Status: Currently Official on 16-Feb-2025
Official Date: Official as of 01-Nov-2020
Document Type: USP Monographs
DocId: GUID-D348694A-F089-4CAE-A044-91A4F9677E55_2_en-US
DOI: https://doi.org/10.31003/USPNF_M69080_02_01
DOI Ref: 22p7i

Primaquine Phosphate Tablets

DEFINITION
Primaquine Phosphate Tablets contain NLT 93.0% and NMT 107.0% of the labeled amount of primaquine phosphate ($C_{15}H_{21}N_3O \cdot 2H_3PO_4$).

IDENTIFICATION

Change to read:

• **A.** ▲The UV spectrum of the major peak of the *Sample solution* corresponds to that of the *Standard solution*, as obtained in the *Assay*.▲ (USP 1-Aug-2020)

• **B.** The retention time of the major peak of the *Sample solution* corresponds to that of the *Standard solution*, as obtained in the *Assay*.

ASSAY

Change to read:

• **Procedure**

Mobile phase: Acetonitrile, tetrahydrofuran, trifluoroacetic acid, and water (9:1:0.1:90)

Standard solution: 0.4 mg/mL of USP Primaquine Phosphate RS in *Mobile phase*. Sonicate with intermittent shaking to dissolve, if necessary.

System suitability stock solution: 0.4 mg/mL of USP Primaquine Related Compound A RS in *Mobile phase*

System suitability solution: Transfer 1.0 mL of *System suitability stock solution* to a 10-mL volumetric flask, and dilute with *Standard solution* to volume.

Sensitivity solution: 0.2 µg/mL of USP Primaquine Phosphate RS from *Standard solution* ▲in *Mobile phase*▲ (USP 1-Aug-2020)

Sample stock solution: Transfer a quantity of Tablets (NLT 20), accurately counted and weighed, to a 500-mL volumetric flask. Add 300 mL of *Mobile phase*, then sonicate and shake for 15 min. Add 150 mL of *Mobile phase*, then sonicate and shake for 15 min. Dilute with *Mobile phase* to volume, and filter.

Sample solution: ▲Nominally▲ (USP 1-Aug-2020) 0.4 mg/mL of primaquine phosphate in *Mobile phase* from the *Sample stock solution*

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

Mode: LC

Detector: UV 265 nm. ▲For *Identification A*, use a diode array detector in the range of 220–400 nm.▲ (USP 1-Aug-2020)

Column: 4.6-mm × 75-mm; 3-µm packing L7

Flow rate: 1.5 mL/min

Injection volume: 10 µL

Run time: ▲NLT▲ (USP 1-Aug-2020) 3 times the retention time of primaquine

System suitability

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

Suitability requirements

Resolution: NLT 2.5 between primaquine phosphate and primaquine related compound A, *System suitability solution*

Relative standard deviation: NMT 1.0% for primaquine phosphate, *Standard solution*

Signal-to-noise ratio: NLT 10 for the primaquine peak, *Sensitivity solution*

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of primaquine phosphate ($C_{15}H_{21}N_3O \cdot 2H_3PO_4$) in the portion of Tablets 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 Primaquine Phosphate RS in the *Standard solution* (mg/mL)

C_U = nominal concentration of primaquine phosphate in the *Sample solution* (mg/mL)

Acceptance criteria: 93.0%–107.0%

PERFORMANCE TESTS

Change to read:

• **Dissolution** ⟨711⟩

Medium: 0.01 N hydrochloric acid; 900 mL

Apparatus 2: 50 rpm

Time: 60 min

Solution A: 961 mg of sodium 1-pentanesulfonate and 1 mL of glacial acetic acid in 400 mL of water

Mobile phase: Methanol and *Solution A* (3:2)

Sample solution: Pass a portion of the solution under test through an appropriate filter.

