

**Science 1206**  
Unit 2: Chemical Reactions  
Worksheet 1: Laboratory Safety And WHMIS



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### **PART A: GENERAL SAFETY EQUIPMENT**

It is important that specific pieces of safety equipment be available in the room where you are conducting activities.

- small fire extinguisher
- fire blanket
- eye wash station
- safety shower
- chemical resistant gloves
- plastic dustpan and brush
- first aid kit
- fume hood
- glass disposal container
- chemical spill kit
- pair of safety tongs
- sharps container



### **PART B: PERSONAL SAFETY EQUIPMENT**

You should also check to see if the following safety equipment is available for your personal use

- safety glasses ( goggles)
- lab coat or apron
- disposable gloves

### **PART C: PRACTICES.**

**Read the safety rules and practices listed below and then answer the questions that follow.**

#### **GENERAL SAFETY**

- 1) Always listen to the teacher and obey his or her instructions. Do not run or horse
- 2) Read the instructions for each activity carefully before coming to the lab. Never try anything other than the written laboratory.
- 3) Make sure you know how to use your lab equipment properly before you start an activity.
- 4) Always use appropriate protective equipment, such as a lab coat or protective eye wear. Tell your teacher if you are wearing contact lenses.
- 5) Do not wear loose clothing, sandals, or open-toed shoes
- 6) Do not chew gum or eat or drink anything in the laboratory.
- 7) Know the location and use of all emergency equipment and emergency exits
- 8) If you should discover a fire, notify your teacher immediately. Warn other students to keep away from the area and follow your teacher's directions. If the fire is large, evacuate the room, close the door and pull the fire alarm.
- 9) If your clothing or hair should catch fire, drop to the floor and roll to extinguish the flames. Do Not Run - this can make the fire worse. Yell to catch the attention of others so that they can help extinguish the flames with water or a fire blanket. If you see another student whose clothing or hair has ignited, tell the teacher and get clean water or a fire blanket to help them extinguish the flames.
- 10) After the lab activity, clean off your bench area. Always wash your hands with warm water and soap after the lab
- 11) Report all accidents to the teacher, no matter how small they may seem.

#### **GLASSWARE**

- 12) Do not use cracked or chipped glassware and be careful with glass pipettes and other pointed glassware. Dispose of it in a “sharps” bucket or as your teacher directs. Use clean glassware. After using glassware, wash it or put it in an approved place to soak

## **CHEMICALS**

- 13) Know the safety precautions and hazards for all chemicals you are using before you start your lab
- 14) If you come in contact with a solid substance, brush it off immediately. For liquid spills, wash the affected area thoroughly with water. If you get anything in your eyes, do not touch them. Rinse them immediately and continuously for 15 minutes and inform your teacher.
- 15) Hold containers away from your face when pouring liquids.
- 16) Read labels on containers. Never use a chemical from a container that does not have a readable label. Inform your teacher if label cannot be read.
- 17) When in the lab, never put anything in your mouth such as fingers, equipment, hair, pencils, or chemicals that you are working with, even if they are food items.
- 18) Never return a chemical to its original container. Doing this could contaminate the original stock.
- 19) Never put any chemical down the sink or into the garbage without permission.
- 20) Clean up any spills according to your teacher's instructions
- 21) If you are asked to smell a substance, never smell it directly. Hold the container at arm's length and waft fumes toward you
- 22) When diluting a concentrated acid with water, add the acid to the water, not the water to the acid. This prevents sudden overheating of the water.
- 23) Do not enter the chemical storeroom without permission from your teacher
- 24) When getting chemicals for use in an experiment, read the label twice to make sure you have the right chemical at the correct concentration. Read any safety information on the label as well.
- 25) Report any spills of chemicals to the teacher.

## **HOT PLATES AND OPEN FLAMES**

- 26) Handle hot objects carefully. Be especially careful with a hot plate even if it looks as though it has cooled down.
- 27) Never leave a hot plate or open flame unattended. A person may get a serious burn
- 28) Tie long hair back out of the way and do not wear loose clothing or hats with protruding brims.
- 29) If you are not sure whether a piece of equipment or glassware is hot or cold, approach it with the back of your hand so that you can detect any heat before grasping it.

## **ELECTRICAL EQUIPMENT**

- 30) Make sure your hands are dry when touching electrical cords, plugs, or sockets.
- 31) Pull the plug, not the cord, when unplugging electrical equipment
- 32) Report frayed cords and any other damaged equipment to your teacher.
- 33) If any electrical component becomes hot during an activity, disconnect the circuit immediately.

