

α,β -Diaryl Unsaturated Ketones via Palladium-Catalyzed Ring-Opening of Cyclopropenones with Orgnoboronic Acids

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General information

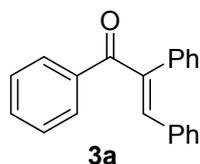
All chemicals were purchased from energy chemical company, sukailu company. All reagents and solvents were purchased from commercial suppliers and used without further purification. Unless otherwise stated, all experiments were conducted in a Schlenk tube under N₂ atmosphere. Reactions were monitored by TLC or GC-MS analysis. Flash column chromatography was performed over silica gel (300-400 mesh). ¹H-NMR and ¹³C-NMR spectra were recorded in CDCl₃ on a Bruker Avance 500 spectrometer (500 MHz ¹H, 125 MHz ¹³C) at room temperature. Chemical shifts were reported in ppm on the scale relative to ¹H-NMR, $\delta = 77.00$ for ¹³C-NMR) as an internal CDCl₃ ($\delta = 7.26$ for reference. High resolution mass spectra were recorded using a Thermo Fisher Scientific LTQ FT Ultra or Waters Micromass GCT Premier instrument. Coupling constants (J) were reported in Hertz (Hz).

General Experimental Procedures:

General Procedure for Palladium-Catalyzed Ring-Opening of Cyclopropanones with Orgnoboronic Acids: In a 25 mL Schlenk tube equipped with a stir bar were placed 2,3-diphenylcycloprop-2-enone (0.2 mmol), phenylboronic acid (0.3 mmol), Pd(PPh₃)₄ (1 mol %), in dioxane (2 mL). The tube was evacuated and refilled with N₂ three times. The reaction mixture was stirred at room temperature for 3 h. After it was cooled, the reaction mixture was diluted with 10 mL of ethyl ether, and filtered through a pad of silica gel, followed by washing the pad of silica gel with the same solvent (20 mL). The filtrate was washed with water (3×15 mL). The organic phase was dried over Na₂SO₄, filtered, and concentrated under reduced pressure. The residue was then purified by flash chromatography on silica gel to provide the corresponding product.

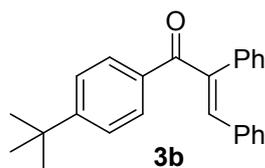
Characterization of Products in Details :

(E)-1,2,3-triphenylprop-2-en-1-one



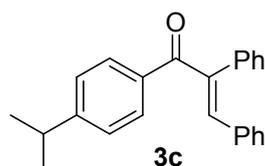
Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a pale-yellow solid (92% yield) , mp 98-99°C. **¹H NMR** (500 MHz, CDCl₃): δ 7.86 (d, *J* = 5.0 Hz, 2H), 7.56-7.53 (m, 1H), 7.46-7.43 (m, 2H), 7.37-7.33 (m, 3H), 7.29-7.28 (m, 2H), 7.24-7.17 (m, 4H), 7.09(d, *J* = 10.0 Hz, 2H); **¹³C NMR** (125 MHz, CDCl₃): δ 197.6, 141.0, 140.1, 138.2, 136.5, 135.0, 132.2, 130.4, 130.0, 129.7, 129.0, 128.8, 128.3, 128.2, 128.0. **HRMS** (ESI): calcd for C₂₁H₁₇O [M+H]⁺: 285.1274, found: 285.1275.

(E)-1-(4-(tert-butyl)phenyl)-2,3-diphenylprop-2-en-1-one



Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a white solid (67% yield) , mp 102-103 °C. **¹H NMR** (500 MHz, CDCl₃): δ 7.84 (d, *J* = 5.0 Hz, 2H), 7.46 (d, *J* = 5.0 Hz, 2H), 7.35-7.27 (m, 5H), 7.21-7.16 (m, 4H), 7.09 (m, 1H) 1.28-1.27 (d, *J* = 5.0 Hz 2H), 1.35(s 9H); **¹³C NMR** (125 MHz, CDCl₃): δ 197.2, 156.0, 141.0, 139.0, 137.0, 135.3, 135.0, 130.2, 130.0, 129.6, 128.7, 128.2, 128.0, 125.3, 35.1, 31.1. **HRMS** (ESI): calcd for C₂₅H₂₅O [M+H]⁺: 341.1900, found: 341.1902.

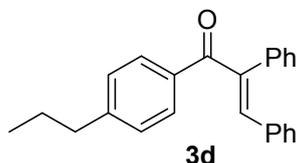
(E)-1-(4-isopropylphenyl)-2,3-diphenylprop-2-en-1-one



Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a white solid (79% yield) , mp 115-116°C. **¹H NMR** (500 MHz, CDCl₃): δ 7.85 (d, *J* = 10.0 Hz, 2H), 7.38-7.30 (m, 7H), 7.24-7.17 (m, 4H), 7.11 (d, *J* = 10.0 Hz, 2H),

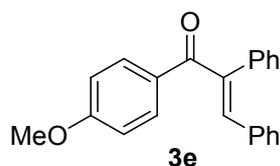
2.99 (dd, $J = 10.0, 5.0$ Hz, 1H), 1.29 (d, $J = 5.0$ Hz, 6H); ^{13}C NMR (125 MHz, CDCl_3): δ 197.3, 154.0, 141.0, 139.0, 137.0, 136.0, 135.0, 130.3, 130.2, 130.0, 129.0, 128.2, 128.0, 127.8, 126.5, 34.25, 23.72. HRMS (ESI): calcd for $\text{C}_{24}\text{H}_{23}\text{O}$ $[\text{M}+\text{H}]^+$: 327.1744, found 327.1445.

(E)-1-(phenanthren-9-yl)-2,3-diphenylprop-2-en-1-one



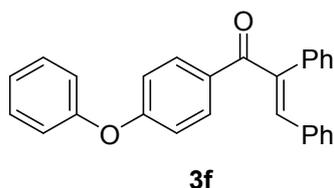
Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a yellow liquid (74% yield), ^1H NMR (500 MHz, CDCl_3): δ 7.82 (d, $J = 5.0$ Hz, 2H), 7.36-7.32 (m, 3H), 7.30-7.29 (m, 2H), 7.22-7.20 (m, 2H), 7.20-7.17 (m, 4H), 7.10 (d, $J = 5.0$ Hz, 2H), 2.65 (t, $J = 5.0$ Hz, 2H), 1.68 (dd, $J = 10.0, 5.0$ Hz, 2H), 0.98-0.95 (m, 3H); ^{13}C NMR (125 MHz, CDCl_3): δ 197.3, 148.0, 141.3, 139.0, 137.0, 136.0, 135.0, 130.3, 130.1, 130.0, 129.0, 128.4, 128.2, 128.0, 127.2, 38.1, 24.2, 14.0. HRMS (ESI): calcd for $\text{C}_{24}\text{H}_{23}\text{O}$ $[\text{M}+\text{H}]^+$: 327.1744, found 327.1745.

(E)-1-(4-methoxyphenyl)-2,3-diphenylprop-2-en-1-one



Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a yellow liquid (75% yield). ^1H NMR (500 MHz, CDCl_3): δ 8.18 (d, $J = 10.0$ Hz, 1H), 8.01 (d, $J = 10.0$ Hz, 1H), 7.95-7.94 (m, 1H), 7.61-7.53 (m, 3H), 7.42-7.37 (m, 3H), 7.25-7.20 (m, 2H), 7.11-7.08 (m, 1H), 7.00 (s, 1H), 6.86 (d, $J = 10.0$ Hz, 1H), 3.72 (s, 3H). ^{13}C NMR (125 MHz, CDCl_3): δ 196.2, 163.1, 141.0, 137.7, 136.8, 135.1, 132.3, 130.5, 130.1, 129.6, 128.7, 128.6, 128.2, 127.8, 113.6, 55.5. HRMS (ESI): calcd for $\text{C}_{22}\text{H}_{19}\text{O}_2$ $[\text{M}+\text{H}]^+$: 315.1380, found: 315.1381.

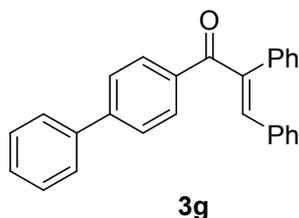
(E)-1-(4-phenoxyphenyl)-2,3-diphenylprop-2-en-1-one



Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a pale-yellow solid (76% yield), mp 123-124 °C. ^1H NMR (500 MHz, CDCl_3): δ 7.89 (d, $J = 5.0$ Hz, 2H), 7.42-7.38 (m, 2H), 7.35-7.32 (m, 3H), 7.30-7.28 (m, 2H),

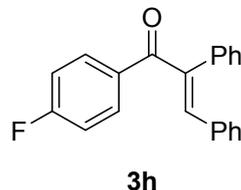
7.22-7.17 (m, 5H), 7.12-7.08 (m, 4H), 6.99 (d, $J = 10.0$ Hz, 2H); ^{13}C NMR (125 MHz, CDCl_3): δ 196.2, 161.5, 155.5, 141.0, 138.4, 137.0, 135.0, 132.3, 132.2, 130.2, 130.0, 129.6, 129.0, 128.7, 128.2, 128.0, 124.5, 120.2, 117.2. **HRMS** (ESI): calcd for $\text{C}_{27}\text{H}_{21}\text{O}_2$ $[\text{M}+\text{H}]^+$: 377.1536, found: 377.1534.

(E)-1-([1,1'-biphenyl]-4-yl)-2,3-diphenylprop-2-en-1-one



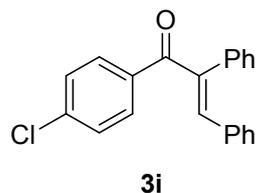
Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a yellow liquid (84% yield). ^1H NMR (500 MHz, CDCl_3): δ 8.47 (s, 1H), 8.21-8.19 (m, 1H), 8.01-7.99 (m, 1H), 7.54-7.51 (m, 1H), 7.40-7.32 (m, 3H), 7.29-7.27 (m, 3H), 7.24-7.17 (m, 3H), 7.09 (d, $J = 10.0$ Hz, 2H); ^{13}C NMR (125 MHz, CDCl_3): δ 197.1, 145.0, 141.0, 140.0, 139.5, 137.0, 136.6, 136.0, 135.0, 130.4, 130.3, 130.0, 129.0, 128.8, 128.3, 128.1, 128.0, 127.3, 127.0. **HRMS** (ESI): calcd for $\text{C}_{27}\text{H}_{21}\text{O}$ $[\text{M}+\text{H}]^+$: 361.1587, found: 361.1588.

(E)-1-(4-fluorophenyl)-2,3-diphenylprop-2-en-1-one



Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a yellow solid (90% yield), mp 108-109 °C. ^1H NMR (500 MHz, CDCl_3): δ 7.90-7.87 (m, 2H), 7.35-7.33 (m, 3H), 7.27 (m, 1H), 7.23-7.17 (m, 5H), 7.13-7.09 (m, 4H); ^{13}C NMR (125 MHz, CDCl_3): δ 197.5, 140.4 (d, $J = 123.8$ Hz), 138.2, 136.5, 134.8, 132.1, 130.3, 129.7 (d, $J = 11.3$ Hz), 128.9 (d, $J = 6.3$ Hz), 128.8, 128.7, 128.4, 128.2 (d, $J = 2.5$ Hz), 127.9, 126.4. ^{19}F NMR (470 MHz, CDCl_3): δ -108.16 (s, 1F). **HRMS** (ESI): calcd for $\text{C}_{21}\text{H}_{16}\text{FO}$ $[\text{M}+\text{H}]^+$: 303.1180, found: 303.1181.

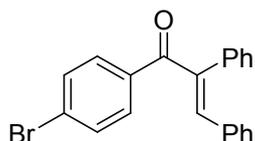
(E)-1-(4-chlorophenyl)-2,3-diphenylprop-2-en-1-one



Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant

afford a yellow solid (91% yield), mp 115-116 °C. **¹H NMR** (500 MHz, CDCl₃): δ 7.78 (d, *J* = 5.0 Hz, 2H), 7.40 (d, *J* = 5.0 Hz, 2H), 7.37-7.31 (m, 4H), 7.23-7.18 (m, 5H), 7.09 (m, 2H), 7.18-7.16 (m, 2H), 7.10-7.09 (m, 2H), 6.78-6.72 (m, 1H), 5.86 (d, *J*=10.0Hz, 2H); **¹³C NMR** (125 MHz, CDCl₃): δ 196.2, 140.5, 140.2, 138.5, 136.5, 136.3, 134.6, 131.2, 130.4, 129.6, 129.1, 129.0, 128.6, 128.3, 128.1. **HRMS** (ESI): calcd for C₂₁H₁₆ClO [M+H]⁺: 319.0885, found: 319.0882.

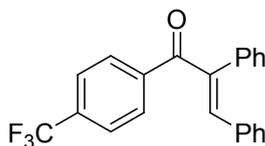
(E)-1-(4-bromophenyl)-2,3-diphenylprop-2-en-1-one



3j

Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a Pale-yellow solid (91% yield), mp 83-84 °C. **¹H NMR** (500 MHz, CDCl₃): δ 7.71 (d, *J* = 10.0Hz, 2H), 7.57 (d, *J* = 10.0Hz, 2H), 7.36-7.33 (m, 3H), 7.25-7.22 (m, 4H), 7.20-7.17 (m, 2H), 7.09(d, *J* = 10.0Hz, 2H); **¹³C NMR** (125 MHz, CDCl₃): δ 196.4, 140.5, 140.4, 137.0, 136.3, 134.60, 132.0, 131.3, 130.4, 130.0, 129.2, 129.0, 128.3, 128.1, 127.1. **HRMS** (ESI): calcd for C₂₁H₁₆BrO [M+H]⁺: 363.0380, found: 363.0382

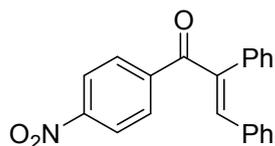
(E)-2,3-diphenyl-1-(4-(trifluoromethyl)phenyl)prop-2-en-1-one



3K

Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a Pale-yellow solid (90% yield), mp 100-101 °C. **¹H NMR** (500 MHz, CDCl₃): δ 8.25 (d, *J* = 7.0 Hz, 3H), 7.91 (d, *J* = 8.0 Hz, 1H), 7.76-7.70 (m, 2H), 7.62-7.60 (m, 1H), 7.53-7.50 (m, 3H), 7.42-7.37 (m, 2H), 7.29-7.27 (m, 1H), 7.19 (t, *J* = 10.0 Hz, 1H), 7.09 (s, 1H); **¹³C NMR** (125 MHz, CDCl₃): δ 196.3, 141.6 (q, *J* = 25.0 Hz), 140.4, 136.0, 134.4, 133.4 (q, *J* = 32.5 Hz), 130.5, 129.8, 129.7, 129.4, 128.9, 128.4, 128.2, 126.4, 125.3 (q, *J* = 3.75 Hz), 123.7 (q, *J* = 275.0 Hz). **¹⁹F NMR** (470 MHz, CDCl₃): δ -62.96 (s, 3F). **HRMS** (ESI): calcd for C₂₂H₁₆F₃O [M+H]⁺: 353.1148, found: 353.1145.

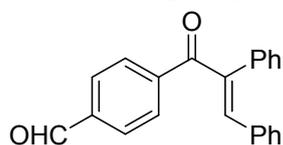
(E)-1-(4-nitrophenyl)-2,3-diphenylprop-2-en-1-one



3l

Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a yellow solid (95% yield), mp 125-126 °C. **¹H NMR** (500 MHz, CDCl₃): δ 8.27 (d, *J* = 5.0 Hz, 1H), 8.17 (d, *J* = 5.0 Hz, 2H), 7.91 (d, *J* = 5.0 Hz, 1H), 7.44 (d, *J* = 5.0 Hz, 1H), 7.40-7.36 (m, 3H), 7.33 (s, 1H), 7.25-7.23 (m, 2H), 7.22-7.18 (m, 3H), 7.09 (d, *J* = 10.0 Hz, 1H); **¹³C NMR** (125 MHz, CDCl₃): δ 195.6, 149.5, 143.9, 142.6, 140.1, 135.7, 134.2, 131.0, 130.3, 129.7, 129.1, 128.4, 128.3, 126.5, 123.5. **HRMS** (ESI): calcd for C₂₁H₁₆NO₃ [M+H]⁺: 330.1125, found: 330.1127.

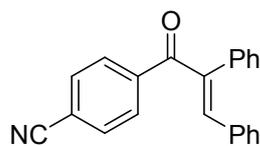
(E)-4-(2,3-diphenylacryloyl)benzaldehyde



3m

Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a white solid (60% yield), mp 144-145 °C. **¹H NMR** (500 MHz, CDCl₃): δ 10.08 (s, 1H), 7.93 (s, 4H), 7.36-7.35 (m, 3H), 7.29 (s, 1H), 7.25-7.22 (m, 3H), 7.19-7.16 (m, 2H), 7.07 (d, *J* = 5.0 Hz, 2H); **¹³C NMR** (125 MHz, CDCl₃): δ 195.6, 149.5, 143.9, 142.6, 140.1, 135.7, 134.2, 131.0, 130.3, 129.7, 129.1, 128.4, 128.3, 126.5, 123.5. **HRMS** (ESI): calcd for C₂₂H₁₇O₂ [M+H]⁺: 313.1223, found: 313.1222.

