-05	1.99261E-10	-9.7006	1.83809E-10	-9.7356	9.22458E-01	-.0351
96	H2SO4	0	4.13126E-45	4.21371E-50	-49.3753	4.21946E-50	-49.3747	1.00136E+00	.0006
93	HCL	0	2.00038E-37	5.48827E-42	-41.2606	5.49575E-42	-41.2600	1.00136E+00	.0006

MOLE RATIOS FROM ANALYTICAL MOLALITY

CL/CA	=	2.5826E-01
CL/MG	=	1.2533E+00
CL/NA	=	1.7625E-01
CL/K	=	9.5049E-01
CL/AL	=	2.9909E+26
CL/FE	=	2.9909E+26
CL/SO4	=	1.7951E+00
CL/HCO3	=	8.3132E-02
CA/MG	=	4.8527E+00
NA/K	=	5.3929E+00

MOLE RATIOS FROM COMPUTED MOLALITY

CL/CA	=	2.6998E-01
CL/MG	=	1.3110E+00
CL/NA	=	1.7666E-01
CL/K	=	9.5115E-01
CL/AL	=	2.9909E+26
CL/FE	=	2.9909E+26
CL/SO4	=	2.0496E+00
CL/HCO3	=	8.4841E-02
CA/MG	=	4.8559E+00
NA/K	=	5.3841E+00

LOG ACTIVITY RATIOS

LOG CA/H2	=	12.3068
LOG MG/H2	=	11.6223
LOG NA/H1	=	4.8937
LOG K/H1	=	4.1618
LOG AL/H3	=	-6.9000
LOG FE/H2	=	-14.6000
LOG CA/MG	=	.6845
LOG NA/K	=	.7319

164 CTRO AGROPECUARIO,AGS CE CAMPO=563.00 MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	8.5519E-08	3.0872E-05	-7.0679	-4.5104	2.7701E-03	-2.55751	-3.44235
22	ARAGONIT	5.6608E-09	6.5237E-09	-8.2471	-8.1855	8.6773E-01	-.06162	-.08293
151	ARTIN	2.6812E-26	4.1530E-19	-25.5717	-18.3816	6.4560E-08	-7.19003	-9.67764
20	BRUCITE	2.2916E-17	3.8153E-12	-16.6399	-11.4185	6.0064E-06	-5.22139	-7.02788
13	CALCITE	5.6608E-09	3.5371E-09	-8.2471	-8.4513	1.6004E+00	.20422	.27488
12	DOLOMITE	6.6256E-18	1.1551E-17	-17.1788	-16.9374	5.7359E-01	-.24140	-.32492
19	GYPSUM	8.5497E-08	1.7314E-05	-7.0681	-4.7616	4.9380E-03	-2.30645	-3.10443
65	HALITE	4.3021E-07	3.7398E+01	-6.3663	1.5729	1.1504E-08	-7.93917	-10.68596
118	HUNTITE	9.0767E-36	5.5815E-31	-35.0421	-30.2532	1.6262E-05	-4.78883	-6.44566
39	HYDMAG	4.2985E-53	2.7187E-38	-52.3667	-37.5656	1.5811E-15	-14.80104	-19.92191
11	MAGNESIT	1.1704E-09	6.6296E-09	-8.9316	-8.1785	1.7655E-01	-.75314	-1.01371
67	MIRABI	2.5823E-10	4.9860E-02	-9.5880	-1.3022	5.1792E-09	-8.28574	-11.15244
59	NAHCOL	5.0875E-06	2.5997E-01	-5.2935	-.5851	1.9569E-05	-4.70842	-6.33744
61	NATRON	1.7093E-11	3.4046E-02	-10.7672	-1.4679	5.0207E-10	-9.29924	-12.51659
150	NESQUE	1.1700E-09	7.0259E-06	-8.9318	-5.1533	1.6653E-04	-3.77852	-5.08581
66	THENAR	2.5856E-10	6.7097E-01	-9.5874	-.1733	3.8536E-10	-9.41413	-12.67124
62	THRNAT	1.7113E-11	1.4221E+00	-10.7667	.1529	1.2034E-11	-10.91960	-14.69756
60	TRONA	8.7051E-17	2.4233E-01	-16.0602	-.6156	3.5922E-16	-15.44463	-20.78817

147 MONTORO,AGS CE CAMPO=747.00MMHOS

INITIAL SOLUTION

TEMPERATURE = 22.30 DEGREES C PH = 7.090 ANALYTICAL EPMCAT = 6.375 ANALYTICAL EPMAN = 5.137

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.73729E-03	-2.7601	6.96000E+01
MG	2	1.56370E-04	-3.8058	3.80000E+00
NA	1	2.10186E-03	-2.6774	4.83000E+01
K	1	4.88681E-04	-3.3110	1.91000E+01
CL	-1	3.66844E-04	-3.4355	1.30000E+01
SO4	-2	1.87462E-04	-3.7271	1.80000E+01
HCO3	-1	4.39774E-03	-2.3568	2.68220E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	6.375	6.254
EPMAN	5.137	5.016

PH 7.090

TEMPERATURE 22.30 DEG C

IONIC STRENGTH 7.608258E-03

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 4.397654E+00 MEQ/KG H2O
ELECT = 1.238375E+00 MEQ/KG H2O

ACTIVITY H2O = .9998
PCO2 = 2.034609E-02
LOG PCO2 = -1.6915
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 5.138738E-03
DENSITY = 1.0000
TDS = 440.0MG/L
CARBONATE ALK = 4.397627E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.863VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	6.65138E+01	1.66026E-03	-2.7798	1.16470E-03	-2.9338	7.01518E-01	-.1540
2	MG	2	3.62251E+00	1.49066E-04	-3.8266	1.05100E-04	-3.9784	7.05058E-01	-.1518
3	NA	1	4.81730E+01	2.09633E-03	-2.6785	1.91527E-03	-2.7178	9.13629E-01	-.0392
4	K	1	1.90859E+01	4.88320E-04	-3.3113	4.45143E-04	-3.3515	9.11581E-01	-.0402
64	H	1	8.88260E-05	8.81598E-08	-7.0547	8.12830E-08	-7.0900	9.21996E-01	-.0353
5	CL	-1	1.30000E+01	3.66844E-04	-3.4355	3.34408E-04	-3.4757	9.11581E-01	-.0402
6	SO4	-2	1.52103E+01	1.58408E-04	-3.8002	1.10728E-04	-3.9557	6.99003E-01	-.1555
7	HCO3	-1	2.63888E+02	4.32671E-03	-2.3638	3.96040E-03	-2.4023	9.15336E-01	-.0384
18	CO3	-2	1.84145E-01	3.06995E-06	-5.5129	2.15503E-06	-5.6665	7.01977E-01	-.1537
86	H2CO3	0	4.63631E+01	7.47817E-04	-3.1262	7.49224E-04	-3.1254	1.00188E+00	.0008
27	OH	-1	1.87630E-03	1.10371E-07	-6.9571	1.00586E-07	-6.9975	9.11342E-01	-.0403
19	MGOH	1	7.53471E-05	1.82433E-09	-8.7389	1.67380E-09	-8.7763	9.17489E-01	-.0374
23	MGSO4 AQ	0	2.25232E-01	1.87193E-06	-5.7277	1.87521E-06	-5.7269	1.00175E+00	.0008
22	MGHCO3	1	4.45273E-01	5.22059E-06	-5.2823	4.76342E-06	-5.3221	9.12429E-01	-.0398
21	MGCO3 AQ	0	1.74487E-02	2.07022E-07	-6.6840	2.07385E-07	-6.6832	1.00175E+00	.0008
29	CAOH	1	1.79881E-04	3.15237E-09	-8.5014	2.88922E-09	-8.5392	9.16524E-01	-.0379
32	CASO4 AQ	0	3.48709E+00	2.56250E-05	-4.5913	2.56699E-05	-4.5906	1.00175E+00	.0008
30	CAHCO3	1	4.85261E+00	4.80206E-05	-4.3186	4.40120E-05	-4.3564	9.16524E-01	-.0379
31	CACO3 AQ	0	3.35848E-01	3.35697E-06	-5.4741	3.36285E-06	-5.4733	1.00175E+00	.0008
44	NASO4	-1	1.42216E-01	1.19510E-06	-5.9226	1.09392E-06	-5.9610	9.15336E-01	-.0384
43	NAHCO3	0	3.57477E-01	4.25802E-06	-5.3708	4.26548E-06	-5.3700	1.00175E+00	.0008
42	NACO3	-1	6.04362E-03	7.28474E-08	-7.1376	6.66799E-08	-7.1760	9.15336E-01	-.0384
94	NACL	0	3.73495E-32	6.39360E-37	-36.1943	6.40481E-37	-36.1935	1.00175E+00	.0008
63	HSO4	-1	8.61124E-05	8.87511E-10	-9.0518	8.10732E-10	-9.0911	9.13490E-01	-.0393
96	H2SO4	0	7.15937E-44	7.30292E-49	-48.1365	7.31573E-49	-48.1357	1.00175E+00	.0008
93	HCL	0	9.88902E-37	2.71341E-41	-40.5665	2.71817E-41	-40.5657	1.00175E+00	.0008

MOLE RATIOS FROM ANALYTICAL MOLALITY

CL/CA	=	2.1116E-01
CL/MG	=	2.3460E+00
CL/NA	=	1.7453E-01
CL/K	=	7.5068E-01
CL/AL	=	3.6684E+26
CL/FE	=	3.6684E+26
CL/SO4	=	1.9569E+00
CL/HCO3	=	8.3417E-02
CA/MG	=	1.1110E+01
NA/K	=	4.3011E+00

MOLE RATIOS FROM COMPUTED MOLALITY

CL/CA	=	2.2096E-01
CL/MG	=	2.4609E+00
CL/NA	=	1.7499E-01
CL/K	=	7.5124E-01
CL/AL	=	3.6684E+26
CL/FE	=	3.6684E+26
CL/SO4	=	2.3158E+00
CL/HCO3	=	8.4786E-02
CA/MG	=	1.1138E+01
NA/K	=	4.2929E+00

LOG ACTIVITY RATIOS

LOG CA/H2	=	11.2462
LOG MG/H2	=	10.2016
LOG NA/H1	=	4.3722
LOG K/H1	=	3.7385
LOG AL/H3	=	-8.7300
LOG FE/H2	=	-15.8200
LOG CA/MG	=	1.0446
LOG NA/K	=	.6337

147 MONTORO,AGS CE CAMPO=747.00MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	1.2897E-07	3.0009E-05	-6.8895	-4.5228	4.2976E-03	-2.36677	-3.19971
22	ARAGONIT	2.5100E-09	6.3800E-09	-8.6003	-8.1952	3.9341E-01	-.40515	-.54774
151	ARTIN	2.4072E-28	4.0958E-19	-27.6185	-18.3877	5.8773E-10	-9.23082	-12.47941
20	BRUCITE	1.0634E-18	3.8398E-12	-17.9733	-11.4157	2.7693E-07	-6.55763	-8.86544
13	CALCITE	2.5100E-09	3.4785E-09	-8.6003	-8.4586	7.2156E-01	-.14173	-.19161
12	DOLOMITE	5.6849E-19	1.0852E-17	-18.2453	-16.9645	5.2384E-02	-1.28080	-1.73155
19	GYPSUM	1.2892E-07	1.7348E-05	-6.8897	-4.7607	7.4314E-03	-2.12893	-2.87816
65	HALITE	6.4048E-07	3.7657E+01	-6.1935	1.5759	1.7008E-08	-7.76934	-10.50360
118	HUNTITE	2.9164E-38	4.5978E-31	-37.5352	-30.3375	6.3430E-08	-7.19770	-9.73078
39	HYDMAG	2.7965E-57	2.2436E-38	-56.5534	-37.6491	1.2465E-19	-18.90432	-25.55730
11	MAGNESIT	2.2649E-10	6.3288E-09	-9.6449	-8.1987	3.5788E-02	-1.44626	-1.95524
67	MIRABI	4.0548E-10	5.7520E-02	-9.3920	-1.2402	7.0494E-09	-8.15185	-11.02072
59	NAHCOL	7.5852E-06	2.6735E-01	-5.1200	-.5729	2.8372E-05	-4.54711	-6.14737
61	NATRON	7.8916E-12	3.8330E-02	-11.1028	-1.4165	2.0589E-10	-9.68637	-13.09528
150	NESQUE	2.2638E-10	6.7263E-06	-9.6452	-5.1722	3.3656E-05	-4.47294	-6.04710
66	THENAR	4.0618E-10	6.6808E-01	-9.3913	-.1752	6.0797E-10	-9.21611	-12.45953
62	THRNAT	7.9038E-12	1.3924E+00	-11.1022	.1438	5.6763E-12	-11.24593	-15.20370
60	TRONA	5.9942E-17	2.1163E-01	-16.2223	-.6744	2.8325E-16	-15.54784	-21.01957

187 VIĚEDOS CHURUBUSCO,AGS CE CAMPO=787.00 MMHOS

INITIAL SOLUTION

TEMPERATURE = 21.80 DEGREES C   PH = 7.070   ANALYTICAL EPMCAT = 6.470   ANALYTICAL EPMAN = 5.306

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.69737E-03	-2.7702	6.80000E+01
MG	2	1.56372E-04	-3.8058	3.80000E+00
NA	1	2.30206E-03	-2.6379	5.29000E+01
K	1	4.63101E-04	-3.3343	1.81000E+01
CL	-1	3.27341E-04	-3.4850	1.16000E+01
SO4	-2	2.91611E-04	-3.5352	2.80000E+01
HCO3	-1	4.39778E-03	-2.3568	2.68220E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED	PH
EPMCAT	6.470	6.322	7.070
EPMAN	5.306	5.159	

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 4.397696E+00 MEQ/KG H2O
ELECT = 1.164278E+00 MEQ/KG H2O

TEMPERATURE
21.80 DEG C

IONIC STRENGTH
7.751864E-03

ACTIVITY H2O = .9998
PCO2 = 2.116319E-02
LOG PCO2 = -1.6744
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 5.180214E-03
DENSITY = 1.0000
TDS = 450.6MG/L
CARBONATE ALK = 4.397683E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000   EQUIVALENT EH = 5.853VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	6.45008E+01	1.61003E-03	-2.7932	1.12654E-03	-2.9483	6.99701E-01	-.1551
2	MG	2	3.60028E+00	1.48153E-04	-3.8293	1.04194E-04	-3.9822	7.03287E-01	-.1529
3	NA	1	5.27444E+01	2.29529E-03	-2.6392	2.09563E-03	-2.6787	9.13014E-01	-.0395
4	K	1	1.80793E+01	4.62572E-04	-3.3348	4.21372E-04	-3.3753	9.10932E-01	-.0405
64	H	1	9.30617E-05	9.23647E-08	-7.0345	8.51138E-08	-7.0700	9.21497E-01	-.0355
5	CL	-1	1.16000E+01	3.27341E-04	-3.4850	2.98186E-04	-3.5255	9.10932E-01	-.0405
6	SO4	-2	2.37843E+01	2.47705E-04	-3.6061	1.72687E-04	-3.7627	6.97145E-01	-.1567
7	HCO3	-1	2.64066E+02	4.32967E-03	-2.3635	3.96054E-03	-2.4022	9.14743E-01	-.0387
18	CO3	-2	1.74397E-01	2.90747E-06	-5.5365	2.03569E-06	-5.6913	7.00159E-01	-.1548
86	H2CO3	0	4.88997E+01	7.88739E-04	-3.1031	7.90255E-04	-3.1022	1.00192E+00	.0008
27	OH	-1	1.72534E-03	1.01492E-07	-6.9936	9.24279E-08	-7.0342	9.10688E-01	-.0406
19	MGOH	1	6.82761E-05	1.65314E-09	-8.7817	1.51581E-09	-8.8194	9.16927E-01	-.0377
23	MGSO4 AQ	0	3.43624E-01	2.85593E-06	-5.5443	2.86104E-06	-5.5435	1.00179E+00	.0008
22	MGHCO3	1	4.40477E-01	5.16442E-06	-5.2870	4.70887E-06	-5.3271	9.11792E-01	-.0401
21	MGCO3 AQ	0	1.62146E-02	1.92382E-07	-6.7158	1.92726E-07	-6.7151	1.00179E+00	.0008
29	CAOH	1	1.59426E-04	2.79393E-09	-8.5538	2.55909E-09	-8.5919	9.15948E-01	-.0381
32	CASO4 AQ	0	5.23716E+00	3.84858E-05	-4.4147	3.85546E-05	-4.4139	1.00179E+00	.0008
30	CAHCO3	1	4.62531E+00	4.57717E-05	-4.3394	4.19245E-05	-4.3775	9.15948E-01	-.0381
31	CACO3 AQ	0	3.03690E-01	3.03557E-06	-5.5178	3.04099E-06	-5.5170	1.00179E+00	.0008
44	NASO4	-1	2.42051E-01	2.03408E-06	-5.6916	1.86066E-06	-5.7303	9.14743E-01	-.0387
43	NAHCO3	0	3.91138E-01	4.65901E-06	-5.3317	4.66733E-06	-5.3309	1.00179E+00	.0008
42	NACO3	-1	6.09178E-03	7.34287E-08	-7.1341	6.71684E-08	-7.1728	9.14743E-01	-.0387
94	NACL	0	3.64386E-32	6.23772E-37	-36.2050	6.24887E-37	-36.2042	1.00179E+00	.0008
63	HSO4	-1	1.38798E-04	1.43053E-09	-8.8445	1.30588E-09	-8.8841	9.12869E-01	-.0396
96	H2SO4	0	1.22421E-43	1.24877E-48	-47.9035	1.25100E-48	-47.9027	1.00179E+00	.0008
93	HCL	0	9.23303E-37	2.53344E-41	-40.5963	2.53797E-41	-40.5955	1.00179E+00	.0008

MOLE RATIOS FROM ANALYTICAL MOLALITY		MOLE RATIOS FROM COMPUTED MOLALITY		LOG ACTIVITY RATIOS	
CL/CA =	1.9285E-01	CL/CA =	2.0331E-01	LOG CA/H2 =	11.1917
CL/MG =	2.0934E+00	CL/MG =	2.2095E+00	LOG MG/H2 =	10.1578
CL/NA =	1.4220E-01	CL/NA =	1.4261E-01	LOG NA/H1 =	4.3913
CL/K =	7.0685E-01	CL/K =	7.0766E-01	LOG K/H1 =	3.6947
CL/AL =	3.2734E+26	CL/AL =	3.2734E+26	LOG AL/H3 =	-8.7900
CL/FE =	3.2734E+26	CL/FE =	3.2734E+26	LOG FE/H2 =	-15.8600
CL/SO4 =	1.1225E+00	CL/SO4 =	1.3215E+00	LOG CA/MG =	1.0339
CL/HCO3 =	7.4433E-02	CL/HCO3 =	7.5604E-02	LOG NA/K =	.6966
CA/MG =	1.0855E+01	CA/MG =	1.0867E+01		
NA/K =	4.9710E+00	NA/K =	4.9620E+00		

187 VIËEDOS CHURUBUSCO,AGS CE CAMPO=787.00 MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	1.9454E-07	3.0337E-05	-6.7110	-4.5180	6.4126E-03	-2.19297	-2.95972
22	ARAGONIT	2.2933E-09	6.4347E-09	-8.6395	-8.1915	3.5639E-01	-.44807	-.60474
151	ARTIN	1.8870E-28	4.1176E-19	-27.7242	-18.3854	4.5828E-10	-9.33887	-12.60412
20	BRUCITE	8.9012E-19	3.8304E-12	-18.0505	-11.4168	2.3239E-07	-6.63379	-8.95323
13	CALCITE	2.2933E-09	3.5013E-09	-8.6395	-8.4558	6.5497E-01	-.18378	-.24803
12	DOLOMITE	4.8642E-19	1.1115E-17	-18.3130	-16.9541	4.3761E-02	-1.35891	-1.83404
19	GYPSUM	1.9447E-07	1.7335E-05	-6.7111	-4.7611	1.1218E-02	-1.95007	-2.63190
65	HALITE	6.2489E-07	3.7558E+01	-6.2042	1.5747	1.6638E-08	-7.77890	-10.49872
118	HUNTITE	2.1884E-38	4.9527E-31	-37.6599	-30.3052	4.4186E-08	-7.35472	-9.92623
39	HYDMAG	1.8004E-57	2.4151E-38	-56.7446	-37.6171	7.4548E-20	-19.12757	-25.81535
11	MAGNESIT	2.1211E-10	6.4425E-09	-9.6734	-8.1909	3.2923E-02	-1.48250	-2.00084
67	MIRABI	7.5705E-10	5.4452E-02	-9.1209	-1.2640	1.3903E-08	-7.85689	-10.60398
59	NAHCOL	8.2998E-06	2.6450E-01	-5.0809	-.5776	3.1380E-05	-4.50335	-6.07790
61	NATRON	8.9244E-12	3.6626E-02	-11.0494	-1.4362	2.4366E-10	-9.61321	-12.97439
150	NESQUE	2.1200E-10	6.8397E-06	-9.6737	-5.1650	3.0995E-05	-4.50871	-6.08513
66	THENAR	7.5838E-10	6.6919E-01	-9.1201	-.1745	1.1333E-09	-8.94566	-12.07343
62	THRNAT	8.9385E-12	1.4037E+00	-11.0487	.1473	6.3677E-12	-11.19602	-15.11060
60	TRONA	7.4175E-17	2.2291E-01	-16.1297	-.6519	3.3275E-16	-15.47788	-20.88958

S/N EL SALTO SALADO,AGS   CE CAMPO=1137.0 MMHOS

INITIAL SOLUTION

TEMPERATURE = 22.10 DEGREES C   PH = 7.720   ANALYTICAL EPMCAT = 9.823   ANALYTICAL EPMAN = 8.293

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	2.63651E-03	-2.5790	1.05600E+02
MG	2	2.05798E-05	-4.6866	5.00000E-01
NA	1	3.71720E-03	-2.4298	8.54000E+01
K	1	7.98451E-04	-3.0978	3.12000E+01
CL	-1	1.57498E-03	-2.8027	5.58000E+01
SO4	-2	5.62518E-04	-3.2499	5.40000E+01
HCO3	-1	5.59858E-03	-2.2519	3.41380E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	9.823	9.485
EPMAN	8.293	7.956

PH 7.720

TEMPERATURE 22.10 DEG C

IONIC STRENGTH 1.165805E-02

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 5.598577E+00 MEQ/KG H2O
ELECT = 1.530768E+00 MEQ/KG H2O

ACTIVITY H2O = .9997
PCO2 = 5.857502E-03
LOG PCO2 = -2.2323
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 5.772473E-03
DENSITY = 1.0000
TDS = 673.9MG/L
CARBONATE ALK = 5.598107E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000   EQUIVALENT EH = 5.859VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	9.75771E+01	2.43620E-03	-2.6133	1.59264E-03	-2.7979	6.53738E-01	-.1846
2	MG	2	4.63224E-01	1.90662E-05	-4.7197	1.25557E-05	-4.9012	6.58533E-01	-.1814
3	NA	1	8.50450E+01	3.70174E-03	-2.4316	3.32050E-03	-2.4788	8.97010E-01	-.0472
4	K	1	3.11381E+01	7.96866E-04	-3.0986	7.12402E-04	-3.1473	8.94005E-01	-.0487
64	H	1	2.11245E-05	2.09710E-08	-7.6784	1.90546E-08	-7.7200	9.08618E-01	-.0416
5	CL	-1	5.58000E+01	1.57498E-03	-2.8027	1.40804E-03	-2.8514	8.94005E-01	-.0487
6	SO4	-2	4.41788E+01	4.60211E-04	-3.3370	2.99206E-04	-3.5240	6.50150E-01	-.1870
7	HCO3	-1	3.30654E+02	5.42268E-03	-2.2658	4.87684E-03	-2.3119	8.99342E-01	-.0461
18	CO3	-2	1.03320E+00	1.72289E-05	-4.7637	1.12709E-05	-4.9480	6.54183E-01	-.1843
86	H2CO3	0	1.34055E+01	2.16276E-04	-3.6650	2.16900E-04	-3.6637	1.00289E+00	.0013
27	OH	-1	8.03518E-03	4.72771E-07	-6.3253	4.22489E-07	-6.3742	8.93645E-01	-.0488
19	MGOH	1	3.83416E-05	9.28558E-10	-9.0322	8.37902E-10	-9.0768	9.02370E-01	-.0446
23	MGSO4 AQ	0	7.22383E-02	6.00522E-07	-6.2215	6.02136E-07	-6.2203	1.00269E+00	.0012
22	MGHCO3	1	6.66704E-02	7.81858E-07	-6.1069	6.99923E-07	-6.1549	8.95206E-01	-.0481
21	MGCO3 AQ	0	1.08558E-02	1.28830E-07	-6.8900	1.29176E-07	-6.8888	1.00269E+00	.0012
29	CAOH	1	1.04925E-03	1.83922E-08	-7.7354	1.65717E-08	-7.7806	9.01016E-01	-.0453
32	CASO4 AQ	0	1.28476E+01	9.44328E-05	-4.0249	9.46866E-05	-4.0237	1.00269E+00	.0012
30	CAHCO3	1	8.25900E+00	8.17486E-05	-4.0875	7.36569E-05	-4.1328	9.01016E-01	-.0453
31	CACO3 AQ	0	2.38913E+00	2.38861E-05	-4.6219	2.39503E-05	-4.6207	1.00269E+00	.0012
44	NASO4	-1	6.77061E-01	5.69097E-06	-5.2448	5.11812E-06	-5.2909	8.99342E-01	-.0461
43	NAHCO3	0	7.62282E-01	9.08189E-06	-5.0418	9.10630E-06	-5.0407	1.00269E+00	.0012
42	NACO3	-1	5.51904E-02	6.65400E-07	-6.1769	5.98422E-07	-6.2230	8.99342E-01	-.0461
94	NACL	0	2.72326E-31	4.66285E-36	-35.3313	4.67538E-36	-35.3302	1.00269E+00	.0012
63	HSO4	-1	5.52501E-05	5.69564E-10	-9.2445	5.10740E-10	-9.2918	8.96721E-01	-.0473
96	H2SO4	0	1.06190E-44	1.08344E-49	-48.9652	1.08635E-49	-48.9640	1.00269E+00	.0012
93	HCL	0	9.74954E-37	2.67577E-41	-40.5726	2.68296E-41	-40.5714	1.00269E+00	.0012

MOLE RATIOS FROM ANALYTICAL MOLALITY		MOLE RATIOS FROM COMPUTED MOLALITY		LOG ACTIVITY RATIOS	
CL/CA =	5.9737E-01	CL/CA =	6.4649E-01	LOG CA/H2 =	12.6421
CL/MG =	7.6530E+01	CL/MG =	8.2606E+01	LOG MG/H2 =	10.5388
CL/NA =	4.2370E-01	CL/NA =	4.2547E-01	LOG NA/H1 =	5.2412
CL/K =	1.9725E+00	CL/K =	1.9765E+00	LOG K/H1 =	4.5727
CL/AL =	1.5750E+27	CL/AL =	1.5750E+27	LOG AL/H3 =	-6.8400
CL/FE =	1.5750E+27	CL/FE =	1.5750E+27	LOG FE/H2 =	-14.5600
CL/SO4 =	2.7999E+00	CL/SO4 =	3.4223E+00	LOG CA/MG =	2.1033
CL/HCO3 =	2.8132E-01	CL/HCO3 =	2.9044E-01	LOG NA/K =	.6685
CA/MG =	1.2811E+02	CA/MG =	1.2778E+02		
NA/K =	4.6555E+00	NA/K =	4.6454E+00		

S/N EL SALTO SALADO,AGS CE CAMPO=1137.0 MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	4.7653E-07	3.0139E-05	-6.3219	-4.5209	1.5811E-02	-1.80105	-2.43324
22	ARAGONIT	1.7950E-08	6.4018E-09	-7.7459	-8.1937	2.8040E+00	.44777	.60494
151	ARTIN	3.1691E-28	4.1045E-19	-27.4991	-18.3867	7.7211E-10	-9.11232	-12.31087
20	BRUCITE	2.2412E-18	3.8360E-12	-17.6495	-11.4161	5.8424E-07	-6.23341	-8.42142
13	CALCITE	1.7950E-08	3.4877E-09	-7.7459	-8.4575	5.1468E+00	.71154	.96130
12	DOLOMITE	2.5402E-18	1.0957E-17	-17.5951	-16.9603	2.3184E-01	-.63481	-.85764
19	GYPSUM	4.7629E-07	1.7343E-05	-6.3221	-4.7609	2.7463E-02	-1.56125	-2.10927
65	HALITE	4.6754E-06	3.7618E+01	-5.3302	1.5754	1.2429E-07	-6.90557	-9.32952
118	HUNTITE	5.0871E-38	4.7365E-31	-37.2935	-30.3245	1.0740E-07	-6.96899	-9.41519
39	HYDMAG	8.9789E-58	2.3106E-38	-57.0468	-37.6363	3.8860E-20	-19.41050	-26.22385
11	MAGNESIT	1.4151E-10	6.3740E-09	-9.8492	-8.1956	2.2202E-02	-1.65361	-2.23406
67	MIRABI	3.2906E-09	5.6274E-02	-8.4827	-1.2497	5.8475E-08	-7.23303	-9.77192
59	NAHCOL	1.6194E-05	2.6621E-01	-4.7907	-.5748	6.0831E-05	-4.21588	-5.69571
61	NATRON	1.2396E-10	3.7640E-02	-9.9067	-1.4244	3.2932E-09	-8.48238	-11.45981
150	NESQUE	1.4141E-10	6.7714E-06	-9.8495	-5.1693	2.0883E-05	-4.68021	-6.32302
66	THENAR	3.2990E-09	6.6853E-01	-8.4816	-.1749	4.9347E-09	-8.30674	-11.22252
62	THRNAT	1.2424E-10	1.3969E+00	-9.9057	.1452	8.8937E-11	-10.05092	-13.57893
60	TRONA	2.0113E-15	2.1607E-01	-14.6965	-.6654	9.3089E-15	-14.03110	-18.95621

146 S/N,AGS CE CAMPO=1066.00 MMHOS

INITIAL SOLUTION

TEMPERATURE = 18.60 DEGREES C   PH = 7.250   ANALYTICAL EPMCAT = 8.146   ANALYTICAL EPMAN = 7.188

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	2.31674E-03	-2.6351	9.28000E+01
MG	2	2.05782E-05	-4.6866	5.00000E-01
NA	1	2.82902E-03	-2.5484	6.50000E+01
K	1	6.47409E-04	-3.1888	2.53000E+01
CL	-1	1.13175E-03	-2.9463	4.01000E+01
SO4	-2	3.12485E-05	-4.5052	3.00000E+00
HCO3	-1	5.99792E-03	-2.2220	3.65760E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	8.146	8.037
EPMAN	7.188	7.079

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 5.997862E+00 MEQ/KG H2O
ELECT = 9.589396E-01 MEQ/KG H2O

PH
7.250

TEMPERATURE
18.60 DEG C

IONIC STRENGTH
9.843149E-03

ACTIVITY H2O = .9998
PCO2 = 1.806883E-02
LOG PCO2 = -1.7431
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 6.722420E-03
DENSITY = 1.0000
TDS = 592.5MG/L
CARBONATE ALK = 5.997798E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000   EQUIVALENT EH = 5.789VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	8.92923E+01	2.22917E-03	-2.6519	1.50385E-03	-2.8228	6.74621E-01	-.1709
2	MG	2	4.76656E-01	1.96174E-05	-4.7074	1.33176E-05	-4.8756	6.78866E-01	-.1682
3	NA	1	6.48155E+01	2.82099E-03	-2.5496	2.55127E-03	-2.5932	9.04391E-01	-.0436
4	K	1	2.52973E+01	6.47339E-04	-3.1889	5.83781E-04	-3.2338	9.01816E-01	-.0449
64	H	1	6.19447E-05	6.14895E-08	-7.2112	5.62341E-08	-7.2500	9.14532E-01	-.0388
5	CL	-1	4.01000E+01	1.13175E-03	-2.9463	1.02063E-03	-2.9911	9.01816E-01	-.0449
6	SO4	-2	2.48409E+00	2.58747E-05	-4.5871	1.73747E-05	-4.7601	6.71494E-01	-.1730
7	HCO3	-1	3.59040E+02	5.88772E-03	-2.2301	5.33683E-03	-2.2727	9.06434E-01	-.0427
18	CO3	-2	3.42817E-01	5.71611E-06	-5.2429	3.85874E-06	-5.4136	6.75064E-01	-.1707
86	H2CO3	0	4.57318E+01	7.37745E-04	-3.1321	7.39577E-04	-3.1310	1.00248E+00	.0011
27	OH	-1	2.05466E-03	1.20881E-07	-6.9176	1.08976E-07	-6.9627	9.01509E-01	-.0450
19	MGOH	1	9.99171E-06	2.41960E-10	-9.6163	2.19958E-10	-9.6577	9.09066E-01	-.0414
23	MGSO4 AQ	0	4.05201E-03	3.36819E-08	-7.4726	3.37584E-08	-7.4716	1.00227E+00	.0010
22	MGHCO3	1	7.52458E-02	8.82352E-07	-6.0544	7.96636E-07	-6.0987	9.02855E-01	-.0444
21	MGCO3 AQ	0	3.73772E-03	4.43533E-08	-7.3531	4.44539E-08	-7.3521	1.00227E+00	.0010
29	CAOH	1	2.47543E-04	4.33878E-09	-8.3626	3.93913E-09	-8.4046	9.07888E-01	-.0420
32	CASO4 AQ	0	6.83521E-01	5.02364E-06	-5.2990	5.03504E-06	-5.2980	1.00227E+00	.0010
30	CAHCO3	1	7.60930E+00	7.53117E-05	-4.1231	6.83746E-05	-4.1651	9.07888E-01	-.0420
31	CACO3 AQ	0	7.22078E-01	7.21864E-06	-5.1415	7.23502E-06	-5.1406	1.00227E+00	.0010
44	NASO4	-1	2.92959E-02	2.46224E-07	-6.6087	2.23186E-07	-6.6513	9.06434E-01	-.0427
43	NAHCO3	0	6.41255E-01	7.63934E-06	-5.1169	7.65667E-06	-5.1160	1.00227E+00	.0010
42	NACO3	-1	1.20062E-02	1.44740E-07	-6.8394	1.31197E-07	-6.8821	9.06434E-01	-.0427
94	NACL	0	1.51745E-31	2.59800E-36	-35.5854	2.60390E-36	-35.5844	1.00227E+00	.0010
63	HSO4	-1	8.53436E-06	8.79722E-11	-10.0557	7.95413E-11	-10.0994	9.04164E-01	-.0438
96	H2SO4	0	5.37335E-45	5.48192E-50	-49.2611	5.49436E-50	-49.2601	1.00227E+00	.0010
93	HCL	0	2.08667E-36	5.72641E-41	-40.2421	5.73940E-41	-40.2411	1.00227E+00	.0010

MOLE RATIOS FROM ANALYTICAL MOLALITY		MOLE RATIOS FROM COMPUTED MOLALITY		LOG ACTIVITY RATIOS	
CL/CA =	4.8851E-01	CL/CA =	5.0770E-01	LOG CA/H2 =	11.6772
CL/MG =	5.4997E+01	CL/MG =	5.7691E+01	LOG MG/H2 =	9.6244
CL/NA =	4.0005E-01	CL/NA =	4.0119E-01	LOG NA/H1 =	4.6568
CL/K =	1.7481E+00	CL/K =	1.7483E+00	LOG K/H1 =	4.0162
CL/AL =	1.1317E+27	CL/AL =	1.1317E+27	LOG AL/H3 =	-8.2500
CL/FE =	1.1317E+27	CL/FE =	1.1317E+27	LOG FE/H2 =	-15.5000
CL/SO4 =	3.6218E+01	CL/SO4 =	4.3739E+01	LOG CA/MG =	2.0528
CL/HCO3 =	1.8869E-01	CL/HCO3 =	1.9222E-01	LOG NA/K =	.6405
CA/MG =	1.1258E+02	CA/MG =	1.1363E+02		
NA/K =	4.3698E+00	NA/K =	4.3578E+00		

146 S/N,AGS CE CAMPO=1066.00 MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	2.6129E-08	3.2554E-05	-7.5829	-4.4874	8.0264E-04	-3.09548	-4.13246
22	ARAGONIT	5.8030E-09	6.8011E-09	-8.2364	-8.1674	8.5324E-01	-.06893	-.09202
151	ARTIN	8.1219E-30	4.2620E-19	-29.0903	-18.3704	1.9056E-11	-10.71996	-14.31113
20	BRUCITE	1.5816E-19	3.7699E-12	-18.8009	-11.4237	4.1952E-08	-7.37725	-9.84862
13	CALCITE	5.8030E-09	3.6392E-09	-8.2364	-8.4390	1.5946E+00	.20265	.27054
12	DOLOMITE	2.9821E-19	1.2981E-17	-18.5255	-16.8867	2.2974E-02	-1.63877	-2.18776
19	GYPSUM	2.6117E-08	1.7251E-05	-7.5831	-4.7632	1.5140E-03	-2.81988	-3.76454
65	HALITE	2.6039E-06	3.6918E+01	-5.5844	1.5672	7.0532E-08	-7.15162	-9.54740
118	HUNTITE	7.8752E-40	8.0202E-31	-39.1037	-30.0958	9.8192E-10	-9.00792	-12.02557
39	HYDMAG	1.1020E-60	3.8934E-38	-59.9578	-37.4097	2.8304E-23	-22.54816	-30.10176
11	MAGNESIT	5.1389E-11	7.2308E-09	-10.2891	-8.1408	7.1069E-03	-2.14832	-2.86800
67	MIRABI	1.1283E-10	3.8169E-02	-9.9476	-1.4183	2.9561E-09	-8.52929	-11.38659
59	NAHCOL	1.3616E-05	2.4671E-01	-4.8660	-.6078	5.5189E-05	-4.25815	-5.68462
61	NATRON	2.5058E-11	2.7280E-02	-10.6010	-1.5642	9.1857E-10	-9.03689	-12.06423
150	NESQUE	5.1353E-11	7.6222E-06	-10.2894	-5.1179	6.7374E-06	-5.17151	-6.90396
66	THENAR	1.1309E-10	6.7639E-01	-9.9466	-.1698	1.6720E-10	-9.77677	-13.05197
62	THRNAT	2.5111E-11	1.4793E+00	-10.6001	.1701	1.6975E-11	-10.77019	-14.37819
60	TRONA	3.4182E-16	3.1219E-01	-15.4662	-.5056	1.0949E-15	-14.96062	-19.97240

S/N´S/N,AGS CE CAMPO=707.00MMHOS

INITIAL SOLUTION

TEMPERATURE = 25.80 DEGREES C PH = 7.300 ANALYTICAL EPMCAT = 5.975 ANALYTICAL EPMAN = 5.680

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.31798E-03	-2.8801	5.28000E+01
MG	2	1.97525E-04	-3.7044	4.80000E+00
NA	1	2.51968E-03	-2.5987	5.79000E+01
K	1	4.27286E-04	-3.3693	1.67000E+01
CL	-1	3.01948E-04	-3.5201	1.07000E+01
SO4	-2	2.91615E-04	-3.5352	2.80000E+01
HCO3	-1	4.79775E-03	-2.3190	2.92610E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	5.975	5.833
EPMAN	5.680	5.538

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 4.797704E+00 MEQ/KG H2O
ELECT = 2.949927E-01 MEQ/KG H2O

PH
7.300

TEMPERATURE
25.80 DEG C

IONIC STRENGTH
7.370192E-03

ACTIVITY H2O = .9998
PCO2 = 1.436537E-02
LOG PCO2 = -1.8427
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 5.266163E-03
DENSITY = 1.0000
TDS = 463.5MG/L
CARBONATE ALK = 4.797516E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.932VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	4.95792E+01	1.23758E-03	-2.9074	8.70674E-04	-3.0601	7.03530E-01	-.1527
2	MG	2	4.51100E+00	1.85632E-04	-3.7313	1.31242E-04	-3.8819	7.07003E-01	-.1506
3	NA	1	5.77134E+01	2.51156E-03	-2.6001	2.29634E-03	-2.6390	9.14310E-01	-.0389
4	K	1	1.66790E+01	4.26748E-04	-3.3698	3.89329E-04	-3.4097	9.12314E-01	-.0399
64	H	1	5.47366E-05	5.43274E-08	-7.2650	5.01187E-08	-7.3000	9.22532E-01	-.0350
5	CL	-1	1.07000E+01	3.01948E-04	-3.5201	2.75471E-04	-3.5599	9.12314E-01	-.0399
6	SO4	-2	2.42929E+01	2.53006E-04	-3.5969	1.77379E-04	-3.7511	7.01087E-01	-.1542
7	HCO3	-1	2.87728E+02	4.71770E-03	-2.3263	4.32139E-03	-2.3644	9.15996E-01	-.0381
18	CO3	-2	3.49559E-01	5.82778E-06	-5.2345	4.10277E-06	-5.3869	7.04003E-01	-.1524
86	H2CO3	0	2.97804E+01	4.80355E-04	-3.3184	4.81216E-04	-3.3177	1.00179E+00	.0008
27	OH	-1	3.96737E-03	2.33381E-07	-6.6319	2.12863E-07	-6.6719	9.12082E-01	-.0400
19	MGOH	1	2.07371E-04	5.02107E-09	-8.2992	4.60988E-09	-8.3363	9.18107E-01	-.0371
23	MGSO4 AQ	0	4.93847E-01	4.10452E-06	-5.3867	4.11150E-06	-5.3860	1.00170E+00	.0007
22	MGHCO3	1	6.19078E-01	7.25852E-06	-5.1392	6.62810E-06	-5.1786	9.13147E-01	-.0395
21	MGCO3 AQ	0	4.37738E-02	5.19371E-07	-6.2845	5.20253E-07	-6.2838	1.00170E+00	.0007
29	CAOH	1	2.91195E-04	5.10322E-09	-8.2922	4.68047E-09	-8.3297	9.17161E-01	-.0376
32	CASO4 AQ	0	4.30282E+00	3.16201E-05	-4.5000	3.16739E-05	-4.4993	1.00170E+00	.0007
30	CAHCO3	1	4.40291E+00	4.35714E-05	-4.3608	3.99620E-05	-4.3984	9.17161E-01	-.0376
31	CACO3 AQ	0	5.16420E-01	5.16201E-06	-5.2872	5.17077E-06	-5.2864	1.00170E+00	.0007
44	NASO4	-1	2.79110E-01	2.34554E-06	-5.6298	2.14851E-06	-5.6679	9.15996E-01	-.0381
43	NAHCO3	0	4.67686E-01	5.57088E-06	-5.2541	5.58034E-06	-5.2533	1.00170E+00	.0007
42	NACO3	-1	1.64654E-02	1.98472E-07	-6.7023	1.81799E-07	-6.7404	9.15996E-01	-.0381
94	NACL	0	3.68898E-32	6.31504E-37	-36.1996	6.32577E-37	-36.1989	1.00170E+00	.0007
63	HSO4	-1	9.36449E-05	9.65166E-10	-9.0154	8.82342E-10	-9.0544	9.14186E-01	-.0390
96	H2SO4	0	4.36047E-44	4.44801E-49	-48.3518	4.45556E-49	-48.3511	1.00170E+00	.0007
93	HCL	0	5.02304E-37	1.37829E-41	-40.8607	1.38063E-41	-40.8599	1.00170E+00	.0007

MOLE RATIOS FROM ANALYTICAL MOLALITY			MOLE RATIOS FROM COMPUTED MOLALITY			LOG ACTIVITY RATIOS		
CL/CA	=	2.2910E-01	CL/CA	=	2.4398E-01	LOG CA/H2	=	11.5399
CL/MG	=	1.5287E+00	CL/MG	=	1.6266E+00	LOG MG/H2	=	10.7181
CL/NA	=	1.1984E-01	CL/NA	=	1.2022E-01	LOG NA/H1	=	4.6610
CL/K	=	7.0666E-01	CL/K	=	7.0755E-01	LOG K/H1	=	3.8903
CL/AL	=	3.0195E+26	CL/AL	=	3.0195E+26	LOG AL/H3	=	-8.1000
CL/FE	=	3.0195E+26	CL/FE	=	3.0195E+26	LOG FE/H2	=	-15.4000
CL/SO4	=	1.0354E+00	CL/SO4	=	1.1934E+00	LOG CA/MG	=	.8218
CL/HCO3	=	6.2935E-02	CL/HCO3	=	6.4003E-02	LOG NA/K	=	.7707
CA/MG	=	6.6725E+00	CA/MG	=	6.6668E+00			
NA/K	=	5.8969E+00	NA/K	=	5.8853E+00			

