Adsorption Study of Metal Ions on Electrochemically Synthesized Poly-(ortho-phenylenediamine)

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The present work deals with the study of uptake behavior of Cd(II), Pb(II), Hg(II) and Zn(II) ions by Electrochemically synthesized Poly-(ortho-phenylenediamine) (POPD) using batch equilibration technique with both single and binary mixtures. The effect of the various parameters such as electrochemically synthesis method, physical oxidation state of the polymer, polymer thickness, solution pH and metal ion concentration on the adsorption, kinetics and efficiency were investigated.

The results showed avary broad concentration range of the metal ions from (0.2 to 20 mg/L) can be adsorbed on the polymer at pH = 6.6 (efficiently >98%). The adsorption capacity of the polymer to different concentrations of metal ions was evaluated as the milligram of metal ions by one gram of various forms of the polymer. The DC conductivity measurements were also employed on the solid polymer before and after adsorption of metal ions. The experimental adsorption date was fitted to different mathematical isotherms to estimate the binding constant of metal ions with the polymer in both single and mixed ion solutions.