

Photocatalytic and Dark-Active ZnO₂/Polypyrrole Composite for Wastewater Treatment

Technology Domain: Chemistry

Patent Application Number: 201641024032

Status (Patent/TRL): Granted Patent / TRL 4

Technology Summary:

This invention introduces a novel nanocomposite of ZnO₂ / polypyrrole, designed for highly efficient degradation of dyes in industrial effluents. The key technical solution lies in the specific synthesis and combination of these materials to create a powerful catalytic agent.

The key inventive feature is the composite's remarkable ability to achieve 100% dye degradation in both dark conditions (within 20 minutes) and light conditions (in less than 10 minutes) for a 10^{-5} M dye concentration, significantly outperforming existing methods as indicated by comparison to literature. The use of this product is for advanced and rapid effluent treatment, offering a highly effective and potentially more sustainable solution for industrial wastewater purification.