S/N S/N,AGS CE CAMPO=707.00MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	1.5444E-07	2.7836E-05	-6.8112	-4.5554	5.5482E-03	-2.25585	-3.08587
22	ARAGONIT	3.5722E-09	6.0145E-09	-8.4471	-8.2208	5.9393E-01	-.22626	-.30951
151	ARTIN	3.2004E-27	3.9481E-19	-26.4948	-18.4036	8.1061E-09	-8.09119	-11.06829
20	BRUCITE	5.9467E-18	3.9054E-12	-17.2257	-11.4083	1.5227E-06	-5.81739	-7.95787
13	CALCITE	3.5722E-09	3.3107E-09	-8.4471	-8.4801	1.0790E+00	.03302	.04516
12	DOLOMITE	1.9235E-18	9.1990E-18	-17.7159	-17.0363	2.0910E-01	-.67965	-.92973
19	GYPSUM	1.5439E-07	1.7439E-05	-6.8114	-4.7585	8.8531E-03	-2.05290	-2.80826
65	HALITE	6.3258E-07	3.8353E+01	-6.1989	1.5838	1.6493E-08	-7.78269	-10.64628
118	HUNTITE	5.5768E-37	2.7509E-31	-36.2536	-30.5605	2.0273E-06	-5.69309	-7.78782
39	HYDMAG	4.9955E-55	1.3488E-38	-54.3014	-37.8701	3.7037E-17	-16.43137	-22.47718
11	MAGNESIT	5.3846E-10	5.5963E-09	-9.2688	-8.2521	9.6217E-02	-1.01675	-1.39085
67	MIRABI	9.3373E-10	8.3993E-02	-9.0298	-1.0758	1.1117E-08	-7.95402	-10.88065
59	NAHCOL	9.9234E-06	2.8794E-01	-5.0033	-.5407	3.4464E-05	-4.46264	-6.10463
61	NATRON	2.1597E-11	5.2467E-02	-10.6656	-1.2801	4.1164E-10	-9.38549	-12.83882
150	NESQUE	5.3818E-10	5.9930E-06	-9.2691	-5.2224	8.9801E-05	-4.04672	-5.53568
66	THENAR	9.3535E-10	6.6051E-01	-9.0290	-.1801	1.4161E-09	-8.84890	-12.10480
62	THRNAT	2.1631E-11	1.3168E+00	-10.6649	.1195	1.6427E-11	-10.78443	-14.75249
60	TRONA	2.1462E-16	1.4781E-01	-15.6683	-.8303	1.4520E-15	-14.83803	-20.29759

S/N S/N,AGS CE CAMPO=750.00 MMHOS

INITIAL SOLUTION

TEMPERATURE = 19.00 DEGREES C PH = 7.050 ANALYTICAL EPMCAT = 9.172 ANALYTICAL EPMAN = 6.316

***** OXIDATION - REDUCTION *****

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DISSOLVED OXYGEN =   .000 MG/L
EH MEASURED WITH CALOMEL =    .0000 VOLTS                       FLAG    CORALK  PECALC  IDAVES
MEASURED EH OF ZOBELL SOLUTION =   .0000 VOLTS                    2        0       0       0
CORRECTED EH =   .0000 VOLTS
PE COMPUTED FROM CORRECTED EH =    .000
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*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	4.36874E-04	-3.3596	1.75000E+01
MG	2	2.05776E-05	-4.6866	5.00000E-01
NA	1	8.16042E-03	-2.0883	1.87500E+02
K	1	1.02355E-04	-3.9899	4.00000E+00
CL	-1	6.46292E-04	-3.1896	2.29000E+01
SO4	-2	4.37467E-04	-3.3591	4.20000E+01
HCO3	-1	4.79825E-03	-2.3189	2.92610E+02

