P- ISSN 1991-8941 E-ISSN 2706-6703 *Journal of University of Anbar for Pure Science (JUAPS)* Open Access
2016,10 (3) :22-34

Preparation and Characterization of Derivatives of Pyrimidines in two ways Clascical and Microwave

Waleed F. AL-Hiti* Samea J.Khammase BushraT.Mahdi***

*University Of Anbar- College of Education for Women.
**Baghdad University - College of Science for Women

ARTICLE INFO

Received: 03 / 08 /2016
Accepted: 08 / 03 /2017
Available online: 27/12/2017
DOI: 10.37652/juaps.2016.135152

Keywords:
Preparation ,
Characterization ,
Derivatives ,
Pyrimidines ,
Clascical ,
Microwave.

ABSTRACT

This study includes synthesis and characterization of new pyrimidine derivatives (R or Ar-2,3,4,6,7,8-hexahydroquinazolin-5(1H)-one), via of the reaction from cyclohexane-1,3-dione with aldehyde derivatives and guanidinehydrochlorid. Usingabsolute ethanol as a solvent .This mixture was refluxed for (4 – 6) hrs;While maintaining the pH at 6. The same derivatives of pyrimidine were prepared in microwave waytechnique.The prepared compounds were characterized by melting point , FT-IR , UV-Vis ^{1}H-NMR and ^{13}C-NMR spectroscopy.

1. Introduction

Pyrimidineswere recognized in their antifungal [1,2] anticancer [3,4] and antimicrobial [5,7]. Pyrimidines are heterocycleorganic aromatic compounds[8]. The basic skeleton of a pyrimidine ring composed of two nitrogen in 1,3-position and carbonatoms.They are also named as diazines 1 and 3.[9]

The significant position of pyrimidine and its derivatives in organic chemistry is primarily related to their bio activity. Above of all, that's, the constitute of nucleic acids which are the base of life, three nitrogenous base (cytosine, thymine and uracil) are pyrimidine derivatives[10].The biodynamic property of pyrimidine ring structure has urged the medicinal chemists to synthesize such pyrimidine derivatives which can stimulate pharmacophores to utilize it for various pharmacological application.

* Corresponding author at: University Of Anbar- College of Education for Women
.E-mail address:

The core structure of pyrimidine helps them by offering certain reaction sites that can be used to reach further with different moieties[11,12].

The present research was designed to synthesize derivatives of pyrimidine compounds adopting conventional synthesis reported in literature and the microwave technique that is assisted synthesis[13]. Microwave assisted synthesis is acknowledged a major breakthroughsynthetic chemistry in recent years. This technique has overcome the certain backdraws associated with conventional routes i.e. long reaction time, lower yields ,purity and slow rate of reaction[14] .

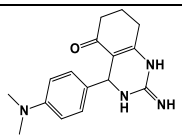
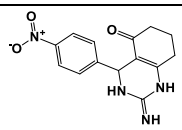
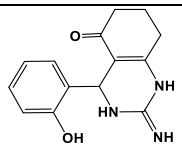
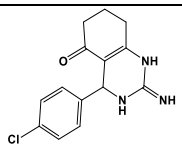
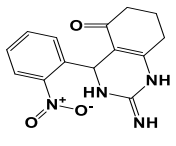
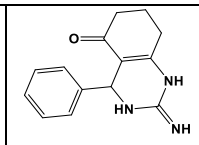
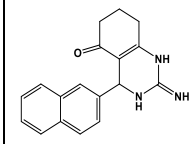
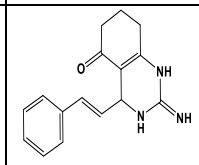
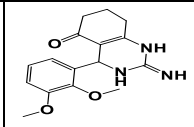
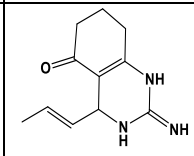
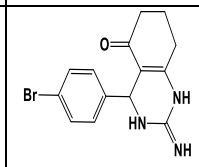
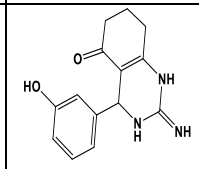
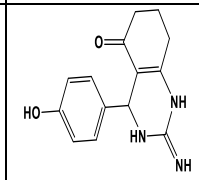
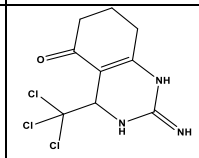
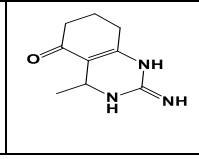
The use of microwave irradiation is the alternative heating technique in synthetic chemistry. Microwave synthesis provides more opportunities to organic chemists to expand their synthetic avenues by applying microwave irradiation to a variety of organic reactions with improved results[15,17].

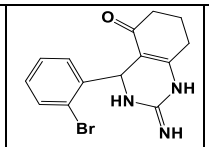
2. Material and Methods:

PreparationofPyrimidines Derivatives[18]

A series of pyrimidine derivatives were synthesizedby the reaction of cyclohexane-1,3-dione (3.36 g , 0.03mol) with aldehyde derivatives (0.025mole) and guanidinehydrochlorid (2.1 g , 0.022 mole) in ethanol absolute (100 ml). This mixture was refluxed for (4-6) hrs. at (90 C^{o}) few drops of hydrochlorid acid to keep pH at (6) the end of the reaction was checked by (T.L.C.). The sludge was filtered recrystallized from ethanol and preserved. All physical properties are listed in table (1).

Table [1]: Physical properties of compounds [C1 – C16] prepared by conventional method.

Comp. No	Structure of the compounds	Color	Yield%	M.P	Time of reaction	aldehydes' Weight (g)or(ml)
C1		orange	96	159-161	4h	3.05 g
C2		yellow	78	148-150	5h	3.78 g
C3		Light Brown	78	220-222	5h	3.05 g
C4		Light yellow	55	242-244	4h	3.5 g
C5		Light Brown	85	152-154	5h	3.78 g
C6		white	90	267-269	5h	2.5 ml
C7		Yellow-greenish	98	194-196	5h	3.6 ml
C8		Light yellow	56	136-138	6h	3.1 ml
C9		Browne	95	oily	6h	3.19 g
C10		Light Brown	85	oily	5h	2.07 ml
C11		dark Brown	80	oily	5h	4.63 g
C12		Light Brown	80	oily	4h	3.05 g
C13		Brown- reddish	60	146-148	6h	3.05 g
C14		Light yellow	48	oily	9h	2.62ml
C15		yellow	95	oily	4h	1.4 ml

C16		yellow	80	187-189	5h	2.92 ml

Microwave Assisted Synthesis of Pyrimidine Derivatives. (R or Ar -2,3,4,6,7,8-hexahydroquinazolin-5(1H)-one)

The same method used for conventional preparation was used to prepare the compound using the microwave technique except 10 ml of ethanol was added instead of 100 ml.The physicalproperties and the time of reactions for the compounds were listed in table[2].

