

# The composition of solutions formed fluorite-leucophanite-melinophane-eudidymite ores of Ermakovka beryllium deposit (West Transbaikalia, Russia)

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Ermakovka F-Be deposit which located in the Transbaikalia is characterized by the highest average grade of BeO (1.3%) in the world. Main ores of deposit are the massive phenakite-bertrandite-fluorite ores which were formed via infiltration-metasomatic replacement of fissured limestones by the Be-bearing, F-rich solutions. However beryllium ores in this deposit have different mineral types which differ from each other in abundance, grade, mineral assemblages and morphology.

Fluorite-leucophanite-melinophane-eudidymite ores form relatively small ore body and have a specific composition (fluorite, phenakite, eudidymite, melinophane, leucophanite, albite, calcite, in small amounts apatite, bavenite, helvite, phlogopite are present). Formation of eudidymite and melinophane/leucophanite is the result of phenakite replacement, which related to increasing of sodium and reducing of beryllium activities in the solutions.

Primary fluid inclusions (FI) in fluorite are studied. They have a three-phase composition: gas + water solution + calcite crystal. The size of these inclusions varies from 15 to 35  $\mu\text{m}$ . Based on the complex of thermobarogeochemical methods are observed that these ores are formed by high-F and low-salinity (4-11% equiv. NaCl) alkaline hydrothermal solutions without  $\text{CO}_2$ . Ore deposition occurs in the temperature range from  $\geq 320$  to  $136^\circ\text{C}$  and pressures about 5-77 MPa by means of the solution cooling. ). Using LA-ICP-MS in the analyzed fluid inclusions increased contents of the following elements: Li, Be, Na, Mg, Al, Fe, Cu, Zn, Nb, Mo, Ag, Sn, W, Pb are determined. Be content in the ore-forming solutions is close to Be content in solutions forming main phenakite-bertrandite-fluorite ores.

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