

The fluid flux and fault rock development along the subduction seismogenic Okitsu Fault, Shimanto accretionary complex, SW Japan

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The Okitsu Fault is pseudotachylite bearing ancient seismogenic fault of the Shimanto accretionary complex, SW Japan. This paper discusses the relationship between fluid flux and fault rock development. The structural analysis revealed that the Okitsu Fault develops at the roof thrust of the duplex structure of the Okitsu Mélange. Among the mélange zone, the rock around the Okitsu Fault has suffered high temperature, and the fault zone is characterized by many vein minerals and altered basalt blocks. Hydrothermal activity along the fault zone likely transfer the heat from the deep. The fault rock seems to be developed with fluid flow. The hydro-fracturing, vein mineral precipitation and pressure solution deformations are occurred at thick fault area. This fault thickness may vary with fluid flux. The CO₂ flux along the fault zone is estimated from the alteration grade of the basalt blocks within the fault zone. More than 118 kmol/m² of CO₂ fluid flux was obtained in thick fault zone, and it drops in thinner fault zone. Such partial distribution of fluid flux implies that the fluid pathway may have existed at same location historically along the fault. The fluid pathway possibly concern with fault rock asperity.

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