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Removal of dye contaminants from waste water by using highly cross-linked polymer as novel adsorbent

Cansel Tuncer, Mehtap Kilinc and **Vural Butun**
Eskisehir Osmangazi University, Turkey

Waste water treatment is a huge problem in many industrial sectors. There are various pollutants in waste water such as dyes, heavy metals, pharmaceuticals and phenols. Dyes are complex organic compounds and mainly classified into cationic, non-ionic and anionic groups. They are used in great numbers of industries as coloring agents. Various physical and chemical methods have been investigated for the removal of dye contaminants. Most commonly used methods are adsorption, biological degradation, coagulation/flocculation, ion exchange, ozonation, chemical precipitation, reverse osmosis, etc. Polymeric materials are often used and play an important role in waste water applications. Herein, new types of highly cross-linked (HCL) polymers were synthesized from a tertiary amine methacrylate based monomers (DMA, DEA, DPA and GMA) as a dye adsorbent. Systematically, the effect of pH change on dye adsorption and the adsorption capacity of related polymers were determined. Adsorption isotherms were analyzed to understand dye-polymer interactions. From related isotherm, kinetic adsorption rate of the polymer-dye system and thermodynamical parameters (ΔH, ΔS and ΔG) were calculated. Secondly, dye molecules were extracted from aqueous phase. Host-guest relationship (between copolymer and dye molecules) was used as a method for extracting. Since HCL polymers have cavities and functional groups, dye molecules were easily pulled from the aqueous phase to the organic phase. Extraction capacities of HCL polymers were calculated from UV-Vis spectrophotometer data.

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Biography

Cansel Tuncer completed her PhD at Eskisehir Osmangazi University in 2015. She has been working as a Research Assistant at the same university since 2009. She has published 7 papers in reputed journals. She has worked as Researcher on various projects based on biotechnology and polymer technology. She is currently working on 2 projects as a Director. She has great experience on the synthesis of polymers and their derivatizations, hydrogels, microgels, nanoparticles and metal production by using various methods including GTP, ATRP, free radical polymerization and heterogen polymerization techniques.

ctasagir@ogu.edu.tr

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