

Supporting Information

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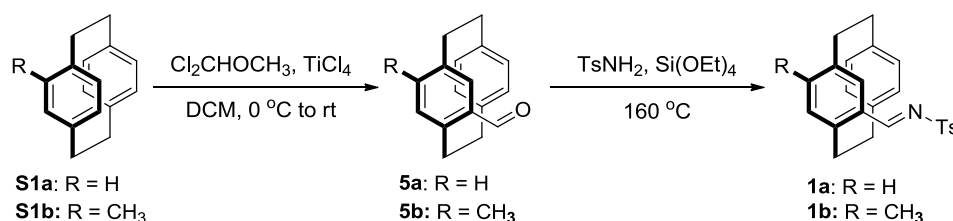
1. General and Materials

Commercially available reagents were used without further purification. Solvents were treated prior to use according to the standard methods. ^1H NMR, ^{13}C NMR and ^{19}F NMR spectra were recorded at room temperature in CDCl_3 on 400 MHz instrument with TMS (tetramethylsilane) as internal standard. Enantiomeric excess was determined by HPLC analysis, using chiral column described below in detail. Optical rotations were measured by polarimeter. Flash column chromatography was performed on silica gel (200-300 mesh). All reactions were monitored by TLC analysis or NMR analysis.

Materials: Commercially available reagents were used throughout without further purification. The anhydrous solvents were also purchased without the further purification.

2. General Procedure for Synthesis of [2.2]Paracyclophane Aldimines

The [2.2]paracyclophane aldimines **1** could be synthesized from formyl[2.2]paracyclophanes **5** and *p*-toluenesulfonamide in the presence of tetraethyl orthosilicate according to the known literature procedure.^[1] The intermediate formyl[2.2]paracyclophanes **5a** and **5b** were synthesized from the [2.2]paracyclophanes **S1** according to the known literature procedures.^[2] Starting material 4-methyl[2.2]paracyclophane **S1b** was prepared from 4-formyl[2.2]paracyclophane **5a** according to the known literature procedures.^[3]



[2.2]Paracyclophanes **S1** (14.7 mmol) were dissolved in dichloromethane (50 mL) and cooled to 0 °C. Titanium tetrachloride (3.22 mL, 29.4 mmol) and dichloromethoxymethane (1.39 mL, 15.4 mmol) were added subsequently. The mixture was stirred at room temperature overnight, poured into water (30 mL) and stirred at room temperature for another 2 h. The two phases were separated, and the aqueous phase was extracted with dichloromethane (20 mL×3). The combined organic phases were dried by anhydrous sodium sulfate and concentrated under reduced pressure. The residue was purified by column chromatography on silica gel using hexanes, ethyl acetate and dichloromethane as eluent to afford the aldehyde **5a** or **5b**.

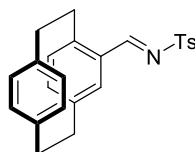
4-Formyl-7-methyl[2.2]paracyclophane 5b: The reaction was conducted by using 4-methyl[2.2]paracyclophane **S1b** (3.528 g, 14.7 mmol), affording **5b** 2.293 g, 62% yield, white solid, mp

= 173-175 °C, the known compound,^[4] R_f = 0.50 (hexanes/ethyl acetate 10/1). ^1H NMR (400 MHz, CDCl_3) δ 9.93 (s, 1H), 6.91 (s, 1H), 6.81-6.71 (m, 1H), 6.51-6.39 (m, 3H), 6.22 (s, 1H), 4.12-3.99 (m, 1H), 3.41-3.29 (m, 1H), 3.29-3.14 (m, 2H), 3.07-2.94 (m, 2H), 2.89-2.71 (m, 2H), 2.16 (s, 3H). ^{13}C NMR (100 MHz, CDCl_3) δ 191.7, 144.3, 143.3, 139.4, 139.4, 139.4, 138.2, 137.6, 134.8, 132.6, 132.5, 132.1, 128.2, 35.2, 33.5, 33.3, 33.3, 20.4. HRMS: Calculated for $\text{C}_{18}\text{H}_{19}\text{O}$ $[\text{M}+\text{H}]^+$ 251.1430, found: 251.1434.

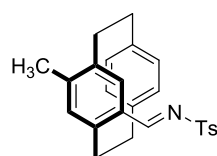
The above aldehyde **5a** or **5b** (6.1 mmol), *p*-toluenesulfonamide (1.044 g, 6.1 mmol) and tetraethyl orthosilicate (1.271 g, 1.36 mL, 6.1 mmol) were combined in a schlenk flask and heated at 160 °C under nitrogen for 12 h. After cooling to room temperature, the reaction mixture was

purified by column chromatography on silica gel using hexanes and dichloromethane as eluent to afford the corresponding aldimine **1a** or **1b**.

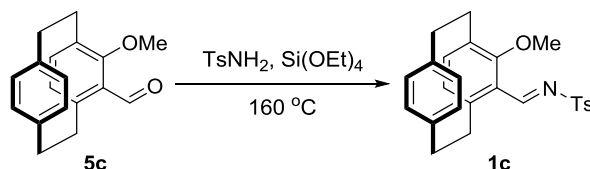
(±)-*N*-Tosyl[2.2]paracyclophane-4-methanimine **1a**: The reaction was conducted by using 4-formyl[2.2]paracyclophane **5a** (2.363 g, 10.0 mmol), affording **1a** 4.174 g, 91% yield, yellow solid, mp = 172-174 °C, new compound, $R_f = 0.50$ (hexanes/ethyl acetate 10/1). ^1H NMR (400 MHz, CDCl_3) δ 8.98 (s, 1H), 7.98-7.90 (m, 2H), 7.41-7.33 (m, 2H), 7.17 (d, $J = 1.9$ Hz, 1H), 6.73 (dd, $J = 7.8, 1.9$ Hz, 1H), 6.59 (d, $J = 7.8$ Hz, 1H), 6.56-6.45 (m, 2H), 6.35 (dd, $J = 7.9, 1.8$ Hz, 1H), 6.13 (dd, $J = 7.9, 1.8$ Hz, 1H), 3.95-3.83 (m, 1H), 3.27-2.92 (m, 6H), 2.88-2.79 (m, 1H), 2.43 (s, 3H). ^{13}C NMR (100 MHz, CDCl_3) δ 168.6, 145.5, 144.5, 141.1, 139.6, 139.1, 139.0, 136.1, 135.8, 135.8, 133.3, 133.0, 132.5, 132.2, 132.0, 129.9, 127.9, 35.5, 35.3, 34.9, 34.2, 21.8. HRMS: Calculated for $\text{C}_{24}\text{H}_{24}\text{NO}_2\text{S}$ $[\text{M}+\text{H}]^+$ 390.1522, found: 390.1525.



(±)-*N*-Tosyl-7-methyl[2.2]paracyclophane-4-methanimine **1b**: The reaction was conducted by using **5b** (1.529 g, 6.1 mmol), affording **1b** 1.160 g, 47% yield, yellow solid, mp = 216-218 °C, new compound, $R_f = 0.50$ (hexanes/ethyl acetate 5/1). ^1H NMR (400 MHz, CDCl_3) δ 8.97 (s, 1H), 8.05-7.82 (m, 2H), 7.42-7.31 (m, 2H), 7.07 (s, 1H), 6.75 (dd, $J = 7.9, 1.9$ Hz, 1H), 6.43 (dd, $J = 7.9, 1.8$ Hz, 1H), 6.36 (dd, $J = 7.9, 1.8$ Hz, 1H), 6.27-6.15 (m, 2H), 3.96-3.79 (m, 1H), 3.35-3.09 (m, 3H), 3.04-2.91 (m, 1H), 2.88-2.71 (m, 3H), 2.43 (s, 3H), 2.15 (s, 3H). ^{13}C NMR (100 MHz, CDCl_3) δ 168.6, 145.7, 145.6, 144.4, 139.9, 139.5, 139.0, 138.2, 137.2, 136.2, 132.4, 132.3, 132.1, 130.4, 129.9, 128.3, 127.9, 35.5, 33.9, 33.6, 33.1, 21.8, 20.6. HRMS: Calculated for $\text{C}_{25}\text{H}_{26}\text{NO}_2\text{S}$ $[\text{M}+\text{H}]^+$ 404.1679, found: 404.1676.

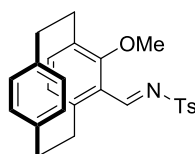


4-Methoxy-5-formyl[2.2]paracyclophane **5c** was synthesized from the [2.2]paracyclophane **S1a** according to the known literature procedure.^[5]

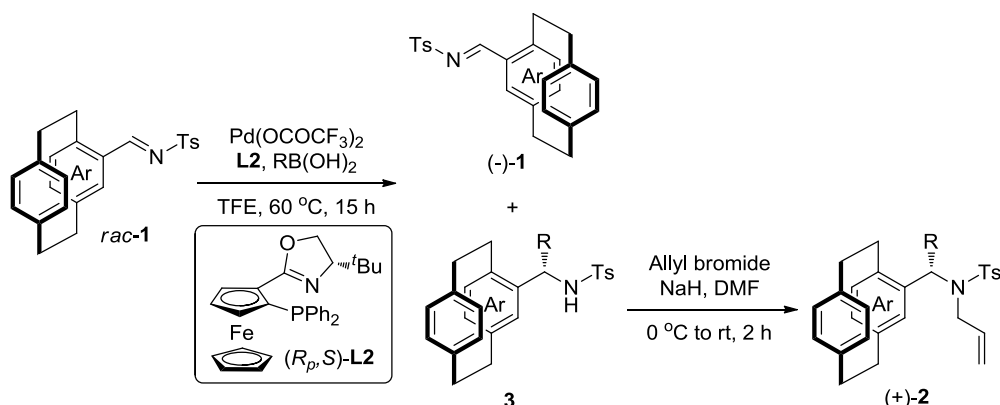


The aldehyde **5c** (0.173 g, 0.7 mmol), *p*-toluenesulfonamide (0.123 g, 0.7 mmol) and tetraethyl orthosilicate (0.150 g, 0.16 mL, 0.7 mmol) were combined in a schlenk flask and heated at 160 °C under nitrogen for 12 h. After cooling to room temperature, the reaction mixture was purified by column chromatography on silica gel using hexanes and ethyl acetate as eluent to afford the corresponding aldimine **1c**.

(±)-*N*-Tosyl-4-methoxy[2.2]paracyclophane-5-methanimine **1c**: 0.195 g, 72% yield, yellow solid, mp = 61-63 °C, new compound, $R_f = 0.35$ (hexanes/ethyl acetate 10/1). ^1H NMR (400 MHz, CDCl_3) δ 9.09 (s, 1H), 8.02-7.90 (m, 2H), 7.41-7.33 (m, 2H), 6.73-6.64 (m, 2H), 6.54-6.48 (m, 1H), 6.45-6.36 (m, 2H), 6.05-5.96 (m, 1H), 4.23-4.06 (m, 1H), 3.76 (s, 3H), 3.36-3.23 (m, 1H), 3.17-2.94 (m, 3H), 2.80-2.59 (m, 3H), 2.44 (s, 3H). ^{13}C NMR (100 MHz, CDCl_3) δ 167.7, 163.5, 145.9, 144.3, 141.7, 139.3, 139.2, 135.9, 133.5, 132.4, 131.9, 131.6, 131.1, 129.8, 129.3, 127.9, 126.1, 62.5, 35.6, 34.1, 33.4, 31.2, 21.7. HRMS: Calculated for $\text{C}_{25}\text{H}_{26}\text{NO}_3\text{S}$ $[\text{M}+\text{H}]^+$ 420.1628, found: 420.1634.



3. General Procedure for Kinetic Resolution



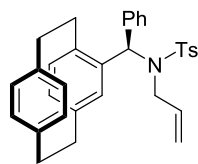
A schlenk tube (25 mL) was charged with $\text{Pd}(\text{OCOCF}_3)_2$ (3.3 mg, 0.01 mmol, 5 mol%) and (*R_p,S*)-**L2** (5.0 mg, 0.01 mmol, 5 mol%) under nitrogen, and degassed anhydrous acetone (1.5 mL) was added. The mixture was stirred at room temperature for 1 h. The solvent was removed under vacuum to give the catalyst. Then substrate *rac*-1 (77.9 mg, 0.20 mmol), arylboronic acid (0.20 mmol) and 2,2,2-trifluoroethanol (4.0 mL) were added into the tube under nitrogen. The mixture was heated to 60 °C. After stirring at 60 °C for 15 h, the reaction mixture was cooled to room temperature, and the solvent was removed by rotary evaporation. The resulting mixture was dried under vacuum and the conversion of *rac*-1 was confirmed by ^1H NMR analysis with benzyl ether as internal standard. The solvent was removed in *vacuo*, the recovered material (-)-1 and addition product **3** were isolated by column chromatography on silica gel using hexanes and ethyl acetate as eluent.

To a solution of the addition product **3** in dry *N,N*-dimethylformamide (DMF, 1.0 mL) was added sodium hydride (15 mg, 0.38 mmol, 60% wt.) at 0 °C, and then allyl bromide (36 mg, 26.0 μL , 0.30 mmol) was added dropwise. The reaction mixture was warmed to room temperature and stirred at room temperature for 2 h. Water (5.0 mL) was added, and extracted with ethyl acetate (10 mL \times 3). The combined organic layer was washed with brine, dried by anhydrous sodium sulfate and filtered, concentrated in *vacuo* and analyzed by crude ^1H NMR to determine diastereomeric ratio. The solvent was removed in *vacuo*, and the residue was purified by column chromatography on silica gel using hexanes and ethyl acetate as eluent to afford the product (+)-2.

(+)-*N*-Allyl-*N*-{[2.2]paracyclophan-4-yl(phenyl)methyl}-4-methylbenzenesulfonamide (2a): 48.9 mg, 48% yield, 12:1 dr, white solid, mp = 144-146 °C, new compound, $R_f = 0.50$ (hexanes/ethyl acetate 10/1), 98.8% ee, $[\alpha]_D^{20} = 114.70$ (*c* 0.24, CHCl_3).

^1H NMR (400 MHz, CDCl_3) δ 8.01-7.89 (m, 2H), 7.43-7.35 (m, 2H), 7.24-7.18 (m, 1H), 7.17-7.07 (m, 3H), 6.92-6.84 (m, 2H), 6.76-6.71 (m, 1H), 6.64-6.46 (m, 4H), 6.34 (d, $J = 7.6$ Hz, 1H), 6.20 (s, 1H), 4.82-4.69 (m, 1H), 4.66-4.50 (m, 2H), 4.05-3.90 (m, 1H), 3.46 (dd, $J = 15.6, 3.6$ Hz, 1H), 3.31-3.15 (m, 2H), 3.08-2.87 (m, 4H), 2.55-2.38 (m, 2H), 2.50 (s, 3H). ^{13}C NMR (100 MHz, CDCl_3) δ 143.5, 140.9, 140.0, 139.5, 139.2, 138.9, 138.6, 136.9, 136.0, 134.0, 133.7, 132.6, 132.3, 132.2, 131.4, 130.5, 129.7, 129.4, 128.4, 128.2, 128.0, 117.2, 64.6, 48.5, 35.5, 35.4, 34.6, 34.5, 21.7. HPLC: Chiracel AD-H column, 254 nm, 30 °C, *n*-Hexane/*i*-PrOH = 90/10, flow = 1.0 mL/min, retention time 6.9 min (major) and 7.5 min. HRMS: Calculated for $\text{C}_{33}\text{H}_{33}\text{KNO}_2\text{S}$ $[\text{M}+\text{K}]^+$ 546.1864, found: 546.1861.

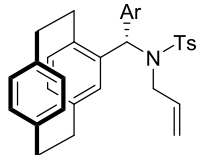
***N*-Allyl-*N*-{[2.2]paracyclophan-4-yl(phenyl)methyl}-4-methylbenzenesulfonamide (2a')**: white solid, mp = 176-178 °C, new compound, $R_f = 0.35$ (hexanes/ethyl acetate 10/1). ^1H NMR



(400 MHz, CDCl_3) δ 7.34-7.27 (m, 2H), 7.26-7.23 (m, 1H), 7.19-7.12 (m, 4H), 6.93 (d, $J = 8.1$ Hz, 2H), 6.87 (dd, $J = 7.9, 1.7$ Hz, 1H), 6.62-6.43 (m, 4H), 6.29 (s, 1H), 6.04 (dd, $J = 7.9, 1.7$ Hz, 1H), 5.68-5.54 (m, 2H), 4.85-4.76 (m, 1H), 4.72-4.59 (m, 1H), 4.00-3.83 (m, 1H), 3.57-3.35 (m, 3H), 3.30-3.20 (m, 1H), 3.05-2.82 (m, 4H), 2.74-2.59 (m, 1H), 2.30 (s, 3H). ^{13}C NMR (100 MHz, CDCl_3) δ 142.5, 140.3, 140.0, 139.7, 139.3, 138.8, 137.2, 136.2, 136.1, 134.1, 133.3, 133.2, 133.0, 132.2, 129.6, 128.8, 128.7, 128.7, 127.6, 127.6, 116.0, 66.0, 49.9, 35.1, 35.0, 34.7, 33.8, 21.5. HRMS: Calculated for $\text{C}_{33}\text{H}_{33}\text{KNO}_2\text{S}$ $[\text{M}+\text{K}]^+$ 546.1864, found: 546.1827.

(-)-*N*-Tosyl[2.2]paracyclophane-4-methanimine (1a): Kinetic resolution from the addition of [2.2]paracyclophane aldimine **1a** with phenylboronic acid, 30.7 mg, 39% yield, 93.7% ee, $[\alpha]_{\text{D}}^{20} = -356.96$ (c 0.63, CHCl_3). HPLC: Chiralcel AD-3 column, 254 nm, 30 °C, *n*-Hexane/*i*-PrOH = 80/20, flow = 0.8 mL/min, retention time 16.6 min and 18.9 min (major).

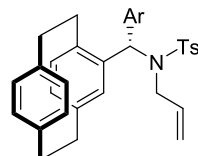
(+)-*N*-Allyl-*N*-{[2.2]paracyclophan-4-yl(*o*-tolyl)methyl}-4-methylbenzenesulfonamide (2b): 51.9 mg, 50% yield, 7:1 dr, white solid, mp = 58-60 °C, new compound, $R_f = 0.60$ (hexanes/ ethyl acetate 10/1), 98.7% ee, $[\alpha]_{\text{D}}^{20} = 45.71$ (c 0.28, CHCl_3). ^1H NMR (400 MHz,



CDCl_3) δ 7.96-7.88 (m, 2H), 7.37-7.30 (m, 2H), 7.26-7.23 (m, 1H), 7.19-7.08 (m, 2H), 6.85 (t, $J = 7.4$ Hz, 1H), 6.77-6.68 (m, 3H), 6.64-6.59 (m, 1H), 6.56-6.46 (m, 3H), 6.32 (d, $J = 7.5$ Hz, 1H), 4.34-4.23 (m, 3H), 3.96-3.85 (m, 1H), 3.60-3.50 (m, 1H), 3.35-2.90 (m, 7H), 2.69 (s, 3H), 2.54-2.41 (m, 2H), 2.45 (s, 3H). ^{13}C NMR (100 MHz, CDCl_3) δ 143.6, 140.0, 139.7, 139.4, 139.3, 138.5, 138.2, 137.7, 137.1, 136.0, 133.6, 133.4, 132.6, 132.1, 132.0, 131.1, 130.9, 130.4, 130.3, 129.4, 128.6, 127.9, 125.6, 115.7, 61.1, 47.4, 35.5, 35.4, 34.8, 34.1, 21.6, 20.0. HPLC: Chiralcel AD-H column, 254 nm, 30 °C, *n*-Hexane/*i*-PrOH = 90/10, flow = 1.0 mL/min, retention time 5.3 min (major) and 7.0 min. HRMS: Calculated for $\text{C}_{34}\text{H}_{35}\text{NaNO}_2\text{S}$ $[\text{M}+\text{Na}]^+$ 544.2281, found: 544.2282.

(-)-*N*-Tosyl[2.2]paracyclophane-4-methanimine (1a): Kinetic resolution from the addition of [2.2]paracyclophane aldimine **1a** with 2-methylphenylboronic acid, 29.6 mg, 38% yield, 80.1% ee. HPLC: Chiralcel AD-3 column, 254 nm, 30 °C, *n*-Hexane/*i*-PrOH = 80/20, flow = 0.8 mL/min, retention time 16.7 min and 18.9 min (major).

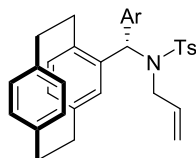
(+)-*N*-Allyl-*N*-{[2.2]paracyclophan-4-yl(*m*-tolyl)methyl}-4-methylbenzenesulfonamide (2c): 50.7 mg, 49% yield, 12:1 dr, white solid, mp = 63-65 °C, new compound, $R_f = 0.60$ (hexanes/ethyl acetate 10/1), 98.1% ee, $[\alpha]_{\text{D}}^{20} = 135.93$ (c 0.32, CHCl_3). ^1H NMR (400 MHz,



CDCl_3) δ 7.98-7.88 (m, 2H), 7.44-7.35 (m, 2H), 7.13-7.07 (m, 1H), 7.03-6.95 (m, 2H), 6.73 (s, 1H), 6.67-6.57 (m, 3H), 6.55-6.45 (m, 3H), 6.32 (d, $J = 7.6$ Hz, 1H), 6.05 (s, 1H), 4.84-4.73 (m, 1H), 4.68-4.51 (m, 2H), 3.95 (dd, $J = 16.4, 7.8$ Hz, 1H), 3.45 (dd, $J = 16.4, 4.3$ Hz, 1H), 3.28-3.13 (m, 2H), 3.09-2.86 (m, 4H), 2.51 (s, 3H), 2.48-2.38 (m, 2H), 2.12 (s, 3H). ^{13}C NMR (100 MHz, CDCl_3) δ 143.4, 140.7, 140.0, 139.6, 139.2, 139.0, 138.7, 137.9, 137.0, 136.0, 134.3, 133.8, 132.7, 132.3, 132.2, 131.5, 130.5, 130.2, 129.7, 128.7, 128.3, 128.2, 126.3, 117.3, 64.6, 48.6, 35.5, 35.4, 34.6, 34.6, 21.7, 21.4. HPLC: Chiralcel IC column, 254 nm, 30 °C, *n*-Hexane/*i*-PrOH = 90/10, flow = 1.0 mL/min, retention time 15.8 min and 21.7 min (major). HRMS: Calculated for $\text{C}_{34}\text{H}_{35}\text{NaNO}_2\text{S}$ $[\text{M}+\text{Na}]^+$ 544.2281, found: 544.2282.

(-)-*N*-Tosyl[2.2]paracyclophane-4-methanimine (1a): Kinetic resolution from the addition of [2.2]paracyclophane aldimine **1a** with 3-methylphenylboronic acid, 21.7 mg, 28% yield, 91.2% ee. HPLC: Chiralcel AD-3 column, 254 nm, 30 °C, *n*-Hexane/*i*-PrOH = 80/20, flow = 0.8 mL/min, retention time 16.6 min and 18.9 min (major).

(+)-*N*-Allyl-*N*-{[2.2]paracyclophan-4-yl(*p*-tolyl)methyl}-4-methylbenzenesulfonamide (2d): 55.2 mg, 53% yield, 13:1 dr, white solid, mp = 56-58 °C, new compound, $R_f = 0.55$ (hexanes/ethyl acetate 10/1), 98.3% ee, $[\alpha]_D^{20} = 134.91$ (*c* 0.61, CHCl₃).

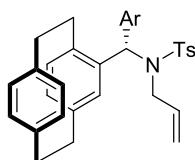


Ar = 4-MeC₆H₄

¹H NMR (400 MHz, CDCl₃) δ 8.03-7.87 (m, 2H), 7.47-7.34 (m, 2H), 7.09 (d, *J* = 7.7 Hz, 1H), 6.93 (d, *J* = 7.8 Hz, 2H), 6.79-6.69 (m, 3H), 6.59 (t, *J* = 8.0 Hz, 2H), 6.55-6.45 (m, 2H), 6.32 (d, *J* = 7.6 Hz, 1H), 6.15 (s, 1H), 4.82-4.70 (m, 1H), 4.68-4.53 (m, 2H), 4.01-3.87 (m, 1H), 3.51-3.39 (m, 1H), 3.28-3.14 (m, 2H), 3.07-2.86 (m, 4H), 2.56-2.41 (m, 2H), 2.50 (s, 3H) 2.28 (s, 3H). ¹³C NMR (100 MHz, CDCl₃) δ 143.4, 140.0, 139.5, 139.3, 139.0, 138.7, 137.9, 137.7, 137.2, 136.0, 134.2, 133.7, 132.6, 132.3, 132.2, 131.5, 130.5, 129.7, 129.3, 129.0, 128.2, 117.2, 64.4, 48.5, 35.5, 35.4, 34.6, 34.6, 21.7, 21.2. HPLC: Chiralcel AD-H column, 254 nm, 30 °C, *n*-Hexane/*i*-PrOH = 90/10, flow = 1.0 mL/min, retention time 7.1 min and 8.5 min (major). HRMS: Calculated for C₃₄H₃₅NaNO₂S [M+Na]⁺ 544.2281, found: 544.2284.

(-)-*N*-Tosyl[2.2]paracyclophane-4-methanimine (1a): Kinetic resolution from the addition of [2.2]paracyclophane aldimine **1a** with 4-methylphenylboronic acid, 27.8 mg, 36% yield, 88.0% ee. HPLC: Chiralcel AD-3 column, 254 nm, 30 °C, *n*-Hexane/*i*-PrOH = 80/20, flow = 0.8 mL/min, retention time 16.5 min and 18.8 min (major).

(+)-*N*-Allyl-*N*-{[2.2]paracyclophan-4-yl(4-fluorophenyl)methyl}-4-methylbenzenesulfonamide (2e): 51.9 mg, 49% yield, 16:1 dr, white solid, mp = 164-166 °C, new compound, $R_f = 0.45$ (hexanes/ethyl acetate 10/1), 96.3% ee, $[\alpha]_D^{20} = 105.59$ (*c* 0.25, CHCl₃).

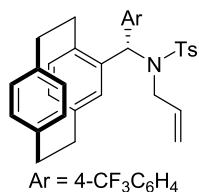


Ar = 4-FC₆H₄

¹H NMR (400 MHz, CDCl₃) δ 7.96-7.88 (m, 2H), 7.43-7.36 (m, 2H), 7.04 (dd, *J* = 7.8, 1.8 Hz, 1H), 6.89-6.78 (m, 4H), 6.71-6.66 (m, 1H), 6.62-6.57 (m, 1H), 6.55-6.45 (m, 3H), 6.37-6.30 (m, 1H), 6.18 (s, 1H), 4.77-4.58 (m, 3H), 4.05-3.90 (m, 1H), 3.50-3.36 (m, 1H), 3.24-3.13 (m, 2H), 3.04-2.87 (m, 4H), 2.56-2.35 (m, 2H), 2.50 (s, 3H). ¹³C NMR (100 MHz, CDCl₃) δ 162.4 (d, *J*_{C-F} = 247.7 Hz), 143.7, 140.2, 139.6, 139.2, 138.9, 138.5, 137.0 (d, *J*_{C-F} = 3.3 Hz), 136.8, 136.1, 133.9, 133.7, 132.7, 132.5, 132.3, 131.4, 131.1 (d, *J*_{C-F} = 8.1 Hz), 130.4, 129.8, 128.1, 117.4, 115.3 (d, *J*_{C-F} = 21.3 Hz), 63.8, 48.5, 35.5, 35.4, 34.6, 34.5, 21.7. ¹⁹F NMR (376 MHz, CDCl₃) δ -113.8. HPLC: Chiralcel IB column, 254 nm, 30 °C, *n*-Hexane/*i*-PrOH = 80/20, flow = 1.0 mL/min, retention time 5.1 min (major) and 5.5 min. HRMS: Calculated for C₃₃H₃₂FN₂O₂S [M+Na]⁺ 548.2030, found: 548.2026.

(-)-*N*-Tosyl[2.2]paracyclophane-4-methanimine (1a): Kinetic resolution from the addition of [2.2]paracyclophane aldimine **1a** with 4-fluorophenylboronic acid, 33.8 mg, 43% yield, 99.2% ee. HPLC: Chiralcel AD-3 column, 254 nm, 30 °C, *n*-Hexane/*i*-PrOH = 80/20, flow = 0.8 mL/min, retention time 16.4 min and 18.6 min (major).

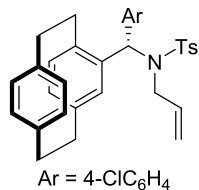
(+)-*N*-Allyl-*N*-{[2.2]paracyclophan-4-yl(4-(trifluoromethyl)phenyl)methyl}-4-methylbenzenesulfonamide (2f): 58.2 mg, 51% yield, >20:1 dr, white solid, mp = 108-110 °C, new compound,



$R_f = 0.43$ (hexanes/ethyl acetate 10/1), 98.7% ee, $[\alpha]_D^{20} = 106.49$ (c 0.20, CHCl₃). ¹H NMR (400 MHz, CDCl₃) δ 7.96-7.87 (m, 2H), 7.45-7.36 (m, 4H), 7.08-7.00 (m, 3H), 6.72-6.67 (m, 1H), 6.64-6.58 (m, 1H), 6.56-6.47 (m, 3H), 6.35 (d, $J = 7.6$ Hz, 1H), 6.27 (s, 1H), 4.74-4.57 (m, 3H), 4.02-3.92 (m, 1H), 3.50-3.38 (m, 1H), 3.26-3.14 (m, 2H), 3.07-2.89 (m, 4H), 2.57-2.43 (m, 1H), 2.51 (s, 3H), 2.39-2.27 (m, 1H). ¹³C NMR (100 MHz, CDCl₃) δ 145.1, 143.8, 140.3, 139.6, 139.1, 138.7, 138.3, 136.2, 135.9, 133.6, 133.5, 132.7, 132.7, 132.4, 131.4, 130.4, 130.2 (q, $J_{C-F} = 32.4$ Hz), 129.8, 129.8, 128.1, 125.3 (q, $J_{C-F} = 3.7$ Hz), 124.0 (q, $J_{C-F} = 272.2$ Hz), 117.5, 64.0, 48.6, 35.4, 35.4, 34.6, 34.5, 21.7. ¹⁹F NMR (376 MHz, CDCl₃) δ -62.5. HPLC: Chiralcel IB column, 254 nm, 30 °C, *n*-Hexane/*i*-PrOH = 90/10, flow = 1.0 mL/min, retention time 5.9 min (major) and 6.6 min. HRMS: Calculated for C₃₄H₃₆F₃N₂O₂S [M+NH₄]⁺ 593.2444, found: 593.2462.

(-)-*N*-Tosyl[2.2]paracyclophane-4-methanimine (1a): Kinetic resolution from the addition of [2.2]paracyclophane aldimine **1a** with 4-trifluoromethylphenylboronic acid, 28.8 mg, 37% yield, 98.5% ee. HPLC: Chiralcel AD-3 column, 254 nm, 30 °C, *n*-Hexane/*i*-PrOH = 80/20, flow = 0.8 mL/min, retention time 16.1 min and 18.3 min (major).

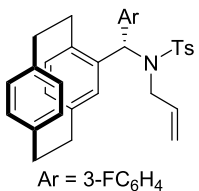
(+)-*N*-Allyl-*N*-{[2.2]paracyclophan-4-yl(4-chlorophenyl)methyl}-4-methylbenzenesulfonamide (2g): 54.1 mg, 50% yield, >20:1 dr, white solid, mp = 139-141 °C, new compound, $R_f = 0.43$



(hexanes/ethyl acetate 10/1), 98.9% ee, $[\alpha]_D^{20} = 134.50$ (c 0.82, CHCl₃). ¹H NMR (400 MHz, CDCl₃) δ 7.96-7.88 (m, 2H), 7.43-7.36 (m, 2H), 7.15-7.08 (m, 2H), 7.05 (dd, $J = 7.8, 1.4$ Hz, 1H), 6.86-6.79 (m, 2H), 6.72-6.67 (m, 1H), 6.64-6.57 (m, 1H), 6.56-6.46 (m, 3H), 6.34 (d, $J = 7.6$ Hz, 1H), 6.17 (s, 1H), 4.80-4.60 (m, 3H), 4.03-3.88 (m, 1H), 3.49-3.35 (m, 1H), 3.25-3.14 (m, 2H), 3.06-2.89 (m, 4H), 2.55-2.45 (m, 1H), 2.50 (s, 3H), 2.44-2.33 (m, 1H). ¹³C NMR (100 MHz, CDCl₃) δ 143.7, 140.2, 139.6, 139.5, 139.1, 138.8, 138.4, 136.4, 136.1, 133.9, 133.8, 133.6, 132.7, 132.6, 132.3, 131.4, 130.7, 130.4, 129.8, 128.6, 128.1, 117.5, 63.8, 48.5, 35.4, 35.4, 34.6, 34.5, 21.7. HPLC: Chiralcel IB column, 254 nm, 30 °C, *n*-Hexane/*i*-PrOH = 80/20, flow = 0.8 mL/min, retention time 6.4 min (major) and 7.0 min. HRMS: Calculated for C₃₃H₃₆ClN₂O₂S [M+NH₄]⁺ 559.2181, found: 559.2175 (³⁵Cl), 561.2160 (³⁷Cl).

(-)-*N*-Tosyl[2.2]paracyclophane-4-methanimine (1a): Kinetic resolution from the addition of [2.2]paracyclophane aldimine **1a** with 4-chlorophenylboronic acid, 31.2 mg, 40% yield, 99.6% ee. HPLC: Chiralcel AD-3 column, 254 nm, 30 °C, *n*-Hexane/*i*-PrOH = 80/20, flow = 0.8 mL/min, retention time 16.4 min and 18.6 min (major).

(+)-*N*-Allyl-*N*-{[2.2]paracyclophan-4-yl(3-fluorophenyl)methyl}-4-methylbenzenesulfonamide (2h): 52.2 mg, 50% yield, >20:1 dr, white solid, mp = 134-136 °C, new compound, $R_f = 0.43$

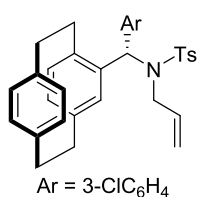


(hexanes/ethyl acetate 10/1), 98.9% ee, $[\alpha]_D^{20} = 123.93$ (c 0.66, CHCl₃). ¹H NMR (400 MHz, CDCl₃) δ 7.99-7.90 (m, 2H), 7.45-7.36 (m, 2H), 7.16-7.02 (m, 2H), 6.95-6.84 (m, 1H), 6.75-6.67 (m, 2H), 6.64-6.58 (m, 1H), 6.57-6.46 (m, 4H), 6.34 (d, $J = 7.6$ Hz, 1H), 6.16 (s, 1H), 4.78-4.59 (m, 3H), 4.04-3.93 (m, 1H), 3.49-3.38 (m, 1H), 3.26-3.14 (m, 2H), 3.06-2.89 (m, 4H), 2.57-2.46 (m, 1H), 2.51 (s, 3H), 2.46-2.37 (m, 1H). ¹³C NMR (100 MHz, CDCl₃) δ 162.7 (d, $J_{C-F} = 246.7$ Hz), 143.8, 143.5 (d, $J_{C-F} = 6.6$ Hz), 140.2, 139.6, 139.2, 138.7, 138.5, 136.2, 136.1, 133.8, 133.7, 132.7, 132.6, 132.3, 131.4, 130.4, 129.8 (d, $J_{C-F} = 8.0$ Hz), 129.8, 128.1, 125.1 (d, $J_{C-F} = 2.8$ Hz),

117.4, 116.4 (d, J_{C-F} = 22.1 Hz), 115.0 (d, J_{C-F} = 21.1 Hz), 64.0 (d, J_{C-F} = 1.6 Hz), 48.5, 35.4, 35.4, 34.6, 34.5, 21.7. ^{19}F NMR (376 MHz, CDCl_3) δ -112.6. HPLC: Chiracel IA column, 254 nm, 30 $^\circ\text{C}$, *n*-Hexane/*i*-PrOH = 90/10, flow = 1.0 mL/min, retention time 6.4 min (major) and 7.2 min. HRMS: Calculated for $\text{C}_{33}\text{H}_{32}\text{FNaNO}_2\text{S}$ $[\text{M}+\text{Na}]^+$ 548.2030, found: 548.2061.

(-)-*N*-Tosyl[2.2]paracyclophane-4-methanimine (**1a**): Kinetic resolution from the addition of [2.2]paracyclophane aldimine **1a** with 3-fluorophenylboronic acid, 31.9 mg, 41% yield, 97.4% ee. HPLC: Chiralcel AD-3 column, 254 nm, 30 $^\circ\text{C}$, *n*-Hexane/*i*-PrOH = 80/20, flow = 0.8 mL/min, retention time 16.2 min and 18.3 min (major).

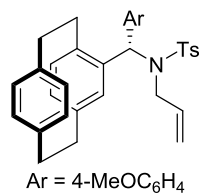
(+)-*N*-Allyl-*N*-{[2.2]paracyclophan-4-yl(3-chlorophenyl)methyl}-4-methylbenzenesulfonamide (**2i**): 54.4 mg, 50% yield, >20:1 dr, white solid, mp = 56-58 $^\circ\text{C}$, new compound, R_f = 0.41



(hexanes/ethyl acetate 10/1), 99.4% ee, $[\alpha]_D^{20}$ = 114.30 (*c* 1.10, CHCl_3). ^1H NMR (400 MHz, CDCl_3) δ 7.98-7.89 (m, 2H), 7.47-7.38 (m, 2H), 7.21-7.15 (m, 1H), 7.10-7.01 (m, 2H), 6.82-6.75 (m, 1H), 6.73-6.68 (m, 1H), 6.63-6.58 (m, 2H), 6.58-6.47 (m, 3H), 6.34 (d, J = 7.6 Hz, 1H), 6.06 (s, 1H), 4.86-4.58 (m, 3H), 4.07-3.92 (m, 1H), 3.52-3.37 (m, 1H), 3.29-3.13 (m, 2H), 3.08-2.85 (m, 4H), 2.58-2.31 (m, 2H), 2.52 (s, 3H). ^{13}C NMR (100 MHz, CDCl_3) δ 143.9, 142.9, 140.2, 139.6, 139.1, 138.6, 138.4, 136.2, 136.1, 134.3, 133.8, 133.7, 132.7, 132.6, 132.3, 131.4, 130.4, 129.9, 129.6, 129.5, 128.2, 128.1, 127.4, 117.6, 64.0, 48.6, 35.4, 35.4, 34.6, 34.5, 21.7. HPLC: Chiralcel IC column, 254 nm, 30 $^\circ\text{C}$, *n*-Hexane/*i*-PrOH = 80/20, flow = 0.8 mL/min, retention time 11.2 min and 13.2 (major) min. HRMS: Calculated for $\text{C}_{33}\text{H}_{36}\text{ClN}_2\text{O}_2\text{S}$ $[\text{M}+\text{NH}_4]^+$ 559.2181, found: 559.2175 (^{35}Cl), 561.2155 (^{37}Cl).

(-)-*N*-Tosyl[2.2]paracyclophane-4-methanimine (**1a**): Kinetic resolution from the addition of [2.2]paracyclophane aldimine **1a** with 3-chlorophenylboronic acid, 32.7 mg, 42% yield, 98.4% ee. HPLC: Chiralcel AD-3 column, 254 nm, 30 $^\circ\text{C}$, *n*-Hexane/*i*-PrOH = 80/20, flow = 0.8 mL/min, retention time 16.3 min and 18.5 min (major).

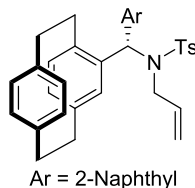
(+)-*N*-Allyl-*N*-{[2.2]paracyclophan-4-yl(4-methoxyphenyl)methyl}-4-methylbenzenesulfonamide (**2j**): 51.6 mg, 48% yield, 13:1 dr, white solid, mp = 65-67 $^\circ\text{C}$, new compound, R_f = 0.25



(hexanes/ethyl acetate 10/1), 96.5% ee, $[\alpha]_D^{20}$ = 135.32 (*c* 0.30, CHCl_3). ^1H NMR (400 MHz, CDCl_3) δ 7.97-7.88 (m, 2H), 7.42-7.35 (m, 2H), 7.07 (dd, J = 7.8, 1.5 Hz, 1H), 6.80-6.74 (m, 2H), 6.73-6.69 (m, 1H), 6.68-6.62 (m, 2H), 6.61-6.44 (m, 4H), 6.32 (d, J = 7.6 Hz, 1H), 6.13 (s, 1H), 4.81-4.72 (m, 1H), 4.70-4.59 (m, 2H), 3.98-3.89 (m, 1H), 3.75 (s, 3H), 3.47-3.38 (m, 1H), 3.25-3.14 (m, 2H), 3.05-2.88 (m, 4H), 2.56-2.43 (m, 2H), 2.49 (s, 3H). ^{13}C NMR (100 MHz, CDCl_3) δ 159.2, 143.4, 140.0, 139.5, 139.3, 139.0, 138.7, 137.4, 136.0, 134.3, 133.7, 133.1, 132.7, 132.3, 132.2, 131.5, 130.6, 130.5, 129.7, 128.2, 117.2, 113.6, 64.1, 55.3, 48.5, 35.5, 35.4, 34.6, 34.6, 21.7. HPLC: Chiralcel AD-H column, 254 nm, 30 $^\circ\text{C}$, *n*-Hexane/*i*-PrOH = 80/20, flow = 1.0 mL/min, retention time 6.5 min and 7.2 min (major). HRMS: Calculated for $\text{C}_{34}\text{H}_{35}\text{KNO}_3\text{S}$ $[\text{M}+\text{K}]^+$ 576.1969, found: 576.1959.

(-)-*N*-Tosyl[2.2]paracyclophane-4-methanimine (**1a**): Kinetic resolution from the addition of [2.2]paracyclophane aldimine **1a** with 4-methoxyphenylboronic acid, 35.1 mg, 45% yield, 83.9% ee. HPLC: Chiralcel AD-3 column, 254 nm, 30 $^\circ\text{C}$, *n*-Hexane/*i*-PrOH = 80/20, flow = 0.8 mL/min, retention time 16.3 min and 18.5 min (major).

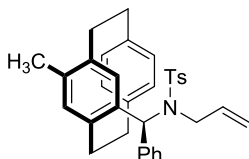
(+)-*N*-Allyl-*N*-{[2.2]paracyclophan-4-yl(2-naphthyl)methyl}-4-methylbenzenesulfonamide (2k): 54.0 mg, 48% yield, 12:1 dr, white solid, mp = 66-68 °C, new compound, $R_f = 0.38$



(hexanes/ethyl acetate 10/1), 98.4% ee, $[\alpha]_D^{20} = 155.39$ (c 0.87, CHCl_3). ^1H NMR (400 MHz, CDCl_3) δ 8.02-7.94 (m, 2H), 7.80-7.74 (m, 1H), 7.63 (d, $J = 8.5$ Hz, 1H), 7.55-7.50 (m, 1H), 7.49-7.38 (m, 4H), 7.21-7.18 (m, 1H), 7.18-7.12 (m, 1H), 7.03 (dd, $J = 8.5, 1.5$ Hz, 1H), 6.84-6.79 (m, 1H), 6.63 (d, $J = 8.0$ Hz, 2H), 6.53 (d, $J = 7.1$ Hz, 2H), 6.39-6.29 (m, 2H), 4.76-4.67 (m, 1H), 4.64-4.49 (m, 2H), 4.04-3.92 (m, 1H), 3.63-3.50 (m, 1H), 3.31-3.20 (m, 2H), 3.12-2.96 (m, 3H), 2.95-2.85 (m, 1H), 2.54 (s, 3H), 2.48-2.39 (m, 2H). ^{13}C NMR (100 MHz, CDCl_3) δ 143.5, 140.1, 139.6, 139.2, 138.9, 138.7, 138.2, 136.9, 136.1, 134.1, 133.8, 133.0, 132.9, 132.7, 132.5, 132.3, 131.6, 130.5, 129.8, 128.5, 128.3, 128.1, 128.1, 127.7, 127.3, 126.4, 126.3, 117.4, 64.7, 48.7, 35.5, 35.4, 34.6, 21.7. HPLC: Chiracel AD-3 column, 254 nm, 30 °C, *n*-Hexane/ *i*-PrOH = 90/10, flow = 1.0 mL/min, retention time 9.0 min and 13.8 min (major). HRMS: Calculated for $\text{C}_{37}\text{H}_{35}\text{NaNO}_2\text{S}$ $[\text{M}+\text{Na}]^+$ 580.2281, found: 580.2279.

(-)-*N*-Tosyl[2.2]paracyclophane-4-methanimine (1a): Kinetic resolution from the addition of [2.2]paracyclophane aldimine **1a** with 2-naphthaleneboronic acid, 31.9 mg, 41% yield, 82.3% ee. HPLC: Chiralcel AD-3 column, 254 nm, 30 °C, *n*-Hexane/*i*-PrOH = 80/20, flow = 0.8 mL/min, retention time 16.3 min and 18.5 min (major).

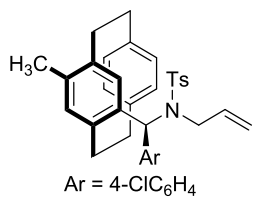
(+)-*N*-Allyl-*N*-{7-methyl[2.2]paracyclophan-4-yl(phenyl)methyl}-4-methylbenzenesulfonamide (2l): 52.1 mg, 50% yield, 8:1 dr, white solid, mp = 183-185 °C, new compound, $R_f = 0.50$



(hexanes/ethyl acetate 10/1), 97.9% ee, $[\alpha]_D^{20} = 158.03$ (c 0.52, CHCl_3). ^1H NMR (400 MHz, CDCl_3) δ 8.00-7.88 (m, 2H), 7.44-7.32 (m, 2H), 7.24-7.08 (m, 4H), 6.96-6.82 (m, 3H), 6.61 (s, 1H), 6.57-6.50 (m, 1H), 6.46-6.35 (m, 1H), 6.22 (s, 1H), 5.96 (s, 1H), 4.80-4.65 (m, 1H), 4.65-4.49 (m, 2H), 4.03-3.90 (m, 1H), 3.51-3.40 (m, 1H), 3.40-3.29 (m, 1H), 3.19 (t, $J = 11.8$ Hz, 1H), 3.04-2.74 (m, 4H), 2.50 (s, 3H), 2.41-2.29 (m, 2H), 2.13 (s, 3H). ^{13}C NMR (100 MHz, CDCl_3) δ 143.4, 141.1, 139.2, 139.0, 138.9, 138.5, 138.2, 138.1, 136.6, 134.7, 134.2, 133.9, 132.6, 131.3, 130.8, 129.7, 129.4, 128.4, 128.2, 128.0, 127.8, 117.2, 64.5, 48.4, 34.3, 34.0, 33.6, 33.4, 21.7, 19.8. HPLC: Chiralcel IB column, 254 nm, 30 °C, *n*-Hexane/*i*-PrOH = 80/20, flow = 0.8 mL/min, retention time 6.2 min (major) and 7.1 min. HRMS: Calculated for $\text{C}_{34}\text{H}_{35}\text{NaNO}_2\text{S}$ $[\text{M}+\text{Na}]^+$ 544.2281, found: 544.2262.

(-)-*N*-Tosyl-7-methyl[2.2]paracyclophane-4-methanimine (1b): Kinetic resolution from the addition of [2.2]paracyclophane aldimine **1b** with phenylboronic acid, 32.2 mg, 40% yield, 99.4% ee, $[\alpha]_D^{20} = -400.28$ (c 0.65, CHCl_3). HPLC: Chiralcel AD-H column, 254 nm, 30 °C, *n*-Hexane/*i*-PrOH = 80/20, flow = 0.8 mL/min, retention time 16.7 min and 20.5 min (major).

(+)-*N*-Allyl-*N*-{7-methyl[2.2]paracyclophan-4-yl(4-chlorophenyl)methyl}-4-methylbenzenesulfonamide (2m): 52.3 mg, 47% yield, 17:1 dr, white solid, mp = 55-57 °C, new compound, $R_f = 0.50$

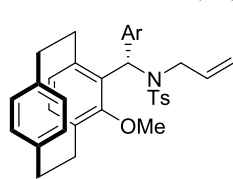


(hexanes/ethyl acetate 10/1), 97.9% ee, $[\alpha]_D^{20} = 150.36$ (c 0.54, CHCl_3). ^1H NMR (400 MHz, CDCl_3) δ 7.98-7.86 (m, 2H), 7.46-7.34 (m, 2H), 7.15-7.04 (m, 3H), 6.90-6.78 (m, 3H), 6.56 (s, 1H), 6.49 (dd, $J = 7.8, 1.4$ Hz, 1H), 6.39 (dd, $J = 7.8, 1.6$ Hz, 1H), 6.18 (s, 1H), 5.96 (s, 1H), 4.81-4.57 (m, 3H), 4.03-3.90 (m, 1H), 3.48-3.27 (m, 2H), 3.23-3.10 (m, 1H), 3.06-2.85 (m, 3H), 2.84-2.70 (m, 1H), 2.50 (s, 3H), 2.41-2.27 (m, 2H), 2.12 (s, 3H). ^{13}C NMR (100 MHz, CDCl_3) δ 143.7, 139.7, 139.2, 138.9, 138.8, 138.6, 138.2, 138.0, 136.9, 134.1,

133.9, 133.8, 133.8, 132.6, 131.4, 130.7, 130.7, 129.8, 128.6, 128.1, 127.9, 117.5, 63.7, 48.5, 34.3, 34.1, 33.6, 33.4, 21.7, 19.8. HPLC: Chiracel IB column, 254 nm, 30 °C, *n*-Hexane/*i*-PrOH = 80/20, flow = 0.8 mL/min, retention time 6.4 min (major) and 7.5 min. HRMS: Calculated for C₃₄H₃₈ClN₂O₂S [M+NH₄]⁺ 573.2337, found: 573.2376 (³⁵Cl), 575.2360 (³⁷Cl).

