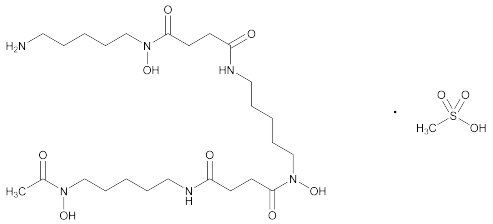
Deferoxamine Mesylate



$C_{25}H_{48}N_6O_8 \cdot CH_4O_3S$ 656.79

Butanediamide, *N*′-[5-[[4-[[5-(acetylhydroxyamino)pentyl]-amino]-1,4-dioxobutyl]hydroxyamino]pentyl]-*N*-(5-aminopentyl)-*N*-hydroxy-, monomethanesulfonate;
N-[5-[3-[(5-Aminopentyl)hydroxycarbamoyl]propionamido]-pentyl]-3-[[5-(*N*-hydroxyacetamido)pentyl]carbamoyl]propionohydroxamic acid monomethanesulfonate (salt) [138-14-7].

DEFINITION

Change to read:

Deferoxamine Mesylate contains NLT •93.0%• (RB 1-May-2011) and NMT 102.0% of $C_{25}H_{48}N_6O_8 \cdot CH_4O_3S$, calculated on the anhydrous basis.

IDENTIFICATION

Delete the following:

▲• **A. PROCEDURE**
Sample: 5 mg
Analysis: Dissolve the *Sample* in 5 mL of water, add 2 mL of tribasic sodium phosphate solution (1 in 200), then add 10 drops of β-naphthoquinone-4-sodium sulfonate solution (1 in 40).
Acceptance criteria: A blackish-brown color is produced.▲*USP34*

Add the following:

▲• **A. INFRARED ABSORPTION** ⟨197K⟩▲*USP34*

Add the following:

▲• **B.** The retention time of the major peak of the *Sample solution* corresponds to that of the *Standard solution*, as obtained in the *Assay*.▲*USP34*

ASSAY

Change to read:

• **PROCEDURE**
▲**Solution A:** 1.32 g/L of dibasic ammonium phosphate in water. Adjust with phosphoric acid to a pH of 3.0.
Solution B: Acetonitrile and *Solution A* (1:1)
Mobile phase: See *Table 1*.

Table 1

Time (min)	Solution A (%)	Solution B (%)
0	88	12
20	80	20
35	57.5	42.5
35.1	88	12
40	88	12

Diluent: Acetonitrile and water (6:94)
Standard solution: 1.0 mg/mL of USP Deferoxamine Mesylate RS in *Diluent*
Sample solution: 1.0 mg/mL of Deferoxamine Mesylate in *Diluent*
Chromatographic system
(See *Chromatography* ⟨621⟩, *System Suitability*.)
Mode: LC
Detector: UV 220 nm
Column: 4.6-mm × 7.5-cm; 3.5-µm packing L1
Temperature
Column: 32°
Autosampler: 5°
Flow rate: 1.5 mL/min
Injection size: 20 µL
System suitability
Sample: *Standard solution*
Suitability requirements
Relative standard deviation: NMT 2.0%
Analysis
Samples: *Standard solution* and *Sample solution*
Calculate the percentage of deferoxamine mesylate ($C_{25}H_{48}N_6O_8 \cdot CH_4O_3S$) in the portion of Deferoxamine Mesylate taken:

$$\text{Result} = (r_U/r_S) \times (C_S/C_U) \times 100$$

r_U = peak response of deferoxamine from the *Sample solution*
r_S = peak response of deferoxamine from the *Standard solution*
C_S = concentration of the *Standard solution* (mg/mL)
C_U = concentration of the *Sample solution* (mg/mL)

Acceptance criteria: •93.0%• (RB 1-May-2011)–102.0% on the anhydrous basis▲*USP34*

IMPURITIES

• **RESIDUE ON IGNITION** ⟨281⟩**:** NMT 0.1%, 2.0 g being used
• **CHLORIDE AND SULFATE,** *Chloride* ⟨221⟩**:** A 1.2-g portion shows no more chloride than corresponds to 0.20 mL of 0.020 N hydrochloric acid (NMT 0.012%).
• **CHLORIDE AND SULFATE,** *Sulfate* ⟨221⟩**:** A 0.5-g portion shows no more sulfate than corresponds to 0.20 mL of 0.020 N sulfuric acid (NMT 0.04%).
• **HEAVY METALS,** *Method II* ⟨231⟩**:** NMT 10 ppm

Change to read:

▲• **ORGANIC IMPURITIES**
Solution A, Solution B, Diluent, Mobile phase, Sample solution, and **Chromatographic system:** Proceed as directed in the *Assay*.
Standard stock solution: Use the *Standard solution*, prepared as directed in the *Assay*. [NOTE—USP Deferoxamine Mesylate RS contains impurity A as a minor component.]

Standard solution: 0.01 mg/mL of USP Deferoxamine Mesylate RS in *Diluent* from the *Standard stock solution*
System suitability
Samples: *Standard stock solution* and *Standard solution*
Suitability requirements
Resolution: NLT 2.0 between the impurity A and deferoxamine peaks, *Standard stock solution*
Relative standard deviation: NMT 5.0% for the deferoxamine peak, *Standard solution*
Analysis
Samples: *Standard solution* and *Sample solution*
Calculate the percentage of each impurity in the portion of Deferoxamine Mesylate taken:

$$\text{Result} = (r_U/r_S) \times (C_S/C_U) \times 100$$

r_U = peak response of each impurity from the *Sample solution*
r_S = peak response of deferoxamine from the *Standard solution*
C_S = concentration of the *Standard solution* (mg/mL)
C_U = concentration of the *Sample solution* (mg/mL)

Acceptance criteria: See *Table 2*.
[NOTE—The reporting level for impurities is 0.04%.]

Table 2

Name	Relative Retention Time	Acceptance Criteria, NMT (%)
Impurity A*	0.85	•3.0•(RB 1-May-2011)
Deferoxamine	1.0	—
Any unspecified impurity	—	1.0
Total impurities •eluting before deferoxamine•(RB 1-May-2011)	—	5.0
•Total impurities eluting after deferoxamine•(RB 1-May-2011)	—	•2.0•(RB 1-May-2011)

* Des-methylene impurity (desferrioxamine A_1).

▲*USP34*

SPECIFIC TESTS
- **pH** ⟨**791**⟩**:** 4.0–6.0, in a solution (1 in 100)
- **Water Determination,** *Method I* ⟨**921**⟩**:** NMT 2.0%
- **Sterility Tests** ⟨**71**⟩**:** Where the label states that Deferoxamine Mesylate is sterile, it meets the requirements.
- **Bacterial Endotoxins Test** ⟨**85**⟩**:** Where the label states that Deferoxamine Mesylate is sterile or must be subjected to further processing during the preparation of injectable dosage forms, it contains NMT 0.33 USP Endotoxin Unit/mg of deferoxamine mesylate.

ADDITIONAL REQUIREMENTS

Change to read:

- **Packaging and Storage:** Preserve in tight containers. ▲Store in a cold place.▲*USP34*
- **Labeling:** Where it is intended for use in preparing injectable dosage forms, the label states that it is sterile or must be subjected to further processing during the preparation of injectable dosage forms.
- **USP Reference Standards** ⟨**11**⟩
USP Deferoxamine Mesylate RS
USP Endotoxin RS