

Kingdom of Saudi Arabia
King saud University
College of Science
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*Analysis of 2D NMR Spectra of Some
Sterically Hindered Imines*

Thesis submitted in partial fulfillment of the requirements of
M.Sc. Degree in Chemistry

By

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SUMMARY الملخص الإنجليزي

This project includes NMR spectral analysis of 2D NMR of some sterically hindered imines. The choice of this subject is a great importance of 2D NMR in recent years. This technique is considered one of the fastest and reliable method for structural determination of organic compounds. COSY and HETCOR are the most used spectra where they enable researchers to determine stereochemistry instead of the old method in measuring along range coupling (4J , 5J) which are not applicable in some cases.

This thesis consists of four main chapters as follow :

Chapter one :

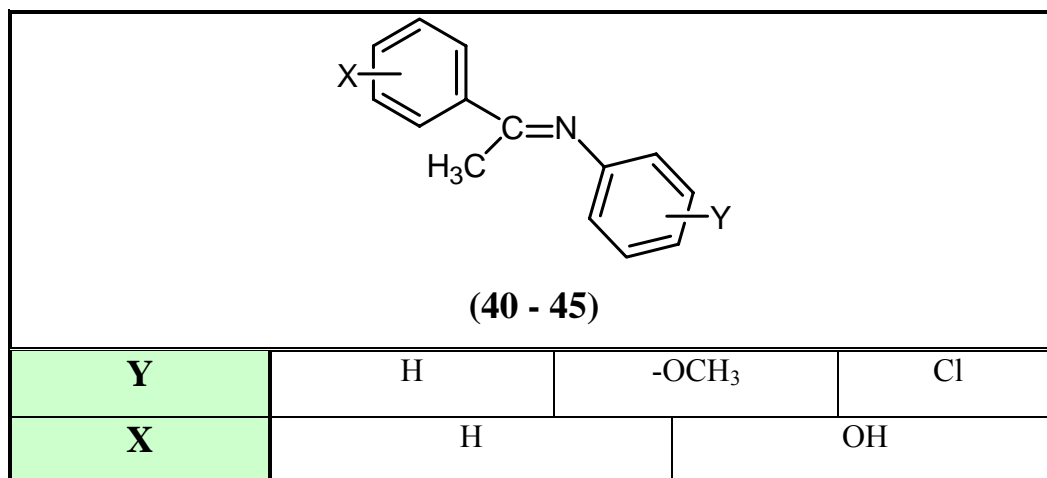
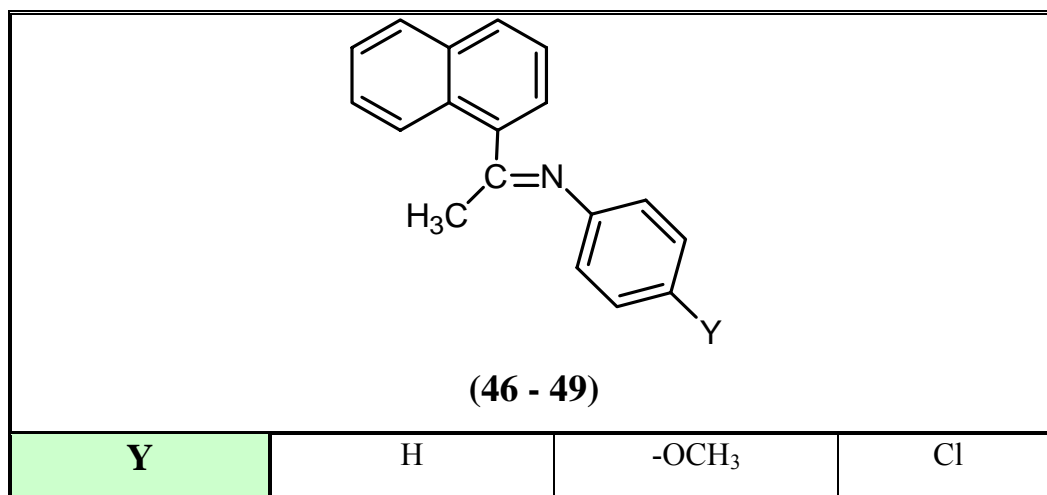
This chapter includes objectives of the project, introduction and literature survey. Concentration on stereochemistry and various spectral methods as UV, IR, ^1H and ^{13}C NMR .

