

SAFETY DATA SHEET

1. Identification

Product identifier	EPA Method 554 Carbonyl Mixture		
Other means of identification			
Item	M-EPA554CARBA4		
Recommended use	For Laboratory Use Only		
Recommended restrictions	None known.		
Manufacturer/Importer/Supplier/Distributor information			
Manufacturer			
Company name	Chem Service, Inc.		
Address	660 Tower Lane West Chester, PA 19380 United States		
Telephone	Toll Free	800-452-9994	
	Direct	610-692-3026	
Website	www.chemservice.com		
E-mail	info@chemservice.com		
Emergency phone number	Chemtrec US	800-424-9300	
	Chemtrec outside US	+1 703-527-3887	

2. Hazard(s) identification

Physical hazards	Flammable liquids	Category 2
Health hazards	Acute toxicity, oral	Category 3
	Acute toxicity, dermal	Category 3
	Acute toxicity, inhalation	Category 3
	Serious eye damage/eye irritation	Category 2A
	Sensitization, skin	Category 1
	Carcinogenicity	Category 1
Environmental hazards	Hazardous to the aquatic environment, acute hazard	Category 3
OSHA defined hazards	Not classified.	
Label elements		



Signal word	Danger
Hazard statement	Highly flammable liquid and vapor. Toxic if swallowed. Toxic in contact with skin. May cause an allergic skin reaction. Causes serious eye irritation. Toxic if inhaled. May cause cancer. Harmful to aquatic life.
Precautionary statement	
Prevention	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. 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 or vapor. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Contaminated work clothing must not be allowed out of the workplace. Avoid release to the environment. Wear eye protection/face protection. Wear protective gloves/protective clothing/eye protection/face protection.

Response	If swallowed: Immediately call a poison center/doctor. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If inhaled: Remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a poison center/doctor. Rinse mouth. If skin irritation or rash occurs: Get medical advice/attention. If eye irritation persists: Get medical advice/attention. Take off immediately all contaminated clothing and wash it before reuse. In case of fire: Use appropriate media to extinguish.
Storage	Store in a well-ventilated place. Keep container tightly closed. Store in a well-ventilated place. Keep cool. Store locked up.
Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.
Hazard(s) not otherwise classified (HNOC)	Static accumulating flammable liquid can become electrostatically charged even in bonded and grounded equipment. Sparks may ignite liquid and vapor. May cause flash fire or explosion.
Supplemental information	0.2% of the mixture consists of component(s) of unknown acute oral toxicity. 0.3% of the mixture consists of component(s) of unknown acute dermal toxicity. 0.5% of the mixture consists of component(s) of unknown acute inhalation toxicity. 99.2% of the mixture consists of component(s) of unknown acute hazards to the aquatic environment.

3. Composition/information on ingredients

Mixtures

Chemical name	Common name and synonyms	CAS number	%
Acetonitrile		75-05-8	98 - 99
Acetaldehyde		75-07-0	0.1
Benzaldehyde		100-52-7	0.1
Crotonaldehyde		4170-30-3	0.1
Cyclohexanone		108-94-1	0.1
Decyl aldehyde		112-31-2	0.1
Formaldehyde		50-00-0	0.1
Heptaldehyde		111-71-7	0.1
Hexaldehyde		66-25-1	0.1
n-Butyraldehyde		123-72-8	0.1
Nonanal		124-19-6	0.1
Octyl aldehyde		124-13-0	0.1
Propionaldehyde		123-38-6	0.1
Valeraldehyde		110-62-3	0.1

Composition comments Inhibited with 1000 ppm Hydroquinone.

4. First-aid measures

Inhalation	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Oxygen or artificial respiration if needed. Do not use mouth-to-mouth method if victim inhaled the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Call a POISON CENTER or doctor/physician.
Skin contact	Remove contaminated clothing immediately and wash skin with soap and water. Get medical advice/attention if you feel unwell. In case of eczema or other skin disorders: Seek medical attention and take along these instructions. Wash contaminated clothing before reuse.
Eye contact	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.
Ingestion	Call a physician or poison control center immediately. Rinse mouth. Do not induce vomiting without advice from poison control center. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Do not use mouth-to-mouth method if victim ingested the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.
Most important symptoms/effects, acute and delayed	Convulsions. Nausea, vomiting. Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. May cause an allergic skin reaction. Dermatitis. Rash.

Indication of immediate medical attention and special treatment needed	Provide general supportive measures and treat symptomatically. Thermal burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital. Keep victim warm. Keep victim under observation. Symptoms may be delayed.
General information	Take off immediately all contaminated clothing. IF exposed or concerned: Get medical advice/attention. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before reuse.
5. Fire-fighting measures	
Suitable extinguishing media	Alcohol resistant foam. Water fog. Carbon dioxide (CO ₂). Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.
Specific hazards arising from the chemical	Vapors may form explosive mixtures with air. Vapors may travel considerable distance to a source of ignition and flash back. This product is a poor conductor of electricity and can become electrostatically charged. If sufficient charge is accumulated, ignition of flammable mixtures can occur. To reduce potential for static discharge, use proper bonding and grounding procedures. This liquid may accumulate static electricity when filling properly grounded containers. Static electricity accumulation may be significantly increased by the presence of small quantities of water or other contaminants. Material will float and may ignite on surface of water. During fire, gases hazardous to health may be formed.
Special protective equipment and precautions for firefighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
Fire fighting equipment/instructions	In case of fire and/or explosion do not breathe fumes. Move containers from fire area if you can do so without risk.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	Highly flammable liquid and vapor.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Wear appropriate protective equipment and clothing during clean-up. Avoid inhalation of vapors and spray mists. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them. Use appropriate containment to avoid environmental contamination. Transfer by mechanical means such as vacuum truck to a salvage tank or other suitable container for recovery or safe disposal. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up	Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Take precautionary measures against static discharge. Use only non-sparking tools. Keep combustibles (wood, paper, oil, etc.) away from spilled material. Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Prevent product from entering drains. Following product recovery, flush area with water. Small Spills: Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination. Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.
Environmental precautions	Avoid release to the environment. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground. Inform appropriate managerial or supervisory personnel of all environmental releases. Use appropriate containment to avoid environmental contamination.

7. Handling and storage

Precautions for safe handling

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. Explosion-proof general and local exhaust ventilation. Minimize fire risks from flammable and combustible materials (including combustible dust and static accumulating liquids) or dangerous reactions with incompatible materials. Handling operations that can promote accumulation of static charges include but are not limited to: mixing, filtering, pumping at high flow rates, splash filling, creating mists or sprays, tank and container filling, tank cleaning, sampling, gauging, switch loading, vacuum truck operations. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Use non-sparking tools and explosion-proof equipment. Avoid inhalation of vapors and spray mists. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. Do not taste or swallow. When using, do not eat, drink or smoke. Should be handled in closed systems, if possible. Use only outdoors or in a well-ventilated area. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Avoid release to the environment. Wash contaminated clothing before reuse. Observe good industrial hygiene practices.

For additional information on equipment bonding and grounding, refer to the Canadian Electrical Code in Canada, (CSA C22.1), or the American Petroleum Institute (API) Recommended Practice 2003, "Protection Against Ignitions Arising out of Static, Lightning, and Stray Currents" or National Fire Protection Association (NFPA) 77, "Recommended Practice on Static Electricity" or National Fire Protection Association (NFPA) 70, "National Electrical Code".

Conditions for safe storage, including any incompatibilities

Store locked up. Keep away from heat, sparks and open flame. Prevent electrostatic charge build-up by using common bonding and grounding techniques. Eliminate sources of ignition. Avoid spark promoters. Ground/bond container and equipment. These alone may be insufficient to remove static electricity. Store in a cool, dry place out of direct sunlight. Store in original tightly closed container. Store in a well-ventilated place. Keep in an area equipped with sprinklers. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Components	Type	Value
Formaldehyde (CAS 50-00-0)	STEL	2 ppm
	TWA	0.75 ppm

