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Morphological features of zircons from gabbroids of the 3^d layer of oceanic crust in axial zone of the Mid-Atlantic Ridge, 6^o N (Markov Deep)

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Recent discoveries of ancient zircons in gabbroids of third layer of oceanic crust in axial zone of the low-spreading Mid-Atlantic Ridge (MAR) face with a problem of age and formation of its lower crust (Pilot et al., 1998; Sharkov et al., 2004, etc.). As long as U-Pb dating on zircon is the major in isotopic geochronology, it is led to necessity of detailed study of zircons in oceanic rocks for the purpose of their convenience for such dating.

Populations of zircons from gabbroids of the 3^{nd} layer of MAR, dredged in 10 cruse R/V "Akademik Ioffe" (2001-2002) and 22 cruise of R/V "Professor Logachev"(2003) from slopes of riftogenic Markov Deep in axial part of the MAR were studied. These gabbroids were undergone by deformations and metamorphism to a varied degree. Early high-temperature cataclasm is evident from deformative textures in magmatic minerals (olivine, pyroxene, plagioclase, etc) host-rocks and their granulation. Late cataclasm occurred under conditions of not higher than greenstone facies and was accompanied by appearance actinolite, albite, chlorite, etc. These structural-metamorphic processes were also affected on morphology and inner structure of zircons.

155 zircon grains separated from gabbroids have been studied. Along with crystals of primary-magmatic zircons (or their fragments) with oscillatory and specific sectorial

zonations, numerous structural-reformed zircons from practically undeformed crystals to absolute changed were found. Deformation of hot solid rocks was led to subsequent recrystallization here. This process began from appearance of specific forms of the “fluid dilution” of furrow type, formation of small zircon crystals on the surface of prisms, appearance of dipiramidal forms as well as shear deformations in crystals. Late cataclasm is distinguished in appearance in early zircons microcracks, corrosion of surfaces of prisms and pyramids with following healing, and rimmed them by new, hydrothermal generation of the latest zircon, which sometimes contains low-temperature albite. In site I1028 fragments of zircons crystals rimmed by colloform zircon.

All these features of morphology and structure of the zircons are revealed under detailed precision study using CL techinque.

From these data follows that the zircons contain information about different processes into oceanic lower crust of the MAR: (1) time of their magmatic crystallization, (2) about different subsequent deformations and metamorphic processes, which led to appearance of shears off primary crystals, their partly dissolving and redeposition of material, which healing cracks and/or forming new crystals, which could occur in different time, and (3) about hydrothermal processes, which led to appearance of different rims around fragments of zircons (unstructured and collomoform varieties).