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

Strong Acid

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

0.15mol/L 0.15mol/L 0.15mol/L

$K_w = [H^+][OH^-]$

$[OH^-] = \frac{K_w}{[H^+]}$

$[OH^-] = \frac{1.0 \times 10^{-14}}{[0.15]}$

$[OH^-] = 6.7 \times 10^{-14} M$

$pOH = -\log[OH^-]$

$pOH = -\log[6.7 \times 10^{-14}]$

$pOH = 13.17$

$pH + pOH = 14.00$

$pH = 14.00 - 13.17$

$pH = 0.83$

$$NaCl \overset{>50\%}{\rightleftharpoons} Na^+ + Cl^-$$

$$NaCl \longrightarrow Na^+ + Cl^-$$

ORANGES

$[H^+] = 5.5 \times 10^{-3}\ M$

$[OH^-] = ?$

$pH = ?$

$pOH = ?$

$pH = -\log[H^+]$

$pH = 2.26$

10^x

ASPARAGUS

$pOH = 5.6$

$[OH^-] = 10^{-pOH}$

$[OH^-] = 10^{-5.6}$ $10^{\wedge}$

$[OH^-] = 3 \times 10^{-6}\ M$

Strong Bases
(Ionic Hydroxides)

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

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

0.25mol/L 0.25mol/L 0.50mol/L

$$K_w = [H^+][OH^-]$$

$$[H^+] = \frac{K_w}{[OH^-]}$$

$$[H^+] = \frac{1.0\times10^{-14}}{0.50\,mol/L}$$

$$[H^+] = 2.0\times10^{-14}\,M$$

Worksheet #2-4

H^+