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

GB/T 30544.3-2025

Replacing GB/T 30544.3-2015

Nanotechnologies - Vocabulary - Part 3: Carbon nano-objects

纳米科技 术语 第3部分：碳纳米物体

(English Translation)

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document is part 3 of GB/T 30544 "Nanotechnology Terminology". GB/T 30544 has been published in the following parts.

- Part 1: Core terms;
- Part 3: Carbon nanomaterials;
- Part 4: Nanostructured materials;
- Part 5: Nano/bio interfaces;
- Part 6: Characterization of nano-objects;
- Part 7: Nanomedicine diagnosis and therapy;
- Part 8: Nanomanufacturing processes;
- Part 12: Quantum phenomena in nanotechnology;
- Part 13: Graphene and related two-dimensional materials.

This document replaces GB/T 30544.3-2015 "Nanotechnology Terminology Part 3: Carbon Nanoobjects".

Compared with 2015, in addition to structural adjustments and editorial changes, the main technical changes are as follows.

- a) The definitions of "nano-object" and "nanoparticle" have been changed (see 3.1.3, 3.1.5, 2.2, 2.3 of the 2015 edition);
- b) Added "nanomaterials", "nanostructured materials", "layers", "two-dimensional

materials", "double-layer graphene", "bunch of grapes", "nodules", "Delete the terms and definitions of "wavelength", "quantum confinement" and "quantum dot" (see 3.1.2, 3.1.4, 3.1.15, 3.1.16, 3.1.17, 3.1.19, 3.1.20, 3.1.21, 3.1.22, 3.1.23);

c) Deleted the term and definition of "cup-stacked carbon nanotubes" (see 4.8 of the 2015 edition);

d) Added the term "carbon nano-objects containing nanostructures" (see 3.4).

This document is modified to adopt ISO/T S80004-3:2020 "Nanotechnology Terminology Part 3: Carbon Nanoobjects", and the file type is changed from ISO 's technical specifications are adjusted to our country's national standards.

The technical differences between this document and ISO/T S80004-3:2020 and their reasons are as follows.

--- Increased the scope of application of this document;

--- The term and definition of "carbon quantum dots" in 3.3.11 of ISO/T S80004-3:2020 have been deleted as the term is incorrect.

Introduction

In recent years, the rapid development of nanotechnology has promoted the discovery, synthesis and manufacture of a variety of new carbon-based nanomaterials, including fullerenes, Graphene and carbon nanotubes. These materials have unique electronic, electromagnetic, thermal, optical and mechanical properties and are widely used in many fields related to nanotechnology.

It shows wide application potential in various fields.

As scientific knowledge accumulates and technology develops, the terminology for these materials is becoming more and more diverse. This document aims to unify the definition of carbon Important terms and concepts of nano-objects are introduced, and their interrelationships with each other and with traditional carbon material terms are clarified.

This document is part of a body of standardized terminology for many aspects of nanotechnology. The definitions in this document are consistent with the emerging terminology of nanotechnology.

The hierarchical structure system is consistent. In some cases, the terminology hierarchy method also needs to be coordinated with the specific usage of individual terms. GB/T 30544.13 this document further supplements this document by providing terminology for graphene and related two-dimensional materials. This document contains only a subset of these terms.

This document aims to promote the research and development, industrial application and

cooperation of relevant stakeholders of carbon-based nanomaterials by unifying the key terms and concepts of these materials.

Communication between.

my country has established a basic national standard system for terminology in the field of nanotechnology. GB/T 30544 is planned to consist of 14 parts.

constitute.

--- Part 1: Core terms. The purpose is to define the basic terms in the field of nanotechnology.

--- Part 2: Nano-objects. The purpose is to define the terminology of nano-objects.

--- Part 3: Carbon nano-objects. The purpose is to define the terminology of carbon nano-objects.

--- Part 4: Nanostructured materials. The purpose is to define the terms related to nanostructured materials.

--- Part 5: Nano/bio interface. The purpose is to define the terminology of nano/bio interface.

--- Part 6: Characterization of nano-objects. The purpose is to define the terms for characterization of nano-objects.

--- Part 7: Nanomedicine diagnosis and therapy. The purpose is to define the terms of nanomedicine diagnosis and therapy.

--- Part 8: Nanomanufacturing processes. The purpose is to define the terminology of nanomanufacturing processes.

--- Part 9: Nano-electrotechnical products. The purpose is to define the terminology of nano-electrotechnical products.

--- Part 10: Nanophotonic devices. The purpose is to define the terminology of nanophotonic devices.

--- Part 11: Nanolayers, nanocoatings, nanofilms and related terms. The purpose is to define nanolayers, nanocoatings, nanofilms and related terms.

Membranes and related terms.

--- Part 12: Quantum phenomena in nanotechnology. The purpose is to define the terminology of quantum phenomena in nanotechnology.

--- Part 13: Graphene and related two-dimensional materials. The purpose is to define the terms of graphene and related two-dimensional materials.

--- Part 14: Graphdyne. The purpose is to define the terms related to Graphdyne.

Nanotechnology Terminology Part 3: Carbon nano-objects

1 Scope

This document defines terms related to carbon nanoobjects in the field of nanotechnology.

This document aims to promote mutual communication among nanotechnology stakeholders. GB/T 30544.13 provides information on graphene and two-dimensional materials.

Other terms and definitions.

Appendix A lists carbon nanomaterials related to traditional carbon materials.

This document applies to terminology related to carbon nano-objects in the field of nanotechnology.

2 Normative references

This document has no normative references.

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 Basic terms for describing carbon nanoobjects

3.1.1

Nanoscale

The size range is 1nm~100nm.

[Source. ISO 80004-1:2023, 3.1.1] 3.1.2 Nanomaterials Materials with one or more external dimensions on the nanometer scale (3.1.1) or containing nanometer-scale internal or surface structures.

Note 1 to entry. This generic term includes nano-objects (3.1.3) and nano-structured materials (3.1.4).

Note 2: See engineered nanomaterials, manufactured nanomaterials and associated nanomaterials.

[Source. ISO 80004-1:2023, 3.1.4] 3.1.3 Nano-object Discrete materials whose external dimensions are on the nanometer scale in one, two or three dimensions (3.1.1).

[Source. ISO 80004-1:2023, 3.1.5] 3.1.4 Materials with nanostructures inside or on their surfaces.

NOTE This definition does not exclude nano-objects (3.1.3) that contain internal or surface nanostructures.