Title: Interface engineering and architecture design of Li-rich layered cathode for cycle-stable Li-ion batteries

The electric vehicle (EV) market is undergoing rapid growth. The government regulations will require that at least 20 percent of new vehicles sold in Canada will be zero emission by 2026, at least 60 percent by 2030, and 100 percent by 2035. Li-rich layered cathodes with high specific capacity and low cost are potential cathode materials for next generation lithium-ion batteries (LIBs) for electric vehicles. However, the poor rate capability and the inferior cycling stability of Li-rich cathode batteries still need to be solved prior to commercial application. In this context, LIBs require further development to catch up with the rapid development of modern industry. Recently, crystal facet regulation, element doping, and surface functionalization have been confirmed to be effective strategies to stabilize Li-rich cathodes and regain superior electrochemical performances. In this context, the aim of this project is fabricating low-cost Li-rich batteries with improved reversible capacity and cycling stability.

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