Redox Titration Lab

Name \_\_\_\_\_\_\_\_\_\_\_Partner \_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_ Score \_\_\_\_\_\_\_

Purpose:

* To determine the concentration of an unknown KMnO4(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, H2SO4(aq), FeSO4.7H2O(aq), KMnO4(aq)

* Prelab:The KMnO4(aq) will be the titrant. Write a balanced redox reaction. Be sure to include voltage

* + 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 FeSO4(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 (KMnO4(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 KMnO4(aq)
* Why is acidified KMnO4(aq) a poor primary standard solution?