

Japan Geoscience Union Meeting 2011

(May 22-27 2011 at Makuhari, Chiba, Japan)

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SGL042-03

Room:202

Time:May 23 17:00-17:15

Relationship between detrital chromian spinels from the Paleozoic and Mesozoic clastics and ophiolite zones in the Japan

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The detrital chromian spinels in SW Japan were obtained from the Paleozoic and Mesozoic strata of the Circum-Hida tectonic zone (Renge belt), Oeyama belt, Akiyoshi belt, Maizuru belt and Mino-Tanba belt of Inner Zone, and the Kurosegawa tectonic zone (Chichibu belt) and Shimanto-Sanbagawa belt of Outer Zone. In addition, they were obtained from the similar strata of the South Kitakami belt in NE Japan. All detrital chromian spinels are categorized into two major types based on the scatter pattern on the Cr#-TiO₂ diagram; alpha and beta types. alpha type is represented by a wide range of Cr#, usually 0.3 to 0.9, and very low TiO₂ content, less than 0.5, whereas beta type is characterized by a narrow range of Cr#, 0.4 to 0.6, and higher TiO₂ content, 0.0 to 2.0. The occurrence of two types is different in respective belt and depositional ages of contained sediments. The detrital chromian spinels of alpha type is limited in the Paleozoic strata of the Kurosegawa tectonic zone and the South Kitakami belt as well as the Mesozoic strata of the Circum-Hida tectonic zone. On the other hand, those of beta type are restricted in the post-Carboniferous of the other belts. The chemistry of detrital chromian spinels from the Japanese Islands suggests that the sediments provenance occurred in the late Paleozoic age as evidenced from alpha type to beta type. This might be caused by the difference of formative process among accretionary complexes.

Keywords: detrital chromian spinel, ophiolite, the Japanese Islands, forearc, Paleozoic, Mesozoic