

Atoms (elements)

The smallest particles of ordinary matter

- There are just over 100 types of atoms
- Each atom has an atomic symbol (a one or two letter abbreviation)
- The 12 major atoms that are abundant in living things:

C (carbon)

H (hydrogen)

O (oxygen)

N (nitrogen)

Ca (calcium)

P (phosphorus)

K (potassium)

S (sulfur)

Na (sodium)

Cl (chlorine)

Fe (iron)

Mg (magnesium)

## Molecule (compound)

A particle made out of atoms joined together

- Covalent bond = the “glue” that joins atoms together in molecules

√ Covalent bonds are shown as a line

√ Example molecules:

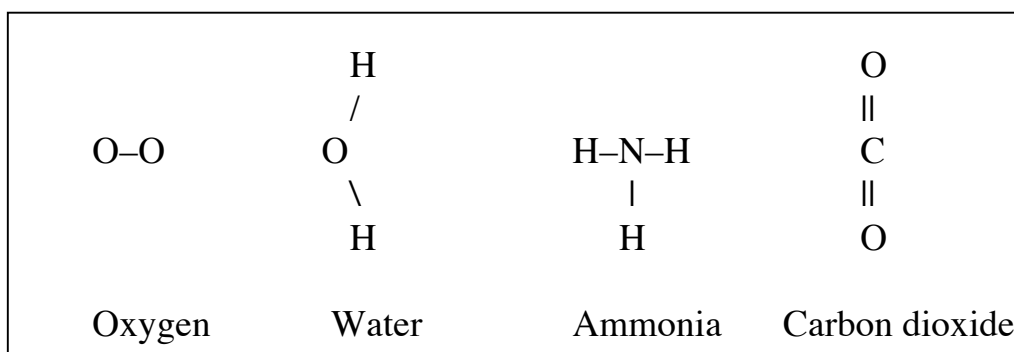


Fig 2.10

## Molecular formula

A way to write a molecule

- All the atomic symbols of the atoms in the molecule are written together, with small numbers to show how many of each atom there are:

Example:  $\text{H}_2\text{O}$  = a molecule of water. It is made of two hydrogen atoms and one oxygen atom

- A large number in front of the molecular formula shows how many molecules are present:

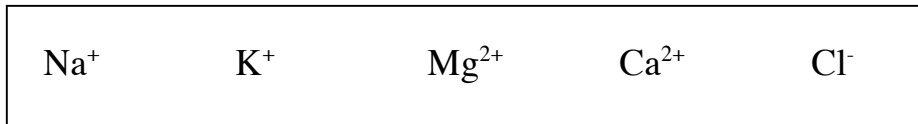
Example:  $3\text{H}_2\text{O}$  = Three water molecules

Fig 2.10

Ion (electrolyte, salt)

An electrically charged atom or molecule

- The type of charge (positive or negative) and the amount of charge are shown in the upper right of each ion
- Anions = Negatively charged ions
- Cations = Positively charged ions
- The body contains many ions that are important for life processes



- Molecule ions have special names:

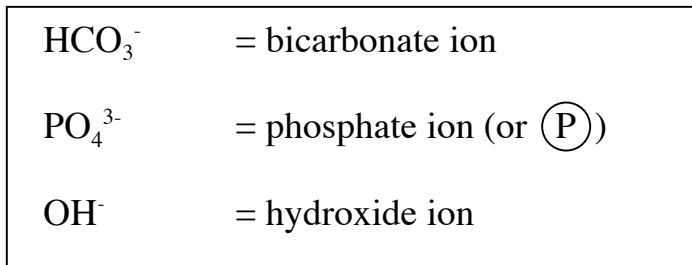


Fig 2.8; Tables 24.6 and 26.1

**Chemical reaction**

When molecules are changed (atoms added or atoms removed from molecules)

- Chemical reactions are written in this way:
  - a) All the reactants (old molecules) are written on the left
  - b) An arrow is written in the middle
  - c) All the products (new molecules) are written on the right.
- Example:  $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$

**Metabolism**

All the chemical reactions in the body

- There are thousands of metabolic reactions taking place in the body at all times

Fig 1.6