Supporting Information for

Synthesis of α-Trifluoromethyl Ethanone Oximes via the Three-component Reaction of Aryl-substituted Ethylenes, tert-Butyl Nitrite, and the Langlois Reagent

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1) General information

All solvents were distilled prior to use. For chromatography, 200-300 mesh silica gel (Qingdao, China) was employed. ^{1}H, ^{13}C and ^{19}F NMR spectra were recorded at 400 MHz, 100 MHz and 376 MHz with Brucker ARX 400 spectrometer. Chemical shifts are reported in ppm using tetramethylsilane as internal standard. HRMS was performed on an FTMS mass instrument.

2) Effect of water on the reaction

A 10 mL sealing tube with a magnetic stirring bar was charged with Langlois reagent (156 mg, 1.0 mmol), DMSO containing 5% water (1 mL) was added via syringe with gentle stirring. Then 1-chloro-4-vinylbenzene (**1a**) (69 mg, 0.5 mmol) and tert-butyl nitrite (90% purity) (114 mg, 1.0 mmol) were added to the reaction mixture and the mixture was heated to 40 °C by a preheated oil bath for 48h. The reaction mixture diluted with ethyl acetate (10 mL) and washed with water (10 mL) three times. The organic layer was dried over Na_2SO_4, concentrated to give a residue which was purified by silica gel chromatography (PE : EA = 10 : 1), to give product compound **4a** (90 mg, 76%) as a white solid.

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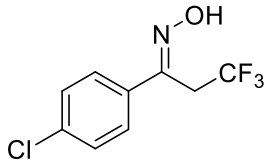
mg, 75%) as a white solid.

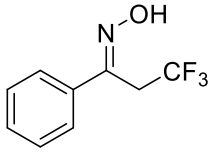
3) ^{18}O-labeling experiment

A 10 mL sealing tube with a magnetic stirring bar was charged with Langlois reagent (156 mg, 1.0 mmol), dry DMSO (1 mL) and $H_2{}^{18}O$ (100 mg, 5 mmol) were added via syringe with gentle stirring. Then 1-chloro-4-vinylbenzene (**1a**) (69 mg, 0.5 mmol) and tert-butyl nitrite (90% purity) (114 mg, 1.0 mmol) were added to the reaction mixture and the mixture was heated to 40 °C by a preheated oil bath for 48h. The reaction mixture diluted with ethyl acetate (10 mL) and washed with water (10 mL) three times. The organic layer was dried over Na_2SO_4, concentrated to give a residue which was purified by silica gel chromatography (PE : EA = 10 : 1), to give the mixture **4a** and **4a'** (89 mg, 75%) as a colorless oil. Analysis of this mixture by HRMS (ESI) was performed. **4a** calcd for $C_9H_8ClF_3NO^+$ $(M+H)^+$ 238.0241, found 238.0230. **4a'** calcd for $C_9H_8ClF_3N{}^{18}O^+$ $(M+H)^+$ 240.0283, found 240.0271.

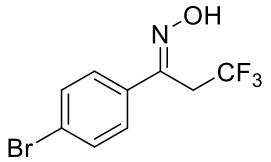
4) The spectral data of the products



(E)-1-(4-chlorophenyl)-3,3,3-trifluoropropan-1-one oxime (4a): after purification by silica gel column chromatography (PE : EA = 10 : 1), compound **4a** was isolated as a white solid (92 mg, 77 %); R_f (PE : EA = 5 : 1) = 0.60; mp (melting point) = 94-96 °C; ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.23 (s, 1H), 7.57 (d, *J* = 8.64 Hz, 2H), 7.40 (d, *J* = 8.60 Hz, 2H), 3.74 (q, *J* = 10.36 Hz, 2H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 149.0 (d, *J* = 2.05 Hz), 136.4, 132.9, 129.2, 127.8, 124.5 (q, *J* = 276.63 Hz), 30.5 (q, *J* = 31.61 Hz). ^{19}F NMR (375 MHz, $CDCl_3$): δ = – 61.3 (s, 3F). HRMS (ESI) m/z calcd for $C_9H_8ClF_3NO^+$ $(M+H)^+$ 238.0241, found 238.0240.

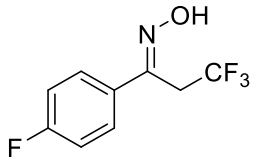


(E)-3,3,3-trifluoro-1-phenylpropan-1-one oxime (4b): after purification by silica gel column chromatography (PE : EA = 10 : 1), compound **4b** was isolated as a white solid (61 mg, 60 %); R_f (PE : EA = 5 : 1) = 0.47; mp (melting point) = 88-90 °C; ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.42 (s, 1H), 7.65-7.63 (m, 2H), 7.45-7.42 (m, 3H), 3.78 (q, *J* = 10.40 Hz, 2H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 149.8 (d, *J* = 1.95 Hz), 134.4, 130.1, 128.9, 126.6, 124.6 (q, *J* = 276.69 Hz), 30.6 (q, *J* = 31.37 Hz). ^{19}F NMR (375 MHz, $CDCl_3$): δ = – 61.3 (s, 3F). HRMS (ESI) m/z calcd for $C_9H_9F_3NO^+$ $(M+H)^+$ 204.0631, found 204.0630.

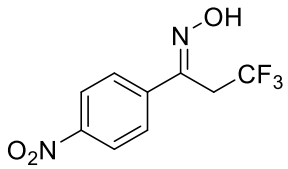


(E)-1-(4-bromophenyl)-3,3,3-trifluoropropan-1-one oxime (4c)[1]: after purification by silica gel

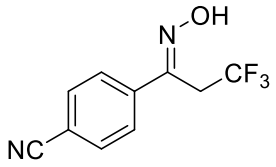
column chromatography (PE : EA = 10 : 1), compound **4c** was isolated as a white solid (89 mg, 63 %); R_f (PE : EA = 5 : 1) = 0.60; ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.02 (s, 1H), 7.56-7.50 (m, 4H), 3.72 (q, *J* = 10.40 Hz, 2H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 148.9 (d, *J* = 1.96 Hz), 133.3, 132.1, 128.0, 124.6, 124.5 (q, *J* = 276.82 Hz), 30.3 (q, *J* = 31.59 Hz). ^{19}F NMR (375 MHz, $CDCl_3$): δ = – 61.3 (s, 3F).



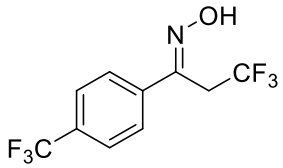
(E)-3,3,3-trifluoro-1-(4-fluorophenyl)propan-1-one oxime (4d): after purification by silica gel column chromatography (PE : EA = 10 : 1), compound **4b** was isolated as a white solid (72 mg, 65 %); R_f (PE : EA = 5 : 1) = 0.59; mp (melting point) = 64-66 °C; ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.19 (s, 1H), 7.65-7.62 (m, 2H), 7.12-7.08 (m, 2H), 3.73 (q, *J* = 10.40 Hz, 2H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 164.0 (d, *J* = 249.02 Hz), 148.9 (d, *J* = 1.95 Hz), 130.6 (d, *J* =3.30 Hz), 128.5 (d, *J* =8.35 Hz), 124.5 (q, *J* = 276.80 Hz), 115.9 (d, *J* =21.78 Hz), 30.5 (q, *J* = 31.47 Hz). ^{19}F NMR (375 MHz, $CDCl_3$): δ = – 61.3 (s, 3F), – 110.8 (s, 1F). HRMS (ESI) m/z calcd for $C_9H_8F_4NO^+$ $(M+H)^+$ 222.0537, found 222.0535.



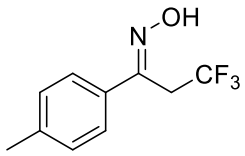
(E)-3,3,3-trifluoro-1-(4-nitrophenyl)propan-1-one oxime (4e): after purification by silica gel column chromatography (PE : EA = 10 : 1), compound **4e** was isolated as a white solid (84 mg, 68 %); R_f (PE : EA = 5 : 1) = 0.43; mp (melting point) = 138-140 °C; ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.46 (s, 1H), 8.26 (d, *J* = 9.04 Hz, 2H), 7.84 (d, *J* = 9.00 Hz, 2H), 3.78 (q, *J* = 10.28 Hz, 2H). ^{13}C NMR (100 MHz, $(CD_3)_2SO$): δ 147.6, 145.8 (d, *J* = 1.78 Hz), 141.0, 127.1, 125.0 (q, *J* = 275.70 Hz), 123.6, 28.6 (q, *J* = 29.96 Hz). ^{19}F NMR (375 MHz, $CDCl_3$): δ = – 61.3 (s, 3F). HRMS (ESI) m/z calcd for $C_9H_8F_3N_2O_3^+$ $(M+H)^+$ 249.0482, found 249.0480.



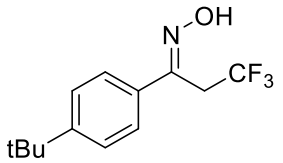
(E)-4-(3,3,3-trifluoro-1-(hydroxyimino)propyl)benzonitrile (4f): after purification by silica gel column chromatography (PE : EA = 10 : 1), compound **4f** was isolated as a white solid (66 mg, 58 %); R_f (PE : EA = 5 : 1) = 0.30; mp (melting point) = 99-101 °C; ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.84 (s, 1H), 7.77 (d, *J* = 8.56 Hz, 2H), 7.70 (d, *J* = 8.60 Hz, 2H), 3.76 (q, *J* = 10.32 Hz, 2H). ^{13}C NMR (100 MHz, $(CD_3)_2SO$): δ 146.0 (d, *J* = 1.99 Hz), 139.2, 132.4, 126.8, 125.0 (q, *J* = 276.69 Hz), 118.5, 111.6, 28.5 (q, *J* = 29.87 Hz). ^{19}F NMR (375 MHz, $CDCl_3$): δ = – 61.3 (s, 3F). HRMS (ESI) m/z calcd for $C_{10}H_8F_3N_2O^+$ $(M+H)^+$ 229.0583, found 229.0579.



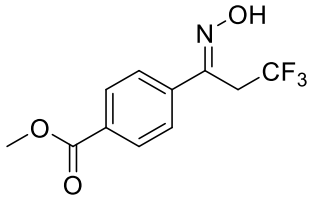
(E)-3,3,3-trifluoro-1-(4-(trifluoromethyl)phenyl)propan-1-one oxime (4g): after purification by silica gel column chromatography (PE : EA = 10 : 1), compound **4g** was isolated as a white solid (93 mg, 69 %); R_f(PE : EA = 5 : 1) = 0.63; mp (melting point) = 87-89 °C; ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.52 (s, 1H), 7.76 (d, *J* = 8.32 Hz, 2H), 7.68 (d, *J* = 8.32 Hz, 2H), 3.78 (q, *J* = 10.32 Hz, 2H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 148.8, 137.8, 132.0 (q, *J* = 32.72 Hz), 126.9, 125.8, 124.4 (q, *J* = 274.40 Hz), 124.0 (q, *J* = 274.40 Hz), 30.4 (q, *J* = 31.74 Hz). ^{19}F NMR (375 MHz, $CDCl_3$): δ = – 61.3 (s, 3F), – 62.9 (s, 3F). HRMS (ESI) m/z calcd for $C_{10}H_8F_6NO^+$ $(M+H)^+$ 272.0505, found 272.0506.



(E)-3,3,3-trifluoro-1-(p-tolyl)propan-1-one oxime (4h): after purification by silica gel column chromatography (PE : EA = 10 : 1), compound **4h** was isolated as a white solid (72 mg, 67 %); R_f (PE : EA = 5 : 1) = 0.53; mp (melting point) = 98-100 °C; ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.91 (s, 1H), 7.53 (d, *J* = 8.24 Hz, 2H), 7.23 (d, *J* = 8.04 Hz, 2H), 3.75 (q, *J* = 10.44 Hz, 2H), 2.39 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 149.6 (d, *J* = 2.07 Hz), 140.3, 131.6, 129.6, 126.4, 124.6 (q, *J* = 277.34 Hz), 30.4 (q, *J* = 31.35 Hz), 21.4. ^{19}F NMR (375 MHz, $CDCl_3$): δ = – 61.3 (s, 3F). HRMS (ESI) m/z calcd for $C_{10}H_{11}F_3NO^+$ $(M+H)^+$ 218.0787, found 218.0788.

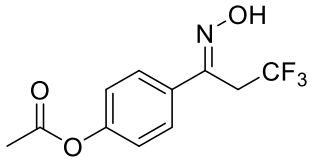


(E)-1-(4-(tert-butyl)phenyl)-3,3,3-trifluoropropan-1-one oxime (4i): after purification by silica gel column chromatography (PE : EA = 10 : 1), compound **4i** was isolated as a white solid (87 mg, 67 %); R_f(PE : EA = 5 : 1) = 0.59; mp (melting point) = 90-92 °C; ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.39 (s, 1H), 7.58 (d, *J* = 8.80 Hz, 2H), 7.43 (d, *J* = 8.52 Hz, 2H), 3.74 (q, *J* = 10.48 Hz, 2H), 1.34 (s, 9H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 153.5, 149.5 (d, *J* = 1.99 Hz), 131.5, 126.2, 125.9, 124.7 (q, *J* = 276.67 Hz), 34.9, 31.3, 30.5 (q, *J* = 31.40 Hz). ^{19}F NMR (375 MHz, $CDCl_3$): δ = – 61.2 (s, 3F). HRMS (ESI) m/z calcd for $C_{13}H_{17}F_3NO^+$ $(M+H)^+$ 260.1257, found 260.1258.

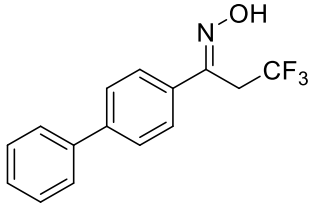


(E)-methyl 4-(3,3,3-trifluoro-1-(hydroxyimino)propyl)benzoate (4j): after purification by silica gel column chromatography (PE : EA = 10 : 1), compound **4j** was isolated as a white solid (95 mg,

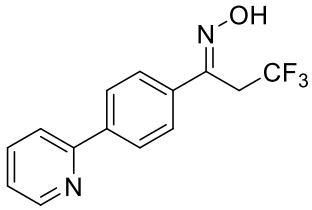
73 %); R_f (PE : EA = 5 : 1) = 0.40; mp (melting point) = 130-132 °C; ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.62 (s, 1H), 8.08 (d, *J* = 8.44 Hz, 2H), 7.72 (d, *J* = 8.44 Hz, 2H), 3.94 (s, 3H), 3.77 (q, *J* = 10.36 Hz, 2H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 166.8, 148.9 (d, *J* = 2.04 Hz), 138.6, 131.4, 130.0, 126.5, 124.5 (q, *J* = 276.62 Hz), 52.5 (d, *J* = 3.92 Hz), 30.3 (q, *J* = 31.53 Hz). ^{19}F NMR (375 MHz, $CDCl_3$): δ = – 61.3 (s, 3F). HRMS (ESI) m/z calcd for $C_{11}H_{11}F_3NO_3^+$ $(M+H)^+$ 262.0686, found 262.0689.



(E)-4-(3,3,3-trifluoro-1-(hydroxyimino)propyl)phenyl acetate (4k): after purification by silica gel column chromatography (PE : EA = 10 : 1), compound **4k** was isolated as a white solid (74 mg, 56 %); R_f (PE : EA = 3 : 1) = 0.49; mp (melting point) = 120-122 °C; ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.15 (s, 1H), 7.69-7.65 (m, 2H), 7.16-7.13 (m, 2H), 3.72 (q, *J* = 10.44 Hz, 2H), 2.31 (s, 3H). ^{13}C NMR (100 MHz, $(CD_3)_2SO$): δ 169.0, 151.2, 146.3, 132.5, 127.2, 125.1 (q, *J* = 276.56 Hz), 121.9, 28.7 (q, *J* = 29.82 Hz), 20.8. ^{19}F NMR (375 MHz, $CDCl_3$): δ = – 61.2 (s, 3F). HRMS (ESI) m/z calcd for $C_{11}H_{11}F_3NO_3^+$ $(M+H)^+$ 262.0686, found 262.0686.

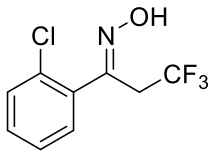


(E)-1-([1,1'-biphenyl]-4-yl)-3,3,3-trifluoropropan-1-one oxime (4l): after purification by silica gel column chromatography (PE : EA = 5 : 1), compound **4l** was isolated as a white solid (92 mg, 66 %); R_f (PE : EA = 3 : 1) = 0.64; mp (melting point) = 173-175 °C; ^{1}H NMR (400 MHz, $(CD_3)_2SO$): δ 11.18 (s, 1H), 6.97 (d, *J* = 8.40 Hz, 2H), 6.87-6.84 (m, 4H), 6.61 (t, *J* = 7.48 Hz, 2H), 6.52 (t, *J* = 7.24 Hz, 1H), 3.12 (q, *J* = 11.32 Hz, 2H). ^{13}C NMR (100 MHz, $(CD_3)_2SO$): δ 146.6, 140.8, 139.3, 134.0, 129.0, 127.8, 126.7, 126.64, 126.60, 125.2 (q, *J* = 282.91 Hz), 28.7 (q, *J* = 29.86 Hz). ^{19}F NMR (375 MHz, $CDCl_3$): δ = – 61.2 (s, 3F). HRMS (ESI) m/z calcd for $C_{15}H_{13}F_3NO^+$ $(M+H)^+$ 280.0944, found 280.0947.

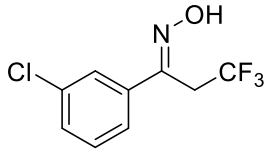


(E)-3,3,3-trifluoro-1-(4-(pyridin-2-yl)phenyl)propan-1-one oxime (4m): after purification by silica gel column chromatography (PE : EA = 5 : 1), compound **4m** was isolated as a white solid (90 mg, 64 %); R_f (PE : EA = 2 : 1) = 0.37; mp (melting point) = 172-174 °C; ^{1}H NMR (400 MHz, $(CD_3)_2SO$): δ 12.09 (s, 1H), 8.69 (d, *J* = 4.64 Hz, 1H), 8.14 (d, *J* = 8.48 Hz, 2H), 8.02 (d, *J* = 7.92 Hz, 1H), 7.92-7.85 (m, 3H), 7.39-7.36 (m, 1H) 3.99 (q, *J* = 11.32 Hz, 2H). ^{13}C NMR (100 MHz, $(CD_3)_2SO$): δ 155.2, 149.6, 146.6, 139.2, 137.2, 135.4, 126.4 (d, *J* = 14 Hz), 124.9 (q, *J* = 227.34

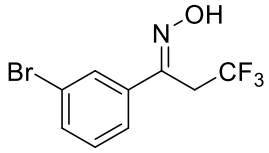
Hz), 122.8, 120.3, 28.7 (q, J = 29.76 Hz). ^{19}F NMR (375 MHz, $(CD_3)_2SO$): δ = – 60.3 (s, 3F). HRMS (ESI) m/z calcd for $C_{14}H_{12}F_3N_2O^+$ $(M+H)^+$ 281.0896, found 281.0899.



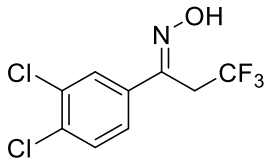
(E)-1-(2-chlorophenyl)-3,3,3-trifluoropropan-1-one oxime (4n): after purification by silica gel column chromatography (PE : EA = 10 : 1), compound **4n** was isolated as a white solid (71 mg, 60 %, 1:1 *E/Z* ratio); R_f(PE : EA = 5 : 1) = 0.60; *E*-isomer: ^{1}H NMR (400 MHz, $CDCl_3$): δ 9.20 (s, 1H), 7.47-7.44 (m, 1H), 7.38-7.34 (m, 2H), 7.31-7.30 (m, 1H), 3.80 (q, J = 10.64 Hz, 2H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 150.0 (d, J = 2.08 Hz), 133.9, 131.8, 131.0, 130.7, 129.9, 127.1, 124.7 (q, J = 276.25 Hz), 39.4 (q, J = 30.01 Hz). ^{19}F NMR (375 MHz, $CDCl_3$): δ = – 61.5 (s, 3F). *Z*-isomer: ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.63 (s, 1H), 7.43-7.41 (m, 1H), 7.34-7.31 (m, 2H), 7.24-7.22 (m, 1H), 3.42 (q, J = 10.24 Hz, 2H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 148.7 (d, J = 3.07 Hz), 132.7, 131.1, 130.5, 129.7, 129.5, 126.8, 124.4 (q, J = 276.40 Hz), 32.5 (q, J = 30.64 Hz). ^{19}F NMR (375 MHz, $CDCl_3$): δ = – 63.1 (s, 3F). HRMS (ESI) m/z calcd for $C_9H_8ClF_3NO^+$ $(M+H)^+$ 238.0241, found 238.0243.



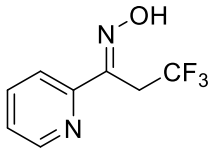
(E)-1-(3-chlorophenyl)-3,3,3-trifluoropropan-1-one oxime (4o): after purification by silica gel column chromatography (PE : EA = 10 : 1), compound **4o** was isolated as a white solid (80 mg, 67 %); R_f(PE : EA = 5 : 1) = 0.60; mp (melting point) = 63-65 ^{o}C; ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.97 (s, 1H), 7.67 (s, 1H), 7.51 (d, J = 7.64 Hz, 1H), 7.41-7.32 (m, 2H), 3.72 (q, J = 10.36 Hz, 2H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 148.8 (d, J = 2.01 Hz), 136.2, 135.0, 130.14, 130.08, 126.7, 124.7, 124.4 (q, J = 276.87 Hz), 30.5 (q, J = 31.72 Hz). ^{19}F NMR (375 MHz, $CDCl_3$): δ = – 61.3 (s, 3F). HRMS (ESI) m/z calcd for $C_9H_8ClF_3NO^+$ $(M+H)^+$ 238.0241, found 238.0240.



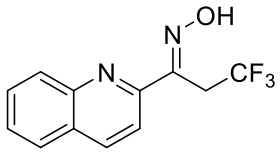
(E)-1-(3-bromophenyl)-3,3,3-trifluoropropan-1-one oxime (4p): after purification by silica gel column chromatography (PE : EA = 10 : 1), compound **4p** was isolated as a white solid (94 mg, 66 %); R_f(PE : EA = 5 : 1) = 0.63; mp (melting point) = 61-63 ^{o}C; ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.93 (s, 1H), 7.82 (s, 1H) 7.55 (d, J = 7.92 Hz, 2H), 7.29 (d, J = 7.92 Hz, 1H), 3.71 (q, J = 10.32 Hz, 2H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 148.7 (d, J = 12.74 Hz), 136.4 (d, J = 4.21 Hz), 133.1 (d, J = 5.57 Hz), 130.3 (d, J = 3.86 Hz), 129.6, 125.2, 124.4 (q, J = 277.34 Hz), 123.1, 30.4 (q, J = 31.52 Hz). ^{19}F NMR (375 MHz, $CDCl_3$): δ = – 61.3 (s, 3F). HRMS (ESI) m/z calcd for $C_9H_8BrF_3NO^+$ $(M+H)^+$ 281.9736, found 281.9740.



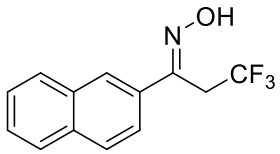
(E)-1-(3,4-dichlorophenyl)-3,3,3-trifluoropropan-1-one oxime (4q): after purification by silica gel column chromatography (PE : EA = 10 : 1), compound **4q** was isolated as a white solid (73 mg, 63 %); R_f (PE : EA = 5 : 1) = 0.57; mp (melting point) = 111-113 °C; ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.49 (s, 1H), 7.75 (d, *J* = 1.72 Hz, 1H), 7.50-7.45 (m, 2H), 3.71 (q, *J* = 10.32 Hz, 2H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 147.9 (d, *J* = 1.97 Hz), 134.4, 134.3, 133.3, 130.8, 128.4, 125.6, 124.3 (q, *J* = 276.73 Hz), 30.2 (q, *J* = 31.67 Hz). ^{19}F NMR (375 MHz, $CDCl_3$): δ = – 61.3 (s, 3F). HRMS (ESI) m/z calcd for $C_9H_7Cl_2F_3NO^+$ $(M+H)^+$ 271.9851, found 271.9855.



(E)-3,3,3-trifluoro-1-(pyridin-2-yl)propan-1-one oxime (4r): after purification by silica gel column chromatography (PE : EA = 5 : 1), compound **4r** was isolated as a white solid (66 mg, 65 %); R_f (PE : EA = 2 : 1) = 0.49; mp (melting point) = 134-136 °C; ^{1}H NMR (400 MHz, $(CD_3)_2SO$): δ 11.45 (s, 1H), 7.76 (d, *J* = 4.76 Hz, 1H), 7.05 (d, *J* = 8.00 Hz, 1H), 7.00-6.95 (m, 1H), 6.57-6.54 (m, 1H),3.14 (q, *J* = 11.24 Hz, 2H). ^{13}C NMR (100 MHz, $(CD_3)_2SO$): δ 152.5, 148.7 (d, *J* = 10.06 Hz), 147.8, 136.9, 125.2 (q, *J* = 276.67 Hz), 124.1, 119.9, 27.6 (q, *J* = 30.36 Hz). ^{19}F NMR (375 MHz, $(CD_3)_2SO$): δ = – 60.2 (s, 3F). HRMS (ESI) m/z calcd for $C_8H_8F_3N_2O^+$ $(M+H)^+$ 205.0583, found 205.0584.

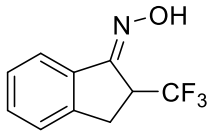


(E)-3,3,3-trifluoro-1-(quinolin-2-yl)propan-1-one oxime (4s): after purification by silica gel column chromatography (PE : EA = 10 : 1), compound **4s** was isolated as a yellow solid (63 mg, 50 %); R_f (PE : EA = 5 : 1) = 0.49; mp (melting point) = 138-140 °C; ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.16-8.09 (m, 3H), 8.01 (d, *J* = 8.64 Hz, 1H), 7.83 (d, *J* = 8.24 Hz, 1H),7.75-7.71 (m, 1H), 7.59-7.55 (m, 1H), 4.23 (q, *J* = 10.60 Hz, 2H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 152.3, 151.4, 147.5, 136.6, 130.0, 129.9, 128.4, 127.6, 127.5, 125.0 (q, *J* = 276.56 Hz), 118.3, 28.5 (q, *J* = 31.52 Hz). ^{19}F NMR (375 MHz, $CDCl_3$): δ = – 61.4 (s, 3F). HRMS (ESI) m/z calcd for $C_{12}H_{10}F_3N_2O^+$ $(M+H)^+$ 255.0740, found 255.0741.

