Origin of the Bato gabbro-diorite suite, Yamizo area, Northeast Japan

*Yoshiaki Kon[1], Terumi Ejima[2], Shigenori Kawano[3], Daisuke Araoka[1]

1. Geological Survey of Japan, AIST, 2. Faculty of Science, Shinshu University, 3. Tochigi Prefectural Museum

To constrain the formation process of the Bato plutonic suite, whole-rock and microscale elemental analyses, U–Pb dating combined with cathodoluminescence imaging, and microscope observations were carried out. The Bato pluton consists of gabbros and diorites. Six zircon grains separated from a gabbro sample have a unimodal zircon U-Pb age (105.7 ±1.0 Ma), and indicate solidification age. The zircon grains of a diorite have inherited core, oscillatory zoned mantle, and dark rim. The U-Pb ages of the inherited cores range 2165 to 161Ma. The ^{238}U–^{206}Pb ages of the oscillatory zoned mantles and dark rims are 109.0 ±1.3 Ma and 107.7 ±1.3 Ma, respectively. Whole-rock composition of the diorite samples can be explained by simple mixing process of the gabbro sample and the minimum-melt of a felsic component.
Based on our results, we proposed formation processes of Bato pluton. Primitive magma of diorite intruded into sedimentary rocks, and dioritic magma was formatted by assimilation of the sedimentary rocks before 109 Ma. Then, the diorite solidified in this place at 108 Ma. Finally, gabbroitic magma solidified at 106 Ma.

Keywords: U-Pb age, gabbro, diorite

