2024, 21(12 Suppl.): 3947-3960
https://doi.org/10.21123/bsj.2024.8657
P-ISSN: 2078-8665 - E-ISSN: 2411-7986
Baghdad Science Journal

# Preparation, Characterization, of Some Oxadiazol Derivatives Prepared from Different Carboxylic Acids

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Received 30/03/2023, Revised 02/10/2024, Accepted 04/10/2024, Published Online First 20/06/2024, Published 22/12/2024



## Abstract

A series of Mefenamic acid derivatives were designed and synthesized and the products were characterized spectroscopically using FT-IR, 1H NMR, and 13C NMR techniques. Series A included the transformation of six drugs (Mefenamic acid, Ampiciline, Noproxen, Benzilic acid, Diclofenac acid, and cephics) which are known to have highly medicinal effectiveness to acid chloride then react with thiosemicarbazide to synthesize series B. In the third stage, oxadiazole was prepared using POCl3 as a ring-closing agent to compounds (B1-B6). The final step in the strategy was building new Mefenamic acid derivatives consisting of condensation of the Mefenamic acid chloride with the compounds (C1-C6) to give new compounds (D1-D6).

**Keywords**: Derivatives, Drugs, Mefenamic acid, Ring-closing, Synthesis oxadiazole.

## Introduction

Mefenamic acid (MEF), which was first sold in the 1960s, is still one of the most often prescribed and reasonably priced non-steroidal anti-inflammatory (NSAIDs) medications in use today [1,2], the mechanism of action of NSAIDs, such as diclofenac, ibuprofen, and Mefenamic acid, aided in the development of more NSAIDs[3]. Additionally, Mefenamic acid is developed as a new class of cancer chemopreventive therapies, together with other anti-inflammatory medications [4-6]. However, NSAID-related adverse effects, particularly in the renal and gastrointestinal tract, frequently restrict its use. Because of this, significant attempts have been made to boost their activity while reducing negative effects [7]. Mefenamic acid, an anthralinic acid derivative, is comparable to the NSAIDs tolfenamic and flufenamic acid [8]. MFA has been clinically used to relieve pain brought on by musculoskeletal problems and primary dysmenorrhea [9,10], antioxidant, bactericidal, and fungicidal activity, anti-viral and used as an antipyretic, especially in pediatric cases [11-14]. Currently, Mefenamic acid is used as an efficient catalyst [15]. 1,3,4-oxadiazoles were important for the development of heterocyclic chemistry theory and are exceedingly used in organic synthesis [16]. Oxadiazole molecules have numerous properties that are useful in a variety of industries. These compounds have a broad range of biological activity, allowing them to be used as active agents in medicine and pharmacology, such as anti-inflammatory and analgesic agents. Because of their potential biological activity, these compounds are also used in agriculture as herbicides, insecticides, and plant protection agents against viruses, fungi, and bacteria[17]. In this paper, we synthesized and characterized new derivatives by making a combination of six drugs, the aim is to gain access to novel active biomolecules that may have potent antimicrobial activity.

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https://doi.org/10.21123/bsj.2024.8657
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## Materials and Methods

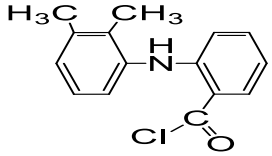
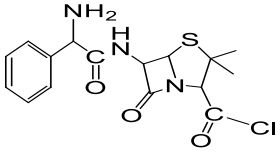
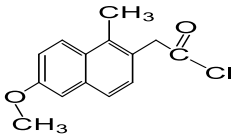
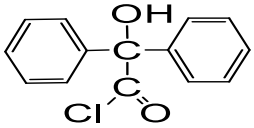
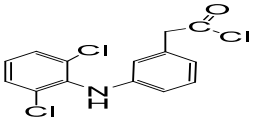
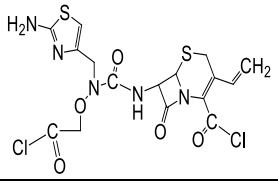
### Materials and Physical Measurements:

All starting materials and solvents were obtained from Fluka and Sigma-Aldrich, and utilized without additional purification. Uncorrected measurements of the melting point were made using the Gallen Kamp melting point instrument. In the University of Al-Albyat in Jordan, 1HNMR and 13C-NMR spectra were recorded on a Bruker specrospin Ultra shield 300 MHZ instrument with (tetramethyl silane, TMS) as an internal standard and (DMSO-d6) as a solvent. Shimadzu FT-IR 8400 Fourier Transformer infrared spectra were recorded as KBr disk.

### Synthesis of Compounds(A1-A6) [18]

Carboxylic drugs (Mefenamic acid, Ampiciline, Noproxen, Benzilic acid, Diclofenic acid, cephics) (0.01mol) were dissolved in the smallest possible amount of $CHCl_3$, newly distilled thionyl chloride (0.01mol) was gently added to it. The mixture was refluxed at 60-70°C for 15 hours using a magnetic stirrer to continuously stir. The sticky liquid was quickly put into a petri dish and vacuum dried, yielding yellow crude Mefenamic acid chloride. The structural formula, physical data, and molecular formula of thecompounds are illustrated in Table .1.

**Table 1. Physical Characteristic of compounds (A1-A6).**

| Comp. No. | Structure | Chemical Formula | Molecular Weight | Color | M. P. °C | Yield % |
|---|---|---|---|---|---|---|
| A1 |  | $C_{15}H_{14}ClNO$ | 259.73 | Brown | 110-112 | 75% |
| A2 |  | $C_{16}H_{18}ClN_3O_3S$ | 367.85 | Yellow | Oily | 60% |
| A3 |  | $C_{14}H_{13}ClO_2$ | 248.70 | Light Yellow | 135-138 | 64% |
| A4 |  | $C_{14}H_{11}ClO_2$ | 246.69 | Brown | Oily | 55% |
| A 5 |  | $C_{14}H_{10}Cl_3NO$ | 314.59 | Brown | 105-106 | 45% |
| A6 |  | $C_{16}H_{15}Cl_2N_5O_5S_2$ | 492.36 | Dark Read | Oily | 55% |

### Synthesis of Compounds(B1-B6) [19]

Anhydrous sodium carbonate (0.005mol) and carbon disulfide were added to thiosemicarbazide (0.005mol), and compounds (A1-A6) (0.005mol) were suspended in anhydrous ethanol (20 ml). For 1 hour, the mixture was warmed by stirring under reflux. Next, it was heated for 4 hours in a steam bath. The solvent was mostly removed, and the residue was then dissolved in water (15 ml) and slightly acidified with concentrated hydrochloric acid to yield the product. The structural formula, physical data, and molecular formula of the compounds are shown in Table 2.

