FABRICATION OF ANODE MATERIALS FOR THE DESIGN OF LITHIUM ION BATTERIES

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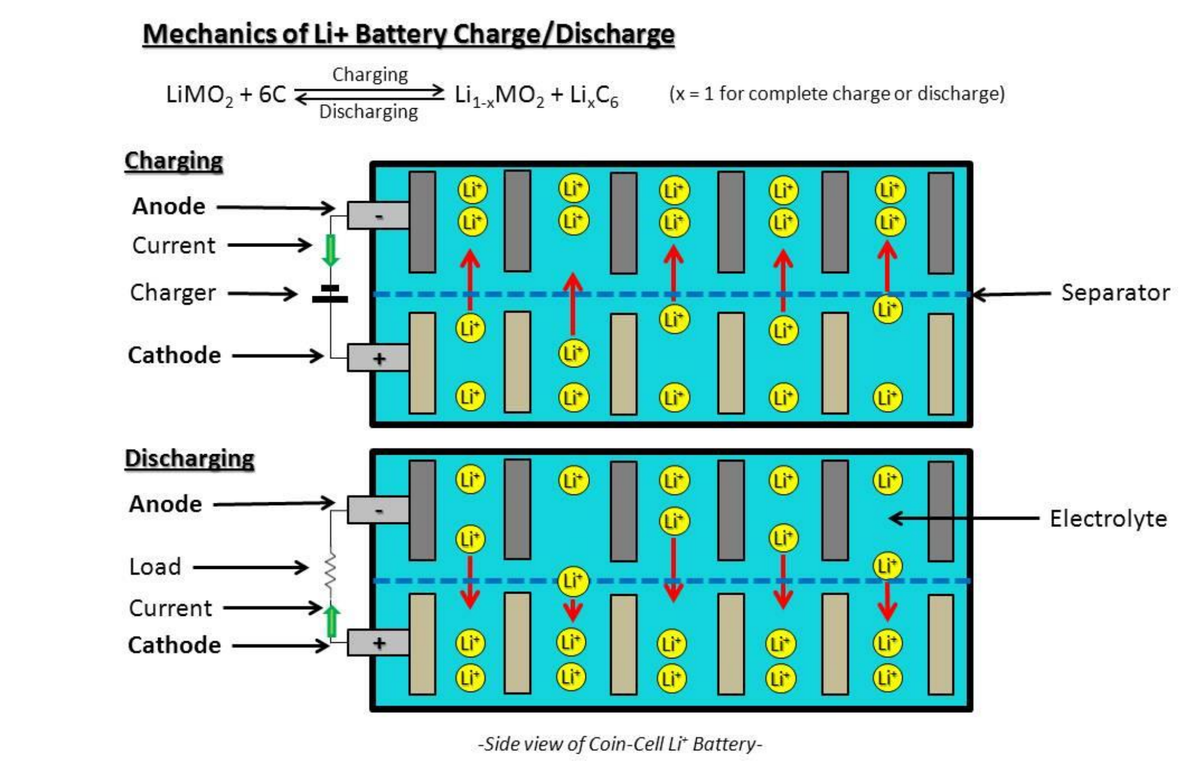
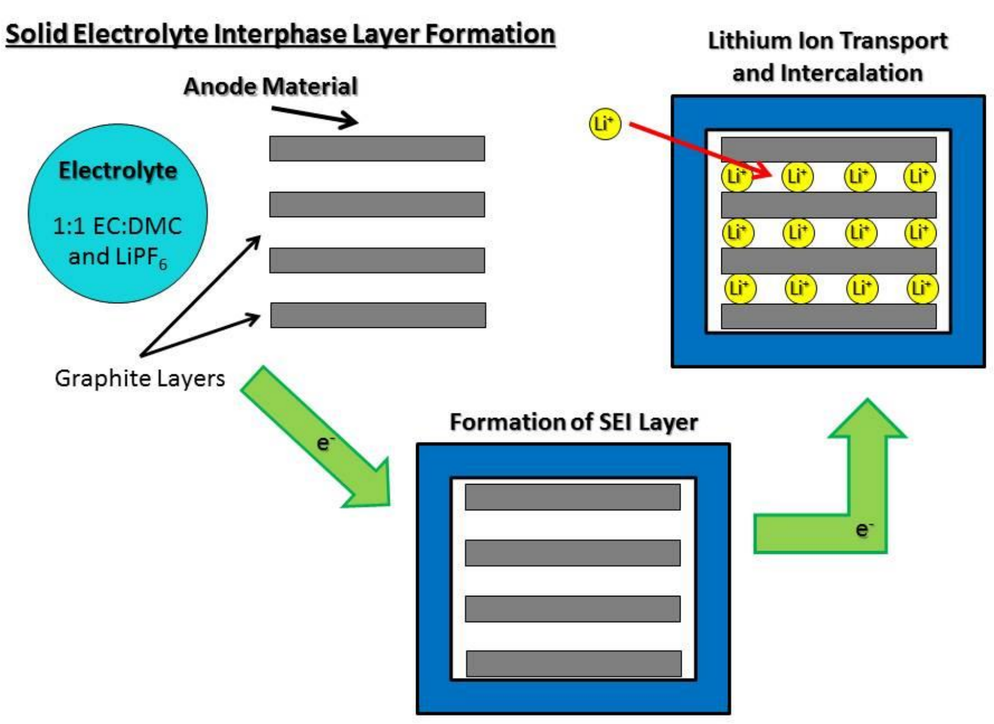
DESCRIPTION SUMMARY

