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Zircon U-Pb ages of Early Crataceous igneous rocks in the Kitakami Mauntains, Japan

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Early Cretaceous igneous rocks in the Kitakami Mountains consist of volcanic rocks, dike rocks, and plutonic rocks, from older to younger. Plutonic rocks are composed mainly of adakitic granites in central part of zoned plutonic bodies surrounded by adakitic to non-adakitic granites in marginal part. These adakitic plutons is divided into E and W zones based on the ages and geochemistry. Zircon U-Pb ages were determined with laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS) for 22 samples from 13 rock bodies including the Early Cretaceous adakitic granites in the Kitakami Mountains (Tsuchiya et al., 2015). Zircons from the adakitic granites of E zone give older ages (127–117 Ma) compared with those of W zone (119–113 Ma). Zircon ages become younger from the northern Hashikami pluton and marginal facies of the Tanohata pluton (127–125 Ma) to southern Takase granites (118–117 Ma), in the E zone adakitic granites. Petrochemical differences between the E zone and W zone rocks indicate that the adakitic melt of E zone rocks are considered to be derived from vapor-absent melting condition, while those of W zone rocks are from higher pressure and vapor-present condition. Calc-alkaline to shoshonitic plutonic rocks and dike rocks show narrow range of zircon U-Pb age (128–124 Ma), and are almost contemporaneous to those of the Hashikami, Tanohata, and Miyako plutons (127–125 Ma). Taking all these data into consideration, the Early Cretaceous magmatisms in Kitakami can be explained by the differential subduction model of the Farallon-Izanagi plates or slab rollback model accompanied with asthenospheric upwelling.

Keywords: adakite, zircon geochronology, Kitakami, petrochemistry, Cretaceous