

MATERIAL SAFETY DATA SHEET**Product Trade Name:** CL-40™ CROSSLINKER**Revision Date:** 06-Mar-2015**Revision Number:** 13**SECTION 1. Product and Company Identification****Product Identifier**

Product Trade Name: CL-40™ CROSSLINKER
Synonyms: None
Chemical Family: Blend
Internal ID Code: HM005817

Product Use

Application: Crosslinker

Manufacturer's Name and Contact Details

Name and Address Halliburton Energy Services
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Calgary, AB
T2P 4G8
Canada

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Prepared By

Chemical Stewardship
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SECTION 2. Hazard(s) Identification**WHMIS Classification**

WHMIS Hazard Class D2B Toxic Materials

WHMIS Symbol(s)**Summary of hazards of the product**

Hazard Overview May cause eye and skin irritation.

SECTION 3: Composition/information on Ingredients

Substances	CAS Number	PERCENT (w/w)	HMIRA Registry Number	Decision Granted Date
Zirconium complex	Proprietary	10 - 30%	9294	March 3, 2015
Triisopropanolamine	122-20-3	10 - 30%	Not applicable	Not applicable
Sulfate	Proprietary	5 - 10%	9294	March 3, 2015

SECTION 4. First aid measures

Description of first aid measures**Inhalation**

If inhaled, remove to fresh air. If not breathing give artificial respiration (AR), preferably mouth-to-mouth. If breathing is difficult, oxygen should be given by trained personnel. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation (CPR) immediately. Get medical attention immediately.

Eyes

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

Skin

Wash with soap and water. Get medical attention if irritation persists.

Ingestion

Do not induce vomiting. Never give anything by mouth to an unconscious person. If breathing has stopped, trained personnel should begin rescue breathing / artificial respiration (AR) immediately. If the heart has stopped, trained personnel should begin CPR immediately. Obtain medical attention immediately.

Most important symptoms and effects, both acute and delayed

May cause eye and skin irritation.

Indication of any immediate medical attention and special treatment needed**Notes to Physician**

Treat symptomatically

SECTION 5. Fire Fighting Measures**Extinguishing media****Suitable Extinguishing Media**

All standard fire fighting media

Extinguishing media which must not be used for safety reasons

None known.

Special hazards arising from the substance or mixture**Special Exposure Hazards**

Decomposition in fire may produce toxic gases.

Advice for firefighters**Special Protective Equipment for Fire-Fighters**

Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

Hazardous combustion products

Oxides of nitrogen. Oxides of sulfur. Carbon monoxide and carbon dioxide. Hydrogen cyanide.

SECTION 6. Accidental release measures**Personal precautions and emergency procedures****Protective Equipment**

Use appropriate protective equipment.

Environmental Precautionary Measures

Prevent from entering sewers, waterways, or low areas.

Procedure for Cleaning / Absorption

Contain spill with sand or other inert materials. Scoop up and remove.

SECTION 7. Handling and Storage**Precautions for safe handling**

Avoid contact with eyes, skin, or clothing.

Conditions for safe storage and Incompatible materials for storage

Store away from oxidizers. Product has a shelf life of 24 months.

SECTION 8: Exposure Controls/Personal Protection

Occupational Exposure Limits

Exposure Limits

Substances	CAS Number	ACGIH TLV-TWA	OSHA PEL-TWA
Zirconium complex	Proprietary	TWA: 5 mg/m ³ STEL: 10 mg/m ³	TWA: 5 mg/m ³
Triisopropanolamine	122-20-3	Not available	Not available
Sulfate	Proprietary	Not available	Not available

Appropriate engineering controls

Engineering Controls

Use in a well ventilated area.

Personal Protective Equipment (PPE)

Respiratory Protection

If engineering controls and work practices cannot keep exposure below occupational exposure limits or if exposure is unknown, wear a NIOSH certified, European Standard EN 149, AS/NZS 1715:2009, or equivalent respirator when using this product. Selection of and instruction on using all personal protective equipment, including respirators, should be performed by an Industrial Hygienist or other qualified professional.

