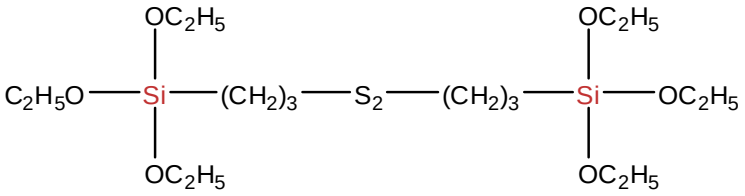
SiSiB® PC2200 SILANE

Chemical Name

Bis(3-triethoxysilylpropyl)disulfide

Chemical Structure



Background

When the mixing temperature of rubber is low, the sufficient reinforcing effect is not obtained by silane coupling agent SiSiB® PC2000. Dispersion of the silica into the rubber is also inferior, and this causes deterioration of the low heat buildup property that is the strong point of a rubber composition containing silica. Moreover, the silane coupling agent is hydrolyzed, and the generated ethanol does not vaporize sufficiently and vaporizes during extrusion. Thus, there is a drawback in that blisters are formed.

On the other hand, when mixing is conducted at high temperatures of 150°C. or more, the reinforcing property is improved. However, as a drawback, the polysulfide is to decarbolize to form free sulfur during mixing at high temperatures of 150°C or higher. The free sulfur will result in the vulcanization of rubber at the temperatures. So that, in this temperature range, gelation of the polymer reduces the rheological property of system. Thus, processing in later stages becomes impossible in actuality.

To prevent gelation of the polymer, it is necessary to reduce the content of high polysulfide silane such as pentasulfide silane, heptasulfide silane, hexasulfide silane, and the like, in the polysulfide Silane. Therefore, as a result we developed a novel silane coupling agent SiSiB® PC2200 which is suitable for mixing at a high temperature.

Introduction

The novel silane coupling agent SiSiB® PC2200 solves the above problems of the conventional art. The polysulfide structure in which the distribution of sulfur is specified

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can ensure its stability at high temperature. Thus, it can be avoided to decarbolize to form free sulfur. The silanol group on the surface of silica can react sufficiently with the silane coupling agent. And at the same time, the dispersion of the silica into a rubber is remarkably improved; furthermore there are no effects on the property processing. Thus it can improve the productivity of rubber processing and the low heat buildup property and abrasion resistance is improved.

Typical Physical Properties

Chemical Name	Bis(3-triethoxysilylpropyl)disulfide
CAS No.	56706-10-6
EINECS No.	260-350-7
Empirical Formula	$C_{18}H_{42}O_6S_2Si_2$
Molecular Weight	486
Color and Appearance	Light Yellowish liquid
Density(16/24°C)(g/cm^3)	1.03 +/- 0.02
Secondary Components	Propyltriethoxysilane
	Chloropropyltriethoxylsilane
	Ethanol
Flash Point (°C)	>120
Volatiles Components(%)	<= 4.0
Average Chain Length(%)	2.35 +/- 0.15
Total Sulfur (standard value)(%)	15.2 +/- 0.5

Solubility:

Soluble in Primary alcohols, ketones, benzene, toluene, dimethylformaminde, chlorinated hydtocarbons, cetonitrile, dimethysulfoxide; Insoluble in Water;

Application Area

Footwear

- Abrasion resistance
- Cutting and chunking resistance
- Flex life improvement

Rolls

- Abrasion resistance
- Aging resistance
- Processing

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- Set reduction (better load bearing)
- Reduced water swell
- Lower hysteresis

Mechanical Molded Goods

- Increased modulus
- Better heat aging
- Compression set reduction
- Dynamic property improvement
- Reduced swell to polar liquids
- Filler substitution (non-black for black)

Hose

- Improved abrasion on cover
- Better heat aging
- Increased modulus
- Lower compression set
- Improved adhesion to reinforcing elements

Solid Tires

- Improved abrasion
- Lower hysteresis
- Higher modulus
- Improved processing
- Possibly better adhesion

Tires

- Treads for abrasion, hot tear
- Carcass for adhesion and/or filler substitution
- Breaker (belt) stocks for adhesion

Belts

Flat Belts

- Increased abrasion
- Improved reversion resistance
- Reduced cost with clay substitution for black
- Improved cord adhesion
- Increased flex life and modulus

V Belts

- Increased modulus
- Improved abrasion
- Longer flex life
- Improved adhesion to reinforcing elements

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Packing and Storage

SiSiB® PC2200 is supplied in net weight 200Kg steel drum or 1000Kg IBC tote.

In the unopened original container SiSiB® PC2200 has a shelf life of five years in a dry and cool place.

Notes

All information in the leaflet is based on our present knowledge and experience. We reserve the right to make any changes according to technological progress or further developments. Performance of the product described herein should be verified by testing.

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Please send all technical questions concerning quality and product safety to: silanes@SiSiB.com.

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