

Chapter 17 Worksheet 3 (titrations)

Name:

UGA ID:

Instructions:

- Please enter your first and last name as it appears on the eLC roster (do not use a nickname).
- Your UGA myID is a combination of letters and numbers (example: mine is wpe28548). **Do not use your 81x number.**
- If you do not have a printer, type your answers in the then upload the worksheet template to Gradescope by Monday, April 9 at 11:59 pm. Write your work on separate sheets of paper, convert to a PDF and upload to eLC.
- If you have a printer download the worksheet, convert it to a PDF and upload to Gradescope by Monday, April 9 at 11:59 pm. You do not need to upload anything to eLC.

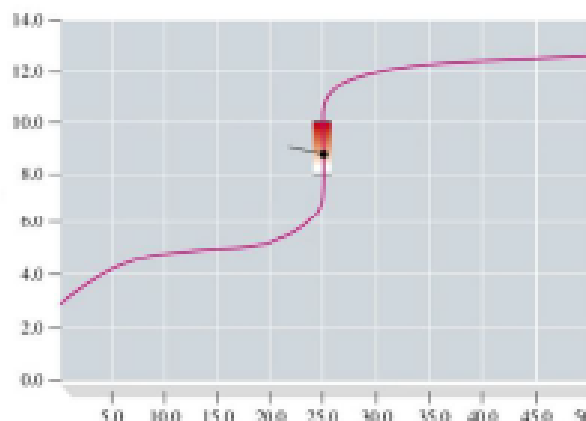
1. The titration curve best represents the titration of:

- A. a weak base with a strong acid.
- B. a weak acid with a strong base.
- C. a strong acid with a strong base.
- D. a strong base with a strong acid.

2. When titrating a solution containing a weak acid such as acetic acid, the pH at the equivalence point of the titration:

- A. depends on the indicator used
- B. is below 7.0
- C. is above 7.0

3. Calculate the pH of a solution formed by mixing 150.0 mL of 0.10 M $\text{HC}_7\text{H}_5\text{O}_2$ with 100.0 mL of 0.30 M $\text{NaC}_7\text{H}_5\text{O}_2$. The K_a for $\text{HC}_7\text{H}_5\text{O}_2$ is 6.5×10^{-5} .



4A. A 100.0 mL sample of 0.18 M HClO_4 is titrated with 0.27 M LiOH . Determine the pH of the solution before the addition of any LiOH .

B. A 100.0 mL sample of 0.18 M HClO_4 is titrated with 0.27 M LiOH . Determine the pH of the solution after the addition of 30.0 mL of LiOH .

C. A 100.0 mL sample of 0.18 M HClO_4 is titrated with 0.27 M LiOH . Determine the pH of the solution after the addition of 50.0 mL of LiOH .

D. A 100.0 mL sample of 0.18 M HClO_4 is titrated with 0.27 M LiOH . Determine the pH of the solution after the addition of 66.67 mL of LiOH .

E. A 100.0 mL sample of 0.18 M HClO_4 is titrated with 0.27 M LiOH . Determine the pH of the solution after the addition of 75.0 mL of LiOH .

F. A 100.0 mL sample of 0.18 M HClO_4 is titrated with 0.27 M LiOH . Determine the pH of the solution after the addition of 100.0 mL of LiOH .

5. Suppose you have just added 50.0 ml of a solution containing 0.0400 moles of weak acid HA to 500.0 ml of 0.6000 M NaOH . What is the final pH? The K_a of HA is 1.77×10^{-5} .

Matching Questions

- A. equivalence point of a strong acid/strong base titration
- B. equivalence point of a weak base/strong acid titration
- C. half-way to equivalence point of a weak acid/strong base titration
- D. 3/4 of the way to second equivalence point of a diprotic acid/strong base titration
- E. equivalence point of a weak acid/strong base titration

6. $\text{pH} = 7$

7. $\text{pH} = \text{p}K_a$

8. $\text{pH} > 7$

9. $\text{pH} < 7$

10. $\text{pH} = \text{pK}_{\text{a}2}$

11. The half equivalence point in the titration of 0.100 M CH_3NH_2 ($K_{\text{b}} = 3.7 \times 10^{-4}$) with 0.250 M HCl occurs at $\text{pH} = \underline{\hspace{2cm}}$.