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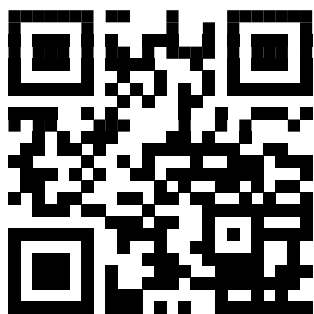
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BOOK OF ABSTRACTS





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Preliminary Investigation of Origin of Polycyclic Aromatic Hydrocarbons in Select Street Dust Samples, Pančevo, Serbia

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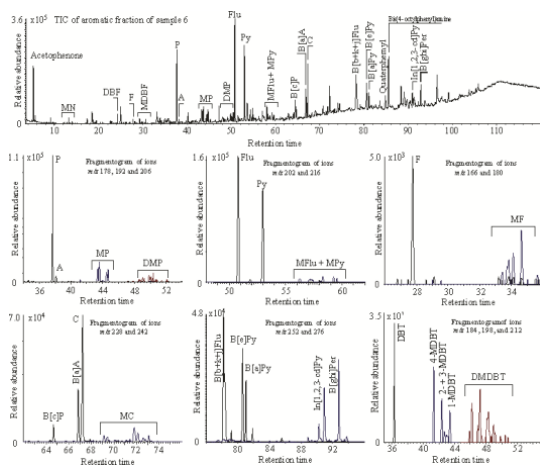


Figure 1. Representative GC-MS chromatograms showing distribution of all PAHs analyzed in this study. The aim of this study was to investigate the origin of polycyclic aromatic hydrocarbons (PAH) in street dust samples from a small industrial city Pančevo in Serbia. The samples were collected in different parts of the city and sieved to separate the <250 μm fraction. Aromatic hydrocarbons were isolated by extraction and column chromatography. In these extracts, PAH were analysed by gas chromatography - mass spectrometry (GC/MS) using total ion current (TIC) and single ion monitoring (SIM) methods. Monitored ions were: $m/z = 128$ (naphthalene; N), $m/z = 152$ (acenaphthylene), $m/z = 154$ (acenaphthene), $m/z = 166$ (fluorene; F), $m/z = 178$ (phenanthrene and anthracene; P and A), $m/z = 202$ (fluoranthene and pyrene; Flu and Py), $m/z = 228$ (benzo[a]anthracene and chrysene; B[a]A and C), $m/z = 252$ (benzo[b]fluoranthene, benzo[k]fluoranthene, benzo[j]fluoranthene,

benzo[e]pyrene and benzo[a]pyrene; B[b]F, B[k]F, B[j]F, B[e]Py and B[a]Py), and $m/z = 276$ (indeno[1,2,3-c,d]pyrene and benzo[g,h,i]perylene; In[1,2,3-cd]Py and B[ghi]Per). All these compounds were quantified (using the reference standard Z-014G PAH mix) and characteristic molecular ratios were calculated.

The concentrations of non-methylated (parent) PAH in the street dust samples were found to be in the range from 175 to 2746 ppb. Content of PAHs in street dust

samples is not regulated by the Serbian National legislation. However, some of these values are higher than the limit values for soils as set by Serbian National legislation [1].

All samples contain smaller amounts of lower, 2-3 ring, PAH (13 - 347 ppb), in comparison to the higher, 4-5 ring, PAH (175 - 2399 ppb) indicating pyrogenic origin of these compounds in the samples investigated [2].

Low abundance of methylated PAHs, as seen in ratio $\Sigma\text{MP}/\text{P}$ (lower than 1 in all samples) indicates pyrogenic origin of these compounds. Similar conclusion can be drawn from $\text{Flu}/(\text{Flu}+\text{Py})$ ratio which, depending on the sample, indicates source from petroleum or biomass and coal combustion. Furthermore, PAH origin from traffic emissions, for samples collected closer to busy roads, and from biomass and coal combustion, for samples collected within residential areas, is shown by values of $\text{B[a]A}/(\text{B[a]A}+\text{C})$, $\text{B[a]Py}/(\text{B[a]Py}+\text{B[ghi]Per})$ and $\text{In}[1,2,3\text{-cd}]\text{Py}/(\text{In}[1,2,3\text{-cd}]\text{Py}+\text{B[ghi]Per})$ ratios [3].

It can be concluded that the dominant source of PAHs in the selected street dust samples is combustion of petrol, diesel, biomass and coal which agrees with the results for similar samples in other cities in the world [2, 3].

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