

## Deformation experiment of antigorite serpentinite with a solid medium deformation apparatus

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Serpentinite is an important rock in the area of oceanic plates undergoing subduction. Deformation of serpentinite probably plays an important role in subduction and exhumation process of slab. However, rheological behavior of serpentinite is poorly understood, especially at more than 1 GPa. We present the results of deformation experiments of antigorite serpentinite in order to understand the rheological behavior of it.

Experiments were conducted at Hiroshima Univ. (HU) and Univ. California, Riverside (UCR) with a modified Griggs type apparatuses. Experimental conditions were 1 GPa and 3GPa confining pressures, 450 C to 700 C, and constant strain rates of 2.0 to  $2.4 \times 10^{-5}$ /s. The serpentinite sample was collected from Nagasaki metamorphic belt, which develops foliation. Cylinders with ca. 7.0 mm in diameter x ca. 7.0 mm in length (for HU) or ca.3.0 mm diameter x ca.8.0 mm length (for UCR) were cored perpendicular to the foliation plane for the starting samples.

The flow stresses obtained so far are: At 1 GPa, 1070 MPa for 450 C, 960 MPa and 1200 MPa for 500 C and 830 MPa and 1080 MPa for 550 C. At 3 GPa, 2100 MPa for 600 C, 1300 MPa for 650 C and 845 MPa for 700 C. These results combined with those obtained by Raleigh and Paterson (1965), whose deformation conditions are less than 500 MPa, indicate that the flow stress at same temperature and temperature dependence flow stress increase with an increasing confining pressure. The change of flow stress with confining pressure is probably attributed to change of deformation mechanism from Peierls mechanism to dislocation creep.