Захраа Аль-Абд

Магистрант, факультет наук

Химический факультет Университета Аль-Баас,

Хомс, Сирия.

М.Мудар Аль-Худер

Научный руководитель: д.т.н. в области неорганической химии в университете Аль-Баас, Хомс, Сирия.

Аднан Кодлаа

Научный руководитель: д.т.н. Кандидат физико-квантовой химии в университете Аль-Баас, Хомс, Сирия.

Zahraa Al-Abd

Master student, Faculty of Sciences

Department of Chemistry, Al-Baath University,

Homs, Syria.

M.Moudar Al-Khuder

Scientific Supervisor:Prof.Dr. in inorganic chemistry in Al-Baath University, Homs, Syria.

Adnan Kodlaa

Scientific Supervisor:Prof.Dr. in Physical -Quantum Chemistry in Al-Baath University, Homs, Syria.

SYNTHESIS OF ZINC (II) COMPLEXES WITH HYDRAZIDE LIGAND

Annotation: *Hydrazide compound was used as a ligand to form some of transition metal complexes because it has coordination centers . a new ligand (L)= [1 □4-phenylene bis (methanylylidene) bis (4-Hydroxybenzohydrazide)] was synthesized by the condensation reaction of 1,4-Benzenedialdehyde with 4-hydroxybenzohydrazide . Then the reaction of this ligand with zinc (II) ion were carried out using metal chloride salt by the (1:2) molar ration respectively conduced [Zn_2*

LCl_4]. The ligand and complexes wereand studied on the basis of (IR) and (UV-VIS). the results were comparative with the proposed structures.

Keywords: *Schiff base, hydrazide, metal complexe.*

СИНТЕЗ КОМПЛЕКСОВ ЦИНКА (II) С ГИДРАЗИДНЫМ ЛИГАНДОМ

Аннотация: *Гидразидное соединение использовалось в качестве лиганда для образования некоторых комплексов переходных металлов, поскольку оно имеет координационные центры, новый лиганд (L) = [1-4-фенилен-бис (метанилилиден) -бис (4-гидроксибензогидразид)] был синтезирован реакцией конденсации 1,4-бензолдиальдегида с 4-гидроксибензогидразидом. Затем реакцию этого лиганда с ионом цинка (II) проводили с использованием соли хлорида металла с молярным соотношением (1: 2), соответственно проведенным [Zn2 LCl4]. Лиганд и комплексы были исследованы на основе (ИК) и (УФ-ВИС), результаты были сопоставимы с предлагаемыми структурами.*

Ключевые слова: *основание Шиффа, гидразид, комплекс металла.*

1.Introduction:

Schiff bases have been subject of intense interest as a result of their synthetic accessibility and rich coordination chemistry [1,c.617]. These compounds [2,c.2048] and their metal complexes have been reported to exhibit a wide spectrum of biological properties [3,c.4368] . hydrazides are a special group of the Schiff base family. they are an important organic compound in the preparation of many organic derivatives such as triazole, hydrazone and others

2. Experimental

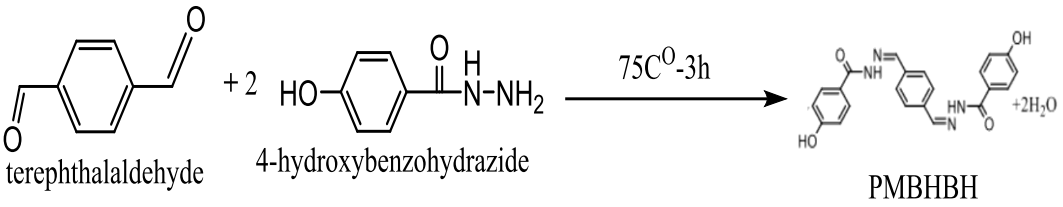
2.1.Apparatus and chemicals:

All the chemicals used were purchased from both merch and sigma Aldrich companies and used without further purification . FT-IR spectra was recorded using jasco Japanese taype (A) infrared spectrophotometer fourier transform FT-IR -4100(KBr), UV/Vis spectroscopy (model: HITACHI U-1900).

2.2.Experimental Procedure:

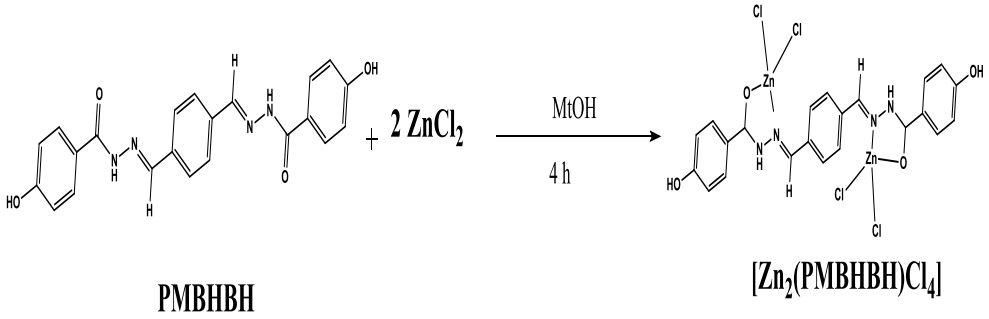
2.2.1. Synthesis of the ligand (L):

The Schiff base, (L) was prepared by condensation **of** 4-hydroxybenzohydrazide (2 mol, 0.30430 gr) with a solution 1,4- Benzenedialdehyde (1 mol,0.136877 gr) in ethanol 95% (5ml). The mixture was refluxed with stirring for 3h. The precipitated [1.4-phenylene bis (methanylylidene) bis (4-Hydroxybenzohydrazide)] were filtered and recrystallized from ethanol and dried in vacuum desiccators. Ligand as white crystals was obtained with a yield of (74.9%).



