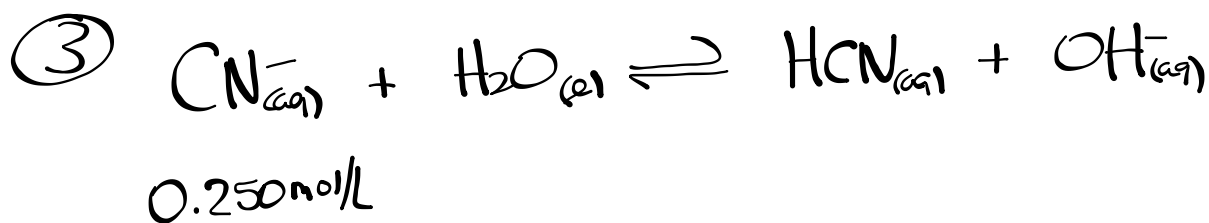


## Worksheet



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

$$K_a K_b = K_w$$

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

$$K_b = \frac{K_w}{K_a} = \frac{1.0 \times 10^{-14}}{6.2 \times 10^{-10}} = 1.61 \times 10^{-5}$$

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

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

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

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

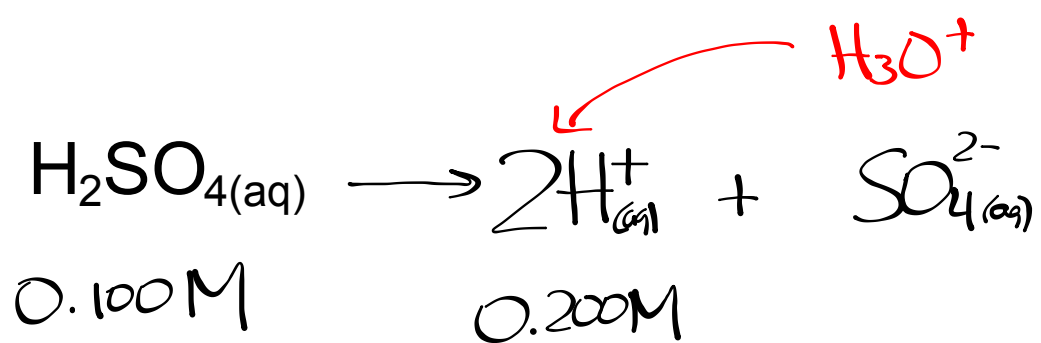
$$\boxed{\text{pOH} = 2.697}$$

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

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

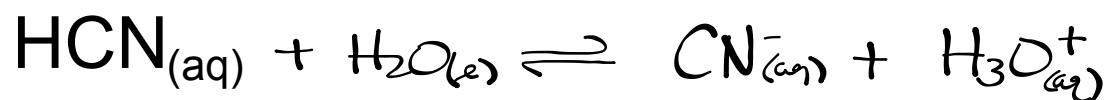
$$\boxed{\text{pH} = 11.303}$$

## Strong Acids



$$\text{pH} = -\log[\text{H}_{3\text{O}}^+]$$

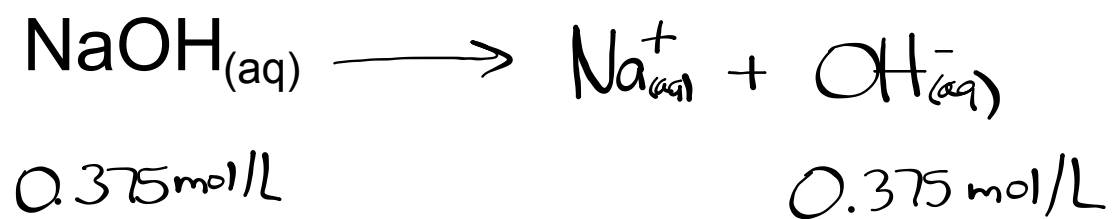
## Weak Acids




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

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

## Strong Bases




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

# Worksheet