

## Petrogenesis of dunite xenoliths from Mt. Pinatubo, Philippines

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The 1991 Mt. Pinatubo pyroclastic deposits host a suite of mantle-derived ultramafic xenoliths comprised of harzburgites, minor dunites, and rare lherzolite. In this study, we present novel data on the dunite xenoliths hosted by volcanic rocks found in Mt. Pinatubo. Discordant dunites are thought to be reaction products of percolating melt with harzburgite-dominated sub-arc mantle wedge. This study will look into the petrogenetic history of the dunites and its geochemical relationships with the harzburgite xenoliths.

The dunites are composed of primary olivine and chromian spinel, with secondary orthopyroxene and amphibole veinlets and reaction rims. Olivines exhibit subparallel partings that terminate along crystal boundaries. The samples plot within the olivine-spinel mantle array of Arai (1994). The Cr# of the chromian spinels ranges from 0.44-0.49. Olivines are characterized by high Fo (=90.2-91.5) and NiO contents (=0.29-0.42 wt%). TiO<sub>2</sub> content varies at relatively constant Cr<sub>2</sub>O<sub>3</sub> values (or Cr#), indicating melt-rock element exchange. Results of Raman spectroscopy concur with that of Kawamoto *et al.* (2013) for harzburgites xenoliths from Mt. Pinatubo. Fluid inclusions in dunite olivines revealed presence of liquid water, CO<sub>2</sub> gas, magnesite, chrysotile and magnetite.

Arai (1994) *Chem Geol* **113**, 191-204.

Kawamoto *et al.*, (2013) *PNAS* **110**, 9663-9668.