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High Performance Short-Channel Organic Field-Effect Transistors with Graphene Electrodes[1] NARAE KANG, SAIFUL I. KHONDAKER, NanoScience Technology Center and Department of Physics, University of Central Florida — Organic Field-Effect Transistors (OFETs) have received a great deal of attention due to their easy-processing, low-cost, flexibility, and transparency that can lead to future electronic applications such as flexible display, solar cell, and sensors. One of the major challenges in fabricating high-performance OFETs is to reduce a large injection barrier formed at metal/organic interface, which results in poor electrical transport performance. In order to overcome this issue, graphene has been suggested as a promising electrode material for OFETs due to its unique electronic properties as well as strong π-π interaction with organic molecule, which can reduce the injection barrier at the electrode/organic interface. In this study, we fabricated short-channel OEFTs using mechanically exfoliated graphene electrodes, and performed temperature dependent transport studies. We will present the detailed temperature dependent data and discuss the charge carrier injection mechanism at graphene/organic interface.

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