INTISARI

KAJIAN SIFAT OPTIK MENGGUNAKAN SPEKTROSKOPI ELIPSOMETRI TERHADAP LAPISAN *BULK-HETEROJUNCTION REDUCED GRAPHENE OXIDE*/PCBM YANG DISINTESIS MENGGUNAKAN METODE *VACUUM DROP CONSOLIDATION*

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Telah dilakukan kajian sifat optik lapisan tipis *Bulk Heterojunction* pada *reduced Graphene Oxide*(rGO) *doping* PCBM dengan berbagai volume. *Graphene Oxide*(GO) diperoleh dari sintesis secara kimia menggunakan metode Hummer's. *Reduced Graphene Oxide* (rGO) diperoleh dari proses reduksi GO dilakukan secara kimia menggunakan *hydrazine hidrate*. Telah dilakukan *blending* rGO dan PCBM([6,6]-*phenyl-C61-butyric acid methyl ester*) sehingga didapatkan *Bulk-Heterojunction* rGO-/PCBM. Pengkajian sifat optik pada penelitian ini dilakukan dengan mengekstraksi data ψ dan Δ *Bulk-Heterojunction* rGO/PCBM yang diperoleh dari spektroskopi elipsometri. Kemudian data ψ dan Δ diekstraksi dengan persamaan Drude-Lorentz menggunakan perangkat lunak *RefFit*. Dari hasil ekstraksi didapatkan sifat optik indeks bias (n,k) dan konstanta dielektrik (ε_1,ε_2). Telah diperoleh nilai ε_2 menurun pada rentang energi 1,3-4,5 eV seiring dengan pertambahan volume PCBM dan nilai k menurun pada rentang energi 1,3-5 eV seiring dengan pertambahan volume PCBM. Berdasarkan hasil sifat optik yang diperoleh tersebut dapat disimpulkan bahwa kemampuan rGO menyerap cahaya semakin rendah, karakter rGO semakin transparan dan adanya penurunan konduktifitas rGO.

Kata kunci :Elipsometri, lapisan tipis, PCBM, *reduced graphene oxide*, sifat optik, .

ABSTRACT

STUDY OF OPTICAL PROPERTIES USING SPECTROSCOPY ELLIPSOMETRY TO THIN FILM OF BULK-HETEROJUNCTION REDUCED GRAPHENE OXIDE PCBM SYNTHESIZED BY VACUUM DROP CONSOLIDATION METHOD

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Study of the optical properties of the thin layer Bulk Heterojunction at reduced Graphene oxide (rGO) with various concentrations has been carried out. Graphene Oxide(GO) is obtained from chemical synthesis using a modified Hummer method. Reduced Graphene Oxide (rGO) obtained from the GO reduction process is carried out chemically using hydrazine hydrate. Blending of rGO and PCBM([6,6]-phenyl-C61-butyric acid methyl ester) has been done so that we get the Bulk-Heterojunction rGO/PCBM. The study of optical properties in this study was carried out by extracting ψ and Δ Bulk-Heterojunction rGO/PCBM data obtained from ellipsometry spectroscopy. Then the ψ and Δ data were extracted using the Drude-Lorentz equation using RefFit software. From the extraction, the optical properties of refractive index and dielectric constant were obtained. It has been found that the value of ε_2 decreases in the energy range of 1.3-4.5 eV as the volume of PCBM increases and the value of k decreases in the energy range of 1.3-5 eV as the volume of PCBM increases. Based on the results of the optical properties obtained, it can be concluded that the ability of rGO to absorb light is lower, the character of rGO is more transparent and there is a decrease in the conductivity of rGO.

Keywords : Thin film, reduced Graphene Oxide, PCBM, optical properties, ellipsometry