

In-situ ultrahigh-pressure metamorphism of the south Sulu, eastern-China: Evidence from the ZK703 drillhole

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The ZK703 drillhole with depth of 558m, located in Donghai area of Southern Sulu ultrahigh-pressure (UHP) metamorphic belt, eastern China, consists of eclogite, garnet peridotite, gneiss, garnet-phengite schist, jadeite quartzite and kyanite quartzite. Their protoliths include mafic-ultramafic, mafic, intermediate, intermediate acidic and acidic rocks, and meta-sediments. These rocks show an intimate interlayering on several of meters to several of millimeter scale. Contacts between the rocks are often sharp and untectonized, suggesting in-situ metamorphism of the eclogite facies. The following features indicate that the non-mafic rocks together with eclogites have been experienced UHP metamorphism: (1) Phengite relics in the gneisses, schists and quartzites contain up to 3.52 Si p. f. u. (per formula unite); (2) Jadeite relics in the gneisses and quartzites; (3) Various types of symplectitic corona and pseudomorph after jadeite, kyanite and phengite occur extensively in gneisses, schists and quartzites; (4) Polycrystalline quartz pseudomorphs after coesite occur as inclusions within garnets of gneisses and schists. These evidences further indicate that the supracrustal rocks in the Sulu area as a coherent massif were subducted to a depth of at least 100 km and then exhumed to earth surface.