

# PENYELIDIKAN, PENCIPTAAN NILAI & PERUSAHAAN

Mesyuarat Fakulti Bil. 4/2023

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# Unit Penyelidikan

## 1. Pencapaian penerbitan sehingga 15 Jun 2023 (WOS)

Author-UM	Title	Source
Asmadi, MS; Kasmani, RM; Siri, Z;	Erratum: "Thermal performance analysis for moderate Rayleigh numbers of Newtonian hybrid nanofluid filled U-shaped cavity with various thermal profiles"	PHYSICS OF FLUIDS
Hapipi, NM;	Improvement of rheological and transient response of magnetorheological grease with amalgamation of cobalt ferrite	JOURNAL OF MATERIALS RESEARCH AND TECHNOLOGY-JMR&T
Liew, SY;	Morphinan Alkaloids from the Leaves of <i>Alphonsea cylindrica</i> and Their Antibacterial Properties	PLANTA MEDICA
Liew, SY; Hazni, H; Awang, K	Neuroprotective Activities of New Monoterpenoid Indole Alkaloid from <i>Nauclea officinalis</i>	PROCESSES
Jamaludin, MF; Yusof, F;	Parameters Optimization for Electropolishing Titanium by Using Taguchi-Based Pareto ANOVA	METALS
Asmadi, MS; Kasmani, RM; Siri, Z; Saleh, H; Ghani, NAC	Buoyancy-driven heat transfer performance, vorticity and fluid flow analysis of hybrid nanofluid within a U-shaped lid with heated corrugated wall	ALEXANDRIA ENGINEERING JOURNAL

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## 2. Pencapaian penerbitan sehingga 15 Jun 2023 (SCOPUS)

Author-UM	Title	Source
Syed Mohd Fadzil S.A.F., Woo H.J., Azzahari A.D., Kufian M.Z.,	Sodium-rich prussian blue analogue coated by poly(3,4-ethylenedioxythiophene) polystyrene sulfonate as superior cathode for sodium-ion batteries	Materials Today Chemistry

### 3. Senarai Pemohon Geran dari PASUM

Nama geran	Pemohon	bilangan
RSC	Dr. Liew	1
FRGS	Dr. Farhana, Dr. Fahmi, Dr. Zainal, Dr. Aisyah, Dr. Haslina, Dr. Danial, Dr. Liew	7
MBSJ	Dr. Norli, Dr Hiwani	2
Torray	En Amirul	1
Lembaga Timah KeTSA	Dr Farhana, Dr Faizzi	1
SATU JRS	Dr Fahmi, Dr Shafiza	2
MBPJ	Dr Fahmi	1
UMTERG	En Amirul, Dr Fahmi	2
Selangor GPNS	Dr Liew, Dr Faizzi	2
Total		19

RESEARCH TEAM  
Principal Researchers  
18 Associate Researchers  
20 National Collaborators  
20 International Collaborators  
50 Postgraduates Trained

CULINARY & MEDICINAL

### PALM OIL-BASED CELLULOSIC ELECTROLYTE FOR SUSTAINABLE ELECTROCHEMICAL DEVICES

MUHAMMAD HAZWAN AHMAD<sup>1</sup>, NURSHAFIZA SHAHABUDDIN<sup>2</sup>, SITI NOR FARHANA YUSUF<sup>3</sup>, ROSIYAH YAHYA<sup>4</sup>, FARIDAH SONJULIN<sup>4</sup>

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<sup>4</sup>Corresponding author: nurshafiza@um.edu.my

**ABSTRACT**  
The approach towards green chemistry has paved its way to the peak of polymer science arena. In conjunction of this awareness, the scientific community has widely utilized cellulose in various applications due to its quality of being environment-friendly and cost-efficient. In this present study, a rapid transesterification of cellulose extracted from oil palm empty fruit bunches (OPEFB) has been carried out to synthesize cellulose acetate (CA). A significant improvement of organosolubility in dimethylsulfoxide (DMSO), dimethylacetamide (DMA) and dimethylformamide (DMF) for the modified cellulose as compared to its native form has been shown. A successful acetylation of cellulose was confirmed through FTIR and proton NMR spectroscopies. XRD measurements revealed the crystallinity level of the CA fibres with different degree of substitution. TGA showed that the CA is thermally stable up to 300 °C. Film polymer electrolytes (PE) were prepared from the synthesized CA powders for electrochemical devices application.

**RESEARCH QUESTION**

- HOW TO UTILIZE AGRO-WASTE INTO VALUE-ADDED PRODUCT?
- HOW IS THE PERFORMANCE OF PALM OIL-BASED ELECTROLYTES IN THE ELECTROCHEMICAL CELLS?

**OBJECTIVES**

- TO EXTRACT CELLULOSE FROM OIL PALM EMPTY FRUIT BUNCHES
- TO SYNTHESIZE CELLULOSE ACETATE FROM EXTRACTED CELLULOSE
- TO PREPARE AND CHARACTERIZE CELLULOSE-BASED POLYMER ELECTROLYTE FOR USE IN ELECTROCHEMICAL CELLS

**METHODOLOGY**

**RESULTS**

**ACKNOWLEDGEMENT**

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**METHODOLOGY**

**RESULTS**

**CONCLUSION**

**ACKNOWLEDGEMENT**



**UM** RESEARCH GALLERY 2023

Theme : Climate Action & Planetary Health

In collaboration with  
Universiti Malaya Sustainability and Development Centre (UMSDC)  
<https://bit.ly/3peBn7W>

**Exhibition Hall**  
RESEARCH MANAGEMENT & INNOVATION COMPLEX (KPPI)  
BUILDING, UNIVERSITI MALAYA

# Terima Kasih

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