Table [2]: Physical properties and time of compounds [C1 – C16]

Comp. No.	Nomenclature	Chemical formula	Time of reaction Min.	M. wt. (g/mol)
C1	4-(4-(dimethylamino)phenyl)-2-imino-2,3,4,6,7,8-hexahydroquinazolin-5(1H)-one	$C_{16}H_{20}N_3O$	0:05	284.36
C2	2-imino-4-(4-nitrophenyl)-2,3,4,6,7,8-hexahydroquinazolin-5(1H)-one	$C_{14}H_{14}N_4O_3$	0:38	286.29
C3	4-(2-hydroxyphenyl)-2-imino-2,3,4,6,7,8-hexahydroquinazolin-5(1H)-one	$C_{14}H_{15}N_3O_2$	0:10	257.29
C4	4-(4-chlorophenyl)-2-imino-2,3,4,6,7,8-hexahydroquinazolin-5(1H)-one	$C_{14}H_{14}ClN_3O$	0:13	275.74
C5	2-imino-4-(2-nitrophenyl)-2,3,4,6,7,8-hexahydroquinazolin-5(1H)-one	$C_{14}H_{14}N_3O$	0:31	286.29
C6	2-imino-4-phenyl-2,3,4,6,7,8-hexahydroquinazolin-5(1H)-one	$C_{14}H_{15}N_3O$	0:51	241.29
C7	2-imino-4-(naphthalen-2-yl)-2,3,4,6,7,8-hexahydroquinazolin-5(1H)-one	$C_{18}H_{17}N_3O$	0:09	291.35
C8	(E)-2-imino-4-styryl-2,3,4,6,7,8-hexahydroquinazolin-5(1H)-one	$C_{16}H_{17}N_3O$	0:13	267.33
C9	4-(2,3-dimethoxyphenyl)-2-imino-2,3,4,6,7,8-hexahydroquinazolin-5(1H)-one	$C_{16}H_{19}N_3O_3$	0:12	301.35
C10	(E)-2-imino-4-(prop-1-en-1-yl)-2,3,4,6,7,8-hexahydroquinazolin-5(1H)-one	$C_{11}H_{15}N_3O$	0:11	203.26
C11	4-(4-bromophenyl)-2-imino-2,3,4,6,7,8-hexahydroquinazolin-5(1H)-one	$C_{14}H_{14}BrN_3O$	0:33	320.19
C12	4-(3-hydroxyphenyl)-2-imino-2,3,4,6,7,8-hexahydroquinazolin-5(1H)-one	$C_{14}H_{15}N_3O_2$	0:11	257.29
C13	4-(4-hydroxyphenyl)-2-imino-2,3,4,6,7,8-hexahydroquinazolin-5(1H)-one	$C_{14}H_{15}N_3O_2$	0:10	257.29
C14	2-imino-4-(trichloromethyl)-2,3,4,6,7,8-hexahydroquinazolin-5(1H)-one	$C_9H_{10}Cl_3N_3O$	2:00	282.55
C15	2-imino-4-methyl-2,3,4,6,7,8-hexahydroquinazolin-5(1H)-one	$C_9H_{13}N_3O$	2:00	179.22
C16	4-(2-bromophenyl)-2-imino-2,3,4,6,7,8-hexahydroquinazolin-5(1H)-one	$C_{14}H_{14}BrN_3O$	0:16	320.19

3. Results and Discussions :

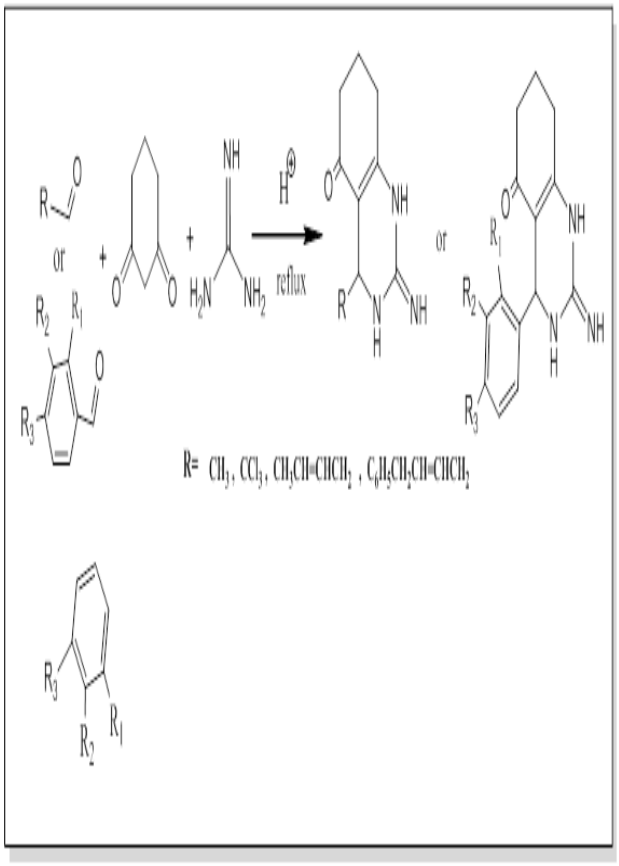
The compounds [C1-C16]were prepared by the reaction of cyclohexane-1,3-dione; different aldehydes

and guanidinehydrochlorid in the presence of HCl and absolute ethanol , as show in schem(1).

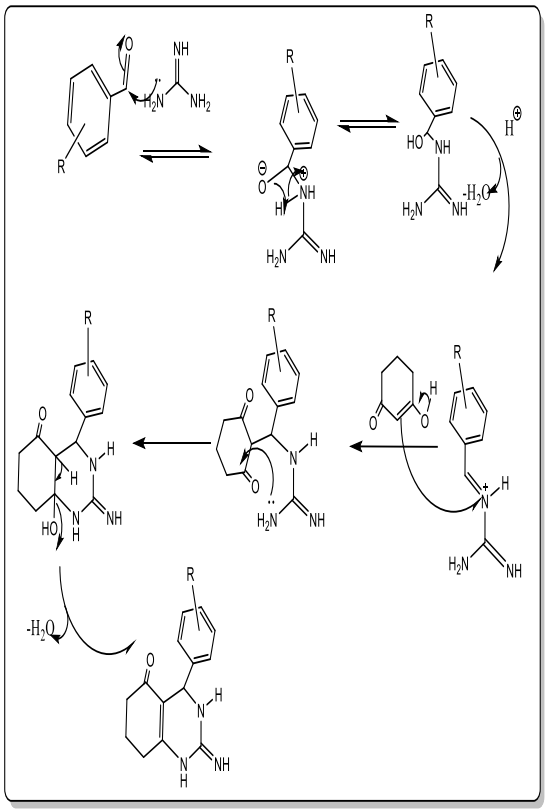
The mechanism involves nucleophilc attack of amino group of guanidine hydrochlorid on carbonyl group of banzaldehyde followed by elimination of water molecule. as shown in the following scheme(2)

The structure of compound was identified by FT-IR , ^{1}H-NMR , ^{13}C-NMR and U.V spectrum .The FT-IR spectrum of compound [C2] Fig(1), table [2] shows appearing of stretching vibration of (NH) group of amine at(3306) cm^{-1} and increasing frequency of (C=O) to(1708) cm^{-1}, also spectrum shows other bands (3034) cm^{-1} for aromatic (C-H) , also spectrum shows anther band at (2954) cm^{-1} for aliphatic (C-H) ; band at (1517,1454,1421) cm^{-1} due to aromatic (C=C); bands at (1620) cm^{-1} for stretching vibration of (NO_2) group , and bands at (1388) cm^{-1} for stretching vibration of (C-N) group. In compound [C14] ,Fig (2) , C-Cl_3 note three bands (798, 754, 700) because found Neighboring group for C-Cl , appearing of stretching vibration of (NH) group of amine at (3303-3400) cm^{-1} because found deferent Neighboring group.

