

CATALYTIC DECOMPOSITION OF HYDROGEN PEROXIDE ON MANGANESE DIOXIDE NANOPARTICLES AT DIFFERENT PH VALUES

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ABSTRACT

Catalytic decomposition of hydrogen peroxide on manganese dioxide nanoparticles was studying under different experimental conditions such as pH (1, 6.5 and 14) and at 15°C Temp. The kinetics of the reaction was analyzed by first order equation and rate constants were determined from the slopes of the straight lines. It was observed from the experimental results that the decomposition rate constant was found to be dependent on pH. MnO₂ nanoparticles used as a catalyst for decomposition H₂O₂ were synthesized by chemical co-precipitation method. The as-prepared MnO₂ nanoparticles were systematically characterized by X-Ray diffraction (XRD), FTIR and SEM - EDX analysis techniques. The average particle size of manganese dioxide nanoparticles was calculated from the XRD study. The average particle size of MnO₂ nanoparticles was 14 nm. The resulting MnO₂ nanoparticles were found to exhibit remarkable environmental catalytic performance in the catalytic decomposition of hydrogen peroxide in aqueous solution.

KEYWORDS: Chemical Co-Precipitation, MnO₂ Nanoparticles, H₂O₂, Catalytic Decomposition