OPEN SEMINAR

Speaker: Mr. Syed M. H. Rizvi

Department: Department of Electrical Engineering

Title: A Reliable Approach Towards Electrical Characterization Of Organic Semiconductor Thin Films

Date: 12th May 2017

Time: 05:00 PM

Place: Samtel Centre Seminar Room (access from ground level)

Abstract: In this work, improved techniques for characterization of thin film organic semiconductors including mobility, built-in voltage, traps and background doping is described. Based on a revised analytical expressions for space charge limited current under field dependent mobility that takes effects of diffusion current into account, estimation of mobility from current voltage characteristics was extended to voltages less than one volt with accuracy better than 10%. The proposed methodology was also extended to obtain accurate estimates of mobility in devices with significant built-in voltage thereby facilitating mobility estimation in light emitting diode and photovoltaic devices as well. A differential current-voltage technique is proposed for a reliable estimation of built-in voltage in organic diodes. This technique was also used to detect presence of traps within organic semiconductor films and classification of trap distribution in three broad categories of discrete, gaussian and exponential. An improved technique based on capacitance-voltage characteristics is described for estimation of unintentional background doping that allows effects of energetic depth of dopants to be taken into account.