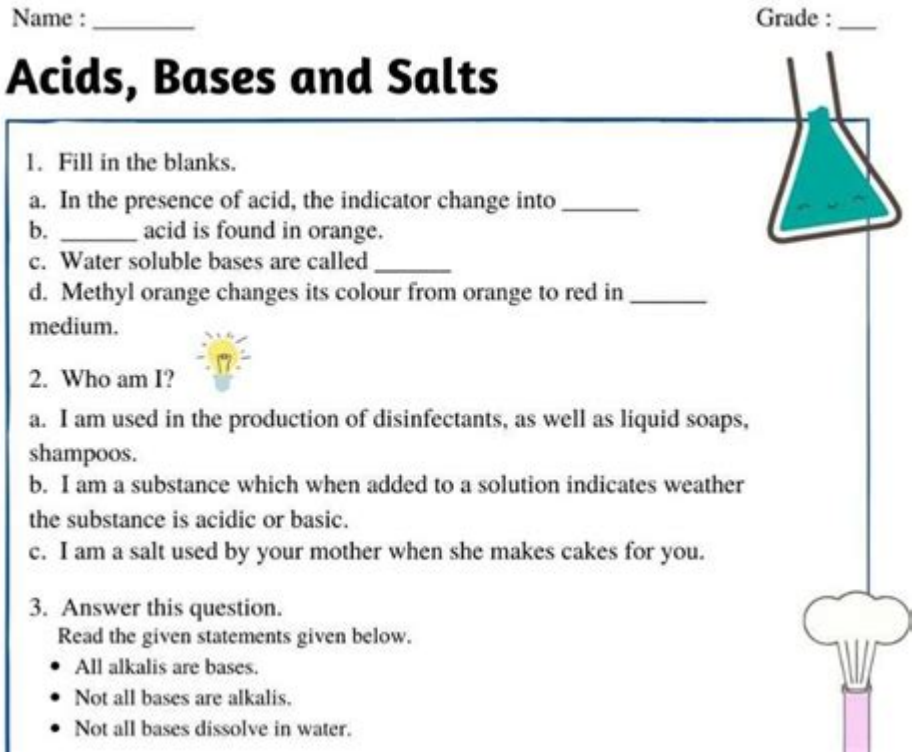
Chapter 19 Acids Bases And Salts Answer Key



Name : _____ Grade : ___

Acids, Bases and Salts

1. Fill in the blanks.
a. In the presence of acid, the indicator change into _____
b. _____ acid is found in orange.
c. Water soluble bases are called _____
d. Methyl orange changes its colour from orange to red in _____ medium.

2. Who am I?
a. I am used in the production of disinfectants, as well as liquid soaps, shampoos.
b. I am a substance which when added to a solution indicates weather the substance is acidic or basic.
c. I am a salt used by your mother when she makes cakes for you.

3. Answer this question.
Read the given statements given below.
- All alkalis are bases.
- Not all bases are alkalis.
- Not all bases dissolve in water.

Chapter 19 acids bases and salts answer key is a critical resource for students and educators delving into the fundamental concepts of chemistry. Understanding the properties and behaviors of acids, bases, and salts is essential for mastering chemical reactions and their applications in various fields. This article will explore the key concepts outlined in Chapter 19, providing a comprehensive answer key that can serve as a study guide or reference for chemistry learners.

Understanding Acids, Bases, and Salts

Before diving into the answer key, it's crucial to grasp the basic definitions and properties of acids, bases, and salts.

What are Acids?

Acids are substances that donate protons (H^+ ions) in a chemical reaction. They typically have a sour taste and can be corrosive. Some common properties of acids include:

- They turn blue litmus paper red.
- They react with bases to form salts and water (neutralization).
- They have a pH value of less than 7.

- They can conduct electricity in solution (electrolytes).

What are Bases?

Bases are substances that accept protons or release hydroxide ions (OH^-) in solution. They tend to have a bitter taste and a slippery feel. Common properties of bases include:

- They turn red litmus paper blue.
- They react with acids to form salts and water.
- They have a pH value greater than 7.
- They can also conduct electricity in solution.

What are Salts?

Salts are ionic compounds that result from the neutralization reaction between an acid and a base. They are composed of cations (positively charged ions) and anions (negatively charged ions). Salts can form in various ways, and their properties include:

- They are typically crystalline solids.
- They can be soluble or insoluble in water.
- They can conduct electricity when dissolved in water.

Key Concepts from Chapter 19

Chapter 19 covers several essential topics related to acids, bases, and salts. Below is an outline of the primary concepts, along with answers and explanations where necessary.

1. The pH Scale

The pH scale is a measure of how acidic or basic a solution is. It ranges from 0 to 14, where:

- pH < 7: Acidic solutions
- pH = 7: Neutral solutions (e.g., pure water)
- pH > 7: Basic solutions

Understanding the pH scale is crucial for predicting the behavior of various substances in chemical reactions.

