

Abstract Submitted
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Molecules production/losses on surfaces under plasma exposure

O. GUAITELLA, D. MARINOV, A. ROUSSEAU, LPTP, CNRS, France — The production/losses of molecules on surfaces such as walls plasma reactors is interesting for numerous applications but especially for plasma/catalyst coupling used in air treatment devices. The processes like adsorption, desorption, surface production or destruction of molecules on different surfaces are crucial to understand the kinetics of molecule oxidation by air plasma. These mechanisms are studied for C_2H_2 , NO and NO_2 molecules in a low pressure discharge (1mbar) in a 50 cm long tube with IR tunable diodes to perform time resolved in situ measurements during the plasma “on” phase as well as after switching off the plasma. Surfaces are treated by different plasmas (capacitive or DC discharge) in Ar, O_2 , N_2 or air, for several pretreatment durations, injected powers, with pulsed or continuous plasma. These parameters are used to separate cleaning of adsorption sites from adsorption of reacting species which could both induce losses of molecules considered on surface. After these different pre-treatment procedures, two kinds of experiments are made: i) the study of molecule losses on pre-treated surfaces by introducing a controlled amount of molecules in the closed tube reactor; this gives information about the adsorption of the introduced molecule on vacant sites or its reactivity with species already adsorbed during the pre-treatment ii) the production of molecules by a N_2 or O_2 plasma reacting with species adsorbed on wall during pretreatment.

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