Cetylpyridinium Chloride

Type of Posting	Revision Bulletin
Posting Date	28–Jul-2017
Official Date	01–Aug–2017
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 requirement for any unspecified impurity in *Organic Impurities* scheduled to become official on Aug. 1, 2017.

The Cetylpyridinium Chloride Revision Bulletin supersedes the currently official Cetylpyridinium Chloride monograph. The Revision Bulletin will be incorporated in *First Supplement* to *USP 41–NF 36*

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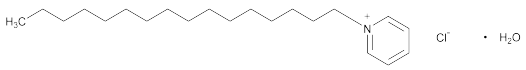
Should you have any questions, please contact S. Ramakrishna Ph.D., MBA (301–816–8349 or sxr@usp.org).

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

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

IDENTIFICATION

- **A. Infrared Absorption** ⟨197K⟩
- **B.** The retention time of the major peak of the *Sample solution* corresponds to that of the *Standard solution*, as obtained in the *Assay*.

Change to read:

- **C. Identification Tests—General** ⟨191⟩**,** *Chloride*
  Sample solution: 2 mg/mL in water
  Acceptance criteria: A 10-mL portion of the *Sample solution* meets the requirements •of test *A*,• (CN 1-May-2018) except that when silver nitrate TS is added, turbidity is produced rather than a curdy white precipitate.

ASSAY

- **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

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 unspecified impurity	—	0.1 (Postponed indefinitely)• (RB 1-Aug-2017)
Total impurities	—	1.0

SPECIFIC TESTS

- **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** ⟨**921**⟩**,** *Method I***:** 4.5%–5.5%

ADDITIONAL REQUIREMENTS

- **PACKAGING AND STORAGE:** Preserve in well-closed containers.
- **USP REFERENCE STANDARDS** ⟨**11**⟩
  USP Cetylpyridinium Chloride RS