

## USING OF WASTE SORBENT FROM FOOD INDUSTRY FOR THE REMOVAL OF COPPER IONS FROM WATER

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**Abstract.** The purpose of the work was to investigate the effectiveness of using a previously regenerated spent food industry sorbent modified with sulphide and hydrosulphide ions for the adsorption removal of copper (II) ions from water. A comparative analysis of the degree of removal and adsorption of copper (II) ions by the regenerated sorbent (RS) and its modified form (MS) was carried out. Insignificant adsorption of  $\text{Cu}^{2+}$  on the surface of the regenerated sorbent (RS) is explained both by the nature of the adsorbate and the morphology of the adsorbent after its acid-alkaline activation. Modification of the regenerated sorbent surface with more active sulphide and hydrosulphide ions leads to a significant increase in its selective adsorption in relation to copper (II) ions. IR-spectral and X-ray phase studies have established that on the surface of the modified sorbent (MS) there are topochemical reactions of the formation of copper (II) sulphide  $\text{CuS}$  and elemental sulphur. The use of a sorbent modified with sulphide and hydrosulphide ions increases the removal of copper (II) cations from the studied solutions by 65.5 times. The obtained results allow us to recommend the use of a regenerated sorbent (RS) of the food industry, modified with sulphide and hydrosulphide ions, to remove copper (II) ions from water.

**Keywords:** spent sorbent, reuse, regeneration, modification, copper (II) ions, removal, adsorption.