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BOOK OF ABSTRACTS

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Preliminary Investigation of Origin of Aliphatic Compounds in Street Dust Samples, Pančevo, Serbia

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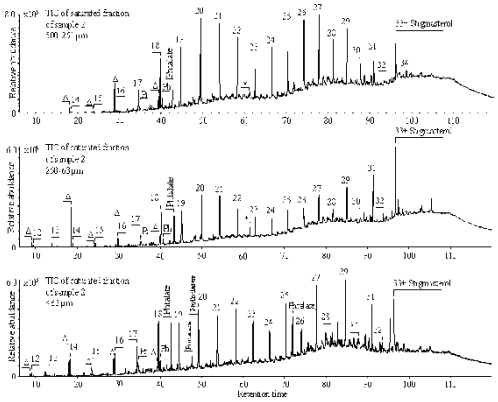

Figure 1. Representative total ion chromatograms of the saturated fractions isolated from different size fractions of the same sample.

The aim of this study was analysis of the origin of the aliphatic compounds in selected street dust samples. The samples were collected in the city of Pančevo, Serbia, within residential areas in close vicinity to heavy traffic roads.

In order to determine if there was a significant difference in composition of aliphatic fraction depending on particle size, the samples were sieved and separated in three fractions, 500–250 μm, 250–63 μm and <63 μm. The samples were extracted, and the extracts were separated to aliphatic, aromatic and polar fractions by column chromatography. The aliphatic fractions were further analysed by GC/MS. *n*-alkanes were identified using mass ion *m/z* 71, hopanes *m/z* 191 and steranes *m/z* 217 [1].

Concentrations of total hydrocarbons in the street dust samples were in the range from 34.5 to 280.0 μg/g. It is generally accepted that total hydrocarbons content higher than 50 μg per 1g of sediment can be considered as a potential anthropogenic pollution [2]. According to these results, presence of organic pollutants in almost all samples can be presumed.

Concentrations lower than 50 μg/g were observed in coarser fractions (500-250 μm). Higher concentrations of total hydrocarbons were observed in the finest fraction (< 63 μm). With only few exceptions, concentration of total hydrocarbons increases with decrease of grain size of samples indicating greater affinity of these compounds for the smallest particles.

In all samples analysed, the most abundant compounds were *n*-alkanes, followed by n-alk-1-enes, regular isoprenoids and hopanes. No significant compositional changes were observed in different size fractions of the samples.

n-Alkane distribution in all samples is bimodal, with *n*-alkane maximum at C_{20} in the range C_{13}-C_{23}, and with maximum at odd number *n*-alkanes in the range C_{24}–C_{34}. Carbon Preference Index (CPI) [2] for the whole range of *n*-alkanes (CPI C_{13}-C_{33}) is in the range of 1.07 – 2.40, CPI C_{13}-C_{20} is close to 1, and CPI C_{25}-C_{34} is in the range from 1.0 to 3.9. These results and distribution of *n*-alkanes in the chromatograms (Figure 1) indicate that the investigated *n*-alkanes in the C_{13}-C_{23} range originate from a mature organic matter source while those in the C_{24}–C_{34} range originate from the native terrestrial organic matter.

Definite proof that the aliphatic fractions of the street dust samples contain petroleum pollutant can be seen by distributions of hopanes, steranes and diasteranes, which have typical distributions found in crude oils.

It can be concluded that the aliphatic compounds in the street dust samples investigated in this study are mixtures of a natural terrestrial source (indicated by presence of even alk-1-enes and odd higher *n*-alkanes) and a petroleum pollutant (indicated by CPI values and presence of typical crude oil biomarkers)

Acknowledgements

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