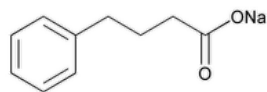


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Sodium Phenylbutyrate



$C_{10}H_{11}NaO_2$ 186.18

Benzenebutanoic acid, sodium salt;

Sodium 4-phenylbutyrate;

Sodium 4-phenylbutanoate. CAS RN[®]: 1716-12-7; UNII: NT6K61736T.

DEFINITION

Sodium Phenylbutyrate contains NLT 99.0% and NMT 101.0% of sodium phenylbutyrate ($C_{10}H_{11}NaO_2$), calculated on the anhydrous basis.

IDENTIFICATION

Change to read:

• A. **SPECTROSCOPIC IDENTIFICATION TESTS (197), Infrared Spectroscopy: 197K** (CN 1-MAY-2020)

• B. **IDENTIFICATION TESTS—GENERAL (191), Sodium**

Sample solution: Dissolve 150 mg in 2 mL of water.

Acceptance criteria: Meets the requirements of test A

ASSAY

PROCEDURE

Sample: 150 mg

Analysis: Disperse the *Sample* in 50 mL of anhydrous acetic acid. [NOTE—The opalescence of the solution disappears during the titration.]

Titrate with 0.1 N perchloric acid VS, determining the endpoint potentiometrically. Each mL of 0.1 N perchloric acid is equivalent to 18.62 mg of sodium phenylbutyrate ($C_{10}H_{11}NaO_2$).

Acceptance criteria: 99.0%–101.0% on the anhydrous basis

IMPURITIES

LIMIT OF PHENYLBUTYRATE RELATED COMPOUND C

Silylation solution: To 2 mL of bis(trimethylsilyl)trifluoroacetamide add 0.04 mL of chlorotrimethylsilane, and mix.

Sample solution: Dissolve 50.0 mg of Sodium Phenylbutyrate in 3 mL of water, and add 0.5 mL of hydrochloric acid. Extract with 2 quantities, each of 5 mL, of methylene chloride. Evaporate the combined methylene chloride extracts to dryness in a vial with a screw cap, and add 0.5 mL of the *Silylation solution*. Seal the vial, and heat at $70 \pm 5^\circ$ for 20 min.

Standard stock solution: 0.5 mg/mL of [USP Phenylbutyrate Related Compound C RS](#) in methylene chloride

Diluted standard stock solution: 0.05 mg/mL of [USP Phenylbutyrate Related Compound C RS](#) in methylene chloride from *Standard stock solution*

Standard solution: Place an amount of the *Diluted standard stock solution*, equivalent to 0.05 mg, in a vial with a screw cap, evaporate to dryness, and add 0.5 mL of the *Silylation solution*. Seal the vial, and heat at $70 \pm 5^\circ$ for 20 min.

System suitability solution: Prepare a solution containing 0.4 mg/mL of [USP Sodium Phenylbutyrate RS](#) in water. To 3 mL of this solution add 0.1 mL of hydrochloric acid. Extract with 2 quantities, each of 5 mL, of methylene chloride. Combine the methylene chloride extracts in a vial with a screw cap, and add 2 mL of *Standard stock solution*. Evaporate to dryness, and add 0.5 mL of the *Silylation solution*. Seal the vial, and heat at $70 \pm 5^\circ$ for 20 min.

Chromatographic system

(See [Chromatography \(621\), System Suitability](#).)

Mode: GC

Detector: Flame ionization

Column: 25-m × 0.25-mm fused silica capillary; coated with a 1.0-µm film of phase G27

Temperatures

Injector: 270°

Detector: 270°

Column: See [Table 1](#).

Table 1

Initial Temperature (°)	Temperature Ramp (°/min)	Final Temperature (°)	Hold Time at Final Temperature (min)
50	0	50	5
50	10	270	5

Carrier gas: Helium

Flow rate: 0.9 mL/min

Injection volume: 1 µL

Split ratio: 1:100

System suitability

Sample: *System suitability solution*

[NOTE—The relative retention times for phenylbutyrate related compound C and phenylbutyrate are about 0.98 and 1.0, respectively.]

Suitability requirements

Resolution: NLT 3.0 between the phenylbutyrate related compound C and phenylbutyrate peaks

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of phenylbutyrate related compound C in the portion of Sodium Phenylbutyrate taken:

$$\text{Result} = (r_U/r_S) \times (W_S/W_U) \times 100$$

r_U = peak response of phenylbutyrate related compound C from the *Sample solution*

r_S = peak response of phenylbutyrate related compound C from the *Standard solution*

W_S = amount of [USP Phenylbutyrate Related Compound C RS](#) taken to prepare the *Standard solution* (mg)

W_U = amount of Sodium Phenylbutyrate taken to prepare the *Sample solution* (mg)

Acceptance criteria: NMT 0.1%

• **ORGANIC IMPURITIES**

Mobile phase: Methanol, glacial acetic acid, and water (49:1:50)

Impurity stock solution A: 0.1 mg/mL of [USP Phenylbutyrate Related Compound A RS](#) in methanol

Impurity standard solution A: Dilute 1.0 mL of *Impurity stock solution A* with water to 50.0 mL. This solution contains 2 µg/mL of [USP Phenylbutyrate Related Compound A RS](#).

Impurity stock solution B: 0.02 mg/mL of [USP Phenylbutyrate Related Compound B RS](#) in methanol

Impurity standard solution B: Dilute 1.0 mL of *Impurity stock solution B* with water to 50.0 mL. This solution contains 0.4 µg/mL of [USP Phenylbutyrate Related Compound B RS](#).

System suitability solution: Prepare a solution containing 20 mg/mL of [USP Sodium Phenylbutyrate RS](#) in methanol. Transfer 10 mL of this solution to a 50-mL volumetric flask, add 1.0 mL of *Impurity stock solution B*, and dilute with water to volume.

Sensitivity solution: Dilute 6.0 mL of *Impurity standard solution A* with water to 10.0 mL. This solution contains 1.2 µg/mL of [USP Phenylbutyrate Related Compound A RS](#).

Sample solution: 4.0 mg/mL of Sodium Phenylbutyrate, prepared as follows. Dissolve it first in methanol, using 20% of the final volume, and dilute with water to volume.

Chromatographic system

(See [Chromatography \(621\)](#), *System Suitability*.)

Mode: LC