

## DEFINITIONS

**MATTER:** anything that takes up space and has mass... it is made up of elements!!

**ELEMENT:** substance that cannot be broken down into other substances by chemical reactions

**COMPOUND:** substance that consists of 2 or more elements in a fixed ratio

## SHAPE AND FUNCTION

- molecular function related to its shape

- shape is determined by **bond angles**

- shape is used in how molecules recognize and relate to each other

- **INDUCED FIT** lock and key model

- allows for molecular mimics

## CHEMICAL REACTIONS

- the making & breaking of bonds that leads to changes in the composition of matter

- chemical reactions change reactants into products while conserving matter

- most are reversible

## EXAMPLE

$2\text{H}_2 + \text{O}_2 = 2\text{H}_2\text{O}$  reactants= products

## EMERGENT PROPERTIES

\* sodium (Na) is a metal

\* chlorine (Cl) is a poisonous gas

\* combined= NaCl= table salt

## CHEMICAL BONDING

### IONIC BONDS

- transfer of electrons

-forms + and - ions

-weak bond formed because of their opposite charges

- ionic compounds are called salts

- environment affects the strength of ionic bonds

## CHEMICAL BONDING

### HYDROGEN BONDS

- weak chemical bond

-partially +H atom in water molecule is attracted to the partially -O in another

- can occur wherever an -OH exists in a larger molecule

## EQUILIBRIUM

- chemical equilibrium is reached when the forward and reverse reaction rates are

### EQUAL

5 to 5 or 10 to 10

## LIFE NEEDED ELEMENTS

### CHNOPS

96% = CHON

4%= SPKCa

## CHEMICAL BONDING

### COVALENT BONDS

- sharing electrons

-strong = both atoms holding onto bond electrons

- forms molecules

-double 2 atoms can share more covalent than one pair of electrons bonds

"double and triple bonds"

## POLAR COVALENT BONDS

- electrons are not shared equally

- electronegativity

-oxygen is one of the most electronegative of the 92 elements