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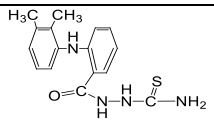
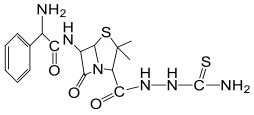
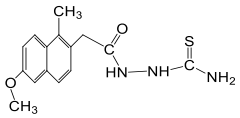
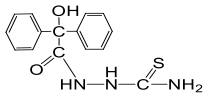
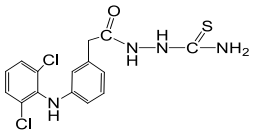
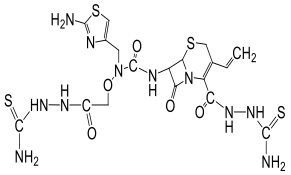
https://doi.org/10.21123/bsj.2024.8657
P-ISSN: 2078-8665 - E-ISSN: 2411-7986
Baghdad Science Journal

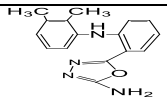
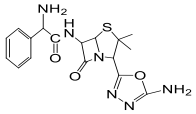
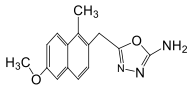
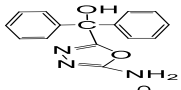
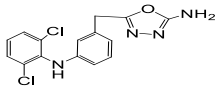
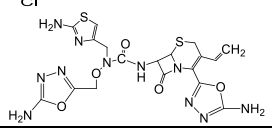
**Table 2. Physical Characteristic of compounds (B1-B6).**

| Comp. No. | Structure | Chemical Formula | Molecular Weight | Color | M. P. °C | Yield % |
|---|---|---|---|---|---|---|
| B1 |  | $C_{16}H_{18}N_4OS$ | 314.41 | Light Brown | Oily | 60% |
| B2 |  | $C_{17}H_{22}N_6O_3S_2$ | 422.52 | Dark Yellow | 196-198 | 70% |
| B3 |  | $C_{15}H_{17}N_3O_2S$ | 303.38 | Dark Brown | Oily | 50% |
| B4 |  | $C_{15}H_{15}N_3O_2S$ | 301.36 | White | 188-190 | 80% |
| B5 |  | $C_{15}H_{14}Cl_2N_4OS$ | 369.27 | Redish Brown | Oily | 65% |
| B6 |  | $C_{18}H_{23}N_{11}O_5S_4$ | 601.71 | Yellowish Brown | 105-106 | 58% |

**Synthesis of Compounds [C1-C6]** [20]

Synthesis of compounds C1-C6 was conducted by using $POCl_3$(0.001mol) which was added drop wise to an ice-stirred solution of compound [B1-B6] (0.001mol) in dry DMF (15 ml), and the mixture was allowed to be at room temperature and then heated at 80 C for (4 hours), using a water bath, the mixture was then poured onto ice water, neutralized with dilute sodium hydroxide, and allowed to stand for 24 hours before recrystallization with ethyl acetate. The structural formula, physical data, and molecular formula of the compounds are exhibited in Table 3.

**Table 3. Physical Characteristic of compounds (C1-C6).**

| Comp. No. | Structure | Chemical Formula | Molecular Weight | Color | M. P. °C | Yield % |
|---|---|---|---|---|---|---|
| C1 |  | $C_{18}H_{18}N_2O$ | 278.35 | Light Brown | Oily | 40% |
| C2 |  | $C_{19}H_{22}N_4O_3S$ | 386.47 | Brown | Oily | 70% |
| C3 |  | $C_{17}H_{17}NO_2$ | 267.32 | Dark Brown | Oily | 60% |
| C4 |  | $C_{17}H_{15}NO_2$ | 265.31 | Dark Brown | Oily | 45% |
| C5 |  | $C_{17}H_{14}Cl_2N_2O$ | 333.21 | Redish Brown | Oily | 30% |
| C6 |  | $C_{22}H_{23}N_7O_5S_2$ | 529.59 | Dark Brown | Oily | 78% |

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https://doi.org/10.21123/bsj.2024.8657
P-ISSN: 2078-8665 - E-ISSN: 2411-7986
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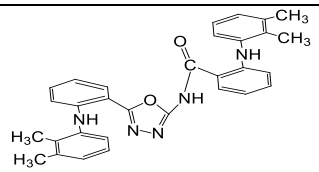
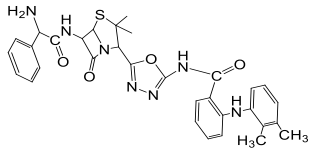
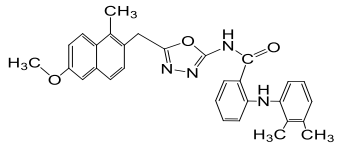
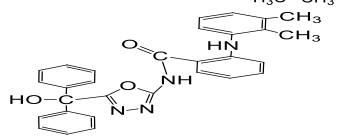
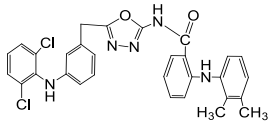
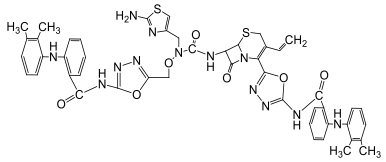
**Synthesis of Compounds [D1-D6]** [21]

To a stirred solution of an acid chloride (0.001 mol in THF (15 mL) at 0 °C, trimethylamine (0.001 mol,) and a primary amine (0.001 mol,) were added. The resultant mixture was allowed to warm to rt. over 2 hours. After adding 8 mL of water, the mixture was stirred until the product precipitated. To obtain pure amide, the precipitate was filtered and washed with water. Table 4, shows the structural formula, physical data, and molecular formula of the compounds (D1-D6 ) .

**Table 4. physical Characteristic of compounds (D1-D6).**

| Comp. No. | Structure | Chemical Formula | Molecular Weight | Color | M. P. °C | Yield % |
|---|---|---|---|---|---|---|
| D1 |  | $C_{33}H_{31}N_3O_2$ | 501.62 | Redish Brown | Oily | 40% |
| D2 |  | $C_{34}H_{35}N_5O_4S$ | 609.74 | Dark Yellow | Oily | 35% |
| D3 |  | $C_{32}H_30N_2O_3$ | 490.59 | Lead | 235-238 | 70% |
| D4 |  | $C_{32}H_{28}N_2O_3$ | 488.58 | Light Brown | Oily | 65% |
| D5 |  | $C_{32}H_{27}Cl_2N_3O_2$ | 556.48 | Light Orange | Oily | 65% |
| D6 |  | $C_{52}H_{49}N_9O_7S_2$ | 976.13 | Brown | Oily | 40% |

## Results and discussion

Six drugs were combined to create new Mefenamic acid derivatives. These compounds are used as a starting material to design new drugs system. These derivatives are synthesized via reaction with different carboxylic drugs (Mefenamic acid, Ampiciline, Noproxen, Benzilic acid, Diclofenic acid, cephics) respectively, the proposed structures of the compounds were confirmed on the basis of spectroscopic data (IR, $^1$H NMR, and $^{13}$C NMR). The first step included preparing six new compounds (A1-A6) prepared from the reaction of different carboxylic drugs with thionyl chloride in chloroform according to Scheme 1.

