nm.

Purity Clarity and color of solution—Dissolve 1.0 g of sodium *p*-phenol sulfonate in 25 mL of water: the solution is clear and colorless.

Content: not less than 90.0%. Assay—Dissolve about 0.5 g of sodium *p*-phenol sulfonate, accurately weighed, in 50 mL of water. Transfer the solution to a chromatographic column, prepared by pouring strongly acidic ion exchange resin (H type) for column chromatography (150 to 300 μm in particle diameter) into a chromatographic tube about 1 cm in inside diameter and about 30 cm in height, and allow to flow. Wash the chromatographic column with water until the washing is no longer acidic, combine the washings with the above effluent solution, and titrate with 0.1 mol/L sodium hydroxide VS (indicator: 5 drops of bromocresol green-methyl red TS). Separately, dissolve 0.5 g of sodium *p*-phenol sulfonate, previously weighed accurately, in 50 mL of water and titrate with 0.1 mol/L sodium hydroxide VS, and make any necessary correction.

Each mL of 0.1 mol/L sodium hydroxide VS
= 23.219 mg of $C_6H_5O_4NaS.2H_2O$

Sodium pyruvate Prepared for microbial test.

Sodium salicylate HOC_6H_4COONa [K 8397, Special class]

Sodium salicylate-sodium hydroxide TS Dissolve 1 g of sodium salicylate in 0.01 mol/L sodium hydroxide VS to make 100 mL.

Sodium selenite Na_2SeO_3 [K 8036, Special class]

Sodium *p*-styrenesulfonate $C_8H_7NaO_3S$ White crystals or crystalline powder. Freely soluble in water, slightly soluble in ethanol (99.5), and practically insoluble in diethyl ether.

Recrystalize from diluted ethanol (1 in 2), and dry in vacuum.

Identification—Determine the infrared absorption spectrum of sodium *p*-styrenesulfonate according to the potassium bromide disk method under the Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 1236 cm^{-1}, 1192 cm^{-1}, 1136 cm^{-1}, 1052 cm^{-1}, 844 cm^{-1} and 688 cm^{-1}.

Purity—Perform the test with 10 μL of a solution of sodium *p*-styrenesulfonate (1 in 1000) as directed in the Assay under Panipenem: Any obstructive peaks for determination of panipenem are not observed.

Sodium sulfate See sodium sulfate decahydrate.

Sodium sulfate, anhydrous Na_2SO_4 [K 8987, Special class]

Sodium sulfate decahydrate $Na_2SO_4.10H_2O$ [K 8986, Special class]

Sodium sulfide See sodium sulfide enneahydrate.

Sodium sulfide enneahydrate $Na_2S.9H_2O$ [K 8949, Special class]

Sodium sulfide TS Dissolve 5 g of sodium sulfide enneahydrate in a mixture of 10 mL of water and 30 mL of glycerin. Or dissolve 5 g of sodium hydroxide in a mixture of 30 mL of water and 90 mL of glycerin, saturate a half volume of this solution with hydrogen sulfide, while cooling, and mix with the remaining half. Preserve in well-filled, light-resistant bottles. Use within 3 months.

Sodium sulfite See sodium sulfite heptahydrate.

Sodium sulfite, anhydrous Na_2SO_3 [K 8061, Sodium sulfite, Special class]

Sodium sulfite heptahydrate $Na_2SO_3.7H_2O$ [K 8060, Special class]

1 mol/L Sodium sulfite TS Dissolve 1.26 g of anhydrous sodium sulfite in water to make 10 mL.

Sodium tartrate See sodium tartrate dihydrate.

Sodium tartrate dihydrate $C_4H_4Na_2O_6.2H_2O$ [K 8540, Special class]

Sodium tetraborate decahydrate $Na_2B_4O_7.10H_2O$ [K 8866, Special class]

Sodium tetraborate for pH determination [K 8866, for pH standard solution]

Sodium tetraborate-calcium chloride buffer solution, pH 8.0 Dissolve 0.572 g of sodium tetraborate decahydrate and 2.94 g of calcium chloride dihydrate in 800 mL of freshly boiled and cooled water, adjust the pH to 8.0 with 1 mol/L hydrochloric acid TS, and add water to make 1000 mL.

