Printing date 07/29/2016

CHEMICALS, INC

Reviewed on 07/29/2016

## **1** Identification

- · Product name
- · Trade name: (2S,3S)-(-)-Bis(diphenylphosphino)butane (S,S)-CHIRAPHOS
- Item number: 15-0160
- CAS Number: 64896-28-2
- · Details of the supplier of the safety data sheet
- Manufacturer/Supplier: Strem Chemicals, Inc. 7 Mulliken Way NEWBURYPORT, MA 01950 USA info@strem.com
- Information department: Technical Department
  Emergency telephone number: EMERGENCY: CHEMTREC: + 1 (800) 424-9300 During normal opening times: +1 (978) 499-1600

## 2 Hazard(s) identification

· Classification of the substance or mixture

GHS07

Skin Irrit. 2 H315 Causes skin irritation. Eye Irrit. 2A H319 Causes serious eye irritation.

· Label elements

· GHS label elements

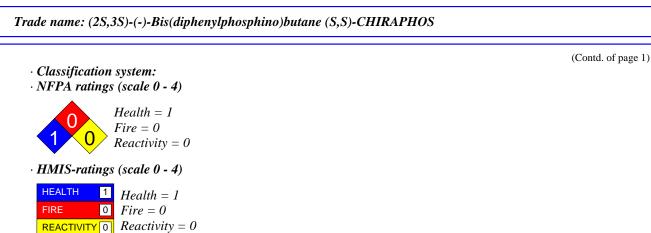
*The substance is classified and labeled according to the Globally Harmonized System (GHS).* • *Hazard pictograms* 



· Signal word Warr	ling
· Hazard statement	S
H315 Causes skin	irritation.
H319 Causes serie	ous eye irritation.
· Precautionary sta	tements
P231	Handle under inert gas.
P262	Do not get in eyes, on skin, or on clothing.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P305+P351+P33	8 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present
	and easy to do. Continue rinsing.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P501	Dispose of contents/container in accordance with local/regional/national/international regulations.
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- · Other hazards
- · Results of PBT and vPvB assessment
- **PBT:** Not applicable.
- vPvB: Not applicable.

### 3 Composition/information on ingredients

- · Chemical characterization: Substances
- · CAS No. Description
- 64896-28-2 (2S,3S)-(-)-Bis(diphenylphosphino)butane (S,S)-CHIRAPHOS

## 4 First-aid measures

- · Description of first aid measures
- General information: Immediately remove any clothing soiled by the product.
- After inhalation: In case of unconsciousness place patient stably in side position for transportation.
- After skin contact: Immediately wash with water and soap and rinse thoroughly.
- After eye contact:
- Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
- After swallowing: If symptoms persist consult doctor.
- Information for doctor:
- · Most important symptoms and effects, both acute and delayed No further relevant information available.
- $\cdot$  Indication of any immediate medical attention and special treatment needed
- No further relevant information available.

## **5** Fire-fighting measures

- · Extinguishing media
- · Suitable extinguishing agents:
- CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- Special hazards arising from the substance or mixture No further relevant information available.
- · Advice for firefighters
- · Protective equipment: No special measures required.

#### 6 Accidental release measures

Personal precautions, protective equipment and emergency procedures Not required.
 Environmental precautions: No special measures required.

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- Methods and material for containment and cleaning up: Dispose contaminated material as waste according to item 13.
   Reference to other sections
- See Section 7 for information on safe handling. See Section 8 for information on personal protection equipment. See Section 13 for disposal information.

# 7 Handling and storage

· Handling: Handle under inert gas.

- Precautions for safe handling No special precautions are necessary if used correctly.
- Information about protection against explosions and fires: No special measures required.
- · Conditions for safe storage, including any incompatibilities
- Storage: Store contents under inert gas.
- Requirements to be met by storerooms and receptacles: No special requirements.
- · Information about storage in one common storage facility: Not required.
- · Further information about storage conditions: Keep receptacle tightly sealed.
- Specific end use(s) No further relevant information available.

### 8 Exposure controls/personal protection

- · Additional information about design of technical systems: No further data; see item 7.
- · Control parameters
- · Components with limit values that require monitoring at the workplace: Not required.
- Additional information: The lists that were valid during the creation were used as basis.
- · Exposure controls
- · Personal protective equipment:
- General protective and hygienic measures:
- Keep away from foodstuffs, beverages and feed. Immediately remove all soiled and contaminated clothing.
- Wash hands before breaks and at the end of work.
- Avoid contact with the eyes and skin. • **Breathing equipment:** Not required.
- Protection of hands:



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation • Material of gloves

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

· Penetration time of glove material

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

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<sup>—</sup> US

INC.		Safety Data Sheet according to OSHA HCS	Page
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Tra	de name: (2S,3S)-(-)-Bis(diphenylph	nosphino)butane (S,S)-CHIRAPHOS	
	Eye protection:		(Contd. of p
	Tightly sealed goggles		
9	Physical and chemical proper	ties	
	Information on basic physical and o General Information	chemical properties	
	Appearance:		
	Form:	Crystalline	
	Color:	White	
	Odor: Odor threshold:	Characteristic Not determined.	
	pH-value:	Not applicable.	
	Change in condition	approaction	
	Melting point/Melting range:	108-109 °C (226-228 °F)	
	Boiling point/Boiling range:	no data °C	
•	Flash point:	Not applicable.	
•	Flammability (solid, gaseous):	Not determined.	
•	Ignition temperature:		
	Decomposition temperature:	Not determined.	
•	Auto igniting:	Not determined.	
•	Danger of explosion:	Product does not present an explosion hazard.	
•	Explosion limits:		
	Lower:	Not determined.	
	Upper:	Not determined.	
	Vapor pressure:	no data hPa	
	Density: Polative density	Not determined. Not determined	
	Relative density Vapor density	Not determined. Not applicable.	
	Evaporation rate	Not applicable.	
	Solubility in / Miscibility with	· · · · · · · · · · · · · · · · · · ·	
-	Water:	Insoluble.	
•	Partition coefficient (n-octanol/wat	er): Not determined.	
	Viscosity:		
	Dynamic:	Not applicable.	
	Kinematic:	Not applicable.	
	Solvent content:		
1	Organic solvents:	0.0 %	
	VOC content:	0.0 g/l / 0.00 lb/gl	
	~ ***	100.0.0/	

100.0 %

Solids content:

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· Other information

No further relevant information available.

