Supplementary Information for:

Highly Efficient Iridium-Catalyzed Asymmetric Hydrogenation of *β*-Acylamino Nitroolefins

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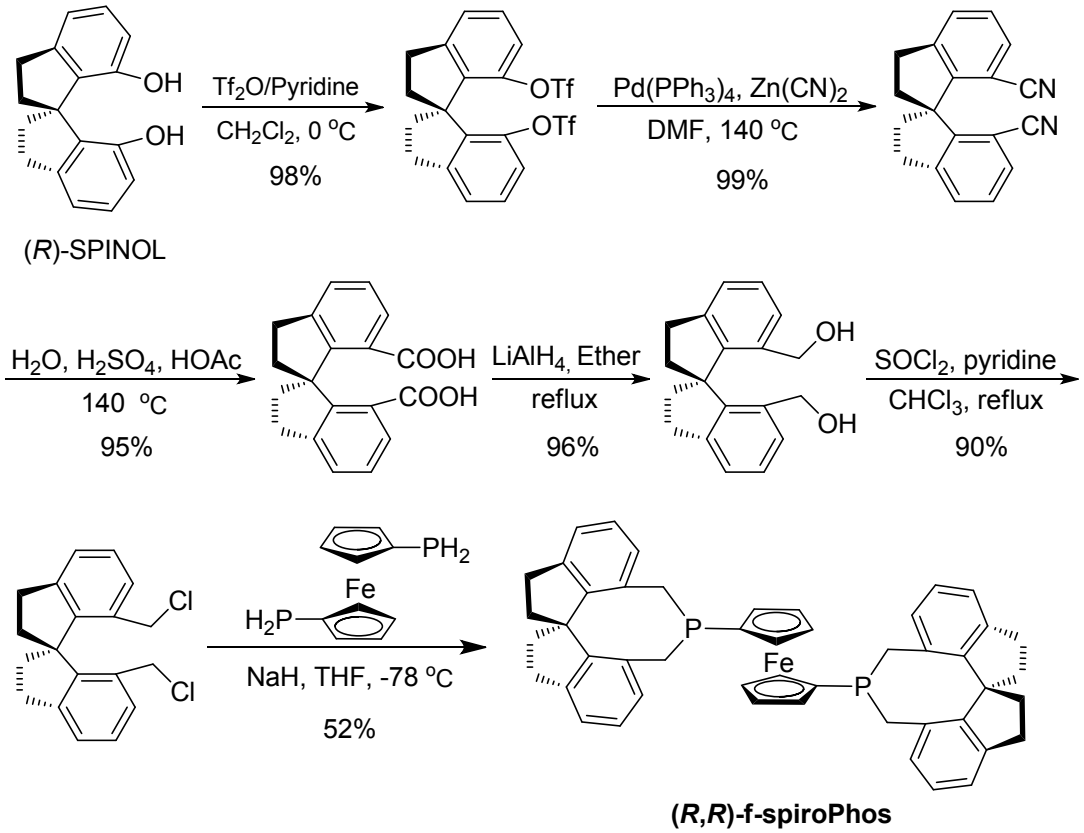
Contents:

1. Experimental Section

General Information: All the air or moisture sensitive reactions and manipulations were performed by using standard Schlenk techniques and in anitrogen-filled glovebox. DME, Et_2O, THF, dioxane and toluene were distilled from sodium benzophenoneketyl. CH_2Cl_2 was distilled from calcium hydride. Anhydrous MeOH was distilled from magnesium. ^1H NMR and ^{13}C NMR spectra were recorded on Bruker AV (400 MHz) spectrometers. $CDC1_3$ or DMSO-d_6 was the solvent used for the NMR analysis, with tetramethylsilane as the internal standard. Chemical shifts were reported upfield to TMS (0.00 ppm) for ^1H NMR. Optical rotation was determined using a Perkin Elmer 241 MC polarimeter. GC analysis was conducted on an Agilent 7890A Series instrument. HPLC analysis was conducted on an Agilent

1260 Series instrument. HRMS were recorded on a mass spectrometer with MALDI.

2. Preparation and Physical Data for (*R*, *R*)-f-spiroPhos[1, 2, 3]

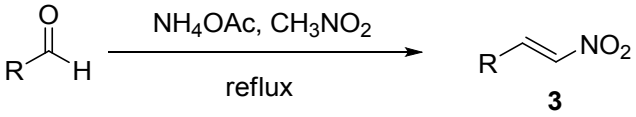


(*R*,*R*)-f-spiroPhos

1,1′-Bis(phosphine)ferrocene (394.0mg, 1.58mmol) was added to a solution of (*R*)-7,7′-dichloromethyl-1,1′-spirobiindane (1.0 g, 3.15mmol) and NaH (60% , 1.0 g, 24.78 mmol) in THF (38 mL) at -78°C under nitrogen. The mixture was stirred at room temperature for 24 h, and then heated at reflux for 17 h (monitored by ^{31}P NMR spectroscopy). After additional 1,1′-Bis(phosphine)ferrocene (50.0 mg, 0.20 mmol) was added, the mixture was stirred at reflux for another 25 h . After the reaction was completed (monitored by ^{31}P NMR spectroscopy), the solvent was removed under vacuum, and the residue was washed with CH_2Cl_2. The organic phase was filtered through a silica-gel plug to give the yellow solid (600.0 mg, 52%). $[\alpha]_D^{20}$ = +172.5 (c = 0.5, CH_2Cl_2); ^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.25 (s, 1H), 7.19-7.17 (m, 3H), 7.11-7.10 (m, 2H), 6.99-6.97 (d, *J*= 7.32 Hz, 2H), 6.78-6.74 (t, *J*= 7.44 Hz, 2H), 5.84-5.82 (d, *J*= 7.48 Hz, 2H), 4.29 (s, 4H), 4.05 (s, 2H), 3.13 (s, 2H), 3.04-2.94(m, 4H), 2.93-2.80 (m, 10H), 2.36-2.29 (dd, *J*= 13.76, 7.84Hz, 2H), 2.27-2.22 (m, dd, *J*= 12.12,

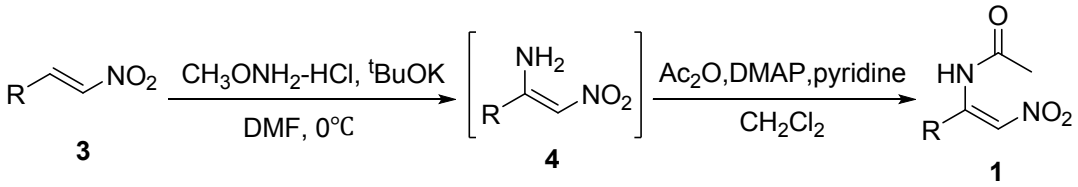
6.52Hz, 2H), 2.19-2.14 (dd, *J*= 12.24, 6.56Hz, 2H), 1.98-1.81 (m, 4H) ;^{13}C NMR (100 MHz, $CDCl_3$) δ = 147.7, 146.5, 142.9, 142.2, 133.0, 130.0, 129.6, 129.0, 128.4, 127.4, 126.0, 122.6, 121.9, 71.4, 70.5, 70.4, 61.2, 38.8, 38.5, 37.5, 30.6, 30.4, 27.4, 26.3; ^{31}P NMR (162 MHz $CDCl_3$) δ = -28.74. MALDI-HRMS Calculated for $C_{48}H_{45}FeP_2^+$ ($[M+H]^+$): 739.2340, found 739.2342.

3. General procedure for the synthesis of compound 3[4]



Benzaldehyde (30.00 mmol), was added to a stirred solution of ammonium acetate (0.58 g, 7.50 mmol) in dry nitromethane (50 mL) at 90°C. The mixture was heated at reflux for 5 h, poured into water and extracted with diethyl ether (3 × 50 mL). The extract was washed with brine, dried over Na_2SO_4, filtered and evaporated under reduced pressure. The residue was purified by recrystallization from ethanol to give the nitrostyrene **3** as light yellow solid.

4. General procedure for the synthesis of compound 1[5,6]

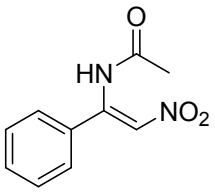


Triethylamine (4.3 mL, 0.03 mol) was added to a solution of methoxylamine-HCl (2.67 g, 0.03 mol) in dimethylformamide (50 mL) at 0 °C in an ice bath. *β*-Nitrostyrene **3** (0.03 mol) was added and stirred at 0 °C for 15 min then at rt for 5 min. Remove the precipate by filtration and wash the solid with a small amout of DMF. Place the combined filtrate into an addition funnel and add dropwise over 30 min to potassium *t*-butoxide (6.72 g, 0.06 mol) in DMF (80 mL) at 0 °C. Remove the bath and stir at rt for 30 min. Quench reaction with sat. NH_4Cl (30 mL). Reaction volume reduced in 1/2 in vacuo and extracted with CH_2Cl_2. Wash with water, brine, and dried

over anhydrous Na_2SO_4, filter and concentrate in vacuo to give the desired material **4**. To a solution of **4** and DMAP (1.19 g, 0.01 mol) in 130 mL of CH_2Cl_2 were added pyridine (16.6 mL, 2.0 eq, 0.12 mol) and Ac_2O (8.90 mL, 0.09 mol) at 0°C. The resultant solution was warmed to rt and then stirred for 5 h. The reaction mixture was diluted with CH_2Cl_2 and washed subsequently with water, and brine. After the solution was dried over anhydrous Na_2SO_4, it was concentrated under vacuum, the residue was purification by flash chromatography on SiO_2 (PE/EA = 1:2) gave **1** as solid (**1r** as liquid).

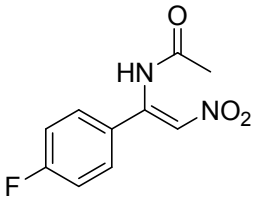
5. NMR and HRMS data of compound 1

(*Z*)-*N*-(2-nitro-1-phenylvinyl)acetamide **1a**



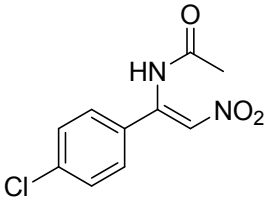
Light yellow solid; Yield: 71%; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 10.81 (s, 1H), 7.52-7.48 (m, 1H), 7.45-7.38 (m, 4H), 6.70 (s, 1H), 2.25 (s, 3H).[7]

(*Z*)-*N*-(1-(4-fluorophenyl)-2-nitrovinyl)acetamide **1b**



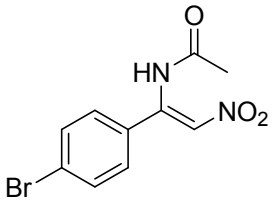
Light yellow solid; Yield: 52%; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 10.80 (s, 1H), 7.40-7.37 (m, 2H), 7.14-7.10 (m, 2H), 6.67 (s, 1H), 2.26 (s, 3H).[7]

(*Z*)-*N*-(1-(4-chlorophenyl)-2-nitrovinyl)acetamide **1c**



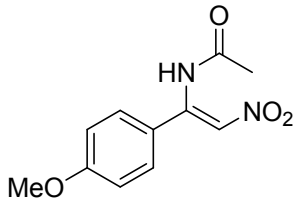
Light yellow solid; Yield: 65%; ^{1}H NMR (400 MHz, $CDCl_3$) δ =10.79 (s, 1H), 7.42-7.39 (m, 2H), 7.34-7.31 (m, 2H), 6.67 (s, 1H), 2.27 (s,3H).[7]

(*Z*)-*N*-(1-(4-bromophenyl)-2-nitrovinyl)acetamide **1d**



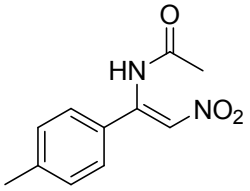
Light yellow solid; Yield: 59%; ^{1}H NMR (400 MHz, $CDCl_3$) δ= 10.77 (s, 1H), 7.56-7.54 (m, 2H), 7.25-7.23 (m, 2H), 6.66 (s, 1H), 2.25 (s, 3H). [7]

(*Z*)-*N*-(1-(4-methoxyphenyl)-2-nitrovinyl)acetamide **1e**



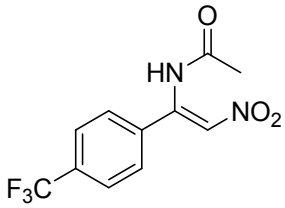
Light yellow solid; Yield: 32%; ^{1}H NMR (400 MHz, $CDCl_3$)δ = 10.80(s, 1H), 7.36-7.34 (m, 2H), 6.95-6.92 (m, 2H), 6.73 (s, 1H), 3.85 (s, 3H), 2.26 (s, 3H). [7]

(*Z*)-*N*-(2-nitro-1-p-tolylvinyl)acetamide **1f**



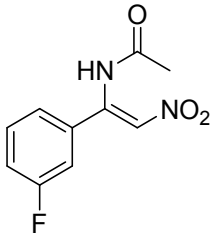
Light yellow solid; Yield: 86%; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 10.79 (s, 1H), 7.29-7.26 (m, 2H), 7.24-7.22 (m, 2H), 6.71 (s, 1H), 2.40 (s, 3H), 2.24 (s, 3H).[7]

(*Z*)-*N*-(1-(4-trifluoromethylphenyl)-2-nitrovinyl)acetamide **1g**



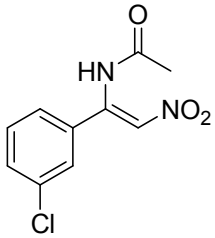
Light yellow solid; Yield: 34%; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 10.82 (s, 1H), 7.70-7.68 (d, *J* = 8.2, 2H), 7.51-7.49 (d, *J* = 8.2, 2H), 6.66 (s, 1H), 2.28 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ = 167.9, 147.8, 135.5, 132.6 (q, *J* = 32.7 Hz), 127.9, 125.6 (q, *J* = 3.6 Hz), 123.6 (q, *J* = 271 Hz), 121.5, 25.0. MALDI-HRMS Calculated for $C_{11}H_9F_3KN_2O_3^+$ ([M+K] $^+$): 313.0197, found 313.0193.

(*Z*)-*N*-(1-(3-fluorophenyl)-2-nitrovinyl)acetamide **1h**



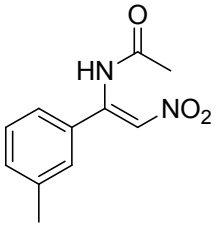
Light yellow solid; Yield: 67%; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 10.68 (s, 1H), 7.36-7.31 (m, 1H), 7.14-7.09 (m, 2H), 7.03-7.00 (m, 1H), 6.61 (s, 1H), 2.19 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ = 167.9, 162.4 (d, *J* = 246.2 Hz), 147.9 (d, *J* = 2.2 Hz), 134.0 (d,*J* = 8.2 Hz), 130.3(d, *J* = 8.3 Hz), 123.3 (d, *J* = 3.2 Hz), 121.4, 117.8 (d, *J* = 21.0 Hz), 114.8 (d, *J* = 23.4 Hz), 25.0. MALDI-HRMS Calculated for $C_{10}H_9FKN_2O_3^+$ ([M+K]$^+$): 263.0229, found 263.0230.

(*Z*)-*N*-(1-(3-chlorophenyl)-2-nitrovinyl)acetamide **1i**



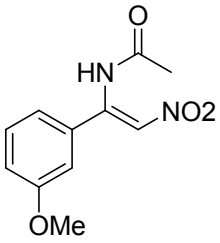
Light yellow solid; Yield: 54%; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 10.68 (s, 1H), 7.40-7.38 (m, 1H), 7.31-7.27 (m, 2H), 7.21-7.18 (m, 1H), 6.59 (s, 1H), 2.19 (s, 3H).[7]

(*Z*)-*N*-(2-nitro-1-m-tolylvinyl)acetamide**1j**



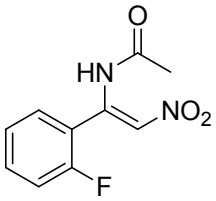
Light yellow solid; Yield: 64%; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 10.78 (s, 1H), 7.32-7.30 (m, 2H), 7.19 (m, 1H), 6.69 (s, 1H), 2.39 (s, 3H), 2.25 (s, 3H).[7]

(*Z*)-*N*-(1-(3-methoxyphenyl)-2-nitrovinyl)acetamide **1k**



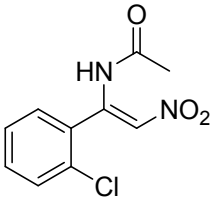
Light yellow solid; Yield: 51%; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 10.76 (s, 1H), 7.34 (t, *J* = 8.0 Hz, 1H), 7.02 (d, *J* = 8.0 Hz, 2H), 6.89 (s, 1H), 6.71 (s, 1H), 3.83 (s, 3H), 2.25(s, 3H).[7]

(*Z*/*E*)-*N*-(1-(2-fluorophenyl)-2-nitrovinyl)acetamide**1l**



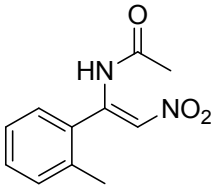
Light yellow solid; Yield: 62%; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 11.00 (s, 1H), 8.72 (s,1H) 7.52-7.44 (m, 2H), 7.32-7.27 (m, 3H), 7.23-7.16 (m, 2H) 7.12-7.08 (m, 2H), 6.73 (s, 1H), 6.61 (s, 1H) 2.25 (s, 3H), 2.19 (s,1H); ^{13}C NMR (100 MHz, $CDCl_3$) = 168.8, 160.3, 157.8, 139.4, 132.3 (d, *J* = 8.2 Hz), 128.9 (d, *J* = 1.9 Hz), 128.2, 124.8 (d, *J* = 3.6 Hz), 121.5 (d, *J* = 15.5), 116.3 (d, *J* = 21.2 Hz), 24.8. MALDI-HRMS Calculated for $C_{10}H_9FKN_2O_3^+$ ([M+K]$^+$): 263.0229, found 263.0230.

(*Z*)-*N*-(1-(2-chlorophenyl)-2-nitrovinyl)acetamide **1m**



Light yellow solid; Yield: 84%; ^{1}H NMR (400 MHz, DMSO-d_6) δ = 10.44(s, 1H), 8.44 (s, 1H) 7.57-7.42 (m, 4H), 2.09 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ = 168.8, 142.5, 132.9, 132.2, 131.2, 130.1, 129.0, 127.9, 127.4, 24.7. MALDI-HRMS Calculated for $C_{10}H_9ClKN_2O_3^+$ ([M+K]$^+$): 278.9933, found 278.9948.

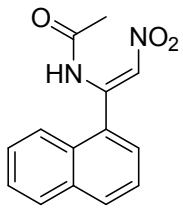
(*Z*/*E*)-*N*-(2-nitro-1-o-tolylvinyl)acetamide**1n**



Light yellow solid; Yield: 79%; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 11.2 (s, 1H), 8.73 (s, 1H), 7.39-7.33 (m, 2H), 7.31-7.26 (m, 2H), 7.24-7.21 (m, 2H), 7.17-7.14 (m, 2H), 6.68 (s, 1H), 6.49 (s, 1H), 2.29 (s, 3H), 2.28 (s, 3H), 2.19 (s, 3H), 2.25 (s, 3H); ^{13}C NMR (100

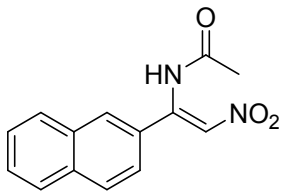
MHz, DMSO-d_6) δ = 171.5, 148.4, 135.6, 133.9, 130.4, 129.6, 127.9, 126.4, 125.6, 24.7, 19.1. MALDI-HRMS Calculated for $C_{11}H_{13}N_2O_3^+$ ($[M+H]^+$): 221.0921, found 221.0926.

(*Z*)-*N*-(1-(naphthalen-1-yl)-2-nitrovinyl)acetamide **1o**



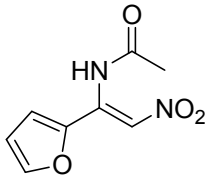
Light yellow solid; Yield: 81%; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.91 (s, 1H), 7.98-7.92 (m, 2H), 7.80-7.78 (m, 1H), 7.58-7.51 (m, 3H), 7.41-7.40 (m, 1H), 6.82 (s, 1H), 2.14 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ = 168.8, 144.1, 133.5,131.5, 130.3, 129.9, 128.8, 128.3, 127.7, 126.8, 125.4, 125.3, 123.7, 24.8. MALDI-HRMS Calculated for $C_{14}H_{13}N_2O_3^+$ ($[M+H]^+$): 257.0921, found 257.0915.

(*Z*)-*N*-(1-(naphthalen-2-yl)-2-nitrovinyl)acetamide **1p**



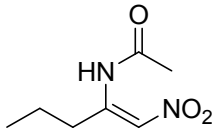
Light yellow solid; Yield: 85%; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 10.90 (s, 1H), 7.89-7.85 (m, 4H), 7.59-7.52 (m, 2H), 7.42 (dd, *J* = 8.5, 1.8 Hz, 1H), 6.82 (s, 1H), 2.28 (s, 3H).[7]

(*Z*)-*N*-(1-furyl-2-nitrovinyl)acetamide**1q**



Light yellow solid; Yield: 80%; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 10.46 (s, 1H), 7.56 (m, 1H), 7.11 (s, 1H), 6.96 (d, *J* = 3.5, 1H), 6.54 (m, 1H) 2.28(s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ = 168.1, 146.2, 144.2, 137.4, 119.7, 117.6, 112.7, 25.0. MALDI-HRMS Calculated for $C_8H_9N_2O_4^+$ ($[M+H]^+$): 197.0557, found 197.0553.

(*Z*)-*N*-(1-nitropent-1-en-2-yl)acetamide **1r**



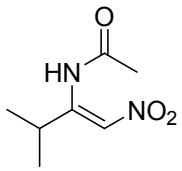
Light yellow liquid; Yield: 25%; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 11.20 (s, 1H), 6.48 (s, 1H), 2.67 (t, *J* = 7.3 Hz, 2H), 2.18 (s, 3H), 1.59-1.50 (m, 2H) 0.92 (t, *J* = 7.3 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ = 168.4, 153.8, 118.1, 33.6, 25.6, 21.6, 13.9. MALDI-HRMS Calculated for $C_7H_{14}N_2O_3^+$ ($[M+H]^+$): 173.0921, found 173.0926.

To a mixture of butyraldehyde (0.14 mol) and nitromethane (0.14 mol) in methanol 30 mL at 0 ^{o}C, a solution of NaOH (0.16 mol) in H_2O (6 mL) was added dropwise.

Further methanol (10 mL) was added and the resulting yellow slurry stirred at 0 °C for 3 h. Water (30 mL) was added and the clear yellow solution was poured into hydrochloric acid (60 mL conc. hydrochloric acid in 90 mL H_2O) and stirred for 15 min. The mixture was extracted with CH_2Cl_2 (3 × 100 mL). The extract was washed with brine, dried over Na_2SO_4, filtered and evaporated under reduced pressure. The residue was purified by column chromatography (PE/EA = 20:1) gave product **3r** as a yellow liquid (6.0 g, 38%).[8]

Triethylamine (5.8 mL, 41.6 mmol) was added to a solution of methoxylamine-HCl (3.6 g, 43.4 mmol) in dimethylformamide (70 mL) at 0 °C in an ice bath. *β*-Nitrostyrene **3r** (34.7 mmol) was added and stirred at 0 °C for 1h then at rt for 1h. Remove the precipate by filtration and wash the solid with a small amout of DMF. Place the combined filtrate into an addition funnel and add dropwise about 50 min to potassium *t*-butyloxide (7.8 g, 69.4 mmol) in DMF (110 mL) at 0 °C. Remove the bath and stir at rt for 30 min. Quench reaction with sat. NH_4Cl (40 mL). Reaction volume reduced in 1/2 in vacuo and extracted with CH_2Cl_2. The organic phase was washed with water, brine, and dried over anhydrous Na_2SO_4, and concentrated in vacuo to give the desired material **4r**. To a solution of **4r** and DMAP (1.39 g, 11.6 mmol) in 120 mL of CH_2Cl_2 were added pyridine (11.5 mL, 4.0 eq, 138.8 mmol) and Ac_2O (11.3 mL, 120.0 mmol) at 0 °C. The resultant solution was warmed to r.t. and then stirred for 4 h. The reaction mixture was diluted with CH_2Cl_2 and washed subsequently with water, and brine. After the solution was dried over anhydrous Na_2SO_4, it was concentrated under vacuum, the residue was purification by flash chromatography on SiO_2 (PE/EA = 1:5) gave **1r** as light yellow liquid (1.2 g, 25%).[5,6]

(*Z*)-*N*-(3-methyl-1-nitrobut-1-en-2-yl)acetamide **1s**



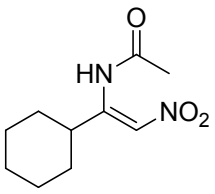
Light yellow solid; Yield: 68%; ^1H NMR (400 MHz, $CDCl_3$) δ = 11.36 (s, 1H), 6.61 (s, 1H), 4.03-3.93 (m, 1H), 2.22 (s, 3H), 1.15-1.13 (m, 6H).[7]

Isobutyraldehyde (80 mmol), was added to a stirred solution of ammonium acetate (1.6 g, 20 mmol) in dry nitromethane (130 mL) at 90°C. The

mixture was heated at reflux for 6 h, poured into water and extracted with diethyl ether (3 × 100 mL). The extract was washed with brine, dried over Na_2SO_4, filtered and evaporated under reduced pressure. The residue was purified by flash chromatography on SiO_2 (PE/EA = 1:20) gave **3s** as yellow liquid (4.2g, 44%).[4]

Triethylamine (6.1 mL, 43.7 mmol) was added to a solution of methoxylamine-HCl (3.8 g, 45.5 mmol) in dimethylformamide (70 mL) at 0 °C in an ice bath. *β*-Nitrostyrene **3s** (36.4 mmol) was added and stirred at 0 °C for 1h then at rt for 1h. Remove the precipate by filtration and wash the solid with a small amout of DMF. Place the combined filtrate into an addition funnel and add dropwise about 50 min to potassium *t*-butoxide (8.2 g, 72.8 mmol) in DMF (110 mL) at 0 °C. Remove the bath and stir at rt for 30 min. Quench reaction with sat. NH_4Cl (40 mL). Reaction volume reduced in 1/2 in vacuo and extracted with CH_2Cl_2. Wash with water, brine, and dried over anhydrous Na_2SO_4, filter and concentrate in vacuo to give the desired material **4s**. To a solution of **4s** and DMAP (1.5 g, 12.1 mmol) in 130 mL of CH_2Cl_2 were added pyridine (12.0 mL, 4.0 eq, 145.6 mmol) and Ac_2O (10.3 mL, 109 mmol) at 0 °C. The resultant solution was warmed to rt and then stirred for 12 h. The reaction mixture was diluted with CH_2Cl_2 and washed subsequently with water, and brine. After the solution was dried over anhydrous Na_2SO_4, it was concentrated under vacuum, the residue was purification by flash chromatography on SiO_2 (PE/EA = 1:5) gave **1s** as light yellow solid (4.3 g, 68%).[5,6]

(*Z*)-*N*-(1-cyclohexyl-2-nitrovinyl)acetamide**1t**



Light yellow solid; Yield: 76%; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 11.40 (s, 1H), 6.63 (s, 1H), 3.71-3.64 (m, 1H), 2.25 (s, 3H), 1.95-1.73 (m, 5H), 1.45-1.34 (m, 2H), 1.25-1.09 (m, 3H). [7]

Cyclohexanecarbaldehyde (50 mol), was added to a stirred solution of ammonium acetate (1.0 g, 13.4 mmol) in dry nitromethane (80 mL) at 90°C. The mixture was heated at reflux for 6 h, poured into water and extracted with diethyl ether (3 × 50 mL). The extract was washed with brine, dried over Na_2SO_4, filtered and evaporated

under reduced pressure. The residue was purified by flash chromatography on SiO_2 (PE/EA = 1:20) gave **3t** as light yellow liquid (5.3g, 64%).[4]

Triethylamine (5.7 mL, 41 mmol) was added to a solution of methoxylamine-HCl (3.6 g, 42.6 mmol) in dimethylformamide (70 mL) at 0 °C in an ice bath. *β*-Nitrostyrene **3t** (34.1 mmol) was added and stirred at 0 °C for 1h then at rt for 1h. Remove the precipate by filtration and wash the solid with a small amout of DMF. Place the combined filtrate into an addition funnel and add dropwise over 30 min to potassium *t*-butoxide (7.6 g, 68.2 mmol) in DMF (100 mL) at 0 °C. Remove the bath and stir at rt for 2h. Quench reaction with sat. NH_4Cl (35 mL). Reaction volume reduced in 1/2 in vacuo and extracted with CH_2Cl_2. The organic phase was washed subsequently with water, brine, and dried over anhydrous Na_2SO_4, filtered and concentrated in vacuo to give the desired material **4t**. To a solution of **4t** and DMAP (0.8 g, 6.8 mmol) in 110 mL of CH_2Cl_2 were added pyridine (11.3 mL, 4.0 eq, 136.4 mmol) and Ac_2O (9.7 mL, 102.3 mmol) at 0 °C. The resultant solution was warmed to rt and then stirred for 5 h. The reaction mixture was diluted with CH_2Cl_2 and washed subsequently with water, and brine. After the solution was dried over anhydrous Na_2SO_4, it was concentrated under vacuum, the residue was purification by flash chromatography on SiO_2 (PE/EA = 1:6) gave **1t** as light yellow solid (5.5g, 76%) .[5,6]

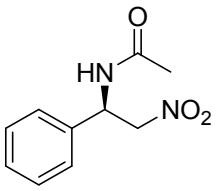
6. General Procedure for Asymmetric Hydrogenation of compound 1

A 20.0 mL vial was loaded with $[Ir(COD)Cl]_2$ (2.1 mg, 0.003 mmol) and (*S*,*S*)-f-Binaphane (5.1 mg, 0.006 mmol). The mixture was dissolved in CH_2Cl_2 (6.0 mL) and stirred for 20 min at room temperature in a nitrogen-filled glovebox. An aliquot of the catalyst solution (1.0 mL, 0.001 mmol) was transferred by syringe into the vials charged with different substrates (0.1 mmol for each) in anhydrous CH_2Cl_2 (2.0 ml). The vials were then placed into a steel autoclave. The inert atmosphere was replaced by H_2 and the reaction mixture was stirred under H_2 (20 atm) at 80°C for 12 h. The hydrogen gas was released slowly and carefully. The solution was concentrated and passed through a short column of silica gel to remove the metal complex. The ee

values of all compounds **2** were determined by GC or HPLC analysis on a chiral stationary phase.

