EMEC21

21st European Meeting on Environmental Chemistry
November 30 – December 3, 2021, Novi Sad, Serbia

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BOOK OF ABSTRACTS

ASSOCIATION OF CHEMISTRY AND THE ENVIRONMENT

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Publisher

Serbian Chemical Society

Karnegijeva 4/III, Belgrade, Republic of Serbia

For the publisher

Dušan Sladić

President of the Serbian Chemical Society

Editors

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Cover page photo

Branko Lučić

Design and prepress

Beoživković, Belgrade

Printed by

RIS Studio, Belgrade

Circulation

150

ISBN

978-86-7132-078-8

Year

2021

Toxic Metals in 3 Fractions (d<63µm, d63-250µm and d250-1000µm) of Dust Collected on Roads of Industrial Town Kostolac, Serbia

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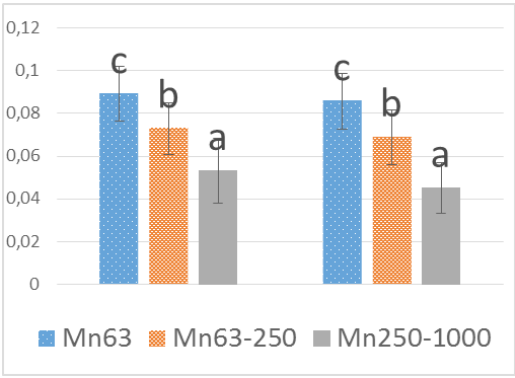

Kostolac is a town exposed to several serious sources of toxic metals and other inorganic pollutants. They arrive from sources typical for urban environments such as traffic, but also from various heavy industry sources: coal mining, burning of coal in power plants, ash landfills, and steel factory.

Toxic metals in the air are concentrated in particulate matter. Their transport and health risks depend strongly on the size of dust particles.

Goals of the research were to estimate: 1. how much does traffic contributes to the total pollution load compared to the natural sources and the industry; 2. how is pollution distributed in different fractions of the dust; 3. are there any spatial trends present and is there any correlation between vicinity of pollution sources and concentrations of toxic elements in different fractions of the dust.

Samples of dust were collected from 10 locations in July and in September. Each location had one sampling site on a major road with intensive traffic and the other site on auxiliary road with much less traffic, located 10-20 m away from the major road.

The dust was dried, sieved through sieves with 3 different apertures (d=63µm, 250µm and 1000µm) and pressed into 32 mm diameter pellets. The samples were analysed by WD-XRF standardless method.

The results showed that Al, P, K, V, Mn, Fe, Co, Zr, Rb and Ti have the highest concentrations in the smallest fraction (d<63µm) and the lowest concentrations in the most coarse fraction with stat. significant differences among concentrations. Concentrations of: Mg, S, Zn and Cu have the same trend as previous group of elements but no stat. significant differences, wile conc. of Si and Ca have the opposite trend.

Neither the time of the year nor the intensity of the traffic have had any significant effect to the concentrations, therefore it can be concluded that industrial sources of pollution have significantly higher attribution to the total pollution load than traffic.

The trend that toxic elements are more concentrated in the smallest fraction of the dust indicates that the source of the pollution is rather anthropogenic than natural.

Concentrations of elements in dust collected on sites from our research were compared to concentrations of the same elements in the soil collected by SEPA (Serbian Environmental Protection Agency). Although locations from both researches were in close proximity, no significant correlation between concentrations was observed. The lack of correlation can be explained by several hypotheses which should be further investigated in future researches.

Acknowledgements

This research was funded by the Ministry of Education, Science and Technological Development of the Republic of Serbia (Grant No: 451-03-68/2020-14/200168) and GEF-funded project *Enhanced Cross-sectoral Land Management through Land Use Pressure Reduction and Planning* implemented by the Ministry of Environmental Protection and Serbian Environmental Protection Agency with the support of UNEP.