Tubocurarine chloride (Tubocurarini chloridum)

**Molecular formula.** C\(_{37}\)H\(_{41}\)ClN\(_2\)O\(_6\), HCl, 5H\(_2\)O

**Relative molecular mass.** 771.7

**Graphic formula.**

![Graphic formula]

**Chemical name.** (+)-Tubocurarine chloride hydrochloride, pentahydrate; 7',12'-dihydroxy-6,6'-dimethoxy-2,2',2'-trimethyltubocuraranium chloride hydrochloride pentahydrate; CAS Reg. No. 6989-98-6 (pentahydrate).

**Description.** A white to yellowish white, crystalline powder; odourless.

**Solubility.** Soluble in 20 parts of water and 30 parts of ethanol (~750 g/l) TS; practically insoluble in acetone R and ether R.

**Category.** Muscle relaxant.

**Storage.** Tubocurarine chloride should be kept in a tightly closed container.

**Additional information.** Tubocurarine chloride melts at about 270°C with decomposition.

**Requirements**

**Definition.** Tubocurarine chloride contains not less than 98.0% and not more than 102.0% of C\(_{37}\)H\(_{41}\)ClN\(_2\)O\(_6\), HCl, calculated with reference to the dried substance.

**Identity tests**

A. Dissolve 10 mg in 1 mL of water and add 1 mL of mercuric nitrate TS; a cherry red colour is slowly produced.

B. Dissolve 10 mg in 1 mL of water and add 0.1 mL of ferric chloride (25 g/l) TS; a green colour is produced, which becomes brown on warming on a water-bath.

C. A 20 mg/mL solution yields reaction A described under 2.1 General identification tests as characteristic of chlorides.

**Specific optical rotation.** Use a 10 mg/mL solution, which has been allowed to stand for 3 hours, and calculate with reference to the dried substance; \([\alpha]_{D}^{20°} = +210° \text{ to } +220°.\]

**Chloroform-soluble substances.** Dissolve 0.25 g in 150 mL of water, add 5 mL of a saturated solution of sodium hydrogen carbonate R, and extract with 3 quantities, each of 20 mL, of chloroform R. Wash the combined chloroform extracts with 10 mL of water, filter the chloroform solution into a beaker, wash the filter with 2 successive quantities, each of 5 mL, of chloroform R, and add the washings to the filtrate. Evaporate the combined filtrate and washings on a water-bath and dry the residue at 105°C for 1 hour; the weight of the residue is not more than 5 mg (2.0%). Add 10 mL of water to the residue; the residue does not dissolve. Then add 1 mL of hydrochloric acid (~70 g/l) TS; the residue dissolves.

**Sulfated ash.** Not more than 2.5 mg/g.

**Loss on drying.** Dry to constant weight at 100°C under reduced pressure (not exceeding 0.6 kPa or about 5 mm of mercury); it loses not less than 90 mg/g and not more than 120 mg/g.

**pH value.** pH of a 10 mg/mL solution, 4.0-6.0.

**Assay.** Dissolve about 0.5 g, accurately weighed, in 20 mL of glacial acetic acid R1 by warming on a water-bath, cool, and add 60 mL of acetic anhydride R and 10 mL of mercuric acetate/acetic acid TS. Titrate with perchloric acid (0.1 mol/l) VS, determining the end-point potentiometrically as described under 2.6 Non-aqueous titration, Method A. Each mL of perchloric acid (0.1 mol/l)
VS is equivalent to 34.08 mg of $\text{C}_{37}\text{H}_{41}\text{ClN}_{2}\text{O}_{6}\cdot\text{HCl}$. 