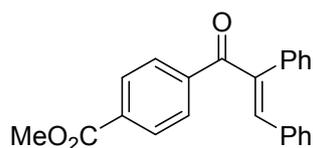
(E)-4-(2,3-diphenylacryloyl)benzotrile



3n

Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a yellow solid (87% yield), mp 105-106 °C. **¹H NMR** (500 MHz, CDCl₃): δ 7.85 (d, *J* = 10.0 Hz, 2H), 7.71 (d, *J* = 10.0 Hz, 2H), 7.35 (s, 3H), 7.28 (s, 3H), 7.25-7.22 (m, 3H), 7.20-7.17 (m, 2H), 7.08 (d, *J* = 10.0 Hz, 2H); **¹³C NMR** (125 MHz, CDCl₃): δ 196.0, 142.1, 140.1, 136.0, 134.3, 132.1, 131.0, 130.0, 129.7, 129.6, 129.0, 128.4, 128.3, 118.0, 115.3. **HRMS** (ESI): calcd for C₂₂H₁₆ON [M+H]⁺: 310.1227, found: 310.12265

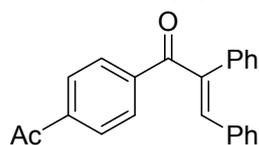
methyl(E)-4-(2,3-diphenylacryloyl)benzoate



3o

Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a white solid (76% yield), mp 105-106 °C. **¹H NMR** (500 MHz, CDCl₃): δ 8.18-8.13(m, 2H), 7.89 (d, *J* = 10.0 Hz, 1H), 7.41-7.38 (m, 2H), 7.32-7.28 (m, 5H), 7.25-7.21 (m, 3H), 7.12 (d, *J* = 10.0 Hz, 2H), 3.98 (s, 3H); **¹³C NMR** (125 MHz, CDCl₃): δ 197.0, 166.3, 142.2, 141.5, 140.5, 136.1, 134.5, 133.0, 130.5, 130.0, 129.5, 129.4, 129.3, 129.0, 128.3, 128.1, 52.35. **HRMS** (ESI): calcd for C₂₃H₁₉O₃ [M+H]⁺: 343.1329, found: 343.1328

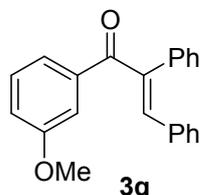
(E)-1-(4-acetylphenyl)-2,3-diphenylprop-2-en-1-one



3p

Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a yellow solid (81% yield), mp 116-117 °C. **¹H NMR** (500 MHz, CDCl₃): δ 8.25 (d, *J* = 5.0 Hz, 1H), 8.00 (d, *J* = 5.0 Hz, 2H), 7.87 (d, *J* = 5.0 Hz, 2H), 7.53-7.50 (m, 2H), 7.37-7.35 (m, 3H), 7.29(s, 1H), 7.20-7.17 (m, 2H), 7.08 (d, *J* = 10.0 Hz, 2H), 2.64 (s, 3H); **¹³C NMR** (125 MHz, CDCl₃): δ 197.4, 197.0, 141.3, 139.3, 136.1, 134.5, 130.5, 130.0, 129.7, 129.3, 129.0, 128.7, 128.3, 128.1, 127.2, 127.1, 27.0. **HRMS** (ESI): calcd for C₂₃H₁₉O₂ [M+H]⁺: 327.1380, found 327.1381.

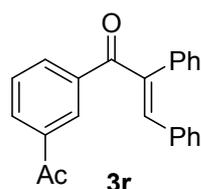
(E)-1-(3-methoxyphenyl)-2,3-diphenylprop-2-en-1-one



3q

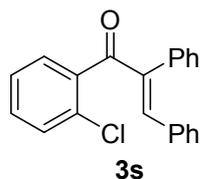
Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a yellow liquid (80% yield), mp 121-122 °C. **¹H NMR** (500 MHz, CDCl₃): δ 8.47 (s, 1H), 8.20 (d, *J* = 10.0 Hz, 1H), 7.54-7.51 (m, 1H), 7.40-7.32 (m, 3H), 7.29-7.27 (m, 3H), 7.20-7.17 (m, 3H), 7.09 (d, *J* = 10.0 Hz, 2H), 3.93 (s, 3H); **¹³C NMR** (125 MHz, CDCl₃): δ 197.0, 166.3, 141.1, 141.0, 139.0, 136.2, 136.0, 135.0, 134.0, 133.0, 131.0, 130.5, 130.0, 129.2, 129.0, 128.5, 128.3, 52.36. **HRMS** (ESI): calcd for C₂₂H₁₉O₂ [M+H]⁺: 315.1380, found: 315.1381.

(E)-1-(3-acetylphenyl)-2,3-diphenylprop-2-en-1-one



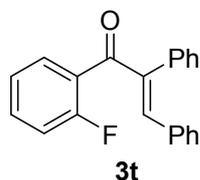
Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a white solid (85% yield), mp 117-118 °C. **¹H NMR** (500 MHz, CDCl₃): δ 8.35 (s, 1H), 8.11 (d, *J* = 10.0 Hz, 1H), 8.01 (d, *J* = 10.0 Hz, 1H), 7.54 (t, *J* = 10.0 Hz, 1H), 7.46 (d, *J* = 10.0 Hz, 1H), 7.38-7.33 (m, 3H), 7.30-7.27 (m, 3H), 7.23 (d, *J* = 5.0 Hz, 1H), 7.19-7.17 (m, 2H), 7.10 (d, *J* = 10.0 Hz, 1H), 2.60 (s, 3H); **¹³C NMR** (125 MHz, CDCl₃): δ 197.2, 196.4, 141.0, 139.0, 137.2, 136.3, 135.0, 134.0, 131.3, 130.5, 130.0, 129.5, 129.2, 129.0, 128.7, 128.3, 128.1, 126.5. **HRMS** (ESI): calcd for C₂₃H₁₉O₂ [M+H]⁺: 327.1380, found: 327.1384.

(E)-1-(2-chlorophenyl)-2,3-diphenylprop-2-en-1-one



Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a yellow solid (71% yield), mp 110-111 °C. **¹H NMR** (500 MHz, CDCl₃): δ 8.07 (s, 1H), 7.42-7.35 (m, 6H), 7.24-7.20 (m, 2H), 7.18-7.13 (m, 4H), 7.10 (d, *J* = 10.0 Hz, 2H); **¹³C NMR** (125 MHz, CDCl₃): δ 197.1, 166.0, 165.0, 163.4, 163.0, 141.3, 132.3, 132.2, 130.2, 130.1, 129.0, 127.3, 127.2, 116.3, 116.1, 116.0, 115.6. **HRMS** (ESI): calcd for C₂₁H₁₆ClO [M+H]⁺: 319.0885, found: 319.0882.

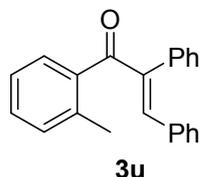
(E)-1-(2-fluorophenyl)-2,3-diphenylprop-2-en-1-one



Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a yellow solid (73% yield), mp 120-121 °C. **¹H NMR** (500 MHz, CDCl₃): δ 7.62 (d, *J* = 5.0 Hz, 1H), 7.53 (d, *J* = 10.0 Hz, 1H), 7.46-7.40 (m, 1H), 7.39-7.33 (m, 3H), 7.27 (s, 1H), 7.25 (s, 1H), 7.24-7.21 (m, 2H), 7.20-7.17 (m, 2H), 7.09 (d, *J* = 10.0 Hz, 2H); **¹³C NMR** (125 MHz, CDCl₃): δ 194.8, 159.7 (d, *J* = 250.0 Hz), 143.0, 141.8, 135.4, 134.6, 132.5 (d, *J* = 7.5 Hz), 130.7, 130.3 (d, *J* = 3.7 Hz), 129.9, 129.5, 128.7, 128.3, 128.0, 124.3, 124.2, 116.1 (d, *J* = 21.3 Hz). **¹⁹F NMR** (470 MHz,

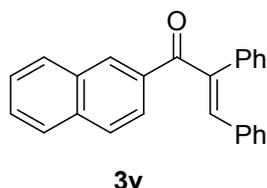
CDCl₃): δ -117.18 (s, 1F). **HRMS** (ESI): calcd for C₂₁H₁₆FO [M+H]⁺: 303.1180, found: 303.1181.

(E)-2,3-diphenyl-1-(o-tolyl)prop-2-en-1-one



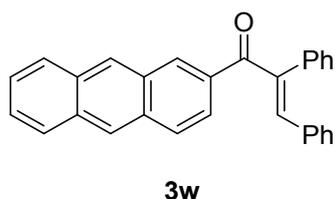
Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a yellow liquid (70% yield). **¹H NMR** (500 MHz, CDCl₃): δ 7.44 (d, *J* = 5.0 Hz, 1H), 7.42 (s, 1H), 7.41-7.36 (m, 3H), 7.29-7.27 (m, 4H), 7.25 (s, 1H), 7.17-7.14 (m, 2H), 7.02 (d, *J* = 10.0 Hz, 2H), 2.45 (s, 3H); **¹³C NMR** (125 MHz, CDCl₃): δ 200.0, 144.0, 142.0, 140.0, 136.2, 136.0, 135.0, 131.0, 130.6, 130.0, 129.4, 129.0, 128.3, 128.1, 128.0, 127.0, 125.3, 20.0. **HRMS** (ESI): calcd for C₂₂H₁₉O [M+H]⁺: 299.1431, found: 299.1432.

(E)-1-(naphthalen-2-yl)-2,3-diphenylprop-2-en-1-one



Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a white solid (89% yield), mp 109-110 °C. **¹H NMR** (500 MHz, CDCl₃): δ 8.40 (s, 1H), 7.97-7.89 (m, 4H), 7.62-7.52 (m, 2H), 7.40-7.32 (m, 5H), 7.32 (s, 1H), 7.25-7.19 (m, 3H), 7.13 (d, *J* = 10.0 Hz, 2H); **¹³C NMR** (125 MHz, CDCl₃): δ 197.5, 141.0, 140.0, 136.6, 135.5, 135.2, 135.0, 132.4, 131.3, 130.4, 130.0, 129.4, 129.0, 128.8, 128.3, 128.2, 128.1, 128.0, 127.7, 126.7, 126.0. **HRMS** (ESI): calcd for C₂₅H₁₉O [M+H]⁺: 335.1431, found 335.1433.

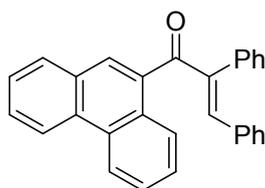
(E)-1-(anthracen-2-yl)-2,3-diphenylprop-2-en-1-one



Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a yellow liquid (64% yield). **¹H NMR** (500 MHz, CDCl₃): δ 8.28-8.27 (m,

1H), 8.58 (s, 1H), 8.53 (s, 1H), 8.45 (s, 1H), 8.06-8.02 (m, 3H), 7.94-7.92 (m, 1H), 7.55-7.49 (m, 2H), 7.39-7.38 (m, 4H), 7.35 (s, 2H), 7.25-7.19 (m, 3H), 7.15 (d, $J = 10.0$ Hz, 2H); ^{13}C NMR (125 MHz, CDCl_3): δ 197.4, 141.0, 139.5, 136.7, 135.0, 133.2, 133.0, 132.5, 130.4, 130.0, 129.0, 128.4, 128.3, 128.2, 128.0, 126.6, 126.3, 126.0, 124.6. HRMS (ESI): calcd for $\text{C}_{29}\text{H}_{21}\text{O}$ $[\text{M}+\text{H}]^+$: 385.1587, found: 385.1589.

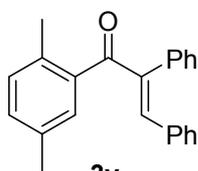
(E)-1-(phenanthren-9-yl)-2,3-diphenylprop-2-en-1-one



3x

Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a yellow liquid (94% yield). ^1H NMR (500 MHz, CDCl_3): δ 8.76 (dd, $J = 5.0, 10.0$ Hz, 1H), 8.22 (d, $J = 10.0$ Hz, 1H), 7.98-7.94 (m, 2H), 7.87-7.64 (m, 5H), 7.48-7.40 (m, 6H), 7.21-7.14 (m, 3H), 7.04-7.00 (m, 2H); ^{13}C NMR (125 MHz, CDCl_3): δ 199.2, 144.5, 142.5, 136.3, 136.0, 134.6, 131.1, 131.0, 130.7, 130.6, 130.3, 130.0, 129.6, 129.5, 129.4, 129.0, 128.2, 128.1, 128.0, 127.2, 127.1, 127.1, 126.3, 123.0, 122.7. HRMS (ESI): calcd for $\text{C}_{29}\text{H}_{21}\text{O}$ $[\text{M}+\text{H}]^+$: 385.1587, found: 385.1582.

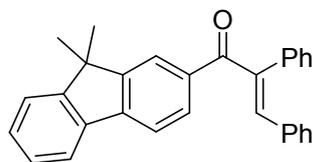
(E)-1-(2,5-dimethylphenyl)-2,3-diphenylprop-2-en-1-one



3y

Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a colorless liquid (61% yield), ^1H NMR (500 MHz, CDCl_3): δ 7.42-7.40 (m, 1H), 7.39-7.35 (m, 2H), 7.27 (s, 1H), 7.25 (s, 1H), 7.23-7.19 (m, 3H), 7.16-7.13 (m, 4H), 7.01 (d, $J = 10.0$ Hz, 2H), 2.38 (s, 3H), 2.34 (s, 3H); ^{13}C NMR (125 MHz, CDCl_3): δ 200.2, 144.0, 142.0, 140.0, 136.0, 135.0, 134.7, 133.0, 131.0, 130.6, 130.5, 130.0, 129.3, 129.0, 128.5, 128.2, 128.0, 21.0, 19.4. HRMS (ESI): calcd for $\text{C}_{23}\text{H}_{21}\text{O}$ $[\text{M}+\text{H}]^+$: 313.1587, found: 313.1585.

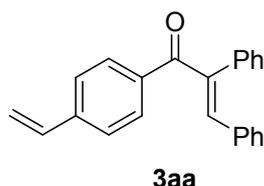
(E)-1-(9,9-dimethyl-9H-fluoren-2-yl)-2,3-diphenylprop-2-en-1-one



3z

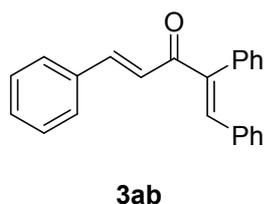
Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a Pale-yellow liquid (82% yield), mp 120-121 °C. **¹H NMR** (500 MHz, CDCl₃): δ 7.91 (s, 1H), 7.87 (d, *J* = 5.0 Hz, 1H), 7.75-7.71 (m, 2H), 7.44-7.42 (m, 1H), 7.35-7.32 (m, 3H), 7.31-7.28 (m, 5H), 7.22-7.15 (m, 3H), 7.10 (d, *J* = 5.0 Hz, 2H), 1.45 (s, 6H); **¹³C NMR** (125 MHz, CDCl₃): δ 197.3, 155.0, 154.0, 143.5, 141.2, 139.0, 138.0, 137.0, 136.7, 135.0, 130.3, 130.0, 129.7, 129.0, 128.5, 128.3, 128.0, 127.2, 126.5, 124.2, 123.0, 121.0, 119.5, 67.1, 47.0, 27.0. **HRMS** (ESI): calcd for C₃₀H₂₅O [M+H]⁺: 401.1900, found 401.1902.

(E)-2,3-diphenyl-1-(4-vinylphenyl)prop-2-en-1-one



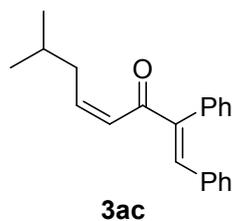
Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a yellow solid (87% yield), mp 133-134 °C. **¹H NMR** (500 MHz, CDCl₃): δ 7.85 (d, *J* = 10.0 Hz, 2H), 7.47 (d, *J* = 5.0 Hz, 2H), 7.38-7.33 (m, 3H), 7.30-7.28 (m, 2H), 7.24-7.22 (m, 2H), 7.21-7.17 (m, 2H), 7.10 (d, *J* = 5.0 Hz, 2H), 6.76 (dd, *J* = 10.0, 5.0 Hz, 1H), 5.88 (d, *J* = 20.0 Hz, 1H), 5.39 (d, *J* = 15.0 Hz, 1H); **¹³C NMR** (125 MHz, CDCl₃): δ 197.0, 141.3, 141.0, 140.0, 137.2, 137.0, 136.0, 135.6, 135.0, 133.0, 130.3, 130.0, 129.0, 128.3, 128.0, 126.1, 116.5. **HRMS** (ESI): calcd for C₂₃H₁₉O [M+H]⁺: 311.1431, found: 311.1433.

(1E,4E)-1,2,5-triphenylpenta-1,4-dien-3-one



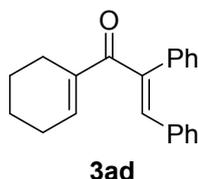
Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a yellow oil (63% yield). **¹H NMR** (500 MHz, CDCl₃): δ 8.26 (d, *J* = 5.0 Hz, 2H), 7.78-7.75 (m, 1H), 7.63-7.60 (m, 1H), 7.54-7.51 (m, 2H), 7.47-7.40 (m, 4H), 7.36-7.35 (m, 2H), 7.25-7.22 (m, 2H), 7.12 (d, *J* = 10.0 Hz, 1H), 6.94 (d, *J* = 15.0 Hz, 1H); **¹³C NMR** (125 MHz, CDCl₃): δ 191.0, 144.0, 141.3, 139.0, 137.0, 136.0, 135.0, 133.0, 131.0, 130.4, 130.0, 129.2, 129.0, 128.4, 128.3, 128.0, 123.3. **HRMS** (ESI): calcd for C₂₃H₁₉O [M+H]⁺: 311.1431, found: 311.1432.

(1E,4E)-7-methyl-1,2-diphenylocta-1,4-dien-3-one



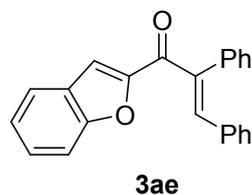
Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a yellow liquid (68% yield). **¹H NMR** (500 MHz, CDCl₃): δ 7.63 (s, 1H), 7.39-7.36 (m, 3H), 7.20-7.14 (m, 5H), 7.06 (d, *J* = 5.0 Hz, 2H), 7.01-6.95 (m, 1H), 6.30 (d, *J* = 15.0 Hz, 1H), 2.06-2.03 (m, 2H), 1.76-1.70 (m, 1H), 0.88 (d, *J* = 5.0 Hz, 6H); **¹³C NMR** (125 MHz, CDCl₃): δ 191.2, 148.0, 141.1, 138.2, 137.0, 135.0, 132.5, 131.0, 130.0, 129.0, 128.2, 128.0, 126.5, 42.0, 28.0, 22.4. **HRMS** (ESI): calcd for C₂₁H₂₃O [M+H]⁺: 291.1744, found: 291.1743.

(E)-1-(cyclohex-1-en-1-yl)-2,3-diphenylprop-2-en-1-one



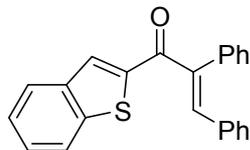
Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a white solid, (75% yield). mp 110-111 °C. **¹H NMR** (500 MHz, CDCl₃): δ 7.33-7.30 (m, 1H), 7.29-7.27 (m, 2H), 7.24-7.21 (m, 2H), 7.20-7.14 (m, 3H), 7.09-7.06 (m, 2H), 6.94 (s, 1H), 2.35-2.24 (m, 4H), 1.71-1.61 (m, 4H); **¹³C NMR** (125 MHz, CDCl₃): δ 198.7, 143.0, 141.0, 139.1, 137.0, 135.2, 130.0, 129.3, 128.6, 128.2, 128.1, 127.6, 126.2, 26.2, 24.0, 22.0, 21.7. **HRMS** (ESI): calcd for C₂₁H₂₁O [M+H]⁺: 289.1587, found: 289.1582.

