

SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

Product Identifier

SRM Number: 2898a
SRM Name: Ethanol-Water Solution (Nominal Mass Fraction 6 %)
Other Means of Identification: Not applicable.

Recommended Use of This Material and Restrictions of Use

This Standard Reference Material (SRM) is a solution of ethanol in water at a nominal concentration of 6 % by mass. This SRM is intended primarily for use in the calibration of instruments and techniques used for the determination of ethanol in water based media. A unit of SRM 2898a consists of five 10 mL ampoules, each containing approximately 10 mL of solution.

Company Information

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2. HAZARDS IDENTIFICATION

Classification

Physical Hazard: Not classified.
Health Hazard: Not classified.

Label Elements**Symbol**

Not applicable.

Signal Word

Not applicable.

Hazard Statement(s)

Not applicable.

Precautionary Statement(s)

Not applicable.

Hazards Not Otherwise Classified: Not applicable.

Ingredients(s) with Unknown Acute Toxicity: Not applicable.

3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Substance: Water ethanol solution

Other Designations:

Water: Dihydrogen oxide; hydrogen oxide; H₂O.

Ethanol: Ethyl alcohol; grain alcohol; ethyl hydroxide; ethyl hydrate; algrain; methyl carbinol; cologne spirits; fermentation alcohol; absolute alcohol; C₂H₅OH.

Components are listed in compliance with OSHA's 29 CFR 1910.1200; for the actual values see the Certificate of Analysis.

| Hazardous Component(s) | CAS Number | EC Number (EINECS) | Nominal Mass Concentration (%) |
|----------------------------|------------|--------------------|--------------------------------|
| Ethanol | 64-17-5 | 200-578-6 | 6 |
| Non-Hazardous Component(s) | | | |
| Water | 7732-18-5 | 231-791-2 | 94 |

4. FIRST AID MEASURES

Description of First Aid Measures:

Inhalation: If adverse effects occur, remove to uncontaminated area. If not breathing, give artificial respiration or oxygen by qualified personnel. Seek immediate medical attention.

Skin Contact: Rinse affected area with soap and water for at least 15 minutes. Seek medical assistance if necessary.

Eye Contact: Immediately flush eyes, including under the eyelids with copious amounts of water for at least 15 minutes. Seek immediate medical attention.

Ingestion: Contact a poison control center immediately for instructions. Give water to rinse out mouth. Never give liquids to a person with reduced awareness or becoming unconscious. If vomiting occurs, keep head lower than hips to prevent aspiration. If not breathing, give artificial respiration by qualified personnel. Seek immediate medical attention.

Most Important Symptoms/Effects, Acute and Delayed: Respiratory tract irritation, skin irritation, eye irritation, liver damage, and central nervous system depression.

Indication of any immediate medical attention and special treatment needed, if necessary: If any of the above symptoms are present, seek immediate medical attention.

5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Negligible fire hazard. See Section 9, "Physical and Chemical Properties" for flammability properties.

Extinguishing Media:

Suitable: Regular dry chemical, carbon dioxide, fine water spray, and alcohol resistant foam.

Unsuitable: None listed.

Specific Hazards Arising from the Chemical: Thermal decomposition will form oxides of carbon.

Special Protective Equipment and Precautions for Fire-Fighters: Avoid inhalation of material or combustion byproducts. Wear full protective clothing and NIOSH approved self-contained breathing apparatus (SCBA).

NFPA Ratings (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health = 0

Fire = 0

Reactivity = 0

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures: Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment; see Section 8, "Exposure Controls and Personal Protection".

Methods and Materials for Containment and Clean up: Do not touch spilled material. Notify safety personnel of spills. Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal. Isolate hazard area and deny entry.

7. HANDLING AND STORAGE

Safe Handling Precautions: See Section 8, "Exposure Controls and Personal Protection". Handle glass ampoules with care.

Storage: Store and handling in accordance with all current regulations and standards. Sealed ampoules, as received, should be stored in the dark at temperatures between 10 °C and 30 °C. Keep separated from incompatible

substances (acids, bases, combustible materials, halo carbons, halogens, metal oxides, metal salts, metals, oxidizing materials, peroxides).

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits:

Component: Ethanol

OSHA (PEL): 1000 ppm TWA or 1900 mg/m³ TWA

ACGIH (TLV): 1000 ppm STEL

NIOSH (REL): 1000 ppm TWA or 1900 mg/m³ TWA
3300 ppm IDLH (10 % LEL)

Engineering Controls: Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

Personal Protection: In accordance with OSHA 29 CFR 1910.132, subpart I, wear appropriate Personal Protective Equipment (PPE) to minimize exposure to this material.

Respiratory Protection: If workplace conditions warrant a respirator, a respiratory protection program that meets OSHA 29CFR 1910.134 must be followed. Refer to NIOSH 42 CFR 84 for applicable certified respirators.

Eye/Face Protection: Wear splash resistant safety goggles with a face shield. An eye wash station should be readily available near areas of use.

