Chapter 4 Assignment **Changes in Matter** **Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Due \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**1. Does each of the following phenomena describe a physical change, chemical change or nuclear transformation? (2)**

a) Decomposition of Uranium-235 to harness energy. \_\_\_\_\_\_\_\_\_\_\_

b) Fermentation of cocoa beans to make chocolate. \_\_\_\_\_\_\_\_\_\_\_

c) Dissolving sugar in a cup of coffee. \_\_\_\_\_\_\_\_\_\_\_

d) Sulfur oxides react with water to produce acid rain. \_\_\_\_\_\_\_\_\_\_\_

**2. For each case below, write one observation that indicates that a chemical change has occurred. (2)**

a) Fireworks explode in the night sky. \_\_\_\_\_\_\_\_\_\_\_

b) Hydrogen peroxide bubbles when placed on a cut. \_\_\_\_\_\_\_\_\_\_\_

c) Two clear liquids mix to form a solid. \_\_\_\_\_\_\_\_\_\_\_

d) Iodine turns a starch solution from clear to black. \_\_\_\_\_\_\_\_\_\_\_

**3. Which of the following is not an oxidation reaction? (2)**

Answer #3

a) Photosynthesis c) Rusting

b) Cellular respiration d) A campfire

**4. The reaction of burning methane gas is depicted below. (2)**

**+ +**

Oxygen (O) = Hydrogen (H) = Carbon (C) =

Which reaction correctly represents the reaction above?

A) CH4 + O4 🡪 2 CO2 + 2 H2O

B) CH4 + 2 O2 🡪 CO2 + H2O

Answer #4

C) CH4 + 2 O2 🡪 2 CO2 + H2O

D) CH4 + 2 O2 🡪 CO2 + 2 H2O

**5. Represent the following reaction using the particle model. (4)**

2Mg + O2 🡪 2MgO Mg = O =

2H2O2 🡪 2H2O + O2 H = O =

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**6. Represent each of the following reactions with a chemical equation. Indicate the physical state of each substance, namely; solid, liquid, gas or aqueous. (8)**

1. One molecule of a hydrochloric acid solution (HCl) reacts with one molecule of a potassium hydroxide (KOH) solution to form one molecule of potassium chloride (KCl) in solution and one molecule of water.
2. Two solid aluminum (Al) atoms react with 3 molecules of copper chloride (CuCl2) in solution to form 3 atoms of solid copper (Cu) and 2 molecules of aluminum chloride (AlCl3) solution.
3. Two molecules of potassium iodide (KI) in solution and one molecule of lead nitrate (Pb(NO3)2) in solution react to form one molecule of solid lead iodide (PbI2) and two molecules of potassium nitrate (K(NO3)) in solution.
4. Two molecules of acetylene gas (C2H2) react with five molecules of oxygen gas to form four molecules of carbon dioxide gas and two molecules of liquid water.

**7. Which part of the fire triangle are firefighters affecting in each of the situations below? (3)**

a) Firefighters at an airport spray foam over a pool of flammable liquid spilled by an airplane.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b) Firefighters spray water onto the roofs and sides of two houses next to a blaze.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c) During a forest fire, firefighters begin clear-cutting a threatened area ahead of the blaze. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**8. Kitchen fires are often caused by a pan of oil left unsupervised on a stove. (2)**

a) Which type of combustion occurs in this situation? circle one: rapid, slow or spontaneous

b) Explain why the oil can ignite without a spark?

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