

Hydrated mantle beneath Arkhangelsk diamondiferous province

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Peridotite xenoliths from V.Grib kimberlite pipe (Arkhangelsk diamondiferous province, Russia) have been studied in order to identify metasomatic alteration and water enrichment. The samples are divided into two groups: garnet lherzolites and phlogopite-garnet lherzolites. The calculated equilibration temperatures [1] for studied lherzolites vary from 790 to 1020 °C (Fig.1). Olivines from garnet lherzolites are characterized by higher Mg# 92.2-92.6 compared with olivines from phlogopite-bearing xenoliths (Mg# 90.9-91.5). Water content in olivines decreases with increasing magnesium number Mg#. This correlation were not previously observed in olivines from peridotites of Udachnaya kimberlites (Yakutia, Russia), where high- and low-temperature trends differ by water content [2]. The higher water content are found in olivines from low-temperature phlogopite-garnet lherzolites from V.Grib pipe, 39-84 ppm. Higher amounts of water in phlogopite-garnet lherzolite may indicate an enrichment caused by phlogopite metasomatism.

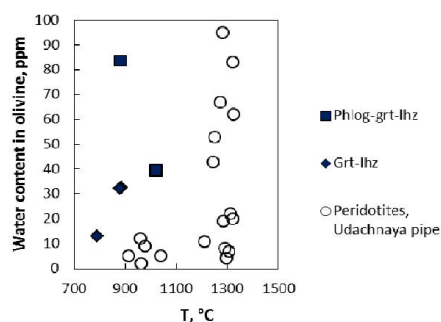


Figure 1. Olivine water content vs. temperature calculated using [1].

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[1] Brey and Koehler (1990) *J.Petrol.*, 31, 1353-1378

[2] Kolesnichenko et al. (2017) *Gondwana Res.*, in press.