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Potassium Citrate Extended-Release Tablets

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DEFINITION

Potassium Citrate Extended-Release Tablets contain NLT 90.0% and NMT 110.0% of the labeled amount of potassium citrate as monohydrate ($C_6H_5K_3O_7 \cdot H_2O$).

IDENTIFICATION

• A. [IDENTIFICATION TESTS—GENERAL \(191\), Chemical Identification Tests, Potassium](#)

Sample solution: Powder 5 Tablets, mix with 20 mL of [water](#), and filter.

Acceptance criteria: The filtrate meets the requirements.

• B. [IDENTIFICATION TESTS—GENERAL \(191\), Chemical Identification Tests, Citrate](#)

Sample: A portion of powdered Tablets containing about 50 mg of potassium citrate

Acceptance criteria: Meet the requirements

ASSAY

• PROCEDURE

Buffer: 3.4 g/L of [monobasic potassium phosphate](#) in [water](#). Adjust with [phosphoric acid](#) to a pH of 2.2.

Mobile phase: [Buffer](#)

Standard solution: 0.4 mg/mL of [USP Citric Acid RS](#) in [Mobile phase](#)

Sample stock solution: Weigh and finely powder NLT 20 Tablets. Transfer a portion of the powder, equivalent to 2000 mg of potassium citrate monohydrate, to a 250-mL volumetric flask, and add 150 mL of hot [water](#) (60°–70°). Sonicate for 20 min with occasional shaking. Allow to cool to room temperature, dilute with [water](#) to volume, and mix.

Sample solution: Pass a portion of the *Sample stock solution* through a suitable filter of 0.45-μm pore size, discarding the first 5 mL of filtrate. Transfer 4 mL of the filtrate to a 50-mL volumetric flask, dilute with *Mobile phase* to volume, and mix. [NOTE—Reserve the remaining filtrate for use in the *Content of Potassium* test.]

Chromatographic system

(See [Chromatography \(621\), System Suitability](#).)

Mode: LC

Detector: UV 210 nm

Column: 4.6-mm × 25-cm; 5-μm packing L1

Column temperature: 55°

Flow rate: 1 mL/min

Injection volume: 20 μL

System suitability

Sample: *Standard solution*

Suitability requirements

Relative standard deviation: NMT 2.0%

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of the labeled amount of potassium citrate monohydrate ($C_6H_5K_3O_7 \cdot H_2O$) in the portion of Tablets taken:

$$\text{Result} = (r_u/r_s) \times (C_s/C_u) \times (M_{r1}/M_{r2}) \times 100$$

r_u = citric acid peak area from the *Sample solution*

r_s = citric acid peak area from the *Standard solution*

C_s = concentration of [USP Citric Acid RS](#) in the *Standard solution* (mg/mL)

C_u = nominal concentration of potassium citrate monohydrate in the *Sample solution* (mg/mL)

M_{r1} = molecular weight of potassium citrate monohydrate, 324.41

M_{r2} = molecular weight of citric acid ($C_6H_8O_7$), 192.13

Acceptance criteria: 90.0%–110.0%

OTHER COMPONENTS

• CONTENT OF POTASSIUM

Standard stock solution: 19.07 µg/mL of potassium chloride, previously dried at 105° for 2 h, in [water](#). This solution contains 10 µg/mL of potassium.

Standard solutions: Transfer 10.0, 15.0, and 20.0 mL, respectively, to separate 100-mL volumetric flasks of the *Standard stock solution*. To each flask, add 2.0 mL of sodium chloride solution (200 mg/mL) and 1.0 mL of hydrochloric acid, and dilute with [water](#) to volume. The *Standard solutions* contain 1.0, 1.5, and 2.0 µg/mL of potassium, respectively.

Sample stock solution: Dilute the clear filtrate, reserved from the Assay, with [water](#) to obtain a solution containing about 160 µg/mL of potassium citrate monohydrate.

Sample solution: Transfer 3.0 mL of the *Sample stock solution* to a 100-mL volumetric flask.

Instrumental conditions

(See [Atomic Absorption Spectroscopy \(852\)](#).)