R_1	H	H	H	H	NO_2	H	OCH_3	H	H	H	Br
R_2	H	H	OH	H	H	H	OCH_3	H	OH	H	H
R_3	$N(CH_3)_2$	NO_2	H	Cl	H	H	H	Br	H	OH	H



Scheme (1).Preparation of pyrimidine derivatives.



Scheme (2) mechanism for the preparation of pyrimidine derivatives

Table (3): FT-IR spectral data of compound [C1_C16]

Com. Code	C1	C2	C3	C4	C5	C6	C7
vs N-H Amine	3400	3306	3380	3306	3354	3302	3300
vs C-H Aromatic	3099	3034	3100	3053	3090	3030	3044
vs C-H Alinbatic	2958	2954	2951	2954	2897	2949	2947
vs C=O	1664	1708	1720	1660	1700	1675	1678
vs C=N	1604	1620	1610	1616	1600	1600	1622
vs C=C Arom.	1550,1519,1478	1517,1454,1421	1579,1560,1485	1489,1450,1417	1550,1521,1458	1492,1489,1421	1495,1454,1425
Others	C-N.. 1124,1168	NO_2.. 1388	OH…3414	C-Cl..768	NO_2…1593	C-N..1117	C-N..1130

C8	C9	C10	C11	C12	C13	C14	C15	C16
3330	3396	3300	3340	3320	3307	3365	3340	3350
3028	3099	----	3010	3020	3010	----	-----	3010
2945	2970	2890	2974	2998	2964	2960	2980	2960
1675	1675	1699	1668	1698	1700	1708	1675	1662
1600	1600	1635	1600	1658	1660	1664	1650	1610
1577,1492,1452	1516,1458,1429	----------	1550,1539,1456	1581,1517,1485	1589,1516,1450	-------	--------	1550,1469,1429
C-N..1110	C-0 1160,1134	C-N..1120	C-Br..775	C-OH—3420	C-OH..3425	C-Cl.. 798,754 ,700	C-N ..1116	C-Br…742

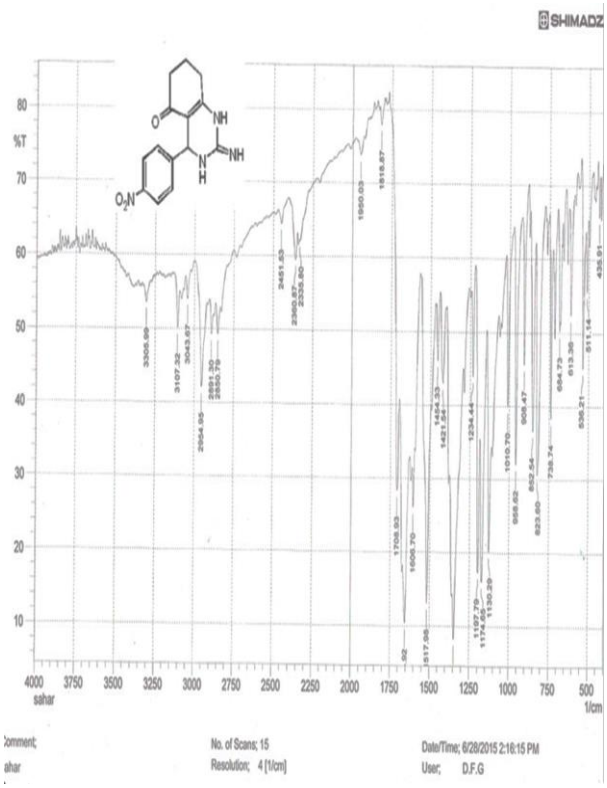


Fig (1): FT-IR spectrum for compound (C2)

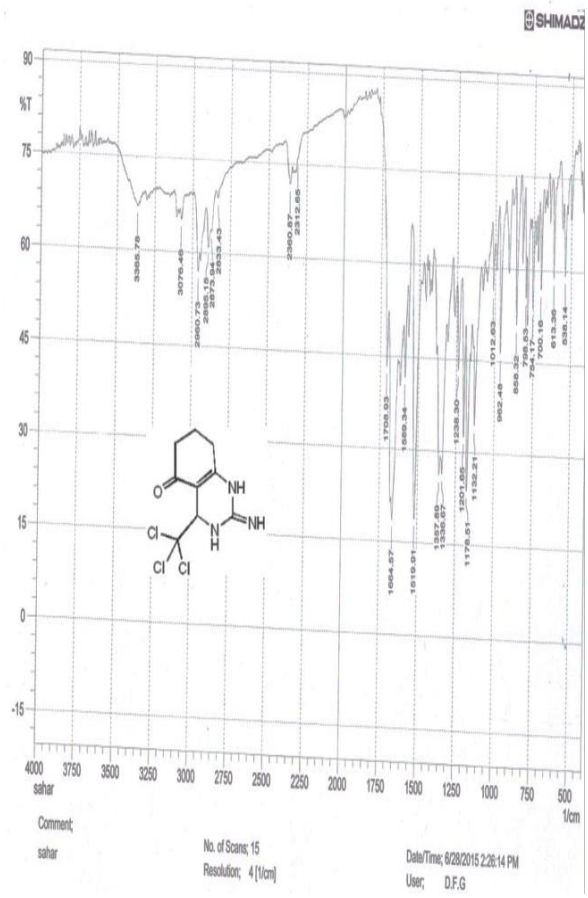
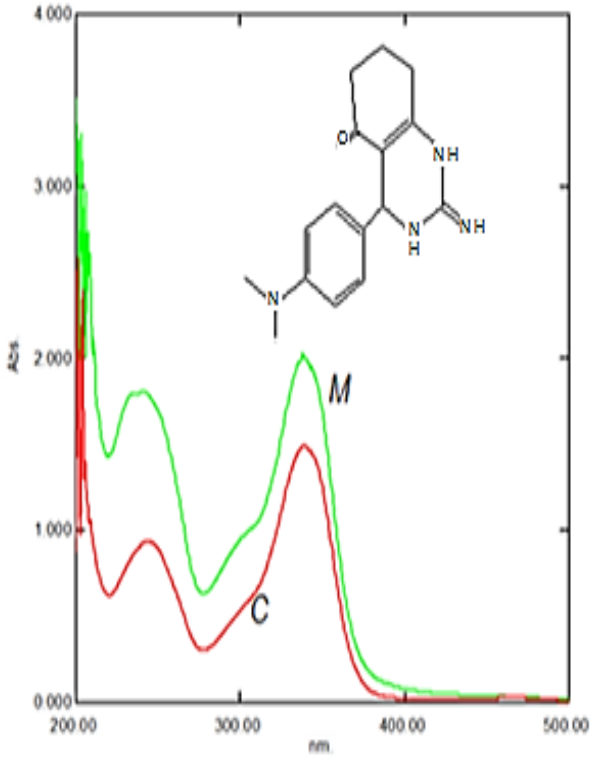


Fig (2): FT-IR spectrum for compound (C14)

By measuring the U.V visible of the compounds prepared by biginelli reaction and microwave method.