****DESCRIPTION OF SOLUTION ****

```
        ANALYTICAL  COMPUTED          PH               ACTIVITY H2O =   .9997
EPMCAT     9.172      9.097          7.050             PCO2 = 2.341075E-02
EPMAN      6.316      6.240                            LOG PCO2 =  -1.6306
                                  TEMPERATURE          PO2 =   .000000E+00
EH =  .0000  PE = 100.000          19.00 DEG C         PCH4 =    .000000E+00
PE CALC S =  1.000000E+02                              CO2 TOT =  5.739368E-03
PE CALC DOX= 1.000000E+02        IONIC STRENGTH        DENSITY =   1.0000
PE SATO DOX= 1.000000E+02         8.492496E-03         TDS =     567.0MG/L
TOT ALK =  4.798147E+00 MEQ/KG H2O                     CARBONATE ALK =  4.798168E+00 MEQ/KG H2O
ELECT   =  2.858409E+00 MEQ/KG H2O
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IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.797VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	1.63924E+01	4.09224E-04	-3.3880	2.82725E-04	-3.5486	6.90881E-01	-.1606
2	MG	2	4.68494E-01	1.92810E-05	-4.7149	1.33945E-05	-4.8731	6.94701E-01	-.1582
3	NA	1	1.86816E+02	8.13065E-03	-2.0899	7.39898E-03	-2.1308	9.10010E-01	-.0410
4	K	1	3.99293E+00	1.02174E-04	-3.9907	9.27487E-05	-4.0327	9.07755E-01	-.0420
64	H	1	9.76937E-05	9.69734E-08	-7.0133	8.91251E-08	-7.0500	9.19067E-01	-.0367
5	CL	-1	2.29000E+01	6.46292E-04	-3.1896	5.86675E-04	-3.2316	9.07755E-01	-.0420
6	SO4	-2	3.93428E+01	4.09790E-04	-3.3874	2.81983E-04	-3.5498	6.88117E-01	-.1623
7	HCO3	-1	2.90287E+02	4.76015E-03	-2.3224	4.34052E-03	-2.3625	9.11845E-01	-.0401
18	CO3	-2	1.73419E-01	2.89150E-06	-5.5389	1.99898E-06	-5.6992	6.91328E-01	-.1603
86	H2CO3	0	5.85834E+01	9.45044E-04	-3.0245	9.47063E-04	-3.0236	1.00214E+00	.0009
27	OH	-1	1.32908E-03	7.81918E-08	-7.1068	7.09582E-08	-7.1490	9.07489E-01	-.0422
19	MGOH	1	6.53789E-06	1.58318E-10	-9.8005	1.44732E-10	-9.8394	9.14185E-01	-.0390
23	MGSO4 AQ	0	6.68872E-02	5.55979E-07	-6.2549	5.57067E-07	-6.2541	1.00196E+00	.0008
22	MGHCO3	1	6.12926E-02	7.18714E-07	-6.1434	6.53078E-07	-6.1850	9.08676E-01	-.0416
21	MGCO3 AQ	0	1.96013E-03	2.32591E-08	-7.6334	2.33047E-08	-7.6326	1.00196E+00	.0008
29	CAOH	1	3.02141E-05	5.29561E-10	-9.2761	4.83562E-10	-9.3155	9.13137E-01	-.0395
30	CAHCO3	1	1.17109E+00	1.15904E-05	-4.9359	1.05836E-05	-4.9754	9.13137E-01	-.0395
31	CACO3 AQ	0	7.08623E-02	7.08395E-07	-6.1497	7.09782E-07	-6.1489	1.00196E+00	.0008
44	NASO4	-1	1.37437E+00	1.15509E-05	-4.9374	1.05326E-05	-4.9775	9.11845E-01	-.0401
43	NAHCO3	0	1.51304E+00	1.80245E-05	-4.7441	1.80598E-05	-4.7433	1.00196E+00	.0008
42	NACO3	-1	1.83125E-02	2.20760E-07	-6.6561	2.01299E-07	-6.6962	9.11845E-01	-.0401
94	NACL	0	2.53049E-31	4.33231E-36	-35.3633	4.34079E-36	-35.3624	1.00196E+00	.0008
63	HSO4	-1	2.20544E-04	2.27331E-09	-8.6433	2.06833E-09	-8.6844	9.09834E-01	-.0410
96	H2SO4	0	2.19128E-43	2.23550E-48	-47.6506	2.23987E-48	-47.6498	1.00196E+00	.0008
93	HCL	0	1.90165E-36	5.21853E-41	-40.2825	5.22874E-41	-40.2816	1.00196E+00	.0008

MOLE RATIOS FROM ANALYTICAL MOLALITY		MOLE RATIOS FROM COMPUTED MOLALITY		LOG ACTIVITY RATIOS	
CL/CA =	1.4794E+00	CL/CA =	1.5793E+00	LOG CA/H2 =	10.5514
CL/MG =	3.1407E+01	CL/MG =	3.3520E+01	LOG MG/H2 =	9.2269
CL/NA =	7.9198E-02	CL/NA =	7.9488E-02	LOG NA/H1 =	4.9192
CL/K =	6.3142E+00	CL/K =	6.3254E+00	LOG K/H1 =	3.0173
CL/AL =	6.4629E+26	CL/AL =	6.4629E+26	LOG AL/H3 =	-8.8500
CL/FE =	6.4629E+26	CL/FE =	6.4629E+26	LOG FE/H2 =	-15.9000
CL/SO4 =	1.4773E+00	CL/SO4 =	1.5771E+00	LOG CA/MG =	1.3244
CL/HCO3 =	1.3469E-01	CL/HCO3 =	1.3577E-01	LOG NA/K =	1.9019
CA/MG =	2.1231E+01	CA/MG =	2.1224E+01		
NA/K =	7.9727E+01	NA/K =	7.9577E+01		

S/N S/N,AGS CE CAMPO=750.00 MMHOS

PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18 ANHYDRIT	7.9724E-08	3.2265E-05	-7.0984	-4.4913	2.4709E-03	-2.60715	-3.48531
22 ARAGONIT	5.6516E-10	6.7537E-09	-9.2478	-8.1705	8.3681E-02	-1.07737	-1.44026
151 ARTIN	1.8044E-30	4.2435E-19	-29.7437	-18.3723	4.2520E-12	-11.37140	-15.20162
20 BRUCITE	6.7442E-20	3.7775E-12	-19.1711	-11.4228	1.7854E-08	-7.74827	-10.35812
13 CALCITE	5.6516E-10	3.6227E-09	-9.2478	-8.4410	1.5600E-01	-.80687	-1.07864
12 DOLOMITE	1.5132E-20	1.2729E-17	-19.8201	-16.8952	1.1888E-03	-2.92488	-3.91007
19 GYPSUM	7.9682E-08	1.7261E-05	-7.0986	-4.7629	4.6162E-03	-2.33571	-3.12245
65 HALITE	4.3408E-06	3.6998E+01	-5.3624	1.5682	1.1732E-07	-6.93061	-9.26504
118 HUNTITE	1.0849E-41	7.5469E-31	-40.9646	-30.1222	1.4375E-11	-10.84239	-14.49442
39 HYDMAG	3.4627E-62	3.6657E-38	-61.4606	-37.4358	9.4463E-25	-24.02474	-32.11697
11 MAGNESIT	2.6775E-11	7.1263E-09	-10.5723	-8.1471	3.7573E-03	-2.42513	-3.24198
67 MIRABI	1.5397E-08	3.9920E-02	-7.8126	-1.3988	3.8569E-07	-6.41376	-8.57410
59 NAHCOL	3.2115E-05	2.4889E-01	-4.4933	-.6040	1.2904E-04	-3.88929	-5.19931
61 NATRON	1.0915E-10	2.8313E-02	-9.9620	-1.5480	3.8550E-09	-8.41398	-11.24805
150 NESQUE	2.6754E-11	7.5187E-06	-10.5726	-5.1239	3.5584E-06	-5.44875	-7.28405
66 THENAR	1.5437E-08	6.7548E-01	-7.8114	-.1704	2.2854E-08	-7.64104	-10.21477
62 THRNAT	1.0940E-10	1.4695E+00	-9.9610	.1672	7.4449E-11	-10.12814	-13.53959
60 TRONA	3.5127E-15	2.9920E-01	-14.4544	-.5240	1.1740E-14	-13.93032	-18.62246

96 LOS CAËOS,AGS CE CAMPO=511.00 MMHOS

INITIAL SOLUTION

TEMPERATURE = 14.10 DEGREES C PH = 7.000 ANALYTICAL EPMCAT = 4.482 ANALYTICAL EPMAN = 4.129

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.17806E-03	-2.9288	4.72000E+01
MG	2	7.81780E-05	-4.1069	1.90000E+00
NA	1	1.65348E-03	-2.7816	3.80000E+01
K	1	3.17230E-04	-3.4986	1.24000E+01
CL	-1	7.05405E-05	-4.1516	2.50000E+00
SO4	-2	3.12409E-05	-4.5053	3.00000E+00
HCO3	-1	3.99764E-03	-2.3982	2.43840E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	4.482	4.442
EPMAN	4.129	4.089

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 3.997532E+00 MEQ/KG H2O
ELECT = 3.526630E-01 MEQ/KG H2O

PH
7.000

TEMPERATURE
14.10 DEG C

IONIC STRENGTH
5.512181E-03

ACTIVITY H2O = .9999
PCO2 = 2.090914E-02
LOG PCO2 = -1.6797
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 4.974285E-03
DENSITY = 1.0000
TDS = 348.8MG/L
CARBONATE ALK = 3.997592E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.700VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	4.60229E+01	1.14868E-03	-2.9398	8.47573E-04	-3.0718	7.37869E-01	-.1320
2	MG	2	1.83588E+00	7.55399E-05	-4.1218	5.59464E-05	-4.2522	7.40621E-01	-.1304
3	NA	1	3.79234E+01	1.65015E-03	-2.7825	1.52746E-03	-2.8160	9.25647E-01	-.0336
4	K	1	1.23985E+01	3.17193E-04	-3.4987	2.93129E-04	-3.5329	9.24134E-01	-.0343
64	H	1	1.08117E-04	1.07296E-07	-6.9694	1.00000E-07	-7.0000	9.32000E-01	-.0306
5	CL	-1	2.50000E+00	7.05405E-05	-4.1516	6.51889E-05	-4.1858	9.24134E-01	-.0343
6	SO4	-2	2.65993E+00	2.76995E-05	-4.5575	2.03855E-05	-4.6907	7.35952E-01	-.1332
7	HCO3	-1	2.41588E+02	3.96072E-03	-2.4022	3.67136E-03	-2.4352	9.26942E-01	-.0329
18	CO3	-2	1.08409E-01	1.80716E-06	-5.7430	1.33416E-06	-5.8748	7.38263E-01	-.1318
86	H2CO3	0	6.07568E+01	9.79891E-04	-3.0088	9.81289E-04	-3.0082	1.00143E+00	.0006
27	OH	-1	7.86339E-04	4.62512E-08	-7.3349	4.27342E-08	-7.3692	9.23958E-01	-.0343
19	MGOH	1	1.52840E-05	3.70027E-10	-9.4318	3.43595E-10	-9.4640	9.28566E-01	-.0322
23	MGSO4 AQ	0	1.76596E-02	1.46758E-07	-6.8334	1.46944E-07	-6.8328	1.00127E+00	.0006
22	MGHCO3	1	2.07461E-01	2.43215E-06	-5.6140	2.24917E-06	-5.6480	9.24767E-01	-.0340
21	MGCO3 AQ	0	5.07270E-03	6.01801E-08	-7.2205	6.02566E-08	-7.2200	1.00127E+00	.0006
29	CAOH	1	5.18527E-05	9.08620E-10	-9.0416	8.43051E-10	-9.0741	9.27837E-01	-.0325
32	CASO4 AQ	0	4.34577E-01	3.19321E-06	-5.4958	3.19726E-06	-5.4952	1.00127E+00	.0006
30	CAHCO3	1	2.51581E+00	2.48937E-05	-4.6039	2.30973E-05	-4.6364	9.27837E-01	-.0325
31	CACO3 AQ	0	1.30913E-01	1.30843E-06	-5.8833	1.31009E-06	-5.8827	1.00127E+00	.0006
44	NASO4	-1	1.95285E-02	1.64092E-07	-6.7849	1.52103E-07	-6.8179	9.26942E-01	-.0329
43	NAHCO3	0	2.64439E-01	3.14952E-06	-5.5018	3.15352E-06	-5.5012	1.00127E+00	.0006
42	NACO3	-1	1.91076E-03	2.30294E-08	-7.6377	2.13469E-08	-7.6707	9.26942E-01	-.0329
94	NACL	0	5.80992E-33	9.94468E-38	-37.0024	9.95731E-38	-37.0019	1.00127E+00	.0006
63	HSO4	-1	1.54138E-05	1.58846E-10	-9.7990	1.47021E-10	-9.8326	9.25558E-01	-.0336
96	H2SO4	0	1.99612E-44	2.03596E-49	-48.6912	2.03855E-49	-48.6907	1.00127E+00	.0006
93	HCL	0	2.37301E-37	6.51062E-42	-41.1864	6.51889E-42	-41.1858	1.00127E+00	.0006

MOLE RATIOS FROM ANALYTICAL MOLALITY		MOLE RATIOS FROM COMPUTED MOLALITY		LOG ACTIVITY RATIOS	
CL/CA =	5.9879E-02	CL/CA =	6.1410E-02	LOG CA/H2 =	10.9282
CL/MG =	9.0231E-01	CL/MG =	9.3382E-01	LOG MG/H2 =	9.7478
CL/NA =	4.2662E-02	CL/NA =	4.2748E-02	LOG NA/H1 =	4.1840
CL/K =	2.2236E-01	CL/K =	2.2239E-01	LOG K/H1 =	3.4671
CL/AL =	7.0541E+25	CL/AL =	7.0541E+25	LOG AL/H3 =	-9.0000
CL/FE =	7.0541E+25	CL/FE =	7.0541E+25	LOG FE/H2 =	-16.0000
CL/SO4 =	2.2580E+00	CL/SO4 =	2.5466E+00	LOG CA/MG =	1.1804
CL/HCO3 =	1.7646E-02	CL/HCO3 =	1.7810E-02	LOG NA/K =	.7169
CA/MG =	1.5069E+01	CA/MG =	1.5206E+01		
NA/K =	5.2123E+00	NA/K =	5.2024E+00		

96 LOS CAËOS,AGS CE CAMPO=511.00 MMHOS

PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18 ANHYDRIT	1.7278E-08	3.6044E-05	-7.7625	-4.4432	4.7937E-04	-3.31933	-4.36295
22 ARAGONIT	1.1308E-09	7.3671E-09	-8.9466	-8.1327	1.5349E-01	-.81391	-1.06981
151 ARTIN	7.6229E-30	4.4795E-19	-29.1179	-18.3488	1.7017E-11	-10.76911	-14.15501
20 BRUCITE	1.0217E-19	3.6843E-12	-18.9907	-11.4336	2.7731E-08	-7.55704	-9.93303
13 CALCITE	1.1308E-09	3.8052E-09	-8.9466	-8.4196	2.9717E-01	-.52699	-.69268
12 DOLOMITE	8.4404E-20	1.6239E-17	-19.0736	-16.7894	5.1975E-03	-2.28420	-3.00238
19 GYPSUM	1.7273E-08	1.7129E-05	-7.7626	-4.7663	1.0084E-03	-2.99637	-3.93845
65 HALITE	9.9573E-08	3.6014E+01	-7.0019	1.5565	2.7649E-09	-8.55833	-11.24913
118 HUNTITE	4.7025E-40	1.6086E-30	-39.3277	-29.7935	2.9232E-10	-9.53414	-12.53175
39 HYDMAG	3.1696E-60	7.7586E-38	-59.4990	-37.1102	4.0852E-23	-22.38879	-29.42800
11 MAGNESIT	7.4641E-11	8.5424E-09	-10.1270	-8.0684	8.7378E-03	-2.05860	-2.70584
67 MIRABI	4.7495E-11	2.2852E-02	-10.3234	-1.6411	2.0784E-09	-8.68227	-11.41204
59 NAHCOL	5.6078E-06	2.2312E-01	-5.2512	-.6515	2.5134E-05	-4.59974	-6.04594
61 NATRON	3.1084E-12	1.7827E-02	-11.5075	-1.7489	1.7436E-10	-9.75855	-12.82672
150 NESQUE	7.4610E-11	8.9127E-06	-10.1272	-5.0500	8.3712E-06	-5.07721	-6.67353
66 THENAR	4.7562E-11	6.8692E-01	-10.3227	-.1631	6.9239E-11	-10.15965	-13.35393
62 THRNAT	3.1123E-12	1.5956E+00	-11.5069	.2029	1.9505E-12	-11.70985	-15.39152
60 TRONA	1.7451E-17	5.0773E-01	-16.7582	-.2944	3.4371E-17	-16.46381	-21.64017

77 SN P CIENEGUILLAS,AGS CE CAMPO=412.00 MMHOS

INITIAL SOLUTION

TEMPERATURE = 21.10 DEGREES C PH = 7.450 ANALYTICAL EPMCAT = 3.563 ANALYTICAL EPMAN = 4.186

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	5.94010E-04	-3.2262	2.38000E+01
MG	2	1.44010E-04	-3.8416	3.50000E+00
NA	1	1.74048E-03	-2.7593	4.00000E+01
K	1	3.47924E-04	-3.4585	1.36000E+01
CL	-1	1.26971E-04	-3.8963	4.50000E+00
SO4	-2	3.12403E-05	-4.5053	3.00000E+00
HCO3	-1	3.99757E-03	-2.3982	2.43840E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED	PH
EPMCAT	3.563	3.529	7.450
EPMAN	4.186	4.151	

TEMPERATURE
21.10 DEG C

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 3.997540E+00 MEQ/KG H2O
ELECT = -6.225207E-01 MEQ/KG H2O

IONIC STRENGTH
4.582893E-03

ACTIVITY H2O = .9999
PCO2 = 8.134061E-03
LOG PCO2 = -2.0897
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 4.297769E-03
DENSITY = 1.0000
TDS = 332.2MG/L
CARBONATE ALK = 3.997345E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.839VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	2.29954E+01	5.73929E-04	-3.2411	4.32424E-04	-3.3641	7.53445E-01	-.1229
2	MG	2	3.36653E+00	1.38518E-04	-3.8585	1.04699E-04	-3.9801	7.55851E-01	-.1216
3	NA	1	3.99160E+01	1.73683E-03	-2.7602	1.61638E-03	-2.7915	9.30651E-01	-.0312
4	K	1	1.35981E+01	3.47875E-04	-3.4586	3.23303E-04	-3.4904	9.29366E-01	-.0318
64	H	1	3.81903E-05	3.78998E-08	-7.4214	3.54814E-08	-7.4500	9.36189E-01	-.0286
5	CL	-1	4.50000E+00	1.26971E-04	-3.8963	1.18002E-04	-3.9281	9.29366E-01	-.0318
6	SO4	-2	2.76591E+00	2.88027E-05	-4.5406	2.16543E-05	-4.6645	7.51817E-01	-.1239
7	HCO3	-1	2.41278E+02	3.95556E-03	-2.4028	3.68576E-03	-2.4335	9.31792E-01	-.0307
18	CO3	-2	3.56064E-01	5.93545E-06	-5.2265	4.47435E-06	-5.3493	7.53836E-01	-.1227
86	H2CO3	0	1.91858E+01	3.09425E-04	-3.5094	3.09777E-04	-3.5090	1.00114E+00	.0005
27	OH	-1	3.84308E-03	2.26040E-07	-6.6458	2.10041E-07	-6.6777	9.29219E-01	-.0319
19	MGOH	1	1.51946E-04	3.67857E-09	-8.4343	3.43283E-09	-8.4643	9.33199E-01	-.0300
23	MGSO4 AQ	0	4.25333E-02	3.53461E-07	-6.4517	3.53835E-07	-6.4512	1.00106E+00	.0005
22	MGHCO3	1	4.02309E-01	4.71635E-06	-5.3264	4.38580E-06	-5.3580	9.29915E-01	-.0316
21	MGCO3 AQ	0	3.54587E-02	4.20658E-07	-6.3761	4.21102E-07	-6.3756	1.00106E+00	.0005
29	CAOH	1	1.35947E-04	2.38217E-09	-8.6230	2.22153E-09	-8.6533	9.32567E-01	-.0303
32	CASO4 AQ	0	2.50768E-01	1.84257E-06	-5.7346	1.84452E-06	-5.7341	1.00106E+00	.0005
30	CAHCO3	1	1.58859E+00	1.57187E-05	-4.8036	1.46587E-05	-4.8339	9.32567E-01	-.0303
31	CACO3 AQ	0	2.52838E-01	2.52697E-06	-5.5974	2.52964E-06	-5.5969	1.00106E+00	.0005
44	NASO4	-1	2.28812E-02	1.92260E-07	-6.7161	1.79146E-07	-6.7468	9.31792E-01	-.0307
43	NAHCO3	0	2.80996E-01	3.34666E-06	-5.4754	3.35020E-06	-5.4749	1.00106E+00	.0005
42	NACO3	-1	9.77948E-03	1.17865E-07	-6.9286	1.09826E-07	-6.9593	9.31792E-01	-.0307
94	NACL	0	1.11317E-32	1.90535E-37	-36.7200	1.90736E-37	-36.7196	1.00106E+00	.0005
63	HSO4	-1	6.98271E-06	7.19590E-11	-10.1429	6.69649E-11	-10.1742	9.30597E-01	-.0312
96	H2SO4	0	2.67001E-45	2.72325E-50	-49.5649	2.72612E-50	-49.5645	1.00106E+00	.0005
93	HCL	0	1.52446E-37	4.18247E-42	-41.3786	4.18688E-42	-41.3781	1.00106E+00	.0005

MOLE RATIOS FROM ANALYTICAL MOLALITY		MOLE RATIOS FROM COMPUTED MOLALITY		LOG ACTIVITY RATIOS	
CL/CA =	2.1375E-01	CL/CA =	2.2123E-01	LOG CA/H2 =	11.5359
CL/MG =	8.8168E-01	CL/MG =	9.1664E-01	LOG MG/H2 =	10.9199
CL/NA =	7.2952E-02	CL/NA =	7.3105E-02	LOG NA/H1 =	4.6585
CL/K =	3.6494E-01	CL/K =	3.6499E-01	LOG K/H1 =	3.9596
CL/AL =	1.2697E+26	CL/AL =	1.2697E+26	LOG AL/H3 =	-7.6500
CL/FE =	1.2697E+26	CL/FE =	1.2697E+26	LOG FE/H2 =	-15.1000
CL/SO4 =	4.0643E+00	CL/SO4 =	4.4083E+00	LOG CA/MG =	.6160
CL/HCO3 =	3.1762E-02	CL/HCO3 =	3.2099E-02	LOG NA/K =	.6989
CA/MG =	4.1248E+00	CA/MG =	4.1434E+00		
NA/K =	5.0025E+00	NA/K =	4.9927E+00		

77 SN P CIENEGUILLAS,AGS   CE CAMPO=412.00 MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	9.3639E-09	3.0805E-05	-8.0285	-4.5114	3.0398E-04	-3.51716	-4.73564
22	ARAGONIT	1.9348E-09	6.5125E-09	-8.7134	-8.1863	2.9709E-01	-.52711	-.70972
151	ARTIN	2.1630E-27	4.1485E-19	-26.6649	-18.3821	5.2140E-09	-8.28283	-11.15232
20	BRUCITE	4.6190E-18	3.8172E-12	-17.3354	-11.4183	1.2101E-06	-5.91719	-7.96713
13	CALCITE	1.9348E-09	3.5327E-09	-8.7134	-8.4519	5.4769E-01	-.26147	-.35205
12	DOLOMITE	9.0639E-19	1.1496E-17	-18.0427	-16.9395	7.8846E-02	-1.10322	-1.48542
19	GYPSUM	9.3616E-09	1.7317E-05	-8.0287	-4.7615	5.4061E-04	-3.26712	-4.39897
65	HALITE	1.9074E-07	3.7418E+01	-6.7196	1.5731	5.0974E-09	-8.29265	-11.16554
118	HUNTITE	1.9891E-37	5.4986E-31	-36.7013	-30.2597	3.6175E-07	-6.44159	-8.67320
39	HYDMAG	2.2235E-55	2.6787E-38	-54.6530	-37.5721	8.3006E-18	-17.08089	-22.99836
11	MAGNESIT	4.6846E-10	6.6059E-09	-9.3293	-8.1801	7.0916E-02	-1.14926	-1.54740
67	MIRABI	5.6506E-11	5.0414E-02	-10.2479	-1.2975	1.1209E-09	-8.95045	-12.05123
59	NAHCOL	5.9576E-06	2.6053E-01	-5.2249	-.5841	2.2867E-05	-4.64079	-6.24854
61	NATRON	1.1676E-11	3.4359E-02	-10.9327	-1.4640	3.3981E-10	-9.46876	-12.74910
150	NESQUE	4.6829E-10	7.0023E-06	-9.3295	-5.1548	6.6877E-05	-4.17473	-5.62101
66	THENAR	5.6576E-11	6.7074E-01	-10.2474	-.1734	8.4348E-11	-10.07393	-13.56392
62	THRNAT	1.1689E-11	1.4198E+00	-10.9322	.1522	8.2327E-12	-11.08446	-14.92453
60	TRONA	6.9627E-17	2.3981E-01	-16.1572	-.6201	2.9035E-16	-15.53709	-20.91972

144 S/N,AGS CE CAMPO=445.00MMHOS

INITIAL SOLUTION

TEMPERATURE = 22.70 DEGREES C PH = 8.000 ANALYTICAL EPMCAT = 3.770 ANALYTICAL EPMAN = 3.312

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	8.38559E-04	-3.0765	3.36000E+01
MG	2	1.97489E-04	-3.7045	4.80000E+00
NA	1	1.43582E-03	-2.8429	3.30000E+01
K	1	2.63488E-04	-3.5792	1.03000E+01
CL	-1	7.33572E-05	-4.1346	2.60000E+00
SO4	-2	2.08258E-05	-4.6814	2.00000E+00
HCO3	-1	3.19786E-03	-2.4951	1.95070E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	3.770	3.716
EPMAN	3.312	3.257

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 3.197885E+00 MEQ/KG H2O
ELECT = 4.585648E-01 MEQ/KG H2O

PH
8.000

TEMPERATURE
22.70 DEG C

IONIC STRENGTH
4.513225E-03

ACTIVITY H2O = .9999
PCO2 = 1.843054E-03
LOG PCO2 = -2.7345
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 3.234192E-03
DENSITY = 1.0000
TDS = 281.4MG/L
CARBONATE ALK = 3.196954E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.871VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	3.23720E+01	8.07911E-04	-3.0926	6.09453E-04	-3.2151	7.54357E-01	-.1224
2	MG	2	4.62477E+00	1.90279E-04	-3.7206	1.43992E-04	-3.8417	7.56739E-01	-.1211
3	NA	1	3.29407E+01	1.43324E-03	-2.8437	1.33426E-03	-2.8748	9.30942E-01	-.0311
4	K	1	1.02990E+01	2.63463E-04	-3.5793	2.44934E-04	-3.6110	9.29673E-01	-.0317
64	H	1	1.07613E-05	1.06789E-08	-7.9715	1.00000E-08	-8.0000	9.36428E-01	-.0285
5	CL	-1	2.60000E+00	7.33572E-05	-4.1346	6.81982E-05	-4.1662	9.29673E-01	-.0317
6	SO4	-2	1.79199E+00	1.86598E-05	-4.7291	1.40462E-05	-4.8524	7.52751E-01	-.1233
7	HCO3	-1	1.89815E+02	3.11171E-03	-2.5070	2.90035E-03	-2.5376	9.32075E-01	-.0305
18	CO3	-2	1.02855E+00	1.71446E-05	-4.7659	1.29399E-05	-4.8881	7.54750E-01	-.1222
86	H2CO3	0	4.15739E+00	6.70462E-05	-4.1736	6.71208E-05	-4.1731	1.00111E+00	.0005
27	OH	-1	1.54229E-02	9.07091E-07	-6.0423	8.43166E-07	-6.0741	9.29528E-01	-.0317
19	MGOH	1	8.54667E-04	2.06902E-08	-7.6842	1.93136E-08	-7.7141	9.33467E-01	-.0299
23	MGSO4 AQ	0	3.95953E-02	3.29029E-07	-6.4828	3.29371E-07	-6.4823	1.00104E+00	.0005
22	MGHCO3	1	4.39307E-01	5.14982E-06	-5.2882	4.79044E-06	-5.3196	9.30216E-01	-.0314
21	MGCO3 AQ	0	1.44550E-01	1.71476E-06	-5.7658	1.71654E-06	-5.7653	1.00104E+00	.0005
29	CAOH	1	7.77468E-04	1.36227E-08	-7.8657	1.27079E-08	-7.8959	9.32841E-01	-.0302
32	CASO4 AQ	0	2.32472E-01	1.70805E-06	-5.7675	1.70983E-06	-5.7670	1.00104E+00	.0005
30	CAHCO3	1	1.84986E+00	1.83029E-05	-4.7375	1.70737E-05	-4.7677	9.32841E-01	-.0302
31	CACO3 AQ	0	1.06504E+00	1.06439E-05	-4.9729	1.06550E-05	-4.9724	1.00104E+00	.0005
44	NASO4	-1	1.23760E-02	1.03985E-07	-6.9830	9.69214E-08	-7.0136	9.32075E-01	-.0305
43	NAHCO3	0	1.82537E-01	2.17390E-06	-5.6628	2.17616E-06	-5.6623	1.00104E+00	.0005
42	NACO3	-1	2.53452E-02	3.05453E-07	-6.5151	2.84705E-07	-6.5456	9.32075E-01	-.0305
94	NACL	0	5.31095E-33	9.08999E-38	-37.0414	9.09944E-38	-37.0410	1.00104E+00	.0005
63	HSO4	-1	1.33361E-06	1.37425E-11	-10.8619	1.27928E-11	-10.8930	9.30892E-01	-.0311
96	H2SO4	0	1.37580E-46	1.40316E-51	-50.8529	1.40462E-51	-50.8524	1.00104E+00	.0005
93	HCL	0	2.48329E-38	6.81273E-43	-42.1667	6.81982E-43	-42.1662	1.00104E+00	.0005

MOLE RATIOS FROM ANALYTICAL MOLALITY		MOLE RATIOS FROM COMPUTED MOLALITY		LOG ACTIVITY RATIOS	
CL/CA =	8.7480E-02	CL/CA =	9.0799E-02	LOG CA/H2 =	12.7849
CL/MG =	3.7145E-01	CL/MG =	3.8552E-01	LOG MG/H2 =	12.1583
CL/NA =	5.1091E-02	CL/NA =	5.1183E-02	LOG NA/H1 =	5.1252
CL/K =	2.7841E-01	CL/K =	2.7843E-01	LOG K/H1 =	4.3890
CL/AL =	7.3357E+25	CL/AL =	7.3357E+25	LOG AL/H3 =	-6.0000
CL/FE =	7.3357E+25	CL/FE =	7.3357E+25	LOG FE/H2 =	-14.0000
CL/SO4 =	3.5224E+00	CL/SO4 =	3.9313E+00	LOG CA/MG =	.6266
CL/HCO3 =	2.2939E-02	CL/HCO3 =	2.3575E-02	LOG NA/K =	.7362
CA/MG =	4.2461E+00	CA/MG =	4.2459E+00		
NA/K =	5.4493E+00	NA/K =	5.4400E+00		

144 S/N,AGS CE CAMPO=445.00MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	8.5605E-09	2.9749E-05	-8.0675	-4.5265	2.8776E-04	-3.54098	-4.79363
22	ARAGONIT	7.8862E-09	6.3367E-09	-8.1031	-8.1981	1.2445E+00	.09501	.12862
151	ARTIN	1.9068E-25	4.0785E-19	-24.7197	-18.3895	4.6752E-07	-6.33020	-8.56956
20	BRUCITE	1.0237E-16	3.8473E-12	-15.9898	-11.4148	2.6608E-05	-4.57499	-6.19344
13	CALCITE	7.8862E-09	3.4601E-09	-8.1031	-8.4609	2.2792E+00	.35779	.48436
12	DOLOMITE	1.4694E-17	1.0647E-17	-16.8329	-16.9728	1.3801E+00	.13990	.18939
19	GYPSUM	8.5588E-09	1.7359E-05	-8.0676	-4.7605	4.9306E-04	-3.30710	-4.47702
65	HALITE	9.0994E-08	3.7737E+01	-7.0410	1.5768	2.4113E-09	-8.61775	-11.66636
118	HUNTITE	5.1012E-35	4.3330E-31	-34.2923	-30.3632	1.1773E-04	-3.92911	-5.31907
39	HYDMAG	1.2333E-51	2.1155E-38	-50.9089	-37.6746	5.8296E-14	-13.23436	-17.91614
11	MAGNESIT	1.8632E-09	6.2395E-09	-8.7297	-8.2048	2.9862E-01	-.52488	-.71057
67	MIRABI	2.4980E-11	6.0091E-02	-10.6024	-1.2212	4.1571E-10	-9.38121	-12.69990
59	NAHCOL	3.8698E-06	2.6965E-01	-5.4123	-.5692	1.4351E-05	-4.84311	-6.55641
61	NATRON	2.3013E-11	3.9745E-02	-10.6380	-1.4007	5.7901E-10	-9.23731	-12.50510
150	NESQUE	1.8627E-09	6.6372E-06	-8.7299	-5.1780	2.8064E-04	-3.55185	-4.80835
66	THENAR	2.5006E-11	6.6721E-01	-10.6020	-.1757	3.7479E-11	-10.42622	-14.11458
62	THRNAT	2.3034E-11	1.3835E+00	-10.6376	.1410	1.6650E-11	-10.77860	-14.59162
60	TRONA	8.9128E-17	2.0303E-01	-16.0500	-.6924	4.3898E-16	-15.35755	-20.79042

S/N LA FORTUNA,AGS CE CAMPO=756.00 MMHOS

INITIAL SOLUTION

TEMPERATURE = 29.00 DEGREES C PH = 7.500 ANALYTICAL EPMCAT = 6.638 ANALYTICAL EPMAN = 5.954

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.17824E-03	-2.9288	4.72000E+01
MG	2	4.11527E-05	-4.3856	1.00000E+00
NA	1	3.74703E-03	-2.4263	8.61000E+01
K	1	4.55449E-04	-3.3416	1.78000E+01
CL	-1	1.55213E-04	-3.8091	5.50000E+00
SO4	-2	3.02042E-04	-3.5199	2.90000E+01
HCO3	-1	5.19787E-03	-2.2842	3.17000E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	6.638	6.497
EPMAN	5.954	5.813

PH
7.500

TEMPERATURE
29.00 DEG C

IONIC STRENGTH
7.567579E-03

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 5.197842E+00 MEQ/KG H2O
ELECT = 6.840429E-01 MEQ/KG H2O

ACTIVITY H2O = .9998
PCO2 = 1.024515E-02
LOG PCO2 = -1.9895
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 5.492539E-03
DENSITY = 1.0000
TDS = 503.6MG/L
CARBONATE ALK = 5.197396E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.996VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	4.38144E+01	1.09372E-03	-2.9611	7.64911E-04	-3.1164	6.99364E-01	-.1553
2	MG	2	9.31699E-01	3.83419E-05	-4.4163	2.69512E-05	-4.5694	7.02918E-01	-.1531
3	NA	1	8.57946E+01	3.73374E-03	-2.4279	3.40855E-03	-2.4674	9.12905E-01	-.0396
4	K	1	1.77752E+01	4.54815E-04	-3.3422	4.14270E-04	-3.3827	9.10854E-01	-.0406
64	H	1	3.45791E-05	3.43219E-08	-7.4644	3.16228E-08	-7.5000	9.21359E-01	-.0356
5	CL	-1	5.50000E+00	1.55213E-04	-3.8091	1.41377E-04	-3.8496	9.10854E-01	-.0406
6	SO4	-2	2.56176E+01	2.66813E-04	-3.5738	1.85934E-04	-3.7306	6.96870E-01	-.1568
7	HCO3	-1	3.11052E+02	5.10034E-03	-2.2924	4.66499E-03	-2.3311	9.14644E-01	-.0387
18	CO3	-2	6.39711E-01	1.06656E-05	-4.9720	7.46434E-06	-5.1270	6.99855E-01	-.1550
86	H2CO3	0	1.95631E+01	3.15564E-04	-3.5009	3.16135E-04	-3.5001	1.00181E+00	.0008
27	OH	-1	7.98897E-03	4.69972E-07	-6.3279	4.27964E-07	-6.3686	9.10616E-01	-.0407
19	MGOH	1	8.90368E-05	2.15593E-09	-8.6664	1.97658E-09	-8.7041	9.16814E-01	-.0377
23	MGSO4 AQ	0	1.15379E-01	9.58993E-07	-6.0182	9.60665E-07	-6.0174	1.00174E+00	.0008
22	MGHCO3	1	1.40271E-01	1.64471E-06	-5.7839	1.49950E-06	-5.8241	9.11712E-01	-.0401
21	MGCO3 AQ	0	1.71767E-02	2.03808E-07	-6.6908	2.04163E-07	-6.6900	1.00174E+00	.0008
29	CAOH	1	5.26097E-04	9.22029E-09	-8.0353	8.44432E-09	-8.0734	9.15841E-01	-.0382
32	CASO4 AQ	0	4.06948E+00	2.99066E-05	-4.5242	2.99588E-05	-4.5235	1.00174E+00	.0008
30	CAHCO3	1	4.61201E+00	4.56425E-05	-4.3406	4.18013E-05	-4.3788	9.15841E-01	-.0382
31	CACO3 AQ	0	8.92574E-01	8.92229E-06	-5.0495	8.93785E-06	-5.0488	1.00174E+00	.0008
44	NASO4	-1	4.43669E-01	3.72858E-06	-5.4285	3.41032E-06	-5.4672	9.14644E-01	-.0387
43	NAHCO3	0	7.49337E-01	8.92614E-06	-5.0493	8.94170E-06	-5.0486	1.00174E+00	.0008
42	NACO3	-1	5.21951E-02	6.29179E-07	-6.2012	5.75475E-07	-6.2400	9.14644E-01	-.0387
94	NACL	0	2.80997E-32	4.81049E-37	-36.3178	4.81888E-37	-36.3171	1.00174E+00	.0008
63	HSO4	-1	6.78487E-05	6.99322E-10	-9.1553	6.38328E-10	-9.1950	9.12782E-01	-.0396
96	H2SO4	0	1.81950E-44	1.85610E-49	-48.7314	1.85934E-49	-48.7306	1.00174E+00	.0008
93	HCL	0	1.62641E-37	4.46293E-42	-41.3504	4.47072E-42	-41.3496	1.00174E+00	.0008

MOLE RATIOS FROM ANALYTICAL MOLALITY

CL/CA	=	1.3173E-01
CL/MG	=	3.7716E+00
CL/NA	=	4.1423E-02
CL/K	=	3.4079E-01
CL/AL	=	1.5521E+26
CL/FE	=	1.5521E+26
CL/SO4	=	5.1388E-01
CL/HCO3	=	2.9861E-02
CA/MG	=	2.8631E+01
NA/K	=	8.2271E+00

MOLE RATIOS FROM COMPUTED MOLALITY

CL/CA	=	1.4191E-01
CL/MG	=	4.0481E+00
CL/NA	=	4.1570E-02
CL/K	=	3.4127E-01
CL/AL	=	1.5521E+26
CL/FE	=	1.5521E+26
CL/SO4	=	5.8173E-01
CL/HCO3	=	3.0432E-02
CA/MG	=	2.8526E+01
NA/K	=	8.2094E+00

LOG ACTIVITY RATIOS

LOG CA/H2	=	11.8836
LOG MG/H2	=	10.4306
LOG NA/H1	=	5.0326
LOG K/H1	=	4.1173
LOG AL/H3	=	-7.5000
LOG FE/H2	=	-15.0000
LOG CA/MG	=	1.4530
LOG NA/K	=	.9153

S/N LA´FORTUNA,AGS CE CAMPO=756.00 MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	1.4222E-07	2.6027E-05	-6.8470	-4.5846	5.4644E-03	-2.26246	-3.12804
22	ARAGONIT	5.7096E-09	5.7054E-09	-8.2434	-8.2437	1.0007E+00	.00031	.00043
151	ARTIN	9.9246E-28	3.8206E-19	-27.0033	-18.4179	2.5977E-09	-8.58541	-11.87007
20	BRUCITE	4.9362E-18	3.9650E-12	-17.3066	-11.4018	1.2449E-06	-5.90486	-8.16397
13	CALCITE	5.7096E-09	3.1468E-09	-8.2434	-8.5021	1.8144E+00	.25873	.35772
12	DOLOMITE	1.1486E-18	7.9352E-18	-17.9398	-17.1004	1.4475E-01	-.83939	-1.16053
19	GYPSUM	1.4217E-07	1.7520E-05	-6.8472	-4.7565	8.1147E-03	-2.09073	-2.89061
65	HALITE	4.8189E-07	3.8986E+01	-6.3171	1.5909	1.2361E-08	-7.90796	-10.93343
118	HUNTITE	4.6485E-38	1.7380E-31	-37.3327	-30.7600	2.6747E-07	-6.57273	-9.08737
39	HYDMAG	8.0787E-57	8.5580E-39	-56.0927	-38.0676	9.4399E-19	-18.02503	-24.92115
11	MAGNESIT	2.0117E-10	5.0135E-09	-9.6964	-8.2999	4.0126E-02	-1.39657	-1.93088
67	MIRABI	2.1561E-09	1.1782E-01	-8.6663	-.9288	1.8299E-08	-7.73757	-10.69786
59	NAHCOL	1.5901E-05	3.0768E-01	-4.7986	-.5119	5.1680E-05	-4.28668	-5.92670
