Sec 3.1 Assessment Questions p. 75 #1-4

...on 3.1 Assessment

...n Summary

- ...n common states of matter ...id, liquid, and gas.
- ...l properties can be observed ...altering a substance's ...ition.
- ...al properties describe a sub... ability to combine with or ...into one or more new ...ces.
- ...al conditions can affect both ...al and chemical properties.

1. MAIN Idea **Create** a table that describes the three common states of matter in terms of their shape, volume, and compressibility.
2. **Describe** the characteristics that identify a sample of matter as a substance.
3. **Classify** each of the following as a physical or a chemical property.
   - **a.** Iron and oxygen form rust.
   - **b.** Iron is more dense than aluminum.
   - **c.** Magnesium burns brightly when ignited.
   - **d.** Oil and water do not mix.
   - **e.** Mercury melts at –39°C.
4. **Organize** Create a chart that compares physical and chemical properties. Give two examples for each type of property.

p.75 #1

	Shape	Volume	Compressibility
Solid	Definite	Definite	incompressible
Liquid	Indefinite	Definite	incompressible
Gas	Indefinite	Indefinite	easily compressed

2. Density, color, odor, hardness, melting point, boiling point are common characteristics that identify a sample of matter as a substance.

3. a) Iron and Oxygen form rust is a chemical property.
   b) Iron is more dense than aluminum is a physical property.
   c) Magnesium burns brightly when ignited is a chemical property
   d) Oil and water do not mix is a physical property.
   e) Mercury melts at -39°C is a physical property.

4. Physical Property
   - can be observed or measured w/out changing the sample's composition.

   Ex: Density, luster(shine) made into sheets, MP BP, conductor of heat/elect.

   Chemical Property
   - the ability of a substance to combine with or change into one or more substance.

   Ex: iron and oxygen form rust, forms new stuff when combined w/ acid.

Sec 3.2 Assessment p. 79 # 10-14

3.2 Assessment

Summary

- [illegible] alters the physical [illegible] substance without [illegible] composition.
- [illegible] change, also known as a [illegible] reaction, involves a change [illegible] composition.
- [illegible] reaction, reactants form [illegible]
- [illegible] conservation of mass [illegible] is neither created nor [illegible] a chemical reaction; [illegible]

10. MAIN Idea **Classify** each example as a physical change or a chemical change.
- **a.** crushing an aluminum can
- **b.** recycling used aluminum cans to make new aluminum cans
- **c.** aluminum combining with oxygen to form aluminum oxide

11. Describe the results of a physical change and list three examples of physical change.

12. Describe the results of a chemical change. List four indicators of chemical change.

13. Calculate Solve each of the following.
- **a.** In the complete reaction of 22.99 g of sodium with 35.45 g of chlorine, what mass of sodium chloride is formed?
- **b.** A 12.2-g sample of *X* reacts with a sample of *Y* to form 78.9 g of *XY*. What is the mass of *Y* that reacted?

14. Evaluate A friend tells you, "Because composition does not change during a physical change, the appearance of a substance does not change." Is your friend correct? Explain.

#10. a) Crushing an aluminum can - physical change
b) recycling used aluminum cans into new aluminum cans - physical
c) Aluminum combining with oxygen to form aluminum oxide.

#11 A physical change occurs by altering a substance without changing its composition. Ex- cutting a sheet of paper, ice melting, crumpling aluminum foil.

#12 A chemical change is a process that involves one or more substances changing into new substances. Ex- iron rusting, burning paper, food rotting.

#13 a) 22.99 g sodium + 35.45 g chlorine = 58.44 g sodium chloride (Law of Conservation of Matter)

b) 12.2 g X + ___ g Y = 78.9 g XY

78.9 - 12.2 = 66.7 g Y

#14 Your friend is incorrect. A substance may appear to look different, but the composition is still the same. Example: Ice melting

Sec 3.3 Assessment p. 83 #15-17

3.3 Assessment

mary

ical blend of two **ances** in any

mogeneous mixtures.

parated by physical **eparation** tech- **ration**, distillation, **ublimation**, and

15. MAIN Idea **Classify** each of the following as either a heterogeneous or a homogeneous mixture.
    a. tap water **b.** air **c.** raisin muffin
16. **Compare** mixtures and substances.
17. **Describe** the separation technique that could be used to separate each of the following mixtures.
    a. two colorless liquids
    b. a nondissolving solid mixed with a liquid
    c. red and blue marbles of the same size and mass
18. **Design** a concept map that summarizes the relationships among matter, mixtures, pure substances, homogeneous mixtures, and heterogeneous mixtures.

p.83 #15 a) tap water - homogeneous b) air - homogeneous
c) raisin muffin - heterogeneous

#16 Mixtures - a combination of 2 or more pure substances. The mixture keeps the properties of the individual substances

Substance - a "pure" substance - an element or a compound that has its own unique properties

#17 a) 2 colorless liquids - separate using distillation. Both liquids have different boiling points. 1 liquid will boil 1st.

b) A Non-dissolving solid + a liquid - Filtration

c) red and blue marbles of the same size and weight - -pick the colored marbles out by hand

Sec 3.4 Assessment Questions p. 90 #24-28

Section 3.4 Assessment

Section Summary

- Elements cannot be broken down into simpler substances.
- Elements are organized in the periodic table of the elements.
- Compounds are chemical combinations of two or more elements, and their properties differ from the properties of their component elements.
- The law of definite proportions states that a compound is always composed of the same elements in the same proportions.
- The law of multiple proportions states that if elements form more than one compound, those compounds will have compositions that are whole-number multiples of each other.

24. MAIN Idea Compare and contrast elements and compounds.

25. Describe the basic organizational feature of the periodic table of the elements.

26. Explain how the law of definite proportions applies to compounds.

27. State the type of compounds that are compared in the law of multiple proportions.

28. Complete the table, and then analyze the data to determine if Compounds I and II are the same compound. If the compounds are different, use the law of multiple proportions to show the relationship between them.

Analysis Data of Two Iron Compounds

Compound	Total Mass (g)	Mass Fe (g)	Mass O (g)	Mass Percent Fe	Mass Percent O
I	75.00	52.46	22.54		
II	56.00	43.53	12.47		

#24 Elements - Pure Substance - can't be separated by physical or chemical means
↳ made of atoms
Compounds - Pure Substance - can be separated by chemical means
↳ made of molecules

#25. The periodic table is organized in rows + columns. Elements in the same column have similar properties. They are in the same family.

#26. The law of definite proportions says that all samples of a compound have the same percentage of each element, regardless of size. Compounds have a set composition.

#27. The law of multiple proportions apply to 2 compounds that have the same elements in them.
Water (H_2O) and Hydrogen Peroxide (H_2O_2).
Twice as much O in H_2O_2 than in H_2O

#28.

Compound	Total Mass	Mass Fe	Mass O	% Fe	% O	
I	75.00	52.46	22.54	69.94%	30.05%	
II	56.00	43.53	12.47	77.73%	22.27%	

I and II are Different compounds because they have different % of Fe.

Compound I $\frac{52.46}{22.54} = \frac{2.32\text{g Fe}}{1\text{g O}}$

Compound II $\frac{43.53}{12.47} = \frac{3.49\text{g Fe}}{1\text{g O}}$

$\frac{\text{Comp II}}{\text{Comp I}} = \frac{3.49\text{g}}{2.32\text{g}} = 1.50$