Electronic Supplementary Information

Visible-light-initiated nickel-catalyzed amination of aryl halides using thioxanthen-9-one as a photocatalyst

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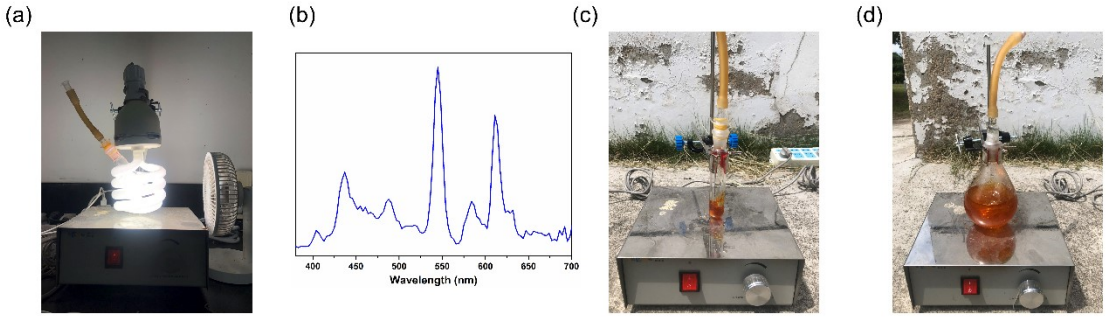


Fig. S1. The reaction set-up with 45 W CFL (the power density is about 0.81 mW cm^{-2}) (a), emission spectra of the 45 W CFL (b), the reaction set-up under sunlight (c) and gram scale reaction set-up (d)

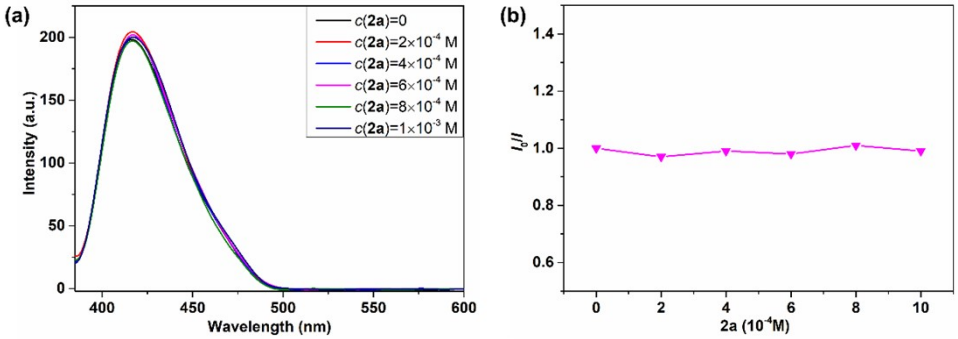
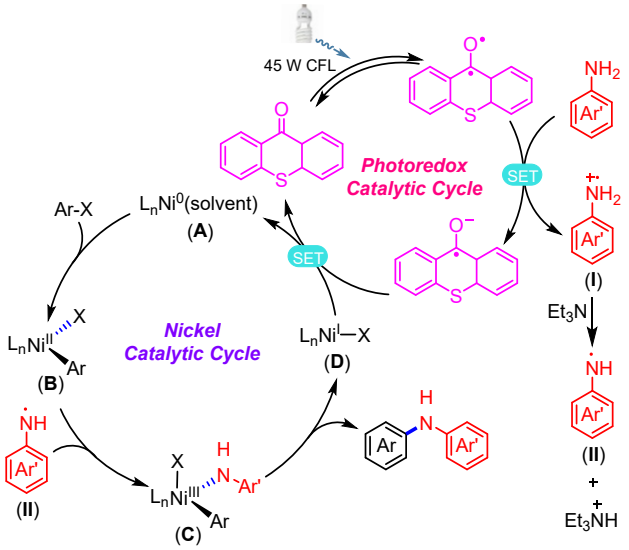


Fig. S2. (a) Emission spectra of TXO in DMAC (10^{-4} M) in the presence of increasing **2a** concentrations excited at λ = 378 nm. (b) Stern-Volmer plot of I_0/I versus **2a** concentration in TXO/DMAC solution (I_0 and I represent the intensities of the emission in the absence and presence of the quencher)



Scheme S1. The electron transfer mechanism.

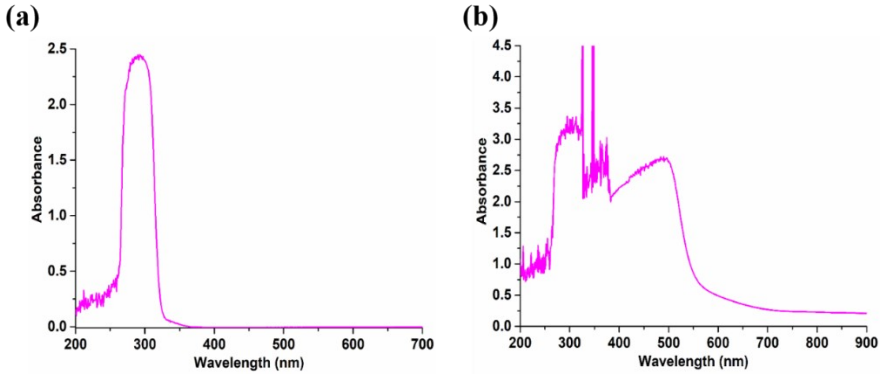


Fig. S3. UV-visible spectrum of the DMAC solution of **1a** (0.001 M), **2a** (0.002 M), Et_3N (0.002 M) (a); the reaction mixture of **1a** (0.1 M), **2a** (0.2 M), Et_3N (0.2 M), dtbbpy (0.012 M) and $Ni(cod)_2$ (0.01 M) in DMAC (b) under a nitrogen atmosphere.

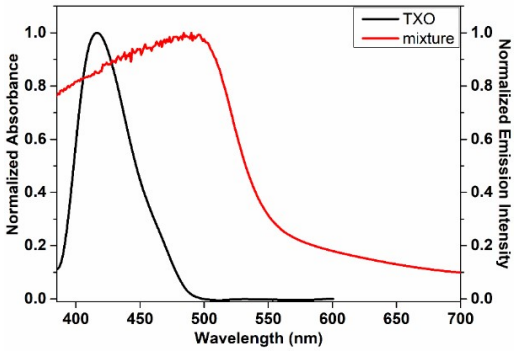


Fig. S4. The emission spectra of TXO and absorbance spectrum of the reaction mixture of **1a** (0.1 M), **2a** (0.2 M), Et_3N (0.2 M), dtbbpy (0.012 M) and $Ni(cod)_2$ (0.01 M) in DMAC under a nitrogen atmosphere.

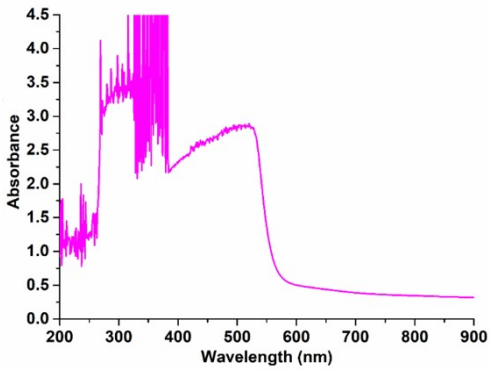


Fig. S5. UV-visible spectrum of the reaction mixture of **1a** (0.1 M), **2a** (0.2 M), Et_3N (0.2 M), dtbbpy (0.012 M) and $Ni(cod)_2$ (0.01 M) in DMAC after the 12 h irradiation of 45 W CFL.

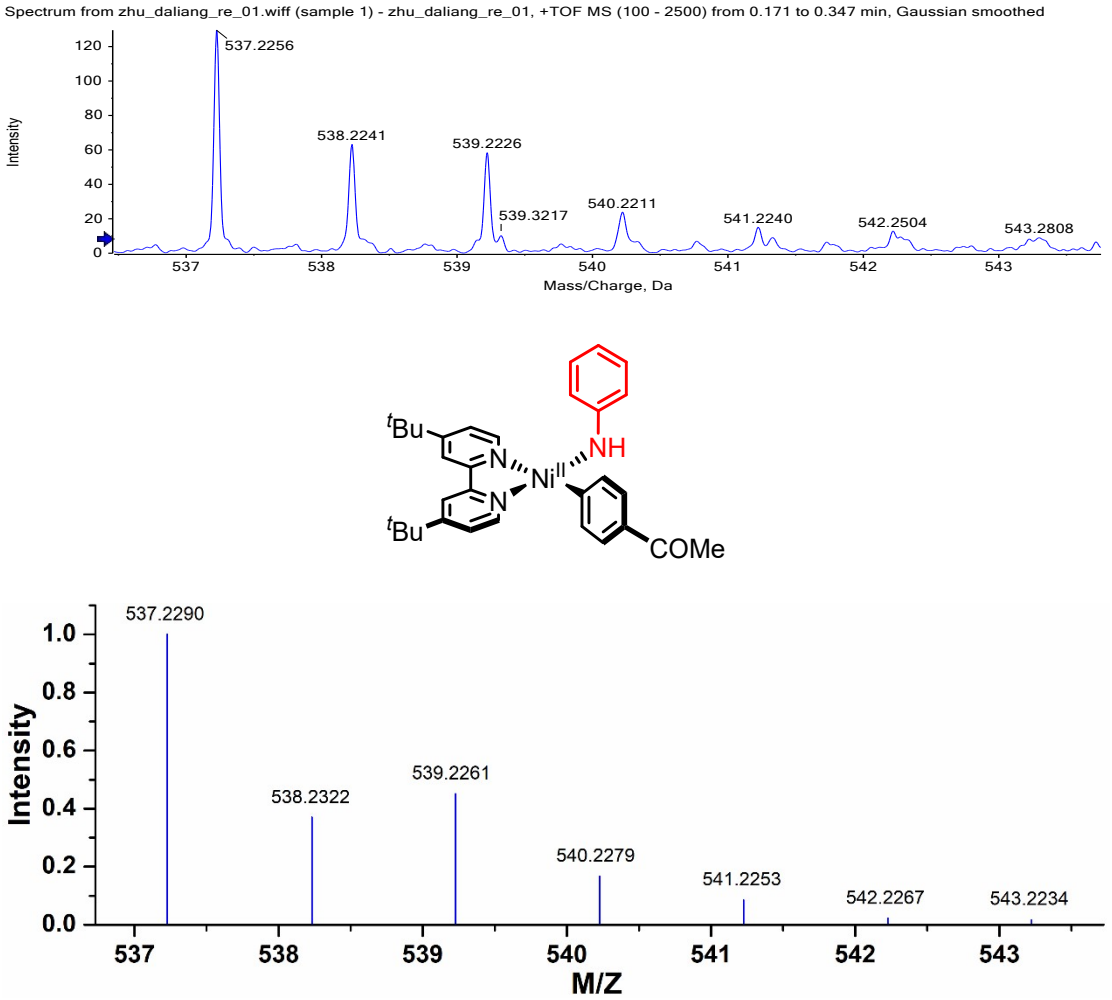
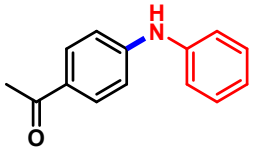


Fig. S6. The ESI-MS spectrum of (dtbbpy)-4-acetylphenyl-nickel(II)-NHPh. The calculated isotope patterns (bottom) and observed patterns (upper).

NMR Data of Products

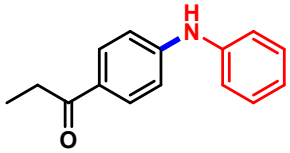
1-(4-phenoxyphenyl)ethan-1-one (3aa)[S1]



Following the General Procedure with the corresponding 1-(4-bromophenyl)ethan-1-one (0.2 mmol) and aniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the colorless solid **3aa** (37.6mg, 89% for 1-(4-bromophenyl)ethan-1-one; 13.1 mg, 31% for 1-(4-chlorophenyl)ethan-1-one).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.87 (d, *J* = 8.8 Hz, 2H), 7.35 (t, *J* = 7.9 Hz, 2H), 7.19 (d, *J* = 7.6 Hz, 2H), 7.08 (t, *J* = 7.4 Hz, 1H), 6.99 (d, *J* = 8.8 Hz, 2H), 2.53 (s, 3H). ^{13}C{^{1}H} NMR (101 MHz, $CDCl_3$, ppm) δ = 196.6, 148.6, 140.8, 130.8, 129.7, 129.2, 123.6, 120.9, 114.6, 26.4. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{14}H_{14}NO^+$ 212.1070; Found 212.1064.

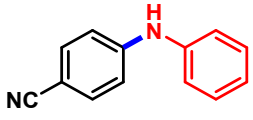
1-(4-(phenylamino)phenyl)propan-1-one (3ba)[S2]



Following the General Procedure with the corresponding 1-(4-bromophenyl)propan-1-one (0.2 mmol) and aniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the yellow solid **3ba** (40.5 mg, 90%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.88 (d, *J* = 8.7 Hz, 2H), 7.34 (t, *J* = 7.9 Hz, 2H), 7.18 (d, *J* = 7.7 Hz, 2H), 7.08 (t, *J* = 7.4 Hz, 1H), 7.00 (d, *J* = 8.7 Hz, 2H), 6.12 (s, 1H), 2.93 (q, *J* = 7.3 Hz, 2H), 1.21 (t, *J* = 7.3 Hz, 3H). ^{13}C{^{1}H} NMR (101 MHz, $CDCl_3$, ppm) δ = 199.4, 148.3, 140.9, 130.5, 129.7, 128.9, 123.4, 120.7, 114.7, 31.4, 8.8. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{15}H_{16}NO^+$ 226.1226; Found 226.1213.

4-(phenylamino)benzonitrile (3ca)[S1]

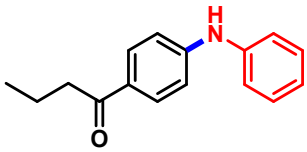


Following the General Procedure with the corresponding 4-bromobenzonitrile (0.2 mmol) and

aniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the colorless solid **3ca** (35.7 mg, 92% for 4-bromobenzonitrile; 13.2 mg, 34% for 4-chlorobenzonitrile).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.47 (d, *J* = 8.7 Hz, 2H), 7.36 (t, *J* = 7.8 Hz, 2H), 7.17 (d, *J* = 7.9 Hz, 2H), 7.12 (t, *J* = 7.4 Hz, 1H), 6.98 (d, *J* = 8.7 Hz, 2H), 6.17 (s, 1H). ^{13}C{^{1}H} NMR (101 MHz, $CDCl_3$, ppm) δ = 148.2, 140.2, 133.9, 129.8, 124.1, 121.4, 120.2, 115.1, 101.5. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{13}H_{11}N_2^+$ 195.0917; Found 195.0908.

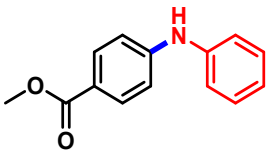
1-(4-(phenylamino)phenyl)butan-1-one (3da)



Following the General Procedure with the corresponding 1-(4-bromophenyl)butan-1-one (0.2 mmol) and aniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the white solid **3da** (41.6 mg, 87%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.88 (d, *J* = 8.8 Hz, 2H), 7.40–7.29 (m, 2H), 7.18 (d, *J* = 7.5 Hz, 2H), 7.07 (t, *J* = 7.4 Hz, 1H), 7.00 (d, *J* = 8.8 Hz, 2H), 6.25 (s, 1H), 2.87 (t, *J* = 7.4 Hz, 2H), 1.84–1.68 (m, 2H), 1.00 (t, *J* = 7.4 Hz, 3H). ^{13}C{^{1}H} NMR (101 MHz, $CDCl_3$, ppm) δ = 199.1, 148.4, 140.9, 130.5, 129.7, 128.9, 123.4, 120.7, 114.6, 40.2, 18.4, 14.2. m.p. = 91.2-91.9 ℃. IR (KBr disk, cm^{-1}) 3331, 2972, 2960, 2926, 2867, 1657, 1585, 1524, 1494, 1448, 1413, 1367, 1326, 1300, 1222, 1177, 1121, 1012, 896, 844, 806, 750, 695, 636, 595, 568, 501. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{16}H_{18}NO^+$ 240.1383; Found 240.1388.

methyl 4-(phenylamino)benzoate (3ea)[S1]

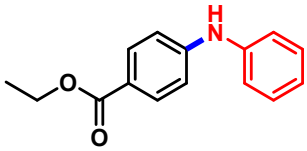


Following the General Procedure with the corresponding methyl 4-bromobenzoate (0.2 mmol) and aniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the colorless oil **3ea** (40.0 mg, 88%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.92 (d, *J* = 8.7 Hz, 2H), 7.34 (t, *J* = 7.9 Hz, 2H), 7.17 (d, *J*

= 8.3 Hz, 2H), 7.07 (t, *J* = 7.4 Hz, 1H), 6.99 (d, *J* = 8.7 Hz, 2H), 6.05 (s, 1H), 3.88 (s, 3H). $^{13}C\{^{1}H\}$ NMR (101 MHz, $CDCl_3$, ppm) δ = 167.2, 148.3, 141.1, 131.7, 129.7, 123.3, 121.3, 120.6, 114.8, 51.9. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{14}H_{14}NO_2^+$ 228.1019; Found 228.1032.

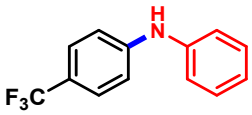
ethyl 4-(phenylamino)benzoate (3fa)[S3]



Following the General Procedure with the corresponding ethyl 4-bromobenzoate (0.2 mmol) and aniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the pale yellow solid **3fa** (41.5 mg, 86%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.92 (d, *J* = 8.8 Hz, 2H), 7.38–7.30 (m, 2H), 7.17 (d, *J* = 7.5 Hz, 2H), 7.06 (t, *J* = 7.4 Hz, 1H), 6.99 (d, *J* = 8.8 Hz, 2H), 6.03 (s, 1H), 4.34 (q, *J* = 7.1 Hz, 2H), 1.37 (t, *J* = 7.1 Hz, 3H). $^{13}C\{^{1}H\}$ NMR (101 MHz, $CDCl_3$, ppm) δ = 166.7, 148.1, 141.1, 131.6, 129.7, 123.3, 121.7, 120.5, 114.8, 60.7, 14.6. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{15}H_{16}NO_2^+$ 242.1176; Found 242.1185.

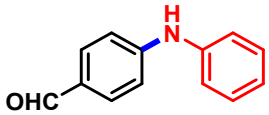
N-phenyl-4-(trifluoromethyl)aniline (3ga)[S1]



Following the General Procedure with the corresponding 1-bromo-4-(trifluoromethyl)benzene (0.2 mmol) and aniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the colorless oil **3ga** (42.2 mg, 89%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.49 (d, *J* = 8.6 Hz, 2H), 7.36 (t, *J* = 7.8 Hz, 2H), 7.17 (d, *J* = 7.8 Hz, 2H), 7.07 (dd, *J* = 13.8, 7.9 Hz, 3H), 5.93 (s, 1H). $^{13}C\{^{1}H\}$ NMR (101 MHz, $CDCl_3$, ppm) δ = 146.9, 141.3, 129.7, 126.9 (q, *J* = 3.8 Hz), 124.8 (q, *J* = 270.8 Hz), 123.1, 121.8 (q, *J* = 32.7 Hz). 120.2, 115.5. ^{19}F NMR (376 MHz, $CDCl_3$, ppm) δ = -61.35. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{13}H_{11}F_3N^+$ 238.0838; Found 238.0855.

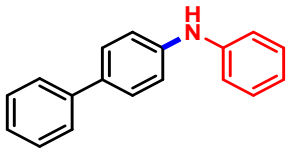
4-(phenylamino)benzaldehyde (3ha)[S1]



Following the General Procedure with the corresponding 4-bromobenzaldehyde (0.2 mmol) and aniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the pale colorless solid **3ha** (33.1 mg, 84%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 9.79 (s, 1H), 7.74 (d, *J* = 8.7 Hz, 2H), 7.41–7.32 (m, 2H), 7.21 (d, *J* = 7.6 Hz, 2H), 7.12 (t, *J* = 7.4 Hz, 1H), 7.03 (d, *J* = 8.7 Hz, 2H), 6.36 (s, 1H). ^{13}C{^{1}H} NMR (101 MHz, $CDCl_3$, ppm) δ = 190.6, 150.1, 140.3, 132.3, 129.8, 128.7, 124.1, 121.5, 114.7. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{13}H_{12}NO^+$ 198.0913; Found 198.0900.

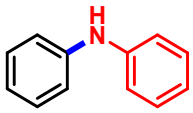
N-phenyl-[1,1'-biphenyl]-4-amine (3ia)[S4]



Following the General Procedure with the corresponding 4-bromo-1,1'-biphenyl (0.2 mmol) and aniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the white solid **3ia** (34.8 mg, 71%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.59 (d, *J* = 7.3 Hz, 2H), 7.55 – 7.50 (m, 2H), 7.44 (t, *J* = 7.7 Hz, 2H), 7.35–7.27 (m, 3H), 7.14 (t, *J* = 8.1 Hz, 4H), 6.97 (t, *J* = 7.3 Hz, 1H), 5.80 (s, 1H). ^{13}C{^{1}H} NMR (101 MHz, $CDCl_3$, ppm) δ = 143.0, 142.7, 141.0, 133.9, 129.6, 128.9, 128.2, 126.8, 126.7, 121.4, 118.3, 117.9. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{18}H_{16}N^+$ 246.1277; Found 246.1275.

diphenylamine (3ja)[S1]

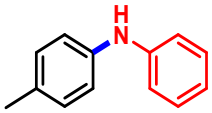


Following the General Procedure with the corresponding bromobenzene (0.2 mmol) and aniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 50/1) as an eluent, to yield the white solid **3ja** (14.5 mg, 43% for bromobenzene; 23.3 mg, 69% for iodobenzene).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.29 (dd, *J* = 14.6, 7.4 Hz, 4H), 7.09 (dd, *J* = 11.4, 8.4 Hz,

4H), 7.02 – 6.89 (m, 2H), 5.70 (s, 1H). $^{13}C\{^{1}H\}$ NMR (101 MHz, $CDCl_3$, ppm) δ = 143.3, 129.6, 129.6, 121.2, 118.0, 118.0. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{12}H_{12}N^+$ 170.0964; Found 170.0986.

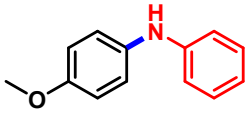
4-methyl-N-phenylaniline (3ka)[S1]



Following the General Procedure with the corresponding 1-bromo-4-methylbenzene (0.2 mmol) and aniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 50/1) as an eluent, to yield the colorless solid **3ka** (16.1 mg, 44% for 1-bromo-4-methylbenzene; 24.9 mg, 68% for 1-iodo-4-methylbenzene).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.23 (d, *J* = 7.6, 2H), 7.09 (d, *J* = 8.2, 2H), 7.01 (dd, *J* = 8.3, 2.5, 4H), 6.88 (t, *J* = 7.3, 1H), 2.30 (s, 3H). $^{13}C\{^{1}H\}$ NMR (101 MHz, $CDCl_3$, ppm) δ = 144.1, 140.5, 131.1, 130.1, 129.5, 120.5, 119.1, 117.0, 20.9. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{13}H_{14}N^+$ 184.1121; Found 184.1110.

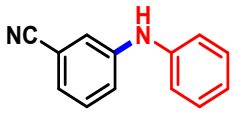
4-methoxy-N-phenylaniline (3la)[S3]



Following the General Procedure with the corresponding 1-bromo-4-methoxybenzene (0.2 mmol) and aniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the white solid **3la** (16.3 mg, 41% for 1-bromo-4-methoxybenzene; 25.1 mg, 63% for 1-iodo-4-methoxybenzene).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.25–7.18 (m, 2H), 7.12–7.05 (m, 2H), 6.96–6.78 (m, 5H), 5.84–5.07 (m, 1H), 3.81 (s, 3H). $^{13}C\{^{1}H\}$ NMR (101 MHz, $CDCl_3$, ppm) δ = 155.5, 145.4, 135.9, 129.5, 122.4, 119.8, 115.8, 114.8, 55.8. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{13}H_{14}NO^+$ 200.1070; Found 200.1068.

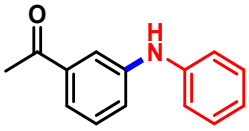
3-(phenylamino)benzonitrile (3ma)[S5]



Following the General Procedure with the corresponding 3-bromobenzonitrile (0.2 mmol) and aniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the pale yellow solid **3ma** (31.4 mg, 81%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.38–7.26 (m, 4H), 7.20 (dd, *J* = 8.2, 2.2 Hz, 1H), 7.12 (t, *J* = 8.8 Hz, 3H), 7.06 (t, *J* = 7.3 Hz, 1H), 5.85 (s, 1H). ^{13}C{^{1}H} NMR (101 MHz, $CDCl_3$, ppm) δ = 144.8, 141.2, 130.4, 129.9, 123.8, 123.3, 120.8, 119.9, 119.2, 119.0, 113.4. QTOF-MS *m/z* [M + H]$^+$ Calcd for $C_{13}H_{11}N_2^+$ 195.0917; Found 195.0920.

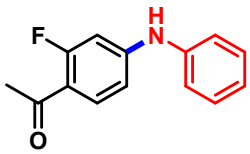
1-(3-(phenylamino)phenyl)ethan-1-one (3na)[S5]



Following the General Procedure with the corresponding 1-(3-bromophenyl)ethan-1-one (0.2 mmol) and aniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the pale yellow solid **3na** (33.8 mg, 80%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.65–7.59 (m, 1H), 7.47 (d, *J* = 7.6 Hz, 1H), 7.37–7.24 (m, 4H), 7.09 (d, *J* = 7.6 Hz, 2H), 6.98 (t, *J* = 7.4 Hz, 1H), 5.86 (s, 1H), 2.57 (s, 3H). ^{13}C{^{1}H} NMR (101 MHz, $CDCl_3$, ppm) δ = 198.4, 144.0, 142.5, 138.6, 129.7, 122.1, 121.8, 121.0, 118.7, 116.7, 26.9. QTOF-MS *m/z* [M + H]$^+$ Calcd for $C_{14}H_{14}NO^+$ 212.1070; Found 212.1063.

1-(2-fluoro-4-(phenylamino)phenyl)ethan-1-one (3oa)

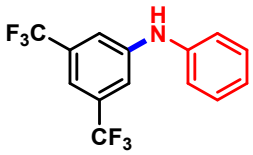


Following the General Procedure with the corresponding 1-(4-bromo-2-fluorophenyl)ethan-1-one (0.2 mmol) and aniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the pale yellow solid **3oa** (38.0 mg, 83%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.82 (t, *J* = 8.6 Hz, 1H), 7.37 (t, *J* = 7.8 Hz, 2H), 7.19 (d, *J* =

7.7 Hz, 2H), 7.13 (t, J = 7.4 Hz, 1H), 6.69 (ddd, J = 16.0, 11.3, 2.2 Hz, 2H), 6.31 (s, 1H), 2.57 (d, J = 5.2 Hz, 3H). $^{13}C\{^{1}H\}$ NMR (101 MHz, $CDCl_3$, ppm) δ = 194.4 (d, J = 3.9 Hz), 164.6 (d, J = 254.0 Hz), 150.7 (d, J = 12.0 Hz), 140.0, 132.5 (d, J = 4.4 Hz), 129.8, 124.4, 121.7, 116.9 (d, J = 13.1 Hz), 111.3 (d, J = 1.9 Hz), 101.0 (d, J = 28.8 Hz), 31.3 (d, J = 7.8 Hz). ^{19}F NMR (376 MHz, $CDCl_3$, ppm) δ = -106.26. m.p. = 99.4-100.3 ℃. IR (KBr disk, cm^{-1}) 3328, 3201, 3125, 3083, 3001, 1662, 1607, 1592, 1527, 1510, 1498, 1454, 1417, 1370, 1347, 1298, 1274, 1177, 1133, 1061, 965, 856, 743, 704, 591, 502. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{14}H_{13}FNO^+$ 230.0976; Found 230.0977.

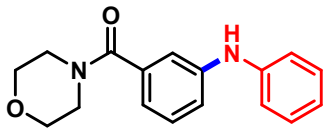
N-phenyl-3,5-bis(trifluoromethyl)aniline (3pa)[S1]



Following the General Procedure with the corresponding 1-bromo-3,5-bis(trifluoromethyl)benzene (0.2 mmol) and aniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the white solid **3pa** (50.6 mg, 83%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.41–7.35 (m, 4H), 7.32 (s, 1H), 7.13 (dd, J = 12.1, 7.6 Hz, 3H), 6.01 (s, 1H). $^{13}C\{^{1}H\}$ NMR (101 MHz, $CDCl_3$, ppm) δ = 145.5, 140.5, 132.9 (q, J = 33.0 Hz), 130.1, 124.0, 123.6 (q, J = 272.7 Hz), 120.6, 115.3 (q, J = 3.0 Hz), 113.2 (dt, J = 7.8, 3.9 Hz). ^{19}F NMR (376 MHz, $CDCl_3$, ppm) δ = -63.19. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{14}H_{10}F_6N^+$ 306.0712; Found 306.0723.

morpholino(3-(phenylamino)phenyl)methanone (3qa)

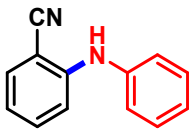


Following the General Procedure with the corresponding (3-bromophenyl)(morpholino)methanone (0.2 mmol) and aniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 10/1) as an eluent, to yield the white solid **3qa** (42.9 mg, 76%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.33–7.23 (m, 4H), 7.13–7.04 (m, 4H), 6.98 (t, J = 7.4 Hz, 1H), 6.88 (d, J = 7.5 Hz, 1H), 5l.84 (s, 1H), 3.81–3.44 (m, 8H). $^{13}C\{^{1}H\}$ NMR (101 MHz, $CDCl_3$, ppm) δ = 170.6, 144.1, 142.3, 136.7, 129.8, 129.7, 122.2, 119.0, 118.9, 118.4, 115.4, 67.1. m.p. =

113.3-114.2 ℃. IR (KBr disk, cm^{-1}) 3279, 3118, 3049, 3002, 2968, 2922, 2852, 1623, 1580, 1530, 1497, 1447, 1435, 1365, 1319, 1303, 1274, 1260, 1222, 1166, 1142, 1110, 1069, 1030, 993, 960, 884, 838, 801, 761, 728, 701, 627, 574, 486. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{17}H_{19}N_2O_2^+$ 283.1441; Found 283.1453.

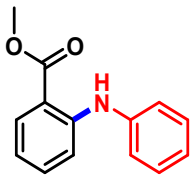
2-(phenylamino)benzonitrile (3ra)[S4]



Following the General Procedure with the corresponding 2-bromobenzonitrile (0.2 mmol) and aniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the slightly yellow solid **3ra** (26.0 mg, 67%).

^1H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.50 (dd, *J* = 7.8, 1.5 Hz, 1H), 7.37 (t, *J* = 7.9 Hz, 3H), 7.24–7.18 (m, 3H), 7.14 (t, *J* = 7.4 Hz, 1H), 6.89–6.81 (m, 1H), 6.35 (s, 1H). $^{13}C\{^1H\}$ NMR (101 MHz, $CDCl_3$, ppm) δ = 147.5, 140.1, 134.1, 133.2, 129.8, 124.4, 121.9, 119.4, 117.8, 114.3, 98.6. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{13}H_{11}N_2^+$ 195.0917; Found 195.0934.

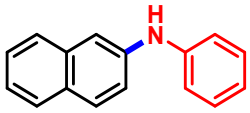
methyl 2-(phenylamino)benzoate (3sa)[S6]



Following the General Procedure with the corresponding methyl 2-bromobenzoate (0.2 mmol) and aniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the pale yellow oil **3sa** (28.6 mg, 63%).

^1H NMR (400 MHz, $CDCl_3$, ppm) δ = 9.47 (s, 1H), 7.96 (dd, *J* = 8.1, 1.4 Hz, 1H), 7.34 (dd, *J* = 11.1, 4.6 Hz, 2H), 7.29 (dd, *J* = 6.9, 1.6 Hz, 1H), 7.27–7.22 (m, 3H), 7.11–7.04 (m, 1H), 6.72 (ddd, *J* = 8.1, 6.8, 1.4 Hz, 1H), 3.89 (s, 3H). $^{13}C\{^1H\}$ NMR (101 MHz, $CDCl_3$, ppm) δ = 169.1, 148.1, 140.9, 134.3, 131.8, 129.5, 129.3, 123.7, 122.7, 117.3, 114.2, 112.1, 52.0. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{14}H_{14}NO_2^+$ 228.1019; Found 228.1027.

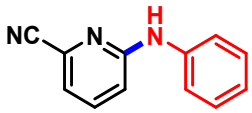
N-phenylnaphthalen-2-amine (3ta)[S7]



Following the General Procedure with the corresponding 2-bromonaphthalene (0.2 mmol) and aniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the colorless solid **3ta** (30.7 mg, 70%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.79–7.68 (m, 2H), 7.62 (d, *J* = 8.2 Hz, 1H), 7.38 (dd, *J* = 11.2, 3.9 Hz, 2H), 7.34–7.25 (m, 3H), 7.18 (dd, *J* = 8.8, 2.2 Hz, 1H), 7.13 (d, *J* = 7.7 Hz, 2H), 6.96 (t, *J* = 7.3 Hz, 1H), 5.81 (s, 1H). ^{13}C{^{1}H} NMR (101 MHz, $CDCl_3$, ppm) δ = 143.1, 141.0, 134.8, 129.6, 129.4, 127.8, 126.7, 126.6, 123.7, 121.6, 120.2, 118.4, 111.7. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{16}H_{14}N^+$ 220.1121; Found 220.1113.

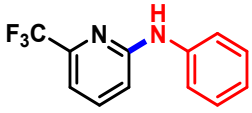
6-(phenylamino)picolinonitrile (3ua)



Following the General Procedure with the corresponding 6-bromopicolinonitrile (0.2 mmol) and aniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 10/1) as an eluent, to yield the yellow solid **3ua** (32.4 mg, 83% for 6-bromopicolinonitrile; 20.7 mg, 53% for 6-chloropicolinonitrile).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.55 (dd, *J* = 8.6, 7.3 Hz, 1H), 7.37 (d, *J* = 4.3 Hz, 4H), 7.18–7.09 (m, 2H), 6.99 (d, *J* = 8.6 Hz, 1H), 6.73 (s, 1H). ^{13}C{^{1}H} NMR (101 MHz, $CDCl_3$, ppm) δ = 156.8, 139.1, 138.3, 132.0, 129.7, 124.4, 121.4, 120.0, 117.8, 112.5. m.p. = 119.0-119.9 °C. IR (KBr disk, cm^{-1}) 3361, 3026, 2920, 2850, 2240, 1621, 1591, 1537, 1499, 1481, 1467, 1450, 1384, 1368, 1310, 1249, 1195, 1077, 794, 753, 719, 691, 624, 553, 503. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{12}H_{10}N_3^+$ 196.0869; Found 196.0864.

N-phenyl-6-(trifluoromethyl)pyridin-2-amine (3va)

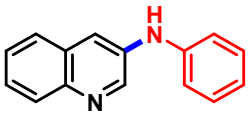


Following the General Procedure with the corresponding 2-bromo-6-(trifluoromethyl)pyridine (0.2

mmol) and aniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 10/1) as an eluent, to yield the pale yellow oil **3va** (38.1 mg, 80% for 2-bromo-6-(trifluoromethyl)pyridine; 26.2 mg, 55% for 2-chloro-6-(trifluoromethyl)pyridine).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.60 (t, *J* = 7.9 Hz, 1H), 7.36 (d, *J* = 4.2 Hz, 4H), 7.16–7.06 (m, 2H), 6.99 (d, *J* = 8.5 Hz, 1H), 6.75 (s, 1H). ^{13}C{^{1}H} NMR (101 MHz, $CDCl_3$, ppm) δ = 156.3, 146.9 (q, *J* = 34.2 Hz), 139.6, 138.8, 129.7, 124.0, 121.7 (q, *J* = 274.0 Hz), 121.1, 111.3 (dd, *J* = 3.1 Hz), 111.2, 111.2. ^{19}F NMR (376 MHz, $CDCl_3$) δ = -68.61. IR (KBr disk, cm^{-1}) 3405, 3039, 2926, 2854, 1612, 1596, 1579, 1530, 1498, 1455, 1419, 1370, 1350, 1319, 1284, 1187, 1135, 1082, 986, 934, 895, 802, 737, 693, 655, 596, 528, 494. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{12}H_{10}F_3N_2^+$ 239.0791; Found 239.0788.

