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

GB/T 30544.6-2016

**Nanotechnologies -- Vocabulary -- Part 6: Nano-object
characterization**

纳米科技 术语 第6部分：纳米物体表征

(English Translation)

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Foreword

GB/T 30544 The term "nanotechnology terminology" has been or is intended to be published in the following sections.

- Part 1. Core terminology;
- Part 2. Nanoparticles. Nanoparticles, nanofibers and nanosheets;
- Part 3. Carbon nano - objects;
- Part 4. nanostructured materials;
- Part 5. Nano/biological interface;
- Part 6. Characterization of nano - objects;
- Part 7. Medical diagnosis and treatment of nanoscale;

- Part 8. Nano manufacturing process;
- Part 9. Nanoelectronic products and systems;
- Part 10. Nano photon components and systems;
- Part 11. nano - layers, nano - coatings, nanofilm and related terms;
- Part 12. Quantum phenomena in nanotechnology;

Part 13. graphene and other two - dimensional materials.

This part is part 6 of GB/T 30544.

This part is drafted in accordance with the rules given in GB/T 1.1-2009.

This section uses the re-drafting method to modify ISO/T S80004-6..2013 "Nanotechnology terminology Part 6. Nano-meter Levy ".

This section has technical differences with ISO/T S80004-6..2013, and the terms involved in these differences have passed through the margin the vertical single line (-) of the position is marked.

The technical differences between this section and ISO/T S80004-6..2013 are as follows.

--- modified the original standard of

2.3,2.4,2.9,3.1.2,3.1.3,3.2.7,3.2.8,3.5.6,3.6.1,3.6.2,4.13,4.14,4.21 and 5.1.2.

For ease of use, this section also makes the following editorial changes to ISO/T S80004-6..2013.

--- delete the focus of the text with the text of the note 3;

--- delete the contents of the text with a duplicate of Note 1;

--- exchange the order of 2.5 and 2.6;

- in the 3.2.7 and 3.2.8 first appeared in the "Brownian movement" place to join the corresponding English noun "(Brownianmotion)", and Deleted the English word "(Brownian)";

- delete Note 3 in 3.4.4;

--- 3.5.13 as a Note 1 into 3.5.13;

--- 4.15 as Note 1 into 4.16;

- has been adopted in the international standard or national standards have been defined, with the corresponding national standard number instead of the international standard number.

This part is presented by the Chinese Academy of Sciences.

This part is headed by the National Technical Committee for Nanotechnology Standardization (SAC/TC279).

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Introduction

Measurement and instrumentation technology effectively opens the door to modern nanotechnology, which characterizes the nature and work of all nano-objects can be the key.

Nano-object characterization involves communication between people in different backgrounds and areas. For example, people who are interested in characterizing nano objects may be Mainly has a test background or theoretical background, including material scientists, biologists, chemists or physicists. Using people who characterize the data Members are beyond the scope of this group, including regulators and toxicologists. In order to avoid misunderstanding, improve comparability and reliable information exchange, it is necessary to clarify concepts, establish terms and their definitions.

The terms of this section are classified by the following headings.

Chapter 2. General terms;

- Chapter 3. Dimensions and Morphology Measuring Terms;

Chapter 4. Chemical Analysis Terms;

Chapter 5. Other properties Measuring terminology.

Because some techniques can measure more than one nature, these headings are for guidance only. 3.1 lists the remainder applicable to Chapter 3 Mainly measured physical quantity. The other measured physical quantities are more dependent on the specific technology and will be placed at the text adjacent to the measurement technique. a, Most of the techniques need to be analyzed in the unnatural state of the sample and involve sample preparation. Such as placing a nano object on a surface or will which is placed in a particular fluid or vacuum, which may alter the properties of the nanometer object.

The technical ordering of this section should not be understood as a prioritization, and the techniques listed in this section are not intended to exhaust all the techniques. The same, in Some of the techniques listed in this section are more commonly used than other techniques when analyzing a certain nature of a nanometer object. Table 1 lists the nano-objects used Characterize the main technology.

Table 1 Main techniques for characterization of nano-objects

Nature of the main technology size Atomic force microscopy (AFM), liquid centrifugal sedimentation (CLS), differential migration Rate analysis system (DMAS), dynamic light scattering (DLS), scanning electron microscopy (SEM), particle tracking analysis (PTA), transmission electron microscopy (TEM) Morphology Atomic force microscopy (AFM), scanning electron microscopy (SEM), transmission electrons Microscopy (TEM) Specific surface area Bruno-Amit-Taylor method (BET method) "Surface" chemical secondary ion mass spectrometry (SIMS), X-ray photoelectron spectroscopy (XPS) "Bulk" sample chemical inductively coupled plasma mass spectrometry (ICP-MS), nuclear magnetic resonance spectroscopy (NMR) the charge zeta-potential in the suspension this part is intended to provide a starting reference for terminology in nanotechnology measurement and characterization.

Nanotechnology terminology Part 6. Characterization of nano - objects

1 Scope

This part of GB/T 30544 specifies the terms and definitions associated with the characterization of nanoscale objects.

Common terminology

Nanoscale

In the range of 1 nm to 100 nm.

Note 1: Some properties can not be extrapolated by large size, but are typically expressed in this size range. For these characteristics, the scale, the lower limit is approximate.

Note 2: The introduction of the lower limit (about 1 nm) in this definition is intended to avoid the consideration of a single atom or atomic cluster as a nanometer object (2.2) or a nanostructure unit.

[GB/T 30544.1-2014, definition 2.1] 2.2 Nano-object in an dimension, two dimensions, or three dimensions on an outer dimension at a nanoscale (2.1) object.

Note: General terms for all discrete nanoscale objects.

[GB/T 30544.1-2014, definition 2.5] 2.3 Nanoparticles the three dimensions of the external dimensions are at the nanometer scale (2.1) and the major axis and the minor axis ratio are less than 3 times the nano object (2.2).

Note 1: If the long axis and the minor axis ratio of the nanometer object are more than 3 times, it is usually called nanorods (2.6) and nanosheets (2.4).

Note 2: Revision of GB/T 32269-2015, definition 4.1.

Nanoplate