Abstract Submitted
for the GEC07 Meeting of
The American Physical Society

Sorting Category: 2.24 (E)

Comparison of gas-phase chemistry during deposition of amorphous carbon films using capacitive and inductive discharges. S. RAMACHANDRAN, L. OVERZET, W. HU, L.S.N. TAO, UT Dallas, G.-S. LEE, C. NELSON, M. GOECKNER, UT Dallas — Diamond like carbon films (amorphous carbons) are just beginning to find applications as protective coatings in nano-imprint lithography. These films have appropriate hardness, inertness and surface free energy. They can be deposited using a variety of plasma tools. We compare the capacitive and inductive methane plasmas for depositing films to be used as mold material in nano-imprint lithography. Gas-phase chemistry studies of the deposition process were made using Fourier transform infrared (FTIR) spectroscopy and emission spectroscopy. It was observed that the methane broke down into CH3, CH2, CH and H. In addition, larger species were found in the gas, including acetylene and ethylene. Vibrational and rotational temperatures of several species were determined. Concurrent studies of the resulting films, shows that the capacitive discharge had a larger processing window for the production of suitable quality films. We believe that this is tied to the degree of dissociation of the methane, as well as the presence of the larger species found in the gas phase.

[X] Prefer Oral Session
[ ] Prefer Poster Session

M. Goeckner
goeckner@utdallas.edu
UT Dallas

Date submitted: 18 Jun 2007 Electronic form version 1.4