METAMORPHIC HISTORY OF HIGH-PRESSURE GRANULITES FROM THE TRANS-NORTH CHINA OROGEN: TECTONIC IMPLICATIONS

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The North China Craton can be divided into the Archaean eastern and western blocks, separated by the Palaeoproterozoic Trans-North China Orogen, which consists of a series of low- and high-grade belts containing both re-worked Archaean components and juvenile Palaeoproterozoic igneous and sedimentary rocks. The newly-discovered high-pressure mafic granulites in the orogen preserve peak high-pressure (M1, 750-800°C @ 14-16 kbar), post-peak decompression (M2, 750-800°C @ 6.0-7.5 kbar) and cooling and retrogression (M3, 600-650°C @ 5.0-6.0 kbar) mineral assemblages. The high-pressure assemblage (M1) is represented by coarse-grained garnet + clinopyroxene + sodic plagioclase + quartz + hornblende ± rutile, of which clinopyroxene and sodic plagioclase (An10-20) occur as pseudomorph after omphacite. The decompression event (M2) is characterised by the growth of Ca-rich plagioclase + orthopyroxene ± clinopyroxene symplectites or coronas on garnet. The cooling and retrogression event (M3) is represented by hornblende + Ca-rich plagioclase ± magnetite symplectites on garnet, or by retrograde hornblende rims surrounding matrix pyroxene grains. These mineral assemblages and their P-T estimates define a nearly isothermal decompressional (ITD) clockwise P-T path, which records the thermal history of collision between the eastern and western blocks of the North China Craton at ~1800 Ma.