Abstract – Poster Presentation

P23

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Degradation of Procion Brilliant Purple H-3R using Ultrasound coupled with Advanced oxidation Processes.

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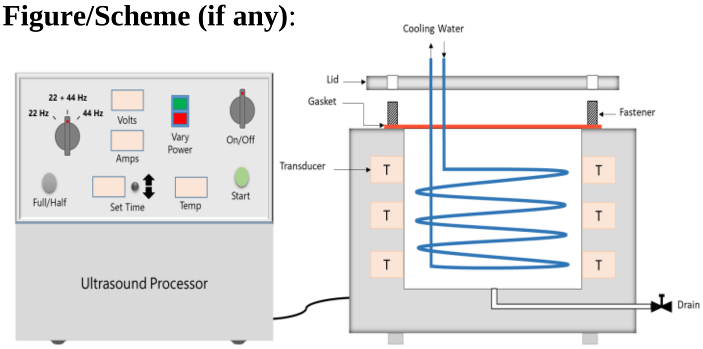
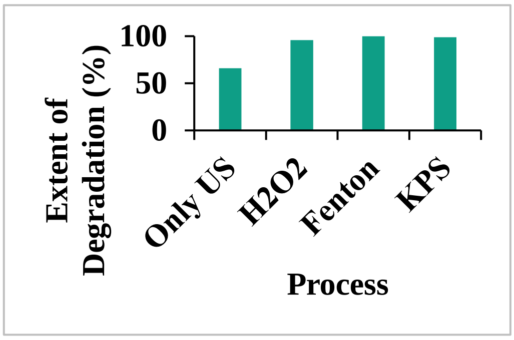
Abstract:

The effluents from textile industries contain a large variety of synthetic dyes, as up to 20 % of total dyes produced are lost in the effluents during the different stages of processing. Synthetic dyes can have significant impact on the environment and pose a health-risk due to their stability, toxicity and hazardous properties. The complexity of the wastewater matrix with the presence of various dyes including other persistent and semi-volatile organic compounds shows resistant to conventional degradation processes and makes the treatment methodology complex. Since cavitation with AOPs can non-selectively attack all the pollutants in the matrix, it can be employed as a tertiary process in wastewater treatment systems. Combination of ultrasound with the use of oxidizing agents such as H_2O_2, Fenton reagent, and KPS has also been studied with Procion Brilliant Purple H-3R considered as the model dye. In the present study, the effect of pH, Frequency, and Power on the extent of degradation have been initially studied with an objective of maximizing the degradation using Cavitation Reactor alone. The established optimum conditions as 12 pH, 22 kHz Frequency and 250 W Power resulted in maximum degradation of dye as 70.25%. It was observed that a significant increase in the extent of degradation is obtained for the combined operations with the actual extent of degradation being 95.99% for H2O2 loading of 500ppm, 99.79% for Fenton loading of 50:1, and 99.05% for KPS loading of 750ppm. Overall, it has been demonstrated that combined process of Cavitation Reactor with Hydrogen Peroxide, Fenton Reagent, and KPS can be effectively used for treatment of wastewater containing Procion Brilliant Purple H-3R.

Figure/Scheme (if any):





References and Notes:

1. R. F. Momin, P. B. Patil and S. Raut Jadhav, "Sonolytic Degradation of Acid Blue 80 Dye," International Journal for Research in Applied Science & Engineering Technology, Volume 5 Issue VI, 2017, 2342 -2349.