Supporting Information

Electrooxidative 1,2-Bromoesterification of Alkenes with Acids and *N*-Bromosuccinimide

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(A) Typical experimental procedure

(a) General information

The ^{1}H and ^{13}C NMR spectra were recorded in $CDCl_3$ solvent on a NMR spectrometer using TMS as internal standar. The instrument for electrolysis is DC power source (PM3005B) (made in China). Cyclic voltammograms were obtained on a CHI 605E potentiostat.

(b) Procedures for the Electrolysis

A 10 mL three–necked round bottom flask was charged with Tempo (0.25 mmol, 0.5 equiv), the alkene (0.5 mmol, 1.0 equiv), $^{n}Bu_4NBF_4$ (1 mmol, 2.0 equiv), NBS (1 mmol, 2.0 equiv) and carboxylic acid (1 mmol, 2.0 equiv). The flask was equipped with a graphite rod anode (Φ6mm×80mm) and a graphite rod (Φ 6mm×80mm) cathode. The flask was flushed with argon and MeCN (10 mL) were added. The constant current (10.0 mA) electrolysis was carried out at room temperature until complete consumption of the substrate (monitored by TLC or GC-MS analysis). The solvent was removed under reduced pressure. The residue was chromatographed through silica gel eluting with AcOEt/hexane to give the desired product.

(c) General procedure for the synthesis of substituted styrenes:

To a stirred suspension of methyltriphenylphosphonium bromide in THF, base (inorganic base like NaH, $NaNH_2$ or organic base like $^{n}BuLi$) was added under argon at 0 ºC and stirred for 30 min. After the mixture was cooled again to 0 ºC, aromatic aldehyde or ketone in THF was added drop wise and stirred for 12 h. The mixture was concentrated in vacuo and residue was dissolved in water and the aqueous layer was

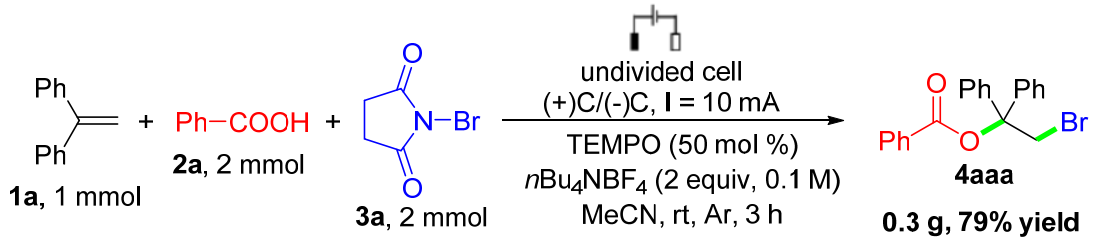
extracted with DCM (3 x 35 mL). The combined organic extracts were dried over anhydrous Na_2SO_4, concentrated and purified by silica gel column chromatography in petroleum ether: ethyl acetate (95:5) to afford pure styrene (85-99% yield).

(d) Typical Experimental Procedure for the synthesis of Vinyl-estrone:

Vinyl-estrone were prepared according to the known method.[1]

(B) Gram scale synthesis

A 25 mL three–necked round bottom flask was charged with TEMPO (0.5 mmol, 0.5 equiv), the alkene (1 mmol, 1.0 equiv), $^{n}Bu_4NBF_4$ (2 mmol, 2.0 equiv), NBS (2 mmol, 2.0 equiv) and carboxylic acid (2 mmol, 2.0 equiv). The flask was equipped with a graphite rod anode (Φ 6mm×80mm) and a graphite rod (Φ 6mm×80mm) cathode. The flask was flushed with argon and MeCN (20 mL) were added. The constant current (10.0 mA) electrolysis was carried out at room temperature until complete consumption of the substrate (monitored by TLC or GC-MS analysis). The solvent was removed under reduced pressure. The residue was chromatographed through silica gel eluting with AcOEt/hexane to give 0.3 g **4aaa**.



(C) Cyclic Voltammogram Curves

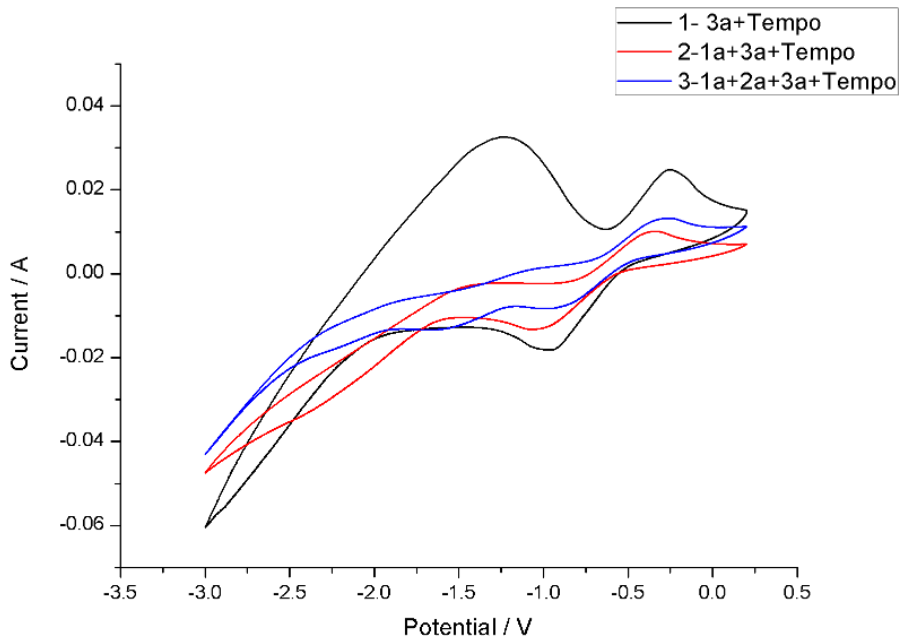
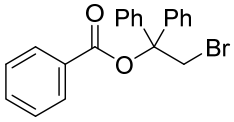


Figure S1. Cyclic Voltammogram Curves. Using carbon plate as working and counter electrode; Ag/AgCl as reference electrode at 100 mV/s scan rate. (1) (black) $^{n}Bu_4NBF_4$ (0.1 M), Tempo (25 mM) and MeCN; (2) (red) 1a (0.05 M), 3a (0.1M),$^{n}Bu_4NBF_4$ (0.1 M), Tempo (25 mM) and MeCN; (3) (blue) 1a (0.05 M), 2a (0.1M), 3a (0.1 M), $^{n}Bu_4NBF_4$ (0.1 M), Tempo (25 mM).

An obvious oxidation peak of substrate **3a** acould be observed at -1.25 V (Fig. 1, black line), while there was no obvious oxidation peak in the cyclic voltammograms (Fig. 1, blue line). A reduction peak was observed at −1.60V under the reaction solvent system (Fig. 1, blue line).

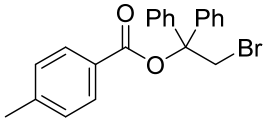
(D) Analytical data

2-Bromo-1,1-diphenylethyl benzoate (4aaa):



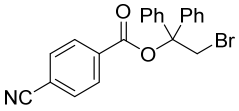
167.8 mg, 88% yield; White solid; mp 153.2-154.7 ºC (uncorrected); ^{1}H NMR (500 MHz, $CDCl_3$) δ: 8.17-8.15 (d, *J* = 7.5 Hz, 2H), 7.62-7.59 (t, *J*=7.5Hz, 1H), 7.51-7.48 (t, *J* = 7.5Hz, 2H), 7.46-7.45 (d, *J* = 7.5 Hz, 4H), 7.37-7.34 (d, *J* = 7.5 Hz, 4H), 7.37-7.34 (t, *J* = 7.5 Hz, 2H), 4.84 (s, 2H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 164.5, 142.4, 133.2, 130.6, 129.7, 128.5, 128.3 (2), 127.8, 126.1, 84.3, 39.4; HRMS *m/z* (ESI) calcd for $C_{21}H_{18}BrO_2$ ([M+H]$^+$) 381.0490, found 381.0498.

2-Bromo-1,1-diphenylethyl 4-methylbenzoate (4aba):



162.1 mg, 82% yield; White solid; mp 158.2-159.7 ºC (uncorrected); ^{1}H NMR (500 MHz, $CDCl_3$) δ: 8.06-8.04(d, *J* = 8.5 Hz, 2H), 7.45-7.44(d, *J* = 7.5 Hz, 4H), 7.36-7.33 (t, *J* = 5.0 Hz, 4H), 7.30-7.27 (t, *J* = 7.5 Hz, 4H), 4.83 (s, 2H) , 2.43 (s, 3H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 164.6, 144.0, 142.6, 129.8, 129.2, 128.3, 127.7, 126.1, 84.1, 39.5, 21.7; HRMS *m/z* (ESI) calcd for $C_{22}H_{20}BrO_2$ ([M+H]$^+$) 395.0647, found 395.0654.

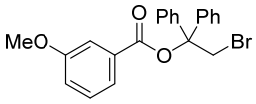
2-Bromo-1,1-diphenylethyl 4-cyanobenzoate (4aca):



117.8 mg, 58% yield; White solid; mp 148.4-150.3 ºC (uncorrected); 1H NMR (500 MHz, CDCl3) δ: 8.24-8.23 (d, J = 8.5 Hz, 2H), 7.80-7.78 (d, J = 8.5 Hz, 2H), 7.43-7.42 (d, J = 7.5 Hz, 4 H), 7.38-7.35 (t, J = 7.5 Hz, 4H), 7.33-7.30 (t, J = 7.5 Hz, 2H), 4.82 (s, 2H); 13C NMR (125 MHz,

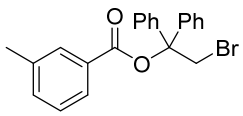
CDCl3) δ: 162.9, 141.8, 134.5, 132.4, 130.2, 128.4, 128.0, 126.1, 117.9, 116.6, 85.3, 39.1; HRMS m/z (ESI) calcd for $C_{22}H_{17}BrNO_2$ ([M+H]$^+$) 406.0443, found 406.0450.

2-Bromo-1,1-diphenylethyl 3-methoxybenzoate (4ada):



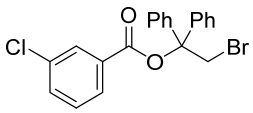
148.1 mg, 72% yield; Colorless oil; mp 159.3-160.5 ºC (uncorrected); ^{1}H NMR (500 MHz, $CDCl_3$) δ: 7.81-7.79 (d, *J* = 7.5 Hz, 1H), 7.64-7.63 (m, 1H), 7.45-7.44 (d, *J* = 8 Hz, 4H), 7.42-7.39 (t, *J* = 7.5 Hz, 1H), 7.36-7.33 (t, *J* = 7.5 Hz, 4H) , 7.30-7.27 (t, *J* = 7.5 Hz, 2H), 7.15-7.13 (m, 1H) , 4.86 (s, 2H), 3.87 (s, 3H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 164.4, 159.6, 142.4, 131.9, 129.5, 128.3, 127.8, 126.1, 122.0, 119.6, 114.3, 84.3, 55.4, 39.4; HRMS *m/z* (ESI) calcd for $C_{22}H_{20}BrO_3$ ([M+H]$^+$) 411.0596, found 411.0603 .

2-Bromo-1,1-diphenylethyl 3-methylbenzoate (4aea):



160.1 mg, 81% yield; White soild; mp 152.3-154.7 ºC (uncorrected); ^{1}H NMR (500 MHz, $CDCl_3$) δ: 7.99-7.96 (d, *J* = 7.5 Hz, 1H), 7.94 (s, 1H), 7.46-7.44 (d, *J* = 7.5 Hz, 4H), 7.42-7.38 (m, 2H), 7.37-7.34 (t, *J* = 7.5 Hz, 4H), 7.30-7.27 (t, *J* = 7.5 Hz, 2H), 4.84 (s, 2H), 2.43(s, 3H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 164.7, 142.5, 138.3, 134.0, 130.6, 130.3, 128.4, 128.3, 127.7, 126.9, 126.1, 84.2, 39.5, 21.4; HRMS *m/z* (ESI) calcd for $C_{22}H_{20}BrO_2$ ([M+H]$^+$) 395.0647, found 395.0654.

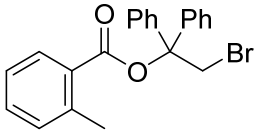
2-Bromo-1,1-diphenylethyl 3-chlorobenzoate (4afa):



180.8 mg, 87% yield; Yellow solid; mp 155.4-157.3 ºC (uncorrected); ^{1}H NMR (500 MHz, $CDCl_3$) δ: 8.11 (s, 1H), 8.04-8.02 (d, *J* = 7.5 Hz, 1H), 7.57-7.55 (d, *J* = 8.0 Hz, 1H), 7.44-7.42 (d, *J* = 7.5 Hz,

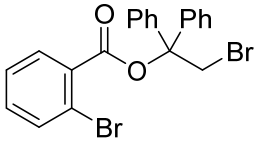
5H), 7.37-7.34 (d, J = 7.5Hz, 4H), 7.31-7.28 (t, J = 7.5 Hz, 2H), 4.82 (s, 2H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 163.3, 142.1, 134.6, 133.2, 132.4, 129.8, 129.7, 128.3, 127.9, 127.8, 126.1, 84.8, 39.3; HRMS *m/z* (ESI) calcd for $C_{21}H_{17}BrClO_2$ ([M+H]$^+$) 415.0100, found 415.0106.

2-Bromo-1,1-diphenylethyl 2-methylbenzoate (4aga):



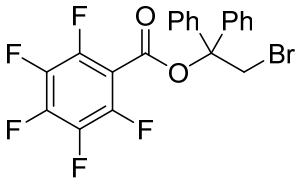
146.3 mg, 74% yield; Colorless oil; ^{1}H NMR (500 MHz, $CDCl_3$) δ: 8.14-8.12 (d, J = 7.5 Hz, 1H), 7.46-7.44 (d, J = 7.5 Hz, 5H), 7.36-7.33 (t, J = 7.5 Hz, 5H), 7.29-7.25 (t, J = 7.5 Hz, 3H), 4.85 (s, 2H), 2.51 (s, 3H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 165.5, 142.5, 140.2, 132.0, 131.6, 130.3 (2), 128.3, 127.7, 126.1, 125.8, 84.2, 39.6, 21.3; HRMS *m/z* (ESI) calcd for $C_{22}H_{20}BrO_2$ ([M+H]$^+$) 395.0647, found 395.0654.

2-Bromo-1,1-diphenylethyl 2-bromobenzoate (4aha):



184.1 mg, 80% yield; Colorless oil; ^{1}H NMR (500 MHz, $CDCl_3$) δ: 7.96-7.94 (d, J = 7.5 Hz, 1H), 7.66-7.65 (d, J = 7.5 Hz, 1H), 7.45-7.43 (d, J = 7.5 Hz, 4H), 7.42-7.39 (t, J = 7.5 Hz, 1H), 7.39-7.32 (t, J = 7.5 Hz, 5H), 7.28-7.25 (t, J = 7.5 Hz, 2H), 4.85 (s, 2H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 164.1, 142.0, 134.3, 132.7, 132.5, 131.3, 128.1, 127.8, 127.2, 126.2, 121.3, 85.3, 39.2; HRMS *m/z* (ESI) calcd for $C_{21}H_{17}Br_2O_2$ ([M+H]$^+$) 458.9595, found 458.9599.

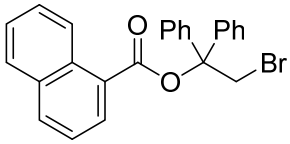
2-Bromo-1,1-diphenylethyl 2,3,4,5,6-pentafluorobenzoate (4aia):



169.6 mg, 72% yield; White solid; mp 148.4-150.3 °C (uncorrected); ^{1}H NMR (500 MHz, $CDCl_3$) δ: 7.40-7.39 (d, J

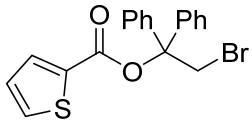
= 7.5 Hz, 4H), 7. 37-7.34 (t, *J* = 7.5 Hz, 4H), 7.31-7.29 (t, *J* = 7.5 Hz, 2H), 4.80 (s, 2H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 156.8, 146.8, 141.3, 138.7, 136.6, 131.5, 128.4, 128.1, 126.2, , 87.3, 38.6; ^{19}F NMR (MHz, $CDCl_3$) δ: -136.2- -136.3 (m)， -146.1- -146.2 (m)， -159.7- -159.8 (m); HRMS *m/z* (ESI) calcd for $C_{21}H_{13}BrF_5O_2$ ([M+H]$^+$) 471.0019, found 471.0043.

2-Bromo-1,1-diphenylethyl 1-naphthoate (4aja):



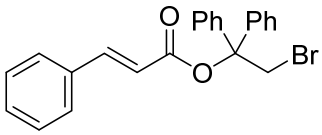
160.9 mg, 76% yield; White solid; mp 162.4-164.3 ºC (uncorrected); ^{1}H NMR (500 MHz, $CDCl_3$) δ: 8.73 (s, 1H), 8.18-8.16 (d, *J* = 9.0 Hz, 1H), 8.01-8.00 (d, *J* = 8.0 Hz, 1H), 7.94-7.90 (m, 2H), 7.63-7.55 (m, 2H), 7.52-7.50 (d, *J* = 8.0 Hz, 4H), 7.40-7.37 (t, *J* = 8.0 Hz, 4H), 7.33-7.30 (t, *J* = 8.0 Hz, 2H), 4.89 (s, 2H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 164.8, 142.5, 135.6, 132.5, 131.3, 129.4, 128.4 (2), 127.9, 127.8 (2), 126.7, 126.2, 125.2, 84.5, 39.5; HRMS *m/z* (ESI) calcd for $C_{25}H_{20}BrO_2$ ([M+H]$^+$) 431.0647, found 431.0655.

2-Bromo-1,1-diphenylethyl thiophene-2-carboxylate (4aka):



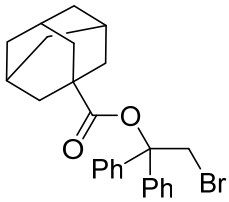
170.4 mg, 88% yield; White solid; mp 151.7-153.3 ºC (uncorrected); ^{1}H NMR (500 MHz, $CDCl_3$) δ: 7.90-7.89 (d, *J* = 4.0 Hz, 1H), 7.62-7.60 (m, 1H), 7.44-7.43 (d, *J* = 8.0 Hz, 4H), 7.37-7.34 (t, *J* = 8.0 Hz, 4H), 7.31-7.28 (t, *J* = 8.0 Hz, 2H), 7.15-7.14 (m, 1H), 4.82 (s, 2H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 160.0, 142.2, 134.0, 133.9 (2), 132.7, 128.3, 127.9, 127.3, 126.1, 84.7, 39.4; HRMS *m/z* (ESI) calcd for $C_{19}H_{16}BrSO_2$ ([M+H]$^+$) 387.0054, found 387.0061.

2-Bromo-1,1-diphenylethyl cinnamate (4ala):



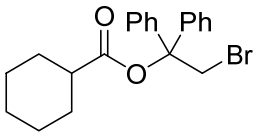
158.8 mg, 78% yield; White solid; mp 142.3-144.3 ºC (uncorrected); ^{1}H NMR (500 MHz, $CDCl_3$) δ: 7.75-7.72 (d, *J* = 8.0 Hz, 1H), 7.60-7.58 (m, 2H), 7.43-7.40 (m, 8H), 7.36-7.33 (m, 5H), 7.29-7.26 (t, *J* = 7.5 Hz, 2H), 6.63-6.60 (d, *J* = 16.0 Hz, 1H), 4.79 (s, 2H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 164.9, 145.6, 142.4, 134.1, 130.5, 128.9, 128.2 (2), 127.7, 126.1, 118.3, 83.8, 39.4; HRMS *m/z* (ESI) calcd for $C_{23}H_{20}BrO_2$ ([M+H]$^+$) 407.0647, found 407.0653.

