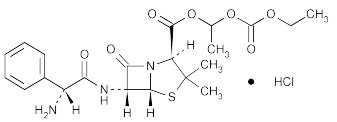
Bacampicillin Hydrochloride



$C_{21}H_{27}N_3O_7S \cdot HCl$ 501.98

4-Thia-1-azabicyclo[3.2.0]heptane-2-carboxylic acid, 6-[(aminophenylacetyl)amino]-3,3-dimethyl-7-oxo-,1-[(ethoxycarbonyl) oxyethyl ester, monohydrochloride, [2S-[2 α,5α, 6β(S*)]]-.

(2*S*,5*R*,6*R*)-6-[(*R*)-(2-Amino-2-phenylacetamido)]-3,3-dimethyl-7-oxo-4-thia-1-azabicyclo[3.2.0]heptane-2-carboxylic acid ester with ethyl 1-hydroxyethyl carbonate, monohydrochloride [37661-08-8].

» Bacampicillin Hydrochloride has a potency of not less than 623 µg and not more than 727 µg of ampicillin ($C_{16}H_{19}N_3O_4S$) per mg.

Packaging and storage—Preserve in tight containers.

USP Reference standards ⟨11⟩**—**
USP Bacampicillin Hydrochloride RS

Identification—Prepare a test solution of it in alcohol containing 2 mg per mL. Prepare a Standard solution of USP Bacampicillin Hydrochloride RS in alcohol containing 2 mg per mL. Apply two 5-µL portions of the test solution 4.0 cm apart to a thin-layer chromatographic plate coated with a 0.25-mm layer of chromatographic silica gel mixture (see *Chromatography* ⟨621⟩). After the spots dry, apply two 5-µL portions of the Standard solution, one midway between the test solution spots and the other to one of the test solution spots. Allow the spots to dry, place the plate in a suitable chromatographic chamber, and develop the chromatogram in a solvent system consisting of a mixture of methylene chloride, chloroform, and alcohol (10:1:1). When the solvent front has moved about three-fourths of the length of the plate, remove the plate from the chamber, and allow to dry. Spray the plate with a spray reagent containing 1 g of ninhydrin and 1 mL of pyridine in each 100 mL of solution in butyl alcohol, and heat at 100 ° for 10 minutes: bacampicillin appears as a purple spot, and the R_F values of the spots from the test solution and from the combined test solution and Standard solution, respectively, correspond to the R_F value of the spot obtained from the Standard solution.

pH ⟨791⟩: between 3.0 and 4.5, in a solution containing 20 mg per mL.

Water, *Method I* ⟨921⟩: not more than 1.0%.

Dimethylaniline ⟨223⟩: meets the requirement, the *Test Preparation* being prepared using 2 N sodium hydroxide instead of 1 N sodium hydroxide.

Assay—

Mobile phase—To 500 mL of 0.02 M dibasic sodium phosphate add portions of 0.02 M monobasic sodium phosphate until a pH of 6.8 ± 0.05 is reached. Prepare a suitable filtered mixture of this pH 6.8 buffer and acetonitrile (500:500). Make adjustments if necessary (see *System Suitability* under *Chromatography* ⟨621⟩).

Standard preparation—Prepare a solution of USP Bacampicillin Hydrochloride RS, accurately weighed, in water having a known concentration of about 0.8 mg per mL, sonicating for about 20 minutes to achieve complete dissolution. Pass through a filter of 0.5-µm or finer porosity.

Assay preparation—Transfer about 80 mg of Bacampicillin Hydrochloride, accurately weighed, to a 100-mL volumetric flask, add 90 mL of water, and sonicate for about 20 minutes. Dilute with water to volume, mix, and pass through a filter of 0.5-µm or finer porosity.

Chromatographic system (see *Chromatography* ⟨621⟩)—The liquid chromatograph is equipped with a 254-nm detector and a 3.9-mm × 15-cm column that contains packing L1. The flow rate is about 1 mL per minute. Chromatograph the *Standard preparation*, and record the responses as directed for *Procedure:* the column efficiency determined from the analyte peak is not less than 3000 theoretical plates, and the relative standard deviation for replicate injections is not more than 2.0%.

