Geophysical Research Abstracts, Vol. 7, 02989, 2005
SRef-ID: 1607-7962/gra/EGU05-A-02989

Gas-particle partitioning and particle-size distribution of semi-volatile organic pollutants in the indoor environment

M. Apostolaki, I. G. Kavouras, S. Koudouri, T. Tziaras, E. G. Stephanou

Environmental Chemical Processes Laboratory, Department of Chemistry, University of Crete, GR-71409 Heraklion, Greece

Organic pollutants that can pose health problems have been identified in a series of public and private buildings. The gas and particulate phase and as well as the particle size distribution of semi-volatile organic compounds such as polyclic aromatic hydrocarbons (PAHs), branched iso- and anteiso-alkanes (environmental tobacco smoke –ETS- markers), polychlorinated biphenyls (PCBs) were studied in public and private buildings in Greece, by using appropriate sampling techniques and gas chromatography mass spectrometry analysis. The objective of this study was to identify the sources and the processes governing the fate of semi-volatile organic pollutants in the indoor environment. PAHs were evenly associated between fine and coarse particles and their corresponding total mean mass median aerodynamic diameter (MMAD) was 1.27 micrometers indicating a mixed origin. Conversely, the MMAD of iso- and anteiso-alkanes varied from 0.30 to 0.62 micrometers denoting a stronger association with indoor sources. The presence and the chemical pattern of PAHs concurrently with this of iso- and anteiso-alkanes have shown that in most buildings their source was ETS. PCBs were mostly determined in the gas phase and their congener distribution in some public buildings, where high concentrations were measured, was related with obsolete electric equipment containing Clophen or Archlor mixtures. Conversely, the concentrations measured in some houses were low, and their presence was related to outdoor sources.