Supporting Information

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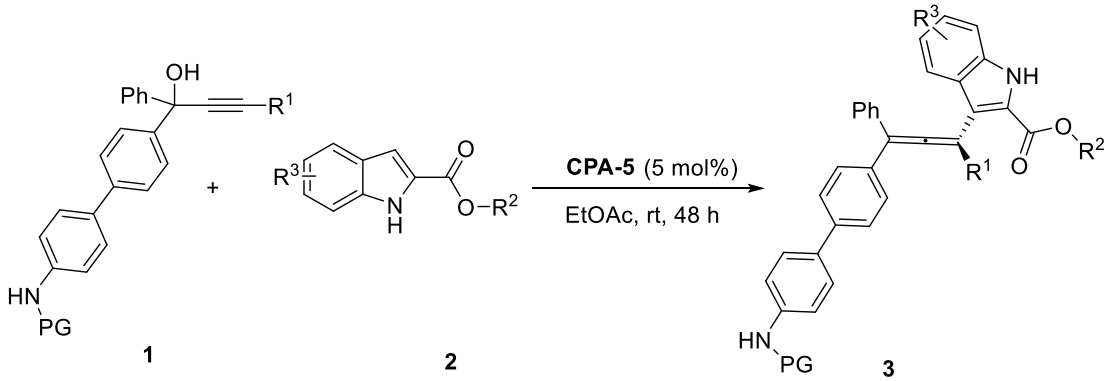
A: General Information and Starting Materials

General Information. Proton nuclear magnetic resonance (^{1}H NMR) spectra and carbon nuclear magnetic resonance (^{13}C NMR) spectra and fluorine nuclear magnetic resonance (^{19}F NMR) spectra were recorded on a Bruker ACF300 spectrometer (500 MHz, 126 MHz and 470 MHz). Chemical shifts for protons are reported in parts per million downfield from tetramethylsilane and are referenced to residual protium in the NMR solvent (DMSO-*d6*: δ 2.50). Chemical shifts for carbon are reported in parts per million downfield from tetramethylsilane and are referenced to the carbon resonances of the solvent (DMSO-*d6*: δ 39.50). Data are represented as follows: chemical shift, integration, multiplicity (br = broad, s = singlet, d = doublet, t = triplet, q = quartet, m = multiplet), coupling constants in Hertz (Hz). All high resolution mass spectra were obtained on a Finnigan/MAT 95XL-T mass spectrometer. For thin layer chromatography (TLC), Merck pre-coated TLC plates (Merck 60 F254) were used, and compounds were visualized with a UV light at 254 nm. Flash chromatography separations were performed on Merck 60 (0.040-0.063 mm) mesh silica gel.

Starting Materials. All solvents, inorganic reagents were from commercial sources and used without purification unless otherwise noted. Propargylic alcohols and 2-indole derivatives were prepared following the literature procedures.[1-3]

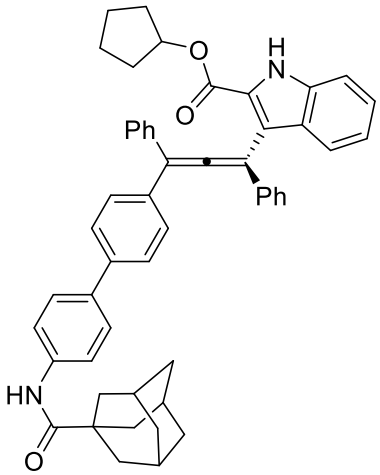
B: General Procedure



To a solution of EtOAc (0.3 mL) were added propargylic alcohols **1** (0.05 mmol), 2-indole derivatives **2** (0.06 mmol) and **CPA-5** (5 mol%). The reaction mixture was stirred at room temperature for 48 h and then the solvent was removed under vacuum. The residue was purified by silica gel chromatography to yield the desired product **3**.

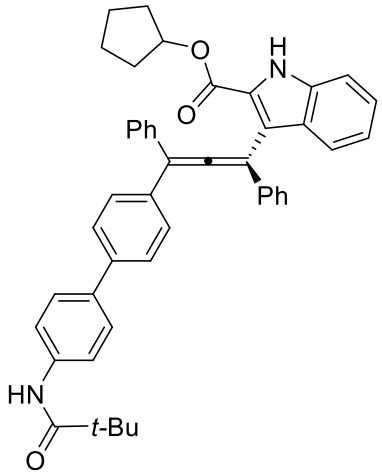
C: Characterization Data

Cyclopentyl 3-(3-(4'-((3r,5r,7r)-adamantane-1-carboxamido)-[1,1'-biphenyl]-4-yl) -1,3-diphenylpropa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3aa)



Eluent for flash column chromatography: petroleum ether/ethyl acetate = 12:1. Yellow solid, 30.7 mg, 82% yield. Mp 194.4-197.5 °C. ^{1}H NMR (DMSO-*d*$_6$, 500 MHz): δ (ppm) 12.15 (s, 1H), 9.21 (s, 1H), 7.77 (d, *J* = 10.0 Hz, 2H), 7.70 (d, *J* = 15.0 Hz, 2H), 7.64 (d, *J* = 5.0 Hz, 2H), 7.50 (d, *J* = 15.0 Hz, 1H), 7.44-7.36 (m, 7H), 7.33-7.30 (m, 2H), 7.27-7.22 (m, 5H), 6.93 (t, *J* = 10.0 Hz, 1H), 5.19-5.17 (m, 1H), 2.01-2.0 (m, 3H), 1.93-1.92 (m, 6H), 1.72-1.70 (m, 6H), 1.59-1.58 (m, 2H), 1.25-1.19 (m, 4H), 1.10-1.09 (m, 2H). ^{13}C NMR (DMSO-*d*$_6$, 126 MHz): δ (ppm) 207.8, 176.6, 161.7, 139.6, 137.0, 136.7, 136.2, 134.6, 129.3, 129.2, 129.1, 128.7, 128.4, 128.0, 127.7, 127.0, 126.9, 126.3, 125.6, 121.1, 120.9, 120.8, 113.3, 112.0, 77.7, 41.5, 38.8, 36.5, 32.5, 28.2, 23.7. HRMS (ESI) m/z: $[M+H]^+$ Calcd for $C_{52}H_{49}N_2O_3$ 749.3743; Found 749.3743. The enantiomeric excess was determined to be 84% by HPLC. [IA column, 254 nm, *n*-hexane:EtOH = 50:50, 1.0 mL/min]: 15.3 min (major), 31.4 min (minor). $[\alpha]^{22}_D$ = +34.0 (c = 0.2, CH_2Cl_2).

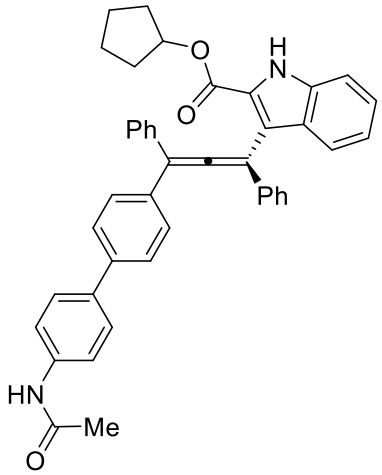
Cyclopentyl 3-(1,3-diphenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-die n-1-yl)-1*H*-indole-2-carboxylate (3ba)



Eluent for flash column chromatography: petroleum ether/ethyl acetate = 12:1. Yellow solid, 29.4 mg, 85% yield. Mp 248.0-251.9 °C. ^{1}H NMR (DMSO-*d*$_6$, 500 MHz): δ (ppm) 12.15 (s, 1H), 9.30 (s, 1H), 7.76 (d, *J* = 10.0 Hz, 2H), 7.70 (d, *J* = 15.0 Hz, 2H), 7.64 (d, *J* = 10.0 Hz, 2H), 7.51 (d, *J* = 5.0 Hz, 1H), 7.44-7.34 (m, 7H), 7.33-7.30 (m, 2H), 7.27-7.21 (m, 5H), 6.93 (t, *J* = 10.0 Hz, 1H), 5.19-5.17 (m, 1H), 1.60-1.57 (m, 2H), 1.23-1.21 (m, 13H), 1.10-1.09 (m, 2H). ^{13}C NMR (DMSO-*d*$_6$, 126 MHz): δ (ppm) 207.7, 177.0, 161.6 139.6, 139.5, 136.9, 136.6, 136.1, 134.6, 134.5, 129.2, 129.1, 129.0, 128.6, 128.3, 127.9, 127.6, 126.9, 126.8, 126.2, 125.5, 121.0 120.9, 120.7, 114.7, 113.2, 112.0, 104.7, 77.6 ,39.7, 32.4, 32.3, 27.7, 23.6. HRMS (ESI) m/z: $[M+H]^+$ Calcd for $C_{46}H_{43}N_2O_3$ 671.3274; Found 671.3272. The enantiomeric excess was determined to be 96% by HPLC. [IA column, 254 nm, *n*-hexane:EtOH = 50:50, 1.0

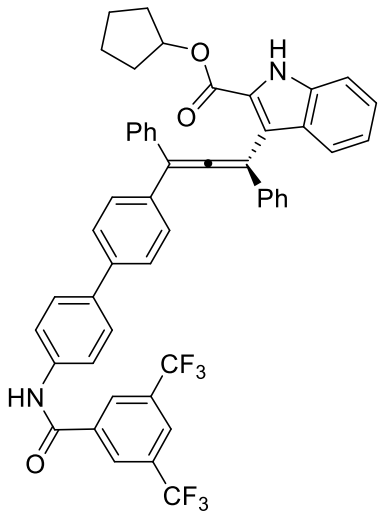
mL/min]: 8.9 min (major), 12.1 min (minor). $[\alpha]^{22}_D$ = +34.0 (c = 0.3, CH_2Cl_2).

Cyclopentyl 3-(3-(4'-acetamido-[1,1'-biphenyl]-4-yl)-1,3-diphenylpropa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3ca)



Eluent for flash column chromatography: petroleum ether/ethyl acetate = 5:3. Yellow solid, 27.0 mg, 88% yield. Mp 125.9-127.8 °C. ^{1}H NMR (DMSO-*d6*, 500 MHz): δ (ppm) 12.15 (s, 1H), 10.05 (s, 1H), 7.68 (d, *J* =10.0 Hz, 4H), 7.64 (d, *J* = 5.0 Hz, 2H), 7.50 (d, *J* = 5.0 Hz, 1H), 7.44-7.34 (m, 7H), 7.33-7.29 (m, 2H), 7.27-7.21 (m, 5H), 6.92 (t, *J* = 10.0 Hz, 1H), 5.19-5.18 (m, 1H), 2.06 (s, 3H), 1.60-1.57 (m, 2H), 1.25-1.16 (m, 4H), 1.10-1.09 (m, 2H). ^{13}C NMR (DMSO-*d6*, 126 MHz): δ (ppm) 207.7, 168.8, 161.6, 139.5, 139.4, 136.9, 136.6, 136.0, 134.5, 134.4, 129.2, 129.1, 129.0, 128.6, 128.3, 127.9, 127.6, 127.3, 127.0, 126.2, 125.5, 120.8, 120.7, 119.8, 114.6, 113.2, 111.9, 104.7, 77.6, 32.4, 32.3, 24.5, 23.6. HRMS (ESI) m/z: $[M+H]^+$ Calcd for $C_{43}H_{37}N_2O_3$ 629.2804; Found 629.2800. The enantiomeric excess was determined to be 74% by HPLC. [IA column, 254 nm, *n*-hexane:EtOH = 50:50, 1.0 mL/min]: 11.1min (major), 13.9 min (minor). $[\alpha]^{22}_D$ = +33.0 (c = 0.2, CH_2Cl_2).

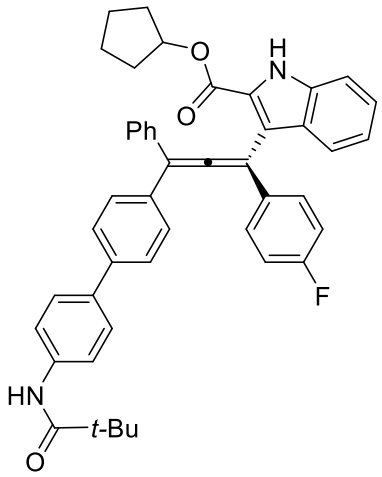
Cyclopentyl 3-(3-(4'-(3,5-bis(trifluoromethyl)benzamido)-[1,1'-biphenyl]-4-yl)-1,3-diphenylpropa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3da)



Eluent for flash column chromatography: petroleum ether/ethyl acetate = 12:1. Yellow solid, 32.5 mg, 80% yield. Mp 160.7-163.5 °C. ^{1}H NMR (DMSO-*d6*, 500 MHz): δ (ppm) 12.16 (s, 1H), 10.77 (s, 1H), 8.63 (s, 2H), 8.37 (s, 1H), 7.89 (d, *J* = 10.0 Hz, 2H), 7.76-7.73 (m, 4H), 7.51 (d, *J* =10.0 Hz, 1H), 7.43-7.30 (m, 7H), 7.28-7.20 (m, 7H), 6.93 (t, *J* = 10.0 Hz, 1H), 5.20-5.19 (m, 1H), 1.61-1.57 (m, 2H), 1.21-1.19 (m, 4H), 1.10-1.09 (m, 2H). ^{13}C NMR (DMSO-*d6*, 126 MHz): δ (ppm) 207.8, 163.0, 161.6, 139.3, 138.6, 137.5, 136.9 136.6, 136.0, 135.8, 134.8, 130.7 (q, *J* = 66.8 Hz), 129.2, 129.1, 129.0, 128.6, 128.3, 127.9, 127.6, 127.3, 127.1, 126.2, 125.6, 125.5, 124.7, 122.5, 121.5, 120.8, 120.7, 114.6, 113.2, 111.9, 104.8, 77.6, 32.4, 32.3, 23.6. HRMS (ESI) m/z: $[M+H]^+$ Calcd for $C_{50}H_{37}F_6N_2O_3$ 827.2708; Found 827.2704. The enantiomeric excess was determined to be 80% by HPLC. [IA column, 254 nm,

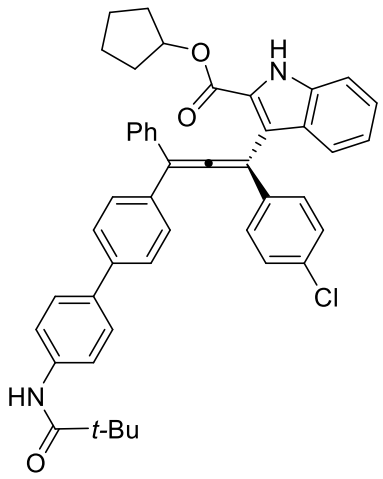
n-hexane:EtOH= 50:50, 1.0 mL/min]: 6.8 min (major), 8.5 min (minor). $[\alpha]^{22}_{D}$ = +30.7 (c = 0.3, CH_2Cl_2).

Cyclopentyl 3-(1-(4-fluorophenyl)-3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl) propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3ea)



Eluent for flash column chromatography: petroleum ether/ethyl acetate = 12:1. Yellow solid, 31.0 mg, 90% yield. Mp 254.3-257.0 ºC. ^{1}H NMR (DMSO-*d*$_6$, 500 MHz): δ (ppm) 12.16 (s, 1H), 9.28 (s, 1H), 7.75-7.72 (m, 2H), 7.68-7.66 (m, 2H), 7.62-7.60 (m, 2H), 7.47 (d, *J* = 10.0 Hz, 1H), 7.39-7.33 (m, 7H), 7.26-.7.19 (m, 4H), 7.14-7.11 (m, 2H), 6.91-6.88 (m, 1H), 5.17-5.15 (m, 1H), 1.60-1.56 (m, 2H), 1.22-1.20 (m, 13H), 1.09-1.07 (m, 2H). ^{13}C NMR (DMSO-*d*$_6$, 126 MHz): δ (ppm) 207.6, 177.1, 161.4 (d, *J* = 244.6 Hz), 139.7, 136.9, 136.0, 134.6, 134.5, 133.1, 129.3, 129.1, 128.7, 128.5, 128.2 (d, *J* = 9.1 Hz), 127.9, 127.1, 127.0, 125.6, 125.5, 121.0, 120.8, 116.1 (d, *J* = 22.7 Hz), 114.6, 113.3, 112.2, 103.9, 77.8, 32.5, 32.4, 27.7, 23.7. ^{19}F NMR (DMSO-*d*$_6$, 470 MHz) δ (ppm) -115.30. HRMS (ESI) m/z: $[M+H]^+$ Calcd for $C_{46}H_{42}FN_2O_3$ 689.3179; Found 689.3175. The enantiomeric excess was determined to be 90% by HPLC. [IA column, 254 nm, *n*-hexane:EtOH = 50:50, 1.0 mL/min]: 8.6 min (major), 10.4 min (minor). $[\alpha]^{22}_{D}$ = +44.7 (c = 0.3, CH_2Cl_2).

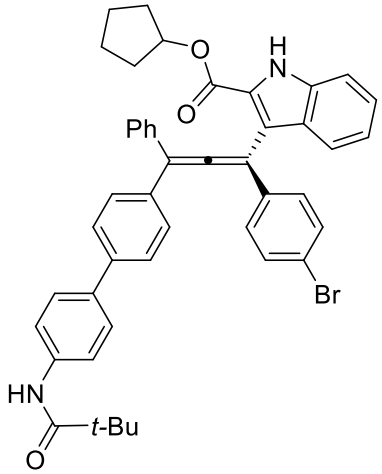
Cyclopentyl 3-(1-(4-chlorophenyl)-3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-y l)propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylatee (3fa)



Eluent for flash column chromatography: petroleum ether/ethyl acetate = 12:1. Yellow solid, 31.5 mg, 87% yield. Mp 260.3-262.6 ºC. ^{1}H NMR (DMSO-*d*$_6$, 500 MHz): δ (ppm) 12.17 (s, 1H), 9.28 (s, 1H), 7.74-7.72 (m, 2H), 7.68-7.67 (m, 2H), 7.62-7.60 (m, 2H), 7.47 (d, *J* = 10.0 Hz, 1H), 7.39-7.33 (m, 9H), 7.24-.7.21 (m, 3H), 7.18 (d, *J* = 10.0 Hz, 1H), 6.90-6.88 (m, 1H), 5.17-5.15 (m, 1H), 1.60-1.56 (m, 2H), 1.25-1.17 (m, 13H), 1.09-1.07 (m, 2H). ^{13}C NMR (DMSO-*d*$_6$, 126 MHz): δ (ppm) 207.9, 177.1, 161.5, 139.7, 139.6, 136.9, 135.9, 135.8, 134.5, 134.3, 132.2, 129.3, 129.2, 129.1, 128.7, 128.6, 128.0, 127.9, 127.0, 125.7, 125.6, 121.0, 120.7, 114.3, 113.3, 112.4, 104.0, 77.8, 32.5, 32.4, 27.7, 23.7. HRMS (ESI) m/z: $[M+H]^+$ Calcd for

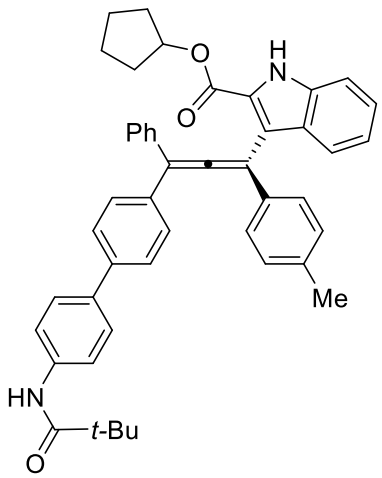
$C_{46}H_{42}ClN_2O_3$ 705.2884; Found 705.2877. The enantiomeric excess was determined to be 84% by HPLC. [IA column, 254 nm, *n*-hexane:EtOH = 50:50, 1.0 mL/min]: 8.9min (major), 11.1 min (minor). $[\alpha]^{22}_D$ = +0.8 (c = 0.3, CH_2Cl_2).

Cyclopentyl 3-(1-(4-chlorophenyl)-3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3ga)



Eluent for flash column chromatography: petroleum ether/ethyl acetate = 12:1. Yellow solid, 33.3 mg, 89% yield. Mp 154.6-156.7 °C. ^{1}H NMR (DMSO-*d*$_6$, 500 MHz): δ (ppm) 12.17 (s, 1H), 9.28 (s, 1H), 7.73 (d, *J* = 10.0 Hz, 2H), 7.67 (d, *J* = 5.0 Hz, 2H), 7.61 (d, *J* = 10.0 Hz, 2H), 7.49-7.46 (m, 3H), 7.41-7.38 (m, 2H), 7.36-7.32 (m, 6H), 7.23-7.20 (m, 1H), 7.17-7.16 (m, 2H), 6.90-6.88 (m, 1H), 5.17-5.16 (m, 1H), 1.61-1.57 (m, 2H), 1.21-1.20 (m, 13H), 1.10-1.08 (m, 2H). ^{13}C NMR (DMSO-*d*$_6$, 126 MHz): δ (ppm) 207.9, 177.1, 161.5, 139.7, 139.6, 137.0, 136.2, 135.8, 134.5, 134.3, 133.8, 132.4, 132.1, 129.3, 129.1, 128.7, 128.6, 128.3, 127.8, 127.0, 125.7, 125.6, 121.0, 120.7, 114.2, 113.3, 112.4, 104.1, 77.8, 39.7, 32.5, 32.4, 27.7, 23.7. HRMS (ESI) m/z: $[M+H]^+$ Calcd for $C_{46}H_{42}BrN_2O_3$ 749.2379; Found 749.2377. The enantiomeric excess was determined to be 87% by HPLC. [IA column, 254 nm, *n*-hexane:EtOH = 50:50, 1.0 mL/min]: 8.0 min (major), 10.0 min (minor). $[\alpha]^{22}_D$ = -27.0 (c = 0.2, CH_2Cl_2).

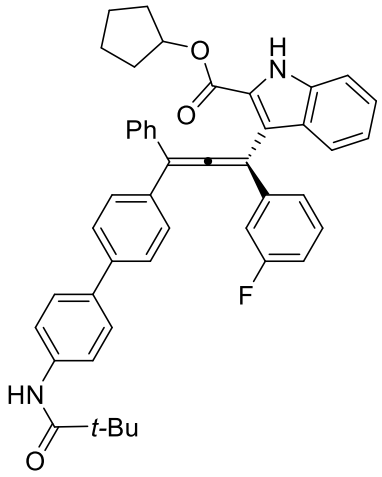
Cyclopentyl 3-(3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)-1-(*p*-tolyl)propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3ha)



Eluent for flash column chromatography: petroleum ether/ethyl acetate = 12:1. Yellow solid, 25.8 mg, 90% yield. Mp 258.0-260.9 °C. ^{1}H NMR (DMSO-*d*$_6$, 500 MHz): δ (ppm) 12.10 (s, 1H), 9.27 (s, 1H), 7.74-7.72 (m, 2H), 7.67-7.65 (m, 2H), 7.62-7.60 (m, 2H), 7.47-7.45 (m, 1H), 7.38-7.32 (m, 7H), 7.22-7.17 (m, 2H), 7.11-7.08 (m, 4H), 6.89-6.86 (m, 1H), 5.15-5.14 (m, 1H), 2.22 (s, 3H), 1.57-1.52 (m, 2H), 1.21-1.19 (m, 13H), 1.10-1.09 (m, 2H). ^{13}C NMR (DMSO-*d*$_6$, 126 MHz): δ (ppm) 207.7, 177.1, 161.7, 139.6, 139.5, 137.0, 136.9, 136.3, 134.8, 134.6, 133.8, 129.7, 129.3, 129.1, 128.7, 128.3, 128.0, 127.0, 126.9, 126.2, 125.5, 121.0, 120.9, 120.8, 115.0,

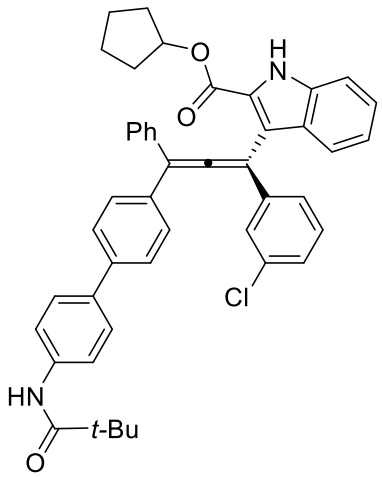
113.3, 111.9, 104.7, 77.7, 32.5, 32.4, 27.7, 23.7, 21.3. HRMS (ESI) m/z: $[M+H]^+$ Calcd for $C_{47}H_{45}N_2O_3$ 685.3430; Found 685.3427. The enantiomeric excess was determined to be 80% by HPLC. [IA column, 254 nm, *n*-hexane:EtOH = 50:50, 1.0 mL/min]: 8.7 min (major), 10.6 min (minor). $[\alpha]^{22}_D$ = +14.5 (c = 0.3, CH_2Cl_2).

Cyclopentyl 3-(1-(4-fluorophenyl)-3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl) propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3ia)



Eluent for flash column chromatography: petroleum ether/ethyl acetate = 12:1. Yellow solid, 20.2 mg, 91% yield. Mp 224.6-226.1 ºC. ^{1}H NMR (DMSO-*d*$_6$, 500 MHz): δ (ppm) 12.20 (s, 1H), 9.30 (s, 1H), 7.76 (d, *J* = 10.0 Hz, 2H), 7.71 (d, *J* = 10.0 Hz, 2H), 7.64 (d, *J* = 5.0 Hz, 2H), 7.52-7.50 (m, 1H), 7.45-7.37 (m, 8H), 7.27-7.22 (m, 2H), 7.13-7.07 (m, 2H), 6.94-6.97 (m, 2H), 5.22-5.19 (m, 1H), 1.63-1.61 (m, 2H), 1.27-1.21 (m, 13H), 1.12-1.10 (m, 2H). ^{13}C NMR (DMSO-*d*$_6$, 126 MHz): δ (ppm) 207.9, 177.0, 163.7 (d, *J* = 244.4 Hz), 139.7, 139.8, 139.6, 139.5, 136.9, 135.7, 134.4, 134.1, 131.2 (d, *J* = 8.8 Hz), 129.3, 129.0, 128.7, 128.5, 127.8, 127.0, 125.6, 125.5, 122.4, 121.0, 120.6, 114.3 (d, *J* = 21.4 Hz), 114.0, 113.3, 112.4, 112.4, 104.0, 103.9, 77.7, 39.7, 32.5, 32.4, 27.7, 23.6. ^{19}F NMR (DMSO-*d*$_6$, 470 MHz) δ (ppm) -113.22. HRMS (ESI) m/z: $[M+H]^+$ Calcd for $C_{46}H_{42}FN_2O_3$ 689.3179; Found 689.3169. The enantiomeric excess was determined to be 98% by HPLC. [IA column, 254 nm, *n*-hexane:EtOH = 50:50, 1.0 mL/min]: 10.0 min (major), 14.3 min (minor). $[\alpha]^{22}_D$ = +16.1 (c = 0.3, CH_2Cl_2).

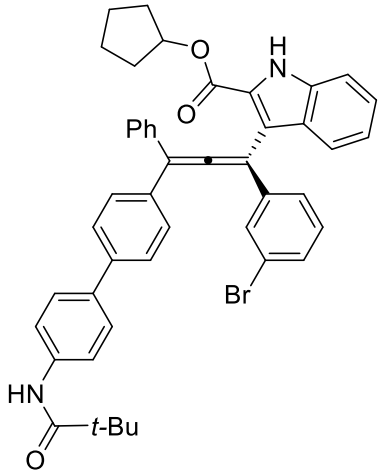
Cyclopentyl 3-(1-(3-chlorophenyl)-3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3ja)



Eluent for flash column chromatography: petroleum ether/ethyl acetate = 12:1. Yellow solid, 23.3 mg, 90% yield. Mp 165.2-167.1 ºC. ^{1}H NMR (DMSO-*d*$_6$, 500 MHz): δ (ppm) 12.21 (s, 1H), 9.30 (s, 1H), 7.76 (d, *J* = 10.0 Hz, 2H), 7.71 (d, *J* = 5.0 Hz, 2H), 7.64 (d, *J* = 5.0 Hz, 2H), 7.51 (d, *J* = 10.0 Hz, 1H), 7.45-7.42 (m, 2H), 7.40-7.30 (m, 7H), 7.28-7.22 (m, 3H), 7.16 (s, 1H), 6.96-6.93 (m, 1H), 5.22-5.20 (m, 1H), 1.63-1.61 (m, 2H), 1.27-1.21 (m, 13H), 1.06-1.04 (m, 2H). ^{13}C NMR (DMSO-*d*$_6$, 126 MHz): δ (ppm) 207.9, 177.0, 139.7,

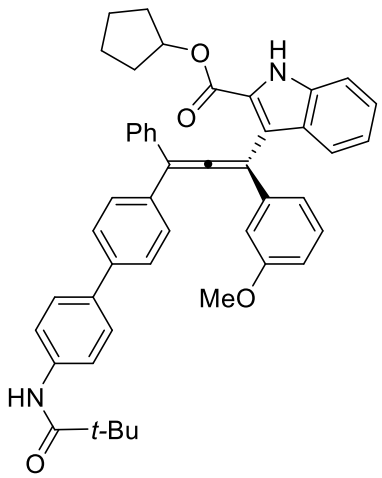
139.6, 139.2, 136.9, 135.6, 134.4, 134.1, 134.0, 131.1, 129.3, 129.0, 128.7, 128.6, 127.8, 127.4, 127.1, 127.0, 125.6, 125.5, 125.4, 124.9, 121.0, 120.9, 120.6, 113.9, 113.3, 112.5, 103.8, 77.8, 39.7, 32.5, 32.4, 27.7, 23.6. HRMS (ESI) m/z: $[M+H]^+$ Calcd for $C_{46}H_{42}ClN_2O_3$ 705.2884; Found 705.2877. The enantiomeric excess was determined to be 90% by HPLC. [IA column, 254 nm, *n*-hexane:EtOH = 50:50, 1.0 mL/min]: 9.6 min (major), 14.5 min (minor). $[\alpha]^{22}_D$ = +24.8 (c = 0.3, CH_2Cl_2).

Cyclopentyl 3-(1-(3-bromophenyl)-3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3ka)



Eluent for flash column chromatography: petroleum ether/ethyl acetate = 12:1. Yellow solid, 30.2 mg, 81% yield. Mp 145.8-148.0 °C. ^{1}H NMR (DMSO-*d*$_6$, 500 MHz): δ (ppm) 12.20 (s, 1H), 9.27 (s, 1H), 7.73 (d, *J* = 10.0 Hz, 2H), 7.69 (d, *J* = 5.0 Hz, 2H), 7.61 (d, *J* = 5.0 Hz, 2H), 7.48 (d, *J* = 5.0 Hz, 1H), 7.42-7.39 (m, 3H), 7.36-7.33 (m, 5H), 7.28-7.26 (m, 3H), 7.24-7.21 (m, 1H), 7.20-7.19 (m, 1H), 6.92-6.89 (m, 1H), 5.19-5.18 (m, 1H), 1.62-1.57 (m, 2H), 1.23-1.20 (m, 13H), 1.09-1.05 (m, 2H). ^{13}C NMR (DMSO-*d*$_6$, 126 MHz): δ (ppm) 208.0, 177.1, 161.5, 139.8, 139.7, 139.5, 136.9, 135.7, 134.5, 134.1, 131.5, 130.4, 129.4, 129.1, 128.7, 128.6, 128.5, 127.8, 127.1, 125.7, 125.6, 125.3, 122.7, 121.1, 121.0, 120.7, 113.9, 113.4, 112.6, 103.8, 77.8, 32.6, 32.5, 27.7, 23.7. HRMS (ESI) m/z: $[M+H]^+$ Calcd for $C_{46}H_{42}BrN_2O_3$ 749.2379; Found 749.2376. The enantiomeric excess was determined to be 80% by HPLC. [IA column, 254 nm, *n*-hexane:EtOH = 70:30, 1.0 mL/min]: 13.1 min (major), 21.6 min (minor). $[\alpha]^{22}_D$ = +19.5 (c = 0.2, CH_2Cl_2).

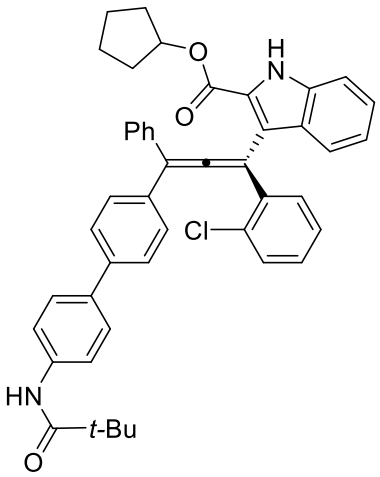
Cyclopentyl 3-(1-(3-methoxyphenyl)-3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3la)



Eluent for flash column chromatography: petroleum ether/ethyl acetate = 12:1. Yellow solid, 27.8 mg, 80% yield. Mp 138.9-140.5 °C. ^{1}H NMR (DMSO-*d*$_6$, 500 MHz): δ (ppm) 12.12 (s, 1H), 9.27 (s, 1H), 7.73-7.72 (m, 2H), 7.68-7.67 (m, 2H), 7.62-7.60 (m, 2H), 7.47 (d, *J* = 5.0 Hz, 1H), 7.39-7.33 (m, 7H), 7.23-7.19 (m, 3H), 6.91-6.89 (m, 1H), 6.82-6.79 (m, 2H), 6.73-6.72 (m, 1H), 5.17-5.15 (m, 1H), 3.61 (s, 3H), 1.59-1.56 (m, 2H), 1.23-1.18 (m, 13H), 1.11-1.08 (m, 2H). ^{13}C NMR

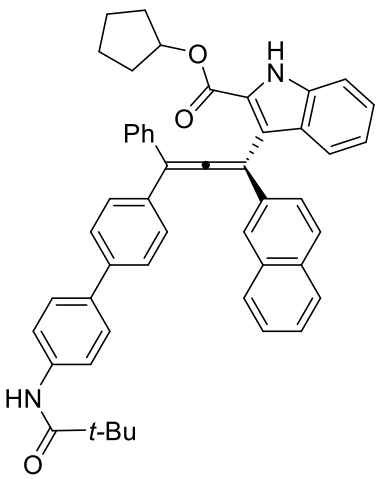
(DMSO-d_6, 126 MHz): δ (ppm) 207.9, 177.1, 161.6, 160.1, 139.7, 139.6, 138.3, 136.9, 136.1, 134.6, 130.3, 129.3, 129.1, 128.7, 128.5, 128.0, 127.0, 125.6, 121.0, 120.9, 120.8, 118.8, 114.7, 113.3, 112.6, 112.3, 112.0, 104.6, 77.7, 55.6, 32.5, 32.4, 27.7, 23.7. HRMS (ESI) m/z: $[M+H]^+$ Calcd for $C_{47}H_{45}N_2O_4$ 701.3379; Found 701.3377. The enantiomeric excess was determined to be 81% by HPLC. [IA column, 254 nm, *n*-hexane:EtOH = 50:50, 1.0 mL/min]: 10.1 min (major), 14.0 min (minor). $[\alpha]^{22}_D$ = +18.8 (c = 0.3, CH_2Cl_2).

Cyclopentyl 3-(1-(2-chlorophenyl)-3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3ma)



Eluent for flash column chromatography: petroleum ether/ethyl acetate = 12:1. Yellow solid, 30.0 mg, 85% yield. Mp 206.7-208.8 °C. ^{1}H NMR (DMSO-d_6, 500 MHz): δ (ppm) 12.09 (s, 1H), 9.29 (s, 1H), 7.76 (d, *J* = 10.0 Hz, 2H), 7.69 (d, *J* = 10.0 Hz, 2H), 7.64 (d, *J* = 5.0 Hz, 2H), 7.49-7.47 (m, 2H), 7.42-7.40 (m, 2H), 7.36-7.30 (m, 5H), 7.25-7.18 (m, 3H), 7.14 (m, 1H), 6.99 (m, 1H), 6.86-6.83 (m, 1H), 5.17-5.16 (m, 1H), 1.70-1.67 (m, 2H), 1.37-1.34 (m, 6H), 1.23 (s, 9H). ^{13}C NMR (DMSO-d_6, 126 MHz): δ (ppm) 209.1, 177.0, 161.2, 139.5, 139.3, 136.7, 136.2, 135.2, 134.7, 134.5, 132.4, 131.1, 130.2, 129.2, 129.1, 129.0, 128.9, 128.2, 128.0, 127.6, 126.9, 126.7, 125.5, 125.0, 121.0, 120.8, 116.2, 113.2, 110.5, 101.7, 77.7, 39.7, 32.4, 32.3, 27.7, 23.8. HRMS (ESI) m/z: $[M+H]^+$ Calcd for $C_{46}H_{42}ClN_2O_3$ 705.2884; Found 705.2878. The enantiomeric excess was determined to be 83% by HPLC. [IA column, 254 nm, *n*-hexane:EtOH = 50:50, 1.0 mL/min]: 9.3 min (major), 18.6 min (minor). $[\alpha]^{22}_D$ = +41.8 (c = 0.3, CH_2Cl_2).

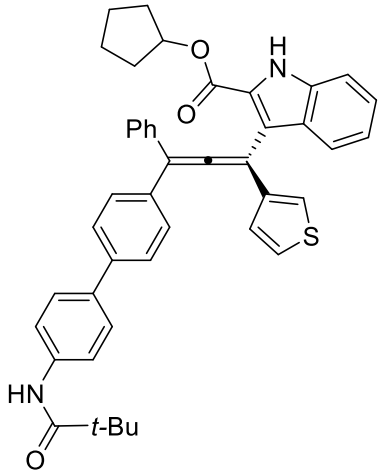
Cyclopentyl 3-(1-(naphthalen-2-yl)-3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3na)



Eluent for flash column chromatography: petroleum ether/ethyl acetate = 12:1. Yellow solid, 29.8 mg, 85% yield. Mp 238.6-240.5 °C. ^{1}H NMR (DMSO-d_6, 500 MHz): δ (ppm) 12.20 (s, 1H), 9.30 (s, 1H), 7.90 (d, *J* = 10.0 Hz, 1H), 7.86 (d, *J* = 5.0 Hz, 1H), 7.77-7.64 (m, 8H), 7.54 (d, *J* = 10.0 Hz, 1H), 7.50 (s, 1H), 7.45-7.41 (m, 7H), 7.39-7.35 (m, 2H), 7.28-7.25 (m, 2H), 6.94-6.91 (m, 1H), 5.15-5.13 (m, 1H), 1.50-1.47 (m,

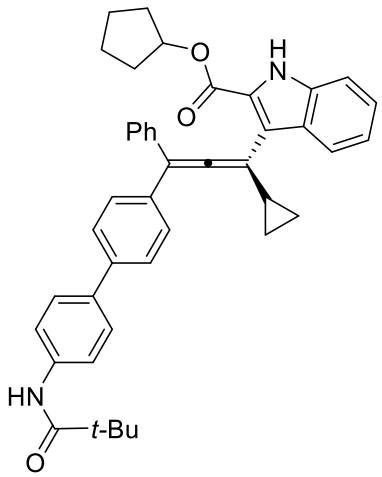
2H), 1.23 (s, 9H), 1.15-1.06 (m, 4H), 0.90-0.87 (m, 2H). ^{13}C NMR (DMSO-*d*$_6$, 126 MHz): δ (ppm) 208.5, 177.0, 161.6, 139.6, 136.9, 136.0, 134.5, 134.2, 133.7, 132.7, 129.2, 129.1, 128.7, 128.4, 128.3, 128.0, 127.9, 127.0, 126.9, 126.8, 126.4, 125.7, 125.5, 124.8, 124.6, 121.0, 120.9, 120.8, 114.6, 113.3, 112.1, 105.1, 77.6, 39.7, 32.4, 32.3, 27.7, 23.4. HRMS (ESI) m/z: $[M+H]^+$ Calcd for $C_{50}H_{45}N_2O_3$ 721.3430; Found 721.3426. The enantiomeric excess was determined to be 86% by HPLC. [IA column, 254 nm, *n*-hexane:EtOH = 50:50, 1.0 mL/min]: 11.2 min (major), 13.4 min (minor). $[\alpha]^{22}_D$ = -6.3 (c = 0.3, CH_2Cl_2).

Cyclopentyl 3-(3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)-1-(thiophen-3-yl) propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3oa)



Eluent for flash column chromatography: petroleum ether/ethyl acetate = 12:1. Yellow solid, 29.5 mg, 87% yield. Mp 145.7-147.9 °C. ^{1}H NMR (DMSO-*d*$_6$, 500 MHz): δ (ppm) 12.10 (s, 1H), 9.29 (s, 1H), 7.76 (d, *J* = 10.0 Hz, 2H), 7.70 (d, *J* = 10.0 Hz, 2H), 7.64 (d, *J* = 10.0 Hz, 2H), 7.55-7.53 (m, 1H), 7.49 (d, *J* = 5.0 Hz, 1H), 7.44-7.34 (m, 7H), 7.25-7.22 (m, 2H), 7.19 (d, *J* = 5.0 Hz, 1H), 6.94-6.90 (m, 2H), 5.24-5.21 (m, 1H), 1.66-1.61 (m, 2H), 1.37-1.28 (m, 4H), 1.24-1.18 (m, 11H). ^{13}C NMR (DMSO-*d*$_6$, 126 MHz): δ (ppm) 207.6, 177.0, 161.6, 139.5, 139.4, 138.4, 136.7, 136.3, 134.8, 134.5, 129.2, 129.1, 128.7, 128.2, 127.6, 127.4, 126.9, 126.8, 126.2, 125.4, 125.3, 122.2, 121.0, 120.8, 120.7, 115.7, 113.2, 111.2, 100.8, 77.6, 39.7, 32.5, 32.4, 27.7, 23.7. HRMS (ESI) m/z: $[M+H]^+$ Calcd for $C_{44}H_{41}N_2O_3S$ 677.2838; Found 677.2835. The enantiomeric excess was determined to be 95% by HPLC. [IA column, 254 nm, *n*-hexane:EtOH = 80:20, 1.0 mL/min]: 24.9 min (major), 30.2 min (minor). $[\alpha]^{22}_D$ = +55.7 (c = 0.3, CH_2Cl_2).

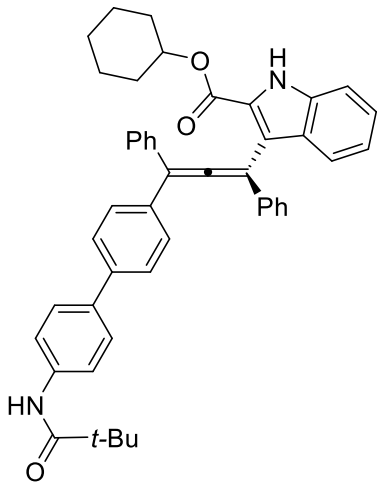
Cyclopentyl 3-(1-cyclopropyl-3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)pro pa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3pa)



Eluent for flash column chromatography: petroleum ether/ethyl acetate = 12:1. Yellow solid, 24.7 mg, 80% yield. Mp 238.5-239.7 °C. ^{1}H NMR (DMSO-*d*$_6$, 500 MHz): δ (ppm) 11.89 (s, 1H), 9.29 (s, 1H), 7.77-7.75 (m, 2H), 7.68-7.63 (m, 4H), 7.44-7.38 (m, 3H), 7.34-7.28 (m, 5H), 7.24-7.20 (m, 2H), 6.95-6.92 (m, 1H), 5.38-5.37 (m, 1H), 1.93-1.83 (m, 3H), 1.74-1.68

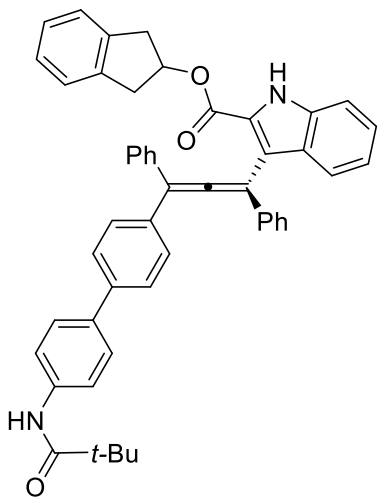
(m, 4H), 1.54-1.53 (m, 2H), 1.24 (s, 9H), 0.78-0.76 (m, 2H), 0.53-0.51 (m, 2H). ^{13}C NMR (DMSO-*d6*, 126 MHz): δ (ppm) 204.0, 177.0, 161.6, 139.5, 139.1, 136.9, 136.4, 135.5, 134.6, 129.0, 128.9, 128.5, 127.9, 127.6, 126.9, 126.7, 125.4, 124.4, 120.9, 120.8, 120.7, 117.1, 113.0, 110.4, 105.9, 77.9, 39.7, 32.8, 32.7, 27.7, 23.9, 15.1, 7.2, 7.1. HRMS (ESI) m/z: $[M+H]^+$ Calcd for $C_{43}H_{43}N_2O_3$ 635.3274; Found 635.3271. The enantiomeric excess was determined to be 87% by HPLC. [IA column, 254 nm, *n*-hexane:EtOH = 50:50, 1.0 mL/min]: 7.9 min (major), 10.2 min (minor). $[\alpha]^{22}_D$ = +90.5 (c = 0.3, CH_2Cl_2).

Cyclohexyl 3-(1,3-diphenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3bb)



Eluent for flash column chromatography: petroleum ether/ethyl acetate = 12:1. Yellow solid, 32.0 mg, 94% yield. Mp 204.7-206.8 °C. ^{1}H NMR (DMSO-*d6*, 500 MHz): δ (ppm) 12.19 (s, 1H), 9.33 (s, 1H), 7.78 (d, *J* = 10.0 Hz, 2H), 7.72 (d, *J* = 10.0 Hz, 2H), 7.66 (d, *J* = 5.0 Hz, 2H), 7.53 (d, *J* = 10.0 Hz, 1H), 7.44-7.37 (m, 7H), 7.34-7.31 (m, 2H), 7.28-7.23 (m, 5H), 6.97-6.94 (m, 1H), 4.77-4.73 (m, 1H), 1.51-1.49 (m, 2H), 1.39-1.31 (m, 3H), 1.25 (s, 9H), 1.13-1.10 (m, 2H), 1.02-0.93 (m, 3H). ^{13}C NMR (DMSO-*d6*, 126 MHz): δ (ppm) 207.7, 177.0, 161.3, 139.6, 139.5, 136.9, 136.8, 136.1, 134.6, 134.5, 129.2, 129.1, 128.7, 128.3, 128.0, 127.6, 127.0, 126.3, 125.5, 125.4, 121.0, 120.9, 120.8, 114.8, 113.3, 111.9, 104.8, 73.0, 39.7, 30.9, 30.8, 27.7, 25.3, 23.1. HRMS (ESI) m/z: $[M+H]^+$ Calcd for $C_{47}H_{45}N_2O_3$ 685.3430; Found 685.3423. The enantiomeric excess was determined to be 79% by HPLC. [OD-H column, 254 nm, *n*-hexane:IPA = 90:10, 1.0 mL/min]: 20.1 min (minor), 26.4 min (major). $[\alpha]^{22}_D$ = +25.1 (c = 0.3, CH_2Cl_2).

