

Highly Efficient Three-Component Coupling Reaction Catalyzed by Gold Nanoparticles Supported on Periodic Mesoporous Organosilica with Ionic Liquid Framework

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1. Experimental Section

1.1. General

Sodium tetrachloro Aureate dihydrate ($\text{NaAuCl}_4 \cdot 2\text{H}_2\text{O}$), Sodium Hydride 95%, Pluronic P123 ($\text{EO}_{20}\text{PO}_{70}\text{EO}_{20}$) and tetramethoxyorthosilicate (TMOS) were obtained from Aldrich. Imidazole and 3-chloropropyl-trimethoxysilan were purchased from Merck. Imidazole was crystallized in distilled CH_2Cl_2 and dried in desiccator under vacuum for 3 days before use.

1.2. Synthesis of ionic liquid precursor

The ionic liquid precursor was prepared using our last synthetic report with slightly modification^{1,2}. In a typical experiment, a suspension of sodium imidazolide in dry THF was prepared from reaction between dried imidazole (2 g) and NaH 95% (0.77 g) at a flame-dried two necks flask containing dry THF (60 ml) under argon atmosphere. 3-chloropropyl-trimethoxysilan (5.4 ml) was added to the mentioned stirred suspension and was refluxed for 30h. Then the reaction mixture is cooled to room temperature and the solvent removed by reduced pressure until the oil containing NaCl obtained. Then 3-chloropropyl-trimethoxysilan (5.4 ml) and dry toluene (60 ml) was added and refluxed for 48h. After cooling the reaction mixture to room temperature, toluene phase was separated by a clean syringe. Dry CH_2Cl_2 was added for removal of precipitated NaCl. Then, CH_2Cl_2 phase was transferred to another well-dried two necks flask. CH_2Cl_2 was removed by reduced pressure until ionic liquid and unreacted starting materials obtained. Finally, ionic liquid was washed by dry toluene for removal of starting materials.

1.3. Synthesis of PMO containing ionic liquid, PMO-IL

PMO-IL was synthesized according to our last methods, too.^{1,2} For a typical synthesis, a molar ratio 0.013 P123: 26.515 H_2O : 5.300 KCl: 4.200 HCl: 1.000 Si was used. The first, Pluronic P123 (1.67g) was dissolved in a mixture of H_2O (10.5g) and HCl, (2M, 46.14g). Then KCl (8.8 g) was added and system stirred until a homogenous solution obtained. A

pre-mixture of ionic liquid (0.86 g) and tetramethoxyorthosilicate (2.74g) in dry methanol was added to mentioned solution and stirred at 40 °C for 24 h. The resulting mixture was aged without stirring at 100 °C for 72h. The obtained PMO with surfactant was filtered and washed with deionized water, and dried at room temperature. The surfactant was extracted from the PMO-IL by a Soxhlet apparatus by using ethanol (100 ml) and *c*-HCl (3 ml). In a typical extraction, as synthesized PMO (1g) washed four times with acidic ethanols over 12 h.

1.4. Preparation of Au@PMO-IL catalyst

Au@PMO-IL was prepared based on simple ion exchange technique according to literature procedure.³ For atypical method, PMO-IL (0.5g, 1.0 mmol IL g⁻¹) was added to 10 ml of deionized water and sonicated for at least 10 min. NaAuCl₄ · 2H₂O (0.034 g, 0.085 mmol) as Au precursor dissolved in 3 ml of deionized water and gradually was added to mentioned suspension and stirred at room temperature for 5 h. The resulted system was filtered and washed with deionized water (3×10 ml) and acetone (2×10 ml) respectively. The resulted yellow solid which is Au@PMO-IL dried at room temperature under vacuity. Loading of Au catalyst was determined 0.16 mmol Au g⁻¹ by atomic absorption spectroscopy (AAS).

1.5. General procedure for three-component coupling reaction of aldehyde, alkynes and amines

Au@PMO-IL (12 mg) was added to the mixture of aldehyde (1mmol), amine (1.2 mmol) and Alkyne (1.3mmol) in 5 ml CHCl₃. The reaction mixture was stirred for appropriate reaction time at room temperature. After completion of reaction, CHCl₃ was evaporated and crude product was purified using column chromatography on silica gel (EtOAc/*n*-hexane).

1.6. Typical procedure for recycling of catalyst

After completion of the reaction of *p*-tolualdehyde (1mmo) with phenyl acetylene (1.3 mmol) and piperidine (1.2 mmol), reaction mixture was centrifuged and solid

catalyst was washed with diethyl ether (2×5 mL), dried and reused for the similar reaction.

Reference

- [1] Karimi, B.; Elhamifar, D.; Clark, J. H.; Hunt, A. J. *Chem. Eur. J.* **2010**, *16*, 8047-8053
- [2] Karimi, B.; Elhamifar, D.; Clark, J. H.; Hunt, A. J. *Org. Biomol. Chem.* **2011**, *9*, 7420-7426.
- [3] Karimi, B.; Ghoreishi-Nezhad, M.; Clark, J. H. *Org. Lett.* **2005**, *7*, 625-628

2. Characterizations of catalyst

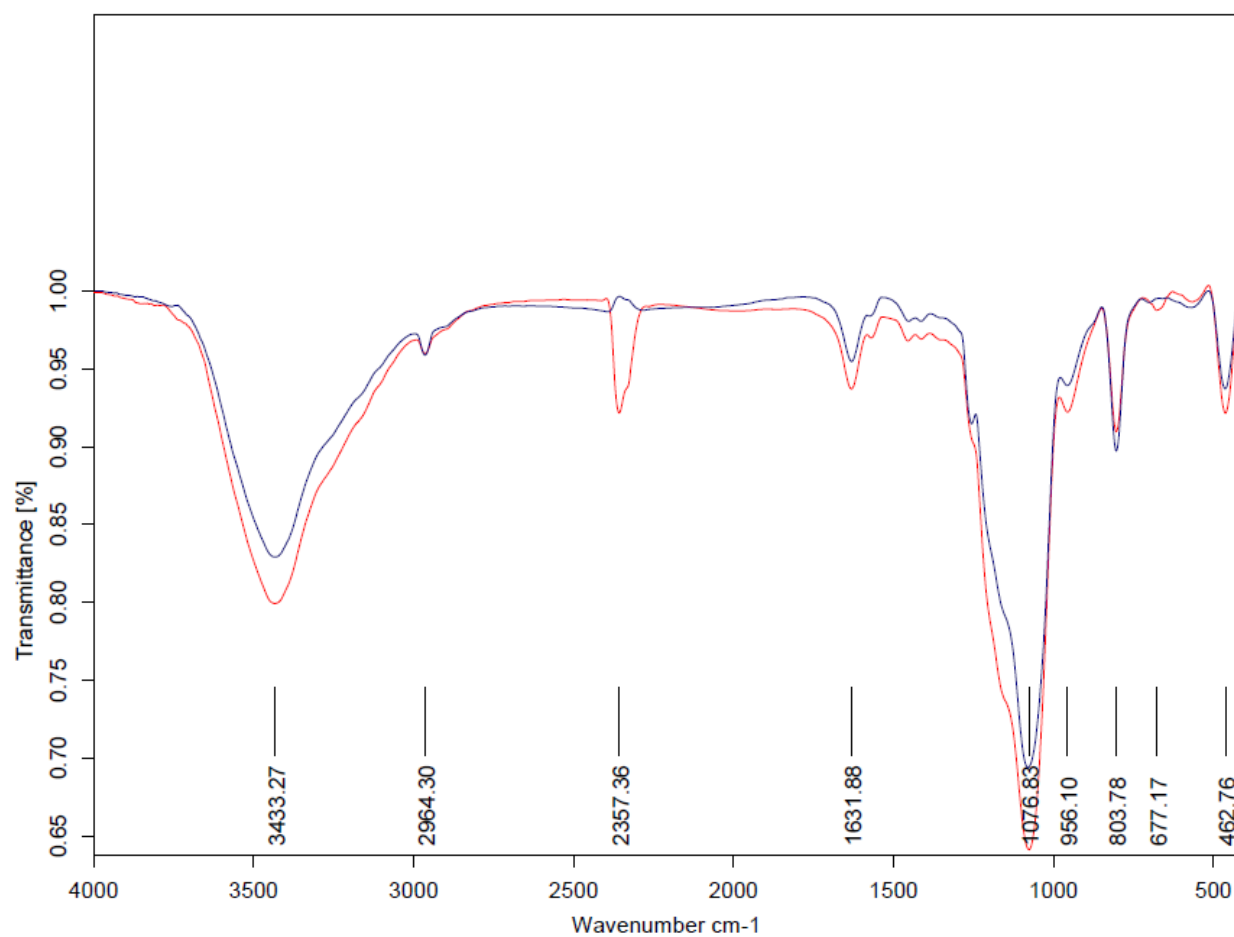


Fig. 1S. FT-IR spectrum for PMO-IL (blue) and Au@PMO-IL (red)

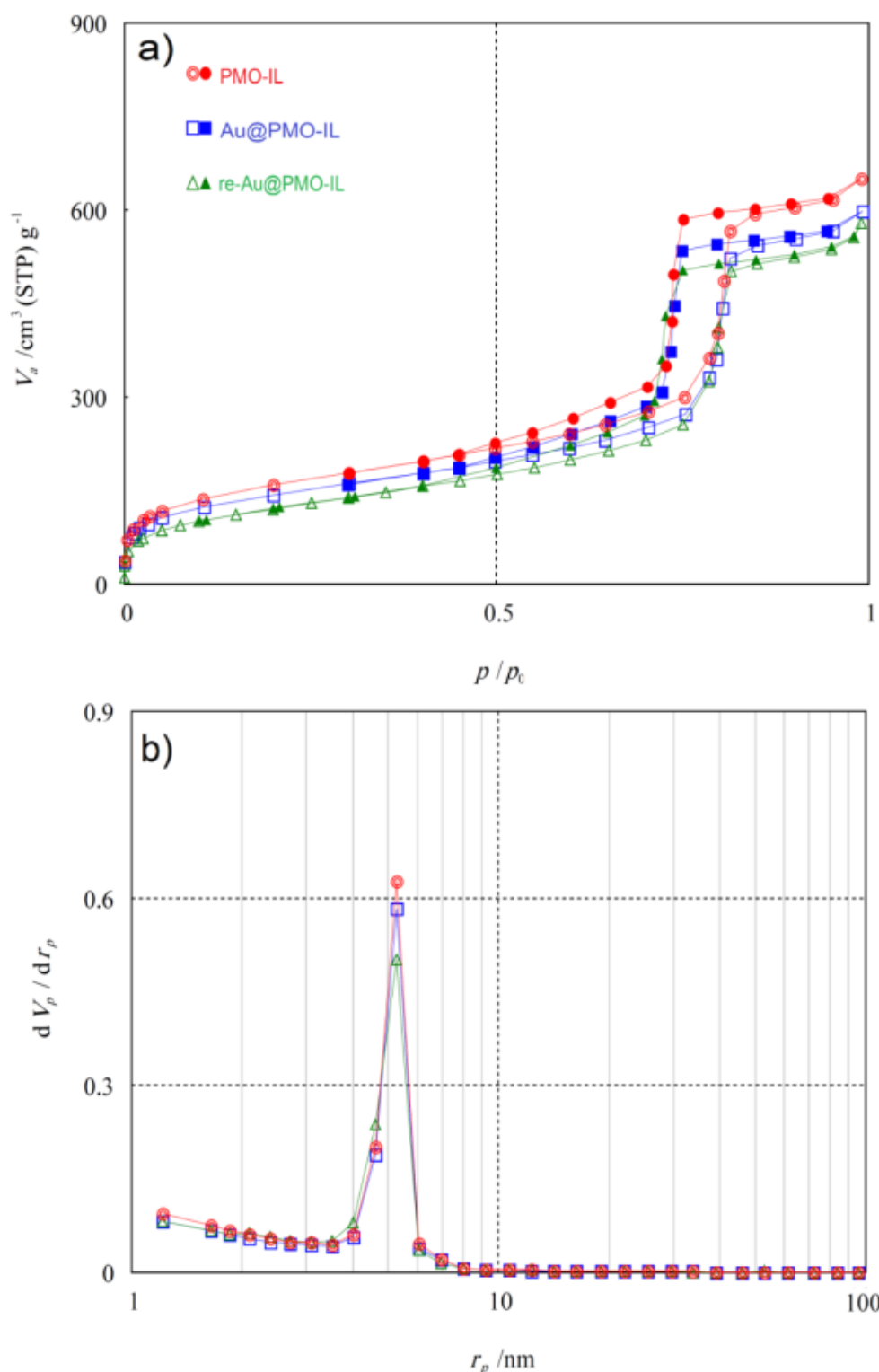


Fig.2S. Nitrogen adsorption-desorption isotherms (a) and pore size distributions (b) of the PMO-IL , Au@PMO-IL and recovered catalyst (re-Au@PMO-IL) after 3rd reaction cycle

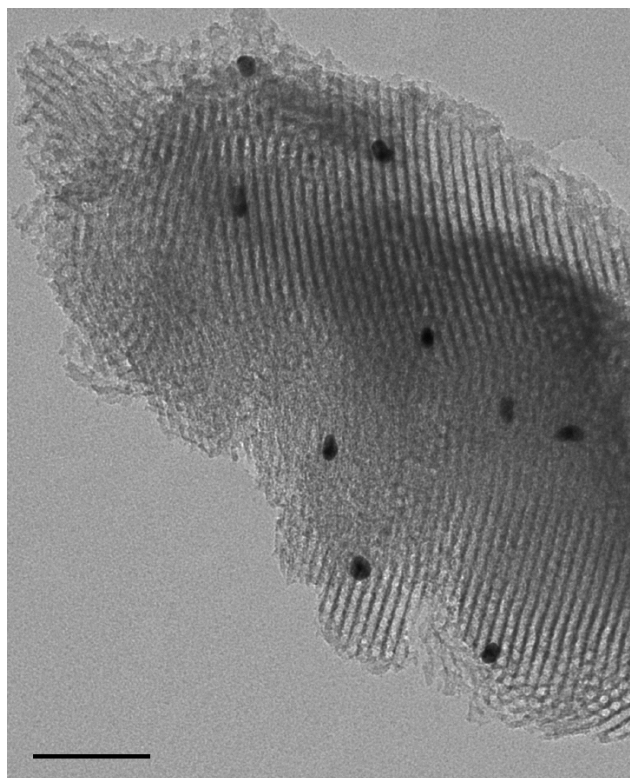


Fig. 3S. TEM image of the fresh Au@PMO-IL

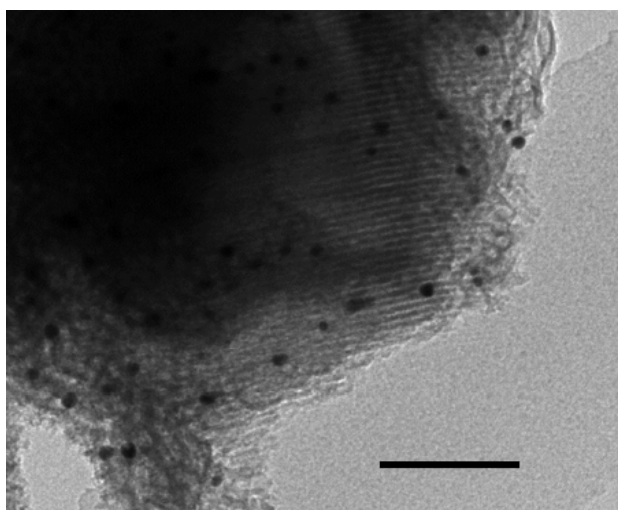


Fig. 4S. TEM image of the recovered Au@PMO-IL

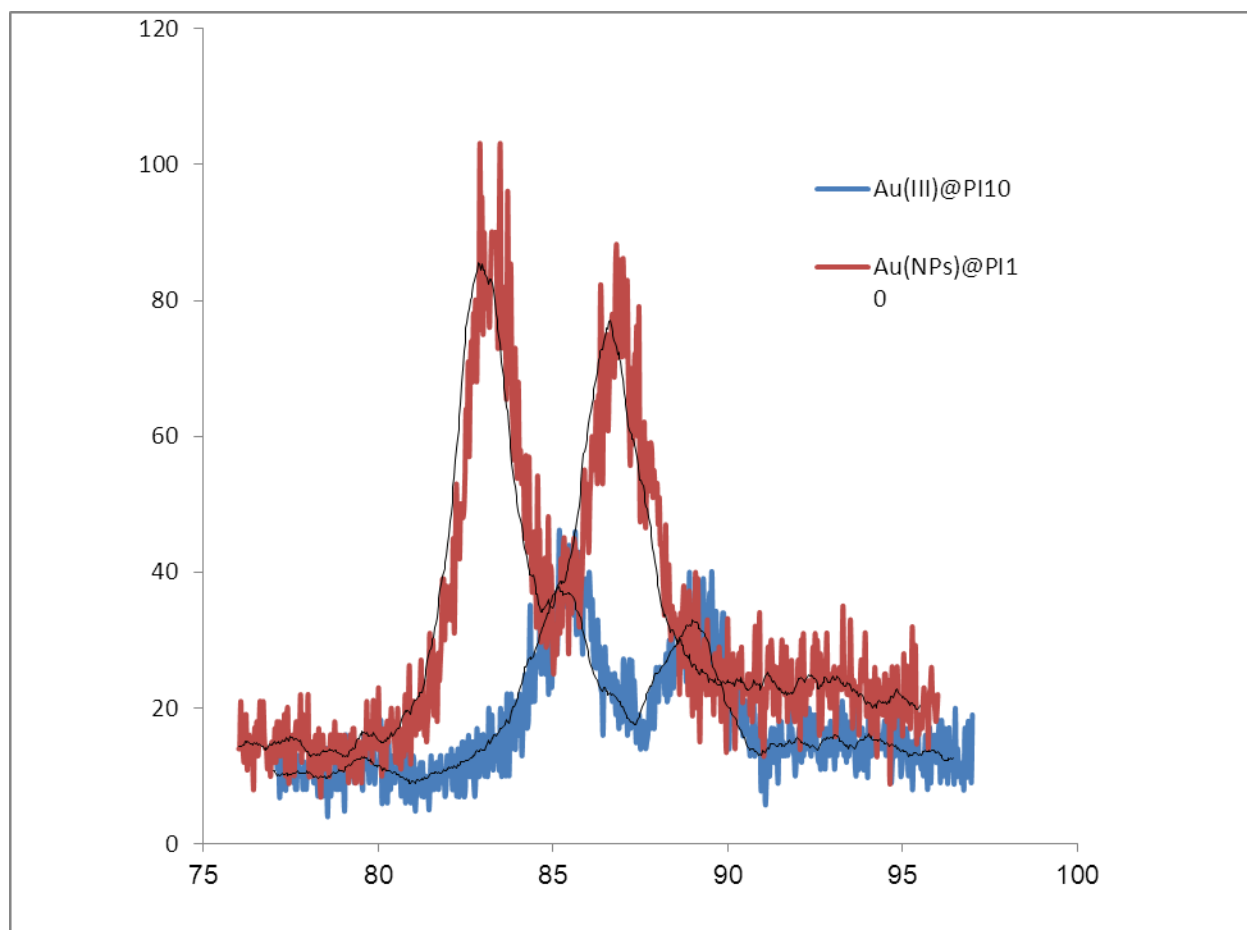
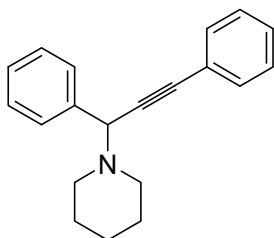
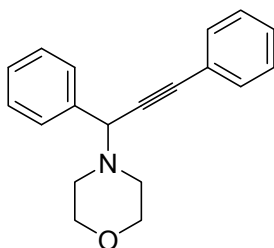


Fig. 5S. XPS spectra for Au@PMO-IL (our active catalyst) and the reduced catalyst Au(0)@PMO-IL (Inactive catalyst)

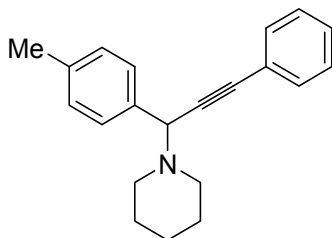
2. Characterizations of products



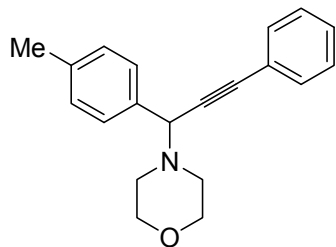
1-(1,3-diphenylprop-2-ynyl) piperidine (table 2, entry 1): ^1H NMR (400 MHz, CDCl_3 , ppm): δ 7.70 (d, $J=7.6$ Hz, 2H), 7.58-7.56 (m, 2H), 7.43-7.32 (m, 6H), 4.86 (s, 1H), 2.64-2.612 (m, 4H), 1.69-1.62 (m, 4H), 1.51-1.48 (m, 2H); ^{13}C NMR (400 MHz, CDCl_3) ppm 138.6, 131.8, 128.5, 128.3, 128.1, 128.0, 127.4, 123.3, 87.9, 86.1, 62.4, 50.5, 26.2, 24.4



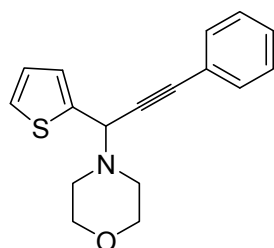
4-(1,3-diphenylprop-2-ynyl)morpholine (table 2, entry 2): ^1H NMR (400 MHz, CDCl_3 , ppm): δ 7.67 (d, $J=7.2$ Hz, 2H), 7.56-7.54 (m, 2H), 7.42-7.32 (m, 6H), 4.83 (s, 1H), 3.87-3.73 (m, 4H), 2.67 (br, 4H); ^{13}C NMR (400 MHz, CDCl_3) ppm 137.8, 131.8, 129.7, 128.6, 128.3, 128.2, 128.2, 127.8, 122.9, 88.5, 88.0, 67.1, 62.0, 49.8.



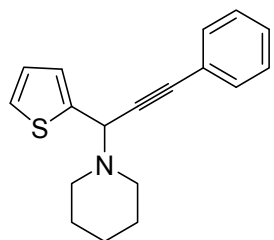
1-(3-phenyl-1-p-tolylprop-2-ynyl) piperidine (table 2, entry 3): ^1H NMR (400 MHz, CDCl_3 , ppm): δ 7.58 (d, $J=8$ Hz, 2H), 7.58 (br, 2H), 7.40-7.37 (m, 3H), 7.23 (d, $J=8$ Hz, 2H), 4.81 (s, 1H), 2.64-2.63 (m, 4H), 2.42 (s, 3H), 1.69-1.62 (m, 4H), 1.51-1.49 (m, 2H); ^{13}C NMR (400 MHz, CDCl_3) ppm 137.1, 135.6, 131.8, 128.8, 128.5, 128.3, 128.0, 123.4, 87.6, 86.4, 62.1, 50.7, 26.2, 24.5, 21.1.



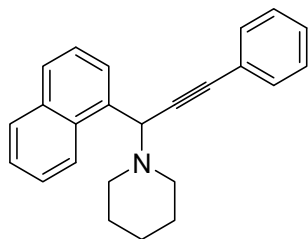
4-(3-phenyl-1-p-tolylprop-2-ynyl)morpholine (table 2, entry 4): ^1H NMR (400 MHz, CDCl_3 , ppm): δ 7.60 (br, 2H), 7.59 (d, $J=8$ Hz, 2H), 7.40-7.39 (m, 3H), 7.25 (d, $J=8$ Hz, 2H), 4.83 (s, 1H), 3.84-3.79 (m, 4H), 2.75-2.67 (m, 4H), 2.43 (s, 3H); ^{13}C NMR (400 MHz, CDCl_3) ppm 137.5, 134.9, 131.8, 129.0, 128.6, 128.3, 128.2, 123.1, 88.3, 86.4, 67.2, 61.8, 49.9, 21.2.



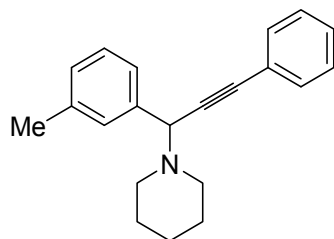
4-(3-phenyl-1-(thiophen-2-yl)prop-2-ynyl)morpholine (table 2, entry 5): ^1H NMR (400 MHz, CDCl_3 , ppm): δ 7.575-7.54 (m, 2H), 7.38-7.37 (m, 3H), 7.33 (d, $J=5.2$ Hz, 1H), 7.28 (d, $J=5.2$ Hz, 1H), 7.01 (dd, $J_1=J_2=5.2$ Hz, 1H), 5.04 (s, 1H), 3.84-3.75 (m, 4H), 2.78-2.67 (m, 4H); ^{13}C NMR (400 MHz, CDCl_3) ppm 142.8, 131.8, 128.4, 128.3, 126.4, 126.3, 125.8, 122.6, 87.6, 84.2, 67.1, 57.8, 49.6.



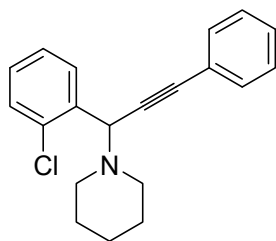
1-(3-phenyl-1-(thiophen-2-yl)prop-2-ynyl)piperidine (table 2, entry 6): ^1H NMR (400 MHz, CDCl_3 , ppm): δ 7.56 (m, 2H), 7.38-7.37 (m, 3H), 7.33 (d, $J=4.8$ Hz, 1H), 7.27 (m, 1H), 7.01 (dd, $J_1=J_2=3.6$ Hz, 1H), 5.04 (s, 1H), 2.71-2.64 (m, 4H), 1.73-1.62 (m, 4H), 1.52-1.49 (m, 2H); ^{13}C NMR (400 MHz, CDCl_3) ppm 144.0, 131.9, 128.3, 128.2, 126.2, 125.8, 125.4, 123.0, 86.9, 85.3, 58.2, 50.6, 26.2, 24.4.



