

IB Chemistry FRQ #7 - Stoichiometry

Name _____

A blue solution of unknown concentration of copper (II) sulfate is analyzed using a spectrophotometer and a series of standard solutions. The following data has been collected:

Solution concentration	Absorbance
0.0100 M	0.30
0.0200 M	0.60
0.0300 M	0.90
unknown	0.52

1. Explain how the copper (II) ions are able to produce a colorful solution:
2. Using the color wheel in the data booklet, determine an appropriate wavelength to run the spectrophotometer in this experiment.
3.
 - a. Prepare a calibration curve and determine the concentration of the unknown solution.
 - b. The unknown solution is put into an oven to fully evaporate all of the water. If the initial volume of solution prior to drying was 18.0 cm^3 , how much copper (II) sulfate will be present upon drying?

4. While drying the copper (II) sulfate the color changes from blue to white. Identify the ligand missing that leads to this color change.

5. If 0.0010 moles of copper (II) sulfate is added to 1.1 kg of water, determine the concentration in ppm.