(-)-*N*-Tosyl-7-methyl[2.2]paracyclophane-4-methanimine (1b): Kinetic resolution from the addition of [2.2]paracyclophane aldimine **1b** with 4-chlorophenylboronic acid, 33.8 mg, 42% yield, 99.9% ee. HPLC: Chiralcel AD-H column, 254 nm, 30 °C, *n*-Hexane/*i*-PrOH = 80/20, flow = 0.8 mL/min, retention time 16.7 min and 20.5 min (major).

(+)-*N*-Allyl-*N*-{4-methoxy[2.2]paracyclophan-5-yl(4-chlorophenyl)methyl}-4-methylbenzenesulfonamide (2n): 14.0 mg, 12% yield, >20:1 dr, white solid, mp = 45-47 °C, new compound,

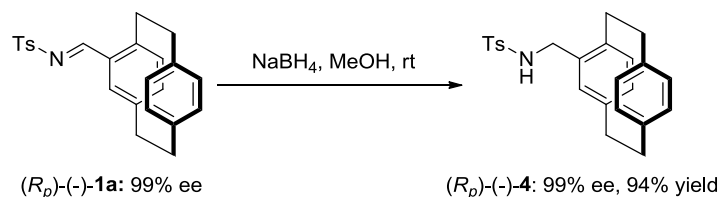


R_f = 0.45 (hexanes/ethyl acetate 10/1), 99.4% ee, [α]_D²⁰ = 6.07 (*c* 0.28, CHCl₃). ¹H NMR (400 MHz, CDCl₃) δ 7.33-7.28 (m, 2H), 7.22-7.12 (m, 4H), 7.11-6.99 (m, 2H), 6.70-6.59 (m, 2H), 6.55-6.49 (m, 1H), 6.40-6.32 (m, 2H), 6.28-6.22 (m, 1H), 6.19-6.13 (m, 1H), 5.13-4.97 (m, 1H), 4.79-4.66 (m, 2H), 3.99-3.80 (m, 2H), 3.65-3.53 (m, 1H), 3.15-2.72 (m, 7H), 2.91 (s, 3H), 2.36 (s, 3H). ¹³C NMR (100 MHz, CDCl₃) δ 158.0, 142.8, 141.5, 139.3, 139.2, 139.0, 137.8, 135.9, 135.1, 133.2, 132.4, 132.0, 131.5, 131.2, 130.9, 129.3, 129.0, 128.7, 128.1, 127.7, 116.6, 61.9, 60.9, 49.0, 34.8, 34.7, 33.2, 31.0, 21.5. HPLC: Chiracel IA column, 254 nm, 30 °C, *n*-Hexane/*i*-PrOH = 90/10, flow = 1.0 mL/min, retention time 9.9 min (major) and 10.9 min. HRMS: Calculated for C₃₄H₃₄ClNNaO₃S [M+Na]⁺ 594.1840, found: 594.1851 (³⁵Cl), 596.1824 (³⁷Cl).

(-)-*N*-Tosyl-4-methoxy[2.2]paracyclophane-5-methanimine (1c): Kinetic resolution from the addition of [2.2]paracyclophane aldimine **1c** with 4-chlorophenylboronic acid, 71.0 mg, 85% yield, 13.2% ee. [α]_D²⁰ = -14.09 (*c* 0.44, CHCl₃). HPLC: Chiralcel IA column, 254 nm, 30 °C, *n*-Hexane/*i*-PrOH = 80/20, flow = 0.8 mL/min, retention time 10.8 min (major) and 16.4 min.

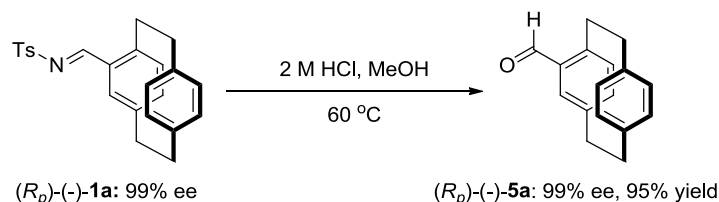
4. Elaborations of Recovered Material and Product

Derivatizations of the Recovered Material (*R_p*)-(-)-**1a**



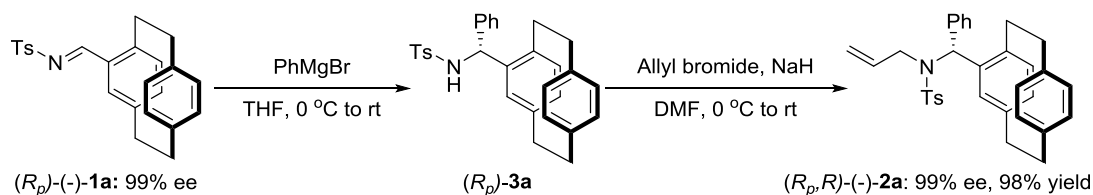
Sodium tetrahydroborate (38 mg, 1.0 mmol) was added to a solution of aldimine (-)-**1a** (78 mg, 0.20 mmol, 99% ee) in methanol (5.0 mL). The reaction was performed at room temperature overnight. The reaction mixture was quenched by addition of saturated aqueous ammonium chloride solution (15 mL). After being extracted with ethyl acetate (15 mL \times 3), the combined organic layer was dried by anhydrous sodium sulfate, concentrated in *vacuo*, then purification by silica gel chromatography using hexanes and ethyl acetate as eluent to give product (-)-**4**.

(-)-*N*-([2.2]Paracyclophan-4-ylmethyl)-4-methylbenzenesulfonamide (**4**): 73 mg, 94% yield, white solid, mp = 49-51 °C, new compound, R_f = 0.50 (hexanes/ethyl acetate 3/1), 99% ee, $[\alpha]_D^{20} = -16.48$ (c 1.42, CHCl₃). ¹H NMR (400 MHz, CDCl₃) δ 7.85-7.75 (m, 2H), 7.40-7.30 (m, 2H), 6.56-6.37 (m, 5H), 6.32-6.24 (m, 1H), 6.16 (s, 1H), 4.50 (t, J = 5.7 Hz, 1H), 4.07 (dd, J = 13.4, 6.1 Hz, 1H), 3.72 (dd, J = 13.4, 5.7 Hz, 1H), 3.25-3.14 (m, 1H), 3.13-2.96 (m, 4H), 2.95-2.83 (m, 2H), 2.81-2.70 (m, 1H), 2.46 (s, 3H). ¹³C NMR (100 MHz, CDCl₃) δ 143.6, 140.4, 139.5, 139.2, 138.1, 136.7, 135.2, 135.2, 133.4, 133.4, 133.3, 132.4, 132.2, 129.9, 128.7, 127.3, 46.3, 35.3, 34.9, 34.3, 32.9, 21.7. HPLC: Chiracel AD-H column, 254 nm, 30 °C, *n*-Hexane/*i*-PrOH = 60/40, flow = 0.7 mL/min, retention time 15.9 min and 26.4 min (major). HRMS: Calculated for C₂₄H₂₅NaNO₂S [M+Na]⁺ 414.1498, found: 414.1502.



To a stirred mixture of aldimine (-)-**1a** (78 mg, 0.20 mmol, 99% ee) in methanol (10 mL) was added aqueous HCl (10 mL, 2 M in water). The resulting mixture was stirred at 60 °C for 8 h. The reaction was quenched by addition of saturated aqueous sodium bicarbonate solution (30 mL), and then extracted with dichloromethane (20 mL \times 3). The combined organic layer was washed with brine, dried by anhydrous sodium sulfate and filtered. The solvent was removed in *vacuo*, and the residue was purified by column chromatography on silica gel using hexanes and ethyl acetate as eluent to afford the corresponding product (-)-**5a**.

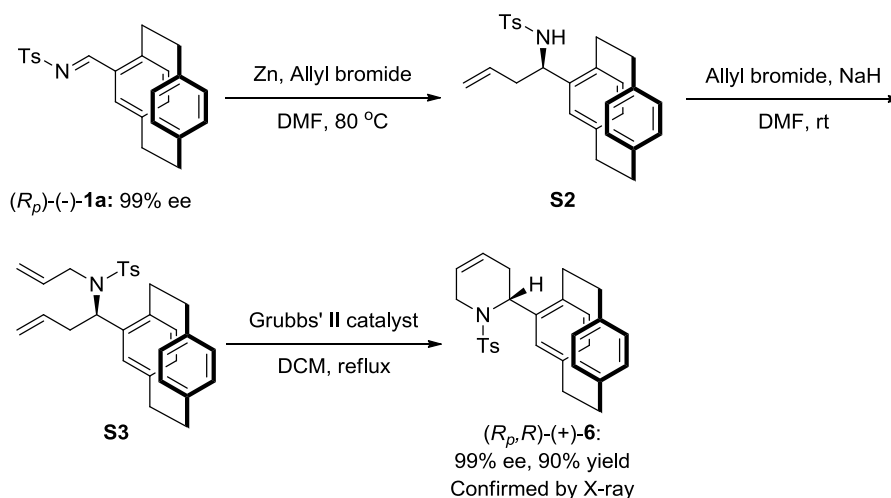
(*R_p*)-(-)-4-Formyl[2.2]paracyclophane (**5a**): 45 mg, 95% yield, white solid, known compound,^[6] R_f = 0.30 (hexanes/ethyl acetate 80/1), 99% ee, $[\alpha]_D^{20} = -181.65$ (c 0.96, CHCl₃), [lit.^[6]: $[\alpha]_D^{20} = 184$ (c 0.41, CHCl₃) for 98.7% ee (*S_p*)]. ¹H NMR (400 MHz, CDCl₃) δ 9.95 (s, 1H), 7.02 (d, J = 1.9 Hz, 1H), 6.76-6.69 (m, 1H), 6.62-6.54 (m, 2H), 6.53-6.48 (m, 1H), 6.46-6.36 (m, 2H), 4.18-4.05 (m, 1H), 3.31-2.90 (m, 7H). ¹³C NMR (100 MHz, CDCl₃) δ 192.0, 143.3, 140.8, 139.6, 139.5, 138.2, 136.7, 136.4, 136.2, 133.4, 133.0, 132.5, 132.3, 35.4, 35.2, 35.1, 33.7. HPLC: Chiracel IC column, 254 nm, 30 °C, *n*-Hexane/*i*-PrOH = 90/10, flow = 0.7 mL/min, retention time 12.6 min (major) and 15.4 min.



To a solution of $(-)\text{-1a}$ (78 mg, 0.20 mmol, 99% ee) in dry tetrahydrofuran (7.0 mL) was added PhMgBr (0.50 mL, 2 M in THF, 1.0 mmol) at 0 °C under nitrogen. The reaction mixture was allowed to warm to room temperature and stirred at room temperature overnight. Water (5.0 mL) was added, and extracted with ethyl acetate (10 mL \times 3). The combined organic layer was washed with brine, dried by anhydrous sodium sulfate and filtered. The solvent was removed in *vacuo*, and the residue was purified by column chromatography on silica gel using hexanes and ethyl acetate as eluent to afford sulfonamide **3a**.

To a solution of the above sulfonamide **3a** in dry *N,N*-dimethylformamide (5.0 mL) was added sodium hydride (24 mg, 1.0 mmol, 60% wt.) at 0 °C, and then allyl bromide (121 mg, 86.0 μ L, 1.00 mmol) was added dropwise. The reaction mixture was warmed to room temperature and stirred at room temperature overnight. Water (10 mL) was added, and extracted with ethyl acetate (10 mL \times 3). The combined organic layer was washed with brine, dried by anhydrous sodium sulfate and filtered. The solvent was removed in *vacuo*, and the residue was purified by column chromatography on silica gel using hexanes and ethyl acetate as eluent to afford the desirable product $(-)\text{-2a}$.

$(-)\text{-N}$ -Allyl- N -{[2.2]paracyclophan-4-yl(phenyl)methyl}-4-methylbenzenesulfonamide (2a**):** 99 mg, 98% yield, white solid, new compound, R_f = 0.50 (hexanes/ethyl acetate 10/1), 99% ee, $[\alpha]_D^{20} = -129.07$ (c 1.37, CHCl_3). $^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.97-7.89 (m, 2H), 7.43-7.33 (m, 2H), 7.24-7.17 (m, 1H), 7.17-7.07 (m, 3H), 6.91-6.84 (m, 2H), 6.77-6.70 (m, 1H), 6.63-6.47 (m, 4H), 6.34 (d, J = 7.6 Hz, 1H), 6.20 (s, 1H), 4.80-4.68 (m, 1H), 4.64-4.48 (m, 2H), 4.04-3.91 (m, 1H), 3.53-3.39 (m, 1H), 3.30-3.15 (m, 2H), 3.08-2.86 (m, 4H), 2.53-2.37 (m, 2H), 2.50 (s, 3H). $^{13}\text{C NMR}$ (100 MHz, CDCl_3) δ 143.5, 140.9, 140.0, 139.5, 139.2, 138.9, 138.6, 136.9, 136.0, 134.0, 133.7, 132.7, 132.3, 132.2, 131.4, 130.5, 129.7, 129.4, 128.4, 128.2, 128.0, 117.2, 64.6, 48.5, 35.5, 35.4, 34.6, 34.5, 21.7. HPLC: Chiracel AD-H column, 254 nm, 30 °C, *n*-Hexane/*i*-PrOH = 90/10, flow = 1.0 mL/min, retention time 6.8 min and 7.4 min (major).



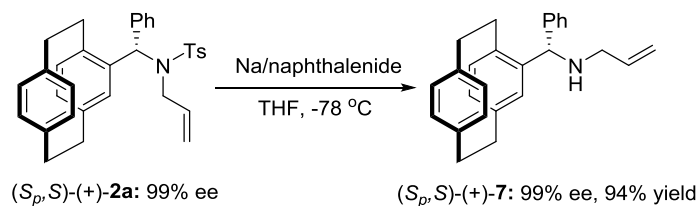
To a suspension of (-)-**1a** (78 mg, 0.20 mmol, 99% ee) and zinc powder (24 mg, 0.36 mmol) in dry *N,N*-dimethylformamide (4.0 mL) was slowly added allyl bromide (36 mg, 26.0 μ L, 0.30 mmol) under nitrogen and the solution was stirred at 80 °C for 4 h. After the addition of saturated aqueous ammonium chloride solution (15 mL), the solution was extracted with ethyl acetate (15 mL \times 3). The combined organic layer was washed by brine, dried by anhydrous sodium sulfate and filtered. The solvent was removed in *vacuo*, and the residue was purified by column chromatography on silica gel using hexanes and ethyl acetate as eluent to afford sulfonamide **S2**.

To a solution of the above sulfonamide **S2** in dry *N,N*-dimethylformamide (2.0 mL) was added sodium hydride (30 mg, 0.75 mmol, 60% wt.) at room temperature, and then allyl bromide (73 mg, 50.0 μ L, 0.60 mmol) was added dropwise. The reaction mixture was stirred at room temperature overnight. Water (10 mL) was added, and extracted with ethyl acetate (15 mL \times 3). The combined organic layer was washed with brine, dried by anhydrous sodium sulfate and filtered. The solvent was removed in *vacuo*, and the residue was purified by column chromatography on silica gel using hexanes and ethyl acetate as eluent to afford the compound **S3**.

To a solution of crude product **S3** in dichloromethane (5.0 mL) was added Grubb's second generation catalyst (17 mg, 0.02 mmol, 10 mol%). The mixture was refluxed overnight and concentrated. The resulting crude product was purified by column chromatography on silica gel using hexanes and ethyl acetate as eluent to afford the desirable product (*R_p,R*)-(+)-**6**.

(+)-2-([2.2]Paracyclophan-4-yl)-1-tosyl-1,2,3,6-tetrahydropyridine (**6**): 80 mg, 90% yield, white solid, mp = 149-151 °C, new compound, R_f = 0.30 (hexanes/ethyl acetate 10/1), 99% ee, $[\alpha]_D^{20} = 73.22$ (*c* 0.62, CHCl₃). ¹H NMR (400 MHz, CDCl₃) δ 7.94-7.82 (m, 2H), 7.41-7.32 (m, 2H), 7.12-7.01 (m, 1H), 6.64 (s, 1H), 6.63-6.54 (m, 2H), 6.54-6.48 (m, 1H), 6.45-6.37 (m, 2H), 5.48-5.34 (m, 3H), 4.23-3.91 (m, 2H), 3.35-3.23 (m, 2H), 3.22-2.93 (m, 6H), 2.51-2.34 (m, 1H), 2.46 (s, 3H), 2.26-2.14 (m, 1H). ¹³C NMR (100 MHz, CDCl₃) δ 143.4, 140.0, 139.9, 139.5, 139.0, 137.8, 136.0, 136.0, 133.4, 132.5, 132.3, 131.1, 129.9, 129.7, 127.1, 123.2, 122.1, 52.2, 42.1, 35.3, 34.9, 33.8, 31.2, 21.6. HPLC: Chiracel AD-H column, 254 nm, 30 °C, *n*-Hexane/*i*-PrOH = 90/10, flow = 1.0 mL/min, retention time 13.4 min (major) and 14.2 min. HRMS: Calculated for C₂₈H₃₀NO₂S [M+H]⁺ 444.1992, found: 444.1971.

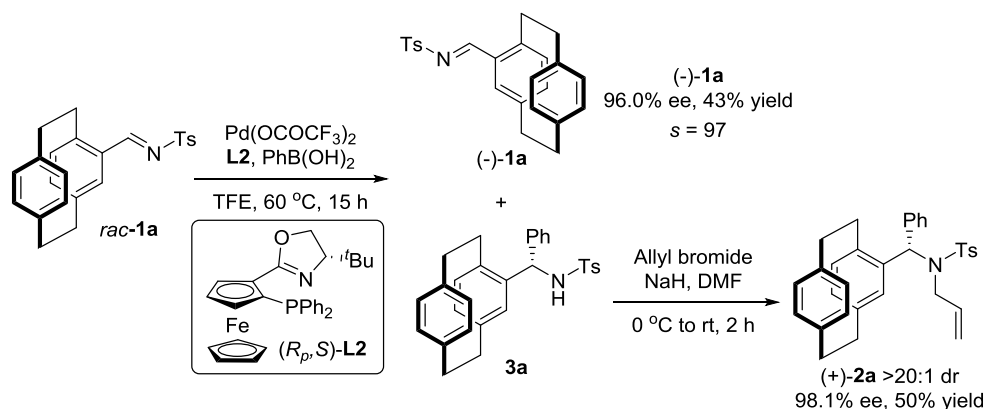
Removal of the Tosyl Group



Sodium (92 mg, 4.0 mmol, 20 equiv; washed free of oil in hexane) was added to a vigorously stirred suspension of naphthalene (513 mg, 4.00 mmol) in tetrahydrofuran (15 mL) at room temperature. The resulting green suspension was stirred for 4 h at room temperature, then was transferred to a solution of (*S_p,S*)-(+)-**2a** (101 mg, 0.20 mmol) in tetrahydrofuran (10 mL) at -78 °C. The dark green solution was stirred at -78 °C for 2 h. Water (20 mL) was added to the solution at -78 °C. The reaction mixture was extracted with ethyl acetate (20 mL \times 3). The combined organic layer was washed with brine, dried by anhydrous sodium sulfate and filtered. The solvent was removed in *vacuo*, and the residue was purified by column chromatography on silica gel using hexanes and ethyl acetate as eluent to afford the desirable product (+)-**7**.

(+)-*N*-([2.2]Paracyclophan-4-yl(phenyl)methyl)prop-2-en-1-amine (**7**): 67 mg, 94% yield, white solid, mp = 99-101 °C, new compound, $R_f = 0.35$ (hexanes/ethyl acetate 10/1), 99% ee, $[\alpha]_D^{20} = 174.32$ (c 0.30, CHCl_3). $^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.25-7.19 (m, 2H), 7.18-7.12 (m, 3H), 6.88 (s, 1H), 6.67-6.60 (m, 1H), 6.60-6.49 (m, 3H), 6.48-6.42 (m, 1H), 6.35 (d, $J = 7.6$ Hz, 1H), 6.19-6.05 (m, 1H), 5.42-5.23 (m, 2H), 4.76 (s, 1H), 3.41-3.02 (m, 9H), 2.77-2.63 (m, 1H). $^{13}\text{C NMR}$ (100 MHz, CDCl_3) δ 143.9, 142.9, 140.1, 139.8, 139.6, 137.2, 136.6, 135.7, 133.8, 133.1, 132.0, 131.5, 129.7, 129.3, 128.4, 128.1, 126.9, 116.6, 62.9, 50.4, 35.5, 35.4, 34.6, 34.1. HPLC: Chiracel IA column, 254 nm, 30 °C, *n*-Hexane/*i*-PrOH = 98/2, flow = 1.0 mL/min, retention time 5.0 min (major) and 5.7 min. HRMS: Calculated for $\text{C}_{26}\text{H}_{28}\text{N}$ $[\text{M}+\text{H}]^+$ 354.2216, found: 354.2213.

5. Scale-up Reaction



A schlenk tube (50 mL) was charged with $\text{Pd}(\text{OCOCF}_3)_2$ (16.6 mg, 0.05 mmol, 5 mol%) and (*R_p,S*)-**L2** (24.8 mg, 0.05 mmol, 5 mol%) under nitrogen, and degassed anhydrous acetone (5.0 mL) was added. The mixture was stirred at room temperature for 1 h. The solvent was removed under vacuum to give the catalyst. Then substrate *rac*-**1a** (389 mg, 1.00 mmol), phenylboronic acid (122 mg, 1.0 mmol) and 2,2,2-trifluoroethanol (20 mL) were added into the tube under nitrogen. The mixture was heated to 60 °C. After stirring at 60 °C for 15 h, the reaction mixture was cooled to room temperature, and the solvent was removed by rotary evaporation. The resulting mixture was dried under vacuum and the conversion of *rac*-**1a** (51% conv.) was confirmed by $^1\text{H NMR}$ analysis with benzyl ether as internal standard. The solvent was removed in *vacuo*, recovered material (-)-**1a** (165.5 mg, 43% yield with 96.0% ee) and addition product **3a** were isolated by column chromatography on silica gel using hexanes and ethyl acetate as eluent.

To a solution of the addition product **3a** in dry *N,N*-dimethylformamide (DMF, 8.0 mL) was added sodium hydride (48 mg, 1.20 mmol, 60% wt.) at 0 °C, and then allyl bromide (242 mg, 0.17 mL, 2.00 mmol) was added dropwise. The reaction mixture was warmed to room temperature and stirred at room temperature for 4 h. Water (10 mL) was added, and extracted with ethyl acetate (15 mL × 3). The combined organic layer was washed with brine, dried by anhydrous sodium sulfate and filtered, concentrated in *vacuo* and analyzed by crude $^1\text{H NMR}$ to determine diastereomeric ratio (> 20:1 dr). The solvent was removed in *vacuo*, and the residue was purified by column chromatography on silica gel using hexanes and ethyl acetate as eluent to afford the product (+)-**2a** (255.0 mg, 50% yield with 98.1% ee).

6. Determination of Absolute Configuration

6.1 Determination of the Absolute Configuration of (+)-2a

To determine the absolute configuration of (+)-**2a**, a single crystal of the **2a** was grown from its solution in dichloromethane and *n*-hexane. *n*-Hexane (3.0 mL) was slowly added into the solution of **2a** in dichloromethane (3.0 mL) at room temperature, then the solvent was slowly evaporated and single crystal was obtained after 6 days. The structure in **Figure S1** showed the absolute configuration of (+)-**2a** is (S_p,S). The CCDC number is 1891926. These details can be obtained free of charge *via* www.ccdc.com.ac.uk/data_request/cif from the Cambridge Crystallographic Data Centre.

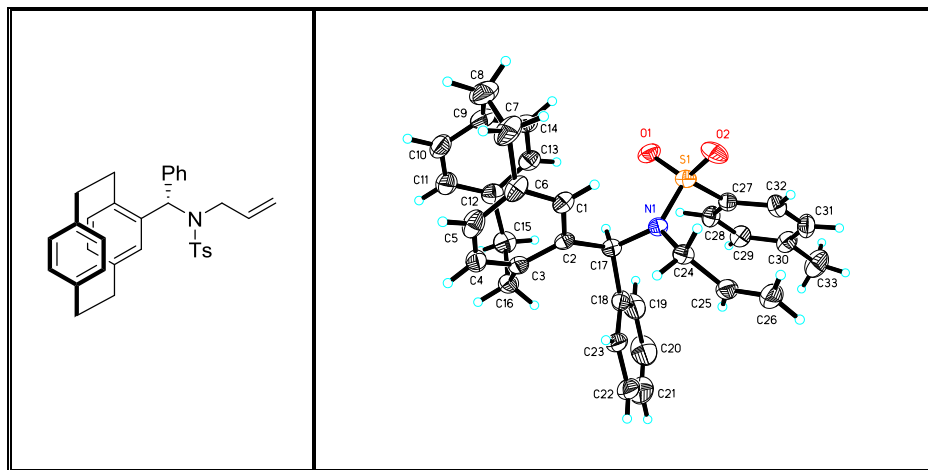


Figure S1. X-ray Crystallographic Analysis of (S_p,S)-**2a**

6.2 Determination of the Absolute Configuration of (+)-2l

To determine the absolute configuration of (+)-**2l**, a single crystal of the **2l** was grown from its solution in dichloromethane and *n*-hexane. *n*-Hexane (1.5 mL) was slowly added into the solution of **2l** in dichloromethane (1.5 mL) at room temperature, then the solvent was slowly evaporated and single crystal was obtained after 3 days. The structure in **Figure S2** showed the absolute configuration of (+)-**2l** is (S_p,S). The CCDC number is 1910494. These details can be obtained free of charge *via* www.ccdc.com.ac.uk/data_request/cif from the Cambridge Crystallographic Data Centre.

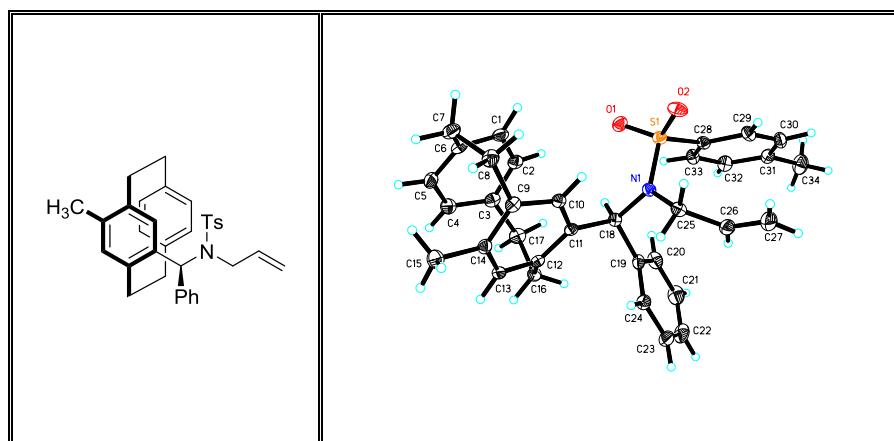


Figure S2. X-ray Crystallographic Analysis of (S_p,S)-**2l**

6.3 Determination of the Absolute Configuration of (+)-**6**

To determine the absolute configuration of (+)-**6**, a single crystal of the **6** was grown from its solution in dichloromethane and *n*-hexane. *n*-Hexane (3.0 mL) was slowly added into the solution of **6** in dichloromethane (3.0 mL) at room temperature, then the solvent was slowly evaporated and single crystal was obtained after 5 days. The structure in **Figure S3** showed the absolute configuration of (+)-**6** is (R_p,R). The CCDC number is 1917426. These details can be obtained free of charge *via* www.ccdc.com.ac.uk/data_request/cif from the Cambridge Crystallographic Data Centre.

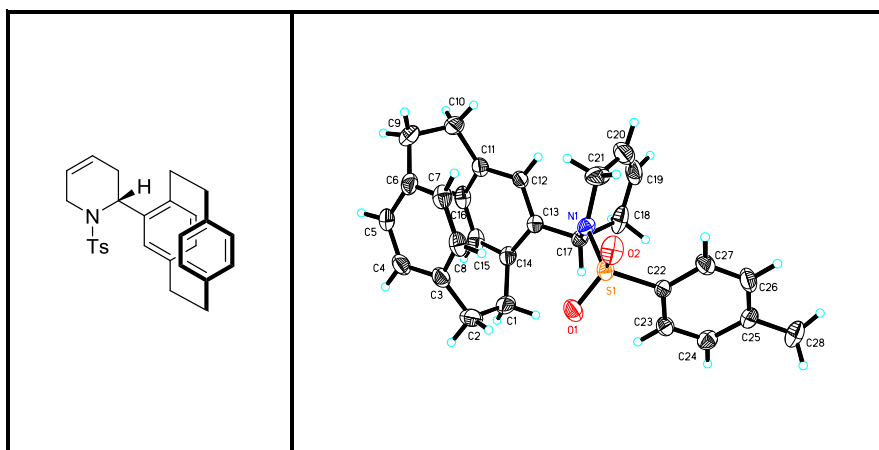
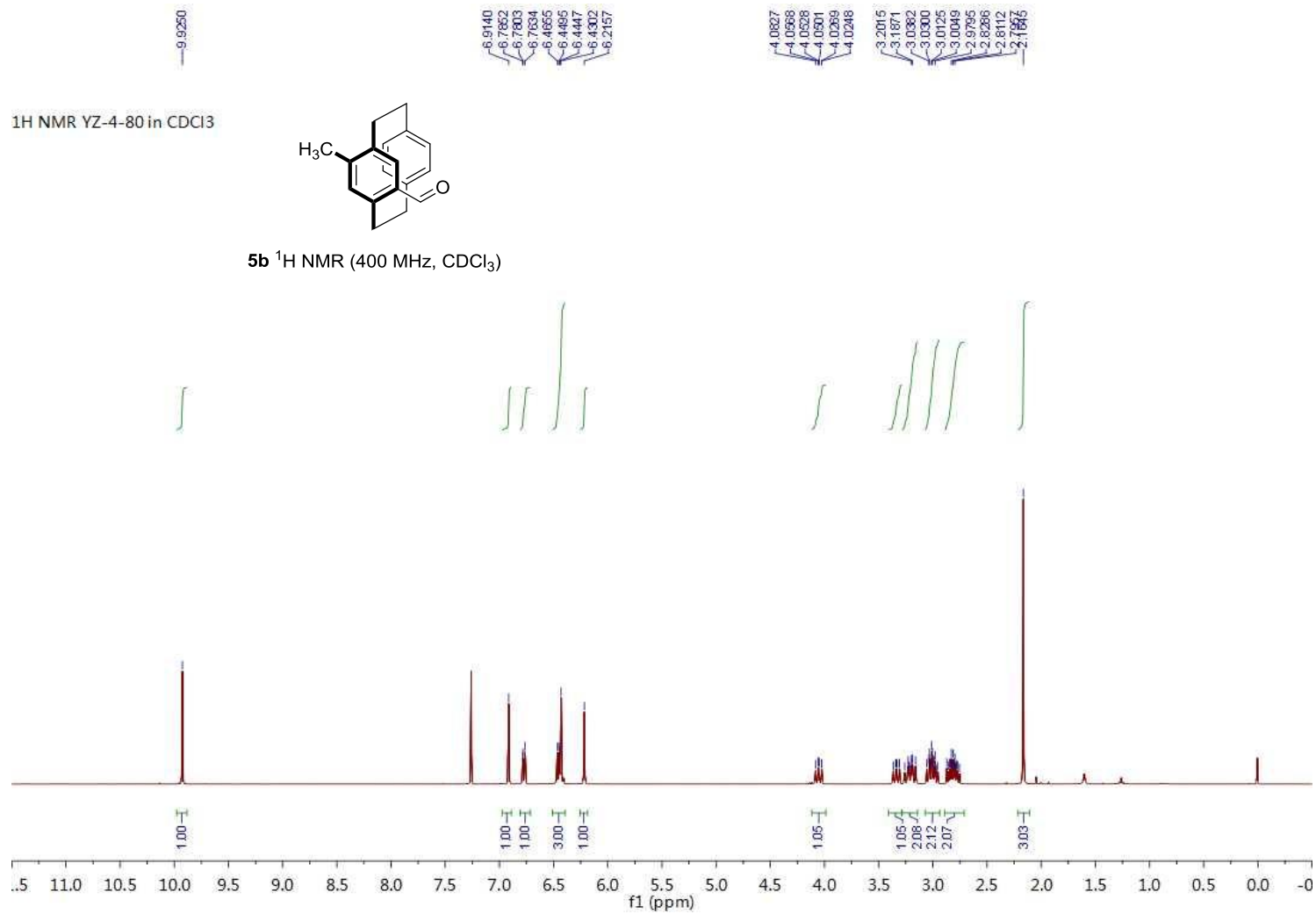


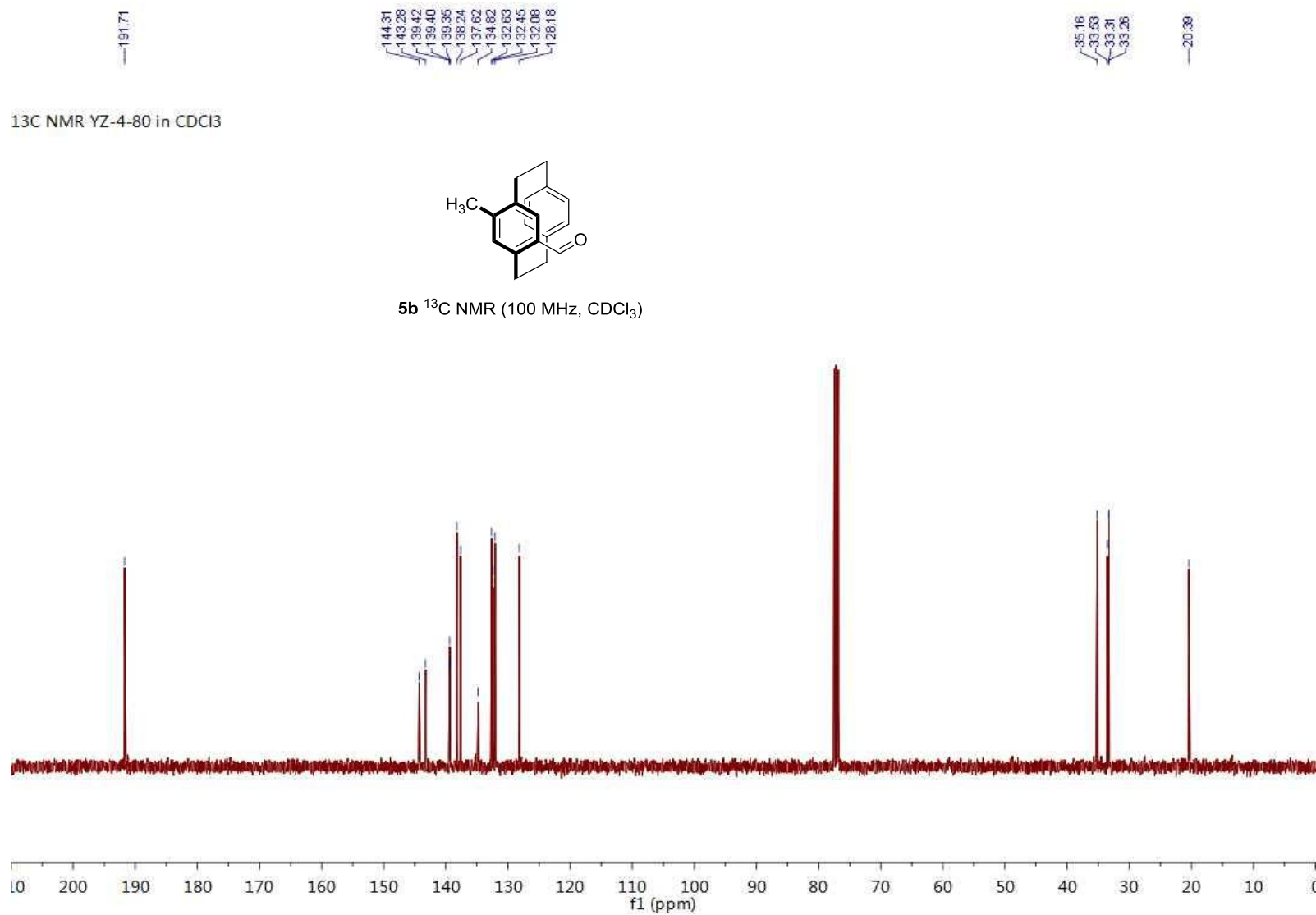
Figure S3. X-ray Crystallographic Analysis of (R_p,R)-**6**

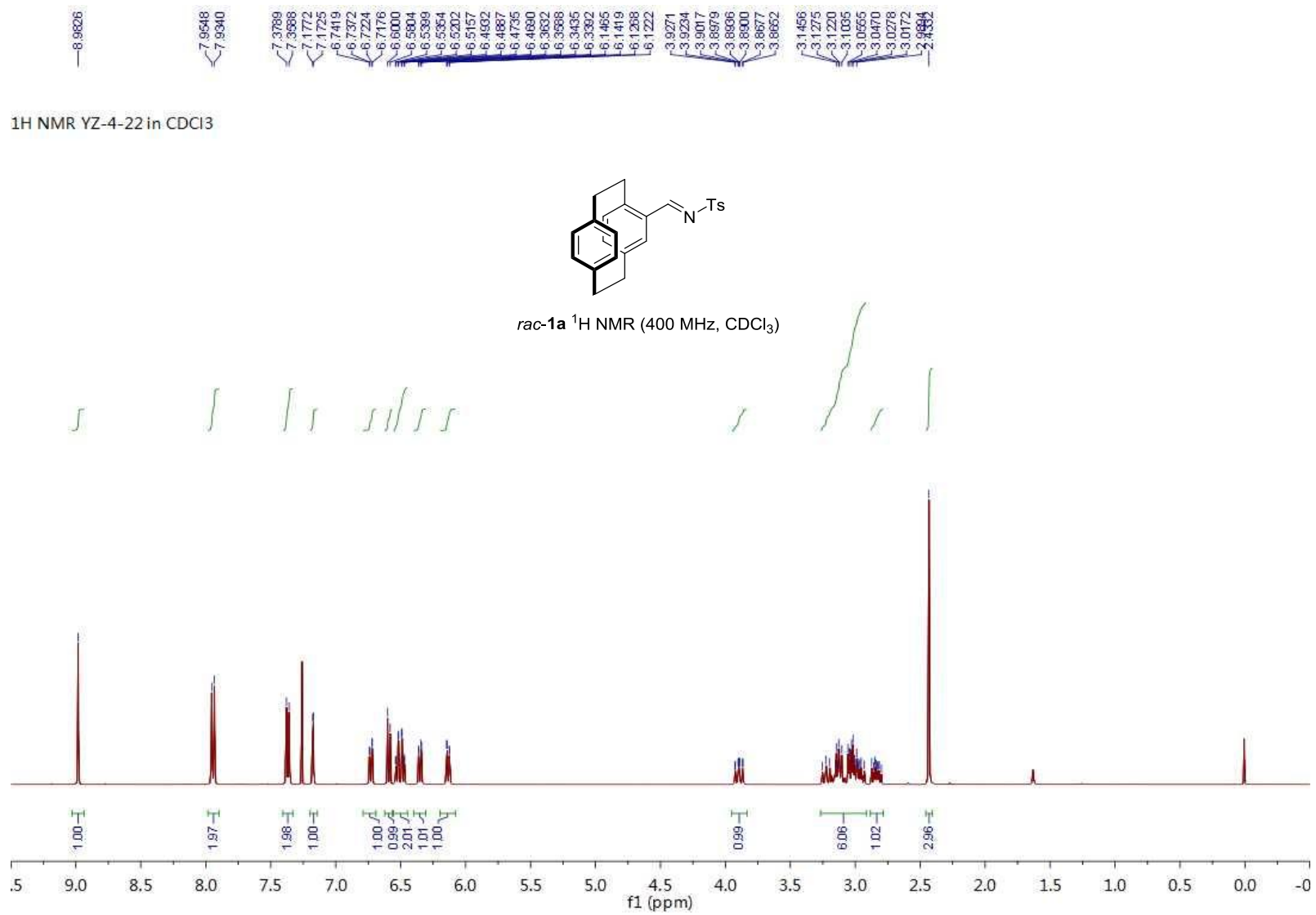
7. References

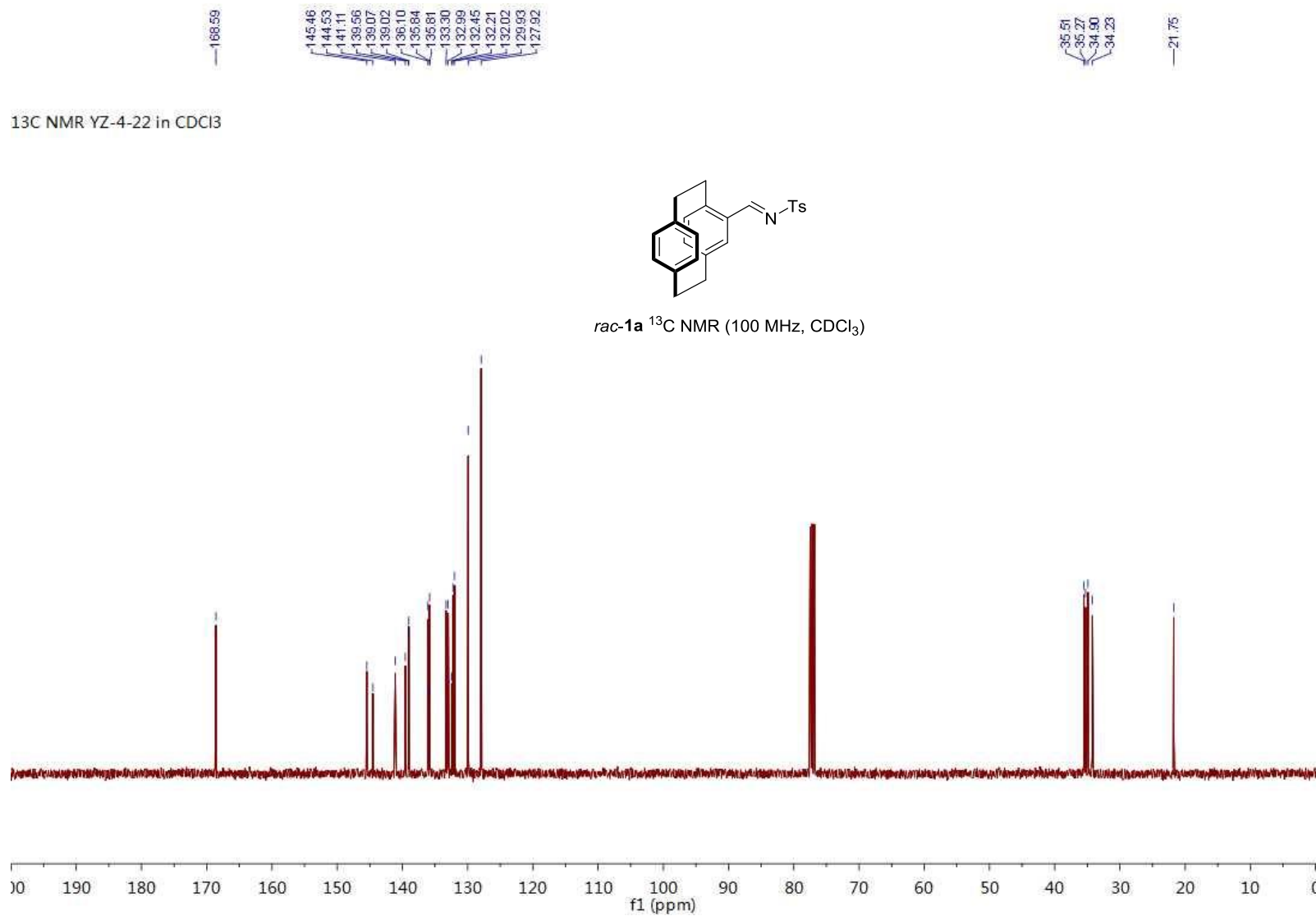
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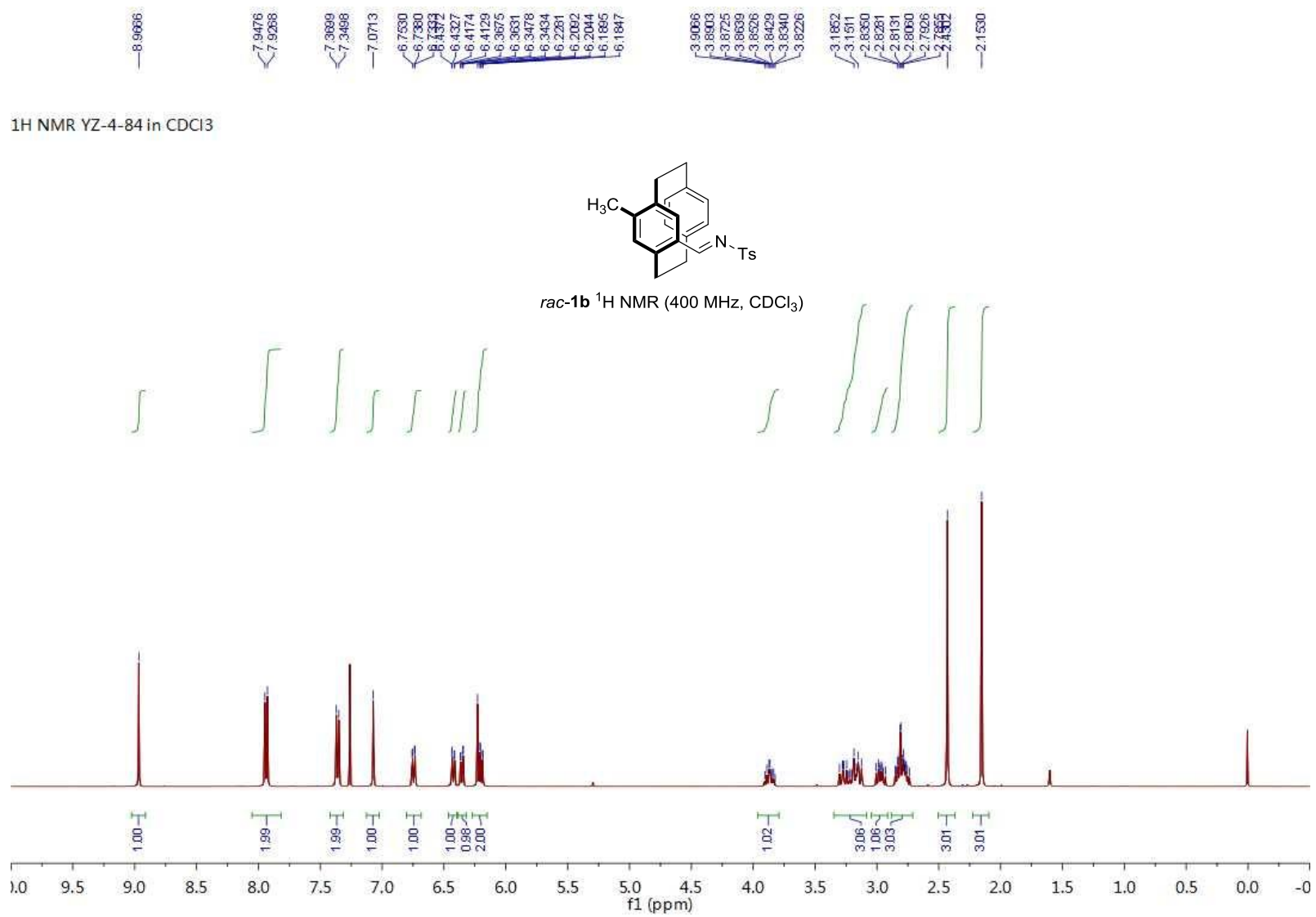
8. Copy of NMR, HPLC for Compounds

