

Shear deformation experiments of serpentines at mantle wedge conditions

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Serpentinite has distinct characteristics including low frictional coefficient, and thus its behavior may correlate to the seismic activities in subduction zones (e.g., Hyndman and Peacock 2003; Seno 2005). However, most previous experiments are limited at low pressure (less than 0.5 GPa) and consequently its rheological behaviors under mantle conditions are not well understood. We have deformed serpentinites at high-pressure (1 GPa) and high-temperature (200-500°C) in order to determine what mechanism controls deformation under mantle wedge conditions. Preliminary results indicate quite different rheological behaviors between low-temperature serpentine (chrysotile and lizardite) and high-temperature serpentine (antigorite). This suggests that the plastic properties of plate interface (when it is serpentinized) can change depending on geothermal gradient at subduction zones.