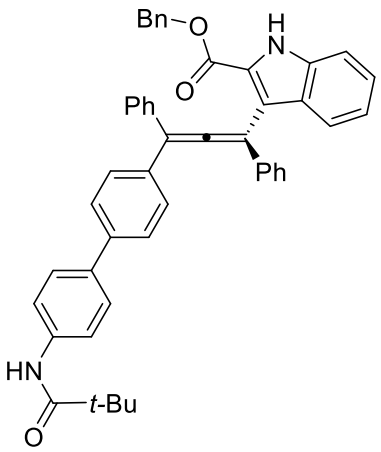
2,3-Dihydro-1*H*-inden-2-yl 3-(1,3-diphenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl) propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3bc)



Eluent for flash column chromatography: petroleum ether/ethyl acetate = 12:1. Yellow solid, 30.8 mg, 86% yield. Mp 137.1-140.6 °C. ^{1}H NMR (DMSO-*d6*, 500 MHz): δ (ppm) 12.19 (s, 1H), 9.33 (s, 1H), 7.78 (d, *J* = 10.0 Hz, 2H), 7.63-7.59 (m, 4H), 7.52 (d, *J* = 10.0 Hz, 1H), 7.40-7.34 (m, 7H), 7.28-7.24 (m, 4H), 7.21-7.18 (m, 3H), 7.11-7.10 (m, 4H), 6.98-6.95 (m, 1H),

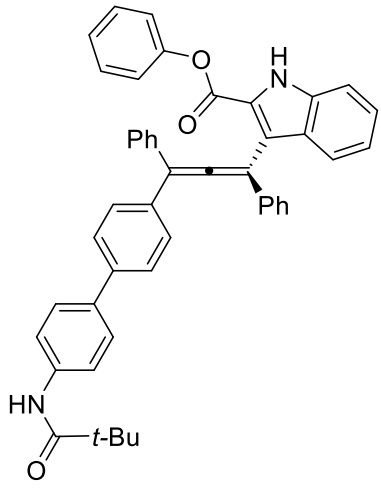
5.54-5.51 (m, 1H), 3.24-3.19 (m, 1H), 3.15-3.10 (m, 1H), 2.68-2.64 (m, 1H), 2.59-2.55 (m, 1H), 1.25 (s, 9H). ^{13}C NMR (DMSO-*d*$_6$, 126 MHz): δ (ppm) 207.9, 177.0, 161.5, 140.3, 139.6, 139.4, 136.9, 136.7, 136.0, 134.5, 134.4, 129.2, 129.1, 128.9, 128.6, 128.3, 127.9, 127.6, 127.1, 127.0, 126.9, 126.1, 125.7, 125.0, 124.9, 120.9, 120.8, 115.4, 113.3, 111.8, 104.7, 75.8, 39.7, 39.2, 38.9, 27.7. HRMS (ESI) m/z: $[M+H]^+$ Calcd for $C_{50}H_{43}N_2O_3$ 719.3274; Found 719.3271. The enantiomeric excess was determined to be 77% by HPLC. [OD-H column, 254 nm, *n*-hexane:EtOH = 90:10, 1.0 mL/min]: 20.3 min (minor), 24.3 min (major). $[\alpha]^{22}_D$ = +16.9 (c = 0.3, CH_2Cl_2).

Benzyl 3-(1,3-diphenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl) -1*H*-indole-2-carboxylate (3bd)



Eluent for flash column chromatography: petroleum ether/ethyl acetate = 12:1. Yellow solid, 25.4 mg, 85% yield. Mp 220.5-223.3 °C. ^{1}H NMR (DMSO-*d*$_6$, 500 MHz): δ (ppm) 12.18 (s, 1H), 9.25 (s, 1H), 7.70 (d, *J* = 10.0 Hz, 2H), 7.56-7.54 (m, 4H), 7.47 (d, *J* = 10.0 Hz, 1H), 7.30-7.23 (m, 11H), 7.20-7.14 (m, 4H), 7.12-7.08 (m, 2H), 6.98-6.94 (m, 3H), 5.14-5.06 (m, 2H), 1.18 (s, 9H). ^{13}C NMR (DMSO-*d*$_6$, 126 MHz): δ (ppm) 207.9, 177.0, 161.5, 139.5, 137.1, 136.5, 136.2, 136.0, 134.5, 134.4, 129.3, 129.2, 129.0, 128.7, 128.6, 128.3, 128.2, 127.9, 127.8, 127.7, 127.0, 126.9, 126.3, 125.8, 124.6, 121.1, 121.0, 120.8, 115.6, 113.7, 111.9, 66.4, 39.7, 27.7. HRMS (ESI) m/z: $[M+H]^+$ Calcd for $C_{48}H_{41}N_2O_3$ 693.3117; Found 693.3111. The enantiomeric excess was determined to be 82% by HPLC. [OD-H column, 254 nm, *n*-hexane:IPA = 80:20, 1.0 mL/min]: 11.9 min (minor), 17.0 min (major). $[\alpha]^{22}_D$ = +22.5 (c = 0.3, CH_2Cl_2).

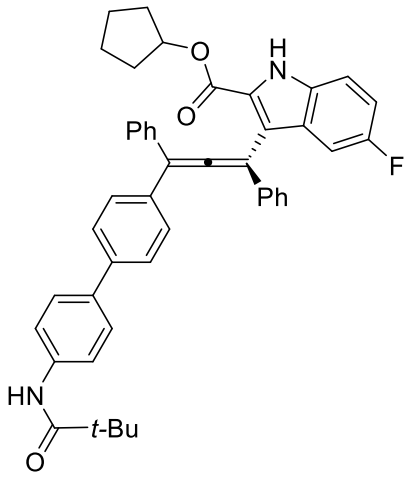
Phenyl 3-(1,3-diphenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl) -1*H*-indole-2-carboxylate (3be)



Eluent for flash column chromatography: petroleum ether/ethyl acetate = 12:1. Yellow solid, 24.8 mg, 85% yield. Mp 149.2-151.7 °C. ^{1}H NMR (DMSO-*d*$_6$, 500 MHz): δ (ppm) 12.41 (s, 1H), 9.26 (s, 1H), 7.70 (d, *J* = 10.0 Hz, 2H), 7.57-7.50 (m, 5H), 7.36-7.24 (m, 15H), 7.19-7.15 (m, 2H), 6.99 (t, *J* = 5.0 Hz, 1H), 6.75-6.73 (m, 2H), 1.18 (s, 9H). ^{13}C NMR (DMSO-*d*$_6$, 126 MHz): δ (ppm) 208.0, 177.0, 160.0, 150.5, 139.6, 137.5, 136.7, 135.9, 134.5, 134.4, 129.9, 129.3, 129.2,

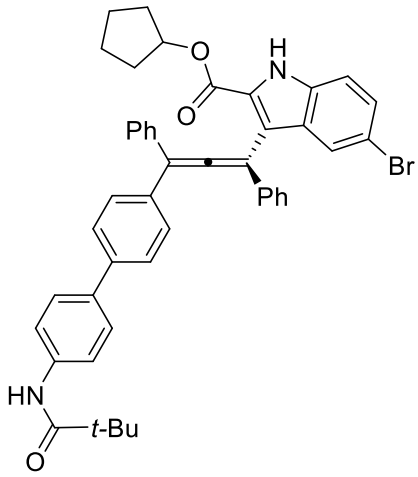
129.1, 128.7, 128.4, 127.8, 127.0, 126.9, 126.8, 126.3, 126.2, 124.0, 121.9, 121.3, 121.0, 116.9, 113.5, 112.1, 104.6, 39.7, 27.7. HRMS (ESI) m/z: $[M+H]^+$ Calcd for $C_{47}H_{39}N_2O_3$ 679.2961; Found 679.2956. The enantiomeric excess was determined to be 62% by HPLC. [IA column, 254 nm, *n*-hexane:EtOH = 60:40, 1.0 mL/min]: 8.3 min (minor), 11.2 min (major). $[\alpha]^{22}_D$ = +5.0 (c = 0.3, CH_2Cl_2).

Cyclopentyl 3-(1,3-diphenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl)-5-fluoro-1*H*-indole-2-carboxylate (3bf)



Eluent for flash column chromatography: petroleum ether/ethyl acetate = 12:1. Yellow solid, 30.7 mg, 90% yield. Mp 140.7-143.2 °C. ^{1}H NMR (DMSO-*d*$_6$, 500 MHz): δ (ppm) 12.29 (s, 1H), 9.30 (s, 1H), 7.76 (d, *J* = 10.0 Hz, 2H), 7.70 (d, *J* = 5.0 Hz, 2H), 7.64 (d, *J* = 5.0 Hz, 2H), 7.52-7.49 (m, 1H), 7.45-7.37 (m, 7H), 7.36-7.31 (m, 2H), 7.27-7.22 (m, 3H), 7.13-7.10 (m, 1H), 6.77 (d, *J* = 10.0 Hz, 1H), 5.18-5.17 (m, 1H), 1.61-1.57 (m, 2H), 1.23-1.21 (m, 13H), 1.16-1.10 (m, 2H). ^{13}C NMR (DMSO-*d*$_6$, 126 MHz): δ (ppm) 207.8, 177.0, 161.3, 159.0 (d, *J* = 235.6 Hz), 139.6, 139.5, 136.4, 136.0, 134.5, 134.4, 133.5, 129.3, 129.2, 129.0, 128.9, 128.6, 128.4, 128.0 (d, *J* = 10.1 Hz), 127.7, 127.2, 127.0, 126.2, 121.0, 114.7 (d, *J* = 18.9 Hz), 114.4, 112.1, 104.6, 104.5, 77.8, 39.7, 32.4, 32.3, 27.7, 23.6. ^{19}F NMR (DMSO-*d*$_6$, 470 MHz) δ (ppm) -122.12. HRMS (ESI) m/z: $[M+H]^+$ Calcd for $C_{46}H_{42}FN_2O_3$ 689.3179; Found 689.3176. The enantiomeric excess was determined to be 87% by HPLC. [IA column, 254 nm, *n*-hexane:EtOH = 50:50, 1.0 mL/min]: 8.6 min (major), 11.6 min (minor). $[\alpha]^{22}_D$ = +41.0 (c = 0.3, CH_2Cl_2).

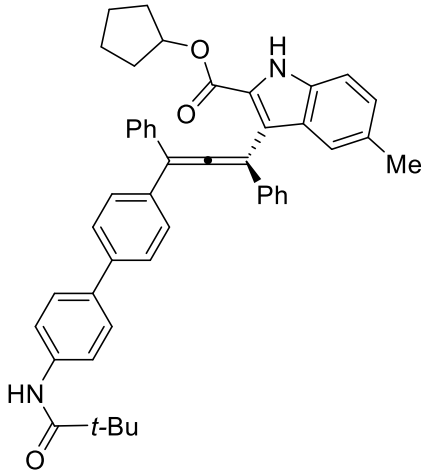
Cyclopentyl 5-bromo-3-(1,3-diphenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3bg)



Eluent for flash column chromatography: petroleum ether/ethyl acetate = 12:1. Yellow solid, 33.1 mg, 88% yield. Mp 160.4-162.9 °C. ^{1}H NMR (DMSO-*d*$_6$, 500 MHz): δ (ppm) 12.39 (s, 1H), 9.29 (s, 1H), 7.75 (d, *J* = 10.0 Hz, 2H), 7.70 (d, *J* = 10.0 Hz, 2H), 7.63 (d, *J* = 10.0 Hz, 2H), 7.46-7.42 (m, 3H), 7.40-7.31 (m, 8H), 7.27-7.21 (m, 4H), 5.21-5.19 (m, 1H), 1.62-1.59 (m, 2H), 1.26-1.21 (m, 13H), 1.14-1.13 (m, 2H). ^{13}C NMR (DMSO-*d*$_6$, 126 MHz): δ (ppm)

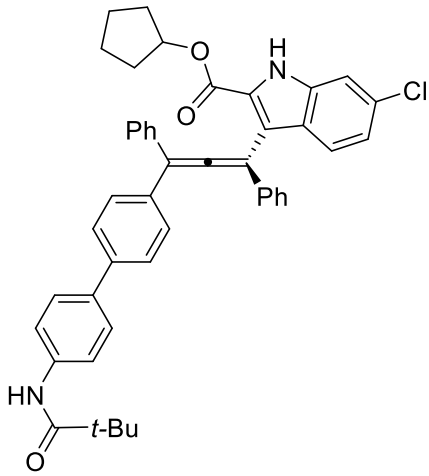
208.0, 177.0, 161.2, 139.8, 139.5, 136.3, 135.8, 135.4, 134.6, 134.4, 129.6, 129.3, 129.2, 128.9, 128.5, 128.4, 128.1, 127.8, 127.1, 127.0, 126.8, 126.2, 123.1, 121.0, 115.3, 113.9, 113.3, 112.3, 77.9, 39.7, 32.4, 32.3, 27.7, 23.6. HRMS (ESI) m/z: $[M+H]^+$ Calcd for $C_{46}H_{42}BrN_2O_3$ 749.2379; Found 749.2377. The enantiomeric excess was determined to be 88% by HPLC. [IA column, 254 nm, *n*-hexane:EtOH = 50:50, 1.0 mL/min]: 7.9 min (major), 9.9 min (minor). $[\alpha]^{22}_D$ = +36.5 (c = 0.3, CH_2Cl_2).

Cyclopentyl 3-(1,3-diphenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl)-5-methyl-1*H*-indole-2-carboxylate (3bh)



Eluent for flash column chromatography: petroleum ether/ethyl acetate = 12:1. Yellow solid, 29.0 mg, 84% yield. Mp 159.3-162.5 ºC. ^{1}H NMR (DMSO-*d*$_6$, 500 MHz): δ (ppm) 12.02 (s, 1H), 9.30 (s, 1H), 7.76 (d, *J* = 10.0 Hz, 2H), 7.70 (d, *J* = 10.0 Hz, 2H), 7.63 (d, *J* = 10.0 Hz, 2H), 7.44-7.35 (m, 8H), 7.33-7.27 (m, 4H), 7.24-7.21 (m, 1H), 7.05 (d, *J* = 10.0 Hz, 1H), 6.87 (s, 1H), 5.19-5.17 (m, 1H), 2.07 (s, 3H), 1.63-1.57 (m, 2H), 1.27-1.19 (m, 13H), 1.16-1.12 (m, 2H). ^{13}C NMR (DMSO-*d*$_6$, 126 MHz): δ (ppm) 208.1, 177.0, 161.6, 139.6, 139.5, 136.7, 136.0, 135.3, 134.6, 134.5, 129.4, 129.2, 129.1, 129.0, 128.6, 128.3, 128.2, 127.6, 127.4, 126.9, 126.8, 126.2, 125.4, 121.0, 120.3, 114.0, 112.8, 111.9, 105.0, 77.5, 39.7, 32.4, 27.7, 23.6, 21.4. HRMS (ESI) m/z: $[M+H]^+$ Calcd for $C_{47}H_{45}N_2O_3$ 685.3430; Found 685.3425. The enantiomeric excess was determined to be 82% by HPLC. [IA column, 254 nm, *n*-hexane:EtOH = 50:50, 1.0 mL/min]: 8.6 min (major), 10.6 min (minor). $[\alpha]^{22}_D$ = +39.1 (c = 0.3, CH_2Cl_2).

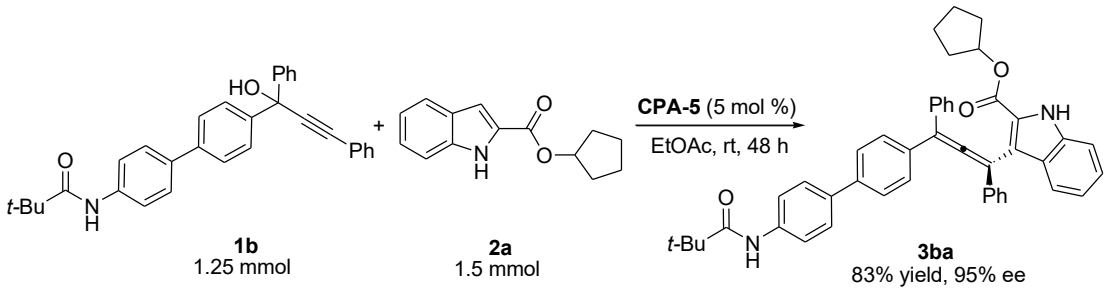
Cyclopentyl 6-chloro-3-(1,3-diphenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3bi)



Eluent for flash column chromatography: petroleum ether/ethyl acetate = 12:1. Yellow solid, 31.0 mg, 88% yield. Mp 155.5-157.6 ºC. ^{1}H NMR (DMSO-*d*$_6$, 500 MHz): δ (ppm) 12.30 (s, 1H), 9.29 (s, 1H), 7.76 (d, *J* = 10.0 Hz, 2H), 7.70 (d, *J* = 10.0 Hz, 2H), 7.64 (d, *J* = 10.0 Hz, 2H), 7.52 (s, 1H), 7.43-7.34 (m, 7H), 7.33-7.30 (m, 2H), 7.26-7.20 (m, 4H), 6.95 (d, *J* = 10.0 Hz, 1H), 5.19-5.17 (m, 1H), 1.58-1.57 (m, 2H), 1.23-1.21 (m, 13H),

1.10-1.09 (m, 2H). ^{13}C NMR (DMSO-d_6, 126 MHz): δ (ppm) 207.6, 177.0, 161.3, 139.6, 139.5, 137.0, 136.3, 135.9, 134.5, 134.4, 130.2, 129.2, 129.1, 129.0, 128.6, 128.4, 127.7, 126.9, 126.7, 126.5, 126.1, 122.2, 121.5, 121.0, 115.0, 112.6, 112.2, 104.3, 77.9, 39.7, 32.4, 32.3, 27.7, 23.6. HRMS (ESI) m/z: $[M+H]^+$ Calcd for $C_{46}H_{42}ClN_2O_3$ 705.2884; Found 705.2876. The enantiomeric excess was determined to be 93% by HPLC. [IA column, 254 nm, *n*-hexane:EtOH = 50:50, 1.0 mL/min]: 8.9 min (major), 11.2 min (mimor). $[\alpha]^{22}_D$ = +62.8 (c = 0.3, CH_2Cl_2).

D: Large-scale Reaction



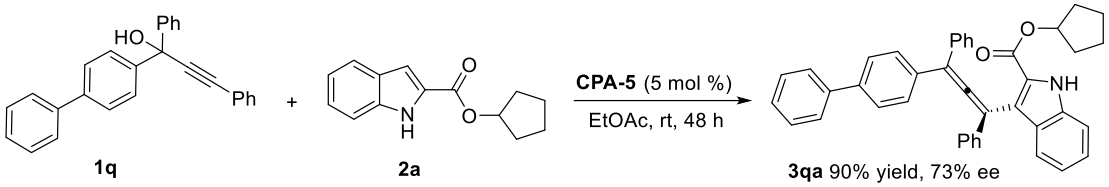
1b
1.25 mmol

2a
1.5 mmol

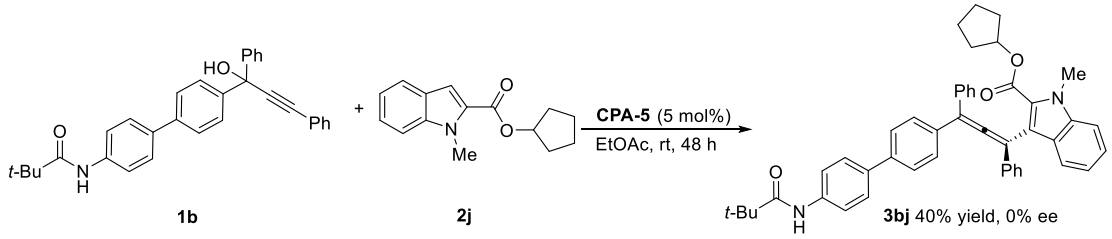
3ba
83% yield, 95% ee

To a solution of ethyl acetate (50.0 mL) were added propargylic alcohol **1b** (1.25 mmol), 2-indole derivatives **2a** (1.5 mmol) and **CPA-5** (0.025 mmol). The reaction mixture was stirred at room temperature for 48 h. The solvent was evaporated to give the crude product, which was directly purified by silica gel chromatography to provide the desired product **3ba** as a yellow solid (83% yield, 95% ee).

E: Mechanism Studies

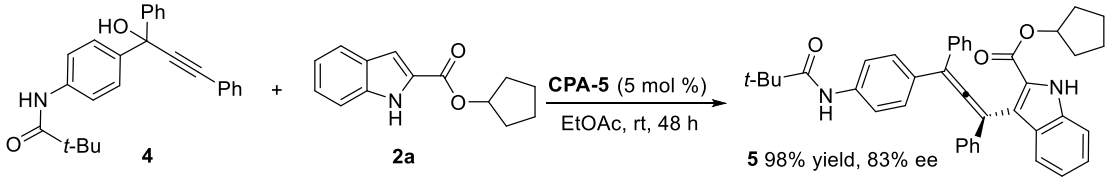


To a solution of EtOAc (0.3 mL) were added propargylic alcohol **1q** (0.05 mmol), 2-indole derivatives **2a** (0.06 mmol) and **CPA-5** (0.0025 mmol). The reaction mixture was stirred at room temperature for 48 h. The solvent was evaporated to give the crude product, which was directly purified by silica gel chromatography to provide the desired products **3qa** as a yellow oil (90% yield, 73% ee).



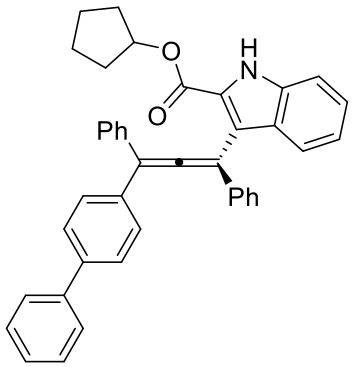
To a solution of EtOAc (0.3 mL) were added propargylic alcohol **1b** (0.05 mmol), *N*-methyl protected 2-indole derivatives **2j** (0.06 mmol) and **CPA-5** (0.0025 mmol). The reaction mixture was stirred at room temperature for 48 h. The solvent was evaporated to give the crude product, which was directly purified by silica gel chromatography to provide the desired products **3bj** as a white solid (40% yield, 0% ee).

F: Further Investigations



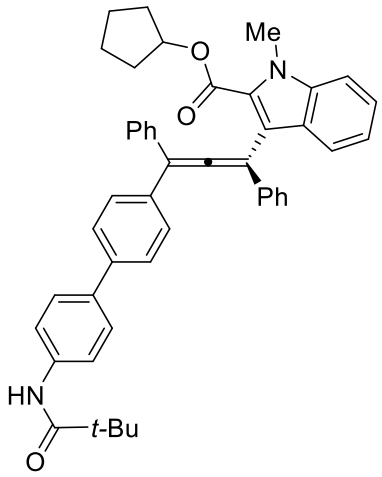
To a solution of EtOAc (0.3 mL) were added propargylic alcohol **4** (0.05 mmol), 2-indole derivatives **2a** (0.06 mmol) and **CPA-5** (0.0025 mmol). The reaction mixture was stirred at room temperature for 48 h. The solvent was evaporated to give the crude product, which was directly purified by silica gel chromatography to provide the desired products **5** as a yellow solid (98% yield, 83% ee).

Cyclopentyl 3-(3-([1,1'-biphenyl]-4-yl)-1,3-diphenylpropa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3qa)



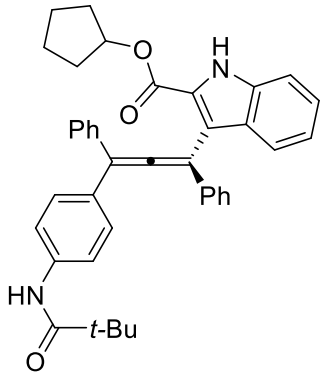
Eluent for flash column chromatography: petroleum ether/ethyl acetate = 15:1. Yellow oil, 27.4 mg, 90% yield. Mp 120.0-121.5 °C. ^{1}H NMR (DMSO-*d*$_6$, 500 MHz): δ (ppm) 12.14 (s, 1H), 7.67 (d, *J* = 5.0 Hz, 2H), 7.64 (d, *J* = 10.0 Hz, 2H), 7.47 (d, *J* = 10.0 Hz, 1H), 7.43-7.38 (m, 7H), 7.35-7.33 (m, 2H), 7.29-7.26 (m, 2H), 7.21-7.23 (m, 3H), 7.20 (d, *J* = 5.0 Hz, 2H), 6.89-6.87 (m, 1H), 5.15-5.14 (m, 1H), 1.56-1.51 (m, 2H), 1.19-1.14 (m, 4H), 1.07-1.04 (m, 2H). ^{13}C NMR (DMSO-*d*$_6$, 126 MHz): δ (ppm) 207.8, 161.7, 140.1, 140.0, 136.9, 136.6, 136.0, 135.2, 129.6, 129.3, 129.2, 129.1, 128.7, 128.4, 128.2, 128.0, 127.7, 127.5, 127.1, 126.2, 125.5, 120.9, 120.8, 114.7, 113.3, 112.0, 104.8, 77.7, 32.5, 32.4, 23.7. HRMS (ESI) m/z: $[M+H]^+$ Calcd for $C_{41}H_{34}NO_2$ 572.2590; Found 572.2583. The enantiomeric excess was determined to be 73% by HPLC. [IA column, 254 nm, *n*-hexane:EtOH = 50:50, 1.0 mL/min]: 11.7 min (minor), 15.0 min (major). $[\alpha]^{22}_D$ = +22.9 (c = 0.3, CH_2Cl_2).

2,3-Dihydro-1*H*-inden-2-yl 3-(3-(4'-methoxy-[1,1'-biphenyl]-4-yl)-1,3-diphenylpropa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3bj)



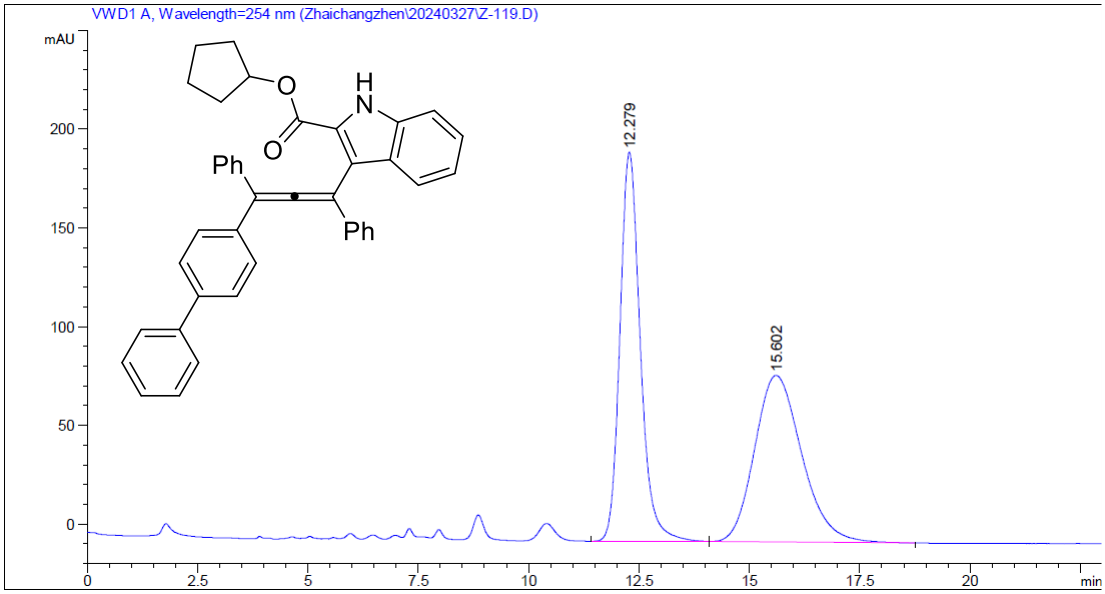
Eluent for flash column chromatography: petroleum ether/ethyl acetate = 15:1. White solid, 13.4 mg, 40% yield. Mp 239.4-241.3 °C. ^{1}H NMR (DMSO-*d*$_6$, 500 MHz): δ (ppm) 9.27 (s, 1H), 7.72 (d, *J* = 5.0 Hz, 2H), 7.67 (d, *J* = 5.0 Hz, 2H), 7.61-7.60 (m, 2H), 7.40-7.38 (m, 2H), 7.36-7.32 (m, 5H), 7.29 (d, *J* = 5.0 Hz, 2H), 7.24-7.19 (m, 4H), 6.93 (d, *J* = 10.0 Hz, 1H), 5.06-5.05 (m, 1H), 4.05 (s, 3H), 1.52-1.47 (m, 2H), 1.21-1.19 (m, 13H), 1.01-1.00 (m, 2H). ^{13}C NMR (DMSO-*d*$_6$, 126 MHz): δ (ppm) 207.6, 177.1, 161.7, 139.6, 138.7, 136.6, 136.1, 134.6, 134.5, 129.3, 129.2, 129.1, 128.7, 128.5, 127.8, 127.0, 126.9, 126.4, 126.3, 125.8, 121.2, 121.1, 121.0, 115.8, 112.1, 111.7, 105.0, 77.9, 40.1, 32.5, 32.4, 32.3, 27.7, 23.7. HRMS (ESI) m/z: $[M+H]^+$ Calcd for $C_{47}H_{45}N_2O_3$ 685.3430; Found 685.3421. The enantiomeric excess was determined to be 0% by HPLC. [OD-H column, 254 nm, *n*-hexane:EtOH = 90:10, 1.0 mL/min]: 12.6 min (minor), 15.2 min (major). $[\alpha]^{22}_D$ = +15.6 (c = 0.3, CH_2Cl_2).

Cyclopentyl 3-(1,3-diphenyl-3-(4-pivalamidophenyl)propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (5)

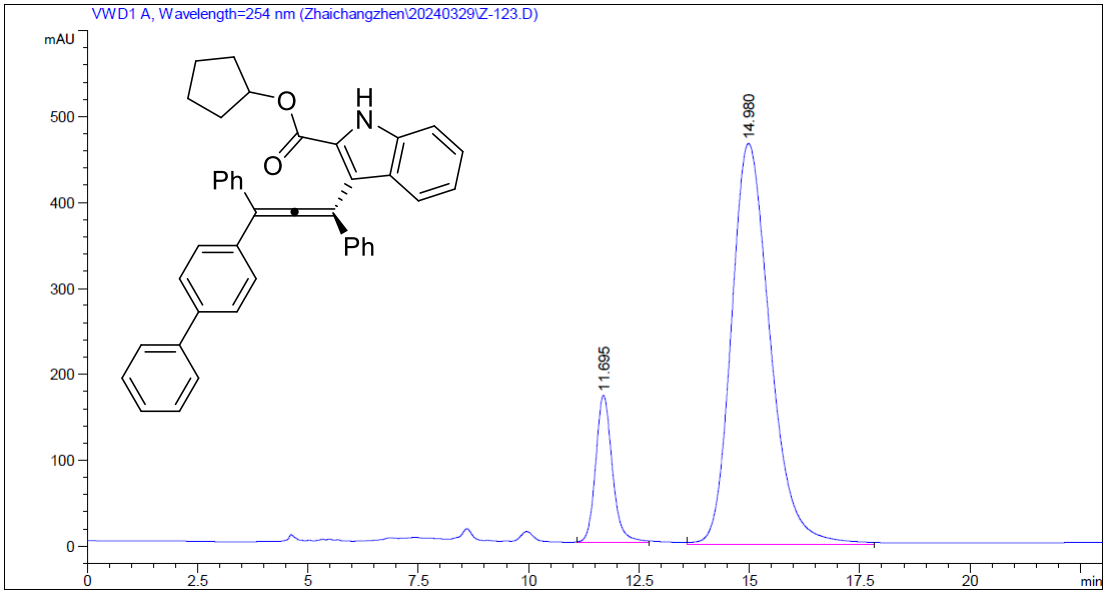


Eluent for flash column chromatography: petroleum ether/ethyl acetate = 12:1. Yellow solid, 29.1 mg, 98% yield. Mp 139.7-142.1 ºC. ^{1}H NMR (DMSO-*d*$_6$, 500 MHz): δ (ppm) 12.12 (s, 1H), 9.31 (s, 1H), 7.70 (d, *J* = 5.0 Hz, 2H), 7.50 (d, *J* = 10.0 Hz, 1H), 7.42-7.39 (m, 2H), 7.35-7.29 (m, 5H), 7.27-7.18 (m, 7H), 6.39-6.90 (m, 1H), 5.18-5.17 (m, 1H), 1.62-1.58 (m, 2H), 1.26-1.19 (m, 13H), 1.14-1.11 (m, 2H). ^{13}C NMR (DMSO-*d*$_6$, 126 MHz): δ (ppm) 207.5, 177.0, 161.6, 139.5, 136.8, 136.7, 136.3, 130.3, 129.1, 129.0, 128.6, 128.5, 128.2, 128.0, 127.5, 126.1, 125.5, 125.4, 120.9, 120.8, 120.7, 114.8, 113.2, 112.0, 104.5, 77.6, 39.7, 32.4, 32.3, 27.6, 23.6. HRMS (ESI) m/z: $[M+H]^+$ Calcd for $C_{40}H_{38}N_2O_3$ 595.2961; Found 595.2954. The enantiomeric excess was determined to be 83% by HPLC. [IA column, 254 nm, *n*-hexane:EtOH = 80:20, 1.0 mL/min]: 11.3 min (minor), 19.6 min (major). $[\alpha]^{22}_D$ = -1.1 (c = 0.3, CH_2Cl_2).

Cyclopentyl 3-(3-([1,1'-biphenyl]-4-yl)-1,3-diphenylpropa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3qa)

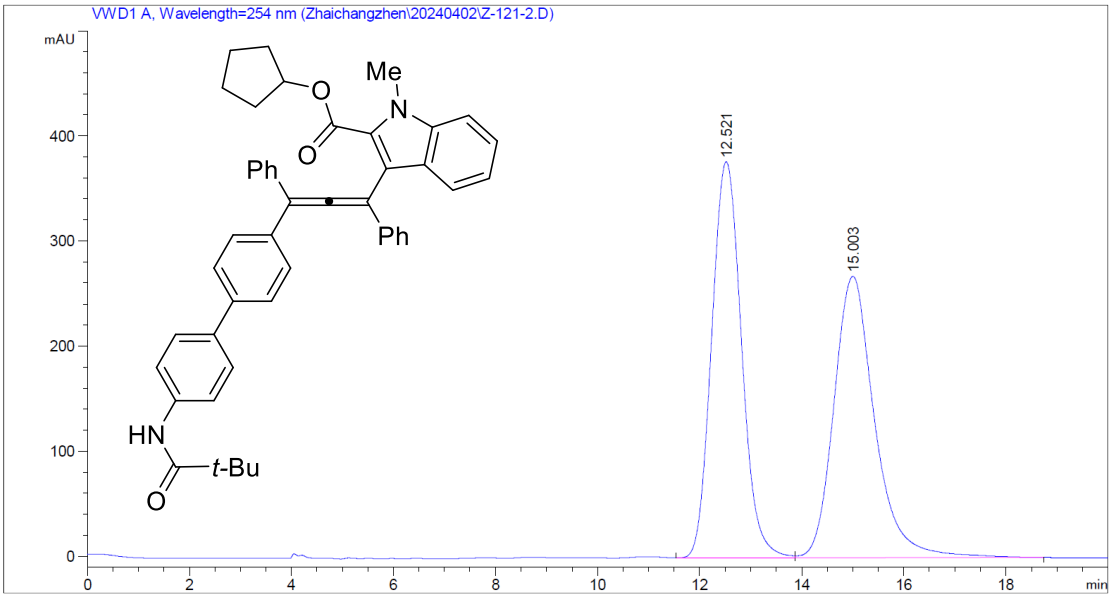


#	Time	Area	Height	Width	Symmetry	Area %
1	12.279	6319.5	197.2	0.4898	0.796	50.199
2	15.602	6269.5	84.4	1.1464	0.788	49.801

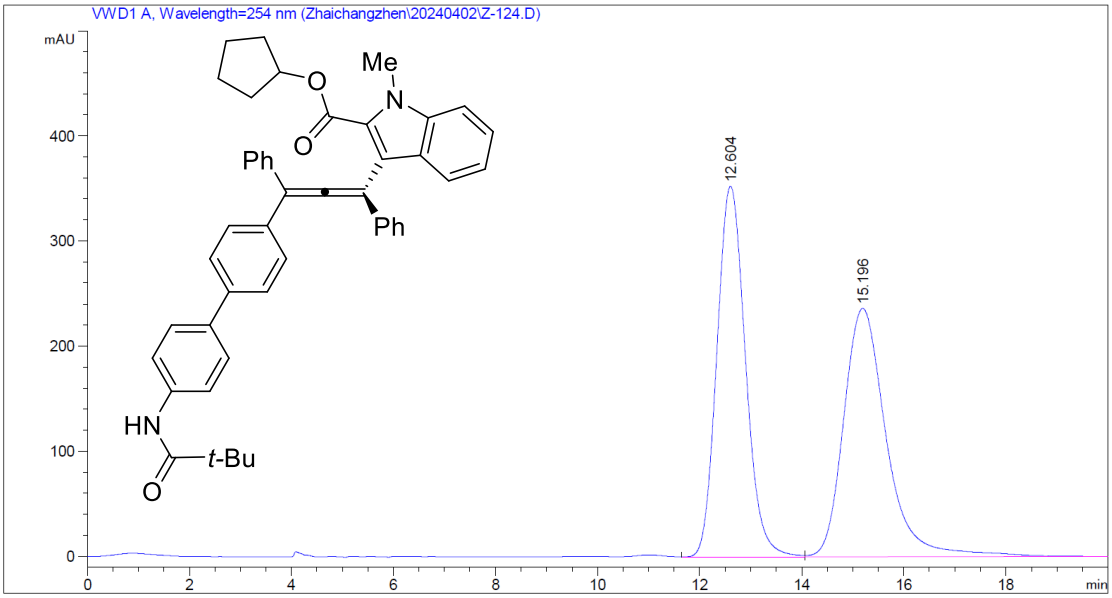


#	Time	Area	Height	Width	Symmetry	Area %
1	11.695	4437	170.4	0.4339	0.849	13.498
2	14.98	28434.8	466.6	1.0157	0.76	86.502

2,3-Dihydro-1*H*-inden-2-yl 3-(3-(4'-methoxy-[1,1'-biphenyl]-4-yl)-1,3-diphenylpropa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3bj)

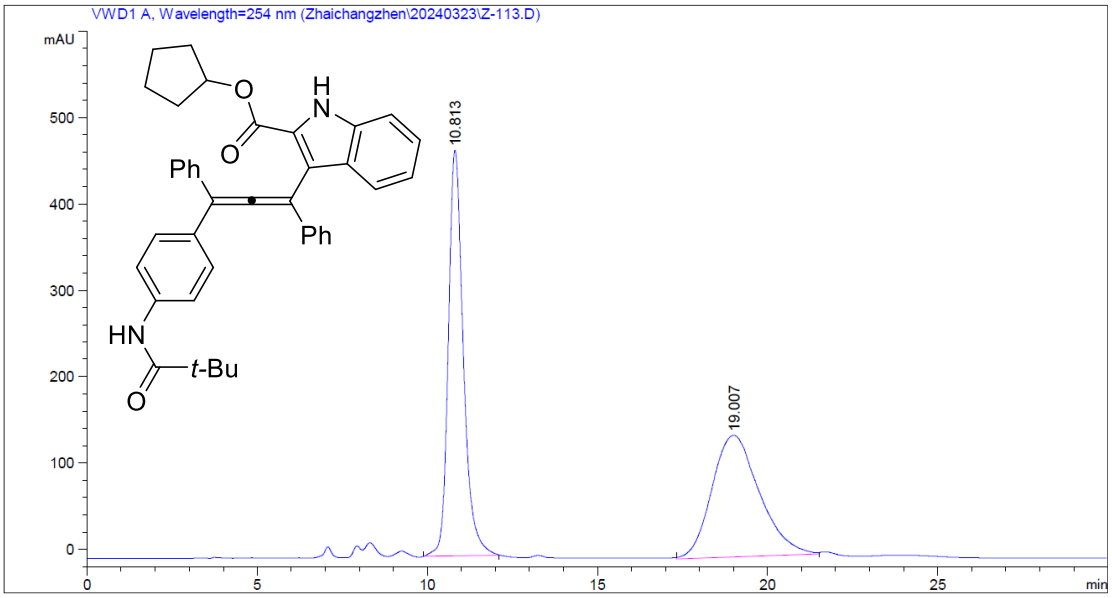


#	Time	Area	Height	Width	Symmetry	Area %
1	12.521	15289.8	376.9	0.6423	0.895	50.705
2	15.003	14864.6	267.7	0.8349	0.795	49.295



#	Time	Area	Height	Width	Symmetry	Area %
1	12.604	13697.4	352.7	0.6051	0.855	49.897
2	15.196	13754	236.3	0.8962	0.732	50.103

Cyclopentyl 3-(1,3-diphenyl-3-(4-pivalamidophenyl)propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (5)



#	Time	Area	Height	Width	Symmetry	Area %
1	10.813	14376.2	469.5	0.5104	0.771	51.286
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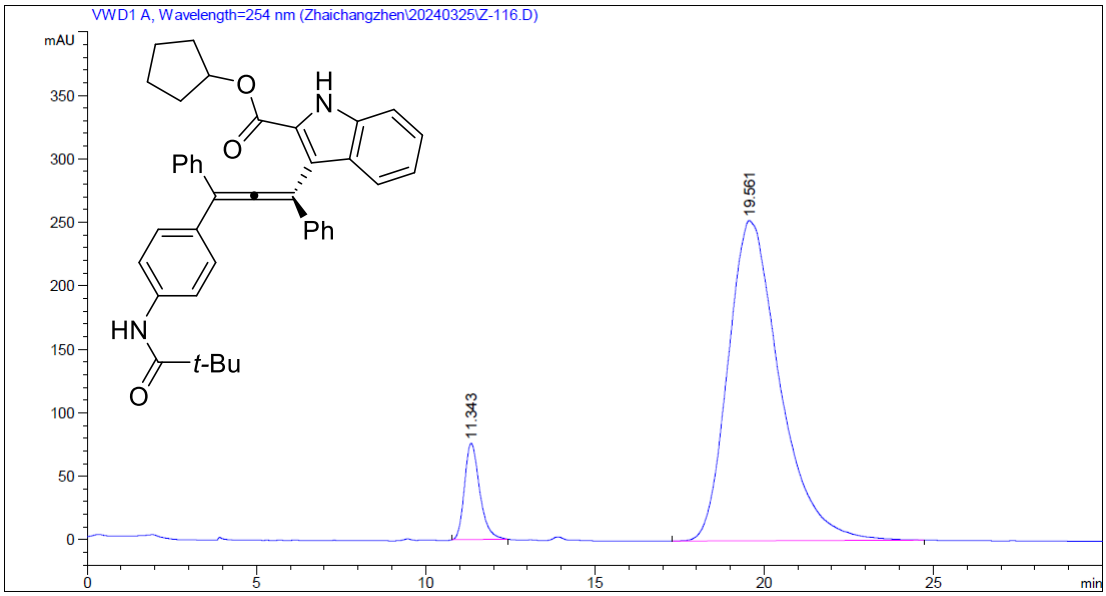
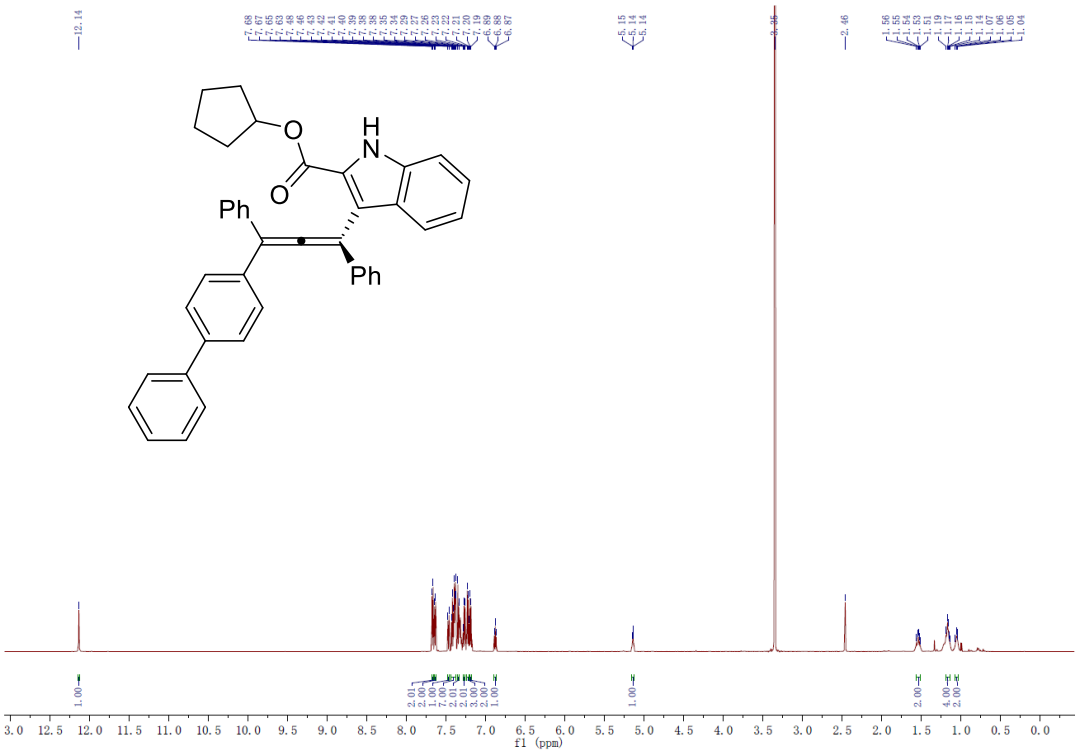
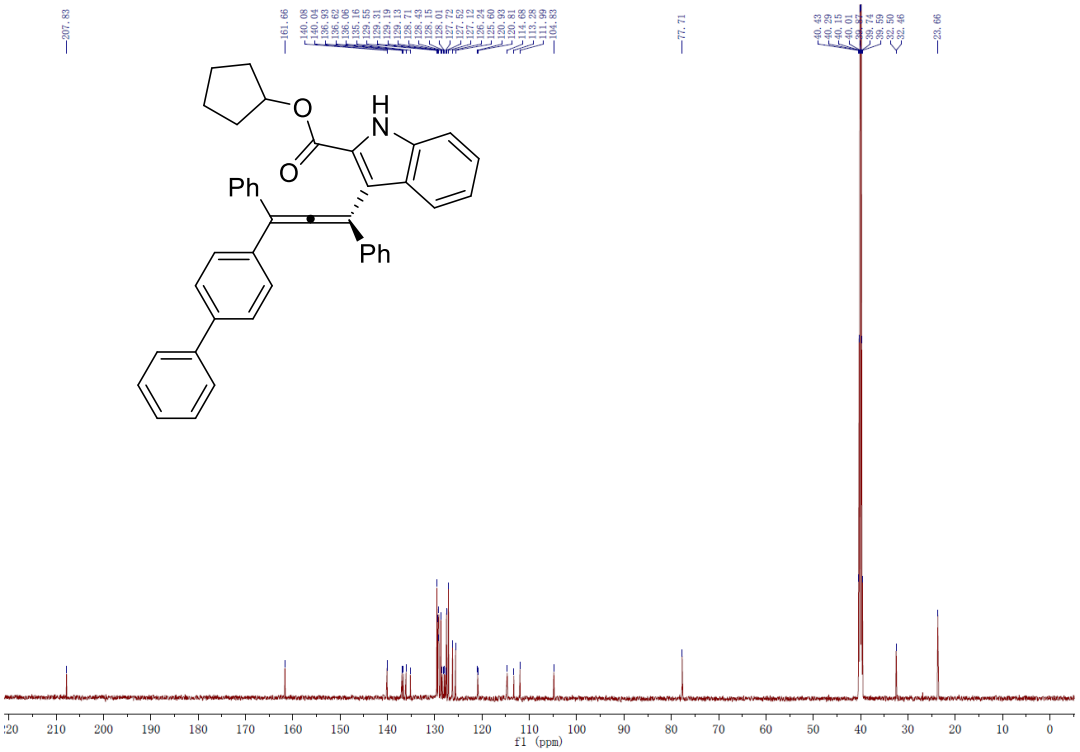


