

Geochronology of the Sanggan potassic granites in the Northern China Craton

HUA-FENG ZHANG^{1*}, MING-GUO ZHAI², ZHI-BO LUO¹

¹State Key Laboratory of Geological Processes and Mineral Resources, China University of Geosciences, Beijing 100083, China (* correspondence: nighty@cugb.edu.cn)

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

The Precambrian Sanggan potassic granites in the northern China Craton are mainly composed of leucosyenogranite, biotite-monzogranite, and garnet-syenogranite. Zircon U-Pb dating was carried out by methods of SHRIMP and LA-ICP-MS for three types of the granites. The leucosyenogranite and biotite-monzogranite have U-Pb ages of 2493 ± 6 Ma and 2437 ± 10 Ma, respectively. Whereas the garnet-syenogranite yields slightly younger ages of 1977 ± 18 Ma and 2003 ± 24 Ma. In addition, metamorphic zircons from two garnet-syenogranite samples gave mean $^{207}\text{Pb}/^{206}\text{Pb}$ age of 1813 ± 21 Ma and 1818 ± 27 Ma. Therefore, the Sanggan potassic granites were generated by multiple tectono-thermal events and underwent late paleoproterozoic high grade metamorphism. The 2500-2400 Ma felsic intrusions were generated by amalgamation of microblocks, whereas the 2000 Ma metamorphism was probably resulted from intra-continental rifting [2].

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REE partitioning between peraluminous melt and coexisting aqueous fluid

H. ZHANG*, Y. TANG AND C.-Q. LIU

Lab. for study of the Earth's Interior and Geofluids, Institute of Geochemistry, Chinese Academy of Sciences, Guiyang 550002, China

(*correspondence: zhanghui65@hotmail.com)

Experiments and Results

Partitioning coefficients of 12 REEs and Y between peraluminous melt and coexisting aqueous fluid were determined in the fluid-saturated experiments at 100 MPa and 800°C. All runs were conducted in externally heated cold-seal pressure vessels using water as a pressure medium for the durations of 144 hours. The experimental results show that REE partitioning coefficients ($D_i^{\text{fluid/melt}}$) are ranged from 0.1×10^{-4} to 19.9×10^{-4} , and decrease gradually as increasing of atomic number of REE from La to Lu, showing a trend of $D_{\text{LREE}} > D_{\text{MREE}} > D_{\text{HREE}}$.

Discussion of Results

Highly differentiated peraluminous magmatic rocks are characterized not only by significant REE tetrad effect, but also by obvious fractionation of equivalent incompatible elements pairs, such as Y-Ho [1-3]. Up to now, it is commonly considered that REE tetrad effect originates from the interaction of peraluminous melt with aqueous fluid [2, 4-5]. As no fractionation between Y and Ho is shown in this study, we put forward here that magmatic-hydrothermal transition system is impossible as a fundamental mechanism for REE tetrad effect in peraluminous magmatic systems.

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