Spinel-Quartz Association, Al_2O_3-Rich Orthopyroxene and Metamorphic P-T Path from Ultrahigh-Temperature Granulites of the South Altay Orogenic Belt, NW China

ZILONG LI[1], HUIHUI WANG[1], HANLIN CHEN[1], WENJIAO XIAO[2], YINQI LI[1] AND SHUFENG YANG[1]

[1]*Department of Earth Science, Zhejiang University, Hangzhou 310027, China*

[2]*Institute of Geology and Geophysics, Chinese Academy of Sciences, Beijing 100029, China*

The study of ultrahigh-temperature (UHT) metamorphism has been becoming a key topic in the field on the earth science recently, because the occurrence such of orthopyroxene-sillimanite-quartz, sapphirine-quartz, spinel-quartz and osumilite-quartz assemblages and Al_2O_3-rich orthopyroxene could indicate ultrahigh-temperature metamorphism (>900ºC). Through the study of ZnO contents, X_{Zn} and X_{Mg} in the spinels of the UHT granulite from the south Altay orogenic belt, ZnO contents of ca. 2.50 wt% and ca. 1.85 wt% from the spinels coexisting with quartz and ilmenite respectively can be obtained, and they are similar to those from the UHT rocks in the world. Orthopyroxenes have high Al_2O_3 contents (up to 9.30 wt%) and coexisting spinel-quartz association as well as other specific mineral evidence in the UHT rock from the south Altay orogenic belt can be as evidences suffered UHT metamorphism. Based on the study of paragenesis of spinel-quartz, and reactions among specific minerals, and subdivision of the episodes of peak metamorphism with the P-T conditions of ca. 1000°C and ca. 10 kbar deduced and retrograde metamorphism, we suppose a clockwise P-T path for the formation of the UHT rock from the south Altay orogenic belt, and the formation of the UHT rock should be genetic link with the subduction of the Paleo-Asian Ocean, and collision and orogeny of the Siberian plate and Kazakhstan-Junggar plate probably during Paleozoic.

References

Z.L. Li, H.H. Wang, H.L. Chen, W.J. Xiao, S.F. Yang and Y.Z. Hu, *Earth Science Frontiers* **17** (2010).