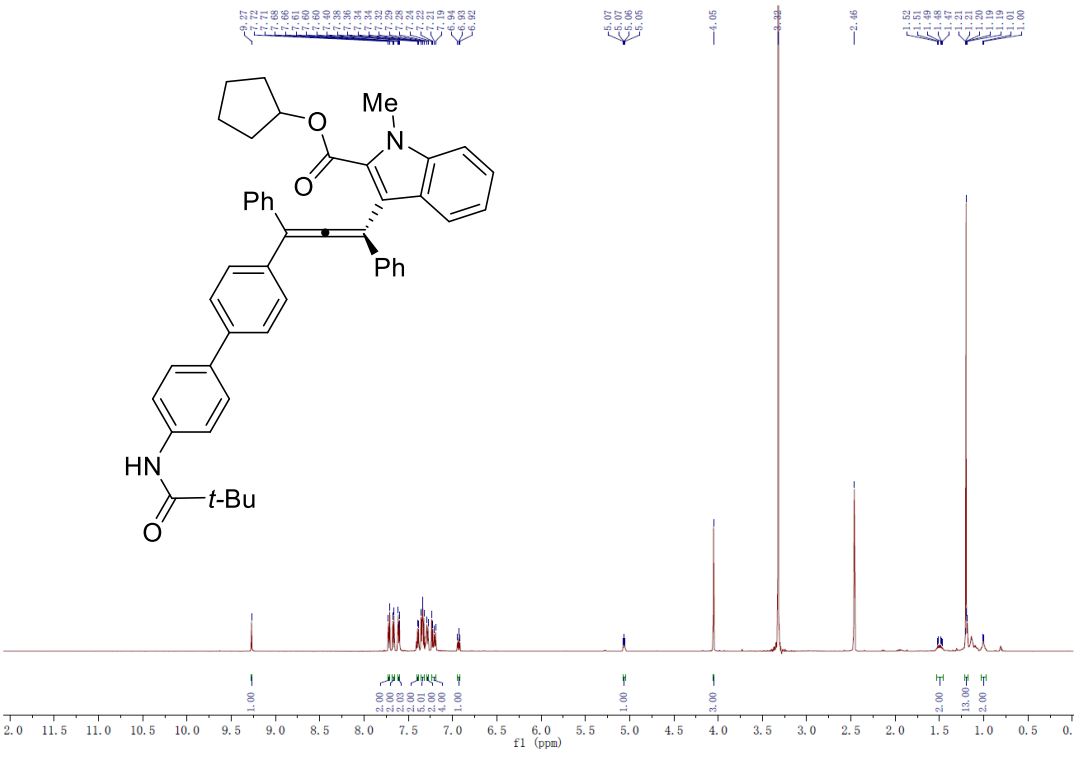
#	Time	Area	Height	Width	Symmetry	Area %
1	11.343	2376.7	75.9	0.501	0	8.165
2	19.561	26732.9	252.1	1.3991	0.656	91.835

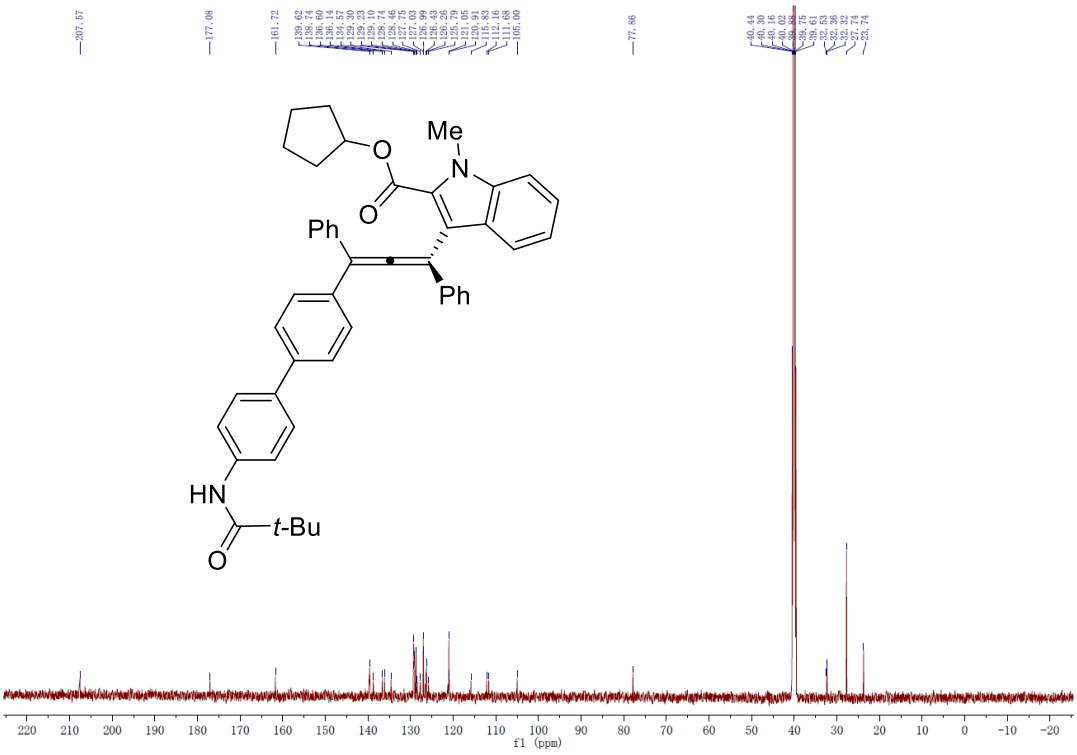
Cyclopentyl 3-(3-([1,1'-biphenyl]-4-yl)-1,3-diphenylpropa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3qa)



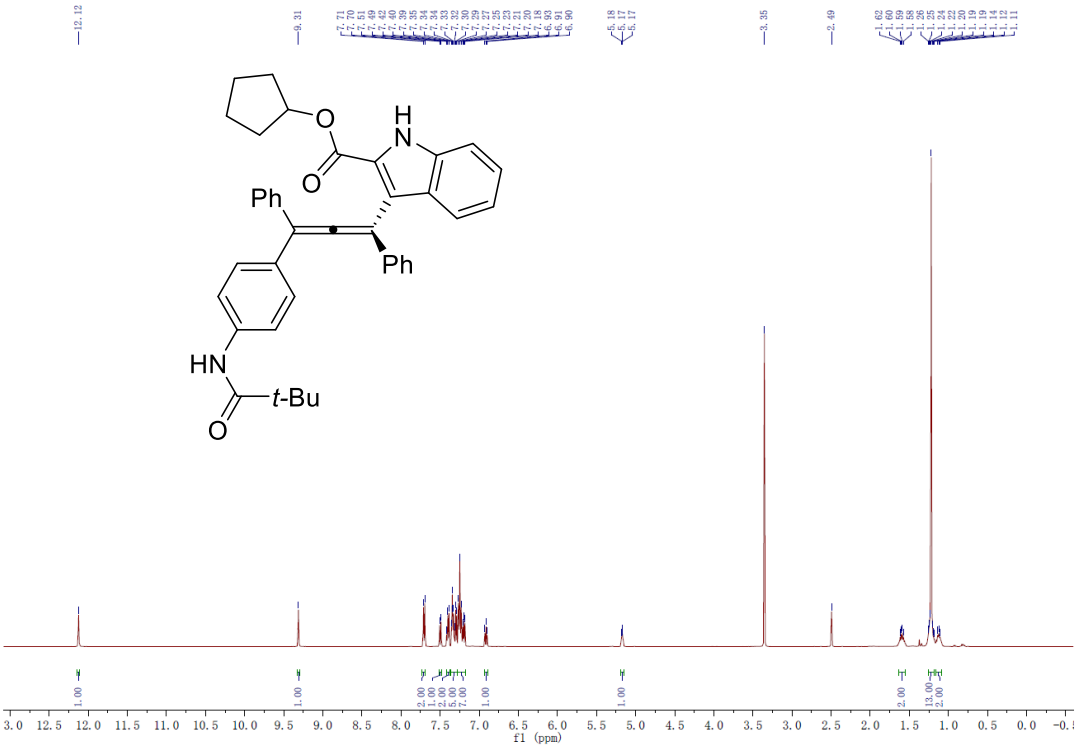


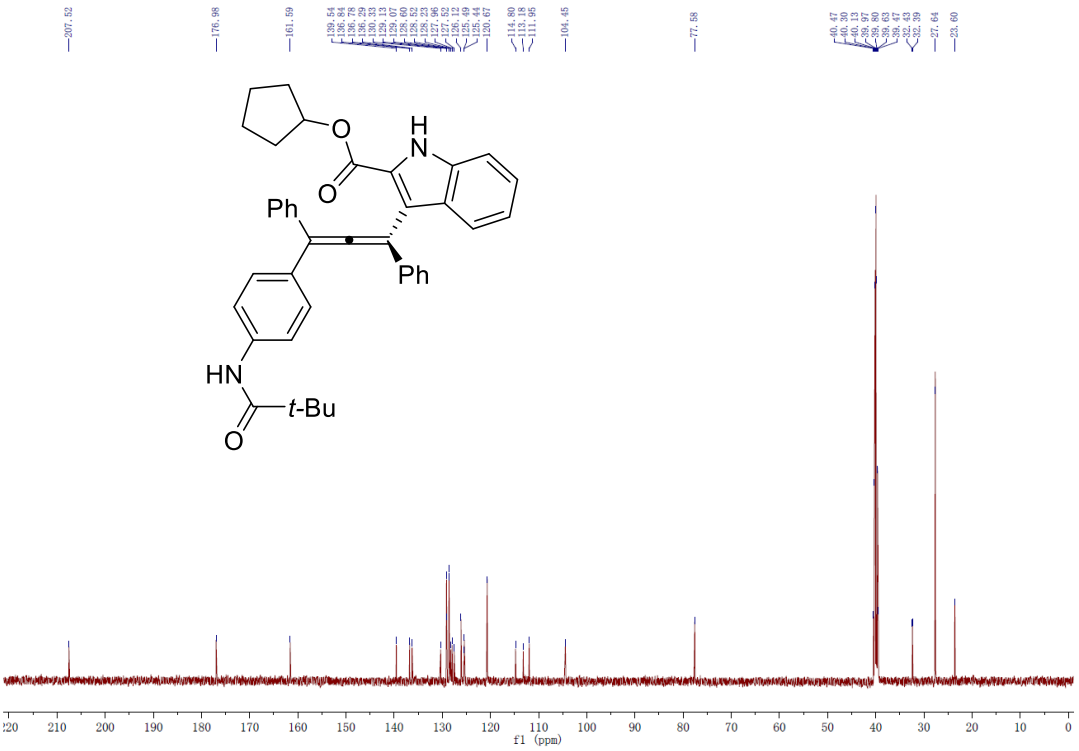
2,3-Dihydro-1*H*-inden-2-yl 3-(3-(4'-methoxy-[1,1'-biphenyl]-4-yl)-1,3-diphenylpropa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3bj)





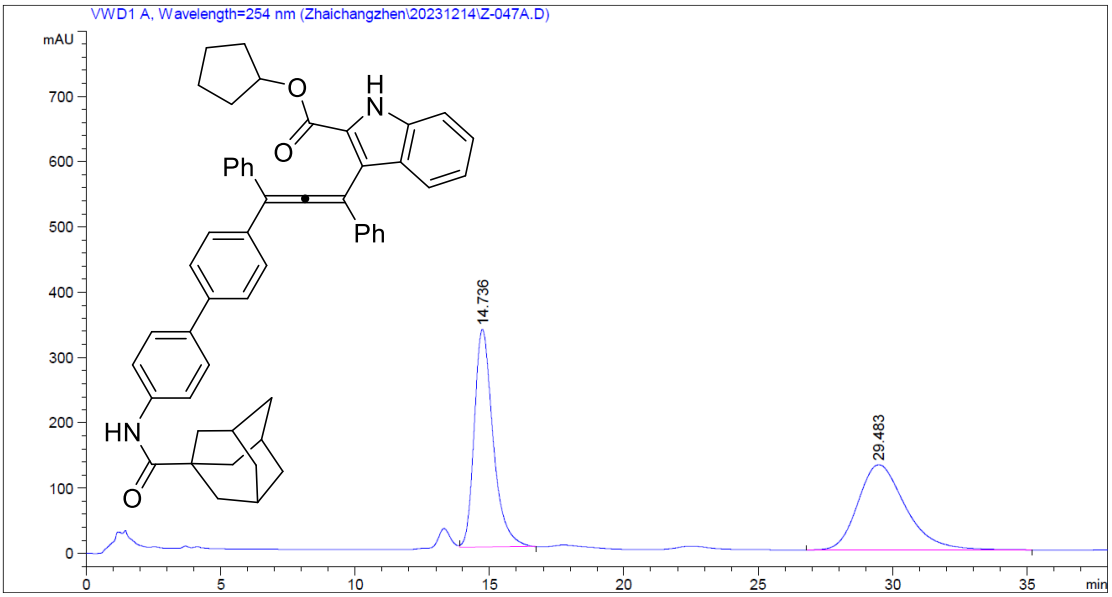
Cyclopentyl 3-(1,3-diphenyl-3-(4-pivalamidophenyl)propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (5)



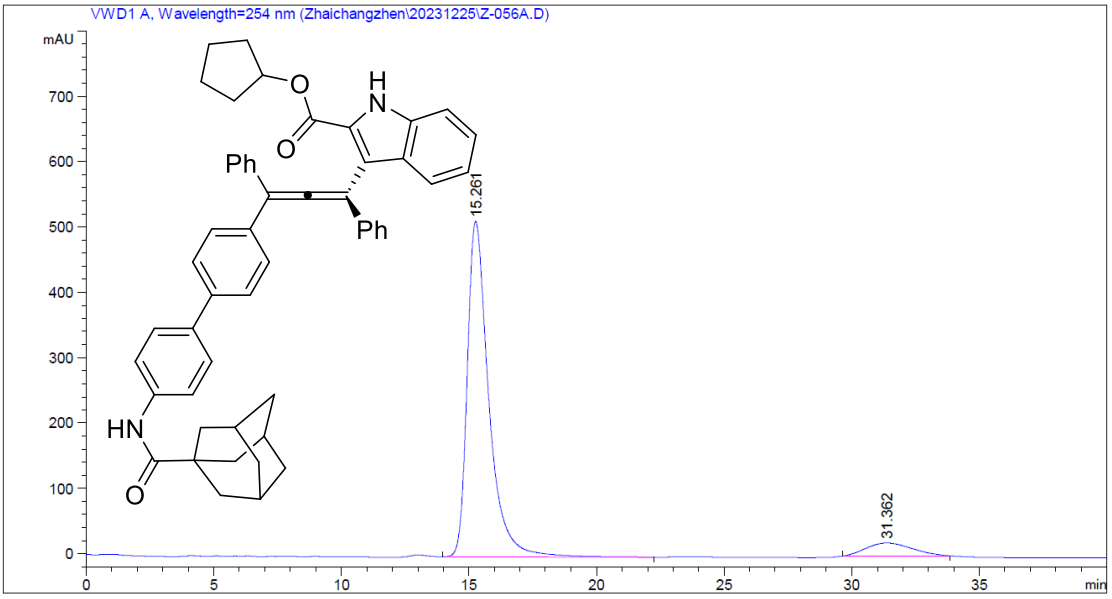


G: HPLC Analysis

Cyclopentyl 3-(3-(4'-((3r,5r,7r)-adamantane-1-carboxamido)-[1,1'-biphenyl]-4-yl)-1,3-diphenylpropa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3aa)

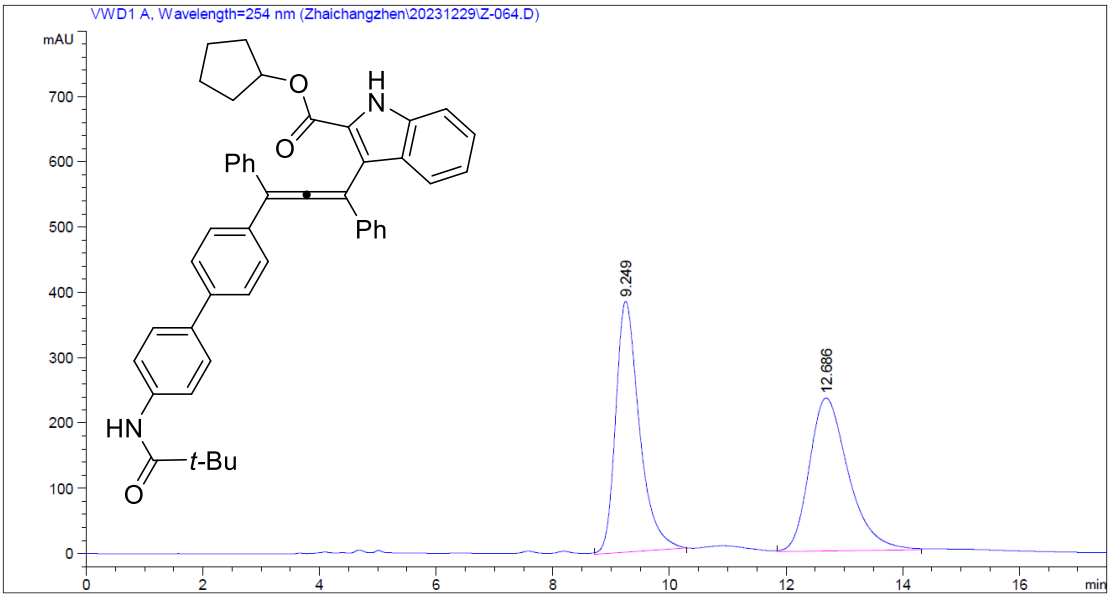


#	Time	Area	Height	Width	Symmetry	Area %
1	14.736	16231.1	333.4	0.8114	0.725	50.300
2	29.483	16037.5	130.4	1.844	0.732	49.700

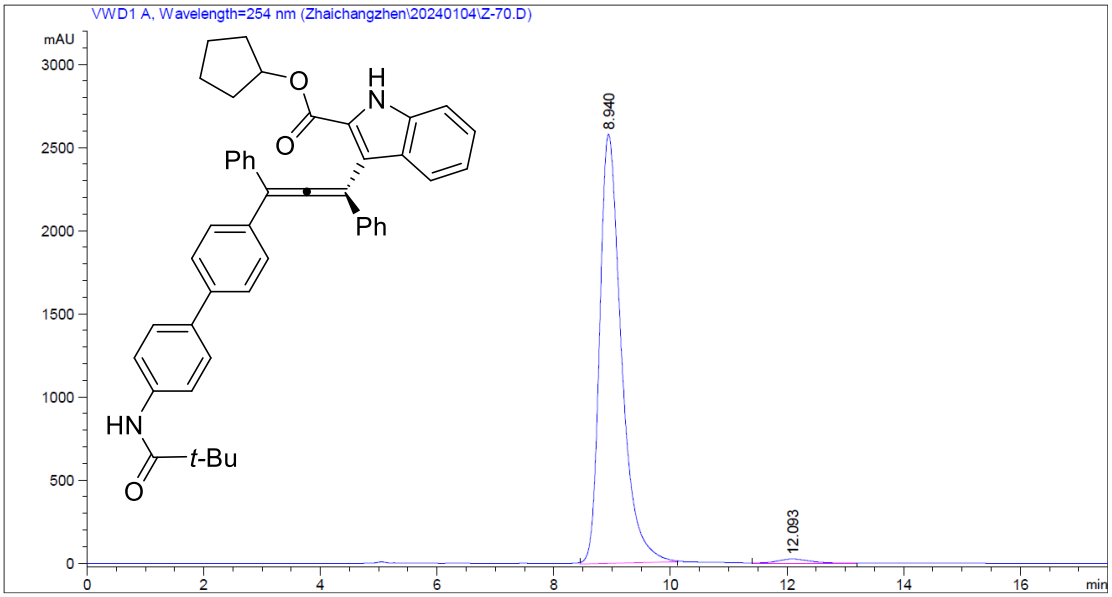


#	Time	Area	Height	Width	Symmetry	Area %
1	15.261	30133.1	513.5	0.8776	0.58	92.044
2	31.362	2604.5	20.3	2.1346	0.774	7.956

Cyclopentyl 3-(1,3-diphenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3ba)

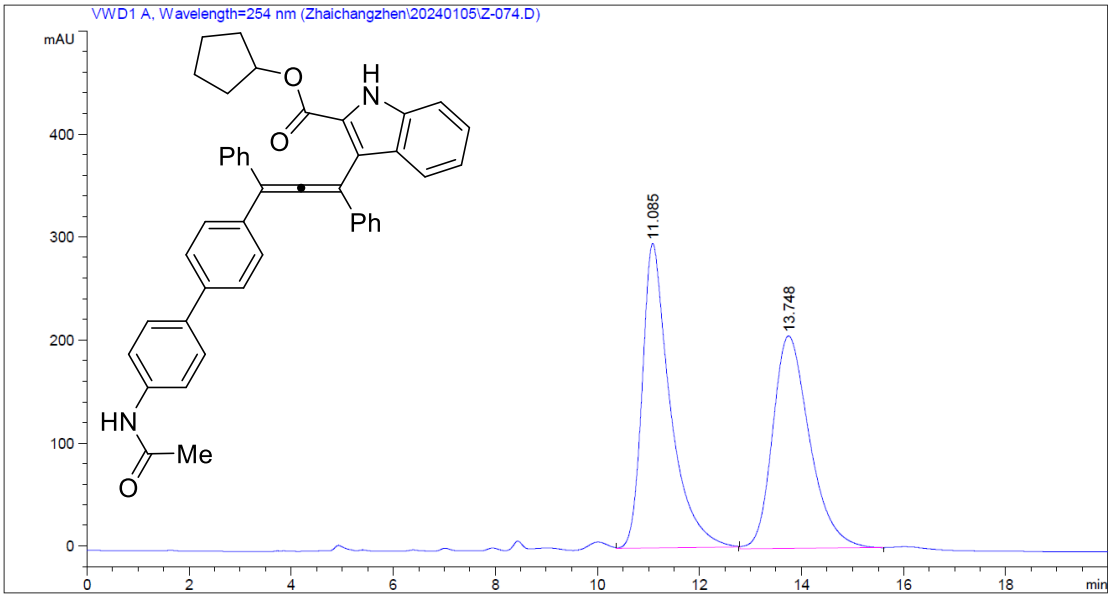


#	Time	Area	Height	Width	Symmetry	Area %
1	9.249	10853.1	384.3	0.4706	0.7	49.811
2	12.686	10935.3	234.4	0.7777	0.727	50.189

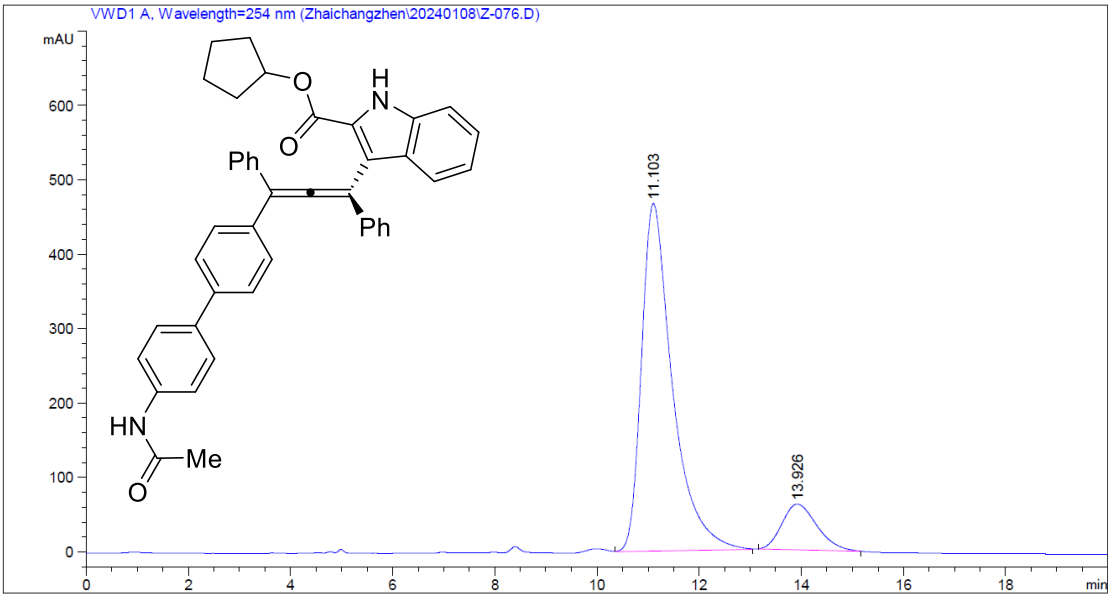


#	Time	Area	Height	Width	Symmetry	Area %
1	8.94	66589.1	2579.1	0.4303	0.654	98.642
2	12.093	916.9	24.3	0.5846	0.771	1.358

Cyclopentyl 3-(3-(4'-acetamido-[1,1'-biphenyl]-4-yl)-1,3-diphenylpropa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3ca)

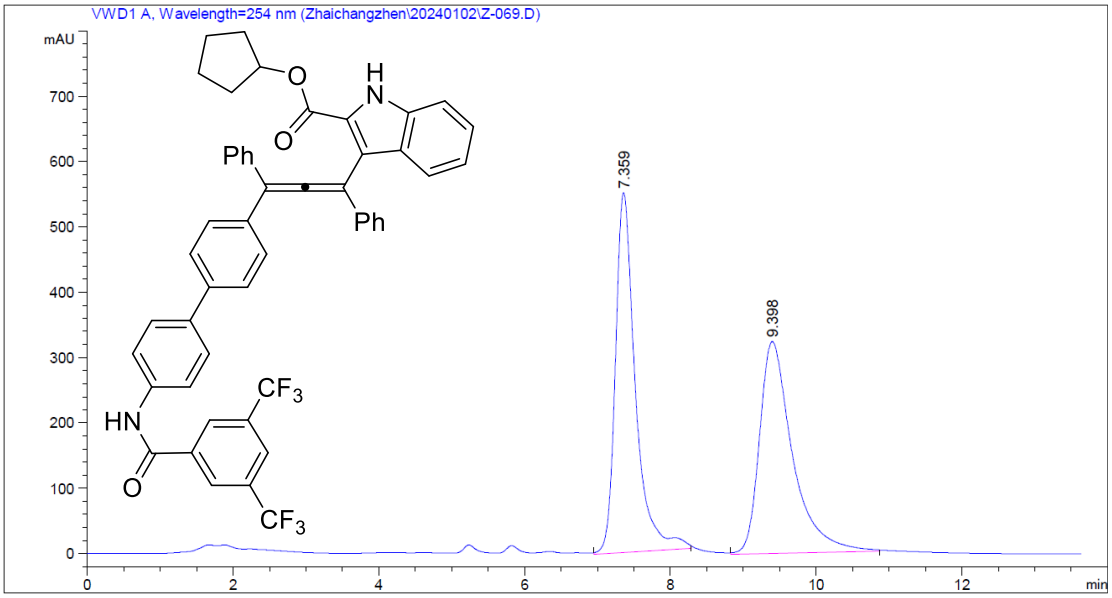


#	Time	Area	Height	Width	Symmetry	Area %
1	11.085	11194	295.4	0.6315	0.579	51.858
2	13.748	10391.8	206.3	0.7666	0.716	48.142

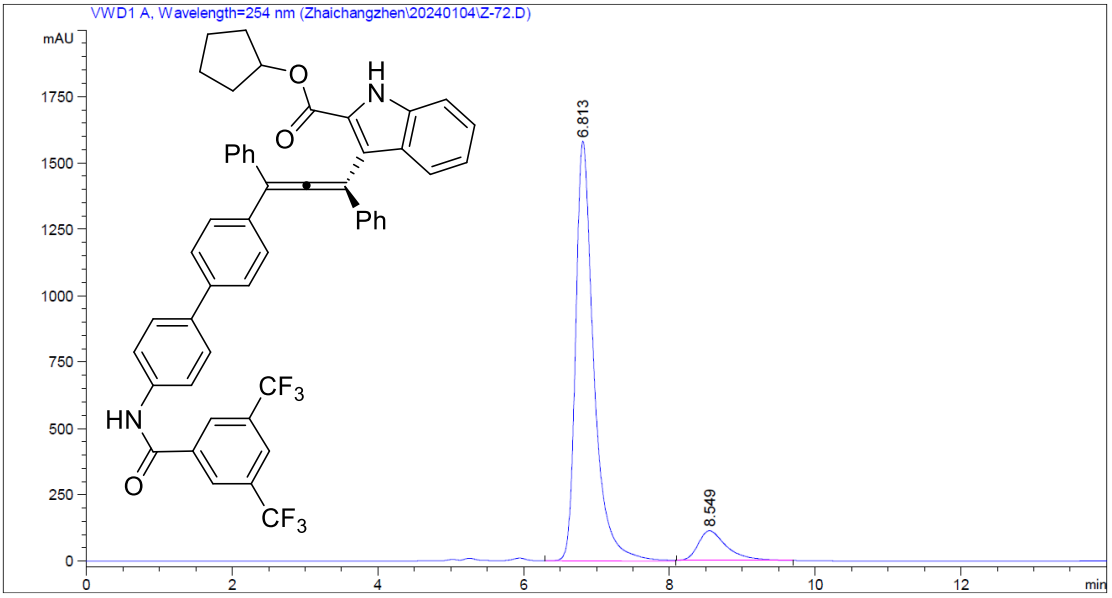


#	Time	Area	Height	Width	Symmetry	Area %
1	11.103	19665.4	467	0.7018	0.597	87.024
2	13.926	2932.3	61.4	0.7954	0.754	12.976

Cyclopentyl 3-(3-(4'-(3,5-bis(trifluoromethyl)benzamido)-[1,1'-biphenyl]-4-yl)-1,3-diphenylpropa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3da)

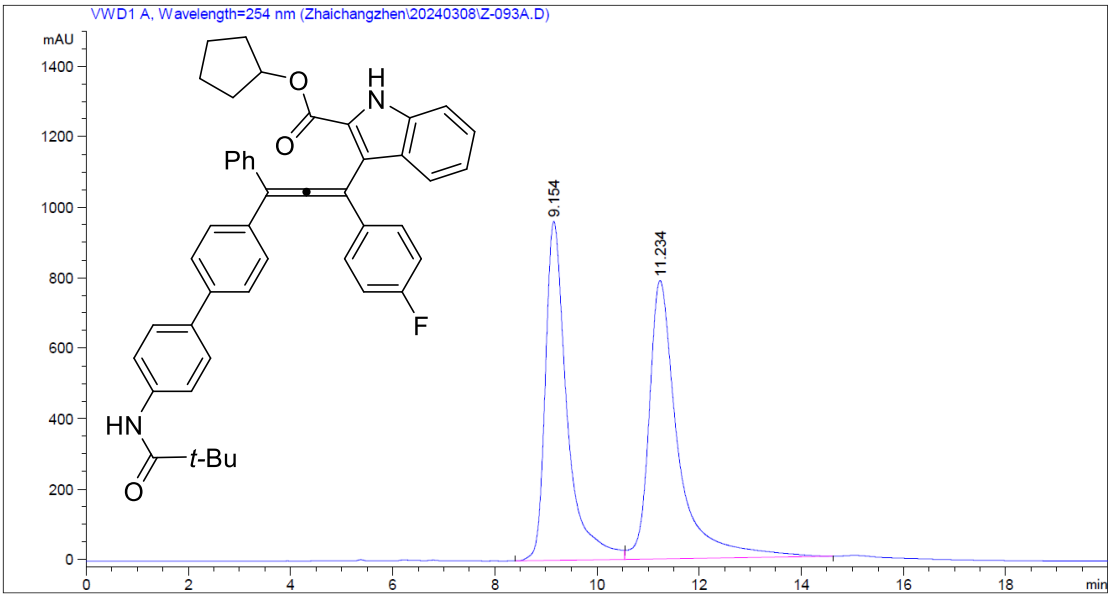


#	Time	Area	Height	Width	Symmetry	Area %
1	7.359	10470.3	550.8	0.3168	0.662	50.541
2	9.398	10246	324.5	0.5262	0.603	49.459

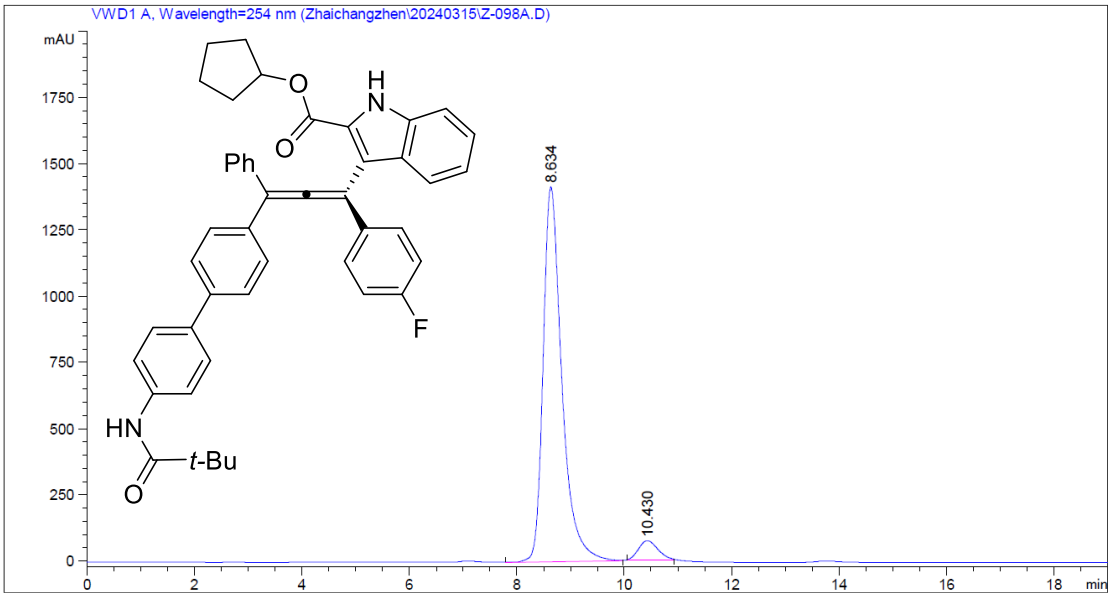


#	Time	Area	Height	Width	Symmetry	Area %
1	6.813	27363.9	1579.6	0.2581	0.61	90.122
2	8.549	2999.2	111	0.4503	0.623	9.878

Cyclopentyl 3-(1-(4-fluorophenyl)-3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl) propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3ea)

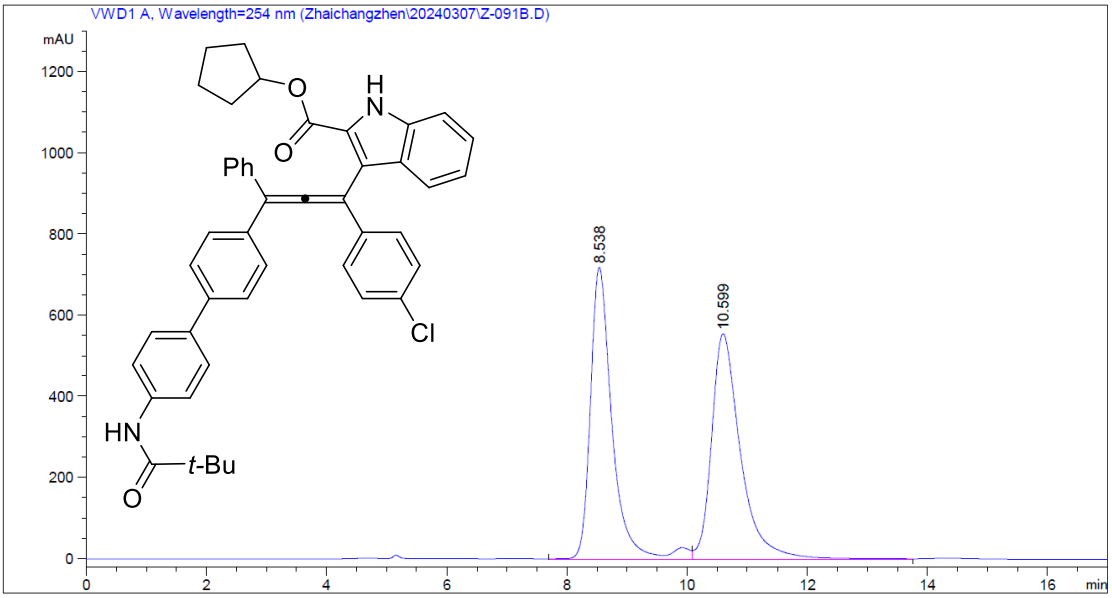


#	Time	Area	Height	Width	Symmetry	Area %
1	9.154	28460.6	961.8	0.4382	0.58	47.696
2	11.234	31210.2	790.1	0.5759	0.55	52.304

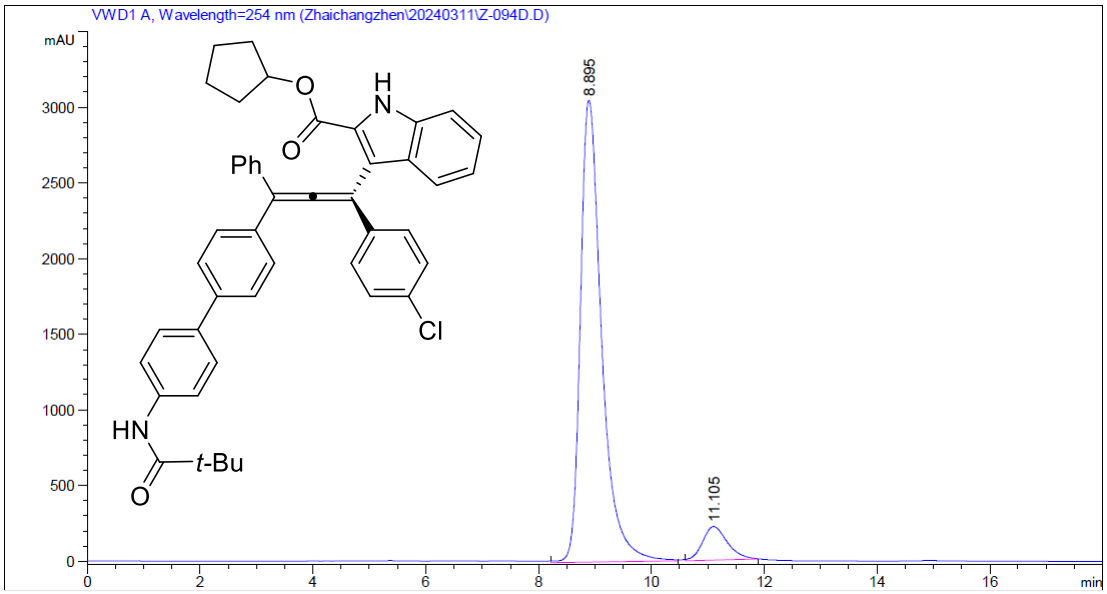


#	Time	Area	Height	Width	Symmetry	Area %
1	8.634	34230.8	1414.1	0.4034	0.674	95.000
2	10.43	1801.7	72.5	0.4144	0.805	5.000

Cyclopentyl 3-(1-(4-chlorophenyl)-3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl) propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylatee (3fa)

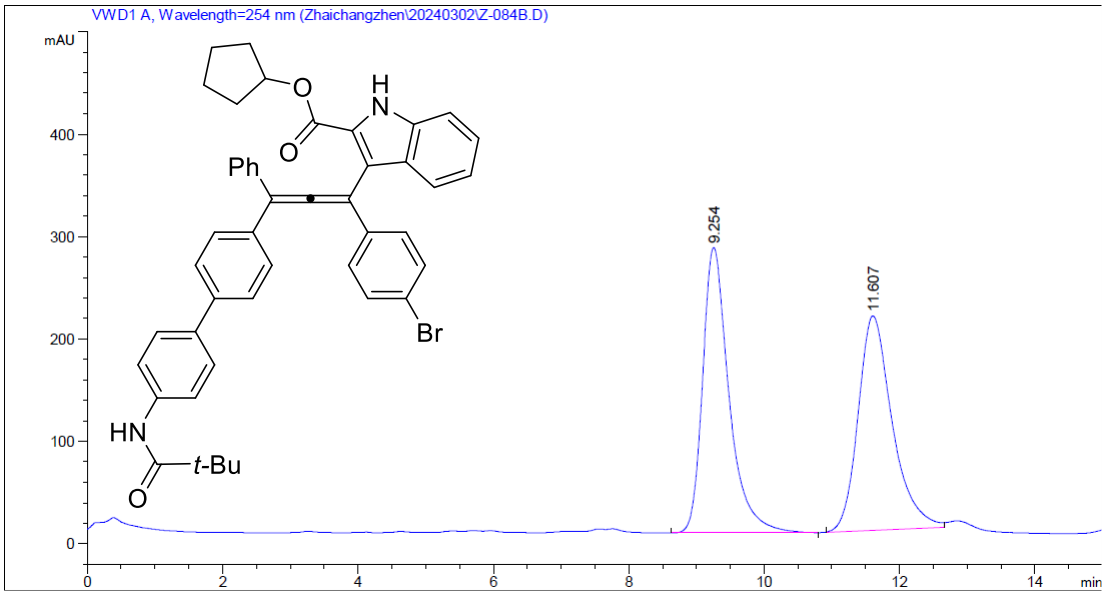


#	Time	Area	Height	Width	Symmetry	Area %
1	8.538	18139.8	717.7	0.3675	0.659	49.531
2	10.599	18483.6	554.8	0.4967	0.615	50.469

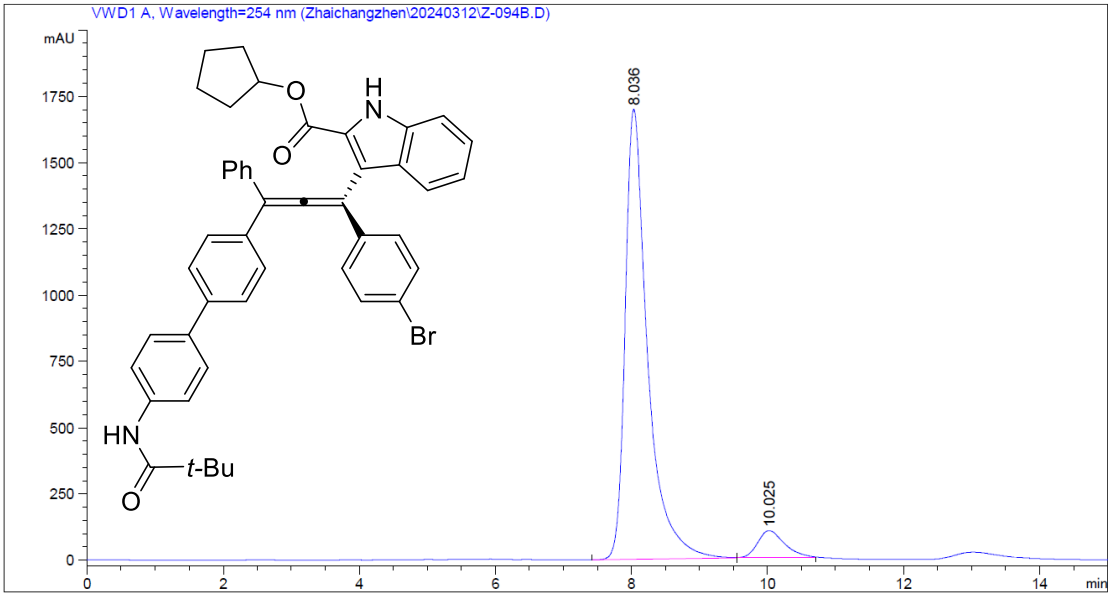


#	Time	Area	Height	Width	Symmetry	Area %
1	8.895	80195.9	3054.6	0.4376	0.636	92.052
2	11.105	6924.7	223.3	0.5169	0.779	7.948

Cyclopentyl 3-(1-(4-chlorophenyl)-3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl) propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3ga)

