



**"Gheorghe Asachi" Technical University of Iasi, Romania**



---

## ION EXCHANGE PROCESSES ON WEAK ACID RESINS FOR WASTEWATER CONTAINING COPPER IONS TREATMENT

**Cristina Modroga<sup>\*</sup>, Alexandra Raluca Miron, Oanamari Daniela Orbulet,  
Cristina Costache, Giani Apostol**

*University "Politehnica" of Bucharest, Faculty of Applied Chemistry and Materials Science,  
Department of Analytical Chemistry and Environmental Engineering, 1-7 Polizu Str., Bucharest, Romania*

---

### Abstract

The capacity of ion exchange resins, MN 500 and C100 H, for the removal of copper ions from aqueous solution has been investigated under different conditions, namely: initial solution pH, initial metal-ion concentration and contact time. The adsorption of Cu(II) on these resins follows the first-order reversible kinetic. The film diffusion of Cu (II) in these ion exchange resins was shown to be the main rate limiting step. The studies showed that these cation exchange resins can be used as efficient adsorbent material for the removal of Cu (II) from aqueous solutions. The adsorption process, which is pH dependent, shows maximum removal of copper in the pH range 2-7 for an initial copper concentration of 10 mg/L. The adsorption rate constants for all these kinetic models have been calculated. Results showed that the intraparticle diffusion and initial Cu(II) sorption into resins was the main rate limiting step. The uptake of copper by the ion exchange resins is reversible and thus has good potential for the removal/recovery of copper from aqueous solutions. After the experiments we concluded that such ion exchange resins can be used for the efficient removal of copper from water and wastewater.

*Key words:* copper, ion exchange, Purolite MN 500, Purolite C 100 H, sorption capacity

*Received: November, 2014; Revised final: February, 2015; Accepted: February, 2015*

---

---

<sup>\*</sup> Author to whom all correspondence should be addressed: e-mail: [c\\_modroga@yahoo.com](mailto:c_modroga@yahoo.com)