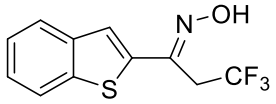


(E)-3,3,3-trifluoro-1-(naphthalen-2-yl)propan-1-one oxime (4t): after purification by silica gel column chromatography (PE : EA = 10 : 1), compound **4t** was isolated as a white solid (64 mg, 50 %); R_f (PE : EA = 5 : 1) = 0.55; mp (melting point) = 124-126 °C; ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.90 (s, 1H), 8.04 (s, 1H), 7.91-7.85 (m, 4H), 7.56-7.51 (m, 2H), 3.89 (q, *J* = 10.40 Hz, 2H). ^{13}C

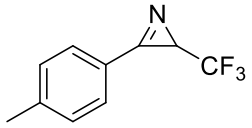
NMR (100 MHz, $CDCl_3$): δ 149.6, 134.1, 133.1, 131.8, 128.8, 128.6, 127.8, 127.3, 126.8, 126.7, 124.7 (q, *J* = 276.71 Hz), 123.4, 30.3 (q, *J* = 31.30 Hz). ^{19}F NMR (375 MHz, $CDCl_3$): δ = – 61.1 (s, 3F). HRMS (ESI) m/z calcd for $C_{13}H_{11}F_3NO^+$ $(M+H)^+$ 254.0787, found 254.0790.



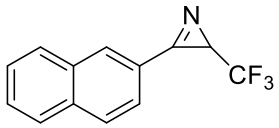
(E)-2-(trifluoromethyl)-2,3-dihydro-1H-inden-1-one oxime (4u): after purification by silica gel column chromatography (PE : EA = 10 : 1), compound **(4u)** was isolated as a yellow solid (38 mg, 36 %); R_f(PE : EA = 5 : 1) = 0.46; *E*-isomer: ^1H NMR (400 MHz, $CDCl_3$): δ 9.68 (s, 1H), 8.48 (d, *J* = 7.24 Hz, 1H), 7.38-7.29 (m, 3H), 3.82-3.71 (m, 1H), 3.33-3.22 (m, 2H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 154.1 (d, *J* = 1.96 Hz), 145.4, 131.8, 129.7, 127.6, 126.1 (q, *J* = 276.86 Hz), 125.18, 121.7, 45.0 (q, *J* = 28.32 Hz), 30.3 (d, *J* = 2.03 Hz). ^{19}F NMR (375 MHz, $CDCl_3$): δ = – 70.4 (s, 3F). *Z*-isomer: ^1H NMR (400 MHz, $CDCl_3$): δ 9.08 (s, 1H), 7.68 (d, *J* = 7.64 Hz, 1H), 7.46-7.40 (m, 3H), 4.33-4.24 (m, 1H), 3.43-3.32 (m, 2H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 155.8, 144.6, 135.2, 132.7, 131.0, 127.7, 125.8 (q, *J* = 278.90 Hz), 125.22, 42.9 (q, *J* = 29.51 Hz), 31.0 (d, *J* = 2.78 Hz). ^{19}F NMR (375 MHz, $CDCl_3$): δ = – 68.2(s, 3F). HRMS (ESI) m/z calcd for $C_{10}H_9F_3NO^+$ $(M+H)^+$ 216.0631, found 216.0633.



(E)-1-(benzo[b]thiophen-2-yl)-3,3,3-trifluoropropan-1-one oxime (4v): after purification by silica gel column chromatography (PE : EA = 10 : 1), compound **(4v)** was isolated as a yellow solid (46 mg, 36 %); R_f(PE : EA = 5 : 1) = 0.62; mp (melting point) = 167-169 °C; ^1H NMR (400 MHz, $CDCl_3$): δ 7.95 (s, 1H), 7.81-7.77 (m, 2H), 7.51 (s, 1H), 7.40-7.34 (m, 2H), 3.78 (q, *J* = 10.36 Hz, 2H). ^{13}C NMR (100 MHz, $(CD_3)_2SO$): δ 143.7, 139.3, 139.2, 138.7, 125.8, 124.9 (q, *J* = 276.56 Hz), 124.7, 124.5, 124.1, 122.2, 29.4 (q, *J* = 30.29 Hz). ^{19}F NMR (375 MHz, $CDCl_3$): δ = – 61.6 (s, 3F). HRMS (ESI) m/z calcd for $C_{11}H_9F_3NOS^+$ $(M+H)^+$ 260.0352, found 260.0356.



3-(p-tolyl)-2-(trifluoromethyl)-2H-azirine (14h)[1]**:** after purification by silica gel column chromatography (PE : EA = 60 : 1), compound **14h** was isolated as a colorless oil (64 mg, 64 %); R_f(PE : EA = 30 : 1) = 0.64; ^1H NMR (400 MHz, $CDCl_3$): δ 7.81 (d, *J* = 8.08 Hz, 2H), 7.41 (d, *J* = 7.92 Hz, 2H), 2.68 (q, *J* = 4.64 Hz, 1H), 2.48 (s, 3H). ^{13}C NMR (100 MHz, $(CD_3)_2SO$): δ 160.3, 145.7, 130.6, 130.3, 124.5 (q, *J* = 271.94 Hz), 119.5, 29.4 (q, *J* = 42.30 Hz), 22.1. ^{19}F NMR (375 MHz, $CDCl_3$): δ = – 66.7 (s, 3F).



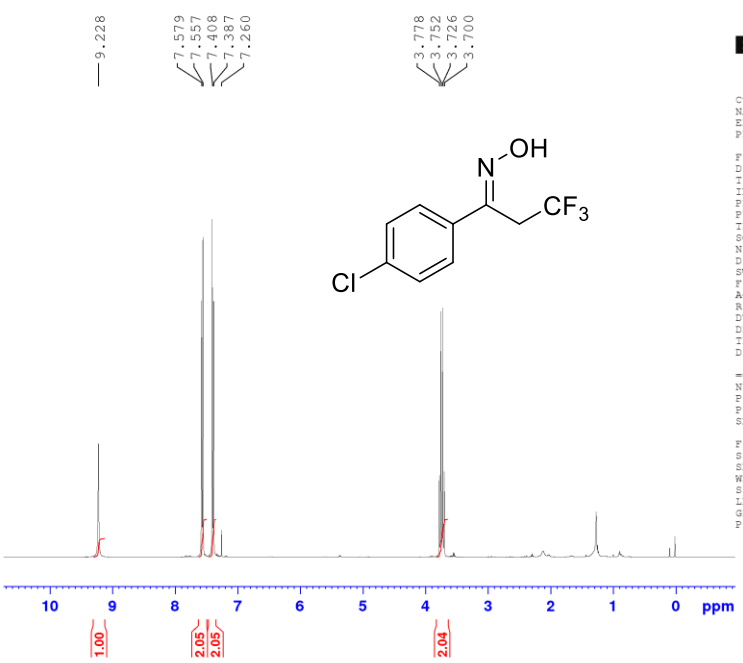
3-(naphthalen-2-yl)-2-(trifluoromethyl)-2H-azirine (14t)[1]**:** after purification by silica gel column chromatography (PE : EA = 60 : 1), compound **14t**was isolated as a white solid (89 mg,

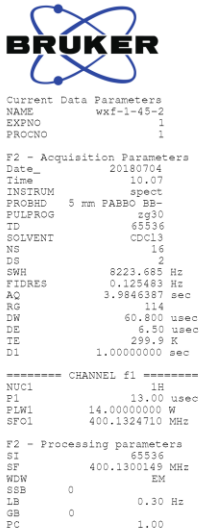
76 %); R_f(PE : EA = 30 : 1) = 0.58; ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.36 (s, 1H), 8.05-7.98 (m, 3H), 7.94 (d, *J* = 8.04 Hz, 1H), 7.70-7.61 (m, 2H), 2.82 (q, *J* = 4.60 Hz, 1H). ^{13}C NMR (100 MHz, $CDCl_3$): δ 160.9 (d, *J* = 1.11 Hz), 136.2, 133.3, 132.8, 129.7, 129.5, 129.4, 128.3, 127.7, 124.6, 124.5 (q, *J* = 271.95 Hz), 119.6, 29.9 (q, *J* = 42.28 Hz). ^{19}F NMR (375 MHz, $CDCl_3$): δ = –67.5 (s, 3F).

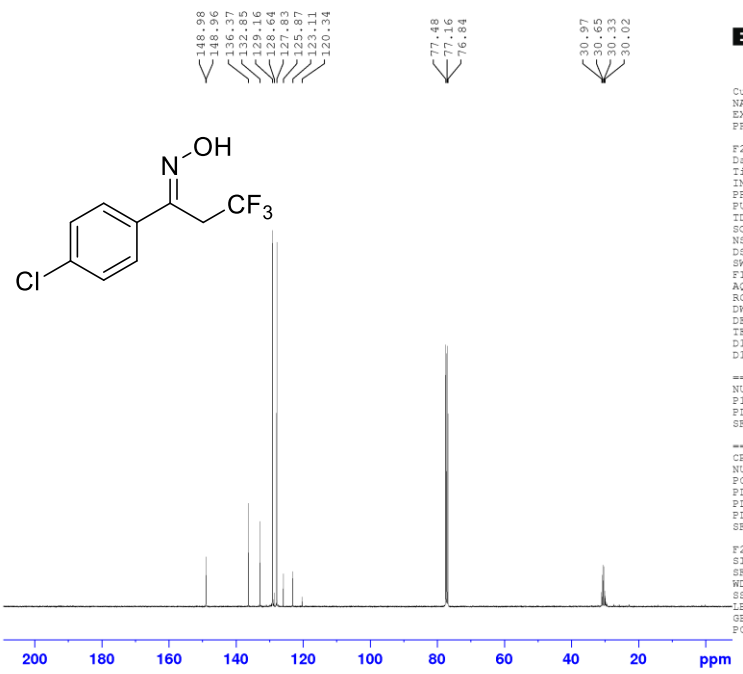
5) Reference

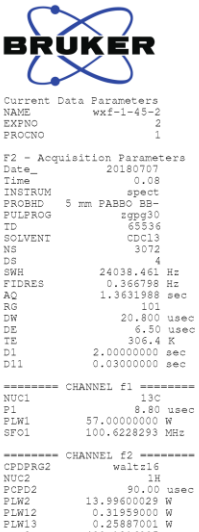
1 Y.-J. Huang, B. Qiao, F.-G. Zhang and J.-A. Ma, *Tetrahedron* 2018, **74**, 3791.

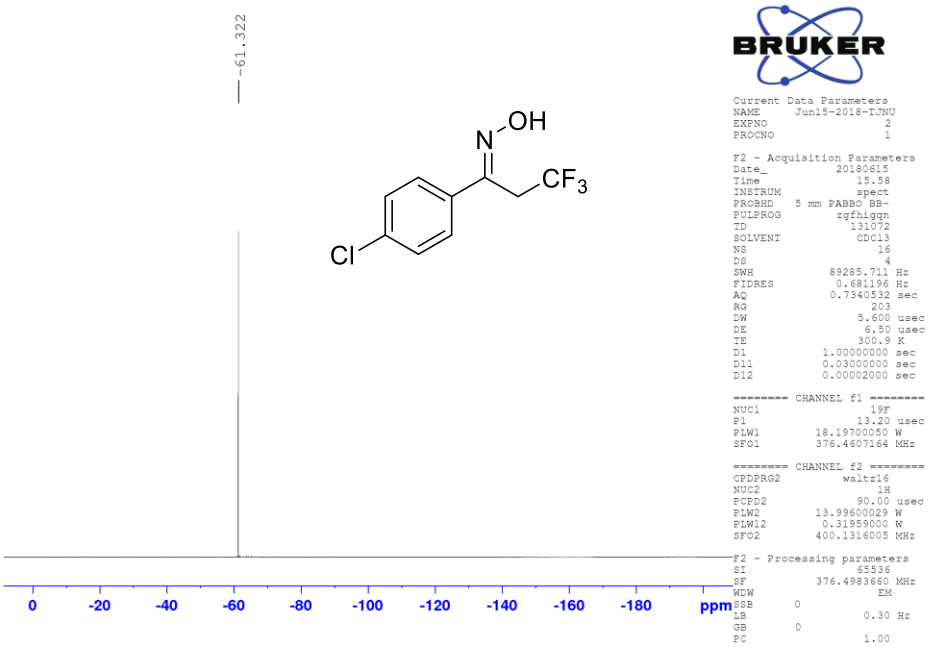
^{1}H,^{13}C and ^{19}F NMR spectra of **(E)-1-(4-chlorophenyl)-3,3,3-trifluoropropan-1-one oxime (4a)** in $CDCl_3$.









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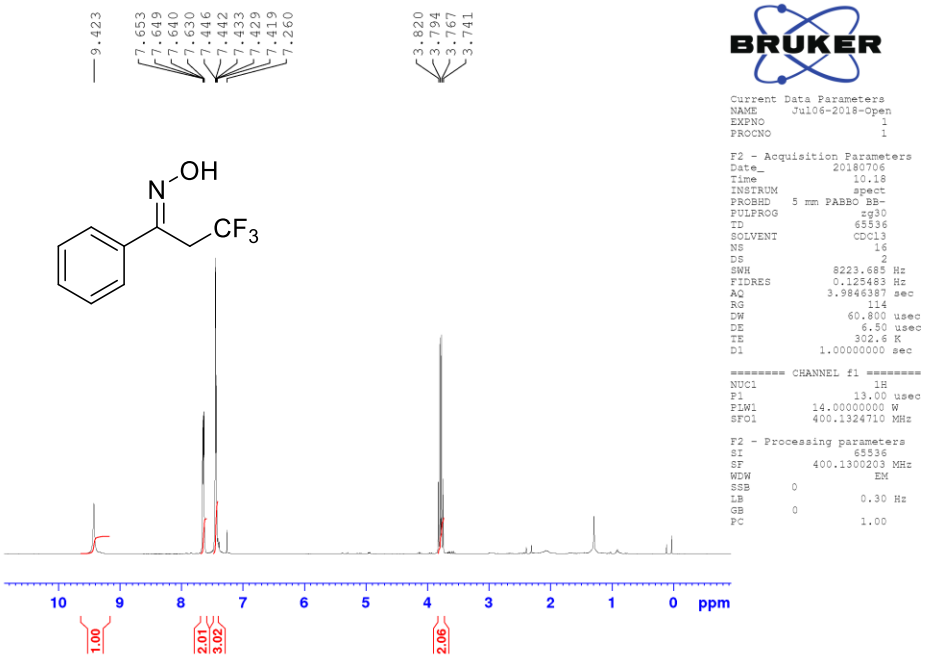
^{1}H,^{13}C and ^{19}F NMR spectra of **(E)-3,3,3-trifluoro-1-phenylpropan-1-one oxime (4b)** in $CDCl_3$.

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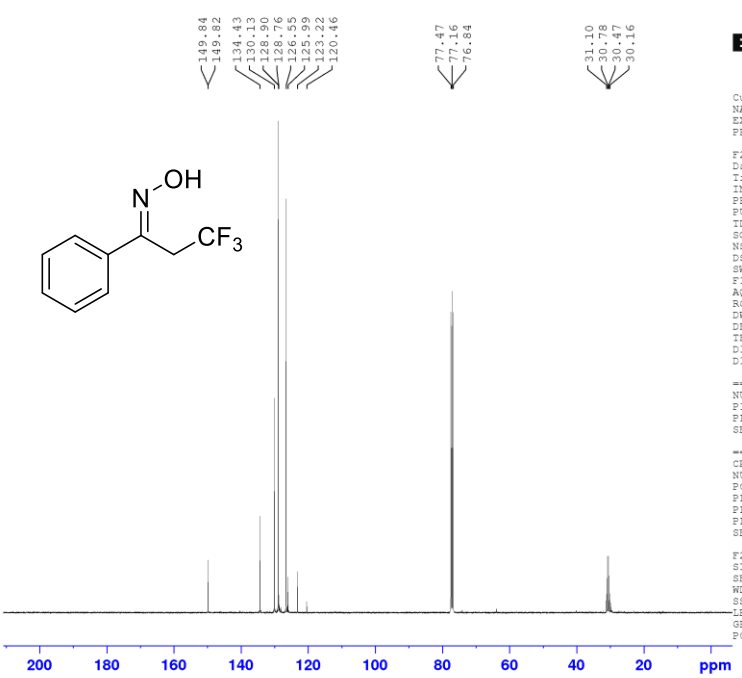

BRUKER

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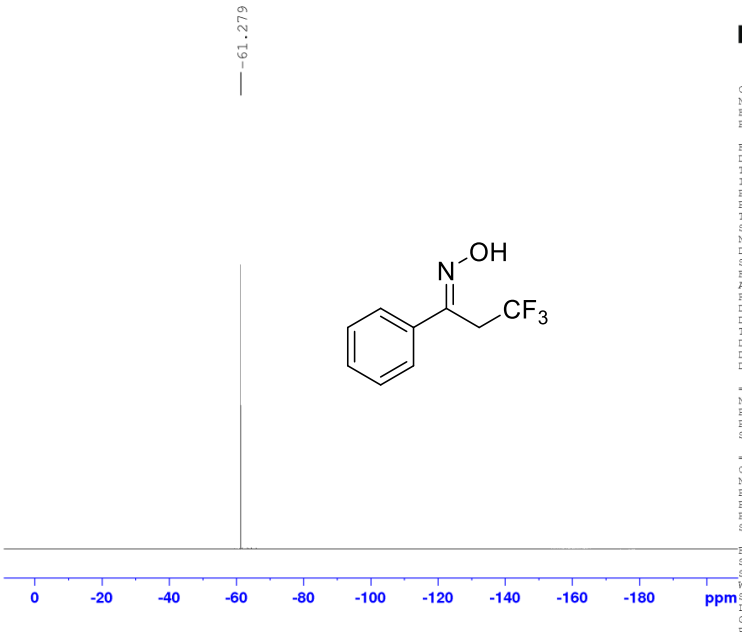

BRUKER

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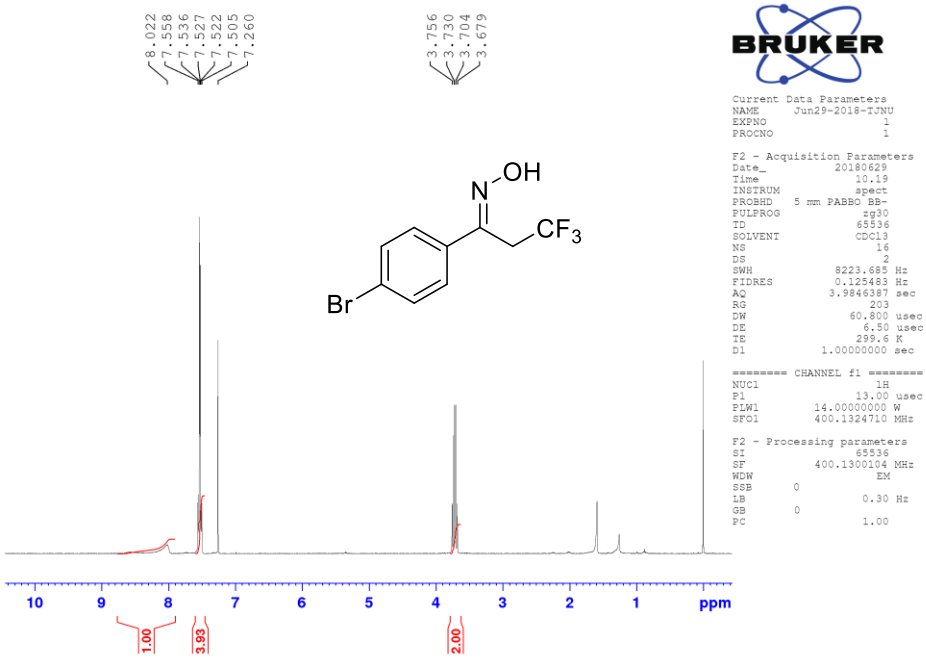
^{1}H,^{13}C and ^{19}F NMR spectra of **(E)-1-(4-bromophenyl)-3,3,3-trifluoropropan-1-one oxime (4c)** in $CDCl_3$

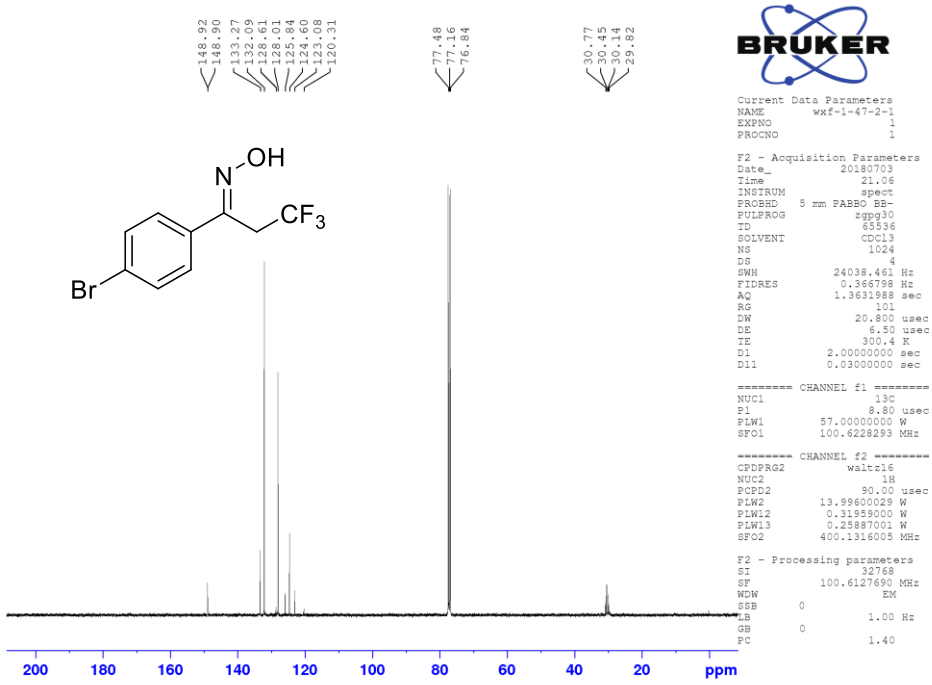


Current Data Parameters
NAME Jun29-2018-TJNU
EXPNO 1
PROCNO 1

F2 - Acquisition Parameters
Date_ 20180629
Time 10.19
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9846387 sec
RG 203
DW 60.800 usec
DE 6.50 usec
TE 299.6 K
D1 1.00000000 sec

======== CHANNEL f1 ========
NUC1 1H
P1 13.00 usec
PLW1 14.00000000 W
SFO1 400.1324710 MHz

F2 - Processing parameters
SI 65536
SF 400.1300104 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



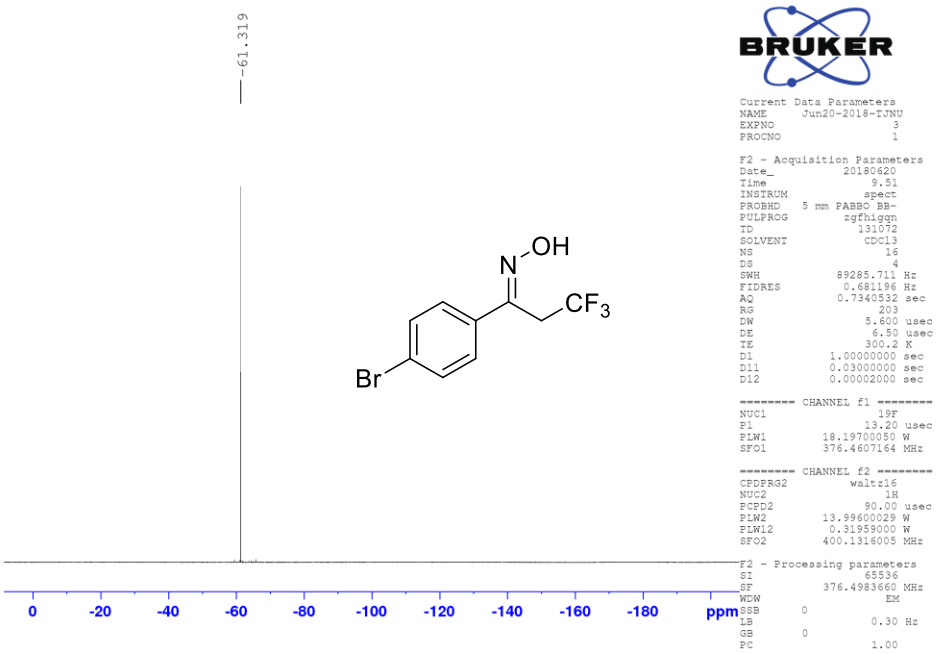
Current Data Parameters
NAME wxf-1-47-2-1
EXPNO 1
PROCNO 1

F2 - Acquisition Parameters
Date_ 20180703
Time 21.06
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 1024
DS 4
SWH 24038.461 Hz
FIDRES 0.366798 Hz
AQ 1.3631988 sec
RG 101
DW 20.800 usec
DE 6.50 usec
TE 300.4 K
D1 2.00000000 sec
D11 0.03000000 sec

======== CHANNEL f1 ========
NUC1 13C
P1 8.80 usec
PLW1 57.00000000 W
SFO1 100.6228293 MHz

======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PLW2 13.99600029 W
PLW12 0.31959000 W
PLW13 0.25887001 W
SFO2 400.1316005 MHz

