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Biosorption of Methylene Blue and Acid Red-88 from Wastewater by Using Cypress Cones

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Abstract : This study represents the removal of harmful dye substances from wastewaters by using waste and cheap adsorbents. Rapid population growth and industrialization occasion anthropogenic pollution which gives irreversible damage to the environment. One of the ways in which water pollution occurs is caused by the release of the dyestuffs in the textile industry. The release of dyestuffs to the environment directly damages the living creatures that have acquired water habitat. Especially, wastewater cannot be used for nutritional purposes. In addition, some adsorbents have mutagenic and/or carcinogenic effects. By blocking photosynthesis, it hinders the inhibition of photosynthetic bacteria in the water, which damages the ecological balance and also causes the formation of malodorous compounds. Moreover, the lack of oxygen can pose a serious danger to the lives of other living organisms that need oxygen. In recent years, some physical and chemical methods are preferred for the removal of dyestuffs. However, the utilization of these methods is expensive. For this reason, the availability of new and cheap adsorbents becomes the more significant issue. In this study, an investigation of various variables on the removal of Methylene Blue and Acid Red-88 dyestuffs from wastewaters by the usage of pulverized cypress cones has been carried out. Thus, various masses of absorbent (0.1-0.25-0.5-1-2-4-5 grams) are used in 50, 100, 150, 200, 300 ppm concentrations of Methylene Blue and Acid Red-88 dyestuffs' solutions, and with a variety of the interaction time (0.25-0.5-1-2-4-5 hours). The mixtures were centrifuged and the absorbance of the filtrates was measured on a UV spectrophotometer to determine their remaining concentrations. In the study, the highest removal ratio of Acid Red-88 dyestuff was found to be 81% at 200 ppm of dyestuff with 2 grams of adsorbent at 300 minutes. For Methylene Blue experiments, the removal percentage was found as 98% where 2 grams of adsorbent is used in 200 ppm dyestuff solution at 120 minutes of interaction.

Keywords : acid red-88, biosorption, methylene blue, cypress cones, water pollution
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