

Chemical Context of Life

2.1 Matter consists of chemical elements in pure form and in combinations called compounds

Organisms are composed of **matter** (take up space and have mass)

Two elements found in many biological systems: Sodium (Na) ~ considered a reactive metal ~ and Chlorine (Cl) ~ poisonous ~

Sodium + Chlorine = Table Salt (Na+Cl-) ~ charge difference makes them attracted

Beginning of the emergent property stairway

Basic elements combined to make unique properties

NAD⁺ → NADH

NADP⁺ → NADPH

Element a substance that cannot be broken down any farther by chemical reactions

Compound a substance consisting of two or more elements in a fixed ratio

20-25% of the 92 elements are essential to life

Carbon, hydrogen, oxygen, and nitrogen make up 96% of living matter

Most of the remains 4% consists of calcium, phosphorus, potassium, and sulfur

Trace elements are those required by an organism in minute quantities

Human Body Elements:

O 65

C 18.5

H 9.5

N 3.3

96%

Ca 1.5

P 1.0

K 0.4

S 0.3

Na 0.2

Cl 0.2

Mg 0.1

4%

Evolution of Tolerance to Toxic Elements

Some species can become adapted to environments containing toxic elements