

EMEC23

23rd European Meeting
on Environmental Chemistry
3-6 December, 2023, Budva Montenegro

Book of Abstracts



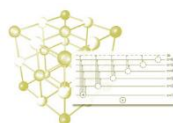
ASSOCIATION OF
CHEMISTRY AND THE
ENVIRONMENT



Chemical
Society
of Montenegro

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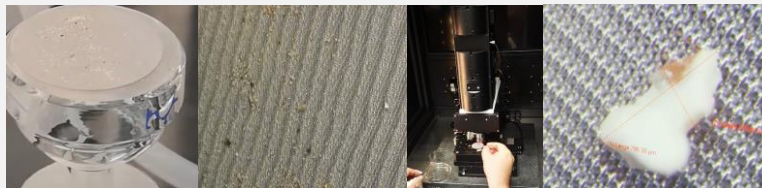
Poster Sessions

Presenting author	Title of presentation	Poster Board Number
Monday, December 4th 2023		
Session Topic: Solid Matrices		
Miljan Bigović	Comparing the Content of Heavy Metals in Peloids from Sutomore and Igalo (Montenegro)	SM1
Ilgaz Cakin	Designing a Biochar-Based Pretreatment Method for Acidic Cu-rich Distillery Effluents Entering Wetlands	SM2
Małgorzata Iwona Szynkowska-Jóźwik	Elemental Analysis of Surface Soil Collected from the Vicinity of the Waste Disposal Places in Lodz Region	SM3
Nives Matijaković Mlinarić	Antibacterial Activity of CuO and ZnO Treated Surfaces	SM4
Jernej Imperl	A Comparative Study of the Effectiveness of Possible Washing Agents for the Remediation of Sediment Contaminated with Heavy Metals	SM5
Dijana Đurović	Heavy Metals and PAHs Content in Agricultural Soil in the Vicinity of Thermal Plant in Pljevlja (Montenegro): Ecological Risk Assessment	SM6
Valentina Jauković	Environmental Risk Assessment and Risk Management of Polymeric Nanoparticles as Drug Carriers	SM7
Milica Balaban	The Influence of Agricultural Activity on the River Sediments of the Ukrina River	SM8
Sanja Pržulj	Biomarkers in River Sediments (Vrbas, Bosnia and Herzegovina)	SM9
Giulia Fucile	Comparison Of Extraction Procedures of Organic Mercury in Soil and Sediments Reference Materials	SM10
Mira Pucarević	Instrumental Methods for the Microplastics Determination in the Environment	SM11
Gordana Gajica	Inorganic Composition of Serbia and Slovenia Peloids in Context Their Applicability as Therapeutic Agents	SM12
Nevena Prlainović	Bacterial Nanocellulose as a Potential Adsorbent for Strategic and Heavy Metals Removal	SM13
Darko Vuksanović	Identification of the Impact of the Quarry on the Environment	SM14
Jelena Ščepanović	Effects of Pollutants on the Quality of The Environment During the Operation of the Plant for The Production of Concrete-Concrete Base	SM15
Nevena Antić	Soil Degradation Indicators as a Tool for Climate-Smart Urban Forestry	SM16
Marian Olazabal Dueñas	Microplastics Risk as a Reservoir of Metallic and Organic Contaminants of Legacy and Emerging Concern on the Cantabrian Coast (Northern Spain)	SM17
Session Topic: Water		
Neda Bošković	Abundance, Distribution Patterns, and Identification of Microplastics in Bojana River Sediments in Montenegro	W1
Viktoriiia Liapun	Versatile Application of BiVO ₄ /TiO ₂ S-scheme Photocatalyst: Photocatalytic CO ₂ and Cr (VI) Reduction	W2

Instrumental Methods for the Microplastics Determination in the Environment

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Microplastics are tiny plastic particles and fragments that are less than 5 millimeters in size. These particles can be found in various environmental compartments. They are a growing concern due to their potential environmental impact and the challenges they pose for ecosystems and human health. Microplastics can vary in shape, composition, and size, with some being so small that they are not visible to the naked eye (nano dimensions). This diversity makes the detection and analysis of microplastics a complex scientific field.

When conducting microplastics analysis, it is essential to choose the appropriate combination of instruments and techniques based on the sample type, and expected particle sizes.

Additionally, methods for the analysis of microplastics are still being developed and have not been brought to the level of standards. Like all other methods of analysis, this procedure involves the extraction of particles from the matrix [1] and then an analysis that enables the confirmation of the identity of the polymer from the point of its particle composition. Particles that are mixed polymers also often appear. That is why it is most practical, and at the same time the most expensive, to have several different techniques to determine the type of particles. Everything gets complicated when applied to micro and nano particle sizes.

Today, different instrumental techniques are used for the detection of microplastics, depending on the dimensions of the particles to be identified.

FTIR Spectrometer works by measuring the absorption of infrared light by the sample, providing information about the types of polymers present. Raman Spectrometer is uses the scattering of laser light to provide information about the molecular structure and composition of microplastics. SEM with Energy-Dispersive X-ray Spectroscopy (EDS) capable to visualize the surface morphology of particles and when coupled with EDS, it can also provide information about the elemental composition of the particle. Micro-Raman spectrometers are specialized for micrometar sizes particles. Pyrolysis instrument and GC-MS system that burns microplastics and this products are analyzed using GC-MS.

None of these techniques have been accepted as standard so far. And this will probably be decided for a long time, because the particle sizes are in a very wide range and not all of these techniques are sensitive and reliable enough for particles of micro and nano size. The choice of technique will also be influenced by the way the results are expressed

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References

[1] Z. Huang, B. Hu, H. Wang (2023) *Environmental Chemistry Letters*, 21: 383-401.



**“The trees are our lungs,
the rivers our circulation,
the air our breath,
and the earth our body.”**

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