

## 強磁場印加コロイドプロセスを用いた細粒緻密配向性オリビン多結晶体の創製 Fabrication of textured Fe-free and Fe-bearing olivine aggregates using colloidal process- ing under high magnetic field

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Crystallographic preferred orientation (CPO) of minerals is considered to be widely produced in the Earth's interior. Due to the presence of anisotropic physical properties such as elasticity, plasticity, electron conductivity and etc... of single crystal minerals, their bulk rock properties can significantly be affected by the presence of CPO. To measure CPO effect on the bulk rock properties by room experiments, it is required to prepare polycrystalline materials with ideally controlled CPO.

Magnetic field was applied to fine-grained (~120 nm) equigranular Fe-free and Fe-bearing olivine particles, which were dispersed in ethanol (solvent) with dispersant (polyethyleneimin). We expected the particles to align with respect to magnetic direction due to their magnetic anisotropy. The aligned particles were gradually deposited on a solid-liquid separation filter during ethanol drainage. The directions of magnetic field and particle deposition were parallel. The dried particles were then densified isostatically at 200 MPa for 10 min and sintered using the alumina tube furnace with vacuum pump.

Highly dense (density of  $\geq 99\%$ ) and fine grained (~1  $\mu\text{m}$ ) samples with a-axis alignment for Fe-free and c-axis alignment for Fe-bearing olivine to the magnetic direction were obtained. Such synthesized aggregates will allow us to measure CPO effect on the physical properties of olivine aggregate.

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