Skin and Body Protection: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Chemical-resistant gloves should be worn at all times when handling chemicals.

9. PHYSICAL AND CHEMICAL PROPERTIES

NOTE: The physical and chemical data provided are for the pure components. No physical or chemical data are available for this solution of ethanol and water.

Descriptive Properties:

| | Water (94 % of this SRM) | Ethanol (6 % of this SRM) |
|---|------------------------------------|--|
| Appearance (physical state, color, etc.): | Colorless liquid | Colorless liquid |
| Molecular Formula: | H ₂ O | C ₂ H ₅ OH |
| Molar Mass (g/mol): | 18.02 | 46.07 |
| Odor: | Odorless | Vinous |
| Odor threshold: | Not available | 5-10 ppm |
| pH: | 7 | Not available |
| Evaporation rate: | Not available | 1.4 (CCl ₄ = 1) |
| Melting point/freezing point (°C): | 0 (32 °F) | Not available |
| Relative Density (g/L): | Not available | Not available |
| Specific Gravity | 1 | 0.7893 |
| Vapor Pressure (mmHg): | 17.5 (20 °C) | 40 (19 °C) |
| Vapor Density (air = 1): | Not available | 1.59 |
| Viscosity (cP): | Not available | 1.22–1.41 (20 °C) |
| Solubility(ies): | Miscible with alcohol | Benzene, ether, acetone, chloroform, organic solvents |
| Partition coefficient (n-octanol/water): | Not available | Not available |
| Particle Size (if relevant) | Not applicable | Not applicable |

Thermal Stability Properties:

| | | |
|--|----------------|--------------------|
| Autoignition Temperature (°C): | Not applicable | 163 (325 °F) |
| Thermal Decomposition (°C): | Not applicable | Not applicable |
| Initial boiling point and boiling range (°C): | 100 (212 °F) | 78.3–78.5 (173 °F) |
| Explosive Limits, LEL (Volume %): | Not applicable | 3.3 |
| Explosive Limits, UEL (Volume %): | Not applicable | 19 |
| Flash Point (°C) | Not applicable | 13 °C (TCC) |
| Flammability (solid, gas): | Not applicable | Not applicable |

10. STABILITY AND REACTIVITY

Reactivity: Not reactive.

Stability: X Stable Unstable

Possible Hazardous Reactions: None listed.

Conditions to Avoid: Avoid heat, flames, sparks and other sources of ignition. Containers may rupture or explode if exposed to heat. Keep out of water supplies and sewers.

Incompatible Materials: Acids, bases, combustible materials, halo carbons, halogens, metal oxides, metal salts, metals, oxidizing materials, peroxides.

Fire/Explosion Information: See Section 5, "Fire Fighting Measures".

Hazardous Decomposition: Thermal decomposition will produce oxides of carbon.

Hazardous Polymerization: Will Occur X Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Exposure: X Inhalation X Skin X Ingestion

Symptoms Related to the Physical, Chemical and Toxicological Characteristics: Respiratory tract irritation, skin irritation, eye irritation, narcosis.

Potential Health Effects (Acute, Chronic and Delayed):

Inhalation: Ethanol may cause irritation of mucous membranes, headache, drowsiness, fatigue, nervousness, dullness, narcosis, lack of concentration, somnolence, and symptoms of drunkenness. Reproductive effects have been reported in animals.

Skin Contact: Ethanol may cause irritation, mild redness and burning, sensitization, allergic, contact dermatitis. Chronic exposure to ethanol may result in defatting of the skin.

Eye Contact: Ethanol may cause irritation, conjunctivitis, and corneal cloudiness.

Ingestion: Ethanol short term exposure may cause headache, drowsiness, emotional lability, decreased inhibitions, exhilaration, boastfulness, talkativeness, remorse, belligerency, gradual visual impairment, muscular incoordination, slurring of speech, and symptoms of drunkenness; long term exposure may result in liver damage. Reproductive effects have been reported in animals.

Numerical Measures of Toxicity:

Acute Toxicity: Not classified.

Ethanol, Rat, Oral LD50: 7060 mg/kg

Ethanol, Rat, Inhalation LC50: 124.7 mg/L (4 h)

Skin Corrosion/Irritation: Not classified.

Ethanol, Rabbit skin, moderate: 20 mg (24 h)

Ethanol, Human skin: 70 %

Serious Eye damage/ Eye irritation: Not classified.

Ethanol, Rabbit eyes, mild: 500 mg (24 h)

Ethanol, Rabbit eyes, severe: 500 mg

Respiratory Sensitization: No data available.

Skin Sensitization: No data available.

Germ Cell Mutagenicity: Not classified.

Ethanol, Human: 15 mmol/L (24 h)

Ethanol, Human: 100 mmol/L (3 h)

Carcinogenicity: Not classified, this SRM is not for human consumption.

Listed as a Carcinogen/Potential Carcinogen Yes X No

IARC lists ethanol (as related to alcoholic beverages) as Group 1 (carcinogenic to humans).

