

Influence of humic substances on the photolysis of organic contaminants

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Depending on their origin and structure, humic substances have a remarkable ability to absorb light and transfer this energy to other substrates and in some cases strongly affect photolysis of xenobiotics. In water and in soils humic substances have been found to act as photosensitisers and they have also been reported to produce oxygen species upon irradiation, and be able to photoinduce the transformation of ecotoxins. The photoquenching effects of humic substances on some chemicals are also known. Also, the possibility of an UV screening by humic substances on chemicals cannot be excluded since the energy-transfer and charge-transfer between the chemical and humic substances can deactivate the excited molecules. Excited singlet and triplet states of dissolved humic acids (HAs), the major component of humic substances, are important players for the transformation of organic chemical contaminants in natural waters. Our knowledge about these processes is still very limited. It was found that HAs apparently catalyzed the formation of some different not toxic photoproducts of contaminants after UV-irradiation treatment by excilamps with different radiation wavelengths ($\lambda = 172, 222, 283, 308$ nm). The discussion includes comparative analysis of the direct and indirect photolysis.

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