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Structural characterization of iron phthalocyanine thin films by X-ray diffractometry[1] CASEY W. MILLER, A. SHARONI, G. LIU, C. N. COLESNIUC, B. FRUHBERGER, IVAN K. SCHULLER, Physics Department, UC San Diego, La Jolla, CA 92093 — The crystal structure of iron phthalocyanine (FePc) thin films was investigated by X-ray diffractometry (XRD) as a function of deposition temperature and *in situ* annealing. FePc was deposited on A-plane sapphire in an organic molecular beam epitaxy (OMBE) system equipped with a low temperature effusion cell. The pressure of the OMBE was better than $5x10^{-9}$ during deposition. The substrates were held at constant temperatures ranging from ambient to 300 ^{o}C during deposition. For each substrate temperature, post-deposition *in situ* annealing at the same temperature was performed for 1, 2, 4, and 8 hours. XRD analysis shows that films were grown to $\sim$10 monolayers thick with 1-2 monolayers of roughness. XRD also reveals the emergence of higher order peaks as deposition temperature increases. Supporting AFM results show improvement toward the deposition of pinhole-free FePc films. OMBE grown films are compared to others deposited using a simple thermal evaporator with a deposition pressure of $\sim10^{-7}$ Torr.

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