

Study of dependence of molecular orientation and optical properties of zinc phthalocyanine grown under two different pressure conditions

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### Abstract

Zinc phthalocyanine (ZnPc) thin films were prepared by organic molecular beam deposition on Si (111) covered with a thin native oxide layer under two different pressure conditions. The samples are characterized by infrared spectroscopy and ellipsometry measurements aiming at the determination of dielectric functions and average molecular orientation in the ZnPc films. A two order of magnitude increase in the pressure during growth increases the average molecular tilt angle with respect to the substrate surface from  $\approx 19^\circ$  to  $\approx 61^\circ$  implying a change of crystal phase as well. Likewise sizeable differences are observed in the anisotropic dielectric functions of the ZnPc thin films in the infrared as well as in the visible and ultraviolet spectral ranges. © 2007 American Institute of Physics.