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## 22 Date of Revision

4 May 2017.

# Magnesium Silicate

## 1 Nonproprietary Names

JP: Magnesium Silicate  
USP–NF: Magnesium Silicate

## 2 Synonyms

E553a; synthetic magnesium silicate.

## 3 Chemical Name and CAS Registry Number

Silicic acid, magnesium salt [1343-88-0]

## 4 Empirical Formula and Molecular Weight

$MgO \cdot SiO_2 \cdot xH_2O$   
See also Sections 5 and 17.

## 5 Structural Formula

Magnesium silicate is a compound of magnesium oxide and silicon dioxide. See also Section 17.

The JP XVII states that magnesium silicate contains not less than 45.0% of silicon dioxide ( $SiO_2$ : molecular weight 60.08) and not less than 20.0% of magnesium oxide ( $MgO$ : 40.30), and the ratio of percentage (%) of magnesium oxide to silicon dioxide is not less than 2.2 and not more than 2.5.

The USP 40–NF 35 S1 describes magnesium silicate as a compound of magnesium oxide ( $MgO$ ) and silicon dioxide ( $SiO_2$ ) that contains not less than 15.0% of  $MgO$  and not less than 67.0% of  $SiO_2$  calculated on the ignited basis.

## 6 Functional Category

Anticaking agent; glidant; lubricant.

## 7 Applications in Pharmaceutical Formulation or Technology

Magnesium silicate is used in oral pharmaceutical formulations as a glidant, lubricant and an anticaking agent.<sup>(1)</sup>

## 8 Description

Magnesium silicate occurs as an odorless and tasteless, fine, white-colored powder that is free from grittiness.

## 9 Pharmacopeial Specifications

See Table I.

**Table I:** Pharmacopeial specifications for magnesium silicate.

Test	JP XVII	USP 40–NF 35 S1
Identification	+	+
pH (10% aqueous suspension)	–	7.0–10.8
Loss on drying	–	≤15%
Soluble salts	≤0.02 g	≤3.0%
Chloride	≤0.053%	–
Free alkali	+	+
Heavy metals	≤30 ppm	≤20 µg/g
Arsenic	≤5 ppm	–
Sulfate	≤0.48%	–
Loss on ignition	≤34%	≤15%
Fluoride	–	≤10 µg/g
Lead	–	≤10 µg/g
Acid-consuming capacity	+	–
Ratio of $SiO_2$ to $MgO$	2.2–2.5	2.5–4.5
Assay for $MgO$	≥20.0%	≥15%
Assay for $SiO_2$	≥45.0%	≥67%

## 10 Typical Properties

*Density (relative)* 2.5 ( $H_2O = 1$ )<sup>(2)</sup>

*Moisture content* Magnesium silicate is slightly hygroscopic.

*Solubility* Practically insoluble in ethanol (95%), ether, and water.

## 11 Stability and Storage Conditions

Magnesium silicate should be stored in a well-closed container in a cool, dry place.