



$$K = \frac{[\text{Products}]}{[\text{Reactants}]} = \frac{[x^2]}{[0.0500-x]}$$

Rule of 500
 $\frac{0.0500}{1.8 \times 10^{-5}} > 500$

$$1.8 \times 10^{-5} = \frac{x^2}{0.0500-x}$$

$$1.8 \times 10^{-5} = \frac{x^2}{0.0500} = (1.8 \times 10^{-5})(0.0500) = x^2$$

$$= \sqrt{9.0 \times 10^{-7}} = x$$

$$x = 9.49 \times 10^{-4}$$

$$[\text{H}_3\text{O}^+] = 9.49 \times 10^{-4} \text{ mol/L}$$

$$\text{pH} = -\log(\text{H}_3\text{O}^+)$$

$$= -\log(9.49 \times 10^{-4}) = 3.02$$

$$\text{pOH} = 14 - 3.02$$

$$= 10.98$$

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

$$= 10^{-10.98} = 1.05 \times 10^{-11} \text{ mol/L}$$

4