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

GB/T 16698-2008

Replacing GB/T 16698-1996

**Measurement of emission rate of alpha particle - Method for
large area proportional counter**

α粒子发射率的测量 大面积正比计数管法

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Foreword

This standard replaces GB/T 16698-1996 "alpha particle emission rate measurement of a large area proportional counter tube method." This standard GB/T 16698-1996 main changes are as follows:

- a) the proportional counter tube by the 1996 version of the standard and size of 170mm x 120mm to 170mm x 130mm;
- b) delete the 1996 version of the standard in Chapter 4 on proportional tube working gas, pre-amplifier, high voltage power supply, the main amplifier, single channel pulse Analyzer dead time control circuit and a scaler content requirements;
- c) The 1996 version of the standard

1 Scope

GB/T 16698-2008 is the Chinese national standard on measurement of emission rate of alpha particle - method for large area proportional counter, in the field of metrology and measurement. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 19 September 2008 by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China; Standardization Administration of China, and has been in force since 1 August 2009. Classification: ICS 17.240, CCS F04. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This standard specifies the gas-flow with a large area multi-wire proportional counter 2pi absolute measurement of alpha particle emission rate principle, means, methods and number Data processing and the like. This standard applies to an area no larger than

170mm x 130mm, and the alpha particle emission rate of $1 \times 10^5 \text{ s}^{-1} \sim 1 \times 10^4 \text{ s}^{-1}$ (2pi sr) Fan Alpha plane around the source. This standard can also be used as beta particle emission measurement reference.

2 Normative references

The following documents contain provisions which, through reference in this standard and become the standard terms. For dated references, subsequent Amendments (not including errata content) or revisions do not apply to this standard, however, encourage the parties to the agreement are based on research Whether the latest versions of these documents. For undated reference documents, the latest versions apply to this standard.

GB/T 4960.4 radionuclides in nuclear science and technology terms

JJF1059 Evaluation and Expression of Uncertainty in Measurement

3 Terms and Definitions

GB/T terms and definitions as well as the following terms and JJF1059 established 4960.4 apply to this standard.

3.1 Surface emission rate is emitted per unit time source surface (or window) has an energy greater than a given number of certain particles.

3.2 A system for measuring large-area sources, in proportional area of $\sim 200 \text{ cm}^2$ gas ionization detector.

4 Fundamentals

Large 2pi multifilament windowless gas flow proportional counter tube (hereinafter referred to as proportional tube) is an anode by a plurality of parallel wires, can be measured Omo Plot alpha, beta plane source particle emission rate is proportional counter tube, usually using gas-flow work, its intrinsic detection efficiency of alpha particles close 100%. When measuring the source into the proportional tube, alpha particles of the working gas ionization to produce positive and negative ions, after gas amplification, the anode may lose That is proportional to the particle energy electrical pulse which is amplified after the screening scalers record. Pulse count rate alpha particle and proportional control work After the relationship between voltage may form a plateau curves, count rate in the floor area of $\sim 200 \text{ cm}^2$ point source of alpha, by the end of this dead time correction and small energy losses, you can Get tested source of surface emissivity alpha particles.

5 Measurement System

5.1 Measurement System Proportional system consists of pipes, the working gas, electronic equipment, working source and other components. 1 by proportional tube

working gas, high voltage power supply, preamplifier Amplifier, main amplifier, single channel pulse analyzer dead time control circuit and a scaler and other electronic equipment components of the measurement system block diagram.

5.3.1

f) items to be restated;

d) Remove 1996 version of the standard in Appendix C. The Standard Annexes A and B are normative appendix. The standard proposed by China National Nuclear Corporation. This standard by the National Standardization Technical Committee of nuclear energy. This standard was drafted. China Institute of Atomic Energy isotopes. The main drafters of this standard. Yao Li-nung, Xiaojing, Zhang in, Qi Jie. This standard replaces the previous standard release case. GB/T 16698-1996. Measuring alpha particle emission rate A large area proportional counter tube method