

**Features of metasomatic treatment of the
Lithosphere mantle depleted peridotites in
relation with scale and diamond grade of
kimberlite magmatism**

N.P. POKHILENKO, A.N. AGASHEV, L.N.
POKHILENKO

¹ Sobolev Institute of Geology and Mineralogy, SB RAS,
Novosibirsk, Russia. chief@igm.nsc.ru

Three main cycle of kimberlite magmatism are known for the Siberian Platform (SP) to date: Middle Paleozoic (D_3), and two Mesozoic (T_{2-3} and J_3). All economic high-grade kimberlites are of Middle Paleozoic (MP) age, and this feature is related with influence of melts/fluids of Permian-Triassic Siberian Super Plume produced huge changes in structure and composition of the SP Lithospheric Mantle (LM) including its enrichment by basaltic components, thinning, increase of f_{O_2} and resorption of diamonds. Nevertheless, there are incredible differences in amounts of kimberlite bodies and their average diamond grade between different kimberlite fields of MP age, and these features are connected with intensity of carbonatite and silicate types of metasomatic treatment of the most deep-seated SP LM depleted peridotites especially of Lithosphere-Asthenosphere (LA) interaction zone. U-type lithospheric diamond formation is related with initial stage of carbonatite metasomatism, and its increase produce wehrliteization and then carbonation of initial Cr-pyropite harzburgites and dunites but not related with diamond formation. Minor scale of silicate metasomatism of these modified LM peridotites produced conditions for generation of insignificant amount of kimberlite melts which form kimberlite fields with few bodies, but significant part of them are presented by high-grade kimberlite. And in case of significant scale of both carbonatite and silicate metasomatism of the LM peridotites produce large volume of kimberlite melt and hundreds of kimberlite bodies in fields with minor amounts of high grade ones.

This study was supported by RSF Grant #17-17-01154.