Abstract Submitted
for the GEC16 Meeting of
The American Physical Society

Influence of SF6/O2 inductively coupled plasma parameters on Si etching rates and profiles VIOLETA GEORGIEVA, STEFAN TINCK, ANNEMIE BOGAERTS, Department of Chemistry, Research group PLASMANT, University of Antwerp — A hybrid 2D Monte Carlo—fluid model, called hybrid plasma equipment model (HPEM) developed by Kushner and co-workers is employed in the present investigation. The model calculates the electron and heavy particle densities, energies and fluxes by solving self-consistently a set of equations including the Maxwell equations, fluid equations, a Monte Carlo procedure or the Boltzmann equation. An additional module, called plasma chemistry Monte Carlo simulation, is used to calculate plasma species fluxes and energy distributions to the substrate to produce detailed information at the substrate level. An analytical module within this hybrid code is addressed to predict the etch rate based on the calculated fluxes and kinetic energies of the different plasma species arriving at the silicon wafer. A detailed SF6/O2 chemistry set is used to simulate the electron – heavy particle collisions and a number of reactions. The influence of operating parameters on plasma characteristics, etch rates and profiles is investigated. It is aimed to understand how the etch process influences the contact hole local critical dimension uniformity.

Violeta Georgieva
Department of Chemistry, Research group PLASMANT, University of Antwerp

Date submitted: 10 Jun 2016 Electronic form version 1.4