

Alginate Wrapped NiO-ZnO Nanocomposites-Based Catalyst for the Reduction of Methylene Blue

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Abstract : In this paper, nickel oxide-zinc oxide (NiO-ZnO) catalyst was embedded in an alginate polymer (Na alg/NiO-ZnO), a nanocomposite that was used as a nano-catalyst for catalytic conversion of deleterious contaminants such as organic dyes (Acridine Orange "ArO", Methylene Blue "MB", Methyl Orange "MO") and 4-Nitrophenol "4-NP" as well. FESEM, EDS, FTIR and XRD techniques were used to identify the shape and structure of the nano-catalyst (Na alg/NiO-ZnO). UV spectrophotometry is used to collect the results and it showed greater and faster reduction rate for MB (illustrated in figures 2, 3, 4 and 5). Data recorded and processed, drawing and analysis of graphs achieved by using Origin 2018. Reduction percentage of MB was assessed to be 95.25 % in just 13 minutes. Furthermore, the catalytic property of Na alg/NiO-ZnO in the reduction of organic dyes was investigated using various catalyst amounts, dye types, reaction times and reducing agent dosages at room temperature (rt). NaBH₄-assisted reduction of organic dyes was studied using alg/NiO-ZnO as a potential catalyst.

Keywords : Alginate, metal oxides, nanocomposites-based, catalysts, reduction, photocatalytic degradation, water treatment

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