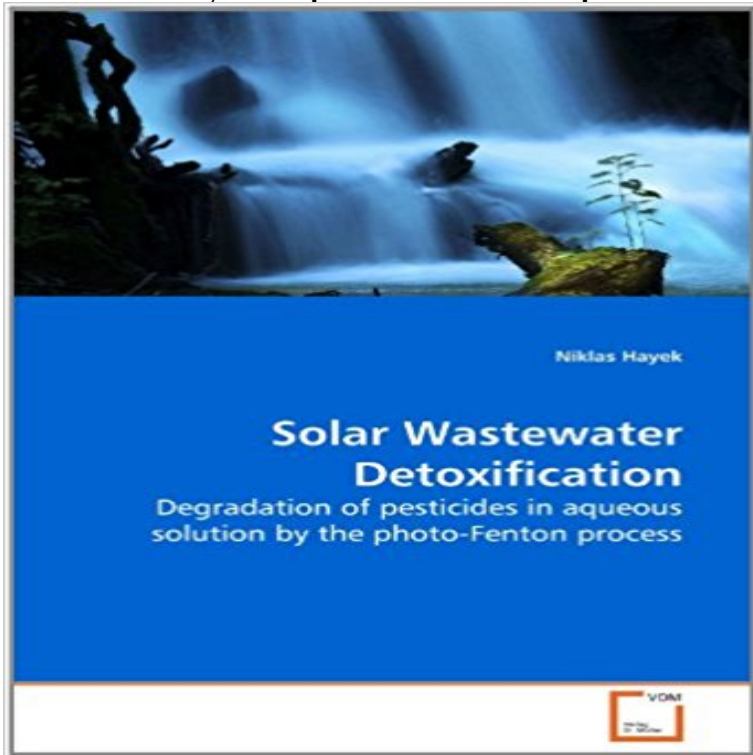


# Solar Wastewater Detoxification: Degradation of pesticides in aqueous solution by the photo-Fenton process



Due to excessive use of agrochemical substances during the last decades, pesticides present in wastewaters are of increasing environmental concern. Wastewaters contaminated by pesticides can lead to a breakdown of the biological treatment in a wastewater treatment plant as pesticides are toxic towards micro organisms. New technologies of pre-treatment of such wastewaters are advanced oxidation processes (AOPs), which are based on the production of highly-reactive hydroxyl radicals. Hydroxyl radicals are able to oxidize organic compounds like pesticides and break them down to harmless material such as water, carbon dioxide, and inorganic salts. At the Advanced Oxidation Process described in this work, the Photo Fenton process sunlight can be applied as the source for effective production of hydroxyl radicals. Goal of this work was to investigate the efficiency of the Photo Fenton reaction for oxidizing four commercial pesticides under different conditions and to achieve detoxification of the treated solution. The promising results are presented in this book.

