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Photoluminescence Influenced by Chain Conformation in Thin Conjugated Polymer Films by Spin Coating and Dewetting P.W. LEE, W.C. LI, Y. CHIEN, Department of Materials Science and Engineering, National Tsing Hua University, G. REITER, nstitute of Physics, Albert-Ludwigs-Universität, Freiburg, Germany, A.C.-M. YANG, Department of Materials Science and Engineering, National Tsing Hua University — Motivated by recent observations of photoluminescence (PL) enhancement by molecular constraints, the chain conformation effect was explored. It was found that PL efficiency decreased with film thickness under a constant spin speed but increased under a constant solution concentration indicating that prolonged solvent evaporation, and hence more open entangled coils, improved PL efficiencies. Strong substrate dependence was observed in the ultrathin regime, revealing the role of substrate-polymer interactions during the condensation process. Upon annealing, the thin film dewetted and resulted multi-fold PL enhancement. As revealed by micro-PL spectroscopy, the PL efficiency was about 10 times greater in the residual layer ($\sim$3 nm) than that in the droplets and demonstrated independence of substrate quenching effect, unveiling important optoelectronic features of the molecular constrained states.

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