Name _____ Date _____

Physical and Chemical Changes: Clues, New Substances and Conservation of Mass

Directions: Answer each question. In number questions, type only the number; the unit is shown next to the box.

1. Each term below describes a way matter can change or a rule about those changes. Match each term to its meaning.

Write the letter of the matching answer on each line.

1. _____ Physical change
2. _____ Chemical change
3. _____ Reactant
4. _____ Product
5. _____ Conservation of mass

Choices for question 1

A. A starting substance that gets changed in a chemical reaction

B. A new substance that forms in a chemical reaction

C. The rule that the total mass in a closed system stays the same during any change

D. A clue, such as bubbles, that always proves a new substance formed

E. The idea that a chemical reaction destroys some of the starting matter

F. A change in which one or more new substances form

G. A change in which every substance present stays the same substance

2. Omar heats a pot of water until large bubbles form and rise to the top. Has a chemical change happened?

A. No, because chemical changes never make bubbles.

B. Yes, because bubbles always mean a new substance formed.

C. Yes, because the heat splits the water into hydrogen gas and oxygen gas.

D. No, because the bubbles are water vapor: the water is only changing state, and no new substance forms.

3. Ana stirs a spoonful of sugar into a glass of warm water, and the sugar seems to disappear. Which statement is correct?

A. The sugar was destroyed, so the sugar water has less mass than the sugar and water had before.

B. It is a chemical change, because the sugar vanished.

C. It is a physical change: the sugar particles spread out among the water particles, and the sugar can be recovered by letting the water evaporate.

D. The sugar turned into water, so the glass now holds only water.

4. Which two of these changes are chemical changes?

☐ A. Water on a stove boils and forms bubbles

☐ B. An iron fence left out in the rain forms reddish-brown rust

☐ C. Butter melts in a warm pan

☐ D. Blue food coloring spreads through a glass of water

☐ E. Wood burns in a campfire, leaving ash and giving off smoke

5. Kai mixes baking soda with vinegar. The mixture fizzes, makes bubbles and gets a little colder. Which observation is the best evidence that a new substance formed?

A. The mixture got colder.

B. Bubbles formed.

C. A test showed that the gas in the bubbles is carbon dioxide, a substance that neither starting material is.

D. The mixture fizzed and made a sound.

6. Before heating, a sample of table sugar is made of white crystals that dissolve easily in water. After strong heating, what is left is a black solid that does not dissolve in water. What does this comparison of properties show?

A. A chemical change happened, because the black solid has different properties, so it is a new substance.

B. Only a physical change happened, because the sugar just got hot.

C. A physical change happened, because a change in color always means a physical change.

D. Nothing changed except the color, so it is still the same substance.

7. A computer simulation shows vinegar and a small cup of baking soda inside a sealed, rigid container that nothing can enter or leave. The container and everything in it have a mass of 312 grams. In the simulation, the baking soda spills into the vinegar, and the mixture fizzes until it stops. What is the total mass now?

_____ g

8. When baking soda and vinegar are mixed in an open cup on a scale, the scale reading drops as the mixture fizzes. Why?

A. The scale stops working correctly when liquids fizz.

B. The reaction destroys some of the matter.

C. Gases have no mass, so the mixture loses mass.

D. Carbon dioxide gas escapes into the air, taking its mass off the scale, but no matter is destroyed.