

School Material Safety Data Sheet

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GENIUM PUBLISHING CORP.

No. 180

ETHYL ALCOHOL

August 1988

SECTION 1. INTRODUCTORY INFORMATION

MATERIAL NAME AND FORMULA: ETHYL ALCOHOL

SYNONYMS: Ethanol; Grain Alcohol; Absolute Alcohol; * Alcohol Anhydrous; * $\text{CH}_3\text{CH}_2\text{OH}$, SDA-3A; * Specially Denatured Alcohol No. 3A; * Methyl Carbinol. * See composition below.

CAS NUMBER: 0064-17-5

TYPICAL COMPOSITION: Absolute or Anhydrous: Ethanol, >94.9; Water, balance. SDA-3A Type: Methanol, (Genium School MSDS 152) ~4.8%; Water <4.5%, Ethanol, Balance.

DOT CLASSIFICATION: Flammable Liquid; UN1170 (Absolute) or UN1896 (SDA-3A)

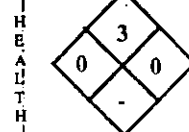
OSHA CLASSIFICATION: Class IB Flammable Liquid

MANUFACTURER'S INFORMATION: Always request material safety data sheets from your chemical supplier. These should indicate the manufacturer's emergency telephone number. See the Resources/Manufacturers Index for some of the larger manufacturers and available telephone numbers.

DESCRIPTION: Ethanol is a clear, colorless, mobile liquid with a characteristic ethanol odor. Odor is detectable at about 10 ppm in air; it becomes disagreeable at >500 ppm.

PRELIMINARY INFORMATION: This material is used as an industrial solvent, cleaning agent, and as a laboratory chemical in addition to its use in various beverages, lotions, colognes, etc. Significant health effects and fire hazards are possible. Both the untreated and denatured forms of ethyl alcohol possess similar chemical properties. The methanol present in the SDA-3A type adds to the health hazards (see sect. 4). Ethanol is also available as Proprietary Solvent (Genium School MSDS 160).

FLAMMABILITY



NFPA FIRE HAZARD SYMBOL

REACTIVITY

SECTION 2. USE AND STORAGE INFORMATION

— PRELIMINARY PLANNING CONSIDERATIONS —

- **PROVIDE FOR SAFE DISPOSAL OF ALL CHEMICAL WASTE** generated in the lab. Check applicable regulations prior to use.
- **Wear safety glasses or goggles** and appropriate protective clothing (rubberized apron, etc.) during all experiments.
- Be sure that eyewash station and safety shower are in good working order.
- Provide adequate ventilation or restrict use to fume hood to avoid exceeding the TLV (see sect. 4).
- Eliminate all possible sources of ignition. Make nearby electrical service and equipment explosion proof (no spark-generation potential).
- Wear rubber gloves as needed to avoid repeated or prolonged skin contact with this chemical.
- Alcohol exposure enhances toxicity hazards of other materials such as chlorinated hydrocarbon solvents or drugs. It can also have teratogenic effects.

— USAGE PRECAUTIONS AND PROCEDURES —

- **READ THE LABEL** and follow all precautions.
- Practice good housekeeping to avoid unintentional mixing of incompatible materials. Do not allow residues or dust to build up in the lab or work area.
- For safety, **DO NOT WEAR CONTACT LENSES IN THE LABORATORY**; soft lenses may absorb irritants, and all lenses may concentrate them.
- After working with this material, always wash hands and face before eating, drinking, or smoking.
- Do not smoke in storage or use area.
- Keep ethanol away from strong oxidizing agents and sources of heat or ignition.
- Do not let this material come into contact with eyes, skin, or clothing. Avoid inhaling the vapor or solution mist from this chemical. Do not taste or swallow this substance.
- Clean up spilled material promptly and thoroughly.

— ADDITIONAL INFORMATION —

Ethyl alcohol does not polymerize. It is stable at room temperature under normal conditions of handling and storage.

- Incompatible materials include oxidizing agents such as perchlorates, peroxides, nitric acid, nitrates, and sulfuric acid. Anhydrous alcohol can react with magnesium and aluminum, especially if heated. A mixture with these metals in powder form may be explosive.

— PREFERRED STORAGE LOCATION AND METHODS —

- Storage area should be cool and well ventilated. Containers should be tightly closed.
- Do not store chemicals alphabetically by name; store them by chemical family, instead, to keep compatibles together.
- Protect all chemical containers from physical damage and keep them out of direct sunlight.
- Do not permit smoking in areas where chemicals are stored.
- Purchase only amounts equivalent to one year's needs.
- Store this material in an approved **FLAMMABLES** cabinet away from oxidizing agents and sources of heat or ignition.

SECTION 3. SPILLS AND DISPOSAL PROCEDURES

IF MATERIAL IS SPILLED:

- Ventilate area of spill.
- Clean up spilled material promptly and thoroughly.
- Eliminate all possible sources of ignition. Make nearby electrical service and equipment explosion proof (no spark-generation potential).
- Cleanup personnel should wear personal protective equipment to prevent skin or eye contact and inhalation of vapors.
- For liquid spills, cover material with an inert solid absorbent (vermiculite, dry sand, etc.) and scoop it into an appropriate container (with a secure lid) for disposal in accordance with existing regulations. Dike the spill area with an inert absorbent material, as needed, to contain the spilled material.
- Dilution with water may be desirable to raise the flash point or flush away from a sensitive area. Do not flush waste to a sewer.
- Use nonsparking tools for cleanup.
- Wash residue from spill area with soap and water.

DISPOSAL OF SMALL QUANTITIES:

NOTE: Emptied containers could contain chemical residues; handle with care.

