

Provenance study of the Tetori Group in the Shokawa area, based on the polycrystalline quartz and whole-rock chemistry

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It is believed that the Jurassic sedimentary rock in Japan was deposited during later stage of the Yangtze and Sino-Korea continental collision. Most of the Jurassic sandstones are characterized by scarceness of rock fragments. The Upper Jurassic sandstones are more quartzose and lack in typical regional metamorphic fragments, however, tectonic environment showing increasing influence from crystalline rocks is obscure. In this study, whole rock geochemistry that obtained by XRF and sedimentary petrology of sandstones in the Middle Jurassic - Lower Cretaceous Tetori Group are discussed.

Sandstones of the Upper Tetori Group contain abundant polycrystalline quartz. Polycrystalline quartz show several varieties from elongated, bimodal, slightly curved, intercrystal boundaries to polygonized. Such polycrystalline quartz was possibly derived from mylonite, ultra mylonite, gneiss and crystalline schist originated from granite and quartzose sedimentary rocks.

The geochemistry of the sandstones in the Upper Tetori Group have less variety in comparison with those in the Lower Tetori Group, which suggests that the Upper Tetori Group was supplied from more monotonous provenance. The Chemical Index of Alteration (CIA : $CIA = Al_2O_3 / (Al_2O_3 + CaO + Na_2O + K_2O)$), which is established as a method of quantifying the degree of source weathering (Nesbitt and Young, 1982, 1984), the Upper Tetori Group exhibits higher CIA values with an enrichment in Zr and REE than those of Lower Tetori Group. Thus the Upper Tetori Group indicates considerable influence by recycled material. Because the late Jurassic major granitic intrusion with uplift are reported in inland area in the eastern part of the Chinese Continent, this transition of provenance implies denudation and exposure of old sedimentary rocks caused by the major uplift of continental crust.