Editorial

Advanced Oxidation Processes for Wastewater Treatment 2013

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1. Introduction

Environmental remediation, particularly, in the field of wastewater treatment, has gained utmost importance in recent years. There is no alternative except to make use of Advanced Oxidation Processes (AOPs) for the treatment of wastewater with high degree of pollution. Hence, the recent research is mainly focused on the efficient, cost-effective, and ecofriendly AOPs in the degradation of any kind of pollutants. This is reflected by the publication of this second special issue in this journal. This special issue contains 18 original research articles and a review article entitled “Recent developments in homogeneous advanced oxidation processes (AOPs) for water and wastewater treatment.”

The review article by M. Muruganandham et al. reports on recent development of AOPs, such as O_3 , UV/O_3 , $UV/O_3/H_2O_2$, UV/H_2O_2 , Fe^{2+}/H_2O_2 , and $UV/Fe^{2+}/H_2O_2$, on the degradation of pollutants. The influence of various experimental processes such as solution pH, temperature, concentration of the oxidants, and dosage of the light source on the process efficiency is also discussed.

2. A Brief Outline of All the Accepted Papers Is Provided Below

Y. Haldorai and J.-J. Shim reported that the chitosan-encapsulated CuO hybrid material exhibited significant photocatalytic activity on methylene blue degradation and excellent antibacterial activity against *E. coli*. Ultrasonic degradation of fuchsin basic in aqueous solution and effects of operating parameters and additives have been investigated

by R.-J. Lan et al. X. Zhao et al. prepared the modified PAN nanofiber Fe complex by the amidoximation and Fe coordination of PAN nanofiber and used for the heterogeneous Fenton degradation of textile dyes as a novel catalyst.

C. W. Lai synthesized well-aligned anodic tungsten trioxide (WO_3) nanotubes and investigated their photocatalytic ability by the degradation of methyl blue (MB) dye.

“Solar photo-Fenton degradation of electro-optical industry wastewater by a pilot-scale Fresnel lens assisted IPCC reactor” was studied by W.-S. Kuo et al. Z. S. Seddig et al. investigated the effect of particle size on the photodegradation of aqueous methyl *tert*-butyl ether using zinc oxide. Zinc oxide of particle size of 421 nm was found to be the most effective in degrading MTBE in an aqueous solution.

G. Trovó et al. studied the treatment of pint industry effluent using solar light assisted photo-Fenton process. The effect of H_2O_2 , iron dosages, and light intensity was investigated. Reactive Black 5 dye degradation using porous phosphate heterostructures-Fe (Fe-PPH) catalysts was analyzed by M. S. Lucas et al. Removal of polyvinyl alcohol using photoelectrochemical oxidation processes based on hydrogen peroxide electrogeneration has been reported by K.-Y. Huang et al. Renovation and reuse of reactive dyeing effluent by a novel heterogeneous Fenton system based on metal-modified PTFE fibrous catalyst/ H_2O_2 was investigated by B. Li et al. Hu et al. studied the application of response surface methodology on COD removal by simultaneous anodic oxidation and cathodic electro-Fenton oxidation.

V. Romero et al. studied the adsorption and photocatalytic degradation of the β -blocker metoprolol in aqueous titanium dioxide as photocatalyst. They have studied effect

of various experimental parameters, kinetics, intermediates, and degradation pathways. P. Ellappan and L. R. Miranda synthesized cerium-doped titanium dioxide photocatalyst and used the catalyst for nitrobenzene degradation under visible light irradiation. The synthesized photocatalyst was characterized by using the suitable analytical methods. They have optimized the experimental parameters. The TiO_2 lattice defects on the photocatalytic processes was investigated by V. Romero et al. They have concluded that the oxygen vacancies and Ti-related defects are the main lattice defects in TiO_2 and that electronic driven forces are vitally necessary for photocatalysis. G.-J. Lee et al. synthesized nitrogen-doped ZnS with camellia brush field yellow nanostructures and studied its photocatalytic activity under visible light irradiation. They have prepared photocatalysts with different amount of dopant and studied the influence of the amount of dopant on the photocatalytic activity. S. Liu et al. investigated microbial fuel cell (MFC) (CW-MFC) to convert solar energy into electricity based on the principles of photosynthetic MFC by utilizing root exudates of *Ipomoea aquatica* as part of fuel. The mineralization of tetramethyl ammonium hydroxide in aqueous solution was studied using ozone-related processes by C.-S. Chiou et al. The degradation efficiencies of various processes were compared and it was concluded that the catalyst combined with ozone and peroxide was more efficient than other processes tested for mineralization. "Ozonation of indigo carmine catalyzed with Fe-pillared clay" was reported by M. Bernal et al. The synthesized clay was characterized by suitable analytical methods. The process conditions for efficient removal of dye were reported.

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