



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

GB 1886.183-2016

National food safety standard - Food additives - Benzoic Acid

食品安全国家标准

(English Translation)

Issued on: August 31, 2016

Implemented on: January 1, 2017

**Issued by: National Health and Family Planning Commission of the
People's Republic of China**

Table of Contents

Foreword	3
1 Application Scope	4
2 Structural Formula, Molecular Formula and Relative Molecular Mass	4
3 Technical Requirements	4
Annex A Test Methods	6

1 Application Scope

This Standard applies to food additive benzoic acid which is made from petroleum toluene through catalytic oxidation and refinement.

2 Structural Formula, Molecular Formula and Relative

Molecular Mass

2.2 Molecular formula

C₇H₆O₂

2.3 Relative molecular mass

122.12 (in accordance with International Standard Relative Atomic Masses 2011)

3.1 Sensory requirements

Sensory requirements shall be as specified in Table 1.

Table 1 -- Sensory Requirements

Item	Requirement	Test method
Colour	White	
State	Crystal or crystalline powder	
Odour	Slight benzaldehyde odour	

Take an appropriate amount of specimen to place on a clean, dry white porcelain dish; observe its colour and state under natural light; smell its odour

The readily oxidizable substances in specimen react with potassium permanganate; it is the end of reaction when the solution appears the pink colour of potassium permanganate after

they react completely. The volume of potassium permanganate standard titration solution consumed is used to control the quantity of oxidizable substances.

A.4.2 Reagents and materials

A.4.2.1 Sulphuric acid

A.4.2.2 Potassium permanganate standard titration solution: $c(\text{KMnO}_4) = 0.1 \text{ mol/L}$.

A.4.3 Analytical procedure

Weigh 1.0 g of specimen, accurate to 0.001 g. Add 1.5 mL of sulphuric acid to 100 mL of water; add dropwise potassium permanganate standard titration solution until pink while boiling; maintain for 30 s without colour fading; add weighed specimen while hot;

use potassium permanganate standard titration solution to titrate until pink while the solution is about 70°C; maintain for 15 s without colour fading. The potassium permanganate standard titration solution consumed shall not be more than 0.5 mL.

A.5 Readily carbonizable substance test

A.5.1 Method summary

Sulphuric acid makes the readily carbonizable substances in specimen dehydrated and carbonized and makes the test solution appear colour. Compare the colour with that of standard colorimetric solution; control the quantity of readily carbonizable substances.

A.5.2 Reagents and materials

A.5.2.1 Sulphuric acid: guaranteed reagent.

A.5.2.2 Q standard colour: prepared and standardized in accordance with the method specified in GB/T 9737.

A.5.3 Analytical procedure

Weigh 0.50 g of specimen, accurate to 0.001 g; place in a 10 mL colorimetric tube; add 5 mL of sulphuric acid; mix up to make the specimen fully dissolve. The colour of the solution shall not be darker than Q standard colour.

A.6 Determination of heavy metals (based on Pb)

A.6.1 Reagents and materials

A.6.1.1 Ethyl alcohol solution: 95%.

Take the arithmetic mean value of the results obtained from two parallel tests as reported result. The absolute difference between the results of two parallel tests shall not be greater than 0.04%.

A.9 Determination of ignition residue

A.9.1 Reagents and materials

Sulphuric acid ($\geq 95\%$).

A.9.2 Analytical procedure

Weigh about 2 g of specimen, accurate to 0.000 1 g; place into a porcelain crucible dried to constant weight; add sulphuric acid for moistening; ignite slowly to make specimen carbonized; cool and add more sulphuric acid for moistening; heat slowly until sulphuric acid vapour is hardly generated; ignite for 2 h at 800°C; place in a desiccator to cool to room temperature; weigh.

A.9.3 Calculation of results

The mass fraction w_3 of ignition residue is calculated in accordance with Formula (A.3):

where, m_2 - mass of residue after ignition, in g;

m_1 - mass of specimen, in g.

Take the arithmetic mean value of the results obtained from two parallel tests as the reported result. The absolute difference between the results of two parallel tests shall not be greater than 20% of the arithmetic mean value of the two values.

A.10 Determination of phthalic acid

A.10.1 Method summary

Dissolve specimen into the mixed solution of methyl alcohol and acetic acid solution; use phthalic acid as external standard and use liquid chromatography to determine the content of phthalic acid in benzoic acid.

A.10.2 Reagents and materials

A.10.2.1 Methyl alcohol.

A.10.2.2 Acetic acid solution: 1 -> 100.

A.10.2.3 Mixed solution of methyl alcohol-acetic acid solution: 2 + 3.

c_{ST} - concentration of phthalic acid standard solution, in $\mu\text{g/mL}$;

AS - peak area of specimen test solution;

V - volume of specimen test solution, in mL;

AST - peak area of phthalic acid standard solution;

m - mass of specimen, in g.

Take the arithmetic mean value of the results obtained from two parallel tests as the

reported result. The absolute difference between the results of two parallel tests shall not be greater than 20% of the arithmetic mean value of the two values.

A.11 Determination of biphenyls

A.11.1 Method summary

Dissolve specimen into N,N-dimethyl formamide; use propyl benzoate as internal standard substance and use quantitative determination for the total content of 5 biphenyl impurities: biphenyl, 2-methyl biphenyl, 3-methyl biphenyl, 4-methyl biphenyl and benzyl benzoate.

A.11.2 Reagents and materials

A.11.2.1 N,N-dimethyl formamide (DMF).

A.11.2.2 Mixed standard working solution: take separately 20 mg of propyl formate (NPB), biphenyl (BP), 2-methyl biphenyl (2MBP), 3-methyl biphenyl (3MBP), 4-methyl biphenyl (4MBP) and benzyl benzoate (BB), accurate to 0.1 mg; place into a 50 mL volumetric flask; use DMF to dissolve; add 10.0 g of benzoic acid; add dropwise DMF to dissolve to scale.

A.11.2.3 Propyl formate (NPB) internal standard solution (10 mg/mL): weigh 250 mg of NPB; place into a 25 mL volumetric flask; add dropwise DMF to dissolve to scale.

A.11.3 Apparatus

Gas chromatograph: equipped with hydrogen flame ionization detector (FID).

A.11.4 Chromatographic column and operating conditions

See Table A.2 for the chromatographic column and operating conditions recommended by this Standard. The chromatographic column and operating conditions which are capable of achieving equal degree of separation may also be used.