Supporting Information

Sustainable Generation of $Ni(OH)_2$ Nanoparticles for the Green Synthesis of 5-Substituted 1*H*-Tetrazoles: A Competent Turn on Fluorescence Sensing of H_2O_2

Mita Halder,[a] Md. Mominul Islam,[b] Pritam Singh,[a] Anupam Singha Roy,[c*] Sk. Manirul Islam,[b*] and Kamalika Sen[a*]

[a]Department of Chemistry, University of Calcutta, 92 APC Road, Kolkata 700 009, India

[b]Department of Chemistry, University of Kalyani, Kalyani, Nadia, 741235, W.B., India

[c]European Bioenergy Research Institute, Aston University, Birmingham B4 7ET, UK.

Number of pages: **30**

Number of figures: **24**

Table of contents **Page**

^{1}H and ^{13}C NMR data of all products

5-phenyl-1*H*-tetrazole (Table 2, 2a): White solid; *mp*: 215-216 ºC, [lit.[1] 217-219 °C]; ^{1}H NMR (400 MHz, DMSO-D_6) δ 8.04-8.03 (m, 2H), 7.45-7.44 (m, 3H). ^{13}C NMR (75 MHz, DMSO-D_6) δ 156.5, 132.6, 129.7, 127.8, 124.4; Elemental analysis for $C_7H_6N_4$; Calculated: C, 57.53; H, 4.14; N, 38.34. Found: C, 57.98; H, 4.02; N, 38.08.

5-(p-tolyl)-1*H*-tetrazole (Table 2, 2b): Colourless crystal; *mp*: 244-245 °C, [lit.[2] 246-248 °C]; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.65-7.63 (m, 2H), 7.19-7.17 (m, 2H), 5.96 (bs, 1H), 2.33 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 169.4, 142.5, 130.4, 129.2, 127.3, 21.4; Elemental analysis for $C_8H_8N_4$; Calculated: C, 59.99; H, 5.03; N, 34.98. Found: C, 59.02; H, 4.89; N, 34.68.

5-(2-nitrophenyl)-1*H*-tetrazole (Table 2, 2c): Pale yellow solid; *mp*: 157-158 °C, [lit.[2] 158-161 °C]; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.66-7.65 (m, 1H), 7.47-7.45 (m, 1H), 7.28 (m, 1H), 7.07-7.05 (m, 1H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 164.1, 151.5, 134.0, 133.6, 131.3, 126.4, 120.4; Elemental analysis for $C_7H_5N_5O_2$; Calculated: C, 43.98; H, 2.64; N, 36.64. Found C, 44.20; H, 2.22; N, 36.05.

5-(3-nitrophenyl)-1*H*-tetrazole (Table 2, 2d): Pale yellow solid; *mp*:154-155 °C, [lit.[1] 155-157 °C]; ^{1}H NMR (400 MHz, DMSO-D_6) δ 8.75 (bs, 1H), 8.28-8.23 (m, 2H), 7.95 (bs, 1H), 7.60-7.55 (m 1H); ^{13}C NMR (100 MHz, DMSO-D_6) δ 166.9, 147.9, 135.4, 133.9, 129.4, 125.9, 122.7; Elemental analysis for $C_7H_5N_5O_2$; Calculated: C, 43.98; H, 2.64; N, 36.64. Found: C, 43.11; H, 2.40; N, 36.60.

5-(4-nitrophenyl)-1*H*-tetrazole (Table 2, 2e): Yellow solid; *mp*: 218-219 °C, [lit.[2] 218-220 °C]; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.26-8.24 (m, 2H), 7.93-7.91 (m, 2H), 6.09. (bs, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 161.9, 148.1, 139.7, 128.5, 123.9; Elemental analysis for $C_7H_5N_5O_2$; Calculated: C, 43.98; H, 2.64; N, 36.64. Found: C, 43.75; H, 2.30; N, 36.12.

5-(4-chlorophenyl)-1*H*-tetrazole (Table 2, 2f): Pale brown solid; *mp*: 248-249 °C, [lit.[3] 249-250 °C]; ^{1}H NMR (400 MHz, DMSO-D_6) δ 7.79-7.78 (m, 2H), 7.34-7.33 (m, 2H), 7.27 (bs, 1H); ^{13}C NMR (100 MHz, DMSO-D_6) δ 168.3, 137.5, 132.1, 129.1, 128.4; Elemental analysis for $C_7H_5ClN_4$; Calculated: C, 46.55; H, 2.79; N, 31.02. Found: C, 46.02; H, 2.85; N, 30.88.

5-(4-bromophenyl)-1*H*-tetrazole (Table 2, 2h): Light yellow solid; *mp*: 263-264 °C, [lit.[4] 267-268 °C]; ^{1}H NMR (400 MHz, DMSO-D_6) δ 7.74-7.72 (m, 2H), 7.54 (bs, 1H), 7.50-7.45 (m, 2H); ^{13}C NMR (100 MHz, DMSO-D_6) δ 168.3, 132.6, 131.2, 129.3, 125.9; Elemental analysis for $C_7H_5BrN_4$; Calculated: C, 37.36; H, 2.24; N, 24.90. Found: C, 37.28; H, 2.11; N, 24.80.

5-(3,4-dimethoxyphenyl)-1*H*-tetrazole (Table 2, 2i): Off-white solid; *mp*: 198-199 °C, [lit.[5] 198-200 °C]; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.39 (m, 1H), 7.28-7.25 (m, 1H), 6.81-6.79 (m, 1H), 5.97 (bs, 1H), 3.86 (s, 3H), 3.84 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 169.1, 152.1, 149.0, 125.8, 120.1, 110.8, 110.2, 56.0; ; Elemental analysis for $C_9H_{10}N_4O_2$; Calculated: C, 52.42; H, 4.89; N, 27.17. Found: C, 52.12; H, 4.67; N, 26.99.

5-(4-methoxyphenyl)-1*H*-tetrazole (Table 2, 2j):White solid; *mp*: 230-231 °C, [lit.[1] 233-234 °C]; ^{1}H NMR (400 MHz, DMSO-D_6) δ 7.77-7.74 (m, 2H), 6.86-6.83 (m, 2H), 5.96 (bs, 1H), 3.78 (s, 3H); ^{13}C NMR (100 MHz, DMSO-D_6) δ 168.9, 162.3, 129.3, 125.8, 113.5, 55.3; Elemental analysis for $C_8H_8N_4O$; Calculated: C, 54.54; H, 4.58; N, 31.80. Found: C, 54.48; H, 4.62; N, 31.63.

2-(1*H*-tetrazol-5-yl)phenol (Table 2, 2k): Whitish solid; *mp*: 217-218 °C, [lit.[1] 219-221 °C]; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.48-7.45 (m, 1H), 7.10-7.08 (m, 2H), 7.06-7.03 (m, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 164.0, 153.5, 132.9, 131.0, 119.6, 117.4, 114.1; Elemental analysis for $C_7H_6N_4O$; Calculated: C, 51.85; H, 3.73; N, 34.55. Found: C, 51.08; H, 3.92; N, 34.11.

4-(1*H*-tetrazol-5-yl)phenol (Table 2, 2l): White solid; *mp*: 235-236 °C, [lit.[2] 238-240 °C]; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.47-7.45 (m, 2H), 6.86-6.84 (m, 2H), 6.05 (bs, 1H); ^{13}C NMR (100 MHz, CDCl3) δ 163.1, 160.3, 134.2, 132.6, 116.4; Elemental analysis for $C_7H_6N_4O$; Calculated: C, 51.85; H, 3.73; N, 34.55. Found: C, 51.17; H, 3.52; N, 34.42.

5-methyl-2-(1*H*-tetrazol-5-yl)phenol (Table 2, 2m): Off-white solid; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.31-7.29 (m, 1H), 6.73-6.69 (m, 2H), 2.27 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 158.6, 146.1, 132.5, 128.8, 121.9, 117.0, 116.9, 21.8; Elemental analysis for $C_8H_8N_4O$; Calculated: C, 54.54; H, 4.58; N, 31.80. Found: C, 54.04; H, 4.60; N, 31.42.

5-(furan-2-yl)-1*H*-tetrazole (Table 3, 3a): Colourless solid; *mp*: 204-205 °C, [lit.[6] 206-208 °C]; ^{1}H NMR (400 MHz, DMSO-D_6) δ 7.42 (t, *J* = 0.8 Hz, 1H), 7.07-7.06 (m, 1H), 6.66 (bs, 1H), 6.44 (dd, *J* = 3.2, 1.6 Hz, 1H); ^{13}C NMR (100 MHz, DMSO-D_6) δ 160.0, 148.2, 145.5, 114.2, 112.3; Elemental analysis for $C_5H_4N_4O$; Calculated: C, 44.12; H, 2.96; N, 41.16. Found: C, 43.95; H, 2.90; N, 41.10.

5-(thiophen-2-yl)-1*H*-tetrazole (Table 3, 3b): Off-white solid; *mp*: 203-204 °C, [lit.[7] 205-206 °C]; ^{1}H NMR (400 MHz, DMSO-D_6) δ 7.59-7.58 (m, 1H), 7.44-7.43 (m, 1H), 7.01 (dd, *J* = 4.8, 4.0 Hz, 1H), 6.23 (bs, 1H); ^{13}C NMR (100 MHz, DMSO-D_6) δ 163.9, 138.7, 130.5, 129.1, 127.6; Elemental analysis for $C_5H_4N_4S$; Calculated: C, 39.46; H, 2.65; N, 36.82. Found: C, 39.16; H, 2.78; N, 36.56.

2-(1*H*-tetrazol-5-yl)pyridine (Table 3, 3c): Pale brown solid; *mp*: 210-211 °C, [lit.[4] 211-213 °C]; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.52-8.50 (m, 1H), 8.15-8.13 (m, 1H), 7.82-7.77 (m, 2H), 7.40-7.37 (m, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 166.9, 149.6, 148.3, 137.3, 126.5, 122.4; Elemental analysis for $C_6H_5N_5$; Calculated: C, 48.98; H, 3.43; N, 47.60. Found: C, 48.37; H, 3.10; N, 47.78.

2-(1*H*-tetrazol-5-yl)quinoline (Table 3, 3d): Brownish solid; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.22 (m, 2H), 8.03-8.01 (m, 2H), 7.80-7.78 (m, 1H), 7.69-7.66 (m, 1H), 7.55-7.52 (m, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 166.7, 150.3, 148.8, 137.0, 129.6, 129.3, 128.8, 127.6, 127.2, 118.3; Elemental analysis for $C_{10}H_7N_5$; Calculated: C, 60.91; H, 3.58; N, 35.51. Found: C, 60.52; H, 3.21; N, 35.04.

1*H*-tetrazole (Table 4, 4a): Colourless solid; 154-155 °C, [lit.[8] 154 °C]; ^{1}H NMR (400 MHz, DMSO-D_6) δ 8.81 (s, 1H), 6.82 (bs, 1H); ^{13}C NMR (100 MHz, DMSO-D_6) δ 142.9; Elemental analysis for CH_2N_4; Calculated: C, 17.15; H, 2.88; N, 79.98. Found: C, 17.26; H, 2.79; N, 79.03.

5-hexyl-1*H*-tetrazole (Table 4, 4b): Colourless viscous oil; ^{1}H NMR (400 MHz, $CDCl_3$) δ 2.87 (t, J = 7.6 Hz, 2H), 1.57-1.52 (m, 2H), 1.30-1.21 (m, 6H), 0.81 (t, *J* = 6.8 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 159.4, 31.5, 29.7, 25.4, 24.8, 22.5, 14.0; Elemental analysis for $C_7H_{14}N_4$; Calculated: C, 54.52; H, 9.15; N, 36.33. Found: C, 54.36; H, 8.88; N, 36.10.

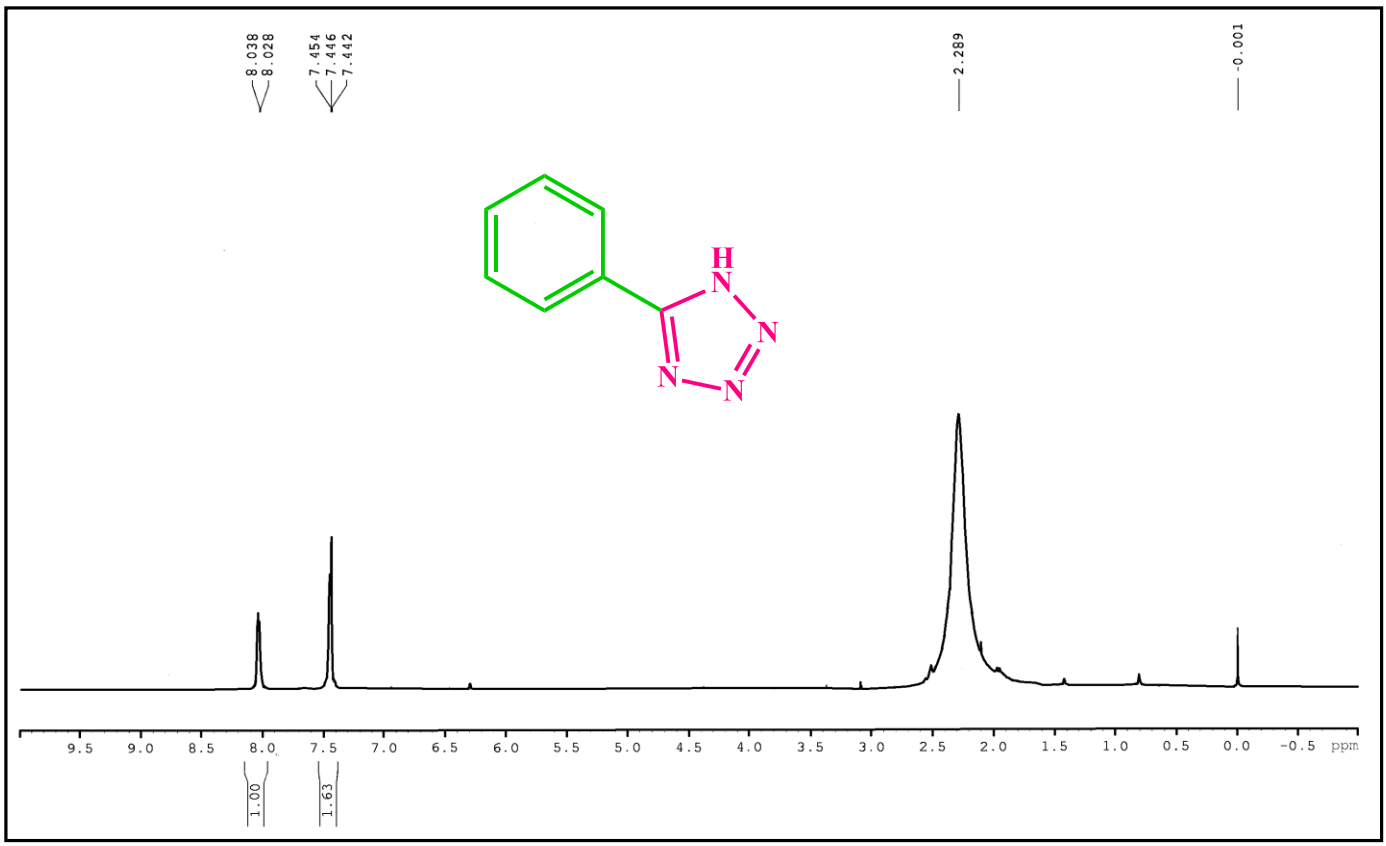
(E)-5-styryl-1*H*-tetrazole (Table 4, 4c): Colourless solid; *mp*: 153-154 °C, [lit.[9] 155-156 °C]; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.47-7.44 (m, 2H), 7.32-7.29 (m, 3H), 6.41-6.37 (d, J = 15.6 Hz, 2H), 6.52 (bs, 1H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 155.8, 137.2, 134.2, 128.6, 128.1, 126.6, 110.1; Elemental analysis for $C_9H_8N_4$; Calculated: C, 62.78; H, 4.68; N, 32.54. Found: C, 62.80; H, 4.32; N, 32.19.

9-(4-iodophenyl)-9*H*-carbazole (Scheme 4, Compound 5): ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.01 (d, *J* = 7.2 Hz, 2H), 7.77 (d, *J* = 7.2 Hz, 2H), 7.30-7.24 (m, 4H), 7.19-7.15 (m, 4H).

9-(4-(5-(quinolin-2-yl)-1*H*-tetrazol-1-yl)phenyl)-9*H*-carbazole (Scheme 4, Compound 6): ^{1}H NMR (400 MHz, $CDCl_3$) δ: 8.36 (dd, *J* = 16.8, 8.4 Hz, 2H), 8.16 (d, *J* = 8.4 Hz, 1H), 8.08 (d, *J* = 8.0 Hz, 2H), 8.03 (d, *J* = 8.8 Hz, 2H), 7.87 (d, *J* = 8.0 Hz, 1H), 7.79-7.75 (m, 1H), 7.61 (t, *J* = 6.0 Hz, 1H), 7.54 (d, *J* = 8.8 Hz, 2H), 7.36-7.35 (m, 4H), 7.24-7.20 (m, 2H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 162.4, 149.4, 146.3, 141.0, 138.1, 137.0, 133.6, 130.5, 129.7, 129.5, 128.3, 127.9, 125.9, 123.3, 121.1, 120.3, 119.9, 118.8, 109.7.

^{1}H and ^{13}C NMR spectra of all products

Figure S1. ^{1}H and ^{13}C NMR NMR Spectra of 5-phenyl-1*H*-tetrazole **(2a)**



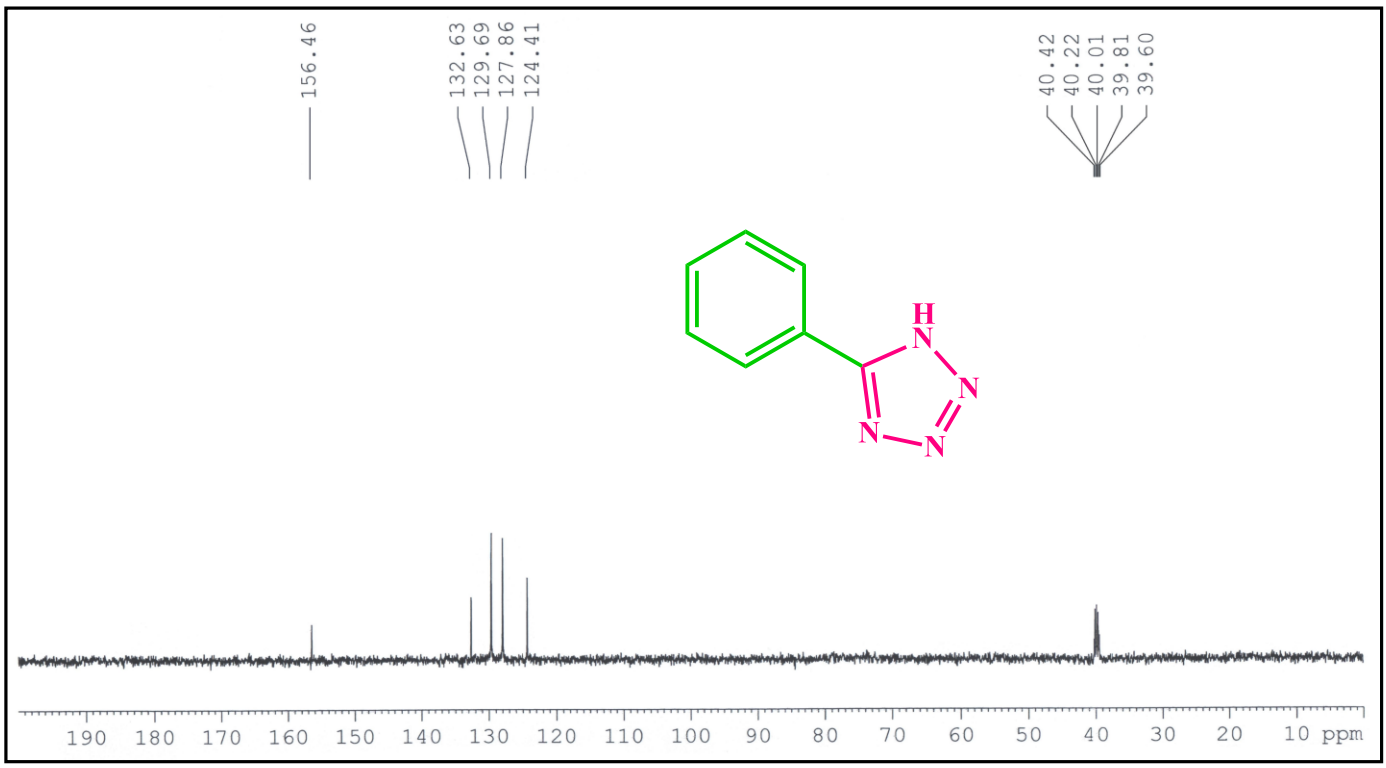
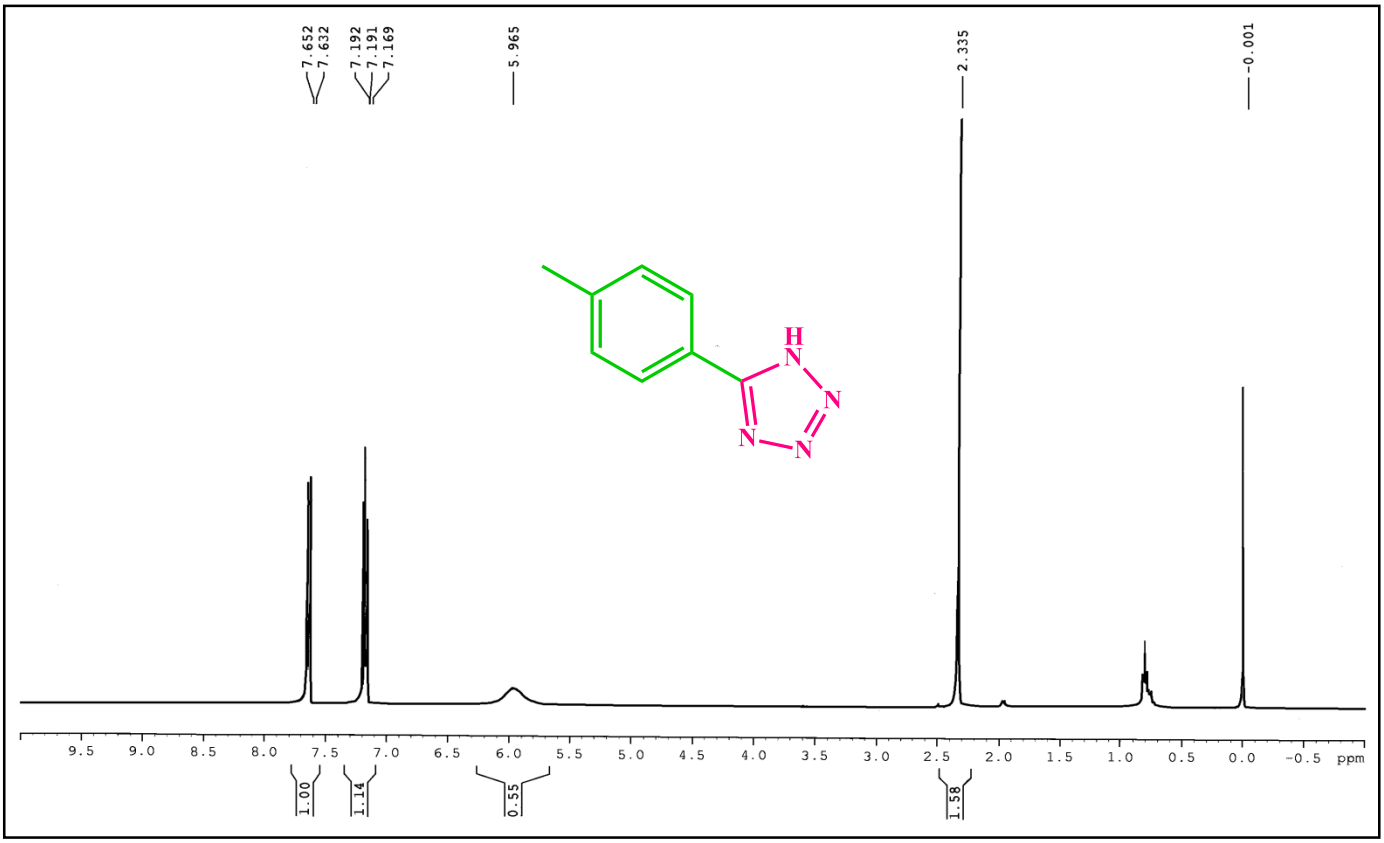