Standard solution: USP Primaquine Phosphate RS in *Medium* in a concentration similar that of the *Sample solution*

Chromatographic system

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

Mode: LC

Detector: UV 254 nm

Column: 3.9-mm × 30-cm; packing L1

Flow rate: 2 mL/min

Injection volume: 20 µL

System suitability

Sample: *Standard solution*

Suitability requirements

Relative standard deviation: NMT 3.0%

Analysis

Samples: *Sample solution* and *Standard solution*

Calculate the ▲percentage of the labeled▲ (USP 1-Aug-2020) amount of primaquine phosphate ($C_{15}H_{21}N_3O \cdot 2H_3PO_4$) dissolved.

$$\text{▲Result} = (r_U/r_S) \times (C_S/L) \times V \times D \times 100$$

r_U = peak response of primaquine from the *Sample solution*

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

C_S = concentration of USP Primaquine Phosphate RS in the *Standard solution* (mg/mL)

L = label claim (mg/Tablet)

V = volume of *Medium*, 900 mL

D = dilution factor for the *Sample solution*, if applicable▲ (USP 1-Aug-2020)

Tolerances: NLT 80% (Q) of the labeled amount of primaquine phosphate ($C_{15}H_{21}N_3O \cdot 2H_3PO_4$) is dissolved.

• **Uniformity of Dosage Units** ⟨905⟩**:** Meet the requirements

IMPURITIES

Change to read:

• **Organic Impurities**

Mobile phase, Standard solution, System suitability solution, Sensitivity solution, Sample solution, Chromatographic system, and **System suitability:** Proceed as directed in the *Assay*.

Analysis

Sample: *Sample solution*

Calculate the percentage of each impurity in the portion of Tablets taken:

Result = $(r_U/r_T) \times 100$

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

r_T = peak response of primaquine phosphate from the *Sample solution*

Acceptance criteria: See *Table 1*.

[NOTE—▲The reporting threshold is▲ (USP 1-Aug-2020) 0.05%.]

Table 1

Name	Relative Retention Time	Acceptance Criteria, NMT (%)
▲Methoxyquinolinamine▲ (USP 1-Aug-2020) [a],▲[b]▲ (USP 1-Aug-2020)	0.24	—
▲Phthalhydrazide[c]▲ (USP 1-Aug-2020)	0.29	0.60
Primaquine related compound A[a],▲[d]▲ (USP 1-Aug-2020)	0.80	—
Primaquine	1.0	—
▲Secaquine▲ (USP 1-Aug-2020) [a],▲[e]▲ (USP 1-Aug-2020)	1.8	—
Any other individual impurity	—	0.20
Total impurities	—	1.0

[a] These process impurities are listed for information only and are not quantified in the drug product.

[b] 6-Methoxyquinolin-8-amine.

[c] 2,3-Dihydrophthalazine-1,4-dione.

[d] 8-[(4-Aminopentyl)amino]-6-methoxyquinoline.

[e] N^3-(6-Methoxyquinolin-8-yl)pentane-1,3-diamine.

ADDITIONAL REQUIREMENTS

Change to read:

• **PACKAGING AND STORAGE:** Preserve in well-closed, light-resistant containers ▲at controlled room temperature.▲ (USP 1-Aug-2020)

• **USP REFERENCE STANDARDS** ⟨11⟩

USP Primaquine Phosphate RS

USP Primaquine Related Compound A RS

8-[(4-Aminopentyl)amino]-6-methoxyquinoline.

$C_{15}H_{21}N_3O$ 259.35

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

Topic/Question	Contact	Expert Committee
PRIMAQUINE PHOSPHATE TABLETS	Documentary Standards Support	SM12020 Small Molecules 1
REFERENCE STANDARD SUPPORT	RS Technical Services RSTECH@usp.org	SM12020 Small Molecules 1

Chromatographic Database Information: Chromatographic Database

Most Recently Appeared In:
Pharmacopeial Forum: Volume No. 45(2)

Current DocID: GUID-D348694A-F089-4CAE-A044-91A4F9677E55_2_en-US
DOI: https://doi.org/10.31003/USPNF_M69080_02_01
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