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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 12519-2021

Replacing GB/T 12519-2010

General specification of analytical instruments

分析仪器通用技术条件

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1 Scope

GB/T 12519-2021 is the Chinese national standard on general specification of analytical instruments, in the field of chemical technology. 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 11 October 2021 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 May 2022. Classification: ICS 71.040.10, CCS N53. 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 document specifies the terms and definitions, instrument classification and naming, requirements, test methods, inspection rules and marking, packaging, transportation and storage of analytical instruments. This document applies to various types of analytical instruments. This document also applies to sample processing, preparation, signal processing and transmission, and auxiliary analysis devices that are used with instruments or form independent products.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 191-2008 Packaging - Pictorial marking for handling of goods

GB/T 6592 Electrical and electronic measurement equipment - Expression of performance

GB/T 9969 General principles for preparation of instructions for use of industrial products

GB/T 11606-2007 Methods of environmental test for analytical instruments

GB/T 13384 General specifications for packing of mechanical and electrical product

GB/T 13966 Terminology for analytical instruments

GB/T 18268.1-2010 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part

4.1 Classification

4.1.1 Classification by test principle According to the test principle, it is divided into electrochemical instruments, optical instruments, chromatographic instruments, mass spectrometers, spectral instruments, energy spectrum and radiation instruments, thermal instruments, etc.

4.1.2 Classification by application occasions According to the application occasions, it is divided into laboratory instruments, portable or mobile instruments, online or process instruments, etc.

4.2 Naming

4.2.1 Naming principles The naming of analytical instrument products mainly considers the test principle and the measuring object, and appropriately takes into account the habits.

4.2.2 Naming of instruments The meaning and naming method of "meter", "analyzer", "microscope", "system" and "instrument" are as follows:

a) Special analytical instruments that measure the mass of a single substance (excluding gas) and assign values should be called "meter", such as pH meter, salt meter, viscometer, etc.;

b) Instruments that measure gas can be called "analyzer", such as carbon monoxide analyzer, carbon dioxide analyzer, etc.;

c) Analytical instruments that study the morphology of the surface of substances by analyzing images can be called "microscopes", such as transmission electron microscopes,

scanning electron microscopes, etc.;

d) Analytical instruments that are composed of sample processing, analytical instruments, data management and auxiliary facilities, etc. (or parts) to achieve the whole process from sample extraction to output of analytical results are generally called "systems", such as air quality monitoring systems, water quality monitoring systems, etc.;

e) Analytical instruments other than a), b),

d) are usually (or generally) called "instruments";

f) Safety alarm instruments that only have sound and light warnings are generally called "alarms"; those with other display methods are generally called "explosion detectors, testers, and detectors."

5 Requirements

5.1 Working conditions of instruments The working conditions of instruments include. normal working conditions, reference working conditions, and extreme working conditions. The conditions of use are as follows:

a) According to the design and use conditions of the instrument, refer to the environmental conditions given in Table 1 of GB/T 11606-2007, and select all quantities that will have a non-negligible impact on the quality characteristics of the instrument and their reference values or reference value ranges as normal working conditions. When it is not possible to fully comply with the provisions of GB/T 11606-2007, the differences shall be indicated in the document.

b) When the evaluation of certain quality characteristics of the instrument needs to exclude the influence of environmental factors, reference working conditions shall be given (see Table 2 in GB/T 11606-2007).

c) If necessary, extreme working conditions shall be given.

5.2 Appearance and structure The appearance and structure of the instrument shall meet the following requirements.

a) The appearance shall be neat, the color shall be uniform, and there shall be no burrs;

b) The nameplate and logo shall be durable and clear, and the content shall comply with the requirements of relevant laws and standards;

c) The fasteners shall not be loose, the various adjustment parts shall be flexible, and the functions shall be normal;

d) The detachable parts of the instrument shall be easy to disassemble and assemble.

5.7.2 Special requirements If necessary, special environmental requirements such as low pressure, mold, salt spray, explosion-proof, etc. shall be specified by the product standard.

5.7.3 Transportation, transportation and storage The circulation conditions shall be specified in the product standard. After testing in accordance with the requirements of Clause 8, Clause 15, Clause 16, Clause 17 and Clause 18 of GB/T 11606-2007, the packaging box shall not have large deformation and damage, and the tested instrument shall not have mechanical damage such as deformation, loosening, and peeling of the coating layer, and its performance characteristics shall comply with the provisions of the product standard.

5.8 Reliability If necessary, reliability indicators such as the mean time between failures shall be specified.

5.9 Electromagnetic compatibility If necessary, electromagnetic compatibility requirements shall be specified. The instrument immunity and emission requirements shall be in accordance with GB/T 18268.1-2010.

5.10 Completeness The completeness of the instrument and its accessories shall be specified in the product standard.

6.1 Test conditions

6.1.1 Test working conditions The instrument shall be tested under the following test conditions.

a) It shall clearly specify the various environmental conditions during the test;

b) When there are special requirements, it shall specify reference conditions.

6.1.2 Test equipment

6.1.2.1 The uncertainty (or maximum allowable error) of the measuring equipment, standard substances (or physical standard samples, working standard samples), etc. used in the test shall be better than the uncertainty (or maximum allowable error) of the tested instrument and shall be within the validity period of verification or calibration.

6.1.2.2 The uncertainty of the measuring equipment, standard substances (or physical standard samples, working standard samples), etc. used in the test shall not exceed one-third of the indication error specified by the instrument. At this time, the error generated by the measurement test can be ignored.

6.1.2.3 When the uncertainty of the measuring equipment, standard substances (or physical standard samples, working standard samples), etc. used in the test is greater than one-third of the absolute value of the maximum allowable error of the instrument, the error generated by the measurement test cannot be ignored and shall be handled according to the following principles.

a) If an instrument is rated with a limit uncertainty of ±e % for a given performance characteristic, and the uncertainty of the instrument used by the manufacturer for test is ±n