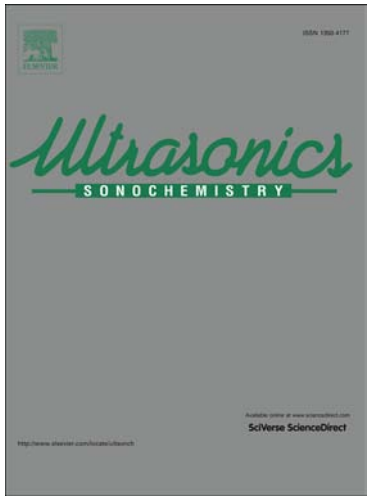

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Synthesis of Polyaniline nanoparticles and their application for the removal of Crystal Violet dye byUltrasonicated adsorption Process Based on Response Surface Methodology

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ABSTRACT

The present study focuses the synthesis of Polyaniline Nanoparticles (PANP) by rapid mixing polymerization method. They were recognized by FTIR and SEM techniques. Moreover they were utilized for the removal of crystal Violet (CV) dye by ultrasonicated adsorption process. It ensures a quick alternative method compared to other conventional processes, which led to enhancement of mass transfer by ultrasound waves. The effectiveness of the process was confirmed through the effect of certain conditions like sonication time, temperature, adsorbent dosage and CV concentrations. The validity of the process was estimated by various adsorption Isotherms. Kinetics and thermodynamic studies was also conducted to authenticate the process. The optimum operating parameters (OOP) were evaluated by Response Surface Methodology (RSM) based on central composite design (CCD) for the removal of CV dye. Moreover analysis of variances (ANOVA) was employed to estimate the significance of experimental variables. The predicated removal efficiency was found to be 94.29% which prove to be effectiveness of the process.

Keywords: Polyaniline nanoparticles, Ultrasonicated adsorption, Central Composite Design, Response Surface Methodology, ANOVA.

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