Ion Concentration in Water

$$H_2O(\ell) + H_2O(\ell) \rightleftharpoons H_3O^+(aq) + OH^-(aq)$$

$$[H_3O^+(aq)] = [OH^-(aq)] = 1.0 \times 10^{-7} \text{ mol/L}$$

acidic solution	neutral solution	basic solution
$[H_3O^+] > [OH^-]$	$[H_3O^+] = [OH^-]$	$[H_3O^+] < [OH^-]$

The relationship between the concentrations of hydronium ions and hydroxide ions in a solution determines whether the solution is acidic, basic, or neutral.