61	NATRON	8.6556E-11	6.9467E-02	-10.0627	-1.1582	1.2460E-09	-8.90448	-12.31121
150	NESQUE	2.0106E-10	5.4054E-06	-9.6967	-5.2672	3.7196E-05	-4.42951	-6.12417
66	THENAR	2.1602E-09	6.5381E-01	-8.6655	-.1846	3.3041E-09	-8.48095	-11.72565
62	THRNAT	8.6705E-11	1.2526E+00	-10.0620	.0978	6.9221E-11	-10.15977	-14.04675
60	TRONA	1.3784E-15	1.0724E-01	-14.8606	-.9697	1.2854E-14	-13.89096	-19.20544

126 SAN FELIPE,AGS   CE CAMPO=814.00MMHOS

INITIAL SOLUTION

TEMPERATURE = 22.20 DEGREES C   PH = 7.450   ANALYTICAL EPMCAT =   6.650   ANALYTICAL EPMAN =   4.880

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN =   .000 MG/L
EH MEASURED WITH CALOMEL =   .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION =   .0000 VOLTS
CORRECTED EH =   .0000 VOLTS
PE COMPUTED FROM CORRECTED EH =   .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.37783E-03	-2.8608	5.52000E+01
MG	2	1.97517E-04	-3.7044	4.80000E+00
NA	1	2.88511E-03	-2.5398	6.63000E+01
K	1	6.16598E-04	-3.2100	2.41000E+01
CL	-1	6.17981E-04	-3.2090	2.19000E+01
SO4	-2	3.33261E-04	-3.4772	3.20000E+01
HCO3	-1	3.59805E-03	-2.4439	2.19450E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED	PH
EPMCAT	6.650	6.511	7.450
EPMAN	4.880	4.742	

TEMPERATURE
22.20 DEG C

IONIC STRENGTH
7.415410E-03

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 3.598017E+00 MEQ/KG H2O
ELECT   = 1.769782E+00 MEQ/KG H2O

ACTIVITY H2O =   .9998
PCO2 = 7.251873E-03
LOG PCO2 = -2.1395
PO2 =   .000000E+00
PCH4 =   .000000E+00
CO2 TOT = 3.853761E-03
DENSITY =   1.0000
TDS =   423.8MG/L
CARBONATE ALK = 3.597795E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000   EQUIVALENT EH = 5.861VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	5.22848E+01	1.30506E-03	-2.8844	9.19175E-04	-3.0366	7.04314E-01	-.1522
2	MG	2	4.55267E+00	1.87340E-04	-3.7274	1.32596E-04	-3.8775	7.07787E-01	-.1501
3	NA	1	6.61169E+01	2.87714E-03	-2.5410	2.63135E-03	-2.5798	9.14571E-01	-.0388
4	K	1	2.40675E+01	6.15767E-04	-3.2106	5.61932E-04	-3.2503	9.12571E-01	-.0397
64	H	1	3.87421E-05	3.84509E-08	-7.4151	3.54814E-08	-7.4500	9.22770E-01	-.0349
5	CL	-1	2.19000E+01	6.17981E-04	-3.2090	5.63952E-04	-3.2488	9.12571E-01	-.0397
6	SO4	-2	2.76749E+01	2.88218E-04	-3.5403	2.02286E-04	-3.6940	7.01853E-01	-.1538
7	HCO3	-1	2.15551E+02	3.53411E-03	-2.4517	3.23812E-03	-2.4897	9.16246E-01	-.0380
18	CO3	-2	3.42805E-01	5.71495E-06	-5.2430	4.02773E-06	-5.3949	7.04770E-01	-.1520
86	H2CO3	0	1.65721E+01	2.67296E-04	-3.5730	2.67786E-04	-3.5722	1.00183E+00	.0008
27	OH	-1	4.26085E-03	2.50635E-07	-6.6010	2.28664E-07	-6.6408	9.12338E-01	-.0398
19	MGOH	1	2.15645E-04	5.22119E-09	-8.2822	4.79489E-09	-8.3192	9.18353E-01	-.0370
23	MGSO4 AQ	0	5.17774E-01	4.30321E-06	-5.3662	4.31057E-06	-5.3655	1.00171E+00	.0007
22	MGHCO3	1	4.58564E-01	5.37633E-06	-5.2695	4.91074E-06	-5.3089	9.13401E-01	-.0393
21	MGCO3 AQ	0	4.10824E-02	4.87418E-07	-6.3121	4.88251E-07	-6.3114	1.00171E+00	.0007
29	CAOH	1	3.22196E-04	5.64630E-09	-8.2482	5.17996E-09	-8.2857	9.17408E-01	-.0374
32	CASO4 AQ	0	5.02350E+00	3.69147E-05	-4.4328	3.69778E-05	-4.4321	1.00171E+00	.0007
30	CAHCO3	1	3.11868E+00	3.08614E-05	-4.5106	2.83125E-05	-4.5480	9.17408E-01	-.0374
31	CACO3 AQ	0	4.94374E-01	4.94144E-06	-5.3061	4.94988E-06	-5.3054	1.00171E+00	.0007
44	NASO4	-1	3.56370E-01	2.99468E-06	-5.5236	2.74387E-06	-5.5616	9.16246E-01	-.0380
43	NAHCO3	0	4.01586E-01	4.78333E-06	-5.3203	4.79150E-06	-5.3195	1.00171E+00	.0007
42	NACO3	-1	1.54240E-02	1.85912E-07	-6.7307	1.70341E-07	-6.7687	9.16246E-01	-.0380
94	NACL	0	8.65419E-32	1.48142E-36	-35.8293	1.48396E-36	-35.8286	1.00171E+00	.0007
63	HSO4	-1	6.84125E-05	7.05076E-10	-9.1518	6.44749E-10	-9.1906	9.14439E-01	-.0388
96	H2SO4	0	2.49236E-44	2.54229E-49	-48.5948	2.54663E-49	-48.5940	1.00171E+00	.0007
93	HCL	0	7.28023E-37	1.99756E-41	-40.6995	2.00098E-41	-40.6988	1.00171E+00	.0007

MOLE RATIOS FROM ANALYTICAL MOLALITY			MOLE RATIOS FROM COMPUTED MOLALITY			LOG ACTIVITY RATIOS		
CL/CA	=	4.4852E-01	CL/CA	=	4.7353E-01	LOG CA/H2	=	11.8634
CL/MG	=	3.1287E+00	CL/MG	=	3.2987E+00	LOG MG/H2	=	11.0225
CL/NA	=	2.1420E-01	CL/NA	=	2.1479E-01	LOG NA/H1	=	4.8702
CL/K	=	1.0022E+00	CL/K	=	1.0036E+00	LOG K/H1	=	4.1997
CL/AL	=	6.1798E+26	CL/AL	=	6.1798E+26	LOG AL/H3	=	-7.6500
CL/FE	=	6.1798E+26	CL/FE	=	6.1798E+26	LOG FE/H2	=	-15.1000
CL/SO4	=	1.8543E+00	CL/SO4	=	2.1441E+00	LOG CA/MG	=	.8409
CL/HCO3	=	1.7175E-01	CL/HCO3	=	1.7486E-01	LOG NA/K	=	.6705
CA/MG	=	6.9757E+00	CA/MG	=	6.9663E+00			
NA/K	=	4.6791E+00	NA/K	=	4.6724E+00			

126 SAN FELIPE,AGS CE CAMPO=814.00MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	1.8594E-07	3.0074E-05	-6.7306	-4.5218	6.1827E-03	-2.20883	-2.98516
22	ARAGONIT	3.7022E-09	6.3909E-09	-8.4315	-8.1944	5.7929E-01	-.23710	-.32044
151	ARTIN	3.7009E-27	4.1001E-19	-26.4317	-18.3872	9.0262E-09	-8.04450	-10.87191
20	BRUCITE	6.9331E-18	3.8379E-12	-17.1591	-11.4159	1.8065E-06	-5.74317	-7.76172
13	CALCITE	3.7022E-09	3.4831E-09	-8.4315	-8.4580	1.0629E+00	.02649	.03580
12	DOLOMITE	1.9772E-18	1.0904E-17	-17.7039	-16.9624	1.8132E-01	-.74155	-1.00219
19	GYPSUM	1.8587E-07	1.7345E-05	-6.7308	-4.7608	1.0716E-02	-1.96997	-2.66235
65	HALITE	1.4840E-06	3.7638E+01	-5.8286	1.5756	3.9428E-08	-7.40420	-10.00656
118	HUNTITE	5.6394E-37	4.6666E-31	-36.2488	-30.3310	1.2085E-06	-5.91776	-7.99769
39	HYDMAG	5.6365E-55	2.2768E-38	-54.2490	-37.6427	2.4756E-17	-16.60633	-22.44297
11	MAGNESIT	5.3406E-10	6.3514E-09	-9.2724	-8.1971	8.4086E-02	-1.07527	-1.45320
67	MIRABI	1.3983E-09	5.6894E-02	-8.8544	-1.2449	2.4577E-08	-7.60946	-10.28397
59	NAHCOL	8.5206E-06	2.6678E-01	-5.0695	-.5738	3.1939E-05	-4.49568	-6.07578
61	NATRON	2.7842E-11	3.7983E-02	-10.5553	-1.4204	7.3300E-10	-9.13490	-12.34555
150	NESQUE	5.3380E-10	6.7488E-06	-9.2726	-5.1708	7.9095E-05	-4.10185	-5.54353
66	THENAR	1.4006E-09	6.6830E-01	-8.8537	-.1750	2.0958E-09	-8.67865	-11.72894
62	THRNAT	2.7883E-11	1.3947E+00	-10.5547	.1445	1.9993E-11	-10.69912	-14.45956
60	TRONA	2.3754E-16	2.1383E-01	-15.6243	-.6699	1.1109E-15	-14.95433	-20.21035

S/N VIË ELIZONDO,AGS CE CAMPO=1490.00 MMHOS

INITIAL SOLUTION

TEMPERATURE = 34.80 DEGREES C PH = 6.430 ANALYTICAL EPMCAT = 11.287 ANALYTICAL EPMAN = 9.028

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	2.01753E-03	-2.6952	8.08000E+01
MG	2	2.05819E-05	-4.6865	5.00000E-01
NA	1	6.27721E-03	-2.2022	1.44200E+02
K	1	9.41858E-04	-3.0260	3.68000E+01
CL	-1	3.44384E-04	-3.4630	1.22000E+01
SO4	-2	1.14599E-03	-2.9408	1.10000E+02
HCO3	-1	6.39905E-03	-2.1939	3.90150E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	11.287	10.831
EPMAN	9.028	8.573

PH 6.430

TEMPERATURE 34.80 DEG C

IONIC STRENGTH 1.245640E-02

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 6.398604E+00 MEQ/KG H2O
ELECT = 2.259362E+00 MEQ/KG H2O

ACTIVITY H2O = .9996
PCO2 = 1.581409E-01
LOG PCO2 = -.8010
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 1.063185E-02
DENSITY = 1.0000
TDS = 774.7MG/L
CARBONATE ALK = 6.398983E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 6.111VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	7.06359E+01	1.76374E-03	-2.7536	1.12882E-03	-2.9474	6.40017E-01	-.1938
2	MG	2	4.39033E-01	1.80723E-05	-4.7430	1.16585E-05	-4.9334	6.45102E-01	-.1904
3	NA	1	1.43303E+02	6.23817E-03	-2.2049	5.56484E-03	-2.2545	8.92063E-01	-.0496
4	K	1	3.66142E+01	9.37103E-04	-3.0282	8.32934E-04	-3.0794	8.88840E-01	-.0512
64	H	1	4.13685E-04	4.10720E-07	-6.3865	3.71535E-07	-6.4300	9.04595E-01	-.0435
5	CL	-1	1.22000E+01	3.44384E-04	-3.4630	3.06102E-04	-3.5141	8.88840E-01	-.0512
6	SO4	-2	9.26885E+01	9.65635E-04	-3.0152	6.14399E-04	-3.2115	6.36265E-01	-.1964
7	HCO3	-1	3.82598E+02	6.27518E-03	-2.2024	5.61387E-03	-2.2507	8.94615E-01	-.0484
18	CO3	-2	7.90069E-02	1.31760E-06	-5.8802	8.43968E-07	-6.0737	6.40537E-01	-.1935
86	H2CO3	0	2.62542E+02	4.23610E-03	-2.3730	4.24843E-03	-2.3718	1.00291E+00	.0013
27	OH	-1	1.05873E-03	6.22994E-08	-7.2055	5.53503E-08	-7.2569	8.88457E-01	-.0514
19	MGOH	1	5.44557E-06	1.31894E-10	-9.8798	1.18425E-10	-9.9266	8.97879E-01	-.0468
23	MGSO4 AQ	0	1.90256E-01	1.58177E-06	-5.8009	1.58631E-06	-5.7996	1.00287E+00	.0012
22	MGHCO3	1	7.77894E-02	9.12345E-07	-6.0398	8.12120E-07	-6.0904	8.90146E-01	-.0505
21	MGCO3 AQ	0	9.17100E-04	1.08847E-08	-7.9632	1.09159E-08	-7.9619	1.00287E+00	.0012
29	CAOH	1	1.06462E-04	1.86635E-09	-8.7290	1.67303E-09	-8.7765	8.96420E-01	-.0475
32	CASO4 AQ	0	2.07717E+01	1.52693E-04	-3.8162	1.53131E-04	-3.8149	1.00287E+00	.0012
30	CAHCO3	1	9.99187E+00	9.89109E-05	-4.0048	8.86657E-05	-4.0522	8.96420E-01	-.0475
31	CACO3 AQ	0	1.74481E-01	1.74461E-06	-5.7583	1.74962E-06	-5.7571	1.00287E+00	.0012
44	NASO4	-1	2.53390E+00	2.13006E-05	-4.6716	1.90558E-05	-4.7200	8.94615E-01	-.0484
43	NAHCO3	0	1.47016E+00	1.75174E-05	-4.7565	1.75677E-05	-4.7553	1.00287E+00	.0012
42	NACO3	-1	1.30236E-02	1.57034E-07	-6.8040	1.40485E-07	-6.8524	8.94615E-01	-.0484
94	NACL	0	9.91901E-32	1.69853E-36	-35.7699	1.70341E-36	-35.7687	1.00287E+00	.0012
63	HSO4	-1	3.17884E-03	3.27735E-08	-7.4845	2.92269E-08	-7.5342	8.91785E-01	-.0497
96	H2SO4	0	8.28778E-42	8.45679E-47	-46.0728	8.48108E-47	-46.0715	1.00287E+00	.0012
93	HCL	0	4.13155E-36	1.13402E-40	-39.9454	1.13728E-40	-39.9441	1.00287E+00	.0012

MOLE RATIOS FROM ANALYTICAL MOLALITY		
CL/CA	=	1.7070E-01
CL/MG	=	1.6732E+01
CL/NA	=	5.4863E-02
CL/K	=	3.6564E-01
CL/AL	=	3.4438E+26
CL/FE	=	3.4438E+26
CL/SO4	=	3.0051E-01
CL/HCO3	=	5.3818E-02
CA/MG	=	9.8024E+01
NA/K	=	6.6647E+00

MOLE RATIOS FROM COMPUTED MOLALITY		
CL/CA	=	1.9526E-01
CL/MG	=	1.9056E+01
CL/NA	=	5.5206E-02
CL/K	=	3.6750E-01
CL/AL	=	3.4438E+26
CL/FE	=	3.4438E+26
CL/SO4	=	3.5664E-01
CL/HCO3	=	5.4880E-02
CA/MG	=	9.7593E+01
NA/K	=	6.6569E+00

LOG ACTIVITY RATIOS		
LOG CA/H2	=	9.9126
LOG MG/H2	=	7.9266
LOG NA/H1	=	4.1755
LOG K/H1	=	3.3506
LOG AL/H3	=	-10.7100
LOG FE/H2	=	-17.1400
LOG CA/MG	=	1.9860
LOG NA/K	=	.8248

S/N VIË ELIZONDO,AGS   CE CAMPO=1490.00 MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	6.9355E-07	2.3125E-05	-6.1589	-4.6359	2.9991E-02	-1.52301	-2.14611
22	ARAGONIT	9.5269E-10	5.1997E-09	-9.0210	-8.2840	1.8322E-01	-.73703	-1.03857
151	ARTIN	3.5106E-31	3.6061E-19	-30.4546	-18.4430	9.7353E-13	-12.01165	-16.92591
20	BRUCITE	3.5718E-20	4.0722E-12	-19.4471	-11.3902	8.7711E-09	-8.05694	-11.35324
13	CALCITE	9.5269E-10	2.8332E-09	-9.0210	-8.5477	3.3626E-01	-.47333	-.66698
12	DOLOMITE	9.3739E-21	6.1183E-18	-20.0281	-17.2134	1.5321E-03	-2.81471	-3.96628
19	GYPSUM	6.9305E-07	1.7664E-05	-6.1592	-4.7529	3.9235E-02	-1.40632	-1.98168
65	HALITE	1.7034E-06	4.0125E+01	-5.7687	1.6034	4.2453E-08	-7.37209	-10.38820
118	HUNTITE	9.0752E-43	7.7471E-32	-42.0421	-31.1109	1.1714E-11	-10.93129	-15.40354
39	HYDMAG	3.3429E-64	3.8436E-39	-63.4759	-38.4153	8.6974E-26	-25.06061	-35.31352
11	MAGNESIT	9.8394E-12	4.1315E-09	-11.0070	-8.3839	2.3816E-03	-2.62314	-3.69633
67	MIRABI	1.8958E-08	2.1374E-01	-7.7222	-.6701	8.8700E-08	-7.05208	-9.93726
59	NAHCOL	3.1240E-05	3.4576E-01	-4.5053	-.4612	9.0354E-05	-4.04405	-5.69858
61	NATRON	2.6042E-11	1.1383E-01	-10.5843	-.9437	2.2878E-10	-9.64058	-13.58478
150	NESQUE	9.8288E-12	4.5079E-06	-11.0075	-5.3460	2.1804E-06	-5.66147	-7.97772
66	THENAR	1.9026E-08	6.4218E-01	-7.7206	-.1923	2.9628E-08	-7.52830	-10.60832
62	THRNAT	2.6126E-11	1.1472E+00	-10.5829	.0596	2.2774E-11	-10.64257	-14.99670
60	TRONA	8.1590E-16	6.0974E-02	-15.0884	-1.2149	1.3381E-14	-13.87351	-19.54950

S/N SN FCO DE ROMOS,AGS   CE CAMPO=716.0 MMHOS

INITIAL SOLUTION

TEMPERATURE = 21.80 DEGREES C   PH = 7.200   ANALYTICAL EPMCAT = 6.527   ANALYTICAL EPMAN = 6.258

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.35798E-03	-2.8671	5.44000E+01
MG	2	1.39920E-04	-3.8541	3.40000E+00
NA	1	2.99417E-03	-2.5237	6.88000E+01
K	1	5.39891E-04	-3.2677	2.11000E+01
CL	-1	2.51165E-04	-3.6000	8.90000E+00
SO4	-2	4.06198E-04	-3.3913	3.90000E+01
HCO3	-1	5.19791E-03	-2.2842	3.17000E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	6.527	6.365
EPMAN	6.258	6.097

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 5.197847E+00 MEQ/KG H2O
ELECT = 2.683271E-01 MEQ/KG H2O

PH
7.200

TEMPERATURE
21.80 DEG C

IONIC STRENGTH
7.993371E-03

ACTIVITY H2O = .9998
PCO2 = 1.854836E-02
LOG PCO2 = -1.7317
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 5.880143E-03
DENSITY = 1.0000
TDS = 512.6MG/L
CARBONATE ALK = 5.197775E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000   EQUIVALENT EH = 5.853VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	5.08198E+01	1.26861E-03	-2.8967	8.83429E-04	-3.0538	6.96377E-01	-.1572
2	MG	2	3.17594E+00	1.30700E-04	-3.8837	9.14955E-05	-4.0386	7.00045E-01	-.1549
3	NA	1	6.85455E+01	2.98309E-03	-2.5253	2.72024E-03	-2.5654	9.11886E-01	-.0401
4	K	1	2.10657E+01	5.39012E-04	-3.2684	4.90364E-04	-3.3095	9.09746E-01	-.0411
64	H	1	6.90524E-05	6.85395E-08	-7.1641	6.30958E-08	-7.2000	9.20576E-01	-.0359
5	CL	-1	8.90000E+00	2.51165E-04	-3.6000	2.28497E-04	-3.6411	9.09746E-01	-.0411
6	SO4	-2	3.40786E+01	3.54940E-04	-3.4498	2.46241E-04	-3.6086	6.93754E-01	-.1588
7	HCO3	-1	3.12554E+02	5.12502E-03	-2.2903	4.68250E-03	-2.3295	9.13656E-01	-.0392
18	CO3	-2	2.79448E-01	4.65913E-06	-5.3317	3.24665E-06	-5.4886	6.96836E-01	-.1569
86	H2CO3	0	4.28527E+01	6.91245E-04	-3.1604	6.92615E-04	-3.1595	1.00198E+00	.0009
27	OH	-1	2.33029E-03	1.37086E-07	-6.8630	1.24679E-07	-6.9042	9.09495E-01	-.0412
19	MGOH	1	8.09613E-05	1.96041E-09	-8.7077	1.79553E-09	-8.7458	9.15895E-01	-.0382
23	MGSO4 AQ	0	4.30219E-01	3.57587E-06	-5.4466	3.58245E-06	-5.4458	1.00184E+00	.0008
22	MGHCO3	1	4.57858E-01	5.36853E-06	-5.2701	4.88874E-06	-5.3108	9.10628E-01	-.0407
21	MGCO3 AQ	0	2.27057E-02	2.69413E-07	-6.5696	2.69910E-07	-6.5688	1.00184E+00	.0008
29	CAOH	1	1.68831E-04	2.95892E-09	-8.5289	2.70709E-09	-8.5675	9.14892E-01	-.0386
32	CASO4 AQ	0	5.85562E+00	4.30333E-05	-4.3662	4.31126E-05	-4.3654	1.00184E+00	.0008
30	CAHCO3	1	4.29304E+00	4.24862E-05	-4.3718	3.88703E-05	-4.4104	9.14892E-01	-.0386
31	CACO3 AQ	0	3.79778E-01	3.79635E-06	-5.4206	3.80334E-06	-5.4198	1.00184E+00	.0008
44	NASO4	-1	4.48528E-01	3.76945E-06	-5.4237	3.44398E-06	-5.4629	9.13656E-01	-.0392
43	NAHCO3	0	6.00199E-01	7.14966E-06	-5.1457	7.16283E-06	-5.1449	1.00184E+00	.0008
42	NACO3	-1	1.26255E-02	1.52194E-07	-6.8176	1.39053E-07	-6.8568	9.13656E-01	-.0392
94	NACL	0	3.62406E-32	6.20422E-37	-36.2073	6.21565E-37	-36.2065	1.00184E+00	.0008
63	HSO4	-1	1.46892E-04	1.51405E-09	-8.8199	1.38041E-09	-8.8600	9.11734E-01	-.0401
96	H2SO4	0	9.59198E-44	9.78501E-49	-48.0094	9.80304E-49	-48.0086	1.00184E+00	.0008
93	HCL	0	5.24429E-37	1.43907E-41	-40.8419	1.44172E-41	-40.8411	1.00184E+00	.0008

MOLE RATIOS FROM ANALYTICAL MOLALITY

CL/CA	=	1.8495E-01
CL/MG	=	1.7951E+00
CL/NA	=	8.3885E-02
CL/K	=	4.6521E-01
CL/AL	=	2.5117E+26
CL/FE	=	2.5117E+26
CL/SO4	=	6.1833E-01
CL/HCO3	=	4.8320E-02
CA/MG	=	9.7054E+00
NA/K	=	5.5459E+00

MOLE RATIOS FROM COMPUTED MOLALITY

CL/CA	=	1.9798E-01
CL/MG	=	1.9217E+00
CL/NA	=	8.4196E-02
CL/K	=	4.6597E-01
CL/AL	=	2.5117E+26
CL/FE	=	2.5117E+26
CL/SO4	=	7.0763E-01
CL/HCO3	=	4.9008E-02
CA/MG	=	9.7063E+00
NA/K	=	5.5344E+00

LOG ACTIVITY RATIOS

LOG CA/H2	=	11.3462
LOG MG/H2	=	10.3614
LOG NA/H1	=	4.6346
LOG K/H1	=	3.8905
LOG AL/H3	=	-8.4000
LOG FE/H2	=	-15.6000
LOG CA/MG	=	.9848
LOG NA/K	=	.7441

S/N SN FCO DE ROMOS,AGS CE CAMPO=716.0 MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	2.1754E-07	3.0337E-05	-6.6625	-4.5180	7.1707E-03	-2.14444	-2.89422
22	ARAGONIT	2.8682E-09	6.4347E-09	-8.5424	-8.1915	4.4574E-01	-.35092	-.47362
151	ARTIN	4.2225E-28	4.1176E-19	-27.3744	-18.3854	1.0255E-09	-8.98908	-12.13203
20	BRUCITE	1.4223E-18	3.8304E-12	-17.8470	-11.4168	3.7132E-07	-6.43025	-8.67853
13	CALCITE	2.8682E-09	3.5013E-09	-8.5424	-8.4558	8.1917E-01	-.08663	-.11691
12	DOLOMITE	8.5201E-19	1.1115E-17	-18.0696	-16.9541	7.6651E-02	-1.11548	-1.50550
19	GYPSUM	2.1745E-07	1.7335E-05	-6.6626	-4.7611	1.2544E-02	-1.90156	-2.56643
65	HALITE	6.2157E-07	3.7558E+01	-6.2065	1.5747	1.6550E-08	-7.78121	-10.50184
118	HUNTITE	7.5182E-38	4.9527E-31	-37.1239	-30.3052	1.5180E-07	-6.81873	-9.20284
39	HYDMAG	1.1066E-56	2.4151E-38	-55.9560	-37.6171	4.5820E-19	-18.33895	-24.75099
11	MAGNESIT	2.9705E-10	6.4425E-09	-9.5272	-8.1909	4.6108E-02	-1.33622	-1.80342
67	MIRABI	1.8186E-09	5.4452E-02	-8.7403	-1.2640	3.3398E-08	-7.47629	-10.09030
59	NAHCOL	1.2738E-05	2.6450E-01	-4.8949	-.5776	4.8158E-05	-4.31733	-5.82685
61	NATRON	2.3977E-11	3.6626E-02	-10.6202	-1.4362	6.5465E-10	-9.18399	-12.39509
150	NESQUE	2.9688E-10	6.8397E-06	-9.5274	-5.1650	4.3406E-05	-4.36245	-5.88775
66	THENAR	1.8221E-09	6.6919E-01	-8.7394	-.1745	2.7229E-09	-8.56497	-11.55964
62	THRNAT	2.4020E-11	1.4037E+00	-10.6194	.1473	1.7111E-11	-10.76672	-14.53120
60	TRONA	3.0589E-16	2.2291E-01	-15.5144	-.6519	1.3722E-15	-14.86257	-20.05914

646 EL MAGUEY,AGS CE CAMPO=910.00 MMHOS

INITIAL SOLUTION

TEMPERATURE = 23.90 DEGREES C PH = 7.120 ANALYTICAL EPMCAT = 8.050 ANALYTICAL EPMAN = 5.848

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.51776E-03	-2.8188	6.08000E+01
MG	2	3.16882E-04	-3.4991	7.70000E+00
NA	1	3.58172E-03	-2.4459	8.23000E+01
K	1	8.03448E-04	-3.0950	3.14000E+01
CL	-1	2.20125E-04	-3.6573	7.80000E+00
SO4	-2	4.16617E-04	-3.3803	4.00000E+01
HCO3	-1	4.79803E-03	-2.3189	2.92610E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	8.050	7.860
EPMAN	5.848	5.658

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 4.797956E+00 MEQ/KG H2O
ELECT = 2.202957E+00 MEQ/KG H2O

PH
7.120

TEMPERATURE
23.90 DEG C

IONIC STRENGTH
8.839145E-03

ACTIVITY H2O = .9998
PCO2 = 2.102790E-02
LOG PCO2 = -1.6772
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 5.529441E-03
DENSITY = 1.0000
TDS = 522.6MG/L
CARBONATE ALK = 4.797898E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.894VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	5.69196E+01	1.42089E-03	-2.8474	9.72548E-04	-3.0121	6.84463E-01	-.1646
2	MG	2	7.21426E+00	2.96892E-04	-3.5274	2.04386E-04	-3.6895	6.88418E-01	-.1621
3	NA	1	8.20136E+01	3.56925E-03	-2.4474	3.24020E-03	-2.4894	9.07809E-01	-.0420
4	K	1	3.13479E+01	8.02114E-04	-3.0958	7.26283E-04	-3.1389	9.05460E-01	-.0431
64	H	1	8.33195E-05	8.27014E-08	-7.0825	7.58578E-08	-7.1200	9.17249E-01	-.0375
5	CL	-1	7.80000E+00	2.20125E-04	-3.6573	1.99314E-04	-3.7005	9.05460E-01	-.0431
6	SO4	-2	3.40924E+01	3.55087E-04	-3.4497	2.42032E-04	-3.6161	6.81613E-01	-.1665
7	HCO3	-1	2.87679E+02	4.71717E-03	-2.3263	4.29135E-03	-2.3674	9.09730E-01	-.0411
18	CO3	-2	2.26723E-01	3.78010E-06	-5.4225	2.58913E-06	-5.5868	6.84937E-01	-.1643
86	H2CO3	0	4.58415E+01	7.39464E-04	-3.1311	7.41068E-04	-3.1301	1.00217E+00	.0009
27	OH	-1	2.28751E-03	1.34571E-07	-6.8710	1.21811E-07	-6.9143	9.05184E-01	-.0433
19	MGOH	1	1.81870E-04	4.40386E-09	-8.3562	4.01706E-09	-8.3961	9.12168E-01	-.0399
23	MGSO4 AQ	0	9.98295E-01	8.29764E-06	-5.0810	8.31455E-06	-5.0802	1.00204E+00	.0009
22	MGHCO3	1	9.53359E-01	1.11785E-05	-4.9516	1.01325E-05	-4.9943	9.06424E-01	-.0427
21	MGCO3 AQ	0	4.17659E-02	4.95577E-07	-6.3049	4.96586E-07	-6.3040	1.00204E+00	.0009
29	CAOH	1	1.84981E-04	3.24201E-09	-8.4892	2.95372E-09	-8.5296	9.11077E-01	-.0404
32	CASO4 AQ	0	6.45050E+00	4.74056E-05	-4.3242	4.75022E-05	-4.3233	1.00204E+00	.0009
30	CAHCO3	1	4.63832E+00	4.59038E-05	-4.3382	4.18218E-05	-4.3786	9.11077E-01	-.0404
31	CACO3 AQ	0	3.48542E-01	3.48415E-06	-5.4579	3.49124E-06	-5.4570	1.00204E+00	.0009
44	NASO4	-1	5.34565E-01	4.49255E-06	-5.3475	4.08701E-06	-5.3886	9.09730E-01	-.0411
43	NAHCO3	0	6.55069E-01	7.80337E-06	-5.1077	7.81927E-06	-5.1068	1.00204E+00	.0009
42	NACO3	-1	1.34114E-02	1.61669E-07	-6.7914	1.47075E-07	-6.8325	9.09730E-01	-.0411
94	NACL	0	3.76470E-32	6.44505E-37	-36.1908	6.45818E-37	-36.1899	1.00204E+00	.0009
63	HSO4	-1	1.84768E-04	1.90446E-09	-8.7202	1.72855E-09	-8.7623	9.07632E-01	-.0421
96	H2SO4	0	1.36249E-43	1.38992E-48	-47.8570	1.39275E-48	-47.8561	1.00204E+00	.0009
93	HCL	0	5.49865E-37	1.50888E-41	-40.8213	1.51195E-41	-40.8205	1.00204E+00	.0009

MOLE RATIOS FROM ANALYTICAL MOLALITY

CL/CA	=	1.4503E-01
CL/MG	=	6.9466E-01
CL/NA	=	6.1458E-02
CL/K	=	2.7397E-01
CL/AL	=	2.2012E+26
CL/FE	=	2.2012E+26
CL/SO4	=	5.2836E-01
CL/HCO3	=	4.5878E-02
CA/MG	=	4.7897E+00
NA/K	=	4.4579E+00

MOLE RATIOS FROM COMPUTED MOLALITY

CL/CA	=	1.5492E-01
CL/MG	=	7.4143E-01
CL/NA	=	6.1672E-02
CL/K	=	2.7443E-01
CL/AL	=	2.2012E+26
CL/FE	=	2.2012E+26
CL/SO4	=	6.1992E-01
CL/HCO3	=	4.6665E-02
CA/MG	=	4.7859E+00
NA/K	=	4.4498E+00

LOG ACTIVITY RATIOS

LOG CA/H2	=	11.2279
LOG MG/H2	=	10.5505
LOG NA/H1	=	4.6306
LOG K/H1	=	3.9811
LOG AL/H3	=	-8.6400
LOG FE/H2	=	-15.7600
LOG CA/MG	=	.6775
LOG NA/K	=	.6495

646 EL MAGUEY,AGS CE CAMPO=910.00 MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	2.3539E-07	2.8989E-05	-6.6282	-4.5378	8.1200E-03	-2.09045	-2.84144
22	ARAGONIT	2.5181E-09	6.2091E-09	-8.5989	-8.2070	4.0554E-01	-.39197	-.53278
151	ARTIN	1.6038E-27	4.0272E-19	-26.7948	-18.3950	3.9825E-09	-8.39984	-11.41748
20	BRUCITE	3.0327E-18	3.8698E-12	-17.5182	-11.4123	7.8367E-07	-6.10587	-8.29940
13	CALCITE	2.5181E-09	3.4035E-09	-8.5989	-8.4681	7.3985E-01	-.13086	-.17787
12	DOLOMITE	1.3325E-18	1.0058E-17	-17.8753	-16.9975	1.3249E-01	-.87783	-1.19319
19	GYPSUM	2.3529E-07	1.7390E-05	-6.6284	-4.7597	1.3530E-02	-1.86869	-2.54001
65	HALITE	6.4582E-07	3.7976E+01	-6.1899	1.5795	1.7006E-08	-7.76940	-10.56055
118	HUNTITE	3.7315E-37	3.6301E-31	-36.4281	-30.4401	1.0279E-06	-5.98804	-8.13924
39	HYDMAG	2.3762E-55	1.7753E-38	-54.6241	-37.7507	1.3385E-17	-16.87338	-22.93514
11	MAGNESIT	5.2918E-10	5.9806E-09	-9.2764	-8.2233	8.8483E-02	-1.05314	-1.43148
67	MIRABI	2.5358E-09	6.8464E-02	-8.5959	-1.1645	3.7038E-08	-7.43135	-10.10106
59	NAHCOL	1.3905E-05	2.7663E-01	-4.8568	-.5581	5.0265E-05	-4.29874	-5.84306
61	NATRON	2.7126E-11	4.4286E-02	-10.5666	-1.3537	6.1253E-10	-9.21287	-12.52259
150	NESQUE	5.2885E-10	6.3784E-06	-9.2767	-5.1953	8.2913E-05	-4.08138	-5.54761
66	THENAR	2.5411E-09	6.6459E-01	-8.5950	-.1774	3.8235E-09	-8.41753	-11.44153
62	THRNAT	2.7177E-11	1.3571E+00	-10.5658	.1326	2.0026E-11	-10.69840	-14.54179
60	TRONA	3.7782E-16	1.7941E-01	-15.4227	-.7461	2.1058E-15	-14.67657	-19.94913

27-B CHICHIMECOS,AGS CE CAMPO=1110.00MMHOS

INITIAL SOLUTION

TEMPERATURE = 25.40 DEGREES C PH = 6.450 ANALYTICAL EPMCAT = 9.742 ANALYTICAL EPMAN = 7.731

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.95740E-03	-2.7083	7.84000E+01
MG	2	2.75768E-04	-3.5595	6.70000E+00
NA	1	4.16115E-03	-2.3808	9.56000E+01
K	1	1.12090E-03	-2.9504	4.38000E+01
CL	-1	4.45958E-04	-3.3507	1.58000E+01
SO4	-2	6.45851E-04	-3.1899	6.20000E+01
HCO3	-1	5.99837E-03	-2.2220	3.65760E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED	PH
EPMCAT	9.742	9.442	6.450
EPMAN	7.731	7.431	

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 5.997971E+00 MEQ/KG H2O
ELECT = 2.012294E+00 MEQ/KG H2O

TEMPERATURE
25.40 DEG C

IONIC STRENGTH
1.103290E-02

ACTIVITY H2O = .9997
PCO2 = 1.243575E-01
LOG PCO2 = -.9053
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 1.019461E-02
DENSITY = 1.0000
TDS = 668.1MG/L
CARBONATE ALK = 5.998340E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.924VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	7.19968E+01	1.79753E-03	-2.7453	1.18397E-03	-2.9267	6.58667E-01	-.1813
2	MG	2	6.16236E+00	2.53639E-04	-3.5958	1.68239E-04	-3.7741	6.63299E-01	-.1783
3	NA	1	9.51667E+01	4.14229E-03	-2.3828	3.72297E-03	-2.4291	8.98773E-01	-.0464
4	K	1	4.36911E+01	1.11811E-03	-2.9515	1.00172E-03	-2.9993	8.95903E-01	-.0477
64	H	1	3.92767E-04	3.89910E-07	-6.4090	3.54814E-07	-6.4500	9.09989E-01	-.0410
5	CL	-1	1.58000E+01	4.45958E-04	-3.3507	3.99536E-04	-3.3984	8.95903E-01	-.0477
6	SO4	-2	5.18043E+01	5.39643E-04	-3.2679	3.53599E-04	-3.4515	6.55246E-01	-.1836
7	HCO3	-1	3.59616E+02	5.89762E-03	-2.2293	5.31399E-03	-2.2746	9.01041E-01	-.0453
18	CO3	-2	6.43183E-02	1.07252E-06	-5.9696	7.06941E-07	-6.1506	6.59140E-01	-.1810
86	H2CO3	0	2.60252E+02	4.19871E-03	-2.3769	4.20999E-03	-2.3757	1.00269E+00	.0012
27	OH	-1	5.53630E-04	3.25741E-08	-7.4871	2.91721E-08	-7.5350	8.95562E-01	-.0479
19	MGOH	1	3.68191E-05	8.91681E-10	-9.0498	8.06042E-10	-9.0936	9.03958E-01	-.0439
23	MGSO4 AQ	0	1.24765E+00	1.03717E-05	-4.9841	1.03981E-05	-4.9830	1.00254E+00	.0011
22	MGHCO3	1	9.90724E-01	1.16184E-05	-4.9349	1.04224E-05	-4.9820	8.97062E-01	-.0472
21	MGCO3 AQ	0	9.59950E-03	1.13920E-07	-6.9434	1.14210E-07	-6.9423	1.00254E+00	.0011
29	CAOH	1	5.49804E-05	9.63735E-10	-9.0160	8.69919E-10	-9.0605	9.02653E-01	-.0445
32	CASO4 AQ	0	1.16124E+01	8.53536E-05	-4.0688	8.55708E-05	-4.0677	1.00254E+00	.0011
30	CAHCO3	1	7.38820E+00	7.31290E-05	-4.1359	6.60101E-05	-4.1804	9.02653E-01	-.0445
31	CACO3 AQ	0	1.19759E-01	1.19733E-06	-5.9218	1.20037E-06	-5.9207	1.00254E+00	.0011
44	NASO4	-1	9.14535E-01	7.68699E-06	-5.1142	6.92629E-06	-5.1595	9.01041E-01	-.0453
43	NAHCO3	0	9.31429E-01	1.10971E-05	-4.9548	1.11253E-05	-4.9537	1.00254E+00	.0011
42	NACO3	-1	4.58209E-03	5.52433E-08	-7.2577	4.97765E-08	-7.3030	9.01041E-01	-.0453
94	NACL	0	8.66529E-32	1.48369E-36	-35.8287	1.48746E-36	-35.8276	1.00254E+00	.0011
63	HSO4	-1	1.32945E-03	1.37050E-08	-7.8631	1.23142E-08	-7.9096	8.98519E-01	-.0465
96	H2SO4	0	4.35198E-42	4.44025E-47	-46.3526	4.45155E-47	-46.3515	1.00254E+00	.0011
93	HCL	0	5.15218E-36	1.41401E-40	-39.8495	1.41761E-40	-39.8484	1.00254E+00	.0011

MOLE RATIOS FROM ANALYTICAL MOLALITY			MOLE RATIOS FROM COMPUTED MOLALITY			LOG ACTIVITY RATIOS	
CL/CA	=	2.2783E-01	CL/CA	=	2.4810E-01	LOG CA/H2 =	9.9733
CL/MG	=	1.6171E+00	CL/MG	=	1.7582E+00	LOG MG/H2 =	9.1259
CL/NA	=	1.0717E-01	CL/NA	=	1.0766E-01	LOG NA/H1 =	4.0209
CL/K	=	3.9786E-01	CL/K	=	3.9885E-01	LOG K/H1 =	3.4507
CL/AL	=	4.4596E+26	CL/AL	=	4.4596E+26	LOG AL/H3 =	-10.6500
CL/FE	=	4.4596E+26	CL/FE	=	4.4596E+26	LOG FE/H2 =	-17.1000
CL/SO4	=	6.9050E-01	CL/SO4	=	8.2640E-01	LOG CA/MG =	.8474
CL/HCO3	=	7.4347E-02	CL/HCO3	=	7.5617E-02	LOG NA/K =	.5701
CA/MG	=	7.0980E+00	CA/MG	=	7.0869E+00		
NA/K	=	3.7123E+00	NA/K	=	3.7047E+00		

27-B CHICHIMECOS,AGS CE CAMPO=1110.00MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	4.1865E-07	2.8074E-05	-6.3781	-4.5517	1.4913E-02	-1.82645	-2.49513
22	ARAGONIT	8.3700E-10	6.0547E-09	-9.0773	-8.2179	1.3824E-01	-.85937	-1.17400
