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Paleoenvironments of the Upper Cretaceous Dinosaur Park Formation in southern Alberta, Canada

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master thesis

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	A	B	C	D	E	F	G	H	I	J	K	L
1	Type	Sample ID	SiO2	Al2O3	Fe2O3	MgO	CaO	Na2O	K2O	TiO2	P2O5	MnO
2			%	%	%	%	%	%	%	%	%	%
3	SMP	R 01	74.5	9.11	2.47	1.87	1.84	1.04	2.23	0.46	0.1	< 0.01
4	SMP	R-30	64.2	13.4	5.19	1.75	1.82	2.38	1.96	0.62	0.13	0.12
5	SMP	R-32	65.2	14.4	3.93	1.42	1.18	2.5	1.97	0.66	0.1	0.02
6	SMP	R 34	67.8	14.2	4.79	1.1	0.92	2.41	1.99	0.76	0.03	< 0.01
7	SMP	R 35	73.8	12.4	2.88	0.71	0.66	2.11	1.66	0.66	0.02	< 0.01
8	SMP	R 36	73.7	12.5	2.91	0.73	0.68	2.13	1.65	0.65	0.02	< 0.01
9	SMP	CS 01	74.7	11.3	2.85	1.24	0.44	1.17	2.64	0.56	0.12	< 0.01
10	SMP	CS 02	74.4	12.1	3.09	1.1	0.17	1.13	2.81	0.58	0.07	< 0.01
11	SMP	CS 03	73.2	12.9	3	1.01	0.12	1.11	2.82	0.61	0.03	< 0.01
12	SMP	CS 04	76.2	10.8	2.55	0.76	0.42	1.11	1.87	0.57	0.02	< 0.01
13	SMP	CS 05	81.4	8.58	2	0.59	0.18	1.02	1.63	0.57	0.02	< 0.01
14	SMP	CS 06	71.6	11.5	2.99	1.03	0.85	1.3	2.27	0.57	0.07	0.01
15	SMP	CS 15	67.5	14.4	4.42	1.15	0.53	1.85	2.5	0.62	0.09	< 0.01
16	SMP	CS 19	67.9	14.4	4.09	0.98	0.41	1.84	2.47	0.67	0.03	< 0.01
17	SMP	CS 22	63.7	16.2	4.51	1.32	0.38	1.87	2.69	0.74	0.06	< 0.01
18	SMP	CS 25	69.9	13.6	3.84	0.83	0.32	1.94	1.84	0.66	0.02	< 0.01
19	SMP	BS 10	68.7	14.2	4.2	1.21	0.52	1.86	2.55	0.66	0.1	< 0.01
20	SMP	BS 11	68.2	14.3	4.36	1.25	0.52	1.84	2.58	0.65	0.1	< 0.01
21	SMP	BS 12	69.8	13.6	3.99	1.18	0.57	1.96	2.44	0.62	0.1	0.01
22	SMP	BS 13	68.2	13.9	4.34	1.18	0.56	1.89	2.55	0.64	0.1	< 0.01
23	SMP	BS 14	64.7	15.6	4.94	1.27	0.46	1.87	2.53	0.71	0.05	< 0.01
24	SMP	BS 15	64.2	16	5.01	1.43	0.55	1.83	2.55	0.74	0.09	< 0.01
25	SMP	BS 16	50.6	12	17.3	1.72	1.79	1.55	1.94	0.54	0.23	0.32
26	SMP	BS 17	64.5	15.2	4.58	1.29	0.57	1.91	2.48	0.68	0.05	0.02
27	SMP	BS 28	61.6	17.2	5.08	1.3	0.35	1.79	2.48	0.68	0.03	< 0.01
28	SMP	BS 30	65.7	15.6	4.71	1.09	0.39	2.01	3.02	0.65	0.04	< 0.01
29	SMP	BS 34	65.4	15.4	4.36	1.26	0.32	1.46	3.07	0.65	0.06	< 0.01
30	SMP	BS 48	63.9	14.1	6.56	2.03	1.25	1.55	3.43	0.57	0.13	0.07
31	SMP	BS 64	72.9	12.9	2.96	0.7	0.27	1.78	1.79	0.62	0.02	< 0.01

