1. Identification

1.1. Product identifier

Trade name: Si 264
Chemical Name: Triethoxy(3-thiocyanatopropyl)silane
CAS-No.: 34708-08-2

1.2. Recommended use of the chemical and restrictions on use

Relevant applications identified: Rubber - producing and processing industry

1.3. Details of the supplier of the safety data sheet

Company: Evonik Corporation USA
299 Jefferson Road
Parsippany, NJ 07054-0677
USA

Telephone: 973-929-8000
Telefax: 973-929-8040
Email address: Product-Regulatory-Services@Evonik.com

1.4. 24 HOUR EMERGENCY TELEPHONE NUMBERS:

CHEMTREC - US & CANADA: 800-424-9300
CHEMTREC MEXICO: 01-800-681-9531
CHEMTREC INTERNATIONAL: +1 703-527-3887 (collect calls accepted)
Product Regulatory Services: 973-929-8060

2. Hazards identification

2.1. Classification of the substance or mixture

Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

- Flammable liquids: Category 4, H227
- Acute toxicity (Oral): Category 4, H302
- Acute aquatic toxicity: Category 3, H402

2.2. Label elements

Statutory basis: Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

Symbol(s):
Signal word
Warning

Hazard statement
H227 - Combustible liquid.
H302 - Harmful if swallowed.
H402 - Hazardous to aquatic life.

Precautionary statement:
Prevention
P210 - Keep away from heat, sparks, open flames, hot surfaces. - No smoking.
P264 - Wash skin thoroughly after handling.
P270 - Do not eat, drink or smoke when using this product.
P273 - Avoid release to the environment.
P280 - Wear protective gloves/eye protection/face protection.

Precautionary statement:
Reaction
P301 + P312 + P330 - IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. Rinse mouth.
P370 + P378 - In case of fire: Use dry sand, dry chemical, or alcohol-resistant foam to extinguish.

Precautionary statement:
Storage
P403 + P235 - Store in a well-ventilated place. Keep cool.

Precautionary statement:
Disposal
P501 - Dispose of contents/container to an approved waste disposal plant.

Contains Triethoxy(3-thiocyanatopropyl)silane
The following percentage of the mixture consists of ingredient(s) with unknown acute toxicity: 100 %

2.3. Other hazards
None known

3. Composition/information on ingredients

- Triethoxy(3-thiocyanatopropyl)silane <= 100%

<table>
<thead>
<tr>
<th>CAS-No.</th>
<th>34708-08-2</th>
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</thead>
<tbody>
<tr>
<td>Flammable liquids</td>
<td>Category 4</td>
</tr>
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<td>Acute toxicity (Oral)</td>
<td>Category 4</td>
</tr>
<tr>
<td>Acute aquatic toxicity</td>
<td>Category 3</td>
</tr>
<tr>
<td>Chronic aquatic toxicity</td>
<td>Category 3</td>
</tr>
</tbody>
</table>

Other information
This material is classified as hazardous under OSHA regulations.

4. First aid measures

4.1. Description of first aid measures

General advice
Remove contaminated or saturated clothing.

Inhalation
Following inhalation of product dust:
Move victims into fresh air.
If symptoms persist, call a physician.

Skin contact
Wash off with soap and water.

Eye contact
Possible discomfort is due to foreign substance effect.
Rinse thoroughly with plenty of water keeping eyelid open.
In case of persistent discomfort: Consult an ophthalmologist.

**Ingestion**
Have the mouth rinsed with water.
After absorbing large amounts of substance:
Consult a physician.

### 4.2. Most important symptoms and effects, both acute and delayed

**Symptoms**
Following inhalation:
Possible signs of poisoning: headache, dizziness, drowsiness, nausea, seizures, unconsciousness, respiratory disturbance, cessation of breathing, cardiac arrest.

**Hazards**
In the case of fire:

**General advice**
Combustion gases can contain hydrogen cyanide.
Observe self-protection
Move out of dangerous area.

### 4.3. Indication of any immediate medical attention and special treatment needed

If substance has been swallowed:
administration of activated charcoal.

Acceleration of gastrointestinal passage
In case of signs of poisoning:
Notify ambulance immediately (keyword: poisoning by hydrocyanic acid).
Move victims into fresh air.
Do not leave victims unattended.
Keep warm and in a quiet place.
In case of difficulties in breathing, supply oxygen.
Employ artificial respiration if breathing ceases.
No artificial respiration, mouth-to-mouth or mouth to nose. Use suitable instruments/apparatus.
Place person on side in stable position if unconscious.

