

Experimental study on the petrogenesis of Middle Miocene granitoid plutons in the Ehime Prefecture

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The origin of continents with granitic upper crust enriched in incompatible elements is one of the fundamental questions in Earth's evolution. The Middle Miocene granitoid plutons (the Uwajima, Miuchi and Omogo plutons) are distributed in the Ehime prefecture, Southwest Japan. These plutons are composed of incompatible element-enriched granitoids including granodiorites, monzogranites and granites (*sensu stricto*). In order to constrain petrogenesis of the Middle Miocene granitoid plutons, we tried high-temperature melting experiments under deep crustal pressures.

The melting experiments are performed in a piston-cylinder type high-pressure apparatus with 12.7 mm borehole, under conditions at 900-1000 °C and 0.9 GPa. Starting materials prepared for the experiments were (1) powders of the Setouchi andesite (the JA-2 AIST geological standard sample), (2) fragments (~1mm) of Shimanto metasedimentary rocks (psammitic hornfels collected from the contact aureole of the Miuchi pluton), and (3) mixtures of them. The run-products were examined with SEM-EDS.

Experimental glass compositions were ranging from monzogranitic to granitic (*sensu stricto*) and are broadly comparable to the Middle Miocene granitoid plutons in Ehime Prefecture. Although most of the major element concentrations of the experimental glasses were similar to the granitoid plutons, the K₂O contents of glasses were considerably higher than those of the plutons. Additional melting experiments on the starting material with the relatively low-K rocks would be required for a better understanding of the genesis of the Middle Miocene granitoid plutons.

Keywords: Granitoid plutons, Middle Miocene, Melting experiment