Figure S2. ^{1}H and ^{13}C NMR Spectra of 5-(p-tolyl)-1*H*-tetrazole **(2b)**



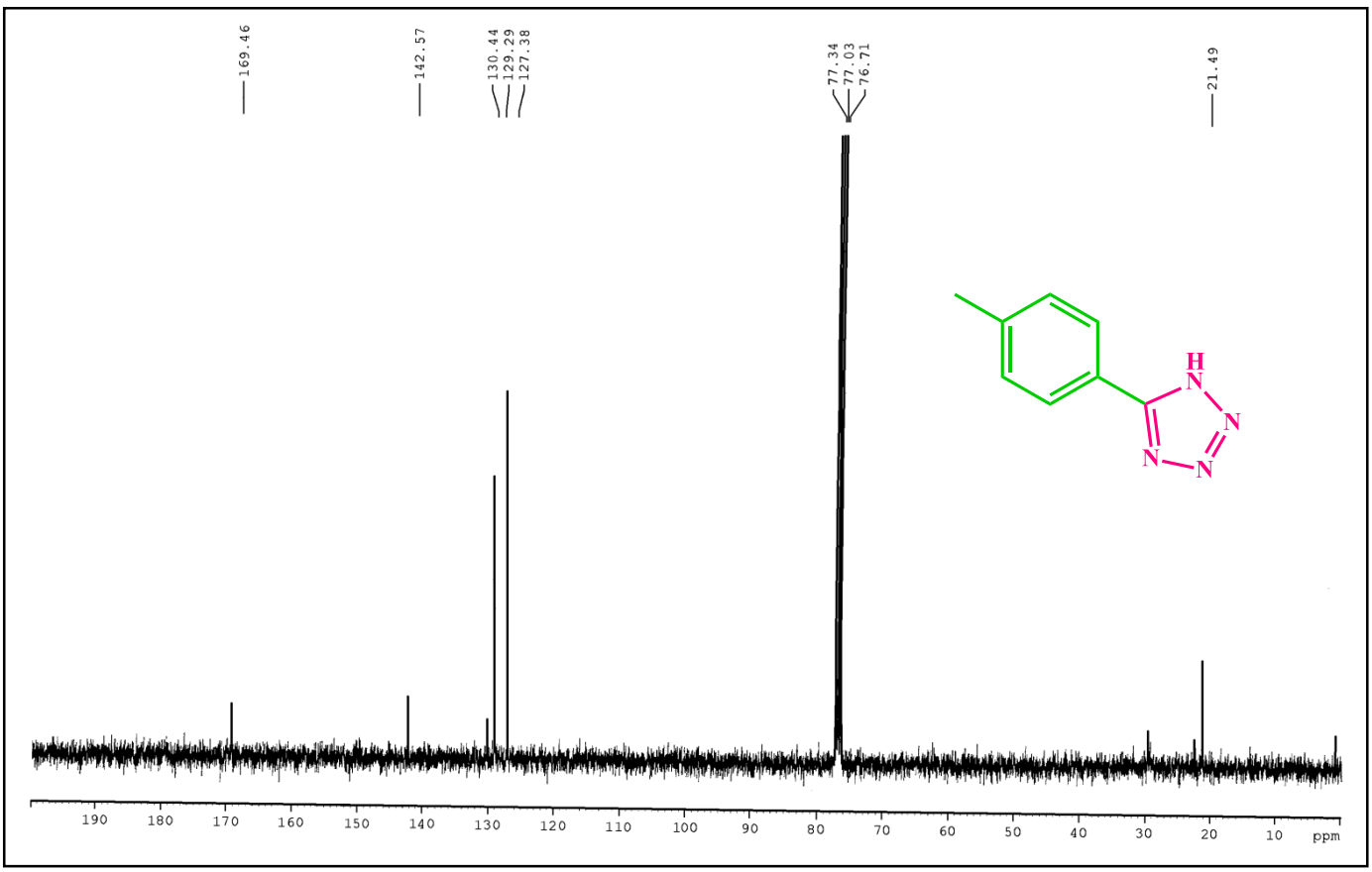
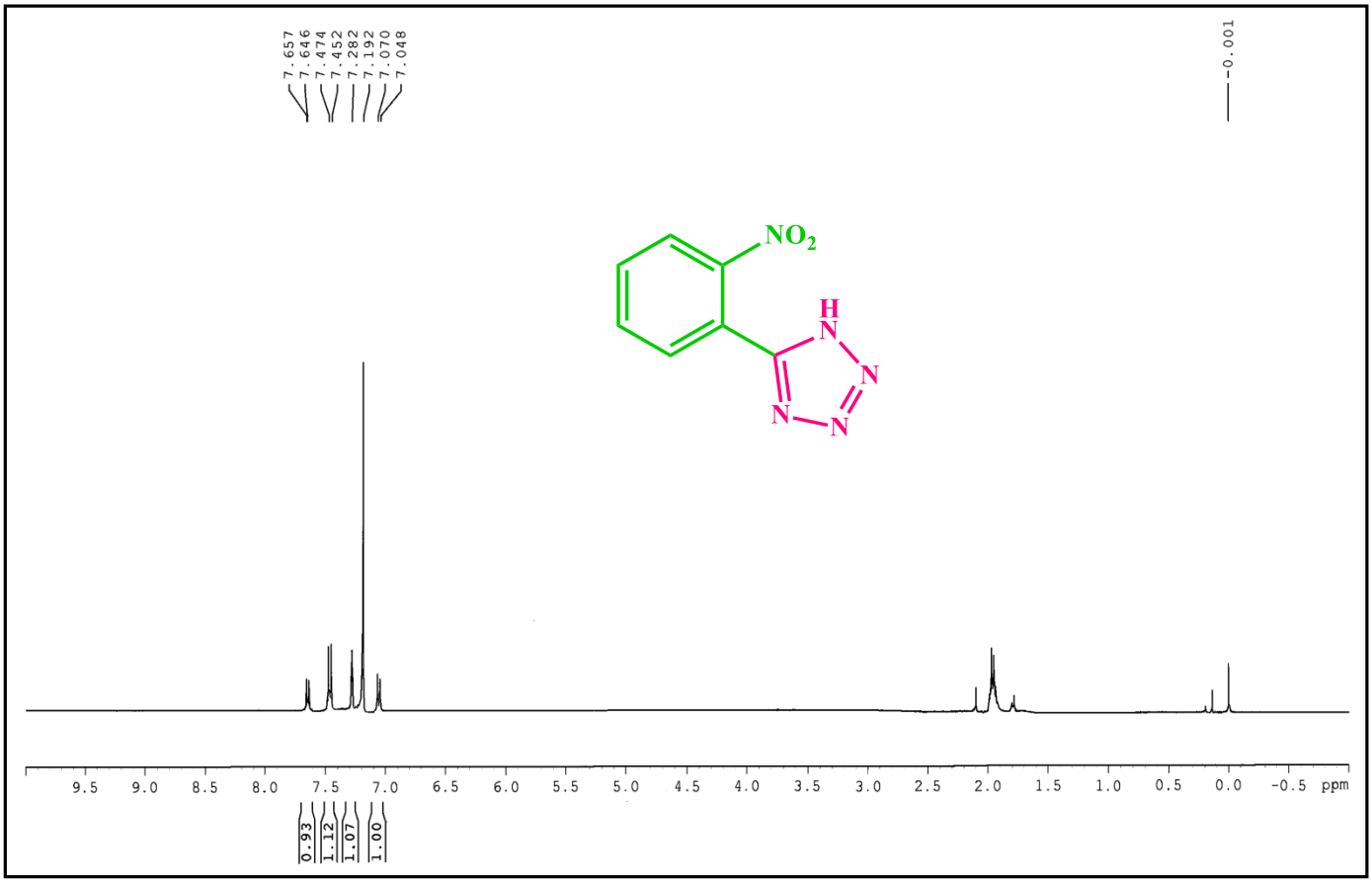


Figure S3. ^{1}H and ^{13}C NMR Spectra of 5-(2-nitrophenyl)-1*H*-tetrazole **(2c)**



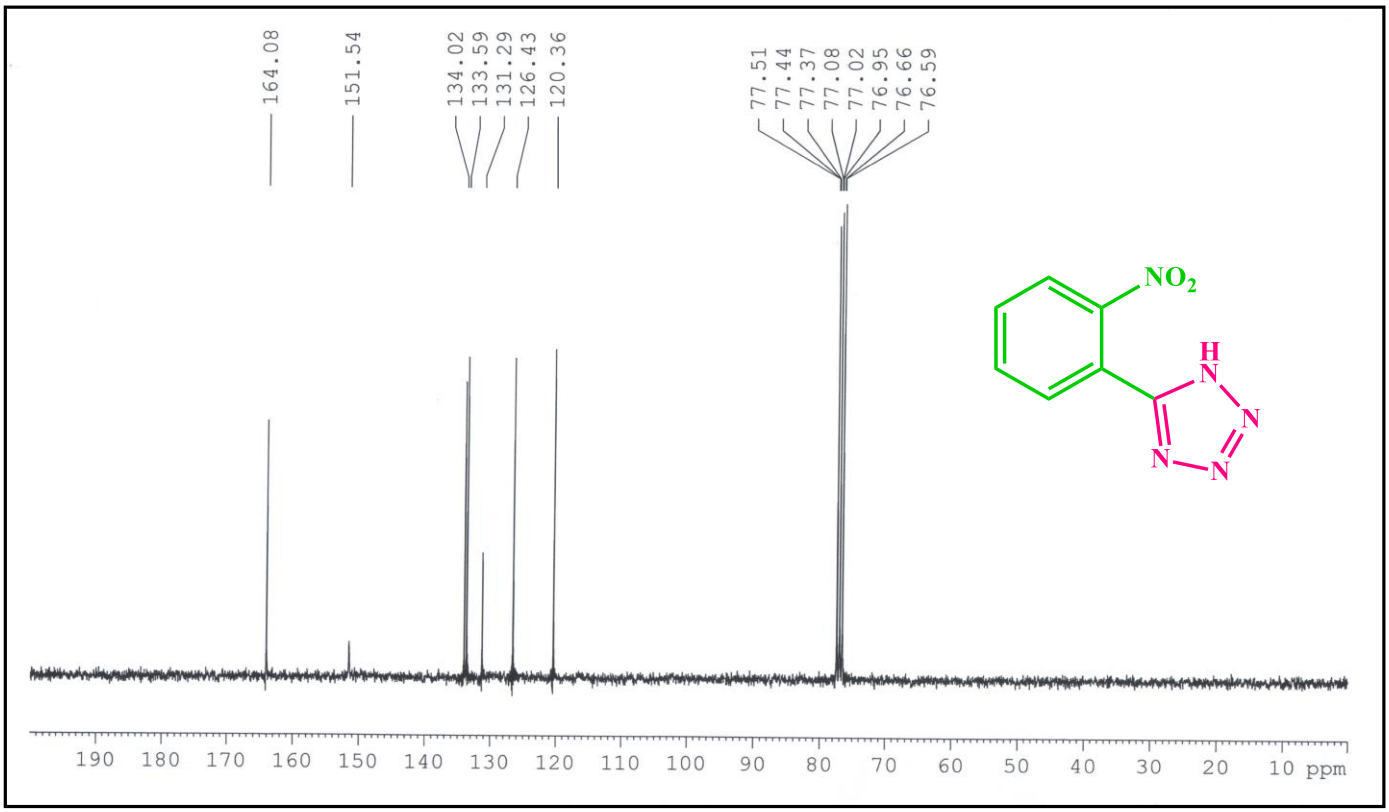
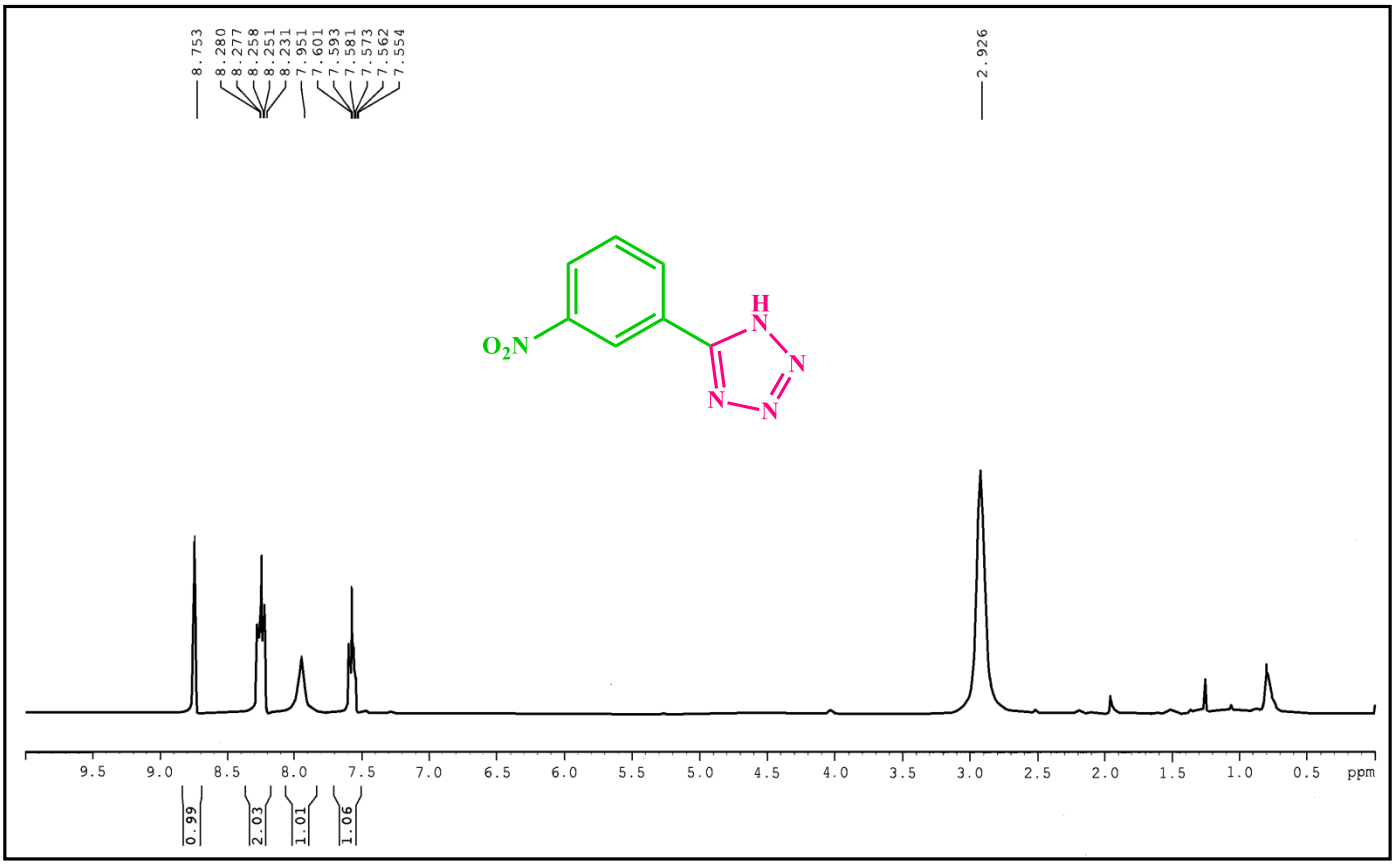


Figure S4. ^{1}H and ^{13}C NMR Spectra of 5-(3-nitrophenyl)-1*H*-tetrazole **(2d)**



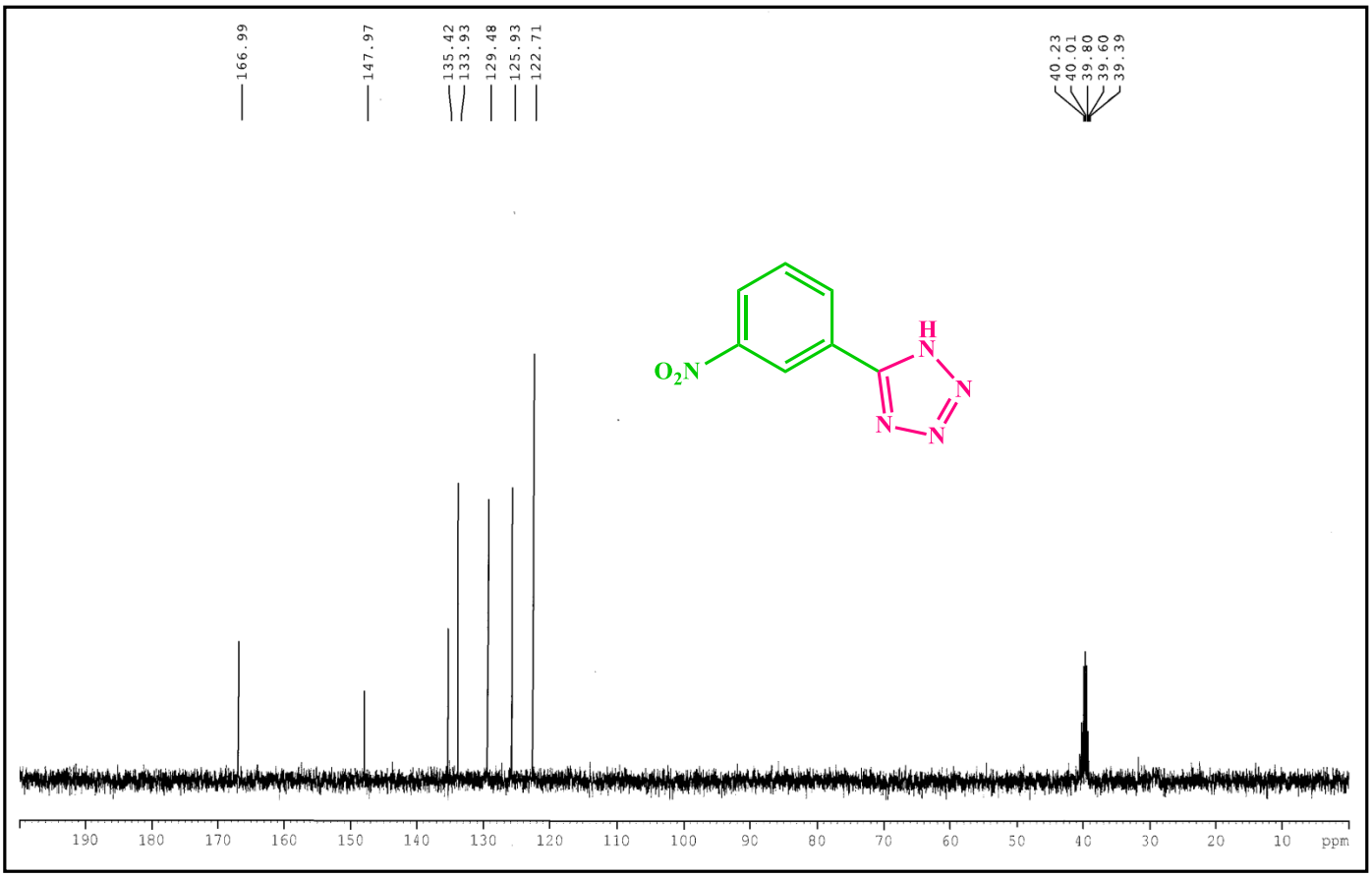
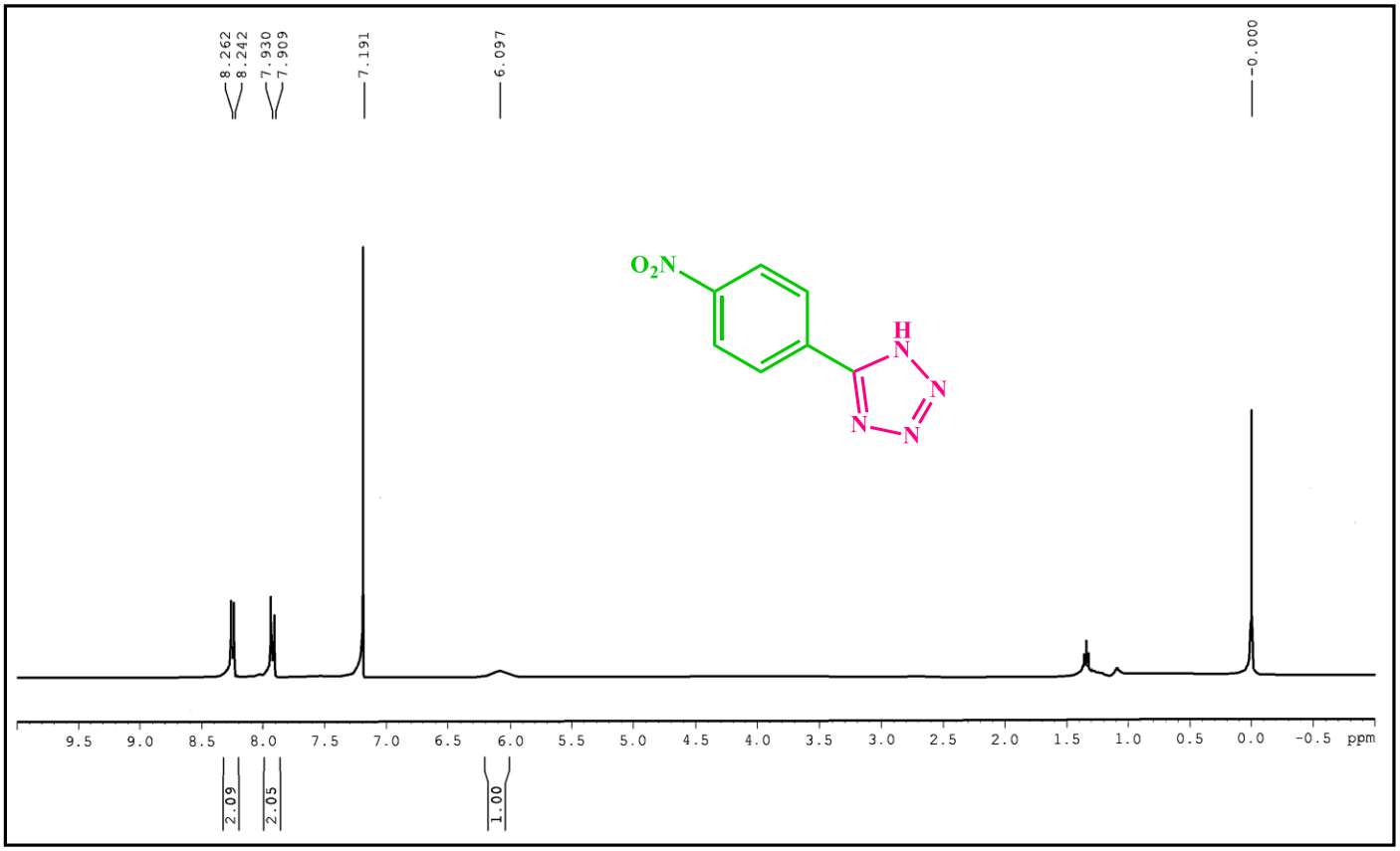


