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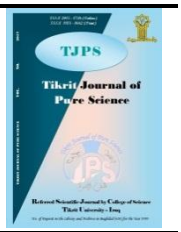

Synthesis of some pyrimidine derivatives from-4- acetyl pyridine

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Abstract

Chalcones compounds(1-4) were prepared from - 4 - acetyl pyridine with different aromatic aldehyde benzaldehyde in the presence of KOH solution .

The compounds (1-4) were reacted with thiourea to give compounds (5-8), with guanidine to give compounds (9-12). and with urea to give the compounds (13-16), in the presence of KOH as abasic.

The prepared compounds were identified using melting point apparatus , F T. IR spectro photo meter and (^{1}H-NMR) spectrometer for some compounds .

Introduction

The Heterocyclic compounds are abundant in nature and the great significance in life because their structural subunits exist in many natural products such as vitamins,Hormones, and antibiotics [1-2] .

A practical method for the synthesis of these compounds is of great interest in synthetic organic chemistry[3].

Pyrimidines are the most important a heterogeneous aromatic compound similar to benzene and pyridine containing two nitrogen atoms in positions 1 and 3 consisting the six-membered rings heterocyclic containing Pyrimidine moiety are of great interest because they constitute an important class of natural and non-natural products, many of which exhibit useful biological activities and clinical applications [4-5].

Pyrimidine occur in the living system in the form of nucleic acids and vitamins, [6], Chalcones have various biological activities such as cytotoxic, [7], antimalarial, [8]. Antioxidant [9], Tyrosinase Inhibitory [10], anti-inflammatory, [11], cancer chemo preventive[12] , and antibacterial[13].

Several pyrimidine derivatives have wide varieties usages and its nucleus is also present in vitamin B2 and folic acid. Pyrimidine heterocyclic possessing hydroxyl group in medicinal chemistry, [14], The literature indicated that compound having pyrimidine nucleus possesses broad range of biological activity like 5-flourouracil as anticancer; idoxuridine and trifluridine as antiviral; zidovudine and stavudine as anti-HIV; trimethoprim, sulfamethazine, sulfadiazine as antibacterial; minoxidil and prazosin as antihypertensive; phenobarbitone as sedative-hypnotic and anticonvulsant; propylthiouracil as antithyroid; thinozylamine as[1] H-antihistaminics and fervennuline as antibiotics[15].

Experimental part:

The Melting point were determined using electro thermal melting point apparatus were (uncorrected) ,the I.R spectro were recorded by F. T. I. R model 84005 shimadzu Japan infraed ,spectro photo meter as KBr disk. ^{1}H -NM R spectro were recorded by ultra shield 300 mHz .Bruker 2003.

2-1: Synthesis of 3-(4-substituted phenyl) -1-(pyridine -4- yl) prop -2- en -1- one (1-4) [16].

A mixture of the 4-acetylpyridine(0.01 mol, 1.21g) and benzaldehydes substituted (0.01 mol) was stirred in absolute ethanol (50 ml) and an aqueous solution of KOH (20 ml) was added, the mixture refluxed for(6 hr), and then poured into crushed of ice, these compounds separated and filtered, recrystallized from absolute ethanol, shown with table (1) .

2-2: Synthesis of 6-(3- substituted phenyl)-4-pyridin-4- yl) -1,6 dihydropyrimidine-2- thiol (5 -8) &(13-16). [17,18].

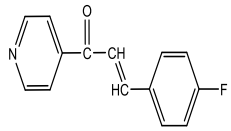
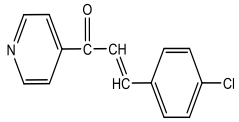
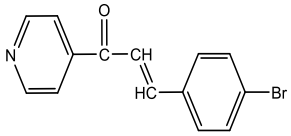
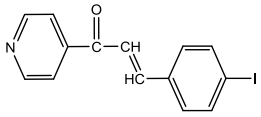
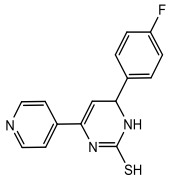
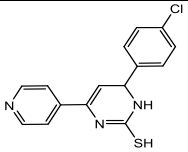
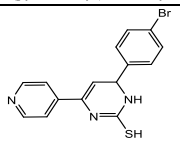
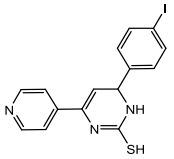
A mixture of compounds (1-4) (0.01 mol,2.74g) and thiourea (0.01 mol) was dissolved in ethanol solution (30ml) and KOH solution (10ml), mixture was

refluxed for (22 hr), cold and poured into cold water with continuous stirring for (1hours), the precipitated was obtained, filtered, washed and crystallized, was used to synthesis compounds (13-16) from compound (1-4) the procedure with urea , shown with table (1)

2-3:Synthesis of 4-(3-substituted phenyl)-6-pyridin -4- yl) pyrimidin-2-yl) amine (9-12). [19].

