

SECTION 1: IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING**1.1 Product identifier**

Trade name: **CARBOBOND® LTCA**
Registration number: NA
Synonym(s): Low-Temperature Chemical Activator
Preparation/Revision date: 23 January 2015

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses: Additive for oil and natural gas well hydraulic fracturing
Uses advised against: None known

1.3 Details of the supplier of the safety data sheetManufacturer / Supplier

Company name: CARBO Ceramics Inc.
Address: 575 N. Dairy Ashford Road, Suite 300
Houston, Texas 77079, USA
Customer service: 1-337-367-6151

1.4 Emergency telephone number

For Chemical Emergency
Spill, Leak, Fire, Exposure, or Accident
Call CHEMTREC Day or Night
Within USA and Canada: 1-800-424-9300

SECTION 2: HAZARDS IDENTIFICATION**2.1 Classification of the substance or mixture**

This article has been assessed and/or tested for its physical, health and environmental hazards and the following classifications apply.

Classification according to the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Classification: Flammable Liquids – Category 2
Acute Toxicity, Oral – Category 3
Acute Toxicity, Dermal – Category 3
Acute Toxicity, Inhalation – Category 3
Serious Eye Damage/Eye Irritation – Category 1
Skin Corrosion/Irritation – Category 2
STOT-Single – Category 1

2.2 Label elements

Contains:

None



Hazard pictogram:

Signal word:

DANGER

Hazard statement:

Highly flammable liquid and vapor. Toxic if swallowed, in contact with skin or if inhaled. Causes serious eye damage. Causes skin irritation. Causes damage to the optic nerve and the central nervous system.

Precautionary statements:

- Prevention:

Keep away from heat / sparks / open flames / hot surfaces. No smoking.
Keep container tightly closed.
Ground / bond container and receiving equipment.
Use explosion-proof electrical / ventilating / lighting equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Avoid breathing mist / vapors / spray.
Use only outdoors or in a well-ventilated area.
Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.
Wear protective gloves / protective clothing / eye protection / face protection.

SECTION 2: HAZARDS IDENTIFICATION (CONT'D)

- Response: IF SWALLOWED: Immediately call a POISON CENTER / medical professional.
Rinse mouth.
IF ON SKIN (or hair): Take off immediately all contaminated clothing and wash before reuse. Wash with plenty of water. If skin irritation occurs, get medical attention / advice.
IF INHALED: Remove person to fresh air and keep comfortable to aid breathing. Call a POISON CENTER / medical professional.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER / medical professional.
IN CASE OF FIRE: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide to extinguish.
- Storage: Store in a well-ventilated place. Keep container tightly closed. Keep cool. Store in locked / secured location.
- Disposal: Dispose of contents / container in accordance with local, regional, national and international regulations.
- Supplemental label information: None

2.3 Other hazards Toxic to aquatic life. Avoid release to the environment. Collect spilled material.

Hazard summary

- Physical hazards: Flammable liquid
- Health hazards: Toxic if swallowed or inhaled or in contact with skin. Causes serious eye damage. Causes skin irritation. Causes damage to the optic nerve and central nervous system.
- Environmental hazards: Toxic to aquatic life.
- Main symptoms: None known

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS**3.1 Mixture**

Chemical Name	Percent	CAS No.	Notes
Methanol	40 - 60	67-56-1	#
Alcohols, C11-15-secondary, ethoxylated	38 - 60	68131-40-8	-
Polyethylene glycol	< 2	25322-68-3	#

#: This substance has workplace exposure limit(s)

Composition comments: All concentrations are in percent by weight unless ingredients are a gas. Gas concentrations are in percent by volume.

SECTION 4: FIRST AID MEASURES**General Information**

Show this Safety Data Sheet to the medical professional in attendance. Exposure is not anticipated with use of this product as intended. If symptoms occur, follow first aid measures as appropriate.

4.1 Description of first aid measures

Inhalation:	Remove to fresh air and keep comfortable to aid breathing. Get medical attention if irritation or symptoms persist.
Skin contact:	Remove immediately all contaminated clothing. Flush skin with large amounts of water. Wash contaminated clothing before reuse. If irritation develops or persists, get medical attention.
Eye contact:	Rinse immediately with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention immediately.
Ingestion:	Rinse mouth. Never give anything by mouth to an unconscious or convulsing person. DO NOT induce vomiting. Get medical attention immediately.
Notes to Physician:	None specified

SECTION 4: FIRST AID MEASURES (CONT'D)**4.2 Most important symptoms and effects, both acute and delayed**

Exposure may cause serious eye damage and irritation of the skin, lungs and mucous membranes. May be toxic if swallowed, inhaled or on skin. Excessive exposure may cause lung injury. Swallowing large amounts may cause serious injury or death. Causes damage to the optic nerve and central nervous system. Prolonged or widespread contact could result in absorption of harmful amounts.

