

## Chapter 5 Reactions

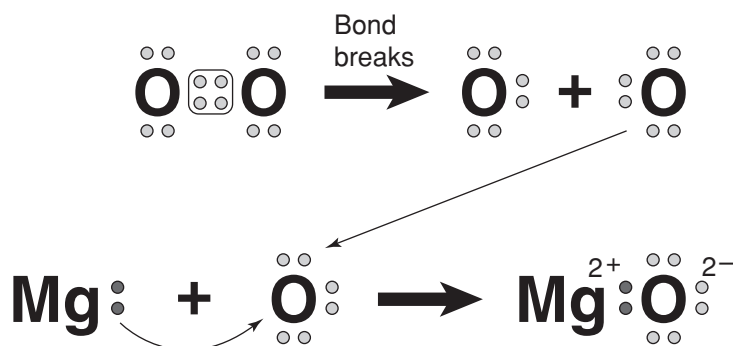
## Evidence of Chemical Change

**5. a.** *Students know* reactant atoms and molecules interact to form products with different chemical properties.

The new substances that form in a chemical change are called **products**. When the atoms rearrange, the chemical makeup of a substance changes. This causes the products of a chemical reaction to have different chemical and physical properties than the reactants. The **reactants** are the atoms and molecules that started the reaction.

During a reaction, the atoms in the reactants rearrange as chemical bonds break and new bonds form. A **chemical bond** is a force of attraction between two atoms. Chemical bonds form when atoms share or transfer electrons.

When magnesium (Mg) burns, it combines with oxygen gas (O<sub>2</sub>) in the air to form magnesium oxide (MgO). Magnesium is a shiny solid that has two electrons available for bonding. Oxygen gas in nature is found as a molecule made up of two oxygen atoms that share electrons. The bond between oxygen atoms breaks apart when oxygen reacts with magnesium. A new bond forms between magnesium and oxygen in which each magnesium atom loses two electrons to an oxygen atom.



**Figure 5-2 Bonding and chemical change** As magnesium burns, bonds between atoms break and new bonds form.

The product of this reaction, magnesium oxide, has properties that differ from those of either reactant. Magnesium is a shiny solid that melts at about 650°C. Oxygen is a gas. Magnesium oxide is a crumbly white powder that melts at temperatures higher than 2,800°C.

In the chemical reaction between magnesium and oxygen, light and heat are given off. This release of energy is a clue that a chemical reaction has occurred. Other evidence for chemical reactions may include the release of a gas, the formation of a solid from two liquid reactants, and a color change.

**Chapter 5 Reactions****Standard 5. a. Check**

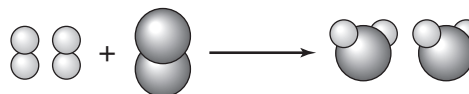
**1** New substances produced in a chemical reaction are called

- A reactants.
- B products.
- C bonds.
- D electrons.

**2** The reactants of a chemical reaction have

- A chemical properties identical to the products.
- B chemical properties different from the products.
- C the same chemical makeup as the products.
- D no chemical bonds.

**3**



Four hydrogen  
atoms, two oxygen  
atoms

Four hydrogen  
atoms, two oxygen  
atoms

**Which of the following statements is true about the reaction shown in the diagram?**

- A The products are identical to the reactants.
- B The atoms of the product rearrange to form new molecules.
- C The atoms of the reactants rearrange to form new molecules.
- D No chemical bonds are broken.

**4**

**Which is evidence that a chemical reaction might have occurred?**

- A release of energy
- B change in shape
- C similarities in physical properties
- D presence of ions