

equivalent to 0.1 g of Benzethonium Chloride according to the labeled amount, add water, or concentrate on a water bath, if necessary, to make 10 mL, and proceed with 1 mL of this solution as directed in the Identification (4) under Benzalkonium Chloride.

Purity (1) Nitrite—Add 1.0 mL of Benzethonium Chloride Solution to a mixture of 1 mL of a solution of glycine (1 in 10) and 0.5 mL of acetic acid (31): no gas is evolved.

(2) Oxidizing substances—To 5 mL of Benzethonium Chloride Solution add 0.5 mL of potassium iodide TS and 2 to 3 drops of dilute hydrochloric acid: no yellow color is produced.

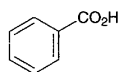
Assay Pipet a volume of Benzethonium Chloride Solution, equivalent to about 0.2 g of benzethonium chloride ($C_{27}H_{42}ClNO_2$), dilute with water to make 75 mL, if necessary, and proceed as directed in the Assay under Benzethonium Chloride.

Each mL of 0.02 mol/L sodium tetraphenylboron VS
= 8.962 mg of $C_{27}H_{42}ClNO_2$

Containers and storage Containers—Tight containers.
Storage—Light-resistant.

Benzoic Acid

安息香酸



$C_7H_6O_2$: 122.12
Benzoic acid [65-85-0]

Benzoic Acid, when dried, contains not less than 99.5% of $C_7H_6O_2$.

Description Benzoic Acid occurs as white crystals or crystalline powder. It is odorless, or has a faint, benzaldehyde-like odor.

It is freely soluble in ethanol (95), in acetone and in diethyl ether, soluble in hot water, and slightly soluble in water.

Identification Dissolve 1 g of Benzoic Acid in 8 mL of sodium hydroxide TS, and add water to make 100 mL. This solution responds to the Qualitative Tests (2) for benzoate.

Melting point 121 – 124°C

Purity (1) Heavy metals—Dissolve 1.0 g of Benzoic Acid in 25 mL of acetone, add 2 mL of dilute acetic acid and water to make 50 mL, and perform the test using this solution as the test solution. Prepare the control solution as follows: to 2.0 mL of Standard Lead Solution add 2 mL of dilute acetic acid, 25 mL of acetone and water to make 50 mL (not more than 20 ppm).

(2) Chlorinated compounds—Take 0.5 g of Benzoic Acid and 0.7 g of calcium carbonate in a crucible, mix with a small amount of water, and dry. Ignite it at about 600°C, dissolve in 20 mL of dilute nitric acid, and filter. Wash the residue with 15 mL of water, combine the filtrate and the washing, add water to make 50 mL, and add 0.5 mL of sil-

ver nitrate TS: this solution has no more turbidity than the following control solution.

Control solution: Dissolve 0.7 g of calcium carbonate in 20 mL of dilute nitric acid, and filter. Wash the residue with 15 mL of water, combine the filtrate and the washings, add 1.2 mL of 0.01 mol/L hydrochloric acid VS and water to make 50 mL, and add 0.5 mL of silver nitrate TS.

(3) Potassium permanganate-reducing substances—Add 0.02 mol/L potassium permanganate VS dropwise to a boiling mixture of 100 mL of water and 1.5 mL of sulfuric acid, until a red color persists for 30 seconds. Dissolve 1.0 g of Benzoic Acid in this boiling solution, and add 0.50 mL of 0.02 mol/L potassium permanganate VS: a red color persists for at least 15 seconds.

(4) Phthalic acid—To 0.10 g of Benzoic Acid add 1 mL of water and 1 mL of resorcinol-sulfuric acid TS, and heat the mixture in an oil bath heated at a temperature between 120°C and 125°C. After evaporating the water, heat the residue for 90 minutes, cool, and dissolve in 5 mL of water. To 1 mL of the solution add 10 mL of a solution of sodium hydroxide (43 in 500), shake, then examine under light at a wavelength between 470 nm and 490 nm: the green fluorescence of the solution is not more intense than that of the following control solution.

Control solution: Dissolve 0.061 g of potassium hydrogen phthalate in water to make exactly 1000 mL. Measure exactly 1 mL of the solution, add 1 mL of resorcinol-sulfuric acid TS, and proceed as directed above.

(5) Readily carbonizable substances—Perform the test with 0.5 g of Benzoic Acid. The solution has no more color than Matching Fluid Q.

Loss on drying Not more than 0.5% (1 g, silica gel, 3 hours).

Residue on ignition Not more than 0.05% (1 g).

Assay Weigh accurately about 0.5 g of Benzoic Acid, previously dried, dissolve in 25 mL of neutralized ethanol and 25 mL of water, and titrate with 0.1 mol/L sodium hydroxide VS (indicator: 3 drops of phenolphthalein TS).

Each mL of 0.1 mol/L sodium hydroxide VS
= 12.212 mg of $C_7H_6O_2$

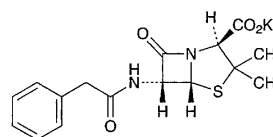
Containers and storage Containers—Well-closed containers.

