

## PETROLOGY OF KOMATIITES AND COMPOSITION OF THEIR SOURCES ON THE BALTIC SHIELD

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In order to understand the geochemical and isotopic evolution of the Archaean crust-mantle system of the Baltic Shield, the geochemistry of incompatible and rare earth elements and Sm-Nd systematic of komatiites from 10 greenstone belts of Kola peninsula and Karelia has been studied. The results of geochemical and petrological computer modelling, imply that the initial magmas giving rise to komatiites of the Baltic Shield can be produced as a result of partial melting of several geochemical types of mantle source area under control of multy-variant phase relations at different P-T-F conditions. The variations in the isotopic and geochemical composition of komatiites could be explained by following petrological models:- partial melting of the undepleted [(Ce/Sm) $N$  =1, (HREE) $N$ =1] garnet peridotite (eNdT +0.3, P=4-9 GPa, F20%) and garnet-free peridotite (P=2.5-4 GPa, F30%);- 2nd stage of partial melting (F20%) of: (1) garnet-bearing residue (DM1, eNdT +2.5, (Ce/Sm) $N$  =0.8, (HREE) $N$ =0.96) of 2% 1st stage melting at P=4-9GPa and (2) garnet-free residue (DM2, eNdT +4.4, (Ce/Sm) $N$  =0.7, (HREE) $N$ =1.2) of 2% 1st stage melting at P=2.5-3GPa;- partial melting of the undepleted garnet-bearing mantle source area (eNdT +1.5), which was previously contaminated by the melt extracted from garnet-free peridotite at 2-5% batch melting. We assume that all these features could be best explained in the context of the mantle plume evolutionary model, which will be discussed. Acknowledgements This study was financially supported by RFBR (project 98-05-65596)