

## 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 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 RS is explained both by the nature of the adsorbate and the morphology of the adsorbent after its acid-alkaline activation. Modification of the surface of the regenerated sorbent with more active sulphide and hydrosulphide ions leads to an increase in the removal of copper(II) cations from the studied solutions by 65.5 times. IR-spectroscopy and X-ray phase analysis have shown that topochemical reactions occur on the surface of the MS, leading to the formation of copper(II) sulphide  $\text{CuS}$  and elemental sulphur. The obtained results allow us to recommend the use of a 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) ion, removal, adsorption.

Received: 28 October 2024/ Revised final: 10 April 2025/ Accepted: 15 April 2025

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