

## GARNET-PYROXENITE-DERIVED END-MEMBER MAGMA TYPE IN KAMCHATKA: THE CASE OF THE KEKUKNAISKY VOLCANO

Nekrylov<sup>1,2</sup>, N., Popov<sup>3</sup>, D. V., Plechov<sup>1,4,5</sup>, P. Yu., Shcherbakov<sup>4</sup>, V. D., Danyushevsky<sup>6</sup>, L. V., Dirksen<sup>7</sup>, O. V.

<sup>1</sup> Fersman Mineralogical Museum RAS, Moscow, Russia

<sup>2</sup> Institute of Experimental Mineralogy RAS, Chernogolovka, Russia

<sup>3</sup> Department of Earth Sciences, University of Geneva, Geneva, Switzerland

<sup>4</sup> Geological Faculty, Moscow State University, Moscow, Russia

<sup>5</sup> Vernadsky Institute of Geochemistry and Analytical Chemistry RAS, Moscow, Russia

<sup>6</sup> School of Earth Sciences, University of Tasmania, Hobart, Australia

<sup>7</sup> Institute of Volcanology and Seismology FEB RAS, Petropavlovsk-Kamchatskii, Russia

Kekuknaisky is a dormant polygenic volcano in Sredinny Range of Kamchatka. It consists of the main edifice and multiple late-Quaternary monogenetic cones, few of which are postglacial and their tephra deposits are preserved in the soil-pyroclastic cover. These tephra deposits contain fresh quenched olivine (up to Fo85) with glassy melt inclusions, which were studied in detail in (Nekrylov, et al. 2018).

Geochemical features of the studied olivine phenocrysts and melt inclusions in them, as well as previously published composition of the related lavas (Koloskov, et al. 2011; Volynets, et al. 2010) suggest that these rocks are derived from a garnet-bearing pyroxenite source. Composition of olivine phenocrysts (high Ni and low Mn content) suggests that studied samples are products of melting of pure pyroxenite (e.g., Sobolev, et al. 2007). This conclusion is further supported by geochemistry of the reconstructed melts and related lavas, which have high FC3MS values (Yang and Zhou 2013). Elevated LREE/HREE ratios suggest that these pyroxenites contained garnet.

This garnet-bearing pyroxenite likely originated from the lower crust or lithospheric mantle. Its melting could have occurred due to delamination and sinking into the hotter mantle.

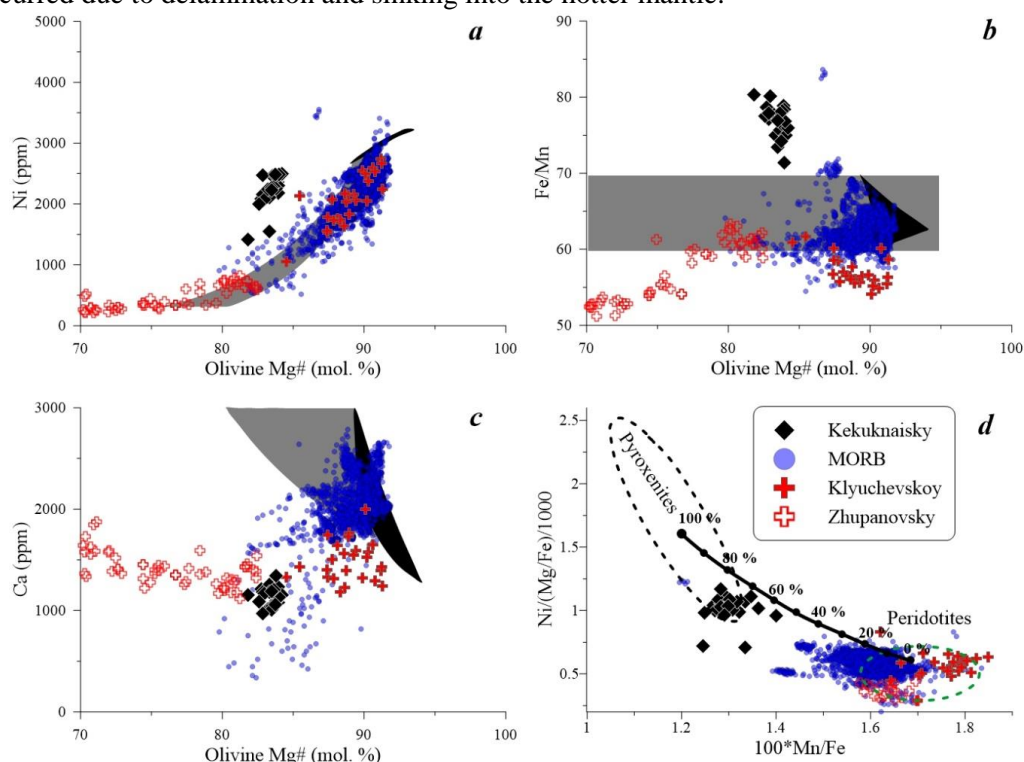


Figure 1: Composition of olivine from tephra deposits of the Kekuknaisky field in comparison with experimental data on peridotite and pyroxenite melting (Herzberg, 2011; Sobolev et al., 2007) olivine from MORBs (Sobolev et al., 2007), Klyuchevskoy (Mironov, et al. 2015) and Zhupanovsky (Plechova, et al. 2011) volcanoes. Black and grey fields on “a”, “b” and “c” show composition of olivine in equilibrium with peridotite-derived melts and products of their evolution, respectively.

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