

Variable chemical composition of the Nobeoka thrust fault core in Shimanto Belt, Kyusyu

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The Nobeoka thrust in Kyushu is a tectonic boundary thrust in the Shimanto Belt, Cretaceous–Miocene accretionary complex in Southwest Japan. The Nobeoka thrust is presumed to be a fossilized megasplay fault which was branched from plate boundary fault (Kondo et al., 2005), and represents multiple deformations at seismogenic depths (~ 10 km below sea floor) (Kondo et al., 2005). Kondo et al. (2005) described lithology and macroscopic/microscopic structure of hanging wall, footwall, and the fault core. Fukuchi et al. (2014) showed mineralogical features across the fault zone based on X-ray Diffraction (XRD) analysis. However, Fukuchi et al. (2014) mainly focused on the illite crystallinity of the hanging wall side, and detail description on mineralogical/geochemical features of the fault core is still to be investigated. Therefore, this study was designed to determine chemical/mineralogical features of the fault core of the Nobeoka thrust. For this purpose, we performed elemental mapping on polished slab-shape samples retrieved the outcrop of the fault core of the Nobeoka thrust by using X-ray fluorescence (XRF) core scanner installed at Kochi Core Center (KCC).

Analyzed sample contains hanging wall, footwall, and ~15 cm-thick fault core. The fault core is bounded from both hanging- and footwall by ~3 mm-thick dark zones. Compared with the wall rocks, the dark boundaries and matrix of the fault core are enriched in Al, K, Ti, Mn, Fe and Mg, and depleted in Si, P, and S. My observation implies the following: (1) matrix of the fault core and the dark boundaries between the fault core and hanging-/footwall correspond with the enrichment of white mica and/or chlorite; (2) Depletion of S would reflect dissolution of pyrite and/or gypsum, suggesting the existence of oxidative fluid within the fault core.

Keywords: Nobeoka thrust, XRF core scanner