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Changes in the Molecular Orbitals during Photochemical Patterning of Polymers K. M. PELLERIN, F. J. HIMPSEL, E. W. EDWARDS, P. F. NEALEY, University of Wisconsin - Madison — Patterning of surfaces by EUV irradiation into hydrophilic and -phobic stripes has recently been demonstrated as promising technique for directed self-assembly [1]. In order to better understand this process we have detected the changes in the molecular orbitals at the surface using near edge X-ray absorption fine structure (NEXAFS) sepctroscopy. In particular, the effect of extreme ultra-violet (EUV) radiation on PS-r-MMA is studied. Irradiation causes spectral weight to be transferred from C 1s to pi* transitions of C=C bonds and similar transitions at C=O bonds, which indicates insertion of oxygen into pi-bonded carbon sites. The effect is quantified by dose-dependent studies. [1] Kim, et al. Nature 424, 411 - 414 (2003)

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