**Formaldehyde Fact Sheet for UMass Medical Students**

Formaldehyde is a corrosive, colorless, strong-smelling gas. The current embalming chemical mixture, Carolina’s Perfect Solution contains Formaldehyde, Phenol, and Ethanol (see attached Safety Data Sheet {SDS}).

# Health Hazard Information

***Acute Effects of Exposure:***

Formaldehyde is a sensitizing agent that can cause an allergic reaction that in rare cases might result in a skin rash (hives), or breathing difficulty (asthma). Acute high-dose exposure is highly irritating to eyes, nose, and throat and can cause and irritant or allergic cough and wheeze. Ingestion of formaldehyde can be fatal. Airborne concentrations of 100 ppm are immediately dangerous to health or life.

***Chronic Effects of Exposure:***

Formaldehyde is a probable cause of nasal cancer and lung cancer in humans who are exposed to formaldehyde for many years. Prolonged or repeated overexposure may also result in respiratory impairment

Exposure Standards

The OSHA formaldehyde permissible exposure limit (PEL) is 0.75 ppm (parts per million parts of air) as an 8-hour time-weighted average (TWA). The short-term exposure limit (STEL) for formaldehyde is 2 ppm (maximum exposure allowed during a 15-minute period of time). The action level –which is the threshold for increased industrial hygiene monitoring and initiation of employee medical surveillance-, is 0.5 ppm when calculated as an 8-hour TWA.

Exposure Monitoring

All students exposed or potentially exposed to formaldehyde will be identified, and exposure risk will be assessed via air sampling on an annual basis by the Environmental, Health and Safety Department. The results of these exposure risk assessments will be communicated to all potentially exposed individuals. If applicable, medical surveillance will be provided in accordance with prescribed OSHA requirements.

Over the past several years, *all formaldehyde sampling results were found to be below the OSHA permissible exposure level, the action level and the short-term exposure limit.* Monitoring will continue on an annual basis.

Safe Work Practices

Gloves, aprons, protective eyewear must be used when coming into contact with formaldehyde solutions. Gloves made of nitrile, neoprene, butyl rubber, polyvinyl chlorine (PVC), or polyethylene laminate should be worn -- not gloves made of latex which may not provide adequate protection and which can cause allergic sensitization skin rash or rarely asthma reactions in some susceptible persons.

Spills and Clean Up

Small spills or drips or work surfaces may be safely cleaned up with commercially-available formaldehyde neutralization products, in the form of absorbent pads or sheets. Immediately after cleanup, remove all contaminated materials from the work area. Report the spill and cleanup to Environmental, Health and Safety~~.~~ For large formaldehyde spills, evacuate the area and call Environmental, Health and Safety.

First Aid Procedures

***Ingestion:***

If the victim is conscious, dilute, inactivate, or absorb by giving milk, activated charcoal or water. Any organic material will inactivate formaldehyde. Keep the person warm and at rest. Get medical attention immediately. If vomiting occurs, keep head lower than hips.

***Inhalation:***

In the event of a significant exposure, remove victim to fresh air immediately. If breathing has stopped, give artificial respiration. Keep warm and at rest. Get immediate medical attention.

***Skin contact:***

Wash the affected area with soap and a large amount of water for at least 15-20 minutes. If there are chemical burns or if irritations persist have the individual seek medical attention.

***Eye contact:***

Wash the eyes immediately with large amounts of water for at least 15-20 minutes. Get medical attention immediately.

Medical Care

Employee Health Services should be consulted for any history of formaldehyde allergy and other health concerns about work with formaldehyde, and for any symptoms related to exposure to formaldehyde by skin or eye contact, inhalation, or ingestion. Call 911 for transport immediately to the Emergency Department at the hospital if serious symptoms occur as a result of exposure to formaldehyde such as an acute generalized allergic or asthmatic reaction.

The Employee Health Services clinic satellite site is located at the University, B Level, Room HB-376. The telephone number is 774-441-6263.

The Employee Health Services (by appointment) is located at 210 Lincoln Street, Worcester, MA. The telephone number is 508-793-6400.

Additional Information

The following web sites have information on formaldehyde.

<http://www.osha.gov/SLTC/formaldehyde/standards.html> <http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10075>

<http://www.osha.gov/OshDoc/data_General_Facts/formaldehyde-factsheet.pdf> . If there are any questions or concerns, please feel free to contact the Environmental Health & Safety office at 508-856-3985.

