

## Two types of dunite in the mantle section of the Lizard ophiolite, Cornwall

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Dunite within the mantle peridotites is useful for our understanding of the behavior of melts, especially the melt/peridotite reaction, if any, within the upper mantle. The Lizard ophiolite, Cornwall, UK, has been interpreted as one of few examples of ophiolites derived from a slow-spreading ridge (Kirby, 1979; Roberts et al., 1993). However, there have been only a few petrological studies on the mantle part of that ophiolite since the pioneering work by Green (1964). We found two types of dunite from the mantle section of the southeastern part of the Lizard ophiolite. One type is dunite band concordant with peridotite foliation, gradually changed to lherzolite via harzburgite. This dunite contains thin chromitite seams. The other type is dunite dike (= discordant dunite) cutting the foliation of lherzolite with sharp boundaries. It is free from spinel concentrations.

All primary silicates are completely serpentized in the dunites, and only chromian spinels can be analyzed. Chromian spinel in lherzolite and harzburgite exhibits a wide range of Cr# (= Cr/(Cr+Al) atomic ratio) from 0.2 to 0.6, and very low TiO<sub>2</sub> (<0.5 wt%) and Fe<sup>3+</sup> ratio (<0.1), in accordance with Kadoshima and Arai (2001). The concordant dunite is similar in spinel chemistry to the surrounding mantle peridotites. Chromian spinel (Cr#=0.6-0.7) in the discordant dunites is quite different in chemistry from the other spinels, being high in both TiO<sub>2</sub> content (3 to 6 wt%) and Fe<sup>3+</sup> ratio (>0.2). High-Ti, high-Fe<sup>3+</sup> spinels have been decomposed into two phases, high-Fe<sup>3+</sup> (0.5-0.6) spinel and low-Cr# (0.3), low-Fe<sup>3+</sup>, low-Ti spinel. Their initial spinel exhibits Cr#=0.5, Fe<sup>3+</sup> ratio=0.4 and TiO<sub>2</sub>=4.5 wt%. The concordant dunite was formed through interaction between MORB-like melt and lherzolite. This is consistent with the presence of spinel concentrations (Arai & Yurimoto, 1994). The discordant dunite is post-deformational, and was precipitated from a high-Ti, -Fe<sup>3+</sup> melt, which was possibly formed from enriched mantle.

Keywords: dunite, lherzolite, harzburgite, Lizard ophiolite, melt/wall interaction