

Synthesis and Characterization of Cellulose Modified Surface to Remove Lead (II) from Aqueous Solution

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Abstract

In the present work, the method developed is cellulose modified surface (CMS) to remove heavy metals such as lead II (Pb^{2+}) from aqueous solution. The objective of present work is to investigate the effectiveness of CMS to remove Pb^{2+} from aqueous solution which includes some certain parameters such as kinetic study, saturation study and pH effect. CMS is prepared by acidification method; then, the activated cellulose is mixed with allylthiourea and acetonitrile. CMS is characterized using Atomic Absorption Spectrometer, Fourier Transform Infrared Spectroscopy and Elemental Analyzer. The most efficient time for sorption is 180 min with sorption capacity of 46%. For saturation study, the highest sorption is 45.89% at the concentration of 1.389 mg L^{-1} . In pH study, it has been found that CMS works the best at pH 7 (64.35%). For qualitative analysis, based on FTIR spectra, there is difference between before and after sorption of CMS. This difference can indicate there is Pb^{2+} on the surface of CMS. Elemental analysis indicates that there is oxidation process occur on CMS surface that shows attachment of thiol group on the surface. In conclusion, further study is required in order to enhance the CMS capability to remove more Pb^{2+} from aqueous solution.