A mixture of compounds (1-4) (0.01 mol 2.56g) was dissolved in alcohol (30ml) guanidine hydrochloride (0.01 mol) and solution KOH(15ml) was added and refluxed for(10 hr), the reaction mixture was cooled , into crushed ice, these compound filtered, and washed with water, dried, and recrystallized from absolute ethanol shown with table (1).

Table (1) some of physical properties and percentage of Yeild for prepared compounds (1-16)

Comp NO.	Structures	M.p °C	Color	Yeild %
1	 (*E*)-3-(4-fluorophenyl)-1-(pyridin-4-yl)prop-2-en-1-one	140-142	Light Green	42
2	 (*E*)-3-(4-chlorophenyl)-1-(pyridin-4-yl)prop-2-en-1-one	139-141	Green	50
3	 (*E*)-3-(4-bromophenyl)-1-(pyridin-4-yl)prop-2-en-1-one	167-169	Brown	68
4	 (*E*)-3-(4-iodophenyl)-1-(pyridin-4-yl)prop-2-en-1-one	150-152	Green	45
5	 6-(4-fluorophenyl)-4-(pyridin-4-yl)-1,6-dihydropyrimidine-2-thiol	184- 186	Brown	55
6	 6-(4-chlorophenyl)-4-(pyridin-4-yl)-1,6-dihydropyrimidine-2-thiol	175- 177	Light Yellow	57
7	 6-(4-bromophenyl)-4-(pyridin-4-yl)-1,6-dihydropyrimidine-2-thiol	180-183	Yellow	62
8	 6-(4-iodophenyl)-4-(pyridin-4-yl)-1,6-dihydropyrimidine-2-thiol	245-246	White	38

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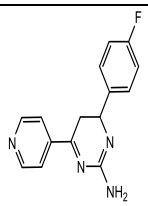
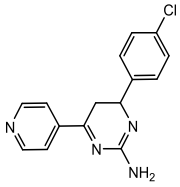
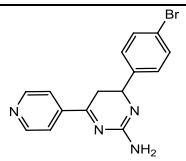
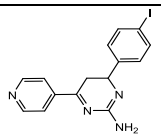
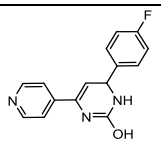
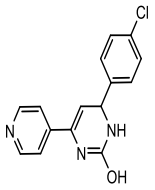
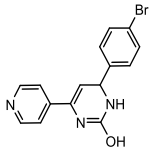
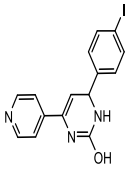
9	 4-(4-fluorophenyl)-6-(pyridin-4-yl)-4,5-dihydropyrimidin-2-amine	**178 -179**	**Yellow**	**55**
10	 4-(4-chlorophenyl)-6-(pyridin-4-yl)-4,5-dihydropyrimidin-2-amine	**160-161**	**Yellow**	**43**
11	 4-(4-bromophenyl)-6-(pyridin-4-yl)-4,5-dihydropyrimidin-2-amine	**224-226**	**Brown**	**47**
12	 4-(4-iodophenyl)-6-(pyridin-4-yl)-4,5-dihydropyrimidin-2-amine	**229-230**	**Yellow**	**50**
13	 6-(4-fluorophenyl)-4-(pyridin-4-yl)-1,6-dihydropyrimidin-2-ol	**179 -181**	**Brick Red**	**49**
14	 6-(4-chlorophenyl)-4-(pyridin-4-yl)-1,6-dihydropyrimidin-2-ol	**169-170**	**Yellow**	**64**
15	 6-(4-bromophenyl)-4-(pyridin-4-yl)-1,6-dihydropyrimidin-2-ol	**205-207**	**Brick Red**	**50**
16	 6-(4-iodophenyl)-4-(pyridin-4-yl)-1,6-dihydropyrimidin-2-ol	**190-192**	**Yellow**	**43**

