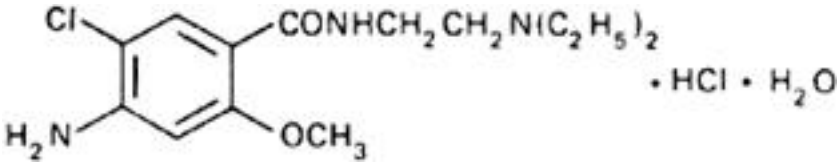
Metoclopramide hydrochloride (Metoclopramidi hydrochloridum)

2018-01

Molecular formula. $C_{14}H_{22}ClN_3O_2,HCl,H_2O$

Relative molecular mass. 354.3

Graphic formula.



Chemical name. 4-Amino-5-chloro-*N*-[2-(diethylamino)ethyl]-*o*-anisamide monohydrochloride monohydrate; 4-amino-5-chloro-*N*-[2-(diethylamino)-ethyl]-2-methoxybenzamide monohydrochloride monohydrate; CAS Reg. No. 54143-57-6 (monohydrate).

Description. A white or almost white, crystalline powder; odourless or almost odourless.

Solubility. Very soluble in water; freely soluble in ethanol (~750 g/l) TS; practically insoluble in ether R.

Category. Antiemetic drug.

Storage. Metoclopramide hydrochloride should be kept in a well-closed container, protected from light.

Requirements

Definition. Metoclopramide hydrochloride contains not less than 98.0% and not more than 101.0% of $C_{14}H_{22}ClN_3O_2,HCl$, calculated with reference to the anhydrous substance.

Identity tests

• Either tests A and D or tests B, C and D may be applied.

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 metoclopramide hydrochloride RS or with the *reference spectrum* of metoclopramide hydrochloride.

B. The absorption spectrum of a 20 µg/mL solution in hydrochloric acid (0.01 mol/l) VS, when observed between 230 nm and 350 nm, exhibits maxima at about 273 nm and 309 nm; the absorbances of a 1-cm layer at these wavelengths are about 0.79 and 0.69, respectively.

C. Dissolve 0.05 g in 5 mL of water and add 5 mL of 4-dimethylaminobenzaldehyde TS5; a yellow-orange colour is produced.

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

Clarity and colour of solution. A solution of 1.0 g in 10 mL of carbon-dioxide-free water R is clear and not more intensely coloured than standard colour solution Yw3 when compared as described under 1.11 Colour of liquids.

Sulfated ash. Not more than 1.0 mg/g.

Water. Determine as described under 2.8 Determination of water by the Karl Fischer method, Method A, using about 0.5 g of the substance; the water content is not less than 45 mg/g and not more than 55 mg/g.

pH value. pH of a 0.10 g/mL solution in carbon-dioxide-free water R, 4.5-6.5.

Related substances. Carry out the test as described under *1.14.1 Chromatography*, Thin-layer chromatography, using silica gel R4 as the coating substance and a mixture of 95 volumes of 1-butanol R and 5 volumes of ammonia (~260 g/l) TS as the mobile phase. Apply separately to the plate 5 µl of each of 2 solutions in methanol R containing (A) 50 mg of the test substance per mL and (B) 0.50 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 0.250 g in a mixture of 5.0 mL of hydrochloric acid (0.01 mol/L) VS and 50 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*. Read the volume added between the two points of inflexion.

1 mL of sodium hydroxide (0.1 mol/L) VS is equivalent to 33.63 mg of $C_{14}H_{22}ClN_3O_2,HCl$.

Additional requirements for Metoclopramide hydrochloride for parenteral use

Complies with the monograph for "Parenteral preparations".

Bacterial endotoxins. Carry out the test as described under 3.4 Test for bacterial endotoxins; contains not more than 2.5 IU of endotoxin RS per mg of metoclopramide.