Geophysical Research Abstracts
Vol. 21, EGU2019-939-1, 2019
EGU General Assembly 2019

Crustal xenoliths from Devonian igneous rocks of the Pripyat rift: mineralogical and geochemical features and their relation to the Fennoscandia–Sarmatia Junction Zone

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Devonian igneous rocks from the Pripyat rift contain crustal xenoliths of various rocks. The studied xenoliths were taken from boreholes in the Zlobin field (the Pripyat rift marginal zone), the Uvarovichi paleovolcanoes area (intermediate rift zone) and the Gomel Structural Dam (axial rift zone). Host rocks of xenoliths are alkaline ultramafic lamprophyres, alkaline picrites, picrobasalts, alkaline basalts and trachytes, which intruded the crystalline basement structures of the East European Craton from the Fennoscandia–Sarmatia junction zone: 1) the Osnitsk-Mikashevichi Igneous belt for the Zlobin field and 2) the Bragin Granulite Domain for the Uvarovichi paleovolcanoes area and the Gomel Structural Dam (Makhnach et al., 2001).

The crustal xenoliths can be divided into several groups based on petrographical data: biotite-garnet gneisses, garnet-clinopyroxene-plagioclase granulites, metagabbroids and granites. Porphyroblastic biotite-garnet gneisses by the distribution of major and trace elements are similar to high-alumina metasedimentary gneisses of Kulazhin series (Paleoproterozoic?) of the Bragin Granulite Domain (Aksamentova, Tolkachikova, 2014). Heteroblastic biotite-garnet gneisses have a negative Eu anomaly and abundant magmatic zircons, which indicate their igneous nature. Garnet-clinopyroxene-plagioclase granulites have a positive Eu anomaly and a negative Nb-trough, for which a subduction origin was proposed (Marckwick et al., 2001). Our P/T estimations show 670 °C and 1 GPa by garnet-clinopyroxene-plagioclase-quartz equilibria (Newton, Perkins, 1982) and 775-791 ° by ternary feldspar geothermometry (Wen, Nekvasil, 1994), corresponding to lower crustal depths.

Trace elements patterns of these granulites are similar to the same for metagabbro xenoliths. The metagabbro xenoliths also fall in MORB fields of various trace element discrimination diagrams. . The granite trace elements pattern shows strong conformity with trace elements patterns of the Osnitsk-Mikashevichi Igneous belt granitic rocks (Shumlyanskyy, 2014).

Thereby the studied xenoliths have diverse protoliths, sources, P-T parameters and indicates complex structure of crystalline basement of the Pripyat rift.

The study was conducted according to the project No. 17-05-00534.

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