4.3 Indication of any immediate medical attention and special treatment needed

Provide general supportive measures and treat symptoms as needed.

SECTION 5: FIRE FIGHTING MEASURES**General fire hazards**

This product is flammable. Keep away from heat / sparks / open flames / hot surfaces. Do not smoke in the vicinity of this product. Keep container tightly closed. Ground and / or bond container and receiving equipment. Use explosion-proof electrical / ventilating / lighting equipment. Use only non-sparking tools. Take precautionary measures against static discharge.

5.1 Extinguishing Media

Suitable extinguishing media:

Water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Unsuitable extinguishing media:

None specified

5.2 Special hazards arising from the substance or mixture

Avoid accumulation of water. Product may be carried across water surface spreading fire or contacting an ignition source. If involved in a fire, oxides of carbon and other hazardous decomposition products may be formed.

5.3 Advice for firefighters

Special protective equipment for firefighters:

In the event of fire, wear self-contained breathing apparatus.

Special firefighting procedures:

Mist or sprays in large (flooding) quantities are most effective. Cool affected containers with water streams. Do not direct a solid stream of water or foam into hot, burning pools as this may cause frothing and increase fire intensity.

Special remarks on fire hazards:

None

SECTION 6: ACCIDENTAL RELEASE MEASURES**6.1 Personal precautions, protective equipment and emergency procedures**

For non-emergency personnel:

Use personal protective equipment as recommended in Section 8. Remove all sources of ignition. Ground / bond container and receiving equipment. Use explosion-proof electrical / ventilating / lighting equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Keep unprotected persons away. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Avoid contact with skin, eyes and clothing. Wash thoroughly after handling. Floor may be slippery. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.

For emergency responders:

Use personal protection recommended in Section 8 of the SDS.

6.2 Environmental Precautions

Prevent leaks and spills if safe to do so. Do not allow material to be released to the environment or to reach drains.

6.3 Methods and materials for containing and cleaning up

Contain spill immediately with inert material. Collect spillage. Transfer liquids and solid diking material to suitable containers for recovery or disposal. Keep away from heat / sparks / open flames / hot surfaces. No smoking. Keep container tightly closed. Ground/bond container and receiving equipment. Use explosion-proof electrical / ventilating / lighting equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Do not use water to flush away spills. Dispose of spilled material as indicated in Section 13. Store captured and reclaimed materials in suitable closed containers.

6.4 Reference to other Sections:

For personal protection, see Section 8. For waste disposal, see Section 13.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

Keep away from heat / sparks / open flames / hot surfaces. No smoking in the vicinity of this product. Keep container tightly closed. Ground and/or bond container and receiving equipment. Use explosion-proof electrical / ventilating / lighting equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Avoid breathing mist / vapors / spray. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Wear protective hand, eye and face protection.

7.2 Conditions for safe storage, including any incompatibilities

Store in a cool, well-ventilated place. Keep container tightly closed. Store locked up. Ground and / or bond container and receiving equipment.

7.3 Specific end use(s)

Industrial use – oil & gas well stimulation.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

United States. Occupational Exposure Limits:

Component	CAS No.	Type	Value	Form
Alcohols, C11-15-secondary, ethoxylated	68131-40-8	N/A	N/A	N/A
Methanol	67-56-1	ACGIH TLV – STEL	250 ppm	N/A
		ACGIH TLV– TWA	200 ppm	N/A
		NIOSH– IDLH	6000 ppm	N/A
		NIOSH – STEL	250 ppm	N/A
		NIOSH – TWA	200 ppm	N/A
			(325 mg/m ³)	
		OSHA PEL – TWA	200 ppm	
			(260 mg/m ³)	
Polyethylene glycol	25322-68-3	AIHA – TWA	10 m/gm ³	MW>200, aerosol

Consult local authorities for acceptable exposure limits

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION (CONT'D)**8.2 Exposure Controls**

Appropriate engineering controls:

Observe occupational exposure limits and prevent exposure to vapor, mist and spray. Use general local exhaust ventilation to keep airborne levels below applicable exposure limits (typically 10 air changes per hour). Ventilation rates should be matched to conditions. Supplemental local exhaust ventilation, closed systems, or respiratory protection may be needed in special circumstances such as poorly ventilated spaces, mechanical generation of mists / sprays, etc. Provide local eye wash and safety shower stations where possible.