2-Bromo-1,1-diphenylethyl adamantane-1-carboxylate (4ama):



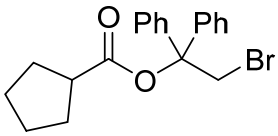
101.1 mg, 46% yield; White solid; mp 138.1-140.3 ºC (uncorrected); ^{1}H NMR (500 MHz, $CDCl_3$) δ: 7.35-7.30 (m, 8H), 7.27-7.24 (m, 2H), 4.74 (s, 2H), 2.21 (s, 2H), 1.97 (s, 3H), 1.70-1.69 (m, 9H), 1.64-1.62 (m, 3H), 1.55 (s, 1H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 170.0, 142.6, 128.1, 127.6, 126.4, 83.8, 49.8, 42.3, 39.3, 36.7, 33.1, 28.6; HRMS *m/z* (ESI) calcd for $C_{25}H_{28}BrO_2$ ([M+H]$^+$) 439.1273, found 439.1280.

2-Bromo-1,1-diphenylethyl cyclohexanecarboxylate (4ana):



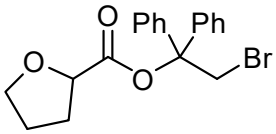
141.4 mg, 73% yield; Colorless oil; ^{1}H NMR (500 MHz, $CDCl_3$) δ: 7.34-7.29 (m, 8H), 7.26-7.23 (m, 2H), 4.72 (s, 2H), 2.50-2.44 (m, 1H), 2.05-2.02 (m, 2H), 1.81-1.77 (m, 2H), 1.68-1.65 (m, 1H), 1.57-1.54 (m, 1H), 1.52-1.49 (m, 1H), 1.37-1.31 (m, 2H), 1.28-1.22 (m, 1H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 173.8, 142.7, 128.2, 127.5, 126.0, 82.9, 44.0, 39.5, 29.0, 25.7, 25.40; HRMS *m/z* (ESI) calcd for $C_{21}H_{24}BrO_2$ ([M+H]$^+$) 387.0960, found 387.0965.

2-Bromo-1,1-diphenylethyl cyclopentanecarboxylate (4aoa):



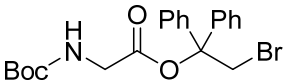
111.9 mg, 60% yield; Colorless oil; ^{1}H NMR (500 MHz, $CDCl_3$) δ: 7.34-7.29 (m, 8H), 7.26-7.23 (m, 2H), 4.72 (s, 2H), 2.95-2.88 (m, 1H), 2.04-1.95 (m, 4H), 1.81-1.74 (m, 2H), 1.70-1.63 (m, 2H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 174.4, 142.7, 128.2, 127.5, 126.0, 83.0, 44.7, 39.5, 29.7, 25.7; HRMS *m/z* (ESI) calcd for $C_{20}H_{22}BrO_2$ ($[M+H]^+$) 373.0803, found 373.0811.

2-Bromo-1,1-diphenylethyl tetrahydrofuran-2-carboxylate (4apa):



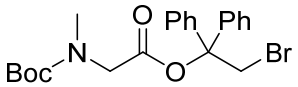
116.3 mg, 62% yield; Colorless oil; ^{1}H NMR (500 MHz, $CDCl_3$) δ: 7.35-7.30 (m, 8H), 7.29-7.26 (m, 2H), 4.76-4.74 (d, *J* = 10.5 Hz, 1H), 4.70-4.68 (d, *J* = 10.5 Hz, 1H), 4.62-4.60 (m, 1H), 4.08-4.03 (m, 1H), 3.98-3.94 (m, 1H), 2.37-2.19 (m, 2H), 2.00-1.90 (m, 2H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 171.3, 142.1, 142.0, 128.2 (2), 127.8 (2), 126.0 (2), 84.0, 69.4, 39.2, 30.2, 25.1; HRMS *m/z* (ESI) calcd for $C_{19}H_{19}BrNaO_3$ ($[M+H]^+$) 397.0415, found 397.0408.

2-Bromo-1,1-diphenylethyl (tert-butoxycarbonyl)glycinate (4aqa):



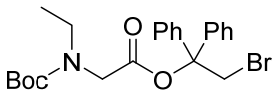
91.3 mg, 42% yield; White solid; mp 147.4-150.5 oC (uncorrected); 1H NMR (500 MHz, CDCl3) δ: 7.33-7.32 (m, 8H), 7.30-7.26 (m, 2H), 4.99 (s, 1H), 4.70 (s, 2H), 4.10-4.09 (d, J = 5.0 Hz, 2H), 1.44 (m, 9H); 13C NMR (125 MHz, CDCl3) δ:168.4, 155.5, 141.8, 128.3, 127.9, 126.1, 84.8, 80.0, 43.1, 39.0, 28.3; HRMS m/z (ESI) calcd for $C_{21}H_{25}BrNO_4$ ([M+H]+) 434.0967, found 434.0973.

2-Bromo-1,1-diphenylethyl N-(tert-butoxycarbonyl)-N-methylglycinate (4ara):



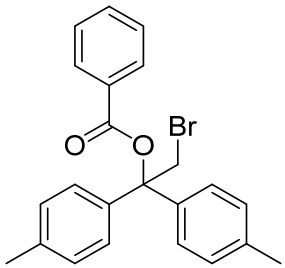
110.9 mg, 48% yield; Colorless oil; ^{1}H NMR (500 MHz, $CDCl_3$) δ: 7.36-7.30 (m, 8.0H), 7.30-7.26 (m, 2.0H), 4.74 (s, 1.2H), 4.73 (s, 0.8H), 4.14 (s, 0.8H), 4.08 (s, 1.2H), 2.99 (s, 1.2H), 2.89 (s, 1.8H), 1.49 (s, 3.6H), 1.41 (s, 5.4H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 168.0, 167.8, 155.8, 155.3, 142.0, 128.3, 127.8, 127.7, 126.0, 84.5, 80.3, 80.2, 51.4, 51.0, 39.1, 39.0, 35.6, 35.5, 28.3, 28.2; HRMS *m/z* (ESI) calcd for $C_{22}H_{27}BrNO_4$ ([M+H]$^+$) 448.1123, found 448.1237.

2-Bromo-1,1-diphenylethyl N-(tert-butoxycarbonyl)-N-ethylglycinate (4asa):



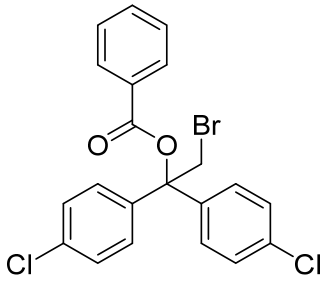
93.5 mg, 40% yield; Colorless oil; ^{1}H NMR (500 MHz, $CDCl_3$) δ: 7.38-7.23 (m, 10H), 5.84-5.82 (d, *J* = 11.0 Hz, 1H), 4.88 (s, 0.96H), 3.92 (s, 2H), 2.04-1.98 (m, 1H), 1.76-1.67 (m, 1H), 1.41 (s, 9H), 0.95-0.92 (t, *J* = 7.5 Hz, 3H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 168.5, 155.5, 139.6, 129.3, 129.1, 128.2, 128.1, 127.5, 127.1, 79.9, 60.4, 43.2, 28.3, 21.0, 13.4; HRMS *m/z* (ESI) calcd for $C_{23}H_{29}BrNO_4$ ([M+H]$^+$) 462.1280, found 462.1288.

2-Bromo-1,1-di-p-tolylethyl benzoate (4baa):



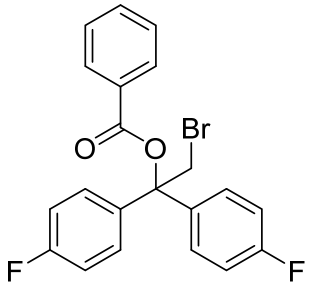
169.8 mg, 83% yield; White solid; mp 155.4-157.3 ºC (uncorrected); ^{1}H NMR (500 MHz, $CDCl_3$) δ: 8.16-8.14 (d, *J* = 7.5 Hz, 2H), 7.59-7.56 (t, *J* = 7.5 Hz, 1H), 7.48-7.45 (t, *J* = 7.5 Hz, 2H), 7.34-7.32 (d, *J* = 8.0 Hz, 4H), 7.15-7.13 (d, *J* = 8.0 Hz, 4H), 4.80 (s, 2H), 2.31 (s, 6H); ^{13}C NMR (125 MHz, $CDCl_3$) δ:164.6, 139.7, 137.4, 133.1, 130.8, 129.7, 128.9, 128.4, 126.0, 84.3, 39.7, 21.0; HRMS *m/z* (ESI) calcd for $C_{23}H_{22}BrO_2$ ([M+H]$^+$) 409.0803, found 409.0807.

2-Bromo-1,1-bis(4-chlorophenyl)ethyl benzoate (4caa):



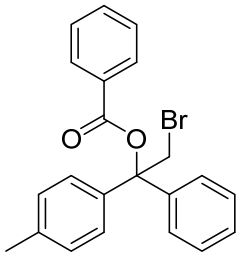
175.6 mg, 78% yield; White solid; mp 157.2-160.4 ºC (uncorrected); ^{1}H NMR (500 MHz, $CDCl_3$) δ: 8.11-8.10 (d, *J* = 8.0 Hz, 2H), 7.63-7.60 (t, *J* = 7.5 Hz, 1H), 7.51-7.48 (t, *J* = 7.5 Hz, 2H), 7.37-7.32 (m, 8H), 4.74 (s, 2H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 164.4, 140.5, 134.0, 133.5, 130.3, 129.7, 128.6, 127.7, 83.5, 38.6; HRMS *m/z* (ESI) calcd for $C_{21}H_{16}BrCl_2O_2$ ([M+H]$^+$) 448.9711, found 448.9715.

2-Bromo-1,1-bis(4-fluorophenyl)ethyl benzoate (4daa):



156.5 mg, 75% yield; White solid; mp 161.4-162.4 ºC (uncorrected); ^{1}H NMR (500 MHz, $CDCl_3$) δ: 8.12-8.11 (d, *J* = 7.5 Hz, 2H), 7.63-7.60 (t, *J* = 7.5 Hz, 1H), 7.51-7.48 (t, *J* = 7.5 Hz, 2H), 7.42-7.39 (m, 4H), 7.07-7.03(m, 4H), 4.76 (s, 2H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 164.5, 163.1, 161.1, 138.1, 138.0, 133.4, 130.4, 129.7, 128.6, 128.2 (2), 115.4, 115.2, 83.7, 39.1; ^{19}F NMR (MHz, $CDCl_3$) δ: -105.7; HRMS *m/z* (ESI) calcd for $C_{21}H_{15}BrF_2NaO_2$ ([M+Na]$^+$) 439.0121, found 439.0126.

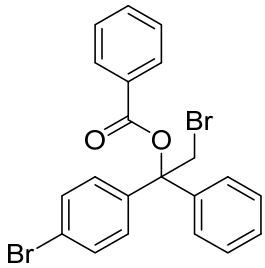
2-Bromo-1-phenyl-1-(p-tolyl)ethyl benzoate (4eaa):



118.6 mg, 60% yield; White solid; mp 148.7-150.3 ºC (uncorrected); ^{1}H NMR (500 MHz, $CDCl_3$) δ: 8.16-8.15 (d, *J* = 7.0 Hz, 2H), 7.60-7.57 (t, *J* = 7.25 Hz, 1H), 7.49-7.44 (m, 4H), 7.36-7.32 (d, *J* = 7.5 Hz, 4H), 7.29-7.26 (t, *J* = 7.5 Hz, 1H), 7.16-7.14 (d, *J* = 7.5 Hz, 2H), 4.87-4.85 (d, *J* = 10.5 Hz, 1H), 4.79-4.77 (d, *J* = 10.5

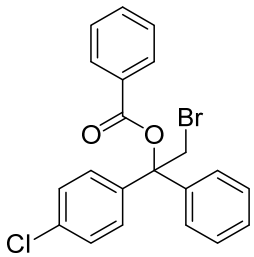
Hz, 1H),2.31 (s, 3H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 164.6, 142.6, 139.5, 137.5, 133.2, 130.7, 129.7, 129.0, 128.5, 128.2, 127.7, 126.1, 126.0, 84.3, 39.6, 21.1; HRMS *m/z* (ESI) calcd for $C_{22}H_{19}BrNaO_2$ ([M+Na]$^+$) 417.0466, found 417.0472.

2-Bromo-1-(4-bromophenyl)-1-phenylethyl benzoate (4faa):



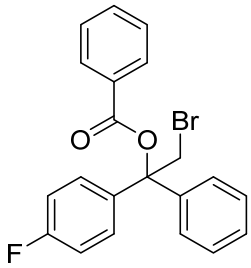
184.1 mg, 80% yield; White solid; mp 156.2-158.3 ºC (uncorrected); ^{1}H NMR (500 MHz, $CDCl_3$) δ: 8.14-8.13 (d, *J* = 7.5 Hz, 2H), 7.63-7.60 (t, *J* = 7.5 Hz, 1H), 7.50-7.49 (t, *J* = 7.5 Hz, 2H), 7.50-7.49 (d, *J* = 6.5 Hz, 2H), 7.43-7.41 (d, *J* = 7.5 Hz, 2H), 7.38-7.29 (m, 5 H), 4.84-4.82 (d, *J* = 10.5 Hz, 1H), 4.75-4.73 (d, *J* = 10.5 Hz, 1H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 164.5, 141.8, 141.6, 133.4, 131.5, 130.4, 129.7, 128.5, 128.4, 128.0 (2), 126.2, 122.9, 83.9, 38.9; HRMS *m/z* (ESI) calcd for $C_{21}H_{17}Br_2O_2$ ([M+H]$^+$) 458.9595, found 458.9599.

2-Bromo-1-(4-chlorophenyl)-1-phenylethyl benzoate (4gaa):



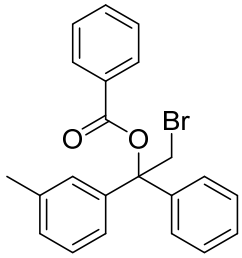
172.5 mg, 83% yield; White solid; mp 157.4-158.4 ºC (uncorrected); ^{1}H NMR (500 MHz, $CDCl_3$) δ: 8.15-8.13 (d, *J* = 7.5 Hz, 2H), 7.64-7.61 (t, *J* = 7.5 Hz, 1H), 7.52-7.49 (t, *J* = 7.5 Hz, 2H), 7.44-7.42 (d, *J* = 7.5 Hz, 2H), 7.40-7.36 (m, 4H),7.34-7.30(m, 3H), 4.85-4.83 (d, *J* = 10.5 Hz, 1H), 4.77-4.74 (d, *J* = 10.5 Hz, 1H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 164.5, 142.0, 141.1, 133.8, 133.4, 130.5, 129.8, 128.5, 128.1, 127.8, 126.2, 84.0, 39.0; HRMS *m/z* (ESI) calcd for $C_{21}H_{17}BrClO_2$ ([M+H]$^+$) 415.0100, found 415.0097.

2-Bromo-1-(4-fluorophenyl)-1-phenylethyl benzoate (4haa):



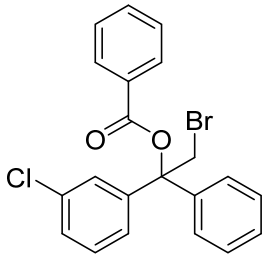
149.7 mg, 75% yield; White solid; mp 162.1-164.2 ºC (uncorrected); ^{1}H NMR (500 MHz, $CDCl_3$) δ: 8.20-8.18 (d, *J* = 7.5 Hz, 2H), 7.61-7.58 (t, *J* = 7.5 Hz, 1H), 7.50-7.47 (t, *J* = 7.5 Hz, 2H), 7.48-7.45 (t, *J* = 7.5 Hz, 4H), 7.42-7.39 (t, *J* = 7.5 Hz, 2H), 7.35-7.32 (t, *J* = 7.5 Hz, 1H), 7.09-7.06 (t, *J* = 7.5 Hz, 2H), 4.88-4.86 (d, *J* = 10.5 Hz, 1H), 4.82-4.80 (d, *J* = 10.5 Hz, 1H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 164.5, 163.0, 161.0, 142.2, 138.3, 133.3, 130.5, 129.7, 128.5, 128.4, 128.2, 128.1, 128.0, 126.1, 115.3, 115.1, 84.0, 39.3; ^{19}F NMR (MHz, $CDCl_3$) δ: -105.844; HRMS *m/z* (ESI) calcd for $C_{21}H_{17}BrFO_2$ ([M+H]$^+$) 399.0396, found 399.0390.

2-Bromo-1-phenyl-1-(*m*-tolyl)ethyl benzoate (4iaa):



164.0 mg, 83% yield; Colorless oil; ^{1}H NMR (500 MHz, $CDCl_3$) δ: 8.17-8.16 (d, *J* = 7.5 Hz, 2H), 7.62-7.59 (t, *J* = 7.5 Hz, 1H), 7.51-7.48 (t, *J* = 7.5 Hz, 2H), 7.48-7.45 (d, *J* = 7.5 Hz, 2H), 7.37-7.34 (t, *J* = 7.5 Hz, 2H), 7.30-7.22 (m, 5H), 7.10-7.09 (d, *J* = 7.5 Hz, 1H), 4.89-4.87 (d, *J* = 10.5 Hz, 1H), 4.79-4.77 (d, *J* = 10.5 Hz, 1H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 164.5, 142.6, 142.4, 138.0, 133.2, 130.7, 129.7, 128.6, 128.5, 128.3, 128.2, 126.6, 126.1, 123.1, 84.3, 39.5, 21.7; HRMS *m/z* (ESI) calcd for $C_{22}H_{20}BrO_2$ ([M+H]$^+$) 395.0647, found 395.0657.

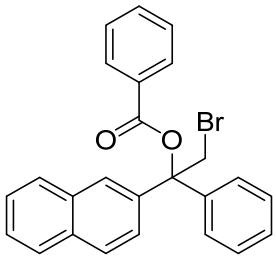
2-Bromo-1-(3-chlorophenyl)-1-phenylethyl benzoate (4jaa):



166.3 mg, 80% yield; White oli; mp 148.4-150.3 ºC (uncorrected); ^{1}H NMR (500 MHz, $CDCl_3$) δ: 8.15-8.14 (d, *J* = 7.5 Hz, 2H), 7.64-7.61 (t, *J* = 7.5 Hz, 1H), 7.53-7.49 (t, *J* =

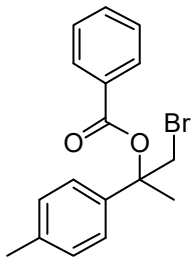
7.5 Hz, 2H), 7.45-7.43 (m, 3H), 7.38-7.35 (t, *J* = 7.5 Hz, 2H), 7.34-7.32 (m, 2H), 7.29-7.28 (m, 2H), 4.85-4.83 (d, *J* = 10.5 Hz, 1H), 4.76-4.74 (d, *J* = 10.5 Hz, 1H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 164.4, 144.5, 141.7, 134.3, 133.4, 130.4, 129.7, 129.6, 128.6, 128.5, 128.1, 128.0, 126.5, 126.0, 124.4, 83.7, 38.9.; HRMS *m/z* (ESI) calcd for $C_{21}H_{16}BrClNaO_2$ ([M+Na]$^+$) 436.9920, found 436.9924.

