

## **Section 1: Safety Lab Practices**

The following maps the videos in this section to the Texas Essential Knowledge and Skills for Science TAC §112.35(c).

### **1.01 Laboratory Safety**

- Chemistry (1)(A)

### **1.02 Safety Data Sheets**

- Chemistry (1)(B)

### **1.03 Proper Disposal**

- Chemistry (1)(C)

Note: Unless stated otherwise, any sample data is fictitious and used solely for the purpose of instruction.

Safety Note: Any chemicals mentioned in these videos are potentially harmful and should be handled with the appropriate safety precautions.

## 1.01

### Laboratory Safety

#### **Pre-Lab Preparation**

- Listen to all your teacher's instructions.
  - Read the entire procedure before starting.
  - Know the specific hazards of each chemical substance you work with.
  - Do only the assigned experiments.
  - Use only the amounts of chemicals specified for an experiment.
- Know where to find and how to operate each of the following:
  - Safety showers
  - Eyewash fountains
  - Safety goggles
  - Fire extinguishers
- Stay organized and know the locations of emergency exits and escape routes.
- Protect your clothing and hair from hazards in the laboratory.
  - Tie back long hair.
  - Roll up loose sleeves.
  - Avoid wearing bulky or loose-fitting clothing.
  - Remove dangling jewelry.
  - Wear closed-toe shoes.

## Safe Lab Practices

- No accident is too small. Report any accident to your teacher.
    - If you receive a minor cut, allow it to bleed for a short time to clean the wound.
    - If you are burned, immediately run cold water over the burned area for several minutes.
  - Protect your eyes by wearing chemical safety goggles when working with chemicals.
    - Do not rub your eyes.
    - If a chemical gets in your eye, remove glasses or contact lenses and immediately use the eyewash fountain to wash your eye with a continuous stream of lukewarm water for at least 15 minutes.
  - Do not eat, drink, chew gum, or taste chemicals in the laboratory.
  - Do not use chipped or cracked glassware.
  - Be careful when heating glassware or equipment.
  - Keep electrical appliances away from sinks and faucets.
  - Report chemical spills immediately to your teacher.
    - Warn other students about the identity and location of spilled chemicals.
    - If a small amount of a corrosive chemical gets on your skin or clothing, notify your teacher. Then wash the affected area with cold running water for several minutes.
    - If a large amount of a corrosive chemical spills on you or your clothing, move immediately to the safety shower and initiate the flow of water to quickly wash away the chemical with large amounts of water.
  - In case of a fire, notify everyone in the lab and immediately exit the building.
    - Do not attempt to use the fire extinguisher. Your teacher may use a fire extinguisher to extinguish a small fire.
    - If you catch on fire, drop immediately to the ground and roll to extinguish the flames.
    - If another student catches on fire, either help him/her roll on the ground or get him/her to a safety shower.
1. When should a safety shower be used in a chemistry laboratory? Who should operate the safety shower under those conditions?

## 1.02

### Safety Data Sheets

For every chemical that is used in a laboratory, we receive a safety data sheet (SDS). The SDS is used to

- describe safety issues with the chemical;
- provide specific data to medical professionals or hazardous materials responders in case of an emergency; and
- inform anyone handling the chemical about other data.

You should review all the specific hazards of the chemical substance you are working with. Make sure to pay attention to flammability, corrosiveness, and radioactivity. This data can be obtained online or from your teacher.

A SDS has the following 16 sections:

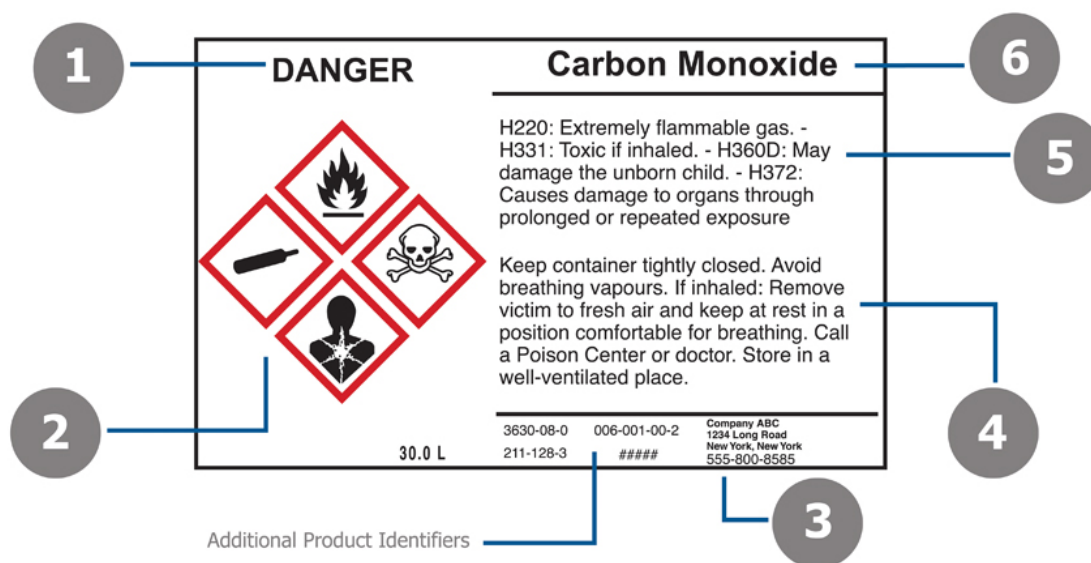
- Identification
- Hazard identification
- Composition/Information on ingredients
- First-aid measures
- Fire-fighting measures
- Accidental release measures
- Handling and storage
- Exposure controls/Personal protection
- Physical and chemical properties
- Stability and reactivity
- Toxicological information
- Ecological information
- Disposal considerations
- Transport information
- Regulatory information
- Other information

**Globally Harmonized System (GHS)** is a system for harmonizing hazard classification criteria and chemical hazard communication elements worldwide.

The GHS includes criteria for the classification of health, physical and environmental hazards, as well as specifying what information should be included on labels of hazardous chemicals as well as safety data sheets.

A GHS label contains 6 main elements:

- The **signal word** indicates the hazard level. “Danger” is used for the most severe instances, while “Warning” is less severe.
- **GHS Symbols (Hazard Pictograms)** are used to identify hazardous products and are commonly grouped by chemical/physical risk, health risk and environmental risk.
- **Manufacturer Information** is listed to identify the manufacturer’s company name, address and telephone number.
- **Precautionary Statements/First Aid** are phrases that are tied to each hazard statement. They describe general preventative, response, storage or disposal precautions.
- **Hazard Statements** are the phrases that describe the nature of hazardous products and the degree of hazard.
  - Hazard statements should be found on the chemical’s SDS and identified by an H-Code (like H220).
  - Like hazard statements, precautionary statements can be identified by a P-Code (like P110).
- **Product Name or Identifiers** identify the product or chemical name. Additional identifiers can be noted to the right of the Manufacturer’s information.



1. According to the SDS, acetic acid has a flammable hazard along with a mild skin corrosion/irritation hazard. What precautions would you take when working with this chemical?

### **1.03**

## **Proper Disposal**

There are multiple ways to dispose of and recycle materials. Always follow your teacher's instructions for proper disposal and recycling of materials.

- Never return unused chemicals to their bottles or flasks.
  - If the chemical is hazardous, do not put it down the drain. It will have to be disposed of in a special container and sent to a designated landfill.
  - When finished with test tubes, empty the test tubes according to your teacher's instructions. Make sure to rinse each test tube with distilled water and dry the test tubes to prepare them for reuse.
  - Wash your hands with soap and water at the end of the lab investigation.
1. Which of the following statements is *false* regarding the proper disposal and recycling of materials?
- A. Some materials used during an investigation can be safely recycled.
  - B. Some chemicals require special waste disposal because they can be hazardous if placed in the regular trash.
  - C. Use the entire quantity available of a chemical needed for the experiment to ensure your investigation is correct.
  - D. To save materials, it is a good idea to return surplus chemicals to their appropriate, labeled reagent bottles.

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