151	ARTIN	1.7012E-29	3.9645E-19	-28.7692	-18.4018	4.2911E-11	-10.36743	-14.16309
20	BRUCITE	1.4317E-19	3.8979E-12	-18.8441	-11.4092	3.6730E-08	-7.43497	-10.15702
13	CALCITE	8.3700E-10	3.3305E-09	-9.0773	-8.4775	2.5131E-01	-.59979	-.81938
12	DOLOMITE	9.9548E-20	9.3726E-18	-19.0020	-17.0281	1.0621E-02	-1.97382	-2.69647
19	GYPSUM	4.1839E-07	1.7428E-05	-6.3784	-4.7587	2.4006E-02	-1.61968	-2.21266
65	HALITE	1.4875E-06	3.8274E+01	-5.8276	1.5829	3.8864E-08	-7.41046	-10.12352
118	HUNTITE	1.4082E-39	2.9154E-31	-38.8513	-30.5353	4.8300E-09	-8.31605	-11.36067
39	HYDMAG	2.8612E-59	1.4287E-38	-58.5435	-37.8451	2.0027E-21	-20.69839	-28.27634
11	MAGNESIT	1.1893E-10	5.6747E-09	-9.9247	-8.2461	2.0959E-02	-1.67863	-2.29320
67	MIRABI	4.8856E-09	8.0472E-02	-8.3111	-1.0944	6.0712E-08	-7.21673	-9.85887
59	NAHCOL	1.9784E-05	2.8553E-01	-4.7037	-.5443	6.9288E-05	-4.15934	-5.68213
61	NATRON	9.7676E-12	5.0636E-02	-11.0102	-1.2955	1.9290E-10	-9.71467	-13.27134
150	NESQUE	1.1882E-10	6.0718E-06	-9.9251	-5.2167	1.9570E-05	-4.70842	-6.43223
66	THENAR	4.9011E-09	6.6136E-01	-8.3097	-.1796	7.4106E-09	-8.13015	-11.10670
62	THRNAT	9.7955E-12	1.3251E+00	-11.0090	.1222	7.3923E-12	-11.13122	-15.20651
60	TRONA	1.9373E-16	1.5393E-01	-15.7128	-.8127	1.2586E-15	-14.90012	-20.35526

134 SALITRILLO,AGS CE CAMPO=736.00 MMHOS

INITIAL SOLUTION

TEMPERATURE = 22.60 DEGREES C PH = 7.650 ANALYTICAL EPMCAT = 6.265 ANALYTICAL EPMAN = 4.828

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.19811E-03	-2.9215	4.80000E+01
MG	2	2.18091E-04	-3.6614	5.30000E+00
NA	1	2.85465E-03	-2.5444	6.56000E+01
K	1	5.80778E-04	-3.2360	2.27000E+01
CL	-1	2.28568E-04	-3.6410	8.10000E+00
SO4	-2	3.02017E-04	-3.5200	2.90000E+01
HCO3	-1	3.99793E-03	-2.3982	2.43840E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	6.265	6.133
EPMAN	4.828	4.697

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 3.997926E+00 MEQ/KG H2O
ELECT = 1.437223E+00 MEQ/KG H2O

PH
7.650

TEMPERATURE
22.60 DEG C

IONIC STRENGTH
7.027742E-03

ACTIVITY H2O = .9998
PCO2 = 5.109097E-03
LOG PCO2 = -2.2917
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 4.164691E-03
DENSITY = 1.0000
TDS = 422.5MG/L
CARBONATE ALK = 3.997524E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.869VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	4.52808E+01	1.13024E-03	-2.9468	8.02325E-04	-3.0956	7.09873E-01	-.1488
2	MG	2	5.00710E+00	2.06039E-04	-3.6861	1.46949E-04	-3.8328	7.13212E-01	-.1468
3	NA	1	6.54082E+01	2.84630E-03	-2.5457	2.60845E-03	-2.5836	9.16437E-01	-.0379
4	K	1	2.26715E+01	5.80050E-04	-3.2365	5.30474E-04	-3.2753	9.14532E-01	-.0388
64	H	1	2.44041E-05	2.42207E-08	-7.6158	2.23872E-08	-7.6500	9.24301E-01	-.0342
5	CL	-1	8.10000E+00	2.28568E-04	-3.6410	2.09033E-04	-3.6798	9.14532E-01	-.0388
6	SO4	-2	2.53695E+01	2.64208E-04	-3.5781	1.86933E-04	-3.7283	7.07522E-01	-.1503
7	HCO3	-1	2.38918E+02	3.91723E-03	-2.4070	3.59620E-03	-2.4442	9.18046E-01	-.0371
18	CO3	-2	6.03898E-01	1.00676E-05	-4.9971	7.15131E-06	-5.1456	7.10327E-01	-.1485
86	H2CO3	0	1.15477E+01	1.86256E-04	-3.7299	1.86579E-04	-3.7291	1.00174E+00	.0008
27	OH	-1	6.94890E-03	4.08753E-07	-6.3885	3.73727E-07	-6.4274	9.14310E-01	-.0389
19	MGOH	1	3.91720E-04	9.48430E-09	-8.0230	8.72616E-09	-8.0592	9.20064E-01	-.0362
23	MGSO4 AQ	0	5.35966E-01	4.45440E-06	-5.3512	4.46161E-06	-5.3505	1.00162E+00	.0007
22	MGHCO3	1	5.64527E-01	6.61866E-06	-5.1792	6.05823E-06	-5.2177	9.15326E-01	-.0384
21	MGCO3 AQ	0	8.13437E-02	9.65094E-07	-6.0154	9.66657E-07	-6.0147	1.00162E+00	.0007
29	CAOH	1	4.60037E-04	8.06188E-09	-8.0936	7.41015E-09	-8.1302	9.19159E-01	-.0366
30	CAHCO3	1	3.05469E+00	3.02281E-05	-4.5196	2.77845E-05	-4.5562	9.19159E-01	-.0366
31	CACO3 AQ	0	7.72686E-01	7.72325E-06	-5.1122	7.73576E-06	-5.1115	1.00162E+00	.0007
44	NASO4	-1	3.26658E-01	2.74500E-06	-5.5615	2.52003E-06	-5.5986	9.18046E-01	-.0371
43	NAHCO3	0	4.42153E-01	5.26652E-06	-5.2785	5.27505E-06	-5.2778	1.00162E+00	.0007
42	NACO3	-1	2.76562E-02	3.33351E-07	-6.4771	3.06032E-07	-6.5142	9.18046E-01	-.0371
94	NACL	0	3.18011E-32	5.44371E-37	-36.2641	5.45252E-37	-36.2634	1.00162E+00	.0007
63	HSO4	-1	4.02483E-05	4.14809E-10	-9.3822	3.80097E-10	-9.4201	9.16318E-01	-.0380
96	H2SO4	0	9.16997E-45	9.35367E-50	-49.0290	9.36882E-50	-49.0283	1.00162E+00	.0007
93	HCL	0	1.70277E-37	4.67209E-42	-41.3305	4.67966E-42	-41.3298	1.00162E+00	.0007

MOLE RATIOS FROM ANALYTICAL MOLALITY

CL/CA	=	1.9077E-01
CL/MG	=	1.0480E+00
CL/NA	=	8.0069E-02
CL/K	=	3.9355E-01
CL/AL	=	2.2857E+26
CL/FE	=	2.2857E+26
CL/SO4	=	7.5680E-01
CL/HCO3	=	5.7172E-02
CA/MG	=	5.4936E+00
NA/K	=	4.9152E+00

MOLE RATIOS FROM COMPUTED MOLALITY

CL/CA	=	2.0223E-01
CL/MG	=	1.1093E+00
CL/NA	=	8.0304E-02
CL/K	=	3.9405E-01
CL/AL	=	2.2857E+26
CL/FE	=	2.2857E+26
CL/SO4	=	8.6511E-01
CL/HCO3	=	5.8349E-02
CA/MG	=	5.4856E+00
NA/K	=	4.9070E+00

LOG ACTIVITY RATIOS

LOG CA/H2	=	12.2044
LOG MG/H2	=	11.4672
LOG NA/H1	=	5.0664
LOG K/H1	=	4.3747
LOG AL/H3	=	-7.0500
LOG FE/H2	=	-14.7000
LOG CA/MG	=	.7372
LOG NA/K	=	.6917

134 SALITRILLO,AGS CE CAMPO=736.00 MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	1.4998E-07	2.9814E-05	-6.8240	-4.5256	5.0306E-03	-2.29838	-3.11040
22	ARAGONIT	5.7377E-09	6.3475E-09	-8.2413	-8.1974	9.0393E-01	-.04386	-.05936
151	ARTIN	2.1559E-26	4.0828E-19	-25.6664	-18.3890	5.2804E-08	-7.27734	-9.84843
20	BRUCITE	2.0525E-17	3.8454E-12	-16.6877	-11.4151	5.3374E-06	-5.27267	-7.13551
13	CALCITE	5.7377E-09	3.4647E-09	-8.2413	-8.4603	1.6560E+00	.21907	.29647
12	DOLOMITE	6.0296E-18	1.0698E-17	-17.2197	-16.9707	5.6361E-01	-.24902	-.33700
19	GYPSUM	1.4993E-07	1.7356E-05	-6.8241	-4.7606	8.6387E-03	-2.06355	-2.79261
65	HALITE	5.4525E-07	3.7717E+01	-6.2634	1.5765	1.4456E-08	-7.83994	-10.60981
118	HUNTITE	6.6588E-36	4.3976E-31	-35.1766	-30.3568	1.5142E-05	-4.81982	-6.52267
39	HYDMAG	2.5016E-53	2.1468E-38	-52.6018	-37.6682	1.1652E-15	-14.93358	-20.20964
11	MAGNESIT	1.0509E-09	6.2617E-09	-8.9784	-8.2033	1.6783E-01	-.77514	-1.04900
67	MIRABI	1.2699E-09	5.9438E-02	-8.8962	-1.2259	2.1364E-08	-7.67031	-10.38025
59	NAHCOL	9.3805E-06	2.6908E-01	-5.0278	-.5701	3.4862E-05	-4.45765	-6.03254
61	NATRON	4.8580E-11	3.9387E-02	-10.3135	-1.4047	1.2334E-09	-8.90890	-12.05642
150	NESQUE	1.0504E-09	6.6594E-06	-8.9787	-5.1766	1.5773E-04	-3.80209	-5.14537
66	THENAR	1.2719E-09	6.6742E-01	-8.8955	-.1756	1.9057E-09	-8.71995	-11.80072
62	THRNAT	4.8650E-11	1.3857E+00	-10.3129	.1417	3.5109E-11	-10.45458	-14.14820
60	TRONA	4.5629E-16	2.0515E-01	-15.3408	-.6879	2.2242E-15	-14.65282	-19.82969

162 LA CARBONERA,AGS   CE CAMPO=861.00 MMHOS

INITIAL SOLUTION

TEMPERATURE = 21.50 DEGREES C   PH = 7.400   ANALYTICAL EPMCAT = 7.483   ANALYTICAL EPMAN = 6.029

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.27809E-03	-2.8934	5.12000E+01
MG	2	2.96300E-04	-3.5283	7.20000E+00
NA	1	3.85149E-03	-2.4144	8.85000E+01
K	1	4.86155E-04	-3.3132	1.90000E+01
CL	-1	4.26132E-04	-3.3705	1.51000E+01
SO4	-2	6.04086E-04	-3.2189	5.80000E+01
HCO3	-1	4.39803E-03	-2.3567	2.68220E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	7.483	7.275
EPMAN	6.029	5.822

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 4.397999E+00 MEQ/KG H2O
ELECT = 1.453901E+00 MEQ/KG H2O

PH 7.400
TEMPERATURE 21.50 DEG C
IONIC STRENGTH 8.542765E-03

ACTIVITY H2O = .9998
PCO2 = 9.809759E-03
LOG PCO2 = -2.0083
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 4.754596E-03
DENSITY = 1.0000
TDS = 507.2MG/L
CARBONATE ALK = 4.397820E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000   EQUIVALENT EH = 5.847VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	4.73697E+01	1.18248E-03	-2.9272	8.14995E-04	-3.0888	6.89226E-01	-.1616
2	MG	2	6.68836E+00	2.75245E-04	-3.5603	1.90765E-04	-3.7195	6.93074E-01	-.1592
3	NA	1	8.81533E+01	3.83640E-03	-2.4161	3.48899E-03	-2.4573	9.09445E-01	-.0412
4	K	1	1.89549E+01	4.85000E-04	-3.3143	4.39979E-04	-3.3566	9.07173E-01	-.0423
64	H	1	4.36634E-05	4.33389E-08	-7.3631	3.98107E-08	-7.4000	9.18591E-01	-.0369
5	CL	-1	1.51000E+01	4.26132E-04	-3.3705	3.86575E-04	-3.4128	9.07173E-01	-.0423
6	SO4	-2	5.05815E+01	5.26820E-04	-3.2783	3.61637E-04	-3.4417	6.86452E-01	-.1634
7	HCO3	-1	2.63718E+02	4.32422E-03	-2.3641	3.94067E-03	-2.4044	9.11303E-01	-.0403
18	CO3	-2	3.74106E-01	6.23728E-06	-5.2050	4.30177E-06	-5.3664	6.89686E-01	-.1613
86	H2CO3	0	2.28522E+01	3.68621E-04	-3.4334	3.69403E-04	-3.4325	1.00212E+00	.0009
27	OH	-1	3.61895E-03	2.12895E-07	-6.6718	1.93075E-07	-6.7143	9.06905E-01	-.0424
19	MGOH	1	2.61114E-04	6.32262E-09	-8.1991	5.77676E-09	-8.2383	9.13665E-01	-.0392
23	MGSO4 AQ	0	1.30671E+00	1.08609E-05	-4.9641	1.08823E-05	-4.9633	1.00197E+00	.0009
22	MGHCO3	1	8.04233E-01	9.42983E-06	-5.0255	8.56327E-06	-5.0674	9.08104E-01	-.0419
21	MGCO3 AQ	0	6.24297E-02	7.40753E-07	-6.1303	7.42212E-07	-6.1295	1.00197E+00	.0009
29	CAOH	1	2.41300E-04	4.22900E-09	-8.3738	3.85941E-09	-8.4135	9.12607E-01	-.0397
32	CASO4 AQ	0	7.91196E+00	5.81451E-05	-4.2355	5.82596E-05	-4.2346	1.00197E+00	.0009
30	CAHCO3	1	3.31084E+00	3.27657E-05	-4.4846	2.99022E-05	-4.5243	9.12607E-01	-.0397
31	CACO3 AQ	0	4.61340E-01	4.61164E-06	-5.3361	4.62072E-06	-5.3353	1.00197E+00	.0009
44	NASO4	-1	8.45420E-01	7.10491E-06	-5.1484	6.47472E-06	-5.1888	9.11303E-01	-.0403
43	NAHCO3	0	6.47781E-01	7.71643E-06	-5.1126	7.73162E-06	-5.1117	1.00197E+00	.0009
42	NACO3	-1	2.11814E-02	2.55329E-07	-6.5929	2.32682E-07	-6.6332	9.11303E-01	-.0403
94	NACL	0	7.86304E-32	1.34611E-36	-35.8709	1.34876E-36	-35.8701	1.00197E+00	.0009
63	HSO4	-1	1.35366E-04	1.39523E-09	-8.8554	1.26864E-09	-8.8967	9.09273E-01	-.0413
96	H2SO4	0	5.60747E-44	5.72029E-49	-48.2426	5.73155E-49	-48.2417	1.00197E+00	.0009
93	HCL	0	5.59742E-37	1.53596E-41	-40.8136	1.53898E-41	-40.8128	1.00197E+00	.0009

MOLE RATIOS FROM ANALYTICAL MOLALITY

CL/CA	=	3.3341E-01
CL/MG	=	1.4382E+00
CL/NA	=	1.1064E-01
CL/K	=	8.7654E-01
CL/AL	=	4.2613E+26
CL/FE	=	4.2613E+26
CL/SO4	=	7.0542E-01
CL/HCO3	=	9.6892E-02
CA/MG	=	4.3135E+00
NA/K	=	7.9223E+00

MOLE RATIOS FROM COMPUTED MOLALITY

CL/CA	=	3.6037E-01
CL/MG	=	1.5482E+00
CL/NA	=	1.1108E-01
CL/K	=	8.7862E-01
CL/AL	=	4.2613E+26
CL/FE	=	4.2613E+26
CL/SO4	=	8.0888E-01
CL/HCO3	=	9.8545E-02
CA/MG	=	4.2961E+00
NA/K	=	7.9101E+00

LOG ACTIVITY RATIOS

LOG CA/H2	=	11.7112
LOG MG/H2	=	11.0805
LOG NA/H1	=	4.9427
LOG K/H1	=	4.0434
LOG AL/H3	=	-7.8000
LOG FE/H2	=	-15.2000
LOG CA/MG	=	.6307
LOG NA/K	=	.8993

162 LA CARBONERA,AGS CE CAMPO=861.00 MMHOS

PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18 ANHYDRIT	2.9473E-07	3.0536E-05	-6.5306	-4.5152	9.6519E-03	-2.01539	-2.71728
22 ARAGONIT	3.5059E-09	6.4679E-09	-8.4552	-8.1892	5.4205E-01	-.26596	-.35859
151 ARTIN	5.8323E-27	4.1308E-19	-26.2342	-18.3840	1.4119E-08	-7.85020	-10.58417
20 BRUCITE	7.1114E-18	3.8247E-12	-17.1480	-11.4174	1.8593E-06	-5.73065	-7.72645
13 CALCITE	3.5059E-09	3.5149E-09	-8.4552	-8.4541	9.9746E-01	-.00111	-.00149
12 DOLOMITE	2.8771E-18	1.1277E-17	-17.5411	-16.9478	2.5514E-01	-.59323	-.79983
19 GYPSUM	2.9462E-07	1.7327E-05	-6.5307	-4.7613	1.7003E-02	-1.76947	-2.38572
65 HALITE	1.3488E-06	3.7498E+01	-5.8701	1.5740	3.5969E-08	-7.44407	-10.03661
118 HUNTITE	1.9375E-36	5.1794E-31	-35.7128	-30.2857	3.7408E-06	-5.42704	-7.31710
39 HYDMAG	3.2225E-54	2.5246E-38	-53.4918	-37.5978	1.2765E-16	-15.89400	-21.42937
11 MAGNESIT	8.2063E-10	6.5119E-09	-9.0859	-8.1863	1.2602E-01	-.89956	-1.21285
67 MIRABI	4.3936E-09	5.2685E-02	-8.3572	-1.2783	8.3393E-08	-7.07887	-9.54422
59 NAHCOL	1.3749E-05	2.6279E-01	-4.8617	-.5804	5.2319E-05	-4.28134	-5.77240
61 NATRON	5.2263E-11	3.5638E-02	-10.2818	-1.4481	1.4665E-09	-8.83372	-11.91023
150 NESQUE	8.2014E-10	6.9088E-06	-9.0861	-5.1606	1.1871E-04	-3.92551	-5.29264
66 THENAR	4.4022E-09	6.6985E-01	-8.3563	-.1740	6.5719E-09	-8.18231	-11.03194
62 THRNAT	5.2355E-11	1.4106E+00	-10.2810	.1494	3.7116E-11	-10.43043	-14.06302
60 TRONA	7.1969E-16	2.2999E-01	-15.1429	-.6383	3.1292E-15	-14.50457	-19.55605

161 LA VICTORIA,AGS CE CAMPO=860.00 MMHOS

INITIAL SOLUTION

TEMPERATURE = 21.00 DEGREES C PH = 7.420 ANALYTICAL EPMCAT = 7.331 ANALYTICAL EPMAN = 5.661

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.25810E-03	-2.9003	5.04000E+01
MG	2	2.96295E-04	-3.5283	7.20000E+00
NA	1	3.61642E-03	-2.4417	8.31000E+01
K	1	6.08963E-04	-3.2154	2.38000E+01
CL	-1	3.07600E-04	-3.5120	1.09000E+01
SO4	-2	4.79094E-04	-3.3196	4.60000E+01
HCO3	-1	4.39796E-03	-2.3567	2.68220E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	7.331	7.154
EPMAN	5.661	5.484

PH 7.420

TEMPERATURE 21.00 DEG C

IONIC STRENGTH 8.198383E-03

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 4.397923E+00 MEQ/KG H2O
ELECT = 1.670302E+00 MEQ/KG H2O

ACTIVITY H2O = .9998
PCO2 = 9.322275E-03
LOG PCO2 = -2.0305
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 4.740873E-03
DENSITY = 1.0000
TDS = 489.6MG/L
CARBONATE ALK = 4.397741E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.837VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	4.70620E+01	1.17478E-03	-2.9300	8.15224E-04	-3.0887	6.93939E-01	-.1587
2	MG	2	6.73816E+00	2.77290E-04	-3.5571	1.93457E-04	-3.7134	6.97672E-01	-.1563
3	NA	1	8.28050E+01	3.60358E-03	-2.4433	3.28306E-03	-2.4837	9.11056E-01	-.0405
4	K	1	2.37552E+01	6.07817E-04	-3.2162	5.52425E-04	-3.2577	9.08868E-01	-.0415
64	H	1	4.16395E-05	4.13292E-08	-7.3837	3.80189E-08	-7.4200	9.19904E-01	-.0363
5	CL	-1	1.09000E+01	3.07600E-04	-3.5120	2.79568E-04	-3.5535	9.08868E-01	-.0415
6	SO4	-2	4.01070E+01	4.17717E-04	-3.3791	2.88751E-04	-3.5395	6.91259E-01	-.1604
7	HCO3	-1	2.63728E+02	4.32429E-03	-2.3641	3.94745E-03	-2.4037	9.12855E-01	-.0396
18	CO3	-2	3.85430E-01	6.42597E-06	-5.1921	4.46217E-06	-5.3505	6.94396E-01	-.1584
86	H2CO3	0	2.20275E+01	3.55311E-04	-3.4494	3.56036E-04	-3.4485	1.00204E+00	.0009
27	OH	-1	3.63876E-03	2.14056E-07	-6.6695	1.94494E-07	-6.7111	9.08610E-01	-.0416
19	MGOH	1	2.64752E-04	6.41059E-09	-8.1931	5.86657E-09	-8.2316	9.15137E-01	-.0385
23	MGSO4 AQ	0	1.04414E+00	8.67839E-06	-5.0616	8.69479E-06	-5.0607	1.00189E+00	.0008
22	MGHCO3	1	8.13186E-01	9.53464E-06	-5.0207	8.67430E-06	-5.0618	9.09767E-01	-.0411
21	MGCO3 AQ	0	6.51754E-02	7.73318E-07	-6.1116	7.74780E-07	-6.1108	1.00189E+00	.0008
29	CAOH	1	2.41907E-04	4.23956E-09	-8.3727	3.87545E-09	-8.4117	9.14115E-01	-.0390
32	CASO4 AQ	0	6.29228E+00	4.62412E-05	-4.3350	4.63286E-05	-4.3342	1.00189E+00	.0008
30	CAHCO3	1	3.26173E+00	3.22791E-05	-4.4911	2.95068E-05	-4.5301	9.14115E-01	-.0390
31	CACO3 AQ	0	4.73948E-01	4.73759E-06	-5.3244	4.74654E-06	-5.3236	1.00189E+00	.0008
44	NASO4	-1	6.32061E-01	5.31175E-06	-5.2748	4.84886E-06	-5.3144	9.12855E-01	-.0396
43	NAHCO3	0	6.10655E-01	7.27405E-06	-5.1382	7.28780E-06	-5.1374	1.00189E+00	.0008
42	NACO3	-1	2.01126E-02	2.42441E-07	-6.6154	2.21313E-07	-6.6550	9.12855E-01	-.0396
94	NACL	0	5.35136E-32	9.16107E-37	-36.0381	9.17838E-37	-36.0372	1.00189E+00	.0008
63	HSO4	-1	1.01634E-04	1.04753E-09	-8.9798	9.54189E-10	-9.0204	9.10895E-01	-.0405
96	H2SO4	0	4.08376E-44	4.16585E-49	-48.3803	4.17372E-49	-48.3795	1.00189E+00	.0008
93	HCL	0	3.86619E-37	1.06088E-41	-40.9743	1.06289E-41	-40.9735	1.00189E+00	.0008

MOLE RATIOS FROM ANALYTICAL MOLALITY

CL/CA	=	2.4450E-01
CL/MG	=	1.0382E+00
CL/NA	=	8.5057E-02
CL/K	=	5.0512E-01
CL/AL	=	3.0760E+26
CL/FE	=	3.0760E+26
CL/SO4	=	6.4204E-01
CL/HCO3	=	6.9942E-02
CA/MG	=	4.2461E+00
NA/K	=	5.9387E+00

MOLE RATIOS FROM COMPUTED MOLALITY

CL/CA	=	2.6184E-01
CL/MG	=	1.1093E+00
CL/NA	=	8.5360E-02
CL/K	=	5.0607E-01
CL/AL	=	3.0760E+26
CL/FE	=	3.0760E+26
CL/SO4	=	7.3638E-01
CL/HCO3	=	7.1133E-02
CA/MG	=	4.2366E+00
NA/K	=	5.9287E+00

LOG ACTIVITY RATIOS

LOG CA/H2	=	11.7513
LOG MG/H2	=	11.1266
LOG NA/H1	=	4.9363
LOG K/H1	=	4.1623
LOG AL/H3	=	-7.7400
LOG FE/H2	=	-15.1600
LOG CA/MG	=	.6247
LOG NA/K	=	.7740

161 LA VICTORIA,AGS CE CAMPO=860.00 MMHOS

PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18 ANHYDRIT	2.3540E-07	3.0872E-05	-6.6282	-4.5104	7.6249E-03	-2.11777	-2.85047
22 ARAGONIT	3.6377E-09	6.5237E-09	-8.4392	-8.1855	5.5761E-01	-.25367	-.34143
151 ARTIN	6.3136E-27	4.1530E-19	-26.1997	-18.3816	1.5203E-08	-7.81808	-10.52298
20 BRUCITE	7.3181E-18	3.8153E-12	-17.1356	-11.4185	1.9181E-06	-5.71713	-7.69515
13 CALCITE	3.6377E-09	3.5371E-09	-8.4392	-8.4513	1.0284E+00	.01217	.01638
12 DOLOMITE	3.1402E-18	1.1551E-17	-17.5030	-16.9374	2.7185E-01	-.56567	-.76139
19 GYPSUM	2.3531E-07	1.7314E-05	-6.6284	-4.7616	1.3591E-02	-1.86676	-2.51263
65 HALITE	9.1784E-07	3.7398E+01	-6.0372	1.5729	2.4542E-08	-7.61008	-10.24302
118 HUNTITE	2.3400E-36	5.5815E-31	-35.6308	-30.2532	4.1924E-06	-5.37754	-7.23806
39 HYDMAG	4.0606E-54	2.7187E-38	-53.3914	-37.5656	1.4936E-16	-15.82577	-21.30118
11 MAGNESIT	8.6324E-10	6.6296E-09	-9.0639	-8.1785	1.3021E-01	-.88536	-1.19167
67 MIRABI	3.1064E-09	4.9860E-02	-8.5077	-1.3022	6.2302E-08	-7.20550	-9.69846
59 NAHCOL	1.2960E-05	2.5997E-01	-4.8874	-.5851	4.9851E-05	-4.30233	-5.79085
61 NATRON	4.8004E-11	3.4046E-02	-10.3187	-1.4679	1.4100E-09	-8.85079	-11.91299
150 NESQUE	8.6275E-10	7.0259E-06	-9.0641	-5.1533	1.2280E-04	-3.91082	-5.26388
66 THENAR	3.1123E-09	6.7097E-01	-8.5069	-.1733	4.6385E-09	-8.33362	-11.21689
62 THRNAT	4.8086E-11	1.4221E+00	-10.3180	.1529	3.3814E-11	-10.47091	-14.09363
60 TRONA	6.2307E-16	2.4233E-01	-15.2055	-.6156	2.5711E-15	-14.58987	-19.63768

160 SN ANTONIO TEPHZALA,AGSCE CAMPO=928.00MMHOS

INITIAL SOLUTION

TEMPERATURE = 22.80 DEGREES C   PH = 7.250   ANALYTICAL EPMCAT = 7.912   ANALYTICAL EPMAN = 6.109

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.49779E-03	-2.8245	6.00000E+01
MG	2	3.16882E-04	-3.4991	7.70000E+00
NA	1	3.61654E-03	-2.4417	8.31000E+01
K	1	6.70393E-04	-3.1737	2.62000E+01
CL	-1	3.18899E-04	-3.4963	1.13000E+01
SO4	-2	6.97834E-04	-3.1562	6.70000E+01
HCO3	-1	4.39810E-03	-2.3567	2.68220E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	7.912	7.657
EPMAN	6.109	5.855

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 4.398050E+00 MEQ/KG H2O
ELECT = 1.803306E+00 MEQ/KG H2O

PH
7.250

TEMPERATURE
22.80 DEG C

IONIC STRENGTH
9.033572E-03

ACTIVITY H2O = .9998
PCO2 = 1.406174E-02
LOG PCO2 = -1.8520
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 4.898185E-03
DENSITY = 1.0000
TDS = 523.5MG/L
CARBONATE ALK = 4.397938E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000   EQUIVALENT EH = 5.873VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	5.52013E+01	1.37800E-03	-2.8608	9.40488E-04	-3.0266	6.82502E-01	-.1659
2	MG	2	7.11785E+00	2.92924E-04	-3.5332	2.01097E-04	-3.6966	6.86514E-01	-.1634
3	NA	1	8.27559E+01	3.60157E-03	-2.4435	3.26709E-03	-2.4858	9.07131E-01	-.0423
4	K	1	2.61283E+01	6.68560E-04	-3.1749	6.04872E-04	-3.2183	9.04739E-01	-.0435
64	H	1	6.18019E-05	6.13435E-08	-7.2122	5.62341E-08	-7.2500	9.16708E-01	-.0378
5	CL	-1	1.13000E+01	3.18899E-04	-3.4963	2.88520E-04	-3.5398	9.04739E-01	-.0435
6	SO4	-2	5.74873E+01	5.98756E-04	-3.2228	4.06913E-04	-3.3905	6.79598E-01	-.1677
7	HCO3	-1	2.63626E+02	4.32277E-03	-2.3642	3.92973E-03	-2.4056	9.09076E-01	-.0414
18	CO3	-2	2.74390E-01	4.57484E-06	-5.3396	3.12448E-06	-5.5052	6.82970E-01	-.1656
86	H2CO3	0	3.15889E+01	5.09558E-04	-3.2928	5.10693E-04	-3.2918	1.00223E+00	.0010
27	OH	-1	2.83938E-03	1.67037E-07	-6.7772	1.51078E-07	-6.8208	9.04456E-01	-.0436
19	MGOH	1	2.19219E-04	5.30825E-09	-8.2750	4.83875E-09	-8.3153	9.11553E-01	-.0402
23	MGSO4 AQ	0	1.60414E+00	1.33334E-05	-4.8751	1.33611E-05	-4.8742	1.00208E+00	.0009
22	MGHCO3	1	8.54059E-01	1.00142E-05	-4.9994	9.07005E-06	-5.0424	9.05717E-01	-.0430
21	MGCO3 AQ	0	4.87576E-02	5.78538E-07	-6.2377	5.79743E-07	-6.2368	1.00208E+00	.0009
29	CAOH	1	2.20359E-04	3.86204E-09	-8.4132	3.51618E-09	-8.4539	9.10444E-01	-.0407
32	CASO4 AQ	0	1.03882E+01	7.63447E-05	-4.1172	7.65037E-05	-4.1163	1.00208E+00	.0009
30	CAHCO3	1	3.97413E+00	3.93306E-05	-4.4053	3.58083E-05	-4.4460	9.10444E-01	-.0407
31	CACO3 AQ	0	3.97180E-01	3.97035E-06	-5.4012	3.97861E-06	-5.4003	1.00208E+00	.0009
44	NASO4	-1	9.00467E-01	7.56764E-06	-5.1210	6.87957E-06	-5.1624	9.09076E-01	-.0414
43	NAHCO3	0	6.04819E-01	7.20477E-06	-5.1424	7.21978E-06	-5.1415	1.00208E+00	.0009
42	NACO3	-1	1.54395E-02	1.86117E-07	-6.7302	1.69195E-07	-6.7716	9.09076E-01	-.0414
94	NACL	0	5.49462E-32	9.40663E-37	-36.0266	9.42622E-37	-36.0257	1.00208E+00	.0009
63	HSO4	-1	2.23553E-04	2.30423E-09	-8.6375	2.08981E-09	-8.6799	9.06945E-01	-.0424
96	H2SO4	0	1.25875E-43	1.28410E-48	-47.8914	1.28677E-48	-47.8905	1.00208E+00	.0009
93	HCL	0	5.90030E-37	1.61910E-41	-40.7907	1.62247E-41	-40.7898	1.00208E+00	.0009

MOLE RATIOS FROM ANALYTICAL MOLALITY

CL/CA	=	2.1291E-01
CL/MG	=	1.0064E+00
CL/NA	=	8.8178E-02
CL/K	=	4.7569E-01
CL/AL	=	3.1890E+26
CL/FE	=	3.1890E+26
CL/SO4	=	4.5698E-01
CL/HCO3	=	7.2508E-02
CA/MG	=	4.7267E+00
NA/K	=	5.3947E+00

MOLE RATIOS FROM COMPUTED MOLALITY

CL/CA	=	2.3142E-01
CL/MG	=	1.0887E+00
CL/NA	=	8.8544E-02
CL/K	=	4.7699E-01
CL/AL	=	3.1890E+26
CL/FE	=	3.1890E+26
CL/SO4	=	5.3260E-01
CL/HCO3	=	7.3772E-02
CA/MG	=	4.7043E+00
NA/K	=	5.3870E+00

LOG ACTIVITY RATIOS

LOG CA/H2	=	11.4734
LOG MG/H2	=	10.8034
LOG NA/H1	=	4.7642
LOG K/H1	=	4.0317
LOG AL/H3	=	-8.2500
LOG FE/H2	=	-15.5000
LOG CA/MG	=	.6699
LOG NA/K	=	.7325

160 SN ANTONIO TEPHZALA,AGSCE CAMPO=928.00MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	3.8270E-07	2.9685E-05	-6.4171	-4.5275	1.2892E-02	-1.88968	-2.55904
22	ARAGONIT	2.9385E-09	6.3259E-09	-8.5319	-8.1989	4.6452E-01	-.33299	-.45094
151	ARTIN	2.8822E-27	4.0741E-19	-26.5403	-18.3900	7.0744E-09	-8.15031	-11.03728
20	BRUCITE	4.5899E-18	3.8492E-12	-17.3382	-11.4146	1.1924E-06	-5.92356	-8.02179
13	CALCITE	2.9385E-09	3.4554E-09	-8.5319	-8.4615	8.5042E-01	-.07037	-.09529
12	DOLOMITE	1.8463E-18	1.0597E-17	-17.7337	-16.9748	1.7424E-01	-.75886	-1.02766
19	GYPSUM	3.8254E-07	1.7361E-05	-6.4173	-4.7604	2.2034E-02	-1.65690	-2.24380
65	HALITE	9.4262E-07	3.7757E+01	-6.0257	1.5770	2.4965E-08	-7.60266	-10.29565
118	HUNTITE	7.2892E-37	4.2693E-31	-36.1373	-30.3696	1.7073E-06	-5.76768	-7.81069
39	HYDMAG	7.1480E-55	2.0847E-38	-54.1458	-37.6810	3.4288E-17	-16.46486	-22.29699
11	MAGNESIT	6.2832E-10	6.2175E-09	-9.2018	-8.2064	1.0106E-01	-.99543	-1.34803
67	MIRABI	4.3346E-09	6.0750E-02	-8.3631	-1.2165	7.1351E-08	-7.14660	-9.67804
59	NAHCOL	1.2839E-05	2.7023E-01	-4.8915	-.5683	4.7511E-05	-4.32321	-5.85456
61	NATRON	3.3283E-11	4.0106E-02	-10.4778	-1.3968	8.2988E-10	-9.08099	-12.29762
150	NESQUE	6.2794E-10	6.6152E-06	-9.2021	-5.1795	9.4924E-05	-4.02262	-5.44750
66	THENAR	4.3433E-09	6.6699E-01	-8.3622	-.1759	6.5119E-09	-8.18629	-11.08601
62	THRNAT	3.3344E-11	1.3812E+00	-10.4770	.1403	2.4140E-11	-10.61725	-14.37806
60	TRONA	4.2801E-16	2.0094E-01	-15.3686	-.6969	2.1300E-15	-14.67163	-19.86856

181 CARBONERA,AGS CE CAMPO=840.00 MMHOS

INITIAL SOLUTION

TEMPERATURE = 21.50 DEGREES C PH = 7.480 ANALYTICAL EPMCAT = 7.335 ANALYTICAL EPMAN = 5.678

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.39789E-03	-2.8545	5.60000E+01
MG	2	3.37446E-04	-3.4718	8.20000E+00
NA	1	3.33789E-03	-2.4765	7.67000E+01
K	1	5.29643E-04	-3.2760	2.07000E+01
CL	-1	3.24531E-04	-3.4887	1.15000E+01
SO4	-2	4.79093E-04	-3.3196	4.60000E+01
HCO3	-1	4.39795E-03	-2.3568	2.68220E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	7.335	7.139
EPMAN	5.678	5.483

PH 7.480

TEMPERATURE 21.50 DEG C

IONIC STRENGTH 8.354970E-03

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 4.397923E+00 MEQ/KG H2O
ELECT = 1.657366E+00 MEQ/KG H2O

ACTIVITY H2O = .9998
PCO2 = 8.147711E-03
LOG PCO2 = -2.0890
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 4.688988E-03
DENSITY = 1.0000
TDS = 487.3MG/L
CARBONATE ALK = 4.397690E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.847VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	5.22723E+01	1.30484E-03	-2.8844	9.02514E-04	-3.0445	6.91668E-01	-.1601
2	MG	2	7.67248E+00	3.15738E-04	-3.5007	2.19581E-04	-3.6584	6.95455E-01	-.1577
3	NA	1	7.64287E+01	3.32608E-03	-2.4781	3.02767E-03	-2.5189	9.10281E-01	-.0408
4	K	1	2.06613E+01	5.28653E-04	-3.2768	4.80045E-04	-3.3187	9.08054E-01	-.0419
64	H	1	3.62915E-05	3.60211E-08	-7.4434	3.31131E-08	-7.4800	9.19270E-01	-.0366
5	CL	-1	1.15000E+01	3.24531E-04	-3.4887	2.94692E-04	-3.5306	9.08054E-01	-.0419
6	SO4	-2	3.96339E+01	4.12790E-04	-3.3843	2.84390E-04	-3.5461	6.88946E-01	-.1618
7	HCO3	-1	2.63113E+02	4.31421E-03	-2.3651	3.93503E-03	-2.4051	9.12109E-01	-.0400
18	CO3	-2	4.47554E-01	7.46170E-06	-5.1272	5.16445E-06	-5.2870	6.92128E-01	-.1598
86	H2CO3	0	1.89817E+01	3.06180E-04	-3.5140	3.06816E-04	-3.5131	1.00207E+00	.0009
27	OH	-1	4.34681E-03	2.55708E-07	-6.5923	2.32130E-07	-6.6343	9.07792E-01	-.0420
19	MGOH	1	3.61059E-04	8.74251E-09	-8.0584	7.99440E-09	-8.0972	9.14428E-01	-.0389
23	MGSO4 AQ	0	1.18289E+00	9.83160E-06	-5.0074	9.85054E-06	-5.0065	1.00193E+00	.0008
22	MGHCO3	1	9.23531E-01	1.08284E-05	-4.9654	9.84269E-06	-5.0069	9.08968E-01	-.0415
21	MGCO3 AQ	0	8.62766E-02	1.02369E-06	-5.9898	1.02566E-06	-5.9890	1.00193E+00	.0008
29	CAOH	1	3.20994E-04	5.62560E-09	-8.2498	5.13836E-09	-8.2892	9.13389E-01	-.0393
32	CASO4 AQ	0	6.89051E+00	5.06375E-05	-4.2955	5.07350E-05	-4.2947	1.00193E+00	.0008
30	CAHCO3	1	3.65806E+00	3.62012E-05	-4.4413	3.30658E-05	-4.4806	9.13389E-01	-.0393
31	CACO3 AQ	0	6.13373E-01	6.13126E-06	-5.2125	6.14307E-06	-5.2116	1.00193E+00	.0008
44	NASO4	-1	5.76431E-01	4.84423E-06	-5.3148	4.41846E-06	-5.3547	9.12109E-01	-.0400
43	NAHCO3	0	5.61360E-01	6.68684E-06	-5.1748	6.69971E-06	-5.1739	1.00193E+00	.0008
42	NACO3	-1	2.20478E-02	2.65768E-07	-6.5755	2.42409E-07	-6.6155	9.12109E-01	-.0400
94	NACL	0	5.20188E-32	8.90515E-37	-36.0504	8.92230E-37	-36.0495	1.00193E+00	.0008
63	HSO4	-1	8.84620E-05	9.11769E-10	-9.0401	8.29815E-10	-9.0810	9.10115E-01	-.0409
96	H2SO4	0	3.05096E-44	3.11228E-49	-48.5069	3.11827E-49	-48.5061	1.00193E+00	.0008
93	HCL	0	3.54936E-37	9.73941E-42	-41.0115	9.75816E-42	-41.0106	1.00193E+00	.0008

MOLE RATIOS FROM ANALYTICAL MOLALITY		MOLE RATIOS FROM COMPUTED MOLALITY		LOG ACTIVITY RATIOS	
CL/CA =	2.3216E-01	CL/CA =	2.4871E-01	LOG CA/H2 =	11.9155
CL/MG =	9.6173E-01	CL/MG =	1.0278E+00	LOG MG/H2 =	11.3016
CL/NA =	9.7227E-02	CL/NA =	9.7572E-02	LOG NA/H1 =	4.9611
CL/K =	6.1274E-01	CL/K =	6.1388E-01	LOG K/H1 =	4.1613