Mode: Atomic absorption spectrophotometry

Analytical wavelength: Potassium emission line at 766.5 nm

Lamp: Potassium hollow-cathode

Flame: Air–acetylene

Blank: [Water](#)

Analysis

Samples: *Standard solutions*, *Sample solution*, and *Blank*

Plot the absorbance of the *Standard solutions* versus the concentration of potassium, in µg/mL, and draw the straight line best fitting the three plotted points. From the graph obtained, determine the concentration of potassium in the *Sample solution* (µg/mL).

Calculate the percentage of potassium (K) in the portion of Tablets taken:

$$\text{Result} = C \times 100/C_u$$

C = concentration of potassium in the *Sample solution* as determined in this test (µg/mL)

C_u = concentration of potassium citrate anhydrous ($C_6H_5K_3O_7$) in the *Sample solution* calculated from the Assay value of potassium citrate monohydrate ($C_6H_5K_3O_7 \cdot H_2O$) (µg/mL)

Acceptance criteria: 36.4%–40.2%

PERFORMANCE TESTS

Change to read:

• [DISSOLUTION \(711\)](#)

Test 1

Medium: [Water](#); 900 mL

Apparatus 2: 50 rpm

Times: 0.5, 1, and 3 h; without *Medium* replacement

[NOTE—Withdraw the same volume at each time point.]

Standard stock solution and **Standard solutions:** Prepare as directed in the *Content of Potassium* test.

Sample solution: Filter the solution under test and dilute quantitatively with *Medium* to obtain a solution containing about 60 µg of potassium citrate per mL. Transfer 5.0 mL of this solution to a 100-mL volumetric flask, add 2.0 mL of [sodium chloride](#) solution (1 in 5) and 1.0 mL of [hydrochloric acid](#). Dilute with [water](#) to volume, and mix.

Instrumental conditions

(See [Atomic Absorption Spectroscopy \(852\)](#).)

Mode: Atomic absorption spectrophotometry

Analytical wavelength: Potassium emission line at 766.5 nm**Lamp:** Potassium hollow-cathode**Flame:** Air-acetylene**Blank:** Water**Analysis****Samples:** Standard solutions, Sample solution, and BlankDetermine the concentration, in $\mu\text{g/mL}$, of potassium in the *Sample solution* at each time point.Calculate the percentage of the labeled amount of potassium citrate monohydrate ($\text{C}_6\text{H}_5\text{K}_3\text{O}_7 \cdot \text{H}_2\text{O}$) dissolved at each time point:

At 0.5 h:

$$\text{Result}_1 = C_1 \times V \times R \times F \times 100/L$$

At 1 h:

$$\text{Result}_2 = [C_2 \times (V - V_s) + C_1 \times V_s] \times R \times F \times 100/L$$

At 3 h:

$$\text{Result}_3 = \{C_3 \times [V - 2 \times V_s] + (C_1 + C_2) \times V_s\} \times R \times F \times 100/L$$

 C = as C_1, C_2, C_3 , concentration of potassium in the *Sample solution* at each time point ($\mu\text{g/mL}$) V = volume of *Medium*, 900 mL R = ratio of the molecular weight of potassium citrate monohydrate to 3 times the atomic weight of potassium, 2.765 F = dilution factor of the *Sample solution* L = label claim (mg/Tablet) V_s = volume of sample withdrawn at each time point (mL)**Tolerances:** The percentages of the labeled amount of potassium citrate monohydrate ($\text{C}_6\text{H}_5\text{K}_3\text{O}_7 \cdot \text{H}_2\text{O}$) dissolved from the Tablets areNMT 45% (Q) in 30 min, NMT 60% (Q') in 1 h, and NLT 80% (Q'') in 3 h. The requirements are met if the quantities dissolved from the Tablets tested conform to [Table 1](#) instead of the table shown under [Dissolution \(711\)](#).**Table 1**

Stage	Number Tested	Acceptance Criteria
S_1	6	Each unit is within the range between $Q \pm 10\%$ and $Q' \pm 10\%$, and is NLT $Q'' + 5\%$ at the stated times.
S_2	6	Average of 12 units ($S_1 + S_2$) is within the range between $Q \pm 10\%$ and $Q' \pm 10\%$ and is NLT Q'' ; no unit is outside the range between $Q \pm 15\%$ and $Q' \pm 15\%$, and no unit is less than $Q'' - 5\%$ at the stated times.
S_3	12	Average of 24 units ($S_1 + S_2 + S_3$) is within the range between $Q \pm 10\%$ and $Q' \pm 10\%$ and is NLT Q'' ; NMT 1 unit is outside the range between $Q \pm 15\%$, NMT 1 unit is outside the range between $Q' \pm 15\%$, and NMT 1 unit is less than $Q'' - 5\%$ at the stated times.

