

Name: _____ Date: _____ Period: _____

Chemistry Vocabulary- Chapter 2 – Matter and Change

Boiling point

Change of state

Chemical property

Chemical reaction

Chemical symbol

Compound

Condensation

Dissolve

Distillation

Element

Gas

Heterogeneous mixture

Homogeneous mixture

Law of conservation of mass

Liquid

Mass

Matter

Melting point

Mixture

Phase

Physical change

Physical property

Product

Reactant

Solid

Solubility

Solution

Substance

Vapor

REV (regular English Vocabulary)

Alters

Composition

Differ

Distinguish

Expand

Nutritious

Odor

Particularly

TEXT REVIEW: Section 2.1 Properties of Matter.

1. What vocabulary term means “anything which has mass and volume” or “anything which has inertia”?
2. What vocabulary term means “the amount of matter an object contains”?
3. Which of the substances listed in table 2.1 are matter?
4. Why is neon a substance, but air is not?
5. Explain why spaghetti sauce is a mixture, not a compound.
6. Explain why water is a compound, rather than a mixture.
7. Is every sample of sucrose, $C_{12}H_{22}O_{11}$, identical to every other sample of sucrose? Explain.
8. Circle the physical properties:
a) melting point b) color c) smell d) ability to tarnish e) density
f) boiling point g) flammability h) mass i) state of matter j) solubility
k) compressibility l) shape m) hardness n) ability to react with acid
9. A substance with indefinite shape, which expands a little when heated, and definite volume is:
a) solid b) liquid c) gas
10. A substance with definite shape, definite volume, is a) solid b) liquid c) gas
11. How would one describe a gas or vapor?
12. What are the three states of matter? What is the fourth state which isn’t mentioned in this text?
13. What happens at the melting point?
14. What happens at the boiling point?
15. Does the appearance of a substance change at the melting or boiling point? Why aren’t those chemical changes?
16. Is every sample of matter a substance? Explain.
17. Which of the following are physical changes:
a) Making caramel from sugar (when you heat sugar it turns brown and gooey).
b) carving a wooden car for the matchbox derby.
c) freezing mercury.
d) dissolving sugar in water.

TEXT REVIEW section 2.1 page 2

17. Which of the following are physical changes:

- a) Making caramel from sugar (when you heat sugar it turns brown and gooey).
- b) carving a wooden car for the matchbox derby.
- c) freezing mercury.
- d) dissolving sugar in water.
- e) distilling alcohol from wood splints.

18. Use table 2.1 to answer the following questions:

- a) Which of the liquids listed has the highest boiling point?
- b) What two properties of sucrose distinguish it from sodium chloride?
- c) What single property do neon, oxygen, and ethanol have in common?
- d) What substance has a melting point and a boiling point which are only 3° different?
- e) Which substance has the largest difference between its melting point and boiling point (excluding sugar)?
- f) What conclusion can you draw about the density of gases?
- g) Are there any liquids which are denser than solids? Which?

19. List three physical properties of a steel chain.

- a)
- b)
- c)

20. What is the physical state of the following at room temperature?

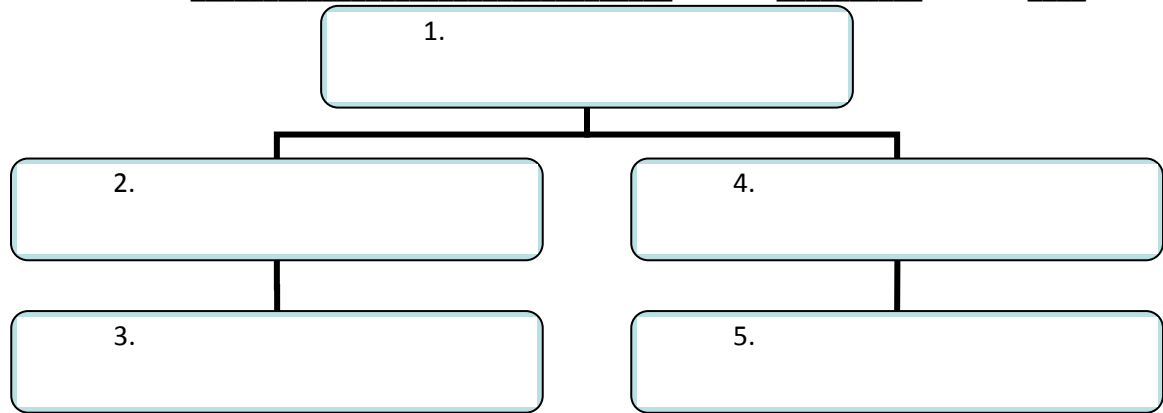
- | | | | | | |
|---|-------------|---|-----------------|---|-----------------------|
| A | Gold | B | Gasoline | C | Paraffin wax (candle) |
| D | Helium | E | Rubbing alcohol | F | Mercury |
| G | Diamond | H | Oxygen | I | Clay |
| J | Cooking oil | K | Neon | L | sucrose |

