

## SILICON DIOXIDE, AMORPHOUS

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### SYNONYMS

Silica; INS No. 551

### DEFINITION

The products included under this specification are: silica aerogel (precipitated silicon dioxide), hydrated silica, "silicic acid", and dehydrated silica gel. The article of commerce can be further specified as to loss on drying and soluble ionizable salts.

### Chemical names

Silicon dioxide

### C.A.S. number

7631-86-9

### Chemical formula

(SiO<sub>2</sub>)<sub>x</sub>

### Formula weight

60.09 (SiO<sub>2</sub>)

### Assay

Silica aerogel: not less than 90% of SiO<sub>2</sub> on the ignited basis.  
Hydrated silica: not less than 89% of SiO<sub>2</sub> on the ignited basis.

### DESCRIPTION

Silica aerogel: a microcellular silica occurring as a fluffy powder or granules  
Hydrated silica: a precipitated, hydrated silicon dioxide occurring as a fine, white, amorphous powder, or as beads or granules

### FUNCTIONAL USES Anticaking agent

### CHARACTERISTICS

#### IDENTIFICATION

#### Solubility (Vol. 4)

Insoluble in water and ethanol; soluble in hydrofluoric acid and alkalis (80° - 100°). (**CAUTION:** hydrofluoric acid is toxic, corrosive, must not contact skin. Work under fume hood).

#### Test for silica

Test for volatility of SiF<sub>4</sub> -see Method of Assay

#### PURITY

#### Loss on ignition (Vol. 4)

Not more than 6% on the dried basis (105° to constant weight), after igniting at 600° (for silica aerogel) or at 900° (for hydrated silica) to constant weight.

#### Lead (Vol. 4)

Not more than 5mg/kg  
Determine using an atomic absorption technique appropriate to the specified level. The selection of sample size and method of sample preparation may be based on the principles of the method described in Volume 4, "Instrumental Methods."

### METHOD OF

Weigh 2 g of the sample to the nearest 0.1 mg, and transfer into a tared

## ASSAY

platinum crucible. Ignite at  $1000^{\circ}$  for 1 h, cool in a desiccator and weigh. Moisten the residue with 7 or 8 drops of ethanol, add 3 drops of concentrate sulfuric acid, and, with CAUTION, add enough hydrofluoric acid to cover the wetted sample. Evaporate to dryness on a hot-plate, using medium heat ( $95-105^{\circ}$ ), then add 5 ml of hydrofluoric acid, swirl the dish carefully to wash down the sides, and again evaporate to dryness. Ignite the dried residue to a red heat over a Meker burner, cool in a desiccator, and weigh. The difference between the total weight loss and the weight loss after ignition at  $1000^{\circ}$  represents the weight of  $\text{SiO}_2$  in the sample taken.