(E)-1-(benzofuran-2-yl)-2,3-diphenylprop-2-en-1-one



Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a yellow solid (86% yield), mp 111-112 °C. **¹H NMR** (500 MHz, CDCl₃): δ 8.25 (d, *J* = 5.0 Hz, 1H), 7.68 (s, 1H), 7.62-7.58 (m, 2H), 7.53-7.44 (m, 2H), 7.42-7.38 (m, 3H), 7.36-7.32 (m, 2H), 7.25-7.19 (m, 3H), 7.15 (d, *J* = 10.0 Hz, 1H), 6.92 (s, 1H); **¹³C NMR** (125 MHz, CDCl₃): δ 185.0, 156.0, 152.4, 140.0, 137.0, 136.0, 133.0, 131.0, 130., 129.2, 129.0, 128.4, 128.3, 128.0, 127.0, 124.0, 123.3, 116.1, 112.5. **HRMS** (ESI): calcd for C₂₃H₁₇O₂ [M+H]⁺: 325.1224, found: 325.1221.

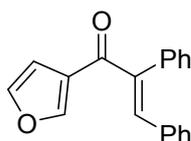
(E)-1-(phenanthren-9-yl)-2,3-diphenylprop-2-en-1-one



3af

Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a yellow-solid (91% yield), mp 113-114 °C. **¹H NMR** (500 MHz, CDCl₃): δ 7.86 (d, *J* = 10.0 Hz, 1H), 7.78 (d, *J* = 10.0 Hz, 1H), 7.66 (s, 1H), 7.54-7.51 (m, 1H), 7.44 (t, *J* = 10.0 Hz, 1H), 7.39-7.34 (m, 6H), 7.23-7.19 (m, 3H), 7.16-7.14 (m, 2H); **¹³C NMR** (125 MHz, CDCl₃): δ 190.0, 144.0, 143.0, 140.3, 139.0, 138.6, 136.5, 135.0, 131.4, 130.5, 130.0, 129.0, 128.9, 128.3, 128.2, 127.3, 126.1, 125.0, 123.0. **HRMS** (ESI): calcd for C₂₃H₁₇OS [M+H]⁺: 341.0095, found: 341.0093.

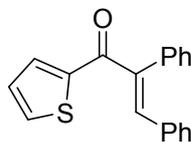
(E)-1-(furan-3-yl)-2,3-diphenylprop-2-en-1-one



3ag

Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a yellow liquid (72% yield). **¹H NMR** (500 MHz, CDCl₃): δ 7.56 (s, 1H), 7.39-7.35 (m, 5H), 7.28-7.27 (m, 2H), 7.22-7.17 (m, 3H), 7.11 (d, *J* = 10.0 Hz, 2H), 7.44-7.41 (m, 1H); **¹³C NMR** (125 MHz, CDCl₃): δ 190.0, 148.0, 143.2, 141.0, 138.4, 137.0, 135.0, 131.0, 130.1, 129.0, 128.4, 128.2, 127.1, 126.4, 110.4. **HRMS** (ESI): calcd for C₁₉H₁₅O₂ [M+H]⁺: 275.1067, found: 275.1065.

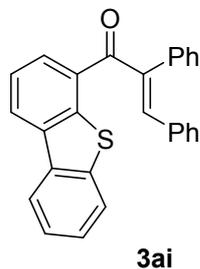
(E)-2,3-diphenyl-1-(thiophen-2-yl)prop-2-en-1-one



3ah

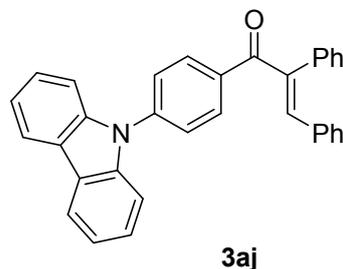
Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a yellow solid (68% yield), mp 126-127 °C. **¹H NMR** (500 MHz, CDCl₃): δ 7.61 (d, *J* = 10.0 Hz, 1H), 7.46 (s, 1H), 7.43 (s, 1H), 7.37-7.36 (m, 3H), 7.33-7.31 (m, 2H), 7.23-7.18 (m, 3H), 7.13 (d, *J* = 10.0 Hz, 2H), 7.03 (t, *J* = 5.0 Hz, 1H); **¹³C NMR** (125 MHz, CDCl₃): δ 188.1, 144.26, 140.5, 138.0, 137.0, 135.0, 134.2, 134.1, 130.4, 130.0, 129.0, 128.8, 128.3, 128.0, 126.4. **HRMS** (ESI): calcd for C₂₁H₁₅O [M+H]⁺: 291.0839, found: 291.0838.

(E)-1-(dibenzo[b,d]thiophen-4-yl)-2,3-diphenylprop-2-en-1-one



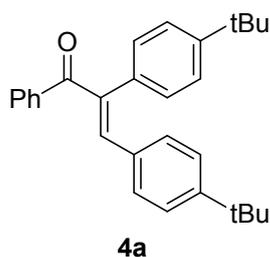
Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a yellow solid (78% yield), mp 122-123 °C. **¹H NMR** (500 MHz, CDCl₃): δ 8.32 (d, *J* = 10.0 Hz, 1H), 8.15 (d, *J* = 10.0 Hz, 1H), 8.08 (d, *J* = 5.0 Hz, 1H), 7.91 (d, *J* = 10.0 Hz, 1H), 7.49-7.43 (m, 4H), 7.37-7.36 (m, 2H), 7.34-7.31 (m, 3H), 7.24-7.15 (m, 3H), 7.12 (d, *J* = 5.0 Hz, 3H); **¹³C NMR** (125 MHz, CDCl₃): δ 196.4, 142.0, 141.0, 140.3, 138.0, 137.4, 136.5, 135.0, 134.1, 131.0, 130.2, 130.0, 129.0, 128.8, 128.3, 128.1, 127.2, 126.4, 126.0, 124.5, 124.0, 123.0, 121.4. **HRMS** (ESI): calcd for C₂₇H₁₉OS [M+H]⁺: 391.1152, found: 391.1150.

(E)-1-(4-(9H-carbazol-9-yl)phenyl)-2,3-diphenylprop-2-en-1-one



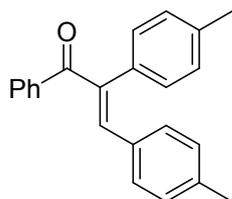
Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a pale-yellow liquid (66% yield), mp 130-131 °C. **¹H NMR** (500 MHz, CDCl₃): δ 8.25 (d, *J* = 5.0 Hz, 2H), 8.19-8.12 (m, 3H), 7.69 (d, *J* = 10.0 Hz, 1H), 7.62-7.59 (m, 1H), 7.53-7.50 (m, 4H), 7.45-7.31 (m, 9H), 7.25-7.21 (m, 2H), 7.17 (d, *J* = 10.0 Hz, 1H); **¹³C NMR** (125 MHz, CDCl₃): δ 196.4, 141.5, 140.3, 140.0, 136.4, 136.0, 135.0, 133.5, 132.7, 131.6, 130.4, 130.0, 129.0, 128.3, 128.0, 126.3, 126.2, 124.0, 120.6, 120.4, 110.0. **HRMS** (ESI): calcd for C₂₇H₂₀ON [M+H]⁺: 374.1540, found 374.1545.

(E)-2,3-bis(4-(tert-butyl)phenyl)-1-phenylprop-2-en-1-one



Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a yellow liquid (71% yield) **¹H NMR** (500 MHz, CDCl₃): δ 7.87 (d, *J* = 10.0 Hz, 2H), 7.56-7.53 (m, 1H), 7.46-7.37 (m, 5H), 7.24-7.18 (m, 4H), 7.06 (d, *J* = 10.0 Hz, 2H), 1.37 (s, 9H), 1.28 (s, 9H); **¹³C NMR** (125 MHz, CDCl₃): δ 198.1, 152.5, 151.0, 140.4, 140.0, 138.6, 133.6, 132.0, 132.0, 130.3, 130.0, 129.2, 128.2, 125.8, 125.3, 34.7, 34.6, 31.4, 31.2. **HRMS** (ESI): calcd for C₂₉H₃₃O [M+H]⁺: 397.2526, found: 397.2524.

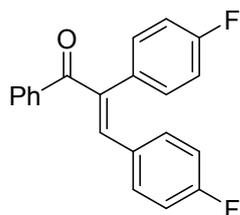
(E)-1-phenyl-2,3-di-p-tolylprop-2-en-1-one



4b

Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a yellow liquid (70% yield). **¹H NMR** (500 MHz, CDCl₃): δ 7.85 (d, *J* = 10.0 Hz, 2H), 7.55-7.52 (m, 1H), 7.46-7.43 (m, 2H), 7.22 (s, 1H), 7.19 (s, 1H), 7.02 (s, 1H), 2.39 (s, 3H), 2.30 (s, 3H); **¹³C NMR** (125 MHz, CDCl₃): δ 198.0, 140.3, 140.0, 139.2, 138.5, 137.6, 133.7, 132.1, 132.0, 130.4, 129.7, 129.5, 129.0, 128.2, 126.2, 21.4, 21.3. **HRMS** (ESI): calcd for C₂₃H₂₁O [M+H]⁺: 313.1587, found: 313.1583.

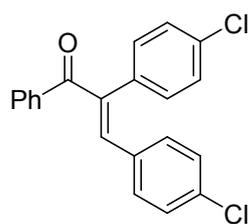
(E)-2,3-bis(4-fluorophenyl)-1-phenylprop-2-en-1-one



4c

Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a white solid (83% yield), mp 150-151 °C. **¹H NMR** (500 MHz, CDCl₃): δ 7.83 (d, *J* = 10.0 Hz, 2H), 7.57-7.54 (m, 1H), 7.47-7.44 (m, 2H), 7.24-7.22 (m, 3H), 7.08-7.05 (m, 4H), 6.89 (t, *J* = 10.0 Hz, 2H); **¹³C NMR** (125 MHz, CDCl₃): δ 197.3, 163.7 (d, *J* = 43.8 Hz), 161.7 (d, *J* = 41.3 Hz), 139.5 (d, *J* = 7.5 Hz), 137.9, 132.3 (d, *J* = 7.5 Hz), 132.2, 132.1 (d, *J* = 2.5 Hz), 131.5, 131.4, 130.7 (d, *J* = 3.8 Hz), 129.7, 128.4, 116.0 (d, *J* = 21.3 Hz), 115.5 (d, *J* = 22.5 Hz). **¹⁹F NMR** (470 MHz, CDCl₃): δ -109.53 (s, 1F), -113.1 (s, 1F). **HRMS** (ESI): calcd for C₂₁H₁₅OF₂ [M+H]⁺: 321.1085, found: 321.1089.

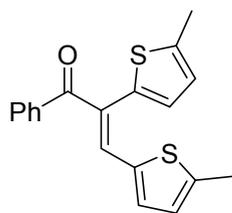
(E)-2,3-bis(4-chlorophenyl)-1-phenylprop-2-en-1-one



4d

Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a yellow liquid (75% yield). **¹H NMR** (500 MHz, CDCl₃): δ 7.82 (d, *J* = 10.0 Hz, 2H), 7.58-7.55 (m, 1H), 7.34 (d, *J* = 10.0 Hz, 2H), 7.47-7.44 (m, 2H), 7.21-7.18 (m, 5H), 7.02 (d, *J* = 10.0 Hz, 2H); **¹³C NMR** (125 MHz, CDCl₃): δ 197.0, 140.1, 139.1, 137.7, 135.1, 134.5, 134.2, 133.0, 132.4, 131.4, 131.0, 129.7, 129.2, 128.7, 128.4. **HRMS** (ESI): calcd for C₂₁H₁₅OCl₂ [M+H]⁺: 353.0495, found: 353.0496.

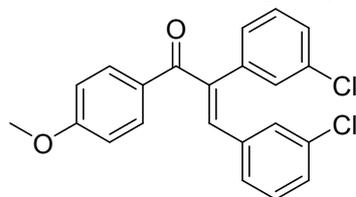
(E)-2,3-bis(5-methylthiophen-2-yl)-1-phenylprop-2-en-1-one



4e

Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a yellow liquid (63% yield). **¹H NMR** (500 MHz, CDCl₃): δ 7.77 (d, *J* = 10.0 Hz, 1H), 7.54-7.51 (m, 2H), 7.46-7.43 (m, 2H), 7.01 (d, *J* = 10.0 Hz, 1H), 6.89 (d, *J* = 10.0 Hz, 1H), 6.80 (s, 1H), 6.64 (d, *J* = 5.0 Hz, 1H), 2.56 (s, 3H), 2.41 (s, 3H); **¹³C NMR** (125 MHz, CDCl₃): δ 195.8, 147.0, 142.8, 138.6, 138.1, 136.4, 134.9, 133.1, 131.6, 129.9, 129.3, 129.1, 128.2, 125.6, 125.4, 15.7, 15.5. **HRMS** (ESI): calcd for C₂₁H₂₁O [M+H]⁺: 325.0715, found: 325.0719.

(E)-2,3-bis(3-chlorophenyl)-1-(4-methoxyphenyl)prop-2-en-1-one

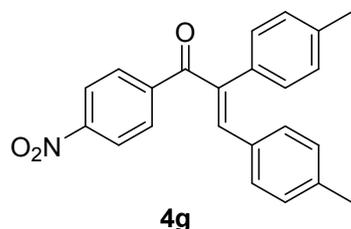


4f

Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a yellow liquid (71% yield). **¹H NMR** (500 MHz, CDCl₃): δ 8.31 (d, *J* = 5.0 Hz, 2H), 7.93 (d, *J* = 5.0 Hz, 2H), 7.39-7.32 (m, 3H), 7.23 (s, 1H), 7.17-7.11 (m, 3H), 7.09 (s, 1H), 3.71 (s, 3H); **¹³C NMR** (125 MHz, CDCl₃): δ 194.7, 149.8, 143.1, 141.3,

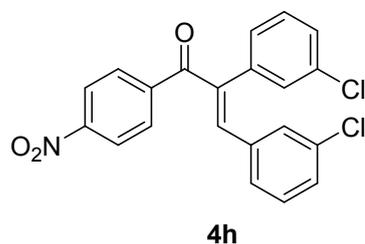
140.0, 136.7, 135.4, 135.0, 134.6, 130.5, 130.4, 130.3, 130.0, 129.8, 129.6, 129.0, 128.3, 127.8, 123.7. **HRMS** (ESI): calcd for C₂₁H₁₇OCl₂ [M+H]⁺: 383.0600, found: 383.0603.

(E)-1-(4-nitrophenyl)-2,3-di-p-tolylprop-2-en-1-one



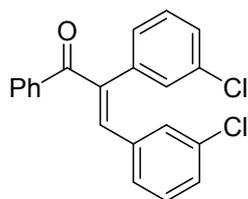
Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a yellow liquid (85% yield). **¹H NMR** (500 MHz, CDCl₃): δ 8.25 (d, *J* = 10.0 Hz, 2H), 7.88 (d, *J* = 10.0 Hz, 2H), 7.28 (s, 1H), 7.18 (d, *J* = 10.0 Hz, 2H), 7.12 (d, *J* = 10.0 Hz, 2H), 7.01 (s, 4H), 2.38 (s, 3H), 2.30 (s, 3H); **¹³C NMR** (125 MHz, CDCl₃): δ 190.7, 144.1, 139.1, 137.7, 135.0, 134.0, 132.9, 127.7, 126.3, 125.5, 125.0, 124.6, 124.4, 124.0, 118.2, 16.2, 16.1. **HRMS** (ESI): calcd for C₂₁H₂₁O [M+H]⁺: 358.1438, found: 358.1433.

(E)-2,3-bis(3-chlorophenyl)-1-(4-nitrophenyl)prop-2-en-1-one



Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a colorless oil (78% yield). **¹H NMR** (500 MHz, CDCl₃): δ 7.95 (d, *J* = 5.0 Hz, 1H), 7.82 (d, *J* = 5.0 Hz, 1H), 7.56-7.49 (m, 1H), 7.47-7.41 (m, 2H), 7.39-7.36 (m, 1H), 7.25-7.22 (m, 2H), 7.10-7.02 (m, 3H), 6.91-6.85 (m, 2H); **¹³C NMR** (125 MHz, CDCl₃): δ 194.7, 149.8, 143.1, 141.3, 140.0, 137.0, 135.5, 135.0, 134.6, 130.5, 130.4, 130.3, 130.0, 129.7, 129.6, 129.0, 128.3, 128.0, 123.7. **HRMS** (ESI): calcd for C₂₁H₁₇O₃NCl₂ [M+H]⁺: 398.0345, found: 398.0342.

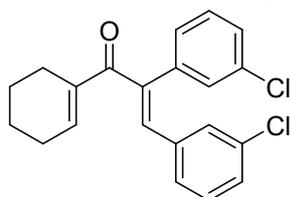
(E)-2,3-bis(3-chlorophenyl)-1-phenylprop-2-en-1-one



4i

Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a yellow liquid (70% yield). **¹H NMR** (500 MHz, CDCl₃): δ 7.85 (d, *J* = 10.0 Hz, 2H), 7.59-7.56 (m, 1H), 7.49-7.46 (m, 2H), 7.35-7.29 (m, 3H), 7.17-7.09 (m, 4H), 6.93 (d, *J* = 5.0 Hz, 1H); **¹³C NMR** (125 MHz, CDCl₃): δ 196.5, 140.6, 138.7, 137.6, 137.5, 136.1, 134.8, 134.4, 132.6, 130.2, 130.1, 129.8, 129.6, 129.5, 129.1, 128.5, 128.4, 128.1, 128.0. **HRMS** (ESI): calcd for C₂₁H₁₅Cl₂O [M+H]⁺: 353.0495, found: 353.0499.

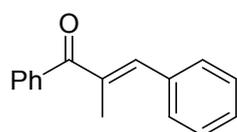
(E)-2,3-bis(3-chlorophenyl)-1-(cyclohex-1-en-1-yl)prop-2-en-1-one



4j

Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a yellow oil (52% yield). **¹H NMR** (500 MHz, CDCl₃): δ 7.33-7.30 (m, 1H), 7.30 (d, *J* = 10.0 Hz, 1H), 7.28-7.27 (m, 1H), 7.24 (s, 3H), 7.13-7.10 (m, 3H), 6.93-6.91 (m, 1H), 6.87 (s, 1H), 2.36-2.29 (m, 4H), 1.72-1.64 (m, 4H); **¹³C NMR** (125 MHz, CDCl₃): δ 197.6, 144.0, 140.7, 139.0, 138.0, 136.5, 134.6, 134.1, 130.0, 129.8, 129.5, 129.1, 128.5, 128.2, 127.7, 127.5, 26.3, 23.8, 22.0, 21.6, 21.0. **HRMS** (ESI): calcd for C₂₁H₁₉OCl₂ [M+H]⁺: 357.0808, found: 357.0812.

