

Magnesium oxide (Magnesii oxidum)

Light Magnesium oxide

Heavy Magnesium oxide

Molecular formula. MgO

Relative molecular mass. 40.30

Chemical name. Magnesium oxide; CAS Reg. No. 1309-48-4.

Description. A white powder; odourless. Light Magnesium oxide is very bulky, whereas heavy Magnesium oxide is a dense powder.

Solubility. Practically insoluble in water and ethanol (~750 g/l) TS; soluble in dilute acids.

Category. Antacid.

Storage. Magnesium oxide should be kept in a tightly closed container.

Labelling. The designation on the container should state whether it is light Magnesium oxide or heavy Magnesium oxide.

Requirements

Definition. Magnesium oxide contains not less than 98.0% and not more than 100.5% of MgO, calculated with reference to the ignited substance.

Identity tests

A. Dissolve 10 mg in 1.0 mL of hydrochloric acid (~70 g/l) TS, add 1.0 mL of ammonium chloride (100 g/l) TS, 0.5 mL of disodium hydrogen phosphate (100 g/l) TS, and 1.0 mL of ammonia (~100 g/l) TS; a white, crystalline precipitate is formed, which is soluble in acetic acid (~300 g/l) TS.

B. Dissolve 10 mg in 1.0 mL of hydrochloric acid (~70 g/l) TS, and add 2.0 mL of sodium hydroxide (~80 g/l) TS; a white, gelatinous precipitate is produced, which is insoluble in an excess of sodium hydroxide (~80 g/l) TS. Add a few drops of iodine TS; the precipitate turns dark brown.

Heavy metals. Dissolve 5.0 g in a mixture of 70 mL of acetic acid (~300 g/l) TS and 30 mL of water, boil for 2 minutes, cool, and dilute to 100 mL with acetic acid (~120 g/l) TS. Filter, if necessary, through a previously ignited and tared porcelain or silica filter crucible of suitable porosity to give a clear filtrate. To 20 mL of the filtrate (retain the filter for the test of substances insoluble in acetic acid and the remaining filtrate for the limit test for calcium) add 15 mL of hydrochloric acid (~250 g/l) TS and shake with 25 mL of methylisobutylketone R for 2 minutes. Allow to stand, separate the layers, and evaporate the aqueous layer to dryness. Dissolve the residue in 1 mL of acetic acid (~300 g/l) TS and dilute to 40 mL with water and mix. Determine the heavy metals content as described under [2.2.3 Limit test for heavy metals](#), according to Method A; not more than 40 µg/g.

Arsenic. Use a solution of 3.3 g in 20 mL of sulfuric acid (~100 g/l) TS and 35 mL of water and proceed as described under [2.2.5 Limit test for arsenic](#); the arsenic content is not more than 3 µg/g.

Barium. To 0.10 g add a few drops of hydrochloric acid (~250 g/l) TS and dissolve in 20 mL of water. Add 0.10 mL of sulfuric acid (~100 g/l) TS and shake; no precipitate is produced within 10 minutes.

Calcium. Dilute 1.3 mL of the filtrate obtained in the test for heavy metals to 150 mL with water.

To 0.20 mL of ethanolic calcium standard (100 µg/mL Ca) TS add 0.8 mL of ammonium oxalate (50 g/l) TS. After 1 minute add 1 mL of acetic acid (~120 g/l) TS and 15 mL of the diluted filtrate prepared above.

Prepare similarly a standard solution using a mixture of 10 mL of calcium standard (10 µg/mL Ca) TS and 5 mL of water. After 15 minutes, any opalescence produced in the test solution is not more intense than that in the standard (15 mg/g).

Iron. Dissolve 0.15 g in 5 mL of hydrochloric acid (~70 g/l) TS and dilute to 10 mL with water. Proceed with 4.0 mL of the resulting solution as described under [2.2.4 Limit test for iron](#); not more than 500 µg/g.

Water-soluble substances. Mix 2.0 g with 100 mL of water and boil for 5 minutes. While still hot filter through a coarse sintered-glass filter, allow to cool, and dilute to 100 mL with water. Evaporate 50 mL of the filtrate to dryness and dry at 105°C to constant weight; the residue weighs not more than 20 mg.

Substances insoluble in acetic acid. Any residue remaining on the filter used in the preparation of the solution to be examined in the test for heavy metals, when washed with water, dried, and ignited at 600°C, weighs not more than 5 mg.

Loss on ignition. Ignite 1.0 g at 900°C to constant weight; it loses not more than 100 mg/g.

Assay. Dissolve about 0.35 g, accurately weighed, in 20 mL of hydrochloric acid (~70 g/l) TS and proceed with the titration as described under [2.5 Complexometric titrations](#) for magnesium. Each mL of disodium edetate (0.05 mol/l) VS is equivalent to 2.015 mg of MgO.