



## LEAD ISOTOPIC COMPOSITION AS ATMOSPHERIC POLLUTANT TRACER IN AN URBAN SYSTEM: SÃO PAULO CITY - BRAZIL

Gioia, S.M.C.L.<sup>1</sup>, Babinski, M.<sup>1</sup>, Kerr A.A.F.S.<sup>2</sup>, and Veríssimo, T.G.<sup>2</sup>

<sup>1</sup> Centro de Pesquisas Geocronológicas. Instituto de Geociências. Universidade de São Paulo, Rua do Lago, 562. CEP:05508-080. São Paulo, Brazil. [sgioia@igc.usp.br](mailto:sgioia@igc.usp.br)

<sup>2</sup> Instituto de Física da USP, Departamento de Física Aplicada, CP 66318 CEP 05315-970

**Keywords:** Aerosols, Lead Isotopes, TIMS, Urban Pollution, Seasonal Campaign.

### ABSTRACT

This work reports monitoring campaign of daily collection of aerosols (PM<sub>2.5-10</sub> and PM<sub>2.5</sub>) in São Paulo city, and close to an industrial plant, in Cubatão City, *ca.* 100 km southeast of São Paulo city. Measurements of lead concentration and isotopic composition by Thermal Ionization Mass Spectrometry (TIMS), associated to determination of particulate matter concentration, and meteorological parameters were used to assess atmospheric pollution in both areas. Lead concentrations in São Paulo range from 0,50 ng/m<sup>3</sup> to 47,34 ng/m<sup>3</sup>, and <sup>206</sup>Pb/<sup>207</sup>Pb ratios between 1,1491 and 1,2527. In Cubatão city, Pb concentrations in aerosols range from 1,53 ng/m<sup>3</sup> to 28,30 ng/m<sup>3</sup>, and <sup>206</sup>Pb/<sup>207</sup>Pb ratios between 1,1854 and 1,3279. The higher Pb concentrations in both areas were measured in the fine fraction (PM<sub>2.5</sub>), during the night periods, being more dangerous to health because it can be attained in lungs. Radiogenic Pb ratios measured in São Paulo city aerosols are coincident to SE wind directions suggesting they have been transported from Cubatão. Lead isotopic compositions obtained in this study allowed us to suggest that, at least, three different sources contribute to São Paulo city atmospheric pollution: (i) radiogenic compositions from industrial emissions; (ii) non-radiogenic Pb from geogenic sources; and (iii) intermediate Pb isotopic compositions from fuels.