Wastewater Treatment from Heavy Metals with Ash from the Combustion of Plant and Mineral Waste

T. A. Vasilenko, I. V. Chernysh

Belgorod State Technological University named after V. G. Shukhov, Belgorod, Russia

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Abstract: The article considers the results of using ash formed during combined combustion of three types of waste of hazard classes IV and V under industrial conditions: bleaching clay with vegetable oils, sunflower husks and residues after mechanical cleaning of sunflower seeds for cleaning aqueous solutions from heavy metals – copper and zinc. Adsorption and desorption isotherms of molecular nitrogen for native ash were obtained, which characterizes it mainly as a mesoporous material. The original ash was modified with salt solutions, alkali and acids with subsequent determination of the amount of extracted ions. The nature of the interaction of ash with heavy metal ions in solutions was established in two directions: ion exchange and reagent purification with the formation of hydroxides. Acid modification of HNO_3 and HCl (20 % solutions) leads to an increase in the amount of extracted copper and zinc ions – from 1.21 to 1.36 times; alkaline and salt modifications of NaON and NaCl (20 % solutions) lead to an increase from 1.18 to 1.23 times.