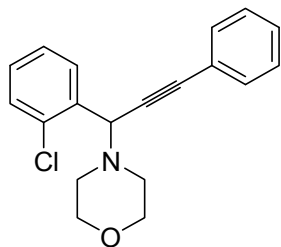
1-(1-(naphthalen-1-yl)-3-phenylprop-2-ynyl)piperidine (table 2, entry 7): ^1H NMR (400 MHz, CDCl_3 , ppm): δ 8.58 (d, $J = 8.4$ Hz, 1H), 8.11 (d, $J = 7.2$ Hz, 1H), 7.99 (d, $J = 8$ Hz, 1H), 7.94 (d, $J = 8.4$ Hz, 1H), 7.73-7.58 (m, 5H), 7.49-7.46 (m, 3H), 5.60 (s, 1H), 2.82-2.80 (m, 4H), 1.74-1.39 (m, 6H); ^{13}C NMR (400 MHz, CDCl_3) ppm 134.3, 134.2, 132.1, 131.9, 128.7, 128.5, 128.4, 128.2, 127.0, 125.9, 125.7, 125.1, 124.9, 123.1, 88.7, 86.0, 60.6, 50.8, 26.4, 24.7.



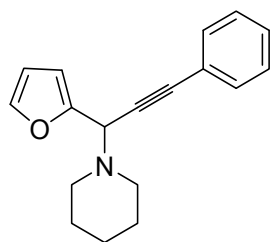
1-(3-phenyl-1-m-tolylprop-2-ynyl)piperidine (table 2, entry 8): ^1H NMR (400 MHz, CDCl_3 , ppm): δ 7.63-7.61 (m, 2H), 7.53 (br, 2H), 7.43-7.40 (m, 3H), 7.35 (t, $J = 7.6$ Hz, 1H), 7.20 (d, $J = 7.6$ Hz), 4.85 (s, 1H), 2.69-2.66 (m, 4H), 2.48 (s, 3H), 1.72-1.68 (m, 4H), 1.56-1.37 (m, 2H); ^{13}C NMR (400 MHz, CDCl_3) ppm 138.6, 137.7, 131.9, 129.3, 128.3, 128.3, 128.0, 128.0, 125.7, 123.5, 87.7, 86.4, 62.5, 50.8, 26.2, 24.5, 21.6.



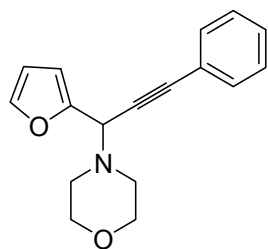
1-(1-(2-chlorophenyl)-3-phenylprop-2-ynyl)piperidine (table 2, entry 9): ^1H NMR (400 MHz, CDCl_3 , ppm): δ 7.81 (dd, $J = 7.2, 1.6$ Hz, 1H), 7.55 (dd, $J = 7.6, 7.2$ Hz, 2H), 7.42 (dd, $J = 7.6, 1.2$ Hz, 1H), 7.37-7.27 (m, 5H), 5.17 (s, 1H), 2.66 (br, 4H), 1.68-1.58 (m, 4H), 1.51-1.46 (m, 2H); ^{13}C NMR (400 MHz, CDCl_3) ppm 136.4, 134.7, 131.8, 130.6, 129.8, 128.8, 128.3, 128.1, 126.2, 123.2, 87.7, 85.8, 59.3, 50.8, 26.2, 24.5.



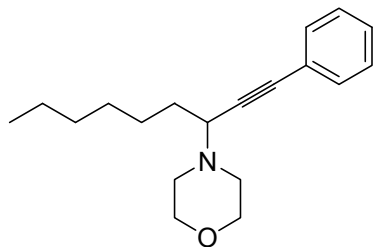
4-(1-(2-chlorophenyl)-3-phenylprop-2-ynyl)morpholine (table 2, entry 10): ^1H NMR (400 MHz, CDCl_3 , ppm): δ 7.21 (dd, $J=7.6$, 2 Hz, 1H), 7.56-7.55 (m, 2H), 7.45 (d, $J=7.2$ Hz, 1H), 7.38-7.27 (m, 5H), 5.19 (s, 1H), 3.79-3.72 (m, 4H), 2.73 (t, $J=4.4$ Hz, 4H); ^{13}C NMR (400 MHz, CDCl_3) ppm 135.6, 134.7, 131.8, 130.5, 129.9, 129.1, 128.4, 128.3, 126.4, 122.8, 88.4, 84.7, 67.1, 58.9, 49.8.



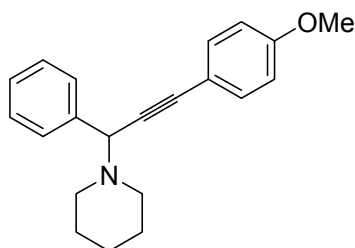
1-(1-(furan-2-yl)-3-phenylprop-2-ynyl)piperidine (table 2, entry 11): ^1H NMR (400 MHz, CDCl_3 , ppm): δ 7.54-7.52 (m, 2H), 7.46 (br, 1H), 7.36-7.35 (m, 3H), 6.51 (d, $J=2.8$ Hz, 1H), 6.38 (d, $J=2$ Hz, 1H), 4.91 (s, 1H), 3.85-3.76 (m, 4H), 2.62-2.60 (m, 4H), 1.71-1.60 (m, 4H), 1.49-1.46 (m, 2H); ^{13}C NMR (400 MHz, CDCl_3) ppm 151.6, 142.5, 131.8, 128.3, 128.2, 122.9, 109.9, 109.2, 86.4, 83.8, 56.5, 50.5, 25.9, 24.3.



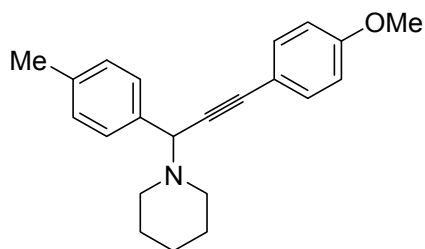
4-(1-(furan-2-yl)-3-phenylprop-2-ynyl)morpholine (table 2, entry 12): ^1H NMR (400 MHz, CDCl_3 , ppm): δ 7.54-7.51 (m, 2H), 7.43 (br, 1H), 7.37-7.36 (m, 3H), 6.54 (d, $J=2.8$ Hz, 1H), 6.40-6.38 (m, 1H), 4.91 (s, 1H), 3.85-3.76 (m, 4H), 2.73-2.66 (m, 4H); ^{13}C NMR (400 MHz, CDCl_3) ppm 150.7, 142.9, 131.8, 128.5, 128.3, 122.5, 110.1, 109.7, 87.0, 82.8, 66.9, 56.1, 49.6.



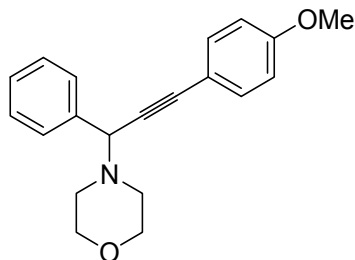
4-(1-phenylnon-1-yn-3-yl)morpholine (table 2, entry 13): ^1H NMR (400 MHz, CDCl_3 , ppm): δ 7.47 (br, 5H), 7.32 (br, 3H), 3.79 (br, 4H), 3.52 (t, $J=7.2$ Hz, 1H), 2.77 (br, 2H), 2.61 (br, 2H), 1.75-1.73 (m, 2H), 1.58-1.51 (m, 2H), 1.35-1.30 (m, 6H), 0.93 (br, 3H); ^{13}C NMR (400 MHz, CDCl_3) ppm 131.7, 128.2, 127.9, 123.2, 87.2, 86.1, 67.1, 58.1, 49.7, 32.9, 31.7, 29.0, 26.6, 22.6, 14.1.



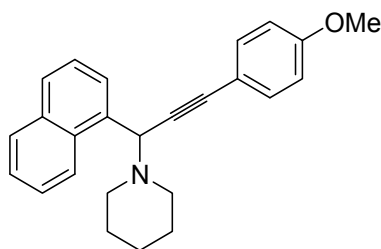
1-(3-(4-methoxyphenyl)-1-phenylprop-2-ynyl) piperidine (table 2, entry 14): ^1H NMR (400 MHz, CDCl_3 , ppm): δ 7.67 (d, $J=7.6$, 2H), 7.49 (d, $J=8.8$ Hz, 2H), 7.39 (dd, $J_1=J_2=7.6$ Hz, 2H), 7.32 ($J_1=J_2=7.6$ Hz, 1H), 6.89 (d, $J=8.8$ Hz, 2H), 4.81 (s, 1H), 3.85 (s, 3H), 2.59 (br, 4H), 1.66-1.60 (m, 4H), 1.49-1.47 (m, 2H); ^{13}C NMR (400 MHz, CDCl_3) ppm 159.4, 138.8, 133.2, 128.4, 128.2, 127.0, 115.5, 113.9, 87.6, 84.5, 62.4, 55.3, 50.7, 26.2, 24.4.



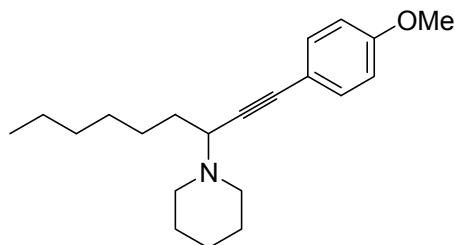
1-(3-(4-methoxyphenyl)-1-p-tolylprop-2-ynyl)piperidine (table 2, entry 15): ^1H NMR (400 MHz, CDCl_3 , ppm): δ 7.58 (d, $J=8$ Hz, 2H), 7.52 (d, $J=8.8$ Hz, 2H), 7.23 (d, $J=8$ Hz, 2H), 6.91 (d, $J=8.8$ Hz, 2H), 4.80 (s, 1H), 3.86 (s, 3H), 2.63 (br, 4H), 2.42 (s, 3H), 1.68-1.64 (m, 4H), 1.52-1.50 (m, 2H); ^{13}C NMR (400 MHz, CDCl_3) ppm 159.4, 137.0, 135.8, 133.2, 128.7, 128.5, 115.6, 113.9, 87.4, 84.9, 62.2, 55.3, 50.7, 26.2, 24.5, 21.1.



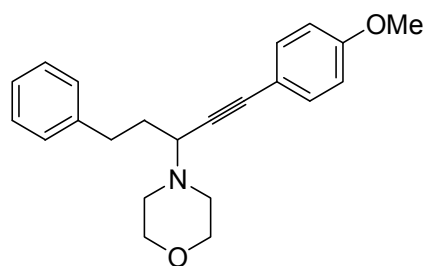
4-(3-(4-methoxyphenyl)-1-phenylprop-2-ynyl)morpholine (table 2, entry 16): ^1H NMR (400 MHz, CDCl_3 , ppm): δ 7.677 (d, $J=7.6$ Hz, 2H), 7.49 (d, $J=8.8$ Hz, 2H), 7.41 (dd, $J_1=J_2=7.6$ Hz, 2H), 7.35 (dd, $J_1=J_2=7.2$ Hz, 1H), 6.90 (d, $J=8.8$ Hz, 2H), 4.81 (s, 1H), 3.85 (s, 3H), 3.79-3.76 (m, 4H), 2.67 (br, 4H); ^{13}C NMR (400 MHz, CDCl_3) ppm 159.6, 138.0, 133.2, 128.6, 128.2, 127.7, 115.1, 113.9, 88.3, 83.5, 67.2, 62.1, 55.3, 49.9.



1-(3-(4-methoxyphenyl)-1-(naphthalen-1-yl)prop-2-ynyl)piperidine (table 2, entry 17): ^1H NMR (400 MHz, CDCl_3 , ppm): δ 8.52 (d, $J=8.4$ Hz, 1H), 8.04 (d, $J=7.6$ Hz, 1H), 7.93 (d, $J=7.6$ Hz, 1H), 7.88 (d, $J=8.4$ Hz, 1H), 7.62-7.52 (m, 5H), 6.94 (d, $J=8.8$ Hz, 2H), 5.52 (s, 1H), 3.86 (s, 3H), 2.74-2.73 (m, 4H), 1.66-1.37 (m, 6H); ^{13}C NMR (400 MHz, CDCl_3) ppm 159.5, 134.5, 134.1, 133.2, 132.0, 128.5, 128.4, 126.9, 125.8, 125.6, 125.1, 124.8, 115.6, 114.0, 88.4, 84.4, 60.6, 55.3, 50.8, 26.3, 24.7.



1-(1-(4-methoxyphenyl)non-1-yn-3-yl)piperidine (table 2, entry 18): ^1H NMR (400 MHz, CDCl_3 , ppm): δ 7.38 (d, $J=8.4$ Hz, 2H), 6.82 (d, $J=8.8$ Hz, 2H), 3.78 (s, 3H), 3.47 (t, $J=6$ Hz, 1H), 2.69 (br, 2H), 2.49 (br, 2H), 1.73-1.61 (m, 7H), 1.57-1.46 (m, 3H), 1.39-1.32 (m, 7H), 0.92-0.89 (m, 3H); ^{13}C NMR (400 MHz, CDCl_3) ppm 159.2, 133.0, 115.8, 113.7, 86.5, 85.3, 58.6, 55.1, 50.5, 33.5, 31.8, 29.1, 26.9, 26.2, 24.6, 22.6, 14.1.

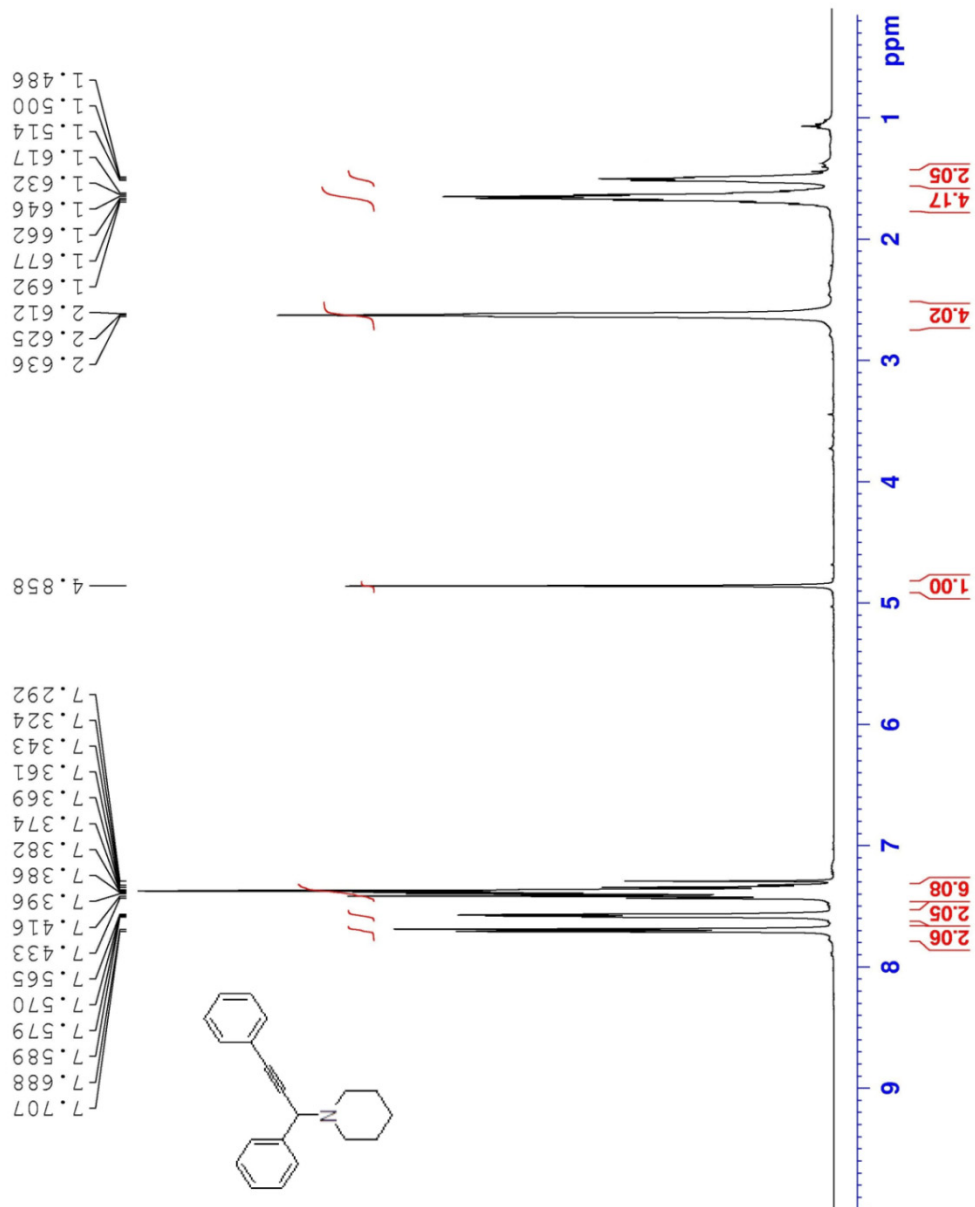


4-(1-(4-methoxyphenyl)-5-phenylpent-1-yn-3-yl)morpholine (table 2, entry 19): ^1H NMR (400 MHz, CDCl_3 , ppm): δ 7.44 (d, $J = 8.8$ Hz, 2H), 7.34-7.25 (m, 5H), 6.89 (d, $J = 8.8$ Hz), 3.84 (s, 3H), 3.83-3.79 (m, 4H), 3.52 (t, $J = 16$ Hz, 1H), 2.98-2.91 (m, 1H), 2.87-2.78 (m, 3H), 2.62-2.61 (m, 2H), 2.09-2.07 (m, 2H); ^{13}C NMR (400 MHz, CDCl_3) ppm 159.4, 141.6, 133.1, 128.6, 128.4, 125.9, 115.3, 113.9, 86.4, 85.2, 67.2, 57.1, 55.3, 49.7, 34.6, 32.6.

3. Copy of original ^1H NMR and ^{13}C NMR of products.



Dr. Gholi nejad
NAME EXPNO 1
PROCNO 28
Date_ 20111102
Time 11.20
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 24
DS 0
SWH 8012.820 Hz
FIDRES 0.122266 Hz
AQ 4.0894966 sec
RG 144
DW 62.400 usec
DE 6.50 usec
TE 297.9 K
D1 6.0000000 sec
TD0 1
===== CHANNEL f1 =====
NUC1 1H
P1 14.00 usec
PL1 -2.00 dB
PL1W 11.86359406 W
SF01 400.2236020 MHz
SI 32768
SF 400.2200000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00





NAME Dr.Gholi nejad
EXPNO 27

PROCNO 1
Date_ 20111102
Time 11.21

INSTRUM spect
PROBHD 5 mm PABBO BB-

PULPROG zgpg
ID 65536

SOLVENT CDCl3
NS 40

DS 0
SWH 25252.525 Hz

FIDRES 0.385323 Hz
AQ 1.2976629 sec

RG 2050
DW 19.800 usec

DE 6.50 usec
TE 298.2 K

D1 3.00000000 sec
D11 0.03000000 sec

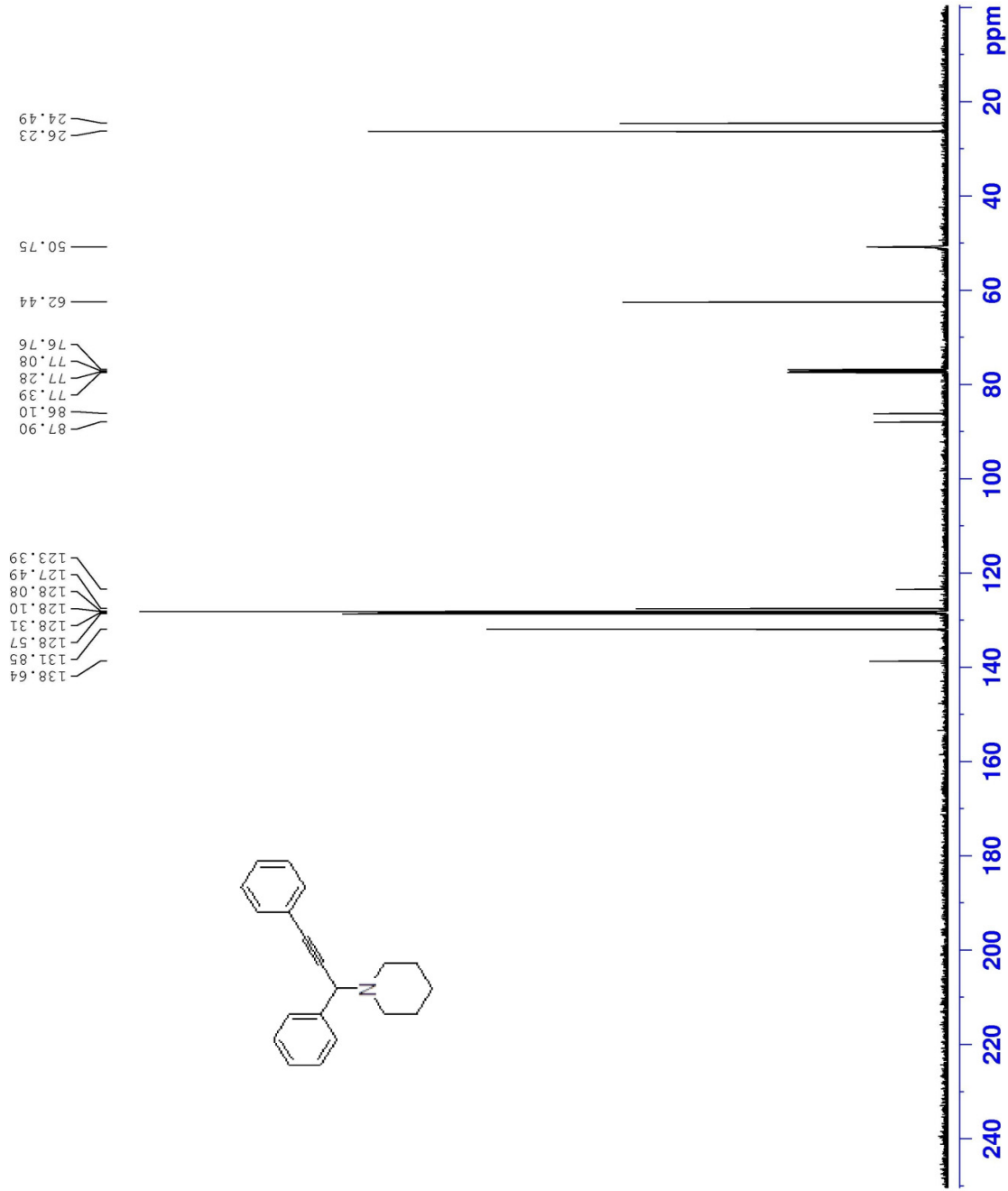
TDO 1

===== CHANNEL f1 =====
NUC1 13C
P1 9.00 usec
PL1 -0.90 dB
PL1W 42.02801895 W
SFO1 100.6479784 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -2.00 dB
PL12 14.16 dB
PL13 17.90 dB

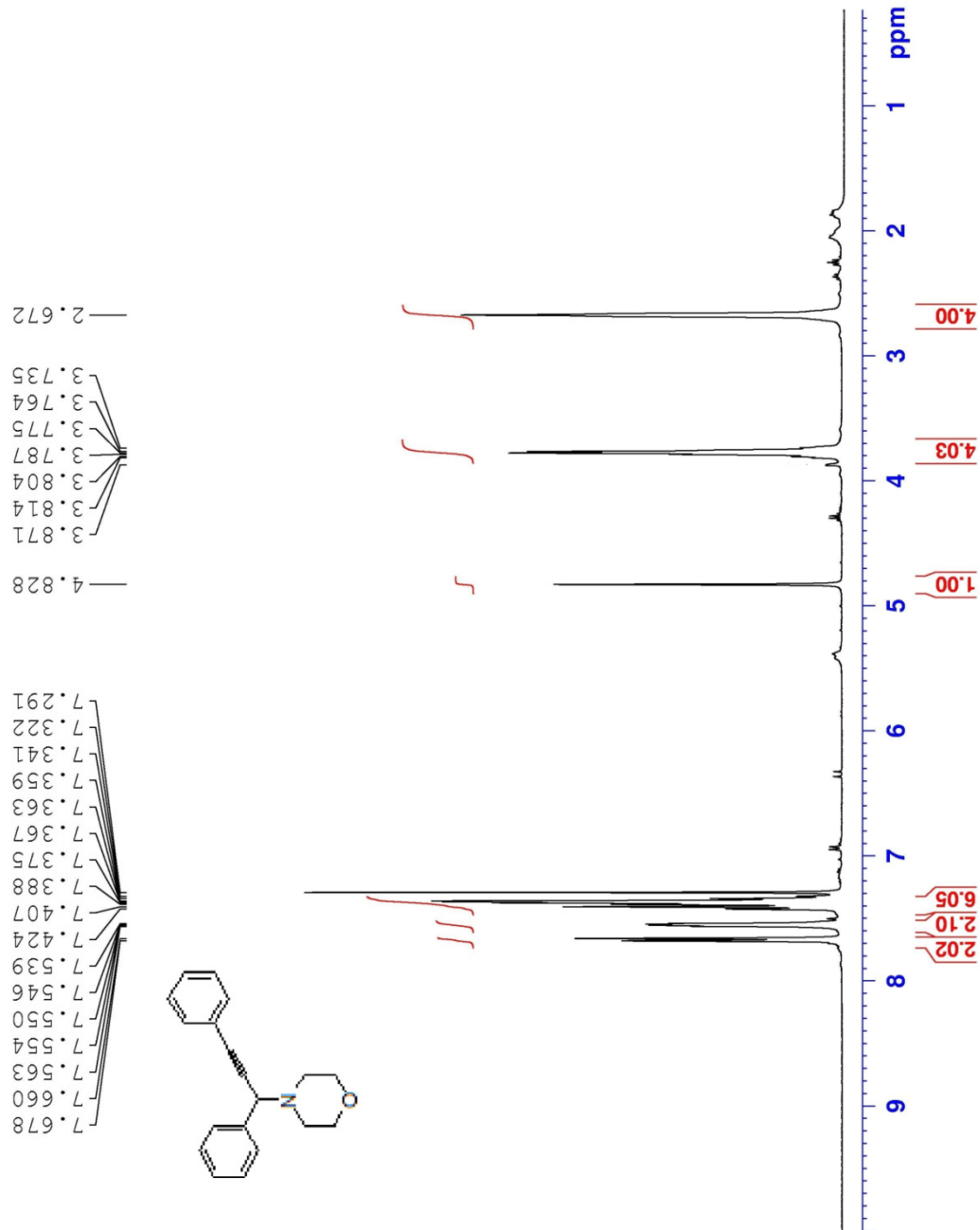
PL12W 11.86359406 W
PL12W 0.28722104 W
PL13W 0.12139934 W
SFO2 400.2216009 MHz
SI 32768
SF 100.6353990 MHz