Figure S5. ^{1}H and ^{13}C NMR Spectra of 5-(4-nitrophenyl)-1*H*-tetrazole **(2e)**



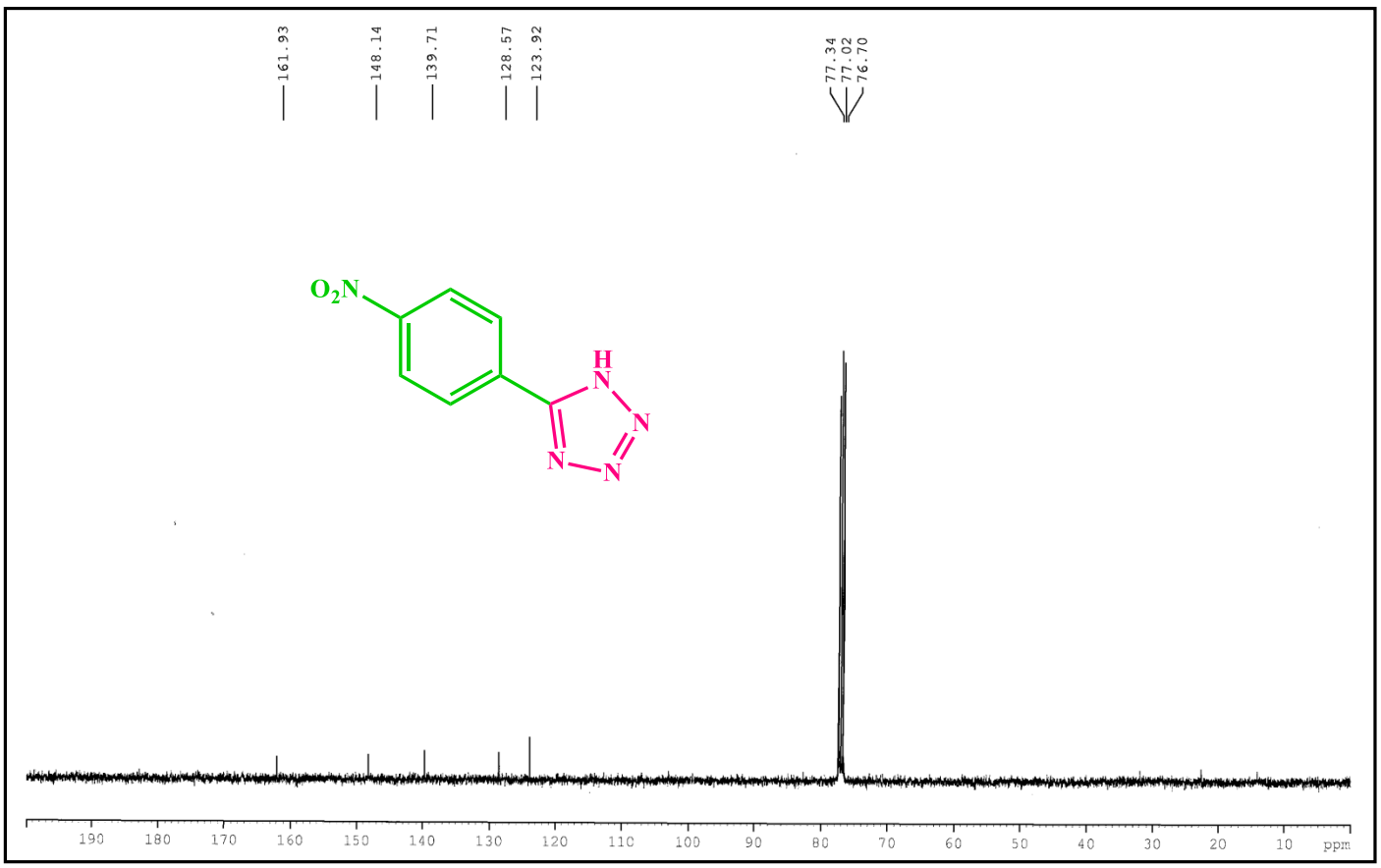


Figure S6. ^{1}H and ^{13}C NMR Spectra of 5-(4-chlorophenyl)-1*H*-tetrazole **(2f)**

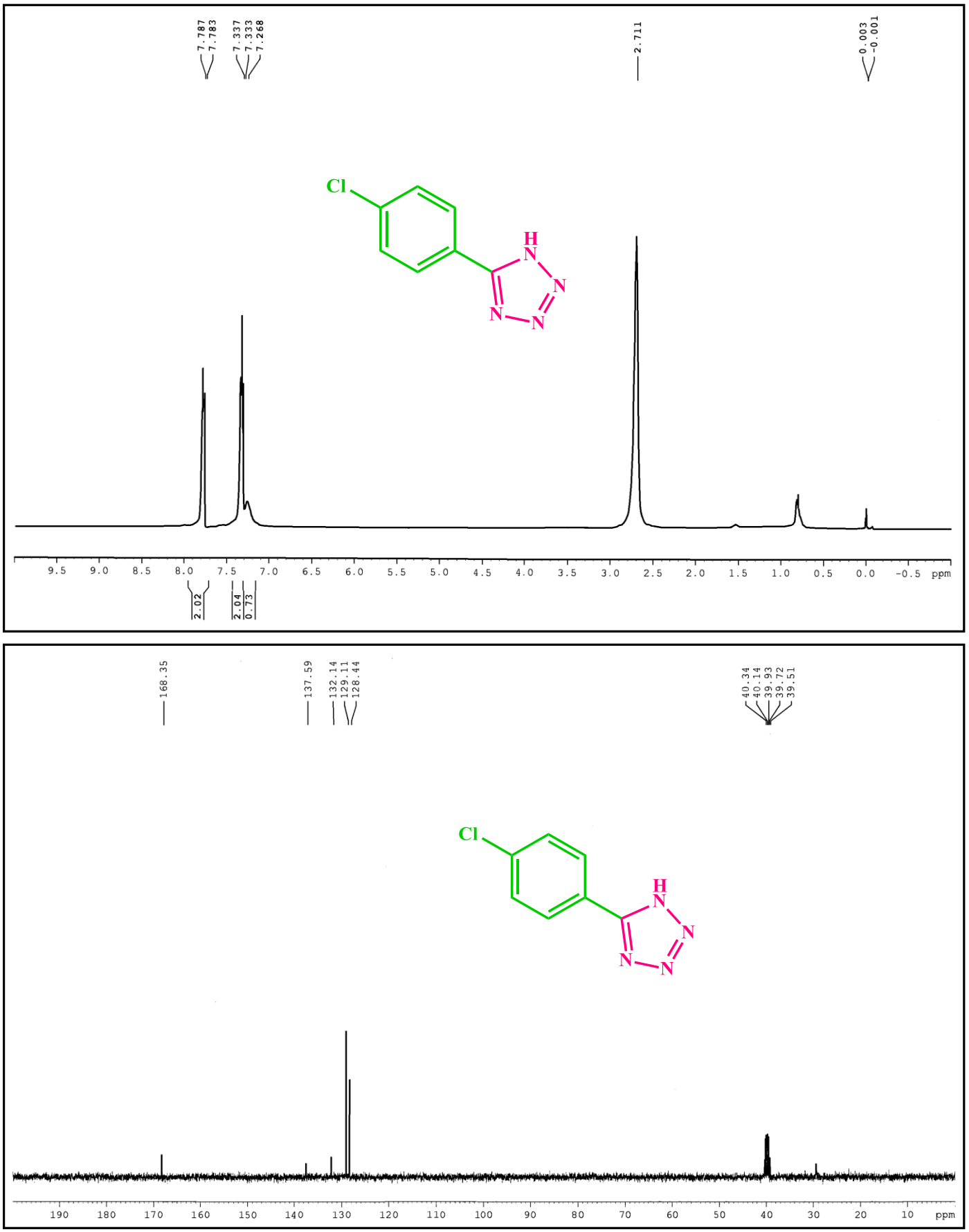
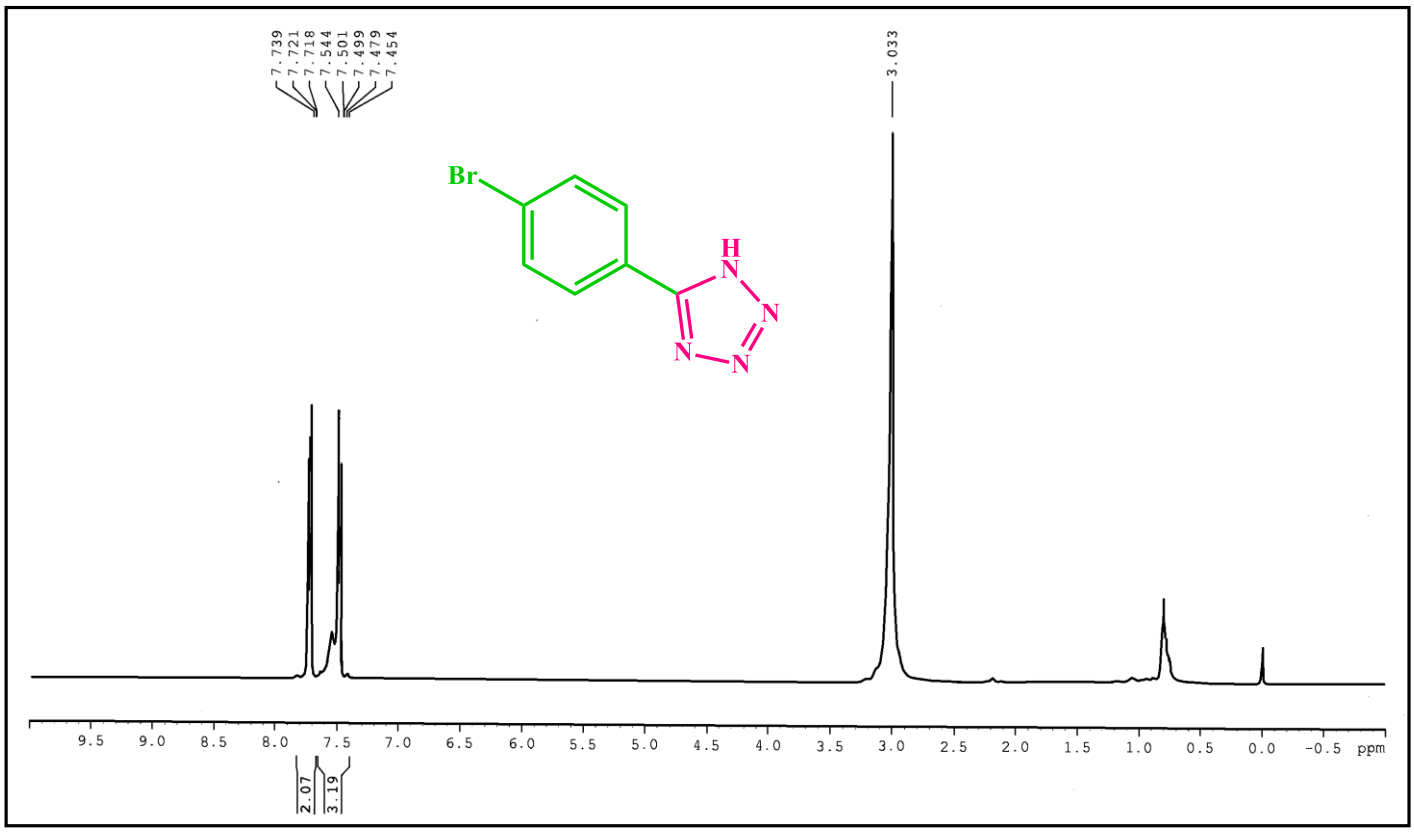


Figure S7. ^{1}H and ^{13}C NMR Spectra of 5-(4-bromophenyl)-1*H*-tetrazole **(2h)**



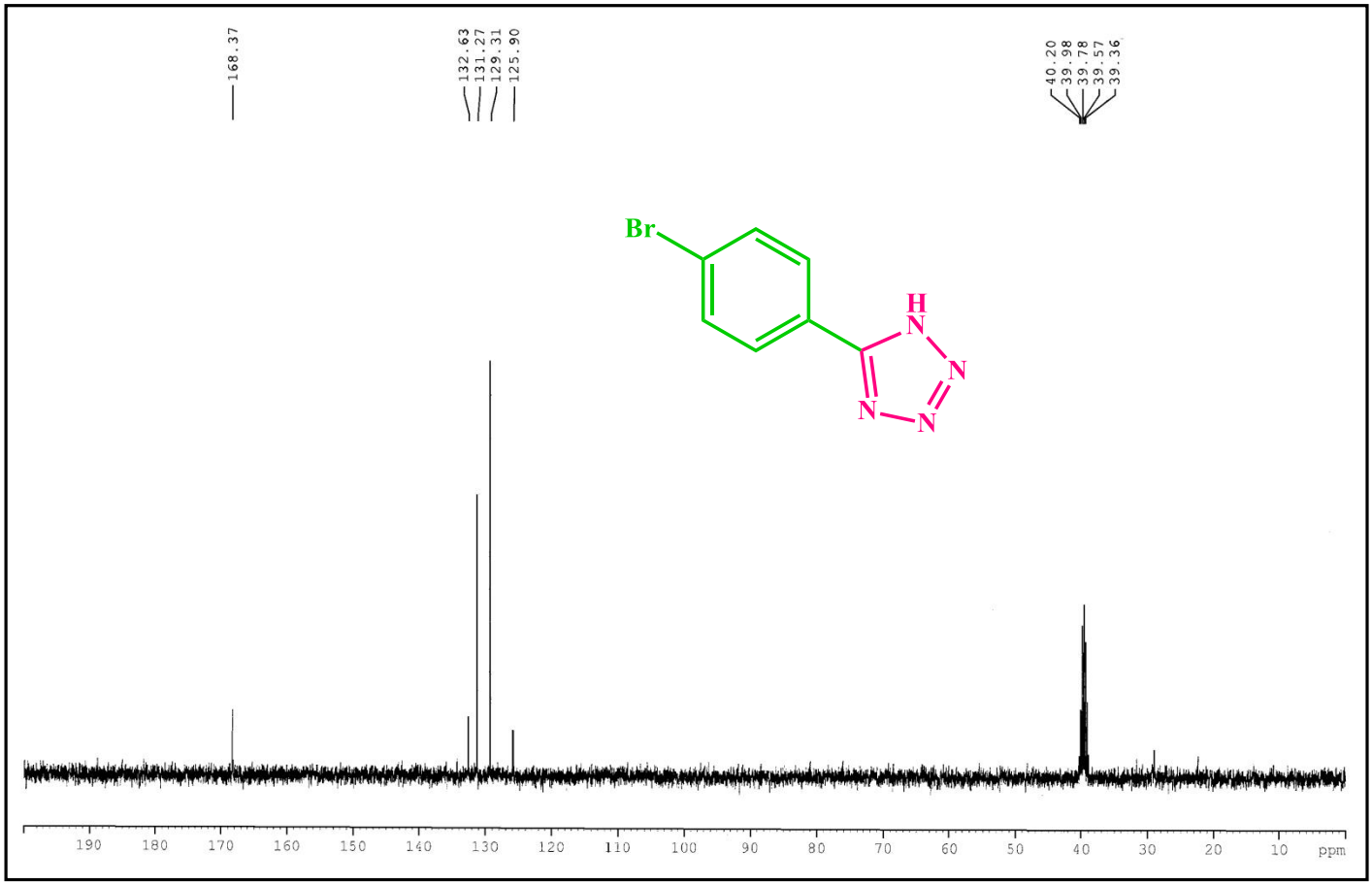
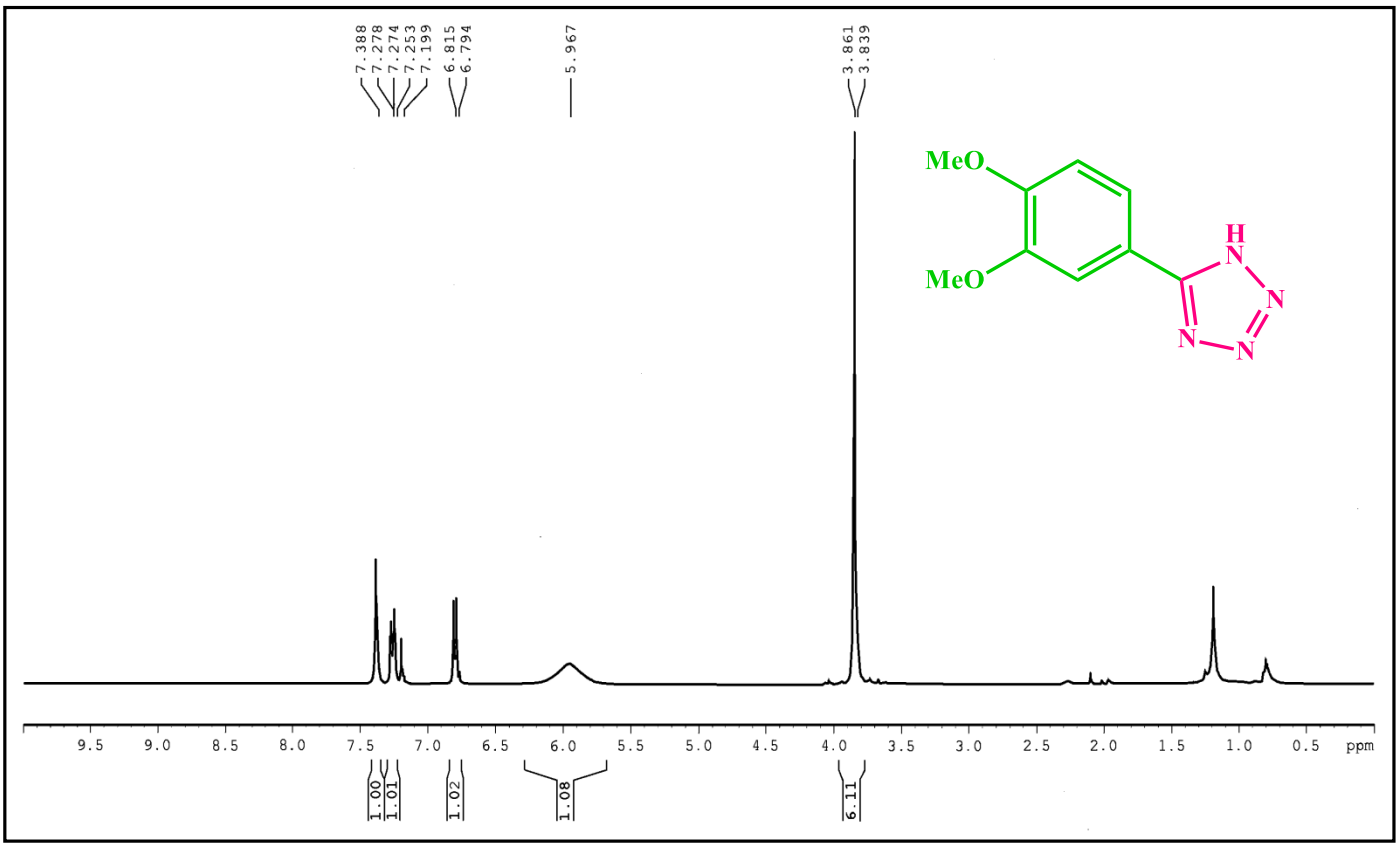