F2 - Processing parameters
SI 32768
SF 100.6127690 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40




```
Current Data Parameters
NAME      Jun20-2018-TJNU
EXPNO                  3
PROCNO                 1

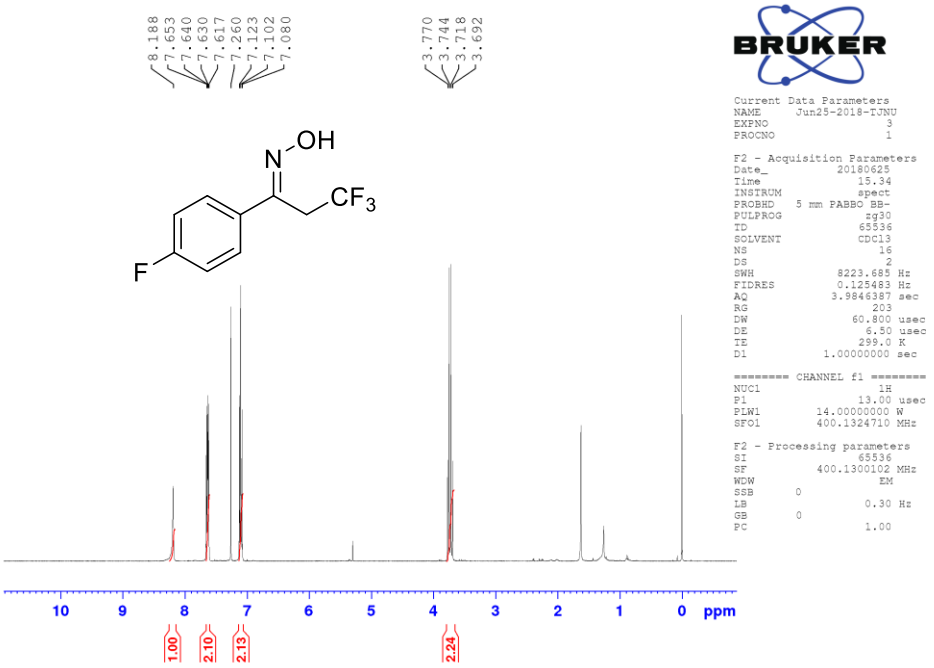
F2 - Acquisition Parameters
Date_           20180620
Time               9.51
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG         zgfhigqn
TD              131072
SOLVENT            CDCl3
NS                    16
DS                     4
SWH           89285.711 Hz
FIDRES         0.681196 Hz
AQ             0.7340532 sec
RG                   203
DW                5.600 usec
DE                6.50 usec
TE               300.2 K
D1            1.00000000 sec
D11           0.03000000 sec
D12           0.00002000 sec

======== CHANNEL f1 ========
NUC1                 19F
P1                 13.20 usec
PLW1         18.19700050 W
SFO1         376.46071640 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2              90.00 usec
PLW2         13.99600029 W
PLW12         0.31959000 W
SFO2         400.1316005 MHz

F2 - Processing parameters
SI                  65536
SF           376.4983660 MHz
WDW                    EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```

^{1}H,^{13}C and ^{19}F NMR spectra of **(E)-3,3,3-trifluoro-1-(4-fluorophenyl)propan-1-one oxime (4d)** in $CDCl_3$.

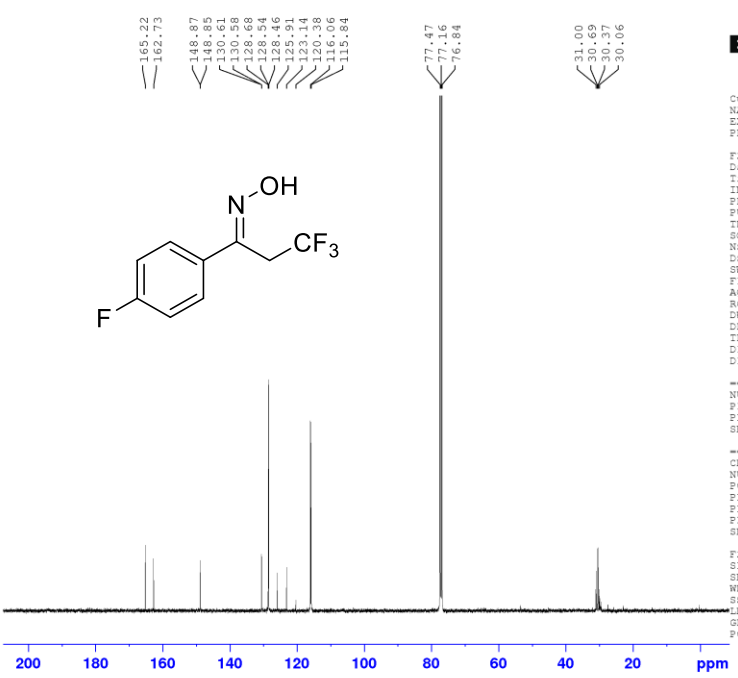



```
Current Data Parameters
NAME      Jun25-2018-TJNU
EXPNO                  3
PROCNO                 1

F2 - Acquisition Parameters
Date_           20180625
Time              15.34
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH           8223.685 Hz
FIDRES        0.125483 Hz
AQ            3.9846387 sec
RG                   203
DW                60.800 usec
DE                6.50 usec
TE               299.0 K
D1            1.00000000 sec

======== CHANNEL f1 ========
NUC1                 1H
P1                 13.00 usec
PLW1         14.00000000 W
SFO1         400.1324710 MHz

F2 - Processing parameters
SI                  65536
SF           400.1300102 MHz
WDW                    EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```



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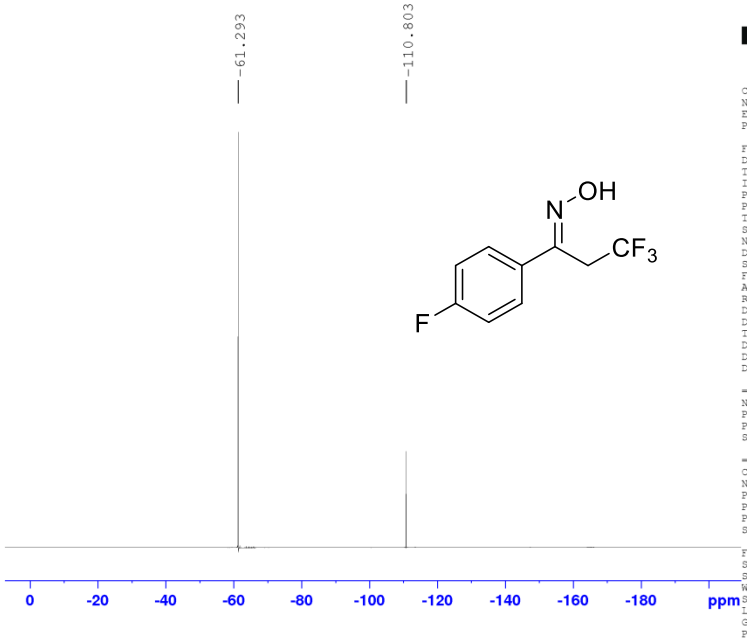
```
Current Data Parameters
NAME          Jun27-2018
EXPNO                  1
PROCNO                 1

F2 - Acquisition Parameters
Date_           20180627
Time               14.55
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                 3072
DS                    4
SWH           24038.461 Hz
FIDRES         0.366798 Hz
AQ             1.3631988 sec
RG                   64
DW                20.800 usec
DE                 6.50 usec
TE                304.2 K
D1             2.00000000 sec
D11            0.03000000 sec

======== CHANNEL f1 ========
NUC1                 13C
P1                  8.80 usec
PLW1         57.00000000 W
SFO1        100.6228293 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2              90.00 usec
PLW2         13.99600029 W
PLW12         0.31959000 W
PLW13         0.25887001 W
SFO2        400.1316005 MHz

F2 - Processing parameters
SI                  32768
SF           100.6127690 MHz
WDW                  EM
SSB       0
LB                 1.00 Hz
GB        0
PC                 1.40
```



BRUKER

```
Current Data Parameters
NAME      Jun19-2018-TJNU
EXPNO                  5
PROCNO                 1

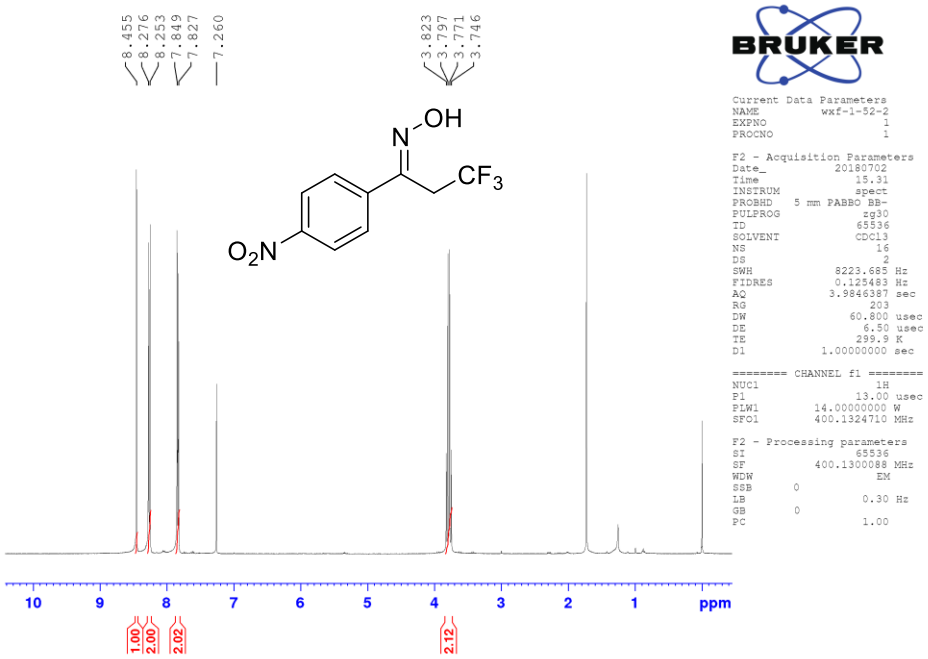
F2 - Acquisition Parameters
Date_           20180619
Time               17.08
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG         zgfhigqn
TD                131072
SOLVENT           CDCl3
NS                   16
DS                    4
SWH           89285.711 Hz
FIDRES         0.681196 Hz
AQ             0.7340532 sec
RG                  203
DW                5.600 usec
DE                 6.50 usec
TE                300.2 K
D1             1.00000000 sec
D11            0.03000000 sec
D12            0.00002000 sec

======== CHANNEL f1 ========
NUC1                 19F
P1                 13.20 usec
PLW1         18.19700050 W
SFO1        376.4607164 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2              90.00 usec
PLW2         13.99600029 W
PLW12         0.31959000 W
SFO2        400.1316005 MHz

F2 - Processing parameters
SI                  65536
SF           376.4983660 MHz
WDW                  EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```

^{1}H,^{13}C and ^{19}F NMR spectra of **(E)-3,3,3-trifluoro-1-(4-nitrophenyl)propan-1-one oxime (4e)**.

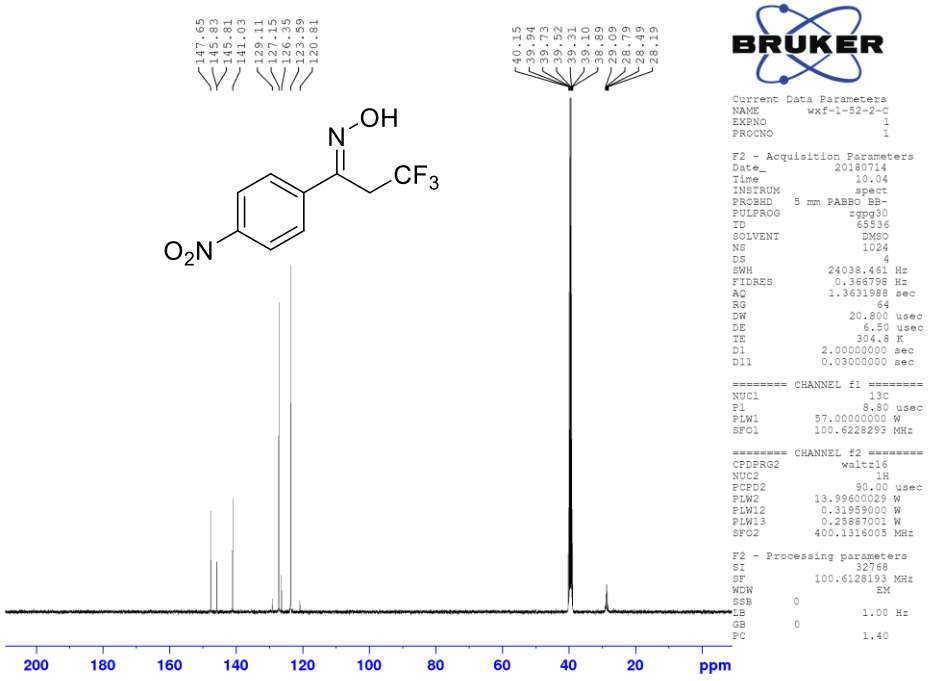



```
Current Data Parameters
NAME          wxf-1-52-2
EXPNO                  1
PROCNO                 1

F2 - Acquisition Parameters
Date_           20180702
Time              15.31
INSTRUM           spect
PROBHD    5 mm PABBO BB-
PULPROG           zg30
TD               65536
SOLVENT          CDCl3
NS                  16
DS                   2
SWH           8223.685 Hz
FIDRES        0.125483 Hz
AQ            3.9846387 sec
RG                 203
DW               60.800 usec
DE                6.50 usec
TE              299.9 K
D1            1.00000000 sec

======== CHANNEL f1 ========
NUC1                1H
P1                13.00 usec
PLW1        14.00000000 W
SFO1        400.1324710 MHz

F2 - Processing parameters
SI                 65536
SF          400.1300088 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```



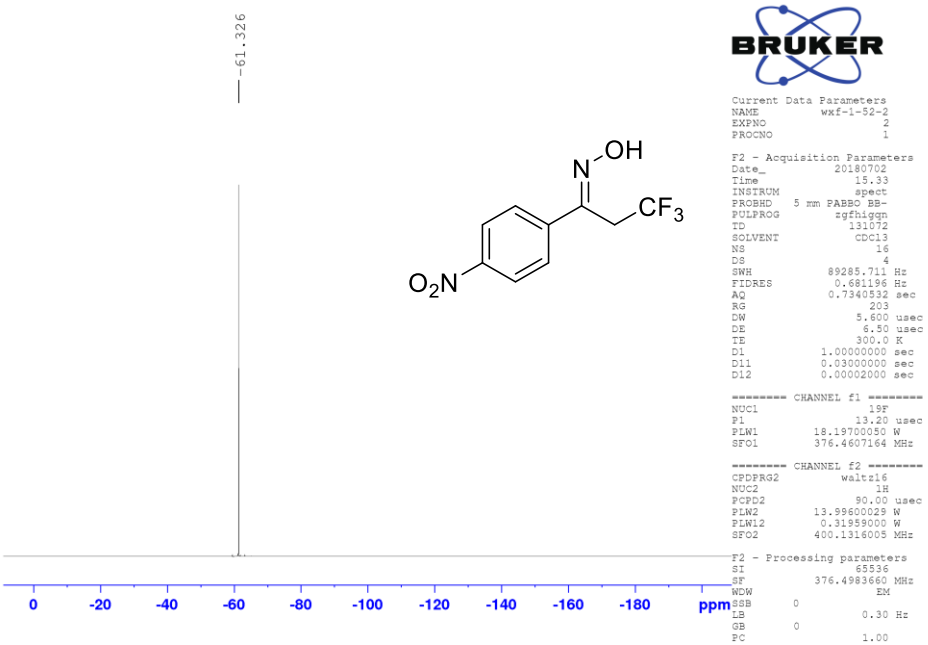

```
Current Data Parameters
NAME        wxf-1-52-2-C
EXPNO                  1
PROCNO                 1

F2 - Acquisition Parameters
Date_           20180714
Time              10.04
INSTRUM           spect
PROBHD    5 mm PABBO BB-
PULPROG         zgpg30
TD               65536
SOLVENT           DMSO
NS                1024
DS                   4
SWH          24038.461 Hz
FIDRES        0.366798 Hz
AQ            1.3631988 sec
RG                  64
DW               20.800 usec
DE                6.50 usec
TE              304.8 K
D1            2.00000000 sec
D11           0.03000000 sec

======== CHANNEL f1 ========
NUC1               13C
P1                8.80 usec
PLW1        57.00000000 W
SFO1        100.6228293 MHz

======== CHANNEL f2 ========
CPDPRG2         waltz16
NUC2                1H
PCPD2             90.00 usec
PLW2        13.99600029 W
PLW12        0.31959000 W
PLW13        0.25887001 W
SFO2        400.1316005 MHz

F2 - Processing parameters
SI                 32768
SF          100.6128193 MHz
WDW                   EM
SSB       0
LB                 1.00 Hz
GB        0
PC                 1.40
```



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Current Data Parameters
NAME wxf-1-52-2
EXPNO 2
PROCNO 1

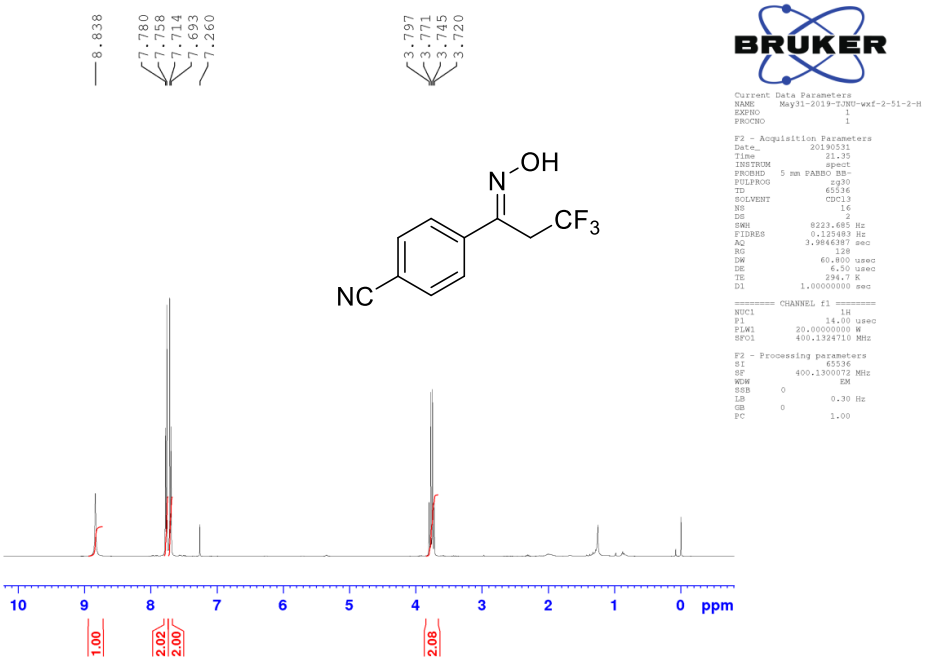
F2 - Acquisition Parameters
Date_ 20180702
Time 15.33
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgfhigqn
TD 131072
SOLVENT CDCl3
NS 16
DS 4
SWH 89285.711 Hz
FIDRES 0.681196 Hz
AQ 0.7340532 sec
RG 203
DW 5.600 usec
DE 6.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
D12 0.00002000 sec

======== CHANNEL f1 ========
NUC1 19F
P1 13.20 usec
PLW1 18.19700050 W
SFO1 376.4607164 MHz

======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PLW2 13.99600029 W
PLW12 0.31959000 W
SFO2 400.1316005 MHz

F2 - Processing parameters
SI 65536
SF 376.4983660 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

^{1}H,^{13}C and ^{19}F NMR spectra of **(E)-4-(3,3,3-trifluoro-1-(hydroxyimino)propyl)benzonitrile (4f)**.



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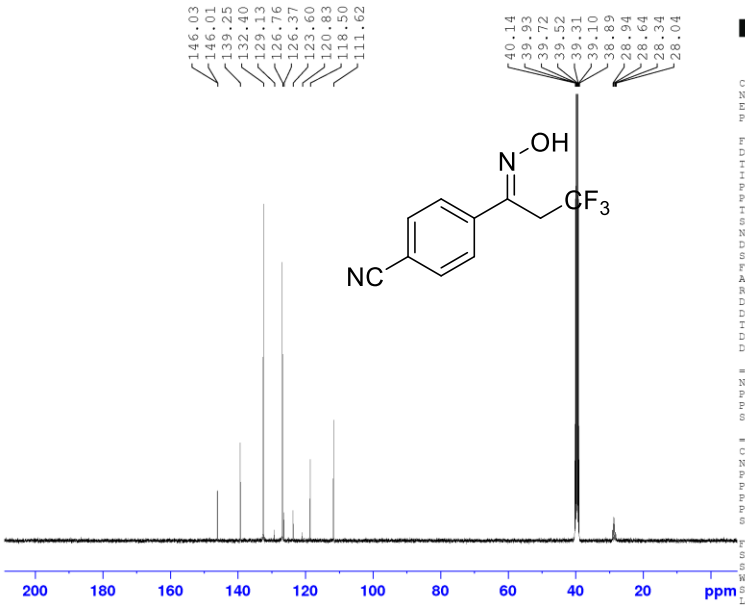
Current Data Parameters
NAME May31-2019-TJNU-wxf-2-51-2-H
EXPNO 1
PROCNO 1

F2 - Acquisition Parameters
Date_ 20190531
Time 21.35
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8223.685 Hz
FIDRES 0.125403 Hz
AQ 3.9866387 sec
RG 128
DW 60.800 usec
DE 6.50 usec
TE 294.7 K
D1 1.00000000 sec

======== CHANNEL f1 ========
NUC1 1H
P1 14.00 usec
PLW1 20.00000000 W
SFO1 400.1324710 MHz

F2 - Processing parameters
SI 65536
SF 400.1300072 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



BRUKER

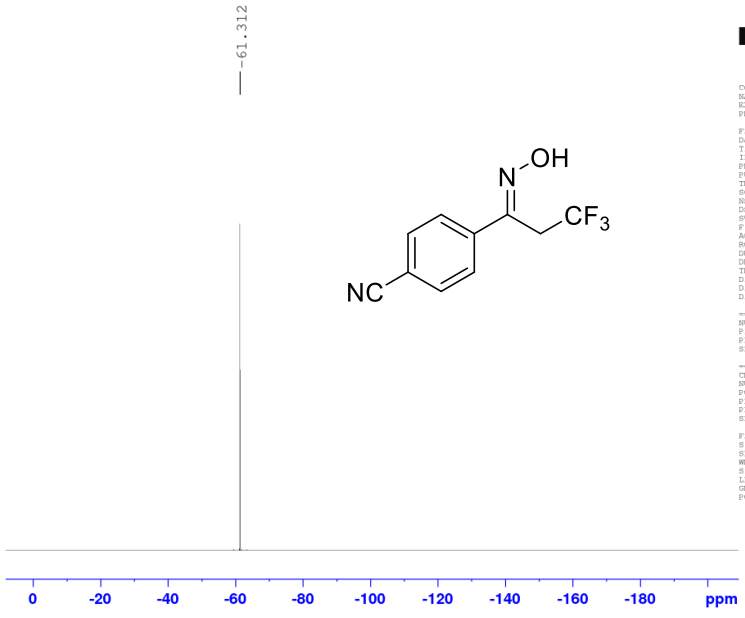
```
Current Data Parameters
NAME         wxf-1-93-2-c
EXPNO                   1
PROCNO                  1

F2 - Acquisition Parameters
Date_           20180829
Time                9.53
INSTRUM            spect
PROBHD    5 mm PABBO BB-
PULPROG          zgpg30
TD                65536
SOLVENT            DMSO
NS                 1024
DS                    4
SWH           24038.461 Hz
FIDRES         0.366798 Hz
AQ             1.3631988 sec
RG                  101
DW               20.800 usec
DE                6.50 usec
TE               302.7 K
D1            2.00000000 sec
D11           0.03000000 sec

======== CHANNEL f1 ========
NUC1               13C
P1                8.80 usec
PLW1         57.00000000 W
SFO1        100.6228293 MHz

======== CHANNEL f2 ========
CPDPRG2         waltz16
NUC2                1H
PCPD2            90.00 usec
PLW2         13.99600029 W
PLW12         0.31959000 W
PLW13         0.25887001 W
SFO2        400.1316005 MHz

F2 - Processing parameters
SI                 32768
SF          100.6128193 MHz
WDW                   EM
SSB       0
LB                1.00 Hz
GB        0
PC                1.40
```



BRUKER

```
Current Data Parameters
NAME      May31-2019-TJNU-wxf-2-51-2-F
EXPNO                   1
PROCNO                  1

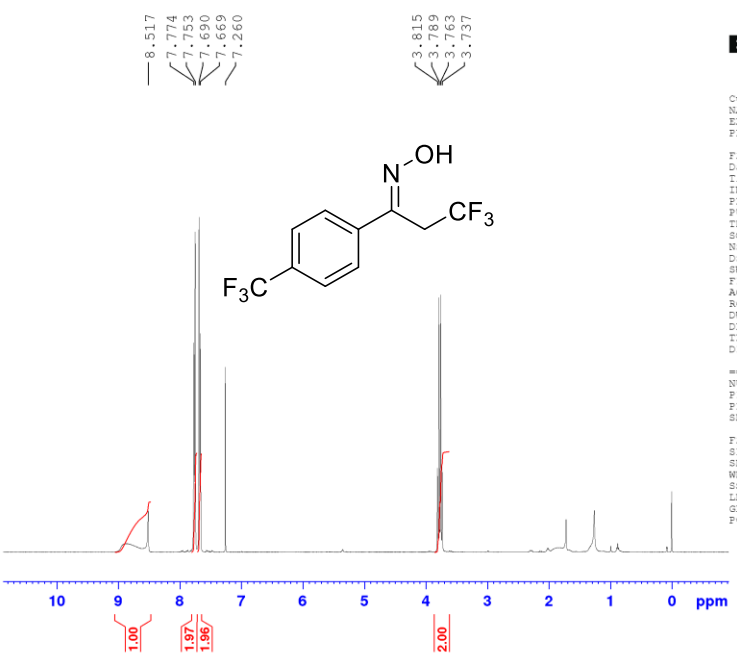
F2 - Acquisition Parameters
Date_           20190531
Time               21.37
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG          zgfhigqn
TD                131072
SOLVENT             CDCl3
NS                    16
DS                     4
SWH           89285.711 Hz
FIDRES         0.681196 Hz
AQ             0.7340532 sec
RG                  203
DW               5.600 usec
DE                6.50 usec
TE               294.9 K
D1            1.00000000 sec
D11           0.03000000 sec
D12           0.00002000 sec

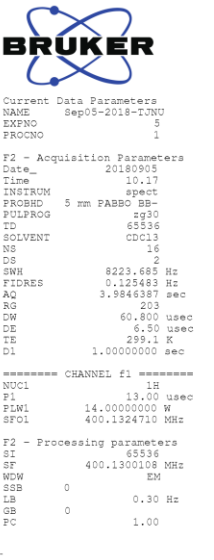
======== CHANNEL f1 ========
NUC1               19F
P1                13.20 usec
PLW1         18.19700050 W
SFO1        376.4607164 MHz

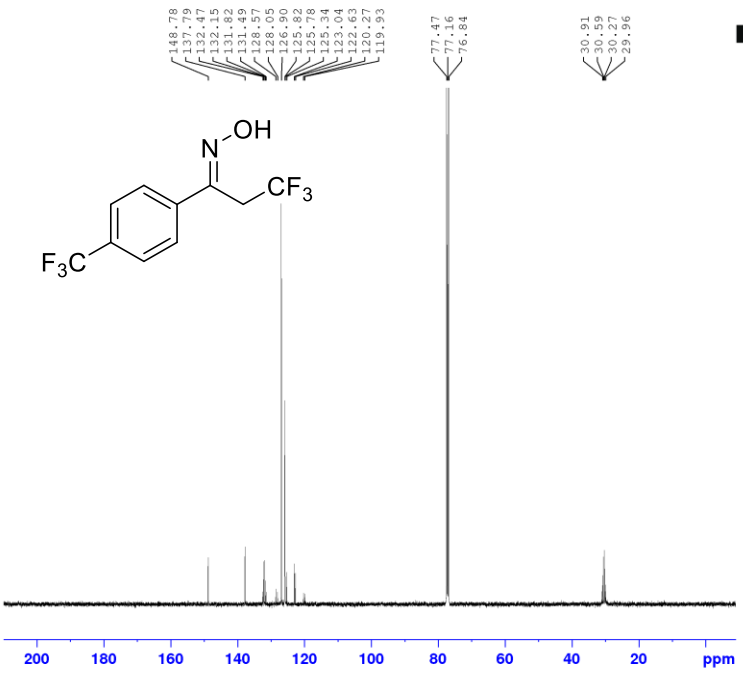
======== CHANNEL f2 ========
CPDPRG2         waltz16
NUC2                1H
PCPD2            90.00 usec
PLW2         13.99600029 W
PLW12         0.31959000 W
SFO2        400.1316005 MHz

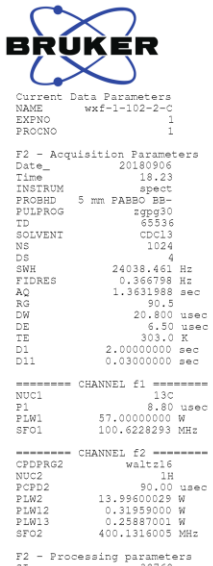
F2 - Processing parameters
SI                 65536
SF          376.4983660 MHz
WDW                   EM
SSB       0
LB                0.30 Hz
GB        0
PC                1.00
```

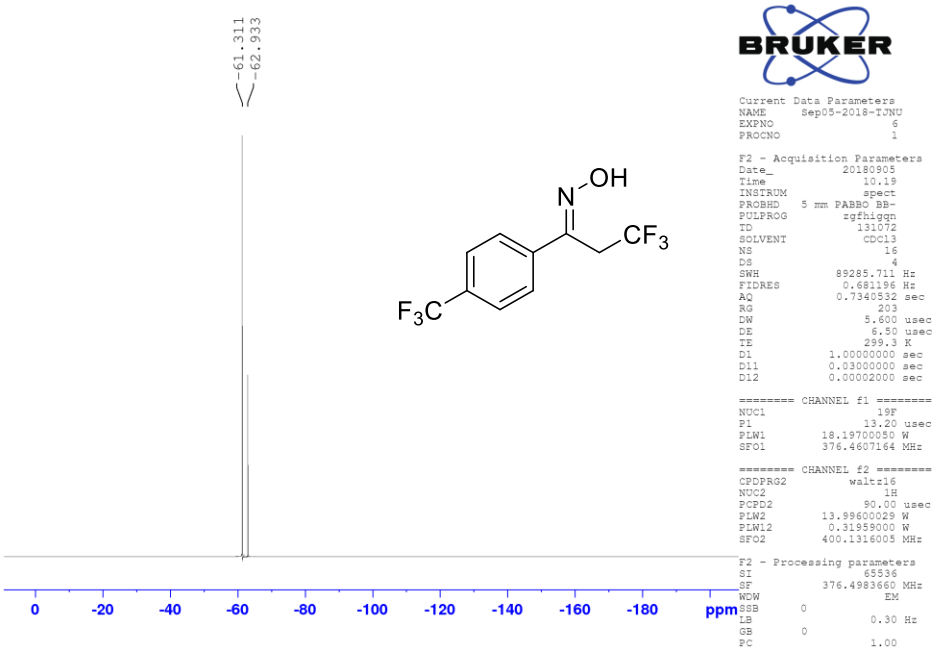
^{1}H,^{13}C and ^{19}F NMR spectra of **(E)-3,3,3-trifluoro-1-(4-(trifluoromethyl)phenyl)propan-1-one oxime (4g)** in $CDCl_3$.