Great part of the literature survey has been devoted for 2D NMR as COSY, HETCOR, HMQC, HMBC and NOESY.

Chapter Two :

This chapter concentrates on different methods of preparations as follow :

1. Condensation Method, Dean-Stark.
2. Condensation Method by Using Acetic acid as a Catalyst.
3. Molecular Sieves Method.
4. Microwave Irradiation Method.
5. TiCl_4 Method.
6. $\text{Mg}(\text{ClO}_4)_2$ Method.
7. Solid-Solid Synthesis Method.

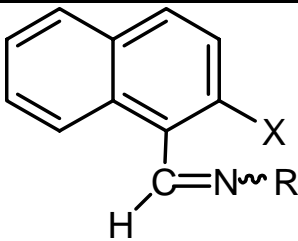
Group 6: Aromatic ketimines from acetophenone derivatives.**Group 7: Aromatic ketimines from 1-acetonaphthone.****Chapter Three :**

This chapter contains practical methods of preparation of these compounds as well as solvent purification and physical constants of the products. Also this chapter includes apparatus and equipments used in this project and 2D NMR parameters.

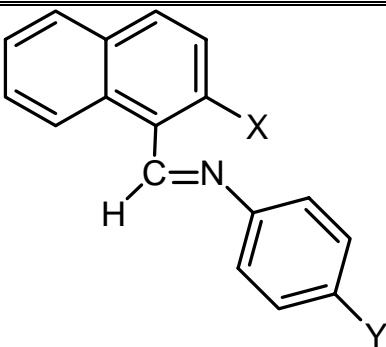
Chapter four :

Includes some extra spectra, references and summary in English.

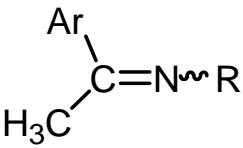
Group 3: Aliphatic aldimines from 1-naphthaldehyde derivatives.

			
(24 - 29)			
R	-CH ₂ -Ph	-CH(CH ₃) ₂	-C(CH ₃) ₃
X	H		OH

Group 4: Aromatic aldimines from 1-naphthaldehyde derivatives.

			
(30 - 35)			
Y	H	-OCH ₃	Cl
X	H		OH

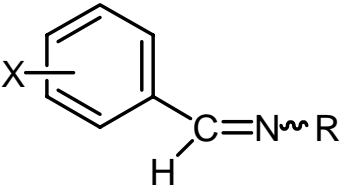
Group 5: Aliphatic ketimines.

				
(36 - 39)				
Ar	2-HO-C ₆ H ₄ -	2-CH ₃ O-C ₆ H ₄ -	C ₁₀ H ₇ -	2-HO-C ₆ H ₄ -
R	-CH(CH ₃) ₂			-CH ₂ -Ph

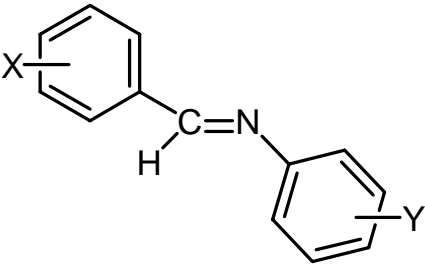
According to these methods, we obtained different yields. Analysis of these products was performed including analysis of 2D NMR spectra. Discussion of results and stereochemical implications were reported.

The synthesized compounds came in seven groups as follows :

Group 1: Aliphatic aldimines from benzaldehyde derivatives.

 (1 - 11)			
R	-CH ₂ -Ph	-CH(CH ₃) ₂	-C(CH ₃) ₃
X	H		NO ₂

Group 2: Aromatic aldimines from benzaldehyde derivatives.

 (12 - 23)			
Y	H	-OCH ₃	Cl
X	H		NO ₂