REE IN CAI's OF THE EFREMOVKA CHONDRITE. A.A.Ulyanov, and G.M.Kolesov. V.I.Vernadsky Institute of Geochemistry and Analitical Chemistry, USSR Academy of Sciences, Moscow, USSR.

Fifteen samples of Ca,Al-rich inclusions (CAI's) in the Efremovka chondrite (C3V) and mineral separates of melilite and Ti,Al-pyroxene from the sample E38 (Type B2 CAI) were analyzed by INAA for the REE, Na, K, Ca, Mn, Fe, Co Ni, Sc, Ta, Au, Ir, and Os.The most samples of CAI's exhibit unfractionated or almost unfractionated chondrite-normalized REE patterns with uniform or almost uniform enrichments in REE, 15-30 times over the average Cl-abundances (Fig. 1). However some inclusions exhibit extremely fractionated REE pattern either with enrichment in light REE, 5-10 times relatively to heavy REE (Fig. 2), or - inversely - with enrichment in heavy REE, 2-3 times relatively to light REE (Fig. 3). Sample E60 (Type B2) shows positive Eu and positive Yb anomalies (2-3 times over in other REE). The chondrite-normalized REE patterns do not correlate with texture-mineralogical types of CAI's. For example, mineralogical and texture similar CAI's belonging to Type B show different REE patterns - from unfractionated (E38) to extremely fractionated in different manner (E48 - monotonic 3 times depleted in heavy REE over light REE, and E60 - positive Eu and Yb anomalies with almost uniform enrichment in other REE relatively to average Cl-abundances), and vice versa - mineralogical and texture different Types A, and B, and unclassifed CAI's show sometimes similar chondrite-normalized REE patterns (see Fig. 1-3). This may indicate on the inhomogeneity in the distribution of REE within the CAI-forming parts of the nebula on the background of rather homogenous distribution of major elements. The chondrite-normalized REE patterns in the CAI's of the Efremovka are very different from ones of the Allende. The chondrite-normalized REE patterns in the CAI's of the Efremovka show the monotonous change in REE abundances, but positive Eu and positive Yb anomalies, which are often presented in the Allende meteorite's CAI's (1), in the Efremovka chondrite's CAI's were found very seldom.

Efremovka's CAI's show 20-30 times enrichment in refractory elements relatively to average Cl-abundances, moreover enrichment in refractory elements is correlated with condensation temperature of the elements.

Co-existence melilite and Ti,Al-pyroxene (Tpx) from the sample E38 (Type B2, CAI) were analyzed by INAA also (Fig. 4). CAI E38 is large oval-shaped inclusion consisting of melilite and Tpx with poikilitic spinel grains. REE pattern of Tpx is U-shaped with depletion in La-Nd interval, unfractionated pattern in Nd-Dy interval and enrichment in Dy-Lu interval. Chondrite-normalized REE pattern of the melilite exhibits monotonous severaly depleted in the heavy REE over light REE with the superposition of the positive Eu anomaly. Pyroxene/melilite ratio pattern for the sample E38 is in a good agreement with those for the CAI's of the Allende meteorite. However absolute magnitude of D(Tpx/Mel) for REE in the sample E38 in 1,5-2 times smaller those calculated by dividing pyroxene/liquid concentration ratio

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for augite by the experimental melilite/liquid ratio (1); thus aparently in this case the pyroxene and the melilite are not in chemical equilibrium in respect to REE distribution.

REFERENCES: 1. Nagasawa et al., 1977, GCA, 41, 1587.
2. Anders E., and Ebihara M., 1983, GCA, 46, 2363.

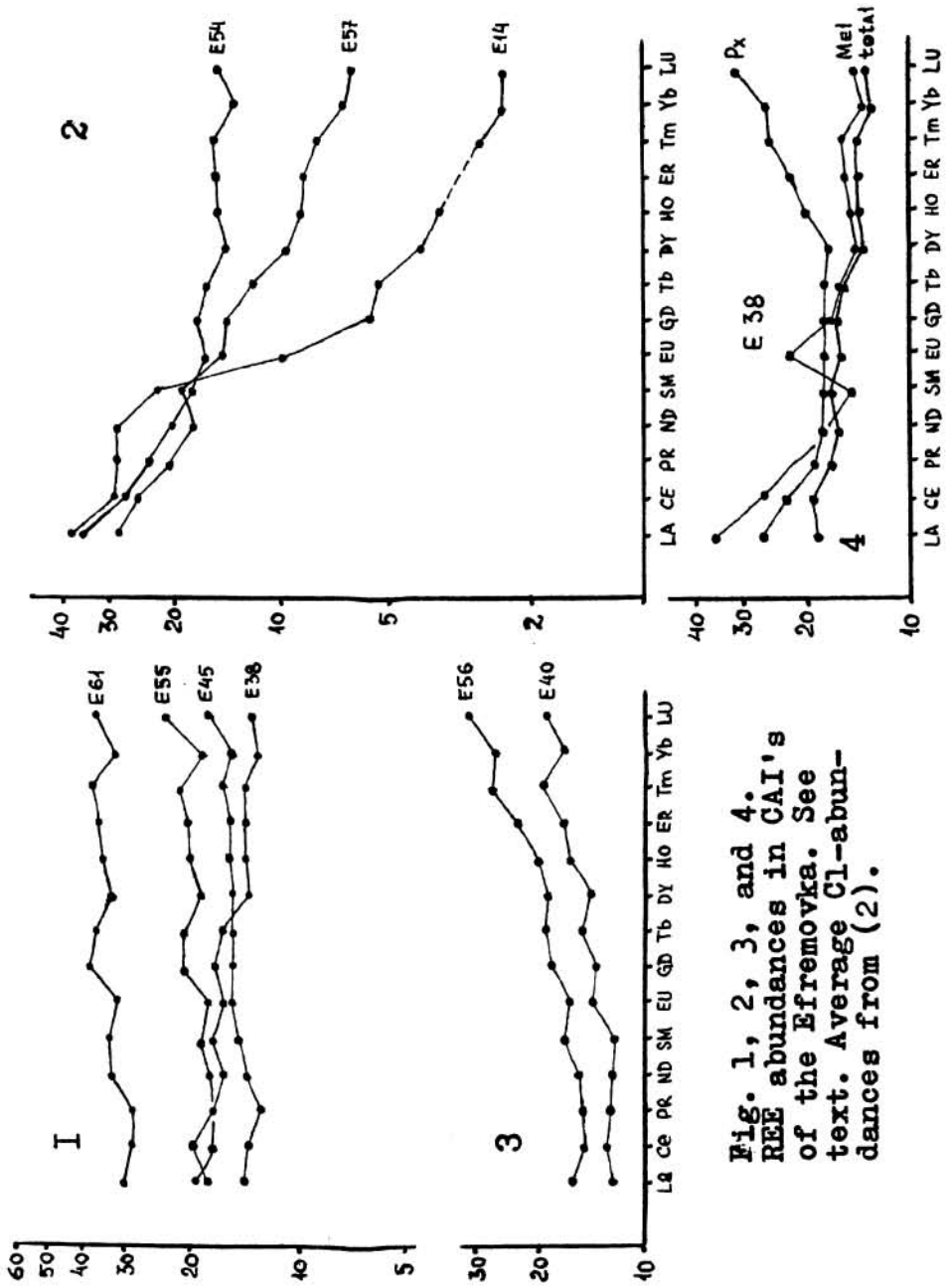

Fig. 1, 2, 3, and 4. REE abundances in CAI's of the Efremovka. See text. Average CI-abundances from (2).