Current Data Parameters
NAME Sep05-2018-TJNU
EXPNO 6
PROCNO 1

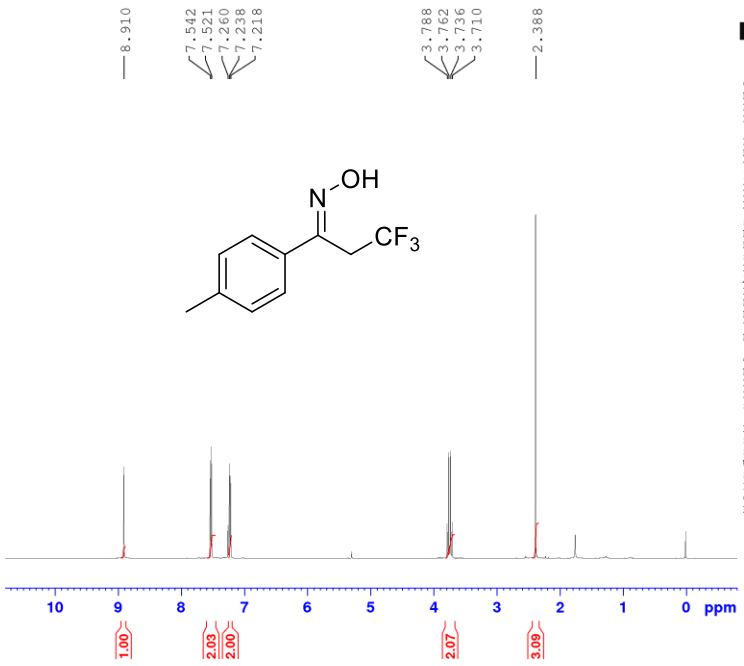
F2 - Acquisition Parameters
Date_ 20180905
Time 10.19
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgfhigqn
TD 131072
SOLVENT CDCl3
NS 16
DS 4
SWH 89285.711 Hz
FIDRES 0.681196 Hz
AQ 0.7340532 sec
RG 203
DW 5.600 usec
DE 6.50 usec
TE 299.3 K
D1 1.00000000 sec
D11 0.03000000 sec
D12 0.00002000 sec

======== CHANNEL f1 ========
NUC1 19F
P1 13.20 usec
PLW1 18.19700050 W
SFO1 376.4607164 MHz

======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PLW2 13.99600029 W
PLW12 0.31959000 W
SFO2 400.1316005 MHz

F2 - Processing parameters
SI 65536
SF 376.4983660 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

^{1}H,^{13}C and ^{19}F NMR spectra of **(E)-3,3,3-trifluoro-1-(p-tolyl)propan-1-one oxime (4h)** in $CDCl_3$.

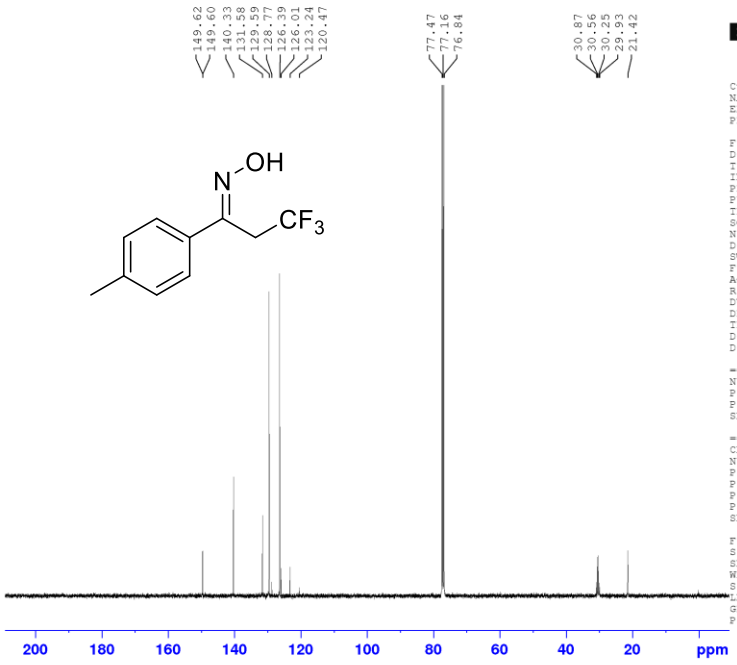


Current Data Parameters
NAME WXF-1-64-1-H-2
EXPNO 1
PROCNO 1

F2 - Acquisition Parameters
Date_ 20180714
Time 10.14
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9845889 sec
RG 181
DW 60.800 usec
DE 6.50 usec
TE 301.3 K
D1 1.00000000 sec

======== CHANNEL f1 ========
NUC1 1H
P1 13.00 usec
PLW1 14.00000000 W
SFO1 400.1324710 MHz

F2 - Processing parameters
SI 65536
SF 400.1300100 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



BRUKER

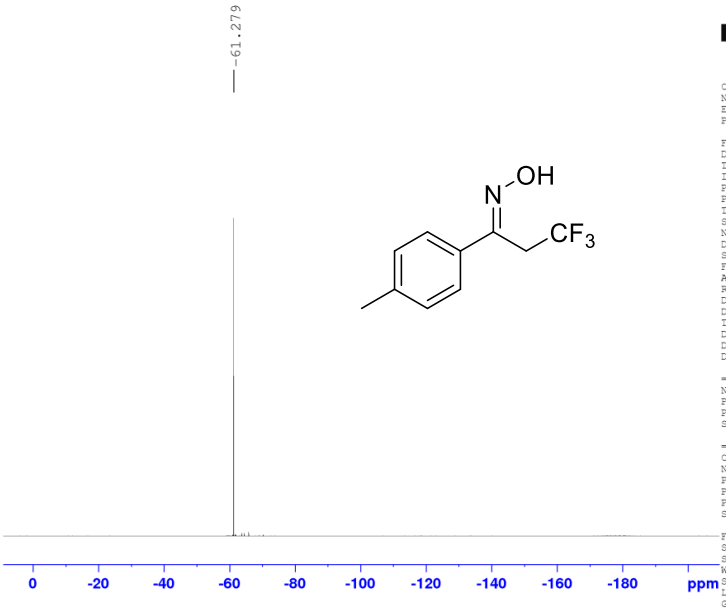
```
Current Data Parameters
NAME          wxf-1-64-1-C
EXPNO                    1
PROCNO                   1

F2 - Acquisition Parameters
Date_           20180717
Time              10.27
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                 1024
DS                    4
SWH           24038.461 Hz
FIDRES         0.366798 Hz
AQ             1.3631988 sec
RG                   64
DW               20.800 usec
DE                6.50 usec
TE               300.9 K
D1            2.00000000 sec
D11           0.03000000 sec

======== CHANNEL f1 ========
NUC1                 13C
P1                  8.80 usec
PLW1        57.00000000 W
SFO1       100.6228293 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2             90.00 usec
PLW2        13.99600029 W
PLW12        0.31959000 W
PLW13        0.25887001 W
SFO2       400.1316005 MHz

F2 - Processing parameters
SI                32768
SF           100.6127690 MHz
WDW                  EM
SSB       0
LB                1.00 Hz
GB        0
PC                1.40
```



BRUKER

```
Current Data Parameters
NAME          wxf-1-64-1-F
EXPNO                    1
PROCNO                   1

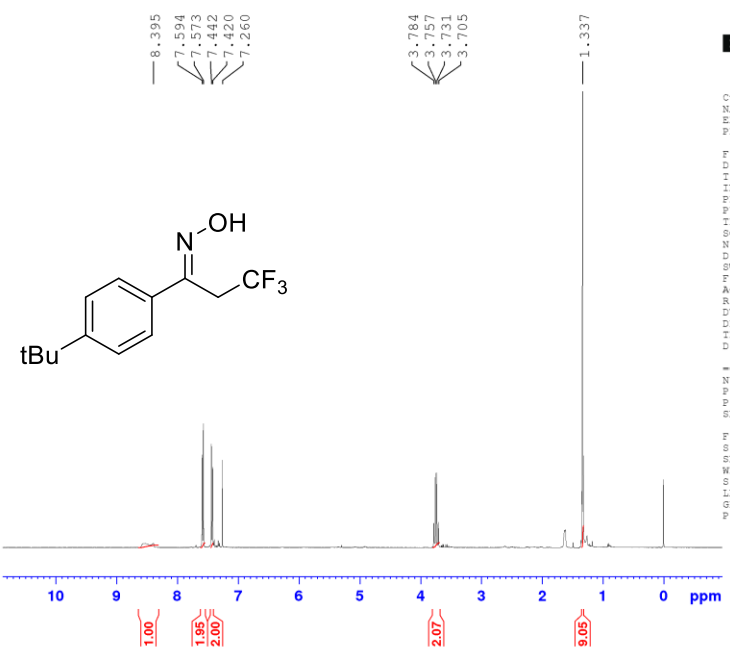
F2 - Acquisition Parameters
Date_           20180712
Time              10.29
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG         zgfhigqn
TD               131072
SOLVENT           CDCl3
NS                   16
DS                    4
SWH           89285.711 Hz
FIDRES         0.681196 Hz
AQ             0.7340532 sec
RG                  203
DW               5.600 usec
DE                6.50 usec
TE               300.5 K
D1            1.00000000 sec
D11           0.03000000 sec
D12           0.00002000 sec

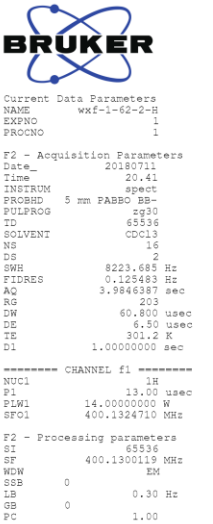
======== CHANNEL f1 ========
NUC1                 19F
P1                 13.20 usec
PLW1        18.19700050 W
SFO1       376.4607164 MHz

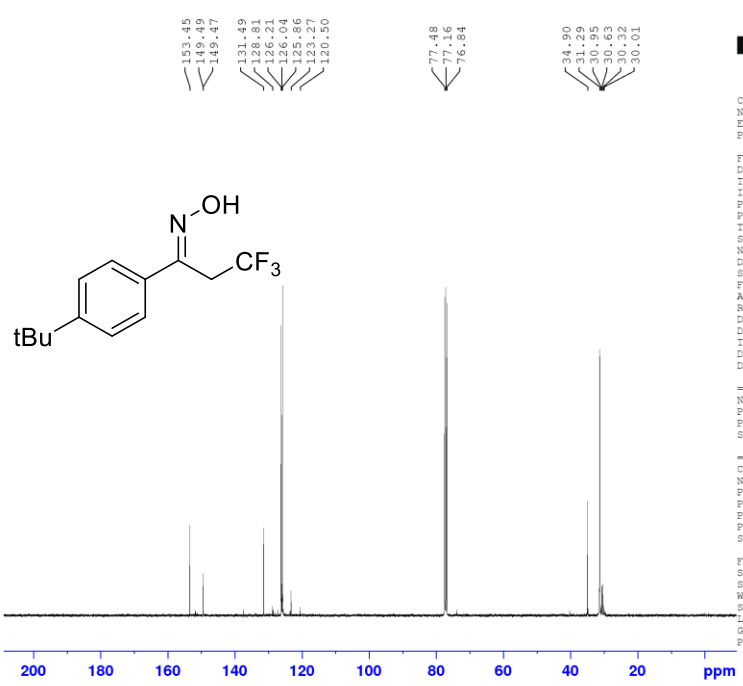
======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2             90.00 usec
PLW2        13.99600029 W
PLW12        0.31959000 W
SFO2       400.1316005 MHz

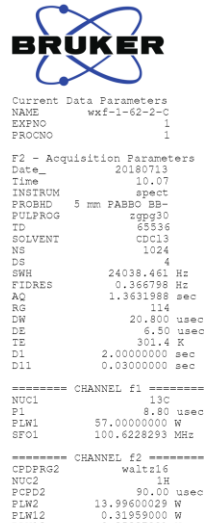
F2 - Processing parameters
SI                65536
SF           376.4983660 MHz
WDW                  EM
SSB       0
LB                0.30 Hz
GB        0
PC                1.00
```

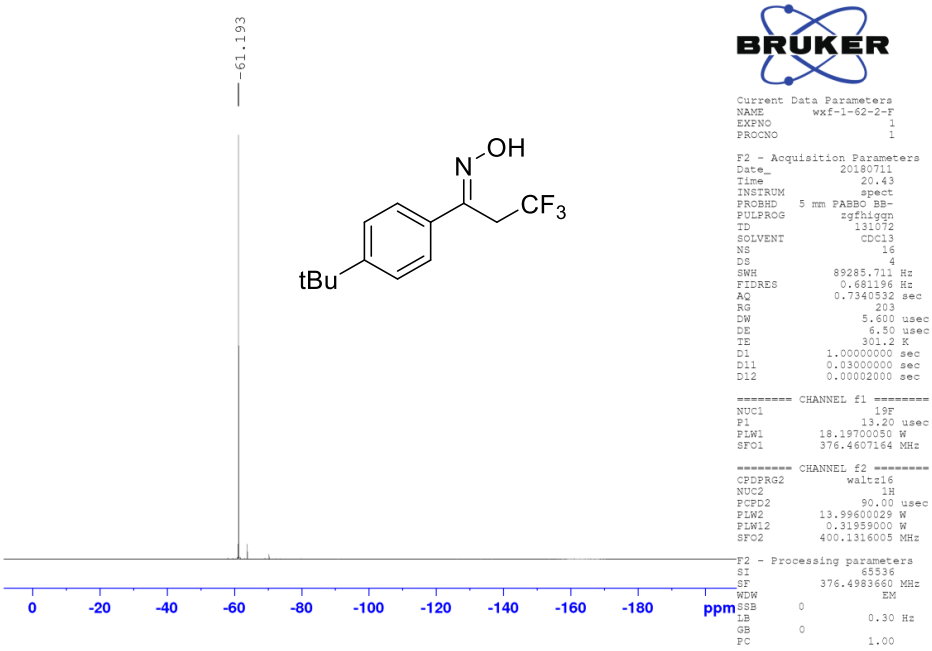
^{1}H,^{13}C and ^{19}F NMR spectra of **(E)-1-(4-(tert-butyl)phenyl)-3,3,3-trifluoropropan-1-one oxime (4i)** in $CDCl_3$.












```
Current Data Parameters
NAME        wxf-1-62-2-F
EXPNO                  1
PROCNO                 1

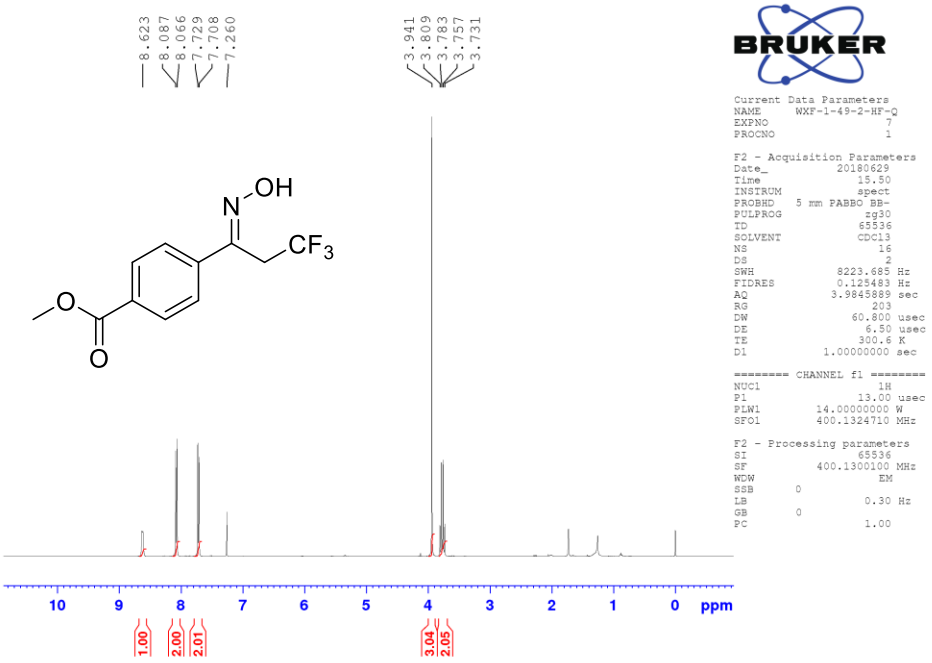
F2 - Acquisition Parameters
Date_           20180711
Time              20.43
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG        zgfhigqn
TD               131072
SOLVENT            CDCl3
NS                    16
DS                     4
SWH           89285.711 Hz
FIDRES         0.681196 Hz
AQ            0.7340532 sec
RG                   203
DW                5.600 usec
DE                6.50 usec
TE                301.2 K
D1           1.00000000 sec
D11          0.03000000 sec
D12          0.00002000 sec

======== CHANNEL f1 ========
NUC1                 19F
P1                 13.20 usec
PLW1        18.19700050 W
SFO1       376.4607164 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2             90.00 usec
PLW2        13.99600029 W
PLW12        0.31959000 W
SFO2       400.1316005 MHz

F2 - Processing parameters
SI                 65536
SF          376.4983660 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```

^{1}H,^{13}C and ^{19}F NMR spectra of **(E)-methyl 4-(3,3,3-trifluoro-1-(hydroxyimino)propyl)benzoate (4j)** in $CDCl_3$.

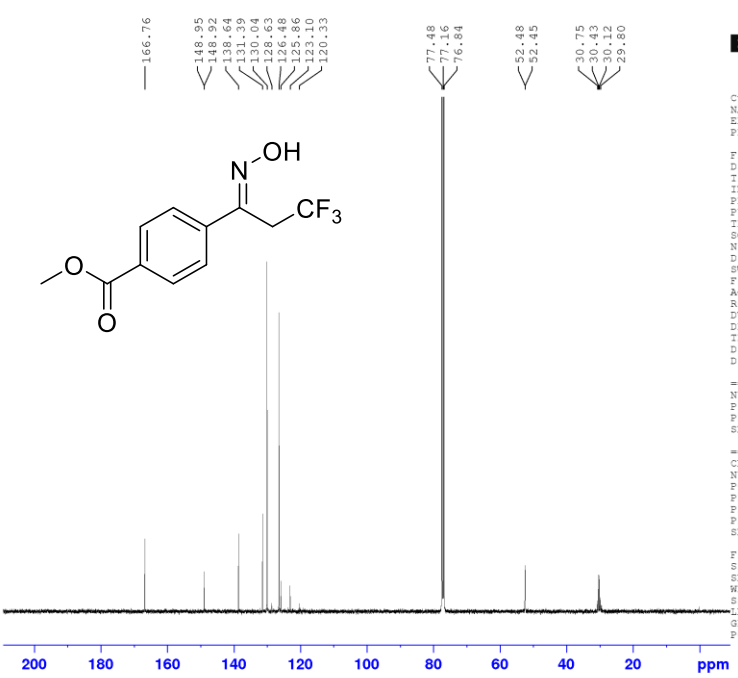



```
Current Data Parameters
NAME      WXF-1-49-2-HF-Q
EXPNO                   7
PROCNO                  1

F2 - Acquisition Parameters
Date_           20180629
Time              15.50
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG             zg30
TD                65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH            8223.685 Hz
FIDRES         0.125483 Hz
AQ             3.9845889 sec
RG                   203
DW                60.800 usec
DE                6.50 usec
TE                300.6 K
D1           1.00000000 sec

======== CHANNEL f1 ========
NUC1                 1H
P1                13.00 usec
PLW1        14.00000000 W
SFO1       400.1324710 MHz

F2 - Processing parameters
SI                 65536
SF          400.1300100 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```



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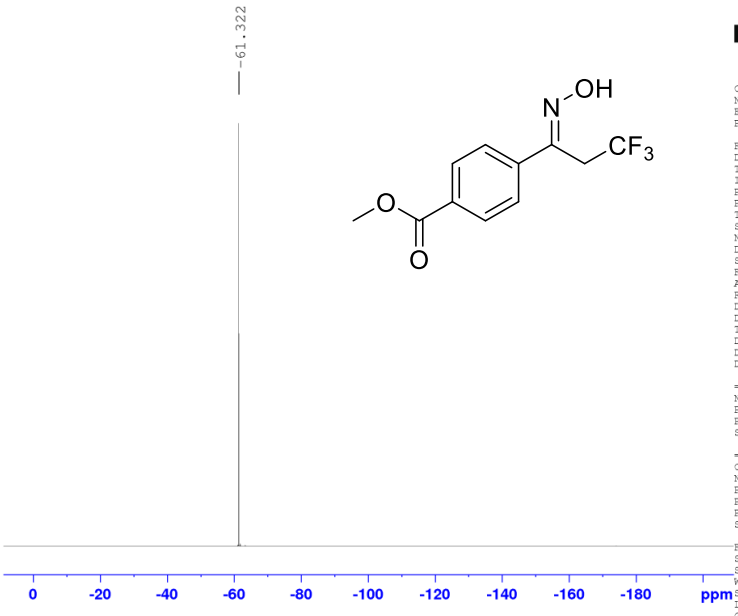
```
Current Data Parameters
NAME                  wxf-1-49-2
EXPNO                          1
PROCNO                         1

F2 - Acquisition Parameters
Date_                   20180702
Time                       22.47
INSTRUM                    spect
PROBHD    5 mm PABBO BB-
PULPROG                 zgpg30
TD                         65536
SOLVENT                    CDCl3
NS                          3072
DS                             4
SWH                    24038.461 Hz
FIDRES                  0.366798 Hz
AQ                      1.3631988 sec
RG                           101
DW                        20.800 usec
DE                         6.50 usec
TE                        303.8 K
D1                     2.00000000 sec
D11                    0.03000000 sec

======== CHANNEL f1 ========
NUC1                         13C
P1                         8.80 usec
PLW1                  57.00000000 W
SFO1                 100.6228293 MHz

======== CHANNEL f2 ========
CPDPRG2                  waltz16
NUC2                         1H
PCPD2                     90.00 usec
PLW2                  13.99600029 W
PLW12                  0.31959000 W
PLW13                  0.25887001 W
SFO2                 400.1316005 MHz

F2 - Processing parameters
SI                         32768
SF                   100.6127690 MHz
WDW                           EM
SSB                0
LB                         1.00 Hz
GB                 0
PC                         1.40
```



