

The metal contents of solutions formed fluorite-leucophanite-melinophane-eudidymite ores of Ermakovka beryllium deposit using LA-ICP-MS (West Transbaikalia, Russia)

L. DAMDINOVA¹, B. DAMDINOV¹, N. BRYANSKY²

¹ Geological Institute SB RAS, Ulan-Ude, Russia, ludamdinova@mail.ru, damdinov@mail.ru

² Institute of Geochemistry SB RAS, Irkutsk, Russia tridigron@yandex.ru

Ermakovka F-Be deposit which located in the Transbaikalia is characterized by the highest average grade of BeO (1.3%) in the world. 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 very rare 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 were studied. They have a three-phase composition: gas + water solution + calcite crystal. Inclusion sizes varies from 15 to 35 μm . 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 CO₂. Ore deposition occurs in the temperature range from ≥ 320 to 136°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 such elements: Li, Be, Na, Mg, Al, Fe, Cu, Zn, Nb, Mo, Ag, Sn, W, Pb are determined. Be content (0.0002-1.04 g/kg) in the ore-forming solutions is similar to Be content in solutions forming main phenakite-bertrandite-fluorite ores (0.06-3.82 g/kg).

This work was supported by RFBR grant: № 14-05-00339-a.