

Methyl orange adsorption from aqueous solution by corn cob based activated carbon

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ABSTRACT

Water is essential to the ecosystem for the energy required to stay alive. Nowadays, rapid development in technology can cause pollution to the environment such as water quality pollution and then faced by society. A dangerous source in wastewater such as dyes poses a severe problem due to its toxicity and it was hard to treat. Based on the adsorption ability, activated carbon from corn cob was made for the removal of dyes in wastewater treatment. Activated carbon from corn cob was developed by using alkaline solution treatment of potassium hydroxide (KOH) with different mass ratios, and then was characterized by FTIR, XRD, and SEM. The synthesized activated carbon was also used for removal of methyl orange from aqueous solution. In this research, the obtained char yield after pre-carbonization at 500 °C was 74.20%, while activated carbon yields were 53.60% to 78.80%, based on its difference mass ratios of KOH. The activated carbon without an activation agent gave adsorption capacities of 14.63%. However, when the char was introduced to KOH, the adsorption was increased from 41.09% to 80.36%. The percentage of dye removal increased when the mass ratios of KOH increased. The produce activated carbon from corn cob by using KOH can be effectively used for wastewater treatment.

KEYWORDS:

Methyl orange adsorption; Aqueous solution; Corn cob