



The problem of the formation of the continental margins of the Arctic: tectonothermal history of the Late Paleozoic collision of the Kara microcontinent and Siberia based on geochronological data and 3D modeling

Valery Vernikovsky (1,2), Antonina Vernikovskaya (1,2), Nikolay Matushkin (1,2), Oleg Polyansky (3), Kirill Voronin (4), Yuriy Laevsky (1,4), Vasily Proskurnin (5), Aleksey Travin (1,3)

(1) Novosibirsk State University, Novosibirsk, Russian Federation (vernikovskyva@ipgg.sbras.ru), (2) A.A.Trofimuk Institute of Petroleum Geology and Geophysics, Siberian Branch of the Russian Academy of Sciences, Novosibirsk, Russian Federation, VernikovskyVA@ipgg.sbras.ru, (3) V.S. Sobolev Institute of Geology and Mineralogy, Siberian Branch of the Russian Academy of Sciences, Novosibirsk, Russian Federation, (4) Institute of Computational Mathematics and Mathematical Geophysics Siberian Branch of the Russian Academy of Sciences, Novosibirsk, Russian Federation, (5) A.P. Karpinsky Russian Geological Research Institute, St. Petersburg, Russian Federation

The tectonothermal history of the formation of the Late Paleozoic collisional Kara orogen has been reconstructed using a complex of geological-tectonic, paleomagnetic, geochronological methods (U-Pb, Rb-Sr and Ar-Ar) and numerical modeling. It has been established that the tectonic factors superimposed on the thermal history of the collision event have a significant effect, the as well as the heterogeneity of the structure of the orogen crust. The latter leads to the formation of zones of temperature anomalies due to radiogenic heat sources. In the present work, the effect of kinematic factors on the thermal history of the formation of the Paleozoic orogen is considered for the first time. To implement the tasks of 3D modeling of the heating of the Kara orogen, modern computer technologies MPI were used. The constructed 3D model for the Paleozoic orogen, taking into account the influence of the process of oblique collision, reflects the period of its warming up for about 40 million years after the start of the collision of continental blocks - the Kara microcontinent and the Siberian paleocontinent, culminating in the melting of the crust and the formation of large volumes of syncollisional granites in the period 309-304 Ma. Then there is a slowdown of collisions, a halt and collapse, which led to post-collisional granitoid magmatism in the range of 264-253 Ma. The final period of the development of the Kara orogen, 253-249 Ma, coincides in time with the manifestation of the Siberian superplume and the outpouring of the traps 251-249 Ma, and the introduction of syenite-granite intrusives associated with them.

This work was supported by the RFBR (Projects 18-05-00854, 18-05-70035).