SUPPLEMENTARY TEXT

Meteoric water circulation in a rolling-hinge detachment system (northern Snake Range core complex, Nevada)

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TEXT DR1: ELECTRON BACKSCATTER DIFFRACTION METHOD AND ANALYTICAL PROCEDURE

Quartz preferred orientations were measured by scanning electron microscopy using electron backscatter diffraction (EBSD; Lloyd et al., 1991; Adams et al., 1993; Dingley and Field, 1997) on the Camscan Crystal Probe X500FE at Geosciences Montpellier (INSU/CNRS – Université de Montpellier 2, France). Electron backscattered diffraction on the scanning electron microscope has become an important tool for the combined study of microstructures in crystalline materials. It is possible to measure complete crystallographic orientations of single crystallites with direct reference to the microstructure (Neumann, 2000; Heidelbach et al., 2000). EBSD is based on the automatic analysis of diffraction patterns. These patterns, composed of Kikuchi bands, are generated by the interaction of a vertical incident electron beam with a highly tilted, 70°, flat crystal surface. A phosphor screen is located close to the polished thin section to collect the diffraction pattern, which is then processed and indexed using the CHANNEL5 software (Schmidt and Olesen, 1989). The precision of crystal orientations measured from electron backscattering patterns is better than 1° (Krieger Lassen, 1996). SEM conditions used were 25mm working distance, 15kV accelerating voltage and ~10nA beam current. For the EBSD analysis we used the following indexing parameters; 6–8 bands, band edges, high resolution of 70, 3 frames of noise reduction, 70 reflectors and a 1.2 MAD cutoff.

TEXT DR2: ^{40}AR/^{39}AR THERMOCHRONOLOGY

Sample preparation and irradiation: Separates were loaded into machined Al discs and irradiated for 10 h, USGS TRIGA Reactor, Denver. Neutron flux monitor Fish Canyon Tuff sanidine (FC-2). Assigned age = 28.02 Ma (Renne et al., 1998).

Instrumentation: Mass Analyzer Products 215–50 mass spectrometer on line with automated all-metal extraction system. Samples step-heated in Mo double vacuum resistance furnace. Reactive gases removed during a 7 min heating with a SAES GP-50 getter operated at ~450 °C. Additional cleanup (2 min) following heating with 2 SAES GP-50 getters, 1 operated at ~450 °C and 1 at 20 °C. Gas also exposed to cold finger –140 °C during heating.

Analytical parameters: Electron multiplier sensitivity ~1.0x10–16 moles/pA. Total system blank and background: 200, 1.5, 0.4, 2.0, 0.9 × 10–17 moles for masses 40, 39, 38, 37, 36, respectively. J-factors determined to a precision of ~ ± 0.10% by CO2 laser-fusion of 6 single crystals from each of 6 radial positions around the irradiation tray. Correction factors for interfering nuclear reactions were determined using K-glass and CaF2 and are as follows:

$(^{40}Ar/^{39}Ar)_K = 0.008236 \pm 0.00013$; $(^{36}Ar/^{37}Ar)_{Ca} = 0.0002730 \pm 2e\text{-}7$;
$(^{39}Ar/^{37}Ar)_{Ca} = 0.000698 \pm 8e\text{-}06$; $(^{38}Ar/^{39}Ar)_K = 0.013$.

TEXT DR3: STABLE ISOTOPE ANALYSES

Hydrogen isotope measurements were performed in the Stable Isotope Laboratory at the Institut für Geologie, Leibniz Universität Hannover. δD values of biotite and hornblende were determined by continuous flow mass spectrometry using a high temperature elemental analyzer (Thermo Finnigan TC/EA) coupled to a Delta V Advantage mass spectrometer in continuous flow mode. Three internationally referenced standard materials and additional in-house working standards were run with the samples. After correction for mass bias, daily drift of the thermal combustion reactor, and offset from the certified reference values, NBS30 (biotite), NBS22 (oil), CH7 (polyethylene foil) had δD = –65.0‰, –118‰, and –103.9‰, respectively. Repeated measurements of various standards and unknowns gave a precision of ± 2‰ for δD. All isotopic ratios are reported relative to standard mean ocean water (SMOW). To calculate hydrogen isotope ratios of water present during deformation in the detachment from measured δD values of hydrous silicates we applied the temperature-dependent fractionation equations from Suzuoki and Epstein (1976).

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Table DR1

Strength of the lattice preferred orientation (LPO) investigated using the J index (Bunge, 1977) for the c- and a-axis, as well as the P, G, and R indices of the c-axis distribution (Vollmer, 1990) and the software PFch5 (Mainprice, 2005).

The magnitude of those indices defines whether the LPO defines a point (P), a girdle (G) or a random (R) distribution, which are plotted in a ternary PGR Vollmer diagram (Fig. 3).

Section	Sample	P	G	R	Pn	J c	J<a>
Negro Creek	SR09-NC07A	0.10	0.43	0.47	0.19	1.49	1.15
Negro Creek	SR09-NC09	0.12	0.38	0.50	0.24	1.50	1.19
Negro Creek	SR09-NC011	0.05	0.39	0.56	0.12	1.41	1.15
Negro Creek	SR09-NC015	0.09	0.32	0.59	0.23	1.31	1.10
Hendry´s Creek	SR08-3	0.56	0.39	0.05	0.59	5.95	2.79
Hendry´s Creek	SR08-6A	0.52	0.39	0.09	0.57	4.87	2.30
Hendry´s Creek	SR08-11B	0.75	0.20	0.04	0.79	8.23	2.51
Hendry´s Creek	SR08-20	0.54	0.42	0.03	0.56	6.01	2.76
Hendry´s Creek	SR08-24	0.66	0.31	0.03	0.68	7.02	2.70
Hendry´s Creek	SR08-26	0.48	0.47	0.05	0.51	5.18	2.59
Hendry´s Creek	SR08-31	0.69	0.27	0.04	0.72	6.80	2.42
Hendry´s Creek	SR08-34	0.75	0.22	0.04	0.77	7.90	3.01

Table DR2
Microstructural analysis results using EBSD software capabilities.
Percentage of quartz grains and associated surface area on the basis of their sizes (gs).