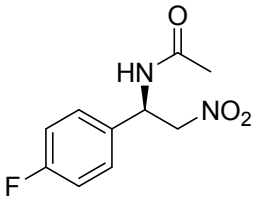
7. NMR, GC, HPLC, optical rotation and HRMS Data of compound 2

N-(2-nitro-1-phenylethyl)acetamide **2a**



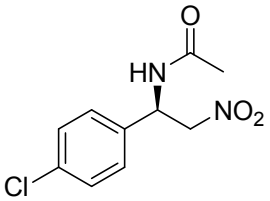
White solid; 99% ee; $[\alpha]_D^{20}$ = -69.20 (c = 0.5, CH_2Cl_2); GC condition: Supelco gamma Dex™ 225 column (30 m × 0.25 mm × 0.25 μm), N_2 3.0 mL/min, programmed from 110 °C to 190 °C at 8.0 °C/min; t_R = 21.9 min (major), t_R = 23.3 min (minor). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.41-7.29 (m, 5H), 6.23 (d, *J* = 5.8 Hz, 1H), 5.70-5.65 (m, 1H), 4.93 (dd, *J* = 13.0, 6.3 Hz, 1H), 4.74 (dd, *J* = 13.0, 5.6 Hz, 1H), 2.07 (s, 3H). [9]

N-(1-(4-fluorophenyl)-2-nitroethyl)acetamide **2b**



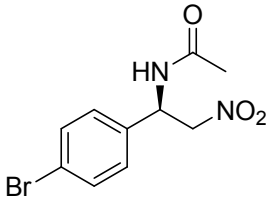
White solid; 99% ee; $[\alpha]_D^{20}$ = -63.50 (c = 0.5, CH_2Cl_2); GC condition: Supelco gamma Dex™ 225 column (30 m × 0.25 mm × 0.25 μm), N_2 3.0 mL/min, programmed from 110 °C to 190 °C at 8.0 °C/min; t_R = 26.3 min (major), t_R = 30.4 min (minor). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.31-7.28 (m, 2H), 7.10-7.05 (m, 2H), 6. 24 (d, *J* = 6.2 Hz, 1H), 5.64 (m, 1H), 4.91 (dd, *J* = 13.0, 6.2 Hz, 1H), 4.71 (dd, *J* = 13.0, 5.5 Hz, 1H), 2.06 (s, 3H). [7]

N-(1-(4-chlorophenyl)-2-nitroethyl)acetamide **2c**



White solid; >99.9% ee; $[\alpha]_D^{20}$ = -76.30 (c = 0.5, CH_2Cl_2); GC condition: Supelco gamma Dex™ 225 column (30 m × 0.25 mm × 0.25 μm), $N_2$8.0 mL/min, programmed from 120 °C to 190 °C at 15.0 °C/min; t_R = 28.0 min (major), t_R = 35.9 min (minor). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.29 (d, *J* = 8.5 Hz, 2H), 7.18 (d, *J* = 9.9 Hz, 2H), 6.33 (d, *J* = 7.3 Hz, 1H), 5.60-5.55 (m, 1H), 4.82 (dd, *J* = 13.1, 6.4Hz, 1H), 4.65 (dd, *J* = 13.1, 5.3 Hz, 1H), 1.99 (s, 3H). [7]

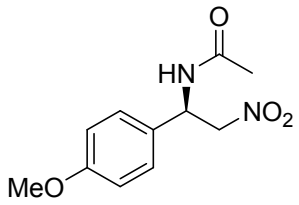
N-(1-(4-bromophenyl)-2-nitroethyl)acetamide **2d**



White solid; >99.9%ee; $[\alpha]_D^{20}$ = -74.40 (c = 0.5, CH_2Cl_2); GC

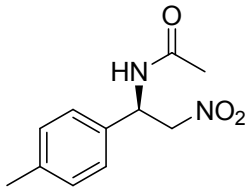
condition: Supelco gamma Dex™ 225 column (30 m × 0.25 mm × 0.25 μm), N_2 8.0 mL/min, programmed from 120 °C to 190 °C at 15.0 °C/min; t_R = 41.7 min (major). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.52 (d, *J* = 8.5 Hz, 2H), 7.19 (d, *J* = 8.5 Hz, 2H), 6.30 (d, *J* = 7.2 Hz, 1H), 5.65-5.60 (m, 1H), 4.90 (dd, *J* = 13.1, 6.2 Hz, 1H), 4.72 (dd, *J* = 13.1, 5.3 Hz, 1H), 2.07 (s, 3H). [10]

N-(1-(4-methoxyphenyl)-2-nitroethyl)acetamide **2e**



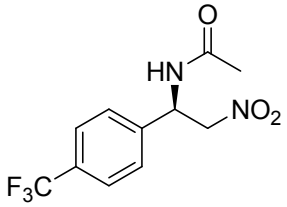
White solid; 99.3% ee; $[\alpha]_D^{20}$ = -85.70 (c = 0.5, CH_2Cl_2); GC condition: Supelco gamma Dex™ 225 column (30 m × 0.25 mm × 0.25 μm), N_2 3.0 mL/min, programmed from 110 °C to 190 °C at 8.0 °C/min; t_R = 46.3 min (major), t_R = 49.4 min (minor). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.22 (d, *J* = 8.7 Hz, 2H), 6.90 (d, *J* = 8.7 Hz, 2H), 6.28 (d, *J* = 6.4 Hz, 1H), 5.63-5.58 (m, 1H), 4.89 (dd, *J* = 12.8, 6.5 Hz, 1H), 4.68 (dd, *J* = 12.8, 5.9 Hz, 1H), 3.80 (s, 3H), 2.03 (s, 3H). [7]

N-(2-nitro-1-p-tolylethyl)acetamide **2f**



White solid; 99% ee; $[\alpha]_D^{20}$ = -92.50 (c = 0.5, CH_2Cl_2); GC condition: Supelco gamma Dex™ 225 column (30 m × 0.25 mm × 0.25 μm), N_2 3.0 mL/min, programmed from 110 °C to 190 °C at 8.0 °C/min; t_R = 26.3 min (major), t_R = 27.5 min (minor). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.20-7.15 (m, 4H), 6.16 (d, *J* = 6.1 Hz, 1H), 5.65-5.60 (m, 1H), 4.91 (dd, *J* = 12.8, 6.3 Hz, 1H), 4.71 (dd, *J* = 12.8, 5.8 Hz, 1H), 2.34 (s, 3H), 2.05 (s, 3H).[7]

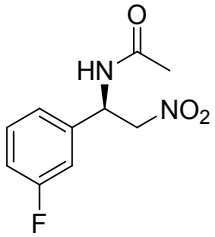
N-(1-(4-trifluoromethylphenyl)-2-nitroethyl)acetamide **2g**



White solid; 99.6% ee; $[\alpha]_D^{20}$ = -46.30 (c = 0.5, CH_2Cl_2); GC condition: Supelco gamma Dex™ 225 column (30 m × 0.25 mm × 0.25 μm), N_2 3.0 mL/min, programmed from 110 °C to 190 °C at 8.0 °C/min; t_R = 29.5 min (major), t_R = 36.9 min (minor). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.64 (dd, *J* = 8.2 Hz, 1H), 7.44 (dd, *J* = 8.2 Hz, 1H), 6.59 (d, *J* = 7.9 Hz, 1H), 5.76-5.71 (m, 1H), 4.91 (dd, *J* = 13.3, 6.5 Hz, 1H), 4.75 (dd, *J* = 13.3, 5.0 Hz, 1H), 2.07 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ = 169.9,

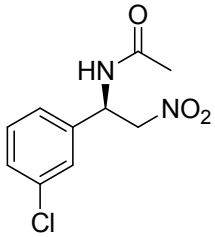
140.4, 130.0 (q, J = 32.8 Hz), 126.9, 126.2 (q, 3.6 Hz), 123.7 (q, J = 273.5 Hz), 77.9, 50.8, 23.1. MALDI-HRMS Calculated for $C_{11}H_{12}F_3N_2O_3^+$ ([M+H]$^+$): 277.0795, found 277.0792.

N-(1-(3-fluorophenyl)-2-nitroethyl)acetamide **2h**



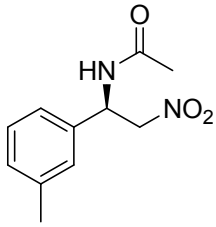
White solid; 99% ee; $[\alpha]_D^{20}$ = -55.80 (c = 0.5, CH_2Cl_2); GC condition: Supelco gamma Dex^{TM} 225 column (30 m × 0.25 mm × 0.25 μm), N_2 3.0 mL/min, programmed from 110 ^{o}C to 190 ^{o}C at 8.0 ^{o}C/min; t_R = 26.1 min (major), t_R = 29.4 min (minor). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.32-7.27 (m, 1H), 7.03-6.94 (m, 3H), 6.24 (d, J = 5.76 Hz, 1H), 5.63-5.58 (m, 1H), 4.86-4.81 (dd, J = 13.2, 6.2 Hz, 1H), 4.69-4.64 (dd, J = 13.2, 5.2 Hz, 1H), 2.01 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ = 169.2, 162.1 (d, J = 246.2 Hz), 138.1 (d, J = 6.6 Hz), 129.9(d, J = 8.2 Hz), 121.2 (d, J = 2.8 Hz), 114.7 (d, J = 20.7 Hz), 112.7 (d, J = 22.5 Hz), 77.1, 49.9, 22.0. MALDI-HRMS Calculated for $C_{10}H_{11}FKN_2O_3^+$ ([M+K]$^+$):265.0385, found 265.0387.

N-(1-(4-chlorophenyl)-2-nitroethyl)acetamide **2i**



White solid; 99.2% ee; $[\alpha]_D^{20}$ = -66.70 (c = 0.5, CH_2Cl_2); GC condition: Supelco gamma Dex^{TM} 225 column (30 m × 0.25 mm × 0.25 μm), N_2 8.0 mL/min, programmed from 110 ^{o}C to 190 ^{o}C at 15.0 ^{o}C/min; t_R = 24.2 min (major), t_R = 30.4 min (minor). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.26-7.25 (m, 3H), 7.15-7.11 (m, 1H), 6.25 (d, J = 6.5 Hz, 1H), 5.61-5.56 (m, 1H), 4.85-4.81 (dd, J = 13.2, 6.3 Hz, 1H), 4.68-4.63 (dd, J = 13.2, 5.2 Hz, 1H), 2.01 (s, 3H). [7]

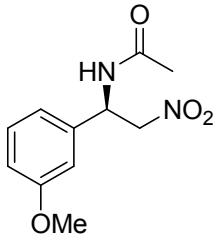
N-(2-nitro-1-m-tolylethyl)acetamide **2j**



White solid; 99% ee; $[\alpha]_D^{20}$ = -71.20 (c = 0.5, CH_2Cl_2); GC condition: Supelco gamma Dex^{TM} 225 column (30 m × 0.25 mm × 0.25 μm), N_2 3.0 mL/min, programmed from 110 ^{o}C to 190 ^{o}C at 8.0 ^{o}C/min; t_R = 24.1 min (major), t_R = 25.0 min (minor). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.26-7.22 (m, 1H), 7.13-7.05 (m, 3H), 6.15 (d, J = 7.0Hz, 1H) 5.60 (m, 1H), 4.88 (dd, J = 12.9, 6.3 Hz, 1H), 4.69 (dd, J = 12.9, 5.7 Hz, 1H), 2.32 (s,

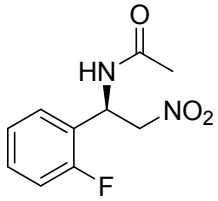
3H), 2.03 (s, 3H).[7]

N-(1-(3-methoxyphenyl)-2-nitroethyl)acetamide **2k**



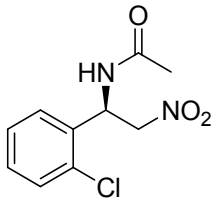
White solid; 99% ee; $[\alpha]_D^{20}$ = -69.50 (c = 0.5, CH_2Cl_2); GC condition: Supelco gamma Dex™ 225 column (30 m × 0.25 mm × 0.25 μm), N_2 3.0 mL/min, programmed from 110 °C to 190 °C at 8.0 °C/min; t_R = 39.2 min (major), t_R = 41.2 min (minor). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.32-7.28 (m, 1H), 6.89-6.83 (m, 3H), 6.22 (d, *J* = 7.3 Hz, 1H), 5.67-5.62 (m, 1H), 4.90 (dd, *J* = 13.0, 6.4 Hz, 1H), 4.72 (dd, *J* = 13.0, 5.6 Hz, 1H), 3.81 (s, 3H), 2.06 (s, 3H).[7]

N-(1-(2-fluorophenyl)-2-nitroethyl)acetamide **2l**



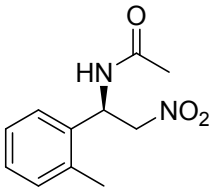
White solid; 98% ee; $[\alpha]_D^{20}$ = -69.80 (c = 0.5, CH_2Cl_2); GC condition: Supelco beta Dex™ 225 column (30 m × 0.25 mm × 0.25 μm), N_2 1.0 mL/min, programmed from 100 °C to 190 °C at 1.0 °C/min; t_R = 83.5 min (minor), t_R = 84.9 min (major). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.37-7.31 (m, 2H), 7.18-7.08 (m, 2H), 6.36 (d, *J* = 7.7 Hz, 1H), 5.92-5.86 (m, 1H), 4.90 (dd, *J* = 12.8, 6.7 Hz, 1H), 4.72 (dd, *J* = 12.8, 5.7 Hz, 1H), 2.06 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ = 169.8, 162.8 (d, *J* = 249.3Hz), 132.2 (d, *J* = 3.2Hz), 128.3 (d, *J* = 8.4Hz), 116.3 (d, *J* =21.8Hz), 78.2, 50.7, 23.2. MALDI-HRMS Calculated for $C_{10}H_{11}FKN_2O_3^+$ ($[M+K]^+$): 265.0385, found 265.0388.

N-(1-(2-chlorophenyl)-2-nitroethyl)acetamide **2m**



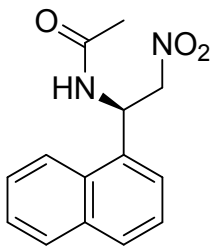
White solid; 99% ee; $[\alpha]_D^{20}$ = -46.80 (c = 0.5, CH_2Cl_2); GC condition: Supelco beta Dex™ 225 column (30 m × 0.25 mm × 0.25 μm), N_2 1.0 mL/min, programmed from 100 °C to 190 °C at 1.0 °C/min; t_R = 97.9 min (minor), t_R = 99.4 min (major). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.38-7.36 (m, 1H), 7.31-7.23 (m, 3H), 6.58 (d, *J* = 7.2 Hz, 1H), 5.95 (m, 1H), 4.91 (dd, *J* = 13.0, 6.7 Hz, 1H), 4.75 (dd, *J* = 13.0, 5.0 Hz, 1H), 2.02 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ = 169.9, 159.8, 128.4, 127.8, 114.6, 78.2, 55.3, 51.0, 23.2. MALDI-HRMS Calculated for $C_{10}H_{11}ClKN_2O_3^+$ ($[M+K]^+$): 281.0090, found 281.0091.

N-(2-nitro-1-o-tolylethyl)acetamide **2n**



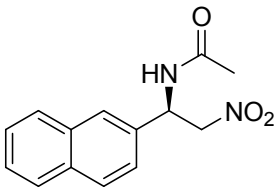
White solid; 99.3% ee; $[\alpha]_D^{20}$= -92.30 (c = 0.5, CH_2Cl_2); GC condition: Supelco beta Dex™ 225 column (30 m × 0.25 mm × 0.25 μm), N_2 0.8 mL/min, programmed from 100 °C to 190 °C at 0.8 °C/min; t_R = 115.7 min (minor), t_R = 118.9 min (major). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.54-7.50 (m, 4H), 6.25-6.19 (m, 2H), 5.15 (dd, *J* = 12.6, 6.68 Hz, 1H), 5.00 (dd, *J* = 12.6, 6.28 Hz, 1H), 2.74 (s, 3H), 2.32 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ = 169.8, 136.3, 134.7, 131.3, 128.8, 126.8, 125.0, 77.3, 47.9, 23.0, 19.2. MALDI-HRMS Calculated for $C_{11}H_{14}KN_2O_3^+$ ($[M+K]^+$): 261.0636, found 261.0642.

N-(1-(naphthalen-1-yl)-2-nitroethyl)acetamide **2o**



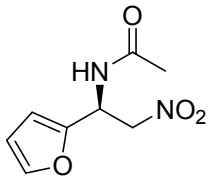
White solid; 97% ee; $[\alpha]_D^{20}$ = -86.00 (c = 0.5, CH_2Cl_2); HPLC condition for corresponding acetamide: C-1 column, hexane: isopropanol = 80:20; flow rate = 1.0 mL/min; UV detection at 230 nm; t_R = 17.3 min (minor), t_R = 35.6 min (major).^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.09 (d, J = 8.5 Hz, 1H), 7.91-7.85 (m, 2H), 7.64-7.53 (m, 2H), 7.47-7.42 (m, 2H) 6.55 (s, 1H), 6.19 (d, J = 7.6 Hz, 1H), 4.99 (dd, J = 12.8, 6.92 Hz, 1H), 4.79 (dd, J = 12.8, 6.2 Hz, 1H), 2.04 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ = 169.6, 134.1, 132.0, 130.4, 129.7, 129.2, 127.4, 126.4, 125.1, 123.2, 122.3, 47.5, 23.1. MALDI-HRMS Calculated for $C_{14}H_{14}KN_2O_3^+$($[M+K]^+$): 297.0636, found 297.0642.

N-(1-(naphthalen-2-yl)-2-nitroethyl)acetamide **2p**



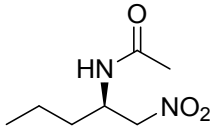
White solid; 99% ee; $[\alpha]_D^{20}$ = -116.00 (c = 0.5, CH_2Cl_2); HPLC condition for corresponding acetamide: C-1 column, hexane: isopropanol = 60:40; flow rate = 1.0 mL/min; UV detection at 230 nm; t_R = 13.0 min (minor), t_R = 23.7 min (major). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.87-7.80 (m, 3H), 7.76 (s, 1H), 7.53-7.49 (m, 2H), 7.39(dd, *J* = 8.5, 1.8 Hz, 1H) 6.43 (d, *J* = 7.5 Hz, 1H), 5.87-5.81 (m, 1H), 5.00 (dd, *J* = 13.0, 6.5 Hz, 1H), 4.81(dd, *J* = 13.0, 5.5 Hz, 1H), 2.08 (s, 3H).[7]

N-(1-furyl-2-nitroethyl)acetamide **2q**



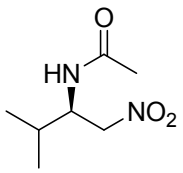
White solid; 97% ee; $[\alpha]_D^{20}$ = -65.40 (c = 0.5, CH_2Cl_2); GC condition: Supelco gamma Dex™ 225 column (30 m × 0.25 mm × 0.25 μm), N_2 3.0 mL/min, programmed from 110 °C to 190 °C at 3.0 °C/min; t_R = 25.8 min (major), t_R = 26.8 min (minor). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.35 (s, 1H), 6.70 (d, *J* = 7.3 Hz, 1H), 6.32-6.29 (m, 1H), 5.77-5.73 (m, 1H), 4.85 (dd, *J* = 13.1, 5.9 Hz, 1H), 4.71 (dd, *J* = 13.1, 5.7 Hz, 1H), 2.01 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ = 169.9, 149.0, 142.9, 110.7, 108.0, 76.1, 45.5, 22.9. MALDI-HRMS Calculated for $C_8H_{10}KN_2O_4^+$ ($[M+K]^+$): 237.0272, found 237.0276.

N-(1-nitropentan-2-yl)acetamide **2r**



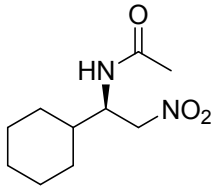
White solid; 91% ee; $[\alpha]_D^{20}$ = +43.6 (c = 0.5, CH_2Cl_2); GC condition: Supelco gamma Dex™ 225 column (30 m × 0.25 mm × 0.25 μm), N_2 3.0 mL/min, programmed from 100 °C to 190 °C at 5°C/min; t_R = 16.9 min (major), t_R = 17.9 min (minor). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 5.80 (s, 1H), 4.56 (dd, *J* = 4.4, 1.4 Hz, 2H), 4.44-4.36 (m, 1H), 2.02 (s, 3H), 1.61-1.56 (m, 2H), 1.48-1.36 (m, 2H), 0.95 (t, *J* = 7.3 Hz, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ = 169.2, 77.1, 46.6, 32.5, 22.1, 18.2, 12.6. MALDI-HRMS Calculated for $C_7H_{14}KN_2O_3^+$ ($[M+K]^+$): 213.0636, found 213.0642.

N-(3-methyl-1-nitrobutan-2-yl)acetamide **2s**



White solid; 96% ee; $[\alpha]_D^{20}$ = +27.50 (c = 0.5, CH_2Cl_2); GC condition: Supelco gamma Dex™ 225 column (30 m × 0.25 mm × 0.25 μm), N_2 3.0 mL/min, programmed from 100 °C to 190 °C at 5°C/min; t_R = 17.5 min (major), t_R = 18.6 min (minor). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 5.83 (d, *J* = 6.0 Hz, 1H), 4.63 (dd, *J* = 12.9, 5.7 Hz, 1H), 4.54 (dd, *J* = 12.9, 3.9 Hz, 1H), 4.24-4.17 (m, 1H), 2.04 (s, 3H), 1.94-1.85 (m, 1H), 1.03-0.98 (m, 6H).[7]

N-(1-cyclohexyl-2-nitroethyl)acetamide **2t**



White solid; 98% ee; $[\alpha]_D^{20}$ = +26.20 (c = 0.5, CH_2Cl_2); GC condition: Supelco beta Dex™ 225 column (30 m × 0.25 mm ×

0.25 μm), N_2 1.0 mL/min, programmed from 100 °C to 190 °C at 1.0 °C/min; t_R = 85.8 min (major), t_R = 87.6 min (minor). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 5.84 (d, *J* = 8.4 Hz, 1H), 4.66 (dd, *J* = 13.0, 5.5 Hz, 1H), 4.53 (dd, *J* = 13.0, 3.8 Hz, 1H), 4.26-4.19 (m,1H), 2.03 (s, 3H), 1.82-1.66 (m, 5H), 1.56-1.51 (m, 1H), 1.29-0.95 (m, 5H).[7]

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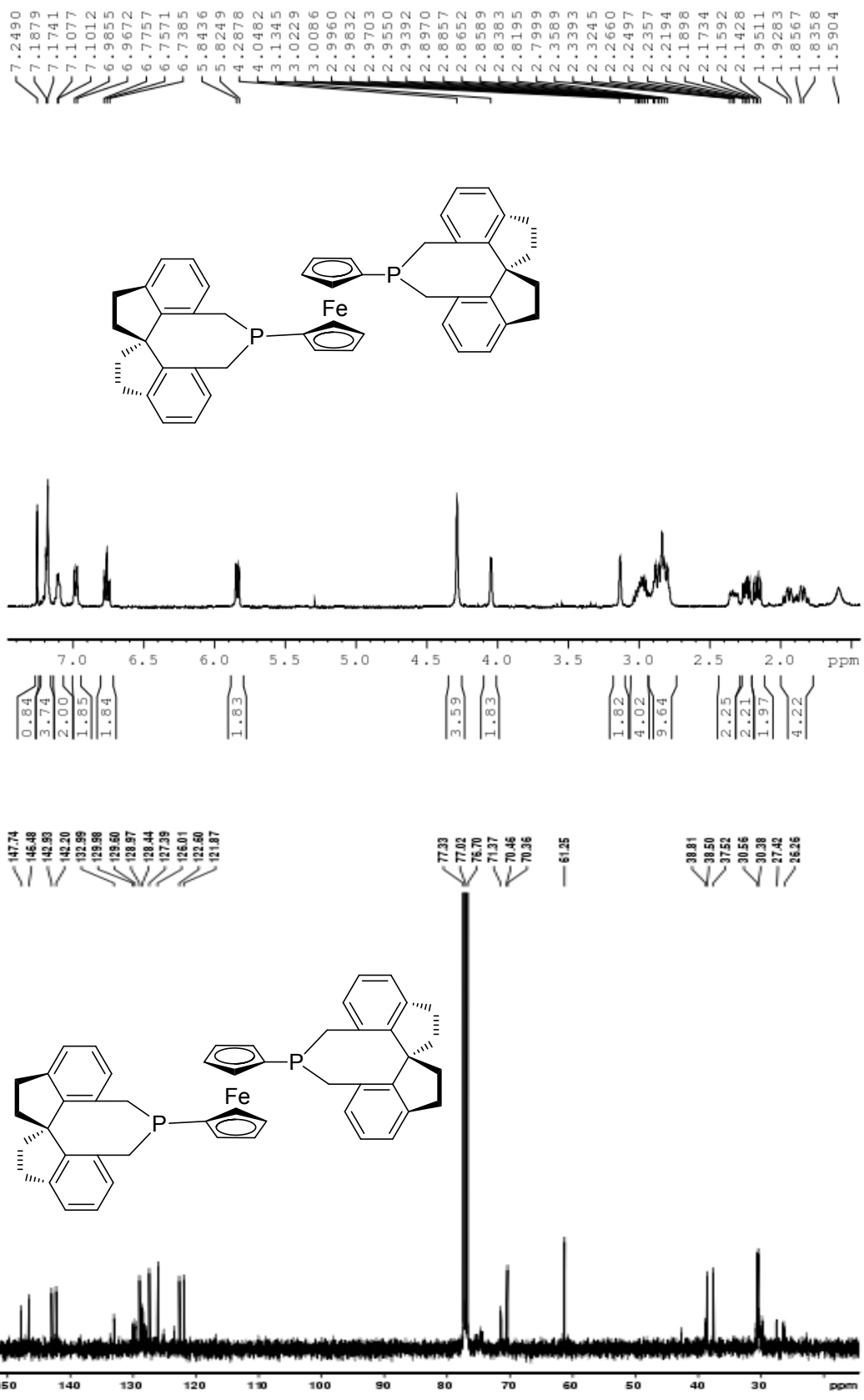
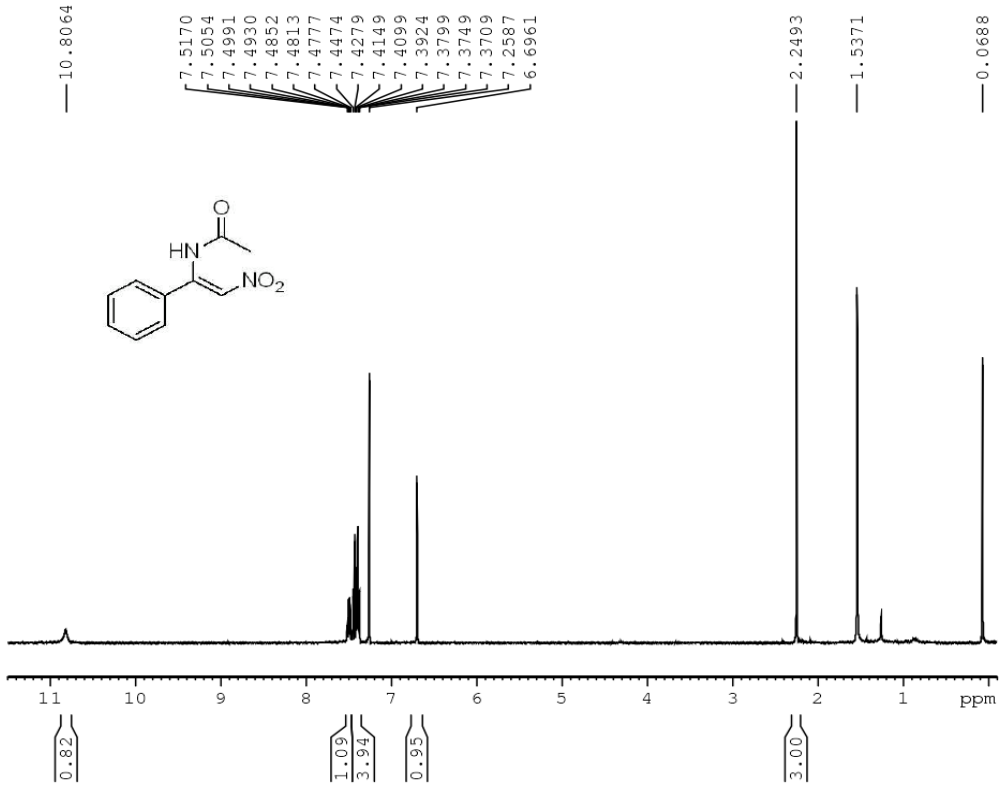
8. NMR spectra of (*R*,*R*)-f-spiroPhos, 1, 2, and GC or HPLC spectra of 2

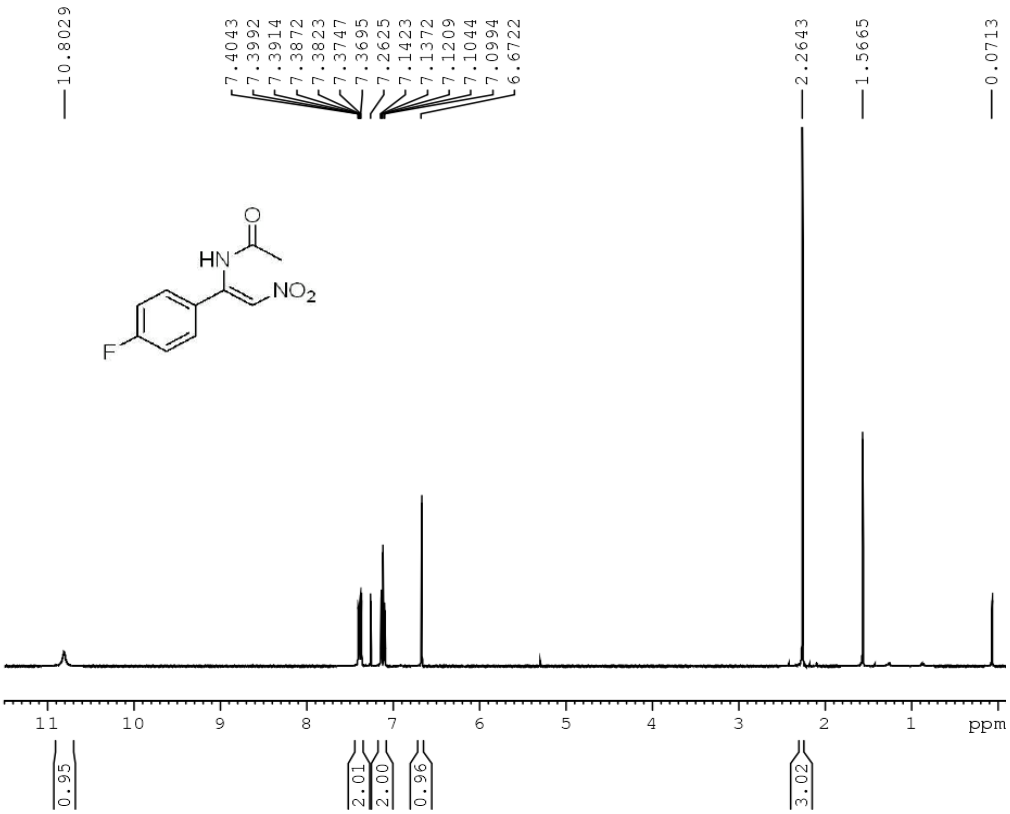
(*R*, *R*)-f-spiroPhos



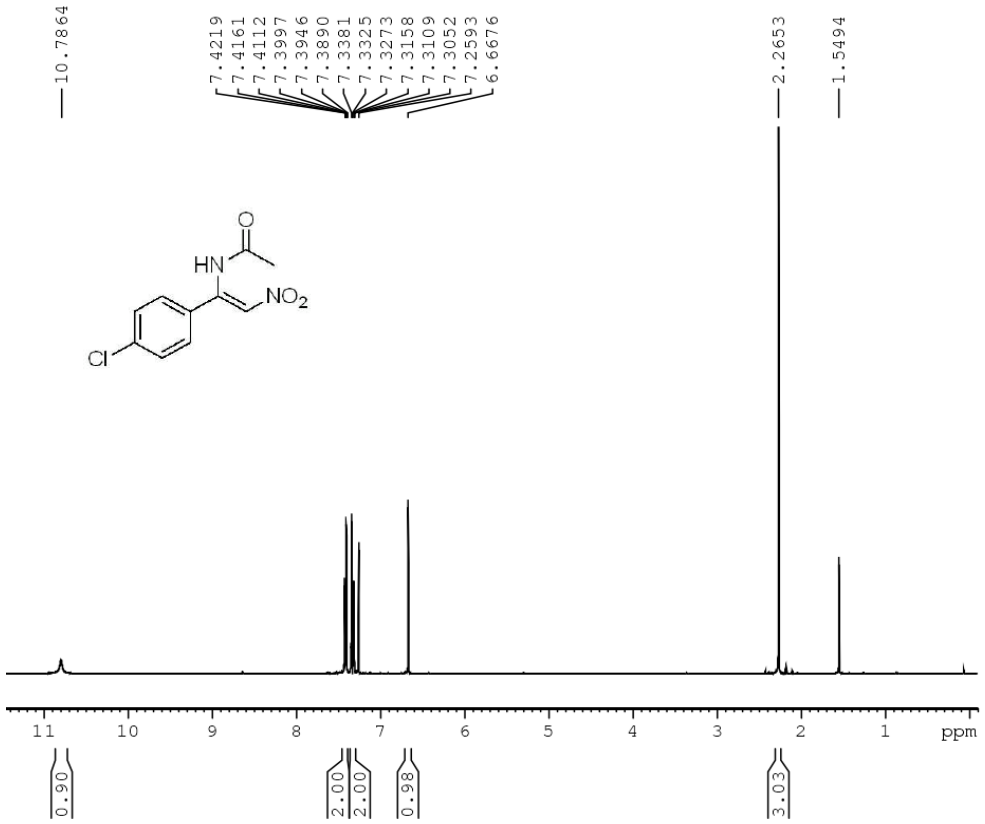
(*Z*)-*N*-(2-nitro-1-phenylvinyl)acetamide **1a**



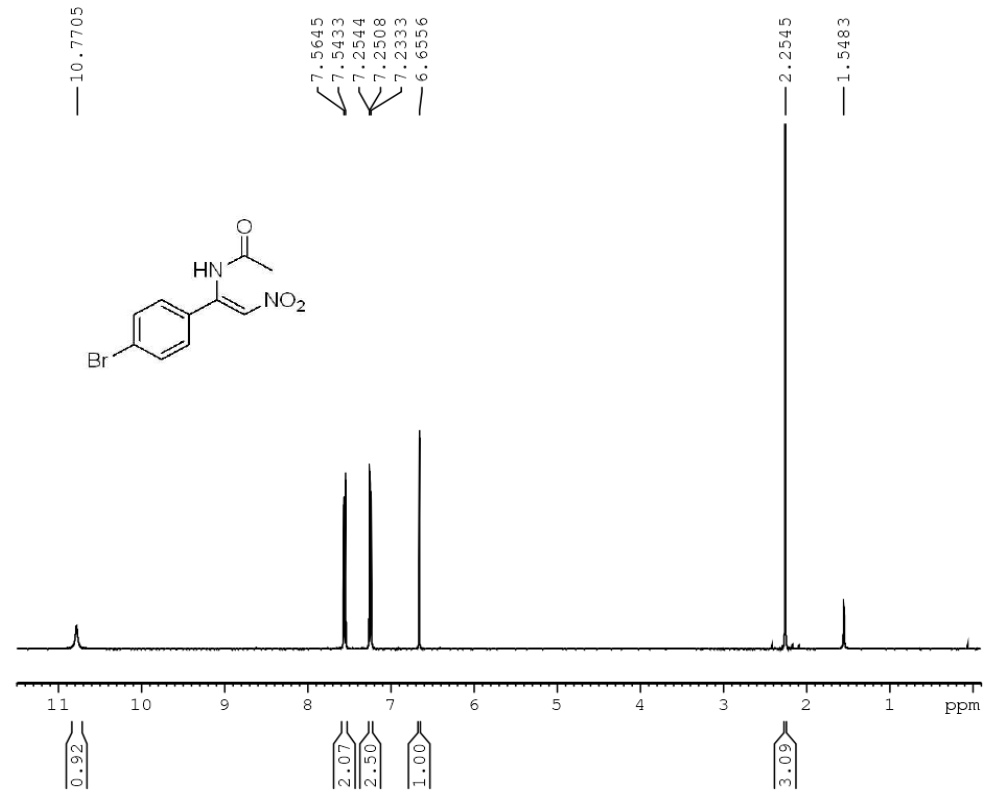
(*Z*)-*N*-(1-(4-fluorophenyl)-2-nitrovinyl)acetamide **1b**



