

Safety Data Sheet

Modified Davidson's Fixative

Section 1 - Chemical Product and Company Identification

SDS Name: Modified Davidson's Fixative

Catalog Numbers: SO-834, F-88

Company Identification: Transene Company, Inc., DBA ROWLEY BIOCHEMICAL, Inc.
10 ELECTRONICS AVENUE
DANVERS, MA 01923

For information, call: 978-739-4883

Emergency Number: 800-424-9300

For CHEMTREC assistance, call: 800-424-9300

Section 2 - Hazards Identification

GHS Classifications

H225-Flammable liquids: 2

H290-Corrosive to metals: 1

H302-Acute toxicity, oral: 4

H311-Acute toxicity, dermal: 3

H314-Skin corrosion/irritation: 1B

H317-Sensitisation, skin: 1

H318-Serious eye damage/eye irritation: 1

H331-Acute toxicity, inhalation: 3

H335-Specific target organ toxicity, single exposure: 3

H341-Germ cell mutagenicity: 2

H350-Carcinogenicity: 1A

H370-Specific target organ toxicity, single exposure: 1

H372-Specific target organ toxicity, repeated exposure: 1

H401-Hazardous to the aquatic environment, acute toxicity: 2

Pictograms or Hazard symbols and Hazard statement(s):



Signal Word: Danger

Hazard Statements:

H225-Highly flammable liquid and vapour
H290-May be corrosive to metals
H302-Harmful if swallowed
H311-Toxic in contact with skin
H314-Causes severe skin burns and eye damage
H317-May cause an allergic skin reaction
H318-Causes serious eye damage
H331-Toxic if inhaled
H335-May cause respiratory irritation
H341-Suspected of causing genetic defects
H350-May cause cancer
H370-Causes damage to organs (target organs: respiratory system, central nervous system, and optic nerve)
H372-Causes damage to organs through prolonged or repeated exposure (target organs: kidney, liver, heart, spleen, and blood)
H401-Toxic to aquatic life

Precautionary Statements:

P201-Obtain special instructions before use.
P202-Do not handle until all safety precautions have been read and understood.
P210-Keep away from heat, hot surfaces, sparks, open flames, and other ignition sources. No smoking.
P233-Keep container tightly closed.
P234-Keep only in original packaging.
P240-Ground and bond container and receiving equipment.
P241-Use explosion-proof electrical/ventilating/lighting/equipment.
P242-Use non-sparking tools.
P243-Take action to prevent static discharges.
P260-Do not breathe dust/fume/gas/mist/vapours/spray.
P261-Avoid breathing dust/fume/gas/mist/vapours/spray.
P264-Wash thoroughly after handling.
P270-Do not eat, drink, or smoke when using this product.
P271-Use only outdoors or in a well-ventilated area.
P272-Contaminated work clothing should not be allowed out of the workplace.
P273-Avoid release to the environment.
P280-Wear protective gloves/protective clothing/eye protection/face protection.
P301+P312-If swallowed: Call a Poison Center/doctor if you feel unwell.
P301+P330+P331-If swallowed: Rinse mouth. Do NOT induce vomiting.
P302+P352-If on skin: Wash with plenty of soap and water.
P303+P361+P353-If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340-If Inhaled: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338-If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P311-If exposed or concerned: Call a Poison Center/doctor.
P308+P313-If exposed or concerned: Get medical advice/attention.
P310-Immediately call a Poison Center/doctor.
P311-Call a Poison Center/doctor.
P312-Call a Poison Center/doctor if you feel unwell.
P314-Get medical advice/attention if you feel unwell.
P330-Rinse mouth.
P333+P313-If skin irritation or rash occurs: Get medical advice/attention.
P361+P364-Take off immediately all contaminated clothing and wash it before reuse.

P362+P364-Take off contaminated clothing and wash it before reuse.
P363-Wash contaminated clothing before reuse.
P370+P378-In case of fire: Use dry chemical, carbon dioxide, dry sand, water spray, or alcohol-resistant foam to extinguish.
P390-Absorb spillage to prevent material damage.
P403+P233-Store in a well-ventilated place. Keep container tightly closed.
P403+P235-Store in a well-ventilated place. Keep cool.
P405-Store locked up.
P406-Store in a corrosion resistant container with a resistant inner liner.
P501-Dispose of contents/container in accordance with local/regional/national/international regulations.

