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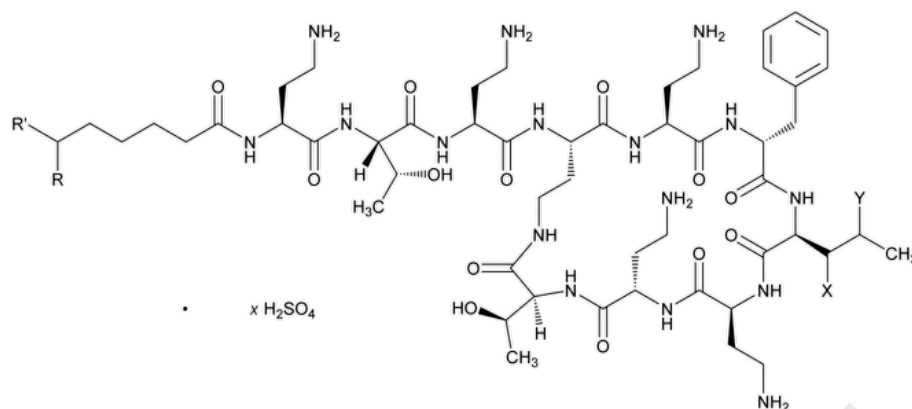
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Polymyxin B Sulfate



Polymyxin	R	R'	X	Y
B1				
B2				
B3				
B1-l				

 $C_{56}H_{98}N_{16}O_{13}$

1203.48

Polymyxin B1:

N-[(*S*)-4-Amino-1-[[[(2*S*,3*R*)-1-[(*S*)-4-amino-1-oxo-1-[(3*S*,6*S*,9*S*,12*S*,15*S*,18*S*,21*S*)-6,9,18-tris(2-aminoethyl)-15-benzyl-3-[(*R*)-1-hydroxyethyl]-12-isobutyl-2,5,8,11,14,17,20-heptaoxo-1,4,7,10,13,16,19-heptaazacyclotricosan-21-yl]amino)butan-2-yl]amino]-3-hydroxy-1-oxobutan-2-yl]amino]-1-oxobutan-2-yl]-6-methyloctanamide CAS RN®: 4135-11-9.

 $C_{55}H_{96}N_{16}O_{13}$

1189.45

Polymyxin B2:

N-[(*S*)-4-Amino-1-[[[(2*S*,3*R*)-1-[(*S*)-4-amino-1-oxo-1-[(3*S*,6*S*,9*S*,12*S*,15*S*,18*S*,21*S*)-6,9,18-tris(2-aminoethyl)-15-benzyl-3-[(*R*)-1-hydroxyethyl]-12-isobutyl-2,5,8,11,14,17,20-heptaoxo-1,4,7,10,13,16,19-heptaazacyclotricosan-21-yl]amino)butan-2-yl]amino]-3-hydroxy-1-oxobutan-2-yl]amino]-1-oxobutan-2-yl]-6-methylheptanamide CAS RN®: 34503-87-2.

 $C_{55}H_{96}N_{16}O_{13}$

1189.45

Polymyxin B3:

N-[(*S*)-4-Amino-1-[[[(2*S*,3*R*)-1-[(*S*)-4-amino-1-oxo-1-[(3*S*,6*S*,9*S*,12*S*,15*S*,18*S*,21*S*)-6,9,18-tris(2-aminoethyl)-15-benzyl-3-[(*R*)-1-hydroxyethyl]-12-isobutyl-2,5,8,11,14,17,20-heptaoxo-1,4,7,10,13,16,19-heptaazacyclotricosan-21-yl]amino)butan-2-yl]amino]-3-hydroxy-1-oxobutan-2-yl]amino]-1-oxobutan-2-yl]octanamide CAS RN®: 71140-58-4.

 $C_{56}H_{98}N_{16}O_{13}$

1203.48

Polymyxin B1-l:

N-[(*S*)-4-Amino-1-[[[(2*S*,3*R*)-1-[(*S*)-4-amino-1-oxo-1-[(3*S*,6*S*,9*S*,12*S*,15*S*,18*S*,21*S*)-6,9,18-tris(2-aminoethyl)-15-benzyl-3-[(*R*)-1-hydroxyethyl]-12-[(*S*)-sec-butyl]-2,5,8,11,14,17,20-heptaoxo-1,4,7,10,13,16,19-heptaazacyclotricosan-21-yl]amino)butan-2-yl]amino]-3-hydroxy-1-oxobutan-2-yl]amino]-1-oxobutan-2-yl]-6-methyloctanamide.

