

## Weak Bases Quiz Answer Key PDF

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#### In the reaction of a weak base with water, what is formed?

- A. Only  $\text{OH}^-$  ions
- B. Only  $\text{H}^+$  ions
- C.  $\text{BH}^+$  and  $\text{OH}^-$  ions ✓**
- D. Only  $\text{BH}^+$  ions

#### In which scenarios would you find weak bases being used? (Select all that apply)

- A. Buffer solutions ✓**
- B. Strong acid neutralization
- C. Cleaning agents
- D. Biological systems ✓**

#### Which of the following are true about the pH calculation of weak bases? (Select all that apply)

- A.  $\text{pH} = 14 - \text{pOH}$  ✓**
- B. Requires  $K_b$  value ✓**
- C. Directly measured by pH meter
- D. Involves calculating pOH first ✓**

#### Which of the following are weak bases? (Select all that apply)

- A. Ammonia ( $\text{NH}_3$ ) ✓**
- B. Sodium hydroxide (NaOH)
- C. Aniline ( $\text{C}_6\text{H}_5\text{NH}_2$ ) ✓**
- D. Potassium hydroxide (KOH)

#### Which of the following statements about weak bases are true? (Select all that apply)

- A. They have a high  $K_b$  value.
- B. They establish an equilibrium in solution. ✓**
- C. They are fully ionized in water.
- D. They can act as buffers. ✓**

**What are the characteristics of weak bases? (Select all that apply)**

- A. High pH
- B. Partial ionization ✓**
- C. Strong electrolyte
- D. Forms a buffer with its salt ✓**

**What is the relationship between  $K_b$  and  $K_a$  for a conjugate acid-base pair?**

- A.  $K_b = K_a$
- B.  $K_b \times K_a = K_w$  ✓**
- C.  $K_b + K_a = 1$
- D.  $K_b - K_a = 0$

**Which of the following best describes the pH of a solution containing a weak base?**

- A. Exactly 7
- B. Less than 7
- C. Greater than 7 ✓**
- D. Exactly 14

**Which of the following weak bases is commonly used in pharmaceuticals?**

- A. Sodium bicarbonate
- B. Methylamine ✓**
- C. Potassium hydroxide
- D. Calcium carbonate

**What is a characteristic of a weak base?**

- A. Completely dissociates in water
- B. Partially dissociates in water ✓**

- C. Does not dissociate in water
- D. Forms a strong acid

**Which factor does NOT affect the strength of a weak base?**

- A. Temperature
- B. Concentration
- C. Pressure ✓**
- D. Common ion effect

**Which of the following is an example of a weak base?**

- A. Sodium hydroxide (NaOH)
- B. Ammonia (NH<sub>3</sub>) ✓**
- C. Hydrochloric acid (HCl)
- D. Sulfuric acid (H<sub>2</sub>SO<sub>4</sub>)

**What does the equilibrium constant (K<sub>b</sub>) represent for a weak base?**

- A. The rate of reaction
- B. The extent of dissociation ✓**
- C. The color change in a reaction
- D. The temperature of the solution

**Outline the steps involved in calculating the pH of a solution containing a weak base.**

**To calculate the pH of a weak base solution, first determine the concentration of OH<sup>-</sup> ions using the K<sub>b</sub> value, calculate the pOH, and then use the formula pH = 14 - pOH.**

**How does the common ion effect influence the equilibrium of a weak base in solution?**

**The common ion effect shifts the equilibrium position of a weak base towards the undissociated form, decreasing ionization and affecting the pH of the solution.**

**Discuss the significance of the equilibrium constant (K<sub>b</sub>) in determining the strength of a weak base.**

The equilibrium constant ( $K_b$ ) indicates the extent of ionization of a weak base; a higher  $K_b$  value means a stronger base as it dissociates more in solution.

Provide an example of a weak base used in a biological system and explain its function.

Ammonia is a weak base used in biological systems to excrete nitrogen waste in the form of urea, helping to maintain pH balance in the body.

Explain why weak bases do not completely dissociate in water.

Weak bases do not completely dissociate in water because they have a lower tendency to donate hydroxide ions, resulting in an equilibrium between the undissociated base and its ions.

Describe the role of weak bases in buffer solutions and how they help maintain pH stability.

Weak bases in buffer solutions react with added acids to neutralize them, maintaining pH stability by resisting changes in pH when small amounts of acid or base are added.

What are the effects of the common ion on weak bases? (Select all that apply)

- A. Shifts equilibrium position ✓
- B. Increases ionization
- C. Decreases ionization ✓
- D. Affects pH ✓