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Enigma of lamprohyres

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Till now lamprophyres are 'the camera obscure' in petrology. There is no the complete agreement about the origin, classification, genetic links and their role in the ore formation processes yet. Traditionally ca-alkaline lamprophyres associated with the diorites, syenites and granitoids. But modern studies show the geochronological, geochemical and isotopic evidences of the genetic links between lamprophyres and carbonatites (Woodard, 2010;.Coulson et al., 2003) and as a consequence the formation of REE-ore deposits. These authors explain the origin of lamprophyres and carbonatites by the different melting degrees of the metasomatised mantle. In this work we found another mechanism of their generation - the liquation of carbonate-silica melt.

Within the area of Chuya complex (South-East Altai-North-West Mongolia) the lamphrophyric dykes are distributed irregularly and create the belts or series of bodies located next to the faults of different order. We studied about 30 dykes from three different areas (South Chuya, Yustyd, Aktash) and related rocks from the Tarakhata intrusion. Very similar rock and mineral composition, close time-space characteristics allow us to suggest their comagmatic nature. In the lamprophyres of South-Chuya area there are strong petrography evidences of liquation of carbonate-silicate melt during their evolution. The ocellar structures with the ocelli composed by the silicate mineral and inter globule material represented by carbonates with ore and other nonmetallic minerals. One of them is Ba-celestine which compiles the intergranular space, veinlets and pseudomorphoses after the silicates. It associates with the apatites, quartz, chlorite, carbonates (calcite and dolomite) and oxides (magnetite, goethite, chromite etc).

The multi-element and rare-earth diagrams of all investigated rocks are equal in the form, at the position of HFSE minima, high La/Yb and Gd/Yb relations, except the Ba and Sr anomalies. In the graphs of the south-chuya area rocks, where Ba-celestine was found, marked Ba and Sr minima. Accordingly this fact Ba and Sr couldn't be brought into the system. And Ba-celestine is the residual sign of the segregated liquid, enriched in Ba, Sr, Ca P.

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