Individual Protective Measures

General Information:

Personal protective equipment should be chosen according to applicable standards and in consultation with the supplier of the personal protective equipment.

Eye/face protection:

Wear safety glasses with side shields or goggles. Avoid wearing contact lenses while handling.

Skin protection:

- Hand protection:
- Other:

Wear protective gloves that are chemically resistant to this material. Avoid direct contact with skin. Wear suitable chemical-resistant clothing to prevent contact with skin. The type of protective equipment should be selected according to the concentration and amount of the substance at the specific workplace. Wash skin after handling. Launder work clothes regularly.

Respiratory protection:

Use under local exhaust ventilation. If engineering controls do not maintain airborne concentrations to an acceptable level, use an appropriate respirator. The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

Thermal hazards:

Not applicable

Hygiene measures

Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking and / or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

Environmental exposure controls

Avoid release to the environment. Environmental manager must be informed of all major releases.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Form	Liquid	Explosive properties	Not available
Color	Clear	Explosive limit	Not available
Odor	Alcohol-like	Vapor pressure	Not available
Odor threshold	Not available	Vapor density	Not available
pH	Not available	Evaporation rate	Not available
Melting/freezing point	Not available	Relative density	0.89 (water = 1)
Boiling point, initial boiling point and boiling range	Not available	Partition coefficient (n-octanol/water)	Not available
Flash point	53.6 °F / 12 °C (Methanol)	Solubility (water)	Soluble in water
Auto-ignition temperature	Not available	Decomposition temperature	Not available
Flammability (solid, gas)	Not applicable	Bulk density	7.47 lb/gal (0.90 kg/L)
Flammability limit-lower%	Not available	Viscosity	Not available
Flammability limit-upper%	Not available	VOC (weight %)	Not available
Oxidizing properties	Not applicable	Percent volatile	Not available

9.2 Other Information

No relevant additional information available

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

Vapors may form explosive mixtures with air.

10.2 Chemical stability

Material is stable under normal conditions.

10.3 Possibility of hazardous reactions

Hazardous polymerization does not occur under normal conditions.

10.4 Conditions to avoid

Keep away from heat, sparks, open flames, hot surfaces and direct sunlight.

10.5 Incompatible materials

Oxidizing agents, acid anhydrides, aluminum, halogenated compounds, acids, strong bases at high temperatures and materials reactive with hydroxyl compounds.

10.6 Hazardous decompositions products

Thermal decomposition may produce oxides of carbon and other hazardous decomposition products.

SECTION 11: TOXICOLOGICAL INFORMATION

General information on likely routes of exposure

Ingestion:	Toxic if swallowed. Swallowing large amounts may cause serious injury or death.
Inhalation:	Toxic if inhaled. Excessive exposure may cause lung injury.
Skin contact:	Toxic in contact with skin. Causes skin irritation. Prolonged or widespread contact could result in absorption of harmful amounts.
Eye contact:	Causes serious eye damage.
Symptoms:	Exposure may cause serious eye damage and irritation of the skin, lungs and mucous membranes. Causes damage to the optic nerve and central nervous system.

11.1 Information on toxicological effects

Acute Toxicity: No data were identified for the product as a whole. Data are for constituents:

Product / ingredient name	Result	Species	Dose	Exposure
Secondary Alcohol Ethoxylate Surfactant	LD ₅₀	Rat	>412 mg/kg	Oral
	LD ₅₀	Rat	>14,000 mg/kg	Dermal
	4h LC ₅₀	Rat	1.06 mg/L	Inhalation (Aerosol)
Methanol*	LD ₅₀	Rat	<790 -13,000 mg/kg	Oral
	LD	Human	300-1,000 mg/kg	Oral
	LD ₅₀	Mouse	7,300-10,000 mg/kg	Oral
	LD ₅₀	Rabbit	15,800 - 20,000 mg/kg	Dermal
	LD ₅₀	Rat	> 45,000 mg/kg	Dermal
	4h LC ₅₀	Rat	83.2-128.8 mg/L	Inhalation (Vapor)

* Methanol exhibits a higher degree of toxicity in humans than in test animals as humans are not able to remove the toxic metabolite, formate, as efficiently as animals.

Serious Eye Damage/Irritation: No data were identified for this product as a whole. The secondary alcohol ethoxylate surfactant, present in this product at 38 – 60%, may cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur. Available studies show that methanol, present in this product at 40 – 60%, is a slight eye irritant with doses of 0.05 to 0.1 mL. Some reversibility of effects was observed.

