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Fabrication and Electrical Characterization of Organic-On-Inorganic Photodiodes

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Abstract

The electrical characteristics of the fabricated Au/organic layer/p-Si/Al diode have been investigated using current voltage (I-V), capacitance-voltage (C-V) and conductance-voltage (G/omega) measurements. I-V measurements of the photodiode were carried out various illumination conditions. The values of ideality factor (n) and barrier height (Phi(B0)) for all illumination conditions are found to be about 4.2 and 0.72 eV, respectively. Also, the photocurrent results in the reverse bias of the diode indicate that photocurrent under illumination is higher than the dark current. In addition, negative capacitance (NC) behavior observed in the C-V plots can be explained by taking into account the loss of interface charges at occupied states below Fermi level.

Keywords

Author Keywords: Photodiode; Organic Semiconductor; Ideality Factor; Barrier Height; Series Resistance

KeyWords Plus: METAL-SEMICONDUCTOR INTERFACES; SOL-GEL METHOD; NEGATIVE CAPACITANCE; VOLTAGE CHARACTERISTICS; OPTICAL-PROPERTIES; SCHOTTKY CONTACTS; THIN-FILMS; DIODE; BARRIER; ORIGIN

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