



Research Lectures

Wednesday, 4/12/2019, 14:00-15:00, Room K2.A1

Adsorption of analgesics from water on agricultural waste based activated carbons (AC)

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Abstract

The presentation deals with a study of removal of three analgesics – paracetamol (acetaminophen), diclofenac sodium salt and ibuprofen, via adsorption on six samples of agricultural waste based activated carbon (red mombin seeds, corncob, coffee husk, guava seeds and external and internal parts of mango seeds). Kinetics of pharmaceuticals removal and adsorption isotherms were studied in this work. Kinetics experiments were provided with $150 \mu\text{g}\cdot\text{ml}^{-1}$ water solutions of paracetamol and diclofenac and $50 \mu\text{g}\cdot\text{ml}^{-1}$ water solution of ibuprofen. Adsorption isotherms were measured in concentration range of $30\text{-}300 \mu\text{g}\cdot\text{ml}^{-1}$ for paracetamol and diclofenac and $10\text{-}100 \mu\text{g}\cdot\text{ml}^{-1}$ for ibuprofen. Due to low solubility in water, ibuprofen was first dissolved in methanol and then diluted with water. Concentrations of residual pharmaceuticals were measured with an aid of UV-VIS spectroscopy and HPLC. Red mombin seed AC and corncob AC showed best adsorption properties for all three pharmaceuticals, whilst guava seed AC had lowest adsorption capability. Kinetics of adsorption followed the (pseudo)second order, adsorption isotherms corresponded mostly with Freundlich model.

Short CV

Jan Bednárek has completed his PhD Study in the field of Chemistry, Technology and Properties of Materials in Brno University of Technology, Faculty of Chemistry in 2019. During his PhD study he participated at research projects focused at silicate materials. Since 2019 he works as researcher at the Institute of Environmental Technology (VŠB-Technical University of Ostrava). His research is focused at removal of xenobiotics from waters by carbonaceous materials.