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value
Acetaldehyde (CAS 75-07-0)	PEL	360 mg/m3
Acetonitrile (CAS 75-05-8)	PEL	200 ppm
		70 mg/m3
		40 ppm
Crotonaldehyde (CAS 4170-30-3)	PEL	6 mg/m3
		2 ppm
Cyclohexanone (CAS 108-94-1)	PEL	200 mg/m3
		50 ppm

US. ACGIH Threshold Limit Values

Components	Type	Value
Acetaldehyde (CAS 75-07-0)	Ceiling	25 ppm
Acetonitrile (CAS 75-05-8)	TWA	20 ppm
Crotonaldehyde (CAS 4170-30-3)	Ceiling	0.3 ppm
Cyclohexanone (CAS 108-94-1)	STEL	50 ppm
	TWA	20 ppm
Formaldehyde (CAS 50-00-0)	Ceiling	0.3 ppm

US. ACGIH Threshold Limit Values

Components	Type	Value
Propionaldehyde (CAS 123-38-6)	TWA	20 ppm
Valeraldehyde (CAS 110-62-3)	TWA	50 ppm

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value
Acetonitrile (CAS 75-05-8)	TWA	34 mg/m3 20 ppm
Crotonaldehyde (CAS 4170-30-3)	TWA	6 mg/m3 2 ppm
Cyclohexanone (CAS 108-94-1)	TWA	100 mg/m3 25 ppm
Formaldehyde (CAS 50-00-0)	Ceiling	0.1 ppm
Valeraldehyde (CAS 110-62-3)	TWA	0.016 ppm 175 mg/m3
		50 ppm

US. Workplace Environmental Exposure Level (WEEL) Guides

Components	Type	Value
Benzaldehyde (CAS 100-52-7)	STEL	17.4 mg/m3
	TWA	4 ppm 8.7 mg/m3
n-Butyraldehyde (CAS 123-72-8)	TWA	2 ppm 75 mg/m3
Propionaldehyde (CAS 123-38-6)	TWA	25 ppm 47.6 mg/m3
		20 ppm

Biological limit values**ACGIH Biological Exposure Indices**

Components	Value	Determinant	Specimen	Sampling Time
Cyclohexanone (CAS 108-94-1)	80 mg/l	1,2-Cyclohexanediol, with hydrolysis	Urine	*
	8 mg/l	Cyclohexanol, with hydrolysis	Urine	*

* - For sampling details, please see the source document.

Exposure guidelines**US - California OELs: Skin designation**

Acetonitrile (CAS 75-05-8)	Can be absorbed through the skin.
Crotonaldehyde (CAS 4170-30-3)	Can be absorbed through the skin.
Cyclohexanone (CAS 108-94-1)	Can be absorbed through the skin.

US - Minnesota Haz Subs: Skin designation applies

Acetonitrile (CAS 75-05-8)	Skin designation applies.
Cyclohexanone (CAS 108-94-1)	Skin designation applies.

US - Tennessee OELs: Skin designation

Cyclohexanone (CAS 108-94-1)	Can be absorbed through the skin.
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US ACGIH Threshold Limit Values: Skin designation

Acetonitrile (CAS 75-05-8)	Can be absorbed through the skin.
Crotonaldehyde (CAS 4170-30-3)	Can be absorbed through the skin.
Cyclohexanone (CAS 108-94-1)	Can be absorbed through the skin.

US NIOSH Pocket Guide to Chemical Hazards: Skin designation

Cyclohexanone (CAS 108-94-1)

Can be absorbed through the skin.

Appropriate engineering controls

Explosion-proof general and local exhaust ventilation. Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Provide eyewash station. Eye wash fountain and emergency showers are recommended.

Individual protection measures, such as personal protective equipment

Eye/face protection

Chemical respirator with organic vapor cartridge and full facepiece.

Skin protection

Hand protection

Wear appropriate chemical resistant gloves. Suitable gloves can be recommended by the glove supplier.

Other

Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended.

Respiratory protection

Chemical respirator with organic vapor cartridge and full facepiece.

