



Removal of Heavy Metals with Combined Methods

Teuta Selimi*, Meleke Behluli-Nimani

Department of Chemistry, Faculty of Natyrale Sciences, University of Prishtina, Mother Teresa. 5: 10000 Prishtina, Republic of Kosovo

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Abstract: Influence of heavy metals in the environment is known, therefore they should be removed. Heavy metals were usually removed by coagulation method. The aim of work is the removal of heavy metals from wastewaters by coagulated process and reverse osmosis. Coagulants that has been used this purpose are: $\text{FeSO}_4 \times 7\text{H}_2\text{O}$, CaO and: $\text{FeSO}_4 \times 7\text{H}_2\text{O}$ $\text{FeSO}_4 \times 7\text{H}_2\text{O} + \text{CaO}$. Metal concentration is defined before treatment. Time of treatment is 60 minutes or 120 minutes and temperature is 293-303 K. During the coagulation with: $\text{FeSO}_4 \times 7\text{H}_2\text{O}$ the removal of Zn in the water has been noticed on low degree (10%) after the treatment by mixed of coagulants ($700\text{mg}/\text{dm}^3$ with $125\text{mg}/\text{dm}^3$), Zn removed for 100%, Pb and Cd will be removed by high percent during the use of high doses of $\text{FeSO}_4 \times 7\text{H}_2\text{O}$. For more efficient removed, this method were combined with the method of reverse osmosis, where we used heterogeneous membranes cellulose acetate-coal. Polyvalent ions (Pb^{2+} , Cu^{2+} , Cd^{2+} , Zn^{2+}) are separated as expected (> 90%).

Key words: *removal, coagulation, coagulant, reverse osmosis, heavy metals*

* Corresponding: E-Mail: teutaselimi3@gmail.com.; Tel: 0037745588412; Fax: 00381 38 – 244 187