
Pre-Laboratory Assignment: pH Measurement and Its Applications

Name _____

Date _____

Section _____

1. Solution X was tested with several acid base indicators and gave the following results: violet in methyl violet, yellow in thymol blue, yellow in methyl yellow, orange red in congo red and green in bromcresol green. What is its pH range? Explain your answer.

2. Which of the following 0.1M solutions will have the highest pH: acetic acid, HCl, ammonium chloride, NaH_2PO_4 ? Explain your answer.

3. You measure the pH of a 0.50 M unknown acid solution using a pH meter and it is found to be 1.74. What is K_a for the acid? Show your calculations.

4. In part 4 of this experiment, you are asked to prepare a solution in which the concentration of a weak acid is equal to the concentration of its conjugate base. To produce the base, you titrate a portion of the weak acid with NaOH to the end point of phenolphthalein. In the lab procedure, it was explained that the concentration of HA and A⁻ are not equal at this point. How do you equalize these two concentrations?

5. You find the K_a of your unknown acid is 6.3×10^{-5} . If you are being asked to make a buffer at pH 4.00, what is the appropriate ratio of A⁻ to HA to be combined in your flask?