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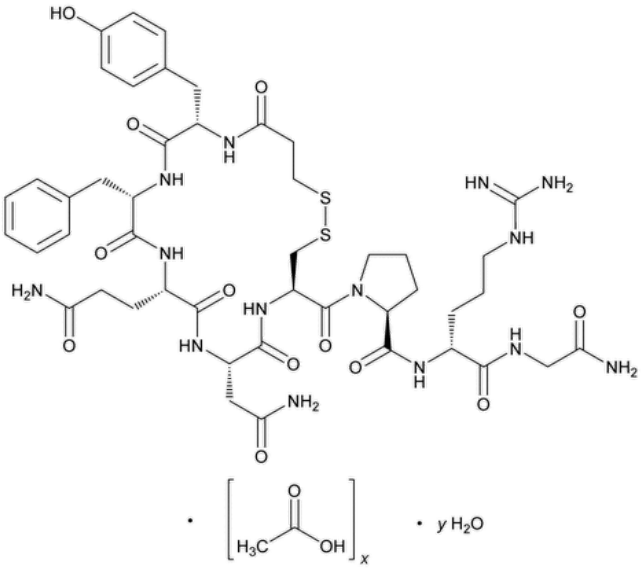
Desmopressin Acetate



$C_{46}H_{64}N_{14}O_{12}S_2 \cdot xC_2H_4O_2 \cdot yH_2O$ 1069.22 (anhydrous, free base)

Vasopressin, 1-(3-mercaptopropanoic acid)-8-D-arginine-, acetate (salt) hydrate;
1-(3-Mercaptopropionic acid)-8-D-arginine-vasopressin, acetate (salt) hydrate.

x(acetate), *y*(water).

Monoacetate trihydrate CAS RN®: 62357-86-2; UNII: XB13HYU18U.

Monoacetate anhydrous CAS RN®: 62288-83-9; UNII: 1K12647SFC.

DEFINITION

Desmopressin Acetate is a synthetic octapeptide hormone having the property of antidiuresis. It is a synthetic analog of vasopressin. It contains NLT 95.0% and NMT 105.0% of desmopressin ($C_{46}H_{64}N_{14}O_{12}S_2$), calculated on the anhydrous, acetic acid-free basis.

IDENTIFICATION

- **A.** The monoisotopic mass by *Mass Spectrometry* ⟨736⟩ is 1068.4 ± 0.5 mass units.
- **B.**

Buffer solution, Mobile phase, Standard solution, and **Sample solution:** Prepare as directed in the *Assay*.

Identity sample solution: 10 µg/mL each of USP Desmopressin Acetate RS and Desmopressin Acetate in *Mobile phase*

Acceptance criteria: The retention time of the major peak of the *Sample solution* corresponds to that of the *Standard solution*, as obtained in the *Assay*. The major peaks of the *Identity sample solution* coelute.

ASSAY

Change to read:

- **Procedure**

Buffer solution: Dissolve 3.4 g of monobasic potassium phosphate and 2.0 g of sodium 1-heptanesulfonic acid in 1000 mL of water. Adjust with phosphoric acid or sodium hydroxide to a pH of 4.50 ± 0.05, as needed. Pass through a filter of 0.45-µm pore size.

Mobile phase: Mix acetonitrile and *Buffer solution* (22:78), and degas. Make adjustments, if necessary (see *Chromatography* ⟨621⟩, *System Suitability*). [Note—The retention time of desmopressin is very sensitive to the composition of the *Mobile phase*.]

Standard solution: 20 µg/mL of USP Desmopressin Acetate RS in *Mobile phase*

Sample solution: 20 µg/mL of Desmopressin Acetate in *Mobile phase*

System suitability solution: Dissolve about 1 mg of ▲USP Oxytocin Identification RS,▲ (IRA 1-Mar-2021) accurately weighed, in a 50-mL volumetric flask, dilute with *Mobile phase* to volume, and mix. Transfer 5.0 mL each of the resulting solution and the *Sample solution* to a 100-mL volumetric flask, dilute with *Mobile phase* to volume, and mix.

Chromatographic system

(See *Chromatography ⟨621⟩, System Suitability*.)