Thermal hazards

Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations

When using do not smoke. Keep away from food and drink. 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. Contaminated work clothing should not be allowed out of the workplace.

9. Physical and chemical properties

Appearance

Physical state

Liquid.

Form

Liquid.

Color

Not available.

Odor

Not available.

Odor threshold

Not available.

pH

Not available.

Melting point/freezing point

-49 °F (-45 °C) estimated

Initial boiling point and boiling range

178.88 °F (81.6 °C) estimated

Flash point

42.0 °F (5.6 °C) estimated

Evaporation rate

Not available.

Flammability (solid, gas)

Not applicable.

Upper/lower flammability or explosive limits

Flammability limit - lower (%)

3 % estimated

Flammability limit - upper (%)

16 % estimated

Explosive limit - lower (%)

Not available.

Explosive limit - upper (%)

Not available.

Vapor pressure

118.39 hPa estimated

Vapor density

Not available.

Relative density

Not available.

Solubility(ies)

Solubility (water)

Not available.

Partition coefficient (n-octanol/water)

Not available.

Auto-ignition temperature

975.2 °F (524 °C) estimated

Decomposition temperature

Not available.

Viscosity

Not available.

Other information

Density	0.7881 g/cm3 estimated
Explosive properties	Not explosive.
Flammability class	Flammable IB estimated
Oxidizing properties	Not oxidizing.
Percent volatile	99.4 % estimated
Specific gravity	0.79 estimated
VOC (Weight %)	99.4 % estimated

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	Avoid heat, sparks, open flames and other ignition sources. Avoid temperatures exceeding the flash point. Contact with incompatible materials.
Incompatible materials	Strong oxidizing agents.
Hazardous decomposition products	No hazardous decomposition products are known.

11. Toxicological information

Information on likely routes of exposure

Inhalation	Toxic if inhaled.
Skin contact	Toxic in contact with skin. May cause an allergic skin reaction.
Eye contact	Causes serious eye irritation.
Ingestion	Toxic if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics	Convulsions. Nausea, vomiting. Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. May cause an allergic skin reaction. Dermatitis. Rash.
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Information on toxicological effects

Acute toxicity	Toxic if inhaled. Toxic in contact with skin. Toxic if swallowed. May cause an allergic skin reaction.
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Components	Species	Test Results
Acetaldehyde (CAS 75-07-0)		
<u>Acute</u>		
Dermal		
LD50	Rabbit	3540 mg/kg
Inhalation		
LC50	Hamster	17000 ppm, 4 Hours
		31 mg/l, 4 Hours
	Mouse	1500 ppm, 4 Hours
<i>Vapor</i>		
LC50	Rat	24040 mg/m3, 4 Hours
		13300 ppm, 4 Hours
LC50	Rat	37 mg/l, 30 Minutes
		24 mg/l, 4 Hours
Oral		
LD50	Dog	> 600 mg/kg
	Mouse	1230 mg/kg
	Rat	661 mg/kg

Components	Species	Test Results
Acetonitrile (CAS 75-05-8)		
<u>Acute</u>		
Dermal		
LD50	Rabbit	390 mg/kg 0.5 ml/kg
Inhalation		
LC100	Dog	16000 ppm, 4 Hours
LC50	Guinea pig	5655 ppm, 4 Hours
	Mouse	3587 ppm, 4 Hours 2693 ppm, 1 Hours
	Rabbit	2825 ppm, 4 Hours
	Rat	17100 ppm, 4 Hours 7500 ppm, 8 Hours 330 ppm, 90 Days 75 mg/l
	Guinea pig	140 mg/kg 0.177 ml/kg
	Mouse	269 mg/kg
	Rat	158 mg/kg 1.68 - 4.49 ml/kg
Other		
LD50	Mouse	0.25 g/kg
	Rat	1100 mg/kg 0.85 ml/kg
Benzaldehyde (CAS 100-52-7)		
<u>Acute</u>		
Dermal		
LD50	Guinea pig	> 2000 mg/kg
Inhalation		
<i>Vapor/aerosol</i>		
LC50	Rat	1 - 5 mg/l, 4 Hours
Oral		
LD50	Guinea pig	1000 mg/kg
	Rat	1300 mg/kg 1.43 ml/kg
Crotonaldehyde (CAS 4170-30-3)		
<u>Acute</u>		
Dermal		
LD50	Guinea pig	30 mg/kg, Hours 26 mg/kg
Inhalation		
LC50	Mouse	200 mg/m3 1.51 mg/l, 2 Hours
	Rat	0.16 - 0.48 mg/l, 6 Hours 247 mg/m3 120 ppm

