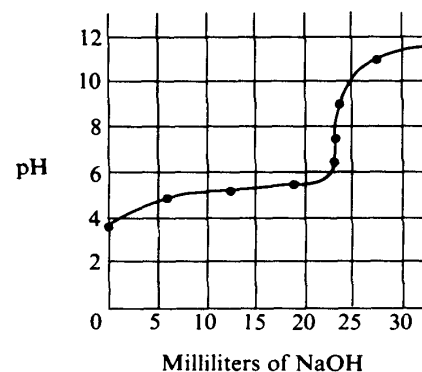


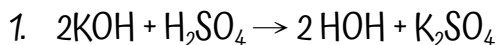
ACID/BASE TITRATION STOICHIOMETRY

1. What volume of 0.8 M KOH is needed to titrate 15.0 mL of 0.5 M H_2SO_4 ?
2. Determine the concentration of sulfuric acid required if it takes 28.5 mL of sulfuric acid to titrate a 36 mL sample of 0.45 M KOH.
3. Calculate the molarity of an acetic acid solution ($\text{HC}_2\text{H}_3\text{O}_2$) if 34.57 mL of this solution are needed to neutralize 25.19 mL of 0.1025 M sodium hydroxide
4. What volume of 0.250 M sulfuric acid, $\text{H}_2\text{SO}_{4(aq)}$, is needed to react completely with 37.2 mL of 0.650 M potassium hydroxide, KOH(aq) ?
5. Answer the following questions based upon the titration curve to the right.
 - a. In this reaction was the acid added to the base or vice versa? Justify your answer.
 - b. At what volume of added reagent was the equivalence point reached?
 - c. What is the approximate pH of the salt and water at the end point?
 - d. What type of acid and base was this a reaction between, strong or weak?

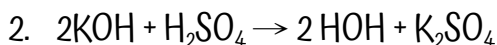


ACID/BASE TITRATION STOICHIOMETRY

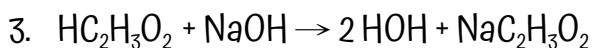
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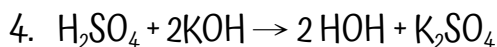
$$0.0150 \text{ L } H_2SO_4 \times \frac{0.50 \text{ mol } H_2SO_4}{1 \text{ L}} \times \frac{2 \text{ mol } KOH}{1 \text{ mol } H_2SO_4} \times \frac{1 \text{ L } KOH}{0.80 \text{ mol } KOH} = 0.019 \text{ L } KOH$$



$$0.036 \text{ L } KOH \times \frac{0.45 \text{ mol } KOH}{1 \text{ L}} \times \frac{1 \text{ mol } H_2SO_4}{2 \text{ mol } KOH} = \frac{0.0081 \text{ mol } H_2SO_4}{0.0285 \text{ L } H_2SO_4} = 0.28 \text{ M } H_2SO_4$$



$$0.02519 \text{ L } NaOH \times \frac{0.1025 \text{ mol } NaOH}{1 \text{ L}} \times \frac{1 \text{ mol } HC_2H_3O_2}{1 \text{ mol } NaOH} = \frac{0.002582 \text{ mol } HC_2H_3O_2}{0.03457 \text{ L } HC_2H_3O_2} = 0.07469 \text{ M } HC_2H_3O_2$$



$$0.0372 \text{ L } KOH \times \frac{0.650 \text{ mol } KOH}{1 \text{ L}} \times \frac{1 \text{ mol } H_2SO_4}{2 \text{ mol } KOH} \times \frac{1 \text{ L } H_2SO_4}{0.250 \text{ mol } H_2SO_4} = 0.0484 \text{ L } KOH$$

5. Graph

- Acid started in the flask (low pH of ~3.8 to start) and base was added (pH increases until ~11.7)
- ~23 mL of base was added
- ~7.8
- Strong base added to a weak acid