

PROYECTO CAMPECHE: RESULTADOS DE CONCENTRACIÓN DE ELEMENTOS TRAZA, HORIZONTE SUPERIOR.

ANÁLISIS QUÍMICO: LABORATORIO ACTLABS

Hoja 1 de 2

Id.		Al	Ca	Fe	K	Mg	Na	P	S	Ag	As	B	Ba	Be	Bi	Cd	Ce	Co	Cr	Cs	Cu	Dy	Er	Eu	Ga	Gd	Hf	Ho	In	La	Li	Lu	
No.	CLAVE	%	%	%	%	%	%	%	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
4	Ca-2D.HA	7.46	0.41	4.38	0.2	0.32	0.06	0.005	0.009	0.2	6.7	2	82.9	2.5	0.6	0.18	118	15	74.4	5.26	22.5	5.76	3.2	1.4	21	6.7	1.3	1.1	0.09	42.6	62.1	0.4	
6	Ca-2F.HA	6.04	0.86	4.13	0.4	0.29	0.01	0.013	0.029	0.12	7.9	4	101	3	0.63	0.52	141	15.5	65.6	3.52	29.1	8.63	4.9	2.1	17.5	10.2	1.4	1.7	0.09	68.2	57.1	0.6	
8	Ca-2H.HA	3.76	0.35	6.27	0.15	0.08	0.01	0.014	0.022	0.34	13	4	229	3.9	0.83	1.79	306	27.7	159	1.11	40.8	20.9	11.6	4.5	18	25.1	1	4.1	0.11	171	37.2	1.5	
9	Ca-3E.HA	6.81	1.14	3.44	0.9	0.74	0.01	0.014	0.025	0.19	6.9	6	145	2.6	0.42	0.67	102	12.2	76.1	3.52	31	5.77	3.2	1.4	16.8	6.7	1.4	1.1	0.07	41.1	48.3	0.4	
10	Ca-3G.HA	3.71	12.1	2.62	0.4	0.44	0.07	0.024	0.063	0.1	7	19	106	1.7	0.34	0.77	83	10.3	58.8	1.7	30.8	4.43	2.6	1	10.4	5.2	0.6	0.9	0.05	30.1	28.9	0.4	
15	Ca-4H.HA	2.42	20.3	2.22	0.2	0.28	0.02	0.015	0.052	0.05	5.6	9	70.4	1.2	0.27	0.73	60.7	7.5	60.7	1.26	29.8	3.67	2	0.8	7.71	4.2	0.3	0.7	0.04	24	17.3	0.3	
19A	Ca-6D.HA	4.95	0.37	7.15	0.2	0.11	0.02	0.032	0.014	0.2	13.7	5	374	3.8	0.69	0.75	422	39.9	149	1.88	36.9	15.4	8	3.6	18.7	18.3	0.5	2.9	0.12	107	34.6	1.1	
20A	Ca-5F.HA	6.99	0.72	3.78	0.2	0.41	0.04	0.013	0.02	0.39	4.3	23	66.2	2.4	0.41	0.44	92.3	12.6	55.5	4.89	15.8	5.93	3.3	1.4	19.3	6.9	1.1	1.2	0.09	45	46.7	0.5	
22	Ca-7E.HA	3.07	18.1	1.94	0.3	0.33	0.02	0.134	0.041	0.07	4.7	7	88	1.5	0.23	0.4	84.6	8.7	32.6	1.67	19.2	4.98	2.8	1.1	8.34	5.6	0.6	1	0.04	35.3	18.3	0.4	
23	Ca-7F.HA	4.35	0.34	5.1	0.2	0.11	0.01	0.012	0.013	0.16	7.8	2	289	3.3	0.72	0.68	339	43.1	53.9	1.51	29.7	20.7	11.6	4.8	17	23.8	0.9	4.1	0.1	161	32.5	1.4	
24	Ca-7G.HA	6.43	1.62	4	0.5	0.63	0.03	0.012	0.022	0.15	8.4	6	232	2.7	0.51	1.1	139	18.8	65.4	4.43	20.2	9.3	5.1	2.4	17.6	11.4	1	1.9	0.08	86.4	39.1	0.7	
26	Ca-8D.HA	4.43	0.56	5.1	0.2	0.14	0.01	0.015	0.016	0.16	9.1	2	321	3.2	0.64	1.96	275	32.2	114	1.65	29	17.1	9.3	3.8	15.7	19.6	0.8	3.3	0.09	130	28.4	1.2	
