The 3rd Advances in Green Chemistry

BOOK OF ABSTRACTS

Poznan, Poland

26 -30 September 2022

Poznan 2022

About 3rd Advances in Green Chemistry

The aim of our conference is to create a place where leading scientists, both from Poland and Europe, will be able to share their latest achievements in five key research areas related to green chemistry, i.e., the area of ionic liquids, materials research, electrochemistry, catalysis and biosciences. The conference is to provide an impulse for scientists to discuss current research in these areas, initiate a discussion on the implementation and commercialization potential of the results, and be a platform for the emergence of new research ideas. This international meeting will create an environment which will promote the formation of new research partnerships between scientists from around the world, using their specialized knowledge and experience in specific areas. Special mention at **3rd AGChem** will have the technology of modern ecological materials, i.e., polymers, as well as the results of research on technologies for obtaining and recovering raw materials for their production. The thematic areas of the conference constitute of an entirety of research on green technologies, combining catalytic processes of production or processing of raw materials with application in electrochemistry (energy storage, energy acquisition) or biosciences. We would like to strongly emphasize the importance of research on ionic liquids as substances with versatile possibilities and great potential in virtually every thematic area of the conference. Ionic liquids are significant in the industry of the future; therefore they have their own thematic area at **AGChem 2022**. Close relationship between basic research and industrial exploitation of the results is the main idea behind this conference. International cooperation is the motto that should define this conference. We want the technologies and research presented by scientists to show the possibilities that they will provide to the society, what processes they improve and, most importantly, how they affect the environment. Everything that will be discussed at the conference will concern broadly understood term of green chemistry. These will include waste recycling technologies and their reuse or improvement of production processes, in which the impact on the natural environment will be reduced. In addition, we want to present the results of research on technologies dedicated to the circular economy and how research concepts are created in these areas "from idea to implementation". Another issue is the production of bio-based materials and biomaterials, considering environmental aspects and adapting new technologies to the changing global pro-ecological policy. Important, from the point of view of the end recipients - society, research in the areas of biosciences and agriculture will be presented, where we want to put special emphasis on research and implementation works on technologies that eliminate the use of plant protection products, for which there is no longer a place in the sustainable economy of the future. **AGChem 2022** is a conference that aims to show the scientific community and industry where we are in the areas of green chemistry, what we are currently working on and what research directions we have in global terms and present what we have already implemented.

Marcin Śmiglak
Conference Chair

Abstracts

in alphabetical order by name of the author

Removal of estrogens from water using activated carbon obtained from olive stones

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Micropollutants are natural or synthetic substances that are continuously released to aquatic environments that, even present at very low concentrations, such as μg/L or ng/L, can present adverse effects to the environment [1]. Micropollutants include a huge range of compounds such as pharmaceuticals, hormones, cosmetics, disinfectants, pesticides, among others [2]. Estrogens are hormones that can be found naturally in fish, reptiles, birds, and mammals. The main therapeutic molecules of estrogens are 17β-Estradiol, estriol and synthetic 17α-Ethinylestradiol normally used has contraceptives [3]. When present in water bodies, they can represent an environmental and health problem since traditional sewage and drinking water treatment plants are not able to remove or degrade this pharmaceutical compounds. This work will present some experimental studies for the removal of estrogens by adsorption using biomass-based materials, namely different types of activated carbon, obtained using olive stones.

Five different activated carbon materials were obtained from olive stones, namely the original granulated olive stones, chemical activation with acid or base, carbonization and pyrolysis. Then the main physicochemical properties for removal by adsorption were measured, such as the surface area, pore-volume, FTIR analysis and pH_{ZC}. In some, few published works, it can be observed that some adsorbents prepared from biobased materials own high adsorptive abilities to remove several micropollutants. Activated carbon obtained from olive stones can present a superficial area from 500 to 1200 m^2/g depending on the type of activation and values such as temperature, pyrolysis time and atmosphere (N_2, CO_2, air, and steam) in addition to the type of alkaline (KOH, NaOH) or acid (H_2SO_4, H_3PO_4, HCl and HNO_3) chemical activation agent. The use of olive stones is a promising and inexpensive source for the production of adsorbent materials with the potential to adsorb estrogen molecules from aqueous matrices.

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