Shown fig (3), and (4).

Fig (3) spectrum for compound (C1)M– microwave C – classical

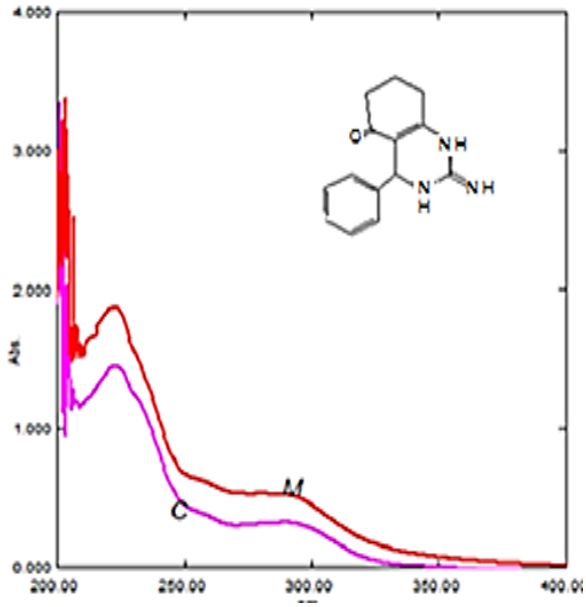


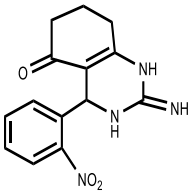
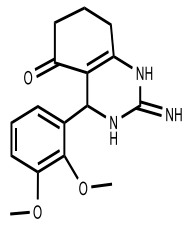
Fig (4) U.V –Visible spectrum for compound (C6) M – microwave C – classical

We noticed that there is matching between these peaks which mean that this method is good, for the preparation but with a little differences

4.Characterization of compounds [C1-C16] by (^{13}C-NMR) for the conventional and microwave methods

The ^{13}C- NMR spectrum for compound (C5) , Fig. (5a), table [4] shows chemical shift at δ=19.0 ppm assigned to ($CH_2\underline{C}H_2CH_2$). Signal related to ($CH_2CH_2\underline{C}H_2$) was detected at δ=26.47ppm. Signal related to ($CH_2C\underline{H}_2C$=O) was detected at δ=39.01 ppm , Chemical shifts at δ= 41.87 ppm assigned to (HC-N-C) . Signal related (C=NH) was detected at δ=158.13 ppm respectively. Chemical shifts at δ= 127.2- 148.59 ppm attributed to the aromatic ring (C-Ar.). Chemical shift at δ=196.0 ppm assigned to (C=O). The solvent residual signal at δ=40.13 ppm is due to DMSO.(^{13}C-NMR) data for compounds synthesized by both conventional and microwave as shown in fig (5 b),fig (6a)fig (6 b).

Table [4]; ^{13}C-NMR spectral data of compound (C5,C9)

Comp.No.	Compound Structure	^{13}C-NMR Spectral data(δ ppm) M.	^{13}C-NMR Spectral data (δ ppm) C.
C5		δ=20.0 ($CH_2\underline{C}H_2CH_2$) δ=26.49 ($CH_2CH_2\underline{C}H_2$) , δ=36.34($CH_2C\underline{H}_2C$=O) , δ=41.8 (N-CH-C), δ= 127.29-149.15 (C-Ar) , δ=149.06 (C=NH) , δ=159.70 (C=C-NH) , δ=196.1 (C=O)	δ=19.0 ($CH_2\underline{C}H_2CH_2$) δ=26.47 ($CH_2CH_2\underline{C}H_2$) , δ=39.01 ($CH_2C\underline{H}_2C$=O) , δ=41.87 (H C-N-C) , δ= 127.2- 148.5 (C-Ar) , δ=158.13 (C=NH), δ=159.19 (C=C-NH), δ=196.0 (C=O)
C9		δ=20.0 ($CH_2\underline{C}H_2CH_2$), δ=28.00 ($CH_2CH_2\underline{C}H_2$), δ=36.41 ($CH_2C\underline{H}_2C$=O) , δ=41.76 (HC-N-C) , δ=55.35-55.39(.H_3C-O), δ= 119.95-148.38 (C-Ar), δ=157.85 (C=NH)	δ=20.0 ($CH_2\underline{C}H_2CH_2$), δ=30.00 ($CH_2CH_2\underline{C}H_2$), δ=36.41 ($CH_2C\underline{H}_2C$=O) , δ=41.68 (HC-N-C) , δ=55.33-55.58(.H_3C-O), δ= 113.95-148.87 (C-Ar), δ=157.86 (C=NH)

P- ISSN 1991-8941 E-ISSN 2706-6703 *Journal of University of Anbar for Pure Science (JUAPS)* Open Access
2016,10 (3) :22-34

