



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI  
SHORT ABSTRACT OF THESIS

Name of the Student : Anamika Dey  
Roll Number : 136153003  
Programme of Study : Ph.D.  
Thesis Title : Device Engineering of Organic Field Effect Transistors for Sensing Applications  
Name of Thesis Supervisor(s) : Prof. Parameswar K. Iyer  
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Considering the demand of future technology, the thesis entitled "***Device Engineering of Organic Field Effect Transistors for Sensing Applications***" introduces important methodologies which have been developed for improving the performances of OFET. The thesis mainly focuses to modify the gate dielectric layer to reduce the operational voltage of both p-type and n-type OFETs and use them for various sensing applications. By modulating gate dielectric layer with the combinations of a high-k inorganic and two low-k organic dielectric materials, the operational voltage of OFET was effectively reduced from 50 V to 7 V, which was later used for photo-sensing application. Again, by using the combination of two inorganic and one organic dielectric material layer, the operational voltage of OFET was further successfully reduced from 7 V to 2 V and the same device architecture was used for bio-sensing application. This thesis mainly described very simple, unique and robust methodologies for lowering the operational voltage of OFETs up to 2 V, which can be further used as very effective and stable platforms in the next generation of portable electronics.