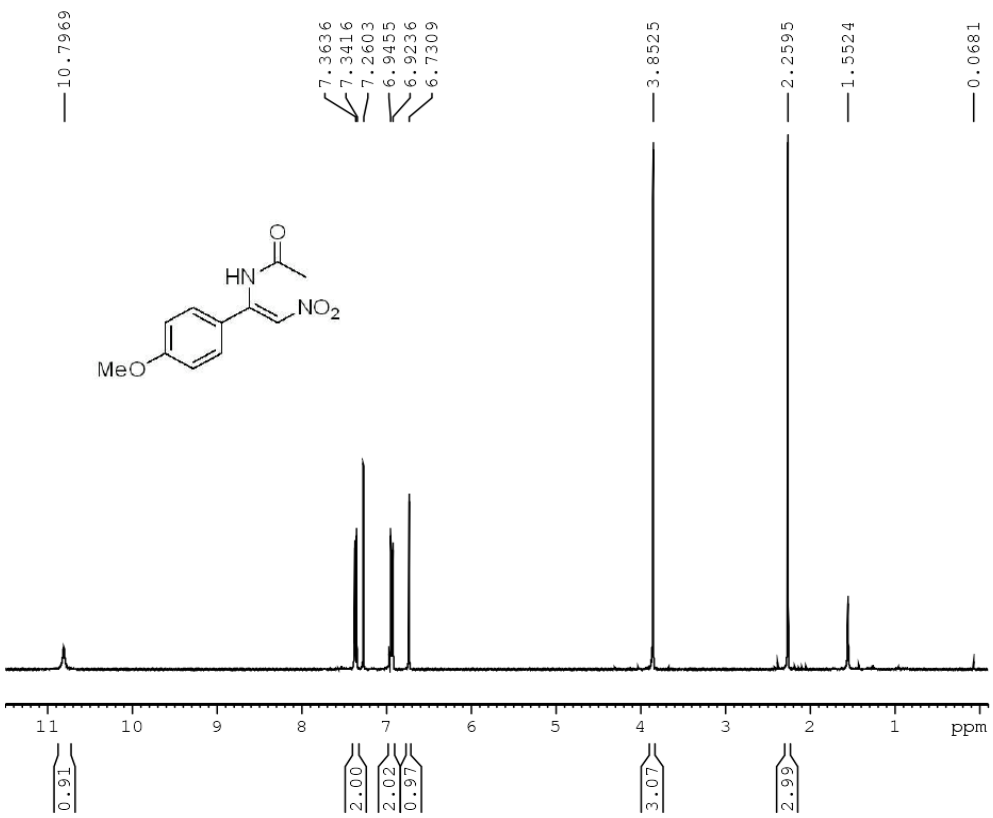
(*Z*)-*N*-(1-(4-chlorophenyl)-2-nitrovinyl)acetamide **1c**



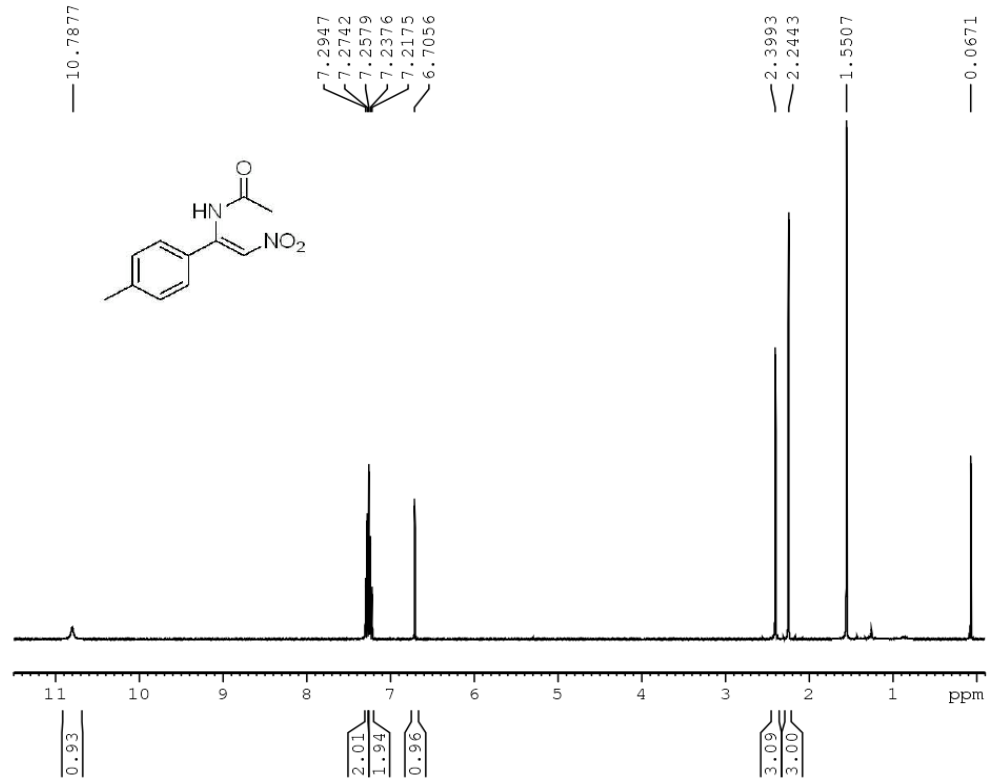
(*Z*)-*N*-(1-(4-bromophenyl)-2-nitrovinyl)acetamide **1d**



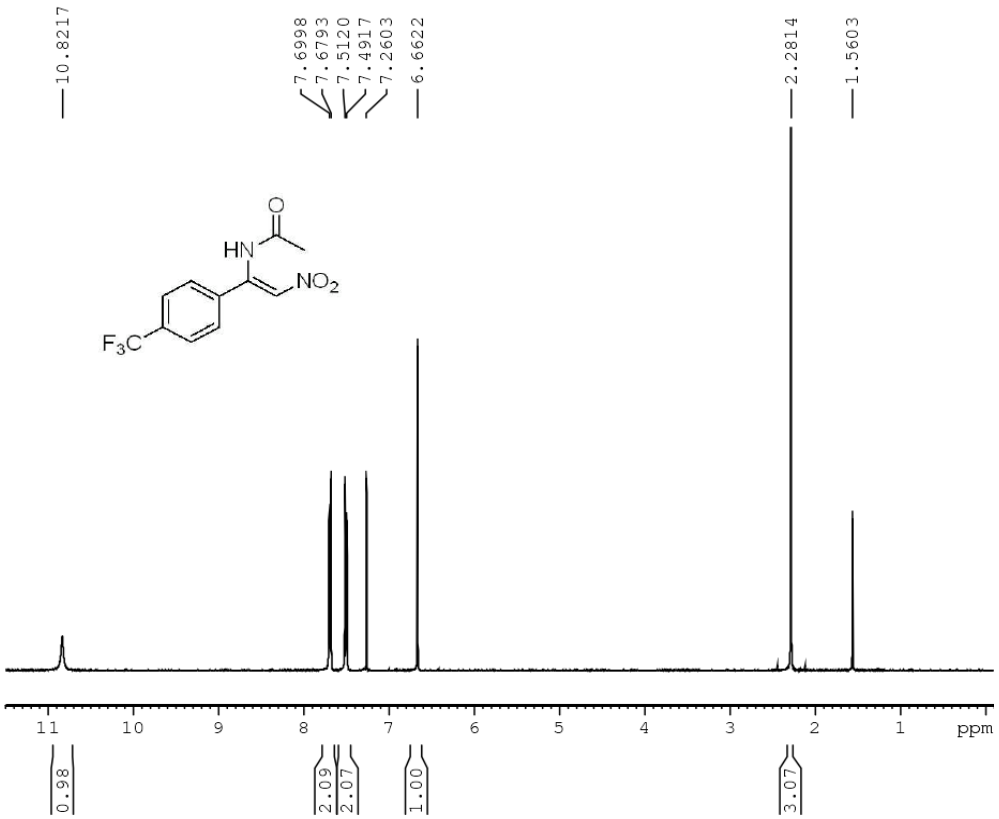
(*Z*)-*N*-(1-(4-methoxyphenyl)-2-nitrovinyl)acetamide **1e**



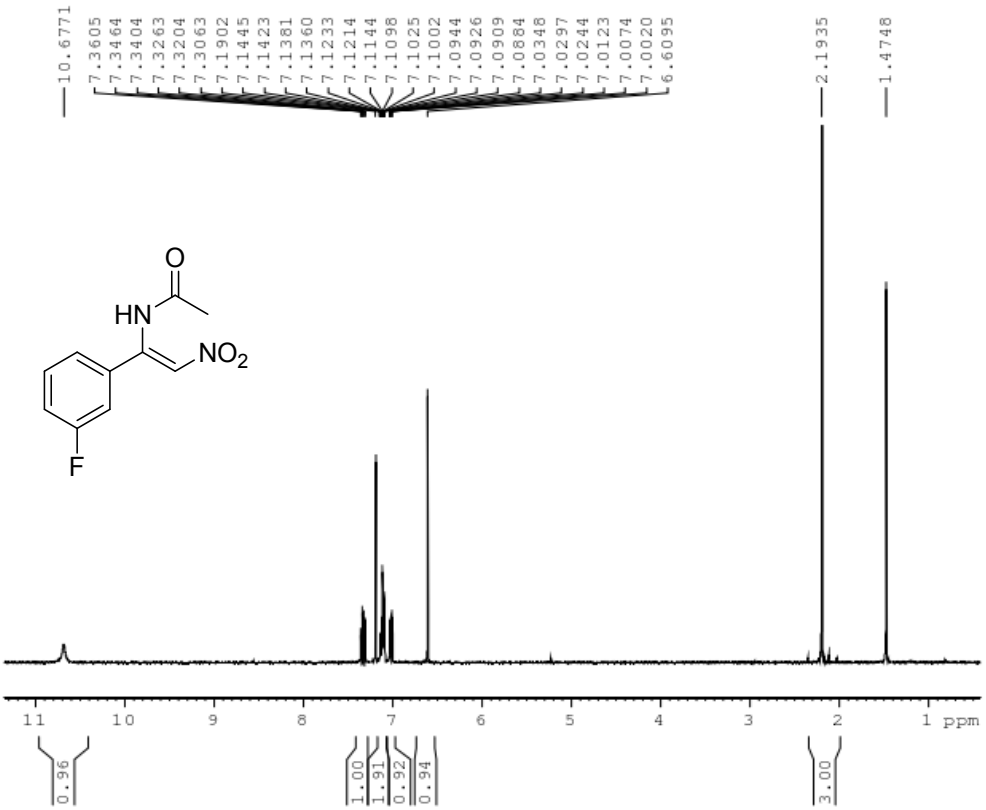
(*Z*)-*N*-(2-nitro-1-p-tolylvinyl)acetamide **1f**

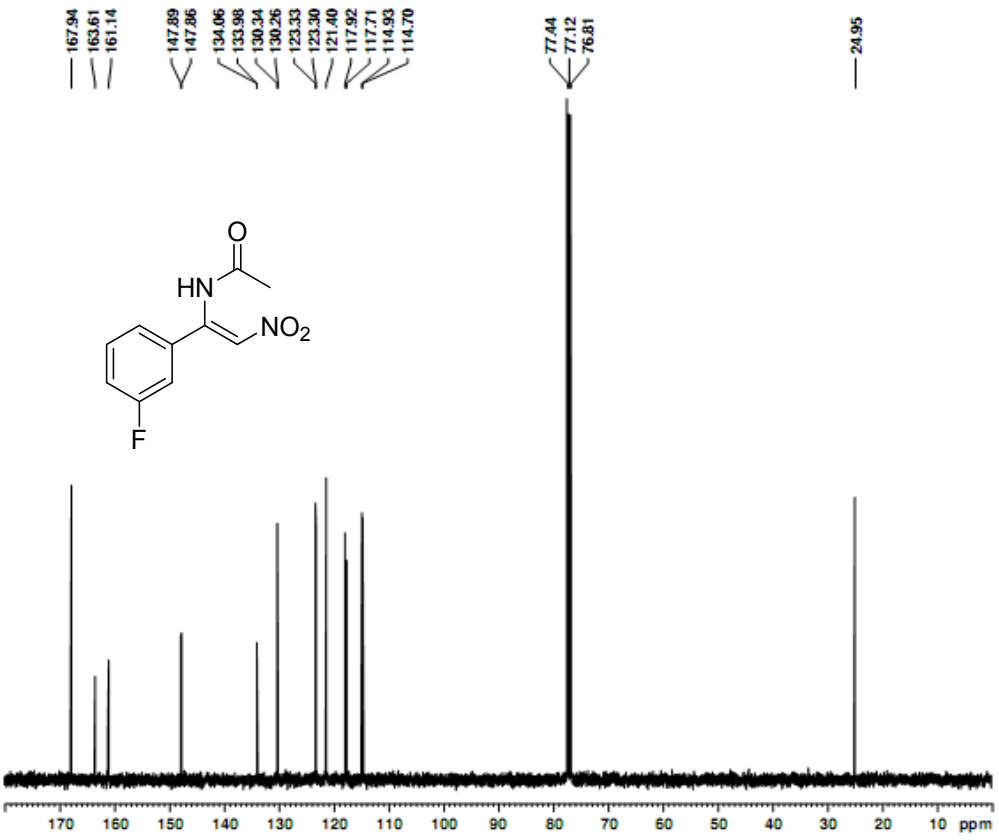


(*Z*)-*N*-(1-(4-trifluoromethylphenyl)-2-nitrovinyl)acetamide **1g**

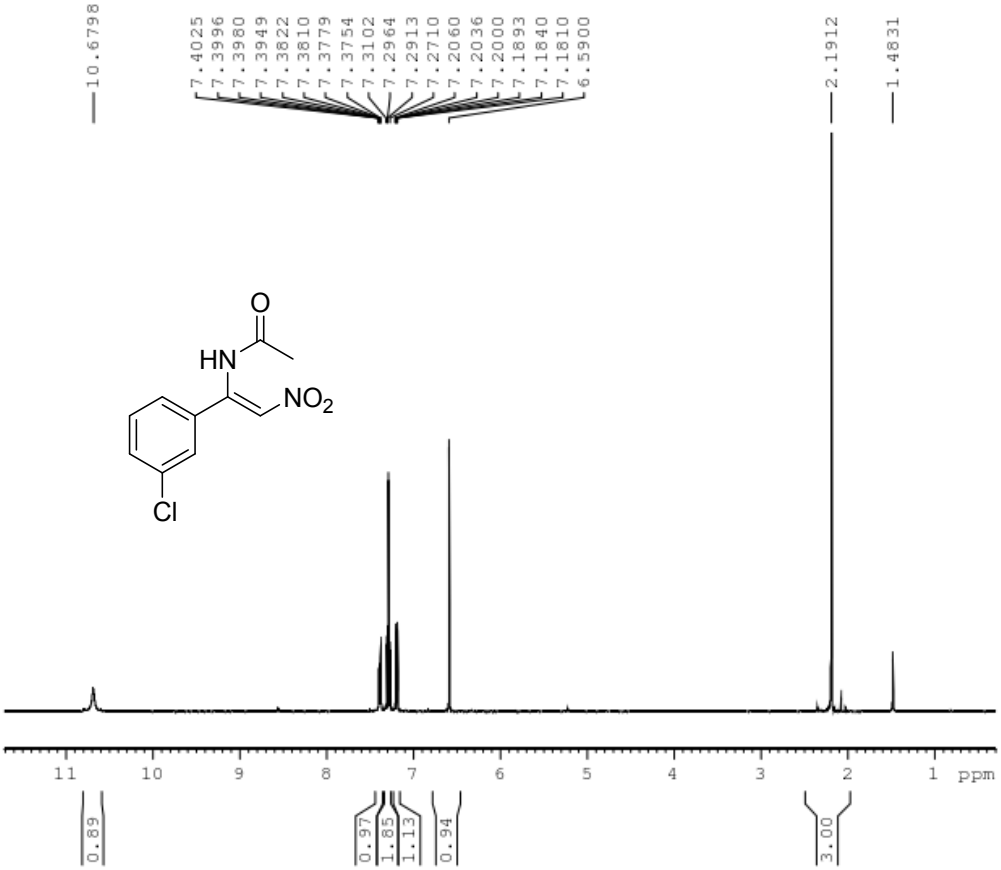


(*Z*)-*N*-(1-(3-fluorophenyl)-2-nitrovinyl)acetamide **1h**

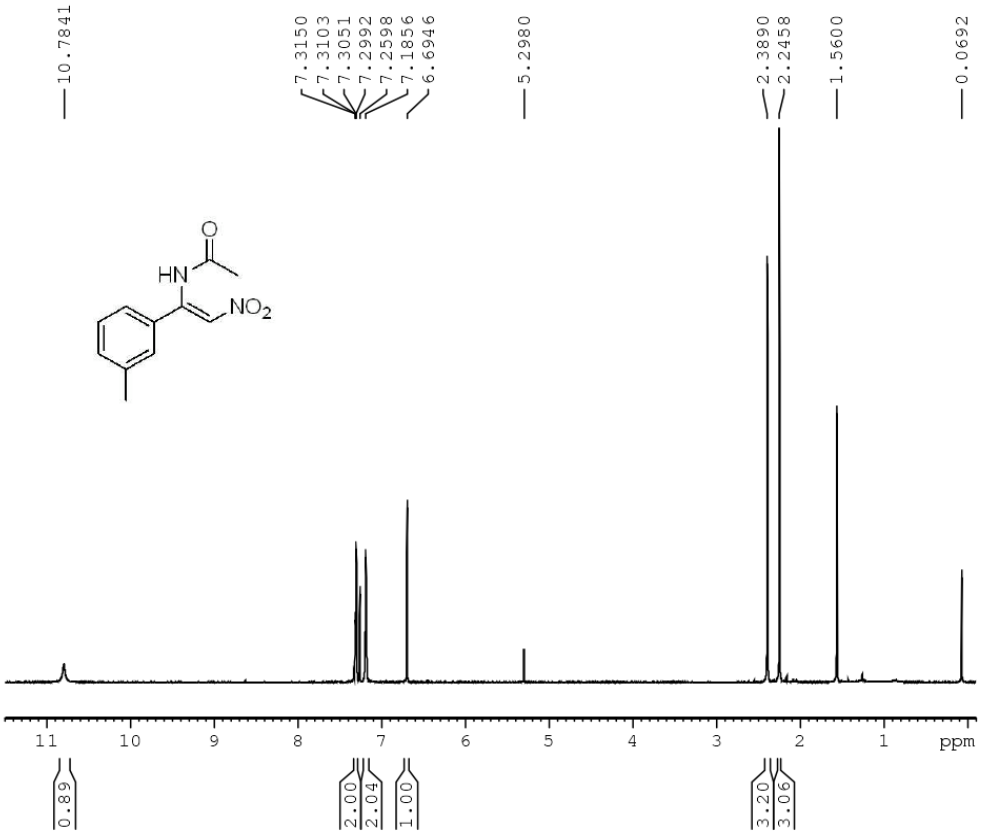




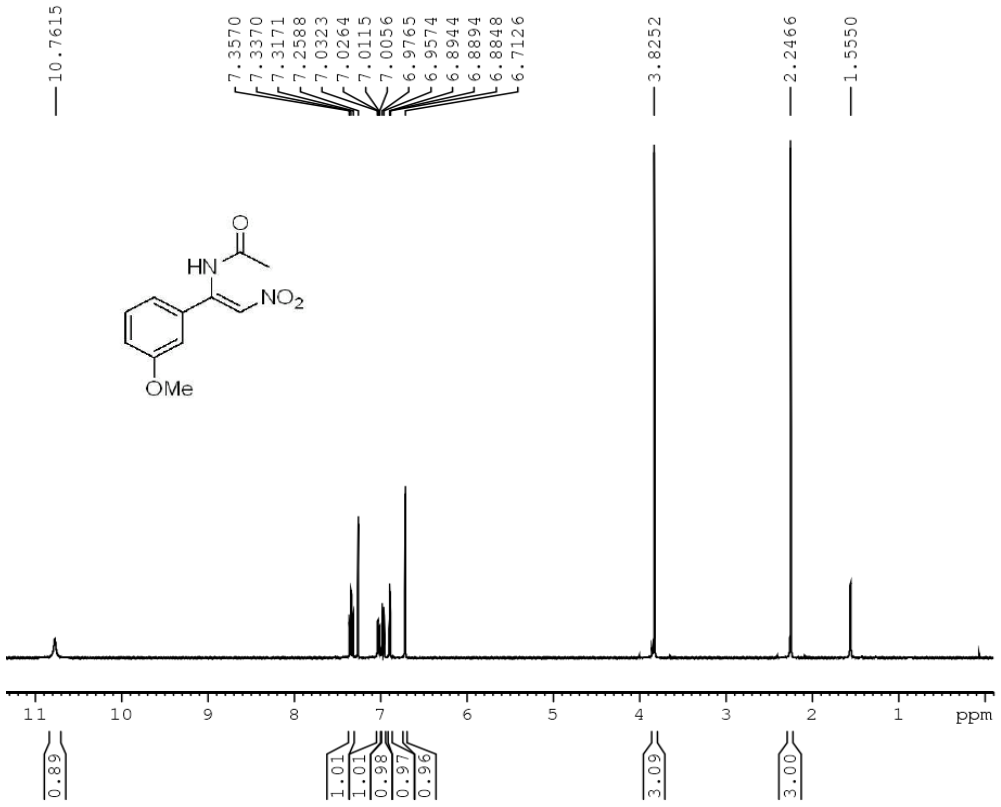
(*Z*)-*N*-(1-(3-chlorophenyl)-2-nitrovinyl)acetamide **1i**



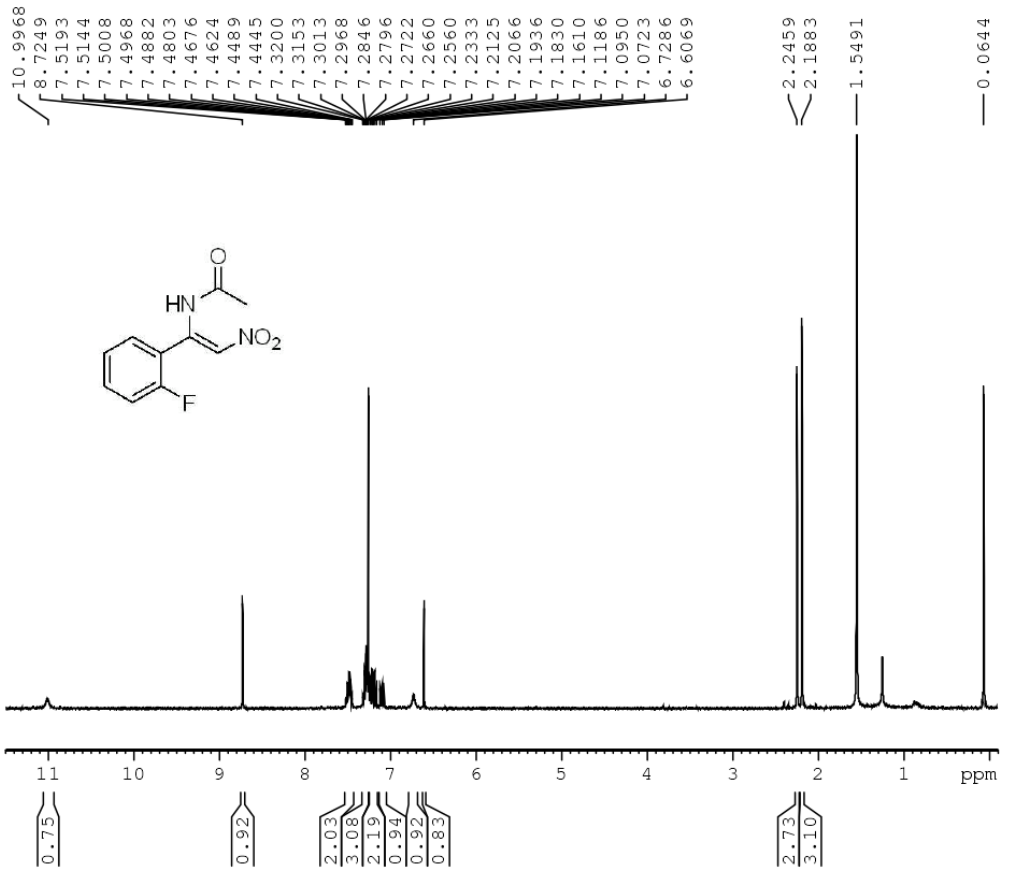
(*Z*)-*N*-(2-nitro-1-m-tolylvinyl)acetamide**1j**

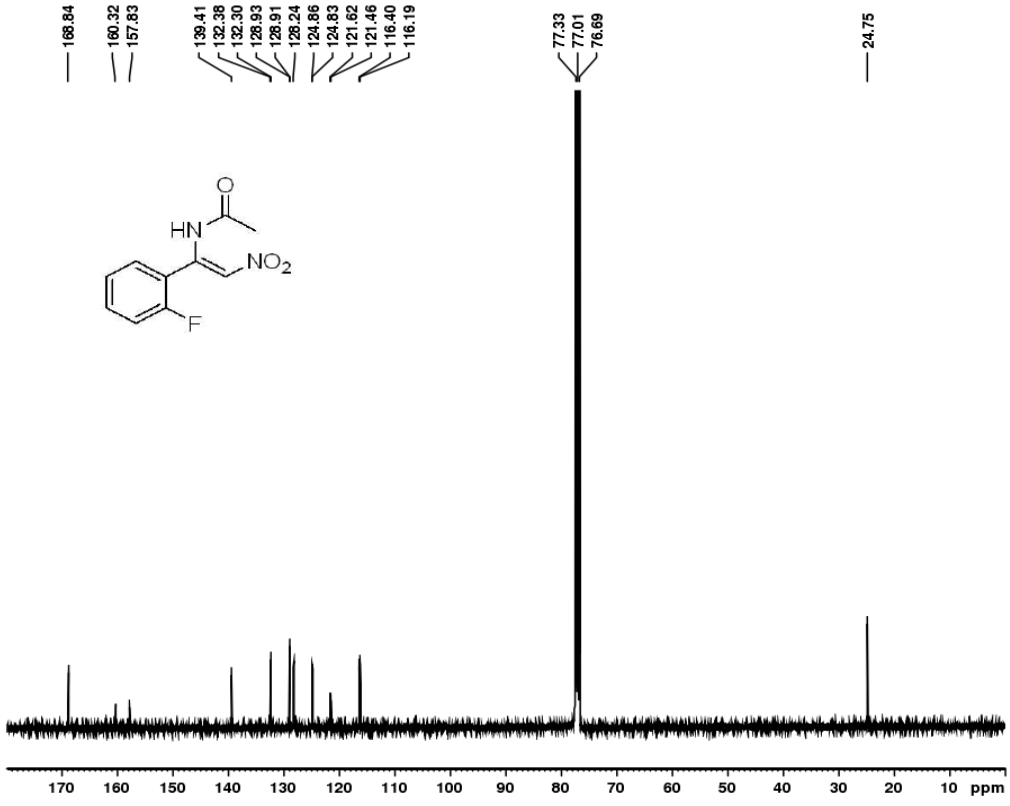


(*Z*)-*N*-(1-(3-methoxyphenyl)-2-nitrovinyl)acetamide **1k**

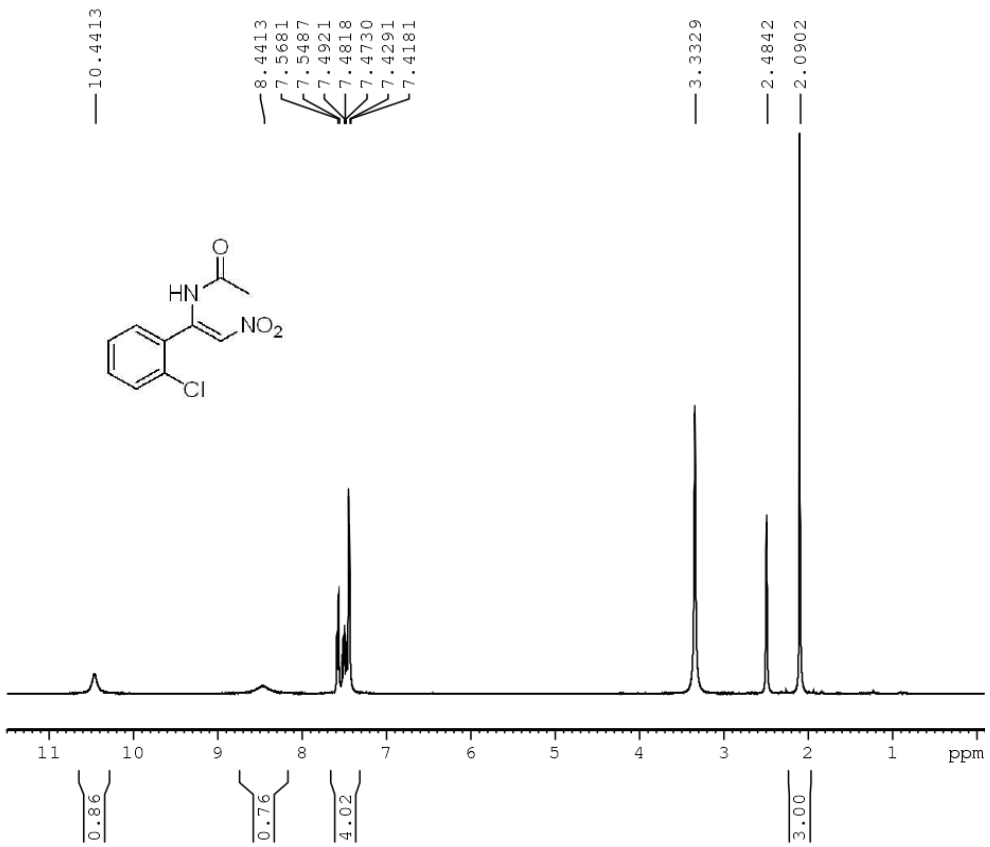


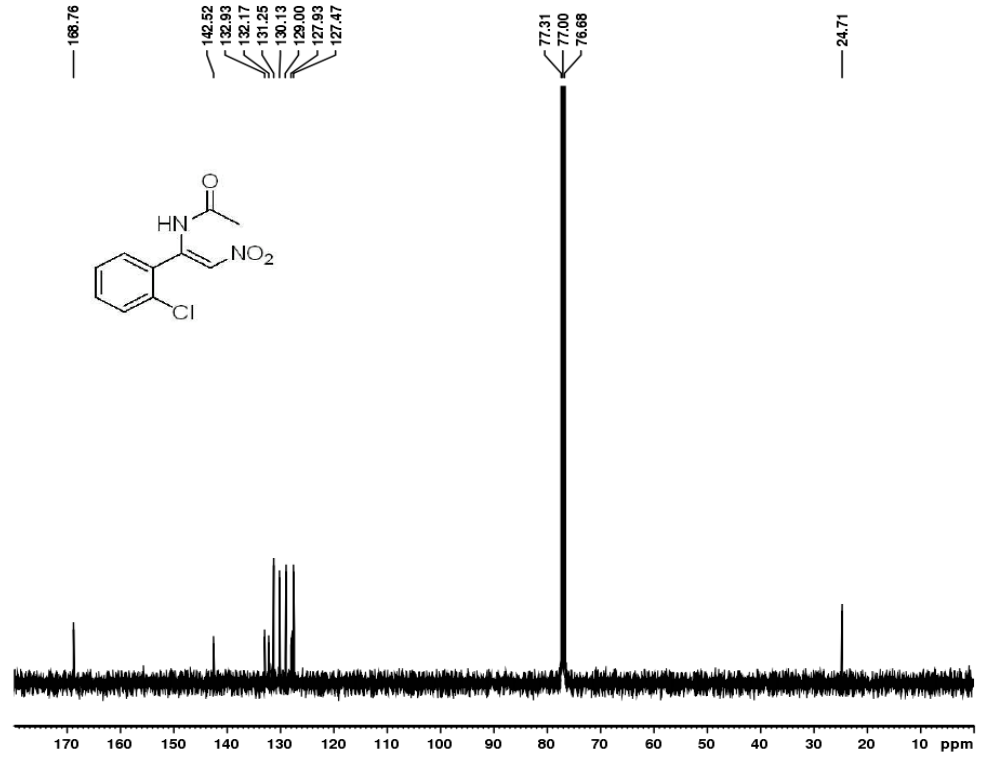
(*Z*/*E*)-*N*-(1-(2-fluorophenyl)-2-nitrovinyl)acetamide**1l**