**WHMIS** The **W**orkplace **H**azardous **M**aterials **I**nformation **S**ystem is a national system designed to ensure that employers and employees have the information needed to handle hazardous materials safely and thus reduce the incidents of illness and injury.

**The main components of WHMIS:**

- hazard identification and product classification,
- labelling,
- material safety data sheets (MSDS)
- worker training and education



**Controlled Product** are those substances which fall into one or more of six classes.

**Class A**

**Compressed Gas**

Contents under high pressure. Cylinder may explode or burst when heated, dropped or damaged



**Class B**

**Flammable and Combustible Materials**

May catch fire when exposed to heat, spark or flame. May burst into flames.



**Class C**

**Oxidizing Materials**

May cause fire or explosion when in contact with wood, fuels or other combustible material.



**Class D**

**Poisonous and Infectious Materials**



**D1 - Immediate and serious toxic effects**

Poisonous substance. A single exposure may be fatal or cause serious or permanent damage to health.



**D2 - Other toxic effects**

Poisonous substance. May cause irritation. Repeated exposure may cause cancer, birth defects, or other permanent damage.



**D3 - Biohazardous infectious materials**

May cause disease or serious illness. Drastic exposures may result in death.

**Class E**

**Corrosive Materials**

Can cause burns to eyes, skin or respiratory system.



**Class F**

**Dangerously Reactive Materials**

May react violently causing explosion, fire or release of toxic gases, when exposed to light, heat, vibration or extreme temperatures.



**MSDS - Material Safety Data Sheets**

are information sheets on the hazards, safe handling, and first aids measures for controlled products. (Refer to Handout to identify nine categories)

## PART A: MULTIPLE CHOICE

1. If you see something in the classroom or laboratory that is dangerous, tell the teacher
  - (A) When you have time
  - (B) At once
  - (C) After class
  - (D) After school
2. Always point a test tube
  - (A) Away from you and toward others
  - (B) Away from you and others
  - (C) Toward you and others
  - (D) Toward you and away from others
3. To safely smell a chemical in the lab
  - (A) Smell it slowly
  - (B) Inhale the fumes directly from the container
  - (C) Heat the substance before smelling
  - (D) Gently wave the fumes toward your nose using a wafting motion
4. To put out a fire in a person's clothing, use
  - (A) The fire blanket
  - (B) A handy chemical
  - (C) The wind from running
  - (D) The shower
5. Playing (as opposed to working) in the laboratory or bothering another person is
  - (A) Always against the rules
  - (B) Always okay
  - (C) Okay if your partner is working
  - (D) Sometimes all right
6. Chemicals, small parts, glassware, and stirring rods are not to be
  - (A) Used in the laboratory
  - (B) Put in the mouth
  - (C) Put on the bench
  - (D) Taken from boxes
7. You should know the proper use of safety equipment in the laboratory and
  - (A) Where it is located
  - (B) Use it twice a year
  - (C) Use it once a week
  - (D) Where it is produced
8. When using a hot plate
  - (A) Don't leave it unattended
  - (B) Reach over it
  - (C) Wear loose and baggy clothing
  - (D) All of the above

9. If glassware becomes chipped or broken
- (A) Don't do anything, just keep working
  - (B) Throw it in the trash
  - (C) Put it up on the counter so that the teacher can dispose of it
  - (D) Notify the teacher immediately
10. Keep all work areas
- (A) Clean
  - (B) Clear of all unnecessary materials
  - (C) Organized
  - (D) All of the above
11. If you injure yourself or others,
- (A) Don't tell anyone
  - (B) Tell the teacher immediately
  - (C) Wait until the end of the experiment to tell the teacher
  - (D) Wait until after class to go to the nurse
12. you come into class with gum or candy
- (A) Offer some to the teacher
  - (B) Spit it out after the lab is over
  - (C) Spit it out before the lab begins
  - (D) Wait until the teacher calls on you
13. When mixing acid and water
- (A) Pour water into acid
  - (B) Let the teacher pour them
  - (C) Pour them at the same time
  - (D) Pour acid into water
14. What does the acronym WHMIS stand for?
- (A) Workplace transportation guide
  - (B) Environmental system
  - (C) Workplace hazardous materials information system
  - (D) Workplace hazardous waste disposal system
15. Why is it important for you to be trained in WHMIS?
- (A) To get your job done faster
  - (B) To have information to protect your health and safety
  - (C) To serve our customers better
  - (D) To become aware of the dangers in your household
16. What are the 3 main communication components of WHMIS?
- (A) Labels, MSDS, and training
  - (B) Reading, writing and labeling
  - (C) Heating, waste and storage
  - (D) Stickers, shipping and storage
17. What does the symbol below mean:
- (A) Is biohazardous
  - (B) Is corrosive
  - (C) Produces toxic effects immediately upon exposure
  - (D) Produces toxic effects after prolonged exposure



