

## **Proterozoic Orogenic and Hydrothermal Events Recorded in a Shear Zone at the Eastern Margin of the East European Craton**

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The Taratash Complex in the Middle Urals comprises Archean to Proterozoic crustal segments affected by amphibolite to granulite facies metamorphism. Granitoid intrusive rocks and migmatites formed between 2.3 and 2.0 Ga.

A shear zone within granitoid rocks characterized by epidote-amphibolite and greenschist-facies conditions forms the eastern part of the complex. Abundant monazite in the shear zone exhibits magmatic zonation in cores and has Th concentrations between 7.6 and 13.9 %, typical of magmatic monazite. Compositional variation can entirely be explained as monazite-huttonite solid solution. The major volume of the crystals is not zoned, chemically homogeneous and can be distinguished from the magmatic cores by the presence of a brabantite component. These domains are considered as being formed by recrystallisation during a single stage at elevated temperatures and probably reflect shear zone formation. Some crystals and rims of most grains are enriched in Th and display a monazite-huttonite solid solution trend. These crystals and rims are considered as products of fluid-rock interaction subsequent to shear zone formation. All monazite domains have identical REY-patterns with high enrichment (relative to CI chondrite) of La, Ce, Pr and Nd whereas Y is less enriched and shows variable concentrations.

Chemical U-Th-Pb dating of monazite domains which can clearly be distinguished on the basis of their composition yields ages of  $2031 \pm 110$  Ma ( $n = 12$ , 2sigma) for the magmatic cores,  $1874 \pm 24$  Ma ( $n = 273$ ) for monazite reflecting shear zone formation and  $1282 \pm 70$  Ma ( $n = 31$ ) for the subsequent hydrothermal event. The age of magmatism is in line with ages of intrusive rocks within the Taratash Complex. The Mesoproterozoic age of hydrothermal activity supports previous Rb-Sr- and Ar-Ar-data and is in a range of ages of anorogenic magmatic events probably related to a rifting event at the (present-day) eastern margin of the East European Craton. The well constrained age of the shear zone is close to granite formation at  $1848 \pm 8$  Ma (zircon ID-TIMS) in the Alexandrovskiy Complex farther to the east of the shear zone considered here. It may reflect Palaeoproterozoic orogenic activity between 1.9 and 1.8 Ga which is recorded in many places in the world – but so far has not been reported at the eastern margin of the East European Craton.

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