

How can podiform chromitites tell us about the mantle dynamics?

ARAI, Shoji^{1*}

¹Dept. Earth Sci., Kanazawa Univ.

The UHP chromitites, which contain UHP minerals such as diamond and moissanite, are possibly of deep recycling origin (Arai, 2010, 2011 JpGU presentation). They sometimes show an orbicular texture (e.g., Zhou et al., 1996; Yamamoto et al., 2009), one of typical shallow igneous textures; it can be preserved even after deep recycling, because no reaction cannot be expected between olivine and chromian spinel or their high-pressure polymorphs. The UHP orbicular texture is, however, slightly but clearly different from low-P one; the orbicular spinel aggregates of the former are frequently fractured and invaded by olivine. This can be seen in deserpentinized chromitites (Arai, 1978), but this is not the case for Tibetan UHP chromitites. This may be due to a possible difference in compressibility between the two minerals (or their polymorphs). Although the chromitites could be a good indicator for mantle dynamics, it is still difficult to distinguish two types of mantle convection, whole-mantle convection and two-layer convection, for the UHP recycling involved.

Two structural types of podiform chromitite from Oman ophiolite were examined in detail in comparison with the UHP chromitites. They are different from each other in involved magma chemistry in addition to the duration of cooling. Both of them are clearly different from UHP chromitites in the absence of primary hydrous minerals in the latter (Miura et al., submitted). The depth limit for magmatic generation of chromitite may be an important question now.

Keywords: chromitites, Oman ophiolite, UHP minerals, deep recycling, mantle dynamics