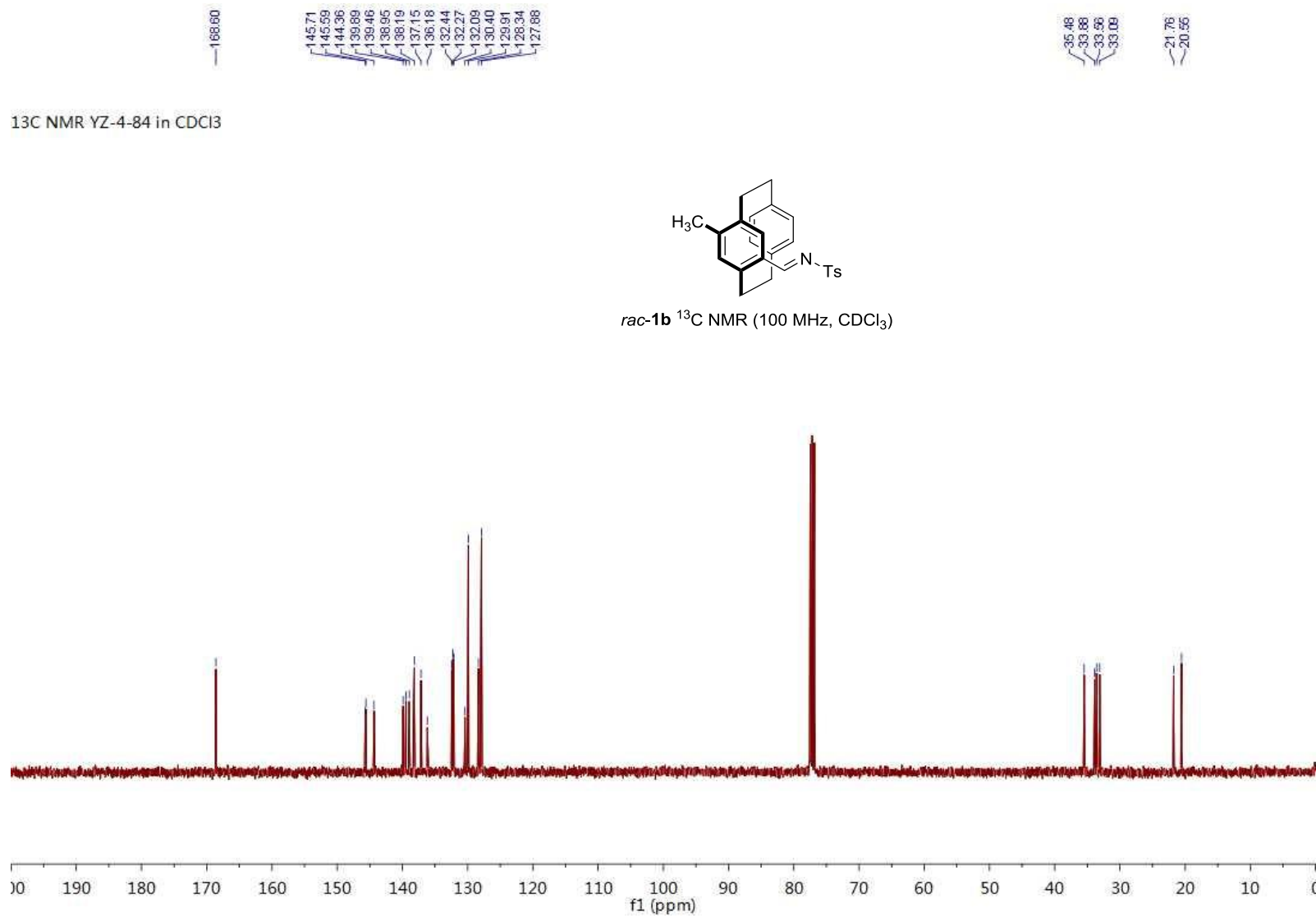


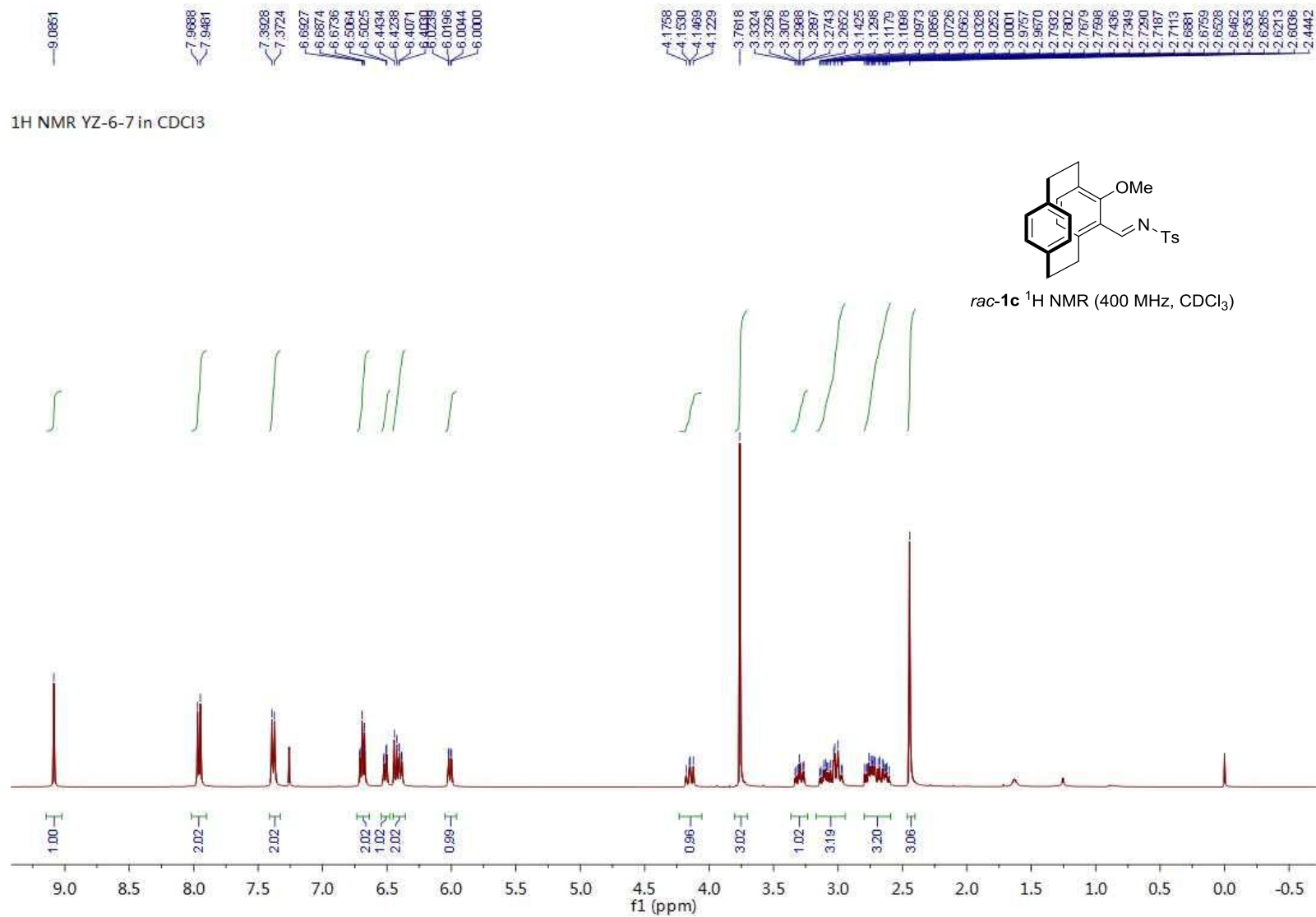


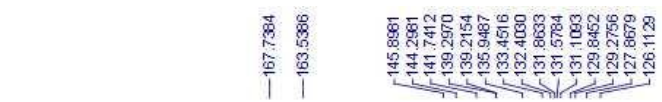




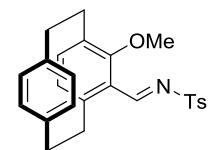




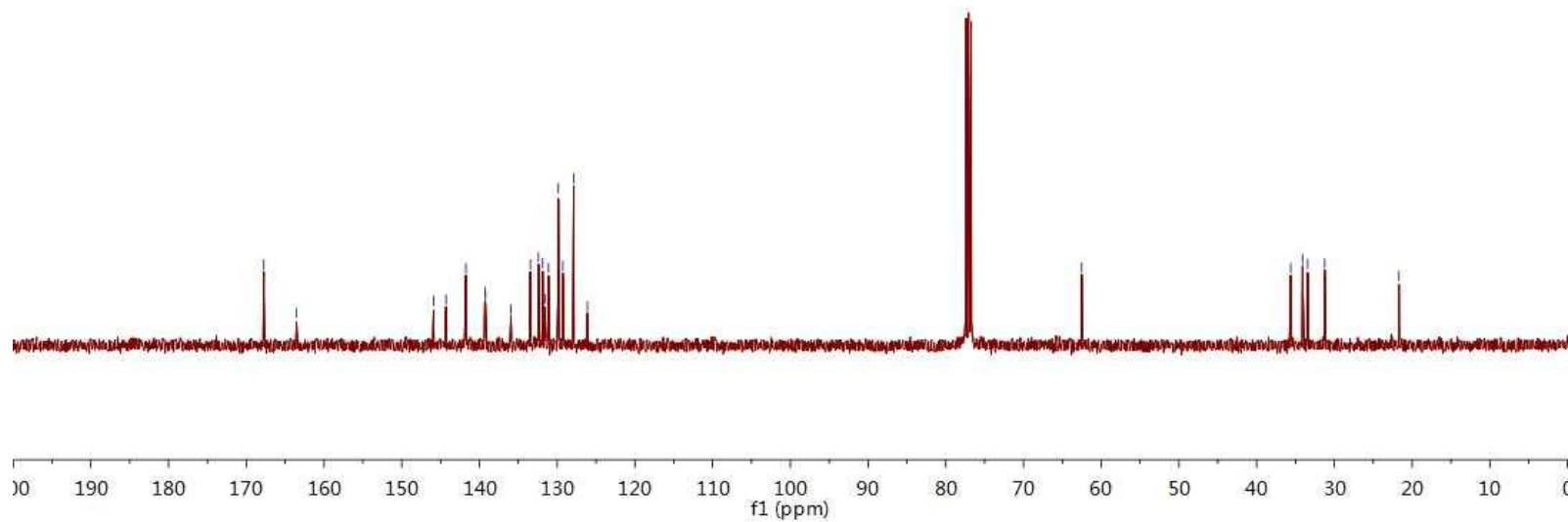




13C NMR YZ-6-7 in CDCl3

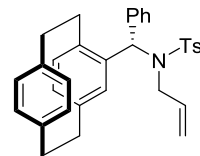


rac-1c ¹³C NMR (100 MHz, CDCl₃)

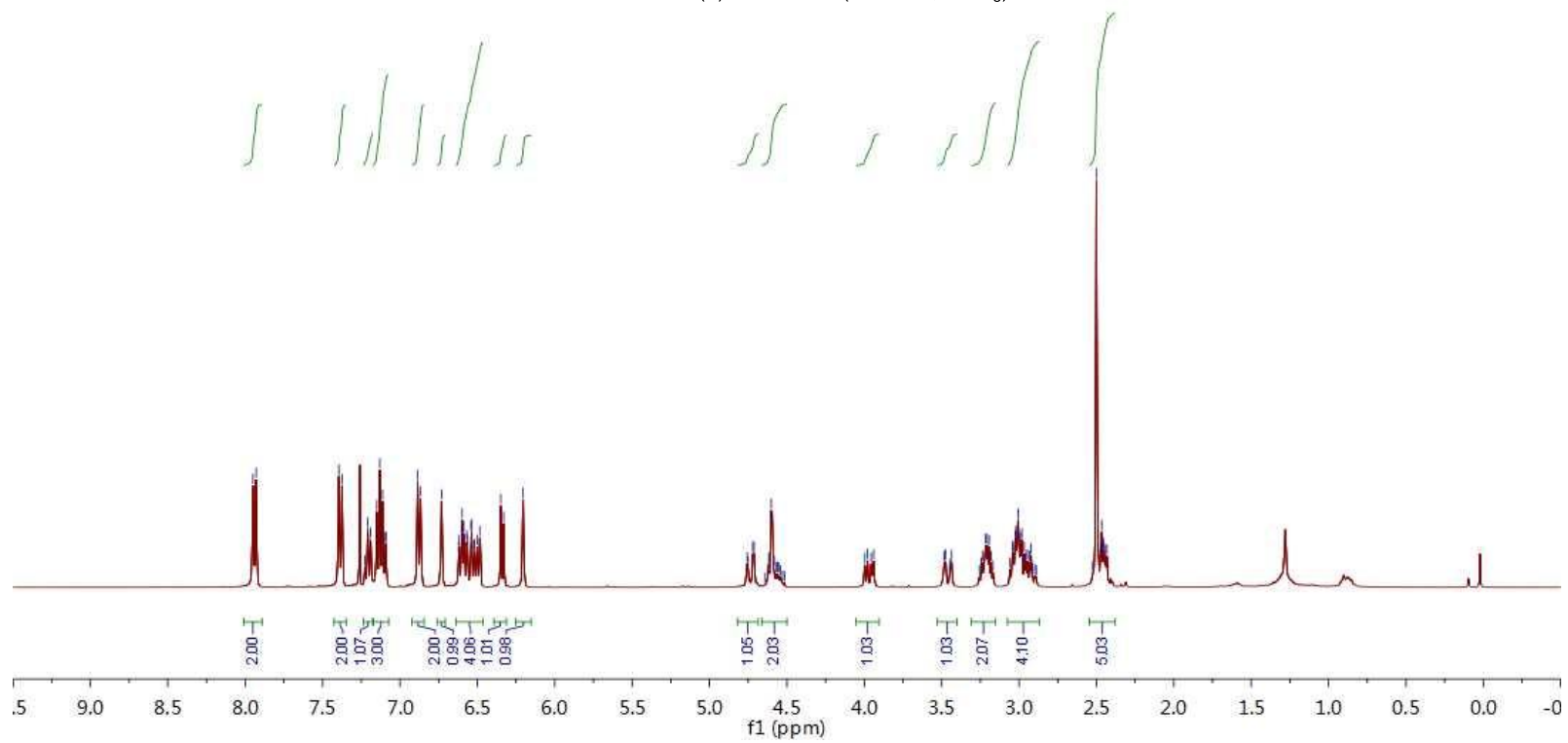


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3.0246
3.0201
3.0066
2.9909
2.9814
2.5005
2.4733
2.4658
2.4563
2.4504
2.4419
2.4319

¹H NMR YZ-4-58B major in CDCl₃



(+)-**2a** ¹H NMR (400 MHz, CDCl₃)





64.63

48.47

35.46

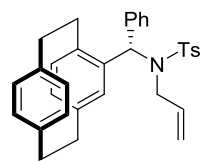
35.41

34.57

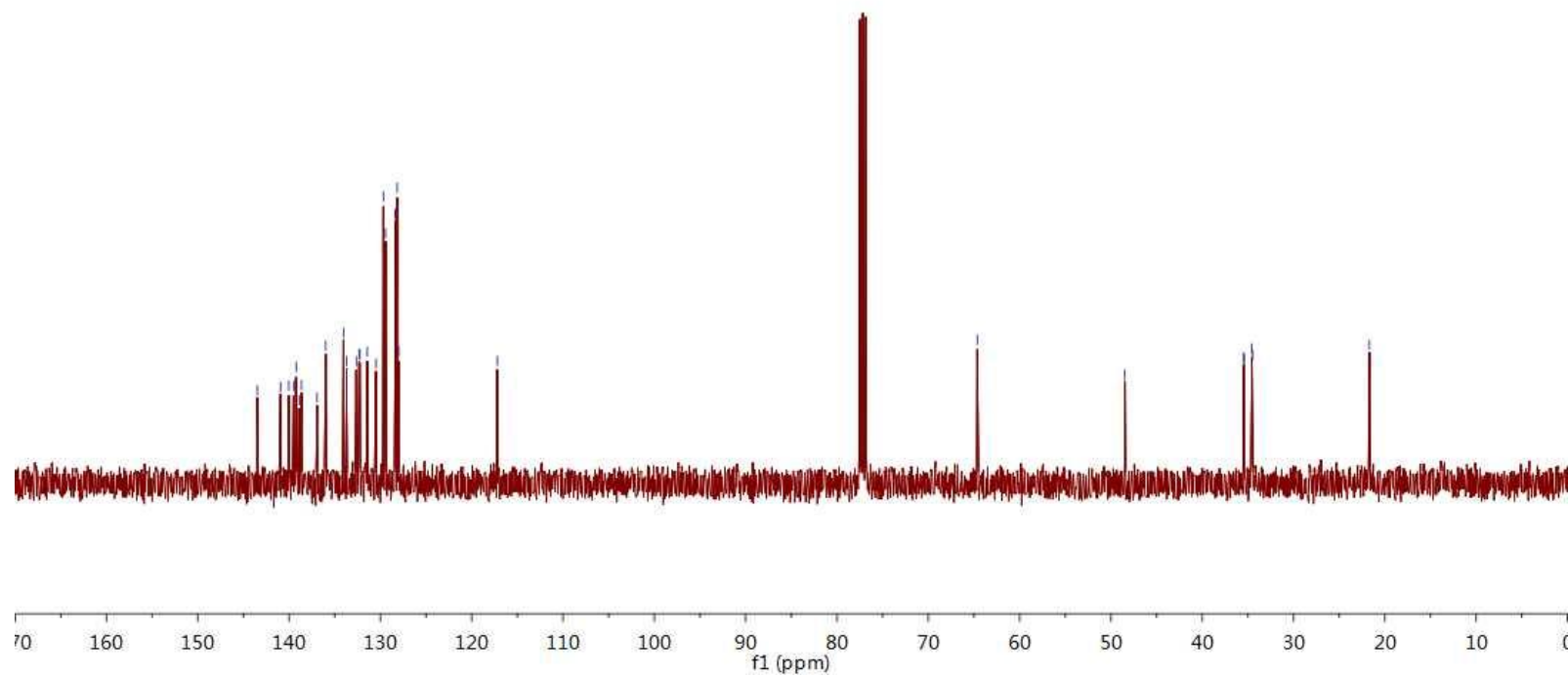
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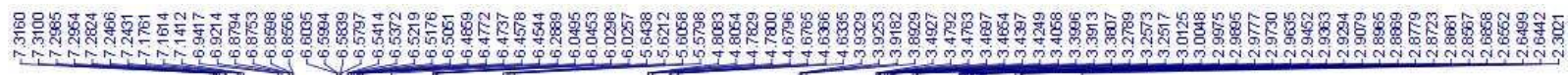
21.70

^{13}C NMR YZ-4-58B major in CDCl_3

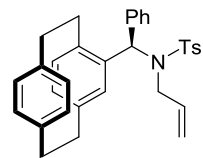


(+)-**2a** ^{13}C NMR (100 MHz, CDCl_3)

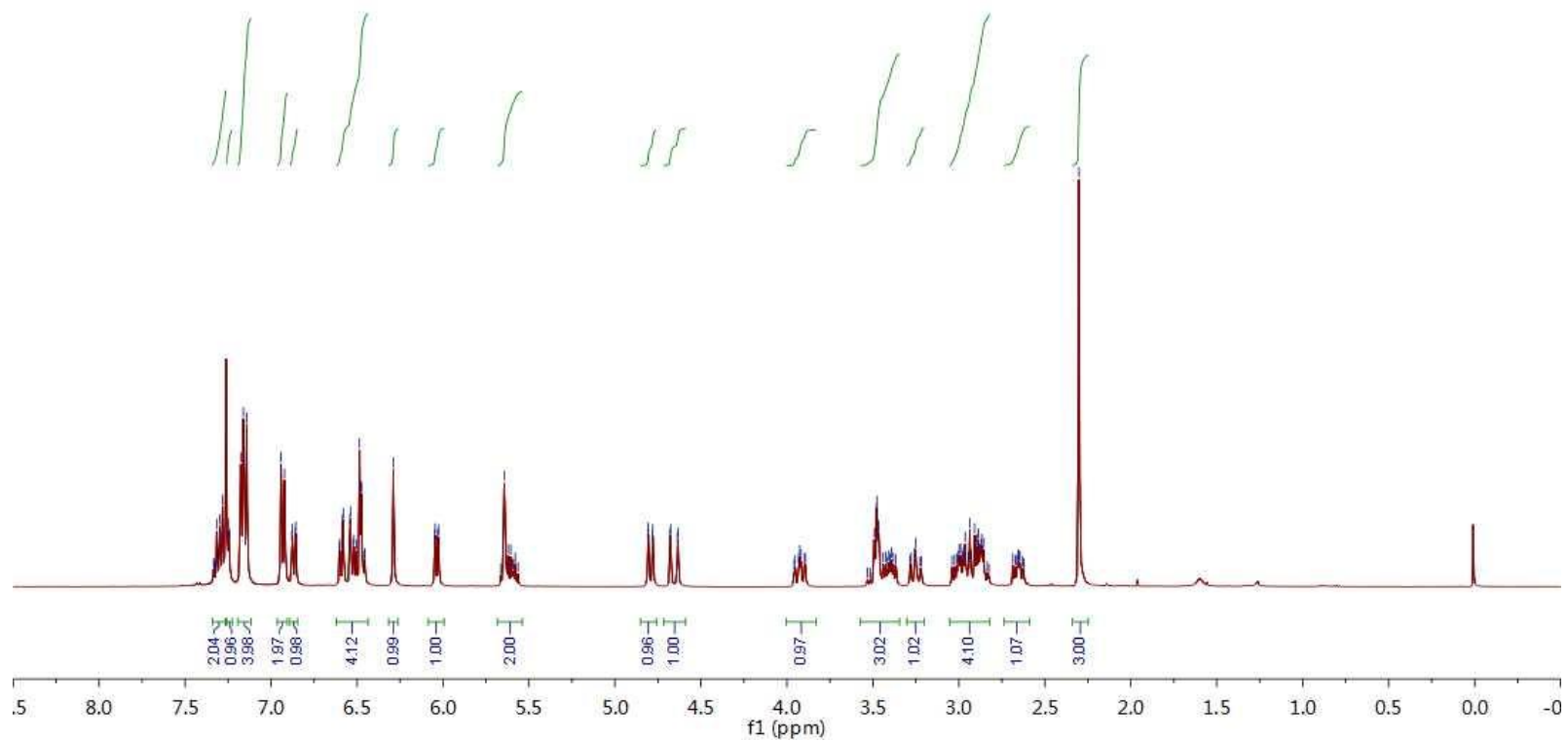


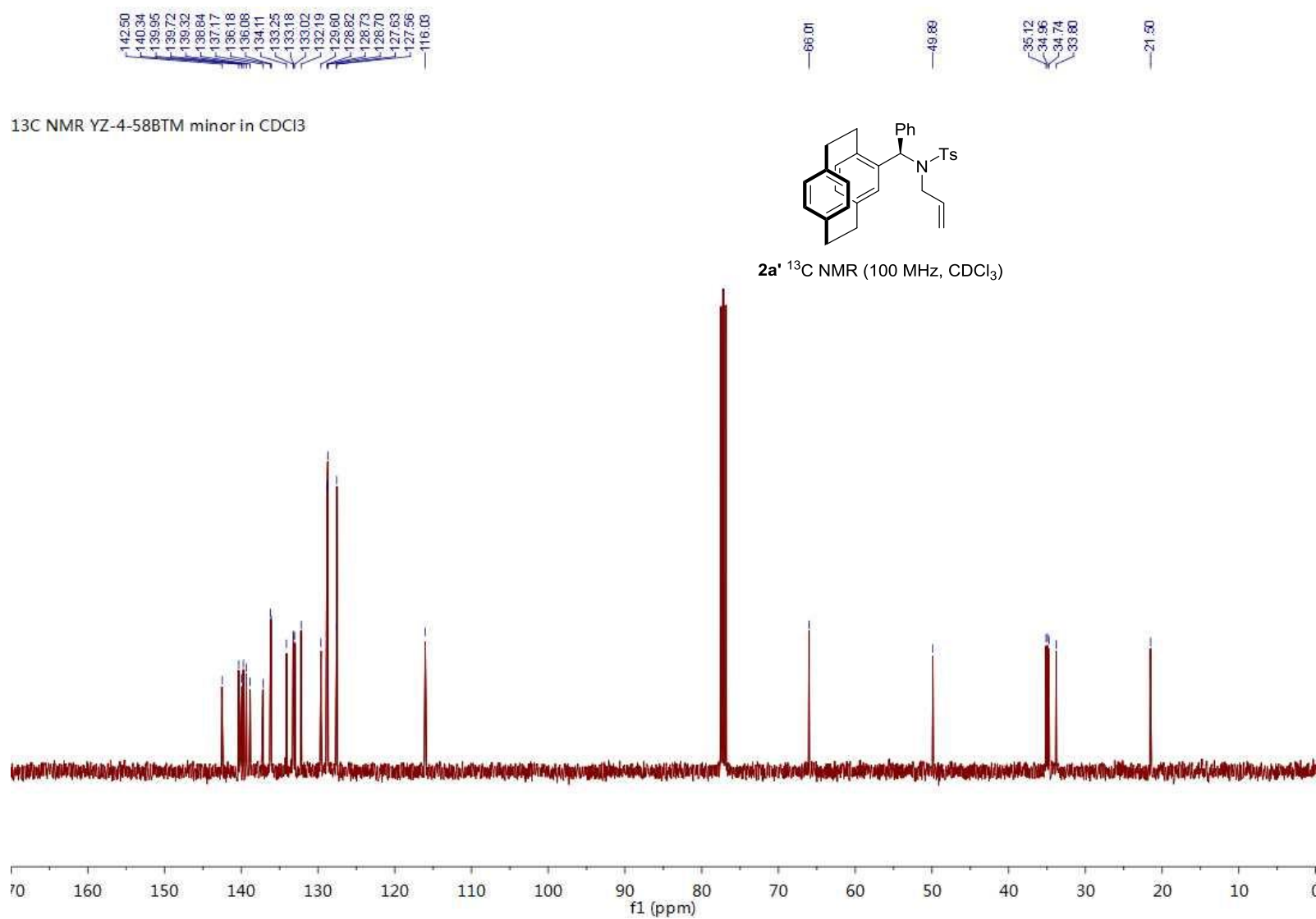


1H NMR YZ-4-58BTM minor in CDCl₃



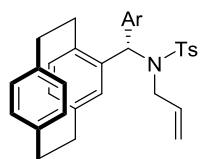
2a' ¹H NMR (400 MHz, CDCl₃)





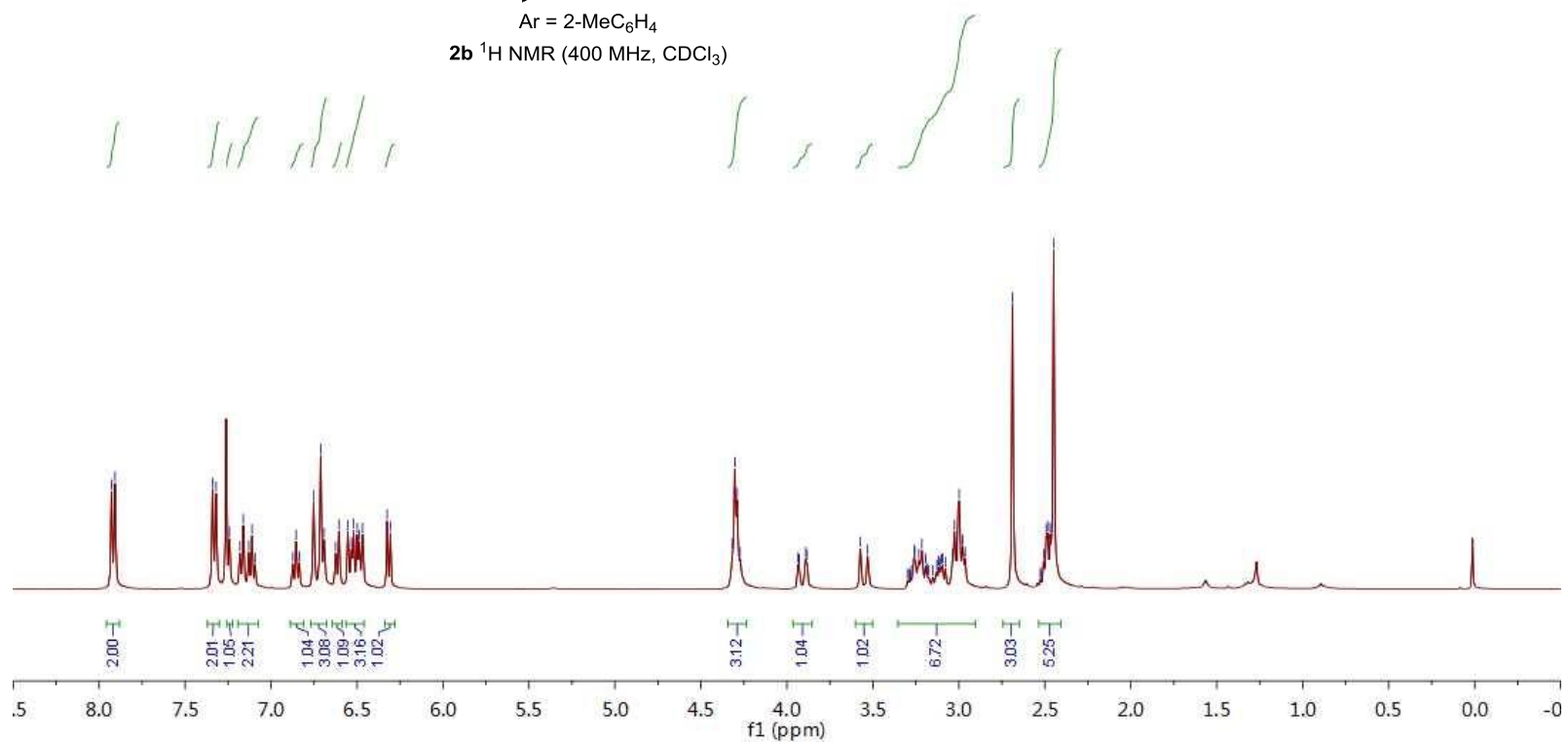


^1H NMR YZ-4-60ATM in CDCl_3



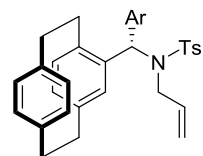
Ar = 2-MeC₆H₄

2b ^1H NMR (400 MHz, CDCl_3)



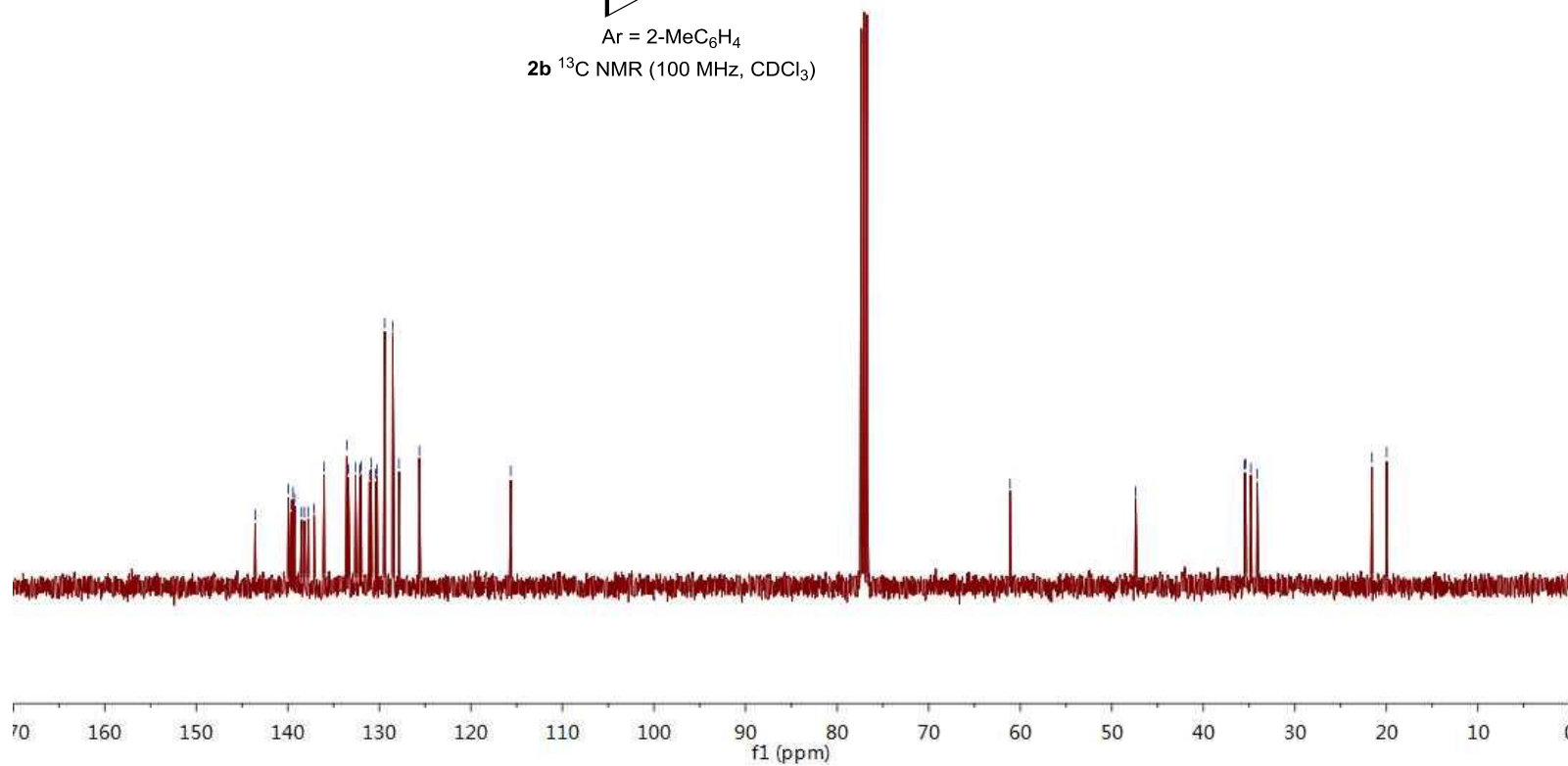


^{13}C NMR YZ-4-60ATM in CDCl_3



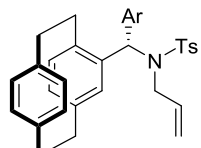
Ar = 2-MeC₆H₄

2b ^{13}C NMR (100 MHz, CDCl_3)



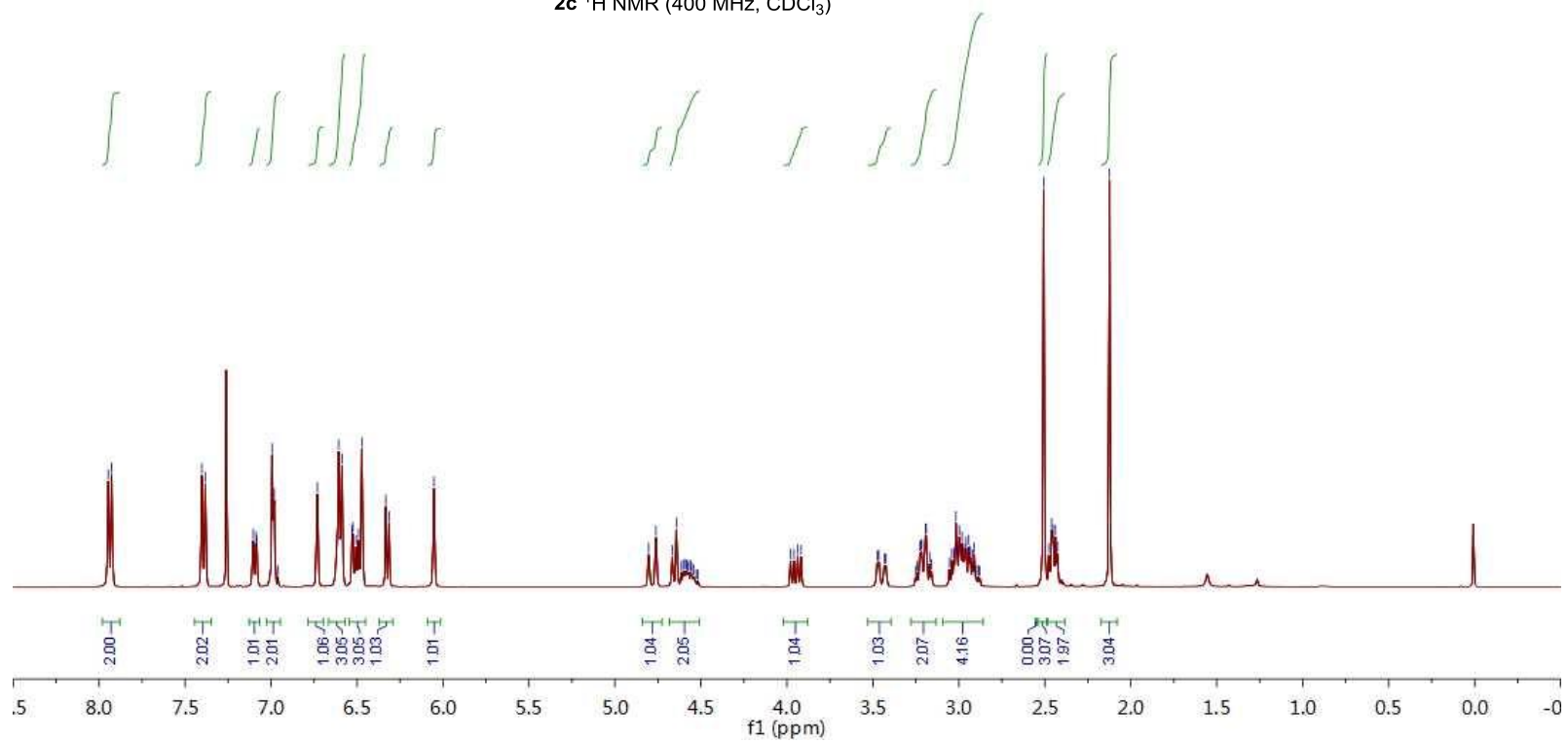


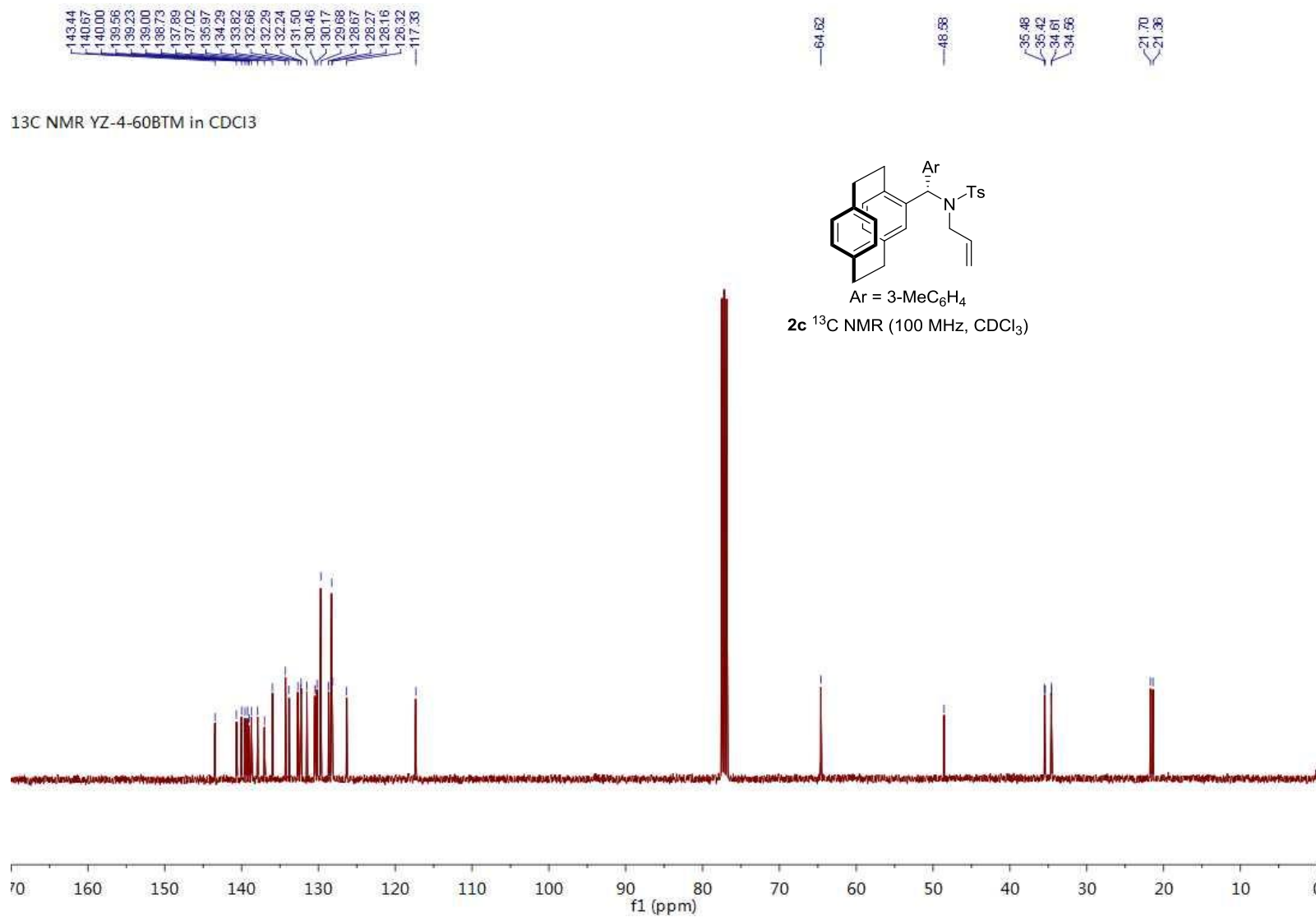
¹H NMR YZ-4-60BTM in CDCl₃



Ar = 3-MeC₆H₄

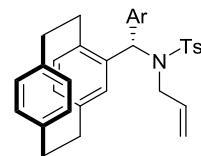
2c ¹H NMR (400 MHz, CDCl₃)





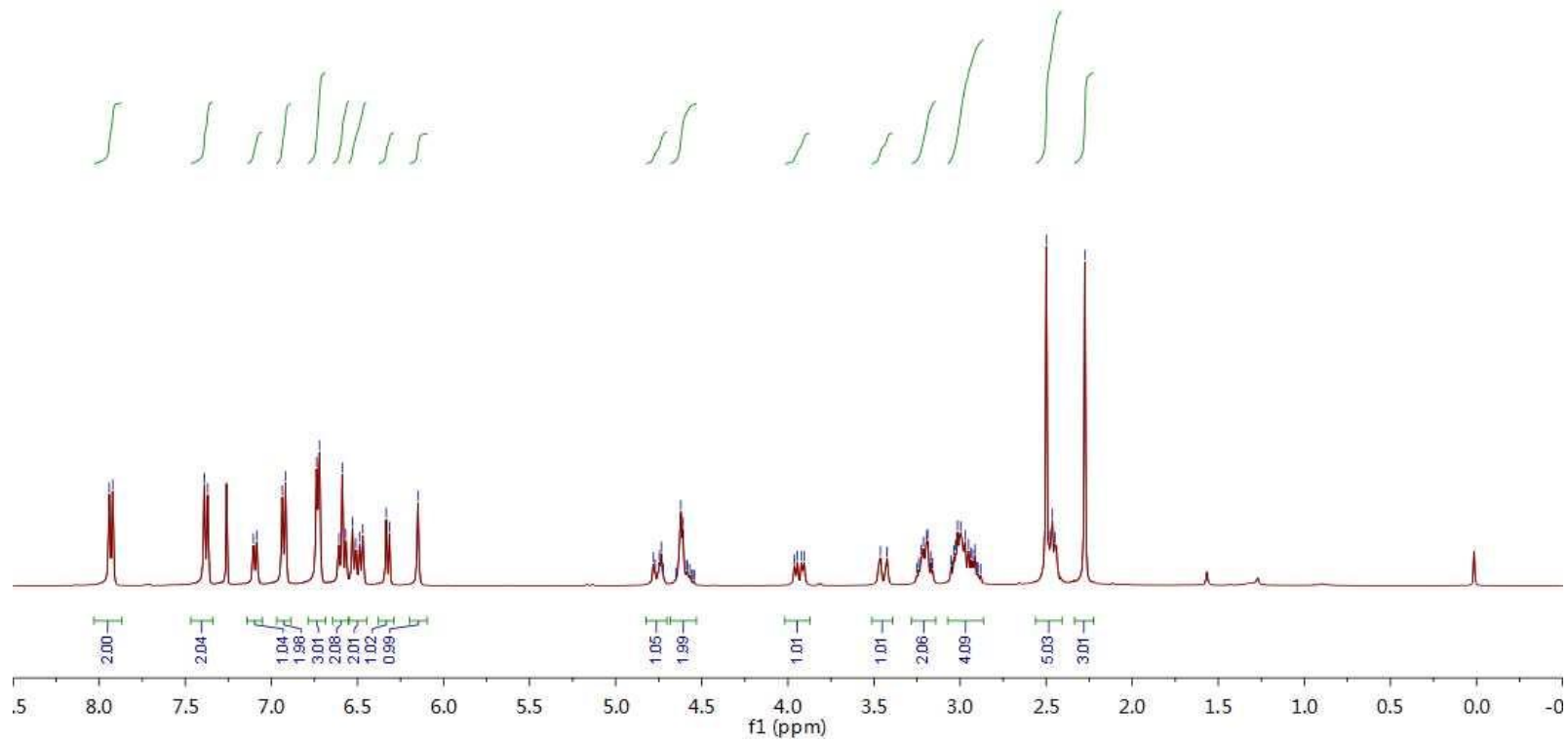
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6.6077
6.5680
6.5678
6.5282
6.5088
6.4873
6.4687
6.3334
6.3146
6.1466
4.7803
4.7707
4.7452
4.7347
4.7240
4.7232
4.6513
4.6216
4.6106
4.5879
4.5625
4.5703
4.5569
3.9476
3.9447
3.9210
3.9044
3.2247
3.2127
3.1950
3.1878
3.0260
3.0148
2.9704
2.9503
2.9184
2.8850
2.4635
2.4481
2.2753

¹H NMR YZ-4-62TM in CDCl₃



Ar = 4-MeC₆H₄

2d ¹H NMR (400 MHz, CDCl₃)





64.39

48.48

35.48

35.42

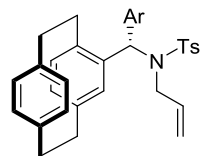
34.58

34.56

21.72

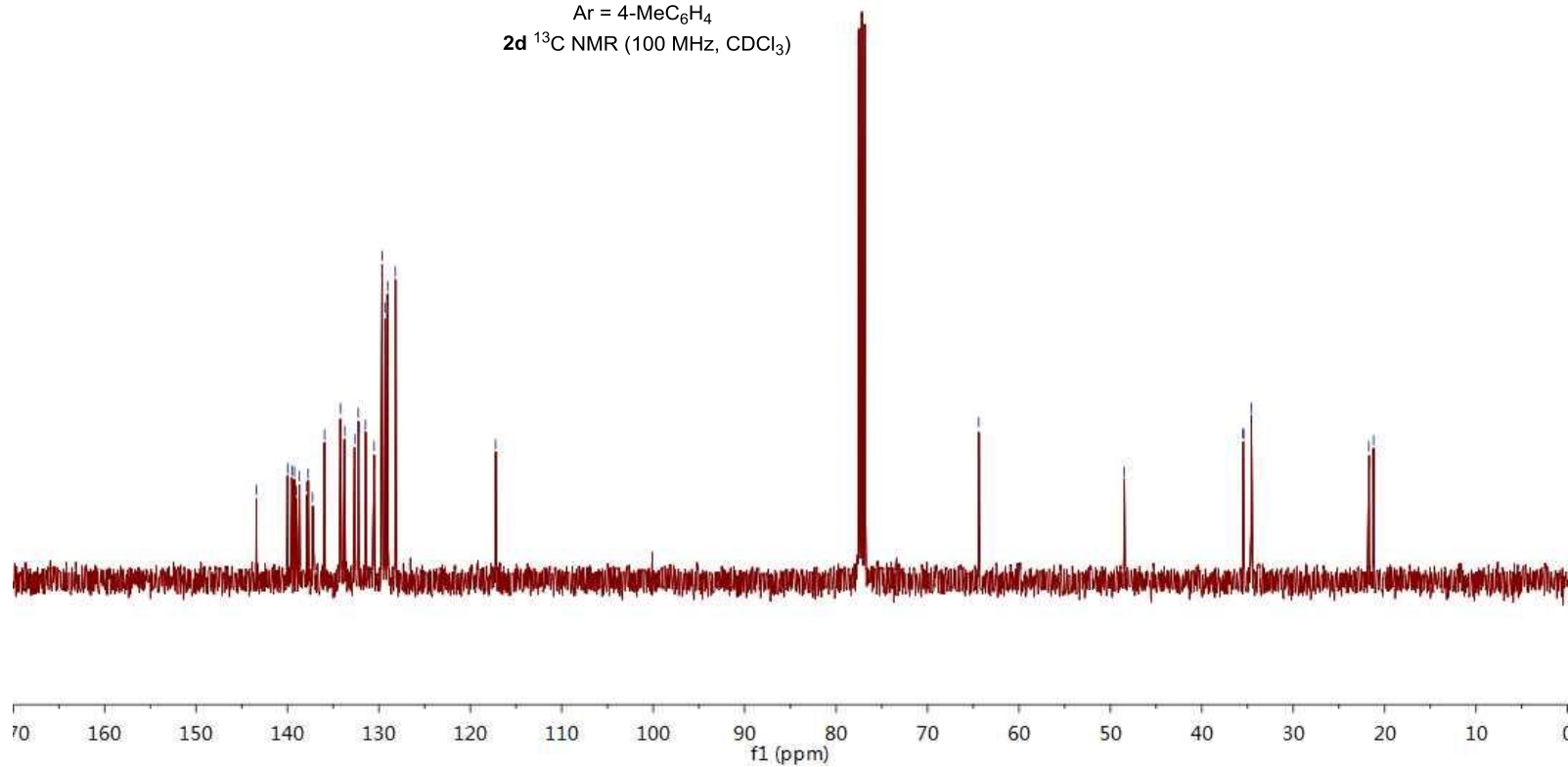
21.20

^{13}C NMR YZ-4-62TM in CDCl_3



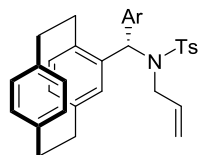
Ar = 4-MeC₆H₄

2d ^{13}C NMR (100 MHz, CDCl_3)