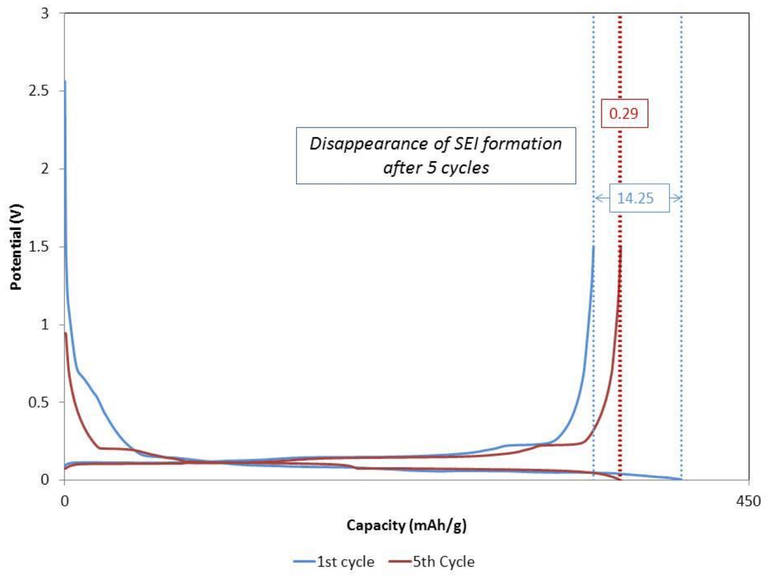
This project's mission is the fabrication of anode materials using commercial graphite as active material, investigation of the effects of varying active material compositions on battery capacity and capacity fade, comparison of performance of commercial and experimental anode materials and the design of Li-ion battery with performance characteristics comparable to commercial batteries. Most Li-ion battery fabrication utilizes graphite anodes. Higher-capacity anode materials can be produced using complex synthesis methods. However, these materials have very high irreversible capacities and incur extra costs from the additional cathode material required to compensate. Graphite has a much lower irreversible capacity since its SEI layer deteriorates after initial discharge.

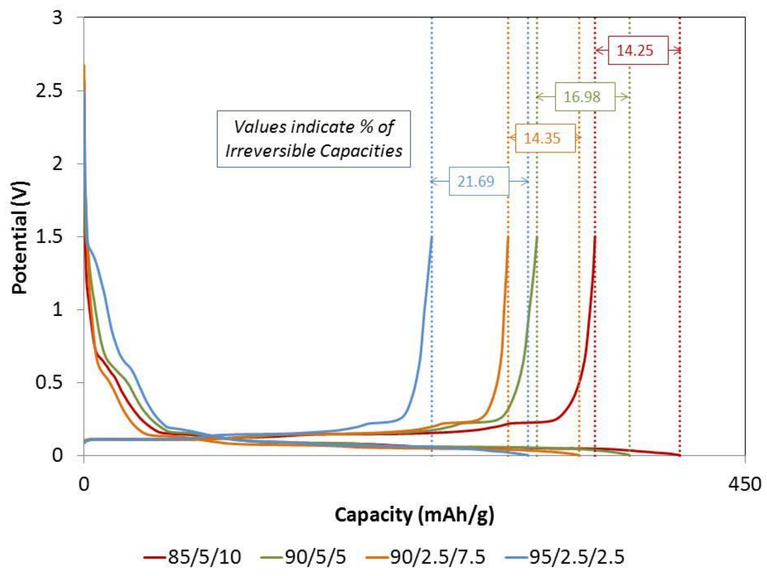
Li-ion battery with 85% graphite anode composition has the capacity closest to the theoretical (i.e. maximum) capacity of 372 mAh/g. This composition shows good capacity fade results. 85% graphite composition has the lowest irreversible capacity. SEI layer is non-existent approaching the fifth charge-discharge cycle. Further research and data acquisition is required to compare capacity fade results.

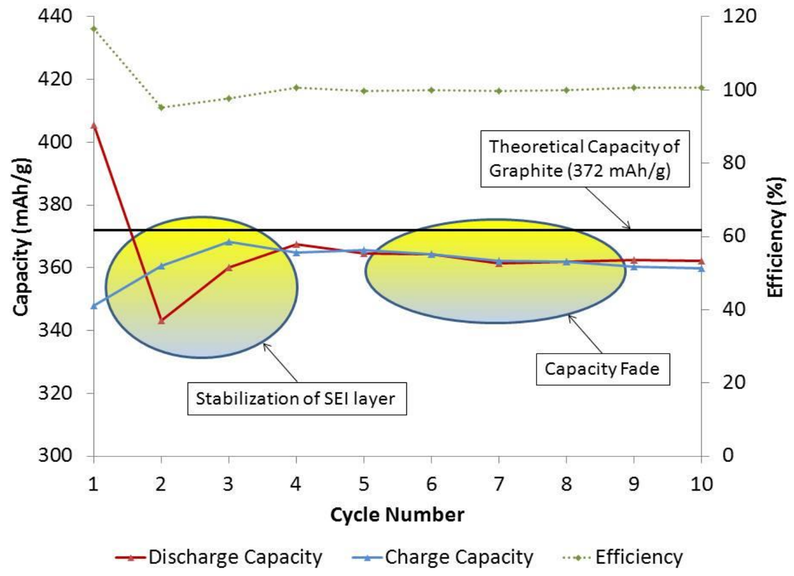


-Side view of Coin-Cell Li^+ Battery-









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