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AROMATIC HYDROCARBON LEVELS AND $PM_{2.5}$ CHARACTERIZATION IN ROME URBAN AREA: PRELIMINARY RESULTS

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Abstract

The preliminary results of aromatic hydrocarbon (AR) levels and $PM_{2.5}$ physico-chemical characterization in Rome urban air throughout the 2014 are reported. A gas chromatograph was used for continuous measurements of AR concentrations with 30 minute time intervals. $PM_{2.5}$ was collected by PM swam Dual Channel. Metal content was determined by ICP-MS. Single particle characterization was performed by Scanning Electron Microscopy equipped with a thin window system for X-ray microanalysis by energy dispersion spectrometry. X-ray microanalysis data were used to classify the particles into clusters of similar chemical composition. Results showed variations in seasonal AR levels, higher concentrations in winter and lower in summer. Toluene was the most abundant compound, followed by *m*,*p*–xylene and benzene. The compounds showed similar correlations in winter and summer. According to T/B ratio and meteorological analysis, AR levels were under the influence of vehicular sources. Seasonal variation of different inter-species ratios showed a decreasing trend from winter to summer and an increase from August to December. ICP-MS analysis revealed Fe, Al and Zn as the most abundant elements, decreasing from March to July (except Zn). $PM_{2.5}$ single particle characterization detected four particle clusters: C-rich particles, metal particles, sulphates and soil dust. C-rich particles were constituted of a large number of spherule aggregates carrying trace of S, Na and K. Metal particles are the second significant component, including Fe, Pb, Cu, Zn, Ni and Ti.
Further studies must be performed to better understand the processes of transformation that undergo the carbonaceous particles in the atmosphere.

Key words: analytical electron microscopy, aromatic hydrocarbons, physico-chemical characterization, $PM_{2.5}$

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