



Consecutive removal of basic dye and reactive dye using biological sludge from wastewater treatment process

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A consecutive removal of basic dye and reactive dye was proposed based on the concept of using biological sludge bearing different charge on surface and electrostatic interaction. The sludge was first used to remove methylene blue (basic dye) which is a positively charged dye in aqueous solution. The effect of pH and the initial concentration were studied by batch method. The results showed that the suitable pH for methylene blue removal was pH 4 and higher. The adsorption of methylene blue followed Langmuir isotherm with maximum adsorption capacity of 181.8 mg/g. The sludge containing methylene blue (MB-sludge) was consecutively used to remove reactive red 22 (reactive dye) which is a negatively charged dye. The MB-sludge showed a greater efficiency in the removal of reactive red 22 compared to bare sludge, likely due to a reduction in repulsive force between negative charges of reactive dye and sludge surface. A high efficiency in reactive red 22 removal by MB-sludge could be obtained in solution having the pH higher than 2. FT-IR and zetasizer were used to characterize the adsorbents in this research.

Keywords: Sludge; Dye; Adsorption; Consecutive removal