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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 20252-2014

Replacing GB/T 20252-2006

Lithium cobalt oxide

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**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine;
Standardization Administration of the PRC**

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Foreword

This standard is in accordance with GB/T 1.1-2009 given rules drafted. This standard replaces GB/T 20252-2006 "lithium cobalt oxide." This standard compared with GB/T 20252-2006 main technical changes are as follows:

- Increasing the term clause;
- Increasing the lithium cobalt oxide product classification;
- Increased performance requirements of different types of lithium cobalt oxide;
- Increasing the residual alkali content, magnetic foreign matter content requirements;
- Change the primary element content and product requirements;
- Modify the content of impurity elements and product requirements;
- Modify the test items and sample content.
- Remove the chemical composition of the two elements Li and Co content requirements molar ratio;
- Remove the standard in Appendix A, Appendix B, Appendix C and Appendix D. This standard by the national non-ferrous metals Standardization Technical Committee (SAC/TC243) centralized. This standard was drafted. CITIC Guoan MGL Power Technology Co., Ltd., Guangdong loop Bump Technology Co., Ltd. Beijing when I material Technology Co., Ltd., Ningbo Jinhe New Materials Co., Ltd., Xiamen Tungsten Co., Ltd., advanced energy storage materials National Engineering Institute Research Centre. The main drafters of this standard. Jiang Weijun, Cui Yan, Li Changdong, Yu Haijun, even paper money, Chen Yanbin, Liu Daliang, Gao Wei, Shi Jianzhen. This standard replaces the standards previously issued as follows:
 - GB/T 20252-2006. Lithium cobalt oxide

1 Scope

China's national product standard for lithium cobalt oxide - the cathode material of the

lithium-ion battery in almost every phone and laptop. It specifies the terms, the requirements, the test methods, the inspection rules, the marking, packaging, transport and storage, the quality certificate and the content of the contract or order, and it applies to lithium cobalt oxide used as the positive electrode active material of lithium-ion cells. Lithium cobalt oxide is the material Sony commercialised in 1991 and it still holds the consumer electronics market, because nothing else combines its energy density per unit volume with the same manufacturing maturity. What a cell maker buys is not a chemical but a powder with a defined physical form, and the standard is built accordingly. The chemical requirements fix the cobalt and lithium content and the lithium-to-cobalt ratio, and limit the metallic impurities - nickel, manganese, magnesium, aluminium, iron, sodium, calcium and copper - because iron and copper particles in a cathode are a direct cause of internal short circuits and of the field failures that make lithium batteries dangerous. The physical requirements are equally binding: the particle size distribution by laser diffraction, the specific surface area, the tap density, the pH of the aqueous suspension and the moisture, since all of them determine how the powder behaves in the slurry, how densely the electrode coats and how the cell performs. And the crystalline phase is checked against the reference diffraction pattern, since the layered structure is what makes the material work at all. The electrochemical requirements are the final proof: the first discharge capacity and first-cycle efficiency, and the plateau capacity ratio and cycle life, each by its own referenced method. Issued on 24 July 2014 and in force since 1 February 2015, it replaces GB/T 20252-2006.

This standard specifies the terms of lithium cobalt oxide, requirements, test methods, inspection rules, marking, packaging, transportation, storage, quality certificates and contracts (Or orders) content. This standard applies to lithium ion battery cathode active material for lithium cobalt oxide.

2 Normative references

The following documents for the application of this document is essential. For dated references, only the dated version suitable for use herein Member. For undated references, the latest edition (including any amendments) applies to this document. Determination of

GB/T 1717 aqueous pigment suspension pH value Determination of

GB/T 5162 metal powder tap density

GB/T 5314 sampling powder metallurgy method

GB/T 6283 Determination of moisture content of chemical products Karl Fischer method (General method)

GB/T 13390 metal powder specific surface area by nitrogen adsorption

GB/T 19077.1 laser diffraction particle size analysis - Part 1. General

GB/T 23365 cobalt lithium electrochemical performance testing initial discharge capacity and initial charge-discharge efficiency test method

GB/T 23366 cobalt lithium electrochemical performance testing platform discharge capacity ratio and cycle life test method

GB/T 23367.1 lithium cobalt oxide chemical analysis methods - Part 1. Determination of cobalt content EDTA titration

GB/T 23367.2 lithium cobalt oxide chemical analysis - Part 2. Determination of electric lithium, nickel, manganese, magnesium, aluminum, iron, sodium, calcium and copper content Inductively coupled plasma atomic emission spectrometry

GB/T 24533-2009 lithium-ion battery anode material graphite JCPDS1) (50-0653) lithium cobalt standard X-ray powder diffraction pattern 1)

JointCommitteeonPowderDiffractionStandards (Joint Committee on Powder Diffraction Standards)

3 Terms and Definitions

The following terms and definitions apply to this document.

3.1 Specific capacity specificcapacity Per unit mass of the active material charging or discharging electrochemical capacity under specified conditions, the unit is mAh per gram (mAh/g).

3.2 efficiency charge-discharge efficiency The percentage of the discharge capacity and the charge capacity of the active substance under specified conditions.

3.3 Rate performance ratecapability The percentage of capacity and a low current discharge capacity of the active material at a high current discharge.