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

GB/T 43012-2023

**Pulp - Determination of cellulose nanocrystal sulfur and sulfate
half-ester content**

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1. Structure and Drafting Rules of Standardization Documents"

Drafting.

This document is modified to adopt ISO 21400.2018 "Determination of sulfur element and sulfate half-ester content in pulp cellulose nanocrystals".

The technical differences between this document and ISO 21400.2018 and their reasons are as follows.

---Replaced ISO /T S80004-1 (see Chapter 3) with the normatively quoted GB/T 30544.1 to adapt to my country's technical conditions;

---Replaced ISO /T S80004-6 (see Chapter 3) with the normatively quoted GB/T 30544.6 to adapt to my country's technical conditions;

---Replaced ISO 3696 (see 5.2.1, 6.2.1, A.1.1) with normatively quoted GB/T 6682 to adapt to my country's technology

condition;

---Replaced ISO 14644-1 (see A.1.7) with the normatively cited GB/T 25915.1 to adapt to my country's technical conditions.

Please note that some content in this document may be subject to patents. The publisher of this document assumes no responsibility for identifying patents.

1 Scope

This document describes the laboratory determination of fibers by inductively coupled plasma optical emission spectroscopy (ICP-OES) and conductometric titration, respectively.

Steps to determine the content of elemental sulfur and sulfate half-ester in plain nanocrystals (CNCs).

This document applies to the following types of cellulose nanocrystals.

- a) With monovalent counterions (especially hydronium ions and sodium ions);
- b) Dispersions that have not been dried or are redispersed from a dry state;
- c) It is obtained by hydrolyzing cellulose raw materials in nature through sulfuric acid or hydrolyzing and then acidifying with sulfuric acid.

2 Normative reference documents

The contents of the following documents constitute essential provisions of this document through normative references in the text. Among them, the dated quotations

For undated referenced documents, only the version corresponding to that date applies to this document; for undated referenced documents, the latest version (including all amendments) applies to

this document.

GB/T 6682 Analytical laboratory water specifications and test methods (GB/T 6682-2008, ISO 3696:1987, MOD)

GB/T 25915.1 Clean rooms and related controlled environments Part 1. Classification of air cleanliness levels according to particle concentration

(GB/T 25915.1-2021, ISO 14644-1:2015, MOD)

GB/T 30544.1 Nanotechnology terminology Part 1. Core terms (GB/T 30544.1-2014, ISO /T S80004-1.

2010, IDT)

GB/T 30544.6 Nanotechnology terminology Part 6. Characterization of nano-objects (GB/T 30544.6-2016,

ISO /T S80004-6:2013, MOD)

ISO /T S80004-2 Nanotechnology Vocabulary Part 2. Nanotechnologies-Vocabulary-Part 2. Nano-objects)

3 Terms and definitions

The following terms and definitions as defined in GB/T 30544.1, GB/T 30544.6 and ISO /T S80004-2 apply to this document.

3.1

nanoscale

In the size range between 1nm and 100nm.

Note. This size range generally, but not exclusively, exhibits characteristics that cannot be extrapolated from larger sizes.

[Source. GB/T 30544.1-2014,2.1]

3.2

nano-object nano-object

Materials whose one, two or three external dimensions are at the nanometer scale (3.1).