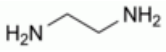
Edition: BP 2025 (Ph. Eur. 11.6 update)

Ethylenediamine

General Notices

(Ph. Eur. monograph 0716)



$C_2H_8N_2$ 60.1 *107-15-3*

Ph Eur

DEFINITION

Ethane-1,2-diamine.

Content

98.0 per cent to 101.0 per cent.

CHARACTERS

Appearance

Clear, colourless or slightly yellow liquid, hygroscopic.

Solubility

Miscible with water and with anhydrous ethanol.

On exposure to air, white fumes are evolved. On heating, it evaporates completely.

IDENTIFICATION

A. Relative density (2.2.5): 0.895 to 0.905.
B. Boiling point (2.2.12): 116 °C to 118 °C.
C. To 0.2 mL add 0.5 mL of *acetic anhydride R*. Boil. A crystalline mass forms after cooling, which dissolves in 5 mL of *2-propanol R* with heating. Cool the solution and add 5 mL of *ether R*. If necessary, initiate crystallisation by scratching the walls of the test-tube with a glass rod. Filter through a sintered-glass filter (2.1.2), wash with several portions of *ether R* and dry at 100-105 °C. The residue melts (2.2.14) at 173 °C to 177 °C.

TESTS

Solution S

Mix 10 g with *carbon dioxide-free water R* and dilute to 100 mL with the same solvent.

Appearance of solution

Solution S is clear (*2.2.1*) and not more intensely coloured than the reference solution BY_6 (*2.2.2, Method II*).

Carbonate

A mixture of 4 mL of solution S and 6 mL of *calcium hydroxide solution R* is not more opalescent than reference suspension II (*2.2.1*).

Chlorides (*2.4.4*)

Maximum 100 ppm.

To 5 mL of solution S add 5 mL of *dilute nitric acid R* and dilute to 15 mL with *water R*.

Ammonia and other bases

Dissolve 1.2 g in 20 mL of *ethanol (96 per cent) R* and add, dropwise with stirring, 4.5 mL of *hydrochloric acid R*. Evaporate to dryness on a water-bath, breaking up any resulting cake with a glass rod, and dry at 100-105 °C for 1 h. 1 g of the residue is equivalent to 0.4518 g of $C_2H_8N_2$. Calculate the percentage content of $C_2H_8N_2$: it does not vary by more than 0.5 from the percentage content determined in the assay.

Iron (*2.4.9*)

Maximum 10 ppm, determined on solution S.

Residue on evaporation

Maximum 0.3 per cent.

Evaporate 5.00 g to dryness on a water-bath and dry at 100-105 °C for 1 h. The residue weighs a maximum of 15 mg.

ASSAY

Place 25.0 mL of *1 M hydrochloric acid* and 0.2 mL of *methyl red mixed solution R* in a flask. Add 0.600 g of the substance to be examined. Titrate with *1 M sodium hydroxide* until the colour changes from violet-red to green.

1 mL of *1 M hydrochloric acid* is equivalent to 30.05 mg of $C_2H_8N_2$.

STORAGE

In an airtight container, protected from light.