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Series resistance controlling photosensor of Ag/DNA/p-Si/Al diode

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Abstract

The Ag/DNA/p-Si/Al Schottky barrier diode was fabricated using spin-coating technique. The electrical characterization of the diode was performed using current-voltage and capacitance-voltage-frequency measurements. The ideality factor and barrier height of the diode were found to be 2.26 and 0.72 eV, respectively. The photoresponse measurements indicate that the diode behaves as a photodiode. The alternative current (AC) measurements were performed in detail. The capacitance-voltage-frequency (C-V-f) measurements indicate that the capacitance of the diode depends on voltage and frequency. The observed decrease in the capacitance and increase in the conductance with increase in frequency were explained on the basis of interface states. The density of interface states of the diode is decreased with increasing frequency. It was observed that the series resistance of the diode is decreased with increasing light intensity and increased with decreasing frequency under constant light intensity. (C) 2012 Elsevier B.V. All rights reserved.

Keywords

Author Keywords: DNA; Organic material; Photoresponse; Schottky diode; Ideality factor

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