

Lithium carbonate (Lithii carbonas)**Molecular formula.** Li_2CO_3 **Relative molecular mass.** 73.89**Chemical name.** Dilithium carbonate; CAS Reg. No. 554-13-2.**Description.** A white, crystalline powder; odourless.**Solubility.** Soluble in 100 parts of water; less soluble in boiling water; very slightly soluble in ethanol (~750 g/l) TS.**Category.** Antidepressant.**Storage.** Lithium carbonate should be kept in a well-closed container.**Additional information.** Lithium carbonate has a slightly alkaline taste.**Requirements****Definition.** Lithium carbonate contains not less than 99.5% and not more than 100.5% of Li_2CO_3 , calculated with reference to the dried substance.**Identity tests**

A. Moisten a few crystals with hydrochloric acid (~420 g/l) TS and introduce them on a platinum wire into the flame of a Bunsen burner; a carmine-red colour is produced in the flame.

B. Dissolve 0.2 g in 5 mL of hydrochloric acid (~420 g/l) TS, boil, add 2 mL of sodium hydroxide (~80 g/l) TS, 5 mL of disodium hydrogen phosphate (40 g/l) TS and boil; a white precipitate is produced.

C. To a small amount add hydrochloric acid (~70 g/l) TS; it effervesces and the gas is colourless. Add a few drops of calcium hydroxide TS; immediately a white precipitate is formed.

Heavy metals. For the preparation of the test solution use 1.0 g dissolved in 10 mL of acetic acid (~60 g/l) TS, adjust the pH to 3-4, 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 20 µg/g.

Arsenic. Use a solution of 5.0 g dissolved in a mixture of 15 mL of brominated hydrochloric acid AsTS and 45 mL of water and remove the excess bromine with a few drops of stannous chloride AsTS; proceed with the solution as described under [2.2.5 Limit test for arsenic](#); the arsenic content is not more than 2 µg/g.

Calcium and magnesium. Dissolve 1.0 g in 30 mL of hydrochloric acid (1 mol/l) VS and neutralize with ammonia (~100 g/l) TS, filter if necessary, and divide into 2 equal portions. To one portion add 1 mL of ammonium oxalate (25 g/l) TS; no turbidity or precipitate is produced when the mixture is allowed to stand for 5 minutes (limit of calcium). To the second portion add 1 mL of disodium hydrogen phosphate (40 g/l) TS; no turbidity or precipitate is produced when the mixture is allowed to stand for 5 minutes (limit of magnesium).

Chlorides. Dissolve 0.35 g in a mixture of 3 mL of nitric acid (~130 g/l) TS and 30 mL of water, and proceed as described under [2.2.1 Limit test for chlorides](#); the chloride content is not more than 0.7 mg/g.

Sodium. Determine by atomic absorption spectrophotometry "[1.8 Atomic spectrometry: emission and absorption](#)" at a wavelength of 589 nm; use a standard solution prepared by dissolving sodium chloride R, previously dried to constant weight, in 1000 mL of water to give a solution containing 508.4 mg of NaCl (0.2 mg of Na per mL); the sodium content is not more than 2.0 mg/g.

Sulfates. Dissolve 0.5 g in 20 mL of water, add 3 mL of hydrochloric acid (~250 g/l) TS, and proceed as described under [2.2.2 Limit test for sulfates](#); the sulfate content is not more than 1 mg/g.

Loss on drying. Dry to constant weight at 105°C; it loses not more than 5.0 mg/g.

Assay. Dissolve about 0.75 g, accurately weighed, in 100 mL of water, add 50 mL of hydrochloric acid (1 mol/l) VS, boil to remove carbon dioxide, cool, and titrate the excess acid with sodium hydroxide (1 mol/l) VS, using methyl orange/ethanol TS as indicator. Each mL of hydrochloric acid (1 mol/l) VS is equivalent to 36.95 mg of Li_2CO_3 .