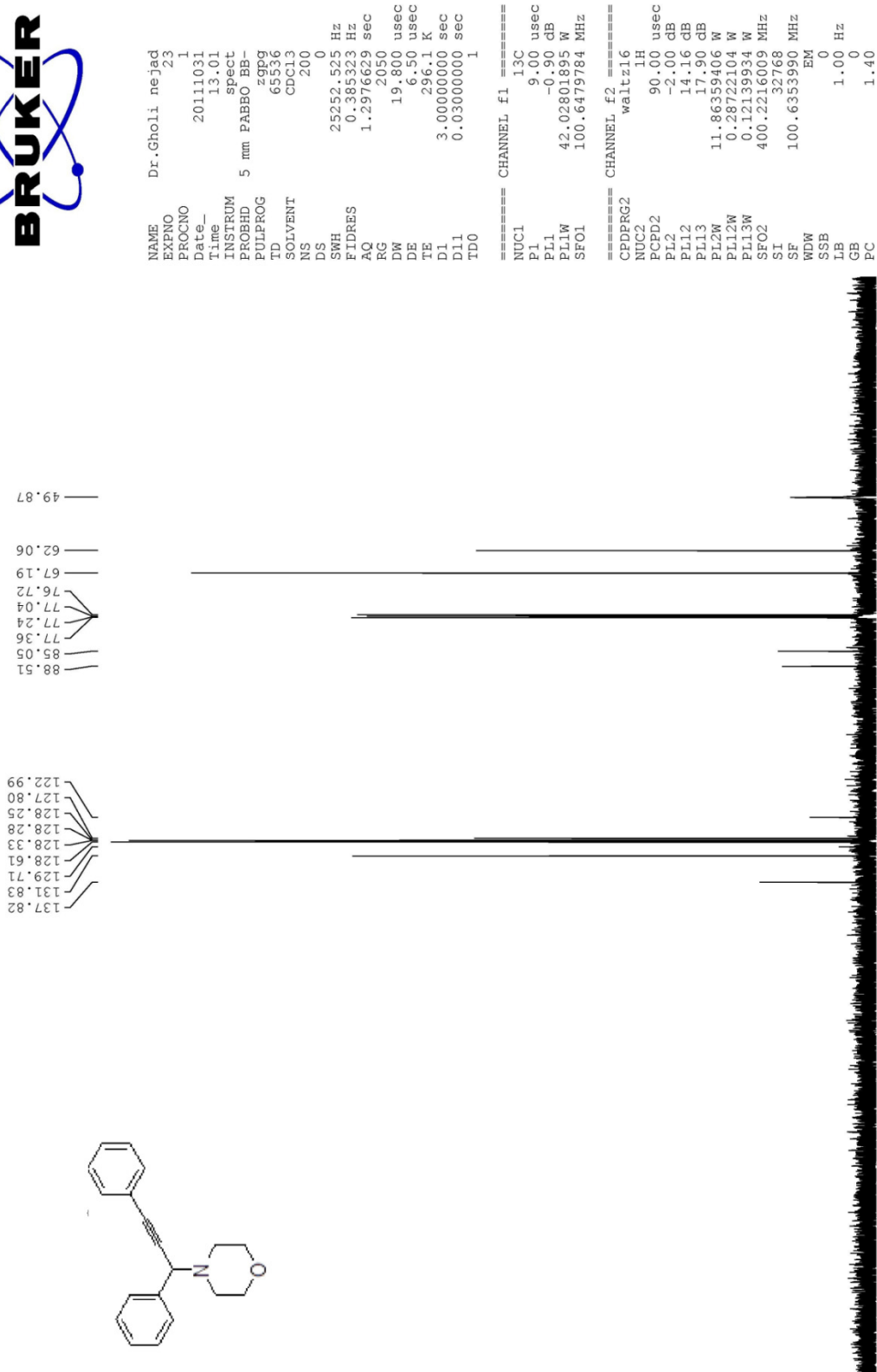
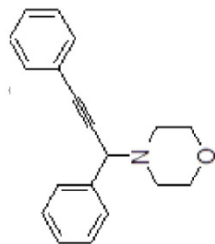
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40





Dr. Ghollı nejad
NAME EXPNO 1
PROCNO 24
Date_ 20111031
Time_ 13.01
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 24
DS 0
SWH 8012.820 Hz
FIDRES 0.122266 Hz
AQ 4.0894966 sec
RG 1820
DW 62.400 usec
DE 6.50 usec
TE 295.9 K
DL 6.00000000 sec
TD0 1
===== CHANNEL f1 =====
NUC1 1H
PI 14.00 usec
PL1 -2.00 dB
PL1W 11.86359406 W
SFO1 400.2236020 MHz
SI 32768
SF 400.2200000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00





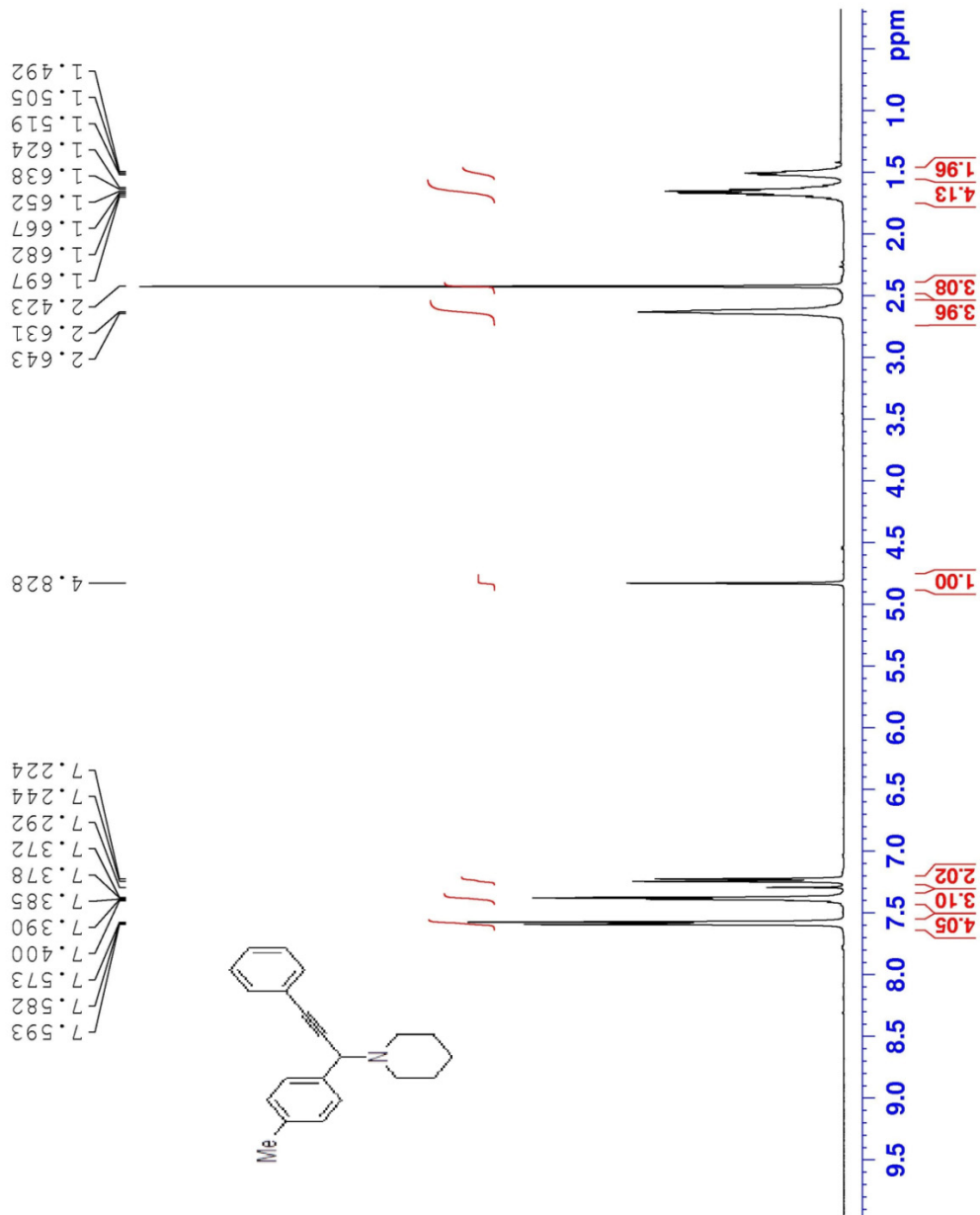
NAME Dr.Gholi nejad
EXPNO 23
PROCNO 1
Date_ 20111031
Time 13.01
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg
TD 65536
SOLVENT CDCl3
NS 200
DS 0
SWH 25252.525 Hz
FIDRES 0.385323 Hz
AQ 1.2976629 sec
RG 2050
DW 19.800 usec
DE 6.50 usec
TE 296.1 K
D1 3.00000000 sec
D11 0.03000000 sec
TD0 1

==== CHANNEL f1 =====
NUC1 13C
P1 9.00 usec
PL1 -0.90 dB
PL1W 42.02801895 W
SFO1 100.6479784 MHz

==== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -2.00 dB
PL12 14.16 dB
PL13 17.90 dB
PL2W 11.86359406 W
PL12W 0.28722104 W
PL13W 0.12139934 W
SFO2 400.2216009 MHz
SI 32768
SF 100.6353990 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40



Dr. Chohli nejad
NAME
EXPNO 34
PROCNO 1
Date_ 20111109
Time_ 15.36
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDC13
NS 24
DS 0
SWH 8012.820 Hz
FIDRES 0.122266 Hz
AQ 4.0894966 sec
RG 128
DE 62.400 usec
WE 6.50 usec
TE 296.7 K
D1 6.0000000 sec
TD0 1
===== CHANNEL f1 =====
NUC1 1H
P1 14.00 usec
PL1 -2.00 dB
PL1W 11.86359406 W
SFO1 400.2236020 MHz
SI 32768
SF 400.2200000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

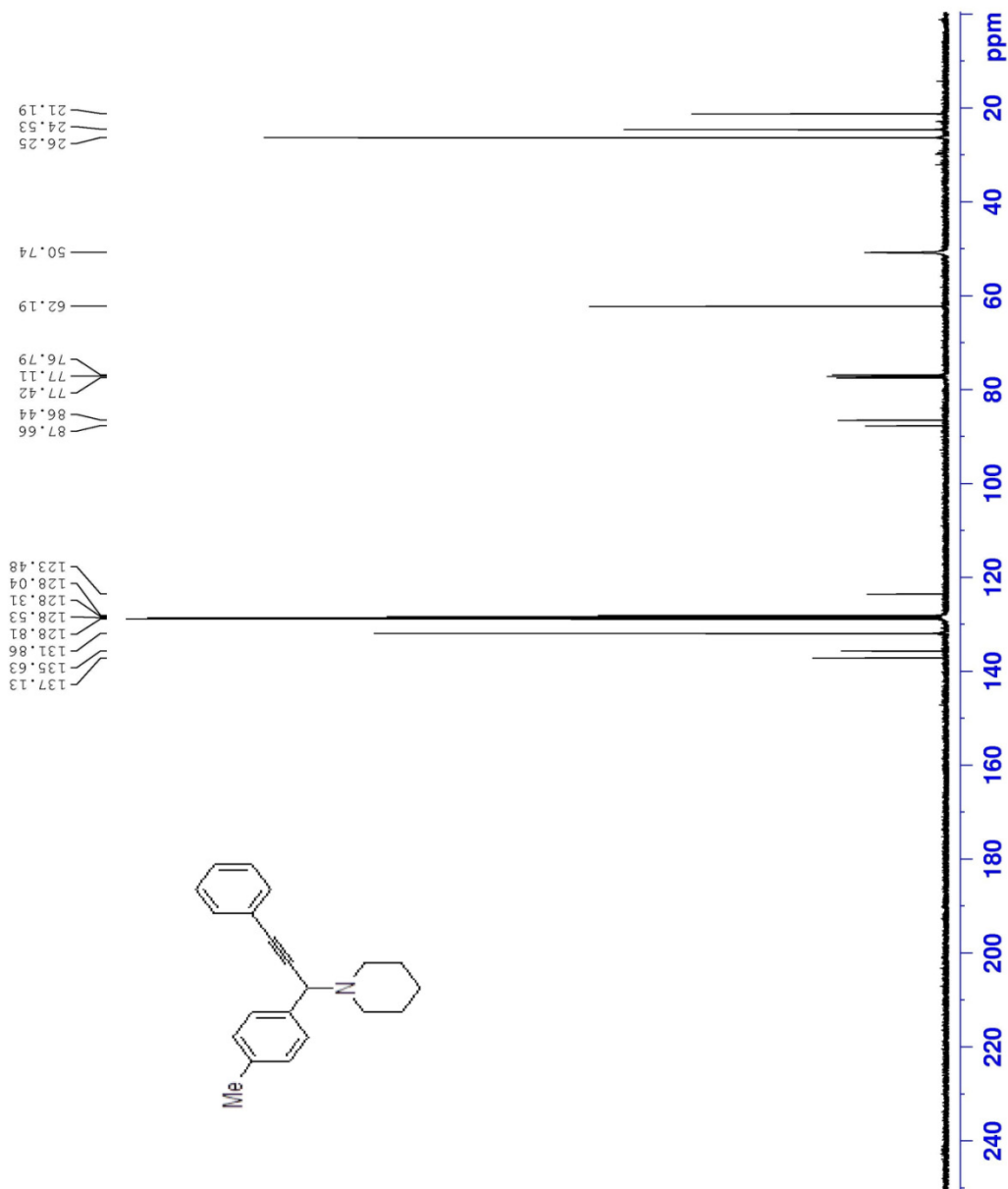




Dr.Ghoili nejad
NAME
EXENO 33
PROCNO 1
Date_ 20111109
Time 15.38
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg
TD 65536
SOLVENT CDCl3
NS 81
DS 0
SWH 25252.525 Hz
FIDRES 0.385323 Hz
AQ 1.2976829 sec
RG 2030
DW 19.800 usec
DE 6.50 usec
TE 296.7 K
D1 3.0000000 sec
D11 0.0300000 sec
TD0 1

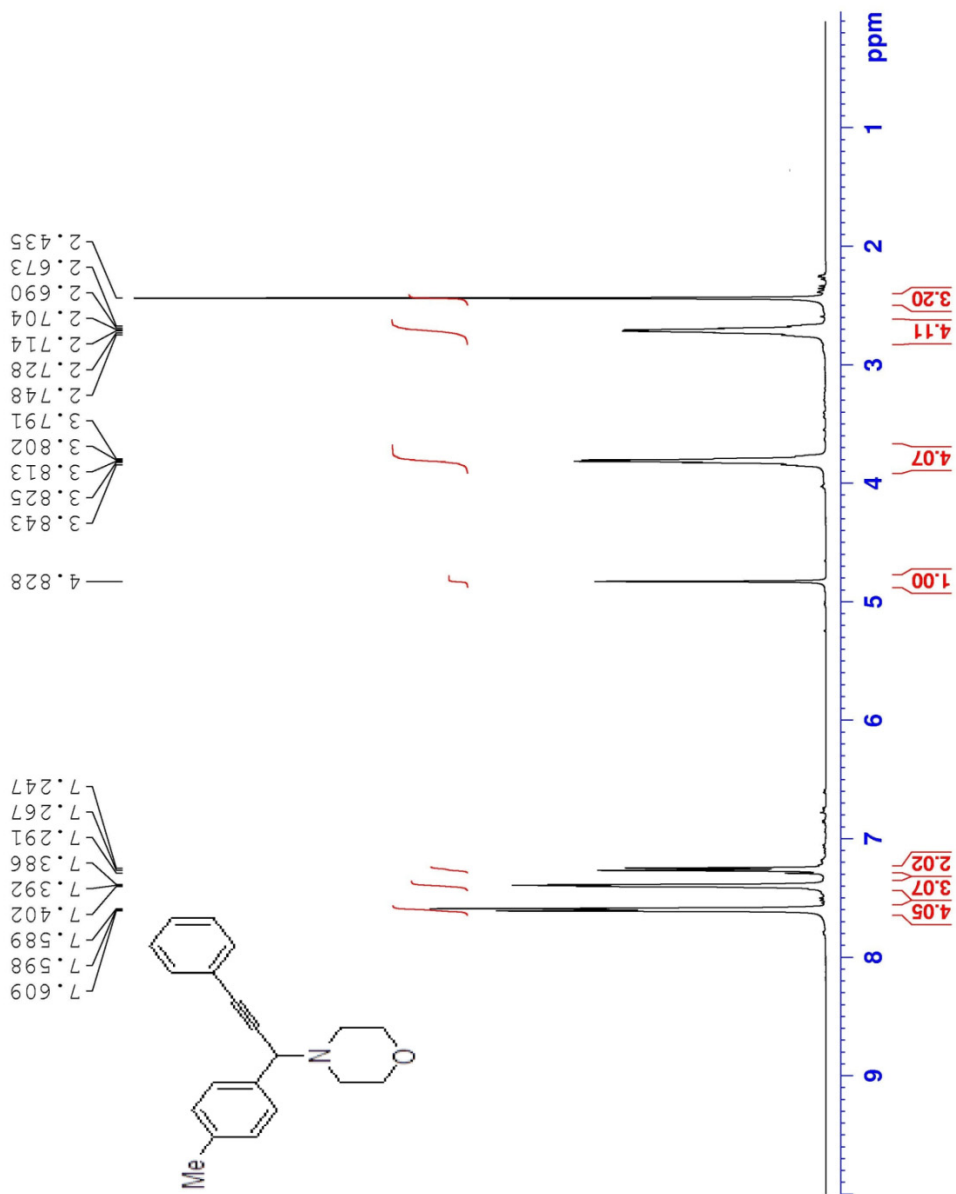
==== CHANNEL f1 =====
NUC1 13C
P1 9.00 usec
PL1 -0.90 dB
PL1W 42.02801895 W
SFO1 100.6479784 MHz

==== CHANNEL f2 =====
CPDPRG2 wait#16
NUC2 1H
PCPD2 90.00 usec
PL2 12.00 dB
PL12 14.16 dB
PL13 17.90 dB
PL2W 11.86359406 W
PL12W 0.28722104 W
PL13W 0.12139934 W
SFO2 400.2216009 MHz
SI 32768
SF 100.6353990 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40





Dr.Ghohli nejad
NAME
EXPNO 47
PROCNO 1
Date_ 20111126
Time 14.44
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDC13
NS 24
DS 0
SWH 8012.820 Hz
FIDRES 0.122266 Hz
AQ 4.0894966 sec
RG 256
DW 62.400 usec
DE 6.50 usec
TE 295.1 K
D1 6.0000000 sec
TD0 1
===== CHANNEL f1 =====
NUC1 1H
P1 14.00 usec
PL1 -2.00 dB
PL1W 11.86359406 W
SFO1 400.2236020 MHz
SI 32768
SF 400.2200000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

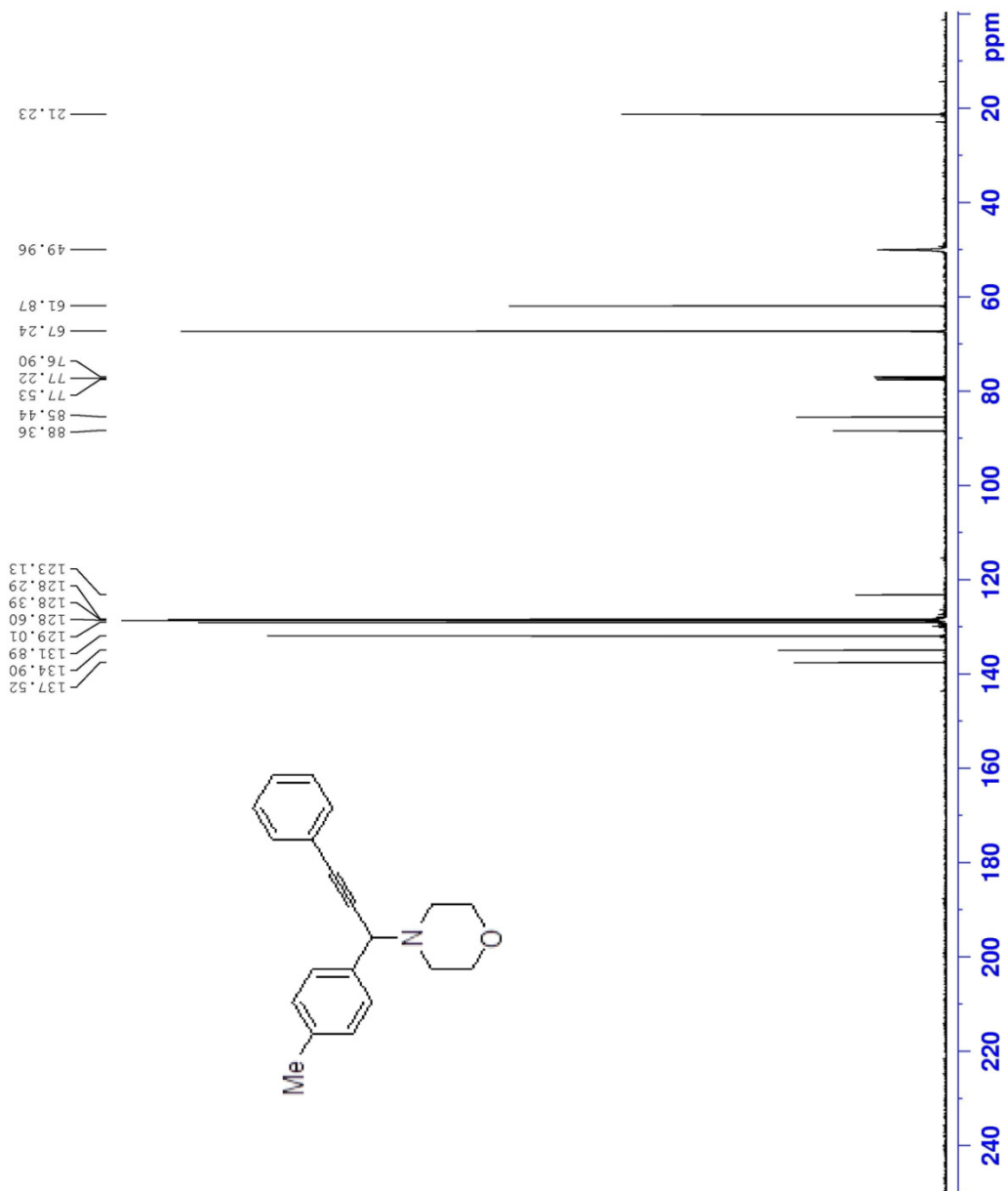




NAME Dr.Gholi nejad
EXPNO 46
PROCNO 1
Date_ 20111126
Time_ 14.46
INSTRUM spect
PROBHD 5 mm FAPBO BB-
PULPROG zgpg
TD 65536
SOLVENT CDCl3
NS 40
DS 0
SWH 25252.525 Hz
FIDRES 0.385323 Hz
AQ 1.2976629 sec
RG 2050
DW 19.800 usec
DE 6.50 usec
TE 295.5 K
D1 3.00000000 sec
D11 0.03000000 sec
TD0 1

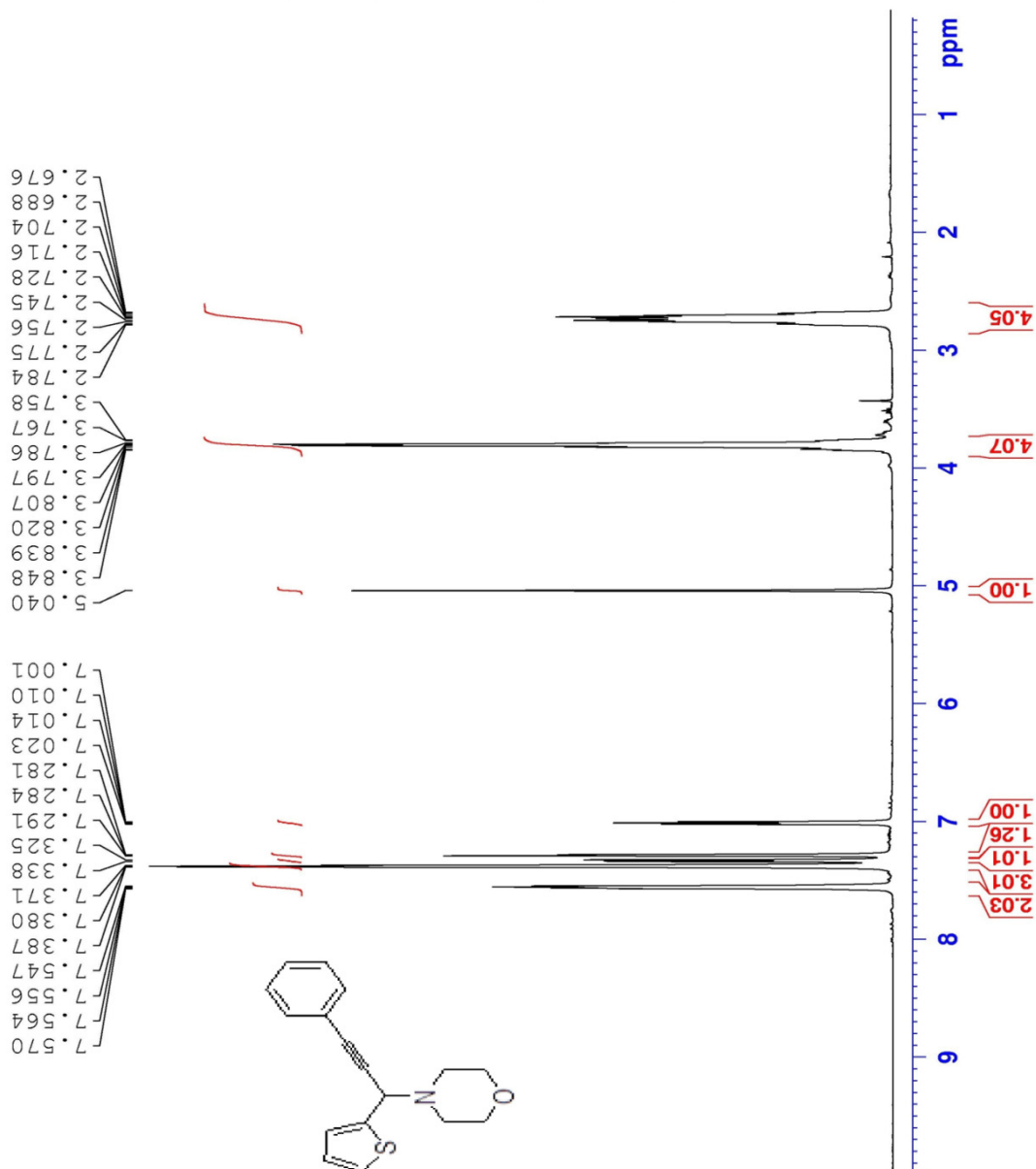
===== CHANNEL f1 =====
NUC1 13C
PL 9.00 usec
PL1 -0.50 dB
PL1W 42.02801895 W
SFO1 100.6479784 MHz

