

Supporting Information

Table S1. Chemical compositions of chromites in jadeite jade.

Sample No.	F-1-1-1	F1-2-2	F1-22	J1-2-78	J1-1-99	J2-3	J2-13	J2-14	J3-42
SiO ₂	0.08	0.08	0.00	0.07	0.13	0.11	0.31	0.17	1.23
TiO ₂	0.20	0.20	0.13	0.00	0.01	0.00	0.01	0.00	0.05
Al ₂ O ₃	9.07	9.54	10.31	5.71	7.36	0.17	2.25	8.73	6.89
Cr ₂ O ₃	46.19	46.18	48.25	53.12	53.85	67.11	64.87	58.51	55.84
Fe ₂ O ₃	10.91	10.27	8.18	6.92	5.67	0.00	0.45	0.00	2.00
FeO	24.42	25.19	25.73	28.17	28.78	19.39	20.50	20.87	28.97
NiO	0.15	0.24	0.14	0.00	0.01	0.00	0.00	0.00	0.01
MgO	1.74	1.69	1.68	1.11	1.20	0.90	1.73	1.81	0.98
MnO	5.03	4.47	4.50	2.03	1.91	9.13	8.63	7.56	1.68
CaO	0.01	0.02	0.01	0.00	0.02	0.01	0.00	0.02	0.02
Na ₂ O	0.15	0.12	0.09	0.04	0.11	0.20	0.14	0.33	0.47
K ₂ O	0.01	0.01	0.01	0.00	0.00	0.00	0.02	0.01	0.00
Total	97.96	98.01	99.02	97.17	99.05	97.02	98.91	98.01	98.14
Si	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.04
Ti	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	0.38	0.40	0.43	0.25	0.31	0.01	0.10	0.37	0.29
Cr	1.31	1.31	1.35	1.56	1.53	2.00	1.88	1.65	1.59
Fe ³⁺	0.30	0.28	0.22	0.19	0.15	0.00	0.01	0.00	0.05
Ni	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mg	0.09	0.09	0.09	0.06	0.06	0.05	0.09	0.10	0.05
Mn	0.15	0.14	0.14	0.06	0.06	0.30	0.27	0.23	0.05
Fe ²⁺	0.73	0.76	0.76	0.87	0.87	0.61	0.63	0.62	0.87
Ca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Na	0.01	0.01	0.01	0.00	0.01	0.02	0.01	0.02	0.03
K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Mg#	11	11	10	7	7	8	13	13	6
Cr#	77	76	76	86	83	100	95	82	84

The FeO and Fe₂O₃ contents and chromite formulas were calculated on the basis of 4 cations and 6 oxygens; Mg#: $\text{Mg}/(\text{Mg}+\text{Fe}^{2+})\times 100$; Cr#: $\text{Cr}/(\text{Cr}+\text{Al})\times 100$.

Table S2. Chemical compositions of kosmochlors in jadeite jade.

Sample No.	F1-2-3	F1-2-4	J3-44	J3-45	J2-15	J2-16	J2-17	J1-1-94	J1-1-96	J2-5	J2-6	J2-11	J2-13
	Kos	Kos	Kos	Kos	Kos	Kos	Kos	Kos	Kos	Kos	Kos	Kos	Kos
SiO ₂	54.46	54.03	54.34	54.33	53.44	55.06	55.66	55.40	55.41	53.59	52.05	53.94	54.28
TiO ₂	0.04	0.03	0.04	0.09	0.00	0.02	0.01	0.00	0.04	0.00	0.01	0.04	0.00