(E)-2-methyl-1,3-diphenylprop-2-en-1-one

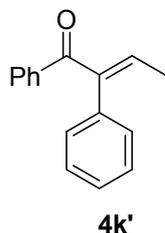


4k

Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a colourless oil (40% yield). **¹H NMR** (500 MHz, CDCl₃): δ 7.74 (d, *J* = 5.0 Hz, 2H), 7.55-7.52 (m, 1H), 7.47-7.39 (m, 6H), 7.33 (d, *J* = 5.0 Hz, 1H), 7.18 (s, 1H), 2.27 (s, 3H); **¹³C NMR** (125 MHz, CDCl₃): δ 199.4, 142.0, 138.5, 136.9, 135.8, 131.6, 129.6, 129.5, 128.5, 128.4, 128.2, 14.4. **HRMS** (ESI): calcd for C₁₆H₁₅O [M+Na]⁺:

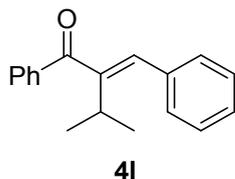
245.0937, found: 245.0940.

(E)-1,2-diphenylbut-2-en-1-one



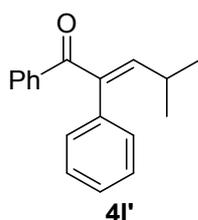
Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a colourless oil (30% yield). **¹H NMR** (500 MHz, CDCl₃): δ 7.75 (d, *J* = 5.0 Hz, 2H), 7.50-7.47 (m, 1H), 7.41-7.36 (m, 4H), 7.30 (t, *J* = 5.0 Hz, 1H), 7.25 (d, *J* = 5.0 Hz, 2H), 6.60-6.56 (m, 1H), 1.87 (d, *J* = 5.0 Hz, 3H); **¹³C NMR** (125 MHz, CDCl₃): δ 197.1, 142.9, 139.4, 138.5, 135.8, 131.8, 129.6, 128.2, 128.1, 127.5, 125.9, 15.5. **HRMS** (ESI): calcd for C₁₆H₁₅O [M+Na]⁺: 245.0937, found: 245.0940.

(E)-2-benzylidene-3-methyl-1-phenylbutan-1-one

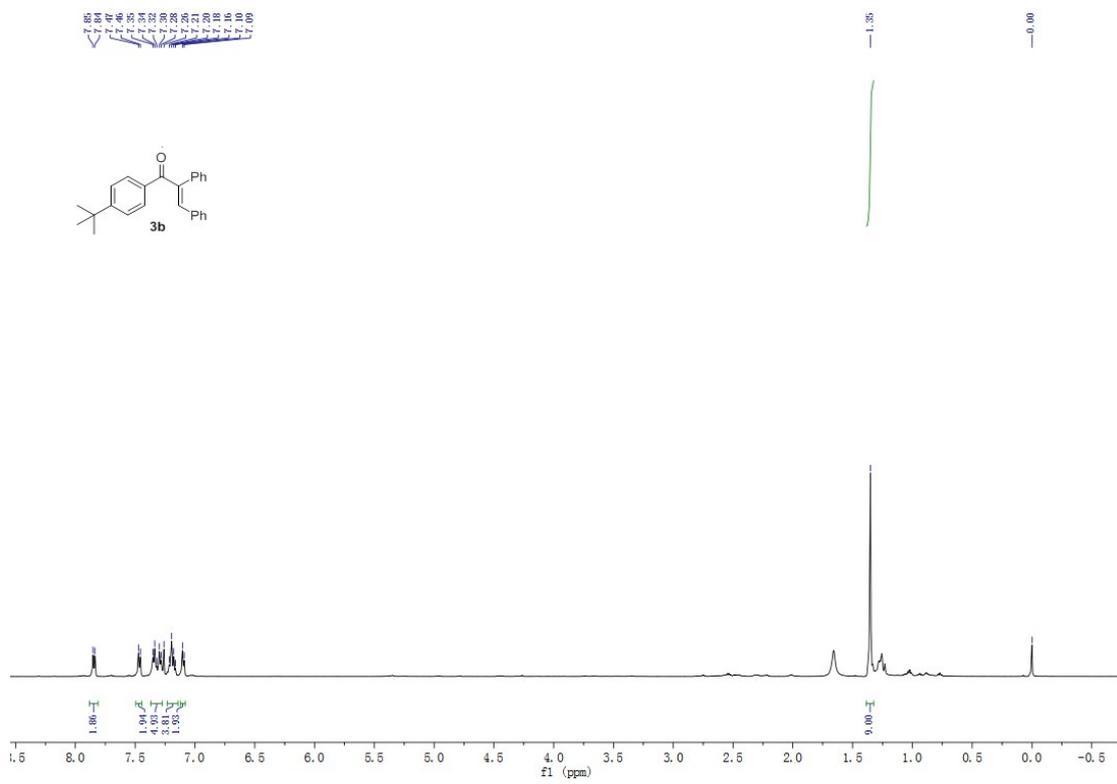
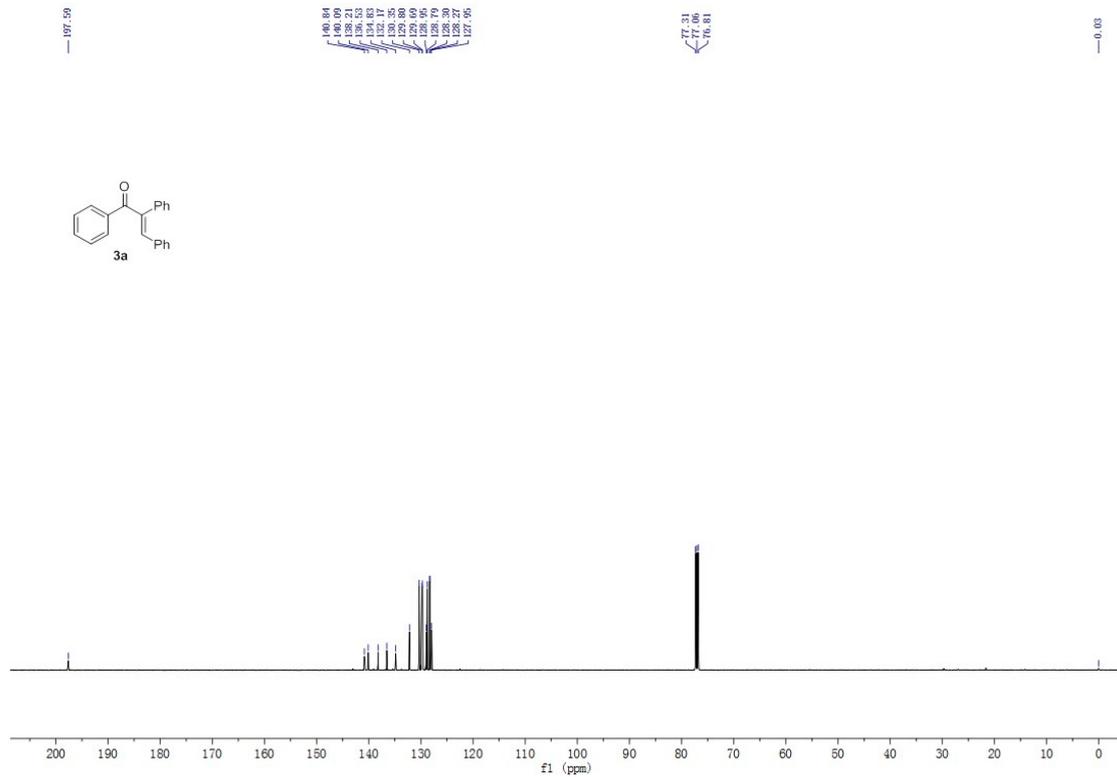


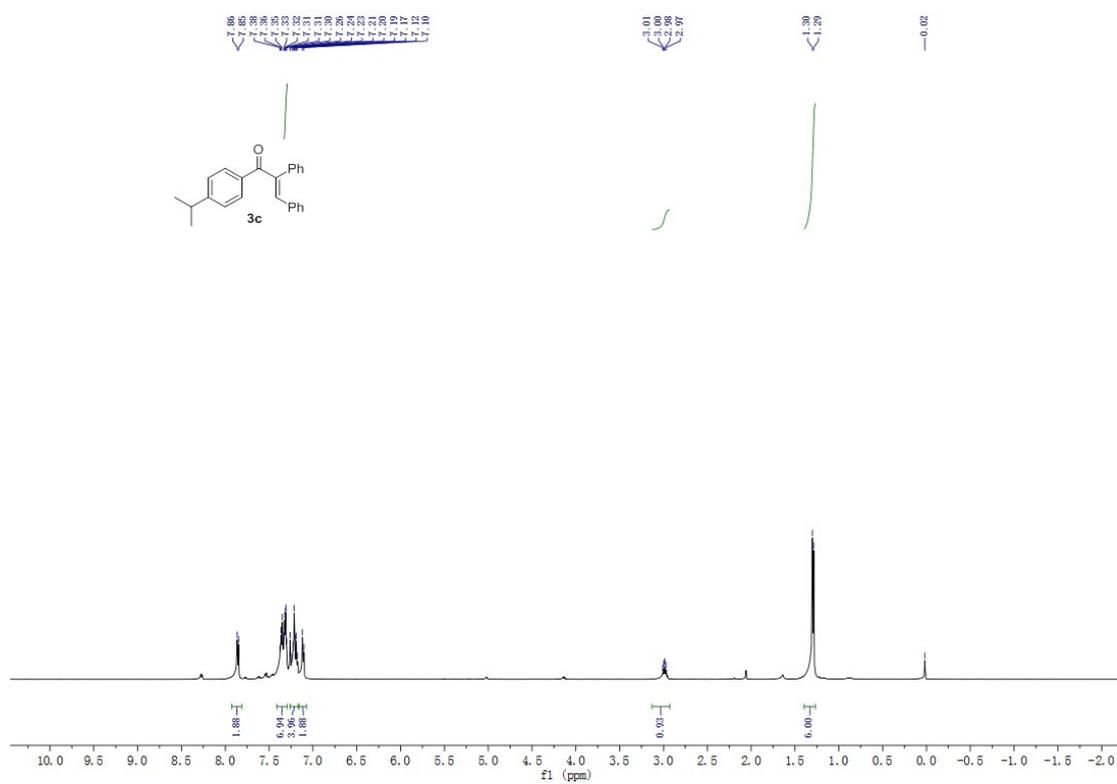
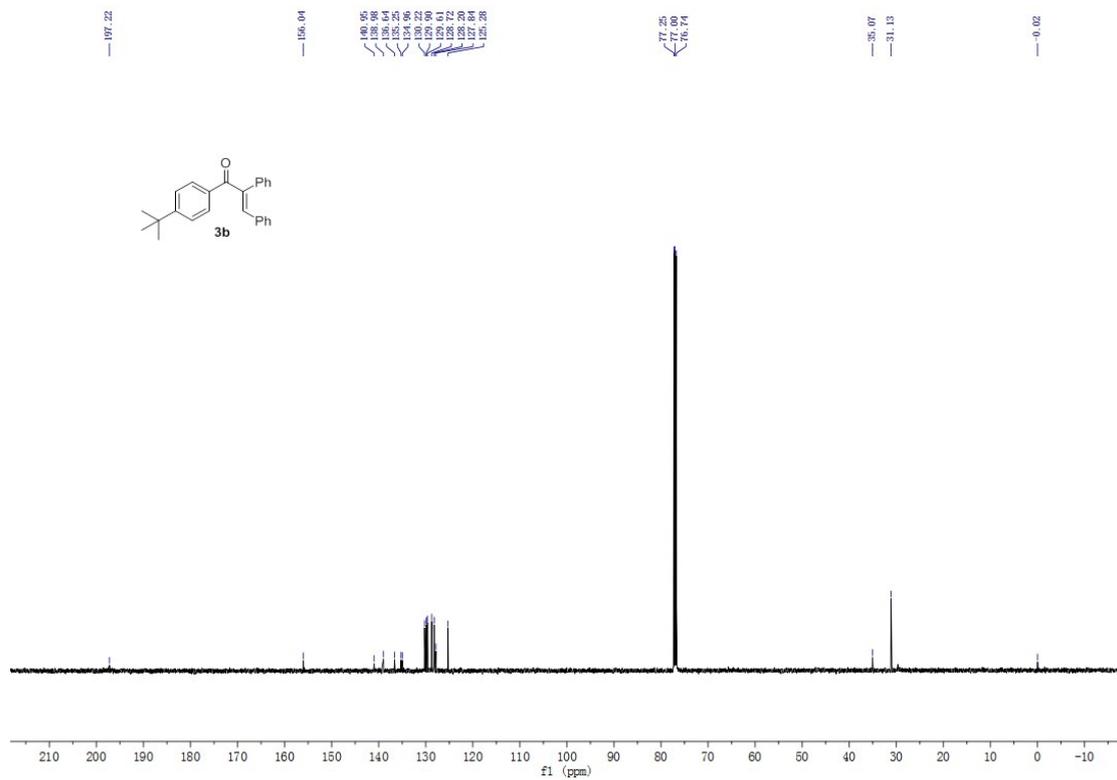
Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a colourless oil (34% yield). **¹H NMR** (500 MHz, CDCl₃): δ 7.92-7.86 (m, 2H), 7.55-7.36 (m, 8H), 6.82 (t, *J* = 5.0 Hz, 1H), 3.33-3.28 (m, 1H), 1.32 (d, *J* = 10.0 Hz, 6H); **¹³C NMR** (125 MHz, CDCl₃): δ 199.5, 146.6, 139.1, 136.6, 135.8, 132.3, 129.8, 128.9, 128.5, 128.2, 127.9, 28.8, 21.6. **HRMS** (ESI): calcd for C₁₈H₁₉O [M+H]⁺: 251.1430, found: 251.1438.

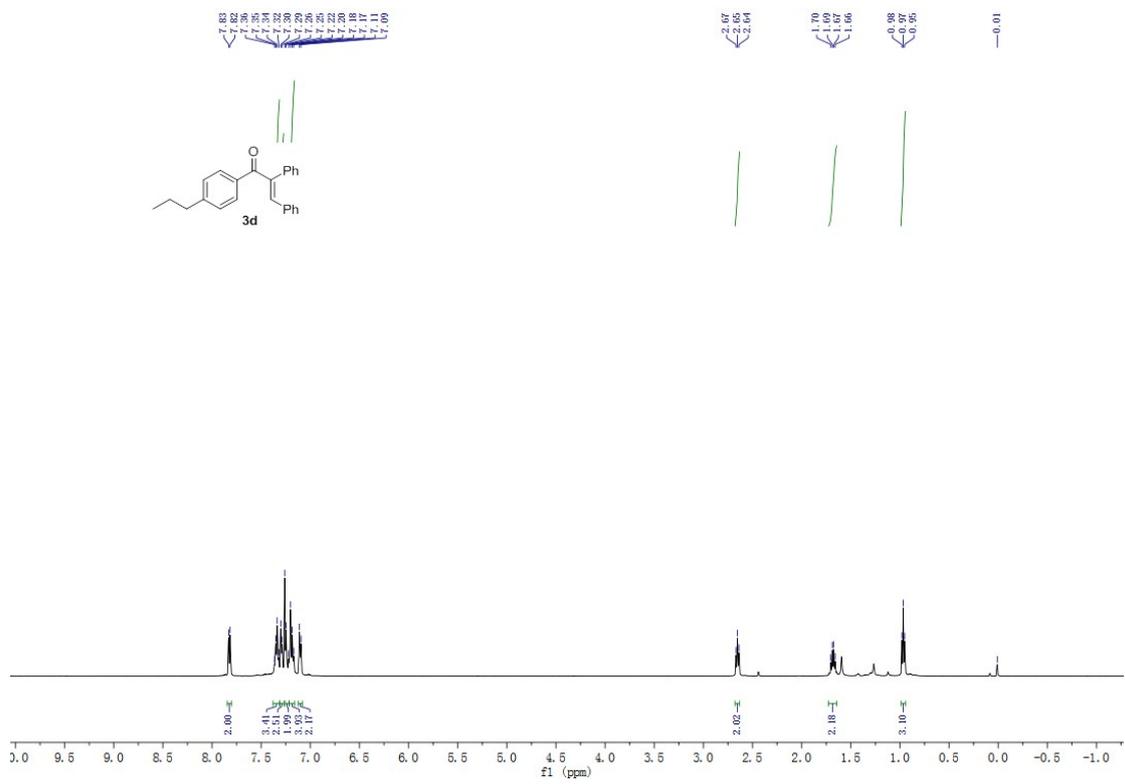
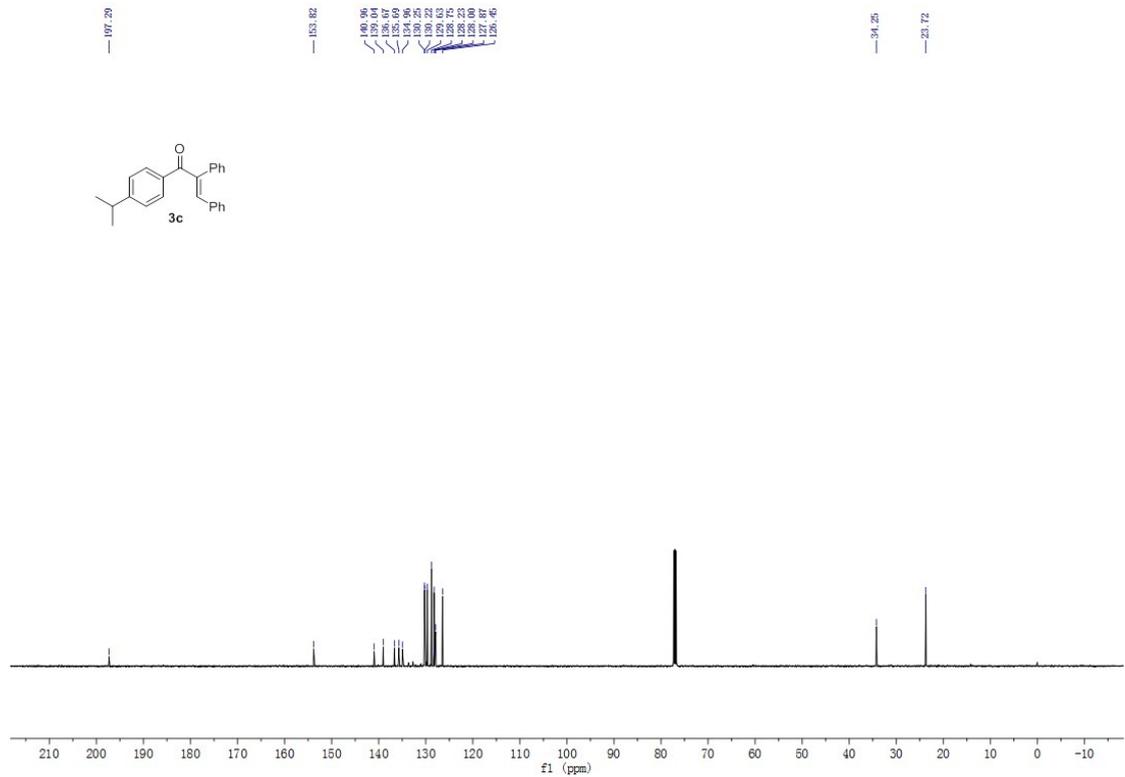
(E)-4-methyl-1,2-diphenylpent-2-en-1-one

