

Standard Operating Procedures for Ethanol—95% and Absolute

Revised: February 23, 2008

Reviewed by EOHSS May 2008

Effective: Immediately

Applicable Legislation:

Occupational Health and Safety Act (OHSA), R.S.O. 1990, Sections 27 (2) (a), 27 (2) (c) & 28 (1) (a), 28 (1) (b), 28(1).

Intent: To outline safe handling procedures of Ethanol, including any equipment that is used in conjunction with Ethanol, and to outline potential hazards and first aid measures should an incident occur.

Definitions:

Ethanol: A chemical used as a general purpose organic solvent, disinfectant and reagent.

Qualified person: A person who, in respect of a specific duty, is qualified by knowledge, training and experienced to perform the duty safely and properly.

Requirements of OHSA, Section 27 (2) a, c and Section 28(1) a, b, c

27. (2) (a) A supervisor shall advise a worker of the existence of any potential or actual danger to the health or safety of the worker of which the supervisor is aware.

27. (2) (c) Take every precaution reasonable in the circumstances for the protection of a worker.

Duties of workers

28. (1) A worker shall,

(a) work in compliance with the provisions of this Act and the regulations;

(b) use or wear the equipment, protective devices or clothing that the worker's employer requires to be used or worn;

(c) report to his or her employer or supervisor the absence of or defect in any equipment or protective device of which the worker is aware and which may endanger himself, herself or another worker

Potential Hazards

WARNING!!: Ethanol is extremely flammable and poses a serious risk of fire, and thus burns to persons, when used in conjunction with gas and / or alcohol burners or near sources of ignition such as hot plates.

Inhalation: High vapor concentrations may cause a burning sensation in the throat and nose, stinging and watering in the eyes. At concentrations which cause irritation; dizziness, faintness, drowsiness, nausea and vomiting may occur.

Ingestion: May cause dizziness, faintness, drowsiness, decreased awareness and responsiveness, euphoria, abdominal discomfort, nausea, vomiting, staggering gait, lack of coordination and coma.

Eye Contact: Severe eye irritant. Vapors can irritate eyes. Eye damage from contact with liquid is reversible and proper treatment will result in healing within a few days. Damage is usually mild to moderate conjunctivitis, seen mainly as redness of the conjunctiva.

Chronic Exposure: Long term repeated oral exposure to ethanol may result in the development of progressive liver injury with fibrosis.

Aggravation of Pre-existing Conditions: Repeated exposure to ethanol may exacerbate liver injury produced from other causes.

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Other effects of overexposure: Repeated ingestion of ethanol by pregnant mothers has been shown to adversely affect the central nervous system of the fetus, producing a collection of effects which together constitute the fetal alcohol syndrome.

Explosion Hazards: Vapor may travel considerable distance to source of ignition and flash back. Container explosion may occur under fire conditions.

Description of Procedures

1. All persons shall consult the Material Safety Data Sheet and SOP and follow all recommendations on Ethanol before using the chemical.
2. All users will have WHMIS, Fire Safety, Chemical handling and Spills training.
3. All persons shall wear personal protective equipment when handling Ethanol. This includes wearing a lab coat, chemical splash goggles, gloves and closed toe shoes when working with Ethanol. Leave lab coats, gloves, and other personal protective equipment in the lab once your work is complete to prevent the spread of this or other chemicals outside of the lab.
4. All persons shall know Life Sciences Building Emergency Procedures including the location of Fire pull stations, eye wash stations and safety showers.
5. Ethanol can only be purchased by approved person. Maintain inventory of ethanol use.
6. Any containers/bottles in which Ethanol has been decanted must be labeled properly with the solution name, concentration, and 'see MSDS'.
7. Decanting of flammable materials may require bonding/grounding of containers. See MSDS
8. Any Ethanol containers with a volume greater than 500ml must be stored in the flammables cabinet beneath the fume hood. See MSDS for proper storage requirements.
9. Work conducted using flammable materials is to be completed in a fume hood
10. All persons are to make sure that all materials used to wipe up ethanol (paper towel, cloths etc) have been removed from the bench before the alcohol burner (or other ignition sources) is lit.
11. Persons using ethanol in conjunction with ignition sources, shall make themselves aware of the location of fire extinguishers, fire blankets, safety showers, safety kits and any other safety/fire fighting equipment. If unsure of the location, all persons are to ask their supervisor of location before doing any work.

Waste Management and Environmental Responsibility

Solid waste containing ethanol (such as paper towels, rags etc) are to be disposed of into labeled waste bins. These waste bins must be away from any ignition source.

No chemicals are to be disposed of by pouring it down the sink. Persons who wish to dispose of ethanol are to follow hazardous chemical waste procedure as designated by EOHSS ext 24352.

Waste disposal procedures

Follow McMaster University Hazardous waste disposal procedures

Handling and Storage Requirements (refer to MSDS)

Handling:

Avoid breathing vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

Wash hands and clothing thoroughly after exposure to Ethanol.

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Storage:

Conditions to Avoid: Moisture.

Materials to Avoid: Alkali metals, Ammonia, Oxidizing agents, Peroxides.

Take precautions to prevent static electricity buildup when transferring contents.

Keep container closed. Keep away from heat, sparks, and open flame. Store in a cool dry place

Hygroscopic.

Contingency Plan and Reporting

All accidents and spills will require persons involved to fill out an "incident report" after the situation has been contained. **In case of a critical injury or major spill Dial 88 and EOHSS ext 24352.**

In case of Fire: Refer to MSDS

Small fires should be extinguished immediately by using water, fire extinguishers or fire blankets. Persons should only attempt to extinguish fires if they feel safe in doing so.

Evacuate all persons

Pull the Fire Pull station located at the entrance to all Life Science Building stairwells

Dial 88 to contact Security Services

Accident response

Evacuate area. Shut off all sources of ignition.

ORAL EXPOSURE: If swallowed, wash out mouth with water provided person is conscious. Call a physician.

INHALATION EXPOSURE: If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

DERMAL EXPOSURE: In case of contact, immediately wash skin with soap and copious amounts of water.

EYE EXPOSURE: In case of contact, immediately flush eyes with copious amounts of water for at least 15 minutes.

Spill clean up

Wear appropriate PPEs

Cover with dry-lime, sand, or soda ash. Place in covered containers using non-sparking tools and dispose of through the McMaster University Hazardous waste disposal.

Ventilate area and wash spill site after material pickup is complete.

References:

Material Safety Data Sheets: Sigma Aldrich

Risk Management Manual (RMM) McMaster University

Occupational Health and Safety Act (OHSA)

Cameron Lab Protocols (2008)