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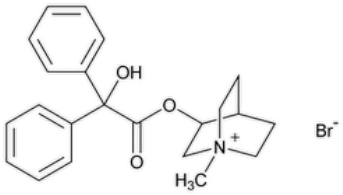
Clidinium Bromide



$C_{22}H_{26}BrNO_3$ 432.35

1-Azoniabicyclo[2.2.2]octane, 3-[(hydroxydiphenylacetyl)oxy]-1-methyl-, bromide, (±)-;

(±)-3-Hydroxy-1-methylquinuclidinium bromide benzilate CAS RN®: 3485-62-9; UNII: 91ZQW5JF1Z.

DEFINITION

Clidinium Bromide contains NLT 99.0% and NMT 100.5% of $C_{22}H_{26}BrNO_3$, calculated on the dried basis.

IDENTIFICATION

Change to read:

• **A.** ▲**Spectroscopic Identification Tests ⟨197⟩, *Infrared Spectroscopy*: 197K**▲ (CN 1-May-2020)

• **B.** The R_F value of the principal spot of the *Sample solution* corresponds to that of the *Standard solution*, as obtained in the test for *Organic Impurities*.

• **C. Bromide**

Sample solution: 50 mg/mL

Analysis: To 2 mL of the *Sample solution* add a few drops of 2 N nitric acid and 1 mL of silver nitrate TS.

Acceptance criteria: A yellowish white precipitate is formed.

ASSAY

• **Procedure**

Sample: 1.2 g

Analysis: Dissolve the *Sample* in 80 mL of glacial acetic acid, warming if necessary to effect solution. Cool, and add 15 mL of mercuric acetate TS. Titrate with 0.1 N perchloric acid in dioxane VS, determining the endpoint potentiometrically. Perform a blank determination (see *Titrimetry* ⟨541⟩). Each mL of 0.1 N perchloric acid is equivalent to 43.24 mg of $C_{22}H_{26}BrNO_3$.

Acceptance criteria: 99.0%–100.5% on the dried basis

IMPURITIES

• **Residue on Ignition ⟨281⟩:** NMT 0.1%

• **Organic Impurities**

Standard solution: 100 mg/mL of USP Clidinium Bromide RS in 0.1 N methanolic hydrochloric acid

Sample solution: 100 mg/mL of Clidinium Bromide in 0.1 N methanolic hydrochloric acid

Reference solution: Dissolve 100 mg of USP Clidinium Bromide RS in 1.0 mL of 0.1 N methanolic hydrochloric acid, and add 20 µL of a solution of 25.0 mg of USP Clidinium Bromide Related Compound A RS in 1.0 mL of 0.1 N methanolic hydrochloric acid.

Chromatographic system

(See *Chromatography* ⟨621⟩, *Thin-Layer Chromatography*.)

Adsorbent: 0.25-mm layer of chromatographic silica gel mixture

Application volume: 20 µL

Developing solvent system: Acetone, methanol, hydrochloric acid, and water (70:20:5:5)

Spray reagent: Dissolve 850 mg of bismuth subnitrate in a mixture of 10 mL of glacial acetic acid and 40 mL of water. In a separate container, dissolve 20 g of potassium iodide in 50 mL of water. Mix the two solutions, and dilute with dilute sulfuric acid (1 in 10) to 500 mL. Add 7.5 g ± 2.5 g of iodine, and mix until the solution is complete.

Chromatographic plates: Predevelop suitable thin-layer chromatographic plates by placing in a chromatographic chamber saturated with the *Developing solvent system*, and allow the *Developing solvent system* to move about 15 cm. Remove the plates from the chamber, dry at 105° for 15 min, and cool.

Analysis 1 (3-quinuclidinyl benzilate): Apply the *Standard solution* and the *Sample solution* to a *Chromatographic plate*. Place the plate in an unsaturated chromatographic chamber containing freshly prepared *Developing solvent system*, and allow the solvent front to move 10 cm. Remove the plate, dry at 105° for 10 min, cool, and spray with potassium iodoplatinate TS.

Acceptance criteria 1: The *Sample solution* shows no spot at an R_F value (about 0.8) corresponding to that of 3-quinuclidinyl benzilate.

Analysis 2 (limit of clidinium bromide related compound A): Apply the *Sample solution* and *Reference solution* to a second *Chromatographic plate*. Place the plate in an unsaturated chromatographic chamber containing freshly prepared *Developing solvent system*, and allow the solvent front to move 15 cm. Remove the plate, dry at 105° for 10 min, cool, and spray with the *Spray reagent*.

Acceptance criteria 2: Any spot from the *Sample solution* at an R_F value of about 0.4 is not greater in size or intensity than the minor spot of the *Reference solution:* NMT 0.5% of clidinium bromide related compound A is found.

SPECIFIC TESTS

• **Loss on Drying ⟨731⟩:** Dry a sample at 105° for 3 h: it loses NMT 0.5% of its weight.

ADDITIONAL REQUIREMENTS

• **Packaging and Storage:** Preserve in tight, light-resistant containers.

• **USP Reference Standards ⟨11⟩**

USP Clidinium Bromide RS

USP Clidinium Bromide Related Compound A RS

3-Hydroxy-1-methylquinuclidinium bromide.

$C_8H_{16}BrNO$ 222.13

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

Topic/Question	Contact	Expert Committee
CLIDINIUM BROMIDE	Documentary Standards Support	SM32020 Small Molecules 3

Chromatographic Database Information: Chromatographic Database

Most Recently Appeared In:
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