

## Determination of $\lambda_{\max}$ for $\text{KMnO}_4$

### Experiment # 1:-

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##### Apparatus:-

Beaker, UV-Visible spectrophotometer.

##### Chemical:-

$\text{KMnO}_4$  solution 10 ppm

Distilled water.

##### Theory:-

Spectrophotometry is a technique that uses the absorbance of light by an analyte at a certain wavelength to determine the analyte concentration. UV-Visible spectrophotometry uses light in UV and visible part of electromagnetic spectrum.

Light of this wavelength is able to effect the excitation of electrons in the atomic or molecular ground state to higher energy level, giving rise to an absorbance at wavelength specific to each molecule.

The calibration curve method is used in single beam spectrophotometer in which spectrophotometer is calibrated against standard solvent (distilled water). The resulting data is plotted to get a graph of Absorbance of solution against the wavelength of the light.

### Procedure:

10 ppm solution of  $\text{KMnO}_4$  was prepared as follows



1000 ppm, 2.87 g/L

It was then diluted upto 10 ppm

$$M_1 V_1 = M_2 V_2$$

$$1000 \times V_1 = 10 \times 100$$

$$V_1 = \frac{10 \times 100}{1000}$$

$$V_1 = 1 \text{ ml}$$

Cuvettes were rinsed with distilled water and one of them was filled with distilled water. The cuvette was then placed in spectrophotometer as reference solution. At 450 nm wavelength the spectrophotometer was calibrated. Then  $\text{KMnO}_4$  solution was filled in another cuvette and Absorbance was measured at 450 nm and recorded.

Absorbance was recorded upto 600 nm by using interval of 10 and graph was plotted.

# Experiment # 1

## Determination of $\lambda_{max}$ for $KMnO_4$

### Apparatus:

UV-Visible spectrophotometer

### Chemical:

30 ppm  $KMnO_4$  solution  
Distilled Water

### Observations and Calculations:

Wavelength ( $\lambda$  nm)

Absorbance

450	nm	0.01
460	nm	0.03
470	nm	0.04
480	nm	0.07
490	nm	0.14
500	nm	0.22
510	nm	0.27
520	nm	0.34
530	nm	0.42
540	nm	0.47
550	nm	0.49
560	nm	0.50
570	nm	0.45
580	nm	0.32
590	nm	0.26
600	nm	0.20