CL/AL =	3.2453E+26	CL/AL =	3.2453E+26	LOG AL/H3 =	-7.5600
CL/FE =	3.2453E+26	CL/FE =	3.2453E+26	LOG FE/H2 =	-15.0400
CL/SO4 =	6.7739E-01	CL/SO4 =	7.8619E-01	LOG CA/MG =	.6139
CL/HCO3 =	7.3792E-02	CL/HCO3 =	7.5224E-02	LOG NA/K =	.7998
CA/MG =	4.1425E+00	CA/MG =	4.1327E+00		
NA/K =	6.3022E+00	NA/K =	6.2916E+00		

181 CARBONERA,AGS CE CAMPO=840.00 MMHOS

PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18 ANHYDRIT	2.5667E-07	3.0536E-05	-6.5906	-4.5152	8.4053E-03	-2.07545	-2.79826
22 ARAGONIT	4.6610E-09	6.4679E-09	-8.3315	-8.1892	7.2064E-01	-.14228	-.19184
151 ARTIN	1.3410E-26	4.1308E-19	-25.8726	-18.3840	3.2464E-08	-7.48860	-10.09664
20 BRUCITE	1.1832E-17	3.8247E-12	-16.9269	-11.4174	3.0936E-06	-5.50954	-7.42834
13 CALCITE	4.6610E-09	3.5149E-09	-8.3315	-8.4541	1.3261E+00	.12257	.16526
12 DOLOMITE	5.2856E-18	1.1277E-17	-17.2769	-16.9478	4.6873E-01	-.32908	-.44369
19 GYPSUM	2.5657E-07	1.7327E-05	-6.5908	-4.7613	1.4807E-02	-1.82952	-2.46669
65 HALITE	8.9223E-07	3.7498E+01	-6.0495	1.5740	2.3794E-08	-7.62353	-10.27856
118 HUNTITE	6.7973E-36	5.1794E-31	-35.1677	-30.2857	1.3124E-05	-4.88194	-6.58217
39 HYDMAG	1.9553E-53	2.5246E-38	-52.7088	-37.5978	7.7451E-16	-15.11098	-20.37365
11 MAGNESIT	1.1340E-09	6.5119E-09	-8.9454	-8.1863	1.7414E-01	-.75909	-1.02346
67 MIRABI	2.6021E-09	5.2685E-02	-8.5847	-1.2783	4.9389E-08	-7.30637	-9.85094
59 NAHCOL	1.1914E-05	2.6279E-01	-4.9239	-.5804	4.5336E-05	-4.34356	-5.85628
61 NATRON	4.7253E-11	3.5638E-02	-10.3256	-1.4481	1.3259E-09	-8.87749	-11.96923
150 NESQUE	1.1334E-09	6.9088E-06	-8.9456	-5.1606	1.6405E-04	-3.78502	-5.10323
66 THENAR	2.6069E-09	6.6985E-01	-8.5839	-.1740	3.8918E-09	-8.40985	-11.33873
62 THRNAT	4.7333E-11	1.4106E+00	-10.3248	.1494	3.3556E-11	-10.47424	-14.12208
60 TRONA	5.6381E-16	2.2999E-01	-15.2489	-.6383	2.4514E-15	-14.61058	-19.69898

51 CLUB CAMPESTRE,AGS CE CAMPO=750.00MMHOS

INITIAL SOLUTION

TEMPERATURE = 21.50 DEGREES C PH = 7.400 ANALYTICAL EPMCAT = 6.474 ANALYTICAL EPMAN = 5.829

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.43782E-03	-2.8423	5.76000E+01
MG	2	1.19340E-04	-3.9232	2.90000E+00
NA	1	2.74602E-03	-2.5613	6.31000E+01
K	1	6.16633E-04	-3.2100	2.41000E+01
CL	-1	2.87843E-04	-3.5408	1.02000E+01
SO4	-2	5.72825E-04	-3.2420	5.50000E+01
HCO3	-1	4.39792E-03	-2.3568	2.68220E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	6.474	6.274
EPMAN	5.829	5.629

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 4.397882E+00 MEQ/KG H2O
ELECT = 6.453738E-01 MEQ/KG H2O

PH
7.400

TEMPERATURE
21.50 DEG C

IONIC STRENGTH
7.901346E-03

ACTIVITY H2O = .9998
PCO2 = 9.846361E-03
LOG PCO2 = -2.0067
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 4.755814E-03
DENSITY = 1.0000
TDS = 481.1MG/L
CARBONATE ALK = 4.397707E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.847VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	5.33409E+01	1.33150E-03	-2.8757	9.29061E-04	-3.0320	6.97754E-01	-.1563
2	MG	2	2.69568E+00	1.10932E-04	-3.9549	7.78065E-05	-4.1090	7.01389E-01	-.1540
3	NA	1	6.28567E+01	2.73543E-03	-2.5630	2.49568E-03	-2.6028	9.12354E-01	-.0398
4	K	1	2.40451E+01	6.15228E-04	-3.2110	5.60003E-04	-3.2518	9.10236E-01	-.0408
64	H	1	4.35523E-05	4.32274E-08	-7.3642	3.98107E-08	-7.4000	9.20959E-01	-.0358
5	CL	-1	1.02000E+01	2.87843E-04	-3.5408	2.62005E-04	-3.5817	9.10236E-01	-.0408
6	SO4	-2	4.78884E+01	4.98758E-04	-3.3021	3.46714E-04	-3.4600	6.95156E-01	-.1579
7	HCO3	-1	2.63897E+02	4.32704E-03	-2.3638	3.95538E-03	-2.4028	9.14106E-01	-.0390
18	CO3	-2	3.70927E-01	6.18412E-06	-5.2087	4.31782E-06	-5.3647	6.98211E-01	-.1560
86	H2CO3	0	2.29417E+01	3.70055E-04	-3.4317	3.70781E-04	-3.4309	1.00196E+00	.0009
27	OH	-1	3.60685E-03	2.12178E-07	-6.6733	1.93079E-07	-6.7143	9.09988E-01	-.0410
19	MGOH	1	1.06196E-04	2.57135E-09	-8.5898	2.35619E-09	-8.6278	9.16323E-01	-.0380
23	MGSO4 AQ	0	5.11058E-01	4.24764E-06	-5.3719	4.25538E-06	-5.3711	1.00182E+00	.0008
22	MGHCO3	1	3.28165E-01	3.84772E-06	-5.4148	3.50569E-06	-5.4552	9.11109E-01	-.0404
21	MGCO3 AQ	0	2.55624E-02	3.03300E-07	-6.5181	3.03852E-07	-6.5173	1.00182E+00	.0008
29	CAOH	1	2.74266E-04	4.80664E-09	-8.3182	4.39966E-09	-8.3566	9.15330E-01	-.0384
32	CASO4 AQ	0	8.64864E+00	6.35574E-05	-4.1968	6.36731E-05	-4.1960	1.00182E+00	.0008
30	CAHCO3	1	3.77714E+00	3.73794E-05	-4.4274	3.42145E-05	-4.4658	9.15330E-01	-.0384
31	CACO3 AQ	0	5.27963E-01	5.27747E-06	-5.2776	5.28708E-06	-5.2768	1.00182E+00	.0008
44	NASO4	-1	5.78013E-01	4.85749E-06	-5.3136	4.44027E-06	-5.3526	9.14106E-01	-.0390
43	NAHCO3	0	4.65167E-01	5.54097E-06	-5.2564	5.55106E-06	-5.2556	1.00182E+00	.0008
42	NACO3	-1	1.51613E-02	1.82756E-07	-6.7381	1.67059E-07	-6.7771	9.14106E-01	-.0390
94	NACL	0	3.81268E-32	6.52692E-37	-36.1853	6.53881E-37	-36.1845	1.00182E+00	.0008
63	HSO4	-1	1.29367E-04	1.33336E-09	-8.8751	1.21630E-09	-8.9150	9.12203E-01	-.0399
96	H2SO4	0	5.37702E-44	5.48506E-49	-48.2608	5.49505E-49	-48.2600	1.00182E+00	.0008
93	HCL	0	3.79437E-37	1.04117E-41	-40.9825	1.04306E-41	-40.9817	1.00182E+00	.0008

MOLE RATIOS FROM ANALYTICAL MOLALITY		MOLE RATIOS FROM COMPUTED MOLALITY		LOG ACTIVITY RATIOS	
CL/CA =	2.0019E-01	CL/CA =	2.1618E-01	LOG CA/H2 =	11.7680
CL/MG =	2.4120E+00	CL/MG =	2.5948E+00	LOG MG/H2 =	10.6910
CL/NA =	1.0482E-01	CL/NA =	1.0523E-01	LOG NA/H1 =	4.7972
CL/K =	4.6680E-01	CL/K =	4.6786E-01	LOG K/H1 =	4.1482
CL/AL =	2.8784E+26	CL/AL =	2.8784E+26	LOG AL/H3 =	-7.8000
CL/FE =	2.8784E+26	CL/FE =	2.8784E+26	LOG FE/H2 =	-15.2000
CL/SO4 =	5.0250E-01	CL/SO4 =	5.7712E-01	LOG CA/MG =	1.0770
CL/HCO3 =	6.5450E-02	CL/HCO3 =	6.6522E-02	LOG NA/K =	.6490
CA/MG =	1.2048E+01	CA/MG =	1.2003E+01		
NA/K =	4.4532E+00	NA/K =	4.4462E+00		

51 CLUB CAMPESTRE,AGS CE CAMPO=750.00MMHOS

PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18 ANHYDRIT	3.2212E-07	3.0536E-05	-6.4920	-4.5152	1.0549E-02	-1.97680	-2.66525
22 ARAGONIT	4.0115E-09	6.4679E-09	-8.3967	-8.1892	6.2022E-01	-.20745	-.27970
151 ARTIN	9.7395E-28	4.1308E-19	-27.0115	-18.3840	2.3578E-09	-8.62750	-11.63218
20 BRUCITE	2.9006E-18	3.8247E-12	-17.5375	-11.4174	7.5838E-07	-6.12011	-8.25155
13 CALCITE	4.0115E-09	3.5149E-09	-8.3967	-8.4541	1.1413E+00	.05740	.07739
12 DOLOMITE	1.3477E-18	1.1277E-17	-17.8704	-16.9478	1.1951E-01	-.92259	-1.24390
19 GYPSUM	3.2200E-07	1.7327E-05	-6.4921	-4.7613	1.8584E-02	-1.73087	-2.33367
65 HALITE	6.5388E-07	3.7498E+01	-6.1845	1.5740	1.7438E-08	-7.75851	-10.46055
118 HUNTITE	1.5211E-37	5.1794E-31	-36.8179	-30.2857	2.9368E-07	-6.53213	-8.80706
39 HYDMAG	3.6923E-56	2.5246E-38	-55.4327	-37.5978	1.4625E-18	-17.83489	-24.04622
11 MAGNESIT	3.3595E-10	6.5119E-09	-9.4737	-8.1863	5.1591E-02	-1.28743	-1.73580
67 MIRABI	2.1557E-09	5.2685E-02	-8.6664	-1.2783	4.0916E-08	-7.38811	-9.96115
59 NAHCOL	9.8713E-06	2.6279E-01	-5.0056	-.5804	3.7563E-05	-4.42524	-5.96640
61 NATRON	2.6846E-11	3.5638E-02	-10.5711	-1.4481	7.5328E-10	-9.12304	-12.30031
150 NESQUE	3.3578E-10	6.9088E-06	-9.4740	-5.1606	4.8601E-05	-4.31335	-5.81556
66 THENAR	2.1595E-09	6.6985E-01	-8.6657	-.1740	3.2238E-09	-8.49163	-11.44900
62 THRNAT	2.6888E-11	1.4106E+00	-10.5704	.1494	1.9062E-11	-10.71983	-14.45321
60 TRONA	2.6538E-16	2.2999E-01	-15.5761	-.6383	1.1538E-15	-14.93785	-20.14023

48H S/N,AGS CE CAMPO=514.00 MMHOS

INITIAL SOLUTION

TEMPERATURE = 21.60 DEGREES C PH = 7.380 ANALYTICAL EPMCAT = 6.098 ANALYTICAL EPMAN = 5.204

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.11825E-03	-2.9515	4.48000E+01
MG	2	4.36187E-04	-3.3603	1.06000E+01
NA	1	2.39340E-03	-2.6210	5.50000E+01
K	1	5.98694E-04	-3.2228	2.34000E+01
CL	-1	2.70898E-04	-3.5672	9.60000E+00
SO4	-2	4.68652E-04	-3.3291	4.50000E+01
HCO3	-1	3.99797E-03	-2.3982	2.43840E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	6.098	5.930
EPMAN	5.204	5.035

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 3.997939E+00 MEQ/KG H2O
ELECT = 8.946676E-01 MEQ/KG H2O

PH
7.380

TEMPERATURE
21.60 DEG C

IONIC STRENGTH
7.353624E-03

ACTIVITY H2O = .9998
PCO2 = 9.409718E-03
LOG PCO2 = -2.0264
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 4.340343E-03
DENSITY = 1.0000
TDS = 432.2MG/L
CARBONATE ALK = 3.997769E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.849VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	4.18889E+01	1.04558E-03	-2.9806	7.37601E-04	-3.1322	7.05444E-01	-.1515
2	MG	2	9.93869E+00	4.08974E-04	-3.3883	2.89919E-04	-3.5377	7.08893E-01	-.1494
3	NA	1	5.48144E+01	2.38532E-03	-2.6225	2.18245E-03	-2.6611	9.14951E-01	-.0386
4	K	1	2.33557E+01	5.97560E-04	-3.2236	5.45553E-04	-3.2632	9.12968E-01	-.0395
64	H	1	4.55020E-05	4.51604E-08	-7.3452	4.16869E-08	-7.3800	9.23085E-01	-.0348
5	CL	-1	9.60000E+00	2.70898E-04	-3.5672	2.47321E-04	-3.6067	9.12968E-01	-.0395
6	SO4	-2	3.92683E+01	4.08959E-04	-3.3883	2.87498E-04	-3.5414	7.02999E-01	-.1530
7	HCO3	-1	2.39878E+02	3.93300E-03	-2.4053	3.60504E-03	-2.4431	9.16612E-01	-.0378
18	CO3	-2	3.20066E-01	5.33590E-06	-5.2728	3.76660E-06	-5.4241	7.05897E-01	-.1513
86	H2CO3	0	2.18669E+01	3.52701E-04	-3.4526	3.53344E-04	-3.4518	1.00182E+00	.0008
27	OH	-1	3.46103E-03	2.03589E-07	-6.6912	1.85823E-07	-6.7309	9.12736E-01	-.0397
19	MGOH	1	3.80312E-04	9.20818E-09	-8.0358	8.45957E-09	-8.0727	9.18702E-01	-.0368
23	MGSO4 AQ	0	1.58354E+00	1.31609E-05	-4.8807	1.31832E-05	-4.8800	1.00169E+00	.0007
22	MGHCO3	1	1.11191E+00	1.30365E-05	-4.8848	1.19126E-05	-4.9240	9.13790E-01	-.0392
21	MGCO3 AQ	0	8.32319E-02	9.87506E-07	-6.0055	9.89180E-07	-6.0047	1.00169E+00	.0007
29	CAOH	1	2.09161E-04	3.66546E-09	-8.4359	3.36403E-09	-8.4731	9.17765E-01	-.0373
32	CASO4 AQ	0	5.69957E+00	4.18831E-05	-4.3780	4.19541E-05	-4.3772	1.00169E+00	.0007
30	CAHCO3	1	2.73438E+00	2.70587E-05	-4.5677	2.48336E-05	-4.6050	9.17765E-01	-.0373
31	CACO3 AQ	0	3.66456E-01	3.66288E-06	-5.4362	3.66909E-06	-5.4354	1.00169E+00	.0007
44	NASO4	-1	4.18285E-01	3.51500E-06	-5.4541	3.22189E-06	-5.4919	9.16612E-01	-.0378
43	NAHCO3	0	3.70821E-01	4.41692E-06	-5.3549	4.42441E-06	-5.3541	1.00169E+00	.0007
42	NACO3	-1	1.15945E-02	1.39755E-07	-6.8546	1.28101E-07	-6.8924	9.16612E-01	-.0378
94	NACL	0	3.14785E-32	5.38854E-37	-36.2685	5.39767E-37	-36.2678	1.00169E+00	.0007
63	HSO4	-1	1.12319E-04	1.15760E-09	-8.9364	1.05900E-09	-8.9751	9.14820E-01	-.0387
96	H2SO4	0	4.88969E-44	4.98769E-49	-48.3021	4.99614E-49	-48.3014	1.00169E+00	.0007
93	HCL	0	3.75117E-37	1.02926E-41	-40.9875	1.03101E-41	-40.9867	1.00169E+00	.0007

MOLE RATIOS FROM ANALYTICAL MOLALITY		MOLE RATIOS FROM COMPUTED MOLALITY		LOG ACTIVITY RATIOS	
CL/CA =	2.4225E-01	CL/CA =	2.5909E-01	LOG CA/H2 =	11.6278
CL/MG =	6.2106E-01	CL/MG =	6.6238E-01	LOG MG/H2 =	11.2223
CL/NA =	1.1319E-01	CL/NA =	1.1357E-01	LOG NA/H1 =	4.7189
CL/K =	4.5248E-01	CL/K =	4.5334E-01	LOG K/H1 =	4.1168
CL/AL =	2.7090E+26	CL/AL =	2.7090E+26	LOG AL/H3 =	-7.8600
CL/FE =	2.7090E+26	CL/FE =	2.7090E+26	LOG FE/H2 =	-15.2400
CL/SO4 =	5.7804E-01	CL/SO4 =	6.6241E-01	LOG CA/MG =	.4055
CL/HCO3 =	6.7759E-02	CL/HCO3 =	6.8878E-02	LOG NA/K =	.6021
CA/MG =	2.5637E+00	CA/MG =	2.5566E+00		
NA/K =	3.9977E+00	NA/K =	3.9918E+00		

48H S/N,AGS CE CAMPO=514.00 MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	2.1206E-07	3.0470E-05	-6.6735	-4.5161	6.9597E-03	-2.15741	-2.90975
22	ARAGONIT	2.7782E-09	6.4568E-09	-8.5562	-8.1900	4.3028E-01	-.36625	-.49397
151	ARTIN	1.0927E-26	4.1264E-19	-25.9615	-18.3844	2.6480E-08	-7.57708	-10.21941
20	BRUCITE	1.0011E-17	3.8266E-12	-16.9995	-11.4172	2.6162E-06	-5.58234	-7.52904
13	CALCITE	2.7782E-09	3.5104E-09	-8.5562	-8.4546	7.9144E-01	-.10158	-.13701
12	DOLOMITE	3.0339E-18	1.1223E-17	-17.5180	-16.9499	2.7034E-01	-.56809	-.76620
19	GYPSUM	2.1199E-07	1.7330E-05	-6.6737	-4.7612	1.2233E-02	-1.91248	-2.57941
65	HALITE	5.3977E-07	3.7518E+01	-6.2678	1.5742	1.4387E-08	-7.84203	-10.57675
118	HUNTITE	3.6178E-36	5.1027E-31	-35.4416	-30.2922	7.0901E-06	-5.14935	-6.94506
39	HYDMAG	1.4227E-53	2.4875E-38	-52.8469	-37.6042	5.7192E-16	-15.24267	-20.55818
11	MAGNESIT	1.0920E-09	6.4887E-09	-8.9618	-8.1878	1.6829E-01	-.77393	-1.04382
67	MIRABI	1.3672E-09	5.3268E-02	-8.8642	-1.2735	2.5666E-08	-7.59064	-10.23770
59	NAHCOL	7.8678E-06	2.6336E-01	-5.1041	-.5795	2.9875E-05	-4.52469	-6.10257
61	NATRON	1.7912E-11	3.5965E-02	-10.7469	-1.4441	4.9803E-10	-9.30274	-12.54685
150	NESQUE	1.0915E-09	6.8857E-06	-8.9620	-5.1621	1.5851E-04	-3.79993	-5.12506
66	THENAR	1.3694E-09	6.6963E-01	-8.8635	-.1742	2.0450E-09	-8.68931	-11.71950
62	THRNAT	1.7938E-11	1.4083E+00	-10.7462	.1487	1.2737E-11	-10.89492	-14.69426
60	TRONA	1.4111E-16	2.2761E-01	-15.8504	-.6428	6.1996E-16	-15.20763	-20.51093

45 SORTENEJO(JESUS MA)AGS CE CAMPO=672.0 MMHOS

INITIAL SOLUTION

TEMPERATURE = 21.80 DEGREES C PH = 7.420 ANALYTICAL EPMCAT = 6.045 ANALYTICAL EPMAN = 4.350

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.19806E-03	-2.9215	4.80000E+01
MG	2	3.74443E-04	-3.4266	9.10000E+00
NA	1	2.36281E-03	-2.6266	5.43000E+01
K	1	5.39819E-04	-3.2678	2.11000E+01
CL	-1	2.99101E-04	-3.5242	1.06000E+01
SO4	-2	4.26971E-04	-3.3696	4.10000E+01
HCO3	-1	3.19817E-03	-2.4951	1.95070E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	6.045	5.891
EPMAN	4.350	4.196

PH 7.420

TEMPERATURE 21.80 DEG C

IONIC STRENGTH 6.903376E-03

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 3.198146E+00 MEQ/KG H2O
ELECT = 1.696307E+00 MEQ/KG H2O

ACTIVITY H2O = .9999
PCO2 = 6.893373E-03
LOG PCO2 = -2.1616
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 3.445827E-03
DENSITY = 1.0000
TDS = 379.2MG/L
CARBONATE ALK = 3.197949E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.853VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	4.52302E+01	1.12893E-03	-2.9473	8.03872E-04	-3.0948	7.12068E-01	-.1475
2	MG	2	8.60262E+00	3.53977E-04	-3.4510	2.53221E-04	-3.5965	7.15361E-01	-.1455
3	NA	1	5.41435E+01	2.35600E-03	-2.6278	2.16086E-03	-2.6654	9.17170E-01	-.0376
4	K	1	2.10633E+01	5.38880E-04	-3.2685	4.93236E-04	-3.3069	9.15297E-01	-.0384
64	H	1	4.14187E-05	4.11056E-08	-7.3861	3.80189E-08	-7.4200	9.24910E-01	-.0339
5	CL	-1	1.06000E+01	2.99101E-04	-3.5242	2.73766E-04	-3.5626	9.15297E-01	-.0384
6	SO4	-2	3.55735E+01	3.70460E-04	-3.4313	2.62935E-04	-3.5802	7.09752E-01	-.1489
7	HCO3	-1	1.91732E+02	3.14344E-03	-2.5026	2.88805E-03	-2.5394	9.18753E-01	-.0368
18	CO3	-2	2.79783E-01	4.66409E-06	-5.3312	3.32325E-06	-5.4784	7.12517E-01	-.1472
86	H2CO3	0	1.59323E+01	2.56966E-04	-3.5901	2.57406E-04	-3.5894	1.00171E+00	.0007
27	OH	-1	3.84442E-03	2.26130E-07	-6.6456	2.06926E-07	-6.6842	9.15079E-01	-.0385
19	MGOH	1	3.69970E-04	8.95729E-09	-8.0478	8.24733E-09	-8.0837	9.20739E-01	-.0359
23	MGSO4 AQ	0	1.27187E+00	1.05701E-05	-4.9759	1.05869E-05	-4.9752	1.00159E+00	.0007
22	MGHCO3	1	7.77006E-01	9.10942E-06	-5.0405	8.34494E-06	-5.0786	9.16078E-01	-.0381
21	MGCO3 AQ	0	6.43470E-02	7.63405E-07	-6.1172	7.64619E-07	-6.1166	1.00159E+00	.0007
29	CAOH	1	2.53629E-04	4.44451E-09	-8.3522	4.08828E-09	-8.3885	9.19848E-01	-.0363
32	CASO4 AQ	0	5.69171E+00	4.18231E-05	-4.3786	4.18896E-05	-4.3779	1.00159E+00	.0007
30	CAHCO3	1	2.39673E+00	2.37161E-05	-4.6250	2.18152E-05	-4.6612	9.19848E-01	-.0363
31	CACO3 AQ	0	3.53866E-01	3.53685E-06	-5.4514	3.54248E-06	-5.4507	1.00159E+00	.0007
44	NASO4	-1	3.78389E-01	3.17957E-06	-5.4976	2.92124E-06	-5.5344	9.18753E-01	-.0368
43	NAHCO3	0	2.94176E-01	3.50381E-06	-5.4555	3.50938E-06	-5.4548	1.00159E+00	.0007
42	NACO3	-1	1.02103E-02	1.23063E-07	-6.9099	1.13065E-07	-6.9467	9.18753E-01	-.0368
94	NACL	0	3.45049E-32	5.90629E-37	-36.2287	5.91569E-37	-36.2280	1.00159E+00	.0007
63	HSO4	-1	9.39763E-05	9.68500E-10	-9.0139	8.88166E-10	-9.0515	9.17053E-01	-.0376
96	H2SO4	0	3.72016E-44	3.79452E-49	-48.4208	3.80056E-49	-48.4202	1.00159E+00	.0007
93	HCL	0	3.78750E-37	1.03918E-41	-40.9833	1.04083E-41	-40.9826	1.00159E+00	.0007

MOLE RATIOS FROM ANALYTICAL MOLALITY

CL/CA	=	2.4965E-01
CL/MG	=	7.9879E-01
CL/NA	=	1.2659E-01
CL/K	=	5.5408E-01
CL/AL	=	2.9910E+26
CL/FE	=	2.9910E+26
CL/SO4	=	7.0052E-01
CL/HCO3	=	9.3522E-02
CA/MG	=	3.1996E+00
NA/K	=	4.3770E+00

MOLE RATIOS FROM COMPUTED MOLALITY

CL/CA	=	2.6494E-01
CL/MG	=	8.4497E-01
CL/NA	=	1.2695E-01
CL/K	=	5.5504E-01
CL/AL	=	2.9910E+26
CL/FE	=	2.9910E+26
CL/SO4	=	8.0738E-01
CL/HCO3	=	9.5151E-02
CA/MG	=	3.1893E+00
NA/K	=	4.3720E+00

LOG ACTIVITY RATIOS

LOG CA/H2	=	11.7452
LOG MG/H2	=	11.2435
LOG NA/H1	=	4.7546
LOG K/H1	=	4.1131
LOG AL/H3	=	-7.7400
LOG FE/H2	=	-15.1600
LOG CA/MG	=	.5017
LOG NA/K	=	.6416

45 SORTENEJO(JESUS MA)AGS CE CAMPO=672.0 MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	2.1137E-07	3.0337E-05	-6.6750	-4.5180	6.9673E-03	-2.15694	-2.91109
22	ARAGONIT	2.6715E-09	6.4347E-09	-8.5733	-8.1915	4.1516E-01	-.38178	-.51527
151	ARTIN	9.1202E-27	4.1176E-19	-26.0400	-18.3854	2.2149E-08	-7.65464	-10.33102
20	BRUCITE	1.0843E-17	3.8304E-12	-16.9649	-11.4168	2.8307E-06	-5.54811	-7.48795
13	CALCITE	2.6715E-09	3.5013E-09	-8.5733	-8.4558	7.6299E-01	-.11748	-.15856
12	DOLOMITE	2.2481E-18	1.1115E-17	-17.6482	-16.9541	2.0225E-01	-.69411	-.93680
19	GYPSUM	2.1130E-07	1.7335E-05	-6.6751	-4.7611	1.2189E-02	-1.91402	-2.58323
65	HALITE	5.9157E-07	3.7558E+01	-6.2280	1.5747	1.5751E-08	-7.80269	-10.53084
118	HUNTITE	1.5920E-36	4.9527E-31	-35.7981	-30.3052	3.2143E-06	-5.49291	-7.41346
39	HYDMAG	5.4341E-54	2.4151E-38	-53.2649	-37.6171	2.2500E-16	-15.64781	-21.11892
11	MAGNESIT	8.4152E-10	6.4425E-09	-9.0749	-8.1909	1.3062E-01	-.88399	-1.19308
67	MIRABI	1.2259E-09	5.4452E-02	-8.9115	-1.2640	2.2514E-08	-7.64755	-10.32144
59	NAHCOL	6.2407E-06	2.6450E-01	-5.2048	-.5776	2.3595E-05	-4.62719	-6.24504
61	NATRON	1.5495E-11	3.6626E-02	-10.8098	-1.4362	4.2305E-10	-9.37361	-12.65101
150	NESQUE	8.4115E-10	6.8397E-06	-9.0751	-5.1650	1.2298E-04	-3.91016	-5.27731
66	THENAR	1.2277E-09	6.6919E-01	-8.9109	-.1745	1.8346E-09	-8.73645	-11.79107
62	THRNAT	1.5515E-11	1.4037E+00	-10.8092	.1473	1.1053E-11	-10.95653	-14.78738
60	TRONA	9.6809E-17	2.2291E-01	-16.0141	-.6519	4.3429E-16	-15.36222	-20.73348

142 GAVILANES,AGS CE CAMPO=666.00 MMHOS

INITIAL SOLUTION

TEMPERATURE = 22.10 DEGREES C PH = 7.420 ANALYTICAL EPMCAT = 6.078 ANALYTICAL EPMAN = 4.223

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.17809E-03	-2.9288	4.72000E+01
MG	2	4.15588E-04	-3.3813	1.01000E+01
NA	1	2.30188E-03	-2.6379	5.29000E+01
K	1	5.90984E-04	-3.2284	2.31000E+01
CL	-1	2.76526E-04	-3.5583	9.80000E+00
SO4	-2	3.74900E-04	-3.4261	3.60000E+01
HCO3	-1	3.19816E-03	-2.4951	1.95070E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED	PH
EPMCAT	6.078	5.935	7.420
EPMAN	4.223	4.080	

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 3.198132E+00 MEQ/KG H2O
ELECT = 1.855639E+00 MEQ/KG H2O

TEMPERATURE
22.10 DEG C

IONIC STRENGTH
6.846814E-03

ACTIVITY H2O = .9999
PCO2 = 6.920400E-03
LOG PCO2 = -2.1599
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 3.444540E-03
DENSITY = 1.0000
TDS = 374.2MG/L
CARBONATE ALK = 3.197927E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.859VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	4.46529E+01	1.11451E-03	-2.9529	7.94445E-04	-3.0999	7.12819E-01	-.1470
2	MG	2	9.57835E+00	3.94124E-04	-3.4044	2.82229E-04	-3.5494	7.16092E-01	-.1450
3	NA	1	5.27561E+01	2.29562E-03	-2.6391	2.10605E-03	-2.6765	9.17421E-01	-.0374
4	K	1	2.30646E+01	5.90078E-04	-3.2291	5.40252E-04	-3.2674	9.15561E-01	-.0383
64	H	1	4.14097E-05	4.10965E-08	-7.3862	3.80189E-08	-7.4200	9.25114E-01	-.0338
5	CL	-1	9.80000E+00	2.76526E-04	-3.5583	2.53176E-04	-3.5966	9.15561E-01	-.0383
6	SO4	-2	3.11620E+01	3.24517E-04	-3.4888	2.30575E-04	-3.6372	7.10519E-01	-.1484
7	HCO3	-1	1.91661E+02	3.14228E-03	-2.5028	2.88774E-03	-2.5394	9.18995E-01	-.0367
18	CO3	-2	2.81307E-01	4.68947E-06	-5.3289	3.34485E-06	-5.4756	7.13268E-01	-.1467
86	H2CO3	0	1.58617E+01	2.55825E-04	-3.5921	2.56259E-04	-3.5913	1.00169E+00	.0007
27	OH	-1	3.93327E-03	2.31355E-07	-6.6357	2.11769E-07	-6.6741	9.15344E-01	-.0384
19	MGOH	1	4.23397E-04	1.02508E-08	-7.9892	9.44063E-09	-8.0250	9.20968E-01	-.0358
23	MGSO4 AQ	0	1.25309E+00	1.04139E-05	-4.9824	1.04303E-05	-4.9817	1.00158E+00	.0007
22	MGHCO3	1	8.67183E-01	1.01666E-05	-4.9928	9.31602E-06	-5.0308	9.16337E-01	-.0379
21	MGCO3 AQ	0	7.25191E-02	8.60354E-07	-6.0653	8.61712E-07	-6.0646	1.00158E+00	.0007
29	CAOH	1	2.56987E-04	4.50332E-09	-8.3465	4.14343E-09	-8.3826	9.20083E-01	-.0362
32	CASO4 AQ	0	4.94563E+00	3.63407E-05	-4.4396	3.63980E-05	-4.4389	1.00158E+00	.0007
30	CAHCO3	1	2.38962E+00	2.36457E-05	-4.6262	2.17560E-05	-4.6624	9.20083E-01	-.0362
31	CACO3 AQ	0	3.54174E-01	3.53991E-06	-5.4510	3.54550E-06	-5.4503	1.00158E+00	.0007
44	NASO4	-1	3.23949E-01	2.72211E-06	-5.5651	2.50160E-06	-5.6018	9.18995E-01	-.0367
43	NAHCO3	0	2.86689E-01	3.41461E-06	-5.4667	3.42000E-06	-5.4660	1.00158E+00	.0007
42	NACO3	-1	1.01693E-02	1.22568E-07	-6.9116	1.12640E-07	-6.9483	9.18995E-01	-.0367
94	NACL	0	3.11010E-32	5.32361E-37	-36.2738	5.33201E-37	-36.2731	1.00158E+00	.0007
63	HSO4	-1	8.30709E-05	8.56107E-10	-9.0675	7.85312E-10	-9.1050	9.17306E-01	-.0375
96	H2SO4	0	3.26238E-44	3.32758E-49	-48.4779	3.33283E-49	-48.4772	1.00158E+00	.0007
93	HCL	0	3.50271E-37	9.61033E-42	-41.0173	9.62549E-42	-41.0166	1.00158E+00	.0007

MOLE RATIOS FROM ANALYTICAL MOLALITY		MOLE RATIOS FROM COMPUTED MOLALITY		LOG ACTIVITY RATIOS	
CL/CA =	2.3472E-01	CL/CA =	2.4811E-01	LOG CA/H2 =	11.7401
CL/MG =	6.6538E-01	CL/MG =	7.0162E-01	LOG MG/H2 =	11.2906
CL/NA =	1.2013E-01	CL/NA =	1.2046E-01	LOG NA/H1 =	4.7435
CL/K =	4.6791E-01	CL/K =	4.6863E-01	LOG K/H1 =	4.1526
CL/AL =	2.7653E+26	CL/AL =	2.7653E+26	LOG AL/H3 =	-7.7400
CL/FE =	2.7653E+26	CL/FE =	2.7653E+26	LOG FE/H2 =	-15.1600
CL/SO4 =	7.3760E-01	CL/SO4 =	8.5211E-01	LOG CA/MG =	.4495
CL/HCO3 =	8.6464E-02	CL/HCO3 =	8.8002E-02	LOG NA/K =	.5909
CA/MG =	2.8347E+00	CA/MG =	2.8278E+00		
NA/K =	3.8950E+00	NA/K =	3.8904E+00		

142 GAVILANES,AGS CE CAMPO=666.00 MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	1.8318E-07	3.0139E-05	-6.7371	-4.5209	6.0777E-03	-2.21626	-2.99419
22	ARAGONIT	2.6573E-09	6.4018E-09	-8.5756	-8.1937	4.1509E-01	-.38186	-.51590
151	ARTIN	1.1943E-26	4.1045E-19	-25.9229	-18.3867	2.9098E-08	-7.53614	-10.18143
20	BRUCITE	1.2657E-17	3.8360E-12	-16.8977	-11.4161	3.2995E-06	-5.48155	-7.40565
13	CALCITE	2.6573E-09	3.4877E-09	-8.5756	-8.4575	7.6191E-01	-.11810	-.15955
12	DOLOMITE	2.5085E-18	1.0957E-17	-17.6006	-16.9603	2.2895E-01	-.64026	-.86501
19	GYPSUM	1.8313E-07	1.7343E-05	-6.7372	-4.7609	1.0559E-02	-1.97637	-2.67010
65	HALITE	5.3320E-07	3.7618E+01	-6.2731	1.5754	1.4174E-08	-7.84850	-10.60343
118	HUNTITE	2.2355E-36	4.7365E-31	-35.6506	-30.3245	4.7198E-06	-5.32608	-7.19561
39	HYDMAG	1.0046E-53	2.3106E-38	-52.9980	-37.6363	4.3477E-16	-15.36174	-20.75392
11	MAGNESIT	9.4401E-10	6.3740E-09	-9.0250	-8.1956	1.4810E-01	-.82943	-1.12058
67	MIRABI	1.0212E-09	5.6274E-02	-8.9909	-1.2497	1.8147E-08	-7.74118	-10.45845
59	NAHCOL	6.0817E-06	2.6621E-01	-5.2160	-.5748	2.2846E-05	-4.64119	-6.27031
61	NATRON	1.4814E-11	3.7640E-02	-10.8293	-1.4244	3.9359E-10	-9.40496	-12.70623
150	NESQUE	9.4360E-10	6.7714E-06	-9.0252	-5.1693	1.3935E-04	-3.85589	-5.20936
66	THENAR	1.0227E-09	6.6853E-01	-8.9903	-.1749	1.5298E-09	-8.81537	-11.90968
62	THRNAT	1.4834E-11	1.3969E+00	-10.8287	.1452	1.0619E-11	-10.97392	-14.82592
60	TRONA	9.0201E-17	2.1607E-01	-16.0448	-.6654	4.1747E-16	-15.37937	-20.77774

44 JESUS MARIA,AGS CE CAMPO=958.00MMHOS

INITIAL SOLUTION

TEMPERATURE = 23.10 DEGREES C PH = 7.050 ANALYTICAL EPMCAT = 8.779 ANALYTICAL EPMAN = 6.957

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.89734E-03	-2.7219	7.60000E+01
MG	2	3.74524E-04	-3.4265	9.10000E+00
NA	1	3.54717E-03	-2.4501	8.15000E+01
K	1	6.93473E-04	-3.1590	2.71000E+01
CL	-1	2.79410E-04	-3.5538	9.90000E+00
SO4	-2	5.41643E-04	-3.2663	5.20000E+01
HCO3	-1	5.59815E-03	-2.2520	3.41380E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	8.779	8.511
EPMAN	6.957	6.689

PH
7.050

TEMPERATURE
23.10 DEG C

IONIC STRENGTH
1.016679E-02

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 5.598056E+00 MEQ/KG H2O
ELECT = 1.823270E+00 MEQ/KG H2O

ACTIVITY H2O = .9998
PCO2 = 2.830078E-02
LOG PCO2 = -1.5482
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 6.606419E-03
DENSITY = 1.0000
TDS = 597.0MG/L
CARBONATE ALK = 5.598041E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.878VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	7.04657E+01	1.75918E-03	-2.7547	1.17700E-03	-2.9292	6.69061E-01	-.1745
2	MG	2	8.44420E+00	3.47534E-04	-3.4590	2.34038E-04	-3.6307	6.73424E-01	-.1717
3	NA	1	8.11656E+01	3.53261E-03	-2.4519	3.18800E-03	-2.4965	9.02447E-01	-.0446
4	K	1	2.70448E+01	6.92062E-04	-3.1599	6.22707E-04	-3.2057	8.99785E-01	-.0459
64	H	1	9.83466E-05	9.76244E-08	-7.0104	8.91251E-08	-7.0500	9.12939E-01	-.0396
5	CL	-1	9.90000E+00	2.79410E-04	-3.5538	2.51409E-04	-3.5996	8.99785E-01	-.0459
6	SO4	-2	4.34208E+01	4.52280E-04	-3.3446	3.01154E-04	-3.5212	6.65857E-01	-.1766
7	HCO3	-1	3.35045E+02	5.49427E-03	-2.2601	4.96995E-03	-2.3036	9.04569E-01	-.0436
18	CO3	-2	2.24778E-01	3.74795E-06	-5.4262	2.50935E-06	-5.6004	6.69526E-01	-.1742
86	H2CO3	0	6.30317E+01	1.01683E-03	-2.9928	1.01938E-03	-2.9917	1.00250E+00	.0011
27	OH	-1	1.84314E-03	1.08437E-07	-6.9648	9.75362E-08	-7.0108	8.99469E-01	-.0460
19	MGOH	1	1.66060E-04	4.02134E-09	-8.3956	3.64853E-09	-8.4379	9.07292E-01	-.0423
23	MGSO4 AQ	0	1.39221E+00	1.15727E-05	-4.9366	1.15998E-05	-4.9355	1.00234E+00	.0010
22	MGHCO3	1	1.26598E+00	1.48453E-05	-4.8284	1.33736E-05	-4.8738	9.00864E-01	-.0453
21	MGCO3 AQ	0	4.57681E-02	5.43106E-07	-6.2651	5.44379E-07	-6.2641	1.00234E+00	.0010
29	CAOH	1	1.79252E-04	3.14184E-09	-8.5028	2.84674E-09	-8.5457	9.06074E-01	-.0428
32	CASO4 AQ	0	9.64333E+00	7.08754E-05	-4.1495	7.10415E-05	-4.1485	1.00234E+00	.0010
30	CAHCO3	1	6.37824E+00	6.31278E-05	-4.1998	5.71985E-05	-4.2426	9.06074E-01	-.0428
31	CACO3 AQ	0	4.01626E-01	4.01509E-06	-5.3963	4.02450E-06	-5.3953	1.00234E+00	.0010
44	NASO4	-1	6.54748E-01	5.50300E-06	-5.2594	4.97784E-06	-5.3030	9.04569E-01	-.0436
43	NAHCO3	0	7.46149E-01	8.88900E-06	-5.0511	8.90983E-06	-5.0501	1.00234E+00	.0010
42	NACO3	-1	1.23470E-02	1.48850E-07	-6.8273	1.34645E-07	-6.8708	9.04569E-01	-.0436
94	NACL	0	4.67039E-32	7.99616E-37	-36.0971	8.01490E-37	-36.0961	1.00234E+00	.0010
