

Plasma polymerization of silicon-containing monomers

ABSTRACT

Plasma depositions of ultra thin films from seven silicon-containing liquid monomers were investigated using a continuous wave (CW) plasma source. The deposition rate of plasma polymerized films were determined using a quartz crystal microbalance (QCM) technique while the film composition were determined spectroscopically using primarily X-ray photoelectron spectroscopy (XPS) and Fourier transform infrared method (FT-IR). The wettability of the plasma-polymerized films was also investigated by measuring the contact angles of water on the film surfaces. It was observed that the C=C absorption band was not present in these films. This observation is consistent with selective polymerization through the double bond. Oxygen was present in all samples investigated and this may be attributed to the quenching of radicals in the film by reactions with oxygen when exposed to atmosphere.

Keyword: Plasma polymerization; Silicon-containing monomers; Deposition rate; Quartz crystal microbalance (QCM); XPS