Calculation:

Weight of copper sulphate pentahydrate present in 100 cm^3 of the given solution = 55 mg

Weight of $CuSO_4.5H_2O$ in 1 cm^3 of its solution = X/100 mg = 0.55 = 'Y' mg

Weight of copper present in 1 cm^3 of its solution = $\frac{'Y' * 63.54}{249.54}$ = 'W' mg

Model Procedure /Flow Chart:

Fill in 2, 4, 6, 8, 10 cm^3 of Copper sulphate solutions in 25 cm^3 volumetric flask from a burette. Add 2.5 cm^3 of ammonia to all flasks and make all solutions to mark by using double distilled water. Prepare a blank solution by using 2.5 cm^3 of ammonia & distilled water in 25 cm^3 flask. also fill the given ~~given~~ solution, add 2.5 cm^3 ammonia and fill it to mark with distilled water. mix the solutions properly.

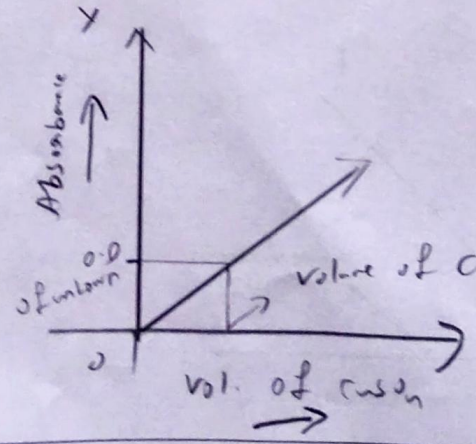
use the 620nm filters in the Colorimeter

Initially put the blank solution and make it to zero

Note down the reading of the readings of different flasks and plot a graph.

From the graph find the volume & wt of copper in given solution

Model graph:



Model Calculation:

Weight of $CuSO_4.5H_2O$ in 100 cm^3 of solution = 55 mg

Wt of $CuSO_4.5H_2O$ in 1 cm^3 = $\frac{55}{100}$ = 0.55 mg

Wt of Cu in 1 cm^3 solution = $\frac{0.55 \times 63.54}{249.54}$ = 0.14 mg

Wt of Cu in given solution = $V_{Cu} \times 0.14$ mg

Tabulation:

Sl. No.	Vol. of $CuSO_4$ in cm^3	Optical Density	Wt. of Copper (mg)
1.	0 [Blank]	_____	_____
2.	2	0.06	0.28
3.	4	0.11	0.56
4.	6	0.18	0.84
5.	8	0.24	1.12
6.	10	0.30	1.40
7.	Unknown	0.14	0.672mg

Calculation:

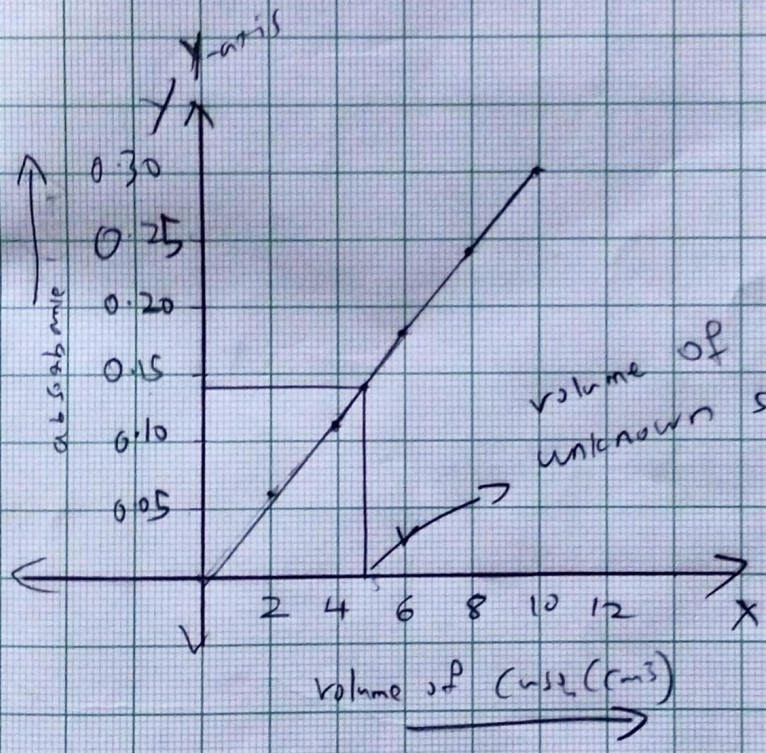
1) V = 2 cm^3, wt of Cu = 2 x 0.14 = 0.28 mg
2) V = 4 cm^3, wt of Cu = 4 x 0.14 = 0.56 mg
3) V = 6 cm^3, wt of Cu = 6 x 0.14 = 0.84 mg
4) V = 8 cm^3, wt of Cu = 8 x 0.14 = 1.12 mg
5) V = 10 cm^3, wt of Cu = 10 x 0.14 = 1.40 mg
6) V = 4.7 cm^3, wt of Cu in solution = 4.7 x 0.14 = 0.672 mg

unknown

Scale

x-axis → 1unit → 2cm³

y-axis → 1unit → 0.05



volume of unknown solution = 5.6cm³

Volume of $CuSO_4$ in unknown solution = 4.8cm³

Inference:

In this experiment, optical density of different solutions of known concentration of copper is found. and it is compared with ~~the~~ reading of unknown solution to find the volume of Cu in it and also to find the weight in it.

Relevance to Society & Environment:

~~It~~ This procedure can be used in food industry to check harmful heavy metals like Cu, lead etc in food items.

. This can also be used in medical industries ~~to~~ for analysis of blood, medicines etc.

Report:

1. Volume of unknown solution = 4.8 cm^3
2. Amount of Copper in the given unknown solution = 0.672 mg

Evaluation of experiment - 8		
Components	Marks	
	Max	Obtained
Model Procedure, Model Graph & Calculation	16	16
Expected Volume & Execution	20	19
Inference & Societal Relevance	04	03
Total	40	38
Signature of Teacher	Ref	