Components	Species	Test Results
<i>Vapor</i>		
LC50	Rat	100 % (saturated), 3 Minutes
LC50	Rat	4 mg/l, 30 Minutes
		0.2 mg/l, 2 Hours
Oral		
LD50	Rat	165 mg/kg
Cyclohexanone (CAS 108-94-1)		
<u>Acute</u>		
Inhalation		
<i>Vapor</i>		
LC50	Rat	> 6.2 mg/l, 4 Hours
Oral		
LD50	Rat	1620 mg/kg
Formaldehyde (CAS 50-00-0)		
<u>Acute</u>		
Inhalation		
LC50	Mouse	0.414 mg/l, 4 Hours
		0.4 mg/l, 2 Hours
<i>Gas</i>		
LC50	Rat	1000 mg/m3, 30 Minutes
LC50	Rat	0.82 mg/l, 0.5 Hours
		0.48 mg/l, 4 Hours
Oral		
LD50	Guinea pig	260 mg/kg
	Mouse	42 mg/kg
	Rat	460 mg/kg
Heptaldehyde (CAS 111-71-7)		
<u>Acute</u>		
Dermal		
LD50	Rabbit	> 5000 mg/kg
Oral		
LD50	Mouse	20 g/kg
	Rat	> 5000 mg/kg
Hexaldehyde (CAS 66-25-1)		
<u>Acute</u>		
Oral		
LD50	Rat	4890 mg/kg
n-Butyraldehyde (CAS 123-72-8)		
<u>Acute</u>		
Dermal		
LD50	Rabbit	3560 mg/kg
Inhalation		
LC50	Mouse	44.61 mg/l, 2 Hours
<i>Vapor</i>		
LC50	Rat	> 5.46 mg/l, 4 Hours
LC50	Rat	60000 ppm, 30 Minutes
Oral		
LD50	Rat	5890 mg/kg

Components	Species	Test Results
Nonanal (CAS 124-19-6)		
<u>Acute</u>		
Dermal		
LD50	Rabbit	> 5000 ml/kg
Oral		
LD50	Rat	> 5000 ml/kg
Octyl aldehyde (CAS 124-13-0)		
<u>Acute</u>		
Dermal		
LD50	Rabbit	5207 mg/kg, 24 Hours 6.35 ml/kg, 24 Hours
Inhalation		
<i>Vapor</i>		
LC50	Rat	> 830 mg/m3
Oral		
LD50	Rat	4617 mg/kg 5.63 ml/kg
Propionaldehyde (CAS 123-38-6)		
<u>Acute</u>		
Dermal		
LD50	Rabbit	2460 mg/kg, 24 Hours
Inhalation		
LC50	Mouse	9000 ppm, 2 Hours
<i>Vapor</i>		
LC50	Rat	> 4.6 mg/l, 4 Hours
LC50	Rat	26000 ppm, 30 Minutes
Oral		
LD50	Rat	1690 mg/kg
Valeraldehyde (CAS 110-62-3)		
<u>Acute</u>		
Dermal		
LD50	Guinea pig	20000 mg/kg
	Rabbit	4857 mg/kg, 24 Hours
Inhalation		
<i>Vapor</i>		
LC50	Rat	14.3 mg/l
Oral		
LD50	Mouse	6400 mg/kg
	Rat	6490 mg/kg

* Estimates for product may be based on additional component data not shown.

Skin corrosion/irritation Prolonged skin contact may cause temporary irritation.

Serious eye damage/eye irritation Causes serious eye irritation.