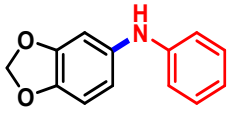
N-phenylquinolin-3-amine (3wa)[S8]



Following the General Procedure with the corresponding 3-bromoquinoline (0.2 mmol) and aniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 10/1) as an eluent, to yield the colorless oil **3wa** (27.3 mg, 62%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 8.70 (d, *J* = 2.7 Hz, 1H), 8.01 (d, *J* = 8.2 Hz, 1H), 7.73 (d, *J* = 2.6 Hz, 1H), 7.63 (dd, *J* = 8.0, 1.3 Hz, 1H), 7.49 (dtd, *J* = 14.7, 6.9, 1.4 Hz, 2H), 7.35 (dd, *J* = 8.3, 7.5 Hz, 2H), 7.23–7.15 (m, 2H), 7.05 (t, *J* = 7.4 Hz, 1H), 6.09 (s, 1H). ^{13}C{^{1}H} NMR (101 MHz, $CDCl_3$, ppm) δ = 145.2, 143.8, 142.0, 137.2, 129.8, 129.2, 129.0, 127.4, 126.7, 126.7, 122.5, 118.8, 117.1. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{15}H_{13}N_2^+$ 221.1073; Found 221.1090.

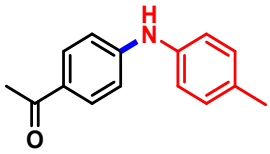
N-phenylbenzo[*d*][1,3]dioxol-5-amine (3xa)[S9]



Following the General Procedure with the corresponding 5-bromobenzo[*d*][1,3]dioxole (0.2 mmol) and aniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the colorless oil **3xa** (20.9 mg, 49% for 5-bromobenzo[*d*][1,3]dioxole; 25.6 mg, 60% for 5-iodobenzo[*d*][1,3]dioxole).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.15 (t, *J* = 7.9 Hz, 2H), 6.86 (d, *J* = 7.9 Hz, 2H), 6.78 (t, *J* = 7.3 Hz, 1H), 6.67 (d, *J* = 8.2 Hz, 1H), 6.63 (d, *J* = 2.1 Hz, 1H), 6.48 (dd, *J* = 8.2, 2.2 Hz, 1H), 5.87 (s, 2H), 5.44 (s, 1H). ^{13}C{^{1}H} NMR (101 MHz, $CDCl_3$, ppm) δ = 148.4, 144.9, 143.1, 137.5, 129.5, 120.2, 116.4, 113.2, 108.8, 102.8, 101.3. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{13}H_{12}NO_2^+$ 214.0863; Found 214.0855.

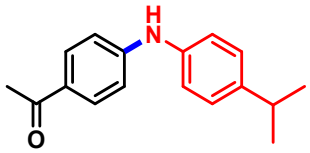
1-(4-(*p*-tolylamino)phenyl)ethan-1-one (3ab)[S10]



Following the General Procedure with the corresponding 1-(4-bromophenyl)ethan-1-one (0.2 mmol) and *p*-toluidine (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the pale yellow solid **3ab** (41.0 mg, 91%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.85 (d, *J* = 8.6 Hz, 2H), 7.16 (d, *J* = 8.1 Hz, 2H), 7.09 (d, *J* = 8.2 Hz, 2H), 6.92 (d, *J* = 8.6 Hz, 2H), 6.06 (s, 1H), 2.52 (s, 3H), 2.34 (s, 3H). ^{13}C{^{1}H} NMR (101 MHz, $CDCl_3$, ppm) δ = 196.6, 149.3, 138.0, 133.6, 130.9, 130.3, 128.8, 121.8, 114.0, 26.3, 21.1. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{15}H_{16}NO^+$ 226.1226; Found 226.1210.

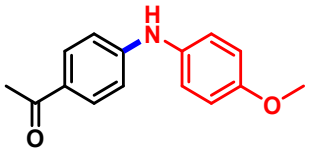
1-(4-((4-isopropylphenyl)amino)phenyl)ethan-1-one (3ac)[S11]



Following the General Procedure with the corresponding 1-(4-bromophenyl)ethan-1-one (0.2 mmol) and 4-isopropylaniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the white solid **3ac** (45.5 mg, 90%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.85 (d, *J* = 8.7 Hz, 2H), 7.21 (d, *J* = 8.4 Hz, 2H), 7.12 (d, *J* = 8.4 Hz, 2H), 6.94 (d, *J* = 8.7 Hz, 2H), 6.03 (s, 1H), 2.91 (dt, *J* = 13.8, 6.9 Hz, 1H), 2.52 (s, 3H), 1.27 (s, 7H), 1.25 (s, 3H). ^{13}C{^{1}H} NMR (101 MHz, $CDCl_3$, ppm) δ = 196.6, 149.2, 144.7, 138.3, 130.9, 128.8, 127.6, 121.6, 114.1, 33.8, 26.3, 24.3. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{17}H_{20}NO^+$ 254.1539; Found 254.1538.

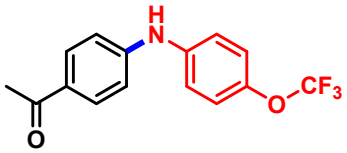
1-(4-((4-methoxyphenyl)amino)phenyl)ethan-1-one (3ad)[S11]



Following the General Procedure with the corresponding 1-(4-bromophenyl)ethan-1-one (0.2 mmol) and 4-methoxyaniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the white solid **3ad** (44.8 mg, 93%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.83 (d, *J* = 8.7 Hz, 2H), 7.14 (d, *J* = 8.8 Hz, 2H), 6.91 (d, *J* = 8.8 Hz, 2H), 6.81 (d, *J* = 8.7 Hz, 2H), 5.92 (s, 1H), 3.82 (s, 3H), 2.51 (s, 3H). ^{13}C{^{1}H} NMR (101 MHz, $CDCl_3$, ppm) δ = 196.6, 156.9, 150.3, 133.4, 131.0, 128.4, 124.9, 115.0, 113.4, 55.8, 26.3. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{15}H_{16}NO_2^+$ 242.1176; Found 242.1153.

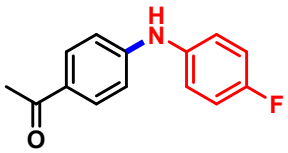
1-(4-((4-(trifluoromethoxy)phenyl)amino)phenyl)ethan-1-one (3ae)[S11]



Following the General Procedure with the corresponding 1-(4-bromophenyl)ethan-1-one (0.2 mmol) and 4-(trifluoromethoxy)aniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the white solid **3ae** (40.7, 69%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.88 (d, *J* = 8.7 Hz, 2H), 7.19 (s, 4H), 6.99 (d, *J* = 8.7 Hz, 2H), 6.21 (s, 1H), 2.54 (s, 3H). ^{13}C{^{1}H} NMR (101 MHz, $CDCl_3$, ppm) δ = 196.7, 148.1, 144.7, 139.8, 130.9, 129.8, 122.6, 121.6, 120.7 (q, *J* = 256.7 Hz), 114.9, 26.4. ^{19}F NMR (376 MHz, $CDCl_3$, ppm) δ = -58.18. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{15}H_{13}F_3NO_2^+$ 296.0893; Found 296.0899.

1-(4-((4-fluorophenyl)amino)phenyl)ethan-1-one (3af)[S12]

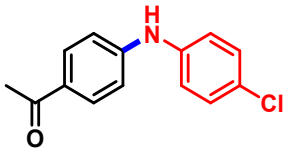


Following the General Procedure with the corresponding 1-(4-bromophenyl)ethan-1-one (0.2 mmol) and 4-fluoroaniline (0.4 mmol). The crude product was purified by preparative TLC, using

PE and EA (v/v = 20/1) as an eluent, to yield the yellow solid **3af** (28.4 mg, 62%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.85 (d, *J* =8.7 Hz, 2H), 7.16 (dd, *J* = 8.8, 4.7 Hz, 2H), 7.05 (t, *J* = 8.5 Hz, 2H), 6.88 (d, *J* = 8.7 Hz, 2H), 6.04 (s, 1H), 2.52 (s, 3H). ^{13}C{^{1}H} NMR (101 MHz, $CDCl_3$, ppm) δ = 196.6, 159.6 (d, *J* = 243.3 Hz), 149.3, 136.7 (d, *J* = 2.8 Hz), 130.9, 129.1, 123.8 (d, *J* = 8.1 Hz), 116.5 (d, *J* = 22.6 Hz), 114.0, 26.3. ^{19}F NMR (376 MHz, $CDCl_3$, ppm) δ = -118.54. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{14}H_{13}FNO^+$ 230.0976; Found 230.0979.

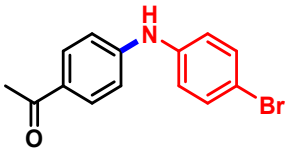
1-(4-((4-chlorophenyl)amino)phenyl)ethan-1-one (3ag)[S11]



Following the General Procedure with the corresponding 1-(4-bromophenyl)ethan-1-one (0.2 mmol) and 4-chloroaniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the white solid **3ag** (30.9 mg, 63%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.87 (d, *J* = 8.6 Hz, 2H), 7.29 (d, *J* = 8.6 Hz, 2H), 7.11 (d, *J* = 8.6 Hz, 2H), 6.97 (d, *J* = 8.6 Hz, 2H), 6.12 (s, 1H), 2.53 (s, 3H). ^{13}C{^{1}H} NMR (101 MHz, $CDCl_3$, ppm) δ = 196.6, 148.1, 139.6, 130.8, 129.8, 129.7, 128.4, 122.0, 114.9, 26.4. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{14}H_{13}ClNO^+$ 246.0680; Found 246.0669.

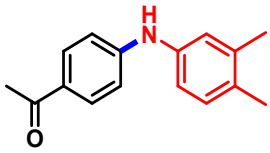
1-(4-((4-bromophenyl)amino)phenyl)ethan-1-one (3ah)[S13]



Following the General Procedure with the corresponding 1-(4-bromophenyl)ethan-1-one (0.2 mmol) and 4-bromoaniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the white solid **3ah** (38.1 mg, 66%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.87 (d, *J* = 8.7 Hz, 2H), 7.44 (d, *J* = 8.7 Hz, 2H), 7.06 (d, *J* = 8.7 Hz, 2H), 6.98 (d, *J* = 8.7 Hz, 2H), 6.10 (s, 1H), 2.53 (s, 3H). ^{13}C{^{1}H} NMR (101 MHz, $CDCl_3$, ppm) δ = 196.6, 147.9, 140.1, 132.7, 130.8, 129.8, 122.2, 115.7, 115.0, 26.4. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{14}H_{13}BrNO^+$ 290.0175; Found 290.0191.

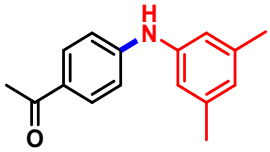
1-(4-((3,4-dimethylphenyl)amino)phenyl)ethan-1-one (3ai)



Following the General Procedure with the corresponding 1-(4-bromophenyl)ethan-1-one (0.2 mmol) and 3,4-dimethylaniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the white solid **3ai** (40.6 mg, 85%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.85 (d, *J* = 8.8 Hz, 2H), 7.11 (d, *J* = 8.0 Hz, 1H), 7.02–6.87 (m, 4H), 6.02 (s, 1H), 2.52 (s, 3H), 2.26 (s, 6H). ^{13}C{^{1}H} NMR (101 MHz, $CDCl_3$, ppm) δ = 196.6, 149.4, 138.3, 138.1, 132.4, 130.8, 130.7, 128.7, 123.2, 119.2, 114.0, 26.3, 20.1, 19.3. m.p. = 144.0-144.8 ℃. IR (KBr disk, cm^{-1}) 3321, 2974, 2934, 1919, 1649, 1588, 1565, 1521, 1504, 1424, 1383, 1358, 1330, 1278, 1251, 1180, 1120, 1072, 1024, 955, 873, 848, 830, 802, 785, 699, 628, 591, 472. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{16}H_{18}NO^+$ 240.1383; Found 240.1375.

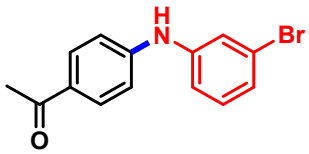
1-(4-((3,5-dimethylphenyl)amino)phenyl)ethan-1-one (3aj)[S14]



Following the General Procedure with the corresponding 1-(4-bromophenyl)ethan-1-one (0.2 mmol) and 3,5-dimethylaniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the yellow solid **3aj** (40.2 mg, 84%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.86 (d, *J* = 8.7 Hz, 2H), 6.98 (d, *J* = 8.7 Hz, 2H), 6.81 (s, 2H), 6.74 (s, 1H), 6.13 (s, 1H), 2.53 (s, 3H), 2.31 (s, 6H). ^{13}C{^{1}H} NMR (101 MHz, $CDCl_3$, ppm) δ = 196.7, 148.8, 140.6, 139.4, 130.8, 128.9, 125.4, 118.6, 114.6, 26.3, 21.6. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{16}H_{18}NO^+$ 240.1383; Found 240.1385.

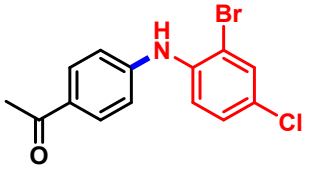
1-(4-((3-bromophenyl)amino)phenyl)ethan-1-one (3ak)[S15]



Following the General Procedure with the corresponding 1-(4-bromophenyl)ethan-1-one (0.2 mmol) and 3-bromoaniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the pale yellow solid **3ak** (34.7 mg, 60%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.89 (d, *J* = 8.7 Hz, 2H), 7.33 (s, 1H), 7.18 (d, *J* = 6.5 Hz, 2H), 7.11–7.06 (m, 1H), 7.02 (d, *J* = 8.7 Hz, 2H), 6.11 (s, 1H), 2.54 (s, 3H). ^{13}C{^{1}H} NMR (101 MHz, $CDCl_3$, ppm) δ = 196.6, 147.5, 142.6, 131.0, 130.8, 130.2, 126.1, 123.4, 122.9, 118.7, 115.5, 26.4. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{14}H_{13}BrNO^+$ 290.0175; Found 290.0164.

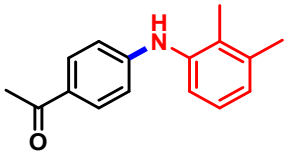
1-(4-((2-bromo-4-chlorophenyl)amino)phenyl)ethan-1-one (3al)



Following the General Procedure with the corresponding 1-(4-bromophenyl)ethan-1-one (0.2 mmol) and 2-bromo-4-chloroaniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the pale grey solid **3al** (34.2 mg, 53%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.91 (d, *J* = 8.7 Hz, 2H), 7.59 (d, *J* = 2.3 Hz, 1H), 7.35 (d, *J* = 8.7 Hz, 1H), 7.24 (dd, *J* = 8.7, 2.3 Hz, 1H), 7.06 (d, *J* = 8.7 Hz, 2H), 6.22 (s, 1H), 2.56 (s, 3H). ^{13}C{^{1}H} NMR (101 MHz, $CDCl_3$, ppm) δ = 196.6, 146.6, 138.2, 132.9, 130.9, 130.8, 128.6, 127.7, 119.9, 116.6, 115.1, 26.5. m.p. = 94.7-95.5 ℃. IR (KBr disk, cm^{-1}) 3402, 3071, 2952, 2917, 2849, 1673, 1604, 1585, 1520, 1498, 1459, 1416, 1380, 1356, 1325, 1280, 1226, 1180, 1144, 1123, 1102, 1032, 956, 925, 868, 849, 816, 735, 656, 591, 542, 491. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{14}H_{12}BrClNO^+$ 323.9785; Found 323.9790.

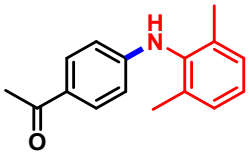
1-(4-((2,3-dimethylphenyl)amino)phenyl)ethan-1-one (3am)



Following the General Procedure with the corresponding 1-(4-bromophenyl)ethan-1-one (0.2 mmol) and 2,3-dimethylaniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the pale yellow solid **3am** (33.0 mg, 69%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.83 (d, *J* = 8.7 Hz, 2H), 7.15 – 7.10 (m, 2H), 7.07–7.01 (m, 1H), 6.70 (d, *J* = 8.7 Hz, 2H), 5.80 (s, 1H), 2.51 (s, 3H), 2.33 (s, 3H), 2.15 (s, 3H). ^{13}C{^{1}H} NMR (101 MHz, $CDCl_3$, ppm) δ = 196.6, 150.4, 138.6, 138.5, 132.0, 130.9, 128.3, 127.3, 126.4, 122.6, 113.6, 26.3, 20.8, 14.19. m.p. = 120.5-121.1 ℃. IR (KBr disk, cm^{-1}) 3321, 2913, 2852, 1661, 1599, 1572, 1524, 1468, 1424, 1384, 1334, 1277, 1175, 1119, 1091, 1020, 961, 826, 808, 777, 748, 699, 606, 576, 490. QTOF-MS *m/z* [M + H]$^+$ Calcd for $C_{16}H_{18}NO^+$ 240.1383; Found 240.1368.

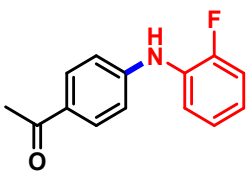
1-(4-((2,6-dimethylphenyl)amino)phenyl)ethan-1-one (3an)



Following the General Procedure with the corresponding 1-(4-bromophenyl)ethan-1-one (0.2 mmol) and 2,6-dimethylaniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the white solid **3an** (32.0 mg, 67%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.81 (d, *J* = 8.8 Hz, 2H), 7.15 (s, 3H), 6.46 (d, *J* = 8.7 Hz, 2H), 5.60 (s, 1H), 2.50 (s, 3H), 2.20 (s, 6H). ^{13}C{^{1}H} NMR (101 MHz, $CDCl_3$, ppm) δ = 196.6, 150.9, 136.8, 136.6, 131.1, 128.9, 128.0, 127.2, 112.3, 26.3, 18.5. m.p. = 110.1-110.8 ℃. IR (KBr disk, cm^{-1}) 3374, 2921, 2851, 1651, 1602, 1586, 1515, 1478, 1377, 1361, 1333, 1276, 1176, 1163, 1121, 1071, 1033, 956, 831, 779, 688, 594, 552, 503. QTOF-MS *m/z* [M + H]$^+$ Calcd for $C_{16}H_{18}NO^+$ 240.1383; Found 240.1374.

1-(4-((2-fluorophenyl)amino)phenyl)ethan-1-one (3ao)[S16]

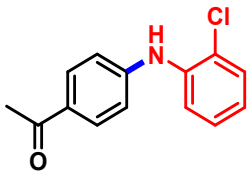


Following the General Procedure with the corresponding 1-(4-bromophenyl)ethan-1-one (0.2 mmol) and 2-fluoroaniline (0.4 mmol). The crude product was purified by preparative TLC, using

PE and EA (v/v = 20/1) as an eluent, to yield the yellow oil **3ao** (22.9 mg, 50%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.90 (d, *J* = 8.8 Hz, 2H), 7.47–7.37 (m, 1H), 7.19–7.08 (m, 2H), 7.03 (d, *J* = 8.7 Hz, 3H), 6.12 (s, 1H), 2.55 (s, 3H). ^{13}C{^{1}H} NMR (101 MHz, $CDCl_3$, ppm) δ = 196.7, 154.5 (d, *J* = 243.6 Hz), 147.6, 130.7, 129.9, 129.2 (d, *J* = 11.3 Hz), 124.7 (d, *J* = 3.8 Hz), 123.6 (d, *J* = 7.5 Hz), 121.0 (d, *J* = 1.4 Hz), 116.3 (d, *J* = 19.4 Hz), 115.3, 26.4. ^{19}F NMR (376 MHz, $CDCl_3$, ppm) δ = -128.68. QTOF-MS *m/z* [M + H]$^+$ Calcd for $C_{14}H_{13}FNO^+$ 230.0976; Found 230.0976.

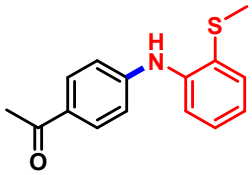
1-(4-((2-chlorophenyl)amino)phenyl)ethan-1-one (3ap)[S11]



Following the General Procedure with the corresponding 1-(4-bromophenyl)ethan-1-one (0.2 mmol) and 2-chloroaniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the pale yellow solid **3ap** (25.5 mg, 52%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.91 (d, *J* = 8.6 Hz, 2H), 7.43 (t, *J* = 8.5 Hz, 2H), 7.23 (t, *J* = 7.7 Hz, 1H), 7.09 (d, *J* = 8.6 Hz, 2H), 6.97 (t, *J* = 7.6 Hz, 1H), 6.32 (s, 1H), 2.55 (s, 3H). ^{13}C{^{1}H} NMR (101 MHz, $CDCl_3$, ppm) δ = 196.6, 147.0, 138.1, 130.7, 130.5, 130.3, 127.7, 124.5, 123.3, 119.4, 116.3, 26.4. QTOF-MS *m/z* [M + H]$^+$ Calcd for $C_{14}H_{13}ClNO^+$ 246.0680; Found 246.0682.

1-(4-((2-(methylthio)phenyl)amino)phenyl)ethan-1-one (3aq)

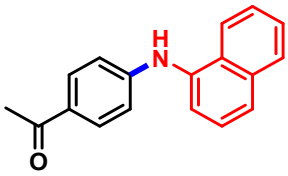


Following the General Procedure with the corresponding 1-(4-bromophenyl)ethan-1-one (0.2 mmol) and 2-(methylthio)aniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the pale yellow solid **3aq** (36.0 mg, 70%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.89 (d, *J* = 8.7 Hz, 2H), 7.41 (dd, *J* = 18.5, 4.7 Hz, 2H), 7.25–7.18 (m, 1H), 7.05 (dd, *J* = 13.2, 5.0 Hz, 3H), 6.57 (s, 1H), 2.54 (s, 3H), 2.39 (s, 3H). ^{13}C{^{1}H} NMR

(101 MHz, $CDCl_3$, ppm) δ = 196.7, 148.1, 140.3, 131.3, 130.8, 129.7, 128.7, 127.7, 123.7, 119.7, 115.4, 26.4, 17.5. m.p. = 83.6-84.5 ℃. IR (KBr disk, cm^{-1}) 3301, 3079, 2911, 1659, 1596, 1576, 1523, 1462, 1431, 1414, 1384, 1332, 1306, 1276, 1252, 1179, 1122, 1070, 1023, 962, 829, 748, 734, 677, 640, 592, 491, 447. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{15}H_{16}NOS^+$ 258.0947; Found 258.0936.

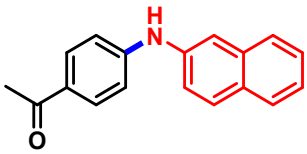
1-(4-(naphthalen-1-ylamino)phenyl)ethan-1-one (3ar)[S15]



Following the General Procedure with the corresponding 1-(4-bromophenyl)ethan-1-one (0.2 mmol) and naphthalen-1-amine (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the pale yellow solid **3ar** (31.8 mg, 61%).

^1H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.97 (d, *J* = 8.1 Hz, 1H), 7.93–7.89 (m, 1H), 7.85 (d, *J* = 8.8 Hz, 2H), 7.77–7.71 (m, 1H), 7.57–7.45 (m, 4H), 6.84 (d, *J* = 8.8 Hz, 2H), 2.52 (s, 3H). $^{13}C\{^1H\}$ NMR (101 MHz, $CDCl_3$, ppm) δ = 196.6, 150.5, 136.4, 135.0, 130.9, 129.5, 128.8, 126.7, 126.6, 126.1, 125.9, 122.5, 121.0, 114.3, 26.3. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{18}H_{16}NO^+$ 262.1226; Found 262.1239.

1-(4-(naphthalen-2-ylamino)phenyl)ethan-1-one (3as)[S15]

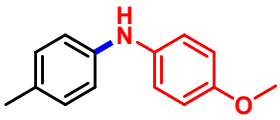


Following the General Procedure with the corresponding 1-(4-bromophenyl)ethan-1-one (0.2 mmol) and naphthalen-2-amine (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the pale yellow solid **3as** (33.9 mg, 65%).

^1H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.91 (d, *J* = 8.7 Hz, 2H), 7.81 (t, *J* = 8.4 Hz, 2H), 7.72 (d, *J* = 8.1 Hz, 1H), 7.59 (d, *J* = 1.5 Hz, 1H), 7.47 (t, *J* = 7.4 Hz, 1H), 7.40 (t, *J* = 7.5 Hz, 1H), 7.31 (dd, *J* = 8.7, 2.1 Hz, 1H), 7.08 (d, *J* = 8.7 Hz, 2H), 6.30 (s, 1H), 2.55 (s, 3H). $^{13}C\{^1H\}$ NMR (101 MHz, $CDCl_3$, ppm) δ = 196.6, 148.4, 138.5, 134.5, 130.9, 130.5, 129.7, 129.6, 127.9, 127.1, 126.9, 124.9,

121.6, 116.2, 115.0, 26.4. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{18}H_{16}NO^+$ 262.1226; Found 262.1210.

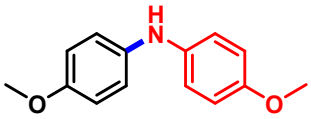
4-methoxy-N-(p-tolyl)aniline (3k′d)[S17]



Following the General Procedure with the corresponding 1-iodo-4-methylbenzene (0.2 mmol) and 4-methoxyaniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the brown solid **3k′d** (32.4 mg, 76%).

^1H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.05 (dd, *J* = 10.4, 3.8 Hz, 4H), 6.94–6.80 (m, 4H), 5.42 (s, 1H), 3.81 (s, 3H), 2.30 (s, 3H). $^{13}C\{^1H\}$ NMR (101 MHz, $CDCl_3$, ppm) δ = 154.9, 142.6, 136.8, 130.0, 129.5, 121.3, 116.7, 114.8, 55.8, 20.6. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{14}H_{16}NO^+$ 214.1226; Found 214.1230.

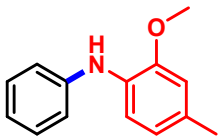
bis(4-methoxyphenyl)amine (3l′d)[S17]



Following the General Procedure with the corresponding 1-iodo-4-methoxybenzene (0.2 mmol) and 4-methoxyaniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 10/1) as an eluent, to yield the brownish white solid **3l′d** (35.7 mg, 78%).

^1H NMR (400 MHz, $CDCl_3$, ppm) δ = 6.98–6.92 (m, 4H), 6.87–6.80 (m, 4H), 5.32 (s, 1H), 3.79 (s, 6H). $^{13}C\{^1H\}$ NMR (101 MHz, $CDCl_3$, ppm) δ = 154.3, 138.1, 119.7, 114.9, 55.8. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{14}H_{16}NO_2^+$ 230.1176; Found 230.1195.

2-methoxy-4-methyl-N-phenylaniline (3j′t)[S17]

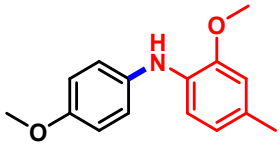


Following the General Procedure with the corresponding iodobenzene (0.2 mmol) and 2-methoxy-4-methylaniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA

(v/v = 20/1) as an eluent, to yield the white solid **3j′t** (26.4 mg, 62%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.34–7.25 (m, 3H), 7.14 (dd, *J* = 8.5, 1.0, 2H), 6.95 (t, *J* = 7.3, 1H), 6.76 (d, *J* = 7.1, 2H), 6.06 (s, 1H), 3.88 (s, 3H), 2.38 (s, 3H). ^{13}C{^{1}H} NMR (101 MHz, $CDCl_3$, ppm) δ = 148.8, 143.6, 130.2, 130.1, 129.4, 121.0, 120.6, 117.7, 116.0, 111.8, 55.6, 21.3. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{14}H_{16}NO^+$ 214.1226; Found 214.1211.

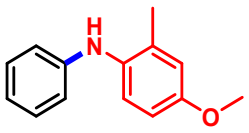
2-methoxy-N-(4-methoxyphenyl)-4-methylaniline (3l′t)[S18]



Following the General Procedure with the corresponding 1-iodo-4-methoxybenzene (0.2 mmol) and 2-methoxy-4-methylaniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 10/1) as an eluent, to yield the yellow oil **3l′t** (29.2 mg, 60%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.12–7.05 (m, 2H), 6.97 (d, *J* = 8.0, 1H), 6.88–6.82 (m, 2H), 6.70 (d, *J* = 1.3, 1H), 6.65 (dd, *J* = 8.0, 0.8, 1H), 5.83 (s, 1H), 3.88 (s, 3H), 3.80 (s, 3H), 2.31 (s, 3H). ^{13}C{^{1}H} NMR (101 MHz, $CDCl_3$, ppm) δ = 155.0, 147.9, 136.4, 132.4, 128.8, 122.0, 121.2, 114.8, 113.6, 111.6, 55.8, 55.7, 21.3. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{15}H_{18}NO_2^+$ 244.1332; Found 244.1343.

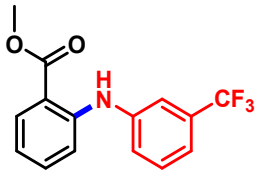
4-methoxy-2-methyl-N-phenylaniline (3j′u)[S19]



Following the General Procedure with the corresponding iodobenzene (0.2 mmol) and 4-methoxy-2-methylaniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the white solid **3j′u (MMDPA)** (30.2 mg, 71%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 7.21–7.12 (m, 3H), 6.79 (dd, *J* = 11.2, 4.8, 2H), 6.73 (dd, *J* = 10.0, 4.9, 3H), 5.19 (s, 1H), 3.80 (s, 3H), 2.22 (s, 3H). ^{13}C{^{1}H} NMR (101 MHz, $CDCl_3$, ppm) δ = 156.5, 146.4, 134.2, 133.7, 129.5, 125.2, 118.9, 116.5, 115.0, 112.0, 55.7, 18.4. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{14}H_{16}NO^+$ 214.1226; Found 214.1223.

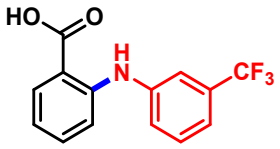
methyl 2-((3-(trifluoromethyl)phenyl)amino)benzoate (3sv)[S20]



Following the General Procedure with the corresponding methyl 2-bromobenzoate (0.2 mmol) and 3-(trifluoromethyl)aniline (0.4 mmol). The crude product was purified by preparative TLC, using PE and EA (v/v = 20/1) as an eluent, to yield the colourless oil **3sv** (36.0 mg, 61%).

^{1}H NMR (400 MHz, $CDCl_3$, ppm) δ = 9.52 (s, 1H), 7.90 (dd, *J* = 8.0, 1.5 Hz, 1H), 7.40 (s, 1H), 7.36–7.25 (m, 3H), 7.22–7.14 (m, 2H), 6.72 (ddd, *J* = 8.1, 7.2, 1.1 Hz, 1H), 3.81 (s, 3H). ^{13}C{^{1}H} NMR (101 MHz, $CDCl_3$, ppm) δ = 169.0, 146.9, 141.8, 134.5, 132.0 (q, *J* = 32.2 Hz), 131.9, 130.1, 124.7, 124.2 (q, *J* = 272.5 Hz), 119.7 (q, *J* = 3.9 Hz), 118.5, 118.2 (q, *J* = 3.8 Hz). 114.5, 113.1, 52.1. ^{19}F NMR (376 MHz, $CDCl_3$, ppm) δ = -62.79. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{15}H_{13}F_3NO_2^+$ 296.0893; Found 296.0890.

2-((3-(trifluoromethyl)phenyl)amino)benzoic acid (Flufenamic Acid)[S21]



The 100 mL round bottom flask containing a stirring bar was charged with methyl 2-((3-(trifluoromethyl)phenyl)amino)benzoate (29.5 mg, 0.2 mmol) in EtOH (2 mL) and KOH (11.2 mg, 0.2 mmol) in water (2 mL), which was stirred for 24 h at 100 °C. After that, EtOH was evaporated from the reaction mixture and the resultant solution was acidified to pH 2 by HCl (2M). Next, 4 mL of water was added, and the mixture was extracted three times with DCM. The combined organic layer was washed with brine, dried over anhydrous Na_2SO_4, and concentrated under reduced pressure. The pure product was obtained by TLC using PE and EA as the eluent, to yield the white solid **Flufenamic Acid** (50.6 mg, 90%).

^{1}H NMR (400 MHz, d_6-DMSO, ppm) δ = 13.21 (s, 1H), 9.70 (s, 1H), 7.93 (d, *J* = 7.9 Hz, 1H), 7.52 (s, 3H), 7.45 (t, *J* = 7.1 Hz, 1H), 7.39–7.23 (m, 2H), 6.88 (t, *J* = 7.3 Hz, 1H). ^{13}C{^{1}H} NMR (101 MHz, d_6-DMSO, ppm) δ = 169.7, 145.5, 142.0, 134.2, 132.0, 130.6, 130.3 (q, *J* = 31.5 Hz), 124.1

(q, J = 272.3 Hz), 123.7, 118.9, 118.6 (q, J = 3.7 Hz), 116.4 (q, J = 3.8 Hz). 114.9, 114.4. ^{19}F NMR (376 MHz, d_6-DMSO, ppm) δ = -61.36. QTOF-MS *m/z* $[M + H]^+$ Calcd for $C_{14}H_{11}F_3NO_2^+$ 282.0736; Found 282.0719.

