

# Homework - Bases

WEAK BASE



0.250M/L

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

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

$$1.6 \times 10^{-5} = \frac{[\text{OH}^-_{(aq)}]^2}{[0.250]}$$

$$[\text{OH}^-_{(aq)}] = \sqrt{(1.6 \times 10^{-5})(0.250)}$$

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

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

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

$$\text{pOH} = 2.697$$

$$K_a K_b = K_w$$

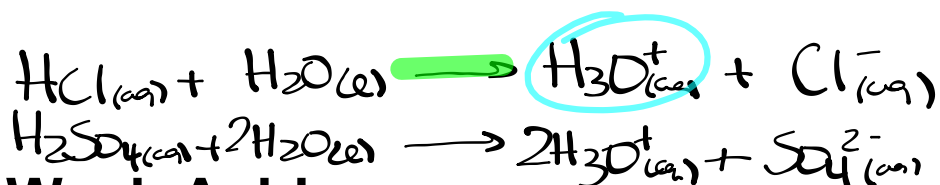
$$K_b = \frac{K_w}{K_a} = \frac{1.0 \times 10^{-14}}{6.2 \times 10^{-10}}$$

$$K_b = 1.6 \times 10^{-5}$$

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

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

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

Strong AcidsWeak Acids

$K_a =$

Strong Bases

0.375M

0.375M

Weak Bases

$$\text{pH} = -\log[\text{H}_3\text{O}^+]$$

$$[\text{H}_3\text{O}^+] = 10^{-\text{pH}}$$

$$K_w = [\text{H}_3\text{O}^+][\text{OH}^-]$$

$$K_a K_b = K_w$$

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

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

$$\text{pH} + \text{pOH} = 14.00$$

$$K_w = 1.0 \times 10^{-14}$$



# Worksheet

## Acids and Bases