

## **Electrical characterization and source-drain voltage dependent mobility of P-channel organic field-effect transistors using MATLAB simulation**

### **ABSTRACT**

We demonstrate fabrication of bottom gate/top source-drain contacts for p-channel (small molecule) organic field-effect transistor (OFET) using pentacene as an active semiconductor layer and silicon dioxide (SiO<sub>2</sub>) as gate dielectric. The device exhibits a typical output curve of a field-effect transistor (FET). Furthermore, analysis of electrical characterization was done to investigate the source-drain voltage ( $V_{ds}$ ) dependent mobility. The mobility which calculated using MATLAB simulation exhibited a range from 0.0234 to 0.0258 cm<sup>2</sup>/Vs with increasing source-drain voltage (average mobility was 0.0254 cm<sup>2</sup>/Vs). This work suggests that the mobility increase with increasing source-drain voltage similar to the gate voltage dependent mobility phenomenon.