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スリランカ南西グループの高温変成岩におけるジルコンの内部構造と化学組成
Internal textures and chemical composition of zircon from high grade metamorphic rocks of Southwest Group, Sir Lanka

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High-grade metamorphic terrene of Sri Lanka, consists of four major crustal units as, Highland Complex (HC), Wanni Comples (WC), Vijayan Complex (VC) and Kadugannawa Complex (KC). Western part of the HC is also regarded as Southwest Group (SWG). The SWG is dominated by garnet biotite gneiss, garnet biotite cordierite gneiss and charnockitic gneiss. In these rock types, zircon is identified as a major accessory mineral. During metamorphism, detrital zircon can be recrystallized. Thus, the preserved internal textures particularly, igneous oscillatory zoning can be progressively changed into: convoluted, blurred, and thickened. Then, the dominant texture is transgressive zircon patches and lobes. By introducing a chemical and internal textural classification of zircons, to SWG of Sri Lanka, it may helps to identify the relationships between chemical and internal textural domains, and petrological evolution of the rock. Basically, zircon occurred in matrix and as inclusions in garnet, biotite, and cordierite. Average chemical formulas of the studied zircons in these three different rock samples are $Zr_{0.939}Hf_{0.012}Si_{1.043}O_4$, $Zr_{0.945}Hf_{0.013}Si_{1.039}O_4$, $Zr_{0.936}Hf_{0.010}Si_{1.047}O_4$, respectively. Using backscattered electron (BSE) images from electron probe micro analyzer (EPMA), several types of internal textural domains were observed as detrital core, and overgrowth patterns. Overgrowth patterns are fir-tree texture, radial zoning, resorption, euhedral faces, and planner banded zoning. These textures may indicate the different geological and petrological events. According to the chemical analysis, Hf content may not contribute to the zoning of zircon. Then, further consideration should be based on the other trace elements and rare earth elements (REE). Zircon structure is available for the large radius atoms like REE, and especially, radiogenic elements may causes the damage of zircon structure. It is usual to observe that pleochroic halo around the zircon and fracture patterns during the long period of time. The damaged and fractured area allows the impurity elements (Ca, Al) to enter the zircon structure. Then, these impurities could be detected in considerable amount, in highly darker area of the zircon. The changes of internal textures of zircon, that is, oscillatory zoned zircons, gradually get faded and the chemical bands during the recrystallization may appear as new bands around rim area and sometimes in core area. Later, transgressive recrystallization patches developed with loss of trace elements (Pidgeon et al., 1998). In the case of high grade metamorphism finally, the all the banded pattern get disappeared. These transformations highly related to the metamorphic stages and the observed textures, in different grade of rocks and shows respective textural behavior.

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