SR09-NC07A (39m)	0 < gs < 50μm	50 < gs < 100μm	gs > 100μm
%	84	15	1
Area [%]	43.8	46.7	9.5

SR09-NC09 (61m)	0 < gs < 50μm	50 < gs < 100μm	gs > 100μm
%	78	20	2
Area [%]	39.1	46.2	14.7

SR09-NC011 (77m)	0 < gs < 50μm	50 < gs < 100μm	gs > 100μm
%	88	11.5	0.5
Area [%]	53.6	40.5	5.9

SR09-NC015 (114m)	0 < gs < 50μm	50 < gs < 100μm	gs > 100μm
%	66	31	3
Area [%]	29.2	54.2	16.6

Table DR3: Furnace Step Heating 40Ar/39Ar data of muscovite from mylonitic quartzite co

along the western flank of the northern Snake Range (Negro Creek).

ID	Temp (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	^{39}Ar (%)	Age (Ma)	±1σ (Ma)
SR09-NC07A, Muscovite, 3.46 mg, J=0.00237±0.04%, D=1.002±0.001, NM-250H, Lab#=61243-01										
A	600	13.77	0.012	18.652	1.54	41.1	60.0	1.1	34.960	0.530
B	650	10.36	0.008	5.113	1.48	65.8	85.4	2.1	37.426	0.454
C	700	9.89	0.000	2.514	2.65	-	92.5	4.0	38.674	0.257
D	740	9.80	0.002	1.471	3.45	251.0	95.6	6.5	39.551	0.205
E	780	9.93	0.000	1.609	6.29	1154.3	95.2	11.0	39.936	0.136
F	830	10.48	0.000	2.373	7.88	6147.0	93.3	16.6	41.304	0.122
G	880	11.64	0.000	2.144	15.99	6244.8	94.6	28.0	46.416	0.101
H	910	11.66	0.000	1.036	14.17	8950.9	97.4	38.1	47.861	0.096
I	940	11.58	0.000	1.061	11.29	-	97.3	46.1	47.508	0.115
J	980	11.56	0.000	1.283	13.25	1610.5	96.7	55.6	47.161	0.109
K	1040	11.66	0.000	1.284	20.20	-	96.7	70.0	47.559	0.086
L	1070	12.42	0.000	1.096	19.15	-	97.4	83.6	50.941	0.101
M	1100	13.04	0.000	0.548	17.24	-	98.8	95.9	54.196	0.097
N	1140	13.52	0.000	0.632	5.73	-	98.6	100.0	56.077	0.149
Integrated age ± 1σ			n=14		140.3	2208.7	K2O=6.57%		47.746	0.065
SR09-NC11, Muscovite, 2.92 mg, J=0.0023631±0.04%, D=1.002±0.001, NM-250H, Lab#=61244-01										
A	600	12.16	0.0341	13.979	1.18	15.0	66.0	1.1	33.883	0.457
B	650	11.14	0.0632	7.239	1.34	8.1	80.8	2.3	37.978	0.397
C	700	10.33	0.0063	4.023	2.17	80.6	88.5	4.3	38.540	0.235
D	740	9.96	0.0057	2.797	3.24	90.0	91.7	7.2	38.473	0.165
E	780	10.00	0.0064	2.583	3.93	79.7	92.4	10.8	38.927	0.152
F	830	10.44	0.0047	3.354	6.11	108.3	90.5	16.3	39.798	0.127
G	880	11.25	0.0016	2.936	11.43	315.2	92.3	26.7	43.712	0.114
H	910	11.17	0.0013	1.732	11.62	380.6	95.4	37.2	44.861	0.109
I	940	10.89	0.0009	1.649	9.86	545.0	95.5	46.2	43.765	0.102
J	980	10.73	0.0006	1.648	12.46	884.7	95.5	57.5	43.110	0.099
K	1040	11.09	0.0004	1.443	18.81	1220.0	96.2	74.5	44.847	0.092
L	1070	11.96	0.0004	0.943	21.04	1376.7	97.7	93.6	49.086	0.084
M	1100	12.48	0.0010	1.033	6.31	518.0	97.6	99.3	51.119	0.124
N	1140	14.49	0.0105	5.436	0.72	48.8	89.0	100.0	54.110	0.618
Integrated age ± 1σ			n=14		110.2	193.4	K2O=6.14%		44.667	0.064
SR09-NC15, Muscovite, 2.06 mg, J=0.0023583±0.05%, D=1.002±0.001, NM-250H, Lab#=61245-01										
A	600	10.33	0.0374	3.137	1.13	13.6	91.0	1.3	39.542	0.476
B	650	8.72	0.0253	-4.905	0.26	20.2	116.7	1.6	42.729	1.696
C	700	9.85	0.0141	0.655	0.96	36.3	98.0	2.7	40.575	0.502
D	740	10.10	0.0086	1.625	1.97	59.0	95.2	4.9	40.420	0.275
E	780	10.54	0.0066	2.860	2.83	77.3	92.0	8.1	40.752	0.204
F	830	11.65	0.0080	4.597	4.70	63.5	88.3	13.4	43.225	0.188
G	880	12.53	0.0074	3.721	9.52	69.1	91.2	24.2	47.966	0.119
H	910	12.35	0.0050	2.238	10.96	102.8	94.6	36.6	49.040	0.120
I	940	11.74	0.0052	2.003	8.69	97.7	95.0	46.4	46.793	0.108
J	980	11.62	0.0042	1.993	9.51	121.4	94.9	57.2	46.303	0.111
K	1040	12.23	0.0048	1.901	13.89	106.0	95.4	72.9	48.924	0.104
L	1070	13.05	0.0030	0.978	15.23	169.8	97.8	90.1	53.470	0.108
M	1100	13.55	0.0063	0.967	7.46	81.3	97.9	98.5	55.554	0.117
N	1140	16.23	0.0439	9.286	1.30	11.6	83.2	100.0	56.504	0.521
Integrated age ± 1σ			n=14		88.4	80.2	K2O=6.99%		48.819	0.072
SR09-NC18, Muscovite, 5.22 mg, J=0.0015873±0.09%, D=1.005±0.001, NM-233M, Lab#=59603-01										
W	550	14.18	0.0434	20.707	3.53	11.7	56.8	1.7	22.911	0.282
X	600	10.80	0.1233	5.229	6.13	4.1	85.8	4.6	26.324	0.130
Y	650	10.76	0.1477	4.271	7.90	3.5	88.4	8.4	27.003	0.121
Z	700	10.36	0.0172	3.099	18.78	29.6	91.2	17.4	26.815	0.066
AA	750	10.36	0.0046	3.270	24.44	111.7	90.7	29.1	26.661	0.079
AB	800	10.64	0.0039	4.448	28.17	129.3	87.6	42.6	26.491	0.071
AC	850	11.12	0.0032	6.064	31.06	159.9	83.9	57.4	26.492	0.071
AD	880	11.60	0.0027	7.186	26.65	189.3	81.7	70.2	26.897	0.087
AE	900	11.93	0.0030	8.524	18.25	169.5	78.9	78.9	26.721	0.102
AF	930	12.47	0.0029	9.692	15.64	173.7	77.0	86.4	27.272	0.113
AG	960	13.14	0.0027	11.381	12.04	190.3	74.4	92.2	27.752	0.135
AH	990	13.67	0.0034	12.439	7.97	148.8	73.1	96.0	28.366	0.166
AI	1020	12.73	0.0017	6.747	3.99	301.7	84.3	97.9	30.466	0.237
AJ	1040	13.10	0.0023	3.620	1.71	224.6	91.8	98.7	34.106	0.440
AK	1060	14.67	0.0092	2.338	0.88	55.8	95.3	99.1	39.556	0.791
AL	1080	16.99	0.0103	0.581	0.61	49.4	99.0	99.4	47.494	1.026
AM	1110	20.29	0.0182	4.076	0.63	28.1	94.1	99.7	53.864	1.220
AN	1140	20.46	0.0092	4.763	0.38	55.3	93.1	99.9	53.724	1.758
AO	1170	23.54	0.1273	11.737	0.12	4.0	85.3	100.0	56.591	4.653
AP	1220	38.55	0.0853	86.591	0.07	6.0	33.6	100.0	36.732	8.703
Integrated age ± 1s			n=20		209.0	35.4	K2O=9.69%		27.178	0.060
Plateau ± 1s steps X-AI			n=11	MSWD=21.57	197.0	133.4	±72.7	94.3	26.796	0.131