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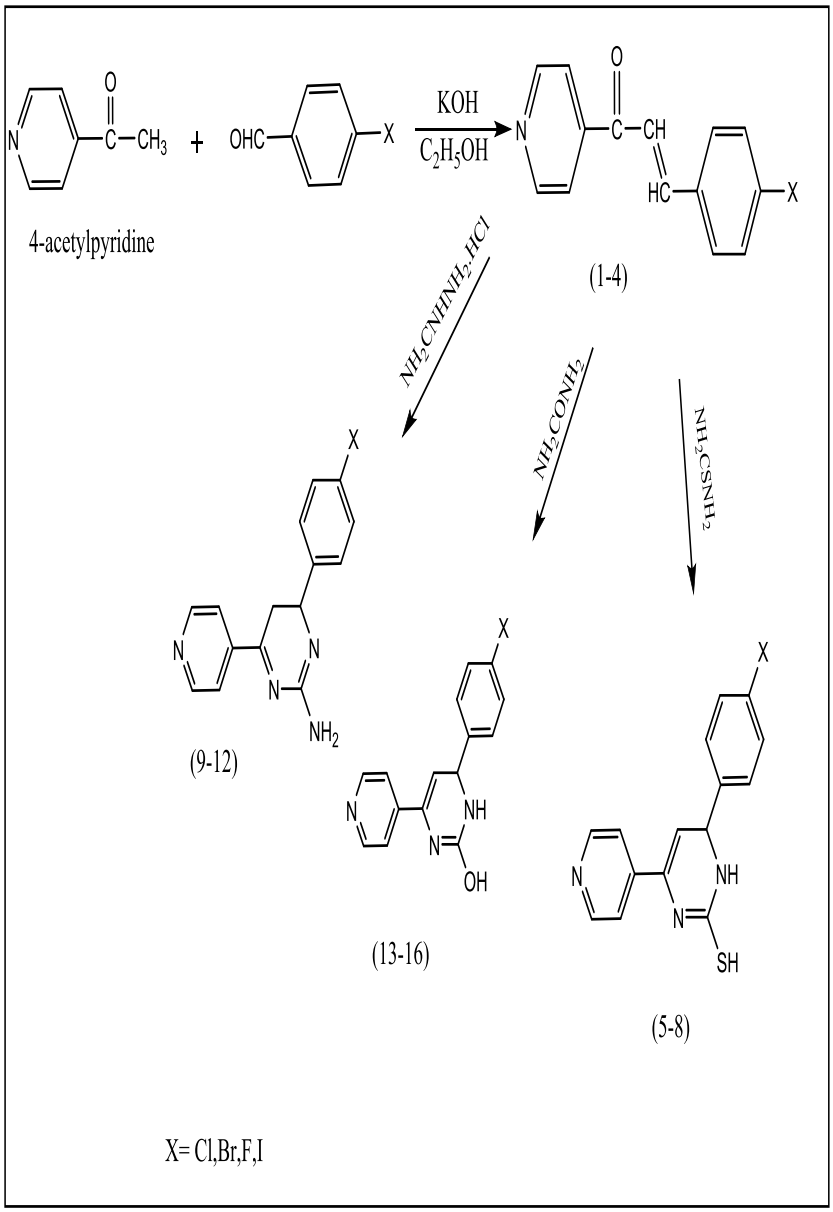

Scheme (1): Synthesis steps of prepared compounds (1-16)

Results and discussion

I.R spectra showed the **compound 1** (C=O) at (1700 cm^{-1}), (C=N str) at(1600 cm^{-1}), (C…C aromatic) ,at(1554 cm^{-1}), (C-H aromatic) absorbed at (3037 cm^{-1}), also the **compound 2** showed (C=O) at (1711 cm^{-1}), (C=N str) at(1610 cm^{-1}), (C= C aromatic) at(1540 cm^{-1}), (C= Cl) at (750 cm^{-1}), (C-H aromatic) absorbed at (3085 cm^{-1}), **the compound 3** showed (C=O) at (1703 cm^{-1}), (C=N str) at(1633cm^{-1}), (C= C aromatic) at(1498 cm^{-1}), (C-H aromatic) absorbed at (3005 cm^{-1}), **the compound 4** showed (C=O) at (1720 cm^{-1}), (C=N str) at(1637 cm^{-1}), (C= Caromatic) at(1565 cm^{-1}), (C-H aromatic)(3109 cm^{-1}) ,[20].

