Granitoid batholithes thermochronology and dynamics of their formation in orogens

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Plate tectonics conception distinguishes subduction driven, transpression type and collision type orogens [1]. Modern isotope methods and techniques allow to investigate protolithes composition, estimate duration of granites formation and orogenic events [2-3]. We carry out here comparative analysis of granite batholithes formation dynamics in different types of orogenic structures.

We suggest approach for reconstruction of geodynamic conditions of granite batholithes formation based on thermochronologic investigations. It was ascertained that granite batholithes formed in conditions of postcollision extension ascend to the depth of 5-6 km faster than in 5-6 Ma. Higher Himalaya Leucogranite, Tethyan Himalaya Leucogranite, Mesozoic Metamorphic Core Complexes from North America and Europe, Late Paleozoic Cornubian batholithe (SW England) and Kalba-Narym batholithe (Eastern Kazakhstan) can be considered as characteristic example. The granite batholithe formed in conditions of subduction driven and transpression type orogen ascend to the depth of 5-6 km in 5-6 – 30 Ma. Ascend duration depends from specific features such as subduction direction, spreading ridge subduction etc. In a case of transpression type orogen granite batholithe ascend can be “freezed” up to 30 Ma and even more.

We apply approach suggested for interpretation of thermochronological data for granite batholithe and metamorphic complexes from Central Asian Orogenic Belt [3-4].

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[1] Şengör A.M.C. *et al* // *Nature*, 1993, v. **364**, p. 299–307
[2] Vladimirov A.G. *et al* // *Russ. Geol. Geoph.*, 2003. V. **44**. N12. P. 1321-1338 [3] Travin A.V. *et al* // Proceedings of XLVI Tectonic Conference, Moscow, 28 January – 1 February, 2014 [4] Kotler *et al* // *Mineralogical Magazine*. Goldschmidt 2013. V. **77**. № 5. P. 1503