

SR AND SM-ND ISOTOPIC COMPOSITION OF THE BRP-1 BASALT BRAZILIAN REFERENCE MATERIAL USING THERMO-IONIZATION MASS SPECTROMETRY

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ABSTRACT

Strontium and Sm-Nd isotopic ratios are presented for the BRP-1 (Ribeirão Preto) basalt reference material (bottle # 18) that was recently produced by the CPRM- Brazilian Geological Survey, from a Cretaceous basalt collected in the Paraná Basin - Brazil.

The analyses were performed using ion exchange columns after digestion of ~ 30 mg of sample, in Parr bombs and Savillex vials, using a 12:1 proportion of HF 48% and HNO₃ 6N. For the separation of Sr and REE the Bio-Rad AG-50W-X-8 (200-100 *mesh*) resin was used, and for separation of Sm and Nd the Eichrom LN-Spec (50-100 µm) was used.

The samples were loaded with H₃PO₄ onto double Re filaments and analysed with the multi-collector TRITON thermo-ionization mass spectrometer.

For the Sr analyses, electric currents of the ionization and evaporation filaments were respectively of 3200 mA and ~ 1900 mA. At least 100 cycles were analysed in static mode, using an array of 5 Faraday cups. The isotopic ratios were corrected for interference of Rb and for mass fractionation using the constant ⁸⁸Sr/⁸⁶Sr ratio of 8.375219.

The weighted average of 33 measurements of the ⁸⁷Sr/⁸⁶Sr ratio is 0.7059948 ± 0.0000032 (MSWD = 11). Coincident results were obtained in sample digestion with Parr bombs and Savillex vials.

For the Sm and Nd analyses, electric currents of the ionization and evaporation filaments were respectively of 4500 mA and between ~ 2100 mA. For each run, a minimum of 160 cycles were analysed in static mode, using an array of 8 Faraday cups. The isotopic ratios were corrected for mass fractionation using the constant ¹⁴⁶Nd/¹⁴⁴Nd ratio of 0.7219.

The weighted average of 30 measurements of the ¹⁴³Nd/¹⁴⁴Nd ratio is 0.5123912 ± 0.0000029 (MSWD = 22).

