



**"Gh. Asachi" Technical University of Iasi, Romania**

---

## **NEW METHODS FOR COPPER AND SULPHIDE IONS RETAINING FROM WASTEWATER**

**Silvia Patachia<sup>\*</sup>, Luminita Isac, Mihaela Rinja**

*"Transilvania" University of Brasov, Chemistry Department, 29 Eroilor Str., Brasov, Code  
500036, Romania*

---

### **Abstract**

This paper presents a study of the poly(vinyl alcohol) hydrogel [PVA-HG] capacity for retaining the copper and sulphide ions from the waste water. PVA-HG-s have been obtained by the freezing-thawing repeated cycles method, starting from the aqueous solution of a PVA with 900 polymerization degree and 98% hydrolysis degree. Opaque, heterogeneous, white membranes of PVA hydrogel have been obtained. These have been immersed in a basic solution of  $\text{CuSO}_4$ , and a green complex of PVA-HG has been obtained. The distribution constant of copper ions between the hydrogel and the aqueous solution has been determined as approximately 14. The complexed hydrogel has been immersed in ammonium sulphide solutions, with different concentration, and the sulphide ions have been retained in the hydrogel membranes. Black nano-particles of  $\text{CuS}$  have been obtained and retained in the hydrogel matrix. The distribution constant of the sulphide ions between the hydrogel and the aqueous solution has been determined to be approximately 14, that is mean that the amount of the copper ions from the membrane determines the amount of the sulphide ions retention. Taking into account that PVA is a non-toxic, non-carcinogenic, biocompatible, biodegradable and non-expensive material, its capacity of copper and sulphide ions retention from the waste water could be an alternative solution to water purification.

*Keywords:* poly(vinyl alcohol) hydrogel, retention of  $\text{Cu}^{2+}$  and  $\text{S}^{2-}$ , waste water

---

---

<sup>\*</sup> Author to whom all correspondence should be addressed: e-mail: [st.patachia@unitbv.ro](mailto:st.patachia@unitbv.ro)