

Occurrence of boninite in the Oman ophiolite: implication for the Oman ophiolite petrogenesis

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Boninites recently found in the Oman ophiolite occur as lavas and dikes of the Alley volcanics that overlie or crosscut the spreading ridge-derived lavas (Geotimes volcanics) and sheeted dikes. The phenocryst mineral assemblage and the major and trace element compositions observed for these boninites indicate that they represent primitive melts generated by partial melting of hydrous peridotite in shallow subduction zone. The occurrence of boninite strongly suggests that an extremely hot, hydrous shallow mantle underlay the ophiolitic lithosphere in the time of boninite generation. The initiation of subduction of a young, hot oceanic lithosphere near the spreading ridge and the resultant melting of highly depleted, shallow mantle wedge metasomatized by slab-derived aqueous fluid are the most favorable mechanism for the genesis of the Oman boninite.