

Eclogite-facies metabasalts in ophiolitic mélange from the Changning–Menglian suture zone, southeast Tibetan Plateau: P – T – t path and tectonic implication

BAODI WANG¹, ZHENGBIN GOU¹, DONGBIN WANG¹,
ZHIMING PENG¹

¹ *Chengdu Center, China Geological Survey, Chengdu, 610081, China*

The Changning – Menglian suture zone (CMSZ), southeast Tibetan Plateau, is the remnants of the subducted Palaeo-Tethys Oceanic crust between the Sibumasu and Indochina blocks. In this paper, we conducted a petrologic, phase equilibria modeling and geochronological study of the garnet amphibolite from the newly identified Wanhe ophiolitic mélange in the CMSZ. Phase equilibria modeling predicates that the garnet amphibolite has a peak mineral assemblage of garnet, glaucophane, lawsonite, chlorite, rutile, phengite and quartz, and a clockwise P – T path with a prograde segment from blueschist-facies to eclogite-facies with a peak-metamorphic P – T condition of 20– 21 kbar and 495– 515 °C, indicating a cold geothermal gradient of 24– 26 °C/kbar. The retrograde metamorphic P – T path is characterized by nearly isothermal decompression to lower amphibolite-facies and subsequent cooling to greenschist-facies. The metamorphic zircons have a fractionated HREE patterns and significant negative Eu anomalies, and therefore the obtained zircon U– Pb age of 231 ± 1.5 Ma is interpreted to be the lower amphibolite-facies metamorphic time of the garnet amphibolite. The present study probably indicates that the garnet amphibolite in the Wanhe ophiolitic mélange was the retrograded high-pressure eclogite-facies blueschists, instead of the previously proposed eclogite, and the garnet amphibolite recorded the subduction and exhumation process of the Palaeo-Tethys Oceanic crust in the Triassic.