Dynasylan®

Product Information

Dynasylan® HMDS

Hexamethyldisilazane

CAS NUMBER

999-97-3

PRODUCT DESCRIPTION

Dynasylan® HMDS - Hexamethyldisilazane acts as efficient silylating agent in the pharmaceutical industry, as adhesion promoter in the microelectronic industry and as hydrophobation agent, e.g. for fillers. Dynasylan® HMDS is a clear colourless liquid.

Typical Properties

Property	Unit	Value
Appearance		clear, colourless liquid
Boiling Point, min. (1013 hPa) DIN 51751	°C	126
Chemical Name		Hexamethyldisilazane
Density (20 °C) DIN 51757	g/cm³	~0.77
Flash Point, min. DIN EN ISO 13736	°C	11
Refractive Index n(20,D) DIN 51423		1.409

The data represents typical values (no product specification)

TYPICAL APPLICATIONS

Dynasylan® HMDS is the most commonly used reagent for silylation of protic organic and inorganic materials.

The main applications are:

- Blocking and protection of hydroxylic groups in natural products
- Stabilization for further modification, formation of volatile products
- Blocking and protection of functional groups in organic intermediates
- The silylated derivatives exhibit improved chemical stability than the basic products and enable chemical reactions which otherwise would not be possible
- Derivatization of protic compounds for analytical in vestigations
- The silylated derivatives are volatile and can be detected by gas chromatography

BENEFITS & ADVANTAGES

- Hydrophobation product for e.g. Aerosil products

- Easy and fast hydrophobation

- Silylating agents in the pharmaceutical industry, adhesion promoters in the electronic industry, hydrophobation of fillers

- HMDS is used as a coating material in the semiconductor industry before applying a photoresist. When HMDS is deposited on a surface, it leaves methyl groups behind. These then bond with the OH molecules on the silicon surface and help develop a strong adhesion when a photoresist is applied

DOSAGE

Dynasylan® HMDS can react with protic substances such as alcohols, phenols, carboxylic acids, amino acids, carbohydrates, thiols and amines under formation of the silylated derivatives and ammonia release.

$(CH_3)_3Si\text{-}NH\text{-}Si(CH_3)_3$ 2 HX-R => 2 $(CH_3)_3Si\text{-}X\text{-}R$ NH_3

Normally reactions are carried out by refluxing the substrate with an excess of Dynasylan® HMDS until evolution of ammonia ceases. Hexamethyldisilazane is particularly

effective with alcohols and phenols. The addition of acidic catalysts such as sulfuric acid or ammonium sulfate increases the reaction rate and the degree of silylation.

A combination of Dynasylan® HMDS with trimethyl chloro silane preferrably in the molar ratio 1:1 represents a very effective silylation agent for 3 mol equivalents of the substrate. The cleavage product in this case is ammonium chloride.

Silylations with Dynasylan® HMDS are usually conducted without solvent. The silylation reaction generally results in very high, often quantitative yields. Dynasylan® HMDS decomposes in presence of water or acids. Strong oxidation agents cause oxidation.

HANDLING & PROCESSING

Deblocking is preferably carried out by means of hydrolysis, resulting in high yields. In some cases a thermal deblocking is possible

- Silylation of inorganic particularly silicatic substrates such as silica
- Hydrophobation of substrates for better dispersion and viscosity reduction and for better adhesion as filler in polymers
- Silylation of metals (iron, non iron, precious metal) and metalloids (silicon)
- Hydrophobation and adhesion promotion to polymers such as duroplastics/thermosets (e.g. photo-resists) or thermoplastics
- Before considering the use of Dynasylan® products please read its Safety Data Sheet (SDS) thoroughly for safety and toxicological data as well as for information on proper transportation, storage and use.The Safety Data Sheet is available on our website https://silanes.evonik.com/en or upon request from your local representative, customer service or from Evonik Operations GmbH, Product Safety Department, E-MAIL sds-hu@evonik.com.

PACKAGING

Dynasylan® HMDS is supplied in 150 kg drums or in 750 kg bulk containers.

SHELF LIFE

In the originally closed drums Dynasylan® HMDS has a shelf life of min. 1 year after delivery.

Registration Listings

Registry	Status
Australia (AIIC)	Yes
Canada (DSL)	Yes
China (IECSC)	Yes
EU (REACH)	Yes
EU (EINECS/ELINCS)	Yes
Japan (ENCS)	Yes
South Korea (KECL)	Yes
Philippines (PICCS)	Yes
USA (TSCA)	Yes

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