28	Ca-8F.HA	5.18	1.79	4.64	0.6	0.56	0.01	0.018	0.041	0.09	8.7	8	193	2.6	0.49	0.93	140	18.6	130	2.32	31.6	8.06	4.5	1.8	14.9	9.1	1.1	1.6	0.08	57.3	28	0.6	
29	Ca-8G.HA	6.15	0.8	3.84	0.3	0.38	0.02	0.011	0.02	0.09	6.7	3	141	2.5	0.46	0.37	123	13.2	64.2	4.06	21.9	8.43	4.8	2	17.7	9.8	1.2	1.7	0.09	65.3	42.8	0.6	
34	Ca-10D.HA	5.72	0.62	3.07	0.1	0.35	0.07	0.001	0.008	0.04	1.4	1	338	1.9	0.44	0.38	89.6	9.8	47.3	2.51	14.2	4.89	2.7	1.1	15.9	5.6	0.6	1	0.07	33.4	29.9	0.4	
36	Ca-10F.HC1	5.66	0.54	3.06	0.1	0.29	0.03	0.013	0.032	0.1	1.7	7	50	1.7	0.38	0.34	62	6.2	52.5	2.64	14.9	4.47	2.6	1	15.8	4.7	1.4	0.9	0.07	27.3	32.3	0.4	
37	Ca-10H.HC1	6.54	0.92	4.48	0.4	0.43	0.04	0.015	0.025	0.09	9	6	179	2.9	0.54	0.61	130	13.9	81.9	3.99	22.9	10.2	5.8	2.4	18.2	11.7	1	2	0.09	76.9	45.3	0.7	
40	Ca-11G.HC1	5.79	0.92	3.35	0.2	0.33	0.03	0.017	0.041	0.24	3.2	6	81.6	2.2	0.39	0.59	120	15.7	58.5	2.91	24.5	7.44	4.1	1.7	15.6	8.4	1.1	1.5	0.07	50.6	35.6	0.6	
43	Ca-12D.HC1	6.42	1.06	3.82	0.3	0.5	0.02	0.008	0.022	0.14	6.2	3	689	3.3	0.46	1.37	703	60.8	56.7	4.33	22.9	20.5	11	4.3	16.3	24.3	1	4	0.07	167	35.5	1.2	
56	Ca-14G.HC1	6.04	0.72	3.32	0.2	0.4	0.03	0.011	0.022	0.15	4.2	6	105	2.5	0.38	0.67	130	17.5	67.8	3.77	24.2	9.9	5.4	2.2	15.8	10.9	1.3	2	0.07	67.6	41.1	0.7	
60	Ca-15B.HC1	7.05	4.13	3.27	0.4	1.02	0.15	0.01	0.092	0.18	1.3	4	125	2.7	0.28	0.71	143	19.8	67.6	3.39	26.4	9.84	5.7	2	17.3	10.6	1.2	2	0.07	70.4	44.3	0.7	
61	Ca-15DH.C1	5.97	0.92	2.78	0.1	0.46	0.03	0.009	0.032	0.18	1.4	1	78.5	2.3	0.29	0.49	130	9.9	56.6	2.15	26.9	8.37	4.4	1.8	15.1	9.4	1.4	1.7	0.06	58.7	30.8	0.6	
65	Ca-16D.HA	3.79	13.4	1.96	0.3	0.43	0.02	0.017	0.053	0.1	3	10	164	1.5	0.2	0.71	143	14.2	40.8	2.2	25.4	6	3.3	1.3	8.63	7	0.6	1.2	0.04	49.6	17.7	0.4	
67	Ca-16G.HC1	6.99	1.4	3.75	0.4	0.65	0.01	0.012	0.021	0.12	5	4	303	2.8	0.45	0.8	183	23.4	82.1	4.24	29.9	11.8	6.5	2.7	17.4	13.9	1	2.3	0.08	105	40.6	0.7	
70	Ca-17F.HC1	7.34	1.56	3.11	0.4	1.1	0.06	0.018	0.055	0.13	1.4	4	205	2.5	0.21	0.62	103	17.6	72.6	3.88	25	7.31	4	1.7	16.7	8.4	0.9	1.5	0.06	55.4	24.9	0.5	
71	Ca-17G.HA	0.63	28.4	0.37	0.1	0.35	0.01	0.097	0.065	0.02	0.5	16	230	0.3	0.03	0.17	9.5	2.5	6	0.27	14.6	0.77	0.4	0.2	0.8	0.8	0.2	0.2	0.02	4.5	4.8	0.1	