**Notes to physician**
Therapy as for hydrocyanic acid poisoning.
Observe national methods of treatment.

### 5. Fire-fighting measures

#### 5.1. Extinguishing media

Suitable extinguishing media: water spray, foam, Carbon dioxide (CO2), dry powder

Unsuitable extinguishing media: high volume water jet

#### 5.2. Special hazards arising from the substance or mixture

May be released in case of fire:
Hydro-cyanic acid
Carbon dioxide (CO2)
Carbon monoxide
organic and sulphurous products of decomposition

#### 5.3. Advice for firefighters

As in any fire, wear self-contained positive-pressure breathing apparatus, (MSHA/NIOSH approved or equivalent) and full protective gear.
Water used to extinguish fire should not enter drainage systems, soil or stretches of water.
Ensure there are sufficient retaining facilities for water used to extinguish fire.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Wear personal protective equipment.

6.2. Environmental precautions
Obey relevant local, state, provincial and federal laws and regulations. Do not contaminate any lakes, streams, ponds, groundwater or soil.

6.3. Methods and material for containment and cleaning up
Pick up mechanically with a suitable material and collect in a suitable container.

Additional advice
Defect containers must be isolated and sealed immediately.

7. Handling and storage

7.1. Precautions for safe handling
Always close container tightly after removal of product. If temperature is > 120°C: hydrocyanic acid may be released during processing. Information on request. Encapsulation or suction necessary. Do not introduce suctioned air to the work rooms.

7.2. Conditions for safe storage, including any incompatibilities

Advice on protection against fire and explosion
Keep away from sources of ignition - No smoking.
Take precautionary measures against static discharges.
Explosion protection is recommended in case the explosion limits for the following substance might be exceeded: Ethanol.
Danger of explosion from residual product fumes; therefore avoid spark production through cutting, grinding, or welding work in the area of the container.
When repairs of the production system are to be made (e.g. welding work), the section to be repaired must be essentially free of product.

Storage
Keep in a dry, cool and well-ventilated place.

Storage stability
12 month  10 - 40 °C

8. Exposure controls/personal protection

8.1. Control parameters

- Ethanol

<table>
<thead>
<tr>
<th>CAS-No.</th>
<th>Control parameters</th>
<th>Permissible exposure limit:(OSHA Z1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>64-17-5</td>
<td>1000 ppm&lt;br&gt;1900 mg/m³</td>
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<tr>
<th>Control parameters</th>
<th>Time Weighted Average (TWA) Permissible Exposure Limit (PEL): (US CA OEL)</th>
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</table>

<table>
<thead>
<tr>
<th>Control parameters</th>
<th>Short Term Exposure Limit (STEL): (ACGIH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000 ppm</td>
<td></td>
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</table>

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<th>Control parameters</th>
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</table>

8.2. Exposure controls
Engineering measures
Ensure suitable suction/aeration at the work place and with operational machinery.
see also section 7.

Personal protective equipment
Respiratory protection
A respiratory protection program that meets OSHA 1910.134 and ANSI Z88.2 or applicable
federal/provincial requirements must be followed whenever workplace conditions warrant respirator use.
NIOSH's "Respirator Decision Logic" may be useful in determining the suitability of various types of
respirators.

Hand protection
Wear protective gloves made of resistant material.
Glove material for example, butyl-rubber
Material thickness 0.5 mm
Break through time >= 480 min
Glove material for example, Fluorinated rubber (Viton)
Material thickness 0.4 mm
Break through time >= 480 min
The above mentioned hand protection is based on knowledge of the chemistry and anticipated uses of this
product but it may not be appropriate for all workplaces. A hazard assessment should be conducted prior
to use to ensure suitability of gloves for specific work environments and processes prior to use.
Use impermeable gloves. Suitability for specific workplaces should be clarified with protective glove manufacturers.
The rupture time and material thickness data are guideline values! Exact rupture time / material thickness
data can be obtained from the protective glove manufacturer.
Please observe that the daily duration of usage of a chemical protective glove is in practice far shorter due
to the many influencing factors (e.g. temperature, mechanical strain on the glove material) than the
permeation time determined acc. EN 374.

Eye protection

Skin and body protection
When handling larger quantities:
chemical protective suit, disposable protective suit
Remove contaminated or saturated clothing.
A safety shower and eye wash fountain should be readily available.
To identify additional Personal Protective Equipment (PPE) requirements, it is recommended that a
hazard assessment in accordance with the OSHA PPE Standard (29CFR1910.132) be conducted before
using this product.

Hygiene measures
The usual precautionary measures for dealing with chemicals should be observed. No eating, drinking,
smoking, or snuffing tobacco at work. Wash face and/or hands before break and end of work.
Preventive skin protection is recommended.

