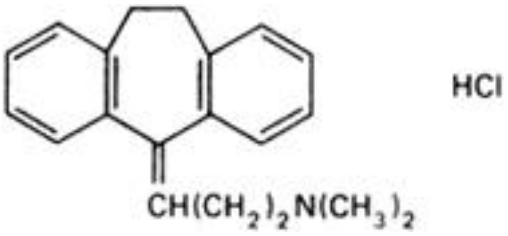
Amitriptyline hydrochloride (Amitriptylini hydrochloridum)

2018-01

Molecular formula. $C_{20}H_{23}N,HCl$

Relative molecular mass. 313.9

Graphic formula.



Chemical name. 10,11-Dihydro-*N,N*-dimethyl-5*H*-dibenzo[*a,d*]cycloheptene-$\Delta^{5,\gamma}$-propylamine hydrochloride; 3-(10,11-dihydro-5*H*-dibenzo[*a,d*]cyclohepten-5-ylidene)-*N,N*-dimethyl-1-propanamine hydrochloride; CAS Reg. No. 549-18-8.

Description. Colourless crystals or a white or almost white powder; odourless or almost odourless.

Solubility. Soluble in 1 part of water and in 1.5 parts of ethanol (~750 g/l) TS; practically insoluble in ether R.

Category. Antidepressant.

Storage. Amitriptyline hydrochloride should be kept in a tightly closed container, protected from light.

Additional information. Amitriptyline hydrochloride has a bitter and burning taste that is followed by a sensation of numbness. Even in the absence of light, Amitriptyline hydrochloride is gradually degraded on exposure to a humid atmosphere, the decomposition being faster at higher temperatures.

Requirements

Definition. Amitriptyline hydrochloride contains not less than 99.0% and not more than 101.5% of $C_{20}H_{23}N,HCl$, calculated with reference to the dried substance.

Identity tests

A. Carry out the examination as described under 1.7 Spectrophotometry in the infrared region. The infrared absorption spectrum is concordant with the spectrum obtained from amitriptyline hydrochloride RS or with the *reference spectrum* of amitriptyline hydrochloride.

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

C. Melting temperature, about 197°C.

Sulfated ash. Not more than 1.0 mg/g.

Loss on drying. Dry to constant weight at 60°C under reduced pressure (not exceeding 0.6 kPa or about 5 mm of mercury); it loses not more than 5.0 mg/g.

pH value. pH of a 10 mg/mL solution, 4.5-6.0.

Related substances. Carry out the test as described under *1.14.1 Chromatography*, Thin-layer chromatography, using silica gel R2 as the coating substance and a mixture of 85 volumes of cyclohexane R, 15 volumes of ethyl acetate R and 3 volumes of diethylamine R as the mobile phase. Apply separately to the plate 10 µl of each of 2 solutions in chloroform R containing (A) 20 mg of the test substance per mL and (B) 0.20 mg of the test substance per mL. After removing the plate from the chromatographic chamber, allow it to dry in air, and examine the chromatogram in ultraviolet light (254 nm). Any spot obtained with solution A, other than the principal spot, is not more intense than that obtained with solution B.

Assay.

Dissolve 0.25 g, accurately weighed, in 30 mL of dehydrated ethanol R. Carry out a potentiometric titration using sodium hydroxide (0.1 mol/L) VS, as described under *2.6 Non-aqueous titration*.

1 mL of sodium hydroxide (0.1 mol/L) VS is equivalent to 31.39 mg of $C_{20}H_{23}N,HCl$.