Table DR4:
Hydrogen isotope data from mylonitic quartzite collected along the western flank of the northern Snake Range (Negro Creek).

Sample	dDms (per mil)	Fraction size (μm)	Distance to hanging wall (m)	Universal Transverse Mercator Coordinates (WGS84 Projection)	
SR09-NC02	-85.9	100<f<180	10	11S0734997	4351088
SR09-NC03	-67.6	100<f<180	14	11S0734985	4351074
SR09-NC04	-63.9	100<f<180	21	11S0734996	4351051
SR09-NC06A	-80.3	100<f<180	29	11S0735012	4351024
SR09-NC07A	-98.4	250<f<500	39	11S0735009	4350999
SR09-NC08	-97.9	180<f<250	51	11S0734972	4350987
SR09-NC09	-69.7	100<f<180	61	11S0734948	4350964
SR09-NC10B	-97.6	100<f<180	71	11S0734946	4350951
SR09-NC11	-123.6	100<f<180	77	11S0734932	4350942
SR09-NC13	-82.7	100<f<180	92	11S0734847	4350894
SR09-NC14	-66.4	100<f<180	102	11S0734733	4350911
SR09-NC15	-129.9	100<f<180	114	11S0734521	4350995
SR09-NC16	-109.1	100<f<180	124	11S0734382	4350970
SR09-NC18	-142.4	100<f<180	154	11S0733548	4351190

Table DR5:

Hydrogen isotope data from mylonitic quartzite collected along the eastern flank of the northern Snake Range (Hendry´s Creek).

Sample	dDms (per mil)	Fraction size (μm)	Distance to hanging wall (m)	Universal Transverse Mercator Coordinates (WGS84 Projection)	
SR08-3	-145	100<f<180	10	11S0752452	4344296
SR08-4	-76	100<f<180	15	11S0752389	4344323
SR08-5A	-84	100<f<180	25	11S0752357	4344330
SR08-5B	-92	100<f<180	25	11S0752357	4344330
SR08-6A	-148	100<f<180	35	11S0752334	4344311
SR08-6A	-150	180<f<250	35	11S0752334	4344311
SR08-6B	-122	180<f<250	35	11S0752334	4344311
SR08-7	-144	180<f<250	45	11S0752335	4344289
SR08-7	-144	100<f<180	45	11S0752335	4344289
SR08-8	-139	100<f<180	55	11S0752338	4344201
SR08-9	-140	100<f<180	60	11S0752395	4344117
SR08-10	-143	100<f<180	65	11S0752352	4344153
SR08-11A	-149	180<f<250	75	11S0752343	4344139
SR08-12	-145	100<f<180	83	11S0752361	4344111
SR08-13	-92	100<f<180	91	11S0752340	4344116
SR08-14A	-90	100<f<180	97	11S0752354	4344088
SR08-16	-63	100<f<180	110	11S0750896	4345146
SR08-17A	-91	100<f<180	115	11S0750881	4345115
SR08-18A	-82	100<f<180	130	11S0750859	4345073
SR08-19	-81	100<f<180	134	11S0750855	4345062
SR08-20	-92	100<f<180	144	11S0750855	4345062
SR08-21	-113	100<f<180	158	11S0750877	4345033
SR08-21	-112	180<f<250	158	11S0750886	4345026
SR08-22	-108	100<f<180	168	11S0750911	4345026
SR08-23	-126	180<f<250	178	11S0750911	4345006
SR08-24	-117	100<f<180	188		
SR08-24	-114	180<f<250	188		
SR08-25	-82	180<f<250	198		
SR08-26	-75	100<f<180	200		
SR08-27	-76	180<f<250	208		
SR08-28	-73	100<f<180	216	11S0750849	4344963
SR08-29	-73	100<f<180	223		
SR08-30	-78	100<f<180	226	11S0750878	4344938
SR08-31	-88	100<f<180	236	11S0750903	4344926
SR08-32	-64	100<f<180	246	11S0750935	4344893
SR08-33	-74	100<f<180	255		
SR08-34	-72	100<f<180	265		
SR08-34	-72	180<f<250	265		
SR08-35	-77	100<f<180	275		

Table DR6:
Representative muscovite compositions from five samples collected over the Snake Range detachment footwall at Negro Creek. For each sample, we performed compositional profiles for at least two different muscovites labeled Ms1, Ms2...Major element compositions of muscovites were performed with a JEOL JXA 8900RL electron microprobe of the Institute of Geosciences at Goethe Universität, Frankfurt am Main.