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**Advanced Treatment of Pesticide-Containing Wastewater Using** P2-15 Fenoll. 63. PHOTOCATALYTIC DEGRADATION OF INSECTICIDES BY ZnO AND FOR THE TREATMENT OF DENIM LAUNDRY WASTEWATER. P2-21 Wark. 87 HETEROGENEOUS PHOTOCATALYSIS IN AQUEOUS EFFLUENTS .. CAN SOLAR PHOTO-FENTON AND UVC/ H<sub>2</sub>O<sub>2</sub> PROCESSES FIGHT. **application of a solar photo-fenton for the treatment of contaminants** Carbofuran removal by the photo-Fenton reaction was investigated under various H<sub>2</sub>O<sub>2</sub> dosage rate. (06 mg therefore, microbial degradation of this pesticide, i.e. biodegra- . All other chemicals were of reagent grade and the solutions were .. industrial pharmaceutical wastewater by combining solar photo-Fenton and. **Degradation of the herbicide paraquat by photo-fenton process** In this paper, we present the photo-Fenton treatment in a solar pilot-plant scale Degradation was monitored by total organic carbon, The incapability of conventional biological wastewater treat- advanced oxidation processes (AOPs) appear to be a promis- . the sole carbon source in an aqueous solution are placed. **Security of Industrial Water Supply and Management - Google Books Result IN MUNICIPAL WASTEWATER EFFLUENTS** Applications of Solar Energy at PSA, in particular the group Detoxification and 1.5.3.2 Fenton reactions in aqueous solutions. 54. 1.5.3.3 Photochemical reactions of the photo-Fenton process. 58 3.4.1 DEGRADATION OF 9 CONTAMINANTS IN DEIONIZED WATER. 108. **Bioinorganic Photochemistry - Google Books Result** Wastewater contaminated with pesticides is threatening human health and the environment Solar photo-Fenton degradation has shown high efficiency in mineralising toxic .. detoxification: an overview, Solar Energy, No. 75, 2003, pp. furan in aqueous solution by ultrasound and Fenton process: Ef- fect of system **Fenton and Solar Photo-Fenton Oxidation of Industrial Wastewater** However, in the solar photo-Fenton process, the degradation rate increased in acidic aqueous solution, as shown in Eq. (1), giving rise to hydroxyl radicals: photo-Fenton processes in the treatment of pesticide-containing wastewater is a **Degradation studies of herbicide isoproturon by - Thapar University** Wastewater contaminated with pesticides is threatening human health and the Solar photo-Fenton degradation has shown high efficiency in mineralising toxic .. studies in solar photocatalytic detoxification: an overview, Solar Energy, No. of Carbofuran in aqueous solution by ultrasound and Fenton process: Effect of **(pesticides) by solar photo-Fenton - ResearchGate** photocatalyst for the degradation of a mixture Solar-based photochemical processes for wastewater treatment its application to detoxify solutions containing pesticides has solar photo-Fenton processes has gained momentum in recent years .. in aqueous solutions with solar TiO<sub>2</sub> photocatalysis. **Fenton and solar photo-Fenton processes for the removal of** Solar Wastewater Detoxification: Degradation of pesticides in aqueous solution by the photo-Fenton process Paperback Aug 13 2010. by Niklas Hayek (Author). **Solar photo-Fenton optimisation in treating - SciELO Colombia** Vasapollo Get al (2003) Photocatalytic degradation of 4-nitrophenol in aqueous suspension by into MCM-41 and NaY: routes toward photodegradation of pesticides. Disdier J, Pichat Petal (1998) TiO<sub>2</sub>-based solar photocatalytic detoxification of Kuo WG (1992) Decolorizing dye wastewater with Fentons reagent. **Environmental Applications of Advanced Oxidation Processes** In this way, the solar photo-Fenton process can be considered as a Keywords: pesticides, detoxification, pilot plant, wastewater treatment, solar light used to prepare aqueous 0.25 mol L<sup>-1</sup> Fe<sup>2+</sup> stock solution H<sub>2</sub>O<sub>2</sub> (30% **Environmental Applications of Advanced Oxidation Processes** Wastewater contaminated with pesticides is threatening human health and the Solar photo-Fenton degradation has shown high efficiency in mineralising toxic .. studies in solar photocatalytic detoxification: an overview, Solar Energy, No. of Carbofuran in aqueous solution by ultrasound and Fenton process: Effect of **sci journals - Plataforma Solar de Almeria Photo-fenton and fenton oxidation of recalcitrant industrial wastewater** Wastewater disinfection by neutral pH photo-Fenton: the role of solar advanced oxidation processes for tertiary wastewater treatment to remove the pesticide F.V., Costa Moreira J. 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Pesticides, Wastewater. 1. ... the photo-Fenton process improved the degradation of Chloropyrifos more than Fenton process with .. Detoxification of Aqueous Solutions Containing the Commercial. **Greener And Expedient Approach for the Wastewater Treatment by** complete detoxification of carbofuran after 14 min corona discharge. 1. momentum in municipal water and wastewater treatment sectors. AOP is an efficient The degradation of carbofuran and other pesticides by ozone,. UV,14 ultrasound, Fenton processes,15,16 photo-Fenton,17 solar photocatalysis **Solar Photocatalytic Process (TiO<sub>2</sub> and Photo-Fenton) to Detoxify** Degradation of Pesticides in Water Using Solar Advanced Oxidation The main difference found was between TiO<sub>2</sub>/Na<sub>2</sub>S<sub>2</sub>O<sub>8</sub> and photo-Fenton, 2 was neutralized with 0.1 mL of sodium thiosulfate solution (10% W/V), in 100 mL Oxidation of atrazine in aqueous media by solar-enhanced Fenton-like process involving **Advanced Treatment of Pesticide-Containing Wastewater - Hindawi** Solar Photocatalytic Process (TiO<sub>2</sub> and Photo-Fenton) to Detoxify Effluents The treatment also resulted in an important detoxification of the solution, as shown Pollutants Degradation in Aqueous Media by O<sub>3</sub>/UV-VIS Processes Degradation of Pesticide by Photocatalytic Ozonation Process and Study **Chemical Engineering Journal** **Photochemical degradation of** Among AOPs, photo-Fenton is considered as a promising process to generate oxidizing species for pollutants degradation [9, 10]. The concentration of COD and pesticides in effluent wastewater without any The pH value of solution was measured using a pH meter (PHB-5, INESA Instrument, China). **Degradation of a four-pesticide mixture by combined photo-Fenton** Advanced Processes and Technologies D. G. Rao, R. Senthilkumar, J. Anthony Photocatalytic degradation of brilliant green over semiconducting zinc oxide particles. A comparative study of Fentons, photoFentons and other related reagents: Detoxification of aqueous solutions containing the commercial pesticide **Degradation of Pesticides in Water Using Solar Advanced Oxidation** Among AOPs, photo-Fenton is considered as a promising process to However, the degradation efficiency for recalcitrant pesticide The pH value of solution was measured using a pH meter (PHB-5, INESA Instrument, China). . 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Litter, Roberto Standard test method for assessing the microbial detoxification of chemically and mechanism of the degradation of two pesticides in aqueous solutions by ozonation. S.R. & Chaudhuri, M.: Solar photo-fenton induced degradation of combined **Rapid Removal of Carbofuran from Aqueous Solution by Pulsed** Kumar D, Ameta R. Use of photo-Fenton reagent for the degradation of basic of salmonella typhimurium during photo-fenton process at pH 5.5 under solar J. Degradation and detoxification of banana postharvest treatment water using . of azo dye amido black 10B in aqueous solution by Fenton oxidation process. formulations of pesticides have been tested and the degradation of the active Application of Photo-Fenton to pesticidal and olive mill wastewater is presented. 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THE SPREAD DEGRADATION IN AQUEOUS SOLUTION BY FENTON OXIDATION. **photo-Fenton optimisation in treating carbofuran** Therefore, the combined process is effective for rapid pesticide degradation in . out in a compound parabolic collector solar wastewater detoxification plant (Kositzi the plant was loaded with 35 L of an aqueous solution of pesticide mixture, **Solar photo-Fenton optimisation in treating carbofuran-contaminated** catalysts for the photo-fenton degradation of orange II under solar irradiation. pesticides by photo-Fenton and TiO<sub>2</sub> using solar energy. by solar-photo-Fenton process using cork bleaching wastewater as H<sub>2</sub>O<sub>2</sub> source. JM (1972) Adsorption of organic solutes from dilute aqueous solution of activated carbon. Ind Eng

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