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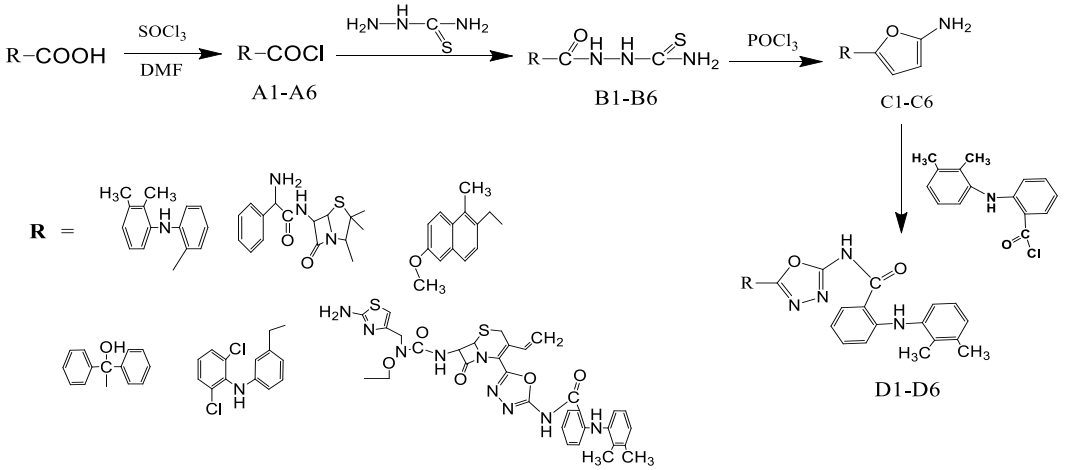
https://doi.org/10.21123/bsj.2024.8657
P-ISSN: 2078-8665 - E-ISSN: 2411-7986
Baghdad Science Journal




**Scheme 1. Synthesis of all compounds**

FTIR spectra of the prepared derivatives [A1-A6] showed the disappearance of υ(C=O) of acid absorption bands indicating the success of the reaction and the acid chloride formation. The spectra showed clear absorption bands due to [υ (C-H aromatic), υ (C=O), υ (N-H)] appeared about at [(3001-3085)$cm^{-1}$, (1650-1757)$cm^{-1}$ and (3282-3323)$cm^{-1}$] respectively, others bands are listed in Table 5 and shown in Fig. 1,2 .$^{1}$H-NMR spectrum of compound [A3] showed signals at δ1.23 ppm of (s, 3H, $CH_3$), δ 2.09 ppm of (s, 3H, $CH_3$),,δ 4.23ppm of (s, 1H, NH), δ 6.69-8.78ppm of (m, 7H, ArH) as listed in Table 9 and shown in Fig. 7,8,9, while $^{13}$C-NMR spectrum in δ (ppm) of compound (A4),Table 10, exhibited the signals for carbon (C=O ) in 178 and twelve aromatic carbon appeared at 118-139 ppm.

**Table 5. FT-IR Spectral data of synthesized compounds (A1-A6) in $cm^{-1}$**

| Comp. No. | υN-H | υC-H Aromatic | υC-H Aliphatic | υC=O of acid | υC=C aromatic | υC-N | Others |
|---|---|---|---|---|---|---|---|
| A1 | 3313 | 3066 | 2975, 2862 | 1650 | 1575,1448 | 1328 | …….. |
| A2 | 3323 | 3042 | 2970,2840 | 1743 | 1572,1440 | 1338 | $NH_2$ 4115,3342 C=O lactam 1679 |
| A3 | …… | 3001 | 2974, 2939 | 1728 | 1604, 1485 | 1394 | C-O 1228, 1159 |
| A4 | …… | 3045 | 2957, 2845 | 1752 | 1583 | 1384 | υ OH 3412 |
| A 5 | 3323 | 3085 | 2953,2885 | 1731 | 1593,1456 | 1396 | C-Cl 1084 |
| A6 | 3282 | 3047 | 2979,2939 | 1749 | 1573 | 1332 | $NH_2$ 3407, 3350 C=O lactam 1677 C=N 1627 |

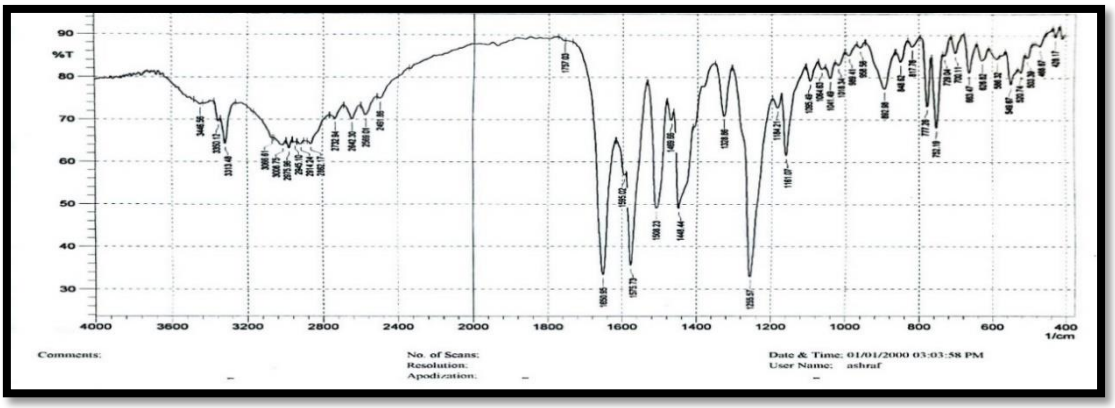



**Figure 1. FTIR spectrum for compound (A1)**

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https://doi.org/10.21123/bsj.2024.8657
P-ISSN: 2078-8665 - E-ISSN: 2411-7986
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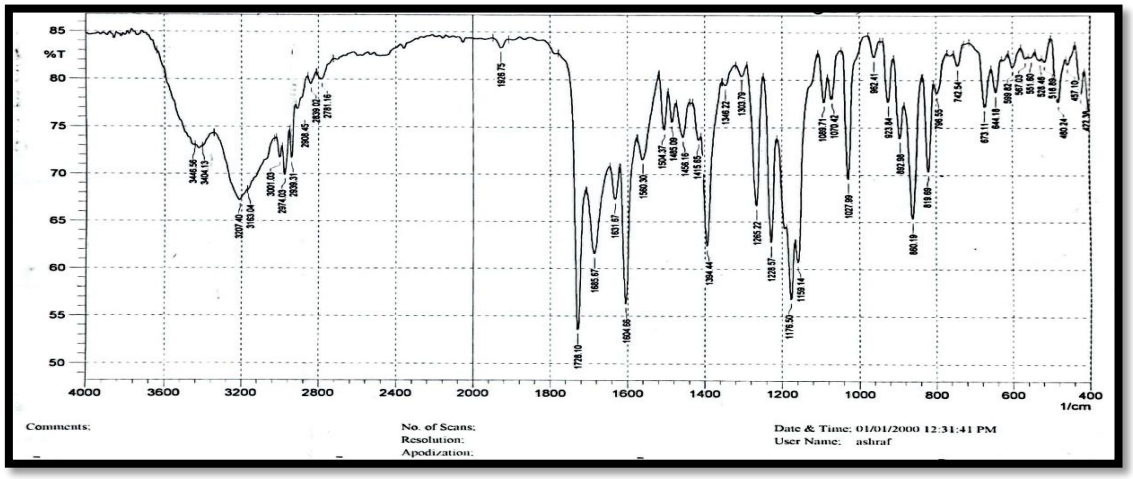


