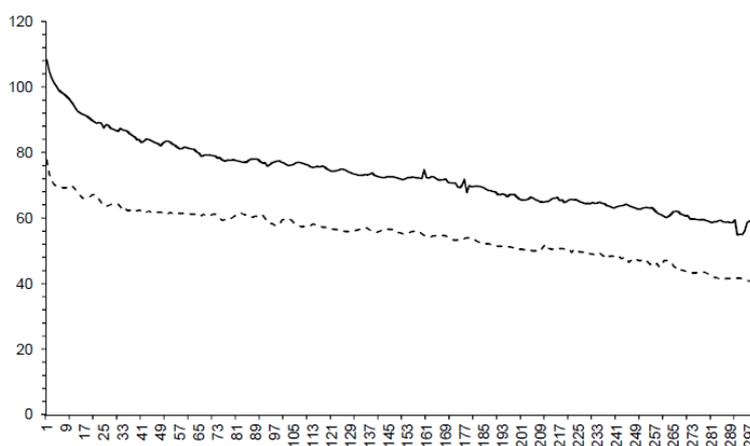


ELECTRODE MATERIAL

PATENT NUMBER: WO2023170023A1

INVENTORS: Marta Cabello (CIC energigUNE), Aitor Villaverde (CIC energigUNE), Nicholas Drewett (CIC energigUNE)

The authors of the present invention have developed a lithium-rich manganese-rich layered oxide material doped with copper suitable for use as cathode material in batteries and exhibiting high coulombic efficiency, high capacity gain, high energy density and high capacity retention rate. The compound of the invention is a composite material forming two phases and comprising a monoclinic phase consisting of Li_2MnO_3 and a trigonal phase consisting of a mixed metal oxide of an alkali metal M or a mixture thereof, manganese, nickel, cobalt and copper; providing a compound of formula: $\text{Li}_a\text{M}_b\text{Mn}_c\text{Ni}_x\text{Co}_y\text{Cu}_z\text{O}_2$.



Energy density (Wh/kg) at a rate of 1C of a cathode comprising the compound of the invention (plain line) and of a cathode comprising the non-doped compound of formula $\text{Li}_{1.15}\text{Mn}_{0.7}\text{Ni}_{0.2}\text{Co}_{0.1}\text{O}_2$ (dashed line) as a function of the number of charging cycles.

The compound of the invention unexpectedly exhibits higher discharge capacity values than the equivalent undoped material. In addition, when the compound of the invention comprises large amounts of copper, the discharge capacity does not deteriorate as fast after several charging cycles, as is observed for the compounds doped with copper known in the art. Such compound thus possesses improved capacity retention rates.

ADDED VALUE

- ✓ High discharge capacity values
- ✓ High energy density
- ✓ High capacity retention

APPLICATION OF THE TECHNOLOGY

- ✓ Cathodes in electrochemical cells (e.g. lithium-ion batteries)

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MEMBER OF
BASQUE RESEARCH
& TECHNOLOGY ALLIANCE



cicenergigune.com

Parque Tecnológico
C/Albert Einstein, 48
01510 Vitoria-Gasteiz
(Álava) SPAIN
+34 945 29 71 08

LICENSING CONTACT

Business Development Manager

businessdev@cicenergigune.com

T: +34 945 297108

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