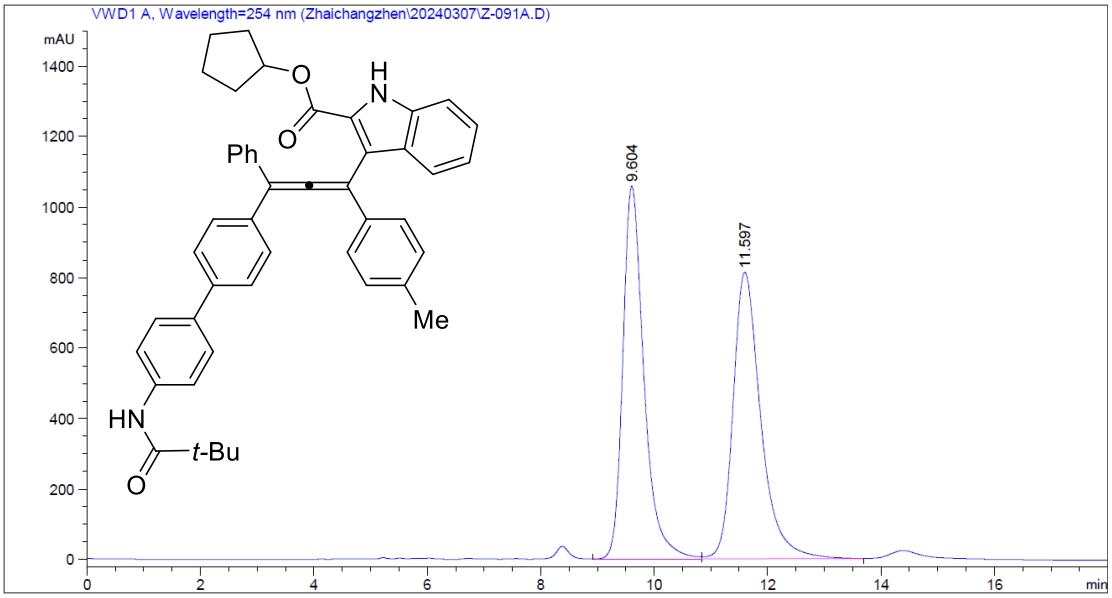


#	Time	Area	Height	Width	Symmetry	Area %
1	9.254	7552	278.6	0.4062	0.662	50.670
2	11.607	7352.3	209.4	0.5751	0	49.330

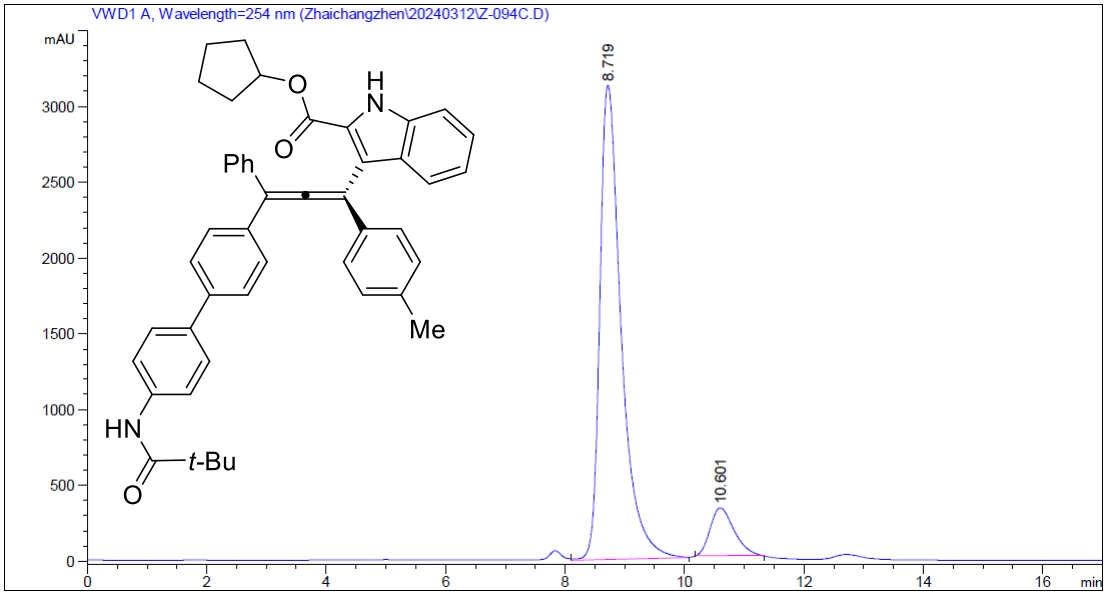


#	Time	Area	Height	Width	Symmetry	Area %
1	8.036	38861.2	1698.6	0.3813	0.587	93.341
2	10.025	2772.3	101.7	0.4544	0.706	6.659

Cyclopentyl 3-(3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)-1-(*p*-tolyl)propa-1, 2-dien-1-yl)-1*H*-indole-2-carboxylate (3ha)

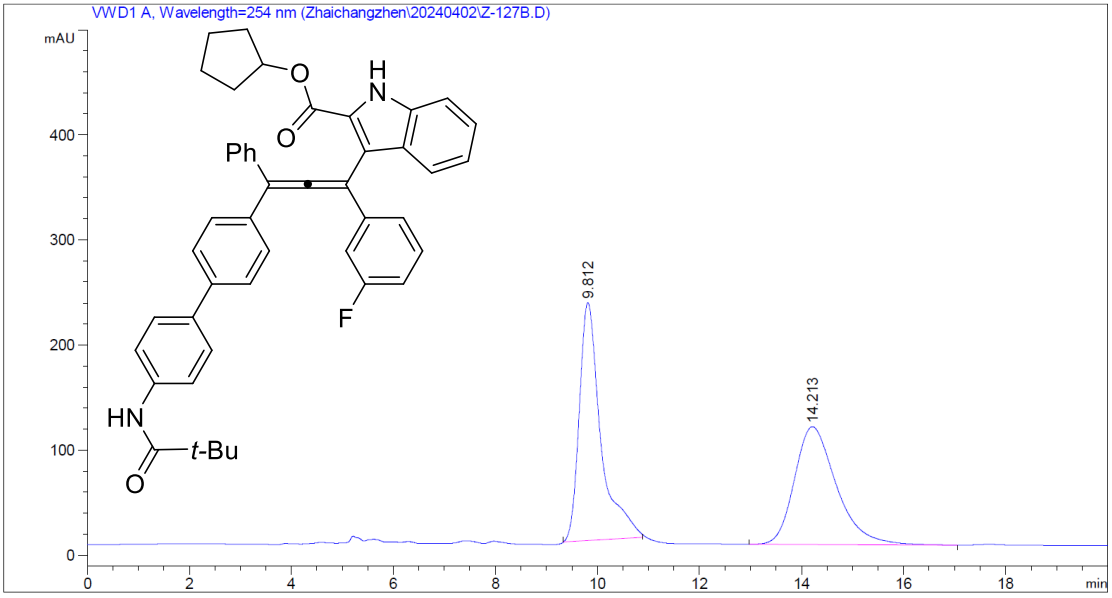


#	Time	Area	Height	Width	Symmetry	Area %
1	9.604	27396.9	1058.6	0.3909	0.684	49.787
2	11.597	27631.6	813.2	0.5124	0.686	50.213

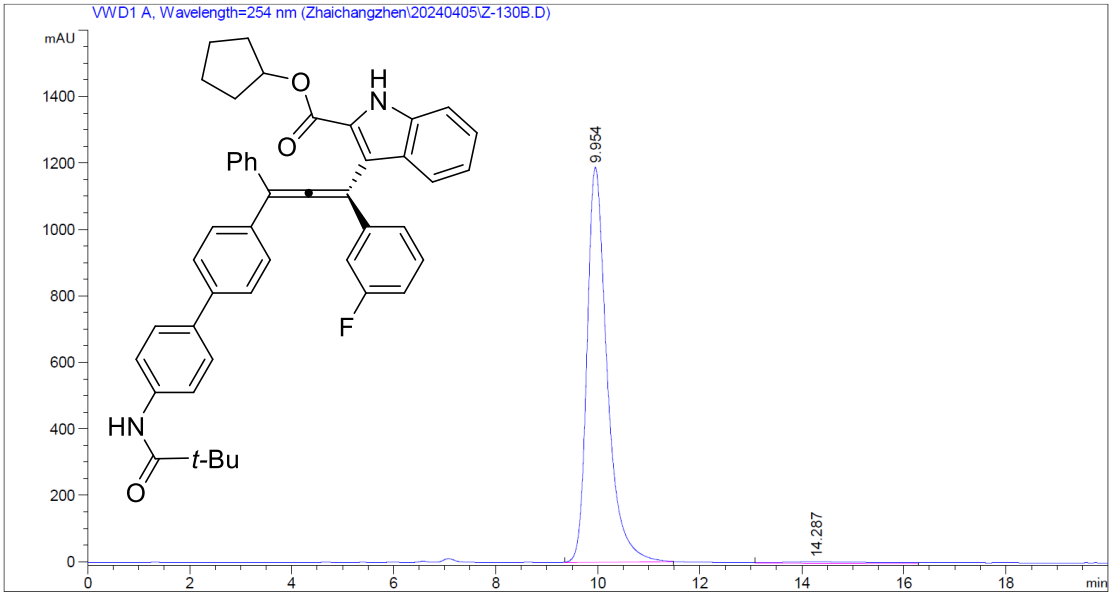


#	Time	Area	Height	Width	Symmetry	Area %
1	8.719	77809.8	3129.6	0.4144	0.579	89.925
2	10.601	8718.1	315.7	0.4602	0.716	10.075

Cyclopentyl 3-(1-(4-fluorophenyl)-3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl) propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3ia)

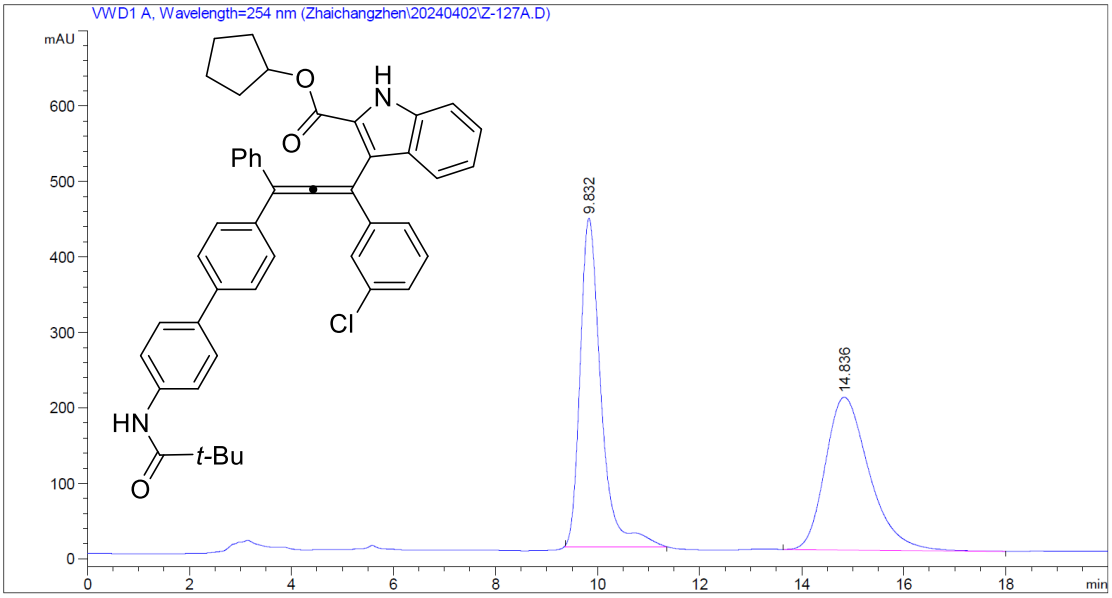


#	Time	Area	Height	Width	Symmetry	Area %
1	9.812	6638.4	226.2	0.4891	0.636	50.908
2	14.213	6401.6	112.1	0.8713	0.703	49.092

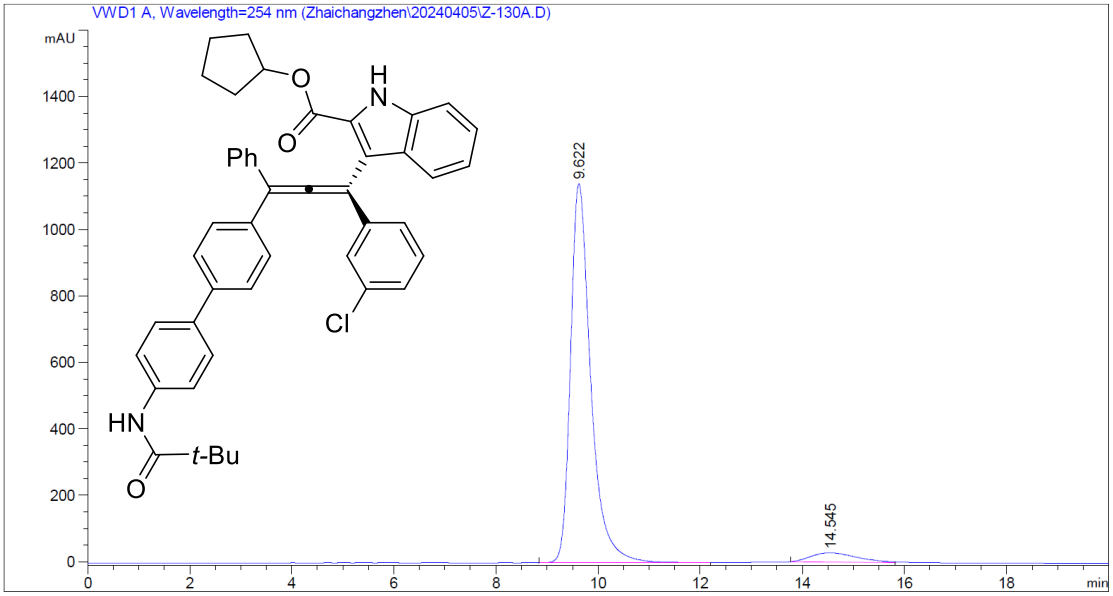


#	Time	Area	Height	Width	Symmetry	Area %
1	9.954	32566.9	1188	0.4039	0	98.369
2	14.287	540.1	4.4	2.0576	0.459	1.631

Cyclopentyl 3-(1-(3-chlorophenyl)-3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl) propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3ja)

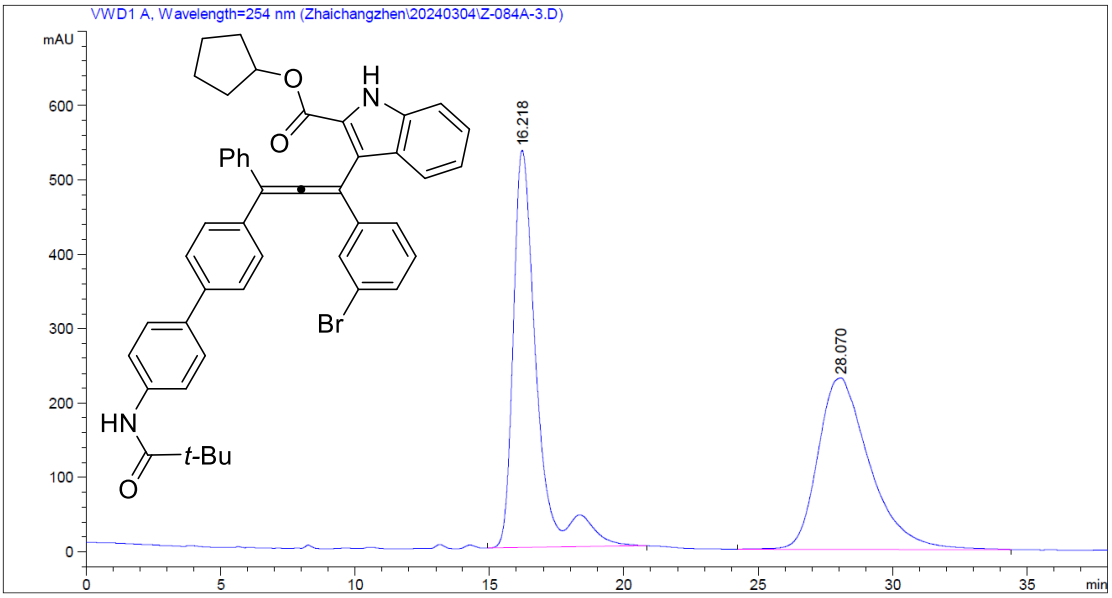


#	Time	Area	Height	Width	Symmetry	Area %
1	9.832	12441	435.8	0.4758	0.688	50.740
2	14.836	12078	202.3	0.9136	0.717	49.260

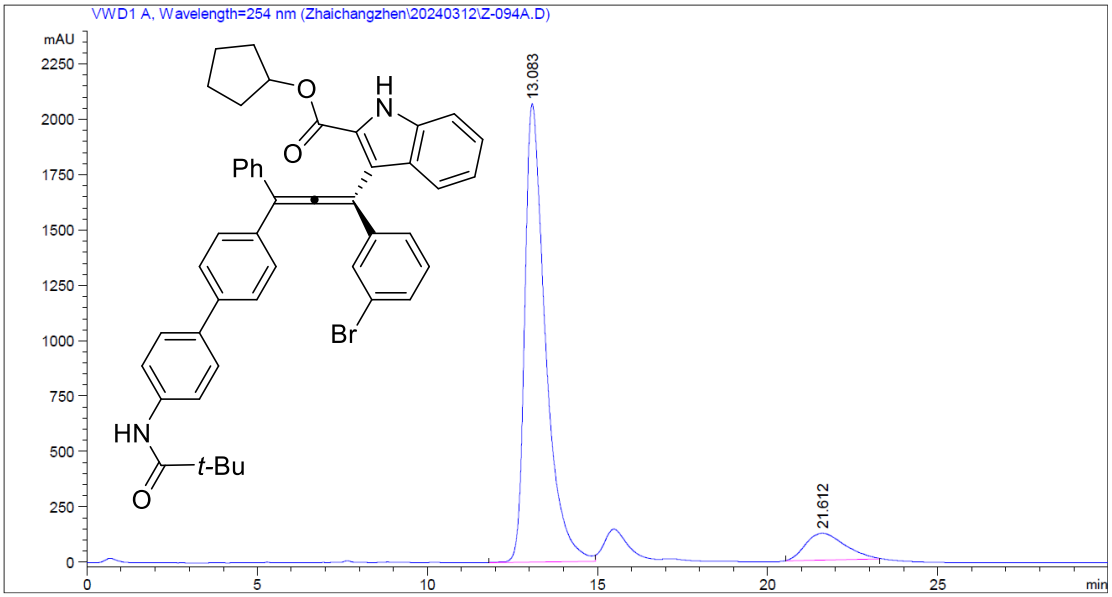


#	Time	Area	Height	Width	Symmetry	Area %
1	9.622	31433.2	1140.2	0.4146	0.646	95.005
2	14.545	1652.7	27.2	1.012	0.666	4.995

Cyclopentyl 3-(1-(3-bromophenyl)-3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3ka)

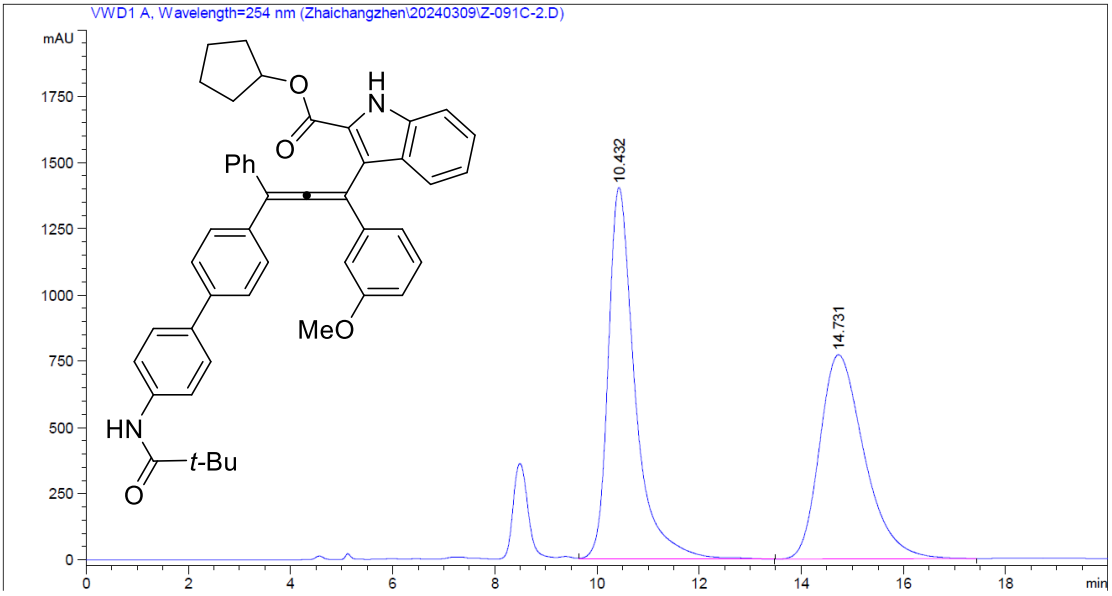


#	Time	Area	Height	Width	Symmetry	Area %
1	16.218	32740.8	534.2	0.854	0.647	51.568
2	28.07	30749.5	230.5	1.8385	0.724	48.432



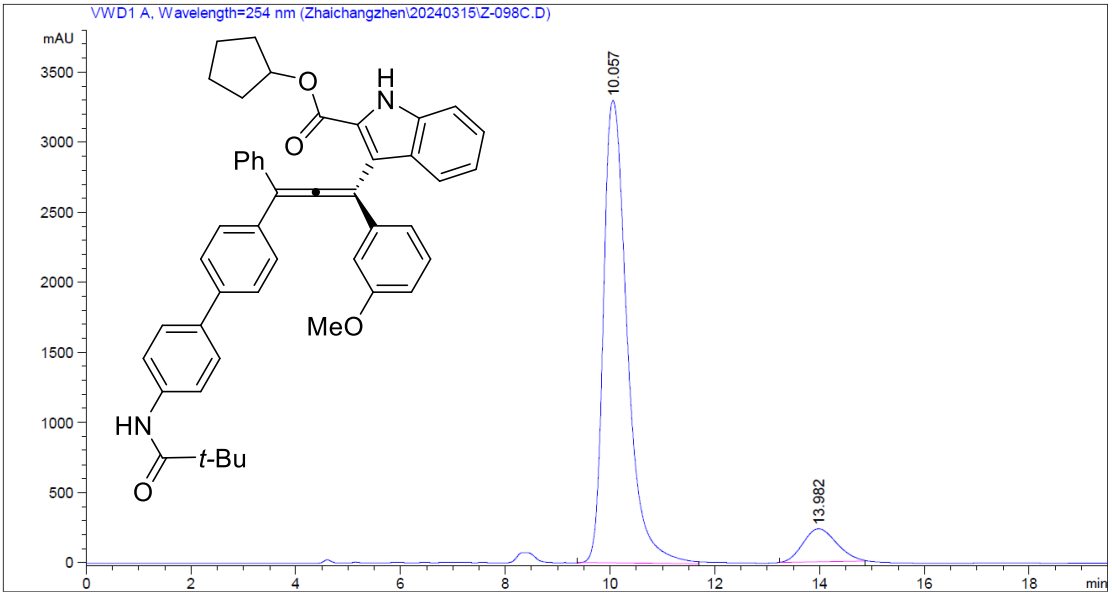
#	Time	Area	Height	Width	Symmetry	Area %
1	13.083	87757.2	2071	0.7062	0.54	90.101
2	21.612	9642	120.3	1.3358	0.733	9.899

Cyclopentyl 3-(1-(3-methoxyphenyl)-3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3la)



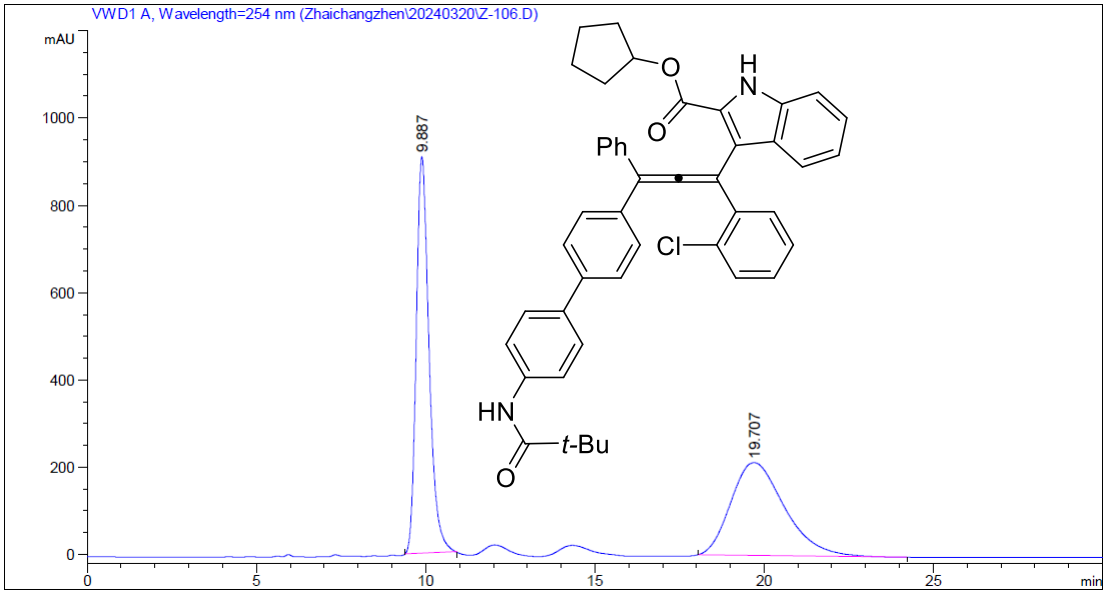
#	Time	Area	Height	Width	Symmetry	Area %
1	10.432	51252.4	1402.8	0.5463	0.614	52.331
2	14.731	46687.2	770.4	0.931	0.689	47.669

v

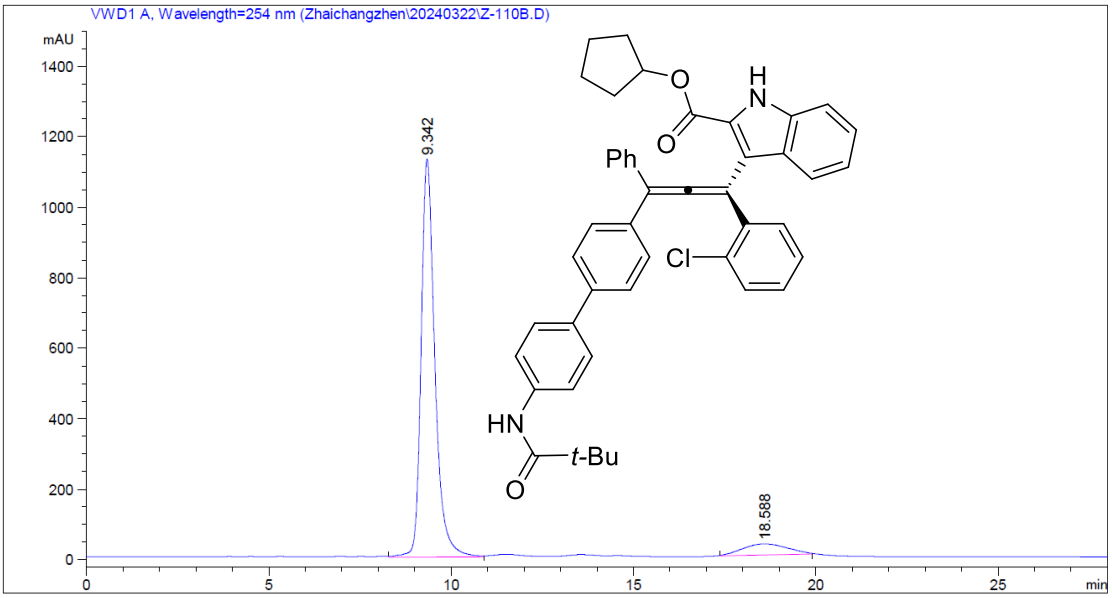


#	Time	Area	Height	Width	Symmetry	Area %
1	10.057	103704.6	3298.1	0.5241	0.634	90.847
2	13.982	10447.9	234.6	0.7424	0.842	9.153

Cyclopentyl 3-(1-(2-chlorophenyl)-3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl) propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3ma)

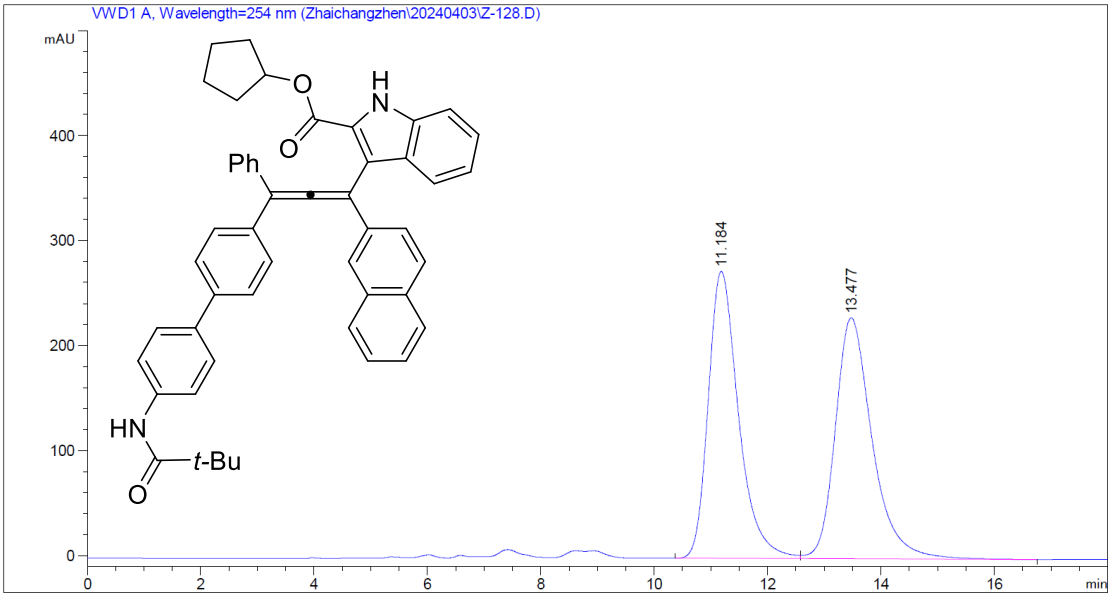


#	Time	Area	Height	Width	Symmetry	Area %
1	9.887	23902.5	908	0.4387	0.742	50.504
2	19.707	23425.2	212.5	1.5841	0.711	49.496

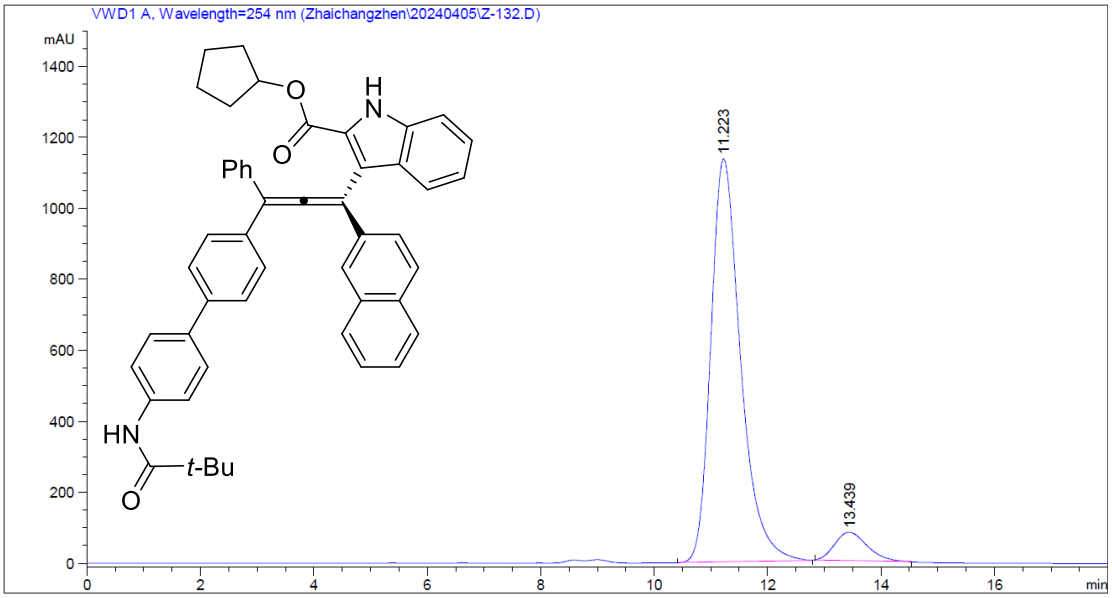


#	Time	Area	Height	Width	Symmetry	Area %
1	9.342	29643.4	1129.1	0.4376	0.737	91.725
2	18.588	2674.4	31.4	1.4175	0.943	8.275

Cyclopentyl 3-(1-(naphthalen-2-yl)-3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3na)

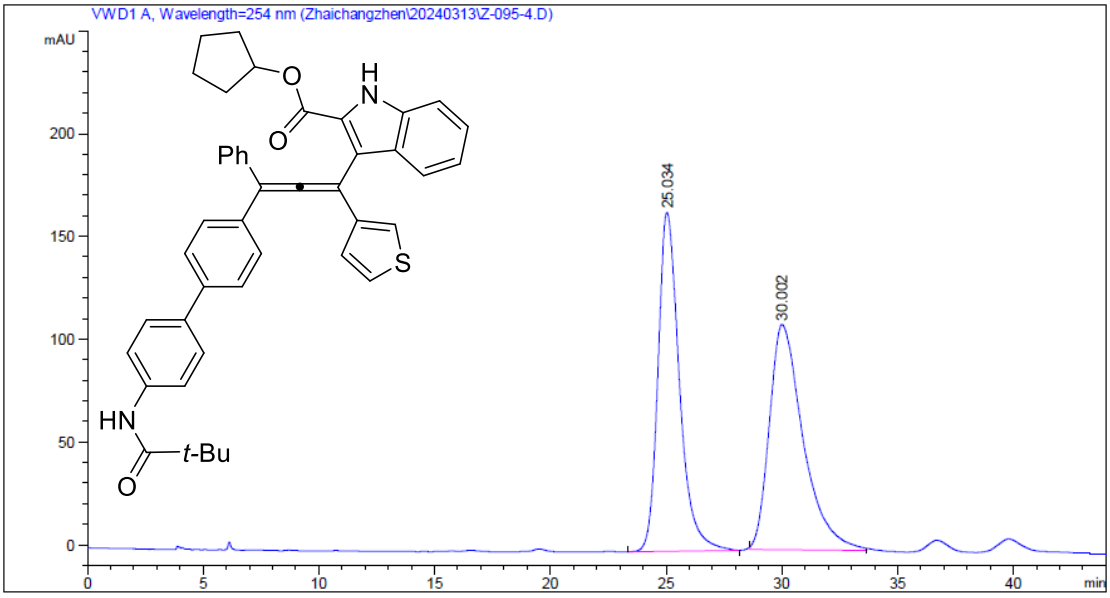


#	Time	Area	Height	Width	Symmetry	Area %
1	11.184	10171.6	273.2	0.5653	0.699	49.464
2	13.477	10392.1	229.5	0.6863	0.707	50.536

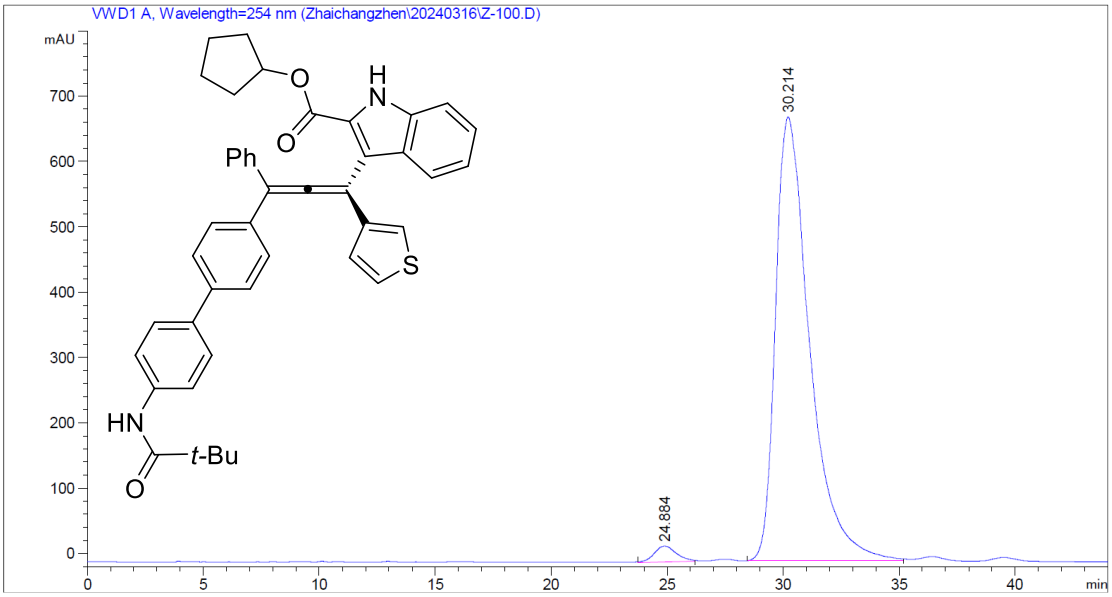


#	Time	Area	Height	Width	Symmetry	Area %
1	11.223	41309.6	1135.3	0.6065	0.72	92.923
2	13.439	3146	79.8	0.6572	0.766	7.077

Cyclopentyl 3-(3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)-1-(thiophen-3-yl) propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3oa)

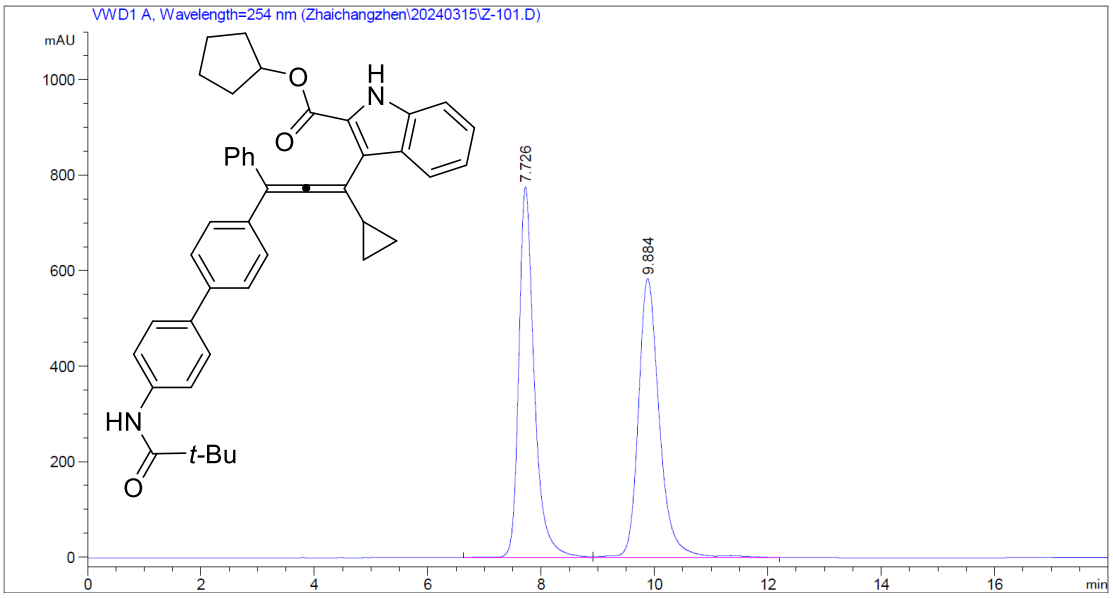


#	Time	Area	Height	Width	Symmetry	Area %
1	25.034	10577.9	164.8	0.9919	0.672	48.771
2	30.002	11110.8	109.5	1.691	0.576	51.229

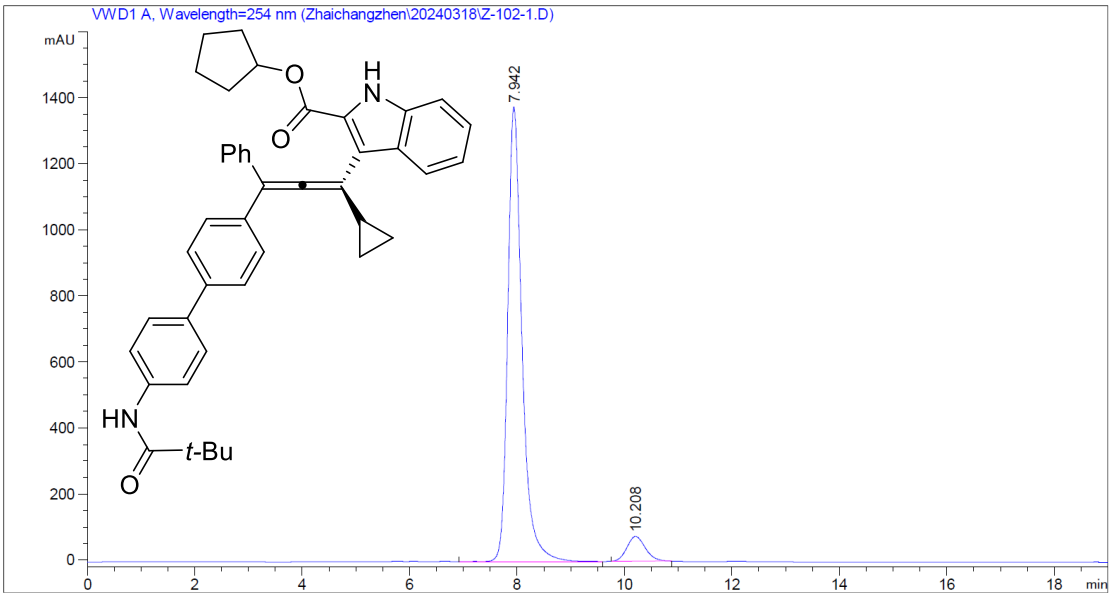


#	Time	Area	Height	Width	Symmetry	Area %
1	24.884	1636.5	24.3	1.1217	0.869	2.299
2	30.214	69533.8	679.4	1.7058	0.558	97.701

Cyclopentyl 3-(1-cyclopropyl-3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3pa)

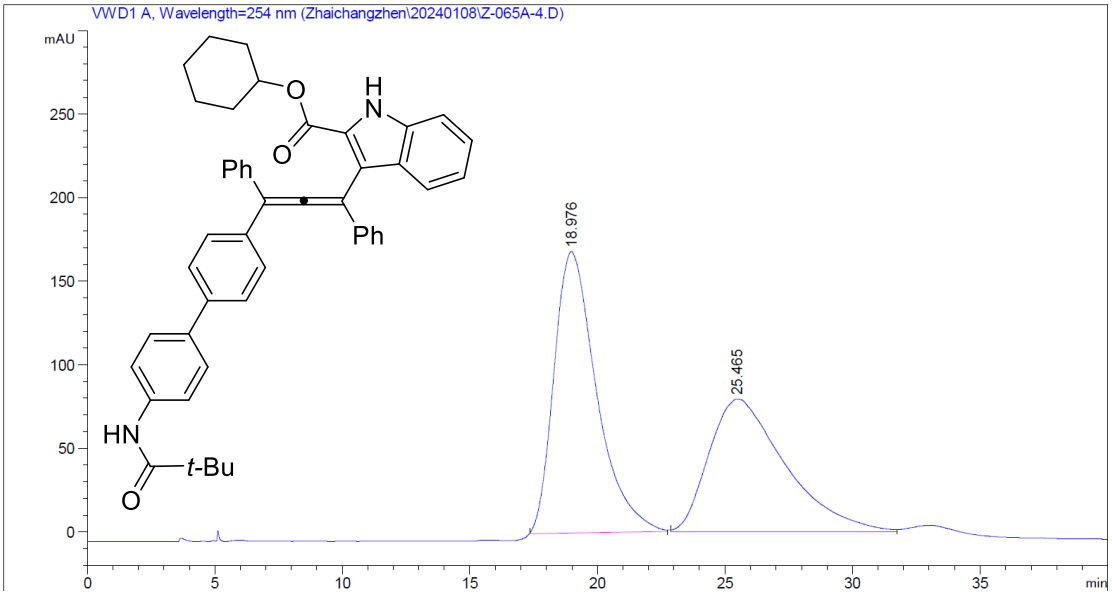


#	Time	Area	Height	Width	Symmetry	Area %
1	7.726	14757.9	776.5	0.2847	0.692	49.352
2	9.884	15145.6	584.4	0.3899	0.755	50.648

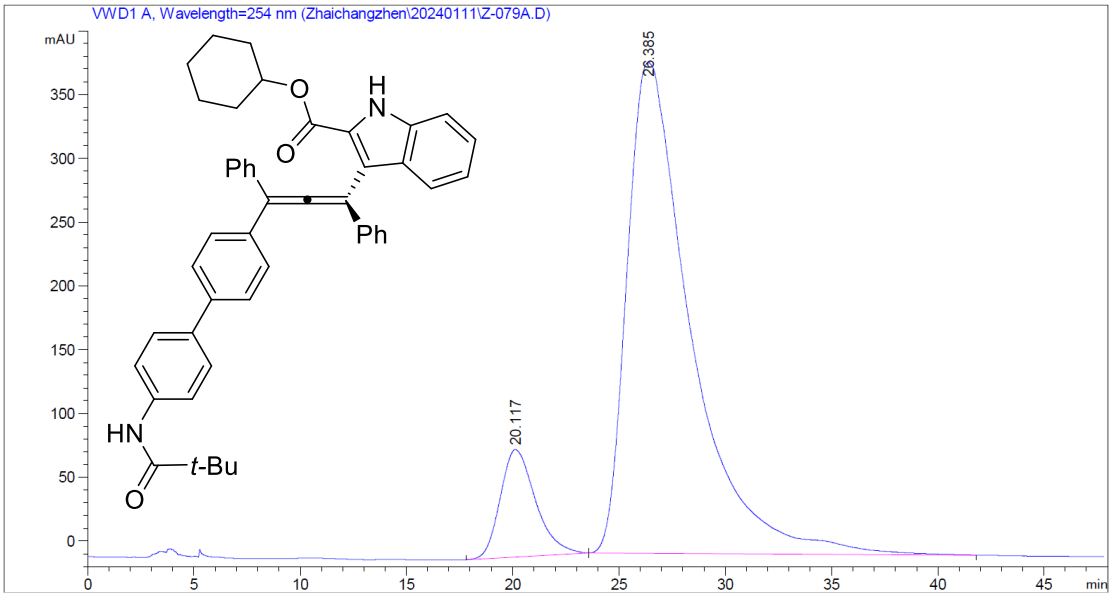


#	Time	Area	Height	Width	Symmetry	Area %
1	7.942	25421.3	1376.2	0.2785	0.698	93.456
2	10.208	1780.1	74.9	0.3959	0.858	6.544

Cyclohexyl 3-(1,3-diphenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3bb)

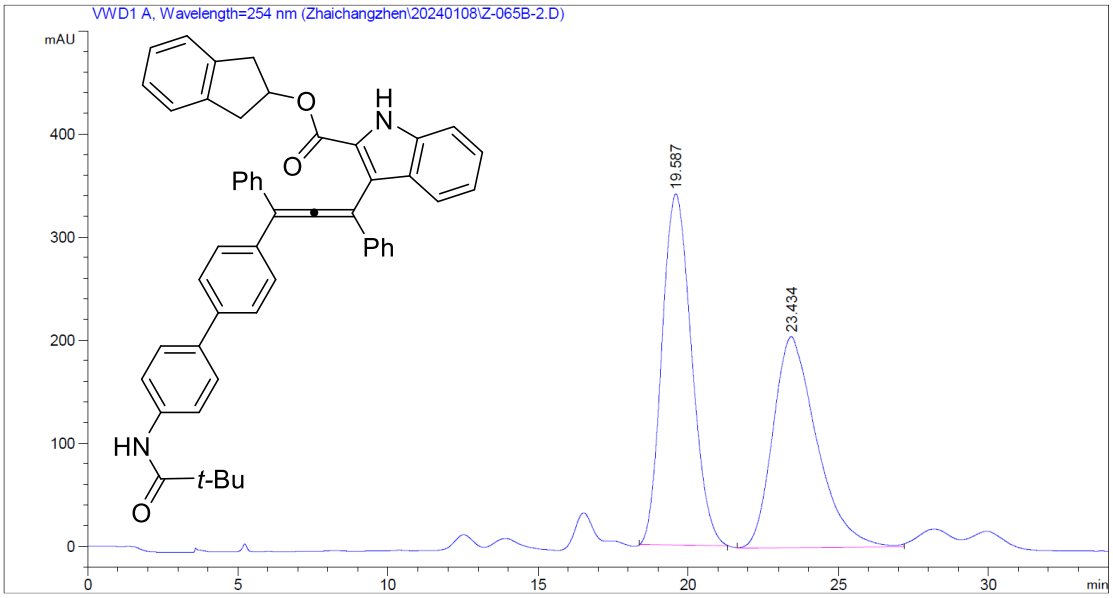


#	Time	Area	Height	Width	Symmetry	Area %
1	18.976	19489.5	168.5	1.8962	0	53.975
2	25.465	16618.9	79.6	3.4787	0.564	46.025

