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Perpustakaan Sultanah Nur Zahirah (UMT)
Universiti Malaysia Terengganu



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An investigation of chitosan/PEO based blend electrolytes doped
with LiTFSI for lithium battery application / Muhamad Azerudi
Mukhtar.

PERPUSTAKAAN SULTANAH NUR ZAHIRAH
UNIVERSITI MALAYSIA TERENGGANU (UMT)
21030 KUALA TERENGGANU

1100061753		

Lihat sebelah

HAK MILIK
PERPUSTAKAAN SULTANAH NUR ZAHIRAH UMT

**AN INVESTIGATION OF CHITOSAN/PEO BASED BLEND
ELECTROLYTES DOPED WITH LiTFSI FOR LITHIUM BATTERY
APPLICATION**

By
Muhamad Azerudi bin Mukhtar

A final year project report submitted in partial
fulfillment of the requirements for the award of the degree of
Bachelor of Applied Science (Physics Electronics and Instrumentations)

**Department of Physical Sciences
Faculty of Sciences and Technology
UNIVERSITI MALAYSIA TERENGGANU
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JABATAN SAINS FIZIK
FAKULTI SAINS DAN TEKNOLOGI
UNIVERSITI MALAYSIA TERENGGANU

PENGAKUAN DAN PENGESAHAN LAPORAN PITA I DAN II

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk: *An investigation of diffusion/PEC based blend electrospoke dope with LiTFSI for Ozone battery application.*

oleh *Mohamed Asyadi Mukhtar*, no. matrik: *UK 12710*.

telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Fizik sebagai memenuhi sebahagian daripada keperluan memperolehi Ijazah *S.M.S. Guru Sains Fizik (Electrocoat & Instrumentasi)* Fakulti Sains dan Teknologi, UMT.

Disahkan oleh:

.....
Penyelia Utama **NURUL HAYATI IDRIS**
Nama: **Pensyarah**
Cop Rasmi: **Jabatan Sains Fizik**
Fakulti Sains dan Teknologi
Universiti Malaysia Terengganu
21030 Kuala Terengganu

Tarikh: *4/5/2008*

.....
Penyelia Bersama (jika ada)
Nama: **DR. MOHD IKMAR NIZAM BIN MOHAMAD ISA**
Cop Rasmi: **Pensyarah**
Jabatan Sains Fizik
Fakulti Sains dan Teknologi
Universiti Malaysia Terengganu
21030 Kuala Terengganu

Tarikh: *4/5/2008*

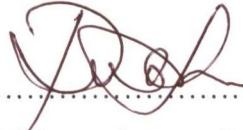
.....
Ketua Jabatan Sains Fizik
Nama: **PROF. DR. SENIN BIN HASSAN**
Cop Rasmi: **Ketua**
Jabatan Sains Fizik
Fakulti Sains dan Teknologi
Universiti Malaysia Terengganu
21030 Kuala Terengganu

Tarikh: *4/5/2008*

DECLARATION

I hereby declare that this thesis entitled An Investigation of Chitosan/PEO Based Blend Electrolytes Doped With LiTFSI for Lithium Battery Application is the result of my own research except as cited in the references.

Signature	:
Name	: Muhamad Azerudi Mukhtar
Matrix No	: UK 12710
Date	: 4 th May 2008



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ABSTRACT

In the present study, the chitosan/PEO at ratio 80:20 w/w containing different LiTFSI concentration have been prepared. The electrical conductivity at room temperature for the highest conducting sample in the system is 5.94×10^{-7} S/cm. The increase in conductivity is due to the increase in the number of mobile ions and the decrease of the conductivity is attributed to ion association and decrease in mobility of the sample. The increase and decrease in the number of ions can be implied from the dielectric constant, ϵ_R vs frequency plot. The values of loss tangent can be obtained by dividing the imaginary and the real part of complex permittivity. Infrared spectroscopy shows complexation between the salt and the chitosan/PEO polymer.

ABSTRAK

Dalam kajian yang dijalankan, kitosan/PEO dalam nisbah 80:20 w/w dan mengandungi kepakatan garam LiTFSI yang berbeza telah disediakan dan dianalisis. Hasilnya, nilai konduktiviti tertinggi yang diperoleh pada suhu bilik ialah 5.94×10^{-7} S/cm. Penambahan nilai konduktiviti adalah disebabkan bertambahnya bilangan ion yang bergerak manakala penurunan nilai konduktiviti adalah disebabkan penyatuan ion-ion dan penurunan kadar pengaliran ion dalam sampel. Penambahan dan penurunan di dalam bilangan ion dijelaskan oleh plot ε_R melawan frekuensi. Nilai kehilangan tangen diperolehi dengan membahagikan nilai modulus elektrik, M_I dan M_R daripada data yang yang diperoleh. Spektroskopi inframerah pula menunjukkan struktur kompleks antara garam dan polimer kitosan/PEO.