

伊豆-小笠原前弧域から採取されたかんらん岩の微細構造解析 Microstructural analysis of peridotites obtained from the Izu-Ogasawara forearc region

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Forearc locates a frontal side of volcanic front in an island arc, where provides a key information for the initiation of magmatic and subduction process in island arc formation. However, there are a few studies discussed geological interpretations of the upper mantle structure in the forearc region, although there are many studies for understanding the evolution of crustal structures of the island arc. Here, we report microstructural results of five harzburgites sampled from the landward slope of the Izu-Ogasawara Trench (dredge site KH07-02-D31 and dive site KR08-07-7K417). Morishita et al. (2011) have already reported a major and trace element compositions of the harzburgite samples in this study; they show high forsterite (91.7-92.1) and NiO (0.4 wt%) contents of olivine, high Cr# [Cr/(Cr + Al) atomic ratio; 0.65-0.73] of spinel and low Al₂O₃ (<1.5 wt%), Na₂O (<0.04 wt%) contents of pyroxene, suggesting a refractory origin. The harzburgites are characterized by coarse granular textures consisting of coarse olivine grains and elongated orthopyroxene grains. The olivine and orthopyroxene grains show intracrystalline deformations such as wavy extinction. Crystallographic preferred orientations (CPOs) of olivine show mainly a [100](001) pattern, which has a strong alignment of [100] axis to the lineation and [001]-axis concentration perpendicular to the foliation. All olivine CPOs studied have much higher intensities than those of Mariana forearc region (e.g. Michibayashi et al., 2007). The CPOs of orthopyroxene shows a [001](100) pattern with [001] parallel to the lineation and (100) normal to foliation. Since these harzburgite samples are refractory origin associated with boninitic melting during initiation of subduction (e.g. Morishita et al., 2011), their deformation characteristics could be possibly related to the initiation of subduction in the Izu-Ogasawara forearc region.

Keywords: harzburgite, olivine, orthopyroxene, crystallographic preferred orientation, Izu-Ogasawara forearc region