

Decontamination of polluted water by veterinary antibiotics by studying the photochemical behavior under light excitationSoumaya Mezghich^{1,2}, Fadila Ayari¹, Dalila Ben Hassen Chehimi¹ and Mohamed Sarakha²¹University of Carthage, Tunisia²Blaise Pascal University, France

Nowadays, the emergence of pharmaceuticals in the aquatic and terrestrial environment has been a major concern. They have been detected in sewage-treatment plants, sediments, and soils, as well as, at surface and drinking water. So far, there is limited information in the literature on the fate of these compounds when they are exposed to solar light in the various environmental compartments. The objective of the present study is to investigate the degradation process of two different antibiotics Sulfamethoxazole (STZ), Hydrochlorothiazide (HCD) in aqueous solutions when exposed to simulated solar light. We mainly concentrate our effort on the kinetic studies by evaluating the degradation quantum yield, as well as, the effect of various parameters such as oxygen concentration, pH and the presence of inorganic ions. The main effect was observed by molecular oxygen parameter. We also make an important effort in the elucidation of the main intermediate and stable byproducts. A lot of information is available on the stability and fate of parent compounds and not so many on their transformation products. These may present a toxicity level higher than the precursor substrate and should be identified and analyzed. The structure elucidation was obtained by using the HPLC/ESI/MS and HPLC/ESI/MS² techniques in negative, as well as, positive modes and through the complete study of the various fragmentation pathways. The main involved photochemical processes were: The scission of the bridge through a photohydrolysis process, selective hydroxylation of the aromatic moiety, desulfonation process and in the case of HCD to dechloration reaction. A mechanism was then proposed in the light of the kinetic and analytical studies.

soumaya.mezguich@gmail.com

Notes: