

Abstract Submitted
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Time-resolved electron density and OES measurements for studying the surface loss rates of H and Cl atoms in a Cl₂-H₂ ICP plasma
GARRETT CURLEY, IEMN-CNRS, University of Lille 1, Lille, France / LPN-CNRS, Marcoussis, France, LINA GATILOVA, STEPHANE GUILLET, SOPHIE BOUCHOULE, LPN-CNRS, Marcoussis, France, GURUSHARAN GOGNA, NISHANT SIRSE, SHANTANU KARKARI, NCPST, Dublin City University, Dublin, Ireland, JEAN-PAUL BOOTH, LPP, Ecole Polytechnique, Palaiseau, France — The recombination coefficients of H and Cl atoms were determined under etching conditions in an inductively coupled plasma using a time-resolved emission spectroscopy technique referred to as pulsed induced fluorescence. We used a 100 % modulation of the RF power with the plasma off-time and duty cycle varied. The measurements were performed at 10 mTorr in H₂ and Cl₂ plasmas with a small addition (10 %) of argon. The validity of the technique was examined through correlation with simultaneous time-resolved electron density measurements. The study of Cl atoms required the use of an actinometer, but care was needed to choose emission lines that are not influenced by the presence of metastables. We believe this condition to be of greater importance than choosing emission lines with similar excitation thresholds. We show that a time-resolved actinometry procedure using argon can be valid if appropriate argon lines are chosen.

Garrett Curley
IEMN-CNRS, University of Lille 1, Lille, France

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