

pH and pOH

- Use K_w to calculate the $[H_3O^+(aq)]$ in a solution which has a $[OH^-(aq)]$ of 1.0×10^{-11} mol/L.
 $[H_3O^+] = 0.001 \text{ mol/L}$
- Use K_w to calculate the $[OH^-(aq)]$ in a solution which has a $[H_3O^+(aq)]$ of 1.0×10^{-4} mol/L.
 $[OH^-] = 1.0 \times 10^{-10} \text{ mol/L}$
- Determine the pH from the following $[H_3O^+(aq)]$ or $[OH^-(aq)]$.
 - $[H_3O^+(aq)] = 1.0 \times 10^{-13}$ mol/L pH = 13.00 acidic or basic basic
 - $[H_3O^+(aq)] = 1 \times 10^{-2}$ mol/L pH = 2.0 acidic or basic acidic
 - $[H_3O^+(aq)] = 10^{-6}$ mol/L pH = 6 acidic or basic acidic
 - $[OH^-(aq)] = 0.0010$ mol/L pH = 11.00 acidic or basic basic
 - $[OH^-(aq)] = 1.0 \times 10^{-6}$ mol/L pH = 8.00 acidic or basic basic
- Find the pH of a lime that has $[H_3O^+(aq)] = 0.0120$ mol/L. pH = 1.921
- Determine the pH of a blood sample with a $[OH^-(aq)] = 2.6 \times 10^{-7}$ mol/L. pH = 7.41
- An ammonia solution has a pOH of 2.92. What is the concentration of hydroxide ions in solution?
 $[OH^-] = 0.0012 \text{ mol/L}$
- Find the $[H_3O^+(aq)]$ and pH of a solution made by dissolving 10.0 g of KOH in water to make 4.00 L of solution.
 $[H_3O^+] = 2.24 \times 10^{-13} \text{ mol/L}$
- A sodium hydroxide solution is prepared by dissolving 2.50 g to make 2.00 L of solution. Calculate both the hydroxide ion and hydrogen ion concentrations.
 $[OH^-] = 0.0313 \text{ mol/L}$ $[H_3O^+] = 3.20 \times 10^{-13} \text{ mol/L}$
- A 0.728 g sample of hydrogen chloride gas is dissolved in 200 mL of water. Calculate both the hydroxide ion and hydrogen ion concentrations.
 $[H^+] = 0.0998 \text{ mol/L}$ $[OH^-] = 1.00 \times 10^{-13} \text{ mol/L}$
- Calculate the pH of a solution made by dissolving 7.50 g of strontium hydroxide to make 500 mL of solution. pH = 13.392
- Complete the following table:

$[H_3O^+(aq)]$	$[OH^-(aq)]$	pH	pOH	Acid/Base/Neutral
4.0×10^{-6} mol/L	2.5×10^{-9}	5.40	8.60	acid
3.2×10^{-10}	3.2×10^{-5}	9.50	4.50	base
5.0×10^{-4}	2.0×10^{-11} mol/L	3.30	10.70	acid
10 mol/L	1.0×10^{-15}	-1.00	15.00	acid
2.735×10^{-6}	3.656×10^{-9}	5.563	8.437	acid
2.3×10^{-12}	4.4×10^{-2}	12.64	1.36	base