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NMR Spectra

Fig. S7. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for 1-(4-phenoxyphenyl)ethan-1-one (**3aa**) in $CDCl_3$

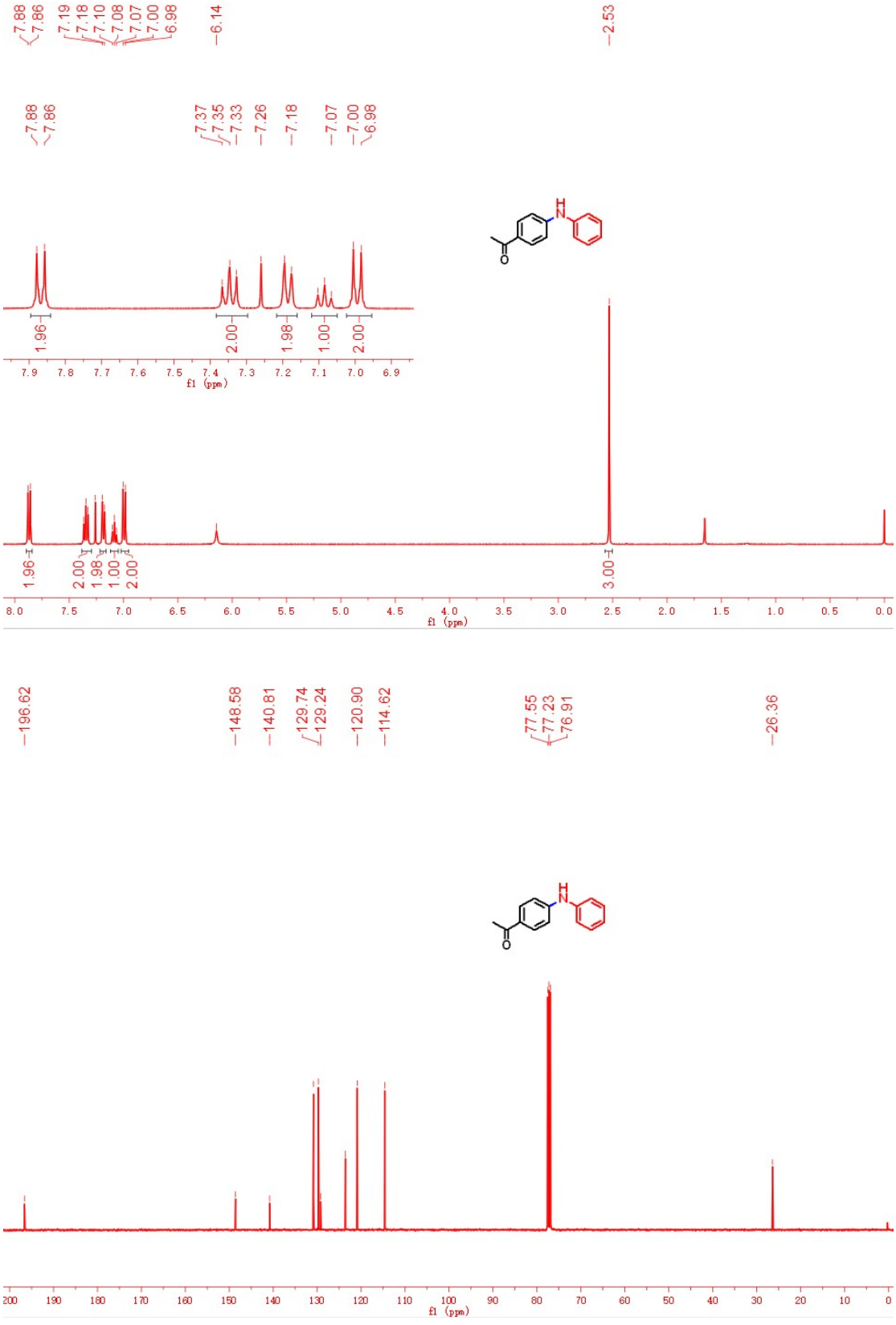


Fig. S8. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for 1-(4-(phenylamino)phenyl)propan-1-one (**3ba**) in $CDCl_3$

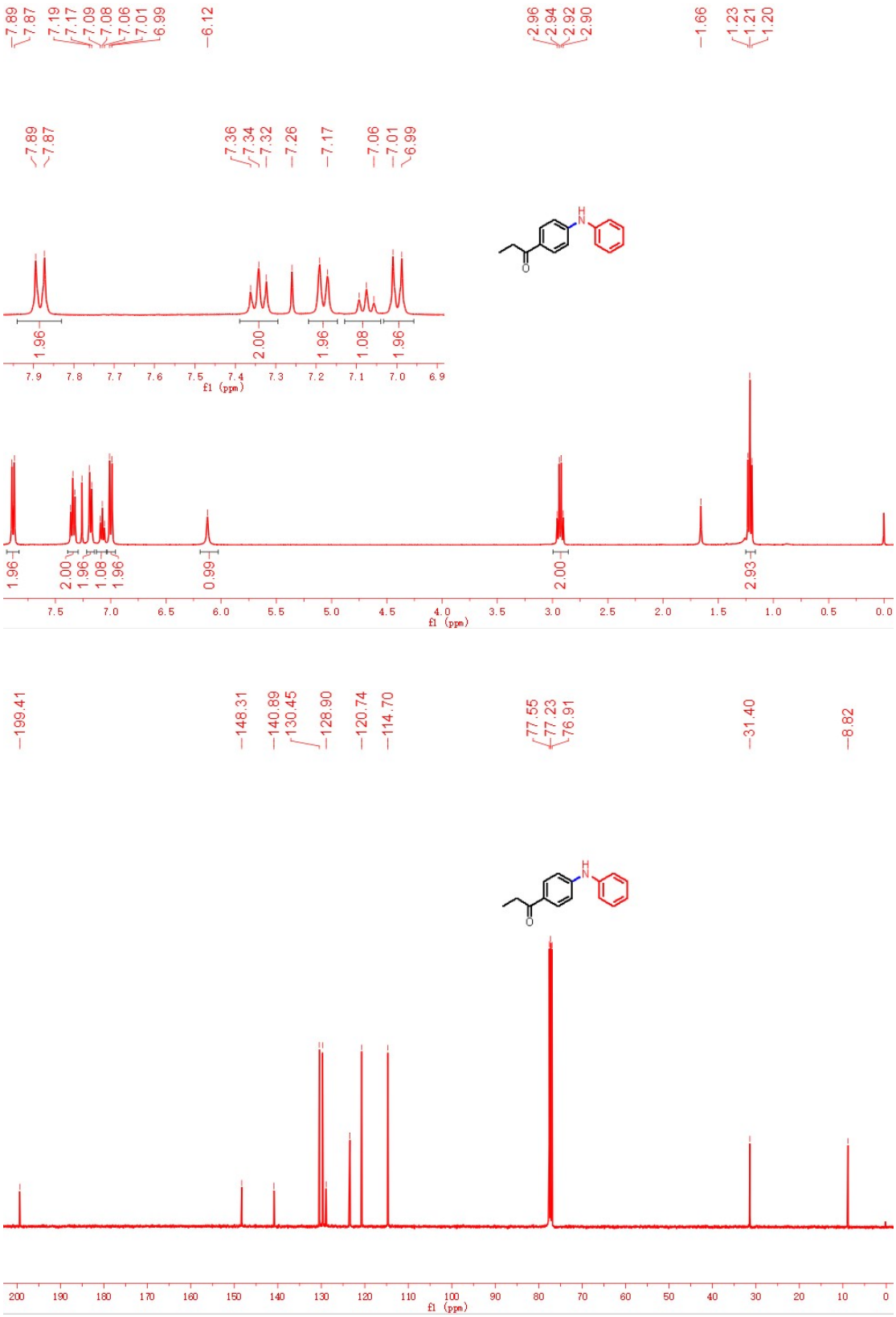


Fig. S9. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for 4-(phenylamino)benzonitrile (**3ca**) in $CDCl_3$

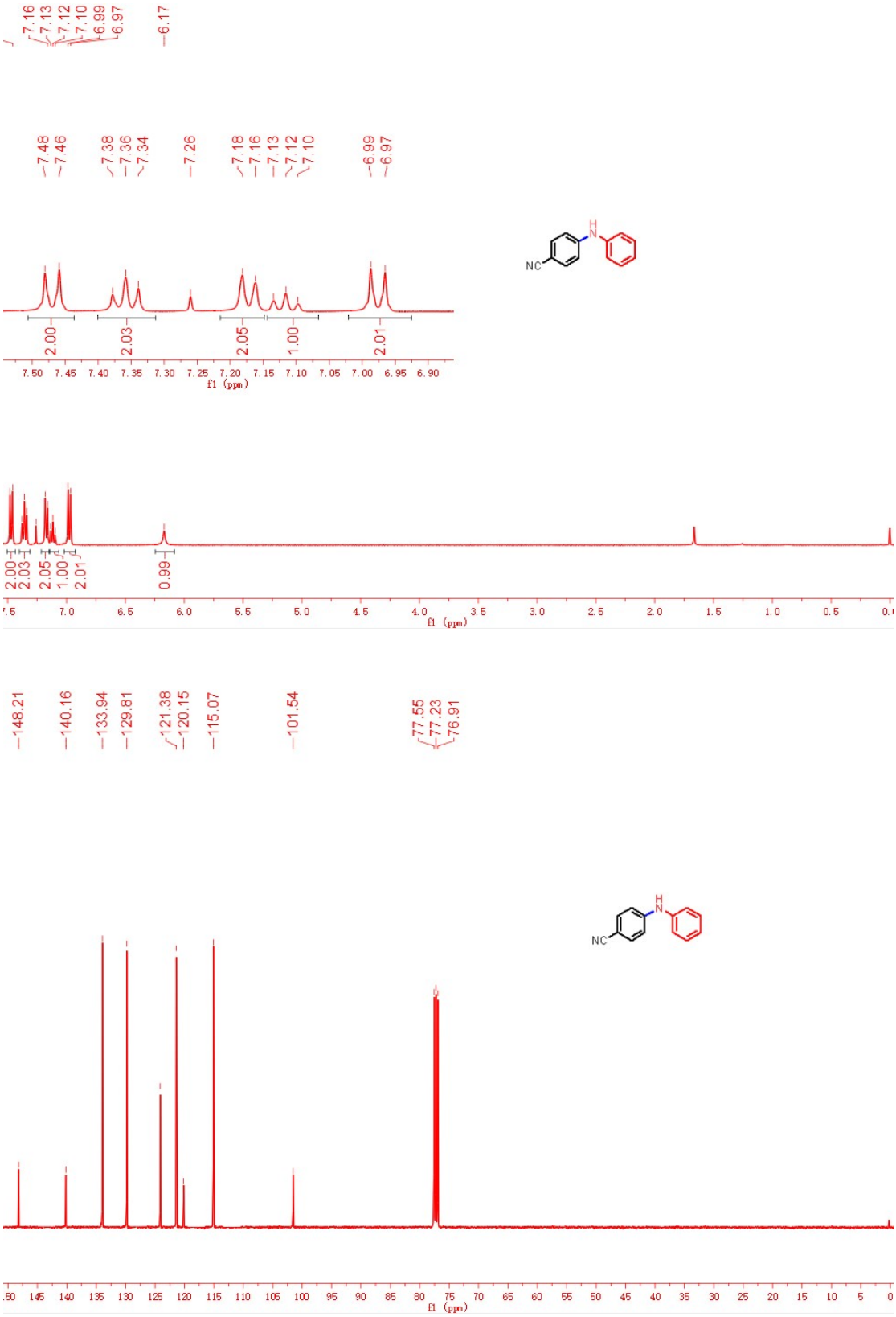


Fig. S10. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for 1-(4-(phenylamino)phenyl)butan-1-one (**3da**) in $CDCl_3$

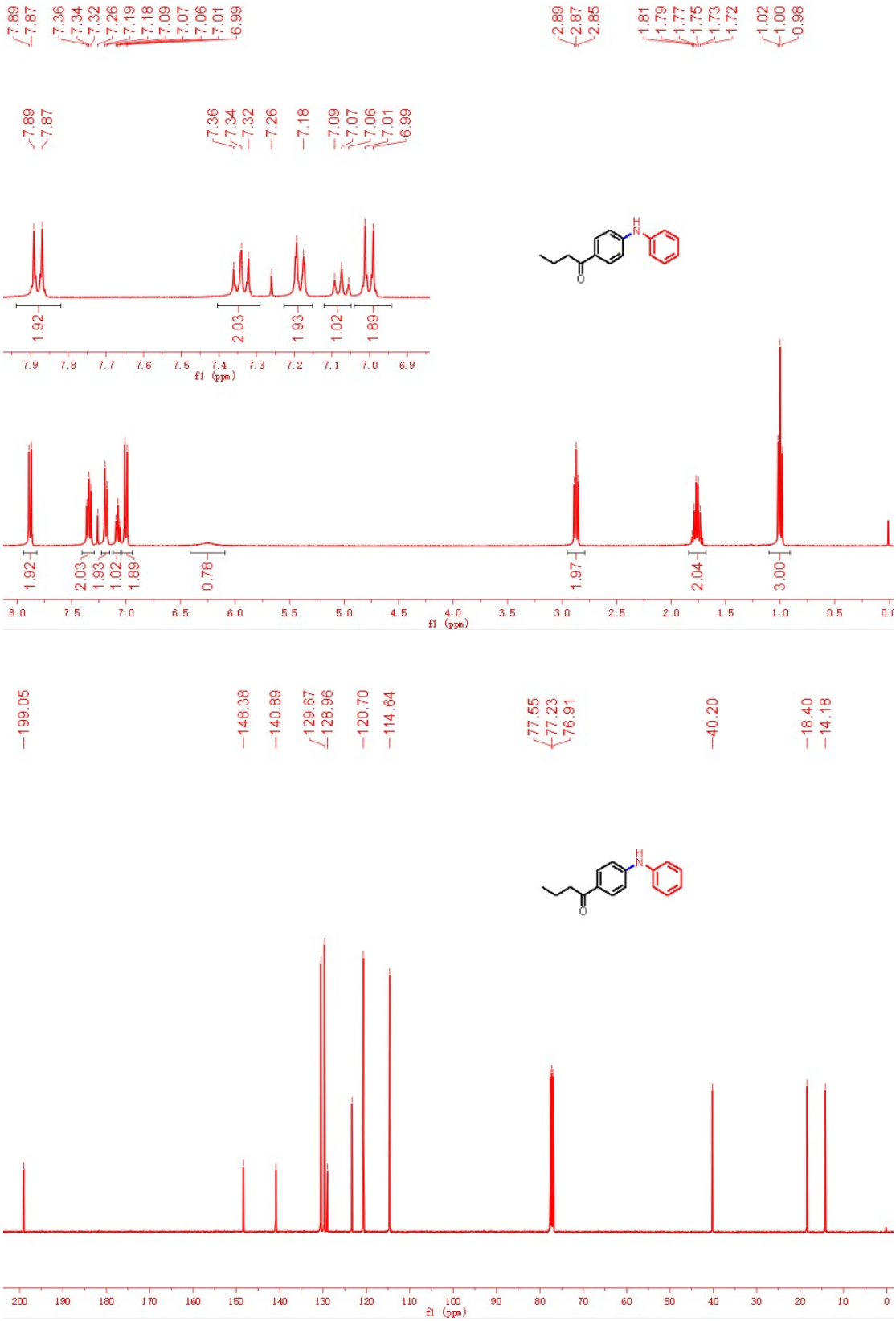


Fig. S11. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for methyl 4-(phenylamino)benzoate (**3ea**) in $CDCl_3$

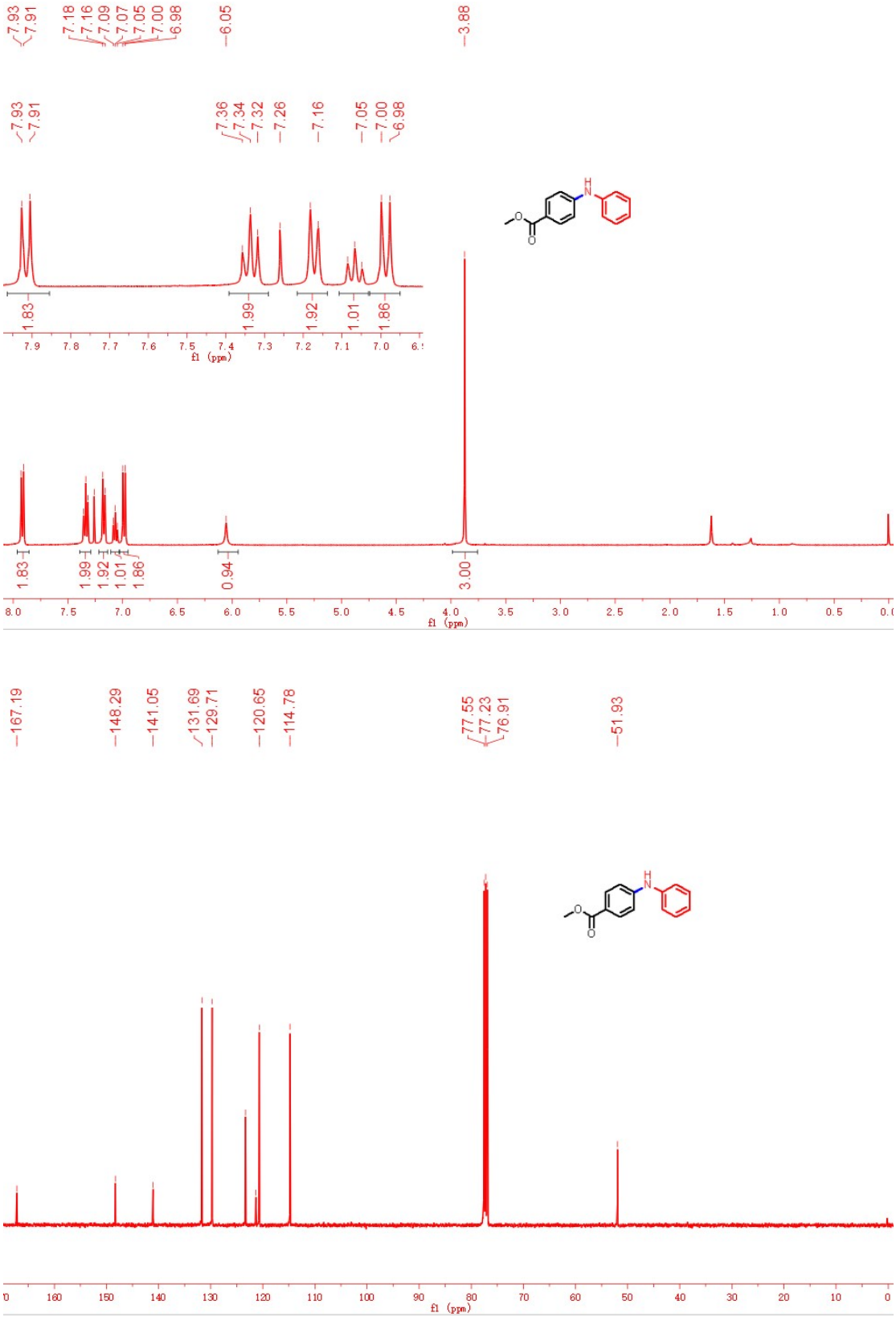


Fig. S12. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for ethyl 4-(phenylamino)benzoate (**3fa**) in $CDCl_3$

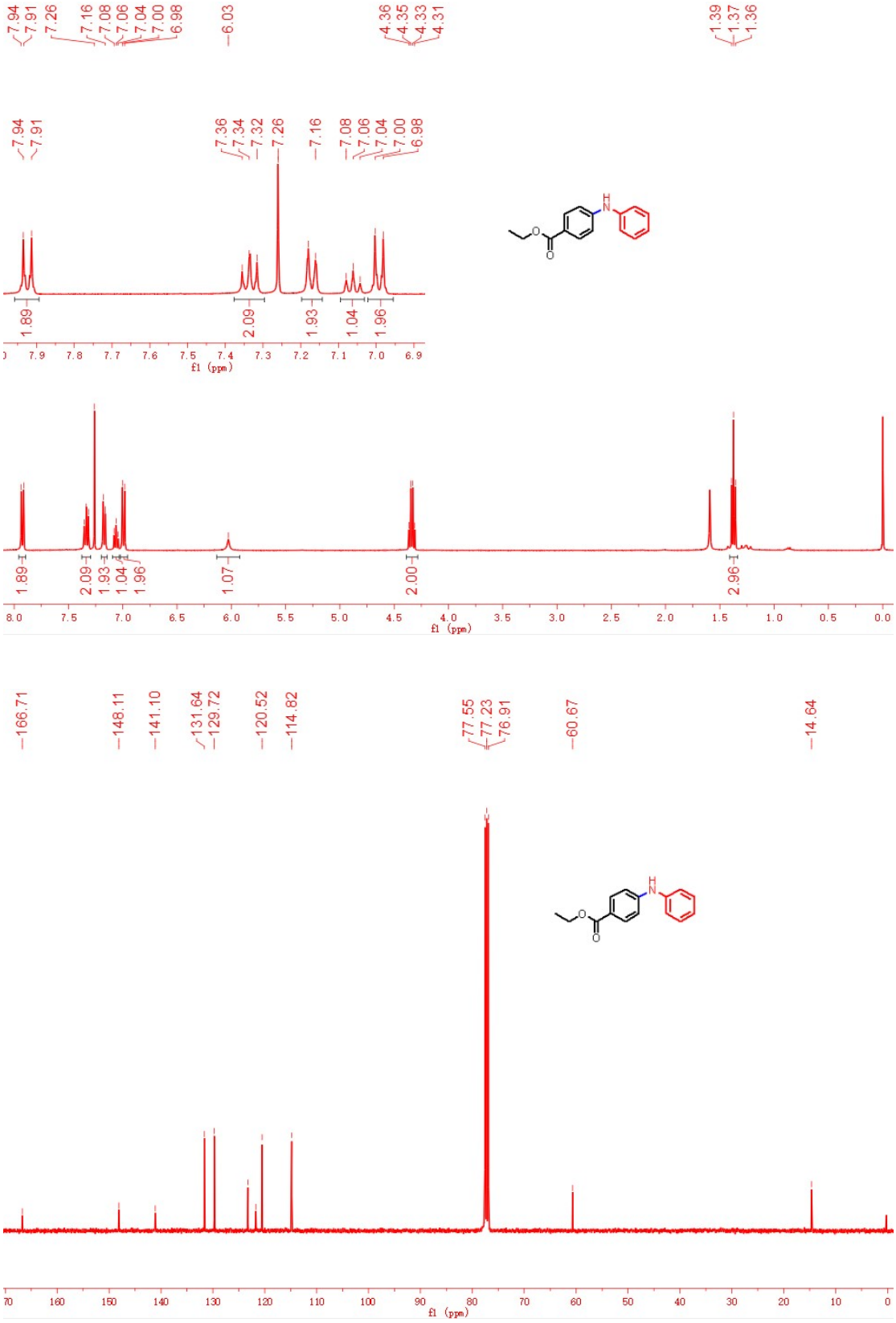
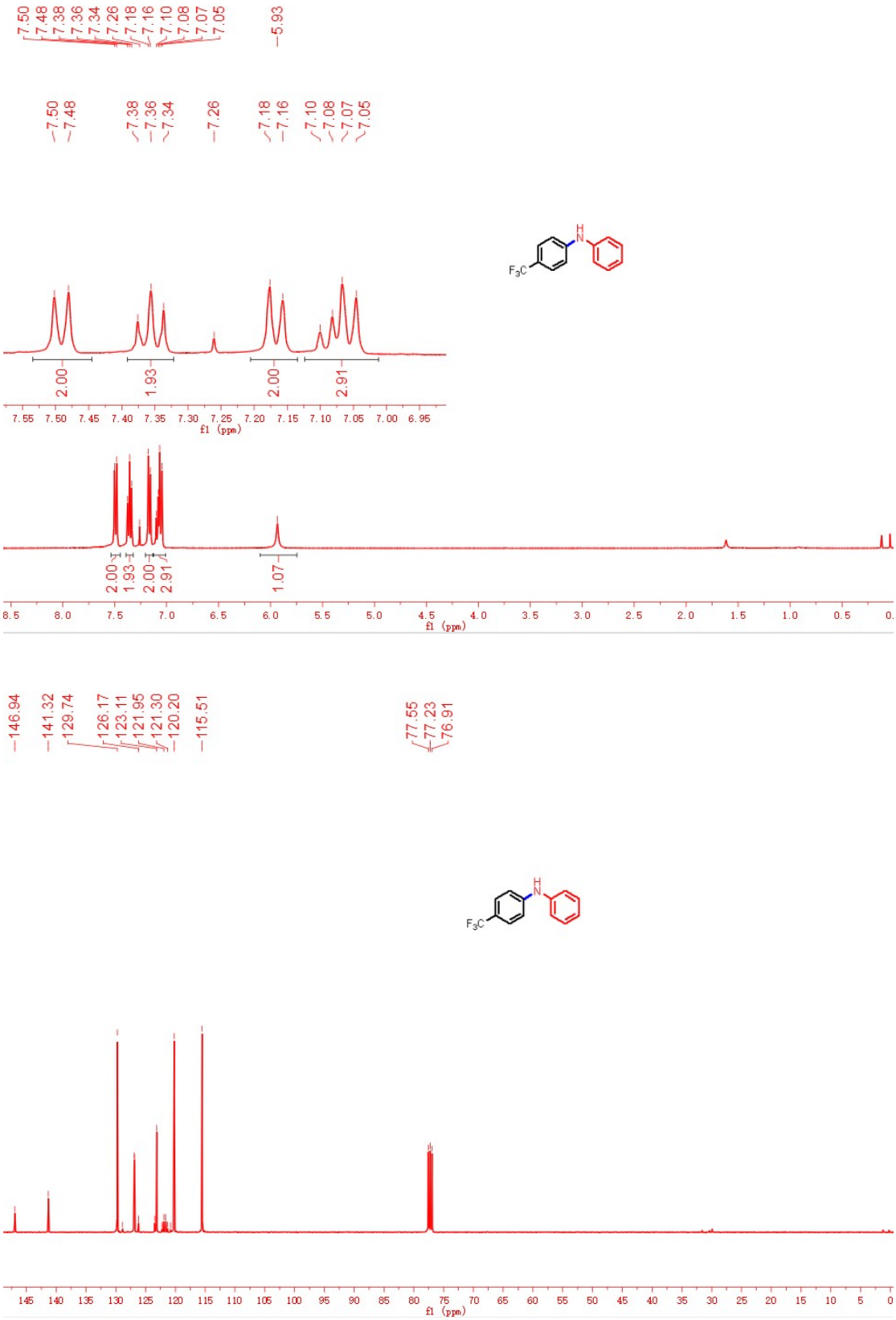


Fig. S13. The ^{1}H (400 MHz), $^{13}C\{^{1}H\}$ (101 MHz) and ^{19}F NMR (377 MHz) NMR spectra for N-phenyl-4-(trifluoromethyl)aniline (**3ga**) in $CDCl_3$



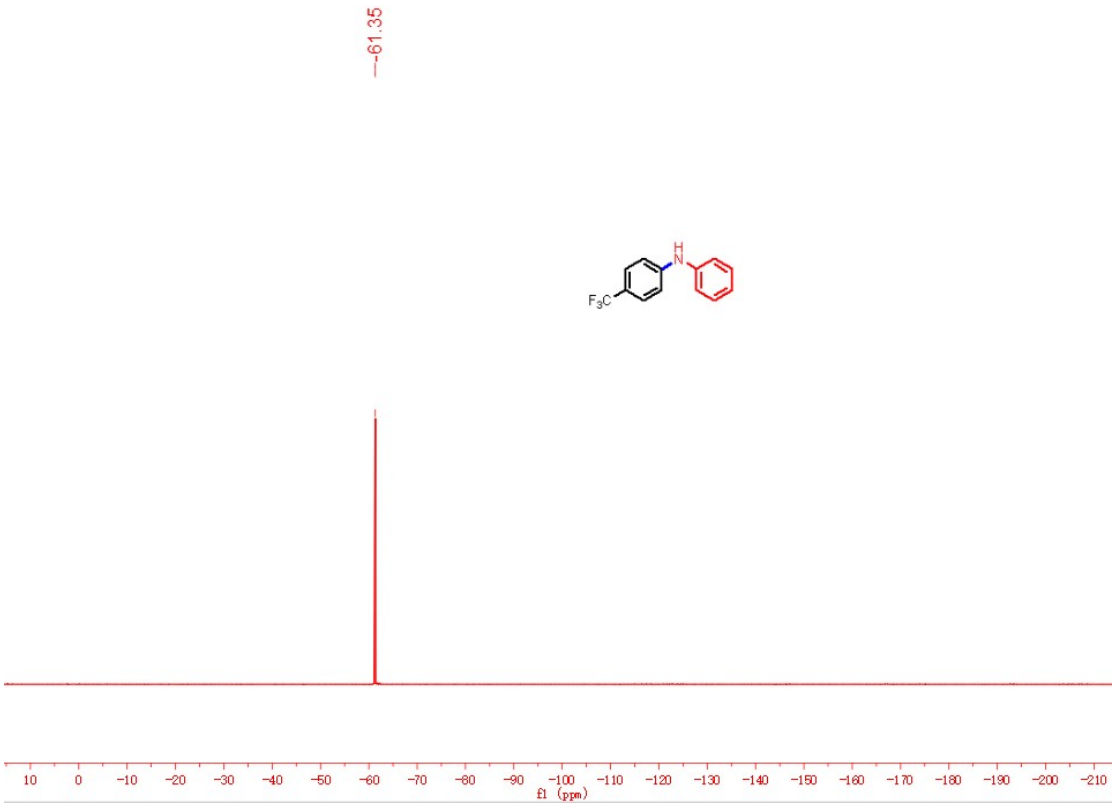

-61.35
F3C
NH
10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 -120 -130 -140 -150 -160 -170 -180 -190 -200 -210
f1 (ppm)

Fig. S14. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for 4-(phenylamino)benzaldehyde (**3ha**) in $CDCl_3$

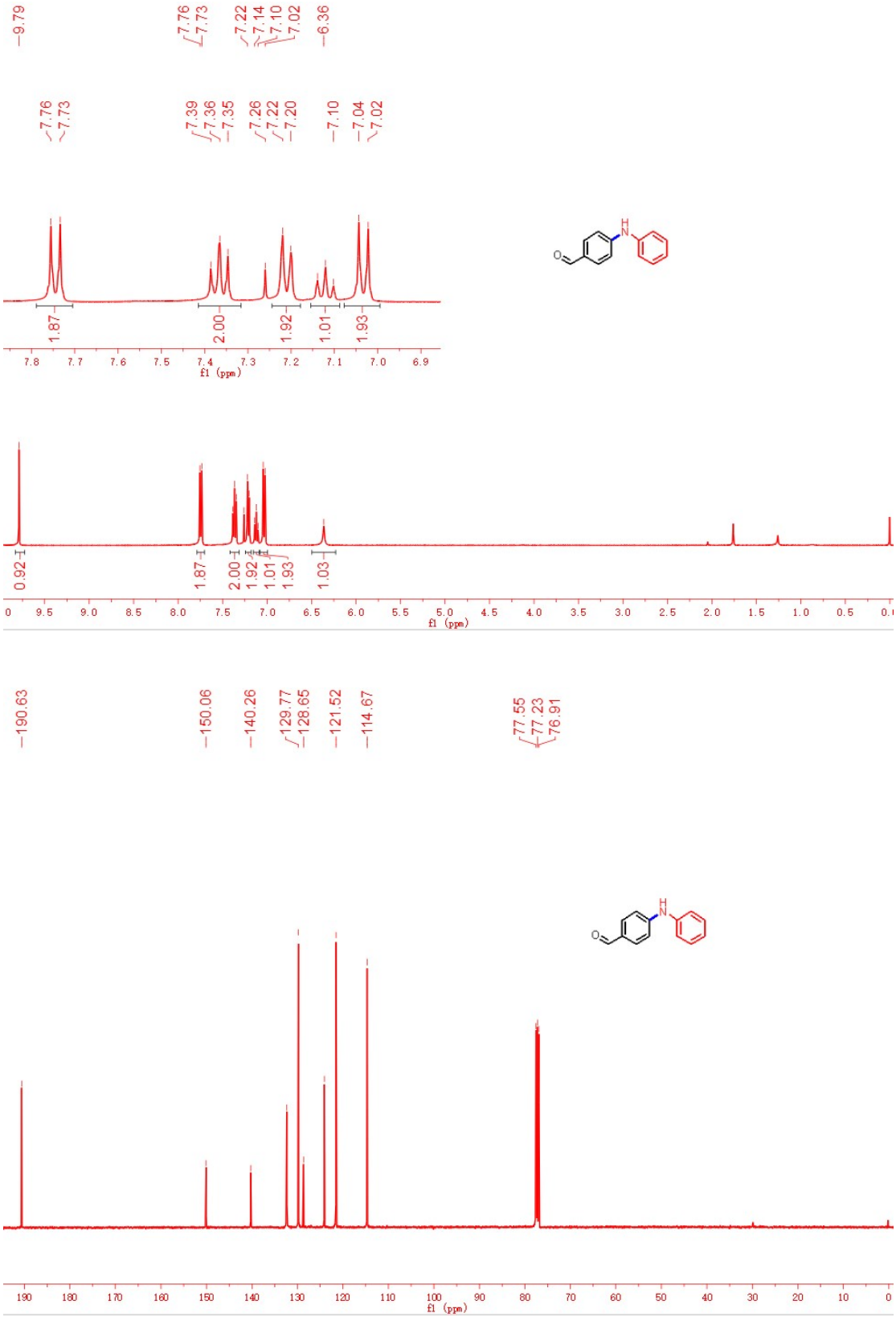


Fig. S15. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for N-phenyl-[1,1'-biphenyl]-4-amine (**3ia**) in $CDCl_3$

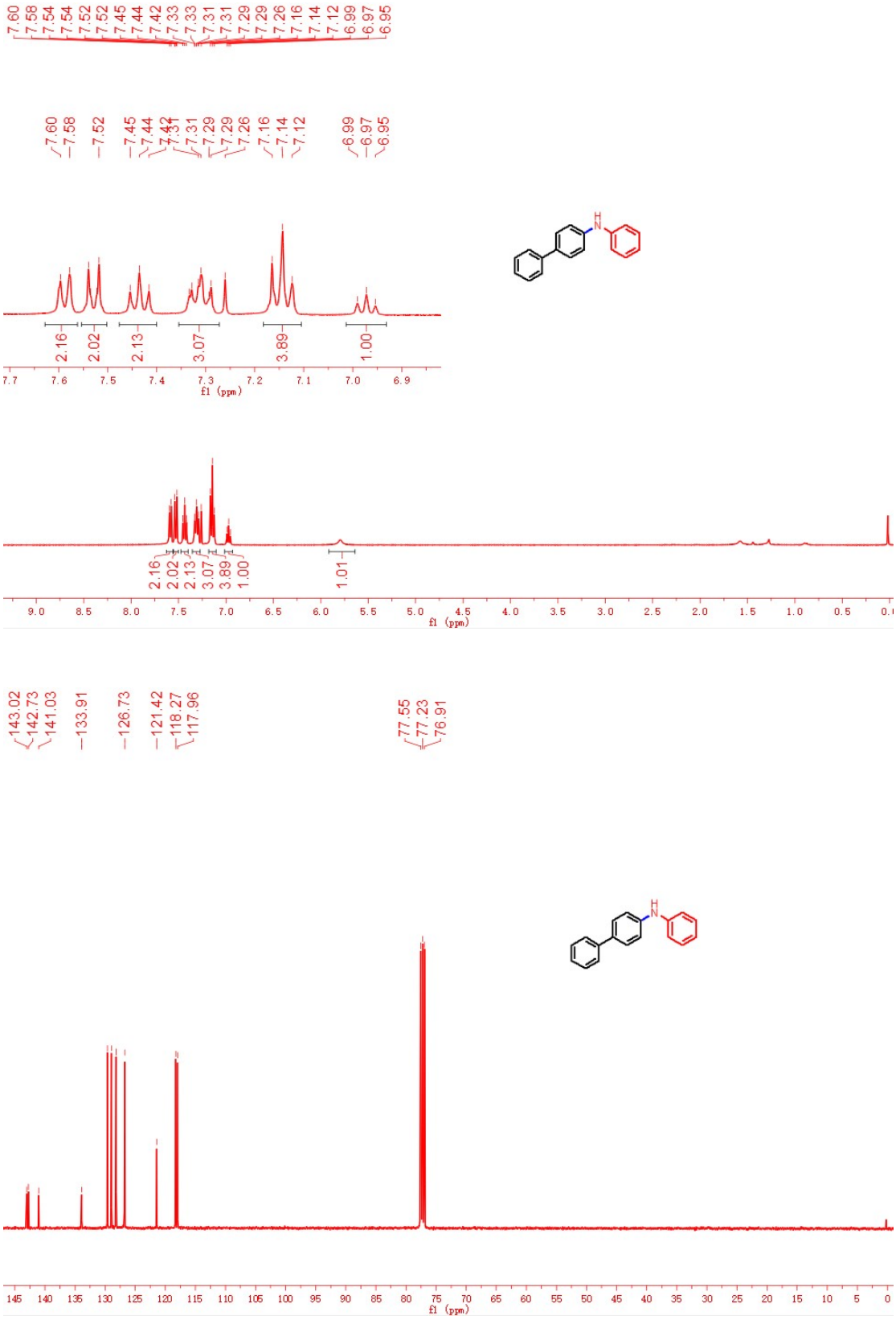


Fig. S16. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for diphenylamine (**3ja**) in $CDCl_3$