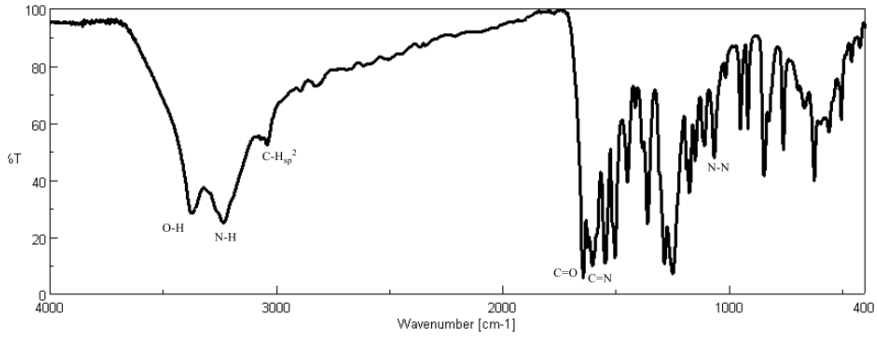
2.2.2. Synthesis of metal complexes:

A hot solution of potassium hydroxide KOH (20 mmol, 1.12 g) in ethanol 15 ml was added to a suspension of the ligands (10 mmol) in ethanol 50 ml respectively. To the resulting yellow solution, a hot solution of metal zinc (II) chloride anhydrous (20 mmol) in ethanol 25 ml was added. The mixture was then refluxed, with constant stirring, for 4 hours to complete the precipitation. The resultant cooling at room temperature, then the precipitated complex compounds were filtered by Buchner Fennel, washed with hot water and ethanol, followed by dry diethyl ether (2×3 ml), then dried in a vacuum oven, , A precipitate is obtained with a yellow crystalline yield of (90%) .



3.3. Infrared Spectra:

The infrared spectra for the present compounds taken in the range 400-4000 cm-1 help to indicate regions of absorption vibrations. The main stretching modes are for ν(C=N) and ν(C-O).



.Figure 1: IR spectrum for ligand (L)

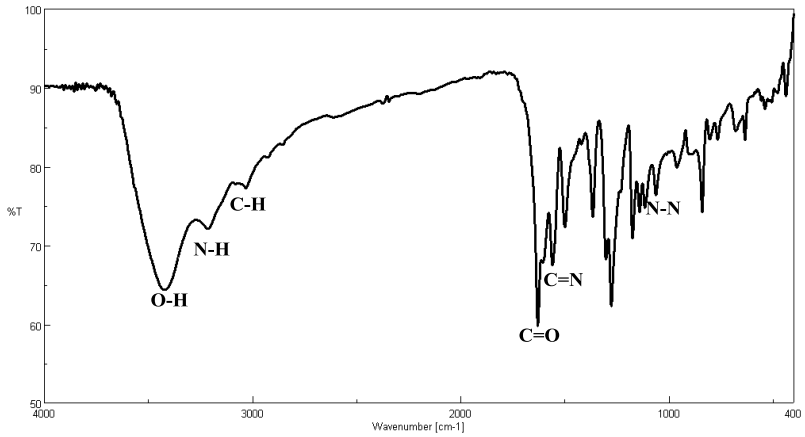


Figure 2: IR spectrum for ligand [Zn_2LCl_4].

TABLE 1.

conductivity of the ligind and complex.

Comp.	**ν(O-H)**	**ν(N-H)**	**ν(C-H_{SP^3})**	**ν(C=O)**	**ν(C=N)**	**ν(N-N)**	**ν(C-N)**	**ν(C=C)**	**ν(M-O)**
L	3374	3233	3041	1644	1604	1066	1248	1547	-
[Zn_2LCl_4]	3422	3213	3030	1629	1559	1063	1276	1500	437

3.4. Electronic spectral data:

The spectrum of Schiff base (L) presented band in the UV interval at 345nm assigned to (n→ π*). The electronic spectra of the **[Zn_2LCl_4]** in DMSO has two bands at 259 nm assigned to (π→ π*) and 420nm assigned to (d-d) respectively .

References:

[1] Aslantas. M, Kendi. E, Demir. N, A.E. Sabik. A.E, Tumer. M and Kertmen. M.Synthesis, spectroscopic, structural characterization, electrochemical and antimicrobial activity studies of the Schiff base ligand and its transition metal complexes // Journal of Spectrochimica Acta Part A .-2009 .- N (74) .- C . 617 -624

[2] Xu. S.P, Shi.L, Lv. P.C, Fang. R.Q. and Zhu. H.L. Synthesis and antibacterial activities of metal(II) complexes with Schiff bases derived from 3,5-diiodosalicylaldehyde // Journal of Coordination Chemistry.- 2009. – N (62). – C. 2048 -2057

[3] Nejo. A. A, Kolawole. G. A, Dumbele. M. C. and Opoku. A. R. Spectral, magnetic, biological, and thermal studies of metal(II) complexes of some unsymmetrical Schiff base //Journal of Coordination Chemistry. – 2010. –N(63). – C. 4367 -4379

[4] Chaudhary NK, Mishra P. Metal complexes of a novel schiff base based on penicillin: characterization, molecular modeling, and antibacterial activity study// Bioinorganic chemistry and applications- 2017.