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Temperature dependent electrical and optical characterization of polyfluorene based organic light-emitting-diodes[1] MOHAMMAD ARIF, S. GUHA, Department of Physics, Univ. of Missouri-Columbia, M.S. YUN, S. GANGOPADHYAY, Department of Electrical Engineering,Univ. of Missouri-Columbia
— Polyfluorene (PF) conjugated polymers have received widespread attention due to their strong blue emission, high charge mobility and excellent chemical and thermal stability which creates great prospect for optoelectronic device applications. Efficient and well balanced injection of charge carriers and transport capabilities are of paramount importance for high luminescence efficiency of organic light emitting diodes (OLEDs). The maximum current flowing through metal/semiconductor is limited by available space and trapped charges, barrier heights, applied electric field and mobility of the carriers. In this work we present detailed current- voltage (I-V) measurements as a function of temperature from 2- ethylhexyl substituted PF (PF2/6) based OLEDs. PF2/6 is characterized by Tg of 80 ^{o}C and a nematic liquid crystalline phase above 150 ^{o}C. Barrier heights for current injection were calculated as a function of thermal cycling. The characteristic I-V measurements were fitted with ideal space charge limited conduction (SCLC) with traps to calculate carrier mobilities and trap concentration. Preliminary studies of Raman scattering from these working devices will be discussed.

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