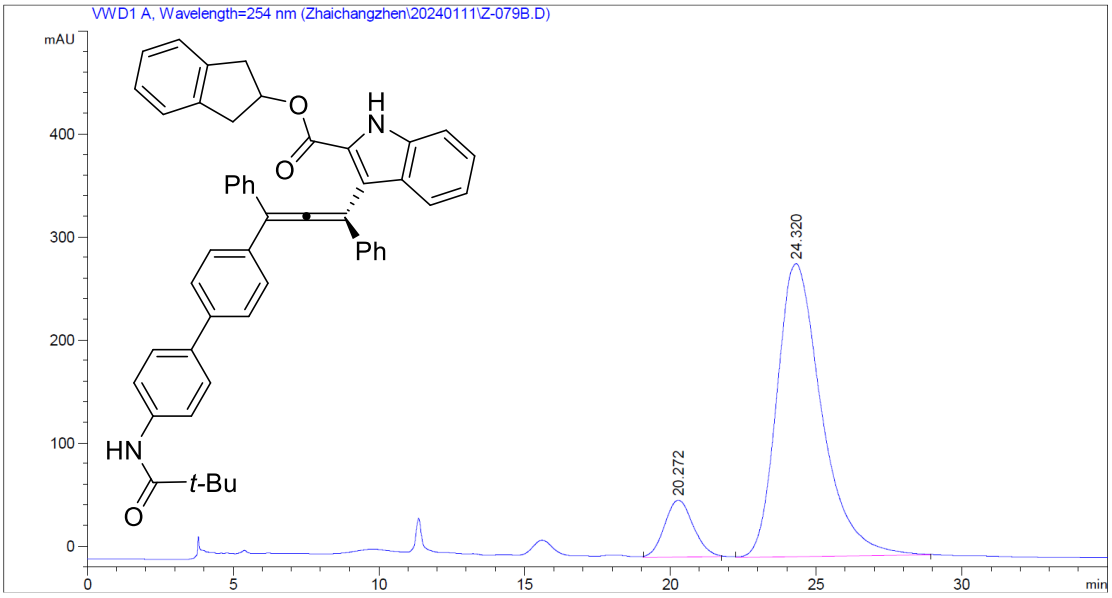


#	Time	Area	Height	Width	Symmetry	Area %
1	20.117	9697	84.2	1.656	0.703	10.795
2	26.385	80134.2	385	2.7475	0.464	89.205

2,3-dihydro-1H-inden-2-yl 3-(1,3-diphenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl) propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3bc)

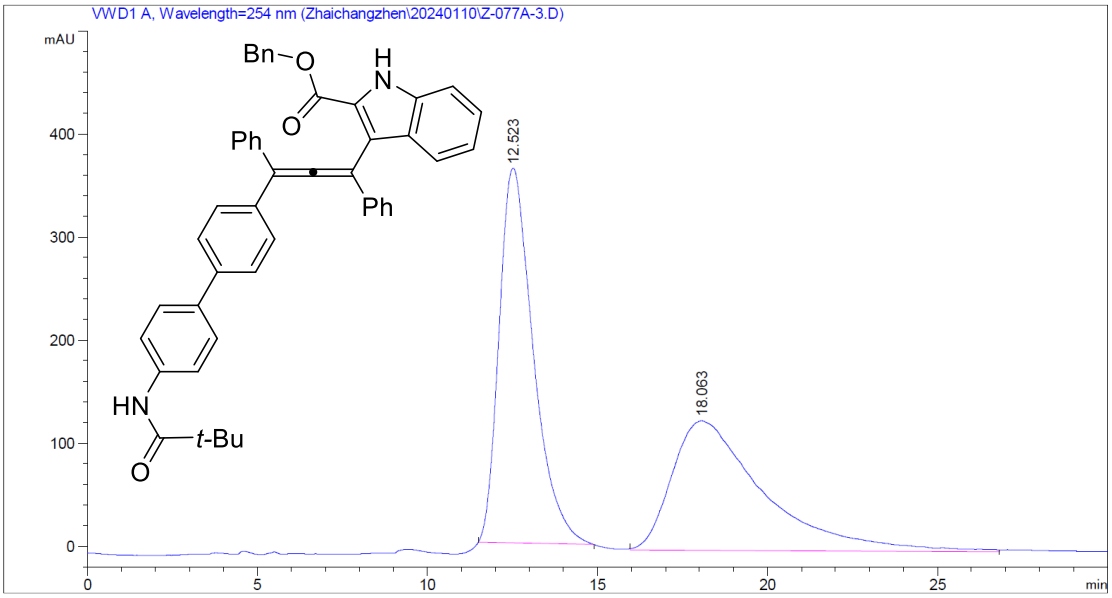


#	Time	Area	Height	Width	Symmetry	Area %
1	19.587	23317	340.8	1.1405	0.844	52.996
2	23.434	20680.3	204.9	1.6821	0.699	47.004

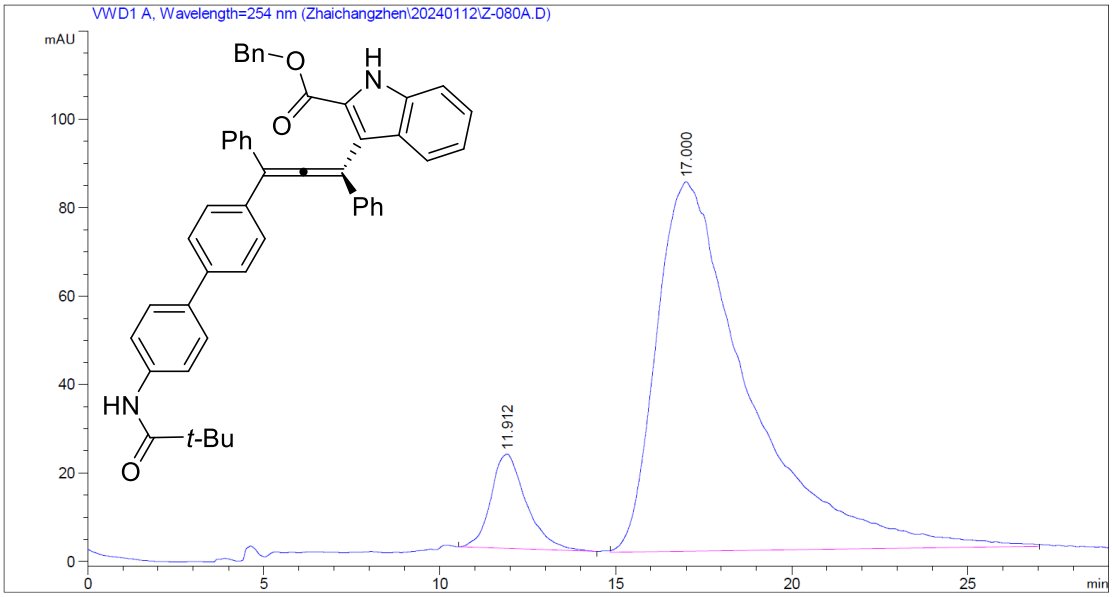


#	Time	Area	Height	Width	Symmetry	Area %
1	20.272	3825.4	55.4	1.1519	0.885	11.173
2	24.32	30413.5	284.7	1.7806	0.724	88.827

Benzyl 3-(1,3-diphenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl) -1*H*-indole-2-carboxylate (3bd)

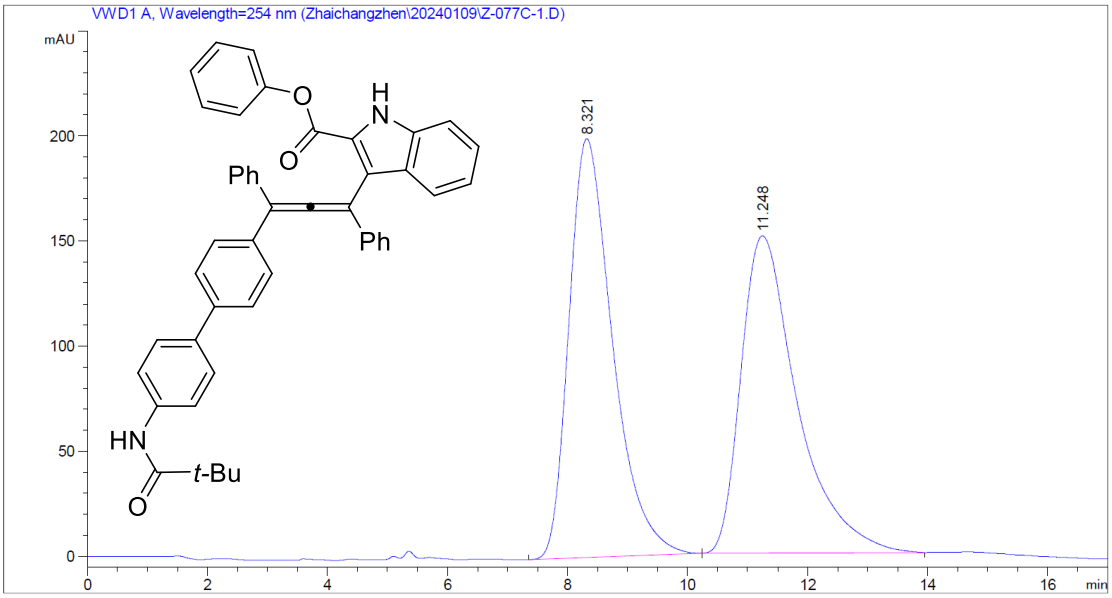


#	Time	Area	Height	Width	Symmetry	Area %
1	13.315	27730.8	385.1	1.2001	0.707	53.535
2	19.38	24068.7	127.7	2.2696	0.532	46.465

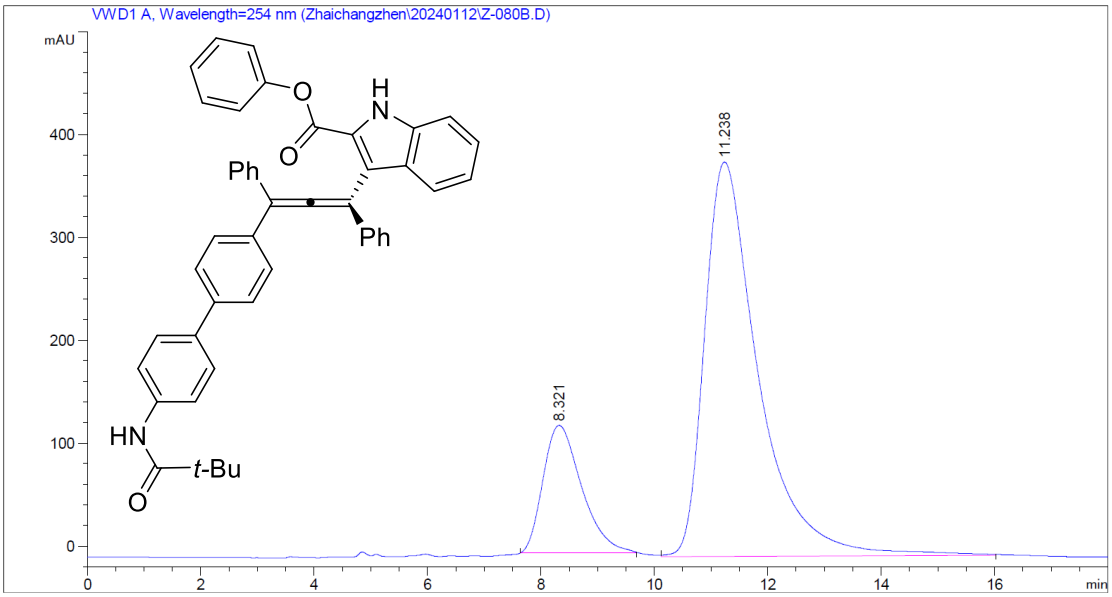


#	Time	Area	Height	Width	Symmetry	Area %
1	11.912	1482.6	21.3	0.9893	0.773	8.857
2	17	15256.1	83.6	3.0431	0.457	91.143

Phenyl 3-(1,3-diphenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl) -1*H*-indole-2-carboxylate (3be)

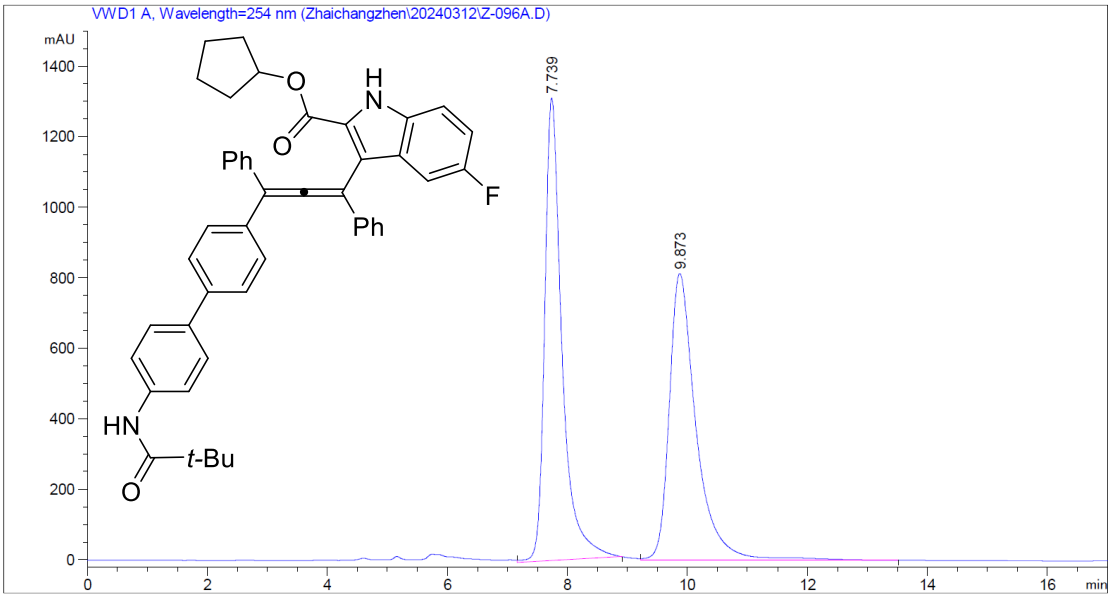


#	Time	Area	Height	Width	Symmetry	Area %
1	8.321	10052.8	199.2	0.7757	0.644	50.670
2	11.248	9786.9	150.9	0.9638	0.574	49.330

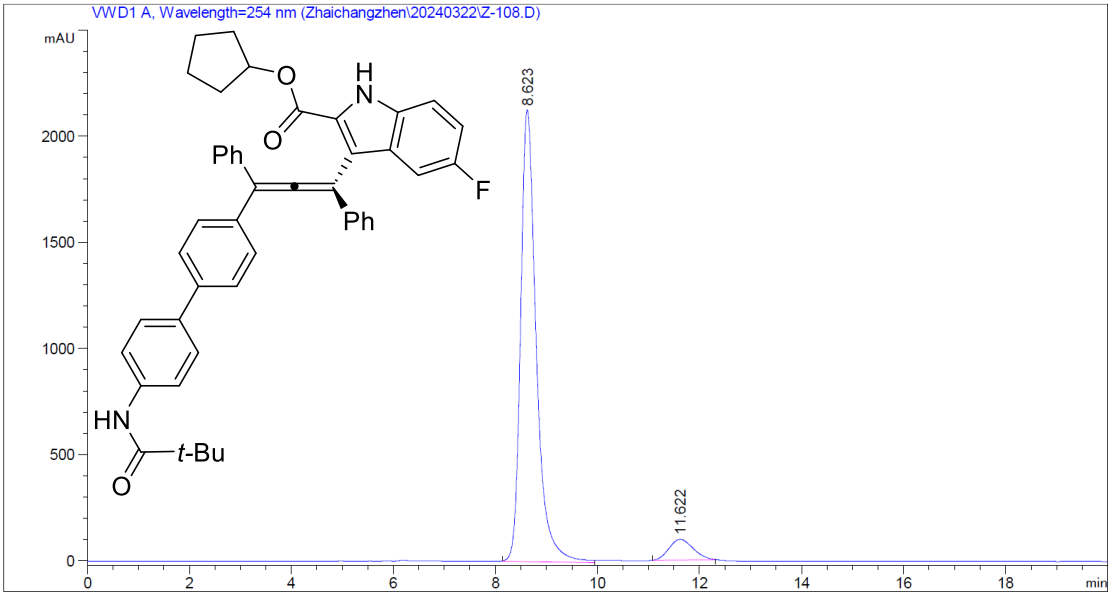


#	Time	Area	Height	Width	Symmetry	Area %
1	8.321	5878.2	124.1	0.7897	0.692	18.821
2	11.238	25354.7	383.4	1.1022	0.56	81.179

Cyclopentyl 3-(1,3-diphenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl)-5-fluoro-1*H*-indole-2-carboxylate (3bf)

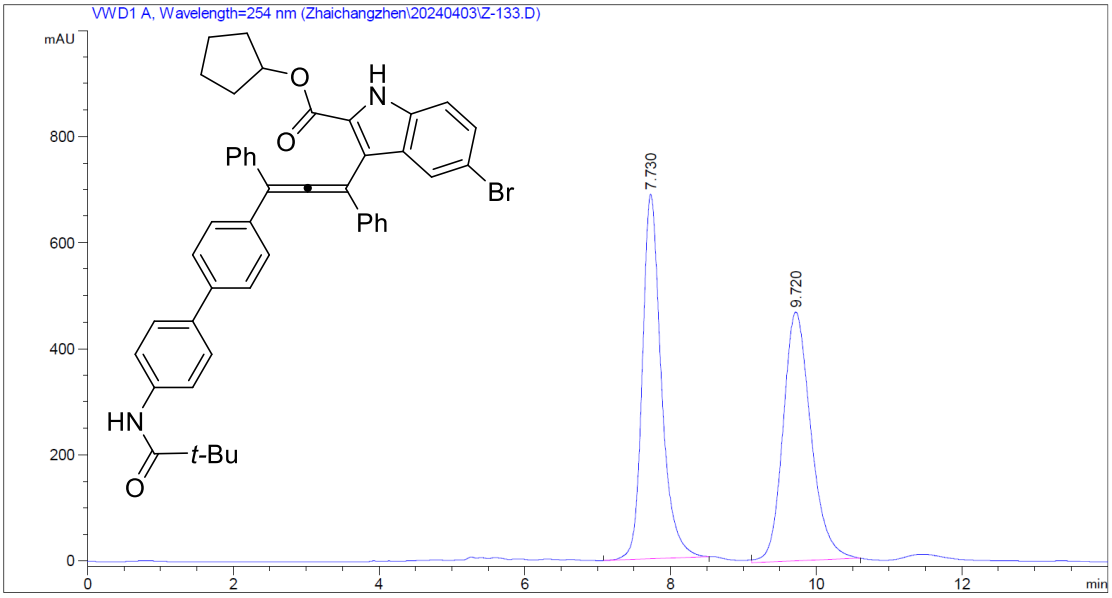


#	Time	Area	Height	Width	Symmetry	Area %
1	7.739	26245.3	1311.4	0.3336	0.648	50.788
2	9.873	25430.3	812.8	0.463	0.579	49.212

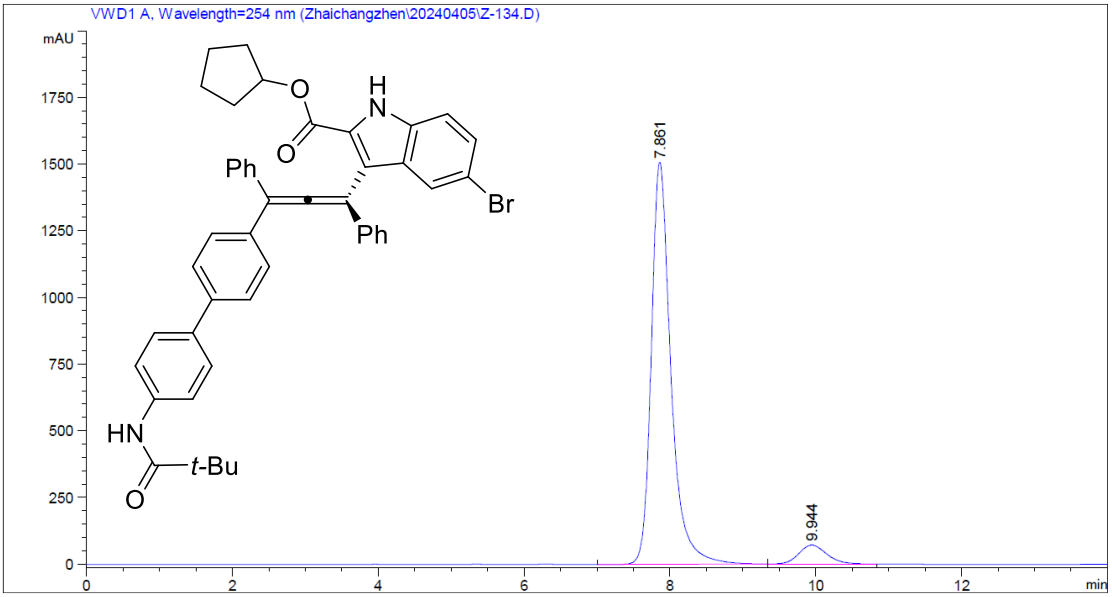


#	Time	Area	Height	Width	Symmetry	Area %
1	8.623	45200.8	2128.1	0.354	0.693	93.421
2	11.622	3183.2	97.4	0.5373	0	6.579

Cyclopentyl 3-(1,3-diphenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl)-5-methyl-1*H*-indole-2-carboxylate (3bg)

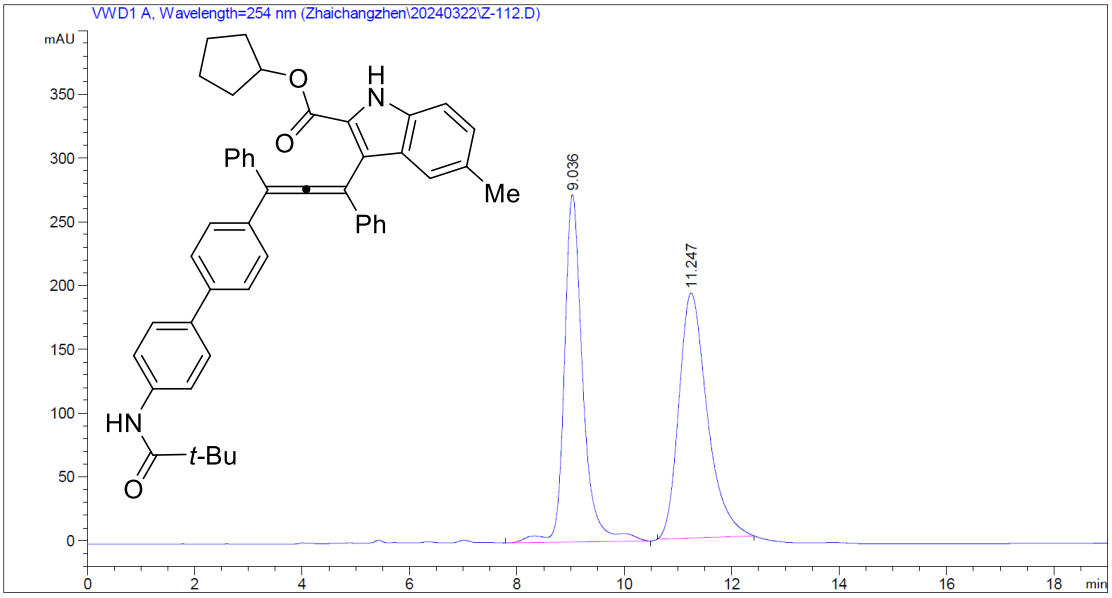


#	Time	Area	Height	Width	Symmetry	Area %
1	7.73	12410.1	687.2	0.2727	0.742	49.768
2	9.72	12525.9	469.4	0.4447	0.811	50.232

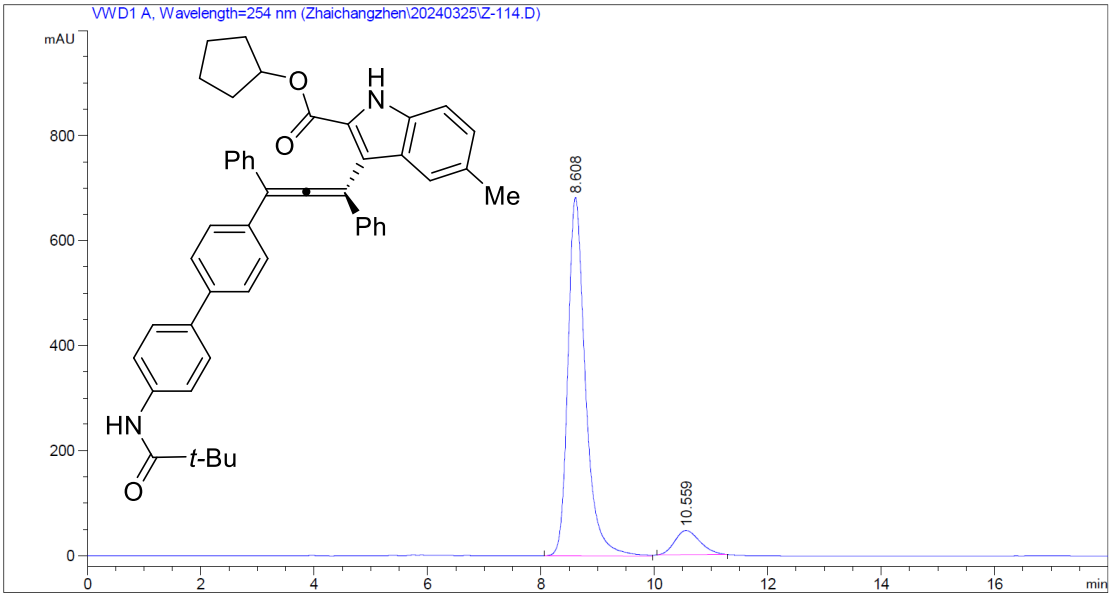


#	Time	Area	Height	Width	Symmetry	Area %
1	7.861	28211.8	1506	0.2815	0.692	93.575
2	9.944	1937	71.5	0.4151	0.83	6.425

Cyclopentyl 3-(1,3-diphenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl)-5-methyl-1*H*-indole-2-carboxylate (3bh)

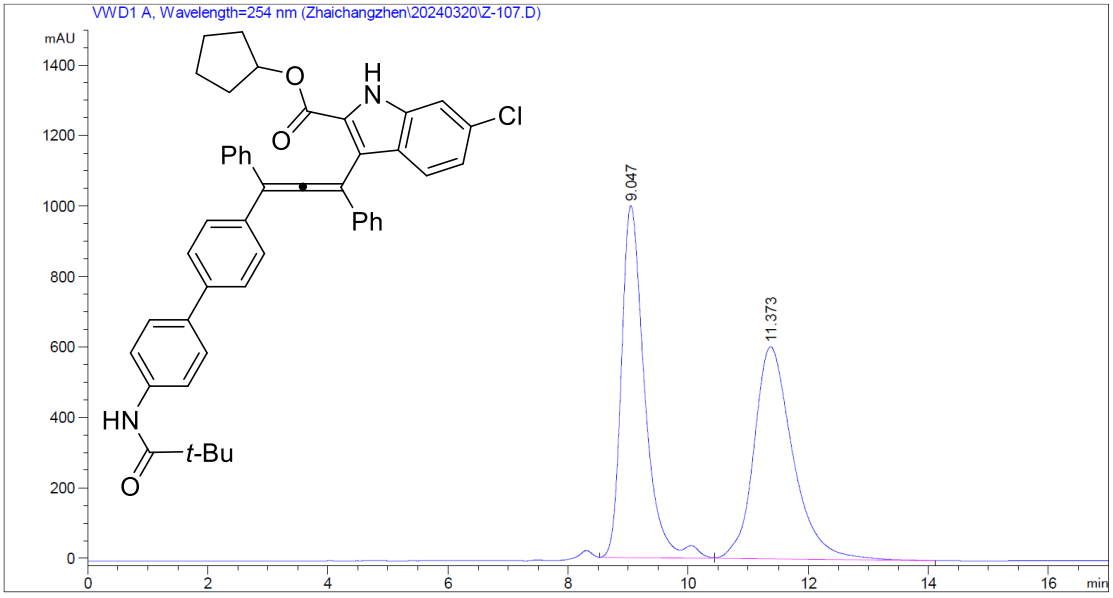


#	Time	Area	Height	Width	Symmetry	Area %
1	9.036	6538.9	272.5	0.3486	0.808	48.030
2	11.247	7075.4	192.2	0.6134	0.728	51.970

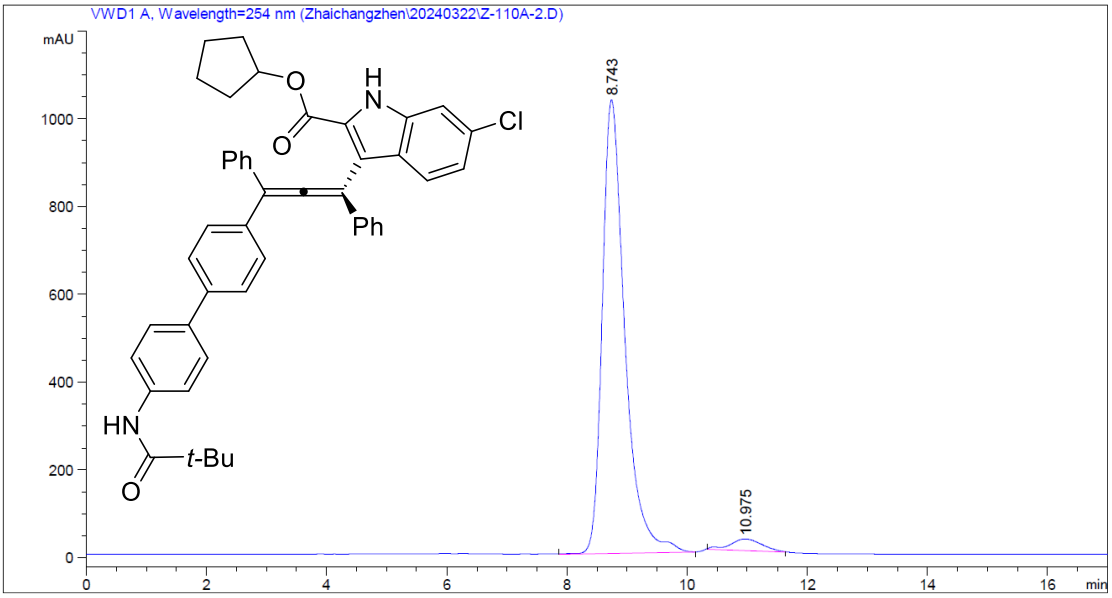


#	Time	Area	Height	Width	Symmetry	Area %
1	8.608	14711.5	682.9	0.359	0.712	91.075
2	10.559	1441.7	46.4	0.5135	0	8.925

Cyclopentyl 6-chloro-3-(1,3-diphenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)prop a-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3bi)



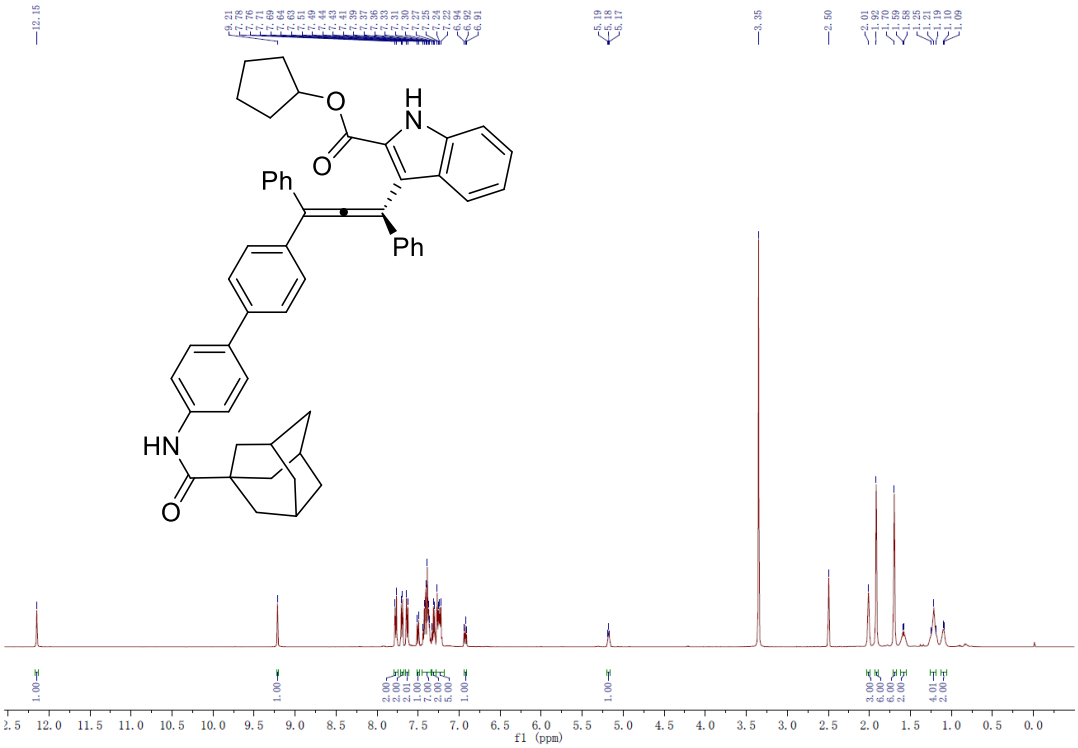
#	Time	Area	Height	Width	Symmetry	Area %
1	9.047	26768.4	999.1	0.3988	0.651	49.739
2	11.373	27049.3	602	0.6782	0.703	50.261

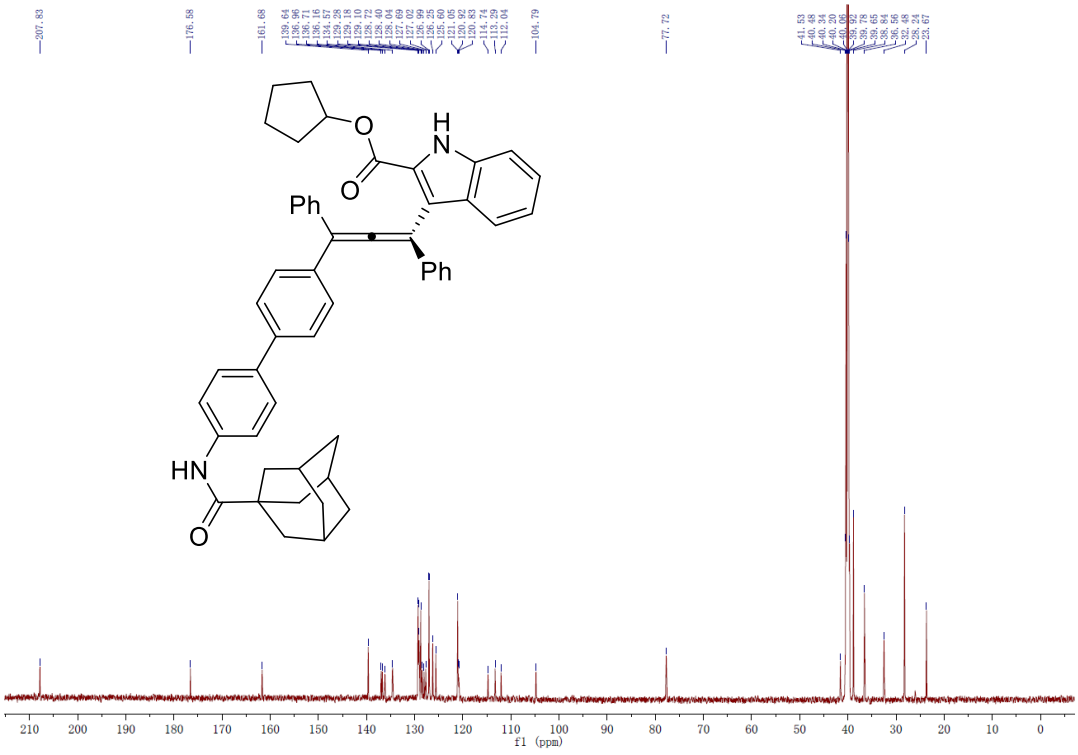


#	Time	Area	Height	Width	Symmetry	Area %
1	8.885	54329.5	2092.7	0.3926	0.627	96.742
2	11.184	1829.7	55	0.5542	0.703	3.258

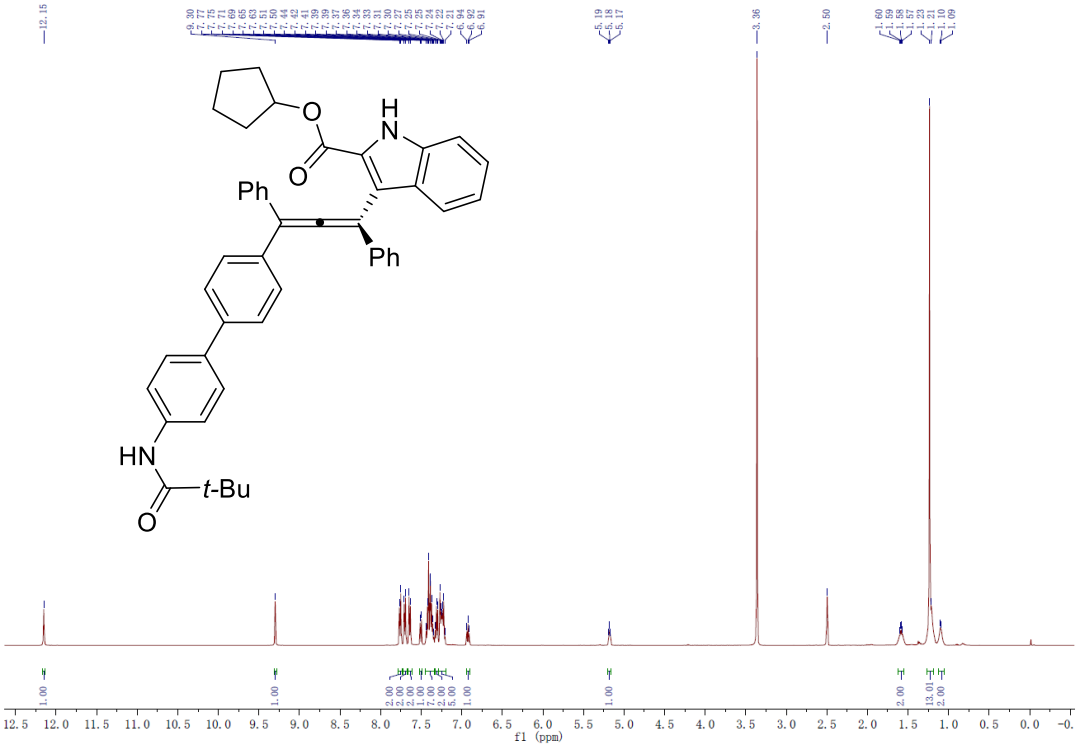
H: NMR Analysis

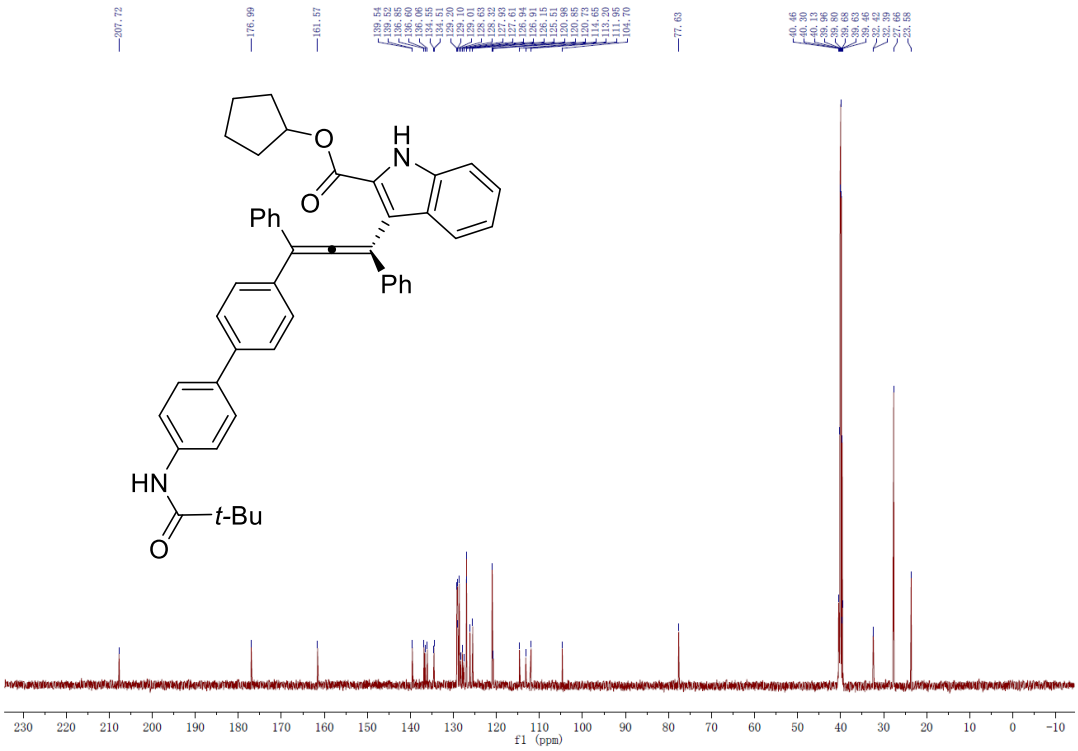
Cyclopentyl 3-(3-(4'-((3r,5r,7r)-adamantane-1-carboxamido)-[1,1'-biphenyl]-4-yl)-1,3-diphenylpropa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3aa)



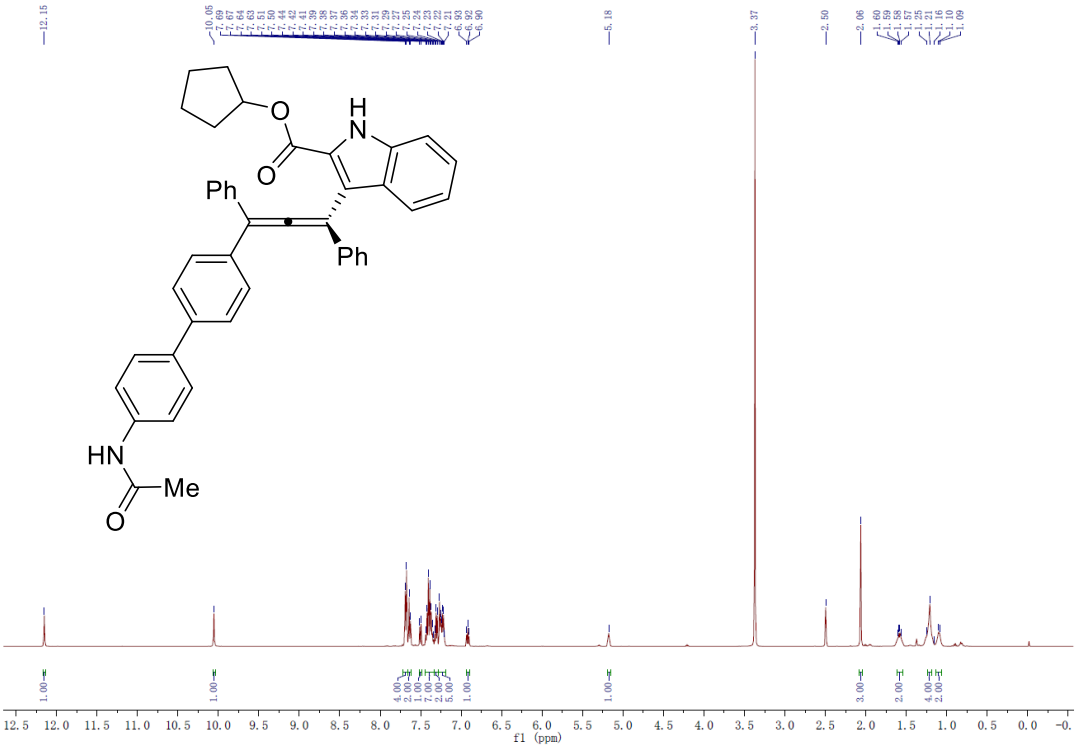


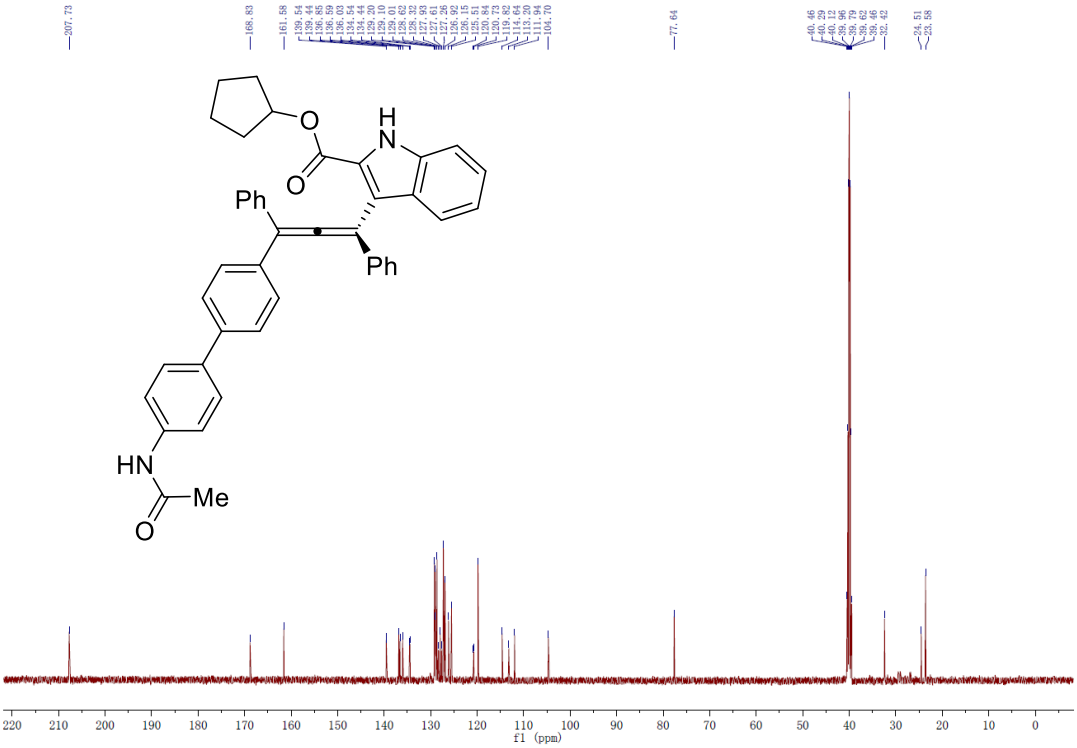
Cyclopentyl 3-(1,3-diphenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3ba)



