

Section 5.2.

Salts.

Textbook pages 234 to 243.

Before You Read.

How many different uses for salts can you name?

What are salts?

In chemistry, **salts** are a class of ionic compounds that can be formed during the reaction of an acid and a base. A salt is made up of a positive ion from a base and a negative ion from an acid. An acid and a base react to form a salt and water in a chemical reaction called a **neutralization (acid-base)** reaction. For example:

H.C.l. plus N.a.O.H. yields N.a.C.l. plus H.2.O.
acid plus base yields salt plus water

Which other compounds react with acids to produce salts?

Acids can also react with metals and carbonates to produce salts.

1. **Metals:** When metals react with acids to produce a salt, they usually release hydrogen gas, as shown below. $2\text{H.C.l.} + \text{M.g.} \rightarrow \text{M.g.C.l.}_2 + \text{H}_2$. The most reactive metals are the **alkali metals** and alkaline **earth metals**, which appear on the extreme left of the periodic table. Within these groups, the elements at the bottom of the columns react the most vigorously.
2. **Carbonates:** Carbonates can also react with acids to produce salts. Much of the carbon dioxide on the surface of Earth is trapped in rocks, such as limestone, dolomite, and calcite, which contain carbonate ions. When carbonate rocks react with acids, such as those in acid precipitation, the carbonates help to neutralize the acid. Sulphuric acid is one component of acid precipitation.

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The chemical reaction between this acid and carbonate releases carbon dioxide gas, as shown below.

$\text{H}_2\text{S.O}_4 + \text{C.a.C.O}_3 \rightarrow \text{C.a.S.O}_4 + \text{H}_2\text{O} + \text{C.O}_2$

What are oxides?

An **oxide** is a chemical compound that includes at least one oxygen atom or ion along with one or more other elements. Both metals and non-metals can form oxides.

1. Metal oxides: A **metal oxide** is a chemical compound that contains a metal chemically combined with oxygen. A metal oxide, such as sodium oxide, combines with water to form a base (see below).

Na_2O plus H_2O yields 2NaOH . (a base)
sodium hydroxide

The base can then react chemically with an acid to form a salt.

2. Non-metal oxides: A **non-metal oxide** is a chemical compound that contains a non-metal chemically combined with oxygen. A non-metal oxide, such as carbon dioxide, combines with water to form an acid.

CO_2 plus H_2O yields H_2CO_3 .
carbonic acid

This acid can react chemically with a base to form a salt.

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