Matter

1. What physical characteristic
   a. distinguishes liquids from solid? _____

   b. is common to the gaseous and liquid states?_____

2. Indicate if the following substances do or do not take the shape of their container.
a. copper wire _____

b. oxygen gas _____

c. water _____

3. The following are properties of the metal beryllium. Classify them as physical or chemical.
a. In powdered form, it burns brilliantly on ignition. _____

b. It has a density of 1.85 g/cm^3 at 20^oC. _____

c. It is a relatively soft, silvery-white metal. _____

4. The following are properties of the metal aluminum. Classify them as physical or chemical.
a. It generates a colorless, odourless gas when added to sulfuric acid. _____

b. It can easily be formed into thin foils. _____

c. It is a solid at room temperature. _____

c. It is a good conductor of heat. _____

5. Indicate whether each of the following statements describes a physical or chemical property.
a. silver compounds discolour the skin by reacting with skin protein. _____

b. Lithium metal is light enough to float on water. _____

c. Mercury is a liquid at room temperature. _____

6. Classify the following as intensive or extensive properties.
a. length _____ b. density _____

c. temperature _____ d. melting point _____

7. Classify each of the following changes as physical or chemical.
a. crushing a leaf. _____

b. hammering a metal into a thin sheet. _____

c. burning your chemistry book. _____

d. slicing ham. _____

e. evaporation of water from a lake. _____

f. melting candle wax. _____

8. Indicate whether each of the following methods for obtaining various substances involves physical or chemical change.
a. sodium chloride is obtained from salt water by evaporation of water. _____

b. Nitrogen gas is obtained from air by letting the nitrogen boil off from liquid air.

c. Oxygen gas is obtained by decomposition of the oxygen-containing compound potassium chlorate. _____

d. Water is obtained by the high temperature reaction of gaseous hydrogen with gaseous oxygen. _____

e. Mercury is obtained by decomposing a mercury-oxygen compound, liberating the oxygen and leaving the mercury behind. _____

f. Ammonia is obtained by the high-temperature, high pressure reaction between hydrogen and nitrogen. _____

9. Give the name of the processes for the following changes of physical states.
a. Water is made into ice cubes. _____

b. Mothballs in the closet disappear with time. _____

c. Perspiration dries. _____

d. Dry ice disappears without melting. _____

e. Ice cubes in a glass of water disappear with time. _____

10. Methane burns by reacting with oxygen in the air to produce steam and carbon dioxide.
a. Write a chemical equation for the above reaction.

_____

b. Identify the reactants. _____ and _____.

c. Identify the products. _____ and _____.

d. Using the law of conservation of mass, calculate the mass of oxygen that reacts if burning 50.0 g of methane produces 112.3 g of steam and 137.1 g of carbon dioxide.

11. How much heat (in cal) is necessary to heat 20.0 grams of octane (s = 0.526 cal/g °C from 50.6°C to 67.2°C?

12. How many grams of water (s = 4.184 J/g . °C) will release 1367 J of heat when cooled from 45.2°C to 36.2°C?