



## Studies on the photocatalytic decolorization of pararosaniline chloride dye and its simulated dyebath effluent

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Received 5 April 2010; Accepted in revised form 22 July 2010

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### ABSTRACT

In the present study the photocatalytic decolorization of pararosaniline chloride dye (unhydrolysed and hydrolysed forms) and its simulated dyebath effluent has been investigated by employing heterogeneous photocatalysis process. The photocatalytic activity of different semiconductors viz.  $\text{TiO}_2$ , ZnO, CdS and ZnS has been compared in order to select the most active catalyst for the decolorization of this dye. It was observed that ZnO exhibits better photocatalytic activity than the others. Thereafter different operational parameters which affect the decolorization process like catalyst dose, pH, initial dye concentration have been optimized. The maximum decolorization of the dye solutions was noticed in alkaline conditions and the optimum value of catalyst dose was found to be  $1 \text{ g L}^{-1}$ . Further the study has been extended to explore the applicability of this system for the decolorization of the dye in its hydrolysed form and simulated dyebath effluent. The decolorization rate as well as chemical oxygen demand (COD) reduction of the hydrolysed dye solutions was higher than that of the unhydrolysed dye solutions, whereas the simulated dye bath effluent decolorized at a somewhat slower rate than hydrolysed and unhydrolysed dye solutions.

*Keywords:* Decolorization; Pararosaniline chloride; Photocatalysis; Titanium dioxide; Zinc oxide

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