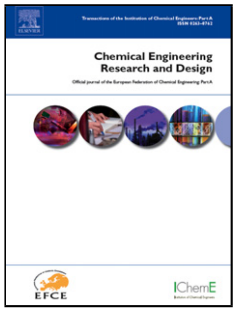

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Simultaneous Absorption-Oxidation of Nitric oxide and Sulfur dioxide Using Ammonium Persulfate Synergistically Activated by UV-Light and Heat

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Highlights

- A process for simultaneous removal of NO and SO_2 is proposed;
- A novel UV-impinging stream reactor is developed.
- Effects of process parameters are studied.
- Mass transfer-reaction kinetics of NO removal is studied.

ABSTRACT: Simultaneous absorption-oxidation process of nitric oxide (NO) and sulfur dioxide (SO_2) from flue gas using aqueous ammonium persulfate synergistically activated by UV-light and heat in a novel UV-impinging stream reactor was developed. The main influencing factors, products and active species of NO and SO_2 simultaneous removal were studied. The mass transfer and kinetics of NO absorption-oxidation were also investigated. The present studies show that SO_2 is very easy to remove because of its very high solubility in water (SO_2 removal efficiencies reach 100% under most of experimental conditions). Increasing $S_2O_8^{2-}$ concentration, UV radiation power, activation temperature or liquid-gas ratio promotes absorption-oxidation of NO. Increasing solution pH, concentrations of NO and SO_2 or flue gas flow inhibits absorption-oxidation of NO. The contents of