21. Fingernail polish (mostly acetone) is a liquid at room temperature, you can smell the acetone, which indicates that gaseous acetone is present. Would you describe this evaporated gas as a vapor or a gas? Explain.

22. Use Table 2.1 to identify four substances that undergo a physical change if the temperature is decreased from 50°C to -50°C. Describe the nature of the physical change.

TEXT REVIEW Section 2.2

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Fill in the blanks with the words and definitions below:

Mixture, heterogeneous mixture, homogeneous mixture, solution, more than one phase.

6. List several ways to separate mixtures.

7. Describe a method used in cooking to separate noodles from the water after they are cooked. Was the mixture homogeneous or heterogeneous? Explain.

8. Describe a method used to separate oil from vinegar in Italian dressing. Was the mixture homogeneous or heterogeneous?

9. Describe a procedure to separate a mixture of sand and salt.

10. Describe a procedure to separate a mixture of ethanol and water.

11. Classify each as homogeneous or heterogeneous, mixture or substance.

	Substance	Homo/heterogeneous	Mixture/substance	Element compound or neither
a.	silver			
b.	Alphabet soup			
c.	Textbook			
d.	Table salt (NaCl)			
e.	Glass			
f.	Muddy water			
g.	Salt water			
H	air			

Separating a Mixture Lab

Purpose: To separate a mixture using chromatography.

Hypothesis: **If** the black ink is a mixture, **then** it should be able to be separated by physical means.

Materials: Black (or other color) marker

filter paper or coffee filter.

Beaker or plastic cup

metric ruler

pencil or bic pen

about 2 – 5 mL of water

scissors

Procedure:

1. Cut two strips from the coffee filter (or use the filter strip).
2. Use the marker to draw a line 2 cm from one end of the strip.
3. Put between 2 and 5 mL of water in the beaker (so the bottom is wet about 1 cm).
4. Suspend the paper so the line you drew is about 1cm above the water level and the top of the strip is suspended from the top of the beaker.
5. Observe for fifteen minutes.
6. Take out the strip and measure the following:
 - a) how far the water travelled from the original marker line.
 - b) how far from the original line to the MIDDLE of the next color.
 - c) how far from the original line to the middle of the other colors.
7. While you write up this lab, repeat the experiment but this time, by writing your name down the strip in black letters. Allow your art-work to develop while you fill in the data table and do the math.

Results:

Color	Distance
Original Black line	0.00 cm
Color 1	
Color 2	
Color 3	
Color 4	
Water line	

Calculations: To calculate the R_f value (a value which allows you to look up the components of a dye).

Divide the distance traveled by color 1 by the distance to the water line. Repeat for all of the colors.

Compare your values to those of your classmates.

Show your work here:

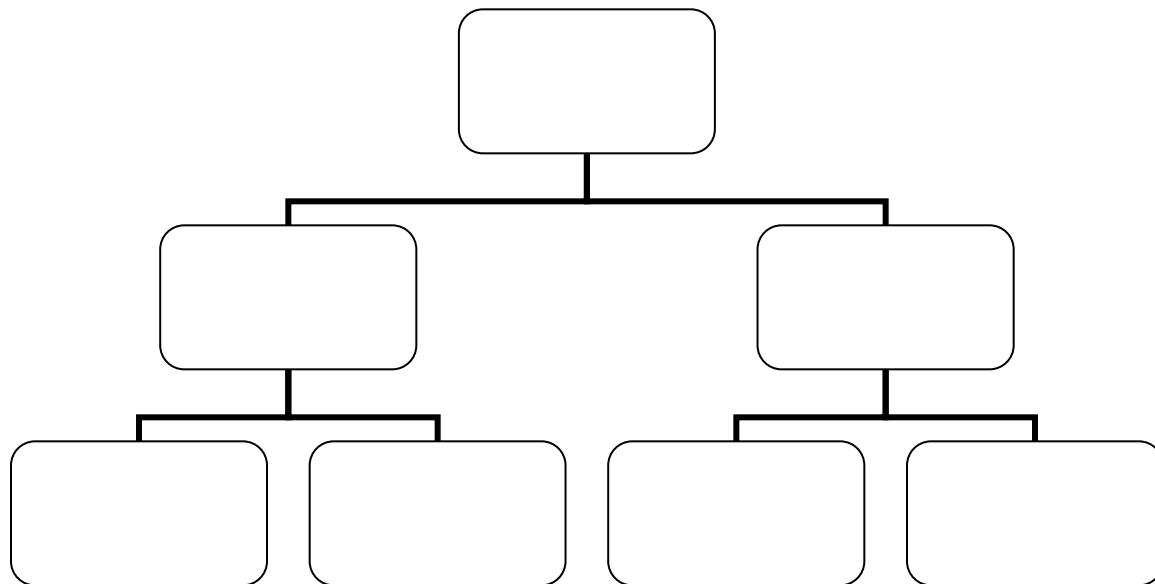
$$\frac{\text{Color 1}}{\text{Water line}} = \frac{\quad}{\quad} =$$