Sodium tetraphenylborate $(C_6H_5)_4BNa$ [K 9521]

Sodium thioglycolate $HSCH_2COONa$ [K 8631: 1961, Special class] Preserve in containers, protected from light and in a dark, cold place.

Sodium thiosulfate See sodium thiosulfate pentahydrate.

Sodium thiosulfate pentahydrate $Na_2S_2O_3.5H_2O$ [K 8637, Special class]

Sodium thiosulfate TS Dissolve 26 g of sodium thiosulfate pentahydrate and 0.2 g of anhydrous sodium carbonate in freshly boiled and cooled water to make 1000 mL (0.1 mol/L).

Sodium toluenesulfonchloramide trihydrate $C_7H_7ClNNaO_2S.3H_2O$ [K 8318, Sodium *p*-toluenesulfonchloramide trihydrate, Special class]

Sodium toluenesulfonchloramide TS Dissolve 1 g of sodium toluensulfonchloramide trihydrate in water to make 100 mL. Prepare before use.

Sodium tridecanesulfonate $C_{13}H_{27}SO_3Na$ White, crystals or powder.

Purity Absorbance—Dissolve 1.43 g of sodium tridecansulfonate in 1000 mL of water, and perform the test as directed under the Ultraviolet-visible Spectrophotometry: the absorbances at 230 nm and 245 nm are not more than 0.05 and 0.01, respectively.

Sodium 3-trimethylsilylpropanesulfonate for nuclear magnetic resonance spectroscopy $(CH_3)_3SiCH_2CH_2CH_2SO_3Na$ Prepared for nuclear magnetic resonance spectroscopy.

Sodium 3-trimethylsilylpropionate-d_4 for nuclear magnetic resonance spectroscopy $(CH_3)_3SiCD_2CD_2COONa$ Prepared for nuclear magnetic resonance spectroscopy.

Sodium tungstate See sodium tungstate (VI) dihydrate.

Sodium tungstate (VI) dihydrate $Na_2WO_4.2H_2O$ [K 8612, Special class]

Soluble starch See starch, soluble.

Soluble starch TS Triturate 1 g of soluble starch in 10 mL of cooled water, pour gradually into 90 mL of boiled water while costantly stirring, boil gently for 3 minutes, and cool. Prepare before use.

Sorbitan sesquioleate [Same as the namesake monograph in Part II]

D-Sorbitol [Same as the namesake monograph in Part II]

D-Sorbitol for gas chromatography Prepared for gas chromatography.

Soybean oil [Same as the namesake monograph in Part II]

Soybean peptone See peptone, soybean.

Standard particles for calibrating light-shielded automatic fine particle counter Use plastic spherical particles of known size and number.

Stannous chloride See tin (II) chloride dihydrate.

Stannous chloride-sulfuric acid TS See tin (II) chloride-sulfuric acid TS.

Stannous chloride TS See tin (II) chloride TS.

Stannous chloride TS, acidic See tin (II) chloride TS, acidic.

Starch [K 8658, Special class]

Starch-sodium chloride TS Saturate starch TS with sodium chloride. Use within 5 to 6 days.

Starch, soluble [K 8659, Special class]

Starch TS Triturate 1 g of starch with 10 mL of cold water, and pour the mixture slowly, with constant stirring, into 200 mL of boiling water. Boil the mixture until a thin, translucent fluid is obtained. Allow to settle, and use the supernatant liquid. Prepare before use.

Stearic acid for gas chromatography $C_{18}H_{36}O_2$ [K 8585, Special class]

Stearyl alcohol [Same as the namesake monograph in Part II]

Strong ammonia water See ammonia solution (28).

