

## Quiz for Video 4 – Buffer Solutions

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