

ICS 71.040.50

CCS A 40



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

GB/T 39261-2020

**Nanotechnologies. Guidance on physico-chemical
characterization of engineered nanoscale materials for
toxicologic assessment**

Issued on: November 19, 2020

Implemented on: June 1, 2021

**Issued by: State Administration for Market Regulation, China National
Standardization Administration**

Table of Contents

1 Scope	1
2 Terms and definitions	1
3 Abbreviations	5
4 Importance of physicochemical characterization before toxicological assessment	5
5 Characterization parameters of physical and chemical properties of nano-objects before toxicological assessment	9
6 Measurement results and uncertainty	16
7 Report	17
Appendix A (informative appendix) illustrates the application of physical and chemical characterization in toxicological testing	19
Appendix B (Informative Appendix) Examples of Measurement Methods and Standards	20
Reference	23

Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This standard uses the translation method equivalent to ISO /T R13014.2012

"Nanotechnology and Nanomaterials Physical and Chemical Properties before Toxicology Evaluation"

Enlistment Guide.

This standard has made the following editorial changes.

---Reorder the references.

This standard was proposed by the Chinese Academy of Sciences.

This standard is under the jurisdiction of the National Nanotechnology Standardization Technical Committee (SAC/TC279).

Drafting organization of this standard. National Nano Science Center.

Introduction

In recent years, with the widespread application of nanomaterials in consumer goods and other products, people have increasingly paid attention to exposure to nanomaterials (especially

It is the health and environmental problems that may be caused by nano-objects and their aggregates and aggregates (NOAA)]. Although there has been a lot of information about NOAA

However, most of these studies did not provide detailed physical and chemical characterization data, or did not evaluate and compare the test results obtained.

fruit. Given that different NOAAs have similar compositions, specific physical and chemical characterization is the key to determining the material under study, and is conducive to further

Step to understand the toxicity of nanomaterials.

This guide provides guidance for the physical and chemical characterization of commercial man-made nano-objects before toxicity assessment (including population and ecological assessment). The purpose is to cooperate

To help scientists in other fields understand, plan, identify and confirm the physical and chemical properties of these materials before conducting toxicological research.

The premise of academic evaluation is consistent with other ISO standards. For example, ISO 10993-18 provides chemical tables for materials used in medical equipment.

According to ISO 14971, toxicological risk analysis needs to consider the chemical properties of materials.

Characterization of physical and chemical properties can provide important information for a better understanding of the relationship between toxicological test results and physical and chemical properties. This guide

The following valuable physical and chemical characterization information is provided to facilitate subsequent toxicological evaluation.

---How does the physical and chemical characterization fit in with NOAA's toxicology testing process;

---Physical and chemical characterization is the key to toxicology testing;

---What parameters are included in the physical and chemical characterization.

nanotechnology

Guidelines for characterization of physical and chemical properties of nanomaterials before toxicological evaluation

1 Scope

This standard provides guidance on the characterization of physical and chemical properties of man-made nano-objects and aggregates and aggregates (NOAA) larger than

100 nm.

The purpose is to provide assistance in evaluating and clarifying the influence of physical and chemical properties on toxicological effects, and it can also be used to distinguish the material to be tested from its similar materials.

material. This standard provides descriptions, instructions, correlations, examples of methods to be measured and test methods for each physical and chemical property.

This standard is intended for researchers who are committed to studying the potential toxicological effects of NOAA (such as toxicologists, ecotoxicologists, management personnel,

Health and safety experts) have reference value.

2 Terms and definitions

ISO /T S27687, ISO /T S80004-1, ISO /T S80004-3, ISO /IEC Guide99 and the following terms and definitions apply to this document.

2.1

Aggregates

The external surface area of new particles composed of strongly bound or fused particles may be significantly smaller than the sum of the surface areas of individual particles.

Note 1.The forces supporting the aggregates are strong forces, such as covalent bonds or derived from sintering or complex physical entanglement.

Note 2.Aggregates are also called secondary particles, while source particles are called primary particles.

[ISO /T S27687.2008, definition 3.3]

2.2

Aggregates

The aggregates, aggregates, or mixtures of weakly bound particles have an external surface area similar to the sum of the surface area of individual particles.

Note 1.The forces supporting the agglomerates are weak forces, such as van der Waals forces or simple physical entanglements.

Note 2.Agglomerates are also called secondary particles, while source particles are called primary particles.

[ISO /T S27687.2008, definition 3.2]

2.3

Carbon nanotube

Nanotubes made of carbon atoms.

Note. It is usually composed of crimped carbon monolayers, including single-wall carbon nanotubes and multi-wall carbon nanotubes.

[ISO /T S80004-3:2010, definition 4.3]

2.4

colloid

A multi-phase substance composed of nanoparticles (1nm to 100nm) uniformly suspended in a liquid (dispersion medium) by the action of electric charges, which

These particles exhibit Brownian motion and electrophoresis.

Note 1.It has colloidal properties.

Note 2.Rewrite ISO 1942-2.

2.5

composition

The properties of nanomaterials are determined by the characteristics and composition of each specific component.

Note. Rewrite ISO 6141.