Trimethadione (Trimethadionum)

Molecular formula. $C_6H_9NO_3$

Relative molecular mass. 143.1

Graphic formula.

Chemical name. 3,5,5-Trimethyl-2,4-oxazolidinedione; CAS Reg. No. 127-48-0.

Description. Colourless, granular crystals; odour, slightly camphoraceous.

Solubility. Soluble in water; freely soluble in ethanol (~750 g/l) TS and ether R.

Category. Anticonvulsant.

Storage. Trimethadione should be kept in a well-closed container.

Requirements

Definition. Trimethadione contains not less than 98.0% and not more than 101.0% of $C_6H_9NO_3$, calculated with reference to the dried substance.

Identity tests

• Either test A alone 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 trimethadione RS or with the reference spectrum of trimethadione.

B. To 5 mL of a 20 mg/mL solution add 2 mL of barium hydroxide (15 g/l) TS; a precipitate is immediately produced.

C. Heat 0.5 g with 10 mL of sodium hydroxide (~80 g/l) TS on a water-bath for 30 minutes, evaporate to low bulk, cool in ice, and cautiously add hydrochloric acid (~70 g/l) TS until acid to litmus paper R. To 0.5 mL add 2 drops of ferric chloride (25 g/l) TS; a deep yellow colour is produced. Retain the remainder of the solution for test D.

D. Extract the remainder of the solution obtained in test C 3 times with ether R, using 10 mL each time; evaporate the combined ether extracts on a water-bath for 30 minutes and scratch the inner surface of the container to induce crystallization; melting temperature, about 80°C ($\alpha$-hydroxyisobutyric acid).

Melting range. 45-47°C, determined without previous drying.

Sulfated ash. Not more than 1.0 mg/g.

Loss on drying. Dry to constant weight over silica gel, desiccant, R at ambient temperature; it loses not more than 5.0 mg/g.

Assay. Carry out the assay as described under 1.14.5 Gas chromatography. As an internal standard use 2-phenylethanol TS. Use the following 3 solutions: (1) to 0.10 g of trimethadione RS add 5 mL of 2-phenylethanol TS and sufficient methanol R to produce 10 mL, (2) dissolve 0.20 g of the substance being examined in sufficient methanol R to produce 10 mL, and (3) to 0.20 g of the substance being examined add 5 mL of 2-phenylethanol TS and sufficient methanol R to produce 10 mL. For the procedure use a glass column 1.5 m long and 0.4 cm in internal diameter packed with an adequate quantity of an adsorbent composed of 10 g of diethylene glycol succinate R supported on 90 g of acid-washed, silanized kieselguhr R4. Maintain the column at 105 °C, use nitrogen R as the carrier gas and a flame ionization detector. Prepare chromatograms A, B, and C from solutions 1, 2 and 3, respectively. Measure the appropriate peak areas in chromatograms A, B, and C, and calculate the content of $C_6H_9NO_3$, using the data obtained from chromatograms A and C, introducing if necessary the correction resulting from chromatogram B.