REGULAR LAB 9d: Titration Simulation

KOH vs. HNO$_3$ titration

1. Write a balanced chemical equation to show the reaction between KOH and HNO$_3$.

2. The titration computer simulation to accompany this LAB is located at
http://www.chem.iastate.edu/group/Greenbowe/sections/projectfolder/flashfiles/stoichiometry/acid_base.html

Go to the computer simulation and do the following;

    (a) Select the type of reaction: Choose 'Strong Acid vs. Strong Base'.

    (b) Fill the burette: Choose 'Acid'.

    (c) Select the Acid and the Base: Choose 'HNO$_3$' as the acid and 'KOH' as the base. The computer will automatically fill the burette with acid, and assign a molarity and volume to the base in the Erlenmeyer flask.

    (d) Select the indicator: Choose 'Methyl Red'.

    (e) Use the slider to add a few mL of the acid to the base solution.

    (f) Titrate to the end point. Getting the exact end point requires great care (adding dropwise) and will be reached when there is a permanent color change in the flask. Avoid adding too much acid, missing the end point, and having to start over.

    (g) Fill in the first three lines of the table below.

    (h) Calculate the molarity of the acid, enter this number (to three sig. figs) and click-on "OK". If you have done the titration accurately and correctly completed the calculation then you will have the correct answer. If NOT, then repeat the titration until the "Correct" message is seen.

    HINT: If you do miss the end point, clicking on 'Concordant Values' will allow you to repeat the titration with the same Molarity and Volume of Base, and hence slightly reduce the amount of acid added in the repeat titration.

	With Methyl Red	**With Bromothymol Blue**
Molarity of base		
Volume of base		
Volume of acid added		
Molarity of the acid		

3. Repeat the steps in 2. (a)-(h), this time using Bromothymol Blue as the indicator.

NaOH vs. H_2SO_4 titration

4. Write a balanced chemical equation to show the reaction between NaOH and H_2SO_4.

5. The titration computer simulation to accompany this LAB is located at
http://www.chem.iastate.edu/group/Greenbowe/sections/projectfolder/flashfiles/stoichiometry/acid_base.html

Go to the computer simulation and do the following;

   (a) Select the type of reaction: Choose 'Strong Acid vs. Strong Base'.

   (b) Fill the burette: Choose 'Acid'.

   (c) Select the Acid and the Base: Choose 'H_2SO_4' as the acid and 'NaOH' as the base. The computer will automatically fill the burette with acid, and assign a molarity and volume to the base in the Erlenmeyer flask.

   (d) Select the indicator: Choose 'Methyl Red'.

   (e) Use the slider to add a few mL of the acid to the base solution.

   (f) Titrate to the end point. Getting the exact end point requires great care (adding dropwise) and will be reached when there is a permanent color change in the flask. Avoid adding too much acid, missing the end point, and having to start over.

   (g) Fill in the first three lines of the table below.

   (h) Calculate the molarity of the acid, enter this number (to three sig. figs) and click-on "OK". If you have done the titration accurately and correctly completed the calculation then you will have the correct answer. If NOT, then repeat the titration until the "Correct" message is seen.

   HINT: If you do miss the end point, clicking on 'Concordant Values' will allow you to repeat the titration with the same Molarity and Volume of Base, and hence slightly reduce the amount of acid added in the repeat titration.

	With Methyl Red	**With Bromothymol Blue**
Molarity of base		
Volume of base		
Volume of acid added		
Molarity of the acid		

6. Repeat the steps in 5. (a)-(h), this time using Bromothymol Blue as the indicator.