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Supplementary table 1. Chemical composition of NWA 5790 augite.

	Core	Core	Core	Core	Core	Core	Core	Core	Core	Core	Core	Core	Core	Core	Rim	Rim	Rim
SiO ₂	50.97	50.70	49.57	50.00	50.15	49.99	49.68	50.78	50.12	50.55	50.99	50.45	50.80	50.97	48.03	47.88	47.92
TiO ₂	0.37	0.35	0.45	0.42	0.37	0.39	0.35	0.42	0.38	0.39	0.31	0.26	0.26	0.26	0.90	0.65	0.64
Al ₂ O ₃	1.22	1.20	1.38	1.22	1.11	1.24	1.25	1.21	1.02	1.11	0.97	0.88	0.91	0.78	2.65	2.56	2.56
Cr ₂ O ₃	0.20	0.20	0.10	0.14	0.19	0.14	0.18	0.16	0.22	0.19	0.21	0.23	0.27	0.26	dl	dl	dl
FeO	16.19	16.43	17.01	16.58	16.26	17.74	16.30	16.02	15.62	15.76	15.32	14.79	14.82	14.39	23.80	22.87	22.61
MnO	0.33	0.34	0.46	0.41	0.39	0.44	0.36	0.34	0.38	0.36	0.39	0.38	0.38	0.35	0.55	0.47	0.51
MgO	10.34	10.33	10.57	10.64	10.58	10.63	10.76	11.35	11.40	11.44	11.57	11.92	12.02	12.16	6.41	6.51	6.69
CaO	19.06	18.79	18.93	19.03	19.05	17.63	18.95	18.64	19.04	18.80	19.07	19.04	19.06	19.16	16.86	17.40	17.23
Na ₂ O	0.34	0.33	0.36	0.35	0.34	0.33	0.35	0.30	0.32	0.32	0.27	0.29	0.34	0.29	0.37	0.36	0.37
K ₂ O	dl	dl	dl	dl	dl	dl	0.03	dl	dl	dl	0.01	dl	dl	dl	dl	0.04	0.02
Total	99.03	98.68	98.83	98.79	98.44	98.53	98.20	99.22	98.49	98.91	99.10	98.26	98.87	98.62	99.57	98.74	98.55
Cations per 6 oxygens																	
Si	1.97	1.97	1.94	1.95	1.96	1.96	1.95	1.96	1.95	1.96	1.97	1.96	1.96	1.97	1.92	1.92	1.92
Ti	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.03	0.02	0.02
Al	0.06	0.06	0.06	0.06	0.05	0.06	0.06	0.06	0.05	0.05	0.04	0.04	0.04	0.04	0.12	0.12	0.12
Cr	0.01	0.01	0.00	0.00	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00
Fe ²⁺	0.53	0.54	0.56	0.54	0.53	0.58	0.53	0.52	0.51	0.51	0.50	0.48	0.48	0.47	0.79	0.77	0.76
Mn	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02
Mg	0.60	0.60	0.62	0.62	0.62	0.62	0.63	0.66	0.66	0.67	0.67	0.69	0.70	0.71	0.38	0.39	0.40
Ca	0.80	0.79	0.79	0.80	0.80	0.74	0.80	0.78	0.80	0.79	0.80	0.80	0.80	0.80	0.72	0.75	0.74
Na	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.03	0.03	0.03
K	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
Total	4.01	4.00	4.03	4.02	4.01	4.01	4.02	4.03	4.02	4.03	4.03	4.02	4.04	4.03	4.01	4.01	4.01
Molecular proportions																	
En	31.2	31.3	31.3	31.6	31.7	32.0	32.1	33.6	33.7	33.9	34.2	35.2	35.3	35.8	20.1	20.4	21.1
Fs	27.4	27.9	28.3	27.7	27.3	29.9	27.3	26.6	25.9	26.2	25.4	24.5	24.4	23.7	41.9	40.3	39.9
Wo	41.3	40.9	40.4	40.7	41.0	38.1	40.6	39.7	40.4	40.0	40.5	40.4	40.3	40.5	38.0	39.3	39.0

Data acquired by EPMA. dl denotes below detection limits.

Supplementary table 2. Chemical composition of NWA 5790 olivine grains.

SiO ₂	31.16	32.42	32.47	32.48	32.65	32.66	32.70	32.97	33.11
TiO ₂	0.02	0.04	0.03	0.04	0.03	0.02	0.04	0.03	0.03
FeO	50.85	51.07	50.99	51.16	51.26	51.06	50.93	50.73	50.63
MnO	0.96	0.92	0.95	0.96	0.90	0.93	0.95	1.01	0.91
MgO	15.14	14.28	14.45	14.09	14.20	14.47	14.36	14.24	14.14
CaO	0.54	0.54	0.55	0.54	0.56	0.55	0.54	0.54	0.55
NiO	0.03	dl	0.02	dl	dl	dl	dl	dl	0.03
Cr ₂ O ₃	dl	dl	dl	dl	dl	dl	dl	dl	dl
Total	98.70	99.26	99.46	99.27	99.60	99.69	99.52	99.52	99.41
Cations per 4 oxygens									
Si	1.93	1.99	1.99	2.00	2.00	1.99	2.00	2.01	2.02
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe	1.32	1.31	1.31	1.31	1.31	1.30	1.30	1.29	1.29
Mn	0.03	0.02	0.02	0.03	0.02	0.02	0.02	0.03	0.02
Mg	0.70	0.65	0.66	0.65	0.65	0.66	0.65	0.65	0.64
Ca	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Ni	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Molecular proportions									
Fo	34.3	32.9	33.1	32.5	32.7	33.2	33.0	32.9	32.8
Fa	65.7	67.1	66.9	67.5	67.3	66.8	67.0	67.1	67.2

Data acquired by EPMA from coarse grains of olivine (not mesostasis olivine). dl denotes below detection limits.