2-Bromo-1-(naphthalen-2-yl)-1-phenylethyl benzoate (4kaa):



157.4 mg, 73% yield; White solid; mp 147.1-149.3 ºC (uncorrected); ^{1}H NMR (500 MHz, $CDCl_3$) δ: 8.20-8.18 (m, 2H), 8.06 (s, 1H), 7.90-7.88 (d, *J* = 8.0 Hz, 1H), 7.80-7.76 (m, 2H), 7.64-7.61 (t, *J* = 7 Hz, 1H), 7.53-7.47 (m, 6H), 7.41-739 (m, 1H), 7.37-7.34 (t, *J* = 7.5 Hz, 2H), 7.31-7.28 (t, *J* = 7.5 Hz, 1H), 5.03-5.01 (d, *J* = 10.5 Hz, 1H), 4.92-4.90 (d, *J* = 10.5 Hz, 1H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 164.6, 142.3, 139.7, 133.3, 132.7, 132.6, 130.7, 129.8, 128.6, 128.5 (2), 128.4, 128.3, 127.9, ,127.6, 126.5, 126.4, 126.3, 125.0, 124.2, 84.5, 39.3.; HRMS *m/z* (ESI) calcd for $C_{25}H_{20}BrO_2$ ([M+H]$^+$) 431.0647, found 431.0657.

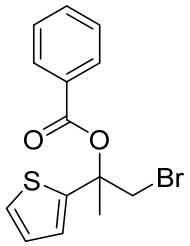
1-Bromo-2-(*p*-tolyl)propan-2-yl benzoate (4laa):



131.6 mg, 79% yield; Colorless oil; ^{1}H NMR (500 MHz, $CDCl_3$) δ: 8.10-8.09 (d, *J* = 7.5 Hz, 2H), 7.60-7.58 (t, *J* = 7.5 Hz, 1H), 7.47-7.44 (t, *J* = 7.5 Hz, 2H), 7.30-7.28 (d, *J* = 8.5 Hz, 2H), 7.18-7.16 (d, *J* = 8.5 Hz, 2H), 4.04-4.02 (d, *J* = 10.5 Hz, 1H), 3.84-3.79 (d, *J* = 10.5 Hz, 1H)，2.33 (s, 3H), 2.10 (s, 3H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 164.7, 138.7, 137.7, 133.0, 130.8, 129.7, 129.3, 128.4, 124.7, 81.6, 42.0,

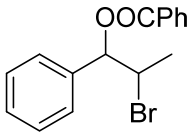
24.0, 21.1; HRMS *m/z* (ESI) calcd for $C_{17}H_{17}BrNaO_2$ ($[M+Na]^+$) 355.0310, found 355.0301.

1-Bromo-2-(thiophen-2-yl)propan-2-yl benzoate (4maa):



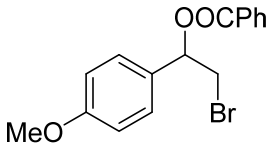
94.6 mg, 60% yield; Yellow olid; ^{1}H NMR (500 MHz, $CDCl_3$) δ: 8.13-8.12 (d, *J* = 7.0 Hz, 2H), 7.63-7.60 (t, *J* = 7.5 Hz, 1H), 7.49-7.46 (t, *J* = 7.75 Hz, 2H), 7.25-7.24 (m, 1H), 6.99-6.98 (m, 2H), 3.79-3.77 (d, *J* = 10.5 Hz, 1H), 3.70-3.68 (d, *J* = 10.5 Hz, 1H), 1.7 (s, 3H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 172.0, 148.7, 133.7, 130.2, 129.3, 128.4 (2), 126.9, 124.8, 123.4, 72.4, 45.7, 28.5; HRMS *m/z* (ESI) calcd for $C_{14}H_{14}BrSO_2$ ($[M+H]^+$) 324.9898, found 324.9903.

2-Bromo-1-phenylpropyl benzoate (4naa):



83.0 mg, 52% yield; Colorless oil; ^{1}H NMR (500 MHz, $CDCl_3$) δ: 8.16-8.14 (d, *J* = 7.5 Hz, 2H), 7.62-7.59 (t, *J* = 7.5 Hz, 1H), 7.50-7.47 (t, *J* = 7.5 Hz, 2H), 7.46-7.45 (d, *J* = 7.5 Hz, 2H), 7.40-7.37 (t, *J* = 7.5 Hz, 2H), 7.36-7.33 (t, *J* = 7.5 Hz, 1H), 6.22-6.21 (d, *J* = 5.0 Hz, 1H), 4.55-4.50 (m, 1H), 1.77-1.75 (d, *J* = 5 Hz, 3H),; ^{13}C NMR (125 MHz, $CDCl_3$) δ: 165.1, 137.0, 133.3, 129.8, 128.5 (2), 128.4, 128.4, 127.0, 78.7, 50.2, 20.9; HRMS *m/z* (ESI) calcd for $C_{16}H_{16}BrO_2$ ($[M+H]^+$) 319.0334, found 319.0339.

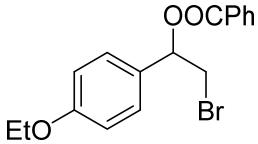
2-Bromo-1-(4-methoxyphenyl)ethyl benzoate (4oaa):



100.6 mg, 60% yield; Colorless oil; ^{1}H NMR (500 MHz, $CDCl_3$) δ: 8.13-8.11 (d, *J* = 7.5 Hz, 2H), 7.60-7.57 (t, *J* = 7.5 Hz, 1H), 7.48-7.45 (t, *J* = 7.5 Hz, 2H), 7.40-7.38 (d, *J* = 8.5 Hz,

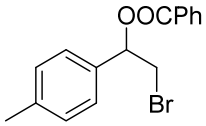
2H), 6.93-6.91 (d, J = 8.5 Hz, 2H), 3.84-3.81 (m, 1H), 3.80 (s, 3H), 3.72-.3.69 (m, 1H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 165.5, 159.9, 133.3, 129.8, 128.5, 128.0, 114.1, 75.2, 55.3, 34.6; HRMS *m/z* (ESI) calcd for $C_{16}H_{16}BrO_3$ ($[M+H]^+$) 334.0283, found 334.0290.

2-Bromo-1-(4-ethoxyphenyl)ethyl benzoate (4paa):



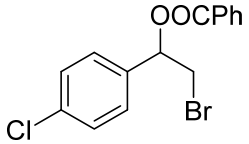
96.0 mg, 55% yield; White solid; mp 148.4-150.3 °C (uncorrected); ^{1}H NMR (500 MHz, $CDCl_3$) δ: 8.11-8.09 (m, 2H), 7.58-7.55 (t, J = 7.5 Hz, 1H), 7.46-7.43 (t, J = 7.5 Hz, 2H), 7.37-7.35 (d, J = 8.5 Hz, 2H), 6.89-6.87 (d, J = 8.5 Hz, 2H), 6.17-6.15 (m, 1H), 4.03-3.99 (m, 2H), 3.82-3.78 (m, 1H), 3.70-3.67 (m, 1H), 1.41-1.38 (t, J = 7.0 Hz, 3H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 165.4, 159.3, 133.2, 129.8, 129.7, 129.6, 128.4, 127.9, 114.6, 75.1, 63.4, 34.5, 14.7; HRMS *m/z* (ESI) calcd for $C_{17}H_{17}BrNaO_3$ ($[M+Na]^+$) 371.0259, found 371.0250.

2-Bromo-1-(p-tolyl)ethyl benzoate (4qaa):



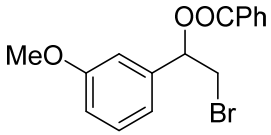
86.2 mg, 54% yield; Colorless oil; ^{1}H NMR (500 MHz, $CDCl_3$) δ: 8.12-8.10 (d, J = 7.5 Hz, 2H), 7.60-7.57 (t, J = 7.5 Hz, 1H), 7.48-7.45 (t, J = 7.5 Hz, 2H), 7.34-7.33 (d, J = 8.0 Hz, 2H), 7.20-7.19 (d, J = 8.0 Hz, 2H), 6.19-6.16 (m, 1H), 3.82-3.79 (m, 1H), 3.73-3.69 (m, 1H), 2.35 (s, 3H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 165.5, 138.8, 134.8, 133.3, 129.8, 129.5, 128.5, 126.5, 75.3, 34.5, 21.3; HRMS *m/z* (ESI) calcd for $C_{16}H_{16}BrO_2$ ($[M+H]^+$) 319.0334, found 319.0338.

2-Bromo-1-(4-chlorophenyl)ehyl benzoate (4raa):



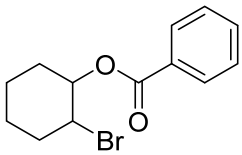
84.2 mg, 50% yield; Yellow oil; ^{1}H NMR (500 MHz, $CDCl_3$) δ: 8.12-8.10 (d, *J* = 7.5 Hz, 2H), 7.62-7.59 (t, *J* = 7.5 Hz, 1H), 7.49-7.46 (t, *J* = 7.5 Hz, 2H), 7.40-7.39 (d, *J* = 8.5 Hz, 2H), 7.37-7.36 (d, *J* = 8.5 Hz, 2H), 6.19-6.16 (m, 1H), 3.80-3.77 (m, 1H), 3.73-3.70 (m, 1H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 165.4, 136.2, 134.8, 133.5, 129.8, 129.0, 128.6, 128.0, 74.6, 34.3; HRMS *m/z* (ESI) calcd for $C_{15}H_{13}BrClO_2$ ($[M+H]^+$) 338.9787, found 338.9790.

2-Bromo-1-(3-methoxyphenyl)ethyl benzoate (4saa):



95.5 mg, 57% yield; Colorless oil; ^{1}H NMR (500 MHz, $CDCl_3$) δ: 8.13-8.11 (d, *J* = 8.0 Hz, 2H), 7.60-7.57 (t, *J* = 7.5 Hz, 1H), 7.48-7.47 (t, *J* = 7.5 Hz, 2H), 7.31-7.28 (t, *J* = 7.5 Hz, 1H), 7.03-7.02 (d, *J* = 7.5 Hz, 1H), 6.98 (s, 1H), 6.88-6.86 (m, 1H), 6.19-6.17 (m, 1H), 3.81-3.77 (m, 4H), 3.73-3.70 (m, 1H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 165.2, 159.6, 139.1, 133.2, 129.7 (2), 129.5, 128.3, 118.7, 113.8, 112.2, 75.3, 55.1, 34.3; HRMS *m/z* (ESI) calcd for $C_{16}H_{16}BrO_3$ ($[M+H]^+$) 335.0283, found 335.0290.

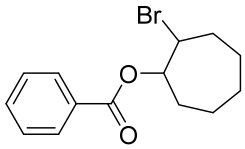
2-Bromocyclohexyl benzoate (4taa):



107.6 mg, 76% yield; Colorless oil; ^{1}H NMR (500 MHz, $CDCl_3$) δ: 8.08-8.07 (d, *J* = 8.0 Hz, 2H), 7.58-7.55 (t, *J* = 8.0 Hz, 1H), 7.46-7.43 (t, *J* = 8.0 Hz, 2H), 5.15-5.11 (m, 1H), 4.18-4.13 (m, 1H), 2.43-2.39 (m, 1H), 2.29-2.26 (m, 1H), 1.98-1.91 (m, 1H), 1.83-1.75 (m, 2H), 1.56-1.48 (m, 2H), 1.42-1.34 (m, 1H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 165.5, 133.0,

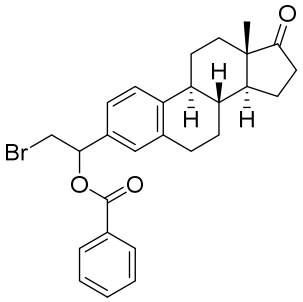
130.2, 129.7, 128.3, 76.3, 52.6, 35.5, 31.0, 25.4, 23.2; HRMS *m/z* (ESI) calcd for $C_{13}H_{16}BrO_2$ ($[M+H]^+$) 283.0334, found 283.0338.

2-Bromocycloheptyl benzoate (4uaa):



101.0 mg, 68% yield; Colorless oil; ^{1}H NMR (500 MHz, $CDCl_3$) δ: 8.07-8.06 (d, *J* = 7.5 Hz, 2H), 7.58-7.55 (t, *J* = 7.5 Hz, 1H), 7.47-7.44 (t, *J* = 7.5 Hz, 2H), 5.38-5.34 (m, 1H), 4.39-4.35 (m, 1H), 2.36-2.30 (m, 1H), 2.18-2.11 (m, 1H), 2.07-2.02 (m, 1H), 1.87-1.76 (m, 3H), 1.65-1.64 (m, 2H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 165.4, 133.0, 130.2, 129.6, 128.3, 80.4, 56.3, 34.8, 30.8, 27.4, 24.5, 22.1; HRMS *m/z* (ESI) calcd for $C_{14}H_{17}BrNaO_2$ ($[M+Na]^+$) 319.0310, found 319.0316.

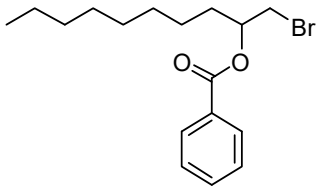
2-bromo-1-((8R,9S,13S,14S)-13-methyl-17-oxo-7,8,9,11,12,13,14,15,16,17-decahydro-6H-cyclopenta[a]phenanthren-3-yl)ethyl benzoate (4vaa):



117.9 mg, 49% yield; White solid; mp 153.1-155.3 ºC (uncorrected); ^{1}H NMR (500 MHz, $CDCl_3$) δ: 8.13-7.12 (m, 2H), 7.63-7.60 (t, *J* = 7.5 Hz, 1H), 7.49-7.46 (t, *J* = 7.5 Hz, 2H), 7.31-7.29 (m, 1H), 7.20-7.17(m, 1H), 7.13-7.11 (m, 1H), 5.13-5.10 (m, 1H), 4.08-4.01 (m, 2H), 2.94-2.92 (m, 2H), 2.54-2.49 (m, 1H), 2.43-2.39 (m, 1H), 2.32-2.27 (m, 1H), 2.19-2.12 (m, 1H), 2.09-2.01 (m, 2H), 2.00-1.96 (m, 1H), 1.67-1.59 (m, 2H), 1.57-1.51 (m, 2H), 1.46-1.42 (m, 2H), 0.91 (s, 3H); ^{13}C NMR (125 MHz, $CDCl_3$) δ: 220.8, 171.8, 140.9 (2), 137.0 (2), 135.8 (2), 133.6, 130.1, 129.3, 128.4, 128.1, 128.0, 125.8 (2), 124.8, 124.6, 51.0 (2), 50.4, 47.8,

44.3, 37.8 (2), 35.7, 34.9, 34.8, 31.4, 29.2 (2), 26.2, 25.4, 21.5, 13.7; HRMS *m/z* (ESI) calcd for $C_{27}H_{30}BrO_3$ ($[M+H]^+$) 481.1378, found 481.1373.

1-bromodecan-2-yl benzoate (4waa):



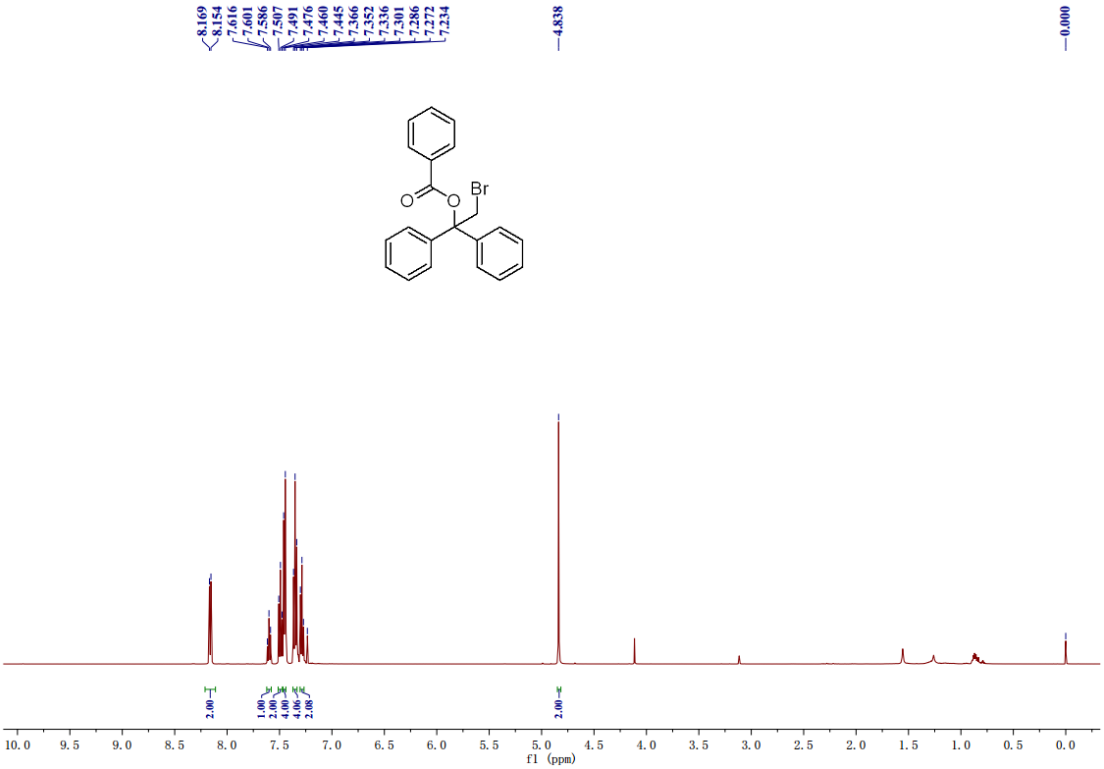
75.2 mg, 48% yield; Colorless oil; ^{1}H NMR (500 MHz, $CDCl_3$) δ: 8.08-8.07 (d, *J* = 8.5 Hz, 2.0H), 7.60-7.56 (m, 1.0H), 7.48-7.44 (m, 2.0H), 5.27-5.23 (m, 0.60H), 4.56-4.54(m, 0.8H), 4.29-4.24 (m, 0.40H), 3.65-3.62 (m, 1.2H), 1.99-1.78(m, 2.0H), 1.60-1.56(m, 1.0H), 1.39-1.32(m, 2.0H), 1.31-1.21(m, 9.0H), 0.89-0.85 (m, 3.0H); C NMR (125 MHz, $CDCl_3$) δ: 166.0 (2), 133.2, 133.1, 129.9, 129.7, 129.6, 128.4 (2), 72.9, 68.2, 51.7, 35.2, 34.4, 32.5, 31.8 (2), 29.3 (2), 29.2, 28.9, 27.2, 25.1, 22.6, 14.1 (2); HRMS *m/z* (ESI) calcd for $C_{17}H_{26}BrO_2$ ($[M+H]^+$) 341.1116, found 341.1121.

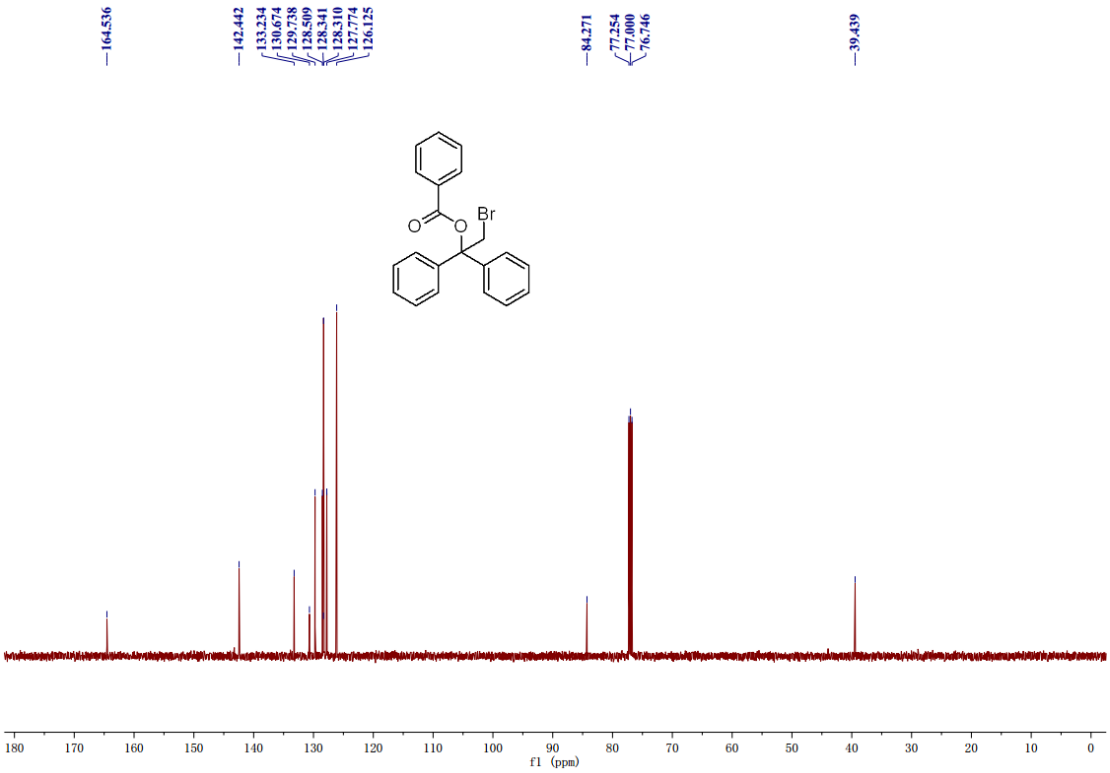
(E) References

(1) Mato, M.; Herle, B.; Echavarren A. M. *Org. Lett*. **2018**, *20*, 4341.