Section 3 - Composition, Information on Ingredients

| CAS# | Chemical Name | Percent |
|-----------|----------------------|---------|
| 50-00-0 | Formaldehyde, 37-40% | 9 v/v |
| 64-17-5 | Ethyl alcohol | 14 v/v |
| 64-19-7 | Glacial Acetic Acid | 5 v/v |
| 67-56-1 | Methyl alcohol | 2 v/v |
| 7732-18-5 | Water | Balance |

Section 4 - First Aid Measures

Eye Exposure: In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Remove contact lenses if present. Get immediate medical attention.

Dermal Exposure: In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Get immediate medical attention. Wash clothing and shoes before reuse.

Oral Exposure: If swallowed, get immediate medical advice. Do NOT induce vomiting. Rinse mouth with water.

Inhalation Exposure: If inhaled, remove to fresh air. Get immediate medical attention.

Section 5 - Fire Fighting Measures

General Information: Containers can build up pressure if exposed to heat and/or fire. As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back. Will burn if involved in a fire. Flammable Liquid. Can release vapors that form explosive mixtures at temperatures above the flashpoint. Use water spray to keep fire-exposed containers cool. Containers may explode in the heat of a fire.

Extinguishing Media: For small fires, use dry chemical, carbon dioxide, dry sand, water spray or alcohol-resistant foam. For large fires, use water spray, fog, or alcohol-resistant foam. Use water spray to cool fire-exposed containers. Water may be ineffective. Do NOT use straight streams of water.

Hazardous Combustion Products: Carbon oxides, hydrogen, formaldehyde, irritating and toxic fumes and gases.

Flash Point: Not available

Autoignition Temperature: Not available

Explosion Limits, Lower: Not available

Upper: Not available

NFPA Rating: (estimated) Health: 3; Flammability: 3; Instability: 0

Note: Causes burns of the eyes, skin, and mucous membranes.

Note: Static discharge could act as an ignition source.

Section 6 - Accidental Release Measures

Procedure(s) of Personal Precaution(s):

Wear personal protective equipment. Do not ingest or inhale. Do not get on skin or clothing. Do not get in eyes. Ensure adequate ventilation. Keep away from heat. Eliminate all sources of ignition. Use spark-proof tools and explosion-proof equipment. Take precautionary measures against static discharge.

Methods for Cleaning up: Absorb with sand, earth, or vermiculite. Do not absorb with combustible material such as saw dust or cellulosic material. Carefully sweep up and containerize for proper disposal. Use spark-proof tools and explosion-proof equipment. Take precautionary measures against static discharge. Do not release to the environment. Do not release to drains.

Section 7 - Handling and Storage

Use care when handling. Use only under a chemical fume hood. Wear personal protective equipment. Wash thoroughly after handling. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation. Store in a cool, dry, and well-ventilated area. Keep in a tightly closed and non-metal container. Use only non-sparking tools. Eliminate all sources of ignition. Use explosion-proof electrical/ventilating/lighting/equipment. Use proper grounding procedures to avoid static electricity. Keep away from incompatible materials. Protect from heat, open flames, and hot surfaces. Vapors heavier than air may travel considerable distance and ignite or explode.

Note: Static discharge could act as an ignition source.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use explosion-proof ventilation equipment. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

Exposure Limits:

| Chemical Name | ACGIH - TLV | NIOSH - IDLH | OSHA - Final PELs |
|------------------------------------|----------------------------------|--|--------------------------------|
| Formaldehyde CAS#50-00-0 | 0.1 ppm TWA 0.3 ppm STEL | 0.1 ppm Ceiling 0.016 ppm TWA 20 ppm IDLH | 0.75 ppm TWA 2 ppm STEL |
| Ethyl Alcohol CAS#64-17-5 | 1000 ppm STEL | 1000 ppm TWA 1900 mg/mg TWA 3300 ppm IDLH | 1000 ppm TWA 1900 mg/m3 TWA |
| Glacial Acetic Acid CAS#64-19-7 | 10 ppm TWA 15 ppm STEL | 10 ppm TWA 25 mg/m3 TWA 15 ppm STEL 37 mg/m3 STEL 50 ppm IDLH | 10 ppm TWA 25 mg/m3 TWA |
| Methyl Alcohol CAS#67-56-1 | 200 ppm TWA 250 ppm Skin STEL | 200 ppm TWA 260 mg/mg3 TWA 250 ppm STEL 325 mg/m3 STEL 6000 ppm IDLH | 200 ppm TWA 260 mg/m3 TWA |

OSHA Vacated PELs: Formaldehyde: 5 ppm Ceiling; 3 ppm TWA; 10 ppm STEL
 Ethyl Alcohol: 1000 ppm TWA; 1900 mg/m3 TWA
 Glacial Acetic Acid: 10 ppm TWA; 25 mg/m3 TWA
 Methyl Alcohol: 200 ppm TWA; 260 mg/mg TWA; 250 ppm STEL;
 325 mg/m3 Skin STEL