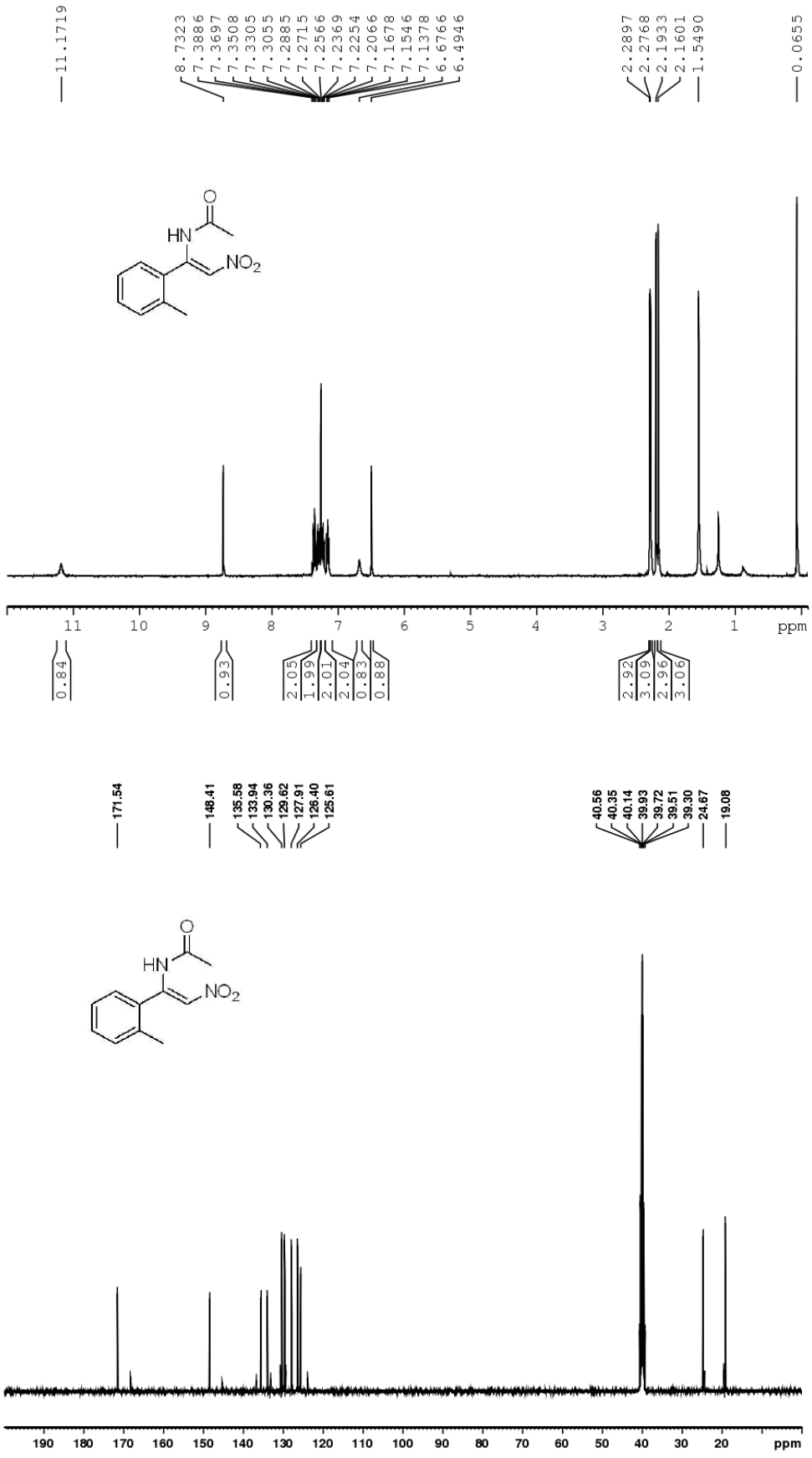


(*Z*)-*N*-(1-(2-chlorophenyl)-2-nitrovinyl)acetamide **1m**

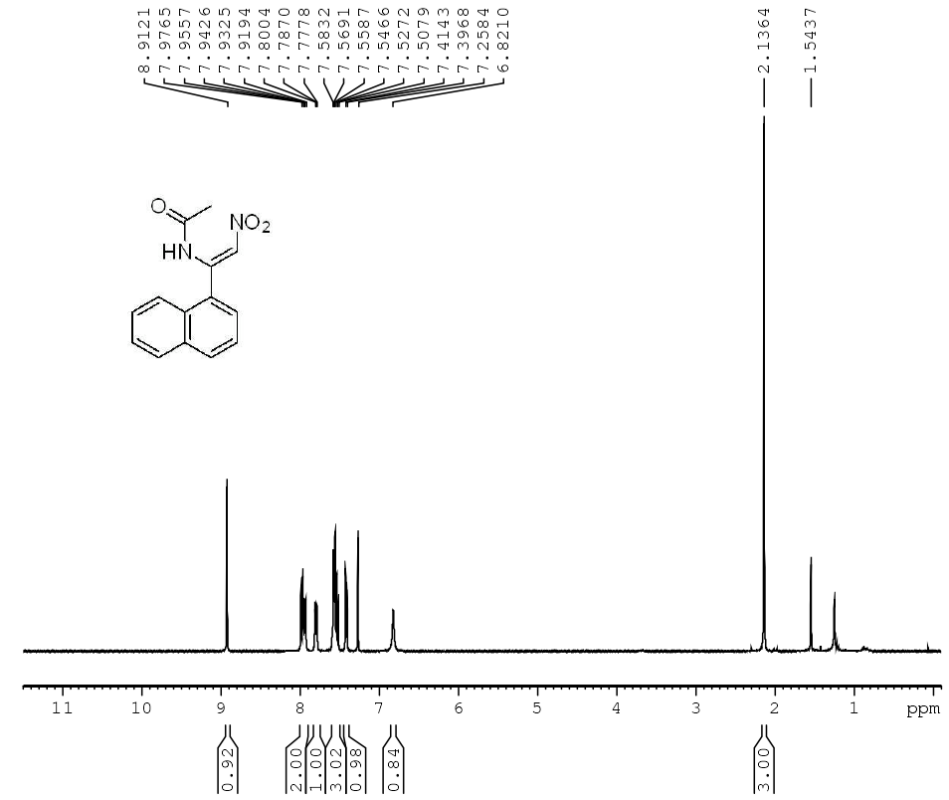


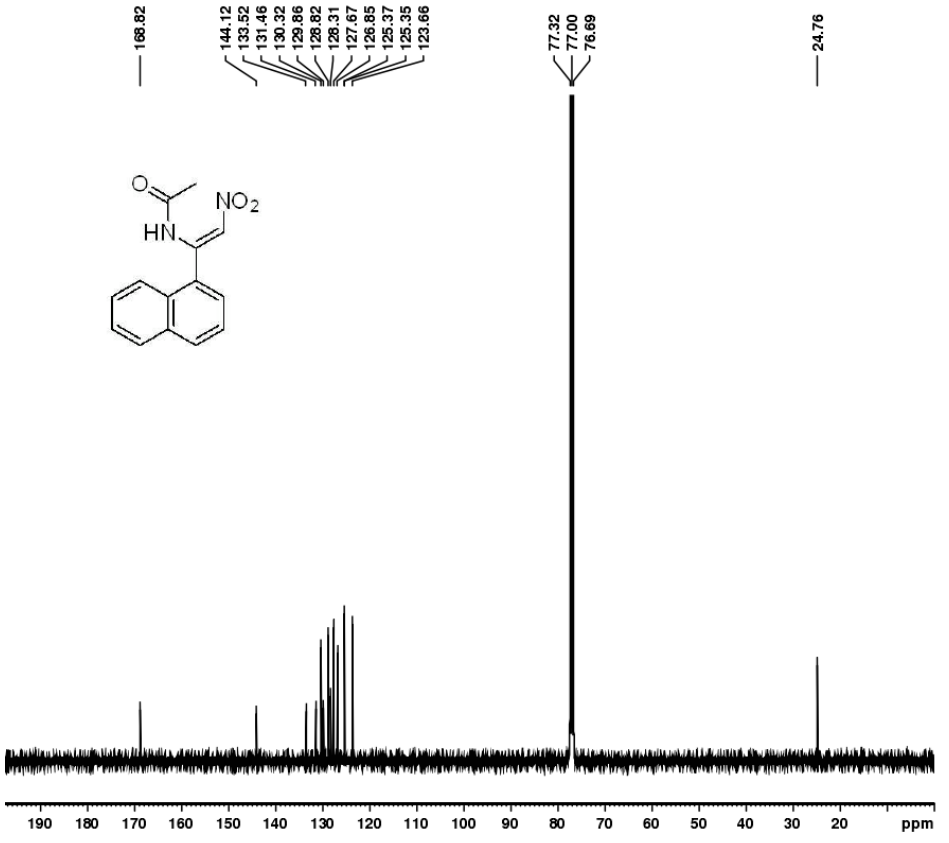


(*Z*/*E*)-*N*-(2-nitro-1-o-tolylvinyl)acetamide**1n**

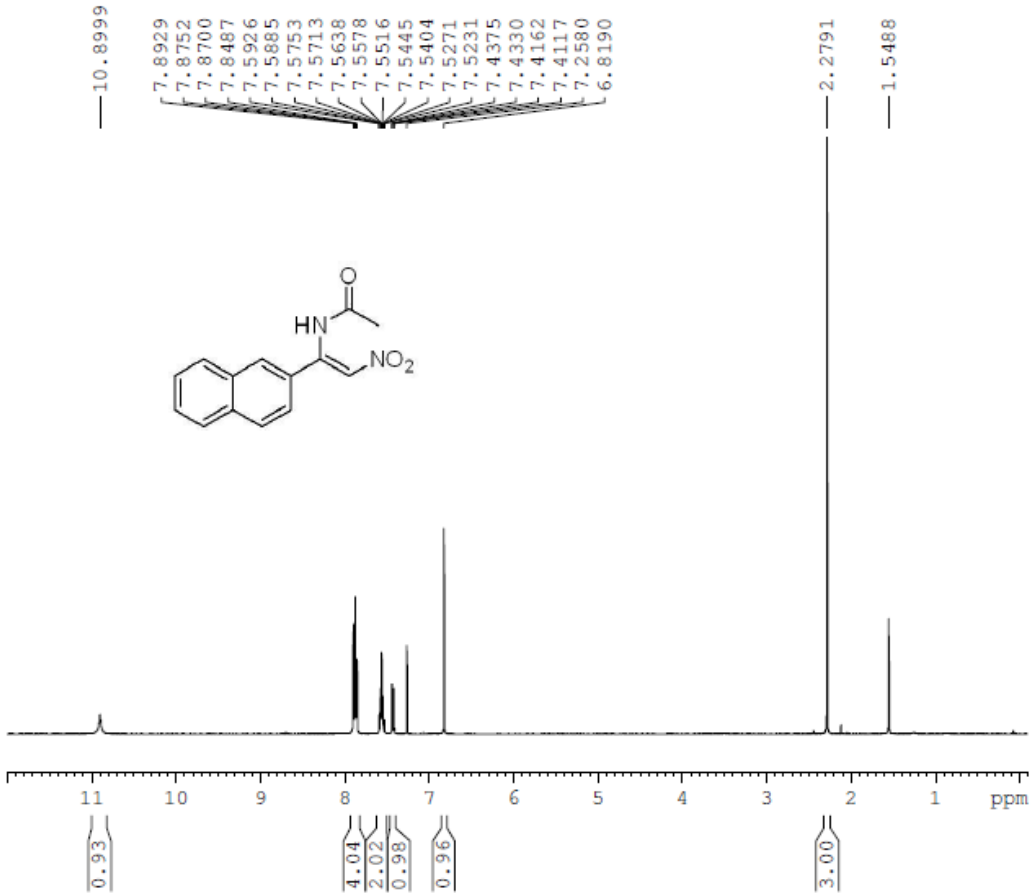


(*Z*)-*N*-(1-(naphthalen-1-yl)-2-nitrovinyl)acetamide **1o**

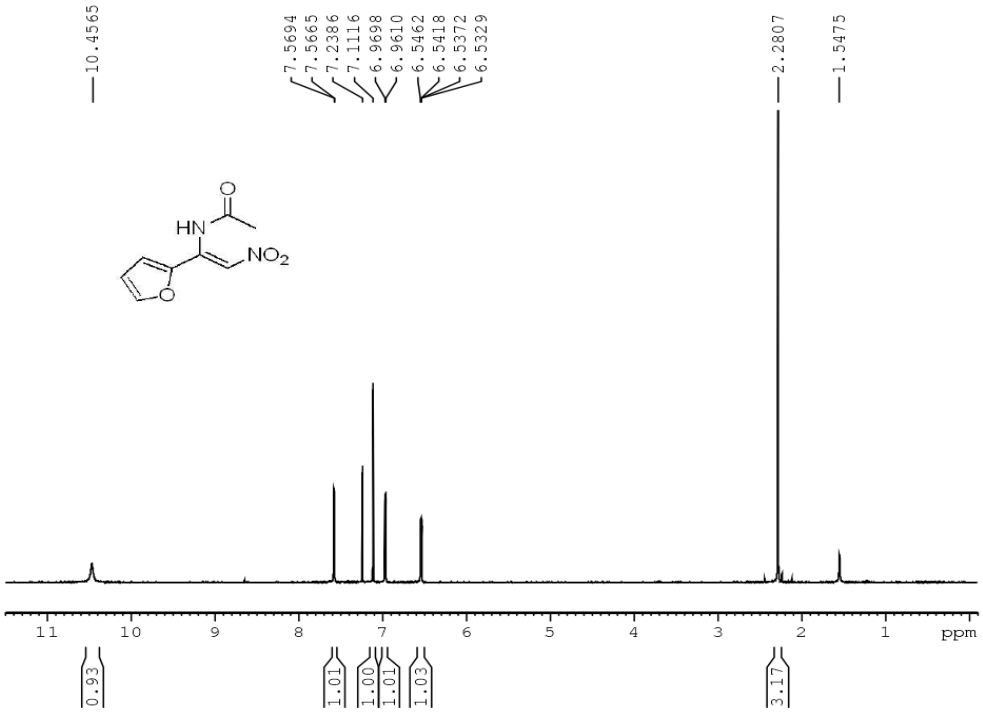


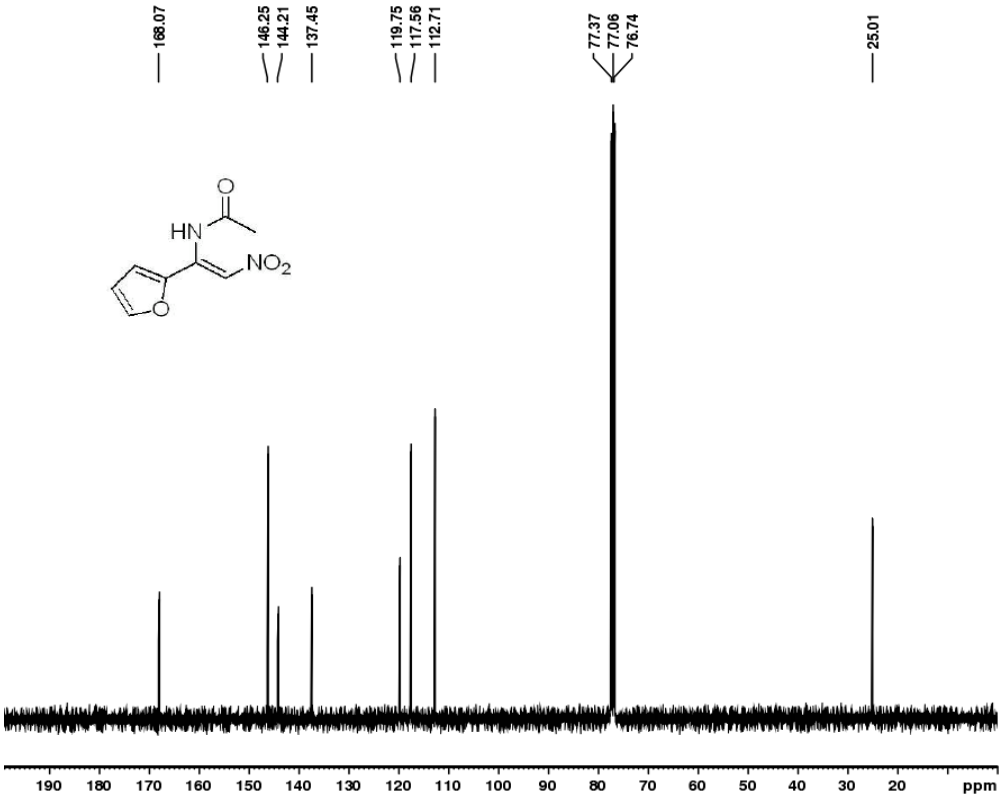


(*Z*)-*N*-(1-(naphthalen-2-yl)-2-nitrovinyl)acetamide **1p**

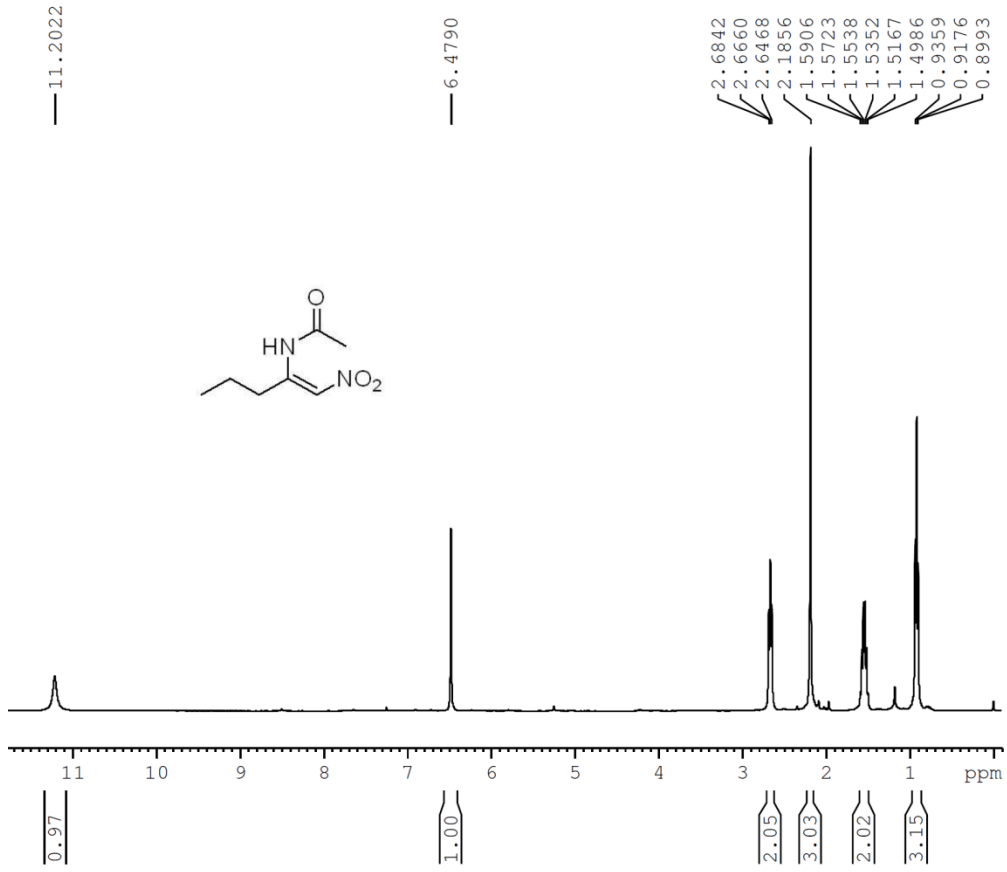


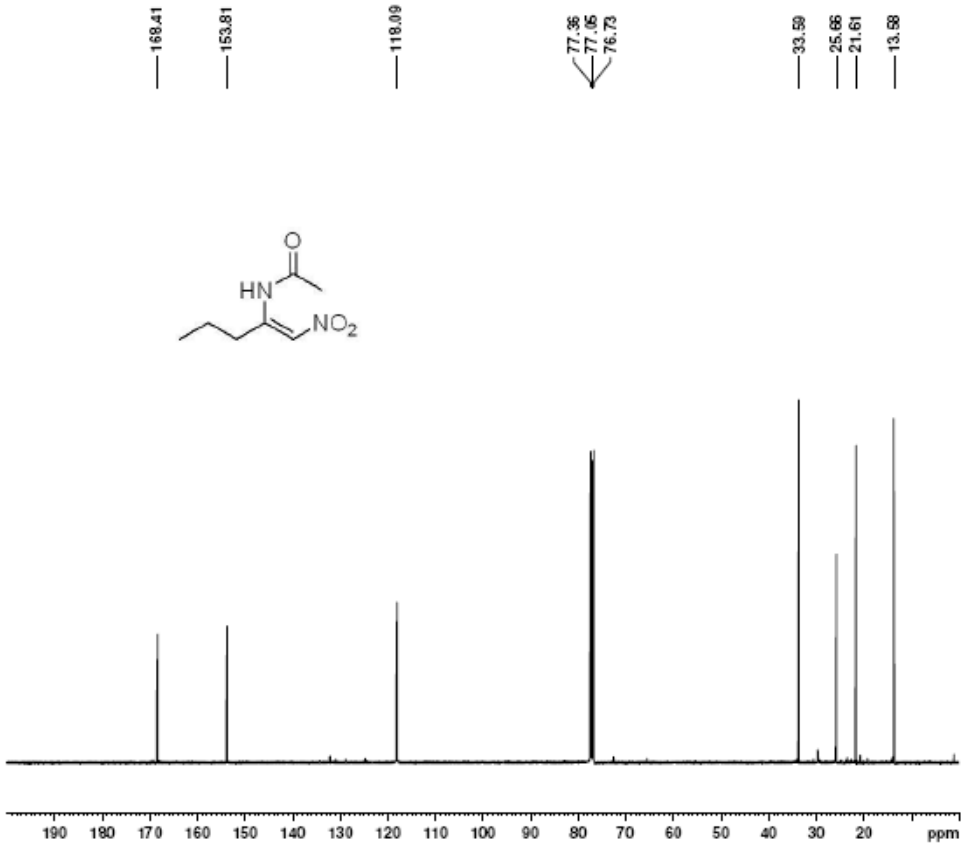
(*Z*)-*N*-(1-furyl-2-nitrovinyl)acetamide**1q**



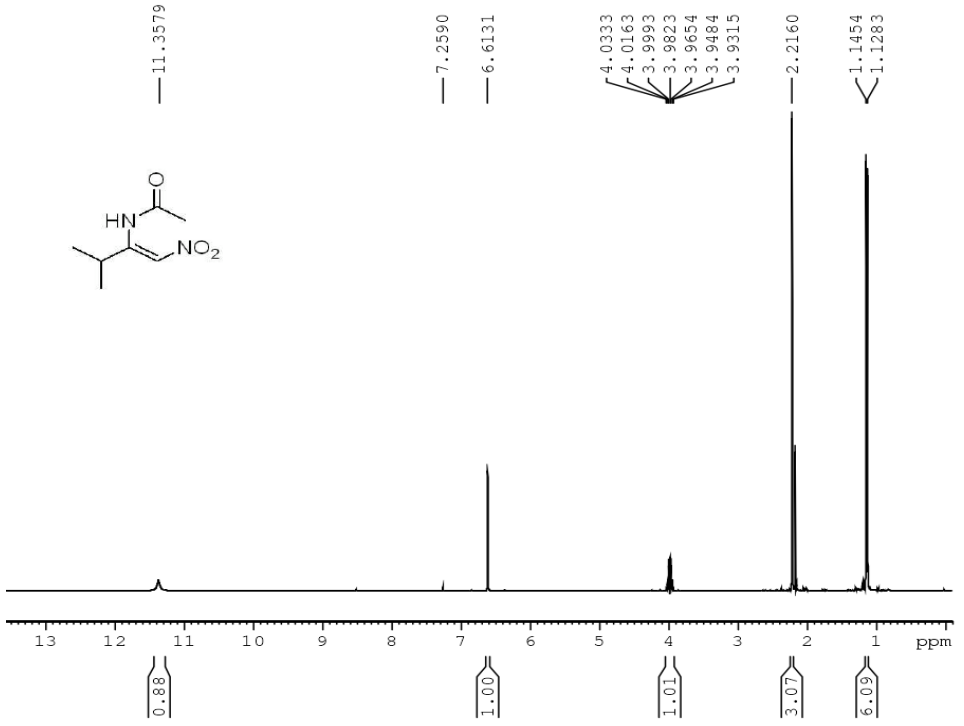


(*Z*)-*N*-(1-nitropent-1-en-2-yl)acetamide **1r**

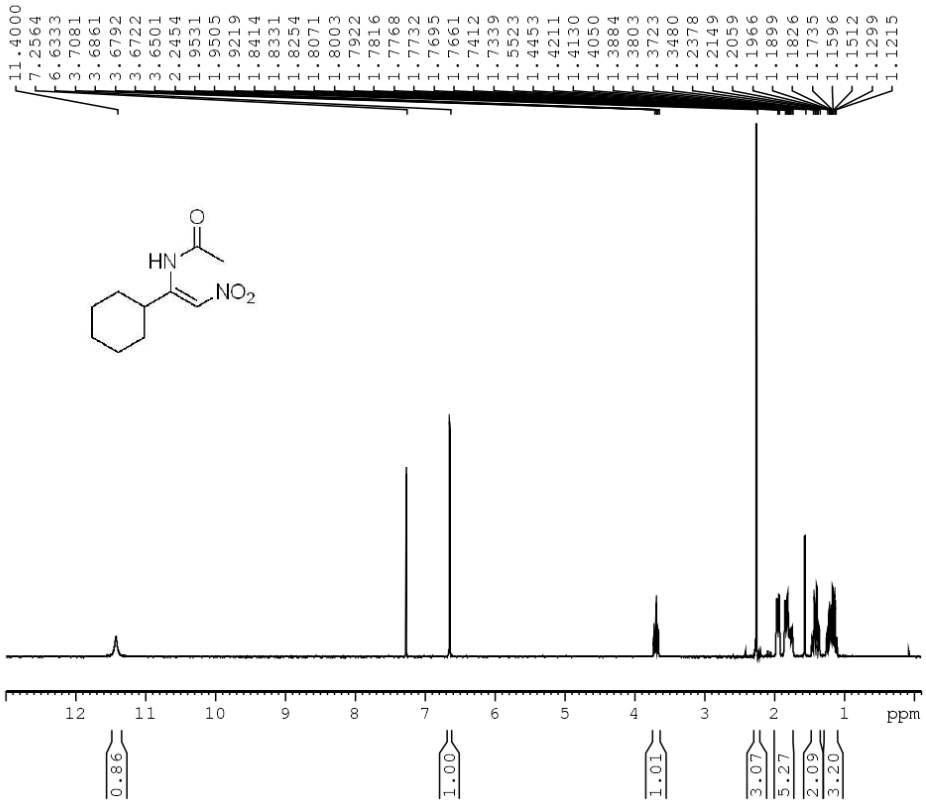




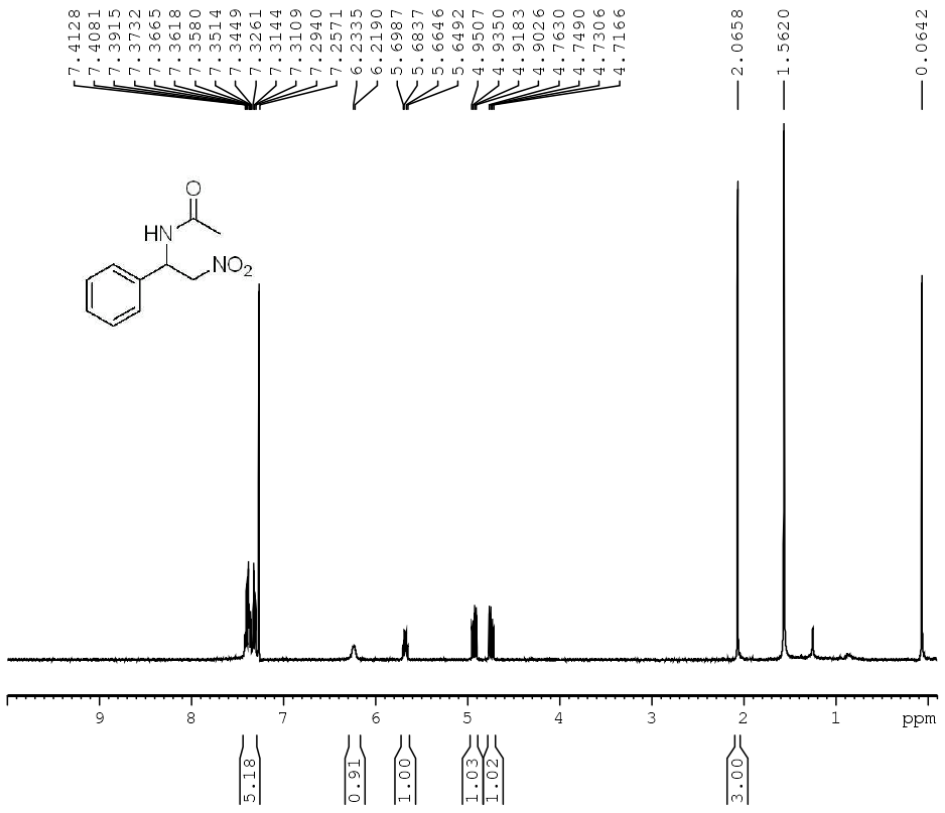
(*Z*)-*N*-(3-methyl-1-nitrobut-1-en-2-yl)acetamide **1s**



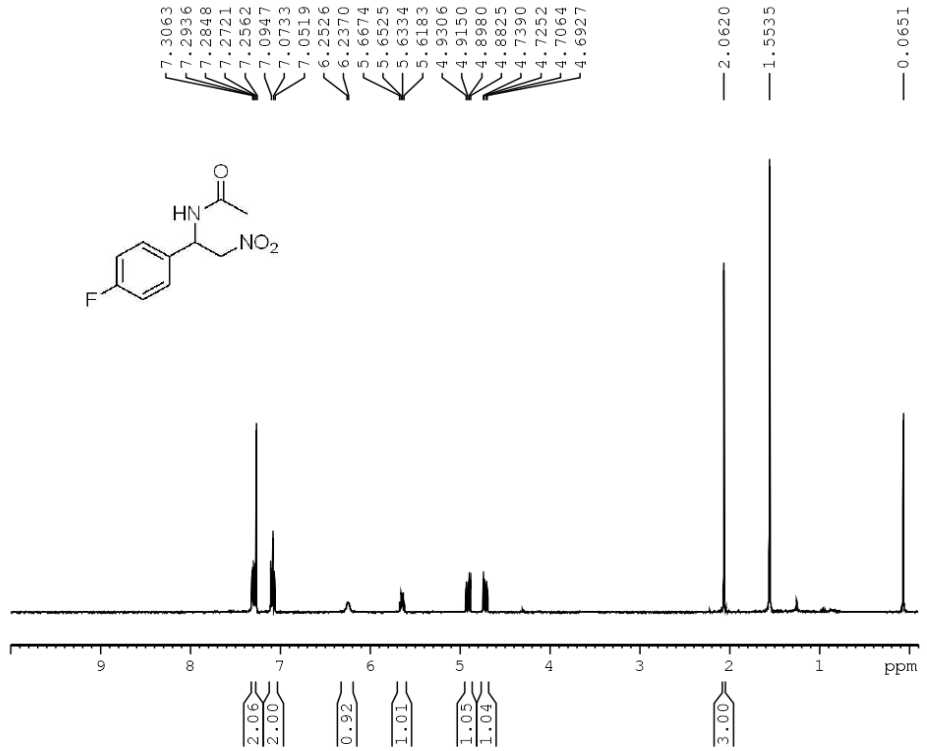
(*Z*)-*N*-(1-cyclohexyl-2-nitrovinyl)acetamide**1t**



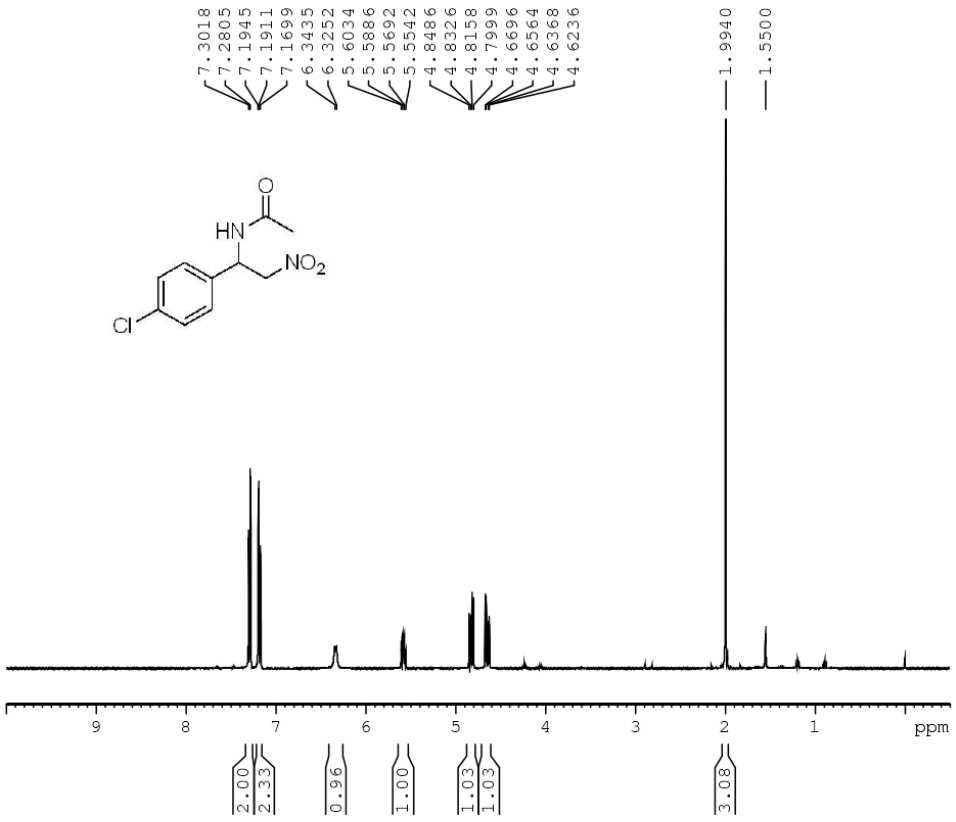
N-(2-nitro-1-phenylethyl)acetamide **2a**



