

The Future Made Clear



# LITHIUM ION CONDUCTING GLASS-CERAMIC (LICGC™) POWDER



## LICGC™ Powder

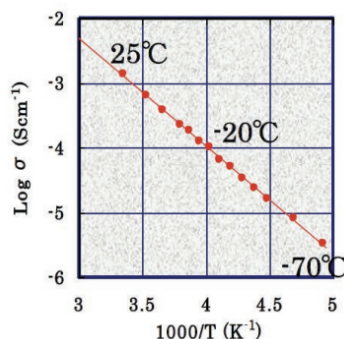
LICGC™ Powder can be used as an organic electrolyte or cathode additive in lithium ion secondary batteries. When used as a cathode additive, LICGC™ Powder can lead to significant improvements in the discharge capacity and reduced charge times at higher rates. An increased discharge capacity may also be seen at low temperatures.

### Material Composition

- $\text{Li}_2\text{O}-\text{Al}_2\text{O}_3-\text{SiO}_2-\text{P}_2\text{O}_5-\text{TiO}_2$  System

### Main Crystalline Phase

- $\text{Li}_2\text{O}-\text{Al}_2\text{O}_3-\text{SiO}_2-\text{P}_2\text{O}_5-\text{TiO}_2$  System



Arrhenius Plot of LICGC™ Powder

### Advantages

- High Lithium Ion Conductivity:
  - $1 \times 10^{-4}$  S/cm at 25 °C
- Used as an organic electrolyte and cathode additive
- Physical, Mechanical, and Chemical Properties
  - Stable in air and water
  - Non-flammable
  - RW(p) JOGIS Class 1 water resistance
  - RA(p) JOGIS Class 1 acid resistance
- Supplied as 1.0um and 4um average particle size
- Enables increased discharge capacity and faster charge times

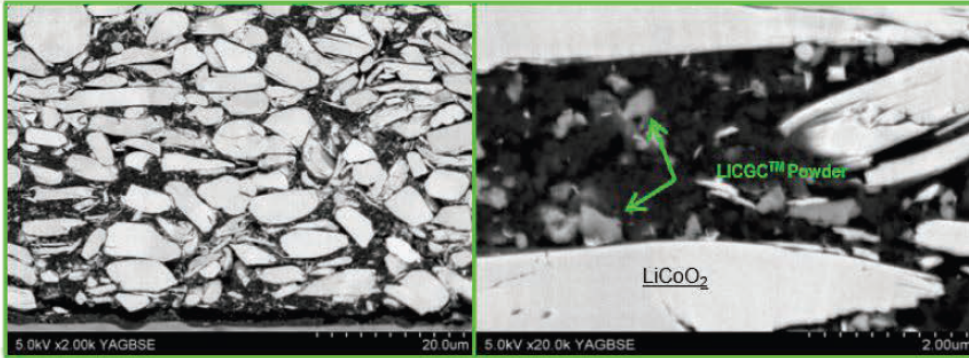
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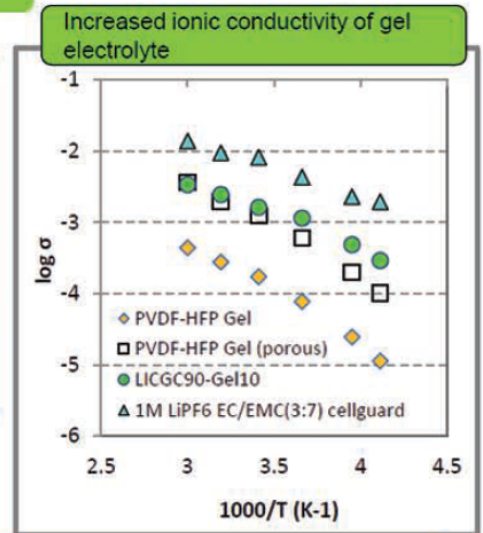
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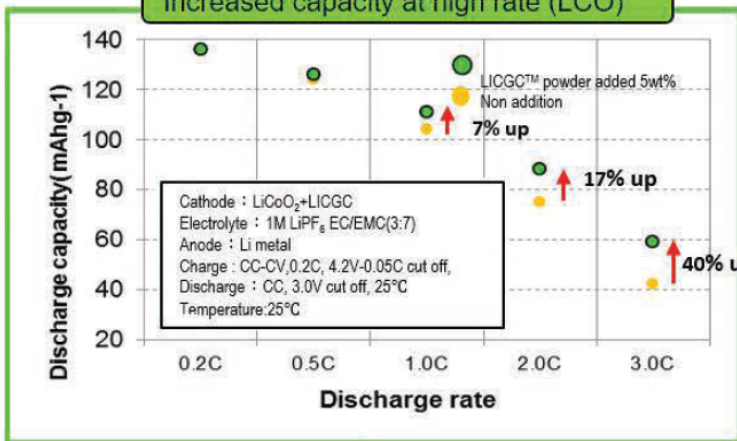
Properties of cathodes utilizing LICGC™ Powder as an additive



