**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