

**Table S1: Instrumental settings, detection limits and analytical uncertainties of the electron microprobe analyses**

Element	Crystal	Line	Measurement time (sec) peak (Background)	Standard material for calibration	Limit of Detection oxide (wt.%)	SDev (wt.%)
F	LDE1	K $\alpha_1$	60 (40)	SrF <sub>2</sub>	0.015	0.03
Na	TAP	K $\alpha_1$	20 (12)	Albite	0.059	0.04
Mg	TAP	K $\alpha_1$	30 (16)	MgO	0.024	0.02
Al	TAP	K $\alpha_1$	20 (12)	Orthoclase	0.026	0.02
Sr	TAP	L $\alpha_1$	60 (30)	SrF <sub>2</sub>	0.026	0.03
Ca	PETJ	K $\alpha_1$	30 (16)	Apatite	0.027	0.17
P	PETJ	K $\alpha_1$	30 (16)	Apatite	0.161	0.37
K	PETJ	K $\alpha_1$	30 (16)	Orthoclase	0.017	0.02
Mn	LIF	K $\alpha_1$	60 (30)	Rhodonite	0.047	0.03
Fe	LIF	K $\alpha_1$	40 (20)	Fe <sub>2</sub> O <sub>3</sub>	0.030	0.02
Cl	PETH	K $\alpha_1$	40 (24)	Cancrinite	0.004	0.01
S	PETH	K $\alpha_1$	30 (16)	ZnS	0.044	0.02
Si	PETH	K $\alpha_1$	20 (10)	Orthoclase	0.031	0.02