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EDITORIAL NOTE

Evaluation of atrazine degradation applied to different energy systems

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Abstract Atrazine is an herbicide widely used in crops and has drawn attention due to potential pollution present in soil, sediment, water, and food. Since conventional methods are not potentially efficient to persistent degradation of organic compounds, new technology has been developed to remove them, especially practices utilizing advanced oxidation processes (AOPs). This work aims to evaluate the use of different energies (ultraviolet (UV), microwaves (MW), and radiations (MW-UV)) to the herbicide atrazine through the process of photo-oxidation. These systems found degradation rates of around 12% (UV), 28% (MW), and 83% (MW-UV), respectively, with time intervals of 120 s. After the photolytic processes, the samples were analyzed at a wavelength scanning the range of 190 to 300 nm, where the spectral analysis of the signal was used to evaluate the degradation of atrazine and the appearance of some other peaks (degradation products). The spectrum evaluation resulting from photolytic processes gave rise to a new signal which was confirmed by chromatography. This spectrum indicated the possible pathway of atrazine degradation by the process of photolytic MW-UV, generating atrazine-2-hydroxy, atrazine-desethyl-2-hidroxy, and atrazine-desisopropyl-2-hydroxy. The process indicated that in all situations, chloride was present in the analytic structure and was substituted by a hydroxyl group, which lowered the toxicity of the compound through the photolytic processMW-UV. Chromatographic analysis ascertained these preliminary assessments using spectrophotometry. It was also significantly observed that the process can be optimized by adjusting the pH of the solution, which was evident by an improvement of 10% in the rate of degradation when subjected to a pH solution equal to 8.37.

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