



Mingling process of a Tonalite-trondhjemite-granodioritic magma (TTG) in Late Cretaceous granite in Gyeongsang Basin, SE Korea

Mohammed S. M. Adam, Sambit Prasanajit Naik, and Young-Seog Kim

Pukyong National university, Marine and environmentl sciences, Earth and Environmental Sciences, Busan, Korea, Republic Of
(mosaif74@gmail.com)

Late Cretaceous granitic intrusions known as Bulguksa Granite are common in the southeastern part of the Korean peninsula, which intruded during the period between 110Ma and 70Ma as a result of the subduction of the Pacific plate under the eastern margin of the Asian continent. Most of these granitic intrusions enclose microgranular enclaves (MEs), which have almost the same age as their plutons. The Bulguksa Granite in Taejongda Geopark shows a special type of enclaves, which was described as zoned microgranular enclaves and distinguished from the normal enclaves composed of single rock type. The zoned enclaves are composed of several orbicular zones distributed from the center to the rim as follows; mafic porphyritic rocks in the center changing gradually to be fine to medium in texture towards the rim. This fine to medium zone is surrounded by a dioritic zone, which has sharp contact with the host granite. This zoned MEs has not been reported in any other Late Cretaceous Bulguksa Granites indicating a special setting for the formation mechanism. Therefore, we have done a petrographic and geochemical study for the granite and its enclaves, which was compared with other intrusions in Gyeongsang Basin. The result indicates that the dioritic zone of the zoned MEs and some of the simple enclaves show chemical characteristics of tonalite–trondhjemite–granodiorite (TTG) with low K₂O composition (~ 1 -1.5%) in the zoned MEs and less than 1% in the simple MEs. TTG is the dominant intrusive rocks in Archean terranes. Because the zoned MEs in Taejongdae granite show several pieces of evidence of magma mixing and mingling, the studied granite might be generated with different forming stages. The tonalite–trondhjemite–granodiorite magma chamber was first generated and then injected into the Bulguksa Granite in this study area.