Figure S8. ^{1}H and ^{13}C NMR Spectra of 5-(3,4-dimethoxyphenyl)-1*H*-tetrazole **(2i)**



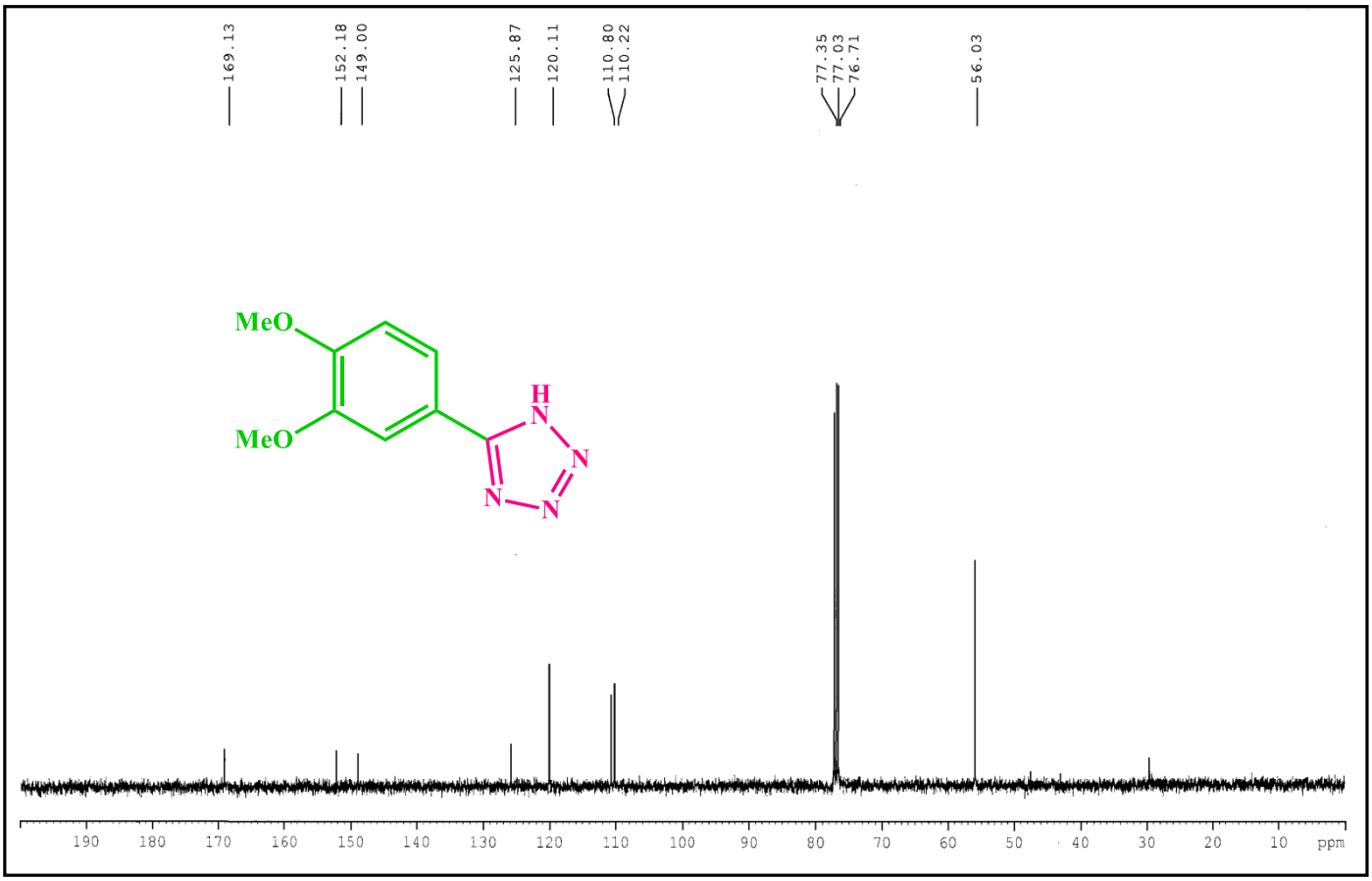
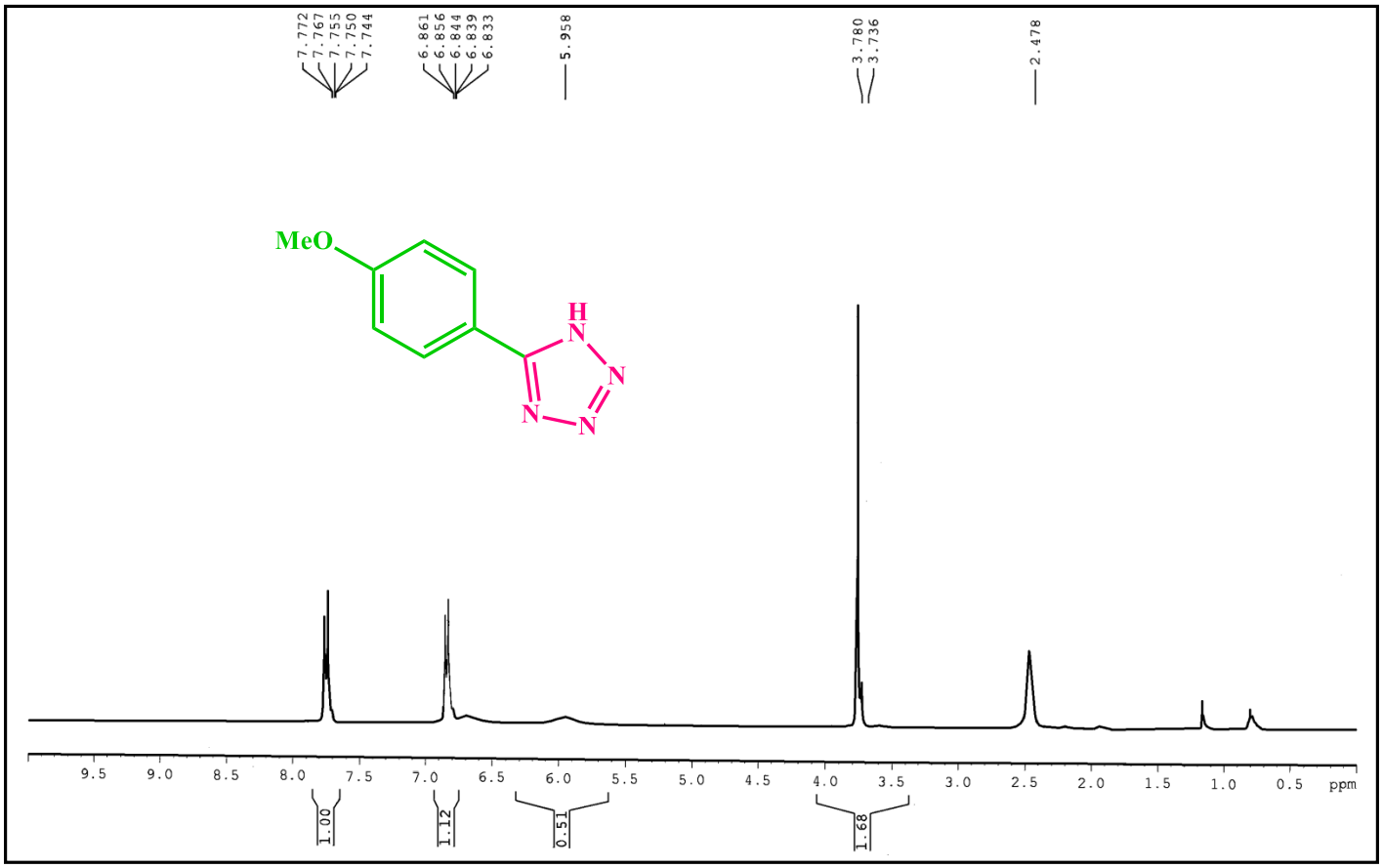


Figure S9. ^{1}H and ^{13}C NMR Spectra of 5-(4-methoxyphenyl)-1*H*-tetrazole **(2j)**



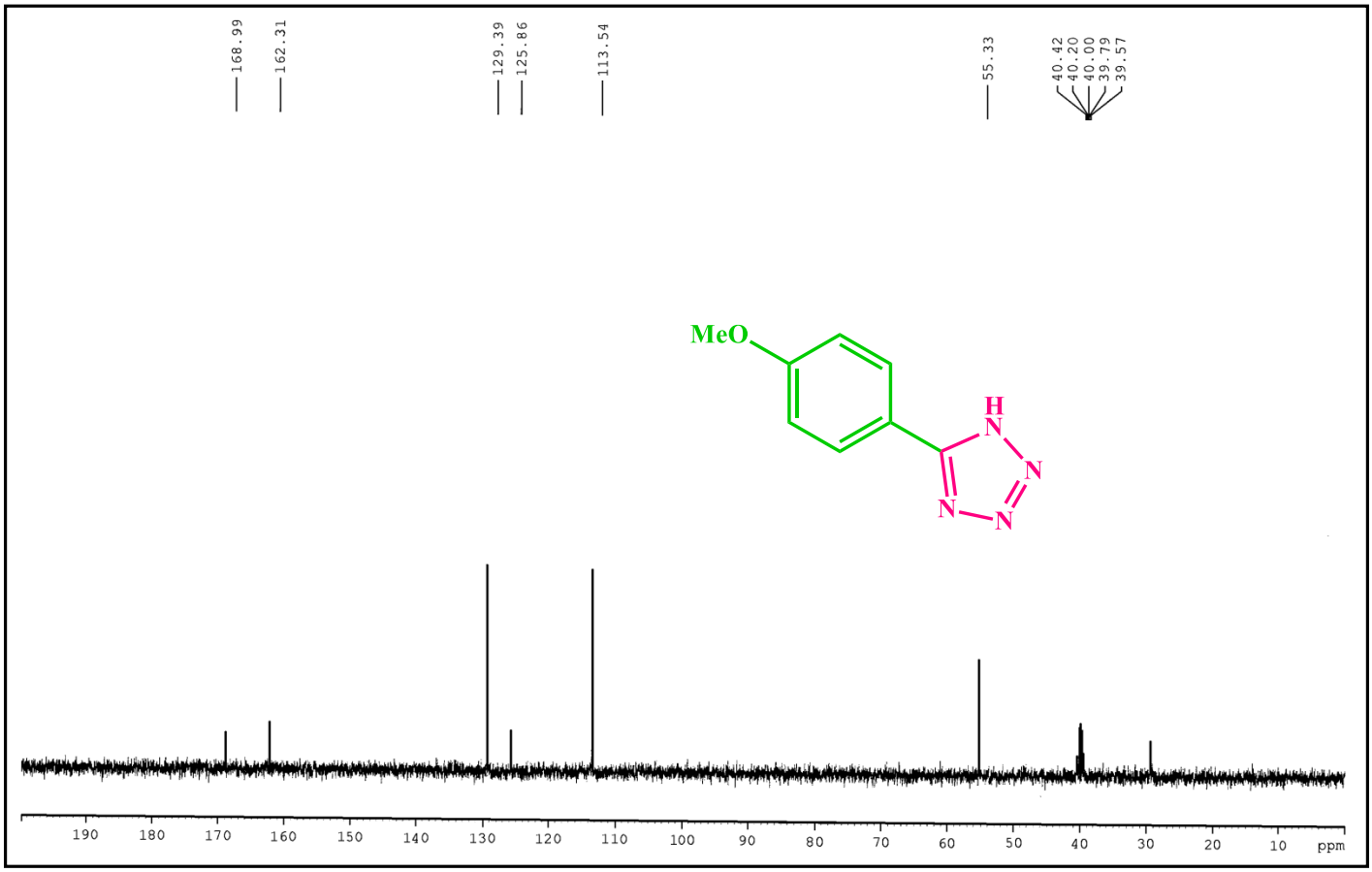
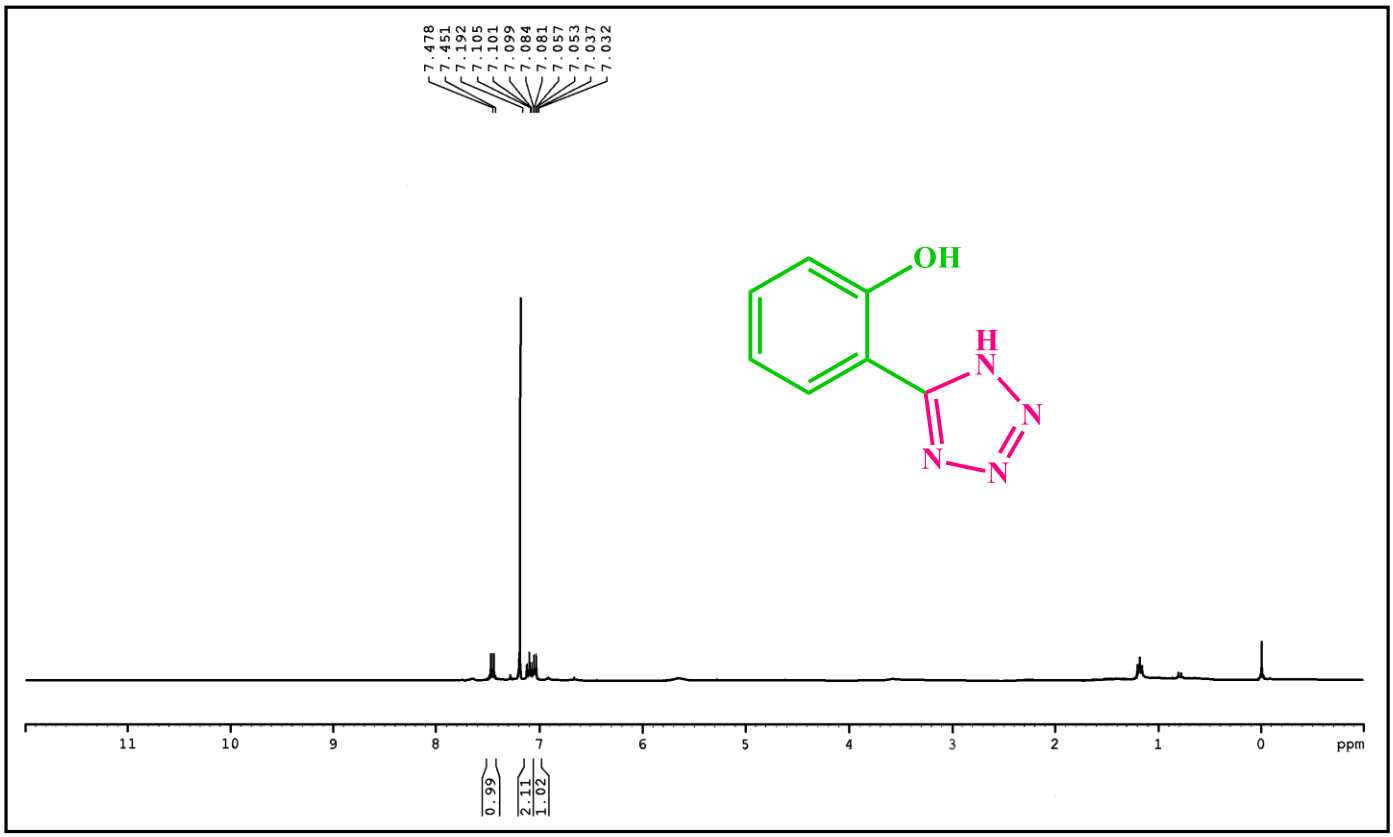


Figure S10. ^{1}H and ^{13}C NMR Spectra of 2-(1*H*-tetrazol-5-yl)phenol **(2k)**



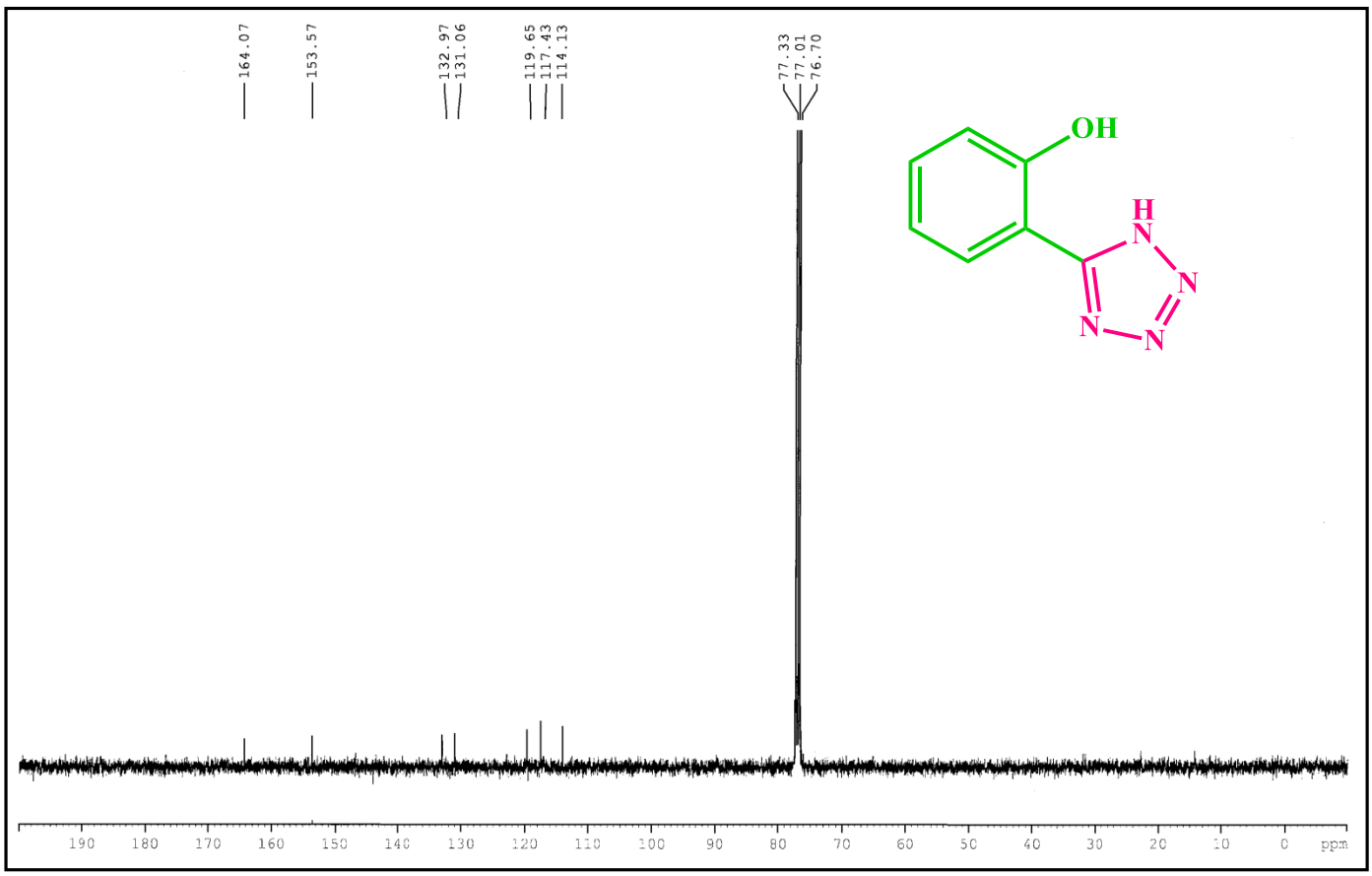
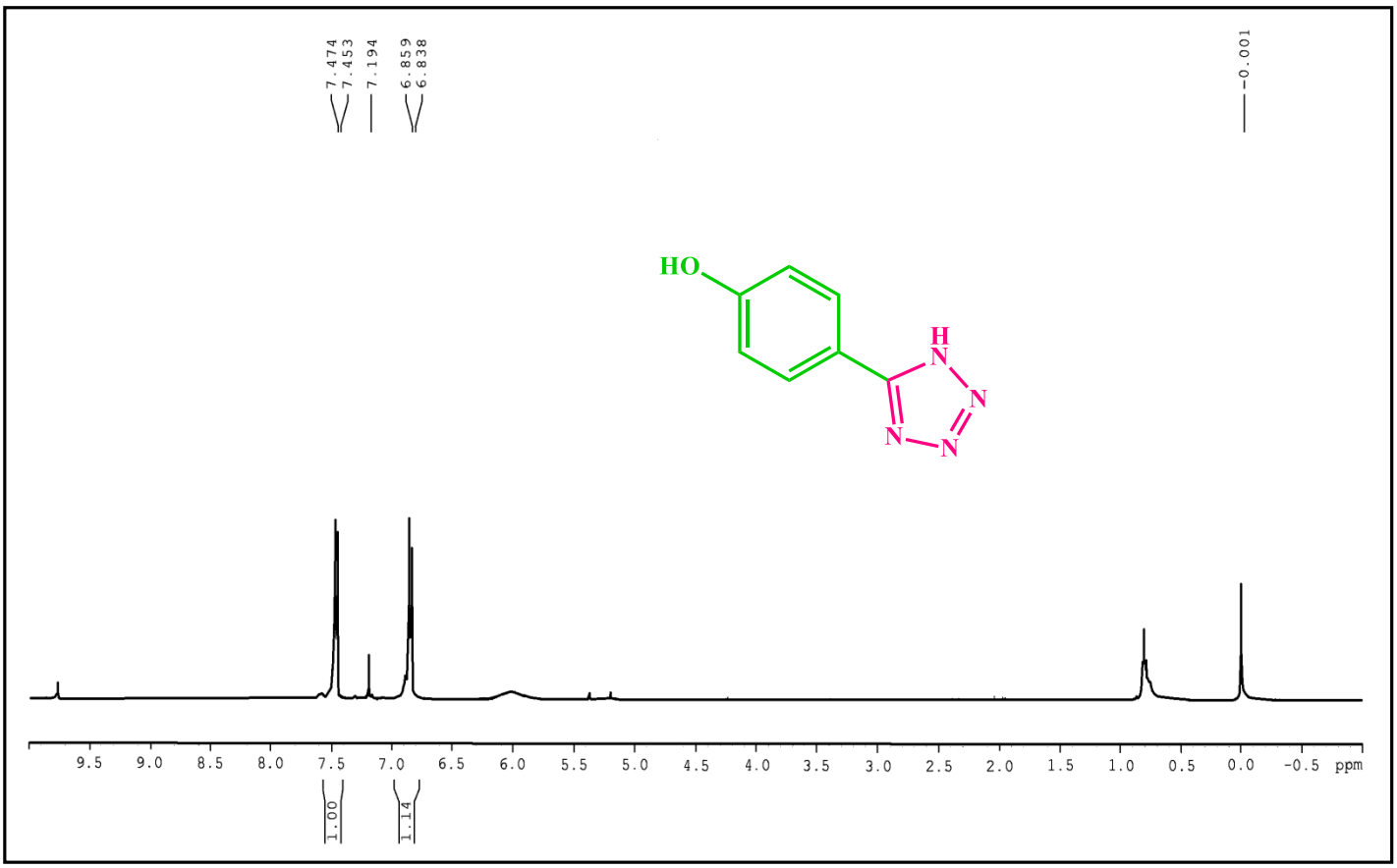


