Abstract Submitted
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Chemically active species in an Oxygen Inductively Coupled Plasma[1] NATHANIEL LY, JOHN BOFFARD, CHUN LIN, AMY WENDT, University of Wisconsin-Madison, SVETLANA RADOVANOV, HAROLD PERSING, ALEXANDRE LIKHANSKII, Applied Materials, Varian Semiconductor — Oxygen plasmas are used in a wide variety of applications including ion implantation and photoresist striping. Here we combine noninvasive optical emission spectroscopy (OES) measurements and numerical simulations to investigate the plasma parameters in both oxygen inductively coupled plasmas (ICP) and oxygen-argon ICPs. An emission model makes use of available electron impact excitation cross sections for atomic and molecular oxygen to relate measured O and O_2^+ emission intensities to corresponding plasma parameters, including the electron temperature, electron density, and the dissociation fraction of the neutral oxygen. For plasma simulations we use the CRTRS, 2D/3D code that selfconsistently solves for ICP power deposition, electrostatic potential and plasma dynamics in the driftdiffusion approximation (or full momentum equations). Comparison of the experimental OES measurements are used to check the validity of the plasma simulation which yields results that the OES approach has difficulty in measuring including the relative fluxes of O^+ and O_2^+, which is important for ion implantation.

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