

Abstract Submitted
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Study of organic pollutants oxidation by atmospheric plasma discharge DIANE GUMUCHIAN, Laboratoire de Genie des Procédés Plasma et Traitements de Surface/Institut Jean le Rond d'Alembert, SIMEON CAVADIAS, Laboratoire de Genie des Procédés Plasma et Traitements de Surface, XAVIER DUTEN, Laboratoire des Sciences des Procédés et Matériaux, MICHAEL TATOU-LIAN, Laboratoire de Genie des Procédés Plasma et Traitements de Surface, PATRICK DA COSTA, Institut Jean Le Rond d'Alembert, STEPHANIE OGNIER, Laboratoire de Genie des Procédés Plasma et Traitements de Surface — Ozonation is one of the usual steps in water treatment processes. However, some organic molecules (acetic acid) cannot be decomposed during ozonation. In that context, we are developing an Advanced Oxidation Process based on the use of a needle plate discharge at atmospheric pressure. The process is a reactor with a plasma discharge between a high voltage electrode and the solution in controlled atmosphere. Characterizations of the plasma obtained in different atmospheres were carried out (Optical Emission Spectroscopy, iCCD camera observations, etc). The efficiency of the process was evaluated by the percentage of degradation of the model-pollutant, measured by liquid chromatography analysis. Treatments in nitrogen lead to the formation of NO_x species that decrease the efficiency of the process. Indeed, NO_x lead to the consumption of actives species created. Treatments in argon are the most efficient. Two hypotheses are considered: (i) metastable argon participates to the degradation of acetic acid or to the formation of radicals (ii) discharges in argon lead to the formation of many streamers of low energy that increase the interface plasma/solution.

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