**MATERIAL SAFETY DATA SHEET**

Revised: 08/27/07

CAROLINA'S PERFECT SOLUTION(TM) CONC. W/ PHENOL Replaces: 07/16/04

CAROLINA BIOLOGICAL SUPPLY COMPANY Printed: 07/20/10

**1. PRODUCT DESCRIPTION**

Product Name: Carolina's Perfect Solution® Concentrate with Phenol

Product Code(s): Various

Size: Various

Chemical Name: Product is a mixture

CAS Number: See section 2

Formula: See section 2

Synonyms: Carosafe 2000 Concentrate with Phenol

Distributor: Carolina Biological Supply Company

2700 York Road

Burlington, NC 27215

Chemical Information: 800-227-1150 (8am-5pm (ET) M-F)

Chemtrec (Transportation Spill Response 24 hours): 800-424-9300

**2. COMPOSITION/INFORMATION ON INGREDIENTS**

Principal Hazardous Components:

The composition of Carolina's Perfect Solution® is proprietary and a

trade secret.

TLV and PEL units: 1000 ppm TLV/PEL for one component

Contains formaldehyde (CAS#50-00-0)

TLV and PEL units for formaldehyde:

ACGIH-TLV Ceiling 0.3ppm;

OSHA-PEL 0.75 ppm (TWA), STEL 2 ppm

Phenol (CAS#108-95-2)is added in this formulation at 10% concentration.

TLV and PEL units for phenol:

ACGIH-TLV: 5ppm (TWA)

OSHA-PEL: 5ppm (TWA)

**3. HAZARD IDENTIFICATION**

Emergency Overview: WARNING! Hazardous liquid. Harmful if swallowed or

absorbed through the skin.

Potential Health Effects:

Eyes: May cause irritation or burns to the eye.

Skin: May cause irritation. Absorption of phenol through the skin is

possible with exposure to large surface areas or to moist skin areas.

Ingestion: May be harmful if swallowed. Phenol is a highly toxic

material. Ingestion may result in oral burns. Symptoms which may occur

include burning pain in the mouth and throat, nausea, abdominal pain,

vomiting, headache, dizziness, muscular weakness, increase in heart

rate, irregular breathing, central nervous system effects, coma, and

possibly death.

Inhalation: May cause irritation to respiratory tract. Excessive

inhalation of phenol vapors may result in symptoms similar to those

arising from ingestion.

**4. FIRST AID MEASURES**

Emergency and First Aid Procedures:

Eyes - Flush with water for at least 15 minutes, raising and lowering

eyelids occasionally. Get medical attention if irritation persists.

Skin - Thoroughly wash exposed area for at least 15 minutes. Remove

contaminated clothing. Launder contaminated clothing before reuse. Get

medical attention if irritation persists.

Ingestion - Do not induce vomiting. If swallowed, if conscious, give

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plenty of water immediately and call a physician or poison control

center. Never give anything by mouth to an unconscious person.

Inhalation - Remove to fresh air. Give oxygen if breathing is

difficult; give artificial respiration if breathing has stopped. Keep

person warm, quiet, and get medical attention.

**5. FIREFIGHTING PROCEDURES**

Flash Point(T.C.C.): 92 F

NFPA Rating: Health 3

Flammability 3

Reactivity 0

Extinguisher Media:

Use dry chemical, CO2 or appropriate foam.

Flammable Limits in Air % by Volume: N/A

Autoignition Temperature: N/A

Special Firefighting Procedures:

Firefighters should wear full protective equipment and NIOSH approved

self-contained breathing apparatus.

Unusual Fire and Explosion Hazards: Under intense heat, components of

this mixture may produce hazardous decomposition products, give off

irritating vapors, and give off heavy smoke and flammable vapors.

**6. SPILL OR LEAK PROCEDURES**

Steps to be Taken in Case Material is Released or Spilled: Use water

fog to supress production of vapors at hazardous concentrations. Wear

appropriate personal protective equipment to minimize exposure. Apply

absorbent and containerize. Decontaminate clothing and spill area with

detergent and flush with copious amounts of water.

**7. SPECIAL PRECAUTIONS**

Precautions to be Taken in Handling or Storing: Avoid contact with

skin, eyes and clothing. Store in a cool, dry, well-ventilated area

below 120 F. Control access to this and all other hazardous materials.