	A	B	C	D	E	F	G	H	I	J	K	L
32	SMP	IS 71	69.4	13.8	4.05	0.94	0.55	1.8	1.38	0.66	0.02	< 0.01
33	SMP	IS 75	65	15.7	4.31	1.1	0.76	2.24	1.41	0.56	0.02	< 0.01
34	SMP	IS 76	65.3	15.6	4.29	1.13	0.87	2.35	1.38	0.53	0.02	< 0.01
35	SMP	IS 77	63.8	15.7	4.98	1.2	0.62	2.23	1.64	0.63	0.03	< 0.01
36	SMP	IS 90	66.8	15.1	3.38	1.3	1.1	2.59	1.41	0.53	0.04	0.01
37	SMP	IS 91	74.4	11.9	3.14	0.81	0.71	2.02	1.1	0.64	0.02	< 0.01
38	SMP	IS 92	72.2	12.3	3.2	0.86	0.46	2.01	1.12	0.64	0.02	< 0.01
39	SMP	IS 93	75.1	11.7	2.98	0.77	0.6	1.94	1.03	0.67	0.02	< 0.01
40	SMP	IS 94	65.7	12.7	3.29	0.84	0.62	1.9	1.09	0.61	0.02	< 0.01
41	SMP	IS 95	65	15	4.19	1.29	0.6	2.16	1.53	0.62	0.04	< 0.01
42	SMP	IS 96	64.3	15	4.32	1.28	0.67	2.27	1.54	0.59	0.03	0.01
43	SMP	IS 97	62.1	15	4.96	1.2	0.68	2.15	1.55	0.59	0.02	< 0.01
44	SMP	IS 98	66	14.3	4.52	1.17	0.67	2.05	1.69	0.53	0.03	0.02
45	SMP	IS 99	65.9	14.3	4.57	1.14	0.7	2.07	1.67	0.53	0.03	0.02
46	SMP	IS 100	66.6	14	4.43	1.12	0.74	2.02	1.59	0.53	0.02	< 0.01
47	SMP	IS 101	65.4	14.2	4.11	1.15	0.77	2.09	1.38	0.53	0.02	< 0.01
48	SMP	IS 102	65	14.7	4.74	1.23	0.85	2.06	1.29	0.54	0.02	< 0.01
49	SMP	IS 103	64.9	14.5	4.11	1.16	0.75	2.09	1.15	0.55	0.02	< 0.01
50	SMP	BB30 09	66.7	15	4.51	1.32	0.79	2.37	1.92	0.63	0.03	< 0.01
51	SMP	BB30 10	68.4	14.5	4.02	1.29	0.72	2.34	1.88	0.6	0.02	< 0.01
52	SMP	BB30 11	66.1	14.9	4.66	1.36	0.52	1.94	2.22	0.64	0.05	0.01
53	SMP	BB30 12	64.5	15.8	4.79	1.55	0.47	1.94	2.39	0.68	0.05	< 0.01
54	SMP	BB30 13	64.7	15.4	4.96	1.36	0.47	1.97	2.35	0.68	0.06	< 0.01
55	SMP	BB30 14	64.1	15.7	5.17	1.45	0.42	1.97	2.4	0.71	0.05	0.01
56	SMP	BB30 15	70.5	13	3.57	1.01	0.44	1.97	2.11	0.61	0.04	< 0.01
57	SMP	GP-02	79.4	8.99	2.79	0.5	0.15	1	1.72	0.57	0.02	< 0.01
58	SMP	GP-03	72.8	11.6	3.22	0.78	0.22	1.1	2.12	0.57	0.07	< 0.01
59	SMP	GP-04	72.9	11.7	3.41	0.85	0.21	1.15	2.36	0.56	0.09	< 0.01
60	SMP	GP-05	69	13.3	4.08	1.02	0.27	1.29	2.48	0.61	0.08	0.01
61	SMP	GP-06	64.2	15.3	4.62	1.28	0.36	1.47	2.79	0.7	0.1	0.02
62	SMP	GP-07	64.1	15.8	4.68	1.19	0.42	1.74	2.8	0.68	0.1	0.02

