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沈み込みプレート境界深部における岩石-流体相互作用
Fluid-rock interaction in deep portions of subduction plate boundaries

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Fluid-rock interaction at deep portions of subduction plate boundaries is a key to understand roles of fluid on deformation and mass transfer during subduction and accretion. In the Upper Cretaceous Shimanto accretionary complex of eastern Kyushu, the melange composed of basaltic slices in the argillaceous matrix and the coherent clastic rock occur three times, representing the repetition of ocean plate stratigraphy associated with the duplex underplating at a depth of ~ 13 km and temperatures of 340-400 ℃. One well-exposed basaltic slice consists mainly of massive basalt, pillow basalt, and dolerite in which argillaceous rocks are intercalated with the dolerite in the uppermost part of the slice. The argillaceous matrix commonly shows pressure solution cleavage in which muscovite and carbonaceous material occur as insoluble residue. The argillaceous rock less than 20 cm from the upper boundary of the basaltic slice is highly bleached in association with the modal increase in albite and consumption of muscovite and carbonaceous material, while that intercalated with the dolerite shows various degree of bleaching. Plagioclase phenocrysts in the dolerite near the upper boundary are replaced to muscovite. Mass-balance estimated from isocon method indicates that the bleached argillaceous rock and the uppermost dolerite are depleted in fluid-mobile elements such as Sr and Ba relative to surrounding rocks. Deformation is concentrated into the uppermost dolerite, which is marked by elongated phenocrysts. These results suggest that the albitization of argillaceous rock by infiltration of Na-rich fluid and the deformation accompanying with fluid-dolerite interaction occurred during the melange-forming process. Infiltration metamorphism during incorporation of basaltic slices in the argillaceous melange matrix may play an important role on mass transfer in subduction plate boundary.

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