

CH 105 Supplemental Instruction

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Sessions: Monday, 1:15-2:15, EB 128

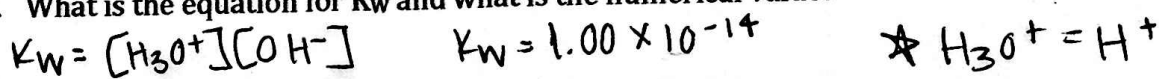
Wednesday, 3:30-4:30, EB 133

Office Hour: Thursday, 3:30-4:30, EB 242 (Academic Success Center)

Acids and Bases Cont.

1. Weak acids have a small K_a and strong acids have a large K_a .

2. What is the equation for K_w and what is the numerical value?



3. When an acid is added to solution, H_3O^+ increases. When base is added to solution, OH^- increases.

4. What is the $[H^+]$ of a sample of lake water with $[OH^-]$ of $4.0 \times 10^{-9} M$? Is the lake acidic, basic, or neutral?

$$\frac{K_w}{[OH^-]} = \frac{[H^+][OH^-]}{[OH^-]} \Rightarrow [H^+] = \frac{K_w}{[OH^-]} = \frac{1.00 \times 10^{-14}}{4.0 \times 10^{-9} M}$$
$$[H^+] = 2.5 \times 10^{-6}, \text{ acidic}$$

5. What is the $[H^+]$ of human saliva if its $[OH^-]$ is $4 \times 10^{-8} M$? Is human saliva acidic, basic, or neutral?

$$[H^+] = \frac{K_w}{[OH^-]} = \frac{1.00 \times 10^{-14}}{4 \times 10^{-8} M} = 2.5 \times 10^{-7}, \text{ neutral}$$

(v.v., slightly basic/acidic)

6. Describe the pH for an acidic solution, a basic solution, and a neutral solution.

acidic pH < 7 basic pH > 7

neutral pH = 7

7. Mathematically, what is pH?

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

8. Calculate the $[OH^-]$ of a solution of baking soda with a pH of 8.5.

$$pOH = 14 - pH$$

$$14 = pH + pOH$$

$$pOH = 14 - 8.5$$

$$pOH = 5.5$$

$$[OH^-] = 10^{(-pOH)}$$

$$[OH^-] = 10^{(-5.5)} = 3.2 \times 10^{-6} M$$