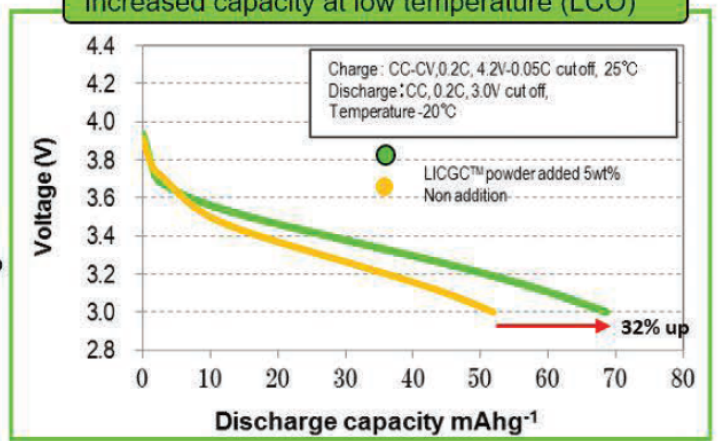
Cross section SEM image of LiCoO<sub>2</sub> cathode utilizing LICGC™ powder as an additive. This cathode was fabricated by casting a slurry containing the composite materials LCO, carbon, binder, NMP, and LICGC™ powder onto Al foil.



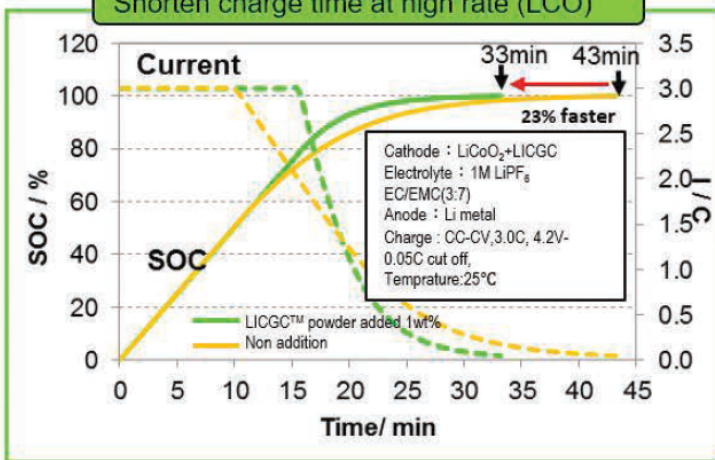
Increased capacity at high rate (LCO)



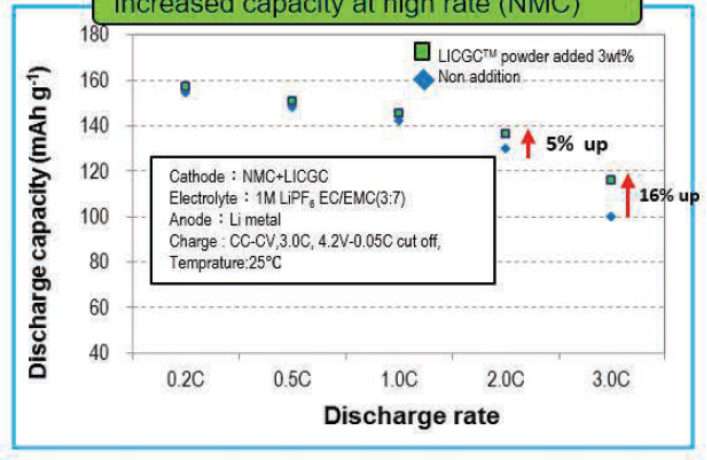
Increased capacity at low temperature (LCO)



Shorten charge time at high rate (LCO)



Increased capacity at high rate (NMC)



Please contact us to discuss your specific requirements.

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