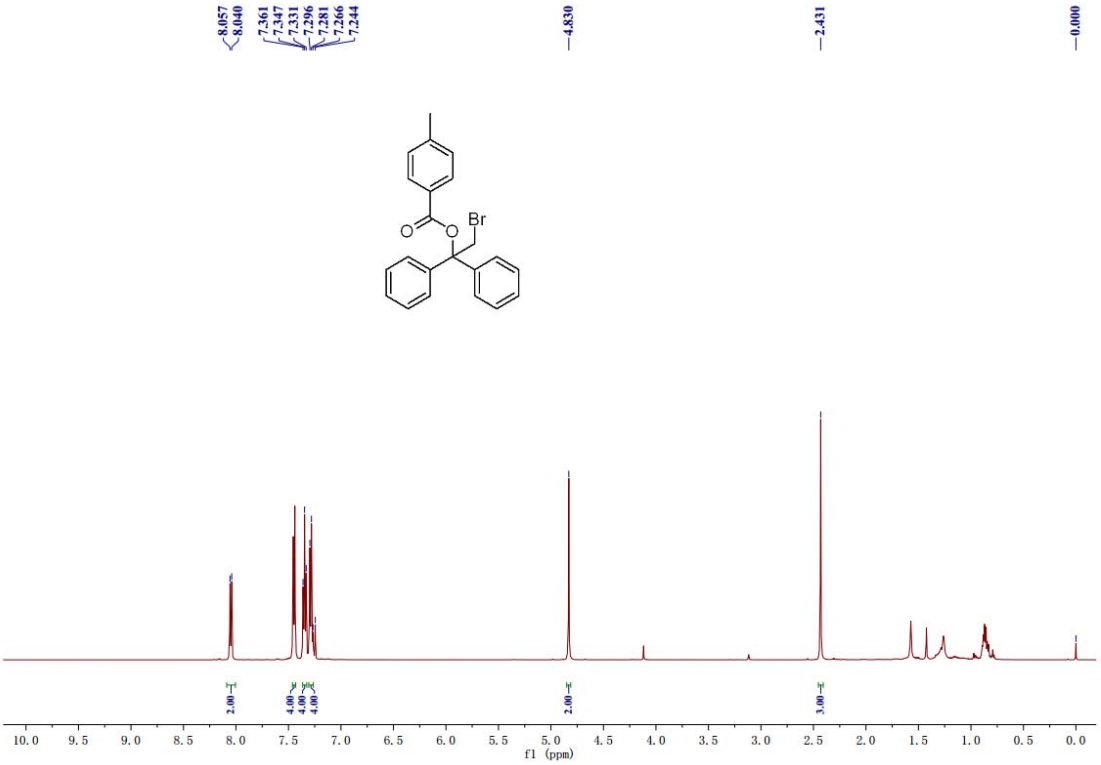
(F) Spectra

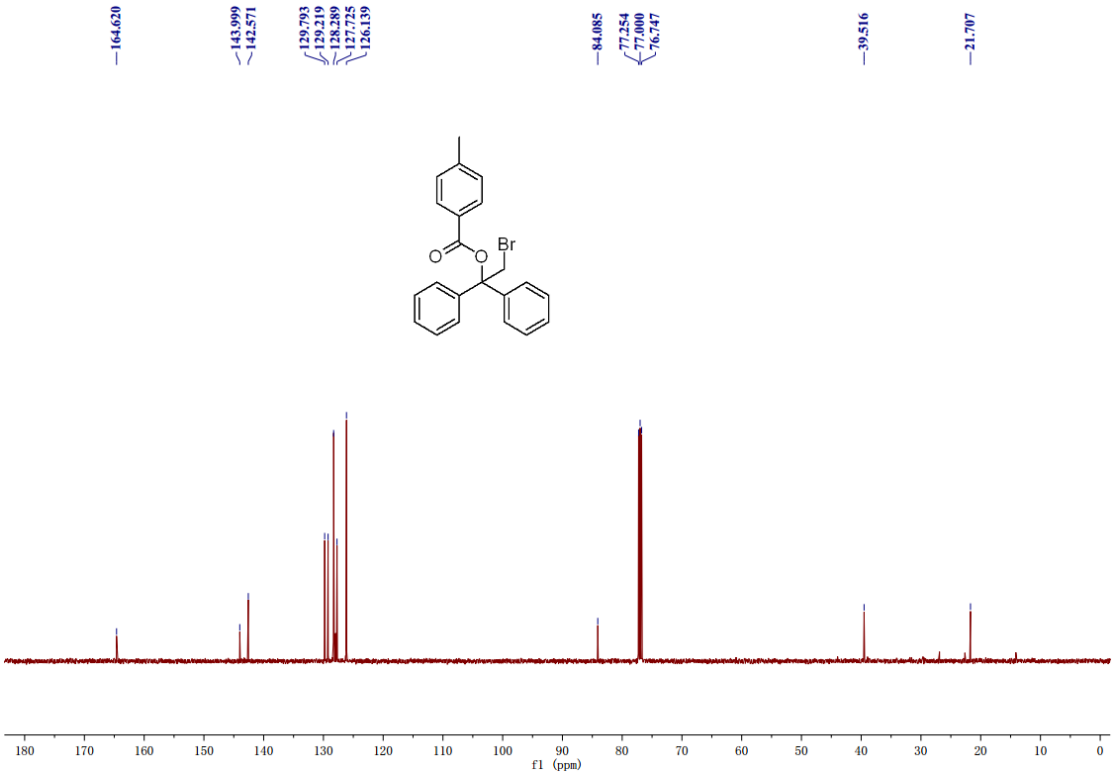
2-bromo-1,1-diphenylethyl benzoate (4aaa)



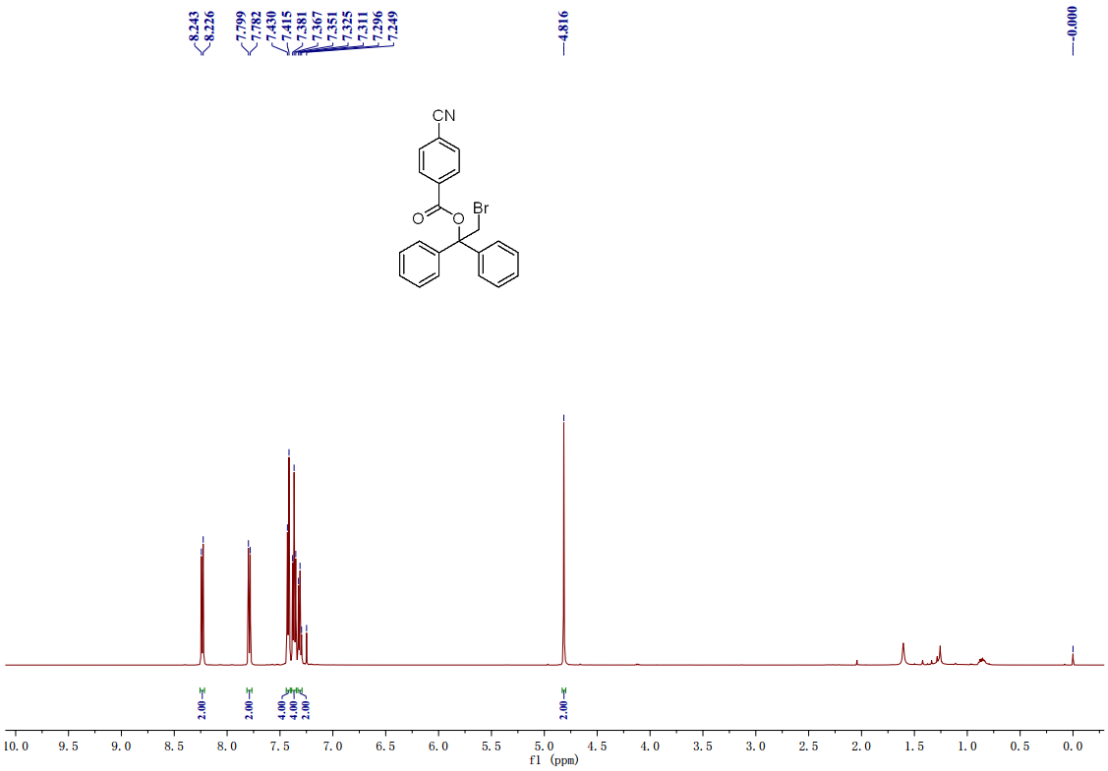


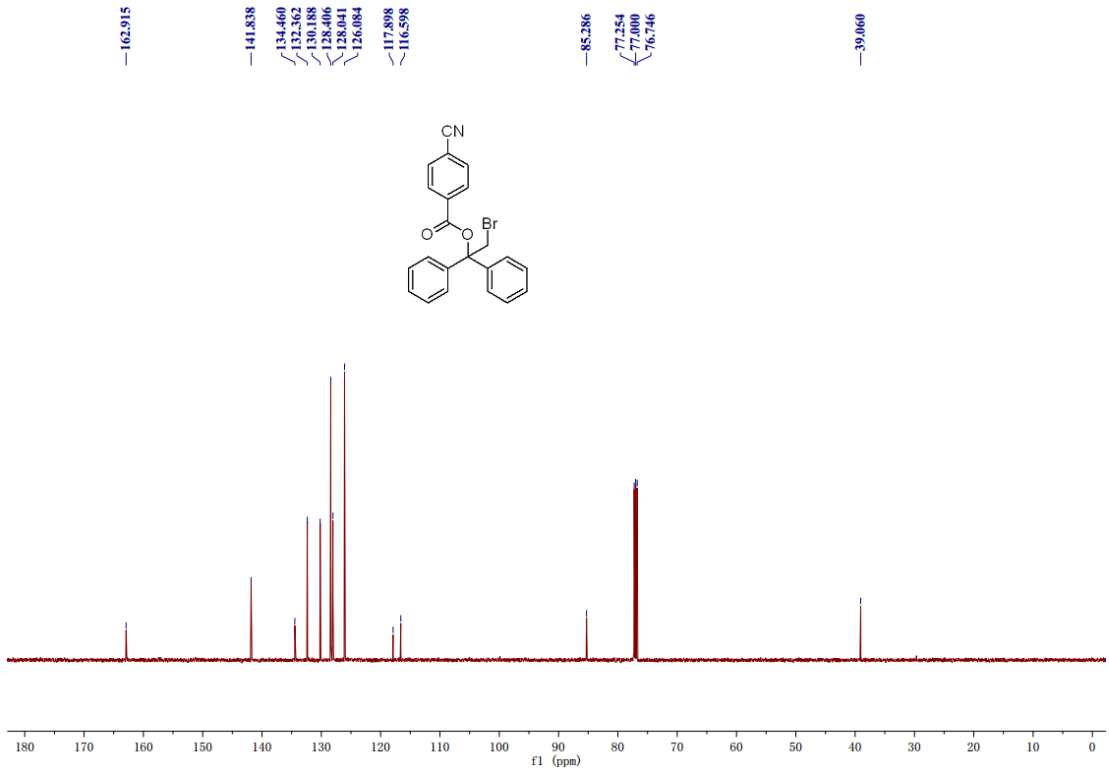
2-bromo-1,1-diphenylethyl 4-methylbenzoate (4aba)



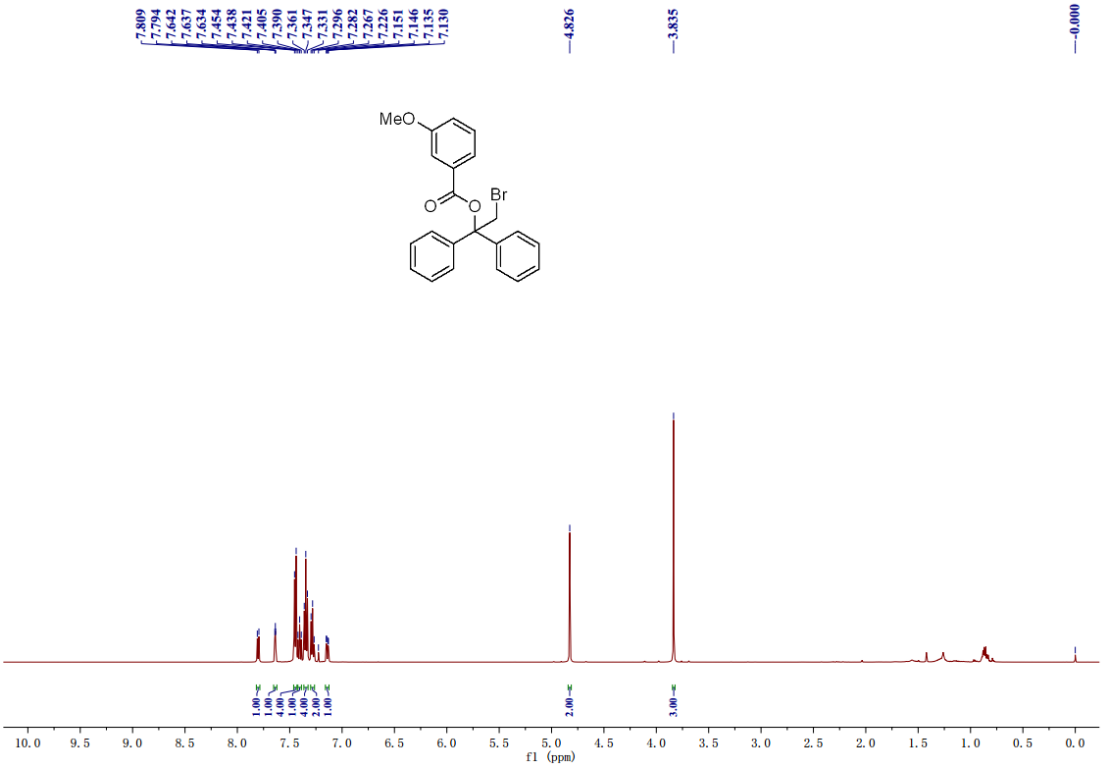


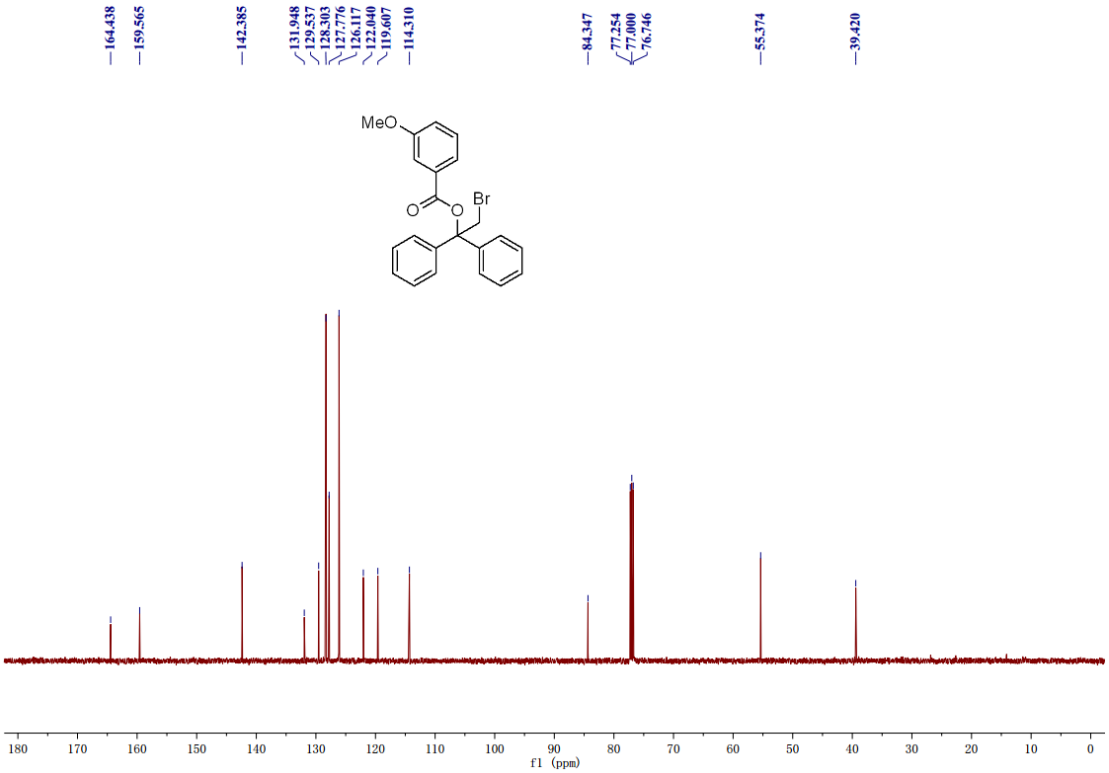
2-bromo-1,1-diphenylethyl 4-cyanobenzoate (4aca)



