**Chemistry** (Chapter 2) **Page 1**

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)

Table 2.1

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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:

 H O

 / ||

 O–O O H–N–H C

 \ | ||

 H H O

 Oxygen Water Ammonia Carbon dioxide

Fig 2.3

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: H2O = 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: 3H2O = Three water molecules

Fig 2.3

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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

Na+ K+ Mg2+ Ca2+ Cl-

 • Molecule ions have special names:

 HCO3- = bicarbonate ion

 PO43- = phosphate ion (or P )

 OH- = hydroxide ion

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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: C6H12O6 + 6O2  6CO2 + 6H2O

Metabolism

 All the chemical reactions in the body

 • There are thousands of metabolic reactions taking place in the body

 at all times