

Thin-laminated zones of zircon with loss of crystallinity

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The crystal structure of zircons from Paleoproterozoic weathering horizon (lake M.Janisjarvi, Karelia, Russia) had been studied with EBSD TESCAN LYRA 3 GMH. Studied grains have a complex internal structure and demonstrate significant changes in chemical and isotopic composition (Alfimova et.al., 2011, 2017). Detailed analysis of crystallinity had shown thin-banded oscillatory zonation in zircon grains, where some bends still have crystallinity and others have lost long order (Figure 1).

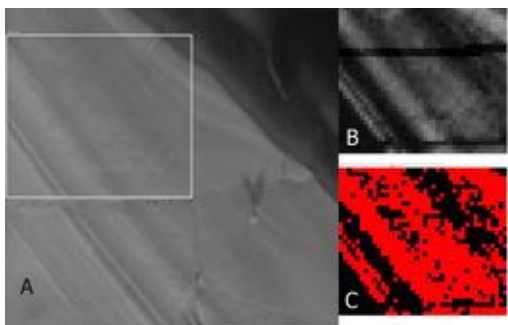


Figure 1. Thin-laminated structure of studied zircons grain. A – BSE image of zircon rim, B – a map of quality of Kikuchi patterns in studied area (white – good pattern, black – no Kikuchi structures), C – phase map (red – crystalline structure identified as zircon, black – areas with lack of crystallinity)

For in-situ EBSD measurements, high quality of surface smoothness is required. To obtain it, parts of zircons had been polished with Ga ion, thus suggesting that observed Kikuchi patterns (and lack of it in thin-bends) is not an artefact.

Such thin-banded interchanges in crystallinity are highly likely to support the previous conclusion about fluids, but not pressure or uranium-induced damage, being responsible for observed changes.

[1] Alfimova et.al. (2011), 438, 632-635. [2] Alfimova et.al.(2017) GRA, V.19., EGU2017-1678.