

Zn-Sr-Pb ISOTOPES IN ATMOSPHERIC POLLUTION STUDY

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The Zn-Sr-Pb isotopes can provide important information about pollutant sources and dynamics in the atmospheric environment of megacities. Recent results of the isotopic characterization of atmospheric particulate matter collected in São Paulo City (at University of São Paulo campus) and Mogi Valley (Vila Parisi, Industrial City, Cubatão), Brazil, during the Summer and Winter of 2006, were used to trace the pollutant sources. The $\delta^{66}\text{Zn}$ values range between -0.96 and -0.37‰ and between -1.04 and +0.02‰ in coarse and fine particles, respectively, in São Paulo City. In contrast, in the industrial area of Vila Parisi, $\delta^{66}\text{Zn}$ values are isotopically heavier and range between -0.34 and +0.39‰ in fine and between +0.28 to -0.42‰ in coarse fractions. The $^{206}\text{Pb}/^{207}\text{Pb}$ ratios vary between 1.1357 and 1.2730 in São Paulo and are more radiogenic (1.1698 and 1.3279) in Cubatão. In addition, the $^{87}\text{Sr}/^{86}\text{Sr}$ ratios in aerosols (average value = 0.7138 ± 0.0008) and cement plant in São Paulo (0.7139) are similar suggesting important input from the city constructions, which cannot be distinguished by Pb isotopes. The isotopic ratios of all three elements studied showed significant variations in both cities. Comparing them with the signatures of the sources, we suggest that the stable isotopes of these elements indeed enable us to indicate the following as major sources for aerosols during the Summer and Winter of 2006: traffic emissions, industrial emissions from cement plants and, likely, longer range transport from industrial areas, located at the coast, to São Paulo City.