

# Deformation and transformation of subduction zone hydrous minerals and rocks

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Hydrous minerals condition water transport and location down to depths in the earth, and are crucial to the overall dynamics in subduction zones. Their presence, destabilisation or growth, can affect the long- or short-term coupling between subducting slab and overlying mantle, generate earthquakes, modify the convection in the mantle wedge. Their deformation properties and the coupling between deformation and mineralogical reactions in which they are involved, are therefore of interest to several communities in the geosciences, from modeling the evolution of subduction zones, interpreting seismic data and earthquakes locations, to helping field observations interpretations. In this lecture I will try to provide a view of the progresses made in the last two decades, particularly those allowed by the development of experimental approaches involving in-situ measurements. Among the main hydrous minerals and rocks of subduction zones, the focus will be on the deformation properties of serpentines and serpentinites. I will present mechanical behaviors and deformation mechanisms from single-phase aggregates deformation studies to deformation of polyphased rocks, and also those seen when coupled with mineralogical reactions. I will also propose a view on the limitations and interests of these results for their application to subduction zones dynamics.