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# Prilocaine Hydrochloride Injection

## DEFINITION

Prilocaine Hydrochloride Injection is a sterile solution of Prilocaine Hydrochloride in Water for Injection. It contains NLT 95.0% and NMT 105.0% of the labeled amount of prilocaine hydrochloride ($C_{13}H_{20}N_2O \cdot HCl$).

## IDENTIFICATION

***Delete the following:***

▲• **A. Identification—Organic Nitrogenous Bases ⟨181⟩:** Meets the requirements ▲2S *(USP41)*

***Add the following:***

▲• **A.** The retention time of the major peak of the *Sample solution* corresponds to that of the *Standard solution*, as obtained in the *Assay*.▲2S *(USP41)*

***Delete the following:***

▲• **B.**

**Sample:** A volume of Injection equivalent to 300 mg of prilocaine hydrochloride

**Analysis:** Dilute the *Sample* with 5 mL of water, and add 4 mL of 6 N ammonium hydroxide. Extract with 50 mL of chloroform and filter the extract. Evaporate the filtrate on a steam bath with the aid of a current of air. Dissolve 100 mg of the prilocaine so obtained in 1 mL of alcohol, add 10 drops of cobaltous chloride TS, and shake for 2 min.

**Acceptance criteria:** A bright green color develops, and a precipitate is formed.▲2S *(USP41)*

***Add the following:***

▲• **B.** The UV spectrum of the major peak of the *Sample solution* corresponds to that of the *Standard solution*, as obtained in the *Assay*.▲2S *(USP41)*

## ASSAY

***Change to read:***

• **Procedure**

▲**Solution A:** Transfer 10 mL of glacial acetic acid to a 1000-mL volumetric flask containing 950 mL of water and dilute with water to volume. Adjust with ammonium hydroxide to a pH of 5.5.

**Mobile phase:** Acetonitrile and *Solution A* (21:79)

**System suitability stock solution:** 0.65 mg/mL of USP Prilocaine Related Compound A RS and 0.5 mg/mL of USP Prilocaine Related Compound B RS in *Mobile phase*

**System suitability solution:** 0.5 mg/mL of USP Prilocaine Hydrochloride RS, and 0.0065 mg/mL of USP Prilocaine Related Compound A RS and 0.005 mg/mL of USP Prilocaine Related Compound B RS from *System suitability stock solution*; in *Mobile phase*

**Standard solution:** 0.5 mg/mL of USP Prilocaine Hydrochloride RS in *Mobile phase*

**Sample solution:** Nominally 0.5 mg/mL of prilocaine hydrochloride from Injection in *Mobile phase*

**Chromatographic system**

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

**Mode:** LC

**Detector:** UV 230 nm. For *Identification B*, use a diode array detector in the range of 210–400 nm.

**Column:** 4.6-mm × 15-cm; 5-µm packing L1

**Column temperature:** 35°

**Flow rate:** 1 mL/min

**Injection volume:** 10 µL

**Run time:** NLT 3 times the retention time of prilocaine

**System suitability**

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

[NOTE—See *Table 1* for relative retention times.]

**Suitability requirements**

**Resolution:** NLT 6.0 between prilocaine and prilocaine related compound B; NLT 4.0 between prilocaine related compound B and prilocaine related compound A, *System suitability solution*

**Tailing factor:** NMT 2.0, *Standard solution*

**Relative standard deviation:** NMT 1.0%, *Standard solution* ▲2S *(USP41)*

**Analysis**

**Samples:** *Standard solution* and *Sample solution*

Calculate the percentage of the labeled amount of prilocaine hydrochloride ($C_{13}H_{20}N_2O \cdot HCl$) in the volume of Injection taken:

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

$r_U$ = peak area from the *Sample solution*

$r_S$ = peak area from the *Standard solution*

$C_S$ = concentration of USP Prilocaine Hydrochloride RS in the *Standard solution* (mg/mL)

$C_U$ = nominal concentration of prilocaine hydrochloride in the *Sample solution* (mg/mL)