Respiratory or skin sensitization

ACGIH sensitization

Formaldehyde (CAS 50-00-0) Sensitizer.

Respiratory sensitization Not a respiratory sensitizer.

Skin sensitization May cause an allergic skin reaction.

Germ cell mutagenicity No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity May cause cancer.

IARC Monographs. Overall Evaluation of Carcinogenicity

Crotonaldehyde (CAS 4170-30-3)	3 Not classifiable as to carcinogenicity to humans.
Cyclohexanone (CAS 108-94-1)	3 Not classifiable as to carcinogenicity to humans.
Formaldehyde (CAS 50-00-0)	1 Carcinogenic to humans.

US. National Toxicology Program (NTP) Report on Carcinogens

Acetaldehyde (CAS 75-07-0)	Reasonably Anticipated to be a Human Carcinogen.
Formaldehyde (CAS 50-00-0)	Known To Be Human Carcinogen.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Formaldehyde (CAS 50-00-0)	Cancer
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Reproductive toxicity This product is not expected to cause reproductive or developmental effects.

Specific target organ toxicity - single exposure Not classified.

Specific target organ toxicity - repeated exposure Not classified.

Aspiration hazard Not an aspiration hazard.

Chronic effects Prolonged inhalation may be harmful.

12. Ecological information

Ecotoxicity Harmful to aquatic life.

Components		Species	Test Results
Acetaldehyde (CAS 75-07-0)			
Aquatic			
Crustacea	EC50	Water flea (<i>Daphnia magna</i>)	39.4 - 59.1 mg/l, 48 hours
Fish	LC50	Fathead minnow (<i>Pimephales promelas</i>)	28 - 34 mg/l, 96 hours
Acetonitrile (CAS 75-05-8)			
Aquatic			
Fish	LC50	Fathead minnow (<i>Pimephales promelas</i>)	> 100 mg/l, 96 hours
Benzaldehyde (CAS 100-52-7)			
Aquatic			
Fish	LC50	Bluegill (<i>Lepomis macrochirus</i>)	0.8 - 1.44 mg/l, 96 hours
Crotonaldehyde (CAS 4170-30-3)			
Aquatic			
Fish	LC50	Inland silverside (<i>Menidia beryllina</i>)	1.3 mg/l, 96 hours
Cyclohexanone (CAS 108-94-1)			
Aquatic			
Fish	LC50	Fathead minnow (<i>Pimephales promelas</i>)	481 - 578 mg/l, 96 hours
Formaldehyde (CAS 50-00-0)			
Aquatic			
Crustacea	EC50	Water flea (<i>Daphnia pulex</i>)	4.3 - 7.8 mg/l, 48 hours
Fish	LC50	Striped bass (<i>Morone saxatilis</i>)	10.302 - 16.743 mg/l, 96 hours
Hexaldehyde (CAS 66-25-1)			
Aquatic			
Fish	LC50	Fathead minnow (<i>Pimephales promelas</i>)	21 - 23 mg/l, 96 hours
n-Butyraldehyde (CAS 123-72-8)			
Aquatic			
Fish	LC50	Fathead minnow (<i>Pimephales promelas</i>)	13 - 13.8 mg/l, 96 hours
Propionaldehyde (CAS 123-38-6)			
Aquatic			
Fish	LC50	Inland silverside (<i>Menidia beryllina</i>)	100 mg/l, 96 hours

Components	Species	Test Results
Valeraldehyde (CAS 110-62-3)		
Aquatic		
Fish	LC50	Fathead minnow (Pimephales promelas) 11.3 - 13.6 mg/l, 96 hours

* Estimates for product may be based on additional component data not shown.

Persistence and degradability No data is available on the degradability of this product.

Bioaccumulative potential

Partition coefficient n-octanol / water (log Kow)

Acetonitrile	-0.34
Benzaldehyde	1.48
Cyclohexanone	0.81
Formaldehyde	0.35
Hexaldehyde	1.78
n-Butyraldehyde	0.88
Nonanal	3.27

Mobility in soil No data available.

