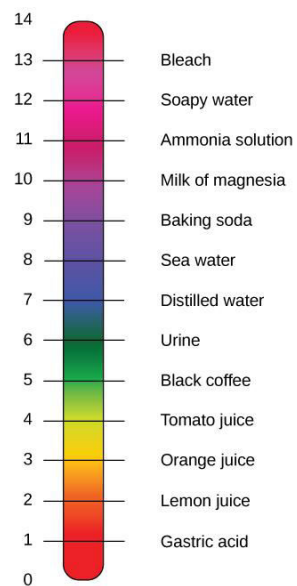


# The pH Scale

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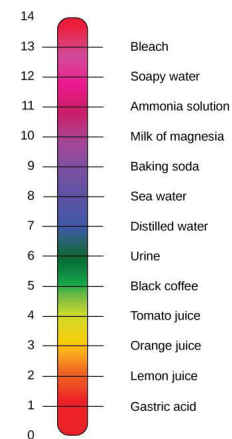


- A measure of acidity: pH
- pOH and Other p Scales

# A measure of acidity: pH

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- A basic solution will have a pH above 7.0, while an acidic solution will have a pH below 7.0.
- Buffers are solutions that contain a weak acid together with its a conjugate base; as such, they can absorb excess  $\text{H}^+$  ions or  $\text{OH}^-$  ions that are introduced, and thereby maintain an overall steady pH in the solution.
- pH is equal to the negative logarithm of the concentration of  $\text{H}^+$  ions in solution;  
 $\text{pH} = -\log[\text{H}^+]$ .

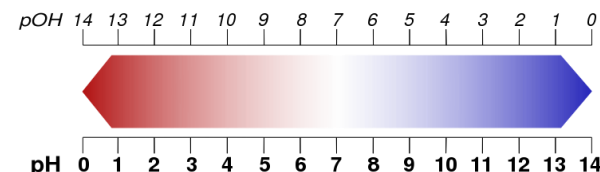


The pH Scale

[View on Boundless.com](https://www.boundless.com)

# pOH and Other p Scales

- The p-scale is a logarithmic scale in which each value is ten more times higher or lower in magnitude. It is denoted by the equation:  $\text{p}x = -\log x$  in which x represents the value or concentration of interest.
- The most common p-scales encountered are the pH and pOH scales, in which the concentration of hydrogen and hydroxide ions are measured. According to the water ion product,  $[\text{H}^+] + [\text{OH}^-] = 14$  for all aqueous solutions.
- Because of the convenience of the p-scale, it is used to also denote the dissociation constants of acids and bases, given by the  $\text{p}K_a$  and  $\text{p}K_b$ .

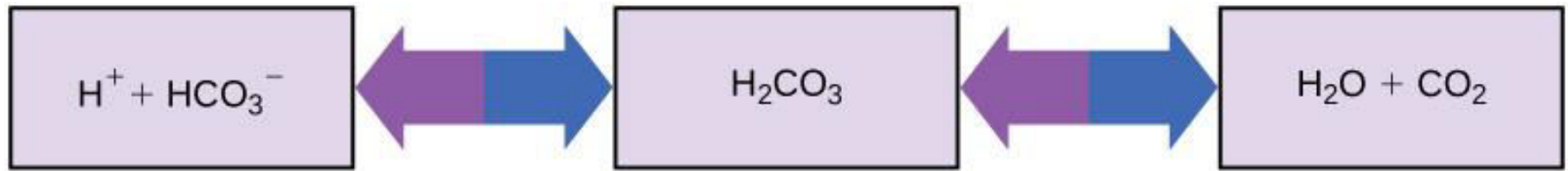


The pH and pOH Scale

# Key terms

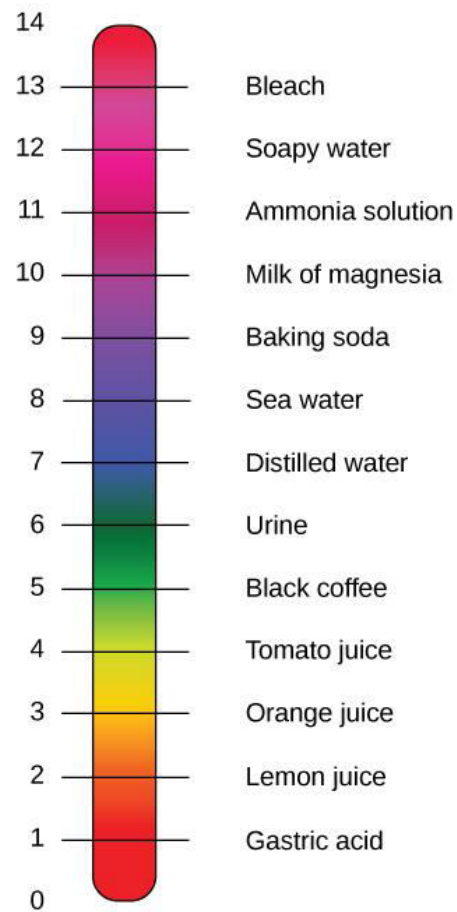
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- **acidic** Having a pH less than 7
- **alkaline** Having a pH greater than 7; basic
- **buffer** A solution composed of a weak acid and its conjugate base that can be used to stabilize the pH of a solution
- **dissociation** Referring to the process by which compounds split into smaller constituent molecules, usually in a reversible manner.
- **logarithm** For a number  $x$ , the power to which a given base number must be raised in order to obtain  $x$ . Written  $\log_b x$ . For example,  $\log_2 16 = 4$  because  $2^4 = 16$ .



## Buffers in the Body

This diagram shows the body's buffering of blood pH levels. The blue arrows show the process of raising pH as more  $\text{CO}_2$  is made. The purple arrows indicate the reverse process: the lowering of pH as more bicarbonate is created.



## The pH Scale

The pH scale measures the concentration of hydrogen ions ( $H^+$ ) in a solution.