BRUKER

```
Current Data Parameters
NAME          Jun29-2018-TJNU
EXPNO                        8
PROCNO                       1

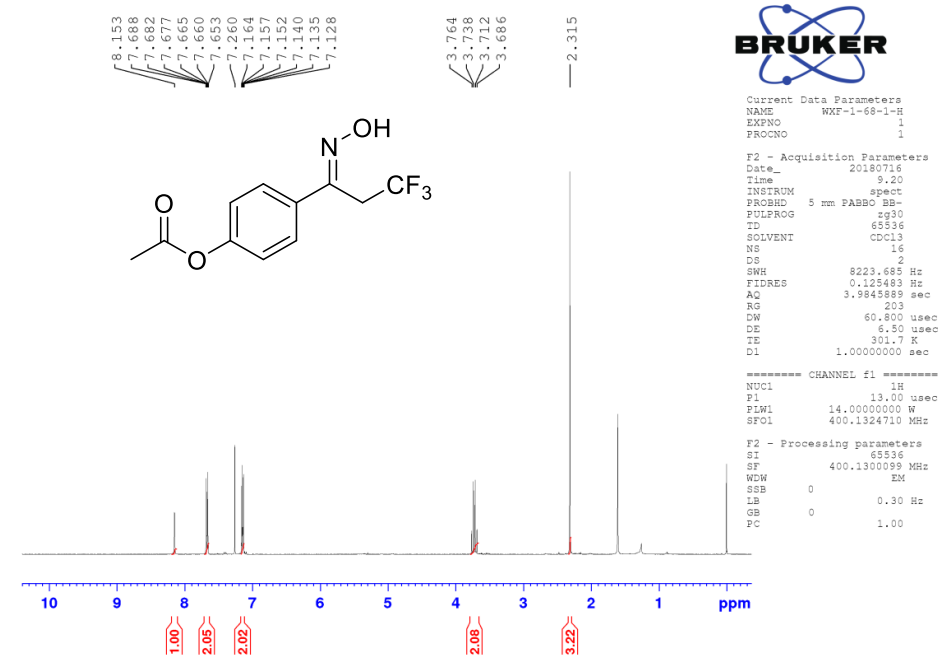
F2 - Acquisition Parameters
Date_                 20180629
Time                     15.53
INSTRUM                  spect
PROBHD    5 mm PABBO BB-
PULPROG               zgfhigqn
TD                      131072
SOLVENT                  CDCl3
NS                          16
DS                           4
SWH                  89285.711 Hz
FIDRES                0.681196 Hz
AQ                    0.7340532 sec
RG                         203
DW                       5.600 usec
DE                        6.50 usec
TE                       300.6 K
D1                   1.00000000 sec
D11                  0.03000000 sec
D12                  0.00002000 sec

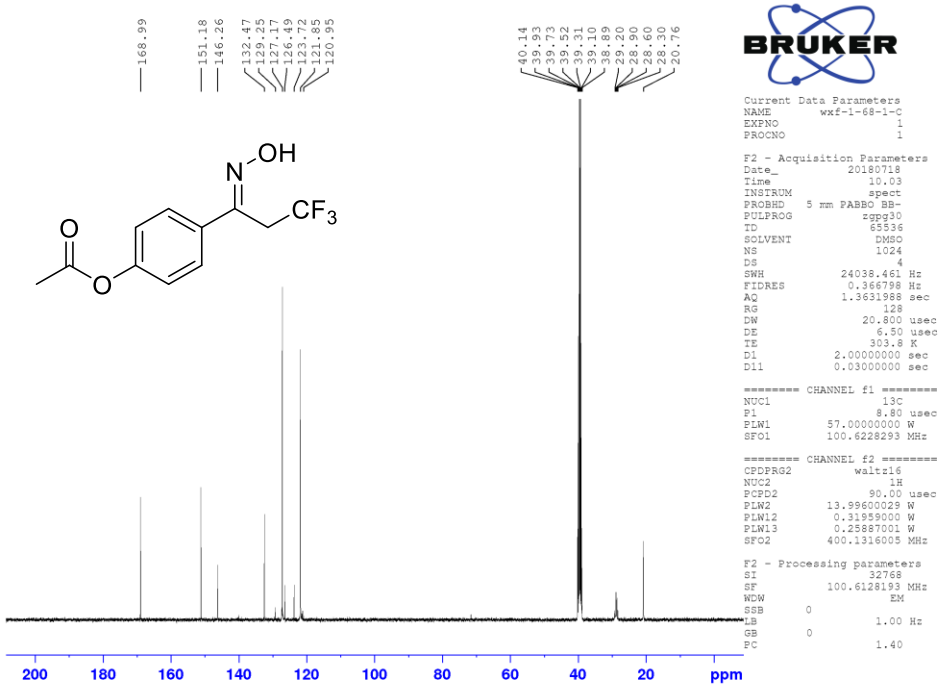
======== CHANNEL f1 ========
NUC1                        19F
P1                        13.20 usec
PLW1                 18.19700050 W
SFO1                376.4607164 MHz

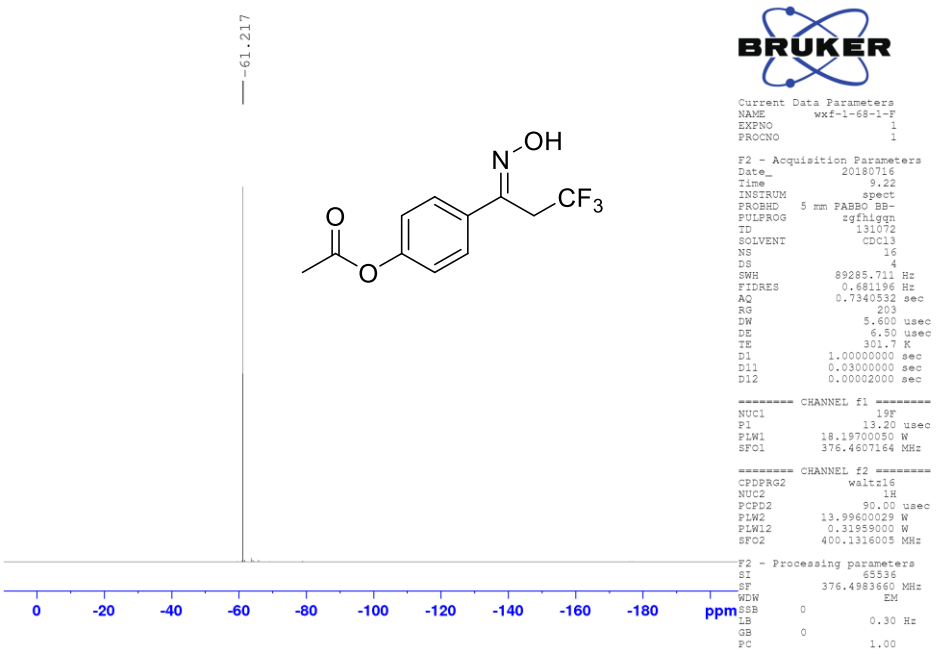
======== CHANNEL f2 ========
CPDPRG2                  waltz16
NUC2                         1H
PCPD2                     90.00 usec
PLW2                  13.99600029 W
PLW12                  0.31959000 W
SFO2                 400.1316005 MHz

F2 - Processing parameters
SI                         65536
SF                   376.4983660 MHz
WDW                           EM
SSB                0
LB                         0.30 Hz
GB                 0
PC                         1.00
```

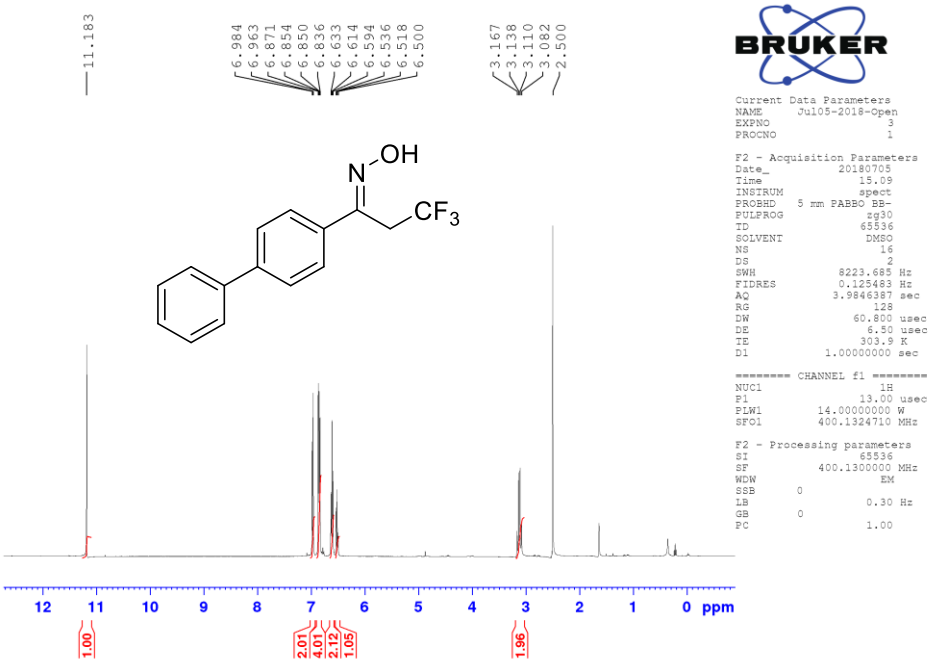
^{1}H,^{13}C and ^{19}F NMR spectra of **(E)-4-(3,3,3-trifluoro-1-(hydroxyimino)propyl)phenyl acetate (4k)**.

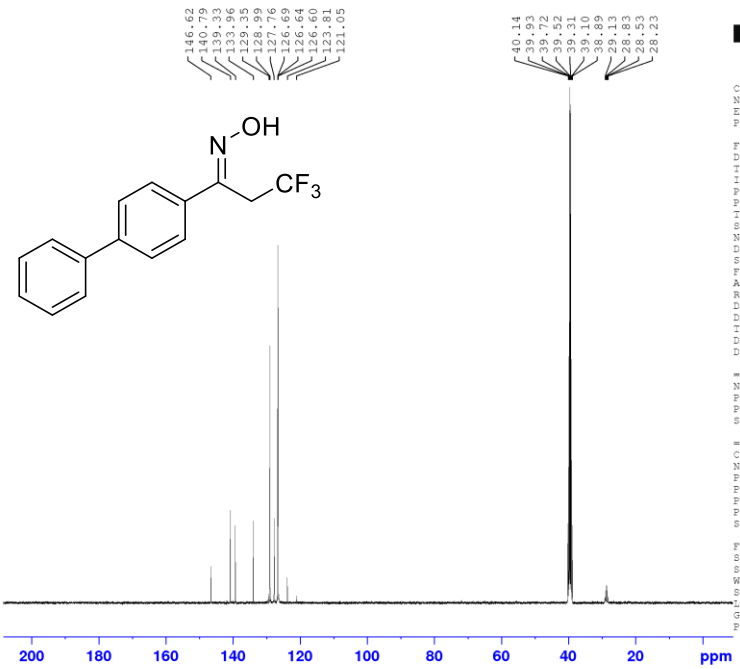






^{1}H,^{13}C and ^{19}F NMR spectra of **(E)-1-([1,1'-biphenyl]-4-yl)-3,3,3-trifluoropropan-1-one oxime (4l)**.





BRUKER

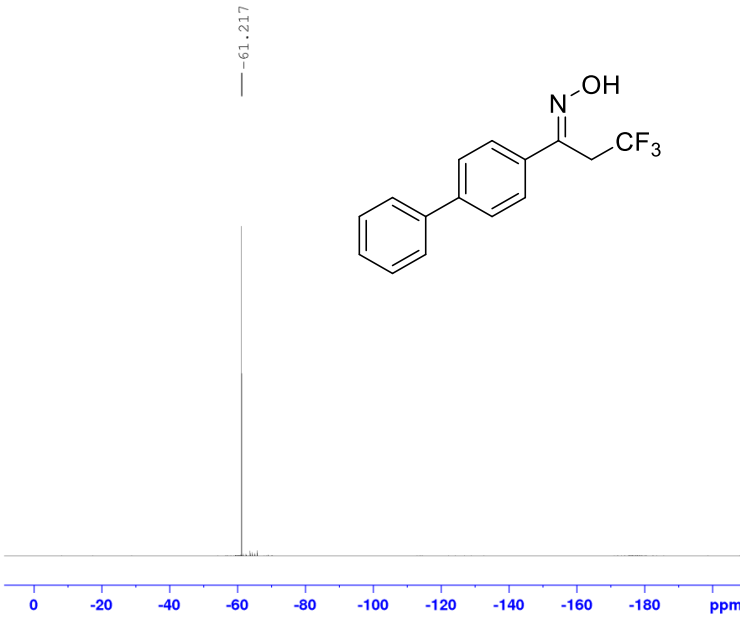
```
Current Data Parameters
NAME        wxf-1-57-1-c
EXPNO                  1
PROCNO                 1

F2 - Acquisition Parameters
Date_           20180717
Time               18.00
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG          zgpg30
TD                65536
SOLVENT             DMSO
NS                  1024
DS                     4
SWH           24038.461 Hz
FIDRES         0.366798 Hz
AQ             1.3631988 sec
RG                   128
DW                20.800 usec
DE                 6.50 usec
TE                301.0 K
D1             2.00000000 sec
D11            0.03000000 sec

======== CHANNEL f1 ========
NUC1                 13C
P1                  8.80 usec
PLW1         57.00000000 W
SFO1        100.6228293 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                  1H
PCPD2              90.00 usec
PLW2         13.99600029 W
PLW12         0.31959000 W
PLW13         0.25887001 W
SFO2        400.1316005 MHz

F2 - Processing parameters
SI                 32768
SF          100.6128193 MHz
WDW                   EM
SSB       0
LB                 1.00 Hz
GB        0
PC                 1.40
```



BRUKER

```
Current Data Parameters
NAME          wxf-1-57-1
EXPNO                  2
PROCNO                 1

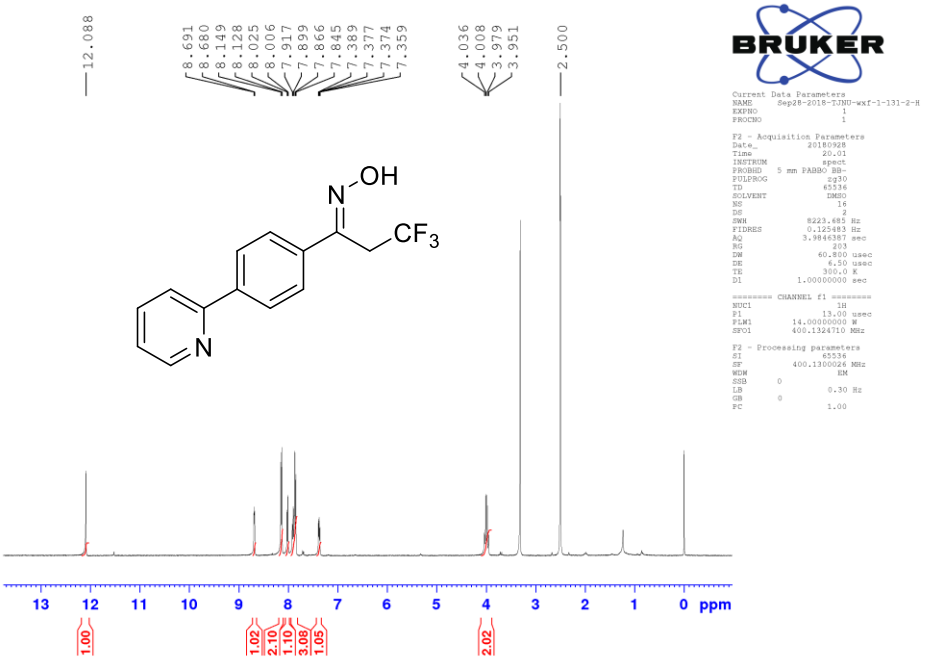
F2 - Acquisition Parameters
Date_           20180704
Time               10.15
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG         zgfhigqn
TD                131072
SOLVENT             CDCl3
NS                    16
DS                     4
SWH            89285.711 Hz
FIDRES         0.681198 Hz
AQ             0.7340532 sec
RG                   203
DW                5.600 usec
DE                 6.50 usec
TE                299.7 K
D1             1.00000000 sec
D11            0.03000000 sec
D12            0.00002000 sec

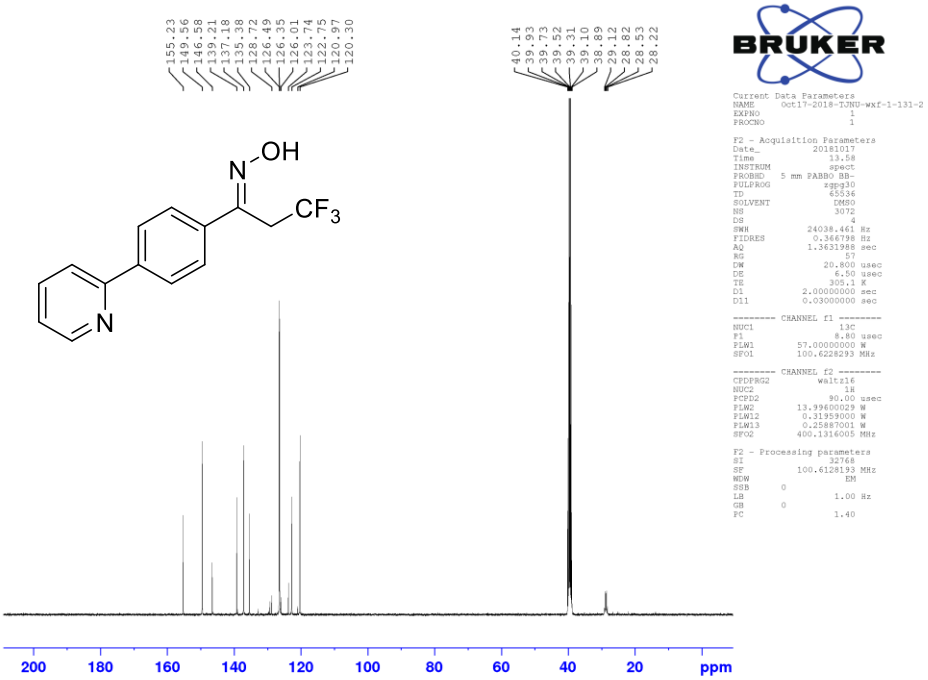
======== CHANNEL f1 ========
NUC1                 19F
P1                 13.20 usec
PLW1         18.19700050 W
SFO1        376.4607164 MHz

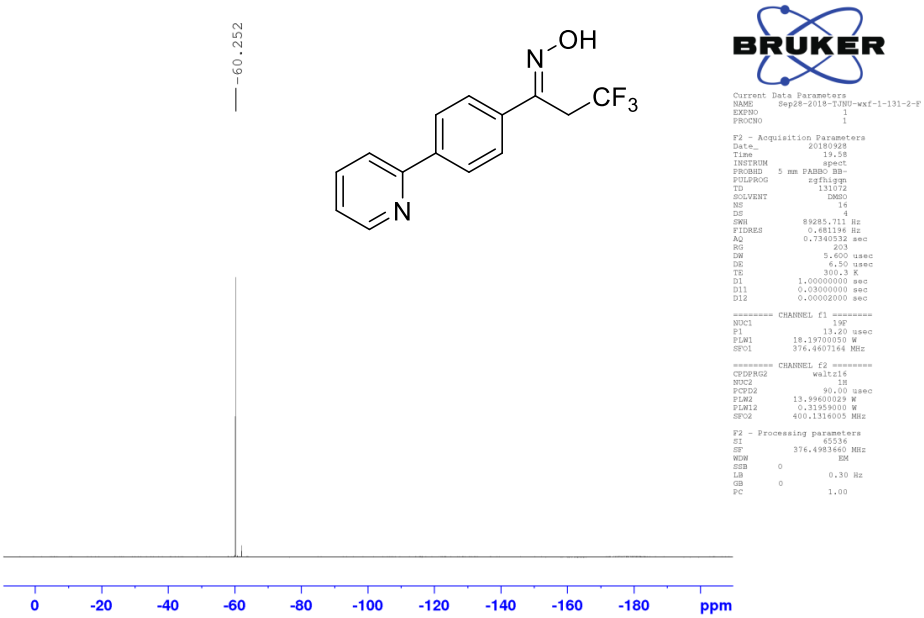
======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                  1H
PCPD2              90.00 usec
PLW2         13.99600029 W
PLW12         0.31959000 W
SFO2        400.1316005 MHz

F2 - Processing parameters
SI                 65536
SF          376.4983660 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```

^{1}H,^{13}C and ^{19}F NMR spectra of **(E)-3,3,3-trifluoro-1-(4-(pyridin-2-yl)phenyl)propan-1-one oxime (4m)** in $(CD_3)_2SO$.







BRUKER

Current Data Parameters
NAME Sep28-2018-TJNU-wxf-1-131-2-F
EXPNO 1
PROCNO 1

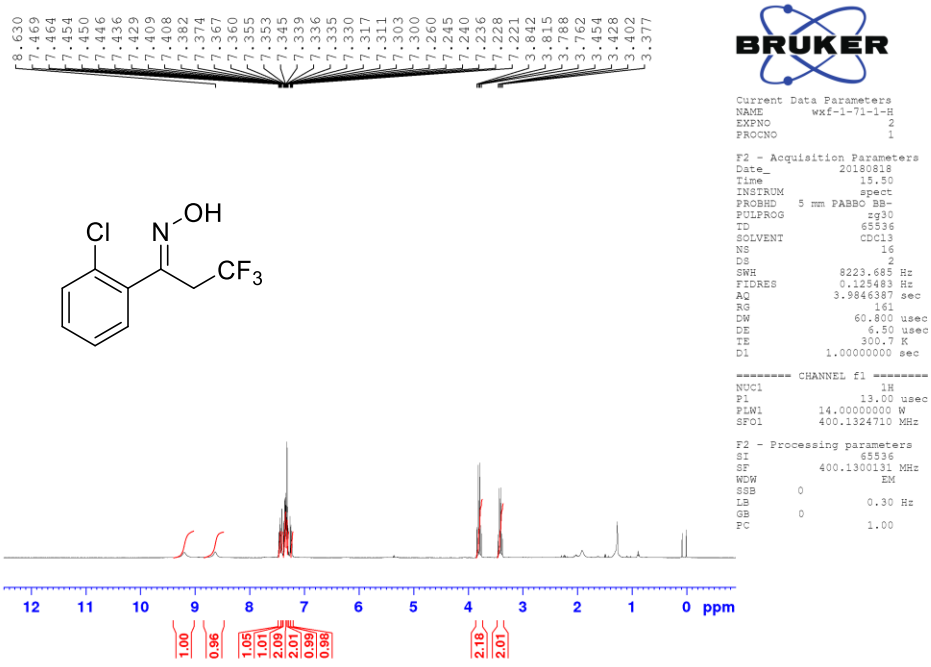
F2 - Acquisition Parameters
Date_ 20180928
Time 19.58
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgfhigqn
TD 131072
SOLVENT DMSO
NS 16
DS 4
SWH 89285.711 Hz
FIDRES 0.681196 Hz
AQ 0.7340532 sec
RG 203
DW 5.600 usec
DE 6.50 usec
TE 300.3 K
D1 1.00000000 sec
D11 0.03000000 sec
D12 0.00002000 sec

======== CHANNEL f1 ========
NUC1 19F
P1 13.20 usec
PLW1 18.19700050 W
SFO1 376.4607164 MHz

======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PLW2 13.99600029 W
PLW12 0.31959000 W
SFO2 400.1316005 MHz

F2 - Processing parameters
SI 65536
SF 376.4983660 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

^{1}H,^{13}C and ^{19}F NMR spectra of **(E)-1-(2-chlorophenyl)-3,3,3-trifluoropropan-1-one oxime (4n)** in $CDCl_3$.



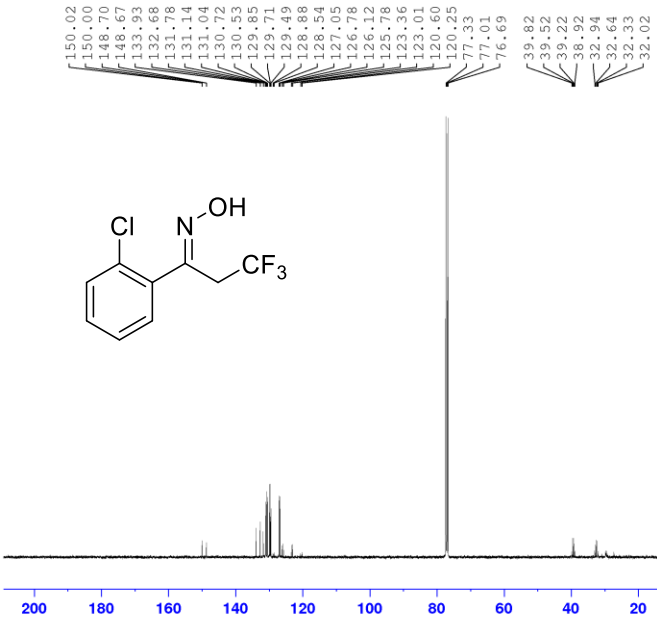
BRUKER

Current Data Parameters
NAME wxf-1-71-1-H
EXPNO 2
PROCNO 1

F2 - Acquisition Parameters
Date_ 20180818
Time 15.50
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9846387 sec
RG 161
DW 60.800 usec
DE 6.50 usec
TE 300.7 K
D1 1.00000000 sec

======== CHANNEL f1 ========
NUC1 1H
P1 13.00 usec
PLW1 14.00000000 W
SFO1 400.1324710 MHz

F2 - Processing parameters
SI 65536
SF 400.1300131 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



BRUKER

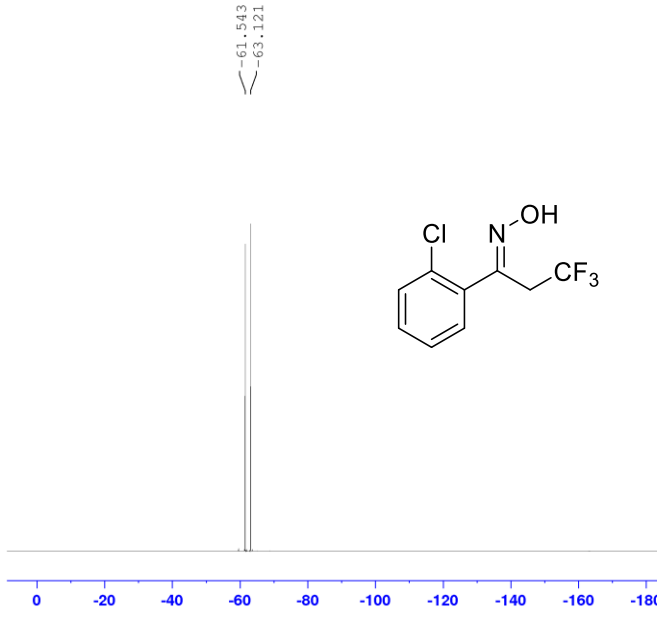
```
Current Data Parameters
NAME         wxf-1-71-1-C
EXPNO                   1
PROCNO                  1

F2 - Acquisition Parameters
Date_           20180822
Time              21.31
INSTRUM           spect
PROBHD    5 mm PABBO BB-
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                 1024
DS                    4
SWH          24038.461 Hz
FIDRES        0.366798 Hz
AQ            1.3631988 sec
RG                  114
DW               20.800 usec
DE                6.50 usec
TE                303.2 K
D1           2.00000000 sec
D11          0.03000000 sec

======== CHANNEL f1 ========
NUC1                13C
P1                 8.80 usec
PLW1        57.00000000 W
SFO1       100.6228293 MHz

======== CHANNEL f2 ========
CPDPRG2         waltz16
NUC2                1H
PCPD2            90.00 usec
PLW2        13.99600029 W
PLW12        0.31959000 W
PLW13        0.25887001 W
SFO2       400.1316005 MHz

F2 - Processing parameters
SI                 32768
SF          100.6127690 MHz
WDW                   EM
SSB       0
LB                 1.00 Hz
GB        0
PC                 1.40
```



BRUKER