**Acceptance criteria:** 95.0%–105.0%

## IMPURITIES

***Add the following:***

▲• **ORGANIC IMPURITIES**

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

**Standard solution:** 0.01 mg/mL each of USP Prilocaine Hydrochloride RS and USP Prilocaine Related Compound A RS in *Mobile phase*

**Sample solution:** Nominally 5.0 mg/mL of prilocaine hydrochloride from Injection in *Mobile phase*

**Chromatographic system:** Proceed as directed in the *Assay*, except for *Injection volume* and *Run time*.

**Injection volume:** 30 µL

**Run time:** NLT 6.5 times the retention time of prilocaine

**System suitability**

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

[NOTE—See *Table 1* for relative retention times.]

**Suitability requirements**

**Resolution:** NLT 6.0 between prilocaine and prilocaine related compound B; NLT 4.0 between prilocaine related compound B and prilocaine related compound A, *System suitability solution*

**Relative standard deviation:** NMT 5.0%, *Standard solution*

**Analysis**

**Samples:** *Standard solution* and *Sample solution*

Calculate the percentage of prilocaine related compound A in the portion of Injection taken:

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

$r_U$ = peak area of prilocaine related compound A from the *Sample solution*

$r_S$ = peak area of prilocaine related compound A from the *Standard solution*

$C_S$ = concentration of USP Prilocaine Related Compound A RS in the *Standard solution* (mg/mL)

$C_U$ = nominal concentration of prilocaine hydrochloride in the *Sample solution* (mg/mL)

Calculate the percentage of any individual unspecified degradation product in the portion of Injection taken:

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

$r_U$ = peak area of any individual unspecified degradation product from the *Sample solution*

$r_S$ = peak area of prilocaine from the *Standard solution*

$C_S$ = concentration of USP Prilocaine Hydrochloride RS in the *Standard solution* (mg/mL)

$C_U$ = nominal concentration of prilocaine hydrochloride in the *Sample solution* (mg/mL)

**Acceptance criteria:** See *Table 1*.

**Table 1**

| Name | Relative Retention Time | Acceptance Criteria, NMT (%) |
|---|---|---|
| Prilocaine | 1.0 | — |
| Prilocaine related compound B[a] | 1.7 | — |
| Prilocaine related compound A | 2.1 | 0.2 |
| Any individual unspecified degradation product | — | 0.2 |
| Total impurities | — | 0.5 |

[a] Process impurity included in the table for identification only. Process impurities are controlled in the drug substance, and are not to be reported or included in the total impurities for the drug product.

▲2S *(USP41)*

**SPECIFIC TESTS**

- **Bacterial Endotoxins Test ⟨85⟩:** NMT 0.9 USP Endotoxin Units/mg of prilocaine hydrochloride
- **pH ⟨791⟩:** 6.0–7.0
- **Other Requirements:** It meets the requirements in *Injections and Implanted Drug Products ⟨1⟩*.

**ADDITIONAL REQUIREMENTS**

***Change to read:***

- **Packaging and Storage:** Preserve in single-dose or multiple-dose containers, preferably of Type I glass. ▲Store at controlled room temperature. Protect from freezing.▲2S *(USP41)*

***Change to read:***

- **USP Reference Standards ⟨11⟩**

▲▲ (CN 1-May-2018)

USP Prilocaine Hydrochloride RS

▲ USP Prilocaine Related Compound A RS

*o*-Toluidine hydrochloride.

$C_7H_9N \cdot HCl$ 143.61

USP Prilocaine Related Compound B RS

2-Propylamino-*N*-(*p*-tolyl)propanamide.

$C_{13}H_{20}N_2O$ 220.31▲2S *(USP41)*

| Topic/Question | Contact | Expert Committee |
|---|---|---|
| PRILOCAINE HYDROCHLORIDE INJECTION | Documentary Standards Support | SM52020 Small Molecules 5 |
| REFERENCE STANDARD SUPPORT | RS Technical Services<br>RSTECH@usp.org | SM52020 Small Molecules 5 |

**Chromatographic Database Information:** Chromatographic Database

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