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Geochemistry of the early Cretaceous Gunbuk-Jindong granitoids in the Gyeongsang basin, South Korea

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The Gunbuk-Jindong granitoids are located in the southwestern part of the Gyeongsang Basin in South Korea. The granitoids consists of gabbro, quartz diorite, granodiorite and granite that are intruded into Cretaceous sedimentary rocks of the Jindong formation. Gunbuk granitoids exhibit relatively high Al_2O_3,MgO, Cr and Sr contents, high Sr/Y and La/Yb ratios, but low Y and Yb contents, similar to adakites produced by slab melting associated with ridge subduction. In contrast, the Jindong granitoids have low Sr and high Y contents and are typical of calc-alkaline I-type granitoids.

The Rb-Sr isotopic age of 97.0±8.4Ma with an initial Sr ratio of 0.7046 recommend that the magma has mantle signature and intruded during Early Cretaceous. The geochemical and tectonic features reveal that adakite-like signatures of the Gunbuk granitoids were generated by the interaction of slab-derived adakitic melts(caused by the thermal effect of ridge subduction) and mantle peridotite. The Gunbuk granitoids have similar geochemical characteristics, paleotectonic environments and intrusion ages to those of the Shiraishino granodiorites of Kyushu Island and the Tamba granitoids of San'yo belt located on southwestern Japanese arc. Chondrite normalized REE patterns show generally enriched LREEs and slight negative to flat Eu anomalies. On the ANK vs. A/CNK and tectonic discrimination diagrams, parental magma type of the granites corresponds to I-type and volcanic arc granite(VAG). Interpretations of the chemical characteristics of the granitic rocks favor their emplacement in a compressional tectonic regime at continental margin during the subduction of the Izanagi plate beneath the northeastern part of the Eurasian plate.