===== CHANNEL f2 =====
CFPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -2.00 dB
PL12 14.16 dB
PL13 17.90 dB
PL2W 11.86359406 W
PL12W 0.28722104 W
PL13W 0.12139934 W
SFO2 400.2216009 MHz
SI 32768
SF 100.6353990 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40





NAME Dr.Gholi nejad
EXPNO 32
PROCNO 1
Date_ 20111105
Time 15.10
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 24
DS 0
SWH 8012.820 Hz
FIDRES 0.122266 Hz
AQ 4.0894966 sec
RG 1030
DE 62.400 usec
TE 297.4 K
D1 6.00000000 sec
TDO 1
===== CHANNEL f1 =====
NUC1 1H
P1 14.00 usec
PL1 -2.00 dB
PL1W 11.86359406 W
SFO1 400.2236020 MHz
SI 32768
SF 400.2200000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

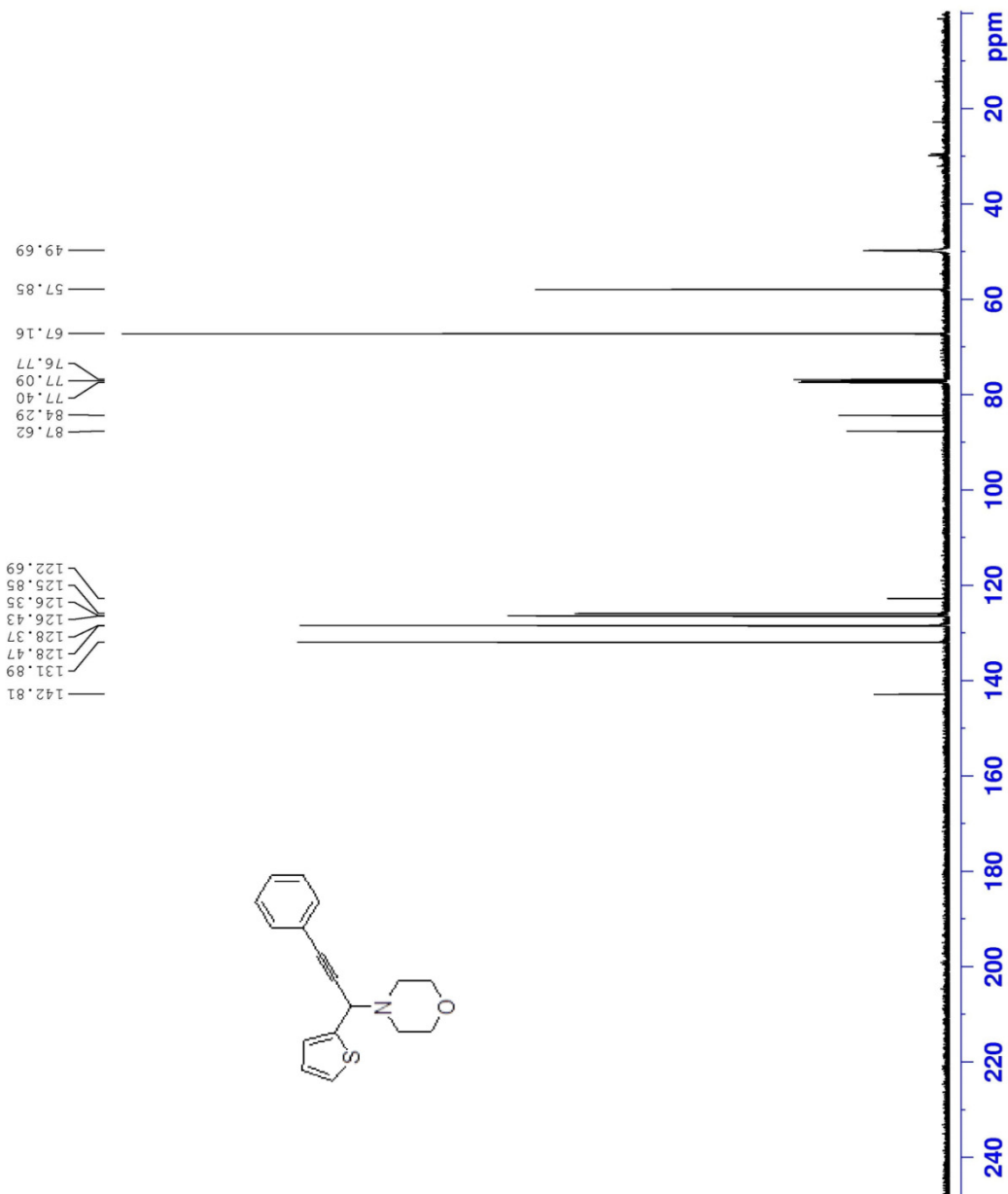




Dr.Gholi nejad
NAME
EXPNO 51
PROCNO 1
Date_ 20111105
Time 15.13
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg
TD 65536
SOLVENT CDCl3
NS 100
DS 0
SWH 25252.525 Hz
FIDRES 0.385323 Hz
AQ 1.2976629 sec
RG 2050
DW 19.800 usec
DE 6.50 usec
TE 297.8 K
D1 3.0000000 sec
D11 0.0300000 sec
TD0 1

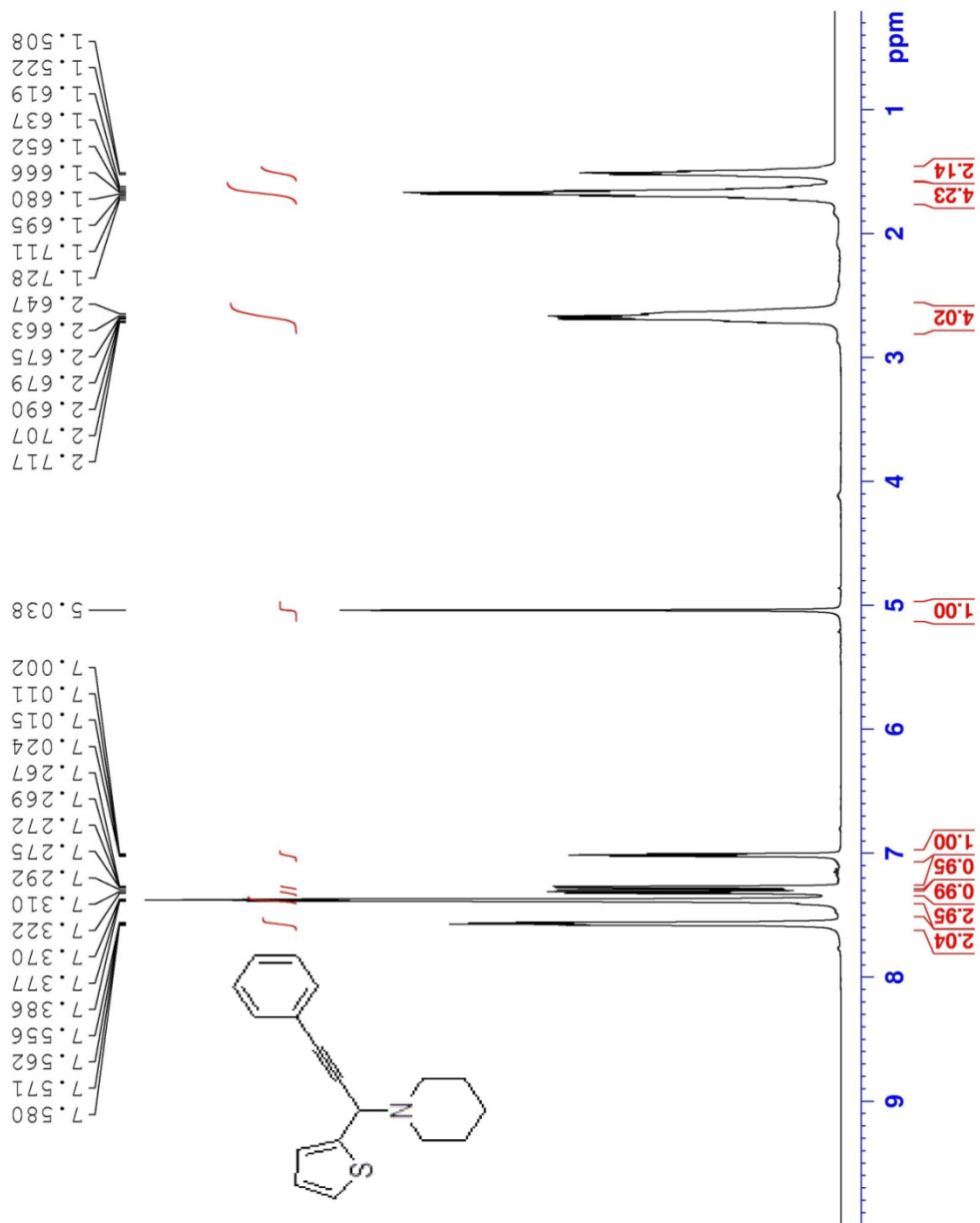
==== CHANNEL f1 =====
NUC1 13C
P1 9.00 usec
PL1 -0.90 dB
PL1W 42.02801895 W
SF01 100.6479784 MHz

==== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -2.00 dB
PL12 14.16 dB
PL13 17.90 dB
PL2W 11.86359406 W
PL12W 0.28722104 W
PL13W 0.12139934 W
SFO2 400.2216009 MHz
SI 32768
SF 100.6353990 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40





NAME Dr.Gholi nejad
EXPNO 1
PROCNO 62
Date_ 20111214
Time_ 10.39
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 19
DS 0
SWH 8012.820 Hz
FIDRES 0.122266 Hz
AQ 4.0894966 sec
RG 114
DW 62.400 usec
DE 6.50 usec
TE 297.0 K
D1 6.0000000 sec
TD0 1
===== CHANNEL f1 =====
NUC1 1H
P1 14.00 usec
PL1 -2.00 dB
PL1W 11.86359406 W
SF01 400.2236020 MHz
SI 32768
SF 400.2200000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

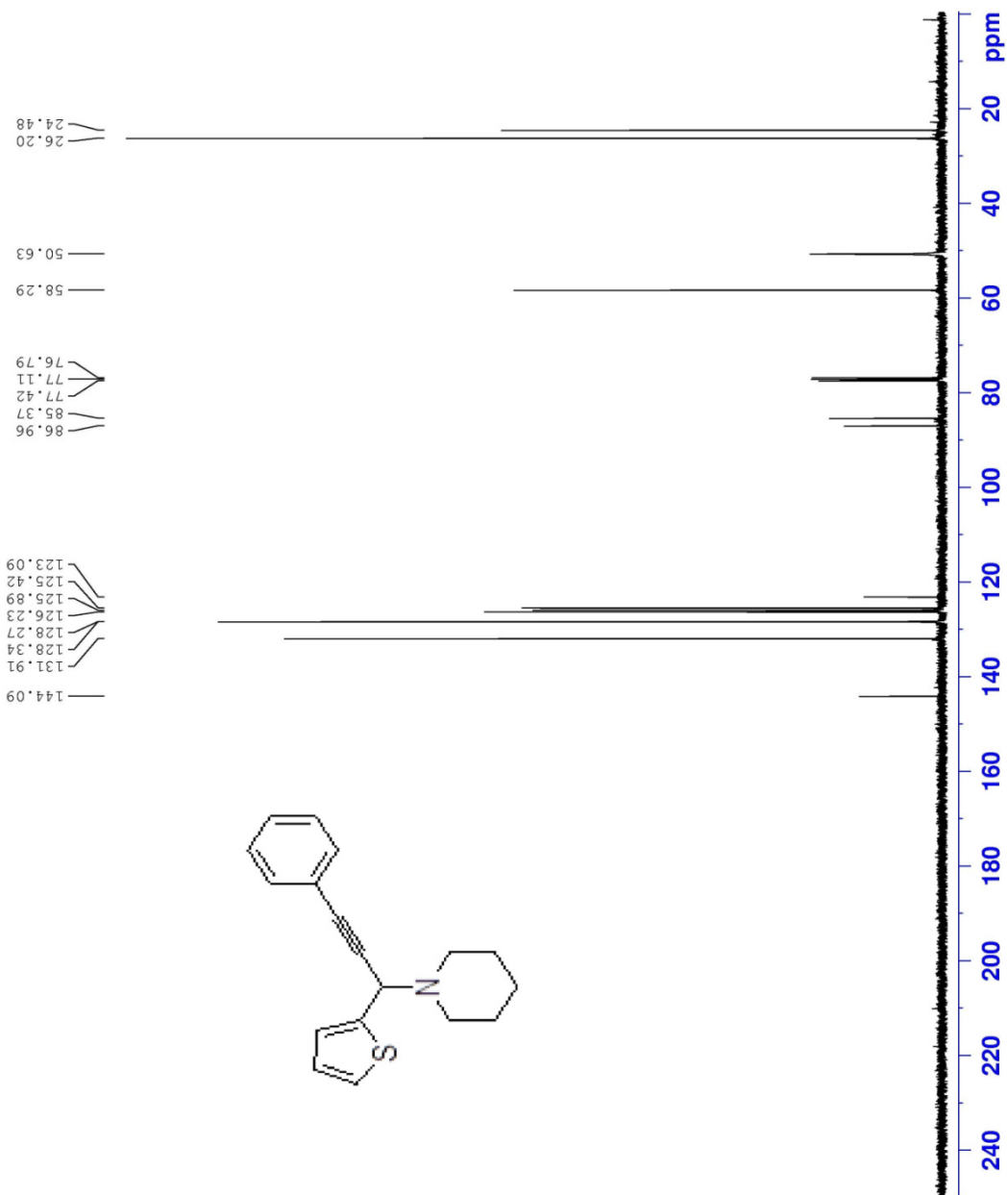




NAME Dr.Gholi nejad
EXPNO 58
PROCNO 1
Date_ 20111212
Time_ 10.05
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg
TD 65536
SOLVENT CDCl3
NS 50
DS 0
SWH 25252.525 Hz
FIDRES 0.385323 Hz
AQ 1.2976629 sec
RG 2050
DW 19.800 usec
DE 6.50 usec
TE 297.4 K
D1 3.00000000 sec
D11 0.03000000 sec
TD0 1

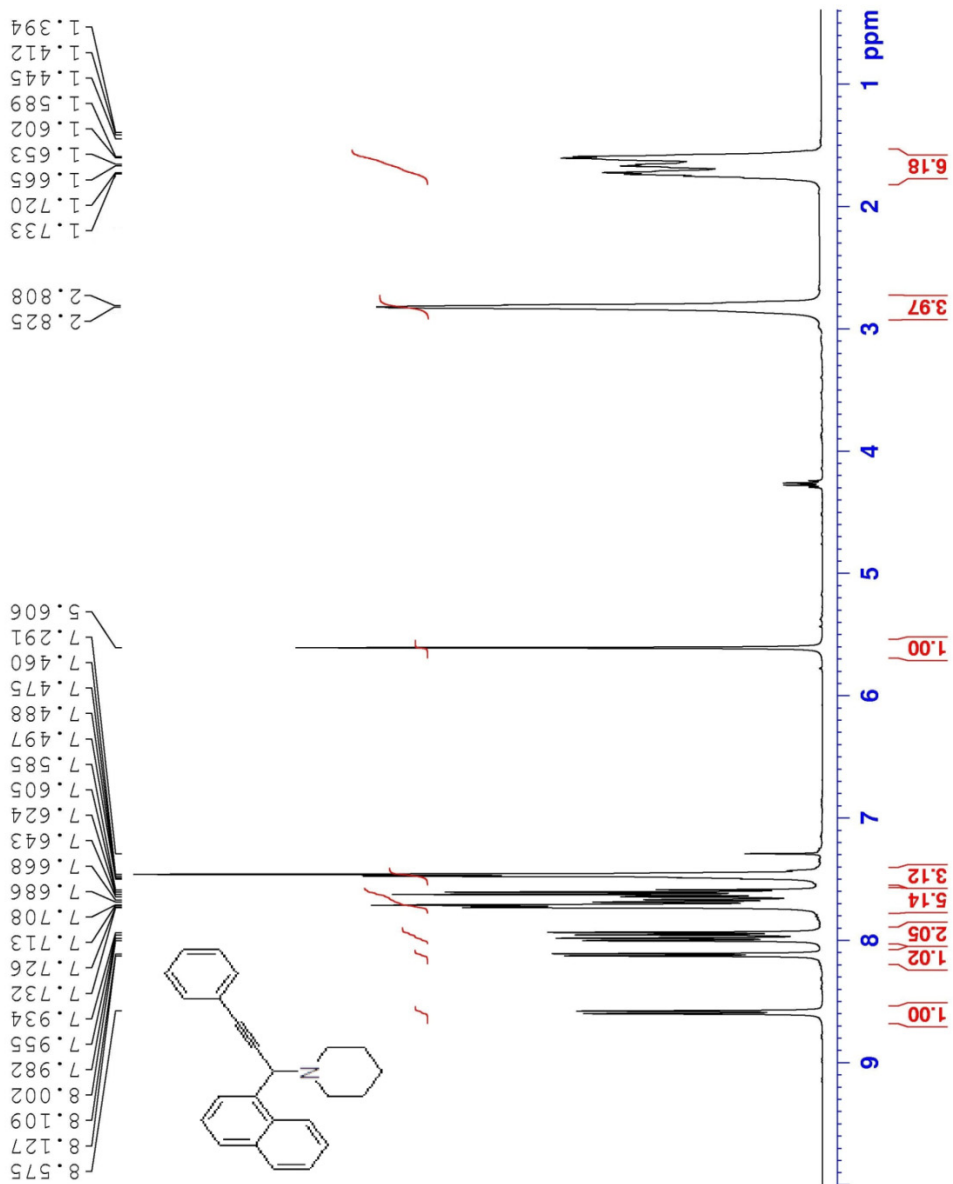
==== CHANNEL f1 =====
NUC1 13C
P1 9.00 usec
PL1 -0.50 dB
PL1W 42.02801895 W
SFO1 100.6479784 MHz

==== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -2.00 dB
PL12 14.16 dB
PL13 17.90 dB
PL2W 11.86359406 W
PL12W 0.28722104 W
PL13W 0.12139934 W
SFO2 400.2216009 MHz
SI 32768
SF 100.6353990 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40





Dr.Ghohli nejad
NAME
EXPNO 43
PROCNO 1
Date_ 20111121
Time 10.39
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDC13
NS 24
DS 0
SWH 8012.820 Hz
FIDRES 0.122266 Hz
AQ 4.0894966 sec
RG 256
DW 62.400 usec
DE 6.50 usec
TE 295.9 K
D1 6.0000000 sec
TD0 1
===== CHANNEL f1 =====
NUC1 1H
P1 14.00 usec
PL1 -2.00 dB
PL1W 11.86359406 W
SF01 400.2236020 MHz
SI 32768
SF 400.2200000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

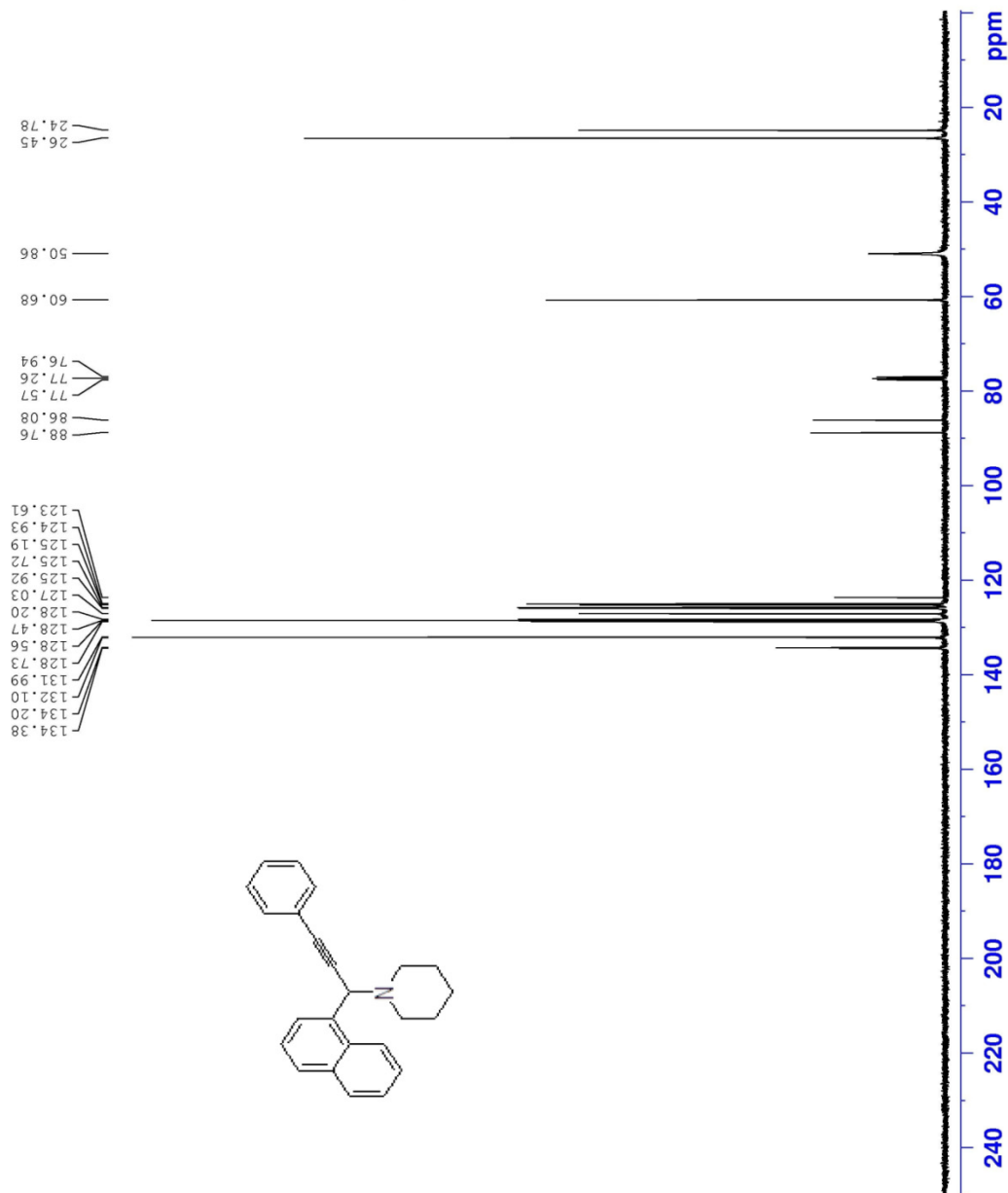




Dr.Gholi nejad
NAME
EXPNO 42
PROCNO 1
Date_ 20111121
Time 10.41
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65392
SOLVENT CDCl3
NS 30
DS 0
SWH 25252.525 Hz
FIDRES 0.385323 Hz
AQ 1.2376629 sec
RG 2050
DW 19.800 usec
DE 6.50 usec
TE 296.2 K
D1 3.00000000 sec
D11 0.03000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 13C
PI 9.00 usec
PL1 -0.90 dB
PL1W 42.02801895 W
SFO1 100.6479784 MHz