SR09-NC07A	Ms1	Ms1	Ms1	Ms1	Ms1	Ms1	Ms1	Ms1	Ms1	Ms2	Ms2	Ms2	Ms2	Ms2	Ms2	Ms2	Ms2	Ms2	Ms2	Ms3	Ms3	Ms3	Ms3	Ms3	Ms3	Ms3	Ms3
FeO	4.57	4.74	4.24	4.28	4.20	4.25	4.03	4.16	4.15	4.04	3.92	4.25	4.39	4.25	4.09	3.90	4.31	4.35	4.31	4.03	4.18	4.17	4.18	4.32	4.27	4.21	4.20
Na2O	0.20	0.16	0.23	0.27	0.27	0.29	0.23	0.23	0.26	0.16	0.18	0.27	0.24	0.28	0.22	0.21	0.23	0.30	0.24	0.13	0.18	0.25	0.25	0.24	0.16	0.19	0.21
K2O	11.05	11.11	10.99	11.07	10.99	10.94	11.00	10.90	11.04	11.08	11.13	10.98	10.99	11.03	11.10	11.15	11.08	11.03	10.98	10.63	10.99	10.96	10.91	11.01	11.08	11.11	10.98
MnO	0.00	0.01	0.02	0.01	0.00	0.04	0.01	0.02	0.02	0.04	0.03	0.04	0.01	0.02	0.03	0.02	0.03	0.00	0.03	0.00	0.02	0.01	0.00	0.02	0.00	0.02	0.02
SiO2	48.35	48.55	47.77	47.41	47.19	47.37	47.67	48.55	47.18	47.56	47.81	47.50	46.99	47.14	47.65	47.00	47.58	47.36	47.01	48.34	47.13	47.05	47.29	46.78	46.95	47.06	47.50
CaO	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.02	0.02	0.01	0.01	0.00	0.03	0.00	0.00	0.05	0.03	0.00	0.00	0.00	0.01	0.00	0.03
Cr2O3	0.01	0.00	0.00	0.02	0.00	0.01	0.00	0.00	0.01	0.02	0.01	0.01	0.01	0.03	0.01	0.00	0.01	0.03	0.03	0.03	0.01	0.02	0.02	0.01	0.00	0.04	0.00
Al2O3	28.93	29.09	29.76	30.05	30.26	30.56	29.78	29.71	30.15	29.37	30.33	29.97	29.96	29.84	29.76	30.17	30.14	29.91	30.05	29.85	29.69	30.19	30.41	29.29	29.18	29.98	29.48
TiO2	0.84	0.76	1.25	1.45	1.26	1.37	1.43	1.41	1.48	1.31	1.39	1.37	1.40	1.39	0.99	0.97	1.37	1.43	1.49	0.92	1.21	1.43	1.46	1.43	1.33	1.45	0.76
MgO	1.89	1.83	1.63	1.48	1.43	1.44	1.52	1.46	1.39	1.61	1.49	1.54	1.42	1.49	1.59	1.46	1.47	1.56	1.41	1.53	1.55	1.54	1.52	1.52	1.65	1.49	1.70
Total	95.84	96.25	95.90	96.04	95.59	96.27	95.68	96.45	95.67	95.18	96.30	95.94	95.43	95.47	95.46	94.88	96.24	95.96	95.55	95.51	94.99	95.62	96.05	94.61	94.63	95.55	94.88
Si4+	3.26	3.26	3.22	3.19	3.19	3.18	3.22	3.24	3.19	3.23	3.20	3.20	3.19	3.20	3.22	3.20	3.20	3.19	3.18	3.25	3.21	3.18	3.18	3.20	3.21	3.19	3.23
Al3+	2.30	2.30	2.36	2.39	2.41	2.42	2.37	2.34	2.40	2.35	2.40	2.38	2.40	2.38	2.37	2.42	2.39	2.38	2.40	2.37	2.38	2.41	2.41	2.36	2.35	2.39	2.37
Ti4+	0.04	0.04	0.06	0.07	0.06	0.07	0.07	0.07	0.08	0.07	0.07	0.07	0.07	0.07	0.05	0.05	0.07	0.07	0.08	0.05	0.06	0.07	0.07	0.07	0.07	0.07	0.04
Mg2+	0.19	0.18	0.16	0.15	0.14	0.14	0.15	0.15	0.14	0.16	0.15	0.15	0.14	0.15	0.16	0.15	0.15	0.16	0.14	0.15	0.16	0.16	0.15	0.15	0.17	0.15	0.17
Fe t	0.26	0.27	0.24	0.24	0.24	0.24	0.23	0.23	0.23	0.23	0.22	0.24	0.25	0.24	0.23	0.22	0.24	0.25	0.24	0.23	0.24	0.24	0.24	0.25	0.24	0.24	0.24
Mn2+	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca2+	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na+	0.03	0.02	0.03	0.04	0.04	0.04	0.03	0.03	0.03	0.02	0.02	0.04	0.03	0.04	0.03	0.03	0.03	0.04	0.03	0.02	0.02	0.03	0.03	0.03	0.02	0.03	0.03
K+	0.95	0.95	0.94	0.95	0.95	0.94	0.95	0.93	0.95	0.96	0.95	0.94	0.95	0.95	0.96	0.97	0.95	0.95	0.95	0.91	0.95	0.95	0.94	0.96	0.97	0.96	0.95
Cr3+	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XFe	0.58	0.59	0.59	0.62	0.62	0.62	0.60	0.62	0.63	0.59	0.60	0.61	0.63	0.62	0.59	0.60	0.62	0.61	0.63	0.60	0.60	0.60	0.61	0.62	0.59	0.61	0.58
Al IV	0.74	0.74	0.78	0.81	0.81	0.82	0.78	0.76	0.81	0.77	0.80	0.80	0.81	0.80	0.78	0.80	0.80	0.81	0.82	0.75	0.79	0.82	0.82	0.80	0.79	0.81	0.77
Mg-Fet	0.45	0.45	0.40	0.39	0.38	0.38	0.38	0.38	0.37	0.39	0.37	0.39	0.39	0.39	0.39	0.37	0.39	0.40	0.39	0.38	0.40	0.39	0.39	0.40	0.41	0.39	0.41
Al VI	1.56	1.57	1.58	1.58	1.60	1.60	1.58	1.58	1.59	1.58	1.60	1.58	1.58	1.58	1.60	1.62	1.59	1.57	1.58	1.62	1.59	1.59	1.59	1.57	1.57	1.58	1.60

