

**DEPARTMENT OF MECHANICAL ENGINEERING****SEMINAR****Online**

Title: Reversibility of a High-voltage, Cl⁻-regulated, Aqueous Mg Metal Battery Enabled by a Water-in-salt Electrolyte

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Date: 29 April, 2022 (Friday)

Time: 4:00 p.m. (Hong Kong Time)

Zoom meeting: 1) Link to join the meeting:

<https://hku.zoom.us/j/92153053690?pwd=ZzFCKzF4dzVISElnd05qa3FVZytnQT09>

2) Meeting ID: 921 5305 3690

3) Password: 901261

Abstract:

Rechargeable Mg batteries are a promising post-Li-ion battery technology, but its development has been critically hampered by the passivating nature of Mg, particularly in aqueous solutions. Due to a quick dismissal of its reversibility, the use of Mg anodes in aqueous electrolytes has been unfortunately overlooked, and most researchers focus on non-aqueous systems instead. In this seminar, a reversible, aqueous Mg battery mechanism will be introduced. Using a MgCl₂ water-in-salt (WIS) electrolyte, the impermeable passivation film on Mg could be converted to a conductive metallic oxide complex, facilitated by Cl⁻ regulation and the suppression of hydrogen evolution reaction. When coupled with copper hexacyanoferrate as the cathode, the full battery exhibits an impressive voltage plateau of 2.4-2.0 V, and excellent stability of over 700 cycles with a Coulombic efficiency of up to 99% at 0.5 A g⁻¹. The interfacial chemistry of Mg in the MgCl₂ WIS electrolyte raises the once dismissed possibility of reversible Mg dissolution and deposition in aqueous solutions.

ALL INTERESTED ARE WELCOME

For further information, please contact Prof. D.Y.C. Leung at 3917 7911.

Research area: Energy