



FULL FACTORIAL EXPERIMENTAL DESIGN ANALYSIS OF ALIZARIN RED S DYE REMOVAL FROM AQUEOUS SOLUTION USING BOVINE BONE ACTIVATED CARBON

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ABSTRACT

This work investigated the adsorption of Alizarin Red S dye from aqueous solution using Bovine Bone Activated Carbon (BBAC). The effects of pH, initial dye concentration, carbon dosage and contact time on the adsorption process were studied. The interaction effect of process parameters and optimization were also studied using Design Expert 7.0 software. Experimental results showed that percentage adsorption efficiency increased with lower pH, higher initial concentration of the dye and higher carbon dosage. At 95% confidence level, the highest removal efficiency was 99.74% when pH was 3, initial dye concentration was 100 ppm and carbon dosage was 0.5g at 30 mins contact time. From the cube plot, the highest removal efficiency was 99.71% when the pH was 3; initial dye concentration was 100 ppm, carbon dosage of 0.5g at a contact time of 45 minutes. Therefore, bovine bone activated carbon can serve as a cheap and effective alternative to conventional commercial adsorbents.

Keywords: Adsorption, Alizarin Red S, bovine bone, full factorial, optimization.

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