Wear personal protective equipment as is outlined in Section 8 and on

the product label.

Other Precautions: Avoid breathing vapors.

**8. SPECIAL PROTECTION INFORMATION**

Respiratory Protection(Specify Type): None needed under normal

conditions

of use.

Ventilation:

Local Exhaust: Acceptable

Mechanical(General): Required

Special: No

Other: No

Protective Gloves:

Rubber, neoprene, PVC, or equivalent.

Eye Protection:

Splash proof chemical safety goggles should be worn at all times.

Other Protective Clothing or Equipment:

Lab coat, eye wash, and safety shower.

**9. PHYSICAL DATA**

Molecular Weight: Product is a mixture.

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Melting Point: No data available

Boiling Point: 66oC (Carolina's Perfect Solution® Conc.)

Vapor Pressure (mmHg: 19.897(Carolina's Perfect Solution® Conc.)

Vapor Density(Air=1): .9599 (Carolina's Perfect Solution® Conc.)

Specific Gravity(H2O=1): .9606 (Carolina's Perfect Solution® Conc.)

Percent Volatile by Volume: No data available

pH 5.23 (Carolina's Perfect Solution® Conc.)

Evaporation Rate(BuAc=1): 4.3 (Carolina's Perfect Solution® Conc.)

Solubility in Water: Product is an aqueous mixture

Appearance and Odor: Colorless solution; some chemical odor

**10. REACTIVITY DATA**

Stability: Stable

Conditions to Avoid: Temperatures above 425 F, flame

Incompatibility(Materials to Avoid): Alkalies, amines, sulfides, strong

oxidizers, metals, strong bases

Hazardous Decomposition Products: If heated to decomposition, carbon

monoxide carbon dioxide, nitrogen oxides and other unidentified

hydrocarbons will be evolved.

Hazardous Polymerization: Will not occur

**11. TOXICITY DATA**

Toxicity Data: Toxicity of mixture has not been evaluated as a whole.

Carolina's Perfect Solution Concentrate: orl-rat LD50: >5000 mg/kg

Phenol: orl-rat LD50: 317 mg/kg

orl-hmn LDLo: 140 mg/kg

Effects of Overexposure:

Acute: See section 3

Chronic: To the best of our knowledge, the chronic effects data

for this mixture as a whole have not been reported. Mutation data,

reproductive data, and/or tumorigenic data has been cited for components

of this mixture. Formaldehyde listed by the IARC as probably

carcinogenic to humans on the basis of animal evidence.

Conditions Aggravated by Overexposure: Pre-existing conditions of the

respiratory system

Target Organs: N/A

Primary Route(s) of Entry: Inhalation, skin, eye contact

**12. ECOLOGICAL DATA**

EPA Waste Numbers: N/A

**13. DISPOSAL INFORMATION**

Waste Disposal Methods: Dispose in accordance with all applicable

Federal, State and Local regulations.

Always contact a permitted waste disposer (TSD) to assure compliance.

**14. TRANSPORT INFORMATION**

Flammable liquids, toxic, n.o.s.(ethanol, phenol) 3,6.1 UN1992 III

**15. REGULATORY INFORMATION**

WARNING: This product contains a chemical known to the state of

California to cause cancer.

EPA TSCA Status: On TSCA Inventory

Hazard Category for SARA Section 311/312 Reporting: Acute Chronic

**16. ADDITIONAL INFORMATION**

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compilation of data drawn directly from various sources available to us.

Carolina Biological Supply makes no representation or guarantee as to

the suitability of this information to a particular application of the

substance covered in the Material Safety Data Sheet. Any employer must

carefully assess the applicability of any information contained herein

in regards to the particular use to which the employer puts the

material.

Glossary

ACGIH.......American Conference of Governmental Industrial Hygienists

CAS Number..Chemical Abstracts Service Number

CERCLA......Comprehensive Environmental Response, Compensation, and

Liability Act

DOT.........U.S. Department of Transportation

IARC........International Agency of Research on Cancer

mppcf......million particles per cubic foot

N/A.........Not Available

NTP.........National Toxicology Program

OSHA........Occupational Safety and Health Administration

PEL.........Permissible Exposure Limit

ppm.........parts per million

RCRA........Resource Conservation and Recovery Act

SARA........Superfund Amendments and Reauthorization Act

TLV.........Threshold Limit Value

TSCA........Toxic Substances Control Act

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