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Catalytic and non-catalytic photochemical degradations of aniline and nitrobenzene in industrial waste waters: comparison of process parameters

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Abstract

Metal phthalocyanines in the presence of visible light are applied in the semi-pilot level for the degradation of organic pollution represented by nitrobenzene and aniline with potential further scale-up. The effectiveness of the process based on the generation of singlet oxygen active species is compared with commonly used method of photochemical oxidation with hydrogen peroxide in the presence of ultraviolet irradiation. The direct comparison of the reaction systems was conceivable because both oxidation processes were carried out in identical experimental arrangements and under identical reaction conditions. The comparison was performed in terms of nitrobenzene and aniline conversion, TOC removal, apparent quantum yields, kinetic constants, and economy considerations.

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