

Abstract Submitted
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Electrical characterisation of an industrial capacitively coupled plasma processing chamber for actinometry studies in Ar/O₂/SF₆ gas mixtures with global model comparisons CHANEL HAYDEN, EVGUENI GUDIMENKO, STEPHEN DANIELS, NCPST, DCU, DAVID GAHAN, Impedans Ltd, WWW.NCPST.IE/PRECISION - PRECISION COLLABORATION — Actinometry is an optical emission technique for estimating concentrations of radical particle densities in plasmas. This technique is based on normalised emission intensity of a radical to that of an inert gas giving a ratio of concentrations. To determine radical concentrations, electrical characteristics such as electron density, n_e , electron temperature, T_e and electron energy distribution function (EEDF) must be known. A number of electrical diagnostics are used to measure these parameters which are subsequently used in calculation of radical particle densities of a given reactive gas. An investigation of the pressure and power effect on the electron and ion energy distribution functions (IEDF) was carried out for a number of discharge gases including Ar, O₂ and SF₆ in a capacitively coupled plasma reactor. A hairpin probe is used to measure the electron density in the centre of the discharge and a Langmuir probe determines the EEDF. In addition, the EEDF and IEDF at the surface of the electrode are investigated using a retarding field energy analyser (RFEA) for comparison. The data is compared with a global model of the discharge and the results presented.

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