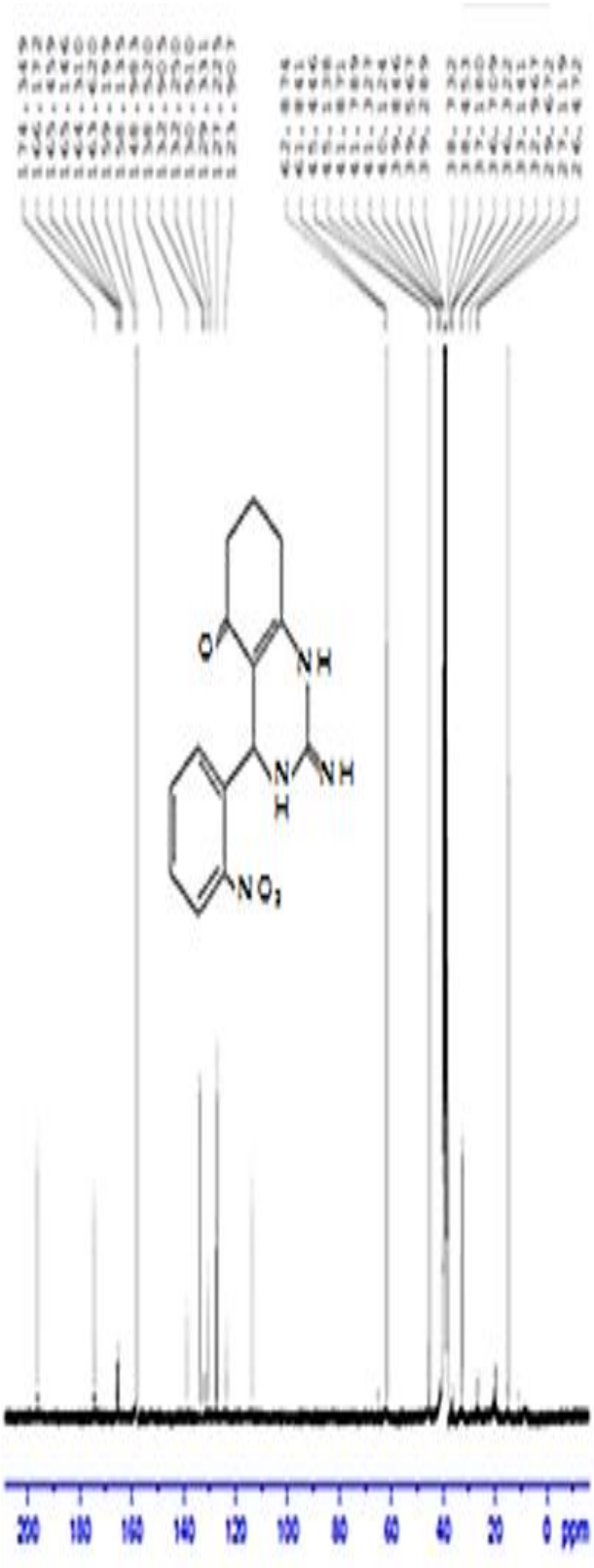


fig.(5a) ; ^{13}C-NMR spectrum for compound(C5) conventional way

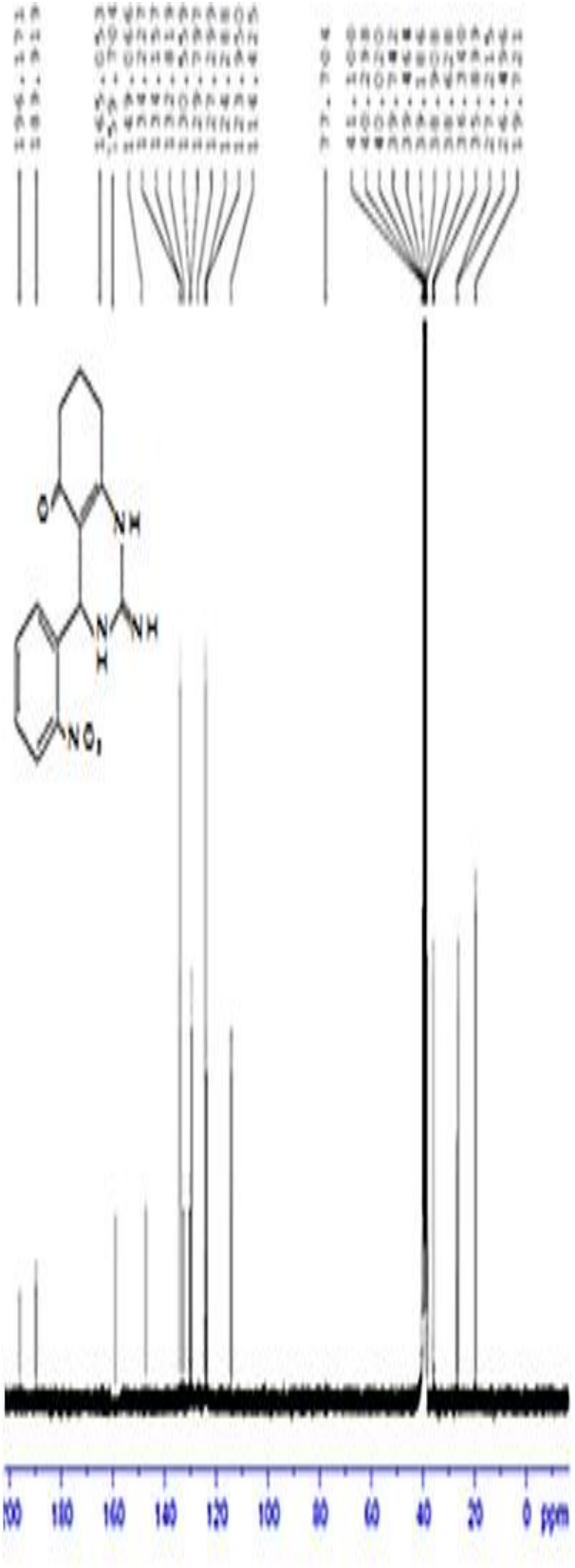


fig.(5b) ; ^{13}C-NMR spectrum for (C5) microwaveway compound

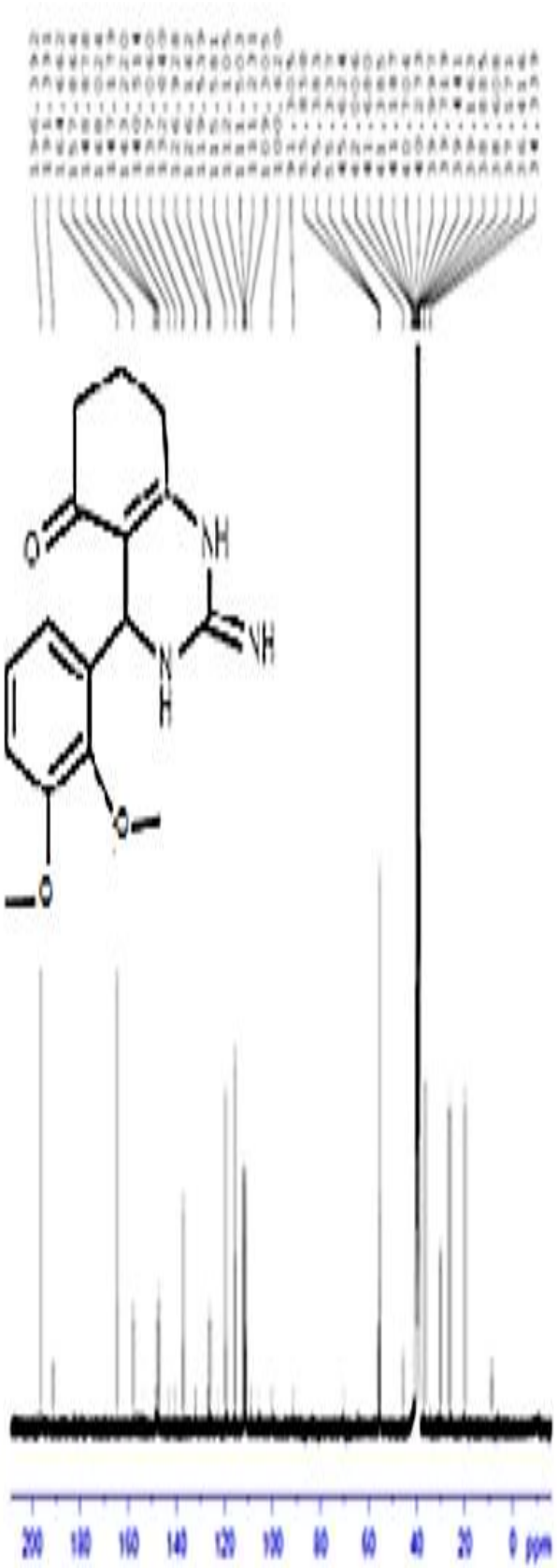


fig.(6a) ; 13C-NMR spectrum for compound (C5) conventional way

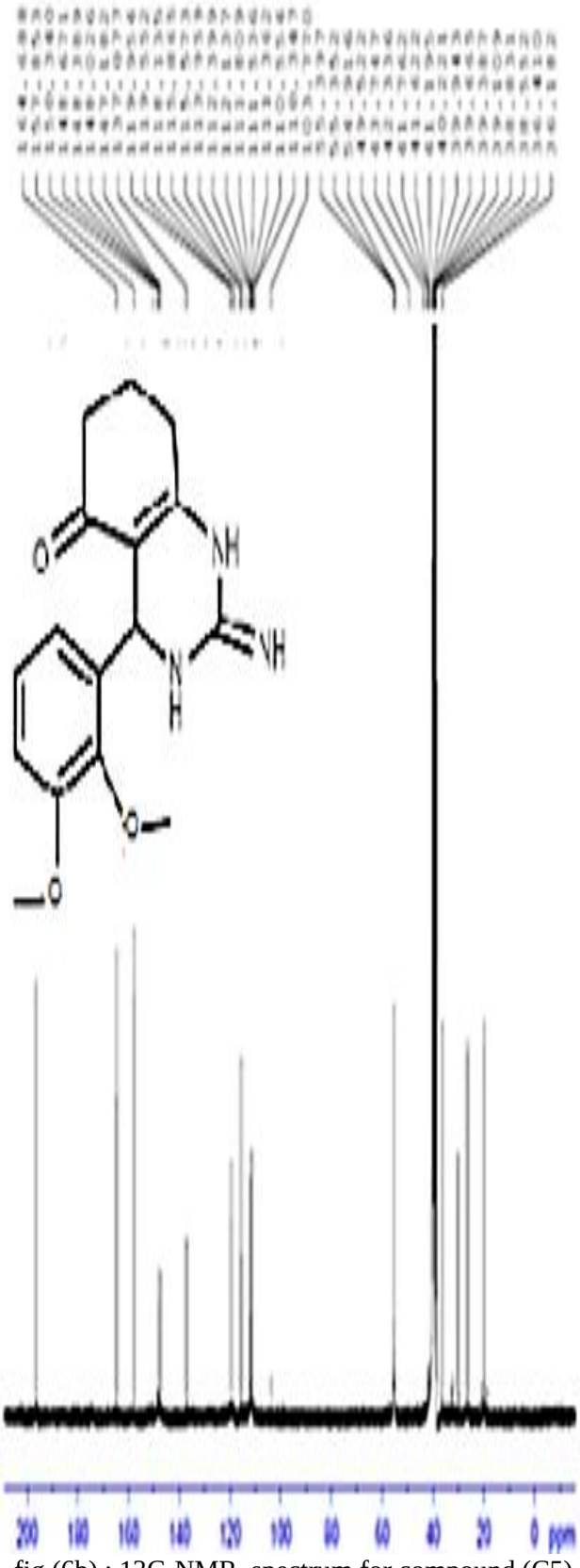
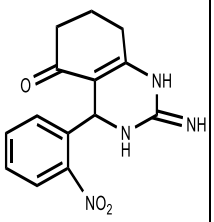
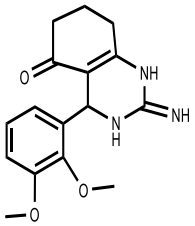


fig.(6b) ; 13C-NMR spectrum for compound (C5) microwave way

5.Characterization of compounds [C1-C16] by (^{1}H-NMR) for the conventional and microwave methods

The ^{1}H NMR spectrum for compound (C5) , Fig. (7a), shows chemical shift at δ=1.4 ppm which assigned to (q,2H,$CH_2\underline{CH_2}CH_2$), signal at δ=1.9 ppm equivalent to protons have been assigned to (t,2H,$\underline{CH_2}CH_2CH_2$) proton. Chemical shift at δ=3.0 ppm which assigned to(s,2H,$\underline{CH_2}CO$) , signal at δ=3.17ppm equivalent to protons have been assigned to (t,1H,NH$\underline{CH}CH_2$) proton .Chemical shift at δ=7.9-8.16ppm assigned to aromatic para- ring substitution protons (m,4H,H-Ar) protons . Chemical shift at δ=7.78ppm equivalent to One protons has been assigned to (s,1H,C=NH) protons . This peak is appeared as expected downfield (from TMS chemical shift) .The solvent residual signal at δ=2.5 ppm is due to DMSO ,as shown table [5].^{1}H-NMR data for compounds synthesized by both conventional and microwave, as shown in fig (7b) , fig (8a),fig (8b).

