The letters “pH” represent the French words “pouvoir hydrogene” which means “hydrogen power”. pH is equal to the negative log (logarithm) of the hydrogen ion concentration of a solution. The logarithm of a number is the power to which 10 must be raised in order to equal that number. For example, the logarithm of 1000 is 3.

The logarithm of 0.001 is -3.

The formula for pH calculation is: \( \text{pH} = -\log[H^+] \)

A pH value of less than 7 indicates an acidic solution. A pH value of 7 indicates a neutral solution. A pH value of more than 7 indicates a basic (alkaline) solution.

Work each of the following problems. Show all work and circle your final answer.

1. Determine the pH of a 0.010 M HNO₃ solution.

2. What is the pH of a 2.5 x 10⁻⁶ M solution of HCl.

3. Calculate the pH of a solution of 0.0025M H₂SO₄?

4. Calculate the pH of a 0.0010 M NaOH solution
5. What is the pH of a 0.020M Sr(OH)$_2$ solution?

6. a) What is the hydrogen ion concentration of an aqueous HCl solution that has a pH of 3.0?

b) What is the hydroxide ion concentration of this same solution?

c) Which ion, H$^+$ or OH$^-$, is in greater concentration?

d) Is this solution acidic or basic? __________________________

7. a) Find the [H$^+$] and the [OH$^-$] of a solution with a pH of 3.494.

b) Is this solution acidic or basic? __________________________