Potassium Citrate Extended-Release Tablets

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In accordance with the Rules and Procedures of the Council of Experts, the Non-botanical Dietary Supplements Expert Committee has revised the Potassium Citrate Extended-Release Tablets monograph. The purpose of this revision is to add *Dissolution Test 6* to accommodate FDA-approved drug products with different tolerances than the existing dissolution tests.

The Potassium Citrate Extended-Release Tablets Revision Bulletin supersedes the currently official monograph.

Should you have any questions, please contact Natalia Davydova, Principal Scientist (301-816-8328 or nd@usp.org).
Potassium Citrate Extended-Release Tablets

DEFINITION
Potassium Citrate Extended-Release Tablets contain NLT 90.0% and NMT 110.0% of the labeled amount of potassium citrate as monohydrate (C₆H₅K₃O₇·H₂O).

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:

\[
\text{Result} = \left(\frac{r_U}{r_S}\right) \times \left(\frac{C_S}{C_U}\right) \times \left(\frac{M_{r1}}{M_{r2}}\right) \times 100
\]

- \(r_U\) = citric acid peak area from the \textit{Sample solution}
- \(r_S\) = citric acid peak area from the \textit{Standard solution}
- \(C_S\) = concentration of \textit{USP Citric Acid RS} in the \textit{Standard solution} (mg/mL)
- \(C_U\) = nominal concentration of potassium citrate monohydrate in the \textit{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

\textbf{Acceptance criteria:} 90.0\%–110.0\%

\section*{OTHER COMPONENTS}

\begin{itemize}
  \item \textbf{Content of Potassium}
  \begin{itemize}
    \item \textbf{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.
    \item \textbf{Standard solutions:} Transfer 10.0, 15.0, and 20.0 mL, respectively, to separate 100-mL volumetric flasks of the \textit{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 \textit{Standard solutions} contain 1.0, 1.5, and 2.0 µg/mL of potassium, respectively.
    \item \textbf{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.
    \item \textbf{Sample solution:} Transfer 3.0 mL of the \textit{Sample stock solution} to a 100-mL volumetric flask.
  \end{itemize}

\end{itemize}

\textbf{Instrumental conditions}

(See \textit{Atomic Absorption Spectroscopy} (852).)

- \textbf{Mode:} Atomic absorption spectrophotometry
- \textbf{Analytical wavelength:} Potassium emission line at 766.5 nm
- \textbf{Lamp:} Potassium hollow-cathode
- \textbf{Flame:} Air–acetylene
- \textbf{Blank:} Water

\textbf{Analysis}

\textbf{Samples:} \textit{Standard solutions, Sample solution, and Blank}

Plot the absorbance of the \textit{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 \textit{Sample solution} (µg/mL).

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

\[
\text{Result} = \frac{C}{C_U} \times 100
\]

- \(C\) = concentration of potassium in the \textit{Sample solution} as determined in this test (µg/mL)
- \(C_U\) = concentration of potassium citrate anhydrous \((C_6H_5K_3O_7)\) in the \textit{Sample solution} calculated from the Assay value of potassium citrate monohydrate \((C_6H_5K_3O_7 \cdot H_2O)\) (µg/mL)

\textbf{Acceptance criteria:} 36.4\%–40.2\%

\section*{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 Blank

Determine the concentration, in µg/mL, of potassium in the Sample solution at each time point. Calculate the percentage of the labeled amount of potassium citrate monohydrate (C₆H₅K₃O₇·H₂O) 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 C₁, C₂, C₃, concentration of potassium in the Sample solution at each time point (µg/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 (C₆H₅K₃O₇·H₂O) dissolved from the Tablets are NMT 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**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Number Tested</th>
<th>Acceptance Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>(S_1)</td>
<td>6</td>
<td>Each unit is within the range between (Q \pm 10%) and (Q' \pm 10%), and is NLT (Q'' + 5%) at the stated times.</td>
</tr>
<tr>
<td>(S_2)</td>
<td>6</td>
<td>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.</td>
</tr>
<tr>
<td>(S_3)</td>
<td>12</td>
<td>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.</td>
</tr>
</tbody>
</table>

**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 ± 0.5°.

**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**

<table>
<thead>
<tr>
<th>Tablet Strength (mg, as potassium citrate monohydrate)</th>
<th>Concentration of Citric Acid (mg/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>540</td>
<td>0.35</td>
</tr>
<tr>
<td>1080</td>
<td>0.70</td>
</tr>
<tr>
<td>1620</td>
<td>1.05</td>
</tr>
</tbody>
</table>

**Sample solution:** Pass a portion of the solution under test through a suitable filter of 0.45-\(\mu\)m 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 × 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 (C₆H₅K₃O₇·H₂O) in the sample withdrawn from the vessel at each time point:

\[
\text{Result} = \left( \frac{r_U}{r_S} \right) \times C_S \times \left( \frac{M_{r_1}}{M_{r_2}} \right)
\]

- \(r_U\) = 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)
- \(M_{r_1}\) = molecular weight of potassium citrate monohydrate (C₆H₅K₃O₇·H₂O), 324.41
- \(M_{r_2}\) = molecular weight of citric acid (C₆H₈O₇), 192.13

Calculate the percentage of the labeled amount of potassium citrate monohydrate (C₆H₅K₃O₇·H₂O) 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 (C₆H₅K₃O₇·H₂O) dissolved at the times specified in Table 3 conform to Dissolution (711), Acceptance Table 2.

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

**Medium:** Deaerated 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-µm 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 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 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 µg/mL of potassium, respectively.

