Abstract Submitted
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**Dual-frequency capacitive radiofrequency discharges: Effect of low-frequency power on electron density and flux**[1] JEAN-PAUL BOOTH, GARRETT CURLEY, LPN, DRAGANA MARIC, Institute of Physics, Zemun, Serbia, JEROME BREDIN, PASCAL CHABERT, LPP — Dual-frequency capacitively-coupled etch reactors using Ar/fluorocarbon/O2 mixtures are widely employed for etching of dielectric films for integrated circuit manufacture. We have measured the ion flux to the wall and the center electron density (using a microwave hairpin resonator) as a function of 2 and 27 MHz power (W2 and W27) in a modified industrial etch reactor. In Ar/O2 discharges both flux and density increase progressively with both W2 and W27, and the flux/density ratio remains constant, in accordance with simple electropositive transport theory. The high plasma densities observed can be attributed to the large secondary electron emission coefficient of oxidized Si. In Ar/C4F8/O2 mixtures flux and density are again increased by both W2 and W27. However, the electron density is much lower, and the ratio flux/density is not constant, reaching very high values for high W2/W27 ratios. The reasons for this will be discussed in terms of negative ion production and plasma chemistry.

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