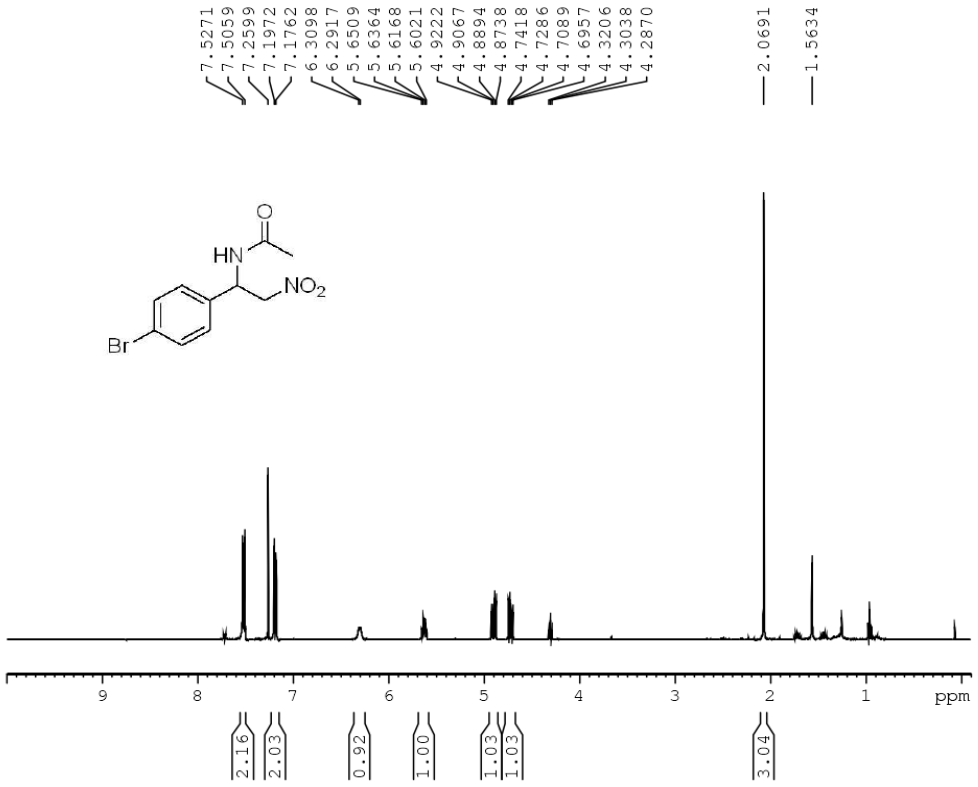
N-(1-(4-fluorophenyl)-2-nitroethyl)acetamide **2b**



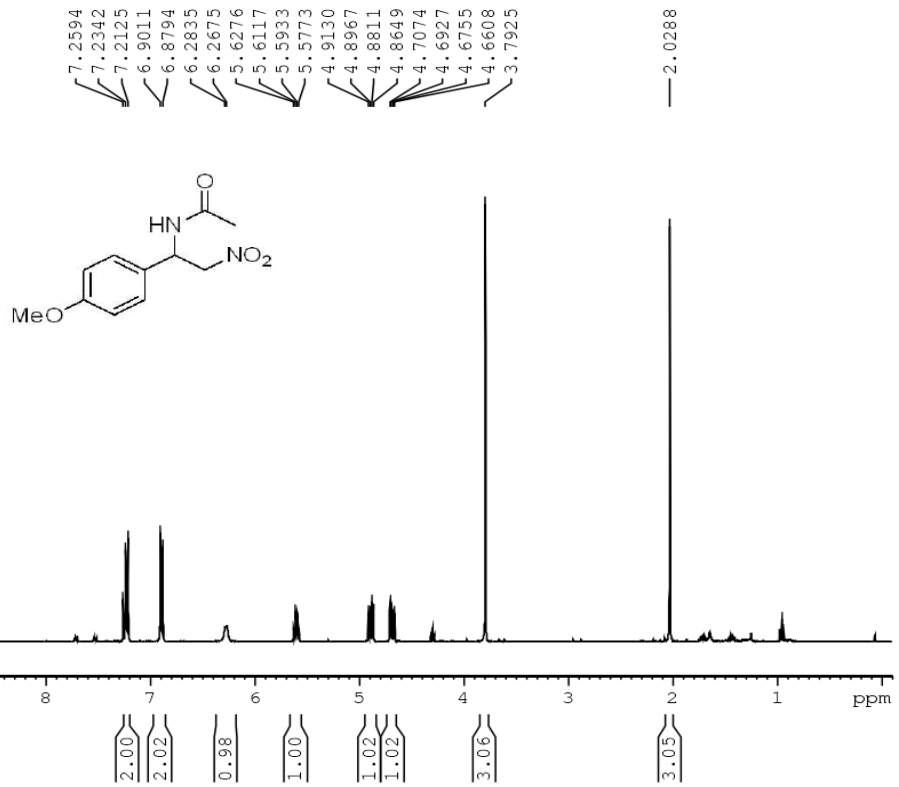
N-(1-(4-chlorophenyl)-2-nitroethyl)acetamide **2c**



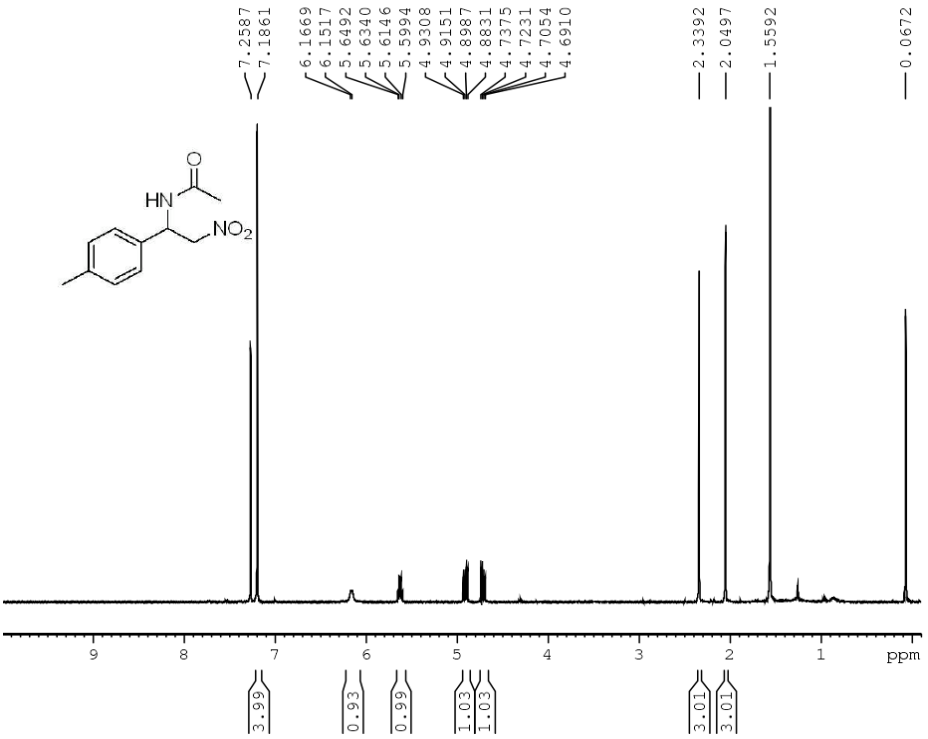
N-(1-(4-bromophenyl)-2-nitroethyl)acetamide **2d**



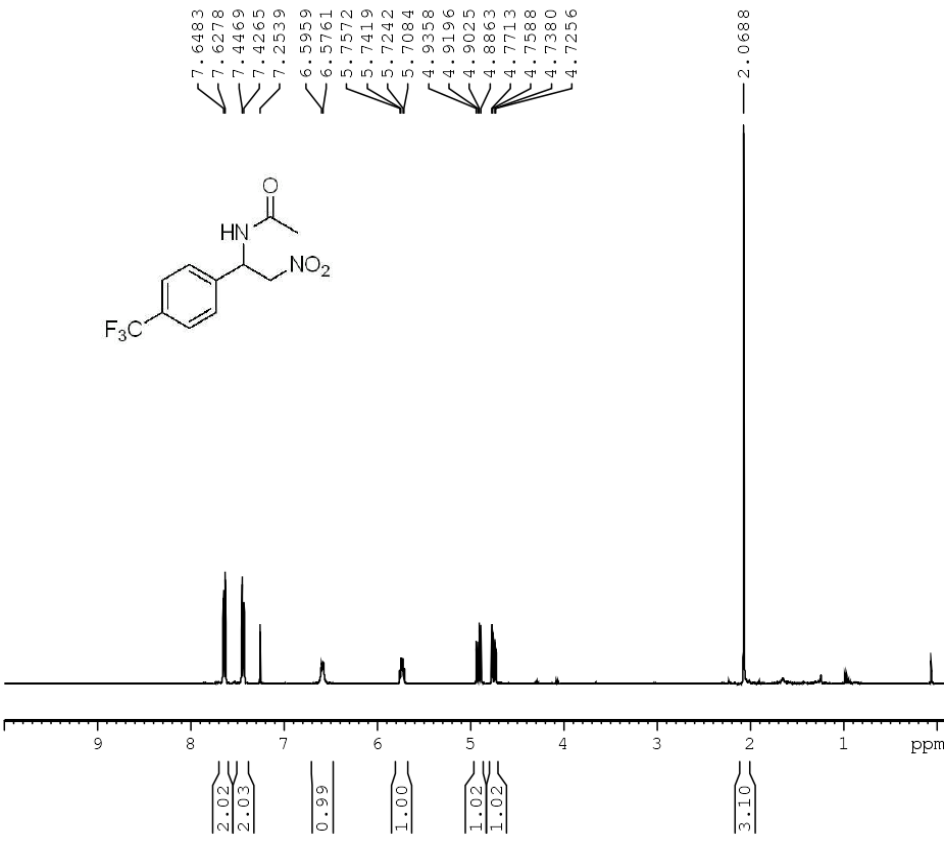
N-(1-(4-methoxyphenyl)-2-nitroethyl)acetamide **2e**

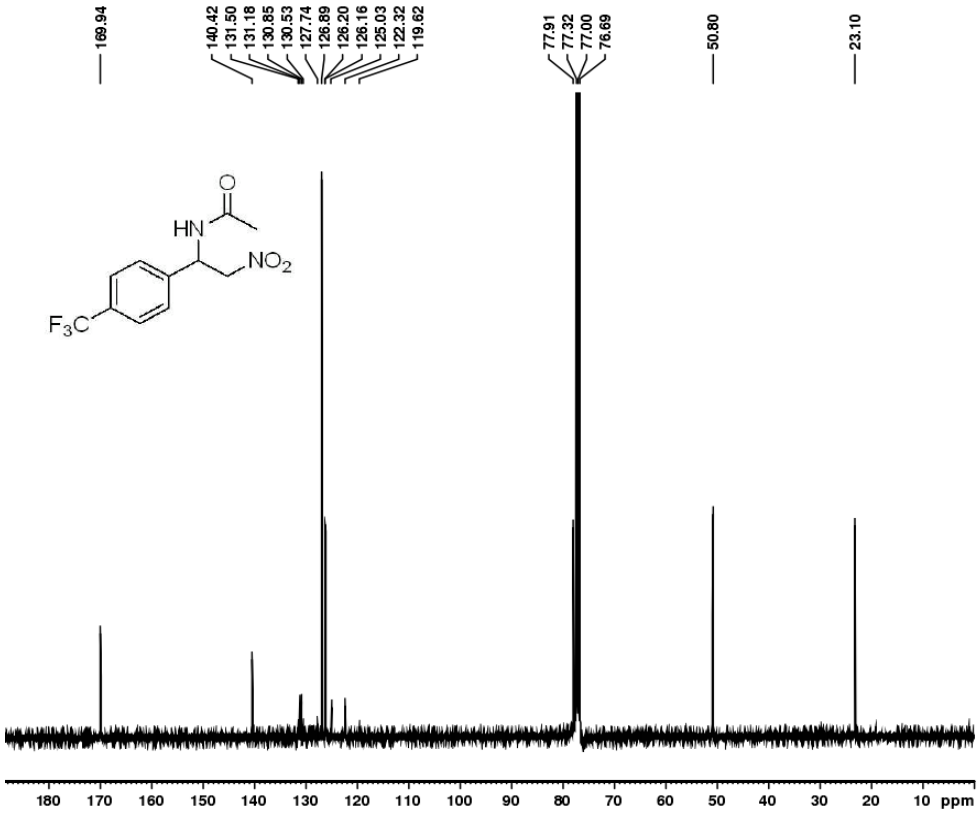


N-(2-nitro-1-p-tolylethyl)acetamide **2f**

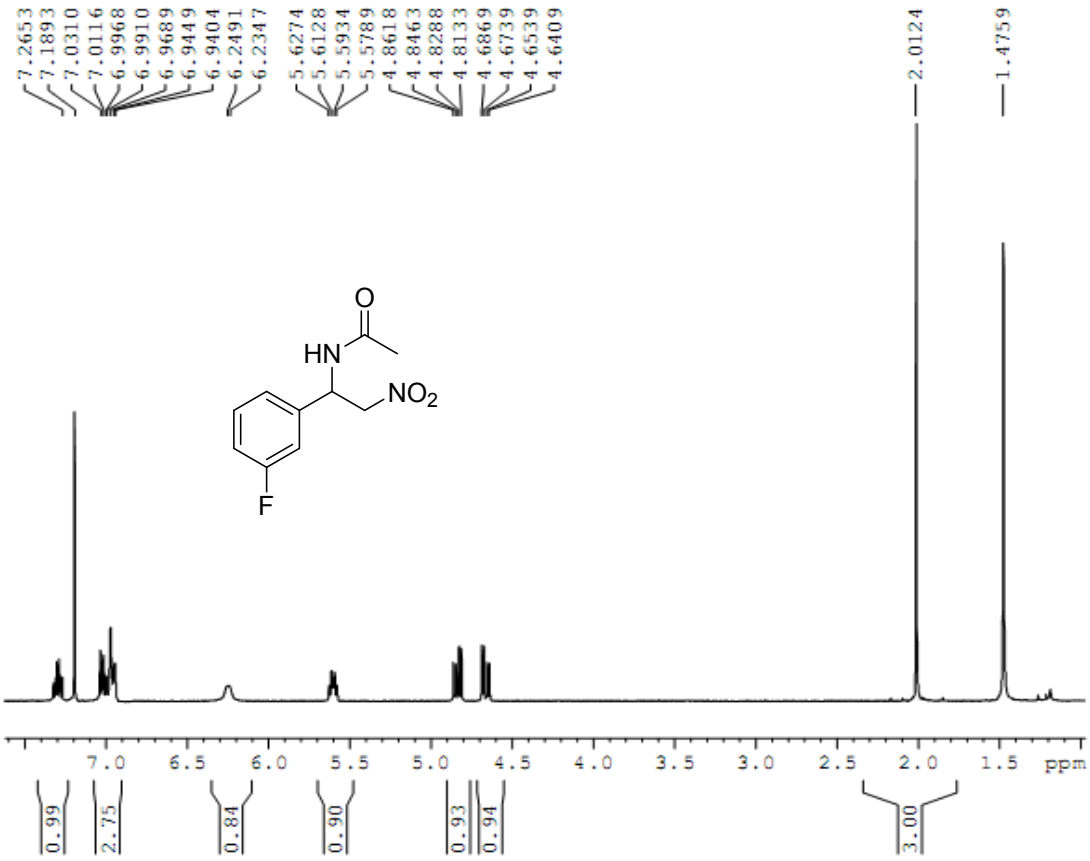


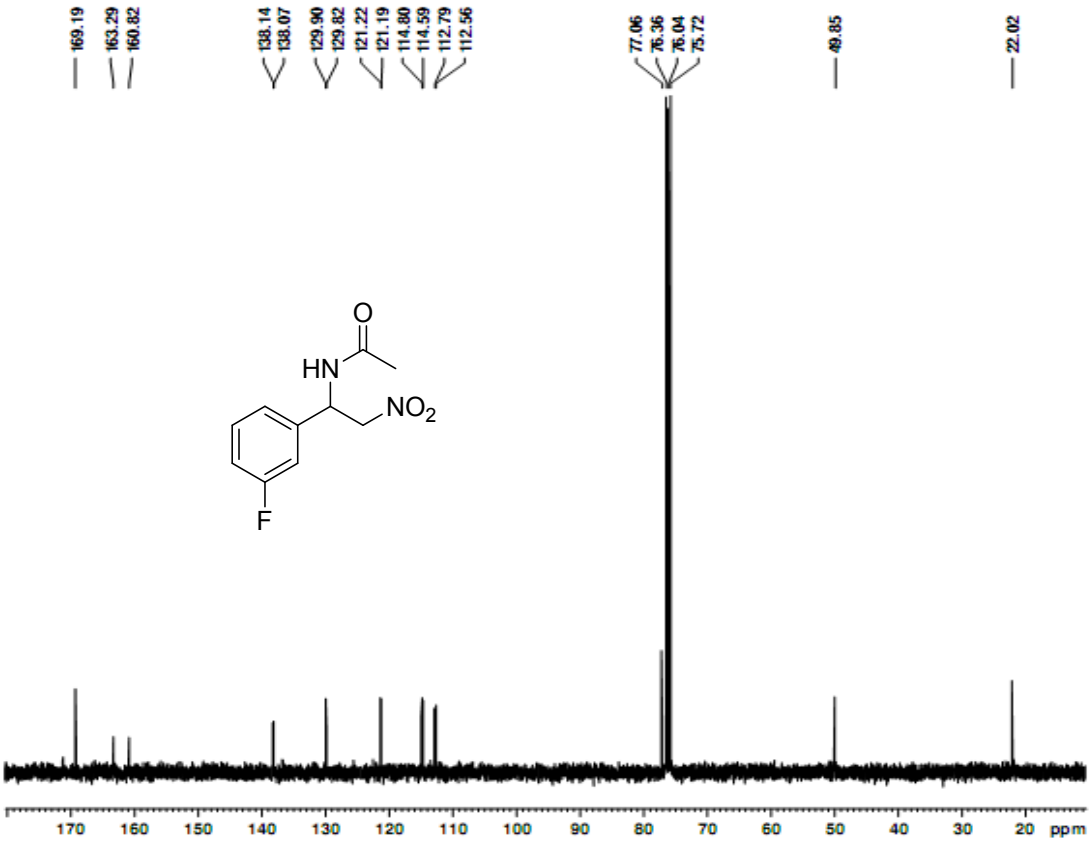
N-(1-(4-trifluoromethylphenyl)-2-nitroethyl)acetamide **2g**



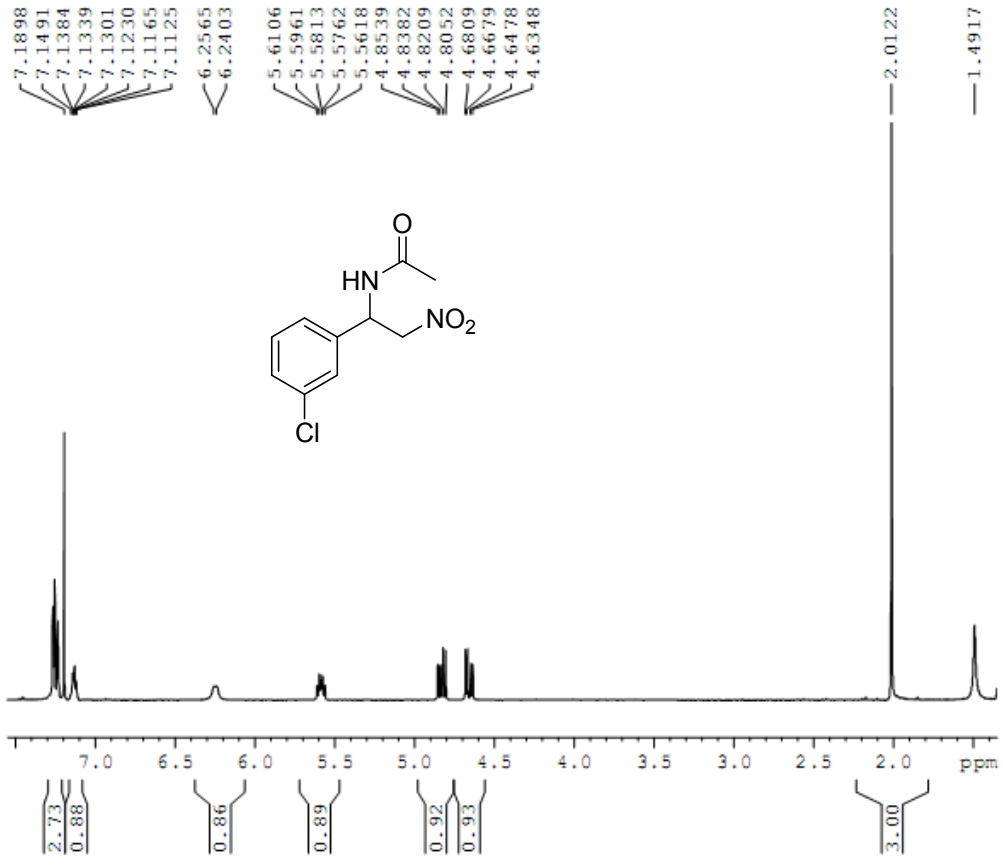


N-(1-(3-fluorophenyl)-2-nitroethyl)acetamide **2h**

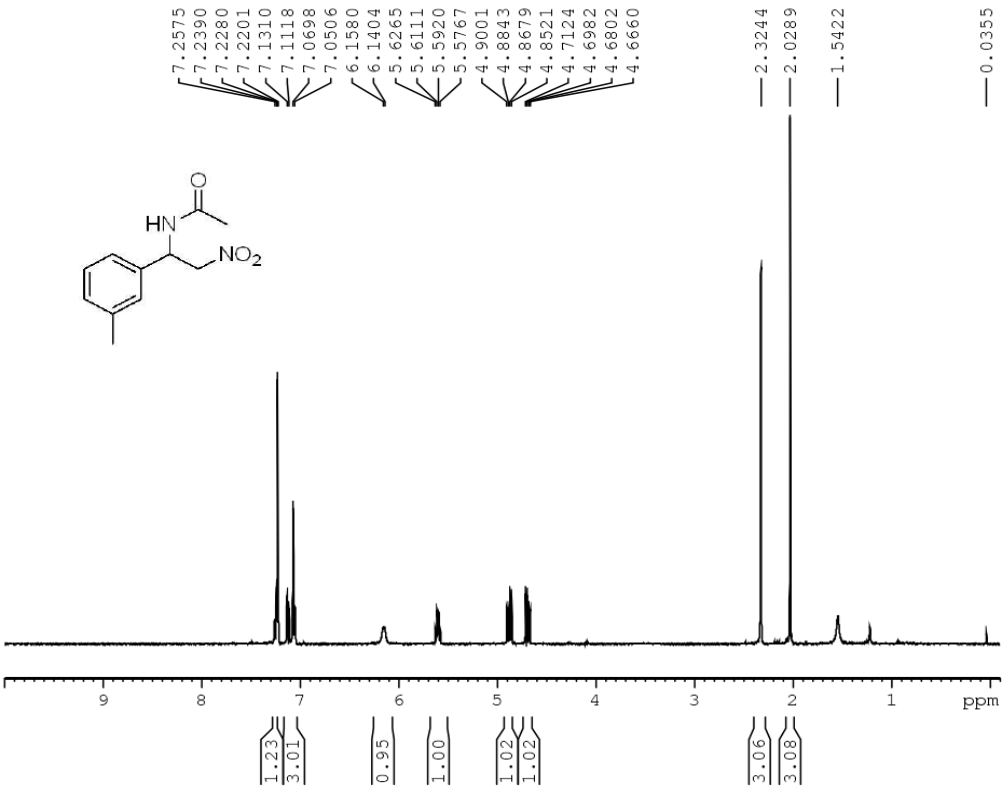




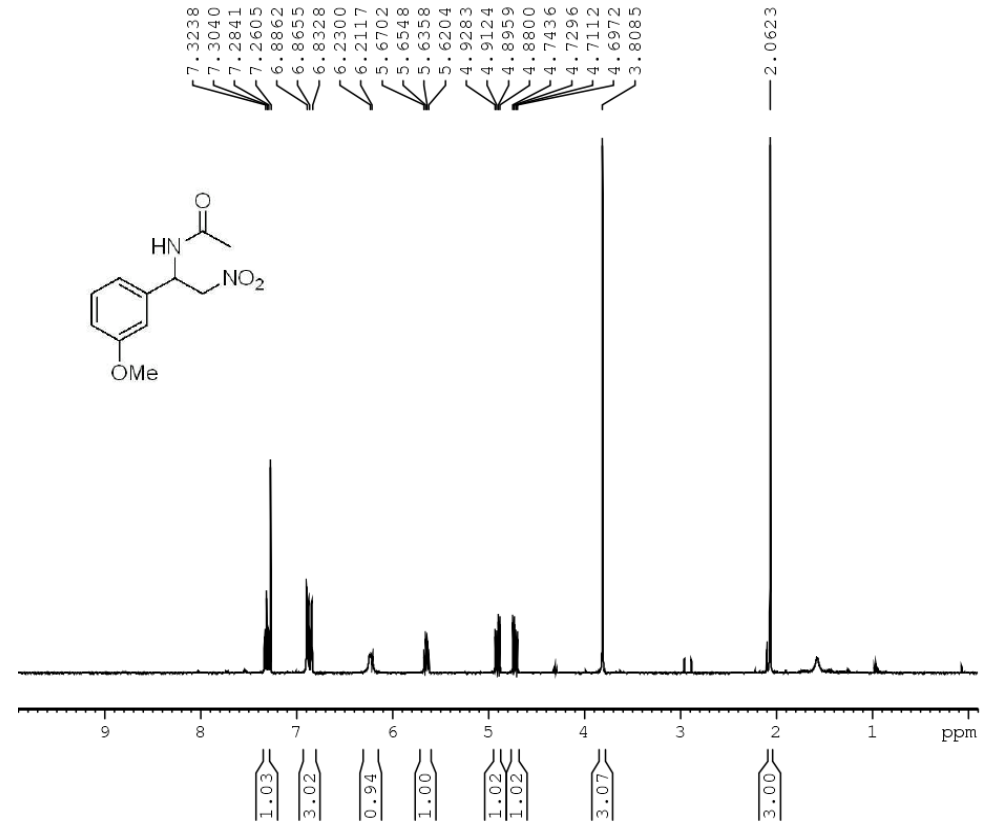
N-(1-(4-chlorophenyl)-2-nitroethyl)acetamide **2i**



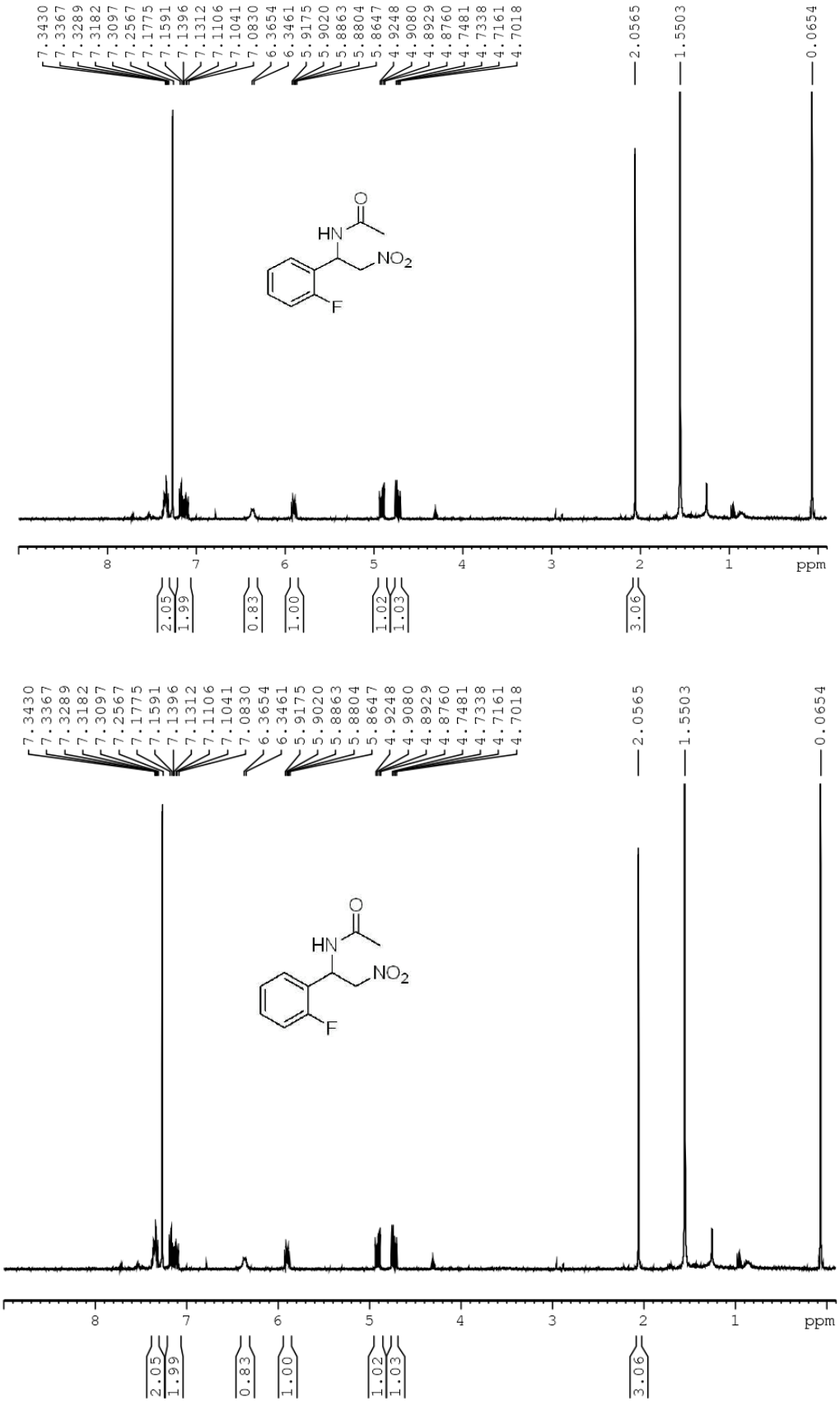
N-(2-nitro-1-m-tolylethyl)acetamide **2j**



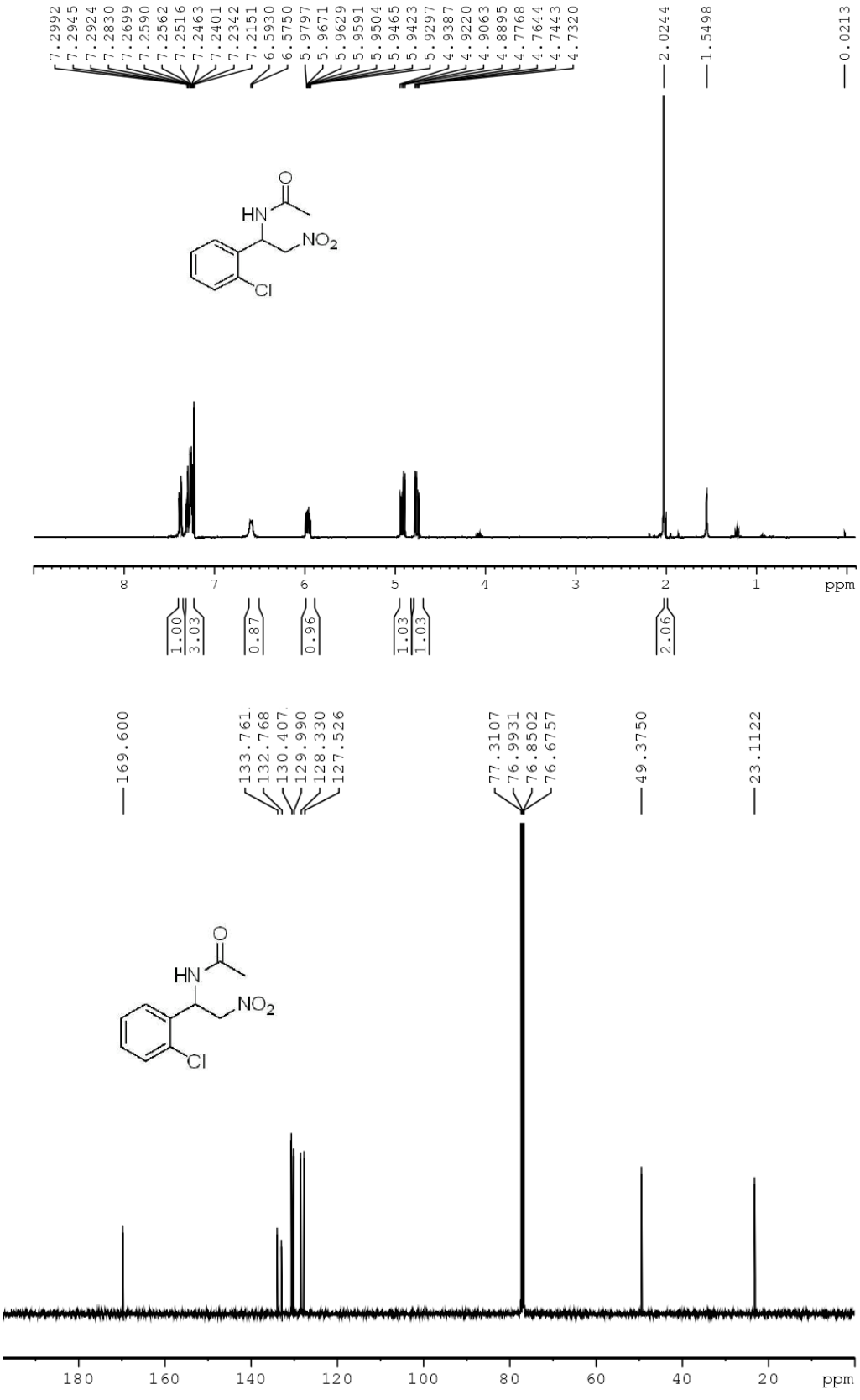
N-(1-(3-methoxyphenyl)-2-nitroethyl)acetamide **2k**



