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Quenching of Photoluminescence and Electroluminescence in OLEDs by Exciton-Charge and Exciton-Dopant Interactions CHRISTOPHER WILLIAMS, WILLIAM SAMPSON, The University of Texas at Dallas, Department of Physics, Nanotech Institute, SERGEY LEE, The University of Texas at Dallas, Nanotech Institute, JOHN FERRARIS, The University of Texas at Dallas, Department of Chemistry, Nanotech Institute, ANVAR ZAKHIDOV, The University of Texas at Dallas, Department of Physics, Nanotech Institute, ORGANIC LIGHT-EMITTING DIODE TEAM — Electronic dopants such as the strong acceptor F4-TCNQ are used for p-type doping of hole transport layers (HTL) in organic light-emitting diodes (OLEDs). These molecules are found to quench the electroluminescence (EL) if they diffuse into the emissive layer. We have observed EL quenching in OLEDs with a HTL doped with F4-TCNQ. To separate the effects of exciton-dopant quenching from exciton-polaron quenching we have intentionally doped the emissive layer of Alq3 with three acceptors (A) of different electron affinity: F4-TCNQ, TCNQ and C60. We have also taken photoluminescence spectra of Alq3 films doped with identical concentrations of the three acceptors in order to separate the effects of these dopants on electroluminescence and photoluminescence. These results are presented, and channels for energy and charge transfer between excitons and both neutral and charged dopant molecules are described.

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