



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

GB/T 41204-2021

**Nanotechnologies - Measurement technique matrix for the
characterization of nano-objects**

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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 of Standardization Documents"

drafted:

This document is modified using ISO /T R18196:2016 "Measurement Technique Matrix for Characterization of Nanoscale Objects in Nanotechnology": file type by

The technical report of ISO is adjusted to the national standard of our country:

Compared with ISO /T R18196:2016, this document has made the following structural adjustments:

--- deleted 5:25:5:2;

--- 5:29:3:7:1~5:29:3:7:5, A:2:2:2:1~A:2:2:2 are changed to list items:

The technical differences between this document and ISO /T R18196:2016 and their reasons are as follows:

--- Chapter 1 adds the description of the scope of application of the standard to meet the specific situation of our country;

--- ISO /T S80004-1 and ISO /T S80006-6 referenced normatively in Chapter 3 are replaced with the corresponding Chinese standards and incorporated into

Chapter 2 Normative references to suit the specific situation of our country;

--- "Size" in 5:24:2 is changed to "object mass" to ensure its scientific nature;

--- Delete the content of 5:25:5:2, the technical content is not applicable;

--- Modify "9nm" in 5:29:3:7 to "50nm~100nm" to conform to the current state of technology in my country;

---5:36:2 Add "binding energy" to adapt to the specific situation of our country:

The following editorial changes have been made to this document:

--- Chapter 3 deleted IEC online browsing platform and website and ISO online browsing platform and website;

--- 5:22:4:3 To avoid repetition, delete the last sentence "The upper limit of particle size detection is limited by the sedimentation in the liquid, which is about a few microns";

--- The first sentence of 5:28:1 is amended to read "The surface analysis method using the probe to scan the surface to be tested and measuring the accompanying response of the detector";

---In the note of 5:29:1, "the spectrum for obtaining information about the surface of the sample" is added:

Please note that some content of this document may be patented: The issuing agency of this document assumes no responsibility for identifying patents:

Introduction

This document correlates frequently measured nanoobject parameters with the corresponding measurement techniques and is a tool for nanotechnology stakeholders to rapidly determine nanomaterials:

Useful tool for measuring information about objects: The measurands of common nano-objects are listed in row 1 of the quick look-up table (see Table 1): If listed in the moment

If the measurement technique for the first column of the array is applicable, mark the intersection of the corresponding row and column in the table: If you need to learn about a measurement technique, you can

The chapter finds descriptions of the corresponding measurement techniques, their advantages and disadvantages, relevant standards, measurands, and the measurable nanoobject parameters for each technique: With technology

As more measurement techniques develop, this document will be regularly reviewed and updated to maintain its applicability:

Some of the measurement techniques listed in this document have not been verified by comparative experiments or other measurement methods: This document is intended as a relevant measurement

A repository of technical information, but not the final or original repository: Readers can refer to relevant standards after determining a certain measurement technology, and

Application for literature research: Other reference materials include instrument instructions and technical literature:

Nanotechnology Matrix of Measurement Techniques for Characterization of Nanoobjects

1 Scope

This document provides a matrix of measurement techniques for characterizing common physicochemical parameters of nanoobjects: Some measurement techniques are also applicable to nanostructures

Material:

This document is applicable to the measurement of common physical and chemical parameters in the field of nanotechnology, and the measurement of physical and chemical parameters in other fields can be referred to:

NOTE: Appendix A gives guidelines for sample isolation and preparation:

2 Normative references

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

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

this document:

GB/T 30544:1 Nanotechnology Terminology Part 1: Core Terminology (GB/T 30544:1-2014, ISO /T S80004-1:

2010, IDT)

GB/T 30544:6 Nanotechnology Terminology Part 6: Characterization of Nanoscale Objects (GB/T 30544:6-2016, ISO /T S80004-6:

2013, MOD)

3 Terms and Definitions

The terms and definitions defined in GB/T 30544:1 and GB/T 30544:6 and the following terms and definitions apply to this document:

3:1 General terms

3:1:1

dispersion system

A heterogeneous system in which finely divided material is dispersed in another substance:

[Source: ISO 472:2013, 2:288]

3:1:2

measurand to be measured

the quantity being measured:

[Source: ISO Guide99:2007, 2:3]

3:1:3

nano-object

Discrete materials with external dimensions at the nanoscale in one, two or three dimensions:

Note: The second and third dimensions are perpendicular to the first dimension and to each other:

[Source: ISO /T S80004-2:2015, 2:2]

3:1:4

nanostructuredmaterial

A material whose internal or surface structure is at the nanoscale: