TABLE 3 *Approximate pH Range of Some Common Materials (at 25°C)*

Material	pH	Material	pH
Gastric juice	1.0–3.0	Bread	5.0–6.0
Lemons	1.8–2.4	Rainwater	5.5–5.8
Vinegar	2.4–3.4	Potatoes	5.6–6.0
Soft drinks	2.0–4.0	Milk	6.3–6.6
Apples	2.9–3.3	Saliva	6.5–7.5
Grapefruit	2.9–3.4	Pure water	7.0
Oranges	3.0–4.0	Blood	7.3–7.5
Cherries	3.2–4.7	Eggs	7.6–8.0
Tomatoes	4.0–4.4	Sea water	8.0–8.5
Bananas	4.5–5.7	Milk of magnesia	10.5

Suppose the $[H_3O^+]$ in a solution is greater than the $[OH^-]$, as is true for acidic solutions. For example, the pH of an acidic solution at 25°C with a $[H_3O^+]$ of 1×10^{-6} M is 6.0.

$$pH = -\log [H_3O^+] = -\log (1 \times 10^{-6}) = -(-6.0) = 6.0$$

The pH of this solution is less than 7. This is the case for all acidic solutions at 25°C. The following calculation shows that the pOH is greater than 7.0, as is true for all acidic solutions at 25°C.

$$pOH = 14.0 - pH = 14.0 - 6.0 = 8.0$$

Similar calculations show that the pH of a basic solution at 25°C is more than 7.0 and the pOH is less than 7.0. These and other relationships are listed in **Table 4.** Remember that as the temperature changes, the exact values will change because the value of K_w changes. However, the relationship $pH + pOH = pK_w$ will remain the same.

TABLE 4 *$[H_3O^+]$, $[OH^-]$, pH, and pOH of Solutions*

Solution	General condition	At 25°C
Neutral	$[H_3O^+] = [OH^-]$ $pH = pOH$	$[H_3O^+] = [OH^-] = 1 \times 10^{-7}$ M $pH = pOH = 7.0$
Acidic	$[H_3O^+] > [OH^-]$ $pH < pOH$	$[H_3O^+] > 1 \times 10^{-7}$ M $[OH^-] < 1 \times 10^{-7}$ M $pH < 7.0$ $pOH > 7.0$
Basic	$[H_3O^+] < [OH^-]$ $pH > pOH$	$[H_3O^+] < 1 \times 10^{-7}$ M $[OH^-] > 1 \times 10^{-7}$ M $pH > 7.0$ $pOH < 7.0$