Cetylpyridinium Chloride

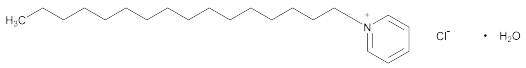
Type of Posting	Revision Bulletin
Posting Date	01–Aug–2016
Official Date	01–Aug–2016
Expert Committee	Chemical Medicines Monographs 6
Reason for Revision	Compliance

In accordance with the Rules and Procedures of the 2015-2020 Council of Experts, the Chemical Medicines Monographs 6 Expert Committee has revised the Cetylpyridinium Chloride monograph. The purpose for the revision is to postpone the limit for Any individual unspecified impurity in the *Organic Impurities* section.

The Cetylpyridinium Chloride Revision Bulletin supersedes the currently official Cetylpyridinium Chloride monograph, which will become official August 1, 2016. The Revision Bulletin will be incorporated in USP 40–NF 35

Should you have any questions, please contact Alan R Potts, Ph.D. (301–816–8364 or arp@usp.org).

Cetylpyridinium Chloride



$C_{21}H_{38}ClN \cdot H_2O$ 358.00
$C_{21}H_{38}ClN$ 339.99
Pyridinium, 1-hexadecyl-, chloride, monohydrate; 1-Hexadecylpyridinium chloride monohydrate [6004-24-6]. Anhydrous [123-03-5].

DEFINITION

Change to read:

Cetylpyridinium Chloride contains ■NLT 98.0%■1S (*USP39*) and NMT 102.0% of cetylpyridinium chloride ($C_{21}H_{38}ClN$), calculated on the anhydrous basis.

IDENTIFICATION

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

Delete the following:

■• **B. ULTRAVIOLET ABSORPTION** ⟨**197U**⟩
Sample solution: 40 µg/mL in water
Acceptance criteria: Meets the requirements
■1S (*USP39*)

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*.
■1S (*USP39*)

• **C. IDENTIFICATION TESTS—GENERAL,** *Chloride* ⟨**191**⟩
Sample solution: 2 mg/mL in water
Acceptance criteria: A 10-mL portion of the *Sample solution* meets the requirements, except that when silver nitrate TS is added, turbidity is produced rather than a curdy white precipitate.

ASSAY

Change to read:

• **PROCEDURE**
■Use 0.1% trifluoroacetic acid–rinsed glassware and silanized vials for all solutions containing cetylpyridinium chloride, as cetylpyridinium may react with the surface.
Solution A: Trifluoroacetic acid and water (1:999)
Solution B: Acetonitrile and trifluoroacetic acid (999:1)
Mobile phase: *Solution A* and *Solution B* (62.5: 37.5)
Standard solution: 0.25 mg/mL of USP Cetylpyridinium Chloride RS in *Solution A*
Sample solution: 0.25 mg/mL of Cetylpyridinium Chloride in *Solution A*
Chromatographic system
(See *Chromatography* ⟨621⟩, *System Suitability*.)
Mode: LC
Detector: UV 258 nm
Column: 2.1-mm × 10-cm; 5-µm packing L78
Column temperature: 40°
Flow rate: 0.6 mL/min
Injection volume: 2 µL
System suitability
Sample: *Standard solution*
Suitability requirements
Tailing factor: NMT 1.5
Relative standard deviation: NMT 0.73%
Analysis
Samples: *Standard solution* and *Sample solution*
Calculate the percentage of cetylpyridinium chloride ($C_{21}H_{38}ClN$) in the portion of Cetylpyridinium Chloride 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 Cetylpyridinium Chloride RS in the *Standard solution* (mg/mL)
C_U = concentration of Cetylpyridinium Chloride in the *Sample solution* (mg/mL)
Acceptance criteria: 98.0%–102.0% on the anhydrous basis
■1S (*USP39*)

IMPURITIES

• **RESIDUE ON IGNITION** ⟨**281**⟩**:** NMT 0.2% on the anhydrous basis

Delete the following:

•• **HEAVY METALS,** *Method II* ⟨**231**⟩**:** NMT 20 ppm
● (Official 1-Jan-2018)

Change to read:

• **ORGANIC IMPURITIES**
■ Use 0.1% trifluoroacetic acid–rinsed glassware and silanized vials for all solutions containing cetylpyridinium chloride, as cetylpyridinium may react with the surface.
Solution A, Solution B, Mobile phase, and **Chromatographic system:** Proceed as directed in the *Assay*.
Standard solution: 2.5 µg/mL of USP Cetylpyridinium Chloride RS in *Solution A*
Sample solution: 2.5 mg/mL of Cetylpyridinium Chloride in *Solution A*
System suitability
Sample: *Standard solution*
Suitability requirements
Relative standard deviation: NMT 2.0%
Analysis
Samples: *Standard solution* and *Sample solution*
Calculate the percentage of each unspecified impurity in the portion of Cetylpyridinium Chloride taken:

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

r_U = peak response of each unspecified impurity from the *Sample solution*
r_S = peak response of cetylpyridinium from the *Standard solution*
C_S = concentration of USP Cetylpyridinium Chloride RS in the *Standard solution* (mg/mL)
C_U = concentration of Cetylpyridinium Chloride in the *Sample solution* (mg/mL)
Acceptance criteria: See *Table 1*. Disregard any impurity peaks less than 0.04%.

Table 1

Name	Relative Retention Time	Acceptance Criteria, NMT (%)
Cetylpyridinium chloride	1.0	—
•Any individual unspecified impurity	—	0.1 (Postponed until 1-Aug-2017)• (RB 1-Aug-2016)
Total impurities	—	1.0

■1S (*USP39*)

SPECIFIC TESTS

Delete the following:

■• **MELTING RANGE OR TEMPERATURE ,** *Class I* ⟨**741**⟩**:** 80°–84°, the preliminary drying treatment being omitted■1S (*USP39*)

• **ACIDITY**
Sample: 500 mg
Analysis: Dissolve *Sample* in 50 mL of water, add phenolphthalein TS, and titrate with 0.020 N sodium hydroxide.
Acceptance criteria: NMT 2.5 mL is required for neutralization.

• **WATER DETERMINATION,** *Method I* ⟨**921**⟩**:** 4.5%–5.5%

ADDITIONAL REQUIREMENTS

• **PACKAGING AND STORAGE:** Preserve in well-closed containers.

• **USP REFERENCE STANDARDS** ⟨**11**⟩
USP Cetylpyridinium Chloride RS