

Research Group of Environmental Quality Improvement – Development of the Method of Monitoring and Removal of Biological Active Substances

Advanced Oxidation Processes, Photodegradation, Pesticides, Drugs, Mycotoxins

The group deals with analytics and the development of efficient, cheap, and green methods of degradation of pesticides, pharmaceutically active components, ionic liquids, paints, and mycotoxins. Great attention is paid to the optimization of energy, construction of various types of reactors, and environmentally acceptable methods of advanced oxidation processes for the removal of biologically active pollutants from wastewater. The efficiency of degradation of selected pesticides (herbicides, fungicides, and insecticides), pharmaceutically active components (beta-blockers, diuretics, antidepressants, antihypertensives, and antibiotics), as well as mycotoxins (aflatoxins and fumonisins), which cannot be removed by traditional biological and chemical treatments are research topics. Also, newly-synthesized nanopowders of improved spectral properties, i.e. higher solar sensitivity (TiO_2 doped with different elements, composite oxides of TiO_2 , nanohybrid TiO_2 /carbon nanomaterials (powder and thin film), ZnO thin films, TiO_2 modified with fullerene) are objectives of our group. The robustness of methods, as well as the cytotoxic effect of the resulting intermediates are studied.

SELECTED EQUIPMENT

- Liquid chromatograph UFLC Shimadzu Nexera™ with diode array detector (UV/VIS), fluorescence detector and conductivity detector;
- T80 + UV/VIS spectrophotometer;
- ultra pure water, ANDRONA SIA, mode: Crystal ex; and
- batch and flow reactors for the removal of organic pollutants and other necessary small equipment.



COLLABORATIONS

- Research Group of Environmental Chemistry, Institute of Chemistry, University of Szeged, Hungary;
- National Institute for Research and Development in Electrochemistry and Condensed Matter, Timisoara, Romania; and
- Center for Solid State Physics and New Materials, Institute of Physics, and Department of Catalysis and Chemical Engineering, Institute of Chemistry, Technology and Metallurgy, University of Belgrade.



SELECTED PROJECTS

Title: *Development of Methods of Monitoring and Removal of Biologically Active Substances Aimed at Improving the Quality of the Environment*

Type: national

Duration: 2011-2019

Contact person:

Dr Biljana Abramović, Full Professor

Title: *Comparison of photocatalytic efficiency of $\text{Zr/Fe}_2\text{O}_3$ and Si/ZrO_2 nanopowders in degradation of biologically active substances present in the environment using simulated solar light*

Type: national

Duration: 2017-2018

Contact person:

Dr Biljana Abramović, Full Professor

Title: *Optimization of Cost Effective and Environmentally Friendly Procedures for Treatment of Regional Water Resources (OCEEFPTRWR)*

Type: Hungary-Serbia IPA Cross-border Co-operation Programme

Duration: 2010-2011

Contact person (Leader):

Dr Biljana Abramović, Full Professor

CONTACT PERSON

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<https://www.dh.uns.ac.rs/unapredenje-kvaliteta-zivotne-sredine-razvoj-metoda-pracenja-i-uklanjanja-bioloski-aktivnih-supstanci/>