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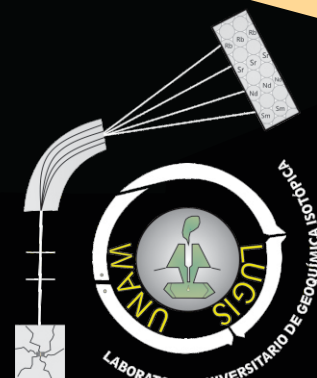
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PROGRAM AND ABSTRACTS



UNIVERSIDAD NACIONAL AUTÓNOMA DE MÉXICO

ssagi10@geofisica.unam.mx

L. Díaz



UNIVERSIDAD NACIONAL AUTÓNOMA DE MÉXICO

Instituto de Geofísica



Instituto de Geología



ORGANIZING COMMITTEE 10th SSAGI

Dr. Peter Schaaf

pschaaf@geofisica.unam.mx

Ing. Teodoro Hernández Treviño

tht@geofisica.unam.mx

M. en C. Gabriela Solís Pichardo

gsolis@geofisica.unam.mx

Dr. Raymundo G. Martínez Serrano

rms@geofisica.unam.mx

Ing. Gerardo Arrieta García

arrietagerardo@hotmail.com

M. en C. Lourdes Godínez Calderón

lourdes@igg.unam.mx



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MULTI ISOTOPE (Pb, Cu AND Zn) ANALYSIS AND SOURCE APPORTIONMENT IN URBAN AEROSOL FROM SÃO PAULO CITY, BRAZIL.

Carlos Oliveira; Marly Babinski; Izabel Ruiz - University of São Paulo, Brazil.

e-mail: carlos.edu.oliveira@usp.br

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Multi-isotope approach (Pb, Zn, Cu, Sr, C, Hg, Nd) has been used as a powerful tool to assess environmental systems and identify pollutant sources. Urban aerosol pollution is an important health public problem in megacities and recent studies have applied Pb and Zn isotopes to identify aerosol sources. Up to date, no Cu isotope measurements in urban aerosol have been published, however some studies, using elemental concentrations and receptor modeling, have associated Cu as indicator of vehicular emission. In order to analyze Pb, Cu and Zn isotopes in a single aerosol membrane sample, a new combined separation procedure was developed. Aerosol membrane was digested with a mixture of HF/HNO₃ 2:1, the solution is then dried and redissolved in 7M HCl. This solution was passed through AG-MP1 resin to separate Cu and Zn from the matrix containing Pb. Lead was purified with AG1-X8 resin while Cu was submitted to a second purification using AG-MP1 resin. Cu and Zn isotopic compositions were determined by a Neptune MC-ICP-MS, while Pb isotopes were measured by ID-TIMS. A set of fourteen aerosol samples, containing fine and coarse particles in each sample were analyzed. The results showed ²⁰⁶Pb/²⁰⁷Pb between 1.166 and 1.245, while $\delta^{66}\text{Zn}_{\text{IRMM}}$ values range from -0.99 to +0.14 ‰. The Cu isotopic composition $\delta^{65}\text{Cu}_{\text{NIST}}$ varied from +0.01 to +0.21 ‰. In order to evaluate contributions of urban anthropogenic sources to aerosol samples, Pb and Zn isotopic composition of the main sources were compared with our results. Most of the samples showed ²⁰⁶Pb/²⁰⁷Pb (1.166 to 1.195) and $\delta^{66}\text{Zn}_{\text{IRMM}}$ (-0.46 to +0.21‰) similar to isotopic sources associated with vehicular traffic, represented by vehicular emissions (²⁰⁶Pb/²⁰⁷Pb = 1.157 to 1.189), gasoline (²⁰⁶Pb/²⁰⁷Pb = 1.147 to 1.192; $\delta^{66}\text{Zn}_{\text{IRMM}}$ = -0.77 to +0.44‰), road dust (²⁰⁶Pb/²⁰⁷Pb = 1.137 to 1.177) and tyres ($\delta^{66}\text{Zn}_{\text{IRMM}}$ = -0.02‰). Only four samples presented more radiogenic signatures in ²⁰⁶Pb/²⁰⁷Pb (1.199 – 1.246) related to those of aerosol from industrial areas (²⁰⁶Pb/²⁰⁷Pb > 1.22), and which are characterized by light Zn isotope signatures ($\delta^{66}\text{Zn}_{\text{IRMM}}$ < -0.98‰). Therefore, our data suggest that vehicular traffic represent the major contribution for urban aerosol in São Paulo city with minor contribution from the industrial areas.