

EXPERIMENT: LABORATORY SAFETY

PURPOSE

- 1) to understand the rationale for laboratory safety awareness
- 2) to recognize and define the acronym WHMIS
- 3) to identify WHMIS hazard symbols
- 4) to recognize WHMIS supplier and workplace labels
- 5) to locate Material Safety Data Sheets
- 6) to apply basic laboratory safety procedures and policies
- 7) to identify and locate laboratory safety equipment

INTRODUCTION

Each of us has a responsibility for maintaining a safe laboratory environment. There is always some level of risk in almost any laboratory situation. By incorporating an awareness of safety into each laboratory experiment, this level of risk becomes more acceptable.

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM

A basic knowledge of the possible hazards associated with the chemicals normally found in a high school science laboratory is recommended. The Workplace Hazardous Materials System (WHMIS) is a system that is designed to provide information on hazardous products that are present at the worksite. It is an information system that was legislated by both federal and provincial jurisdictions in order to establish a national standard for classifying hazardous products.

In order for a substance (controlled product) to be regulated by the WHMIS legislation, it must be included in one or more of the following six classes:

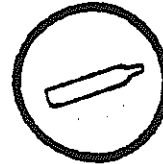
- A. Compressed Gas
- B. Flammable and Combustible Material
- C. Oxidizing Material
- D. Poisonous and Infectious Material
- E. Corrosive Material
- F. Dangerously Reactive Material

Class A - Compressed Gas

These controlled products are substances that are contained under pressure.

The WHMIS hazard symbol for Class A is:

CLASS A:
Compressed gas



Class B - Flammable and Combustible Material

These are substances (gases, liquids, solids, aerosols, reactive flammable materials) that are easily ignited in the presence of air, burn vigorously or may be spontaneously combustible in contact with air and/or water. The WHMIS hazard symbol for Class B is:

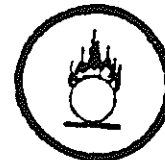
CLASS B:
Flammable and com-
bustible material



Class C - Oxidizing Materials

These are substances that may not necessarily be themselves combustible; but, that support the combustion of other substances. The WHMIS symbol for Class C is:

CLASS C:
Oxidizing material



Class D - Poisonous and Infectious Materials

Class D encompasses three Divisions.

Class D, Division 1 - Immediate and Serious Toxic Effects

These substances have the capability to cause acute lethal effects (death to test animals used in short-term tests). Class D, Division 1 is designated by the following hazard symbol:

CLASS D:
Poisonous and infectious
material
1. Materials causing
immediate and serious
toxic effect



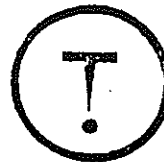
Class D, Division 2 - Other Toxic Effects

This division includes products that cause adverse health effects that either develop over time from a single exposure or develop from prolonged or repeated exposure to the product.

Included within this division are controlled products that can be defined as:

- 1) carcinogens -- these products have the ability to cause cancer in animals or humans.
- 2) teratogens or embryotoxins -- these products have the ability to injure the fetus while not affecting the pregnant female.
- 3) sensitization - respiratory -- these products may cause a severe asthma-like reaction.
- 4) mutagens -- (of reproductive cells), these products have the ability to cause changes in living cells (DNA).
-- (of non-reproductive cells), these products have the ability to cause mutations that are not transmitted to future generations, but can be a part in the development of disease.
- 5) reproductive toxins -- these products can affect the capability to produce offspring.
- 6) skin or eye irritants -- the irritation produced by these products can cause reversible inflammatory changes to the eye or skin.

Class D, Division 2 substances can be recognized by the following hazard symbol:



CLASS D:
2. Materials causing other
toxic effects

Class D, Division 3 - Biohazardous Infectious Materials

This division involves substances that contain organisms capable of causing disease and the toxins of such an organism. These substances are labelled as follows:



CLASS D:
3. Biohazardous
infectious material

Class E - Corrosive Material

These controlled products have the ability to corrode metal (aluminum) and to cause irreversible tissue damage to the skin and eyes. Corrosive materials have the following hazard symbol:



CLASS E:
Corrosive material

Class F - Dangerously Reactive Material

These products can

- 1) polymerize, decompose or condense vigorously
- 2) become self-reactive when subjected to shock or an increase in temperature or pressure
- 3) react with water and a product of that reaction is a toxic gas.

The WHMIS hazard symbol for Class F products is:



CLASS F:
Dangerously react.
material

The WHMIS hazard symbols can be found on supplier and workplace labels. Examples of both types of labels are found on the following pages.

The Material Safety Data Sheet for each controlled product is a technical document that supplies detailed information on that controlled product. An example of a Material Safety Data Sheet is provided.

The Material Safety Data Sheets for the Science Department are located in ROOM 331.