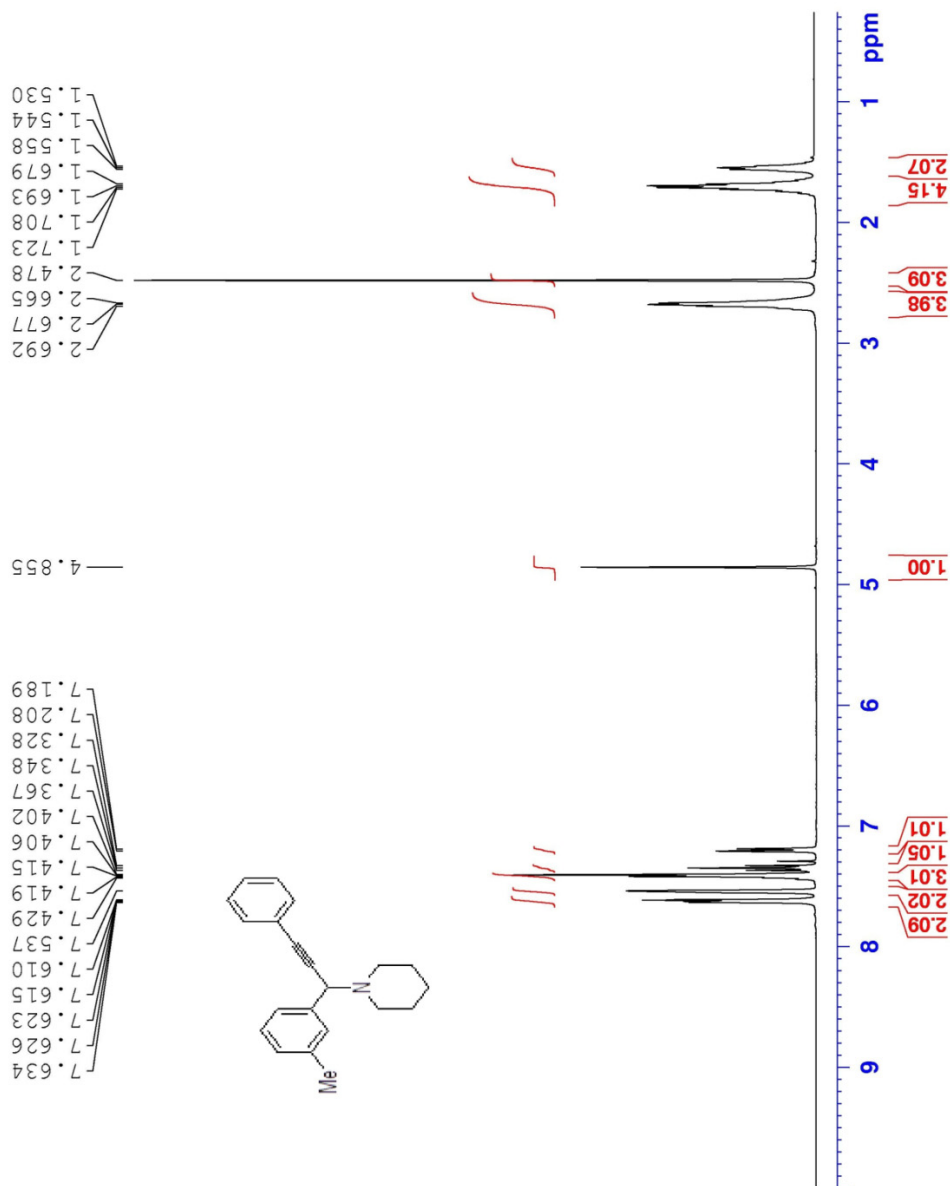
===== CHANNEL f2 =====
CFDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -2.00 dB
PL12 14.16 dB
PL13 17.90 dB
PL2W 11.86359406 W
PL12W 0.28722104 W
PL13W 0.12139934 W
SFO2 400.2216009 MHz
SI 32768
SF 100.6353990 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40





NAME Dr.Gholi nejad
EXNO 49
PROCNO 1
Date_ 20111126
Time 14.56
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 24
DS 0
SWH 8012.820 Hz
FIDRES 0.122266 Hz
AQ 4.0894966 sec
RG 256
DW 62.400 usec
DE 6.50 usec
TE 295.1 K
D1 6.00000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 1H
P1 14.00 usec
PL1 -2.00 dB
PL1W 11.86359406 W
SF01 400.2236020 MHz
SI 32768
SF 400.2200000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

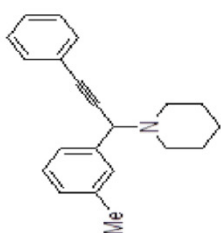
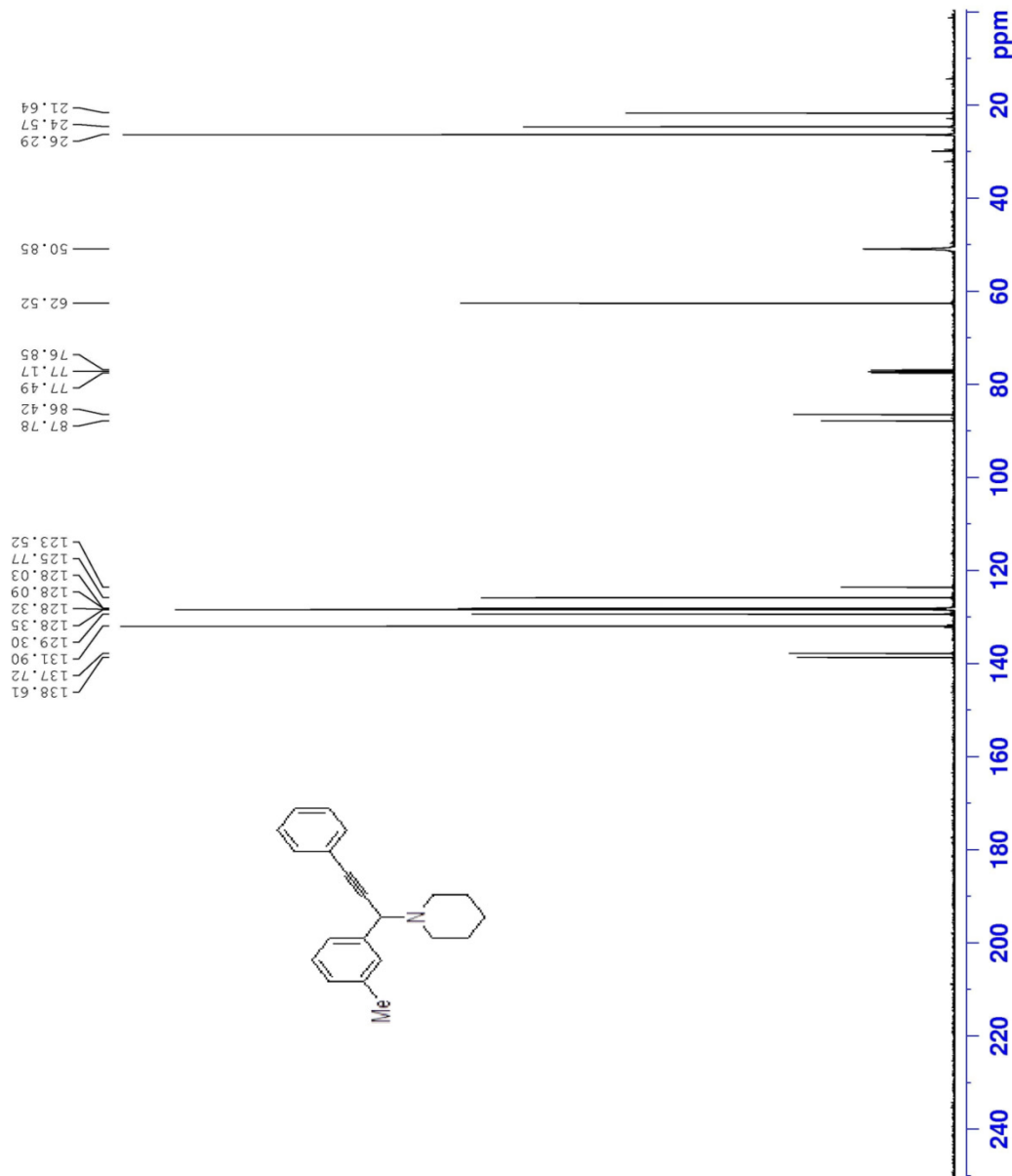




NAME Dr.Gholi nejad
EXPNO 48
PROCNO 1
Date_ 20111126
Time 15.00
INSTRUM Spect
PROBHD 5 mm PABBO BB
PULPROG zgpg
TD 65536
SOLVENT CDCl3
NS 61
DS 0
SWH 25252.525 Hz
FIDRES 0.385323 Hz
AQ 1.2976629 sec
RG 2050
DW 19.800 usec
DE 6.50 usec
TE 295.6 K
D1 3.00000000 sec
D11 0.03000000 sec
TD0 1

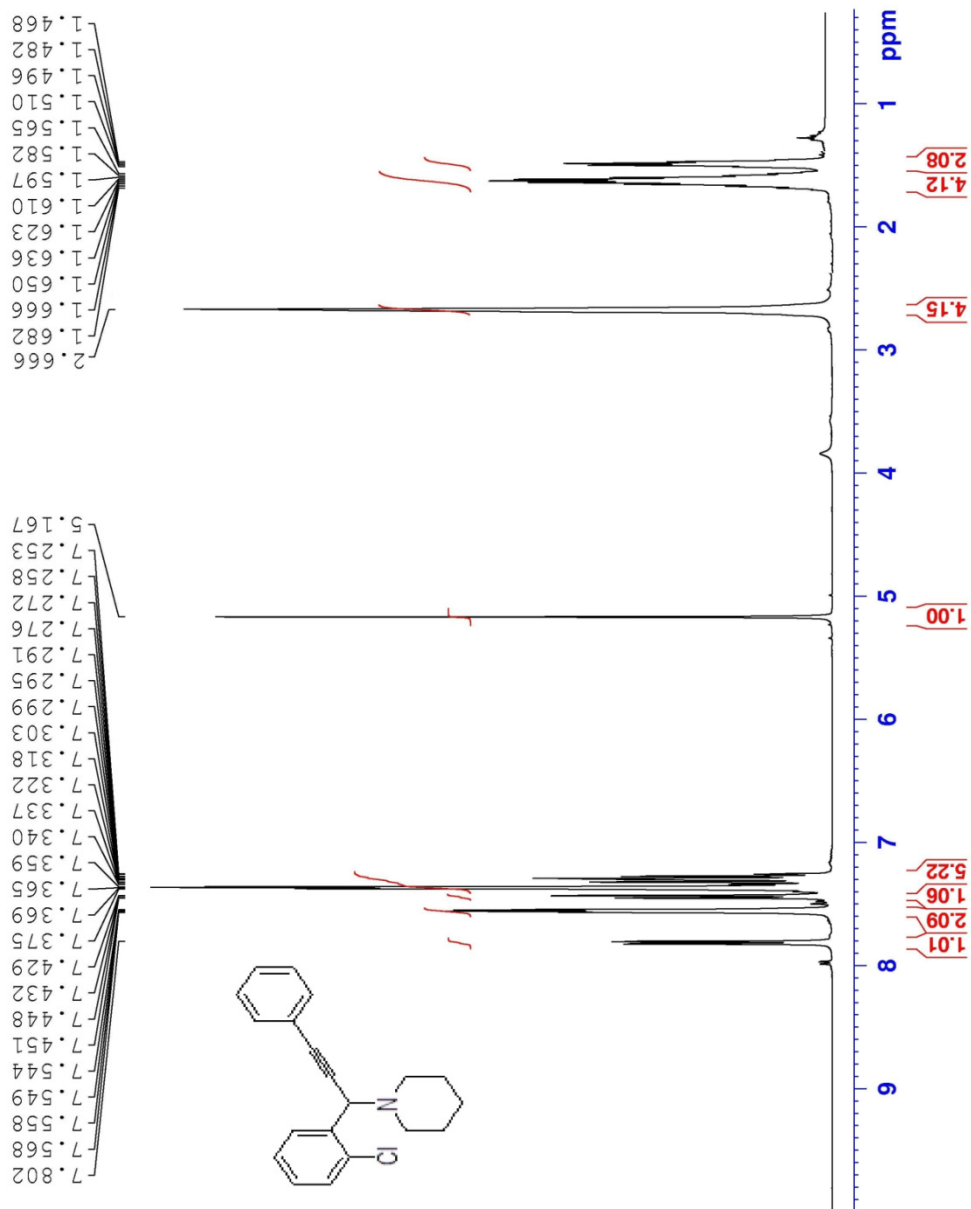
===== CHANNEL f1 =====
NUC1 13C
P1 9.00 usec
PL1 -0.90 dB
PL1W 42.02801895 W
SFO1 100.6479784 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -2.00 dB
PL12 14.16 dB
PL13 17.90 dB
PL2W 11.86359406 W
PL12W 0.28722104 W
PL13W 0.12139934 W
SFO2 400.2216009 MHz
SI 32768
SF 100.6353990 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40





Dr.Gholi nejad
NAME EXPNO 51
PROCNO 1
Date_ 20111128
Time 11.11
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 24
DS 0
SWH 8012.820 Hz
FIDRES 0.122266 Hz
AQ 4.0894966 sec
RG 456
DW 62.400 usec
DE 6.50 usec
TE 296.3 K
D1 6.00000000 sec
TD0 1
===== CHANNEL f1 =====
NUC1 1H
P1 14.00 usec
PL1 -2.00 dB
PL1W 11.86359406 W
SF01 400.22336020 MHz
SI 32768
SF 400.22000000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

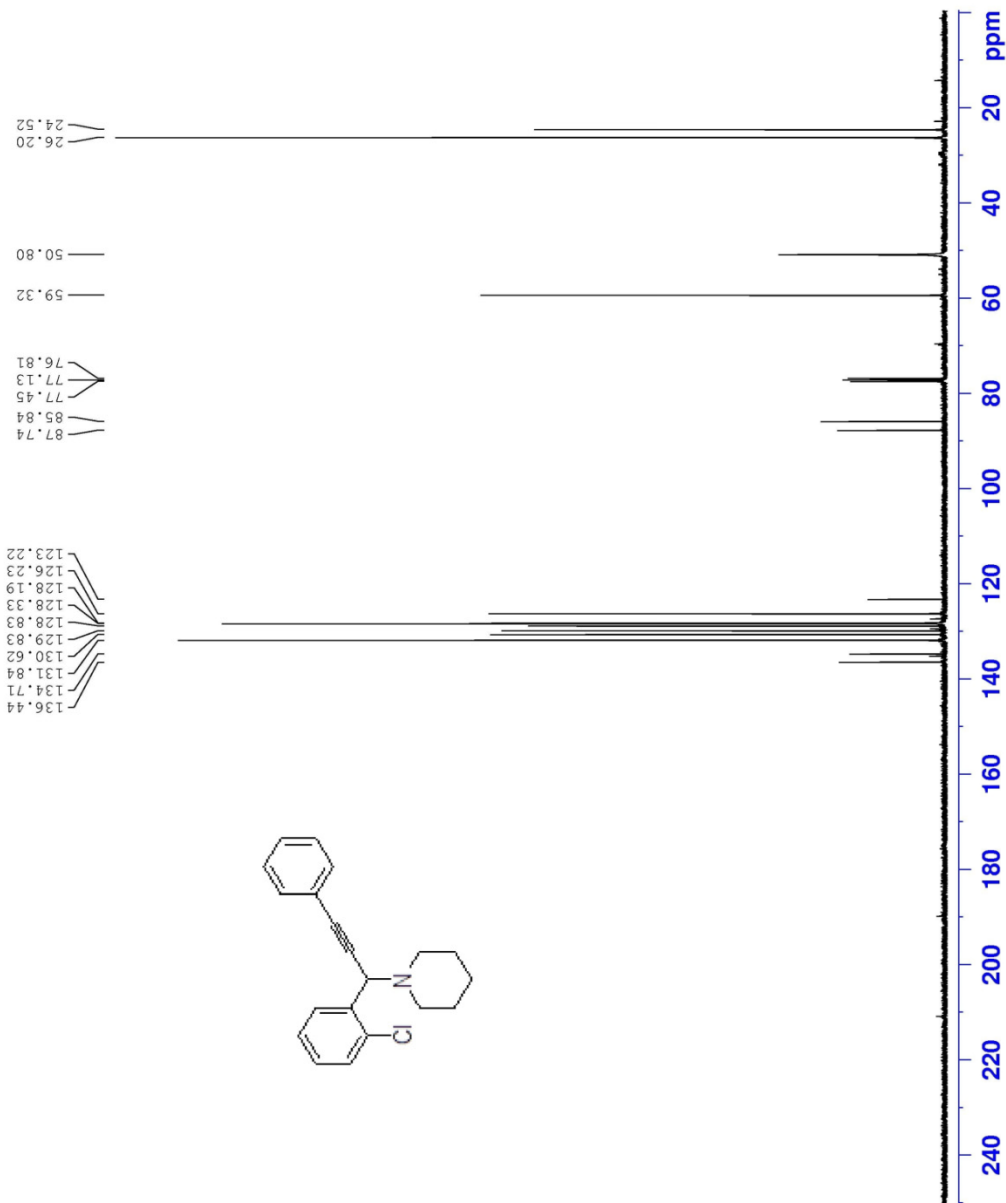




NAME Dr.Gholi nejati
EXPNO 50
PROCNO 1
Date_ 20111128
Time 11.15
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg
TD 65536
SOLVENT CDC13
NS 76
DS 0
SWH 25252.525 Hz
FIDRES 0.385323 Hz
AQ 1.2976629 sec
RG 2050
DW 19.800 usec
DE 6.50 usec
TE 296.7 K
D1 3.00000000 sec
D11 0.03000000 sec
TD0 1

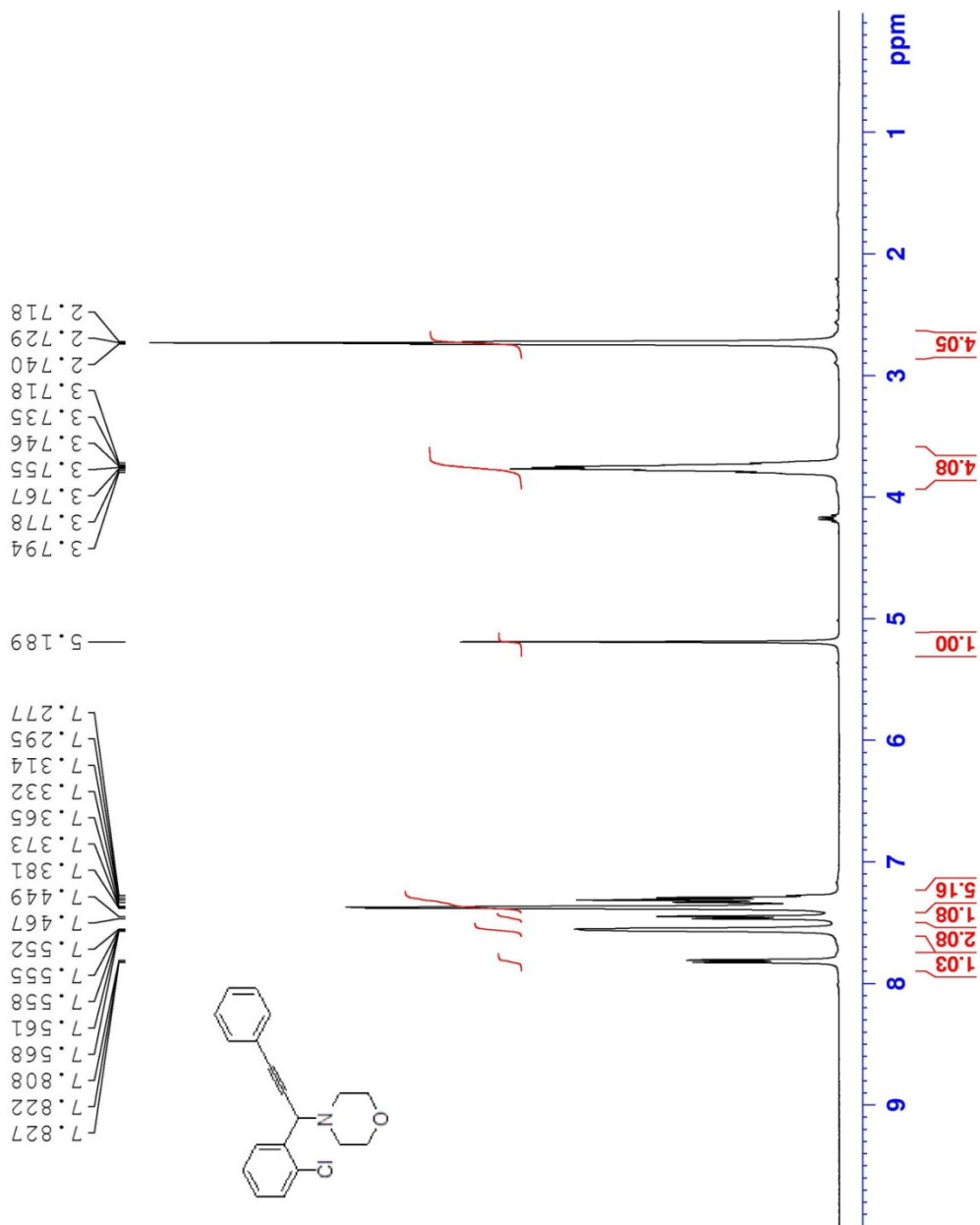
==== CHANNEL f1 =====
NUC1 13C
P1 9.00 usec
PL1 -0.90 dB
PL1W 42.02801895 W
SFO1 100.6479784 MHz

==== CHANNEL f2 =====
CPDPRG2 waitz16
NUC2 1H
P2 90.00 usec
PCPD2 2.00 dB
PL2 14.00 dB
PL2W 14.56 dB
PL3 17.50 dB
PL3W 11.86359406 W
PL4 0.28722104 W
PL4W 0.12139934 W
SFO2 400.2216009 MHz
SI 32768
SF 100.6353990 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40





NAME Dr.Choi.i rejad
EXPNO 53
PROCNO 1
Date_ 20111207
Time_ 10.22
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 14
DS 0
SWH 8012.820 Hz
FIDRES 0.122266 Hz
AQ 4.0894966 sec
RG 362
DW 62.400 usec
DE 6.50 usec
TE 296.9 K
D1 6.00000000 sec
TD0 1
===== CHANNEL f1 =====
NUC1 1H
P1 14.00 usec
PL1 -2.00 dB
PL1W 11.86359406 W
SF01 400.2236020 MHz
SI 32768
SF 400.2200000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

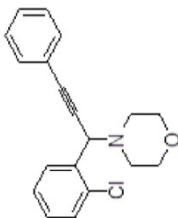
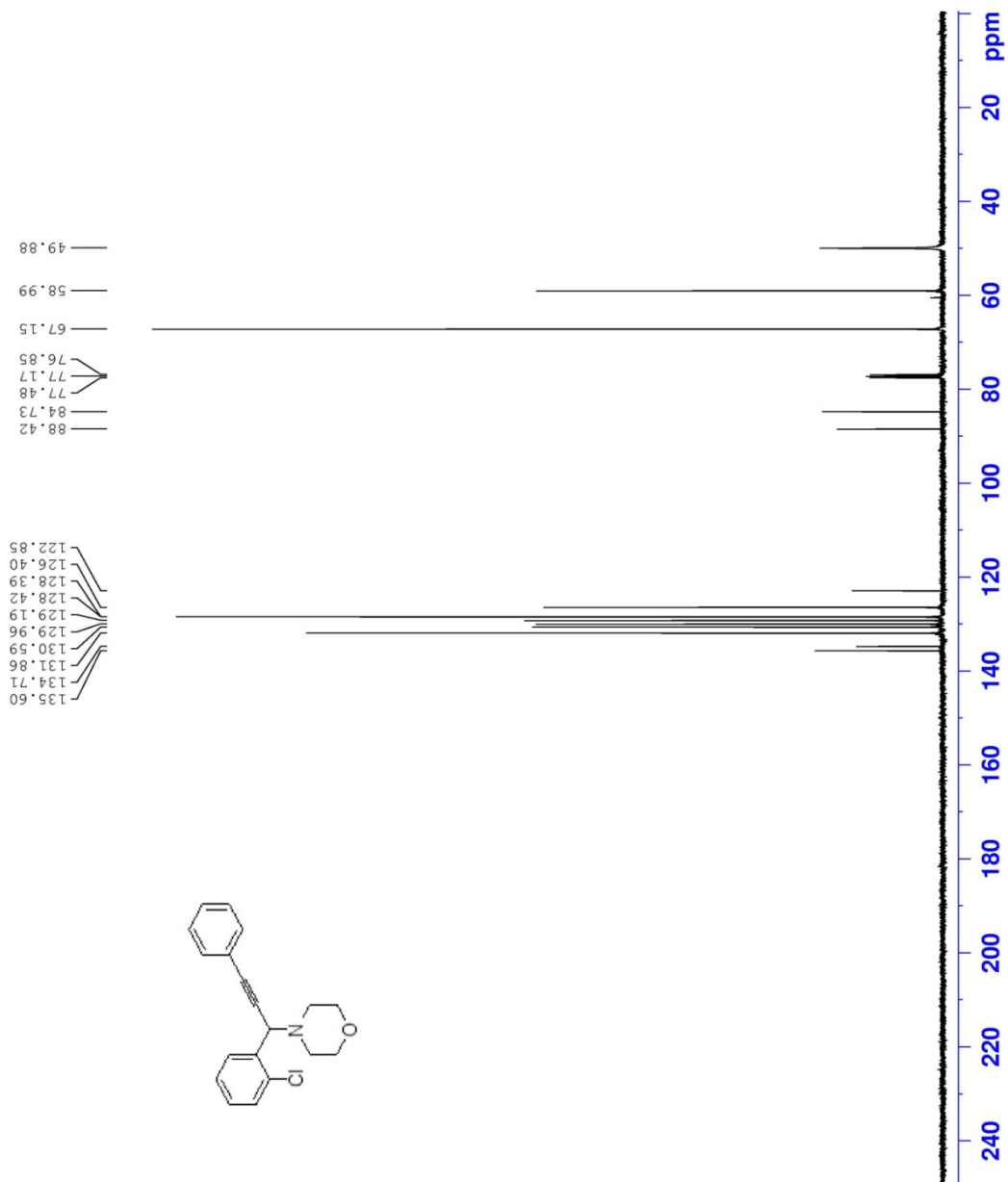




NAME Dr.Gholi nejad
EXPNO 52
PROCNO 1
Date_ 20111207
Time_ 10:23
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg9
TD 65536
SOLVENT CDCl3
NS 50
DS 0
SWH 25252.525 Hz
FIDRES 0.385323 Hz
AQ 1.2976629 sec
RG 2050
DW 19.800 usec
DE 6.50 usec
TE 296.9 K
D1 3.0000000 sec
D11 0.0300000 sec
TD0 1

