

Contact Resistance of Metal/Organic Semiconductor and Capacitance–Voltage Characteristics of Metal/Polymer Insulator/Si Structure

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In organic thin film transistors, polymer dielectrics and other organic molecules have been used as a gate dielectric and also as an interface layer to reduce contact resistance and to improve the morphology and crystallinity of the films grown on it. Polymer dielectric films are usually deposited with spin coating and used for gate insulator layers. Properties of a gate dielectric (dielectric constant, breakdown voltage and surface energy) and the interface between the insulator and the active layer are important. In this presentation, capacitance–voltage (C–V) characteristics of metal/polymer insulator/Si structure will be presented and properties of polymer gate insulators will be discussed based on C–V measurements. Interfacial characteristic such as contact resistance between semiconductor and electrode is a critical factor in the performance of organic thin film transistors (OTFTs). In this work, we studied the reduction of contact resistance of ITO source/drain electrodes in pentacene bottom–contact thin–film transistors (TFTs). The specific contact resistance was determined by TLM (Transmission Line Model) method. An interfacial layer was inserted between the ITO electrodes and pentacene layer to improve the contact performance.