

**A NEW OCCURRENCE OF DIAMONDIFEROUS ROCKS IN
KOKCHETAV MASSIF (NORTHERN KAZAKHSTAN)**

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Three localities of diamondiferous metamorphic rocks have been known in the Kokchetav massif until the present time (SHATSKY & SOBOLEV, 2003). The new locality of diamondiferous rocks which represents a new type was discovered two km west of the Barchi Lake. Eclogite, garnet-kyanite-biotite gneisses, garnet-kyanite micaschists, garnet-clinopyroxene and carbonate rocks occur within this area. Relatively poor outcrop conditions did not allow to present more precise information about the structural settings. Garnet-kyanite-biotite gneisses and schists occur within granite-gneisses. In addition the diamondiferous gneisses are characterized by quartz, phengite and potassic feldspar. Microdiamonds are widely scattered as inclusions in kyanite, garnet and zircon, and are predominantly of cubo-octahedral or octahedral morphology. Diamond size varies from 2 to 40 μm. In the rock matrix graphite flakes appear. In some cases abundant graphite was observed as inclusions in kyanite cores succeeded by diamond in kyanite rim.

Garnets from all samples show chemical zonation patterns. Ca content increases and Fe decreases from core ($Gr_{S_{7.7}}Py_{R_{22.3}}Alm_{70}$) to rim ($Gr_{S_{23.6}}Py_{R_{20}}Alm_{56.4}$).

Garnet-kyanite-biotite gneisses are characterized by high alumina content (up to 19%) in contrast to diamondiferous rocks of Kumdy-Kol deposit. They are enriched in LREE with a negative Eu anomaly and relatively flat HREEs. According to Zr/Hf (37.8 - 40.4), Nb/Ta (11.8 - 14.5), Sm/Nd (0.17 - 0.26) the gneisses are close to upper continental crust. Diamondiferous rocks are depleted in Sr compared to upper crust composition.

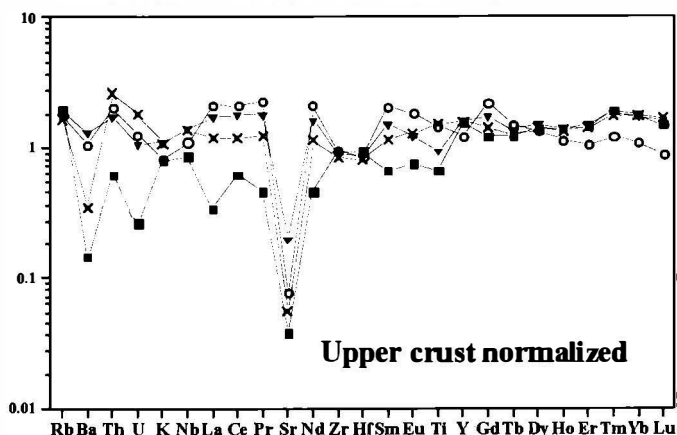


Fig. 1. Multi-element plot of the composition of the garnet-biotite-kyanite gneisses

References

SHATSKY, V. S. & SOBOLEV, N. V. (2003): EMU Notes in Mineralogy, 5, 75-103.