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**Optical anisotropy of organic layers on GaAs(001)**

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The application of the linear-optical, polarization sensitive methods, *in situ* reflectance anisotropy spectroscopy (RAS), and *ex situ* spectroscopic ellipsometry, for the characterization of organic layers is discussed and the results of the investigation of 3,4,9,10-perylenetetracarboxylic dianhydride (PTCDA) layers on sulfur passivated GaAs(001) surfaces are presented. The organic layers were grown via organic molecular beam deposition at room temperature. The RA spectrum of the sulfur terminated GaAs surface shows a derivative like feature at  $E_1$  gap and a feature in the higher energy range related to  $E_2$  of bulk GaAs. Upon the PTCDA deposition, additional features appear in the spectra which can be attributed to PTCDA while the GaAs feature near  $E_1$  remains unchanged indicating that the surface reconstruction stays intact. The imaginary part of the pseudo-dielectric function is found to be angular dependent. This dependence also changes as a function of azimuthal angle. While the first can be well described using existing models for optical uniaxial layers, the latter is likely to be related to in-plane optical anisotropy. ©2001 American Vacuum Society.

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