

Variation of metamorphic P-T conditions from the Permo-Triassic continental collision zone in northern to central Vietnam

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The Asian continent is considered to amalgamate a large number of micro-continents at the Permian-Triassic. Present studied Indochina has been regarded as an assemblage of four major micro-continental blocks named the South China, Indochina, Shan-Thai and West Burma cratons. Among them, the Indochina craton comprising most part of the Indochina Peninsular, is bounded to the northeast by the Song Ma Suture zone as well as the western boundary of the craton is regarded as the Nan-Uttaradit Suture zone.

The studied areas of the Kontum Massif and the Song Ma Belt situate in central and northern Vietnam, respectively, which have been regarded as continental collision products between the South China and Indochina cratons, recently. The Permo-Triassic metamorphic rocks, formed under various P-T conditions are observed in studied area that can be divided into 4 types described below;

(I) High-pressure granulite including ultrahigh-temperature granulite; Grt+Cpx+Qtz with symplectitic Opx from Song Ma (850 C at 1.6 GPa) and Grt+Opx+Sil+Qtz from Kontum (1050 C at 1.2 GPa).

(II) High-temperature eclogite decompressed to ultrahigh-temperature condition; Grt+Cpx+Qtz with symplectitic Opx and Qtz rods-bearing Cpx from Kontum (950 C at 1.8 GPa).

(III) Medium-temperature and medium-pressure amphibolite-facies rocks; Grt+Ged+Ky and Grt+Ky+Bt from Kontum (670 C at 1.2 GPa)

(IV) Low- to medium-temperature eclogite; Grt+Omp+Qtz+Ep+Phg with secondary Bar from Song Ma (650 C at 2.6 GPa).

Metamorphic ages of these rocks vary within small range from 260 to 233 Ma so that they probably had been formed by a single collision event. The difference of metamorphic P-T conditions might be due to the difference of their distributions in original crustal level. The low-temperature eclogite (IV) had been situated at upper level in original continental crust and metamorphosed under high-P/T environment whereas high-pressure granulite (I) had been distributed at basal part and formed under relatively low-P/T condition. The results may provide critical insights into understanding exhumation of metamorphic rocks in continental collision tectonic setting.