Organic vapor/acid gas respirator.

Hand Protection

Chemical-resistant protective gloves (EN 374) Suitable materials for longer, direct contact (recommended: protection index 6, corresponding to > 480 minutes permeation time as per EN 374): Polyvinylchloride gloves. Nitrile gloves. (>= 0.35 mm thickness)

This information is based on literature references and on information provided by glove manufacturers, or is derived by analogy with similar substances. Please note that in practice the working life of chemical-resistant protective gloves may be considerably shorter than the permeation time determined in accordance with EN 374 as a result of the many influencing factors (e.g. temperature). If signs of wear and tear are noticed then the gloves should be replaced. Manufacturer's directions for use should be observed because of great diversity of types.

Skin Protection

Rubber apron.

Eye Protection

Chemical goggles; also wear a face shield if splashing hazard exists.

Other Precautions

Eyewash fountains and safety showers must be easily accessible.

SECTION 9. Physical and Chemical Properties

Information on basic physical and chemical properties

Physical State: Liquid

Color: Clear to Light straw

Odor: Slight Ammonia

Odor Threshold: No information available

Property

Values

Remarks/ - Method

pH:

8.5 - 9.5

pH Concentration of Solution:

No information available.

Freezing Point/Range

No information available.

Melting Point/Range

No information available

Boiling Point/Range (C):

117 °C / 242 °F

Flash Point/Range (C):

No information available.

Flash Point Method:

No information available.

Autoignition Temperature (C):

No information available.

Flammability Limits in Air - Lower (%):

No information available.

Flammability Limits in Air - Upper (%):

No information available.

Evaporation Rate (Butyl Acetate=1):

No information available.

Vapor Pressure @ 20 C (mmHg):

No information available.

Vapor Density (Air=1):

No information available.

Specific Gravity @ 20 C (Water=1):	1.14 - 1.24
Solubility in Water (g/100ml):	Soluble
Solubility in other solvents	No information available.
Partition Coefficient/n-Octanol/Water:	No information available.
Decomposition Temperature (C):	No information available.
Viscosity	No information available
Explosive Properties	No information available
Oxidizing Properties	No information available
Other Information	
Molecular Weight (g/mole):	No information available.
VOC Content (%)	No information available

SECTION 10. Stability and Reactivity

Conditions of Reactivity

Conditions to Avoid	None anticipated
Hazardous Polymerization:	May Occur

Chemical Stability

Stable

Sensitivity to Static Discharge

Not available

Sensitivity to Mechanical Impact

Not available

Incompatible materials

Strong oxidizers.

Hazardous Decomposition Products

Oxides of nitrogen. Oxides of sulfur. Carbon monoxide and carbon dioxide. Hydrogen cyanide.

SECTION 11. Toxicological Information

Routes of entry

Eye or skin contact, inhalation.

Information on Toxicological Effects

Acute effects from exposure

Inhalation	May cause respiratory irritation. Excessive inhalation causes headache, dizziness, nausea and incoordination.
Eye Contact	May cause eye irritation.
Skin Contact	May cause skin irritation.
Ingestion	May be harmful if swallowed. May cause abdominal pain, vomiting, nausea, and diarrhea.

Chronic effects from exposure

Chronic Effects/Carcinogenicity

No data available to indicate product or components present at greater than 1% are chronic health hazards.

Irritancy of product

Irritation	Irritating to eyes Irritating to skin
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Sensitization of product

Sensitization	Not confirmed to cause skin or respiratory sensitization.
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Mutagenicity

Mutagenic Effects	Not regarded as mutagenic.
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Carcinogenicity**Carcinogenic Effects**

No data available to indicate any components present at greater than 0.1% may present a carcinogenic hazard.

Reproductive toxicity**Reproductive Toxicity**

This product does not contain any known or suspected reproductive hazards

Teratogenicity/embryotoxicity**Teratogenic**

Not a teratogen or embryotoxin.

