

## ZIRCON PLASTIC DEFORMATION EXAMPLES FROM THE TAUERN WINDOW

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Minerals deform during metamorphic events due to stresses associated with collision of the phases. Plastic deformation in zircon occurs due to dynamic recrystallization that indicates formation and migration of dislocations under lower-crustal and upper-mantle conditions. As far as the low-angle boundaries potentially act as fast diffusion pathways in the crystal lattice, crystal-plastic deformation in zircon can cause rapid out-diffusion of radiogenic Pb and, therefore, influences the results of isotopic dating.

We have made several profiles through the shear zones in the Western Tauern Window, Zillertal Valley, in order to sample gneisses with different deformation degree. We investigated zircons hosted by these rocks with a number of methods, including EBSD mapping. Zircon exhibit different stages of deformation – from undeformed grains through plastically deformed with low-angle boundaries (Fig. 1) and to brittle-deformed individuals. We have identified several mechanisms of plastic deformation in the zircon crystal lattice, depending on the hosting environment, shape and internal inhomogeneity of the grain.

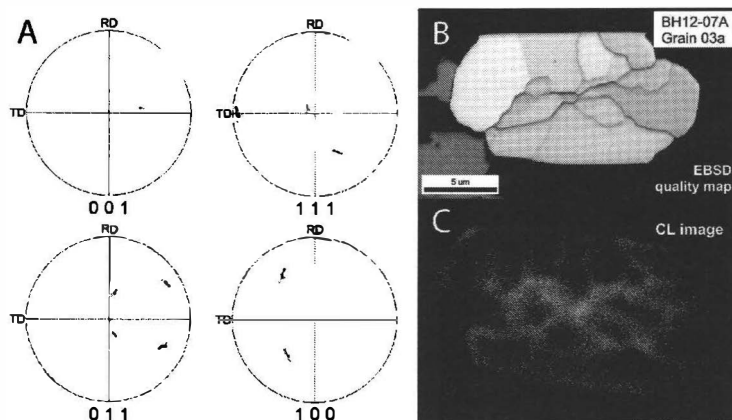


Figure 1. Plastically deformed zircon grain with subgrains (brighter domains on B and dark domains on C), separated by low-angle boundaries (dark lines on B and bright lines on C). A – pole figures with the positions of crystallographic axis of the subgrains; indicates dynamic recrystallization during deformation.

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