



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB 1886.341-2021

**National food safety standard - Food additives - Titanium
dioxide**

Issued on: February 22, 2021

Implemented on: August 22, 2021

Issued by: NHC; SAMR

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1 Scope

This Standard applies to the food additive titanium dioxide, which is produced by the sulfuric acid method, with ilmenite as raw material, or the chlorination process, with rutile ore (or enriched ilmenite) as raw material, and then refined and purified.

2.1 Molecular formula

TiO₂

2.2 Relative molecular mass

79.86 (according to the 2018 international relative atomic mass)

3.1 Sensory requirements

Sensory requirements shall be in accordance with Table 1.

Table 1 - Sensory requirements

3.2 Physical and chemical indicators

Physical and chemical indicators shall be in accordance with Table 2.

Table 2 - Physical and chemical indicators

Appendix A Inspection method

WARNING: Some reagents, which are used in the test method, are toxic, corrosive and flammable. The operator shall be careful! If necessary, it shall be carried out in a fume hood. If it is splashed on the skin, use water to rinse it immediately. If it is serious, seek medical attention immediately.

When flammable products are used, it is strictly forbidden to use an open flame for heating.

A.1 General provisions The reagents and water that are used in this Standard, when no other requirements are specified, refer to analytical reagents and grade-III water which is specified in GB/T 6682. The standard titration solution, the standard solutions, preparations and products for impurity determination, which are used in the test, are all prepared in accordance with the provisions of GB/T 601, GB/T 602, and GB/T 603, when no other requirements are specified. The solution used in the test, if not indicated which solvent is used, refers to aqueous solution.

A.2 Identification test A.2.1 Reagents and materials A.2.1.1 Sulfuric acid.

A.2.1.2 30% hydrogen peroxide.

A.2.2 Identification method Weigh about 0.5 g of the sample; place it in a 250 mL beaker; add 5 mL of sulfuric acid; slowly heat it until the sulfuric acid appears to smoke; cool. Use water to carefully dilute to 100 mL slowly; filter. Then, take 5 mL of the filtrate; add a few drops of 30% hydrogen peroxide; the filtrate appears orange-red.

A.3 Determination of titanium dioxide content Weigh 0.20 g $\pm$ 0.01 g of the sample that is dried according to A.4, accurate to 0.000 1 g; other operations are the same as those in 7.1 of GB/T 1706-2006.

A.4 Determination of loss on drying Same as 7.2 of GB/T 1706-2006, dry for 3 hours.

A.5 Determination of loss on ignition (on a dry basis)

is burnt to constant mass at 800 °C $\pm$ 25 °C; evaporate to dryness on a water bath; then burn to constant mass at 800 °C $\pm$ 25 °C.

A.6.4 Result calculation Calculate the mass fraction w_2 of the hydrochloric acid-dissolved matter according to Formula (A.2).

Where:

m_4 - mass of the residue, in grams (g);

m_3 - sample mass, in grams (g).

The test result is based on the arithmetic mean of the parallel determination results. The absolute difference between two independent determination results that are obtained under repeatability conditions is not more than 0.01%.

A.7 Determination of water-soluble matter A.7.1 Reagents and materials A.7.1.1

Ammonium carbonate solution: 40 g/L.

A.7.1.2 Water: fresh double-distilled water or deionized water, pH of 6–7.

A.7.1.3 Medium-speed qualitative filter paper.

A.7.2 Instruments and apparatuses A.7.2.1 Evaporating dish: 150 mL.

A.7.2.2 Electrothermal constant-temperature dry box: The temperature control range is 105 °C +/- 2 °C.

A.7.3 Analysis steps Weigh about 10 g of the sample, accurate to 0.01 g; place it in a 300 mL beaker;

add 150 mL of water; boil it in an electric furnace and keep it for 5 minutes; after cooling to room temperature, add 25 mL of ammonium carbonate solution under constant stirring; let it stand for 10 minutes. If there is no obvious precipitation in the turbid liquid, add 25 mL of ammonium carbonate solution. Transfer to a 250 mL volumetric flask; use water to dilute to the mark; shake well; pour it into a 250 mL beaker; leave it for about 2 h until the supernatant is clear; then, filter the supernatant through a double-layer medium-speed qualitative filter paper.