Polymyxin B, sulfate;

Polymyxin B sulfate CAS RN®: 1405-20-5; UNII: 19371312D4.

Polymyxin B CAS RN®: 1404-26-8; UNII: J2VZ07J96K.

DEFINITION

Polymyxin B Sulfate is the sulfate salt of a kind of polymyxin, a substance produced by the growth of *Bacillus polymyxa* (Prazmowski) Migula (Fam. Bacillaceae), or a mixture of two or more such salts. It has a potency of NLT 6000 Polymyxin B units/mg, calculated on the dried basis.

IDENTIFICATION

• **A.** The retention times of the major peaks of the *Sample solution* correspond to those of the *Standard solution*, as obtained in the test for *Composition of Polymyxins*.

• **B.**

Solution A: 10 mg/mL of [cupric sulfate](#)

Sample solution: Dissolve 2 mg in 5 mL of [water](#).

Analysis: To the *Sample solution* add 5 mL of [2.5 N sodium hydroxide](#), and mix. Add 5 drops of *Solution A*, shaking after the addition of each drop.

Acceptance criteria: A reddish-violet color is produced.

• **C.** [IDENTIFICATION TESTS—GENERAL \(191\)](#), [Sulfate](#): A 50-mg/mL solution of Polymyxin B Sulfate meets the requirements.

ASSAY

• **PROCEDURE**

Analysis: Proceed with Polymyxin B Sulfate as directed for [Antibiotics—Microbial Assays \(81\)](#).

Acceptance criteria: NLT 6000 Polymyxin B units/mg on the dried basis

IMPURITIES

• [RESIDUE ON IGNITION \(281\)](#).

Analysis: Proceed as directed in the chapter, moistening the charred residue with 2 mL of [nitric acid](#) and 5 drops of [sulfuric acid](#).

Acceptance criteria: NMT 5.0% where used for prescription compounding

• **ORGANIC IMPURITIES**

Buffer, Mobile phase, Diluent, Standard solution, Sample solution, Chromatographic system, and System suitability: Proceed as directed in the test for *Composition of Polymyxins*.

Analysis

Samples: *Standard solution* (the *Standard solution* is used to determine the disregard limit) and *Sample solution*

Calculate the percentage of each impurity in the portion of Polymyxin B Sulfate taken:

$$\text{Result} = (r_U/r_T) \times 100$$

r_U = peak response of each impurity from the *Sample solution*

r_T = sum of the responses of all peaks from the *Sample solution*

Acceptance criteria: Disregard any peak less than 0.007 times the peak response of the polymyxin B1 peak from the *Standard solution*.

Any individual impurity: NMT 3.0%

Total impurities: NMT 17.0%

SPECIFIC TESTS

• [pH \(791\)](#).

Sample solution: 5 mg/mL

Acceptance criteria: 5.0–7.5

• [LOSS ON DRYING \(731\)](#).

Analysis: Dry 100 mg in a capillary-stoppered bottle under vacuum at 60° for 3 h.

Acceptance criteria: NMT 7.0%

• [STERILITY TESTS \(71\)](#): Meets the requirements where the label states that Polymyxin B Sulfate is sterile

• [PYROGEN TEST \(151\)](#).

Sample solution: Nominally 20×10^3 Polymyxin B units/mL in [pyrogen-free saline TS](#)

Analysis: Proceed as directed in the chapter using a test dose of 1.0 mL/kg.

Acceptance criteria: Meets the requirements where intended for injectable dosage forms or where the label states that Polymyxin B Sulfate must be subjected to further processing during the preparation of injectable dosage forms

• **COMPOSITION OF POLYMYXINS**

Buffer: 4.5 g/L of [sodium sulfate anhydrous](#). The pH is adjusted to 2.3 with dilute phosphoric acid (10% w/w) prior to final dilution.

Mobile phase: [Acetonitrile](#) and *Buffer* (20:80)

Diluent: [Acetonitrile](#) and [water](#) (20:80)