

## High voltage carbon encapsulated-graded $\text{LiMn}_2\text{O}_4:\text{LiNi}_{1-x-y}\text{Co}_x\text{Al}_y\text{O}_2$ cathodes for rechargeable Li-ion pouch cells

**Overview:** Layered-structures such as  $\text{LiNi}_{1-x-y}\text{Mn}_x\text{Co}_y\text{O}_2$  and  $\text{LiNi}_{1-x-y}\text{Co}_x\text{Al}_y\text{O}_2$  are currently used as cathode materials in LIB for high-energy applications. However, practical achievable capacity of these materials are restricted to 150-200 mAh/g due to the limitation in the achievable charging voltage (4.2 V) with acceptable cyclic stability. If over-charge (above 4.2 V) induced surface degradation in  $\text{LiNi}_{1-x-y}\text{Co}_x\text{Al}_y\text{O}_2$  can be prevented, it is possible to achieve high reversible capacity up to 230 to 250 mAh/g. The minimization of surface induced degradation is observed in surface modified  $\text{LiNi}_{1-x-y}\text{Co}_x\text{Al}_y\text{O}_2$  (LNCA)

### SEM of Surface modified LNCA

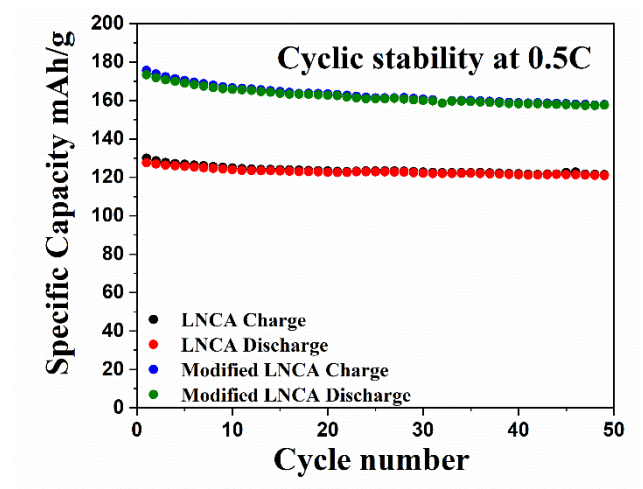
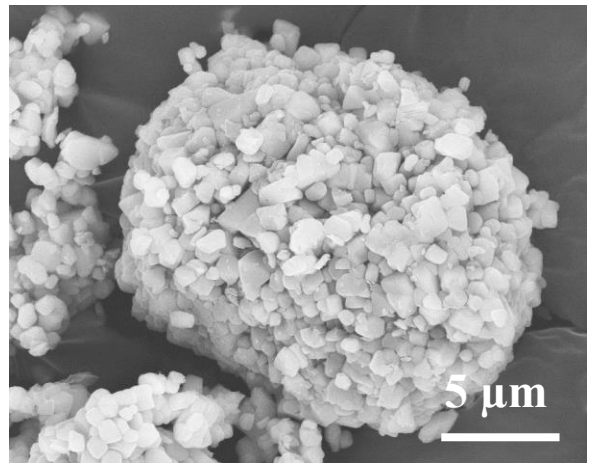
#### Key Features

- Scalable synthesis method
- Higher specific capacity

#### Potential Applications

- Lithium ion batteries

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Cyclic stability of the pristine and surface modified LNCA