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Molecular orientation and photo-degradation of PTCDA films on TiO₂(110) ORHAN KIZILKAYA, EIZI MORIKAWA, CAMD, Louisiana State University, PHILLIP SPRUNGER, Louisiana State University — The molecular orientation and photo-degradation process of 3,4,9,10-perylene-tetracarboxylic-dianhydride (PTCDA) films on TiO₂(110) were investigated by near edge X-ray absorption spectroscopy (NEXAFS). As the incidence angle of p-polarized synchrotron light with respect to the substrate surface normal increases, the intensity of the σ^* resonances diminishes and the π^* resonances is greatly enhanced. This finding indicates that the molecular orientation of the PTCDA film is flat on the TiO₂(110) surface. NEXAFS results of pristine and photo-degraded PTCDA films exposed to synchrotron white light at the VLSPGM beamline of CAMD revealed the photo-degradation mechanism. We found that the intensity of σ^* states diminishes and the intensity of π^* states of increases upon the PTCDA film exposed to white light for 30 minutes.

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