Other adverse effects No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations.
Local disposal regulations	Dispose in accordance with all applicable regulations.
Hazardous waste code	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Waste from residues / unused products	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT

UN number	UN1648
UN proper shipping name	Acetonitrile, solution (Acetonitrile RQ = 5066 LBS)
Transport hazard class(es)	
Class	3
Subsidiary risk	-
Label(s)	3
Packing group	II
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
Special provisions	IB2, T7, TP2
Packaging exceptions	150
Packaging non bulk	202
Packaging bulk	242

IATA

UN number	UN1648
UN proper shipping name	Acetonitrile solution (Acetonitrile)
Transport hazard class(es)	
Class	3
Subsidiary risk	-
Packing group	II
Environmental hazards	No.
ERG Code	3L
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

Other information

Passenger and cargo aircraft Allowed.

Cargo aircraft only Allowed.

IMDG

UN number UN1648

UN proper shipping name ACETONITRILE SOLUTION (Acetonitrile)

Transport hazard class(es)

Class 3

Subsidiary risk -

Packing group II

Environmental hazards

Marine pollutant No.

EmS F-E, S-D

Special precautions for user Read safety instructions, SDS and emergency procedures before handling.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not established.

DOT**IATA; IMDG****15. Regulatory information**

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Acetaldehyde (CAS 75-07-0) 0.1 % One-Time Export Notification only.

CERCLA Hazardous Substance List (40 CFR 302.4)

Acetaldehyde (CAS 75-07-0) Listed.

Acetonitrile (CAS 75-05-8) Listed.

Crotonaldehyde (CAS 4170-30-3) Listed.

Cyclohexanone (CAS 108-94-1) Listed.

Formaldehyde (CAS 50-00-0) Listed.

Hexaldehyde (CAS 66-25-1) Listed.

n-Butyraldehyde (CAS 123-72-8) Listed.

Propionaldehyde (CAS 123-38-6) Listed.

Valeraldehyde (CAS 110-62-3) Listed.

SARA 304 Emergency release notification

Crotonaldehyde (CAS 4170-30-3) 100 LBS

Formaldehyde (CAS 50-00-0) 100 LBS

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Formaldehyde (CAS 50-00-0)

Cancer
 Skin sensitization
 Respiratory sensitization
 Eye irritation
 Skin irritation
 respiratory tract irritation
 Acute toxicity
 Flammability

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories
 Immediate Hazard - Yes
 Delayed Hazard - Yes
 Fire Hazard - Yes
 Pressure Hazard - No
 Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Chemical name	CAS number	Reportable quantity	Threshold planning quantity	Threshold planning quantity, lower value	Threshold planning quantity, upper value
Crotonaldehyde	4170-30-3	100	1000 lbs		
Formaldehyde	50-00-0	100	500 lbs		

SARA 311/312 Hazardous chemical
 No

SARA 313 (TRI reporting)

Chemical name	CAS number	% by wt.
Acetonitrile	75-05-8	98 - 99
Acetaldehyde	75-07-0	0.1
Formaldehyde	50-00-0	0.1

Other federal regulations**Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List**

Acetaldehyde (CAS 75-07-0)
 Acetonitrile (CAS 75-05-8)
 Formaldehyde (CAS 50-00-0)
 Propionaldehyde (CAS 123-38-6)

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Acetaldehyde (CAS 75-07-0)
 Crotonaldehyde (CAS 4170-30-3)
 Formaldehyde (CAS 50-00-0)

Safe Drinking Water Act (SDWA)
 Not regulated.

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))

Benzaldehyde (CAS 100-52-7) 50 %WV

DEA Exempt Chemical Mixtures Code Number

Benzaldehyde (CAS 100-52-7) 8256

US state regulations**US - New Jersey RTK - Substances: Listed substance**

Acetaldehyde (CAS 75-07-0)
 Acetonitrile (CAS 75-05-8)
 Benzaldehyde (CAS 100-52-7)
 Crotonaldehyde (CAS 4170-30-3)
 Cyclohexanone (CAS 108-94-1)
 Formaldehyde (CAS 50-00-0)
 Hexaldehyde (CAS 66-25-1)
 n-Butyraldehyde (CAS 123-72-8)
 Propionaldehyde (CAS 123-38-6)
 Valeraldehyde (CAS 110-62-3)

US - Pennsylvania RTK - Hazardous Substances: Special hazard

Formaldehyde (CAS 50-00-0)

US. California Controlled Substances. CA Department of Justice (California Health and Safety Code Section 11100)

Not listed.

