



Platinum-group minerals from the possible arc podiform chromitite xenoliths from Takashima, southwest Japan

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We found laurite, one of PGM (platinum-group mineral), and pentlandite in chromitite xenoliths from Takashima alkali basalt, the Southwest Japan arc. The Takashima chromitite xenoliths represent current subarc chromitites, possibly of podiform type (Arai and Abe, 1994). This finding is the first report on the occurrence of PGM from chromitites as xenoliths to our knowledge. They show layered textures and, rarely, nodular textures (Arai and Abe, 1994). The examined chromitite comprises relatively fine-grained euhedral chromian spinel in wehrlitic matrix, and showing homogeneous texture. The chromian spinel is full of orbicular anhydrous silicate (mostly pyroxenes) inclusions. They usually show a concentric distribution indicating a primary origin.

Laurite is most commonly found, as minute (<5microns across) solitary grains of euhedral shape embedded in fresh chromian spinel. In a few cases, very fine (around 1 micron) grains of Cu-bearing pentlandite are associated with the silicate inclusions in chromian spinel. The pentlandite is very poor in PGE (platinum-group elements). Chondrite-normalised PGE pattern of Takashima chromitite shows a slightly negative slope from Ru to Pt, which is analogous to that of some podiform chromitites from ophiolites, such as the Oman ophiolite. In addition, laurite is one of most common PGM in podiform chromitites from ophiolites (e.g., Ahmed and Arai, 2003).

The chromian spinel in Takashima chromitite shows a relatively high Cr# (=Cr/(Cr+Al) atomic ratio), 0.6 to 0.8, and a low TiO₂ content, 0.16 to 0.63 (Arai and Abe, 1994). The chemical characteristics of chromian spinel are comparable with some arc-related plutonic rocks (Arai et al., 2011).

The subarc chromitites beneath the Southwest Japan arc are similar to some podiform chromitites from ophiolites in texture, spinel chemistry as well as in PGE and PGM characteristics. This indicates that some of the podiform chromitites from ophiolites, including those from the Oman ophiolite, are of subarc origin.