Figure S11. ^{1}H and ^{13}C NMR Spectra of 4-(1*H*-tetrazol-5-yl)phenol **(2l)**



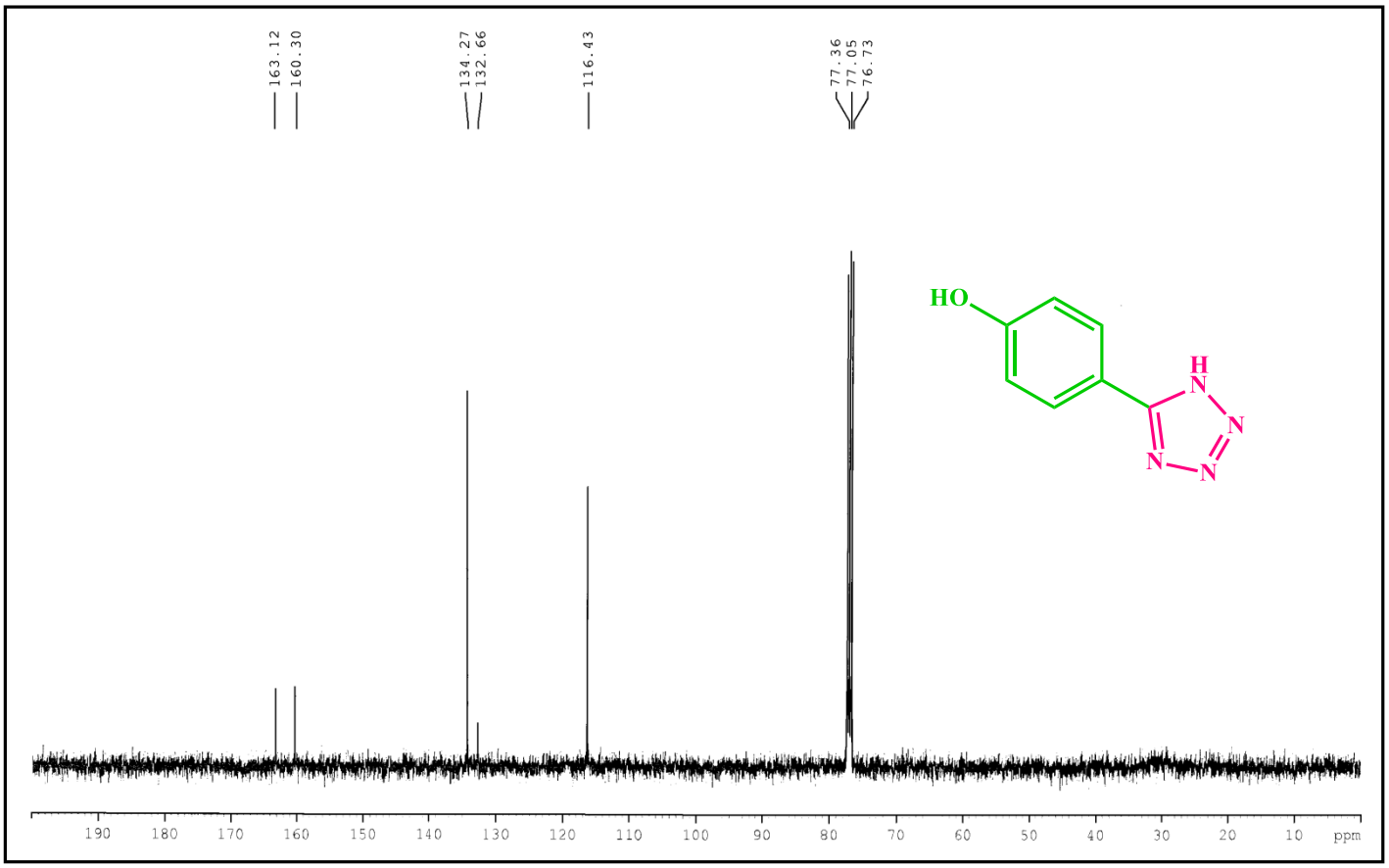
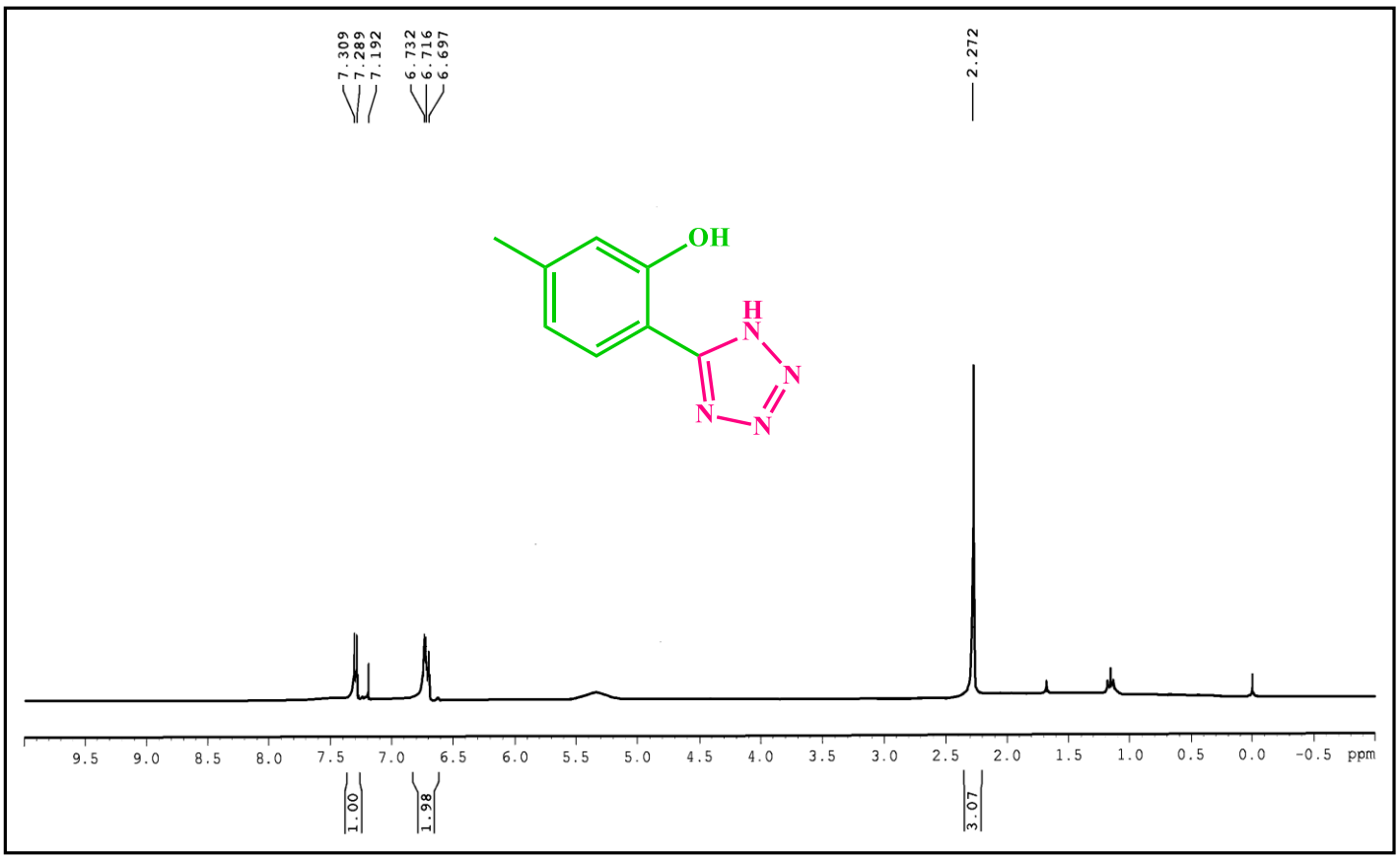


Figure S12. ^{1}H and ^{13}C NMR Spectra of 5-methyl-2-(1*H*-tetrazol-5-yl)phenol **(2m)**



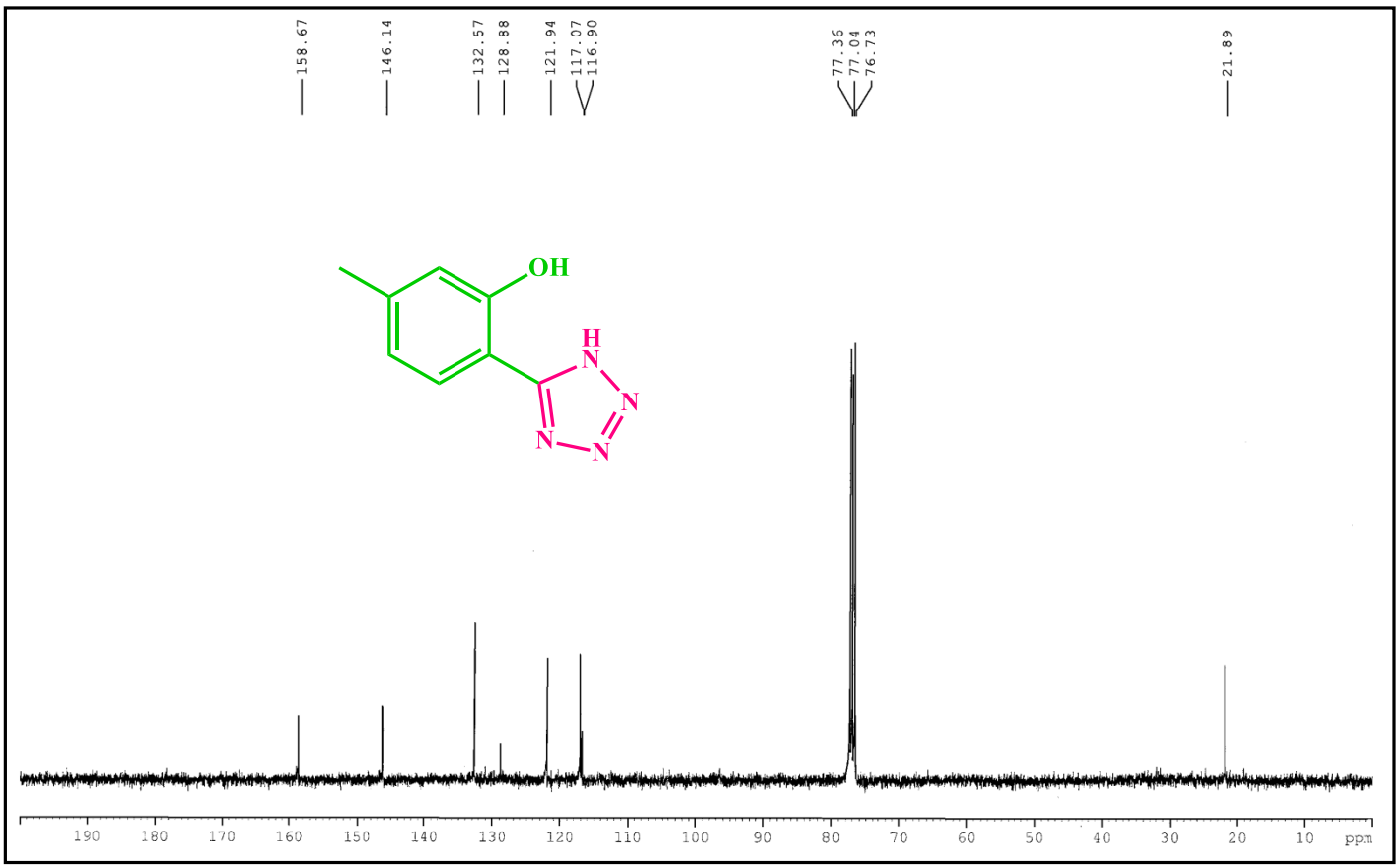


Figure S13. ^{1}H and ^{13}C NMR Spectra of 5-(furan-2-yl)-1*H*-tetrazole **(3a)**

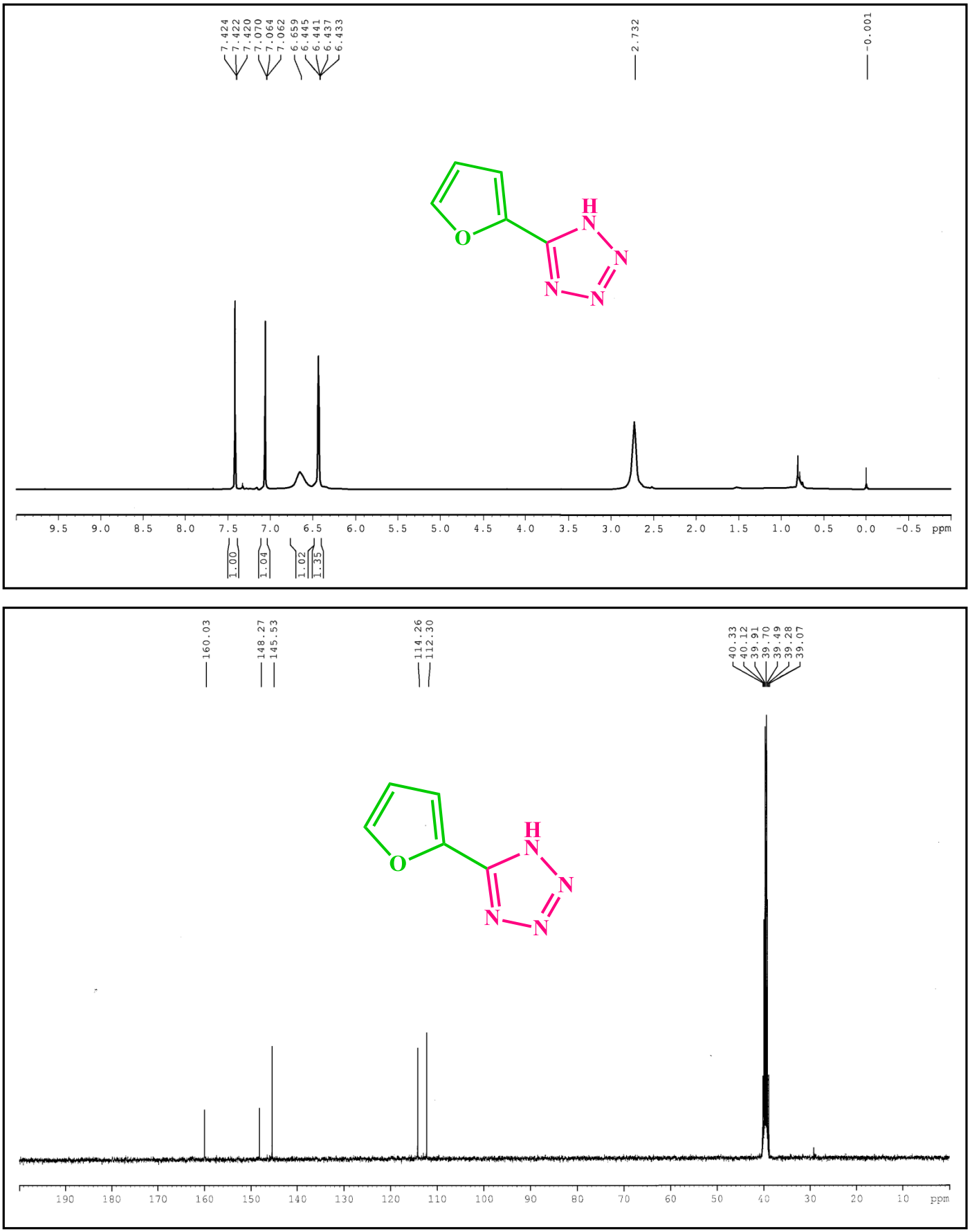
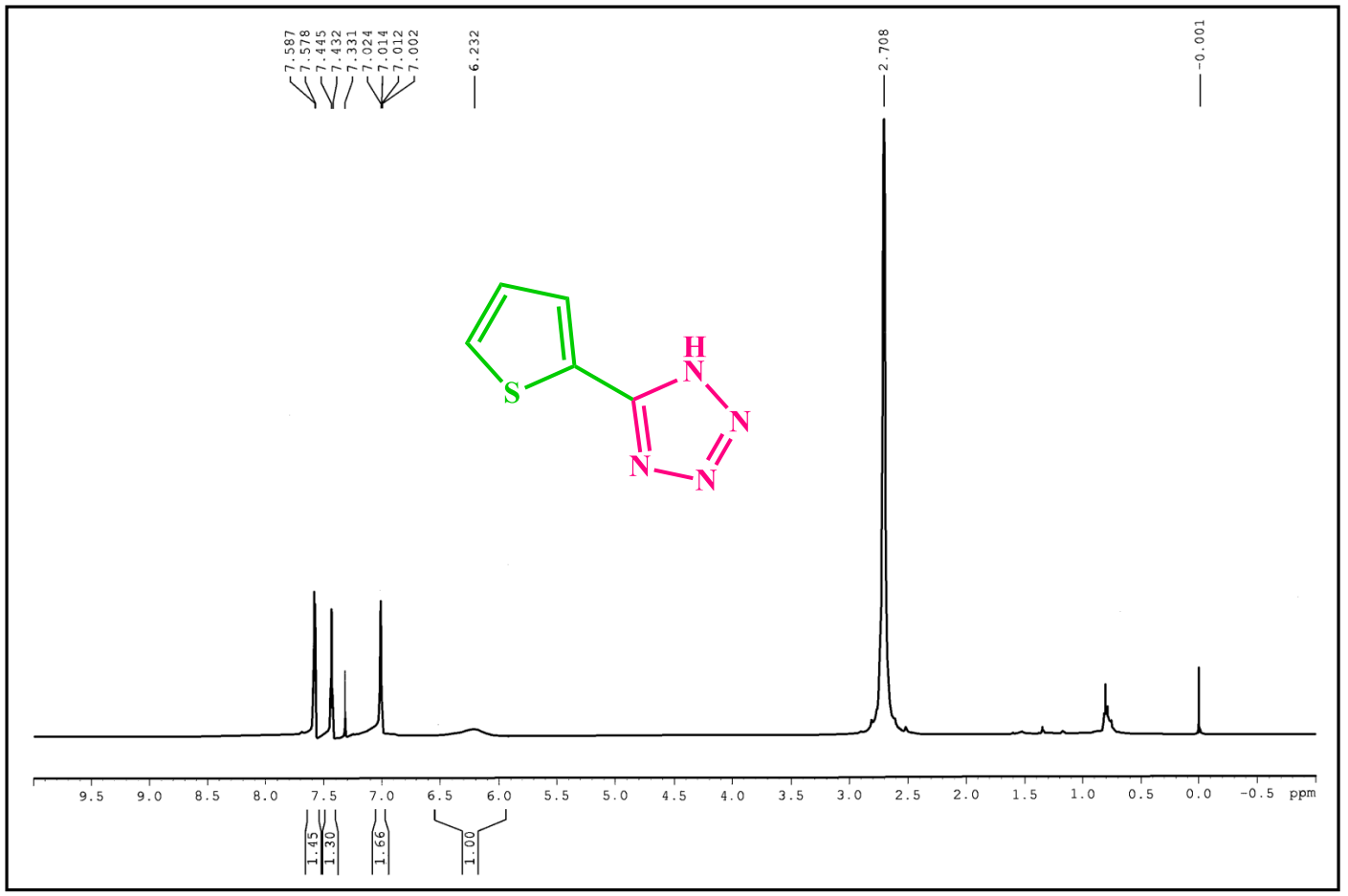


Figure S14. ^{1}H and ^{13}C NMR Spectra of 5-(thiophen-2-yl)-1*H*-tetrazole **(3b)**



