

Geochemical specifics of ore mineralization of pegmatites in Mongolia Altai

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The pegmatite belt of the Mongolia Altai is referred to the largest ore belts of Central Asia. The belt within Western Mongolia is traced on the southern slope of the Mongolia Altai Ridge by almost 600km. Belt pegmatites are spatially and genetically related to double-mica granites of the collision period and are referred to the middle-depth rare-metal formation. Beryllium – niobium and rare-earth – uranium mineralization is typical for them in the western part of the belt. Moreover, titanium has served as another leading mineral forming element of the accessory ore component during the whole period of evolution of these pegmatites up to the final stage. Titanium minerals (ilmenite and ilmenorutile) were the first ones to form in the course of crystallization of pegmatite solutions; then niobium ferro- and manganocolumbite with visible titanium impurity (up to 9% wt. of TiO_2) appeared. The process was completed by occurrence of yttrobetafite - (Y), lead bearing tantalbetafite and lead bearing uranium microlite with a high content of rare earths and uranium. In addition to the specified elements, wolfram (up to 1-5% wt. of WO_3) and lead in the end of development serve as constant impurities in accessory minerals of niobium and tantalum. From the crystallochemical standpoint, wireframe minerals of d-elements in the group of listed phases are replaced by stratified minerals of the same d-elements in the process of crystallization, and the process is completed by crystallization of wireframe oxides of p- and s-elements. Such evolution of accessory minerals of pegmatites reflects directed change of acidic-alkaline conditions with increase of alkalinity by the end of the vein development process.