SECTION 11: TOXICOLOGICAL INFORMATION (CONT'D)

Skin corrosion/Irritation:	No data were identified for this product as a whole. The secondary alcohol ethoxylate surfactant, present in this product at 38 – 60%, may cause moderate skin irritation with local redness upon brief contact and may cause drying, flaking and itching of the skin. Methanol, present in this product at 40 – 60%, exhibited no skin irritation administered under occluded conditions as a 100% concentration. Limited information showed moderate irritation with 500 mg.
Respiratory/Skin Sensitization:	No data were identified for this product as a whole. The secondary alcohol ethoxylate surfactant, present in this product at 38 – 60%, did not cause allergic skin reactions when tested in humans. Methanol, present in this product at 40 – 60%, in a guinea pig maximization assay gave no evidence of contact sensitization after induction and challenge doses of 50 percent.
Germ Cell Mutagenicity:	No data were identified for this product as a whole. The majority of the <i>in vitro</i> assays conducted on methanol, present in this product at 40 – 60%, are negative (Ames, micronucleus/cytogenetic assays, mammalian gene mutation assay, yeast gene mutation assay, mouse lymphoma test, cell transformation assays, and a DNA damage and repair assay). Positive results were observed in the mouse lymphoma test and a mitotic recombination assay in <i>Aspergillus</i> , and ambiguous results were observed in an Ames assay for strain TA102 and in the DNA damage and repair assay. Of the <i>in vivo</i> assays (micronucleus and cytogenicity assays plus a <i>Drosophila</i> SLRL assay), all are negative except one cytogenetic assay, which was positive for aneuploidy, sister chromatid exchange, and micronuclei. Thus, although most studies indicated that methanol does not have the potential to be mutagenic, not all studies lead to that conclusion.
Carcinogenicity:	No data were identified for this product as a whole. Methanol, present in this product at 40 – 60%, was tested in two long-term whole body inhalation studies (24 months in rats and 18 months in mice for 20 and 19 hours per day, respectively). There was no evidence of a carcinogenic potential in rats and mice exposed to air concentrations of up to 1.3 mg/L. None of the components of this product are listed as a carcinogen by OSHA, IARC or NTP.
Reproductive Toxicity:	No data were identified for this product as a whole. Methanol, present in this product at 40 – 60%, when administered to rats via inhalation, produced a reproductive NOAEL of 0.13 mg/L for the F1 and F2 generations.

SECTION 11: TOXICOLOGICAL INFORMATION (CONT'D)

Developmental Effects:	No data were identified for this product as a whole. Methanol, present in this product at 40 – 60%, when administered to rats via inhalation, produced developmental NOAEL's ranging from 1.3 to 6.5 mg/L per day. No epidemiological studies in humans have been located to demonstrate that there is a link between methanol exposure and an increased incidence of fetal malformations or developmental impairment.
STOT – Single Exposure:	No data were identified for this product as a whole. Methanol, present in this product at 40 – 60%, causes damage to the optic nerve and the central nervous system.
STOT – Repeated Exposure:	No data were identified for this product as a whole. While not sufficient for classification, data in monkeys, rats and mice were identified that suggest a possible link between methanol exposure and neurotoxic effects, including degenerative effects in the brain, peripheral nerve damage, and degeneration of the optic nerve. In addition, increased fat granules and mild fibrosis in the liver and kidney effects have also been reported in animal studies.
Aspiration Hazard:	No data were identified for this product or its constituents.
Conclusion/Summary	Exposure may cause serious eye damage and irritation of the skin, lungs and mucous membranes. Toxic if swallowed, inhaled or on skin. Excessive exposure may cause lung injury. Swallowing large amounts may cause serious injury or death. Causes damage to the optic nerve and central nervous system. Prolonged or widespread contact could result in absorption of harmful amounts.

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity / Aquatic ecotoxicity

Product / ingredient name	Test	Result (mg/L)	Species	Exposure
Secondary Alcohol Ethoxylate Surfactant	EC ₅₀	7.3 mg/L	Water Flea (<i>Daphnia Magna</i>)	48 hour
	LC ₅₀	3.2 – 3.6 mg/L	Fathead Minnow (<i>Pimephales promelas</i>)	96 hour
	EC ₅₀	>1,000 mg/L	Bacteria	16 hour
	LC ₅₀	15,400 mg/L	Bluegill (<i>Lepomis macrochirus</i>)	96 hour
Methanol	NOEC	7,900 – 158,000 mg/L	Fish (<i>Oryzias latipes</i>)	8 day
	EC ₅₀	>10,000 mg/L	Water Flea (<i>Daphnia Magna</i>)	24 hour
	EC ₅₀	>10,000 mg/L	Water Flea (<i>Daphnia Magna</i>)	48 hour
	EC ₅₀	Ca. 22,000 mg/L	Algae (<i>Pseudokirchneriella subcapitata</i>)	96 hour
	EC ₅₀	28,440 mg/L (growth)	Algae (<i>Chlorella pyrenoidosa</i>)	10 – 14 day

12.2 Persistence and degradability

No data available for this mixture. The constituents of this mixture are expected to degrade in the environment.

