

Spect. Deter. Of [Mn] in unknown sample & Calculation of ϵ

Introduction:

- What is:

Mn?

ϵ ?

$Mn_{\lambda_{max}}$?

Exp. aims?

- How to:

Convert colorless Mn compound to colored compound?

Maintain colored Mn compound?

Convert concentration unit from ppm to Molar and vice versa?

Mn:

Manganese

atomic number	25	54.938	atomic weight
symbol	Mn		acid-base properties of higher-valence oxides
electron configuration	[Ar]3d ⁵ 4s ²		crystal structure
name	manganese		physical state at 20 °C (68 °F)

 Transition metals	 Solid
 Cubic	 Strongly acidic

Controls sugar levels

Prevents osteoporosis

Maintains thyroid health

Improves metabolism & digestion

Alleviates premenstrual syndrome

Remedy for sprains & inflammation

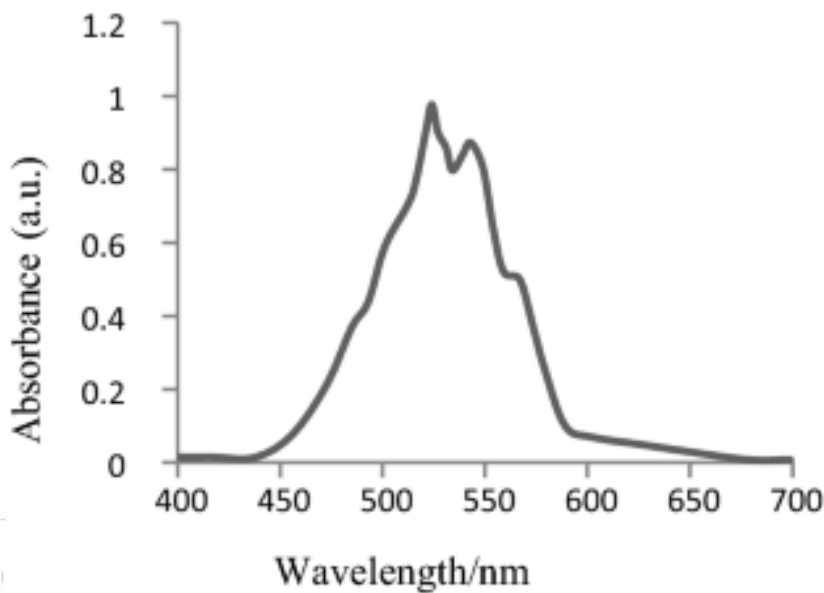
Increases mineral density of spinal bone

Monitors the activity of free radicals in the body

ε:

ε is the molar absorptivity, also known as the extinction coefficient of the sample. It is a unique physical constant of the chemistry of the sample that relates to the sample's ability to absorb light at a given wavelength. Like path length (b) and sample concentration (c), ε is also directly proportional to Absorbance.

Mn_{λmax}:



Experiment's Aims:

1- Finding [Mn] in the unknown sample.

2- Calculating of ε Value.

Converting colorless Mn compound to colored compound:



Maintaining colored Mn compound:










Converting concentration unit from ppm to Molar and vice versa:

$$\text{ppm} = M \times \text{M.Wt.} \times 1000$$

Experimental:

1-Prepare 50ml Of [100ppm] (Mn^{7+}) from ($KMnO_4$) using Tab water.

2-Prepare next (all in 50ml Volumetric flasks):

No	1	2	3	4	5	6	7
Flask							
Mn^{7+} (ppm)	5	10	20	30	40	NIL	NIL

3-Prepare the Blank solution.

4-Move to the next Laboratory and follow given instructions to find the concentration of (Mn) in the unknown sample.

Results:

No	$C_{(ppm)}$	Absorbance
Blank	nil	0
1	5	a_1
2	10	a_2
3	20	a_3
4	30	a_4
5	40	a_5
Unknown	?	?

Calibration Graph:

