

Reasons of different ore mineralization in rare-metal granites

Badanina, Elena¹ Volkova, Elena¹ Syritso, Ljudmila¹ Natalia, Malysheva¹

¹State University of St.-Petersburg, University emb.7/9, St.-Petersburg, Russia

Formation of various ore mineralization in very similar in composition peraluminium rare-metal granites represents rather actual problem by the volatile-rich granite systems investigation. This problem can be solved on the basis of experimental modelling and melt inclusion study. Especially perspective is study of origin of massive-satellite with a various ore mineralization within uniform intrusion. Khangilay ore unit in East Transbaikalia is considered as model object. There are two satellites of biotite granites massifs: there are Orlovka massif of Li-F granite with columbite-tantalite and microlite ore mineralization (a Ta deposit) and Spokojnoje massif with W- and Be-mineralization (a tungsten deposit). Studying of distribution of rare elements in the rocks shows that during differentiation in both massifs there is a progressive synchronous accumulation of Ta, Nb and W. Contrast differences consists in levels of their concentration. So, in the Orlovka massif the W concentration increases only with 5,6 up to 14 ppm, Ta from 7,2 up to 443 ppm while in Spokojnoje massif the W concentration reaches four orders, and the Ta concentration only 18 ppm. About the high potential of W in the Orlovka magmatic chamber argue the huge halo of W carrying out in wall rocks. Albite-topas-zinnwaldite metasomatites zones with abnormal high concentration of W (up to 1784 ppm) are formed on the endocontact of massif. Stockwork of quartz-tungsten veins (ferberite deposit) as well dayks of amazonite granites (situated in wall rocks) with high W concentration in (up to 680 ppm) were observed.

What is interferes with tungsten crystallization and, on the contrary, promotes crystallization of columbite-tantalite mineral group in Li-F granites? Interpretation of this phenomenon was possible on the basis of studying of silicate melt inclusions and an estimation of solubility accessory minerals directly in natural melts. For the first time the parameters of columbite-tantalite and wolframite solubility are estimated for a melt level of Li-F granites. It was shown, that the level of wolframite saturation is not reached there. This circumstance defines process progressive W accumulation in residual melt and following its carrying out from a massif by fluid-hydrothermal substance at a postmagmatic stage.

