



Mantle xenocrysts of Chompolo field of the alkaline volcanics, Aldan shield, South Yakutia.

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New mineralogical and chemical constraints for 10 dikes, veins (360-800m) and pipes (60-110 m) of Chompolo field discovered in 1957-1958 are discussed. Feld is located within Central Aldan Archean and Paleoproterozoic granulite-orthogneiss superterrane of Aldan-Stanovoy Shield, with peak of metamorphism - 2.1-1.9 Ga (Smelov, Timofeev, 2007).

Originally (Shilina and Zeitlin 1959) and later (Kostrovitsky and Garanin 1992, Ashchepkov, Vladykin et al. 2001) these rocks were classified as kimberlites by mineralogy including pyrope, Cr spinel, and Cr diopside. Panina and Vladykin (1994), Davies et al. (2006) identified them as lamprophyres and lamproites.

The age of Chompolo rocks is pre-Jurassic (Vladimirov et. al., 1989) dated by $^{40}\text{Ar}/^{39}\text{Ar}$ as 164.7 ± 1 Ma (233.7 ± 2.2 next plato)(unpublished Ashchepkov). The Rb-Sr isochron for lamprophyre "intrusions 104" indicate later age of 131 ± 4 Ma (Zaitsev, Smelov, 2010).

Magmatic bodies (Aldanskaya, Sputnik, Gornaya, Ogonek, Perevalnaya, Kilier-E) were studied during 2012-2013 fieldworks.

Most of igneous rocks occur as inequigranular volcanic breccias with micro- or crypto-crystalline groundmass of K feldspar (up to 16.3 wt.% K_2O , up to 3.2 wt.% FeO), chlorite, opaque minerals, melanocratic xenocrysts and phenocrysts (garnet, pyroxene, amphibole, Cr spinel, apatite, zircon, mica), and abundant xenogenic fragments of wallrock and crystalline basement.

Garnet chemistry records the presence of mantle and crustal material. Mantle garnets lack the common megacryst, wehrlite, and high-temperature lherzolite varieties. Mantle mineralization prevails in the Aldan dike and the Sputnik, Gornaya, and Ogonek pipes, while crustal and eclogitic material is in the Perevalnaya and Kilier-E pipes. The Cr spinel consists of (in wt%) 3.5 to 50.9 Al_2O_3 , 18.6-63.5 wt% Cr_2O_3 , 6.1 to 19.1 MgO, and 0 to 1.61 TiO_2 . Al and Cr in spinels are in inverse proportion.

The Chompolo alkaline volcanic rocks are most similar to the Central Aldan lamproites in trace-element compositions. Anomalously low HFSE (Nb, Ta, Ti), low HREE, and high La/Nb ratios in multi-element spectra indicate high oxygen fugacity and possible crustal contamination (or influence of fluids).

Cpx thermobarometry (Nimis et al., 2001) indicate a lithospheric thickness beneath Chompolo field > 130 km (4.1 GPa) supported by P38 monomineral garnet barometer (Grütter et al., 2006).

We infer that the Chompolo alkali volcanic rocks are not kimberlites but rather low-Ti alkaline rocks similar to those in the Aldan province. Unlike the Aldan lamproite (Tobuk-Khatystyr field, etc.), the Chompolo rocks contain both crustal and mantle minerals. The compositions of pyrope and Cr spinel, as well as thermobarometry estimates of lithospheric thickness at the time of magmatic activity, indicate that the Chompolo rocks are diamond-barren. RFBR 15-05-04885.

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