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REMOVAL OF SOME HEAVY METALS FROM INORGANIC INDUSTRIAL WASTEWATERS BY ION EXCHANGE METHOD

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Removal of heavy metals such as Cu(II), Cd(II), Zn(II), Ni(II) and Pb(II) from wastewaters in several industrial areas of Kerman, Iran was evaluated by using ion-exchange method. Dowex 50WX8 (H^+) resin was selected as suitable adsorbent for reduction of toxic elements in wastewater. The most effective sorption was observed within in pH between 4 – 6, fow rate of 4 mL · min^{-1} and amount of 200 mg resin. Sorbent capacities for Cu(II), Cd(II), Zn(II), Ni(II) and Pb(II) were 45; 50; 50; 40 and 60 mg/g respectively. The results determine that exchanger resin is extremely effective in lowering the metal content of wastewaters.

Keywords: removal, heavy metal, wastewater, ion exchange method, pollution.

1. Introduction

Humans depend on their surrounding physical environment for the resources. Human exploitation of these resources causes environmental degradation [1]. Anthropogenic influences as well as natural processes degrade surface and groundwater, and impair their use for drinking, industrial, agricultural, recreation or other purposes [2 – 4]. Industries such as mining, steel and electroplating, discharge aqueous effluents containing relatively high levels of heavy metals such as silver, cadmium, copper, cobalt, chromium, zinc, iron and lead. Untreated effluents from these manufacturing processes have an adverse impact on the environment [5,6]. Heavy metals are elements having atomic weights between 63 and 200, and specific gravity greater than 5,0 [7]. Pollution by heavy metals has become a global phenomenon because of its toxicity, persistence for several decades in the aquatic environment, bioaccumulation and biomagnifications in the food chain [8,9]. Zinc

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