Product Information

Dynasylan® A

Tetraethylorthosilicate

PRODUCT DESCRIPTION

Dynasylan® A is the ethyl ester of orthosilicic acid.

In the literature it is frequently also referred to under the name TEOS (tetraethoxysilane). Dynasylan® A is a colourless, low-viscosity liquid with SiO_2 content of 28.5%. Use requires acid- or alkali-catalysed hydrolysis. Since all 4 ethoxy groups are able to participate in this reaction, Dynasylan® A is regarded as tetrafunctional. Hydrolysis leads to silanol groups which, in a subsequent condensation reaction, form very stable siloxane bonds (-Si-O-Si-). Condensation starts before hydrolysis is complete. During storage of these hydrolysates condensation continues until a gel is formed. The rate of gelation depends on the concentration of water.

Typical Properties

Property	Unit	Value
Boiling Point, min. DIN 51751	°C	167
Chemical Name		Tetraethylorthosilicate, TEOS
Density (20 °C) DIN 51757	g/cm³	0.94
Flash Point, min. DIN 51755	°C	45
Viscosity (20 °C) DIN 53015	mPa·s	0.75

The data represents typical values (no product specification)

TYPICAL APPLICATIONS

Dynasylan® A is a ready source of silicic acid for many applications. Silicic acid in usually obtained by hydrolysis, or thermally by condensation at elevated temperature. The resulting silicic acid bonds well to many inorganic substrates and can be deposited in situ in a controlled manner. The surfaces of glass, metals, pigments, fillers and synthetic fibres can be coated with a very thin SiO_2 layer in order to improve chemical and thermal stability and mechanical properties.

Other applications are:

- crosslinkers in silicone rubber systems
- drying agents in sealing compositions

Product Composition

Product Composition	Unit	Value
Silicon Dioxide (SiO_2) Content AN-SAA 0851	wt%	28.3-29.1

The data represents typical values (no product specification)

BENEFITS & ADVANTAGES

Dynasylan® A is an important starting material for sol-gel processes, where the additional use of alkylalkoxysilanes (e. g. Dynasylan® MTES) can give the siloxane network a somewhat organic character as a result of the incorporation of alkyl groups.

It is also possible to construct an inorganic/organic network by adding silanes containing organofunctional groups (e.g. aminopropyl groups) and polymerizing with organic precursors. This principle makes it possible to obtain highly scratch- and abrasion-resistant coatings.

HANDLING & PROCESSING

Dynasylan® A is immiscible with water, so hydrolysis requires the use of a cosolvent such as ethanol. Suitable catalysts are mineral acids or ammonia, or even acetic acid and amines.

Partial hydrolysis gives hydrolysates of Dynasylan® A whose shelf life depends on the amount of water and solvent used. The amount of water determines the activity of the hydrolysate. Activity and shelf life are inversely proportional. The correct choice of the amount of water can give hydrolysates which have a shelf life of up to a year.

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 upon request from your local representative, customer service or from Evonik Operations GmbH, Product Safety Department, E-MAIL sds-hu@evonik.com.

PACKAGING

Dynasylan® A is supplied in 25 kg or 190 kg drums or in 850 kg containers.

STORAGE

Dynasylan® A must be stored with exclusion of moisture.

SHELF LIFE

In a sealed container, Dynasylan® A has a shelf-life of min. 12 months from 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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