US. California. Candidate Chemicals List. Safer Consumer Products Regulations (Cal. Code Regs, tit. 22, 69502.3, subd. (a))

Acetaldehyde (CAS 75-07-0)
Acetonitrile (CAS 75-05-8)
Formaldehyde (CAS 50-00-0)
Propionaldehyde (CAS 123-38-6)

US. Massachusetts RTK - Substance List

Acetaldehyde (CAS 75-07-0)
Acetonitrile (CAS 75-05-8)
Benzaldehyde (CAS 100-52-7)
Crotonaldehyde (CAS 4170-30-3)
Cyclohexanone (CAS 108-94-1)
Formaldehyde (CAS 50-00-0)
Hexaldehyde (CAS 66-25-1)
n-Butyraldehyde (CAS 123-72-8)
Octyl aldehyde (CAS 124-13-0)
Propionaldehyde (CAS 123-38-6)
Valeraldehyde (CAS 110-62-3)

US. New Jersey Worker and Community Right-to-Know Act

Acetaldehyde (CAS 75-07-0)
Acetonitrile (CAS 75-05-8)
Crotonaldehyde (CAS 4170-30-3)
Formaldehyde (CAS 50-00-0)
n-Butyraldehyde (CAS 123-72-8)
Propionaldehyde (CAS 123-38-6)

US. Pennsylvania RTK - Hazardous Substances

Acetaldehyde (CAS 75-07-0)
Acetonitrile (CAS 75-05-8)
Benzaldehyde (CAS 100-52-7)
Cyclohexanone (CAS 108-94-1)
Formaldehyde (CAS 50-00-0)
Hexaldehyde (CAS 66-25-1)
n-Butyraldehyde (CAS 123-72-8)
Propionaldehyde (CAS 123-38-6)
Valeraldehyde (CAS 110-62-3)

US. Pennsylvania Worker and Community Right-to-Know Law

Acetaldehyde (CAS 75-07-0)
Acetonitrile (CAS 75-05-8)
Benzaldehyde (CAS 100-52-7)
Cyclohexanone (CAS 108-94-1)
Formaldehyde (CAS 50-00-0)
Hexaldehyde (CAS 66-25-1)
n-Butyraldehyde (CAS 123-72-8)
Propionaldehyde (CAS 123-38-6)
Valeraldehyde (CAS 110-62-3)

US. Rhode Island RTK

Acetaldehyde (CAS 75-07-0)
Acetonitrile (CAS 75-05-8)
Crotonaldehyde (CAS 4170-30-3)
Cyclohexanone (CAS 108-94-1)
Formaldehyde (CAS 50-00-0)
n-Butyraldehyde (CAS 123-72-8)
Propionaldehyde (CAS 123-38-6)

US. California Proposition 65

WARNING: This product contains a chemical known to the State of California to cause cancer.

US - California Proposition 65 - CRT: Listed date/Carcinogenic substance

Acetaldehyde (CAS 75-07-0)	Listed: April 1, 1988
Formaldehyde (CAS 50-00-0)	Listed: January 1, 1988

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes

Country(s) or region	Inventory name	On inventory (yes/no)*
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date 05-19-2016
Revision date 05-19-2016
Version # 02
NFPA ratings Health: 3
Flammability: 3
Instability: 0

Disclaimer

The above information is believed to be correct on the date it was last revised and must not be considered all inclusive. The information has been obtained only by a search of available literature and is only a guide for handling the chemicals. OSHA regulations require that if other hazards become evident, an upgraded SDS must be made available to the employee within three months. RESPONSIBILITY for updates lies with the employer and not with CHEM SERVICE, Inc.

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