IN SITU Sr ISOTOPIC CHARACTERIZATION OF BRAZILIAN CARBONATE SAMPLES: PROGRESSES AND PITFALLS

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Previous Sr isotopic studies of carbonate phases have increased the understanding of Sr isotopic variation in marine and lacustrine environments. Additionally, advances in the LA-MC-ICP-MS technique and its application on different matrixes [1, 2, 3] have led to significant improvements in spatial resolution (<100 mm) and analytical precision [1]. Here we report a LA-MC-ICP-MS study on three Brazilian carbonate samples collected in Phanerozoic sedimentary sequences. The Sr isotopic microanalyses were obtained at the MITERAC laboratory by means of an interchanged sample-standard procedure, using a spot size of 100um and a repetition rate between 5 to 6 Hz. Data on a modern-day coral standard yields an $^{87}Sr/^{86}Sr$ average value of 0.709299 ± 0.000077 (2σ SD) and also average $^{84}Sr/^{86}Sr$ and $^{88}Sr/^{86}Sr$ ratios of 0.056505 ± 0.000063 (2σ SD) and 0.006748 ± 0.000014 (2σ SD). Such values are close to the reference data previously reported [3], supporting a good external reproducibility of the analytical work carried out. The Sr analyses of carbonate samples (n=90) display internal precision similar to those obtained in standard; however, negative correlations between Sr isotopic ratios were observed. These correlations point to poly-atomic Fe interferences produced during laser ablation [1]. Such inference is supported by the standard's outcomes and the offline data-reduction that considers a double-correction due to REE interferences. Another important feature is the coherence between the stromatolite`s data regarding the Palaeozoic seawater Sr curve, indicating a possible Ordovician age for these samples. The data obtained also suggest that the technique has potential inbroader applications, particularly after some improvements on potential poly-atomic interferences. [1] Schmidberger et al. 2003. Chem. Geol., 199, 317-329. [2] Adams et al. 2005. Chem. Geol., 220, 67-82. [3] Bizarro et al. 2003. Geochim. Cosmochim. Acta 67, 289-302. We thank A. Simonetti (MITERAC, U. Notre Dame, USA) for scientific collaboration and we acknowledge to projects INCT-PETROTEC and NAP-GEO-SEDex for financial support.