Table [5]: ^{1}H-NMR spectral data of compound (C5, C9)

Comp. No.	Compound Structure	^{1}H-NMR Spectral data (δ ppm) M.	^{1}H-NMR Spectral data (δ ppm) C.
C5		δ=1.4(q,2H,$CH_2\underline{CH_2}CH_2$), δ=1.9(t,2H,$\underline{CH_2}CH_2CH_2$), δ=3.0(s,2H,$\underline{CH_2}CO$), δ=3.17(s,2H,$\underline{HC}$-N-C), δ=7.9-8.16(m,4H,Ar), δ=7.78(s,1H,C=$\underline{NH}$), δ=10.5 (s,1H,C=C-$\underline{NH}$)	δ=1.4(q,2H,$CH_2\underline{CH_2}CH_2$), δ=2.1(t,2H,$\underline{CH_2}CH_2CH_2$-), δ=3.1(s,2H,$\underline{CH_2}CO$), δ=3.9(s,2H,$\underline{HC}$-N-C), δ=7.51-7.93(m,4H,Ar), δ=7.85(s,1H,C=$\underline{NH}$), δ=10.5 (s,1H,C=C-$\underline{NH}$)
C9		δ=1.3(q,2H,$CH_2\underline{CH_2}CH_2$), δ=1.8(t,2H,$\underline{CH_2}CH_2CH_2$), δ=3.8(s,3H,H_3C-O), δ=4.58(s,1H,H_3C-$\underline{NH}$-C), δ=6.82-6.93.(m,3H,$\underline{H}$-Ar), δ=7.2(s,1H,C=$\underline{NH}$), δ=10.1(s,1H,C-$\underline{NH}$-C)	δ=1.2(q,2H,$CH_2\underline{CH_2}CH_2$), δ=2.0(t,2H,$\underline{CH_2}CH_2CH_2$), δ=3.82(s,3H,H_3C-O), δ=3.86(s,3H,$\underline{H_3C}$-N-C), δ=4.53(s,1H,H_3C-$\underline{NH}$-C), δ=6.91-6.96(m,3H,$\underline{H}$-Ar), δ=7.57-8.64(s,1H,C=$\underline{NH}$),δ=9.87 (C-$\underline{NH}$-C)

