## Abstract Submitted for the MAR06 Meeting of The American Physical Society

LEEM study of the growth of 6,13-pentacenequinone thin films JERZY SADOWSKI, ABDULLAH AL-MAHBOOB, TSUGUKI NISHIHARA, YA-SUNORI FUJIKAWA, TOSHIO SAKURAI, Institute for Materials Research, Tohoku University, Sendai, Japan — The morphology and dynamics of the growth of 6,13-pentacenequinone ( $PnQ - C_{22}H_{12}O_2$ ) films on Si(111)-7x7 surface have been investigated *in-situ* by the low-energy electron microscopy (LEEM), in order to evaluate the possibility of using PnQ molecules as an organic dopant in pentacene (Pn) films. The results of the experiments show that the nucleation and growth mechanisms dramatically differ between Pn and PnQ films, respectively. At the initial stage of the PnQ growth, after the saturation of the Si dangling bonds by the formation of a disordered wetting layer, the amorphous islands (type-I) having compact shapes were formed. After they have reached a critical size (few hundreds to several thousands nanometers, depending on the molecular flux), a second stage nucleation of the crystalline, highly anisotropic, needle-shaped islands (type-II) occurred. A gradual rotation of the in-plane (ab) unit cell along the type-II islands have been observed, with the direction of the 2D 'chirality' dependent on the direction of the c axis of the PnQ crystal lattice and associated with selective mass incorporation at the side of the island having edge parallel to long diagonal (direction of minimum strain and a favorable direction of a kink formation) of the ab unit cell.

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