SR09-NC09	Ms1	Ms1	Ms1	Ms1	Ms1	Ms1	Ms1	Ms1	Ms2	Ms2	Ms2	Ms2	Ms2	Ms2	Ms2	Ms3	Ms3	Ms3	Ms3	Ms3	Ms3	Ms3	Ms3
FeO	5.92	5.69	5.83	5.70	5.84	5.78	5.58	5.85	5.79	5.90	5.70	5.72	5.72	5.67	5.79	5.72	5.71	5.86	5.80	5.99	5.98	5.75	5.69
Na2O	0.14	0.16	0.18	0.18	0.18	0.18	0.17	0.17	0.17	0.21	0.21	0.18	0.25	0.20	0.20	0.18	0.19	0.17	0.20	0.20	0.21	0.18	0.16
K2O	11.15	11.21	11.16	11.17	11.05	11.06	11.13	11.24	11.07	11.10	11.16	10.87	11.00	11.02	11.00	11.15	11.19	11.18	11.22	11.06	11.16	11.09	11.25
MnO	0.01	0.04	0.02	0.01	0.04	0.03	0.01	0.04	0.04	0.04	0.05	0.01	0.02	0.02	0.04	0.00	0.03	0.00	0.01	0.00	0.04	0.03	0.04
SiO2	47.49	46.43	46.59	46.86	47.10	46.90	47.28	46.58	46.76	46.94	47.28	46.96	47.53	47.45	47.10	47.60	46.97	47.48	47.77	46.73	47.24	48.72	47.54
CaO	0.01	0.04	0.00	0.01	0.01	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.01	0.00	0.01	0.01	0.00	0.01	0.01
Cr2O3	0.00	0.00	0.00	0.02	0.02	0.03	0.04	0.04	0.00	0.05	0.01	0.01	0.01	0.00	0.03	0.01	0.00	0.00	0.02	0.00	0.00	0.00	0.00
Al2O3	27.59	28.39	28.05	28.35	28.09	27.27	28.04	28.05	28.16	27.96	28.22	27.82	27.80	27.83	28.21	28.33	28.40	28.26	28.33	28.54	27.93	27.84	27.85
TiO2	1.01	1.28	1.21	1.25	1.26	1.80	1.24	1.31	1.31	1.33	1.33	1.38	1.27	1.32	1.33	1.29	1.32	1.25	1.29	1.28	1.25	1.10	1.35
MgO	1.92	1.77	1.81	1.62	1.68	2.08	1.88	1.66	1.74	1.80	1.74	1.69	2.00	1.83	1.72	1.74	1.73	1.76	1.79	1.68	1.73	2.03	1.87
Total	95.25	95.00	94.85	95.17	95.27	95.12	95.37	94.93	95.07	95.31	95.69	94.65	95.61	95.34	95.43	96.01	95.55	95.96	96.44	95.49	95.54	96.74	95.75
Si4+	3.26	3.20	3.21	3.22	3.23	3.23	3.23	3.21	3.21	3.22	3.23	3.24	3.24	3.25	3.22	3.23	3.21	3.23	3.23	3.20	3.23	3.28	3.24
Al3+	2.23	2.30	2.28	2.29	2.27	2.21	2.26	2.28	2.28	2.26	2.27	2.26	2.24	2.24	2.27	2.27	2.29	2.27	2.26	2.30	2.25	2.21	2.24
Ti4+	0.05	0.07	0.06	0.06	0.06	0.09	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.07	0.07	0.06	0.06	0.07
Mg2+	0.20	0.18	0.19	0.17	0.17	0.21	0.19	0.17	0.18	0.18	0.18	0.17	0.20	0.19	0.18	0.18	0.18	0.18	0.18	0.17	0.18	0.20	0.19
Fe t	0.34	0.33	0.34	0.33	0.33	0.33	0.32	0.34	0.33	0.34	0.33	0.33	0.33	0.32	0.33	0.32	0.33	0.33	0.33	0.34	0.34	0.32	0.32
Mn2+	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca2+	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na+	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.02	0.03	0.03	0.03	0.02	0.03	0.02	0.03	0.03	0.03	0.02	0.02
K+	0.98	0.98	0.98	0.98	0.97	0.97	0.97	0.99	0.97	0.97	0.97	0.96	0.96	0.96	0.96	0.97	0.98	0.97	0.97	0.97	0.97	0.95	0.98
Cr3+	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XFe	0.63	0.64	0.64	0.66	0.66	0.61	0.63	0.67	0.65	0.65	0.65	0.66	0.62	0.64	0.66	0.65	0.65	0.65	0.65	0.67	0.66	0.61	0.63
Al IV	0.74	0.80	0.79	0.78	0.77	0.77	0.77	0.79	0.79	0.78	0.77	0.76	0.76	0.75	0.78	0.77	0.79	0.77	0.77	0.80	0.77	0.72	0.76
Mg-Fet	0.54	0.51	0.52	0.49	0.51	0.55	0.51	0.51	0.51	0.52	0.50	0.50	0.53	0.51	0.51	0.50	0.50	0.51	0.51	0.51	0.52	0.53	0.51
Al VI	1.49	1.50	1.49	1.51	1.50	1.44	1.50	1.49	1.50	1.48	1.50	1.50	1.48	1.49	1.50	1.50	1.50	1.50	1.49	1.50	1.49	1.49	1.48