Strong cupric acetate TS See copper (II) acetate TS, strong.

Strong hydrogen peroxide water See hydrogen peroxide (30).

Strongly acidic ion exchange resin for column chromatography Prepared for column chromatography.

Strongly acidic ion exchange resin for liquid chromatography Prepared for liquid chromatography.

Strontium chloride $SrCl_2.6H_2O$ [K 8132, Special class]

Strychnine nitrate for assay $C_{21}H_{22}N_2O_2.HNO_3$ To 1 g of strychnine nitrate add 14 mL of water and about 10 mg of active carbon, heat in a water bath for 10 minutes, filter while hot, cool the filtrate quickly to form crystals, and filter the crystals. Add 8 mL of water to the crystals, dissolve by heating in a water bath, filter while hot, cool quickly, and filter the crystals formed. Repeat this procedure with 8 mL of water, and dry the crystals in a desiccator (in vacuum, silica gel) for 24 hours. Colorless or white crystals or crystalline powder. Sparingly soluble in water, in glycerin and in chloroform, slightly soluble in ethanol (95), and practically insoluble in diethyl ether.

Purity Related substances—Dissolve 0.035 g of strychnine nitrate for assay in 100 mL of the mobile phase and use this solution as the sample solution. Pipet 2 mL of the sample solution, add the mobile phase to make exactly 100 mL, and use this solution as the standard solution (1). Perform the test with 20 μL each of the sample solution and the standard solution (1) as directed under the Liquid Chromatography according to the following conditions. Measure each peak area of these solutions by the automatic integration method: the total area of the peaks other than strychnine from the sample solution is not larger than the peak area of strychnine from the standard solution (1).

Operating conditions

Proceed the operating conditions in the Assay under Nux Vomica except detection sensitivity and time span of measurement.

Detection sensitivity: Pipet 1 mL of the standard solution (1), add the mobile phase to make exactly 40 mL, and use this solution as the standard solution (2). Adjust the detection sensitivity so that the peak area of strychnine obtained from 20 μL of the standard solution (2) can be measured by the automatic integration method and the peak height of strychnine from 20 μL of the standard solution (1) is about 20% of the full scale.

Time span of measurement: About 3 times as long as the retention time of strychnine after the solvent peak.

Loss on drying: not more than 0.5% (0.2 g, 105°C, 3 hours).

Content: not less than 99.0% calculated on the dried basis. Assay—Dissolve about 0.5 g of strychnine nitrate for assay, accurately weighed, in 40 mL of a mixture of acetic anhydride and acetic acid (100) (4:1), heat if necessary, cool, and titrate with 0.1 mol/L perchloric acid VS (potentiometric titration). Perform a blank determination, and make any necessary correction.

Each mL of 0.1 mol/L perchloric acid VS
= 39.743 mg of $C_{21}H_{22}N_2O_2.HNO_3$

Styrene C_8H_8 Colorless, clear liquid.

Specific gravity: 0.902 - 0.910

Purity—Perform the test with 1 μL of styrene as directed under the Gas Chromatography according to the following conditions. Measure each peak area by the automatic integration method and calculate the amount of styrene by the area percentage method: it shows the purity of not less than 99%.

Operating conditions

Detector: Thermal conductivity detector.

Column: A glass column, about 3 mm in inside diameter and about 2 m in length, packed with siliceous earth (180 to 250 μm in particle diameter) coated with polyethylene glycol 20 M at the ratio of 10%.

Column temperature: A constant temperature of about 100°C.

Temperature of sample vaporization chamber: A constant temperature of about 150°C.

Carrier gas: Helium

Flow rate: Adjust the flow rate so that the retention time of styrene is about 10 minutes.

Time span of measurement: About twice as long as the retention time of styrene after the solvent peak.

Styrene-divinylbenzene copolymer for liquid chromatography Prepared for liquid chromatography.

