**ABSTRACT**

Metal catalysed reduction of nitro [aromatic compounds](https://www.sciencedirect.com/topics/chemistry/aromatic-compound) to aniline derivatives is a convenient and significant synthetic pathway in several applications. TiO2/Zinc oxide has gained much more recent attention as a significant catalyst in the catalytic reduction of nitro aromatic compounds by sodium boro hydride. In this sample, metallic ZnO particles were stabilised by simple green thermal treatment on the chitosan nano composites in water.TiO2/ZnO based Chitosan gel beads exhibited outstanding catalytic behaviour in the hydrogenation of 1-nitro benzene, 2-nitro aniline when NaBH4 was used as the hydrogen source. The tests of [catalytic activity](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/enzymatic-activity) were replicated by varying the quantity of the catalyst, the concentration of NaBH4, the quantity of nitro aromatic compounds and the temperature. The decreasing reaction was greatly influenced by the temperature of the reaction medium and concentration of NaBH4. Selected reduction reactions went to completion in just (0.15 min) raised temperatures at 45οC. These conclusions indicate that the newly prepared TiO2/ ZnO based Chitosan gel beads can open up a new perspective on catalytic reduction reactions. Antimicrobial activities of TiO2/Zn nano particles grafted with chitosan have been tested against pathogenic microorganisms such as A. Niger, Bacillus subtilis, Escherichia coli.