NATIONAL STANDARD OF THE

PEOPLE'S REPUBLIC OF CHINA

GB 31604.7-2023

National food safety standard - Food contact materials and products - Decolorization test

Issued on: September 6, 2023 **Implemented on: September 6, 2024**

Issued by: NHC; SAMR

Table of Contents

Foreword

This standard replaces GB 31604.7-2016 National food safety standard - Food contact materials and products - Decolorization test.

Compared with GB 31604.7-2016, the main changes in this standard are as follows.

-- The scope is modified;

-- The principle is modified;

-- Reagents and materials are added;

-- Instruments and equipment are added;

-- Analysis steps are modified;

-- The result presentation is modified.

National food safety standard - Food contact materials and products - Decolorization test

1 Scope

This standard specifies the test methods for discoloration of plastic materials and products used in food contact.

This standard is applicable to the determination of soak solution coloring and wipe decolorization of food-contact plastic materials and products with colorants.

2 Principle

The decolorization test is divided into two parts. soak solution coloring and wipe decolorization. The soak solution coloring uses food simulants or chemical alternative solvents obtained from the migration test. The grey scale or 9-step chromatic transference scale for assessing staining is used to evaluate the grade of soak solution coloring. For wipe decolorization, absorbent cotton moistened and saturated with food simulants is used to wipe the food contact surface of the sample, and the coloring grade of the absorbent cotton after wipe is evaluated by using the grey scale or 9-step chromatic transference scale for assessing staining.

3 Reagents and materials

Unless otherwise stated, the reagents used in this method are of analytical grade and the water is second-grade water specified in GB/T 6682.

3.1.3 Isooctane (C8H18).

3.1.4 95% ethanol.

3.1.5 Vegetable oil (olive oil, corn oil). It shall comply with the requirements of GB 5009.156.

3.2 Reagent preparation

Food simulants. They shall be prepared in accordance with the regulations of GB 5009.156.

3.3.2 Grey scale for assessing staining. a grey scale for assessing staining that meets

the requirements of GB/T 251 (see Figure A.1 in Appendix A).

3.3.3 9-step chromatic transference scale. a 9-step chromatic transference scale that meets the standard requirements of the American Association of Textile Chemists and Colorists (AATCC) (see Figure A.2 in Appendix A).

3.3.4 Colorimetric tube with stopper. 50 mL, colorless, only full and half volume

colorless scale marks.

4.1 Electronic balance. The sensitivity is 0.1 g (maximum weighing capacity is >2.0

kg).

4.3 Color assessment booth. It meets the requirements of GB/T 32387, and the light

source is standard illuminator D65.

5.1.1 Soak solution preparation

The sample shall undergo a migration test in accordance with the corresponding product standards, GB 31604.1, and GB 5009.156, the food simulants and migration test conditions shall be selected in accordance with the requirements of the corresponding product standards and GB 31604.1, and the area/volume ratio used for the migration test shall be consistent with the area/volume ratio required by the result presentation. The food simulant or chemical alternative solvent obtained from the migration test is the soak solution. The migration test shall be carried out in at least 2 parallel tests.

5.1.2 Blank test

Process food simulants or chemical alternative solvents that are not in contact with the sample to be tested according to 5.1.1, and the soak solution obtained is the blank soak solution.

5.1.3 Coloring grade assessment

Experimenters shall have no color vision impairment. If laboratory personnel wear corrective glasses, their lenses must have uniform spectral transmittance throughout the visible spectrum. If an experimenter performs continuous colorimetry, the person shall rest for a few minutes at certain intervals to ensure the quality of visual colorimetry. Take colorimetric tubes with stoppers, add 50 mL of the soak solution that has been cooled to room temperature and the blank soak solution respectively, and place them on the colorimetric tube rack in the color assessment booth. Place the colorimetric tube rack and grey scale or 9-step chromatic transference scale for assessing staining on the

same plane in the color assessment booth, and the experimenter shall observe it in the horizontal direction. Visually evaluate the grey scale or 9-step chromatic transference scale grade to which the color difference between the soaking solution and the blank soaking solution belongs. The corresponding number is the coloring grade of the soak solution.

5.2.1 Sample preparation

The samples shall be pretreated in accordance with GB 5009.156, and 2 wipe decolorization samples shall be prepared for each food simulant. Experimenters are required to wear disposable nitrile gloves for the wipe test, and ensure that the nitrile gloves worn do not discolor during the entire test process.

5.2.2 Preparation of food simulants for moistening absorbent cotton

The food simulant used for moistening absorbent cotton is selected according to the total migration test provisions in the corresponding product standards, GB 31604.1, and GB 5009.156.

5.2.3 Preparation of absorbent cotton

Take absorbent cotton, cut it into a size of 2 cmx2 cm in an area of uniform thickness, with a mass of 0.25 g~0.30 g, and completely wet it with the food simulant selected in 5.2.2.

5.2.4 Experimenter's practice and confirmation of wiping force value

Take a plate or sheet of the same material as the sample to be tested, and place it on an electronic balance (or other equivalent device that can display the wiping force value); the experimenter presses the moistened absorbent cotton with the pulp of two fingers (index finger and middle finger) to wipe back and forth 100 times in an area of about 4 cmx2 cm at a speed of about 1 time/s (wipe the absorbent cotton back and forth for one round in the direction of the sample test, counting as 1 time). When wiping, apply force evenly along the test surface, and observe the mass display on the electronic balance throughout the process to ensure that the mass display during the entire wiping process