63	HSO4	-1	2.65766E-04	2.73953E-09	-8.5623	2.47166E-09	-8.6070	9.02220E-01	-.0447
96	H2SO4	0	2.33928E-43	2.38655E-48	-47.6222	2.39215E-48	-47.6212	1.00234E+00	.0010
93	HCL	0	8.14578E-37	2.23544E-41	-40.6506	2.24068E-41	-40.6496	1.00234E+00	.0010

MOLE RATIOS FROM ANALYTICAL MOLALITY		MOLE RATIOS FROM COMPUTED MOLALITY		LOG ACTIVITY RATIOS	
CL/CA =	1.4726E-01	CL/CA =	1.5883E-01	LOG CA/H2 =	11.1708
CL/MG =	7.4604E-01	CL/MG =	8.0398E-01	LOG MG/H2 =	10.4693
CL/NA =	7.8770E-02	CL/NA =	7.9094E-02	LOG NA/H1 =	4.5535
CL/K =	4.0291E-01	CL/K =	4.0374E-01	LOG K/H1 =	3.8443
CL/AL =	2.7941E+26	CL/AL =	2.7941E+26	LOG AL/H3 =	-8.8500
CL/FE =	2.7941E+26	CL/FE =	2.7941E+26	LOG FE/H2 =	-15.9000
CL/SO4 =	5.1586E-01	CL/SO4 =	6.1778E-01	LOG CA/MG =	.7015
CL/HCO3 =	4.9911E-02	CL/HCO3 =	5.0855E-02	LOG NA/K =	.7092
CA/MG =	5.0660E+00	CA/MG =	5.0619E+00		
NA/K =	5.1151E+00	NA/K =	5.1045E+00		

44 JESUS MARIA,AGS CE CAMPO=958.00MMHOS

PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18 ANHYDRIT	3.5446E-07	2.9493E-05	-6.4504	-4.5303	1.2018E-02	-1.92015	-2.60294
22 ARAGONIT	2.9535E-09	6.2938E-09	-8.5297	-8.2011	4.6927E-01	-.32857	-.44541
151 ARTIN	1.3067E-27	4.0612E-19	-26.8838	-18.3913	3.2174E-09	-8.49250	-11.51234
20 BRUCITE	2.2265E-18	3.8548E-12	-17.6524	-11.4140	5.7758E-07	-6.23839	-8.45669
13 CALCITE	2.9535E-09	3.4414E-09	-8.5297	-8.4633	8.5823E-01	-.06640	-.09001
12 DOLOMITE	1.7345E-18	1.0446E-17	-17.7608	-16.9810	1.6604E-01	-.77979	-1.05707
19 GYPSUM	3.5429E-07	1.7369E-05	-6.4506	-4.7602	2.0398E-02	-1.69041	-2.29151
65 HALITE	8.0149E-07	3.7817E+01	-6.0961	1.5777	2.1194E-08	-7.67379	-10.40250
118 HUNTITE	5.9824E-37	4.0841E-31	-36.2231	-30.3889	1.4648E-06	-5.83422	-7.90880
39 HYDMAG	2.6461E-55	1.9951E-38	-54.5774	-37.7000	1.3263E-17	-16.87737	-22.87878
11 MAGNESIT	5.8728E-10	6.1518E-09	-9.2312	-8.2110	9.5466E-02	-1.02015	-1.38291
67 MIRABI	3.0536E-09	6.2769E-02	-8.5152	-1.2023	4.8648E-08	-7.31294	-9.91334
59 NAHCOL	1.5844E-05	2.7196E-01	-4.8001	-.5655	5.8258E-05	-4.23464	-5.74044
61 NATRON	2.5444E-11	4.1208E-02	-10.5944	-1.3850	6.1744E-10	-9.20940	-12.48417
150 NESQUE	5.8687E-10	6.5496E-06	-9.2315	-5.1838	8.9604E-05	-4.04767	-5.48698
66 THENAR	3.0607E-09	6.6633E-01	-8.5142	-.1763	4.5934E-09	-8.33786	-11.30272
62 THRNAT	2.5497E-11	1.3746E+00	-10.5935	.1382	1.8549E-11	-10.73168	-14.54775
60 TRONA	4.0389E-16	1.9481E-01	-15.3937	-.7104	2.0732E-15	-14.68335	-19.90459

174 OJO CALIENTE,AGS CE CAMPO=950.00 MMHOS

INITIAL SOLUTION

TEMPERATURE = 29.90 DEGREES C PH = 6.900 ANALYTICAL EPMCAT = 7.577 ANALYTICAL EPMAN = 5.941

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.43786E-03	-2.8423	5.76000E+01
MG	2	2.96301E-04	-3.5283	7.20000E+00
NA	1	3.76445E-03	-2.4243	8.65000E+01
K	1	3.47985E-04	-3.4584	1.36000E+01
CL	-1	3.75335E-04	-3.4256	1.33000E+01
SO4	-2	3.85365E-04	-3.4141	3.70000E+01
HCO3	-1	4.79796E-03	-2.3189	2.92610E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	7.577	7.391
EPMAN	5.941	5.755

PH 6.900
TEMPERATURE 29.90 DEG C
IONIC STRENGTH 8.522919E-03

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 4.797828E+00 MEQ/KG H2O
ELECT = 1.636685E+00 MEQ/KG H2O

ACTIVITY H2O = .9998
PCO2 = 3.802733E-02
LOG PCO2 = -1.4199
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 5.937346E-03
DENSITY = 1.0000
TDS = 507.8MG/L
CARBONATE ALK = 4.797834E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 6.013VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	5.36589E+01	1.33948E-03	-2.8731	9.18811E-04	-3.0368	6.85948E-01	-.1637
2	MG	2	6.72428E+00	2.76723E-04	-3.5580	1.90891E-04	-3.7192	6.89828E-01	-.1613
3	NA	1	8.62033E+01	3.75154E-03	-2.4258	3.40761E-03	-2.4675	9.08325E-01	-.0418
4	K	1	1.35768E+01	3.47392E-04	-3.4592	3.14751E-04	-3.5020	9.06040E-01	-.0429
64	H	1	1.38222E-04	1.37194E-07	-6.8627	1.25893E-07	-6.9000	9.17622E-01	-.0373
5	CL	-1	1.33000E+01	3.75335E-04	-3.4256	3.40069E-04	-3.4684	9.06040E-01	-.0429
6	SO4	-2	3.15126E+01	3.28212E-04	-3.4838	2.24233E-04	-3.6493	6.83194E-01	-.1655
7	HCO3	-1	2.87577E+02	4.71543E-03	-2.3265	4.29214E-03	-2.3673	9.10233E-01	-.0408
18	CO3	-2	1.53221E-01	2.55457E-06	-5.5927	1.75359E-06	-5.7561	6.86452E-01	-.1634
86	H2CO3	0	7.09917E+01	1.14514E-03	-2.9411	1.14747E-03	-2.9403	1.00203E+00	.0009
27	OH	-1	2.15507E-03	1.26778E-07	-6.8970	1.14832E-07	-6.9399	9.05773E-01	-.0430
19	MGOH	1	1.71805E-04	4.16009E-09	-8.3809	3.79661E-09	-8.4206	9.12627E-01	-.0397
23	MGSO4 AQ	0	1.00800E+00	8.37816E-06	-5.0769	8.39462E-06	-5.0760	1.00196E+00	.0009
22	MGHCO3	1	9.24317E-01	1.08379E-05	-4.9651	9.82982E-06	-5.0075	9.06989E-01	-.0424
21	MGCO3 AQ	0	2.89728E-02	3.43774E-07	-6.4637	3.44449E-07	-6.4629	1.00196E+00	.0009
29	CAOH	1	1.71368E-04	3.00337E-09	-8.5224	2.73774E-09	-8.5626	9.11555E-01	-.0402
30	CAHCO3	1	5.26422E+00	5.20973E-05	-4.2832	4.74895E-05	-4.3234	9.11555E-01	-.0402
31	CACO3 AQ	0	2.57762E-01	2.57664E-06	-5.5889	2.58170E-06	-5.5881	1.00196E+00	.0009
44	NASO4	-1	5.40485E-01	4.54224E-06	-5.3427	4.13450E-06	-5.3836	9.10233E-01	-.0408
43	NAHCO3	0	6.89102E-01	8.20865E-06	-5.0857	8.22478E-06	-5.0849	1.00196E+00	.0009
42	NACO3	-1	1.28732E-02	1.55179E-07	-6.8092	1.41249E-07	-6.8500	9.10233E-01	-.0408
94	NACL	0	6.75577E-32	1.15655E-36	-35.9368	1.15882E-36	-35.9360	1.00196E+00	.0009
63	HSO4	-1	3.35821E-04	3.46135E-09	-8.4608	3.14351E-09	-8.5026	9.08174E-01	-.0418
96	H2SO4	0	3.47692E-43	3.54688E-48	-47.4502	3.55385E-48	-47.4493	1.00196E+00	.0009
93	HCL	0	1.55712E-36	4.27281E-41	-40.3693	4.28121E-41	-40.3684	1.00196E+00	.0009

MOLE RATIOS FROM ANALYTICAL MOLALITY		MOLE RATIOS FROM COMPUTED MOLALITY		LOG ACTIVITY RATIOS	
CL/CA =	2.6104E-01	CL/CA =	2.8021E-01	LOG CA/H2 =	10.7632
CL/MG =	1.2667E+00	CL/MG =	1.3564E+00	LOG MG/H2 =	10.0808
CL/NA =	9.9705E-02	CL/NA =	1.0005E-01	LOG NA/H1 =	4.4325
CL/K =	1.0786E+00	CL/K =	1.0804E+00	LOG K/H1 =	3.3980
CL/AL =	3.7534E+26	CL/AL =	3.7534E+26	LOG AL/H3 =	-9.3000
CL/FE =	3.7534E+26	CL/FE =	3.7534E+26	LOG FE/H2 =	-16.2000
CL/SO4 =	9.7397E-01	CL/SO4 =	1.1436E+00	LOG CA/MG =	.6824
CL/HCO3 =	7.8228E-02	CL/HCO3 =	7.9597E-02	LOG NA/K =	1.0345
CA/MG =	4.8527E+00	CA/MG =	4.8405E+00		
NA/K =	1.0818E+01	NA/K =	1.0799E+01		

174 OJO CALIENTE,AGS CE CAMPO=950.00 MMHOS

PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18 ANHYDRIT	2.0603E-07	2.5547E-05	-6.6861	-4.5927	8.0648E-03	-2.09341	-2.90294
22 ARAGONIT	1.6112E-09	5.6225E-09	-8.7928	-8.2501	2.8656E-01	-.54278	-.75267
151 ARTIN	8.4208E-28	3.7859E-19	-27.0746	-18.4218	2.2242E-09	-8.65282	-11.99890
20 BRUCITE	2.5172E-18	3.9817E-12	-17.5991	-11.3999	6.3218E-07	-6.19916	-8.59640
13 CALCITE	1.6112E-09	3.0993E-09	-8.7928	-8.5087	5.1987E-01	-.28411	-.39398
12 DOLOMITE	5.3935E-19	7.6165E-18	-18.2681	-17.1182	7.0814E-02	-1.14988	-1.59455
19 GYPSUM	2.0594E-07	1.7543E-05	-6.6863	-4.7559	1.1739E-02	-1.93035	-2.67683
65 HALITE	1.1588E-06	3.9163E+01	-5.9360	1.5929	2.9589E-08	-7.52886	-10.44030
118 HUNTITE	6.0437E-38	1.5301E-31	-37.2187	-30.8153	3.9499E-07	-6.40341	-8.87964
39 HYDMAG	3.1580E-56	7.5432E-39	-55.5006	-38.1224	4.1865E-18	-17.37815	-24.09835
11 MAGNESIT	3.3475E-10	4.8628E-09	-9.4753	-8.3131	6.8838E-02	-1.16217	-1.61159
67 MIRABI	2.5983E-09	1.2943E-01	-8.5853	-.8880	2.0075E-08	-7.69734	-10.67393
59 NAHCOL	1.4626E-05	3.1339E-01	-4.8349	-.5039	4.6670E-05	-4.33096	-6.00576
61 NATRON	2.0319E-11	7.5093E-02	-10.6921	-1.1244	2.7059E-10	-9.56768	-13.26754
150 NESQUE	3.3453E-10	5.2528E-06	-9.4756	-5.2796	6.3686E-05	-4.19595	-5.81854
66 THENAR	2.6038E-09	6.5196E-01	-8.5844	-.1858	3.9937E-09	-8.39862	-11.64640
62 THRNAT	2.0358E-11	1.2354E+00	-10.6913	.0918	1.6480E-11	-10.78306	-14.95290
60 TRONA	2.9769E-16	9.8102E-02	-15.5262	-1.0083	3.0345E-15	-14.51791	-20.13204

124 LA MANDOLINA,AGS CE CAMPO=850.00 MMHOS

INITIAL SOLUTION

TEMPERATURE = 23.10 DEGREES C PH = 7.640 ANALYTICAL EPMCAT = 4.174 ANALYTICAL EPMAN = 3.743

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	9.78350E-04	-3.0095	3.92000E+01
MG	2	3.94990E-04	-3.4034	9.60000E+00
NA	1	1.07037E-03	-2.9705	2.46000E+01
K	1	3.58150E-04	-3.4459	1.40000E+01
CL	-1	1.04396E-04	-3.9813	3.70000E+00
SO4	-2	2.08265E-05	-4.6814	2.00000E+00
HCO3	-1	3.59765E-03	-2.4440	2.19450E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	4.174	4.116
EPMAN	3.743	3.684

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 3.597646E+00 MEQ/KG H2O
ELECT = 4.315743E-01 MEQ/KG H2O

PH
7.640

TEMPERATURE
23.10 DEG C

IONIC STRENGTH
5.245071E-03

ACTIVITY H2O = .9999
PCO2 = 4.787633E-03
LOG PCO2 = -2.3199
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 3.752859E-03
DENSITY = 1.0000
TDS = 312.5MG/L
CARBONATE ALK = 3.597234E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.878VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	3.79139E+01	9.46250E-04	-3.0240	6.99889E-04	-3.1550	7.39645E-01	-.1310
2	MG	2	9.26420E+00	3.81174E-04	-3.4189	2.82954E-04	-3.5483	7.42323E-01	-.1294
3	NA	1	2.45539E+01	1.06837E-03	-2.9713	9.89550E-04	-3.0046	9.26226E-01	-.0333
4	K	1	1.39987E+01	3.58117E-04	-3.4460	3.31175E-04	-3.4799	9.24768E-01	-.0340
64	H	1	2.47573E-05	2.45685E-08	-7.6096	2.29087E-08	-7.6400	9.32442E-01	-.0304
5	CL	-1	3.70000E+00	1.04396E-04	-3.9813	9.65422E-05	-4.0153	9.24768E-01	-.0340
6	SO4	-2	1.74892E+00	1.82119E-05	-4.7396	1.34370E-05	-4.8717	7.37816E-01	-.1321
7	HCO3	-1	2.15117E+02	3.52660E-03	-2.4526	3.27095E-03	-2.4853	9.27507E-01	-.0327
18	CO3	-2	5.20831E-01	8.68187E-06	-5.0614	6.42514E-06	-5.1921	7.40064E-01	-.1307
86	H2CO3	0	1.06790E+01	1.72226E-04	-3.7639	1.72448E-04	-3.7633	1.00129E+00	.0006
27	OH	-1	6.97857E-03	4.10454E-07	-6.3867	3.79506E-07	-6.4208	9.24600E-01	-.0340
19	MGOH	1	7.63062E-04	1.84732E-08	-7.7335	1.71632E-08	-7.7654	9.29090E-01	-.0319
23	MGSO4 AQ	0	7.52085E-02	6.24987E-07	-6.2041	6.25743E-07	-6.2036	1.00121E+00	.0005
22	MGHCO3	1	9.80929E-01	1.14994E-05	-4.9393	1.06414E-05	-4.9730	9.25388E-01	-.0337
21	MGCO3 AQ	0	1.41883E-01	1.68317E-06	-5.7739	1.68520E-06	-5.7733	1.00121E+00	.0005
29	CAOH	1	4.04885E-04	7.09459E-09	-8.1491	6.58647E-09	-8.1813	9.28379E-01	-.0323
32	CASO4 AQ	0	2.56220E-01	1.88260E-06	-5.7252	1.88487E-06	-5.7247	1.00121E+00	.0005
30	CAHCO3	1	2.43691E+00	2.41121E-05	-4.6178	2.23852E-05	-4.6500	9.28379E-01	-.0323
31	CACO3 AQ	0	6.12370E-01	6.12017E-06	-5.2132	6.12756E-06	-5.2127	1.00121E+00	.0005
44	NASO4	-1	8.84623E-03	7.43292E-08	-7.1288	6.89409E-08	-7.1615	9.27507E-01	-.0327
43	NAHCO3	0	1.52645E-01	1.81797E-06	-5.7404	1.82017E-06	-5.7399	1.00121E+00	.0005
42	NACO3	-1	9.57309E-03	1.15376E-07	-6.9379	1.07012E-07	-6.9706	9.27507E-01	-.0327
94	NACL	0	5.57476E-33	9.54181E-38	-37.0204	9.55334E-38	-37.0198	1.00121E+00	.0005
63	HSO4	-1	2.97007E-06	3.06068E-11	-10.5142	2.83468E-11	-10.5475	9.26159E-01	-.0333
96	H2SO4	0	6.90579E-46	7.04336E-51	-50.1522	7.05187E-51	-50.1517	1.00121E+00	.0005
93	HCL	0	8.05166E-38	2.20899E-42	-41.6558	2.21165E-42	-41.6553	1.00121E+00	.0005

MOLE RATIOS FROM ANALYTICAL MOLALITY

CL/CA	=	1.0671E-01
CL/MG	=	2.6430E-01
CL/NA	=	9.7532E-02
CL/K	=	2.9149E-01
CL/AL	=	1.0440E+26
CL/FE	=	1.0440E+26
CL/SO4	=	5.0127E+00
CL/HCO3	=	2.9018E-02
CA/MG	=	2.4769E+00
NA/K	=	2.9886E+00

MOLE RATIOS FROM COMPUTED MOLALITY

CL/CA	=	1.1033E-01
CL/MG	=	2.7388E-01
CL/NA	=	9.7716E-02
CL/K	=	2.9151E-01
CL/AL	=	1.0440E+26
CL/FE	=	1.0440E+26
CL/SO4	=	5.7323E+00
CL/HCO3	=	2.9602E-02
CA/MG	=	2.4825E+00
NA/K	=	2.9833E+00

LOG ACTIVITY RATIOS

LOG CA/H2	=	12.1250
LOG MG/H2	=	11.7317
LOG NA/H1	=	4.6354
LOG K/H1	=	4.1601
LOG AL/H3	=	-7.0800
LOG FE/H2	=	-14.7200
LOG CA/MG	=	.3933
LOG NA/K	=	.4754

124 LA MANDOLINA,AGS CE CAMPO=850.00 MMHOS

PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18 ANHYDRIT	9.4044E-09	2.9493E-05	-8.0267	-4.5303	3.1887E-04	-3.49638	-4.73966
22 ARAGONIT	4.4969E-09	6.2938E-09	-8.3471	-8.2011	7.1450E-01	-.14600	-.19791
151 ARTIN	7.4063E-26	4.0612E-19	-25.1304	-18.3913	1.8237E-07	-6.73906	-9.13539
20 BRUCITE	4.0752E-17	3.8548E-12	-16.3898	-11.4140	1.0572E-05	-4.97585	-6.74521
13 CALCITE	4.4969E-09	3.4414E-09	-8.3471	-8.4633	1.3067E+00	.11618	.15749
12 DOLOMITE	8.1754E-18	1.0446E-17	-17.0875	-16.9810	7.8260E-01	-.10646	-.14432
19 GYPSUM	9.4023E-09	1.7369E-05	-8.0268	-4.7602	5.4133E-04	-3.26654	-4.42808
65 HALITE	9.5533E-08	3.7817E+01	-7.0198	1.5777	2.5262E-09	-8.59753	-11.65472
118 HUNTITE	2.7021E-35	4.0841E-31	-34.5683	-30.3889	6.6163E-05	-4.17939	-5.66553
39 HYDMAG	4.4499E-52	1.9951E-38	-51.3516	-37.7000	2.2304E-14	-13.65162	-18.50598
11 MAGNESIT	1.8180E-09	6.1518E-09	-8.7404	-8.2110	2.9553E-01	-.52940	-.71765
67 MIRABI	1.3143E-11	6.2769E-02	-10.8813	-1.2023	2.0938E-10	-9.67905	-13.12082
59 NAHCOL	3.2368E-06	2.7196E-01	-5.4899	-.5655	1.1901E-05	-4.92440	-6.67546
61 NATRON	6.2845E-12	4.1208E-02	-11.2017	-1.3850	1.5250E-10	-9.81672	-13.30744
150 NESQUE	1.8174E-09	6.5496E-06	-8.7405	-5.1838	2.7748E-04	-3.55676	-4.82151
66 THENAR	1.3158E-11	6.6633E-01	-10.8808	-.1763	1.9747E-11	-10.70451	-14.51092
62 THRNAT	6.2909E-12	1.3746E+00	-11.2013	.1382	4.5765E-12	-11.33946	-15.37165
60 TRONA	2.0360E-17	1.9481E-01	-16.6912	-.7104	1.0451E-16	-15.98084	-21.66346

175 MA POZO HONDO,AGS CE CAMPO=825.00 MMHOS

INITIAL SOLUTION

TEMPERATURE = 23.00 DEGREES C PH = 7.800 ANALYTICAL EPMCAT = 4.503 ANALYTICAL EPMAN = 3.429

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	9.38402E-04	-3.0276	3.76000E+01
MG	2	3.37382E-04	-3.4719	8.20000E+00
NA	1	1.81439E-03	-2.7413	4.17000E+01
K	1	1.38141E-04	-3.8597	5.40000E+00
CL	-1	2.11610E-04	-3.6745	7.50000E+00
SO4	-2	1.04131E-05	-4.9824	1.00000E+00
HCO3	-1	3.19791E-03	-2.4951	1.95070E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED	PH
EPMCAT	4.503	4.449	7.800
EPMAN	3.429	3.376	

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 3.197926E+00 MEQ/KG H2O
ELECT = 1.073781E+00 MEQ/KG H2O

TEMPERATURE
23.00 DEG C

IONIC STRENGTH
5.161699E-03

ACTIVITY H2O = .9999
PCO2 = 2.931672E-03
LOG PCO2 = -2.5329
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 3.282387E-03
DENSITY = 1.0000
TDS = 296.5MG/L
CARBONATE ALK = 3.197322E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.876VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	3.64405E+01	9.09464E-04	-3.0412	6.74151E-04	-3.1712	7.41261E-01	-.1300
2	MG	2	7.93582E+00	3.26513E-04	-3.4861	2.42895E-04	-3.6146	7.43907E-01	-.1285
3	NA	1	4.16300E+01	1.81134E-03	-2.7420	1.67866E-03	-2.7750	9.26748E-01	-.0330
4	K	1	5.39975E+00	1.38135E-04	-3.8597	1.27818E-04	-3.8934	9.25311E-01	-.0337
64	H	1	1.71200E-05	1.69892E-08	-7.7698	1.58489E-08	-7.8000	9.32882E-01	-.0302
5	CL	-1	7.50000E+00	2.11610E-04	-3.6745	1.95806E-04	-3.7082	9.25311E-01	-.0337
6	SO4	-2	8.79679E-01	9.16016E-06	-5.0381	6.77355E-06	-5.1692	7.39458E-01	-.1311
7	HCO3	-1	1.90559E+02	3.12396E-03	-2.5053	2.89908E-03	-2.5377	9.28012E-01	-.0324
18	CO3	-2	6.64378E-01	1.10745E-05	-4.9557	8.21372E-06	-5.0855	7.41678E-01	-.1298
86	H2CO3	0	6.55743E+00	1.05753E-04	-3.9757	1.05888E-04	-3.9752	1.00127E+00	.0006
27	OH	-1	1.00044E-02	5.88415E-07	-6.2303	5.44370E-07	-6.2641	9.25146E-01	-.0338
19	MGOH	1	9.38007E-04	2.27081E-08	-7.6438	2.11089E-08	-7.6755	9.29574E-01	-.0317
23	MGSO4 AQ	0	3.24602E-02	2.69742E-07	-6.5691	2.70063E-07	-6.5685	1.00119E+00	.0005
22	MGHCO3	1	7.45463E-01	8.73890E-06	-5.0585	8.09154E-06	-5.0920	9.25923E-01	-.0334
21	MGCO3 AQ	0	1.55467E-01	1.84429E-06	-5.7342	1.84648E-06	-5.7337	1.00119E+00	.0005
29	CAOH	1	5.58748E-04	9.79048E-09	-8.0092	9.09411E-09	-8.0412	9.28872E-01	-.0320
32	CASO4 AQ	0	1.24307E-01	9.13340E-07	-6.0394	9.14427E-07	-6.0389	1.00119E+00	.0005
30	CAHCO3	1	2.07300E+00	2.05111E-05	-4.6880	1.90522E-05	-4.7201	9.28872E-01	-.0320
31	CACO3 AQ	0	7.52465E-01	7.52019E-06	-5.1238	7.52913E-06	-5.1233	1.00119E+00	.0005
44	NASO4	-1	7.55591E-03	6.34864E-08	-7.1973	5.89162E-08	-7.2298	9.28012E-01	-.0324
43	NAHCO3	0	2.29514E-01	2.73342E-06	-5.5633	2.73667E-06	-5.5628	1.00119E+00	.0005
42	NACO3	-1	2.06435E-02	2.48794E-07	-6.6042	2.30884E-07	-6.6366	9.28012E-01	-.0324
94	NACL	0	1.91811E-32	3.28300E-37	-36.4837	3.28690E-37	-36.4832	1.00119E+00	.0005
63	HSO4	-1	1.03238E-06	1.06386E-11	-10.9731	9.85865E-12	-11.0062	9.26683E-01	-.0331
96	H2SO4	0	1.66625E-46	1.69942E-51	-50.7697	1.70144E-51	-50.7692	1.00119E+00	.0005
93	HCL	0	1.12982E-37	3.09962E-42	-41.5087	3.10331E-42	-41.5082	1.00119E+00	.0005

MOLE RATIOS FROM ANALYTICAL MOLALITY

CL/CA	=	2.2550E-01
CL/MG	=	6.2721E-01
CL/NA	=	1.1663E-01
CL/K	=	1.5318E+00
CL/AL	=	2.1161E+26
CL/FE	=	2.1161E+26
CL/SO4	=	2.0322E+01
CL/HCO3	=	6.6171E-02
CA/MG	=	2.7814E+00
NA/K	=	1.3134E+01

MOLE RATIOS FROM COMPUTED MOLALITY

CL/CA	=	2.3268E-01
CL/MG	=	6.4809E-01
CL/NA	=	1.1683E-01
CL/K	=	1.5319E+00
CL/AL	=	2.1161E+26
CL/FE	=	2.1161E+26
CL/SO4	=	2.3101E+01
CL/HCO3	=	6.7738E-02
CA/MG	=	2.7854E+00
NA/K	=	1.3113E+01

LOG ACTIVITY RATIOS

LOG CA/H2	=	12.4288
LOG MG/H2	=	11.9854
LOG NA/H1	=	5.0250
LOG K/H1	=	3.9066
LOG AL/H3	=	-6.6000
LOG FE/H2	=	-14.4000
LOG CA/MG	=	.4433
LOG NA/K	=	1.1184

175 MA POZO HONDO,AGS CE CAMPO=825.00 MMHOS

	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	4.5664E-09	2.9557E-05	-8.3404	-4.5293	1.5450E-04	-3.81108	-5.16452
22	ARAGONIT	5.5373E-09	6.3044E-09	-8.2567	-8.2004	8.7831E-01	-.05635	-.07636
151	ARTIN	1.4355E-25	4.0655E-19	-24.8430	-18.3909	3.5310E-07	-6.45210	-8.74345
20	BRUCITE	7.1979E-17	3.8529E-12	-16.1428	-11.4142	1.8682E-05	-4.72859	-6.40786
13	CALCITE	5.5373E-09	3.4461E-09	-8.2567	-8.4627	1.6068E+00	.20597	.27912
12	DOLOMITE	1.1047E-17	1.0496E-17	-16.9567	-16.9790	1.0525E+00	.02222	.03011
19	GYPSUM	4.5654E-09	1.7366E-05	-8.3405	-4.7603	2.6289E-04	-3.58023	-4.85169
65	HALITE	3.2869E-07	3.7797E+01	-6.4832	1.5775	8.6962E-09	-8.06067	-10.92327
118	HUNTITE	4.3972E-35	4.1449E-31	-34.3568	-30.3825	1.0609E-04	-3.97434	-5.38575
39	HYDMAG	1.1398E-51	2.0245E-38	-50.9432	-37.6937	5.6301E-14	-13.24948	-17.95479
11	MAGNESIT	1.9951E-09	6.1736E-09	-8.7000	-8.2095	3.2316E-01	-.49058	-.66480
67	MIRABI	1.9065E-11	6.2089E-02	-10.7198	-1.2070	3.0707E-10	-9.51277	-12.89105
59	NAHCOL	4.8666E-06	2.7139E-01	-5.3128	-.5664	1.7932E-05	-4.74636	-6.43195
61	NATRON	2.3119E-11	4.0838E-02	-10.6360	-1.3889	5.6612E-10	-9.24709	-12.53103
150	NESQUE	1.9944E-09	6.5714E-06	-8.7002	-5.1823	3.0350E-04	-3.51785	-4.76714
66	THENAR	1.9087E-11	6.6655E-01	-10.7193	-.1762	2.8636E-11	-10.54309	-14.28728
62	THRNAT	2.3143E-11	1.3768E+00	-10.6356	.1389	1.6809E-11	-10.77446	-14.60081
60	TRONA	1.1261E-16	1.9683E-01	-15.9484	-.7059	5.7212E-16	-15.24251	-20.65561

177 SAN MARTIN,AGS CE CAMPO=875.00MMHOS

INITIAL SOLUTION

TEMPERATURE = 25.20 DEGREES C PH = 7.360 ANALYTICAL EPMCAT = 5.259 ANALYTICAL EPMAN = 3.027

***** OXIDATION - REDUCTION *****

DISSOLVED OXYGEN = .000 MG/L
EH MEASURED WITH CALOMEL = .0000 VOLTS
MEASURED EH OF ZOBELL SOLUTION = .0000 VOLTS
CORRECTED EH = .0000 VOLTS
PE COMPUTED FROM CORRECTED EH = .000

FLAG	CORALK	PECALC	IDAVES
2	0	0	0

*** TOTAL CONCENTRATIONS OF INPUT SPECIES ***

SPECIES		TOTAL MOLALITY	LOG TOTAL MOLALITY	TOTAL MG/LITRE
CA	2	1.11809E-03	-2.9515	4.48000E+01
MG	2	4.93725E-04	-3.3065	1.20000E+01
NA	1	1.74040E-03	-2.7594	4.00000E+01
K	1	2.96745E-04	-3.5276	1.16000E+01
CL	-1	2.08787E-04	-3.6803	7.40000E+00
SO4	-2	1.04130E-05	-4.9824	1.00000E+00
HCO3	-1	2.79821E-03	-2.5531	1.70690E+02

****DESCRIPTION OF SOLUTION ****

	ANALYTICAL	COMPUTED
EPMCAT	5.259	5.212
EPMAN	3.027	2.979

EH = .0000 PE = 100.000
PE CALC S = 1.000000E+02
PE CALC DOX= 1.000000E+02
PE SATO DOX= 1.000000E+02
TOT ALK = 2.798180E+00 MEQ/KG H2O
ELECT = 2.233021E+00 MEQ/KG H2O

PH
7.360

TEMPERATURE
25.20 DEG C

IONIC STRENGTH
5.672540E-03

ACTIVITY H2O = .9999
PCO2 = 7.290476E-03
LOG PCO2 = -2.1372
PO2 = .000000E+00
PCH4 = .000000E+00
CO2 TOT = 3.037875E-03
DENSITY = 1.0000
TDS = 287.5MG/L
CARBONATE ALK = 2.797954E+00 MEQ/KG H2O

IN COMPUTING THE DISTRIBUTION OF SPECIES, PE = 100.000 EQUIVALENT EH = 5.920VOLTS

DISTRIBUTION OF SPECIES

I	SPECIES		PPM	MOLALITY	LOG MOL	ACTIVITY	LOG ACT	ACT. COEFF.	LOG A COF
1	CA	2	4.37194E+01	1.09112E-03	-2.9621	7.97653E-04	-3.0982	7.31043E-01	-.1361
2	MG	2	1.16927E+01	4.81081E-04	-3.3178	3.53063E-04	-3.4521	7.33895E-01	-.1344
3	NA	1	3.99440E+01	1.73797E-03	-2.7600	1.60490E-03	-2.7946	9.23434E-01	-.0346
4	K	1	1.15995E+01	2.96732E-04	-3.5276	2.73546E-04	-3.5630	9.21863E-01	-.0353
64	H	1	4.72945E-05	4.69326E-08	-7.3285	4.36516E-08	-7.3600	9.30090E-01	-.0315
5	CL	-1	7.40000E+00	2.08787E-04	-3.6803	1.92473E-04	-3.7156	9.21863E-01	-.0353
6	SO4	-2	8.53689E-01	8.88945E-06	-5.0511	6.48119E-06	-5.1883	7.29088E-01	-.1372
7	HCO3	-1	1.67494E+02	2.74581E-03	-2.5613	2.53935E-03	-2.5953	9.24806E-01	-.0339
18	CO3	-2	2.24294E-01	3.73872E-06	-5.4273	2.73480E-06	-5.5631	7.31482E-01	-.1358
86	H2CO3	0	1.53643E+01	2.47781E-04	-3.6059	2.48124E-04	-3.6053	1.00138E+00	.0006
27	OH	-1	4.30961E-03	2.53469E-07	-6.5961	2.33618E-07	-6.6315	9.21683E-01	-.0354
19	MGOH	1	6.02529E-04	1.45864E-08	-7.8361	1.35144E-08	-7.8692	9.26504E-01	-.0332
23	MGSO4 AQ	0	4.78196E-02	3.97374E-07	-6.4008	3.97894E-07	-6.4002	1.00131E+00	.0006
22	MGHCO3	1	9.65284E-01	1.13157E-05	-4.9463	1.04391E-05	-4.9813	9.22530E-01	-.0350
21	MGCO3 AQ	0	7.78189E-02	9.23150E-07	-6.0347	9.24356E-07	-6.0342	1.00131E+00	.0006
29	CAOH	1	2.88955E-04	5.06308E-09	-8.2956	4.68710E-09	-8.3291	9.25742E-01	-.0335
32	CASO4 AQ	0	1.43385E-01	1.05351E-06	-5.9774	1.05489E-06	-5.9768	1.00131E+00	.0006
30	CAHCO3	1	2.30594E+00	2.28157E-05	-4.6418	2.11214E-05	-4.6753	9.25742E-01	-.0335
31	CACO3 AQ	0	3.11191E-01	3.11004E-06	-5.5072	3.11411E-06	-5.5067	1.00131E+00	.0006
44	NASO4	-1	7.03414E-03	5.91019E-08	-7.2284	5.46578E-08	-7.2623	9.24806E-01	-.0339
43	NAHCO3	0	1.92180E-01	2.28877E-06	-5.6404	2.29176E-06	-5.6398	1.00131E+00	.0006
42	NACO3	-1	7.37309E-03	8.88589E-08	-7.0513	8.21772E-08	-7.0852	9.24806E-01	-.0339
94	NACL	0	1.80242E-32	3.08496E-37	-36.5107	3.08900E-37	-36.5102	1.00131E+00	.0006
63	HSO4	-1	2.90215E-06	2.99062E-11	-10.5242	2.76142E-11	-10.5589	9.23358E-01	-.0346
96	H2SO4	0	1.20929E-45	1.23335E-50	-49.9089	1.23496E-50	-49.9083	1.00131E+00	.0006
93	HCL	0	3.05849E-37	8.39079E-42	-41.0762	8.40175E-42	-41.0756	1.00131E+00	.0006

MOLE RATIOS FROM ANALYTICAL MOLALITY

CL/CA	=	1.8674E-01
CL/MG	=	4.2288E-01
CL/NA	=	1.1996E-01
CL/K	=	7.0359E-01
CL/AL	=	2.0879E+26
CL/FE	=	2.0879E+26
CL/SO4	=	2.0051E+01
CL/HCO3	=	7.4615E-02
CA/MG	=	2.2646E+00
NA/K	=	5.8650E+00

MOLE RATIOS FROM COMPUTED MOLALITY

CL/CA	=	1.9135E-01
CL/MG	=	4.3400E-01
CL/NA	=	1.2013E-01
CL/K	=	7.0362E-01
CL/AL	=	2.0879E+26
CL/FE	=	2.0879E+26
CL/SO4	=	2.3487E+01
CL/HCO3	=	7.6038E-02
CA/MG	=	2.2680E+00
NA/K	=	5.8570E+00

LOG ACTIVITY RATIOS

LOG CA/H2	=	11.6218
LOG MG/H2	=	11.2679
LOG NA/H1	=	4.5654
LOG K/H1	=	3.7970
LOG AL/H3	=	-7.9200
LOG FE/H2	=	-15.2800
LOG CA/MG	=	.3540
LOG NA/K	=	.7684

177 SAN MARTIN,AGS CE CAMPO=875.00MMHOS

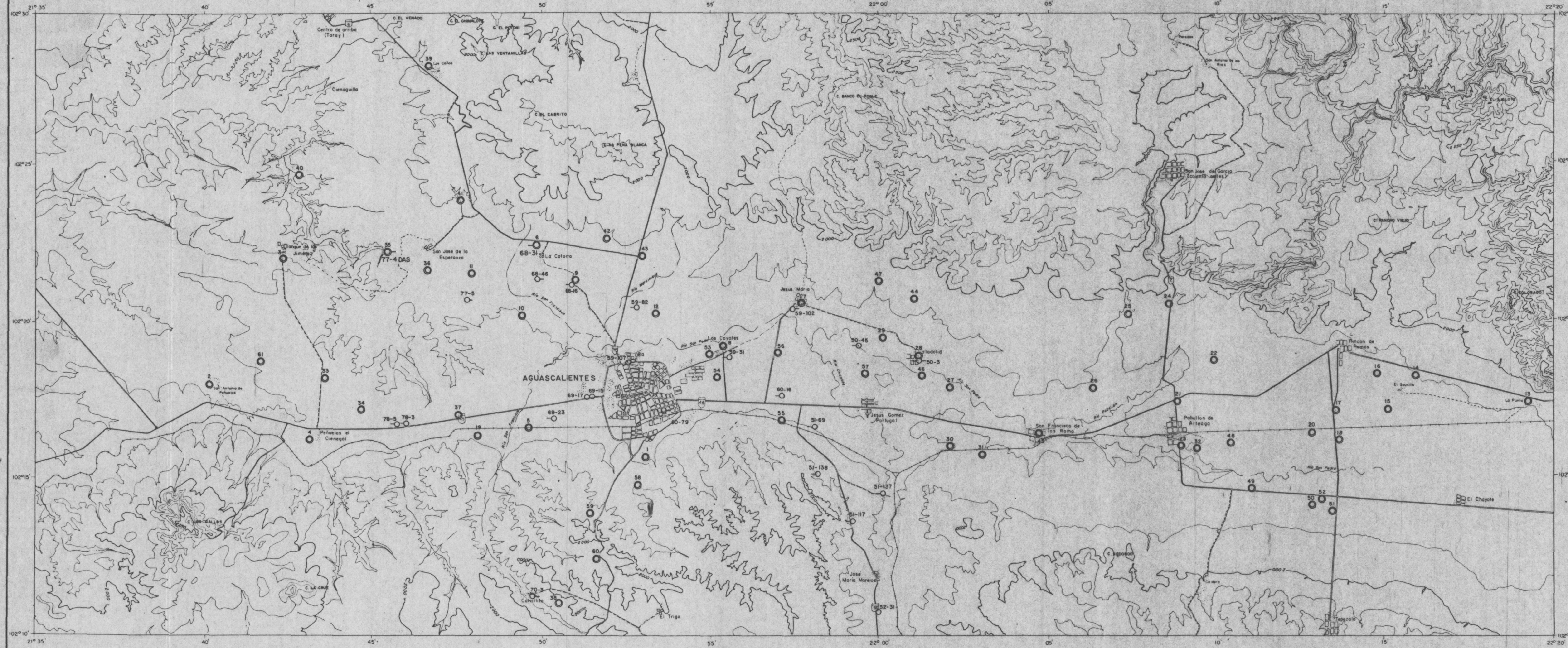
	PHASE	IAP	KT	LOG IAP	LOG KT	IAP/KT	LOG IAP/KT	DELGR
18	ANHYDRIT	5.1697E-09	2.8193E-05	-8.2865	-4.5499	1.8337E-04	-3.73668	-5.10131
22	ARAGONIT	2.1814E-09	6.0750E-09	-8.6613	-8.2165	3.5908E-01	-.44481	-.60725
151	ARTIN	1.8599E-26	3.9728E-19	-25.7305	-18.4009	4.6816E-08	-7.32960	-10.00636
20	BRUCITE	1.9269E-17	3.8942E-12	-16.7151	-11.4096	4.9482E-06	-5.30555	-7.24313
13	CALCITE	2.1814E-09	3.3404E-09	-8.6613	-8.4762	6.5304E-01	-.18506	-.25264
12	DOLOMITE	2.1063E-18	9.4608E-18	-17.6765	-17.0241	2.2263E-01	-.65241	-.89067
19	GYPSUM	5.1685E-09	1.7423E-05	-8.2866	-4.7589	2.9665E-04	-3.52776	-4.81609
65	HALITE	3.0890E-07	3.8234E+01	-6.5102	1.5825	8.0792E-09	-8.09263	-11.04805
118	HUNTITE	1.9637E-36	3.0015E-31	-35.7069	-30.5227	6.5423E-06	-5.18427	-7.07755
39	HYDMAG	1.6741E-53	1.4705E-38	-52.7762	-37.8325	1.1385E-15	-14.94369	-20.40109
11	MAGNESIT	9.6556E-10	5.7144E-09	-9.0152	-8.2430	1.6897E-01	-.77219	-1.05419
67	MIRABI	1.6674E-11	7.8764E-02	-10.7780	-1.1037	2.1170E-10	-9.67429	-13.20732
59	NAHCOL	4.0754E-06	2.8433E-01	-5.3898	-.5462	1.4333E-05	-4.84366	-6.61255
61	NATRON	7.0358E-12	4.9743E-02	-11.1527	-1.3033	1.4144E-10	-9.84942	-13.44641
150	NESQUE	9.6522E-10	6.1116E-06	-9.0154	-5.2138	1.5793E-04	-3.80153	-5.18984
66	THENAR	1.6694E-11	6.6179E-01	-10.7775	-.1793	2.5225E-11	-10.59817	-14.46860
62	THRNAT	7.0432E-12	1.3293E+00	-11.1522	.1236	5.2984E-12	-11.27585	-15.39377
60	TRONA	2.8700E-17	1.5709E-01	-16.5421	-.8038	1.8270E-16	-15.73827	-21.48585

AGUASCALIENTES

No.LAB.	CLAVE FINAL	LOCALIDAD	TEMP(CAMPO) (°C)	pH(CAMPO)	CE(CAMPO) (µmhos/cm)	ALC(CAMPO) (ppm)	CE (µmhos/cm)	pH	ALCT (ppm)	DTOT (ppm)	DCA (ppm)
1	NO TIENE	COL. OJO CALIENTE	32.4	6.56	900	316	980.0	6.65	320.0	154.0	150.0
2	NO TIENE	SAN ANTONIO PEÑUELOS	20.0	6.78	364	100	503.0	7.74	200.0	114.0	94.0
3	NO TIENE	TANQUE LOS JIMENES	19.0	6.75	774	220	756.0	7.19	268.0	170.0	146.0
NO TIENE	PEÑUELOS	PEÑUELOS	17.0	6.73	361	100	379.0	6.74	94.0	64.0	50.0
5	NO TIENE	RUSTICO CALPULLI	23.0	7.35	544	180	[illegible]	7.34	208.0	138.0	122.0
6	NO TIENE	RANCHO LA COTORRA	26.0	7.13	669	200	650.0	7.36	230.0	134.0	128.0
7	NO TIENE	JESUS MARIA	30.6	6.43	1460	360	1247.0	6.52	380.0	200.0	126.0
8	NO TIENE	POSITOS (COYOTES)	22.4	6.56	1222	440	1302.0	6.87	460.0	264.0	164.0
9	NO TIENE	VIÑEDO AGUASCALIENTES	29.0	6.7	1413	380	1265.0	6.71	380.0	214.0	126.0
10	NO TIENE	SAN JOSE DEL RIO	24.2	6.9	1266	300	1160.0	6.95	422.0	308.0	260.0
11	NO TIENE	RANCHO LOS ARBOLITOS	17.7	7.19	1110	300	1020.0	7.07	323.0	122.0	90.0
12	53	SAN IGNACIO	24.8	7.08	1340	360	1208.0	7.06	462.0	288.0	254.0
13	10	LA PUNTA	21.0	6.63	660	200	620.0	6.64	240.0	143.0	92.0
14	85	AL W DE EL SAUCILLO	16.5	7.25	780	220	744.0	7.00	313.0	192.0	142.0
15	NO TIENE	EL SAUCILLO	17.2	6.97	885	240	819.0	6.95	274.0	126.0	75.0
16	NO TIENE	EL BAJIO	20.3	7.4	595	200	568.0	7.16	192.0	103.0	70.0
17	20	RINCON DE ROMOS	21.7	7.63	757	220	700.0	7.34	247.0	129.0	71.0
18	23	RINCON DE ROMOS	23.5	7.47	805	260	728.0	7.08	245.0	117.0	72.0
19	149	RANCHO EL MOSCO	26.2	7.3	950	200	575.0	7.25	218.0	109.0	62.0
20	28	RANCHO CAROLINA	22.3	7.25	775	260	699.0	7.23	286.0	173.0	144.0
21	12-A	VIÑEDOS SAN JUAN	32.7	7.07	797	260	685.0	6.59	291.0	116.0	112.0
22	165	PABELLON DE HIDALGO	17.0	7.64	756	260	663.0	7.45	260.0	144.0	124.0
23	28-A	PABELLON DE ARTEAGA	22.3	7.14	815	260	706.0	7.33	287.0	168.0	128.0