I.R spectra showed the **compound 5** (C-H aromatic) absorbed at(3075cm^{-1}),(SH) at (1683cm^{-1}), (NHstr),at (3101.79 cm^{-1}) ,(C=N) at (1606 cm^{-1}) ,

Compound 6 showed (C-H aromatic) absorbed at(3015cm^{-1}),(SH) at(1664 cm^{-1}) (NHstr),at (3167.22 cm^{-1}),(C=N) at(1608 cm^{-1}),

Compound 7 (C-H aromatic) absorbed at(3109 cm^{-1}), (SH) at(1688cm^{-1}), (NHstr),at (3337.69 cm^{-1}) ,(C=N) at(1602 cm^{-1}), **Compound 8**(C-H aromatic) absorbed at(3100cm^{-1}), (SH) at(1670cm^{-1}), (NHstr), at (3362.04cm^{-1}), (C=N) at (1604 cm^{-1}),

I.R spectra showed the **Compound 9** (NH) band at (3144.50cm^{-1}), (C=N) at (1625cm^{-1}), (C= Caromatic) at (1465 cm^{-1}), **Compound 10** (NH) at (3251.33cm^{-1}), (C =N) at (1601 cm^{-1}) (C=Caromatic)at (1514 cm^{-1}), **Compound11**(NH) at (3185.25cm^{-1}), (C =N) at (1605cm^{-1}), (C=C aromatic)at (1421cm^{-1}), **Compound12** (NH) at (3340.80cm^{-1}), (C =N) at (1620 cm^{-1}), (C = C aromatic)at (1510cm^{-1}),

I.R spectra also showed the **Compound 13** (OH)at(3402 cm^{-1}), (C=N) at (1630 cm^{-1}), (C-H aromatic) at(3101 cm^{-1}), **Compound 14** (OH)at(3462 cm^{-1}), (C-H aromatic) at(3043 cm^{-1}) , (C=N) at (1616 cm^{-1}),

Compound 15(OH)at(3408 cm^{-1}), (C-H aromatic) at(3055 cm^{-1}), (C=N) at (1629 cm^{-1}), **Compound 16**

(OH)at(34 52cm^{-1}), (C-H aromatic) at(3026 cm^{-1}), (C=N) at (1617cm^{-1}),show table(2) .[21].

^{1}H-NMR data for **compound(5)** showed that pyridine at (7.89 -7.871) ppm, and(NH) at(7.304 -7.286) ppm , and(SH) at 4.266 ppm, as shown in the figure(1).

Also the **compound (16)** showed that pyridine at (8.708-8.701)ppm, benzene at (7.740-7.734) ppm,OH at (10.10) ppm, as shown in the figure(2).

The table (3) showed the assigned.

Table (2) IR date for prepard compounds

I.R cm^{-1}							
Comp.NO	**ν C…C Ar**	**ν C-H Ar**	**ν C=N**	**ν C=O**	**ν NH**	**ν SH**	**ν OH**
1	1554	3037	1600	1700			
2	1540	3085	1610	1711			
3	1498	3005	1633	1703			
4	1565	3109	1637	1720			
5		3075	1606		3101.79	1683	
6		3015	1608		3167.22	1664	
7		3109	1602		3337.69	1688	
8		3100	1604		3362.04	1670	
9	1465		1625		3144.50		
10	1514		1601		3251.33		
11	1421		1605		3185.25		
12	1510		1620		3340.80		
13		3101	1630				3402
14		3043	1616				3462
15		3055	1629				3408
16		3026	1617				3452

Table (3) ^{1}H- NMR data of compounds (5,16)

Comp. NO	pyridine	NH	SH	benzene	OH
5	7.89 -7.871	7.304 -7.286	4.266		
16	8.708-8.701			7.740- 7.734	10.10

