Removal of Basic Dye using Activated Carbon from Sugarcane Bagasse

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Abstract

Activated carbon from sugarcane bagasse has been successfully produced through chemical activation process using zinc chloride as activating agent. The effectiveness of activated carbon in different concentrations of dye and actual wastewater from Saffron Textile Dyeing was studied. Trials were made to determine the effectiveness of activated carbon considering different concentration of dye and different mass of activated carbon with respect to time. A 200 mL of simulated wastewater with 15g of activated carbon and varying concentration of 1%, 3% and 5% of dye was used in the experiment. Different mass of activated carbon 15g, 20g and 25g, was also used to remove color from 1% dye concentration of simulated waste water. This is to determine the optimum amount of activated carbon use to adsorb the color in terms of dissolved solids from simulated wastewater.

Samples were taken every hour for each trial. Using UV-VIS spectrophotometer, absorbance reading in each sample was obtained in order to compute the concentration of dissolved solids remove from simulated wastewater. It was noted that the result of absorbance decreases every hour for each trial. It shows that the lower the absorbance reading the lighter the color. And it also shows that the higher the concentration of dye the longer the time it takes to decolorize the simulated wastewater. To enhance the time to remove suspended solids from wastewater, the amount of activated carbon into was increased from 9.1% (20 grams) and 11.11% (25 grams) to decolorize a 200ml, 1% basic dye wastewater sample. Experimental results show that activated carbon from sugarcane bagasse is more effective in a higher concentration. The most economical amount of

activated carbon that can treat a 1% concentration of basic dye wastewater sample and it was 6.98% concentration of activated carbon or 15 grams per 200ml. The highest percent of dye removed was 99.92% for 10hrs.

This study shows that bagasse activated with $ZnCl_2$ is an effective absorbent. The activated carbon from sugarcane bagasse can decolorize the different concentration of basic dye in wastewater.

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