New timing constraints of eclogites and associated metabasites in the Hongseong area, Korea and its tectonic implication

Sung Won Kim, Hee Jae Koh, and Weon-Seo Kee
Korea Institute of Geoscience and Mineral Resources, Geological Research Division, Daejeon, Republic Of Korea
(sungwon@kigam.re.kr +82 42 868 3501)

The Hongseong area of the southwest Gyeonggi block in Korea, a possible eastern extension of the Dabie–Sulu collision belt in China, is a composite tectonic complex formed by the Early–Middle Triassic continent–continent collision between the North and South China blocks in Korea. Petrology, sensitive high-resolution ion microprobe (SHRIMP) U–Pb zircon ages and geochemical and isotopic (Sr, Nd and Pb) data were obtained from lenticular eclogites and associated metabasites in the Hongseong area. In general, eclogites and most of metabasites were metamorphosed into eclogite to high-pressure granulite at 245-235 Ma. The eclogites formed at 16.0-21.0 kb and 770-850 [U+2103] and was overprinted first by granulite facies metamorphism (11.0-15.6 kb and 760-850 [U+2103]) due to isothermal decompression. The eclogites finally retrogradated into amphibolite at 7.0-9.5 kb and 540-730 [U+2103]. Biotites from retrograde eclogites and associated metabasites yield ca. 205-218 Ma of K-Ar ages representing time of uplift. These data indicate that the metamorphic evolution of eclogites and associated metabasites followed clockwise P-T-t path. The geochemical and isotopic (Sr, Nd and Pb) signatures indicate that lenticular eclogites and associated metabasites in the area mostly originated in the arc or back-arc tectonic setting by multiple generations (ca. 1.8 Ga, 0.8 Ga and 0.32 Ga). Ages of zircon core of them are similar to the protolith ages of tectonic episodes in the Central Orogenic Belt of China. Thus, Triassic HP/UHP metamorphism in both China and Korea provides compelling evidence for an eastward extension of the Dabie-Sulu suture zone into the Hongseong area of Korea.