**Sample stock solution:** Filter the solution under test, and dilute quantitatively with water as stated in Table 4.

### Table 4

<table>
<thead>
<tr>
<th>Time (h)</th>
<th>5 mEq Tablet Dilution</th>
<th>10 mEq Tablet Dilution</th>
<th>15 mEq Tablet Dilution</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>6.0 mL into 25 mL</td>
<td>6.0 mL into 50 mL</td>
<td>4.0 mL into 50 mL</td>
</tr>
<tr>
<td>1</td>
<td>5.0 mL into 25 mL</td>
<td>5.0 mL into 50 mL</td>
<td>3.0 mL into 50 mL</td>
</tr>
<tr>
<td>5</td>
<td>7.0 mL into 50 mL</td>
<td>7.0 mL into 100 mL</td>
<td>2.0 mL into 50 mL</td>
</tr>
</tbody>
</table>

**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 µg/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 (mg/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**

<table>
<thead>
<tr>
<th>Time (h)</th>
<th>Amount Dissolved (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>30–50</td>
</tr>
<tr>
<td>1</td>
<td>45–65</td>
</tr>
<tr>
<td>5</td>
<td>NLT 85</td>
</tr>
</tbody>
</table>

**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 ± 0.5°.

[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>
<thead>
<tr>
<th>Tablet Strength (mg, as potassium citrate monohydrate)</th>
<th>Concentration of Citric Acid (mg/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1080</td>
<td>0.70</td>
</tr>
<tr>
<td>1620</td>
<td>1.05</td>
</tr>
</tbody>
</table>

**Table 6**

**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:

\[
\text{Result} = \left(\frac{r_U}{r_S}\right) \times C_S \times \left(\frac{M_{r1}}{M_{r2}}\right)
\]

- \( r_U \) = 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:

\[
\text{Result}_1 = C_1 \times V \times \left(\frac{100}{L}\right)
\]

At 1 h:

\[
\text{Result}_2 = (C_2 \times V + C_1 \times V_S) \times \left(\frac{100}{L}\right)
\]

At 6 h:

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

- \( C_i \) = 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\(_6\)H\(_5\)K\(_3\)O\(_7\)·H\(_2\)O) dissolved at the times specified in Table 7 conform to Dissolution (711), Acceptance Table 2.

<table>
<thead>
<tr>
<th>Time (h)</th>
<th>Amount Dissolved (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>30–50</td>
</tr>
<tr>
<td>1</td>
<td>45–65</td>
</tr>
<tr>
<td>6</td>
<td>NLT 80</td>
</tr>
</tbody>
</table>

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 ± 0.5°.

[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>
<thead>
<tr>
<th>Tablet Strength (mg, as potassium citrate monohydrate)</th>
<th>Concentration of Citric Acid (mg/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1080</td>
<td>0.70</td>
</tr>
<tr>
<td>1620</td>
<td>1.05</td>
</tr>
</tbody>
</table>

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\(_6\)H\(_5\)K\(_3\)O\(_7\)·H\(_2\)O) in the sample withdrawn from the vessel at each time point:

\[
\text{Result} = \left( \frac{r_U}{r_S} \right) \times C_S \times \left( \frac{M_{r1}}{M_{r2}} \right)
\]

\(r_U\) = 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 9.

<table>
<thead>
<tr>
<th>Time (h)</th>
<th>Amount Dissolved (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>26–46</td>
</tr>
<tr>
<td>1</td>
<td>40–60</td>
</tr>
<tr>
<td>2</td>
<td>55–75</td>
</tr>
<tr>
<td>6</td>
<td>NLT 80</td>
</tr>
</tbody>
</table>

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 strengths 540 and 1080 mg as potassium citrate monohydrate; 0.5, 1, and 6 h—for strength 1620 mg as potassium citrate monohydrate. Replace the volume withdrawn with an equal volume of Medium preheated to 37 ± 0.5°.
Withdraw the same volume at each time point. Pass a portion of the withdrawn solution through a suitable 0.45-μm 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 (C₆H₅K₃O₇·H₂O) in the sample withdrawn from the vessel at each time point:

\[
\text{Result} = \frac{r_U}{r_S} \times C_S \times \left(\frac{M_{r1}}{M_{r2}}\right)
\]

- \(r_U\) = 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 (C₆H₅K₃O₇·H₂O), 324.41
- \(M_{r2}\) = molecular weight of citric acid (C₆H₈O₇), 192.13

Calculate the percentage of the labeled amount of potassium citrate monohydrate (C₆H₅K₃O₇·H₂O) 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**

<table>
<thead>
<tr>
<th>Time (h)</th>
<th>Amount Dissolved (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>25–45</td>
</tr>
<tr>
<td>1</td>
<td>40–60</td>
</tr>
<tr>
<td>4</td>
<td>NLT 80</td>
</tr>
</tbody>
</table>

**Table 11. For Tablets Labeled to Contain 1080 and 1620 mg/Tablet**
<table>
<thead>
<tr>
<th>Time (h)</th>
<th>Amount Dissolved (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>25–45</td>
</tr>
<tr>
<td>1</td>
<td>40–60</td>
</tr>
<tr>
<td>6</td>
<td>NLT 80</td>
</tr>
</tbody>
</table>

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 at the times specified conform to **Dissolution (711)**, **Acceptance Table 2**. ▲ (RB 1-Jun-2022)

- **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 \((\text{C}_6\text{H}_5\text{K}_3\text{O}_7 \cdot \text{H}_2\text{O})\) 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**

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**Page Information:**
Not Applicable

**Current DocID:**
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