Procedure—Separately inject equal volumes (about 20 µL) of the *Standard preparation* and the *Assay preparation* into the chromatograph, record the chromatograms, and measure the area responses for the major peaks. Calculate the quantity, in µg, of ampicillin ($C_{16}H_{19}N_3O_4S$) equivalent in each mg of the Bacampicillin Hydrochloride taken by the formula:

$$(349.41/501.99)(100{,}000C / W)(r_U / r_S)$$

in which 349.41 and 501.99 are the molecular weights of anhydrous ampicillin and bacampicillin hydrochloride, respectively, C is the concentration, in mg per mL, of USP Bacampicillin Hydrochloride RS in the *Standard preparation*, W is the weight, in mg, of the portion of Bacampicillin Hydrochloride taken, and r_U and r_S are the bacampicillin peak area responses obtained from the *Assay preparation* and the *Standard preparation*, respectively.

Bacampicillin Hydrochloride for Oral Suspension

» Bacampicillin Hydrochloride for Oral Suspension contains an amount of Bacampicillin Hydrochloride equivalent to not less than 90.0 per cent and not more than 125.0 per cent of the labeled amount of ampicillin ($C_{16}H_{19}N_3O_4S$) when constituted as directed. It contains one or more suitable buffers, colors, flavors, suspending agents, and sweetening ingredients.

Packaging and storage—Preserve in tight containers.

USP Reference standards ⟨11⟩**—**
USP Ampicillin RS
USP Bacampicillin Hydrochloride RS

Identification—Constitute Bacampicillin Hydrochloride for Oral Suspension as directed in the labeling. Transfer a portion of the resulting suspension, equivalent to about 140 mg of ampicillin, to a 100-mL volumetric flask, add 70 mL of alcohol, shake by mechanical means for 30 minutes, dilute with alcohol to volume, and mix: the solution so obtained responds to the *Identification* test under *Bacampicillin Hydrochloride*.

Uniformity of dosage units ⟨905⟩**—**

FOR SOLID PACKAGED IN SINGLE-UNIT CONTAINERS: meets the requirements.

Deliverable volume ⟨698⟩: meets the requirements.

pH ⟨791⟩: between 6.5 and 8.0, in the suspension constituted as directed in the labeling.

Loss on drying ⟨731⟩**—**Dry about 100 mg, accurately weighed, in a capillary-stoppered bottle in vacuum at 60 ° for 3 hours: it loses not more than 2.0% of its weight.

Assay—

Standard preparation—Using USP Ampicillin RS, prepare as directed for *Standard preparation* under *Iodometric Assay—Antibiotics* ⟨425⟩.

Assay preparation—Transfer an accurately measured volume of Bacampicillin Hydrochloride for Oral Suspension, constituted as directed in the labeling and free from bubbles, equivalent to about 87.5 mg of ampicillin, to a 250-mL volumetric flask. Add 200 mL of a solvent mixture consisting of alcohol and 0.1 M phosphoric acid (4:1). Shake by mechanical means for 30 min-

utes, dilute with the same solvent mixture to volume, and mix. Centrifuge a portion of the resulting suspension. Pipet 4.0 mL of the clear solution so obtained into each of two glass-stoppered, 125-mL conical flasks.

Procedure—Proceed as directed for *Procedure* under *Iodometric Assay—Antibiotics* ⟨425⟩. Calculate the quantity, in mg, of $C_{16}H_{19}N_3O_4S$ in each mL of the constituted Bacampicillin Hydrochloride for Oral Suspension taken by the formula:

$$(0.0625F)(B - I) / V$$

in which V is the volume, in mL, of constituted Bacampicillin Hydrochloride for Oral Suspension taken, and the other terms are as defined therein.

Bacampicillin Hydrochloride Tablets

» Bacampicillin Hydrochloride Tablets contain the equivalent of not less than 90.0 per cent and not more than 125.0 per cent of the labeled amount of ampicillin ($C_{16}H_{19}N_3O_4S$).

Packaging and storage—Preserve in tight containers.

USP Reference standards ⟨11⟩**—**
USP Ampicillin RS
USP Bacampicillin Hydrochloride RS

Identification—To a portion of powdered Tablets add alcohol to obtain a solution containing the equivalent of 2 mg of ampicillin per mL: the solution so obtained responds to the *Identification* test under *Bacampicillin Hydrochloride.*

Dissolution ⟨711⟩**—**

Medium: water; 900 mL.

Apparatus 2: 75 rpm.

Time: 30 minutes.

Standard preparation—Dissolve an accurately weighed quantity of USP Ampicillin RS in water to obtain a solution having a known concentration of about 0.3 mg per mL.

Procedure—Determine the amount of ampicillin ($C_{16}H_{19}N_3O_4S$) dissolved as directed for *Procedure* in the section *Antibiotics—Hydroxylamine Assay* under *Automated Methods of Analysis* ⟨16⟩.

