

AP BIO CH 2 Points of Emphasis

1) TRACE ELEMENTS

- Required by organisms in only tiny quantities- i.e. iron, iodine, etc

2) ATOMIC STRUCTURE- protons, neutrons, electrons/ location and charge

3) ISOTOPES- Mass # and Atomic #; Isotope symbols

sodium-23 $^{23}_{11}\text{Na}$ or ^{23}Na

4) RADIOACTIVE ISOTOPES:

- DATING
- TRACERS

5) ELECTRON CONFIGURATIONS; VALENCE ELECTRONS

6) CHEMICAL BONDS

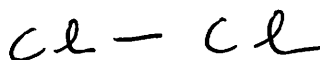
a) COVALENT: sharing electrons to fulfill Octet Rule

- Single--- share one pair ---
- Double--- share two pairs =
- Triple- i.e. atmospheric nitrogen --- share three pairs =

b) POLARITY:

- Identify Polar and Non-Polar Bonds
- (polar) δ^-

(non-polar)



c) ELECTRONEGATIVITY- i.e. Oxygen

7) IONIC BONDS:

- Cations
- Anions
- Salts

8) WEAK ATTRACTIONS:

- **HYDROGEN BONDS:** H and an adjacent O or N; i.e. water, ie. DNA molecule
- VAN DER WAALS INTERACTIONS

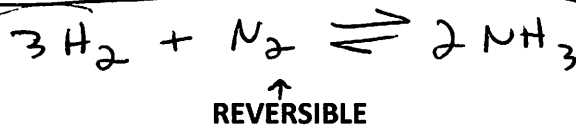
9) **MOLECULAR SHAPE:**

- Linear, tetrahedral, bent etc etc

- "Form and FUNCTION"

BIG IDEA!!!10) **CHEMICAL REACTIONS****REACTANTS \Rightarrow PRODUCTS**

- **BREAKING BONDS REQUIRES ENERGY**
- **FORMING BONDS RELEASES ENERGY**



- **Chemical Equilibrium:**

- DYNAMIC!!!! Still movement
- Not necessarily equal concentrations
- Stabilized at a particular ratio

- **LE CHATELIER'S PRINCIPLE !!!**

11) **CHARACTERISTICS OF WATER:**

- POLAR
- COHESION
- ADHESION
- SURFACE TENSION
- HIGH SPECIFIC HEAT
- UNIVERSAL SOLVENT

12) **SOLUTIONS:**

- SOLVENT, SOLUTE, SOLUTION
- AQUEOUS(aq)

13) **Hydrophilic****Hydrophobic****"Like dissolves like"**14) **MOLAR MASS****Mole(mol) 6.02×10^{23}**

MOLARITY

$$M = \frac{\text{mol solute}}{\text{L soln}}$$

15) ACIDS and BASES:

$$[H^+] = [OH^-] = 7 = \text{NEUTRAL}$$

$$[H^+] > [OH^-] = 0-6 = \text{ACID}$$

$$[H^+] < [OH^-] = 8-14 = \text{BASE}$$

$$pH = -\log[H^+]$$

**** pH DECLINES as H^+ concentration INCREASES

16) BUFFERS

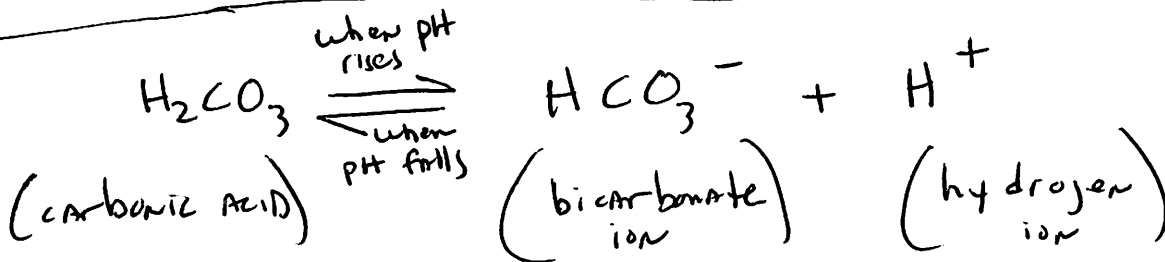
- A SUBSTANCE THAT MINIMIZES CHANGES IN THE CONCENTRATION OF H^+ and OH^- IN A SOLUTION

ALLOW FOR A RELATIVELY CONSTANT pH

!!!

EXAMPLES OF BUFFERING SYSTEMSHUMAN BLOOD:

CO_2 reacts with water in blood plasma to form CARBONIC ACID(H_2CO_3)