2. The Role of Indicators

Indicators are substances that change color in response to the pH of a solution. Common indicators include:

- Litmus: Turns red in acidic solutions and blue in basic solutions.
- Phenolphthalein: Colorless in acidic solutions and pink in basic solutions.
- Bromothymol blue: Yellow in acidic solutions and blue in basic solutions.

Indicators are useful for determining the acidity or basicity of a solution without needing to measure the exact pH.

3. Neutralization Reactions

Neutralization reactions occur when an acid reacts with a base to produce a salt and water. The general formula for a neutralization reaction can be represented as:

Acid + Base → Salt + Water

For example, the reaction between hydrochloric acid (HCl) and sodium hydroxide (NaOH) can be expressed as:

$HCl + NaOH \rightarrow NaCl + H_2O$

This reaction illustrates the formation of sodium chloride (table salt) and water from an acid and a base.

4. Types of Acids and Bases

Acids and bases can be classified into different categories based on their strength and source:

- **Strong Acids:** Completely ionize in solution (e.g., hydrochloric acid, sulfuric acid).
- **Weak Acids:** Partially ionize in solution (e.g., acetic acid, citric acid).
- **Strong Bases:** Completely dissociate in solution (e.g., sodium hydroxide, potassium hydroxide).
- **Weak Bases:** Partially dissociate in solution (e.g., ammonia, magnesium hydroxide).

Answer Key for Chapter 19 Exercises

Now that we have a solid understanding of the concepts, let's look at the answer key for some typical exercises found in Chapter 19.

Exercise 1: Identify Acids and Bases

Given the following substances, classify them as acids, bases, or salts:

1. H_2SO_4 (sulfuric acid) - Acid
2. NaOH (sodium hydroxide) - Base
3. KCl (potassium chloride) - Salt
4. CH_3COOH (acetic acid) - Acid
5. $Ca(OH)_2$ (calcium hydroxide) - Base

Exercise 2: pH Calculation

For the following solutions, determine whether they are acidic, basic, or neutral:

1. pH 3 - Acidic
2. pH 7 - Neutral
3. pH 10 - Basic
4. pH 5 - Acidic
5. pH 8 - Basic

Exercise 3: Write Balanced Equations

Balance the following neutralization reactions:

1. $HCl + NaOH \rightarrow NaCl + H_2O$ (Balanced)
2. $H_2SO_4 + 2NaOH \rightarrow Na_2SO_4 + 2H_2O$ (Balanced)

3. $CH_3COOH + NaOH \rightarrow CH_3COONa + H_2O$ (Balanced)

Conclusion

Understanding acids, bases, and salts is fundamental to chemistry and has applications in various scientific fields. The insights provided in the **Chapter 19 acids bases and salts answer key** serve as a valuable tool for students seeking to reinforce their knowledge and excel in their studies. By mastering these concepts, students will be better prepared to tackle more advanced topics in chemistry and appreciate the role these substances play in everyday life.

Frequently Asked Questions

What are the main characteristics of acids and bases as discussed in Chapter 19?

Acids typically taste sour, turn blue litmus paper red, and release hydrogen ions in solution, while bases taste bitter, feel slippery, and turn red litmus paper blue.

What is the pH scale and what does it measure?

The pH scale ranges from 0 to 14 and measures the acidity or basicity of a solution, where a pH of 7 is neutral, lower values are acidic, and higher values are basic.

How do strong acids differ from weak acids according to the chapter?

Strong acids completely dissociate in water, releasing all their hydrogen ions, while weak acids only partially dissociate, resulting in a lower concentration of hydrogen ions.

What role do salts play in acid-base reactions as per the key concepts in Chapter 19?

Salts are formed from the neutralization reaction between an acid and a base, and they can affect the pH of a solution depending on the acidic or basic nature of their constituent ions.

Can you explain the concept of neutralization presented in Chapter 19?

Neutralization is a chemical reaction between an acid and a base that produces water and a salt, effectively cancelling out the properties of both the acid and the base.

What are some common indicators used to test pH levels

mentioned in the chapter?

Common indicators include litmus paper, phenolphthalein, and bromothymol blue, each changing color at different pH levels to indicate acidity or basicity.

What safety precautions should be taken when handling acids and bases as highlighted in Chapter 19?

Always wear protective gear such as gloves and goggles, work in a well-ventilated area, and be prepared to neutralize spills with appropriate substances.

How does temperature affect the acidity or basicity of solutions according to the chapter?

Temperature can affect the dissociation of acids and bases; typically, higher temperatures increase the ionization of acids, potentially lowering the pH and increasing acidity.

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