

Ultrahigh-pressure metamorphism in western Tianshan, China: Part I. Evidence from inclusions of coesite pseudomorphs in garnet and from quartz exsolution lamellae in omphacite in eclogites

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ABSTRACT

Inclusions of coesite pseudomorphs in garnets have been found in type I eclogites interlayered with mafic blueschists and carbonate eclogites, and quartz exsolution lamellae in omphacites have been recognized in type II eclogites with pillow structure in western Tianshan, China. Based on mineralogy and petrology, the metamorphic evolution of western Tianshan eclogites can be divided into three stages: (1) pre-peak, ultrahigh-pressure (UHP), eclogite-facies stage (356–443 °C, 8–10 kb); (2) UHP eclogite-facies stage (496–598 °C, $25.7\text{--}26.7 \pm 1$ kbar); and (3) retrograde epidote blueschist-facies stage (500–530 °C, 10–12 kbar). Consequently, the eclogites from the western Tianshan region of China have undergone unambiguous UHP metamorphism.