

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_2) 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.

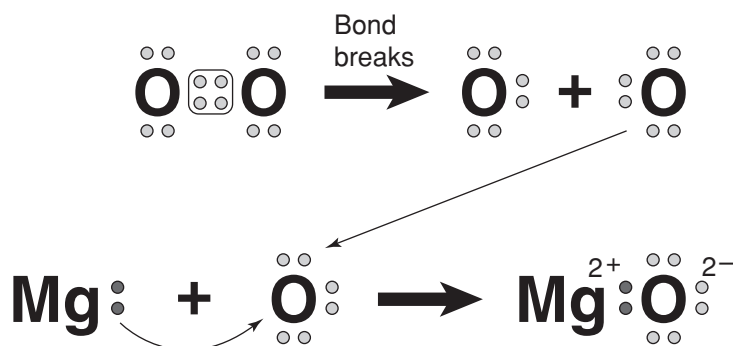


Figure 5–2 Bonding and chemical change As magnesium burns, bonds between atoms break and new bonds form.

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 $2,800^\circ\text{C}$.

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**

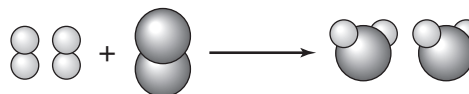
1 New substances produced in a chemical reaction are called

- 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.

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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