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Materials Chemistry McElvain Seminar

*“Paving the way
towards
practical
electrolytes for
rechargeable
magnesium
batteries”*



Recently, the use of Mg metal in rechargeable post Li-ion batteries has been attracting increased attention owing to its high volumetric capacity, absence of dendrite formation, and relatively low cost. Nonetheless, current rechargeable Mg battery technologies suffer from several drawbacks which make them impractical and limited to research lab use only.

In particular, Mg passivation occurs in proximity to ionic salts and most solvents, rendering them unsuitable for battery use. Electrolytes based on ethereal solutions of Grignard/organo-halo/halo Mg reagents were found to be compatible with Mg metal and thus used to prepare several potential electrolytes. While these organo-halo/halo-based systems possessed impressive electrochemical performance, they were found to corrode some metallic battery components. Their corrosive nature has been linked to the chloride ion, which is an integral part of these electrolytes. Therefore, new electrolyte design platforms beyond those existing are highly desired. We have been pioneering the development of a new class of electrolytes that are based on boron-hydrogen salts such as borohydrides. These represent the first examples of inorganic, relatively ionic and halide-free salts reported to date that are compatible with Mg metal. These electrolytes were used to create a new platform to design a novel family of promising Mg battery electrolytes with high potential to overcome the current challenges.

**Monday
October 27th, 2014**

3:30 pm

**Seminar Hall
(1315 Chemistry)**