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# Diurnal variation of semi-volatile organic compounds associated to PM2.5 in a traffic-influenced area in Istanbul

Rosa M Flores (1), Yagmur Nafile (2), Elif Mertoglu (1), Huseyin Ozdemir (3), Bulent Akkoyunlu (1), Goksel Demir (4), Alper Unal (5), and Mete Tayanc (1)

(1) Environmental Engineering Department, Marmara University, Istanbul, Turkey (rflores@marmara.edu.tr, elfmertoglu@gmail.com, bulentoktay@marmara.edu.tr, mtayanc@marmara.edu.tr), (2) Environmental Engineering Department, Istanbul Technical University, Istanbul, Turkey (yagmurnafile33@gmail.com), (3) Istanbul Technical University, Istanbul, Turkey (ozdemirhuseyin@itu.edu.tr), (4) Department of Urban and Regional Planning, Kirklareli University, Turkey (goksel.demir@klu.edu.tr) , (5) Climate and Sea Sciences Department, Eurasia Institute of Earth Sciences, Istanbul Technical University, Istanbul, Turkey (alper.unal@itu.edu.tr)

Atmospheric aerosols are complex mixtures of solid and liquid particles emitted by natural and anthropogenic sources. They affect the radiation budget both directly and indirectly, alter the water cycle, degrade visibility, and have detrimental effects on human health. The organic aerosol (OA) fraction is ubiquitous in the atmosphere and represents 20-90% of the PM2.5 mass fraction. Semi-volatile organic compounds (SVOCs) are of particular interest due to their ability to partition into the gas- and particle- phases, and participate in reactions that produce secondary organic aerosols (SOA). The chemical composition of OA and relative abundance of OA species vary with respect to diurnal changes in emission sources, primary organic aerosol (POA) concentration, level of oxidants ($NO_3$, OH, $O_3$), and meteorological conditions. Understanding the diurnal variation of SOA precursors is necessary for elucidation of sources, formation and transformation processes, and assessing the effects on climate change. Solvent extraction has been traditionally used to process aerosol samples, however, it requires large sample preparation and sampling collection times. In the present study, we used thermal desorption coupled to gas chromatography-mass spectrometry (TD-GC-MS) to identify and quantify 42 SVOCs in high temporal resolution samples. PM2.5 samples were collected every two hours during the daytime (0700-1900h) and 12h overnight (1900-0700h) for two weeks during the winter season in a heavily-influenced traffic area in Istanbul. Approximately 100 samples were collected and analyzed by TD-GC-MS. In this work we present diurnal variations of SVOCs and the study of meteorological conditions and traffic diurnal patterns to provide an insight into the diurnal variability of SVOCs. Understanding variabilities in SVOCs will be helpful for (1) implementing local air management strategies for air pollution control and (2) evaluating the ability of global models to forecast SOA production in urban areas.