**Figure 2. FTIR spectrum for compound (A3)**

The second step in this strategy involved a reaction between acyl chloride and thiosemicarbazide which underwent (nucleophilic addition-elimination) mechanism by attacking amine from the thiosemicarbazide group on carbonyl group in acyl chloride; then followed by leaving the chloride ion to form the acyl thiosemicarbazide [19]. Spectral data for this set of compounds indicates the synthesis of the amide group, and the FT-IR spectra of compounds (B1-B6) confirm the synthesis of amide by the presence of N-H absorption in the region of 3456-3340 $cm^{-1}$. Moreover, ν(C=O) shifted from the acid chloride region 1775 and 1728 $cm^{-1}$ to the amide carbonyl region 1643-1635 $cm^{-1}$, these results agreed with the data presented in the literature [22,23]. Other bands are listed in Table 6 and Fig. 3,4. $^1$H-NMR spectrum of compound [B3] showed signals at δ1.44 ppm of (s, 3H, $CH_3$), δ 2.72 ppm of (s, 3H, $CH_3$-O), δ 4.23ppm of (s, 1H, NH), δ 5.43ppm of (s, 2H, $NH_2$), δ 8.47ppm of (1H, s, NH-C=S), δ 8.57ppm of (1H, s, NH-C=O) , δ 7.07-7.72 ppm of (m, 5H, ArH), in Fig. 10, while $^{13}$C NMR in δ (ppm) spectrum proved the synthesis of compound (B3) by the presence of (C=S) in 157 ppm, (C=O ) in 175 ppm, and ten aromatic carbon appeared at 118-136 ppm, Fig. 11. The NMR spectrum of other compounds is displayed in Table 9 and Table 10. A new series of substituted Oxadiazole was prepared in this part by the cyclization reaction of compounds (B1-B6) using $POCl_3$ as a ring-closing agent. The general reaction was shown in Scheme 1. The FT-IR spectra of compounds (C1-C6) confirm the synthesis of Oxadiazole ring by the disappearance of (C=O) absorption and the presence of (C-O-C Oxadiazole) absorption in the region of (1124,1114-1062,1037 $cm^{-1}$). Other bands are listed in Table 7 and Fig. 5. $^1$H-NMR spectrum of compound [C3] showed signals at δ1.85 ppm of (s, 3H, $CH_3$), δ 3.45 ppm of (s, 2H, $CH_2$), δ 3.12ppm of (s, 3H, CH3-O), δ 5.34ppm of (s, 2H, $NH_2$), δ 7.10-7.89 ppm of (m, 5H, ArH). $^{13}$C-NMR spectrum in δ (ppm) of compound (C1) exhibited the signals for carbon Oxadiazole in 162.-168 ppm, and aromatic carbon appeared at 115-141 ppm, other bands are listed in the Table 10.

**Table 6. FT-IR Spectral data of synthesized compounds (B1-B6) in $cm^{-1}$**

| Comp. No. | υN-H | υNH₂ | υC-H Aromatic | υC-H Aliphatic | υC=O of amide | υC=C aromatic | υC-N | Others |
|---|---|---|---|---|---|---|---|---|
| B1 | 3456 | 3340,3305 | 3012 | 2848,2823 | 1640 | 1546 | 1361 | |
| B2 | 3367 | 3263,3179 | 3005 | 2982,2880 | 1643 | 1600,1492 | 1345 | C=O lactam 1670 |
| B3 | 3452 | 3350,3302 | 3140,3012 | 2920,2868 | 1635 | 1597,1496 | 1361 | C-O 1215,1130 |
| B4 | 3340 | 3305, 3159 | 3012 | 2980,2846 | 1640 | 1548,1496 | 1391 | O-H 3448 |
| B5 | 3435 | 3385, 3302 | 3107 | 2935,2845 | 1635 | 1548 | 1365 | C-Cl 1120 |
| B6 | 3433 | 3340, 32 | 3012 | 2930,2845 | 1641 | 1554 | 1387 | C=O lactam 1678 C=N 1627 |

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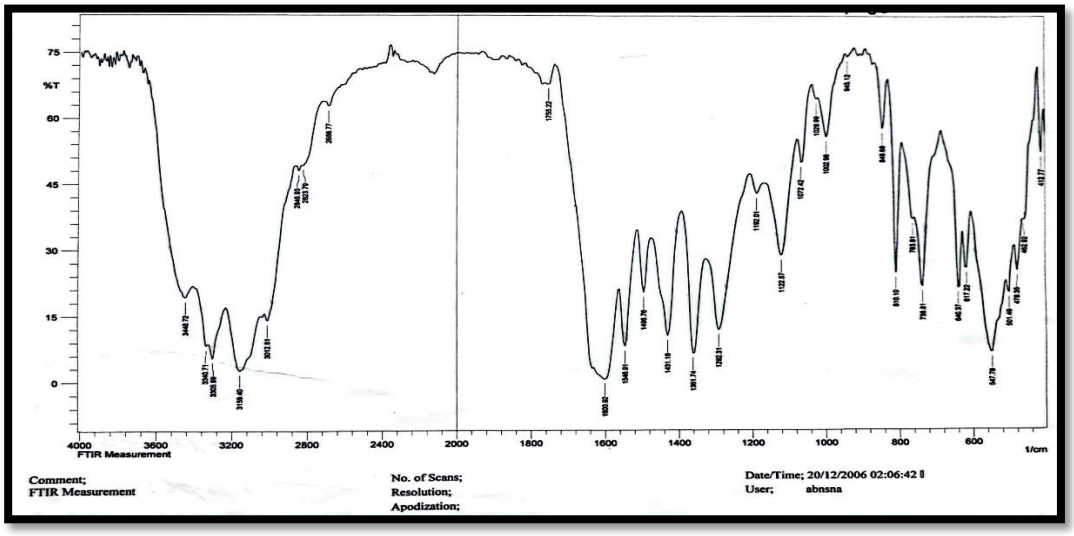


