Low water content in eclogite xenoliths from kimberlite pipe Udachnaya, Yakutia

MARIIA KOLESNICHENKO[1]*, DMITRIY ZEDGENIZOV[1,2], ALEKSEY RAGOZIN[1,2], KONSTANTIN LITASOV[1,2]

[1]V.S. Sobolev Institute of Geology and Mineralogy SB RAS, Novosibirsk, Russia (*correspondence: m.kolesnichenko@igm.nsc.ru)

2Novosibirsk State University, Novosibirsk, Russia

Water plays a key role in evolution and dynamic of the Earth. Water could change physical and chemical properties of mantle minerals, or the part of the mantle, for instance, the effect on mineral deformation and its impact on mantle rheology [1]. Kimberlites are one of the most important objects for research because they carry mantle xenoliths to the surface. Although, the mantle contains small amounts of eclogites, this rocks are the valuble components in the processing of the material between the crust and upper mantle of the Earth (e.g., subduction and exhumation of ultrahigh-pressure metamorphic rocks).

We have studied representative collection of the 25 relatively fresh xenoliths of eclogites. The studied eclogites are bimineralic and contain 40-70 % clinopyroxene (Cpx) and 30-60 % garnet (Grt). Cpx and Grt show wide range of compositions. Clinopyroxenes are characterized by Na_2O (1.66 – 7 mas.%) and Al_2O_3 (1.9 – 15.26 mas.%) contents and Mg#=73 - 91.9. In garnets almandine component varies from 19 to 48%, pyrope component - from 21 to 72%, grossular component - from 8 to 33%. All eclogites are divided into three groups by classification scheme of [2], based on MgO and Na_2O contents in Cpx.

The water in eclogites is mainly stored in omphacite (4-99 ppm); garnets do not contain measurable OH. Taking into account the volume rations of mineral phases in the studied xenoliths, the water contents in eclogites vary over narrow ranges from 2 to 55 ppm. We obtained no correlation between water concentration and temperature, pressure or composition of the rock. Low amounts of water in eclogites may be related to hydration during subduction or partial melting of the rock before kimberlite ascent. Our results confirm limited water transfer in subducted slab which closely associated with intense dehydratation process.

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[1] Miller et al. (1987) *Phys. Chem. Miner.* **14**, 461-472, [2] Taylor et al. (1989) *J. Geol.* **147**, 161-171.