Mode: LC

Detector: UV 220 nm

Column: 4.6-mm × 25-cm; 5-µm packing L1

Column temperature: 30°

Flow rate: 1.0 mL/min

Injection volume: 50 µL

System suitability

Samples: *Standard solution* and *System suitability solution*

Suitability requirements

Resolution: NLT 1.5 between desmopressin and oxytocin, *System suitability solution*

Tailing factor: NMT 2.0, *Standard solution*

Relative standard deviation: NMT 2.0% for the desmopressin peak area for replicate injections, *Standard solution*

Chromatogram similarity: The desmopressin peak elutes before the oxytocin peak, *System suitability solution*.

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of desmopressin ($C_{46}H_{64}N_{14}O_{12}S_2$) in the portion of Desmopressin Acetate taken:

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

r_U = peak response from the *Sample solution*

r_S = peak response from the *Standard solution*

C_S = concentration of USP Desmopressin Acetate RS (calculated on the anhydrous, acetic acid-free basis) in the *Standard solution* (mg/mL)

C_U = concentration of Desmopressin Acetate (calculated on the anhydrous, acetic acid-free basis) in the *Sample solution* (mg/mL)

Acceptance criteria: 95.0%–105.0% on the anhydrous, acetic acid-free basis

IMPURITIES

• **Desmopressin-Related Impurities**

Mobile phase and **System suitability solution:** Prepare as directed in the *Assay*.

Standard solution: 1 µg/mL of USP Desmopressin Acetate RS in *Mobile phase*, prepared by diluting 0.5 mL of the *Standard solution* from the *Assay* with *Mobile phase* to 10 mL

Sample solution: 200 µg/mL of Desmopressin Acetate in *Mobile phase*

Chromatographic system

(See *Chromatography ⟨621⟩, System Suitability*.)

Mode: LC

Detector: UV 220 nm

Column: 4.6-mm × 25-cm; 5-µm packing L1

Column temperature: 30°

Flow rate: 1.0 mL/min

Injection volume: 200 µL

System suitability

Samples: *System suitability solution* and *Standard solution*

Suitability requirements

Resolution: NLT 1.5 between desmopressin and oxytocin, *System suitability solution*

Tailing factor: NMT 2.0, *Standard solution*

Relative standard deviation: NMT 5.0% for the desmopressin peak area for replicate injections, *Standard solution*

Chromatogram similarity: The desmopressin peak elutes before the oxytocin peak, *System suitability solution*.

Analysis

Samples: *Standard solution* and *Sample solution*

Record the chromatograms, and measure the response for each peak, except for the main desmopressin peak of the *Sample solution*. Calculate the percentage of each individual impurity in the portion of Desmopressin Acetate taken:

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

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

r_S = peak response of desmopressin from the *Standard solution*

C_S = concentration of USP Desmopressin Acetate RS (calculated on the anhydrous, acetic acid-free basis) in the *Standard solution* (mg/mL)

C_U = concentration of Desmopressin Acetate (calculated on the anhydrous, acetic acid-free basis) in the *Sample solution* (mg/mL)

Acceptance criteria

Any individual impurity: NMT 0.5%

Total impurities: NMT 1.5%

OTHER COMPONENTS

• **Acetic Acid in Peptides ⟨503⟩:** 3.0%–8.0%

SPECIFIC TESTS

• **Microbial Enumeration Tests ⟨61⟩** and **Tests for Specific Microorganisms ⟨62⟩:** The total aerobic microbial count does not exceed 10^2 cfu/g.

• **Water Determination ⟨921⟩, *Method I, Method Ic*:** NMT 6.0%

• **Bacterial Endotoxins Test ⟨85⟩:** The level of bacterial endotoxins is such that the requirement under the relevant dosage form monograph(s) in which Desmopressin Acetate is used can be met. Where the label states Desmopressin Acetate must be subjected to further processing during the preparation of injectable dosage forms, the level of bacterial endotoxins is such that the requirement under the relevant dosage form monograph(s) in which Desmopressin Acetate is used can be met.

ADDITIONAL REQUIREMENTS

• **Packaging and Storage:** Preserve in tight containers, preferably of Type I glass, protected from light and moisture. Store at a temperature not exceeding 25°, preferably between 2° and 8°.

Change to read:

• **USP Reference Standards ⟨11⟩**

USP Desmopressin Acetate RS

▲USP Oxytocin Identification RS▲ (IRA 1-Mar-2021)

Auxiliary Information - Please check for your question in the FAQs before contacting USP.

Topic/Question	Contact	Expert Committee
DESMOPRESSIN ACETATE	Julie Zhang Associate Science & Standards Liaison	BIO12020 Biologics Monographs 1 - Peptides

Chromatographic Database Information: Chromatographic Database

Most Recently Appeared In:
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