

Status: Currently Official on 15-Feb-2025
Official Date: Official as of 01-Jun-2023
Document Type: USP Monographs
DocId: GUID-74A13B2F-1DA7-48F4-8312-6EDC5ECDF19D_4_en-US
DOI: https://doi.org/10.31003/USPNF_M46910_04_01
DOI Ref: sps55

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Magnesium Phosphate

$Mg_3(PO_4)_2 \cdot 5H_2O$ 352.93

Phosphoric acid, magnesium salt (2:3), pentahydrate;

Magnesium phosphate (3:2) pentahydrate CAS RN®: 10233-87-1; UNII: 453COF7817.

$Mg_3(PO_4)_2$ 262.86 CAS RN®: 7757-87-1; UNII: XMK14ETW2D.

DEFINITION

Magnesium Phosphate, ignited at 425° to constant weight, contains NLT 98.0% and NMT 101.5% of $Mg_3(PO_4)_2$.

IDENTIFICATION

• A.

Sample: 200 mg

Analysis: Dissolve the **Sample** in 10 mL of 2 N nitric acid, and add, dropwise, ammonium molybdate TS.

Acceptance criteria: A greenish-yellow precipitate of ammonium phosphomolybdate is formed, and it is soluble in 6 N ammonium hydroxide.

• B. [IDENTIFICATION TESTS—GENERAL, Magnesium\(191\)](#)

Sample solution: Dissolve 0.1 g in 0.7 mL of 1 N acetic acid and 20 mL of water. Add 1 mL of ferric chloride TS, allow to stand for 5 min, and filter. Use 5 mL of the filtrate.

Acceptance criteria: Meets the requirements

ASSAY

• PROCEDURE

Sample: 200 mg, previously ignited at 425° to constant weight

Analysis: Dissolve the **Sample** in a mixture of 25 mL of water and 10 mL of 2 N nitric acid. Filter, if necessary. Wash any precipitate, add sufficient 6 N ammonium hydroxide to the filtrate to produce a slight precipitate, and then dissolve the precipitate by the addition of 1 mL of 2 N nitric acid. Adjust the temperature to 50°, add 75 mL of ammonium molybdate TS, and maintain the temperature at 50° for 30 min, stirring occasionally. Wash the precipitate once or twice with water by decantation, using 30–40 mL each time and passing the washings through a filter. Transfer the precipitate to the filter, and wash with potassium nitrate solution (1 in 100) until the last washing is not acid to litmus. Transfer the precipitate and filter to the precipitation vessel. Add 50 mL of water and 40.0 mL of 1 N sodium hydroxide VS, and agitate until the precipitate is dissolved. Add phenolphthalein TS, and then titrate the excess alkali with 1 N sulfuric acid VS. Each mL of 1 N sodium hydroxide is equivalent to 5.716 mg of $Mg_3(PO_4)_2$.

Acceptance criteria: 98.0%–101.5% on the previously ignited basis

IMPURITIES

• ACID-INSOLUBLE SUBSTANCES

[NOTE—Perform if an insoluble residue remains in the test for Carbonate.]

Analysis: Filter the solution, wash well with hot water until the last washing is free from chloride, and ignite the residue.

Acceptance criteria: The weight of the residue does not exceed 4 mg (NMT 0.2%).

• SOLUBLE SUBSTANCES

Sample: 2.0 g

Analysis: Digest the **Sample** with 100 mL of water on a steam bath for 30 min. Cool, add sufficient water to restore the original volume, mix, and filter. Evaporate 50 mL of the filtrate to dryness, and ignite gently to constant weight.

Acceptance criteria: The weight of the residue does not exceed 15 mg (NMT 1.5%).

• CARBONATE

Sample: 2.0 g

Analysis: Mix the **Sample** with 20 mL of water, and add hydrochloric acid, dropwise, to dissolve.

Acceptance criteria: No effervescence occurs when the acid is added.

• [CHLORIDE AND SULFATE, Chloride\(221\)](#)

Sample: 0.50 g

Analysis: Dissolve the **Sample** in 50 mL of 2 N nitric acid, and add 1 mL of silver nitrate TS.

