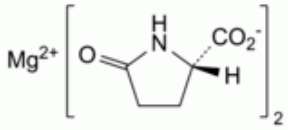
Edition: BP 2025 (Ph. Eur. 11.6 update)

# Magnesium Pidolate

General Notices

*(Ph. Eur. monograph 1619)*



$C_{10}H_{12}MgN_2O_6$ 280.5 *62003-27-4*

Ph Eur

## DEFINITION

Magnesium bis[(2*S*)-5-oxopyrrolidine-2-carboxylate].

### Content

8.49 per cent to 8.84 per cent of Mg ($A_r$ = 24.31) (anhydrous substance).

## CHARACTERS

### Appearance

Amorphous, white or almost white powder, hygroscopic.

### Solubility

Very soluble in water, soluble in methanol, practically insoluble in methylene chloride.

## IDENTIFICATION

A. Thin-layer chromatography (2.2.27).

*Test solution* Dissolve 60 mg of the substance to be examined in 2 mL of *water R* and dilute to 10 mL with *methanol R*.

*Reference solution* Dissolve 55 mg of *pidolic acid CRS* in 2 mL of *water R* and dilute to 10 mL with *methanol R*.

*Plate* *TLC silica gel plate R*.

*Mobile phase* *methanol R*, *glacial acetic acid R*, *methylene chloride R* (15:20:65 *V/V/V*).

*Application* 1 µL.

*Development* Over 2/3 of the plate.

*Drying* At 100-105 °C for 15 min.

*Detection* Spray with *strong sodium hypochlorite solution R*. Allow to stand for 10 min and spray abundantly with *glacial acetic acid R*. Allow to stand again for 10 min and dry at 100-105 °C for 2 min. Spray with *potassium iodide and starch solution R* until spots appear.

*Results* The principal spot in the chromatogram obtained with the test solution is similar in position, colour and size to the principal spot in the chromatogram obtained with the reference solution. The chromatogram obtained with the test solution may show 2 faint secondary spots.

B. To 0.15 mL of solution S (see Tests) add 1.8 mL of *water R*. The solution gives the reaction of magnesium (*2.3.1*).

## TESTS

### Solution S

Dissolve 5.00 g in *carbon dioxide-free water R* prepared from *distilled water R* and dilute to 50.0 mL with the same solvent.

### Appearance of solution

Solution S is clear (*2.2.1*) and not more intensely coloured than reference solution $B_8$ (*2.2.2, Method I*).

### pH (*2.2.3*)

5.5 to 7.0 for solution S.

### Specific optical rotation (*2.2.7*)

-26.5 to -23.3 (anhydrous substance), determined on solution S.

### Impurity A

Thin-layer chromatography (*2.2.27*).

*Test solution* Dissolve 0.250 g of the substance to be examined in 4 mL of *water R* and dilute to 50.0 mL with *methanol R*.

*Reference solution (a)* Dissolve 60.0 mg of *glutamic acid R* in 50 mL of *water R* and dilute to 100.0 mL with *methanol R*. Dilute 1.0 mL of the solution to 20.0 mL with *methanol R*.

*Reference solution (b)* Dissolve 10 mg of *aspartic acid R* and 10 mg of *glutamic acid R* in *water R* and dilute to 25 mL with the same solvent. Dilute 1 mL of the solution to 10 mL with *water R*.

*Plate* *TLC silica gel plate R*.

*Mobile phase* *glacial acetic acid R*, *water R*, *butanol R* (20:20:60 *V/V/V*).

*Application* 5 µL.

*Development* Over 2/3 of the plate.

*Drying* In air.

*Detection* Spray with *ninhydrin solution R* and heat at 100-105 °C for 15 min.

*System suitability* Reference solution (b):

— the chromatogram shows 2 clearly separated spots.

*Limit*:

— *impurity A*: any spot due to impurity A is not more intense than the spot in the chromatogram obtained with reference solution (a) (0.6 per cent).

**Related substances**

Liquid chromatography (*2.2.29*).

