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Electronic Structure of Photo-degraded Polypropylene Ultrathin Films ORHAN KIZILKAYA, PINGHENG ZHOU, EIZI MORIKAWA, CAMD, Louisiana State University — The structural degradation induced by synchrotron radiation in polypropylene ultrathin films has been investigated by ultraviolet photoemission spectroscopy (UPS) and molecular orbital (MO) calculations. The UPS results of pristine and degraded films show very good agreement with the calculated density of states obtained from model MO calculations. The UPS results of the degraded films show a new peak appearance as the highest molecular state in the photoemission spectrum. Model MO calculations and UPS results correlate the new peak to the generation of double bond conjugation. This pi (double) bond generation has also been proved with the near edge X-ray absorption fine structure (NEXAFS) measurements. The pre-edge feature in the C-1S NEXAFS spectrum was augmented after the film exposed to white light emitted from synchrotron radiation.

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