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n-Butyl acetate for industrial use

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n-Butyl acetate for industrial use

WARNING -- This document does not indicate all possible safety issues. Users are responsible for taking appropriate safety and health measures and ensuring that the conditions specified by relevant national laws and regulations are met.

1 Scope

This document specifies the technical requirements, test methods, inspection rules and marking, packaging, transportation and storage of n-butyl acetate for industrial use.

This document applies to n-butyl acetate for industrial use produced by esterification of acetic acid and n-butanol in the presence of a catalyst.

NOTE: The molecular formula of n-butyl acetate is $C_6H_{12}O_2$, the structural formula is $CH_3COO(CH_2)_3CH_3$, and the relative molecular mass is 116.16 (according to the *2022 International Relative Atomic Mass*).

2 Normative references

The provisions of the following documents constitute the essential clauses of this document through normative references in this text. Among them, for referenced documents with dates, only the versions corresponding to the dates are applicable to this document; for referenced documents without dates, the latest versions (including all amendments) are applicable to this document.

GB 190 Packing symbol of dangerous goods

GB/T 601 Chemical reagent - Preparations of reference titration solutions

GB/T 603 Chemical reagent - Preparations of reagent solutions for use in test methods

GB/T 3143 Colour determination method of liquid chemicals (Hazen unit - Platinum-cobalt scale)

GB/T 3723 Sampling of chemical products for industrial use - Safety in sampling

GB/T 4472 Determination of density and relative density for chemical products

GB/T 6283 Chemical products - Determination of water Karl • Fischer method (general method)

GB/T 6324.2 Test method of organic chemical products - Part 2: Determination of dry residue after evaporation on a water bath for volatile organic liquids

GB/T 6324.8 Test methods of organic chemical products - Part 8: Determination of water of liquid products – Carl • Fischer coulometric method

GB/T 6678 General principles for sampling chemical products

GB/T 6680 General rules for sampling liquid chemical products

GB/T 6682 Water for analytical laboratory use - Specification and test methods

GB/T 8170 Rules of rounding off for numerical values & expression and judgment of limiting values

GB/T 9722 Chemical reagent - General rules for the gas chromatography

3 Terms and definitions

There are no terms or definitions that require definition in this document.

4 Technical requirements

The n-butyl acetate for industrial use shall comply with the requirements of Table 1.

5 Test methods

WARNING -- Some test procedures specified in the test methods may lead to dangerous situations. Operators shall take appropriate safety and protective measures.

5.1 General provisions

The reagents and water used in this document, unless otherwise specified, refer to analytical reagents and Grade III water specified in GB/T 6682.

The standard titration solutions, preparations and products used in the test shall be prepared in accordance with the provisions of GB/T 601 and GB/T 603 unless otherwise specified.

5.2 Determination of appearance

Add an appropriate amount of sample into a stoppered colorimetric tube and observe visually under natural light or fluorescent light.

5.3 Determination of chromaticity

Carry out the test according to the method specified in GB/T 3143.

5.4 Determination of n-butyl acetate, n-butanol, benzene, methylbenzene, ethylbenzene and xylene

5.4.1 Principle of the method

Using the capillary column gas chromatography, under selected working conditions, the sample is vaporized and then passed through the chromatographic column to separate the components, which are detected by a hydrogen flame ionization detector and quantified by the corrected area normalization method.

5.4.2 Reagents

5.4.2.1 Nitrogen: with a volume fraction of not less than 99.999%, purified by silica gel and deoxygenation tube.

5.4.2.2 Hydrogen: with a volume fraction of not less than 99.999%, purified by silica gel or molecular sieve.

5.4.2.3 Air: Purified by silica gel or molecular sieve.

5.4.2.4 n-Butanol, benzene, methylbenzene, ethylbenzene, p-xylene, o-xylene, m-xylene: chromatographically pure.

m -- the mass of the sample, in grams (g).

The arithmetic mean of the results of two parallel measurements is taken as the measurement result, and the absolute difference between the two parallel measurement results shall not be greater than 0.001%.

5.7 Determination of density

The density is measured according to the density meter method in GB/T 4472. In the range of 0 °C~40 °C, the temperature correction coefficient of the sample density is 0.0010 g/(cm^3 • °C).

The arithmetic mean of the results of two parallel measurements is taken as the measurement result. The absolute difference between the two parallel measurement results shall not be greater than 0.0005 g/cm^3.

5.8 Determination of evaporation residue

The test is carried out according to the method specified in GB/T 6324.2, with a sample size of 200 g.

The arithmetic mean of the results of two parallel measurements is taken as the measurement result, and the absolute difference between the two parallel measurement results shall not be greater than 0.0005%.

6 Inspection rules

6.1 Inspection is divided into factory inspection and type inspection. Factory inspection items include appearance, chroma, n-butyl acetate, n-butyl alcohol, moisture and acidity, which shall be inspected batch by batch. Type inspection items include all items in Table 1. Under normal production conditions, type inspection shall be carried out at least once every 6 months. Type inspection shall also be carried out in any of the following situations:

a) Any key production process is updated;

b) There are changes in the main raw materials;

c) The production is resumed after the suspension;

d) The factory inspection results are significantly different from the previous type inspection results.

6.2 Under the condition that raw materials and processes remain unchanged, the actual batches of products produced continuously are called a group batch, but the time for several production batches to form an inspection batch usually does not exceed 24 hours.

6.3 Product sampling shall be carried out in accordance with the provisions of GB/T 3723, GB/T 6678 and GB/T 6680. The sample quantity shall always meet the needs by analysis and sample retention. After the samples are fully mixed, they shall be divided into two clean, dry glass bottles with ground stoppers. Label them and indicate the product name, batch number, sampling date, and name of the sampler. One bottle is used for analysis and inspection, and the other is kept for future reference.

6.4 The test results shall be determined according to the rounded value comparison method in GB/T 8170. If one of the indicators in the test results does not meet the requirements, the barreled products shall be re-sampled from 2 times the number of packaging units for re-testing, and the canned products shall be re-sampled in double the sample quantity for re-testing. Even if only one indicator in the re-test results does not meet the requirements, the entire batch of products shall be unqualified.

7 Marking, packaging, transportation and storage

7.1 Marking

7.1.1 The packaging containers of n-butyl acetate for industrial use shall be clearly marked with the name and address of the manufacturer, product name, batch number or production date, net content, and this document number. The packaging containers shall also have the "flammable liquid" mark in accordance with GB 190.

NOTE: For safety information on this product, see Appendix B.

7.1.2 The manufacturer shall ensure that each batch of products leaving the factory complies with the requirements of this document and shall be accompanied by a quality certificate, which shall include the manufacturer's name and address, product name, production date or batch number, product model and this document number, etc.

7.2 Packaging

The n-butyl acetate for industrial use shall be packaged in clean, dry tank trucks or steel drums, and the drum mouth shall be sealed with a sealing ring.

The n-butyl acetate for industrial use may also be packaged and filled in other containers approved by relevant national departments and capable of ensuring safety, and the relevant safety supervision and management regulations of the container shall be implemented.

7.3 Transportation

Transportation and loading and unloading shall be carried out in accordance with the regulations on the transportation of dangerous goods.

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