Succinic acid, anhydrous $C_4H_4O_3$ White or pale yellowish white crystals or flakes. It is odorless. Soluble in water, freely soluble in hot water, and sparingly soluble in ethanol (95).

Purity (1) Chloride: not more than 0.005%.

(2) Iron: not more than 0.001%.

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

Content: not less than 98.0%. Assay—Dissolve about 1 g of anhydrous succinic acid, accurately weighed, in 50 mL of water by warming, cool, and titrate with 1 mol/L sodium hydroxide VS (indicator: 2 drops of phenolphthalein TS).

Each mL of 1 mol/L sodium hydroxide VS
= 50.04 mg of $C_4H_4O_3$.

Substrate solution for peroxidase determination Dissolve 0.195 mL of hydrogen peroxidase (30), 8.38 g of disodium hydrogenphosphate 12-water and 1.41 g of citric acid monohydrate in water to make 300 mL. To 15 mL of this solution add 13 mg of *o*-phenylenediamine dihydrochloride before use.

Substrate TS for kallidinogenase assay (1) Dissolve an appropriate amount of H-D-valyl-L-leucyl-L-arginine *p*-nitroanilide dihydrochloride in 0.1 mol/L tris buffer solution, pH 8.0 to prepare a solution containing 1 mg of H-D-valyl-L-leucyl-L-arginine *p*-nitroanilide dihydrochloride in 5 mL.

Substrate TS for kallidinogenase assay (2) Dissolve 17.7 mg of *N*-α-benzoyl-L-arginine ethyl ester hydrochloride in 0.1 mol/L tris buffer solution, pH 8.0 to make 100 mL.

Substrate TS for kallidinogenase assay (3) Suspend 0.6 g of milk casein purified by the Hammerstein's method in 80 mL of 0.05 mol/L sodium hydrogenphosphate TS, and dissolve by warming at 65°C for 20 minutes. After cooling, adjust to pH 8.0 with 1 mol/L hydrochloric acid TS or sodium hydroxide TS, and add water to make exactly 100 mL. Prepare before use.

Substrate TS for kallidinogenase assay (4) Dissolve 0.025 g of H-D-valyl-L-leucyl-L-arginine-4-nitroanilide dihydrochloride in 28.8 mL of water.

Sucrose $C_{12}H_{22}O_{11}$ [Same as the monograph in Part II Purified Sucrose]

Sudan III $C_{22}H_{16}N_4O$ Red-brown powder. It dissolves in acetic acid (100) and in chloroform, and insoluble in water, in ethanol (95), in acetone and in ether.

Melting point: 170 - 190°C

Sudan III TS Dissolve 0.01 g of sudan III in 5 mL of ethanol (95), filter, and add 5 mL of glycerin to the filtrate. Prepare before use.

Sulbactam sodium for sulbactam penicillamine $C_8H_{10}NNaO_5S$ White to yellowish white crystalline powder. Freely soluble in water, and slightly soluble in ethanol (95).

Identification—Determine the infrared absorption spectrum of sulbactam sodium for sulbactam penicillamine according to the potassium bromide disk method under the Infrared Absorption Spectrophotometry: it exhibits the absorption at the wave numbers of about 1780 cm^{-1}, 1600 cm^{-1}, 1410 cm^{-1}, 1400 cm^{-1}, 1320 cm^{-1}, 1300 cm^{-1}, 1200 cm^{-1} and 1130 cm^{-1}.

Water: not more than 1.0% (0.5 g).

Content: not less than 875 μg per mg, calculated on the anhydrous basis. Assay—Weigh accurately an amount of sulbactam sodium for sulbactam penicillamine and Sulbactam Reference Standard, equivalent to about 0.10 g (potency), dissolve each in a suitable volume of the mobile phase, add exactly 10 mL of the internal standard solution and the mobile phase to make 100 mL, and use these solutions as the sample solution and the standard solution, respectively. Perform the test with 10 μL each of these solutions as directed under the Liquid Chromatography according to the following conditions, and determine the ratios, Q_T and Q_S, of the peak area of sulbactam to that of the internal standard.

