WATER H_2O

→ INORGANIC WITH COVALENT BONDS

→ CHARACTERISTICS IMPORTANT TO LIFE.

1. GOOD SOLVENT
   - DISSOLVES CHEMICAL SUBSTANCES
   - TRANSPORTS SUBSTANCES IN BODY
     eg. BLOOD
   * - CHEMICAL REACTIONS OF BODY OCCUR IN/WITH WATER

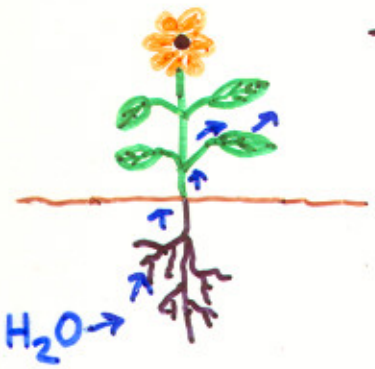
2. HOLDS HEAT
   - WHEN TEMP HOT → H_2O SLOWLY ABSORBS HEAT
   - WHEN TEMP COLD → H_2O SLOWLY RELEASES HEAT
   - OCEANS MAINTAIN CONSTANT TEMP.
   - WATER CONTENT OF BODY PROTECTS COLD BLOODED ANIMALS

3. ICE IS LESS DENSE THAN LIQUID H_2O
   - ORGANISMS IN H_2O AVOID BEING TRAPPED + FROZEN
   - INSULATES FROM TEMP. EXTREMES ABOVE ICE

4. TRANSPARENT
   - PASSAGE OF LIGHT TO PLANTS

5. LUBRICANT
- BETWEEN JOINTS IN BODY

*6. POLAR (PARTIALLY CHARGED)
- MOLECULES "STICK" TOGETHER

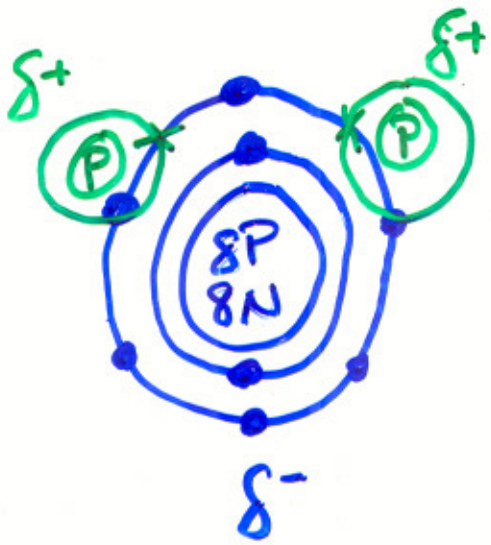


→ HIGH SURFACE TENSION - ALLOWS H_2O MOLECS. TO CREEP THROUGH SOIL TO ROOTS AND UP THROUGH PLANT TO LEAVES.

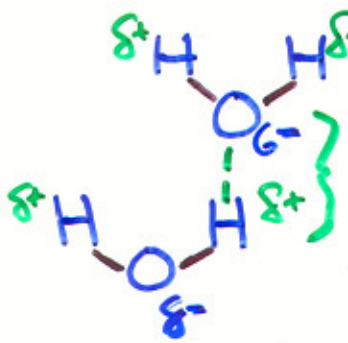
HOW?

O At # 8

H At # 1



O (LARGER) PULLS SHARED H e⁻ CLOSER TO ITS NUCLEUS ∴ PARTIAL CHARGES OCCUR



H BOND - A WEAK BOND

ACIDS + BASES SEE H.O.

Date ____________

ACIDS AND BASES (pp. ~~25-29~~) 28-29

- acids and bases form ions (charged particles) that dissociate (separate) when dissolved in water.
  - **acids** release hydrogen ions (H^+) in water

    eg. HCl -----> H^+ + Cl^-
    hydrochloric acid, hydrogen ion

    - vinegar, lemon juice, and most fruit juices are acids

  - **bases** release hydroxide ions (OH^-) in water

    eg. NaOH -----> Na^+ + OH^-
    sodium hydroxide, hydroxide ion

    - household ammonia and lye are bases

- the **pH scale** indicates how acidic or basic a solution is

  pH POWERS OF HYDROGEN

  $H_2O \rightarrow OH^- + H^+$

  0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 eg. $[H^+]$ 10^{-4} ∴ pH4

  ← acidic — neutral — basic →

  ← increasing H^+ concentration —

  - an acidic solution contrains more H^+ ions than OH^- ions pH 5 $[H^+] > [OH^-]$

  → RXNS TAKE PLACE AT CERTAIN pH LEVELS

- living things are very sensitive to hydrogen ion concentration
  - there must be a constant internal pH

    eg., in humans, the pH of the blood must be 7.4 or we become ill

- **buffers** are chemicals that can take up excess hydrogen or excess hydroxide ions TO KEEP pH CONSTANT

eg. $H_2CO_3 \underset{\text{REFORM}}{\overset{\text{DISSOCIATE}}{\rightleftharpoons}} H^+ + HCO_3^-$

CARBONIC ACID — BICARBONATE ION

IN BLOOD IF:

1. $[H^+]$ HIGH $\quad H^+ + HCO_3^- \longrightarrow H_2CO_3$

2. $[OH^-]$ HIGH $\quad OH^- + H_2CO_3 \longrightarrow HCO_3^- + H_2O$

SALTS - NEUTRALIZATION REACTIONS

ACID + BASE $\longrightarrow$ SALT + WATER

eg. $HCl + NaOH \longrightarrow NaCl + HOH$