

## **U-Pb Microgeochronology: Relating Metamorphic Textures to Growth Phases and Geochemistry of Zircon: Case Studies on UHT Granulites**

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U-Pb studies of zircon are the backbone of modern geochronology in metamorphic and magmatic rocks. However, the interpretation of the obtained dates as metamorphic or magmatic events mostly rests on arguments of morphology and Th/U ratios of zircons from mineral separates. In high grade and/or polymetamorphic rocks where partial melting and zircon growth or dissolution may have occurred in several phases (and the distinction between magmatic and metamorphic zircon growth loses much of its meaning), these tools are often not sufficient.

We use an approach which combines in-situ U-Th-Pb analysis by ion-microprobe with backscatter and cathodoluminescence imaging and trace element analyses by electron microprobe. Single-grain conventional analyses on the zircon thus characterized are carried out later to attain high precision isotopic results. In-situ analysis allows correlation of mineral inclusion relationships with the petrologic metamorphic history and the trace element (Y, Hf, REE) geochemistry of the zircon. The aim of the studies on granulites is to determine relative timing of zircon growth with respect to petrologically significant phases (e.g. in equilibrium with garnet). This approach marks an important step towards direct correlation of U-Pb zircon geochronology with petrologically determined P-T paths.