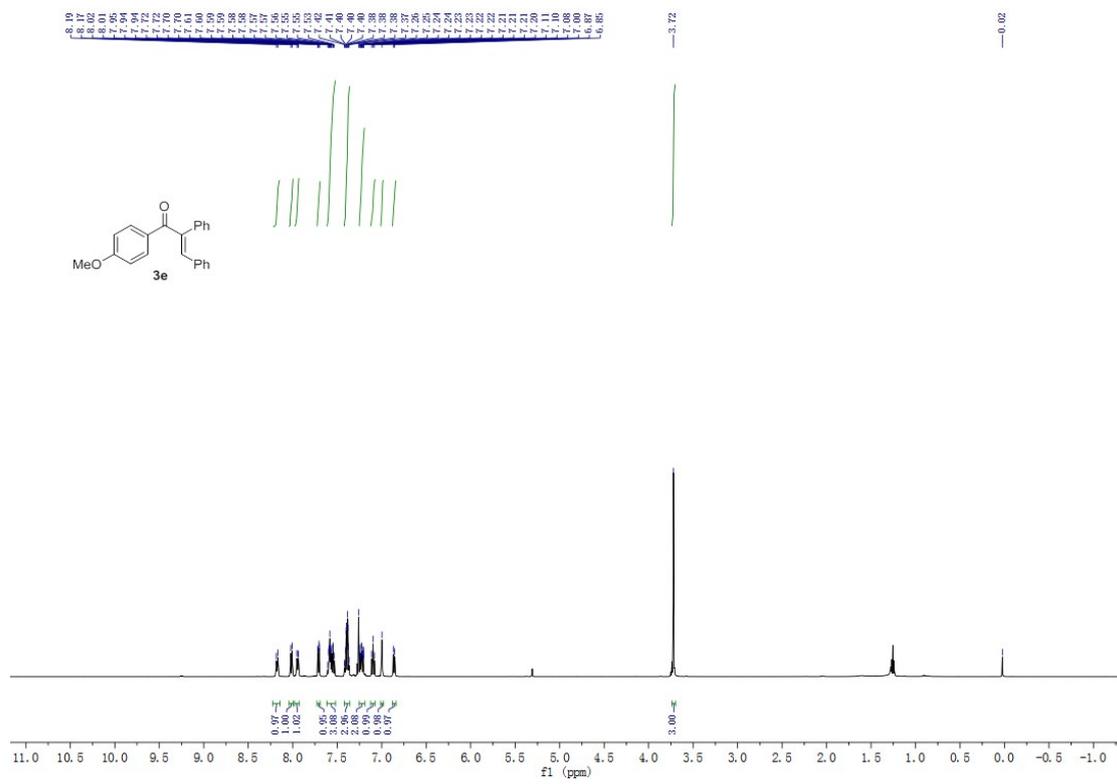
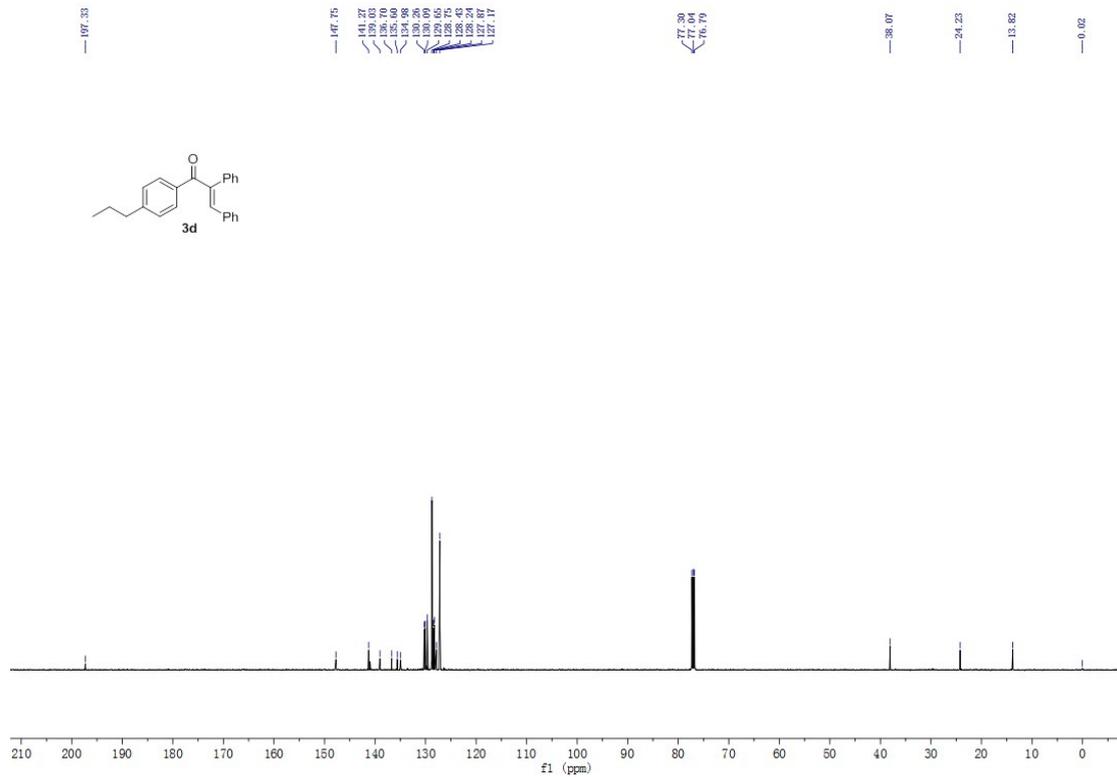


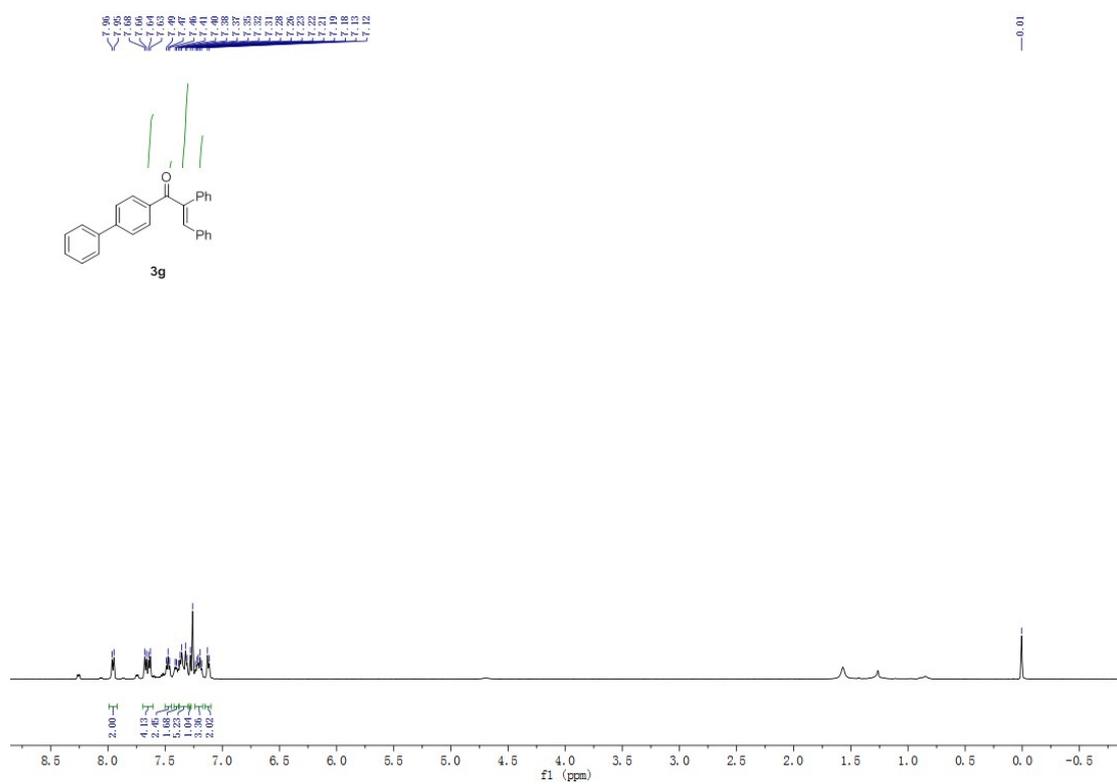
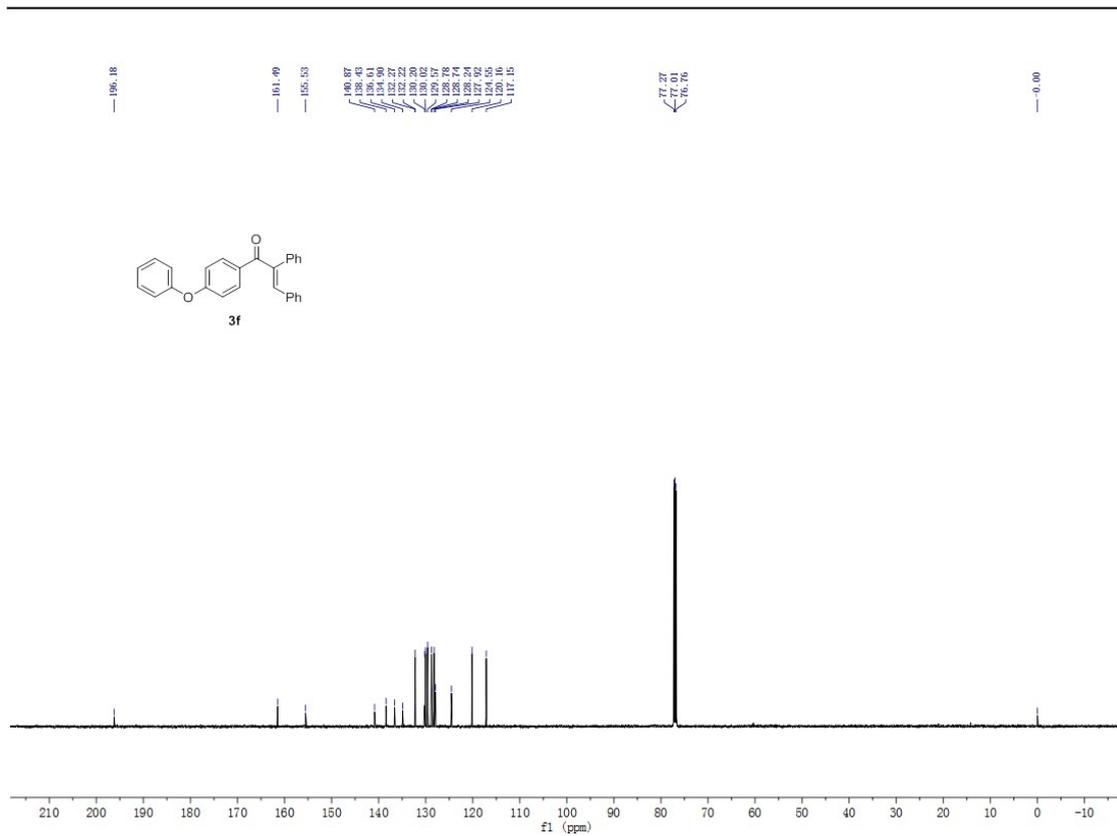
Following the general procedure, using 25 / 1 petroleum ether / EtOAc as the eluant afford a colourless oil (28% yield). **¹H NMR** (500 MHz, CDCl₃): δ 7.77 (d, *J* = 5.0 Hz, 2H), 7.52-7.47 (m, 1H), 7.43-7.22 (m, 7H), 6.25-6.20 (m, 1H), 2.67-2.59 (m, 1H),

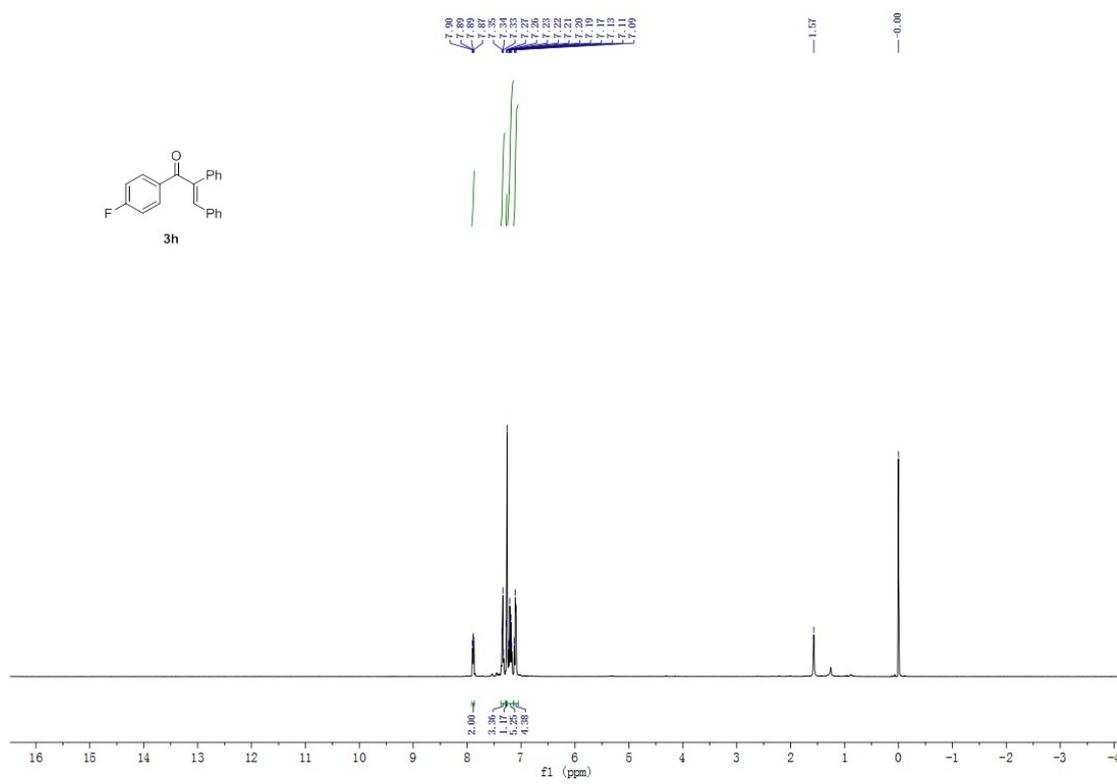
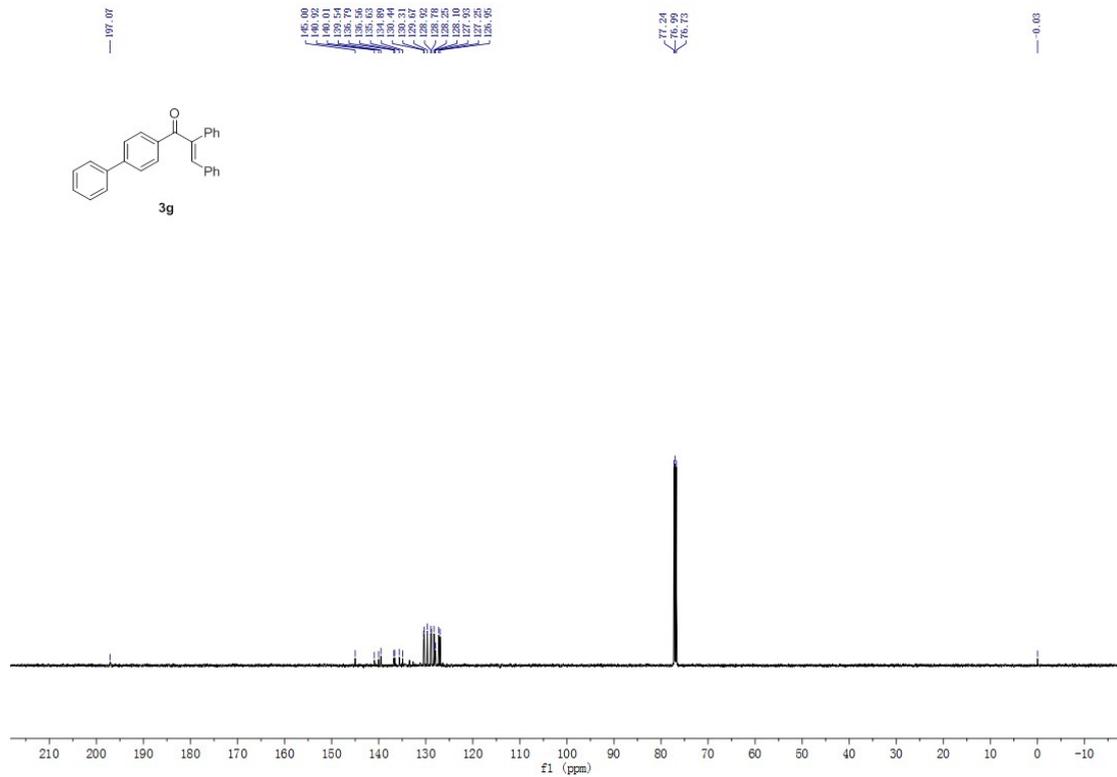


