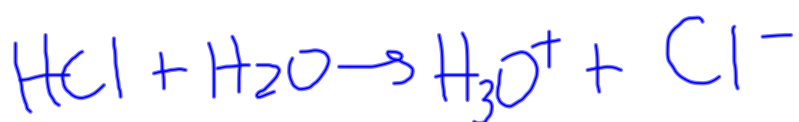
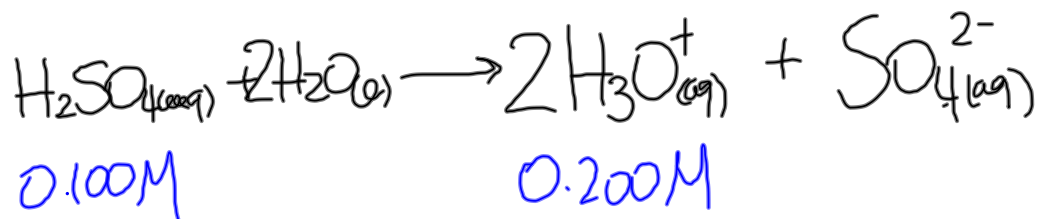
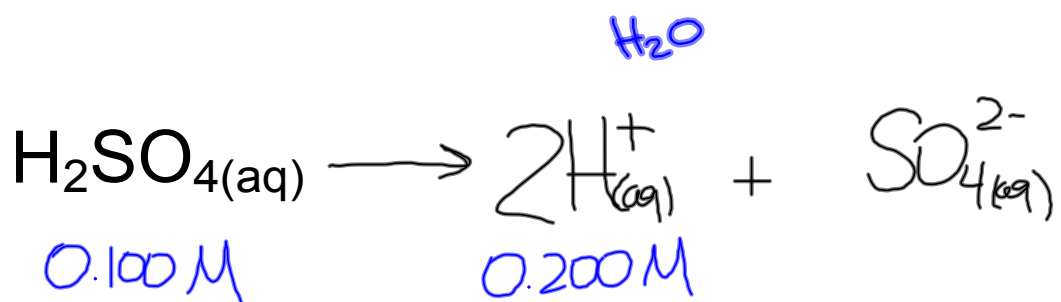
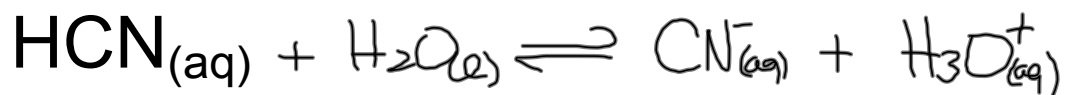


Strong Acids



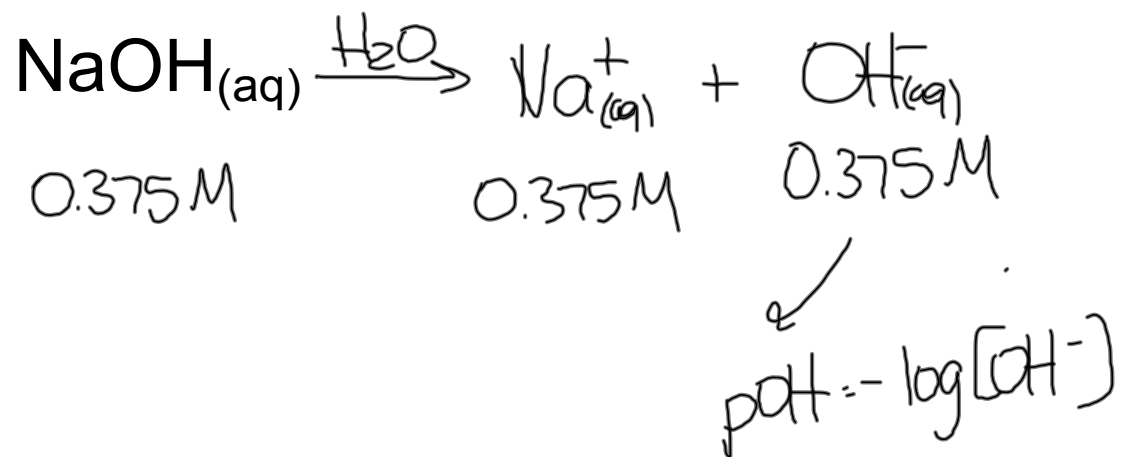
Weak Acids



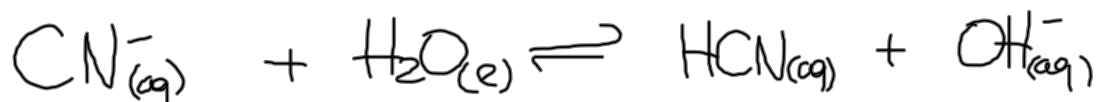
$$K_a = \frac{[\text{CN}^-][\text{H}_3\text{O}^+]}{[\text{HCN}]}, \quad [\text{CN}^-] = [\text{H}_3\text{O}^+]$$

$$K_a = \frac{[\text{H}_3\text{O}^+]^2}{[\text{HCN}]}$$

Strong Bases



Weak Bases



0.250 mol/L

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

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

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

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

$$K_a K_b = K_w$$

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

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

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

$$\text{pOH} = -\log [\text{OH}^-]$$

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

$$\boxed{\text{pOH} = 2.697}$$

$$\text{pH} + \text{pOH} = 14.000$$

$$\text{pH} = 14.000 - 2.697$$

$$\boxed{\text{pH} = 11.303}$$

Worksheet