

CARBON-BASED MATERIALS PREPARED FROM WASTE ANIMAL BONES BY MICROWAVE PYROLYSIS FOR REDUCTION OF XYLENE FROM WASTE GASE

Jankovská Z.^{1,2}, Matějová L.¹, Ostřanská M.^{1,2}

¹*Institute of Environmental Technology, CEET, VŠB – Technical University of Ostrava, 17. listopadu 15/2172, 708 00 Ostrava, Czech Republic*

²*Faculty of Material Science and Technology, Department of Chemistry, VŠB – Technical University of Ostrava, 17. listopadu 15/2172, 708 00 Ostrava, Czech Republic*

Volatile organic compounds (VOCs) are organic compounds with low boiling point, high vapor pressure and strong reactivity at room temperature. VOCs are extremely harmful to humans and the environment. The main treatment methods for VOCs are adsorption, catalytic oxidation, plasma technology, etc., wherein the adsorption method has the advantages of low cost, simple process, good effect and high utilization rate of the adsorbent. Carbon-based materials derived from solid waste (biomass, polymers, etc.) has become a popular adsorbent for VOCs removal due to its advantages of cheap and abundant source [1].

Millions of tons of waste animal bones with a natural porous structure and high organic content (source of carbon) are produced annually. One of the most reliable method for the valorisation of this waste via carbon-based material (biochar) preparation could be pyrolysis [2]. Biochar is a high added-valuable product and being used as a sorbent for e.g. heavy metal ions and organic pollutants (xenobiotics, pesticides, hormones etc.) from waste water [1].

Only very few studies deal with adsorption of VOCs from gas on biochar prepared from waste animal bones which could be a great source of carbon.

Based on mentioned reasons this research has the following objectives: to produce biochar with highly micro-mesoporous structure from five different waste animal bones, to explore textural, surface and structural characteristics of the produced carbonaceous adsorbents (biochars), to investigate the adsorption performance of produced adsorbents in xylene adsorption and to determine the influence of key characteristics on their adsorption capacities.

[1] Yang Y. et al., *Chemosphere* 256 (2020)127054.

[2] Azeem M. et al., *Environmental Pollution* 277 (2021) 116800.

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