

The Cretaceous volcanic and granitic rocks in the Southern coastal region of the South Korea

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The Cretaceous volcanic and granitic rocks occur along the NEE trend in the southern coastal region of the South Korea. The study area, the Yeosu, is located in the south-western part of the Yeongnam massif, and mainly consists of the Cretaceous sediments, andesitic to rhyolitic tuffs and tuffaceous sediments intruded by the Cretaceous granitic rocks. This study is focusing on mainly geochemical characteristics of the Cretaceous volcanic and granitic rocks in the Yeosu area.

Most of the Cretaceous volcanic rocks belong to sub-alkaline series, and show compositional variations ranging basaltic andesite-andesite-dacite-rhyolite. The other volcanic rocks belong to alkaline series trachy-andesite to trachyte ranges. Most of sub-alkaline series volcanic rocks samples belong to High- to Medium-K calc-alkaline series whereas the others belong to shoshonite-series or Low-K tholeiite series in SiO_2 vs. K_2O plot. The whole-rock K-Ar ages dating for volcanic tuffs are 84.7 ± 1.7 Ma, 84.4 ± 1.7 Ma, 79.5 ± 1.6 Ma, 66.7 ± 1.3 Ma and 60.4 ± 1.2 Ma. Rhyolite and andesite show wide age variation ranging 82.0-57.2 Ma and 81.1-63.2 Ma.

The Cretaceous granites show wide compositional variation ranging from diorite through granodiorite to granite in TAS diagram. Granodiorite porphyry belongs to granodiorite range whereas Dolsan granite belongs to diorite-granodiorite-granite ranges. As SiO_2 content increases, Al_2O_3 , Fe_2O_3 , MgO , and CaO contents of the granites decrease whereas K_2O content increases in Hacker diagrams. The $^{206}\text{Pb}/^{238}\text{U}$ age for zircon rims of granodiorite porphyry is 85.3 ± 1.2 Ma and weighted mean of SHRIMP zircon $^{206}\text{Pb}/^{238}\text{U}$ age of the Dolsan granite is 67.38 ± 0.80 Ma whereas weighted mean of LA-MC-ICP-MS zircon $^{206}\text{Pb}/^{238}\text{U}$ age of YS-58 is 78.76 ± 0.36 Ma.

Based on geochemical analysis, the Cretaceous volcanic and granitic rocks in the Yeosu area was formed under the subduction-related primitive arc magmatic environment in an active continental margin.