



زانكۆی سه‌لاحه‌دین-هه‌ولێر
Salahaddin University-Erbil

University of Salahaddin- Hawler
College of Education-Chemistry Department
P. Inorganic Chem., Third Stage

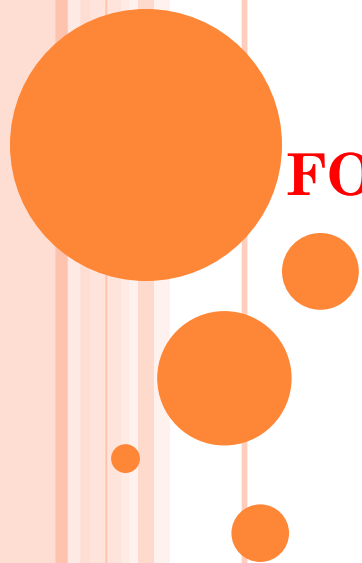
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THE METHOD OF CONTINUOUS VARIATION

(JOB METHOD)

FOR DETERMINATION OF STOICHIOMETRY.



Job ratio method

This method used to determine the **number of mole** for ligand to know the **M:L** ratio to find the **composition** or **structure** of complex.

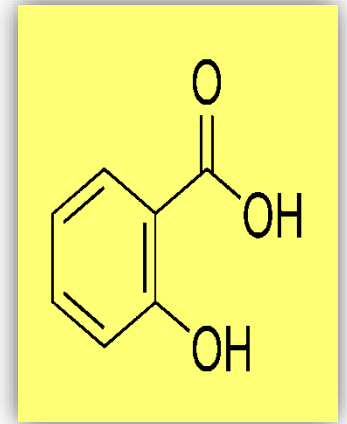


JOB METHOD

In the method of continuous variations, volumes of solutions with identical analytical concentrations of the cation and ligand are mixed in such a way that the total volume of each mixture is the same (for example, 1:9m, 8:2, 7:3, and so forth). The absorbance of each solution is then measured at a suitable wave length.

What is salicylic acid?

1. Sal. Is a molecular abbreviation for salicylic acid.
2. Considered a "chelating or dentate ligand" because it binds to the metal from more than one atom (two teeth).
3. Forms stable complex with various metal.
4. A-Used in organic synthesis.
B-Salicylic acid 2% solution used to keep pores clear and reduce inflammation.



Procedure:

1. Prepare (0.01M) Ferric nitrate $\text{Fe}(\text{NO}_3)_3 \cdot 9\text{H}_2\text{O}$ solution in 100ml D.W.
2. Prepare (0.01M) Salicylic acid 2-(OH) $\text{C}_6\text{H}_4\text{COOH}$ solution in 100ml D.W.
3. Take 6 volumetric flasks and prepare the following solutions.

Series	1	2	3	4	5	6
V_M	0.5	1	2	3	4	4.5
V_L	4.5	4	3	2	1	0.5



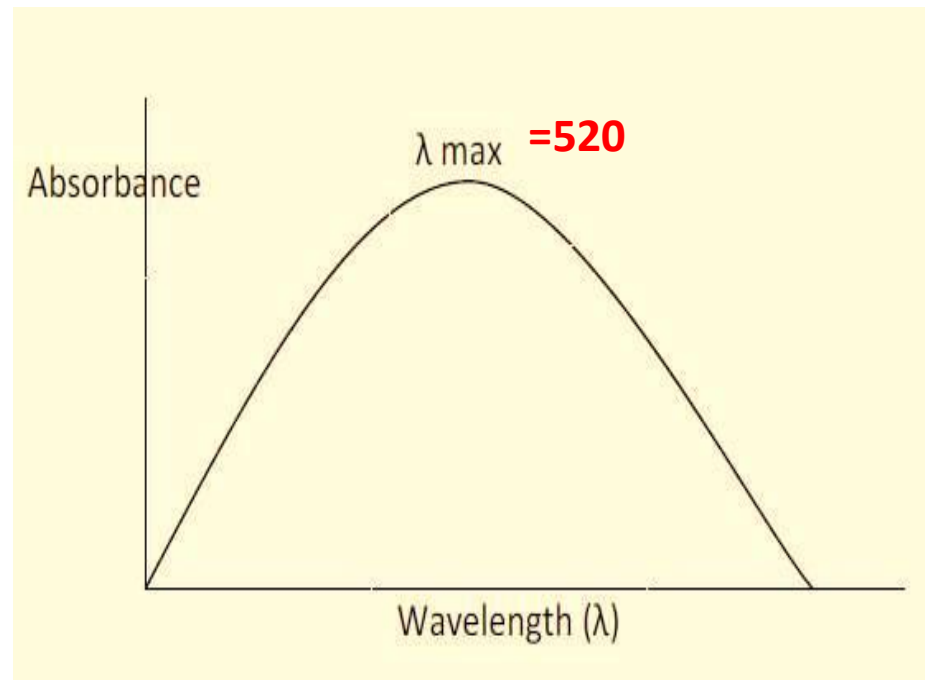
4. Then complete the volume in all flasks with D.W. to 25ml.

