

# Early Cretaceous crustal growth by adakitic magmatism in the Kitakami Mountains, Japan

<sup>1</sup>Tsuchiya, N., <sup>1</sup>Endo, M., <sup>2</sup>Kimura, J-I., and <sup>3</sup>Kagami, H.

<sup>1</sup>Iwate University, <sup>2</sup>Shimane University, <sup>3</sup>Niigata University, Japan

Island arc magmatism along convergent plate margins is one of the major processes of continental crust generation. Compared to modern subducted oceanic crust, the oceanic crust subducted in Archean time was relatively younger and hotter, so it reached the conditions of partial melting and produced adakitic magmas (Martin, 1986; Drummond and Defant, 1990). Large amounts of Cretaceous to Paleogene felsic igneous rocks are distributed in northeast and southwest Japan. Among them, Early Cretaceous plutonic rocks in the Kitakami Mountains attract special interest because of the coexistence of adakitic and calc-alkaline rocks. Adakitic granites occur in central part of three zoned plutonic bodies, Hashikami, Tanohata, and Miyako plutons, surrounded by calc-alkaline granites in marginal part. Similar zoned plutons including adakitic rocks are also distributed in Kinkasan and Wariyama, southern part of the Kitakami Mountains. Petrochemical evidence indicates that the adakitic granites can be derived by direct partial melting of subducted slab leaving garnet, clinopyroxene, quartz, rutile, and apatite as restite (Tsuchiya and Kanisawa, 1994). The calc-alkaline granites of marginal facies are characterized by lower concentration of Sr, Eu, and Ga, and by higher concentration of HREE, Y, K, Rb, Mg, Cr, and Ni than the adakitic granites of central facies. Initial  $^{87}\text{Sr}/^{86}\text{Sr}$  (SrI) and  $^{143}\text{Nd}/^{144}\text{Nd}$  (NdI) ratios of adakitic granites normalized assuming the age of 120 Ma range from 0.70372 to 0.70429 and 0.51252 to 0.51262, respectively. SrI and NdI of the adakitic granites show relatively wide range and vary towards those of the calc-alkaline granites. These petrochemical characteristics suggests that calc-alkaline magmas of marginal facies were formed by reactions between ascending adakitic melt and a wedge mantle peridotite.