#### **10 Stability and reactivity**

- · Reactivity No further relevant information available.
- · Chemical stability
- Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- · Possibility of hazardous reactions No dangerous reactions known.
- · Conditions to avoid No further relevant information available.
- · Incompatible materials: No further relevant information available.
- · Hazardous decomposition products: No dangerous decomposition products known.

#### **11 Toxicological information**

· Information on toxicological effects

- · Acute toxicity:
- Primary irritant effect:
- on the skin: Irritant to skin and mucous membranes.
- on the eye: Irritating effect.
- · Sensitization: No sensitizing effects known.
- · Additional toxicological information:
- · Carcinogenic categories
- · IARC (International Agency for Research on Cancer)

Substance is not listed.

· NTP (National Toxicology Program)

Substance is not listed.

· OSHA-Ca (Occupational Safety & Health Administration)

Substance is not listed.

#### **12** Ecological information

- · Toxicity
- · Aquatic toxicity: No further relevant information available.
- Persistence and degradability No further relevant information available.
- · Behavior in environmental systems:
- · Bioaccumulative potential No further relevant information available.
- *Mobility in soil* No further relevant information available.
- · Additional ecological information:
- · General notes: Not known to be hazardous to water.
- · Results of PBT and vPvB assessment
- · **PBT:** Not applicable.
- **vPvB:** Not applicable.
- · Other adverse effects No further relevant information available.

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## **13 Disposal considerations**

### · Waste treatment methods

### · Recommendation:

Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

- · Uncleaned packagings:
- **Recommendation:** Disposal must be made according to official regulations.

## **14 Transport information**

14 Iransport alformation	
· UN-Number · DOT, ADN, IMDG, IATA	not regulated
· UN proper shipping name · DOT, ADN, IMDG, IATA	not regulated
· Transport hazard class(es)	
· DOT, ADN, IMDG, IATA · Class	not regulated
· Packing group · DOT, IMDG, IATA	not regulated
• Environmental hazards: • Marine pollutant:	No
· Special precautions for user	Not applicable.
• Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	Not applicable.
· UN "Model Regulation":	not regulated

## **15 Regulatory information**

- $\cdot$  Safety, health and environmental regulations/legislation specific for the substance or mixture  $\cdot$  Sara
- $\cdot$  Section 355 (extremely hazardous substances):

Substance is not listed.

 $\cdot$  Section 313 (Specific toxic chemical listings):

Substance is not listed.

• TSCA (Toxic Substances Control Act):

Substance is not listed.

· Proposition 65

· Chemicals known to cause cancer:

Substance is not listed.

· Chemicals known to cause reproductive toxicity for females:

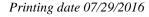
Substance is not listed.

· Chemicals known to cause reproductive toxicity for males:

Substance is not listed.

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- · Chemicals known to cause developmental toxicity:
- Substance is not listed.
- · Carcinogenic categories

· EPA (Environmental Protection Agency)

Substance is not listed.

· TLV (Threshold Limit Value established by ACGIH)

Substance is not listed.

· NIOSH-Ca (National Institute for Occupational Safety and Health)

Substance is not listed.

#### · GHS label elements

- The substance is classified and labeled according to the Globally Harmonized System (GHS).
- · Hazard pictograms



· Signal word Warning

· Hazard statements

H315 Causes skin irritation.

H319 Causes serious eye irritation.

- · Precautionary statements
- P231 Handle under inert gas.
- P262 Do not get in eyes, on skin, or on clothing.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

- P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P403+P233 Store in a well-ventilated place. Keep container tightly closed.
- *P501* Dispose of contents/container in accordance with local/regional/national/international regulations.

· Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

## **16 Other information**

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- · Department issuing SDS: Technical Department.
- · Contact: Technical Director
- · Date of preparation / last revision 07/29/2016 / -
- Abbreviations and acronyms: ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International
- Carriage of Dangerous Goods by Road) IMDG: International Maritime Code for Dangerous Goods
- DOT: US Department of Transportation
- IATA: International Air Transport Association
- ACGIH: American Conference of Governmental Industrial Hygienists
- CAS: Chemical Abstracts Service (division of the American Chemical Society)
- NFPA: National Fire Protection Association (USA)
- HMIS: Hazardous Materials Identification System (USA)
- VOC: Volatile Organic Compounds (USA, EU) PBT: Persistent, Bioaccumulative and Toxic
- *vPvB: very Persistent and very Bioaccumulative*

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NIOSH: National Institute for Occupational Safety OSHA: Occupational Safety & Health TLV: Threshold Limit Value PEL: Permissible Exposure Limit REL: Recommended Exposure Limit Skin Irrit. 2: Skin corrosion/irritation, Hazard Category 2 Eye Irrit. 2A: Serious eye damage/eye irritation, Hazard Category 2A

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