Test 2: If the product complies with this test, the labeling indicates that it meets USP *Dissolution Test 2*.**Medium:** Water; 900 mL

Apparatus 2: 50 rpm**Times:** 0.5, 1, 4, and 6 h. Replace the volume withdrawn with the equal volume of *Medium* preheated to $37 \pm 0.5^\circ$.**Buffer:** 3.4 g/L of monobasic potassium phosphate in water. Adjust with phosphoric acid to a pH of 2.2.**Mobile phase:** *Buffer***Standard solution:** Prepare a solution of USP Citric Acid RS in *Medium* as directed in Table 2.**Table 2**

Tablet Strength (mg, as potassium citrate monohydrate)	Concentration of Citric Acid (mg/mL)
540	0.35
1080	0.70
1620	1.05

Sample solution: Pass a portion of the solution under test through a suitable filter of 0.45- μm pore size, discarding the first 5 mL of filtrate.**Chromatographic system**(See Chromatography (621), System Suitability.)**Mode:** LC**Detector:** UV 210 nm**Column:** 4.6-mm \times 25-cm; 5- μm packing L1**Column temperature:** 55°**Flow rate:** 1.0 mL/min**Injection volume:** 20 μL **System suitability****Sample:** *Standard solution***Suitability requirements****Tailing factor:** NMT 2.0**Relative standard deviation:** NMT 2.0%**Analysis****Samples:** *Standard solution* and *Sample solution*Determine the concentration, in mg/mL, of potassium citrate monohydrate ($\text{C}_6\text{H}_5\text{K}_3\text{O}_7 \cdot \text{H}_2\text{O}$) in the sample withdrawn from the vessel at each time point:

$$\text{Result} = (r_U/r_S) \times C_S \times (M_{r1}/M_{r2})$$

 r_U = citric acid peak area from the *Sample solution* r_S = citric acid peak area from the *Standard solution* C_S = concentration of USP Citric Acid RS in the *Standard solution* (mg/mL) M_{r1} = molecular weight of potassium citrate monohydrate ($\text{C}_6\text{H}_5\text{K}_3\text{O}_7 \cdot \text{H}_2\text{O}$), 324.41 M_{r2} = molecular weight of citric acid ($\text{C}_6\text{H}_8\text{O}_7$), 192.13Calculate the percentage of the labeled amount of potassium citrate monohydrate ($\text{C}_6\text{H}_5\text{K}_3\text{O}_7 \cdot \text{H}_2\text{O}$) dissolved at each time point:

At 0.5 h:

$$\text{Result}_1 = C_1 \times V \times 100/L$$

At 1 h:

$$\text{Result}_2 = (C_2 \times V + C_1 \times V_S) \times 100/L$$

At 4 h:

$$\text{Result}_3 = [C_3 \times V + (C_1 + C_2) \times V_S] \times 100/L$$

At 6 h:

$$\text{Result}_4 = [C_4 \times V + (C_1 + C_2 + C_3) \times V_s] \times 100/L$$

C = as C_1, C_2, C_3, C_4 , concentration of potassium citrate monohydrate in the portion of sample withdrawn at the specified time point (mg/mL)

V = volume of Medium, 900 mL

L = label claim (mg/Tablet)

V_s = volume of sample withdrawn at each time point (mL)

Tolerances: The percentages of the labeled amount of potassium citrate monohydrate ($C_6H_5K_3O_7 \cdot H_2O$) dissolved at the times specified in [Table 3](#) conform to [Dissolution \(711\)](#), [Acceptance Table 2](#).

Table 3

Time (h)	Amount Dissolved (%)
0.5	25–50
1	40–65
4	NLT 70
6	NLT 80

Test 3: If the product complies with this test, the labeling indicates that it meets USP *Dissolution Test 3*.

Medium: [Water](#); 900 mL

Apparatus 2: 50 rpm

[**NOTE**—Employ sinker if necessary to ensure that the Tablets do not float.]