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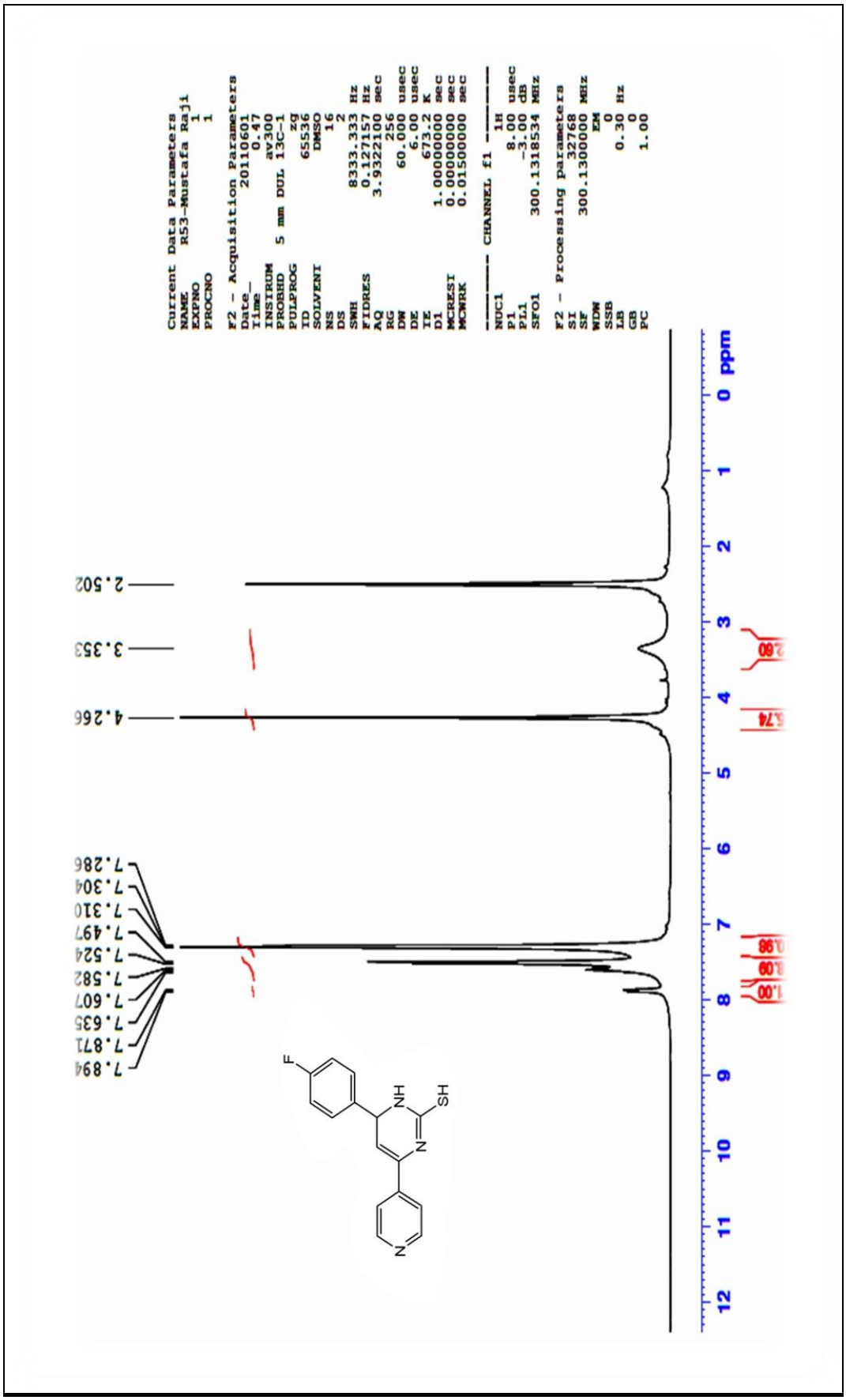

Fig (1) ^{1}H-N.M.R spectrum For compound (5)

