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Fabrication and electrical conductivity characterization of chlorophyll with 8-hydroxyquinoline aluminum thin film as sola cell / Nur Amalina Abd. Rashid.

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FABRICATION AND ELECTRICAL CONDUCTIVITY CHARACTERIZATION
OF CHLOROPHYLL WITH 8-HYDROXYQUINOLINE
ALUMINUM THIN FILM
AS SOLAR CELL

By
Nur Amalina Bt Abd. Rashid

A proposal submitted in partial fulfillment of the requirements for the award of the
degree of Bachelor Science (Physical Science)

DEPARTMENT OF PHYSICAL SCIENCES
FACULTY OF SCIENCE AND TECHNOLOGY
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Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk: *Fabrication and Electrical Conductivity Characterization of Chlorophyll with 8-hydroxyquinoline Aluminum Thin Film as Solar Cell*

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telah diperiksa dan semua pembedaan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Fizik sebagai memenuhi sebahagian daripada keperluan memperoleh Ijazah Sarjana Muda Sains Gunaan (Fizik Elektronik & Instrumentasi), Fakulti Sains dan Teknologi, UMT.

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DECLARATION

I hereby declare that this thesis entitled Fabrication and Electrical Conductivity Characterization of Chlorophyll with 8-hydroxyquinoline Aluminum Thin Film as Solar Cell is the result of my own research except as cited in references.

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FABRICATION AND ELECTRICAL CONDUCTIVITY CHARACTERIZATION OF CHLOROPHYLL WITH 8- HYDROXYQUINOLINE ALUMINUM THIN FILM AS SOLAR CELL

ABSTRACT

This work focused on the study of electrical conductivity to the combination of 8-hydroxyquinoline Aluminum and Chlorophyll thin film on Indium Tin Oxide (ITO) substrate as bulk heterojunction solar cell. 8-hydroxyquinoline Aluminum thin film is deposited to the ITO substrate using Langmuir Blodgett technique. Voltage of AlQ3/CHLO/ITO thin films is measured in the dark and under different intensity of light by using four point probes. The result showed that the AlQ3/CHLO thin film was successfully deposited in ITO substrate with different layer. Electrical conductivity in the dark showed an increasing with the increasing of layer. While as the concentration of CHLO get increases the electrical conductivity is consecutively changed. Electrical conductivity under different intensity of light is diminished with the increasing of intensity and CHLO concentration however increases with the decreasing of layer. In conclusion, combination of AlQ3: CHLO in ratio 1:10 thin film produced the highest electrical conductivity which is 0.981 Sm^{-1} . This combination is suitable to generate a solar cell.

**PENYEDIAAN DAN PENCIRIAN SIFAT ELEKTRIK 8-
HIDROSIKUINOLINA ALUMINIUM DENGAN KLOROFIL FILEM NIPIS
SEBAGAI SEL SOLAR**

ABSTRAK

Fokus kajian ini adalah untuk mengkaji kekonduksian elektrik pada gabungan filem nipis 8-hidroksikuinolina aluminium (AlQ3) dengan klorofil (KLO) di atas substrat Indium Timah Oksida (ITO) sebagai simpangan hetero pukul sel suria. Filem nipis AlQ3 dimendapkan ke atas substrat ITO dengan menggunakan kaedah Langmuir-Blodgett. Voltan filem nipis diukur menggunakan kaedah penduga empat titik dalam keadaan gelap dan di bawah cahaya lampu dengan keamatan yang berbeza. Hasil kajian ini menunjukkan bahawa filem nipis AlQ3 ini berjaya dimendapkan di atas substrat ITO dengan lapisan-lapisan yang berbeza. Kekonduksian elektrik di dalam gelap menunjukkan peningkatan dengan pertambahan lapisan filem nipis. Manakala kekonduksian elektrik menunjukkan pengurangan dengan pertambahan kepekatan klorofil. Kekonduksian elektrik di dalam cahaya yang berkeamatan berbeza adalah berkurangan dengan pertambahan keamatan cahaya dan klorofil namun meningkat dengan pengurangan lapisan. Kesimpulannya, kombinasi AlQ3 : KLO dengan nisbah 1:10 mencapai kekonduksian yang paling tinggi iaitu 0.981 Sm^{-1} . Kombinasi ini sesuai untuk dijadikan sel solar.