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**NONFERROUS METALS INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

YS/T 1521-2022

**Lithium Nickel Cobalt Oxide
(English Translation)**

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1 Scope

This Document specifies the terms and definitions, technical requirements, test methods, inspection rules, marking, packaging, transportation, storage, accompanying document, and order form contents of the lithium nickel cobalt oxide.

This Document applies to the positive active material lithium nickel cobalt oxide used in lithium-ion batteries.

2 Normative References

The provisions in following documents become the essential provisions of this Document through reference in this Document. For the dated documents, only the versions with the dates indicated are applicable to this Document; for the undated documents, only the latest version (including all the amendments) is applicable to this Document.

GB/T 1717 Determination of pH value of an aqueous suspension of pigments GB/T 5162 Metallic powders; Determination of tap density GB/T 5314 Powders for powder metallurgical purposes - Sampling GB/T 6283 Chemical products - Determination of water Karl Fischer method (general method) GB/T 8170 Rules of rounding off for numerical values & expression and judgement of limiting values GB/T 19077 Particle size analysis - Laser diffraction methods GB/T 19587 Determination of the specific surface area of solids by gas adsorption using the BET method GB/T 20252-2014 Lithium cobalt oxide GB/T 24533-2019 Graphite negative electrode materials for lithium-ion battery GB/T 37201 Electrochemical performance test of lithium nickel cobalt manganese oxide - Test method for discharge specific capacity and charge-discharge coulombic efficiency of the first cycle GB/T 37207 Electrochemical performance test of lithium nickel cobalt manganese oxide - Test method

for discharge plateau capacity ratio and cycle life YS/T 1006.1 Methods for chemical analysis of lithium nickel cobalt manganese oxide -Part 1: Determination the total of nickel cobalt manganese content - EDTA disodium salt titration YS/T 1263.1 Methods for chemical analysis of lithium nickel cobalt aluminum oxide - Part 1: Determination of nickel content-Dimethylglyoxime gravimetric method YS/T 1263.2 Methods for chemical analysis of lithium nickel cobalt aluminum oxide - Part 2: Determination of cobalt content-Potentiometric titration YS/T 1263.3 Methods for chemical analysis of lithium nickel cobalt aluminum oxide - Part 3: Determination of lithium content- Flame atomic absorption spectrometric method YS/T 1263.4 Methods for chemical analysis of lithium nickel cobalt aluminum oxide- Part 4:Determination of aluminum, iron, calcium magnesium, copper, zinc, silicon, sodium, manganese contents- Inductively coupled plasma atomic emission spectrometry JCPDS (50-0509) Lithium nickelate X-ray powder diffraction standard pattern

3 Terms and Definitions

For the purposes of this Document, the terms and definitions given in GB/T 20252-2014 apply.

4.1 Chemical composition

The chemical composition of the product shall comply with the provisions of Table 1.

1263.2.

5.1.4 The determination of lithium content in the product shall be carried out in accordance with the provisions of YS/T 1263.3.

5.1.5 The determination of sodium, calcium, iron, zinc and copper content in products shall be carried out in accordance with the provisions of YS/T 1263.4.

5.1.6 The sulfur content in the product shall be measured according to the method agreed upon by the supplier and the purchaser.

5.2 Moisture content

The moisture content of the product shall be measured in accordance with the provisions of GB/T 6283.

5.3 Magnetic foreign matter

The magnetic foreign matter content of the product shall be measured in accordance with the provisions of Appendix K in GB/T 24533-2019.

5.4 Residual alkali content

The residual alkali content of the product is measured according to the method agreed upon by both the supplier and the purchaser.

5.5 PH

The pH value of the product is measured in accordance with the provisions of GB/T 1717.

5.6 Appearance quality

The appearance quality of the product is visually inspected.

5.7 Crystal structure

The crystal structure of the product was detected using an X-ray powder diffractometer.

5.8 Tap density

The tap density of product shall be measured in accordance with the provisions of GB/T 5162.

5.9 Particle size distribution

The particle size distribution of the product shall be measured in accordance with the provisions of GB/T 19077.

5.10 Specific surface area

The specific surface area of product shall be measured in accordance with the provisions of GB/T 19587.

5.11 First discharge specific capacity

The first discharge specific capacity of the product is measured in accordance with the provisions of GB/T 37201. The charge and discharge voltage range is negotiated between the supplier and the purchaser.

5.12 First charge and discharge efficiency

The first charge and discharge efficiency of the product is measured in accordance with the provisions of GB/T 37201. The charge and discharge voltage range is negotiated between the supplier and the purchaser.

5.13 Recycling life

The recycling life of product shall be measured in accordance with the provisions of GB/T 37207.

The charge and discharge voltage range is determined by negotiation between the supplier and the purchaser.

6.1.1 Products shall be inspected by the supplier or a third party to ensure that product quality

complies with the provisions of this document and the order form.

6.1.2 The purchaser may inspect the received products in accordance with the provisions of this document and the order form. If the inspection results are inconsistent with the provisions of this document and the order form, it shall be submitted to the supplier within 3 months from the date of receipt of the product; and the matter shall be resolved through negotiation between the supplier and the purchaser. If arbitration is required, arbitration sampling shall be conducted on the supplier, and shall be conducted jointly by both the supplier and the purchaser.

6.2 Batching

Products shall be submitted for acceptance in batches. Each batch shall be composed of a mixture of products with the same production cycle and the same chemical composition. The weight of each batch shall not exceed 5 t. When the purchaser has special requirements, it shall be determined through negotiation between the supplier and the purchaser.

6.3.1 Inspection classification

- c) Net weight;
- d) Name of supplier;
- e) Factory address;
- f) "Rainproof" mark.

7.2 Packaging

The product is packed in aluminum-plastic lined bags, sealed and put into outer packaging barrels, with a net weight of 25 kg per barrel. If the purchaser has special requirements for the packaging, it shall be determined through negotiation between the supplier and the purchaser.