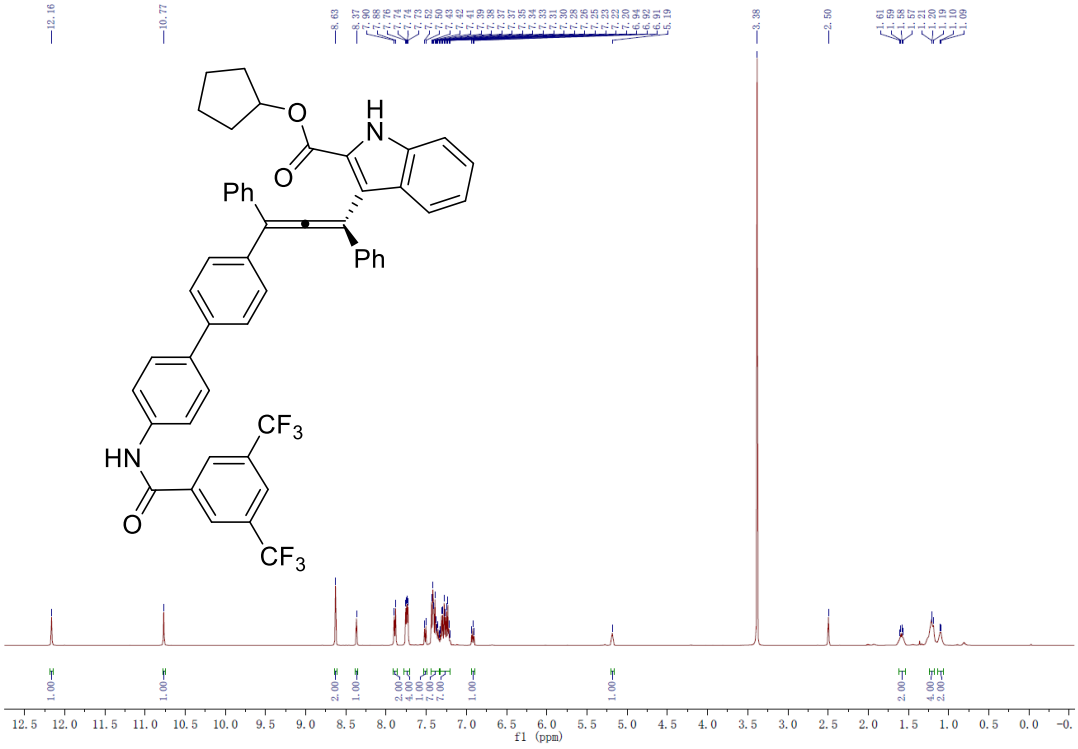


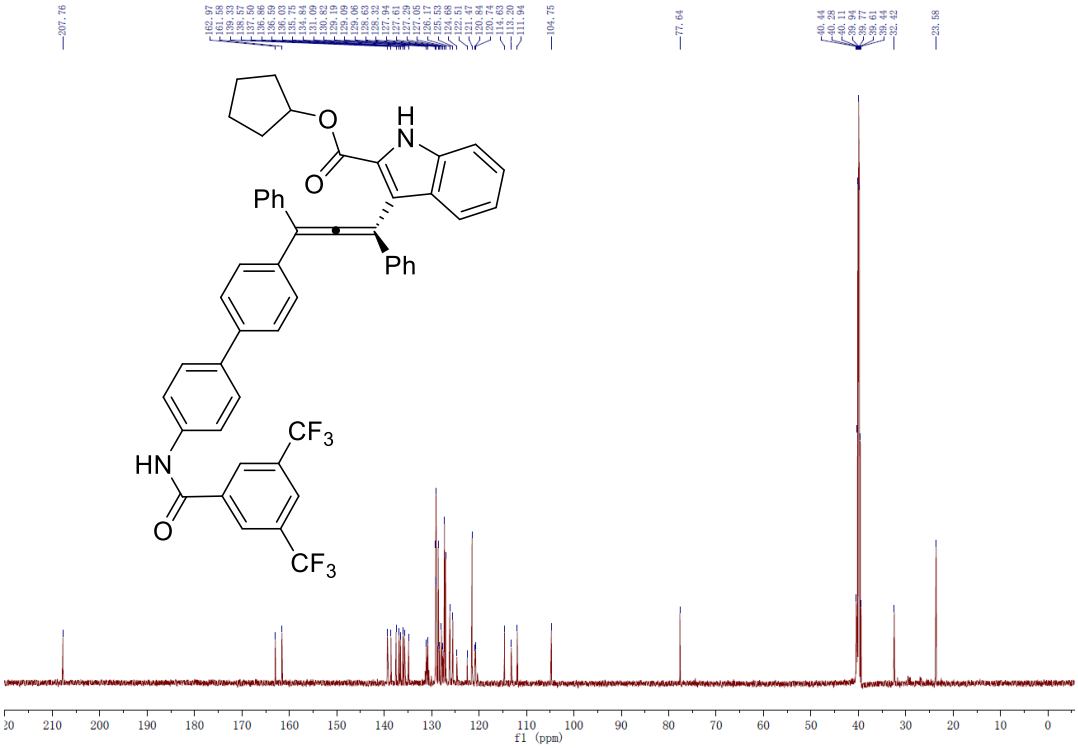
Cyclopentyl 3-(3-(4'-acetamido-[1,1'-biphenyl]-4-yl)-1,3-diphenylpropa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3ca)



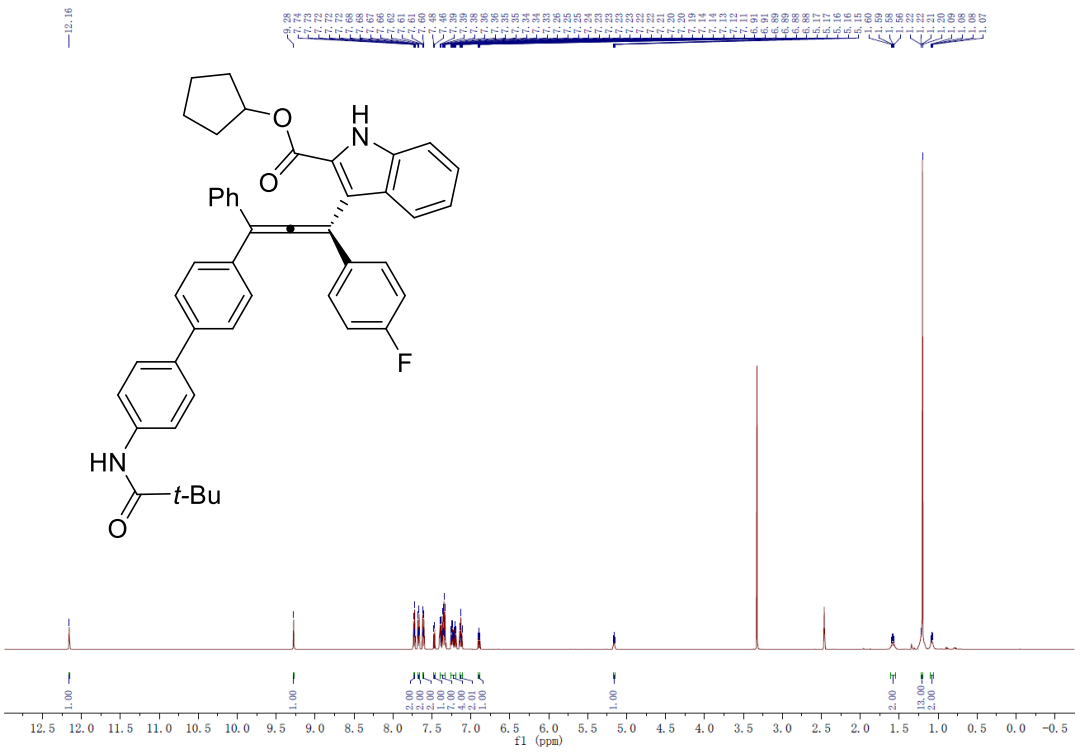


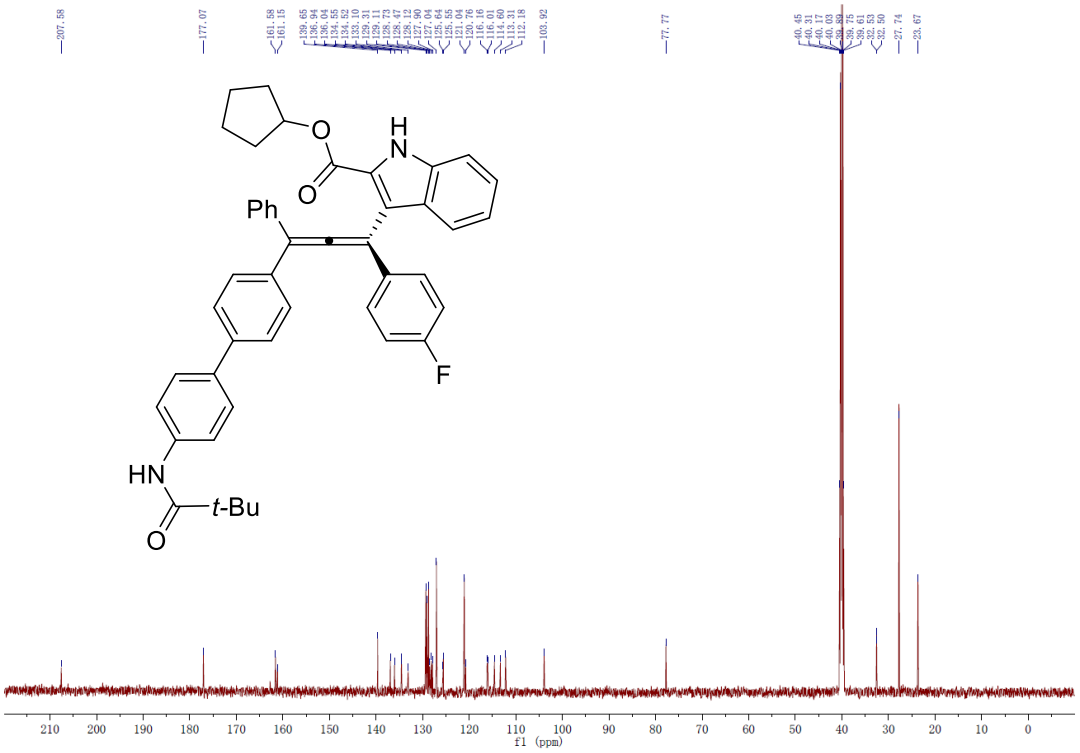
Cyclopentyl 3-(3-(4'-(3,5-bis(trifluoromethyl)benzamido)-[1,1'-biphenyl]-4-yl)-1,3-diphenylpropa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3da)



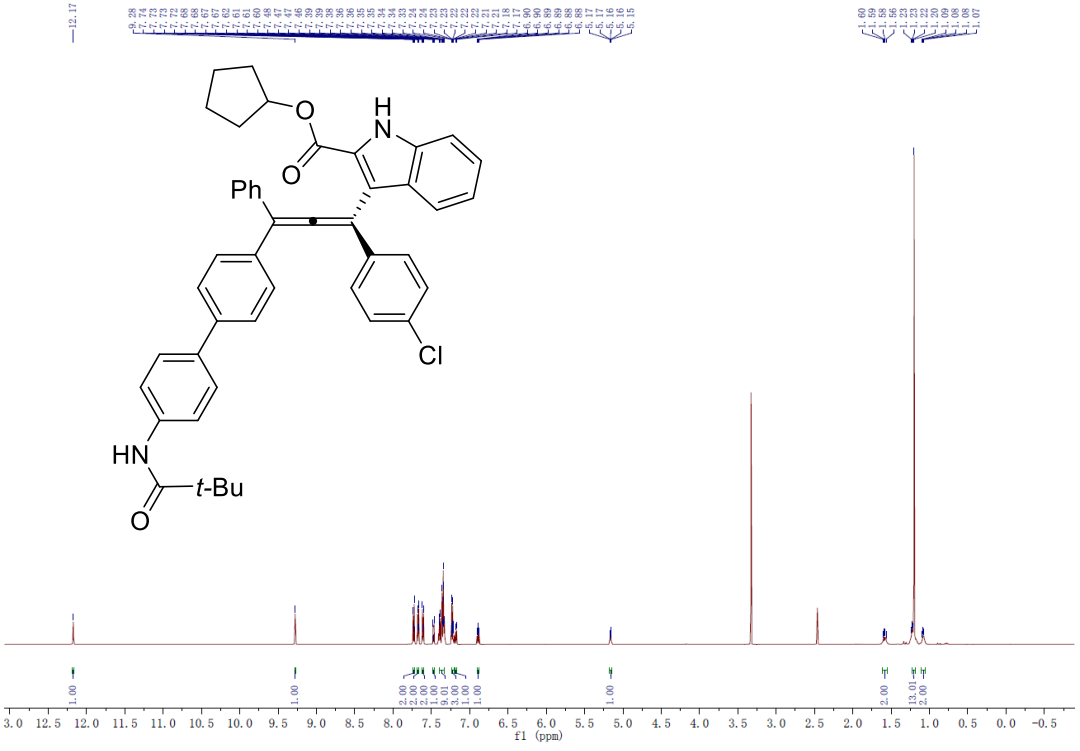


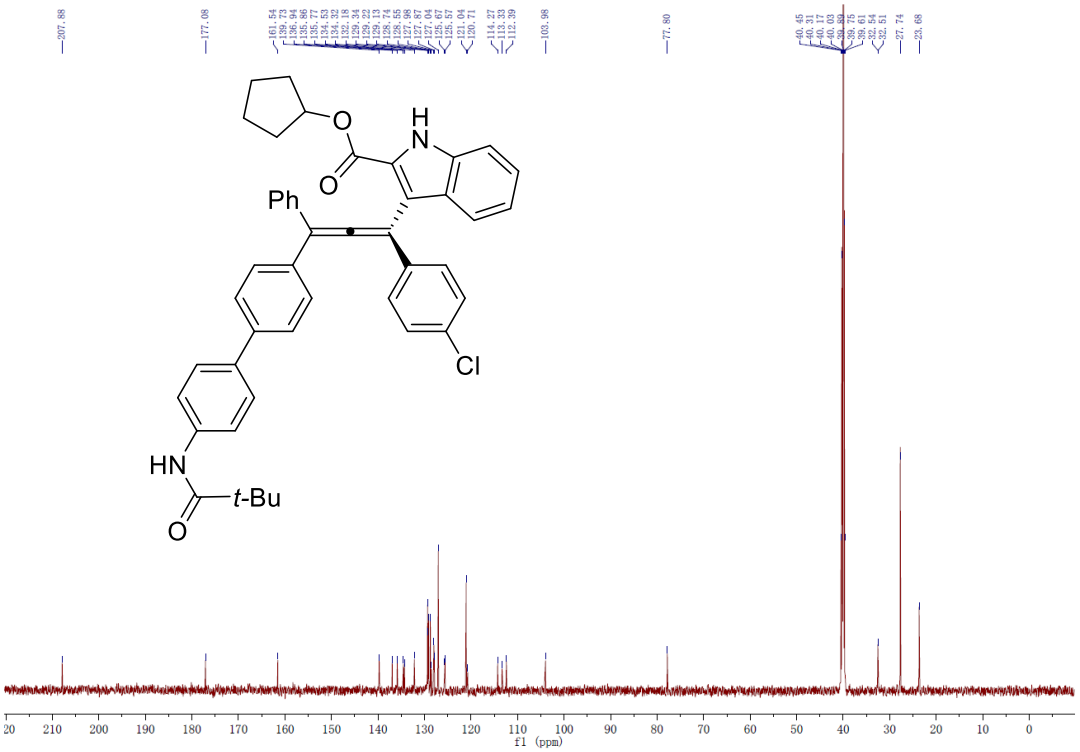
Cyclopentyl 3-(1-(4-fluorophenyl)-3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl) propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3ea)



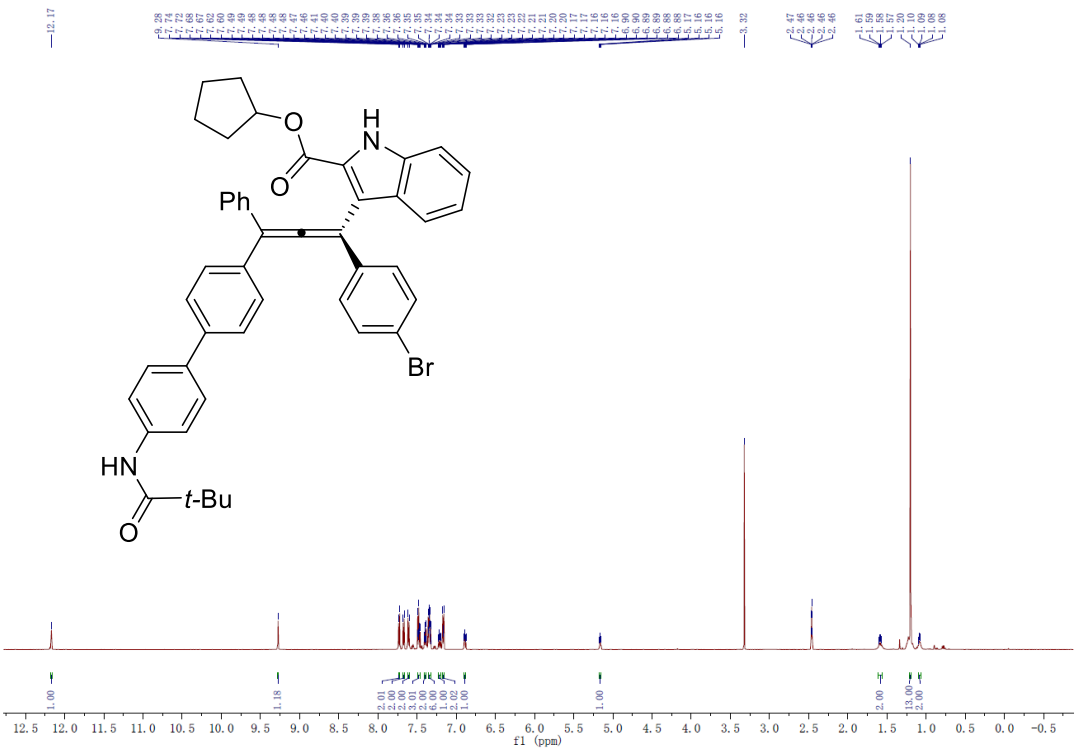


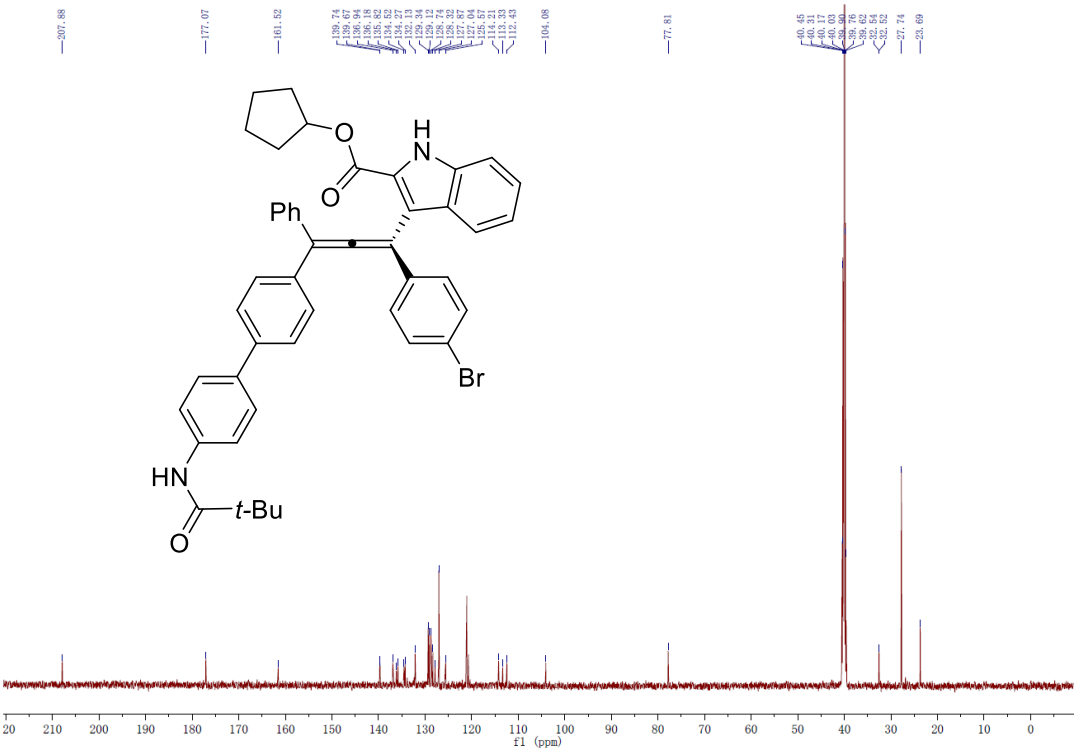
Cyclopentyl 3-(1-(4-chlorophenyl)-3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl) propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylatee (3fa)



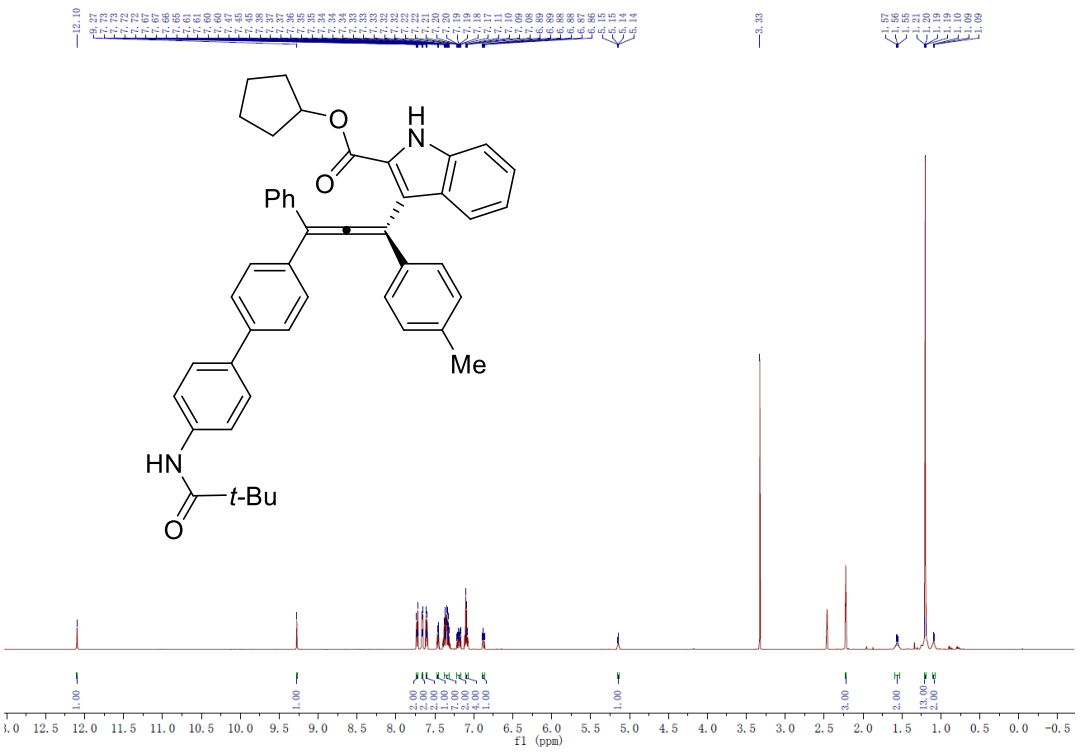


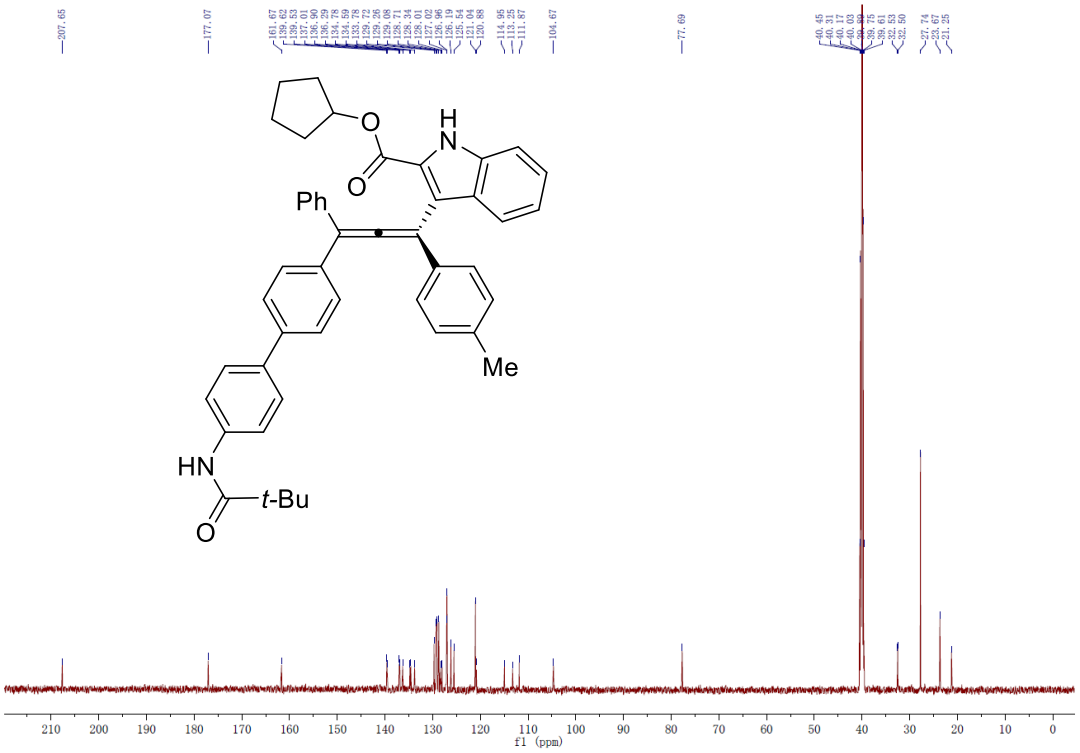
Cyclopentyl 3-(1-(4-chlorophenyl)-3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl) propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3ga)



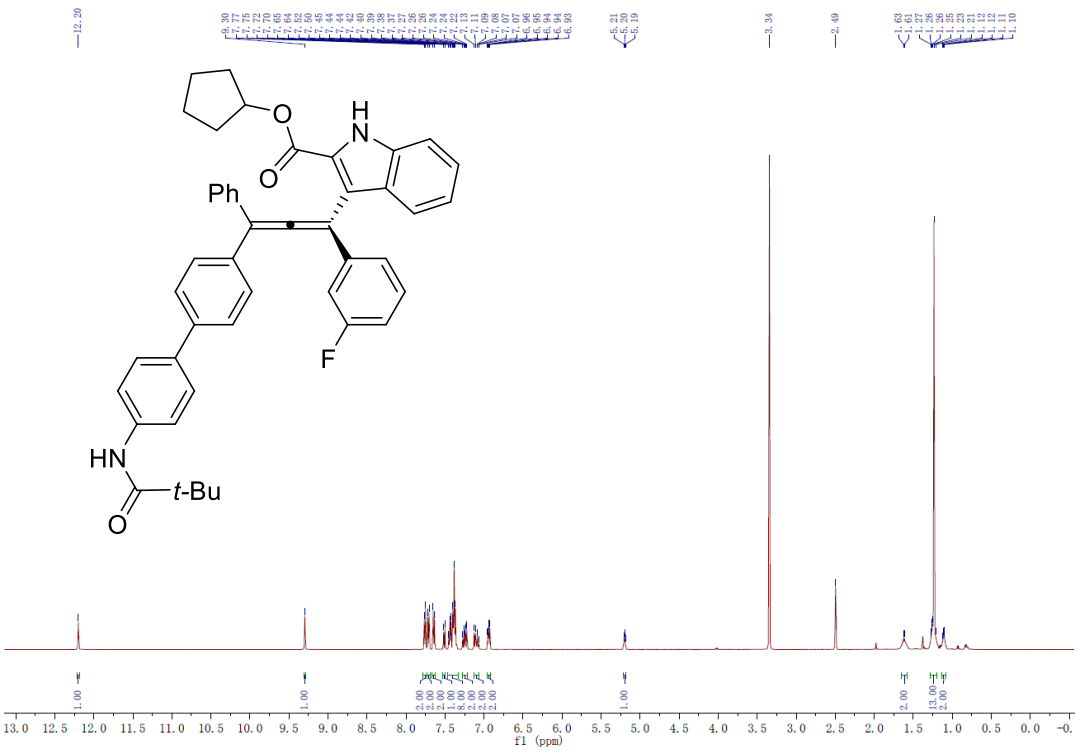


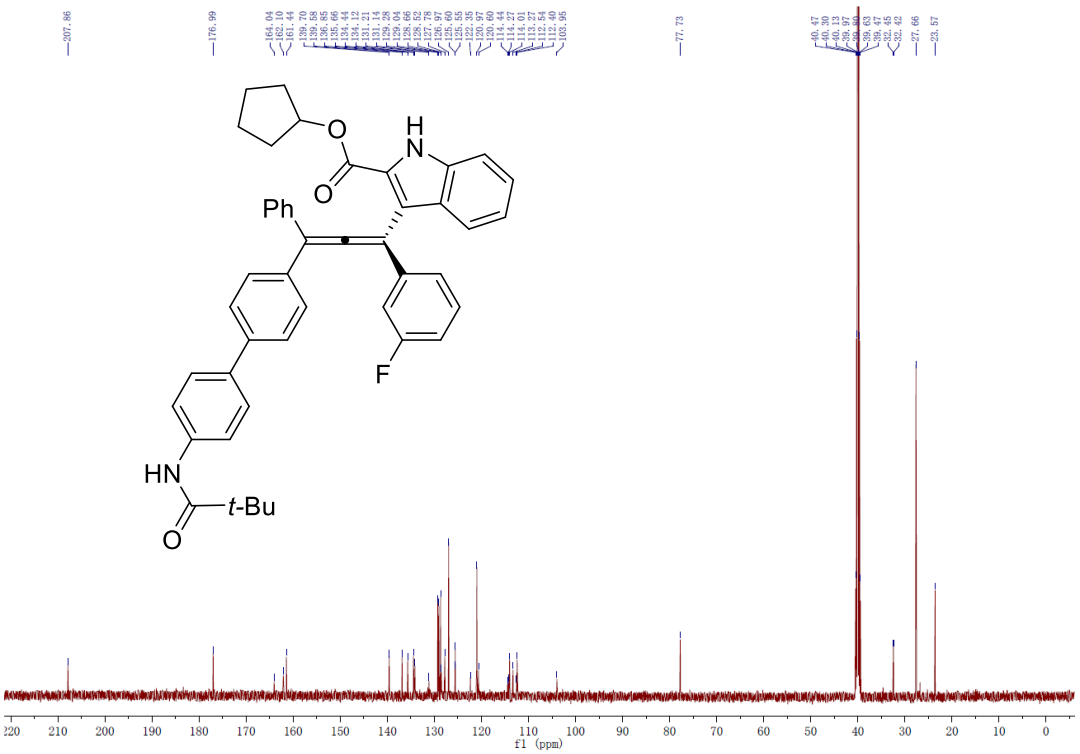
Cyclopentyl 3-(3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)-1-(*p*-tolyl)propa-1, 2-dien-1-yl)-1*H*-indole-2-carboxylate (3ha)



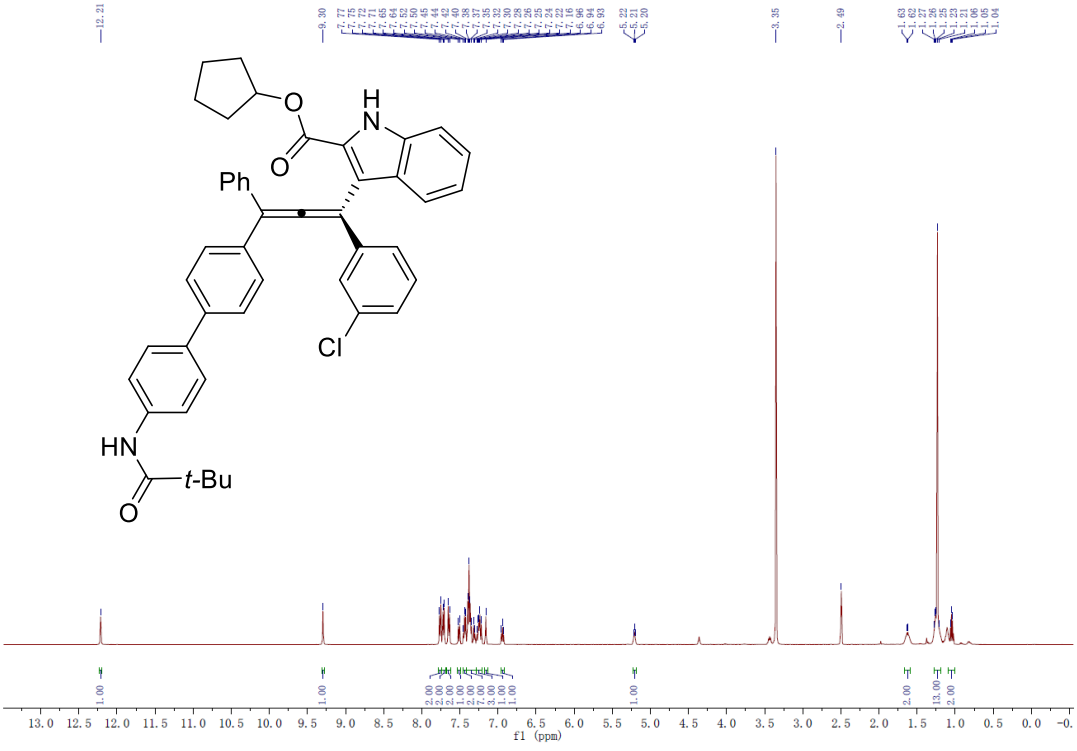


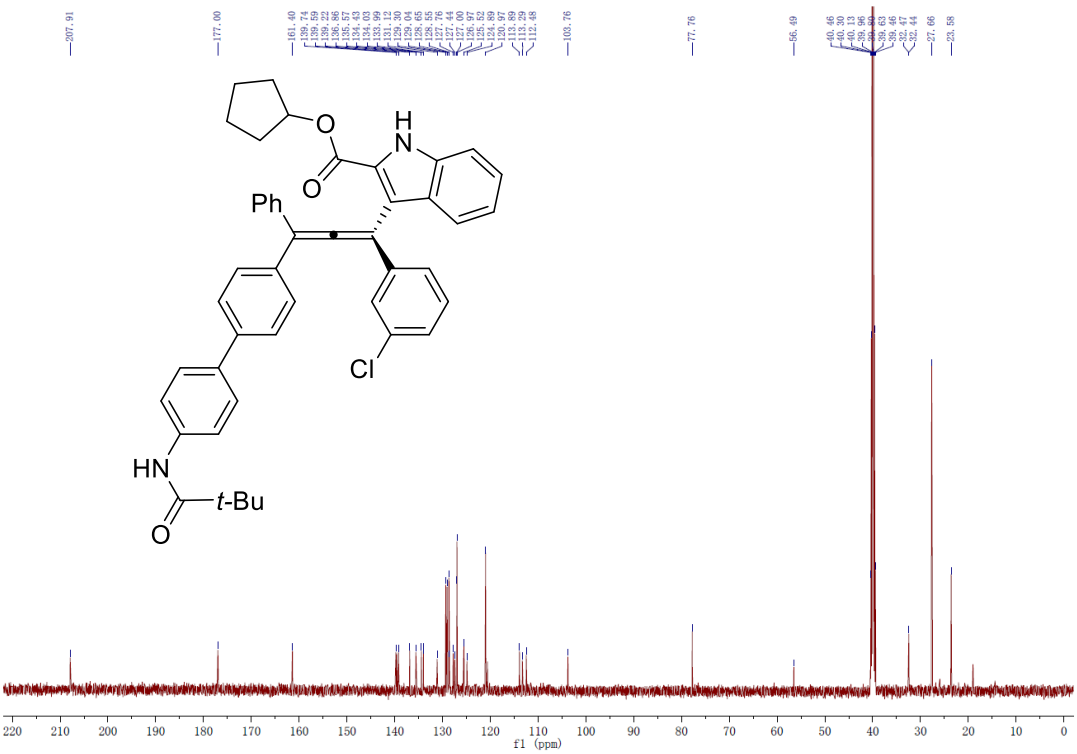
Cyclopentyl 3-(1-(4-fluorophenyl)-3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl) propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3ia)



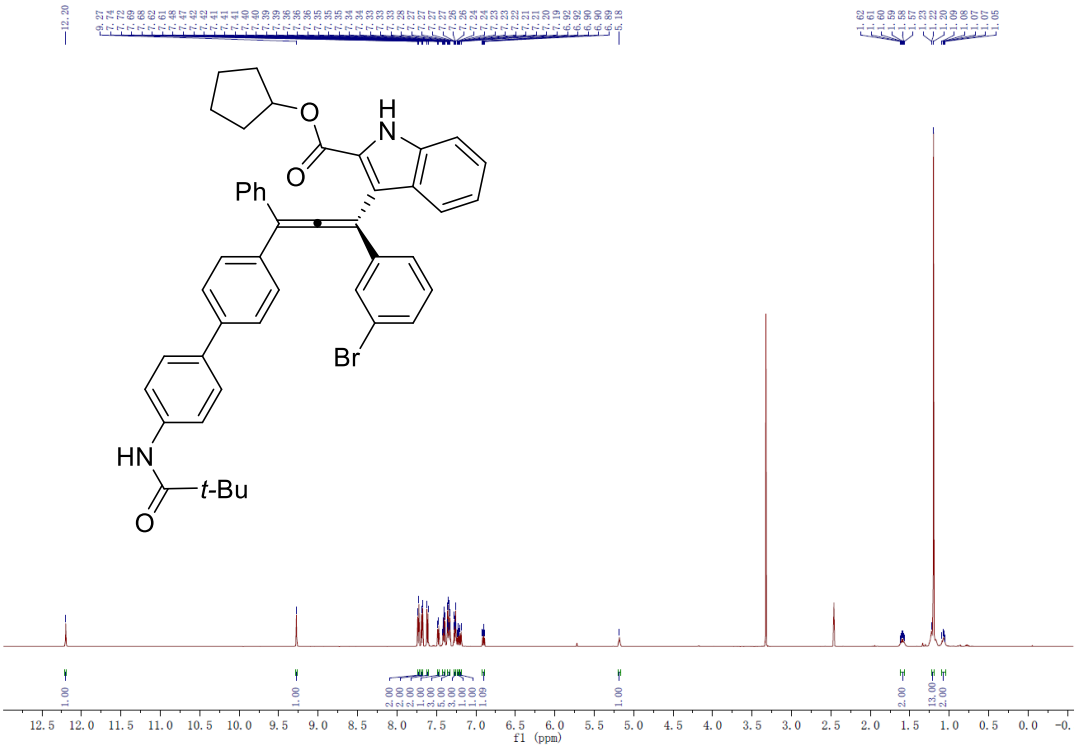


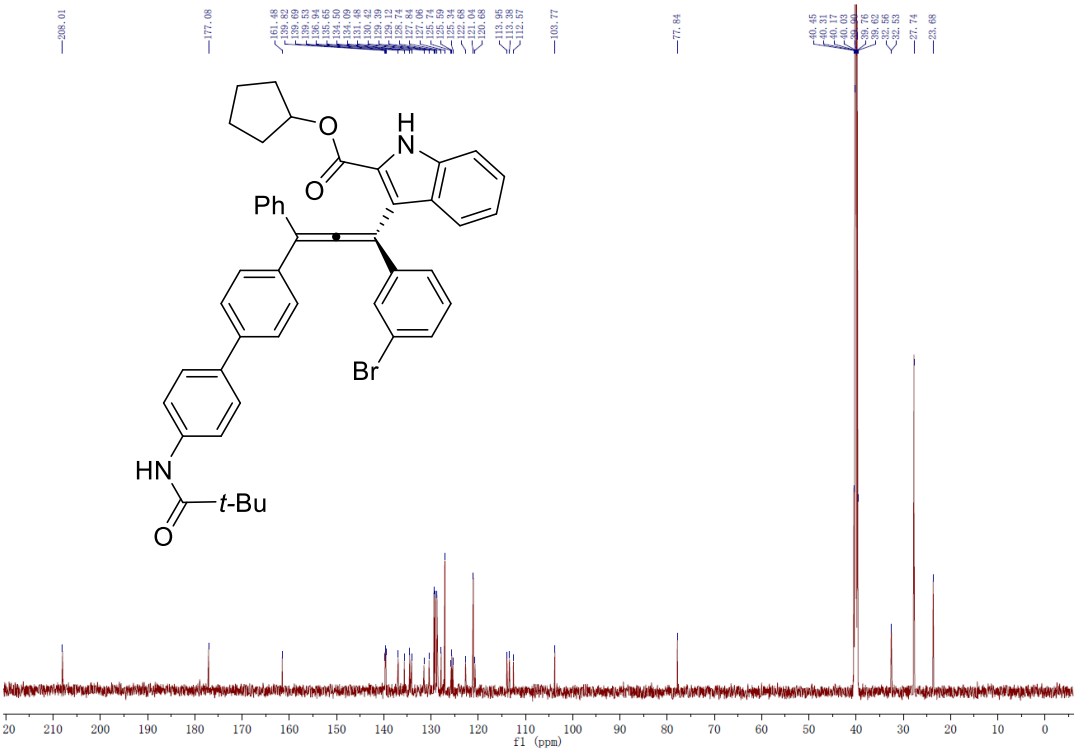
Cyclopentyl 3-(1-(3-chlorophenyl)-3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl) propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3ja)



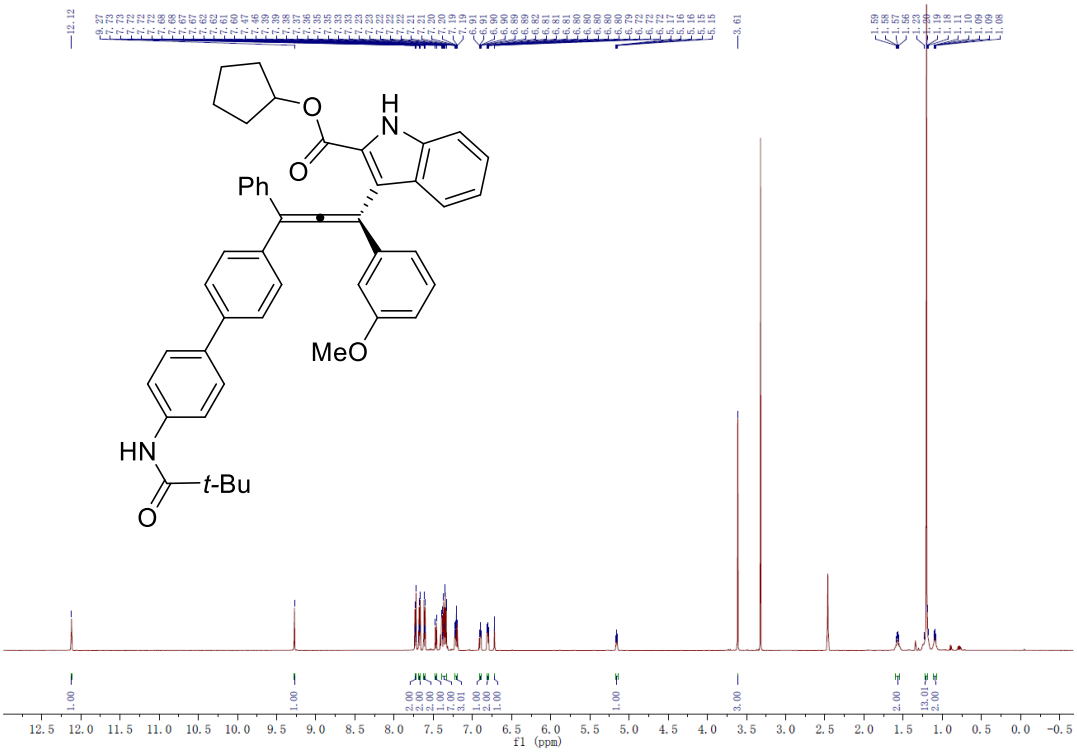


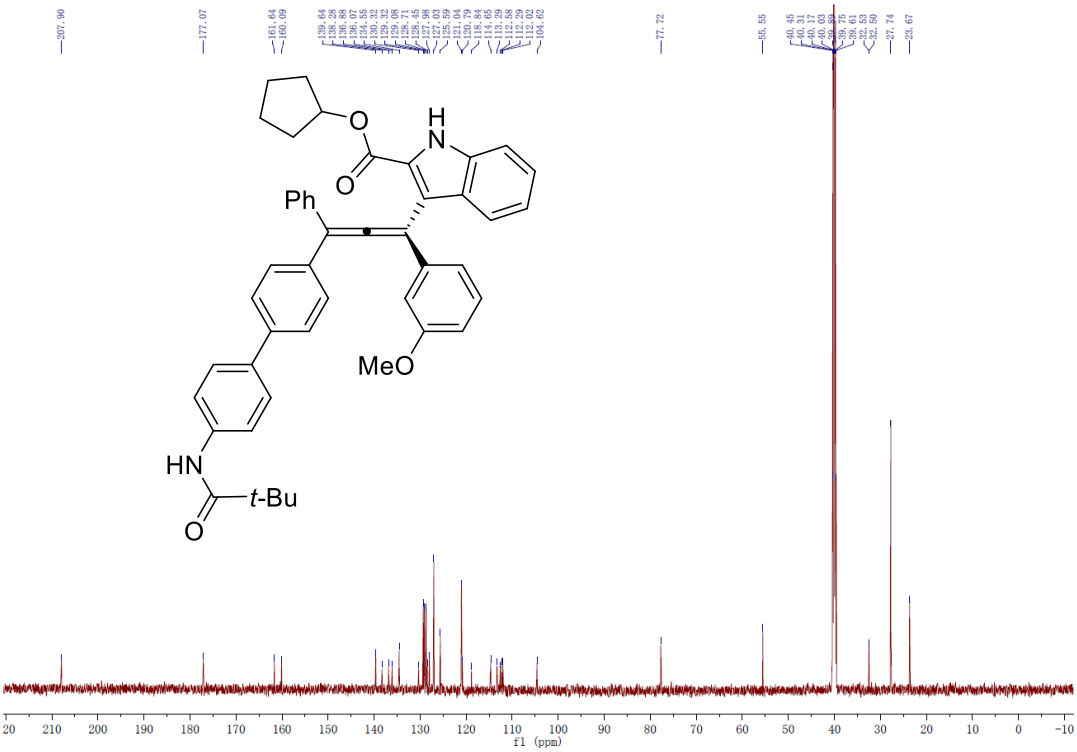
Cyclopentyl 3-(1-(3-bromophenyl)-3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3ka)