24	NO TIENE	AL W DE PABELLON ARTEAGA	17.9	6.97	287	100	258.0	7.12	115.0	88.8	72.8
25	192	SANTIAGO	21.9	7.02	604	180	516.0	7.17	200.0	116.0	104.0
26	68	EMILIANO ZAPATA	23.0	7.12	623	160	563.0	7.09	205.0	120.0	104.0
27	193	LA CONCHA	22.4	7.33	752	240	735.0	7.19	290.0	176.0	142.0
28	40	VALLADOLID	22.9	6.98	1080	300	1005.0	7.05	360.0	228.0	202.0
29	41-A	SAN ANTONIO DE LOS ORCONES	22.3	6.76	1182	300	1207.0	6.73	439.0	264.0	230.0
30	36	EL TIRON	24.0	7.54	746	220	772.0	7.31	251.0	158.0	130.0
31	25	SE DE SAN FCO. DE LOS ROMO	25.3	7.55	778	220	631.0	7.10	245.0	155.0	123.0
32	164	CENTRO DE EST. AGROPECUARIOS	21.0	7.7	563	180	372.0	7.38	190.0	140.0	116.0
33	147	MONTORO	22.3	7.09	747	220	477.0	7.13	262.0	190.0	174.0
34	187	VIÑEDOS CHURUBUSCO	21.8	7.07	787	220	482.0	7.17	260.0	186.0	170.0
35	NO TIENE	EL SALTO DEL SALADO	22.1	7.72	1137	280	781.0	7.16	325.0	266.0	264.0
36	146	SAN JOSE DE LA ESPERANZA	18.6	7.25	1066	300	688.0	7.08	335.0	234.0	232.0
37	NO TIENE	ZONA SUR CD. AGUASCALIENTES	25.8	7.3	707	240	440.0	7.24	240.0	152.0	132.0
38	NO TIENE	CALVILLITO	19.0	7.05	750	240	678.0	7.54	339.0	46.0	43.8
39	96	LOS CAÑOS	14.1	7	511	200	336.0	6.82	209.0	126.0	118.0
40	77	SAN PEDRO CIENEGUILLAS	21.1	7.45	412	200	271.0	[illegible]	153.6	74.0	59.6
41	144	AL SW DE LA COTORRA	22.7	8	445	160	291.0	7.69	173.0	104.0	84.0
42	NO TIENE	LA FORTUNA	29.0	7.5	756	260	478.0	7.19	269.0	122.0	118.0
43	126	SAN FELIPE	22.2	7.45	814	180	486.0	7.29	248.0	158.0	138.0
44	NO TIENE	VIÑEDOS ELIZONDO	34.8	6.43	1490	320	832.0	7.30	423.0	204.0	202.0
45	NO TIENE	SAN FRANCISCO DE ROMOS	21.8	7.2	716	260	461.0	7.23	263.0	150.0	136.0
46	646	EL MAGUEY	23.9	7.12	910	240	668.0	6.51	335.0	184.0	152.0
47	27-B	CHICHIMECOS	25.4	6.45	1110	300	521.0	7.14	376.0	224.0	196.0
48	134	SALITRILLO	22.6	7.65	736	200	439.0	7.30	245.0	142.0	120.0
49	162	LA CARBONERA	21.5	7.4	861	220	521.0	7.29	264.0	158.0	128.0
50	161	LA VICTORIA	21.0	7.42	860	220	519.0	7.32	278.0	156.0	126.0
51	160	SAN ANTONIO DE TEPEZALA	22.8	7.25	928	220	557.0	7.16	286.0	182.0	150.0
52	181	CARBONERA	21.5	7.48	840	220	514.0	7.28	275.0	174.0	140.0
53	51	CLUB CAMPESTRE	21.5	7.4	750	220	496.0	7.38	235.0	158.0	144.0
54	48H	ZONA NTE. CD. AGUASCALIENTES	21.6	7.38	514	200	444.0	7.40	218.0	156.0	112.0
55	45	SORTENEJO(JESUS MARIA)	21.8	7.42	672	160	442.0	7.38	220.0	158.0	120.0
56	142	GAVILANES	22.1	7.42	666	160	435.0	7.30	227.0	160.0	118.0
57	44	JESUS MARIA	23.1	7.05	958	280	614.0	7.05	340.0	228.0	190.0
58	174	OJO CALIENTE	29.9	6.9	950	240	592.0	6.36	294.0	174.0	144.0
59	124	LA MANDOLINA	23.1	7.64	850	180	332.0	7.50	188.0	138.0	98.0
60	175	MARIA POZO HONDO	23.0	7.8	825	160	334.0	7.75	186.0	128.0	94.0
61	177	SAN MARTIN	25.2	7.36	875	140	400.0	7.33	228.0	162.0	112.0

No.LAB.	Ca^{++} (ppm)	Mg^{++} (ppm)	Na^{+} (ppm)	K^{+} (ppm)	HCO_3^{-} (ppm)	Cl^{-} (ppm)	$SO_4^{=}$ (ppm)	NO_3^{-} (ppm)	F^{-} (ppm)	rCa^{++} (meq/l)	rMg^{++} (meq/l)	rNa^{+} (meq/l)	rK^{+} (meq/l)	$rHCO_3^{-}$ (meq/l)	rCl^{-} (meq/l)	$rSO_4^{=}$ (meq/l)	rF^{-} (meq/l)	Cr^{+6} (mg/l)	Pb^{++} (mg/l)	Fe^{++} (mg/l)
1	60.0	1.0	113.5	14.5	390.4	14.7	58.0	7.9	6.19	3.00	0.08	4.93	0.37	6.40	0.41	1.21	0,33			
2	37.6	4.8	46.7	9.6	244.0	6.5	0.0	10.1	6.17	1.88	0.40	2.03	0.25	4.00	0.18	0.00	0,32			
3	58.4	5.8	62.5	26.8	327.0	10.4	32.0	8.4	1.46	2.92	0.48	2.72	0.69	5.36	0.29	0.67	0,08			
NO TIENE	20.0	3.4	28.5	20.6	114.7	6.8	25.0	16.7	1.09	1.00	0.28	1.24	0.53	1.88	0.19	0.52	0,06	0,00	0,04	
5	48.8	3.8	45.0	9.8	253.8	4.0	0.0	10.1	3.01	2.44	0.32	1.96	0.25	4.16	0.11	0.00	0,16	0,00	0,05	
6	51.2	1.4	61.9	12.5	280.6	5.8	27.0	8.4	0.95	2.56	0.12	2.69	0.32	4.60	0.16	0.56	0,05			
7	50.4	17.8	125.0	30.8	463.6	7.5	87.0	5.3	3.70	2.52	1.48	5.43	0.79	7.60	0.21	1.81	0,19			
8	65.6	24.0	121.1	33.1	561.2	4.3	82.0	7.5	1.46	3.28	2.00	5.27	0.85	9.20	0.12	1.71	0,08			
9	50.4	21.1	107.7	30.0	463.6	7.4	77.0	6.2	4.97	2.52	1.76	4.68	0.77	7.60	0.21	1.60	0,26	0,00	0,05	
10	104.0	11.5	89.3	32.1	514.8	11.3	70.0	10.1	1.80	5.20	0.96	3.88	0.82	8.44	0.32	1.46	0,09			
11	36.0	7.7	100.0	27.6	394.1	10.1	8.0	5.3	5.15	1.80	0.64	4.35	0.71	6.46	0.28	0.17	0,27			
12	101.6	8.2	123.1	27.2	563.6	7.1	62.0	7.4	5.08	5.08	0.68	5.35	0.70	9.24	0.20	1.29	0,27		0,05	0,00
13	36.8	12.2	67.5	15.2	292.8	6.8	34.0	7.5	2.74	1.84	1.02	2.93	0.39	4.80	0.19	0.71	0,14		0,05	0,00
14	56.8	12.0	86.1	17.6	381.9	6.6	53.0	7.5	1.66	2.84	1.00	3.74	0.45	6.26	0.19	1.10	0,09			
15	30.0	12.2	91.1	22.0	334.3	8.5	42.0	4.4	1.39	1.50	1.02	3.96	0.56	5.48	0.24	0.88	0,07		0,05	0,00
16	28.0	7.9	48.9	42.4	234.2	6.7	36.0	12.8	2.00	1.40	0.66	2.13	1.09	3.84	0.19	0.75	0,11			
17	28.4	13.9	70.8	29.6	301.3	8.4	36.0	10.6	1.62	1.42	1.16	3.08	0.76	4.94	0.24	0.75	0,09		0,03	0,00
18	28.8	10.8	74.2	23.4	298.9	7.6	40.0	9.7	2.02	1.44	0.90	3.23	0.60	4.90	0.21	0.83	0,11		0,05	0,00
19	24.8	11.3	54.3	11.0	266.0	5.0	7.0	7.9	2.90	1.24	0.94	2.36	0.28	4.36	0.14	0.15	0,15			
20	57.6	7.0	75.0	24.1	348.9	8.1	36.0	12.3	1.73	2.88	0.58	3.26	0.62	5.72	0.23	0.75	0,09			
21	44.8	1.0	90.0	17.6	355.0	3.8	14.0	5.3	2.14	2.24	0.08	3.91	0.45	5.82	0.11	0.29	0,11		0,05	0,00
22	49.6	4.8	71.7	26.5	317.2	6.7	40.0	8.8	2.31	2.48	0.40	3.12	0.68	5.20	0.19	0.83	0,12			
23	51.2	9.6	78.3	26.5	350.1	8.6	37.0	8.4	1.94	2.56	0.80	3.40	0.68	5.74	0.24	0.77	0.10			
24	29.1	3.8	20.4	15.8	140.3	4.7	18.0	10.1	0.73	1.46	0.32	0.89	0.41	2.30	0.13	0.38	0,04			
25	41.6	2.9	52.1	19.8	244.0	6.8	33.0	8.4	0.99	2.08	0.24	2.27	0.51	4.00	0.19	0.69	0,05		0,03	0,00
26	41.6	3.8	43.9	30.1	250.1	6.4	29.0	8.8	0.89	2.08	0.32	1.91	0.77	4.10	0.18	0.60	0,05		0,04	0,00
27	56.8	8.2	77.5	27.4	353.8	8.7	38.0	10.0	1.85	2.84	0.68	3.37	0.70	5.80	0.25	0.79	0,10			
28	80.8	6.2	89.2	33.5	439.2	11.8	54.0	12.3	0.96	4.04	0.52	3.88	0.86	7.20	0.33	1.13	0,05			
29	92.0	8.2	119.2	34.7	535.6	12.0	74.0	11.0	2.73	4.60	0.68	5.18	0.89	8.78	0.34	1.54	0,14		0,02	0,00
30	52.0	6.7	70.0	25.3	306.2	9.2	58.0	7.0	2.00	2.60	0.56	3.04	0.65	5.02	0.26	1.21	0,11		0,04	0,00
31	49.2	7.7	73.3	20.0	298.9	10.6	62.0	7.9	1.69	2.46	0.64	3.19	0.51	4.90	0.30	1.29	0,09		0,02	0,00
32	46.4	5.8	39.0	12.3	231.8	10.6	16.0	12.3	1.51	2.32	0.48	1.70	0.32	3.80	0.30	0.33	0,08		0,06	0,00
33	69.6	3.8	48.3	19.1	319.6	13.0	18.0	9.2	0.99	3.48	0.32	2.10	0.49	5.24	0.37	0.38	0,05			
34	68.0	3.8	52.9	18.1	317.2	11.6	28.0	8.8	1.68	3.40	0.32	2.30	0.46	5.20	0.33	0.58	0,09			
35	105.6	0.5	85.4	31.2	396.5	55.8	54.0	27.2	0.90	5.28	0.04	3.71	0.80	6.50	1.57	1.13	0,05	0,00	0,03	
36	92.8	0.5	65.0	25.3	408.7	40.1	3.0	4.4	0.93	4.64	0.04	2.83	0.65	6.70	1.13	0.06	0,05	0,00	0,02	
37	52.8	4.8	57.9	16.7	292.8	10.7	28.0	8.8	1.85	2.64	0.40	2.52	0.43	4.80	0.30	0.58	0,10	0,00	0,03	
38	17.5	0.5	187.5	4.0	413.6	22.9	42.0	7.4	9.26	0.88	0.04	8.15	0.10	6.78	0.65	0.88	0,49			
39	47.2	1.9	38.0	12.4	255.0	2.5	3.0	5.3	0.90	2.36	0.16	1.65	0.32	4.18	0.07	0.06	0,05			
40	23.8	3.5	40.0	13.6	187.4	4.5	3.0	11.0	0.81	1.19	0.29	1.74	0.35	3.07	0.13	0.06	0,04			
41	33.6	4.8	33.0	10.3	211.1	2.6	2.0	7.9	0.90	1.68	0.40	1.43	0.26	3.46	0.07	0.04	0,05			
42	47.2	1.0	86.1	17.8	328.2	5.5	29.0	7.9	1.23	2.36	0.08	3.74	0.46	5.38	0.16	0.60	0,06	0,00	0,05	
43	55.2	4.8	66.3	24.1	302.6	21.9	32.0	16.7	1.14	2.76	0.40	2.88	0.62	4.96	0.62	0.67	0,06			
44	80.8	0.5	144.2	36.8	516.1	12.2	110.0	6.6	3.05	4.04	0.04	6.27	0.94	8.46	0.34	2.29	0,16		0,05	0,00
45	54.4	3.4	68.8	21.1	320.9	8.9	39.0	5.2	2.05	2.72	0.28	2.99	0.54	5.26	0.25	0.81	0,11		0,06	0,00
46	60.8	7.7	82.3	31.4	408.7	7.8	40.0	8.3	0.97	3.04	0.64	3.58	0.81	6.70	0.22	0.83	0,05			
47	78.4	6.7	95.6	43.8	458.7	15.8	62.0	18.0	4.55	3.92	0.56	4.16	1.12	7.52	0.45	1.29	0,24		0,05	0,00
48	48.0	5.3	65.6	22.7	298.9	8.1	29.0	11.4	2.19	2.40	0.44	2.85	0.58	4.90	0.23	0.60	0,12			
49	51.2	7.2	88.5	19.0	322.1	15.1	58.0	17.1	3.19	2.56	0.60	3.85	0.49	5.28	0.43	1.21	0,17			
50	50.4	7.2	83.1	23.8	339.2	10.9	46.0	7.5	1.48	2.52	0.60	3.61	0.61	5.56	0.31	0.96	0,08			
51	60.0	7.7	83.1	26.2	348.9	11.3	67.0	7.0	1.11	3.00	0.64	3.61	0.67	5.72	0.32	1.40	0,06			
52	56.0	8.2	76.7	20.7	335.5	11.5	46.0	8.8	1.12	2.80	0.68	3.33	0.53	5.50	0.32	0.96	0,06			
53	57.6	2.9	63.1	24.1	286.7	10.2	55.0	8.3	0.90	2.88	0.24	2.74	0.62	4.70	0.29	1.15	0,05			
54	44.8	10.6	55.0	23.4	266.0	9.6	45.0	8.8	1.05	2.24	0.88	2.39	0.60	4.36	0.27	0.94	0,06		0,05	0,00
55	48.0	9.1	54.3	21.1	268.4	10.6	41.0	9.6	1.00	2.40	0.76	2.36	0.54	4.40	0.30	0.85	0,05			
56	47.2	10.1	52.9	23.1	276.9	9.8	36.0	8.3	0.97	2.36	0.84	2.30	0.59	4.54	0.28	0.75	0,05			
57	76.0	9.1	81.5	27.1	414.8	9.9	52.0	11.0	0.93	3.80	0.76	3.54	0.69	6.80	0.28	1.08	0,05			
58	57.6	7.2	86.5	13.6	358.7	13.3	37.0	8.4	3.86	2.88	0.60	3.76	0.35	5.88	0.38	0.77	0,20	0,00	0,05	
59	39.2	9.6	24.6	14.0	229.4	3.7	2.0	13.2	2.44	1.96	0.80	1.07	0.36	3.76	0.10	0.04	0,13			
60	37.6	8.2	41.7	5.4	226.9	7.5	1.0	10.6	4.98	1.88	0.68	1.81	0.14	3.72	0.21	0.02	0,26			
61	44.8	12.0	40.0	11.6	278.2	7.4	1.0	13.6	2.93	2.24	1.00	1.74	0.30	4.56	0.21	0.02	0,15			

TABLA No. 4.1 RESULTADOS DE ANALISIS FISICO-QUIMICOS



ELABORADO POR EXYCO, S.A.
Para la SUBDIRECCION GENERAL DE ADMINISTRACION DEL AGUA
Según contrato Nº SGAA-93-20

PROYECTO ING. DANIEL CASTILLO C. DIBUJO MIRANDA C. Y VARGAS
REVISO ING. RAUL MORALES E. APROBO ING. JOSE LUIS ROBAS L.

ANALISIS QUIMICOS REALIZADOS POR:

ACSA, 1972 ○
IMTA, 1990 ○-
EXYCO, 1994 ◎

SIMBOLOS TOPOGRAFICOS

CURVAS DE NIVEL 1500
CIUDAD O POBLADO PRINCIPAL
RANCHERIA
CARRETERA
TERRACERIA
BRECHA
VIA DE FERROCARRIL
RIO
ARROYO

ESCALA 1:100,000

0 0.5 1 2 3 4 5 10
KILOMETROS

COMISION NACIONAL DEL AGUA

SUBDIRECCION GENERAL DE ADMINISTRACION DEL AGUA
GERENCIA DE AGUAS SUBTERRANEAS
SUBGERENCIA DE EXPLORACION GEOHIDROLOGICA

CARACTERIZACION HIDROGEOQUIMICA DE SEIS DE LOS PRINCIPALES ACUIFEROS DEL PAIS

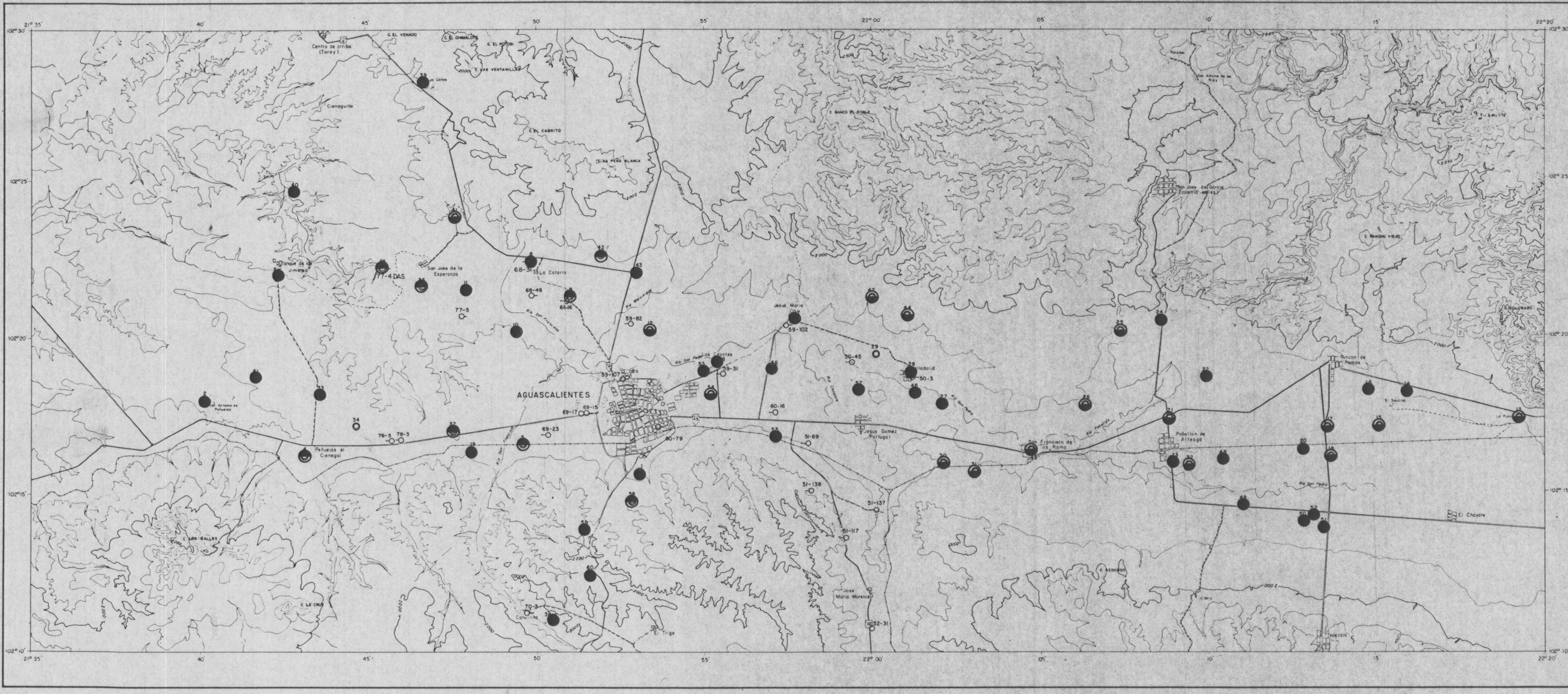
LOCALIZACION DE MUESTREO DE AGUA (VALLE DE AGUASCALIENTES)

ING. JESUS MANUEL HAM CHI
GERENTE DE AGUAS SUBTERRANEAS

DR. FERNANDO GONZALEZ VILLAREAL
DIRECTOR GENERAL

ING. HECTOR GARDUÑO VELASCO
SUBDIRECTOR GENERAL DE ADMINISTRACION DEL AGUA

FECHA MARZO, 1994 PLANO 1



ELABORADO POR EXYCO, S.A.
Para la SUBDIRECCION GENERAL DE ADMINISTRACION DEL AGUA
Según contrato Nº SGAA-93-20

PROYECTO: ING. DANIEL CASTILLO C. — DIBUJO: MIRANDA C. Y VARGAS L.
REVISO: ING. RAUL MORALES E. — APROBO: ING. JOSE LUIS ROSAS L.

ANALISIS QUIMICOS REALIZADOS POR:

ACSA, 1972 ○
IMTA, 1990 ○—
EXYCO, 1994 ◎

SIMBOLOS HIDROGEOQUIMICOS

ANALISIS QUIMICOS NORMALES ●

ANALISIS QUIMICOS NORMALES Y DETERMINACION DE Cr^{+6} y Pb

ANALISIS QUIMICOS NORMALES Y DETERMINACION DE Pb y Fe

SIMBOLOS TOPOGRAFICOS

CURVAS DE NIVEL — 1500
CIUDAD O POBLADO PRINCIPAL
RANCHERIA
CARRETERA
TERRACERIA
BRECHA
VIA DE FERROCARRIL
RIO
ARROYO

ESCALA 1:200,000

0 0.5 1 2 3 4 5 10
KILOMETROS

COMISION NACIONAL DEL AGUA

SUBDIRECCION GENERAL DE ADMINISTRACION DEL AGUA
GERENCIA DE AGUAS SUBTERRANEAS
SUBGERENCIA DE EXPLORACION GEOHIDROLOGICA

CARACTERIZACION HIDROGEOQUIMICA DE SEIS DE LOS PRINCIPALES ACUIFEROS DEL PAIS

DISTRIBUCION Y TIPO DE ANALISIS QUIMICOS REALIZADOS
(VALLE DE AGUASCALIENTES)

ING. JESUS MANUEL HAM CHI
GERENTE DE AGUAS SUBTERRANEAS

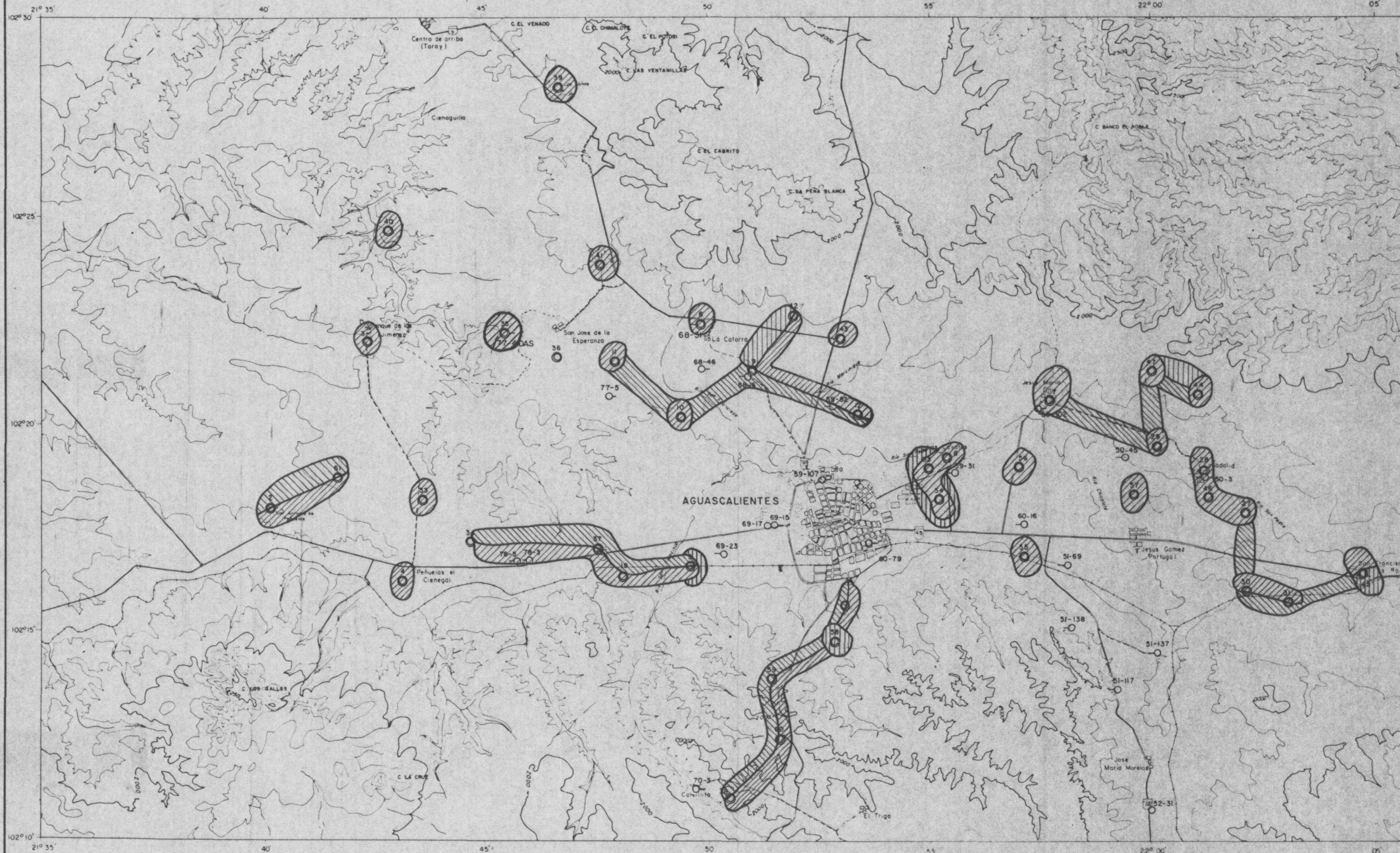
DR. FERNANDO GONZALEZ VILLAREAL
DIRECTOR GENERAL

ING. HECTOR GARDUÑO VELASCO
SUBDIRECTOR GENERAL DE ADMINISTRACION DEL AGUA

FECHA: MARZO, 1994 — PLANO: 2

ELABORADO POR: EXYCO, S.A.
Para la SUBDIRECCION GENERAL DE ADMINISTRACION DEL AGUA
Según contrato Nº SGAA-93-20

PROYECTO	ING. DANIEL CASTILLO C.	DIBUJO	MIRANDA C. Y VARGAS L.
REVISO	ING. RAUL MORALES E.	APROBO	ING. JOSE LUIS ROSAS L.



ANALISIS QUIMICOS REALIZADOS POR:

ACSA, 1972
IMTA, 1990
EXYCO, 1994

SIMBOLOS HIDROGEOQUIMICOS

OBRA EN QUE SE SOBREPASA LA NORMA PERMITIDA EN LA CONCENTRACION DE FLUOR PARA USO DE AGUA POTABLE (1.5 p.p.m.)

OBRA EN QUE SE SOBREPASA LA NORMA PERMITIDA EN LA CONCENTRACION DE NO_3 PARA USO DE AGUA POTABLE (5 p.p.m.)

OBRA EN QUE SE SOBREPASA LA NORMA PERMITIDA EN LA CONCENTRACION DE PLOMO PARA USO DE AGUA POTABLE (0.05 p.p.m.)

NOTA:
LOS LIMITES PERMISIBLES FUERON PUBLICADOS EN EL DIARIO OFICIAL DE LA FEDERACION EL 13 DE DICIEMBRE DE 1989

SIMBOLOS TOPOGRAFICOS

CURVAS DE NIVEL
CIUDAD O POBLADO PRINCIPAL
RANCHERIA
CARRETERA
TERRACERIA
BRECHA
VIA DE FERROCARRIL
RIO
ARROYO

ESCALA 1:200,000

KILOMETROS

COMISION NACIONAL DEL AGUA

SUBDIRECCION GENERAL DE ADMINISTRACION DEL AGUA
GERENCIA DE AGUAS SUBTERRANEAS
SUBGERENCIA DE EXPLORACION GEOHIDROLOGICA

CARACTERIZACION HIDROGEOQUIMICA DE SEIS DE LOS PRINCIPALES ACUIFEROS DEL PAIS

OBRAS QUE SOBREPASAN LAS NORMAS PERMITIDAS PARA USO DE AGUA POTABLE (VALLE DE AGUASCALIENTES)

ING. JESUS MANUEL HAM CH.
GERENTE DE AGUAS SUBTERRANEAS

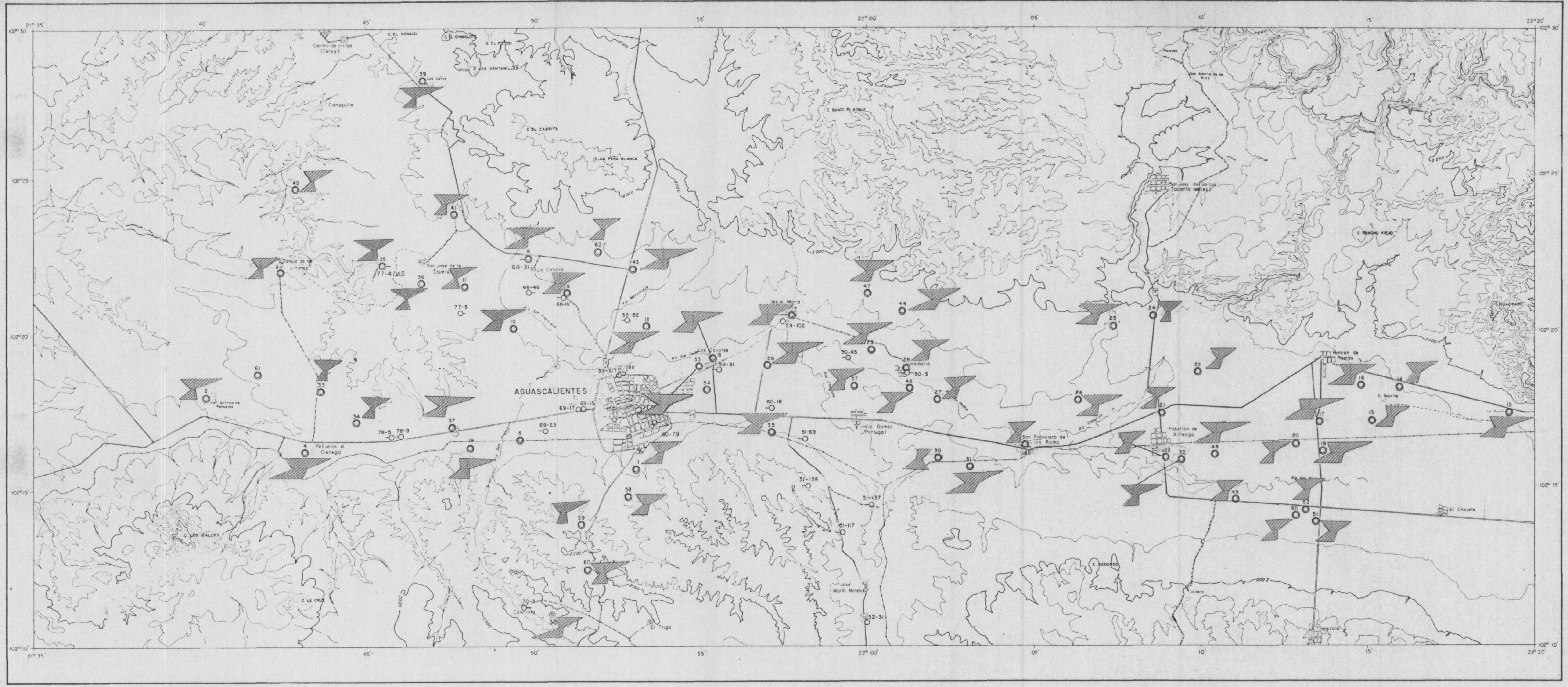
DR. FERNANDO GONZALEZ VILLARREAL
RECTOR GENERAL

ING. HECTOR GARDUÑO VELASCO
SUBDIRECTOR GENERAL DE ADMINISTRACION DEL AGUA

FECHA: MARZO, 1994
PLANO: 3

ELABORADO POR EXYCO, S.A.
Para la SUBDIRECCION GENERAL DE ADMINISTRACION DEL AGUA
Según contrato Nº SGAA-93-20

PROYECTO ING. DANIEL CASTILLO C. — DIBUJO MIRANDA C. Y VARGAS L.
REVISO ING. RAUL MORALES E. — APROBO ING. JOSE LUIS ROSAS L.



ANALISIS QUIMICOS REALIZADOS POR

SIMBOLOS HIDROGEOQUIMICOS

FAMILIA DE AGUAS

BICARBONATADA - CALCICA

BICARBONATADA - SODICA

SIMBOLOS TOPOGRAFICOS

ESCALA 1:100,000

KILOMETROS

COMISION NACIONAL DEL AGUA

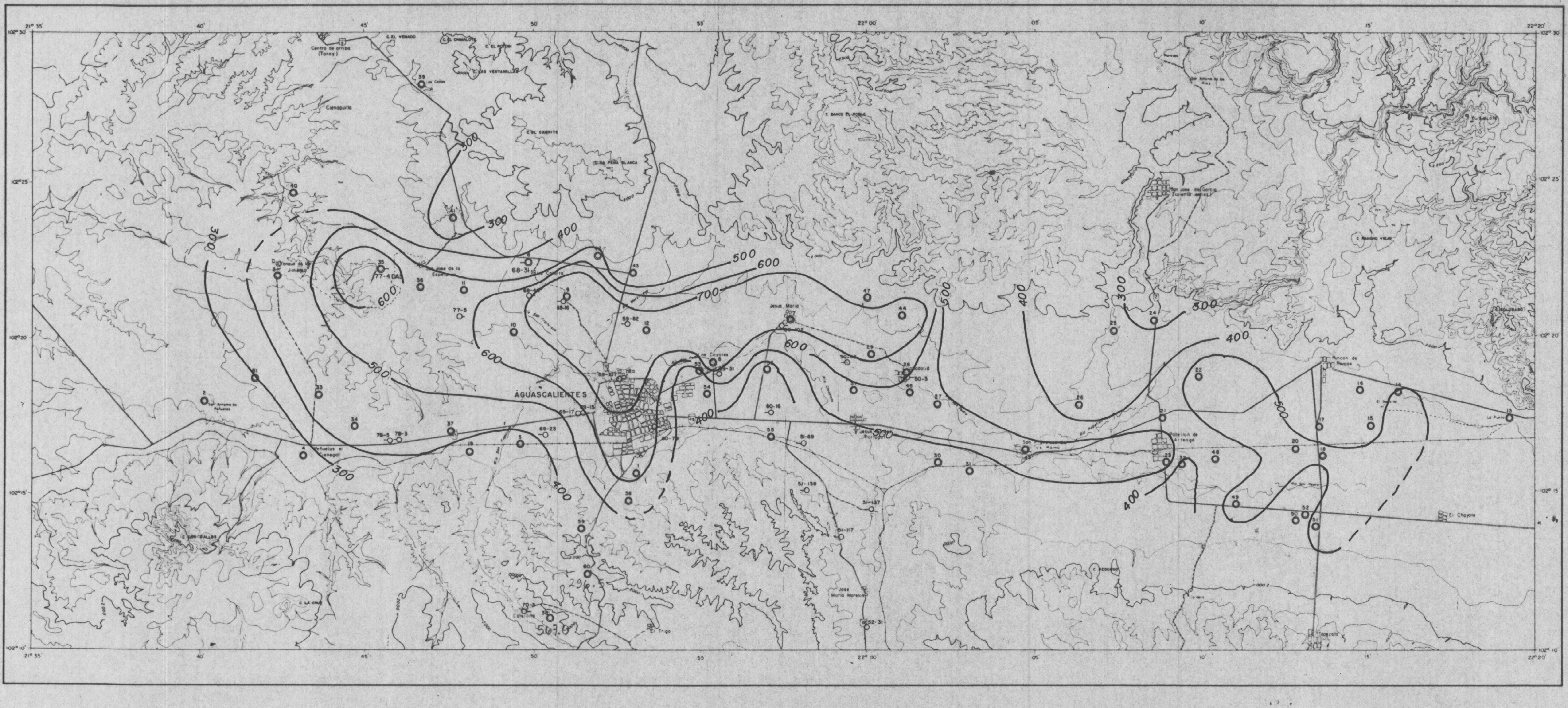
SUBDIRECCION GENERAL DE ADMINISTRACION DEL AGUA
GERENCIA DE AGUAS SUBTERRANEAS
SUBGERENCIA DE EXPLORACION GEOHIDROLOGICA

CARACTERIZACION HIDROGEOQUIMICA DE SEIS DE LOS PRINCIPALES ACUIFEROS DEL PAIS

DIAGRAMA DE STIFF
(VALLE DE AGUASCALIENTES)

ING. JESUS MANUEL HAM CHI — GERENTE DE AGUAS SUBTERRANEAS
ING. HECTOR BARDUÑO VELASCO — SUBDIRECTOR GENERAL DE ADMINISTRACION DEL AGUA
DR. FERNANDO GONZALEZ VILLAREAL — DIRECTOR GENERAL

FECHA MARZO, 1994 — PLANO 4



ELABORADO POR EXYCO, S.A.
Para la SUBDIRECCION GENERAL DE ADMINISTRACION DEL AGUA
Según contrato Nº SGAA-93-20

PROYECTO: ING. DANIEL CASTILLO C. DIBUJO: MIRANDA C. Y VARGAS L.
REVISO: ING. RAUL MORALES E. APROBO: ING. JOSE LUIS ROSAS L.

ANALISIS QUIMICOS REALIZADOS POR:

ACSA, 1972
IMTA, 1990
EXYCO, 1994

CURVA DE IGUAL CONTENDO DE SOLIDOS TOTALES DISUELTOS (STD) 400

CURVA INFERIDA 400

SIMBOLOS TOPOGRAFICOS

CURVAS DE NIVEL
CIUDAD O POBLADO PRINCIPAL
RANCHERIA
CARRETERA
TERRACERIA
BRECHA
VIA DE FERROCARRIL
RIO
ARROYO

ESCALA 1:200,000

0 0.5 1 2 3 4 5 10
KILOMETROS

COMISION NACIONAL DEL AGUA

SUBDIRECCION GENERAL DE ADMINISTRACION DEL AGUA
GERENCIA DE AGUAS SUBTERRANEAS
SUBGERENCIA DE EXPLORACION GEOHIDROLOGICA

CARACTERIZACION HIDROGEOQUIMICA DE SEIS DE LOS PRINCIPALES ACUIFEROS DEL PAIS

DISTRIBUCION DE SOLIDOS TOTALES DISUELTOS (STD) (VALLE DE AGUASCALIENTES)

ING. JESUS MANUEL HAM CH.
GERENTE DE AGUAS SUBTERRANEAS

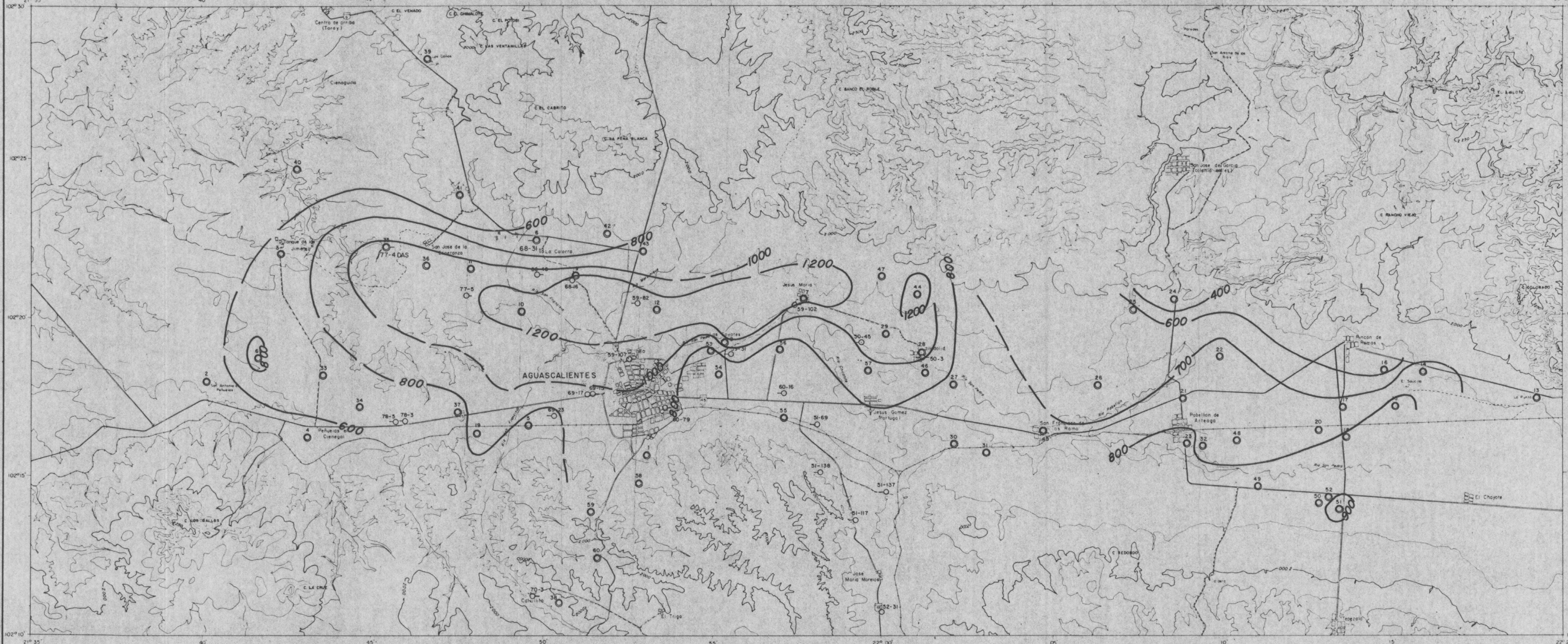
DR. FERNANDO GONZALEZ VILLAREAL
DIRECTOR GENERAL

ING. HECTOR GARDUÑO VELASCO
SUBDIRECTOR GENERAL DE ADMINISTRACION DEL AGUA

FECHA: MARZO, 1994 | PLANO: 5

ELABORADO POR EXYCO, S.A.
Para la SUBDIRECCION GENERAL DE ADMINISTRACION DEL AGUA
Según contrato Nº SGAA-93-20

PROYECTO: ING. DANIEL CASTILLO C. DIBUJO: MIRANDA C. Y VARGAS L.
REVISO: ING. RAUL MORALES E. APROBO: ING. JOSE LUIS ROSAS L.



ANALISIS QUIMICOS REALIZADOS POR:

ACSA, 1972
IMTA, 1990
EXYCO, 1994

SIMBOLOS HIDROGEOLOGICOS

CURVA DE IGUAL CONDUCTIVIDAD ELECTRICA (μmhos/cm) — 400
CURVA INFERIDA — 400

SIMBOLOS TOPOGRAFICOS

CURVAS DE NIVEL
CIUDAD O POBLADO PRINCIPAL
RANCHERIA
CARRETERA
TERRACERIA
BRECHA
VIA DE FERROCARRIL
RIO
ARROYO

ESCALA 1:200,000

COMISION NACIONAL DEL AGUA

SUBDIRECCION GENERAL DE ADMINISTRACION DEL AGUA
GERENCIA DE AGUAS SUBTERRANEAS
SUBGERENCIA DE EXPLORACION GEOHIDROLOGICA

CARACTERIZACION HIDROGEOQUIMICA DE SEIS DE LOS PRINCIPALES ACUIFEROS DEL PAIS

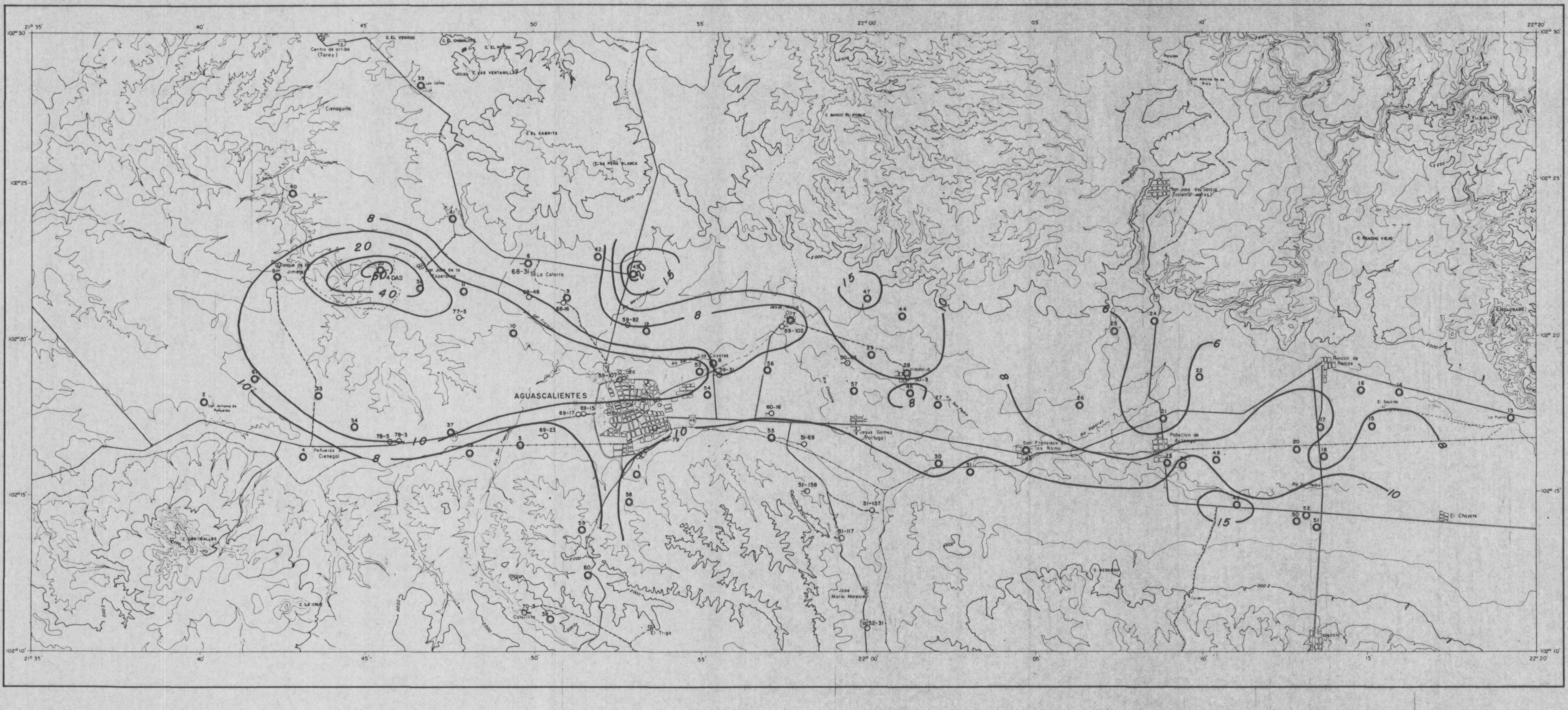
DISTRIBUCION DE LA C.E. (μmhos/cm)
(VALLE DE AGUASCALIENTES)

ING. JESUS MANUEL HAM CHI
GERENTE DE AGUAS SUBTERRANEAS

DR. FERNANDO GONZALEZ VILLAREAL
DIRECTOR GENERAL

ING. HECTOR GARDUÑO VELASCO
SUBDIRECTOR GENERAL DE ADMINISTRACION DEL AGUA

FECHA: MARZO, 1994 PLANO: 6



ELABORADO POR EXYCO, S. A.
Para la SUBDIRECCION GENERAL DE ADMINISTRACION DEL AGUA
Según contrato Nº SGAA-93-20

PROYECTO ING. DANIEL CASTILLO C. — DIBUJO MIRANDA C. Y VARGAS L.
REVISO ING. RAUL MORALES E. — APROBO ING. JOSE LUIS ROSAS L.

ANALISIS QUIMICOS REALIZADOS POR:

- ACSA, 1972
- IMTA, 1990
- EXYCO, 1994

SIMBOLOS HIDROGEOLOGICOS

CURVA DE IGUAL CONTENIDO DE CLORO (p.p.m.) 15

CURVA INFERIDA 15

SIMBOLOS TOPOGRAFICOS

- CURVAS DE NIVEL 1500
- CIUDAD O POBLADO PRINCIPAL
- RANCHERIA
- CARRETERA
- TERRACERIA
- BRECHA
- VIA DE FERROCARRIL
- RIO
- ARROYO

ESCALA 1:200,000

0 0.5 1 2 3 4 5 10
KILOMETROS

COMISION NACIONAL DEL AGUA

SUBDIRECCION GENERAL DE ADMINISTRACION DEL AGUA
GERENCIA DE AGUAS SUBTERRANEAS
SUBGERENCIA DE EXPLORACION GEOHIDROLOGICA

CARACTERIZACION HIDROGEOQUIMICA DE SEIS DE LOS PRINCIPALES ACUIFEROS DEL PAIS

DISTRIBUCION DEL ION CLORO (ppm)
(VALLE DE AGUASCALIENTES)

ING. JESUS MANUEL HAM CHI
GERENTE DE AGUAS SUBTERRANEAS

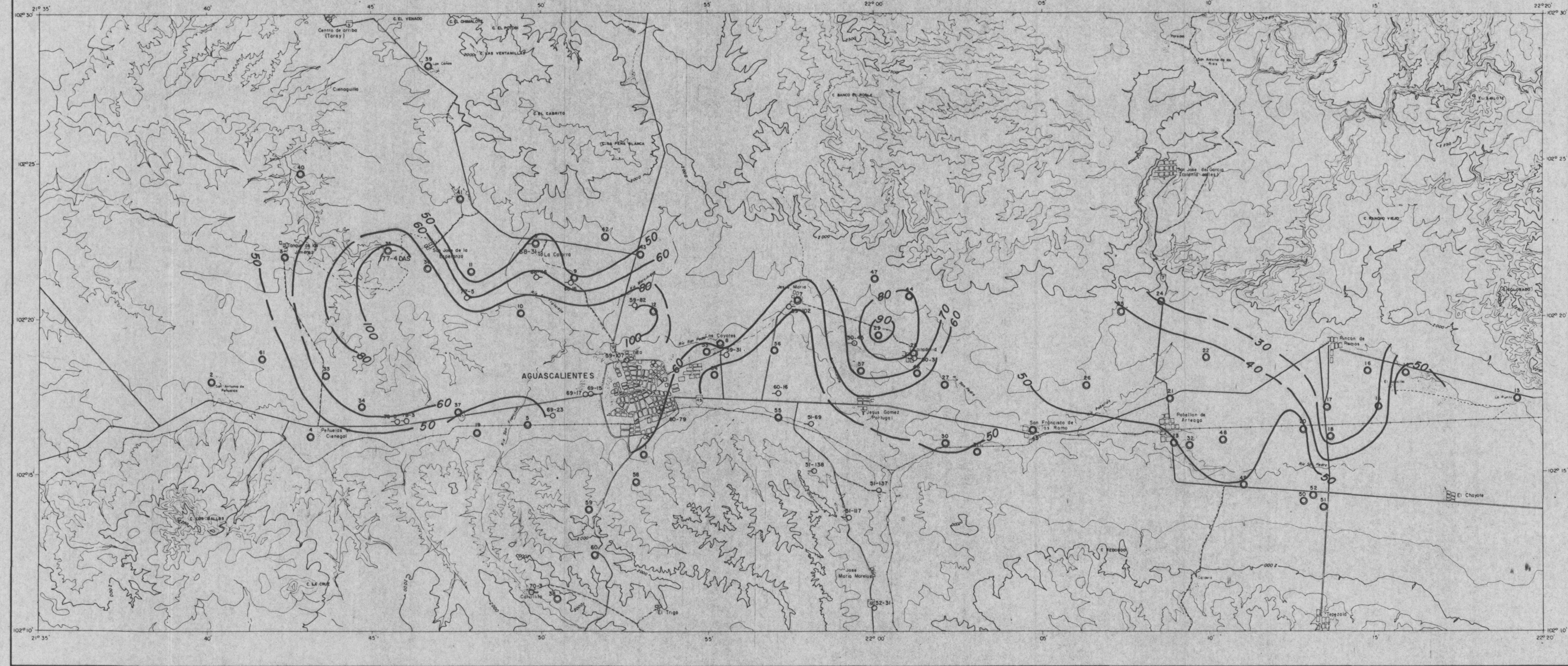
DR. FERNANDO GONZALEZ VILLAREAL
DIRECTOR GENERAL

ING. HECTOR GARDUÑO VELASCO
SUBDIRECTOR GENERAL DE ADMINISTRACION DEL AGUA

FECHA MARZO, 1994 — PLANO 7

ELABORADO POR EXYCO, S.A.
Para la SUBDIRECCION GENERAL DE ADMINISTRACION DEL AGUA
Según contrato Nº SGAA-93-20

PROYECTO: ING. DANIEL CASTILLO C. — DIBUJO: MIRANDA C. Y VARGAS L.
REVISO: ING. RAUL MORALES E. — APROBO: ING. JOSE LUIS ROSAS L.



ANALISIS QUIMICOS REALIZADOS POR:

ACSA, 1972
IMTA, 1990
EXYCO, 1994

SIMBOLOS HIDROGEOLOGICOS

CURVA DE IGUAL CONTENIDO DE CALCIO (ppm) 30
CURVA INFERIDA 30

SIMBOLOS TOPOGRAFICOS

CURVAS DE NIVEL 1500
CIUDAD O POBLADO PRINCIPAL
RANCHERIA
CARRETERA
TERRACERIA
BRECHA
VIA DE FERROCARRIL
RIO
ARROYO

ESCALA 1:200,000

KILOMETROS

COMISION NACIONAL DEL AGUA

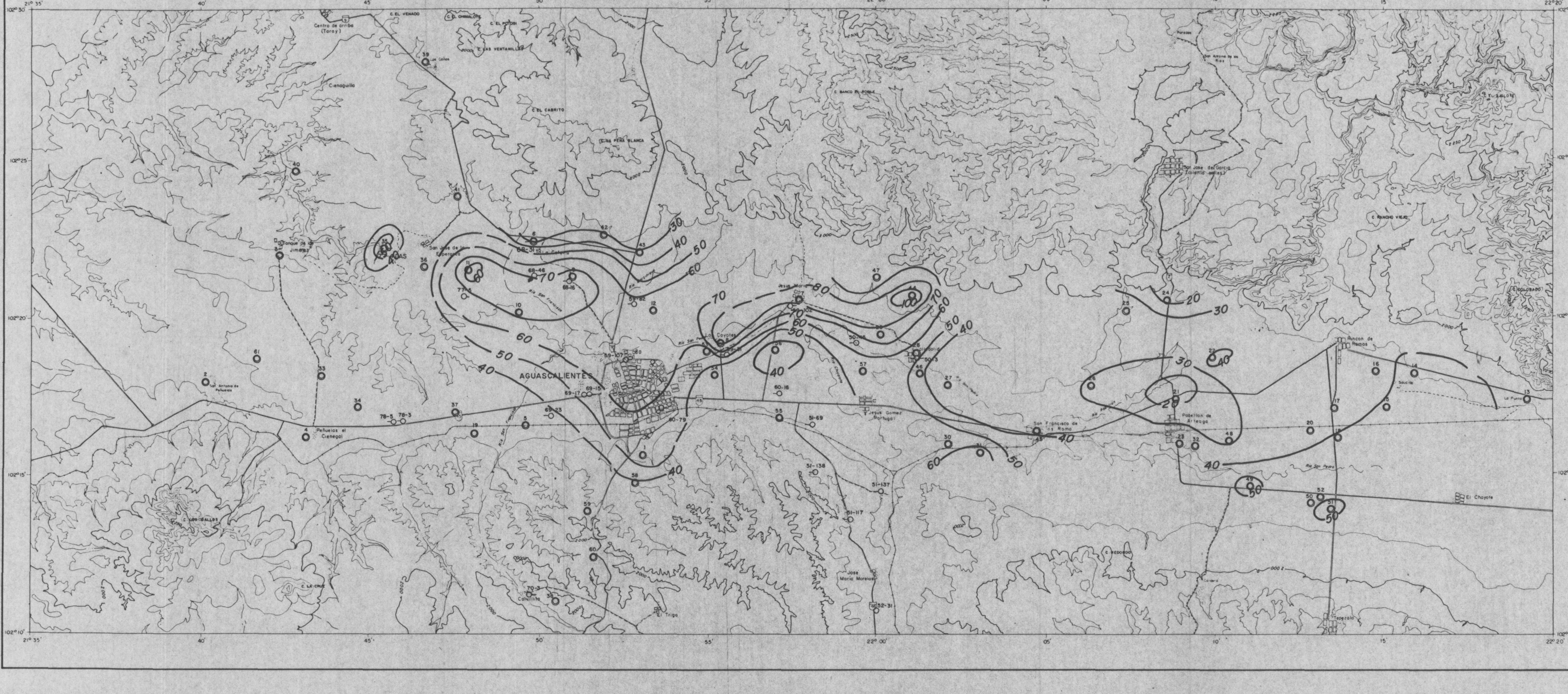
SUBDIRECCION GENERAL DE ADMINISTRACION DEL AGUA
GERENCIA DE AGUAS SUBTERRANEAS
SUBGERENCIA DE EXPLORACION GEOHIDROLOGICA

CARACTERIZACION HIDROGEOQUIMICA DE SEIS DE LOS PRINCIPALES ACUIFEROS DEL PAIS

DISTRIBUCION DEL ION CALCIO (ppm)
(VALLE DE AGUASCALIENTES)

ING. JESUS MANUEL HAM CHI — GERENTE DE AGUAS SUBTERRANEAS
DR. FERNANDO GONZALEZ VILLAREAL — DIRECTOR GENERAL
ING. HECTOR GARDUÑO VELASCO — SUBDIRECTOR GENERAL DE ADMINISTRACION DEL AGUA

FECHA: MARZO, 1994 — PLANO: 8



ELABORADO POR EXYCO, S.A.
Para la SUBDIRECCION GENERAL DE ADMINISTRACION DEL AGUA
Según contrato Nº SGAA-93-20

PROYECTO: ING. DANIEL CASTILLO C. DIBUJO: MIRANDA C. Y VARGAS L.
REVISO: ING. RAUL MORALES E. APROBO: ING. JOSE LUIS ROSAS L.

ANALISIS QUIMICOS REALIZADOS POR:

ACSA, 1972
IMTA, 1990
EXYCO, 1994

SIMBOLOS HIDROGEOLOGICOS

CURVA DE IGUAL CONTENIDO DE SULFATO (ppm) — 30
CURVA INFERIDA — 30

SIMBOLOS TOPOGRAFICOS

CURVAS DE NIVEL — 1500
CIUDAD O POBLADO PRINCIPAL
RANCHERIA
CARRETERA
TERRACERIA
BRECHA
VIA DE FERROCARRIL
RIO
ARROYO

ESCALA 1:200,000

0 0.5 1 2 3 4 5 10
KILOMETROS

COMISION NACIONAL DEL AGUA
SUBDIRECCION GENERAL DE ADMINISTRACION DEL AGUA
GERENCIA DE AGUAS SUBTERRANEAS
SUBGERENCIA DE EXPLORACION GEOHIDROLOGICA

CARACTERIZACION HIDROGEOQUIMICA DE SEIS DE LOS PRINCIPALES ACUIFEROS DEL PAIS

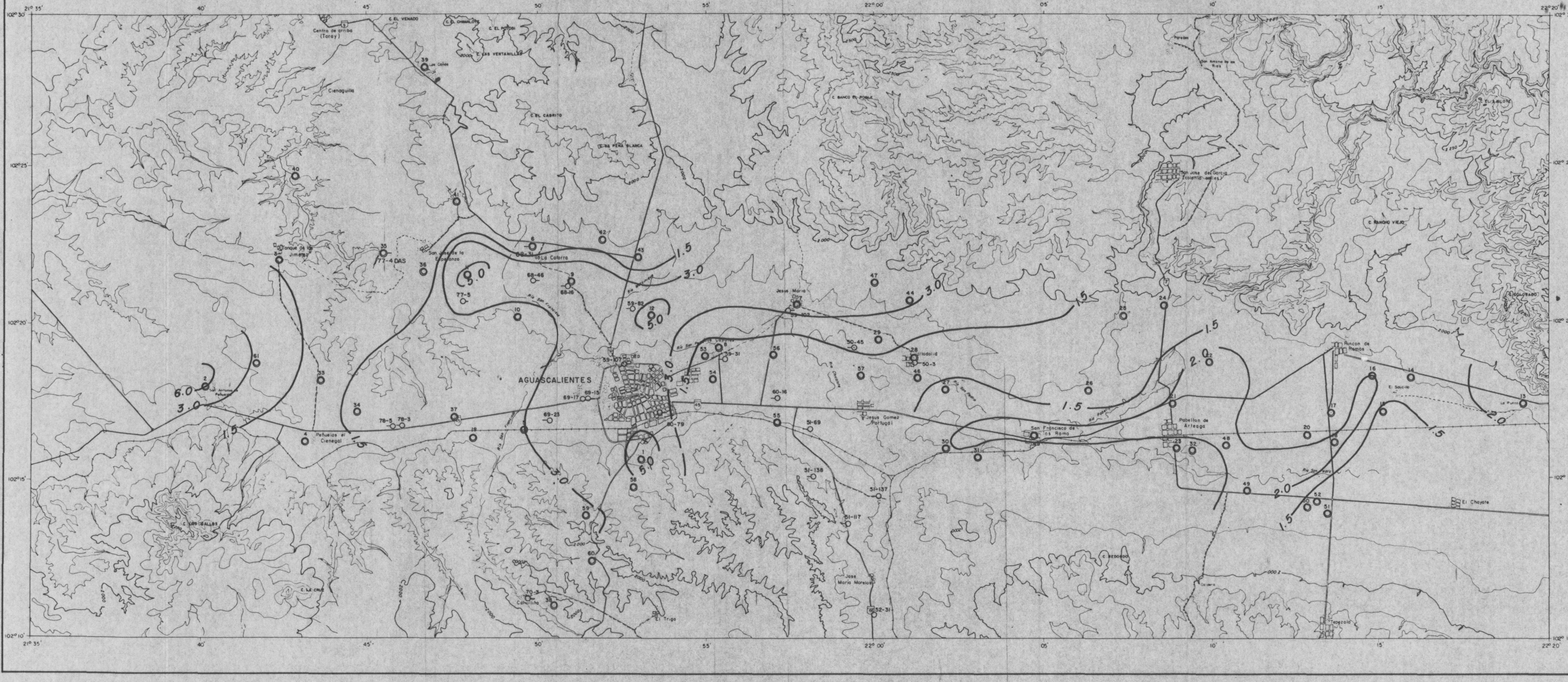
DISTRIBUCION DEL ION SULFATO (ppm)
(VALLE DE AGUASCALIENTES)

ING. JESUS MANUEL HAM CH. — GERENTE DE AGUAS SUBTERRANEAS
DR. FERNANDO GONZALEZ VILLAREAL — DIRECTOR GENERAL
ING. HECTOR GARDUÑO VELASCO — SUBDIRECTOR GENERAL DE ADMINISTRACION DEL AGUA

FECHA: MARZO, 1994
PLANO: 9

ELABORADO POR EXYCO, S.A.
Para la SUBDIRECCION GENERAL DE ADMINISTRACION DEL AGUA
Según contrato Nº SGAA-93-20

PROYECTO: ING. DANIEL CASTILLO C. — DIBUJO: MIRANDA C. Y VARGAS L.
REVISO: ING. RAUL MORALES E. — APROBO: ING. JOSE LUIS ROSAS L.



ANALISIS QUIMICOS REALIZADOS POR:

- ACSA, 1972
- IMTA, 1990
- EXYCO, 1994

SIMBOLOS HIDROGEOLOGICOS

- CURVA DE IGUAL CONTENIDO DE FLUOR (ppm) — 1.5
- CURVA INFERIDA — 1.5

SIMBOLOS TOPOGRAFICOS

- CURVAS DE NIVEL — 1500
- CIUDAD O POBLADO PRINCIPAL
- RANCHERIA
- CARRETERA
- TERRACERIA
- BRECHA
- VIA DE FERROCARRIL
- RIO
- ARROYO

ESCALA 1:200,000

0 0.5 1 2 3 4 5 10
KILOMETROS

COMISION NACIONAL DEL AGUA

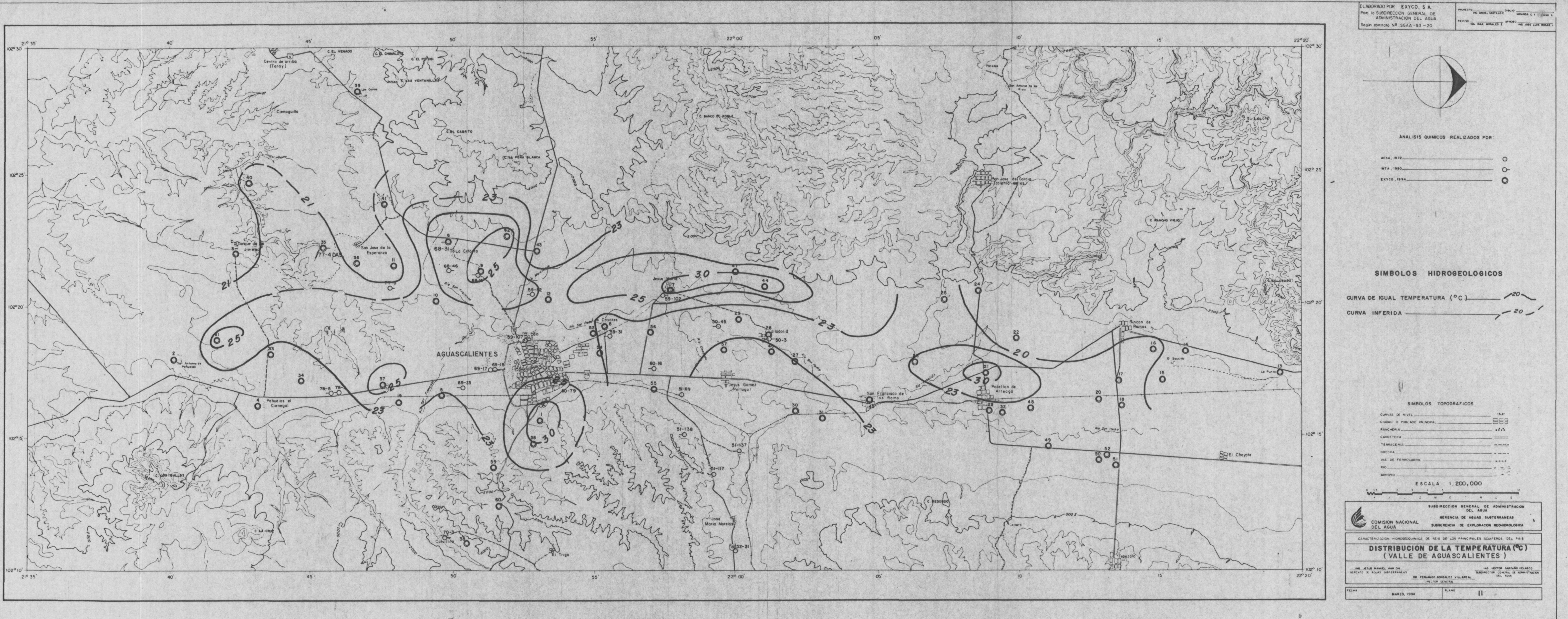
SUBDIRECCION GENERAL DE ADMINISTRACION DEL AGUA
GERENCIA DE AGUAS SUBTERRANEAS
SUBGERENCIA DE EXPLORACION GEOHIDROLOGICA

CARACTERIZACION HIDROGEOQUIMICA DE SEIS DE LOS PRINCIPALES ACUIFEROS DEL PAIS

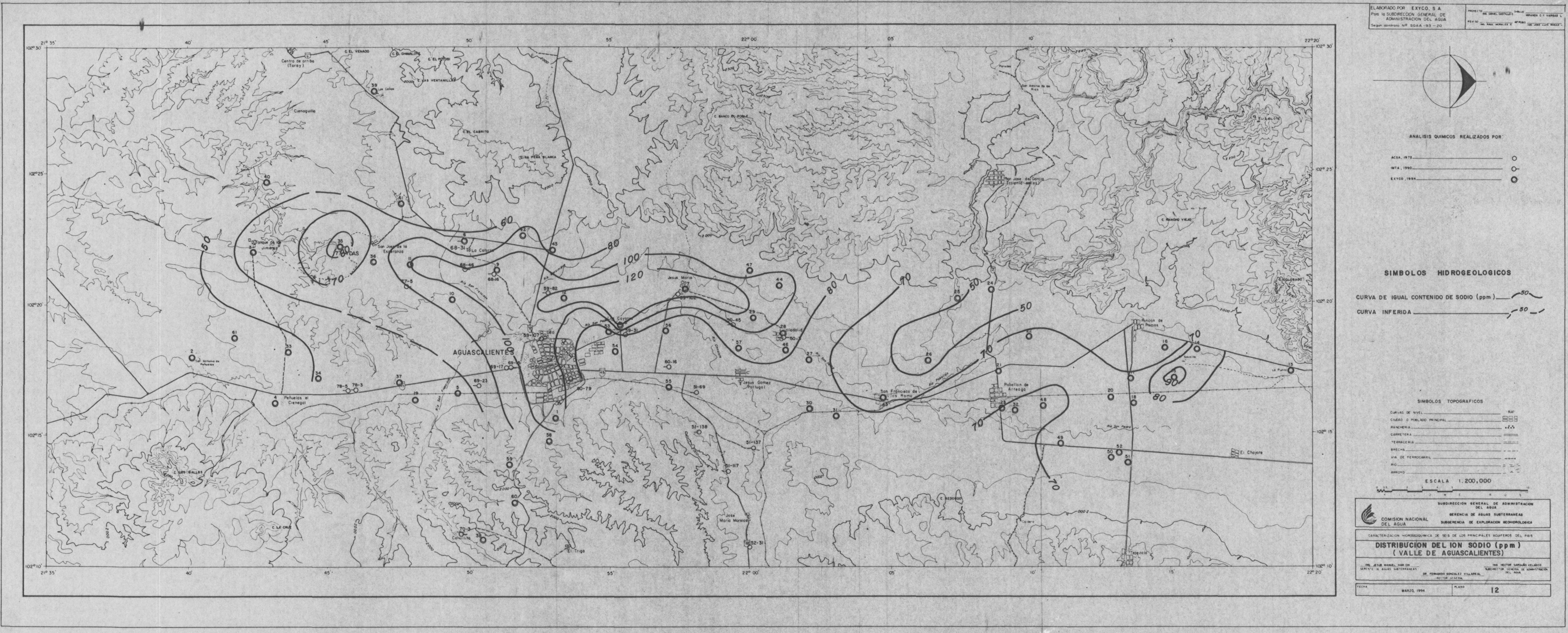
DISTRIBUCION DEL ION FLUOR (ppm) (VALLE DE AGUASCALIENTES)

ING. JESUS MANUEL HAM CHI — GERENTE DE AGUAS SUBTERRANEAS
DR. FERNANDO GONZALEZ VILLAREAL — DIRECTOR GENERAL
ING. HECTOR GARDUÑO VELASCO — SUBDIRECTOR GENERAL DE ADMINISTRACION DEL AGUA

FECHA	PLANO
MARZO, 1994	10

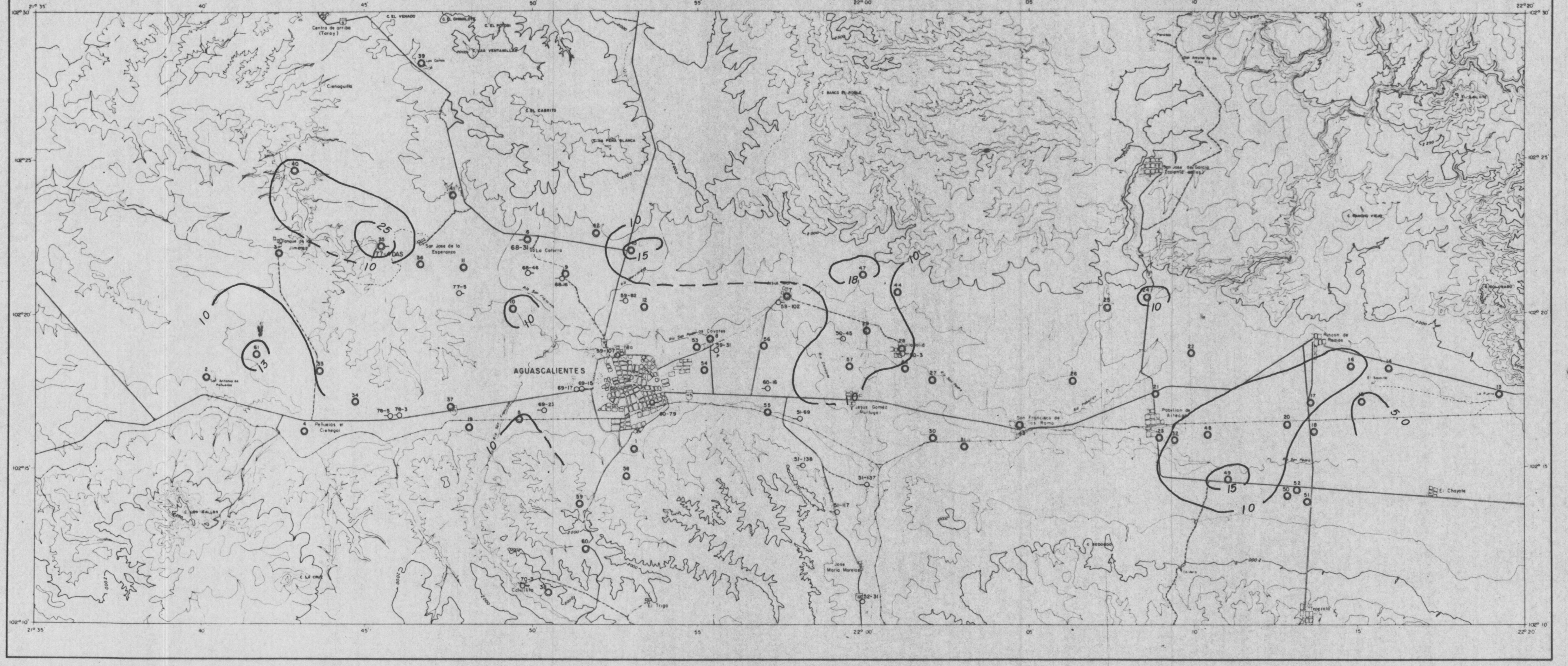


ELABORADO POR EXYCO, S.A.
Para la SUBDIRECCION GENERAL DE ADMINISTRACION DEL AGUA
Según contrato Nº SGAA-93-20
PROYECTO ING. DANIEL CASTILLO C.
DIBUJO MIRANDA C. Y.
REVISO ING. RAUL MORALES E.
APROBO ING. JOSE LUIS ROSAS L.
ANALISIS QUIMICOS REALIZADOS POR:
ACSA, 1972
INITA, 1990
EXYCO, 1994
SIMBOLOS HIDROGEOLOGICOS
CURVA DE IGUAL TEMPERATURA (°C)
CURVA INFERIDA
SIMBOLOS TOPOGRAFICOS
ESCALA 1.200,000
KILOMETROS
AGUASCALIENTES
Jesus Maria
San Francisco de los Romo
Pabellon de Arteaga
Rincon de Romos
Cienaguilla
El Chayote
COMISION NACIONAL DEL AGUA
SUBDIRECCION GENERAL DE ADMINISTRACION DEL AGUA
GERENCIA DE AGUAS SUBTERRANEAS
SUBGERENCIA DE EXPLORACION GEOHIDROLOGICA
CARACTERIZACION HIDROGEOQUIMICA DE SEIS DE LOS PRINCIPALES ACUIFEROS DEL PAIS
DISTRIBUCION DE LA TEMPERATURA (°C)
(VALLE DE AGUASCALIENTES)
ING. JESUS MANUEL HAM CHI
GERENTE DE AGUAS SUBTERRANEAS
DR. FERNANDO GONZALEZ VILLAREAL
DIRECTOR GENERAL
ING. HECTOR GARDUÑO VELASCO
SUBDIRECTOR GENERAL DE ADMINISTRACION DEL AGUA
FECHA MARZO, 1994
PLANO 11


ELABORADO POR EXYCO, S.A.
Para la SUBDIRECCION GENERAL DE ADMINISTRACION DEL AGUA
Según contrato Nº SGAA-93-20
PROYECTO ING. DANIEL CASTILLO C.
DIBUJO MIRANDA C. Y VARGAS L.
REVISO ING. RAUL MORALES E.
APROBO ING. JOSE LUIS ROSAS L.
ANALISIS QUIMICOS REALIZADOS POR:
ACSA, 1973
INTA, 1990
EXYCO, 1994
SIMBOLOS HIDROGEOLOGICOS
CURVA DE IGUAL CONTENIDO DE SODIO (ppm)
CURVA INFERIDA
SIMBOLOS TOPOGRAFICOS
ESCALA 1:200,000
AGUASCALIENTES
SUBDIRECCION GENERAL DE ADMINISTRACION DEL AGUA
GERENCIA DE AGUAS SUBTERRANEAS
SUBGERENCIA DE EXPLORACION GEOHIDROLOGICA
COMISION NACIONAL DEL AGUA
CARACTERIZACION HIDROGEOQUIMICA DE SEIS DE LOS PRINCIPALES ACUIFEROS DEL PAIS
DISTRIBUCION DEL ION SODIO (ppm)
(VALLE DE AGUASCALIENTES)
DR. FERNANDO GONZALEZ VILLAREAL
DIRECTOR GENERAL
ING. HECTOR GARDUÑO VELASCO
SUBDIRECTOR GENERAL DE ADMINISTRACION DEL AGUA
MARZO, 1994
PLANO 12

ELABORADO POR EXYCO, S.A.
Para la SUBDIRECCION GENERAL DE ADMINISTRACION DEL AGUA
Según contrato Nº SGAA-93-20

PROYECTO ING. DANIEL CASTILLO C. DIBUJO MIRANDA C. Y VARGAS L.
REVISO ING. RAUL MORALES E. APROBO ING. JOSE LUIS ROSAS L.



ANALISIS QUIMICOS REALIZADOS POR:

ACSA, 1972
IMTA, 1990
EXYCO, 1994

CURVA DE IGUAL CONTENIDO DE NITRATOS (ppm) 10

CURVA INFERIDA -10-

SIMBOLOS TOPOGRAFICOS

CURVAS DE NIVEL
CIUDAD O POBLADO PRINCIPAL
RANCHERIA
CARRETERA
TERRACERIA
BRECHA
VIA DE FERROCARRIL
RIO
ARROYO

ESCALA 1.200,000

KILOMETROS

COMISION NACIONAL DEL AGUA

SUBDIRECCION GENERAL DE ADMINISTRACION DEL AGUA
GERENCIA DE AGUAS SUBTERRANEAS
SUBGERENCIA DE EXPLORACION GEOHIDROLOGICA

CARACTERIZACION HIDROGEOQUIMICA DE SEIS DE LOS PRINCIPALES ACUIFEROS DEL PAIS

DISTRIBUCION DEL ION NITRATO (ppm)
(VALLE DE AGUASCALIENTES)

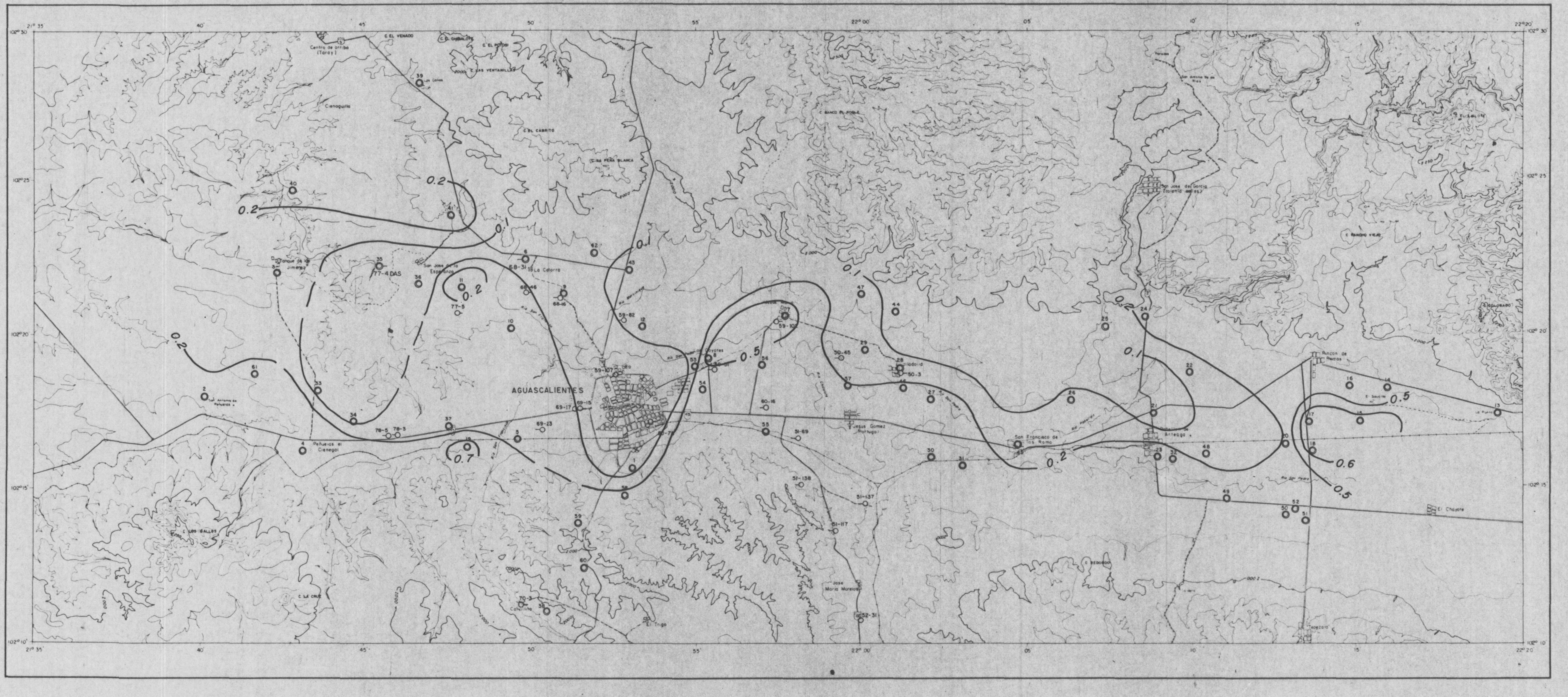
ING. JESUS MANUEL HAM CH.
GERENTE DE AGUAS SUBTERRANEAS

ING. HECTOR GARDUÑO VELASCO
SUBDIRECTOR GENERAL DE ADMINISTRACION DEL AGUA

DR. FERNANDO GONZALEZ VILLAREAL
DIRECTOR GENERAL

FECHA MARZO, 1994

PLANO 13



ELABORADO POR EXYCO, S.A.
Para la SUBDIRECCION GENERAL DE ADMINISTRACION DEL AGUA
Según contrato Nº SGAA-93-20

PROYECTO: ING. DANIEL CASTILLO C. — DIBUJO: MIRANDA C. Y VARGAS L.
REVISO: ING. RAUL MORALES E. — APROBO: ING. JOSE LUIS ROSAS L.

ANALISIS QUIMICOS REALIZADOS POR:

ACSA, 1972
IMTA, 1990
EXYCO, 1994

SIMBOLOS HIDROGEOLOGICOS

CURVA DE IGUAL RELACION IONICA (rMg/rCa) 0.1
CURVA INFERIDA 0.1

SIMBOLOS TOPOGRAFICOS

CURVAS DE NIVEL 500
CIUDAD O POBLADO PRINCIPAL
RANCHERIA
CARRETERA
TERRACERIA
BRECHA
VIA DE FERROCARRIL
RIO
ARROYO

ESCALA 1:200,000

COMISION NACIONAL DEL AGUA
SUBDIRECCION GENERAL DE ADMINISTRACION DEL AGUA
GERENCIA DE AGUAS SUBTERRANEAS
SUBGERENCIA DE EXPLORACION GEOHIDROLOGICA

CARACTERIZACION HIDROGEOQUIMICA DE SEIS DE LOS PRINCIPALES ACUIFEROS DEL PAIS

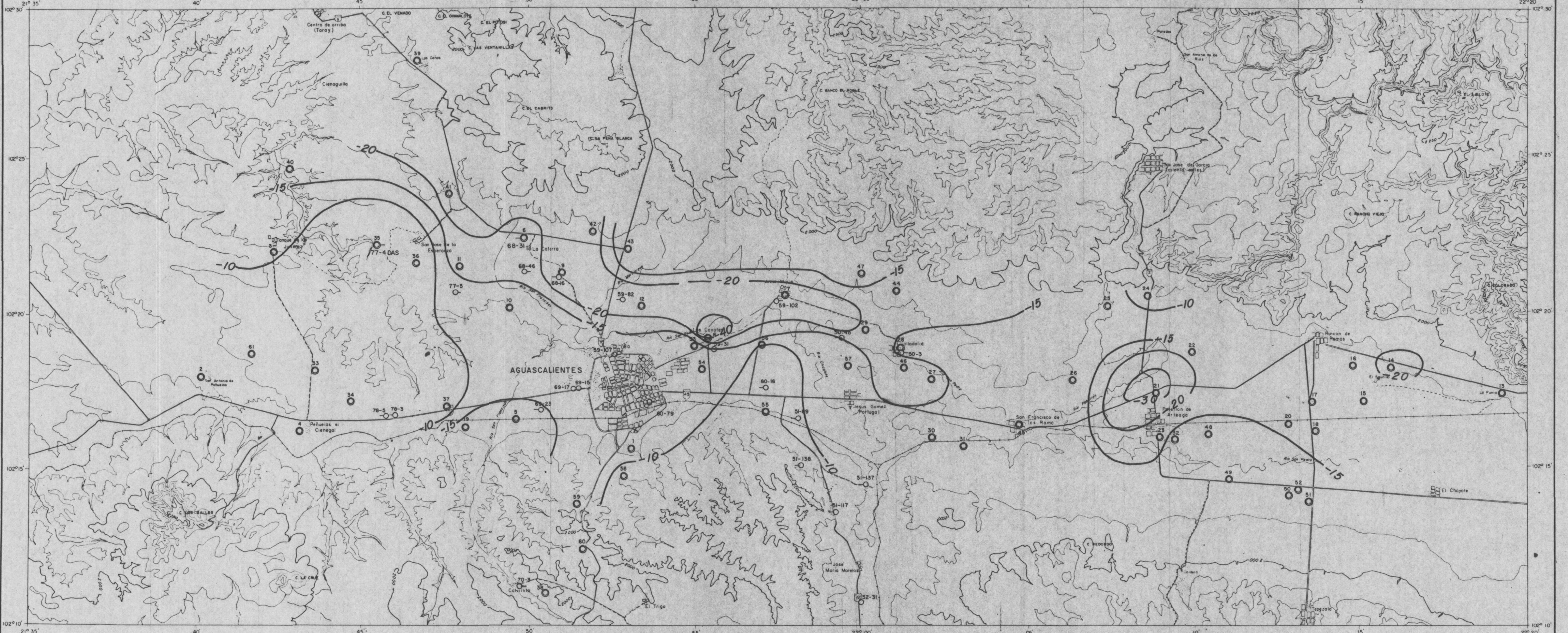
DISTRIBUCION DE LA RELACION IONICA rMg/rCa (VALLE DE AGUASCALIENTES)

ING. JESUS MANUEL HAM CH. — GERENTE DE AGUAS SUBTERRANEAS
DR. FERNANDO GONZALEZ VILLAREAL — DIRECTOR GENERAL
ING. HECTOR GARDUÑO VELASCO — SUBDIRECTOR GENERAL DE ADMINISTRACION DEL AGUA

FECHA: MARZO, 1994 — PLANO: 14

ELABORADO POR EXYCO, S.A.
Para la SUBDIRECCION GENERAL DE ADMINISTRACION DEL AGUA
Según contrato Nº SGAA-93-20

PROYECTO: ING. DANIEL CASTILLO C. — DIBUJO: MIRANDA C. Y VARGAS L.
REVISO: ING. RAUL MORALES E. — APROBO: ING. JOSE LUIS ROSAS L.



ANALISIS QUIMICOS REALIZADOS POR:

ACSA, 1972
IMTA, 1990
EXYCO, 1994

SIMBOLOS HIDROGEOLOGICOS

CURVA DEL INDICE DE CAMBIO DE BASES (ICB) — 20

CURVA INFERIDA — 20

$$ICB = \frac{rCl - r(Na + K)}{rCl}$$

r = CONCENTRACIONES EN MILIEQUIVALENTES

SIMBOLOS TOPOGRAFICOS

CURVAS DE NIVEL — 1500
CIUDAD O POBLADO PRINCIPAL
RANCHERIA
CARRETERA
TERRACERIA
BRECHA
VIA DE FERROCARRIL
RIO
ARROYO

ESCALA 1:200,000

0 0.5 1 2 3 4 5 10 KILOMETROS

COMISION NACIONAL DEL AGUA

SUBDIRECCION GENERAL DE ADMINISTRACION DEL AGUA
GERENCIA DE AGUAS SUBTERRANEAS
SUBGERENCIA DE EXPLORACION GEOHIDROLOGICA

CARACTERIZACION HIDROGEOQUIMICA DE SEIS DE LOS PRINCIPALES ACUIFEROS DEL PAIS

DISTRIBUCION DEL INDICE DE CAMBIO DE BASE (ICB) (VALLE DE AGUASCALIENTES)

ING. JESUS MANUEL HAM CHI — GERENTE DE AGUAS SUBTERRANEAS
DR. FERNANDO GONZALEZ VILLAREAL — DIRECTOR GENERAL
ING. HECTOR GARDUÑO VELASCO — SUBDIRECTOR GENERAL DE ADMINISTRACION DEL AGUA

FECHA: MARZO, 1994 — PLANO: 15