5. Determine the λ_{\max} .

Lambda maximum (λ_{\max}) (wave length)(nm)

It is the wave length which its absorbance (Abs.) is the greatest.

λ_{\max}	Abs.
500	0.765
505	0.780
510	0.790
515	0.794
520	0.800
525	0.805
530	0.820




6. Record absorbance of the solutions.

7. Plot between **absorbance** and **volume fraction** of V_M and V_L

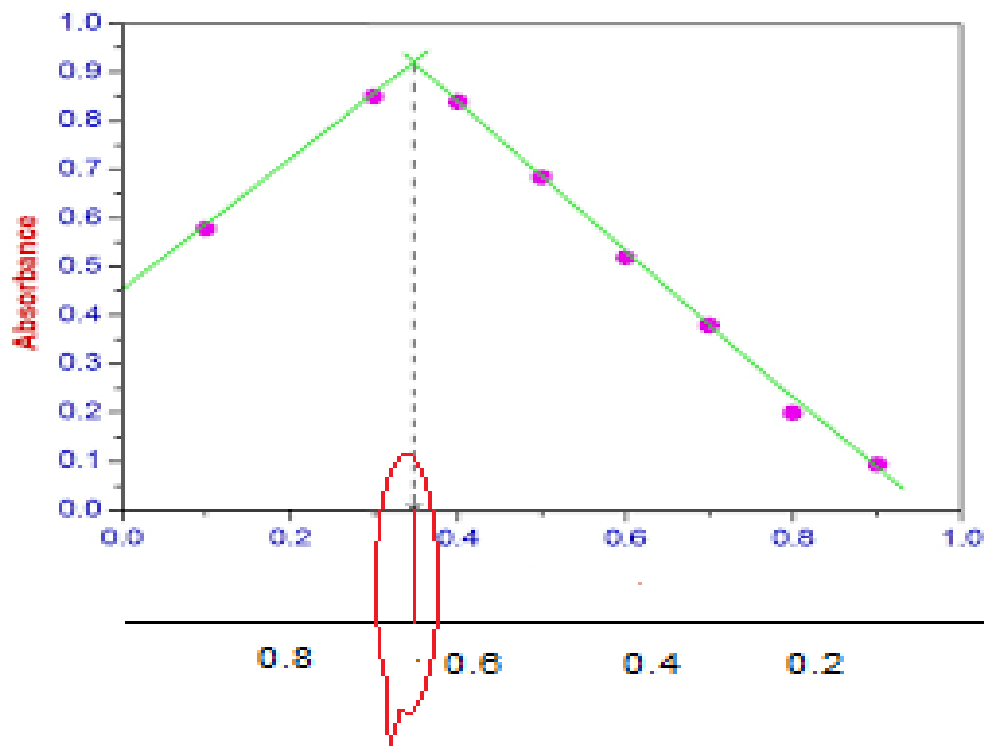
Volume fraction

$$V_M + V_L = 5$$

Series	$V_M/(V_M+V_L)=V_M$	$V_L/(V_M+V_L)=V_L$
1	$0.5/(0.5+4.5)=0.1$	$4.5/(0.5+4.5)=0.9$
2	0.2	0.8
3	0.4	0.6
4	0.6	0.4
5	0.8	0.2
6	0.9	0.1



Series	Abs.
1	---
2	---
3	---
4	---
5	---
6	---



$$\begin{aligned} V_M/V_L &= 0.35/0.65 \\ &= 0.5 \end{aligned}$$



bis(salicylate) ferric(III)



Thank
you