

**The study on Optical and Electrical Properties of Organic-Inorganic Hybrid Thin Films
Deposited By PECVD Method**

배인섭*, 조상진, 부진호
성균관 대학교 화학과

Organic-Inorganic hybrid polymer-like thin films have been deposited on glass and silicon substrates by plasma enhanced chemical vapor deposition (PECVD) method using single molecular precursors of the organic-inorganic hybrid polymers. Methylcyclohexane and TEOS (tetraethylorthosilicate) were utilized as organic and inorganic precursors, and hydrogen and Ar (argon) were used as a bubbler and carrier gases, respectively.

In order to compare the difference of the optical, electrical and mechanical properties of the plasma polymerized thin films, we grew the hybrid polymer-like thin films under the conditions of various RF (radio frequency using 13.56 MHz) powers in the range of 20~50 W, the ratio of TEOS flux and, H₂ flow rate. The as-grown polymerized thin films were in first analyzed by FT-IR, UV-Visible spectroscopy, ellipsometry, and AFM. Impedance analyzer was utilized for the measurements of C-V curves.

The result of FT-IR and UN-Visible measurement showed that the plasma polymerized thin films have highly cross-linked density with increasing RF power and deposition temperature. AFM and SEM also showed that the polymer films with smooth surface and sharp interface could be grown under various depositon conditions. From the electrical property measurements, the lowest dielectric constant and best dielectric constant were obtained to be 2.67.

Reference

1. W. W. Lee, P. S. Ho, MRS Bulletin, 22 (1997) 19-23.
2. M. Vogt, M. Kachel, K. Melzer, and K. Drescher, Surf. & Coat. Technol., 98 (1998) 948-952.
3. Y. C. Quan, J. Joo, and D. Jung, Jpn. J. Appl. Phys, 38 (1999) 1356-1358.