

Abstract Submitted
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The use of a hairpin resonator probe and emission spectroscopy to determine instabilities during silicon etching DAVID KAVANAGH, MOHAMMED MORSHED, STEPHEN DANIELS, Dublin City University — The hairpin resonator probe is a diagnostic method which determines electron density. The probe was placed in a capacitively coupled plasma SF_6 plasma during the etching of silicon and the steady state electron density determined. Due to the absence of substrate cooling, the temperature increase in the chamber as the etch process progressed begins to heat and damage the photoresist. As a result the photoresist begins to desorb and outgas, releasing organic polymers into the discharge. These effluents react with the bulk plasma chemistry and have the effect of reducing the electron density measured by the probe. Optical emission spectroscopy was also used to monitor emissions from the plasma. Emissions from non process gasses were also observed as a result of the photoresist heating. These results allow for the consideration of the hairpin resonator probe as a diagnostic for plasma process monitoring

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