Benzylpenicillin Potassium

Penicillin G Potassium

Crystalline Penicillin G Potassium

ベンジルペニシリンカリウム



$C_{16}H_{17}KN_2O_4S$: 372.48
Monopotassium (2*S*,5*R*,6*R*)-3,3-dimethyl-7-oxo-6-

phenylacetyl-amino-4-thia-1-azabicyclo[3.2.0]heptane-2-carboxylate [113-98-4]

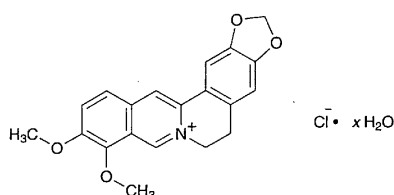
Benzylpenicillin Potassium conforms to the requirements of Benzylpenicillin Potassium in the Requirements for Antibiotic Products of Japan.

Description Benzylpenicillin Potassium occurs as white crystals or crystalline powder.

It is very soluble in water, sparingly soluble in ethanol (95), and practically insoluble in diethyl ether.

Berberine Chloride

塩化ベルベリン



$C_{20}H_{18}ClNO_4 \cdot xH_2O$

5,6-Dihydro-9,10-dimethoxy[1,3]dioxolo[4,5-g]-isoquino[3,2-a]isoquinolin-7-ium chloride hydrate [633-65-8, anhydride]

Berberine Chloride contains not less than 95.0% and not more than 102.0% of $C_{20}H_{18}ClNO_4$ (mol. wt.: 371.81), calculated on the anhydrous basis.

Description Berberine Chloride occurs as yellow crystals or crystalline powder. It is odorless or has a faint, characteristic odor. It has a very bitter taste.

It is sparingly soluble in methanol, slightly soluble in ethanol (95), and very slightly soluble in water.

Identification (1) Determine the absorption spectrum of a solution of Berberine Chloride (1 in 100,000) as directed under the Ultraviolet-visible Spectrophotometry, and compare the spectrum with the Reference Spectrum or the spectrum of a solution of Berberine Chloride Reference Standard prepared in the same manner as the sample solution: both spectra exhibit similar intensities of absorption at the same wavelengths.

(2) Determine the infrared absorption spectrum of Berberine Chloride as directed in the potassium bromide disk method under the Infrared Spectrophotometry, and compare the spectrum with the Reference Spectrum or the spectrum of Berberine Reference Standard: both spectra exhibit similar intensities of absorption at the same wave numbers.

(3) Dissolve 0.1 g of Berberine Chloride in 20 mL of water by warming, add 0.5 mL of nitric acid, cool, and filter after allowing to stand for 10 minutes. To 3 mL of the filtrate add 1 mL of silver nitrate TS, and collect the produced precipitate: the precipitate does not dissolve in dilute nitric acid, but it dissolves in an excess amount of ammonia TS.

Purity (1) Acid—Shake thoroughly 0.10 g of Berberine Chloride with 30 mL of water, and filter. To the filtrate add

2 drops of phenolphthalein TS and 0.10 mL of 0.1 mol/L sodium hydroxide VS: the yellow color changes to an orange to red color.

(2) Sulfate—Shake 1.0 g of Berberine Chloride with 48 mL of water and 2 mL of dilute hydrochloric acid for 1 minute, and filter. Discard the first 5 mL of the filtrate, take the subsequent 25 mL of the filtrate, add water to make 50 mL, and perform the test using this solution as the test solution. Prepare the control solution with 0.50 mL of 0.005 mol/L sulfuric acid VS, 1 mL of dilute hydrochloric acid, 5 to 10 drops of bromophenol blue TS and water to make 50 mL (not more than 0.048%).

(3) Heavy metals—Proceed with 1.0 g of Berberine Chloride according to Method 2, and perform the test. Prepare the control solution with 3.0 mL of Standard Lead Solution (not more than 30 ppm).

(4) Related substances—Dissolve 0.010 g of Berberine Chloride in 100 mL of the mobile phase, and use this solution as the sample solution. Pipet 4 mL of the sample solution, add the mobile phase to make exactly 100 mL, and use this solution as the standard solution. Perform the test with 10 μ L each of the sample solution and the standard solution as directed under the Liquid Chromatography according to the following conditions. Determine each peak area of both solutions by the automatic integration method: the total of the peak of the areas other than berberine of the sample solution is not larger than the peak area of berberine of the standard solution.

Operating conditions—

Detector, column, column temperature, mobile phase, flow rate, and selection of column: Proceed as directed in the operating conditions in the Assay.

Detection sensitivity: Adjust the detection sensitivity so that the peak height of berberine obtained from 10 μ L of the standard solution is about 10% of the full scale.

Time span of measurement: About 2 times as long as the retention time of berberine, after the solvent peak.

Water 8 – 12% (0.1 g, direct titration).

Residue on ignition Not more than 0.10% (1 g).

Assay Weigh accurately 0.010 g of Berberine Chloride, dissolve in the mobile phase to make exactly 100 mL, and use this solution as the sample solution. Separately, weigh accurately about 0.010 g of Berberine Chloride Reference Standard (separately, determined the water content), and dissolve in the mobile phase to make exactly 100 mL, and use this solution as the standard solution. Perform the test with 10 μ L each of the sample solution and the standard solution as directed under the Liquid Chromatography according to the following conditions. Determine the peak areas, A_T and A_S of berberine in each solution.

Amount (mg) of $C_{20}H_{18}ClNO_4$

= amount (mg) of Berberine Chloride Reference

Standard, calculated on the anhydrous basis $\times \frac{A_T}{A_S}$

Operating conditions—

Detector: An ultraviolet absorption photometer (wavelength: 345 nm).

Column: A stainless steel column about 4 mm in inside diameter and about 25 cm in length, packed with octadecylsilanized silica gel for liquid chromatography (5 μ m in particle diameter).