

## Petrography of mantle xenoliths from Lyudao, in the Luzon arc, Taiwan

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Lyudao, island of southeastern Taiwan, is located at the north end of the Luzon arc. Lyudao is volcanic island, which is made up of andesitic rocks and pyroclastic rocks. Peridotite xenoliths have been found in andesite of Lyudao and Lanyu (Chen, 1988 Acta Geol. Taiwanica). Lanyu is the island, which is located on the south of Lyudao. Peridotite xenoliths have been found in the Luzon arc, such as Batan Island (Arai and Kida, 2000 Island Arc; Arai et al., 2004 J. Petrol.), Pinatubo volcano (Kawamoto et al., 2013 PNAS) and Siayan Island (Y. Iizuka, unpublished date). Peridotite xenoliths from Luzon arc can provide spatial information of mantle wedge peridotites at the subduction zone. Because Lyudao is located at the north end of the Luzon arc, it is important for addressing the spatial variations. Peridotite xenoliths in Lyudao Island have never been, however, studied in details since Chen (1988). Here we report petrological characteristics of peridotite xenoliths from Lyudao.

Peridotite xenoliths are mainly harzburgite with one olivine websterite. Harzburgite shows two types in terms of grain size; fine-grained (less than 0.1mm across) and coarse-grained (several millimeters across). These textures coexist in hand-specimen. There is no difference in mineral mode between them. These petrological textures are the same as those of Batan Island (Arai et al., 1996). Amphibole occurs at the border part of the host andesite and peridotite xenoliths. The Fo content [=100Mg/(Mg+Fe<sup>2+</sup>) atomic ratio] of olivine is from 91 to 92. The Al<sub>2</sub>O<sub>3</sub> content and Mg# [=Mg/(Mg+Fe<sup>2+</sup>) atomic ratio] of orthopyroxene are from 2.4 to 3.5 wt%, and from 0.90 to 0.92, respectively. The Al<sub>2</sub>O<sub>3</sub> and Cr<sub>2</sub>O<sub>3</sub> content, and Mg# of clinopyroxene are from 1.7 to 4.3 wt%, about 1 wt%, and from 0.90 to 0.94, respectively. The TiO<sub>2</sub> and Na<sub>2</sub>O contents of clinopyroxene are very low, being from 0 to 0.2 wt%. Fe<sup>3+</sup>/(Cr+Al+Fe<sup>3+</sup>) atomic ratio of spinel is very low, mostly being less than 0.2. There Cr# [=Cr/(Cr+Al) atomic ratio] and TiO<sub>2</sub> content is from 0.4 to 0.6, and from 0 to 0.1wt%, respectively.

Keywords: xenolith, mantle, peridotite, Luzon arc, Taiwan, Lyudao