



### 1.10 方解石 LA-MC-ICP-MS 微区原位 U-Pb 定年分析

方解石 U-Pb 同位素定年在武汉上谱分析科技有限责任公司利用 LA-MC-ICP-MS 分析完成。测试仪器采用 NEW WAVE 193nm 准分子激光剥蚀系统联用 Thermo Neptune XT MC-ICPMS。激光剥蚀过程中，采用氦气作载气，氩气为补偿气以调节灵敏度。两者在进入 ICP 之前通过一个 T 型接头混合，激光剥蚀系统配置有信号平滑装置(Hu et al., 2015)。本次分析的激光束斑和频率分别为 60 $\mu$ m 和 6Hz。U-Pb 同位素定年处理采用 USGS 硅酸盐玻璃标样 NIST614 校正方解石标样及样品  $^{207}\text{Pb}/^{206}\text{Pb}$ ，再使用方解石标样 PTKD-2 校正样品  $^{238}\text{U}/^{206}\text{Pb}$ (Wu et al., 2022)。每个时间分辨分析数据包括大约 20 s 空白信号和 30 s 样品信号。对分析数据的离线处理（包括对样品和空白信号的选择、仪器灵敏度漂移校正及 U-Pb 同位素比值和年龄计算）采用软件 Iolite4.0 完成(Paton et al. 2011)。方解石样品的 Tera-wasserburg 图解绘制和  $^{207}\text{Pb}$  校正年龄加权平均计算采用 Isoplot/Ex\_ver3 (Ludwig, 2003) 完成。

### 1.10 In-situ U-Pb dating analysis of calcite

U-Pb isotope dating of calcite was completed by LA-MC-ICP-MS at the Wuhan SampleSolution Analytical Technology Co., Ltd., Wuhan, China. The test instrument uses the NEW WAVE 193nm excimer laser ablation system combined with Thermo Neptune XT MC-ICPMS. Helium was applied as a carrier gas. Argon was used as the make-up gas and mixed with the carrier gas via a T-connector before entering the ICP. A “wire” signal smoothing device is included in this laser ablation system (Hu et al., 2015). The spot size and frequency of the laser were set to 60 $\mu$ m and 6Hz, respectively, in this study. U-Pb isotope dating processing uses USGS silicate glass standard sample NIST614 to calibrate calcite standard sample and sample  $^{207}\text{Pb}/^{206}\text{Pb}$ , and then uses calcite standard sample PTKD-2 to calibrate sample  $^{238}\text{U}/^{206}\text{Pb}$  (Wu et al., 2022). Each time resolved analysis data includes approximately 20 seconds of blank signal and 30 seconds of sample signal. An software Iolite4.0(Paton et al. 2011) was used to perform off-line selection and integration of background and analyzed signals, time-drift correction and U-Pb dating. The Tera-wasserburg diagram of calcite samples and the  $^{207}\text{Pb}$  corrected age weighted average were calculated using Isoplot/Ex\_Ver3 (Ludwig, 2003) completed.

### References

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