```
Current Data Parameters
NAME         wxf-1-71-1-F
EXPNO                   1
PROCNO                  1

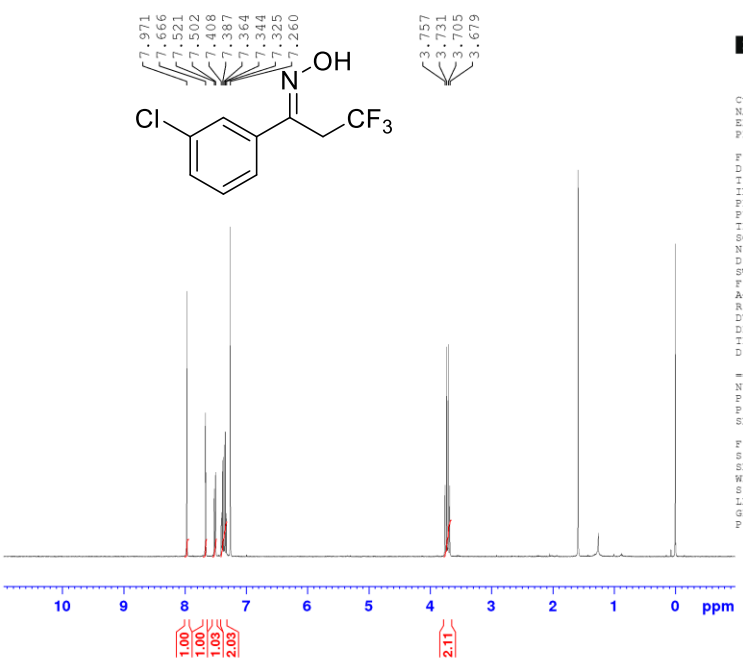
F2 - Acquisition Parameters
Date_           20180717
Time               9.19
INSTRUM           spect
PROBHD    5 mm PABBO BB-
PULPROG         zgfhigqn
TD                131072
SOLVENT           CDCl3
NS                    16
DS                     4
SWH          89285.711 Hz
FIDRES        0.681196 Hz
AQ            0.7340532 sec
RG                  203
DW               5.600 usec
DE                6.50 usec
TE                301.0 K
D1           1.00000000 sec
D11          0.03000000 sec
D12          0.00002000 sec

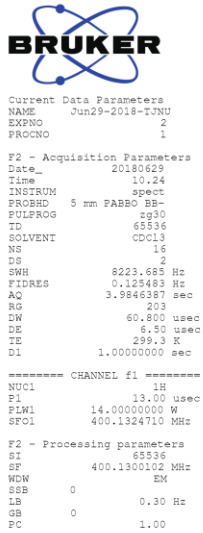
======== CHANNEL f1 ========
NUC1                19F
P1                13.20 usec
PLW1        18.19700050 W
SFO1       376.4607164 MHz

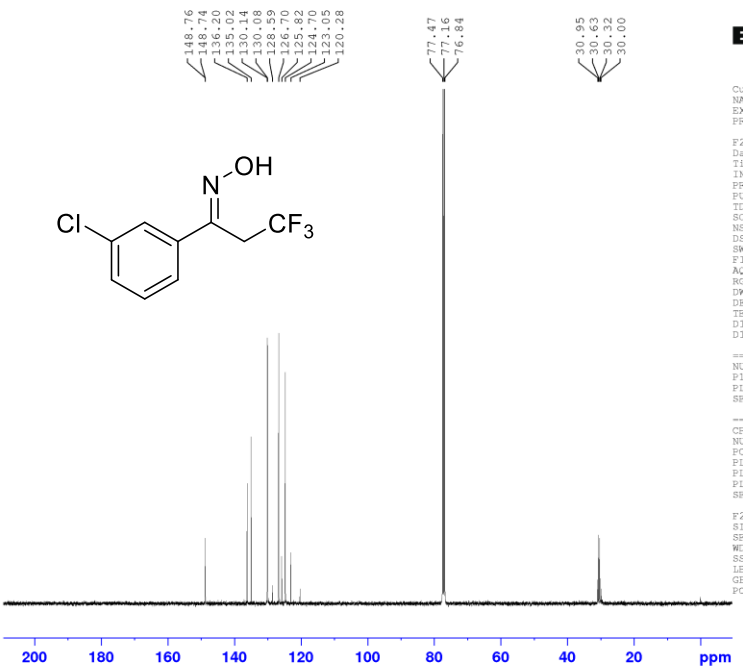
======== CHANNEL f2 ========
CPDPRG2         waltz16
NUC2                1H
PCPD2            90.00 usec
PLW2        13.99600029 W
PLW12        0.31959000 W
SFO2       400.1316005 MHz

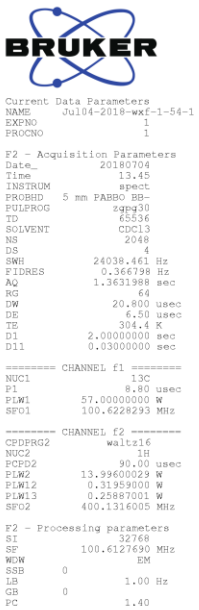
F2 - Processing parameters
SI                 65536
SF          376.4983660 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```

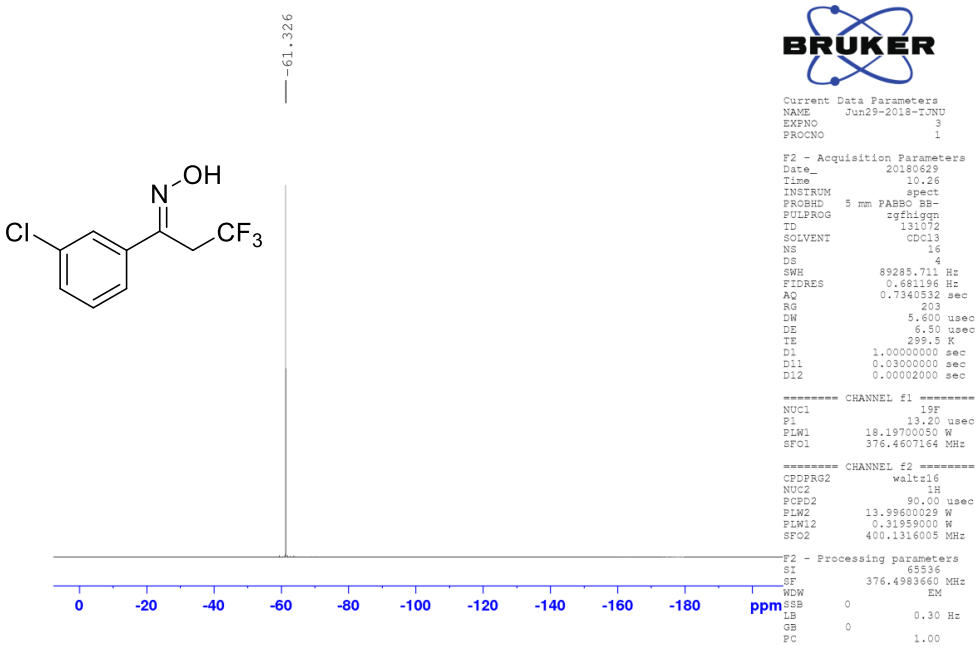
^{1}H,^{13}C and ^{19}F NMR spectra of **(E)-1-(3-chlorophenyl)-3,3,3-trifluoropropan-1-one oxime (4o)** in $CDCl_3$.



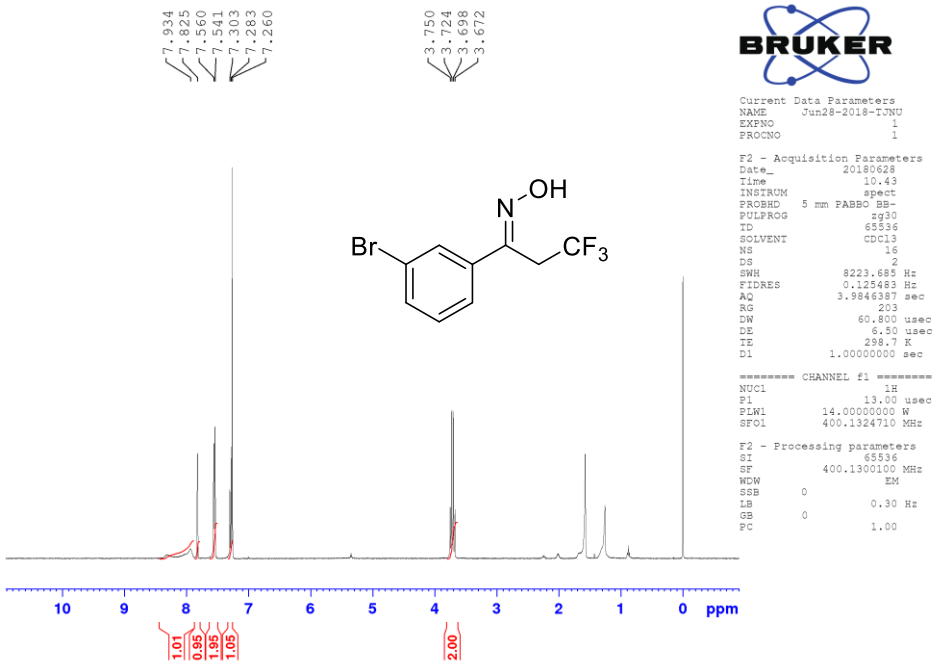


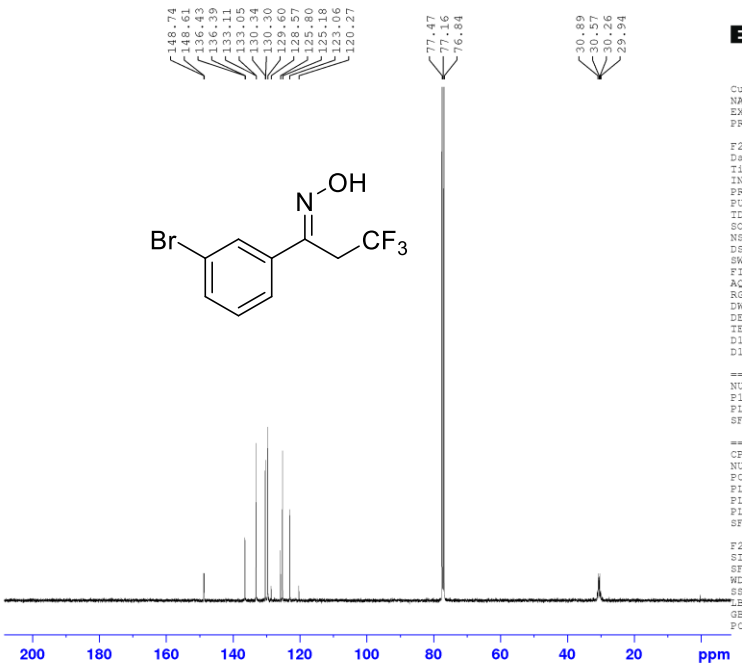






^{1}H,^{13}C and ^{19}F NMR spectra of **(E)-1-(3-bromophenyl)-3,3,3-trifluoropropan-1-one oxime (4p)** in $CDCl_3$.





BRUKER

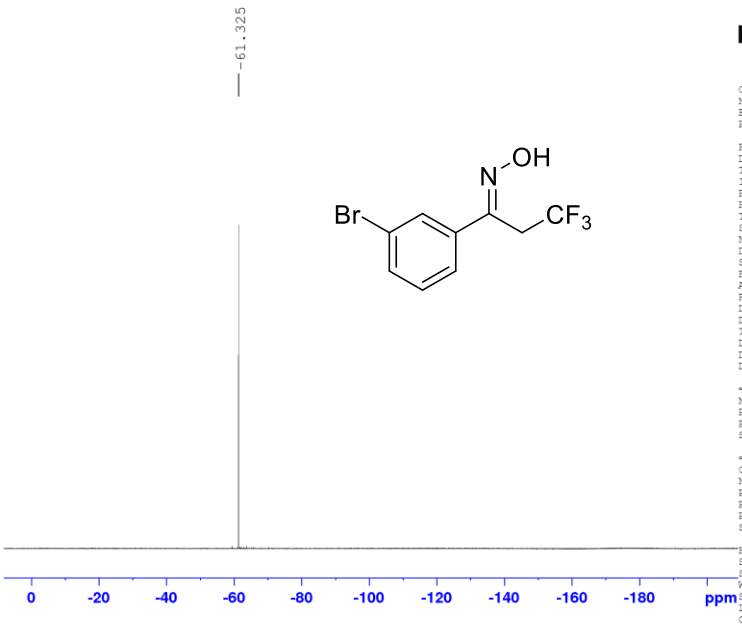
```
Current Data Parameters
NAME          Jun29-2018
EXPNO                  1
PROCNO                 1

F2 - Acquisition Parameters
Date_           20180629
Time               15.13
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                 3072
DS                    4
SWH           24038.461 Hz
FIDRES         0.366798 Hz
AQ             1.3631988 sec
RG                  101
DW               20.800 usec
DE                6.50 usec
TE                304.3 K
D1            2.00000000 sec
D11           0.03000000 sec

======== CHANNEL f1 ========
NUC1                 13C
P1                  8.80 usec
PLW1        57.00000000 W
SFO1       100.6228293 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2             90.00 usec
PLW2        13.99600029 W
PLW12        0.31959000 W
PLW13        0.25887001 W
SFO2       400.1316005 MHz

F2 - Processing parameters
SI                32768
SF           100.6127690 MHz
WDW                  EM
SSB       0
LB                1.00 Hz
GB        0
PC                1.40
```



BRUKER

```
Current Data Parameters
NAME      Jun20-2018-TJNU
EXPNO                   5
PROCNO                  1

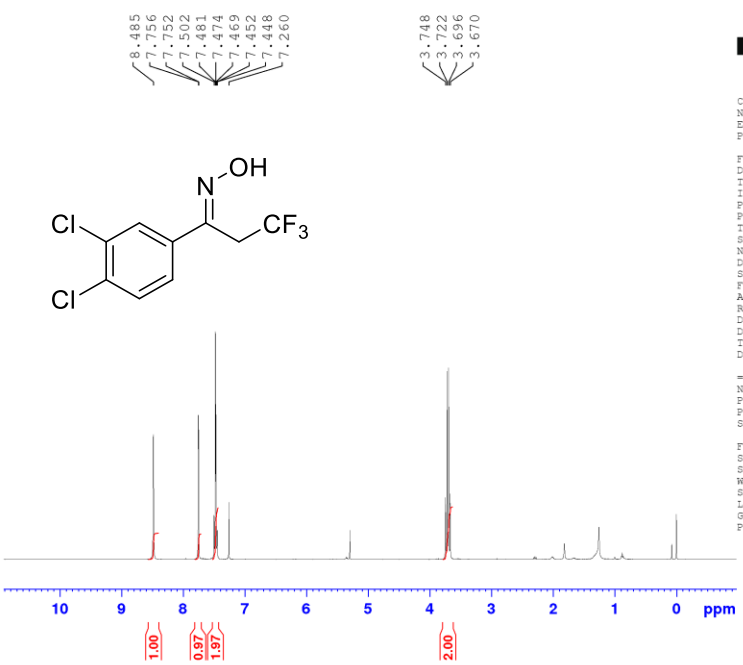
F2 - Acquisition Parameters
Date_           20180620
Time               9.58
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG          zgfhigqn
TD                131072
SOLVENT           CDCl3
NS                    16
DS                     4
SWH           89285.711 Hz
FIDRES         0.681196 Hz
AQ             0.7340532 sec
RG                   203
DW                5.600 usec
DE                6.50 usec
TE                299.8 K
D1            1.00000000 sec
D11           0.03000000 sec
D12           0.00002000 sec

======== CHANNEL f1 ========
NUC1                 19F
P1                13.20 usec
PLW1        18.19700050 W
SFO1       376.4607164 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2             90.00 usec
PLW2        13.99600029 W
PLW12        0.31959000 W
SFO2       400.1316005 MHz

F2 - Processing parameters
SI                65536
SF           376.4983660 MHz
WDW                  EM
SSB       0
LB                0.30 Hz
GB        0
PC                1.00
```

^{1}H,^{13}C and ^{19}F NMR spectra of **(E)-1-(3,4-dichlorophenyl)-3,3,3-trifluoropropan-1-one oxime (4q)** in $CDCl_3$.

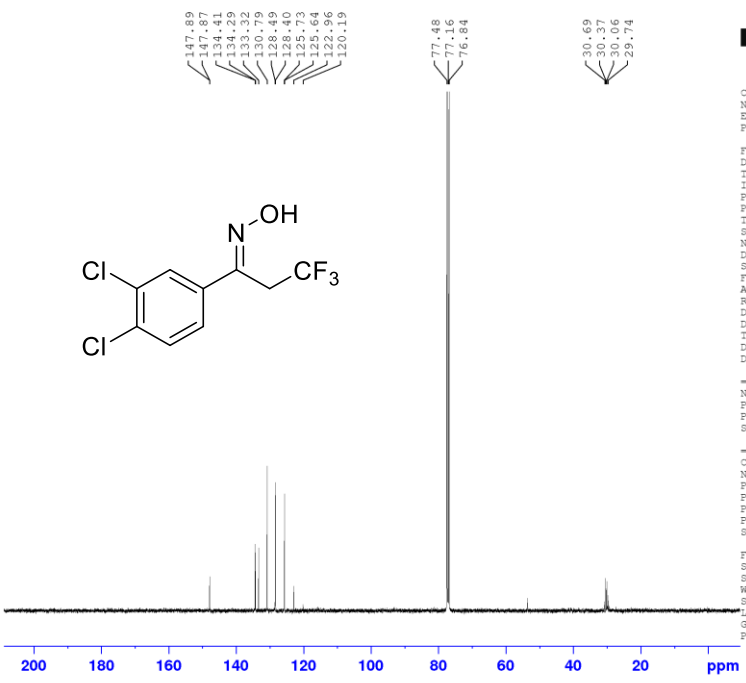


```
Current Data Parameters
NAME       Sep17-2018-TJNU
EXPNO                   4
PROCNO                  1

F2 - Acquisition Parameters
Date_           20180917
TLme              16.03
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG           zg30
TD               65536
SOLVENT          CDCl3
NS                  16
DS                   2
SWH           8223.685 Hz
FIDRES        0.125483 Hz
AQ            3.9846387 sec
RG                 203
DW              60.800 usec
DE               6.50 usec
TE              297.0 K
D1           1.00000000 sec

======== CHANNEL f1 ========
NUC1                1H
P1               13.00 usec
PLW1        14.00000000 W
SFO1       400.1324710 MHz

F2 - Processing parameters
SI                 65536
SF          400.1300102 MHz
WDW                EM
SSB       0
LB               0.30 Hz
GB        0
PC               1.00
```



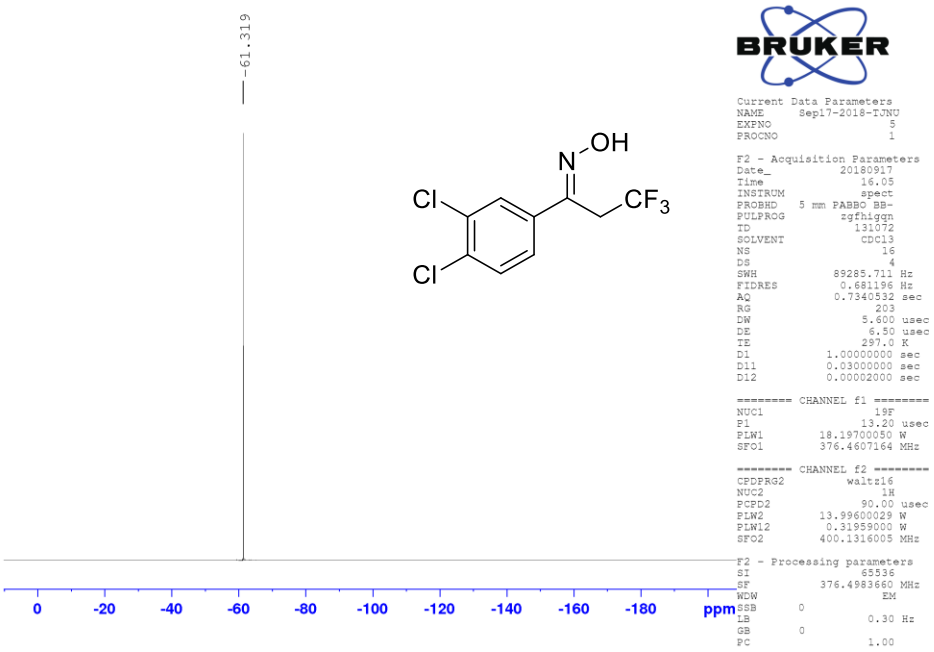
```
Current Data Parameters
NAME          Sep18-2018
EXPNO                   1
PROCNO                  1

F2 - Acquisition Parameters
Date_           20180918
Time              11.29
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG         zgpg30
TD               65536
SOLVENT          CDCl3
NS                1024
DS                   4
SWH          24038.461 Hz
FIDRES        0.366798 Hz
AQ            1.3631988 sec
RG                90.5
DW              20.800 usec
DE               6.50 usec
TE              300.5 K
D1           2.00000000 sec
D11          0.03000000 sec

======== CHANNEL f1 ========
NUC1               13C
P1                8.80 usec
PLW1        57.00000000 W
SFO1       100.6228293 MHz

======== CHANNEL f2 ========
CPDPRG2         waltz16
NUC2               1H
PCPD2           90.00 usec
PLW2        13.99600029 W
PLW12        0.31959000 W
PLW13        0.25887001 W
SFO2       400.1316005 MHz

F2 - Processing parameters
SI                 32768
SF          100.6127690 MHz
WDW                EM
SSB       0
LB               1.00 Hz
GB        0
PC               1.40
```



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```
Current Data Parameters
NAME      Sep17-2018-TJNU
EXPNO                  5
PROCNO                 1

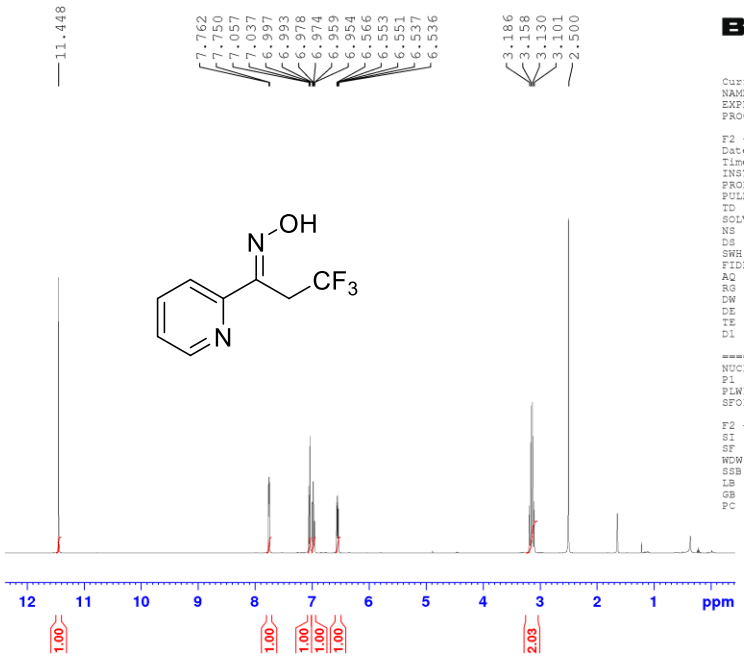
F2 - Acquisition Parameters
Date_           20180917
Time              16.05
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG         zgfhigqn
TD              131072
SOLVENT           CDCl3
NS                   16
DS                    4
SWH          89285.711 Hz
FIDRES        0.681196 Hz
AQ           0.7340532 sec
RG                  203
DW              5.600 usec
DE               6.50 usec
TE              297.0 K
D1           1.00000000 sec
D11          0.03000000 sec
D12          0.00002000 sec

======== CHANNEL f1 ========
NUC1                19F
P1                13.20 usec
PLW1        18.19700080 W
SFO1       376.4607164 MHz

======== CHANNEL f2 ========
CPDPRG2         waltz16
NUC2                1H
PCPD2            90.00 usec
PLW2        13.99600029 W
PLW12        0.31959000 W
SFO2       400.1316005 MHz

F2 - Processing parameters
SI                 65536
SF          376.4983660 MHz
WDW                   EM
SSB                   0
LB                 0.30 Hz
GB                    0
PC                 1.00
```

^{1}H,^{13}C and ^{19}F NMR spectra of **(E)-3,3,3-trifluoro-1-(pyridin-2-yl)propan-1-one oxime (4r)** in $(CD_3)_2SO$.



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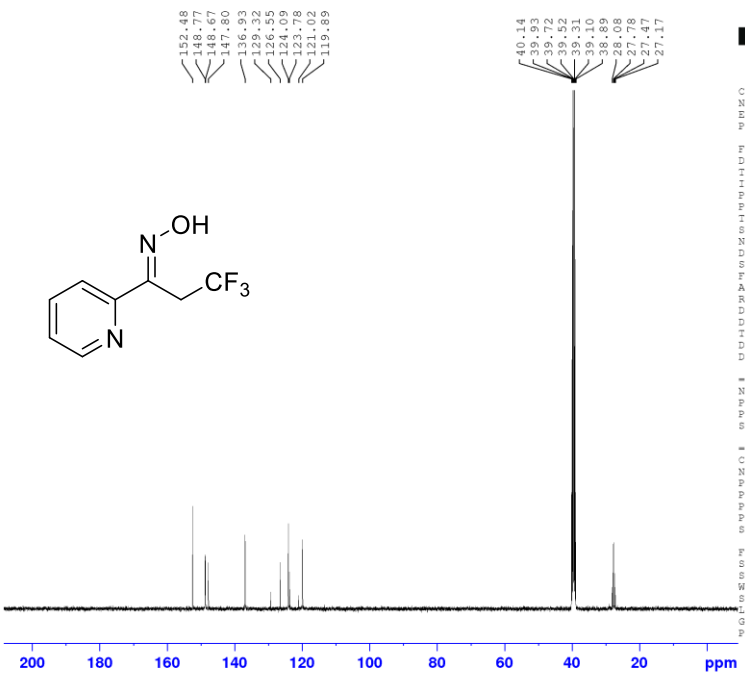
```
Current Data Parameters
NAME       WXF-1-58-2-HF
EXPNO                  5
PROCNO                 1

F2 - Acquisition Parameters
Date_           20180709
Time              16.03
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG           zg30
TD              65536
SOLVENT           DMSO
NS                   16
DS                    2
SWH           8223.685 Hz
FIDRES        0.125483 Hz
AQ           3.9845889 sec
RG                  161
DW              60.800 usec
DE               6.50 usec
TE              300.5 K
D1           1.00000000 sec

======== CHANNEL f1 ========
NUC1                1H
P1                13.00 usec
PLW1        14.00000000 W
SFO1       400.1324710 MHz