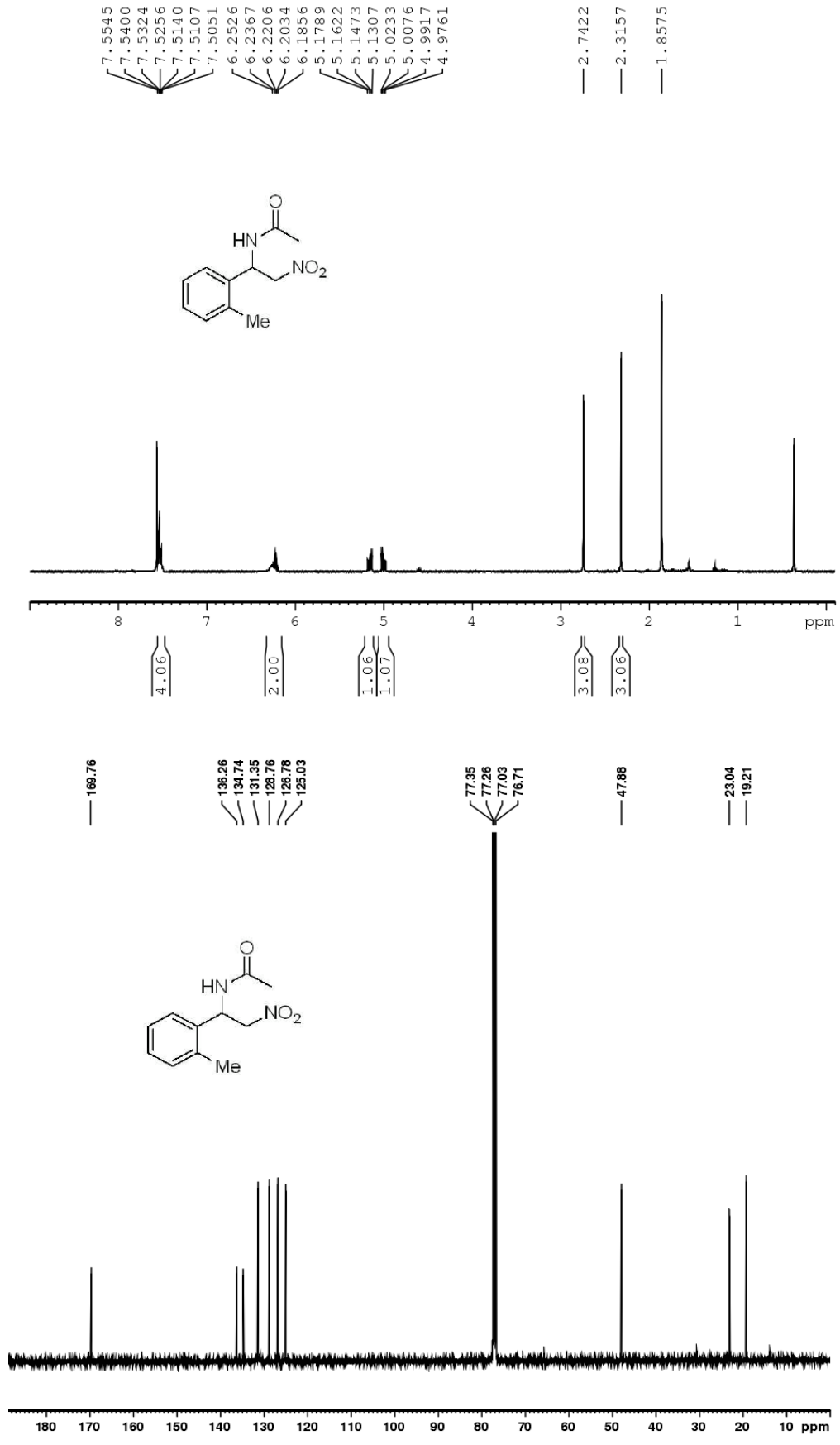
N-(1-(2-fluorophenyl)-2-nitroethyl)acetamide **2l**



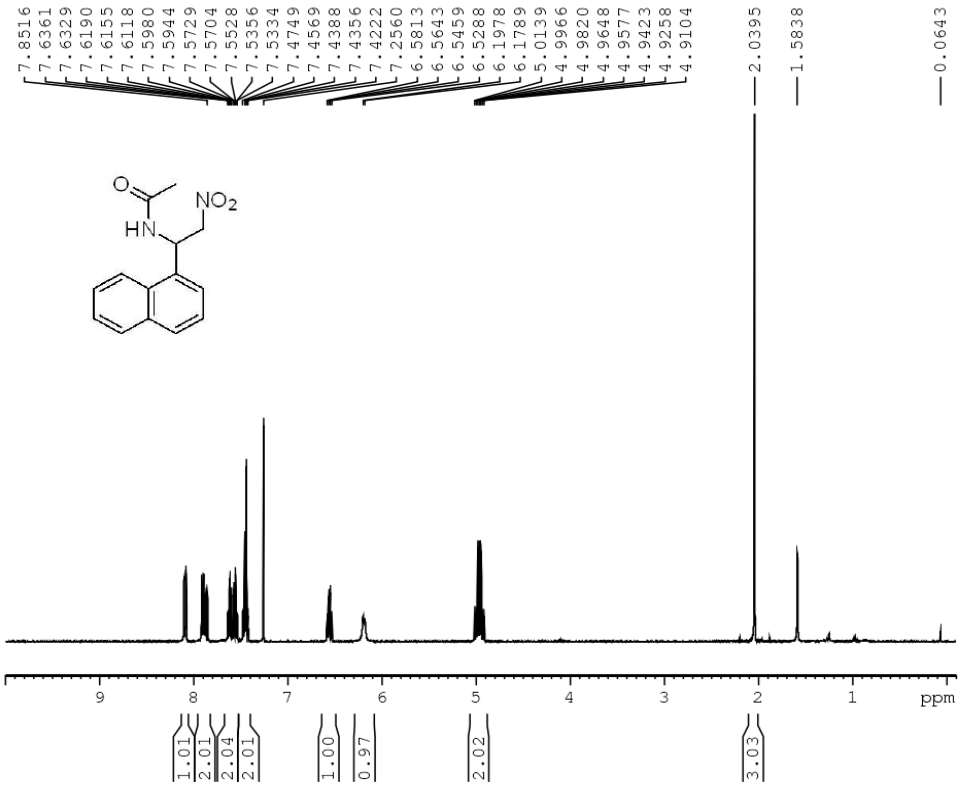
N-(1-(2-chlorophenyl)-2-nitroethyl)acetamide **2m**

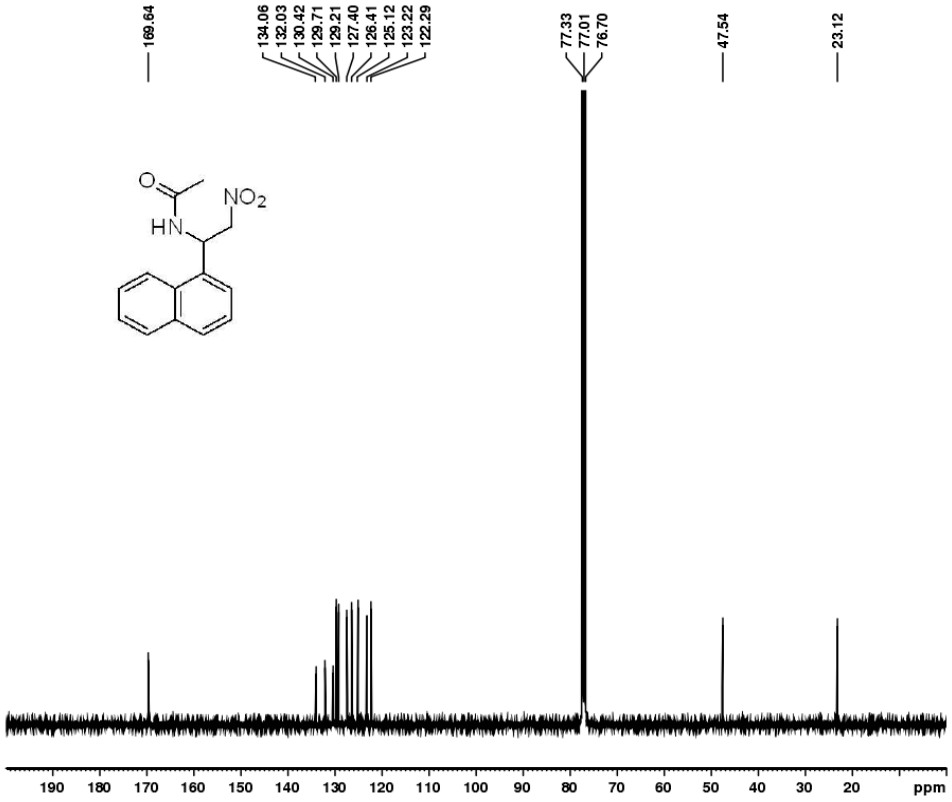


N-(2-nitro-1-o-tolylethyl)acetamide **2n**

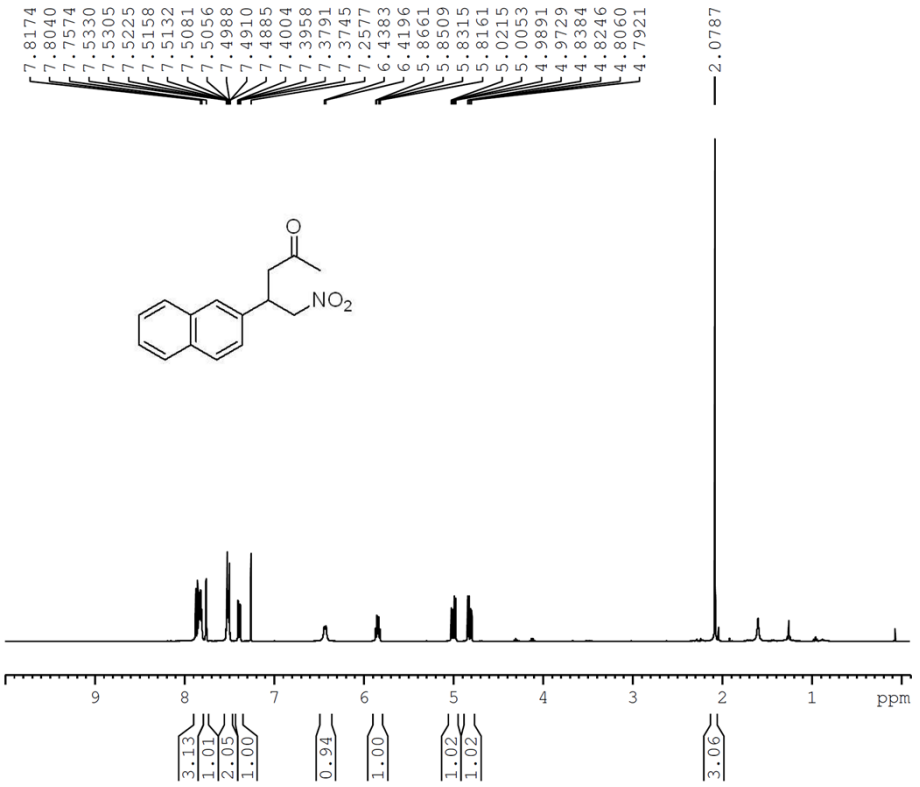


N-(1-(naphthalen-1-yl)-2-nitroethyl)acetamide **2o**

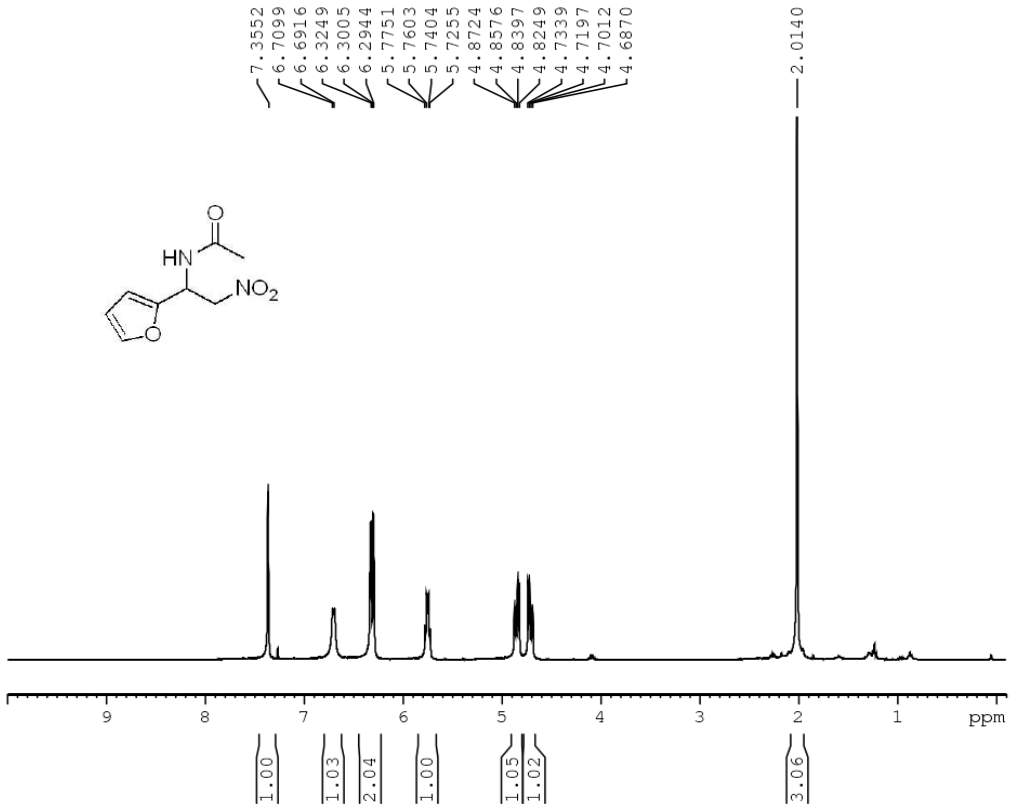


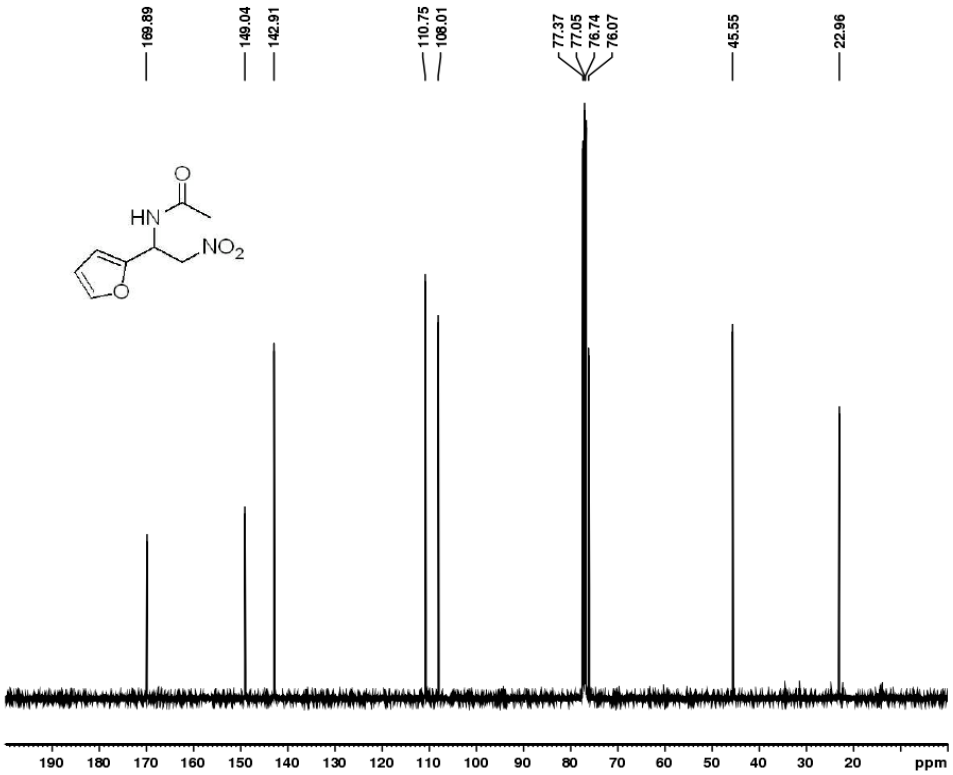


N-(1-(naphthalen-2-yl)-2-nitroethyl)acetamide **2p**

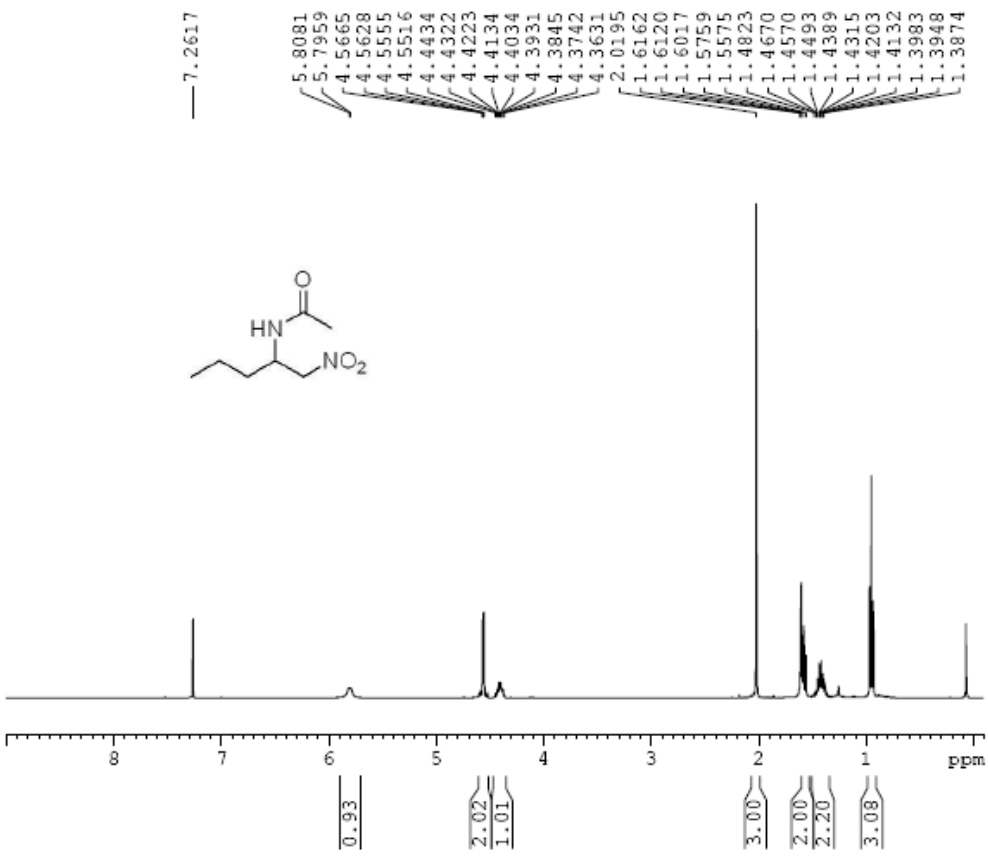


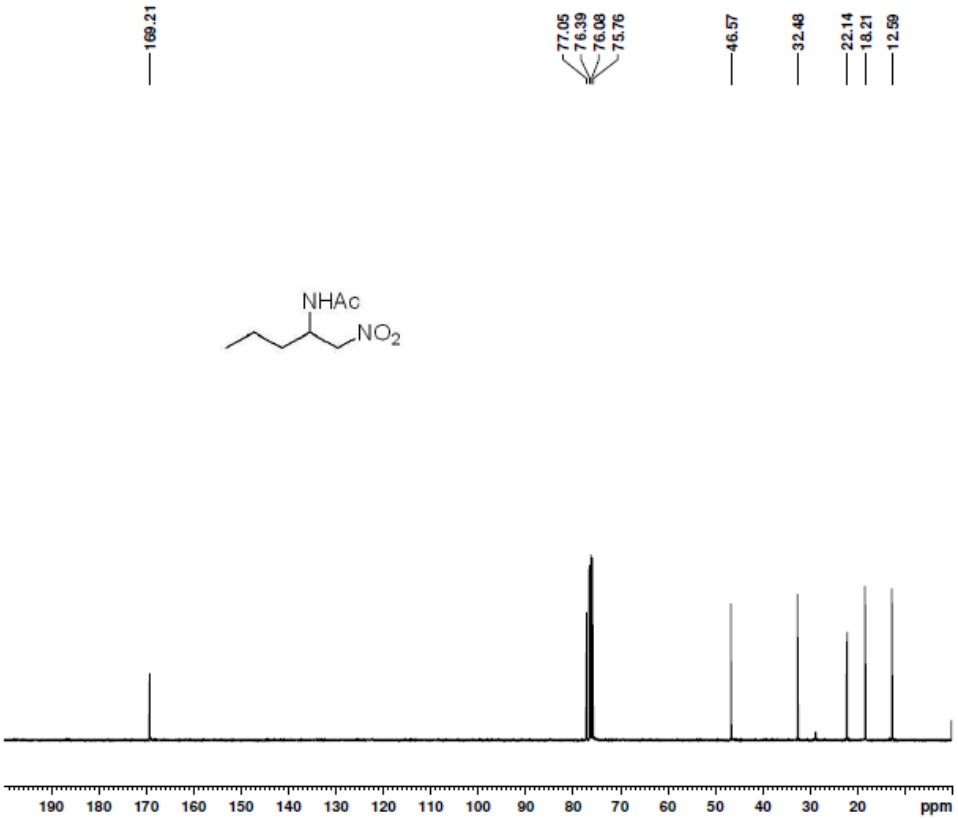
N-(1-furyl-2-nitroethyl)acetamide **2q**



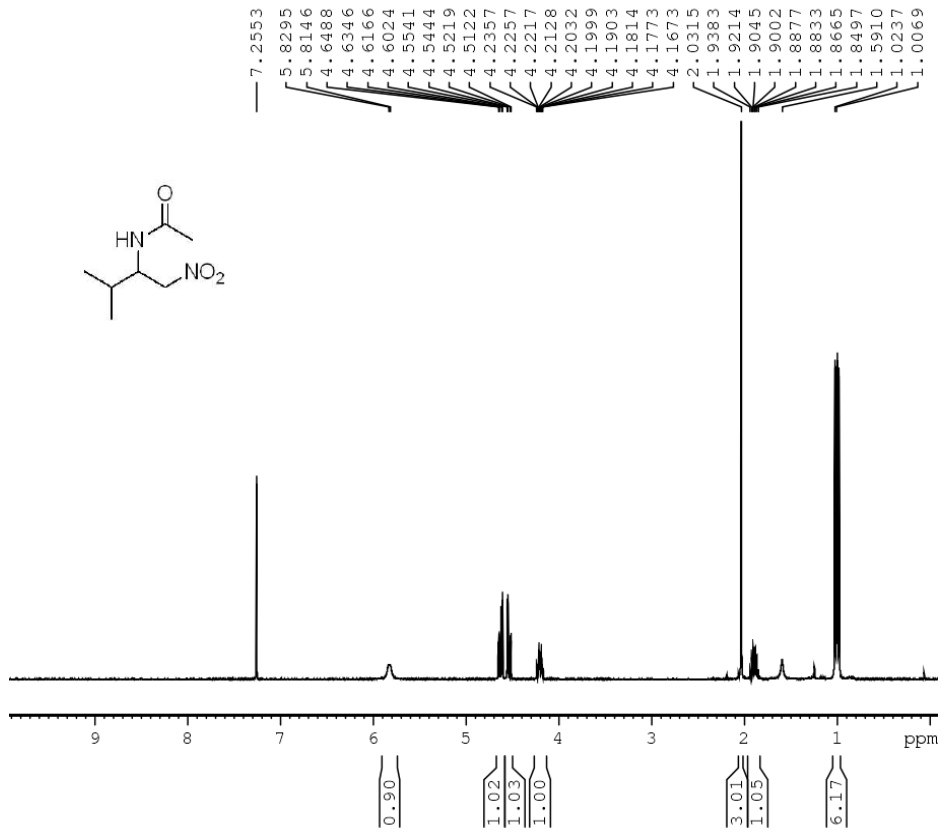


N-(1-nitropentan-2-yl)acetamide **2r**

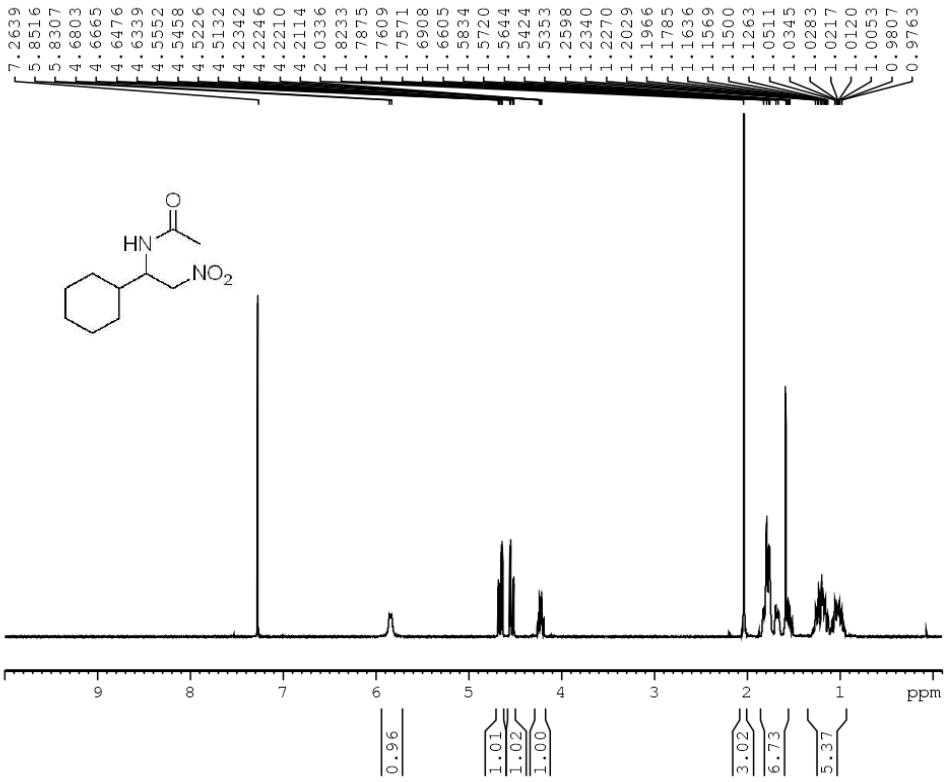


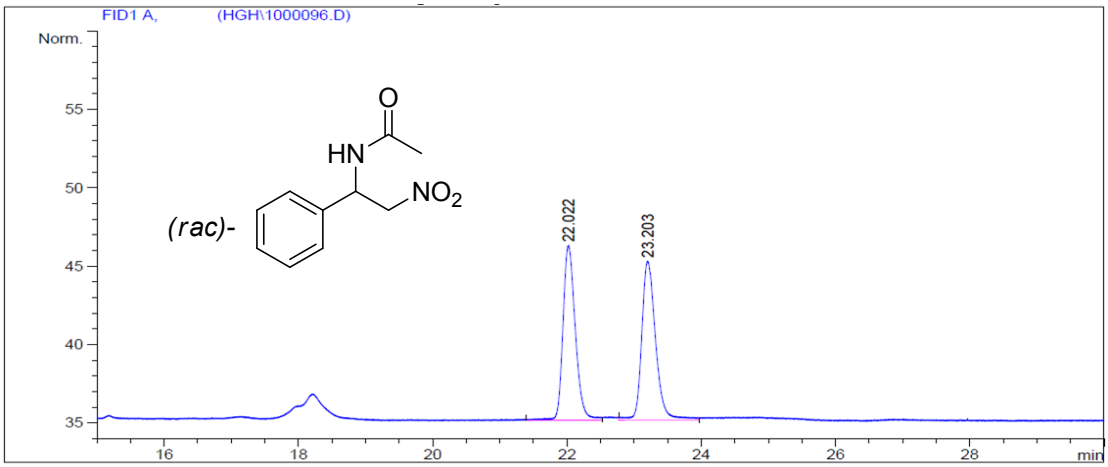


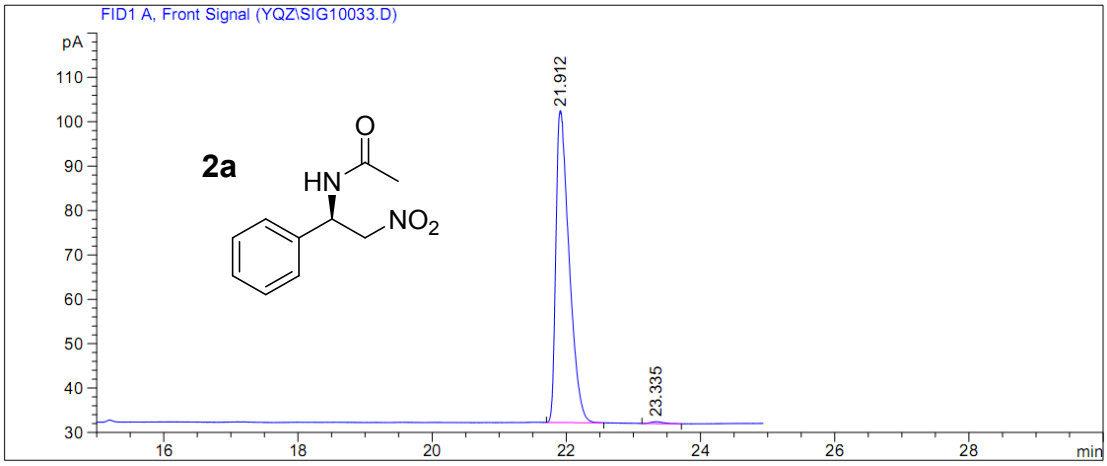
N-(3-methyl-1-nitrobutan-2-yl)acetamide **2s**



