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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 45369-2025

Absorbent sanitary paper products and raw materials - Evaluation method of deodorant performance

吸收性卫生用纸制品及原材料 消臭效果评价方法

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1 Scope

This document describes four evaluation methods for the deodorant performance of

absorbent sanitary paper products and raw materials. detection tube method, gas detector method, liquid chromatography - mass spectrometry/mass spectrometry, and gas chromatography - mass spectrometry.

This document applies to the evaluation of the deodorant performance of absorbent sanitary paper products, such as baby diapers (sheets, pads), adult diapers (sheets, pads), sanitary napkins (panty liners), women's sanitary pants, pet pee pads (pants), and paper cat litter, etc. It also applies to the evaluation of the deodorant performance of raw materials, such as superabsorbent resins, fluff pulp, top layer, composite absorbent core, diversion layer, absorbent liner, and dust-free paper, etc. Other cat litter may take this as a reference.

2 Normative References

GB/T 6682

GB/T 21331-2021

GB/T 27417

3 Terms and Definitions

The following terms and definitions are applicable to this document.

3.1 Unpleasant odor

An unpleasant odor associated with people's living environment.

NOTE. examples include the odor of excrement and body odor.

3.2 Chemical components of unpleasant odor

The main chemical components of unpleasant odor in people's living environment.

3.3 Deodorant performance

The desired effect of reducing unpleasant odor in the surrounding air.

NOTE. deodorant performance can be expressed in ways including but not limited to odor purification and odor removal.

3.4 Evaluation of deodorant performance

Compared to a blank test without a specimen, the determination of the rate of reduction in the concentration of chemical components of unpleasant odor in a container containing a specimen.

4 Principle

Add the specimen and a certain initial concentration of chemical components of unpleasant odor to a sampling bag or conical flask. After the specimen and the chemical components of unpleasant odor have been in contact for a specified time, use a detection tube, a gas detector, liquid chromatograph - mass spectrometer/tandem mass spectrometer, or gas chromatograph - mass spectrometer to respectively determine the concentrations of the chemical components of unpleasant odor in the sampling bag or conical flask with the specimen and without the specimen. Calculate the rate of reduction of the concentration of each chemical component of unpleasant odor to evaluate the deodorant performance.

5 Reagents

Unless otherwise specified, use only reagents of analytical grade or higher. Commercially available dehydrated raw materials should be used to prepare the culture medium.

5.1 Water, GB/T 6682, Grade 1.

5.2 0.1% formic acid aqueous solution. use chromatographically pure formic acid, and use water (5.1) to dilute it.

5.3 Methanol (CH3OH). chromatographically pure.

5.4 Urea [CO(NH2)2]. purity ? 99.5%.

5.5 Urase. enzyme activity is 1 U/mg, sourced from sword bean.

5.6 Physiological saline. 0.9% sodium chloride solution.

5.7 Potassium dihydrogen phosphate. purity ? 99.0%.

5.8 Disodium hydrogen phosphate. purity ? 99.0%.

5.9 Nutrient broth medium. 100 mL of deionized water containing 0.526 g of peptone, 0.263 g of sodium chloride, 0.158 g of beef powder, and 0.053 g of glucose.

5.10 Ammonia water (NH3 ? H2O). 28% by mass.

5.11 Hydrogen sulfide (H2S). standard gas with a concentration of (100 ? 1) ?L/L.

5.12 Methanethiol (CH3SH). standard gas with a concentration of (100 ? 1) ?L/L.

5.13 Trimethylamine (C3H9N). 30% (mass fraction) aqueous solution.

5.14 Butanone (CH3COCH2CH3). purity ? 98.0%.

5.15 Dimethyl disulfide (C2H6S2). purity ? 98.0%.

5.16 Isovaleric acid [(CH3)2CHCH2COOH]. purity ? 98.0%.

5.17 2-Nonenal (C9H16O). purity ? 95.0%.

5.18 Indole (C8H7N). purity ? 97.0%.

5.19 3-Mercapto-3-methyl-1-butanol (C5H12OS). purity > 98.0%.

6 Materials and Equipment

6.1 Diluent gas. nitrogen gas with a purity of 99.99% or higher, or dry air obtained by mixing nitrogen and oxygen with a purity of 99.99% or higher.

6.2 Sampling bag. made of low-adsorbent polytetrafluoroethylene (PTFE) material, with

volumes of 2 L, 5 L and 10 L. The sampling bag is open at one end and equipped with a sealing device. The sealing device shall ensure a complete seal after the sample is placed in the sampling bag. The sampling bag shall be equipped with two PTFE straight-through valves.

Before use, the sampling bag shall be purified to ensure no interference from the analyte inside.

6.3 Syringes. glass syringes with capacities of 10 ?L, 50 ?L and 100 mL.

6.4 Detection tubes. devices for determining gas concentration, consisting of glass tubes filled

with particulate chemical substances that produce a color reaction with a specific gas, the color change being proportional to the concentration of the gas to be determined. The concentration of the chemical components of unpleasant odor can be read from the graduations printed on the surface of the glass tube. Specifically, the measuring range for ammonia detection tubes should be 0.2 ?L/L to 200 ?L/L; the measuring range for hydrogen sulfide detection tubes should be 0.2 ?L/L to 6 ?L/L; the measuring range for methanethiol detection tubes should be 0.25 ?L/L to 2.5 ?L/L.

6.5 Gas detector. equipped with a pump-suction sampling tube. Before use, the limit of quantitation shall be confirmed in accordance with GB/T 27417.The measurement range for ammonia is 0 ?L/L to 500 ?L/L, with a division value of at least 0.1 ?L/L; the measurement range for hydrogen sulfide is 0 ?L/L to 50 ?L/L, with a division value of at least 0.01 ?L/L; the measurement range for methanethiol is 0 ?L/L to 50 ?L/L, with a division value of at least 0.01 ?L/L.

6.6 Liquid chromatograph - mass spectrometer/tandem mass spectrometer. equipped with an

electrospray ionization source (ESI).