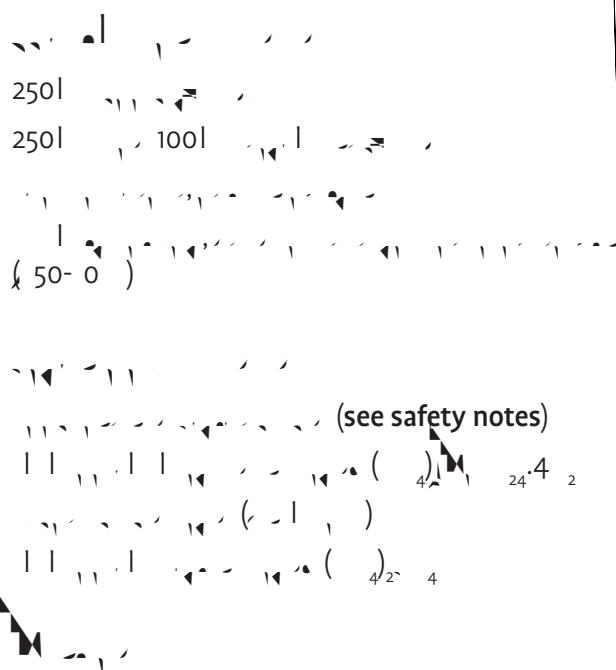


Safety

Lab coats, safety glasses and enclosed footwear must be worn at all times in the laboratory.

Concentrated sulfuric acid is highly corrosive – wear rubber gloves and take care when handling. It will burn your skin, and leave a stain on your skin for some days. If you do splash some on your skin, wash it well with cold running water IMMEDIATELY. Make sure your teacher is told about it. Also, be careful of your clothes, as acid will burn holes in them. When diluting into water, ALWAYS dilute acid into water, and never add water to acid. When you heat your solutions with sulfuric acid, there is a chance that the flask could break. Make sure you have water ready to clean any spills. Your teacher or laboratory supervisor should be with you at all times when you are doing this.



Sample Preparation

1. Add 50 ml of concentrated sulfuric acid to a 250 ml beaker containing 200 ml of water. (see safety notes)
2. Add 250 ml of 0.5 M sodium hydroxide solution to a 500 ml beaker containing 50 ml of the solution from step 1.
3. Add 10 ml of 200 ml of 0.1 M sodium hydroxide solution to a 300 ml beaker containing 30 ml of the solution from step 2.
4. Add 3 ml of 0.1 M sodium hydroxide solution to a 300 ml beaker containing 30 ml of the solution from step 3.

Preparation of standard

1. Weigh 0.220 g of $\text{K}_2\text{Cr}_2\text{O}_7$ (molar mass 294.18 g/mol) and dissolve it in 100 mL of distilled water in a 250 mL volumetric flask. Dilute to the mark with distilled water. This is a 0.00075 M solution.
2. Prepare a series of standard solutions by diluting the stock solution. For example, 10 mL of the stock solution diluted to 100 mL gives a 0.000075 M solution.

Preparation of Complex

1. Weigh 5.00 g of $\text{K}_2\text{Cr}_2\text{O}_7$ (molar mass 294.18 g/mol) and dissolve it in 100 mL of distilled water in a 250 mL volumetric flask. Dilute to the mark with distilled water. This is a 0.017 M solution. (see safety notes).
2. Weigh 10.00 g of $\text{K}_2\text{Cr}_2\text{O}_7$ (molar mass 294.18 g/mol) and dissolve it in 200 mL of distilled water in a 500 mL volumetric flask. Dilute to the mark with distilled water. This is a 0.034 M solution.

Colorimetric Analysis

1. Prepare a series of standard solutions by diluting the stock solution. For example, 10 mL of the stock solution diluted to 100 mL gives a 0.000075 M solution. Measure the absorbance of these solutions at 540 nm using a 1 cm path length cell. Plot absorbance versus concentration to obtain a calibration curve.
2. Weigh 3.00 g of $\text{K}_2\text{Cr}_2\text{O}_7$ (molar mass 294.18 g/mol) and dissolve it in 100 mL of distilled water in a 250 mL volumetric flask. Dilute to the mark with distilled water. This is a 0.010 M solution.
3. Weigh 1.50 g of $\text{K}_2\text{Cr}_2\text{O}_7$ (molar mass 294.18 g/mol) and dissolve it in 50 mL of distilled water in a 100 mL volumetric flask. Dilute to the mark with distilled water. This is a 0.005 M solution.

1. Weigh 0.220 g of $\text{K}_2\text{Cr}_2\text{O}_7$ (molar mass 294.18 g/mol) and dissolve it in 100 mL of distilled water in a 250 mL volumetric flask. Dilute to the mark with distilled water. This is a 0.00075 M solution.
2. Prepare a series of standard solutions by diluting the stock solution. For example, 10 mL of the stock solution diluted to 100 mL gives a 0.000075 M solution.