Amount [μg (potency)] of sulbactam ($C_8H_{11}NO_5S$)
= amount [mg (potency)] of Sulbactam Reference Standard $\times \frac{Q_T}{Q_S} \times 1000$

Internal standard solution A solution of ethyl parahydroxybenzoate in the mobile phase (7 in 1000).

Operating conditions

Detector: Ultraviolet absorption photometer (wavelength: 220 nm)

Column: A stainless steel column 3.9 mm in inside diameter and 30 cm in length, packed with octadecylsilanized silica gel for liquid chromatography (10 μm in particle diameter).

Column temperature: A constant temperature of about 35°C.

Mobile phase: To 750 mL of 0.005 mol/L tetrabutylammonium hydroxide TS add 250 mL of acetonitrile for liquid chromatography.

Flow rate: Adjust the flow rate so that the retention time of sulbactam is about 6 minutes.

System suitability

System performance: When the procedure is run with 10 μL of the standard solution according to the above operating conditions, sulbactam and the internal standard are eluted in this order with the resolution between these peaks being not less than 1.5.

System repeatability: When the test is repeated 6 times with 10 μL of the standard solution according to the above operating conditions, the relative standard deviation of the peak areas of sulbactam is not more than 2.0%.

Sulfamic acid (standard reagent) See amido sulfuric acid (standard reagent).

Sulfanilamide $H_2NC_6H_4SO_2NH_2$ [K 9066, Special class]

Sulfanilamide for titration of diazotization $H_2NC_6H_4SO_2NH_2$ [K 9066, For titration of diazotization]

Sulfanilic acid $H_2NC_6H_4SO_3H$ [K 8586, Special class]

Sulfathiazole $C_9H_9N_3O_3S_2$ White crystalline powder.
Melting point: 200 - 204°C

Sulfosalicylic acid See 5-sulfosalicylic acid dihydrate.

5-Sulfosalicylic acid dihydrate $C_7H_6O_6S.2H_2O$
[K 8589, Special class]

Sulfosalicylic acid TS Dissolve 5 g of 5-sulfosalicylic acid dihydrate in water to make 100 mL.

Sulfur S [K 8088, Special class]

Sulfur dioxide SO_2 Prepare by adding sulfuric acid dropwise to a concentrated solution of sodium bisulfite. Colorless gas, having a characteristic odor.

Sulfuric acid H_2SO_4 [K 8951, Special class]

Sulfuric acid, dilute Cautiously add 5.7 mL of sulfuric acid to 10 mL of water, cool, and dilute with water to make 100 mL (10%).

Sulfuric acid-ethanol TS With stirring add slowly 3 mL of sulfuric acid to 1000 mL of ethanol (99.5), and cool.

Sulfuric acid for readily carbonizable substances To sulfuric acid, the content of which has previously been determined by the following method, add water cautiously, and adjust the final concentration to 94.5% to 95.5% of sulfuric acid (H_2SO_4). When the concentration is changed owing to absorption of water during storage, prepare freshly.

Assay—Weigh accurately about 2 g of sulfuric acid in a glass-stoppered flask rapidly, add 30 mL of water, cool, and titrate the solution with 1 mol/L sodium hydroxide VS (indicator: 2 to 3 drops of bromothymol blue TS).

Each mL of 1 mol/L sodium hydroxide VS
= 49.04 mg of H_2SO_4

Sulfuric acid, fuming $H_2SO_4.nSO_3$ [K 8741, Special class]

Sulfuric acid-hexane-methanol TS To 230 mL of a mixture of hexane and methanol (1:3) add cautiously 2 mL of sulfuric acid.

Sulfuric acid-methanol TS Prepare carefully by adding 60 mL of sulfuric acid to 40 mL of methanol.

Sulfuric acid-methanol TS, 0.05 mol/L Add gradually 3 mL of sulfuric acid to 1000 mL of methanol, while stirring, and allow to cool.