Times: 0.5, 1, and 5 h; without Medium replacement

[**NOTE**—Withdraw the same volume at each time point. Pass a portion of the solution through a 0.45- μ m membrane filter, discarding the first 2 mL of the filtrate.]

Diluent: Transfer 5 g of [sodium chloride](#) to a 100-mL volumetric flask, add 25 mL of [water](#) and 25 mL of [concentrated hydrochloric acid](#), shake until dissolved, cool to room temperature, and dilute with [water](#) to volume.

Standard stock solution: 19.07 μ g/mL of [potassium chloride](#), previously dried at 105° for 2 h, in [water](#). This solution contains 10 μ g/mL of potassium.

Standard solutions: Transfer 5.0, 7.0, 10.0, 15.0, and 20.0 mL of *Standard stock solution* to separate 100-mL volumetric flasks. Add 4.0 mL of *Diluent* to each flask, dilute with [water](#) to volume, and mix well. The *Standard solutions* contain 0.5, 0.7, 1.0, 1.5, and 2.0 μ g/mL of potassium, respectively.

Sample stock solution: Filter the solution under test, and dilute quantitatively with [water](#) as stated in [Table 4](#).

Table 4

Time (h)	5 mEq Tablet Dilution	10 mEq Tablet Dilution	15 mEq Tablet Dilution
0.5	6.0 mL into 25 mL	6.0 mL into 50 mL	4.0 mL into 50 mL
1	5.0 mL into 25 mL	5.0 mL into 50 mL	3.0 mL into 50 mL
5	7.0 mL into 50 mL	7.0 mL into 100 mL	2.0 mL into 50 mL

Sample solution: Transfer 5.0 mL of respective *Sample stock solution* into 100-mL volumetric flasks. Add 4.0 mL of *Diluent*, dilute with [water](#) to volume, and mix well.

Instrumental conditions

(See [Atomic Absorption Spectroscopy \(852\)](#).)

Mode: Atomic absorption spectrophotometry

Analytical wavelength: Potassium emission line at 766.5 nm**Lamp:** Potassium hollow-cathode**Flame:** Air-acetylene**Blank:** Dilute *Diluent* with water (4:96)**Analysis****Samples:** *Standard solutions*, *Sample solution*, and *Blank*Determine the concentration, in $\mu\text{g}/\text{mL}$, of potassium in the *Sample solution* at each time point.

Calculate the percentage of the labeled amount of potassium dissolved at each time point:

At 0.5 h:

$$\text{Result}_1 = C_1 \times D_1 \times V \times 100 / (L \times A)$$

At 1 h:

$$\text{Result}_2 = [C_2 \times D_2 \times (V - V_s) + C_1 \times D_1 \times V_s] \times 100 / (L \times A)$$

At 5 h:

$$\text{Result}_3 = \{C_3 \times D_3 \times [V - 2 \times V_s] + (C_1 \times D_1 + C_2 \times D_2) \times V_s\} \times D \times 100 / (L \times A)$$

 C = as C_1, C_2, C_3 , concentration of potassium in the *Sample solution* at each time point ($\mu\text{g}/\text{mL}$) D = as D_1, D_2, D_3 , dilution factor of the *Sample solution* at each point V = volume of *Medium*, 900 mL L = label claim (mEq/Tablet) A = atomic weight of potassium, 39.1 V_s = volume of sample withdrawn at each time point (mL)

Tolerances: The percentages of the labeled amount of potassium dissolved at the times specified in [Table 5](#) conform to [Dissolution \(711\)](#), [Acceptance Table 2](#).

Table 5

Time (h)	Amount Dissolved (%)
0.5	30–50
1	45–65
5	NLT 85

Test 4: If the product complies with this test, the labeling indicates that it meets USP *Dissolution Test 4*.**Medium:** Water; 900 mL**Apparatus 2:** 50 rpm

[NOTE—Use tablet sinkers if necessary.]

