Session 2
09/03/2025

1. Define Bronsted Acid and Bronsted Base

2. Write down a basic chemical equation & label the conjugate pairs. Using HA, B, A, and BH.

3. Define Ka.

4. How do we know if an acid is weak or not? Define strong acid and weak acids.

5. What is so special about water in terms of biochemistry?

6. Write the chemical equation for the ionization of water.

7. What is Keq? How do we solve for this?

8. What is Kw?

9. Derive the Henerson Hasselbach equation.

10. Define pH and list the formula used to calculate it.

11. Draw and label the pKa dissociation curve. How does the curve change as concentration changes?

Practice Problems

1. Calculate the pH of a mixture of 0.25 M acetic acid and 0.20 M sodium acetate. The pKa of acetic acid is 4.76.

2. Calculate the ratio of lactic acid and lactate required in a buffer system of pH 4.9. The pKa of lactic acid is 3.86.

3. Calculate the pH of a solution containing 150 ml of 0.3 sodium benzoate and 220 ml of 0.4 benzoic acid, AFTER the addition of 42 ml of 0.1 M KOH. pKa of benzoic acid is 4.2.

Additional Notes

- Remember that strength of acid is derived from pKa

- Bigger Ka means H_3O^+ and A^- are in higher concentrations and HA is dissociating more.

- A smaller pKa = a stronger acid (and vice versa)

- If pKa = pH, then the ratio of acid & base are equal