

Ultra-fast Catalytic Degradation of 4-Nitrophenol by Silver Nano Particles for Improving Water Quality

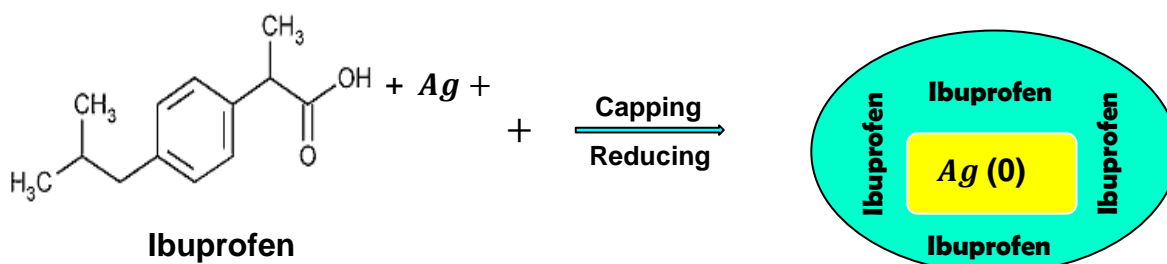
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Abstract:

In this study, we report the facile one-pot chemically synthesized mono dispersed silver nano particles (AgNPs) in aqueous media by simple, efficient and environment friendly method using sodium borohydride (NaBH₄) as the reducing agent and the ibuprofen analgesics drug as capping agent. Colloidal mono dispersed spherical AgNPs were characterized by different analytical techniques such as UV-Visible spectrophotometer, Fourier transform infra-red spectroscopy (FTIR), X-ray diffraction (XRD), Zeta potential analyzer (ZPA) and Transmission electron microscope (TEM). These all techniques confirmed the formation of homogeneously distributed smaller with spherical morphology having size distribution in the range of 13-10.1 nm. These particles were highly stable for more than two months when stored at ambient temperature. After stabilization study these AgNPs were tested for the excellent catalytic degradation activity towards the reduction of aromatic 4-nitro phenol compounds into amino phenols within one minute by improving water quality. This finding is a novel, rapid, cost effective and highly economical alternative for environmental safety against water pollution and extendable for control of other reducible contaminants in water as well.

Graphical Representation:



Keywords: Ibuprofen, Silver nano particles (AgNPs), 4-Nitrophenol

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