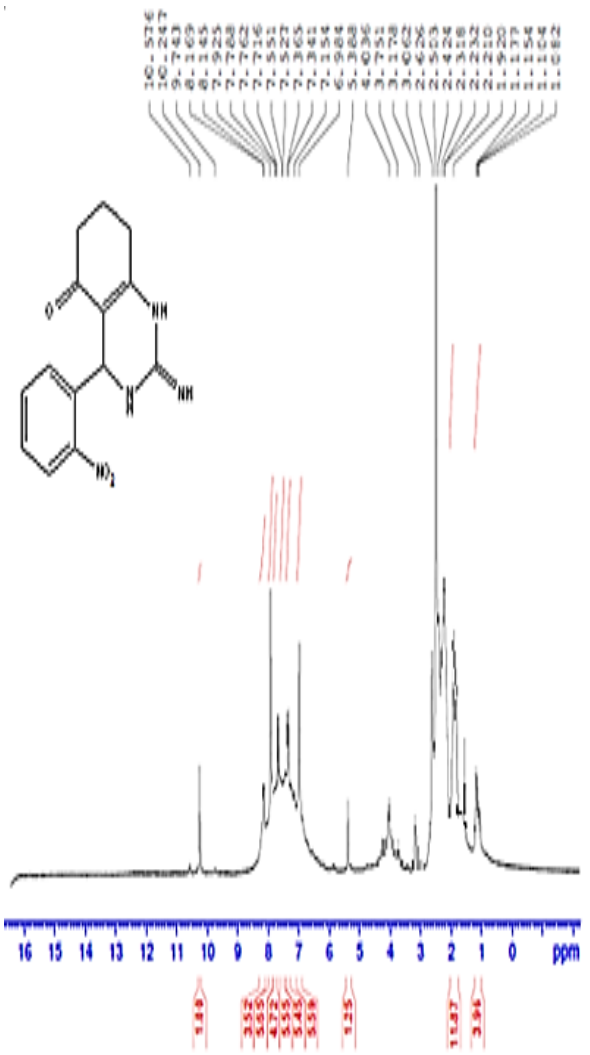


fig.(7a) ; ^{1}H-NMR spectrum for compound (C5) conventional way

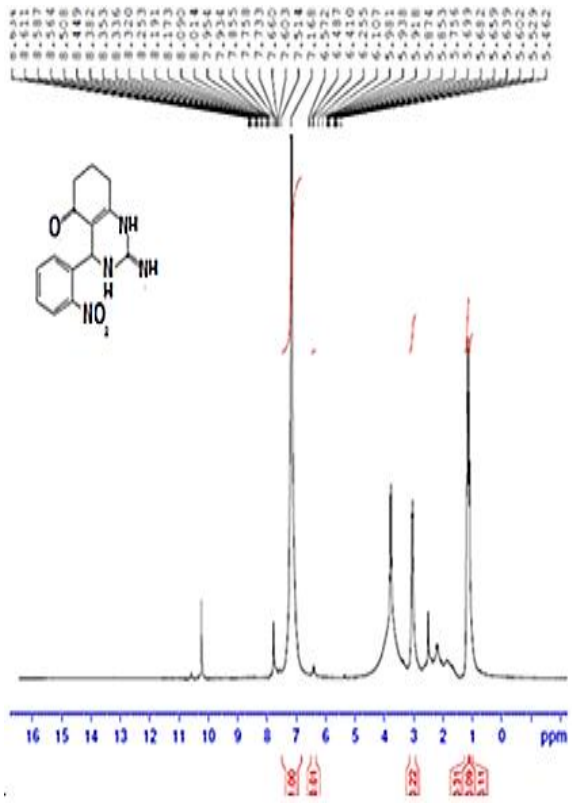


fig.(7b) ; ^{1}H-NMR spectrum for compound (C5) microwave way

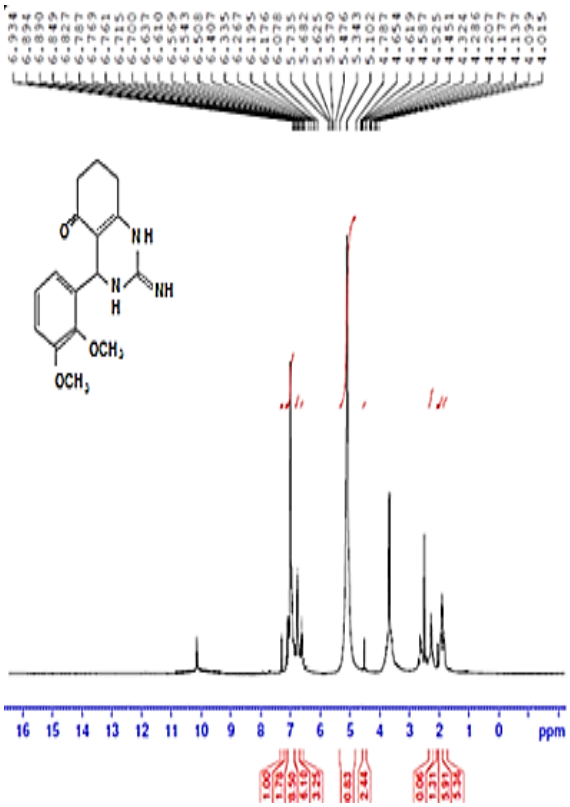


fig.(8b) ; ^{1}H-NMR spectrum for compound (C9) microwave way

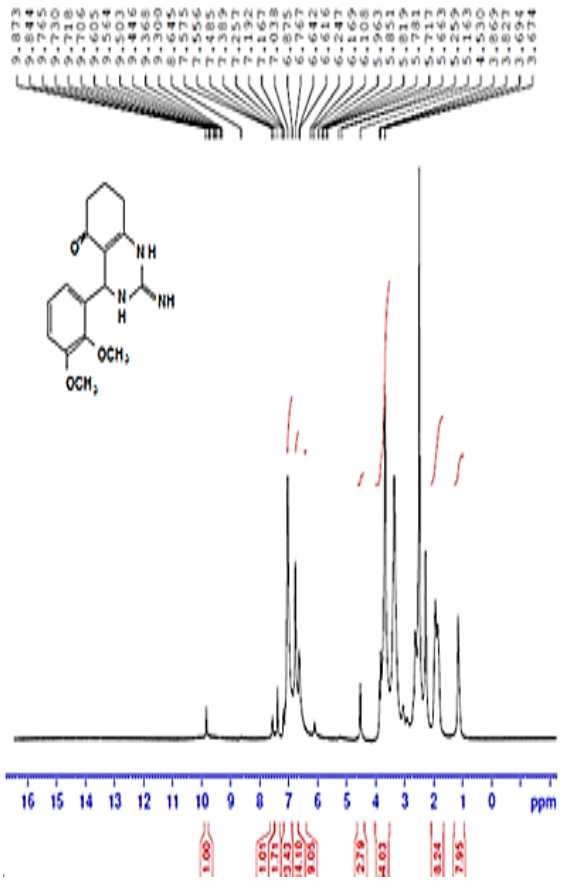


fig.(8a) ; ^{1}H-NMR spectrum for compound (C9) conventional way

References:-

1- Anjos, J.V.D., Srivastava, R.M., Costa-Silva, J.H., Scotti, L., Scotti, M.T., Wanderley, A.G., Leite, E.S., Melo, S.J.D. and Junior, F.J., (2012). "Comparative Computational Studies of 3, 4-Dihydro-2, 6-diaryl-4-oxo-pyrimidine-5-carbonitrile Derivatives as Potential Antinociceptive Agents". Molecules, 17(1), pp.809-819.

