

Title : Synthesis and Characterization of Fe₃O₄ Nanoparticles. Application to the Degradation of Rhodamine B.

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Abstract:

A significant amount of pollution is affecting the environment as a result of various factors. Among these factors include pharmaceutical waste, chemical waste discharges, pollution, and others. We have therefore turned to a method of treating these wastes to lessen the impact of pollution. Based on a study of photocatalytic activity using a supramagnetic catalyst—the magnetic iron oxide (Fe₃O₄)—photocatalysis offers the potential for the degradation of pollutants.

The magnetic iron oxide, or magnetite (Fe₃O₄), was produced chemically, and the nanoparticles were identified by diffraction of X-rays (DRX) and microscopy with balayage coupled to EDS (MEB-EDS). The synthesized particles were used as a catalyst for the degradation of pollutants that were already present, including Rhodamine B.

The following parameters were used to study the photodegradation of Rhodamine B: effect of catalyst mass, effect of solution pH, and effect of catalyst concentration.

Les résultats obtenus ont montré un bon rendement de la dégradation de la Rhodamine B. le meilleur résultat est obtenu pour pH acide (PH=2,36), à la masse m=30mg et à la concentration C=3ppm pour un temps minime de 35 min.

Keywords: Magnetite, Characterization, Photocatalysis, Degradation of pollutants, Rhodamine B.