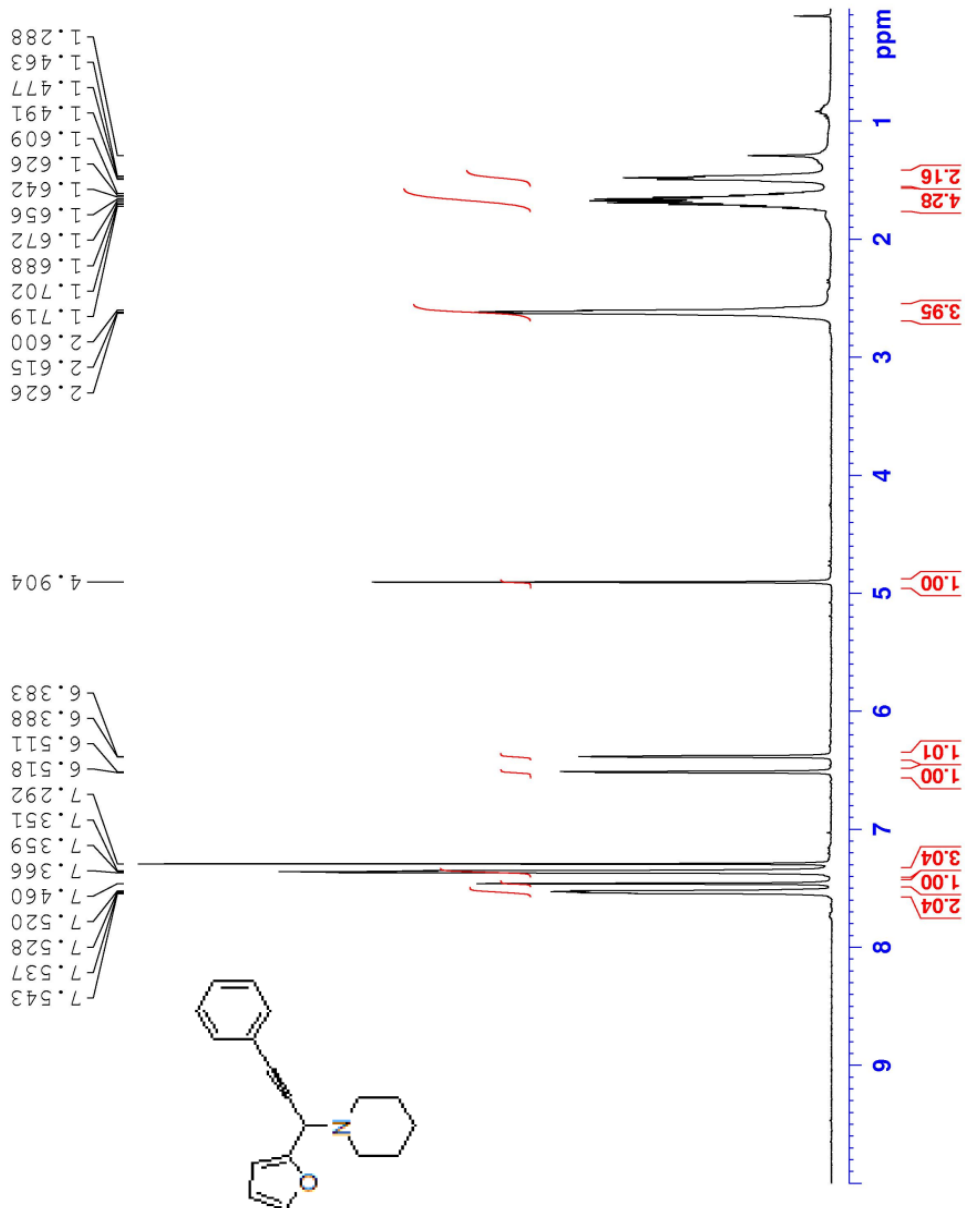
==== CHANNEL f1 =====
NUC1 13C
P1 9.00 usec
PL1 -0.90 dB
PL1W 42.02801895 W
SFO1 100.6479784 MHz

==== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -2.00 dB
PL12 14.16 dB
PL13 17.90 dB
PL2W 11.86359406 W
PL12W 0.28722104 W
PL13W 0.12139934 W
SFO2 400.2216009 MHz
SI 32768
SF 100.6353990 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40





NAME Dr.Gholi nejad
EXPNO 163
PROCNO 1
Date_ 20120305
Time 17.48
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65336
SOLVENT CDCl3
NS 8
DS 0
SWH 8012.820 Hz
FIDRES 0.122266 Hz
AQ 4.0894966 sec
RG 2050
DW 62.400 usec
DE 6.50 usec
TE 295.7 K
D1 6.0000000 sec
TD0 1
===== CHANNEL f1 =====
NUC1 1H
P1 14.00 usec
PL1 2.00 dB
PL1W 11.86359406 W
SF01 400.2236020 MHz
SI 32768
SF 400.2200000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

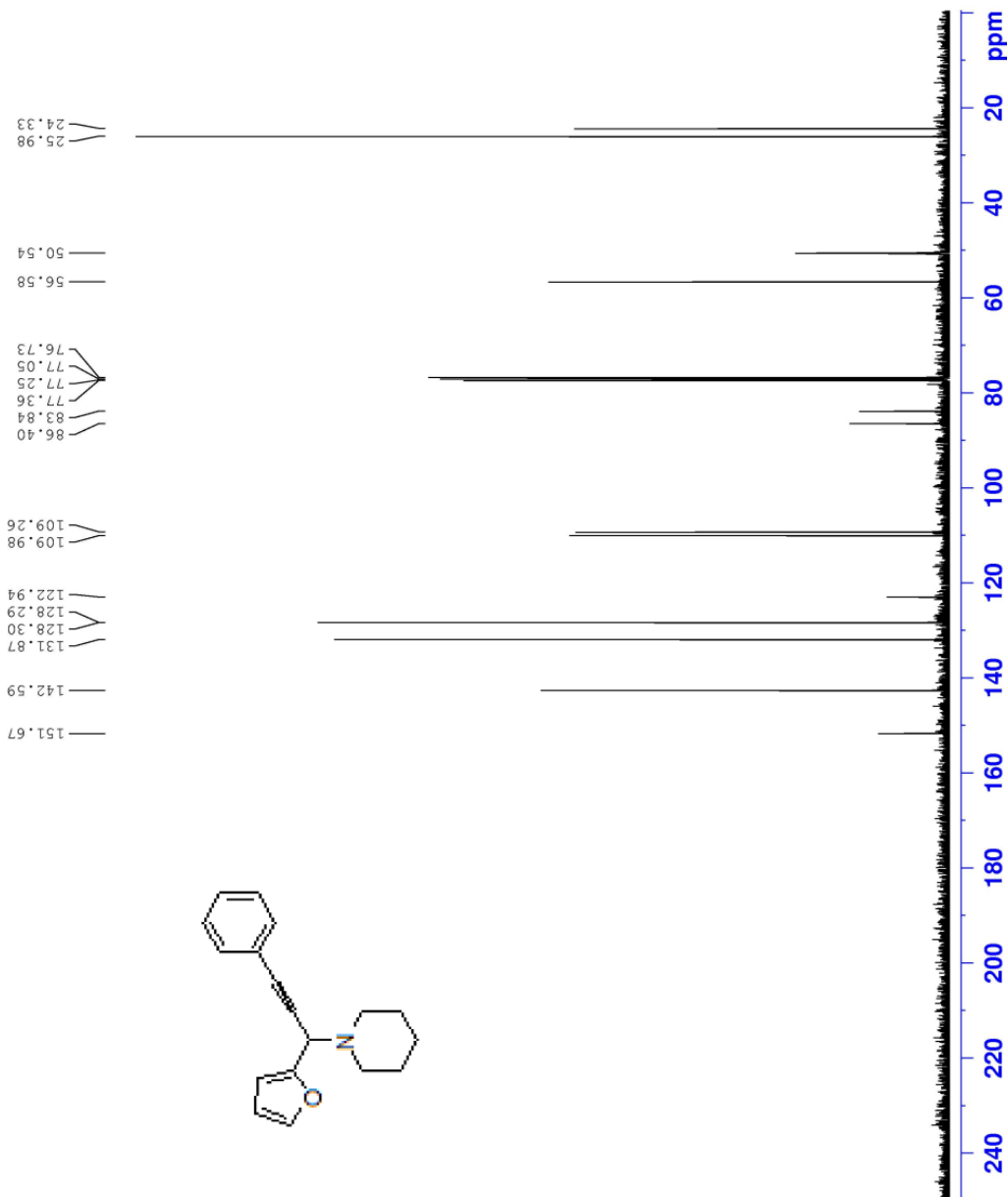




NAME Dr.Gholi nejad
EXPNO 162
PROCNO 1
Date_ 20120305
Time_ 17.49
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg
TD 65536
SOLVENT CDC13
NS 132
DS 0
SWH 25252.525 Hz
FIDRES 0.385323 Hz
AQ 1.2976629 sec
RG 2050
DW 19.800 usec
DE 6.50 usec
TE 295.8 K
D1 3.00000000 sec
D11 0.03000000 sec
TD0 1

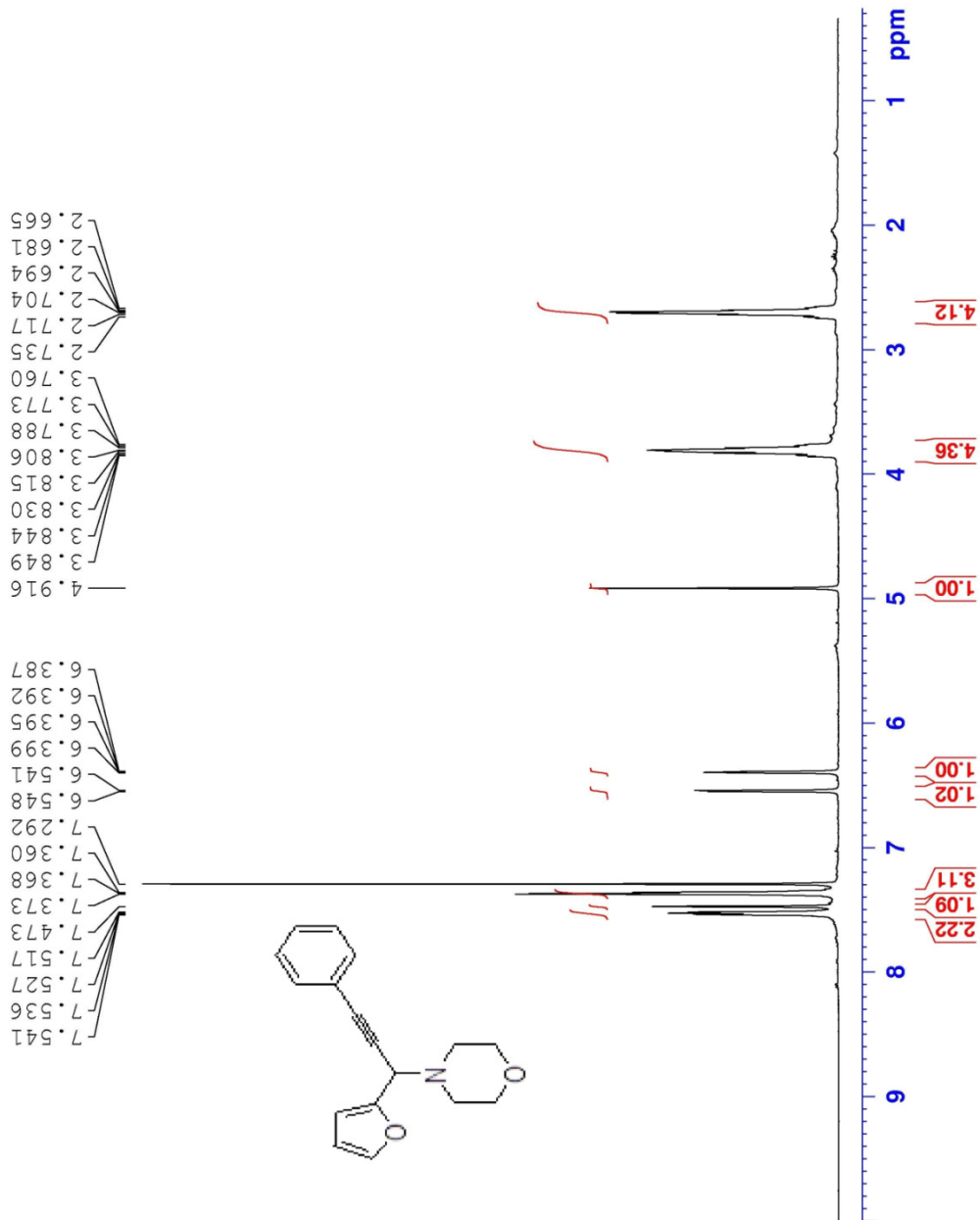
=====
CHANNEL f1
NUC1 13C
P1 9.00 usec
PL1 -0.90 dB
PL1W 42.02801895 W
SF01 100.6479784 MHz

=====
CHANNEL f2
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -2.00 dB
PL12 14.16 dB
PL13 17.90 dB
PL2W 11.86359406 W
PL12W 0.28722104 W
PL13W 0.12139934 W
SF02 400.2216009 MHz
SI 32768
SF 100.6353990 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40





Dr.Gholi nejad
NAME
EXPNO 89
PROCNO 1
Date_ 20120128
Time_ 16.30
INSTRUM Spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 24
DS 0
SWH 8012.820 Hz
FIDRES 0.122266 Hz
AQ 4.0894966 sec
RG 2050
DM 62.400 usec
DE 6.50 usec
TE 295.8 K
D1 6.00000000 sec
TD0 1
===== CHANNEL f1 =====
NUC1 1H
P1 14.00 usec
PL1 -2.00 dB
PL1W 11.86359406 W
SF01 400.2236020 MHz
SI 32768
SF 400.2200000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

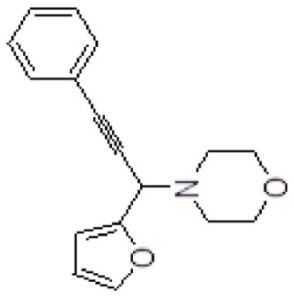
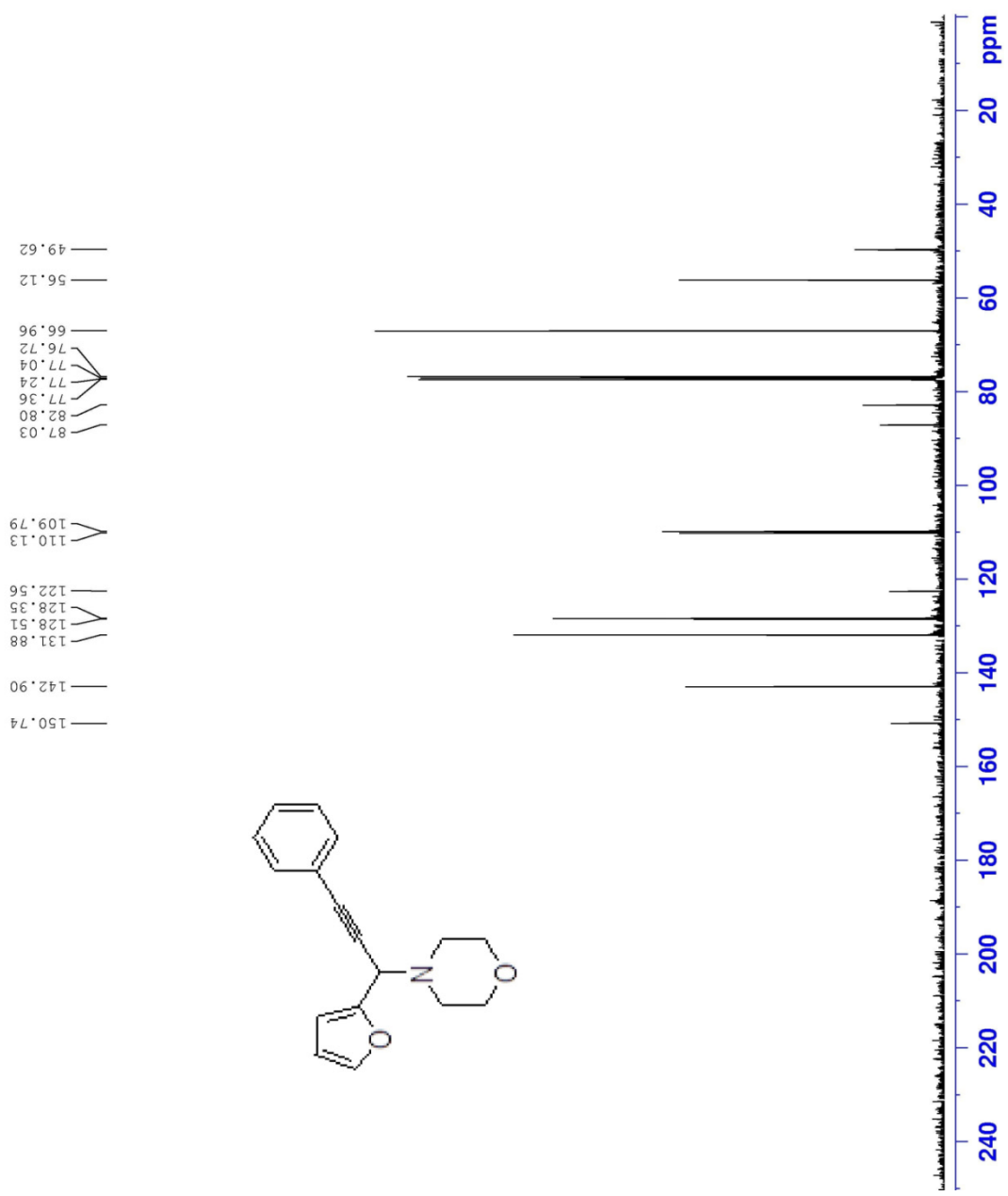




Dr.Gholi nejad
NAME
EXPNO 1
PROCNO 88
Date_ 20120128
Time 16.32
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg
TD 65536
SOLVENT CDCl3
NS 240
DS 0
SWH 25252.525 Hz
FIDRES 0.385323 Hz
AQ 1.2976629 sec
RG 2050
DW 19.800 usec
DE 6.50 usec
TE 296.1 K
D1 3.0000000 sec
D11 0.0300000 sec
TD0 1

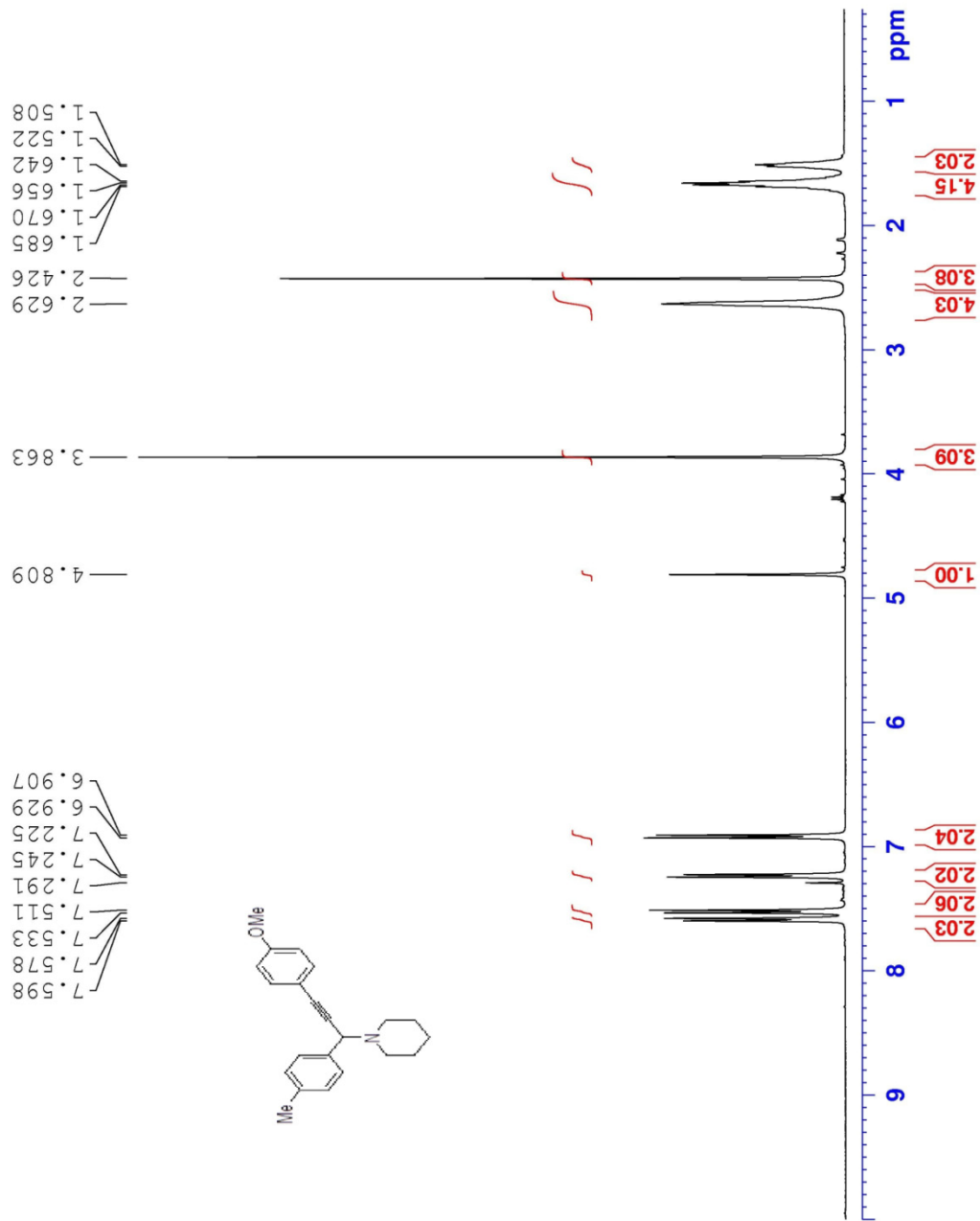
==== CHANNEL f1 =====
NUC1 13C
P1 9.00 usec
PL1 -0.90 dB
PL1W 42.02801895 W
SF01 100.6479784 MHz

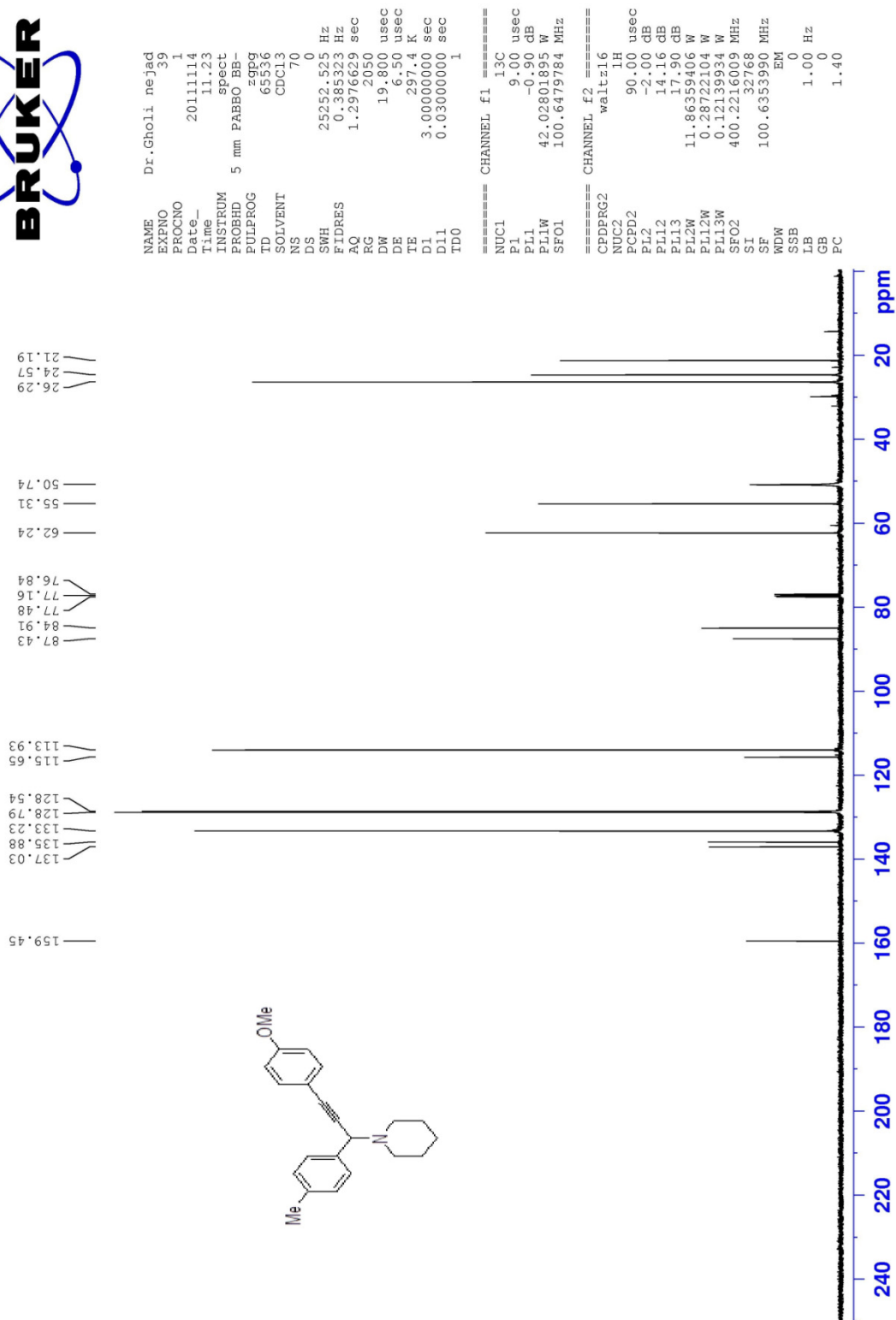
==== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -2.00 dB
PL12 14.16 dB
PL13 17.90 dB
PL2W 11.86359406 W
PL12W 0.28722104 W
PL13W 0.12139934 W
SF02 400.2216009 MHz
SI 32768
SF 100.6353990 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40





