K-feldspar glasses syntheses for external calibration of *in situ* Pb isotope analysis using LA-MC-ICPMS

H.L. YUAN*, J.Y. SONG, K.Y. CHEN, M.N. DAI, Z.A. BAO AND G.F. HE

State Key Laboratory of Continental Dynamics, Department of Geology, Northwest University, Xi'an, 710069 (*correspondence: sklcd@nwu.edu.cn)

Laser ablation Quadruple and multiple collector ICP-MS (LA-Q&MC-ICPMS) is one of the most important analytical technique in terms of in situ analysis of trace elements and isotopic compositions. Matrix matched standards could impair the obstacles of precise measurements including fractionation and matrix effect. Lead isotopic composition of K-feldspar is one of the important ways to trace the history of rock formation and evolution [1]. However, there is no appropriate external standard for in situ Pb isotope analyses using LA-MC-ICPMS. This work describes the synthesis of K-feldspar glasses with a high temperature furnace. The final experimental conditions of the synthesis are melting the 1300mesh K-feldspar powders at 1680 ºC for 2 hours followed by liquid nitrogen quenching. The surface glasses are slightly heterogeneous due to lead evaporation at high temperature while the inside of the glasses are homogenous. The lead isotopic compositions of the glasses are 1.90779 ± 0.00009 ($^{208}Pb/^{206}Pb$,2s), 0.75899 ± 0.00004 ($^{207}Pb/^{206}Pb$, 2s), 20.909 ± 0.002 ($^{206}Pb/^{204}Pb$, 2s), 15.871 ± 0.002 ($^{207}Pb/^{204}Pb$, 2s) and 39.888 ± 0.005 ($^{208}Pb/^{204}Pb$, 2s), and the RSD are 0.007%, 0.008%, 0.016%, 0.016% and 0.021% (Fig. 1), respectively. The results show that the synthesized K-feldspar glasses could be potentially served as external calibration standard for in situ lead isotope measurements.

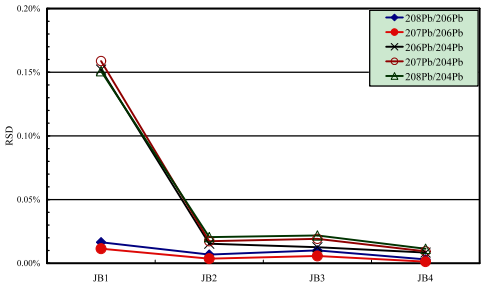

Figure 1 Relative standard deviation of Pb isotope ratio of synthesized K-Feldspar glasses

[1] Gagnevin *et al*., *Geocheim. Cosmochim. Acta,* (2005), **69**(7): 1899-1915

The zircon fission track constraint on the mineralizing ages of the Jiapigou gold deposits, Northeastern China

WANMING YUAN, JUN DENG AND ZHIXIN HUANG

State Key Laboratory of Geological Processes and Mineral Resources, China University of Geosciences, Beijing, 100083, China

The Jiapigou gold district is located at the north margin of the North China Craton, and its evolution is closely related to the Siberian Plate in the north, Yangtze Craton in the southeast and Pacific Plate in the east. The gold deposits belong to quartz vein type and are close related to a NE shear zone and the magmatic activities.

Samples for zircon fission track analyses were collected from different ores and alteration rocks. A total of 12 zircon samples were successfully analyzed. All the sample fission track ages have $P(\chi^2)$ values >5% and all grains counted belong to a single population of ages. The zircon ages range between 78 Ma and 158 Ma and centralize at 4 age groups of 158-152 Ma, 126-116 Ma, 108-98 Ma and 88-78 Ma.

A lot of homogenization temperature values of the metallogenic fluid inclusions from different ore deposits mainly range from 180 °C to 280 °C. This temperature could represent the mineralization temperature of the research gold deposits. The zircon fission tracks have a retention temperature of about 250 °C. Apparently, the zircon fission track ages can represent metallogenic ages in the gold districts.

Therefore, the 4 zircon age groups for different ores and alteration rocks could indicate the 4 epochs of gold mineralization. This could be confirmed by some geological evidences, such as, the different alteration cycle, the multiple periods of intrusions, coincident other thermochronological data and so on.