	A	B	C	D	E	F	G	H	I	J	K	L
63	SMP	GP-08	64.6	15.2	4.67	1.15	0.49	1.65	2.78	0.68	0.08	0.01
64	SMP	GP-09	63.9	15.4	4.8	1.18	0.53	1.74	2.57	0.66	0.1	0.01
65	SMP	GP-10	62.9	15.8	5.6	1.2	0.5	1.73	2.75	0.7	0.09	< 0.01
66	SMP	GP-11	62.6	15.8	5.41	1.21	0.47	1.75	2.73	0.69	0.09	0.01
67	SMP	GP-34	68.7	13.4	3.36	1.18	1.07	2.25	2.06	0.53	0.11	0.02
68	SMP	GP-35	62.2	15.1	4.73	1.08	0.57	1.99	2.3	0.67	0.03	0.03
69	SMP	GP-36	63.5	14.1	6.05	0.85	0.66	2.12	2.04	0.64	0.03	0.02
70	SMP	GP-37	68.6	12.7	3.59	0.69	0.56	2.06	1.85	0.65	0.03	0.01
71	SMP	GP-38	68.7	12.9	3.61	0.73	0.57	2.08	1.76	0.65	0.02	0.01
72	SMP	GP-39	69.2	13	3.45	0.73	0.58	2.09	1.7	0.66	0.02	< 0.01
73	SMP	GP-40	68.3	13.1	3.69	0.78	0.57	2.08	1.67	0.66	0.02	< 0.01
74	SMP	GP-41	65.7	14.5	4.16	1.01	0.61	2.11	1.77	0.62	0.02	< 0.01
75	SMP	GP 01	77.6	11	2.37	0.74	0.19	1.13	2.18	0.56	0.04	< 0.01
76	SMP	GP 12	67.9	15.5	3.89	0.97	0.37	1.85	2.54	0.67	0.03	< 0.01
77	SMP	GP 14	67.6	15.7	4	0.95	0.46	1.85	2.96	0.72	0.08	< 0.01
78	SMP	GP 16	70.4	14.1	3.43	0.71	0.45	1.78	1.92	0.67	0.02	< 0.01
79	SMP	GP 17	73.2	12.8	2.89	0.66	0.33	1.73	2.19	0.67	0.03	< 0.01
80	SMP	GP 19	71.5	13.7	3.29	0.76	0.33	1.66	2.39	0.68	0.03	< 0.01
81	SMP	GP2 08	64.6	14.6	4.78	1.19	0.47	1.89	2.25	0.62	0.05	0.02
82	SMP	GP2 12	65	14.5	4.43	1.62	1.07	1.78	2.07	0.53	0.08	< 0.01

	M	N	O	P	Q	R	S	T	U	V	W
32	0.01	0.02	7.63	100.2							0.198847262
33	0.01	0.02	8.82	99.9							0.241538462
34	< 0.01	0.02	8.29	99.8							0.238897397
35	< 0.01	0.02	9.01	99.9							0.246081505
36	0.01	0.02	8.03	100.4	14	201	45	282	47	728	0.226047904
37	0.01	0.02	6.22	101	12	224	29	206	41	934	0.159946237
38	< 0.01	0.02	6.53	99.4	12	216	24	175	43	529	0.170360111
39	< 0.01	0.02	5.45	100.3	13	224	16	166	37	498	0.155792277
40	< 0.01	0.02	12.7	99.5	13	222	33	250	49	789	0.193302892
41	0.02	0.02	9.49	99.9	13	175	28	235	70	775	0.230769231
42	0.01	0.02	8.95	99	13	171	25	258	72	828	0.233281493
43	< 0.01	0.02	10.2	98.6	13	168	26	249	75	798	0.241545894
44	< 0.01	0.02	8.34	99.3	12	206	32	225	95	849	0.216666667
45	< 0.01	0.02	8.63	99.6	12	202	32	222	94	605	0.216995448
46	< 0.01	0.02	8.47	99.6	13	198	27	200	88	525	0.21021021
47	< 0.01	0.02	9.54	99.2	13	216	30	253	68	572	0.217125382
48	< 0.01	0.02	8.74	99.2	14	208	26	218	66	478	0.226153846
49	< 0.01	0.02	10.6	100	14	228	23	274	56	1181	0.223420647
50	0.01	0.02	6.59	99.9	9	191	35	195	73	491	0.224887556
51	< 0.01	0.02	6.06	99.9	9	180	36	194	70	498	0.211988304
52	< 0.01	0.02	7.16	99.6	10	177	24	194	94	567	0.225416036
53	0.01	0.02	7.86	100.1	11	153	26	150	101	579	0.24496124
54	0.01	0.02	7.49	99.5	11	157	59	161	101	667	0.238021638
55	0.01	0.02	7.35	99.5	11	164	48	172	103	629	0.244929797
56	0.01	0.02	6.08	99.4	11	244	25	142	104	496	0.184397163
57	0.02	0.02	4.26	99.4	14	337	25	65	75	361	0.113224181
58	0.01	0.02	6.54	99.1	14	300	32	80	96	386	0.159340659
59	0.01	0.02	6.58	99.9	13	286	30	73	111	400	0.160493827
60	0.01	0.02	7.4	99.6	13	253	28	92	112	416	0.192753623
61	< 0.01	0.02	8.09	99	13	203	28	112	104	498	0.238317757
62	0.01	0.02	8.37	99.9	11	196	27	131	91	478	0.24648986

