



IMPACT OF PYROLYSIS TEMPERATURE ON THE PHYSICAL AND CHEMICAL PROPERTIES OF BANANA LEAVES BIOCHAR. AMMONIUM ADSORPTION CASE STUDY

Fernanda Pantoja¹, Sándor Beszédes², Tamás Gyulavári³, Erzsébet Illés⁴, Gábor Kozma³, Zsuzsanna László²

¹Doctoral School of Environmental Sciences, University of Szeged, Rerrich Béla Sqr. 1, H-6720 Szeged, Hungary

²Department of Biosystems Engineering, Faculty of Engineering, University of Szeged, Moszkvai krt. 9, H-6725 Szeged, Hungary

³Department of Applied and Environmental Chemistry, Institute of Chemistry, University of Szeged, Rerrich Béla Sqr. 1, H-6720 Szeged, Hungary

⁴Department of Food Engineering, Faculty of Engineering, University of Szeged, Moszkvai krt. 5-7, H-6725 Szeged, Hungary
e-mail: fliceth@hotmail.com

ABSTRACT

Given the current importance of the use of biochar within water treatment, especially as an adsorption process, it is important to study the physical-chemical properties of biochar in order to predict to a certain extent the behaviour of the adsorbent in contact with the adsorbates. Biochar can be made at different temperatures. In this research work, the physical and chemical characteristics of three biochars made with the same raw material which is banana leaves, but at different pyrolysis temperatures were analyzed. The results demonstrated that the increase in temperature in the raw material has a high impact on the structure of the final biochar, as well as on the surface chemistry. Regarding the adsorbent properties in the ammonium case study, the pristine biochar made at 300 °C is the most efficient, achieving a capacity of 7 mg of ammonium for each gram of biochar used, while the pristine biochar prepared at 500 °C shows the less value of ammonium adsorption.

Keywords: biochar, pyrolysis temperature, adsorption, ammonium removal