Reproductive Toxicity: Not classified.

Ethanol, Rat, Oral TDLo: 112 mg/kg (14 d)

Ethanol, Human, Oral TDLo (37 weeks pregnant): 250 mg/kg

Specific Target Organ Toxicity, Single Exposure: Not classified.

Specific Target Organ Toxicity, Repeated Exposure: Not classified.

Aspiration Hazard: No data available.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data:

Component: Ethanol

Fish: Rainbow trout (*Oncorhynchus mykiss*) LC50 (static): 12.0 mg/L – 16.0 mL/L (96 h)

 Fathead minnow (*Pimephales promelas*) LC50 (static): >100 mg/L (96 h)

Invertebrate: Freshwater water flea (*Daphnia magna*) EC50: 10 800 mg/L (24 h)

Persistence and Degradability: No data available.

Bioaccumulative Potential: No data available.

Mobility in Soil: No data available.

Other Adverse effects: No data available.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose of waste in accordance with all applicable federal, state, and local regulations.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: Not regulated by DOT or IATA.

15. REGULATORY INFORMATION

U.S. Regulations:

CERCLA Sections 102a/103 (40 CFR 302.4): Not regulated.

SARA Title III Section 302 (40 CFR 355.30): Not regulated.

SARA Title III Section 304 (40 CFR 355.40): Not regulated.

SARA Title III Section 313 (40 CFR 372.65): Not regulated.

OSHA Process Safety (29 CFR 1910.119): Not regulated.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE HEALTH: No.

CHRONIC HEALTH: No.

FIRE: No.

REACTIVE: No.

PRESSURE: No.

State Regulations:

California Proposition 65: Warning!

This product contains a chemical (ethanol) known to the state of California to cause cancer.

This product contains a chemical (ethanol) known to the state of California to cause reproductive/developmental effects.

U.S. TSCA Inventory: Ethanol and water are listed.

TSCA 12(b), Export Notification: Not listed.

Canadian Regulations:

WHMIS Information: Not provided for this material.

16. OTHER INFORMATION

Issue Date: 14 June 2013

Sources: ChemAdvisor, Inc., MSDS, *Water*, 03 March 2013.

ChemAdvisor, Inc., MSDS, *Ethyl Alcohol, 5 %*, 03 March 2013.

ChemAdvisor, Inc., MSDS, *Ethyl Alcohol*, 03 March 2013.

European Commission, Substances Classified in Annex VI to Regulation (EC) No 1272/2008, *Ethanol*, CAS No. 64-17-5; available at <http://esis.jrc.ec.europa.eu/index.php?PGM=cla> (accessed June 2013)

49 CFR 173.150, *U.S. Department of Transportation*, 2011.

IATA, *Dangerous Goods Regulations*, 2013.

Key of Acronyms:

| | | | |
|--------|---|-------|--|
| ACGIH | American Conference of Governmental Industrial Hygienists | NRC | Nuclear Regulatory Commission |
| ALI | Annual Limit on Intake | NTP | National Toxicology Program |
| CAS | Chemical Abstracts Service | OSHA | Occupational Safety and Health Administration |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act | PEL | Permissible Exposure Level |
| CFR | Code of Federal Regulations | RCRA | Resource Conservation and Recovery Act |
| DOT | Department of Transportation | REL | Recommended Exposure Limit |
| EC50 | Effective Concentration, 50% | RM | Reference Material |
| EINECS | European Inventory of Existing Commercial Chemical Substances | RQ | Reportable Quantity |
| EPCRA | Emergency Planning and Community Right-to-Know Act | RTECS | Registry of Toxic Effects of Chemical Substances |
| IARC | International Agency for Research on Cancer | SARA | Superfund Amendments and Reauthorization Act |
| IATA | International Air Transportation Agency | SCBA | Self-Contained Breathing Apparatus |
| IDLH | Immediately Dangerous to Life and Health | SRM | Standard Reference Material |
| LC50 | Lethal Concentration, 50% | STEL | Short Term Exposure Level |
| LD50 | Lethal Dose, 50 % | TLV | Threshold Limit Value |
| LEL | Lower Explosive Limit | TPQ | Threshold Planning Quantity |
| MSDS | Material Safety Data Sheet | TSCA | Toxic Substances Control Act |
| NFPA | National Fire Protection Association | TWA | Time Weighted Average |
| NIOSH | National Institute for Occupational Safety and Health | UEL | Upper Explosive Limit |
| NIST | National Institute of Standards and Technology | WHMIS | Workplace Hazardous Materials Information System |

Disclaimer: Physical and chemical data contained in this SDS are provided only for use in assessing the hazardous nature of the material. The SDS was prepared carefully, using current references; however, NIST does not certify the data in the SDS. The certified values for this material are given in the NIST Certificate of Analysis.

Users of this SRM should ensure that the SDS in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 948-3730; e-mail srmmsds@nist.gov; or via the Internet at <http://www.nist.gov/srm>.