

## Deformation experiment of Mg<sub>2</sub>GeO<sub>4</sub> olivine at transformation conditions

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Seismology and high-pressure experiments indicate that some of subducting slabs stagnate in the mantle transition zone. The reasons of the slab stagnation are thought be A) strength change of the slab due to the transformation of olivine at the depth, and/or B) density difference between the slab and surrounding mantle. This study focuses the first possibility. In order to clarify this possibility, the deformation experiment of olivine should be conducted at the transformational condition to its high pressure polymorph. However, mantle olivine with (Mg,Fe)<sub>2</sub>SiO<sub>4</sub> composition can not transform under the pressure conditions generated by the deformation apparatus. Therefore, we must use Mg<sub>2</sub>GeO<sub>4</sub> olivine which can transform under the conditions.

The following two experiments were conducted in this research.

- 1) Synthesis of polycrystal Mg<sub>2</sub>GeO<sub>4</sub> olivine from MgO and GeO<sub>2</sub> powder.
- 2) Deformation experiments using the synthesized polycrystal Mg<sub>2</sub>GeO<sub>4</sub> olivine.

The results of this research are the followings:

- 1) Polycrystal Mg<sub>2</sub>GeO<sub>4</sub> olivine with 17 % porosity can be synthesized at the condition of 1400 C for 24 hour heating with an electric furnace.
- 2) Preliminary deformation experiment shows the weakening during the run due to high pressure transformation.