**Figure 3. FTIR spectrum for compound (B4)**

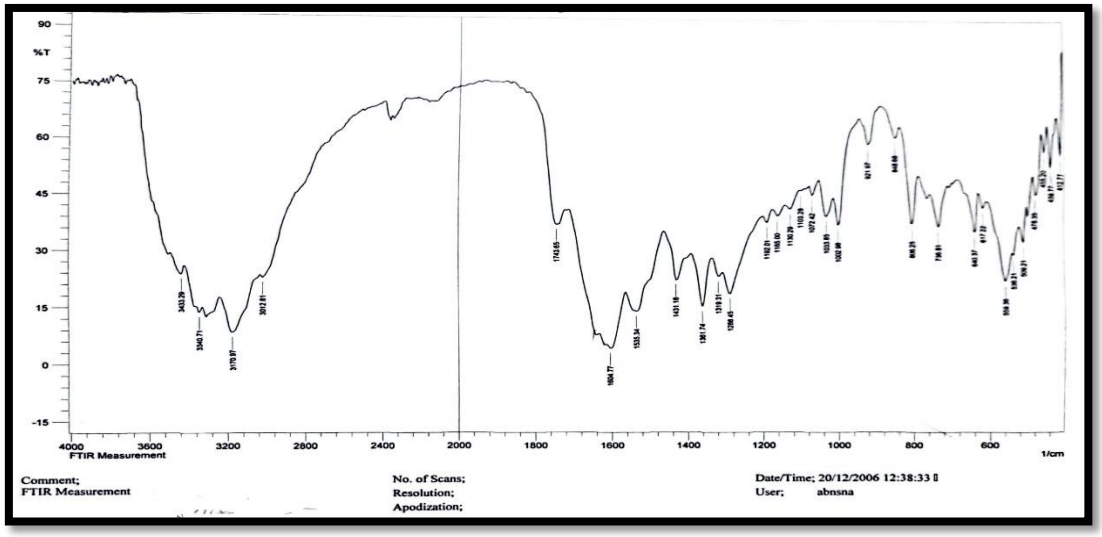


**Figure 4. FTIR spectrum for compound(B6)**

**Table 7. FT-IR Spectral data of synthesized compounds (C1-C6) in $cm^{-1}$**

| Comp. No. | υN- H | υNH2 | υC-H Aromatic | υC-H Aliphatic | υC=N | υC=C aromatic | C-O-C Oxadiazol | Others |
|---|---|---|---|---|---|---|---|---|
| C1 | 3431 | 3281, 3198 | 3002 | 2975,2842 | 1637 | 1558 | 1118,1037 | …... |
| C2 | 3433 | 3404,3259 | 3010 | 2977,2891 | 1635 | 1573 | 1114,1056 | C=O lactam 1676 |
| C3 | …... | 3421,3369 | 3004 | 2995,2892 | 1629 | 1568 | 1122 | …… |
| C4 | …… | 3377, 3211 | 3008 | 2990, 28 | 1633 | 1568 | 1124, 1062 | υ O-H, 3438 |
| C5 | 3433 | 3310,3191 | 3012 | 2935,2887 | 1633 | 1575 | 1118 | υ C-Cl, 1108 |
| C6 | 3436 | 3415,3259 | 3001 | 2978,2890 | 1631 | 1575 | 1118,1060 | υ C=O lactam 1697 |

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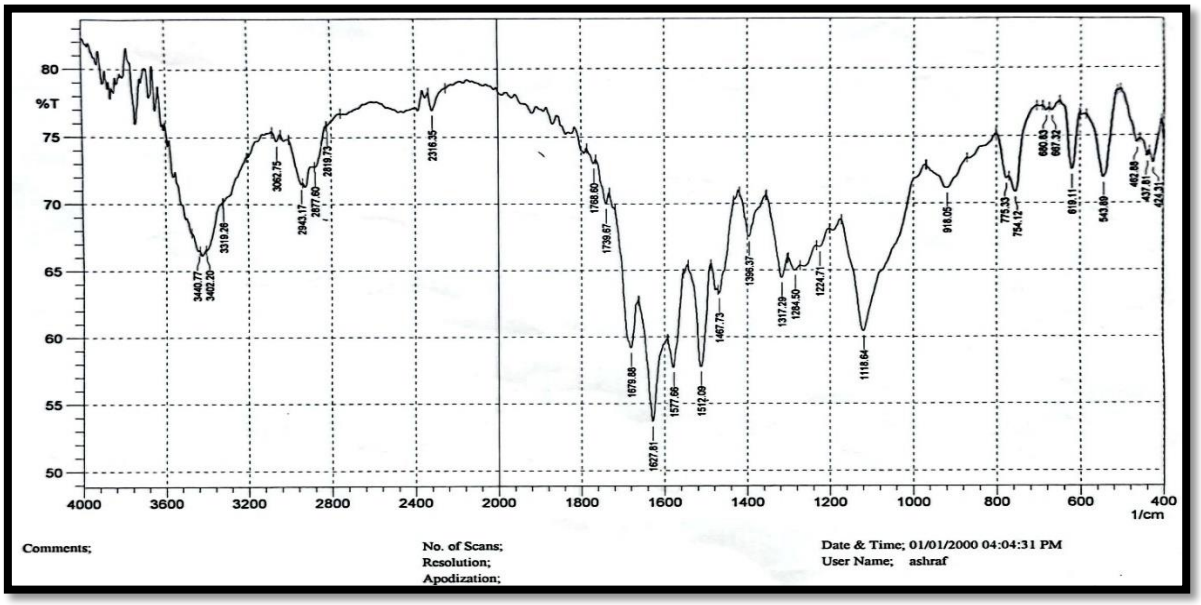


**Figure 5. FTIR spectrum for compound (C4)**

**Table 8. FT-IR Spectral data of synthesized compounds (D1-D6) in $cm^{-1}$**

| Comp. No. | υN-H | υC-H Aromatic | υC-H Aliphatic | υ C=O | υC=C aromatic | C-O-C Oxadiazol | Others |
|---|---|---|---|---|---|---|---|
| D1 | 3396 | 3072 | 2941, 2870 | 1681 | 1577, 1473 | 1120 | ……. |
| D2 | 3286 | 3060 | 2923,2881 | 1679 | 1577,1465 | 1108,1046 | υ $NH_2$, 3367,3309<br>υ C=O $_{lactam,}$ 1724 |
| D3 | 3236 | 3058 | 2920,2889 | 1674 | 1573,1473 | 1118 | …… |
| D4 | 3218 | 3072 | 2947, 2872 | 1679 | 1573, 1512 | 1089 | υ O-H, 3422 |
| D5 | 3402 | 3062 | 2943, 2877 | 1679 | 1577, 1512 | 1118 | C-Cl<br>overlap with(C-O-C) |
| D6 | 3278 | 3037 | 2943,2879 | 1676 | 1579,1473 | 1116 | υ $NH_2$, 3409 , 3355<br>C=O $_{lactam}$1720 |

