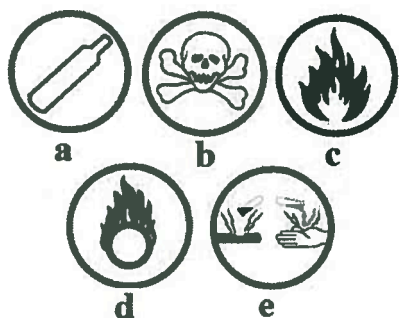


### Chemistry Test #1 Review

#### Practice Questions:

1) Identify the following WHMIS symbols:



- a. compressed gas
- b. poisonous & infectious (immediate/sensory effects)
- c. flammable: combustible
- d. oxidizing material
- e. corrosive material

2) Compare the terms physical and chemical property.

physical property - characteristic that can be determined by observing the substance or using measuring instruments

chemical property - a characteristic behaviour of a substance

3) What are EIGHT physical properties that can be used to describe matter.

|                       |           |
|-----------------------|-----------|
| state                 | viscosity |
| malleability          | density   |
| melting/boiling point | lustre    |
| solubility            | ductility |
|                       | clarity   |

4) What is the difference between lustre, malleability, and ductility?

lustre - shininess or dullness

malleability - ability of a substance to be hammered into a thin sheet

ductility - ability of a substance to be drawn into a fine strand

- 5) Name at least three physical properties that could be used to identify you. Use both qualitative and quantitative properties.

clarity  
height  
weight

- 6) Describe the five components of the particle theory of matter?

- ① all matter is made up of tiny particles that have empty spaces between them
- ② different substance have different kinds of particles
- ③ particles are in constant motion
- ④ particles move faster as temp. increases
- ⑤ particles attract each other

- 7) Describe a physical change. Give three examples of a physical change.

In a physical change, the original substance still exists, it has only changed form.

Examples: ice melts, cut grass, dissolve salt in water

- 8) What are the five pieces of evidence for a chemical change?

- ① a change in colour
- ② a change in odour
- ③ bubbles of a gas are formed
- ④ a solid (precipitate) forms in a liquid
- ⑤ a change in temperature or light

9) Classify each as a chemical or physical change and explain why.

- a. a rusting nail - chemical (change in colour / new substance formed)
- b. wax melting - physical (change in state)
- c. paper burning - chemical (temp. / light given off)
- d. bread rising - chemical (change in colour)
- e. mixing sugar and water - physical (dissolving)
- f. vinegar and baking soda mixed together - chemical (gas produced)

10) What is the difference between a pure substance and a mixture?

pure substance - one or more elements chemically combined which cannot be separated by physical means

mixture - combination of two or more substances that can be separated

11) What is the difference between an element and a compound?

element - matter composed of only one type of atom (ex. Cu, H<sub>2</sub>, Al) or molecule

Compound - matter composed of two or more atoms or molecules

12) What is the difference between a homogeneous and heterogeneous mixture?

homogeneous mixture

- when closely examined, they appear to be only 1 substance (cannot be separated by filtration)

heterogeneous mixture

- when examined closely, the individual particles can be seen. (can be separated by filtration)

13) Classify each of the following based on particle arrangement. Use the following terms:  
element, compound, solution, mechanical mixture, suspension, colloidal dispersion

- a) lemonade with pulp - suspension
- b) carbon - element
- c) a granola bar - mechanical mixture
- d) NaCl (table salt) - compound
- e) Milk - colloidal dispersion
- f) Air - solution
- g) hydrogen gas - element
- h) chalk ( $\text{CaCO}_3$ ) - compound

14) What are the three density formulas?

$$D = \frac{m}{V}$$

$$m = D \times V$$

$$V = \frac{m}{D}$$

15) What are two possible units for density?

$\text{g/cm}^3$  or  $\text{g/mL}$

16) What is the formula for the volume of a rectangular block?

$$V = l \times w \times h$$

17) Solve for the following. Be sure to show ALL work.

