EMEC21

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

Association of Chemistry and the Environment

Serbian Chemical Society

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BOOK OF ABSTRACTS

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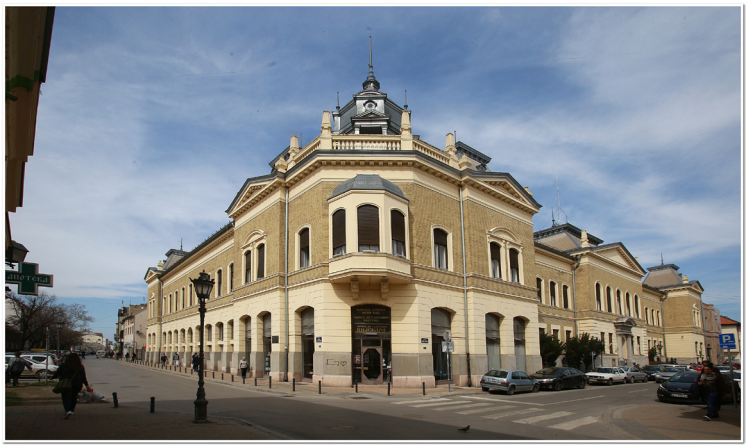

Book of Abstracts

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Publisher

Serbian Chemical Society

Karnegijeva 4/III, Belgrade, Republic of Serbia

For the publisher

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President of the Serbian Chemical Society

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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

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The global production volume of plastics continues to rise. The continued growth in plastics production has not only led to an increasing volume of plastic waste released into the environment but has also contributed to food waste. Plastic polymers released into environment can be slowly degraded by microorganisms, heat, oxidation, light, or hydrolysis. The degradation of plastic will eventually result in formation of microparticles commonly known as microplastics, currently defined as plastic materials with various morphologies in the range of 0.1–5,000 µm. Primary microplastics are already microscopic in size from the point of manufacture. Common examples are microbeads that act as exfoliating agents in cleansers, facial scrubs and other cosmetic products, and virgin pellets that are used as raw materials in the production of plastic goods. Moreover, plastic particles have been ubiquitously detected in the environments of marine water, freshwater, agroecosystems, atmosphere, food, drinking water and biota. Estimates suggest 5.25 trillion plastic particles currently circulate in ocean surface waters. The presence of plastic particles in various environments also pose a threat to food security, food safety, and human health. Unfortunately, solid data on the prevalence of microplastic particles in the environment are still limited due to the analytical and technical challenges of extraction, characterization, and quantification from complex environmental matrices. Microplastics found in the diet can be derived from food additives (salt, sugar), drinking water, microplastics incorporated into the food chain (in particular shellfish) or released from plastic packaging during food processing. Interestingly, the highest reported concentration of microplastics comes not from the food chain, but rather from the processing of foods in plastics. Reusable plastic bottles have also been identified as a source of microplastics which could be generated through cleaning and refiling. In fact, infant exposure to microplastics is higher than was previously recognized due to the prevalence of polypropylene-based products used in formula preparation and highlight an urgent need to assess whether exposure to microplastics at these levels poses a risk to infant health. Apart from their physical presence as environmental pollutants, concerns have been raised regarding binding of the other components to microplastics, in which case, an interplay of contaminants can results in the outcomes that are not easy to predict. For instance, there is a substantial lack of knowledge on binding of allergenic proteins to microplastics and influence on the development of allergy and processes relevant for allergen degradation and presentation to the immune system (i.e. digestibility and bioavailability). EU funded project IMPTOX is investigating impact of micro (and nano)plastics on the allergic diseases. We aim to understand the effect of micro- and nanoplastics combined with potentially harmful environmental contaminants adhering to their surfaces and finding their way into the human body.

Acknowledgements

The project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 965173 (IMPTOX).