

Microstructures and CO₂ fluid inclusions observed in mantle xenoliths from Takashima, Karatsu city, Saga prefecture

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In order to clarify effect of CO₂ on rheological behavior of olivine which is a major constituent mineral of upper mantle, we have observed CO₂ fluid inclusions and microstructures developed in mantle xenoliths from Takashima, Karatsu city, Saga prefecture by using optical microscopy, universal stage, transmission electron microscope, and raman microspectroscope. We focused on grain size, form of grain boundary, lattice preferred orientation, kink band, CO₂ fluid inclusion and dislocation microstructure. These observations showed that the following results. (1) All xenoliths underwent annealing after plastic deformation. (2) Slip systems changed [001] to [100](0kl) with increasing depth of rock source. (3) CO₂ fluid inclusions acted as dislocation multiplication source.