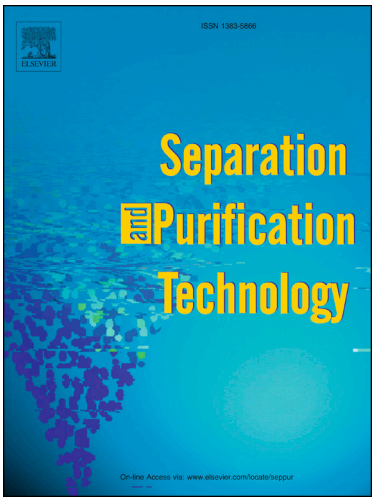

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Synthesis and characterization of Samarium and Nitrogen doped TiO_2 photocatalysts for photo-degradation of 4-Acetamidophenol in combination with hydrodynamic and acoustic cavitation

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Abstract:

In the present work, samarium (Sm) and nitrogen (N) doped TiO_2 photocatalysts have been synthesized using conventional sol-gel process (CSP) and ultrasound assisted sol-gel process (USP). Detailed characterizations of catalysts have been performed using PL, UV-DRS, XPS, XRD, FTIR, FESEM, and EDX analysis. Photocatalytic activity of the catalysts has also been evaluated for the degradation of 4-Acetamidophenol (4-AMP) using different combinations of ultraviolet (UV) irradiation, hydrodynamic cavitation (HC) and ultrasound (US). Initially, the effects of operating parameters i.e. catalyst dosage, solution pH, and 4-AMP initial concentration on the extent of degradation have been investigated. It was observed that degradation of 4-AMP followed first order reaction kinetics and almost 50% degradation with a degradation rate