

Abstract Submitted
for the GEC05 Meeting of
The American Physical Society

Effect of Species Density and Ion Scattering During Ashing on Ultra Low- κ Inter-Level Dielectric Films M.A. WORSLEY, S. BENT, N.C.M. FULLER, T.L. TAI, J. DOYLE, M. ROTHWELL, T.J. DALTON, Stanford University — Results of experimental analysis of an ultra low- κ inter-level dielectric (ILD) after ashing together with a determination of key parameters in the plasma are presented. Optical emission (OE) actinometry is used to measure the absolute densities of reactive radical species in several plasmas, and modeling of sheath thickness and positive ion mean free path is used to estimate the significance of ion scattering. The densities of H, N, and O are determined as a function of pressure and percentage argon in Ar/H₂, Ar/N₂, and Ar/O₂ plasmas respectively. Modeling reveals that a bias power range of 0-350W allows the sampling of different scattering regimes. Patterned structures in a porous organosilicate glass (OSG) are ashed under the characterized plasma conditions and then analyzed using XPS. Data from the OE actinometry and modeling are combined with the XPS data to gain further insight into the mechanism by which modification of the OSG occurs in a patterned structure.

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Date submitted: 08 Sep 2005

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