82	Ca-19F.HC1	7.34	2.18	2.84	0.4	1.2	0.03	0.015	0.02	0.15	1.2	6	283	2.5	0.22	0.57	95.9	13.7	58.5	3.65	23.3	6.51	3.7	1.4	16.5	7.1	1	1.3	0.06	45.2	23.6	0.5	
88	Ca-20G.HC1	7.66	2.77	3.3	0.6	1.36	0.05	0.011	0.025	0.08	1.3	11	357	2.5	0.21	0.69	107	21.5	87.4	4.63	26.3	7.58	4.3	1.8	17.3	8.8	1.2	1.5	0.06	63.3	27.4	0.5	
95	Ca-21F.HC1	6.48	1.34	2.48	0.2	0.73	0.04	0.015	0.019	0.14	1.9	2	245	2.8	0.22	0.59	185	18.6	46	3.68	20	12.3	6.6	2.6	15.3	14.3	0.5	2.4	0.06	95	20.1	0.7	
142	Ca-29F.HA	3.12	18.0	1.33	0.1	0.5	0.01	0.039	0.06	0.08	0.9	10	139	1.2	0.13	0.82	69.4	9.8	30.8	1.48	15.3	4.13	2.3	0.9	6.82	4.6	0.4	0.8	0.03	30.6	9.5	0.3	
146	Ca-30D.HC1	5.46	1.24	2.41	0.2	0.48	0.01	0.022	0.04	0.13	2.7	2	142	2.4	0.22	0.82	189	26.2	60	2.01	22.8	9.6	5.3	2.2	13.1	10.9	0.6	1.9	0.05	71.5	18.7	0.6	
149	Ca-30I.HA	5.56	6.89	2.37	0.4	0.84	0.01	0.02	0.048	0.08	2.3	14	188	1.9	0.22	0.82	103	16.7	73.1	4.93	22.5	6.33	3.5	1.3	12.6	7.2	0.9	1.3	0.05	47.4	18.6	0.4	

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Id.		Mn	Mo	Nd	Ni	Pb	Pr	Rb	Sb	Sc	Se	Sm	Sn	Sr	Tb	Th	Tl	Tm	U	V	Y	Yb	Zn	Zr	Ti	Ge	Nb	Te	Ta	W	Re	Au
No.	CLAVE	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppb
4	Ca-2D.HA	867	1.57	40.8	36	46.1	10.7	60.5	0.36	12	1	8.1	3.39	59.5	1	24.8	1.03	0.5	0.2	85	29.7	3	62	42.2	< 0.01	0.1	< 0.1	< 0.02	< 0.05	< 0.1	< 0.001	< 5
6	Ca-2F.HA	1270	1.15	62.1	39.8	48.6	15.9	52.7	0.57	9.6	1.4	12.3	3.42	48.3	1.5	21.4	0.89	0.7	0.2	70	47.5	4.4	60.1	52.4	0.01	0.1	0.8	0.05	< 0.05	< 0.1	< 0.001	< 5
8	Ca-2H.HA	3840	2.4	146	47.4	101	38.4	17.8	1.69	10.2	3.1	27.9	4.2	11.3	3.5	28.5	1.18	1.6	0.6	136	113	9.9	83.3	50.1	0.03	0.3	0.3	0.11	< 0.05	< 0.1	< 0.001	< 5
9	Ca-3E.HA	737	1.03	39.5	58.4	32.9	10.2	58.8	0.32	8.8	1.1	7.9	2.76	109	1	15.6	0.68	0.5	0.4	49	30.8	3	75.4	48	< 0.01	0.1	0.4	< 0.02	< 0.05	< 0.1	0.001	< 5
10	Ca-3G.HA	1020	0.81	28.8	31.4	28.1	7.5	27	0.55	4.6	1.5	5.9	2.14	78.9	0.8	7.2	0.42	0.4	0.3	39	24.8	2.4	55.7	24.1	< 0.01	< 0.1	0.8	0.05	< 0.05	< 0.1	0.001	< 5
15	Ca-4H.HA	802	0.71	23.1	22.3	28.1	6	17.6	0.79	3.5	1.3	4.8	1.85	118	0.6	5.9	0.33	0.3	0.1	32	19.5	1.9	49.6	13.5	< 0.01	< 0.1	0.6	0.02	< 0.05	< 0.1	0.001	< 5
