MAGNESIUM SULFATE

Prepared at the 68th JECFA (2007), published in FAO JECFA Monographs 4 (2007), superseding the specifications prepared at the 63rd JECFA (2004) and published the Combined Compendium of Food Additive Specifications, FAO JECFA Monographs 1 (2005). An ADI "not specified" was established at the 68th JECFA (2007).

SYNONYMS Epsom salt (heptahydrate); INS No.518

DEFINITION Magnesium sulfate occurs naturally in sea water, mineral springs and in minerals such as kieserite and epsomite. It is recovered from them or by reacting sulfuric acid and magnesium oxide. It is produced with one or seven molecules of water of hydration or in a dried form containing the equivalent of between 2 and 3 waters of hydration.

Chemical names: Magnesium sulfate

C.A.S. number:
Monohydrate: 14168-73-1
Heptahydrate: 10034-99-8
Dried: 15244-36-7

Chemical formula:
Monohydrate: $MgSO_4.H_2O$
Heptahydrate: $MgSO_4.7H_2O$
Dried: $MgSO_4.xH_2O$, where x is the average hydration value (between 2 and 3)

Formula weight:
Monohydrate: 138.38
Heptahydrate: 246.47

Assay: Not less than 99.0 % and not more than 100.5% on the ignited basis

DESCRIPTION Colourless crystals, granular crystalline powder or white powder. Crystals effloresce in warm, dry air.

FUNCTIONAL USES Nutrient; flavour enhancer; firming agent; and processing aid (fermentation aid in the production of beer and malt beverages)

CHARACTERISTICS

IDENTIFICATION

Solubility (Vol. 4): Freely soluble in water, very soluble in boiling water, and sparingly soluble in ethanol.

Test for magnesium (Vol. 4): Passes test

Test for sulfate (Vol. 4): Passes test

PURITY

Loss on ignition (Vol. 4)	Monohydrate: between 13.0 and 16.0 %, Heptahydrate: between 40.0 and 52.0 %, Dried: between 22.0 and 32.0 % (105°, 2h, then 400° to constant weight)
pH (Vol. 4)	Between 5.5 and 7.5 (1 in 20 solution)
Chloride (Vol. 4)	Not more than 0.03% Test 1g of the sample as described under “Chloride Limit Test” using 0.9 ml of 0.01 N hydrochloric acid in the control
Arsenic (Vol. 4)	Not more than 3 mg/kg Determine by the atomic absorption hydride technique. Use Method I for sample preparation.
Iron (Vol. 4)	Not more than 20 mg/kg Use 1 ml of Iron Standard TS
Selenium (Vol. 4)	Not more than 30 mg/kg Determine using an AAS/ICP-AES technique appropriate to the specified level. The selection of sample size and method of sample preparation may be based on principles of methods described in Volume 4 (under “General Methods, Metallic Impurities”).
Lead (Vol. 4)	Not more than 2mg/kg Determine using an AAS/ICP-AES technique appropriate to the specified level. The selection of sample size and method of sample preparation may be based on principles of methods described in Volume 4 (under “General Methods, Metallic Impurities”).
METHOD OF ASSAY	Accurately weigh about 0.5 g of the ignited sample, dissolve in 5 ml of hydrochloric acid TS, Dilute, dilute with water to 100 ml, and mix. Transfer 50 ml of this solution into a 250-ml conical flask; add 10 ml of Ammonia/Ammonium Chloride Buffer TS and 0.1 ml of Eriochrome Black TS. Titrate with 0.05 M disodium EDTA until the colour of red-purple solution changes to blue. Each ml of 0.05 M disodium EDTA is equivalent to 12.04 mg of $MgSO_4$.