N-(1-cyclohexyl-2-nitroethyl)acetamide **2t**







Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
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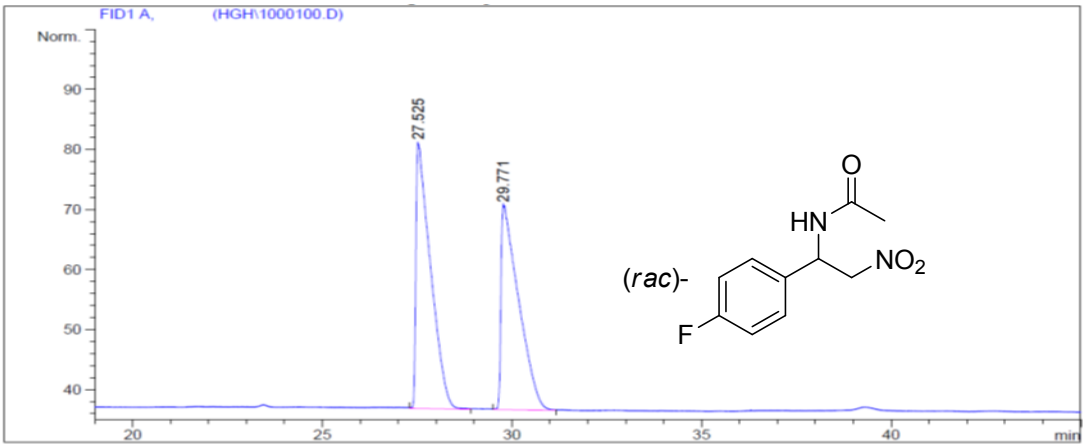
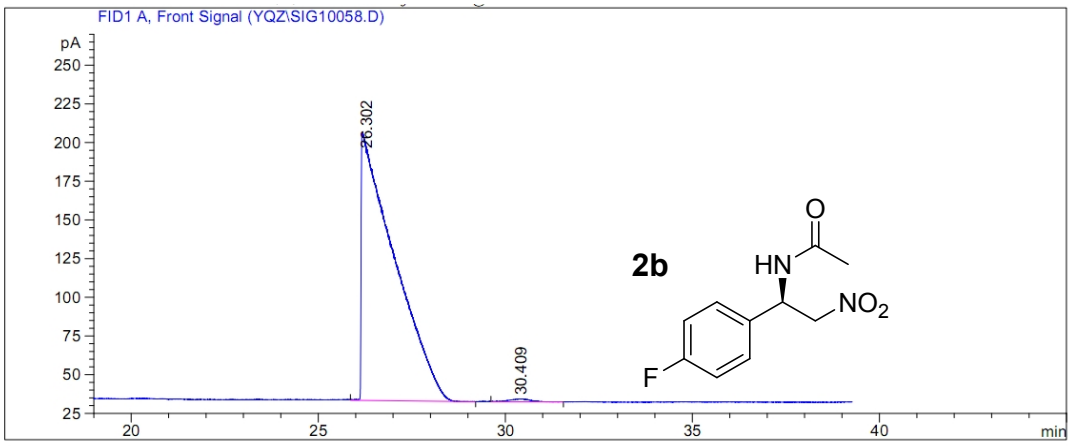
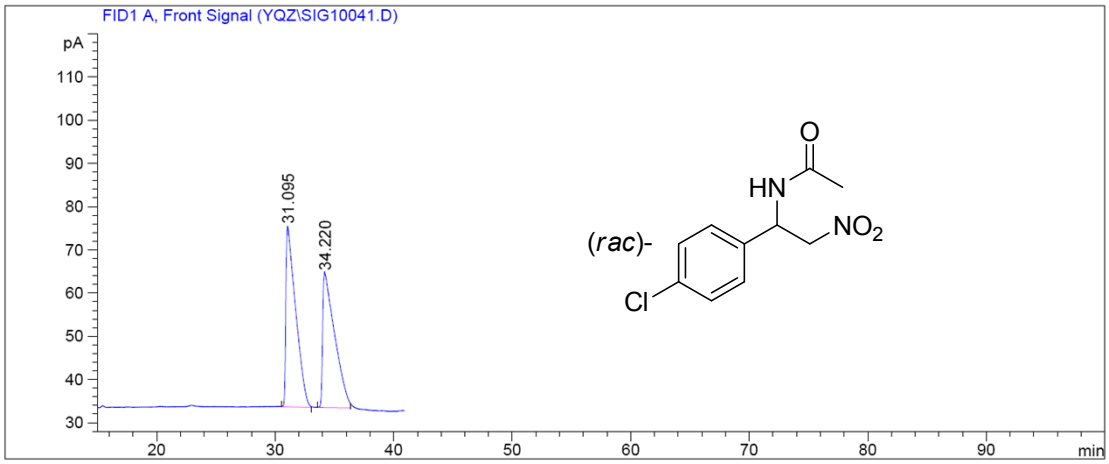
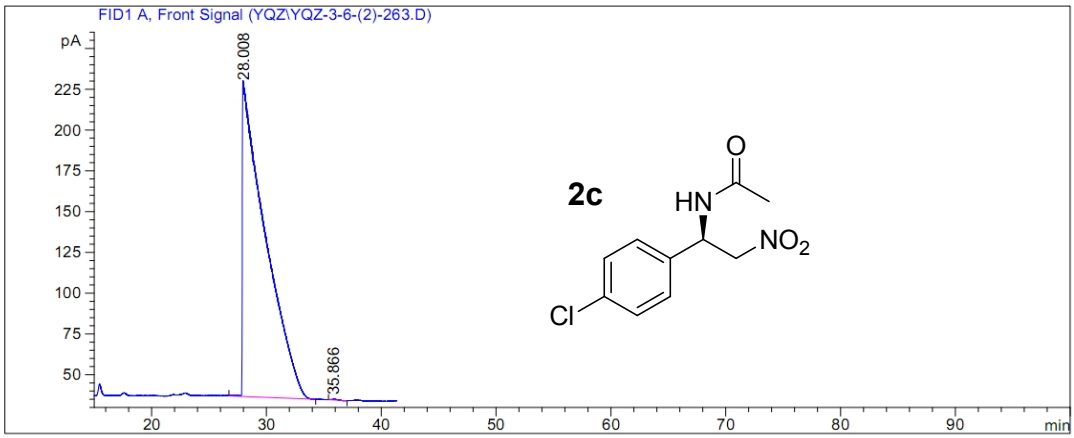
2	23.335	BB	0.1777	5.78518	4.25786e-1	0.59678
Totals :				969.39632	70.58168	



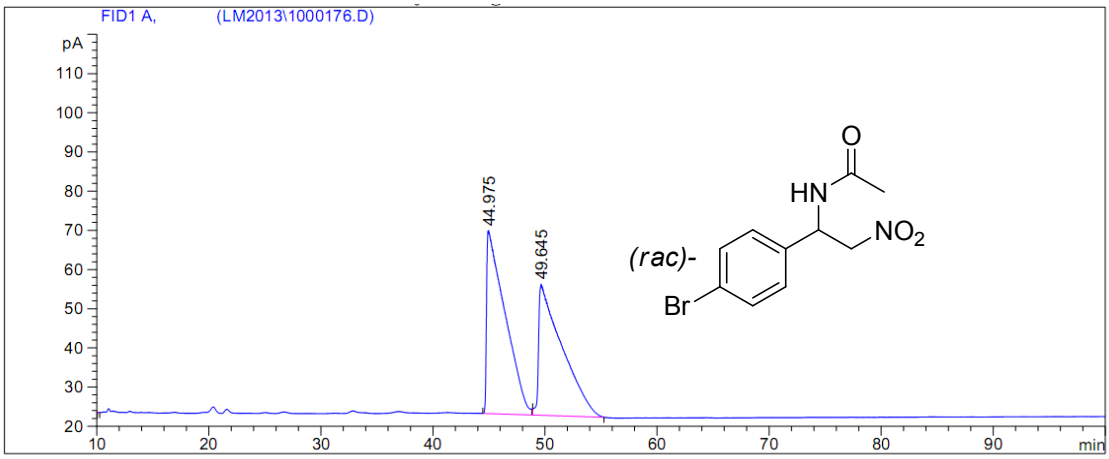


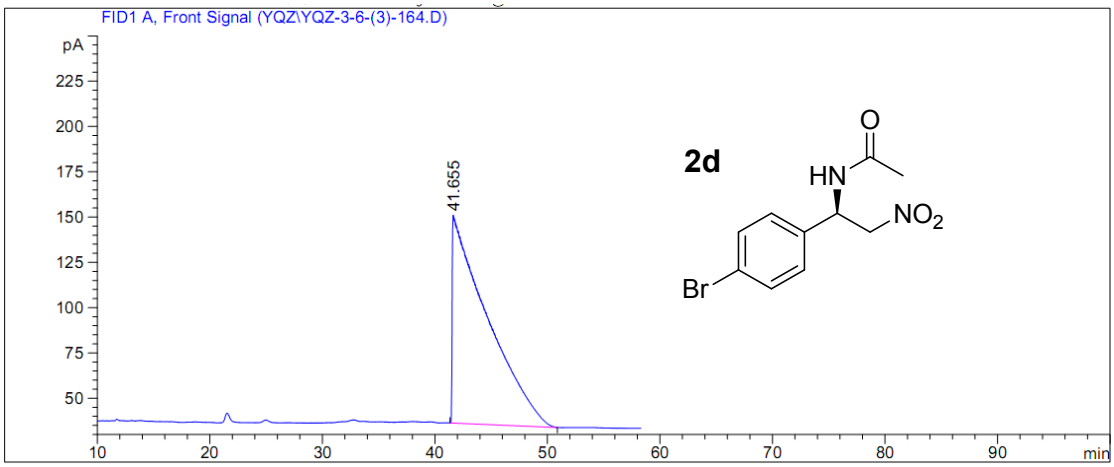
Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	26.302	BB	0.8369	1.06184e4	160.28734	99.37873
2	30.409	BB	0.6179	66.38152	1.71524	0.62127
Totals :				1.06848e4	162.00258	





Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	28.008	BB	1.6716	2.65044e4	191.58089	99.95192
2	35.866	BB	0.4369	12.74998	4.36324e-1	0.04808
Totals :				2.65172e4	192.01721	





Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
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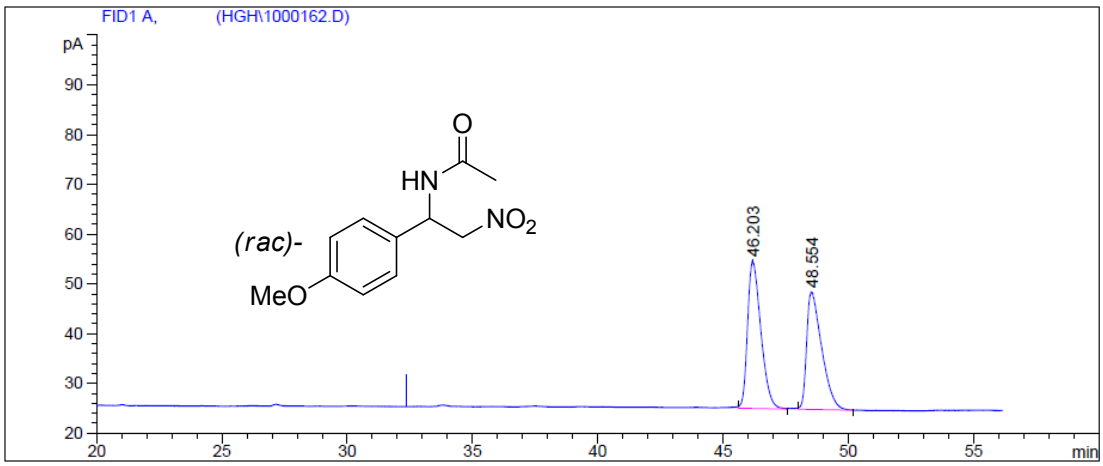
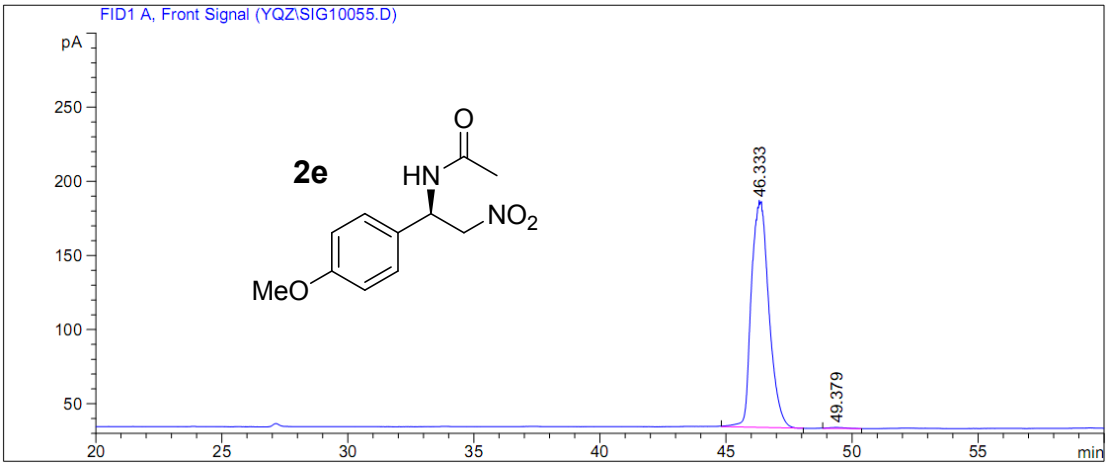
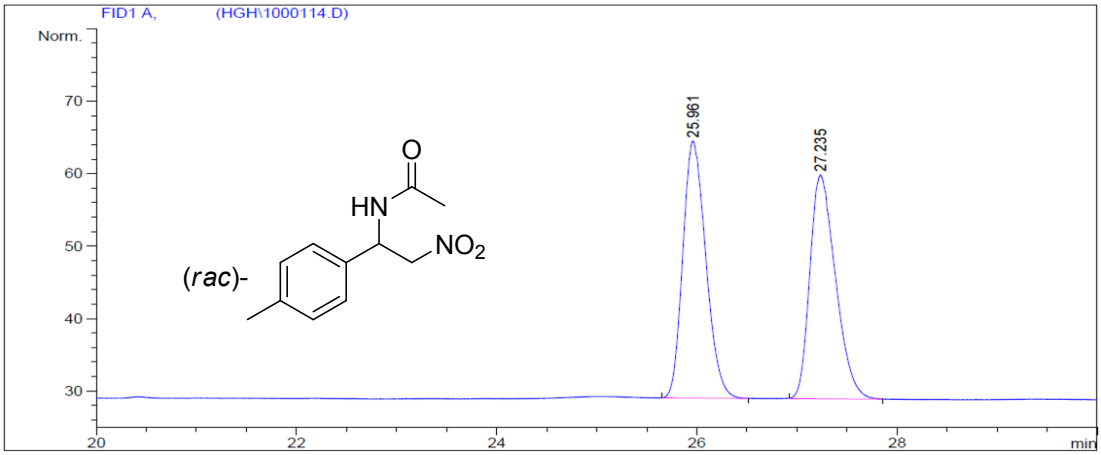
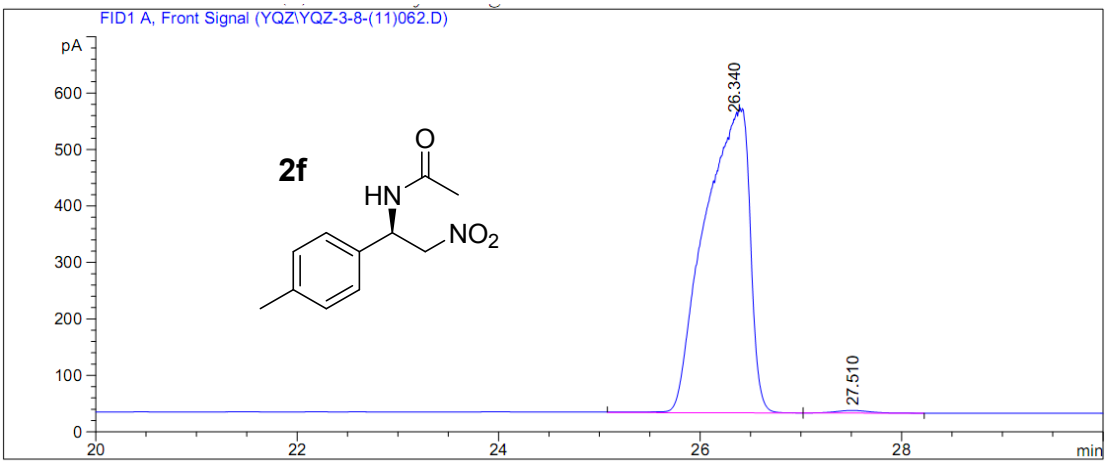
Totals :				2.46950e4	114.33097	



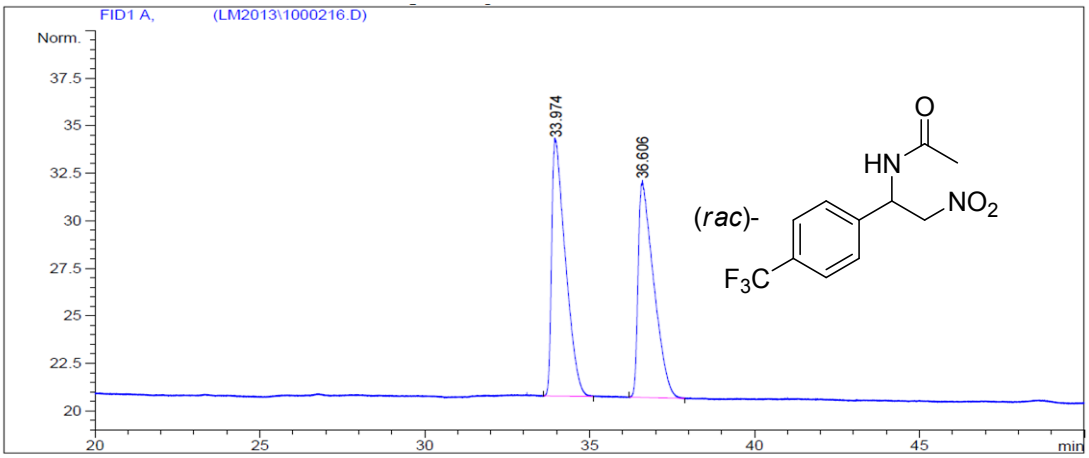


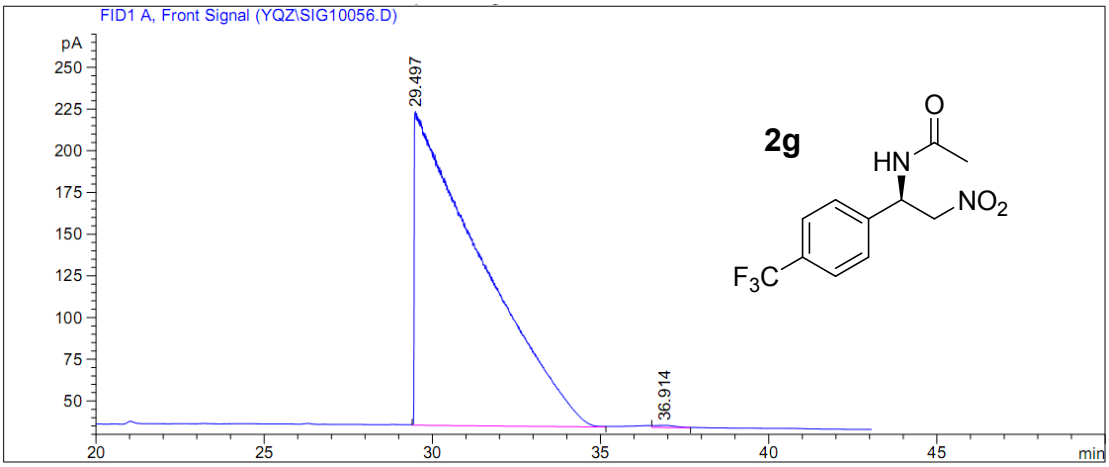
Peak #	Ret Time [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	46.333	BB	0.5793	7392.43896	152.24339	99.62868
2	49.379	BB	0.5599	27.55218	6.16356e-1	0.37132
Totals :				7419.99114	152.85975	



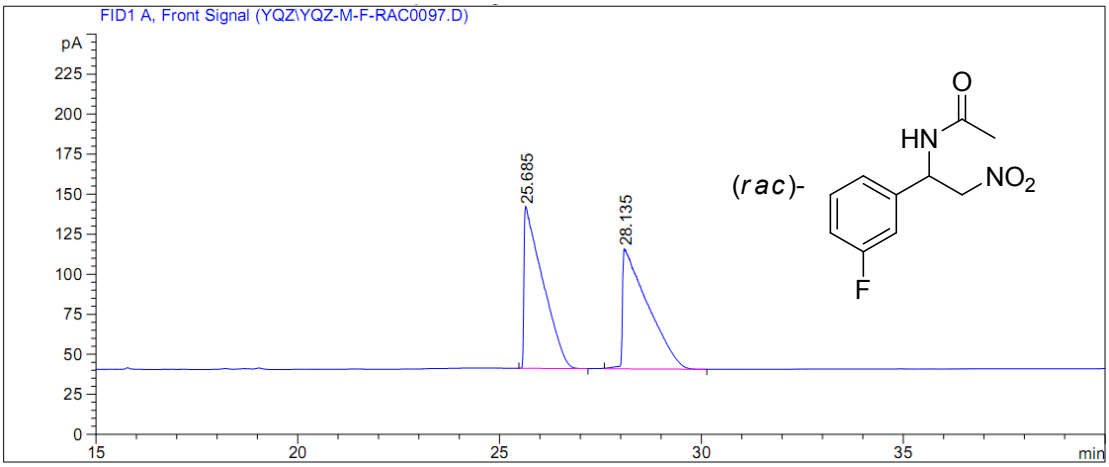


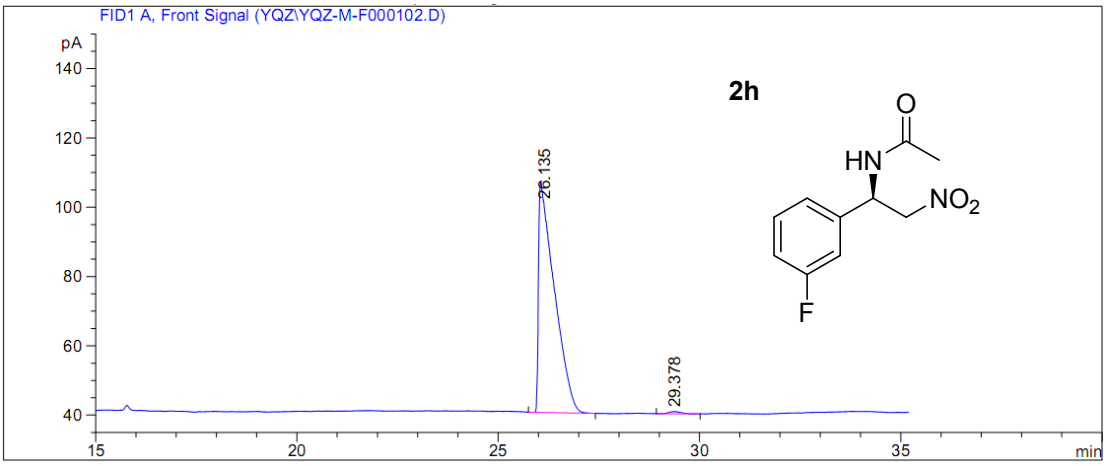
Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	26.340	BV	0.5514	1.67046e4	523.67102	99.39737
2	27.510	VB	0.3635	101.27671	4.52551	0.60263
Totals :				1.68059e4	528.19653	



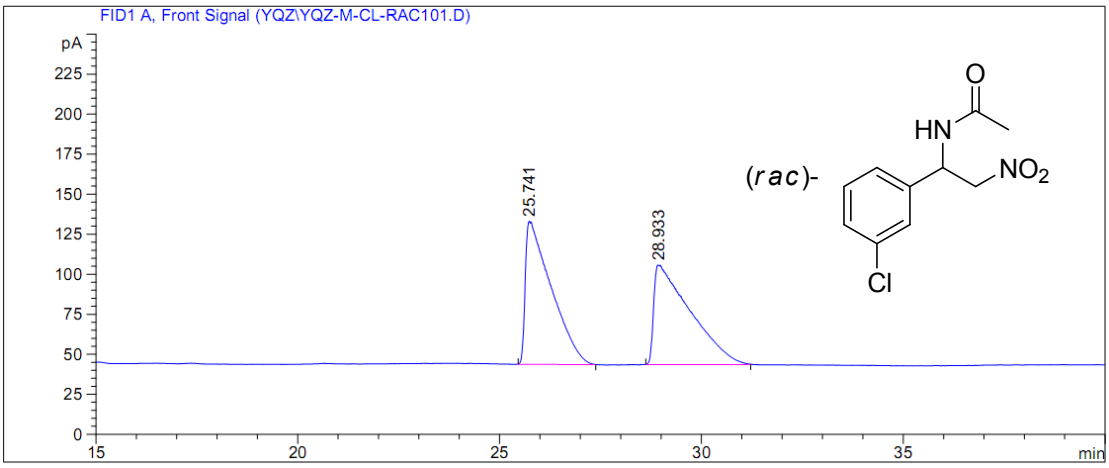


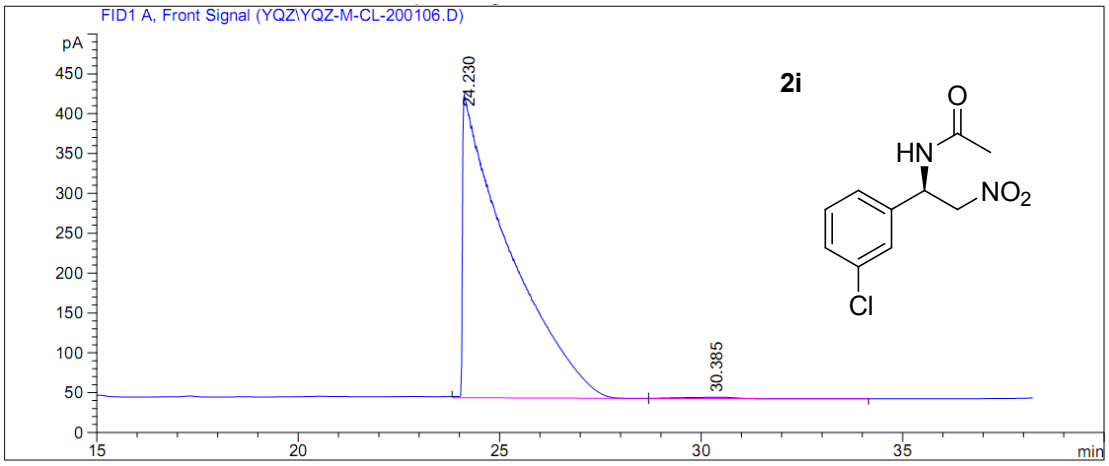
Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	29.497	VV	1.6186	2.58043e4	187.66515	99.77208
2	36.914	VV	0.5468	58.94838	1.27270	0.22792
Totals :				2.58633e4	188.93784	



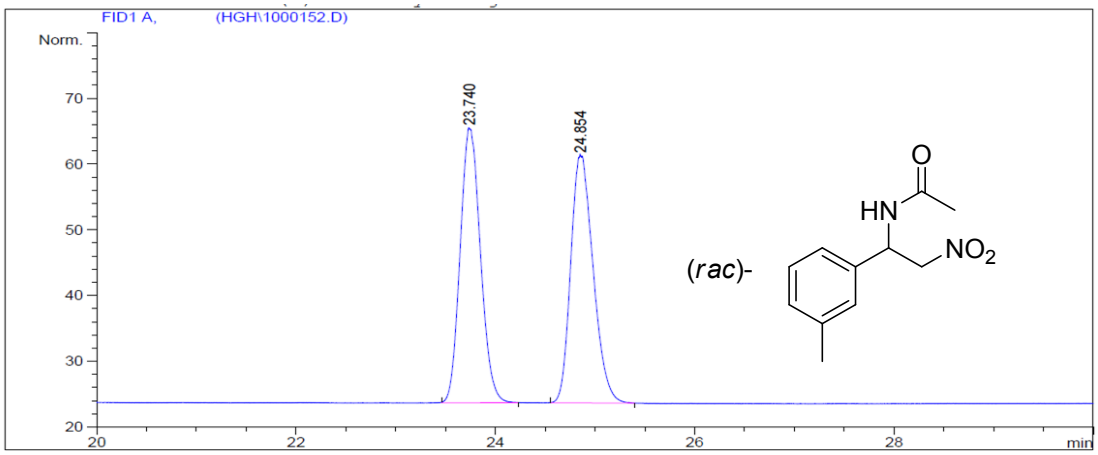


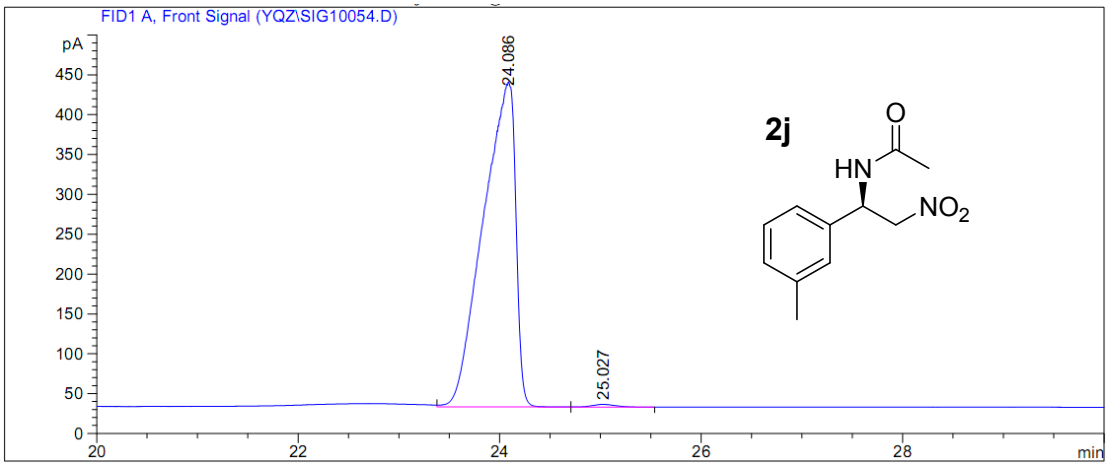
Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	26.135	BB	0.4272	1811.25854	60.30832	99.36621
2	29.378	BB	0.3109	11.55287	6.09188e-1	0.63379
Totals :				1822.81141	60.91751	



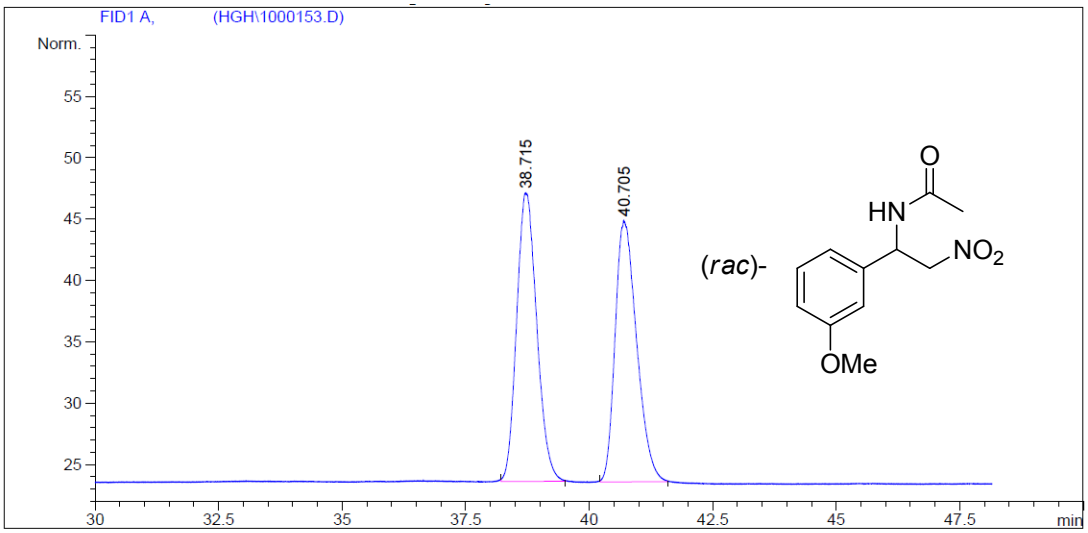


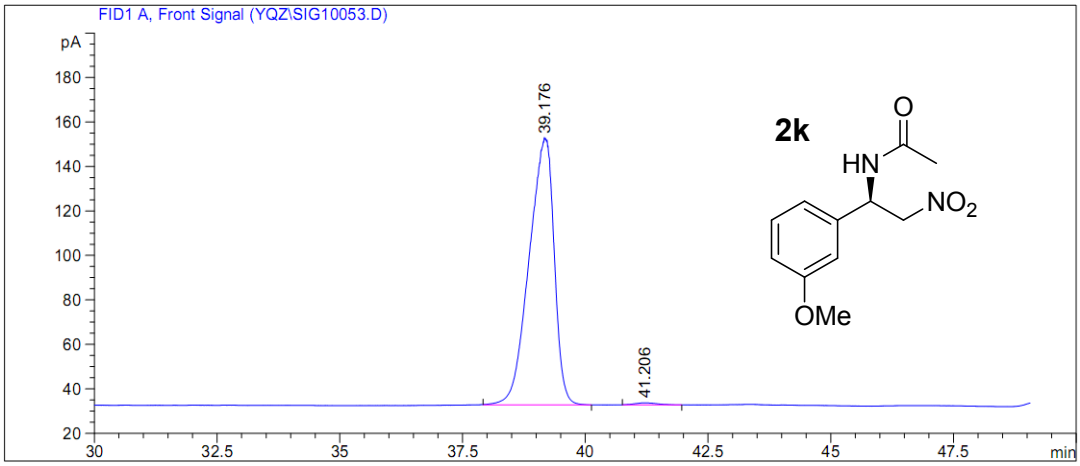
Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	24.230	BB	1.0453	3.02557e4	359.69955	99.60504
2	30.385	BB	1.0479	119.97150	1.66013	0.39496
Totals :				3.03757e4	361.35969	



