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

GB/T 44234-2024

**Nanotechnology-Measurement of thermodynamic and kinetic
parameters of interface interaction between nanomaterials and
gases-Microgravimetric analysis method**

纳米技术 纳米材料与气体表界面作用热力学参数和动力学参数测量 谐振微质量
法

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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 is required.

Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents.

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Introduction

Functional nanomaterials based on interfacial molecular interactions are widely used in the fields of information acquisition, ecological environment, new energy, health care, etc.

This paper describes a resonant micromass method using a resonant microcantilever as the core measurement tool for the purpose of The acquisition of thermodynamic parameters and kinetic parameters of interfacial interaction provides a standard measurement method. This method can effectively avoid the traditional measurement method problems, obtain thermodynamic and kinetic parameters including enthalpy change, entropy change, Gibbs free energy, activation energy, etc., and take into account scientific research Research and industrial application needs.

Nanotechnology, nanomaterials and gas surface interface Thermodynamic and kinetic parameter measurements Resonant Micromass Method

1 Scope

This paper describes a method for obtaining thermodynamic and kinetic parameters of the interface between nanomaterials and gases based on the resonant micromass method.

Including method principles, instruments and equipment, test samples and reagents, test methods, data processing, and test reports.

This document applies to the measurement of thermodynamic and kinetic parameters, including standard enthalpy change (ΔH°), standard entropy change (ΔS°), standard Gibbs free energy change (ΔG°), activation energy (E_a), etc.

2 Normative references

GB/T 2298-2010

GB/T 13464-2008

GB/T 21650.2-2008

GB/T 26111-2023

GB/T 30544.1-2014

GB/T 33047.2-2021

3 Terms and definitions

GB/T 2298-2010, GB/T 13464-2008, GB/T 21650.2-2008, GB/T 26111-2023, The terms and definitions defined in GB/T 30544.1-2014 and GB/T 33047.2-2021 and the following apply to this document.

3.1 Nanomaterials

Any material whose external dimension, internal or surface structure is at the nanoscale.

[Source. GB/T 30544.1-2014, 2.4]

3.2 Resonance

resonance The system response of a forced oscillation system will decrease even when there is a small change in the excitation frequency.

[Source. GB/T 2298-2010, 3.80, modified]

3.3 Resonance micromass method microgravimetric analysis method

A method of measuring tiny mass changes using resonant microsensors such as resonant microcantilever beams.