Times: 0.5, 1, and 6 h. Replace the volume withdrawn with the equal volume of *Medium* preheated to $37 \pm 0.5^\circ$.[NOTE—Withdraw the same volume at each time point. Pass a portion of the withdrawn solution through a 0.45- μm nylon filter, discarding the first 5 mL of filtrate.]**Buffer and Mobile phase:** Prepare as directed in *Test 2*.**Standard solution:** Prepare a solution of [USP Citric Acid RS](#) in *Medium* as directed in [Table 6](#).**Table 6**

Tablet Strength (mg, as potassium citrate monohydrate)	Concentration of Citric Acid (mg/mL)
1080	0.70

Tablet Strength (mg, as potassium citrate monohydrate)	Concentration of Citric Acid (mg/mL)
1620	1.05

Sample solution: Filtered portion of the solution under test

Chromatographic system and System suitability: Proceed as directed in *Test 2*.

Analysis

Samples: Standard solution and Sample solution

Determine the concentration, in mg/mL, of potassium citrate monohydrate ($C_6H_5K_3O_7 \cdot H_2O$) in the sample withdrawn from the vessel at each time point:

$$\text{Result} = (r_U/r_S) \times C_S \times (M_{r1}/M_{r2})$$

r_U = peak area of citric acid from the *Sample solution*

r_S = peak area of citric acid from the *Standard solution*

C_S = concentration of [USP Citric Acid RS](#) in the *Standard solution* (mg/mL)

M_{r1} = molecular weight of potassium citrate monohydrate ($C_6H_5K_3O_7 \cdot H_2O$), 324.41

M_{r2} = molecular weight of citric acid ($C_6H_8O_7$), 192.13

Calculate the percentage of the labeled amount of potassium citrate monohydrate ($C_6H_5K_3O_7 \cdot H_2O$) dissolved at each time point:

At 0.5 h:

$$\text{Result}_1 = C_1 \times V \times (100/L)$$

At 1 h:

$$\text{Result}_2 = (C_2 \times V + C_1 \times V_S) \times (100/L)$$

At 6 h:

$$\text{Result}_3 = [C_3 \times V + (C_1 + C_2) \times V_S] \times 100/L$$

C_i = concentration of potassium citrate monohydrate in the portion of sample withdrawn at the specified time point (mg/mL)

V = volume of *Medium*, 900 mL

L = label claim (mg/Tablet)

V_S = volume of sample withdrawn at each time point (mL)

Tolerances: The percentages of the labeled amount of potassium citrate monohydrate ($C_6H_5K_3O_7 \cdot H_2O$) dissolved at the times specified in [Table 7](#) conform to [Dissolution \(711\)](#), [Acceptance Table 2](#).

Table 7

Time (h)	Amount Dissolved (%)
0.5	30–50
1	45–65
6	NLT 80

Test 5: If the product complies with this test, the labeling indicates that it meets USP *Dissolution Test 5*.

Medium: [Water](#); 900 mL

Apparatus 2: 50 rpm

Times: 0.5, 1, 2 and 6 h. Replace the volume withdrawn with an equal volume of *Medium* preheated to $37 \pm 0.5^\circ$.

[**NOTE**—Withdraw the same volume at each time point. Pass a portion of the withdrawn solution through a 0.45- μm nylon filter, discarding the first 5 mL of filtrate.]

Buffer and Mobile phase: Prepare as directed in *Test 2*.

Standard solution: Prepare a solution of [USP Citric Acid RS](#) in *Medium* as directed in [Table 8](#).

Table 8

Tablet Strength (mg, as potassium citrate monohydrate)	Concentration of Citric Acid (mg/mL)
1080	0.70
1620	1.05

Sample solution: Filtered portion of the solution under test

Chromatographic system and System suitability: Proceed as directed in *Test 2*.

Analysis

Samples: *Standard solution* and *Sample solution*

Determine the concentration, in mg/mL, of potassium citrate monohydrate ($\text{C}_6\text{H}_5\text{K}_3\text{O}_7 \cdot \text{H}_2\text{O}$) in the sample withdrawn from the vessel at each time point:

$$\text{Result} = (r_U/r_S) \times C_S \times (M_{r1}/M_{r2})$$

r_U = peak area of citric acid from the *Sample solution*

r_S = peak area of citric acid from the *Standard solution*

C_S = concentration of [USP Citric Acid RS](#) in the *Standard solution* (mg/mL)

M_{r1} = molecular weight of potassium citrate monohydrate ($\text{C}_6\text{H}_5\text{K}_3\text{O}_7 \cdot \text{H}_2\text{O}$), 324.41