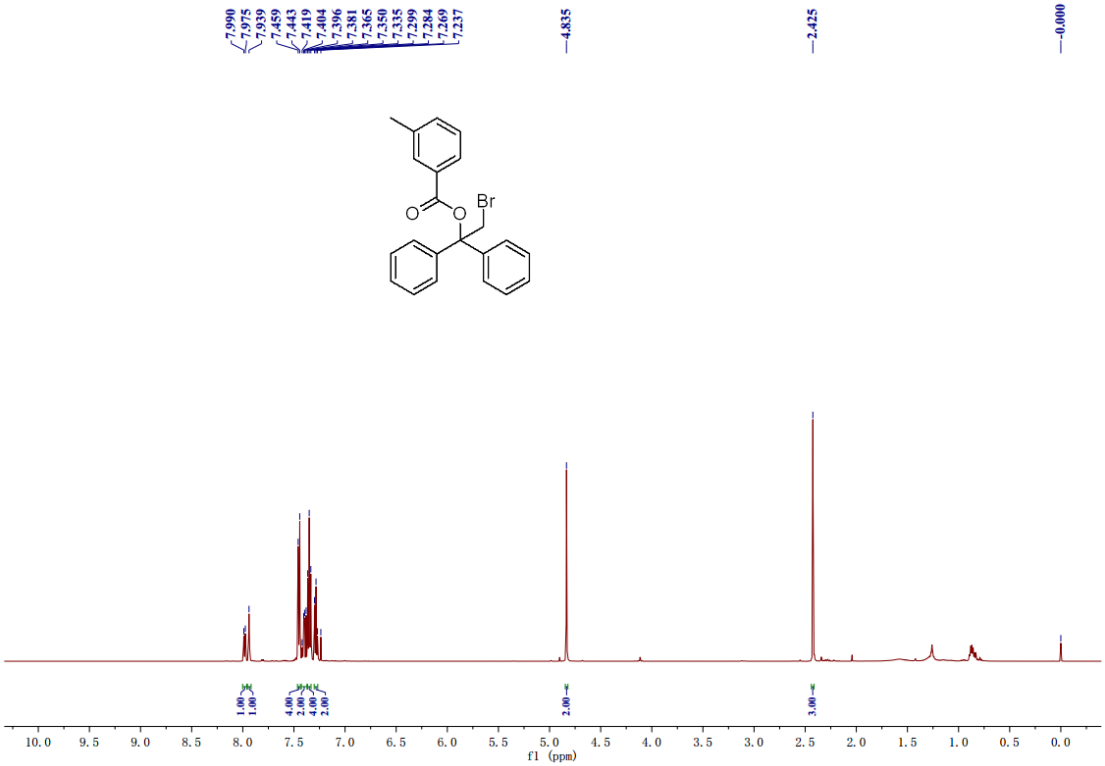


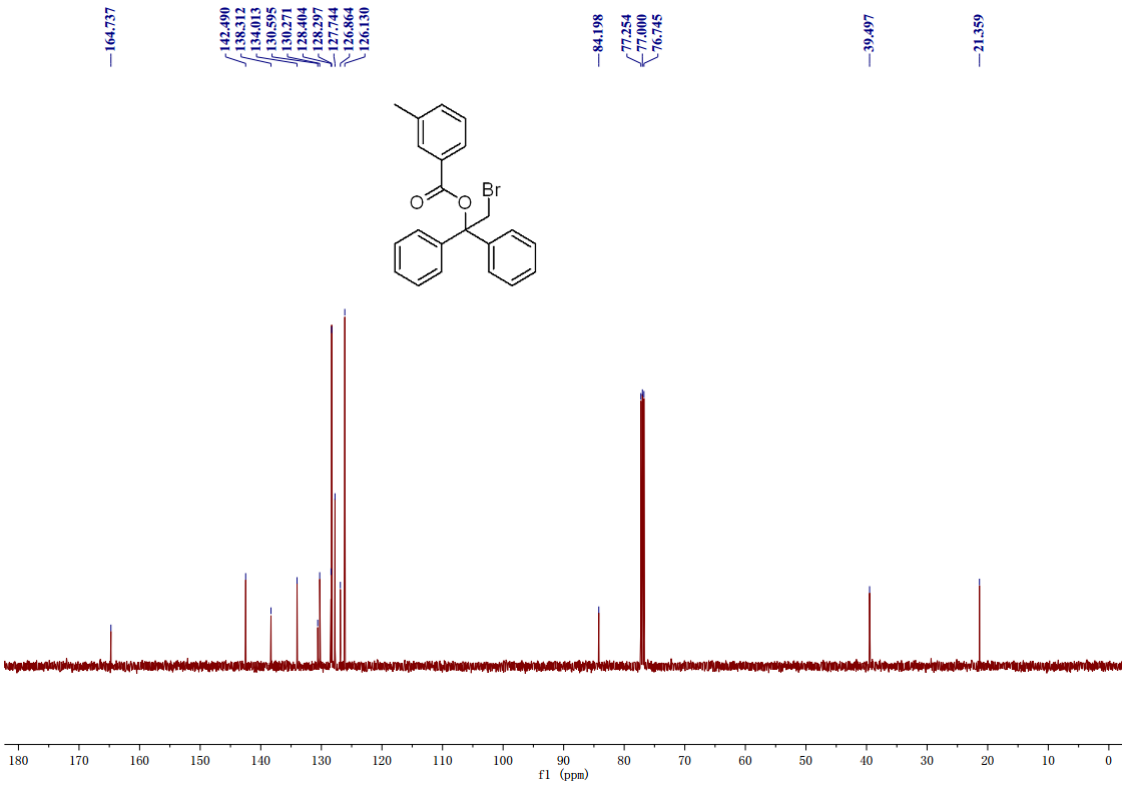
2-bromo-1,1-diphenylethyl 3-methoxybenzoate (4ada)



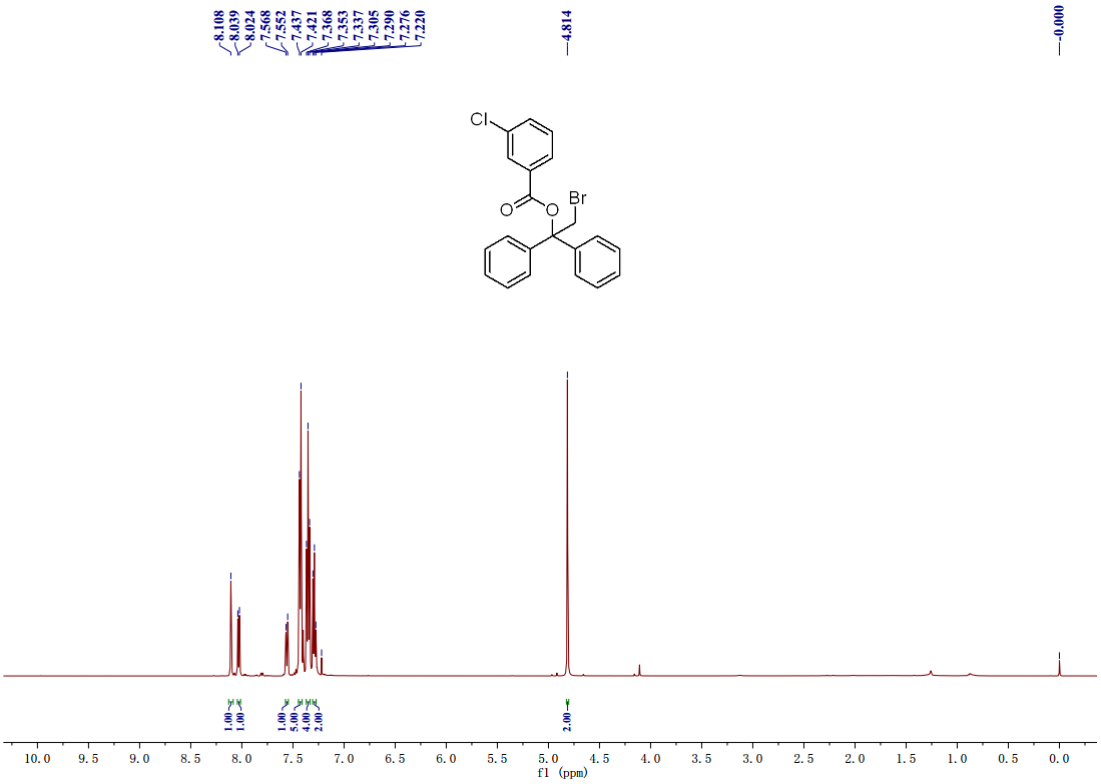


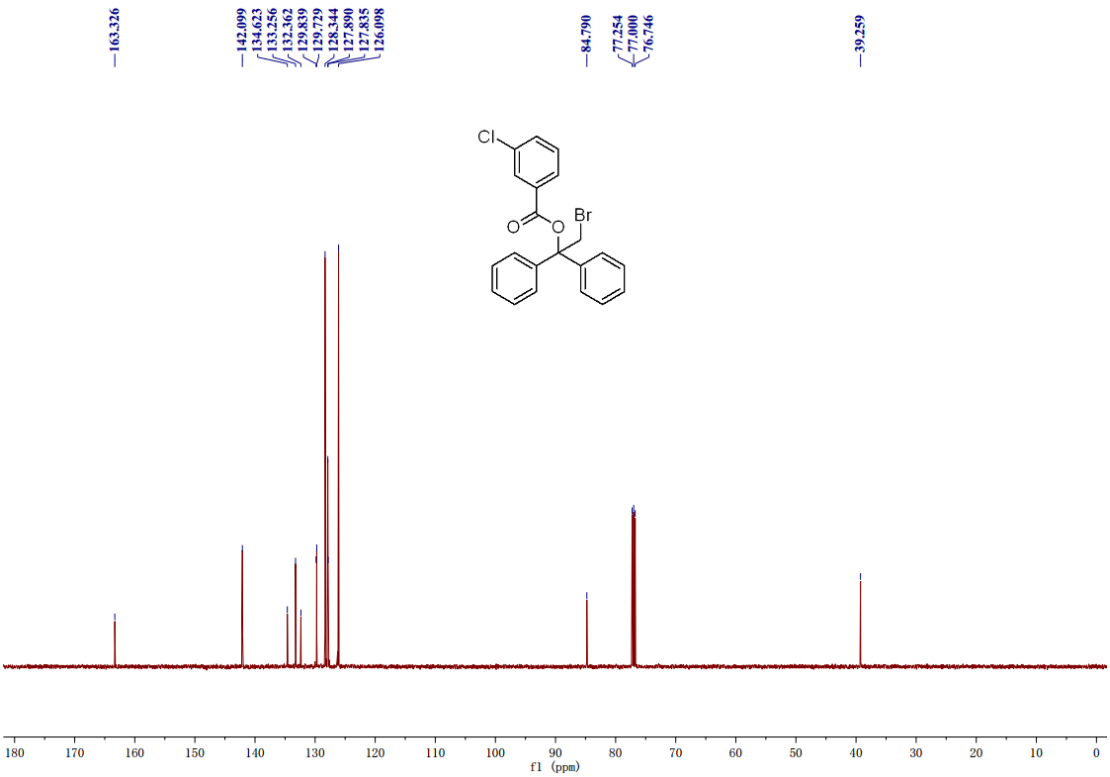
2-bromo-1,1-diphenylethyl 3-methylbenzoate (4aea)



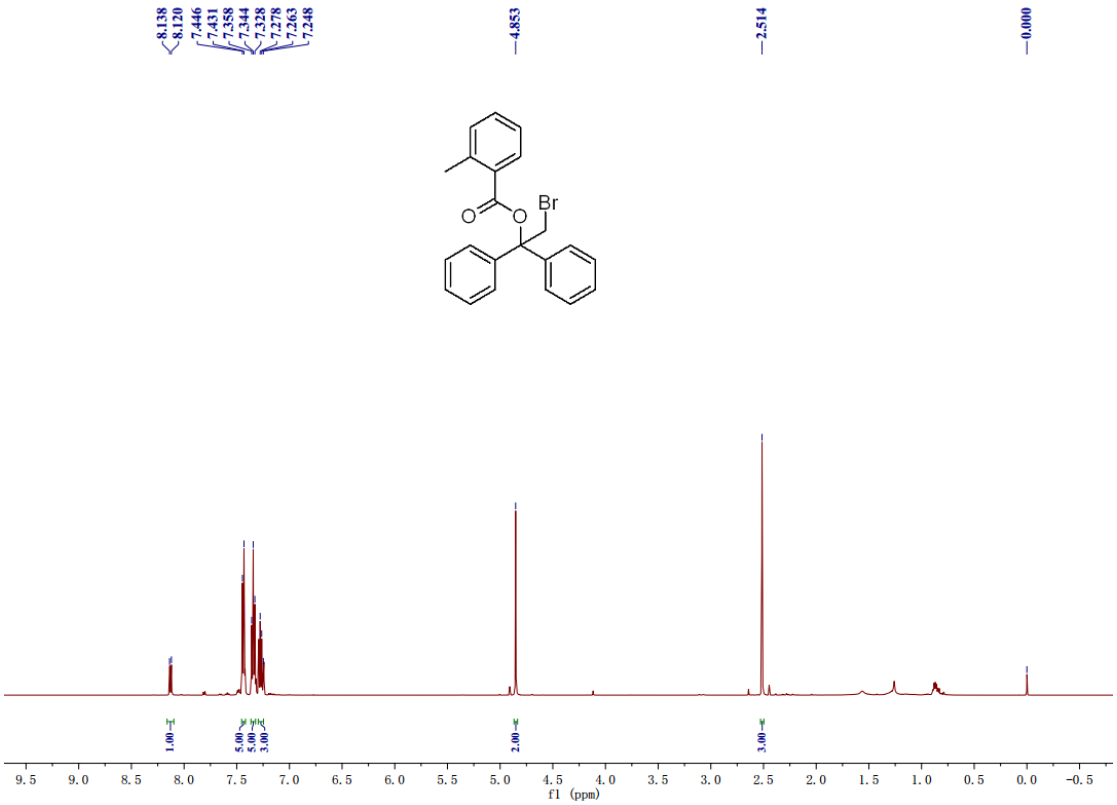


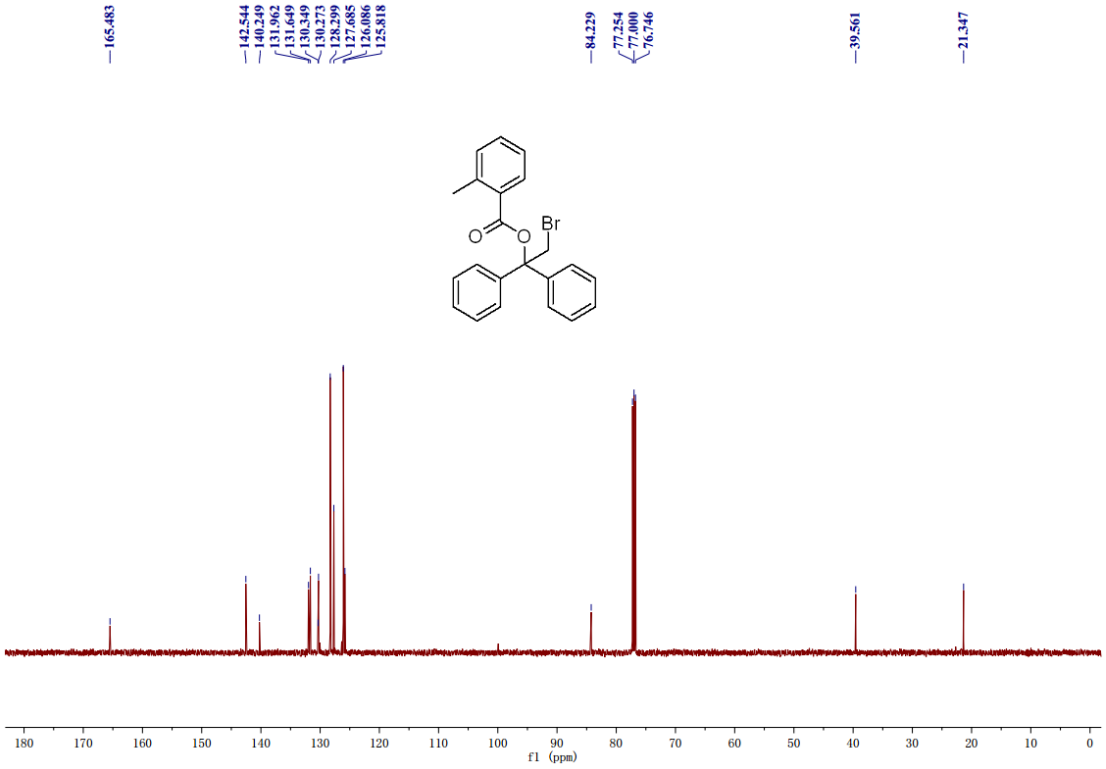
2-bromo-1,1-diphenylethyl 3-chlorobenzoate (4afa)



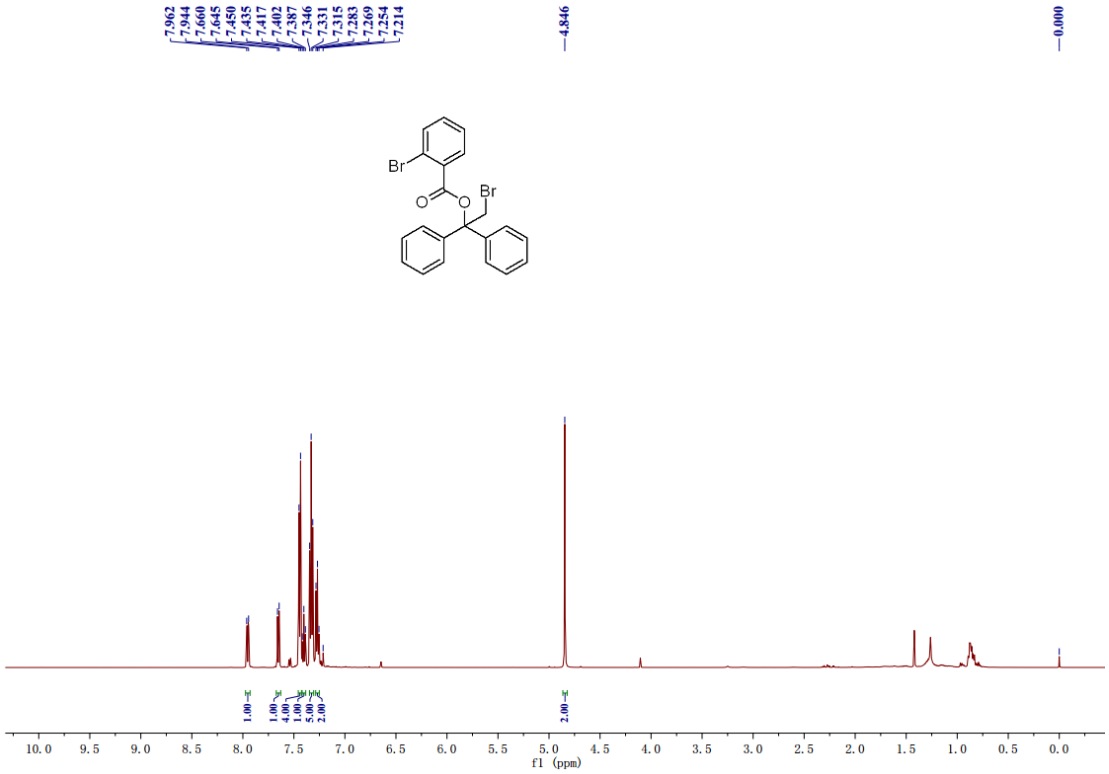


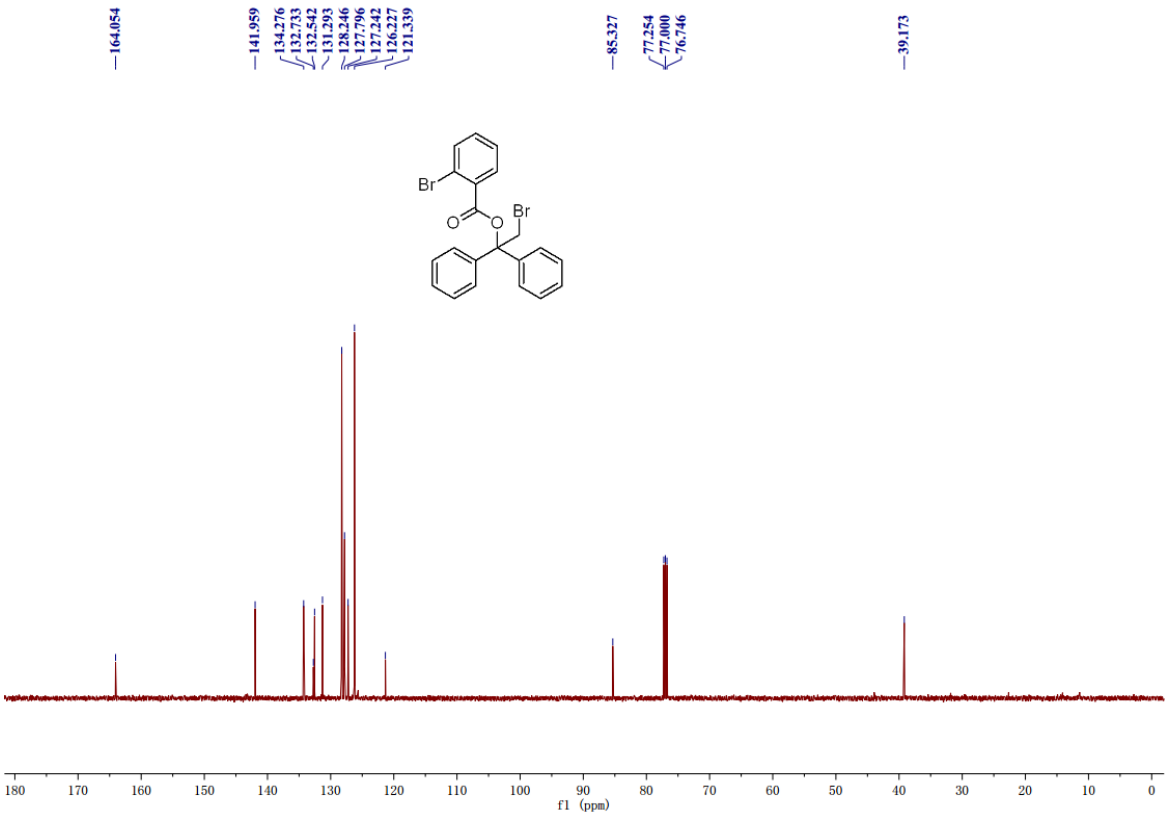
2-bromo-1,1-diphenylethyl 2-methylbenzoate (4aga)