Sulfuric acid-monobasic sodium phosphate TS See sulfuric acid-sodium dihydrogenphosphate TS.

Sulfuric acid, purified Place sulfuric acid in a beaker, heat until white fumes are evolved, then heat for 3 minutes cautiously and gently. Use after cooling.

Sulfuric acid-sodium dihydrogenphosphate TS Add 6.8 mL of sulfuric acid to 500 mL of water, then dissolve 50 g of sodium dihydrogenphosphate dihydrate in this solution, and add water to make 1000 mL.

Sulfuric acid-sodium hydroxide TS With stirring add slowly 120 mL of sulfuric acid to 1000 mL of water, and cool (solution A). Dissolve 88.0 g of sodium hydroxide in 1000 mL of freshly boiled and cooled water (solution B). Mix equal volumes of solution A and solution B.

Sulfuric acid TS Cautiously add 1 volume of sulfuric acid to 2 volumes of water, and while warming on a water bath add dropwise potassium permanganate TS until a pale red color of the solution remains.

0.05 mol/L Sulfuric acid TS Dilute 100 mL of 0.5 mol/L sulfuric acid TS with water to make 1000 mL.

0.25 mol/L Sulfuric acid TS With stirring add slowly 15 mL of sulfuric acid to 1000 mL of water, then cool.

0.5 mol/L Sulfurie acid TS With stirring add slowly 30 mL of sulfuric acid to 1000 mL of water, then cool.

2 mol/L Sulfuric acid TS To 1000 mL of water add gradually 120 mL of sulfuric acid with stirring, and cool.

Sulfurous acid See sulfurous acid solution.

Sulfurous acid solution H_2SO_3 [K 8058, Special class]

Sulpyrine $C_{13}H_{16}N_3NaO_4S.H_2O$ [Same as the namesake monograph]

Sulpyrine for assay [Same as the monograph Sulpyrine. Calculated on the dried basis, it contains not less than 99.0% of sulpyrine ($C_{13}H_{16}N_3NaO_4S$).]

Suxamethonium chloride for thin-layer chromatography $C_{14}H_{30}Cl_2N_2O_4.2H_2O$ [Same as the namesake monograph]

Swertiamarin for thin-layer chromatography $C_{16}H_{22}O_{10}$
White, practically tasteless powder.
Melting point: 113 - 114°C
Purity Related substances—Dissolve 2.0 mg of swertiamarin for thin-layer chromatography in exactly 1 mL of ethanol (95), and perform the test with 20 μL of this solution as directed in the Identification under Swertia Herb: any spot other than the principal spot at the *Rf* value of about 0.5 does not appear.

Synthetic magnesium silicate for column chromatography Prepared for column chromatography (150 - 250 μm in particle diameter).

Syntheric zeolite for drying A mixture of $6(Na_2O).6(Al_2O_3).12(SiO_2)$ and $6(K_2O).6(Al_2O_3).12(SiO_2)$ prepared for drying. Usually, use the spherically molded form, 2 mm in diameter, prepared by adding a binder. White to grayish white, or color transition by adsorbing water. Average fine pore diameter is about 0.3 nm, and the surface area is 500 to 700 m^2 per g.
Loss on ignition: not more than 2.0% [2 g, 550 - 600°C, 4 hours, allow to stand in a desiccator (phosphorus (V) oxide)].

Talc [Same as the namesake monograph in Part II]

Tannic acid [Same as the namesake monograph]

Tannic acid TS Dissolve 1 g of tannic acid in 1 mL of ethanol (95), and add water to make 10 mL. Prepare before use.

Tartaric acid See L-tartaric acid.

L-Tartaric acid $C_4H_6O_6$ [K 8532, L(+)-Tartaric acid, Special class].

Tartrate buffer solution, pH 3.0 Dissolve 1.5 g of L-tartaric acid and 2.3 g of sodium tartarate dihydrate in water to