	X	Y	Z	AA
1	Fe2O3/SiO2 Oxidation	CaO+MgO/Al2O3 Calcareousness	SiO2/Fe2O3 Hydrolysis	Na2O/K2O Salinization
2				
3	0.033154362	0.407244786	30.16194332	0.466367713
4	0.080841121	0.26641791	12.3699422	1.214285714
5	0.060276074	0.180555556	16.59033079	1.269035533
6	0.070648968	0.142253521	14.15448852	1.211055276
7	0.03902439	0.110483871	25.625	1.271084337
8	0.039484396	0.1128	25.32646048	1.290909091
9	0.03815261	0.148672566	26.21052632	0.443181818
10	0.041532258	0.104958678	24.0776699	0.402135231
11	0.040983607	0.087596899	24.4	0.393617021
12	0.033464567	0.109259259	29.88235294	0.593582888
13	0.024570025	0.08974359	40.7	0.625766871
14	0.041759777	0.163478261	23.94648829	0.572687225
15	0.065481481	0.116666667	15.27149321	0.74
16	0.060235641	0.096527778	16.60146699	0.744939271
17	0.070800628	0.104938272	14.12416851	0.695167286
18	0.054935622	0.084558824	18.203125	1.054347826
19	0.061135371	0.121830986	16.35714286	0.729411765
20	0.063929619	0.123776224	15.64220183	0.713178295
21	0.057163324	0.128676471	17.49373434	0.803278689
22	0.063636364	0.125179856	15.71428571	0.741176471
23	0.076352396	0.110897436	13.09716599	0.739130435
24	0.078037383	0.12375	12.81437126	0.717647059
25	0.341897233	0.2925	2.924855491	0.798969072
26	0.071007752	0.122368421	14.08296943	0.77016129
27	0.082467532	0.095930233	12.12598425	0.721774194
28	0.071689498	0.094871795	13.94904459	0.665562914
29	0.066666667	0.102597403	15	0.475570033
30	0.102660407	0.232624113	9.740853659	0.451895044
31	0.040603567	0.075193798	24.62837838	0.994413408

	X	Y	Z	AA
32	0.058357349	0.107971014	17.13580247	1.304347826
33	0.066307692	0.118471338	15.0812065	1.588652482
34	0.065696784	0.128205128	15.22144522	1.702898551
35	0.078056426	0.115923567	12.81124498	1.359756098
36	0.050598802	0.158940397	19.76331361	1.836879433
37	0.042204301	0.127731092	23.69426752	1.836363636
38	0.04432133	0.107317073	22.5625	1.794642857
39	0.039680426	0.117094017	25.20134228	1.883495146
40	0.050076104	0.11496063	19.96960486	1.743119266
41	0.064461538	0.126	15.51312649	1.411764706
42	0.06718507	0.13	14.88425926	1.474025974
43	0.079871176	0.125333333	12.52016129	1.387096774
44	0.068484848	0.128671329	14.60176991	1.213017751
45	0.069347496	0.128671329	14.42013129	1.239520958
46	0.066516517	0.132857143	15.03386005	1.270440252
47	0.062844037	0.135211268	15.91240876	1.514492754
48	0.072923077	0.141496599	13.71308017	1.596899225
49	0.063328197	0.131724138	15.79075426	1.817391304
50	0.067616192	0.140666667	14.78935698	1.234375
51	0.05877193	0.13862069	17.01492537	1.244680851
52	0.070499244	0.126174497	14.18454936	0.873873874
53	0.074263566	0.127848101	13.46555324	0.811715481
54	0.076661515	0.118831169	13.04435484	0.838297872
55	0.080655226	0.11910828	12.39845261	0.820833333
56	0.050638298	0.111538462	19.74789916	0.933649289
57	0.035138539	0.072302558	28.45878136	0.581395349
58	0.044230769	0.086206897	22.60869565	0.518867925
59	0.046776406	0.090598291	21.37829912	0.487288136
60	0.059130435	0.096992481	16.91176471	0.52016129
61	0.071962617	0.107189542	13.8961039	0.52688172
62	0.07301092	0.101898734	13.6965812	0.621428571

