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Charge injection and Raman scattering studies from polyfluorene-based light-emitting diodes[1] M. ARIF, S. GUHA, Dept. of Physics, University of Missouri-Columbia — Efficient and well balanced injection of charge carriers and transport capabilities are of particular importance for high luminescence efficiency in organic light-emitting diodes. 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. Although ethyl-hexyl substituted PF (PF2/6) has a high level of molecular disorder, charge injection in single layer polymer devices can be described very well by space-charge-limited conduction for a discrete set of trap levels. This is attributed to the nature of ordering in the polymer. PFs are characterized by a number of Raman-active peaks originating from C-H bending and C-C stretching type motion. We further analyze our working devices using Raman scattering in the presence of photogenerated carriers. The Raman intensities in the 1000-1250 cm^{-1} corresponding to a C-H bend-type motion quench in the presence of carriers with increasing fields. This effect most probably arises due to the interaction of phonons and free carriers.

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