Protective measures
If there is the possibility of skin/eye contact, the indicated hand/eye/body protection should be used.
If workplace exposure limits are exceeded and/or larger amounts are released (leakage, spilling, dust) the
indicated respiratory protection should be used.

9. Physical and chemical properties

9.1. Information on basic physical and chemical properties
physical state liquid (20 °C) (1013 hPa)
Colour light brown
Form liquid
Odour characteristic

Odour Threshold not determined

pH not applicable

Melting point/range -122 °C
Method: OECD TG 102
glass transition temperature

Boiling point/range 96 °C
Method: (0.1 mm)

Flash point > 93 °C
Method: DIN EN ISO 2719 (Pensky-Martens, Closed Cup)

Evaporation rate not determined

Flammability (solid, gas) not determined

Lower explosion limit not determined

Upper explosion limit not determined

Vapour pressure < 1 hPa (20 °C)

Vapour density not determined

Density ca. 1 g/cm3 (20 °C)

Water solubility insoluble

Partition coefficient: n-octanol/water log Pow: 3.1 (20 °C)
Method: QSAR

Thermal decomposition > 150 °C

Viscosity, dynamic ca. 3 mPa.s (20 °C)
Method: Ubbelohde viscometer

9.2. Other information

Explosiveness not explosive

10. Stability and reactivity

10.1. Reactivity
No dangerous reaction known under conditions of normal use.

10.2. Chemical stability
Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions
Possibility of hazardous reactions No dangerous reactions known.
10.4. Conditions to avoid
Keep away from heat and sources of ignition.
In the presence of oxygen and heat, the ethanol forming during the reaction may produce acetaldehyde.
Material may form acetaldehyde when heated with inorganic pigments in the presence of air.

10.5. Incompatible materials
None known

10.6. Hazardous decomposition products
Decomposition products with heating above decomposition temperature
Ethanol, Hydrogen cyanide (hydrocyanic acid)

11. Toxicological information

11.1. Information on toxicological effects

Acute oral toxicity
LD50 Rat: 1423 mg/kg
Method: OECD Test Guideline 401

Acute inhalation toxicity
No data available

Acute dermal toxicity
LD50 Rat: > 2000 mg/kg
Method: OECD Test Guideline 402
Assessment: The substance or mixture has no acute dermal toxicity

Skin irritation
Rabbit
No skin irritation
Method: OECD Test Guideline 404

Eye irritation
Rabbit
No eye irritation
Method: OECD Test Guideline 405

Sensitization
Buehler Test Rabbit: Does not cause skin sensitisation.
Method: OECD Test Guideline 406

Assessment of STOT single exposure
No evidence for hazardous properties

Assessment of STOT repeat exposure
No evidence for hazardous properties

Risk of aspiration toxicity
No evidence of aspiration toxicity

Genotoxicity in vitro
Ames test S. typhimurium / E. coli negative
Method: OECD 471

Chromosomal aberration Chinese hamster (V 79 -cells) positive
Method: OECD TG 473

Gene mutation TK +/- mouse lymphoma cell (L5178Y) positive
Method: OECD TG 476
carcinogenicity assessment
Contains no carcinogenic substances as defined by NTP, IARC and/or OSHA.

Toxicity to reproduction
No data available

12. Ecological information

12.1. Toxicity

Toxicity to fish
LC50 Brachydanio rerio (zebrafish): 18 mg/l / 96 h
Method: OECD 203

Toxicity in aquatic invertebrates
EC50 Daphnia magna (Water flea): 29 mg/l / 24 h
Method: OECD 202

Toxicity to algae
EC50 Desmodesmus subspicatus (green algae): 160 mg/l / 96 h
Method: OECD TG 201

NOEC Desmodesmus subspicatus (green algae): 32 mg/l / 96 h
Method: OECD TG 201

Toxicity to bacteria
EC 10 local activated sludge: 4.3 mg/l / 3 h
Method: OECD TG 209

EC50 local activated sludge: 130 mg/l / 3 h
Method: OECD TG 209

12.2. Persistence and degradability

Biodegradability
Exposure time: 28 d
Result: 53 % Not readily biodegradable.
Method: OECD 301 C

12.3. Bioaccumulative potential

Bioaccumulation
low

12.4. Mobility in soil

Mobility
Adsorption on the floor: low.

12.5. Other adverse effects

Further Information
Harmful to aquatic life with long lasting effects.

13. Disposal considerations

13.1. Waste treatment methods
Product
Waste must be disposed of in accordance with federal, state and local regulations. Incineration is the preferred method.