- a. The mass of a regulation golf ball is 45.9 g. If its volume is 38.8 mL, what is its density? Will it sink or float? The density of water is 1.0 mg/mL. Explain why.

$$m = 45.9 \text{ g}$$

$$V = 38.8 \text{ mL}$$

$$D = ?$$

$$D = \frac{m}{V} = \frac{45.9 \text{ g}}{38.8 \text{ mL}}$$

$$= 1.18 \text{ g/mL}$$

So the density is 1.18 g/mL.  
The golf ball would sink  
because it has a greater density.

- b. A block of wood has a density of  $0.89 \text{ g/cm}^3$ . If its length, width, and height are  $8.9 \text{ cm}$ ,  $3.4 \text{ cm}$ , and  $2.3 \text{ cm}$ , respectively, what is its mass?

$$D = 0.89 \text{ g/cm}^3$$

$$V = l \times w \times h$$

$$= (8.9 \text{ cm})(3.4 \text{ cm})(2.3 \text{ cm})$$

$$= 69.6 \text{ cm}^3$$

$$m = D \times V$$

$$= 0.89 \frac{\text{g}}{\text{cm}^3} \times 69.6 \text{ cm}^3$$

$$= 61.9 \text{ g}$$

So the mass is  $61.9 \text{ g}$ .

- c. A student finds the mass of a steel marble to be  $16.00 \text{ g}$ . To find the volume of the marble he submerges it in  $25 \text{ cm}^3$  of water and observes that the volume of the water rises to  $27.0 \text{ cm}^3$ .

$$m = 16.00 \text{ g}$$

$$V = 27.0 \text{ cm}^3 - 25 \text{ cm}^3$$

$$= 2 \text{ cm}^3$$

So the density is  $8.0 \text{ g/cm}^3$

$$D = \frac{m}{V}$$

$$= \frac{16.00 \text{ g}}{2 \text{ cm}^3}$$

$$= 8.0 \text{ g/cm}^3$$

- d. A plastic ball has a mass of  $0.15 \text{ kg}$ . If the density of the ball is  $0.80 \text{ g/cm}^3$ , what is its volume?

$$m = 0.15 \text{ kg}$$

$$= 150 \text{ g}$$

$$D = 0.80 \text{ g/cm}^3$$

$$V = \frac{m}{D} = \frac{150 \text{ g}}{0.80 \text{ g/cm}^3}$$

$$= 187.5 \text{ cm}^3$$

So the volume is  $187.5 \text{ cm}^3$

- 20) Describe the following models of the atom: Empedocles, Democritus, Dalton, Thomson and Rutherford.

Empedocles - all matter composed of earth, water, fire, air

Democritus - all matter composed of tiny particles called atoms

Dalton - no smaller particle than atom; all atoms of an element are identical

Thomson - atoms contain electrons which are evenly distributed throughout atom

Rutherford - centre of atom has positive charge (protons); surrounded by negative electrons

21) Describe the location and charge of an electron, neutron, and proton.

electron - surrounding nucleus (negative charge)  
 neutron - nucleus (no charge)  
 proton - nucleus (positive charge)

22) What does the atomic number represent? What does the mass number represent?

atomic number = # of protons

mass number = # of protons + neutrons

23) Fill in the following table:

| Symbol | Element name | Atomic number | Atomic mass | # of protons | # of neutrons | # of electrons |
|--------|--------------|---------------|-------------|--------------|---------------|----------------|
| K      | Potassium    | 19            | 39          | 19           | 20            | 19             |
| Be     | Beryllium    | 4             | 9           | 4            | 5             | 4              |
| S      | Sulfur       | 16            | 32          | 16           | 16            | 16             |
| Br     | Bromine      | 35            | 80          | 35           | 45            | 35             |
| O      | Oxygen       | 8             | 16          | 8            | 8             | 8              |
| Li     | Lithium      | 3             | 7           | 3            | 4             | 3              |
| O      | Oxygen       | 8             | 16          | 8            | 8             | 8              |

24) Draw the Bohr-Rutherford diagrams of Be, Si, and O.

