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What is pH?

The measurement of pH is a value taken to represent the acidity or alkalinity of an aqueous solution; it is defined as the logarithm of the reciprocal of the hydrogen ion concentration of a solution:

pH = log 1/[H+]

Pure water is the standard used in arriving at this value.

Under ordinary conditions water molecules dissociate into the ions H+ and OH- with recombination at such a rate that with very pure water at 22 degrees C there is a concentration of positively charged ions of 1/10,000,000 moles per liter. This is commonly expressed by saying that pure water has a pH of 7.

When acids or hydroxyl-containing bases are in solution they ionize more or less completely, furnishing varying concentrations of H+ and OH- ions, respectively, to the solution. Strong acids and bases ionize much more completely than weak acids and bases, thus strong acids give solutions a pH of 1 to 3, while solutions of weak acids have a pH of about 6. Strong bases give solutions a pH of 12 or 13, while weak bases give solutions a pH of near 8. As the pH scale is logarithmic, the intervals are exponential, and thus represent far greater differences in concentration than the values themselves seem to indicate (See table).

pH Scale and Ion Concentration

	pH Value	Ratio of H^+ or OH^- Concentration to Pure Water at 22°C
Acid side excess of H^+ ions	1	1,000,000
	2	100,000
	3	10,000
	4	1,000
	5	100
	6	10
	7 (Neutral)	1
Alkaline side excess of OH^- ions	8	10
	9	100
	10	1,000
	11	10,000
	12	100,000
	13	1,000,000

Common Liquids and Their pH Values

Liquid	pH Value
Pure Water	7
Sea Water	8.5 – 10
.01 N HCl	2
.01 N NaOH	12
.1 N Acetic Acid	3
.1 N NH_4OH	11
Gastric Juices	2
Urine	5 – 7
Blood	7.3 – 7.5
Milk	6.5 – 7.0

Let’s talk about your project

Every facility has unique challenges when it comes to wastewater treatment. Let’s talk through your wastewater treatment needs. No pressure. No obligation.

Our goal? To give you real value from the very first conversation.

Give us a call today!

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