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Appearance: Clear, colorless

Odor: Pungent

Vapor Pressure: Not available

Odor Threshold: Not available
Vapor Density: Not available
pH: 2.30-2.50
Relative Density: Not available
Melting point/freezing point: Not available
Solubility: Soluble in water
Boiling Point: Not available
Flash Point: Not available
Evaporation Rate: Not available
Flammability (solid, gas): Not available
Partition coefficient: n-octanol/water: Not available
Auto-ignition Temperature: Not available
Decomposition Temperature: Not available
Viscosity: Not available
Specific Gravity/Density: Not available

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Note: Vapors may form explosive mixtures with air.

Conditions to Avoid: Incompatible materials, ignition sources, excess heat, flames, and sparks. Avoid freezing. Avoid direct sunlight.

Incompatible Materials: Strong oxidizing agents, strong bases, acids, reducing agents, aniline, phenol, isocyanates, acid anhydrides, amines, peroxides, acid chlorides, alkali metals, nitriles, chromic acid, ethylene glycol, perchloric acid, nitric acid, phosphorous trichloride, oxidizers, sodium peroxide, strong caustics, carbonates, hydroxides, oxides, phosphates, ammonia, hydrazine, peroxides, sodium, acid anhydrides, calcium hypochlorite, chromyl chloride, nitrosyl perchlorate, bromine pentafluoride, perchloric acid, silver nitrate, mercuric nitrate, potassium-tert-butoxide, magnesium perchlorate, acid chlorides, platinum, uranium hexafluoride, silver oxide, iodine heptafluoride, acetyl chloride, acetyl bromide, disulfuryl difluoride, tetrachlorosilane + water, permanganic acid, ruthenium (VIII) oxide, uranyl perchlorate, potassium dioxide, and metals.

Hazardous Decomposition Products: Carbon oxides, hydrogen, formaldehyde, irritating and toxic fumes and gases.

Section 11 - Toxicological Information

CAS#50-00-0 Formaldehyde:

LD50 Oral: 500 mg/kg (rat)
LD50 Dermal: 270 mg/kg (rabbit)
LC50 Inhalation: 0.578 mg/L 4h (rat)

Carcinogenicity: Formaldehyde CAS#50-00-0 is not listed by OSHA. Formaldehyde is listed by IARC (Group 1, Carcinogenic to Humans), NTP (Known Carcinogen), ACGIH (A1, Known Human Carcinogen), and California Prop. 65 as a carcinogen.

CAS#64-17-5 Ethyl Alcohol: RTECS#: KQ6300000

LD50 Oral: 10470 mg/kg (rat)
LD50 Dermal: Not available
LC50 Inhalation: 124.7 mg/L 4h (rat)

Tumorigen, mutagen, reproductive effector per RTECS.

Draize test, rabbit, eye: 500 mg/24h Mild Irritant

Skin: Repeated exposure may cause skin dryness and cracking.

Ethyl alcohol overexposure may lead to headache, dizziness, tiredness, nausea, and vomiting.

Carcinogenicity: Ethyl Alcohol CAS#64-17-5 is not listed by OSHA. Ethyl Alcohol is listed by IARC (Group 1, Carcinogenic to Humans), NTP (Known Carcinogen), and ACGIH (A3, Animal Carcinogen). Ethyl alcohol is listed by California Prop. 65 as a developmental carcinogen (alcoholic beverages only).

CAS#64-19-7 Glacial Acetic Acid: RTECS#: AF1225000

LD50 Oral: 3310 mg/kg (rat)

LD50 Dermal: 1060 mg/kg (rabbit)

LC50 Inhalation: 11.4 mg/L 4h (rat)

Mutagen, reproductive effector per RTECS.

Skin corrosion/irritation: skin (rabbit), causes severe burns.

Serious eye damage/eye irritation: eyes (rabbit), corrosive to eyes, causes serious eye damage.

Carcinogenicity: Glacial Acetic Acid CAS#64-19-7 is not listed by IARC, NTP, ACGIH, OSHA, or California Prop 65.

CAS#67-56-1 Methyl Alcohol: RTECS#: PC1400000

LD50 Oral: 100.1 mg/kg (expert judgement)

LD50 Dermal: 300.1 mg/kg (expert judgement)

LC50 Inhalation: 3.1 mg/L 4h vapor (expert judgement)

Mutagen, reproductive effector per RTECS.

Draize test, rabbit, eye: 100 mg/24h Moderate Irritant.

Draize test, rabbit, skin: 20 mg/24h Moderate Irritant.

