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# Modeling of Chlorpyrifos degradation by $TiO_2$ photo catalysis under visible light using response surface methodology

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**ABSTRACT**

Chlorpyrifos has been classified by the Stockholm Convention as priority pesticide under consideration because of its toxicological profile that succinctly characterizes the toxicological and adverse effects on health. $TiO_2$ photo catalysis of aqueous chlorpyrifos (CPF) solution using a raceway pond, containing total nitrogen and total phosphorus, has been modeled using response surface methodology (RSM). The RSM was used to improve the optimum condition of CPF degradation using R software. The ANOVA, p-value of lack of fit > 0.05 indicated that the equation was well-fitted. 71.09 ± 1.9% of removal was obtained for CPF (2.84 ppm), time (55.15 min) and dosage of $TiO_2$ (17.07 mg $L^{-1}$) under $TiO_2$ visible photo catalysis compared to the 25.6 ± 0.25% by visible photolysis under similar experimental conditions. Nitrogen and phosphorus showed negligible interference on CPF degradation.

*Keywords:* Chlorpyrifos; $TiO_2$ catalyst; Photolysis; Visible light; POPs; RSM

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