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

GB/T 33822-2025

Replacing GB/T 33822-2017

Nano lithium iron phosphate

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1 Scope

This document specifies the technical requirements, inspection rules, packaging, marking, transportation, storage, and order form contents for nano lithium iron phosphate, and describes the corresponding test methods.

This document applies to the manufacturing and inspection of nano lithium iron phosphate, a cathode material for lithium-ion batteries. Molecular formula. LiFePO_4 .

Relative molecular mass. 157.755 (based on the 2023 international relative atomic mass).

2 Normative References

GB/T 1479.1

GB/T 5162

GB/T 5314

GB/T 6388

GB/T 6682

GB/T 19077

GB/T 19587

GB/T 41232.6

GB/T 41232.8

GB/T 41704-2022

GB/T 42161

GB/T 42260

GB/T 44330

GB/T 45324

3 Terms and Definitions

The following terms and definitions are applicable to this document.

3.1 Magnetic impurities

Impurities in lithium-ion battery cathode materials that can be adsorbed by a magnetic rod with a magnetic induction intensity of not less than 0.5 T (5,000 Gauss).

NOTE. magnetic impurities are usually elemental or compound forms of iron, chromium, nickel and zinc.

[source. GB/T 41704-2022, 3.1, modified]

3.2 Apparent density

The bulk density of powder measured after it has been freely filled into a standard container under specified conditions.

NOTE. the mass per unit volume when the powder is loosely packed.

3.3 Tap density

The mass per unit volume of powder measured after it has been tapped in a container under specified conditions.

3.4 Compacted density

The ratio of the mass of powder sample after it has been compacted under a certain pressure to its occupied volume.

[source. GB/T 41232.2-2021, 3.1.2]

1) Joint Committee on Powder Diffraction Standards.

3.5 Powder resistivity

The ratio of the electric field intensity to the steady-state current density within the powder material.

NOTE. this refers to the volume resistivity per unit volume.

3.6 Specific capacity

The electrochemical capacity of a unit mass of active material under specified conditions for charging or discharging.

[source. GB/T 20252-2014, 3.1, modified]

3.7 Initial charge-discharge efficiency

The percentage of the initial discharge capacity to the charge capacity of an active material under specified conditions.

3.8 Cycle performance

After a certain number of charge-discharge cycles under specified conditions, the percentage of the discharge capacity to the initial discharge capacity of an active material.

4.1 Appearance

The product shall be gray-black powder with uniform color and no lumps.

4.2 Chemical Composition

4.2.1 The chemical composition of the product shall conform to the provisions of Table 1.

4.6.3 Room-temperature cycle performance

At 25 °C ± 2 °C, the full battery shall undergo 1,000 charge-discharge cycles at 1 C. The discharge capacity of the 1,000th cycle shall not be less than 90% of the initial discharge capacity.

NOTE. the initial discharge capacity is generally the discharge capacity after the 2nd or 3rd charge-discharge cycle or determined through negotiation between the supply-side and the demand-side.

4.6.4 High-temperature cycle performance

At 45 °C ± 2 °C, the full battery shall undergo 600 charge-discharge cycles at 1 C. The discharge capacity of the 600th cycle shall not be less than 90% of the initial discharge capacity.

5.1 Appearance

The product appearance shall be visually inspected.

5.2 Chemical Composition

5.2.1 The determination of iron content shall be carried out in accordance with Appendix A or the method determined through negotiation between the supply-side and the demand-side.

5.2.2 The determination of phosphorus content shall be carried out in accordance with Appendix A or the method determined through negotiation between the supply-side and the demand-side.

5.2.3 The determination of lithium content shall be carried out in accordance with the provisions of Appendix A.

5.2.4 The determination of impurity content shall be carried out in accordance with the provisions of Appendix A.

5.2.5 The determination of carbon content shall be carried out in accordance with the provisions of GB/T 41232.6.

5.2.6 The determination of moisture content shall be carried out in accordance with the provisions of GB/T 41232.8.

5.2.7 The determination of magnetic impurity content shall be carried out in accordance with the provisions of 4.1 in GB/T 41704-2022 or the method determined through negotiation between the supply-side and the demand-side. The determination of the number of magnetizable metal impurity particles shall be carried out in accordance with the provisions of

5.3 Physical Properties

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