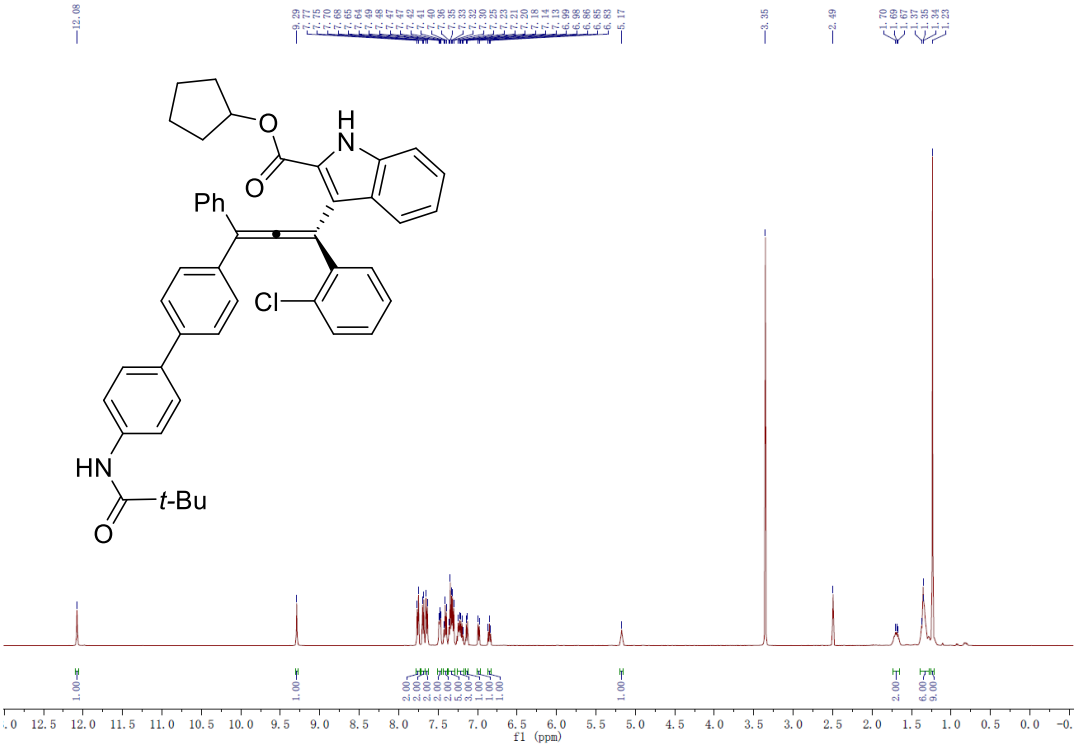


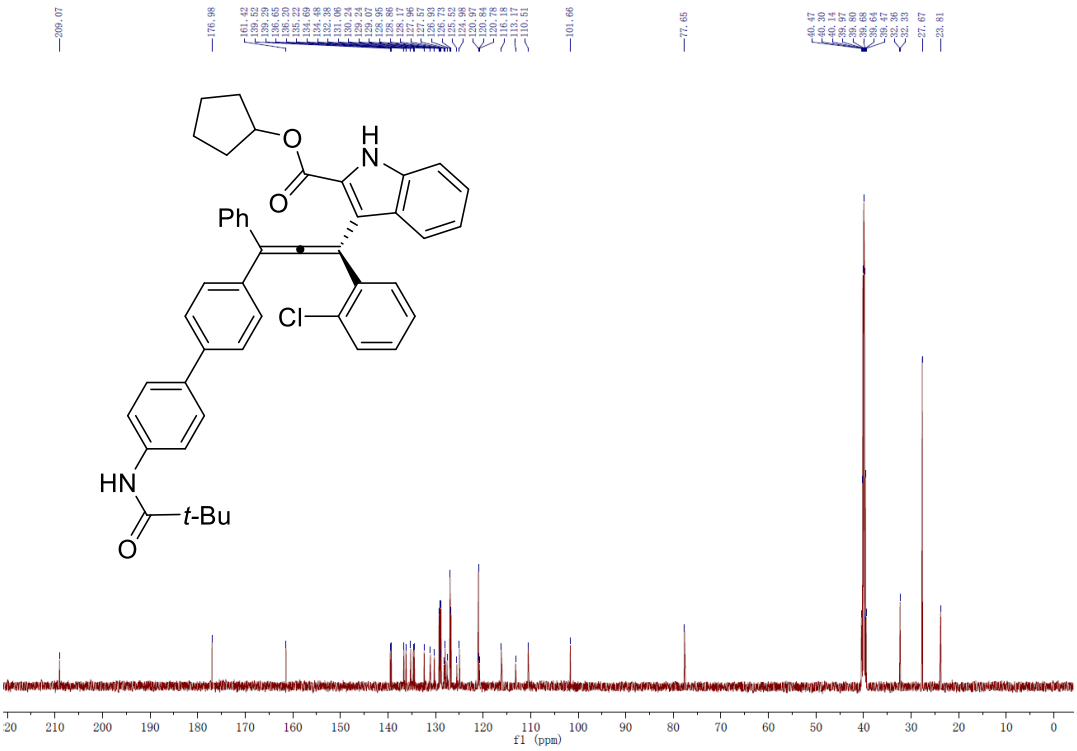
Cyclopentyl 3-(1-(3-methoxyphenyl)-3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3la)



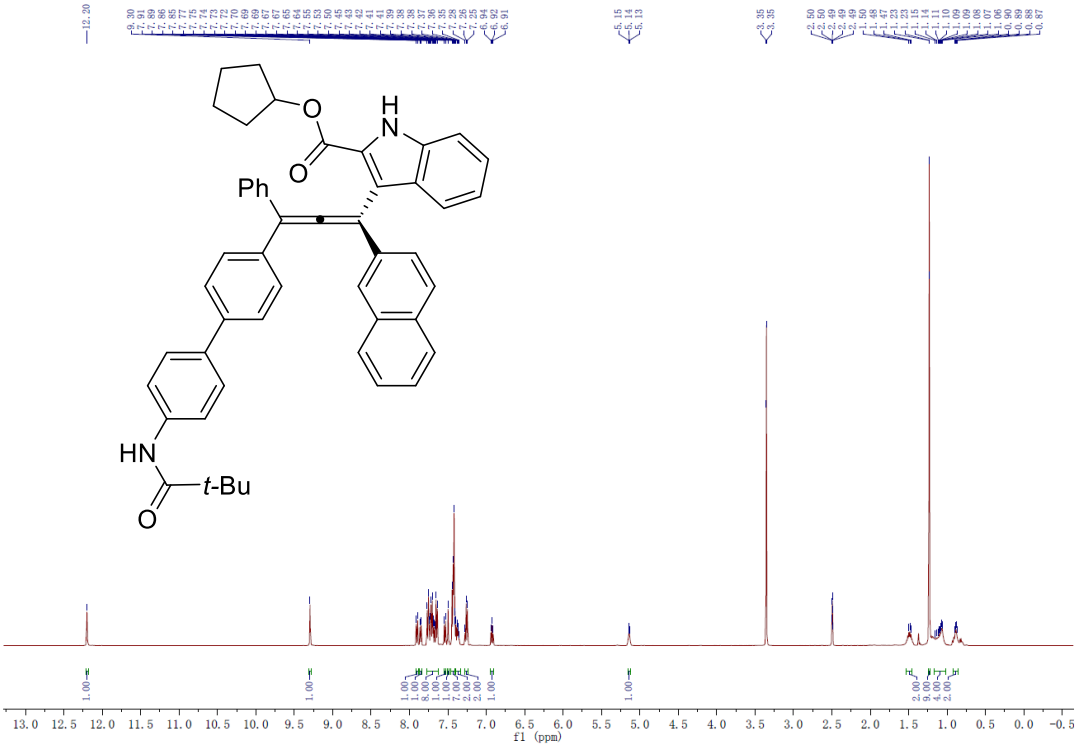


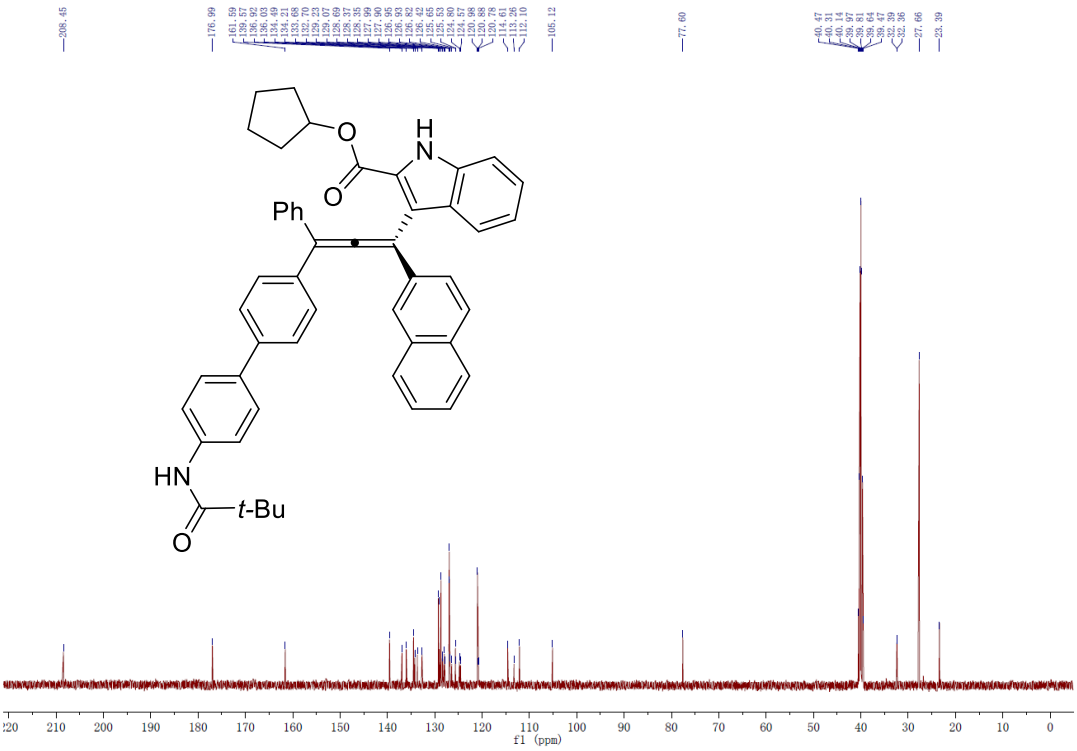
Cyclopentyl 3-(1-(2-chlorophenyl)-3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl) propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3ma)



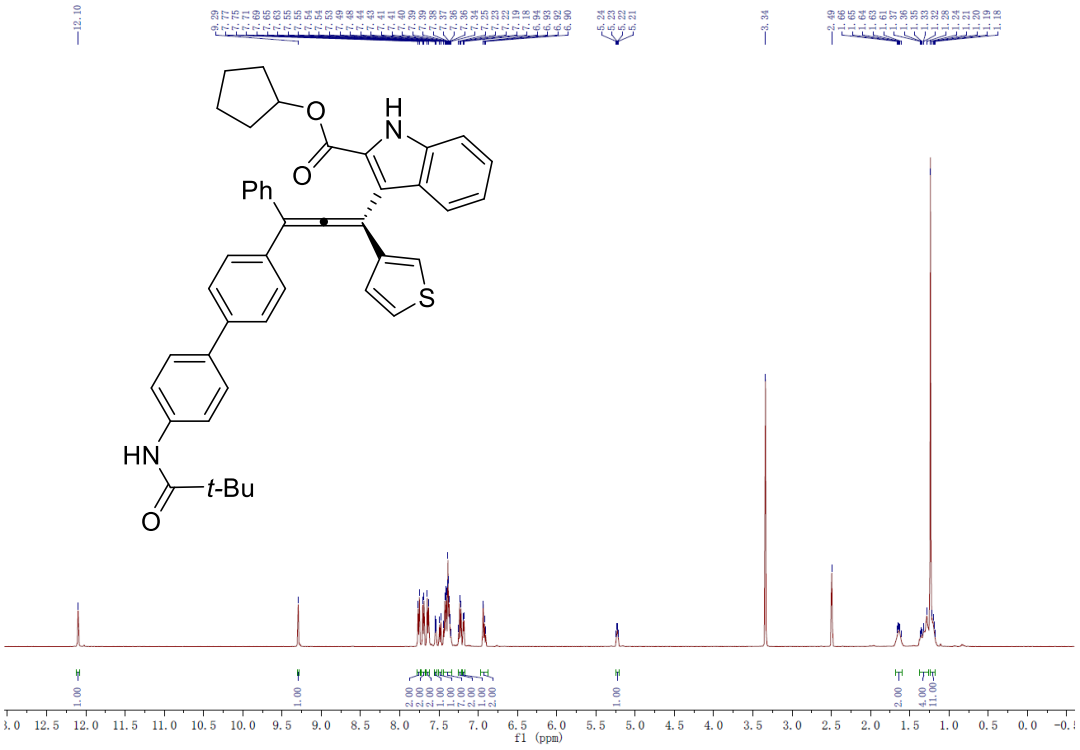


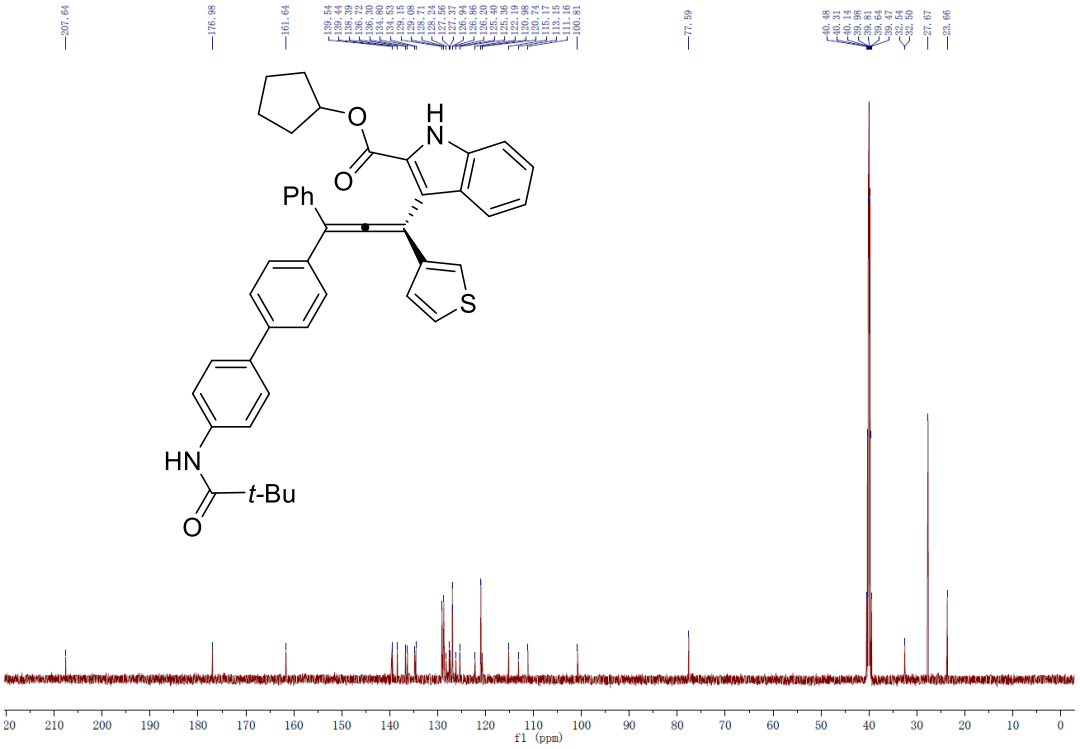
Cyclopentyl 3-(1-(naphthalen-2-yl)-3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3na)



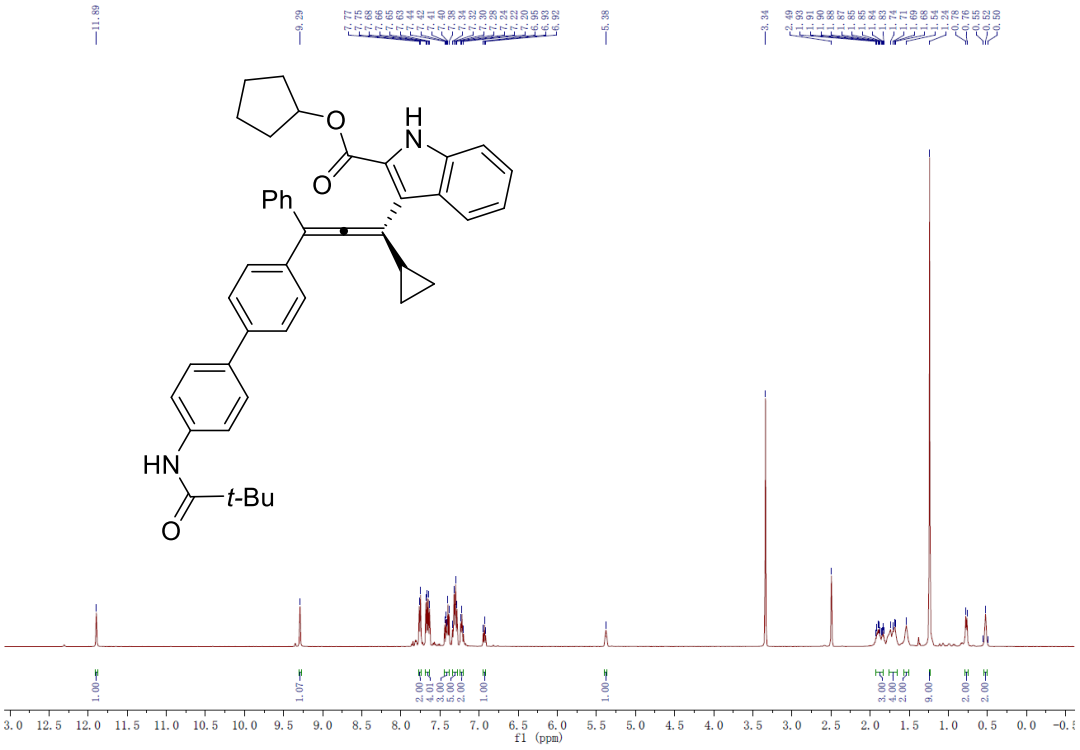


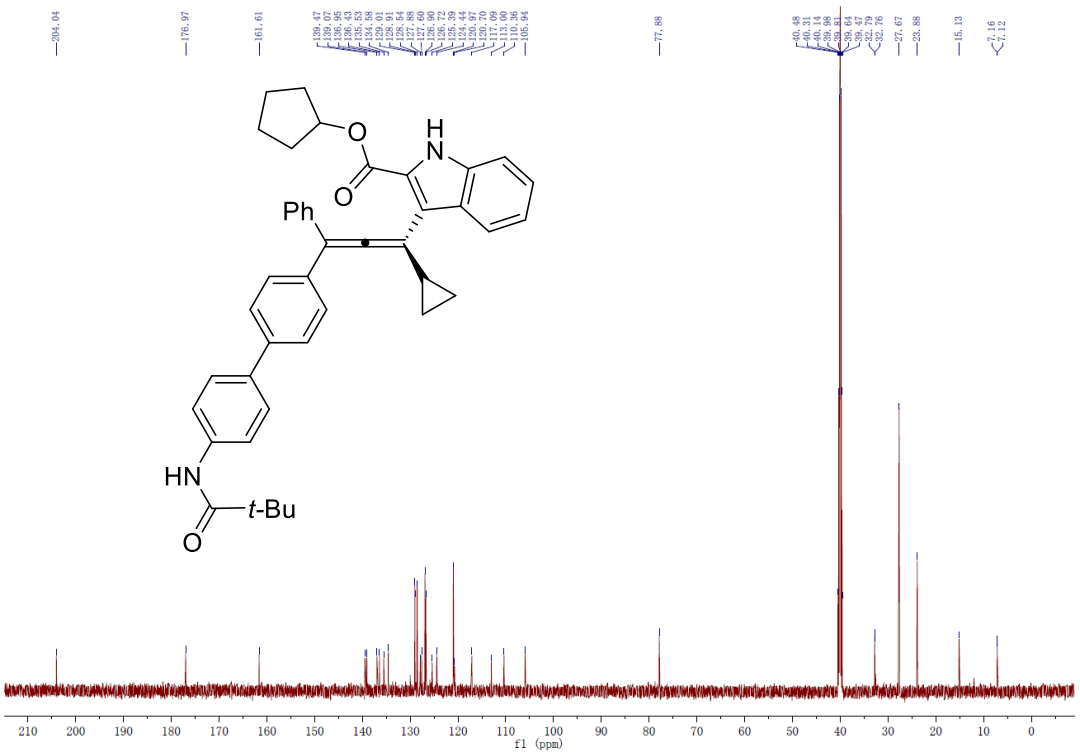
Cyclopentyl 3-(3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)-1-(thiophen-3-yl) propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3oa)



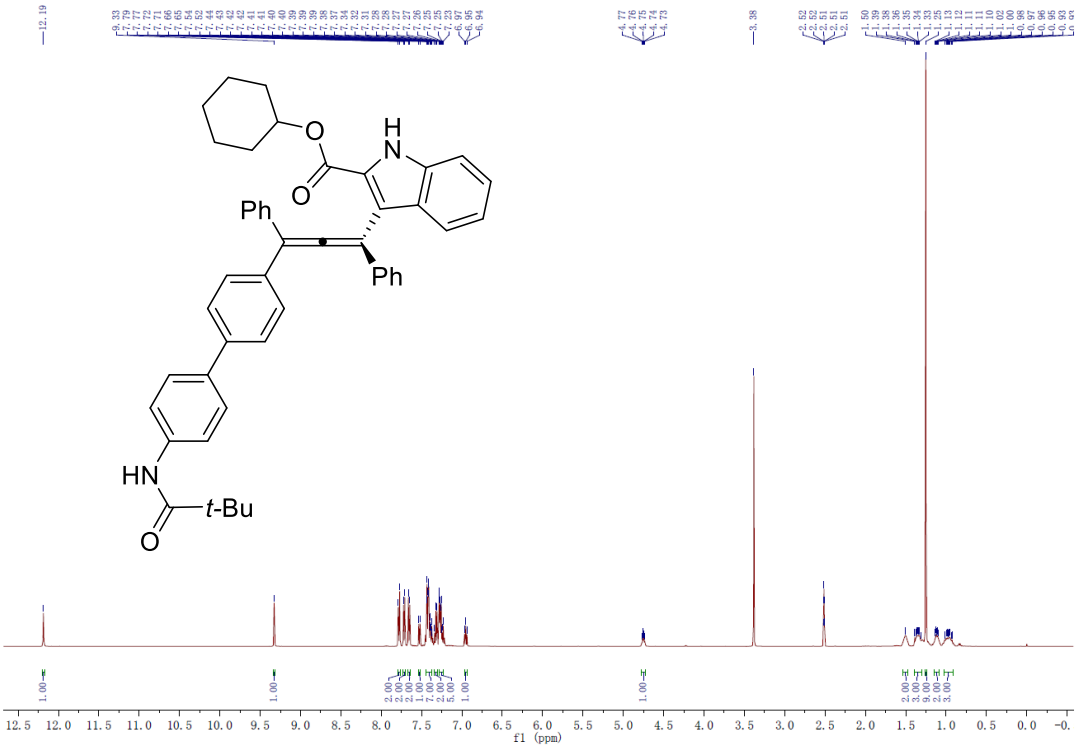


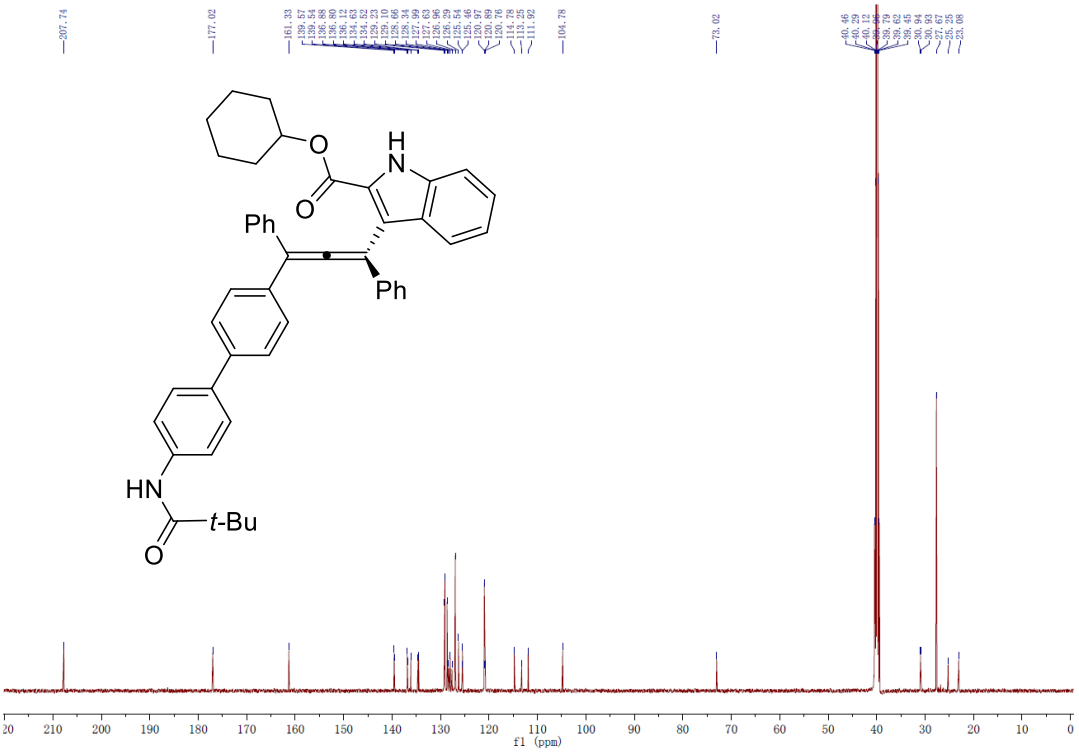
Cyclopentyl 3-(1-cyclopropyl-3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3pa)



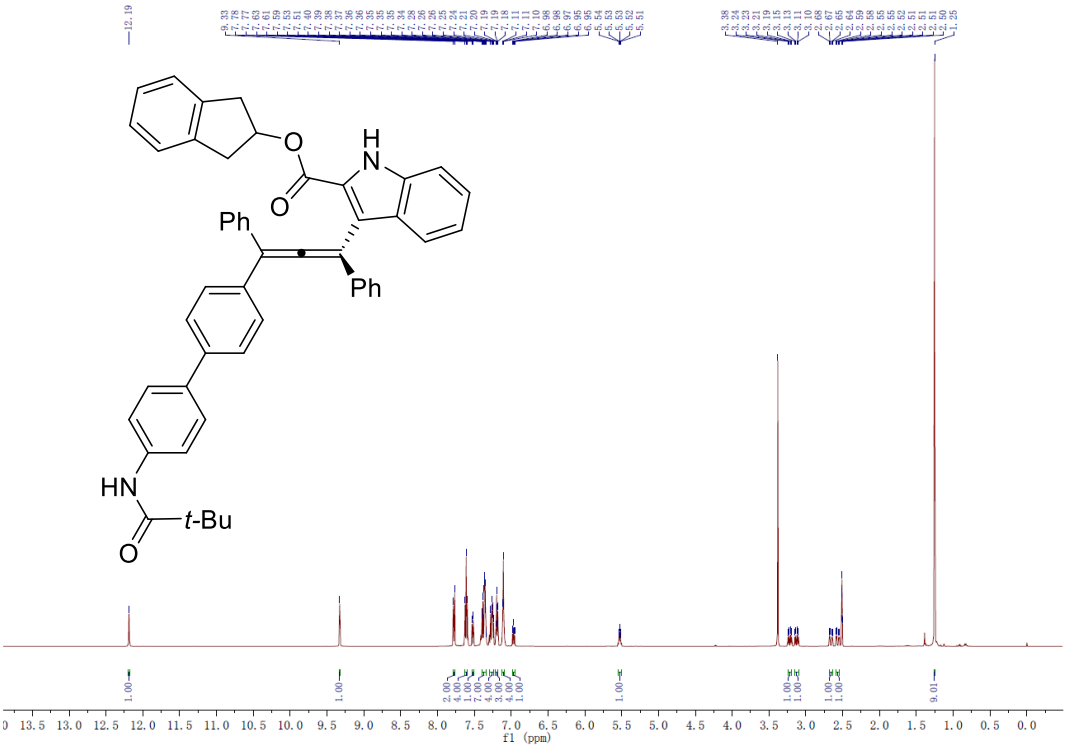


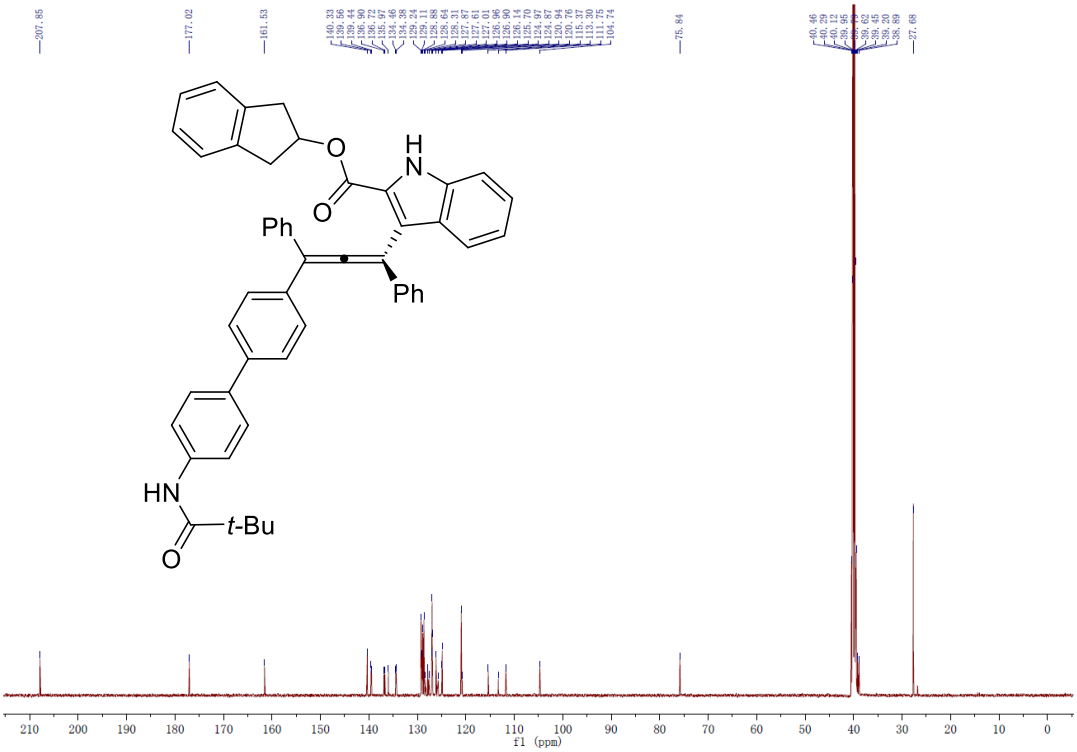
Cyclohexyl 3-(1,3-diphenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3bb)



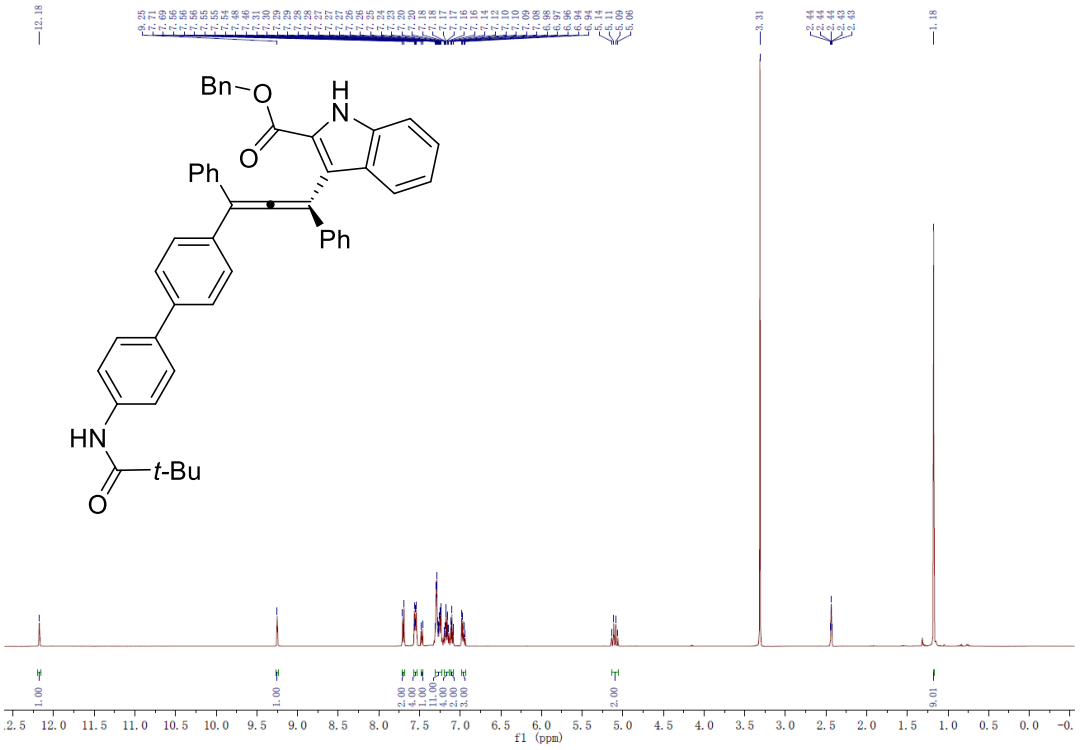


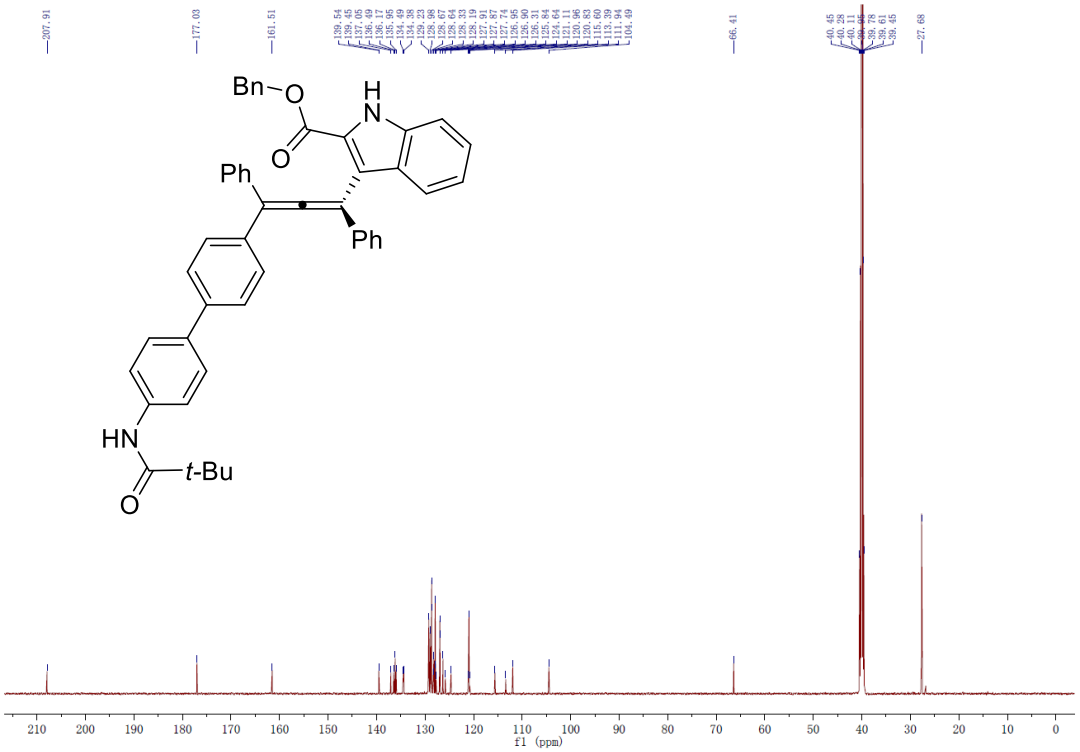
2,3-Dihydro-1*H*-inden-2-yl 3-(1,3-diphenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl) propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3bc)



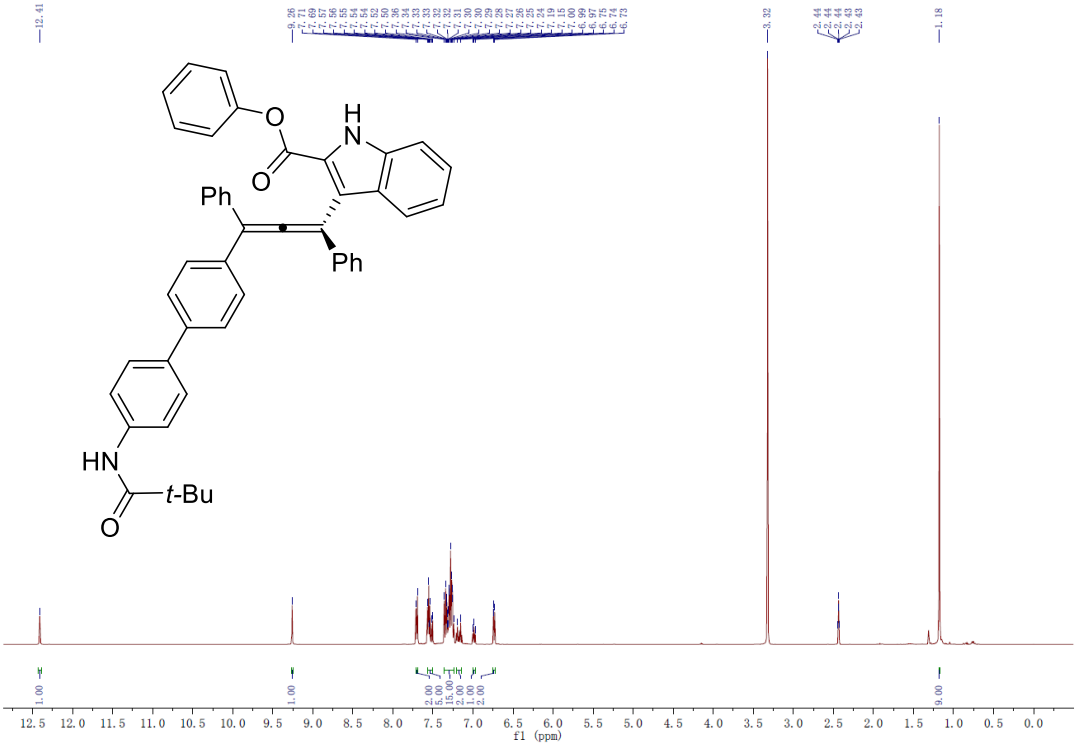


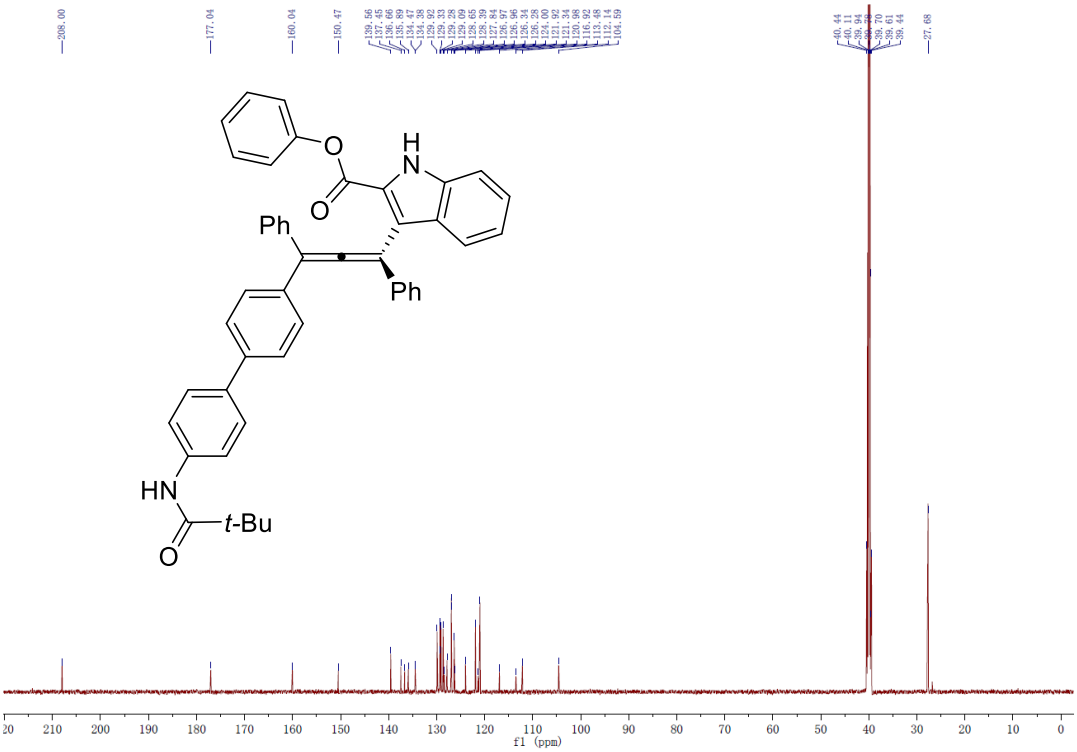
Benzyl 3-(1,3-diphenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl) -1*H*-indole-2-carboxylate (3bd)



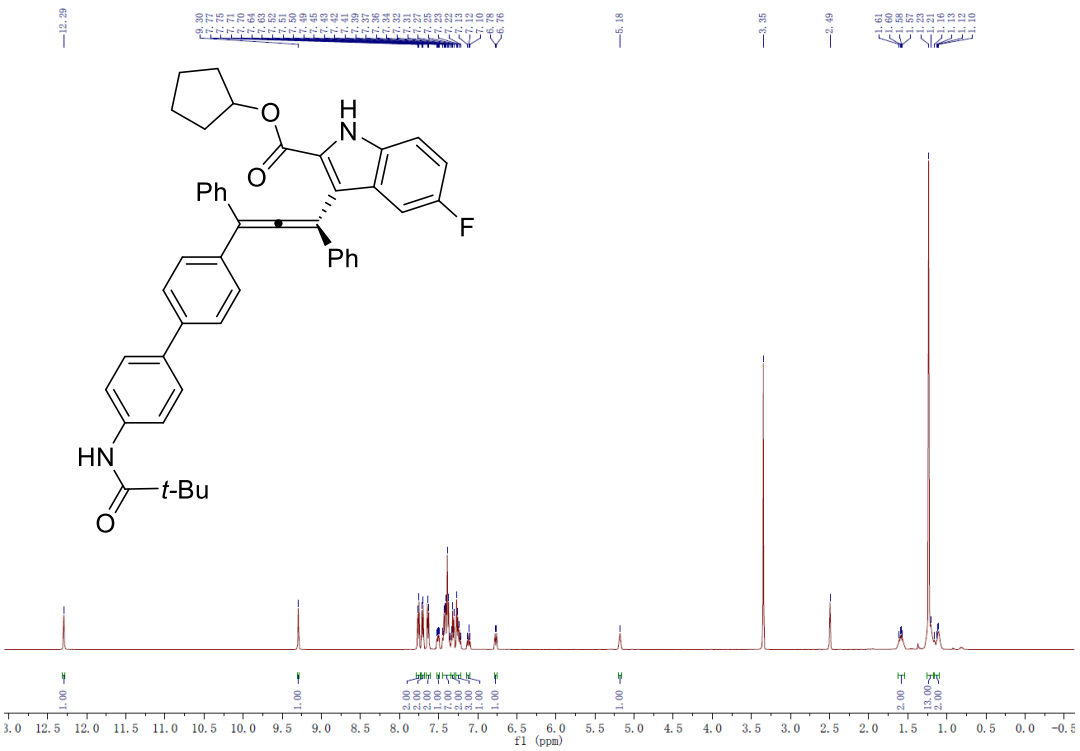


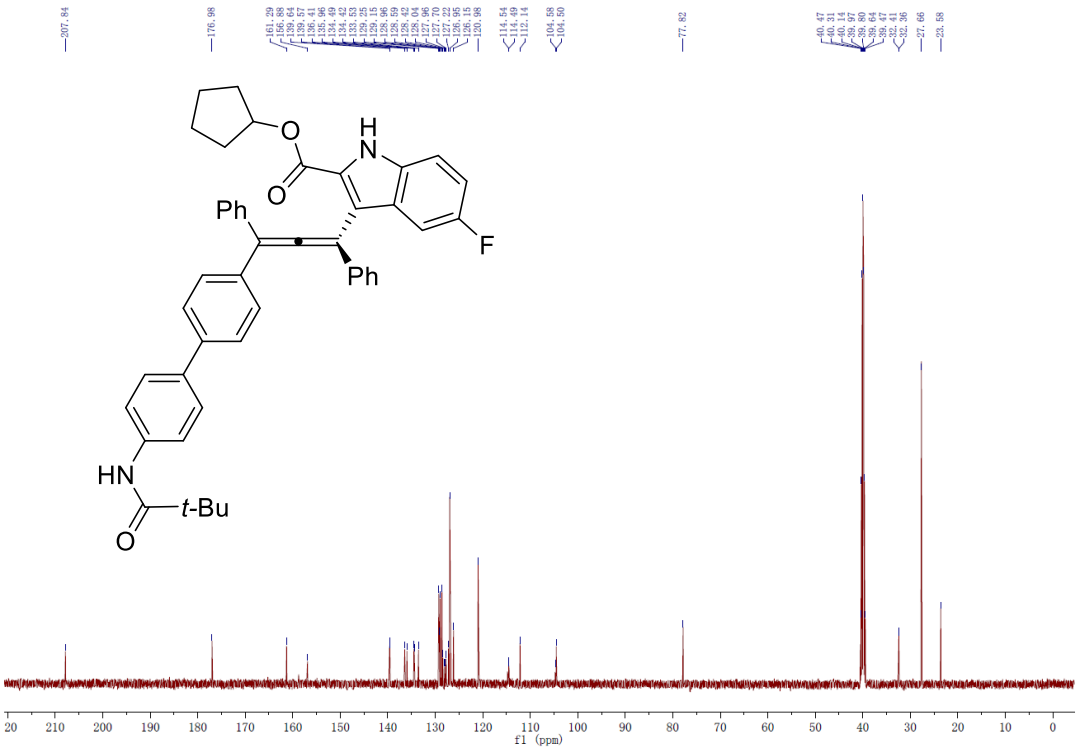
Phenyl 3-(1,3-diphenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl) -1*H*-indole-2-carboxylate (3be)