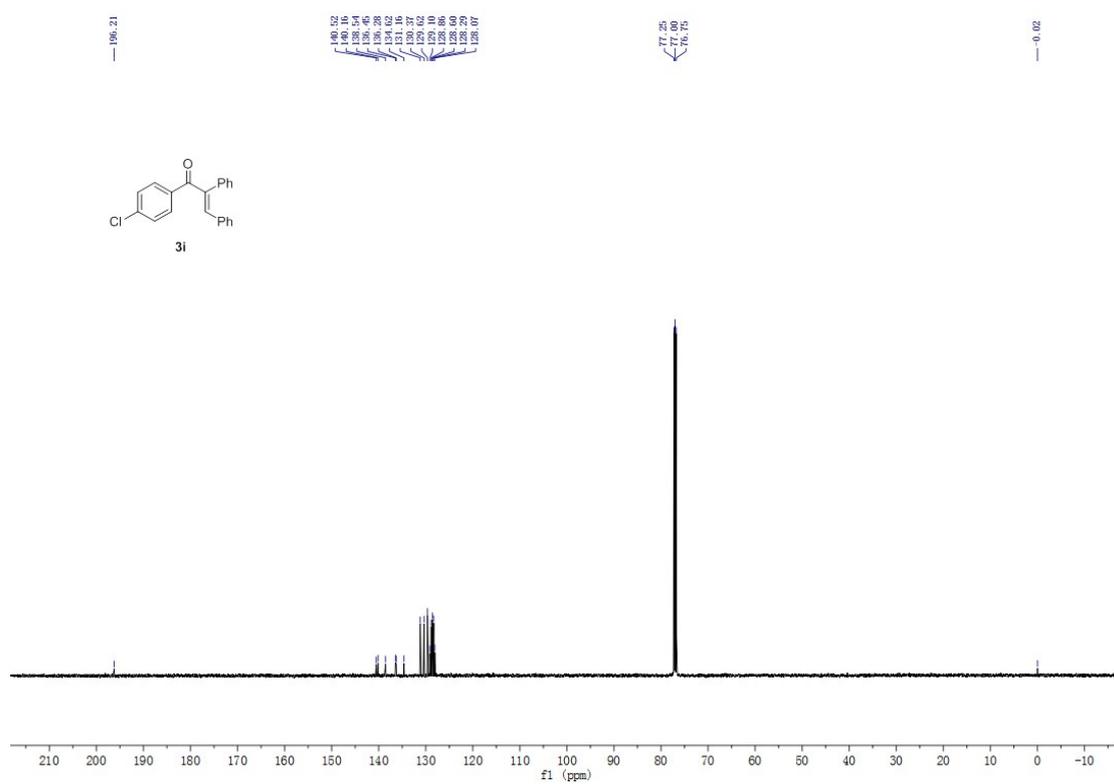
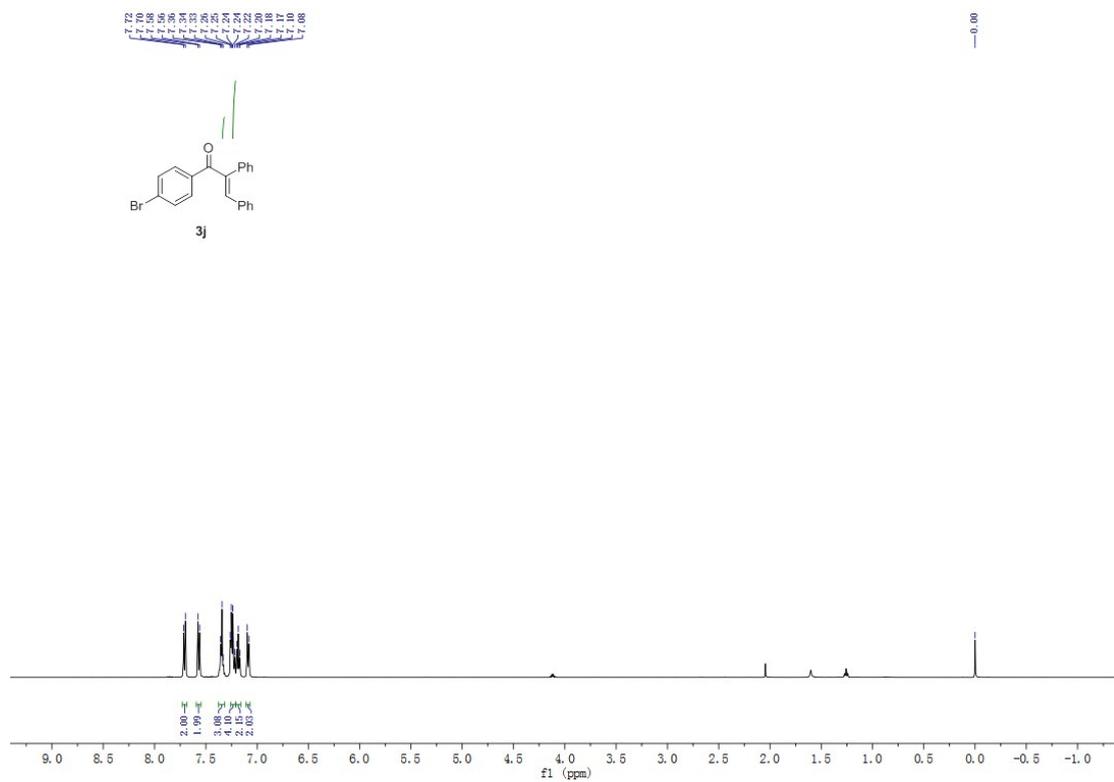












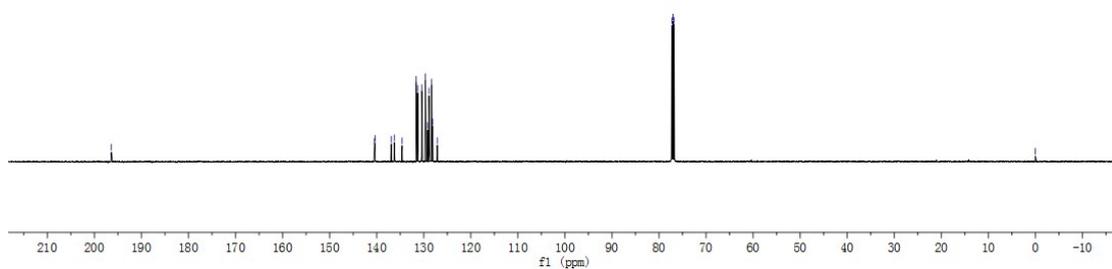
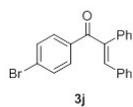


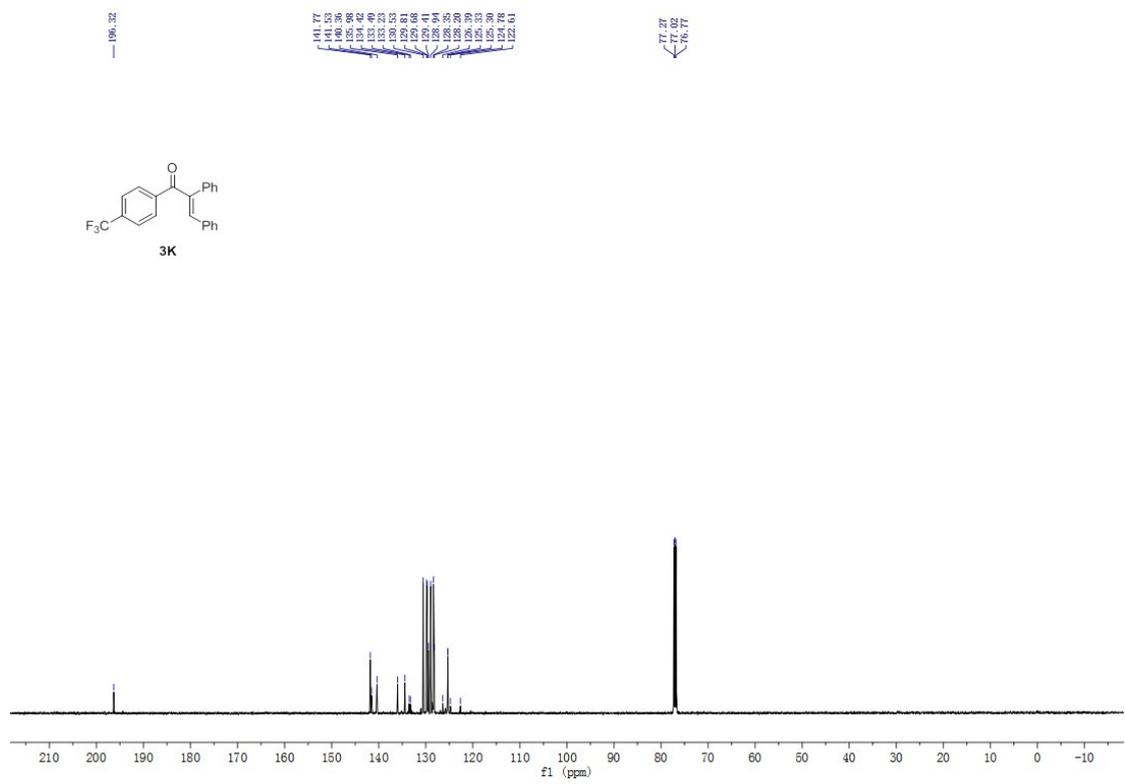
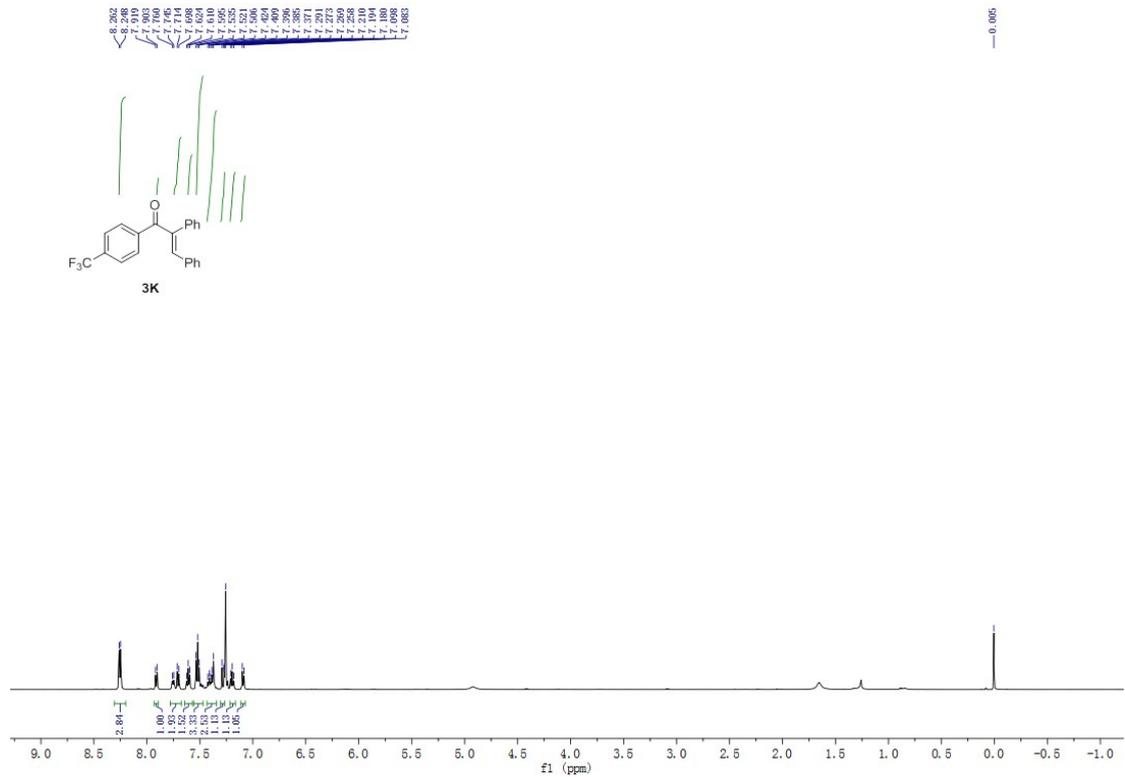
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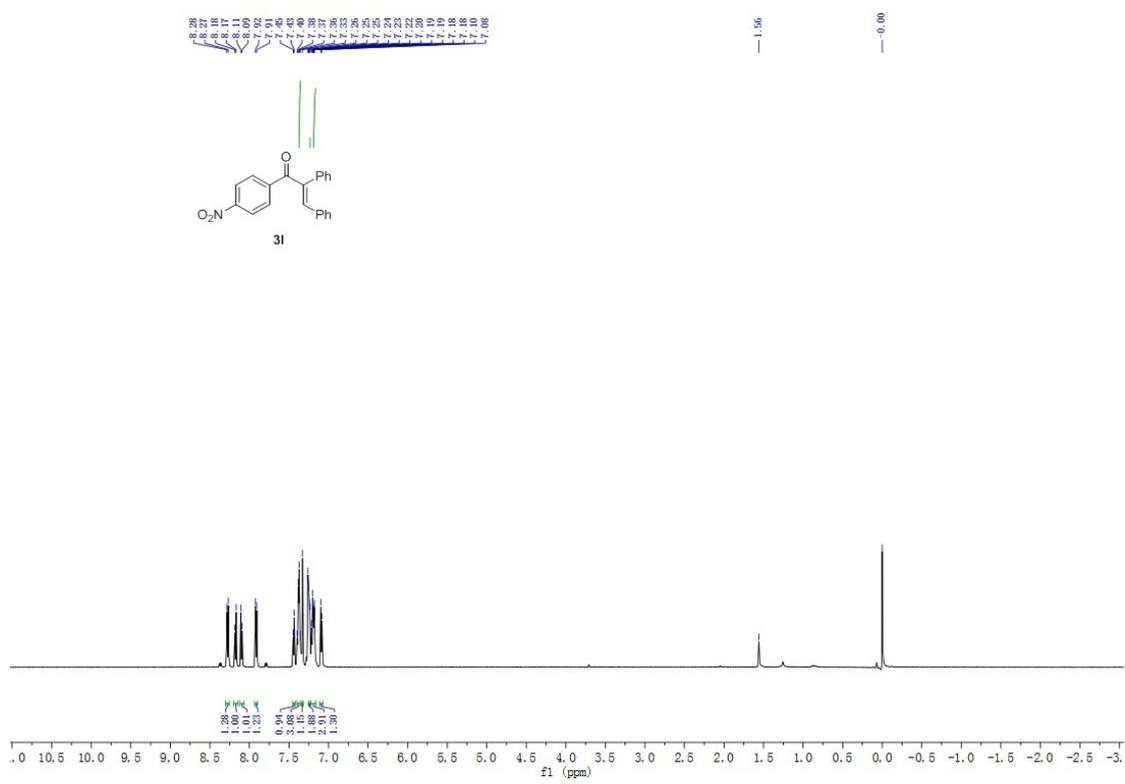
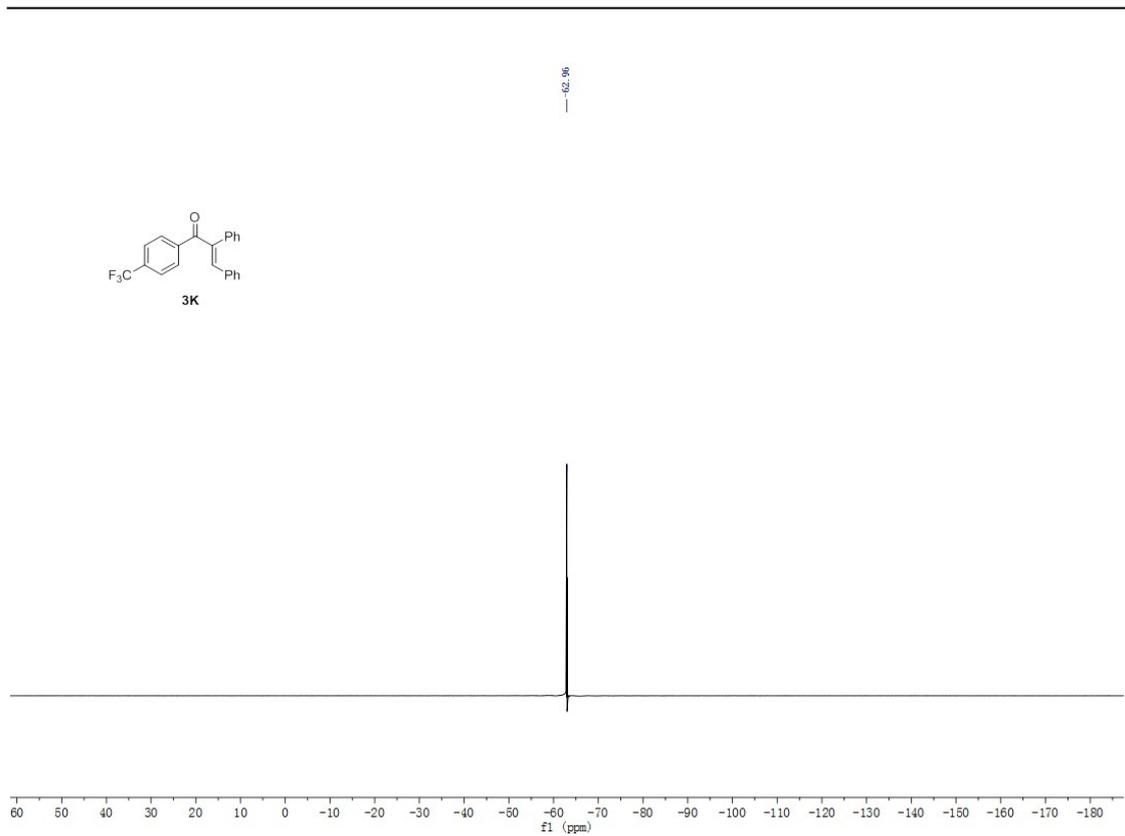
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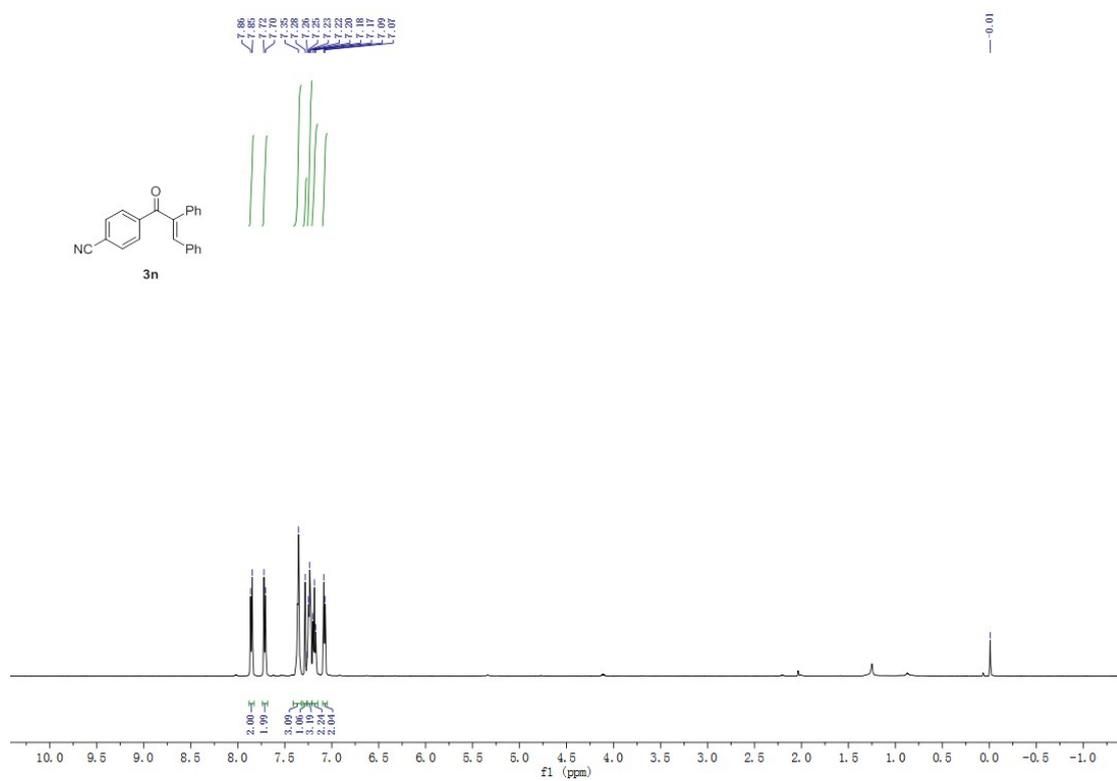
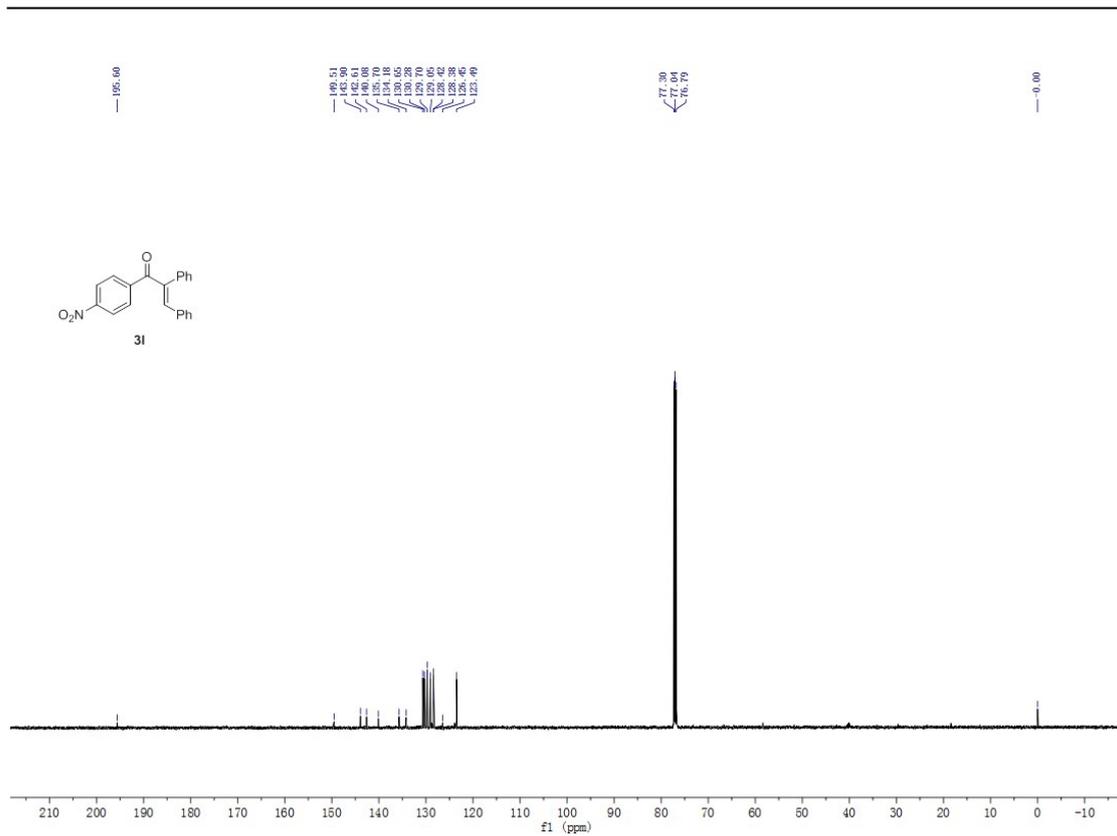
77.20
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76.79

