IEM
The Institution of Engineers, Malaysia

Online Talk

IONIC LIQUIDS IN GREEN ENERGY STORAGE DEVICES :

Lithium-Ion Batteries, Supercapacitors & post-lithium-ion batteries

26th March 2025
3:00 PM - 5:00 PM

Online

Registration Fees

IEM Students : Free
IEM Members : RM 15
Non-IEM Members : RM70

Speaker:
Dr. Masahiro Fujita

Professor, Department of Materials and Life Sciences, Sophia University, Japan

This webinar will discuss the latest advancements in pyrrolidinium salts, their unique properties, and their potential impact on energy storage and sustainable material processing.

Organised By :
Chemical Engineering Technical Division (CETD), IEM

Website
www.myiem.org.my

BEM Approved CPD Hours : 2
Ref No. : IEM25/HQ/093/T (w)

Speaker: Dr. Masahiro Fujita

Dr. Fujita specializes in the design of functional organic electrolytes, including ionic liquids and plastic crystals, for energy storage applications like Li-ion and Mg-ion batteries. His research also focuses on cellulose dissolution and hydrogel synthesis.

Education & Experience:

- Ph.D. in Engineering, Tokyo University of Agriculture & Technology (2002)
- Postdoctoral research at Tokyo University of Agriculture & Technology and Monash University
- Professor at Sophia University since 2019

Awards:

- Award for Encouragement of Research in Polymer Science, The Society of Polymer Science, Japan (2004)
- Linus Pauling Lecture Award, Mahatma Gandhi University, India (2023)

Synopsis:

Pyrrolidinium-based ionic liquids and ionic plastic crystals have gained significant interest due to their high thermal and electrochemical stability. This talk will explore their applications in energy technology and biomass processing.

- *Electrochemical Applications – Pyrrolidinium-based ionic liquids are widely used as electrolytes in lithium-ion batteries, but challenges remain in battery performance. The introduction of zwitterion structures has been explored to improve ion conductivity.*

- *Ionic Plastic Crystals – Certain pyrrolidinium salts exhibit plastic crystalline phases, enhancing ionic conductivity when combined with lithium, sodium, or magnesium salts. These materials show promise as flexible solid electrolytes in rechargeable batteries.*

- *Biomass Processing – Some ionic liquids can dissolve cellulose, an otherwise insoluble natural polymer. Pyrrolidinium hydroxide solutions have shown effective cellulose dissolution at room temperature, presenting new possibilities for biomass processing.*