

Development and Characterization of Cellulose Modified Surface with Allylthiourea as Functional Sites to Remove Basic Red 5 from Aqueous Solution

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Abstract

In this work, the removal of Basic Red 5 (BR5) by using cellulose modified surface with allylthiourea as functional sites (CMS) is studied. CMS is prepared by acidification and then, the activated cellulose is mixed with allylthiourea (AT) in acetonitrile to attach AT onto activated cellulose. There are five parameters that are studied including kinetic study, pH effect, saturation study, FTIR analysis, and elemental analysis. As a result, the higher the concentration of the BR5 in the solution, the higher the percentage of removal. The most efficient pH to remove the BR5 by the CMS is at pH 7 with 80% of removal. pH effect gives significant impact in this work. Carbon, hydrogen, and nitrogen content are found to be slightly increased after adsorption of BR5 as it is loaded with some additional elements such as carbon, hydrogen and nitrogen. However, the sulfur content shows slight decrease after adsorption of the BR5 due to the contribution of active functional sites of CMS that depends on the thiol functional groups which are bonded chemically with the BR5 during separation process in batch mode.