
Registration Seminar

Seminar Title	: Influence of Chelating Agents on the Activation of Oxidants for the Degradation of Tetracycline: Mechanistic Insights, Heterogeneous Activation and ECOSAR Toxicity Assessment
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Venue	: New Seminar Hall, Department of Chemical Engineering
Date and Time	: 30 Apr 2025 (04:30 PM)
Abstract	: Environmental toxins such as pharmaceuticals, in particular antibiotics such as tetracycline (TC), cause serious environmental hazards due to their persistence and low removal in suspended wastewater treatment operations. The study deals with a sustainable and reactive method via advanced oxidation processes (AOPs) and visible light to degrade TC. Sodium percarbonate (SPC) and sodium perborate (SPB) were used in this investigation as green oxidants heterogeneous catalysts were used to activate the oxidants for better radical generation, including kaolin, polypyrrole (PPy), and reduced graphene oxide (rGO). The present study's novelty includes chelating agents, such as citric acid (CA), tartaric acid (TA), and oxalic acid (OA), to modify oxidant reactivity to maximize degradation. Complete material characterization using SEM, EDX, FTIR, and XRD confirmed the successful introduction of SPC within kaolin with changes in structure and surface. Optimization of the operational parameters resulted in a maximum degradation performance of about 89.95% at neutral pH, at a concentration of 0.3 g/L SPC and 0.15 g/L kaolin. The pollutant concentration, catalyst dosage, and pH further affected degradation performance. Also, ECOSAR-based toxicity tests are suggested to study the safety of byproducts. This study sets the groundwork for developing a large-scale vibrant oxidation technology to treat antibiotic-contaminated water.

Keywords: *Tetracycline Advanced Oxidation Processes (AOPs) Chelating agents Heterogeneous catalysts.*