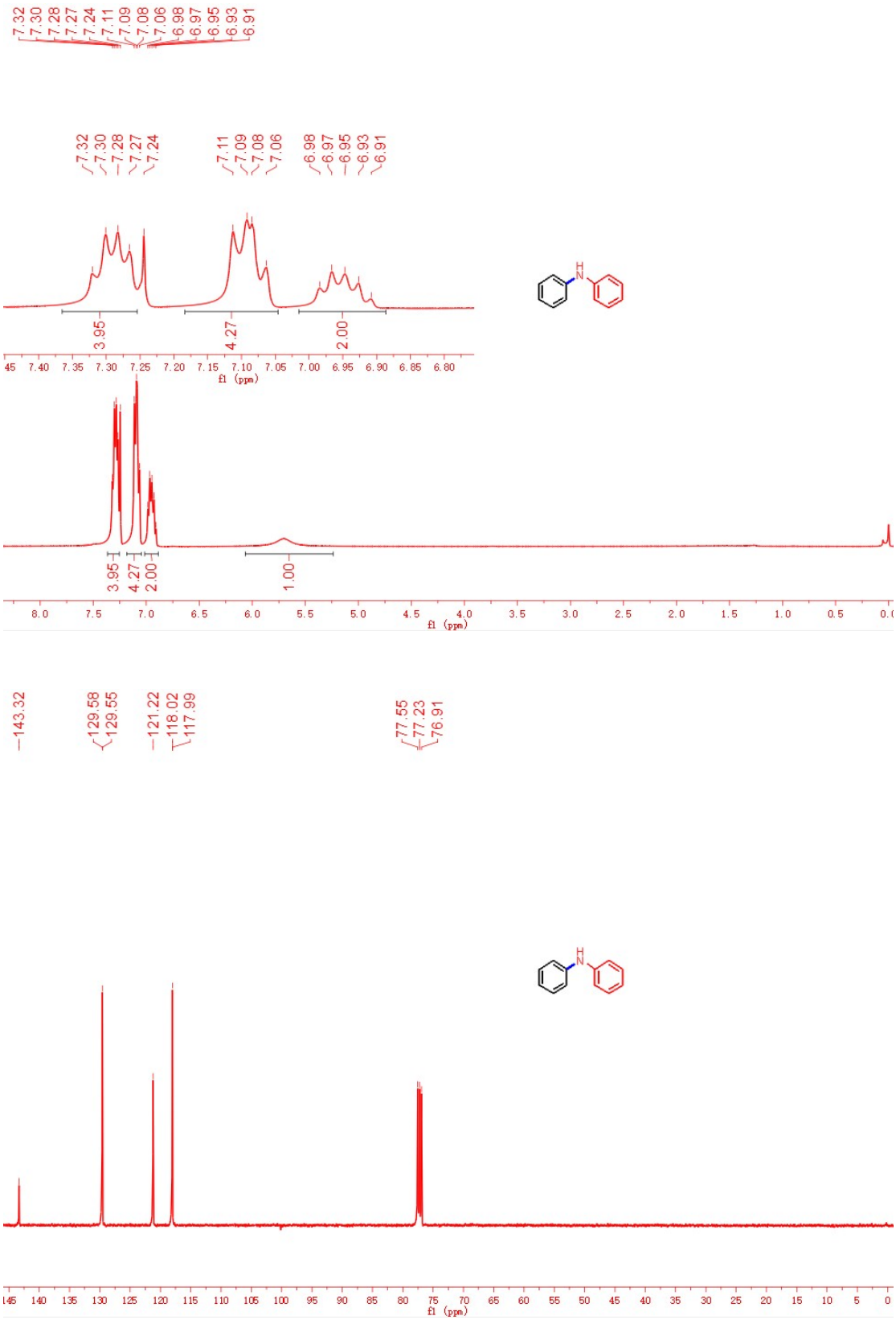


Fig. S17. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for 4-methyl-N-phenylaniline (**3ka**) in $CDCl_3$

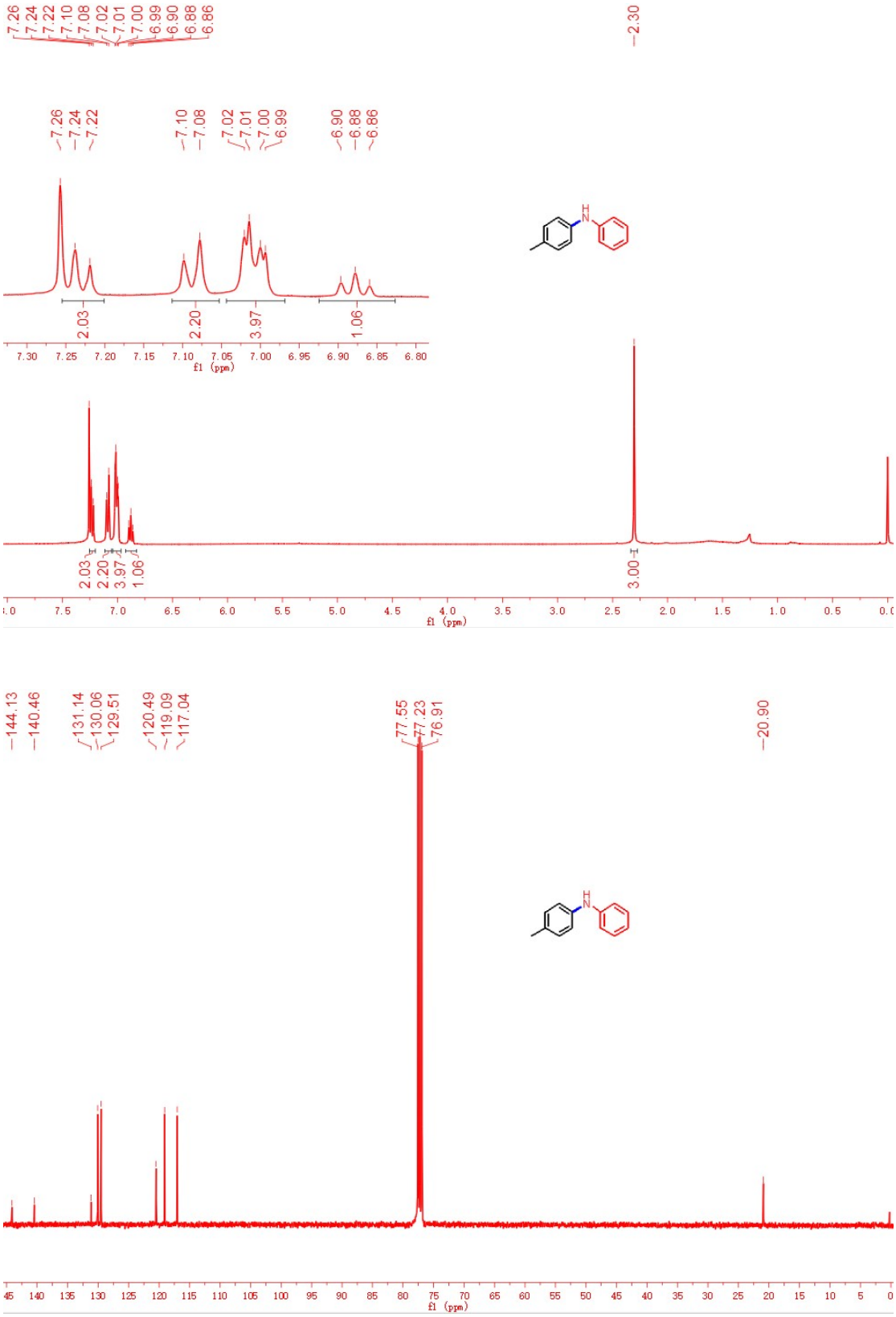


Fig. S18. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for 4-methoxy-N-phenylaniline (**3la**) in $CDCl_3$

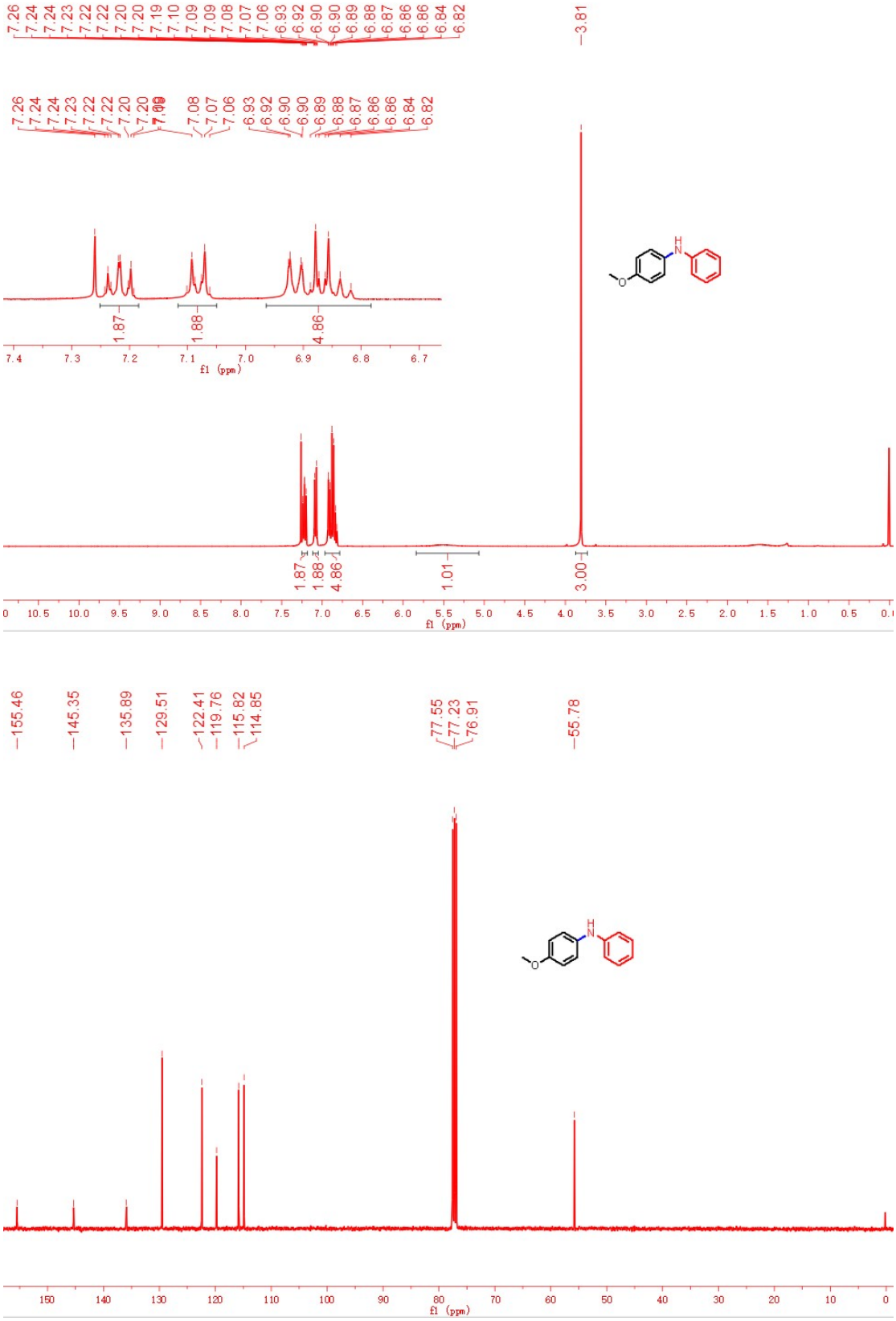


Fig. S19. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for 3-(phenylamino)benzonitrile (**3ma**) in $CDCl_3$

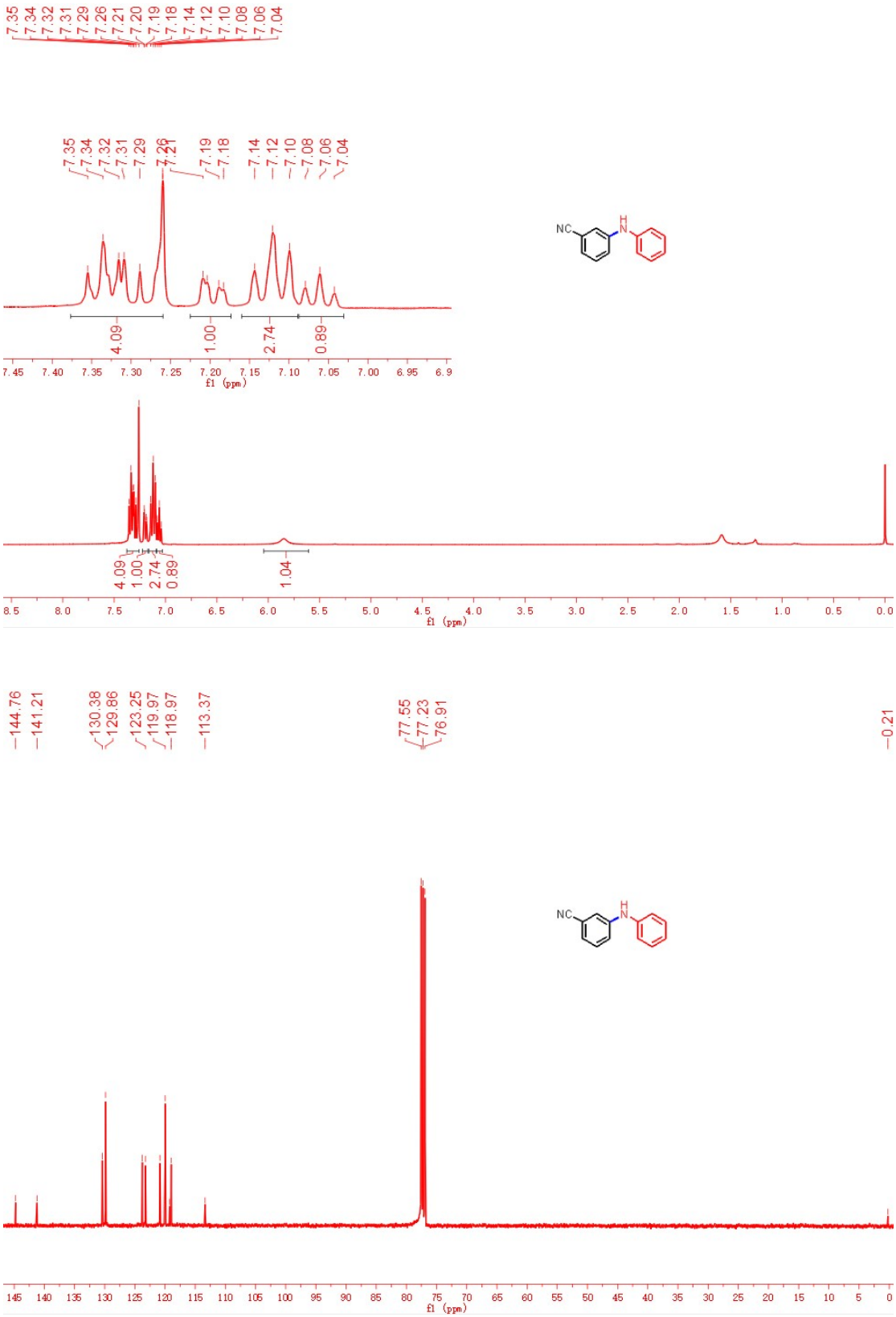


Fig. S20. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for 1-(3-(phenylamino)phenyl)ethan-1-one (**3na**) in $CDCl_3$

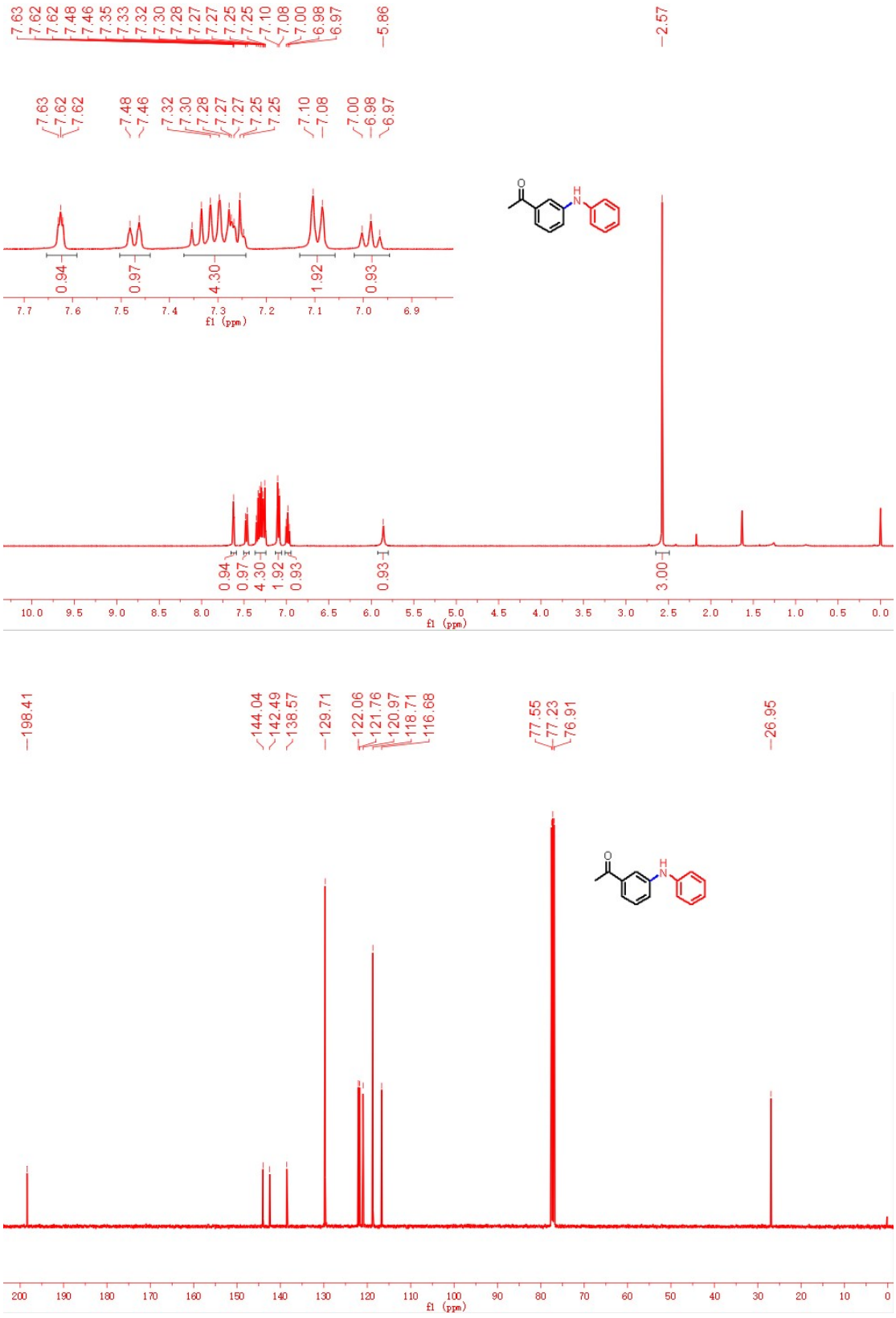
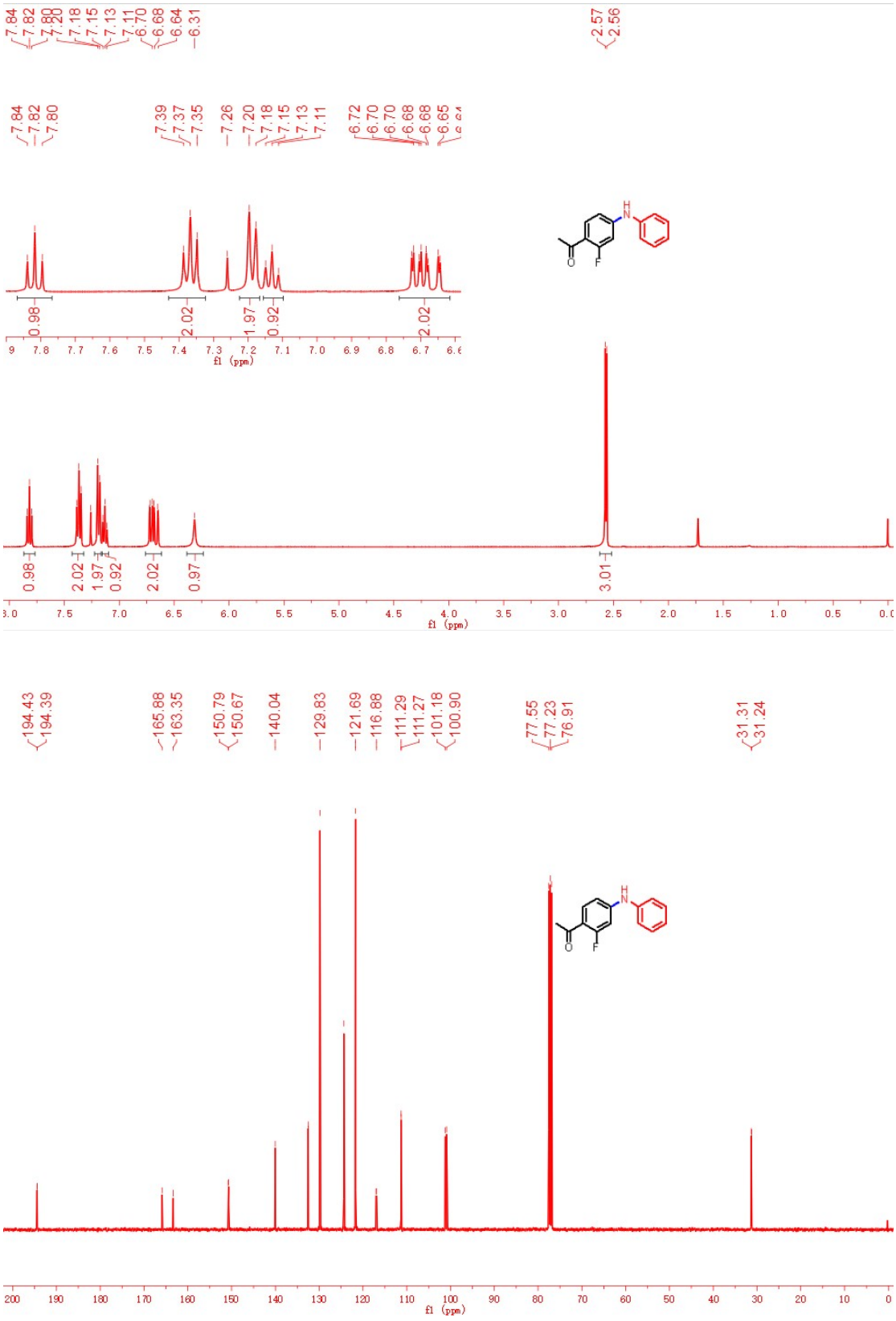


Fig. S21. The ^{1}H (400 MHz), $^{13}C\{^{1}H\}$ (101 MHz) and ^{19}F NMR (377 MHz) NMR spectra for 1-(2-fluoro-4-(phenylamino)phenyl)ethan-1-one (**3oa**) in $CDCl_3$



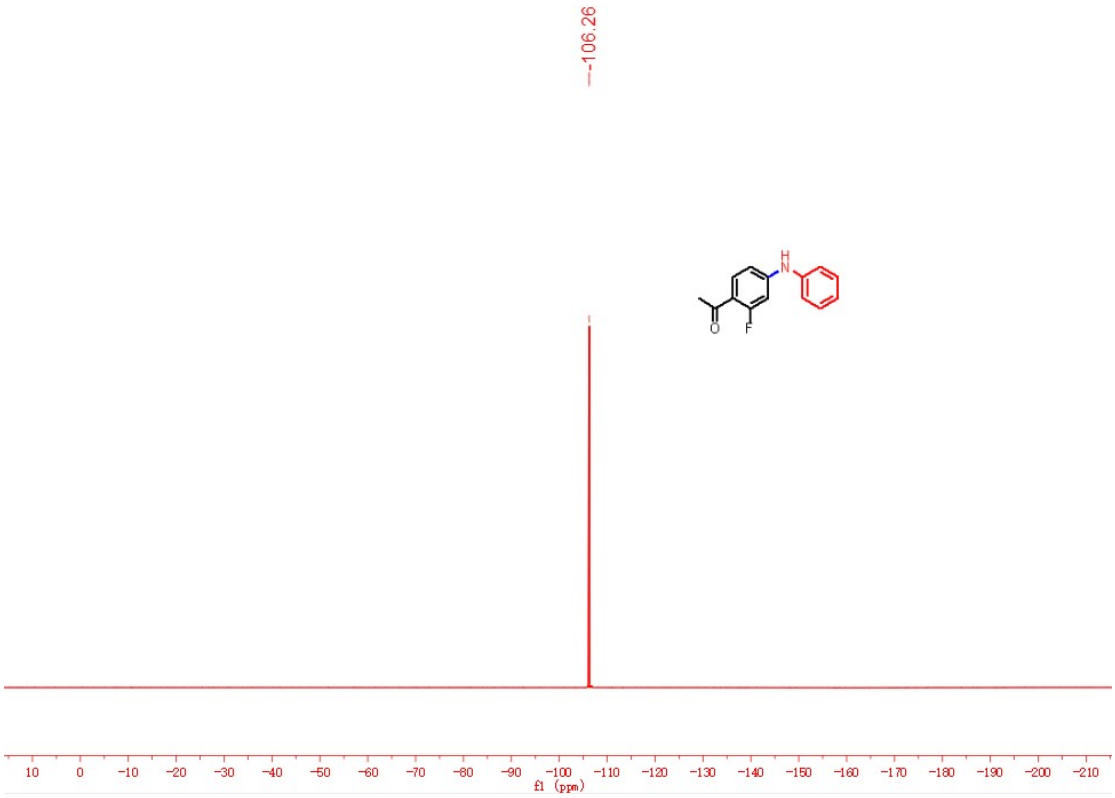
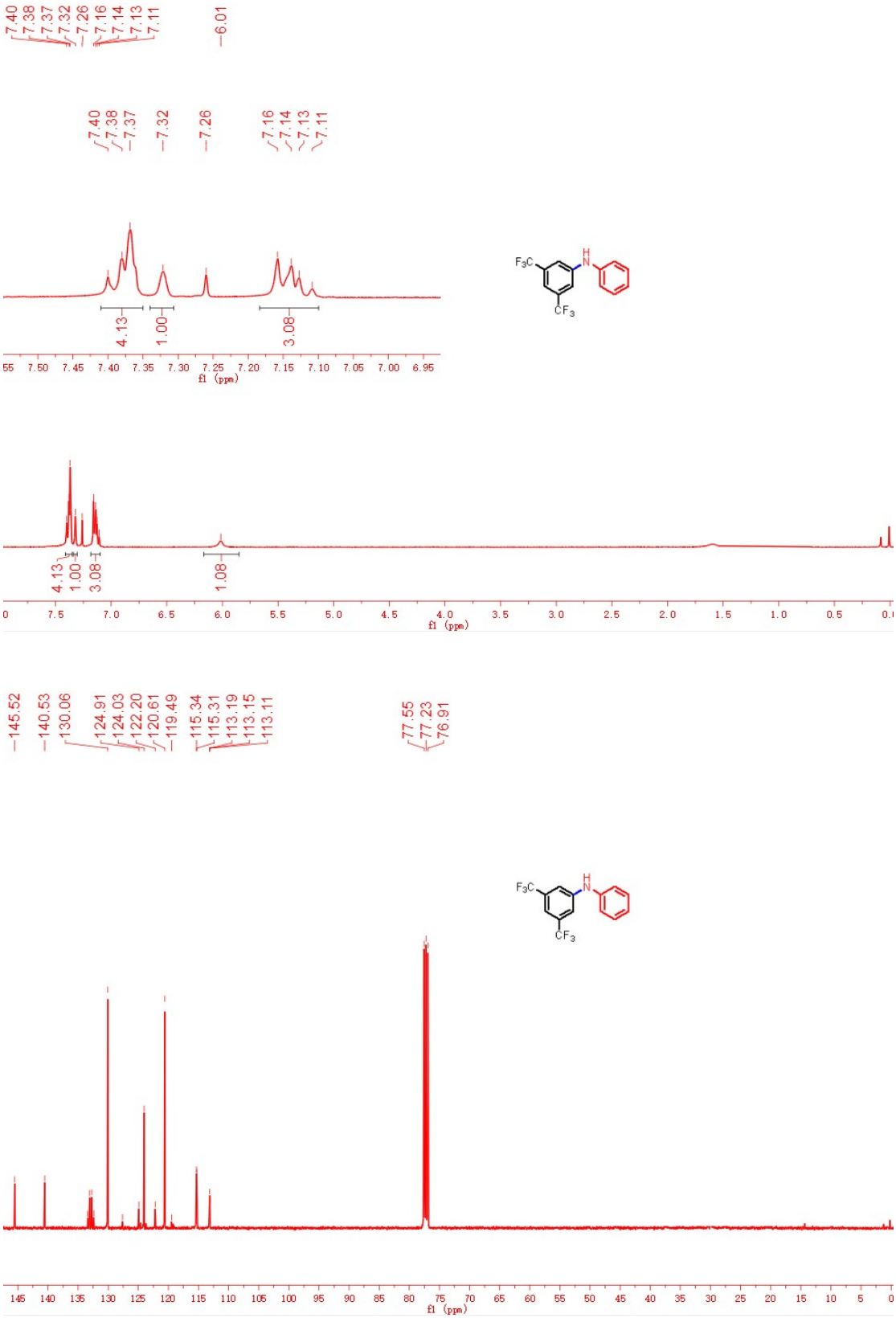

-106.26
H
N
O
F
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

Fig. S22. The ^{1}H (400 MHz), $^{13}C\{^{1}H\}$ (101 MHz) and ^{19}F NMR (377 MHz) NMR spectra for N-phenyl-3,5-bis(trifluoromethyl)aniline (**3pa**) in $CDCl_3$



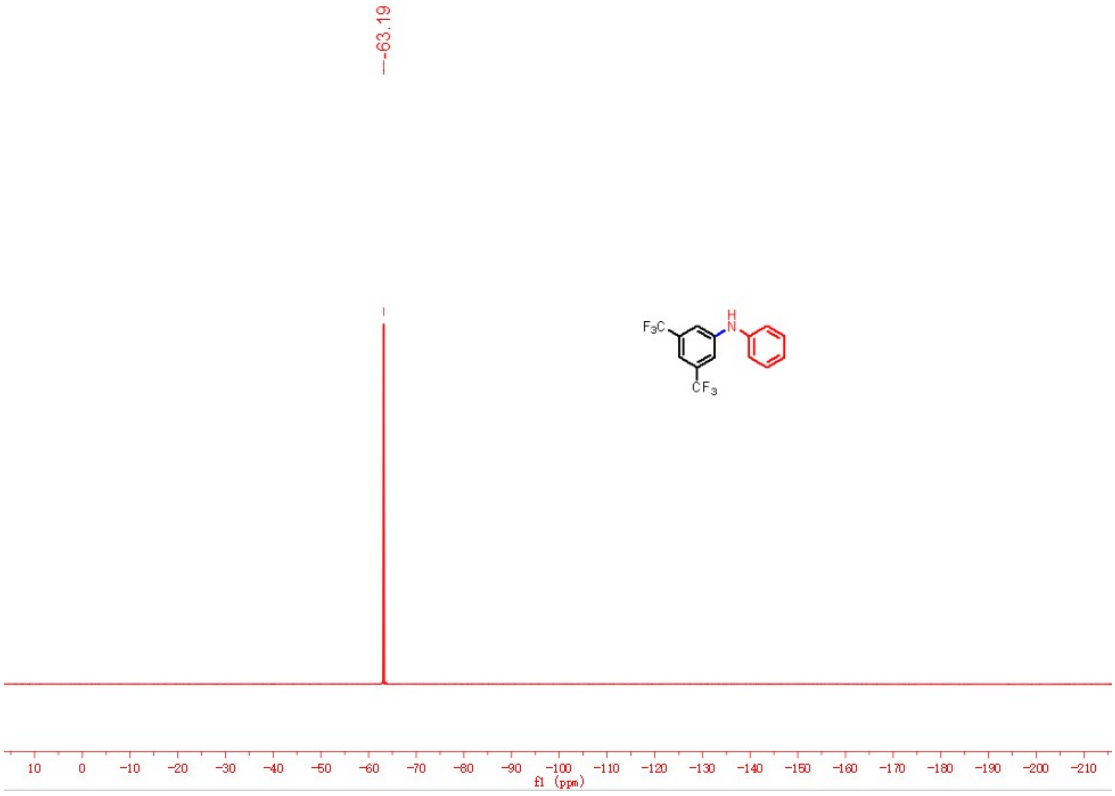

-63.19
F3C
CF3
H
N
10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 -120 -130 -140 -150 -160 -170 -180 -190 -200 -210
f1 (ppm)

Fig. S23. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for morpholino(3-(phenylamino)phenyl)methanone (**3qa**) in $CDCl_3$

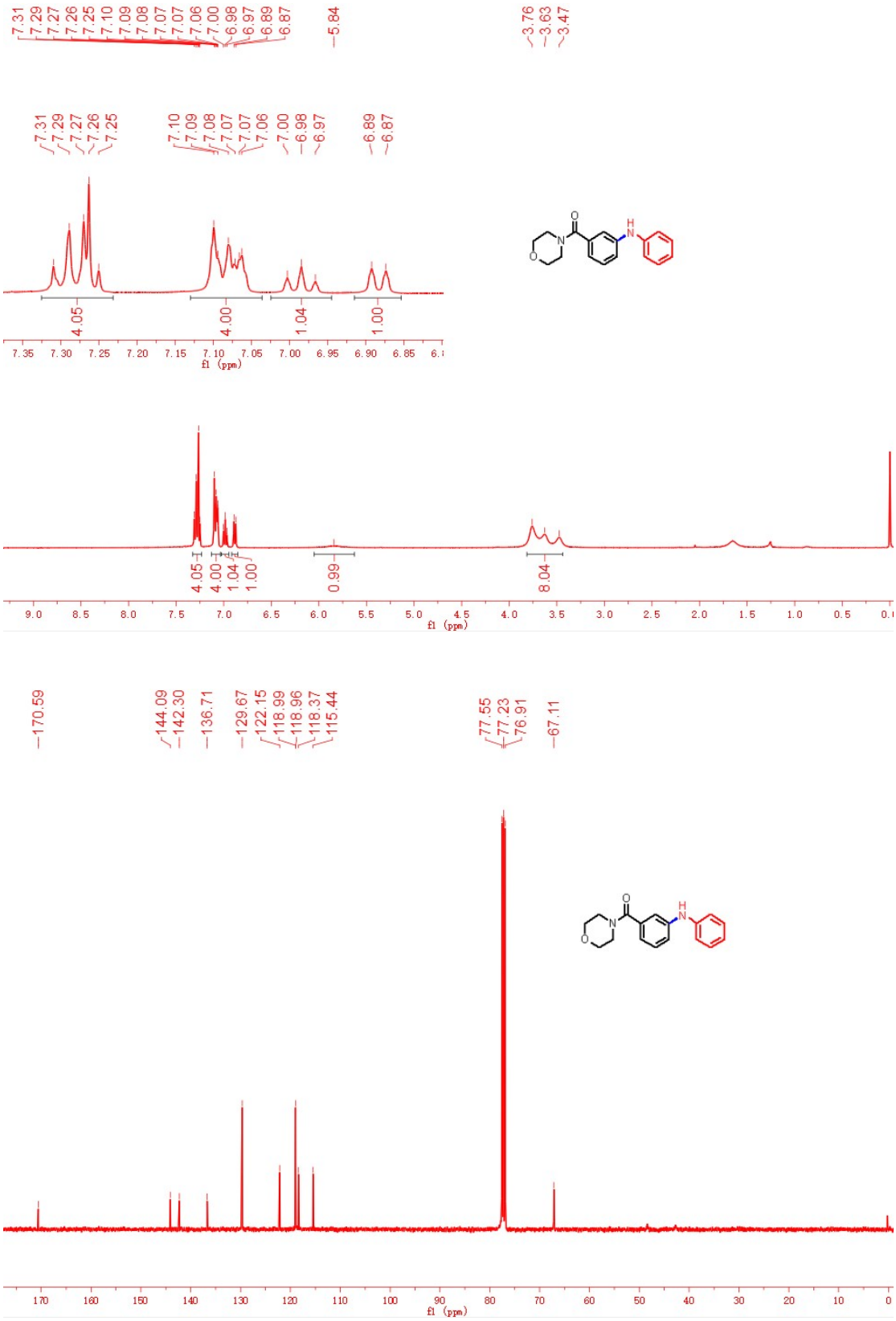


Fig. S24. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for 2-(phenylamino)benzonitrile (**3ra**) in $CDCl_3$