Repeat for the other values.

Section 2.3 Elements and Compounds:

Make a concept map with the following words and definitions:

Elements, compounds, matter, substance, mixture, homogeneous, heterogeneous.



Fix the following to make them true statements:

1. The first letter in the chemical symbol is always _____ letter.
2. If there are more than one letter in the chemical symbol for an element, the second letter is always _____.
3. In a compound, each new element begins with a _____.
4. Some chemical symbols are derived from Latin or Greek. Write the name and symbol for the elements whose latin names are given below:

Latin or Greek (or other)	Name	symbol
Argentum		
Aurum		
Cuprum		
Ferrum		
Hydrargyrum		
Kalium		
Natrium		
Plumbum		
Stibium		
Wolfram		

5. When there is more than _____ of an element in a compound, the number is represented by a subscript.
6. For Fe_2O_3 : How many iron atoms are in the compound? _____ How many oxygen atoms? _____
7. For Na_2O : How many sodium atoms are in the compound? _____ How many oxygen atoms? _____
8. Fill in the chart with the names and symbols of the atoms:

Sn =	S =	Na =	Sr =
Ag =	P =	K =	Cl =

Section 2.3 Elements and Compounds: (cont.)

9. Classify the following as elements, compounds, or mixtures: If it is an element, write the symbol. If it is a compound, write which elements are in the symbol.

Copper =	Oxygen=	Carbon dioxide=	Silver=
Sodium =	Potassium =	Phosphorous=	Soup=
River water =	Cough syrup =	Nitrogen =	Table sugar =
Table salt =	Helium =	Air =	Glass =

10. Which elements make up acetaminophen $C_8H_9O_2N$? _____

11. Classify the following as homogeneous or heterogeneous:

- a. blood
- b. chocolate chip ice cream
- c. ink from a marker
- d. brass
- e. motor oil
- f. black coffee
- g. silver
- h. pine tree
- i. air

12. Circle the elements in the list above.

13. Name the elements found in the following compounds:

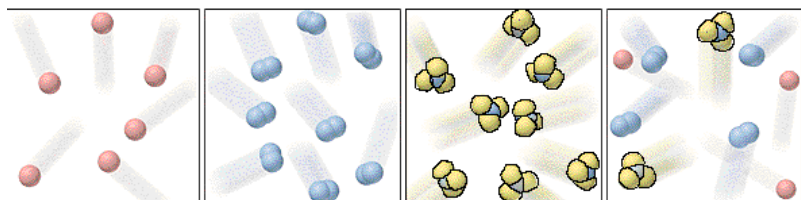
- a. ammonium chloride NH_4Cl
- b. potassium permanganate $KMnO_4$
- c. isopropyl alcohol C_3H_7OH
- d. calcium iodide CaI
- e. phosphoric acid H_3PO_4

14. How many oxygen atoms are in each of the above?

- a. _____, b. _____, c. _____, d. _____, e. _____

15. Is CaI_2 the same thing as Cl_2 ? List as many differences between the two as you can.

16. label the element, compound and mixture pictures with the correct label.



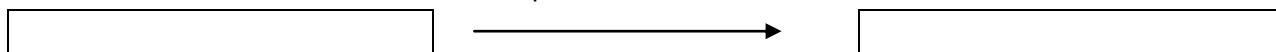
17. Which could be Cl_2 ?

