

# Unit 3- Lesson 4

Chemistry 0

March 2022, L. Tracey Gao



## Last week's homework

- Mike fills a graduated cylinder with 10 mL of water. He then drops a ring into the graduated cylinder and records that the water level is 13 mL. What did he measure?
  - A. The ring's mass
  - B. The ring's volume
  - C. The water's density
  - D. The water's weight

## Last week's homework

- What is a flat-bottomed, cylindrical piece of glassware that is used for mixing and heating compounds?



- A. Beaker
- B. Erlenmeyer flask
- C. Florence flask
- D. Buret

## Last week's homework

- What is the device called? It's attached to a gas line and lit to provide heat for your experiments.
  - A. Heater
  - B. Bunsen burner
  - C. Igniter
  - D. Sparker



## Last week's homework

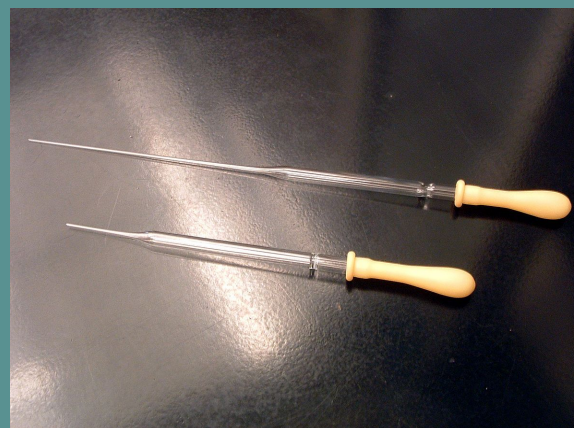
- What is this lab equipment? It's commonly used to measure the volume of a liquid.
  - A. Beaker
  - B. Pipette
  - C. Buret
  - D. Graduated cylinder



## Last week's homework

- Which of the following pieces of chemistry lab equipment is used to transfer liquids from one place to another?

- A. Beaker
- B. Pipette
- C. Buret
- D. Graduated cylinder





# Laboratory and Chemical Safety

- **OBJECTIVES:**
  - Explain the importance of chemical safety and where to find chemical safety information.
  - Identify common chemical safety and protective equipment symbols.
  - List and describe basic laboratory safety guidelines and tips.



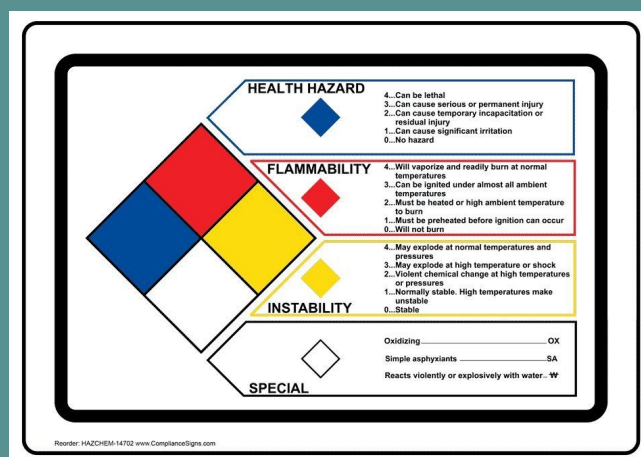
## Laboratory and Chemical Safety

- **WHERE TO FIND CHEMICAL SAFETY INFORMATION:**
  - Product container labels include important information about storage and handling, as well as warnings, first aid information, and other emergency details.
  - Health Flammability Reactivity Symbol gives a very quick overview of things to consider when storing or handling the chemicals.
  - Hazard Communication Standard Labels provides information to the workers on the specific hazardous chemical.
  - Safety Data Sheet (SDS) gives information about the proper way to handle or work with a certain substance.



# Laboratory and Chemical Safety

- **Health Flammability Reactivity Symbol:**
  - The diamond is divided into four sections, each displaying a hazard rating from 0 to 4. A zero indicates no hazard. Higher numbers stand for increasing precautions that need to be taken to safely work with those chemicals.



# Laboratory and Chemical Safety

- Hazard Communication Standard Labels:
  - Labels contain more information about the chemical, such as the name, where it was manufactured, precautionary statements, and other information needed to safely handle that chemical.

**SAMPLE LABEL**


CODE _____ Product Name _____	} <b>Product Identifier</b>	<b>Hazard Pictograms</b>  <b>Signal Word</b> <b>Danger</b>
Company Name _____ Street Address _____ City _____ State _____ Postal Code _____ Country _____ Emergency Phone Number _____	} <b>Supplier Identification</b>	
Keep container tightly closed. Store in a cool, well-ventilated place that is locked. Keep away from heat/sparks/open flame. No smoking. Only use non-sparking tools. Use explosion-proof electrical equipment. Take precautionary measures against static discharge. Ground and bond container and receiving equipment. Do not breathe vapors. Wear protective gloves. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling. Dispose of in accordance with local, regional, national, international regulations as specified.		<b>Hazard Statements</b> Highly flammable liquid and vapor. May cause liver and kidney damage.
<b>Precautionary Statements</b>		
<b>In Case of Fire:</b> use dry chemical (BC) or Carbon Dioxide (CO <sub>2</sub> ) fire extinguisher to extinguish.		<b>Supplemental Information</b> <b>Directions for Use</b> _____ _____ _____ <b>Fill weight:</b> _____ <b>Lot Number:</b> _____ <b>Gross weight:</b> _____ <b>Fill Date:</b> _____ <b>Expiration Date:</b> _____
<b>First Aid</b> If exposed call Poison Center. If on skin (or hair): Take off immediately any contaminated clothing. Rinse skin with water.		

