

Worksheet: Ionization of Water, pH

1. Write the ionization equation for water. Write the equilibrium expression for this reaction.

2. What is the pH of a neutral solution?

3. Calculate the pH of the following solutions:

a. $[\text{H}_3\text{O}^+] = 1.0 \times 10^{-10}$

b. $[\text{H}_3\text{O}^+] = 1.0 \times 10^{-3}$

c. $[\text{H}_3\text{O}^+] = 3.4 \times 10^{-12}$

d. $[\text{H}_3\text{O}^+] = 8.7 \times 10^{-7}$

e. $[\text{OH}^-] = 1.0 \times 10^{-3}$

f. $[\text{OH}^-] = 2.89 \times 10^{-9}$

4. Calculate the $[\text{OH}^-]$ of the following solutions:

a. $\text{pH} = 9.3$

b. $[\text{H}_3\text{O}^+] = 1.0 \times 10^{-3}$