

Elaboration of a nanocomposite with zinc oxide and zeolite: influence of the concentration

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There is a limited literature on the encapsulation of a semiconductor ZnO within pores of zeolite. Some of the recent works made the object of an manufacturing investigation of nanoparticles of ZnO supported by the zeolite and their performance in terms of cathodic luminescence so effective as photocatalysts, and resistant circles in ultraviolet rays with antimicrobial properties. ZnO nanoparticles deposited on the zeolite HY by electrochemical method was estimated for the photo discoloration of blue methylene. In this work, a semiconductor of ZnO nanoparticles with deferent concentrations inside EMT nano-zeolite (polymorph of the zeolite Y) was prepared in soft conditions and rich sodium medium. In a first step, we synthesized the nano-zeolite EMT by hydrothermal method. In a second step, the Zn^{2+} ions were fixed on the zeolite by ion exchange process, then the precipitation of zinc with sodium hydroxide are performed and finally a calcination at 500°C. As a result, ZnO @ EMT nanoparticles are obtained and characterized by (FTIR, DRX). After ion exchange and calcination,. The FT-IR spectra show a new bands which could be attributed to the vibrations of the Zn-O and Zn-O-T groups. However the X-ray diffraction indicates the formation of ZnO nanoparticles of hexagonal structure (würtzite). These results suggest that ZnO crystallites are formed in hexagonal EMT nano-zeolite.

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