M_{r2} = molecular weight of citric acid ($\text{C}_6\text{H}_8\text{O}_7$), 192.13

Calculate the percentage of the labeled amount of potassium citrate monohydrate ($\text{C}_6\text{H}_5\text{K}_3\text{O}_7 \cdot \text{H}_2\text{O}$) dissolved at each time point:

At 0.5 h:

$$\text{Result}_1 = C_1 \times V \times 100/L$$

At 1 h:

$$\text{Result}_2 = (C_2 \times V + C_1 \times V_S) \times 100/L$$

At 2 h:

$$\text{Result}_3 = [C_3 \times V + (C_1 + C_2) \times V_S] \times 100/L$$

At 6 h:

$$\text{Result}_4 = [C_4 \times V + (C_1 + C_2 + C_3) \times V_S] \times 100/L$$

C_i = concentration of potassium citrate monohydrate in the portion of sample withdrawn at the specified time point (mg/mL)

V = volume of *Medium*, 900 mL

L = label claim (mg/Tablet)

V_S = volume of sample withdrawn at each time point (mL)

Tolerances:

See [Table 9](#).

Table 9

Time (h)	Amount Dissolved (%)
0.5	26–46
1	40–60
2	55–75
6	NLT 80

The percentages of the labeled amount of potassium citrate monohydrate ($C_6H_5K_3O_7 \cdot H_2O$) dissolved at the times specified conform to [Dissolution \(711\), Acceptance Table 2](#).

Test 6: If the product complies with this test, the labeling indicates that it meets USP *Dissolution Test 6*.

Medium: [Water](#); 900 mL

Apparatus 2: 50 rpm

Times: 0.5, 1, and 4 h—for strength 540 mg as potassium citrate monohydrate; 0.5, 1, and 6 h—for strengths 1080 and 1620 mg as potassium citrate monohydrate. Replace the volume withdrawn with an equal volume of *Medium* preheated to $37 \pm 0.5^\circ$.

[**NOTE**—Withdraw the same volume at each time point. Pass a portion of the withdrawn solution through a suitable 0.45- μ m filter, discarding the first 5 mL of filtrate.]

Buffer, Mobile phase, Standard solution, Chromatographic system, and System suitability: Proceed as directed in *Test 2*.

Sample solution: Filtered portion of the solution under test

Analysis

Samples: *Standard solution* and *Sample solution*

Determine the concentration, in mg/mL, of potassium citrate monohydrate ($C_6H_5K_3O_7 \cdot H_2O$) in the sample withdrawn from the vessel at each time point:

$$\text{Result} = (r_U/r_S) \times C_S \times (M_{r1}/M_{r2})$$

r_U = peak area of citric acid from the *Sample solution*

r_S = peak area of citric acid from the *Standard solution*

C_S = concentration of [USP Citric Acid RS](#) in the *Standard solution* (mg/mL)

M_{r1} = molecular weight of potassium citrate monohydrate ($C_6H_5K_3O_7 \cdot H_2O$), 324.41

M_{r2} = molecular weight of citric acid ($C_6H_8O_7$), 192.13

Calculate the percentage of the labeled amount of potassium citrate monohydrate ($C_6H_5K_3O_7 \cdot H_2O$) dissolved at each time point:

At 0.5 h:

$$\text{Result}_1 = C_1 \times V \times 100/L$$

At 1 h:

$$\text{Result}_2 = (C_2 \times V + C_1 \times V_S) \times 100/L$$

At 4 h or 6 h:

$$\text{Result}_3 = [C_3 \times V + (C_1 + C_2) \times V_S] \times 100/L$$

C_i = concentration of potassium citrate monohydrate in the portion of sample withdrawn at the specified time point (mg/mL)

V = volume of *Medium*, 900 mL

L = label claim (mg/Tablet)

V_S = volume of sample withdrawn at each time point (mL)

Tolerances: See [Table 10](#) and [Table 11](#).**Table 10. For Tablets Labeled to Contain 540 mg/Tablet**

Time (h)	Amount Dissolved (%)
0.5	25-45
1	40-60
4	NLT 80

Table 11. For Tablets Labeled to Contain 1080 and 1620 mg/Tablet

Time (h)	Amount Dissolved (%)
0.5	25-45
1	40-60
6	NLT 80

The percentages of the labeled amount of potassium citrate monohydrate ($C_6H_5K_3O_7 \cdot H_2O$) dissolved at the times specified conform to [Dissolution \(711\)](#), [Acceptance Table 2](#).

