

## Binder-free Poly(3-hexylthiophene) (P3HT) Field-effect Transistors for Printed Electronics

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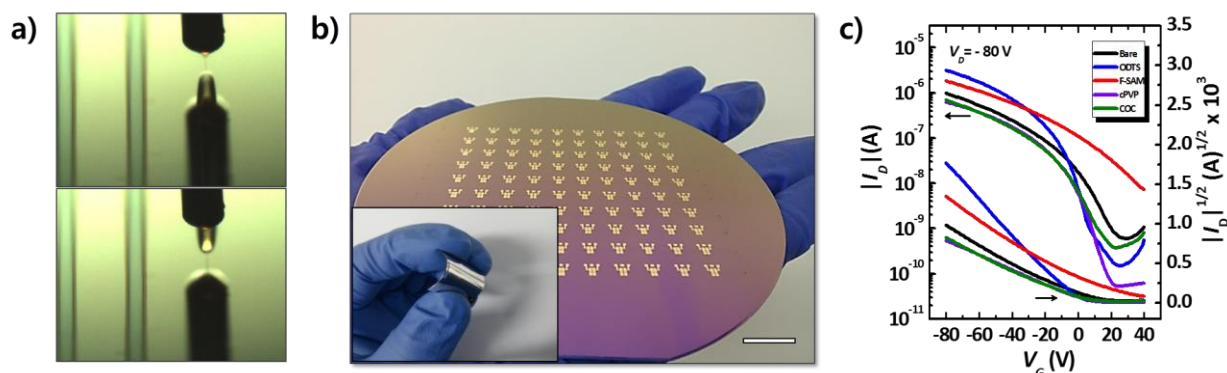
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In this study, we fabricated printed poly(3-hexylthiophene) (P3HT) without any polymer binder by electrohydrodynamic (EHD) jet printing to form organic field-effect transistors (OFETs). We modified the dielectric surface by introducing self-assembled monolayers and polymer thin films to investigate the effect of surface modifications on the characteristics of printed P3HT lines and electrical performances of the OFETs. The morphology of the printed P3HT lines depended on the surface energy and type of surface treated substrate. The resulting OFETs exhibited high performance on octadecyltrichlorosilane-modified substrates, which was comparable to that of other printed P3HT OFETs. In order to realize the commercialization of the OFETs, we also fabricated a large-area transistor array, including 100 OFETs and low-operating-voltage flexible OFETs.



**Fig. 1.** (a) A snapshot of the electrohydrodynamics (EHD) jet printing process; (b) printed TFTs array and flexible TFT device fabricated by EHD jet printing; (c) electrical performances of TFTs on various surface treated substrate

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