OSHA 3492-01R 2016

# Laboratory and Chemical Safety

- **Safety Data Sheet (SDS):**

- It is a standardized document that contains occupational safety and health data.
- It provides more complete resource for details, such as chemical properties, health and environmental hazards, protective measures, as well as safety precautions for storing, handling, and transporting.

SAFETY DATA SHEET	
Hydrogen Sulfide	
<b>Section 1. Identification</b>	
GHS product identifier	: Hydrogen Sulfide
Chemical name	: hydrogen sulphide
Other means of identification	: Hydrogen sulfide; Hydrogen sulfide (H2S); Sulfuretted hydrogen; Sewer gas; Hydrosulfuric acid; dihydrogen sulfide
Product use	: Synthetic/Analytical chemistry.
Synonym	: Hydrogen sulfide; Hydrogen sulfide (H2S); Sulfuretted hydrogen; Sewer gas; Hydrosulfuric acid; dihydrogen sulfide
SDS #	: 001029
Supplier's details	: .
Emergency telephone number (with hours of operation)	: .
<b>Section 2. Hazards Identification</b>	
OSHA/HCS status	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Classification of the substance or mixture	: FLAMMABLE GASES - Category 1 GASES UNDER PRESSURE - Liquefied gas ACUTE TOXICITY (inhalation) - Category 2 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritators) - Category 3 AQUATIC HAZARD (ACUTE) - Category 1
GHS label elements	
Hazard pictograms	
Signal word	: Danger
Hazard statements	: Extremely flammable gas. May form explosive mixtures with air. Contains gas under pressure; may explode if heated. May cause frostbite. Fatal if inhaled. Extended exposure to gas reduces the ability to smell sulfides. May cause respiratory irritation. Very toxic to aquatic life.
Precautionary statements	

<https://www.sciencedirect.com/topics/engineering/safety-data-sheet>

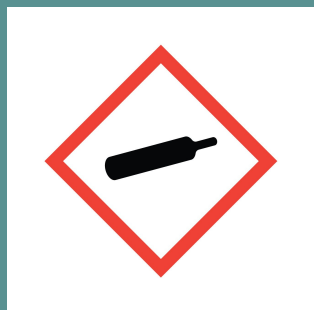


# Laboratory and Chemical Safety

- **WARNING SYMBOLS:**
  - Anyone working with chemicals should become familiar with these common warning symbols. These symbols are often found on chemical containers and around laboratories.
  - Their job is to keep people informed of any potential hazards.
  - They are designed to be noticed and they ultimately help make sure that people use chemicals in a safe and responsible manner.

# Laboratory and Chemical Safety

- WARNING SYMBOLS:



*Gas Symbol*



*Environmental  
Hazard Symbol*



*Explosive Symbol*



*Flame Symbol*



*Corrosive Symbol*

# Laboratory and Chemical Safety

- WARNING SYMBOLS:



*Irritant and Sensitizer Symbol*



*Skull and Crossbones Symbol*



*Chronic Health Hazard Symbol*



*Radiation Symbol*



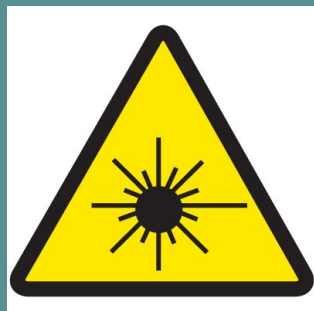
*New Radiation Symbol*

# Laboratory and Chemical Safety

- WARNING SYMBOLS:



*Biohazard Symbol*



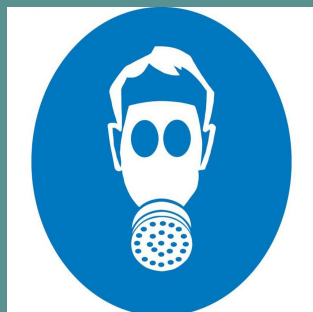
*Laser Symbol*



*Oxidizer Symbol*

# Laboratory and Chemical Safety

- PROTECTIVE EQUIPMENT SYMBOLS:



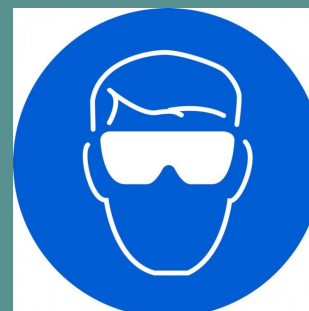
*Respiratory  
Protection Symbol*



*Hand Protection  
Symbol*



*Protective Footwear  
Symbol*



*Eye Protection  
Symbol*



*Face Protection  
Symbol*





# Laboratory and Chemical Safety

- **GENERAL SAFETY RULES:**
  - *When working in the laboratory:*
    - Always read through directions and SDSs completely before beginning an experiment.
    - Avoid touching your eyes, nose or mouth when working in the laboratory.
    - Keep your face away from the opening of a container that holds chemicals.
    - Wear the proper protective gear and clothing.
    - When mixing chemicals, follow the instructions carefully.
    - Work with other people, never work alone.
    - Wear safety goggles to protect your eyes.
    - Know where safety equipment is located.
    - Do not eat or drink in the laboratory.
    - Be careful when working with sharp objects.