



## **Physico-chemical conditions of crystallization of the Guli ultrabasic massif (North Part of the Siberian Platform): evidence from melt inclusions**

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Conditions of formation of the Guli ultrabasic massif (Maimecha Kotui Province in the North Part of the Siberian Platform) attract attention of numerous researchers. For the solution of genetic problems of various rocks from this ultramafic complex the data on melt inclusions in minerals has been earlier used (Sokolov et al., 1999; Rass, Plechov, 2000; Sokolov, 2003; Panina, 2006). At the same time, formation of dunites, occupying the main volume of the Guli massif, remain almost not considered by means of thermobarogeochemical methods and the role of magmatic processes in this case is not ascertained. As a result of melt inclusions study in the Cr-spinel the new data on physical and chemical parameters of dunite crystallization in the Guli ultrabasic massif was obtained.

On the ratio  $(\text{Na}_2\text{O} + \text{K}_2\text{O}) - \text{SiO}_2$  the majority of analyses of glasses and calculated compositions of inclusions settle down in the field of subalkaline series. On the diagram  $\text{MgO} - \text{SiO}_2$  bulk chemical compositions of inclusions (with the magnesium content of 19-28 wt. %) correspond to picrites and picrite-basalts. They are in close association with the data on inclusions in the Cr-spinel from dunites of Konder (Siberian Platform) and Nizhnii Tagil (Ural Mountains) platinum-bearing ultrabasic massifs and also are situated near to the field of inclusions in the olivine phenocrysts from meimechites (Maimecha Kotui Province in the North Part of the Siberian Platform). Similarity of melt inclusions in the Cr-spinel from the dunite of the Guli massif and in the olivine from meimechites is established on the variety of petrochemical components -  $\text{Al}_2\text{O}_3$ , CaO, Na<sub>2</sub>O, K<sub>2</sub>O. The calculated compositions of inclusions from dunites coincide mostly with the data on inclusions from meimechites, while glasses of inclusions from Cr-spinel contain less titan and magnesium. As a whole for the melts of the Maimecha Kotui Province (that form both dunites of the Guli massif and meimechites) much higher contents of  $\text{TiO}_2$  (from above 2.7 wt. %) are characteristic in comparison with magmatic systems of the platinum-bearing ultrabasic massifs of Ural and Siberia. Our computer simulations on the basis of melt inclusion compositions by the PETROLOG program package (Danyushevsky, Plechov, 2011) show the high crystallization temperature of olivines from dunites of the Guli massif in the intrusive chamber - 1590-1415 °C. Formation of the Cr-spinels occurred also at high parameters - 1405-1365 °C. These temperatures correspond to established earlier temperature interval of crystallization of olivines from meimechites - 1600-1420 °C (Sobolev et al., 1999, 2009).

As a whole, the melt inclusions study in the Cr-spinel directly testify to formation of dunites from the Guli massif from high magnesia melt, relative on its petrochemical composition and high-temperature characteristics to meimechite magma. Consecutive evolution of composition of magmatic systems is established during intra-chamber crystallization of dunites from picrite-meimechite to picrite-basalt and basalt melts.

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