

**STUDY OF CHARACTERIZATION AND FORMATION OF CdS/PMMA
COMPOSITE FILM**

By
Loo Leong Hong

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**JABATAN SAINS FIZIK
FAKULTI SAINS DAN TEKNOLOGI
UNIVERSITI MALAYSIA TERENGGANU**

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Disahkan oleh:

Penyelia Utama
Nama: **DR. CHAN KOK SHENG**
Cop Rasmi: **Pensyarah
Jabatan Sains Fizik
Fakulti Sains dan Teknologi
Universiti Malaysia Terengganu
21030 Kuala Terengganu**

Tarikh: **19/4/2010**

Penyelia Bersama (jika ada)
Nama:
Cop Rasmi:


Tarikh:

Ketua Jabatan Sains Fizik
Nama:
Cop Rasmi: **DR. MOHD IKMAR NIZAM BIN MOHAMAD ISA
Head
Department of Physical Sciences
Faculty of Science and Technology
University Malaysia Terengganu
21030 Kuala Terengganu**

Tarikh: **22/4/10**

DECLARATION

I hereby declare that this thesis entitled **Study of Characterization and Formation of CdS/PMMA Composite Film** is the result of my own research except as cited in the references.

Signature : 

Name : Loo Leong Hong

Matrix : UK 15779

Date : 19/4/2010

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STUDY OF FORMATION AND CHARACTERIZATION OF CdS/PMMA COMPOSITE FILM

ABSTRACT

CdS/PMMA composite film with different amount of CdS was prepared by using the solution cast technique. The composite films were characterized by Scanning electron microscopy (SEM) to determine the surface morphology of composite film, Fourier transform infrared spectroscopy (FTIR) to monitor the formation bonding between CdS and PMMA, Electrochemical impedance spectroscopy (EIS) to determine the conductivity of composite film. The SEM revealed that CdS particle were homogeneously dispersed in PMMA polymer matrix. With the amount of CdS increasing, the size of CdS particles was increased and CdS particles became agglomerated. FTIR spectra of CdS/PMMA composite film indicated the present of sulfur in PMMA polymer at peak 841 cm^{-1} and the peaks at the range $1790 - 1675\text{ cm}^{-1}$ and $1220 - 1095\text{ cm}^{-1}$ have increased the intensity of absorption with increase the wt% of CdS. The EIS result showed that increasing amount of CdS has resulted in increasing the conductivity and increase in conductivity can also be associated to the increase in the amorphosity as shown by SEM studies.

KAJIAN PEMBENTUKAN DAN KARAKTERISASI KOMPOSIT FILEM CdS/PMMA

ABSTRAK

Komposit filem CdS/PMMA dihasilkan dengan menggunakan kaedah pembentukan larutan mengikut komposisi CdS yang berbeza. Komposit filem menganalisis dengan menggunakan Scanning electron microscopy (SEM) untuk menentukan tata bentuk permukaan bagi komposit filem, Fourier transform infrared spectroscopy (FTIR) untuk memantau the pembentukan ikatan antara CdS and PMMA, Electrochemical impedance spectroscopy (EIS) untuk menentukan kekonduksian bagi komposit filem. SEM memaklumkan zarah-zarah CdS dibubarkan dengan sekata di dalam PMMA polimer matriks. Saiz bagi zarah-zarah CdS semakin meningkat dan terkumpul apabila menambah komposisi CdS. FTIR spectra bagi komposit filem CdS/PMMA menunjukkan kewujudan unsur belerang dalam PMMA polimer matriks pada puncak spektra 841cm^{-1} dan puncak spectra pada jarak $1790 - 1675\text{ cm}^{-1}$ and $1220 - 1095\text{ cm}^{-1}$ juga menunjukkan keamatan penyerapan inframerah meningkat dengan meningkatkan wt % bagi CdS. Keputusan EIS menunjukkan kekonduksian meningkat dengan menambahkan komposisi CdS dan juga berkaitan dengan peningkatan keamorfan CdS di mana ia ditunjukkan dalam kajian SEM.