

Product Information

DIMETHYLDICHLOROSILANE Sigma Prod. No. D3879

CAS NUMBER: 75-78-5

SYNONYM: DMDCS

PHYSICAL DESCRIPTION:

Appearance: Clear liquid, colorless to faint yellow¹

Molecular formula: $(\text{CH}_3)_2\text{Cl}_2\text{Si}$

Molecular weight: 129.1

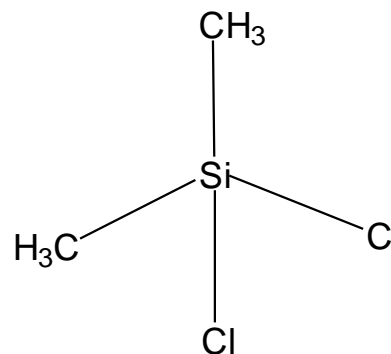
Density: 1.064 g/mL¹

Melting point: -76°C ¹

Boiling point: 70°C ²

Flash point: -16°C ¹

Refractive index: 1.493 at 20°C ²



This product fumes when opened in moist air, releasing HCl vapor. Please consult the Material Safety Data Sheet for hazards and handling before working with it.

STABILITY / STORAGE AS SUPPLIED:

Dimethyldichlorosilane (DMDCS) is extremely moisture-sensitive, and packaged under argon to exclude moisture. If kept dry (well-sealed) and cool, the product should remain suitable for treating glass for more than a year.

SOLUBILITY / STABILITY OF SOLUTIONS:

Dimethyldichlorosilane is soluble and stable in a number of anhydrous organic solvents. Although DMDCS does dissolve in acetone, it reacts to some extent, so acetone is not recommended.³ Sigma tests it at 0.1 mL per mL of hexane, obtaining a clear colorless solution. Several protocols cite 10% solutions (v/v) in toluene or 5% in chloroform or heptane.^{4,5} Chlorosilanes will react with water to produce HCl and a mixture of siloxane biproducts; they react somewhat more slowly with ethanol or other alcohols and with amines.

Due to the reactive nature of dimethyldichlorosilane, freshly prepared solutions should be used.

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USAGE REMARKS:

Organochlorosilanes are basic intermediates for the synthesis of silicone polymers. They react with hydroxyl-containing surfaces to form films permanently bonded to the substrate. DMDCS is one of a number of compounds used to treat glass surfaces, filters, etc., to impart water repellency, to reduce protein binding, to enhance organic compatibility, improving flow characteristics. Its use in treatment of gas chromatography packing materials has been reported.⁶ DMDCS was used in a synthesis of N-trityl amino acids.⁷

Procedures commonly used in molecular biology can be carried out in sterile glassware or plasticware but certain procedures involving single-stranded DNA or sequencing by the Maxam-Gilbert technique require siliconized labware. Several references cite very similar protocols, one using vapor deposition. Either of the following procedures may be used, to be performed only in a fume hood.

1. Place glassware with a beaker containing one mL of dimethyldichlorosilane in a large, glass desiccator, attach through a trap to a vacuum pump and apply suction until the DMDCS begins to boil. Immediately clamp and turn off the pump. Allow to evaporate over a 1-2 hour period before removing the desiccator top and allowing to de-fume.⁴

or

2. Dip, rinse or soak glassware in 5% DMDCS in chloroform, heptane, toluene or carbon tetrachloride. Allow to air dry.^{4,5,6}

Glassware may be rinsed with methanol to remove excess silanizing reagent, then rinsed with water, and/or baked at 180°C for 2 hours.

Glass wool can be silanized using dimethyldichlorosilane; a suggested procedure: soak the glass wool for 5 minutes with 2% (v/v) DMDCS in carbon tetrachloride, then rinse with water and bake the glass wool for 20 minutes at 130°C.⁸

REFERENCES:

1. Sigma quality control or Material Safety Data Sheet
2. *Lange's Handbook of Chemistry*, 13th Ed.,(McGraw-Hill Pub.) 7-286, #D337.
3. Supplier information.
4. *Molecular Cloning: A Laboratory Manual*, 2nd Ed., Sambrook, Fritsch and Maniatis, eds., (Cold Spring Harbor Laboratory Press, 1989), p. E.1-E.2.
5. *Methods in Enzymology*, 141, 326 (1987).
6. Capella, P., and Horning, E.C., *Anal. Chem.*, 38, 316 (1966).
7. Barlos, K., et al., *J. Org. Chem.*, 47, 1324-1326 (1982).
8. Horigome, T. and Hiroshi, S., *J. Chromatog.*, 283, 315 (1984).