SR09-NC11	Ms1	Ms1	Ms1	Ms1	Ms1	Ms1	Ms1	Ms1	Ms1	Ms1	Ms2	Ms2	Ms2	Ms2	Ms2	Ms2	Ms2	Ms2	Ms2
FeO	5.17	5.12	6.08	6.43	6.39	6.91	5.77	6.61	6.10	6.11	6.04	6.14	6.15	6.48	6.22	5.55	5.37	6.19	6.18
Na2O	0.18	0.18	0.15	0.19	0.20	0.14	0.12	0.19	0.20	0.18	0.20	0.16	0.21	0.18	0.19	0.15	0.17	0.21	0.20
K2O	11.08	11.16	11.33	10.99	11.17	11.18	11.24	11.11	11.04	11.35	11.14	11.18	11.20	11.20	11.11	11.11	11.33	11.13	11.12
MnO	0.04	0.03	0.04	0.03	0.02	0.01	0.00	0.02	0.03	0.01	0.02	0.03	0.03	0.03	0.04	0.01	0.01	0.02	0.04
SiO2	48.10	47.78	47.11	46.90	46.98	47.15	46.84	46.38	47.82	46.66	47.88	46.80	46.83	46.67	48.04	47.06	46.68	47.24	47.17
CaO	0.02	0.00	0.02	0.02	0.01	0.01	0.03	0.02	0.00	0.01	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01
Cr2O3	0.07	0.03	0.04	0.13	0.15	0.07	0.00	0.14	0.13	0.13	0.00	0.04	0.08	0.06	0.02	0.07	0.05	0.12	0.04
Al2O3	29.32	28.67	27.37	27.90	27.89	27.61	28.64	28.09	28.34	27.63	27.80	27.67	27.82	27.74	26.92	28.20	28.40	27.35	28.07
TiO2	1.01	1.22	1.06	1.55	1.59	1.01	0.85	1.47	1.55	1.60	1.10	1.57	1.50	1.52	1.13	1.56	1.47	1.53	1.54
MgO	1.95	2.03	1.99	1.74	1.74	1.79	1.80	1.74	1.81	1.73	2.15	1.72	1.74	1.76	2.35	1.75	1.79	1.73	1.79
Total	96.94	96.22	95.19	95.89	96.14	95.88	95.29	95.77	97.02	95.40	96.33	95.31	95.56	95.64	96.02	95.46	95.27	95.52	96.16
Si4+	3.22	3.23	3.24	3.21	3.21	3.23	3.21	3.18	3.22	3.21	3.25	3.22	3.21	3.21	3.27	3.22	3.20	3.24	3.21
Al3+	2.32	2.28	2.22	2.25	2.24	2.23	2.31	2.27	2.25	2.24	2.22	2.24	2.25	2.25	2.16	2.27	2.30	2.21	2.25
Ti4+	0.05	0.06	0.05	0.08	0.08	0.05	0.04	0.08	0.08	0.08	0.06	0.08	0.08	0.08	0.06	0.08	0.08	0.08	0.08
Mg2+	0.19	0.20	0.20	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.22	0.18	0.18	0.18	0.24	0.18	0.18	0.18	0.18
Fe t	0.29	0.29	0.35	0.37	0.36	0.40	0.33	0.38	0.34	0.35	0.34	0.35	0.35	0.37	0.35	0.32	0.31	0.36	0.35
Mn2+	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca2+	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na+	0.02	0.02	0.02	0.03	0.03	0.02	0.02	0.03	0.03	0.02	0.03	0.02	0.03	0.02	0.02	0.02	0.02	0.03	0.03
K+	0.95	0.96	1.00	0.96	0.97	0.98	0.98	0.97	0.95	1.00	0.96	0.98	0.98	0.98	0.97	0.97	0.99	0.97	0.97
Cr3+	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
XFe	0.60	0.59	0.63	0.68	0.67	0.68	0.64	0.68	0.66	0.66	0.61	0.67	0.67	0.67	0.60	0.64	0.63	0.67	0.66
Al IV	0.78	0.77	0.76	0.79	0.79	0.77	0.79	0.82	0.78	0.79	0.75	0.78	0.79	0.79	0.73	0.78	0.80	0.76	0.79
Mg-Fet	0.48	0.49	0.55	0.55	0.54	0.58	0.51	0.56	0.53	0.53	0.56	0.53	0.53	0.55	0.59	0.50	0.49	0.53	0.53
Al VI	1.54	1.51	1.47	1.46	1.45	1.46	1.53	1.46	1.47	1.45	1.47	1.46	1.46	1.45	1.44	1.49	1.50	1.45	1.47

