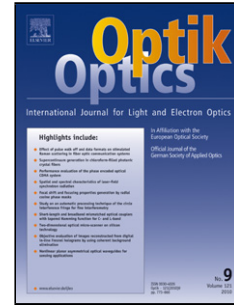


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Modification of gate dielectric on the performance of Copper (II) Phthalocyanine Based on Organic Field Effect Transistors

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Abstract

Top contact Copper (II) Phthalocyanine (CuPc) based on Organic Field Effect Transistors (OFET) using various dielectrics were fabricated. The bare SiO₂ and bilayer Polyvinyl alcohol (PVA)/SiO₂ gate insulators with different thickness (50 and 100 nm) onto thin SiO₂ layers were used as gate dielectrics. It is found that using bilayer gate dielectrics can improve device performance. The PVA/SiO₂ bilayer gate insulator architecture increases the field-effect mobility by 20 times and improves the on/off ratio from 10³ to 10⁴. Also the photosensitivity of device was examined under different light intensities. The photosensitivity CuPc-OFET was found as 10 at a light intensity of 100mW/cm² at the off state. This proposes that the CuPc-OFET behaves as a phototransistor.

Keywords: CuPc; OFET; Field-effect mobility; Phototransistor.

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