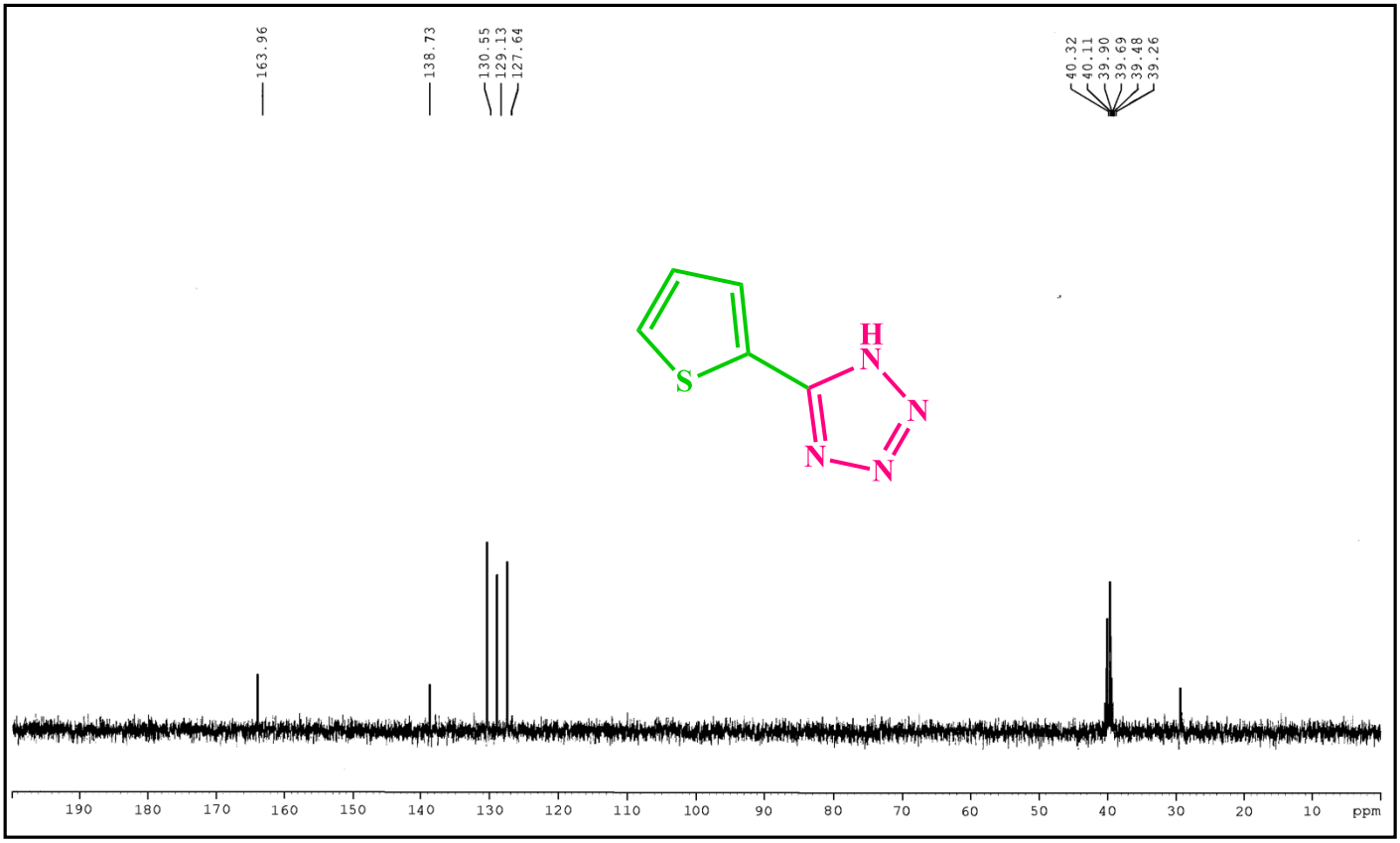


Figure S15. ^{1}H and ^{13}C NMR Spectra of 2-(1*H*-tetrazol-5-yl)pyridine **(3c)**

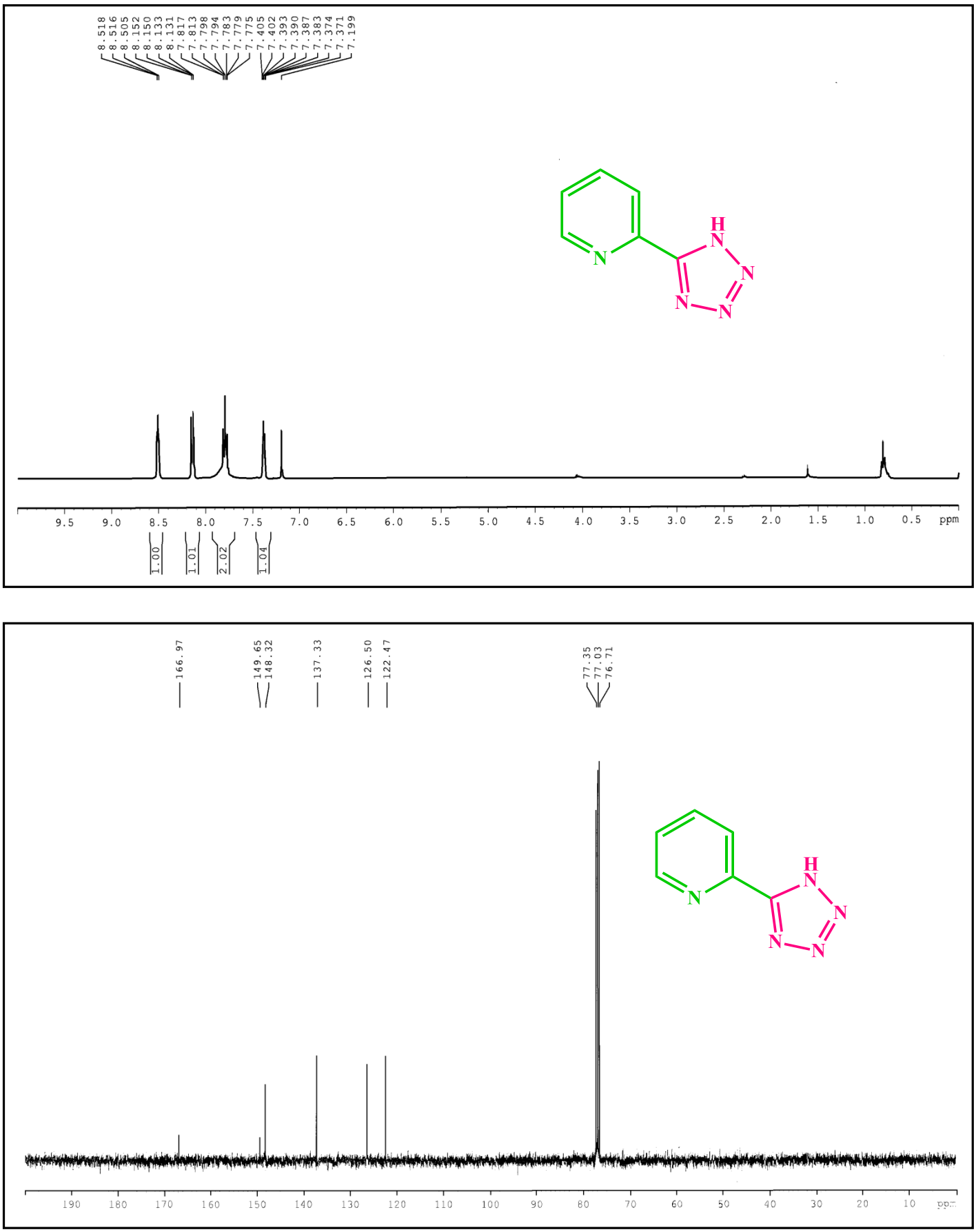
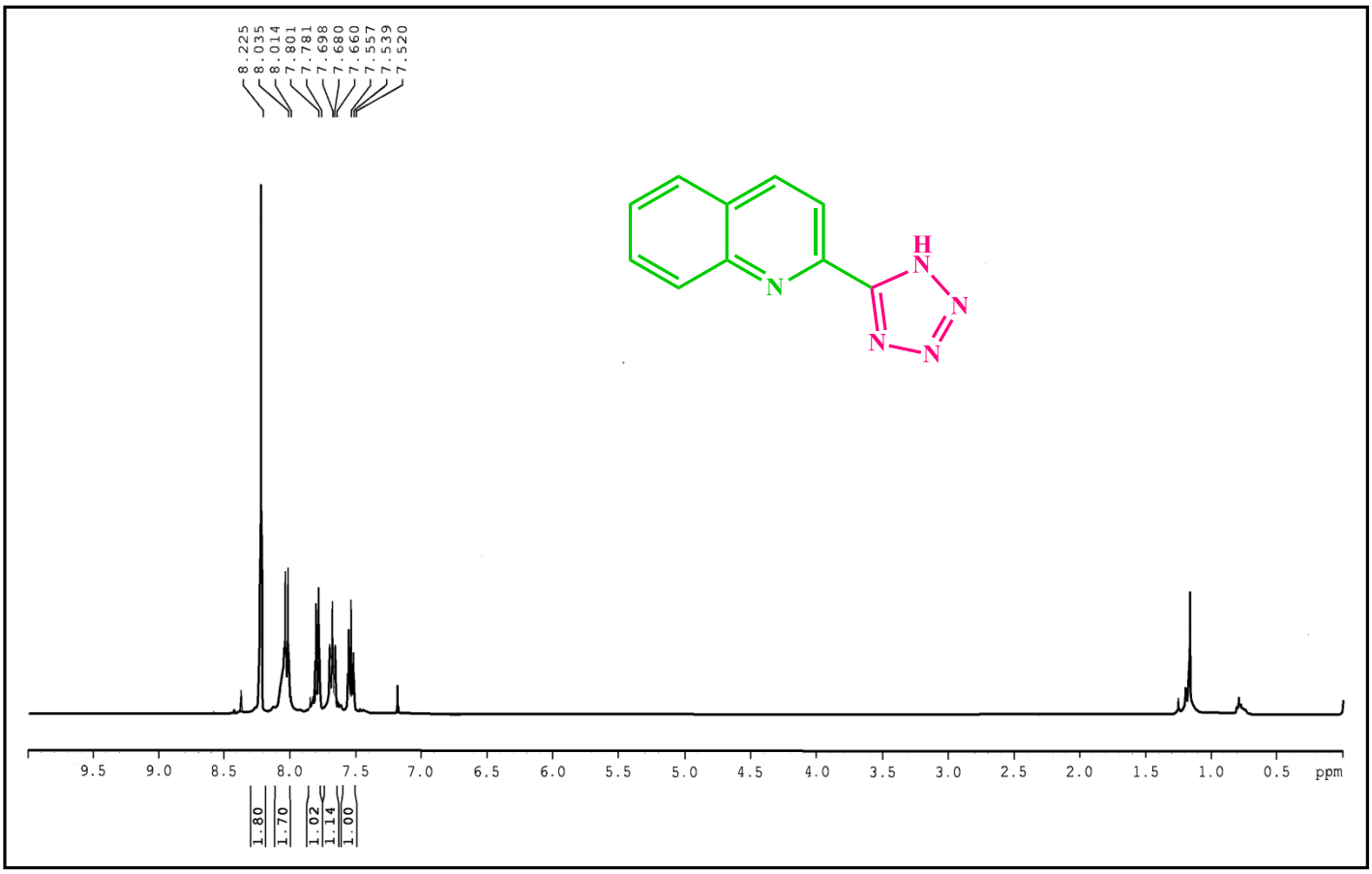


Figure S16. ^{1}H and ^{13}C NMR Spectra of 2-(1*H*-tetrazol-5-yl)quinoline **(3d)**



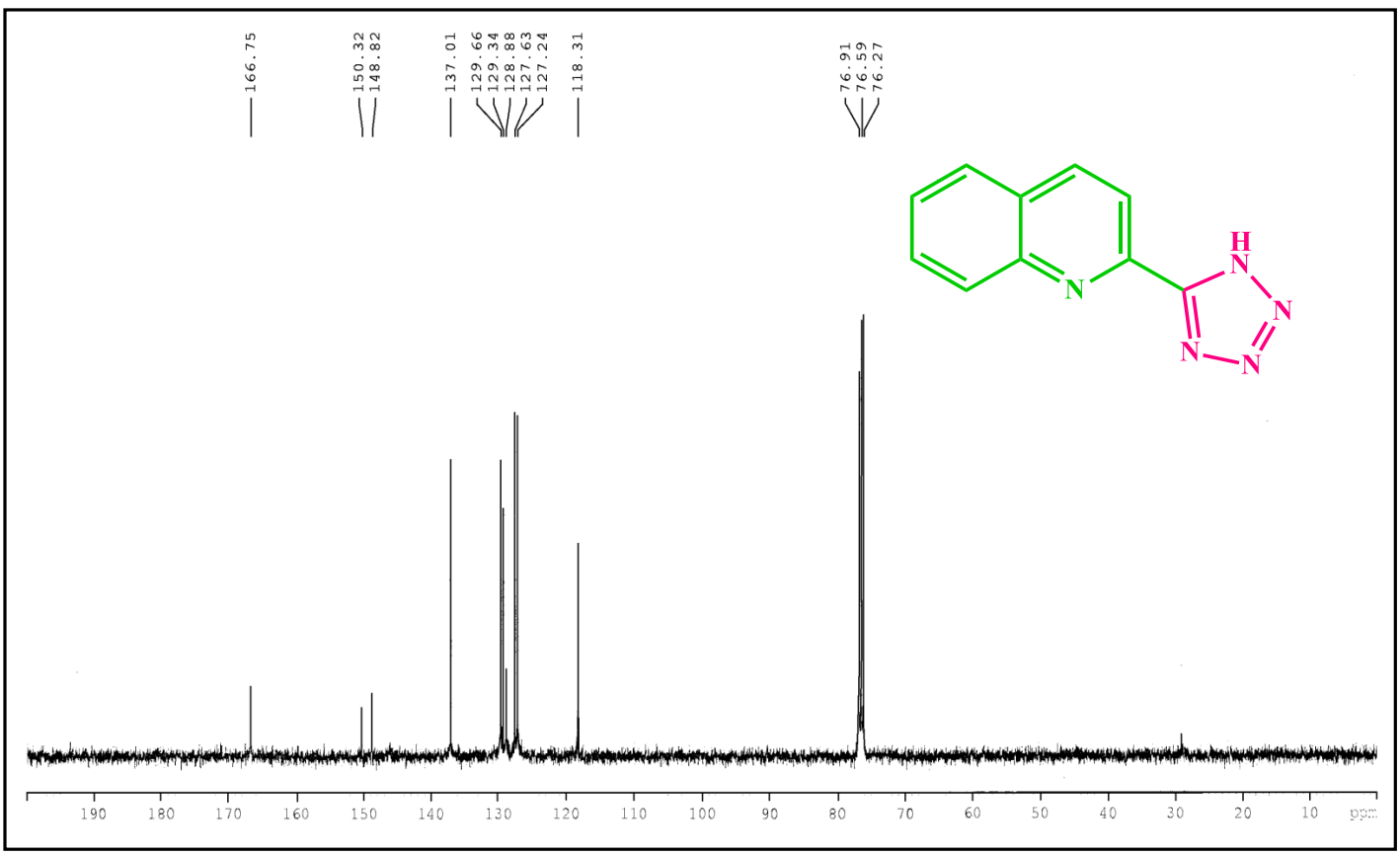
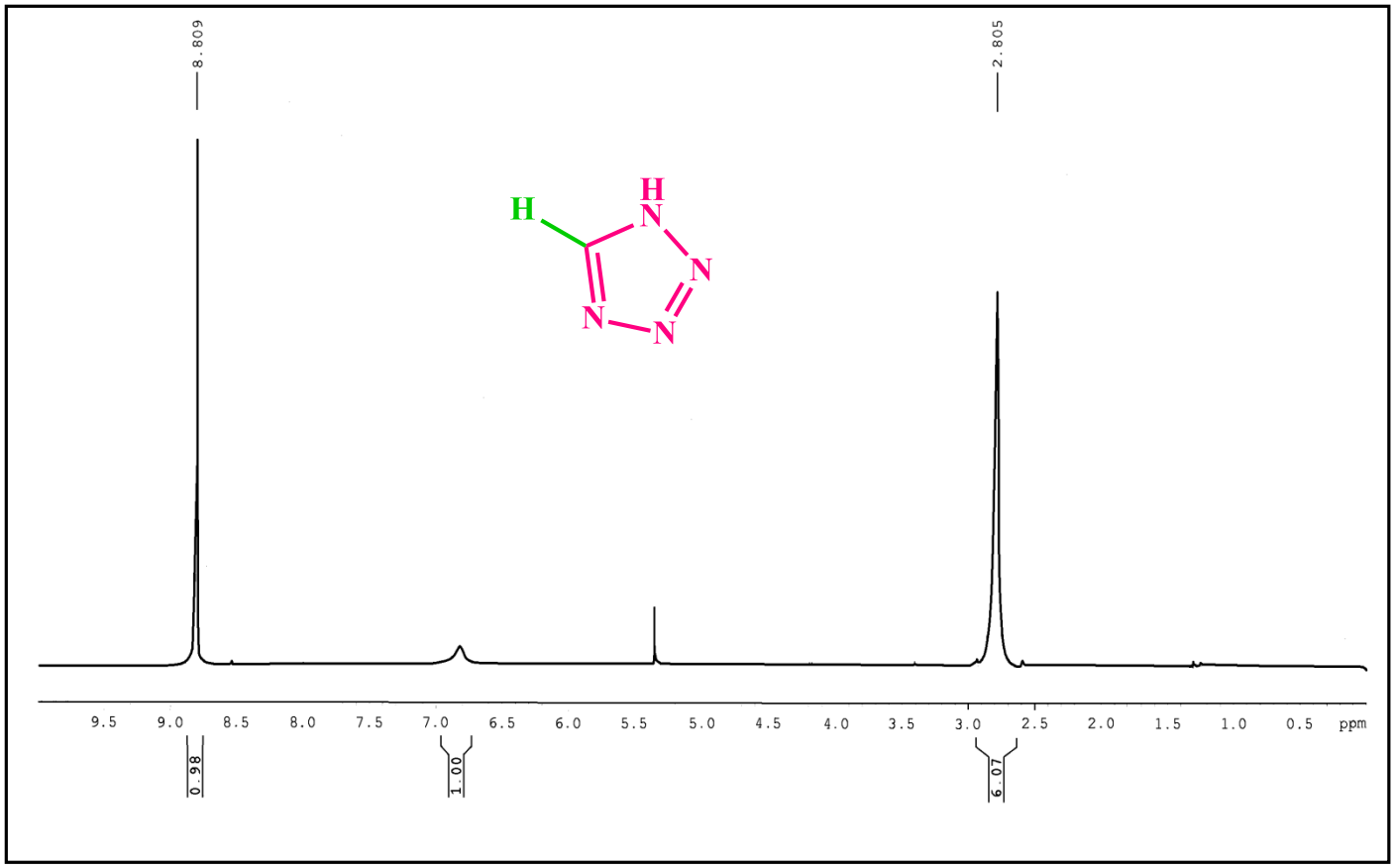


Figure S17. ^{1}H and ^{13}C NMR Spectra of 1*H*-tetrazole **(4a)**



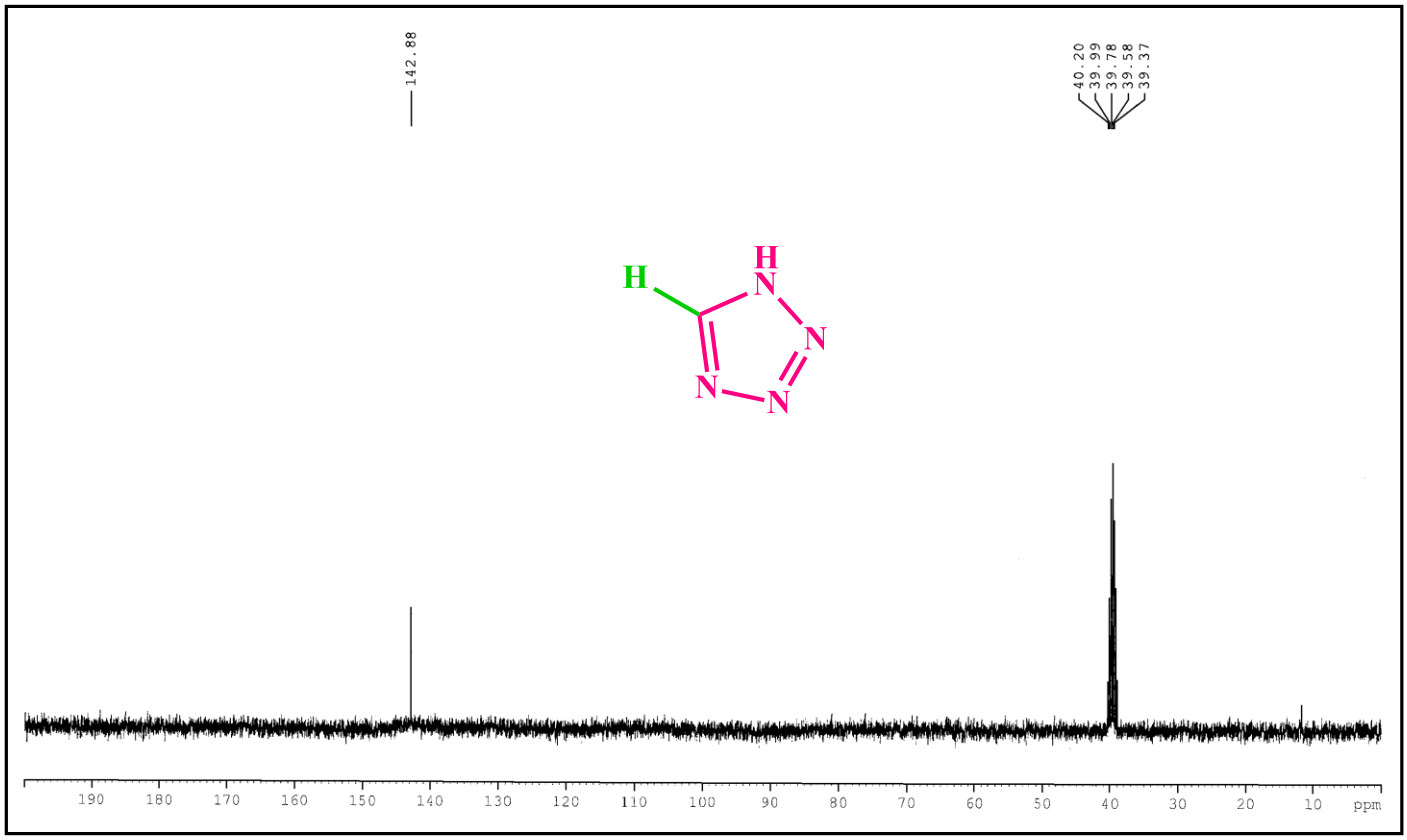
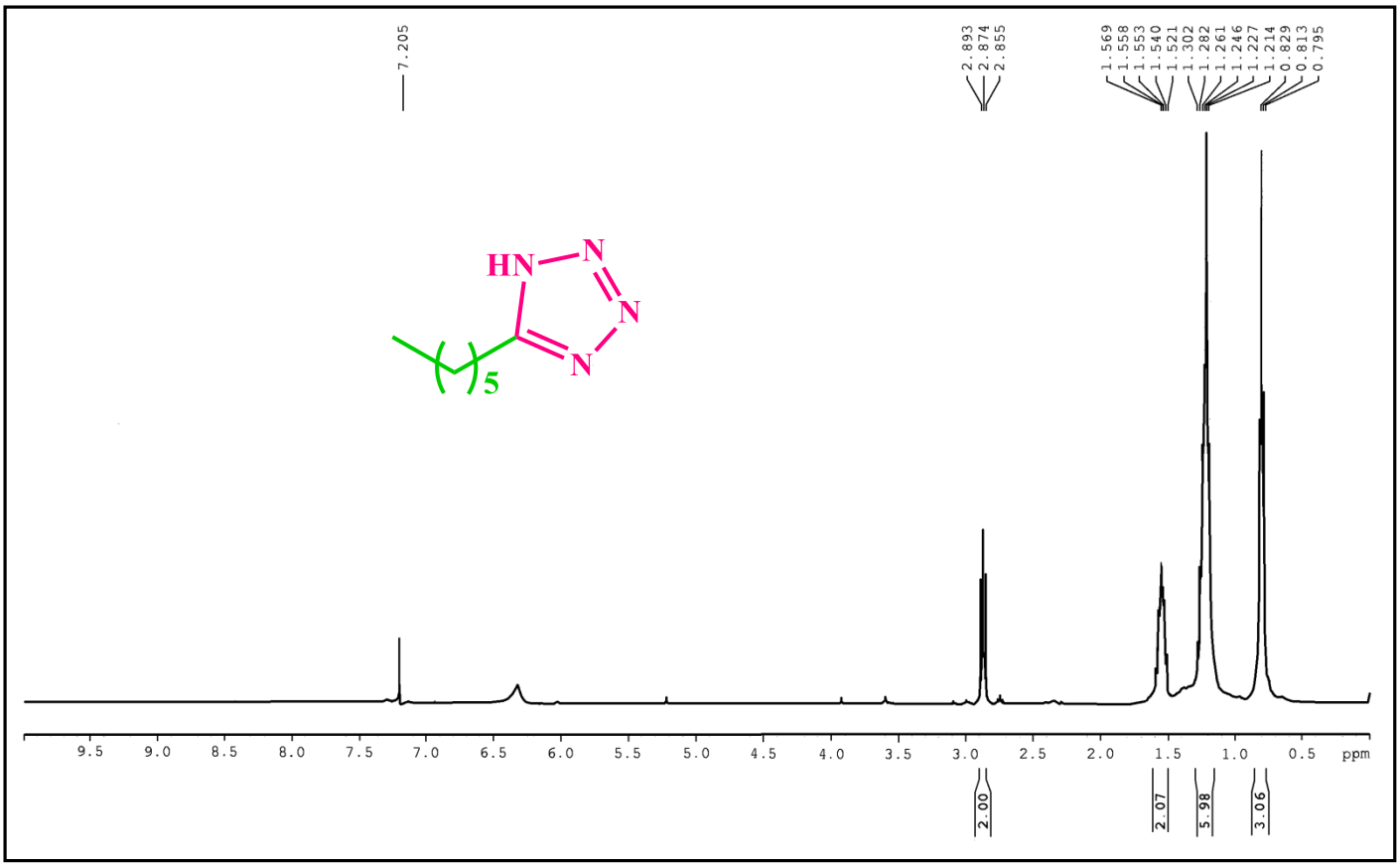