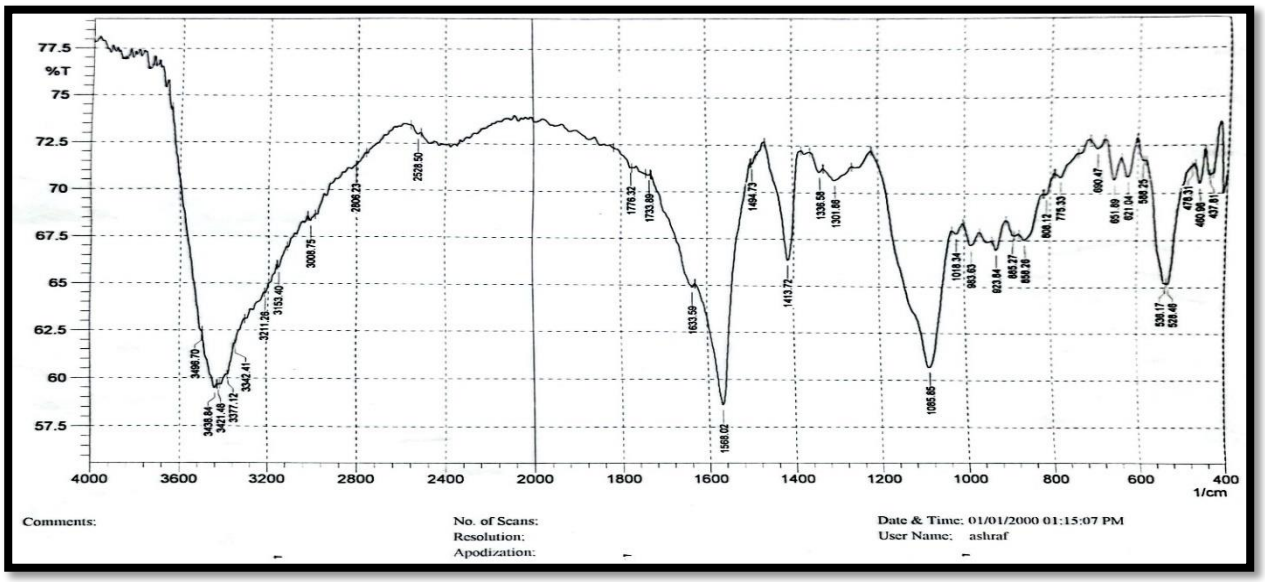


**Figure 6. FTIR spectrum for compound (D5)**

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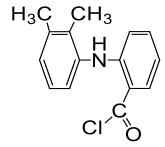
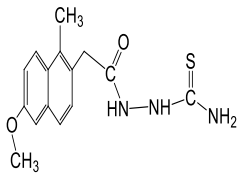
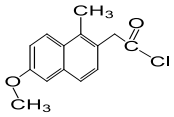
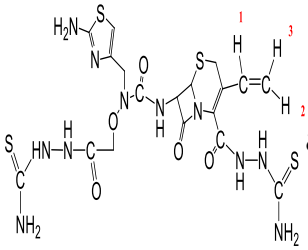
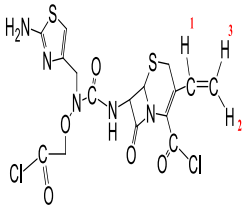
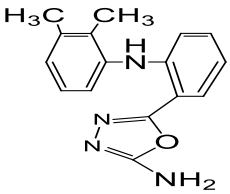
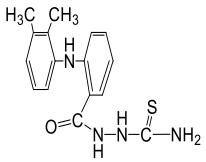
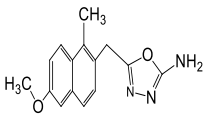
**Table 9. $^1$H-NMR data for some compounds in ppm.**

| Comp. No. | Compound structure | $^1$H-NMR data in ppm | Comp. No. | Compound structure | $^1$H-NMR data in ppm |
|---|---|---|---|---|---|
| A1 |  | δ1.23(s, 3H, $CH_3$), δ2. 09 (s, 3H, $CH_3$), δ 4.23 (s, 1H, NH) δ 6.69-8.78(m, 7H, ArH), | B3 |  | δ1.44(s, 3H, $CH_3$), δ2.72(s, 3H, $CH_3$-O), δ3.38(s, 2H, $CH_2$), δ 5.43(s, 2H, $NH_2$, δ8.47 (1H, s, NH-C=S), δ 8.57 (1H, s, NH-C=O) , δ 7.07-7.72(m, 5H, ArH), |
| A3 |  | δ1.45(s, 3H, $CH_3$), δ2.40 (s, 3H, $CH_3$-O), δ 3.81 (s, 2H, $CH_2$) δ 7.13-7.81(m, 5H, ArH), | B6 |  | δ 1.24-1.31(m, 2H, $CH_2$-S), δ 3.11 (s, 2H, $CH_2$-N), δ 3.32(s, 2H, $CH_2$ –C=O), δ 4.22(s, 1H, CH-C=O), δ 4.40(s, 1H, CH-N), δ 4.20 ( dd, 1H, H-2), 4.49(dd, 1H, H-3), δ 7.18(dd, 1H, H-1), δ δ 7.25(s, CH-S), δ 7.54(s, 1H, $NH_2$ – C=S), δ 7.59 (s, 1H, $NH_2$) δ 8.62 (s, 1H, NH-C=S) δ 9.62 (s, 1H, NH-C=O) |
| A6 |  | δ 1.33-1.75(m, 2H, $CH_2$-S), δ 3.38 (s, 2H, $CH_2$-N), δ 3.88(s, 2H, $CH_2$ –C=O), δ 4.81(s, 1H, CH-C=O), δ 3.90(s, 1H, CH-N), 4.10 ( dd, 1H, H-2), 4.96(dd, 1H, H-3), δ 7.33(dd, 1H, H-1), δ δ δ 7.5(s, CH-S), δ 7.71(s, 1H, $NH_2$) δ9.71(s, 1H, NH-C=O) | C1 |  | δ2.10(s, 3H, $CH_3$), δ2. 25 (s, 3H, $CH_3$), δ 4.12 (s, 1H, NH), δ 5.05 (s, 1H, $NH_2$)δ 7.05-8.11(m, 7H, ArH), |
| B1 |  | δ2.24(s, 3H, $CH_3$), δ3.33(s, 3H, $CH_3$), δ4.49(s, 1H, NH), δ (s, 1H, NH2) δ8.78 (1H, s, NH-C=S), δ 9.47 (1H, s, NH-C=O) , δ 6.69-8.45(m, 7H, ArH), | C3 |  | δ1.85(s, 3H, $CH_3$), δ3.45(s, 2H, $CH_2$), δ 3.12(s, 3H, $CH_3$-O), δ 5.84(s, 2H, $NH_2$, δ 7.10-7.89(m, 5H, ArH) |

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https://doi.org/10.21123/bsj.2024.8657
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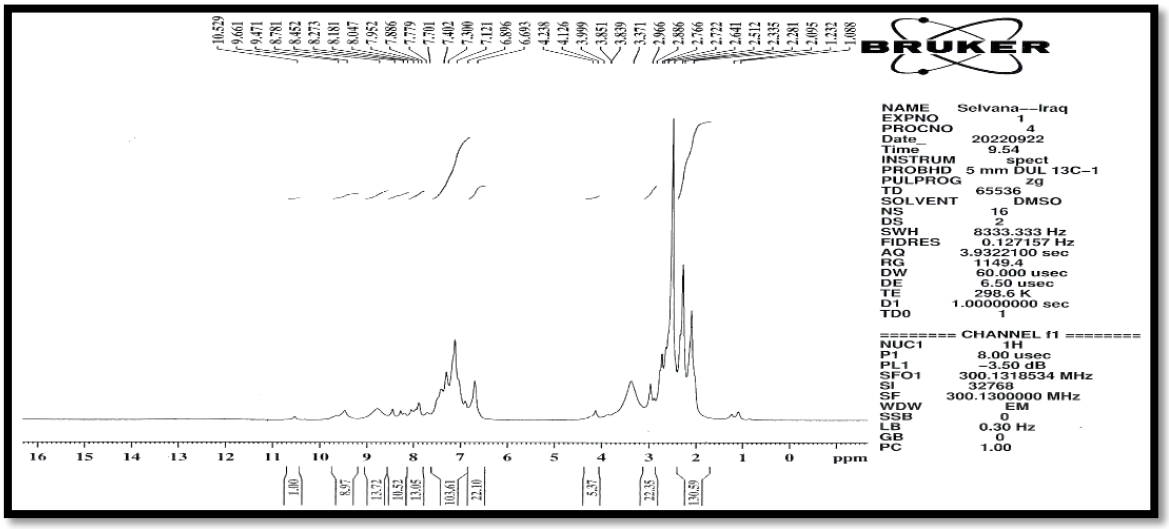


