

A 30.00 milliliter sample of a weak monoprotic acid was titrated with a standardized solution of NaOH with a molarity of 0.1 M. A pH meter was used to measure the pH after each increment of NaOH was added, and the curve above was constructed.

(a) How much base is needed (in mL) to reach the equivalence point? \_\_\_\_\_\_\_\_\_\_\_\_\_ mL

(b) Use the information given above and the titration curve to determine the molarity of the weak acid solution.

(c) What is the pH at the equivalence point? \_\_\_\_\_\_\_\_\_\_\_

Explain why this value is above 7.

(d) Suppose the student performing the experiment did not rinse the buret with NaOH prior to use, so the concentration of NaOH was actually lower than recorded due to water left in the buret. How would this affect the calculated molarity of the acid solution? Defend your answer CLEARLY.

(e) Sketch the titration curve that would result if the weak monoprotic acid were replaced by a strong monoprotic acid, such as HCl of the same molarity. Identify differences between this titration curve and the curve shown above.

Homework QZ (PG.3B)

1. What volume of acid is required to reach the equivalence point in this titration?

\_\_\_\_\_\_\_\_\_\_ mL

b. What is the pH of the solution at this point? \_\_\_\_\_\_\_\_\_\_\_\_ Why?

2. In problem #8, when 12.0 mL of acid is added to 30.0 mL of base, what is the limiting reactant?

b. How many moles of the excess remain? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c. What is the pH of the solution? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. What is the pH of the base before any acid is added? (Problem # 3)? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. What equation(s) did you use to solve this problem?

4. I completed \_\_\_ of the 13 problems and\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(did/did not) complete the graph.