

Theme : Next Generation Battery

Subject: Development of Long Range Lithium-Ion Battery for Electric Vehicles

Introduction

The goal of this research project is to explore novel battery materials and/or battery cell technology that can provide high energy density and long life suitable for long range lithium-ion battery for electric vehicles.

We are looking for new materials or chemistry such as anode, cathode, electrolyte and/or separator and new battery cell structure that will allow us to use such high energy density batteries for many discharge/charge cycles and/or for prolonged period of time.

Scope

Challenges that significantly advance the energy density and/or lifetime of lithium ion batteries include:

- New battery materials such as cathode, anode, electrolyte, separator and/or combination of it
- Novel electrode and/or cell structure
- Methods to overcome the current lithium battery performance.
- Verification of new materials and/or new structure mechanism on the basis of lithium battery chemistry
- Methods to Improve of stability and/or safety for high voltage and/or high capacity battery

Research questions

We are interested in the following research questions. These questions are not exhaustive but different research questions are open to discuss with research partners.

- What are new materials and novel structures that significantly advance the state-of-art energy and/or life time in lithium ion battery?
- What would be the most effective lithium battery structure to maximize the current electrode materials in terms of capacity, cycle life and/or design flexibility?
- What would be the most promising method for maximum energy?
- What would be effective methods to significantly improve life of such battery systems without compromising energy density?

Expected Deliverables

The following is open to discussion:

- Suggestion of new materials or new chemistry
- Progress reports every 3 months summarizing accomplishments
- Material samples (>100 g each) or prototype cell
- Patents with Samsung SDI (If agreed)