U-PB ISOTOPE INVESTIGATION OF THE ZIRCON FROM THE METAMORPHIC ROCK OF THE NORTH-WESTERN PECHENGA REGION.

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U-Pb isotope investigation of the zircon from the metamorphic rock of the north-western Pechenga region.

The study is focused on the metamorphic rock of the Kola non-stratified gneiss complex. The region under the consideration is situated in the north-western part of the Kola-Norwegian megablock composed of the granite-gneisses with the relicts of the biotite-plagioclase gneiss, biotite-amphibole-plagioclase gneiss, amphibolite, garnet-biotite-plagioclase gneiss. The structural-metamorphic scale (Kozlova N.E., unpublished) for the region studied includes the following subdivisions: 1 - garnet-biotite gneiss - the oldest rock type, 2 Õ metamorphism of the garnet-biotite gneiss, 3 - gabbro intruded the gneisses, 4 Õ iron-quartzite formed at the contact of garnet-biotite gneiss and gabbro during the metamorphism. In mineral separates from garnet-biotite gneiss zircons occur as prismatic crystals displaying a range in color from deep brown to very pale brown. The deep brown zircon is zoned with cores, zoning part and pale rims. The pale brown zircon shows no zoning. The pale rims of the deep brown crystals and pale brown crystals are the same and indicate the gneiss metamorphism. The pale brown zircon populations yield an age of 2806±101 Ma. In mineral separates from meta-gabbro zircons occur as prismatic crystals exhibiting a range in color from deep brown to very pale brown. The pale brown zircons having bad outlines suggest their primary magmatic origin in the mafic rock. They yield an age of 2584±5 Ma. The deep brown zircons with numerous faces on the crystal surfaces indicate their metamorphic origin. They yield an age of 2507±10 Ma. In mineral separates from iron-quartzite zircons are represented by deep brown prismatic crystals and pale brown isometric crystals. The deep brown zircons are of the same origin with those from the meta-gabbro.
They give an age of 2503±63 Ma. The pale brown isometric zircons with numerous faces on the crystal surfaces signify their metamorphic origin. They show an age of 2522±53 Ma. Thus, some U-Pb ages of the processes occurred in the area under the examination are obtained: 2806±101 Ma Û for the metamorphism of garnet-biotite gneiss, 2584±55 Ma Û an age corresponding to the time of the gabbro emplacement, and the ages defined to be about 2500 Ma correspond to the time of the metamorphic events. All investigations are supported by Russian Foundation of Basic Research 00-05-72032, 01-0564671.