

Table SI 2. Electron microprobe analyses of representative D- and A-apatite grains.

	Detrital						Authigenic								
	TW836	TW836	TW670	TW670	TW558	TW558	TW650 grain 1-CORE	TW650 grain 1-MID	TW650 grain 1-RIM	TW650 grain 2-CORE	TW650 grain 2-RIM	TW650 grain 8	TW650 grain 8	TW650 grain 8	TW650 grain 8
SiO ₂	0.38	0.12	0.04	0.54	0.13	0.43	0.07	0.02	0.00	0.01	0.00	0.03	0.03	0.00	0.01
TiO ₂	0.00	0.00	0.12	0.09	0.00	0.04	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.02	0.00
Al ₂ O ₃	0.07	0.06	0.00	0.02	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe ₂ O ₃	0.06	0.10	0.03	0.06	0.00	0.00	0.03	0.00	0.00	0.06	0.03	0.02	0.00	0.02	0.00
MnO	0.00	0.08	0.05	0.09	0.00	0.04	0.02	0.03	0.00	0.06	0.05	0.03	0.00	0.01	0.06
MgO	0.00	0.03	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
CaO	55.62	56.09	55.44	55.51	55.29	55.16	56.99	56.88	56.62	56.18	55.81	54.91	55.47	56.36	56.17
Na ₂ O	0.06	0.05	0.08	0.04	0.10	0.02	0.01	0.00	0.03	0.01	0.08	0.06	0.00	0.06	0.05
P ₂ O ₅	39.98	40.09	40.84	39.89	41.18	40.54	38.16	38.21	38.17	38.40	38.64	40.15	38.87	36.73	37.82
K ₂ O	0.00	0.00	0.00	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
SrO	0.00	0.02	0.00	0.00	0.66	0.09	0.01	0.00	0.00	0.00	0.03	0.02	0.00	0.02	0.00
La ₂ O ₃	0.16	0.00	0.00	0.09	0.00	0.29	0.07	0.03	0.06	0.10	0.08	0.05	0.00	0.00	0.00
Ce ₂ O ₃	0.52	0.11	0.03	0.53	0.32	0.43	0.00	0.02	0.03	0.04	0.06	0.00	0.06	0.00	0.08
Y ₂ O ₃	0.20	0.00	0.06	0.08	0.00	0.00	0.01	0.06	0.02	0.04	0.08	0.07	0.00	0.05	0.04
SO ₃	0.02	0.15	0.21	0.19	0.25	0.28	0.19	0.08	0.12	0.05	0.28	0.29	0.08	0.23	0.23
F	3.37	2.64	2.53	3.00	2.79	3.62	4.35	5.09	4.63	4.32	4.01	4.42	4.55	4.96	5.14
Cl	0.09	0.03	0.14	0.03	0.12	0.07	0.01	0.02	0.01	0.00	0.02	0.02	0.02	0.02	0.01
H ₂ O(c)	0.13	0.49	0.52	0.32	0.42	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
O=F	1.42	1.11	1.07	1.27	1.18	1.52	1.83	2.14	1.95	1.82	1.69	1.86	1.91	2.09	2.16
O=Cl	0.02	0.01	0.03	0.01	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
TOTAL Ox%	99.21	98.95	99.02	99.26	100.06	99.51	98.09	98.3	97.74	97.46	97.48	98.22	97.16	96.40	97.46

Notes: Analyses were carried out using a Cameca SX50 electron microprobe analyser, with accelerating voltage = 15 KV, beam current = 20 nA and spot size = 6 µm.

There is no discernible difference in A-apatite chemistry between grain cores and rims.

Lower totals for authigenic apatite largely reflect the substitution of carbonate for phosphate and F content is significantly higher in the A-apatite (e.g. McClellan & Van Kauwenbergh (1990).

In general, SiO₂ and Ce₂O₃ content of D-apatite is significantly higher than in A-apatite.