Strong Acids

Calculate the concentration of the hydroxide ions, pH and pOH of a 0.15 mol/L solution of hydrochloric acid at 25°C.

Strong acids will always completely ionize

$HCl_{(aq)} \longrightarrow H^+_{(aq)} + Cl^-_{(aq)}$

0.15M 0.15M

pH
pOH
[OH]

Strong Bases
(Ionic Hydroxides)

Calculate the hydrogen ion concentration in a 0.25 mol/L solution of barium hydroxide.

$Ba(OH)_{2(s)} \longrightarrow Ba^{2+}_{(aq)} + 2OH^-_{(aq)}$

0.25 mol/L 0.25 M 0.50 mol/L

[OH⁻] ✓
[H⁺]
pH
pOH

$pOH = -\log[OH^-_{(aq)}]$

$pOH = -\log[0.50]$

$pOH = 0.30$

$pH + pOH = 14.00$

$pH = 14.00 - 0.30$

$pH = 13.70$

$K_w = [H^+_{(aq)}][OH^-_{(aq)}] = 1.0 \times 10^{-14}$

$[H^+_{(aq)}] = \frac{1.0 \times 10^{-14}}{0.50\,M}$

$[H^+_{(aq)}] = 2.0 \times 10^{-14}\,M$