

How Substances Dissolve

KEY IDEAS

As you read this section, keep these questions in mind:

- Why is water called the universal solvent?
- How do substances dissolve?

Why Do Substances Dissolve in Certain Solvents?

Water is often called a universal solvent because many substances dissolve in it. However, no one substance can dissolve every solute. A general rule in chemistry is that “like dissolves like.” This rule means that a solvent will dissolve substances that have similar molecular structures. 

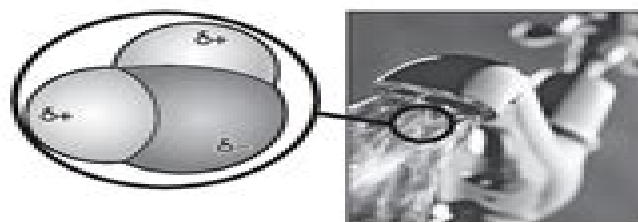
A solvent must be able to attract solute particles and pull them away from one another. Thus, solvent particles must attract solute particles more strongly than the solute particles attract one another.

POLAR MOLECULES

Recall that atoms bonded together do not all share electrons equally. For example, a water molecule is made up of two hydrogen atoms bonded to one oxygen atom. The oxygen atom attracts electrons more strongly than the hydrogen atoms do. Thus, the electrons spend more time near the oxygen atom. This gives each hydrogen atom a partial positive charge (δ^+) and the oxygen atom a partial negative charge (δ^-). 

Molecules that have partially charged positive and negative areas are **polar**. Because water molecules are polar, water can dissolve many other polar substances. Water can also dissolve ionic compounds such as table salt.

Water is a polar molecule because the oxygen atom strongly attracts electrons. Because the electrons spend more time near the oxygen atom, the oxygen atom has a partial negative charge.



READING TOOLBOX

Summarize Read each page of the section silently to yourself. With a partner, take turns summarizing each page.

READING CHECK

1. Identify Why is water called a universal solvent?

because
many substances dissolve
in it

READING CHECK

2. Explain Why does a water molecule have partial charges?

The oxygen atom attracts
electrons more strongly
than the hydrogen atoms
do. Thus, the electrons
spend more time near the
oxygen atom.

How Substances Dissolve Answer Key

Sebastian Brünink

A red circular graphic with a gradient, appearing as a semi-circle or a partial circle, located to the right of the author's name.

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