

Quiz for Video 4 – Buffer Solutions

1. What is the primary role of buffer solutions?
 - a. To neutralize acid
 - b. To resist pH changes
 - c. To be as corrosive as possible
 - d. To maintain homeostasis
2. Which of the following combinations can make a buffer solution?
 - a. Weak acid and its conjugate base
 - b. Strong base and its conjugate acid
 - c. Strong acid and its conjugate base
 - d. Weak acid and another weak acid
3. What could be added to a solution of HF to make a buffer solution?
 - a. HCl
 - b. F⁻
 - c. NaCl
 - d. H₂O
4. When we add H₃O⁺ to a basic ion A⁻, what products will be formed?
 - a. HCl and H₂O
 - b. H⁺ and OH⁻
 - c. HA and H₂O
 - d. H₃O⁺ and A⁻
5. How do buffers maintain a stable pH when either acid or base is added?
 - a. They generate what is needed to neutralize the acid or base
 - b. They do not allow acid or base to dissociate
 - c. They react with either acid or base addition, without creating products that are not part of the buffer
 - d. They turn weak acid into strong acid
6. HCl is a strong acid. Because of this, we know that its conjugate base (Cl⁻) is a:
 - a. Strong acid
 - b. Weak acid
 - c. Strong base
 - d. Neither acidic or basic
7. How would you describe the buffer capacity of a solution?
 - a. The amount of acid/base that can be effectively neutralized
 - b. The margin of error of the concentrations in the solution
 - c. The amount of the acidic component in the solution
 - d. The mass of the solution
8. What is the pH of a buffer with equal concentrations of a weak acid with its conjugate base?
 - a. 7
 - b. The pH of a 1M solution of HA
 - c. The pK_a of HA
 - d. $\log\left(\frac{[A^-]}{[HA]}\right)$
9. What is the Henderson-Hasselbalch equation mathematically equal to?
 - a. The K_a expression
 - b. The buffer capacity
 - c. pK_a
 - d. 7
10. How do we calculate the pH of a buffer after acid addition?
 - a. We don't need to, it won't change
 - b. Calculate the total ion concentration
 - c. Use a reaction table, and calculate the pH of the new composition
 - d. Use K_a again