Confining Electrode Materials in Polymer Composite Frameworks for Li Ion Batteries

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Data: 13th March 2019, Wednesday
Time: 4:30-5:30 pm
Venue: ST 602 (4D Theatre), POLYU

Abstract:
Polymer composite frameworks can confine the electrode active within the electrode of lithium ion batteries (LIBs) to deliver large energy capacity, high energy density and long operation time. We believe the binding mechanism between the binder and electroactive materials mainly consists of mechanical interlocking and interfacial interactions. The latter includes intermolecular forces and chemical bonds. Functional polymer binders can impart special functions such as electronic and ion conductivity, self-healing and flexibility, on electrodes of LIBs. In our lab, the polymer binders have been applied to the most challenging anode materials Si and cathode materials sulfur. This work provides a comprehensive strategy in designing electrodes for long life, large capacity and high rate LIBs.

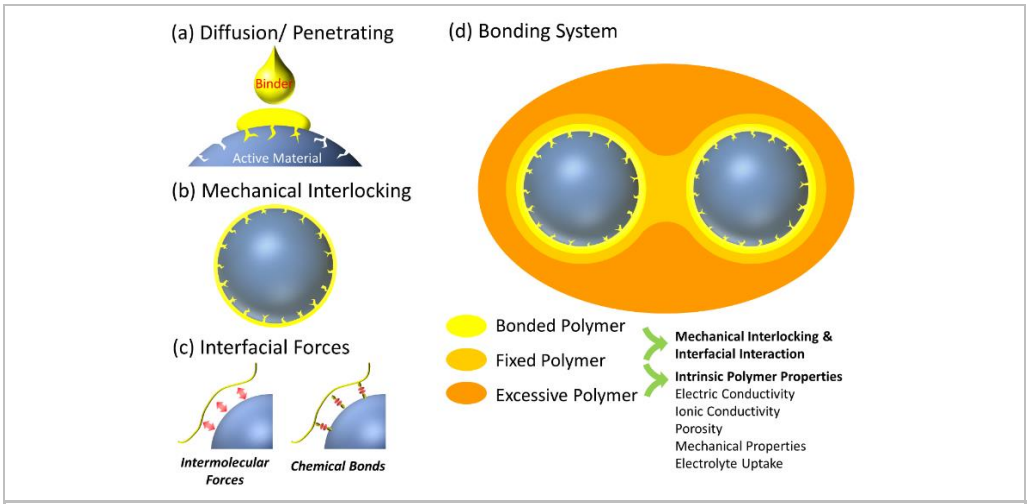

Figure 1. The binding mechanism involved in electrode fabrication for LIBs

References:

[1] Chen, H., Ling, M., Hencz, L., Ling, H. Y., Li, G., Lin, Z., & Zhang, S. (2018). *Chemical Reviews*. 2018 118 (18), 8936-8982.
[2] D. Adekoya, X Gu, M. Rudge, W. Wen, C Lai, M Hankel, & S. Zhang, *Advanced Functional Materials,* 2018, DOI: 10.1002/adfm.201803972.

Biography:

Prof. Eddie Shanqing Zhang obtained his PhD degree in electrochemistry in 2001 at Griffith University, Australia. Since then, he has worked as a research fellow during 2001–2006, senior research fellow during 2007–2009 and associate professor at Centre for Clean Environment and Energy and Griffith School of Environment, Griffith University during 2010-2015. As a core inventor, Dr. Zhang has developed a series of patented and commercialized technologies for environmental monitoring based on functional nanomaterials. He was awarded Australia Research Council Future Fellow for 2009-2013. Currently, Prof. Zhang is mainly engaged in the research on design and synthesis of functional nanomaterials and polymers (binders and solid polymeric electrolyte) for energy conversion and storage devices, as well as the development of intelligent online and/or onsite sensors for environmental monitoring. He has published ca. 150 reputable papers with H-index of 47 and delivered numerous Keynotes and invited lectures.

ALL ARE WELCOME!