Figure S18. ^{1}H and ^{13}C NMR Spectra of 1*H*-tetrazole **(4a)**



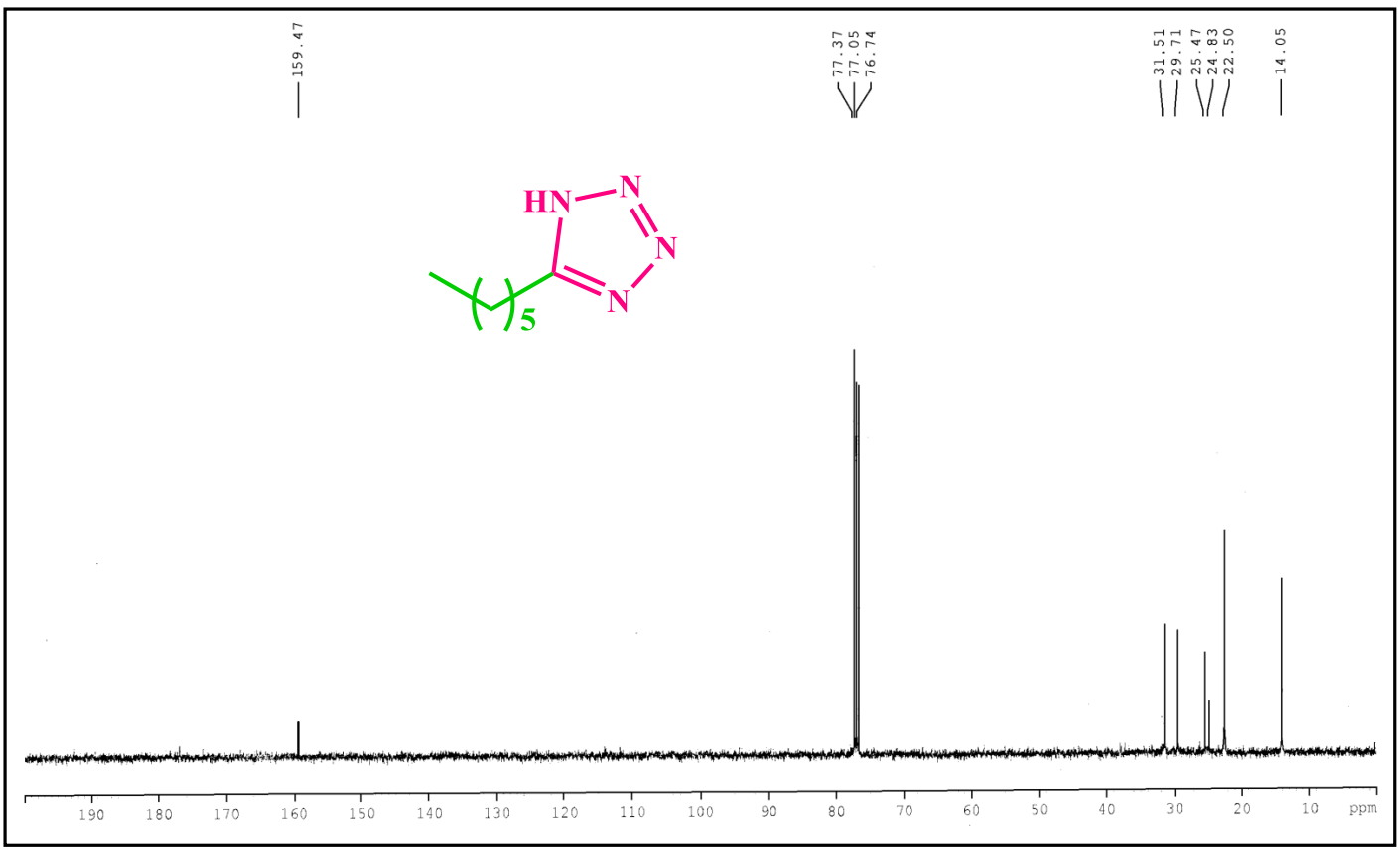
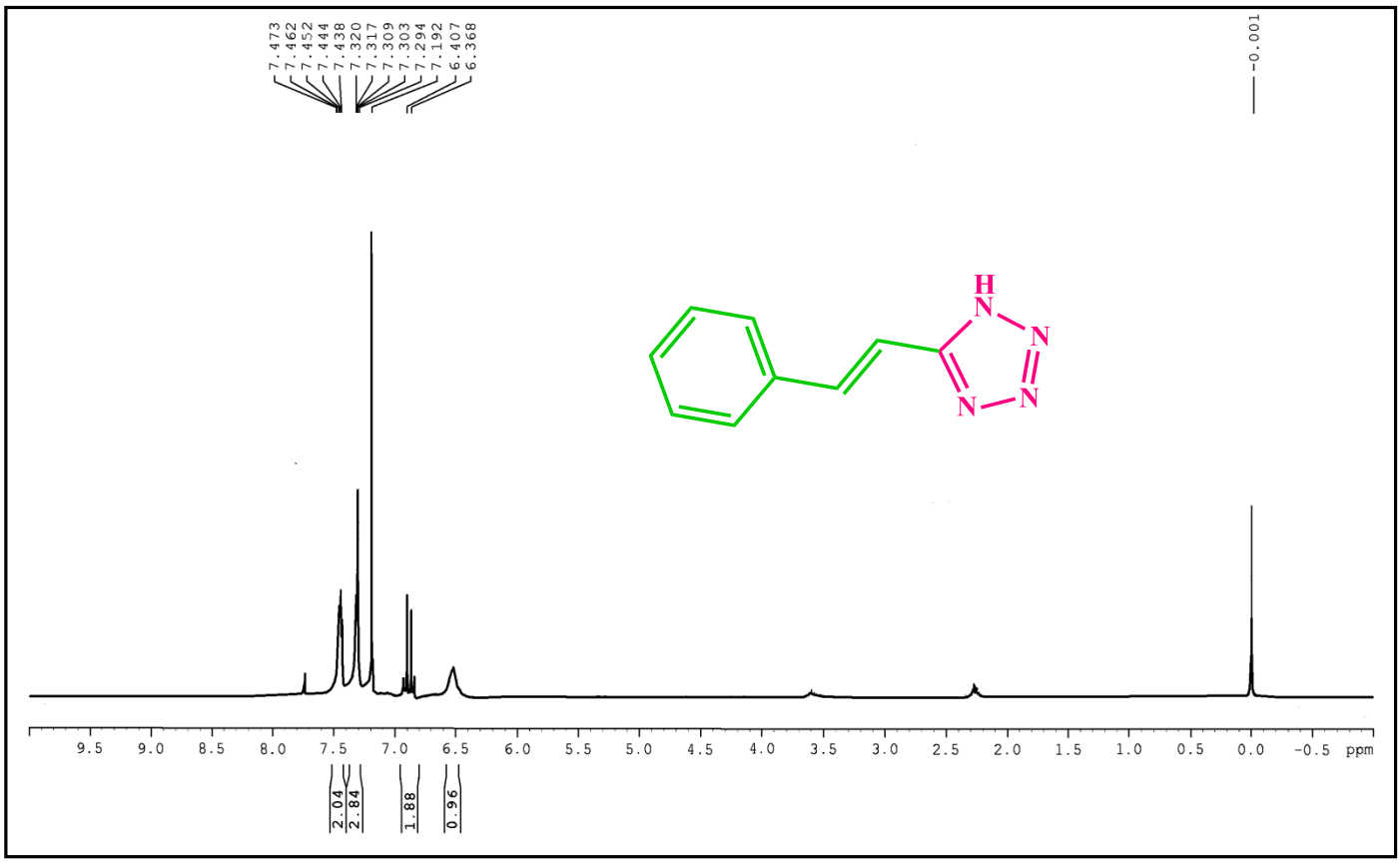


Figure S19. ^{1}H and ^{13}C NMR Spectra of (E)-5-styryl-1*H*-tetrazole **(4c)**



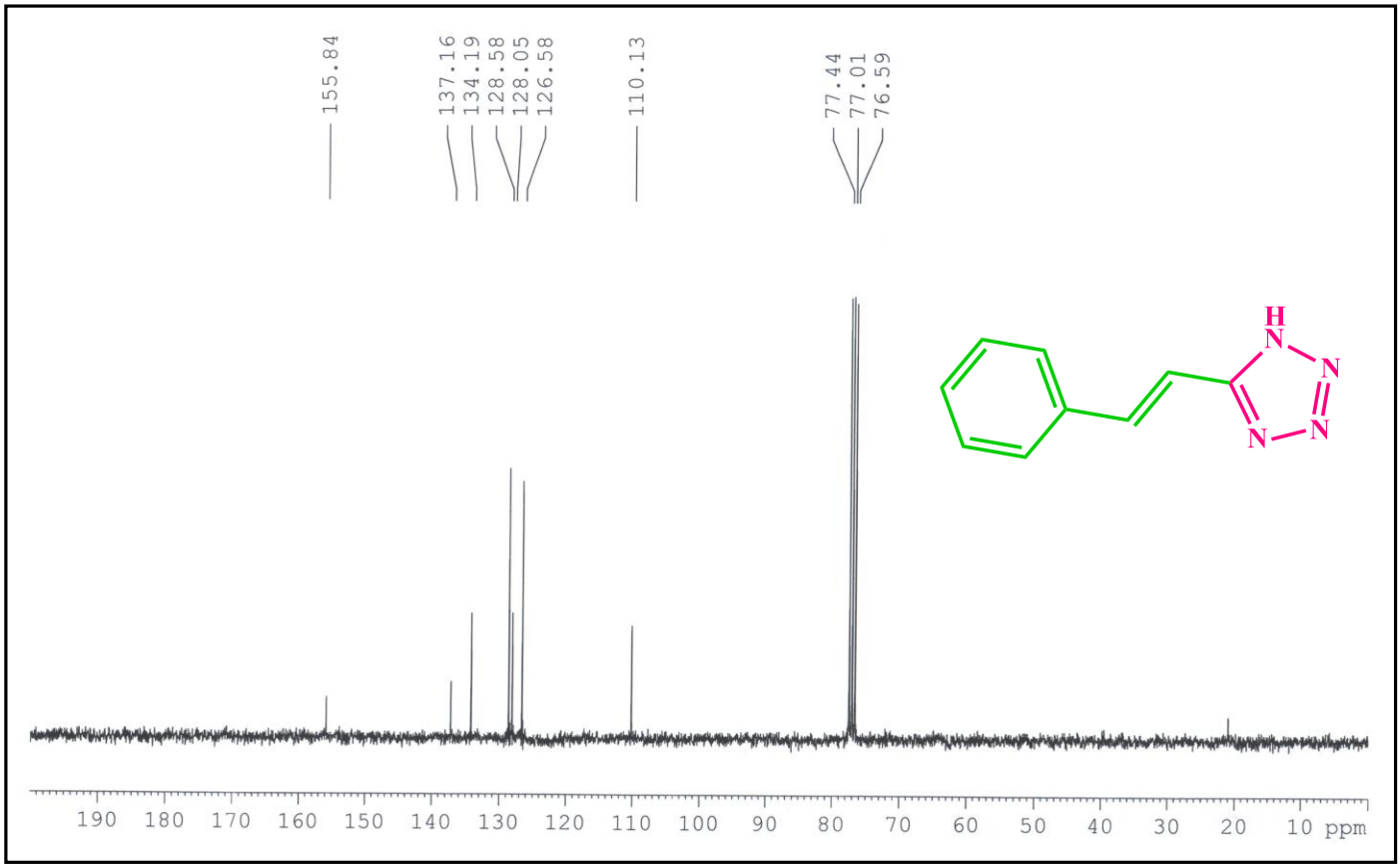


Figure S20. ^{1}H NMR Spectra of 9-(4-iodophenyl)-9*H*-carbazole (**Compound 5**)

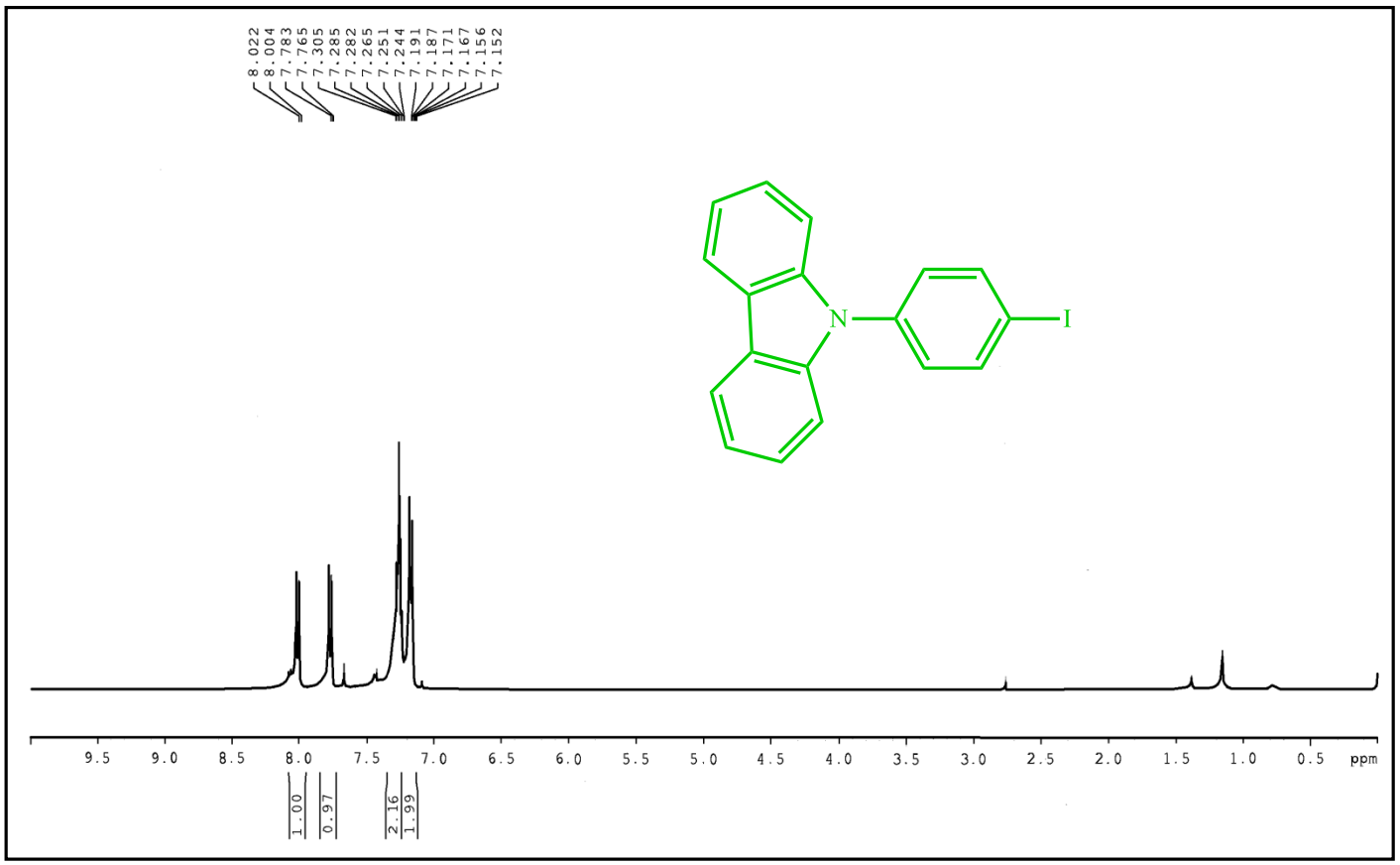
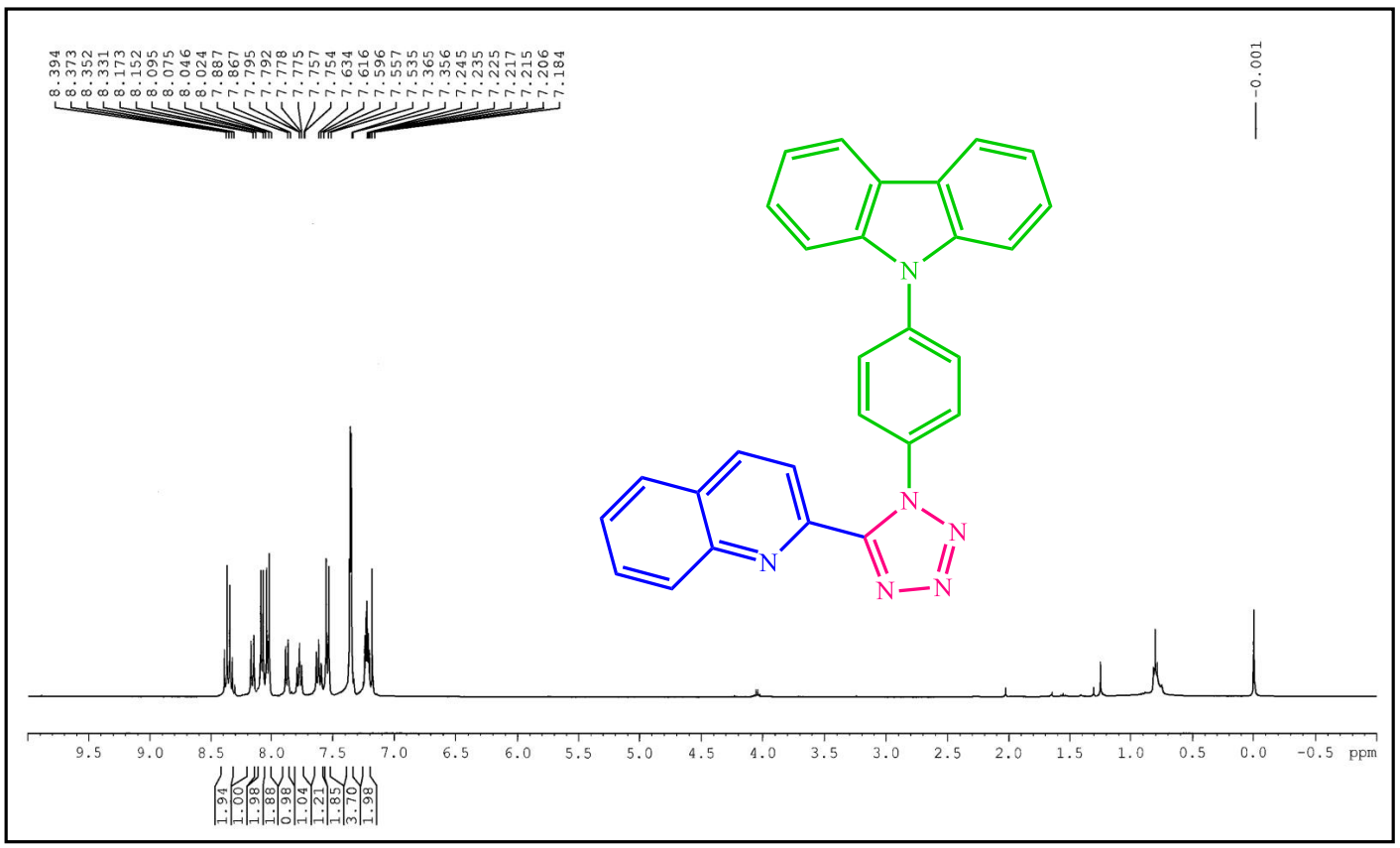


