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Effects of Photoemissions in UV and VUV Regions on Nano-Surface Structures of Soft Materials during Plasma Processes KEN CHO, KOSUKE TAKENAKA, YUICHI SETSUHARA, Osaka Univ., MASAHARU SHIRATANI, Kyusyu Univ., MAKOTO SEKINE, MASARU HORI, Nagoya Univ. — Plasma processing of soft materials are expected as key technologies for fabrication of next-generation devices including flexible electronics, thin-film photovoltaic cells, and advanced ULSIs (low-k interlayer and EUV lithography). As one of the effective plasma sources for these processing, inductivity-coupled plasma (ICP) sources have been developed with multiple low-inductance antenna (LIA) modules, which allowed low-voltage operation of high-density ICPs [1]. For successful fabrication of these next-generation devices, it is of great significance to control nano-surface structures on the basis of understanding plasma interactions with soft materials. This presentation reports nano-surface structures of polymers during plasma processes for investigation of morphologies and chemical bonding states due to exposure with photoemissions in vacuum ultraviolet (VUV) and ultraviolet (UV) regions from the plasmas. The depth analysis of chemical bonding states was carried out via conventional x-ray photoelectron spectroscopy (XPS) and hard x-ray photoelectron spectroscopy (HXPES) at the national synchrotron radiation facility SPring-8 of the Japan Synchrotron Radiation Institute. [1]Y. Setsuhara, et al., Surf. Coat. Technol. 174-175, 33-39 (2003).

Ken Cho
Osaka Univ.

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