	X	Y	Z	AA
63	0.072291022	0.107894737	13.83297645	0.59352518
64	0.075117371	0.111038961	13.3125	0.677042802
65	0.089030207	0.107594937	11.23214286	0.629090909
66	0.086421725	0.106329114	11.57116451	0.641025641
67	0.048908297	0.167910448	20.44642857	1.09223301
68	0.076045016	0.109271523	13.15010571	0.865217391
69	0.095275591	0.107092199	10.49586777	1.039215686
70	0.052332362	0.098425197	19.1086351	1.113513514
71	0.052547307	0.100775194	19.03047091	1.181818182
72	0.049855491	0.100769231	20.05797101	1.229411765
73	0.054026354	0.103053435	18.50948509	1.245508982
74	0.063318113	0.111724138	15.79326923	1.192090395
75	0.030541237	0.084545455	32.74261603	0.518348624
76	0.057290133	0.086451613	17.45501285	0.728346457
77	0.059171598	0.089808917	16.9	0.625
78	0.048721591	0.082269504	20.52478134	0.927083333
79	0.039480874	0.07734375	25.32871972	0.789954338
80	0.046013986	0.079562044	21.7325228	0.694560669
81	0.073993808	0.11369863	13.51464435	0.84
82	0.068153846	0.185517241	14.67268623	0.859903382

	AB	AC
1	Al2O3/(CaO+MgO+Na2O+K2O) Base loss	Ba/Sr Leaching
2		
3	1.305157593	#DIV/0!
4	1.694058154	2.045977011
5	2.036775106	1.869090909
6	2.211838006	2.119298246
7	2.412451362	2.722513089
8	2.408477842	2.791666667
9	2.058287796	5.756756757
10	2.322456814	6
11	2.549407115	5.572815534
12	2.596153846	5.112676056
13	2.50877193	5.271428571
14	2.110091743	4.033898305
15	2.388059701	#DIV/0!
16	2.526315789	#DIV/0!
17	2.587859425	#DIV/0!
18	2.75862069	#DIV/0!
19	2.312703583	4.041666667
20	2.310177706	3.9125
21	2.211382114	3.734567901
22	2.249190939	4.256097561
23	2.544861338	5.067567568
24	2.51572327	4.067114094
25	1.714285714	3.624365482
26	2.432	3.95483871
27	2.905405405	#DIV/0!
28	2.396313364	#DIV/0!
29	2.520458265	#DIV/0!
30	1.707021792	#DIV/0!
31	2.841409692	#DIV/0!

	AB	AC
32	2.95503212	#DIV/0!
33	2.849364791	#DIV/0!
34	2.722513089	#DIV/0!
35	2.759226714	#DIV/0!
36	2.359375	2.581560284
37	2.564655172	4.533980583
38	2.764044944	3.022857143
39	2.695852535	3
40	2.853932584	3.156
41	2.688172043	3.29787234
42	2.604166667	3.209302326
43	2.688172043	3.204819277
44	2.562724014	3.773333333
45	2.562724014	2.725225225
46	2.559414991	2.625
47	2.634508349	2.260869565
48	2.70718232	2.19266055
49	2.815533981	4.310218978
50	2.34375	2.517948718
51	2.327447833	2.567010309
52	2.466887417	2.922680412
53	2.488188976	3.86
54	2.504065041	4.142857143
55	2.516025641	3.656976744
56	2.350813743	3.492957746
57	2.667655786	5.553846154
58	2.748815166	4.825
59	2.560175055	5.479452055
60	2.628458498	4.52173913
61	2.593220339	4.446428571
62	2.569105691	3.648854962

	AB	AC
63	2.504118616	3.795275591
64	2.558139535	3.398601399
65	2.556634304	3.335664336
66	2.564935065	3.515384615
67	2.042682927	2.247863248
68	2.542087542	2.698863636
69	2.486772487	2.066371681
70	2.46124031	2.617142857
71	2.509727626	2.535294118
72	2.549019608	2.033018868
73	2.568627451	2.458333333
74	2.636363636	2.25136612
75	2.594339623	#DIV/0!
76	2.705061082	#DIV/0!
77	2.524115756	#DIV/0!
78	2.901234568	#DIV/0!
79	2.606924644	#DIV/0!
80	2.66536965	#DIV/0!
81	2.517241379	#DIV/0!
82	2.217125382	#DIV/0!