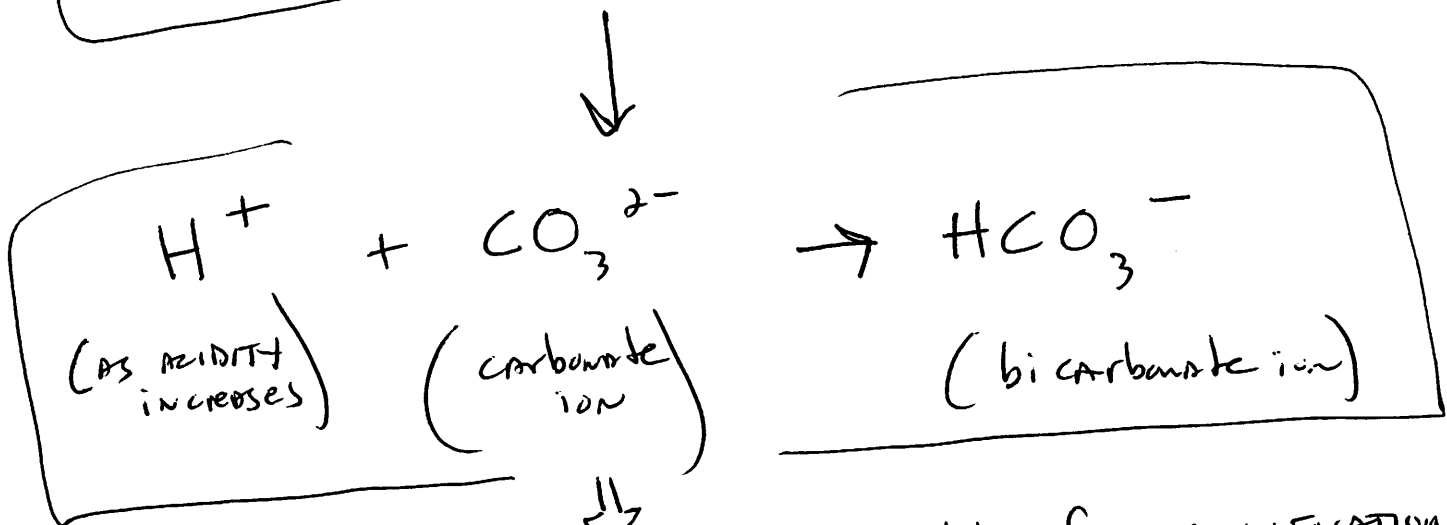
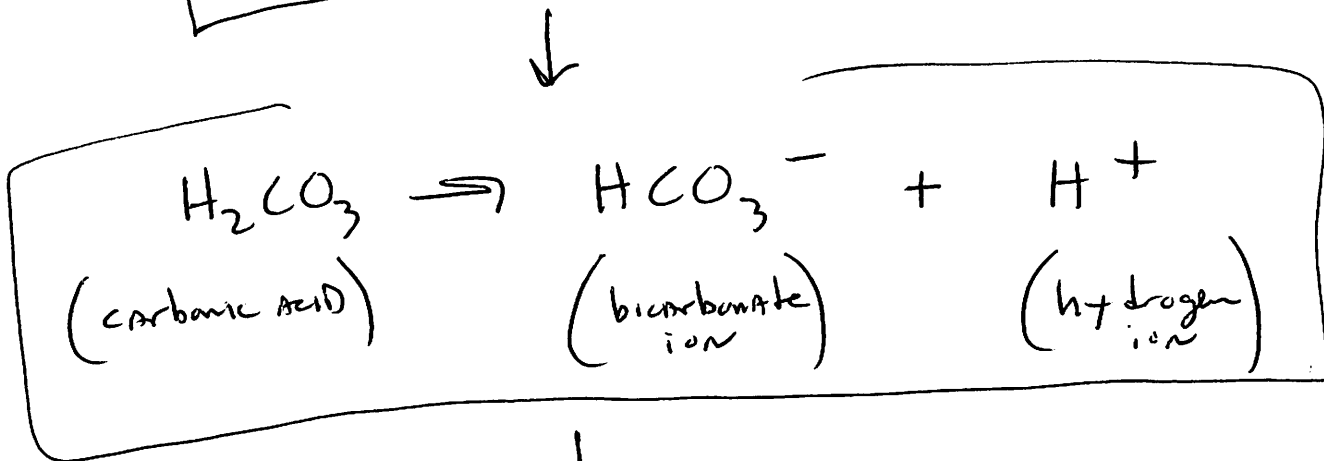
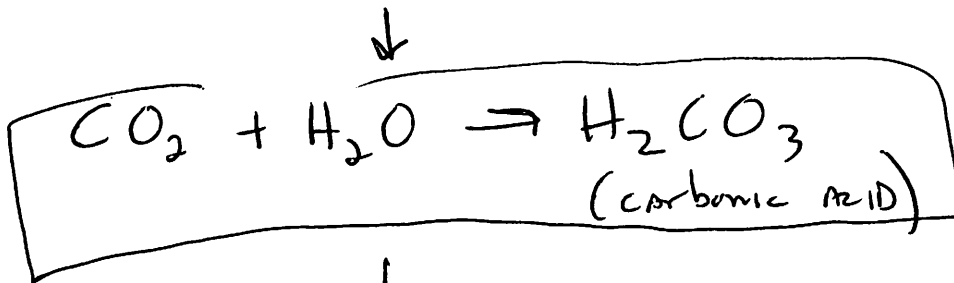
***the Carbonic Acid-bicarbonate buffering system consists of an Acid and Base in equilibrium

(4)

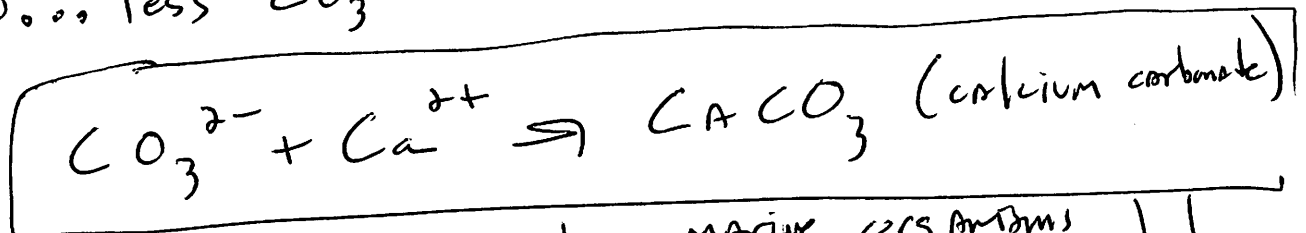
OCEAN ACIDIFICATION:

*** INCREASED DISSOLVED CO_2 from the atmosphere goes into the oceans

..... and, just like BLOOD.....



SO... less CO_3^{2-} is available for CALCIFICATION



→ this is how MARINE organisms make shells !!