



Optimization of Operational Parameters of the Photocatalytic Degradation of Reactive Red 120 Dye under UV Irradiation

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Abstract: The photocatalytic degradation of a reactive azo dye (C.I. Reactive Red 120) has been investigated in aqueous suspension using different photocatalysts under UV irradiation. TiO₂-P25 was found to be more suitable for the degradation of the dye. Adsorption studies of the TiO₂ suspension in dark showed that adsorption has a strong dependence on pH and follows a Langmuir adsorption model. An attempt has been made to optimize the process parameters viz., substrate concentration, pH of the solution and catalyst loading for the degradation of the dye using TiO₂-P25. The degradation of the dye was found as maximum in acidic medium and it follows approximately a pseudo-first kinetic order according to the Langmuir-Hinshelwood model. The effect of addition of the electron acceptors H₂O₂ and K₂S₂O₈ and the influence of additives such as Na₂CO₃ and NaCl on the degradation were also studied.

Keywords: Photocatalytic degradation, TiO₂, UV irradiation, Reactive Red 120

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