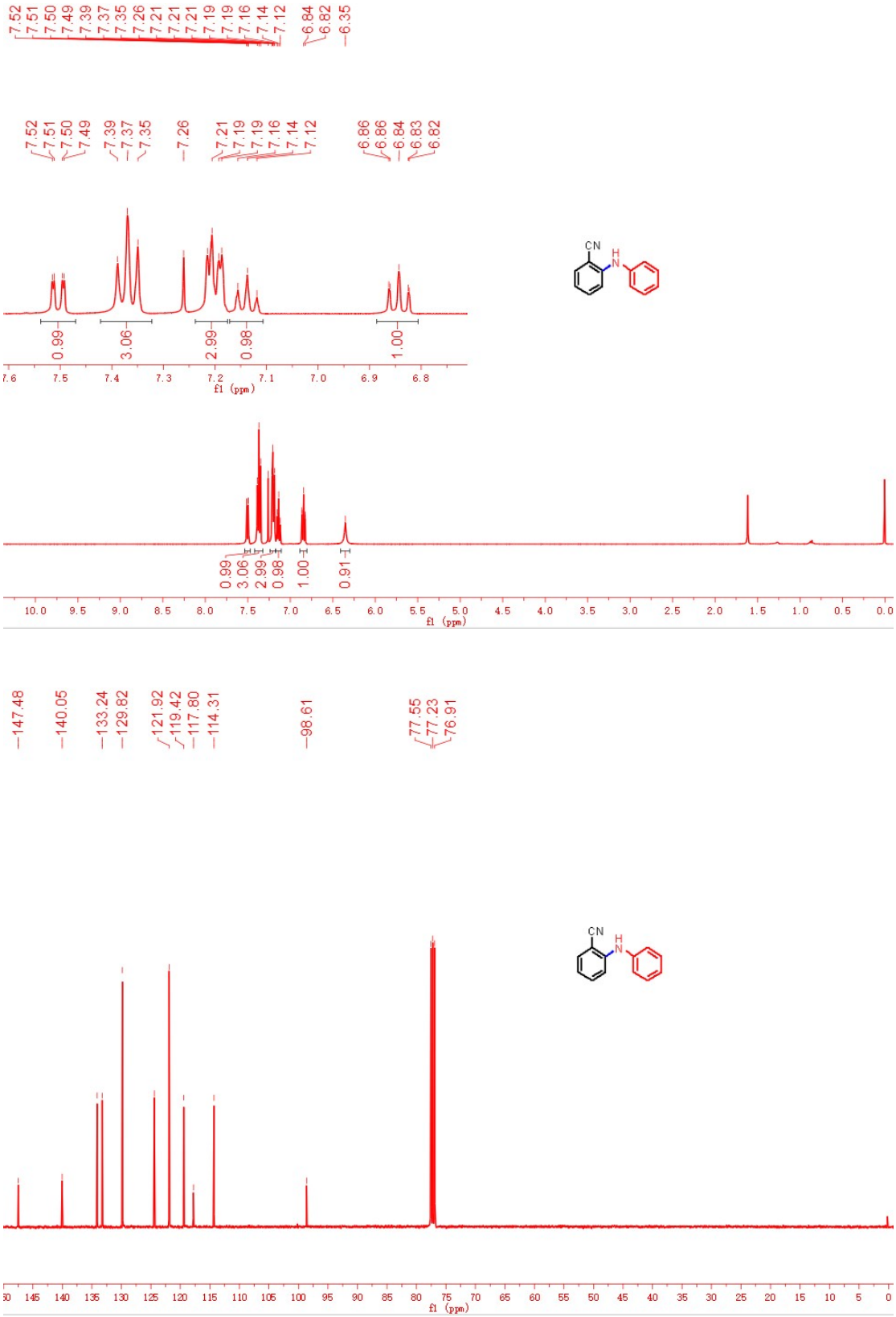


Fig. S25. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for methyl 2-(phenylamino)benzoate (**3sa**) in $CDCl_3$

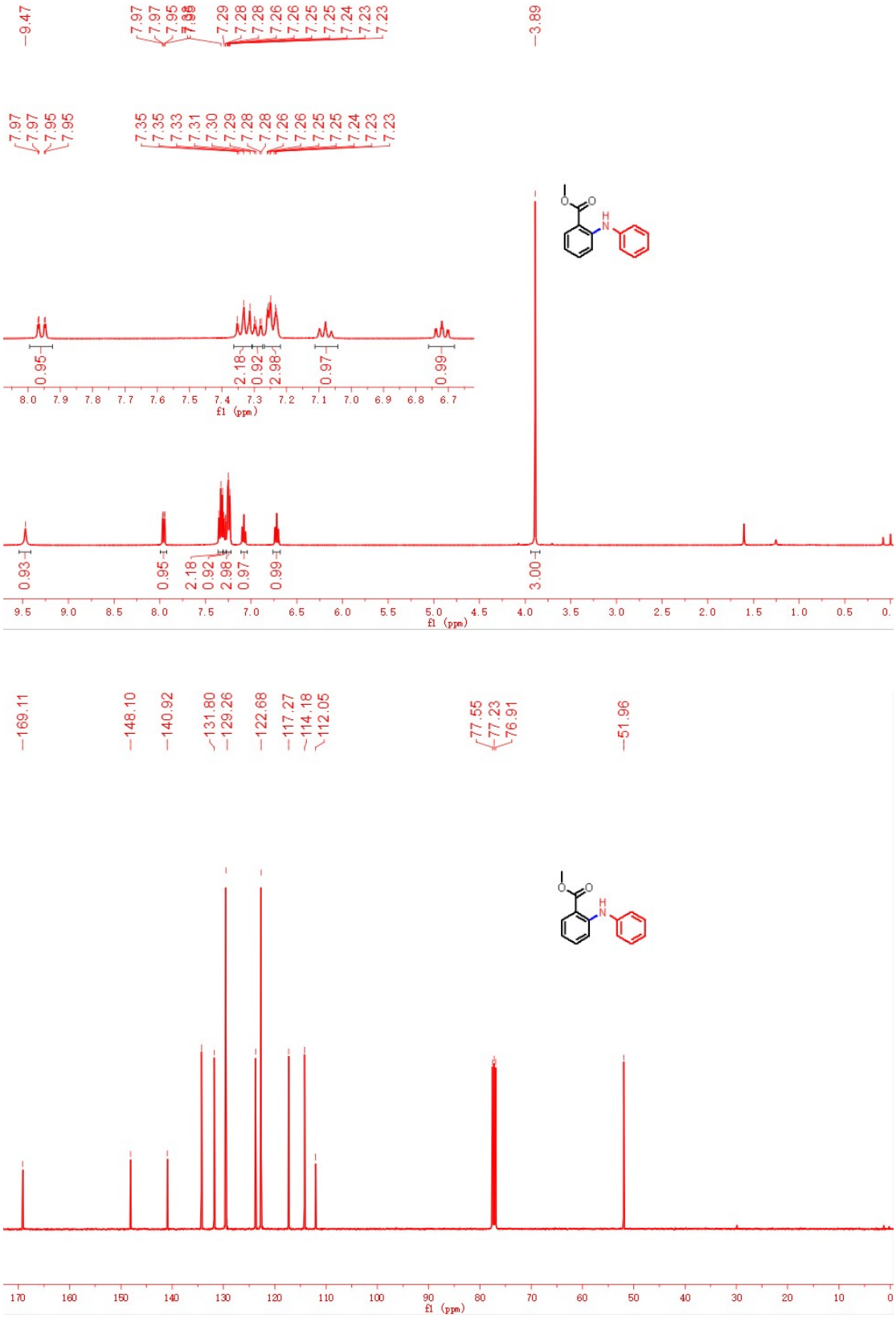


Fig. S26. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for N-phenylnaphthalen-2-amine (**3ta**) in $CDCl_3$

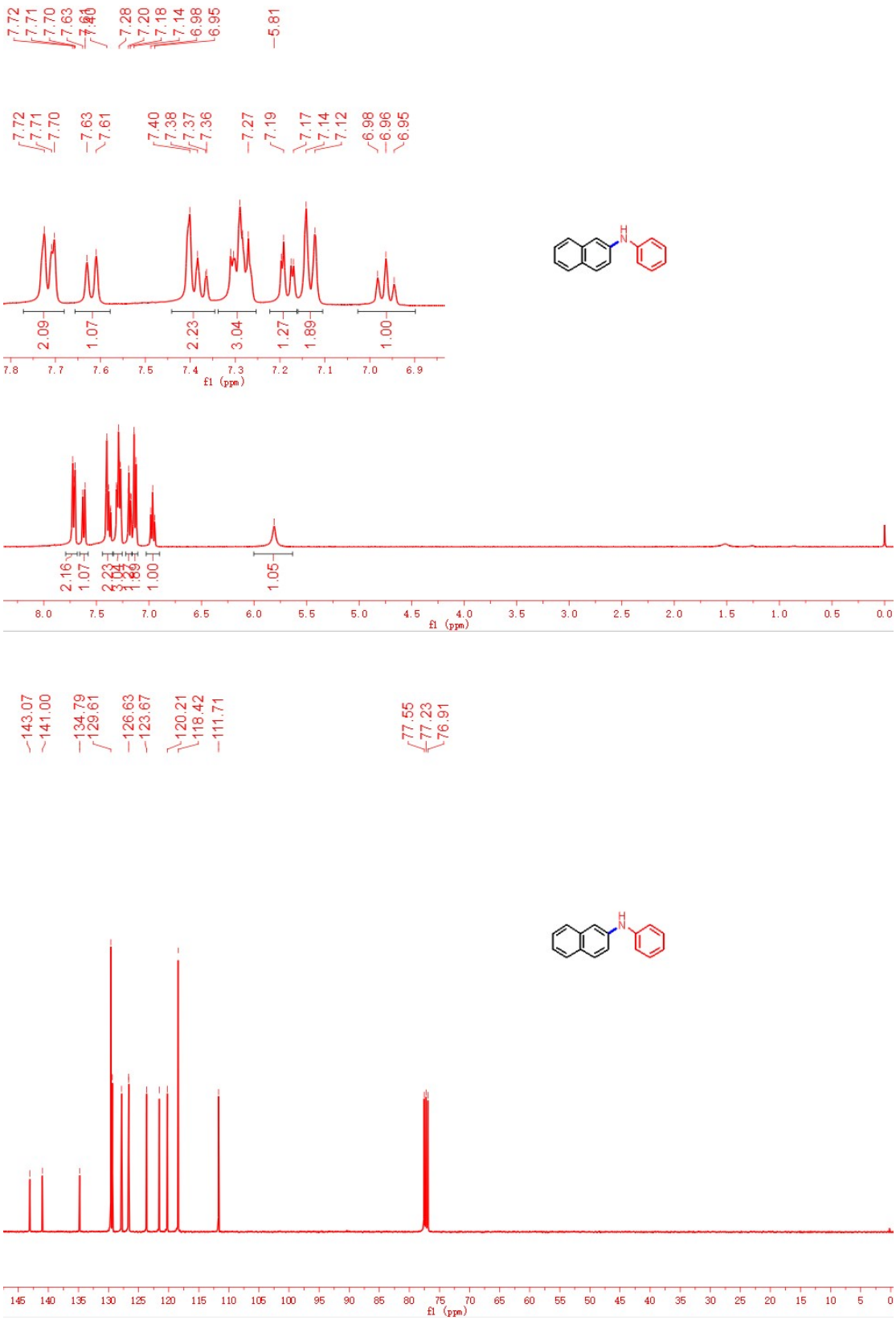


Fig. S27. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for 6-(phenylamino)picolinonitrile (**3ua**) in $CDCl_3$

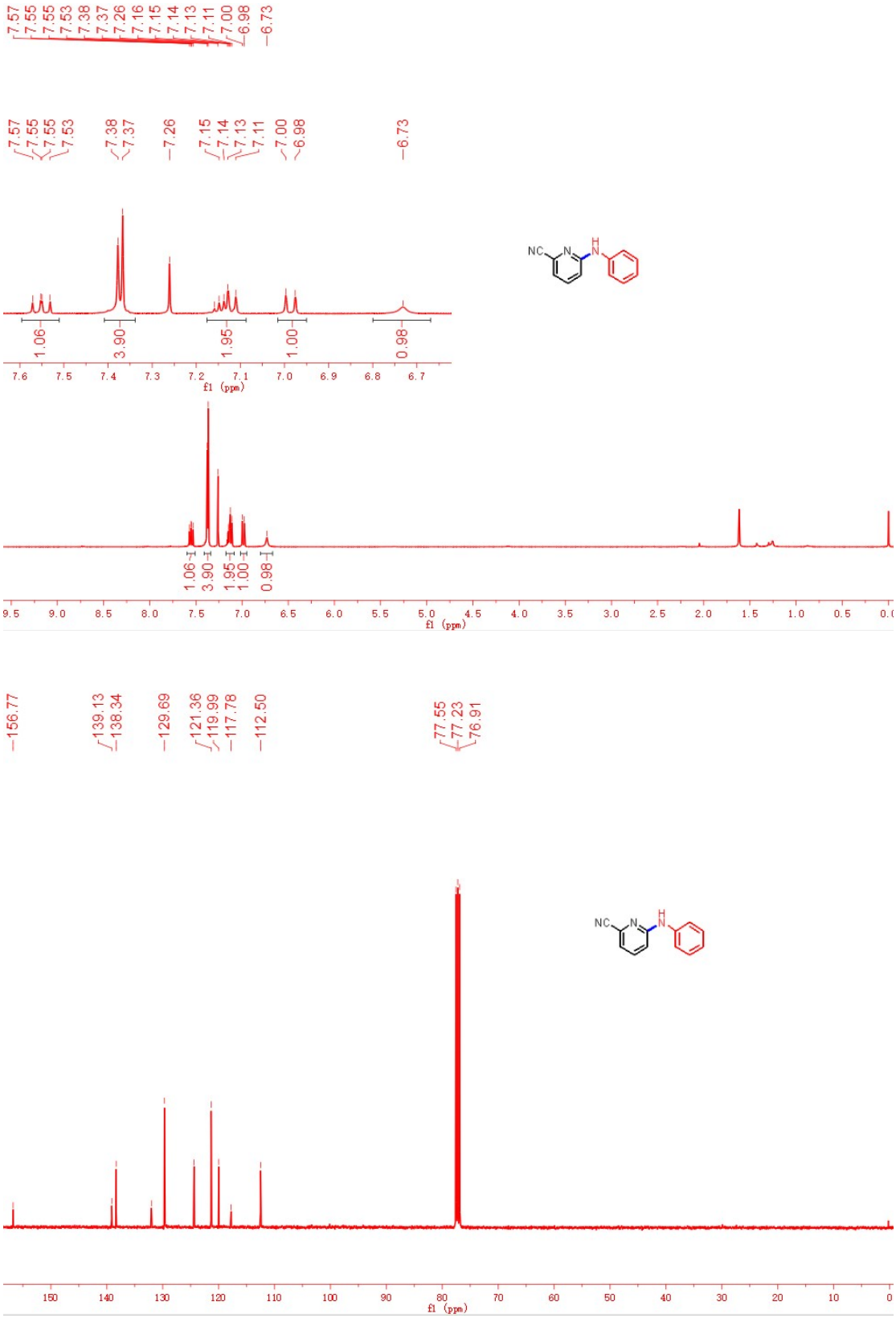
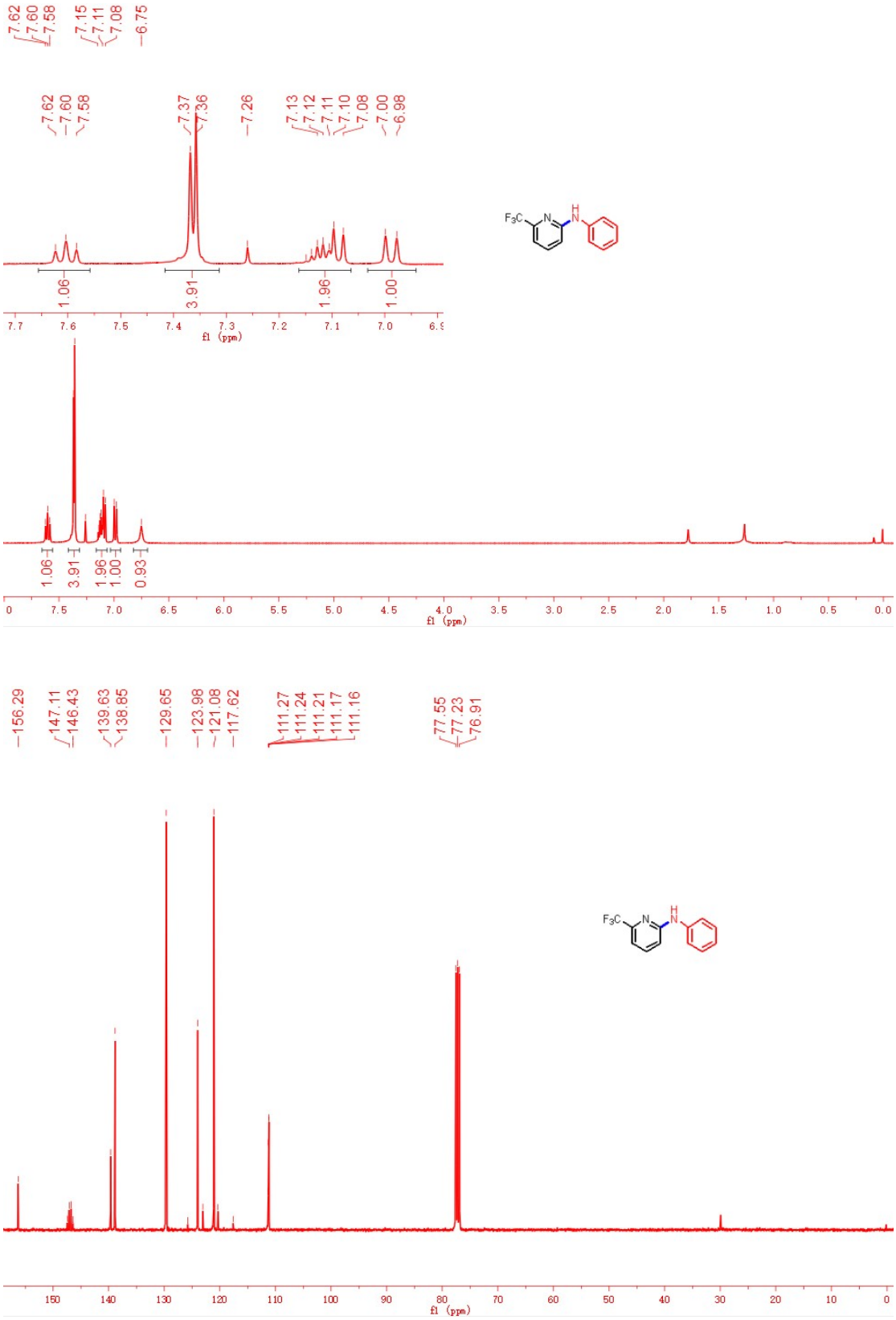


Fig. S28. The ^{1}H (400 MHz), $^{13}C\{^{1}H\}$ (101 MHz) and ^{19}F NMR (377 MHz) NMR spectra for N-phenyl-6-(trifluoromethyl)pyridin-2-amine (**3va**) in $CDCl_3$



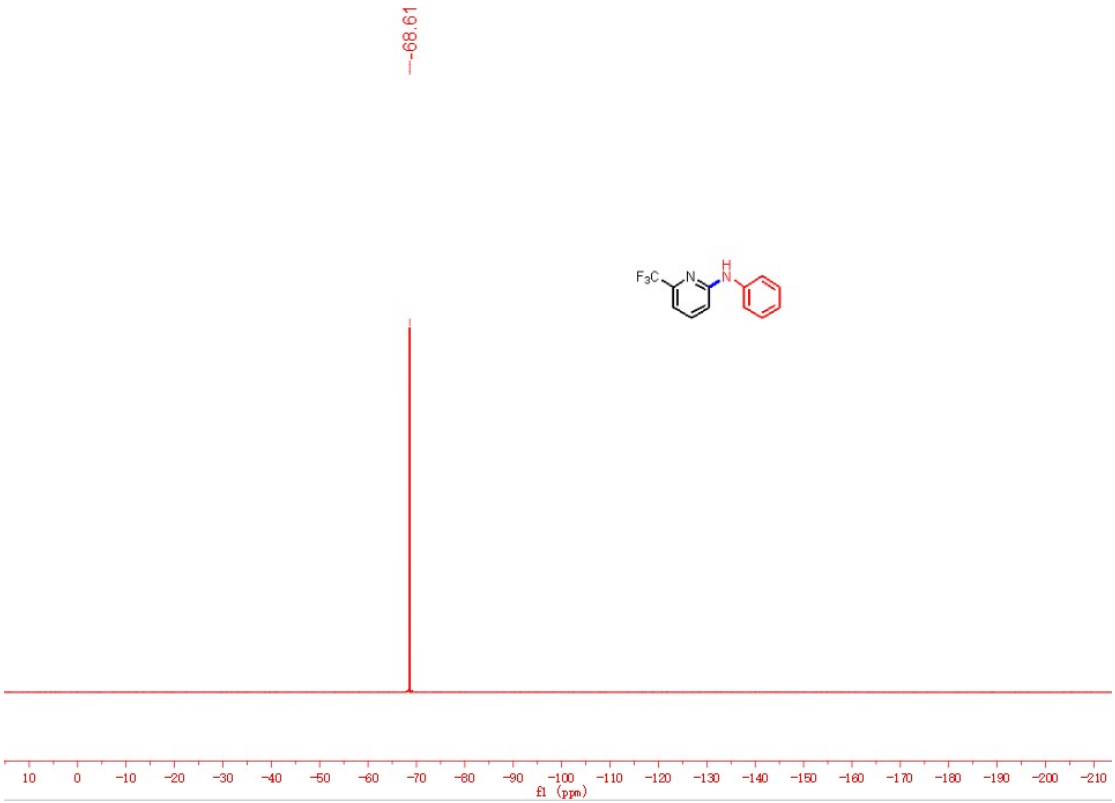

-68.61
F3C
N
H
N
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

Fig. S29. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for N-phenylquinolin-3-amine (**3wa**) in $CDCl_3$

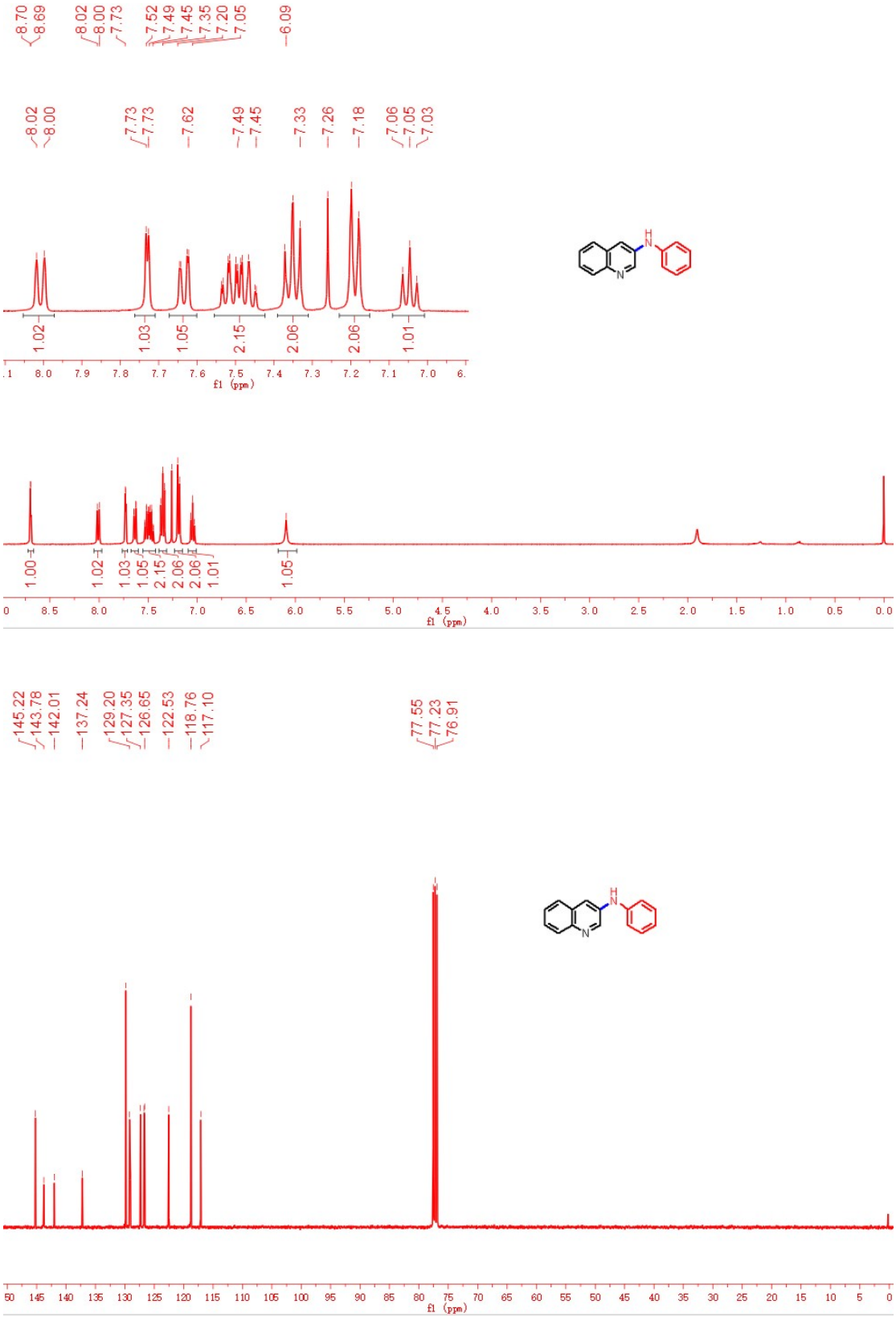


Fig. S30. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for N-phenylbenzo[*d*][1,3]dioxol-5-amine (**3xa**) in $CDCl_3$

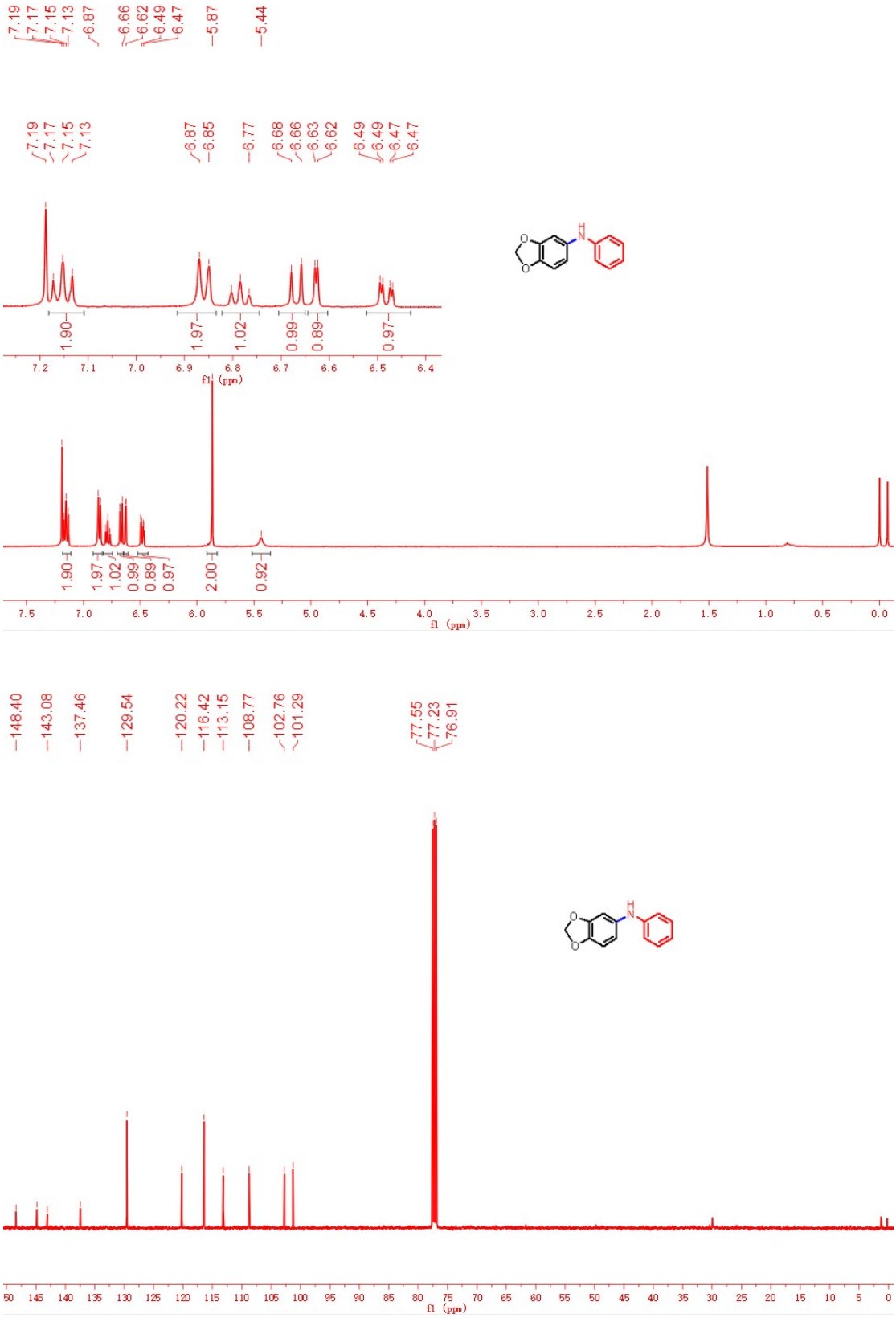


Fig. S31. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for 1-(4-(*p*-tolylamino)phenyl)ethan-1-one (**3ab**) in $CDCl_3$

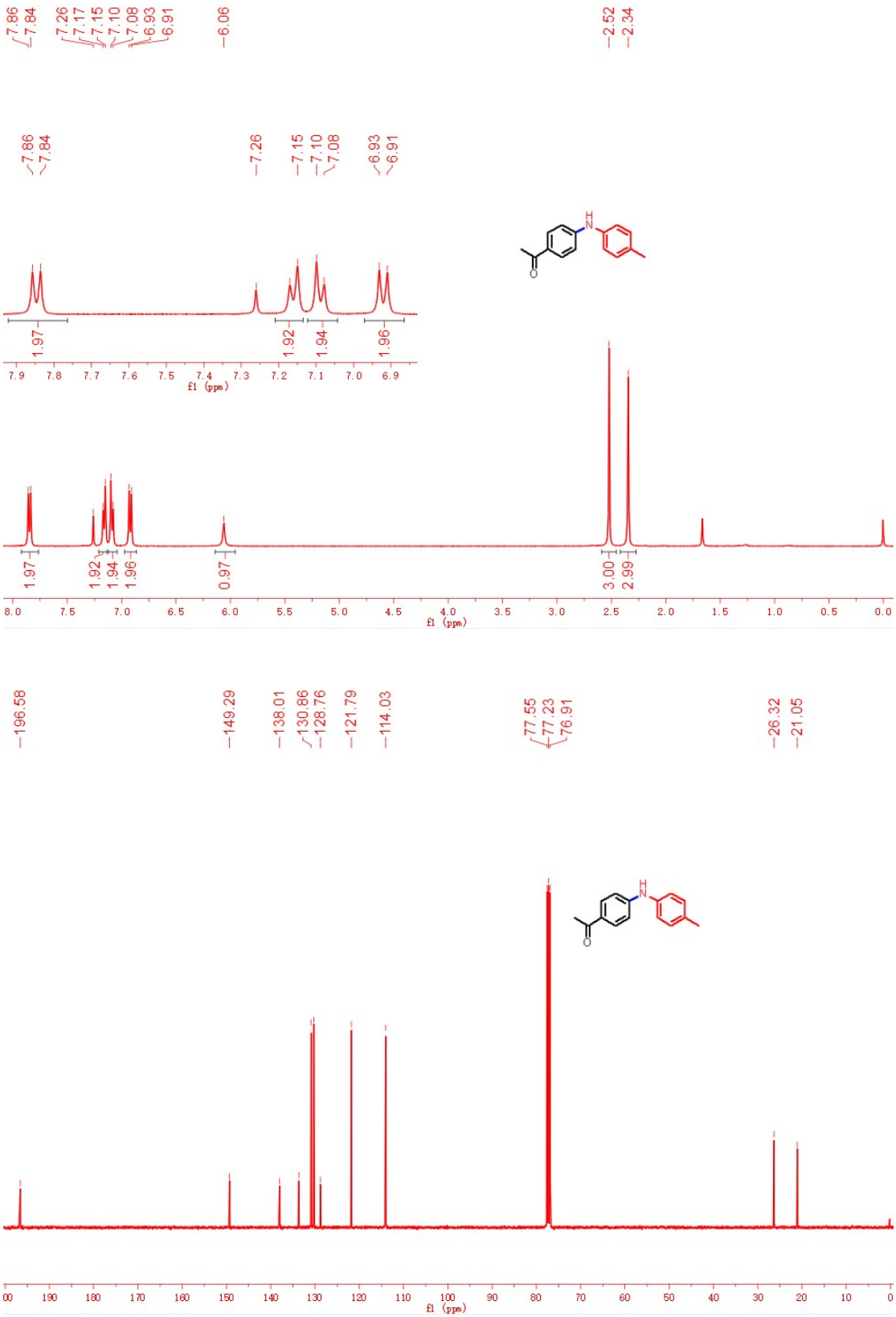


Fig. S32. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for 1-(4-((4-isopropylphenyl)amino)phenyl)ethan-1-one (**3ac**) in $CDCl_3$

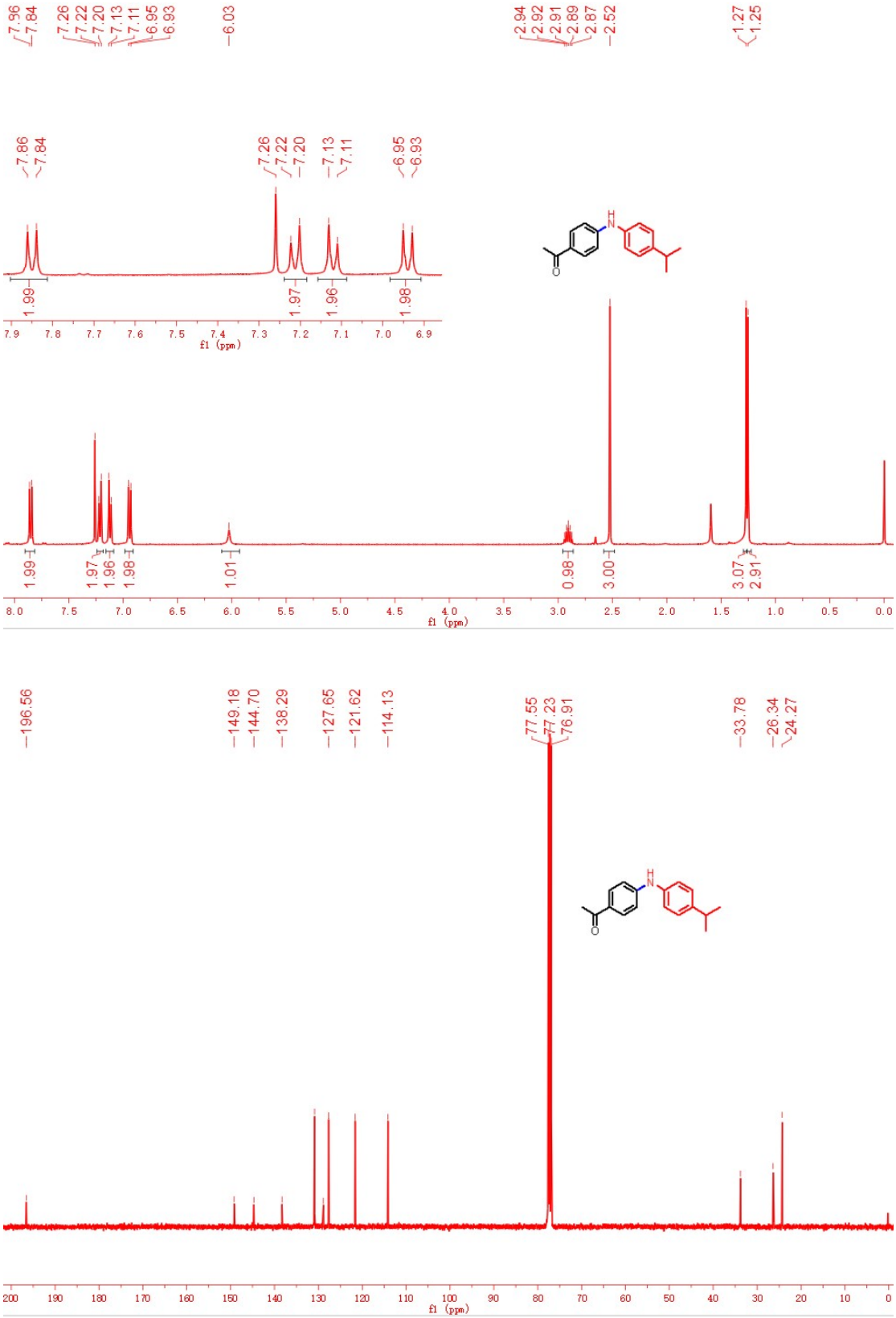


Fig. S33. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for 1-(4-((4-methoxyphenyl)amino)phenyl)ethan-1-one (**3ad**) in $CDCl_3$