*Test solution* Dissolve 0.500 g of the substance to be examined in the mobile phase and dilute to 100.0 mL with the mobile phase.

*Reference solution (a)* Dilute 1.0 mL of the test solution to 100.0 mL with the mobile phase.

*Reference solution (b)* Dissolve 50.0 mg of *pidolate impurity B CRS* in the mobile phase and dilute to 100.0 mL with the mobile phase. Dilute 5.0 mL of the solution to 50.0 mL with the mobile phase.

*Reference solution (c)* Dilute 10.0 mL of reference solution (b) to 100.0 mL with the mobile phase.

*Reference solution (d)* Dilute 1.0 mL of *nitrate standard solution (100 ppm $NO_3$) R* to 100.0 mL with the mobile phase.

*Reference solution (e)* Dilute 6.0 mL of reference solution (a) to 10.0 mL with reference solution (b).

*Column*:

— *size*: *l* = 0.25 m, Ø = 4.6 mm;

— *stationary phase*: *end-capped octadecylsilyl silica gel for chromatography R* (5 µm).

*Mobile phase* Dissolve 1.56 g of *sodium dihydrogen phosphate R* in 1000 mL of *water for chromatography R* and adjust to pH 2.5 with a 10 per cent *V/V* solution of *phosphoric acid R*.

*Flow rate* 1.5 mL/min.

*Detection* Spectrophotometer at 210 nm.

*Injection* 10 µL of the test solution and reference solutions (b), (c), (d) and (e).

*Run time* 4 times the retention time of pidolic acid.

*Retention times* Pidolic acid = about 4.5 min; impurity B = about 7.5 min.

*System suitability* Reference solution (e):

— *resolution*: minimum 10 between the peaks due to pidolic acid and impurity B.

*Limits*:

— *impurity B*: not more than the area of the principal peak in the chromatogram obtained with reference solution (b) (1.0 per cent);

— *unspecified impurities*: for each impurity, not more than the area of the principal peak in the chromatogram obtained with reference solution (c) (0.10 per cent);

— *total of other impurities*: not more than 0.5 times the area of the principal peak in the chromatogram obtained with reference solution (b) (0.5 per cent);

— *disregard limit*: 0.5 times the area of the principal peak in the chromatogram obtained with reference solution (c) (0.05 per cent); disregard any peak due to the nitrate ion ($NO_3^-$).

**Chlorides** (*2.4.4*)

Maximum 500 ppm.

Dilute 1.0 mL of solution S to 15.0 mL with *water R*.

**Nitrates**

Examine the chromatogram obtained with the test solution in the test for related substances.

*Limit*:

— *nitrates*: not more than the area of the principal peak in the chromatogram obtained with reference solution (d) (200 ppm).

**Sulfates** (*2.4.13*)

Maximum 0.1 per cent.

Dilute 1.5 mL of solution S to 15.0 mL with *distilled water R*.

**Iron** (*2.4.9*)

Maximum 200 ppm.

Dilute 0.5 mL of solution S to 10 mL with *water R*.

**Water** (*2.5.12*)

Maximum 8.0 per cent, determined on 0.200 g.

## ASSAY

Dissolve 0.300 g in 50 mL of *water R*. Carry out the complexometric titration of magnesium (*2.5.11*).

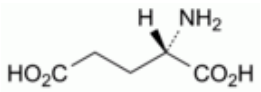
1 mL of *0.1 M sodium edetate* is equivalent to 2.431 mg of Mg.

## STORAGE

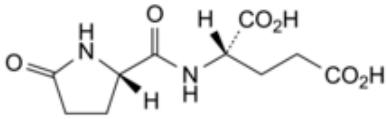
In an airtight container.

## IMPURITIES

*Specified impurities* *A, B*.



A. (2*S*)-2-aminopentanedioic acid (glutamic acid),



B. (2*S*)-2-[(2*S*)-5-oxopyrrolidine-2-carboxamido]pentanedioic acid.

---

Ph Eur