Carcinogenicity: Methyl Alcohol CAS#67-56-1 is not listed by IARC, NTP, ACGIH, or OSHA. Methyl Alcohol is listed by California Prop. 65 as a developmental carcinogen.

Information on the likely routes of exposure: Routes of entry anticipated: oral, dermal, inhalation, and eye.

Epidemiology: Not available.

Teratogenicity: Teratogenic effects have occurred in experimental animals with formaldehyde.

Reproductive Effects: Experiments have shown reproductive toxicity effects on laboratory animals with formaldehyde. Experiments with Methyl Alcohol have shown fetotoxicity, specific developmental abnormalities, and other adverse reproductive effects.

Developmental Effects: Developmental effects have occurred in experimental animals with formaldehyde.

Neurotoxicity: Not available.

Mutagenicity: Mutagenic effects have occurred in humans with formaldehyde. Methyl Alcohol is a mutagen per RTECS.

Specific Target Organ Toxicity, Single Exposure: Respiratory system, central nervous system, and optic nerve.

Specific Target Organ Toxicity, Repeated Exposure: Kidney, liver, heart, spleen, and blood.

Symptoms associated with exposure: Headache, dizziness, tiredness, nausea, and vomiting. Corrosive material. Causes severe skin burns and eye damage. Risk of blindness. If ingested, severe burns of the mouth and throat, and danger of perforation of esophagus and stomach, stomach pains. May cause an allergic skin reaction. Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain, flushing.

Prolonged or repeated exposure can defat the skin and lead to irritation, cracking, redness, blistering and/or dermatitis. Eye contact may result in corneal damage, blindness, pain, irritation, watering, redness, blurred or double vision. Inhalation may cause respiratory tract irritation, coughing, damage to lining of nose/throat/lungs, breathing difficulties. Causes damage to organs if in contact with skin, if inhaled or if swallowed.

The toxicological properties of this material have not been thoroughly investigated.

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| Section 12 - Ecological Information |
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Ecotoxicity: Do not release to the environment. Do not release to drains. Toxic to aquatic life. May cause long-term adverse effects in the aquatic environment.

CAS#50-00-0 Formaldehyde:

LC50, freshwater fish: 15 mg/L 96h (leuciscus idus)
EC50, water flea: 20 mg/L 96h
EC50, water flea: 2 mg/L 48h

CAS#64-17-5 Ethyl Alcohol:

EC50, freshwater algae: 275 mg/L 72h (chlorella vulgaris)
LC50, freshwater fish: 14200 mg/L 96h (pimephales promelas)(fathead minnow)
EC50, water flea: 9268 mg/L 48h
EC50, water flea: 10800 mg/L 24h
EC50, microtox: 34634 mg/L 30min (photobacterium phosphoreum)
EC50, microtox: 35470 mg/L 5min (photobacterium phosphoreum)

CAS#64-19-7 Glacial Acetic Acid:

LC50, freshwater fish: 88 mg/L 96h (pimephales promelas)
LC50, freshwater fish: 75 mg/L 96h (Lepomis macrochirus)
EC50, water flea: 95 mg/L 24h
EC50, microtox: 8.8 mg/L 5min (photobacterium phosphoreum)

CAS# 67-56-1 Methyl Alcohol:

LC50, freshwater fish: 15400 mg/L 96h flow-through (lepomis macrochirus)(bluegill)
LC50, freshwater fish: 19000 mg/L 96h (oncorhynchus mykiss)(rainbow trout)
EC50, water flea: 18260 mg/L 96h semi-static (daphnia magna)
ErC50, algae: 22000 mg/L 96h static (pseudokirchneriella subcapitata)(green algae)
IC50, bacteria: >1000 mg/L 3h (activated sludge)

Persistence and degradability: Not available.

Bio-accumulative potential: Not available.

Mobility: Will likely be mobile in the environment due to its water solubility.

Section 13 - Disposal Considerations

DISPOSAL: Dispose of in accordance with all federal, state, and local regulations.

Section 14 – Transport Information

DOT

Proper Shipping name: Flammable Liquids, Corrosive, N.O.S. (SD Alcohol & Acetic Acid Solution)

UN2924

PG III

Hazard class 3 (8)

Section 15 - Regulatory Information

Canada Regulatory Information

WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the SDS contains all the information required by the CPR.

Section 16 - Additional Information

SDS Creation Date: 11/1/12

Revision #1: 6/23/14 YM

Revision #2: 11-8-18

Revision #3: 11-16-18

Revision #4: 1-2-19

Revision #5: 1-12-23

Revision #6: 1-5-26

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