Hole conduction through poly (2,7-(9,9-di-*n*-octylfluorene))

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Abstract

Various models have been used to explain the charge carrier transport through the conducting organics. Among these models, trapping and mobility models have been used most frequently. According to trapping model conduction is due to drift of charge carriers, while in mobility model charge carriers move from one localized state to another by hopping with field and temperature dependent mobility. The conducting organic poly (2,7-(9,9-di-*n*-octylfluorene)) (PFO) has been used as an important emissive material for organic light emitting devices. Current-voltage (*J*-*V*) characteristics of PFO have been studied as a function of temperature in the hole only structure ITO/PEDOT:PSS/PFO/Au. The *J*-*V* characteristics have been studied from 298 K to 96 K. In the whole experimental temperature range our *J*-*V* charcteristics are in good agreement with the trapping model, with exponentially distributed traps in the energy space. The mobility μ, total trap density H_b and the characteristics trap energy E_t of holes in PFO have been determined.