Figure S21. ^{1}H and ^{13}C NMR Spectra of 9-(4-iodophenyl)-9*H*-carbazole (**Compound 6**)



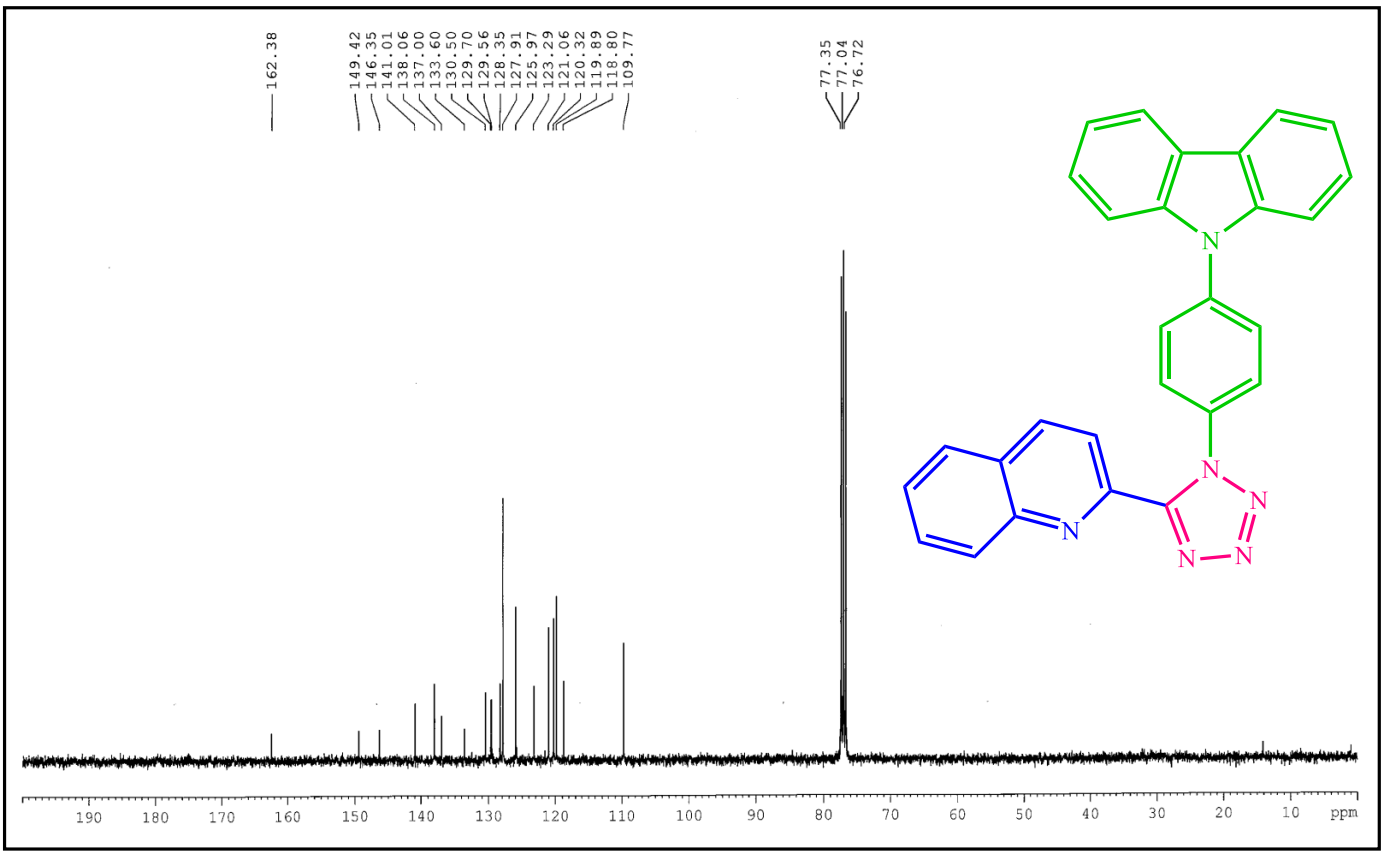


Figure S22. ESI-MS of 9-(4-iodophenyl)-9*H*-carbazole (**Compound 6**)

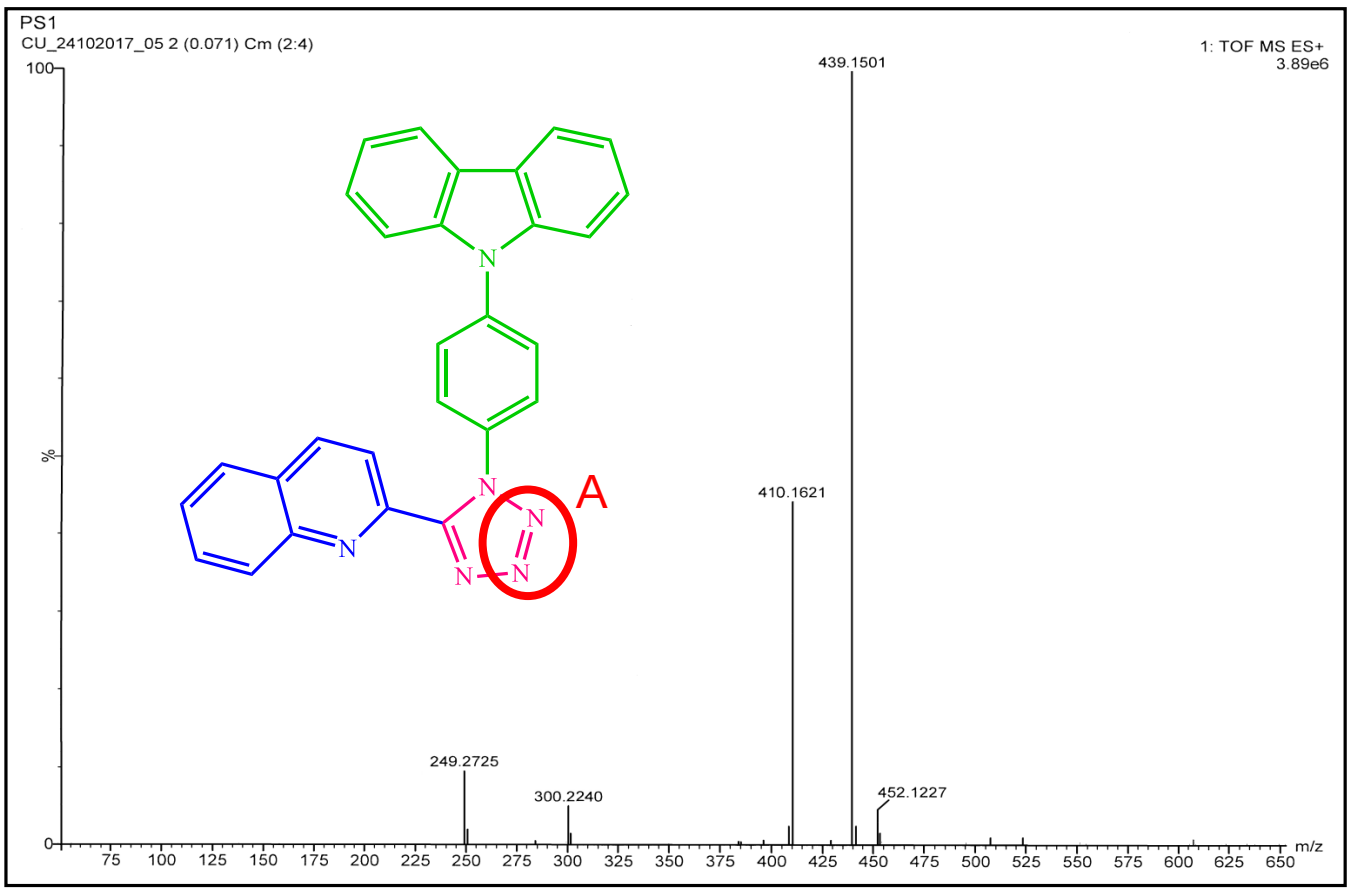


Figure S23. ESI-MS of H_2O_2 treated 9-(4-iodophenyl)-9*H*-carbazole (**Compound 6**)

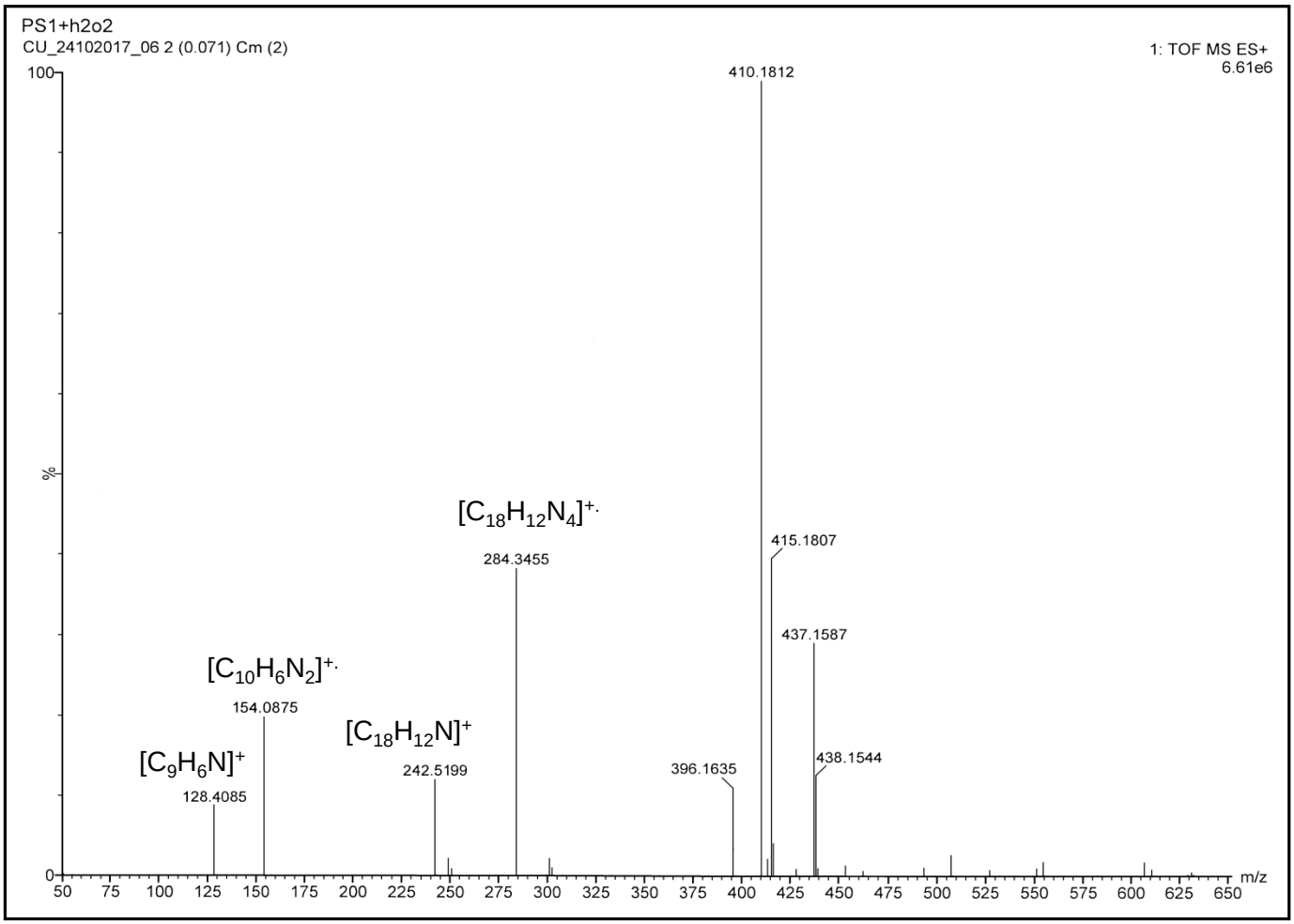


Table S1. A comparison for the detection of H_2O_2 sensing

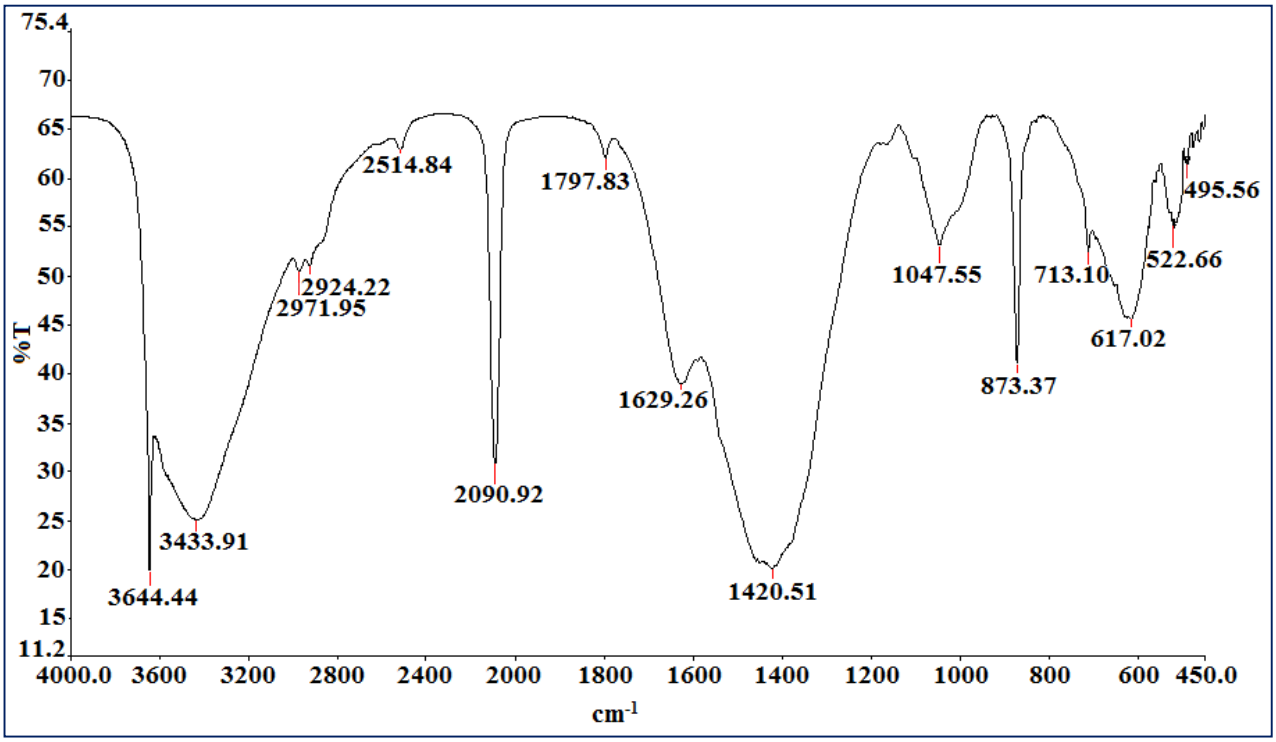
Method	LR	LOD (µM)	Ref.
Amperometry (Enzymatic Method)	0.2-3.4 mM	40	10
Amperometry (Non Enzymatic Method)	2.0-80 mM	19.6	11
Chemiluminisence (Enzymatic Method)	0.1-3.0 mM	670	12
Fl-Spectrophotometry (Non Enzymatic Method)	100-4500 µM	80	13
CDs nanoprobe-micro fluorospectrometry (Non Enzymatic Method)	20-20000 µM	5	14
SI-LOV Spectrophotometry (Enzymatic Method)	1.3-10 mM	500	15
Spectrofluorimetry (Non Enzymatic Method)	**2.4-16550 µM**	**2.22 µM**	**This work**

LR = Linear range, LOD = Limit of detection ($3 \times \sigma/s$)

Table S2. A comparison of the catalytic activity of $Ni(OH)_2$ NPs for the synthesis of 5-substituited 1*H*-tetrazoles with the previous reports.

Catalyst	Reaction Conditions	T (°C)	t (h)	Yield (%)	Ref.
$Cu(OAc)_2$ (25 mol%)	Benzaldoxime, NaN_3, DMF	120	12	98	16
$InCl_3$ (3 mol%)	Benzaldoxime, NaN_3, DMF	120	15	92	17
-	Benzaldoxime, DPPA, DBU, Toluene	110	16	93	3
β-$Ni(OH)_2$ NPs (4.32 mol%)	Benzaldoxime NaN_3, K_2CO_3, Water	reflux	10	98	This work

Figure S24. FTIR spectrum of reused catalyst.



Reference:

(1) Kazemnejadi, M.; Sardarian, A. R. Ecofriendly synthesis of a heterogeneous polyvinyl alcohol immobilized copper(II) Schiff base complex as an efficient, reusable catalyst for the one-pot three-component green preparation of 5- substituted 1*H*-tetrazoles under mild conditions. *RSC Adv*., **2016**, *6*, 91999-92006.

(2) Bonnamour, J.; Bolm. C. Iron salts in the catalyzed synthesis of 5-substituted 1*H*-tetrazoles. *Chem. Eur. J*. **2009**, *15*, 4543-4545.

(3) Ishihara, K.; Kawashima, M.; Shioiri, T.; Matsugi, M. Synthesis of 5-substituted 1*H*-tetrazoles from aldoximes using diphenyl phosphorazidate. *Synlett* **2016**, *27*, 2225-2228.

(4) Nanjundaswamy, H. M.; Abrahamse, H. Green synthesis of 5-substituted-1*H*-1,2,3,4-tetrazoles and 1-sbstituted-1*H*-1,2,3,4-tetrazoles via [3+2] cycloaddition by reusable immobilized $AlCl_3$ on γ–Al_2O_3. *Heterocycles*, **2014**, *89*, 2137-2150.

(5) Sridhar, M.; Mallu, K. K. R.; Jillella, R.; Godala, K. R.; Beeram, C. R.; Chinthala, N. One-step synthesis of 5-substituted 1*H*-tetrazoles from an aldehyde by reaction with acetohydroxamic acid and sodium azide under $Bi(OTf)_3$ catalysis. *Synthesis*, **2013**, *45*, 507-510.

(6) Aridoss, G.; Laali, K. K. Highly efficient synthesis of 5-substituted 1*H*-tetrazoles catalyzed by Cu-Zn alloy nanopowder, conversion into 1,5- and 2,5-disubstituted tetrazoles, and synthesis and NMR studies of new tetrazolium ionic liquids. *Eur. J. Org. Chem*. **2011**, *2011*, 6343-6355.

(7) Abdollahi-Alieik, M.; Moaddeli, A. Cu-MCM-41 nanoparticles: An efficient catalyst for the synthesis of 5-substituted 1*H*-tetrazoles via [3+2] cycloaddition reaction of nitriles and sodium azide. *J. Chem. Sci*. **2016**, *128*, 93-99.

(8) Klapötke, T. M.; Stein, M.; Stierstorfer, J. Salts of 1*H*-tetrazole - synthesis, characterization and properties. *Z. Anorg. Allg. Chem*. **2008**, *634*, 1711-1723.

(9) Demko, Z. P.; Sharpless, K. B. Preparation of 5-substituted 1*H*-tetrazoles from nitriles in water. *J. Org. Chem*. **2001**, *66*, 7945-7950.

(10) Kozan, J. V. B.; Silva, R. P.; Serrano, S. H. P.; Lima, A. W. O.; Angnes, L. Biosensing hydrogen peroxide utilizing carbon paste electrodes containing peroxidases naturally immobilized on coconut (Cocus nuciferaL.) fibers. *Anal. Chim. Acta*., **2007,** *591*, 200-207.

(11) Marimuthu, T.; Mahmoudian, M. R.; Mohamad, S.; Alias, Y. Synthesis and characterization of non-enzymatic hydrogen peroxide sensor of polypyrrole coated cobalt nanocomposites. *Sens. Actuators B.*, **2014,** *202*, 1037-1043.

(12) Díaz, A. N.; Peinado, M. C. R.; Minguez, M. C. T. Sol–gel horseradish peroxidase biosensor for hydrogen peroxide detection by chemiluminescence. *Anal. Chim. Acta*., **1998,** *363*, 221-227.

(13) Ribeiro, J. P. N.; Segundo, M. A.; Reis, S.; Lima, J. L. F. C. Spectrophotometric FIA methods for determination of hydrogen peroxide: Application to evaluation of scavenging capacity. *Talanta*. **2009,** *79*, 1169-1176.

(14) Costas-Mora, I.; Romero, V.; Lavilla, I.; Bendicho, C. In situ photochemical synthesis of fluorescent carbon dots for optical sensing of hydrogen peroxide and antioxidants. *Talanta*. **2015,** *144*, 1308-1315.

(15) Vidigal, S. S. M. P.; Tóth, I. V.; Rangel, A. O. S. S. Sequential injection lab-on-valve system for the on-line monitoring of hydrogen peroxide in lens care solutions. *Microchem. J.* **2009,** *91*, 197-201.

(16) Patil, U. B.; Kumthekar, K. R.; Negarkar, J. M. A novel method for the synthesis of 5-substituted 1*H*-tetrazole from oxime and sodium azide. *Tetrahedron Lett*. **2012**, *53*, 3706-3709.

(17) Guggilapu, S. D.; Prajapti, S. K.; Nagarsenkar, A.; Gupta, K. K.; Babu, B. N. Indium(III) chloride catalyzed synthesis of 5-substituted 1*H*-tetrazoles from oximes and sodium azide. *Synlett*. **2016**, *27*, 1241-1244.