

Zircon as an indikator of metamorphic conditions

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For many years, studying the material composition of the Uralian polymetamorphic complexes with intent to reconstruct metamorphism and to determine the conditions of rock formation, we have been typing zircons [1,2]

We conducted a comparative study of irregularly-shaped zircons (the third morphotype) from two polymetamorphic complexes: the Parikvasshor and Selyankin in the Polar and Southern Urals, accordingly.

In the Parikvasshor complex zircon is represented by colorless or pale grains. Its content in zircon fraction is 55-65%. Optical heterogeneity of zircons is confirmed by microprobe studies. The central part of crystals is enriched in Hf and Fe, and the edge in Th and U; Th/U and Zr/Hf increase from the crystal center to its edge (0.3 to 0.8 and 57.5 to 105.4, respectively). ZrO_2/HfO_2 also increases from the center to the edge.

Irregularly-shaped zircons from plagiogneisses of the Selyankin complex are pale. Crystal sizes are 0.1-0.25 mm, the surface is smooth and shiny. The central part of crystals is enriched in U and Fe, and the edge in Th and Hf; Zr/Hf increases from the crystal center to its edge (102.5 to 337.5). Th/U and ZrO_2/HfO_2 , on the contrary, decrease from the center to the edge (from 5.06 to 0.44 and from 1384.6 to 692.5) correspondingly.

The Selyankin complex is composed of rocks that consistently undergone metamorphism of the granulite and amphibolite facies. Irregularly-shaped zircons indicate the decrease of crystallization temperature to lower stages of the amphibolite facies. The regressive character of the process is confirmed by the decrease of ZrO_2/HfO_2 from the center to the periphery of crystals. As it is known, such a decrease points out to crystallization of the mineral at the fall of temperature and pressure [3]. Rocks of the Parikvasshor complex were subjected to progressive metamorphism of low to medium levels of the amphibolite facies. This is reflected in the geochemical composition of zircon of the third morphotype. ZrO_2/HfO_2 in them increases from the center to the periphery of the

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1. Pystina Yu. I., Pystin A. M. (2002) Zircon chronicle of the Uralian Precambrian. Ekaterinburg: UB RAS, **159**. 2. Pystina Yu. I., Pystin A. M. (2009) Collection of articles № 7. Syktyvkar: KSC UB RAS, **25–29**. 3. Xuezhao B., Songnian L., Xiaochun G., Huiming L. (1996) IGC 30th, **342**.