

A survey on new standard materials for U-Pb dating of carbonate using LA-MC-ICP-MS

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Chronological and geochemical studies of carbonates, which are commonly found as fracture filling minerals in rocks, can provide information about geochemical conditions present during formation including in deep subsurface environments [1,2]. A dating technique for the carbonates using laser ablation-multiple collector-inductively coupled plasma mass spectrometry (LA-MC-ICPMS) is still immature partly because of a lack of a consensus international carbonate standard for the *in-situ* dating technique. In this study, we performed a survey on the carbonate standard materials that may be suitable for high precision U-Th-Pb dating using LA-MC-ICPMS.

We examined carbonate standard materials JCp-1 and JCT-1 issued by the Geological Survey of Japan (GSJ) [3]. Based on solution-based bulk analysis using MC-ICP-MS, heterogeneities in Pb isotope compositions were confirmed. Nevertheless, the ²⁰⁶Pb-based isotopic compositions were all within 1.2‰ variations acceptable for a standard used for age determination using LA-MC-ICPMS. Additional tests on the heterogeneities in U-Th-Pb compositions of the carbonate standards along with determinations of other trace elements using a 2D imaging LA-ICP-MS are ongoing. Examinations on both natural standards and synthetic standards are ongoing for further efforts in determination of the standard suitable for U-Th-Pb dating of carbonates.

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[1] JAEA (2015), 2014 Annual report on METI R&D supporting program for developing geological disposal technology, 229p. *in Japanese*

[2] Iwatsuki *et al.* (2002) *Appl. Geochem.*, **17**, 1241-1257.

[3] GSJ Geochemical Reference samples DataBase.