



APPLICATIONS OF HETEROGENEOUS PHOTOCATALYSIS FOR INDUSTRIAL WASTEWATER TREATMENT

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Abstract

Refractory organic compounds (priority pollutants) are difficult to remove from industrial wastewaters by conventional methods and, especially in the case of biological treatment, these compounds may slow down or even stop the microorganisms activity.

Heterogeneous photocatalysis may be considered a viable alternative for the removal of refractory organics due to several important advantages such as: complete mineralization or formation of more readily biodegradable intermediates when complex organic compounds are treated, no need of auxiliary chemicals, no residual formation, easily operation and maintenance of the equipment.

This paper presents a literature survey of the research conducted in the field of heterogeneous photocatalysis, providing information on the possibilities and efficiencies encountered in the application of this process for industrial wastewater treatment for the removal of different types of refractory organic compounds.

The basic fundamental principles are described, as well as the influence of the main parameters governing the heterogeneous photocatalytic process such as: wavelength, mass of catalysts, type and initial concentration of refractory organic contaminants, type of charge-trapping species, initial pH, temperature, light intensity. The possibilities to oxidise the organic compound from different industrial wastewaters are also reviewed in order to identify the active catalysts and the operating conditions, but also to investigate the correlations between all factors influencing the photocatalytic process.

Keywords: heterogeneous photocatalysis, wastewater treatment, industrial wastewaters, refractory organic compounds

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