

Abstract Submitted
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Characterization of Reactive Species Generation in Liquid Phase by Air Plasma Effluent Exposure¹ KEISUKE TAKASHIMA, YUTAKA KIMURA, KEISUKE SHIMADA, KENJI NIHEI, TOSHIRO KANEKO, Department of Electronic Engineering, Tohoku University — Generation of reactive oxygen and nitrogen species in the liquid phase, during exposure to air atmospheric pressure plasma effluent gas, is experimentally studied through reactive species measurements in gas and liquid phases. Admixture of the plasma effluent gas with the nitric oxides (NO and NO₂) resulted in the significant production of N₂O₅ and HNO₃ and consumption of ozone and NO or NO₂ measured with FT-IR in gas phase. The effects of the admixture on the reactive species in the liquid phase are also analyzed with absorption spectroscopy for nitric acids and resulted in the significant increase of the nitrite concentration. The measured short-lived species in liquid phase with chemical probes suggest the importance of the liquid phase chemical reactions near the gas-liquid interface resulted from the dissolution of the plasma effluent species into the liquid phase. The experimental analysis on the reaction pathways will be discussed along the measured reactive species in gas and liquid phases.

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