

Student's name

Institution affiliation

Course code and name

Date

Chemistry Lab Report

1. Finding analytical wavelength of KMnO_4

Data table 1

Wavelength	% transmittance	Absorbance
500	1.7	1.76
520	0.1	2.5
540	0.1	2.5
560	2	1.7
580	15.7	0.805
600	51.8	0.287

2. Diluting solutions to create beer's raw plot

Data table 3

flask	Initial concentration of KMnO_4	Volume of KMnO_4 used in dilution	Final volume of solution	Final concentration of solution	% transmittance	absorbance
1	2 M	20 mL	50 mL	0.8 M	0.1	2.5
2	2M	15 mL	50 mL	0.6 M	0.8	2.1
3	2M	10 mL	50 mL	0.4 M	9.0	1.05
4	2M	5 mL	50 mL	0.2 M	21.1	0.677
5	2M	2 mL	50 mL	0.08 M	64.8	0.191

3. Determining the concentration of a sample of KMnO_4

Unknown number	12
% transmittance	17.1%
absorbance	0.769
Equation of the trend line	$Y = -0.06127 + 3.2809x$
Concentration of unknown	0.25

Calculations section

1. Finding analytical wavelength of KMnO_4

Data table 1

$$A = 2 - \log (\%T)$$

$$2 - \log (1.7) = 1.76$$

$$2 - \log (0.1) = 2.5$$

$$2 - \log (0.1) = 2.5$$

$$2 - \log (2) = 1.7$$

$$2 - \log (15.7) = 0.805$$

$$2 - \log (51.8) = 0.287$$

2. Diluting solutions to create beer's raw plot

Data table 3



$$6\text{H}_2\text{SO}_4 = 3\text{M}$$

$$4\text{KMnO}_4 = 4 \cdot 3 / 6 = 2\text{M}$$

Using ; $V_1 \cdot M_1 = V_2 \cdot M_2$, calculate final concentration of the solution.

$$2 \cdot 20 / 50 = 0.8 \text{ M}$$

$$2 \cdot 15 / 50 = 0.6 \text{ M}$$

$$2 \cdot 10 / 50 = 0.4 \text{ M}$$

$$2 \cdot 5 / 50 = 0.2 \text{ M}$$

$$2 \cdot 2 / 50 = 0.08 \text{ M}$$

Calculate absorbance from % transmittance

$$A = 2 - \log (\%T)$$

$$2 - \log (0.1) = 2.5$$

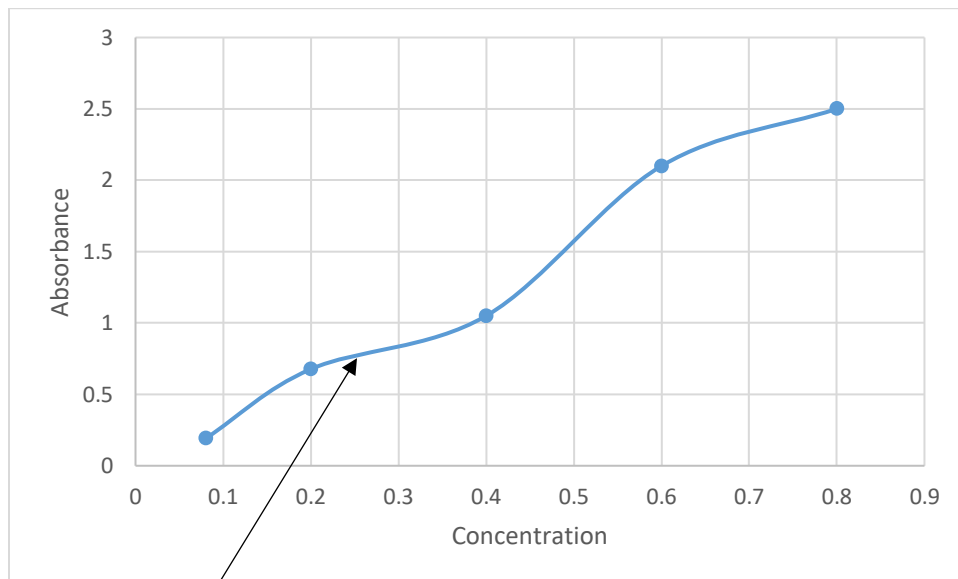
$$2 - \log (0.8) = 2.1$$

$$2-\log (9)= 1.05$$

$$2-\log (21.1)= 0.677$$

$$2-\log (64.8)= 0.191$$

Using excel, plot a graph of absorbance against concentration the result is as follows;



$$Y = -0.06127 + 3.2809x \text{ (Label the trend line)}$$

1. Determining the concentration of a sample of KMnO_4

17.1% transmittance

$$A = 2-\log (17.1\%) = 0.769$$

Replace 0.769 in place of Y in order to find the value of x which is concentration

$$Y = -0.06127 + 3.2809x$$

$$0.769 = -0.06127 + 3.2809x$$

$$x = 0.25 \text{ M}$$