F2 - Processing parameters
SI                 65536
SF          400.1303468 MHz
WDW                   EM
SSB                   0
LB                 0.30 Hz
GB                    0
PC                 1.00
```



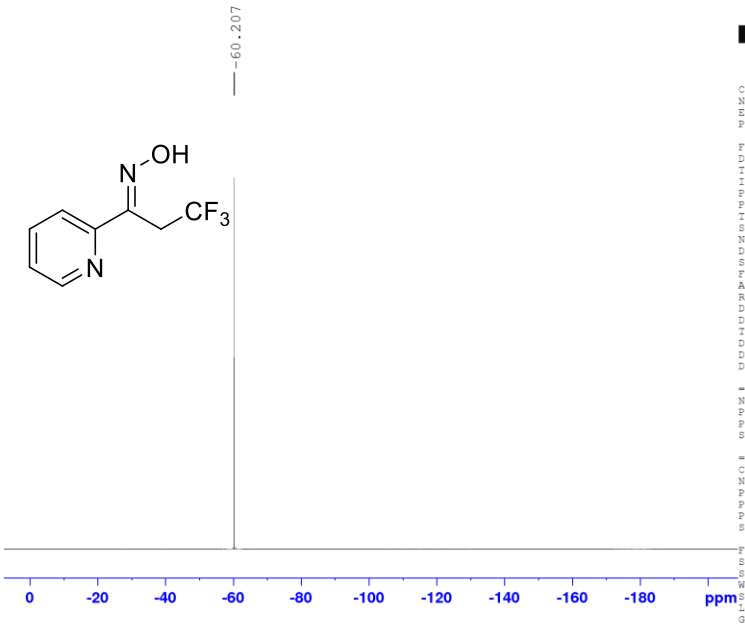

```
Current Data Parameters
NAME                wxf-1-58-2
EXPNO                        1
PROCNO                       1

F2 - Acquisition Parameters
Date_               20180712
Time                   21.10
INSTRUM                spect
PROBHD    5 mm PABBO BB-
PULPROG              zgpg30
TD                    65536
SOLVENT               CDCl3
NS                     1024
DS                        4
SWH              24038.461 Hz
FIDRES            0.366798 Hz
AQ                1.3631988 sec
RG                       57
DW                  20.800 usec
DE                   6.50 usec
TE                   301.3 K
D1               2.00000000 sec
D11              0.03000000 sec

======== CHANNEL f1 ========
NUC1                    13C
P1                     8.80 usec
PLW1            57.00000000 W
SFO1           100.6228293 MHz

======== CHANNEL f2 ========
CPDPRG2             waltz16
NUC2                    1H
PCPD2                90.00 usec
PLW2            13.99600029 W
PLW12            0.31959000 W
PLW13            0.25887001 W
SFO2           400.1316005 MHz

F2 - Processing parameters
SI                    32768
SF             100.6127690 MHz
WDW                      EM
SSB          0
LB                    1.00 Hz
GB           0
PC                    1.40
```




```
Current Data Parameters
NAME          Jul09-2018-Open
EXPNO                        6
PROCNO                       1

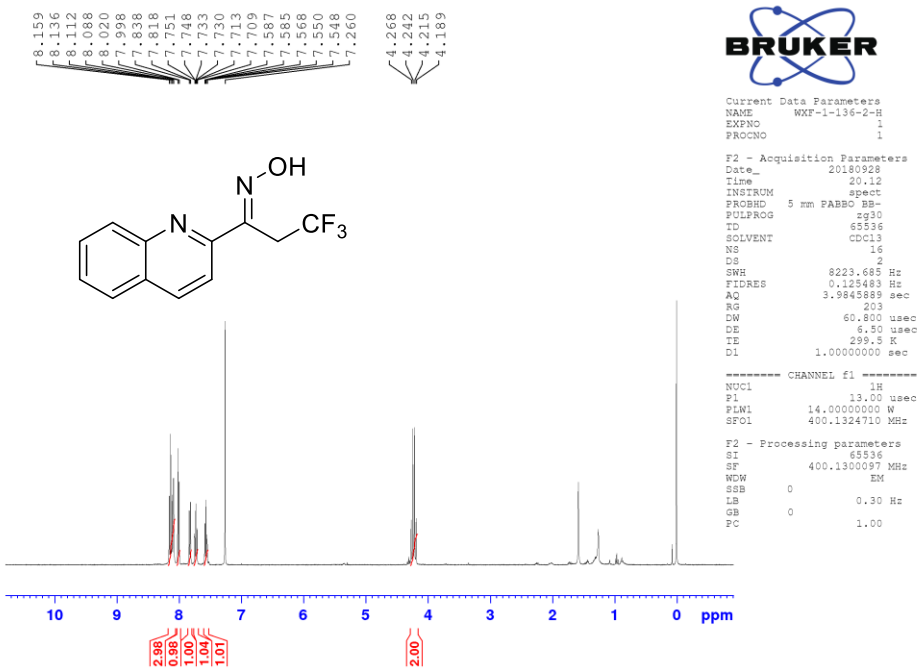
F2 - Acquisition Parameters
Date_               20180709
Time                   16.06
INSTRUM                spect
PROBHD    5 mm PABBO BB-
PULPROG             zgfhigqn
TD                   131072
SOLVENT                DMSO
NS                       16
DS                        4
SWH              89285.711 Hz
FIDRES            0.681196 Hz
AQ                0.7340532 sec
RG                      203
DW                  5.600 usec
DE                   6.50 usec
TE                   300.6 K
D1               1.00000000 sec
D11              0.03000000 sec
D12              0.00002000 sec

======== CHANNEL f1 ========
NUC1                    19F
P1                    13.20 usec
PLW1            18.19700050 W
SFO1           376.4607164 MHz

======== CHANNEL f2 ========
CPDPRG2             waltz16
NUC2                    1H
PCPD2                90.00 usec
PLW2            13.99600029 W
PLW12            0.31959000 W
SFO2           400.1316005 MHz

F2 - Processing parameters
SI                    65536
SF             376.4983660 MHz
WDW                      EM
SSB          0
LB                    0.30 Hz
GB           0
PC                    1.00
```

^{1}H,^{13}C and ^{19}F NMR spectra of **(E)-3,3,3-trifluoro-1-(quinolin-2-yl)propan-1-one oxime (4s)** in $CDCl_3$.



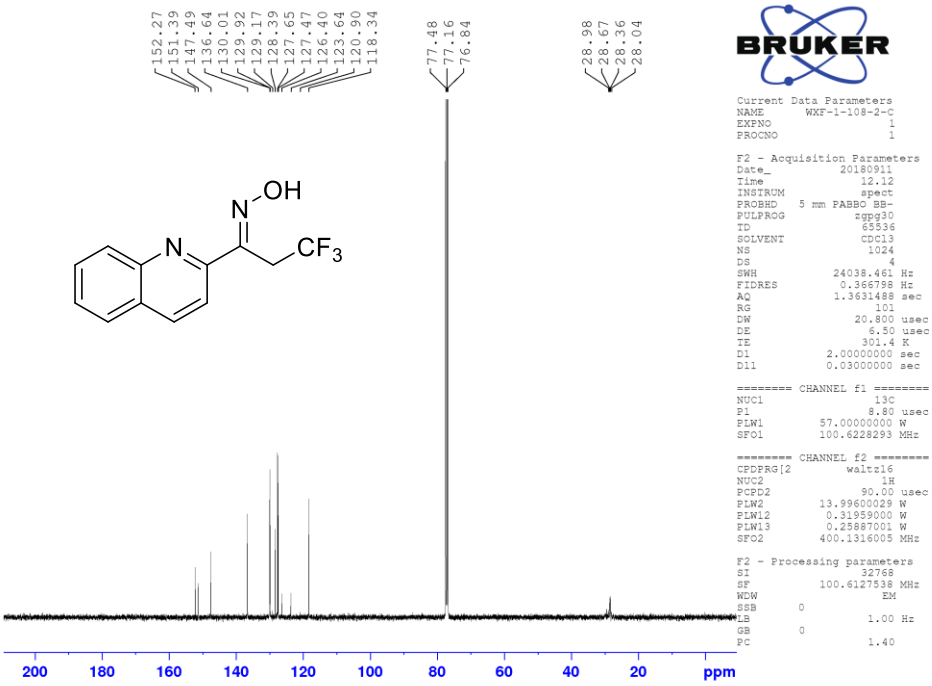
BRUKER

```
Current Data Parameters
NAME        WXF-1-136-2-H
EXPNO                   1
PROCNO                  1

F2 - Acquisition Parameters
Date_            20180928
Time                20.12
INSTRUM             spect
PROBHD    5 mm PABBO BB-
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH             8223.685 Hz
FIDRES          0.125483 Hz
AQ              3.9845889 sec
RG                   203
DW                60.800 usec
DE                 6.50 usec
TE                299.5 K
D1             1.00000000 sec

======== CHANNEL f1 ========
NUC1                   1H
P1                 13.00 usec
PLW1         14.00000000 W
SFO1         400.1324710 MHz

F2 - Processing parameters
SI                 65536
SF           400.1300097 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```



BRUKER

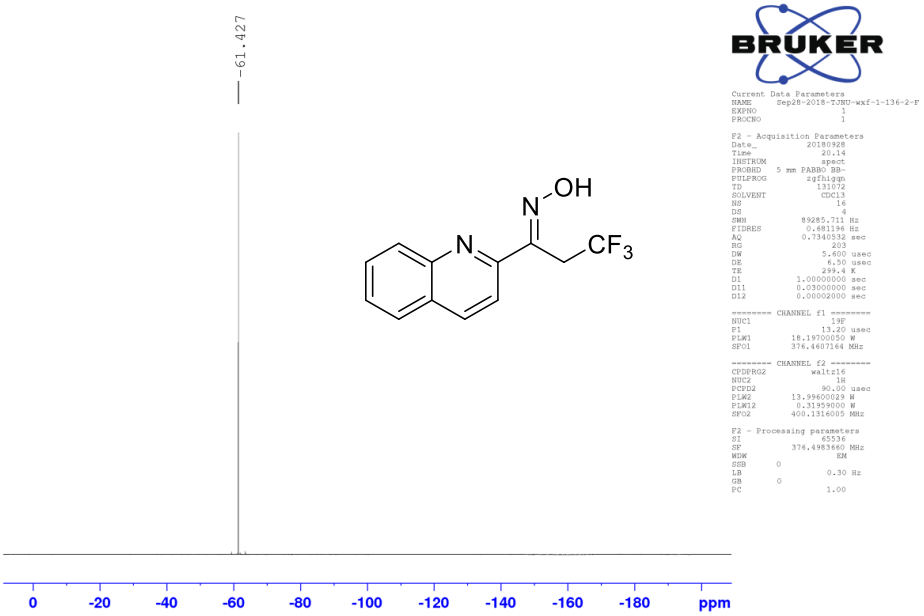
```
Current Data Parameters
NAME        WXF-1-108-2-C
EXPNO                   1
PROCNO                  1

F2 - Acquisition Parameters
Date_            20180911
Time                12.12
INSTRUM             spect
PROBHD    5 mm PABBO BB-
PULPROG          zgpg30
TD                 65536
SOLVENT            CDCl3
NS                  1024
DS                     4
SWH            24038.461 Hz
FIDRES          0.366798 Hz
AQ              1.3631488 sec
RG                   101
DW                20.800 usec
DE                 6.50 usec
TE                301.4 K
D1             2.00000000 sec
D11            0.03000000 sec

======== CHANNEL f1 ========
NUC1                  13C
P1                 8.80 usec
PLW1         57.00000000 W
SFO1         100.6228293 MHz

======== CHANNEL f2 ========
CPDPRG[2          waltz16
NUC2                   1H
PCPD2             90.00 usec
PLW2         13.99600029 W
PLW12         0.31959000 W
PLW13         0.25887001 W
SFO2         400.1316005 MHz

F2 - Processing parameters
SI                 32768
SF           100.6127538 MHz
WDW                   EM
SSB       0
LB                 1.00 Hz
GB        0
PC                 1.40
```



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Current Data Parameters
NAME Sep28-2018-ZJNU-wxf-1-136-2-F
EXPNO 1
PROCNO 1

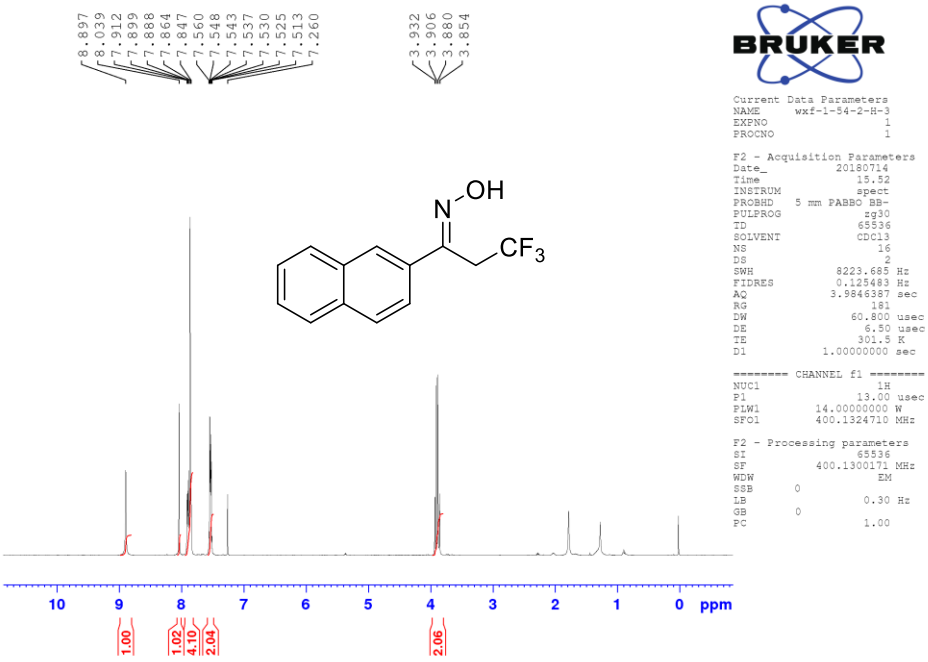
F2 - Acquisition Parameters
Date_ 20180928
Time 20.14
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgfhigqn
TD 131072
SOLVENT CDCl3
NS 16
DS 4
SWH 89285.711 Hz
FIDRES 0.681196 Hz
AQ 0.7340532 sec
RG 203
DW 5.600 usec
DE 6.50 usec
TE 299.4 K
D1 1.00000000 sec
D11 0.03000000 sec
D12 0.00002000 sec

======== CHANNEL f1 ========
NUC1 19F
P1 13.20 usec
PLW1 18.19700050 W
SFO1 376.4607164 MHz

======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PLW2 13.99600029 W
PLW12 0.31959000 W
SFO2 400.1316005 MHz

F2 - Processing parameters
SI 65536
SF 376.4983660 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

^{1}H,^{13}C and ^{19}F NMR spectra of **(E)-3,3,3-trifluoro-1-(naphthalen-2-yl)propan-1-one oxime (4t)** in $CDCl_3$.



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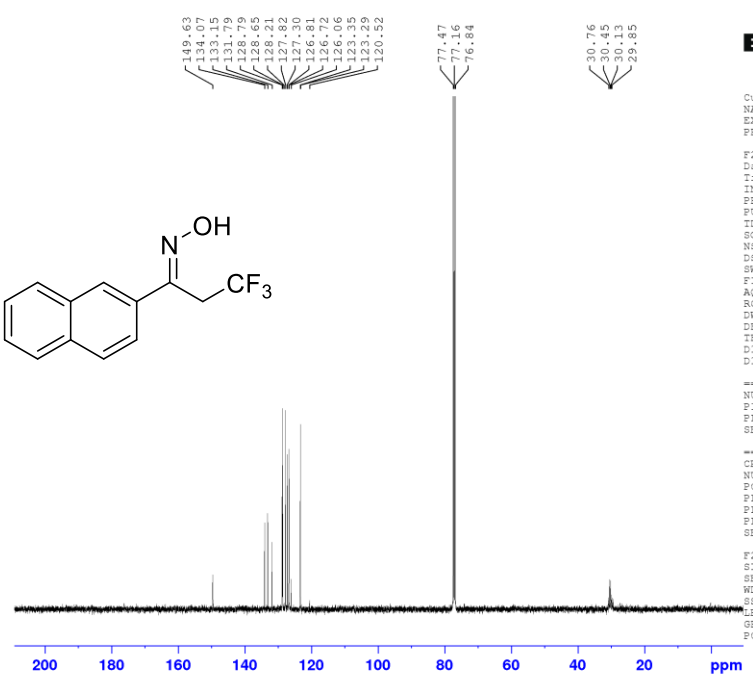
Current Data Parameters
NAME wxf-1-54-2-H-3
EXPNO 1
PROCNO 1

F2 - Acquisition Parameters
Date_ 20180714
Time 15.52
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9846387 sec
RG 181
DW 60.800 usec
DE 6.50 usec
TE 301.5 K
D1 1.00000000 sec

======== CHANNEL f1 ========
NUC1 1H
P1 13.00 usec
PLW1 14.00000000 W
SFO1 400.1324710 MHz

F2 - Processing parameters
SI 65536
SF 400.1300171 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



BRUKER

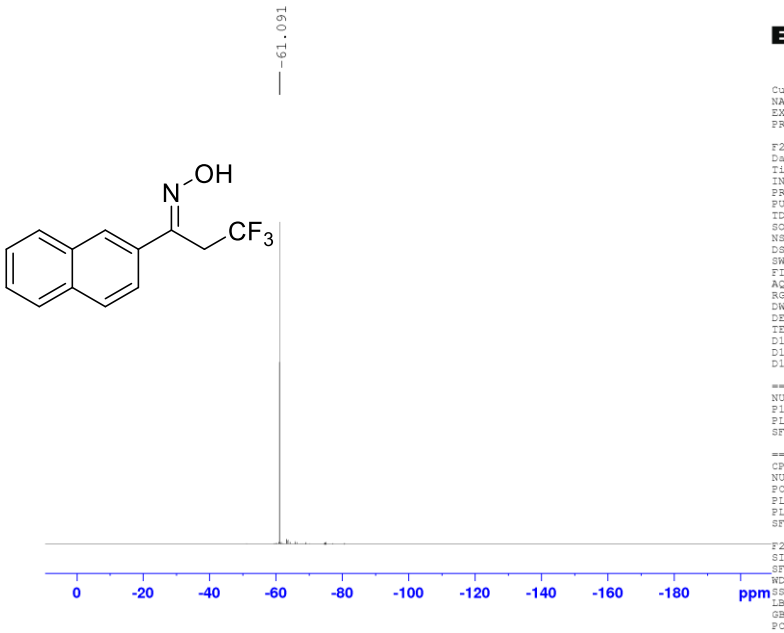
```
Current Data Parameters
NAME         wxf-1-54-2-C
EXPNO                   1
PROCNO                  1

F2 - Acquisition Parameters
Date_           20180716
Time              10.55
INSTRUM           spect
PROBHD    5 mm PABBO BB-
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                 1024
DS                    4
SWH           24038.461 Hz
FIDRES        0.366798 Hz
AQ            1.3631988 sec
RG                  114
DW               20.800 usec
DE                6.50 usec
TE               304.3 K
D1            2.00000000 sec
D11           0.03000000 sec

======== CHANNEL f1 ========
NUC1                13C
P1                 8.80 usec
PLW1        57.00000000 W
SFO1       100.6228293 MHz

======== CHANNEL f2 ========
CPDPRG2         waltz16
NUC2                1H
PCPD2            90.00 usec
PLW2        13.99600029 W
PLW12        0.31959000 W
PLW13        0.25887001 W
SFO2       400.1316005 MHz

F2 - Processing parameters
SI                32768
SF           100.6127690 MHz
WDW                 EM
SSB       0
LB               1.00 Hz
GB        0
PC               1.40
```



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```
Current Data Parameters
NAME      Jul05-2018-Open
EXPNO                   2
PROCNO                  1

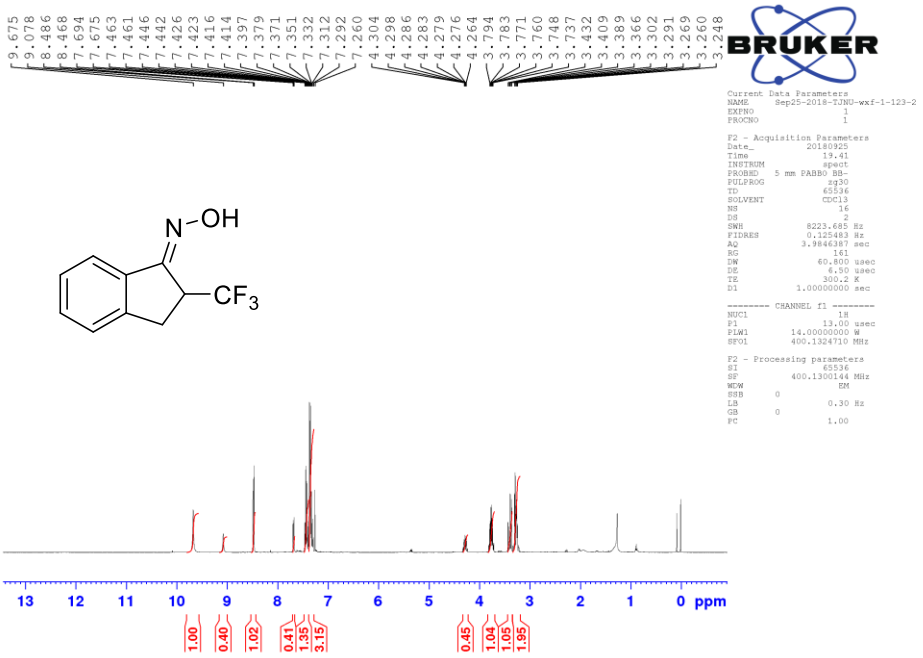
F2 - Acquisition Parameters
Date_           20180705
Time              15.05
INSTRUM           spect
PROBHD    5 mm PABBO BB-
PULPROG        zgfhigqn
TD               131072
SOLVENT           CDCl3
NS                  16
DS                   4
SWH           89285.711 Hz
FIDRES        0.681196 Hz
AQ            0.7340532 sec
RG                  203
DW               5.600 usec
DE                6.50 usec
TE               304.0 K
D1            1.00000000 sec
D11           0.03000000 sec
D12           0.00002000 sec

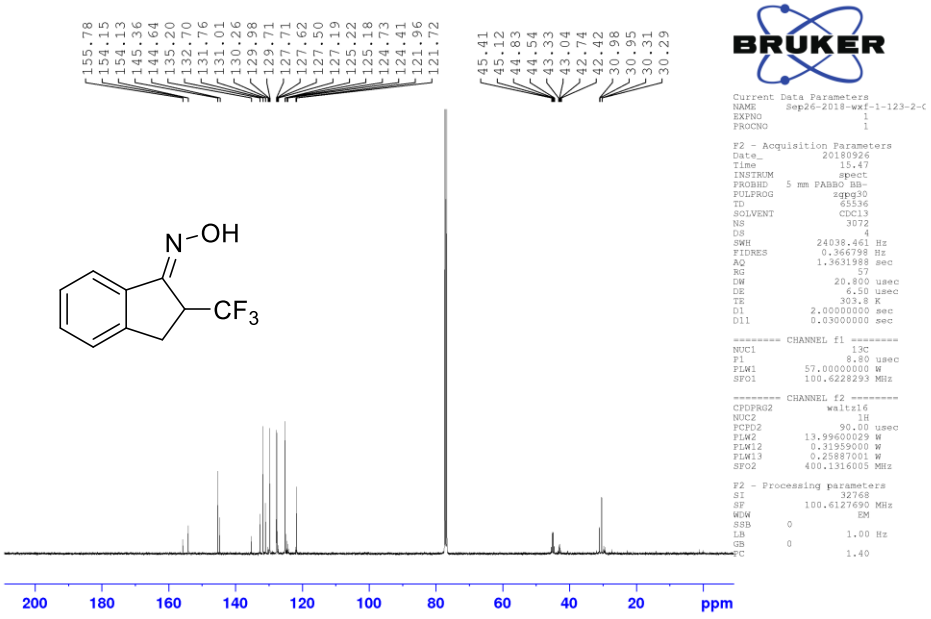
======== CHANNEL f1 ========
NUC1               19F
P1                13.20 usec
PLW1        18.19700050 W
SFO1       376.4607164 MHz

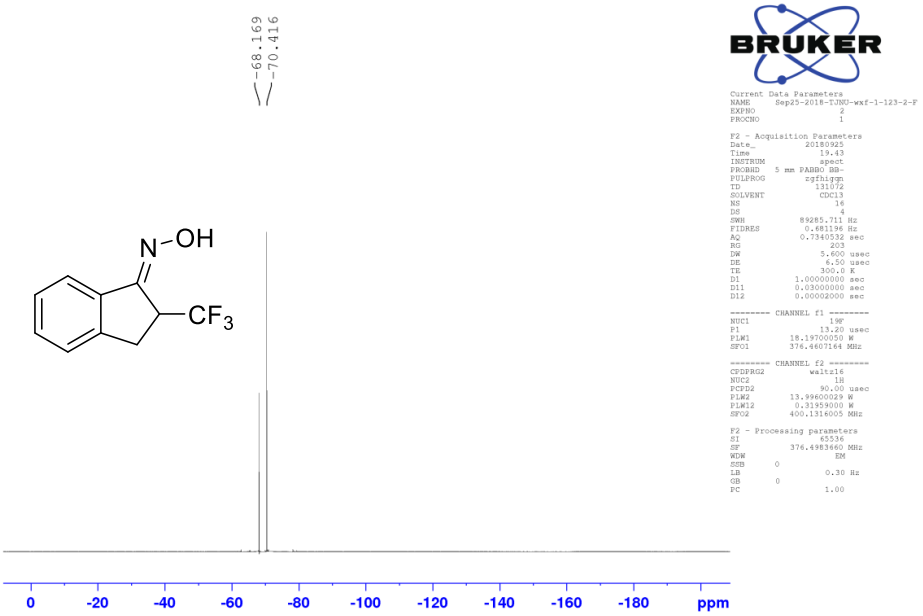
======== CHANNEL f2 ========
CPDPRG2         waltz16
NUC2                1H
PCPD2            90.00 usec
PLW2        13.99600029 W
PLW12        0.31959000 W
SFO2       400.1316005 MHz

