

A-Level Chemistry

Name: _____ Score: _____

1. The conjugate base of CH_3COOH is:
 - ☐ H^+
 - ☐ OH^-
 - ☐ $\text{CH}_3\text{COOH}_2^+$
 - ☐ CH_3COO^- (the acid minus one H^+)
2. A buffer solution is made from:
 - ☐ pure water
 - ☐ a weak acid and its conjugate base
 - ☐ a strong base only
 - ☐ a strong acid only
3. The solubility product K_{sp} is:
 - ☐ the product of the ion concentrations, each raised to its number in the formula
 - ☐ the pH of the solution
 - ☐ the solubility in grams
 - ☐ the sum of the ion concentrations
4. The partition coefficient is:
 - ☐ the solubility product
 - ☐ the pH of the mixture
 - ☐ the ratio of the solute's concentrations in the two immiscible solvents
 - ☐ the sum of the concentrations
5. pH is defined as:
 - ☐ $-\log[\text{H}^+]$
 - ☐ $\text{H}^+ \times 14$
 - ☐ $\text{H}^+ - [\text{OH}^-]$
 - ☐ $\log[\text{OH}^-]$
6. A buffer keeps the pH almost constant when a small amount of acid or alkali is added.
 - ☐ True ☐ False

7. The equilibrium constant for a sparingly soluble salt dissolving is the solubility _____.
- _____
8. The value of the partition coefficient depends on the polarity of the solute and solvents.
- ☐ True ☐ False
9. An acid and the base formed when it loses a proton are a conjugate _____.
- _____
10. A buffer keeps the pH constant however much acid or base is added.
- ☐ True ☐ False

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1. **CH_3COO^- (the acid minus one H^+)**

Removing one H^+ from the acid leaves its conjugate base; the two differ by a single proton.

2. **a weak acid and its conjugate base**

A weak acid and its conjugate base (e.g. ethanoic acid + sodium ethanoate) make a buffer.

3. **the product of the ion concentrations, each raised to its number in the formula**

For a saturated solution, K_{sp} multiplies the ion concentrations (each to the power of its formula coefficient).

4. **the ratio of the solute's concentrations in the two immiscible solvents**

$K_{\text{pc}} = [\text{solute in solvent 1}] / [\text{solute in solvent 2}]$, constant at a fixed temperature.

5. **$-\log[\text{H}^+]$**

$\text{pH} = -\log[\text{H}^+]$; so $[\text{H}^+] = 10^{-\text{pH}}$.

6. **True**

That is exactly what a buffer does – it resists changes in pH.

7. **product**

Written K_{sp} .

8. **True**

Polarity governs how the solute distributes, so it sets the partition coefficient.

9. **pair**

e.g. HA and A^- .

10. **False**

False. A buffer resists changes in pH only when small amounts of acid or base are added. Large additions use up the weak acid or its conjugate base.