

The collision process interpreted using the systematic change of metamorphic pattern along the Qinling–Dabie–Odesan collisional belt between the North and South Korea-China Cratons

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Along the Qinling–Dabie–Odesan collisional belt between the North Korea-China and South Korea-China Cratons, the peak metamorphic conditions reflect systematically changing metamorphic regimes from east to west: ultra-high temperature (UHT) granulite-facies metamorphism in the Odesan area (905–1160°C, 9–10.6 kbar) at 247–245 Ma; high pressure (HP) eclogite-facies metamorphism in the Hongseong area (819–835°C, 23–25 kbar) at 250 Ma; ultra-high pressure (UHP) eclogite-facies metamorphism in the Sulu, Dabie and Hong' an areas (620–880°C, 26–43 kbar) at 220–240 Ma; HP eclogite facies metamorphism in the Tonbai area (530–610°C, 17–20 kbar) at 216 Ma; epidote–amphibolite and blueschist facies metamorphism in the Wudang area (505–550°C, 10–13 kbar) at 216 Ma ; and HP granulite-facies metamorphism in the western Qinling area (657–772°C, 9.7–13.2 kbar) at 214 Ma. Additionally, the Triassic post-collisional igneous rocks regionally intruded at both ends of the collision belt, in the Hongseong–Odesan areas at 230 Ma and in the west Qinling at 210 Ma. These observations indicate that the following collisional processes occurred along the Qinling–Dabie–Odesan collisional belt. The collision between the North Korea-China Craton and South Korea-China Craton first occurred in the eastern margin of the collision belt (the Odesan area) with an angle of approximately 60° between their long axes of two Cratons and propagated towards west. The amount of oceanic slab subducted before the collision increased from the Odesan area to the Sulu area due to westwards increase in the width of the ocean between the North Korea-China and South Korea-China Cratons, resulting an increase in the depth of slab break-off. After slab break-off occurred in the Sulu area, the lateral tearing force strengthened, resulting a decrease in the depth of slab break-off from the Sulu area to the western Qinling area as collision propagated westward. At both ends of the collision belt, post collisional igneous activities occurred with metamorphism higher than granulite facies relating to high heat supply from upwelling mantle due to shallow depth of slab break-off.

Keywords: Qinling–Dabie–Odesan collision belt, The depth of slab break-off, Peak metamorphism, Post collisional igneous activity, Collisional process

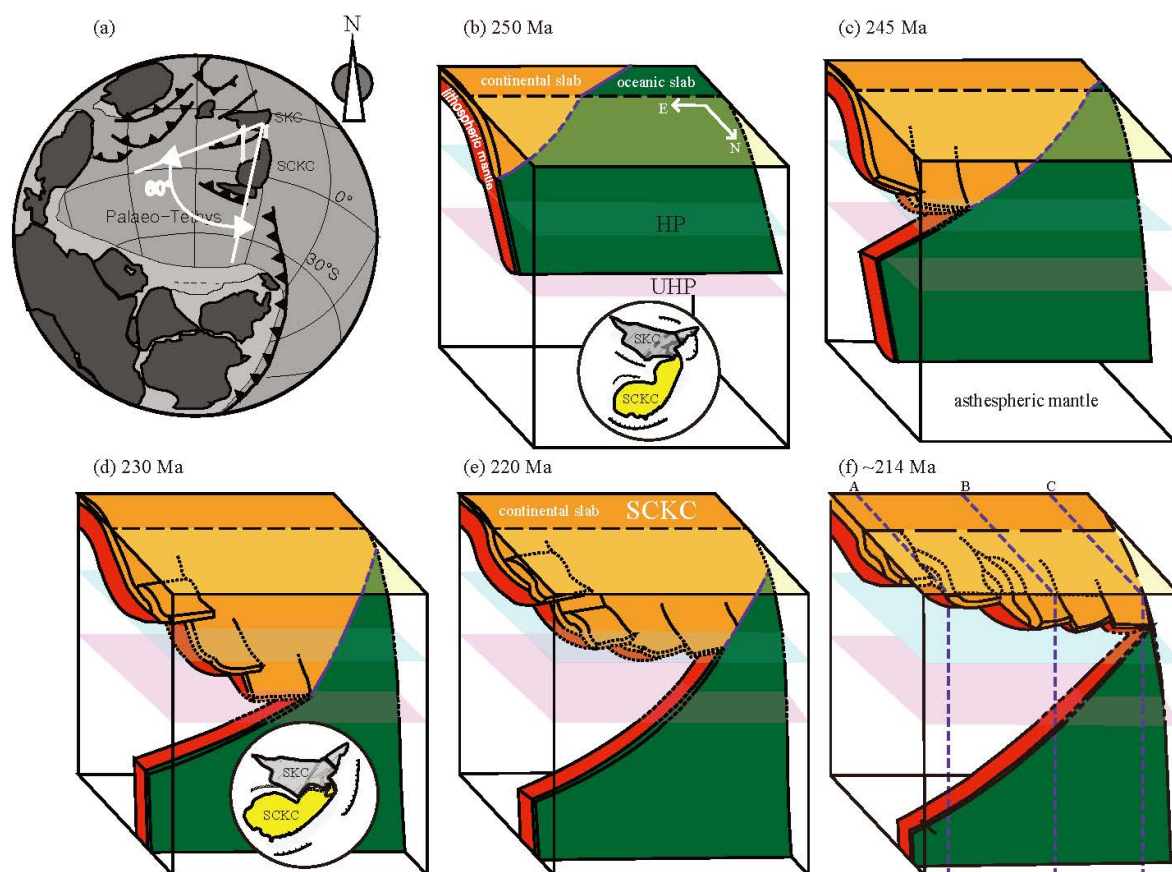


Fig. 16 Oh and Lee,