Uncleaned packaging
Do not reuse empty containers and dispose of in accordance with the regulations issued by the appropriate local authorities. Incorrect disposal or reuse of this container is illegal and can be dangerous. If there is product residue in the emptied container, follow directions for handling on the container's label. Other countries: observe the national regulations.

14. Transport information

Not dangerous according to transport regulations.

14.1. UN number: –
14.2. UN proper shipping name: –
14.3. Transport hazard class(es): –
14.4. Packing group: –
14.5. Environmental hazards (Marine pollutant): –
14.6. Special precautions for user: Yes

Not dangerous according to transport regulations.

15. Regulatory information

US Federal Regulations

OSHA
If listed below, chemical specific standards apply to the product or components:

- None listed

Clean Air Act Section (112)
If listed below, components present at or above the de minimus level are hazardous air pollutants:

- None listed

CERCLA Reportable Quantities
If listed below, a reportable quantity (RQ) applies to the product based on the percent of the named component:

- None listed

SARA Title III Section 311/312 Hazard Categories
The product meets the criteria only for the listed hazard classes:

- Acute Health Hazard
• Fire Hazard

SARA Title III Section 313 Reportable Substances
If listed below, components are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

• None listed

Toxic Substances Control Act (TSCA)
If listed below, non-proprietary substances are subject to export notification under Section 12 (b) of TSCA:

• None listed

State Regulations

California Proposition 65
A warning under the California Drinking Water Act is required only if listed below:

• None listed

An employer using HMIS/NFPA labeling must through training ensure that its employees are fully aware of the hazards of the chemicals used.

HMIS Ratings

Health : 2
Flammability : 2
Physical Hazard : 0

NFPA Ratings

Health : 2
Flammability : 2
Reactivity : 0

16. Other information

Further information
Revision date 05/29/2015

Changes since the last version are highlighted in the margin. This version replaces all previous versions.
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SAFETY DATA SHEET

Material no. 101876
Specification Version 2.1 / US
Order Number Revision date 05/29/2015
Print Date 05/29/2015
Page 12 / 13

Legend

ACC American Chemistry Council
ACGIH American Conference of Governmental Industrial Hygenists
ACS Advisory Committee on Sustainability
ADI Acceptable Daily Intake
ASTM American Society for Testing and Materials
ATP Adaptation to Technical Progress
BCF Bioconcentration factor
BOD Biochemical oxygen demand
c.c. closed cup
CAO Cargo Aircraft Only
Carc Carcinogen
CAS Chemical Abstract Services
CDN Canada
CEPA Canadian Environmental Protection Act
CERCLA Comprehensive Environmental Response – Compensation and Liability Act
CFR Code of Federal Regulations
CMR carcinogenic-mutagenic-toxic for reproduction
COD Chemical oxygen demand
DIN German Institute for Standardization
DMEL Derived minimum effect level
DNEL Derived no effect level
DOT Department of Transportation
EC50 half maximal effective concentration
EPA Environmental Protection Agency
ER50 Reduction of Growth Rate
ERG Emergency Response Guide Book
FDA Food and Drug Administration
GHS Globally Harmonized System of Classification and Labelling of Chemicals (GHS)
GLP Good Laboratory Practice
GMO Genetic Modified Organism
HCS Hazard Communication Standard
HIMIS Hazardous Materials Identification System
IARC International Agency for Research on Cancer
ICAO-TI International Civil Aviation Organization- Technical Instructions
ICCA International Council of Chemical Association
ID Identification number
IMDG International Maritime Dangerous Goods
IUPAC International Union of Pure and Applied Chemistry
ISO International Organization For Standardization
LC50 50 % Lethal Concentration
LD50 50 % Lethal Dose
L(EC)50 LC50 or EC50
LOAEL Lowest observed adverse effect level
LOEL Lowest observed effect level
MARPOL International Convention for the Prevention of Pollution from Ships
NFPA National Fire Protection Association
NOAEL No observed adverse effect level
NOEC no observed effect concentration
NOEL no observed effect level
o. c. open cup
OECD Organisation for Economic Cooperation and Development
OEL Occupational Exposure Limit
OSHA Occupational Safety and Health Administration
PB T Persistent, bioaccumulative, toxic
PEC Predicted effect concentration
PNEC Predicted no effect concentration
RQ Reportable Quantity
SDS Safety Data Sheet
STOT Specific Target Organ Toxicity
UN United Nations
vPvB very persistent, very bioaccumulative
voc  volatile organic compounds
WHMIS  Workplace Hazardous Materials Information System
WHO  World Health Organization