19A	Ca-6D.HA	4730	3.39	102	46.1	113	27.3	31.1	1.61	11.1	2.5	21.1	3.62	20.2	2.6	27.9	1.31	1.2	0.8	151	70.5	7.6	73.1	25.4	0.03	0.2	0.1	0.09	< 0.05	< 0.1	< 0.001	< 5
20A	Ca-5F.HA	1000	1.27	40.8	34.2	39.3	10.7	38.9	0.21	10.6	0.9	8.1	3.24	89	1	22.5	0.74	0.5	0.2	69	33	3.1	74.9	41.4	< 0.01	< 0.1	0.1	< 0.02	< 0.05	< 0.1	< 0.001	< 5
22	Ca-7E.HA	766	0.61	31.9	23.3	24	8.6	29.7	0.71	2.3	1.3	6.5	1.5	65.6	0.8	3.5	0.25	0.4	0.2	32	29	2.5	49.1	15.4	< 0.01	< 0.1	0.3	< 0.02	0.05	< 0.1	0.001	< 5
23	Ca-7F.HA	4930	2.03	145	43.3	77.9	39.5	27.9	0.99	11.4	3	28.3	3.89	6.8	3.5	30.8	0.86	1.6	0.4	97	111	9.6	45	40.7	0.02	0.3	0.1	0.06	< 0.05	< 0.1	0.001	< 5
24	Ca-7G.HA	1760	0.71	72.1	51.8	47	19.3	54.4	0.47	8.7	1.3	13.7	2.82	98.5	1.6	18.2	0.85	0.7	0.2	69	54.5	4.5	71.8	40.1	< 0.01	0.2	0.3	0.03	< 0.05	< 0.1	< 0.001	< 5
26	Ca-8D.HA	5860	1.97	115	51.1	89.7	30.8	40.5	1.21	10.1	2.2	22.7	3.35	9.5	2.8	26.5	0.81	1.3	0.4	102	92.1	8.2	68.2	37.5	0.02	0.2	0.3	0.07	< 0.05	< 0.1	< 0.001	< 5
28	Ca-8F.HA	1650	1.3	50.9	40.4	47.6	13.7	40.1	0.8	7.3	1.8	10.2	2.62	20.1	1.3	14.8	0.47	0.6	0.2	63	43.1	4.3	69.9	44.3	< 0.01	0.1	1	0.1	< 0.05	< 0.1	< 0.001	< 5
29	Ca-8G.HA	908	1.45	58.4	45.5	41.3	15.5	47.6	0.39	9.6	1.2	11.5	3.06	52.6	1.4	19.2	0.75	0.7	0.2	63	48.1	4.4	63.3	44.8	< 0.01	0.1	0.1	0.03	< 0.05	< 0.1	< 0.001	< 5
34	Ca-10D.HA	766	0.37	32.4	27.5	31.5	8.7	22.5	0.13	9.8	0.6	6.6	2.72	37	0.8	27.3	0.4	0.4	0.3	54	28.1	2.6	59.3	16.9	< 0.01	< 0.1	< 0.1	< 0.02	< 0.05	< 0.1	< 0.001	< 5
36	Ca-10F.HC1	332	0.72	27.1	30.3	29.6	7.3	17.4	0.19	9.4	0.7	5.7	2.47	52.8	0.7	24.1	0.25	0.4	0.6	58	23.6	2.4	68.1	48.9	< 0.01	< 0.1	0.2	0.02	< 0.05	< 0.1	0.001	< 5
37	Ca-10H.HC1	1120	1.18	69.6	44.7	46.7	18.5	47.4	0.52	9.3	1.6	13.6	3.07	95.1	1.6	20.5	0.65	0.8	0.3	74	59.2	4.9	70.2	43.2	< 0.01	0.2	0.2	0.04	< 0.05	< 0.1	< 0.001	< 5
40	Ca-11G.HC1	946	0.83	48.7	47.5	41.5	13.1	24.2	0.25	9.1	1.1	10.1	2.53	59.3	1.2	20.9	0.42	0.6	0.8	53	38.2	3.8	86.3	40.3	< 0.01	0.1	0.2	< 0.02	< 0.05	< 0.1	< 0.001	< 5
43	Ca-12D.HC1	7290	1.33	141	60.7	98	39.1	49.9	0.37	8.8	2.7	27.3	2.59	25.6	3.4	23.9	1.21	1.4	0.2	73	111	8.6	58.1	35.1	< 0.01	0.3	< 0.1	0.06	< 0.05	< 0.1	0.001	< 5
