

Redox Titration Lab 2

Name _____ Partner _____ Date _____ Score _____

Purpose:

- To determine the concentration of an unknown $\text{K}_2\text{Cr}_2\text{O}_{7(\text{aq})}$ solution.
- To develop skill with a burette:
- To experience colour change as a visible marker for the endpoint of a reaction

Materials: funnel, volumetric flask, beaker, Erlenmeyer flask, burette, burette brush, pipette, 5.0 mol/L $\text{H}_2\text{SO}_{4(\text{aq})}$, $\text{FeSO}_4 \cdot (\text{NH}_4)_2\text{SO}_4 \cdot 6\text{H}_2\text{O}_{(\text{aq})}$, $\text{K}_2\text{Cr}_2\text{O}_{7(\text{aq})}$

Prelab:

- The $\text{K}_2\text{Cr}_2\text{O}_{7(\text{aq})}$ will be the titrant since it has a vivid colour. Write a balanced redox reaction. Be sure to include voltage

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- ❖ Color of Excess reagent _____
 - ❖ Color of limiting reagent _____
 - ❖ Color at equivalence point _____
 - ❖ Color at end point _____

- Calculate the mass of iron (II) ammonium sulfate hexahydrate that is required to make 0.10 L of 0.10 mol/L solution

Procedure:

- ❖ Make the solution of iron (II) ammonium sulfate.
 - o Weigh out the correct mass of iron (II) ammonium sulfate.
 - o Dissolve it in 50 mL of the 5.0 mol/L acid solution provided. Use a BEAKER for this step
 - o Transfer the solution to a volumetric flask. Do sufficient rinsing with DISTILLED water
 - o Fill the volumetric flask to the 100 mL mark. Use distilled water and an eye dropper.
 - o Stopper and invert several times.
 - o Pour the solution out into a clean, dry beaker.
- ❖ Pipette 10 mL of the $\text{FeSO}_4(\text{NH}_4)_2\text{SO}_{4(\text{aq})}$ from the beaker into an Erlenmeyer flask. Be sure to place a white piece of paper under the flask. This will maximize the colors in the flask.
- ❖ Clean and prepare the burette for the excess reagent ($\text{K}_2\text{Cr}_2\text{O}_{7(\text{aq})}$) that is provided. Be sure to use a funnel. Record the initial volume of the burette.
- ❖ Titrate the iron (II) ammonium sulfate solution with the $\text{K}_2\text{Cr}_2\text{O}_7$ solution until the end point is reached. Record the final volume of the burette.
- ❖ Keep the first trial for color comparison.
- ❖ Do successive trials of this lab until you get three concurrent volumes of titrant. (must be within 0.1 mL) Keep the trials and compare the colors at the end point.
- ❖ CAUTION. Do not discard any of the solutions today down the sink. Save the titrated solutions, the unused solutions and return to the front. There will be labeled containers for you to use.

Observations:

Make a clear and well labeled table to show your observations.

Analysis of DATA

- Calculate concentration of the $\text{K}_2\text{Cr}_2\text{O}_{7(\text{aq})}$ solution that was provided.

- Why is the **acid** added to the iron (II) ammonium sulfate and not to the potassium dichromate solution? Give half reactions to support your answer!