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ZINC ISOTOPIC COMPOSITION METHOD IN LOW-LEVEL AEROSOLS SAMPLES

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ABSTRACT

Measurement of Zn isotopes in environmental samples may provide important information about pollutants sources discrimination. However, the application of this method in aerosols samples is limited by ion exchange chromatography efficiently to avoid blank effect to samples with lower concentrations. In this study, we showed a method for Zn isotopic determination to low-level aerosols samples, testing the precision with the modified sample–standard bracketing method (m-SSB), Empirical External normalization (EEN), and Common Analyte Internal Standardisation Method (CAIS) to account for instrumental mass fractionation during multi-collector ICP-MS measurements. The use of matrix-element spike in inter-element doped standards to increase the mass bias variability was successful with Pb. Accuracy and blank influence for Zn isotopes in this method was assessed by measures of Zn standard (ROMIL Ltd., Cambridge, UK). The method was applied in real samples of aerosols from São Paulo, Brazil. The measurements reveal significant variations in $\delta^{66}Zn$ = -0,96 ‰ to -0,37 ‰ to $PM_{10\text{-}2.5}$, and $\delta^{66}Zn$ = -1,04 ‰ to 0,02 ‰ to $PM_{2.5}$ to São Paulo aerosols in coarse and fine particles, respectively. In an industrial area (Vila Parisi - Cubatão) the range in $\delta^{66}Zn$ = -0,42 ‰ to 0,28 ‰. Hence, Zn isotopic compositions can be a powerful tool to distinguish atmospheric sources, and maybe to elucidate the air mass transport.