SR09-NC15	Ms1	Ms1	Ms1	Ms1	Ms1	Ms1	Ms1	Ms1	Ms2	Ms2	Ms2	Ms2	Ms2	Ms2	Ms2	Ms2	Ms2	Ms2	Ms2	Ms2	Ms2	Ms2	Ms3	Ms3	Ms3	Ms3	Ms3	Ms3	Ms3	Ms3	Ms3	Ms3
FeO	6.70	6.69	6.52	6.52	6.50	6.49	6.42	6.10	6.50	6.35	6.15	6.33	6.34	6.51	6.33	6.71	6.65	6.66	6.75	6.66	6.56	7.30	6.63	6.83	6.48	6.56	6.57	6.53	6.46	6.40	6.53	6.10
Na2O	0.17	0.20	0.24	0.23	0.23	0.19	0.18	0.15	0.12	0.14	0.16	0.20	0.21	0.20	0.19	0.28	0.25	0.30	0.22	0.23	0.17	0.13	0.12	0.15	0.22	0.22	0.23	0.21	0.27	0.21	0.23	0.14
K2O	11.10	11.03	11.09	11.00	11.27	11.10	11.15	11.09	11.17	11.13	11.22	11.23	11.19	11.23	11.31	11.12	10.92	10.95	11.12	11.14	11.21	10.85	10.99	11.25	11.03	11.06	11.17	11.19	11.25	11.12	11.18	10.99
MnO	0.00	0.04	0.00	0.03	0.04	0.01	0.00	0.01	0.00	0.00	0.01	0.01	0.01	0.06	0.02	0.02	0.02	0.03	0.01	0.01	0.02	0.04	0.01	0.03	0.04	0.03	0.00	0.02	0.05	0.03	0.01	0.01
SiO2	48.20	46.84	47.02	47.43	47.14	46.94	46.95	47.59	47.02	48.18	47.87	47.24	47.14	46.09	47.02	45.18	45.96	45.35	46.16	45.24	45.94	46.93	47.37	48.15	47.35	47.28	47.09	46.89	47.09	47.55	46.46	47.54
CaO	0.02	0.00	0.00	0.00	0.02	0.00	0.00	0.05	0.02	0.02	0.00	0.00	0.00	0.01	0.01	0.00	0.01	0.01	0.01	0.00	0.01	0.15	0.04	0.00	0.00	0.00	0.00	0.02	0.01	0.03	0.01	0.02
Cr2O3	0.00	0.00	0.02	0.03	0.01	0.02	0.00	0.03	0.00	0.01	0.00	0.00	0.02	0.01	0.01	0.01	0.00	0.01	0.02	0.00	0.03	0.00	0.01	0.02	0.03	0.00	0.00	0.01	0.00	0.00	0.00	0.02
Al2O3	26.89	27.62	28.19	28.16	28.20	28.01	28.08	27.68	28.18	26.79	27.39	27.79	27.96	28.73	27.20	29.56	29.21	29.87	28.83	29.35	28.57	26.82	27.25	26.81	28.13	28.35	28.36	28.10	28.29	27.97	28.05	27.18
TiO2	0.64	0.93	0.89	0.84	0.92	0.93	0.95	0.73	0.81	1.04	1.14	1.31	1.50	1.43	1.33	1.16	1.17	0.91	1.30	1.61	1.36	0.96	0.98	1.00	0.95	0.92	0.92	0.91	0.97	0.91	0.91	0.89
MgO	2.08	1.65	1.68	1.74	1.71	1.76	1.62	1.96	1.79	2.08	1.99	1.76	1.75	1.40	1.89	1.18	1.30	1.23	1.34	1.17	1.39	2.11	2.05	2.14	1.84	1.89	1.78	1.81	1.80	1.87	1.74	2.36
Total	95.80	95.01	95.65	95.99	96.04	95.46	95.35	95.41	95.61	95.74	95.93	95.88	96.12	95.67	95.31	95.23	95.49	95.32	95.76	95.42	95.26	95.30	95.46	96.38	96.06	96.30	96.12	95.69	96.19	96.09	95.12	95.25
Si4+	3.30	3.24	3.22	3.24	3.22	3.22	3.23	3.26	3.22	3.29	3.26	3.23	3.22	3.17	3.24	3.12	3.16	3.13	3.17	3.12	3.17	3.24	3.25	3.28	3.23	3.22	3.21	3.22	3.21	3.24	3.21	3.26
Al3+	2.17	2.25	2.28	2.26	2.27	2.27	2.27	2.23	2.28	2.16	2.20	2.24	2.25	2.33	2.21	2.41	2.37	2.43	2.33	2.39	2.32	2.18	2.21	2.15	2.26	2.27	2.28	2.27	2.27	2.25	2.28	2.20
Ti4+	0.03	0.05	0.05	0.04	0.05	0.05	0.05	0.04	0.04	0.05	0.06	0.07	0.08	0.07	0.07	0.06	0.06	0.05	0.07	0.08	0.07	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Mg2+	0.21	0.17	0.17	0.18	0.17	0.18	0.17	0.20	0.18	0.21	0.20	0.18	0.18	0.14	0.19	0.12	0.13	0.13	0.14	0.12	0.14	0.22	0.21	0.22	0.19	0.19	0.18	0.19	0.18	0.19	0.18	0.24
Fe t	0.38	0.39	0.37	0.37	0.37	0.37	0.37	0.35	0.37	0.36	0.35	0.36	0.36	0.37	0.36	0.39	0.38	0.38	0.39	0.38	0.38	0.42	0.38	0.39	0.37	0.37	0.37	0.37	0.37	0.36	0.38	0.35
Mn2+	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca2+	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na+	0.02	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.02	0.04	0.03	0.04	0.03	0.03	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.04	0.03	0.03	0.02
K+	0.97	0.97	0.97	0.96	0.98	0.97	0.98	0.97	0.98	0.97	0.98	0.98	0.97	0.98	0.99	0.98	0.96	0.96	0.97	0.98	0.99	0.96	0.96	0.98	0.96	0.96	0.97	0.98	0.98	0.97	0.98	0.96
Cr3+	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XFe	0.64	0.70	0.69	0.68	0.68	0.67	0.69	0.64	0.67	0.63	0.63	0.67	0.67	0.73	0.65	0.76	0.74	0.75	0.74	0.76	0.73	0.66	0.64	0.64	0.67	0.66	0.67	0.67	0.67	0.66	0.68	0.59
Al IV	0.70	0.76	0.78	0.76	0.78	0.78	0.77	0.74	0.78	0.71	0.74	0.77	0.78	0.83	0.76	0.88	0.84	0.87	0.83	0.88	0.83	0.76	0.75	0.72	0.77	0.78	0.79	0.78	0.79	0.76	0.79	0.74
Mg-Fet	0.60	0.56	0.55	0.55	0.55	0.55	0.54	0.55	0.56	0.57	0.55	0.54	0.54	0.52	0.56	0.51	0.52	0.51	0.52	0.50	0.52	0.64	0.59	0.61	0.56	0.57	0.56	0.56	0.55	0.55	0.56	0.59
Al VI	1.46	1.48	1.50	1.50	1.49	1.49	1.50	1.50	1.50	1.45	1.47	1.47	1.46	1.49	1.45	1.53	1.52	1.55	1.50	1.51	1.49	1.43	1.46	1.43	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.46

