Changes in Matter

Read from **Lesson 2: Properties of Matter** in the **Chemistry Tutorial Section, Chapter 2** of **The Physics Classroom**: Part b: Chemical and Physical Changes

Physical vs. Chemical Changes

1. A **physical** change is one that involves a change in form, but not a change in identity. of a substance. These changes can be observed or measured without changing the chemical identity of the substance. Shredding, melting, crushing, boiling – these are examples of physical changes.
   A **chemical** change is a chemical reaction that forms a new substance. Burning, rusting, rotting, molding – these are examples of chemical changes.

   Classify the following changes as physical or chemical. Write letters in the appropriate blank.
   a. An iron nail rusts.
   b Water evaporates.
   c. An ice cube melts.
   d. A fire is ignited.
   e. A document is shredded.
   f. Cheese molds.
   g. A meal is digested.

   Physical: _____

   Chemical: _____

Evidence of a Chemical Change

2. How do you know if a chemical change occurred? Evidence that a chemical change occurred is color change, formation of a precipitate, formation of a gas, odor change, and/or temperature (energy) change.

   During chemistry class, Aaron Agin states that all of the following changes are chemical changes. Why is he correct or incorrect? Justify your answer for each change listed.

   a. Starch is broken down in simple sugars by saliva during the first stages of digestion. Why or why not is this a chemical change? _____

   b. Kale is chopped in a blender to add to a protein smoothie. Why or why not is this a chemical change?

   _____

   c. Nail polish remover evaporates after some is spilled onto the floor. Why or why not is this a chemical change?

   _____

   d. A piece of magnesium is ignited, and a bright burst of light is formed. Why or why not is this a chemical change?

   _____

   e. Socks tumble around as they are heated in a clothes dryer. Why or why not is this a chemical change?

   _____

   f. A container of milk is opened, and it smells rotten. Clearly it is past its expiration date! Why or why not is this a chemical change? _____

   g. A piece of mossy zinc is added to a beaker of hydrochloric acid. Bubbles of hydrogen gas form on the surface of the zinc. Why or why not is this a chemical change?

   _____

   h. Cream is added to a cup of coffee and the coffee changes from a dark black to a light brown color. Why or why not is this a chemical change?

   _____