



**“Gheorghe Asachi” Technical University of Iasi, Romania**



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## STUDIES ON THE USE OF CALCIUM HYPOCHLORITE IN THE TiO<sub>2</sub> MEDIATED DEGRADATION OF PHARMACEUTICAL WASTEWATER

**Amit Dhir<sup>1</sup>, Manmohan Kamboj<sup>1</sup>, Chhotu Ram<sup>2\*</sup>**

<sup>1</sup>Department of Biotechnology & Environmental Sciences, Thapar University, Patiala-147004, India

<sup>2</sup>Department of Civil Engineering, M. M. University Sadopur Ambala, 134007, India

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### Abstract

The present study investigates the effect of addition of calcium hypochlorite in the titanium dioxide (TiO<sub>2</sub>) mediated degradation of bio-recalcitrant wastewater from pharmaceutical industry. The degradation studies were carried out in photoreactor irradiated with ultraviolet (UV) light at 365 nm under slurry mode. The reduction in chemical oxygen demand (COD) was estimated as an index of degradation. The influence of process parameters viz., catalyst dose, pH, oxidant concentration and source of light (UV/Solar) on degradation was studied. The degradation efficiency was also compared with hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) which has been widely used as an oxidant in the photocatalytic systems. The degradation efficiency of wastewater with oxidant alone was found to be comparatively less. Degradation of 67% was achieved in UV/TiO<sub>2</sub> system at optimized conditions (3.0 g/L TiO<sub>2</sub>, pH 4) after 7 h of irradiation. The use of calcium hypochlorite (0.25 g/L) along with TiO<sub>2</sub> (3.0 g/L) at pH 4 has been found to increase the degradation efficiency of wastewater up to 82% which would facilitate the recycling of wastewater from pharmaceutical industry.

*Key words:* oxidant, pharmaceutical wastewater, photocatalytic degradation, photoreactor, titanium dioxide

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\* Author to whom all correspondence should be addressed: [chhoturao2007@gmail.com](mailto:chhoturao2007@gmail.com)