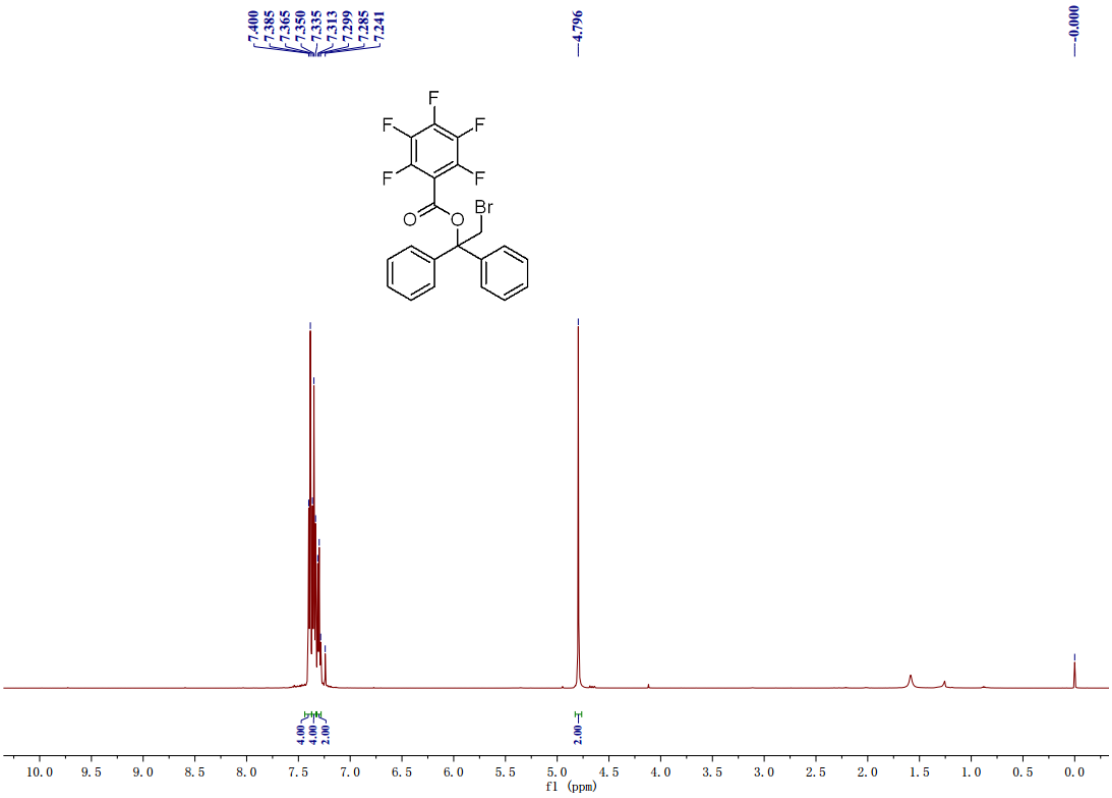


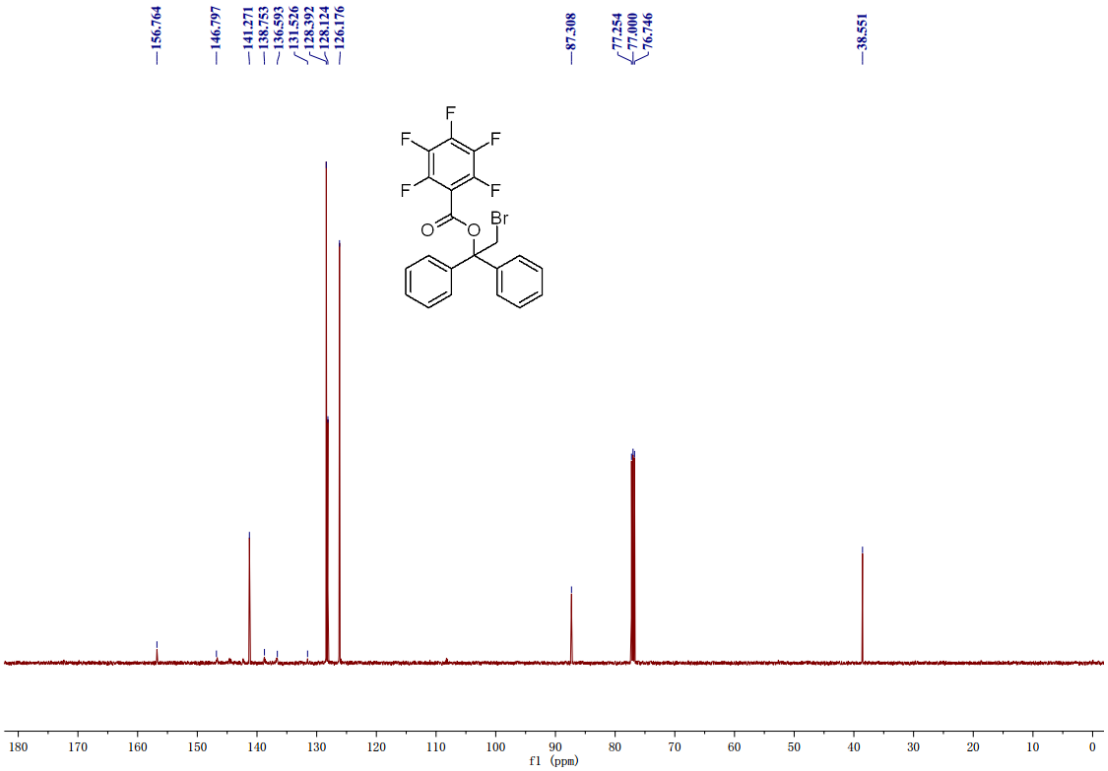
2-bromo-1,1-diphenylethyl 2-bromobenzoate (4aha)

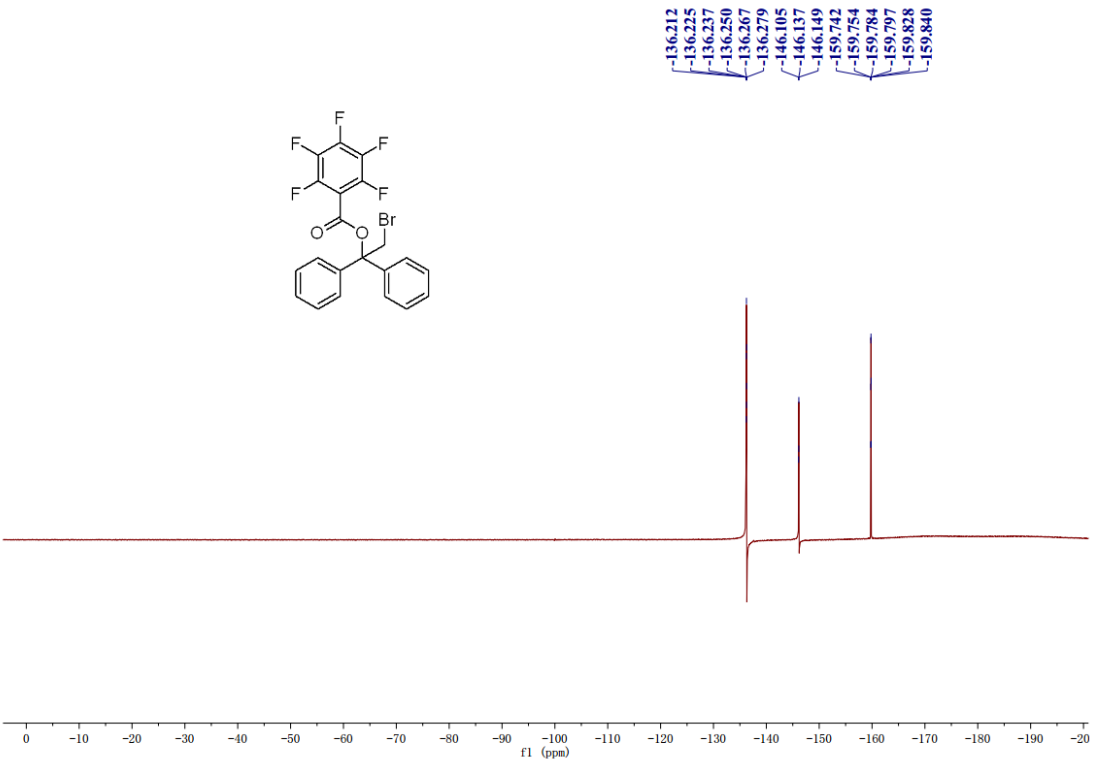




2-bromo-1,1-diphenylethyl 2,3,4,5,6-pentafluorobenzoate (4aia)



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-146.105
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-146.149
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-159.754
-159.784
-159.797
-159.828
-159.840
F
F
F
F
F
O
O
Br
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
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-150
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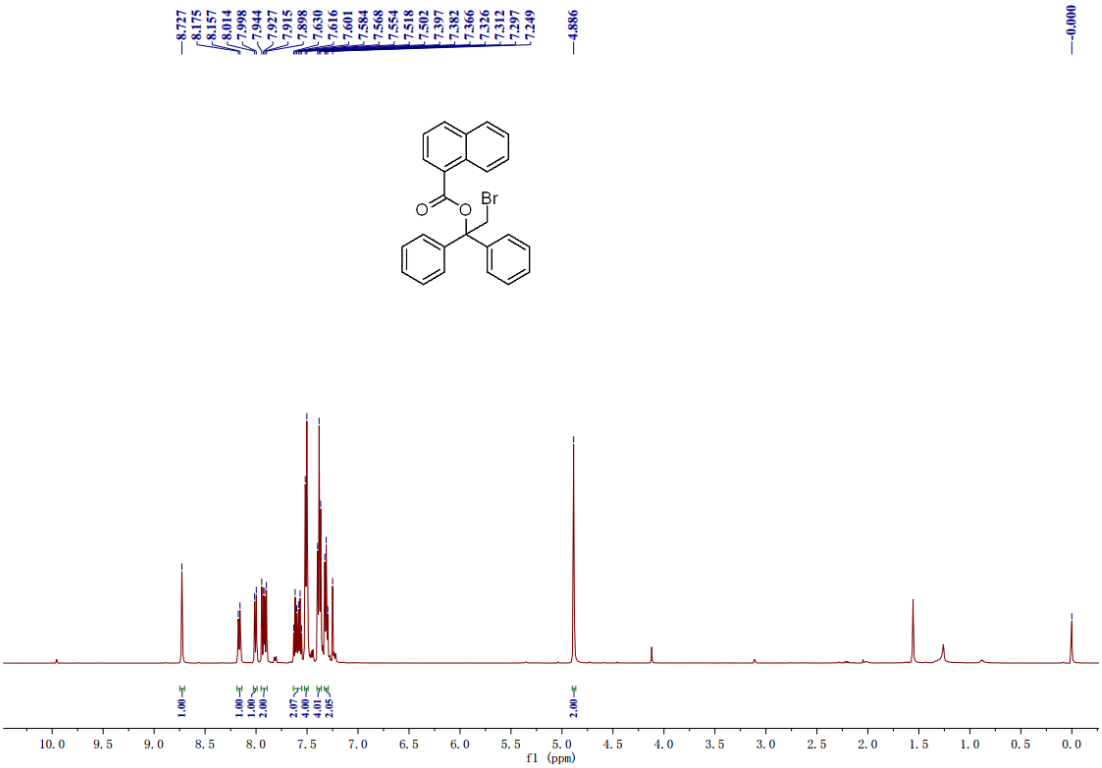
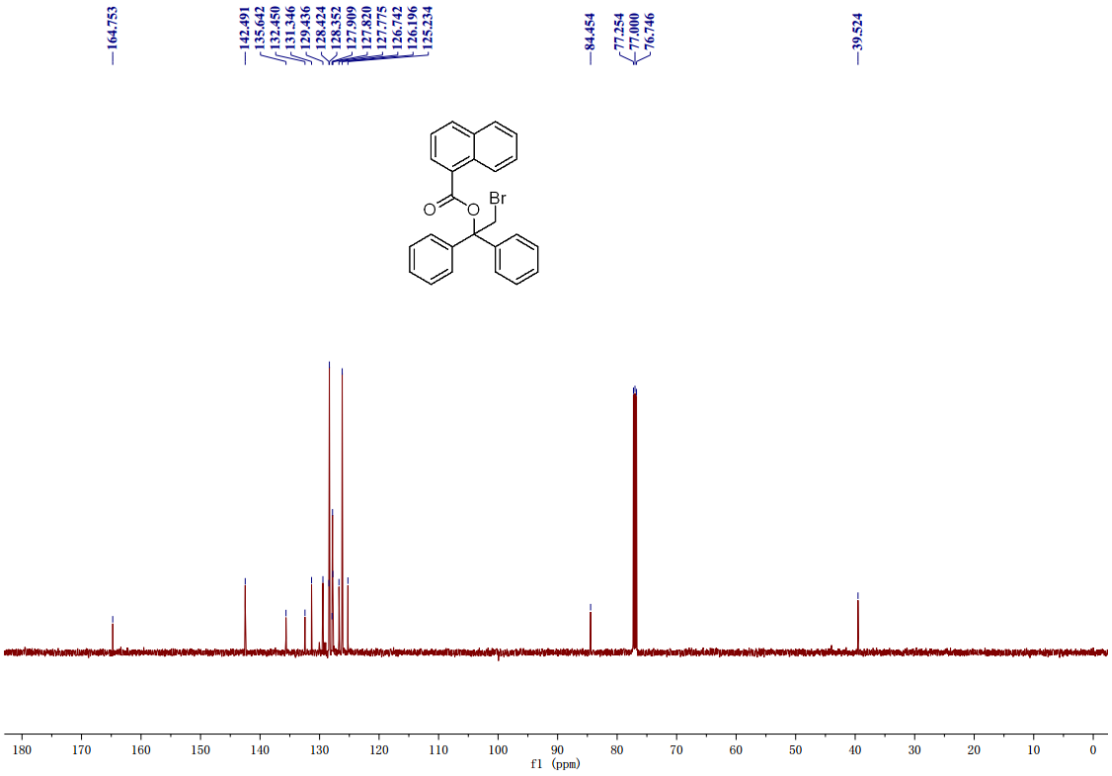
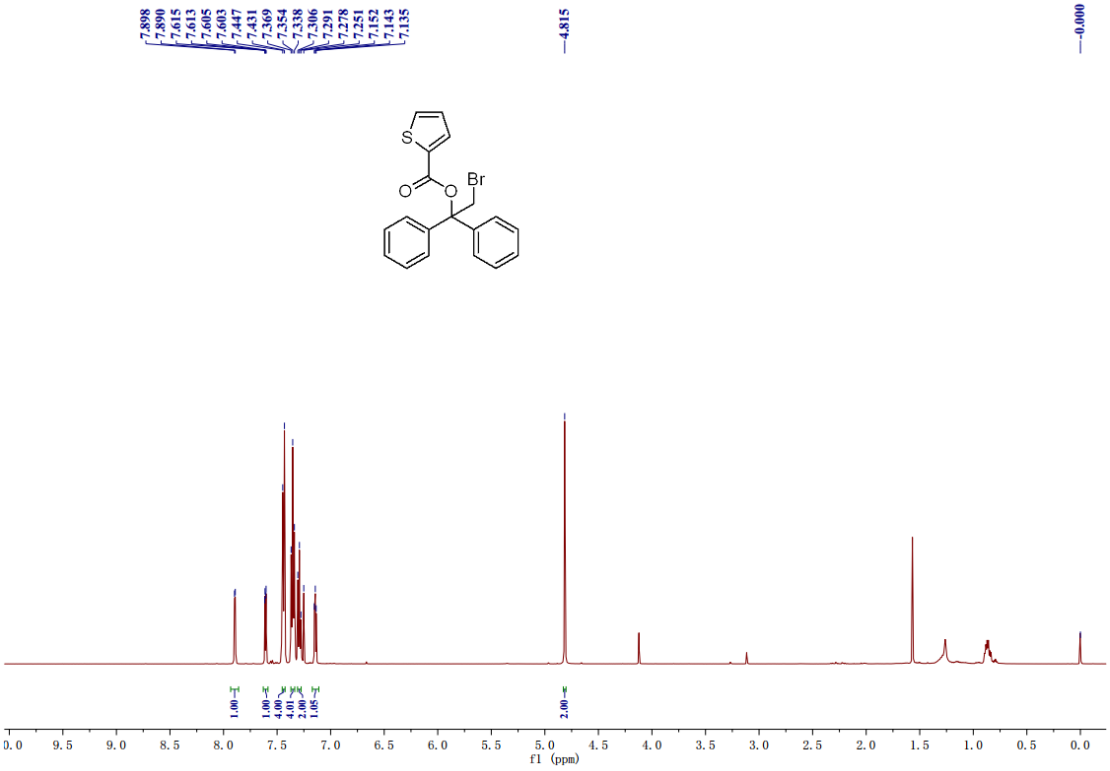
-180
-190
-20
f1 (ppm)

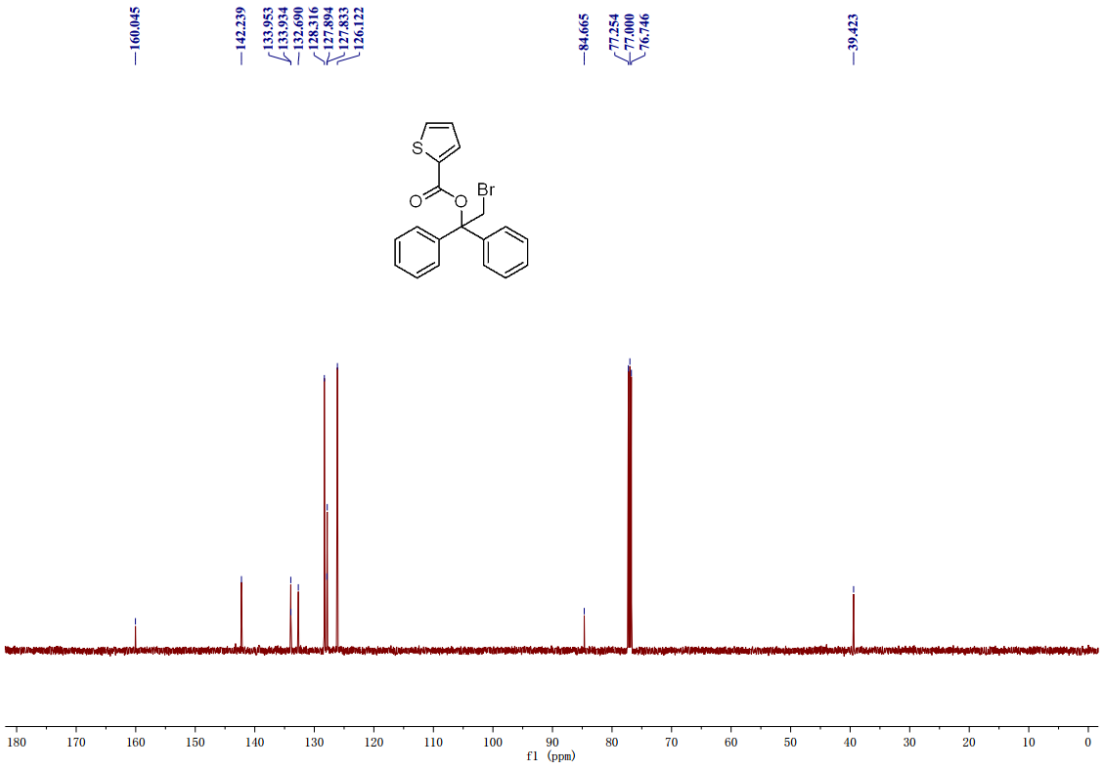
2-bromo-1,1-diphenylethyl 1-naphthoate (4aja)