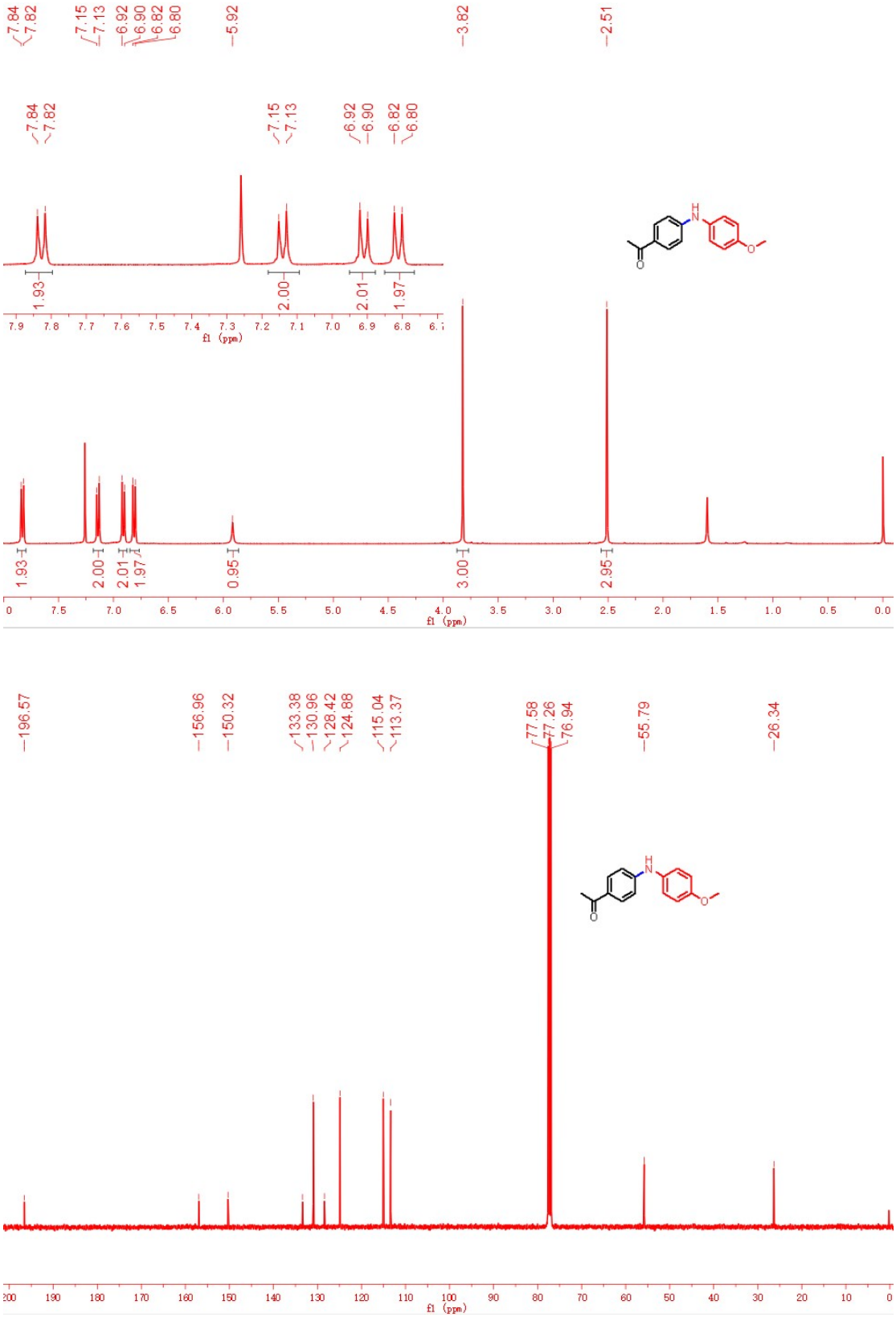
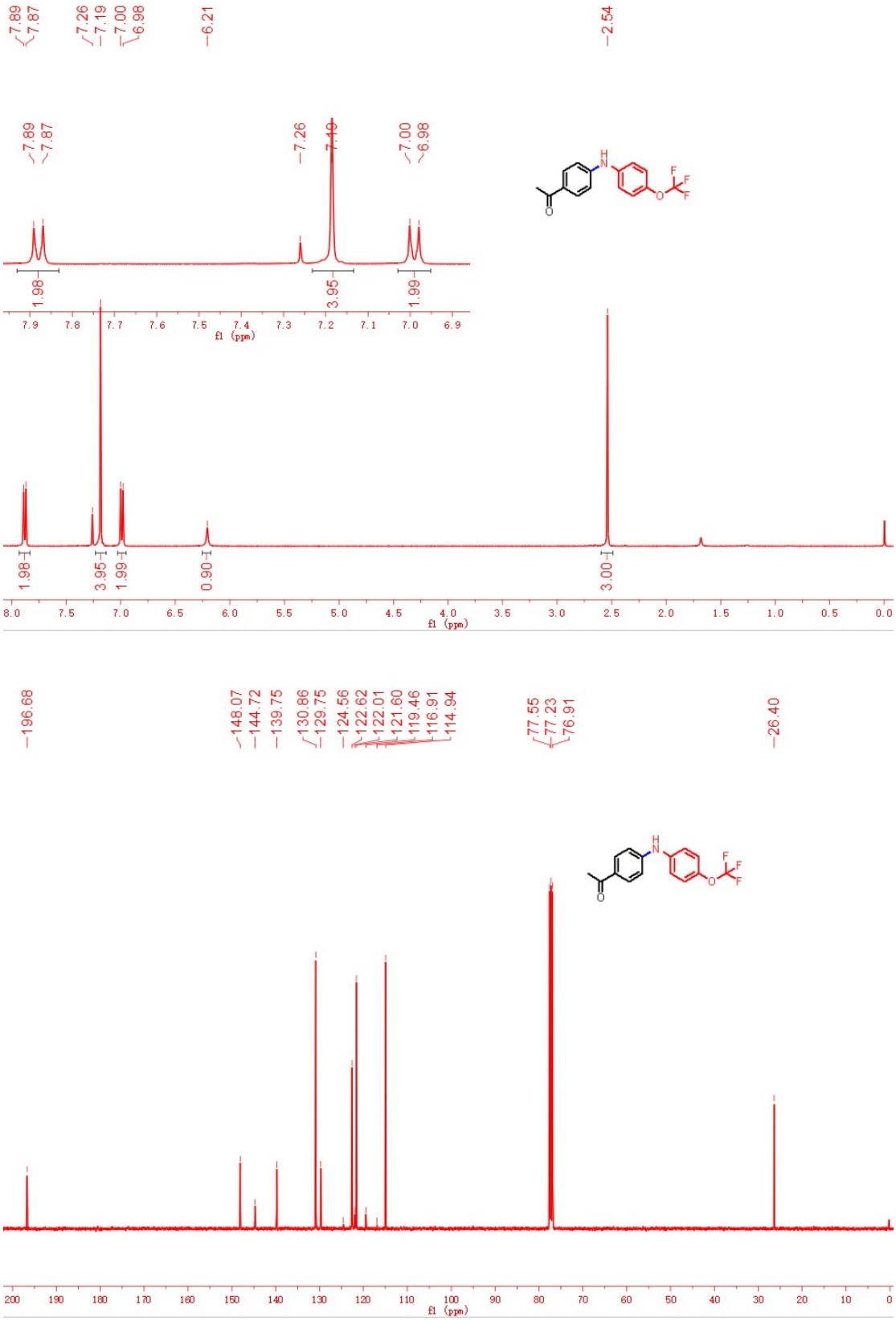


Fig. S34. The ^{1}H (400 MHz), $^{13}C\{^{1}H\}$ (101 MHz) and ^{19}F NMR (377 MHz) NMR spectra for 1-(4-((4-(trifluoromethoxy)phenyl)amino)phenyl)ethan-1-one (**3ae**) in $CDCl_3$



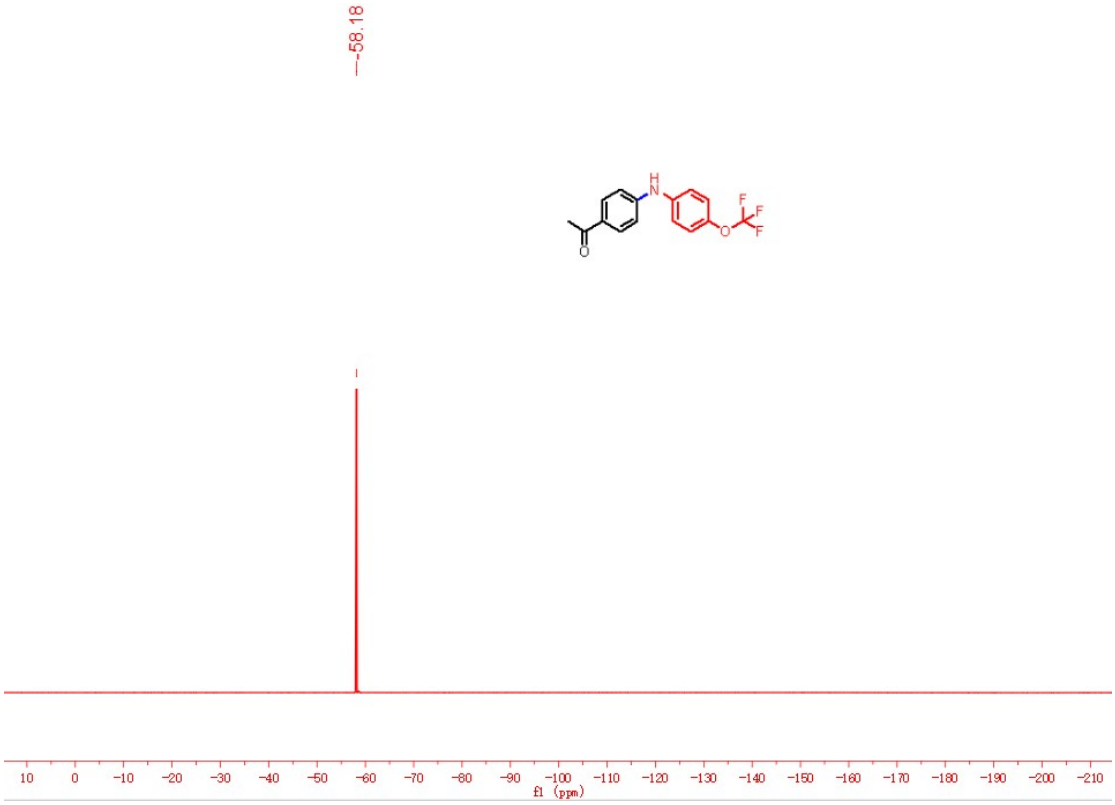
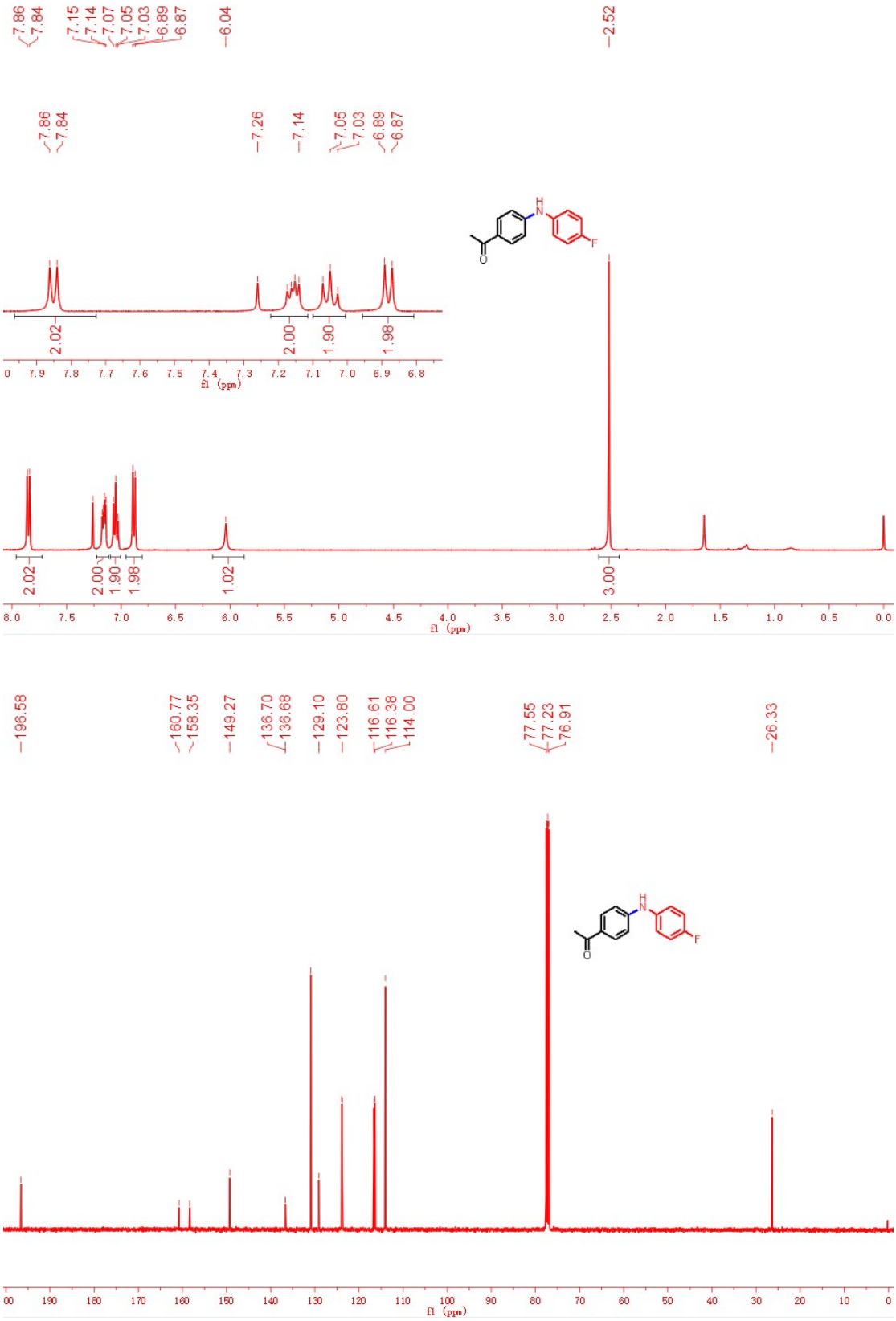

-58.18
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

Fig. S35. The ^{1}H (400 MHz), $^{13}C\{^{1}H\}$ (101 MHz) and ^{19}F NMR (377 MHz) NMR spectra for 1-(4-((4-fluorophenyl)amino)phenyl)ethan-1-one (**3af**) in $CDCl_3$



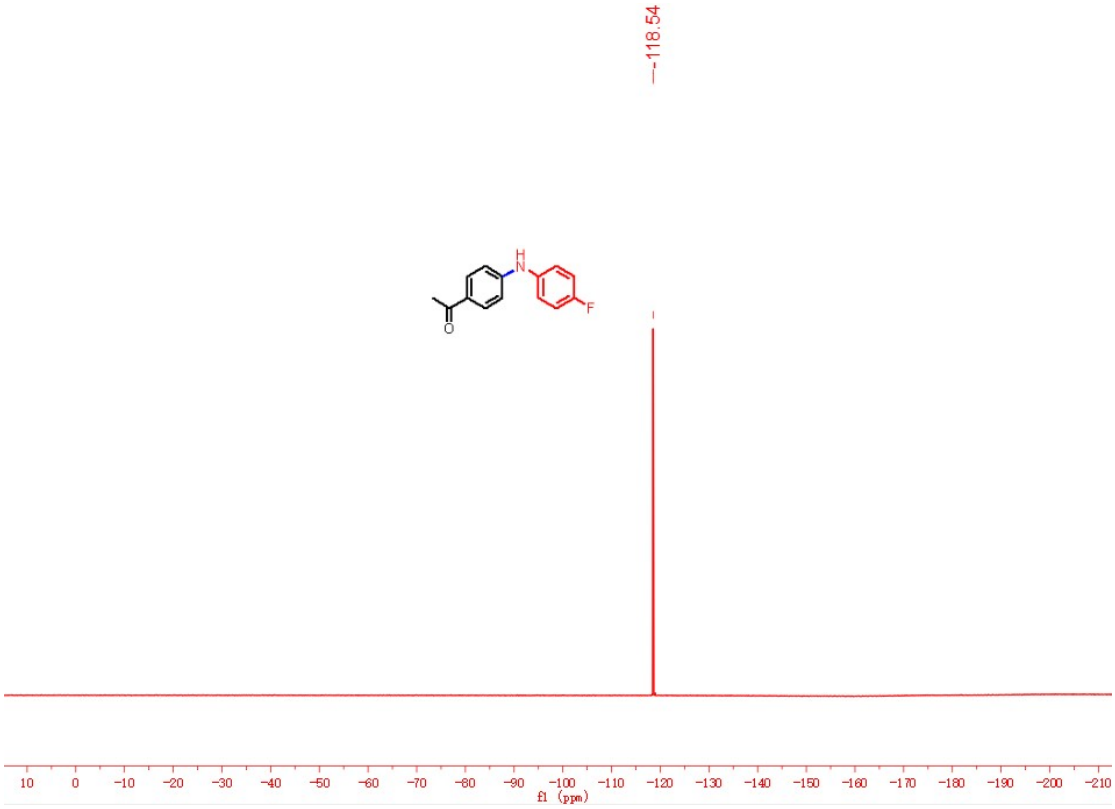

-118.54
H
N
F
O
10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 -120 -130 -140 -150 -160 -170 -180 -190 -200 -210
f1 (ppm)

Fig. S36. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for 1-(4-((4-chlorophenyl)amino)phenyl)ethan-1-one (**3ag**) in $CDCl_3$

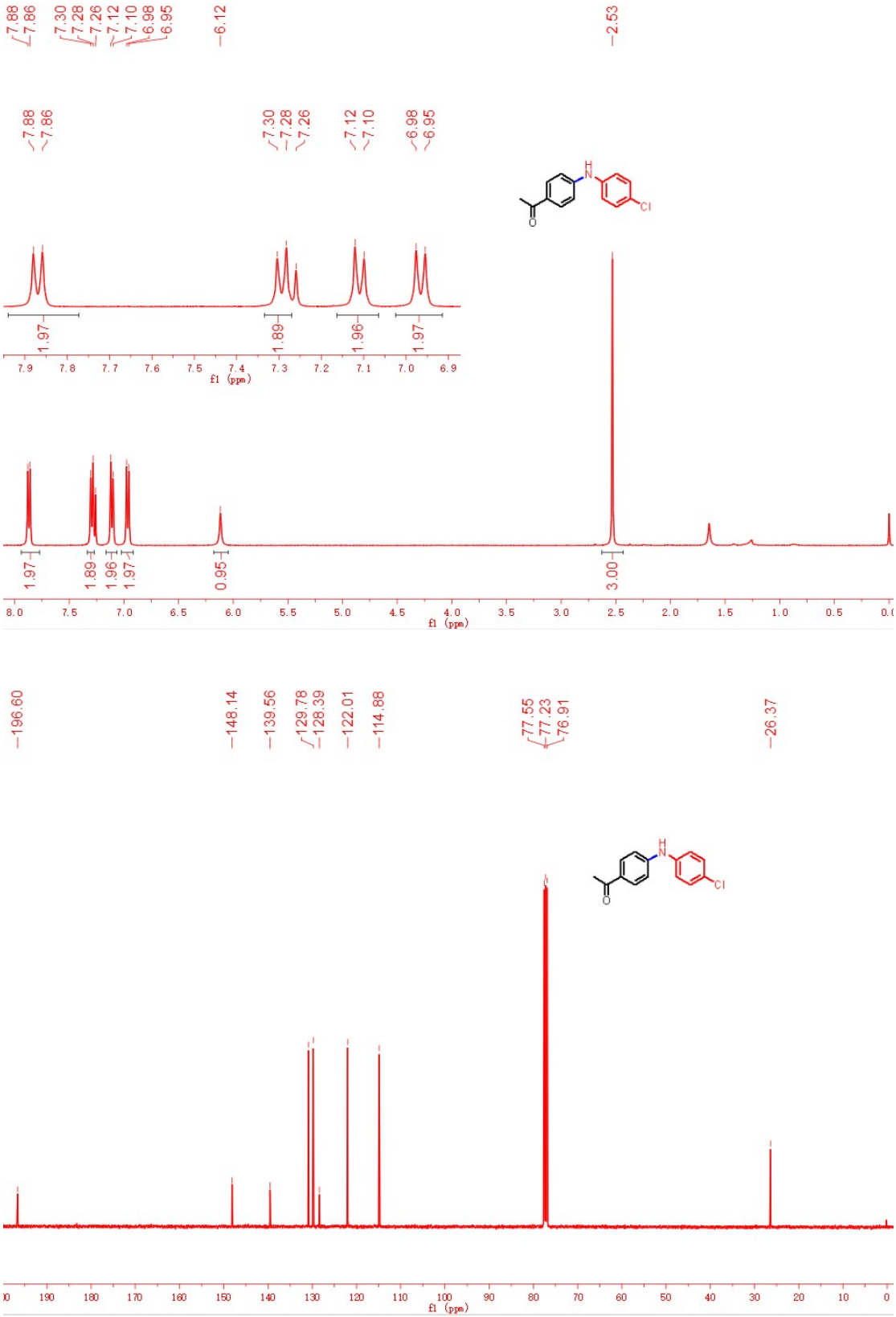


Fig. S37. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for 1-(4-((4-bromophenyl)amino)phenyl)ethan-1-one (**3ah**) in $CDCl_3$

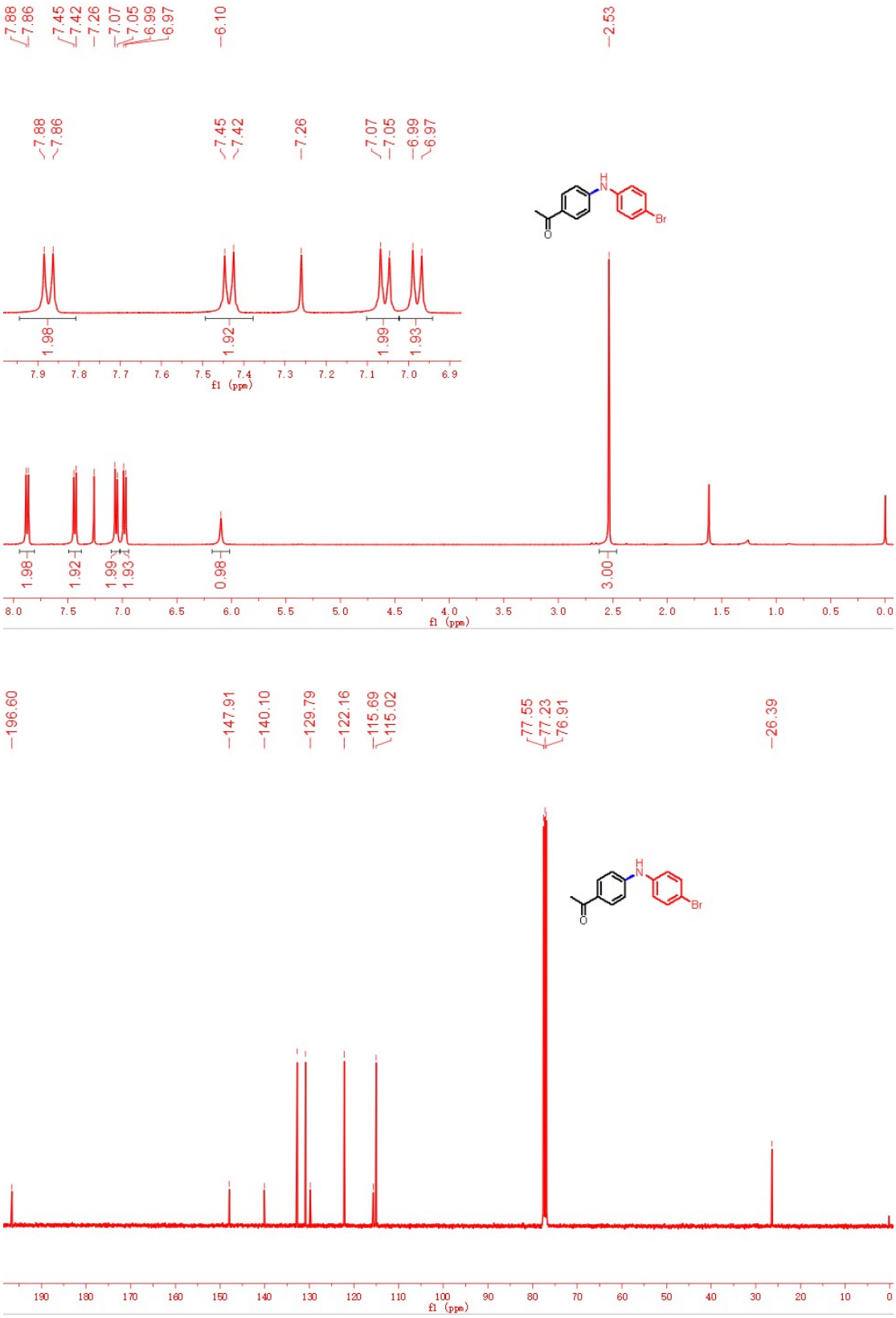


Fig. S38. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for 1-(4-((3,4-dimethylphenyl)amino)phenyl)ethan-1-one (**3ai**) in $CDCl_3$

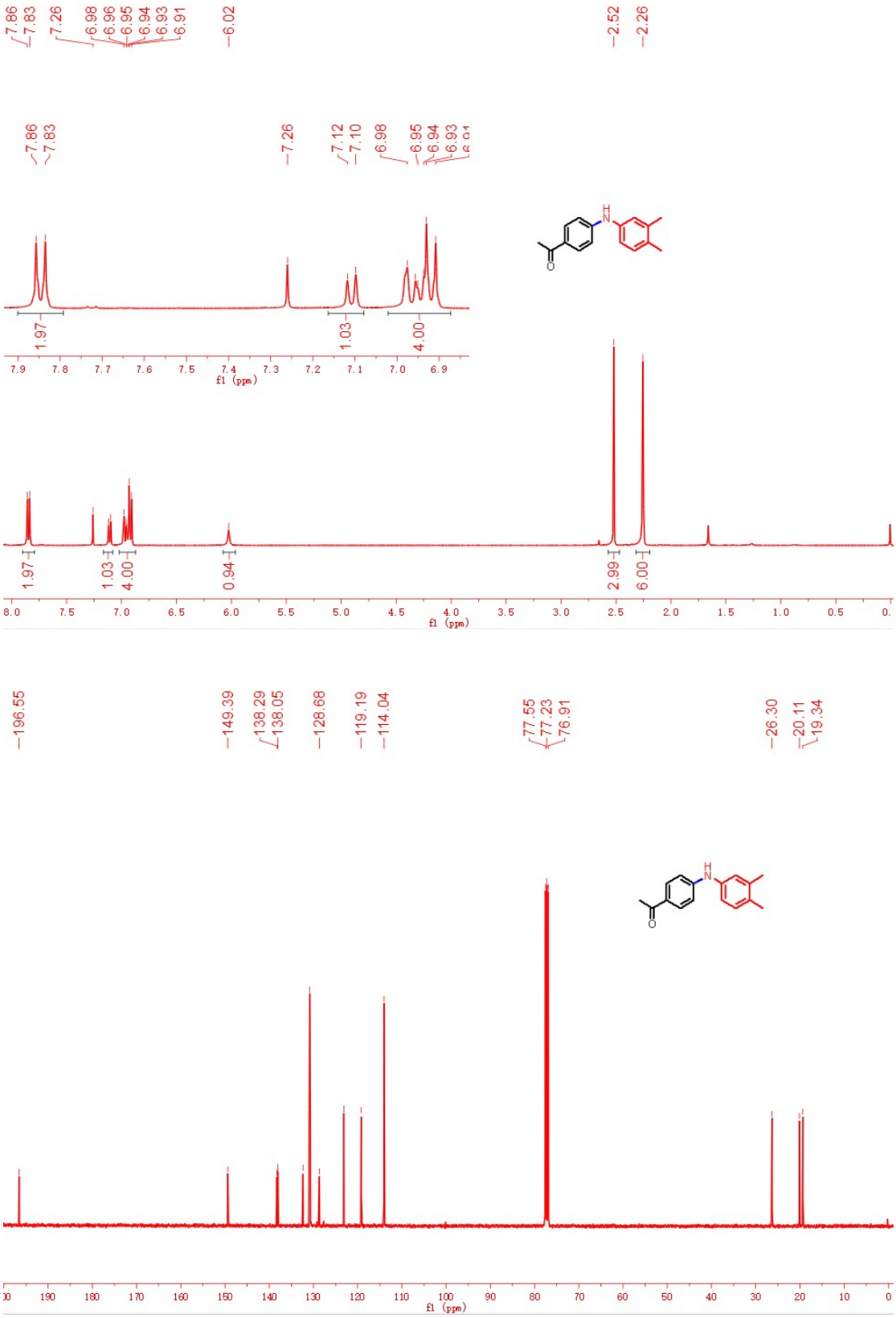


Fig. S39. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for 1-(4-((3,5-dimethylphenyl)amino)phenyl)ethan-1-one (**3aj**) in $CDCl_3$

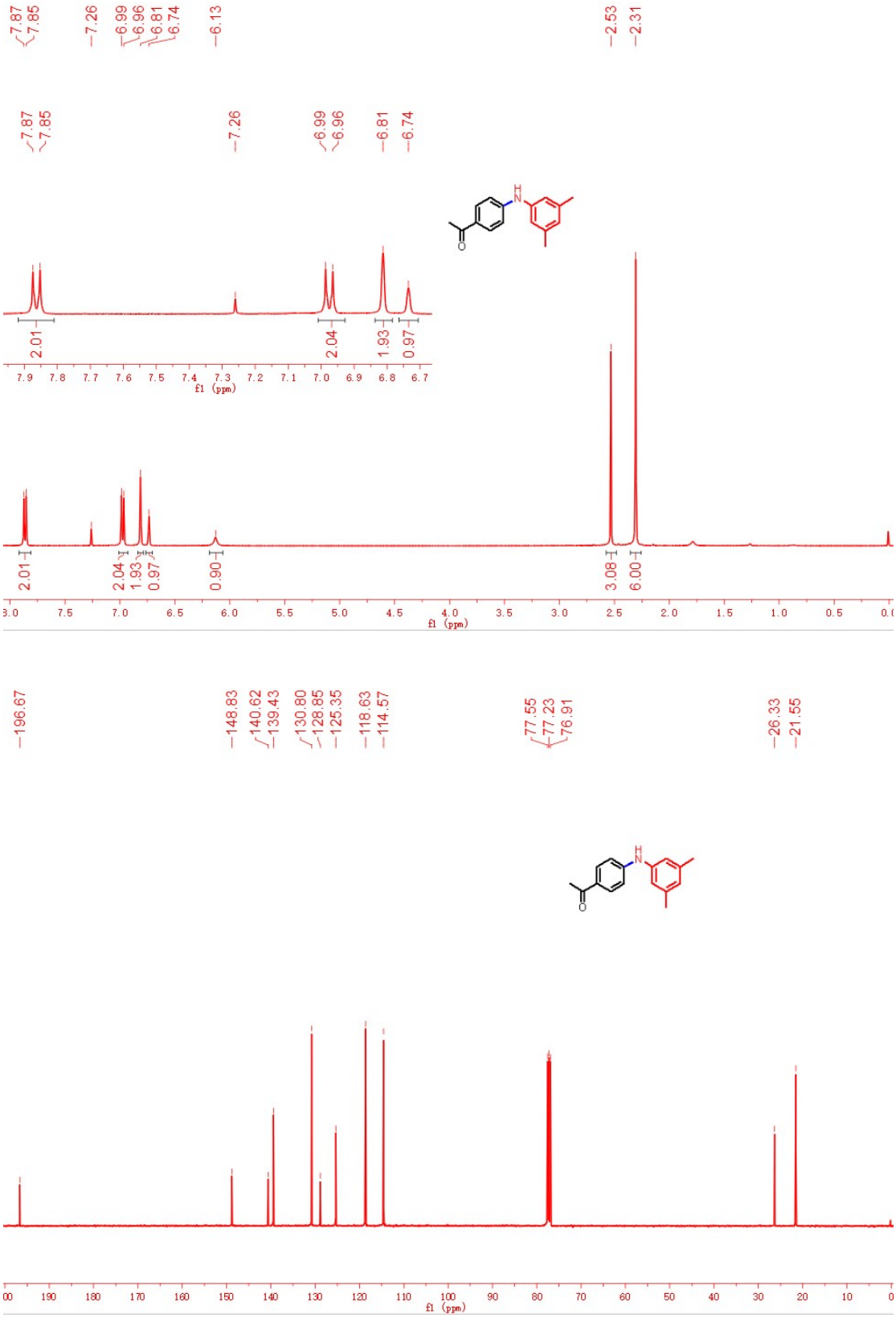


Fig. S40. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for 1-(4-((3-bromophenyl)amino)phenyl)ethan-1-one (**3ak**) in $CDCl_3$