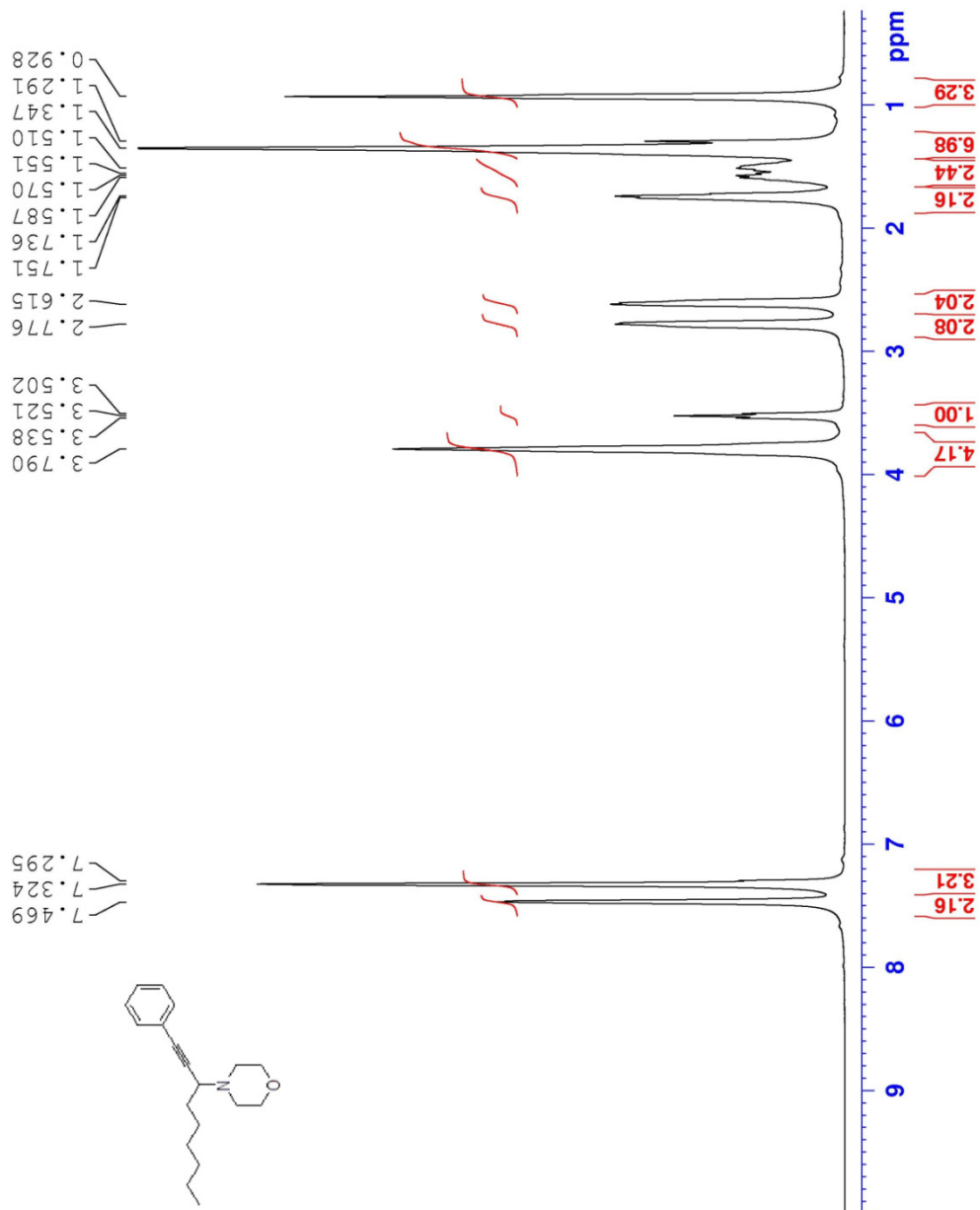
Dr.Gholi nejad
NAME
EXPNO 38
PROCNO 1
Date_ 20111114
Time 11.16
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 24
DS 0
SWH 8012.820 Hz
FIDRES 0.122266 Hz
AQ 4.0894966 sec
RG 362
DW 62.400 usec
DE 6.50 usec
TE 297.0 K
D1 6.00000000 sec
TD0 1
===== CHANNEL f1 =====
NUC1 1H
P1 14.00 usec
PL -2.00 dB
PL1W 11.86359406 W
SFO1 400.2236020 MHz
SI 32768
SF 400.2200000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00





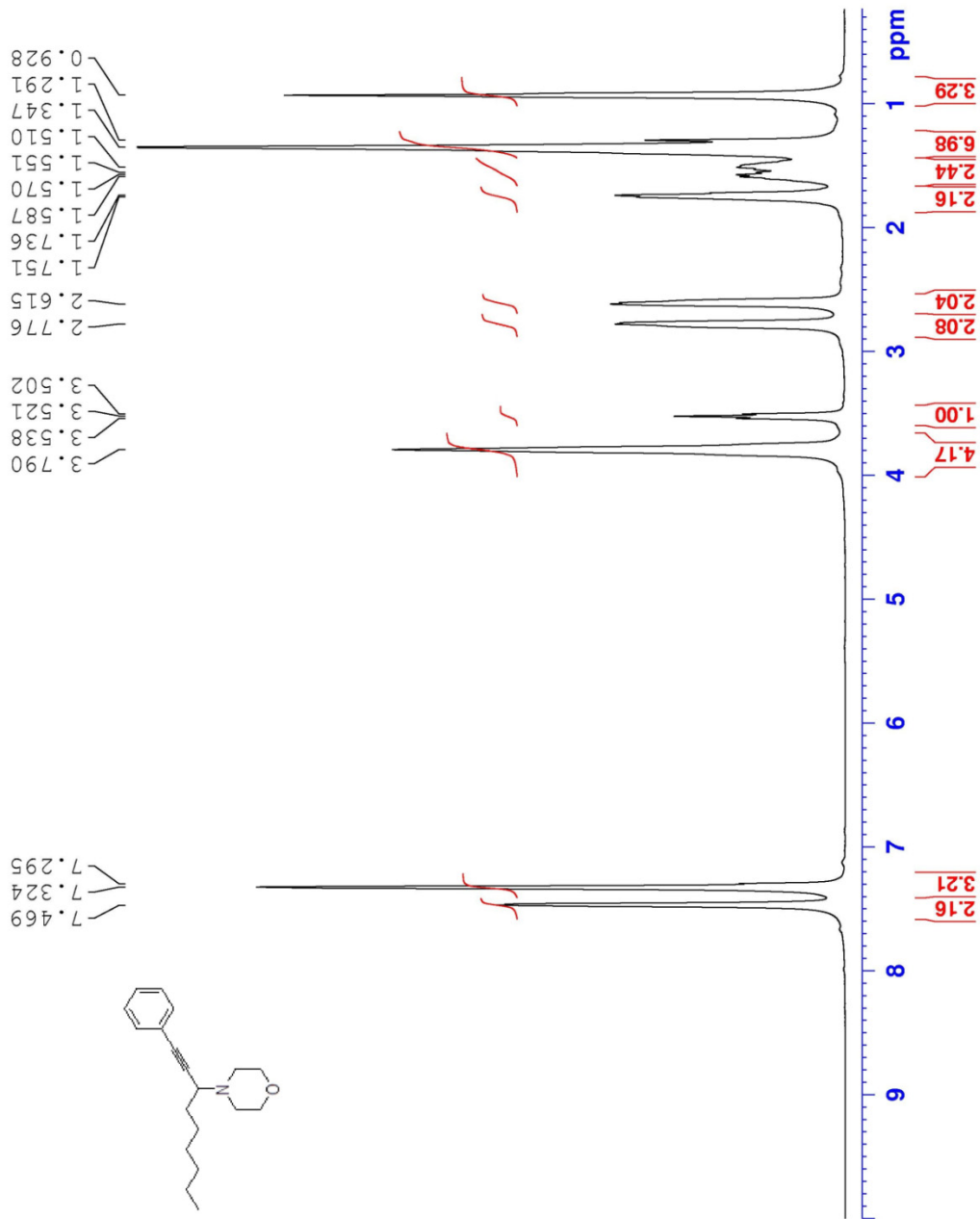


NAME Dr.Gholi nejad
EXPNO 22
PROCNO 1
Date_ 20111029
Time 11.24
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDC13
NS 24
DS 0
SWH 8012.820 Hz
FIDRES 0.122266 Hz
AQ 4.0894966 sec
RG 406
DW 62.400 usec
DE 6.50 usec
TE 294.3 K
D1 6.00000000 sec
TD0 1
===== CHANNEL f1 =====
NUC1 1H
P1 14.00 usec
PL1 -2.00 dB
PL1W 11.86359406 W
SF01 400.2236020 MHz
SI 32768
SF 400.2200000 MHz
EM
WDW 0
SSB 0
LB 0.30 Hz
GB 0
PC 1.00





Dr. Gholi nejad
NAME
EXPNO 22
PROCNO 1
Date_ 20111029
Time 11.24
INSTRUM spect
PROBHD 5 mm PABBO BE-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 24
DS 0
SWH 8012.820 Hz
FIDRES 0.122266 Hz
AQ 4.0894966 sec
RG 406
DW 62.400 usec
DE 6.50 usec
TE 294.3 K
D1 6.00000000 sec
TD0 1
===== CHANNEL f1 =====
NUC1 1H
P1 14.00 usec
PL1 -2.00 dB
PL1W 11.86359406 W
SF01 400.2236020 MHz
SI 32768
SF 400.2200000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

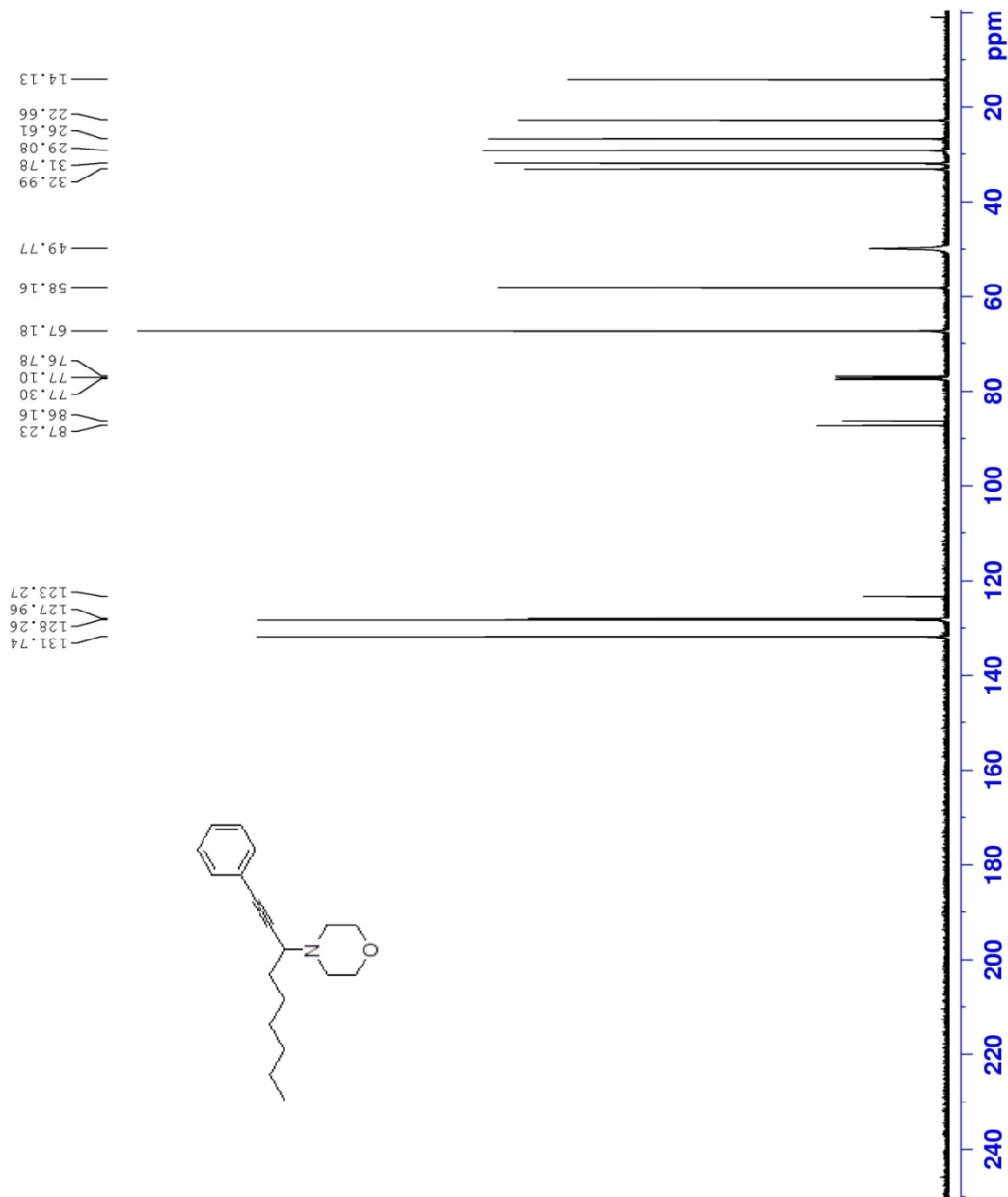




NAME Dr.Gholi nejad
EXENO Z1
PROCNO 1
Date_ 201111029
Time_ 11.27
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg
TD 65536
SOLVENT CDCl3
NS 120
DS 0
SWH 25252.525 Hz
FIDRES 0.385323 Hz
AQ 1.2976629 sec
RG 2050
DW 19.800 usec
DE 6.50 usec
TE 294.5 K
D1 3.00000000 sec
D11 0.03000000 sec
TD0 1

==== CHANNEL f1 =====
NUC1 13C
P1 9.00 usec
PL1 -0.90 dB
PL1W 42.02801895 W
SF01 100.6479784 MHz

==== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -2.00 dB
PL12 14.16 dB
PL13 17.90 dB
PL2W 11.86359406 W
PL12W 0.28722104 W
PL13W 0.12139934 W
SFO2 400.2216009 MHz
SI 32768
SF 100.6353990 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40





NAME Dr.Gholi nejad

EXPNO 30

PROCNO 1

Date_ 20111102

Time_ 11.32

INSTRUM spect

PROBHD 5 mm PABBO BB-

PULPROG zg30

TD 65536

SOLVENT CDCl3

NS 24

DS 0

SWH 8012.820 Hz

FIDRES 0.122266 Hz

AQ 4.0894966 sec

RG 1030

DW 62.400 usec

DE 6.50 usec

TE 297.9 K

D1 6.00000000 sec

TD0 1

==== CHANNEL f1 =====

NUC1 1H

F1 14.00 usec

PL1 -2.00 dB

PL1W 11.86359406 W

SFO1 400.2236020 MHz

SI 32768

SF 400.2200000 MHz

WDW EM

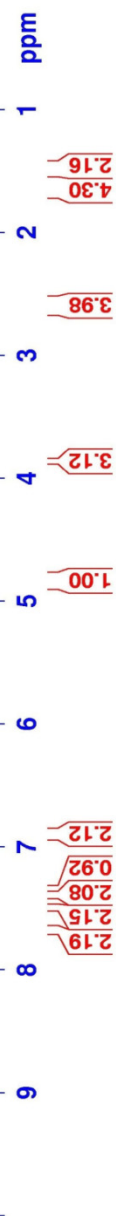
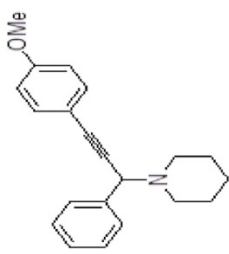
SSB 0

LB 0.30 Hz

GB 0

PC 1.00

7.679
7.660
7.501
7.479
7.448
7.439
7.410
7.392
7.373
7.337
7.319
7.292
6.905
6.883
4.813
3.854
2.593
2.426
1.667
1.652
1.637
1.622
1.608
1.490
1.476
1.301

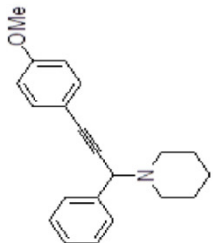
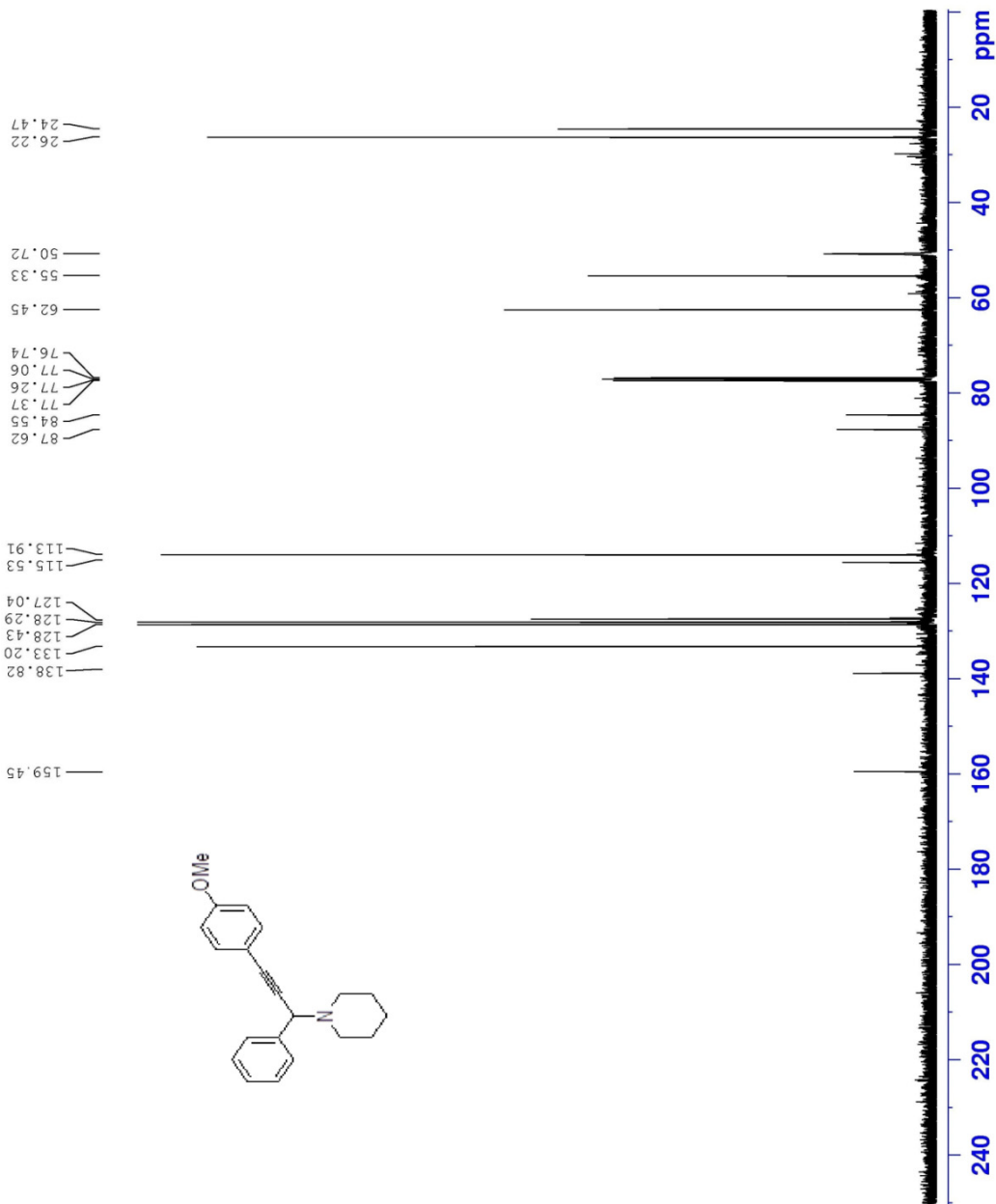




NAME Dr.Gholi nejad
EXPNO 29
PROCNO 1
Date_ 20111102
Time_ 11:35
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg
TD 65536
SOLVENT CDC13
NS 100
DS 0
SWH 25252.525 Hz
FIDRES 0.385323 Hz
AQ 1.2976629 sec
RG 2050
DW 19.800 usec
DE 6.50 usec
TE 298.3 K
D1 3.00000000 sec
D11 0.03000000 sec
TD0 1

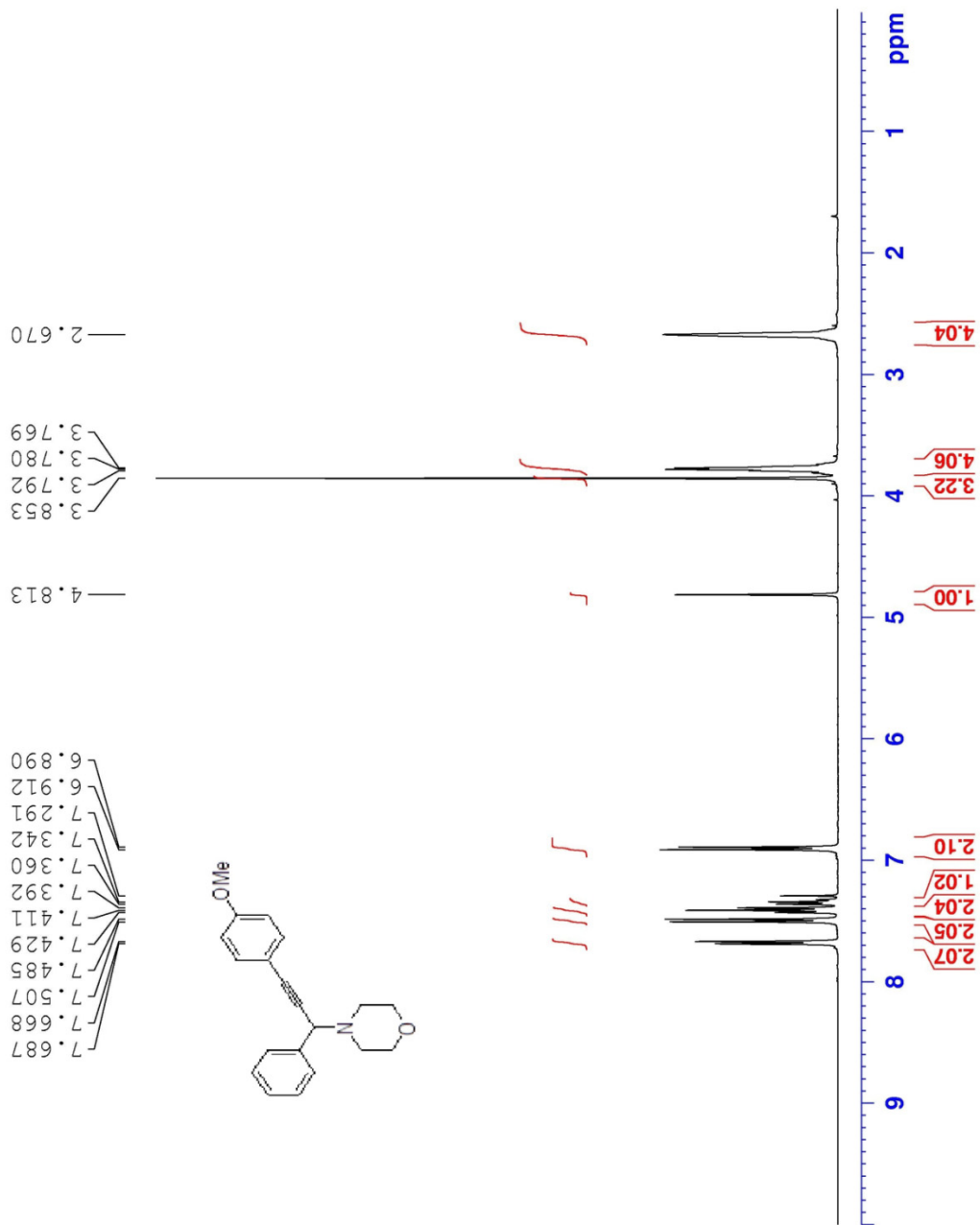
==== CHANNEL f1 =====
NUC1 13C
P1 9.00 usec
PL1 -0.90 dB
PL1W 42.02801895 W
SFO1 100.6479784 MHz

==== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -2.00 dB
PL12 14.16 dB
PL13 17.90 dB
PL1W 11.86359406 W
PL12W 0.28722104 W
PL13W 0.12139934 W
SFO2 400.2216009 MHz
SI 32768
SF 100.6353990 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40





Dr.Gholi nejad
NAME
EXPNO 26
PROCNO 1
Date_ 20111031
Time 14.28
INSTRUM spect
PROBHD 5 mm FAPBO BB-
PULPROG zg30
TD 65536
SOLVENT CDC13
NS 24
DS 0
SWH 8012.820 Hz
FIDRES 0.122266 Hz
AQ 4.0894966 sec
RG 144
DW 62.400 usec
DE 6.50 usec
TE 296.2 K
D1 6.0000000 sec
TD0 1
===== CHANNEL f1 =====
NUC1 IH
P1 14.00 usec
PL1 -2.00 dB
PL1W 11.86359406 W
SFO1 400.2236020 MHz
SI 32768
SF 400.2200000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

