Redox Titration Lab

Name _____ Partner _____ Date _____ Score _____

Purpose:

- To determine the concentration of an unknown $KMnO_{4(aq)}$ solution.
- To develop skill with a burette:
- To understand the properties of a primary standard
- 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, $H_2SO_{4(aq)}$, $FeSO_4.7H_2O_{(aq)}$, $KMnO_{4(aq)}$

➢ Prelab:The $KMnO_{4(aq)}$ will be the titrant. 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) sulfate hepta hydrate that is required to make 0.10 L of 0.10 mol/L solution

Procedure:

- Make the solution of iron (II) sulfate.
  - Weigh out the correct mass of iron (II) sulfate.
  - Dissolve it in 50 mL of the 5.0 mol/L acid solution provided. Use a BEAKER for this step
  - Transfer the solution to a volumetric flask. Do sufficient rinsing with DISTILLED water
  - Fill the volumetric flask to the 100 mL mark. Use distilled water and an eye dropper.
  - Stopper and invert several times.
  - Pour the solution out into a clean, dry beaker.

- Pipette 10 mL of the $FeSO_{4(aq)}$ 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 ($KMnO_{4(aq)}$) that is provided. Be sure to use a funnel. Record the initial volume of the burette.
- Titrate the iron (II) sulfate solution with the KMnO4 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 consistent volumes of titrant. (must be within 0.1 mL) Keep the trials and compare the colors at the end point.

Observations:

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

Analysis of DATA

- Calculate concentration of the $KMnO_{4(aq)}$

- Why is acidified $KMnO_{4(aq)}$ a poor primary standard solution?