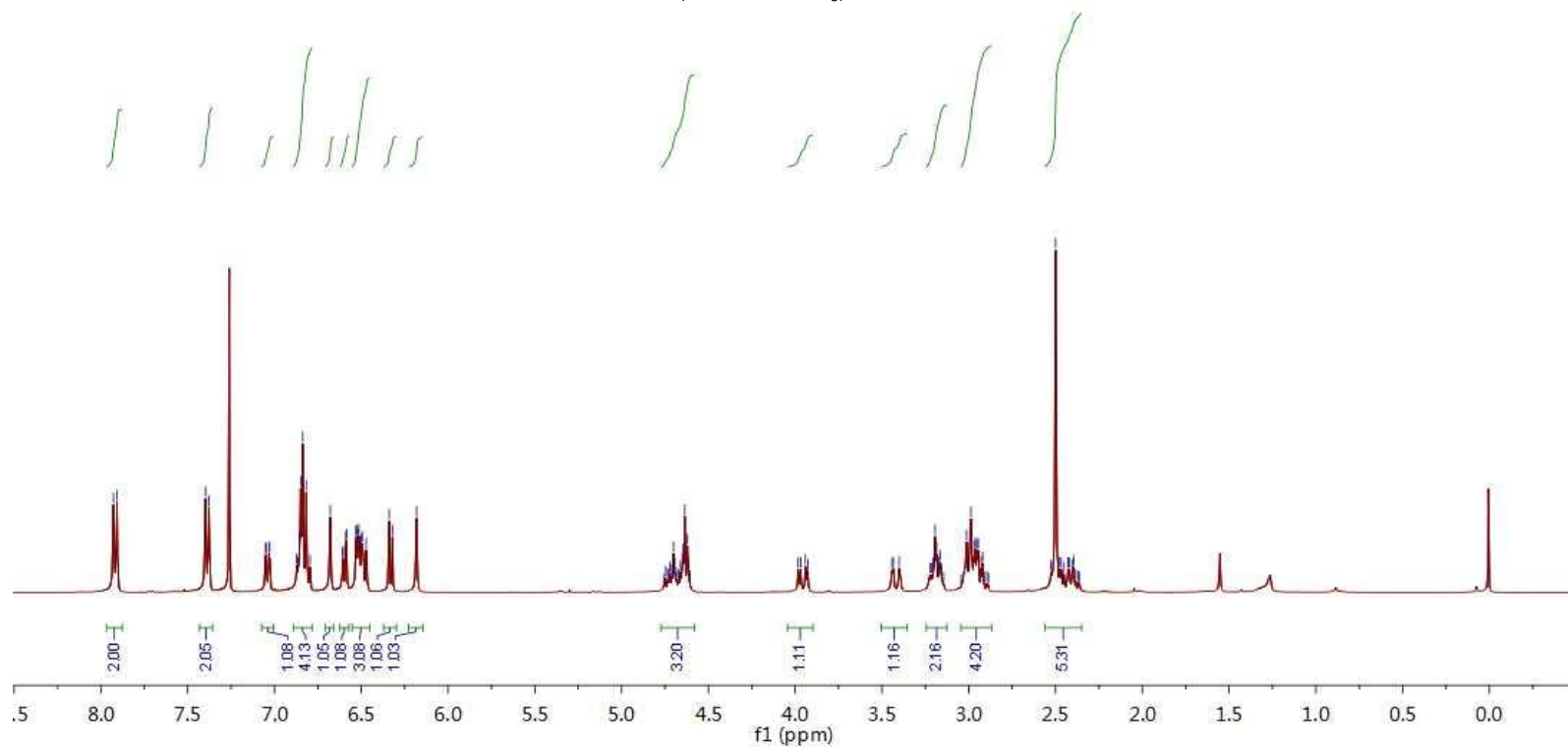


^1H NMR YZ-4-65ATM in CDCl_3



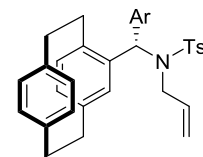
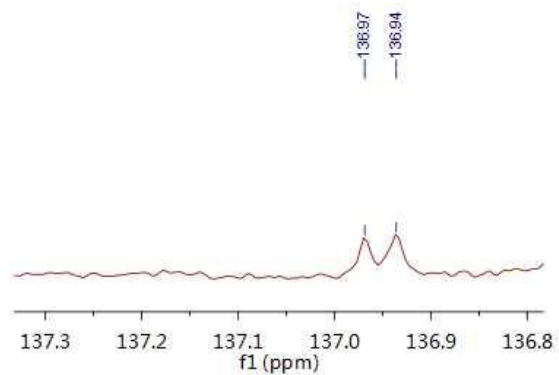
Ar = 4- FC_6H_4

2e ^1H NMR (400 MHz, CDCl_3)



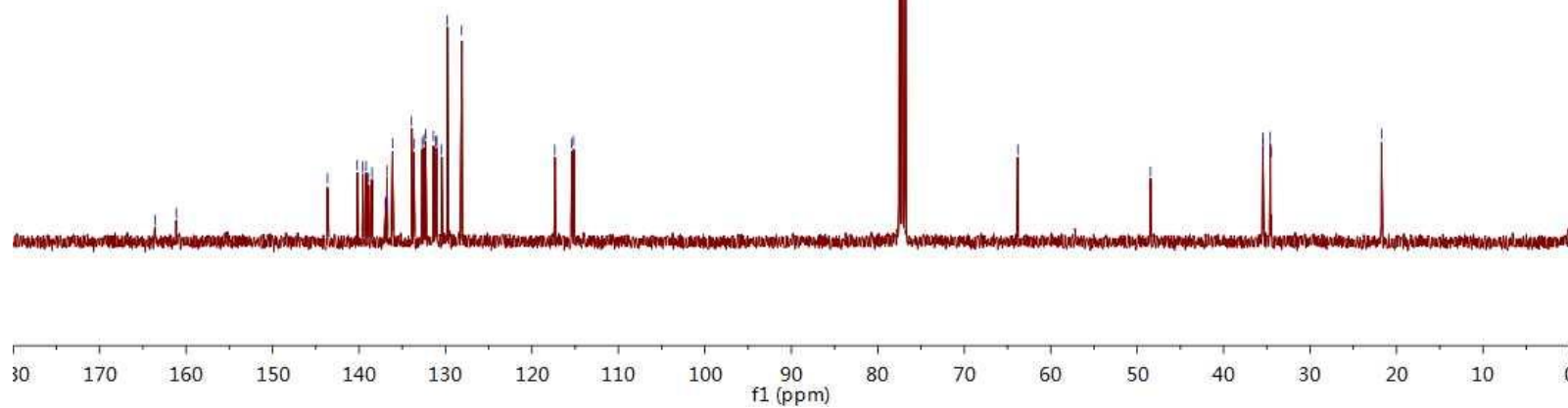


¹³C NMR YZ-4-65ATM in CDCl₃



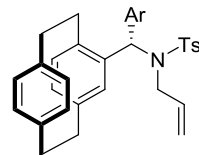
Ar = 4-FC₆H₄

2e ¹³C NMR (100 MHz, CDCl₃)



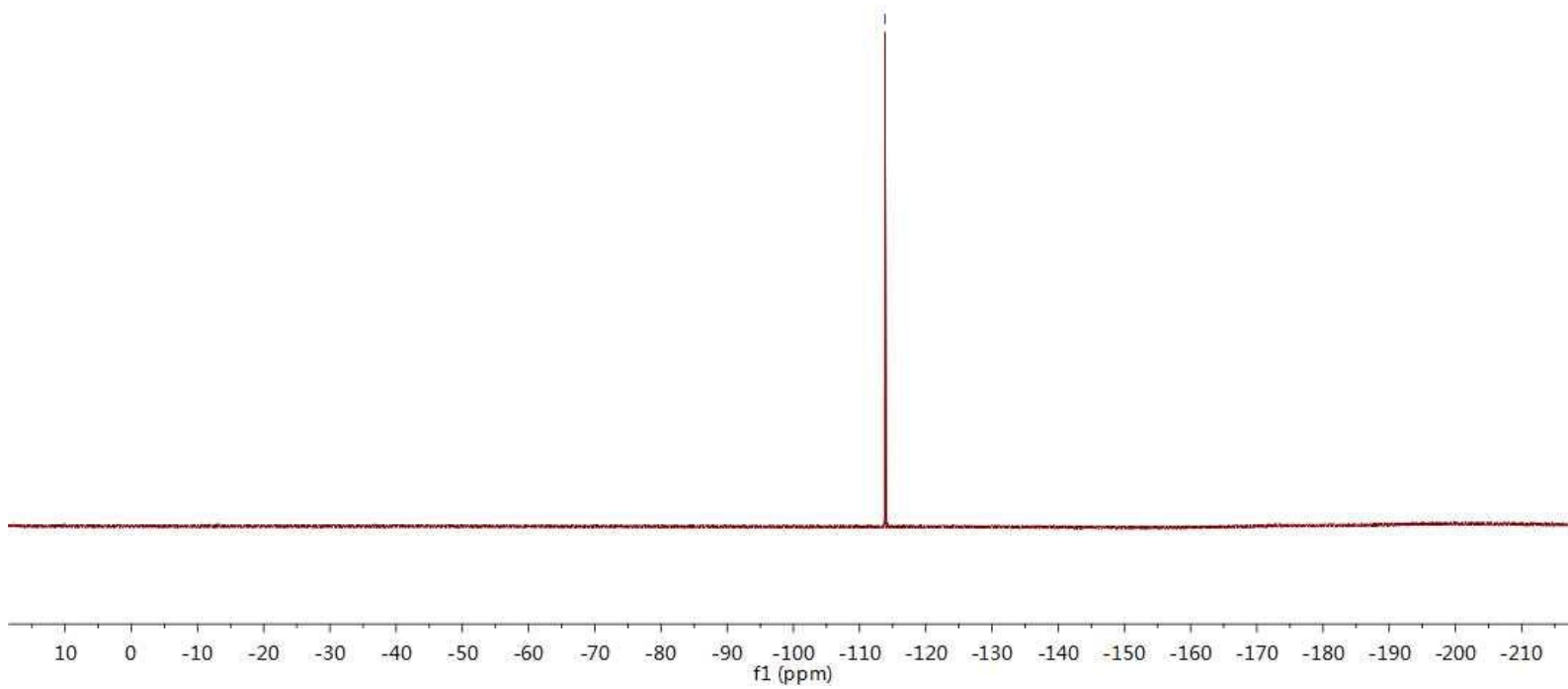
¹⁹F NMR YZ-4-65ATM in CDCl₃

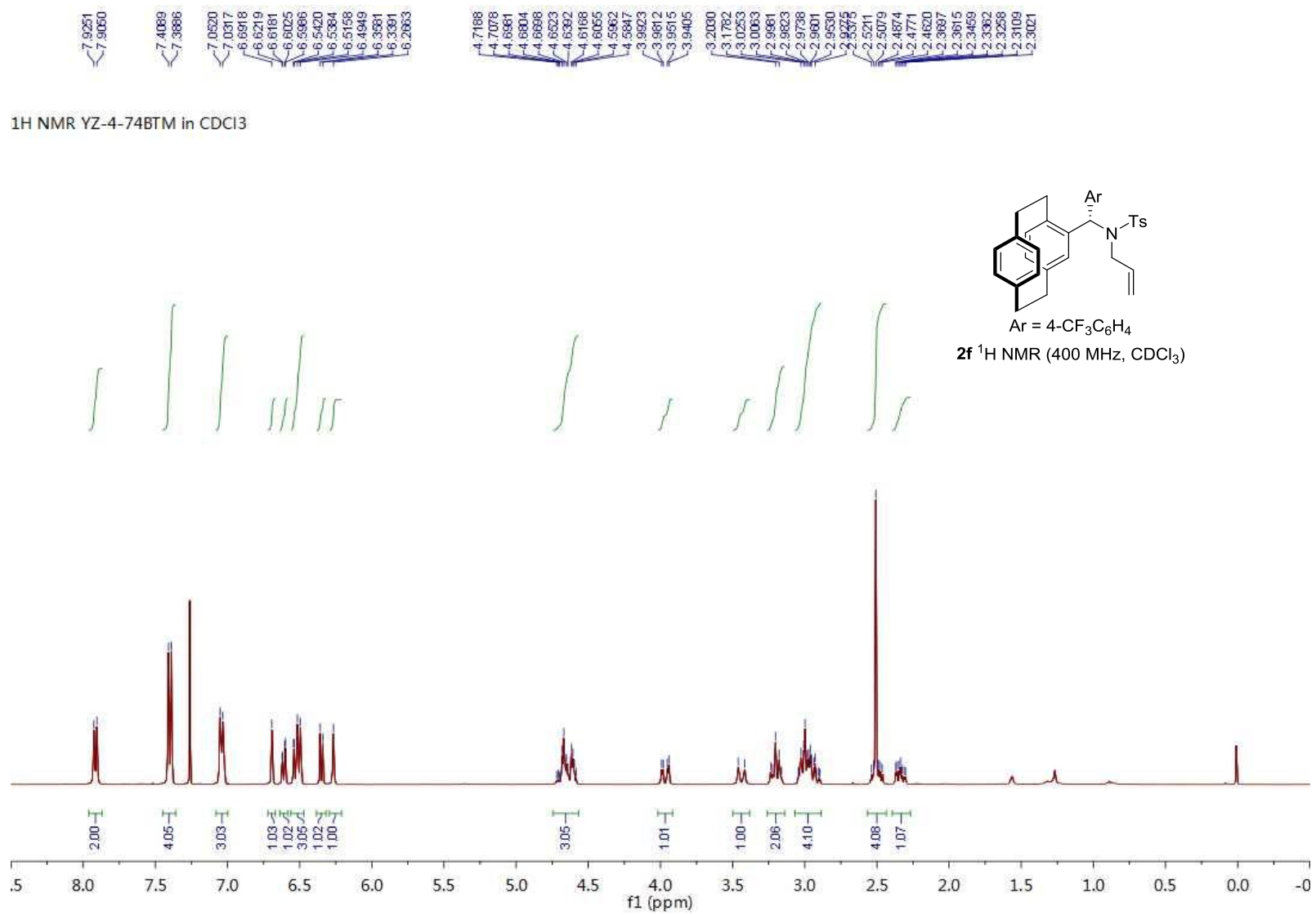
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Ar = 4-FC₆H₄

2e ¹⁹F NMR (376 MHz, CDCl₃)







63.97

48.63

35.44

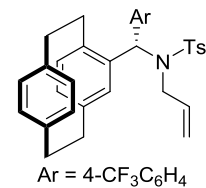
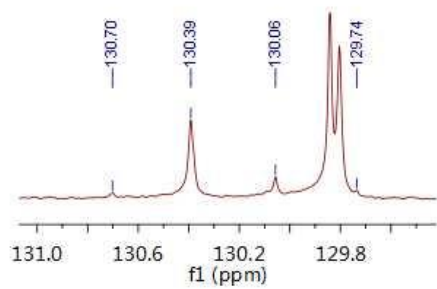
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34.58

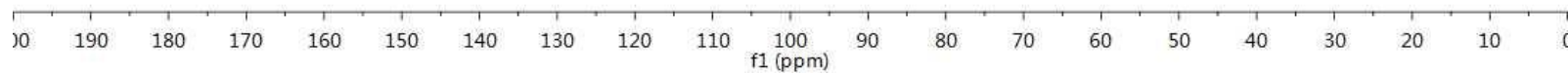
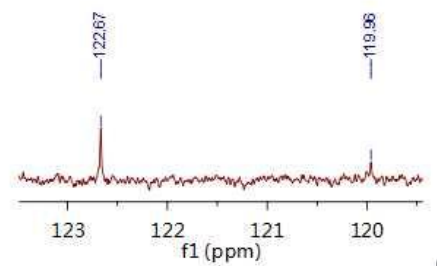
34.47

21.72

¹H NMR YZ-4-74BTM in CDCl₃

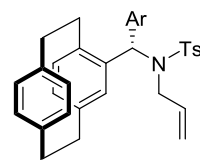


2f ¹³C NMR (100 MHz, CDCl₃)



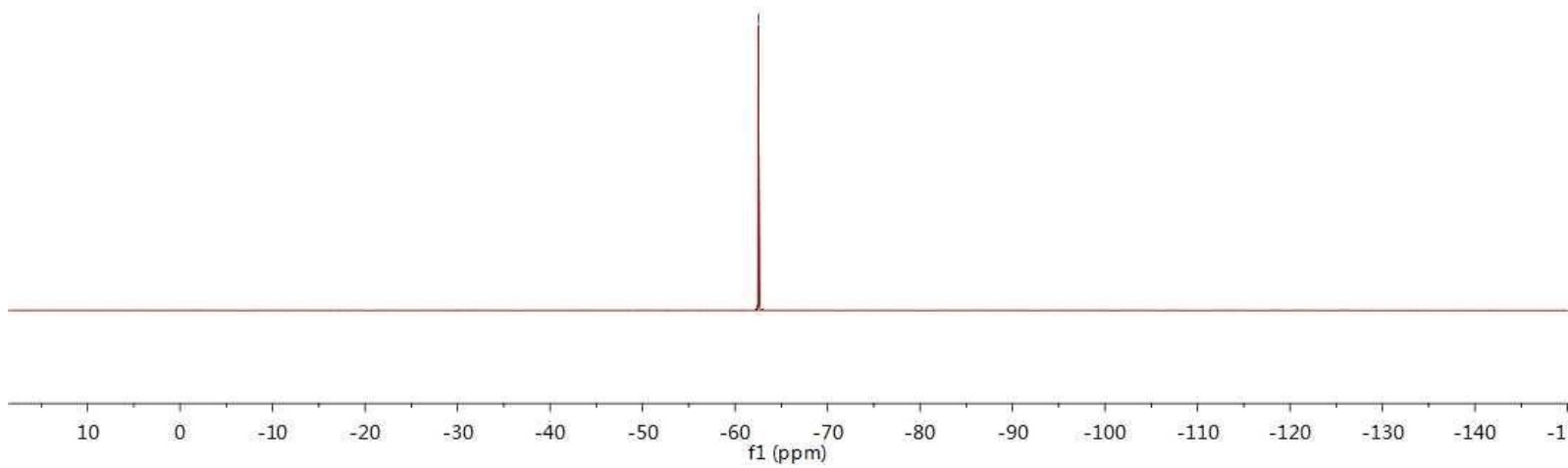
19F NMR YZ-4-74BTM in CDCl3

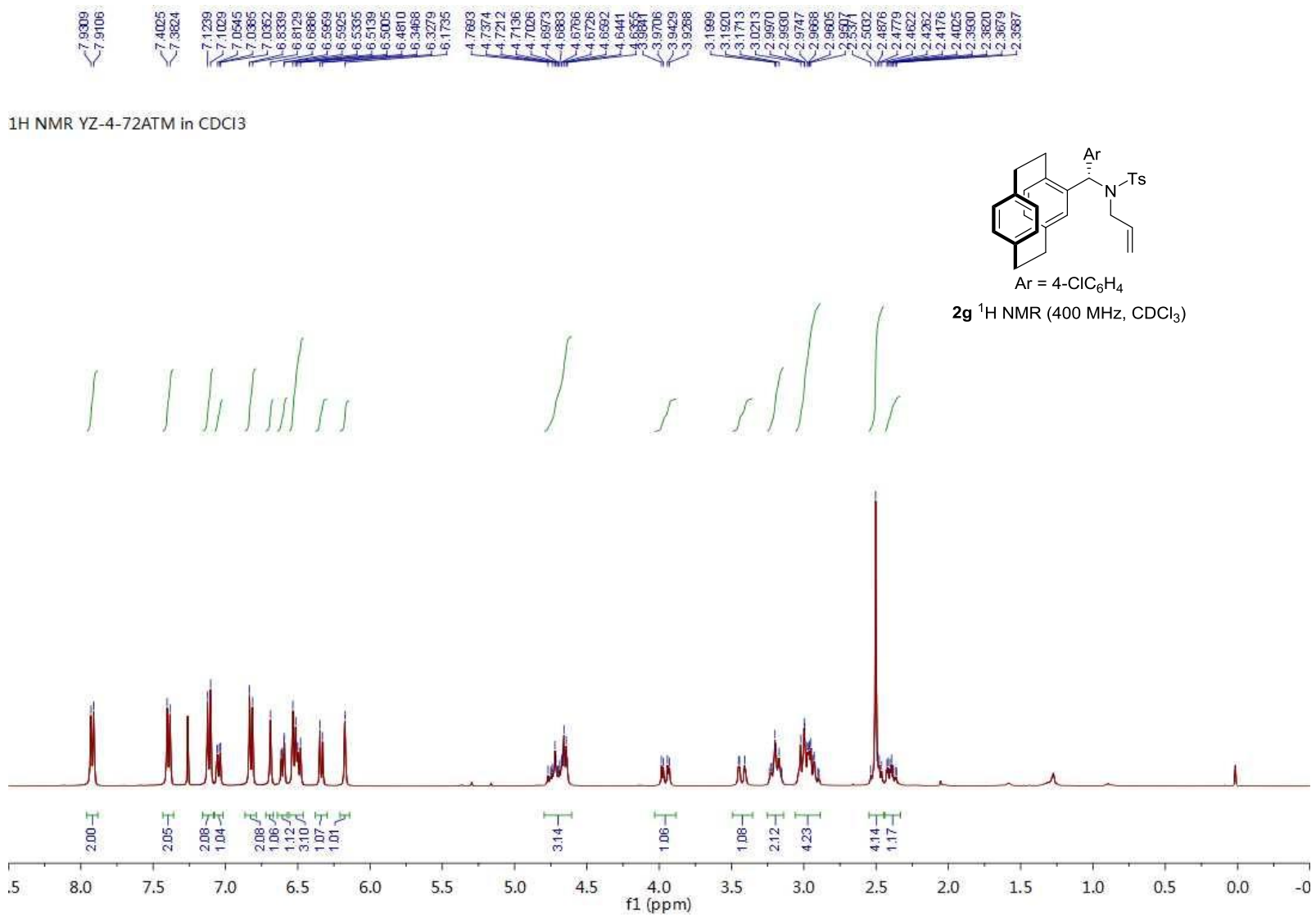
62.52



Ar = 4-CF₃C₆H₄

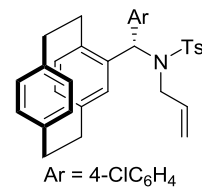
2f ¹⁹F NMR (376 MHz, CDCl₃)



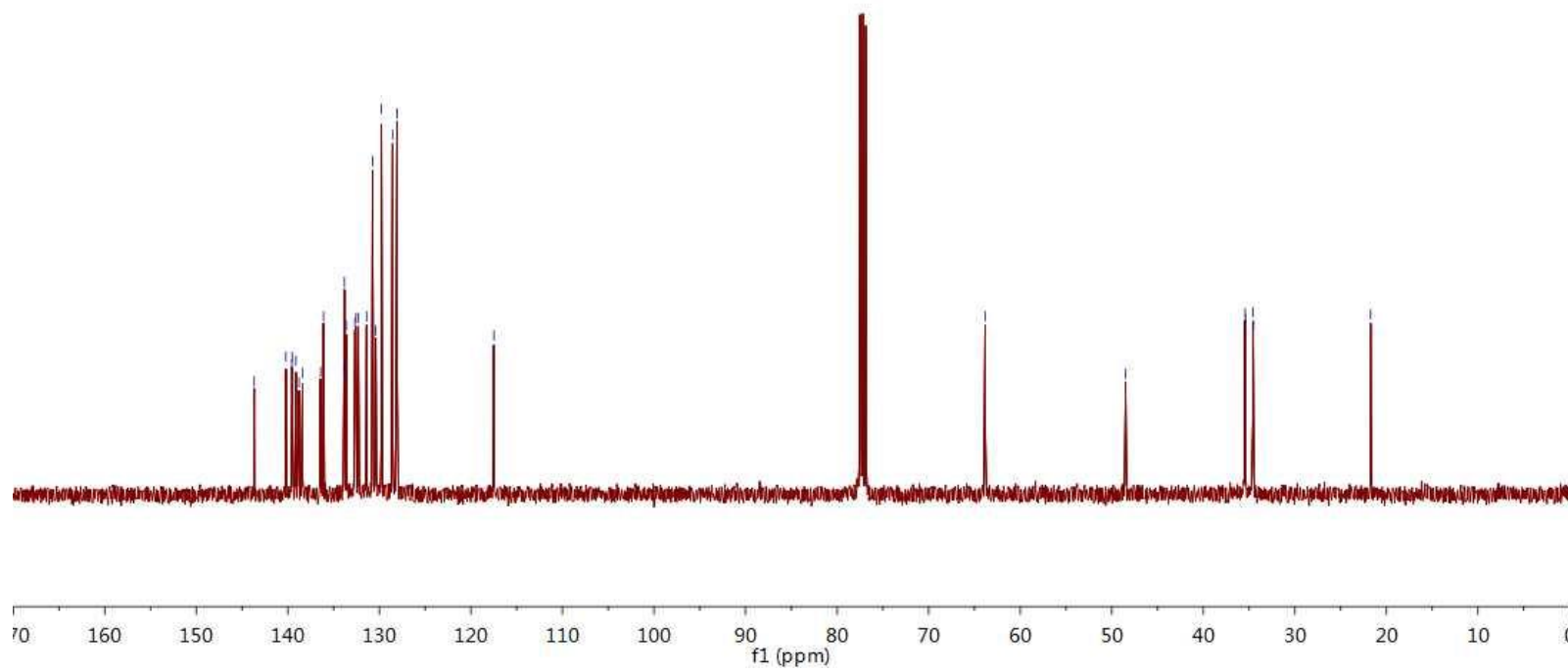




^{13}C NMR YZ-4-72ATM in CDCl_3

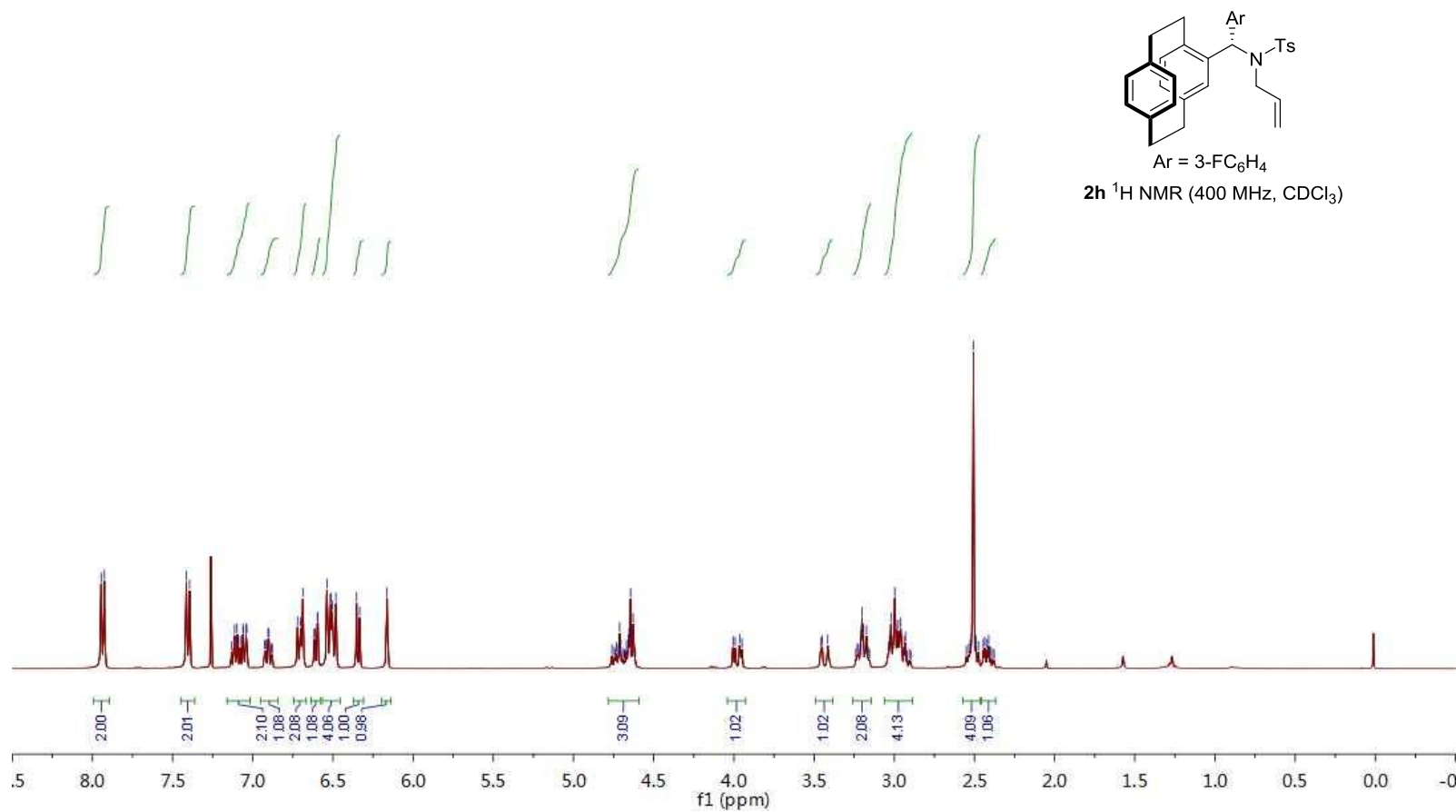


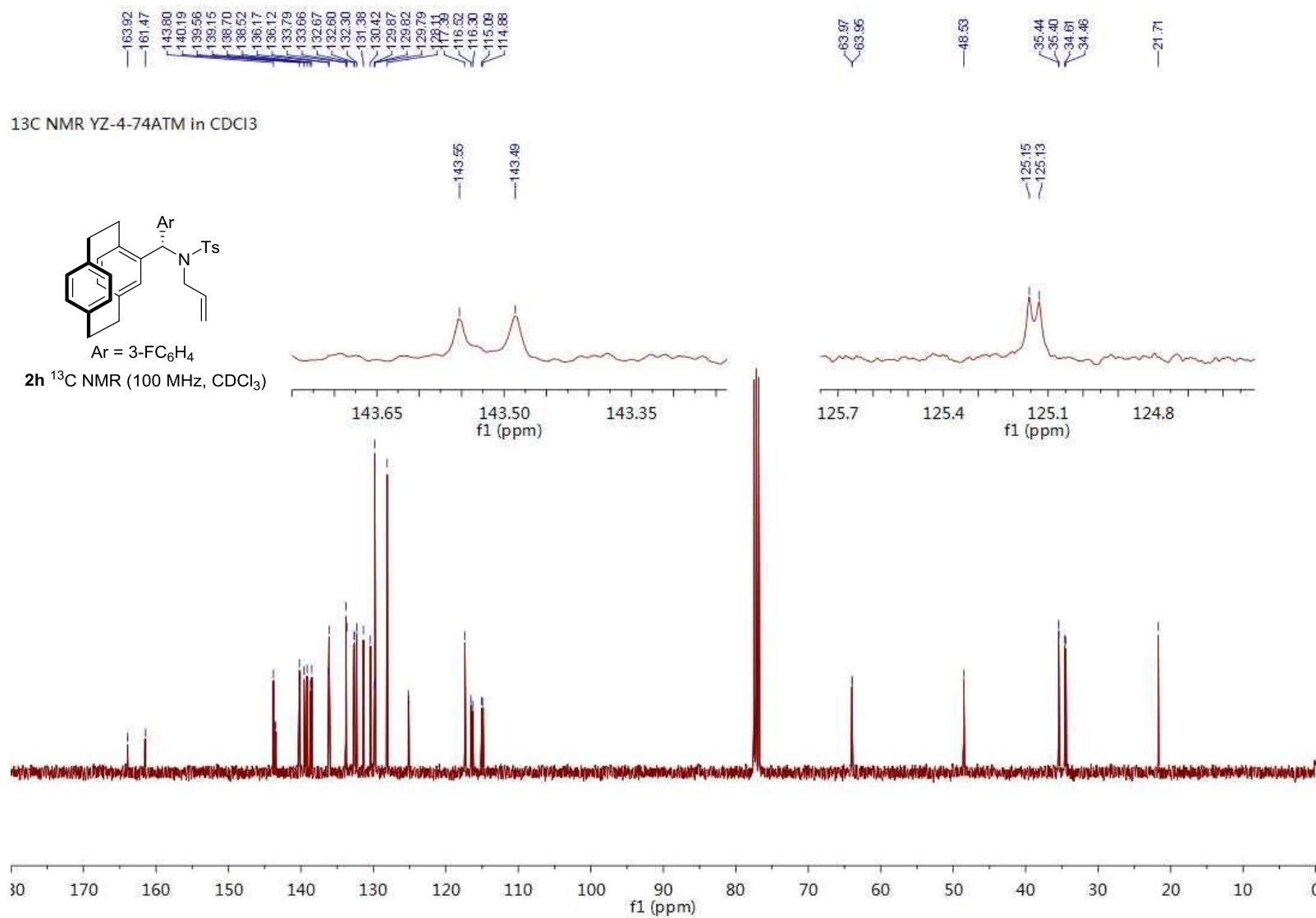
2g ^{13}C NMR (100 MHz, CDCl_3)



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7.9251
7.4142
7.3940
7.1329
7.1176
7.1130
7.0860
7.0681
7.0781
7.0615
7.0571
7.0419
7.0377
6.9253
6.9197
6.9046
6.8990
6.8842
6.8784
6.7208
6.7012
6.6875
6.6169
6.6126
6.5973
6.5932
6.5377
6.5167
6.5139
6.5044
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6.3528
6.3339
6.1629
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4.7450
4.7317
4.7203
4.7123
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4.6696
4.6585
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4.6442
4.6284
4.6143
4.0057
3.9920
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3.2221
3.2103
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3.0206
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2.9388
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2.3881

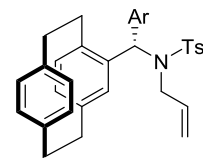
¹H NMR YZ-4-74ATM in CDCl₃





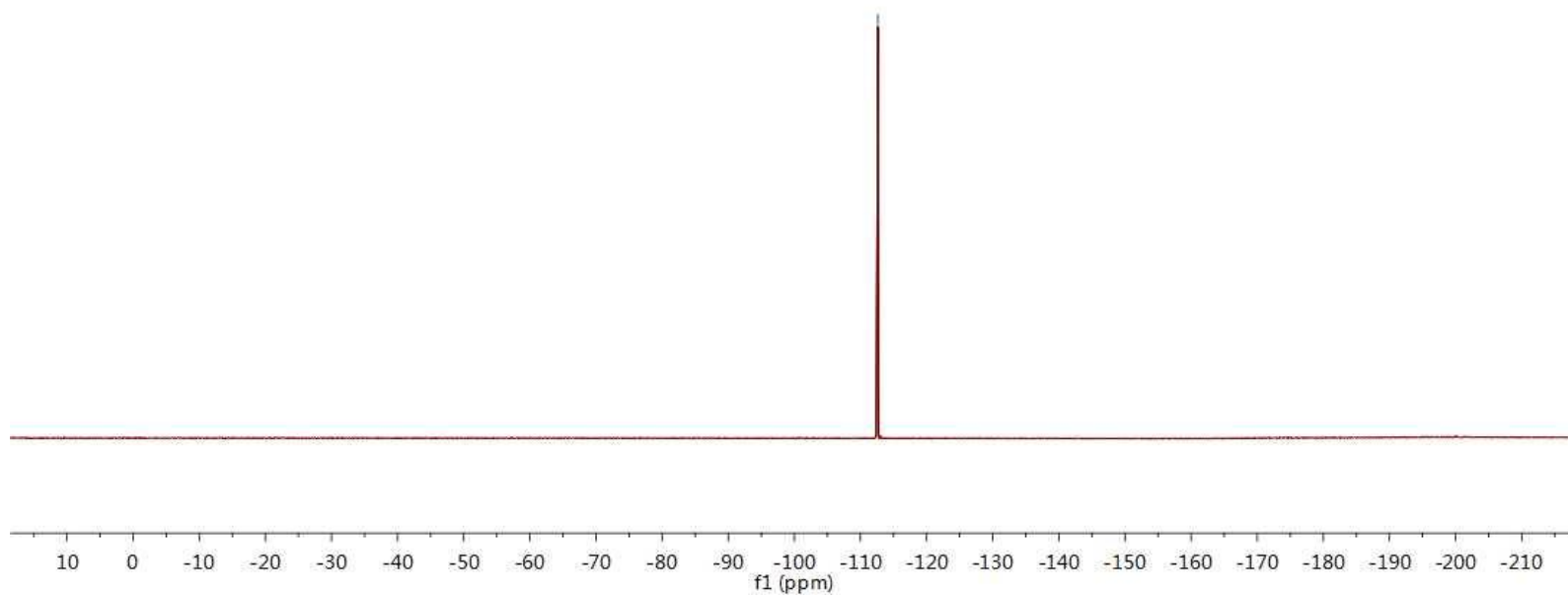
¹⁹F NMR YZ-4-74ATM in CDCl₃

-112.83



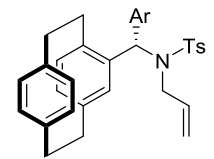
Ar = 3-FC₆H₄

2h ¹⁹F NMR (376 MHz, CDCl₃)



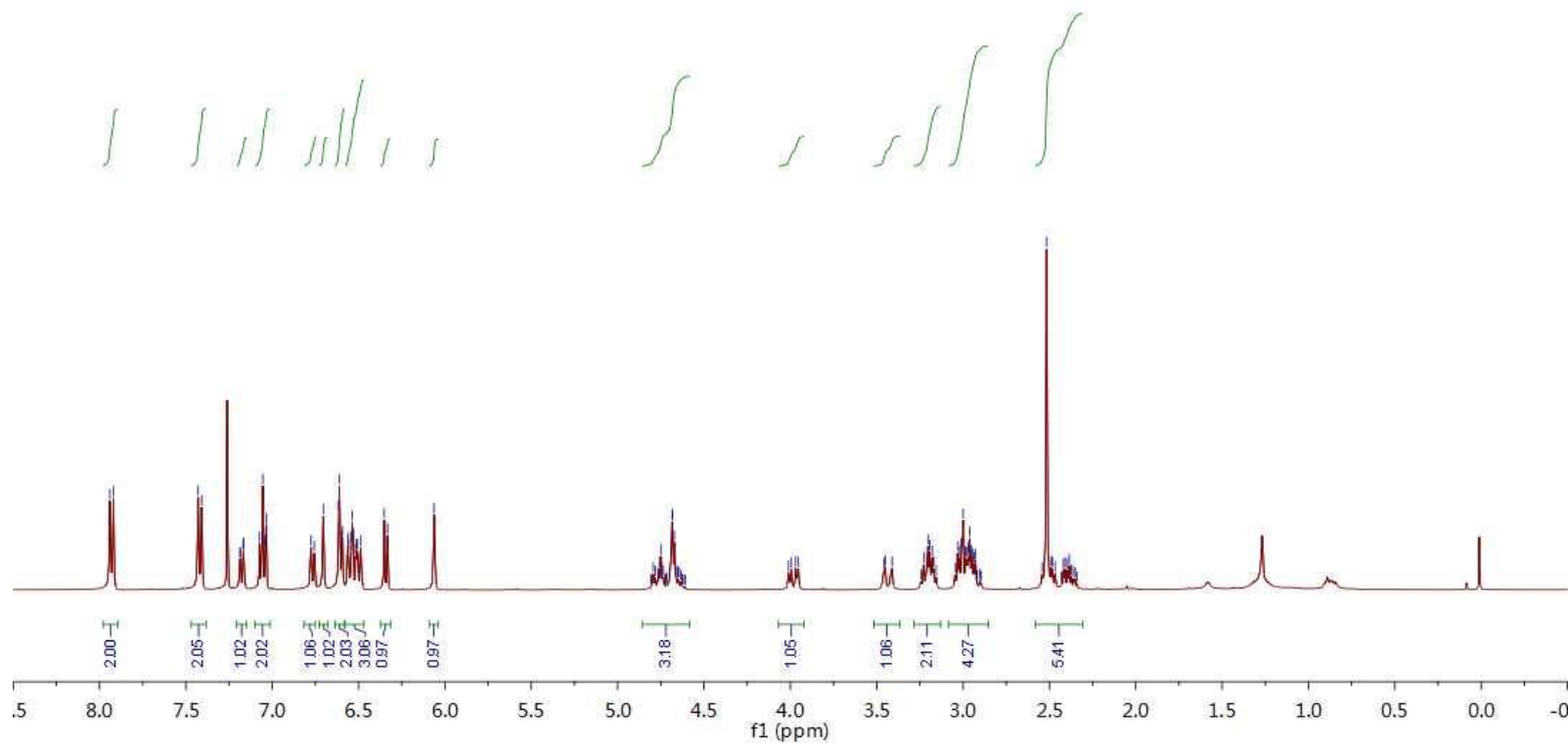
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7.0398
7.0345
6.7754
6.7559
6.7040
6.6155
6.6111
6.5970
6.5925
6.5620
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6.5423
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2.3515

¹H NMR YZ-4-77TM in CDCl₃



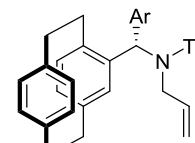
Ar = 3-ClC₆H₄

2i ¹H NMR (400 MHz, CDCl₃)



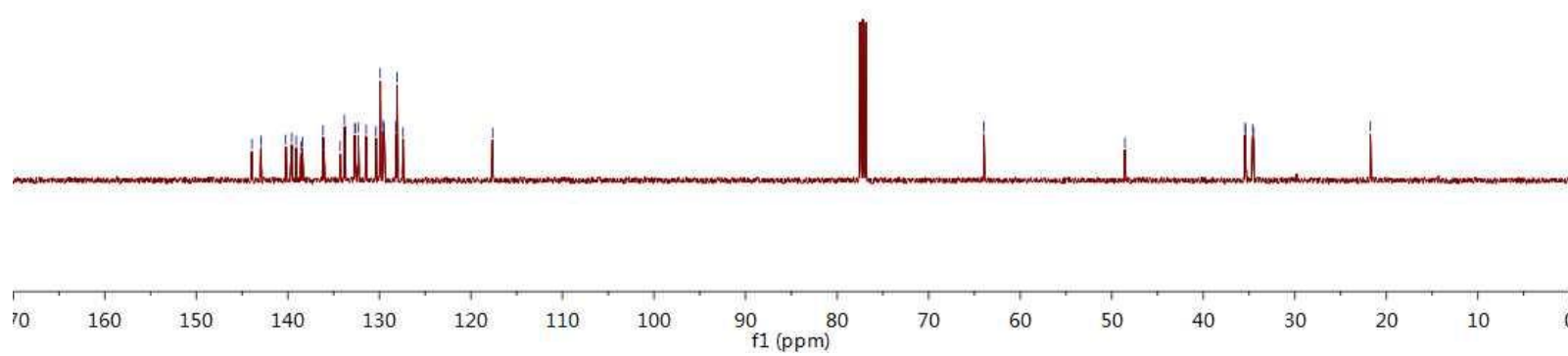


^{13}C NMR YZ-4-77TM in CDCl_3



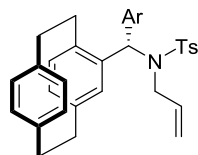
Ar = 3-ClC₆H₄

2i ^{13}C NMR (100 MHz, CDCl_3)



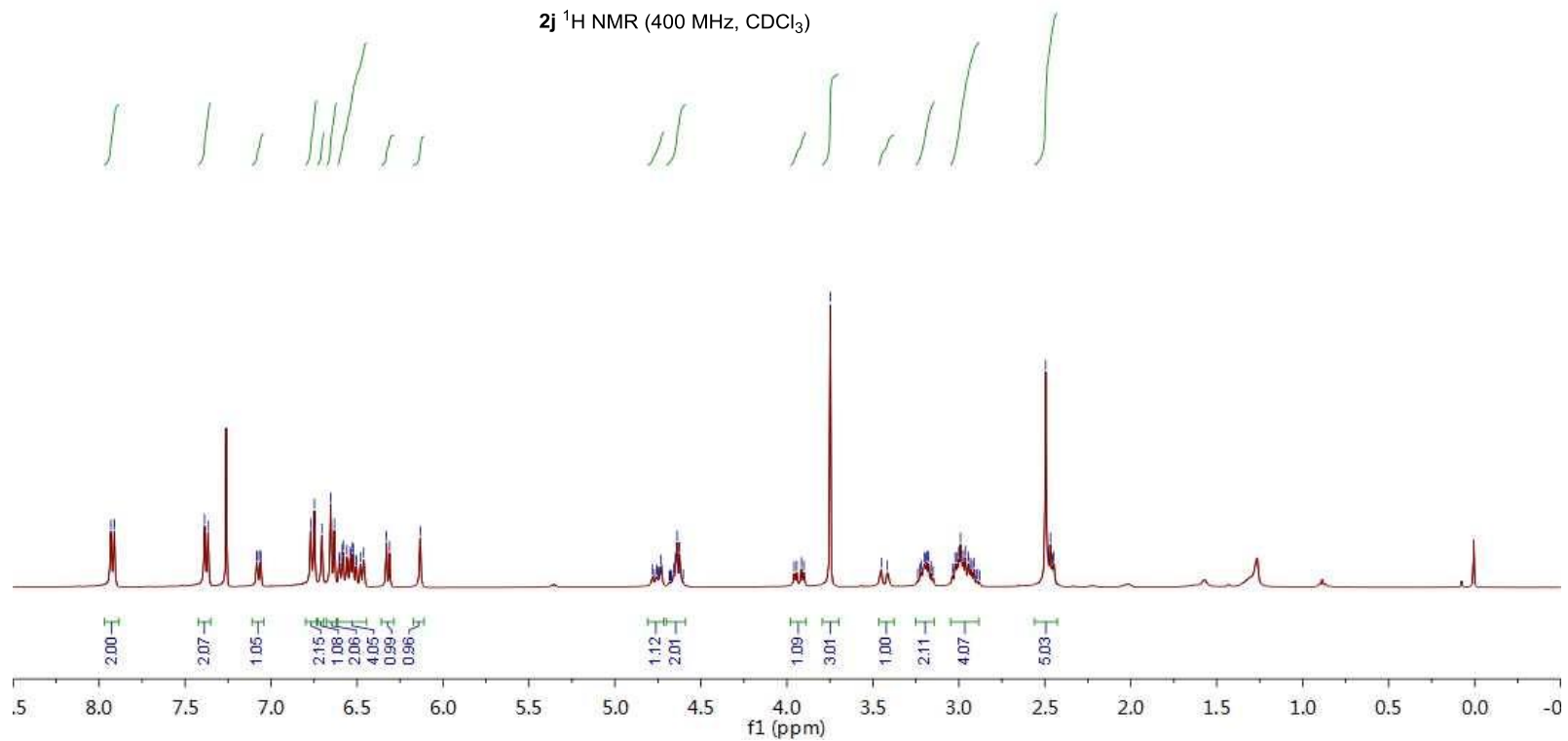


^1H NMR YZ-4-65BTM in CDCl_3



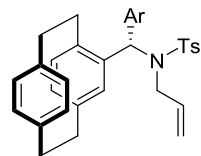
Ar = 4-MeOC₆H₄

2j ^1H NMR (400 MHz, CDCl_3)



