# DISC2023

3rd DIFENEW International Student Conference

# ABSTRACT BOOK

# 3rd DIFENEW INTERNATIONAL STUDENT CONFERENCE

# DISC2023

**Faculty of Technical Sciences**
**University of Novi Sad**

**Hybrid event**
**5th December, 2023**
**Novi Sad, Serbia**

**Organizers:**

Department of Environmental Engineering and Occupational Safety and Health
Faculty of Technical Sciences, University of Novi Sad, Serbia

Institute of Analytical Chemistry, Faculty of Chemical and Food Technology
Slovak University of Technology in Bratislava, Slovakia

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# Abstract Book

# 3rd DIFENEW INTERNATIONAL STUDENT CONFERENCE

# DISC2023

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# PREFACE

We are delighted to announce the release of the Abstract Book, showcasing a wealth of outstanding research contributions presented at the 3rd DIFENEW International Student Conference (DISC2023). This conference represents a collaborative effort of two esteemed institutions, the Department of Environmental Engineering and Occupational Safety and Health from the Faculty of Technical Sciences, University of Novi Sad, Serbia, and the Institute of Analytical Chemistry from the Faculty of Chemical and Food Technology, Slovak University of Technology in Bratislava, Slovakia. This significant event is a part of the dissemination activities associated with the Serbian-Slovak bilateral cooperation project titled "Microplastics Impact on the Occurrence of Plasticizers in Surface Water and Effects on Human Health (PLASTICINE) generously supported by the Ministry of Education, Science, and Technological Development of Serbia and the Slovak Research and Development Agency.

At DISC2023, we aim to provide a dynamic platform for participants to engage in the exchange of research interests, innovative ideas, and valuable experiences across a spectrum of vital fields, including Environmental Engineering and Sustainable Development, Occupational Safety and Health, Sustainable Project Management, Civil Engineering and Education 2.0.

We extend our heartfelt gratitude to all authors, co-authors, and their mentors, whose contributions have been instrumental in shaping this conference. We also want to express our appreciation to the dedicated members of the Scientific and Organizing Committees for their unwavering commitment and hard work.

Furthermore, I would like to extend my heartfelt appreciation to the entire organizing team for their outstanding efforts in making this event possible. I am especially grateful to Dr. Maja Sremački, Dr. Nevena Živančev, Dr. Miljan Šunjević and MSc. Tijana Adamov for their exceptional dedication and leadership in orchestrating the entire event. Your contributions have been invaluable, and I am truly thankful for your hard work and commitment.

Looking forward to DISC2024, which will take place in the city of Novi Sad in December 2024, we extend our best wishes to all participants for a year filled with success and enriching experiences.

Warm regards,

Dr. Maja Petrović

Associate Professor

Editor

# EFFECT OF TEMPERATURE FOR CHLORPYRIFOS ADSORPTION ONTO CARBON MATERIAL DERIVED FROM SPENT COFFEE GROUNDS

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**Abstract:** Pesticides are extensively used in agriculture to enhance crop yield and combat pests and pose a significant threat to ecosystems and human health when their residues accumulate in soil and water. Conventional methods of pesticide removal are often costly or introduce secondary pollutants. The increasing worry about pesticides harming the environment has led to more research on their removal. Various biowaste materials have been investigated for remediation of these contaminants. Among investigated materials, spent coffee grounds, a widely available waste product, offer a promising solution. Coffee consumption is a daily ritual, generating substantial quantities of spent coffee grounds as residual waste. Harnessing the adsorption potential of spent coffee grounds for pesticide removal addresses an environmental challenge and aligns with waste management principles and a circular economy. The carbon material, obtained through a controlled carbonisation process of spent coffee grounds at 900 °C, showed high adsorption potential for chlorpyrifos. The Langmuir and Freundlich models were employed to analyse the adsorption process, revealing favourable adsorption behaviour at different temperatures. Thermodynamic parameters indicated the spontaneous and feasible nature of the adsorption process, with temperature being an important factor for the adsorption of chlorpyrifos on the investigated material.

**Keywords:** *Chlorpyrifos; Spent coffee grounds; Carbon materials; Adsorption; Thermodynamics.*

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