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

GB/T 13181-2024

Replacing GB/T 13181-2002

Methods of performance measurement for solid scintillators

固体闪烁体性能测量方法

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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:

This document replaces GB/T 13181-2002 "Scintillator performance measurement method": Compared with GB/T 13181-2002, in addition to the structural adjustment

Besides the editorial changes, the main technical changes are as follows:

a) The scope of application of the standard has been changed (see Chapter 1, Chapter 1 of the:2002 edition):

b) Added "scintillation" (see 3:1:1), "packaged scintillator" (see 3:1:6), "light output non-uniformity" (see 3:1:11), "alpha-beta ratio" (see

3:1:13), "afterglow" (see 3:1:15), "conformity resolution time" (see 3:1:16), "irradiation hardness" (see 3:1:21), "self-radioactivity

level" (see 3:1:22), "detector efficiency" (see 3:1:23), "beta-gamma ratio" (see 3:1:24), "n-gamma ratio" (see 3:1:25), scintillator

Array (see 3:1:27), "non-uniformity of scintillator array" (see 3:1:28), "optical crosstalk of scintillator array" (see 3:1:29), etc:

Terms and definitions:

c) The standard test conditions for AC power supply voltage and AC power supply frequency have been changed (see 4:1, 4:1 of the:2002 edition):

d) The requirements for scintillator standard samples were changed, and "comply with the relevant provisions of GB/T 4077" was deleted:

The requirements for sample size are added as a new informative annex (see 4:2:3 and Appendix B, 4:2:3 of the:2002 edition):

- e) The requirements for "instability of the measurement system" have been changed (see 4:2:6:2, 4:2:6:3 and 5:1:2:3 of the:2002 edition):
- f) Added the description of the number of repetitions of physical quantity measurement (see 4:3:9):
- g) The calculation formula for "relative light output" has been changed (see 5:1:4, 5:1:4 of the:2002 edition):
- h) Deleted the content on measurement error in data processing of the "Relative Light Output" and "Relative Energy Conversion Efficiency" measurement methods
(See 5:1:4, 5:2:4 and 6:4:2 of the:2002 edition):
- i) Added the measurement method for "light output of packaged scintillator" (see 5:3):

1 Scope

This document describes the relative light output, relative energy conversion efficiency, alpha-beta ratio, intrinsic pulse amplitude resolution, scintillation light attenuation of the scintillator:

length, emission spectrum, time characteristics, irradiation hardness, intrinsic radioactivity level, beta-gamma ratio and n-gamma ratio, temperature effect, non-uniformity of scintillator array

Measurement methods for optical crosstalk, etc:

This document applies to the performance measurements of commonly used solid scintillators:

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document:

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to This document:

GB 4075 General requirements and classification of sealed radioactive sources

GB/T 10257-2001 Quality inspection rules for nuclear instruments and nuclear radiation detectors

GB 18871 Basic Standard for Ionizing Radiation Protection and Radiation Source Safety

GB/T 28544 Measurement method for light output and intrinsic resolution of packaged scintillators