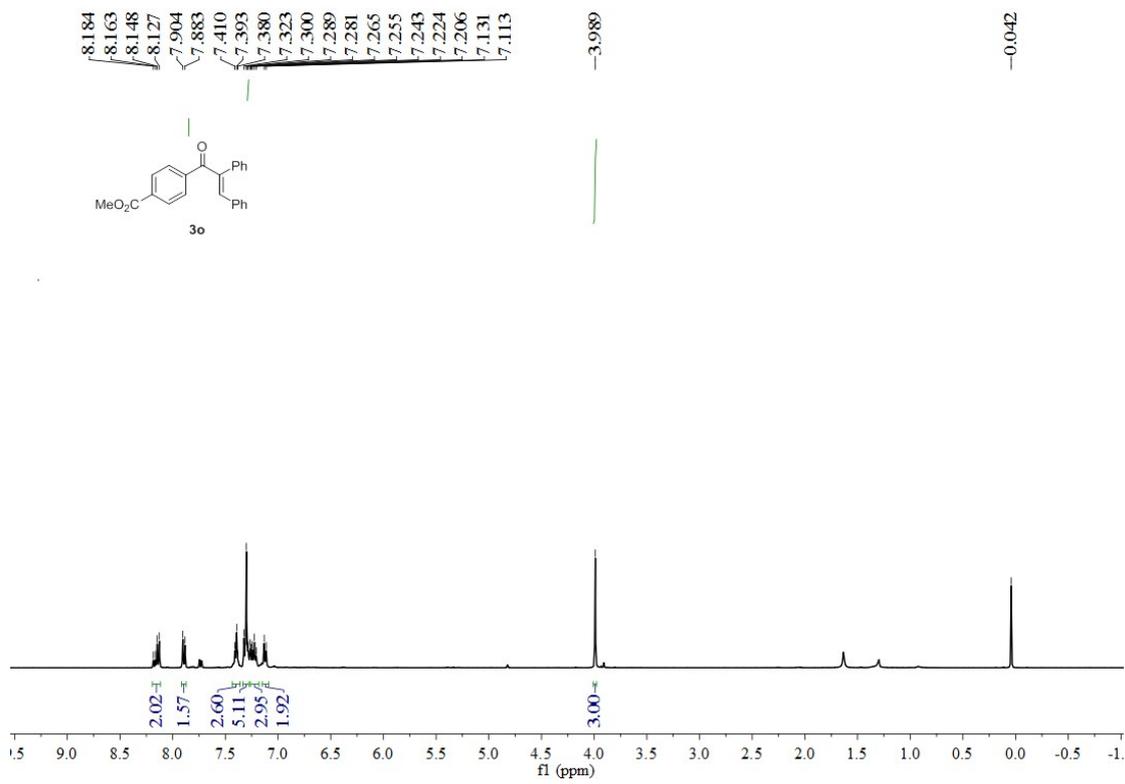
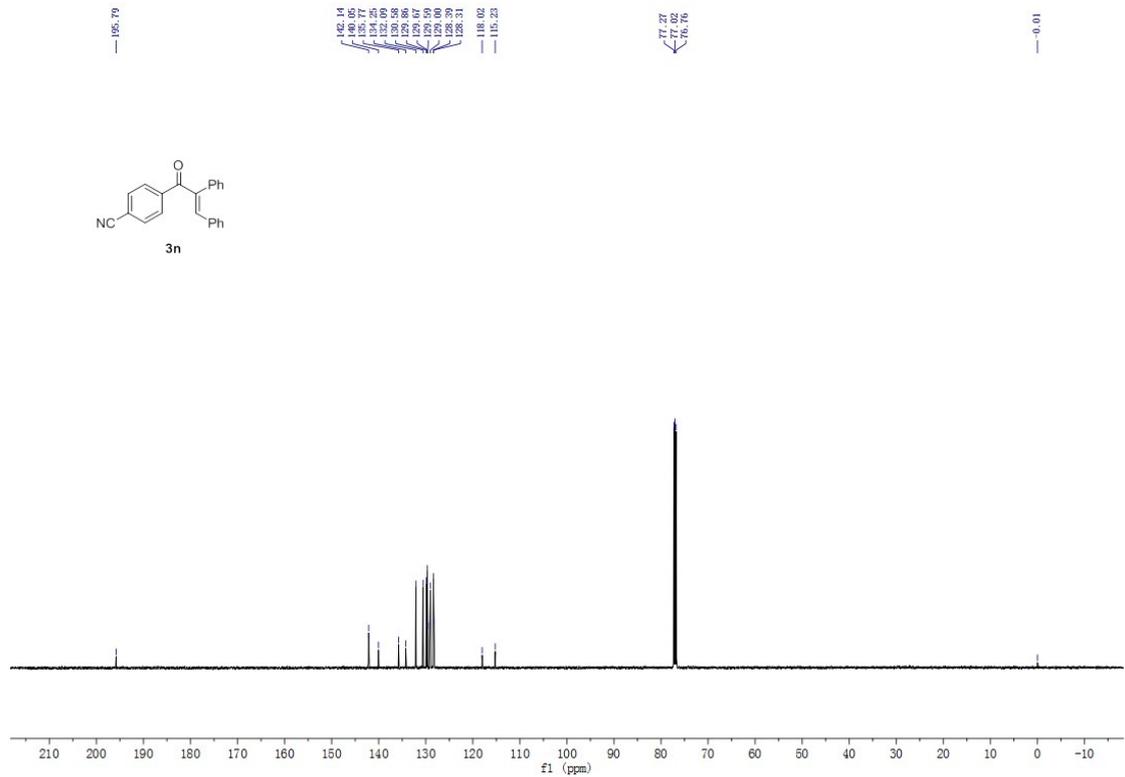
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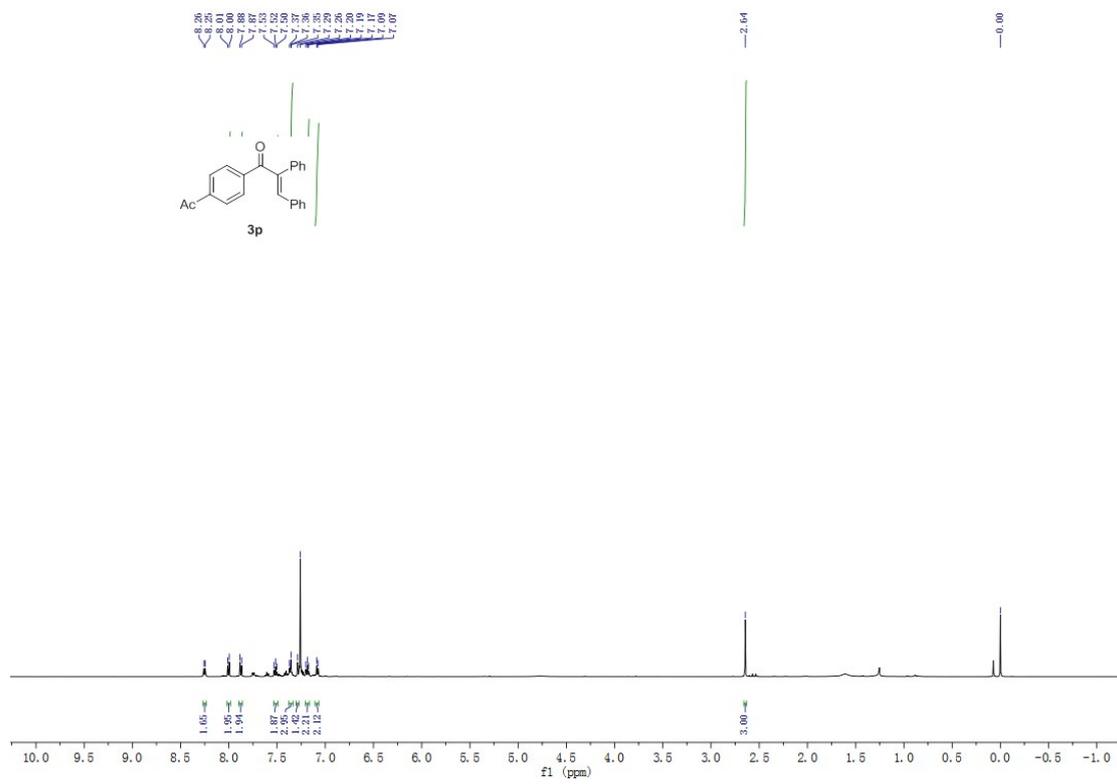
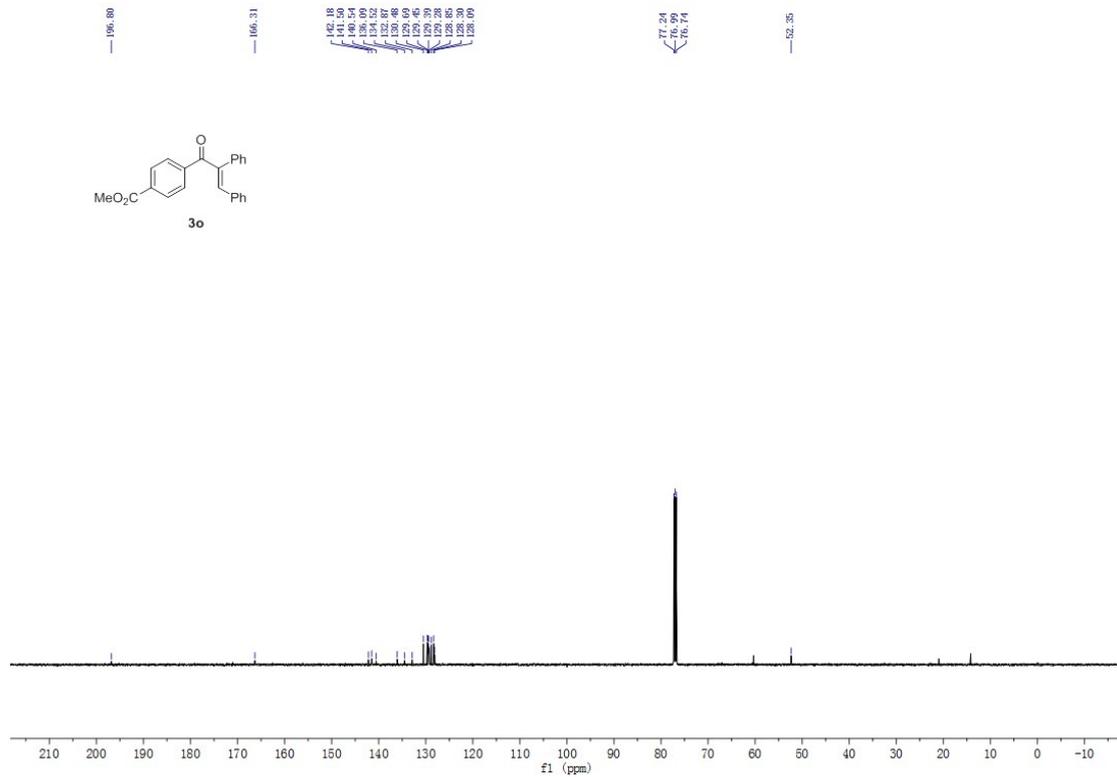


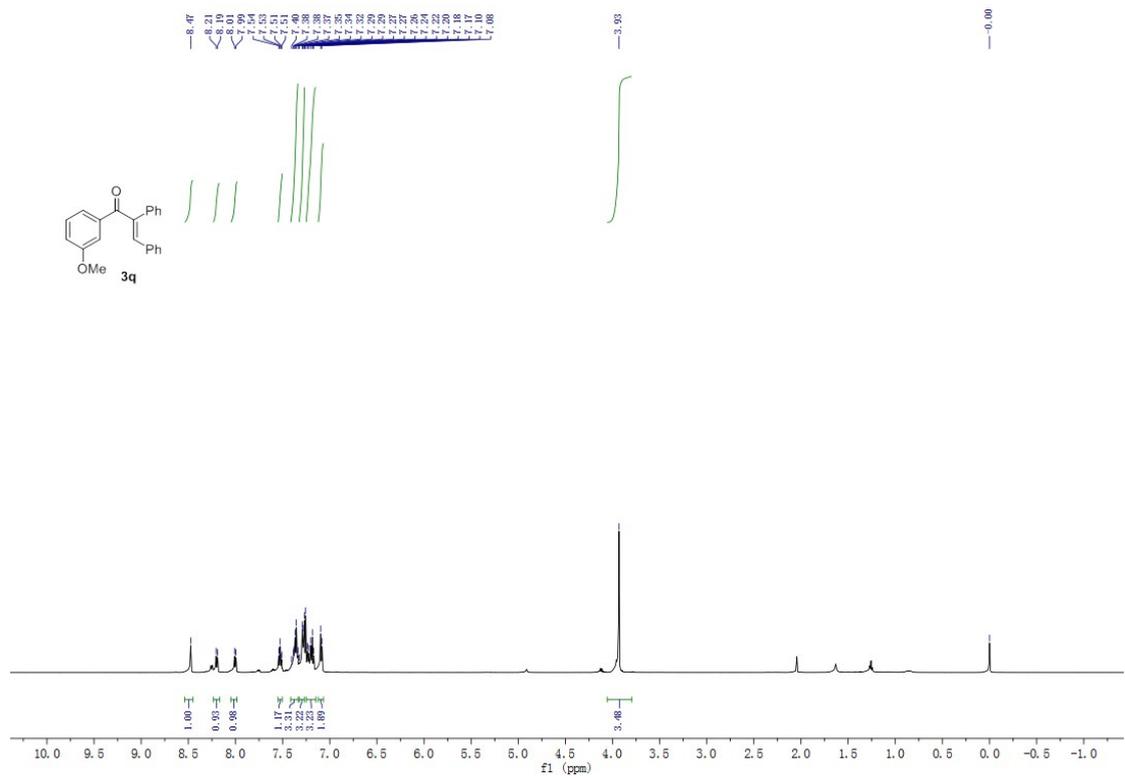
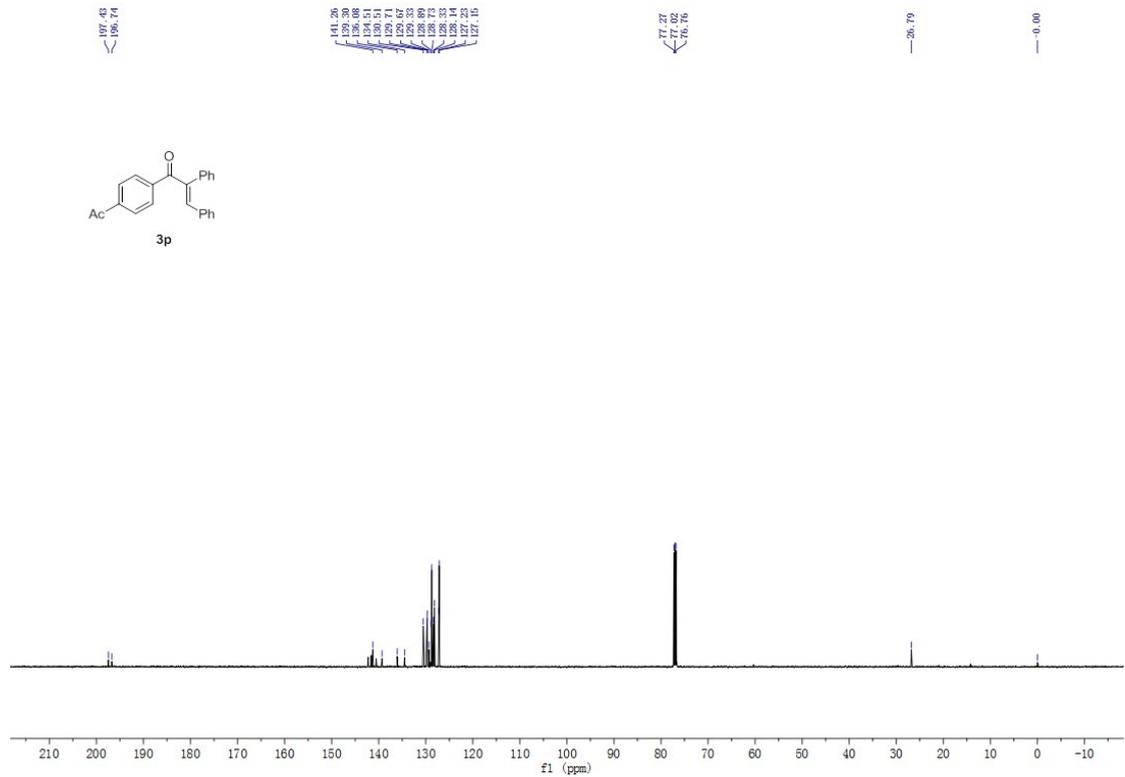


