

Accurate and precise determination of lead isotopic composition in selected Geochemical Reference Materials

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Lead (Pb) isotopes have been extensively employed in tracing the Pb sources and its transport pathways in the environment. However, Pb isotopic ratios in related geochemical reference materials (GRM) are scarce. Here, we reported the high precision Pb isotopic ratios in some GRM measured by Nu Plasma II MC-ICP-MS using the calibrated $^{205}\text{Tl}/^{203}\text{Tl}=2.38865$ (NIST SRM 997) for mass discrimination correction. The long-term external precision (2SD) for $^{208}\text{Pb}/^{206}\text{Pb}$ and $^{206}\text{Pb}/^{207}\text{Pb}$ of NIST SRM 981 Pb, BCR-2 and BHVO-2 are 0.31‰ (n=105), 0.42‰ (n=11), 0.25‰ (n=5) and 0.16‰, 0.53‰, 0.07‰, respectively, and their Pb isotopic ratios are in excellent agreement with the recommended values (Taylor et al. 2015). Using this method, we for the first time reported Pb isotopic compositions in USGS shale SGR-1b ($^{208}\text{Pb}/^{206}\text{Pb}=1.98702\pm 0.00067$, $^{206}\text{Pb}/^{207}\text{Pb}=1.25273\pm 0.00053$), coal CLB-1 ($^{208}\text{Pb}/^{206}\text{Pb}=2.06690\pm 0.00192$, $^{206}\text{Pb}/^{207}\text{Pb}=1.19458\pm 0.00090$), stream sediments GSD17, 21 and 23 (Institute of geophysical and geochemical Exploration: IGGE), soils GSS-12, 13, 14, 15 and 16 (IGGE), plants GSV-1, 2 and 3 (IGGE), and human hair GSH-1 (IGGE).

The work was supported by the National Key Basic Research Program of China (2014CB238903) and the National Natural Science Foundation of China (41673017, 41473028).