SR09-NC18	Ms1	Ms1	Ms1	Ms1	Ms1	Ms1	Ms1	Ms1	Ms1	Ms1	Ms1	Ms2	Ms2	Ms2	Ms2	Ms2	Ms2	Ms2	Ms2	Ms2	Ms2	Ms2	Ms2	Ms3	Ms4	Ms5	Ms6	Ms7
FeO	3.20	3.11	3.66	4.02	3.38	3.38	3.18	2.95	3.88	3.69	4.05	2.15	2.22	2.55	2.37	1.87	2.41	1.34	2.13	1.54	2.27	1.22	2.04	2.17	2.07	2.11	3.10	3.36
Na2O	0.41	0.10	0.05	0.04	0.10	0.03	0.26	0.04	0.05	0.05	0.03	0.05	0.04	0.06	0.27	0.08	0.04	0.07	0.06	0.08	0.03	0.08	0.06	0.58	0.88	0.58	0.67	0.50
K2O	10.76	9.26	11.13	10.94	10.91	10.98	10.77	10.90	11.24	11.08	11.15	11.15	11.19	10.79	11.04	11.03	11.21	10.94	10.75	10.96	10.98	10.40	10.95	10.73	10.31	10.85	10.39	10.53
MnO	0.04	0.04	0.02	0.03	0.01	0.00	0.01	0.00	0.03	0.03	0.00	0.03	0.01	0.01	0.03	0.01	0.01	0.04	0.00	0.00	0.00	0.02	0.00	0.01	0.00	0.00	0.02	0.05
SiO2	48.04	59.33	50.80	50.17	50.29	50.01	48.87	49.85	49.85	49.53	49.48	50.52	50.89	49.54	48.68	50.04	50.24	50.00	49.31	49.47	49.45	50.55	50.41	47.79	46.85	47.21	46.68	47.54
CaO	0.00	0.02	0.00	0.02	0.09	0.01	0.02	0.01	0.00	0.01	0.00	0.01	0.01	0.02	0.00	0.01	0.03	0.03	0.03	0.01	0.02	0.06	0.02	0.00	0.00	0.00	0.02	0.02
Cr2O3	0.03	0.04	0.04	0.02	0.01	0.03	0.04	0.02	0.04	0.04	0.01	0.02	0.00	0.02	0.04	0.03	0.03	0.01	0.00	0.03	0.00	0.00	0.02	0.03	0.02	0.02	0.02	0.00
Al2O3	32.82	23.48	27.62	28.12	28.64	28.38	30.80	29.07	27.57	28.25	28.05	29.28	29.06	28.55	31.86	30.11	29.44	32.04	28.75	31.75	29.69	31.32	30.81	33.41	35.02	34.15	33.93	32.76
TiO2	0.46	0.81	1.02	1.32	1.79	1.21	0.64	1.38	1.70	0.93	0.68	0.53	0.68	2.70	0.62	0.68	0.57	0.37	1.21	0.41	0.51	0.93	0.59	0.38	0.43	0.39	0.39	0.36
MgO	1.11	1.77	2.63	2.27	2.17	2.38	1.49	1.98	2.43	2.45	2.41	2.20	2.28	2.29	1.55	1.88	2.34	1.45	1.90	1.61	1.98	1.48	1.84	1.02	0.85	0.86	0.85	1.20
Total	96.87	97.95	96.97	96.96	97.40	96.42	96.08	96.20	96.78	96.06	95.86	95.95	96.38	96.54	96.45	95.73	96.33	96.29	94.14	95.86	94.94	96.06	96.74	96.12	96.43	96.16	96.07	96.33
Si4+	3.17	3.78	3.36	3.33	3.31	3.32	3.25	3.31	3.32	3.32	3.32	3.35	3.36	3.28	3.22	3.32	3.33	3.28	3.33	3.27	3.32	3.31	3.31	3.17	3.09	3.13	3.11	3.16
Al3+	2.56	1.76	2.15	2.20	2.22	2.22	2.42	2.28	2.16	2.23	2.22	2.29	2.26	2.23	2.48	2.35	2.30	2.48	2.29	2.47	2.35	2.42	2.38	2.61	2.72	2.67	2.66	2.57
Ti4+	0.02	0.04	0.05	0.07	0.09	0.06	0.03	0.07	0.09	0.05	0.03	0.03	0.03	0.13	0.03	0.03	0.03	0.02	0.06	0.02	0.03	0.05	0.03	0.02	0.02	0.02	0.02	0.02
Mg2+	0.11	0.17	0.26	0.22	0.21	0.24	0.15	0.20	0.24	0.24	0.24	0.22	0.22	0.23	0.15	0.19	0.23	0.14	0.19	0.16	0.20	0.14	0.18	0.10	0.08	0.08	0.08	0.12
Fe t	0.18	0.17	0.20	0.22	0.19	0.19	0.18	0.16	0.22	0.21	0.23	0.12	0.12	0.14	0.13	0.10	0.13	0.07	0.12	0.09	0.13	0.07	0.11	0.12	0.11	0.12	0.17	0.19
Mn2+	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca2+	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na+	0.05	0.01	0.01	0.00	0.01	0.00	0.03	0.01	0.01	0.01	0.00	0.01	0.00	0.01	0.03	0.01	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.07	0.11	0.07	0.09	0.06
K+	0.91	0.75	0.94	0.93	0.92	0.93	0.91	0.92	0.96	0.95	0.96	0.94	0.94	0.91	0.93	0.93	0.95	0.92	0.93	0.92	0.94	0.87	0.92	0.91	0.87	0.92	0.88	0.89
Cr3+	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XFe	0.62	0.50	0.44	0.50	0.47	0.44	0.55	0.46	0.47	0.46	0.49	0.36	0.35	0.39	0.47	0.36	0.37	0.35	0.39	0.35	0.39	0.32	0.38	0.54	0.58	0.58	0.67	0.62
Al IV	0.83	0.22	0.64	0.67	0.69	0.68	0.75	0.69	0.68	0.68	0.68	0.65	0.64	0.72	0.78	0.68	0.67	0.72	0.67	0.73	0.68	0.69	0.69	0.83	0.91	0.87	0.89	0.84
Mg-Fet	0.29	0.33	0.46	0.45	0.40	0.42	0.33	0.36	0.46	0.45	0.47	0.34	0.35	0.37	0.28	0.29	0.36	0.22	0.31	0.24	0.33	0.21	0.29	0.22	0.20	0.20	0.26	0.31
Al VI	1.73	1.54	1.52	1.52	1.53	1.55	1.67	1.59	1.48	1.54	1.55	1.64	1.62	1.51	1.70	1.67	1.62	1.76	1.62	1.74	1.66	1.73	1.69	1.78	1.81	1.80	1.77	1.73

Ms4	Ms4	Ms4	Ms4	Ms4	Ms4	Ms4	Ms4
6.43	6.48	6.52	6.49	6.25	6.17	6.31	6.58
0.12	0.19	0.20	0.24	0.21	0.15	0.18	0.18
11.02	11.25	11.25	11.12	11.26	11.24	11.20	10.98
0.00	0.01	0.02	0.03	0.02	0.02	0.00	0.02
47.60	47.28	46.89	46.47	46.68	47.76	47.17	47.11
0.25	0.03	0.00	0.02	0.01	0.02	0.03	0.69
0.00	0.04	0.00	0.01	0.01	0.00	0.03	0.00
27.27	27.65	28.06	28.35	27.94	26.57	28.14	26.52
0.80	0.77	0.93	1.05	0.98	0.59	1.00	0.47
1.99	1.83	1.79	1.68	1.81	2.18	1.77	2.21
95.48	95.52	95.66	95.46	95.16	94.70	95.83	94.76
3.26	3.25	3.22	3.20	3.22	3.30	3.23	3.27
2.20	2.24	2.27	2.30	2.27	2.16	2.27	2.17
0.04	0.04	0.05	0.05	0.05	0.03	0.05	0.02
0.20	0.19	0.18	0.17	0.19	0.22	0.18	0.23
0.37	0.37	0.37	0.37	0.36	0.36	0.36	0.38
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.05
0.02	0.03	0.03	0.03	0.03	0.02	0.02	0.02
0.96	0.99	0.98	0.98	0.99	0.99	0.98	0.97
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.64	0.67	0.67	0.69	0.66	0.61	0.67	0.63
0.74	0.75	0.78	0.80	0.78	0.70	0.77	0.73
0.57	0.56	0.56	0.55	0.55	0.58	0.54	0.61
1.47	1.48	1.49	1.49	1.49	1.47	1.49	1.44