

Late Paleozoic to Early Cenozoic subduction-related magmatism in Korea: cyclic changes of rock type and juvenile mantle input

KYE-HUN PARK^{1,*}, YONG-SUN SONG²

¹ Pukyong National University, Dept. Earth Environmental Sciences, Busan 48513, Korea, khpark@pknu.ac.kr (*presenting author)

² Pukyong National University, Dept. Earth Environmental Sciences, Busan 48513, Korea, yssong@pknu.ac.kr

Subduction along the Eurasian continental margin in the western Pacific caused magmatism over the Late Paleozoic to Early Cenozoic on the Korean peninsula. This magmatism is divided into three periods of activity; Late Permian to Triassic, Jurassic, and Cretaceous to Paleogene. Each period is divided by the resting period of magmatism, and the change of the rock type and the radiogenic isotopes are similar in each period. It is noteworthy that immediately after the beginning of the Permian-Triassic magmatic period, Yeongdeok granite with adakitic character appears at about 252 Ma (Yi et al. [1]). Although adakitic magmatism of the Cretaceous-Paleogene period was not known on the Korean Peninsula, Early Cretaceous adakitic granitoids were reported in both southwest Japan and northeast Japan (Takahashi et al. [2] and Tsuchiya et al. [3]), which is closer to the trench of the time. A-type magmas appeared at the end of all three magmatic periods.

In addition, changes in Sr, Nd, and Hf radiogenic isotopic compositions show similar changes within each period. At the beginning of each period, the Sr, Nd and Hf isotopic compositions of the plutonic rocks show the most depleted values, indicating a relatively high rate of juvenile input, but the effect of the older continental crustal material is gradually increased towards the end of each period. These changes are also seen not only in the exposed plutons but also in the U-Pb ages and Hf isotopic compositions of the detrital zircons in sediments deposited in the Cretaceous Gyeongsang Basin.

A similar cyclic change in rock type and radiogenic isotopic composition during several repeated periods, as occurred in the Phanerozoic magmatism of the Korean Peninsula over about 200 Ma, suggests a type model of subduction-related magmatism in the continental margin.

[1] Yi et al. (2012) *Lithos*, 153, 129-141. [2] Takahashi et al. (2005) *Island Arc*. 14, 150-164. [3] Tsuchiya et al. (2014) *J. Geol. Soc. Jap.* 120, 37-51.