

Unit 8 – Chapter 14 Prelab questions – Experiment 27

Name _____

Period _____

For each of the following questions, circle the correct answer and SHOW YOUR WORK IN THE SPACE BELOW.

- 1) What are the major species present in 0.250 M solutions of each of the following acids?

Calculate the pH of each of the solutions.

- | | |
|--------|----------------------|
| a. HCl | c. HClO ₄ |
| b. HBr | d. HNO ₃ |

- 2) What are the major species present in 0.250 M solutions of each of the following acids?

Calculate the pH of each of these solutions.

- | | |
|---|-----------------------|
| a. HNO ₂ | c. NH ₄ Cl |
| b. CH ₃ CO ₂ H (HC ₂ H ₃ O ₂) | d. HCN |

- 3) Calculate the pH of each of the following solutions of a strong acid in water.

- | | |
|---------------------------|----------------------------|
| a. 0.1 M HCl | c. 0.1 M HClO ₃ |
| b. 0.1 M HNO ₃ | |

- 4) Calculate the pH of each of the following solutions containing a strong acid in water.

- | | |
|--|---------------------------|
| a. $3.0 \times 10^{-5} M$ HCl | c. 4.0 M HNO ₃ |
| b. $2.0 \times 10^{-2} M$ HNO ₃ | |

- 5) A solution is prepared by adding 50.0 mL of concentrated hydrochloric acid and 20.0 mL of concentrated nitric acid to 300 mL of water. Water is added until the final volume is 500.0 mL. Calculate [H⁺], [OH⁻], and the pH for this solution.

- 6) A solution is prepared by mixing 90.0 mL of 5.00 M HCl and 30.0 mL of 8.00 M HNO₃. Water is then added until the final volume is 1.00 L. Calculate [H⁺], [OH⁻], and the pH for this solution.
- 7) Calculate [H⁺] and the pH for 0.050 M, 0.10 M, and 0.40 M solutions of acetic acid.
- 8) For propanoic acid (HC₃H₅O₂ or CH₃CH₂CO₂H) $K_a = 1.3 \times 10^{-5}$. Calculate [H⁺] and the pH for 0.050 M, 0.10 M, and 0.40 M solutions of propanoic acid.