Photocatalytic synthesis of aromatic aldehydes using immobilized graphite-like carbon nitride

Introduction

Photocatalytic synthesis processes can operate under mild conditions, reducing the volume and the toxicity of the generated residues. The possibility of being activated by low energy consumption radiation sources like Light-Emitting Diodes (LEDs) contributes to reducing energy costs. For these reasons, heterogeneous photocatalytic reactions have gained high relevance. Namely, in fine chemical synthesis, concerning process intensification and safety in many applications. Photocatalyst immobilization facilitates reuse, avoid costs related to separation and permits work under continuous operation. In this work graphite-like carbon nitride nanosheets (GCN-TS) were immobilized on polyester fabrics (PES) pre-treated with HNO₃ with concentration ranging from 0.2 to 5.0% v/v. The resulting materials were tested in the photocatalytic oxidation of anisyl alcohol (AA) into anisaldehyde (AAD).

Photocatalytic Experiments

Materials Characterization

Photocatalytic Results

The SEM images reveal that the photocatalyst was uniformly deposited on the supports.
- The acid modification will improve the wettability of PES, consequently the adhesion of GCN-TS on its surface.

Conclusions

- HNO₃ pre-treatment of PES fabrics improves the immobilization of GCN-TS.
- xCN-PES coated materials revealed high efficiency and stability for AAD synthesis under visible light radiation.