

How we can delineate the disappeared continental collision process using metamorphic information

CHANG WHAN OH^{1*}

¹Department of Earth and Environmental Sciences and The Earth and Environmental Sciences System Research Center, Chonbuk National university, Jeonju, Republic of Korea.

The metamorphic trend in the continental collision belt differs from one collision belt to another. In the Himalayan collision belt, the metamorphic conditions change eastward from ultrahigh-pressure eclogite facies at 46-55 Ma (750–770°C, 30–39 kbar) through high-pressure eclogite facies at 30-39 Ma to high-pressure granulite facies metamorphism at 22-25 Ma (890°C, 17–18 kbar). On the other hand along the Qinling–Dabie–Sulu–Hongseong–Odesan collisional belt between the North and South Korea-China Cratons, the metamorphic conditions also change systematically towards west: ultra-high temperature (UHT) metamorphism in the Odesan area at 245 Ma (915–1160°C, 9.0–10.6 kbar); high pressure (HP) eclogite-facies metamorphism in the Hongseong area at 250 Ma (819–835°C, 23.3–25.6 kbar); ultra-high pressure (UHP) eclogite-facies metamorphism in the Sulu, Dabie and Hong'an areas at 240-220 Ma (620–880°C, 26–43 kbar); HP eclogitefacies metamorphism in the Tonbai area at 216 Ma (530–610°C, 17–20 kbar); epidote–amphibolite- and blueschist facies metamorphism in the Wudang area at 216 Ma (505–550°C, 10–13 kbar); and HP granulite-facies metamorphism in the western Qinling area at 214 Ma (657–772°C, 9.7–13.2 kbar). The metamorphic pattern in the Himalayan collision belt indicates the following collision model. The continental collision started from the west where the continental slab subducted to the depths of ultrahigh-pressure metamorphism and then break-off from the oceanic slab at ca. 46–55 Ma. The collision propagated eastwards with decreasing slab break-off until ca. 22–25Ma. The metamorphic pattern along the Qinling–Dabie–Sulu–Hongseong–Odesan collisional belt suggests the following collision model. The North Korea-China and South Korea-China Cratons first collided at their eastern margins (the Odesan area) before 245 Ma and the collision propagated westwards with increasing the depth of slab break-off until the collision occurred in the Dabie area. However, from the Dabie area, the depth of slab break-off decreased during continued westward propagation of collision until the collision was finished in the west Qinling.