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Reduced intermolecular interaction in organic ultrathin films

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Submonolayer sensitivity was achieved using *in situ* ellipsometry to monitor the evolution of the dielectric function of tris(8-hydroxyquinoline)-aluminum(III) (Alq₃) layers from submonolayer coverage to thick bulklike layers. The Alq₃ layers were deposited under ultrahigh vacuum conditions onto hydrogen passivated silicon. The characteristic vacuum-ultraviolet (VUV) absorption lines of Alq₃ were detected using synchrotron radiation as light source. In such ultrathin films the absorption lines corresponding to molecular transitions of the Alq₃ are found to be spectrally blueshifted with respect to bulklike layers. We attribute the shift to the effect of reduced intermolecular interaction in the submonolayer regime. ©2006 American Institute of Physics

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