Amantadine Hydrochloride

C_{10}H_{17}N · HCl 187.71
Tricyclo[3.3.1.1^{3,7}]decan-1-amine, hydrochloride; 1-Adamantanamine hydrochloride [665-66-7].

**DEFINITION**
Amantadine Hydrochloride contains NLT 98.5% and NMT 101.5% of C_{10}H_{17}N · HCl.

**IDENTIFICATION**
- **A. INFRARED ABSORPTION (1975)**
  - **Cell:** 1 mm
  - **Sample solution:** 50 mg in 10 mL of 0.1 N hydrochloric acid, and filter. Transfer the filtrate to a suitable separator, add 1 mL of 5 N sodium hydroxide, and extract with 5 mL of methylene chloride.
  - **Acceptance criteria:** Meets the requirements

**ASSAY**
- **PROCEDURE**
  - **Sample:** Dissolve 120 mg of Amantadine Hydrochloride in a mixture of 30 mL of glacial acetic acid and 10 mL of mercuric acetate TS.
  - **Analysis:** Titrate with 0.1 N perchloric acid VS, determining the endpoint potentiometrically, using suitable electrodes. Perform a blank determination. Each mL of 0.1 N perchloric acid is equivalent to 18.77 mg of amantadine hydrochloride (C_{10}H_{17}N · HCl).
  - **Acceptance criteria:** 98.5%–101.5%

**IMPURITIES**
- **HEAVY METALS, Method I (231)**
  - **Test preparation:** Use 1 mL of 1 N acetic acid.
  - **Acceptance criteria:** NMT 10 ppm
- **ORGANIC IMPURITIES**
  - **Internal standard solution:** 50 mg/mL of adamantane in dichloromethane
  - **Standard solution:** Transfer 10 mg of USP Amantadine Hydrochloride RS to a separator. Add 20 mL of 5.0 N sodium hydroxide and 18 mL of dichloromethane, and shake for 10 min. Remove the water layer, dry the organic layer by swirling with anhydrous sodium sulfate, and allow to stand for a few min to ensure that all remaining water has been removed. Filter, collect the filtrate in a 20-mL volumetric flask, add 0.2 mL of Internal standard solution, and dilute with dichloromethane to volume.
  - **Sample solution:** Transfer 1.0 g of Amantadine Hydrochloride to a separator. Add 20 mL of 5.0 N sodium hydroxide and 18 mL of dichloromethane, and shake for 10 min. Remove the water layer, dry the organic layer by swirling with anhydrous sodium sulfate, and allow to stand for a few min to ensure that all remaining water has been removed. Filter, collect the filtrate in a 20-mL volumetric flask, add 0.2 mL of Internal standard solution, and dilute with dichloromethane to volume.
  - **Chromatographic system**
    - **(See Chromatography (621), System Suitability.)**
    - **Mode:** GC
    - **Detector:** Flame ionization
    - **Detector temperature:** 300 °C
    - **Column:** 0.53-mm × 30-m fused-silica column coated with 1.5-µm G27 stationary phase

**SPECIFIC TESTS**
- **PH (791)**
  - **Sample:** 0.2 g/mL in water
  - **Acceptance criteria:** 3.0–5.5
- **CLARITY AND COLOR OF SOLUTION**
  - **Sample:** Dissolve 2 g in 10 mL of water.
  - **Acceptance criteria:** Solution is clear and nearly colorless.

**ADDITIONAL REQUIREMENTS**
- **PACKAGING AND STORAGE:** Preserve in well-closed containers.
- **USP REFERENCE STANDARDS (11)**
  - USP Amantadine Hydrochloride RS

---

C_{10}H_{17}N · HCl

<table>
<thead>
<tr>
<th>Initial Temperature (°C)</th>
<th>Temperature Ramp (°C/min)</th>
<th>Final Temperature (°C)</th>
<th>Hold Time at Final Temperature (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td>0</td>
<td>70</td>
<td>5</td>
</tr>
<tr>
<td>70</td>
<td>10</td>
<td>250</td>
<td>At least 17</td>
</tr>
</tbody>
</table>

**Column temperature:** See Table 1.

---

**Amantadine Hydrochloride Capsules**

**DEFINITION**
Amantadine Hydrochloride Capsules contain NLT 95.0% and NMT 105.0% of the labeled amount of amantadine hydrochloride (C_{10}H_{17}N · HCl).

**IDENTIFICATION**
- **INFRARED ABSORPTION (1975)**
  - **Cell:** 1 mm
  - **Sample solution:** Place the contents of Capsules, equivalent to 200 mg of amantadine hydrochloride, in a vessel, dissolve in 0.1 N hydrochloric acid, and filter. Transfer the filtrate to...