

# The geochemical features of boninitic rocks from Xinjiang Altay, NW China

# Haixiang Zhang[1]; Hiroaki Sato[2]; Hecai Niu[3]; Xueyuan Yu[3]; Junichi Ito[4]

[1] GIG, CAS; [2] Earth and Planetary Sci, Kobe Univ; [3] Guangzhou Institute of Geochemistry; [4] Global Development Sci., Kobe Univ

Northern Xinjiang (NW China) tectonically belongs to the Central Asian Orogenic Belt (CAOB) that is situated between the Siberian and Sino-Korean-Tarim cratons, and encompasses a vast area from the Urals in the west, through Kazakhstan, NW China, Mongolia, NE China to the Okhotsk Sea in the Russian Far East. The petrological and geochemical studies on the middle Devonian pyroxene-andesites from the north edge of Kazakhstan-Junggar Plate, Xinjiang Altay, NW China show that they were boninitic rocks and were formed in the forearc environment. The pyroxene-andesites from this area have porphyritic textures with phenocrysts of pyroxenes, chromian spinel and plagioclase, whereas the matrix consists of acicular amphiboles and a few micro-plagioclases. Some relict augites have compositions of  $Mg\# = 90-92$ , and  $Cr_2O_3$  contents of 0.4-0.7 wt.%, and chromian spinel have  $Cr/(Cr+Al)$  ratio of 0.84. The bulk rocks of pyroxene andesites have moderate  $SiO_2$  (54.09%-59.52%), low  $TiO_2$  (0.16%-0.34%), high  $MgO$  (7.90%-9.80%) and  $CaO$  (7.84%-9.90%) contents with high  $Mg\#$  (63-72) and  $Al_2O_3/TiO_2$  (39-69) ratios. The compatible element contents are high (e.g. Ni, Cr, Co with averages of 92.1ppm, 348.5ppm and 36.7ppm, respectively), whereas the HFSE (Ti, Zr, Hf, Y, Yb, etc.) depletion is strong in the pyroxene-andesites. The MORB-normalized spider diagrams show obviously negative Nb, Ta, Zr, Hf anomalies and positive Sr anomaly. The total REE contents in the pyroxene-andesites are low and the middle REE are depleted with U-type REE patterns. Therefore, the petrological and chemical features of pyroxene-andesites from the middle Devonian Beitashan group in Xinjiang Altay, NW China are very similar to those of boninites. The existences of middle Devonian boninitic rocks together with Early Devonian adakites and Nb-enriched basalts in the north edge of the Kazakhstan-Junggar Plate indicate that there was a southward subduction of the Paleo-Asian Ocean beneath the Kazakhstan-Junggar Plate in early-middle Devonian. It is a significant evidence for Sengor's suggestion that Central Asian Orogenic Belt is formed dominantly from giant Paleozoic subduction-accretion complexes.