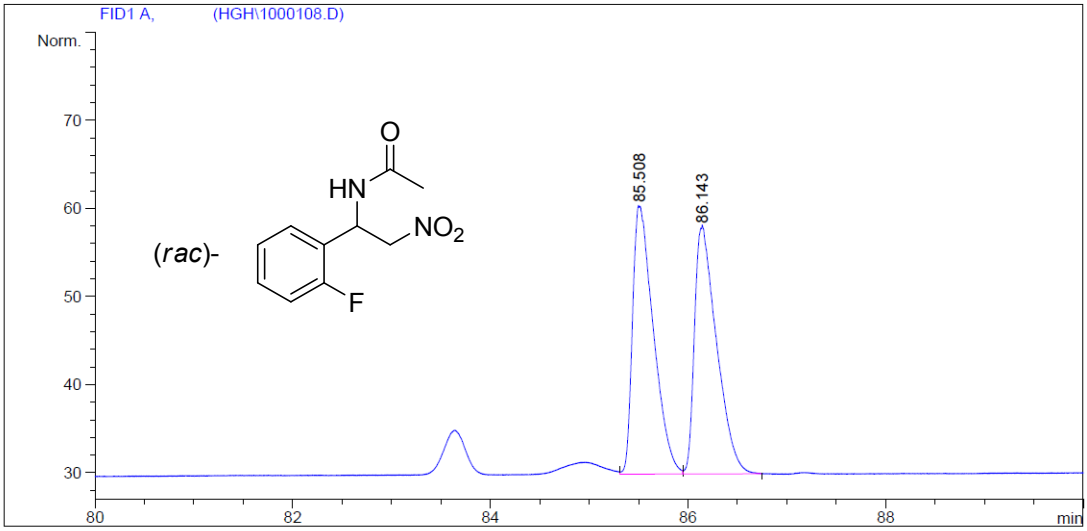


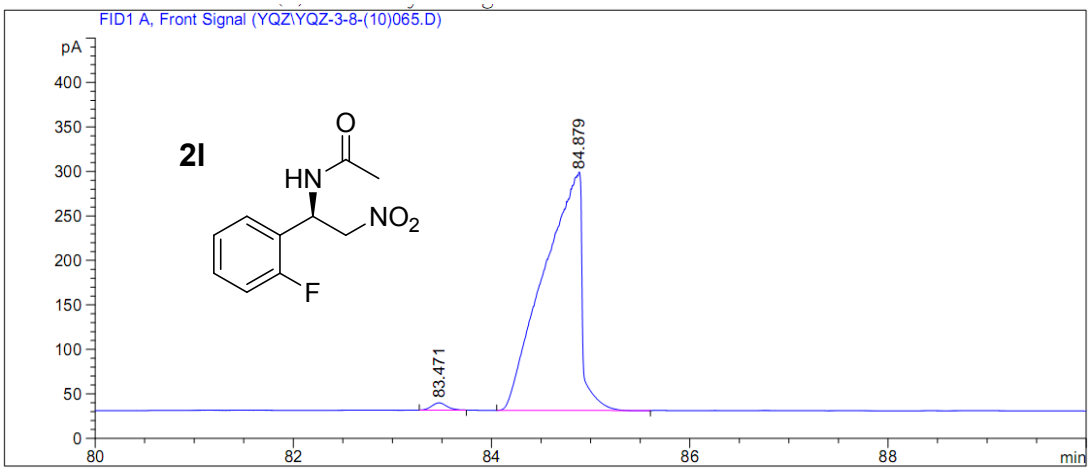
Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	24.086	VV	0.2977	9117.00586	407.66019	99.41799
2	25.027	VB	0.2526	53.37218	3.21991	0.58201
Totals :				9170.37804	410.88010	



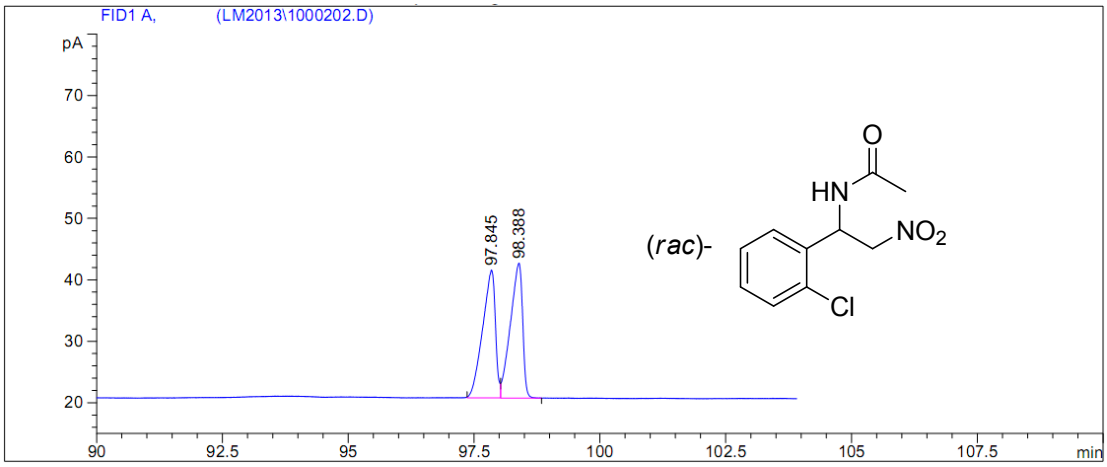


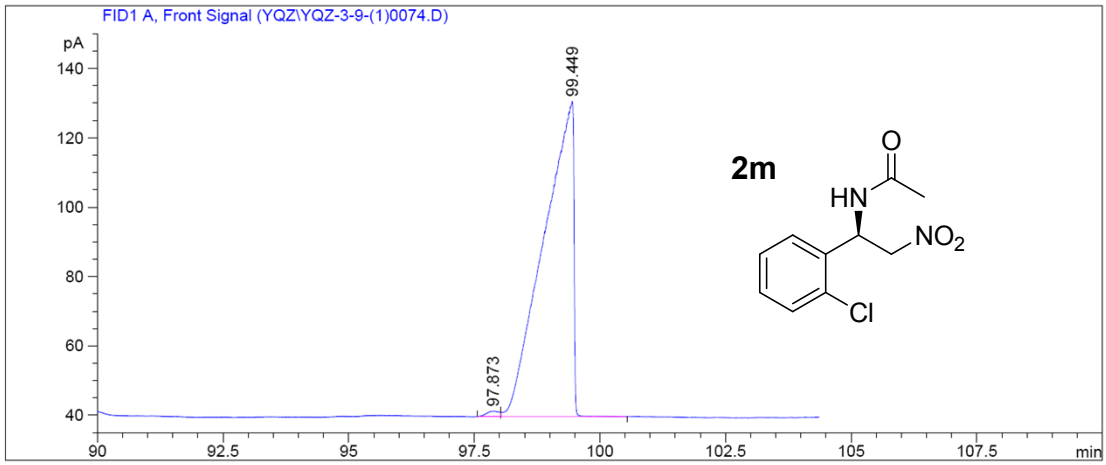
Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	39.176	BB	0.4279	4260.60596	119.75010	99.33835
2	41.206	BB	0.3770	28.37811	9.05123e-1	0.66165
Totals :				4288.98407	120.65522	



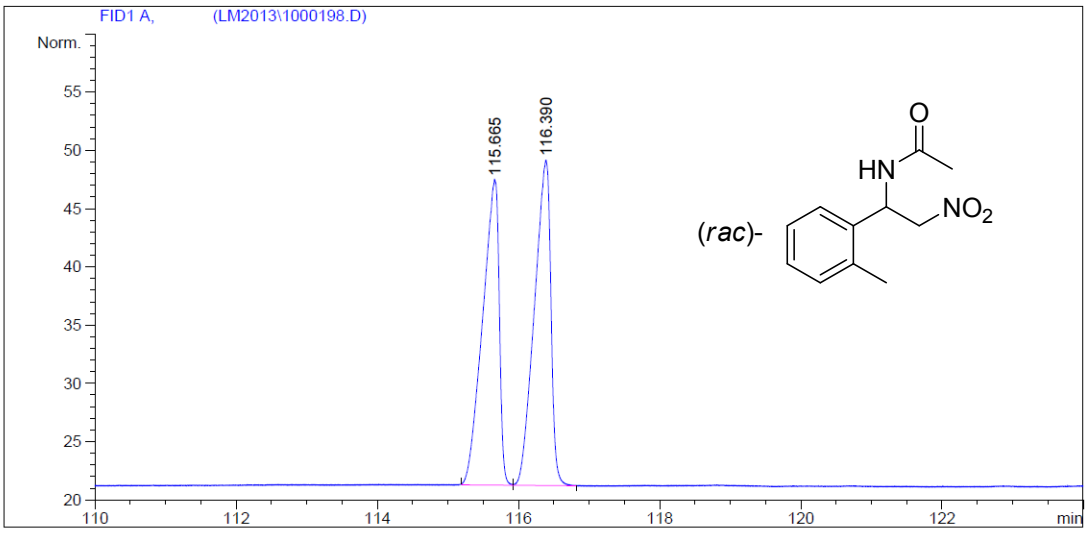


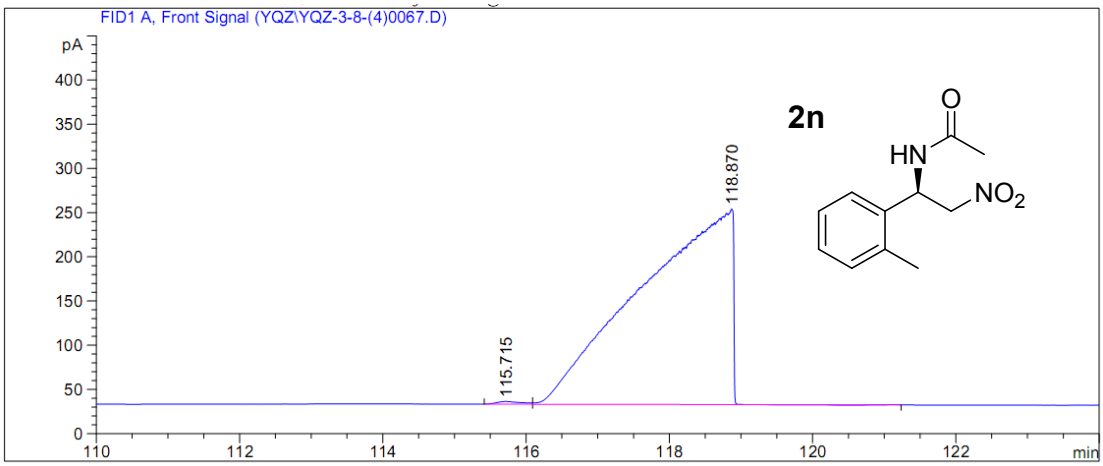
Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	83.471	BB	0.1618	88.24049	8.23541	1.21183
2	84.879	BB	0.3282	7193.32715	266.05344	98.78817
Totals :				7281.56763	274.28885	



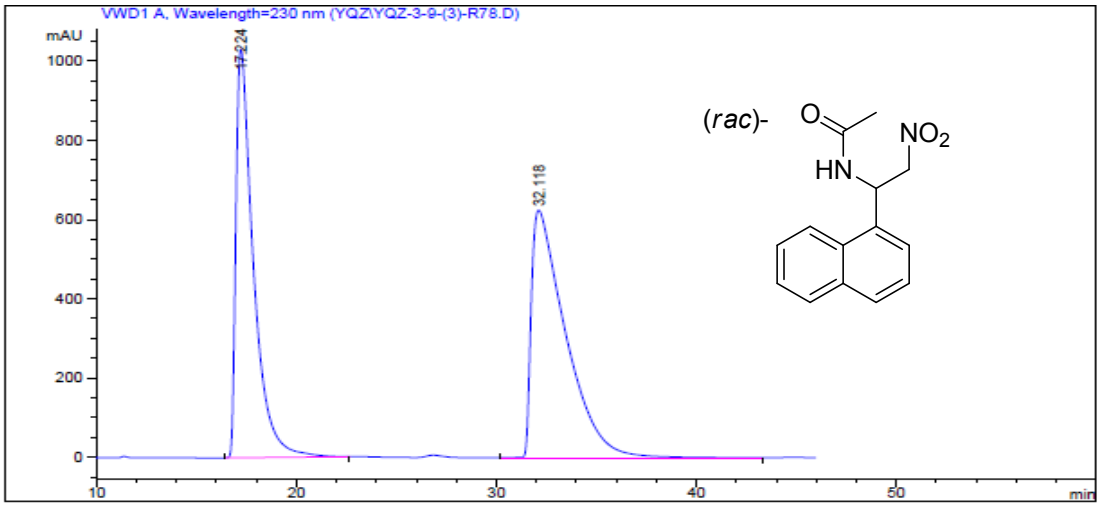


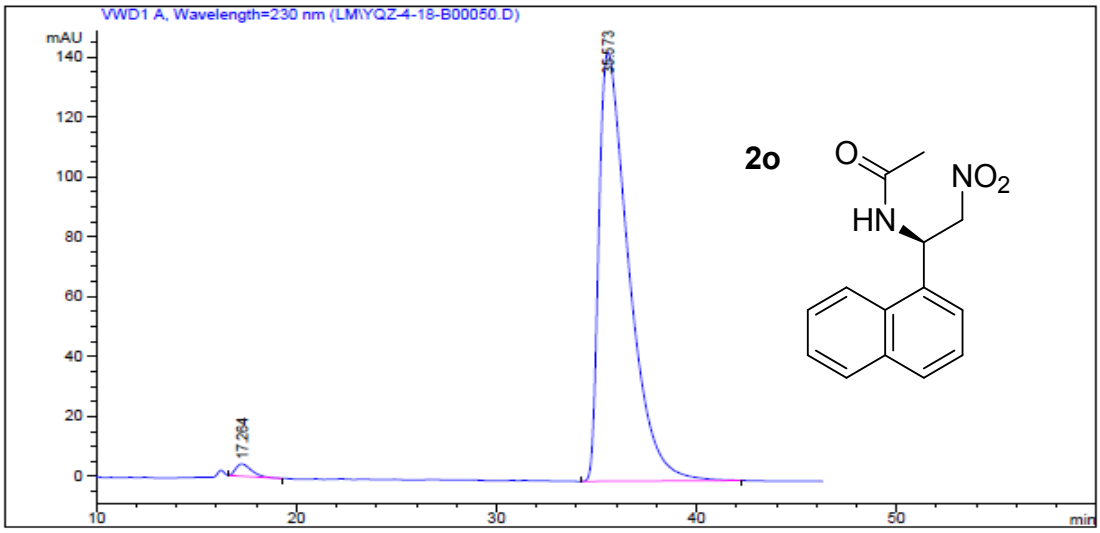
Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	97.873	BV	0.2116	28.58407	1.60012	0.75412
2	99.449	VB	0.4978	3761.79272	90.93818	99.24588
Totals :				3790.37679	92.53830	



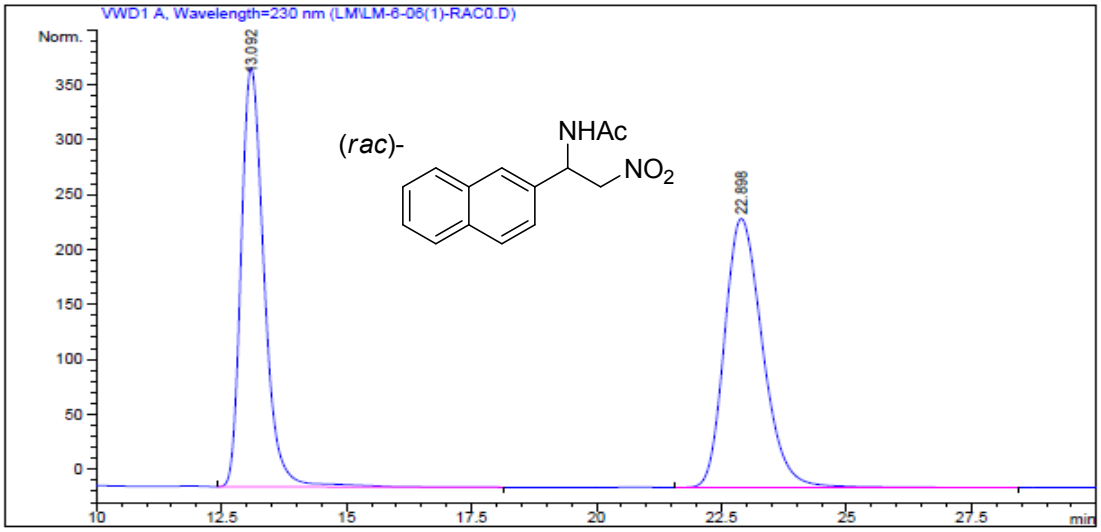


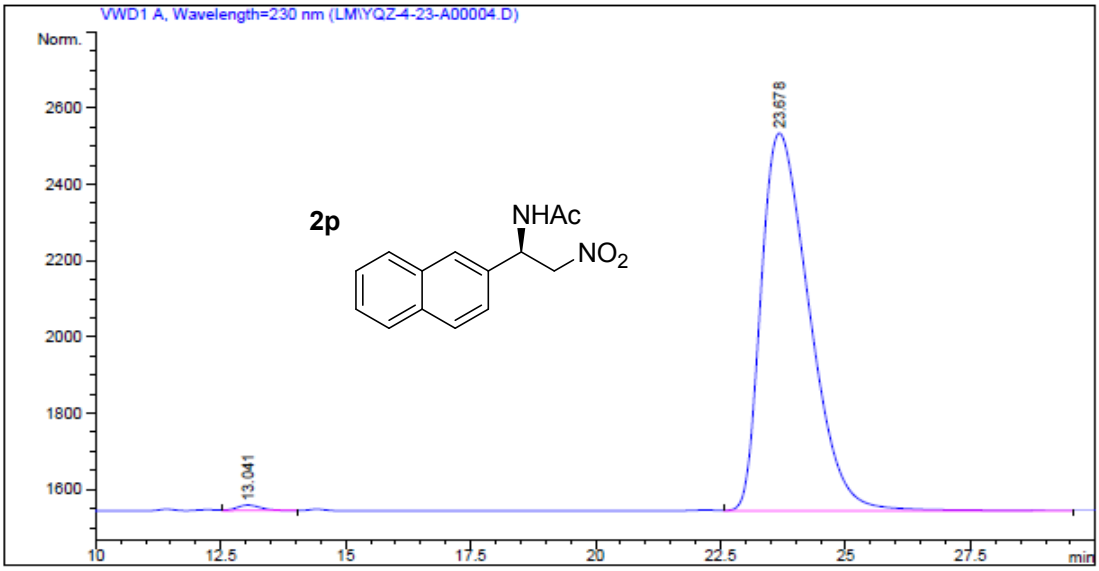
Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	115.715	BV	0.3197	70.57587	2.99528	0.35729
2	118.870	VB	1.0554	1.96825e4	221.27208	99.64271
Totals :				1.97531e4	224.26735	



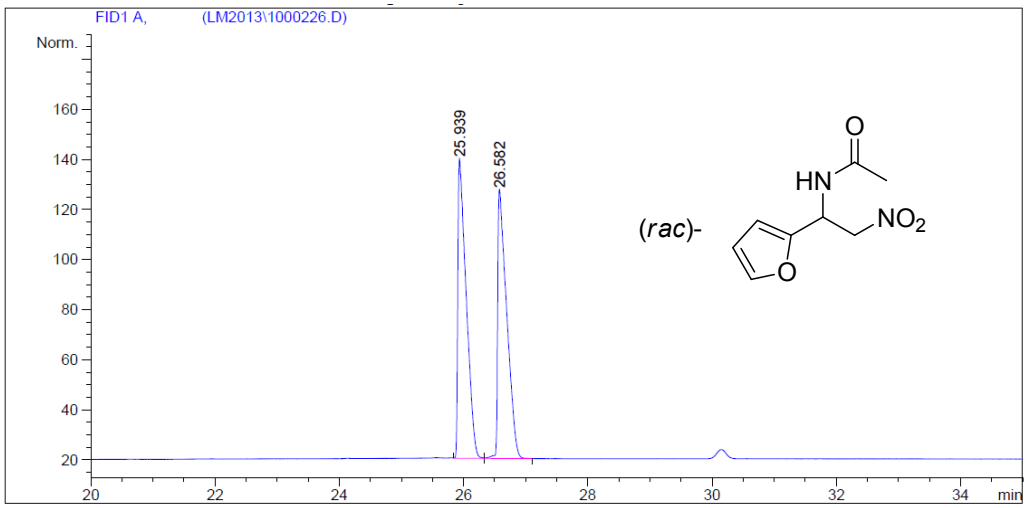


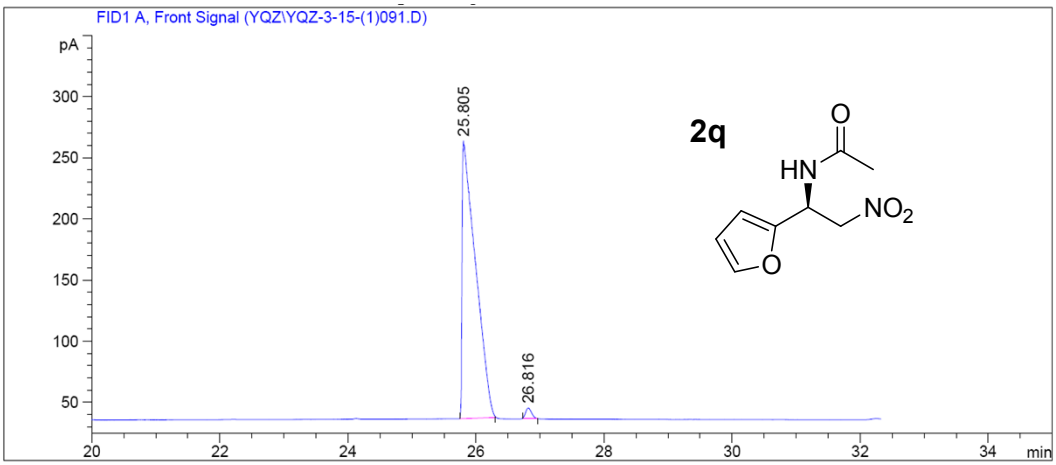
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	17.264	BB	0.8261	222.36137	4.07176	1.4809
2	35.573	BB	1.5547	1.47931e4	143.14575	98.5191
Totals :				1.50155e4	147.21751	



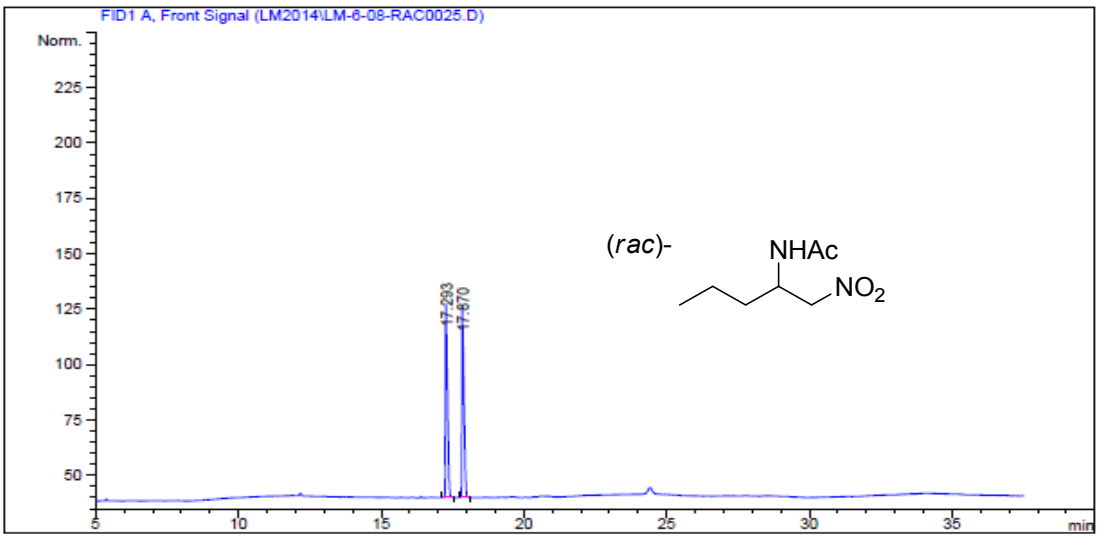


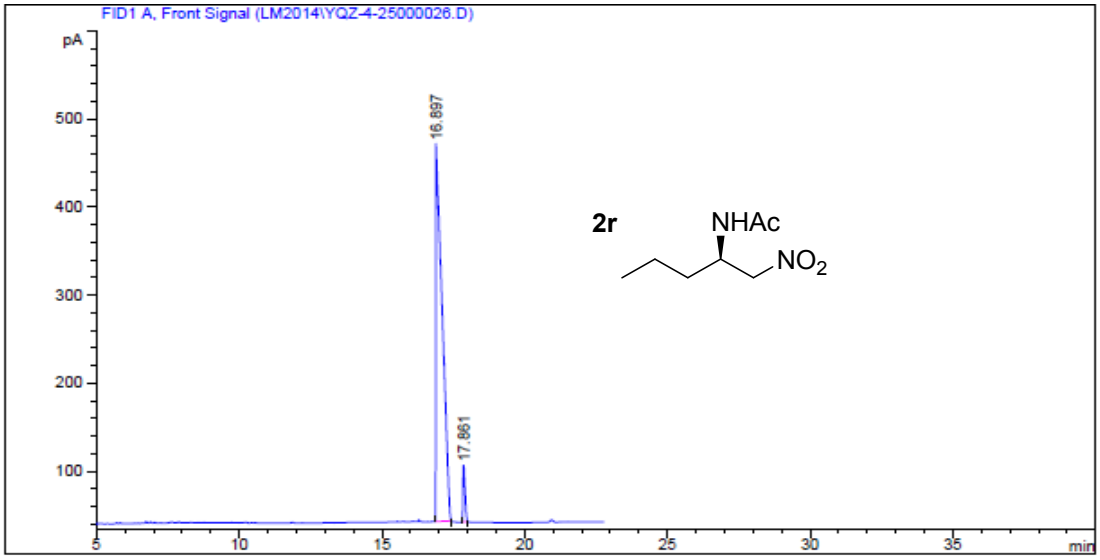
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	13.041	VB	0.5174	493.91513	14.57329	0.7417
2	23.678	VB	1.0529	6.61017e4	990.08136	99.2583
Totals :				6.65956e4	1004.65465	



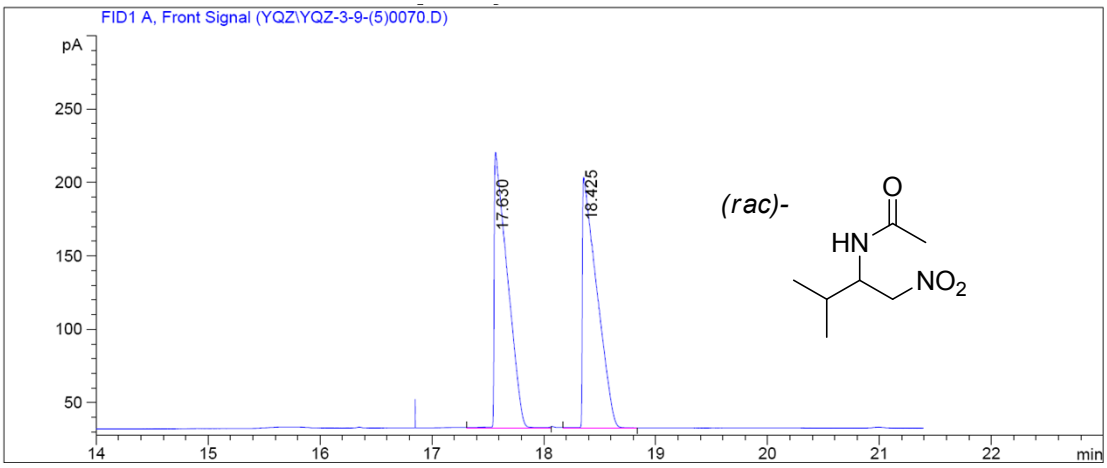


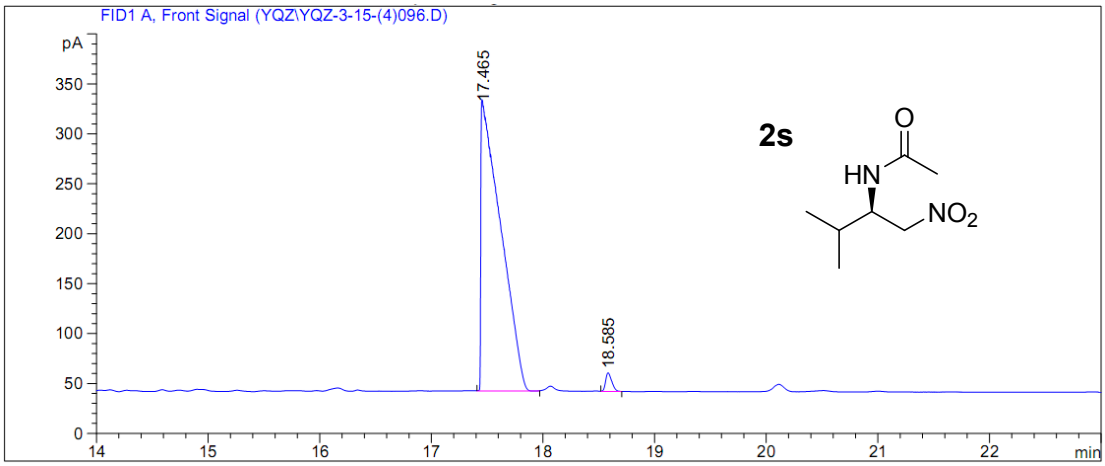
Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	25.805	BB	0.1714	3296.75977	227.05684	98.31242
2	26.816	BB	0.0767	56.59031	8.74770	1.68758
Totals :				3353.35007	235.80454	



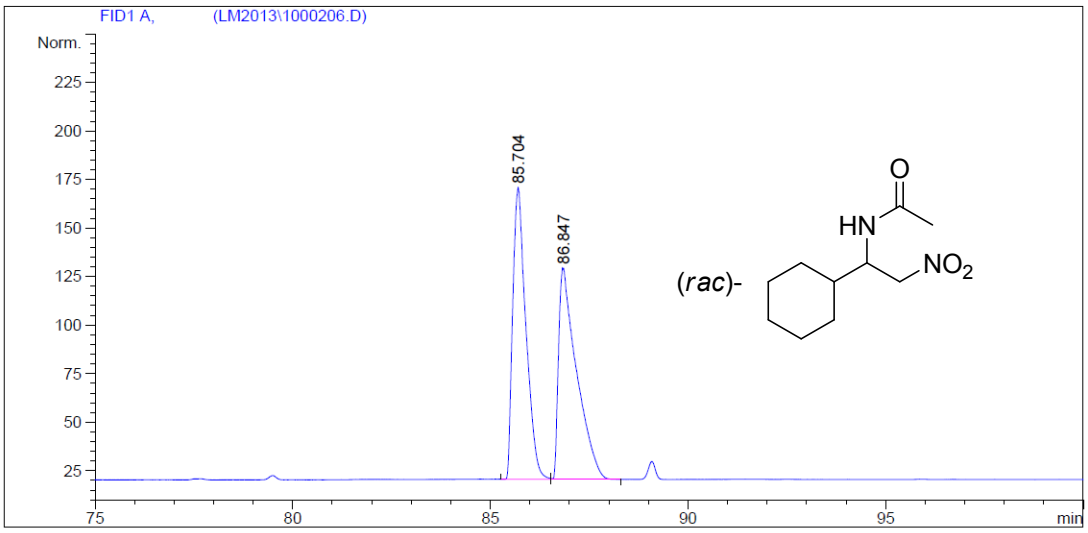


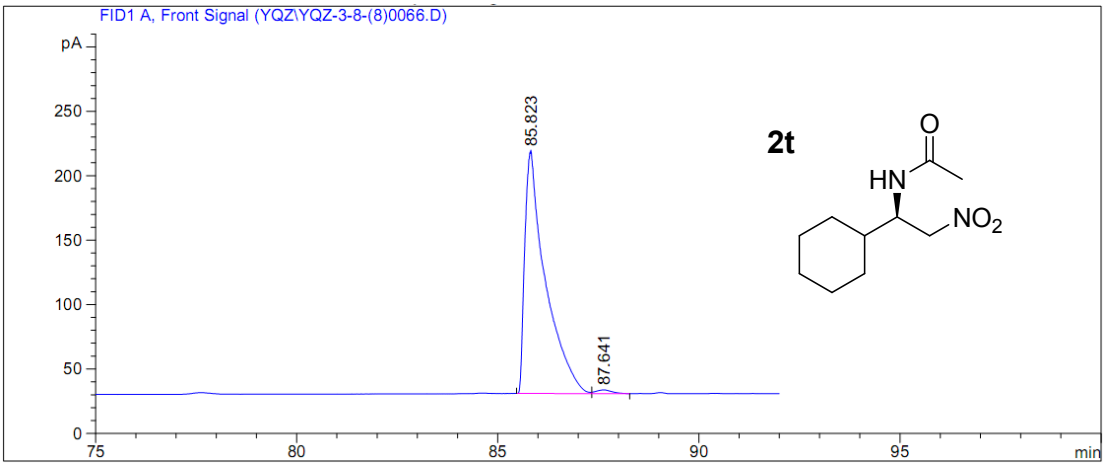
Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	16.897	BB	0.1792	6538.93359	428.66077	95.28071
2	17.861	BB	0.0599	323.87592	64.32095	4.71929
Totals :				6862.80951	492.98171	





Peak #	Ret Time [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	17.465	BB	0.1561	3582.47803	285.32629	98.04352
2	18.585	BB	0.0608	71.48896	18.59858	1.95648
Totals :				3653.96699	303.92487	





Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	85.823	BB	0.4469	6719.51123	188.21558	98.92183
2	87.641	BB	0.3139	73.23739	2.79312	1.07817
Totals :				6792.74862	191.00870	