PT-P022

Influence of Top electrodes (Source-Drain) on Electrical Characteristics of Organic Thin Film Transistors.

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We present the influence of S-D top electrodes on electrical characteristics of organic thin film transistors (OTFTs). For p-type OTFTs, Gold (Au) has been the most constantly used S-D electrode material. Au-based OTFT devices provide for effective carrier injection. That is, it lead to good OTFT device performance. But unfortunately, because of high-price of Au, it limits its use in real-world applications. Thus we deposited low-priced electrode materials : Silver (Ag), Aluminum (Al) respectively and those were compared with Au. The indium-tin-oxide (ITO) coated glass was used as the substrate and the gate electrode. The gate dielectric material used poly-4-vinylphenol (PVP). Pentacene also used as active layer and it was deposited on PVP by using thermal evaporator. Electrical characteristics were measured using HP 4145B parameter analyzer. From the electrical measurements, typical I-V characteristic and the field effect mobility of TFTs were observed. We could obtain comparatively good electrical characteristics in spite of the using the Ag, Al electrode materials.