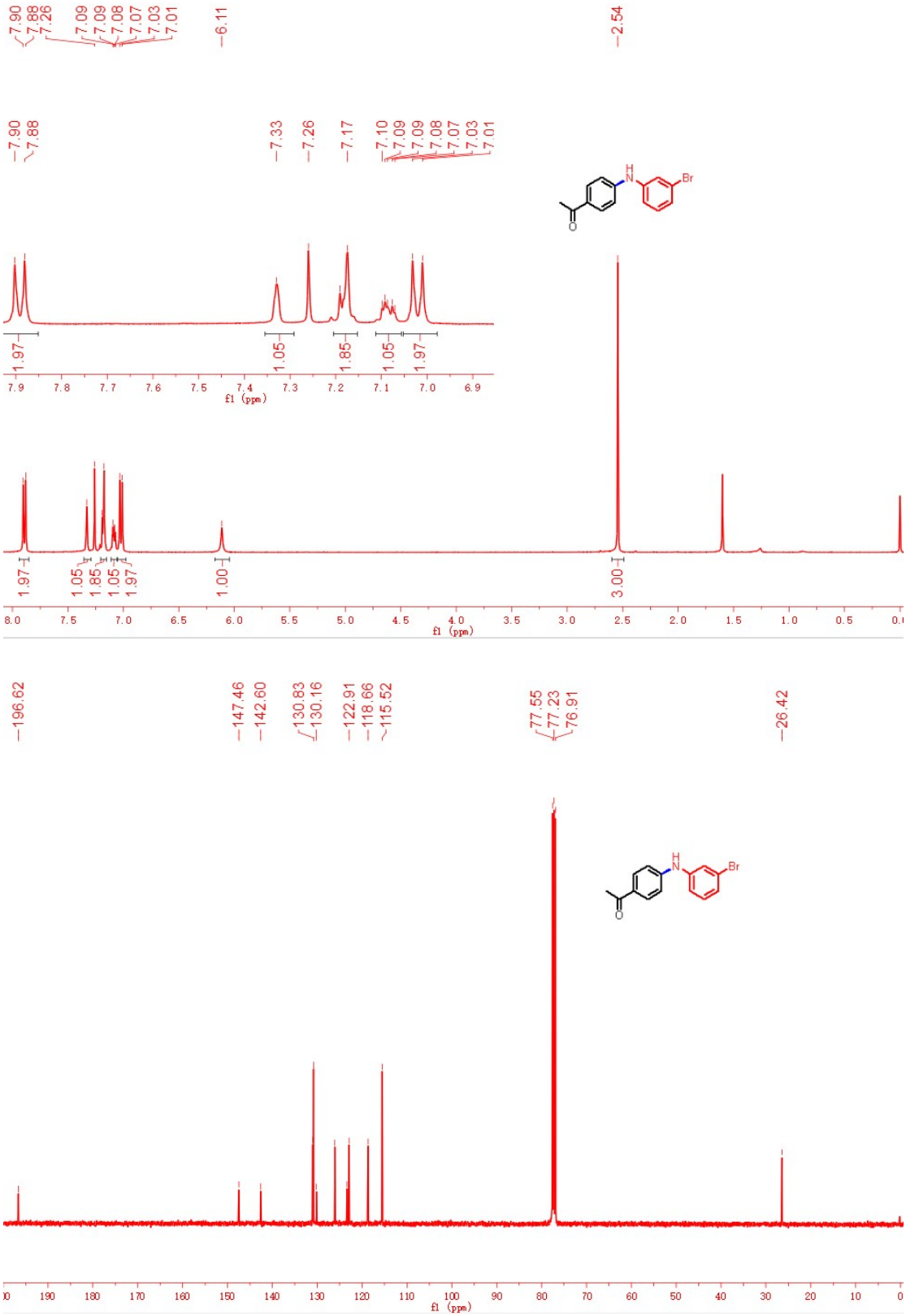


Fig. S41. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for 1-(4-((2-bromo-4-chlorophenyl)amino)phenyl)ethan-1-one (**3al**) in $CDCl_3$

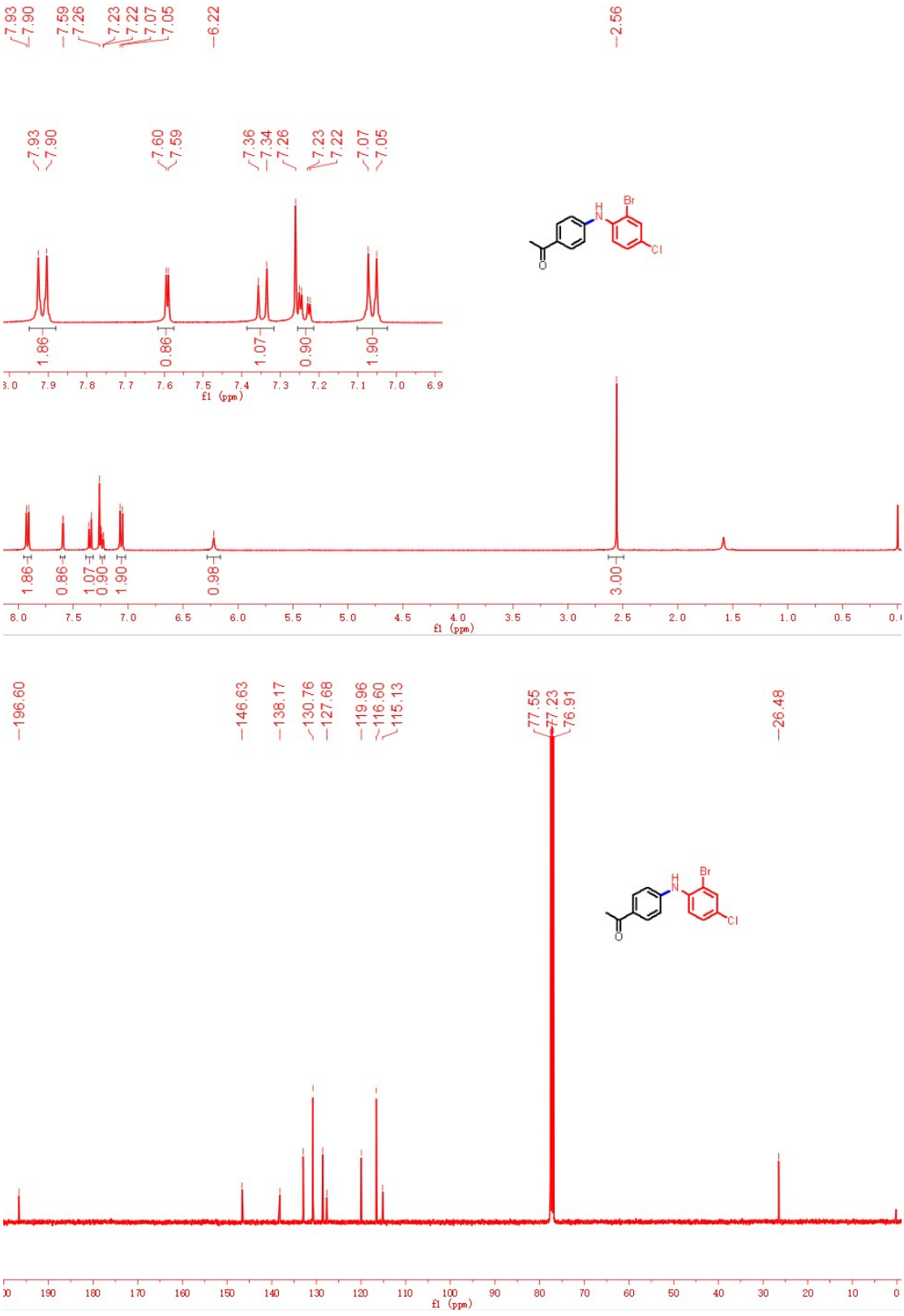


Fig. S42. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for 1-(4-((2,3-dimethylphenyl)amino)phenyl)ethan-1-one (**3am**) in $CDCl_3$

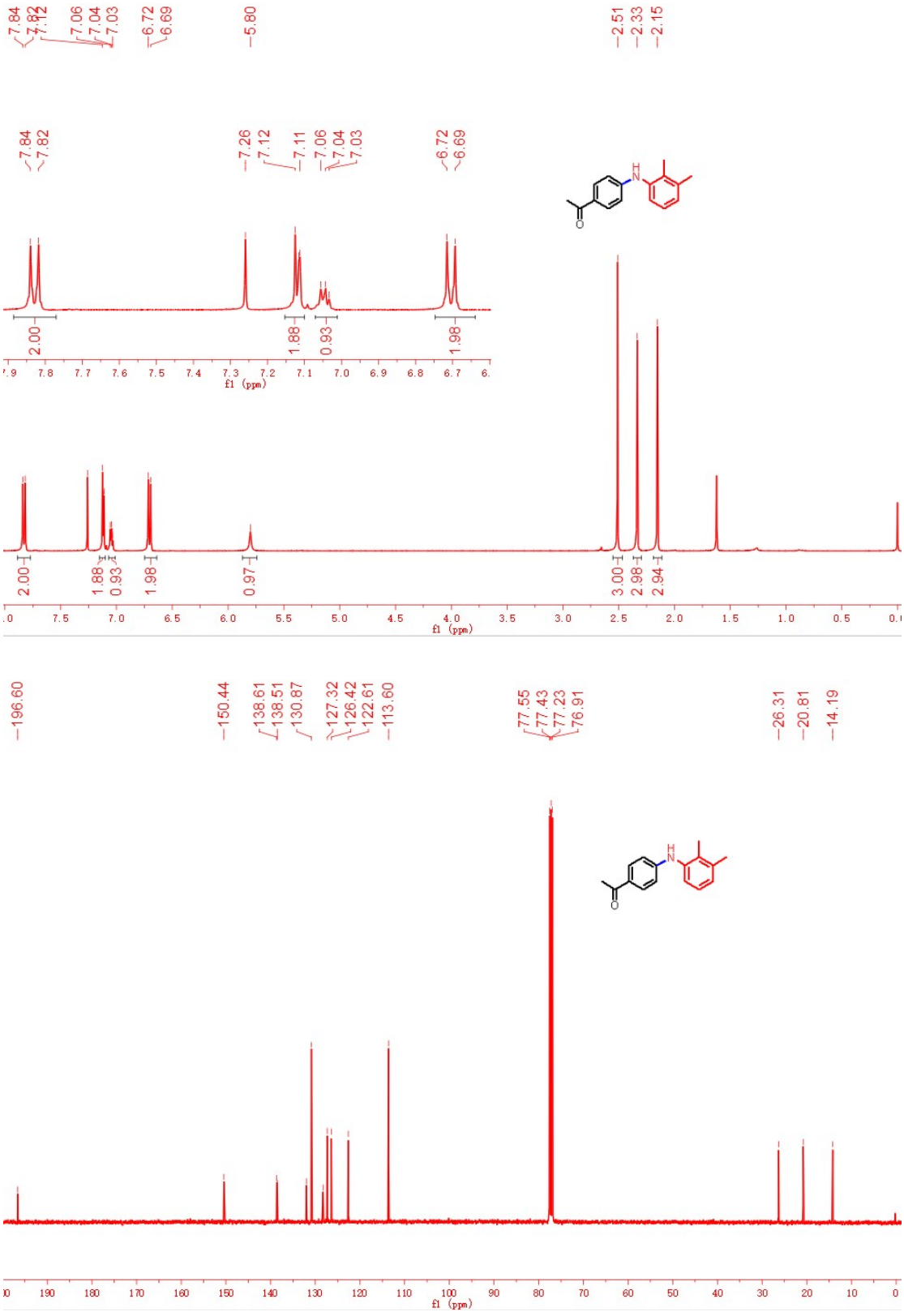


Fig. S43. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for 1-(4-((2,6-dimethylphenyl)amino)phenyl)ethan-1-one (**3an**) in $CDCl_3$

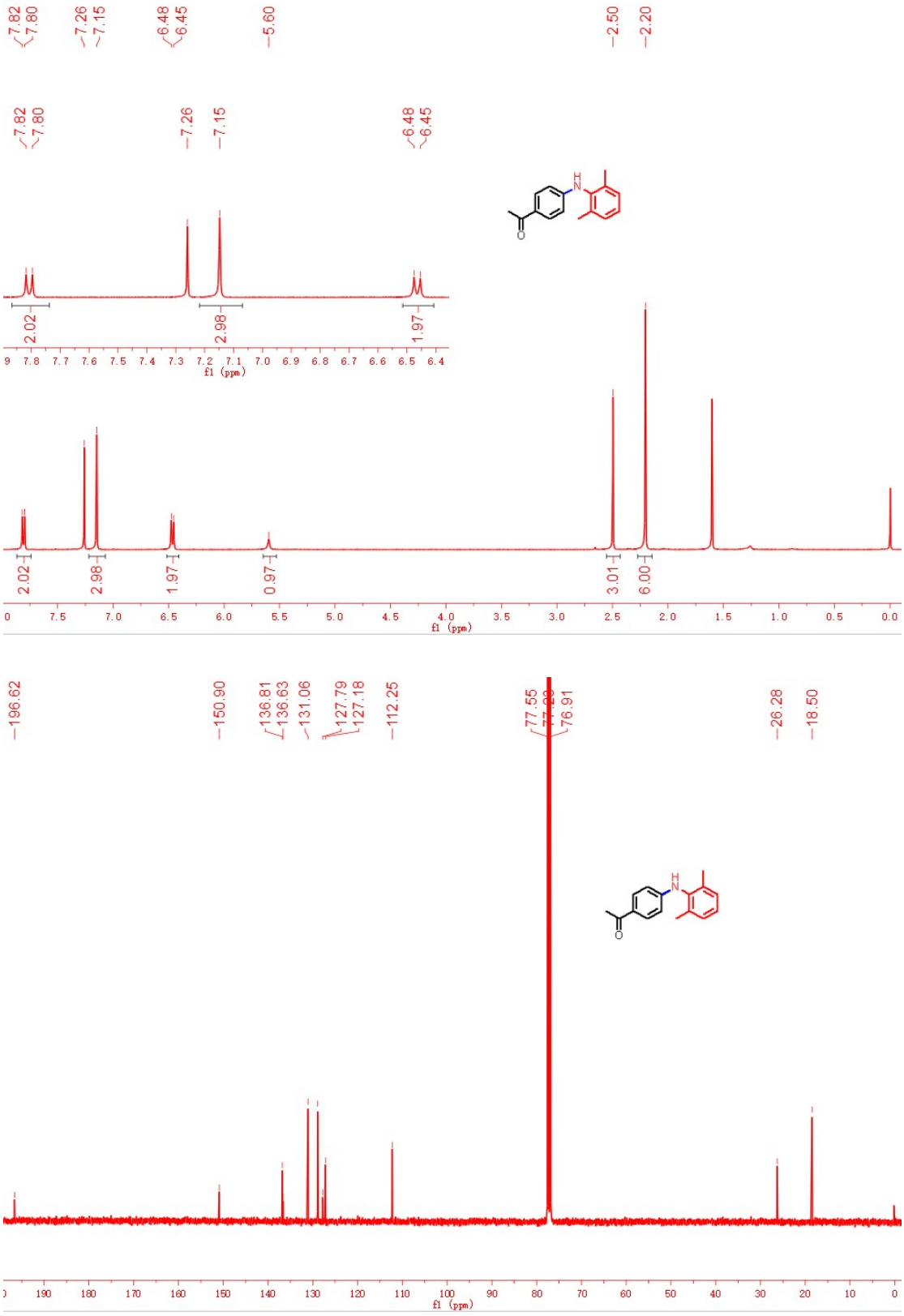
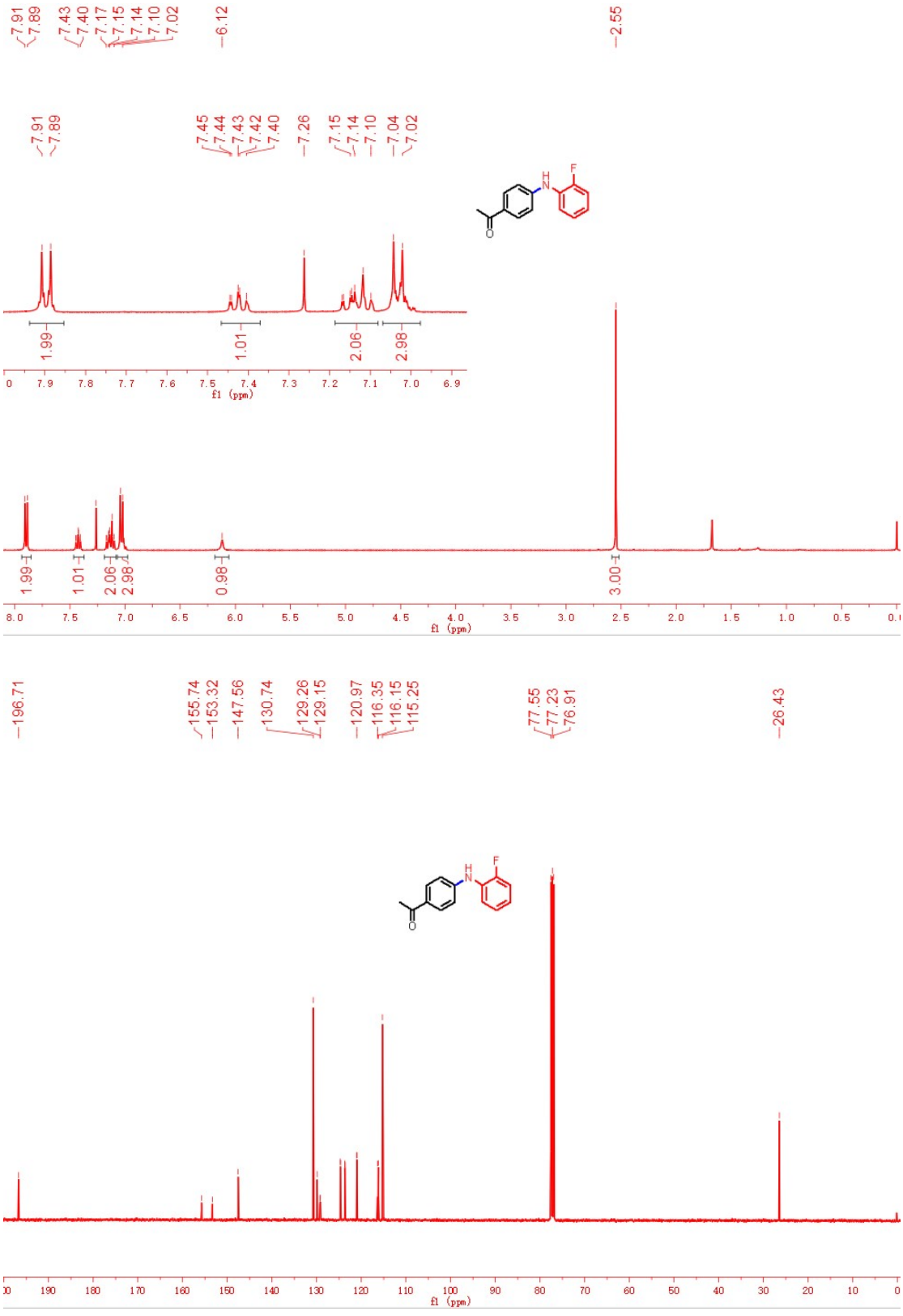


Fig. S44. The ^{1}H (400 MHz), $^{13}C\{^{1}H\}$ (101 MHz) and ^{19}F NMR (377 MHz) NMR spectra for 1-(4-((2-fluorophenyl)amino)phenyl)ethan-1-one (**3ao**) in $CDCl_3$



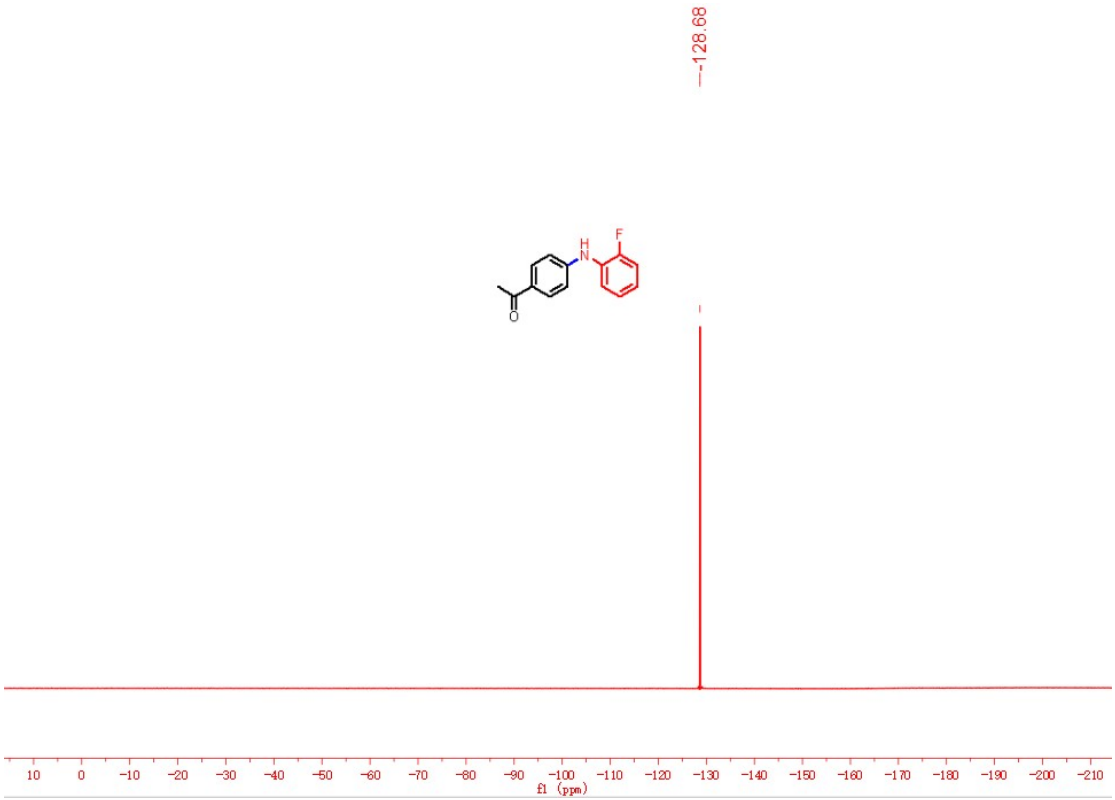

-128.68
F
H
N
O
10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 -120 -130 -140 -150 -160 -170 -180 -190 -200 -210
f1 (ppm)

Fig. S45. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for 1-(4-((2-chlorophenyl)amino)phenyl)ethan-1-one (**3ap**) in $CDCl_3$

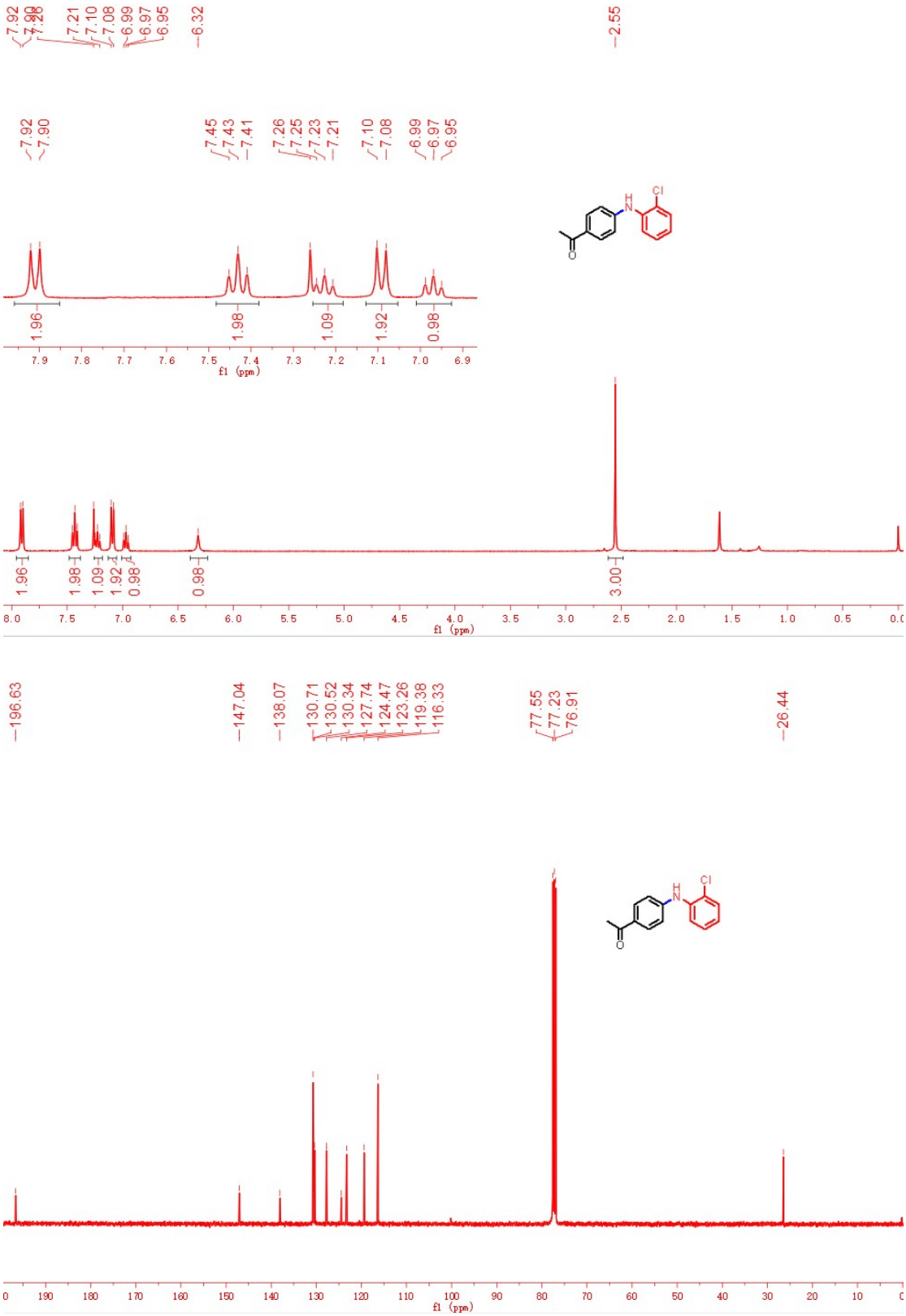


Fig. S46. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for 1-(4-((2-(methylthio)phenyl)amino)phenyl)ethan-1-one (**3aq**) in $CDCl_3$

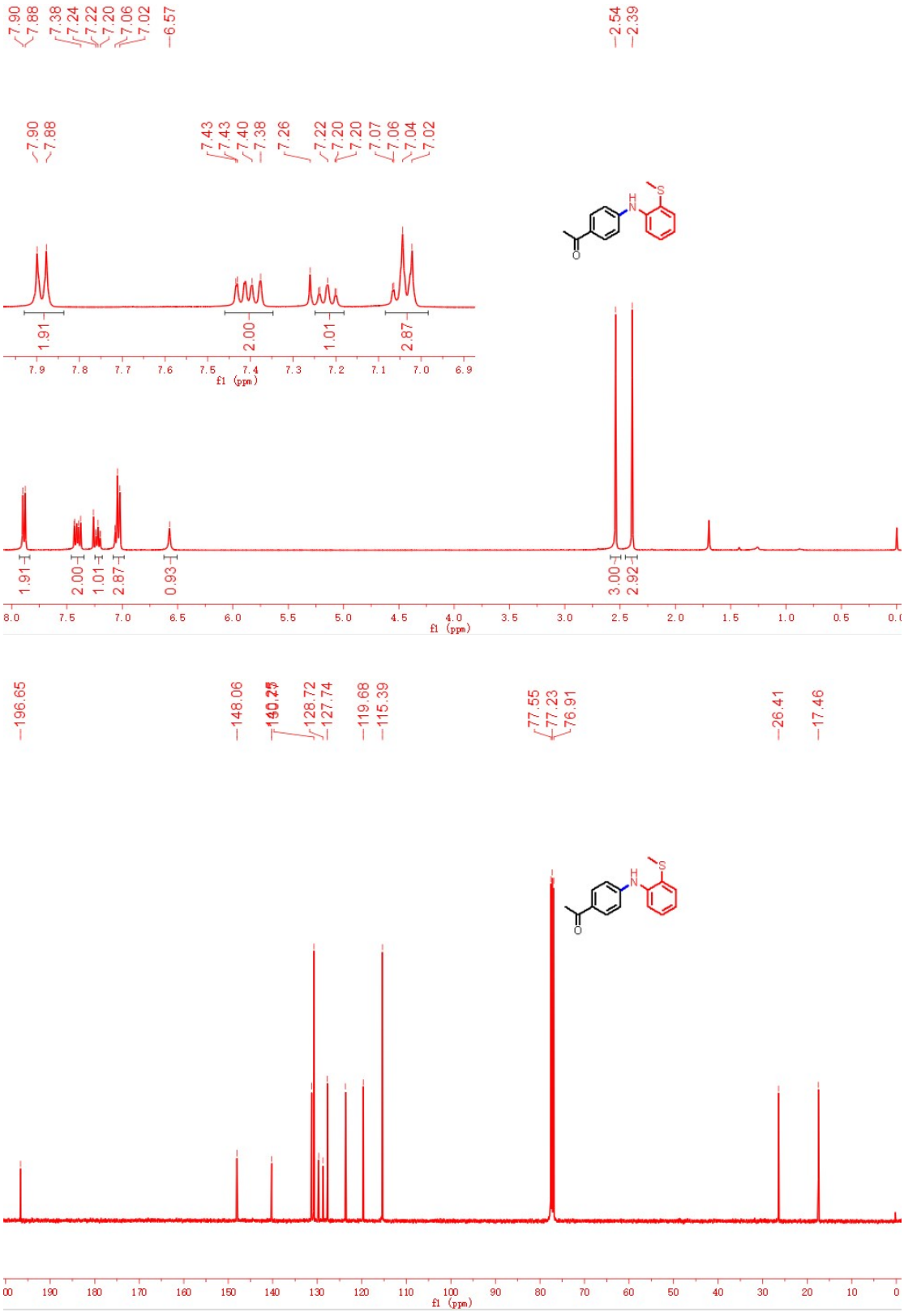


Fig. S47. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for 1-(4-(naphthalen-1-ylamino)phenyl)ethan-1-one (**3ar**) in $CDCl_3$

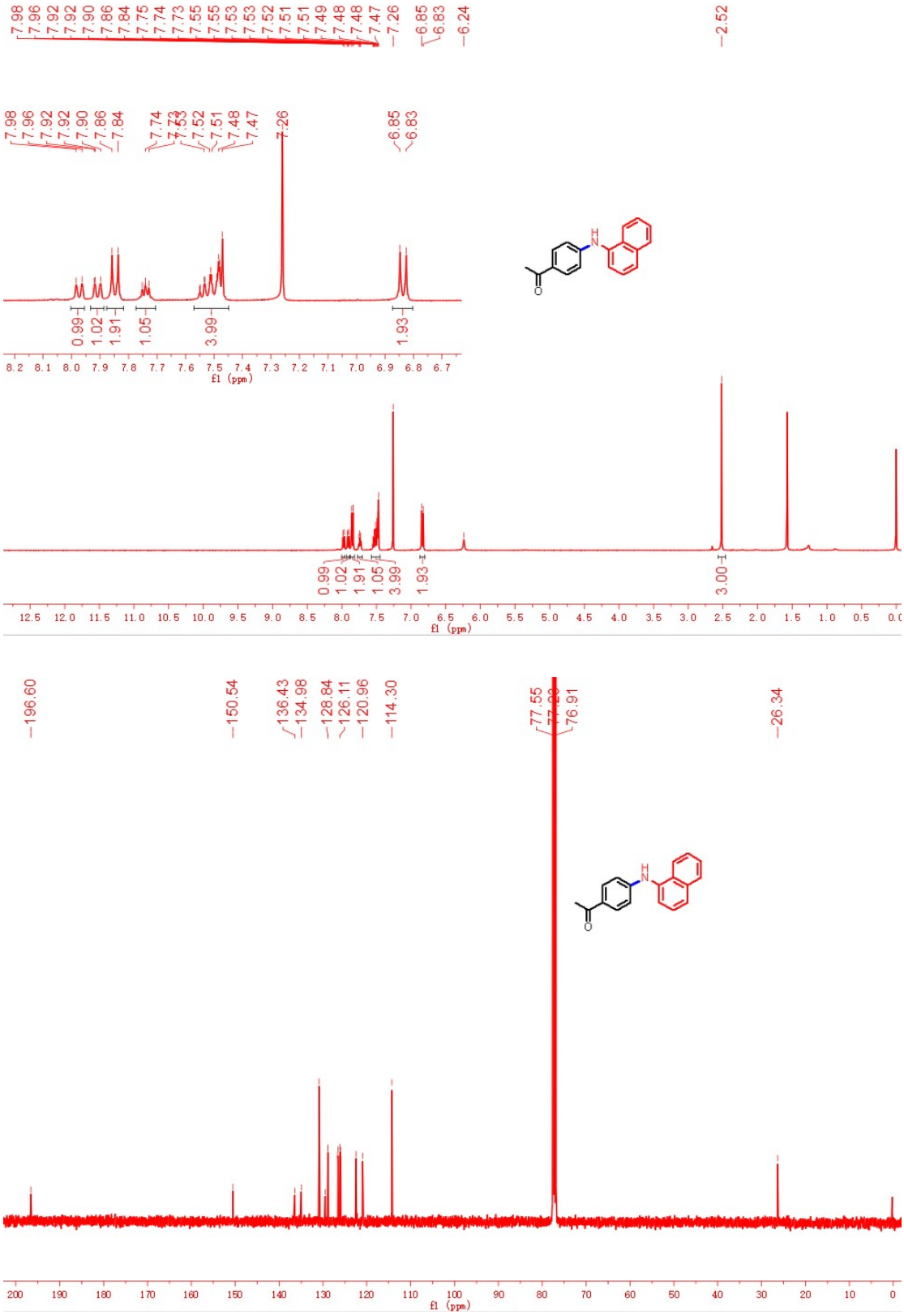


Fig. S48. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for 1-(4-(naphthalen-2-ylamino)phenyl)ethan-1-one (**3as**) in $CDCl_3$

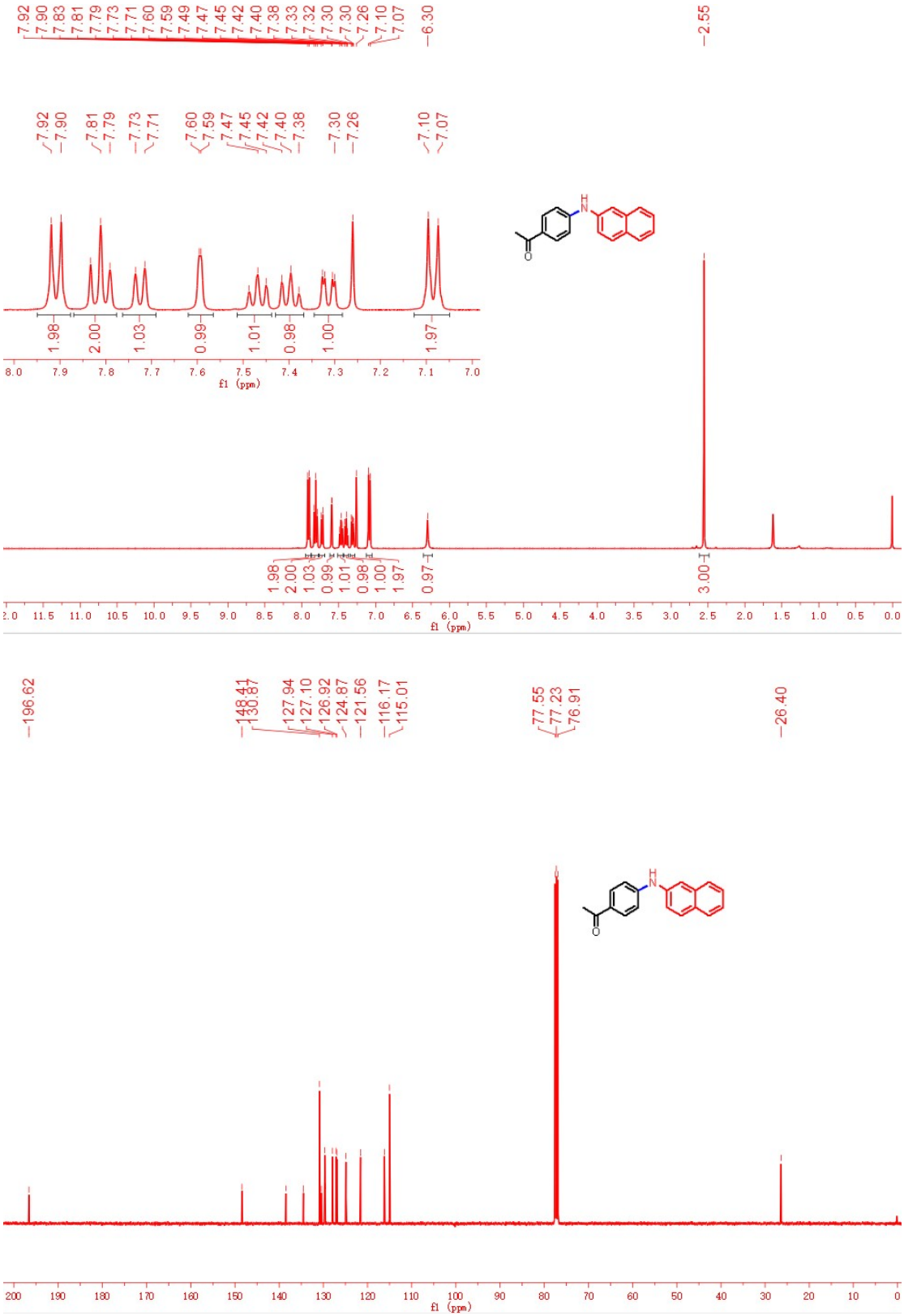


Fig. S49. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for 4-methoxy-N-(*p*-tolyl)aniline (**3k′d**) in $CDCl_3$