Tolerances—Not less than 85% *(Q)* of the labeled amount of $C_{16}H_{19}N_3O_4S$ is dissolved in 30 minutes.

Uniformity of dosage units ⟨905⟩: meet the requirements.

Water, *Method I* ⟨921⟩: not more than 2.5%.

Assay—

Mobile phase, Standard preparation, and *Chromatographic system*—Proceed as directed in the *Assay* under *Bacampicillin Hydrochloride.*

Assay preparation—Weigh and finely powder not fewer than 20 Tablets. Transfer an accurately weighed portion of the powder, equivalent to about 56 mg of ampicillin ($C_{16}H_{19}N_3O_4S$), to a 100-mL volumetric flask, add 90 mL of water, and sonicate for about 20 minutes. Dilute with water to volume, mix, and filter through a filter of 0.5- µm or finer porosity.

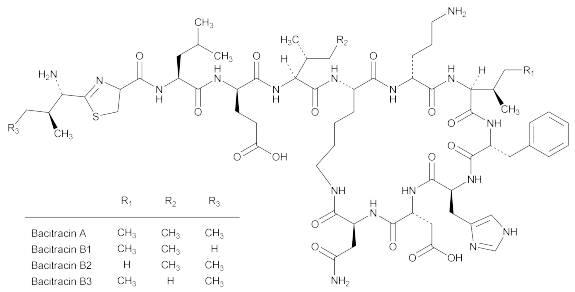
Procedure—Proceed as directed for *Procedure* in the *Assay* under *Bacampicillin Hydrochloride.* Calculate the quantity, in mg, of ampicillin ($C_{16}H_{19}N_3O_4S$) equivalent to the portion of Tablets taken by the formula:

$$(349.41/501.99)(100C)(r_U / r_S)$$

in which the terms are as defined therein.

Bacitracin

Bacitracin [1405-87-4].



» Bacitracin is a mixture of polypeptides produced by the growth of an organism of the *licheniformis* group of *Bacillus subtilis* (Fam. Bacillacaea), the main components being bacitracins A, B1, B2, and B3. It has a potency of not less than 65 Bacitracin Units per mg, calculated on the dried basis.

Packaging and storage—Preserve in tight containers, and store in a cool place.

Labeling—Where it is packaged for prescription compounding, label it to indicate that it is not sterile and that the potency cannot be assured for longer than 60 days after opening, and to state the number of Bacitracin Units per milligram. Where it is intended for use in preparing injectable or other sterile dosage forms, the label states that it is sterile or must be subjected to further processing during the preparation of injectable or other sterile dosage forms.

USP Reference standards ⟨11⟩**—**
USP Bacitracin Zinc RS
USP Endotoxin RS

Identification—

A: *Thin-Layer Chromatographic Identification Test* ⟨201BNP⟩*:* meets the requirements.

B: It meets the requirements of the liquid chromatographic procedure in the test for *Composition.*

pH ⟨791⟩: between 5.5 and 7.5, in a solution containing 10,000 Bacitracin Units per mL.

Loss on drying ⟨731⟩**—**Dry about 100 mg in a capillary-stoppered bottle in vacuum at a pressure not exceeding 5 mm of mercury at 60° for 3 hours: it loses not more than 5.0% of its weight.

Residue on ignition ⟨281⟩**:** not more than 0.5%.

Composition—

Buffer—Dissolve 34.8 g of dibasic potassium phosphate in 1 L of water. Adjust with 27.2 g of monobasic potassium phosphate dissolved in 1 L of water to a pH of 6.0.

Mobile phase—Prepare a mixture of methanol, water, *Buffer,* and acetonitrile (26:15:5:2), mix well, and degas.

System suitability solution—Dissolve an accurately weighed quantity of USP Bacitracin Zinc RS in water, add diluted hydrochloric acid, using about 2% of the final volume, and dilute with water to obtain a solution with a nominal concentration of about 2.0 mg per mL.

Reporting threshold solution—Dilute quantitatively, with *Mobile phase,* a suitable volume of *System suitability solution* to obtain a solution having a known concentration of 0.01 mg per mL. This solution is used to determine the reporting threshold.

Peak identification solution—Dissolve a suitable quantity of USP Bacitracin Zinc RS in a suitable volume of a 40 g per L solution of edetate disodium (pH adjusted to 7.0 with dilute sodium hydroxide), to obtain a solution having a nominal con-