Metamorphic complex, including meta-sedimentary rocks and meta-basic rocks, is widely distributed in Diancang Shan-Ailao Shan metamorphic complex belt, Southeastern Tibetan Plateau. Among them, the meta-basic rocks occur as lenses within the meta-sedimentary rocks. Also, lenses and thin layers of granitic leucosome, parallel to foliations, are ubiquitous in paragneisses and amphibolites. Detailed geochemical analysis shows that the meta-sedimentary rocks have similar contents of main elements and REE. Chondrite-normalized REE patterns suggest that they are rich in LREE, and depleted in HREE with pronounced negative Eu anomalies (Eu/Eu* = 0.55 ~ 0.75). Major and trace element distributions suggest the protoliths of claystone, siltstone, and graywacke. Microprobe and mineral inclusions analysis reveals that garnet porphyroblasts bear a chemical composition zonation from core to rim. The zonation of St-Ky-Grt Bt-Ms schist indicates a temperature-pressure increase during garnet growth. Whereas genetic and characteristics of garnet from (Sil)-Grt-Bt paragneisses, implicate the diffusion zoning and decreasing of temperature-pressure. On the basis of paragenesis, mineral transformation and chemical composition zonation of garnets, four metamorphic stages have been recognized, i.e. early prograde metamorphic stage (M1), peak amphibolite-granulite facies metamorphic stage (M2), near isothermal decompression retrogression metamorphic stage (M3), and late amphibolite facies retrograde stage (M4). Metamorphic P-T conditions for each stage were calculated by P-T pseudosection, and geothermobarometer (GB-GASP) and two-mica thermometer. The mineral assemblage for the early prograde assemblage (M1) is characterized by Pl + Ms + Qz + St ± Ky ± Bt ± Kfs, which as inclusions are preserved in the core of garnet, and formed at 560 ~ 590°C and 5.5 ~ 6.3 kb. The typical mineral assemblage for the peak amphibolite-granulite facies metamorphic stage (M2) assemblage is represented by Grt + Bt + Ky/Sil + Pl + Qz or Grt + Bt + Pl + Qz ± Kfs ± Sil, recording P-T conditions of 720 ~ 760°C and 8.0 ~ 9.3 kb. The near isothermal decompression retrograde stage (M3) is indicated by a mineral assemblage of Grt + Bt + Sil + Pl (rich in Ca) + Qz, which were formed at P-T conditions of 640 ~ 760°C and 5.0 ~ 7.3 kb. Abundant retrogressive minerals, including fine-grained biotite and muscovite, together Pl + Qz ± Kfs ± Grt were formed at the late amphibolite facies retrograde stage (M4), which occurred at P-T conditions of 521 ~ 648°C and 4.0 ~ 5.0 kb. The integrated clockwise P-T path revealed by the meta-sedimentary rocks indicates that the Diancang shan-Ailao shan metamorphic complex belt experienced a tectonic evolution of subduction-collision-exhumation, which was related to the amalgamation between the Indian and Eurasian plates.

**Key words:** Mineral transformation; pseudosection; P-T path; metamorphism; meta-sedimentary rocks; Diancang shan-Ailao shan metamorphic complex belt