U-Pb dating of 31 Ma Zircon by ELA-ICPMS

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Laser ablation ICP-MS is powerful technique for in situ zircon dating and trace elements analysis[1-3]. There are many literatures refers this technique and its applications[4-6]. Zircon dating technique, expecially for the young age zircons, is still an important part of geological applicaions (Ballard et al.2001).This work reports cenozoic zircon dating by excimer laser ablation ICP-MS while setting spot size at 30micron, laser frequency at 10 Hz and laser energy at 100-110 mJ.

Instrument and data processing: A Perkin Elmer/SCIEX ELAN 6100 DRC ICP-MS (ON, Canada) equipped with a 193 nm excimer laser ablation system (GeoLas 200M, MicroLas, Göttingen, Germany) were used in this work. Detailed instrumental setting was given by Gao et al. (2002).

Isotopic ratios were calculated by GLITTER (VER 4.0, Macquarie University). Ages as well as the concordia figure were calculated by Isoplot/Ex (rev.2.49) (Ludwig, 1991).

Results and discussions: 9921-4 is nephelitic sienite from Eastern China. The age reported by SHRIMP is 31.6 ± 1.3 Ma (Wu et al., 2001). The same sample was also studied by ELA-ICPMS in this study in order to establish the dating method. When other parameters were set as above, we obtain $^{206}Pb/^{238}U$ weighted average age 31.06 ± 0.43 Ma (2s), 30.40 ± 0.39 Ma (2s) and 31.50 ± 0.78 Ma (2s) while spot size were 30, 40 and 60micron, respectively. All ages are agree well with SHRIMP result.

With the same method, we analyzed gabbro zircon SK10-2 which was also sampled from Eastern China. 32.10 ± 0.49Ma (2s) and 31.50 ± 0.78Ma (2s) were obtained for 30 and 40 micron (fig. 1). Geological study of this sample was published elsewhere (Yuan et al. 2003).

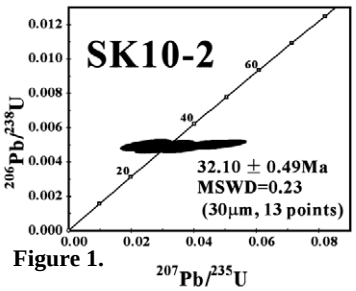

Figure 1.

Conclutions: These results show that the method established in this paper works well for young zircon, and most importantly, it can be applied to dating those zircons with normal U, Pb concentration.

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