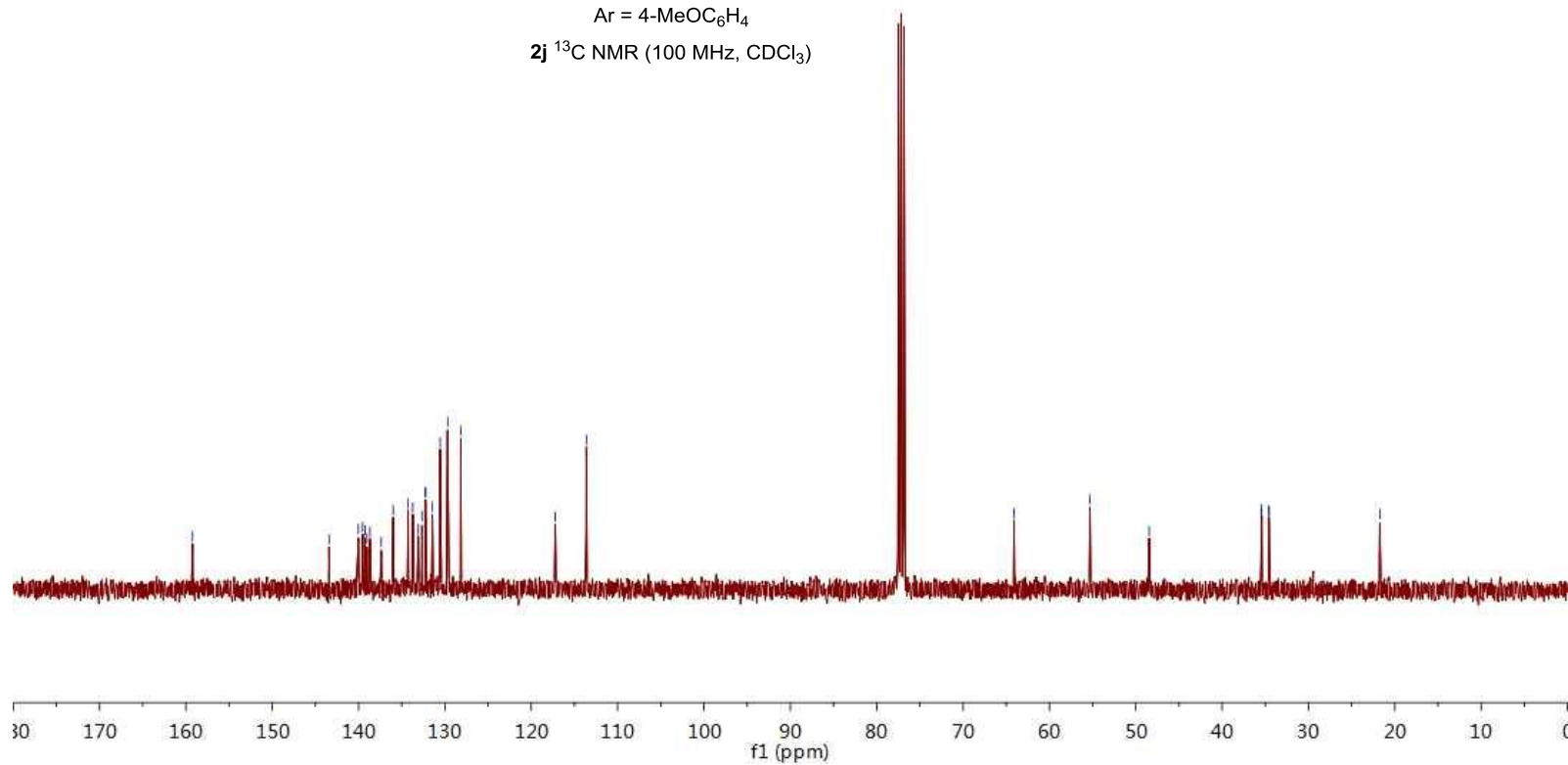


^{13}C NMR YZ-4-65BTM in CDCl_3



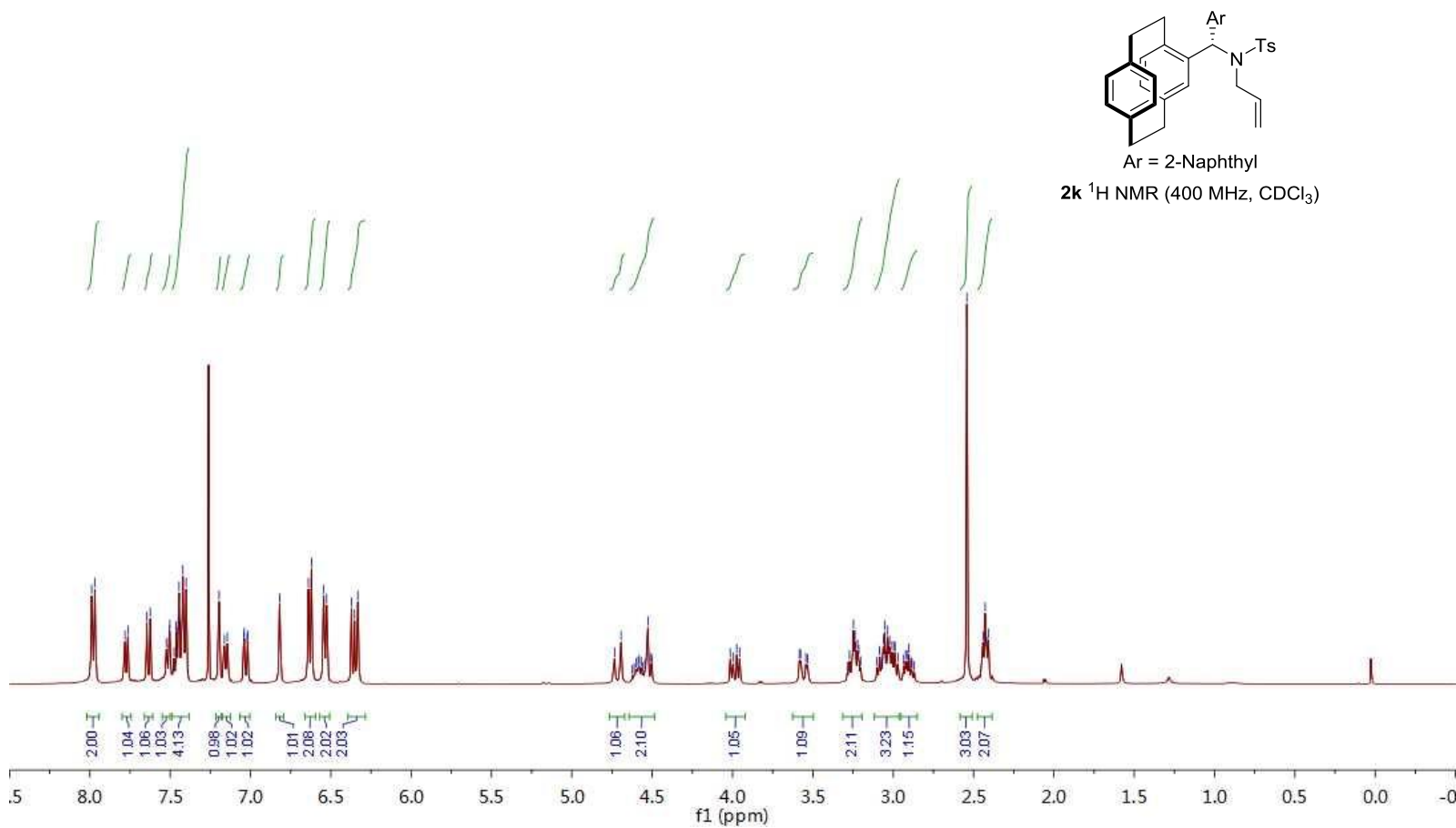
Ar = 4-MeOC₆H₄

2j ^{13}C NMR (100 MHz, CDCl_3)



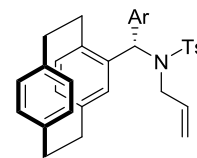
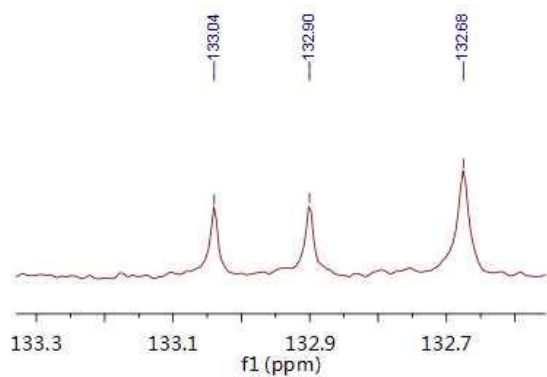
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¹H NMR YZ-4-68TM in CDCl₃



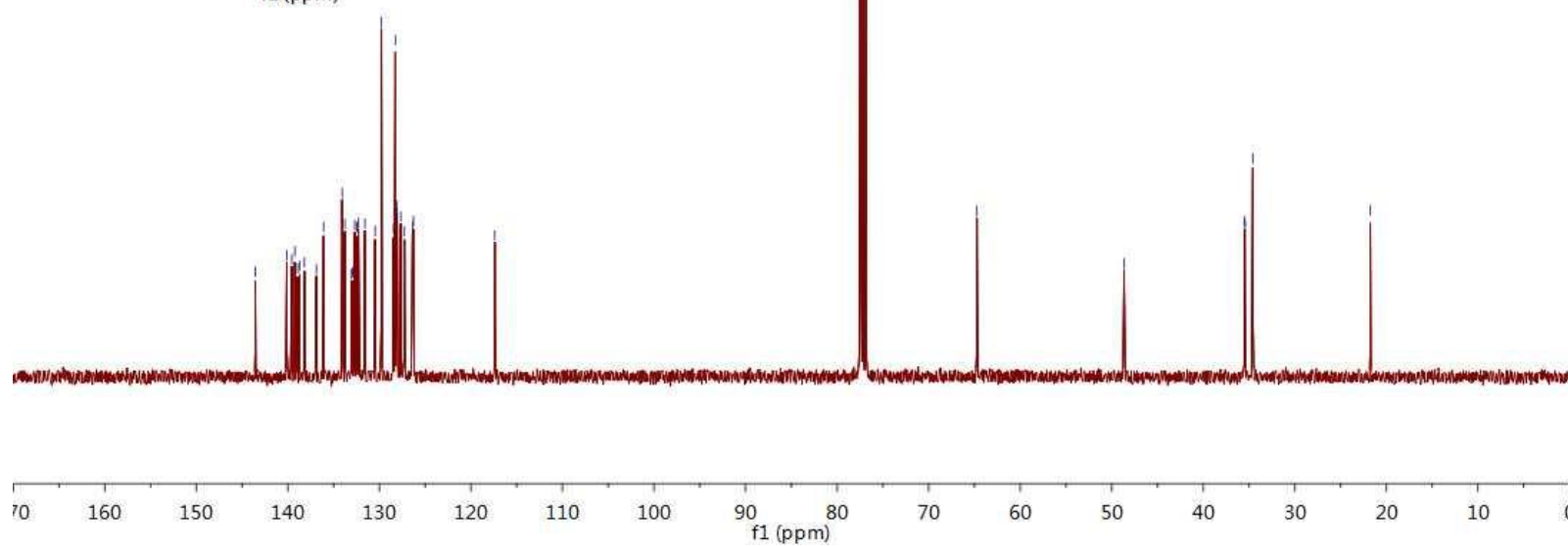


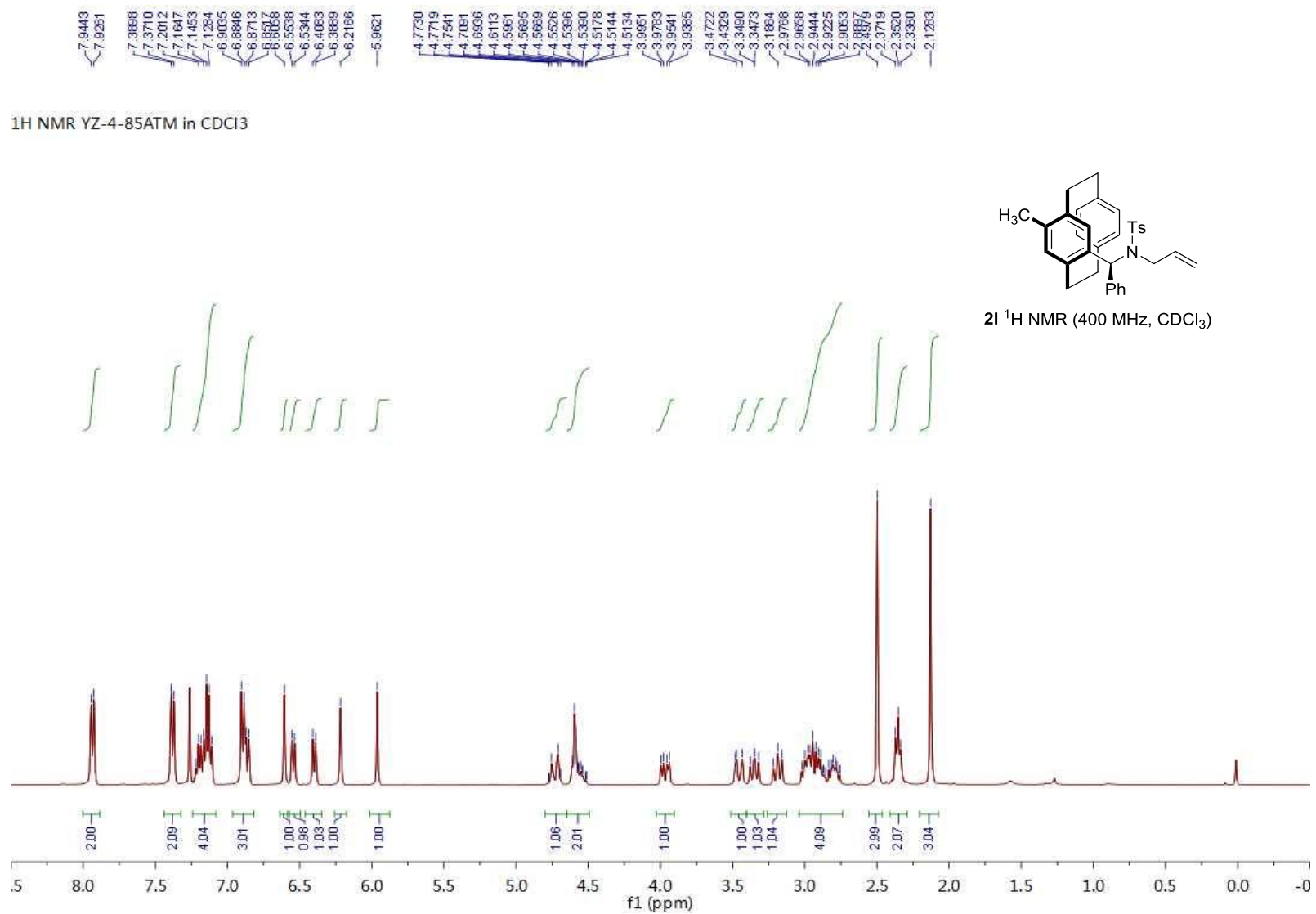
^{13}C NMR YZ-4-68TM in CDCl_3



Ar = 2-Naphthyl

2k ^{13}C NMR (100 MHz, CDCl_3)





143.44
141.09
139.18
139.00
138.94
138.45
138.17
138.10
136.62
134.85
134.15
133.86
132.63
131.31
130.79
129.67
129.41
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127.83
117.15

64.51

48.43

34.25

34.03

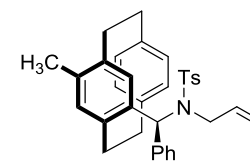
33.61

33.40

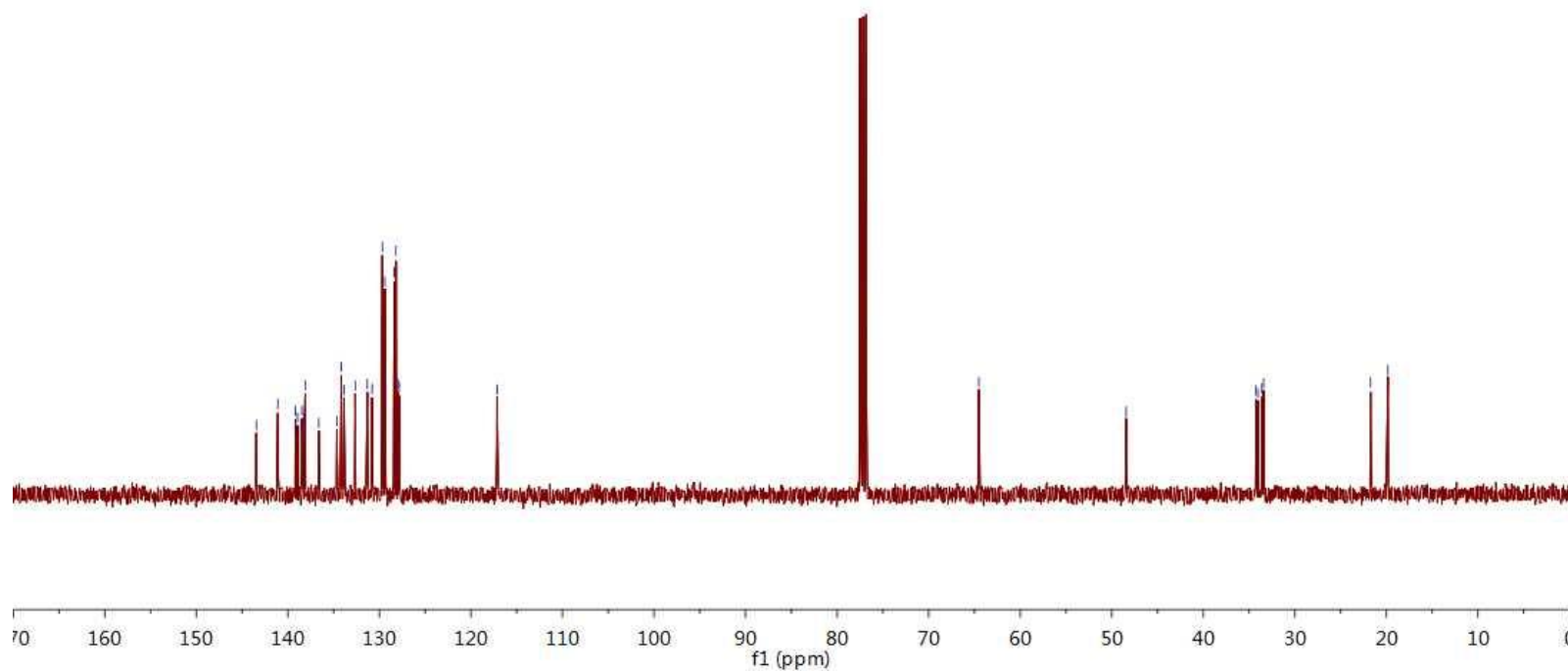
21.72

19.83

^{13}C NMR YZ-4-85ATM in CDCl_3

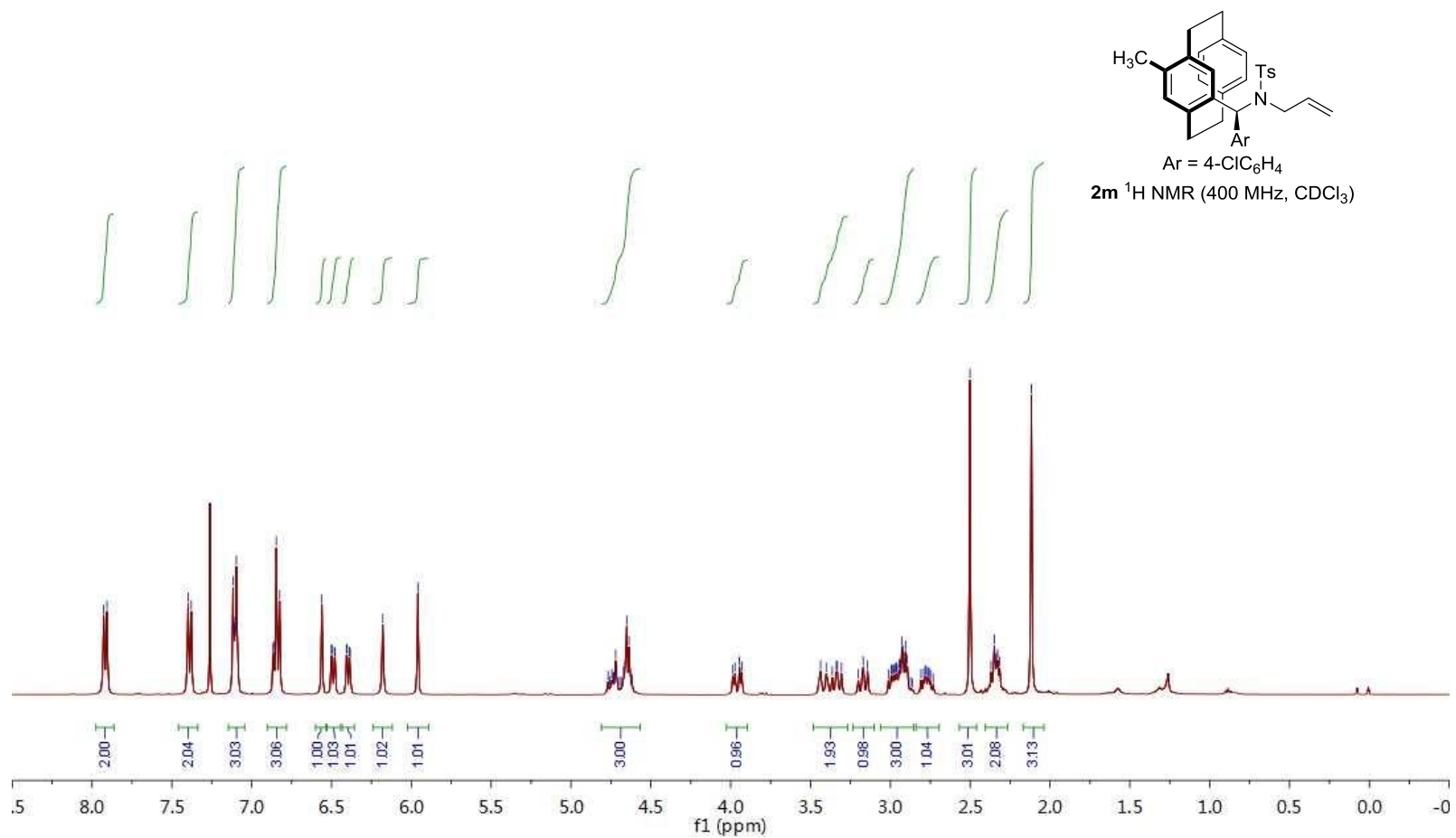


2I ^{13}C NMR (100 MHz, CDCl_3)

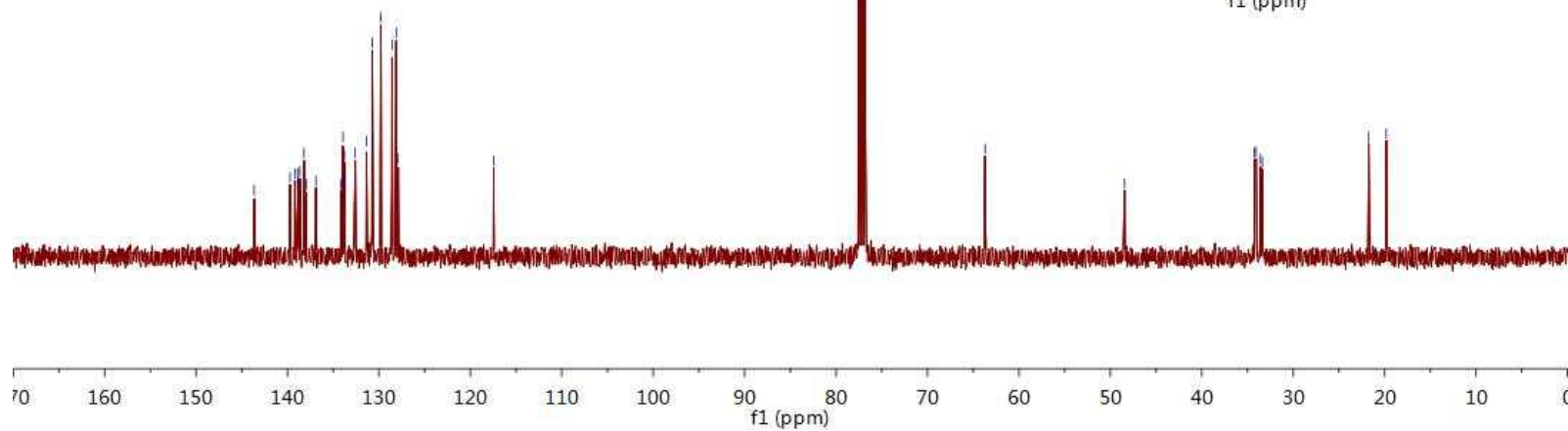
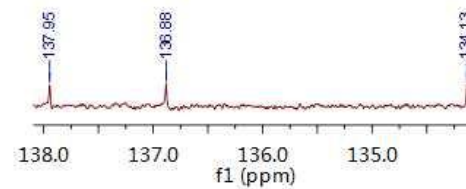
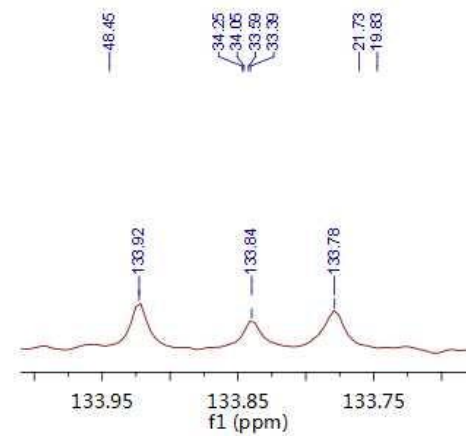
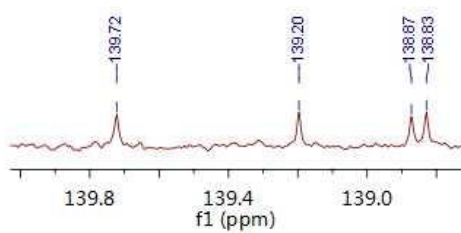
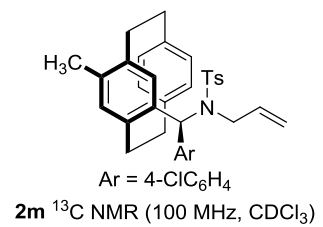


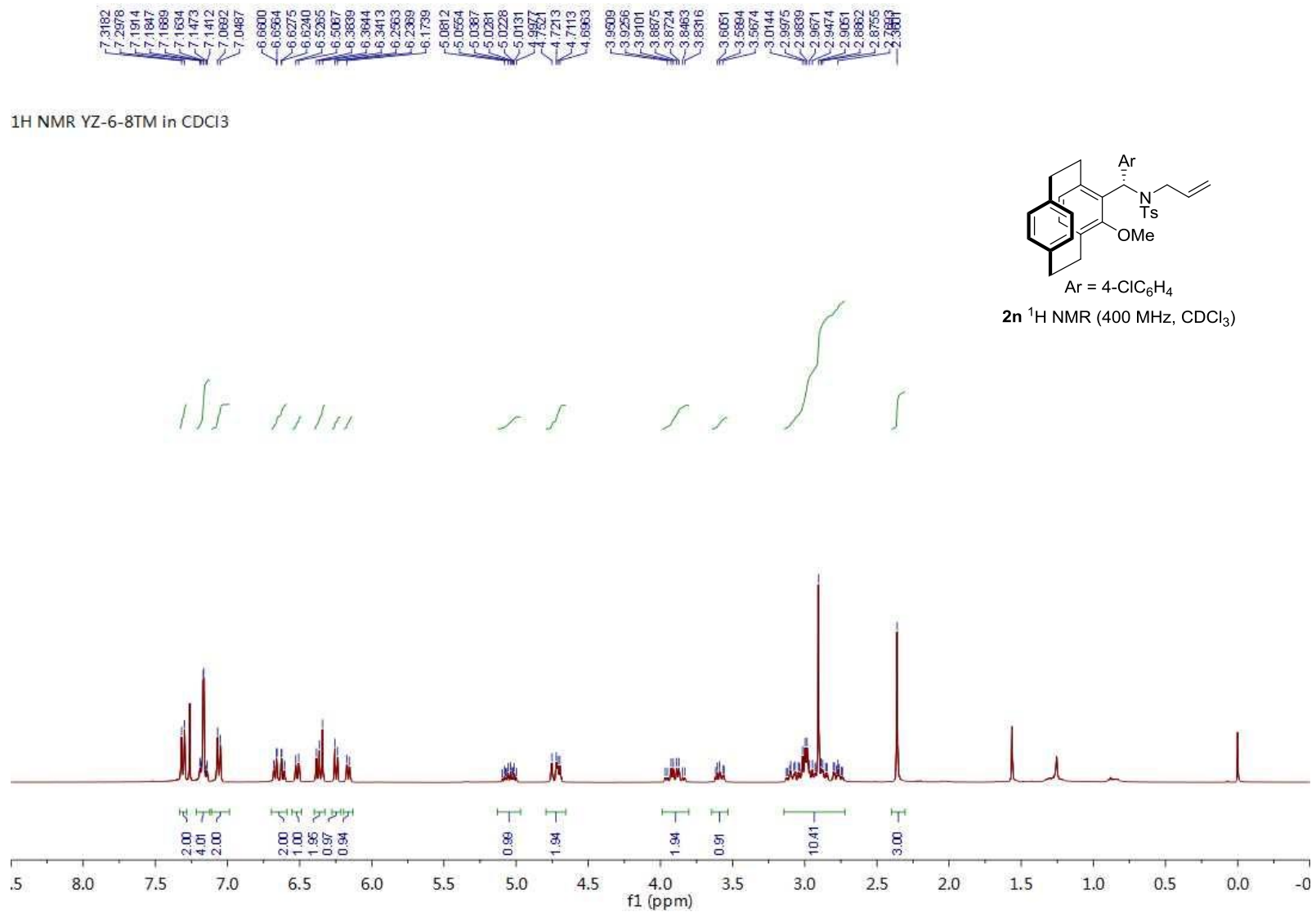
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7.3762
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7.0859
6.8457
6.8246
6.5902
6.5006
6.4971
6.4064
6.4024
6.1790
6.1581
4.7680
4.7566
4.7440
4.7375
4.7314
4.7204
4.7136
4.6957
4.6851
4.6710
4.6513
4.6365
4.6163
3.9873
3.9729
3.9449
3.9311
3.4365
3.3382
3.3316
3.1703
3.1422
2.9454
2.9378
2.9279
2.9217
2.9051
2.8974
2.8904
2.3696
2.3483
2.3353
2.3279
2.3153
2.1169

¹H NMR YZ-4-85BTM in CDCl₃



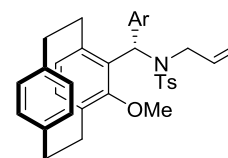
¹³C NMR YZ-4-85BTM in CDCl₃





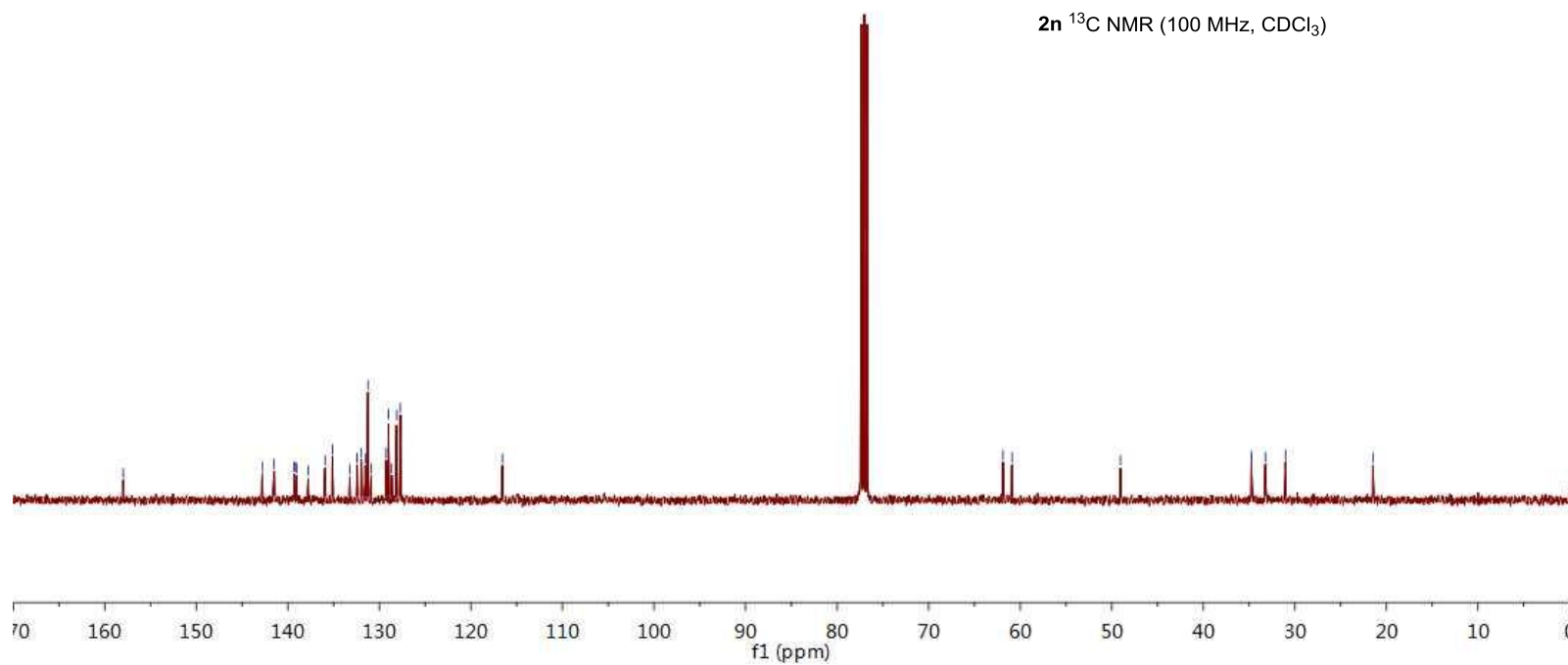


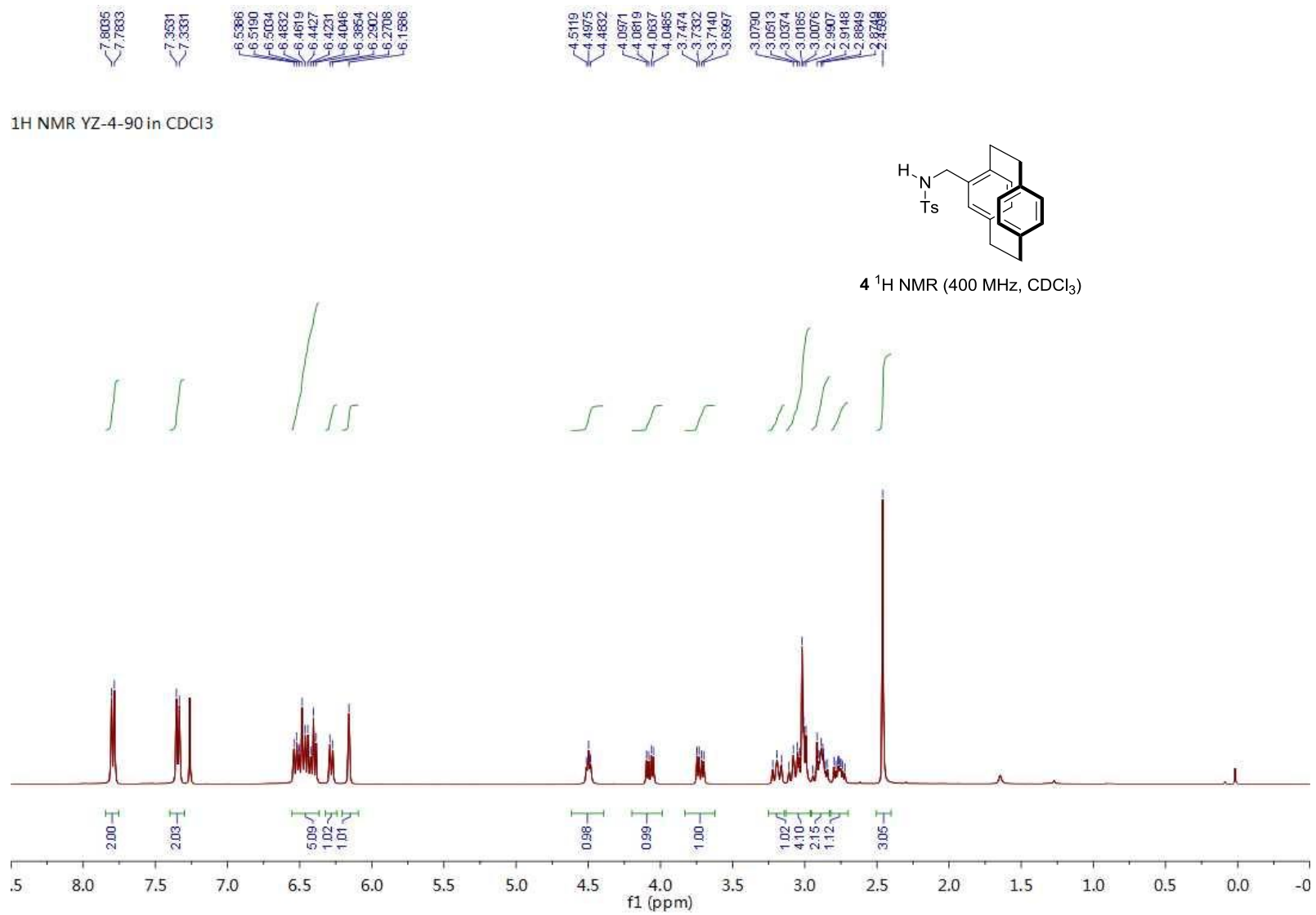
^{13}C NMR YZ-6-8TM in CDCl_3



Ar = 4-ClC₆H₄

2n ^{13}C NMR (100 MHz, CDCl_3)

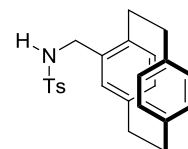




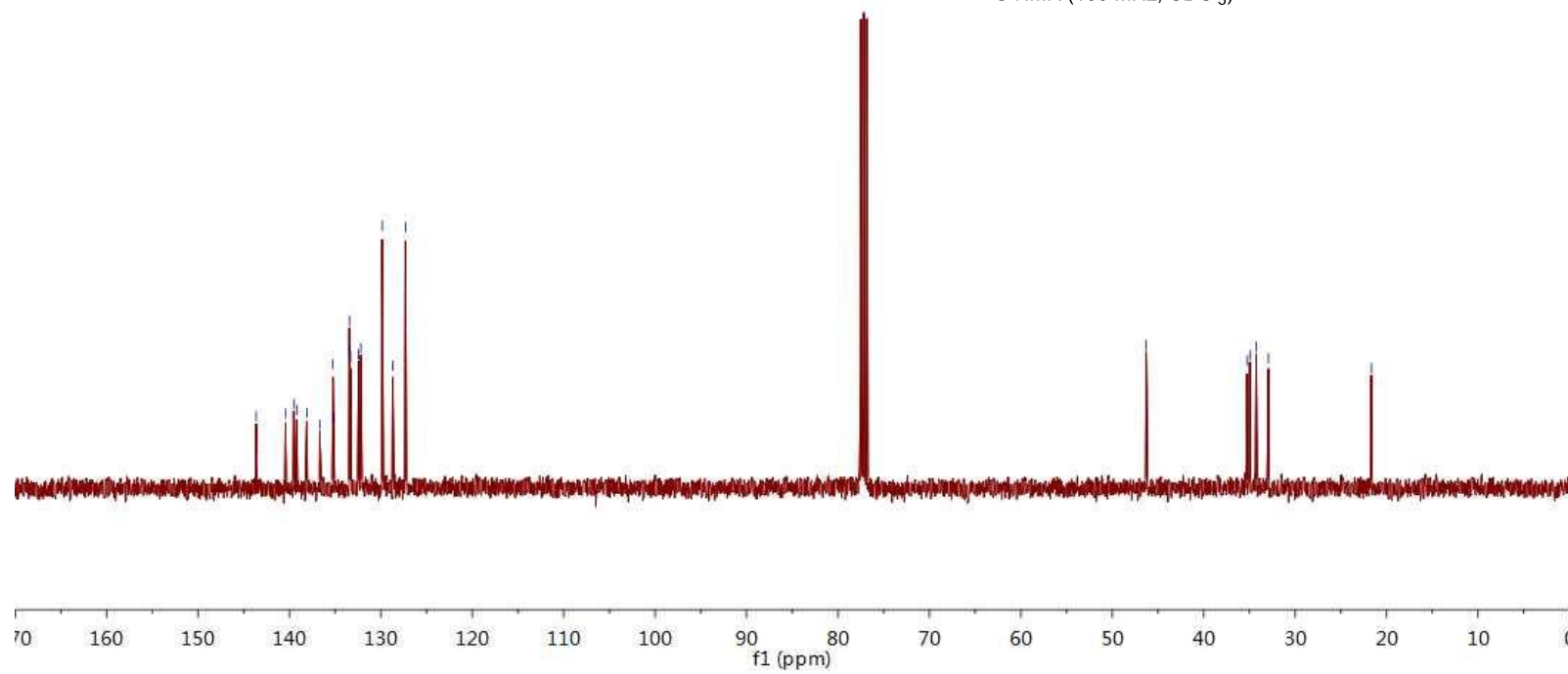
143.63
140.43
139.52
139.20
138.09
136.69
135.74
135.16
133.44
133.43
133.31
132.44
132.19
129.85
128.70
127.31

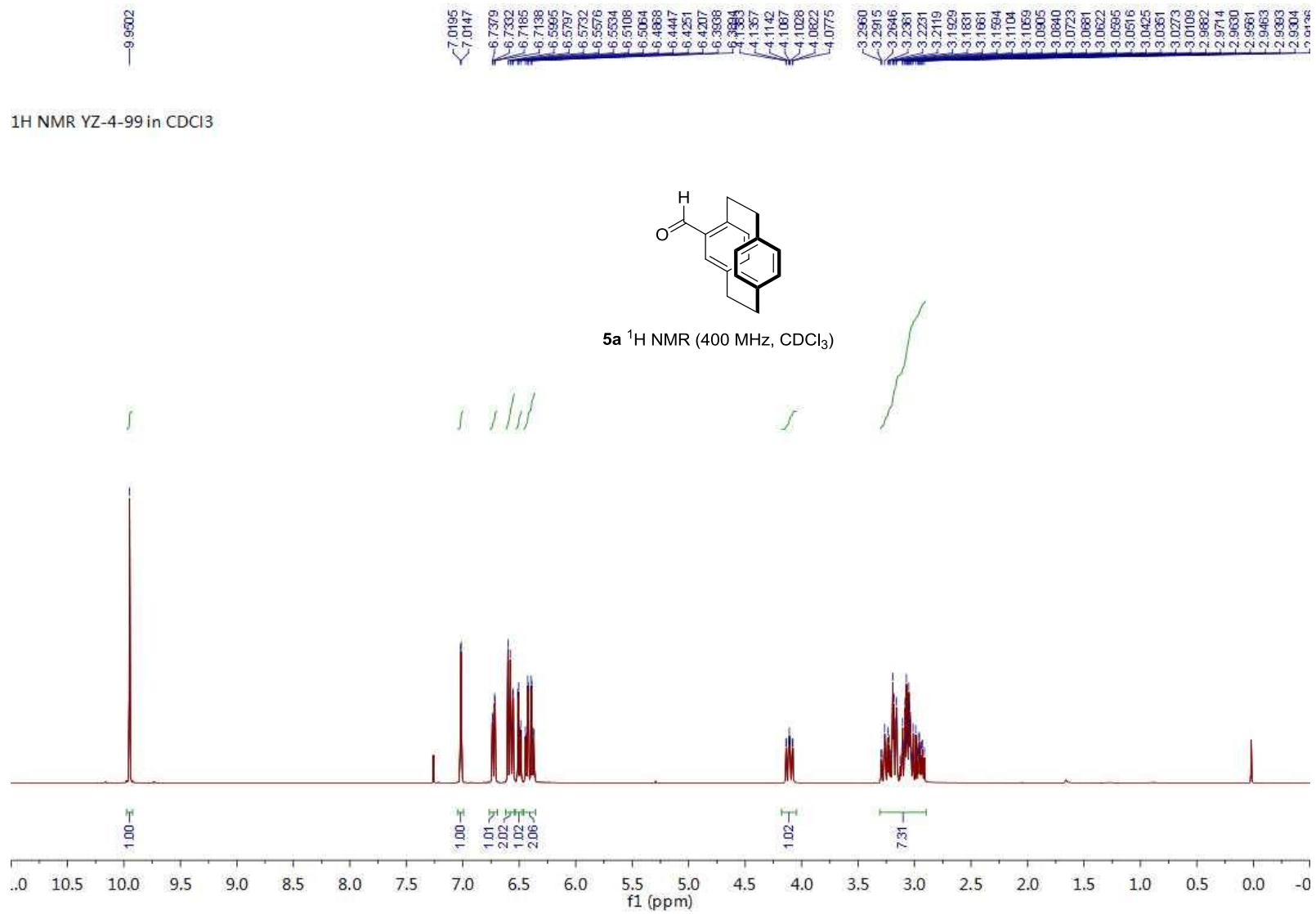
46.28
35.26
34.94
34.27
32.94
21.67

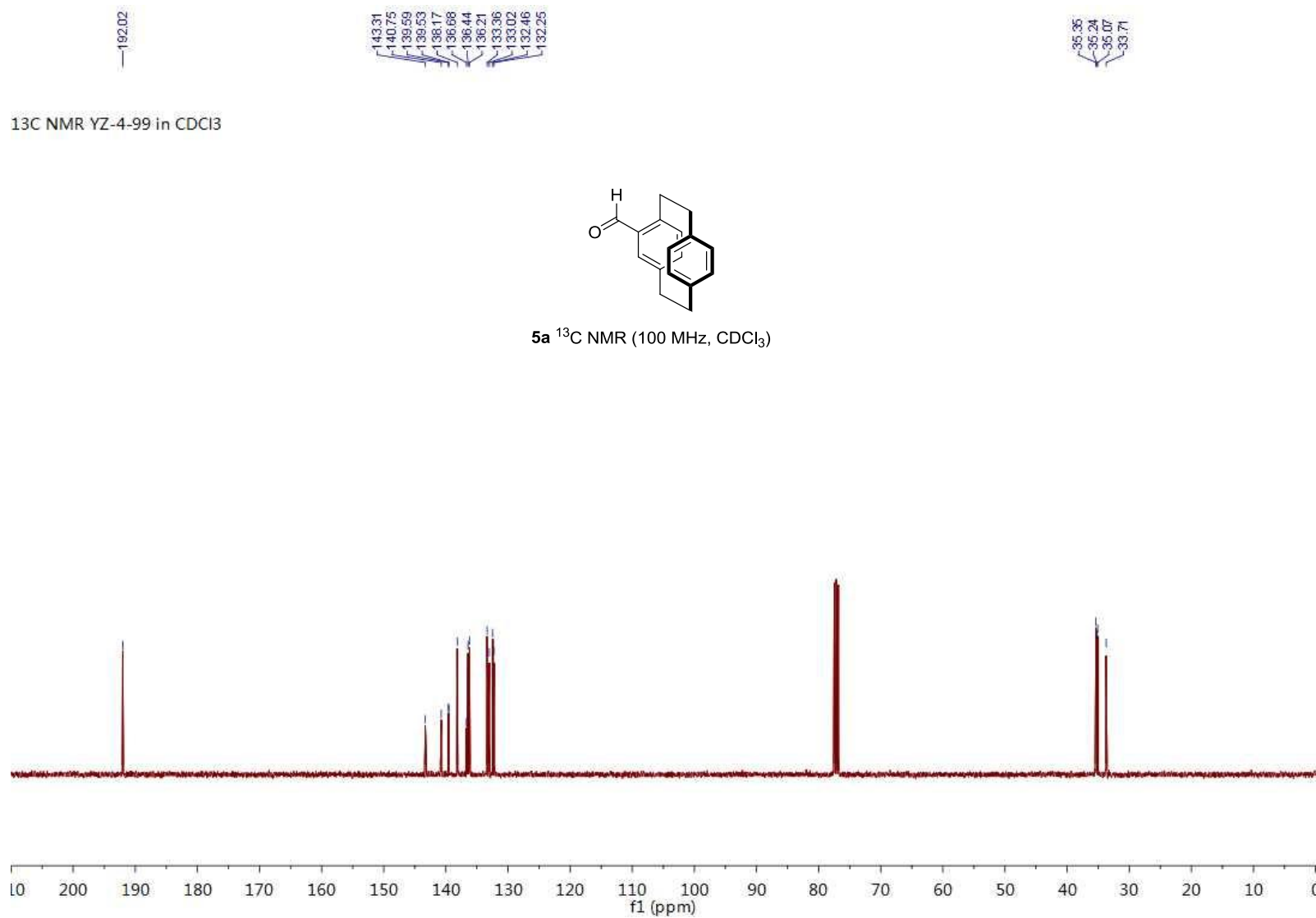
¹³C NMR YZ-4-90 in CDCl₃

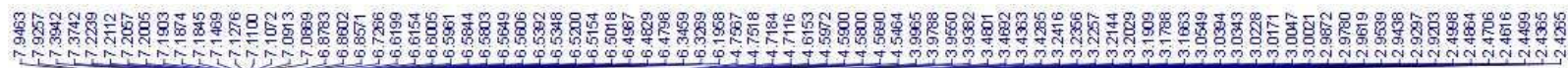


4 ¹³C NMR (100 MHz, CDCl₃)

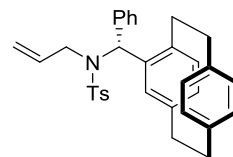




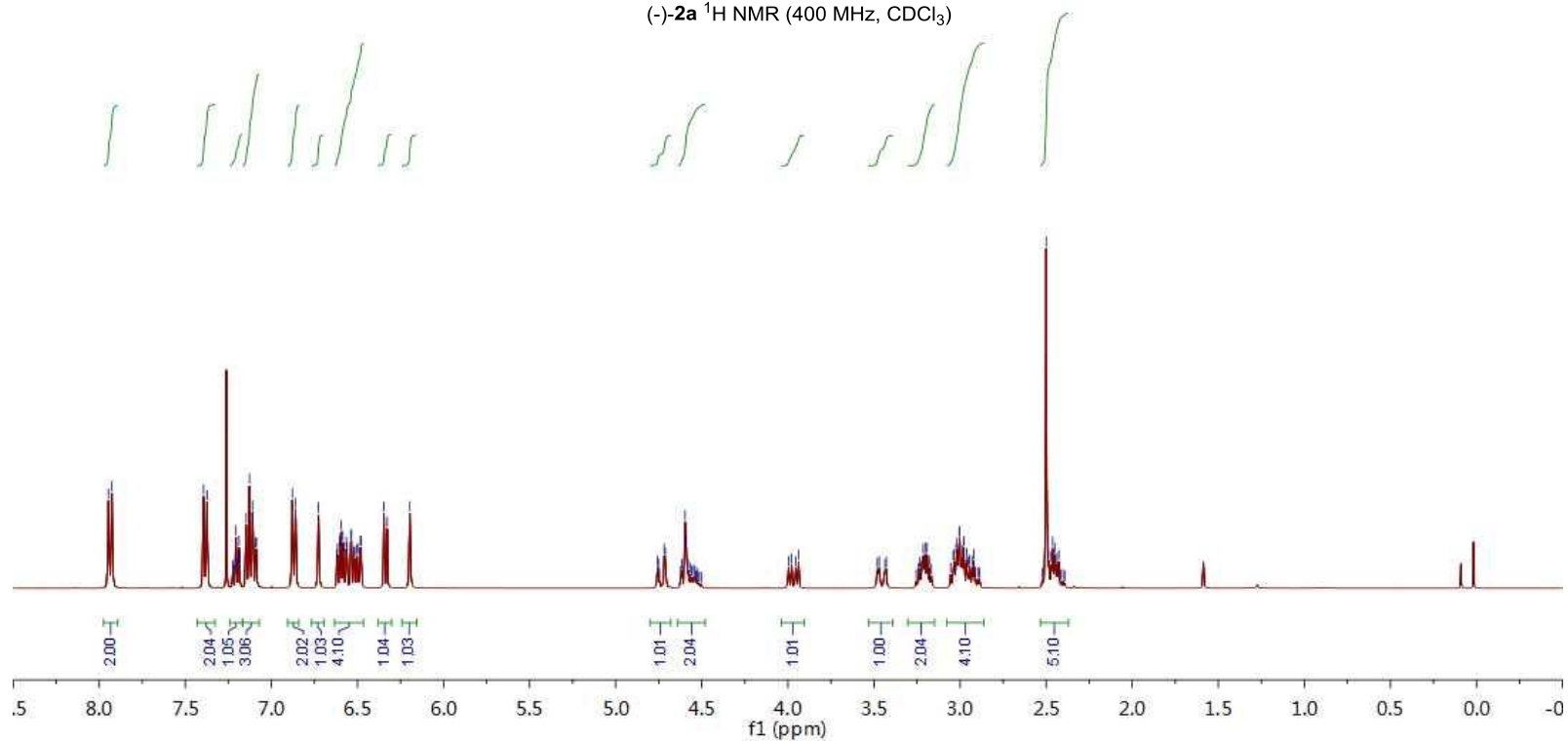




^1H NMR YZ-4-89 in CDCl_3

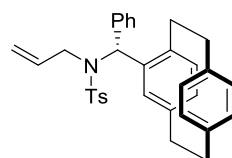


(-)-**2a** ^1H NMR (400 MHz, CDCl_3)

