MANTA

Technical Data Sheet

Version: 1.0

Manta TMOS

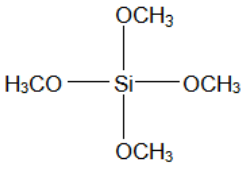
High-Purity Tetramethoxysilane (Orthosilicic Acid Tetramethyl Ester)

Description

Manta TMOS is a colorless liquid utilized primarily as a source of high-purity silicon dioxide (SiO2). Due to its small molecular size and high reactivity, it hydrolyzes significantly faster than Tetraethoxysilane (TEOS), making it the preferred precursor for precision sol-gel processes, thin-film coatings, and advanced chemical synthesis.

When fully hydrolyzed, Manta TMOS yields approximately 39.5% silica by weight, providing a dense silica-gel binder that enhances the structural integrity and chemical resistance of various substrates. Performance equivalent to Evonik Dynasylan M.

Typical Physical Properties

Manta Code:	TMOS
Chemical Name	Tetramethoxysilane; Tetramethyl orthosilicate
CAS NO.	681-84-5
EINECS No.:	211-656-4
Formula	$C_4H_{12}O_4Si$
Appearance	Colorless transparent liquid
Molecular Weight:	152.22
Boiling Point at 760mmHg	121~122°C
Flash Point, Closed cup	26°C
Density (ρ25°C, g/cm³)	1.023
Refractive Index (n25/D)	1.3630-1.3730
Purity (%)	96min
Chemical Structure	

Features

1. Rapid Hydrolysis: Offers significantly faster reaction kinetics compared to TEOS, enabling shorter processing times in sol-gel applications.
2. High Silica Yield: Provides a high concentration of inorganic silicate binder for reinforcement.
3. Optical Clarity: Forms highly transparent, hard silica films ideal for optical and electronic coatings.
4. Inorganic Binder: Creates a robust SiO2 matrix that is resistant to high temperatures and chemical degradation.

Applications

1. Advanced Sol-Gel Process

Manta TMOS is a starting material for the sol-gel production of high-purity silica gels, aerogels, and specialty glasses. It allows for the synthesis of complex organic-inorganic hybrid materials at room temperature.

2. Optical & Scratch-Resistant Coatings

Used in the treatment of glass and plastic lenses to provide a hard, scratch-resistant surface finish. Its ability to form a dense silica-gel binder makes it ideal for anti-reflective (AR) and protective coatings in precision optics.

3. Electronic & Semiconductor Materials

In the electronics industry, it serves as a precursor for chemical vapor deposition (CVD) to form dielectric layers and high-purity insulating films on semiconductor wafers.

4. Silicone Rubber & Sealants

Acts as an efficient crosslinker in room-temperature vulcanized (RTV) silicone rubber systems. It also functions as an effective drying agent (moisture scavenger) in advanced sealing compositions to extend shelf life.

5. Refractory Fillers & Pigment Treatment

Used as an inorganic binder for refractory materials, pigments, and ceramic fibers. It provides high-temperature stability and improves the mechanical strength of the composite by coating the surfaces with a protective silica layer.

6. Chemical Intermediate

Serves as a fundamental building block for the synthesis of organofunctional silanes and specialty polysilicic acid esters.

Packaging

In 20kg pail, 180kg drum and 900kg IBC

Safety and Storage

Extremely sensitive to moisture; ensure containers are hermetically sealed and purged with dry nitrogen after every use.

Safety Note: TMOS is fatal if inhaled (H330), causes serious eye damage (H318) and is a flammable liquid (H226); read the SDS before handling. Handle with strict adherence to safety protocols (PPE and ventilation). When stored at or below 25 °C in the original unopened containers, this product has a usable life of 12 months from the date of production.

Contact Information

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