F2 - Processing parameters
SI                65536
SF           376.4983660 MHz
WDW                 EM
SSB       0
LB               0.30 Hz
GB        0
PC               1.00
```

^{1}H,^{13}C and ^{19}F NMR spectra of **(E)-2-(trifluoromethyl)-2,3-dihydro-1H-inden-1-one oxime (4u)** in $CDCl_3$.







Current Data Parameters
NAME Sep25-2018-TJNU-wxf-1-123-2-F
EXPNO 2
PROCNO 1

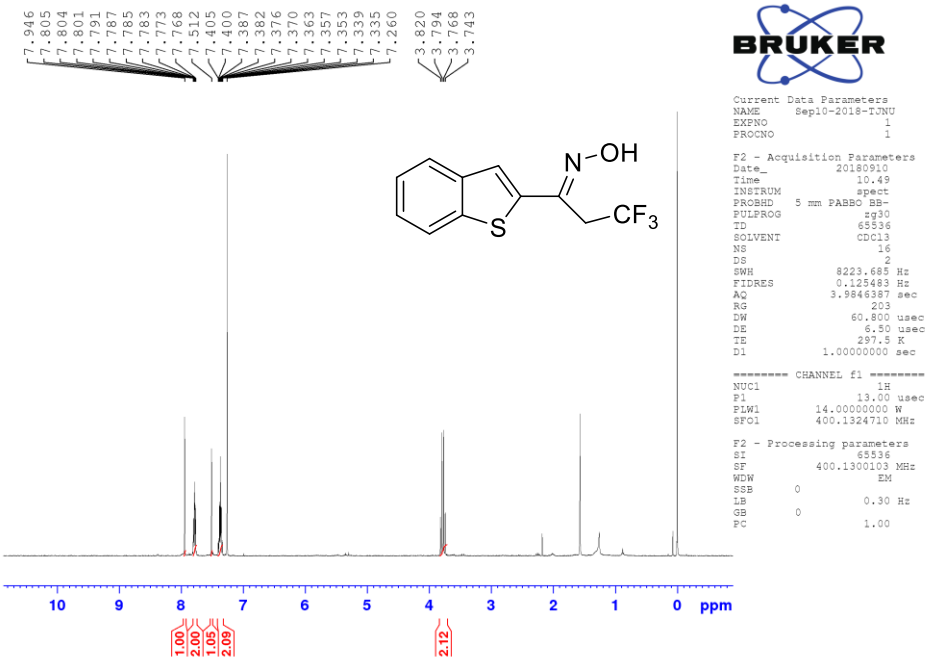
F2 - Acquisition Parameters
Date_ 20180925
Time 19.43
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgfhigqn
TD 131072
SOLVENT CDCl3
NS 16
DS 4
SWH 89285.711 Hz
FIDRES 0.681196 Hz
AQ 0.7340532 sec
RG 203
DW 5.600 usec
DE 6.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
D12 0.00002000 sec

======== CHANNEL f1 ========
NUC1 19F
P1 13.20 usec
PLW1 18.19700050 W
SFO1 376.4607164 MHz

======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PLW2 13.99600029 W
PLW12 0.31959000 W
SFO2 400.1316005 MHz

F2 - Processing parameters
SI 65536
SF 376.4983660 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

^{1}H,^{13}C and ^{19}F NMR spectra of **(E)-1-(benzo[b]thiophen-2-yl)-3,3,3-trifluoropropan-1-one oxime (4v)** in $CDCl_3$.

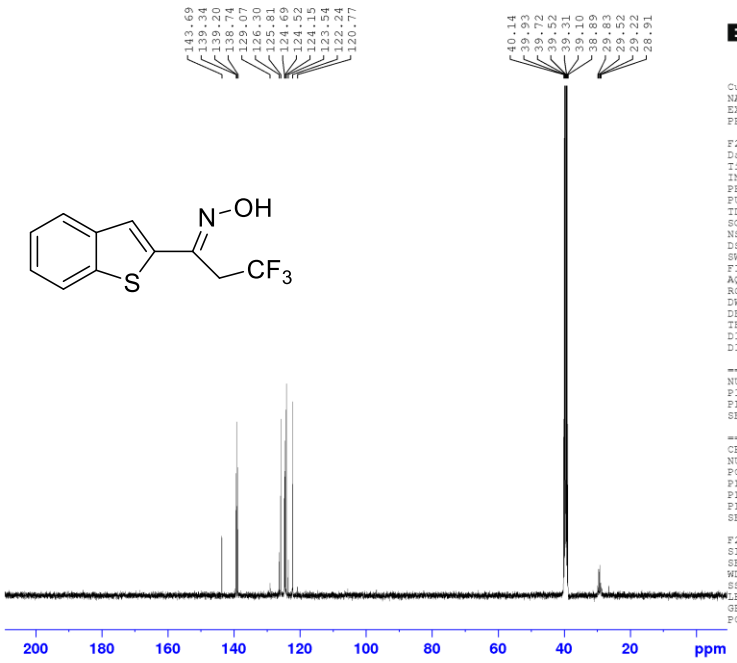


Current Data Parameters
NAME Sep10-2018-TJNU
EXPNO 1
PROCNO 1

F2 - Acquisition Parameters
Date_ 20180910
Time 10.49
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9846387 sec
RG 203
DW 60.800 usec
DE 6.50 usec
TE 297.5 K
D1 1.00000000 sec

======== CHANNEL f1 ========
NUC1 1H
P1 13.00 usec
PLW1 14.00000000 W
SFO1 400.1324710 MHz

F2 - Processing parameters
SI 65536
SF 400.1300103 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



BRUKER

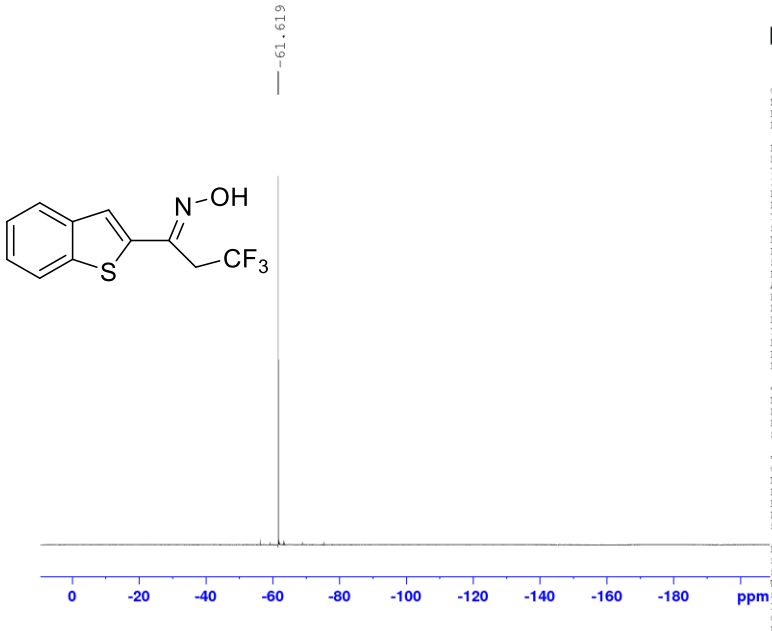
```
Current Data Parameters
NAME          Sep12-2018
EXPNO                  1
PROCNO                 1

F2 - Acquisition Parameters
Date_           20180912
Time               11.43
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG          zgpg30
TD                65536
SOLVENT             DMSO
NS                  1024
DS                     4
SWH           24038.461 Hz
FIDRES         0.366798 Hz
AQ            1.3631988 sec
RG                   101
DW                20.800 usec
DE                 6.50 usec
TE                301.6 K
D1           2.00000000 sec
D11          0.03000000 sec

======== CHANNEL f1 ========
NUC1                 13C
P1                  8.80 usec
PLW1        57.00000000 W
SFO1       100.6228293 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2              90.00 usec
PLW2        13.99600029 W
PLW12        0.31959000 W
PLW13        0.25887001 W
SFO2       400.1316005 MHz

F2 - Processing parameters
SI                  32768
SF         100.6128193 MHz
WDW                  EM
SSB       0
LB                 1.00 Hz
GB        0
PC                 1.40
```



BRUKER

```
Current Data Parameters
NAME      Sep10-2018-TJNU
EXPNO                   2
PROCNO                  1

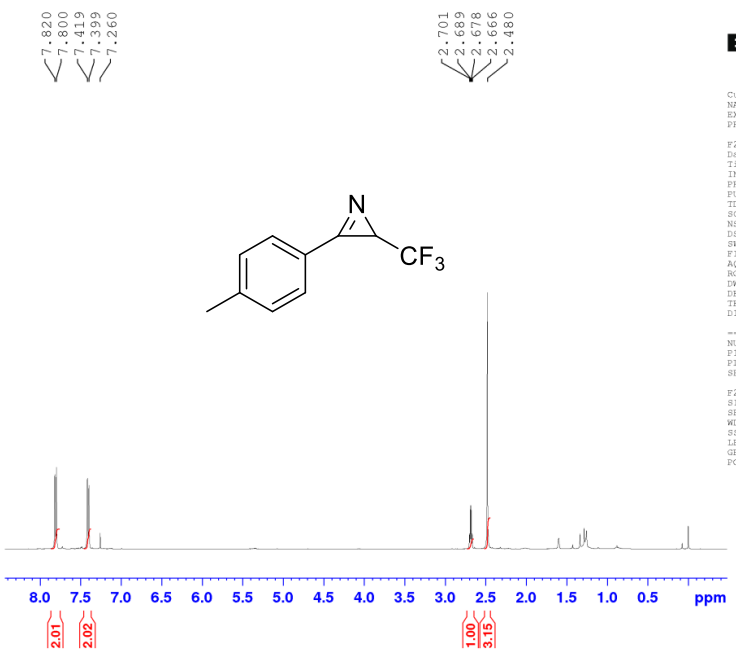
F2 - Acquisition Parameters
Date_           20180910
Time               10.51
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG         zgfhigqn
TD                131072
SOLVENT             CDCl3
NS                     16
DS                      4
SWH           89285.711 Hz
FIDRES         0.681196 Hz
AQ            0.7340532 sec
RG                   203
DW                5.600 usec
DE                 6.50 usec
TE                297.6 K
D1           1.00000000 sec
D11          0.03000000 sec
D12          0.00002000 sec

======== CHANNEL f1 ========
NUC1                 19F
P1                 13.20 usec
PLW1        18.19700050 W
SFO1       376.4607164 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2              90.00 usec
PLW2        13.99600029 W
PLW12        0.31959000 W
SFO2       400.1316005 MHz

F2 - Processing parameters
SI                  65536
SF         376.4983660 MHz
WDW                  EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```

^{1}H,^{13}C and ^{19}F NMR spectra of **3-(p-tolyl)-2-(trifluoromethyl)-2H-azirine (14h)**.




```
Current Data Parameters
NAME       Jun17-2019-LYX-1-77-1-H
EXPNO                 1
PROCNO                1

F2 - Acquisition Parameters
Date_              20190617
Time                 15.53
INSTRUM              spect
PROBHD    5 mm PABBO BB-
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH               8223.685 Hz
FIDRES               0.125483 Hz
AQ                3.9846387 sec
RG                     128
DW                  60.800 usec
DE                   6.50 usec
TE                  295.2 K
D1                1.00000000 sec

======== CHANNEL f1 ========
NUC1                   1H
P1                  14.00 usec
PLW1          20.00000000 W
SFO1          400.1324710 MHz

F2 - Processing parameters
SI                  65536
SF            400.1300095 MHz
WDW                    EM
SSB       0
LB                   0.30 Hz
GB        0
PC                   1.00
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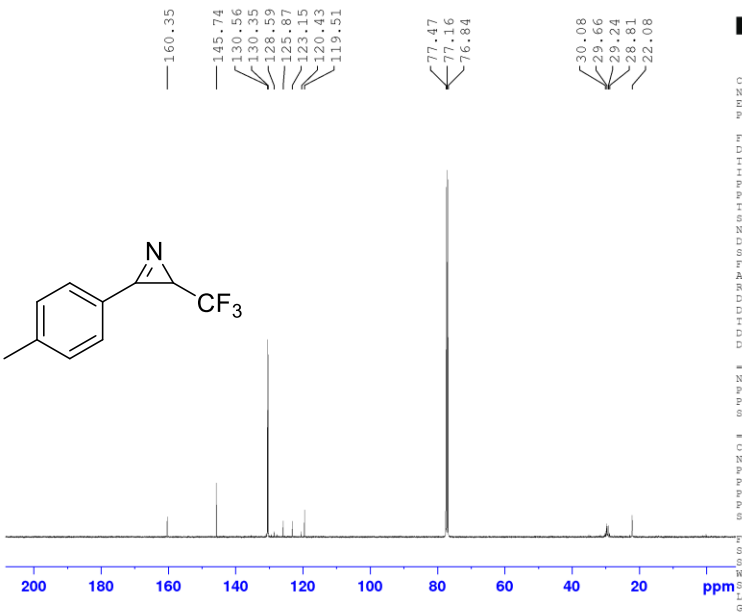


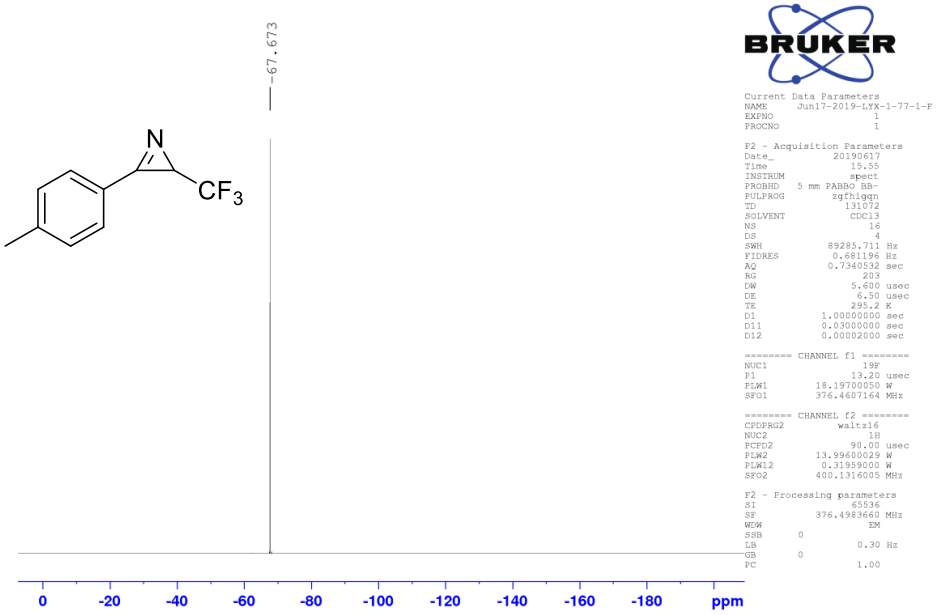

```
Current Data Parameters
NAME         Jun18-2019-c
EXPNO                   1
PROCNO                  1

F2 - Acquisition Parameters
Date_              20190618
Time                 21.32
INSTRUM              spect
PROBHD    5 mm PABBO BB-
PULPROG            zgpg30
TD                  65536
SOLVENT             CDCl3
NS                   3072
DS                      4
SWH              24038.461 Hz
FIDRES               0.366798 Hz
AQ                1.3631988 sec
RG                    90.5
DW                  20.800 usec
DE                   6.50 usec
TE                  300.0 K
D1                2.00000000 sec
D11               0.03000000 sec

======== CHANNEL f1 ========
NUC1                   13C
P1                   8.80 usec
PLW1          57.00000000 W
SFO1          100.6228293 MHz

======== CHANNEL f2 ========
CPDPRG2             waltz16
NUC2                   1H
PCPD2                90.00 usec
PLW2          13.99600029 W
PLW12          0.31959000 W
PLW13          0.25887001 W
SFO2          400.1316005 MHz

F2 - Processing parameters
SI                  32768
SF            100.6127690 MHz
WDW                    EM
SSB       0
LB                   1.00 Hz
GB        0
PC                   1.40
```



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```
Current Data Parameters
NAME      Jun17-2019-LYX-1-77-1-F
EXPNO                 1
PROCNO                1

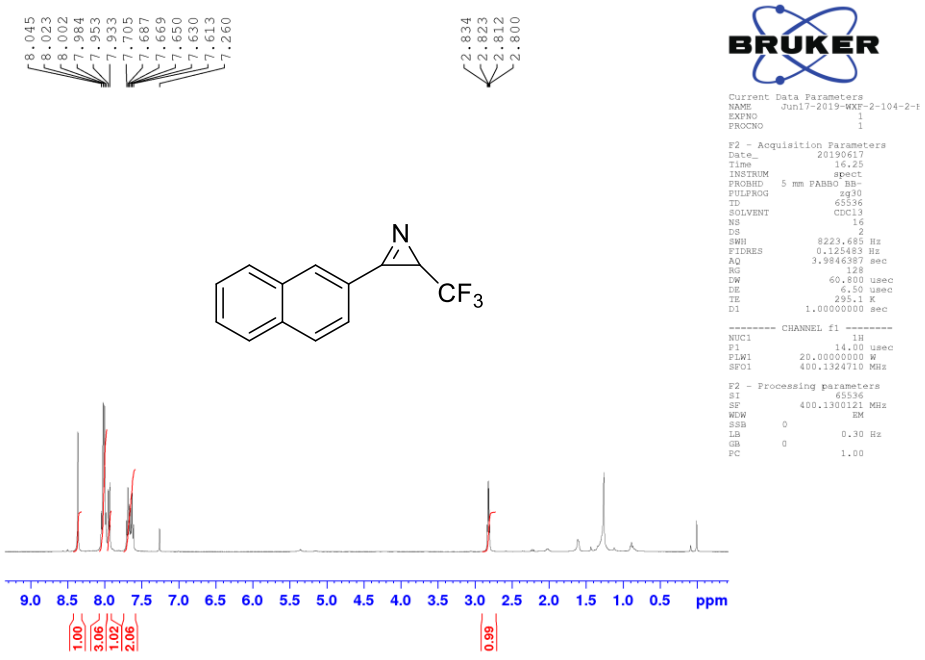
F2 - Acquisition Parameters
Date_              20190617
Time                 15.55
INSTRUM              spect
PROBHD    5 mm PABBO BB-
PULPROG          zgfhigqn
TD                131072
SOLVENT             CDCl3
NS                    16
DS                     4
SWH             89285.711 Hz
FIDRES          0.681196 Hz
AQ              0.7340532 sec
RG                   203
DW                5.600 usec
DE                6.50 usec
TE                295.2 K
D1             1.00000000 sec
D11            0.03000000 sec
D12            0.00002000 sec

======== CHANNEL f1 ========
NUC1                 19F
P1                 13.20 usec
PLW1         18.19700050 W
SFO1         376.46071640 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2              90.00 usec
PLW2         13.99600029 W
PLW12         0.31959000 W
SFO2         400.1316005 MHz

F2 - Processing parameters
SI                  65536
SF           376.4983660 MHz
WDW                    EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```

^{1}H,^{13}C and ^{19}F NMR spectra of **3-(naphthalen-2-yl)-2-(trifluoromethyl)-2H-azirine (14t)** in $CDCl_3$.



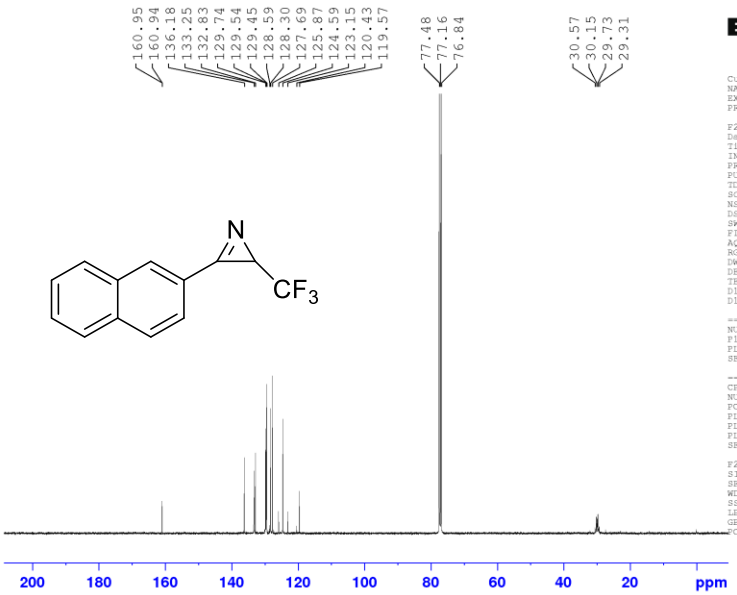
BRUKER

```
Current Data Parameters
NAME      Jun17-2019-WXF-2-104-2-F
EXPNO                 1
PROCNO                1

F2 - Acquisition Parameters
Date_              20190617
Time                 16.25
INSTRUM              spect
PROBHD    5 mm PABBO BB-
PULPROG              zg30
TD                 65536
SOLVENT             CDCl3
NS                    16
DS                     2
SWH              8223.685 Hz
FIDRES          0.125483 Hz
AQ              3.9846387 sec
RG                   128
DW                60.800 usec
DE                6.50 usec
TE                295.1 K
D1             1.00000000 sec

======== CHANNEL f1 ========
NUC1                 1H
P1                 14.00 usec
PLW1         20.00000000 W
SFO1         400.1324710 MHz

F2 - Processing parameters
SI                  65536
SF           400.1300121 MHz
WDW                    EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```



BRUKER

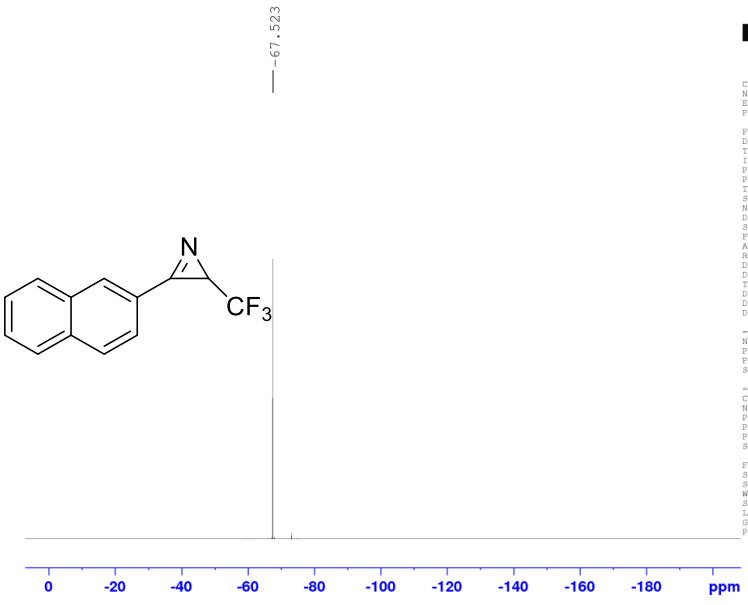
```
Current Data Parameters
NAME      Jun18-2019-WXF-2-104-2-c
EXPNO                1
PROCNO               1

F2 - Acquisition Parameters
Date_           20190618
Time              13.06
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                 3072
DS                    4
SWH           24038.461 Hz
FIDRES         0.366798 Hz
AQ             1.3631988 sec
RG                 90.5
DW               20.800 usec
DE                6.50 usec
TE              299.4 K
D1             2.00000000 sec
D11            0.03000000 sec

======== CHANNEL f1 ========
NUC1               13C
P1                8.80 usec
PLW1        57.00000000 W
SFO1       100.6228293 MHz

======== CHANNEL f2 ========
CPDPRG2         waltz16
NUC2               1H
PCPD2             90.00 usec
PLW2        13.99600029 W
PLW12        0.31959000 W
PLW13        0.25887001 W
SFO2       400.1316005 MHz

F2 - Processing parameters
SI                32768
SF           100.6127690 MHz
WDW                  EM
SSB       0
LB                 1.00 Hz
GB        0
PC                 1.40
```



BRUKER

```
Current Data Parameters
NAME      Jun17-2019-WXF-2-104-2-F
EXPNO                1
PROCNO               1

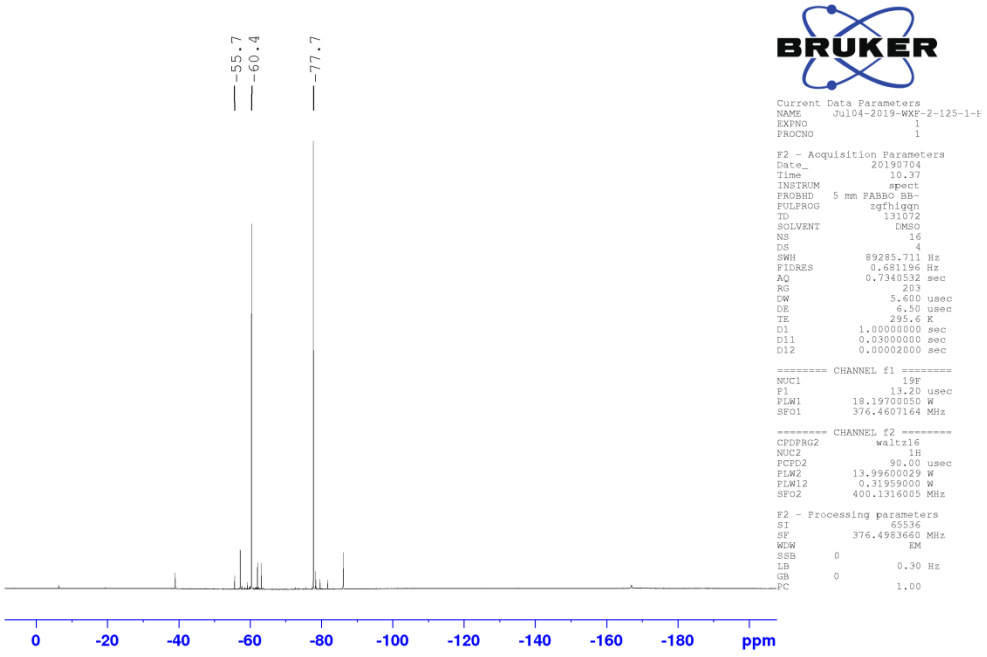
F2 - Acquisition Parameters
Date_           20190617
Time              16.27
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG          zgfhigqn
TD               131072
SOLVENT           CDCl3
NS                   16
DS                    4
SWH           89285.711 Hz
FIDRES         0.681196 Hz
AQ             0.7340532 sec
RG                  203
DW               5.600 usec
DE                6.50 usec
TE              295.3 K
D1             1.00000000 sec
D11            0.03000000 sec
D12            0.00002000 sec

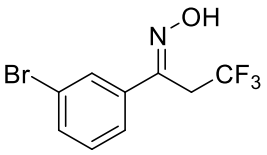
======== CHANNEL f1 ========
NUC1               19F
P1                13.20 usec
PLW1        18.19700050 W
SFO1       376.4607164 MHz

======== CHANNEL f2 ========
CPDPRG2         waltz16
NUC2               1H
PCPD2             90.00 usec
PLW2        13.99600029 W
PLW12        0.31959000 W
SFO2       400.1316005 MHz

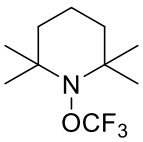
F2 - Processing parameters
SI                65536
SF           376.4983660 MHz
WDW                  EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```

^{19}F NMR spectra of **4p, 5** and **6** in $(CD_3)_2SO$.





4p



5

CF_3SO_3H

6