

THE APPLICATION OF CARBONIZED ASH FOR THE SOLIDIFICATION AND STABILIZATION OF SEDIMENT WITH HIGH CONTENT OF Zn AND As

Nenad Popov¹✉, Srđan Rončević², Snežana Maletić², Nataša Varga², Sandra Jakšić¹,
Željko Mihaljev¹, Milica Živkov Baloš¹

¹Scientific Veterinary Institute „Novi Sad“, Rumenački put 20, Novi Sad, Serbia

²University of Novi Sad Faculty of Sciences, Department of Chemistry, Biochemistry and Environmental Protection, Trg Dositeja Obradovića 3, 21000 Novi Sad, Serbia

✉ nenad.p@niv.ns.ac.rs

Abstract

Large quantities of ash generated by combustion of biomass require a sustainable management strategy [1]. The chemical composition of ash includes heavy metals that classified this kind of material as toxic waste. Accumulation of heavy metals as persistent and toxic substances in sediment can cause potential ecological risks [2]. The characteristics of sediment and examination of level of metal content can determine whether its remediation is necessary. The highest applicable technique of sediment remediation is solidification/stabilization (S/S). The application of this technique results in immobilization of pollutants into less soluble forms less available to the living world [3]. The ash produced by combustion of sunflower stem, after carbonization, was applied as a potential immobilization agent for the solidification/stabilization treatment of the sediment of the Greater Backa Canal. Carbonization causes decrease in leaching of metals by forming new adsorption zones and lowers porosity of a solidifier [4]. The results of the analyses showed that CO₂ combined with (OH)₂ forms CaCO₃, while in the combination with heavy metal oxides it forms their carbonates [5]. This paper presents the preliminary results of single step leaching test DIN 3841-4 S⁴ [6], and TCLP [7], which were used for testing newly formed mixture of sediment and non-carbonized/carbonized ash. The value of Zn and As concentrations in the eluates of the tested samples was monitored for successful evaluation of the treatment efficiency and risk assessment of newly emerging waste for human health and the environment.

Acknowledgments

The authors acknowledge financial support of the Ministry of Education, Science and Technological Development of the Republic of Serbia (Project No. 31011).

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