

**Space-charge-limited bipolar currents in polymer/C<sub>60</sub> diodes**

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*Abstract*

We investigate carriers transport for devices formed by a heterojunction of the substituted polythiophene polymer (PEOPT) and the C<sub>60</sub> molecule, sandwiched between anode of indium-tin oxide(ITO)/poly(3,4-ethylene dioxythiophene)(PEDOT) and cathode of Al, for different thickness of the C<sub>60</sub>. We measure their current-voltage characteristics and find that the forward current is limited by spatial charge of holes in the polymer layer and electrons in the molecule layer. We also find that the effective mobilities of holes in the polymer and of electrons in the C<sub>60</sub> are dependent on the different thickness of the layers. By adapting to our systems an electrical analytical model previously used in the literature to study bilayer organic diodes, we are able to explain the experimental results.

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