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Petrogenesis and zircon geochemistry of adakitic granite at the Utsubo area, Hida Belt, southwest Japan

KENJI HORIE[1,2] AND MAMI TAKEHARA[1]

[1]National Institute of Polar Research
[2]Graduate Institute for Advanced Studies (SOKENDAI)

Magmatism occurring at subduction zones is a critical process for Earth's crustal formation and growth. In the subduction zones, there are variable kinds of magmatism and felsic-zoned plutons can be useful natural analogs to reveal the intrusive history and petrogenetic process including the fractional crystallization and crustal assimilation with information of timescale occurring in magmas that have already separated from their source rocks. In this study, U-Pb geochronology, trace element geochemistry and oxygen isotope of zircon reveal the magmatic and petrogenetic process of adakitic granitoid related with the zoned pluton at the Utsubo area in the Hida Belt. The Utsubo granite zoned pluton is classified into three units, from outer to inner parts, i.e., hornblende tonalite, hornblende biotite granodiorite, and biotite granite. Whole rock trace element composition of tonalite and granodiorite show similar distribution whereas biotite granite has adakitic geochemical signatures. Zircons extracted from tonalite, granodiorite, and adakitic granite yielded 192.3 ± 0.4 Ma, 189.8 ± 0.6 Ma and 188.1 ± 0.5 Ma, respectively. The results indicate that the time interval from tonalite to granodiorite is < 3.2 Ma and adakitic granite was emplaced into granodiorite < 2.7 Ma later after the granodiorite formation, which indicates that different composition melt coexisted at the Utsubo area. In this presentation, the trace element geochemistry and oxygen isotope of zircon will be discussed.