

## Mantle-derived garnet peridotites within Anrakhai metamorphic complex (Southern Kazakhstan)

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In the structure of Anrakhai complex mafic-ultramafic rocks, assigned as a rule to NE part of the complex, are occurred. These rocks make up rather small boudines (up to 2 m in average) among Qtz-Fs paragneisses of various mineral composition and consist of mainly serpentinites (after dunites) and antigorite schists. Rare mentioned melanocratic rocks form large blocks (for about 100 m), characterized by unhomogeneous composition: in central parts of these blocks garnet peridotites are present while outer parts are composed by serpentinites. Observed garnet peridotites possess quite well-preserved mineral assemblages of mantle origin, namely Grt, Spl, Ol, Opx and Cpx.

Garnet peridotites of Anrakhai complex correspond to moderate-high aluminiferous low-alkali tholeiitic picrites ( $K_{Al}$  varies from -0.1 to 0.2;  $SiO_2 = 37.7 - 39.3$  wt.%;  $MgO = 26.4 - 36.5$  wt.%;  $\Sigma Na_2O + K_2O = 0.19 - 0.75$  wt.%). The rocks are highly replaced by mineral aggregates of serpentine group, however initial mineral assemblages of garnet peridotites reveal representative compositions, indicating their primary mantle derivation. Thus Grt contains vast amount of MgO (Prp<sub>55</sub>) and Spl is characterized by high Cr<sub>2</sub>O<sub>3</sub> content (Chr<sub>23-27</sub>) against relatively low FeO<sub>tot</sub> content (Mag<sub>22-26</sub>). Crystals of olivine are intensively altered by Ni-bearing lizardite (up to 18 wt.% of NiO); interior of Ol shows high content of MgO (Fo<sub>85-87</sub>) as well as NiO (0.23 – 0.27 wt.%). Opx, surrounding olivine as a rim, is represented by En<sub>86-88</sub>; in doing so in several analysis raised content of Cr<sub>2</sub>O<sub>3</sub> = 0.29% is remarkable. Cpx is characterized by low FeO<sub>tot</sub> content (2.9 – 4.4 wt.%) against MgO (16.1 – 17.1 wt.%); extremely low content of Na<sub>2</sub>O in Cpx (0.15 wt%) is common for investigated garnet peridotites. Groundmass of the rocks apart from serpentine group minerals consists of amphibole of low-ferriferous edenite composition with conspicuous Cr<sub>2</sub>O<sub>3</sub> (up to 0.33 wt.%) and MgO (18.5 wt.%) contents.

In general, according to obtained characteristics of mineral and chemical compositions garnet peridotites represent primarily mantle-originated cumulates of Mg-Cr type in contrast to initially crust-derived and subsequently buried to UHP-HP fields peridotites of Fe-Ti type [1].

[1] Carswell (1983) *Bull. Minéral.* **106**, 727-750