Remelting of subducted continental lithosphere: Petrogenesis of Mesozoic magmatic rocks in the Dabie-Sulu orogenic belt

Z.-F. ZHAO AND Y.-F. ZHENG

School of Earth and Space Sciences, University of Science and Technology of China, Hefei 230026, China (zfzhao@ustc.edu.cn)

The Dabie-Sulu orogenic belt formed by the Triassic continental collision between the South China Block and the North China Block. There is a large area of Mesozoic mgmatic rocks along this belt, with emplacement ages mainly at Late Triassic, Late Jurassic and Early Cretaceous. The Late Triassic alkaline rocks and the Late Jurassic granitoids only crop out in the eastern part of the Sulu orogen, whereas the Early Cretaceous magmatic rocks occur as massive granitoids, sporadic intermediate-mafic intrusive and volcanic rocks throughout the Dabie-Sulu orogenic belt. Despite the different ages for their emplacement, the Mesozoic magmatic rocks are all characterized not only by enrichment of LREE and LILE but depletion of HFSE, but also by high initial Sr isotope ratios, low ε_{Nd} (t) values and low radiogenic Pb isotope compositions. Some zircons from the granitoids contain inherited magmatic cores with Neoprotozoic and Triassic U-Pb ages, respectively. The Neoproterozoic ages also have been found in some inherited zircon cores from the Cretaceous mafic rocks. Most of the mafic roks have zircon $\delta^{18}O$ values either lower or higher, and whole-rock $\delta^{13}C$ values lower, than those for the normal mantle. A systematic comparison with adjacent UHP metaigneous rocks shows that the Mesozoic granitoids and mafic rocks have elemental and isotopic features similar to the UHP metagranite and metabasite, respectively. This indicates that these magmatic and metamorphic rocks share the diagnostic features of lithospheric source that has a tectonic affinity to the northern margin of the South China Block. Their precursors were derived from reworking of arc-type crust in the Proterozoic. They underwent the UHP metamorphism and the post-collisional anatexis at different times and depths, respectively. Therefore, the Mesozoic magmatic rocks were derived from anatexis of the subducted continental lithosphere itself beneath the collision-thickened orogen. The geodynamic mechanism of post-collisional magmatisms is tectonic collapse of the orogenic roots in response to lithospheric extension. We advocate that reworking of the orogenic lithosphreic mantle and crust is a basic process for petrogenesis of continental igneous rocks.

Study on determination of Lead isotopes ratio in oil shale by Inductively Coupled Plasma Mass Spectrometry

PEI-XI ZHENG[1] AND YAN ZHOU[2]

[1]College of Earth Sciences Jilin University Changchun China 130061

[2]Center of Analysis and Testing Jilin University Changchun China 130026

Oil shale resources are abundant in the world. As an important substitute of energy resource, has caught people's great attentions for its large resource and multi-purpose utilizations.

A method for the determination of Lead Isotopic Rations in oil shale was proposed by Iductively Coupled Plasma Mass Spectrometry (ICP-MS). The instrumental fluctuation from sampling system and plasma that induce the low precision can be avoided by optimizing the operating parameters.For the accuracy results, the ratios acquired should be corrected with the dead time and internal standard mass bias. The ICP-MS (Agilent 7500a) running conditions: RF power 1250W; Carrier gas flow rate 0.4L/min; makeup gas flow rate 0.8L/min, Spray chamber temp 2°C; Sample flow rate 0.1ml/min; Sample depth 7mm.

In the determination of the method, we analyse ^{206}Pb ^{207}Pb ^{208}Pb. Because the contents of oil shale of ^{204}Pb are too low, wo don't analyse ^{204}Pb. The sample was dissolved in mixed acids with pressurized sample digestion and an appropriate amount of mannnitol was added to prevent boron from volatilization..Analytical mass number were carefully selected and the instrumental operating conditionswere optimized.

The major parameters affecting the acccurate and precise measurement of lead isotope ratios by ICP-MS were studied. The analytical precisions of lead isotope ratios for SRM 981 of repeat measurements at lead concentration of 5 μg/L were about 0.1% for $^{206}Pb/^{207}Pb$, 0.12 for $^{206}Pb/^{208}Pb$, respectively applied to the analysis of oil shale samples. The method of ICP-MS, with the merits of high sensitivity and precision, is suitable for the measurement of lead contents in plants.

[1] Zheng PX, Zhou Y, Wang TF *et al*. (2009) Determination of lead isotopes ratio in rock samples by ICP-MS[J] *Geochimica et Cosmochimica Acta* **73**(13), A1522-A1522.