Toxicologically synergistic material Not available

Acute Toxicity

Substances	CAS Number	LD50 Oral	LD50 Dermal	LC50 Inhalation
Zirconium complex	Proprietary	No data available	No data available	No data available
Triisopropanolamine	122-20-3	4730 mg/kg (Rat) 4000 mg/kg (Rat)	> 5000 mg/kg (Rabbit)	No data available
Sulfate	Proprietary	> 2000 mg/kg (Rat) 4250 mg/kg (Rat) 640 mg/kg (Mouse)	> 2000 mg/kg (Rat)	> 0.9 mg/L (Guinea pig, 6h) (saturated concentration)

SECTION 12. Ecological Information

Toxicity**Ecotoxicity Effects**

Substances	CAS Number	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Toxicity to Invertebrates
Zirconium complex	Proprietary	No information available	No information available	No information available	No information available
Triisopropanolamine	122-20-3	EC50 (72h) 35 mg/L (Scenedesmus subspicatus) EC50 (72h) 50 mg/L (Desmodesmus subspicatus) EC50 (72h) 710 mg/L (Desmodesmus subspicatus) NOEC (72h) 0.64 mg/L (Desmodesmus subspicatus)	LC50 (96h) 3158.48 mg/L (Leuciscus idus) LC50 (96h) > 100 mg/L (Pimephales promelas)	EC20 (30m) > 1995 mg/L (activated sludge, industrial)	EC50 (48h) > 500 mg/L (Daphnia magna) EC50 (48h) 966 mg/L (Daphnia magna)
Sulfate	Proprietary	EC50(13d): 2700 mg/L (Chlorella vulgaris)	LC50(96h): 53 mg/L (Oncorhynchus mykiss) LC50: 48 mg/L (Catla catla) MOEC(61d): 11 mg/L (Oncorhynchus mykiss)	EC50(30m): 1618 mg/L (activated sludge)	LC50(48h): 81 - 130 mg/L (Crangon crangon) EC50(48h): 169 mg/L (Daphnia magna)

Persistence and Degradability**Bioaccumulation potential**

Substances	CAS Number	Log Pow
Zirconium complex	Proprietary	No information available
Triisopropanolamine	122-20-3	-0.015
Sulfate	Proprietary	0.48

Mobility in soil

No information available

Results of PBT and vPvB assessment

No information available.

Substances	PBT and vPvB assessment
Triisopropanolamine	Not PBT/vPvB

Other adverse effects**Endocrine Disruptor Information**

This product does not contain any known or suspected endocrine disruptors

SECTION 13. Disposal Considerations

Disposal Method Disposal should be made in accordance with federal, state, and local regulations.

Contaminated Packaging Follow all applicable national or local regulations.

SECTION 14. Transport Information**Canadian TDG**

UN Number: Not restricted
UN Proper Shipping Name: Not restricted
Transport Hazard Class(es): Not applicable
Packing Group: Not applicable

IATA/ICAO

UN Number: Not restricted
UN Proper Shipping Name: Not restricted
Transport Hazard Class(es): Not applicable
Packing Group: Not applicable

IMDG/IMO

UN Number: Not restricted
UN Proper Shipping Name: Not restricted
Transport Hazard Class(es): Not applicable
Packing Group: Not applicable

Special Precautions for User: None

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:

SECTION 15: Regulatory Information

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

Canadian Regulations

Canadian DSL Inventory All components listed on inventory or are exempt.

WHMIS Hazard Class D2B Toxic Materials

WHMIS Symbol(s)**US Regulations**
US TSCA Inventory

All components listed on inventory or are exempt.

SECTION 16. Other Information

Preparation Information
Prepared ByChemical Stewardship
Telephone: 1-580-251-4335
e-mail: fdunexchem@halliburton.com**Revision Date:**

06-Mar-2015

Update to Format SECTION: 8

Additional information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Stewardship at 1-580-251-4335.

Key or legend to abbreviations and acronyms

WHMIS: Workplace Hazardous Materials Information System

Key literature references and sources for datawww.ChemADVISOR.com/**Disclaimer Statement**

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*****END OF MSDS*****