Fine and coarse particulate matter: PAHs composition in São Paulo City, Brazil

C. BOUROTTE[1] AND M.C. FORTI[2]

[1]University of São Paulo – USP/ EACH, R: Arlindo Béttio, 1000, CEP 03828-000 São Paulo, SP-Brazil.
[2]National Institute for Spatial Research, CP 515, São José dos Campos, SP-Brazil, CEP 12245-970.

Airborne particulate matter in urban atmosphere is derived from natural and anthropic sources. The chemical composition of coarse and fine particles is critical when considering their hazardous effect.

The sampling site is located in the western region of the São Paulo City, in the Campus of the University of São Paulo, an area that is under intense vehicular traffic influence. The particulate matter ($PM_{2.5}$ and $PM_{2.5-10}$) was continuously collected during periods of 24 hours. The sampling collection was initiated on May 13th, 2002 and finalized on July 19th, 2002, which is characteristic of the beginning of the southern hemisphere winter with lower temperatures and high frequency of thermal inversion episodes limiting pollutants dispersion within the atmosphere. The suspended particulate matter was sampled every day including the weekends totalizing 9 sampling weeks. The analysis of PAHs (16 USEPA priority PAHs) and benzo(e)pyrene (BeP) was performed by CG-MS.

PAHs composition in fine and coarse fractions of atmospheric particulate matter showed that IND, BghiP and BbF were the predominant compounds for the two fractions and BaP was also predominant in the coarse fraction. The emission sources identified in this study have resulted from PAHs source fingerprints found in the literature associated with calculation of PAHs principal component and cluster analysis from our data set. Our discussion pointed out that vehicular emission may be assumed as the main source of PAHs in the atmosphere of São Paulo. However, it is important to emphasize that Brazil has a diverse fuel pattern than other countries and a significant percentage of the vehicular fleet moves with ethanol or with a mixture of gasoline and ethanol. Therefore, there is a possibility that a different pattern for the PAHs distribution on the particulate matter exists. In addition, it is important to mention that practices of biomass burning that is more intense in the tropical regions and the distinct meteorological conditions in the Southern Hemisphere are key controlling factors for the atmospheric particles' PAHs composition. These considerations lead to the necessity of a broad and comprehensive measurement program of organic aerosol constituents to identify local source profiles and make quantitative source apportionment estimates.

Methane sources and sinks of the past two decades: What did we learn with atmospheric inversions ?

PHILIPPE BOUSQUET

LSCE/UVSQ/IPSL CEA Saclay, Orme des Merisiers, F-91191 Gif sur Yvette (philippe.bousquet@lsce.ipsl.fr)

Methane has received muche interest during the past ten years, as the second anthropogenic greenhouse gas after CO_2 with a much larger global warming potential. Sources and sinks of present atmospheric methane are still largely uncerain in amplitude, in pahse and somtimes in location. Atmospheric measurements, assimilated in chemistry-transport models, provide a unique integrative tool to improvce our knowledge of methane sources and sinks. These mesaurements can be continuous or flask measurements at the surface , aircraft measurements or satellite retrievals of methane atmospheric columns.

The aim of this talk is to propose an overview of what we have learnt about methane sources and sinks as inferred by atmospheric inversions. We will go through the major papers published during the past decade about the source aportionement, the OH variations, the analysis of the methane atmospheric growth rate, and the use of satellite data.