

**PHOTODEGRADATION OF PARACETAMOL USING ACTIVATED CARBON-  
TiO<sub>2</sub> UNDER LOW UV LIGHT**

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## **ABSTRACT**

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The presence of drug residues in environmental matrices, particularly water, poses significant challenges to community health and safety. Photocatalysis has emerged as a promising water treatment method due to its high efficiency, accuracy, and precision. Titanium dioxide (TiO<sub>2</sub>) serves as a semiconductor photocatalyst owing to its stability, affordability, and low toxicity. However, challenges such as rapid electron recombination. In this study, activated carbon (AC) is integrated with TiO<sub>2</sub> to enhance photocatalytic performance against paracetamol under low UV-light irradiation. Various ratios of AC-TiO<sub>2</sub> photocatalysts are evaluated, and the resulting photocatalysts are characterized using SEM-EDX and FTIR analyses. The investigation focuses on activated carbon, and its effects on developing high-performance photocatalysts, encompassing surface morphological, structural, and optical properties, as well as photoinduced electron-hole separation efficiency. The results of photocatalyst performance reveals that the AC-TiO<sub>2</sub> (B) composite exhibits the most effective photocatalytic performance against paracetamol under low UV light intensity, achieving an efficiency of 89.9%. Conversely, AC-TiO<sub>2</sub> (A) and AC-TiO<sub>2</sub> (C) demonstrate lower efficiencies of 86.32% and 78.24%, respectively.

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