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**Method for determination of purificatory effect of indoor
environment decontamination product**

室内空气净化产品净化效果测定方法

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Method for determination of purificatory effect of indoor environment decontamination product

1 Scope

This standard specifies the test methods for the determination of purificatory effect of indoor environment decontamination product.

This standard is applicable to the determination of pollutant removal efficiency of various indoor air passive purification materials. The active purifier is carried out according to GB/T 18801-2002 "Air cleaner".

The determination of microbially contaminated purification products shall be carried out in accordance with the relevant standards of the Ministry of Health.

2 Normative references

The provisions in following documents become the provisions of this Standard through reference in this Standard. For the dated references, the subsequent amendments (excluding corrections) or revisions do not apply to this Standard; however, parties who reach an agreement based on this Standard are encouraged to study if the latest versions of these documents are applicable. For undated references, the latest edition of the referenced document applies.

GB/T 18883-2002 Indoor air quality standard

GB/T 16129-1995 Standard method for hygienic examination of formaldehyde in air of residential areas - Spectrophotometric method

GB/T 18204.26-2000 Methods for determination of formaldehyde in air of public places

GB/T 11737-1989 Standard method for examination of benzene toluene and xylene in air of residential areas-Gas chromatography

GB/T 18801-2002 Air cleaner

3 Definitions

The following definitions apply to this standard.

4.4 Activated carbon sampling tube.

4.5 Spectrophotometer: It has a wavelength of 500 nm AND is equipped with a cuvette which has a light path of 10 mm.

4.6 Gas chromatograph: It is equipped with hydrogen flame ionization detector.

4.7 Portable formaldehyde detector.

4.8 1.5m³ air test chamber: See Appendix A.

5 Preparation of samples

For the passive decontamination materials, prepare appropriate test samples according to the product instructions. For products without product instructions, spray (coat) the decontamination material three times, on three sheets of 1 m² base paper (requires inert material) (use a small spray pump to spray as fine mist as possible). After the first course of spraying is finished and dry, spray the second course. After the second course is dry, spray the third course (the material consumption for brushing: 200 g; the material consumption for spraying: 100 g).

6 Test methods

6.1 General conditions of test

Use two air test chambers (A is blank chamber, B is sample chamber), to test the concentration of gaseous pollutants, which are removed by the decontamination product. The test is carried out at normal temperature and normal pressure.

6.2 Requirements for test chamber

See Appendix A.

6.3 Pretreatment of test chamber

6.3.1 The air test chamber shall be clean, to purify the air quality in the chamber to the maximum extent AND ensure that there are no pollutants.

6.3.2 Before the test, it shall make the release curve of the release source, for the two cabins, respectively. The routine test shall be carried out, after they are basically parallel.

6.4 Preparation of release source

Roll 5 layers of 17 cm □ 40 cm [Translator: should be 17cm × 40cm] medical degreased gauze, on two glass rods, which have a diameter of 5 mm and a length of 30 cm. Use cotton threads to fix it. Place them upright in a 500 mL reagent bottle. Load

200 mL of pollutants, which have a concentration of 0.2% formaldehyde, 1% ammonia, 0.06% benzene, 0.1% toluene, 0.4% xylene, respectively. TVOC is prepared according to the specified proportions of benzene, toluene, xylene. All reagents are of analytical grade. The container is labeled with A₁ and B₁. After the gauze is completely wet, it can be put into use.

6.5 Experimental steps

6.5.1 Hang the untreated base paper in the blank test chamber A. Then hang the base paper with the sprayed decontamination material in the test chamber B. OR place the prototype of the purifier to be tested in the middle of the test chamber B.

6.5.2 Place the containers, which have the prepared pollutant release sources A₁ and B₁ in blank test chamber A and sample test chamber B, respectively. Close the doors immediately.

6.5.3 Turn on the fans of the blank test chamber A and the sample test chamber B. Stir for 1 min, to mix the air in the chamber with the pollutants released by the release source. Turn off the fans, at the same time, to sample the air in the blank chamber. Measure the concentration of pollutants in the air in the blank cabin, which is the initial concentration, denoted as C₀.

6.5.4 After 24 hours, sample the concentration of air pollutants in the two cabins. Analyze and test, that is, the concentration values of cabins A and B within a certain period of time, denoted as C_A and C_B.

7 Sampling and analysis of sampling results

7.1 Sampling method

Connect the air outlet to the sample inlet of the outside air sampler or the test instrument. Collect the cabin air sample, through passing it through the absorption pipe, the sampling pipe or the test instrument, at a certain flow rate. Sampling and analysis follow the methods specified in GB/T 18883. When conditions permit, it is best to use an automatic analytical instrument, to continuously measure the time-dependent changes in the concentration of pollutants in the cabin. Analytical instruments shall meet the technical requirements for indoor environmental testing AND shall be calibrated regularly.

7.2 Sampling of absorbent liquid

According to the requirements of different pollutants, use a bubble absorption tube, which contains 5 mL or 10 mL of absorbing liquid, to connect with the sampling tube port on the test bulkhead. Take 10 L or 20 L of gas, respectively, at a flow rate of 0.5 L/min or 1.0 L/min. After the sampling is completed, immediately use a rubber cap to seal the sampling nozzle of the test chamber. Record the temperature and atmospheric

Appendix A

(Normative)

Structure and equipment of air test chamber

A.1 Structure of the air test chamber

A.1.1 Air test chamber's volume

0.9 m x 0.9 m x 1.85 m = 15 m³

A.1.2 Framework

76 mm x 44 mm aluminum profile.

A.1.3 Walls

Use float glass, which has a thickness of 5 mm.

A.1.4 Flooring

Same as wall.

A.1.5 Roofing

Same as wall.

A.1.6 Sealing material and air tightness

The material of the test chamber shall be non-adsorbent and chemically inert (such as glass or stainless steel). The inner surface of the test chamber shall be smooth. All connections shall be sealed with air-tight materials (such as silicone rubber), to ensure the leakage rate of the test chamber is less than 0.05 m³/h.

A.1.7 Fan

Choose a suitable adjustable low-speed fan, where the control switch is outside the cabin.

A.1.8 Sampling holes

It is located on the cabin wall, at a height of 1.3 m above the floor. The sampling pipe is a metal pipe, which connects the air inside and outside the cabin. The outer end of the sampling pipe is sealed with a rubber cap.

A.2 Release source placement container

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