

WEBINAR TALK ON CIRCULAR ECONOMY AND REE: SUSTAINABLE HYDROMETALLURGICAL PROCESSING OF CRITICAL MATERIALS

Date : 6 September 2025 (Saturday)**Time : 9.00 am - 11.00 am****Platform : Zoom Webinar****Registration Fees:**

- Student Member : FOC
- IEM Member : RM 15.00
- Non-Member : RM 70.00

SYNOPSIS:

Rare Earth Elements (REEs) are essential to modern technologies, from electric vehicles to wind turbines and advanced electronics. However, their conventional extraction and refining methods are energy-intensive and environmentally harmful. Hydrometallurgy offers a cleaner, more selective approach to processing REEs, enabling recovery from both primary ores and secondary sources such as industrial by-products and electronic waste. This synopsis explores how hydrometallurgical technologies such as acid and alkaline leaching, solvent extraction, ion exchange, and precipitation can be optimized for sustainability and circularity. These processes allow for efficient separation of individual REEs, reduced reagent consumption, and lower carbon footprints compared to traditional methods. More importantly, hydrometallurgy enables the recovery of critical materials from end-of-life products and residues, closing the loop between use and reuse. When integrated into a circular economy framework, hydrometallurgy becomes a strategic enabler not just for metal recovery but for redesigning material flows, reducing waste, and supporting long-term resource security. This approach aligns with global efforts to decouple economic growth from raw material extraction, and positions hydrometallurgy as a core technology in achieving sustainable and resilient supply chains for critical minerals like REEs.

SPEAKER: DR NURUL 'AIN JABIT

Dr. Nurul 'Ain Jabit is a Senior Lecturer and currently serves as the Program Chairman for the Mineral Resources Engineering Program at the School of Materials and Mineral Resources Engineering, Universiti Sains Malaysia (USM). She has been with USM since 2017. Dr. Nurul 'Ain obtained her Bachelor of Engineering (B.Eng.) and Master of Science (M.Sc.) in Mineral Resources Engineering from USM and later completed her Ph.D. in Mineral Science at Murdoch University, Western Australia. Her doctoral research focused on chemical and electrochemical leaching studies of synthetic and natural ilmenite in hydrochloric acid, emphasizing reaction kinetics and mechanisms. Her areas of expertise include hydrometallurgy, extractive metallurgy, mineral resources engineering, and mine waste management. Her research focuses on sustainable extraction technologies, emphasizing the recovery and separation of metals from both primary resources and metallurgical waste using hydrometallurgical processes. She is actively involved in advancing research on rare earth element (REE) extraction from ores and secondary resources.