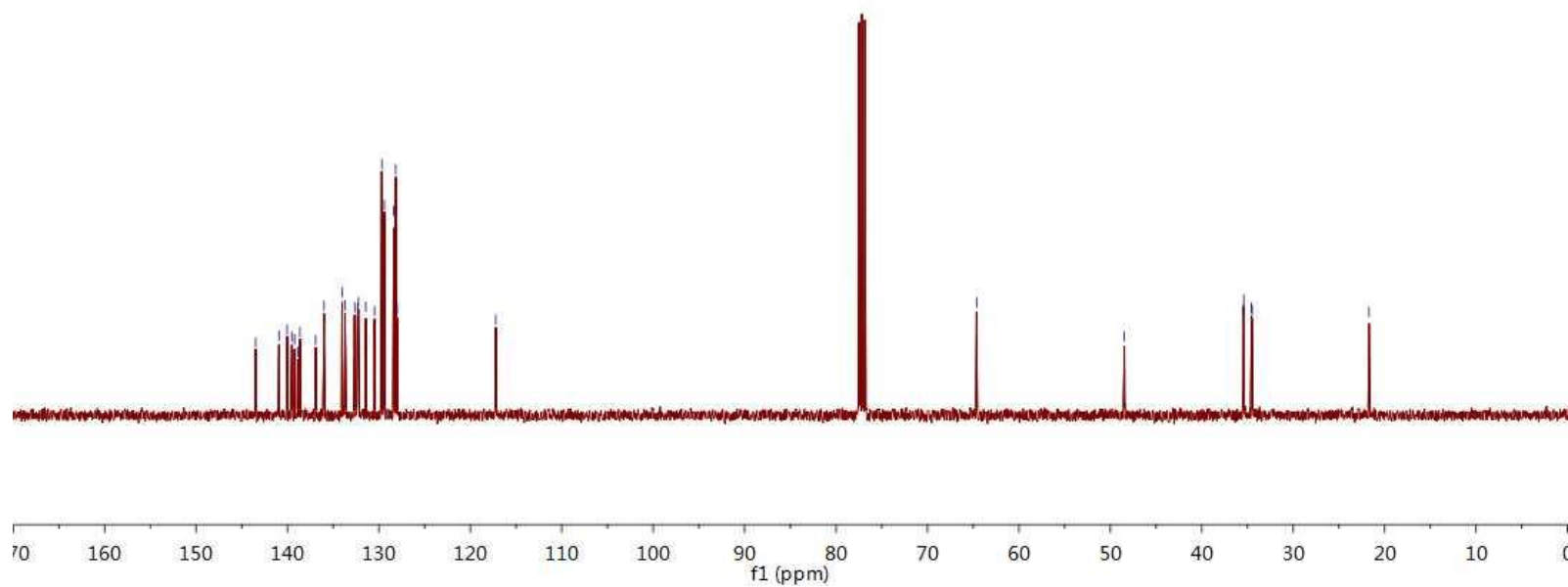




^{13}C NMR YZ-4-89 in CDCl_3

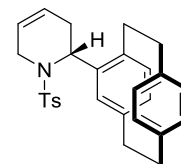


(-)-**2a** ^{13}C NMR (100 MHz, CDCl_3)

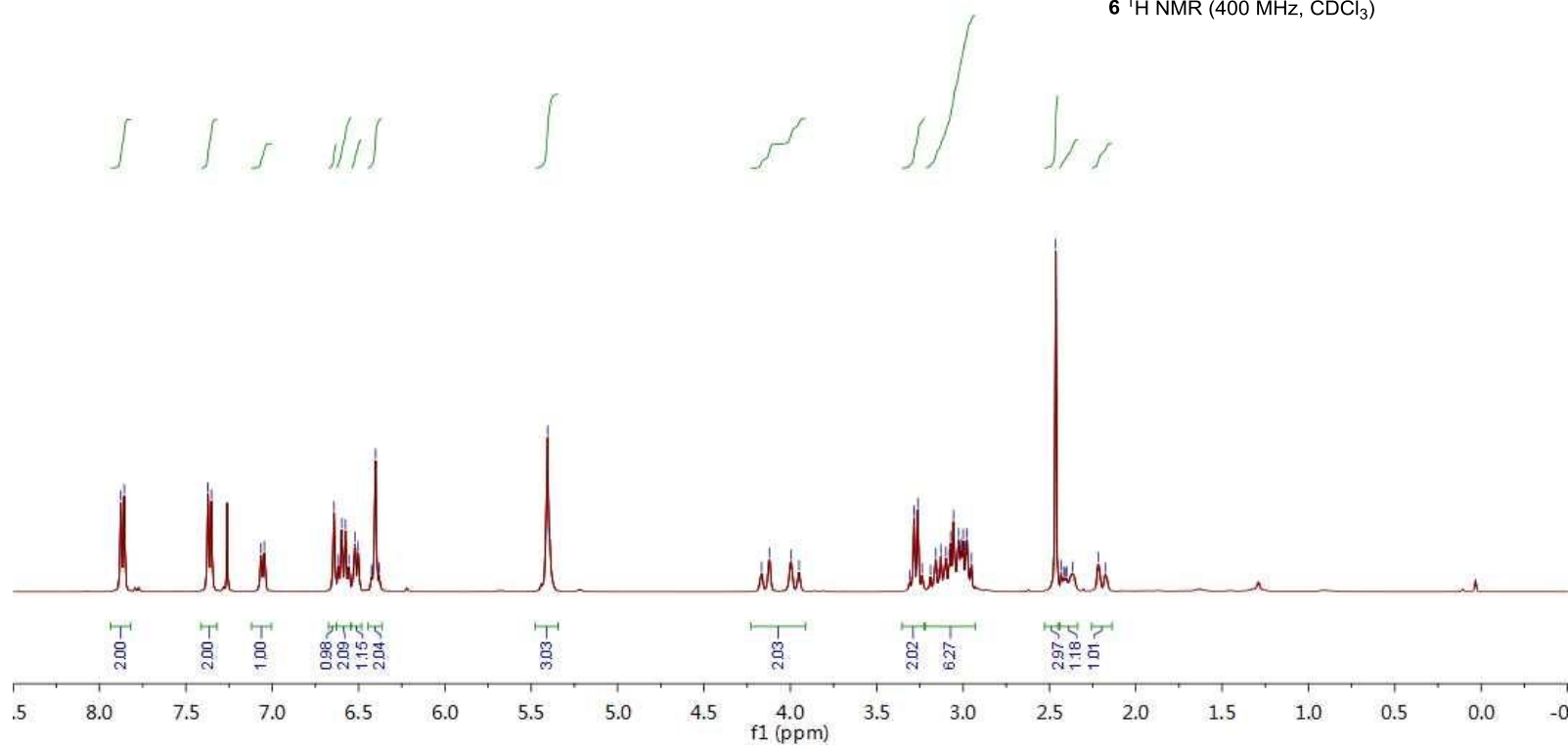


7.8762
7.8683
7.3719
7.3518
7.0647
7.0451
6.8424
6.8166
6.5973
6.5755
6.5568
6.5208
6.5018
6.4247
6.4013
6.3813
5.4064
5.3823
4.1663
4.1215
3.9970
3.9602
3.2845
3.2615
3.1265
3.0716
3.0564
3.0247
3.0150
3.0078
2.9966
2.9843
2.9681
2.4324
2.4173
2.4063
2.4003
2.3966
2.2170
2.1764

¹H NMR YZ-4-97 in CDCl₃



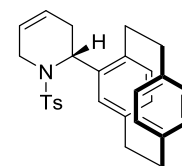
6 ¹H NMR (400 MHz, CDCl₃)



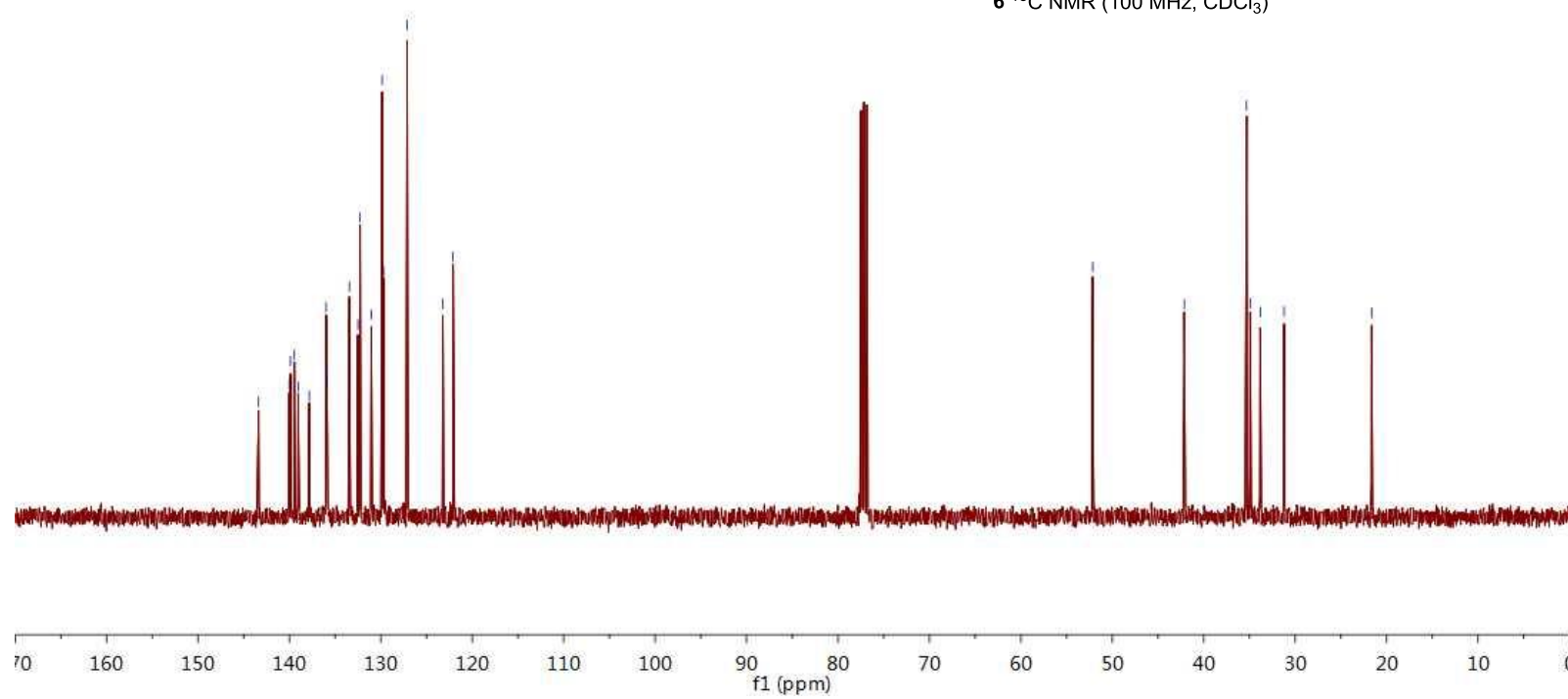
143.37
140.01
139.88
139.45
139.04
137.82
135.98
135.89
133.44
132.51
132.27
131.05
129.86
129.70
127.12
123.21
122.11

52.15
42.13
35.32
34.92
33.82
31.22
21.63

¹³C NMR YZ-4-97 in CDCl₃

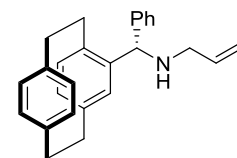


6 ¹³C NMR (100 MHz, CDCl₃)

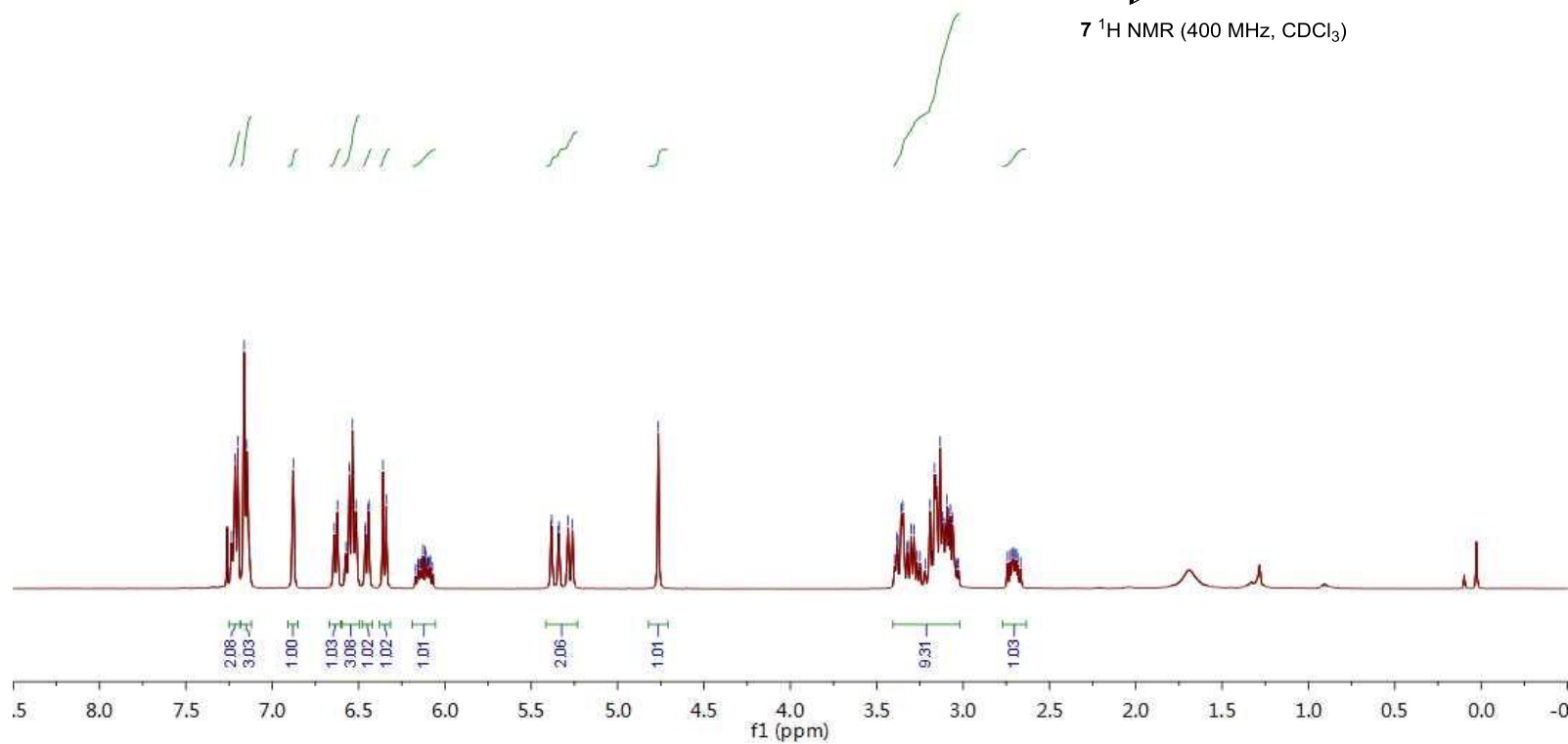


7.2363
7.2156
7.1998
7.1627
7.1472
7.1306
6.8776
6.6414
6.6222
6.5581
6.5361
6.5152
6.4832
6.4597
6.4442
6.4405
6.3987
6.3887
5.3823
5.3428
5.3364
5.2867
5.2612
4.7847
3.3622
3.3785
3.3552
3.3475
3.3011
3.2840
3.1905
3.1645
3.1564
3.1328
3.1201
3.1134
3.1018
3.0932
3.0833
3.0730
3.0693
2.7362
2.7160
2.7085
2.6869
2.6919
2.6825
2.6858

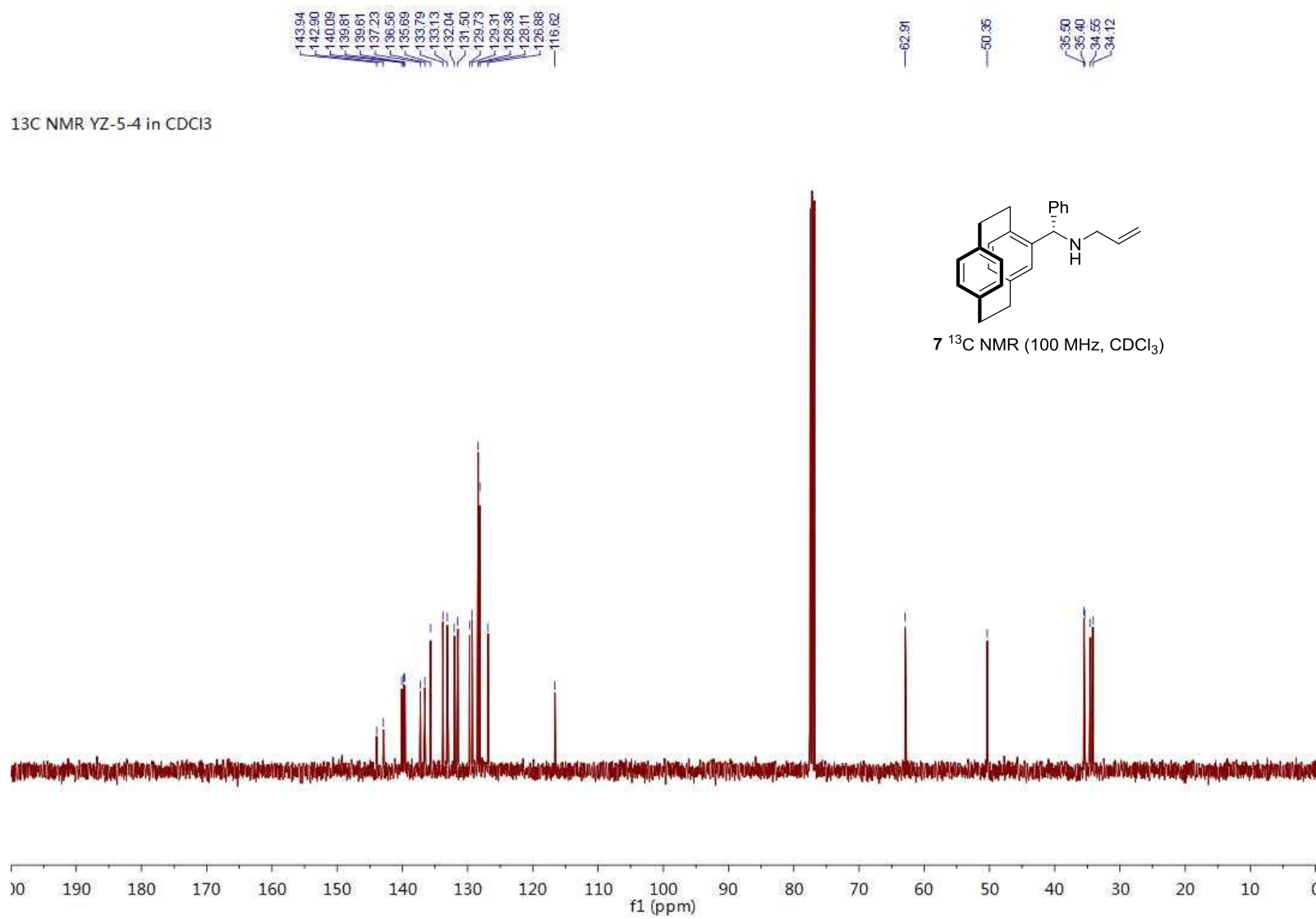
¹H NMR YZ-5-4 in CDCl₃



7 ¹H NMR (400 MHz, CDCl₃)



¹³C NMR YZ-5-4 in CDCl₃



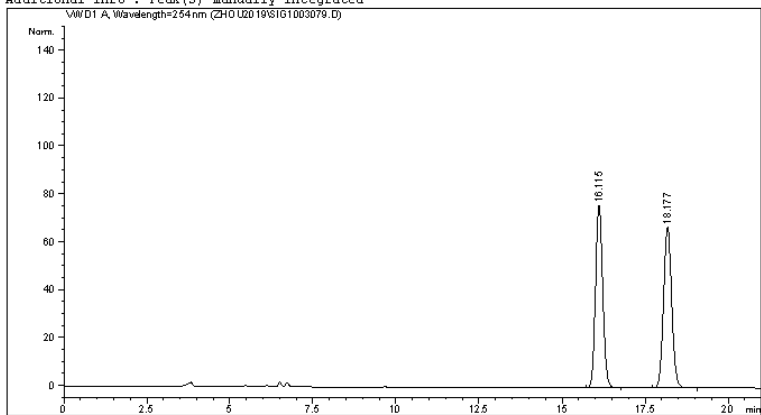
Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1003079.D
 Sample Name: YZ-4-585M(RAC)

```

=====
Acq. Operator   :
Acq. Instrument : 仪器 1                Location : Vial 1
Injection Date  : 5/30/19 9:38:00
                                           Inj Volume : 5.000 µl

Acq. Method    : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 5/30/19 9:07:37
                (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 5/30/19 10:07:23
                (modified after loading)
Sample Info    : AD-3, n-hexane/i-PrOH = 80/20, 0.8 mL/min, 30 oC, 254 n
                m
  
```

Additional Info : Peak(s) manually integrated
 VWDL A, Wavelength=254nm (ZHOU2019\SIG1003079.D)



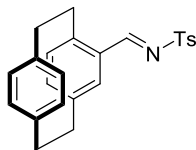
Area Percent Report

```

Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWDL A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	16.115	BV	0.2366	1152.96143	76.14727	49.9519
2	18.177	VB	0.2685	1155.18225	67.21445	50.0481



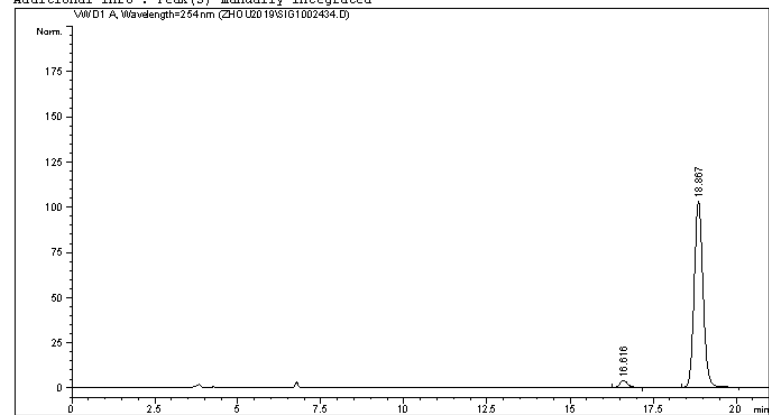
Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002434.D
 Sample Name: YZ-4-58B

```

=====
Acq. Operator   :
Acq. Instrument : 仪器 1                Location : Vial 91
Injection Date  : 1/12/19 13:53:08
                                           Inj Volume : 5.000 µl

Acq. Method    : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 1/12/19 13:05:18
                (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 5/30/19 8:44:40
                (modified after loading)
Sample Info    : AD-3, n-hexane/i-PrOH = 80/20, 0.8 mL/min, 30 oC, 254 n
                m
  
```

Additional Info : Peak(s) manually integrated
 VWDL A, Wavelength=254nm (ZHOU2019\SIG1002434.D)



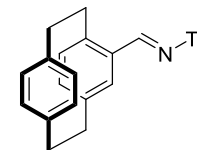
Area Percent Report

```

Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWDL A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	16.616	VB	0.2488	61.41887	3.79507	3.1303
2	18.867	BB	0.2875	1900.67249	102.88990	96.8697



Kinetic resolution
 from PhB(OH)₂

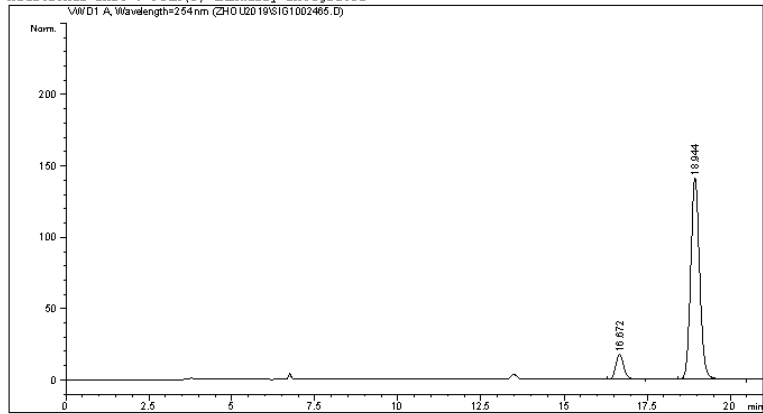
Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002465.D
 Sample Name: YZ-4-60A

```

=====
Acq. Operator   :
Acq. Instrument : 仪器 1                Location : Vial 91
Injection Date  : 1/15/19 14:13:25
                                           Inj Volume : 5.000 µl

Acq. Method    : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 1/15/19 13:26:04
                (modified after loading)
Analysis Method: C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 5/30/19 10:10:26
                (modified after loading)
Sample Info    : AD-3, n-hexane/i-PrOH = 80/20, 0.8 mL/min, 30 oC, 254 n
                m
  
```

Additional Info : Peak(s) manually integrated
 VWDL A, Wavelength=254nm (ZHOU2019\SIG1002465.D)



Area Percent Report

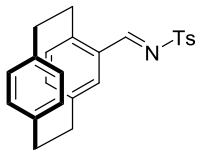
```

Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWDL A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	16.672	BB	0.2563	293.14850	17.42010	9.9678
2	18.944	BB	0.2912	2647.81104	140.90161	90.0322

仪器 1 5/30/19 10:10:32



(-)-1a
 Kinetic resolution
 from 2-MeC₆H₄B(OH)₂

Page 1 of 2

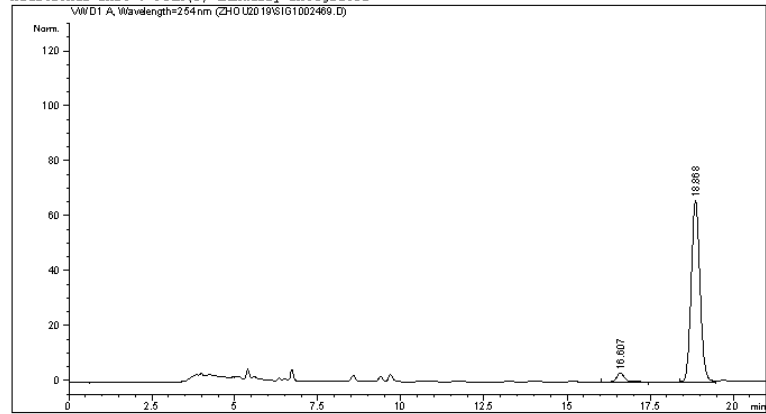
Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002469.D
 Sample Name: YZ-4-60B

```

=====
Acq. Operator   :
Acq. Instrument : 仪器 1                Location : Vial 91
Injection Date  : 1/15/19 22:43:10
                                           Inj Volume : 5.000 µl

Acq. Method    : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 1/15/19 22:40:46
                (modified after loading)
Analysis Method: C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 5/30/19 9:51:56
                (modified after loading)
Sample Info    : AD-3, n-hexane/i-PrOH = 80/20, 0.8 mL/min, 30 oC, 254 n
                m
  
```

Additional Info : Peak(s) manually integrated
 VWDL A, Wavelength=254nm (ZHOU2019\SIG1002469.D)



Area Percent Report

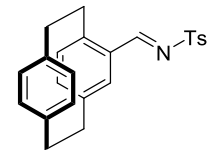
```

Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWDL A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	16.607	VB	0.2640	56.11112	3.20973	4.4128
2	18.868	BV	0.2869	1215.42883	65.99891	95.5872

仪器 1 5/30/19 9:52:11



(-)-1a
 Kinetic resolution
 from 3-MeC₆H₄B(OH)₂

Page 1 of 2

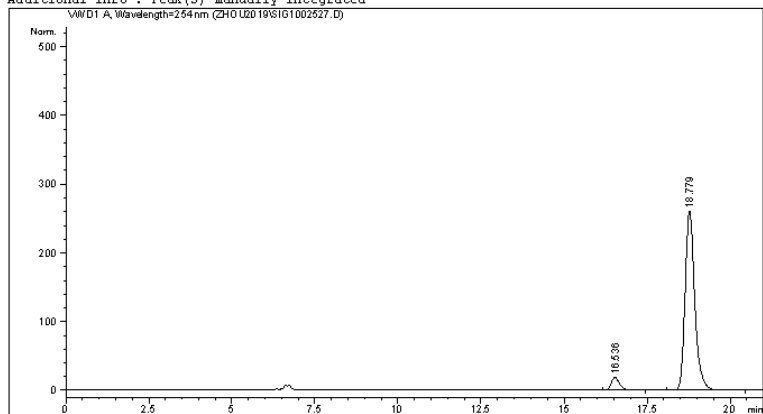
Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002527.D
 Sample Name: YZ-4-62

```

=====
Acq. Operator   :
Acq. Instrument : 仪器 1                Location : Vial 1
Injection Date  : 1/22/19 16:30:41
                                           Inj Volume : 10.000 µl

Acq. Method    : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 1/22/19 16:31:20
                (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 5/30/19 10:18:44
                (modified after loading)
Sample Info    : AD-3, n-hexane/i-PrOH = 80/20, 0.8 mL/min, 30 oC, 254 nm
                m
  
```

Additional Info : Peak(s) manually integrated
 VWDL A, Wavelength=254 nm (ZHOU2019\SIG1002527.D)



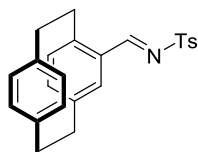
Area Percent Report

```

Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWDL A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	16.536	BB	0.2701	334.76022	18.94763	5.9673
2	18.779	BB	0.3074	5275.15674	261.39069	94.0327



(-)-1a
 Kinetic resolution
 from 4-MeC₆H₄B(OH)₂

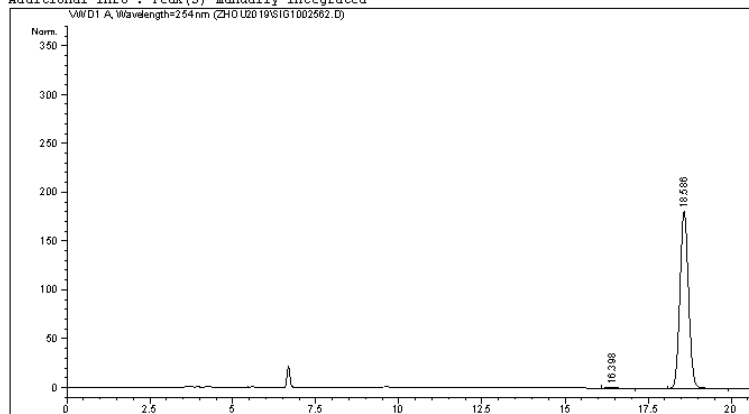
Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002562.D
 Sample Name: YZ-4-65A

```

=====
Acq. Operator   :
Acq. Instrument : 仪器 1                Location : Vial 1
Injection Date  : 2/23/19 14:27:02
                                           Inj Volume : 5.000 µl

Acq. Method    : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 2/23/19 14:06:41
                (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 5/30/19 10:21:45
                (modified after loading)
Sample Info    : AD-3, n-hexane/i-PrOH = 80/20, 0.8 mL/min, 30 oC, 254 nm
                m
  
```

Additional Info : Peak(s) manually integrated
 VWDL A, Wavelength=254 nm (ZHOU2019\SIG1002562.D)



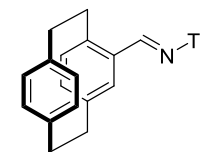
Area Percent Report

```

Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWDL A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	16.398	BB	0.2462	12.59610	7.72629e-1	0.3868
2	18.586	BB	0.2806	3243.52002	181.41284	99.6132



(-)-1a
 Kinetic resolution
 from 4-FC₆H₄B(OH)₂

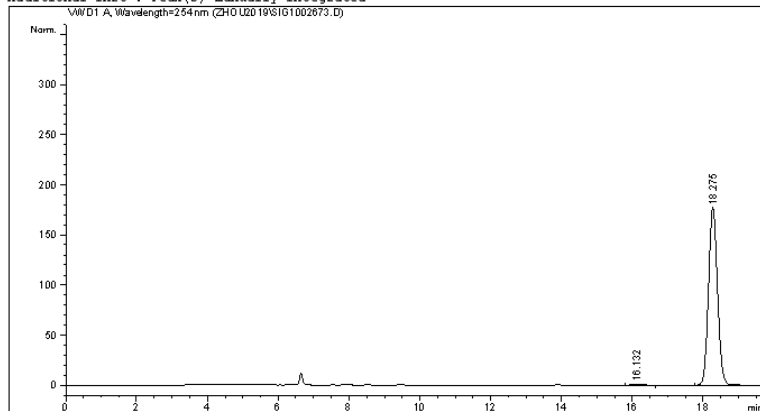
Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002673.D
 Sample Name: YZ-4-74E

```

=====
Acq. Operator   :
Acq. Instrument : 仪器 1                Location : Vial 1
Injection Date  : 3/11/19 21:25:13
                                           Inj Volume : 5.000 µl

Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/11/19 21:22:09
                 (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 5/30/19 10:53:00
                 (modified after loading)
Sample Info     : AD-3, n-hexane/i-PrOH =80/20, 0.8 mL/min, 30 oC, 254 nm
  
```

Additional Info : Peak(s) manually integrated



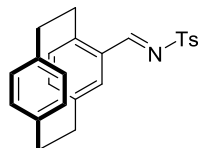
Area Percent Report

```

Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	16.132	BV	0.2730	24.26760	1.32900	0.7670
2	18.275	VV	0.2746	3139.73730	177.32698	99.2330



(-)-1a
Kinetic resolution
from 4-CF₃C₆H₄B(OH)₂

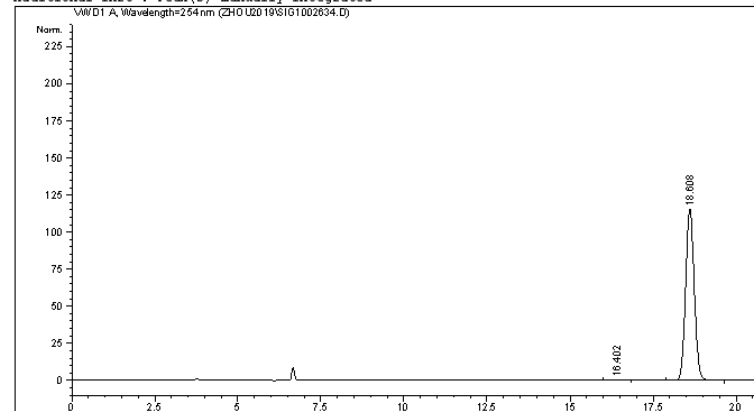
Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002634.D
 Sample Name: YZ-4-72A

```

=====
Acq. Operator   :
Acq. Instrument : 仪器 1                Location : Vial 1
Injection Date  : 3/7/19 14:52:57
                                           Inj Volume : 5.000 µl

Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/7/19 13:49:58
                 (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 5/30/19 10:37:16
                 (modified after loading)
Sample Info     : AD-3, n-hexane/i-PrOH =80/20, 0.8 mL/min, 30 oC, 254 nm
  
```

Additional Info : Peak(s) manually integrated



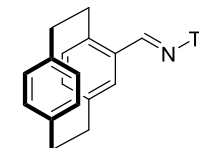
Area Percent Report

```

Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	16.402	BB	0.2663	4.59826	2.65129e-1	0.2218
2	18.608	BB	0.2771	2068.83301	115.40721	99.7782



(-)-1a
Kinetic resolution
from 4-ClC₆H₄B(OH)₂

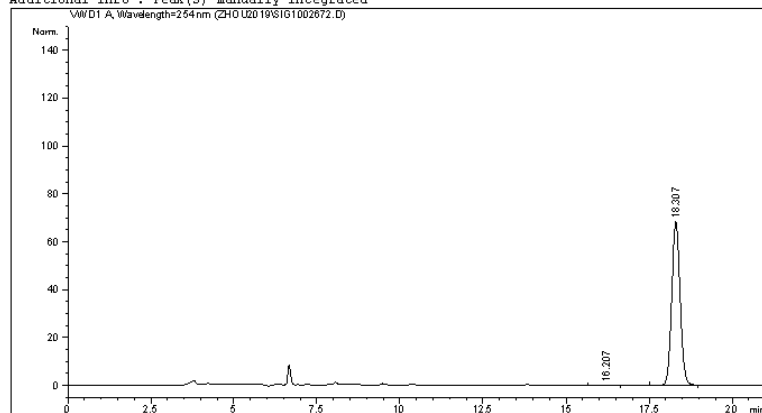
Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002672.D
 Sample Name: YZ-4-74A

```

=====
Acq. Operator   :
Acq. Instrument : 仪器 1                Location : Vial 1
Injection Date  : 3/11/19 20:48:19
                                           Inj Volume : 5.000 µl

Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/11/19 20:25:14
                 (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 5/30/19 10:44:02
                 (modified after loading)
Sample Info     : AD-3, n-hexane/i-PrOH =80/20, 0.8 mL/min, 30 oC, 254 nm
  
```

Additional Info : Peak(s) manually integrated



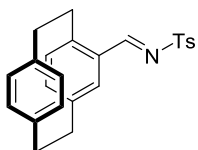
Area Percent Report

```

=====
Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	16.207	VV	0.6405	16.37306	3.20245e-1	1.3236
2	18.307	BV	0.2758	1220.64233	68.52013	98.6764



(-)-1a
 Kinetic resolution
 from 3-FC₆H₄B(OH)₂

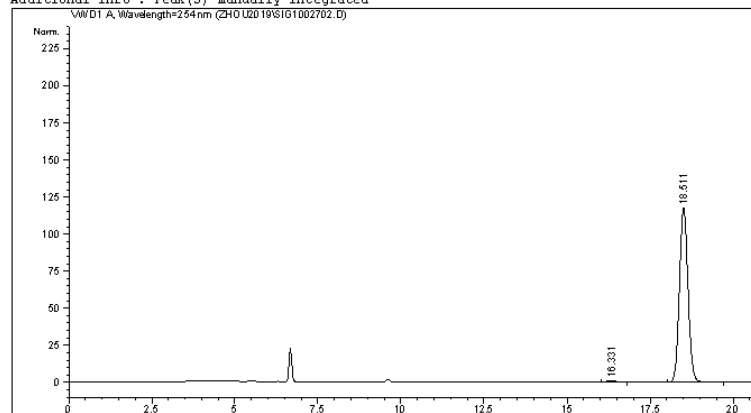
Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002702.D
 Sample Name: YZ-4-77

```

=====
Acq. Operator   :
Acq. Instrument : 仪器 1                Location : Vial 1
Injection Date   : 3/16/19 16:34:44
                                           Inj Volume : 5.000 µl

Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/16/19 16:28:23
                 (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 5/30/19 11:00:32
                 (modified after loading)
Sample Info     : AD-3, n-hexane/i-PrOH =80/20, 0.8 mL/min, 30 oC, 254 nm
  
```

Additional Info : Peak(s) manually integrated



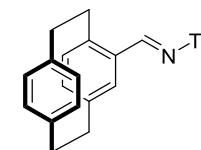
Area Percent Report

```

=====
Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	16.331	BB	0.2472	17.21958	1.09678	0.8148
2	18.511	BB	0.2764	2096.09521	117.34330	99.1852



(-)-1a
 Kinetic resolution
 from 3-CIC₆H₄B(OH)₂

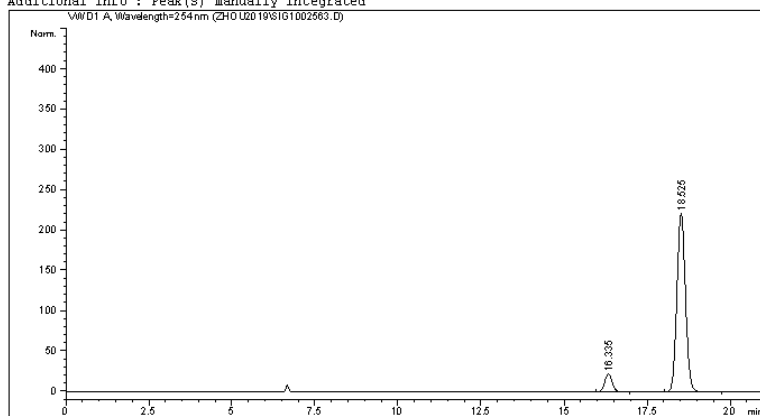
Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002563.D
 Sample Name: YZ-4-65E

```

=====
Acq. Operator   :
Acq. Instrument : 仪器 1                Location : Vial 1
Injection Date  : 2/23/19 14:49:53
                                           Inj Volume : 5.000 µl

Acq. Method    : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 2/23/19 14:48:56
                (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 5/30/19 10:27:42
                (modified after loading)
Sample Info    : AD-3, n-hexane/i-PrOH = 80/20, 0.8 mL/min, 30 oC, 254 nm
                m
  
```

Additional Info : Peak(s) manually integrated
 VWDL A, Wavelength=254 nm (ZHOU2019\SIG1002563.D)



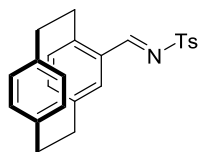
Area Percent Report

```

Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWDL A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	16.335	BB	0.2425	347.60333	22.21527	8.0739
2	18.525	VB	0.2768	3957.66699	221.08186	91.9261



(-)-1a
 Kinetic resolution
 from 4-MeOC₆H₄B(OH)₂

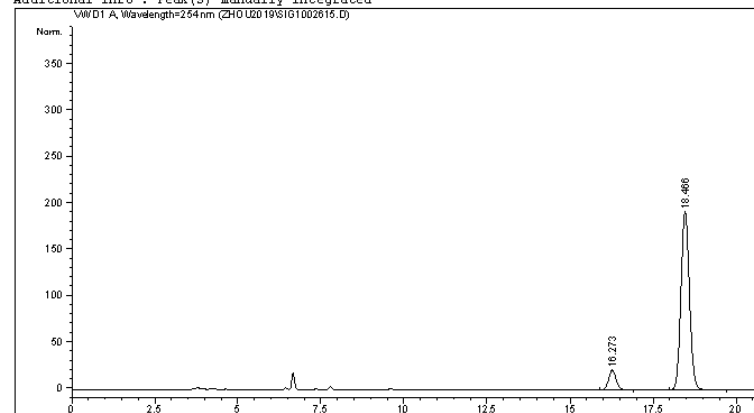
Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002615.D
 Sample Name: YZ-4-68

```

=====
Acq. Operator   :
Acq. Instrument : 仪器 1                Location : Vial 1
Injection Date  : 3/2/19 19:08:27
                                           Inj Volume : 5.000 µl

Acq. Method    : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 3/2/19 18:34:41
                (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 5/30/19 10:34:34
                (modified after loading)
Sample Info    : AD-3, n-hexane/i-PrOH =80/20, 0.8 mL/min, 30 oC, 254 nm
  
```

Additional Info : Peak(s) manually integrated
 VWDL A, Wavelength=254 nm (ZHOU2019\SIG1002615.D)



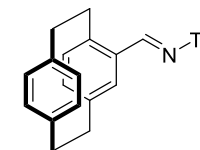
Area Percent Report

```

Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWDL A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	16.273	BB	0.2409	329.95752	21.27563	8.8296
2	18.466	BB	0.2793	3406.98022	191.71454	91.1704



(-)-1a
 Kinetic resolution
 from 2-naphthylB(OH)₂

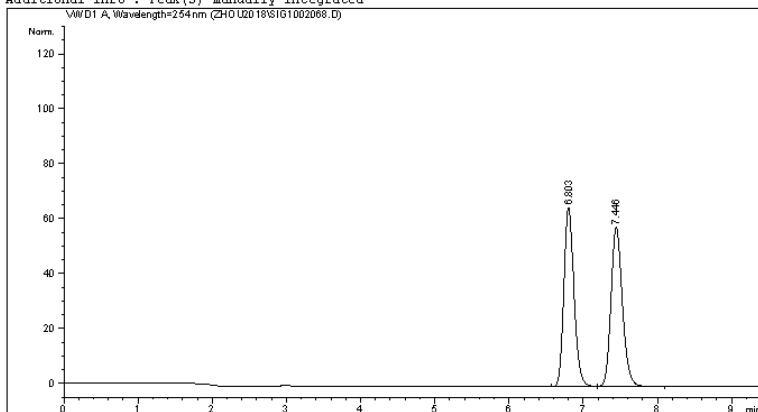
Data File C:\CHEM32\1\DATA\ZHOU2018\SIG1002068.D
 Sample Name: YZ-4-34A(RAC)

```

=====
Acq. Operator   :
Acq. Instrument : 仪器 1                Location : Vial 91
Injection Date  : 12/8/18 10:42:08
                                           Inj Volume : 5.000 µl

Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 12/8/18 10:40:33
                 (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 5/30/19 9:41:08
                 (modified after loading)
Sample Info     : AD-H, n-hexane/i-PrOH = 90/10, 1.0 mL/min, 30 oC, 254 n
                 m
  
```

Additional Info : Peak(s) manually integrated
 VWDL1 A, Wavelength=254nm (ZHOU2018\SIG1002068.D)



Area Percent Report

```

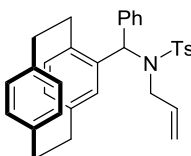
Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWDL1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	6.803	VV	0.1468	616.60956	64.94445	49.8919
2	7.446	VB	0.1690	619.28156	57.78165	50.1081

仪器 1 5/30/19 9:41:19

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rac-2a

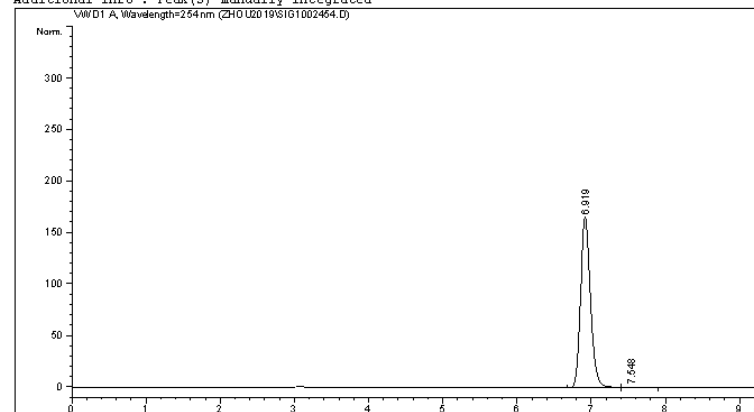
Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002454.D
 Sample Name: YZ-4-58BTM

```

=====
Acq. Operator   :
Acq. Instrument : 仪器 1                Location : Vial 91
Injection Date  : 1/13/19 15:08:47
                                           Inj Volume : 5.000 µl

Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 1/13/19 14:42:39
                 (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 5/30/19 9:44:46
                 (modified after loading)
Sample Info     : AD-H, n-hexane/i-PrOH = 90/10, 1.0 mL/min, 30 oC, 254 n
                 m
  
```

Additional Info : Peak(s) manually integrated
 VWDL1 A, Wavelength=254nm (ZHOU2019\SIG1002454.D)



Area Percent Report

```

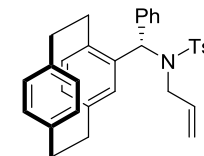
Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWDL1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	6.919	VV	0.1410	1546.39587	165.49921	99.3899
2	7.548	VB	0.1748	9.49277	7.98050e-1	0.6101

仪器 1 5/30/19 9:44:53

Page 1 of 2



(+)-2a

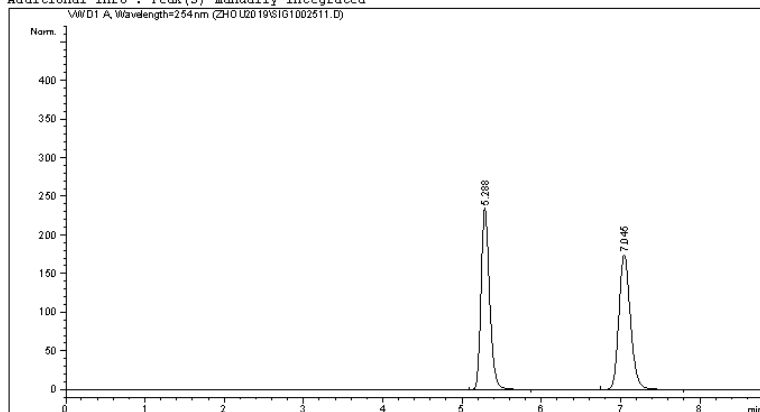
Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002511.D
 Sample Name: YZ-4-60ATH-rac

```

=====
Acq. Operator   :
Acq. Instrument : 仪器 1                Location : Vial 91
Injection Date  : 1/20/19 13:43:52
                                           Inj Volume : 5.000 µl

Acq. Method    : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 1/20/19 13:36:11
                (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 5/30/19 10:13:31
                (modified after loading)
Sample Info    : AD-H, n-hexane/i-PrOH = 90/10, 1.0 mL/min, 30 oC, 254 n
                m
  