56	Ca-14G.HC1	1070	0.68	64.7	65.8	46.9	17	33.6	0.64	9.7	1.5	12.9	2.58	82.4	1.6	23.9	0.45	0.7	0.9	51	53.5	4.6	73.6	45.3	< 0.01	0.1	0.1	0.03	< 0.05	< 0.1	< 0.001	< 5
60	Ca-15B.HC1	707	0.46	58.8	71.9	29.6	15.6	49.6	0.14	8.9	1.8	11.6	2.36	387	1.5	13	0.59	0.8	0.3	50	65.3	4.8	67.2	44.5	< 0.01	0.1	0.1	0.02	< 0.05	< 0.1	< 0.001	< 5
61	Ca-15DH.C1	516	0.46	53.6	48.1	36.1	14.3	23.3	0.17	9.2	1.1	10.6	2.21	101	1.3	21.8	0.29	0.6	0.6	42	46.8	4	74.9	48.2	< 0.01	0.1	0.2	< 0.02	< 0.05	< 0.1	< 0.001	< 5
65	Ca-16D.HA	1650	0.33	39.8	43.6	21.8	10.8	35.3	0.34	4.3	1.6	7.9	1.5	27.3	0.9	5.4	0.42	0.5	0.2	19	37.6	2.7	50.6	20.5	< 0.01	< 0.1	0.6	0.05	< 0.05	< 0.1	0.001	< 5
67	Ca-16G.HC1	2150	0.62	84.1	78.6	48.7	22.5	56.5	0.47	9.3	1.6	16	2.62	24.2	1.9	17.4	0.57	0.8	0.2	43	68.6	5.1	73.9	40.2	< 0.01	0.2	0.2	0.06	< 0.05	< 0.1	< 0.001	< 5
70	Ca-17F.HC1	1050	0.33	48	93.3	27	12.6	49.1	0.5	9	1.4	9.6	2.05	182	1.2	12.3	0.51	0.6	0.3	34	43.1	3.3	77.1	37.3	< 0.01	0.1	< 0.1	0.02	< 0.05	< 0.1	< 0.001	7
71	Ca-17G.HA	177	0.18	4.24	22.8	3.44	1.1	7.4	0.11	0.5	1.3	0.9	0.34	167	0.1	0.8	0.04	0.1	0.2	4	4.41	0.4	24.7	6.2	< 0.01	< 0.1	< 0.1	< 0.02	< 0.05	< 0.1	< 0.001	< 5
82	Ca-19F.HC1	865	0.24	39.4	75	26.5	10.6	47.8	0.13	8.4	1.1	8	2.36	123	1	13.3	0.51	0.5	0.2	31	37.9	3.2	76.6	37.2	< 0.01	< 0.1	< 0.1	< 0.02	< 0.05	< 0.1	< 0.001	< 5
88	Ca-20G.HC1	1290	0.36	51.1	138	23.7	13.5	71.2	0.21	9.4	1.3	9.9	1.99	185	1.2	10.8	0.58	0.6	0.2	29	48	3.3	72.8	45.2	< 0.01	0.1	0.1	0.03	< 0.05	< 0.1	< 0.001	5
95	Ca-21F.HC1	1680	0.55	81.4	48.4	37.6	21.8	52.5	0.17	7.4	1.7	16.1	2.01	63.4	1.9	14.1	0.58	0.9	0.2	26	69.8	5.2	63.7	21.4	< 0.01	0.2	< 0.1	< 0.02	< 0.05	< 0.1	0.002	< 5
142	Ca-29F.HA	476	0.3	26.4	44.3	14.7	7	21.8	0.24	2.5	1.4	5.1	0.98	61.5	0.6	2.6	0.23	0.3	0.2	7	24.6	2	32.4	11.9	< 0.01	< 0.1	0.2	< 0.02	< 0.05	< 0.1	< 0.001	< 5
146	Ca-30D.HC1	1400	0.71	61.9	65	43.7	16.6	28.8	0.21	7.1	1.5	12.4	1.75	20	1.5	13.6	0.39	0.7	0.3	31	51.3	4.4	54.7	26.3	< 0.01	0.1	0.1	< 0.02	< 0.05	< 0.1	< 0.001	< 5
149	Ca-30I.HA	1090	0.68	41.3	129	23.6	10.9	66.1	0.28	6.8	1.4	8.1	1.77	60.5	1	8.2	0.65	0.5	0.2	16	37.5	2.8	53.7	40	< 0.01	< 0.1	0.2	0.03	< 0.05	< 0.1	0.002	< 5

Nota: Concentraciones abajo del límite de detección; Ti, Ge, Nb, Te, Ta, W, Re y Au