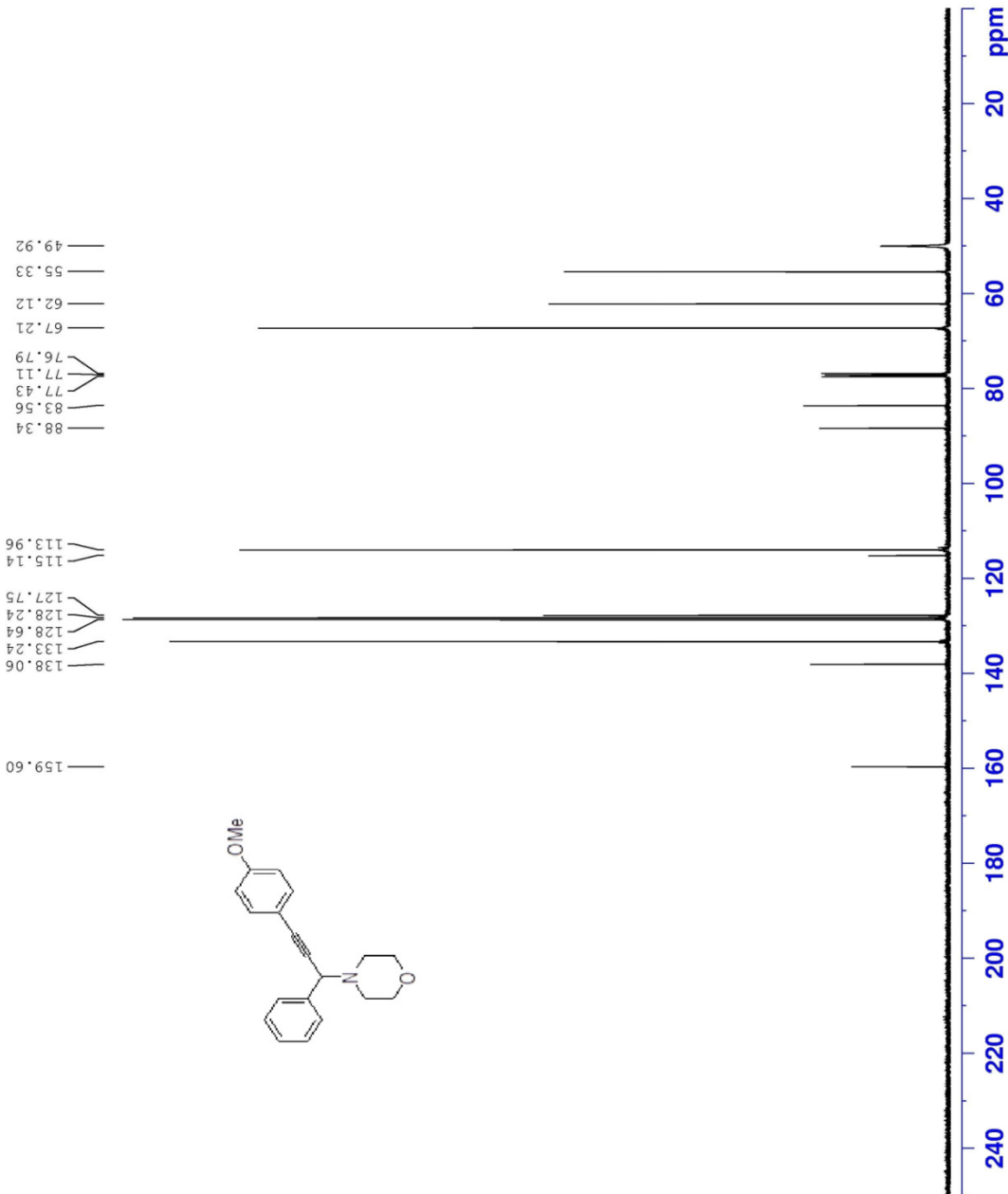




NAME Dr.Gholi nejad
EXPNO 25
PROCNO 1
Date_ 20111031
Time 14.37
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg
TD 65536
SOLVENT CDCl3
NS 160
DS 0
SWH 25252.525 Hz
FIDRES 0.385323 Hz
AQ 1.2976629 sec
RG 2050
DW 19.800 usec
DE 6.50 usec
TE 296.6 K
D1 3.00000000 sec
D11 0.03000000 sec
TD0 1

==== CHANNEL f1 =====
NUC1 13C
P1 9.00 usec
PL1 -0.90 dB
PL1W 42.02801895 W
SFO1 100.6479784 MHz

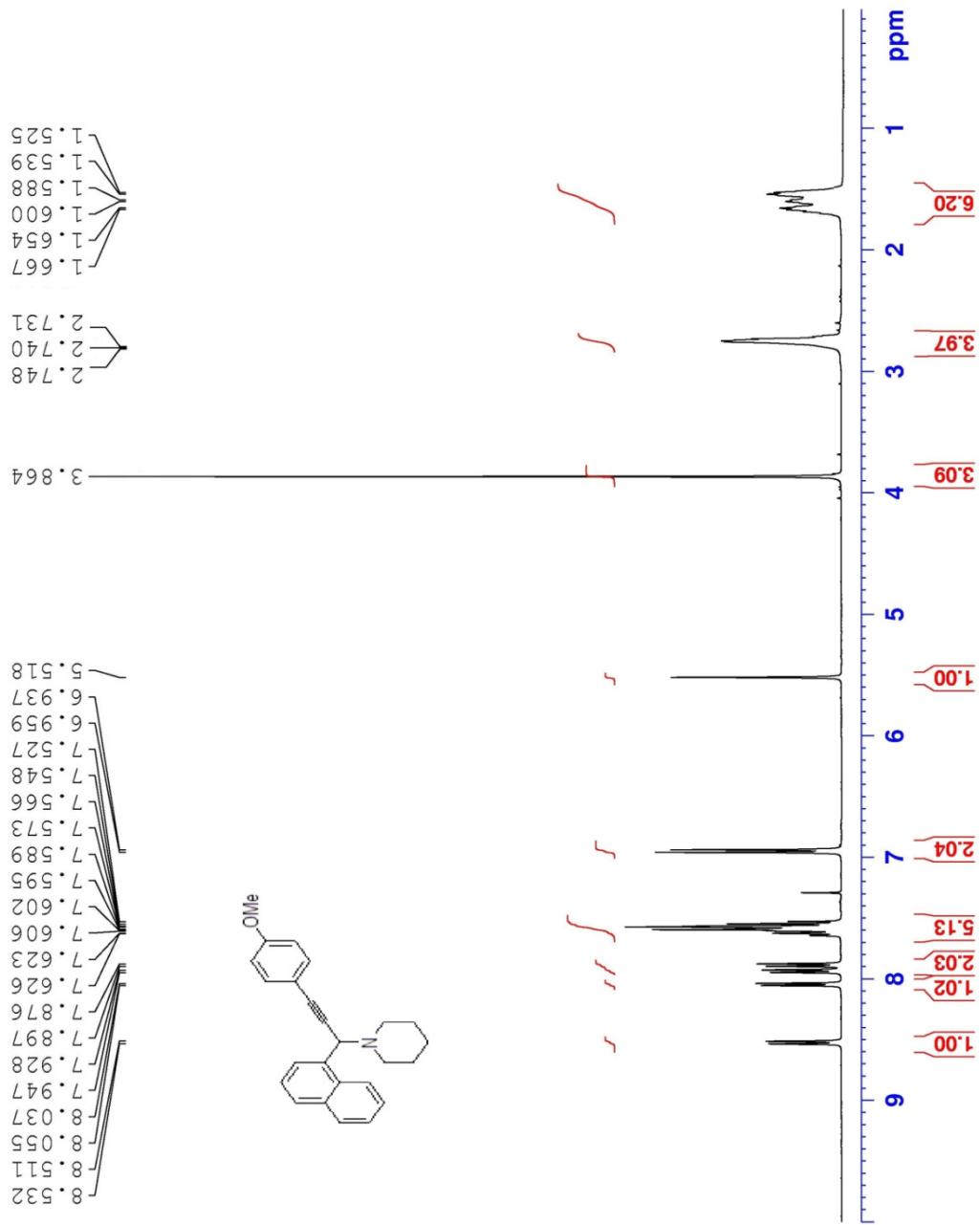
==== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -2.00 dB
PL12 14.16 dB
PL13 17.90 dB
PL2W 11.86359406 W
PL12W 0.28722104 W
PL13W 0.12139934 W
SFO2 400.2216009 MHz
SI 32768
SF 100.6353990 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

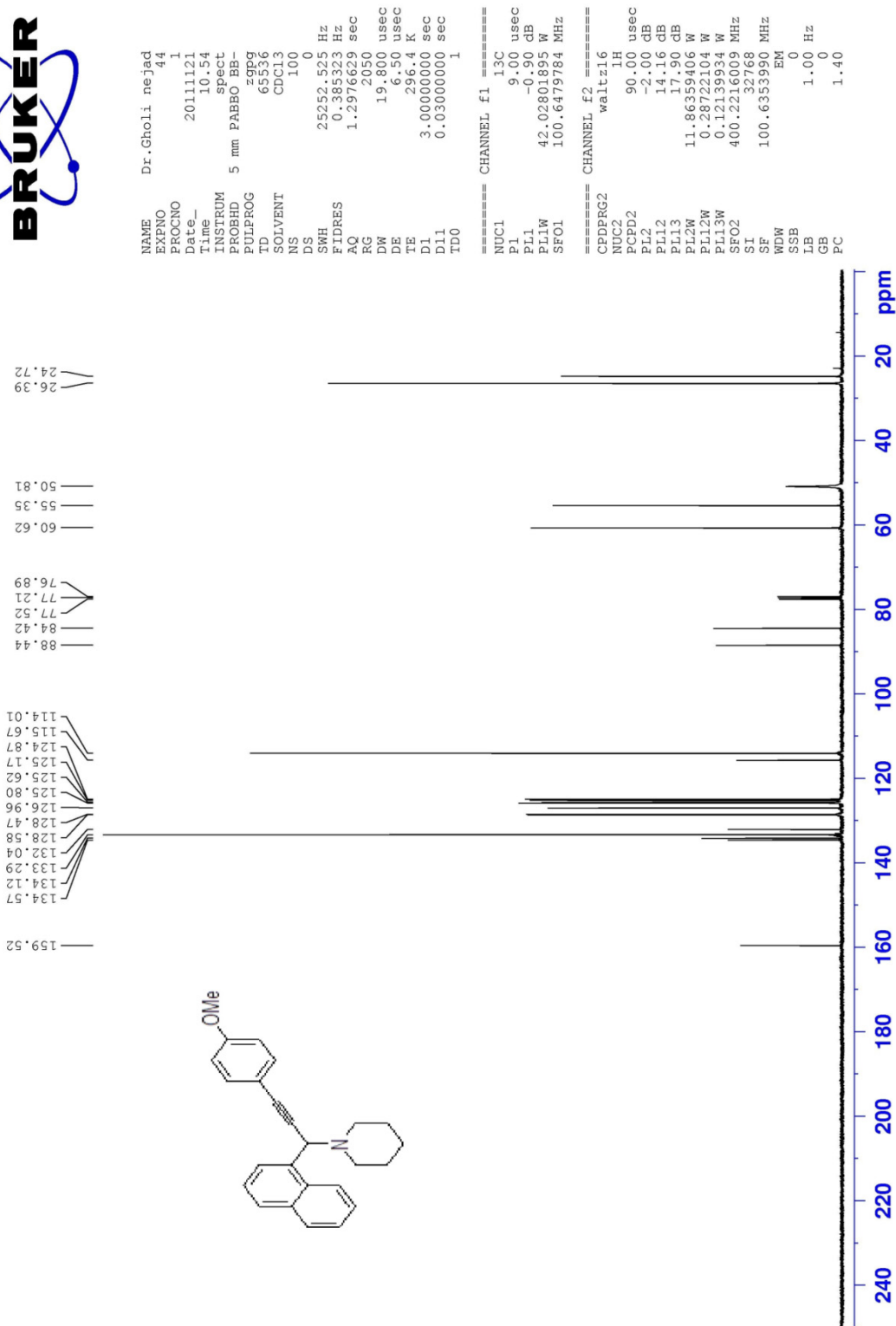




NAME Dr.Gholi nejad
EXPNO 45
PROCNO 1
Date_ 20111121
Time 10.50
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65836
SOLVENT CDCl3
NS 24
DS 0
SWH 8012.820 Hz
FIDRES 0.122266 Hz
AQ 4.0894966 sec
RG 256
DW 62.400 usec
DE 6.50 usec
TE 295.9 K
D1 6.00000000 sec
TD0 1

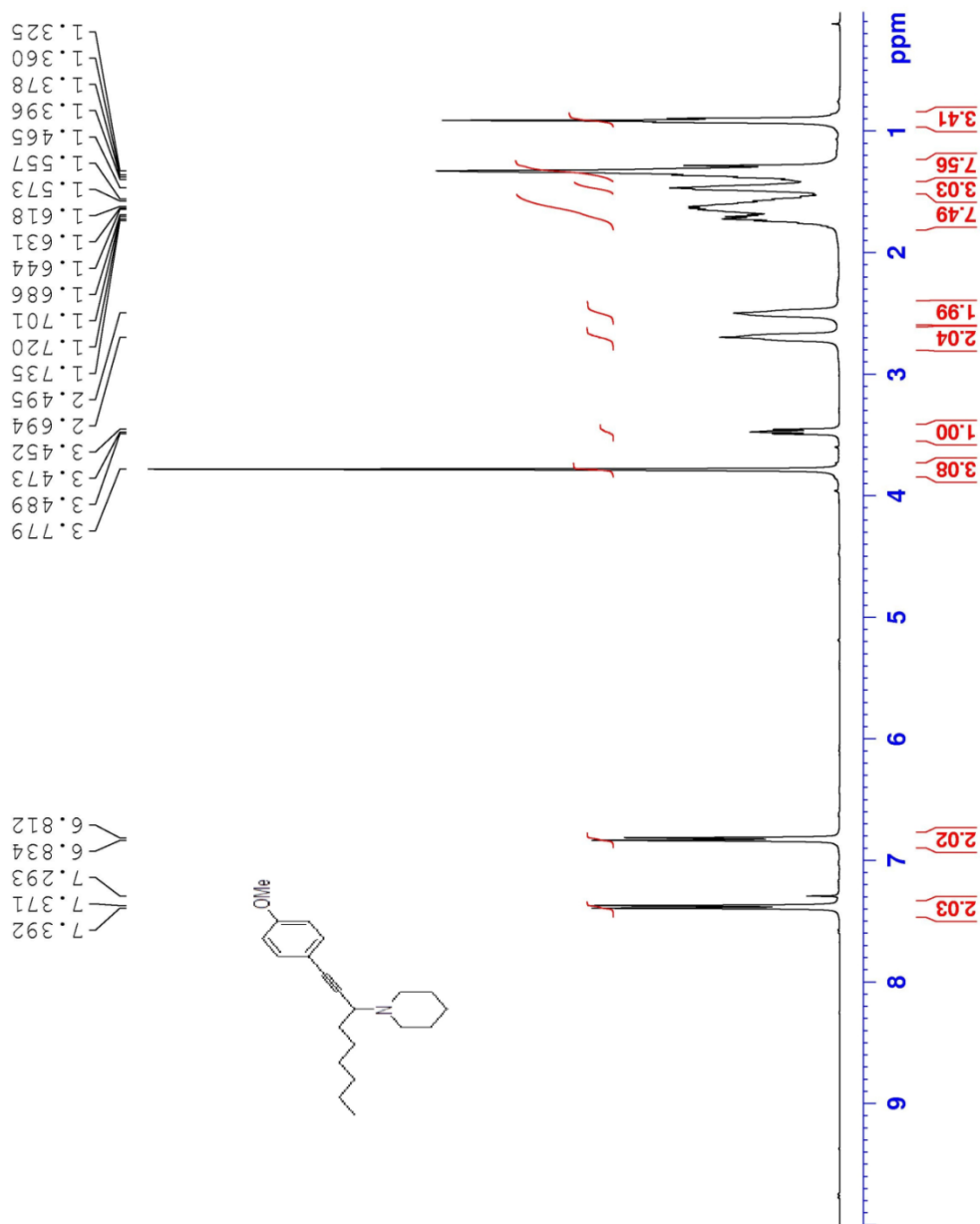
==== CHANNEL f1 =====
NUC1 1H
P1 14.00 usec
PL1 -2.00 dB
PL1W 11.86359406 W
SF01 400.2236020 MHz
SI 32768
SF 400.2200000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00







Dr.Gholi nejad
NAME
EXPNO 41
PROCNO 1
Date_ 20111119
Time 14.06
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDC13
NS 24
DS 0
SWH 8012.820 Hz
FIDRES 0.122266 Hz
AQ 4.0894966 sec
RG 28.5
DW 62.400 usec
DE 6.50 usec
TE 296.3 K
D1 6.0000000 sec
TD0 1
===== CHANNEL f1 =====
NUC1 1H
P1 14.00 usec
PL1 -2.00 dB
PL1W 11.86359406 W
SF01 400.2236020 MHz
SI 32768
SF 400.2200000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

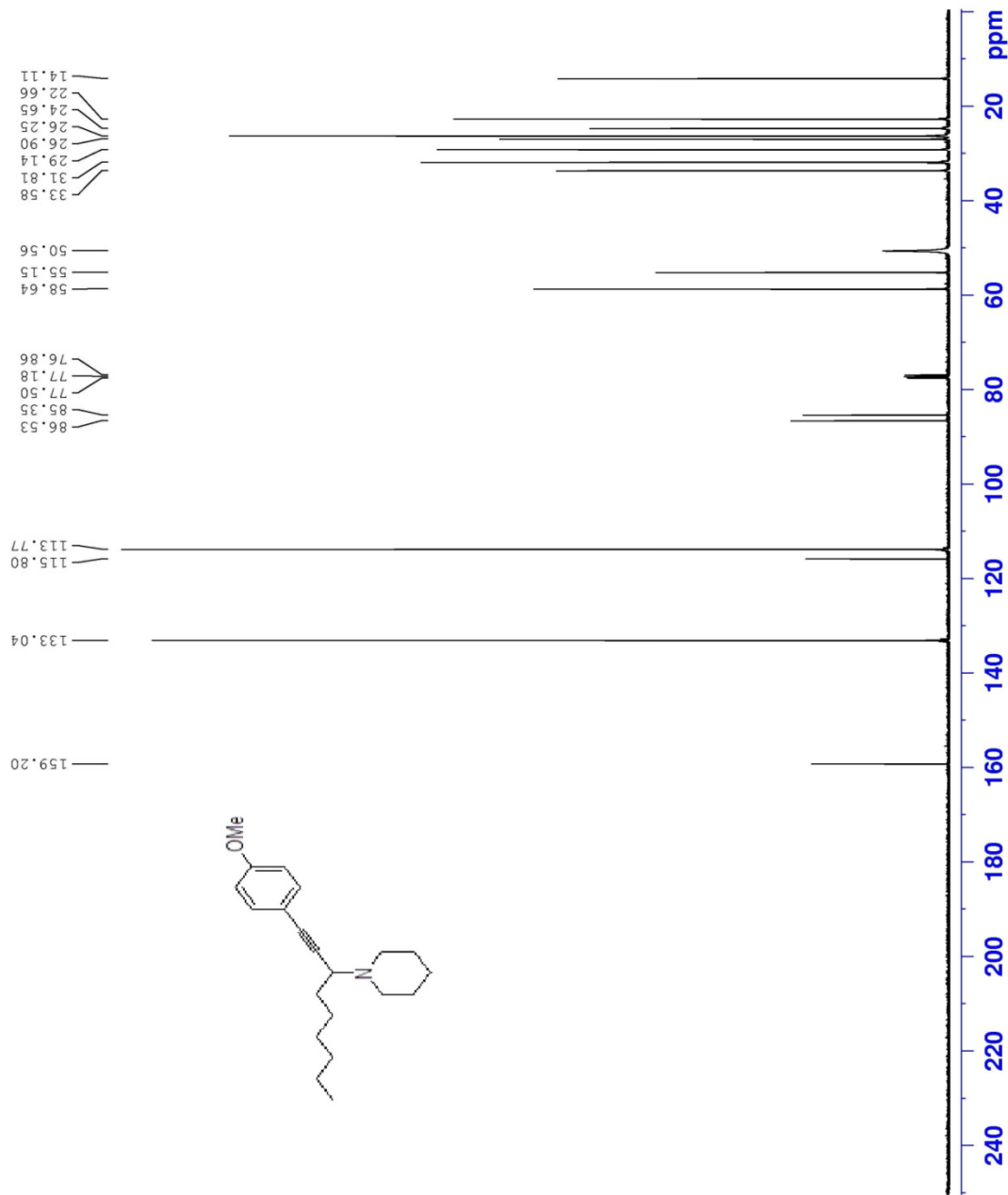




NAME Dr.Gholi nejad
EXPNO 40
PROCNO 1
Date_ 20111119
Time 14.08
INSTRUM spect
PROBHD 5 mm FAPBO BB-
PULPROG zgpg
TD 65536
SOLVENT CDCl3
NS 41
DS 0
SWH 25252.525 Hz
FIDRES 0.365323 Hz
AQ 1.2976629 sec
RG 2050
DW 19.800 usec
DE 6.50 usec
TE 296.6 K
D1 3.00000000 sec
D11 0.03000000 sec
TD0 1

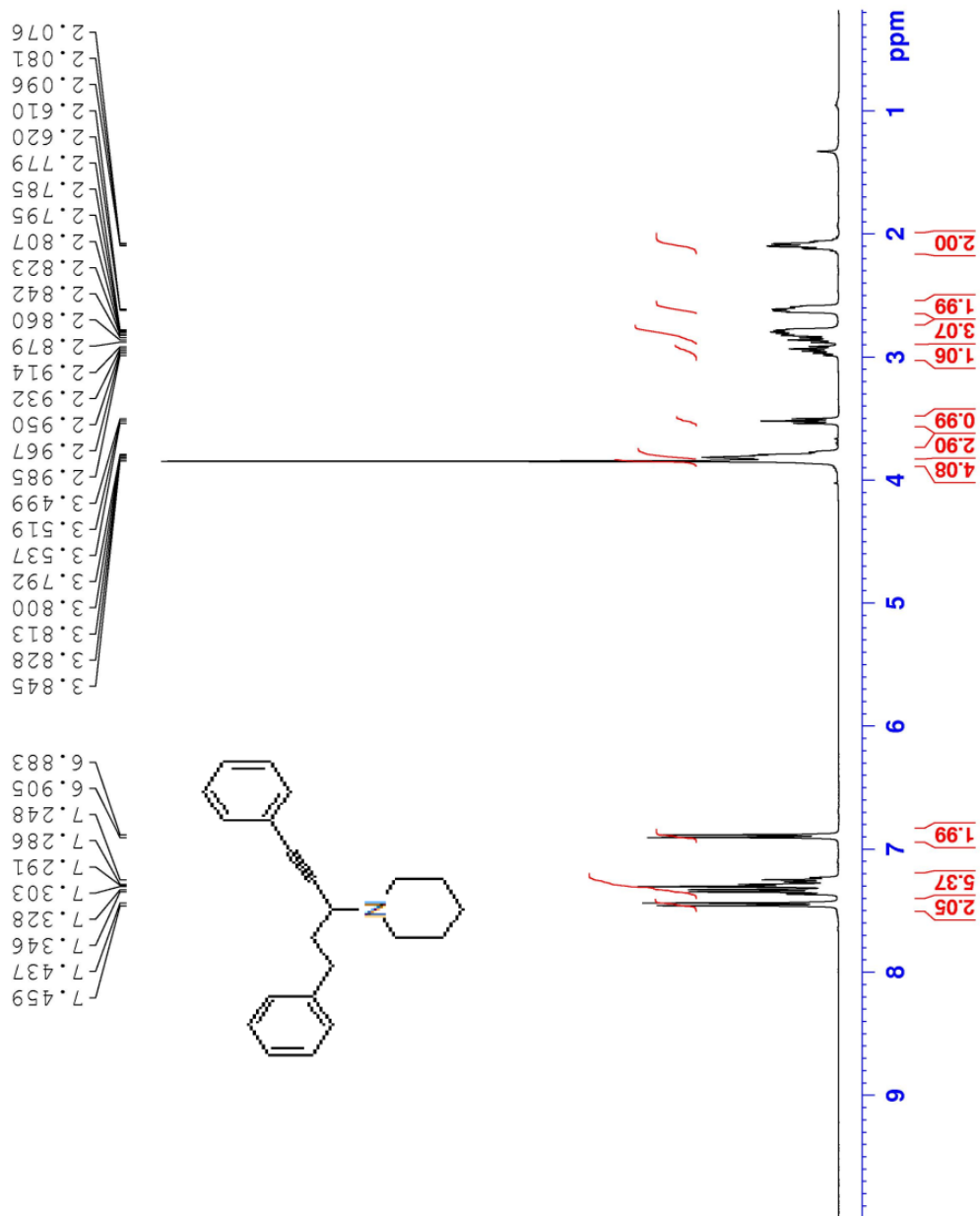
==== CHANNEL f1 =====
NUC1 13C
P1 9.00 usec
PL1 -0.90 dB
PL1W 42.02801895 W
SF01 100.6479784 MHz

==== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -2.00 dB
PL12 14.16 dB
PL13 17.90 dB
PL2W 11.86359406 W
PL12W 0.28722104 W
PL13W 0.12139834 W
SFO2 400.2216009 MHz
SI 32768
SF 100.6353990 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40





Dr. Gholi nejad
NAME
EXPNO 78
PROCNO 1
Date_ 20120102
Time_ 14.45
INSTRUM spect
PROBHD 5 mm PABEO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 11
DS 0
SWH 8012.820 Hz
FIDRES 0.122266 Hz
AQ 4.0894966 sec
RG 406
DM 62.400 usec
DE 6.50 usec
TE 297.0 K
D1 6.0000000 sec
TD0 1
===== CHANNEL f1 =====
NUC1 1H
P1 14.00 usec
PL1 -2.00 dB
PL1W 11.86359406 W
SFO1 400.2236020 MHz
SI 32768
SF 400.2200000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00





NAME Dr.Gholi.nejad
EXPNO 79
PROCNO 1
Date_ 20120102
Time_ 14.47
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg
TD 65536
SOLVENT CDC13
NS 30
DS 0
SWH 25252.525 Hz
FIDRES 0.385323 Hz
AQ 1.2976629 sec
RG 2050
DW 19.800 usec
DE 6.50 usec
TE 297.2 K
D1 3.0000000 sec
D11 0.0300000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 13C
P1 9.00 usec
PL1 -0.90 dB
PL1W 42.02801895 W
SFO1 100.6479784 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -2.00 dB
PL12 14.16 dB
PL13 17.50 dB
PL2W 11.86359406 W
PL12W 0.28722104 W
PL13W 0.12139934 W
SFO2 400.2216009 MHz
SI 32768
SF 100.6353990 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

