

Trace element geochemistry of volcanic rocks of the Oman ophiolite: Implications for magmatism in the initial stage of subduction

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Recent discovery of boninite from the Oman ophiolite suggested that the Alley volcanics (including boninite) in the Oman ophiolite was formed by melting of a hot, hydrous shallow mantle wedge in the early stage of subduction near the spreading ridge. Here we show the chemical characteristics of the Alley volcanics inferred from the trace element analyses of the cpx phenocrysts, and discuss the magma genesis in the initial stage of subduction. In terms of the trace element characteristics, the Alley volcanics is subdivided into two types, that is, type1 (tholeiite with low Pb and Sr) and type2 (boninite series calc-alkaline rocks). The type2 rocks show significant variation in fluid-mobile element composition and some of them have type1-like trace element characteristics. The observed chemical variation in the Alley volcanics may reflect the varied PT conditions of the slab dehydration and the mantle melting in the initial stage of subduction of a hot oceanic lithosphere into a hot mantle.