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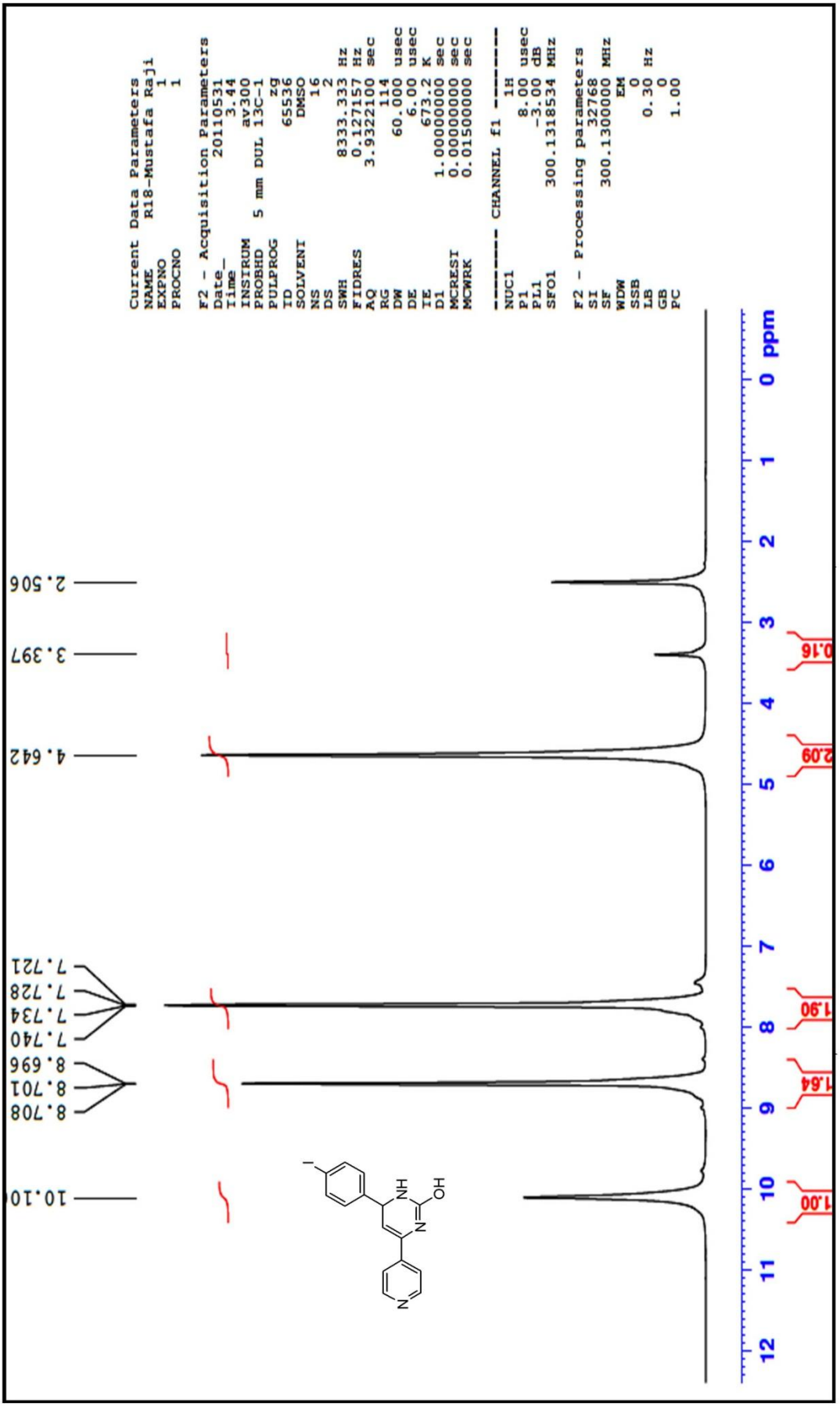

Fig (2) ^{1}H-N.M.R spectrum For compound (16)

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تحضير بعض مشتقات البيريميدين المشتقة من 4- استيايل بريدين

ريم سهيل نجم

كلية الطب البيطري ، جامعة تكريت ، تكريت ، العراق

الملخص

حضرت مركبات الجالكون (1 - 4) من تفاعل المركب 4- أستيايل بريدين مع ألديهايدات أروماتيه مختلفة لمعوضات البنزالديهايد بوجود محلول هيدروكسيد البوتاسيوم.

وتم تفاعل المركبات من (1-4) مع كل من الثايويوريا لتعطي المركبات (5- 8) , والكواندين لتعطي المركبات (9-12)، واليوريا لتعطي المركبات (13-16). بوجود KOH كقاعدة.

تم تشخيص المركبات المحضرة باستخدام جهاز قياس درجة الانصهار ومطيافية الاشعة تحت الحمراء ومطيافية الرنين النووي المغناطيسي للبروتون (^{1}H –NMR) لبعض المركبات.

الكلمات المفتاحية: الجالكون ، البيريميدين المشتقة، 4- استيايل بريدين.