12.3 Bioaccumulative potential

No data available for this mixture. Accumulation of methanol, present in this product at 40 – 60%, in fish is expected to be low.

12.4 Mobility

No data available for this product or its constituents.

12.5 Results of PBT and vPvB assessment

Not a PBT or vPvB material.

12.6 Other adverse effects

None known.

Conclusion/Summary

Toxic to aquatic life.

SECTION 13: DISPOSAL CONSIDERATIONS**13.1 Waste treatment methods**

Residual waste:	Dispose of in accordance with all applicable regulations. Contact a licensed waste disposal company to ensure proper handling.
Contaminated packaging:	Empty containers should be taken to an approved waste handling site for recycling or disposal.
Disposal methods/information:	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents / container in accordance with local, regional, national, international regulations.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

SECTION 14: TRANSPORT INFORMATION

14.1 UN Number	UN1230
14.2 UN proper shipping name	Methanol solution
14.3 Transport hazard class(es)	3
14.4 Packing group	II
14.5 Environmental hazards	Marine pollutant
14.6 Special precautions for user	None known
14.7 Transport in bulk according to Annex II MARPOL73/78 and the IBC Code	Product Name: Alcohol C-6 - C-17 (secondary)poly(7-12) ethoxylate Ship Type: 2 Pollution Category: Y

SECTION 15: REGULATORY INFORMATION**15.1 Chemical Safety Assessment**

No Chemical Safety Assessment has been carried out.

USA Federal Regulations

29 CFR 1910.1200 Hazard Communication Standard (HCS):

Hazardous

TSCA - U.S. Inventory (TSCA 8b):

Exempt/Compliant

SARA Title III – Section 302, Extremely Hazardous Substances (EHS):

Not listed

CERCLA - Hazardous substances:

Components	Concentration	Section 304 CERCLA Hazardous Substance	CERCLA Reportable Quantity	Product Reportable Quantity
Methanol	-	-	5,000 lbs	8,330 lbs

Release of CERCLA hazardous substances in excess of any reportable quantity threshold to the environment requires notification to the National Response Center (+1-800-424-8802 or +1-202-267-2675).

SARA Title III – 311/312, Hazard Classes:

Fire / Flammability Yes

Reactivity No

Release of Pressure No

Acute Health Hazard Yes

Chronic Health Hazard No

SARA 313 – Toxic Chemicals:

Methanol (1.0% de minimis)

USA State Regulations

California Prop 65:

Methanol

Massachusetts – Right-to-Know:

Methanol

New Jersey – Right-to-Know:

Methanol

Pennsylvania – Right-to-Know:

Methanol

Other Regulations:

None specified

SECTION 16: OTHER INFORMATION**Label Requirements**

This product has been classified as hazardous and requires labeling.

List of abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
AIHA	American Industrial Hygiene Association
CAS	Chemical Abstract Service
CFR	Code of Federal Regulations
EC50/90	Effective Concentration (median / 90th percentile)
IARC	International Agency for Research on Cancer
IDLH	Immediately Dangerous to Life and Health
LC50/90	Lethal Concentration (median / 90th percentile)
NOEC	No Observed Effect Concentration
NIOSH	National Institute of Occupational Safety and Health
NTP	National Toxicology Program
OSHA	Occupational Safety and Health Administration (United States)
PEL	Permissible Exposure Limit
PBT	Persistent, Bioaccumulative and Toxic
SARA	Superfund Amendments and Reauthorization Act
SDS	Safety Data Sheet
STEL	Short Term Exposure Limit
TLV	Threshold Limit Value
TSCA	Toxic Substances Control Act
TWA	Time Weighted Average
vPvB	Very Persistent and Very Bioaccumulative

References

ChemAdvisor List of Lists (LOLI)
IARC Monographs. Overall Evaluation of Carcinogenicity
OECD SIAR
ECHA Dissemination Portal
Supplier SDS

Information on evaluation method leading to the classification of mixture

The classification for health and environmental hazards is derived by a combination of calculation methods and test data, if available. For details refer to Sections 9, 11 and 12.

SECTION 16: OTHER INFORMATION (CONT'D)**Training information**

Follow training instructions when handling this material.

SDS Revisions

SDS prepared on 23 January 2015.

Disclaimer

The information in the sheet was written based on the best knowledge and experience currently available.