Department of **Materials Science & Engineering** seminar series 2019

Presents

Solid-state Protected Lithium Anodes

by *Phuah Kia Chai*

Date: 23 April 2019 (Tuesday)
Time: 2pm to 5pm
Venue: EA-06-04

Abstract

Lithium metal is envisioned as an ideal material for high energy-density electrochemical energy applications due to its light weight and high electropositivity. However, due to its strongly reducing nature, there are many challenges in effectively using it in practical devices. Liquid electrolytes that are commonly used today are unsuitable due to the tendency to decompose in contact with Li metal and the inability to resist lithium dendrite formation on cycling. In this work we focus on enabling solid electrolytes for practical devices incorporating Li metal. We first identify candidate materials for stabilization with Li metal through computational screening of various compounds. Atomic layer deposition of thin films of aluminates and tantalates are performed and observed to stabilize the interface of Li metal and the NASICON-type LAGP solid electrolyte, thereby confirming the initial materials screening. The family of Li-rich antiperovskites are investigated and also observed to remain stable with Li metal, hence providing another option for stabilization of Li metal. We then fabricated polymer-ceramic composite solid electrolytes via photopolymerization in order to make processing of thin solid electrolytes scalable and rapid.

Speaker *Phuah Kia Chai*

Biography

Kia Chai received his B.Eng and B.Sc from National University of Singapore in 2013. He joined Assoc. Prof. Stefan Adams' research group as a Ph.D. candidate since 2015. His research interests include electrochemistry and thin film membrane processing for application in energy devices.

ALL ARE WELCOME!

Prof Gong Hao Host