```

Additional Info : Peak(s) manually integrated
 VWDL A, Wavelength=254nm (ZHOU2019\SIG1002511.D)



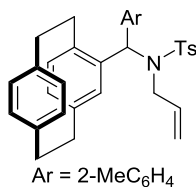
Area Percent Report

```

=====
Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWDL A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	5.288	VB	0.1161	1773.82800	234.77663	49.8177
2	7.045	VB	0.1554	1786.80872	174.56734	50.1823



仪器 1 5/30/19 10:13:37

Page 1 of 2

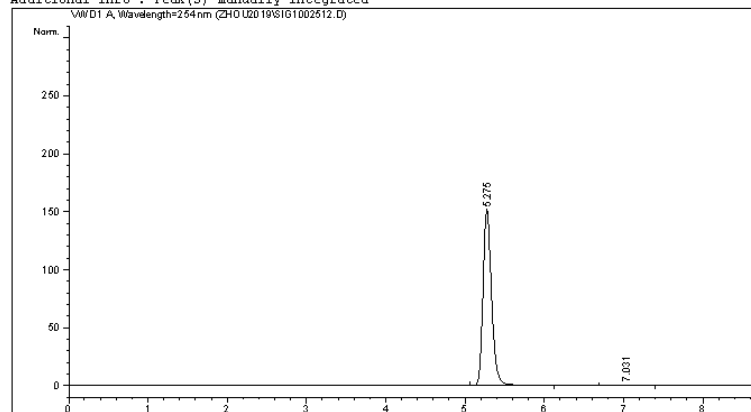
Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002512.D
 Sample Name: YZ-4-60ATH

```

=====
Acq. Operator   :
Acq. Instrument : 仪器 1                Location : Vial 91
Injection Date  : 1/20/19 14:00:58
                                           Inj Volume : 5.000 µl

Acq. Method    : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 1/20/19 13:53:05
                (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 5/30/19 10:15:57
                (modified after loading)
Sample Info    : AD-H, n-hexane/i-PrOH = 90/10, 1.0 mL/min, 30 oC, 254 n
                m
  
```

Additional Info : Peak(s) manually integrated
 VWDL A, Wavelength=254nm (ZHOU2019\SIG1002512.D)



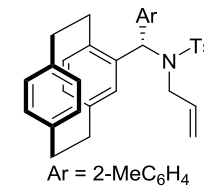
Area Percent Report

```

=====
Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWDL A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	5.275	VB	0.1157	1137.33081	151.29573	99.3545
2	7.031	VB	0.1814	7.38900	5.93066e-1	0.6455



仪器 1 5/30/19 10:16:02

Page 1 of 2

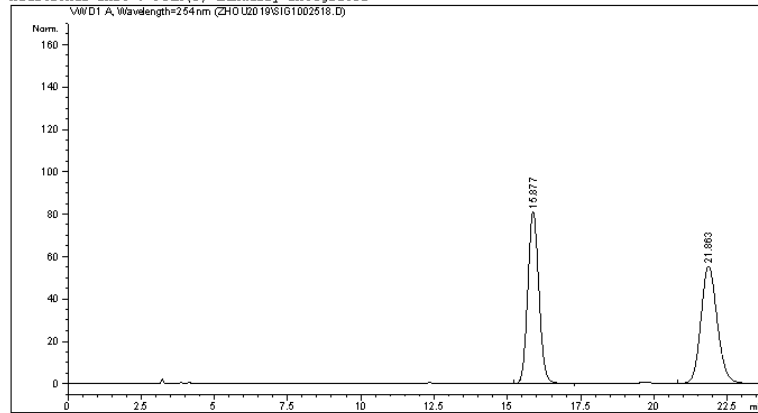
Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002518.D
 Sample Name: YZ-4-60BTM-rac

```

=====
Acq. Operator   :
Acq. Instrument : 仪器 1                Location : Vial 91
Injection Date  : 1/20/19 16:14:19
                                           Inj Volume : 5.000 µl

Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 1/20/19 16:08:14
                 (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 5/30/19 9:56:17
                 (modified after loading)
Sample Info     : IC, n-hexane/i-PrOH = 90/10, 1.0 mL/min, 30 oC, 254 nm
  
```

Additional Info : Peak(s) manually integrated



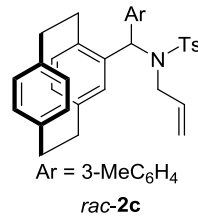
Area Percent Report

```

=====
Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	15.877	BB	0.4098	2122.69409	80.99484	49.8428
2	21.863	BB	0.5953	2136.08423	55.22515	50.1572



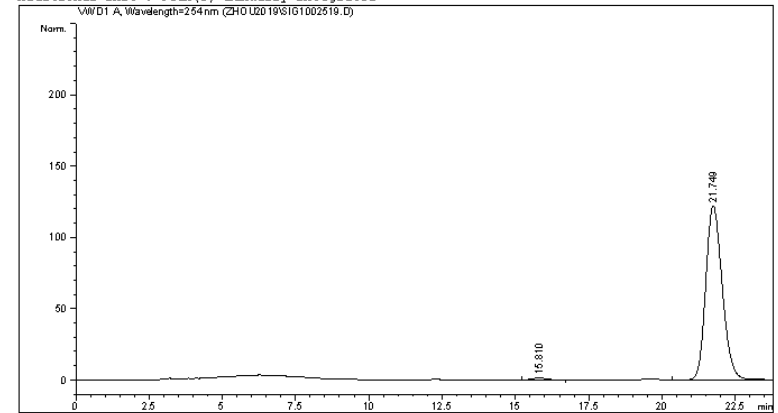
Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002519.D
 Sample Name: YZ-4-60BTM

```

=====
Acq. Operator   :
Acq. Instrument : 仪器 1                Location : Vial 91
Injection Date  : 1/20/19 16:44:09
                                           Inj Volume : 5.000 µl

Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 1/20/19 16:39:16
                 (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 5/30/19 10:00:29
                 (modified after loading)
Sample Info     : IC, n-hexane/i-PrOH = 90/10, 1.0 mL/min, 30 oC, 254 nm
  
```

Additional Info : Peak(s) manually integrated



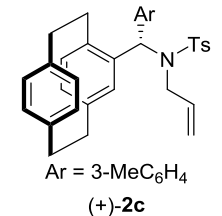
Area Percent Report

```

=====
Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

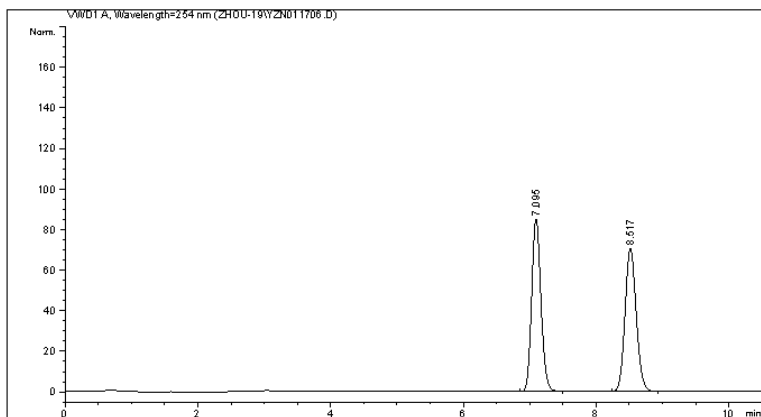
Signal 1: VWD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	15.810	BB	0.4197	45.00853	1.66333	0.9363
2	21.749	VB	0.6029	4762.27295	122.14498	99.0637



Data File C:\CHEM32\1\DATA\ZHOU-19\YZN011706.D
 Sample Name: YZ-4-62TMac

=====
 Acq. Operator :
 Acq. Instrument : Instrument 1 Location : -
 Injection Date : 1/24/2019 8:46:16 PM
 Acq. Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 1/24/2019 8:28:38 PM
 (modified after loading)
 Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 5/30/2019 11:42:24 AM
 (modified after loading)
 Sample Info : AD-H, Hexane/i-PrOH = 90/10, 1.0 mL/min, 30 oC, 254nm



=====
 Area Percent Report
 =====

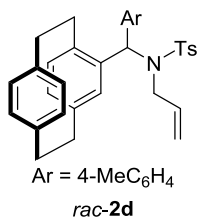
Sorted By : Signal
 Multiplier: : 1.0000
 Dilution: : 1.0000
 Use Multiplier & Dilution Factor with ISTDs

Signal 1: WVD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU]	%s	Height [mAU]	Area %
1	7.095	BB	0.1498	828.18707		85.17899	50.0782
2	8.517	BB	0.1819	825.60114		70.45312	49.9218

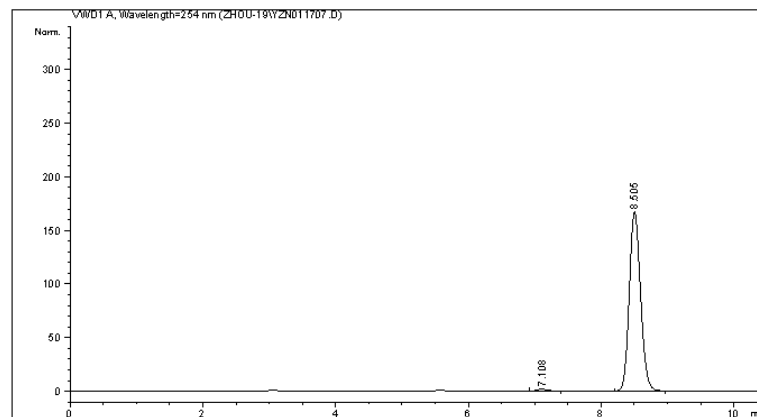
Totals : 1653.78821 155.63210

=====
 *** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-19\YZN011707.D
 Sample Name: YZ-4-62TM

=====
 Acq. Operator :
 Acq. Instrument : Instrument 1 Location : -
 Injection Date : 1/24/2019 9:20:35 PM
 Acq. Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 1/24/2019 9:08:41 PM
 (modified after loading)
 Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 5/30/2019 2:12:38 PM
 (modified after loading)
 Sample Info : AD-H, Hexane/i-PrOH = 90/10, 1.0 mL/min, 30 oC, 254nm



=====
 Area Percent Report
 =====

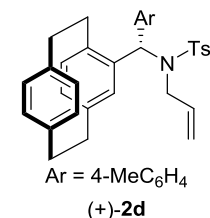
Sorted By : Signal
 Multiplier: : 1.0000
 Dilution: : 1.0000
 Use Multiplier & Dilution Factor with ISTDs

Signal 1: WVD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU]	%s	Height [mAU]	Area %
1	7.108	BB	0.1513	16.94180		1.71987	0.8538
2	8.505	BB	0.1840	1967.32690		166.99042	99.1462

Totals : 1984.26870 168.71029

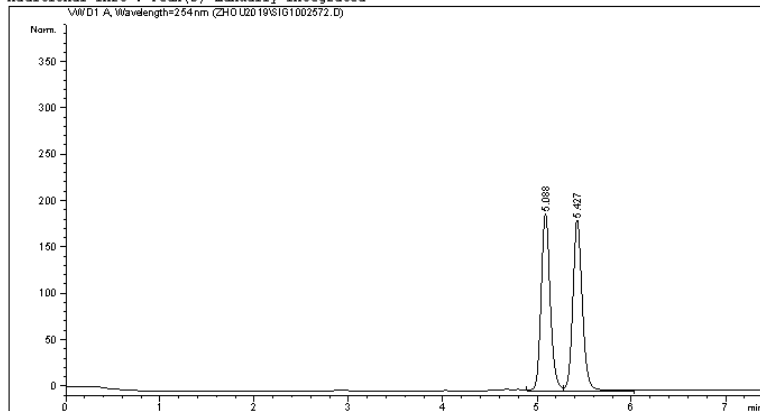
=====
 *** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002572.D
 Sample Name: YZ-4-65ATH(RAC)

=====
 Acq. Operator :
 Acq. Instrument : 仪器 1 Location : Vial 1
 Injection Date : 2/26/19 9:40:56 Inj Volume : 5.000 µl
 Acq. Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 2/26/19 9:37:52
 (modified after loading)
 Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 5/30/19 10:23:50
 (modified after loading)
 Sample Info : IB, n-hexane/i-PrOH =80/20, 1.0 mL/min, 30 oC, 254 nm

Additional Info : Peak(s) manually integrated

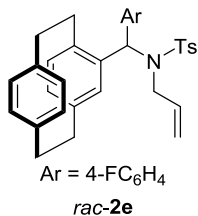


=====
 Area Percent Report
 =====

Sorted By : Signal
 Multiplier: : 1.0000
 Dilution: : 1.0000
 Use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=254 nm

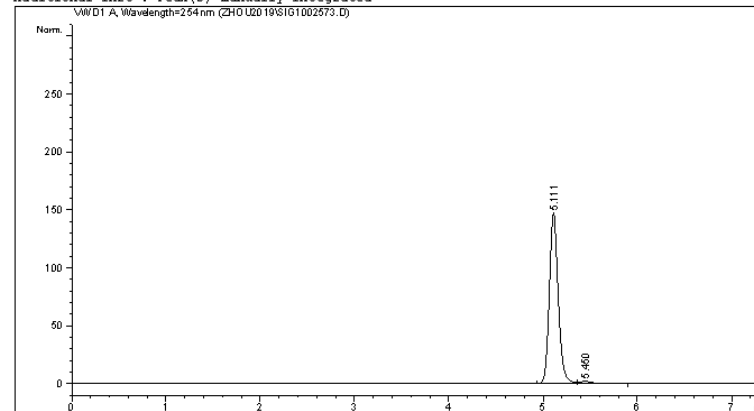
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	5.088	VV	0.1074	1295.38733	190.37517	49.6614
2	5.427	VV	0.1076	1313.04907	183.26695	50.3386



Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002573.D
 Sample Name: YZ-4-65ATH

=====
 Acq. Operator :
 Acq. Instrument : 仪器 1 Location : Vial 1
 Injection Date : 2/26/19 10:10:55 Inj Volume : 5.000 µl
 Acq. Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 2/26/19 9:55:52
 (modified after loading)
 Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 5/30/19 10:26:07
 (modified after loading)
 Sample Info : IB, n-hexane/i-PrOH =80/20, 1.0 mL/min, 30 oC, 254 nm

Additional Info : Peak(s) manually integrated

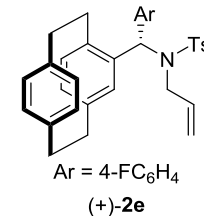


=====
 Area Percent Report
 =====

Sorted By : Signal
 Multiplier: : 1.0000
 Dilution: : 1.0000
 Use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	5.111	VV	0.1058	976.24976	146.41737	98.0768
2	5.450	VV	0.1333	19.14368	2.04433	1.9232



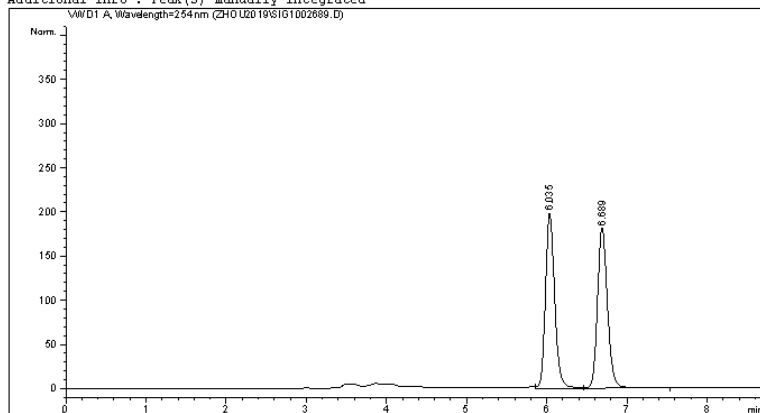
Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002689.D
 Sample Name: YZ-4-74BTH(RAC)

```

=====
Acq. Operator   :
Acq. Instrument : 仪器 1                Location : Vial 1
Injection Date  : 3/13/19 15:35:31
                                           Inj Volume : 5.000 µl

Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/13/19 15:25:54
                 (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 5/30/19 10:54:57
                 (modified after loading)
Sample Info     : IB, n-hexane/i-PrOH =90/10, 1.0 mL/min, 30 oC, 254 nm
  
```

Additional Info : Peak(s) manually integrated



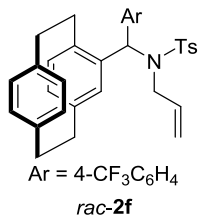
Area Percent Report

```

Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	6.035	VV	0.1249	1574.70276	197.71895	50.1111
2	6.689	VB	0.1333	1567.71960	180.62619	49.8889



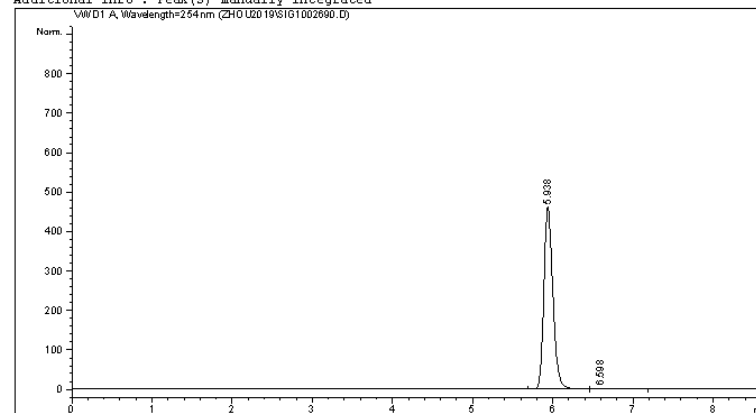
Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002690.D
 Sample Name: YZ-4-74BTH

```

=====
Acq. Operator   :
Acq. Instrument : 仪器 1                Location : Vial 1
Injection Date  : 3/13/19 15:48:33
                                           Inj Volume : 5.000 µl

Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/13/19 15:44:49
                 (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 5/30/19 10:57:45
                 (modified after loading)
Sample Info     : IB, n-hexane/i-PrOH =90/10, 1.0 mL/min, 30 oC, 254 nm
  
```

Additional Info : Peak(s) manually integrated



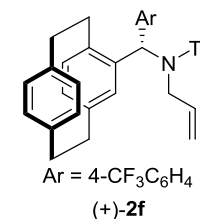
Area Percent Report

```

Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWD1 A, Wavelength=254 nm

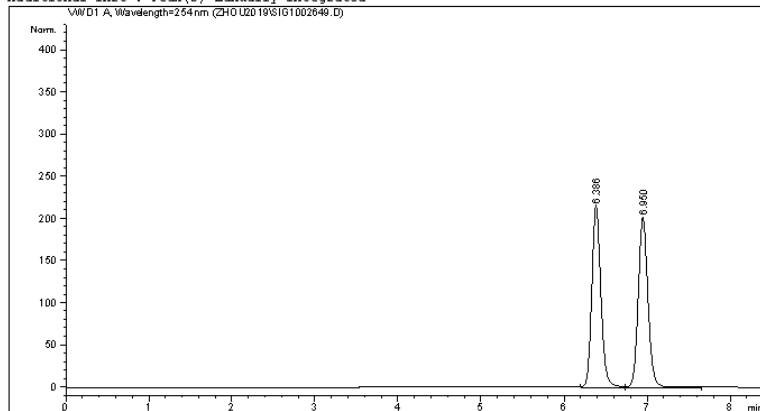
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	5.938	VV	0.1197	3623.50244	461.16406	99.3273
2	6.598	VV	0.1821	24.54160	1.90772	0.6727



Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002649.D
 Sample Name: YZ-4-72ATH RAC

=====
 Acq. Operator :
 Acq. Instrument : 仪器 1 Location : Vial 1
 Injection Date : 3/9/19 9:45:10 Inj Volume : 5.000 µl
 Acq. Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 3/9/19 9:38:16
 (modified after loading)
 Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 5/30/19 10:39:35
 (modified after loading)
 Sample Info : IB, n-hexane/i-PrOH =80/20, 0.8 mL/min, 30 oC, 254 nm

Additional Info : Peak(s) manually integrated

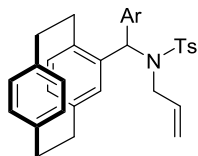


=====
 Area Percent Report
 =====

Sorted By : Signal
 Multiplier: : 1.0000
 Dilution: : 1.0000
 Use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	6.386	VV	0.1217	1653.46570	214.99780	49.9937
2	6.950	VV	0.1280	1653.88330	200.99446	50.0063

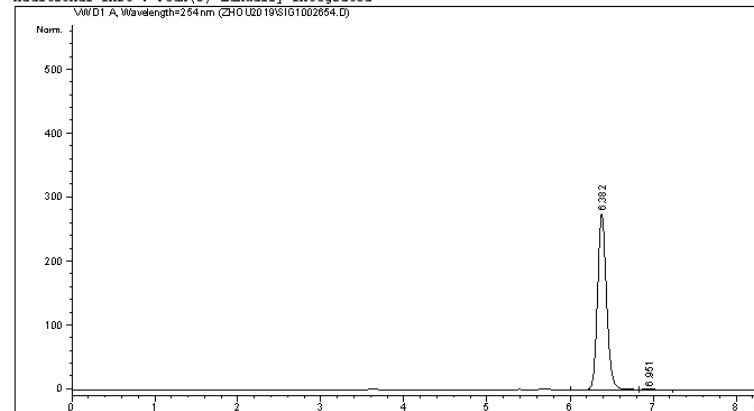


Ar = 4-ClC₆H₄
rac-2g

Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002654.D
 Sample Name: YZ-4-72ATH

=====
 Acq. Operator :
 Acq. Instrument : 仪器 1 Location : Vial 1
 Injection Date : 3/9/19 14:20:02 Inj Volume : 5.000 µl
 Acq. Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 3/9/19 14:17:28
 (modified after loading)
 Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 5/30/19 10:41:45
 (modified after loading)
 Sample Info : IB, n-hexane/i-PrOH =80/20, 0.8 mL/min, 30 oC, 254 nm

Additional Info : Peak(s) manually integrated

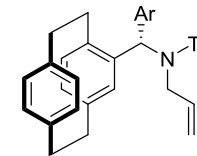


=====
 Area Percent Report
 =====

Sorted By : Signal
 Multiplier: : 1.0000
 Dilution: : 1.0000
 Use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	6.382	VV	0.1170	2098.80957	275.09128	99.4442
2	6.951	VV	0.1537	11.73071	1.08846	0.5558

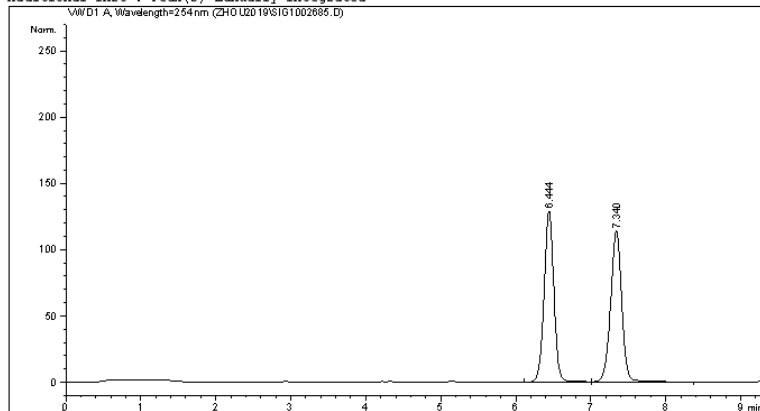


Ar = 4-ClC₆H₄
(+)-2g

Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002685.D
 Sample Name: YZ-4-74ATH(RAC)

=====
 Acq. Operator :
 Acq. Instrument : 仪器 1 Location : Vial 1
 Injection Date : 3/13/19 11:35:41 Inj Volume : 5.000 µl
 Acq. Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 3/13/19 11:33:58
 (modified after loading)
 Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 5/30/19 10:46:04
 (modified after loading)
 Sample Info : IA, n-hexane/i-PrOH =90/10, 1.0 mL/min, 30 oC, 254 nm

Additional Info : Peak(s) manually integrated

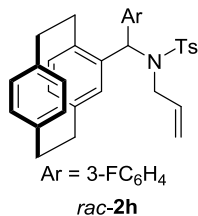


=====
 Area Percent Report
 =====

Sorted By : Signal
 Multiplier: : 1.0000
 Dilution: : 1.0000
 Use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=254 nm

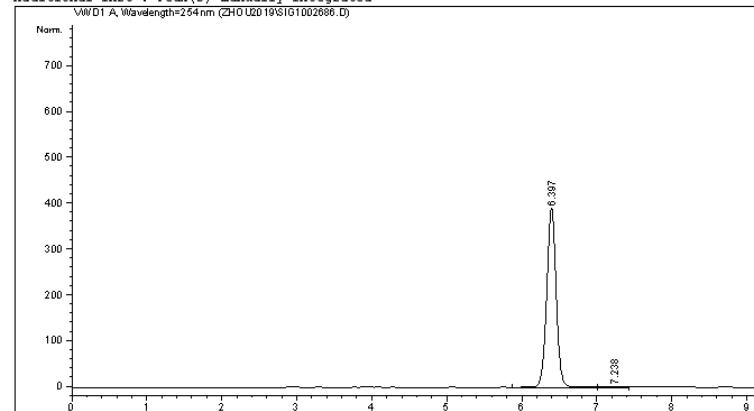
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	6.444	VV	0.1419	1170.60938	128.92268	49.6684
2	7.340	VB	0.1576	1186.24072	113.80168	50.3316



Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002686.D
 Sample Name: YZ-4-74ATH

=====
 Acq. Operator :
 Acq. Instrument : 仪器 1 Location : Vial 1
 Injection Date : 3/13/19 14:20:13 Inj Volume : 5.000 µl
 Acq. Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 3/13/19 13:47:06
 (modified after loading)
 Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 5/30/19 10:48:45
 (modified after loading)
 Sample Info : IA, n-hexane/i-PrOH =90/10, 1.0 mL/min, 30 oC, 254 nm

Additional Info : Peak(s) manually integrated

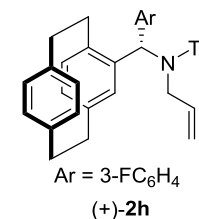


=====
 Area Percent Report
 =====

Sorted By : Signal
 Multiplier: : 1.0000
 Dilution: : 1.0000
 Use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=254 nm

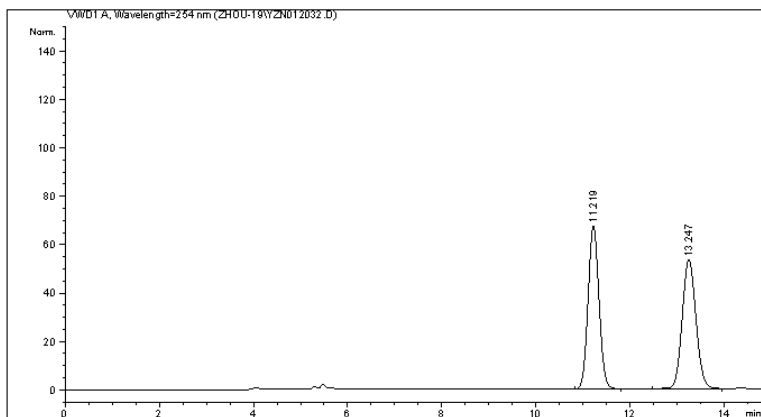
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	6.397	VV	0.1351	3452.54590	390.52866	99.4426
2	7.238	VV	0.1987	19.35161	1.38728	0.5574



Data File C:\CHEM32\1\DATA\ZHOU-19\YZN012032.D
 Sample Name: YZ-4-77TM (RAC)

```

=====
Acq. Operator   :                               Location : -
Acq. Instrument : Instrument 1
Injection Date  : 3/18/2019 9:39:09 PM
Acq. Method    : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 3/18/2019 9:07:39 PM
                (modified after loading)
Analysis Method: C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 5/30/2019 3:06:15 PM
                (modified after loading)
Sample Info    : IC, Hexane/i-PrOH = 80/20, 0.8 mL/min, 30 oC, 254 nm
  
```



Area Percent Report

```

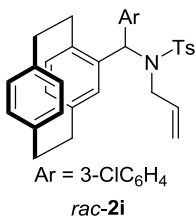
Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU]	%s	Height [mAU]	Area %
1	11.219	BB	0.2505	1088.86633		67.61742	49.9980
2	13.247	BB	0.3161	1088.95276		53.49617	50.0020

Totals : 2177.81909 121.11358

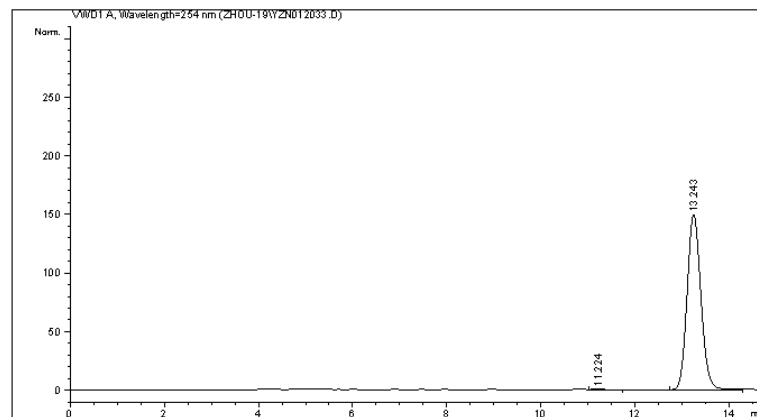
*** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-19\YZN012033.D
 Sample Name: YZ-4-77TM

```

=====
Acq. Operator   :                               Location : -
Acq. Instrument : Instrument 1
Injection Date  : 3/18/2019 9:58:13 PM
Acq. Method    : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 3/18/2019 9:53:52 PM
                (modified after loading)
Analysis Method: C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 5/30/2019 3:12:11 PM
                (modified after loading)
Sample Info    : IC, Hexane/i-PrOH = 80/20, 0.8 mL/min, 30 oC, 254 nm
  
```



Area Percent Report

```

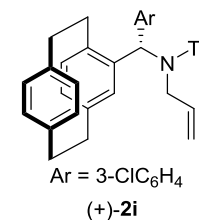
Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU]	%s	Height [mAU]	Area %
1	11.224	VB	0.2855	9.32760		4.78741e-1	0.3064
2	13.243	BB	0.3156	3034.82080		149.38318	99.6936

Totals : 3044.14840 149.86192

*** End of Report ***



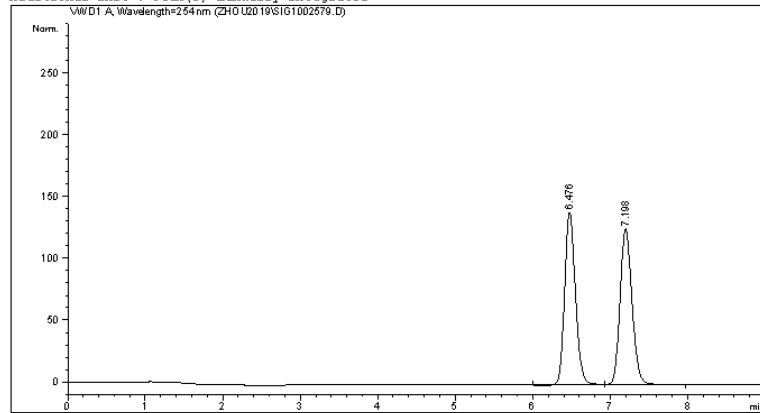
Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002579.D
 Sample Name: YZ-4-65BTHRAC

```

=====
Acq. Operator   :
Acq. Instrument : 仪器 1                Location : Vial 1
Injection Date  : 2/26/19 19:28:36
                                           Inj Volume : 5.000 µl

Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 2/26/19 19:26:35
                 (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 5/30/19 10:30:25
                 (modified after loading)
Sample Info     : AD-H, n-hexane/i-PrOH =80/20, 1.0 mL/min, 30 oC, 254 nm
  
```

Additional Info : Peak(s) manually integrated



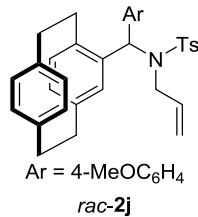
Area Percent Report

```

Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	6.476	VV	0.1500	1364.39746	139.67671	49.8383
2	7.198	VB	0.1669	1373.24829	126.26674	50.1617



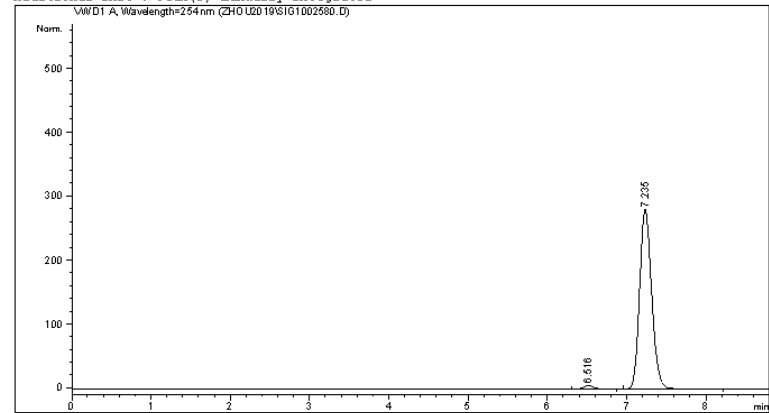
Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002580.D
 Sample Name: YZ-4-65BTH

```

=====
Acq. Operator   :
Acq. Instrument : 仪器 1                Location : Vial 1
Injection Date  : 2/26/19 19:42:14
                                           Inj Volume : 5.000 µl

Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 2/26/19 19:37:55
                 (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 5/30/19 10:32:27
                 (modified after loading)
Sample Info     : AD-H, n-hexane/i-PrOH =80/20, 1.0 mL/min, 30 oC, 254 nm
  
```

Additional Info : Peak(s) manually integrated



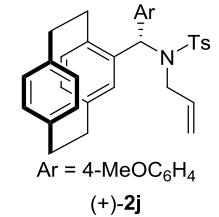
Area Percent Report

```

Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

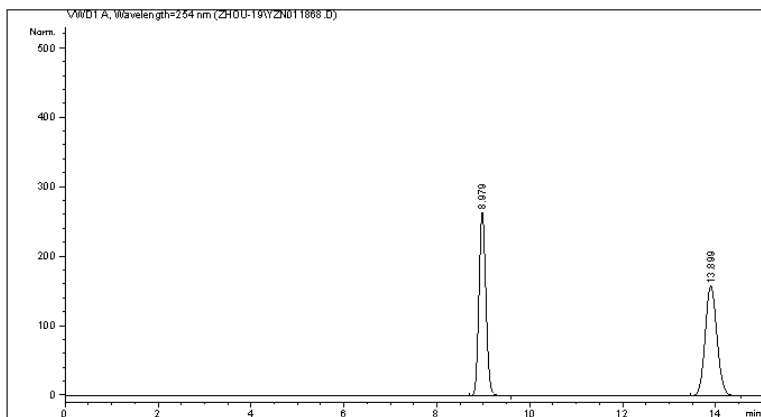
Signal 1: VWD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	6.516	VB	0.1543	52.88145	5.21458	1.7472
2	7.235	BB	0.1635	2973.78955	280.84409	98.2528



Data File C:\CHEM32\1\DATA\ZHOU-19\YZN011866.D
 Sample Name: YZ-4-68TRAC

=====
 Acq. Operator :
 Acq. Instrument : Instrument 1 Location : -
 Injection Date : 3/4/2019 2:21:07 PM
 Acq. Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 3/4/2019 2:12:49 PM
 (modified after loading)
 Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 5/30/2019 3:01:05 PM
 (modified after loading)
 Sample Info : AD-3, Hexane/i-PrOH = 90/10, 1.0 mL/min, 30 oC, 254 nm



=====
 Area Percent Report
 =====

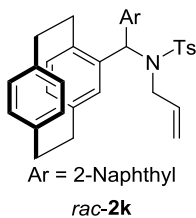
Sorted By : Signal
 Multiplier: : 1.0000
 Dilution: : 1.0000
 Use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU]	%s	Height [mAU]	Area %
1	8.979	BB	0.1607	2742.24780	263.62332	263.62332	49.7799
2	13.899	BB	0.2732	2766.49902	157.65988	157.65988	50.2201

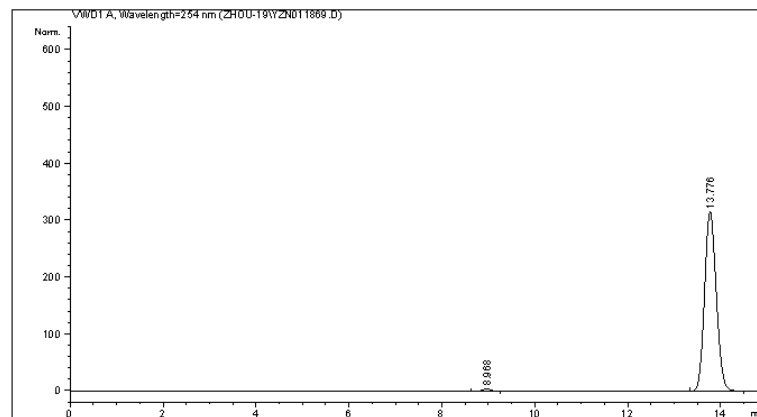
Totals : 5508.74683 421.28320

=====
 *** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-19\YZN011869.D
 Sample Name: YZ-4-68TM

=====
 Acq. Operator :
 Acq. Instrument : Instrument 1 Location : -
 Injection Date : 3/4/2019 2:42:07 PM
 Acq. Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 3/4/2019 2:37:25 PM
 (modified after loading)
 Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 5/30/2019 3:03:12 PM
 (modified after loading)
 Sample Info : AD-3, Hexane/i-PrOH = 90/10, 1.0 mL/min, 30 oC, 254 nm



=====
 Area Percent Report
 =====

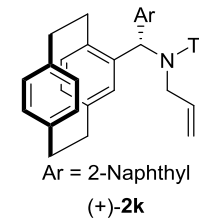
Sorted By : Signal
 Multiplier: : 1.0000
 Dilution: : 1.0000
 Use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU]	%s	Height [mAU]	Area %
1	8.968	BB	0.1706	43.85571	3.89708	3.89708	0.7900
2	13.776	BB	0.2723	5507.79785	315.25461	315.25461	99.2100

Totals : 5551.65356 319.15169

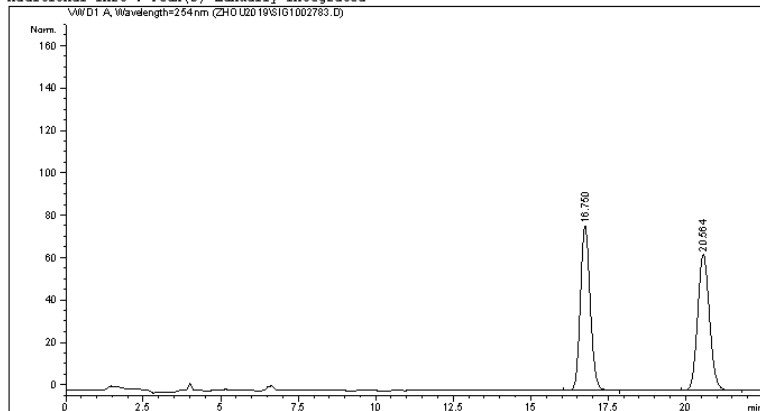
=====
 *** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002783.D
 Sample Name: YZ-4-85SM(RAC)

=====
 Acq. Operator :
 Acq. Instrument : 仪器 1 Location : Vial 1
 Injection Date : 3/28/19 15:10:36 Inj Volume : 5.000 µl
 Acq. Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 3/28/19 15:07:42
 (modified after loading)
 Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 5/30/19 11:10:50
 (modified after loading)
 Sample Info : AD-H, n-hexane/i-PrOH =80/20, 0.8 mL/min, 30 oC, 254 nm

Additional Info : Peak(s) manually integrated

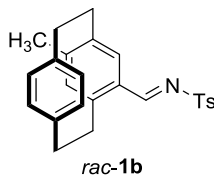


=====
 Area Percent Report
 =====

Sorted By : Signal
 Multiplier: : 1.0000
 Dilution: : 1.0000
 Use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=254 nm

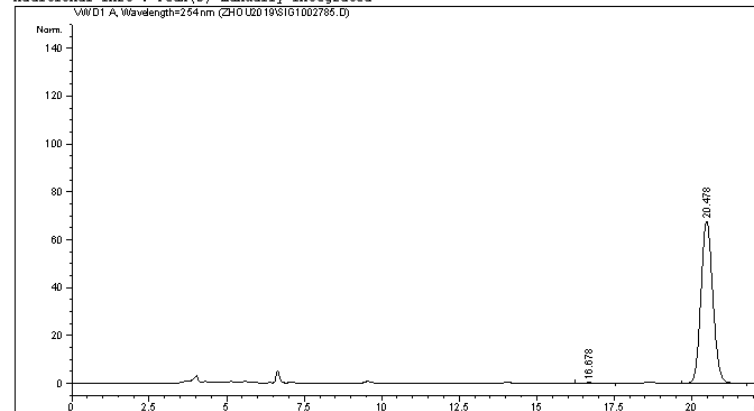
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	16.750	VB	0.3398	1703.34778	77.67725	50.0414
2	20.564	BB	0.4090	1700.52625	64.20832	49.9586



Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002785.D
 Sample Name: YZ-4-85A5M

=====
 Acq. Operator :
 Acq. Instrument : 仪器 1 Location : Vial 1
 Injection Date : 3/28/19 16:11:29 Inj Volume : 5.000 µl
 Acq. Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 3/28/19 16:03:42
 (modified after loading)
 Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 5/30/19 11:13:02
 (modified after loading)
 Sample Info : AD-H, n-hexane/i-PrOH =80/20, 0.8 mL/min, 30 oC, 254 nm

Additional Info : Peak(s) manually integrated

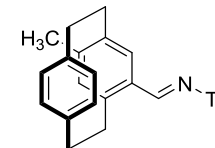


=====
 Area Percent Report
 =====

Sorted By : Signal
 Multiplier: : 1.0000
 Dilution: : 1.0000
 Use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	16.678	VB	0.3780	5.37114	2.19076e-1	0.2988
2	20.478	VB	0.4126	1792.24390	67.75414	99.7012

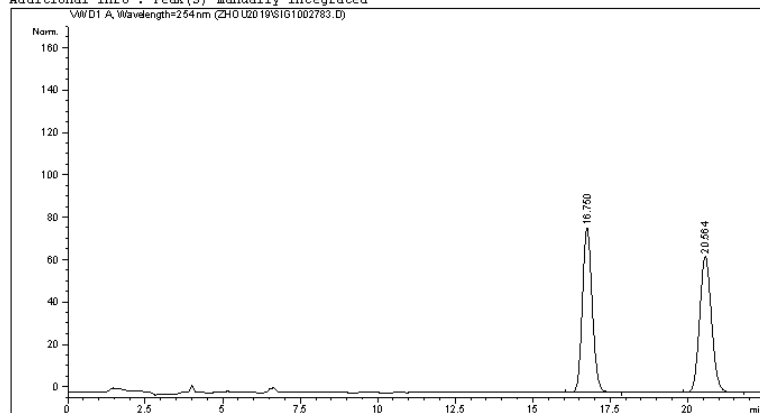


Kinetic resolution
 from PhB(OH)₂

Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002783.D
 Sample Name: YZ-4-85SM(RAC)

=====
 Acq. Operator :
 Acq. Instrument : 仪器 1 Location : Vial 1
 Injection Date : 3/28/19 15:10:36 Inj Volume : 5.000 µl
 Acq. Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 3/28/19 15:07:42
 (modified after loading)
 Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 5/30/19 11:10:50
 (modified after loading)
 Sample Info : AD-H, n-hexane/i-PrOH =80/20, 0.8 mL/min, 30 oC, 254 nm

Additional Info : Peak(s) manually integrated

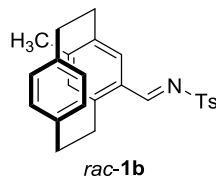


=====
 Area Percent Report
 =====

Sorted By : Signal
 Multiplier: : 1.0000
 Dilution: : 1.0000
 Use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=254 nm

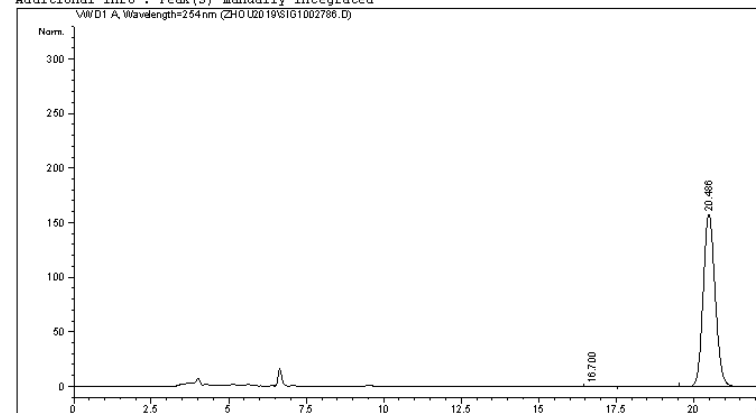
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	16.750	VB	0.3398	1703.34778	77.67725	50.0414
2	20.564	BB	0.4090	1700.52625	64.20832	49.9586



Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002786.D
 Sample Name: YZ-4-85BSM

=====
 Acq. Operator :
 Acq. Instrument : 仪器 1 Location : Vial 1
 Injection Date : 3/28/19 16:41:59 Inj Volume : 5.000 µl
 Acq. Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 3/28/19 16:36:17
 (modified after loading)
 Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 5/30/19 11:16:11
 (modified after loading)
 Sample Info : AD-H, n-hexane/i-PrOH =80/20, 0.8 mL/min, 30 oC, 254 nm

Additional Info : Peak(s) manually integrated

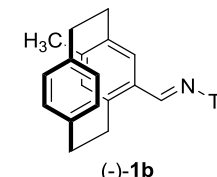


=====
 Area Percent Report
 =====

Sorted By : Signal
 Multiplier: : 1.0000
 Dilution: : 1.0000
 Use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=254 nm

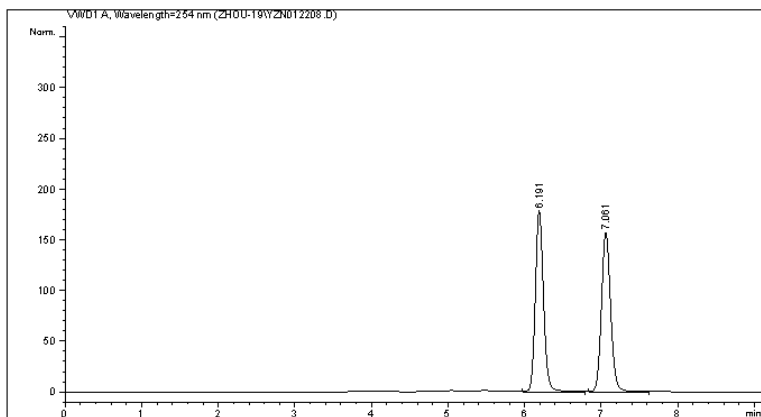
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	16.700	BB	0.3320	1.72371	8.10932e-2	0.0410
2	20.486	VB	0.4141	4197.48438	157.91101	99.9590



Kinetic resolution
 from 4-CIC₆H₄B(OH)₂

Data File C:\CHEM32\1\DATA\ZHOU-19\YZN012206.D
 Sample Name: YZ-4-85ATM(RAC)

=====
 Acq. Operator :
 Acq. Instrument : Instrument 1 Location : -
 Injection Date : 3/29/2019 6:14:54 PM
 Acq. Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 3/29/2019 5:45:37 PM
 (modified after loading)
 Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 5/30/2019 3:14:00 PM
 (modified after loading)
 Sample Info : IB, Hexane/i-PrOH = 80/20, 0.8 mL/min, 30 oC, 254 nm



=====
 Area Percent Report
 =====

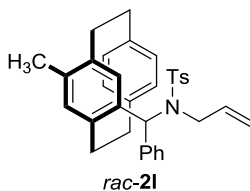
Sorted By : Signal
 Multiplier: : 1.0000
 Dilution: : 1.0000
 Use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU]	%s	Height [mAU]	Area %
1	6.191	VB	0.1162	1327.92615	177.90462	50.1746	
2	7.061	BV	0.1300	1318.68494	156.98839	49.8254	

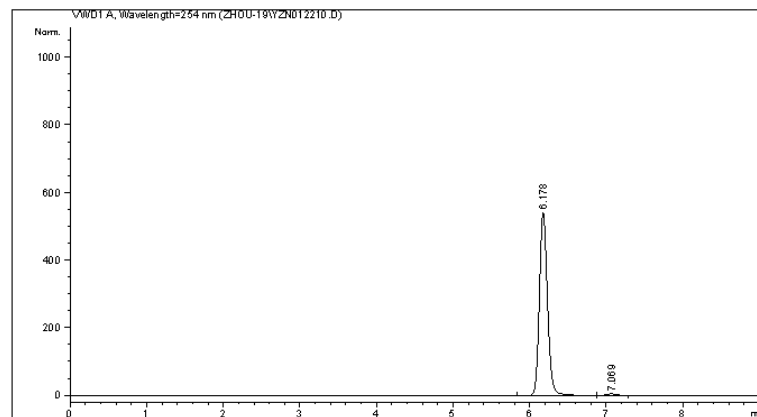
Totals : 2646.61108 334.89301

=====
 *** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-19\YZN012210.D
 Sample Name: YZ-4-85ATM

