

Buffers Quiz PDF

Buffers Quiz PDF

Disclaimer: *The buffers quiz pdf was generated with the help of StudyBlaze AI. Please be aware that AI can make mistakes. Please consult your teacher if you're unsure about your solution or think there might have been a mistake. Or reach out directly to the StudyBlaze team at max@studyblaze.io.*

Which buffer system is primarily responsible for maintaining blood pH?

- Phosphate buffer system
- Ammonia buffer system
- bicarbonate buffer system
- Acetate buffer system

Buffers are essential in biochemical research because they:

- Enhances the color of solutions
- Maintain a stable pH for reactions
- Increase the speed of reactions
- Reduce the cost of experiments

Natural buffers in the human body include: (Select all that apply)

- bicarbonate buffer system
- Phosphate buffer system
- Ammonia buffer system
- Sulfate buffer system

The Henderson-Hasselbalch equation requires which of the following inputs? (Select all that apply)

- pKa of the acid
- Concentration of the conjugate base
- Temperature of the solution
- Concentration of the weak acid

What is the primary function of a buffer solution?

- To change the pH of a solution
- To resist changes in pH

- To increase the acidity of a solution
- To neutralize all acids and bases

Which of the following is an example of an acidic buffer?

- Ammonia and ammonium chloride
- Acetic acid and sodium acetate
- Hydrochloric acid and sodium hydroxide
- Sodium bicarbonate and carbonic acid

A buffer solution typically consists of:

- A strong acid and a strong base
- A weak acid and its conjugate base
- A strong base and its conjugate acid
- Water and salt

Buffers are used in which of the following industries? (Select all that apply)

- Pharmaceuticals
- Agriculture
- Food processing
- Textile manufacturing

Explain how a buffer solution works to maintain pH stability when an acid is added.

Describe the role of a conjugate base in an acidic buffer system.

How does the concentration of buffer components affect the buffer capacity?

Why is a buffer most effective within ± 1 pH unit of the pKa of the buffering agent?

Calculate the pH of a buffer solution containing 0.1 M acetic acid and 0.1 M sodium acetate. (Assume pKa of acetic acid is 4.76)

Buffer capacity is defined as:

- The pH range over which a buffer is effective

- The amount of acid or base a buffer can neutralize
- The concentration of the buffer components
- The temperature at which a buffer operates

Factors that affect buffer capacity include: (Select all that apply)

- Concentration of buffer components
- Temperature
- Volume of the solution
- pH of the solution

A buffer is most effective when the pH is:

- Equal to the pKa of the buffering agent
- 2 units above the pKa
- 2 units below the pKa
- Equal to the pH of pure water

The Henderson-Hasselbalch equation is used to calculate:

- The concentration of a buffer
- The pH of a buffer solution
- The temperature of a buffer solution
- The volume of a buffer solution

A buffer is effective within which of the following pH ranges relative to the pKa? (Select all that apply)

- ± 1 pH unit
- ± 2 pH units
- ± 0.5 pH units
- ± 3 pH units

Which of the following are components of a basic buffer? (Select all that apply)

- Weak base
- Strong acid
- Conjugate acid
- Strong base

Discuss the importance of the bicarbonate buffer system in maintaining blood pH.