▲ **Test 7:** If the product complies with this test, the labeling indicates that it meets USP *Dissolution Test 7*.

Medium: [Water](#); 900 mL

Apparatus 2: 50 rpm

Times: 0.5, 1, 2 and 6 h. Replace the volume withdrawn with an equal volume of *Medium* preheated to $37 \pm 0.5^\circ$.

[**NOTE**—Withdraw the same volume at each time point. Pass a portion of the withdrawn solution through a nylon filter of 0.45- μ m pore size, discarding the first 5 mL of filtrate.]

Buffer, Mobile phase, and Standard solution: Prepare as directed in *Test 2*.

Sample solution: Filtered portion of the solution under test

Chromatographic system and System suitability: Proceed as directed in *Test 2*.

Analysis

Samples: *Standard solution* and *Sample solution*

Determine the concentration, in mg/mL, of potassium citrate monohydrate ($C_6H_5K_3O_7 \cdot H_2O$) in the sample withdrawn from the vessel at each time point:

$$\text{Result} = (r_U/r_S) \times C_S \times (M_{r1}/M_{r2})$$

r_U = peak area of citric acid from the *Sample solution*

r_S = peak area of citric acid from the *Standard solution*

C_S = concentration of [USP Citric Acid RS](#) in the *Standard solution* (mg/mL)

M_{r1} = molecular weight of potassium citrate monohydrate ($C_6H_5K_3O_7 \cdot H_2O$), 324.41

M_{r2} = molecular weight of citric acid ($C_6H_8O_7$), 192.13

Calculate the percentage of the labeled amount of potassium citrate monohydrate ($C_6H_5K_3O_7 \cdot H_2O$) dissolved at each time point:

At 0.5 h:

$$\text{Result}_1 = C_1 \times V \times 100/L$$

At 1 h:

$$\text{Result}_2 = (C_2 \times V + C_1 \times V_S) \times 100/L$$

At 2 h:

$$\text{Result}_3 = [C_3 \times V + (C_1 + C_2) \times V_s] \times 100/L$$

At 6 h:

$$\text{Result}_4 = [C_4 \times V + (C_1 + C_2 + C_3) \times V_s] \times 100/L$$

C_i = concentration of potassium citrate monohydrate in the portion of sample withdrawn at the specified time point (mg/mL)

V = volume of *Medium*, 900 mL

L = label claim (mg/Tablet)

V_s = volume of sample withdrawn at each time point (mL)

Tolerances:

See [Table 12](#).

Table 12

Time (h)	Amount Dissolved (%)
0.5	28–48
1	40–60
2	57–77
6	NLT 80

The percentages of the labeled amount of potassium citrate monohydrate ($C_6H_5K_3O_7 \cdot H_2O$) dissolved at the times specified conform to

[Dissolution \(711\)](#), [Acceptance Table 2](#).▲ (RB 1-Aug-2024)

- [UNIFORMITY OF DOSAGE UNITS \(905\)](#): Meet the requirements.

ADDITIONAL REQUIREMENTS

- **PACKAGING AND STORAGE**: Preserve in tight containers.
- **LABELING**: The label states the amount of potassium citrate as monohydrate ($C_6H_5K_3O_7 \cdot H_2O$) in mEq and in g/Tablet. The label indicates the *Dissolution* test with which the product complies.
- [USP REFERENCE STANDARDS \(11\)](#).

[USP Citric Acid RS](#)

Auxiliary Information - Please [check for your question in the FAQs](#) before contacting USP.

Topic/Question	Contact	Expert Committee
POTASSIUM CITRATE EXTENDED-RELEASE TABLETS	Natalia Davydova Scientific Liaison	NBDS2020 Non-botanical Dietary Supplements
REFERENCE STANDARD SUPPORT	RS Technical Services RSTECH@usp.org	NBDS2020 Non-botanical Dietary Supplements

Chromatographic Database Information: [Chromatographic Database](#)

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