Acceptance criteria: The turbidity does not exceed that produced by 1.0 mL of 0.020 N hydrochloric acid (NMT 0.14%).

• [CHLORIDE AND SULFATE, Sulfate\(221\)](#)

Sample: 0.50 g

Analysis: Dissolve the **Sample** in the smallest possible amount of 3 N hydrochloric acid, dilute with water to 48 mL, and add 2 mL of barium chloride TS.

Acceptance criteria: The turbidity does not exceed that produced by 3.0 mL of 0.020 N sulfuric acid (NMT 0.6%).

• LIMIT OF NITRATE**Sample:** 0.20 g

Analysis: Mix the **Sample** with 5 mL of water, and add just sufficient hydrochloric acid to dissolve. Dilute with water to 10 mL, add 0.1 mL of indigo carmine TS, then add, with stirring, 10 mL of sulfuric acid.

Acceptance criteria: The blue color persists for NLT 5 min.

Change to read:

- [▲ ARSENIC \(211\), Procedures, Procedure 1](#) ▲ (CN 1-Jun-2023)

Test preparation: Prepare as directed in the chapter, using 1.0 g and dissolving it first in just a sufficient amount of 3 N hydrochloric acid (about 9 mL).

Acceptance criteria: NMT 3 ppm

• BARIUM**Sample:** 2.0 g

Analysis: Mix the **Sample** with 40 mL of water. Heat, add hydrochloric acid, dropwise, to dissolve, and then add 1 mL of acid in excess. Cool, dilute with water to 50 mL, and filter. To 5 mL of the filtrate add 1 mL of potassium sulfate TS.

Acceptance criteria: No turbidity is produced within 15 min.

• CALCIUM**Sample:** 0.50 g

Analysis: Mix the **Sample** with 15 mL of water. Heat, and add sufficient hydrochloric acid, in small portions, to dissolve. Cool, add 6 N ammonium hydroxide, in small portions, to produce a slight permanent precipitate, then add 2 mL of 6 N acetic acid. Dilute with water to 25 mL, and filter. To 10 mL of the filtrate add 2 mL of ammonium oxalate TS.

Acceptance criteria: NMT a slight turbidity is produced within 5 min.

• DIBASIC SALT AND MAGNESIUM OXIDE**Sample:** Ignite about 2.5 g to constant weight and use 2 g of the ignited salt.

Analysis: Dissolve the **Sample** by warming with 50.0 mL of 1 N hydrochloric acid VS. Cool, add 1 or 2 drops of methyl orange TS, and slowly titrate the excess 1 N hydrochloric acid VS with 1 N sodium hydroxide VS to a yellow color, vigorously shaking the mixture during the titration.

Acceptance criteria: 14.8–15.4 mL of 1 N hydrochloric acid is consumed for each g of the ignited salt.

Change to read:

- [▲ LEAD \(251\), Procedures, Procedure 1](#) ▲ (CN 1-Jun-2023)

Test preparation: Dissolve 1.0 g in 20 mL of 3 N hydrochloric acid, evaporate on a steam bath to 10 mL, dilute with water to 20 mL, and cool.

Analysis: Proceed as directed in the chapter, using 5 mL of *Diluted Standard Lead Solution* (5 µg of Pb).

Acceptance criteria: NMT 5 ppm

SPECIFIC TESTS

- [MICROBIAL ENUMERATION TESTS \(61\)](#) and [TESTS FOR SPECIFIED MICROORGANISMS \(62\)](#): It meets the requirements of the test for the absence of *Escherichia coli*.
- [LOSS ON IGNITION \(733\)](#): Ignite a sample at 425° to constant weight; it loses 20.0%–27.0% of its weight.

ADDITIONAL REQUIREMENTS

- **PACKAGING AND STORAGE:** Preserve in well-closed containers.

Auxiliary Information - Please [check for your question in the FAQs](#) before contacting USP.

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MAGNESIUM PHOSPHATE	Documentary Standards Support	SM32020 Small Molecules 3

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Current DocID: [GUID-74A13B2F-1DA7-48F4-8312-6EDC5ECDF19D_4_en-US](#)

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