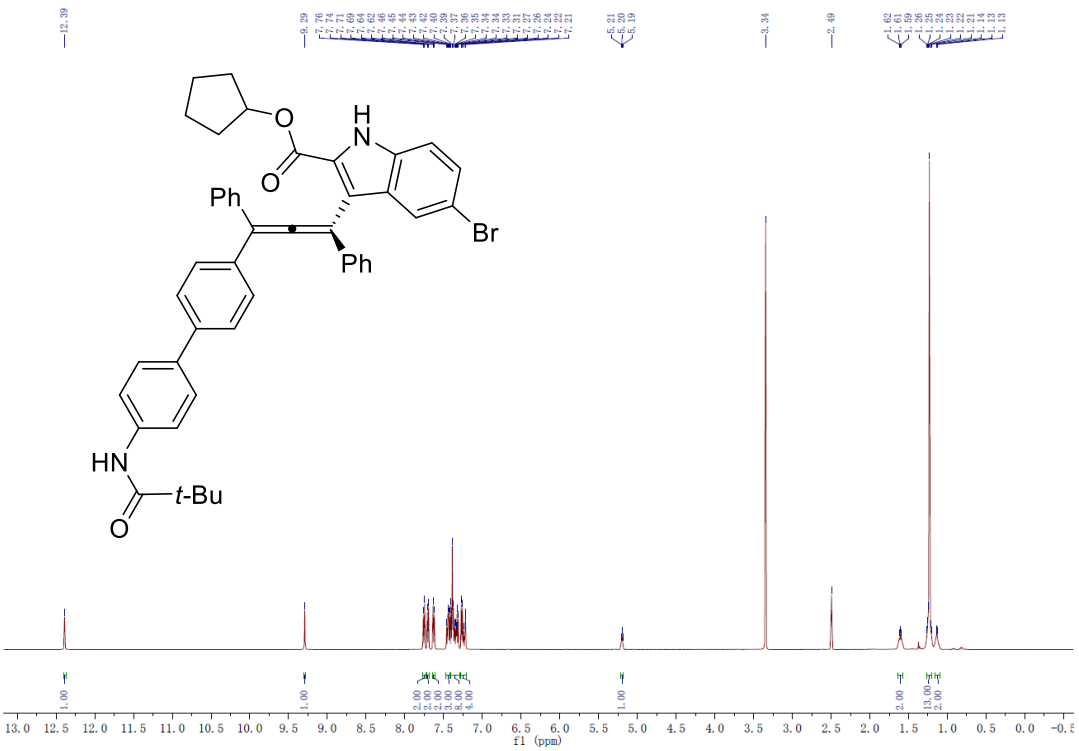


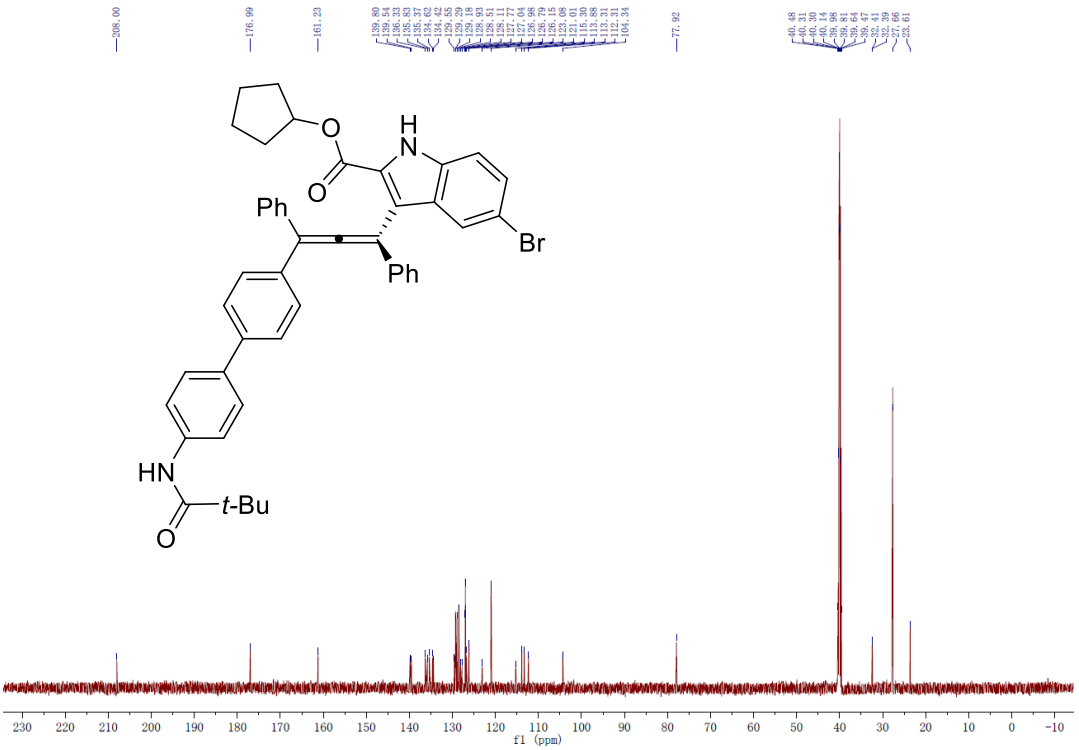
Cyclopentyl 3-(1,3-diphenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl)-5-fluoro-1*H*-indole-2-carboxylate (3bf)



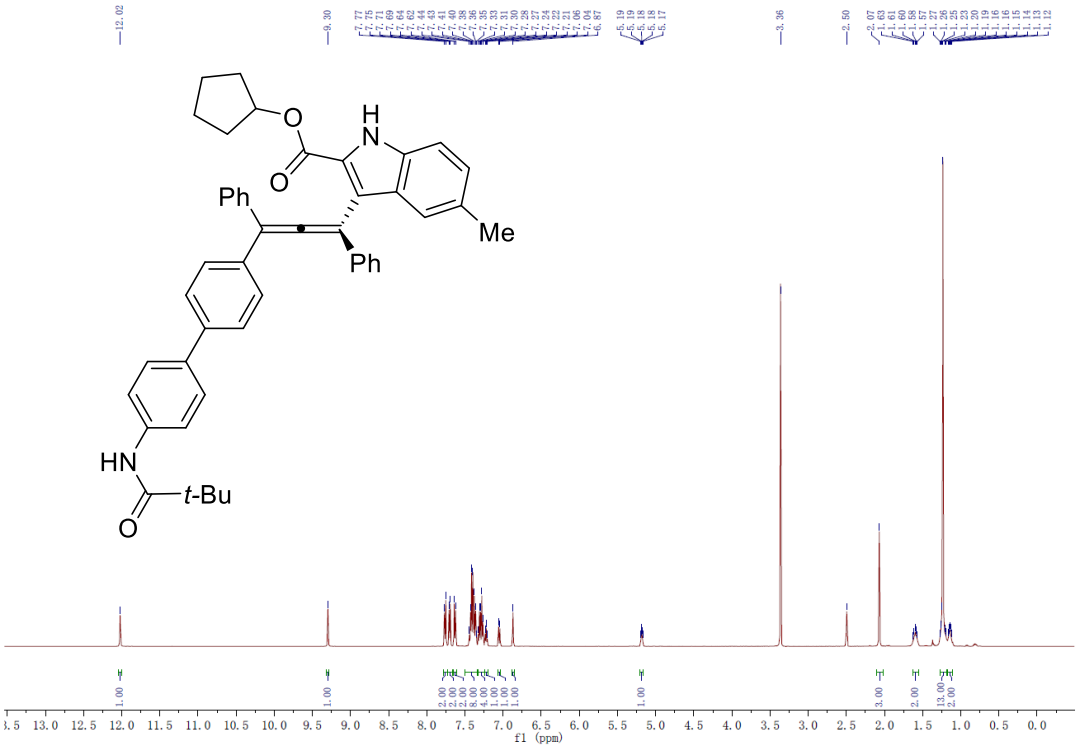


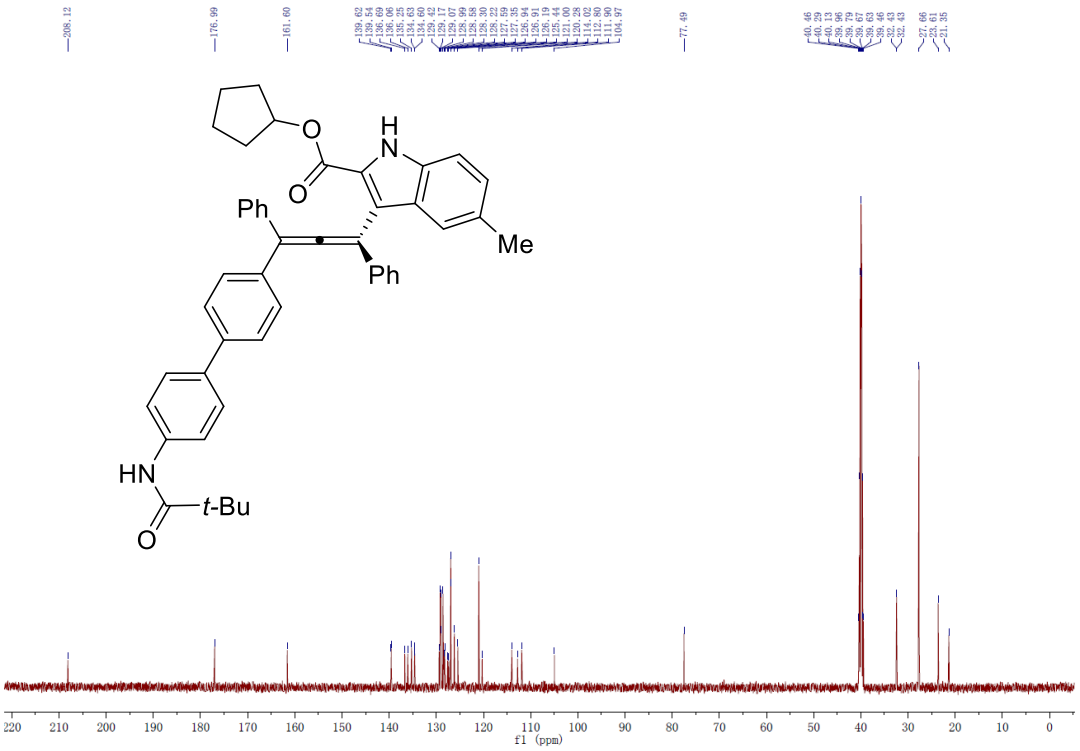
Cyclopentyl 3-(1,3-diphenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl)-5-methyl-1*H*-indole-2-carboxylate (3bg)



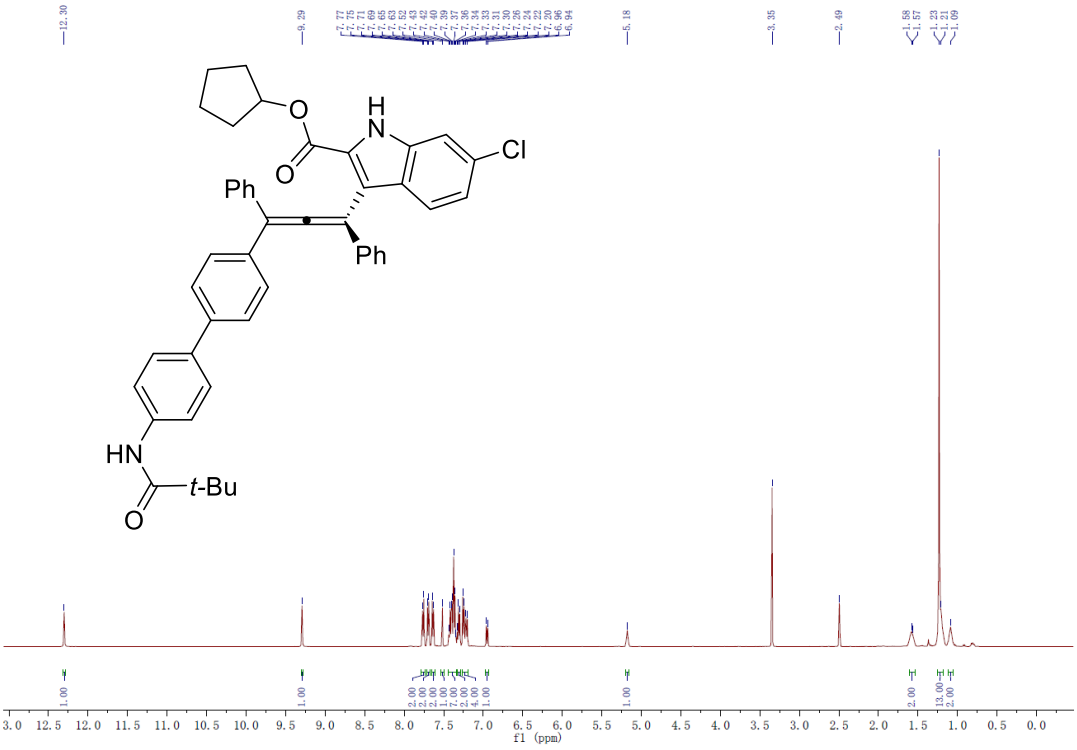


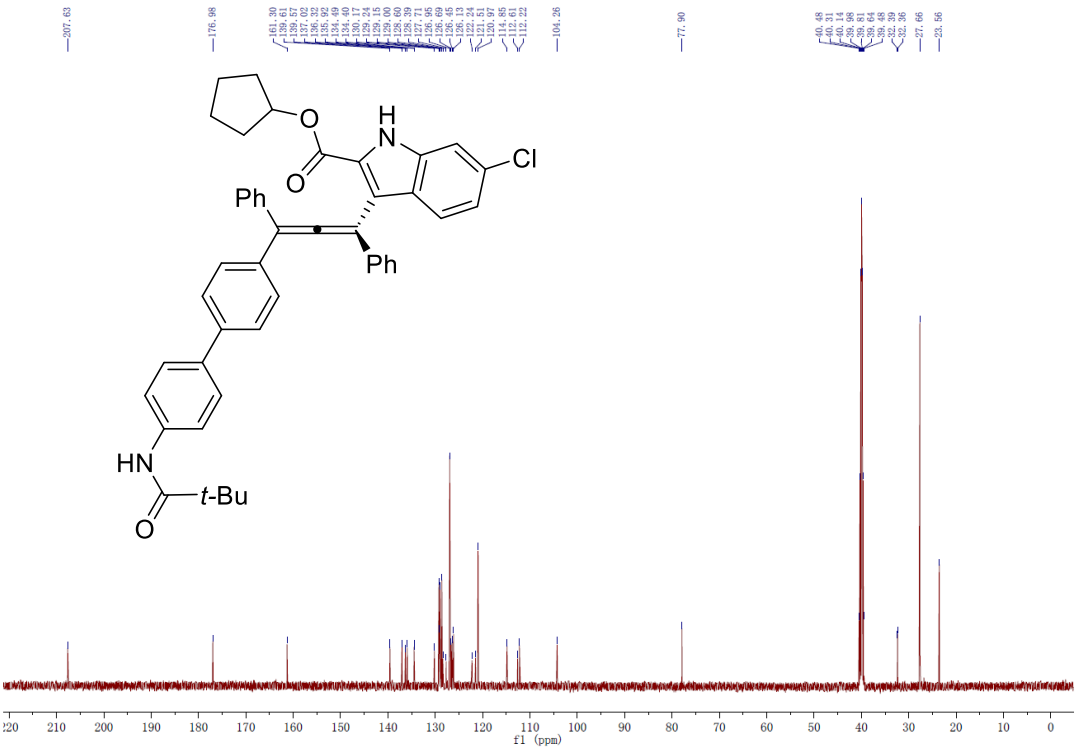
Cyclopentyl 3-(1,3-diphenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl)-5-methyl-1*H*-indole-2-carboxylate (3bh)



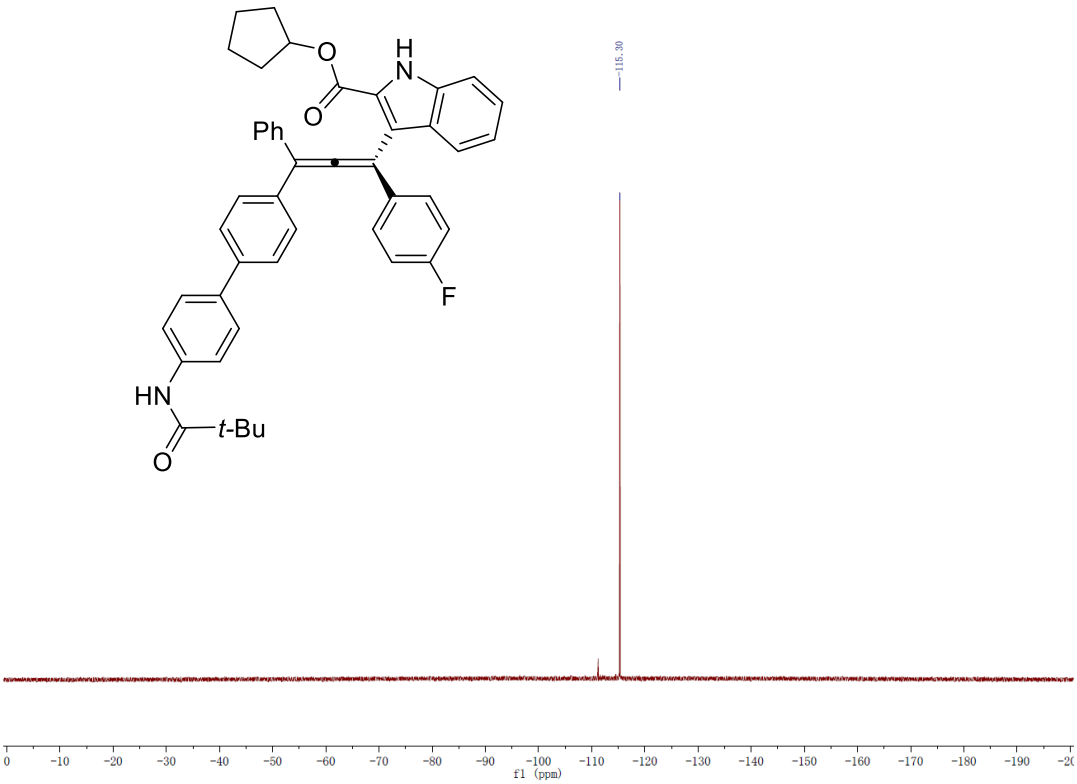


Cyclopentyl 6-chloro-3-(1,3-diphenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)prop a-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3bi)

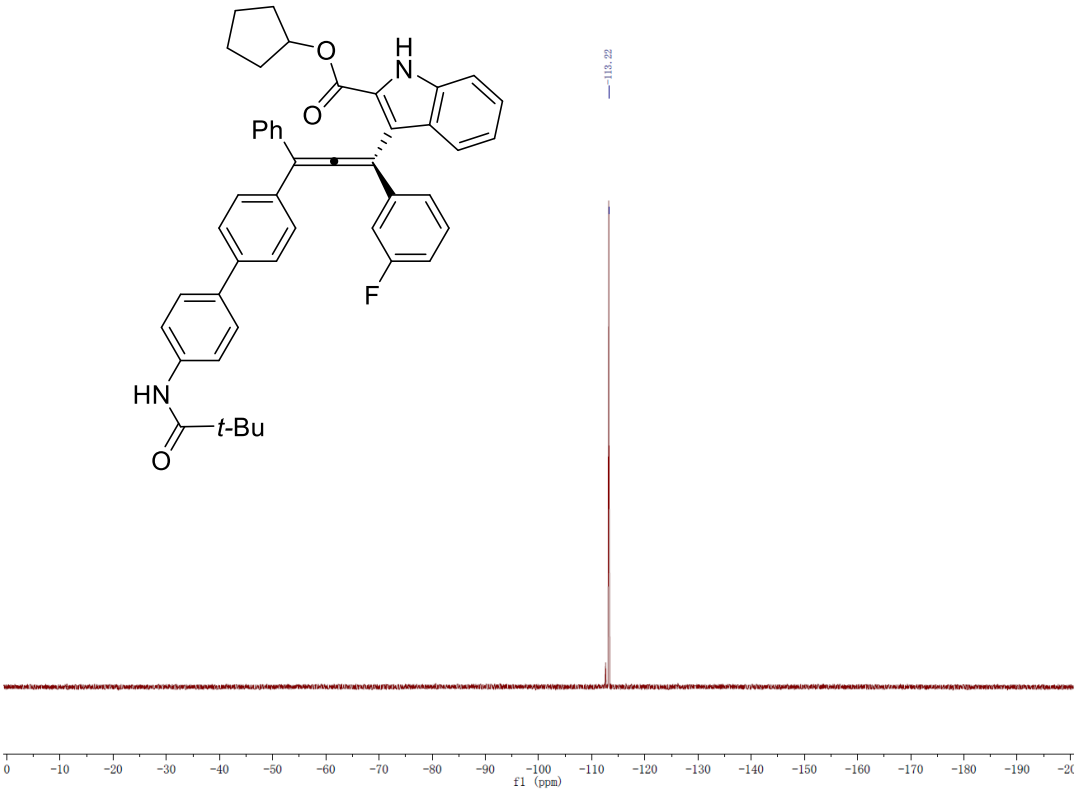




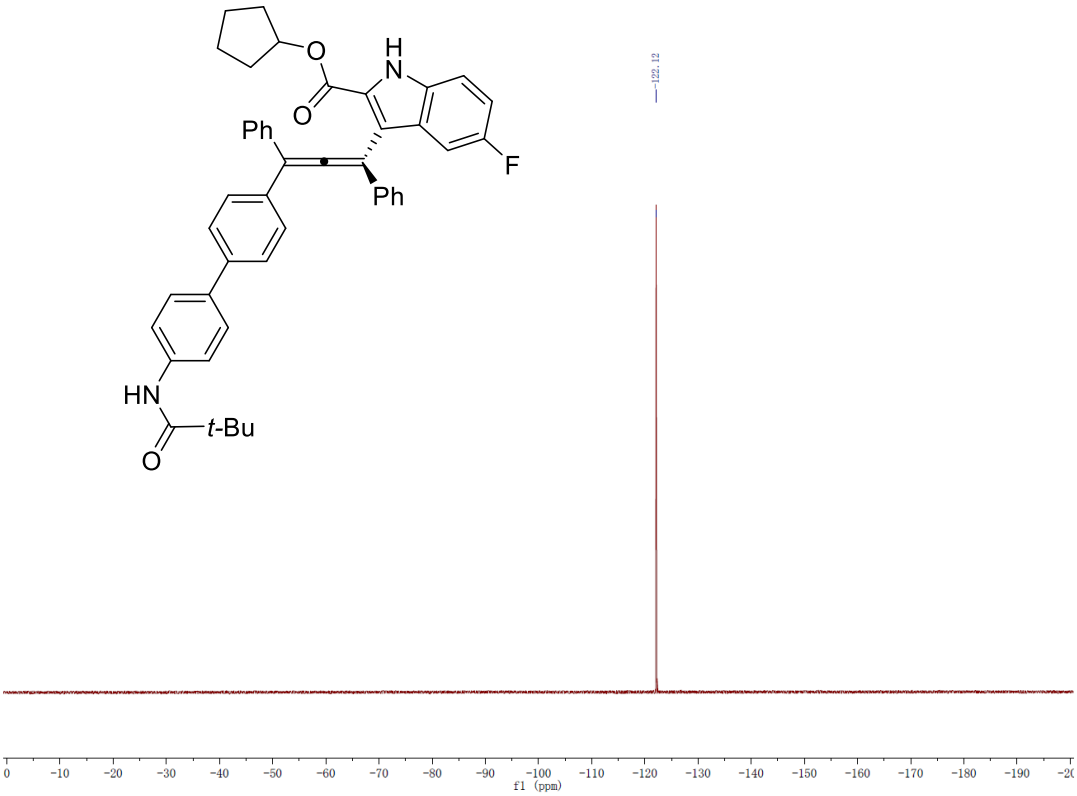
Cyclopentyl 3-(1-(4-fluorophenyl)-3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl) propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3ea)



Cyclopentyl 3-(1-(4-fluorophenyl)-3-phenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl) propa-1,2-dien-1-yl)-1*H*-indole-2-carboxylate (3ia)



Cyclopentyl 3-(1,3-diphenyl-3-(4'-pivalamido-[1,1'-biphenyl]-4-yl)propa-1,2-dien-1-yl)-5-fluoro-1*H*-indole-2-carboxylate (3bf)



I: Reference

1. C. H. Tang, Y. Z. Yuan, N. Jiao, *Org. Lett*. **2015**, *17*, 2206-2209.
2. L. Guo, A. Chatupheeraphat, M, Rueping. *Angew. Chem. Int. Ed*. **2016**, *55*, 11810-11813.
3. X. Li, J. Sun, *Angew. Chem. Int. Ed*. **2020**, *59*, 17049-17054.

J: Determination of the Absolute Configuration.

The absolute configuration of **3ba** was determined by ECD. Conformations of **(*S*)-3ba** was searched using Grimme's programs xTB 6.3. Next, Conformers within 2 kcal/mol were conducted at the M06-2X/6-31+G(d) level in DCM solvent by a self-consistent reaction field (SCRF) using the SMD implicit solvent model with *Gaussian 16*. Then, conformers with distinct conformations were further subjected to TD-DFT calculation at the M06-2X/6-31+G(d) level in DCM solvent as aforementioned for dipole and rotational strengths of the first 20 excited states in the UV range. Next, ECD spectra of **(*S*)-3ba** were calculated from excitation energies and rotational strengths as averages weighed on Boltzmann conformer relative populations as a sum of Gaussian functions centered at the wavelength of each transition with appropriate widths of the band at half-height using SpecDis (version 1.71), respectively.

Samples of compound **3ba** for ECD were dissolved in DCM solvent, and spectra were acquired in a 1.0-mm pathlength cuvette, respectively. The UV and ECD spectra were recorded using a Chirascan Spectrophotometer with the following instrumental parameters: 230-400 nm with a 1 nm step and a 2 nm bandwidth with data averaging over 1.0 sec per point. Three spectral acquisitions were taken for each sample and were averaged and smoothed thereafter.

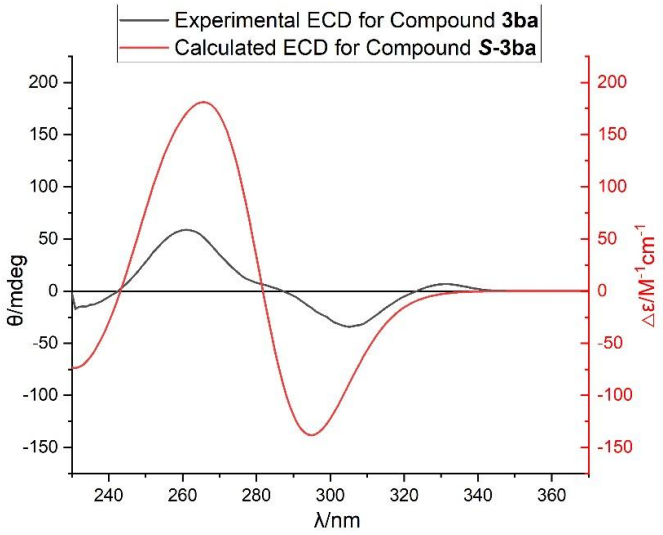


Figure S1. Comparison of the calculated ECD of compound (*S*)-3ba with the experimental one of compound 3fa. Width of the band at half-height σ: 0.25 eV; Shift: 0 nm.

The calculated spectrum for **(*S*)-3ba** was same to the experimental one, and thus, the absolute configuration of compound **3ba** was assigned to ***S*** accordingly. The absolute configurations of other chiral products were assigned by analogue to that of **3ba**.

Table S1. Energies of calculated conformers of (*S*)-3ba. Energies (E) (in Hartree) of the structures calculated at the SMD$_{(DCM)}$/M06-2X/6-31+G(d) level of theory.

Structure (*S*)-3ba	$E_{(solv\text{-}M06\text{-}2X)}$	$G_{(corr\text{-}solv\text{-}M06\text{-}2X)}$	$G_{(solv\text{-}M06\text{-}2X)}$	Boltzmann distribution(%)
conformer-1	-2112.641429	0.690543	-2111.950886	99.72%
conformer-2	-2112.63522	0.686488	-2111.948732	0.14%
conformer-3	-2112.635202	0.688427	-2111.946775	0.14%
conformer-4	-2112.63245	0.69127	-2111.94118	0.01%

Cartesian coordinates for DFT-optimized structures for conformers of (*S*)-3fa

(*S*)-3fa-conformer-1

C	3.81806900	-1.66985300	-1.79240800
C	4.15529700	-0.58376600	-1.00807100
C	5.22361700	-0.45376200	-3.03627900
C	6.05297800	0.05900000	-4.04706600
C	6.70296100	1.25179200	-3.78604800
C	6.54323800	1.93221800	-2.55325900
C	5.72786500	1.42558700	-1.55856700
C	5.05420000	0.21050300	-1.79449100
H	6.17337500	-0.46138000	-4.99277700
H	7.35109600	1.68027400	-4.54536400
H	7.07150300	2.86774000	-2.39401900
H	5.60083200	1.94916300	-0.61372900
N	4.45921000	-1.58700100	-3.00589600
H	4.35254000	-2.26391500	-3.75338900
C	2.87967000	-2.77810800	-1.55274400
O	2.55017300	-3.56719800	-2.41976100
O	2.45765800	-2.79284900	-0.29382300
C	1.42932400	-3.73985600	0.09299600
C	0.07803400	-3.03081600	-0.01165300
C	1.62975200	-4.02360400	1.59345700
H	1.52259500	-4.62066500	-0.54324000
C	0.02106800	-2.21666200	1.28530400
H	-0.71794400	-3.78681800	-0.01705100
H	-0.00371600	-2.43874100	-0.92956700
C	0.53239400	-3.21863000	2.32985300
H	1.55404200	-5.09602300	1.79437100
H	2.63517600	-3.70150600	1.88611200
C	3.64861900	-0.24317700	0.34888700
C	2.86310500	0.80812100	0.45768100
C	2.04488300	1.83715900	0.54527000
C	4.04289300	-1.05671600	1.53541500
C	5.11039500	-1.95852400	1.45757000

H	5.65479100	-2.07002900	0.52352000
C	4.78439600	-2.59004600	3.77048900
H	5.06864800	-3.18525600	4.63372800
C	3.71825000	-1.69166900	3.85548100
H	3.16574400	-1.58728100	4.78556100
C	3.34957600	-0.93355800	2.74756600
H	2.50823800	-0.24674600	2.81699500
C	2.55930400	3.20724000	0.83421400
C	3.72241200	3.38378300	1.59683700
C	1.90368000	4.33699400	0.32788100
C	4.22635900	4.66008400	1.83547000
H	4.22621700	2.51302300	2.01126400
C	2.40946600	5.61414000	0.56732200
H	1.00149500	4.21661300	-0.26622000
C	3.57178400	5.78057100	1.32045800
H	5.12704900	4.78004300	2.43125200
H	1.89421100	6.48016400	0.16108800
H	3.96277900	6.77647600	1.50895700
C	5.47865000	-2.71858600	2.56754800
H	6.30990200	-3.41406700	2.48923800
C	0.58104000	1.60099100	0.36177800
C	0.12027500	0.75941800	-0.65697800
C	-0.35498000	2.17142100	1.23353800
C	-1.23643000	0.48201400	-0.79201700
H	0.83442600	0.32446800	-1.35327400
C	-1.71049000	1.88519900	1.10337700
H	-0.01822600	2.82453800	2.03511800
C	-2.17619700	1.03280000	0.09068200
H	-1.56993800	-0.15712100	-1.60585900
H	-2.41352800	2.30961200	1.81545500
C	-3.61975100	0.71411200	-0.03626700
C	-4.04512100	-0.56136400	-0.43815300
C	-4.60493900	1.66739200	0.24452500
C	-5.39432900	-0.86262200	-0.55193700
H	-3.31285500	-1.33768800	-0.64660000
C	-5.96474600	1.38178700	0.13472400
H	-4.31142400	2.67180300	0.53941700
C	-6.37258600	0.10285100	-0.26734000

H	-5.70222800	-1.85991600	-0.85870000
H	-6.69888000	2.14497800	0.35076800
H	-0.28617300	-3.88506600	2.62685100
H	-0.97743800	-1.82771100	1.51017300
H	0.70707700	-1.36132800	1.21089500
H	0.90897300	-2.73478100	3.23590900
N	-7.71352300	-0.29399700	-0.40744200
C	-8.85454700	0.44370300	-0.23302600
O	-8.83259100	1.62178100	0.10246900
C	-10.16337300	-0.31814700	-0.49987000
C	-10.25607500	-1.54682000	0.41978000
H	-9.49297300	-2.30018700	0.19530100
H	-10.15680600	-1.26024000	1.47280800
H	-11.23412400	-2.02276000	0.28685300
C	-11.33779900	0.61797200	-0.21335900
H	-12.27683200	0.08771200	-0.40533800
H	-11.33516300	0.95150500	0.82905800
H	-11.30378600	1.50552300	-0.85227300
C	-10.20931600	-0.75703100	-1.97318000
H	-10.10554100	0.10358900	-2.64353500
H	-9.42283700	-1.47934200	-2.21814700
H	-11.17402500	-1.23490500	-2.17795400
H	-7.83523100	-1.26185000	-0.68370900

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C	-3.66996800	1.69405500	-0.27065100
C	-4.29585700	0.57479600	0.24350300
C	-5.85775600	2.01251900	-0.63372700
C	-7.11679500	2.50992500	-1.00652900
C	-8.21792300	1.72510200	-0.71454200
C	-8.08467300	0.47085800	-0.07012500
C	-6.84341800	-0.01624600	0.29680500
C	-5.70328900	0.76472500	0.01917400
H	-7.21617000	3.46985600	-1.50494100
H	-9.20885500	2.07661000	-0.98785300
H	-8.97595400	-0.11428200	0.13689000
H	-6.74512600	-0.98021500	0.78980800

N	-4.61140200	2.54927400	-0.80050900
H	-4.39681600	3.44209400	-1.22860200
C	-2.23937600	2.05710500	-0.28084700
O	-1.36544900	1.44691700	0.29569500
O	-2.03011900	3.16322600	-1.00776000
C	-0.65878100	3.63711800	-1.08501700
C	-0.25948500	4.34710900	0.22751200
C	-0.63921800	4.71867100	-2.16179900
H	-0.03180500	2.77448400	-1.31878500
C	-0.20022600	5.85522500	-0.10752900
H	0.69408800	3.96562300	0.60311700
H	-1.01341100	4.13982500	0.99366500
C	-1.01195800	5.99544600	-1.40249900
H	0.38548100	4.80390100	-2.54403500
H	-1.29661600	4.47179700	-3.00059400
C	-3.68509000	-0.63891700	0.83934200
C	-2.78658000	-1.31161900	0.15107900
C	-1.90303200	-1.98447100	-0.55749800
C	-4.13899600	-1.09277600	2.18712200
C	-4.70989700	-0.18360800	3.08617400
H	-4.82970300	0.85732400	2.79668500
C	-4.96627900	-1.93337900	4.73665800
H	-5.28824200	-2.25934500	5.72169800
C	-4.40211600	-2.84729300	3.84330200
H	-4.28655500	-3.88913100	4.12948500
C	-3.99485000	-2.43160100	2.57894600
H	-3.56941500	-3.15000000	1.88160100
C	-2.36486300	-3.04093400	-1.50890700
C	-1.59979300	-4.19589400	-1.71926700
C	-3.58672100	-2.90689000	-2.18228900
C	-2.05265000	-5.19782800	-2.57659000
H	-0.65134500	-4.31664300	-1.20227700
C	-4.03779900	-3.90826400	-3.03938800
H	-4.17982000	-2.00663200	-2.03641400
C	-3.27197700	-5.05787100	-3.24011300
H	-1.45093600	-6.09047200	-2.72400800
H	-4.98532000	-3.78621800	-3.55697700
H	-3.62172500	-5.83738300	-3.91112500

C	-5.11840900	-0.60168100	4.35275000
H	-5.55628500	0.11759300	5.03946100
C	-0.44672300	-1.69952300	-0.40273600
C	0.40411300	-1.68781000	-1.51504300
C	0.09375500	-1.40560800	0.85390600
C	1.75384900	-1.38012800	-1.37373200
H	0.00465100	-1.90188900	-2.50334900
C	1.44395000	-1.10441500	0.99519000
H	-0.55186200	-1.42167900	1.72891800
C	2.30006700	-1.08604900	-0.11577900
H	2.38678700	-1.34962800	-2.25692000
H	1.84304800	-0.90620500	1.98655100
C	3.74287800	-0.77525700	0.03811200
C	4.18794000	0.15307400	0.99171300
C	4.71019100	-1.40133100	-0.75613400
C	5.53805500	0.43490600	1.14054400
H	3.46834600	0.67726300	1.61541200
C	6.07057000	-1.13034200	-0.61971900
H	4.40422900	-2.14119400	-1.49145900
C	6.49844000	-0.20357800	0.34031600
H	5.85984400	1.16326100	1.88177100
H	6.79061300	-1.64046100	-1.24366900
H	-0.77941200	6.90865900	-1.95829400
H	0.83686000	6.15613900	-0.29734000
H	-0.58053600	6.47790400	0.70740100
H	-2.08685000	5.99902400	-1.18051100
N	7.84326300	0.13756600	0.56786500
C	8.96960800	-0.34433600	-0.04493100
O	8.92637200	-1.17281300	-0.94652600
C	10.29231200	0.22744800	0.49131800
C	10.44718000	-0.14603200	1.97484200
H	11.42641700	0.19185800	2.33254600
H	9.68455400	0.32410800	2.60551600
H	10.38816100	-1.23111400	2.11617400
C	11.44470900	-0.38118100	-0.30820600
H	11.36246900	-0.13760400	-1.37196800
H	12.39384600	0.01700100	0.06646100
H	11.46372300	-1.47083100	-0.21127000

C	10.31115400	1.75574300	0.32690900
H	11.29198000	2.13861200	0.63065000
H	10.14180700	2.04221700	-0.71715600
H	9.55845700	2.25542900	0.94625100
H	7.98229900	0.82003200	1.30498700

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C	-4.20947000	0.74993900	-1.08454500
C	-3.40773700	1.49583900	-0.24255300
C	-3.88244500	2.69834300	-2.14103600
C	-3.87728700	3.77127900	-3.04673800
C	-3.15789700	4.89729100	-2.68850100
C	-2.45243900	4.96808400	-1.46232200
C	-2.45940200	3.91003100	-0.57168100
C	-3.18959900	2.75191900	-0.90643000
H	-4.41590100	3.71392000	-3.98817700
H	-3.13148200	5.74804500	-3.36362000
H	-1.89812000	5.87085300	-1.22278500
H	-1.91583700	3.96662700	0.36831100
N	-4.48605500	1.47443300	-2.22369000
H	-5.06182200	1.13955100	-2.98719700
C	-4.78832700	-0.59415900	-0.89545900
O	-4.69525000	-1.25398500	0.11668700
O	-5.44615600	-0.98951100	-1.99393700
C	-6.09045200	-2.29009400	-1.93216900
C	-6.52857300	-2.61677100	-3.35697100
C	-7.39196400	-2.20520400	-1.10515800
H	-5.36216200	-2.99349100	-1.52405100
C	-7.90056200	-1.94664900	-3.47673900
H	-6.64141800	-3.70475500	-3.44069800
H	-5.79031200	-2.29198300	-4.09603900
C	-8.54993000	-2.28342300	-2.12721000
H	-7.43578800	-3.00940900	-0.36547200
H	-7.40928100	-1.25985400	-0.55367600
C	-2.81349800	1.10903800	1.06090500
C	-2.03567800	0.04885800	1.12373500
C	-1.24410600	-1.00336000	1.16685400

C	-3.07487800	1.96279200	2.25737600
C	-4.19852100	2.79728500	2.30062100
H	-4.88020500	2.82788200	1.45448200
C	-3.59047500	3.54955200	4.51777000
H	-3.78859200	4.16420300	5.39135200
C	-2.46459400	2.72317100	4.48005700
H	-1.78030200	2.69542300	5.32368200
C	-2.20707900	1.93957400	3.35901300
H	-1.32140500	1.30860300	3.32908100
C	-1.80435700	-2.34527900	1.50886500
C	-1.38202800	-3.48926500	0.81936800
C	-2.78117200	-2.47362200	2.50294000
C	-1.93588400	-4.73465100	1.11154900
H	-0.62544400	-3.40239600	0.04324300
C	-3.33102100	-3.71926100	2.79847500
H	-3.10954200	-1.58871300	3.04318400
C	-2.91112000	-4.85397400	2.10296100
H	-1.60509200	-5.61246000	0.56307700
H	-4.08714600	-3.80360900	3.57430700
H	-3.33893600	-5.82570800	2.33372900
C	-4.45482800	3.58310100	3.42444900
H	-5.33342800	4.22218400	3.44239800
C	0.21389100	-0.84759800	0.88494700
C	0.67116500	0.13805400	-0.00005500
C	1.16151000	-1.65769200	1.52374100
C	2.03082300	0.31377800	-0.23176000
H	-0.04970600	0.76164100	-0.52440900
C	2.52232000	-1.47928800	1.29212600
H	0.83577500	-2.42274500	2.22361200
C	2.98352100	-0.49145600	0.41053800
H	2.35433200	1.06914700	-0.94340300
H	3.23641700	-2.10298000	1.82389100
C	4.43454200	-0.30495000	0.16353500
C	4.97560300	0.97181900	-0.05043400
C	5.31378700	-1.39336600	0.13783400
C	6.33336100	1.14537300	-0.27523300
H	4.33071500	1.84622400	-0.01999600
C	6.68029200	-1.23723700	-0.08771000

H	4.92638600	-2.39939300	0.27775300
C	7.20507100	0.04536900	-0.29629500
H	6.73178800	2.14573400	-0.42980100
H	7.32878000	-2.10156700	-0.10848600
H	-8.94885300	-3.30399400	-2.16316000
H	-8.47991900	-2.30463200	-4.33296000
H	-7.77857700	-0.86096700	-3.58133000
H	-9.37713000	-1.61526100	-1.87094900
N	8.56548300	0.31781900	-0.52383200
C	9.61138200	-0.55955400	-0.64035700
O	9.46644800	-1.77262700	-0.54793300
C	10.97886800	0.09300500	-0.90247600
C	10.94406100	0.83628300	-2.24861500
H	11.94168000	1.23324300	-2.46797500
H	10.65897700	0.16082300	-3.06306300
H	10.24576600	1.68039000	-2.24350100
C	11.32083500	1.06891600	0.23526700
H	12.33046200	1.46545600	0.07989000
H	10.63526400	1.92220100	0.27748400
H	11.29856500	0.56324000	1.20717100
C	12.03984000	-1.00655900	-0.96026300
H	12.08913000	-1.56143200	-0.01824100
H	11.83028300	-1.71999600	-1.76287800
H	13.01918300	-0.55260100	-1.14657000
H	8.78325700	1.30408600	-0.61739500

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C	-4.26278000	0.82895100	-1.42215200
C	-3.62603900	1.66218700	-0.52160200
C	-4.11480500	2.81479200	-2.44799800
C	-4.18409700	3.88709300	-3.35171400
C	-3.63774900	5.09158100	-2.94657500
C	-3.02952600	5.23877800	-1.67613500
C	-2.96479900	4.18145100	-0.78689900
C	-3.52221500	2.94359700	-1.16716600
H	-4.64568400	3.76899900	-4.32781900
H	-3.67181100	5.94425300	-3.61891800

H	-2.60776700	6.20092500	-1.40038900
H	-2.49508300	4.30008500	0.18617000
N	-4.54618800	1.52370400	-2.57679800
H	-5.02697000	1.12907900	-3.37669900
C	-4.65578300	-0.58842800	-1.28273700
O	-4.62487400	-1.21124100	-0.24484000
O	-5.06387000	-1.08224700	-2.45957700
C	-5.47975100	-2.46990600	-2.54385100
C	-6.61897400	-2.86711600	-1.57425200
C	-4.32609600	-3.46005000	-2.30067800
H	-5.82382200	-2.52899900	-3.57753200
C	-6.04175400	-3.99737700	-0.70829300
H	-7.46219900	-3.23998900	-2.16611000
H	-6.97704300	-2.01369900	-0.99255000
C	-5.00974300	-4.65867000	-1.63108800
H	-3.80314100	-3.71167900	-3.22775300
H	-3.60326000	-3.01884600	-1.60601800
C	-3.06535100	1.32195100	0.80800700
C	-2.27307700	0.27710800	0.92900500
C	-1.48565000	-0.77368400	1.03212800
C	-3.38774000	2.18905400	1.97983500
C	-4.57476800	2.93123600	2.00909200
H	-5.25989800	2.88535700	1.16629000
C	-4.01817900	3.78562300	4.20290700
H	-4.26102200	4.40471600	5.06196100
C	-2.82987200	3.05207000	4.17865100
H	-2.14163600	3.10064600	5.01809900
C	-2.51573200	2.26328400	3.07539300
H	-1.58232000	1.70495100	3.05376700
C	-2.07060000	-2.10456000	1.37817300
C	-1.65586600	-3.25840600	0.70149600
C	-3.06467400	-2.21150200	2.35715000
C	-2.23662600	-4.49288600	0.98872600
H	-0.88589300	-3.18760400	-0.06339800
C	-3.64056100	-3.44633500	2.64922000
H	-3.38770200	-1.31801100	2.88648600
C	-3.23065700	-4.59096800	1.96365400
H	-1.91306300	-5.37835500	0.44788000

H	-4.41193900	-3.51429700	3.41165200
H	-3.68275000	-5.55355000	2.18754900
C	-4.88765300	3.72236800	3.11441800
H	-5.81442700	4.28950300	3.12279200
C	-0.01627100	-0.63557900	0.80862700
C	0.48781400	0.33658500	-0.06595800
C	0.89543200	-1.45201300	1.49007000
C	1.85750200	0.49254900	-0.24681000
H	-0.20408700	0.96472700	-0.62295800
C	2.26639100	-1.29283400	1.30979600
H	0.53310300	-2.20713000	2.18269600
C	2.77431700	-0.31937300	0.43815700
H	2.21791300	1.23683400	-0.95232200
H	2.95113700	-1.92084600	1.87389100
C	4.23611500	-0.15582000	0.24373300
C	4.80341500	1.11033200	0.03439900
C	5.09978800	-1.25687300	0.26359400
C	6.17091400	1.26185400	-0.14262900
H	4.17104400	1.99439100	0.03113600
C	6.47564500	-1.12296400	0.08625200
H	4.69289200	-2.25550700	0.40135100
C	7.02652600	0.14918200	-0.11886600
H	6.58911000	2.25474600	-0.29386800
H	7.11168000	-1.99655700	0.09936800
H	-5.51980200	-5.27373700	-2.38473400
H	-6.81066800	-4.69232700	-0.35647600
H	-5.53075200	-3.57378100	0.16323800
H	-4.30121900	-5.30058700	-1.09814100
N	8.39813300	0.39826700	-0.30113300
C	9.43542000	-0.49495200	-0.36085200
O	9.27080700	-1.70381600	-0.24839900
C	10.82040700	0.13455400	-0.58501700
C	10.84542000	0.85473800	-1.94366400
H	11.85645700	1.23253300	-2.13346200
H	10.57888400	0.17014800	-2.75676600
H	10.16139400	1.70967300	-1.97726100
C	11.13365400	1.12680000	0.54675200
H	12.15473200	1.50488000	0.42337800

H	10.46075000	1.99109500	0.54551400
H	11.06571300	0.64074100	1.52651300
C	11.86761800	-0.97959500	-0.58484700
H	11.87575000	-1.51772900	0.36803300
H	11.67701200	-1.70474200	-1.38171000
H	12.85901800	-0.54183500	-0.74410300
H	8.63331700	1.37922000	-0.40744800