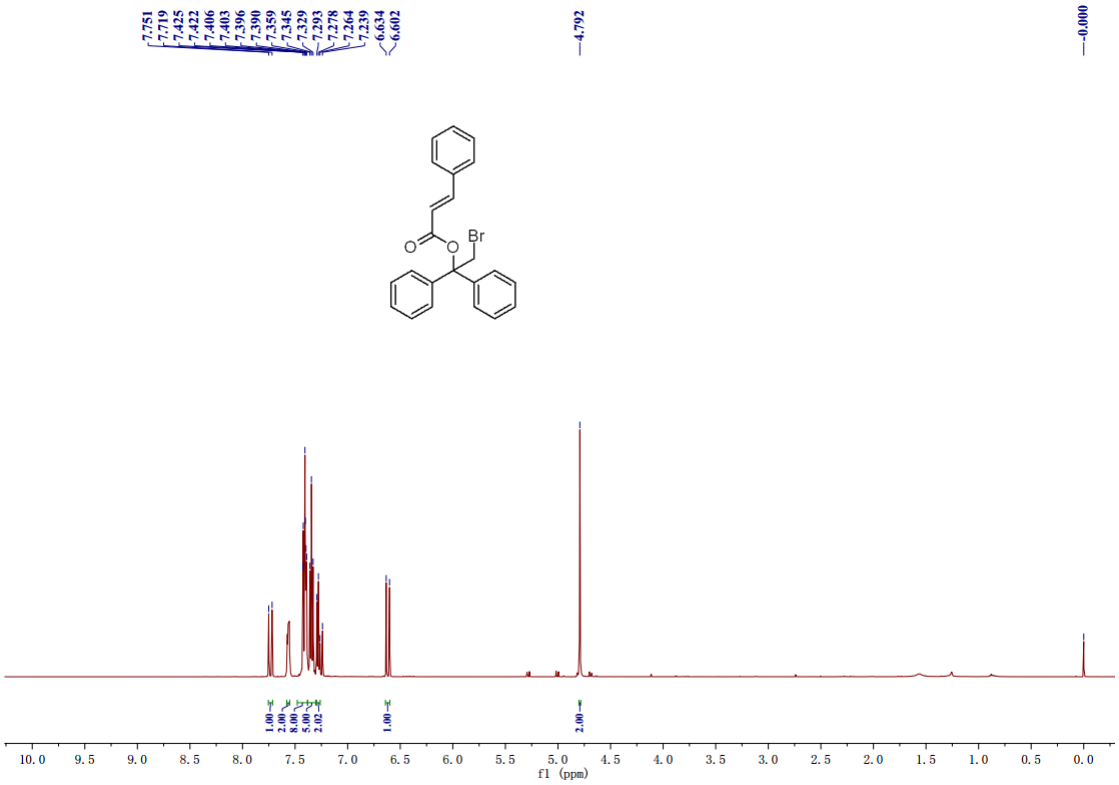


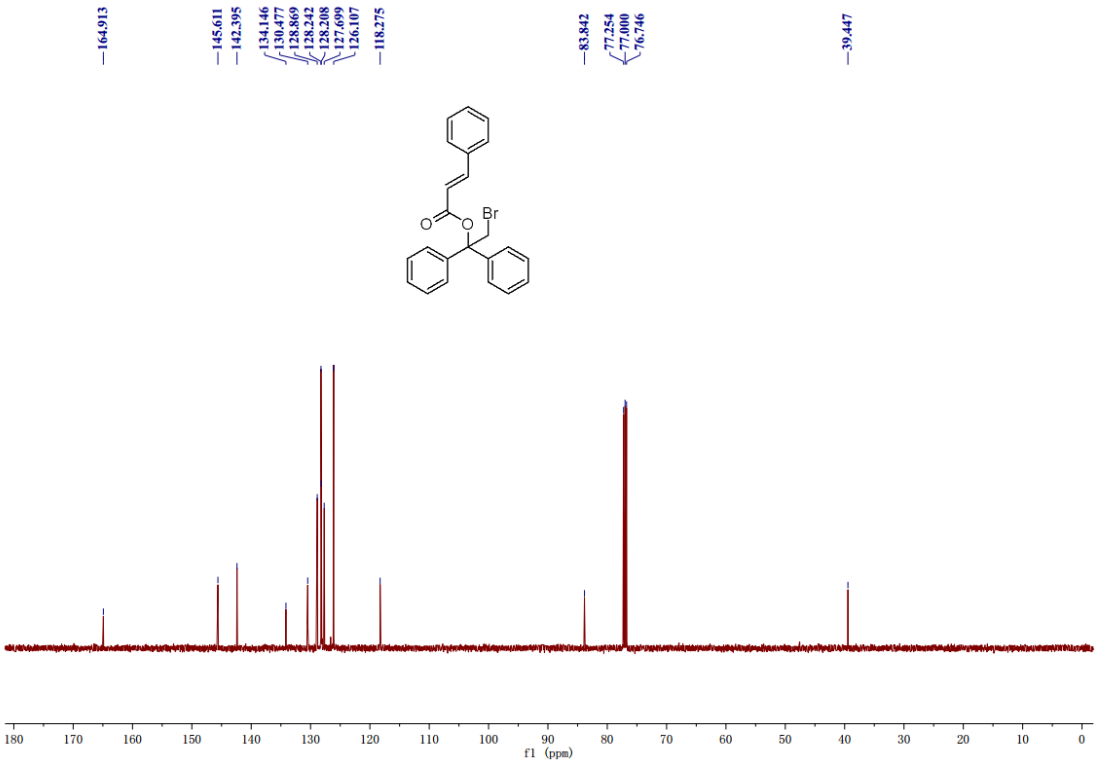
2-bromo-1,1-diphenylethyl thiophene-2-carboxylate (4aka)



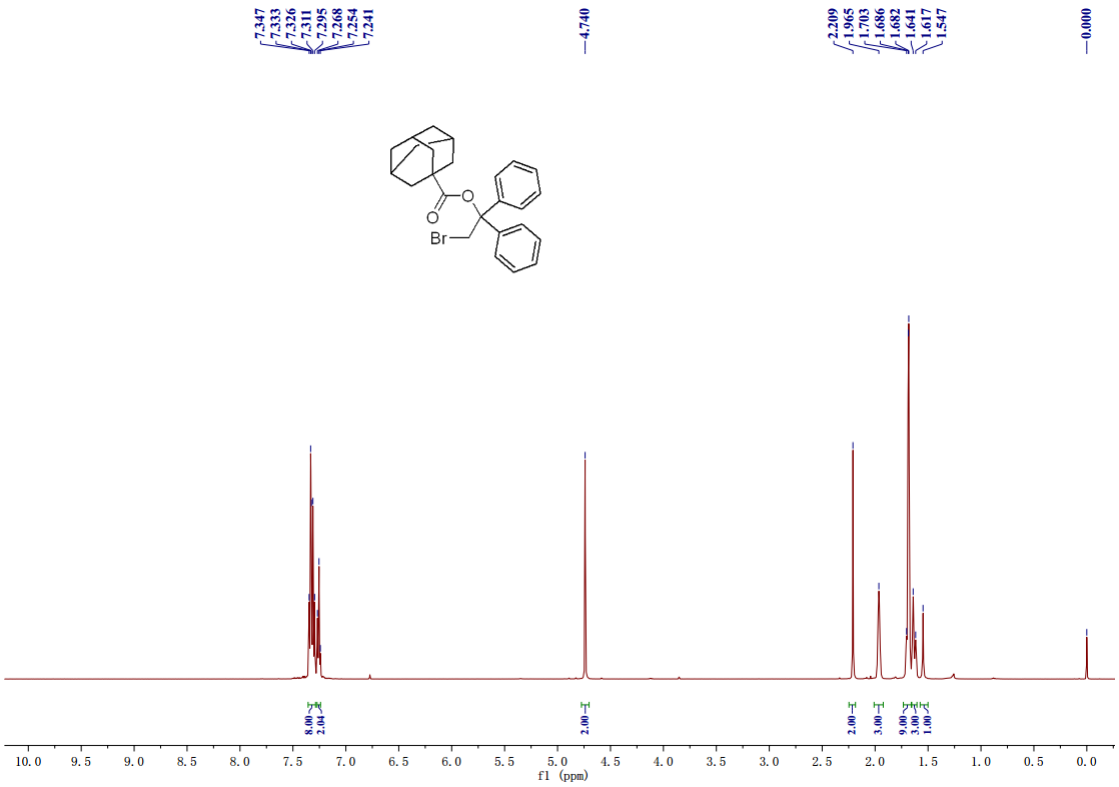


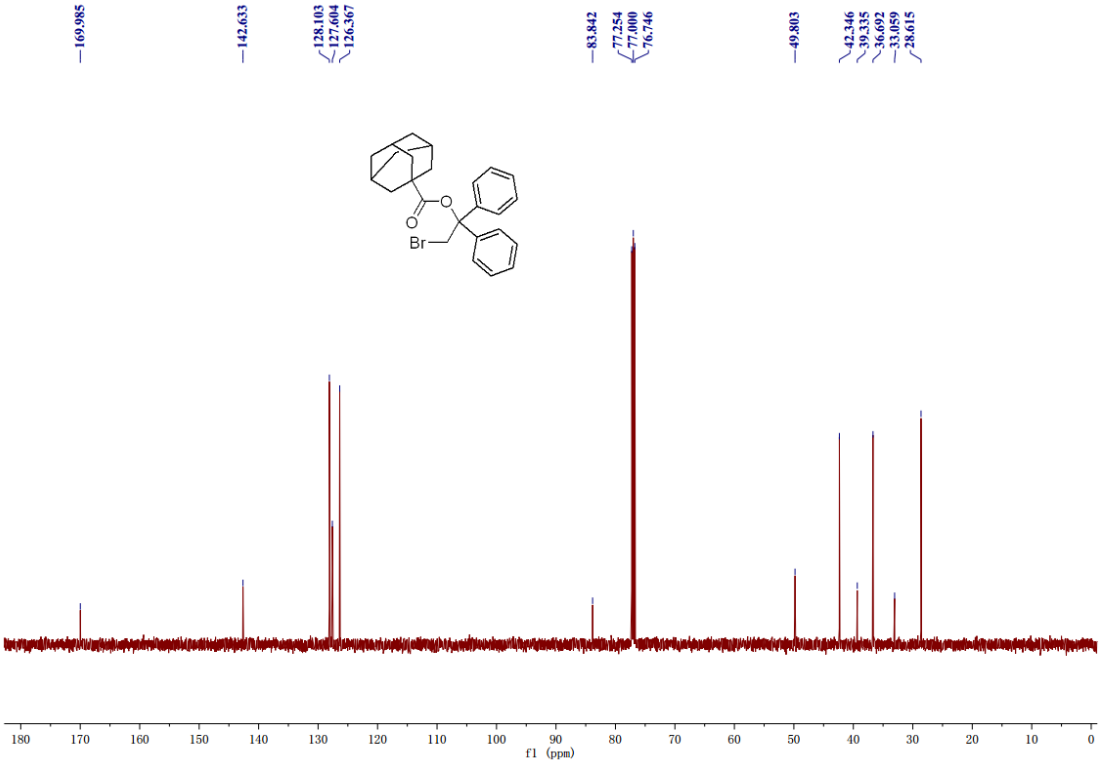
2-bromo-1,1-diphenylethyl cinnamate (4ala)



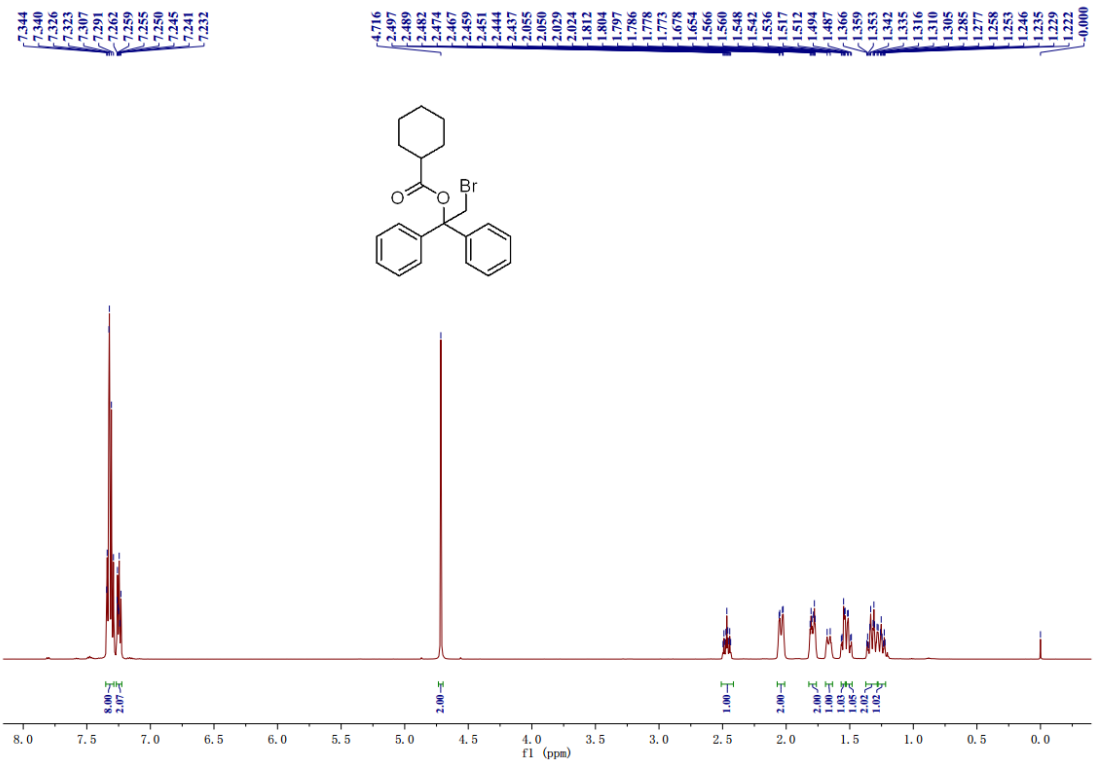


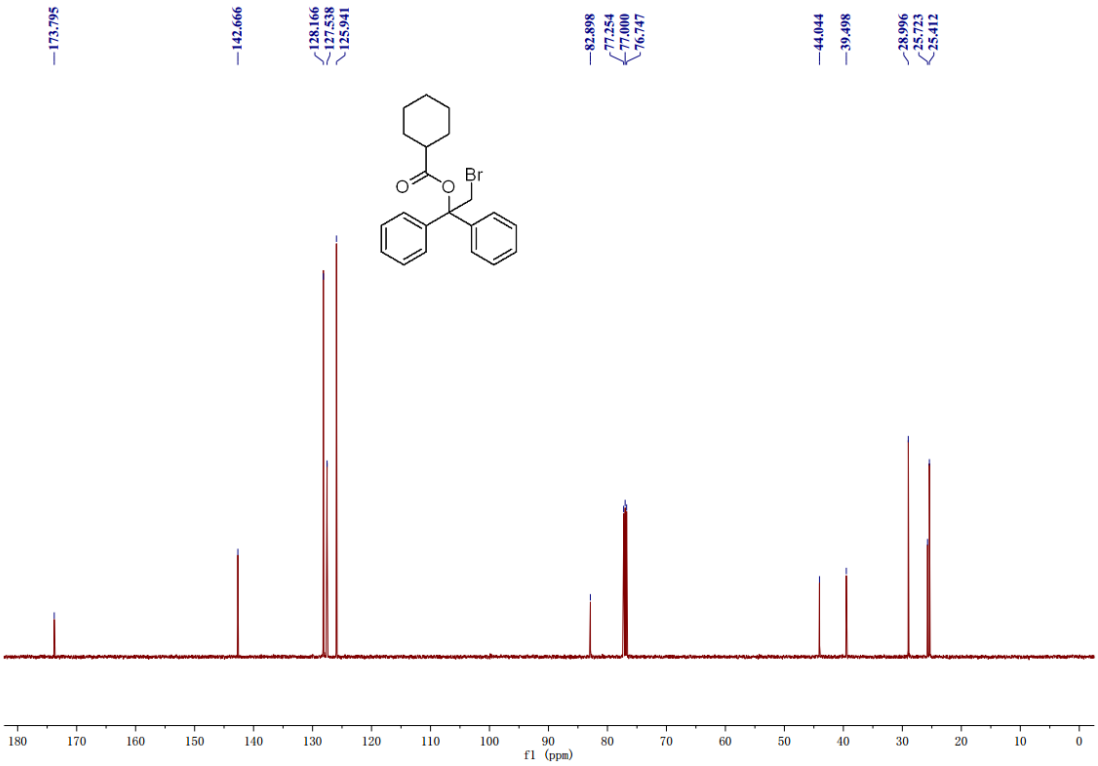
2-bromo-1,1-diphenylethyl adamantane-1-carboxylate (4ama)