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TEXT REVIEW: Section 2.4 – Chemical Reactions

For all chemical reactions, there are three parts to the reaction: before, during, and after.

1. Fill in the boxes with the words which represent before and after.



2. The ability to undergo a chemical reaction is a _____.

3. A chemical change occurs when _____ turn into _____.

4. In the book seven chemical changes are listed, they are:

- a.
- b.
- c.
- d.
- e.
- f.
- g.

5. How are chemical changes related to chemical properties?

6. Why is an energy change not sufficient proof to show that a chemical reaction has occurred?

7. Is a change in color or odor enough proof to show that a chemical change has occurred? Explain.

8. What is sufficient proof all by itself that something is a chemical change?

9. List all the observations which indicate that a chemical change has probably taken place. These things can all happen in physical changes, but when they are contrary to normal expectations, they constitute proof that a chemical change has occurred. (for example a solid forming from a liquid when heat is applied).

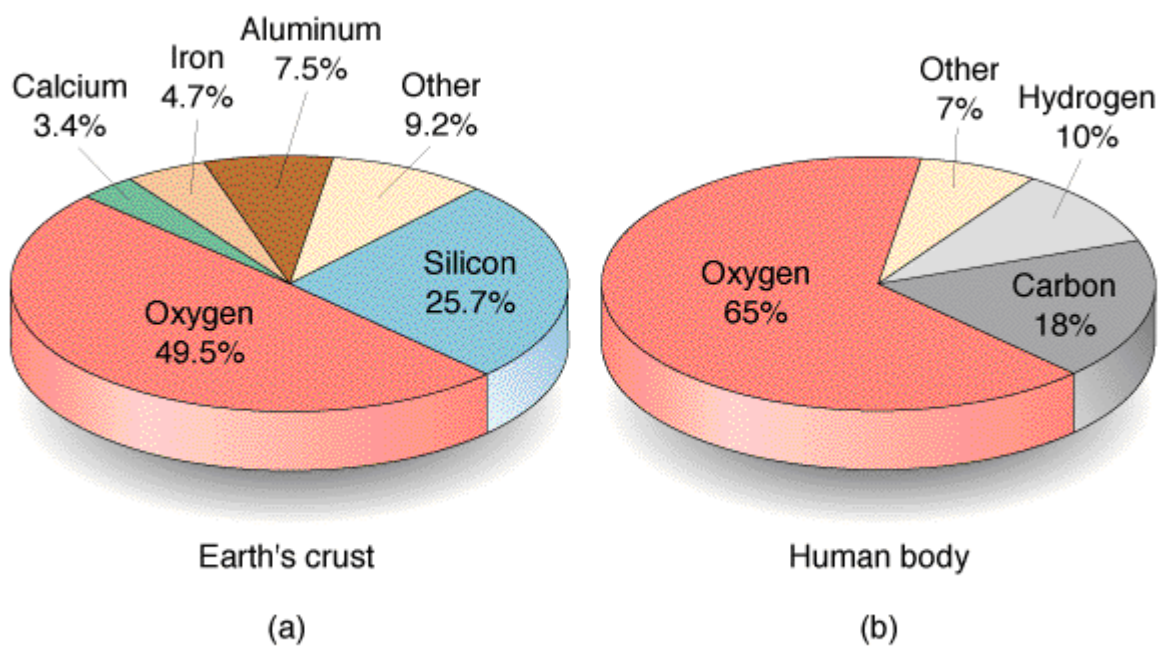
10. Is the mass of products ever greater than the mass of reactants? What law explains this?

11. Classify the following as chemical (C) or physical changes (P):

Cookies are baked	Water boils	Salt dissolves in water	Milk spoils
Metal chair rusts	Firefly emits light	Burning coal	Bending wire
Cooking steak	Cutting grass	Wax melting	Wax burning

12. Identify the reactants and products in the following:

flour + eggs + baking powder + vanilla → pancake



Make a chart comparing the most abundant elements in the earth's crust with those in the human body. Answer the following questions:

Symbol for element	% in Earth's Crust	% in Human Body
1.		
2. <i>ex.</i> Si	25.7%	0%
3.		
4.		
5.		
6.		
7.		

- Which has a higher percentage of oxygen?
- Which elements are in the human body but are not listed as part of the earth's crust?
- From the chart, can you determine if there is some in the earth's crust? If there is, why would it not be listed (predict)?
- You learned in Biology that Calcium is important in cell-cell signaling, and in bones in humans. Does this observation support the hypothesis you proposed in #3. If it does not, re-write your hypothesis.