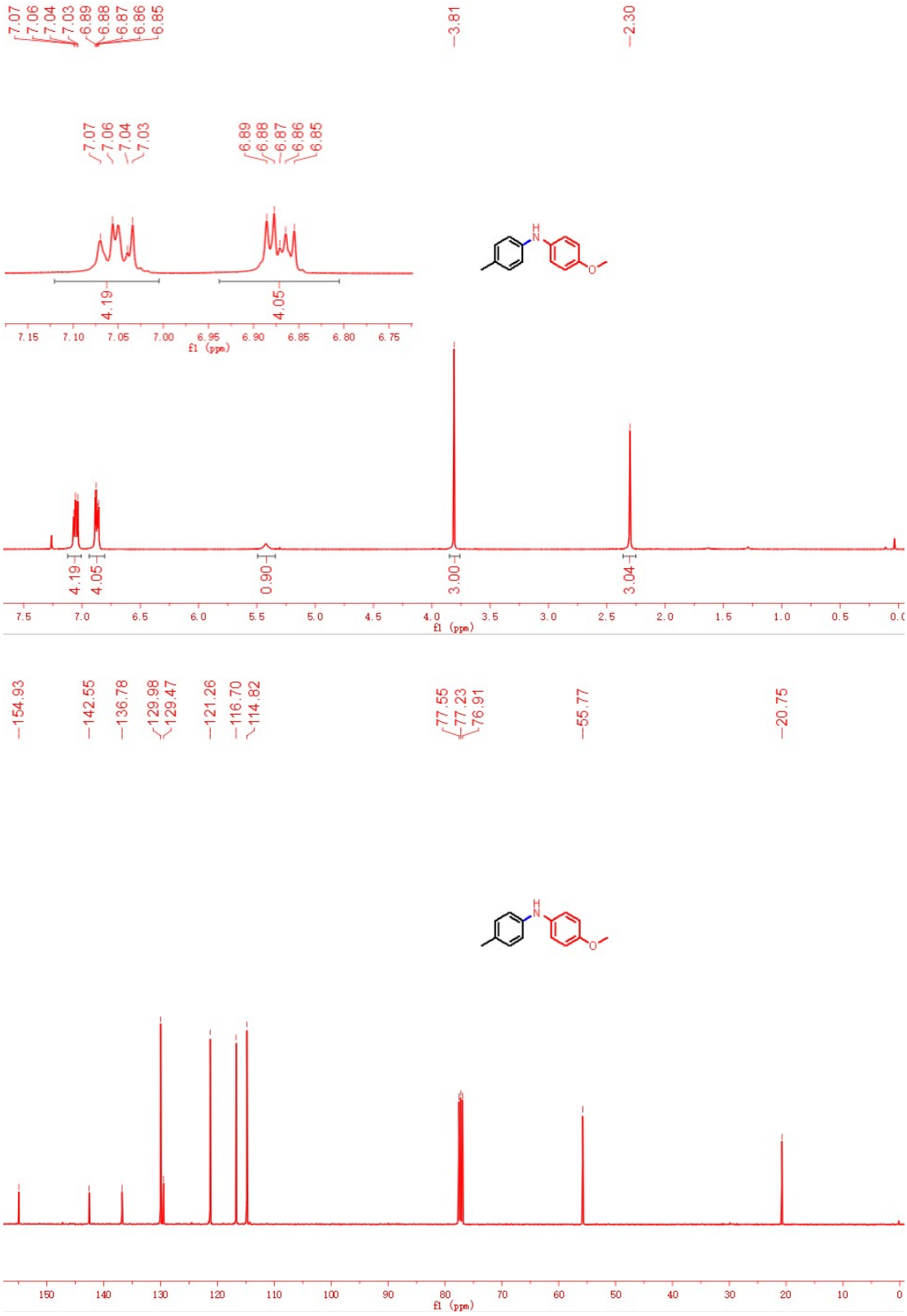


Fig. S50. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for bis(4-methoxyphenyl)amine (**3l′d**) in $CDCl_3$

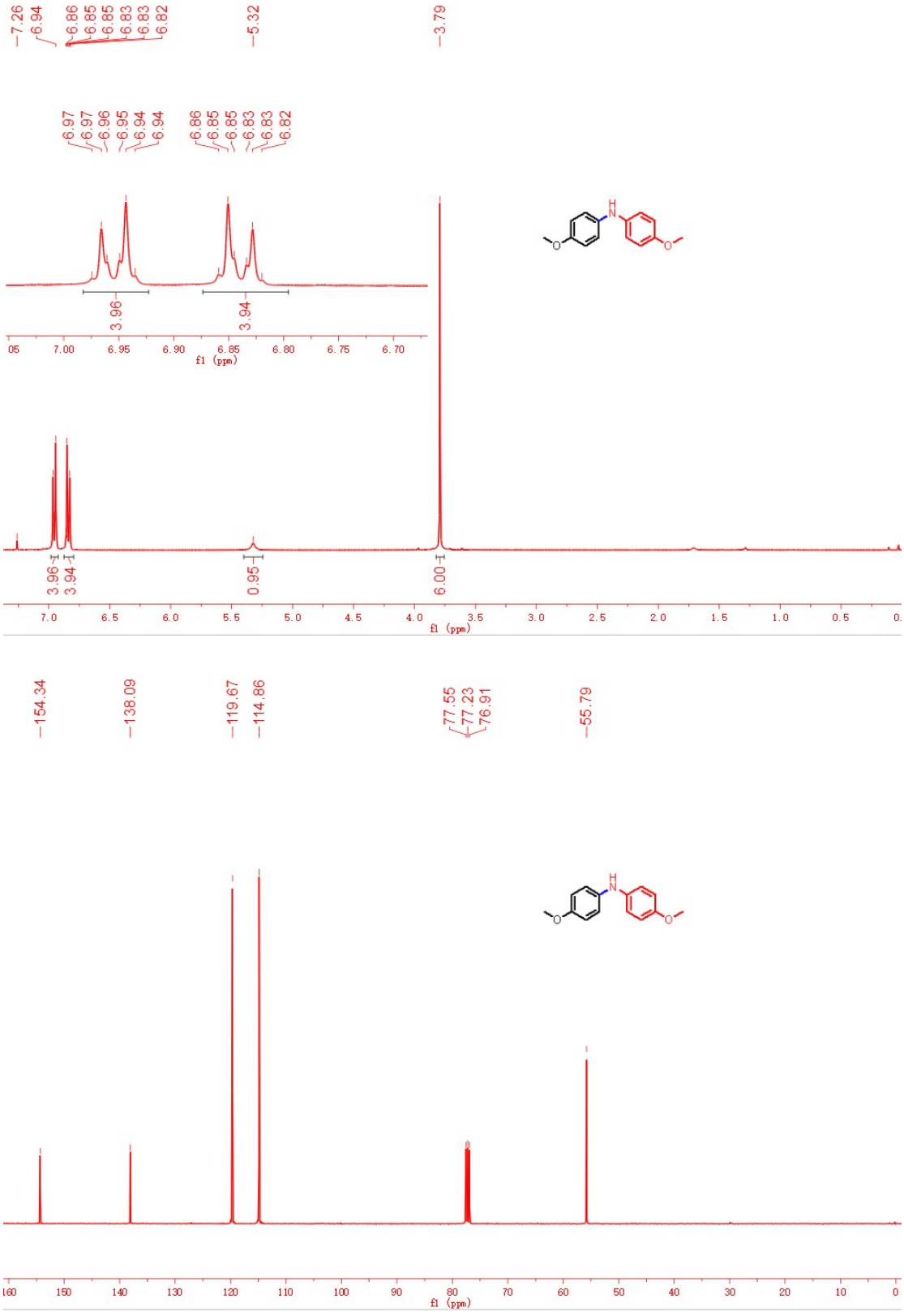


Fig. S51. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for 2-methoxy-4-methyl-N-phenylaniline (**3j′t**) in $CDCl_3$

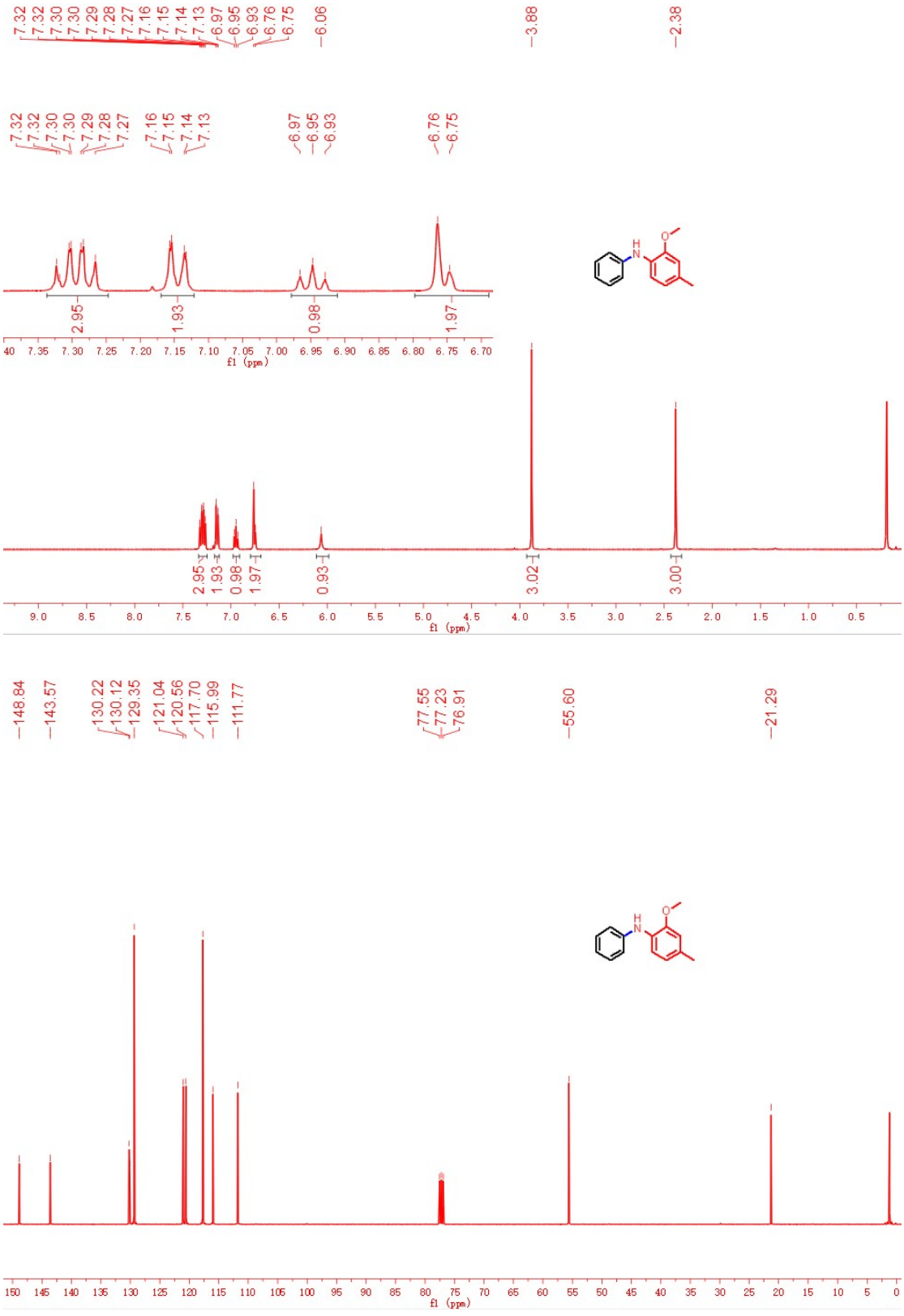


Fig. S52. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for 2-methoxy-N-(4-methoxyphenyl)-4-methylaniline (**3l′t**) in $CDCl_3$

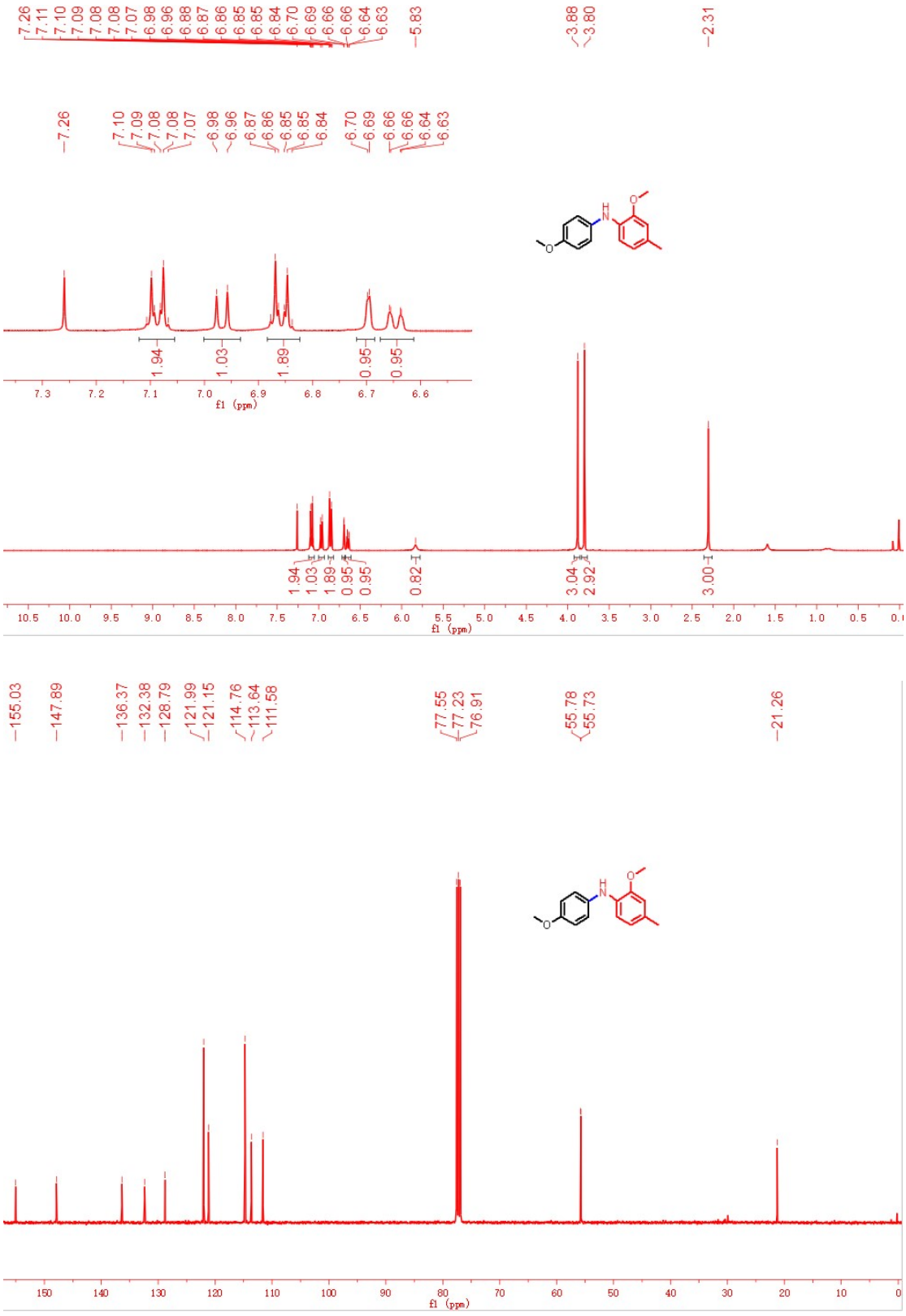


Fig. S53. The ^{1}H (400 MHz) and $^{13}C\{^{1}H\}$ (101 MHz) NMR spectra for 4-methoxy-2-methyl-N-phenylaniline (**3j′u**) in $CDCl_3$

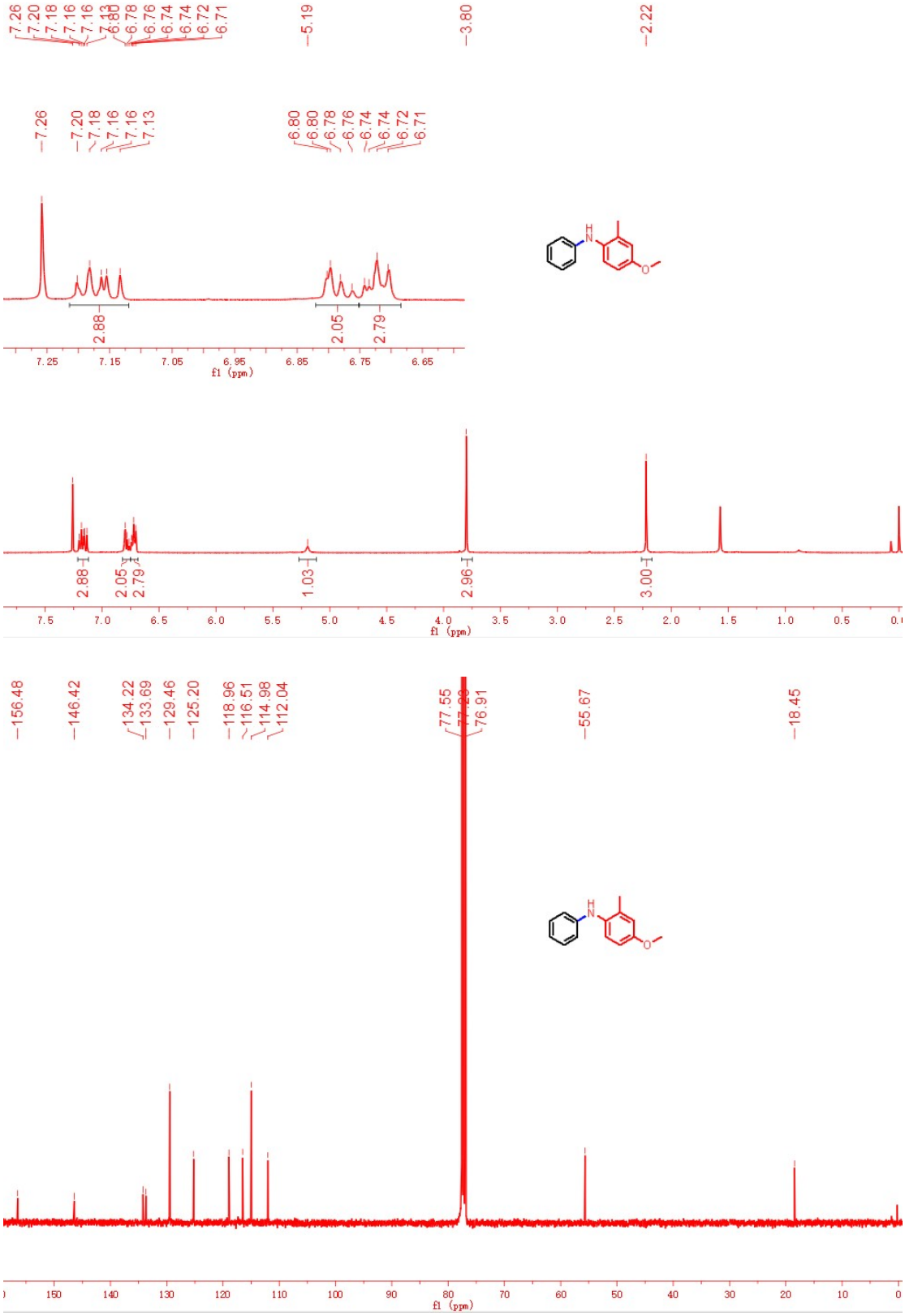
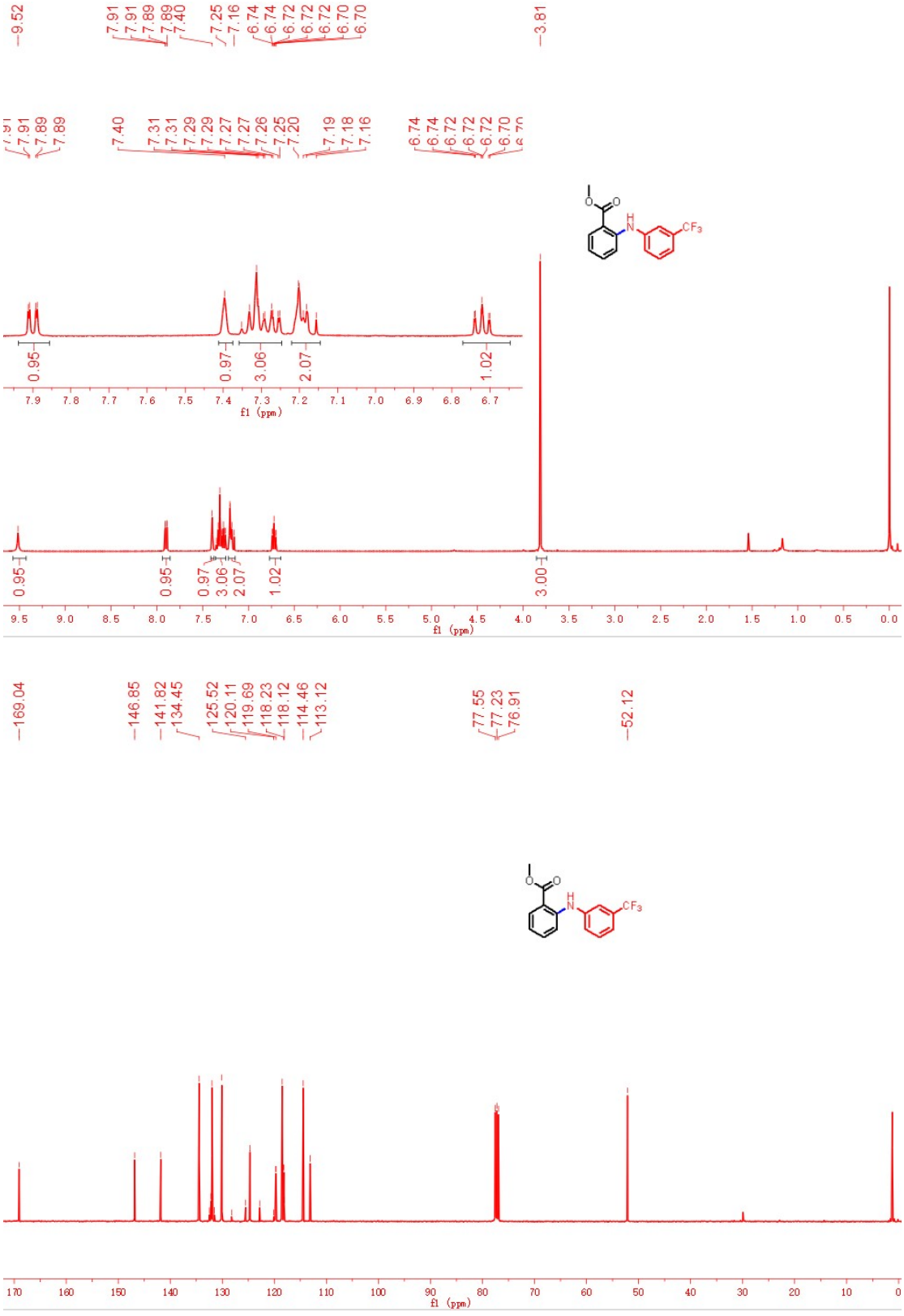


Fig. S54. The ^{1}H (400 MHz), $^{13}C\{^{1}H\}$ (101 MHz) and ^{19}F NMR (377 MHz) NMR spectra for methyl 2-((3-(trifluoromethyl)phenyl)amino)benzoate (**3sv**) in $CDCl_3$



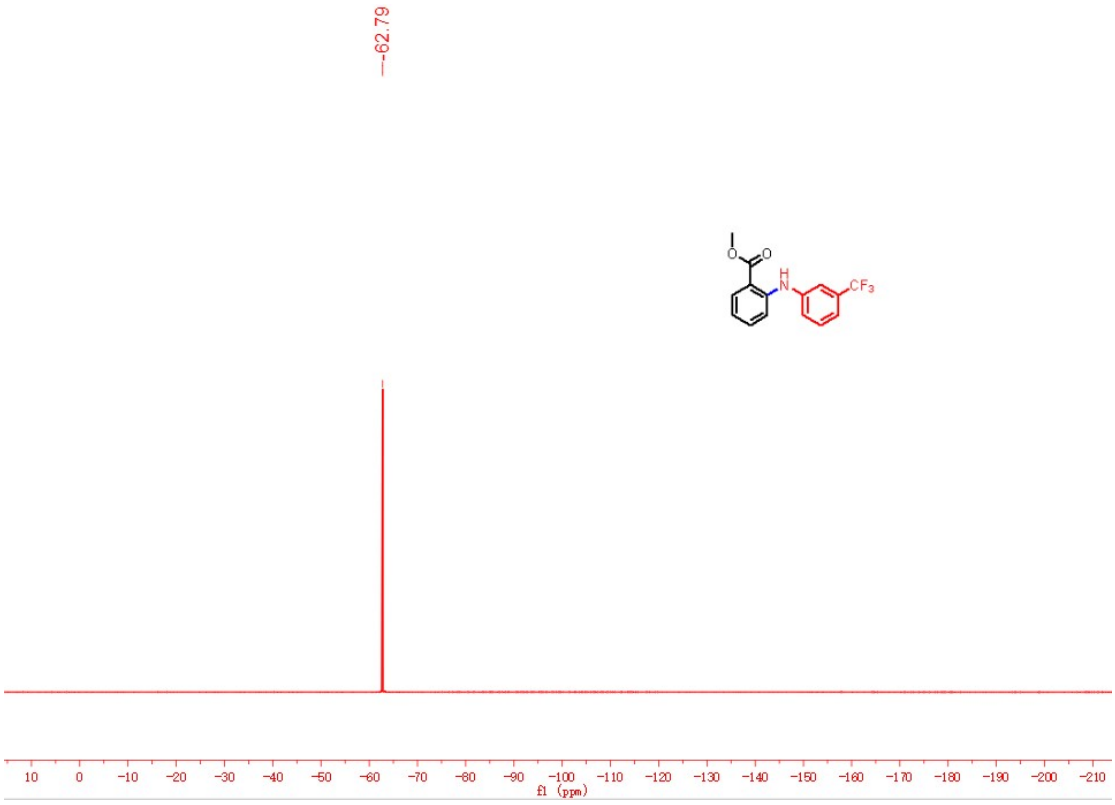
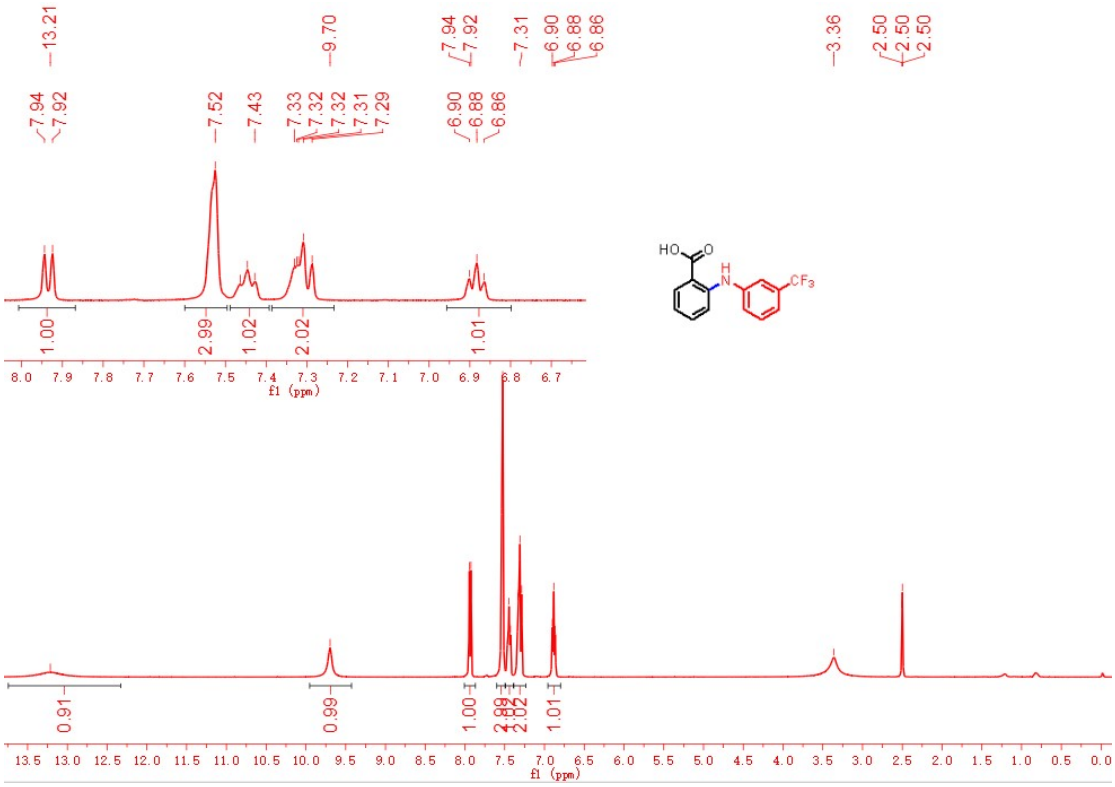
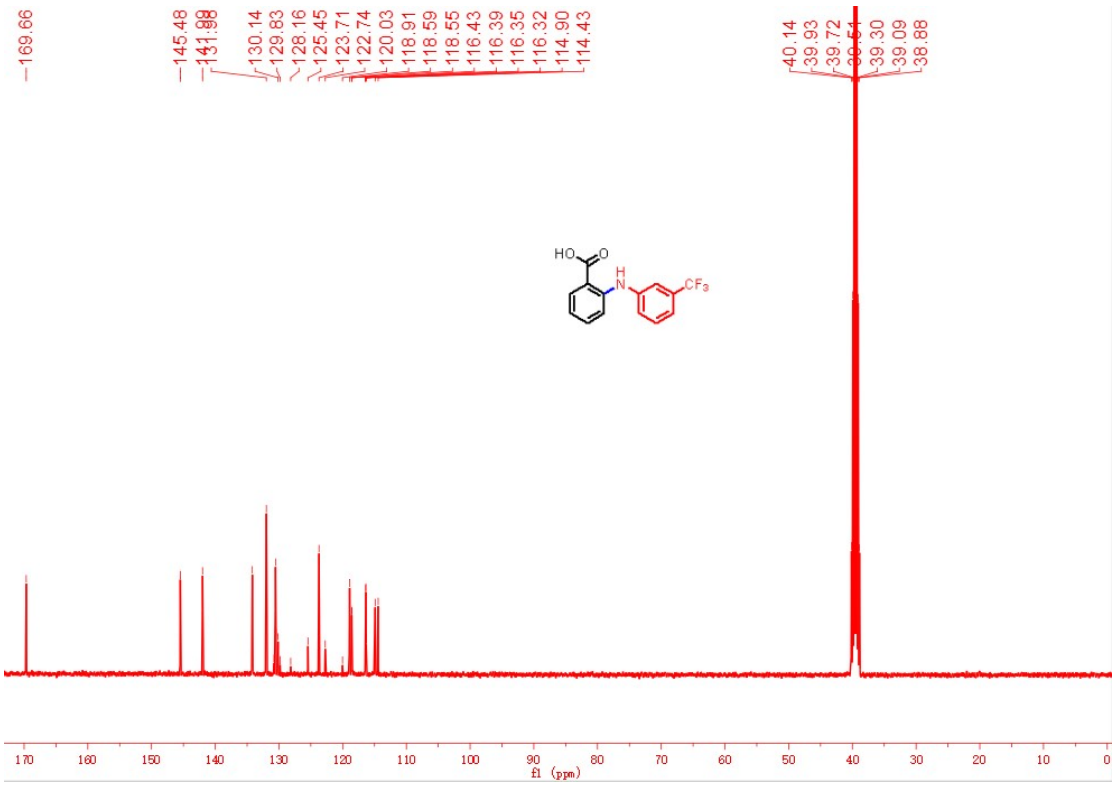
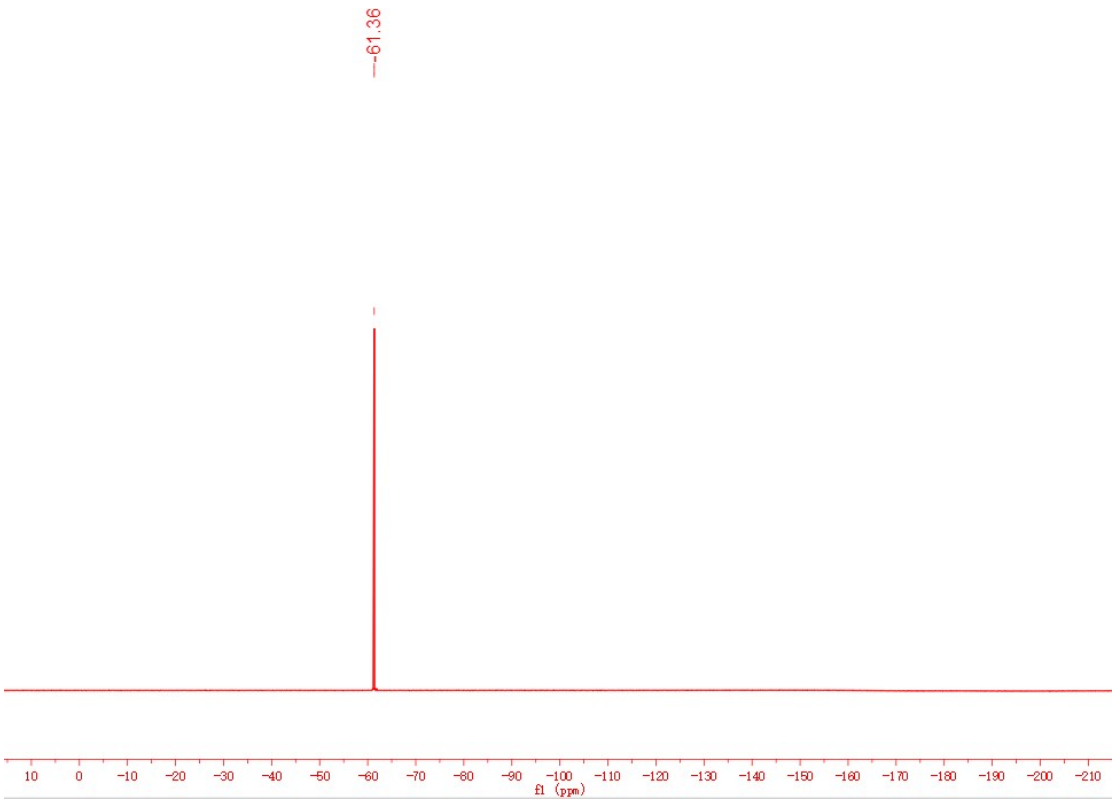

-62.79
O
O
H
N
CF3
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

Fig. S55. The ^{1}H (400 MHz), $^{13}C\{^{1}H\}$ (101 MHz) and ^{19}F NMR (377 MHz) NMR spectra for 2-((3-(trifluoromethyl)phenyl)amino)benzoic acid (Flufenamic Acid) in d_6-DMSO






-61.36
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)