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Study of caffeine degradation by UVC/electrogenerated H_2O_2 based process using GDE composed of Printex L6 carbon

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Caffeine (CAF) is an indicator of short-term, untreated anthropogenic inputs. Overall, the presence, behavior, and sources of organic micropollutants in the urban water cycle is indicators of anthropogenic impacts. Processes, such as ozone-based, are alternatives due to their ability to treat organic compounds in aqueous media for CAF degradation [3], but the high toxicity of the by-products formed limits their application in real treatments systems. In this sense, the use of electrogenerated hydrogen peroxide (H_2O_2) as an oxidant in indirect electrochemical processes stand out promising as an alternative to high the degradation and mineralization of compounds as CAF. Considering the H_2O_2 production by electrochemical method, an excellent system to it, , are process that using gas diffusion electrode (GDE). In this case, an advantage of the GDE system is the absence of a catalyst that promotes the generation of an exact quantity of oxidant species. It is also easy to access and competitive because of the low costs. In this work, the effect of UVC/H_2O_2 in differents conditions as pH and currently density (*j*) was investigated for the CAF degradation and mineralization. The influence of the *j* and pH was analyzing on the UVC/H_2O_2 process. The optimal conditions are being doing (CAF concentration and degradation/mineralization of several matrices of water). On the other hand, in all measures the total (100%) elimination of the CAF was reached in the 20 min of treatment and TOC removal, mineralization with 60%, after 90 min of electrolysis. Overall, the fabricated Printex L6 carbon-based reach high concentrations of H_2O_2, favored by the increase pH as well as the UVC/H_2O_2 process allowed the total degradation and 60% mineralization in short period time. Finally, pos-treatment the samples will be evaluated by *Lactuca sativa L* method to show the absence or ausence of toxicity of the by-products

formed and exhaustive CAF oxidation/mineralization during 5h will be done on the study.

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