# Worksheet

# Strong Acids

$H_2SO_{4(aq)}$

# Weak Acids

$HCN_{(aq)}$

# Strong Bases

$Ba(OH)_2 \rightarrow Ba^{2+} + 2OH^-$

0.1 0.2

$NaOH_{(aq)} \longrightarrow Na^+_{(aq)} + OH^-_{(aq)}$

0.375mol/L 0.375mol/L

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

$pOH = -\log[0.375]$

$pOH = 0.426$

$pH + pOH = 14.000$

$pH = 14.000 - 0.426$

$pH = 13.574$

# Weak Bases

$$CN^-_{(aq)} + H_2O_{(l)} \rightleftharpoons HCN_{(aq)} + OH^-_{(aq)}$$

0.250mol/L

$K_b = \frac{[HCN_{(aq)}][OH^-_{(aq)}]}{[CN^-_{(aq)}]}$, $[HCN_{(aq)}] = [OH^-_{(aq)}]$

$K_aK_b = K_w$

$K_b = \frac{[OH^-_{(aq)}]^2}{[CN^-_{(aq)}]}$

$K_b = \frac{K_w}{K_a}$

$K_b = \frac{1.0 \times 10^{-14}}{6.2 \times 10^{-10}}$

$[OH^-_{(aq)}] = \sqrt{K_b[CN^-_{(aq)}]}$

$K_b = 1.61 \times 10^{-5}$

$[OH^-_{(aq)}] = \sqrt{(1.61 \times 10^{-5})[0.250]}$

$[OH^-_{(aq)}] = 2.01 \times 10^{-3} M$

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

$pOH = -\log[2.01 \times 10^{-3}]$

$pOH = 2.697$

$pH + pOH = 14.000$

$pH = 14.000 - 2.697$

$pH = 11.303$

# Worksheet