# Hf isotopic composition of metamorphic zircons from lower crustal xenoliths from NW Russia

KORESHKOVA, M. YU.[1] AND DOWNES, H.[2]

[1]St Petersburg State University, 199034 St Petersburg, Russia, mk6456@mail.ru

[2]Birkbeck, University of London, London WC1E 7HX, UK, h.downes@ucl.ac.uk

In the absence of geologic information, data obtained from zircon is the most important tool to investigate the geological history of xenoliths. We have studied zircons separated from granulite and pyroxenite xenoliths from lamprophyres and kimberlites of NW Russia for their age, trace elements and Hf isotope compositions. Magmatic zircons are rarely preserved and show ages of ca. 2.7Ga. Their εHf values (-3 to -1) suggest formation from an enriched source or re-setting of older zircons. Several generations of metamorphic zircons (formed between 1.96 and 1.65Ga) have been recognized on the basis of their textures and compositions. In one case, three metamorphic generations show the same age but Hf isotopes show that the younger zircons crystallized from a medium becoming enriched in radiogenic Hf with time. Sometimes recrystallization of older zircon generations occurs instead of formation of new ones. These zircons have the same $^{176}Hf/^{177}Hf$ ratio as their precursors. However, some latest overgrowths also show $^{176}Hf/^{177}Hf$ ratios very similar to the older generations. In a few samples, zircon is not in equilibrium with garnet (this follows from calculated $D^{Zrn/Grt}$ values) and might postdate it. If garnet retains radiogenic Hf and the groundmass evolves to a less radiogenic composition, zircon formed from the groundmass or Lu-poor and Hf-rich minerals (cpx, rutile) can have even lower εHf than an older zircon generation. Otherwise there could be an addition of a melt or fluid depleted in radiogenic Hf. But in samples with no signs of metasomatism, garnet seems to control Hf isotopes in later zircons.