=====
 Acq. Operator :
 Acq. Instrument : Instrument 1 Location : -
 Injection Date : 3/29/2019 7:21:42 PM
 Acq. Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 3/29/2019 7:17:30 PM
 (modified after loading)
 Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 5/30/2019 3:16:29 PM
 (modified after loading)
 Sample Info : IB, Hexane/i-PrOH = 80/20, 0.8 mL/min, 30 oC, 254 nm



=====
 Area Percent Report
 =====

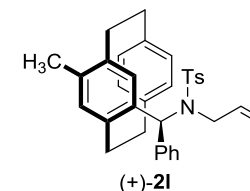
Sorted By : Signal
 Multiplier: : 1.0000
 Dilution: : 1.0000
 Use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU]	%s	Height [mAU]	Area %
1	6.178	VV	0.1147	3966.83667	540.66260	98.8784	
2	7.069	VV	0.1416	44.99822	4.78936	1.1216	

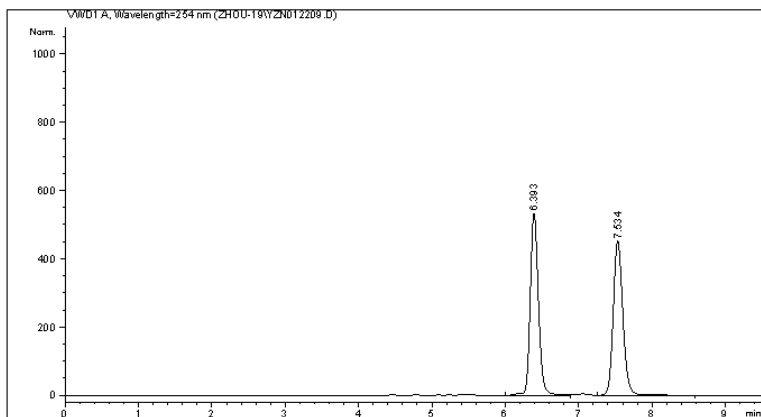
Totals : 4011.83489 545.45195

=====
 *** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-19\YZN012209.D
 Sample Name: YZ-4-85BTM(RAC)

=====
 Acq. Operator :
 Acq. Instrument : Instrument 1 Location : -
 Injection Date : 3/29/2019 6:50:04 PM
 Acq. Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 3/29/2019 6:31:53 PM
 (modified after loading)
 Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 5/30/2019 3:18:19 PM
 (modified after loading)
 Sample Info : IB, Hexane/i-PrOH = 80/20, 0.8 mL/min, 30 oC, 254 nm



=====
 Area Percent Report
 =====

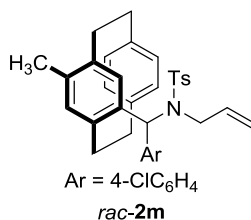
Sorted By : Signal
 Multiplier: : 1.0000
 Dilution: : 1.0000
 Use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU]	%s	Height [mAU]	Area %
1	6.393	VV	0.1201	4162.28418	533.65631	50.1410	
2	7.534	VB	0.1449	4138.87744	451.23529	49.8590	

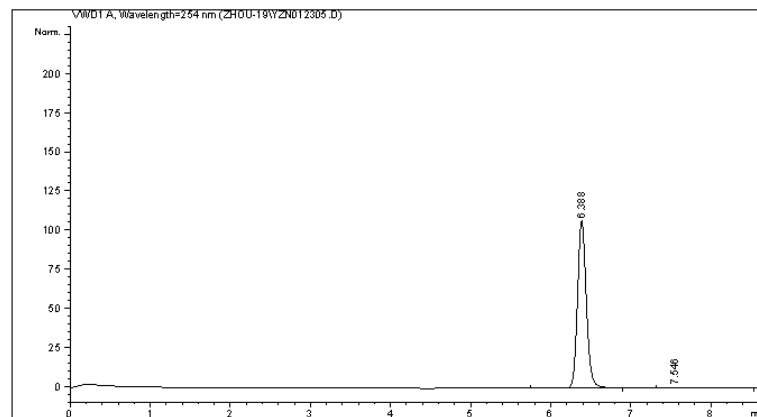
Totals : 8301.16162 984.89160

=====
 *** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-19\YZN012305.D
 Sample Name: YZ-4-85BTM

=====
 Acq. Operator :
 Acq. Instrument : Instrument 1 Location : -
 Injection Date : 4/4/2019 4:42:52 PM
 Acq. Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 4/4/2019 4:38:27 PM
 (modified after loading)
 Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 5/30/2019 3:21:28 PM
 (modified after loading)
 Sample Info : IB, Hexane/i-PrOH = 80/20, 0.8 mL/min, 30 oC, 254nm



=====
 Area Percent Report
 =====

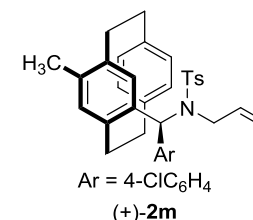
Sorted By : Signal
 Multiplier: : 1.0000
 Dilution: : 1.0000
 Use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU]	%s	Height [mAU]	Area %
1	6.388	VV	0.1195	829.39233	107.05394	98.9261	
2	7.546	VB	0.2344	9.00354	5.42591e-1	1.0739	

Totals : 838.39587 107.59653

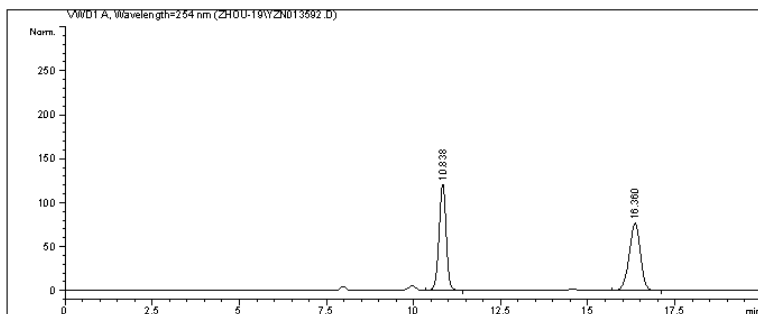
=====
 *** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-19\YZN013592.D
 Sample Name: YZ-6-8SM(rac)

```

=====
Acq. Operator   :
Acq. Instrument : Instrument 1          Location : -
Injection Date  : 10/4/2019 7:59:13 AM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 10/4/2019 7:29:59 AM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 10/8/2019 10:15:37 PM
                  (modified after loading)
Sample Info     : IA, Hexane/i-PrOH = 80/20, 0.8 mL/min, 30 oC, 254 nm
=====
  
```



=====
 Area Percent Report
 =====

```

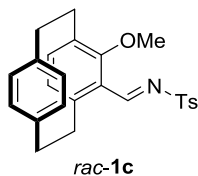
Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	10.838	VB	0.2183	1721.50732	121.04810	50.0515
2	16.360	BB	0.3434	1717.96399	76.97136	49.9485

Totals : 3439.47131 198.01946

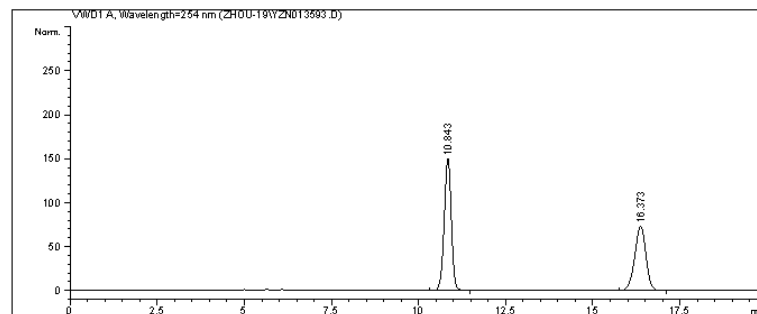
=====
 *** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-19\YZN013593.D
 Sample Name: YZ-6-8SM

```

=====
Acq. Operator   :
Acq. Instrument : Instrument 1          Location : -
Injection Date  : 10/4/2019 8:29:25 AM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 10/4/2019 8:25:01 AM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 10/8/2019 10:18:11 PM
                  (modified after loading)
Sample Info     : IA, Hexane/i-PrOH = 80/20, 0.8 mL/min, 30 oC, 254 nm
=====
  
```



=====
 Area Percent Report
 =====

```

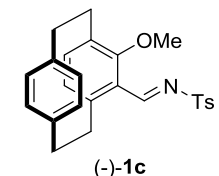
Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	10.843	VB	0.2182	2133.72656	150.12553	56.5968
2	16.373	BB	0.3431	1636.32202	73.39268	43.4032

Totals : 3770.04858 223.51822

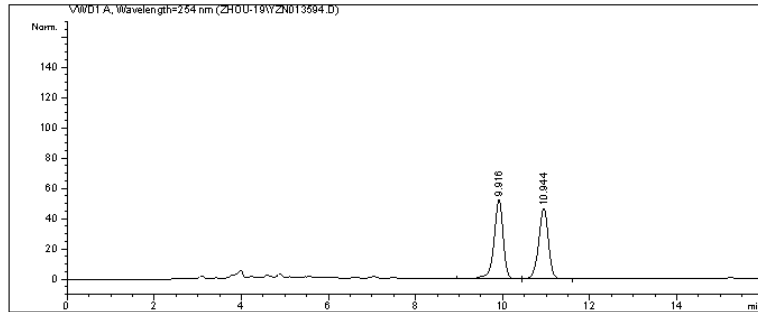
=====
 *** End of Report ***



Kinetic resolution
 from 4-ClC₆H₄B(OH)₂

Data File C:\CHEM32\1\DATA\ZHOU-19\YZN013594.D
 Sample Name: YZ-6-8TM(RAC)

=====
 Acq. Operator :
 Acq. Instrument : Instrument 1 Location : -
 Injection Date : 10/7/2019 12:17:09 AM
 Acq. Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 10/6/2019 11:15:04 PM
 (modified after loading)
 Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 10/8/2019 9:25:29 PM
 (modified after loading)
 Sample Info : IA, Hexane/i-PrOH = 90/10, 1.0 mL/min, 30 oC, 254 nm



=====
 Area Percent Report
 =====

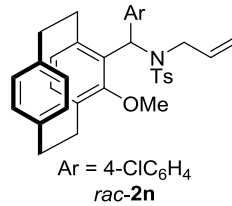
Sorted By : Signal
 Multiplier: : 1.0000
 Dilution: : 1.0000
 Use Multiplier & Dilution Factor with ISTDs

Signal 1: WVD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	9.916	VV	0.2252	774.40588	52.28675	51.4118
2	10.944	VB	0.2416	731.87537	46.56057	48.5882

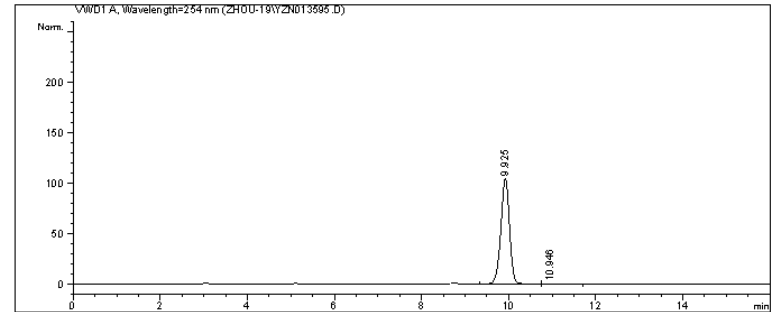
Totals : 1506.28125 98.84732

=====
 *** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-19\YZN013595.D
 Sample Name: YZ-6-8TM

=====
 Acq. Operator :
 Acq. Instrument : Instrument 1 Location : -
 Injection Date : 10/7/2019 2:33:03 AM
 Acq. Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 10/7/2019 2:15:22 AM
 (modified after loading)
 Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
 Last changed : 10/8/2019 11:09:42 PM
 (modified after loading)
 Sample Info : IA, Hexane/i-PrOH = 90/10, 1.0 mL/min, 30 oC, 254 nm



=====
 Area Percent Report
 =====

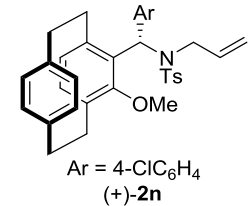
Sorted By : Signal
 Multiplier: : 1.0000
 Dilution: : 1.0000
 Use Multiplier & Dilution Factor with ISTDs

Signal 1: WVD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	9.925	VB	0.2147	1448.35022	104.10171	99.7152
2	10.946	BB	0.3016	4.13618	1.77072e-1	0.2848

Totals : 1452.48640 104.27878

=====
 *** End of Report ***



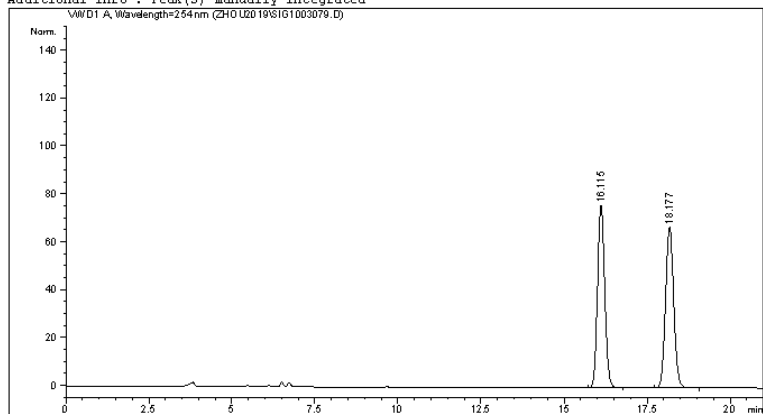
Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1003079.D
 Sample Name: YZ-4-58ESH(RAC)

```

=====
Acq. Operator   :
Acq. Instrument : 仪器 1                Location : Vial 1
Injection Date  : 5/30/19 9:38:00
                                           Inj Volume : 5.000 µl

Acq. Method    : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 5/30/19 9:07:37
                (modified after loading)
Analysis Method: C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 5/30/19 10:07:23
                (modified after loading)
Sample Info    : AD-3, n-hexane/i-PrOH = 80/20, 0.8 mL/min, 30 oC, 254 n
                m
  
```

Additional Info : Peak(s) manually integrated
 VW/D1 A, Wavelength=254nm (ZHOU2019\SIG1003079.D)



Area Percent Report

```

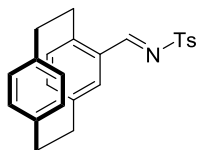
=====
Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VW/D1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	16.115	BV	0.2366	1152.96143	76.14727	49.9519
2	18.177	VB	0.2685	1155.18225	67.21445	50.0481

仪器 1 5/30/19 10:07:42

Page 1 of 2



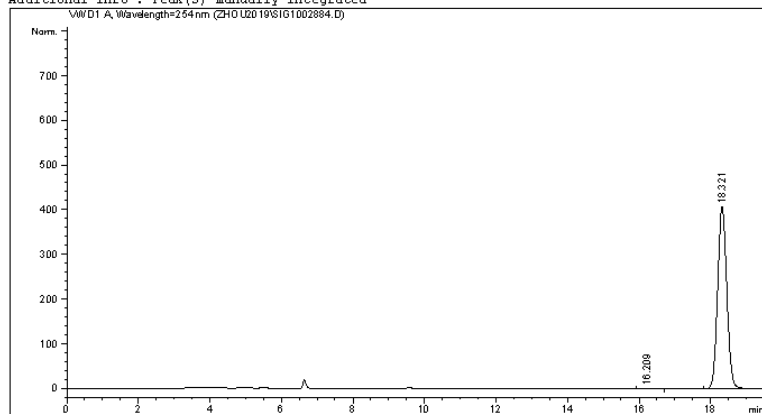
Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002884.D
 Sample Name: YZ-4-89SM

```

=====
Acq. Operator   :
Acq. Instrument : 仪器 1                Location : Vial 1
Injection Date  : 4/15/19 15:25:10
                                           Inj Volume : 5.000 µl

Acq. Method    : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 4/15/19 14:50:36
                (modified after loading)
Analysis Method: C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 5/30/19 11:24:17
                (modified after loading)
Sample Info    : AD-3, n-hexane/i-PrOH = 80/20, 0.8 mL/min, 30 oC, 254 n
                m
  
```

Additional Info : Peak(s) manually integrated
 VW/D1 A, Wavelength=254nm (ZHOU2019\SIG1002884.D)



Area Percent Report

```

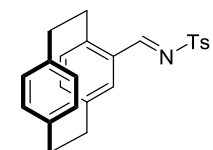
=====
Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VW/D1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	16.209	BB	0.2479	4.46118	2.76951e-1	0.0620
2	18.321	BBA	0.2743	7188.56885	406.57086	99.9380

仪器 1 5/30/19 11:24:24

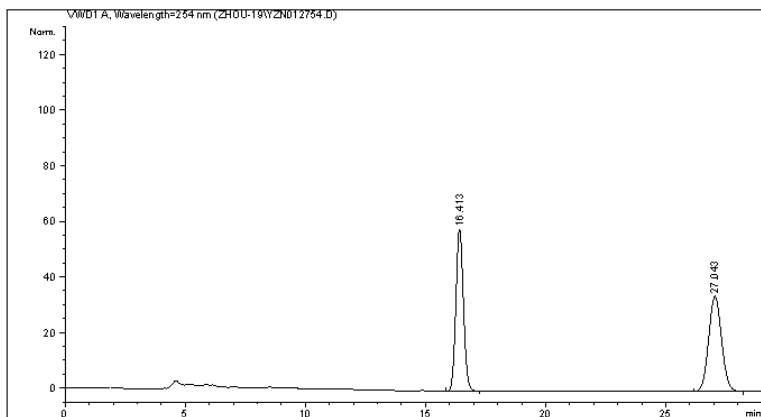
Page 1 of 2



Data File C:\CHEM32\1\DATA\ZHOU-19\YZN012754.D
 Sample Name: YZ-4-90(RAC)

```

=====
Acq. Operator   :
Acq. Instrument : Instrument 1          Location : -
Injection Date  : 5/30/2019 4:43:47 PM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 5/30/2019 4:22:40 PM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 5/30/2019 6:06:15 PM
                  (modified after loading)
Sample Info     : AD-H, Hexane/i-PrOH = 60/40, 0.7 mL/min, 30 oC, 254 nm
  
```



Area Percent Report

```

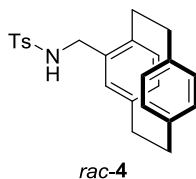
Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU]	%s	Height [mAU]	Area %
1	16.413	BB	0.3404	1280.18188	58.35740	49.9418	
2	27.043	BB	0.5851	1283.16443	34.29058	50.0582	

Totals : 2563.34631 92.64797

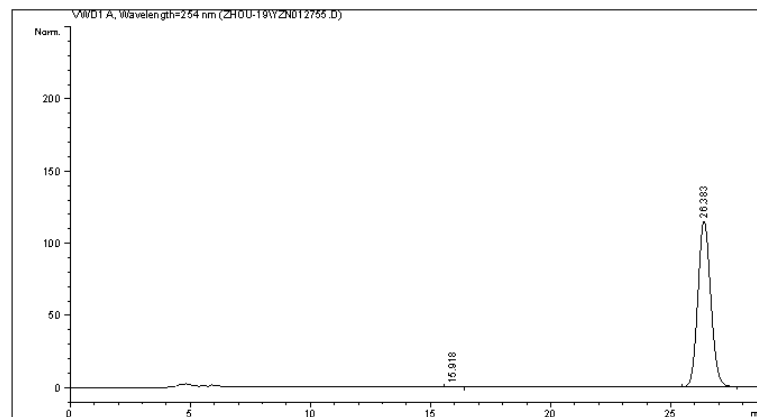
*** End of Report ***



Data File C:\CHEM32\1\DATA\ZHOU-19\YZN012755.D
 Sample Name: YZ-4-90

```

=====
Acq. Operator   :
Acq. Instrument : Instrument 1          Location : -
Injection Date  : 5/30/2019 5:16:44 PM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 5/30/2019 5:15:35 PM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 5/30/2019 6:11:10 PM
                  (modified after loading)
Sample Info     : AD-H, Hexane/i-PrOH = 60/40, 0.7 mL/min, 30 oC, 254 nm
  
```



Area Percent Report

```

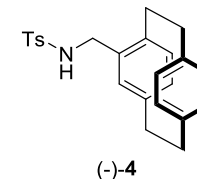
Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU]	%s	Height [mAU]	Area %
1	15.918	BB	0.2614	3.77989	1.80796e-1	0.0887	
2	26.383	BB	0.5753	4256.37598	114.78807	99.9113	

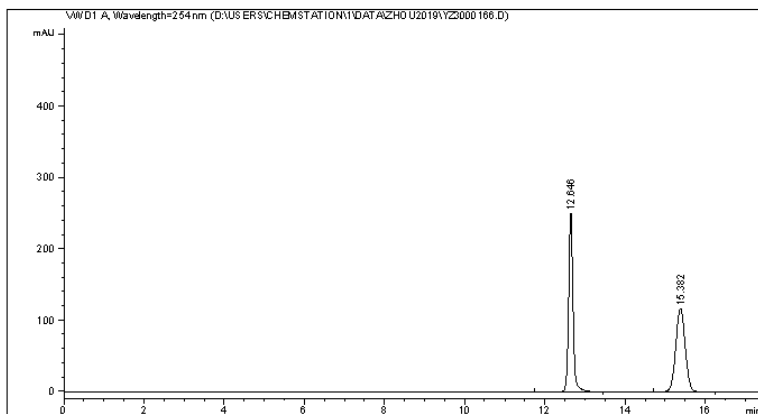
Totals : 4260.15587 114.96887

*** End of Report ***



Data File D:\USERS\CHEMSTATION\1\DATA\ZHOU2019\YZ3000166.D
Sample Name: YZ-4-99(RAC)

=====
Acq. Operator : SYSTEM
Sample Operator : SYSTEM
Acq. Instrument : 1260II Location : 1
Injection Date : 5/10/2019 11:35:04 AM Inj : 1
Inj Volume : No inj
Acq. Method : C:\Users\Public\Documents\ChemStation\1\Methods\def_LC.M
Last changed : 5/10/2019 9:35:07 AM by SYSTEM
(modified after loading)
Analysis Method : C:\Users\Public\Documents\ChemStation\1\Methods\def_LC.M
Last changed : 5/30/2019 4:48:00 PM by SYSTEM
(modified after loading)
Sample Info : IC, n-Hexane/i-PrOH = 90/10, 0.7 mL/min, 30 oC, 254 nm



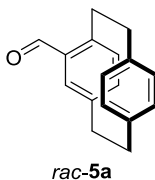
=====
Area Percent Report
=====

Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=254 nm

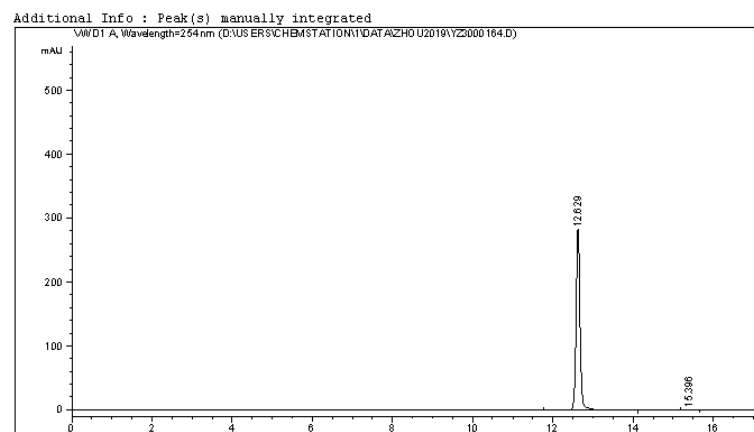
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	12.646	BB	0.1126	1885.05750	251.01039	49.9288
2	15.382	BB	0.2521	1890.43579	116.64406	50.0712

Totals : 3775.49329 367.65445



Data File D:\USERS\CHEMSTATION\1\DATA\ZHOU2019\YZ3000164.D
Sample Name: YZ-4-99

=====
Acq. Operator : SYSTEM
Sample Operator : SYSTEM
Acq. Instrument : 1260II Location : 1
Injection Date : 5/10/2019 10:31:04 AM Inj : 1
Inj Volume : No inj
Acq. Method : C:\Users\Public\Documents\ChemStation\1\Methods\def_LC.M
Last changed : 5/10/2019 9:35:07 AM by SYSTEM
(modified after loading)
Analysis Method : C:\Users\Public\Documents\ChemStation\1\Methods\def_LC.M
Last changed : 5/30/2019 4:51:31 PM by SYSTEM
(modified after loading)
Sample Info : IC, n-Hexane/i-PrOH = 90/10, 0.7 mL/min, 30 oC, 254 nm



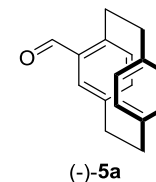
Additional Info : Peak(s) manually integrated

=====
Area Percent Report
=====

Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: VWD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	12.629	VB R	0.1026	1896.74072	281.16125	99.9318
2	15.396	VB	0.2399	1.29462	8.03803e-2	0.0682



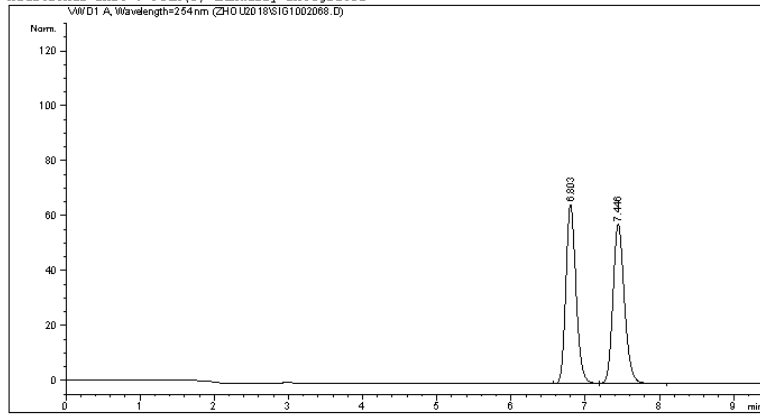
Data File C:\CHEM32\1\DATA\ZHOU2018\SIG1002068.D
 Sample Name: YZ-4-34A(RAC)

```

=====
Acq. Operator   :
Acq. Instrument : 仪器 1                Location : Vial 91
Injection Date  : 12/8/18 10:42:08
                                           Inj Volume : 5.000 µl

Acq. Method    : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 12/8/18 10:40:33
                (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 5/30/19 9:41:08
                (modified after loading)
Sample Info    : AD-H, n-hexane/i-PrOH = 90/10, 1.0 mL/min, 30 oC, 254 n
                m
  
```

Additional Info : Peak(s) manually integrated
 VWDL A, Wavelength=254nm (ZHOU2018\SIG1002068.D)



Area Percent Report

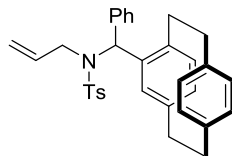
```

Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWDL A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	6.803	VV	0.1468	616.60956	64.94445	49.8919
2	7.446	VB	0.1690	619.28156	57.78165	50.1081

仪器 1 5/30/19 9:41:19



rac-2a

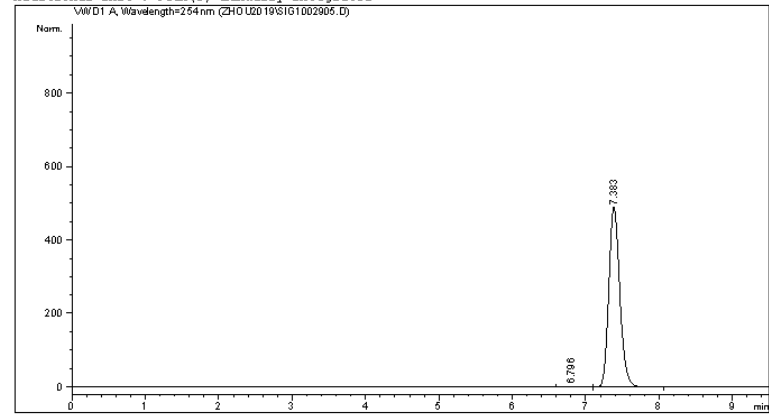
Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002905.D
 Sample Name: YZ-4-89

```

=====
Acq. Operator   :
Acq. Instrument : 仪器 1                Location : Vial 1
Injection Date   : 4/18/19 19:24:49
                                           Inj Volume : 5.000 µl

Acq. Method    : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 4/18/19 19:17:25
                (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 5/30/19 11:26:22
                (modified after loading)
Sample Info    : AD-H, n-hexane/i-PrOH = 90/10, 1.0 mL/min, 30 oC, 254 n
                m
  
```

Additional Info : Peak(s) manually integrated
 VWDL A, Wavelength=254nm (ZHOU2019\SIG1002905.D)



Area Percent Report

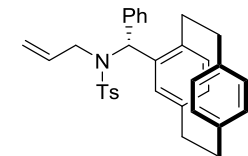
```

Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWDL A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	6.796	VV	0.2092	15.77220	1.06260	0.3078
2	7.383	VV	0.1618	5108.03760	489.32965	99.6922

仪器 1 5/30/19 11:26:33



(-)-2a

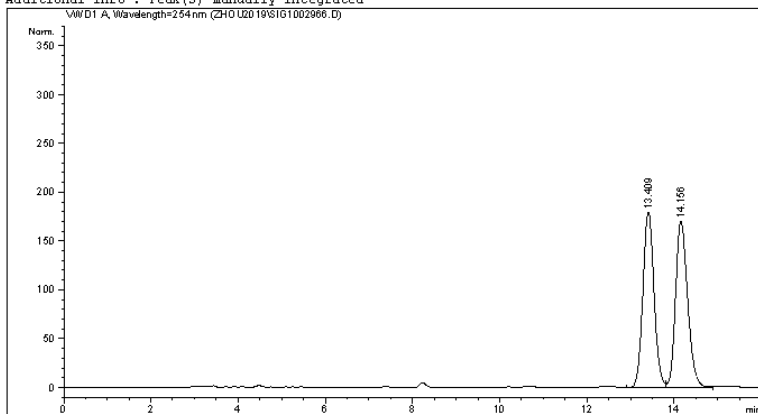
Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002966.D
 Sample Name: YZ-4-97RAC

```

=====
Acq. Operator   :
Acq. Instrument : 仪器 1                Location : Vial 1
Injection Date  : 5/7/19 15:17:34
                                           Inj Volume : 5.000 µl

Acq. Method    : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 5/7/19 15:10:19
                (modified after loading)
Analysis Method: C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 5/30/19 11:30:52
                (modified after loading)
Sample Info    : AD-H, n-hexane/i-PrOH = 90/10, 1.0 mL/min, 30 oC, 254 n
                m
  
```

Additional Info : Peak(s) manually integrated
 VWDL A, Wavelength=254nm (ZHOU2019\SIG1002966.D)



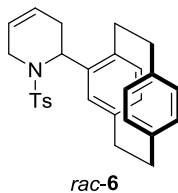
Area Percent Report

```

=====
Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWDL A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	13.409	VV	0.2764	3212.07471	179.84615	49.3653
2	14.156	VV	0.2974	3294.67456	170.52757	50.6347



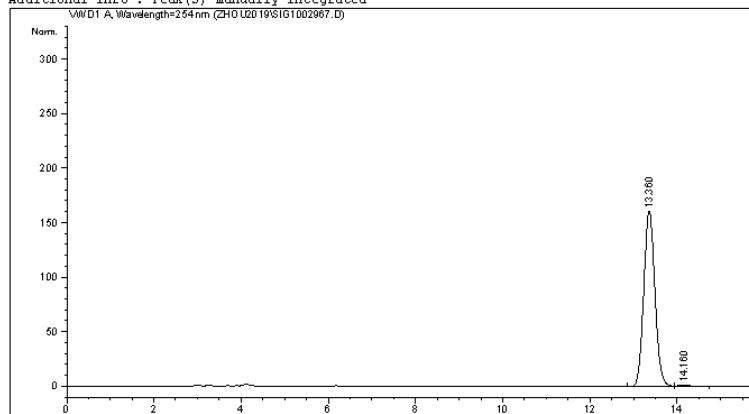
Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002967.D
 Sample Name: YZ-4-97

```

=====
Acq. Operator   :
Acq. Instrument : 仪器 1                Location : Vial 1
Injection Date  : 5/7/19 15:42:58
                                           Inj Volume : 5.000 µl

Acq. Method    : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 5/7/19 15:36:07
                (modified after loading)
Analysis Method: C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 5/30/19 11:32:57
                (modified after loading)
Sample Info    : AD-H, n-hexane/i-PrOH = 90/10, 1.0 mL/min, 30 oC, 254 n
                m
  
```

Additional Info : Peak(s) manually integrated
 VWDL A, Wavelength=254nm (ZHOU2019\SIG1002967.D)



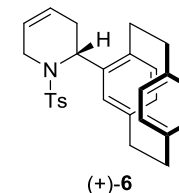
Area Percent Report

```

=====
Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWDL A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	13.360	VV	0.2753	2854.07349	160.65536	99.2197
2	14.160	VB	0.3117	22.44633	1.07450	0.7803



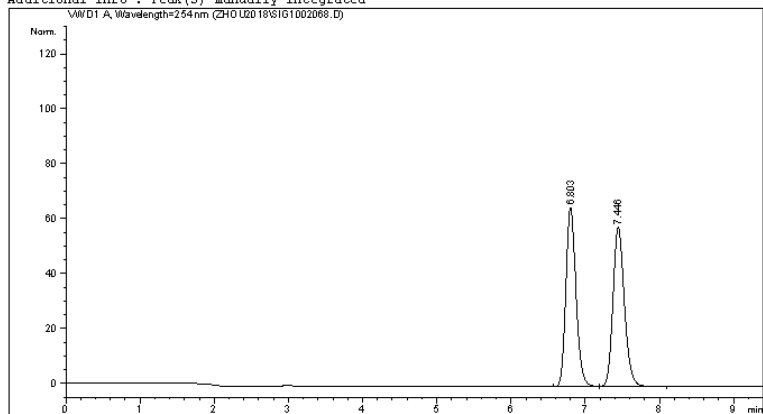
Data File C:\CHEM32\1\DATA\ZHOU2018\SIG1002068.D
 Sample Name: YZ-4-34A(RAC)

```

=====
Acq. Operator   :
Acq. Instrument : 仪器 1                Location : Vial 91
Injection Date  : 12/8/18 10:42:08
                                           Inj Volume : 5.000 µl

Acq. Method    : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 12/8/18 10:40:33
                (modified after loading)
Analysis Method: C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 5/30/19 9:41:08
                (modified after loading)
Sample Info    : AD-H, n-hexane/i-PrOH = 90/10, 1.0 mL/min, 30 oC, 254 n
                m
  
```

Additional Info : Peak(s) manually integrated
 VWDL A, Wavelength=254nm (ZHO02018\SIG1002068.D)



Area Percent Report

```

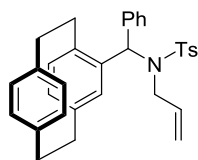
Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWDL A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	6.803	VV	0.1468	616.60956	64.94445	49.8919
2	7.446	VB	0.1690	619.28156	57.78165	50.1081

仪器 1 5/30/19 9:41:19

Page 1 of 2



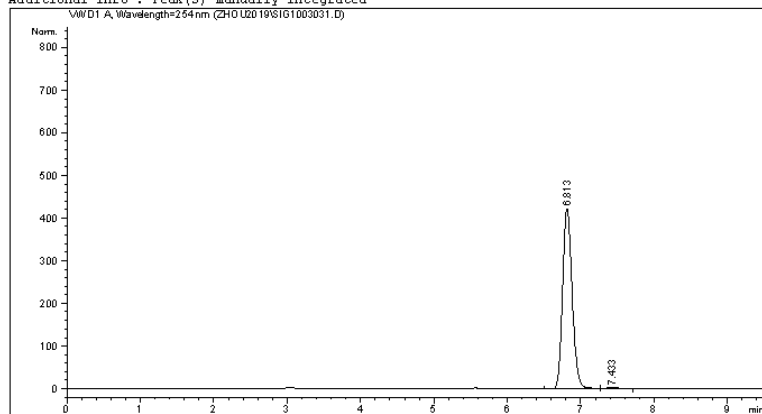
Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1003031.D
 Sample Name: YZ-5-45H

```

=====
Acq. Operator   :
Acq. Instrument : 仪器 1                Location : Vial 1
Injection Date   : 5/17/19 19:45:19
                                           Inj Volume : 5.000 µl

Acq. Method    : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 5/17/19 19:05:30
                (modified after loading)
Analysis Method: C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 5/30/19 11:37:07
                (modified after loading)
Sample Info    : AD-H, n-hexane/i-PrOH = 90/10, 1.0 mL/min, 30 oC, 254 n
                m
  
```

Additional Info : Peak(s) manually integrated
 VWDL A, Wavelength=254nm (ZHO02019\SIG1003031.D)



Area Percent Report

```

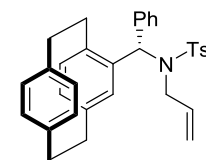
Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWDL A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	6.813	VV	0.1375	3814.08960	421.62192	99.2674
2	7.433	VV	0.1819	28.14677	2.31449	0.7326

仪器 1 5/30/19 11:37:21

Page 1 of 2

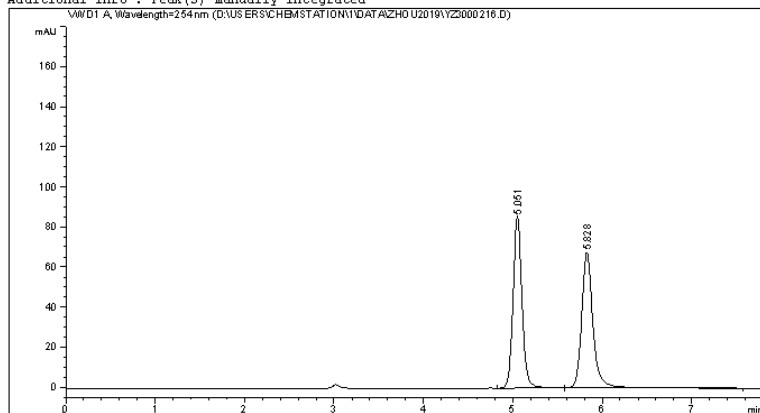


Data File D:\USERS\CHEMSTATION\1\DATA\ZHOU2019\YZ3000216.D
 Sample Name: YZ-5-4RAC

```

=====
Acq. Operator   : SYSTEM
Sample Operator : SYSTEM
Acq. Instrument : 1260II                Location : 1
Injection Date  : 5/17/2019 4:37:26 PM Inj       : 1
                                           Inj Volume: No inj
Acq. Method     : C:\Users\Public\Documents\ChemStation\1\Methods\def_LC.M
Last changed    : 5/17/2019 4:32:37 PM by SYSTEM
                 (modified after loading)
Analysis Method : C:\Users\Public\Documents\ChemStation\1\Methods\def_LC.M
Last changed    : 5/30/2019 4:53:40 PM by SYSTEM
                 (modified after loading)
Sample Info     : IA, n-Hexane/i-PrOH = 98/2, 1.0 mL/min, 30 oC, 254 nm
  
```

Additional Info : Peak(s) manually integrated



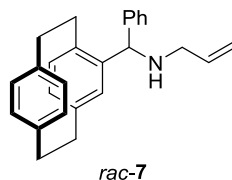
Area Percent Report

```

Sorted By      : Signal
Multiplier     : 1.0000
Dilution       : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: WVD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	5.051	BB	0.1053	593.43890	85.17809	50.1176
2	5.828	BV R	0.1341	590.65308	67.34789	49.8824

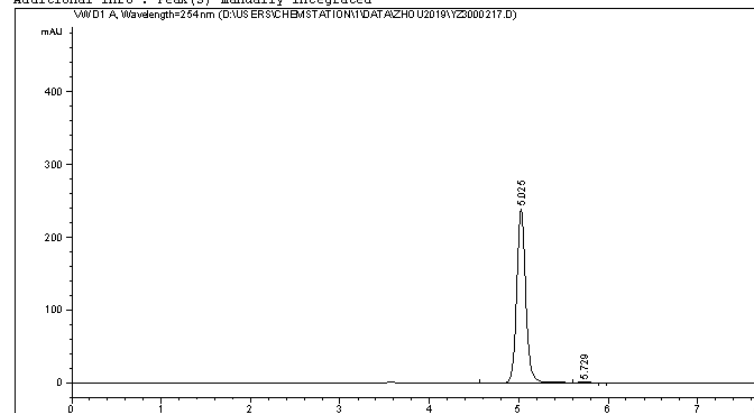


Data File D:\USERS\CHEMSTATION\1\DATA\ZHOU2019\YZ3000217.D
 Sample Name: YZ-5-4

```

=====
Acq. Operator   : SYSTEM
Sample Operator : SYSTEM
Acq. Instrument : 1260II                Location : 1
Injection Date  : 5/17/2019 5:00:29 PM Inj       : 1
                                           Inj Volume: No inj
Acq. Method     : C:\Users\Public\Documents\ChemStation\1\Methods\def_LC.M
Last changed    : 5/17/2019 4:32:37 PM by SYSTEM
                 (modified after loading)
Analysis Method : C:\Users\Public\Documents\ChemStation\1\Methods\def_LC.M
Last changed    : 5/30/2019 5:01:27 PM by SYSTEM
                 (modified after loading)
Sample Info     : IA, n-Hexane/i-PrOH = 98/2, 1.0 mL/min, 30 oC, 254 nm
  
```

Additional Info : Peak(s) manually integrated



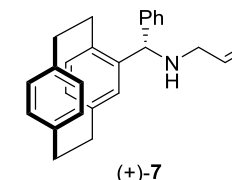
Area Percent Report

```

Sorted By      : Signal
Multiplier     : 1.0000
Dilution       : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: WVD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	5.025	VV R	0.1057	1674.16895	238.95752	99.6326
2	5.729	VB E	0.1184	6.17409	8.33798e-1	0.3674



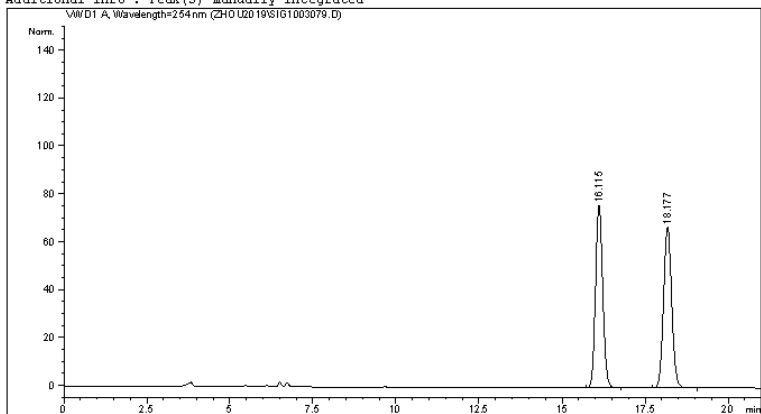
Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1003079.D
 Sample Name: YZ-4-585M(RAC)

```

=====
Acq. Operator   :
Acq. Instrument : 仪器 1                Location : Vial 1
Injection Date  : 5/30/19 9:38:00
                                           Inj Volume : 5.000 µl

Acq. Method    : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 5/30/19 9:07:37
                (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 5/30/19 10:07:23
                (modified after loading)
Sample Info    : AD-3, n-hexane/i-PrOH = 80/20, 0.8 mL/min, 30 oC, 254 n
                m
  
```

Additional Info : Peak(s) manually integrated
 VW/D1 A, Wavelength=254nm (ZHOU2019\SIG1003079.D)



Area Percent Report

```

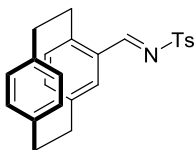
=====
Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VW/D1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	16.115	BV	0.2366	1152.96143	76.14727	49.9519
2	18.177	VB	0.2685	1155.18225	67.21445	50.0481

仪器 1 5/30/19 10:07:42

Page 1 of 2



rac-1a

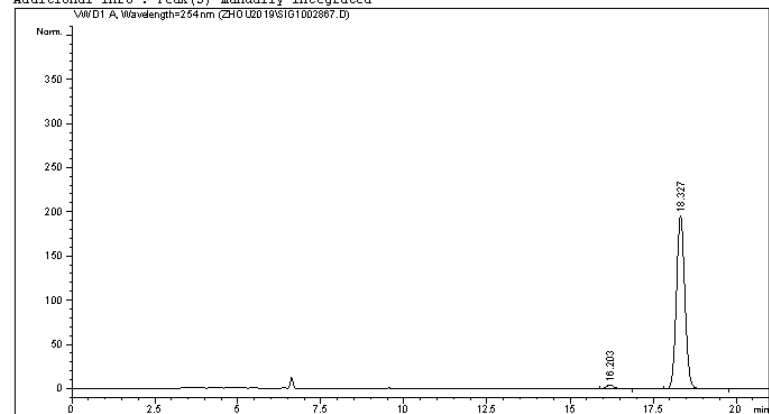
Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002867.D
 Sample Name: YZ-4-875M

```

=====
Acq. Operator   :
Acq. Instrument : 仪器 1                Location : Vial 1
Injection Date  : 4/10/19 13:52:10
                                           Inj Volume : 5.000 µl

Acq. Method    : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 4/10/19 13:21:10
                (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 5/30/19 11:18:21
                (modified after loading)
Sample Info    : AD-3, n-hexane/i-PrOH = 80/20, 0.8 mL/min, 30 oC, 254 n
                m
  
```

Additional Info : Peak(s) manually integrated
 VW/D1 A, Wavelength=254nm (ZHOU2019\SIG1002867.D)



Area Percent Report

```

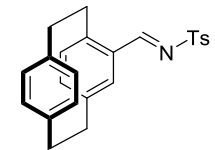
=====
Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VW/D1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	16.203	VB	0.2422	71.66651	4.58964	2.0196
2	18.327	BB	0.2744	3476.82568	196.49471	97.9804

仪器 1 5/30/19 11:18:25

Page 1 of 2



(-)-1a

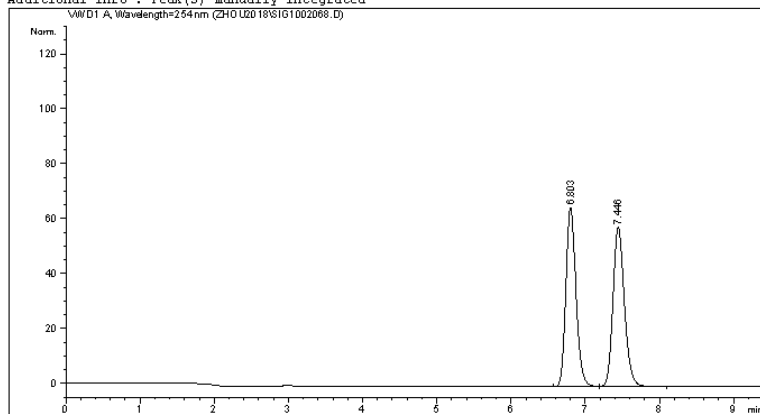
Data File C:\CHEM32\1\DATA\ZHOU2018\SIG1002068.D
 Sample Name: YZ-4-34A(RAC)

```

=====
Acq. Operator   :
Acq. Instrument : 仪器 1                Location : Vial 91
Injection Date  : 12/8/18 10:42:08
                                           Inj Volume : 5.000 µl

Acq. Method    : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 12/8/18 10:40:33
                (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 5/30/19 9:41:08
                (modified after loading)
Sample Info    : AD-H, n-hexane/i-PrOH = 90/10, 1.0 mL/min, 30 oC, 254 n
                m
  
```

Additional Info : Peak(s) manually integrated
 VWDL A, Wavelength=254nm (ZHOU2018\SIG1002068.D)



Area Percent Report

```

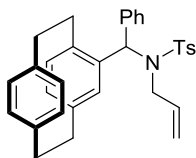
Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWDL A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	6.803	VV	0.1468	616.60956	64.94445	49.8919
2	7.446	VB	0.1690	619.28156	57.78165	50.1081

仪器 1 5/30/19 9:41:19

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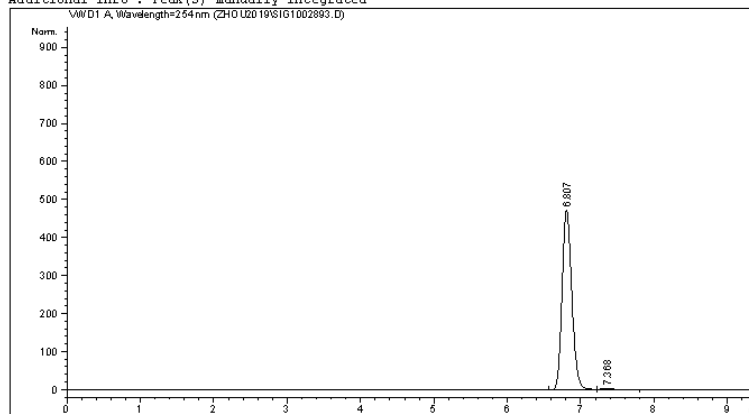
Data File C:\CHEM32\1\DATA\ZHOU2019\SIG1002893.D
 Sample Name: YZ-4-87TH

```

=====
Acq. Operator   :
Acq. Instrument : 仪器 1                Location : Vial 1
Injection Date   : 4/17/19 15:11:09
                                           Inj Volume : 5.000 µl

Acq. Method    : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 4/17/19 14:28:15
                (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed   : 5/30/19 11:21:01
                (modified after loading)
Sample Info    : AD-H, n-hexane/i-PrOH = 90/10, 1.0 mL/min, 30 oC, 254 n
                m
  
```

Additional Info : Peak(s) manually integrated
 VWDL A, Wavelength=254nm (ZHOU2019\SIG1002893.D)



Area Percent Report

```

Sorted By      :      Signal
Multiplier:    :      1.0000
Dilution:      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWDL A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	6.807	VV	0.1430	4333.33105	472.46912	99.0518
2	7.368	VV	0.1897	41.48112	3.23173	0.9482

仪器 1 5/30/19 11:21:10

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