- Small quantities of waste material may be evaporated in a properly functioning fume hood or burned in an incinerator if approved methods and applicable regulations are followed.
- Do not flush material down drains.
- If the methods described above are not practical, feasible, or in accord with existing regulations, contact your supplier or a licensed disposal contractor for specific treatment/disposal procedures.

FOR THE DISPOSAL OF LARGER AMOUNTS contact a licensed disposal company.

FOLLOW ALL APPLICABLE LOCAL, STATE, AND FEDERAL REGULATIONS FOR ALL WASTE DISPOSAL.

SECTION 4: HEALTH HAZARDS

Ethyl alcohol has not been identified as a known or suspected carcinogen by the NTP, IARC, or OSHA.

Current OSHA PEL and ACGIH TLV: 8-hr TWA: 1000 ppm (1900 mg/m³) for ethanol; for methanol (present in SDA-3A), 8-hr TWA is 200 ppm (260 mg/m³), and ACGIH adds a skin absorption hazard.*

- Mutagenic effects and toxic central nervous system effects have been reported for ethanol.

- Rat, Oral, LD₅₀: 14 gm/kg for ethanol

- Human, Oral, LD_{Lo}: 1430 mg/kg (produces toxic CNS effects)

- Human, Oral, LD_{Lo}: 340 mg/kg (methanol) (Genium School MSDS 152)

- Excessive inhalation of ethanol vapors is irritating to the eyes and upper respiratory tract, with slight symptoms of intoxication. Inhalation of 0.5% by volume (5000 ppm) will rapidly cause stupor and sleepiness. Inhalation of vapor can have effects similar to ingestion of liquid.

- Ingestion of ethyl alcohol will at first produce stimulant effects, followed by symptoms of mental excitement, depression, drowsiness, impaired vision, ataxia, and stupor as the level of intake increases. Large doses can affect the GI tract and CNS.

- Prolonged or repeated skin contact will cause defatting and dermatitis.

- Eye contact causes burning and stinging sensation.

- The methanol content of SDA-3A alcohol makes this material poisonous by ingestion and excessive inhalation. Possible blindness can result from the effects of the methanol. Methanol may also be absorbed through the skin. Body elimination of methanol is slow, so toxic effects may occur after excessive contact daily for several days.

*Skin notation indicates that absorption through the skin may contribute significantly to the overall TLV.

SECTION 5: FIRST AID PROCEDURES

Eye contact:

- Flush eyes promptly, including under the eyelids, with plenty of running water. Continue for at least 15 minutes.
- Get prompt medical attention.*

Skin contact:

- Remove contaminated clothing promptly.
- Wash exposed areas of skin with soap and water.

Inhalation:

- Remove victim to fresh air; restore/support his breathing as necessary.
- Get medical help if victim is breathing with difficulty or coughing or has not returned to normal within 10 minutes.*

Ingestion:

- Rinse victim's mouth thoroughly with water.
- Give victim several glasses of milk or water to drink. Induce vomiting, but ONLY if victim is conscious and alert.
- Never give anything by mouth to someone who is unconscious or convulsing.
- Medical lavage by a physician may be indicated.
- Get prompt medical attention.*

* Get medical help (in school, paramedic, or community) for further treatment, observation, and support after first aid

- To physician: Hemodialysis or infusion of 200g fructose may be helpful for a deeply comatose patient.

SECTION 6: FIRE PROCEDURES AND DATA

- Extinguishing media: carbon dioxide, dry chemical, or alcohol type of foam or water spray.
- Ethyl alcohol is an OSHA class IB flammable liquid.
- Ethyl alcohol is a dangerous fire hazard and moderate explosion hazard when exposed to heat or flame. It reacts vigorously or violently with oxidizers.
- If possible to do so safely, remove containers of this material from the fire area.
- For major fires, or if large quantities of this material are involved, fire fighters should wear appropriate protective clothing and use respiratory protection.
- Self-contained breathing apparatus is recommended.
- Use of a direct stream of water may not be effective and could scatter the fire.
- A water spray may be used to cool fire-exposed containers, disperse vapor, reduce fire intensity, and dilute or flush spilled liquid.

HAZARDOUS PRODUCTS OF DECOMPOSITION INCLUDE: Aldehydes, carbon monoxide

FLASH POINT: (SDA-3A): 60 to 65°F, TOC Method; (Absolute): 50 to 55°F, TCC Method

AUTOIGNITION TEMPERATURE: 700 to 800°F

FLAMMABILITY LIMITS IN AIR (Vol %): Lower: 3.3 Upper: 19

SECTION 7: PHYSICAL DATA

BOILING RANGE (@ 1 atm.) (190-Proof Base): 167 to 176°F (75 to 80°C) SPECIFIC GRAVITY (60/60°F): ~0.815 for 190-Proof Base
BOILING RANGE (@ 1 atm.) (200-Proof Base): 169 to 174°F (76 to 79°C) (~0.794 for 200-Proof Base)

ABSOLUTE VISCOSITY (20 cps): 1.22 (for 200 proof)

VAPOR PRESSURE (@ 20°C, mm Hg): ~50

VAPOR DENSITY (air = 1): ~1.5

SOLUBILITY IN WATER (@ 20°C): Miscible

FREEZING POINT: -173.4°F (-114.1°C) (for 200-Proof Ethanol)

MOLECULAR WEIGHT: 46.07

EVAPORATION RATE (CCl₄ = 1): 1.4

% VOLATILE: 100

REFERENCES: Genium Industrial MSDSs 361 (10/81) and 579 (2/86) and references 2, 4-12, 16, 20, 23-26, 34, 37, 38, 42, 47, 82, 84, 506, (see glossary for titles) 509-11, 522.

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