Al ₂ O ₃	5.69	4.19	5.01	4.55	3.49	3.98	7.85	6.54	6.26	2.32	4.29	1.17	3.43
Cr ₂ O ₃	20.23	24.61	24.05	23.49	26.91	25.95	19.43	19.92	17.17	29.92	26.62	30.83	26.86
TFeO	1.66	1.04	1.60	1.92	1.12	0.91	2.10	1.07	0.92	0.43	1.65	0.46	1.17
NiO	0.00	0.12	0.03	0.02	0.00	0.00	0.00	0.01	0.00	0.02	0.02	0.03	0.00
MgO	2.30	1.21	0.38	0.77	0.29	0.27	0.71	1.49	3.52	0.06	0.44	0.06	0.35
MnO	0.24	0.12	0.06	0.04	0.10	0.11	0.05	0.07	0.06	0.16	0.51	0.13	0.15
CaO	3.17	1.64	0.52	0.76	0.43	0.37	0.91	1.97	4.86	0.23	0.56	0.16	0.48
Na ₂ O	13.17	13.97	13.74	13.38	13.34	13.38	12.92	13.07	11.18	13.45	13.12	12.98	12.80
K ₂ O	0.00	0.01	0.00	0.00	0.02	0.04	0.01	0.00	0.02	0.01	0.00	0.02	0.01
Total	100.96	100.97	99.78	99.35	99.13	100.08	99.65	99.54	99.44	100.19	99.26	99.82	99.53
Si	1.96	1.96	2.00	2.02	2.01	2.04	2.04	2.03	2.03	2.01	1.95	2.04	2.04
Ti	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
Al	0.24	0.18	0.22	0.20	0.15	0.17	0.34	0.28	0.27	0.10	0.19	0.05	0.15
Cr	0.58	0.71	0.70	0.69	0.80	0.76	0.56	0.58	0.50	0.88	0.79	0.92	0.80
Fe ³⁺	0.00	0.00	0.00	0.04	0.01	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
Ni	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
Mg	0.12	0.07	0.02	0.04	0.02	0.02	0.04	0.08	0.19	0.00	0.03	0.00	0.02
Mn	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.01
Fe ²⁺	0.05	0.03	0.05	0.02	0.03	0.03	0.07	0.02	0.03	0.01	0.05	0.02	0.04
Ca	0.12	0.06	0.02	0.03	0.02	0.02	0.04	0.08	0.19	0.01	0.02	0.01	0.02
Na	0.92	0.98	0.98	0.96	0.97	0.96	0.92	0.93	0.79	0.98	0.95	0.95	0.93
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
Sum	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Jd	28.35	21.68	25.39	10.92	13.15	20.92	36.70	28.42	29.74	10.03	15.42	6.33	16.17
WEF	14.15	7.72	4.51	4.69	3.25	3.08	7.10	8.65	20.66	1.57	5.68	1.47	4.13
Kos	57.50	70.60	70.10	68.80	79.70	76.00	56.20	57.50	49.60	88.40	78.90	92.20	79.70
Ae	0.00	0.00	0.00	15.59	3.90	0.00	0.00	5.43	0.00	0.00	0.00	0.00	0.00

^TFeO is total iron. The clinopyroxene formulas were calculated on the basis of 4 cations and 6 oxygens. Kos=Kosmochlor. #

Table S3. Chemical compositions of jadeites and omphacites in jadeite jade.

[illegible]

Mg	0.54	0.04	0.17	0.03	0.22	0.10	0.11	0.08	0.06	0.06	0.02	0.07	0.09	0.03	0.03	0.09	0.03
Mn	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
Fe ²⁺	0.03	0.06	0.03	0.01	0.04	0.01	0.02	0.04	0.01	0.04	0.03	0.06	0.06	0.03	0.00	0.09	0.04
Ca	0.59	0.04	0.16	0.03	0.21	0.11	0.11	0.06	0.05	0.05	0.02	0.06	0.07	0.02	0.02	0.06	0.03
Na	0.42	0.90	0.82	0.96	0.79	0.89	0.75	0.91	0.94	0.92	0.97	0.88	0.94	0.99	0.98	0.88	0.93
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
Sum	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Jd	8.20	92.62	74.73	96.43	60.80	84.94	83.44	48.50	50.45	59.22	75.97	87.17	70.88	79.55	77.24	77.08	84.61
WEF	58.37	7.38	17.92	3.57	22.90	10.64	13.66	8.83	6.55	7.58	3.54	9.83	10.42	3.45	2.37	11.62	4.89
Kos	16.55	0.00	0.50	0.00	16.30	3.90	2.90	37.60	34.90	33.20	18.60	3.00	18.70	17.00	17.50	11.30	10.50
Ae	16.88	0.00	6.85	0.00	0.00	0.52	0.00	5.07	8.11	0.00	1.90	0.00	0.00	0.00	2.89	0.00	0.00

[†]FeO is total iron. The clinopyroxene formulas were calculated on the basis of 4 cations and 6 oxygens. Omp=Omphacite, Jd=Jadeite.