**Figure 7. [1]HNMR spectrum for compound (A1)**

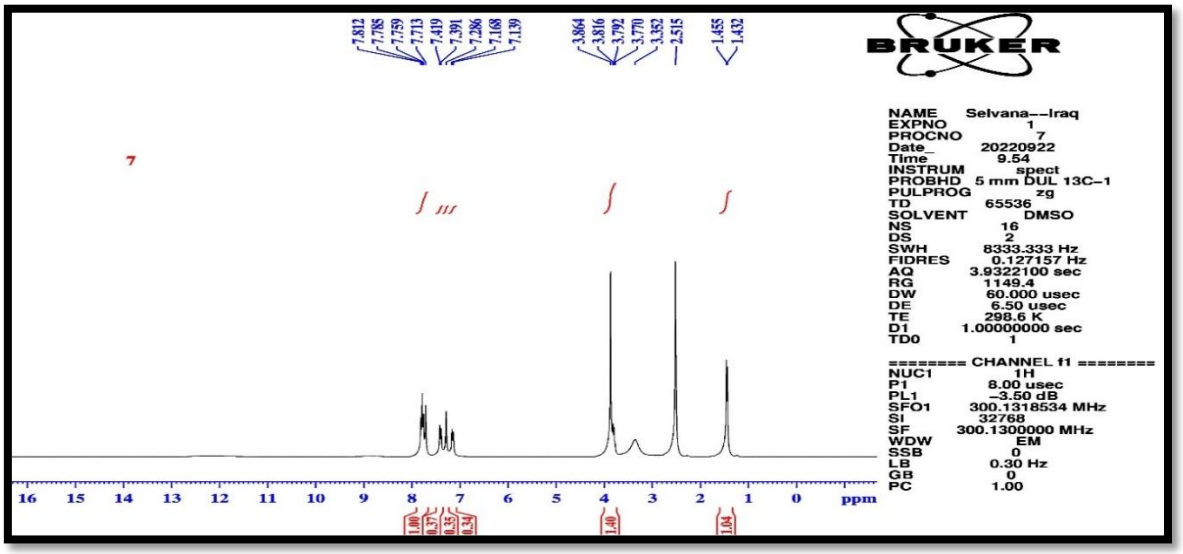


**Figure 8. [1]HNMR spectrum for compound (A3)**

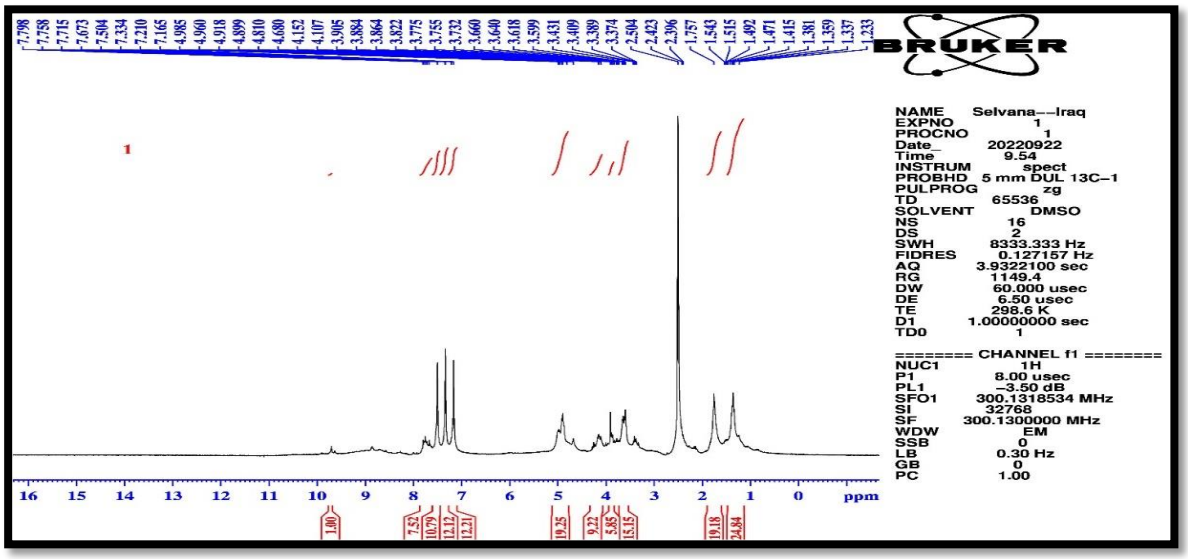


**Figure 9. [1]HNMR spectrum for compound (A6)**

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https://doi.org/10.21123/bsj.2024.8657
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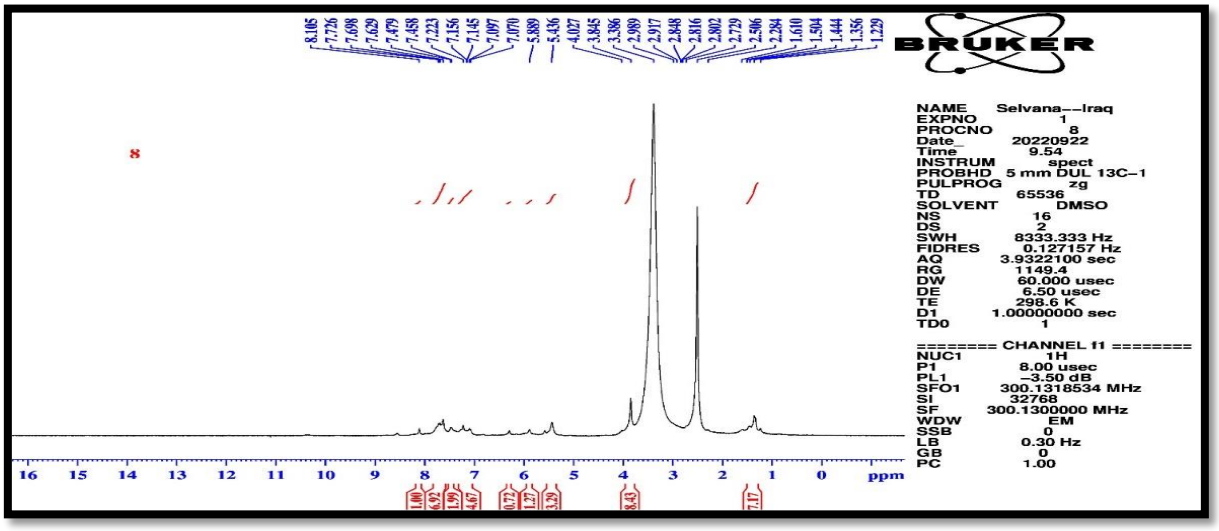



