ON ORIGIN OF THE OLIVINE INCLUSIONS FROM THE KAINSAZ CO CARBONACEOUS CHONDRITE. A. K. Lavrukhina, Z. A. Lavrentjeva, A. Yu. Ljul, and K. I. Ignatenko. V. I. Vernadsky Institute of Geochemistry and Analytical Chemistry, Russian Academy of Science, Moscow, Russia.

Olivine inclusions and chondrules of Kainsaz have been formed in a unique process of dust matter melting.

The elemental abundances of four fractions of olivine (Ol) inclusions from Kainsaz were analyzed by INAA. The inclusions of fraction A ($160 < d < 260$ µm) have Fe-Ni grains, the inclusions of fractions B ($100 < d < 160$ µm), C ($160 < d < 260$ µm), and D ($260 < d < 360$ µm) have not theirs. Table shows the everage elemental enrichment factors relative to CI chondrite (1) for each fraction and chondrules of Kainsaz (2). The enrichment factors of siderophile Co, Ni, Ir, Au and non-refractory Na in all fractions are less than 1. The factors of refractory Ca, Sc, La, Sm, Yb are comparative with the corresponding values of Ol aggregates of Allende CV (average 4.76) (3). For chondrules of Kainsaz these values are lower. Fraction A is enriched in Co, Ir, Au relative Ni and CI chondrites: Ir > Au > Co. The values of $(Me/Ni)_{inc}/(Me/Ni)_{CI}$ are equal to 3.25 for Ir, 2.1 for Au and 1.2 for Co. The superabundances in Ir and Au relative to Ni witness to formation of Fe-Ni grains of Ol inclusions by agglomeration of grains enriched in refractory metal with grains enriched in non-refractory metal (Au). The enrichments of fraction A in Ca, Sc, La, Sm, Yb witness about presence of high-temperature phases in Ol inclusions.

Ol inclusions with Fe-Ni grains are like to lithic PO and POP chondrules of Kainsaz in accordance with abundances of various volative elements Ca, Cr, Fe, Au, but differ from them in low abundances of Na, Sc, Co, Ni, Ir (also of various volatilities). Such regularities can not be as result of successive condensation of these elements from solar gas. Hence Ol inclusion with Fe-Ni grains are, lake to lithic chondrules, partial melt agglomerates of different temperature mineral phases.

The elemental enrichment factors of Ol inclusions without Fe-Ni metal (fractions B, C, and D) are less than 1, with exceptions of Sc, Cr, and Eu (in fraction C). Co and Ni are very depleted. The abundances of non-refractory elements Na, Co, Eu, Au are increased and of refractory elements Sc, Sm, Ir are decreased with increasing of grain sizes. The contents of Na, Ca, Co, Ir are essentially less than those in lithic and droplet PO and POP chondrules of Kainsaz (2). The contents of Sc in fraction B, and Cr, Fe in all fractions lie in limits their values of these chondrules. The model of REE in fraction B is flat. The ratios between siderophile elements in Ol inclusions without Fe-Ni grains differ from those of Ol inclusion with Fe-Ni grains. Thus the ratios of $(Co/Ni)_{inc}/(Co/Ni)_{CI}$ are equal to 0.02 for former and 0.01 for the latters. This value corresponds

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Table. Average element enrichment factors of olivine inclusions and chondrules of Kainsaz

Element	A	B	C	D	Chondrules (2)
Na	0.66	0.41	0.57	0.67	1.13
Ca	3.1	0.96	<1.10	0.96	3,85
Sc	1.43	1.93	1.68	1.31	2.36
Cr	0.95	1.03	1.17	1.20	1.13
Fe	0.55	0.74	0.75	0.86	0.83
Co	0.31	0.23	0.31	0.35	0.74
Ni	0.25	0.12	0.17	0.16	0.68
La	5.96	0.85	<1.27	0.85	3.67
Sm	5.0	0.80	<1.36	0.54	3.58
Eu	<7.17	0.95	1.53	<1.79	2.51
Yb	5.9	0.98	<1.84	0.98	3.40
Lu	<7.5	0.75	<4.1	<2.5	3.0
Ir	0.80	0.68	0.47	0.23	1.32
Au	0.52	0.24	--	0.81	0.73

to the same of metal condensate from solar gas at $T \leq 1460$ K and $p=10^{-3}$ atm (4). The increasing of Co/Ni ratios in metal condensates had been found by us (5) at vacuum recondensation of metal streams, formed by heating of iron meteorite Sikhote Alin spieces at 1600°C. Obviously Ol unclusions of fractions B,C,D content submicron Fe-Ni grains condensated from gas which in chondrule formation process had formed (6). The decreasing of $(Ir/Ni)_{inc}/(Ir/Ni)_{CI}$ from 5.8 to 1.4 and increasing of $(Au/Ni)_{inc}/(Au/Ni)_{CI}$ from 2.0 to 5.1 and also of non-refractory element contents with grain size increasing of Ol inclusions can be explained by the model (7), according which large Ol inclusions, also as large chondrules, from small ones have been formed. This process are accompanied by capture of fine dispersical matter, enriched in non-refractory and depleted in refractory elements.

Thus the above-mentioned data support an idea what Ol inclusions and chondrules of Kainsaz have been formed in a unique process of dust matter melting. The compositions of these matters were changed at the expence of increasing of low-temperature matter contents in succession: Ol unclusions with Fe-Ni grains < lithic and droplet PO and POP chondrules < Ol inclusions without Fe-Ni grains.

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