

THE 1.8GA THERMAL EVENT IN THE NORTH CHINA CRATON: A RECORD OF EARLY UPWELLING MANTLE PLUMES

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A strong 1.8 Ga thermal event has been extensively recorded in the North China craton. The main evidences are as follows: (1), All rocks of granulite facies, no matter which are distributed in northern, southern and eastern parts of the North China craton, suffered a strong retrogressive metamorphism of amphibolite facies. (2), The high-pressure granulites and eclogites mainly occur in northern margin and eastern margin of the craton. All they have clockwise PTt paths with a rapid decreasing pressure from high pressure to middle pressure. (3), The dominant tonalitic-trondhjemitic-granodioritic gneisses commonly suffered stronger migmatization and resetting. (4), The concentrated ductile shear bands and zones are exposed on the surface, which are usually accompanied by small-scale partial melting. (5), Mafic dike swarms with NW-NE striking, are extensively developed in the North China craton. Abundant isotopic data indicate above-mentioned 5 geological facts happened in period of 1.75 Ga-1.82 Ga. The 1.8 Ga geological event is most important and typical tectonic-thermal event in the North China craton.

The 1.8 Ga event possibly is related to early upwelling mantle plumes, which not only provide heat for metamorphism and migmatization, but also added a large volume of mafic material. As a result, the concentrated mafic dike swarms are crowded in the craton, which are originally linked with gabbroic magma underplating. The regional metamorphism, migmatization and shear structure reflect lower crust uplifting and crustal vertical growth.