**Figure 10. [1]HNMR spectrum for compound (B3)**

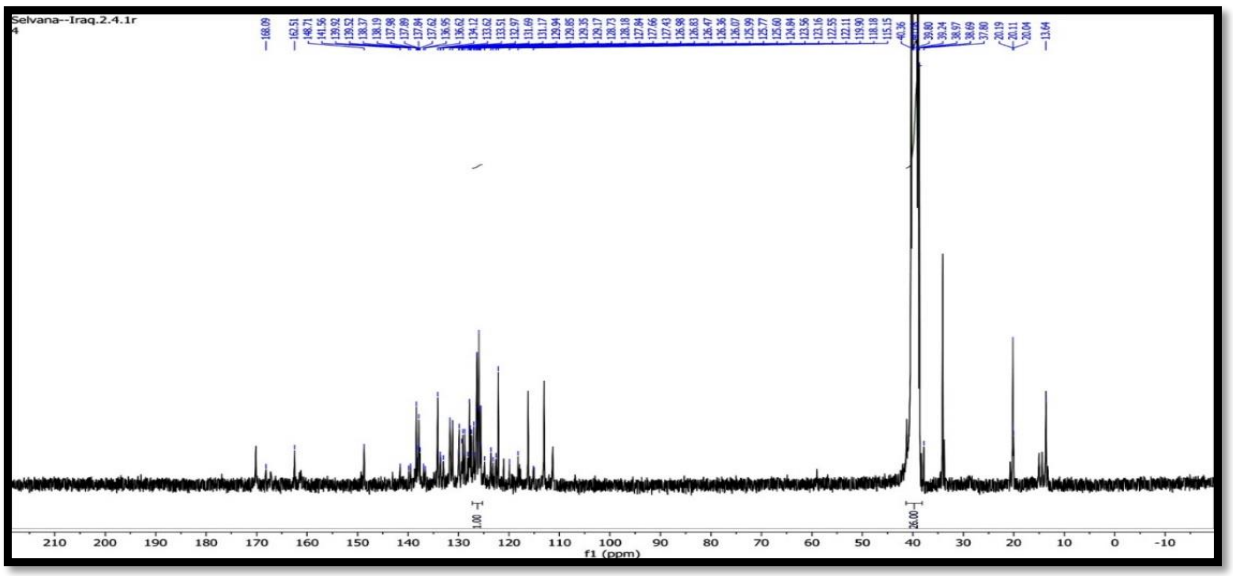
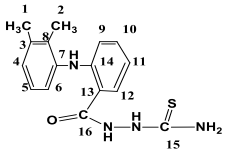
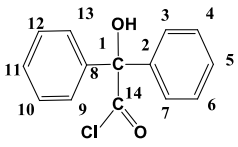
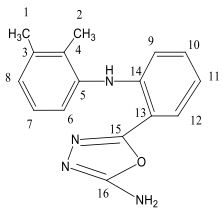
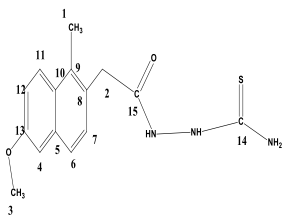



**Figure 11. [13]CNMR spectrum for compound (B3)**

**Table 10. [13]C NMR data for some compounds in ppm.**

| Comp. No. | Compound structure | [13]CNMR data in ppm | Comp. No. | Compound structure | [13]CNMR data in ppm |
|---|---|---|---|---|---|
| B1 |  | C1=18.44,C2=22.32,[C3,C4,C5,C6,C7,C8,C9,C10.C11,C12,C13.C14] =117.89-132.79,C15=162.45,C16-169.56 | A4 |  | C1=98.32,C2,C3,C4,C5,C6,C7,C8,C9,C10,C11,C12,C13=118.22-1339.87,C14=178.45 |
| C1 |  | C1=13.64; C2=20.11; [C3, C4,C5,C6,C7, C8,C9,C10,C11,C12,C13, C14] =115.15-141.69, C15=162.51,C16=168.09 | B3 |  | C1=18.41; C2=39.50; C3=44.97; [C4,C5,C6,C7,C8,C9,C10,C11,C12,C13] =118.64-136.30,C14=157.08,C15=175.41 |

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The final step in the strategy is building is the creation of new Mefenamic acid derivatives consisting of condensation of the Mefenamic acid chloride with the compounds (C1-C6). Spectral data for this set of compounds indicates the synthesis of a new amide group that corresponds to the (C=O) by the presence in the region of (1681-1674 $cm^{-1}$) and the spectra showed clear absorption bands due to υ (C-H aromatic), υ (N-H) and υ (C-O-C) appeared about at [(3001-3085 $cm^{-1}$), (3218-3402 $cm^{-1}$) and (1118-1124), (1037-1062)$cm^{-1}$] respectively, others bands are listed in Table 8 and shown in Fig. 6.

## Conclusion

In this study, a facile method for the modification of six drug derivatives by incorporating the oxadiazole ring within the formulation of the drug. Oxadiazol derivatives prepare by the cyclization reaction of (B1-B6) using POCl3 as a ring-closing agent. It should be noted that the chemical structure of these modification drugs may be important in creating different effects in some biological models.

## Acknowledgment

I would like to express my sincere gratitude to the College of Science for Women.

## Author's Declaration

- Conflicts of Interest: None.
- I hereby confirm that all the Figures and Tables in the manuscript are mine. Furthermore, any Figures and images, that are not mine, have been included with the necessary permission for re-publication, which is attached to the manuscript.
- Authors sign on ethical consideration's approval.
- Ethical Clearance: The project was approved by the local ethical committee at University of Baghdad.
- No animal studies are present in the manuscript.
- No human studies are present in the manuscript.
- No potentially identified images or data are present in the manuscript.

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2024, 21(12 Suppl.): 3947-3960
https://doi.org/10.21123/bsj.2024.8657
P-ISSN: 2078-8665 - E-ISSN: 2411-7986
Baghdad Science Journal

# تحضير وتشخيص بعض مشتقات الاوكساديازول المحضرة من حوامض كاربوكسيلية مختلفة

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## الخلاصة

تم تصميم وتصنيع سلسلة من مشتقات حامض الميفيناميك وتم وصف المنتجات طيفيًا باستخدام تقنيات (FT-IR, $^{1}$HNMR, $^{13}$CNMR. تضمنت السلسلة أ تحويل ستة عقاقير (حمض الميفيناميك ، الأمبيسيلين ، النوبروكسين ، حمض البنزيلك ، حمض الديكلوفيناك ، والكيفيكس) و المعروفة بفعاليتها الطبية العالية الى كلوريد الحامض ومن ثم تتفاعل مع ثيوسيميكاربازايد لتكوين السلسلة ب وفي المرحلة الثالثة ، تم تحضير حلقة الأوكساديازول باستخدام $POCl_3$ كعامل إغلاق حلقي للمركبات (B1-B6). كانت الخطوة الأخيرة في الاستراتيجية هي بناء مشتقات حامض الميفيناميك الجديدة التي تتكون من تكثيف كلوريد حمض الميفيناميك مع المركبات. (C1-C6) لإعطاء مركبات جديد.(D1-D6)

**الكلمات المفتاحية:** اوكساديازول , ادوية كاربوكسيلية,تخليق ,حامض المينافيمك,غلق حلقي,تخليق.