2- Saladino, R., Ciambecchini, U., Maga, G., Mastromarino, P., Conti, C. and Botta, M., (2002). "A new and efficient synthesis of substituted 6-[(2′-Dialkylamino) ethyl] pyrimidine and 4-N, N-Dialkyl-6-vinyl-cytosine derivatives and evaluation of their anti-Rubella activity". Bioorganic & medicinal chemistry, 10(7), pp.2143-2153.

3- Zhao, X.L., Zhao, Y.F., Guo, S.C., Song, H.S., Wang, D. and Gong, P., (2007). "Synthesis and anti-

tumor activities of novel [1, 2, 4] triazolo [1, 5-a] pyrimidines". Molecules, 12(5), pp.1136-1146.

4- Cordeu, L., Cubedo, E., Bandrés, E., Rebollo, A., Sáenz, X., Chozas, H., Domínguez, M.V., Echeverría, M., Mendivil, B., Sanmartin, C. and Palop, J.A., (2007). "Biological profile of new apoptotic agents based on 2, 4-pyrido [2, 3-d] pyrimidine derivatives". Bioorganic & medicinal chemistry, 15(4), pp.1659-1669.

5- Sharma, P., Rane, N. and Gurram, V.K., (2004). "Synthesis and QSAR studies of pyrimido [4, 5-d] pyrimidine-2, 5-dione derivatives as potential antimicrobial agents". Bioorganic & medicinal chemistry letters, 14(16), pp.4185-4190.

6- Anjos, J.V.D., Srivastava, R.M., Costa-Silva, J.H., Scotti, L., Scotti, M.T., Wanderley, A.G., Leite, E.S., Melo, S.J.D. and Junior, F.J., (2012). "Comparative Computational Studies of 3, 4-Dihydro-2, 6-diaryl-4-oxo-pyrimidine-5-carbonitrile Derivatives as "Pharm., 27(2),pp.343-373.

7- 7- White, D.C., Greenwood, T.D., Downey, A.L., Bloomquist, J.R. and Wolfe, J.F., (2004). "Synthesis and anticonvulsant evaluation of some new 2-substituted-3-arylpyrido [2, 3-d] pyrimidinones". Bioorganic & medicinal chemistry, 12(21), pp.5711-5717.

8- Yamaguchi, M., Wakasugi, K., Saito, R., Adachi, Y., Yoshikawa, Y., Sakurai, H. and Katoh, A.,(2006). "Syntheses of vanadyl and zinc (II) complexes of 1-hydroxy-4, 5, 6-substituted 2 (1H)-pyrimidinones and their insulin–mimetic activities". Journal of inorganic biochemistry, 100(2), pp.260-269.

9- Elkholy, Y.M. and Morsy, M.A., (2006). "Facile synthesis of 5, 6, 7, 8-tetrahydropyrimido [4, 5-b]-quinoline derivatives". Molecules, 11(11), pp.890-903.

10- Holla, B.S., Mahalinga, M., Karthikeyan, M.S., Akberali, P.M. and Shetty, N.S., 2006. "Synthesis of some novel pyrazolo [3, 4-d] pyrimidine derivatives as potential antimicrobial agents". Bioorganic & medicinal chemistry, 14(6), pp.2040-2047.

11- Ingarsal, N., Saravanan, G., Amutha, P. and Nagarajan, S., (2007). "Synthesis, in vitro antibacterial and antifungal evaluations of 2-amino-4-(1-naphthyl)-6-arylpyrimidines". European journal of medicinal chemistry, 42(4), pp.517-520.

12- Sharma, P., Rane, N. and Gurram, V.K., (2004). "Synthesis and QSAR studies of pyrimido [4, 5-d] pyrimidine-2, 5-dione derivatives as potential antimicrobial agents". Bioorganic & medicinal chemistry letters, 14(16), pp.4185-4190.

13- Kandil, S.S., Katib, S.M. and Yarkandi, N.H., (2007). "Nickel (II), palladium (II) and platinum (II) complexes of N-allyl-N′-pyrimidin-2-ylthiourea". Transition Metal Chemistry, 32(6), pp.791-798.

14- Elkholy, Y.M. and Morsy, M.A., (2006). "Facile synthesis of 5, 6, 7, 8-tetrahydropyrimido [4, 5-b]-quinoline derivatives". Molecules, 11(11), pp.890-903.

15- Xavier, A.L., Simas, A.M., Falcão, E.P.D.S. and dos Anjos, J.V., (2013). "Antinociceptive pyrimidine derivatives: aqueous multicomponent microwave assisted synthesis". Tetrahedron Letters, 54(26), pp.3462-3465.

16- Ehsan, S., (2015). "Conventional & Microwave-Assisted Synthesis and Antimicrobial Evaluation of Pyrimidine Azo Compounds". International Journal of Science and Research, 3(12), pp.368-373.

17- Xavier, A.L., Simas, A.M., Falcão, E.P.D.S. and dos Anjos, J.V., (2013). "Antinociceptive pyrimidine derivatives: aqueous multicomponent microwave

assisted synthesis". Tetrahedron Letters, 54(26), pp.3462-3465.

18- Srivastava, V., (2013). "An Improved protocol for biginelli reaction". Green Sustainable Chemistry, 34(22), pp.38-40.

19- Matloobi, M. and Kappe, C.O., (2007). "Microwave-assisted solution-and solid-phase synthesis of 2-amino-4-arylpyrimidine derivatives". Journal of combinatorial chemistry, 9 (2), pp. 275-284.

تحضير وتشخيص مشتقات البريميدنات بطريقتي الكلاسيكية والمايكروويف

وليد فرج حمادي سميعة جمعة خماس بشرى تركي مهدي

الخلاصة

اشتمل هذا البحث تحضير وتشخيص بعض مشتقات البريميدين (الكيل أو اريل –8,7,6,4,3,2–سداسي هايدوركوينوزولين5–(1H) –اون) عبر تفاعل هكسان الحلقي– 3,1,– داي اون مع الديهايداتمعوضة و الكواندينهيدروكلورايد. أستخدام الايثانول المطلق كمذيب ويستمر تصعيد التفاعل من (4–6)ساعة.مع المحافظة على الدالة الحامضيةالهيدروجيني عند pH 6. حضرت البريمدينات السابقة ايضاً بطريقة المايكرويف وتم تشخيص المركبات المحضرة بقياس درجة انصهار والاشعة تحت الحمراء والاشعة فوق البنفسجية وأطياف الرنين النووي المغناطيسي لنوى الهيدروجين (^{1}H–NMR)والرنين النووي المغناطيسي لذرة الكاربون 13 (^{13}C–NMR).