PH And POH Calculations Worksheet Answer Key PDF

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Part 1: Foundational Knowledge

What is the pH of a neutral solution at 25°C?

undefined. 0
undefined. 7 ✓
undefined. 14
undefined. 1

The pH of a neutral solution at 25°C is 7.

Which of the following statements are true about pH and pOH? (Select all that apply)

undefined. A) pH + pOH = 14 at 25°C ✓
undefined. A) pH measures hydroxide ion concentration
undefined. C) pOH measures hydrogen ion concentration
undefined. D) A solution with pH 3 is acidic ✓

The correct statements are A and D.

Explain the relationship between $[H^+]$ and $[OH^-]$ in a solution.

In a neutral solution, $[H^+]$ and $[OH^-]$ are equal, and their product is constant.

List the formulas used to calculate pH and pOH.

1. What is the formula for pH?

The formula for pH is $pH = -\log[H^+]$.

2. What is the formula for pOH?

The formula for pOH is $pOH = -\log[OH^-]$.

The formulas are pH = -log[H^+] and pOH = -log[OH^-].

Part 2: comprehension

If a solution has a pH of 4, what can be said about its acidity?

undefined. It is neutral
undefined. It is acidic ✓
undefined. It is basic
undefined. It is a strong base

A solution with a pH of 4 is considered acidic.

Which of the following are characteristics of a basic solution? (Select all that apply)

undefined. A) pH > 7 ✓
undefined. $H^+ > OH^-$
undefined. C) pOH < 7 ✓
undefined. D) [OH^-] > [H^+] ✓

The correct characteristics are A, C, and D.

Describe how you would determine the pOH of a solution if you know its pH.

To find pOH, subtract the pH from 14.

Part 3: Application

What is the pH of a solution with [H^+] = 1.0×10^{-3} M?

undefined. 3 ✓
undefined. 11
undefined. 7
undefined. 14

The pH of the solution is 3.

You have a solution with a pOH of 9. Which of the following are true? (Select all that apply)

undefined. A) The solution is acidic
undefined. The solution is basic ✓
undefined. C) The pH is 5 ✓
undefined. D) The $[OH^-]$ is 1.0×10^{-9} M ✓

The correct statements are B, C, and D.

Calculate the $[OH^-]$ concentration of a solution with a pH of 10.

The $[OH^-]$ concentration can be calculated using the formula $[OH^-] = 10^{(-14 + pH)}$.

Part 4: Analysis

If the pH of a solution decreases from 6 to 4, what happens to the $[H^+]$ concentration?

undefined. It decreases by a factor of 100
undefined. It increases by a factor of 100 ✓
undefined. It remains the same
undefined. It increases by a factor of 10

The $[H^+]$ concentration increases by a factor of 100.

Analyze the following scenarios and determine which would result in a decrease in pH. (Select all that apply)

undefined. A) Adding a strong acid to the solution ✓
undefined. Diluting the solution with water
undefined. C) Adding a strong base to the solution
undefined. D) Increasing the temperature ✓

The correct scenarios are A and D.

Explain how the pH and pOH of a solution are affected when the temperature changes from 25°C to 50°C.

As temperature increases, the ion product of water changes, affecting pH and pOH.

Part 5: Evaluation and Creation

Which of the following solutions would you expect to have the highest pH?

undefined. Lemon juice
undefined. Distilled water
undefined. Ammonia solution ✓
undefined. Vinegar

Ammonia solution is expected to have the highest pH.

Evaluate the following statements and select those that correctly describe the relationship between pH, pOH, and solution concentration. (Select all that apply)

undefined. A) A low pH corresponds to a high $[H^+]$ concentration ✓
undefined. A) A high pOH corresponds to a low $[OH^-]$ concentration ✓
undefined. C) A neutral solution has equal $[H^+]$ and $[OH^-]$ concentrations ✓
undefined. D) A solution with pH 8 is more acidic than a solution with pH 6

The correct statements are A, B, and C.

Design an experiment to measure the pH of various household liquids and predict their pH values based on their chemical nature. Include a hypothesis and a method for testing.

The experiment should include a hypothesis about expected pH values and a method for measuring pH.