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High-capacity lithium-ion batteries

A versatile platform technology for controlled production of metal-oxide coatings

Technology

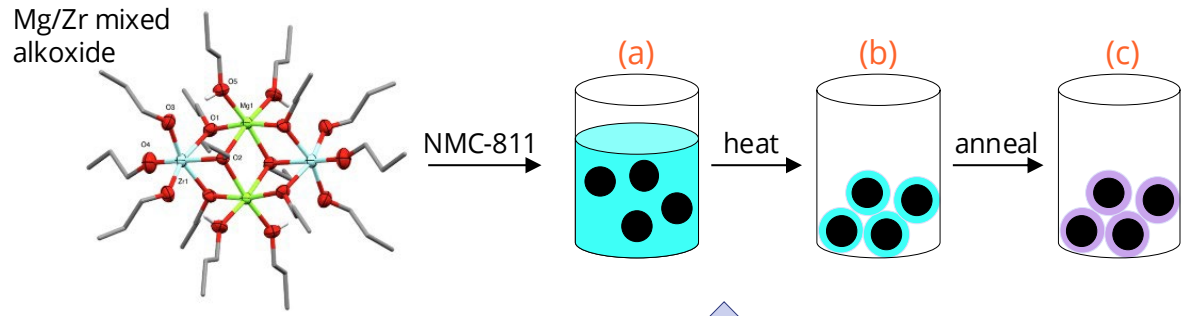
Bimetallic alkoxides act as low-cost precursors to mixed metal oxide coatings to stabilise cathodes in high-capacity Li-ion batteries.

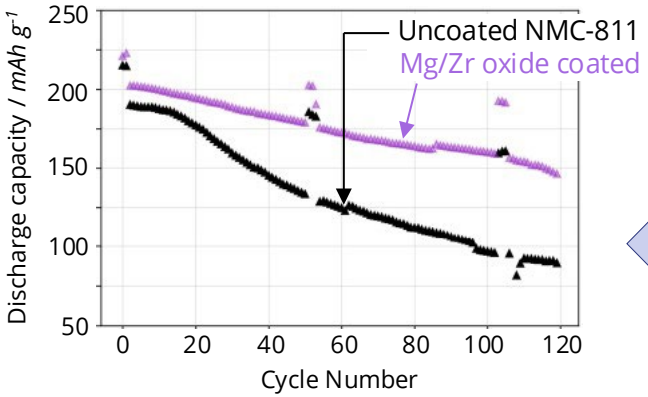
Benefits

- Versatile, non-hazardous and readily scaled chemistry.
- Can be used to stabilise high nickel cathodes and hence increased Li-ion cell capacities without a reduction in useable lifetime.
- Offers potential for low- / zero- cobalt content, alleviating costs and ethical concerns associated with its mining.

Commercial applications

- Ideal for development of high capacity lithium-ion batteries including NMC-811, $(LiNi_{0.8}Mn_{0.1}Co_{0.1})O_2$ (i.e. 80% nickel; 10% manganese; 10% cobalt) -.
- A platform primed for optimisation: applicable to a wide range of metals, allowing e.g., electrode barrier and ion transport properties to be controlled and improved.





Top: NMC-811 $(LiNi_{0.8}Mn_{0.1}Co_{0.1})O_2$ is (a) mixed with $Mg_2Zr_2(OPr)_{12}(PrOH)_4$; (b) heated to remove solvent and give a mixed alkoxide coating; (c) annealed to generate oxide coated NMC-811.

Left: The Mg/Zr oxide cathode (purple) shows a slower rate of capacity fade than the uncoated NMC-811 (black).

Opportunity

We are seeking partners to license or co-develop this technology.

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