18. What does the symbol below mean:

- (A) Corrosive
- (B) Flammable and combustible
- (C) Biohazardous
- (D) Oxidizing material



19. What does this symbol tell you about the hazardous material?

- (A) The cylinder is too heavy to lift
- (B) The material may eat through metal
- (C) The material is under pressure
- (D) The material may catch fire



20. What does this symbol tell you about the hazardous material?

- (A) It can not harm anyone
- (B) It will Evaporate quickly
- (C) It can be used in cleaning
- (D) It can cause tissue damage



21. What does the symbol below indicate?

- (A) Could harm you now or in the future
- (B) Give you an infectious disease
- (C) Be used without having a MSDS
- (D) Cause cancer



22. The WHMIS symbol for compressed gas is:

- (A) "T" in a circle
- (B) a cylinder in a circle
- (C) a flame in a triangle
- (D) "G" in a circle

23. Supplier and workplace labels must have

- (A) The name of the product
- (B) Safe handling or precautions
- (C) Reference to MSDS
- (D) All of the Above.

24. How could you protect yourself while you work with hazardous material?

- (A) Talk to your supervisor about safe work procedures
- (B) Wear the proper protective equipment when working with this material
- (C) Read the label and MSDS to find out how to work safely with this material
- (D) All of the above

25. Material Safety Data Sheets should be:

- (A) Read before using a product
- (B) Kept in a locked file
- (C) Taped on containers
- (D) Sent to all departments

26. A Material Safety Data Sheet (MSDS) contains information on the following:

- (A) Hazardous ingredients
- (B) Toxicological Information
- (C) Physical Properties
- (D) All of the above

27. A chemical's characteristics (odor, appearance, etc) will be listed on the MSDS under:
- (A) Reactivity data
  - (B) Physical data
  - (C) Product identifier
  - (D) Toxicological properties
28. Personal protective equipment (PPE) that is recommended on a MSDS:
- (A) Should be ignored
  - (B) Does not have to be maintained
  - (C) Must be available and used by employees when required
  - (D) Does not have to be available on the unit

***Use the MSDS sheet on Copper (II) Sulfate to answer the following questions. Answer must be recorded on the Scantron sheet.***

29. How many sections would you find on a MSDS?
- (A) 8
  - (B) 9
  - (C) 10
  - (D) 11
30. Which section would you find the chemical formula for copper (II) sulfate?
- (A) Ingredients of Mixtures
  - (B) Name
  - (C) Physical Data
  - (D) Reactivity Data
31. Where would you look to find the boiling point of copper (II) sulfate?
- (A) Ingredients of Mixtures
  - (B) Name
  - (C) Physical Data
  - (D) Special Precautions
32. Copper (II) sulfate is non-flammable.
- (A) True
  - (B) False
33. What should you do if copper (II) sulfate gets into your eyes?
- (A) Remove to Fresh air
  - (B) Flush eyes thoroughly with water for at least 15 minutes
  - (C) Wash with mild soap and water
  - (D) Give artificial respiration
34. The Reactivity Section of the MSDS indicates that copper (II) sulfate is unstable?
- (A) True
  - (B) False
35. Copper(II) sulfate should not be mixed with acetylene because it may create an explosive material.
- (A) True
  - (B) False

36. Which section would you look on a MSDS to find the steps to take if the material is spilled?
- (A) 5
  - (B) 6
  - (C) 7
  - (D) 8
37. How do you dispose of copper (II) sulfate?
- (A) Pour it down a sink
  - (B) Put it back in the original container
  - (C) Give it to a waste disposal agency
  - (D) Put in a refrigerator
38. What protective gear should you wear when using copper (II) sulfate?
- (A) Just gloves
  - (B) Just a laboratory jacket
  - (C) Both gloves and a laboratory jacket
  - (D) You do not have to wear any protective gear.
39. Where should copper (II) sulfate be stored?
- (A) In a cool, dry place
  - (B) In a cool, damp place
  - (C) In a warm, dry place
  - (D) In a warm, damp place
40. What are some of the side effects of being overexposed to copper (II) sulfate?
- (A) Cause vomiting
  - (B) Burns of the cornea
  - (C) Allergic skin reaction
  - (D) All of the above