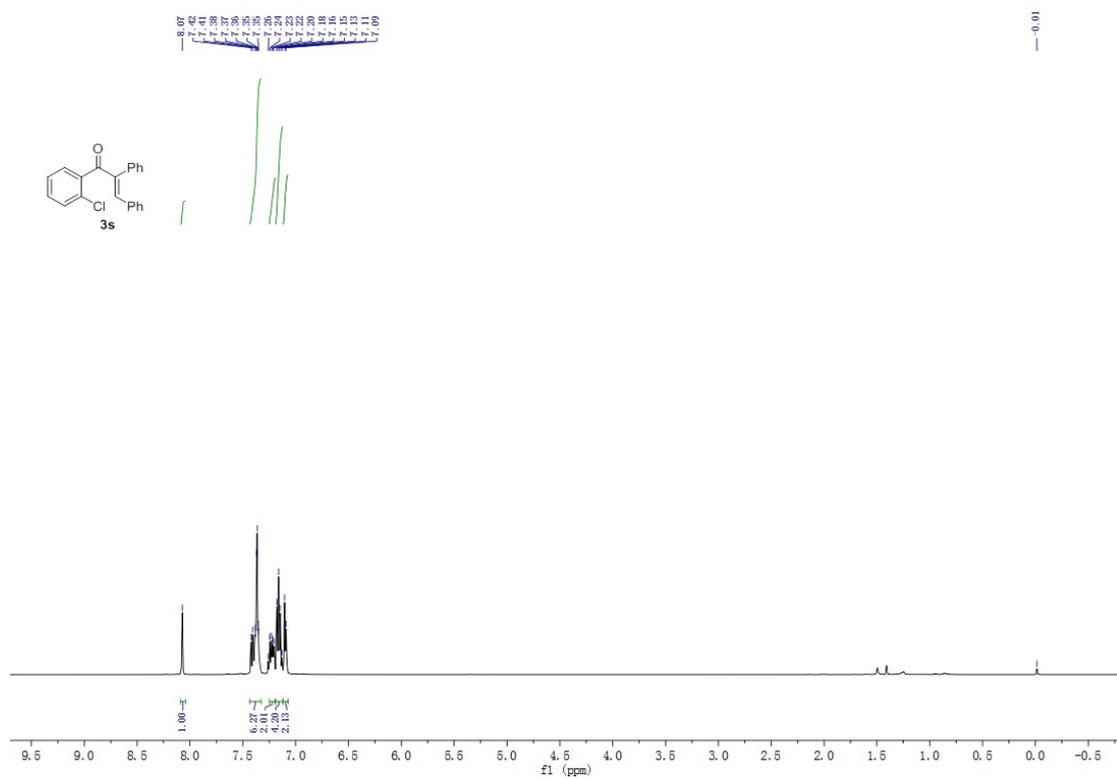
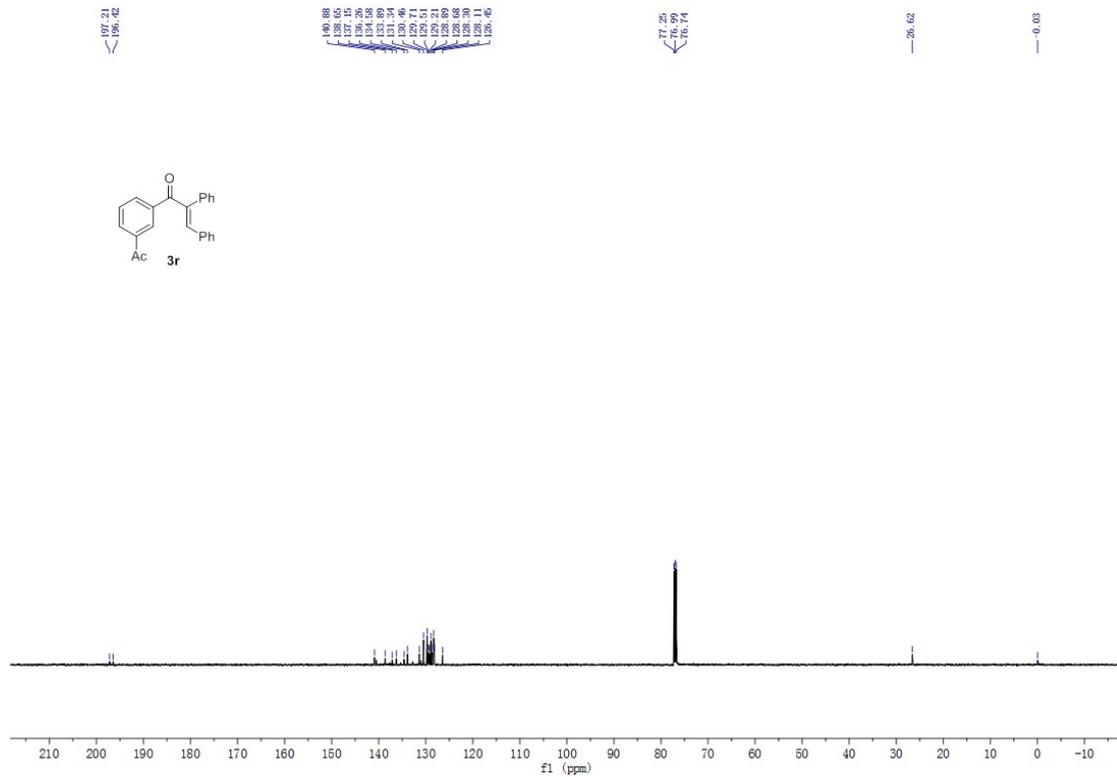


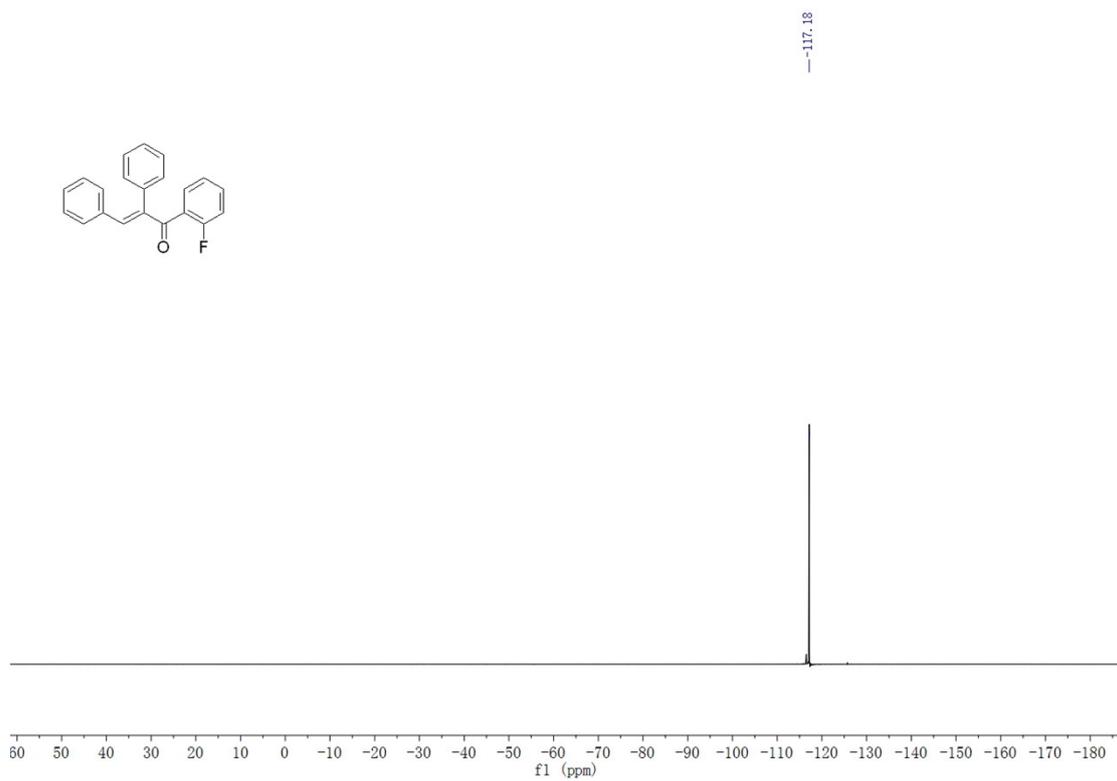
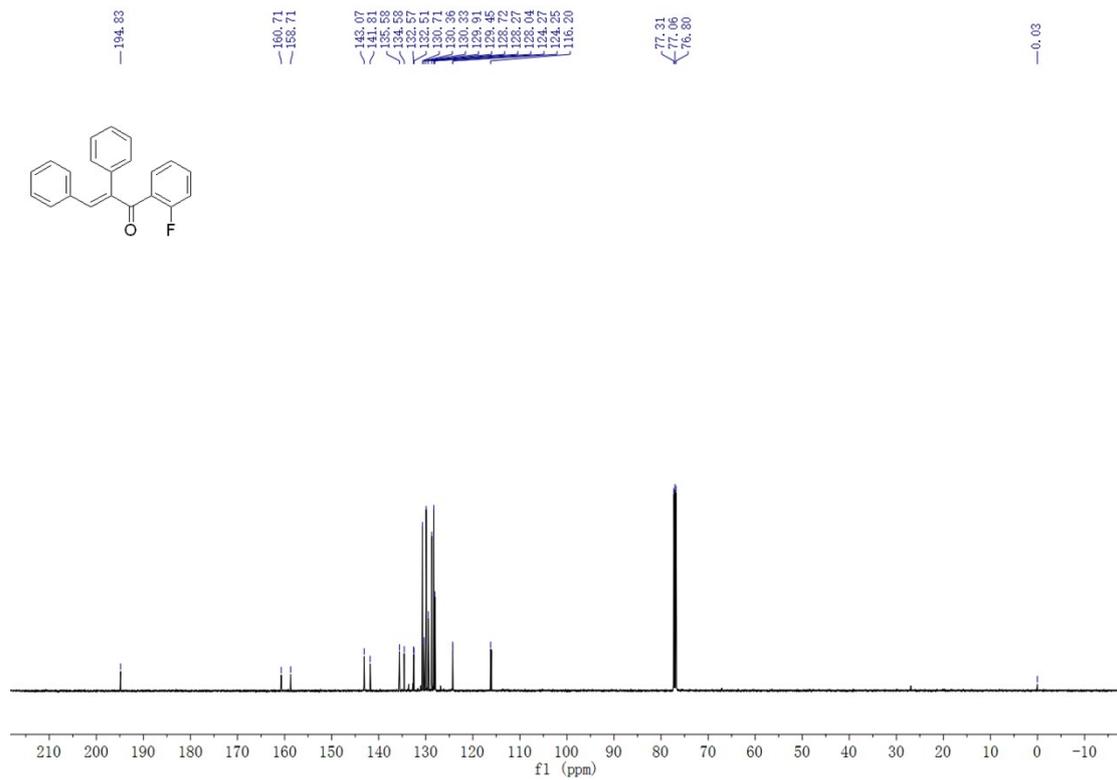


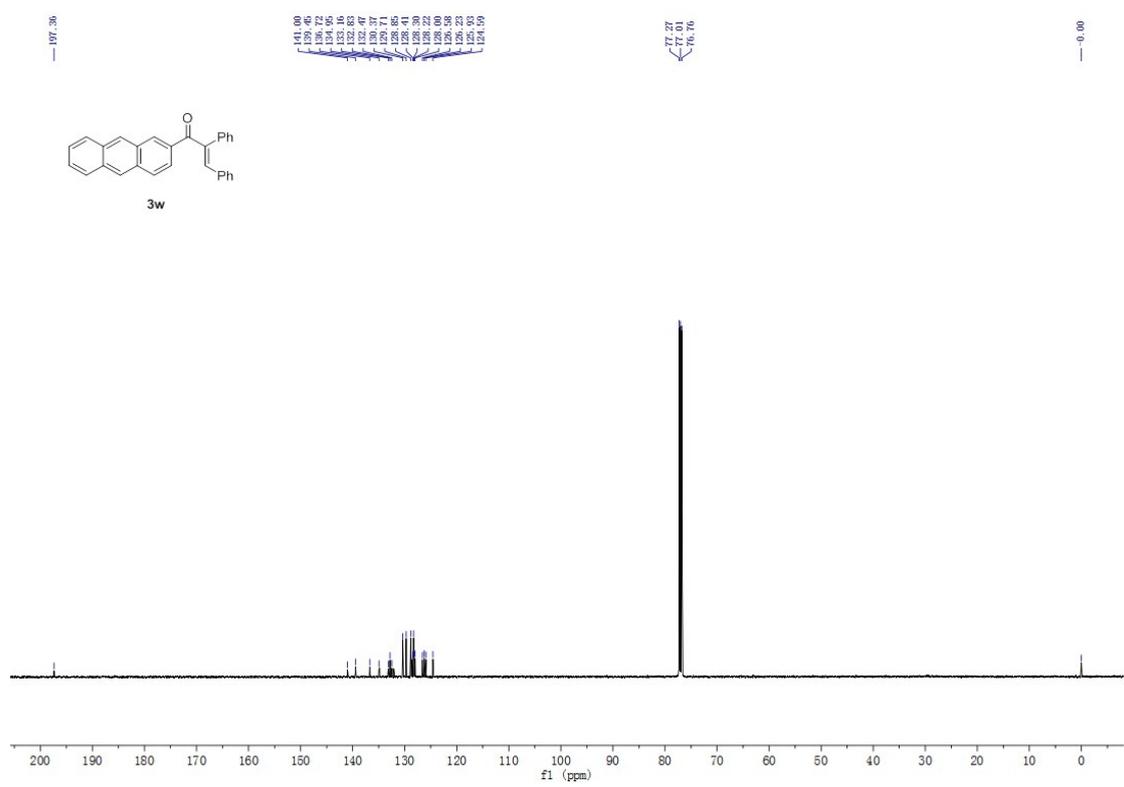
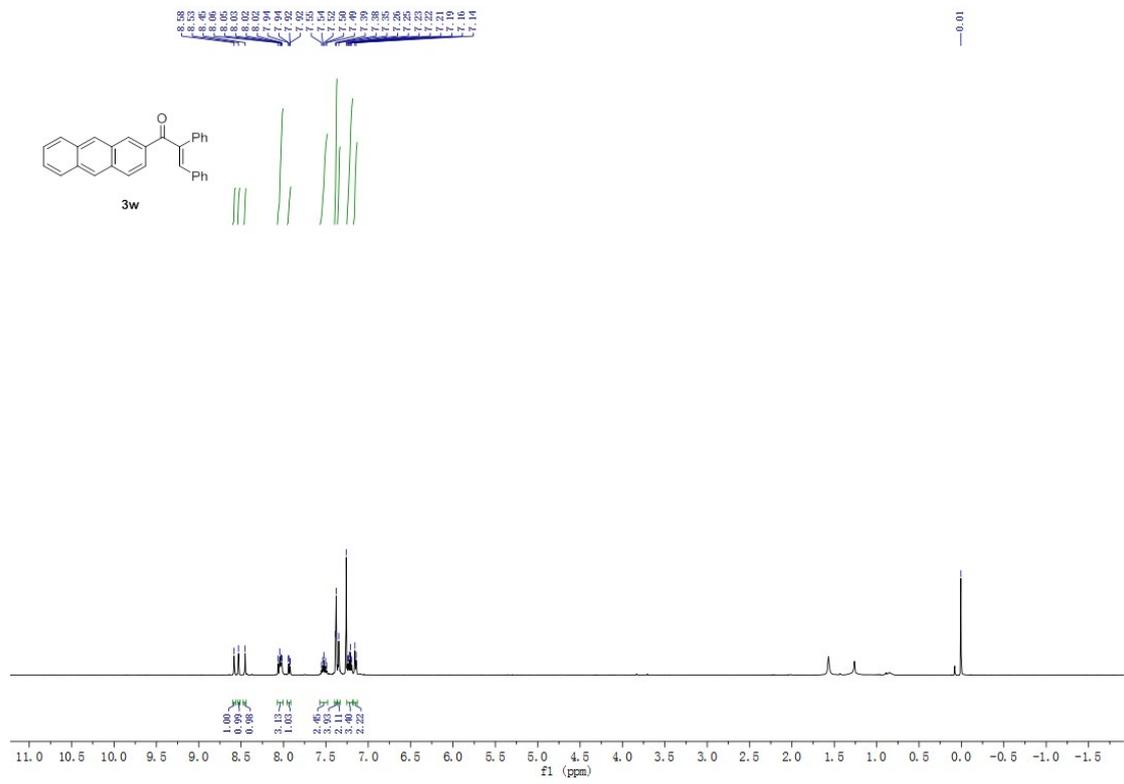


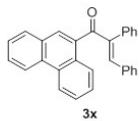






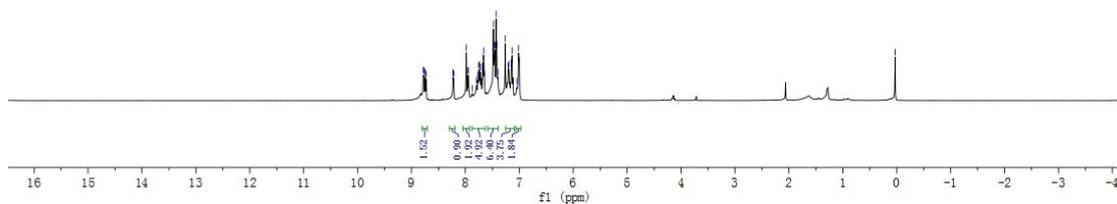
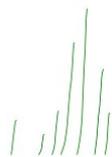






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7.41
7.30
7.21
7.19
7.14
7.01
7.00

0.03



199.15

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142.48
135.96
134.56
133.88
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128.05
127.14
127.13
126.97
122.70

77.28
77.02
76.77

0.00