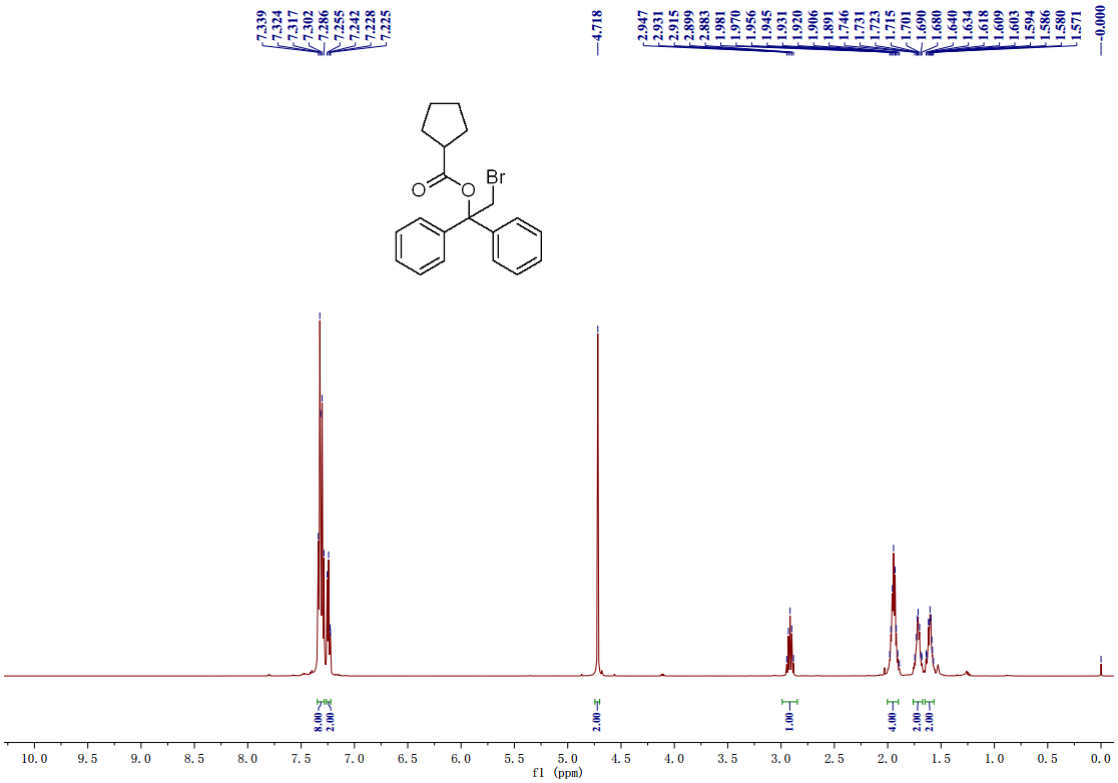


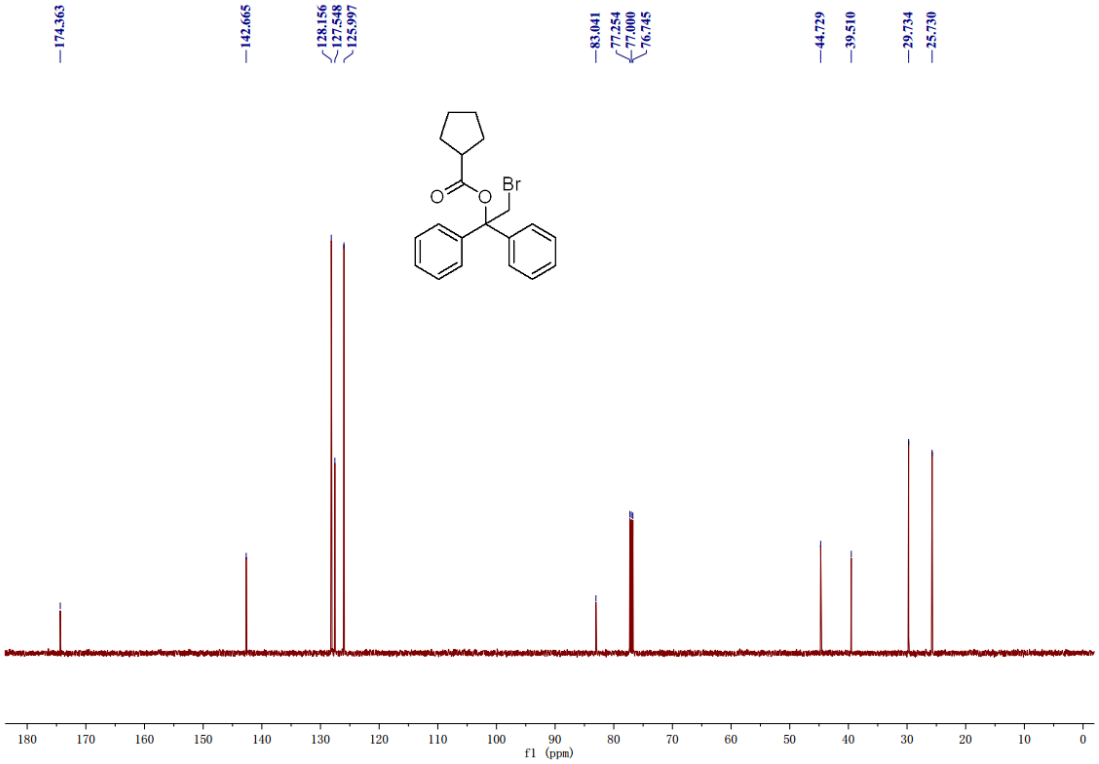
2-bromo-1,1-diphenylethyl cyclohexanecarboxylate (4ana)



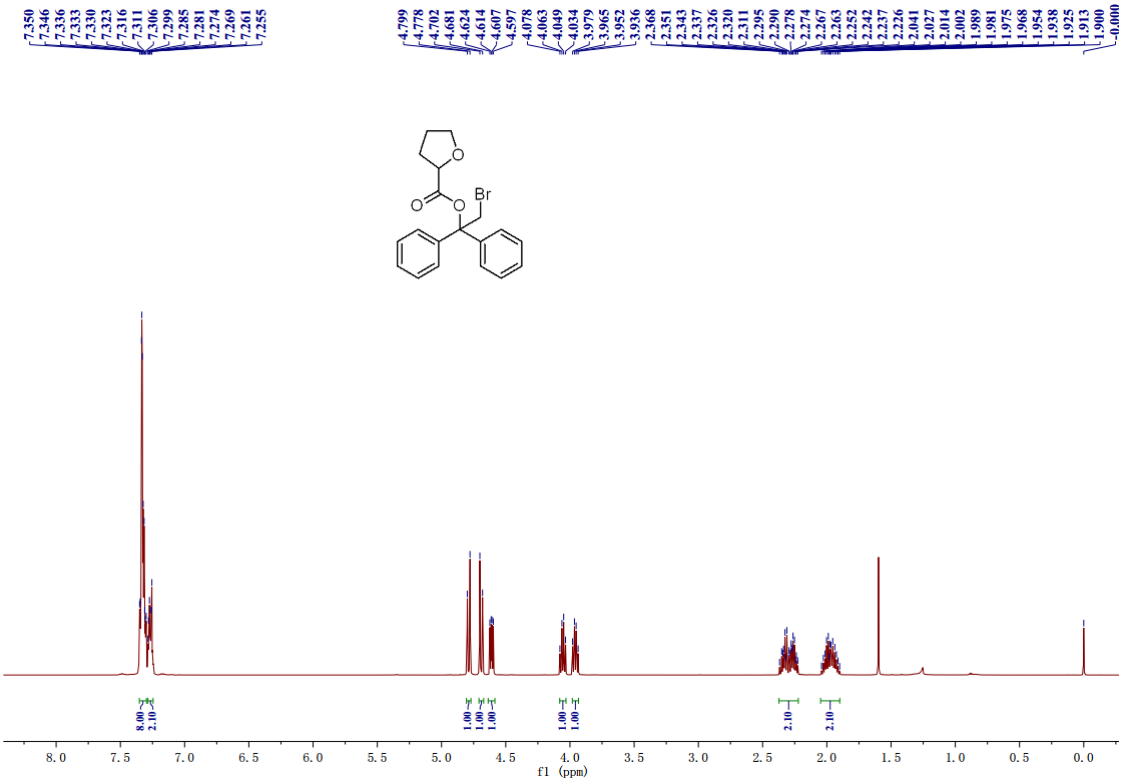


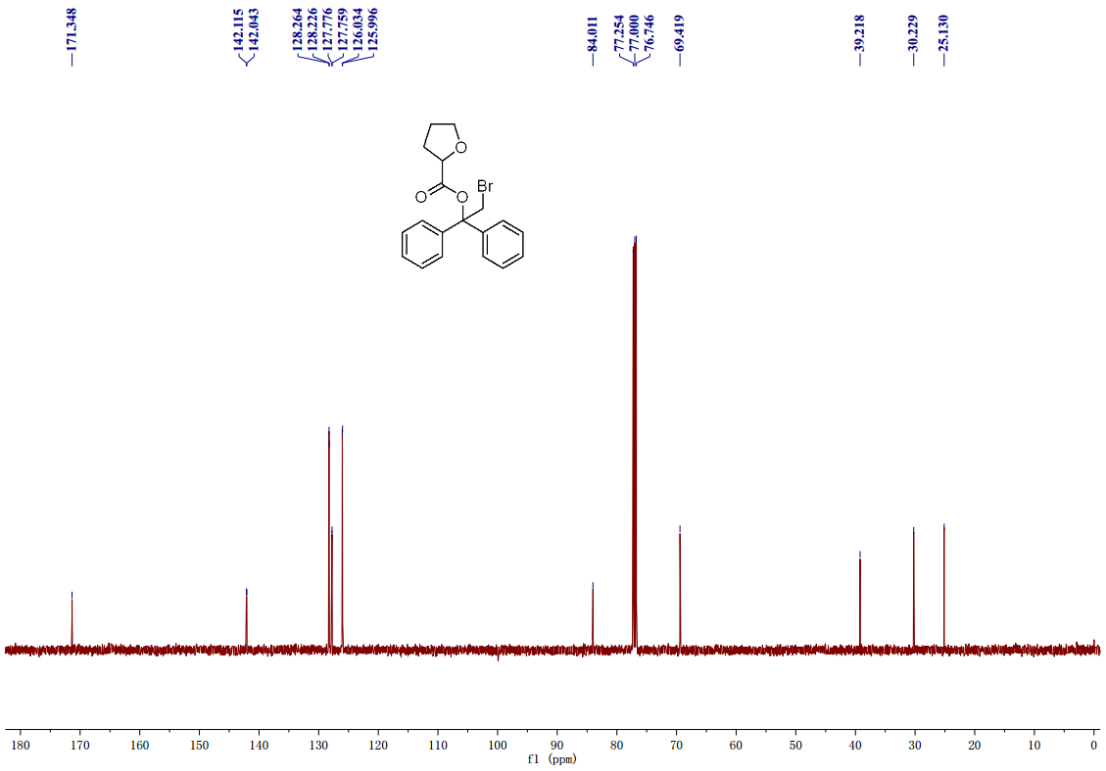
2-bromo-1,1-diphenylethyl cyclopentanecarboxylate (4aoa)



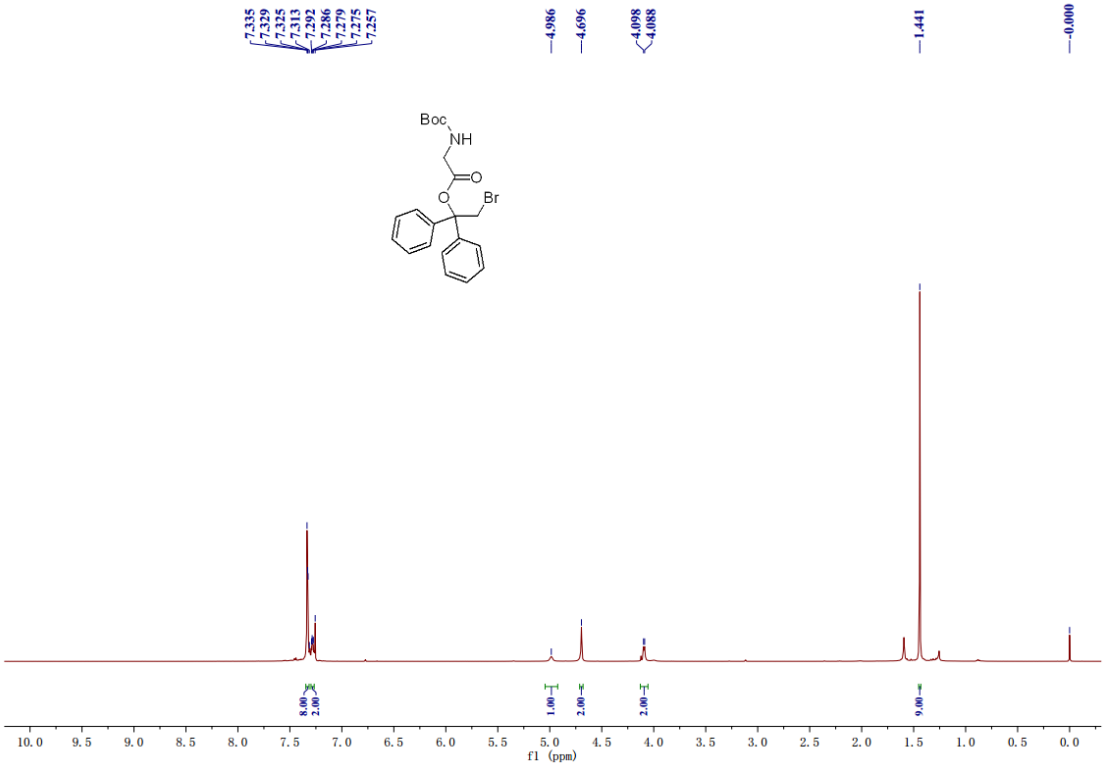


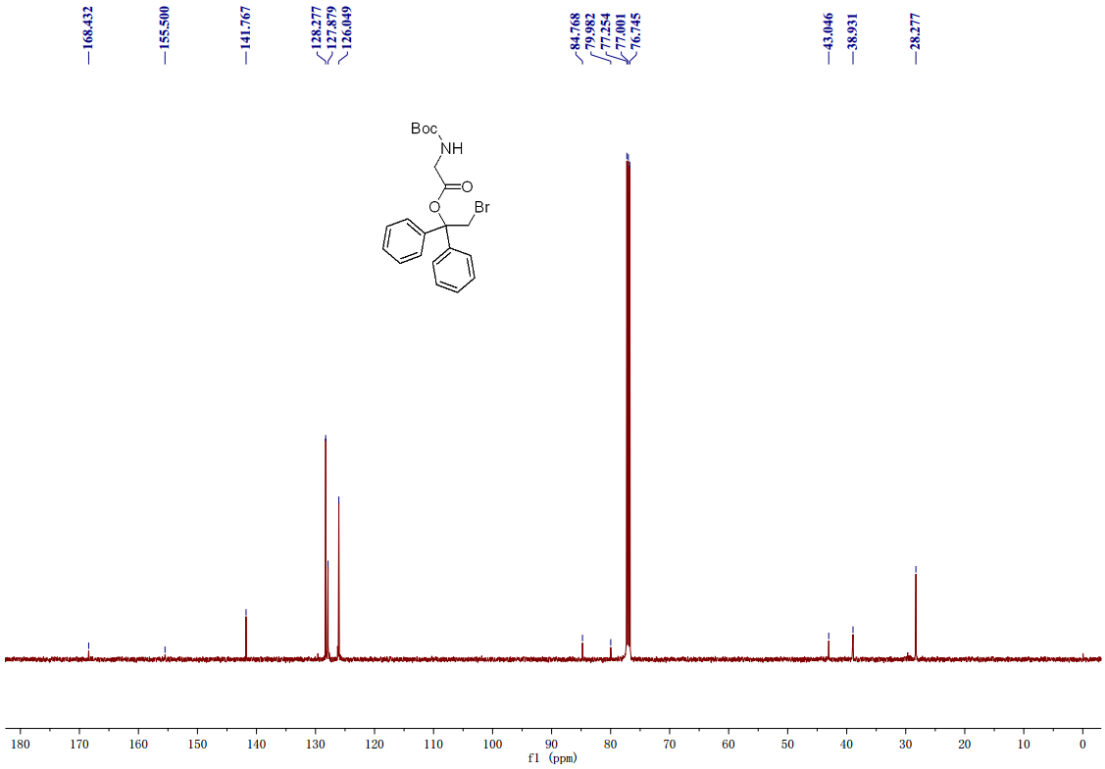
2-bromo-1,1-diphenylethyl tetrahydrofuran-2-carboxylate (4apa)



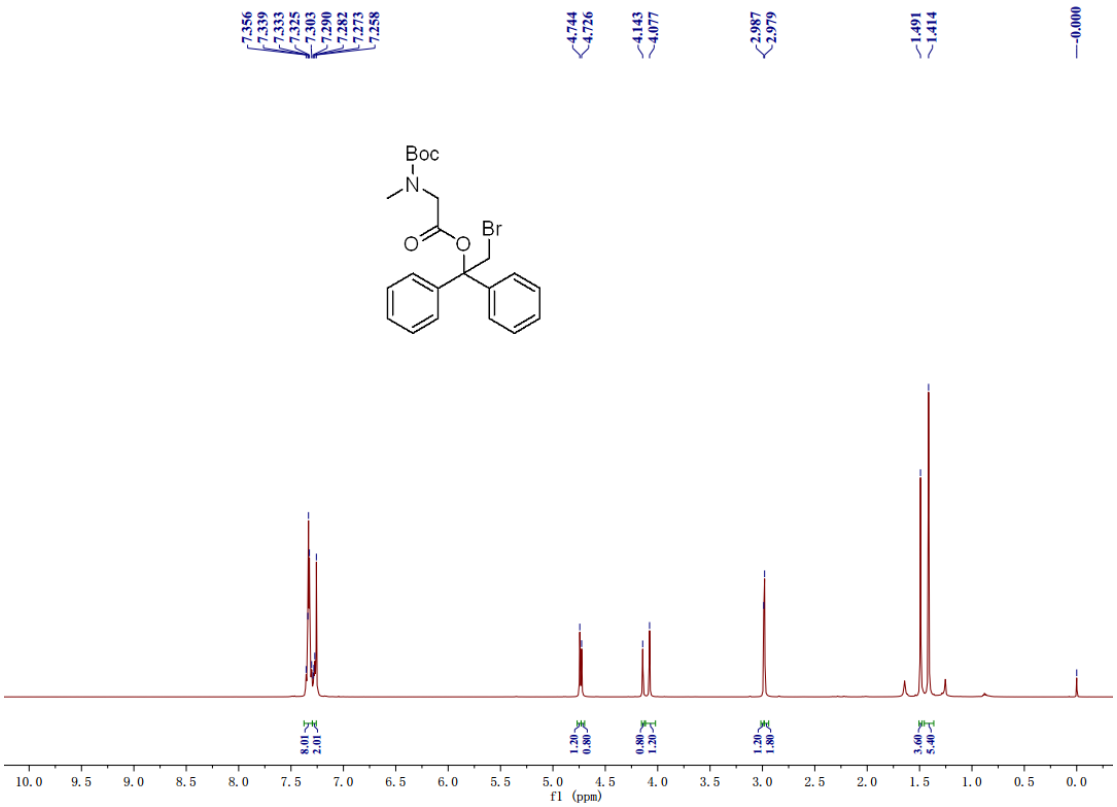


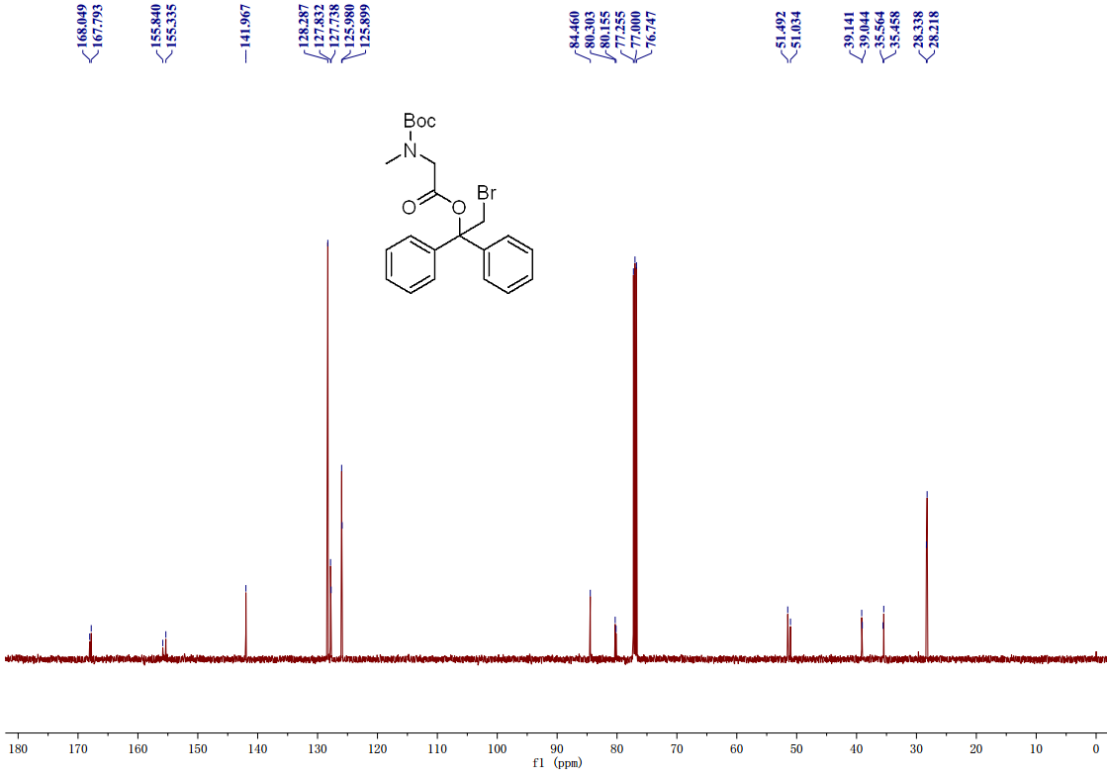
2-bromo-1,1-diphenylethyl (tert-butoxycarbonyl)glycinate (4aqa)



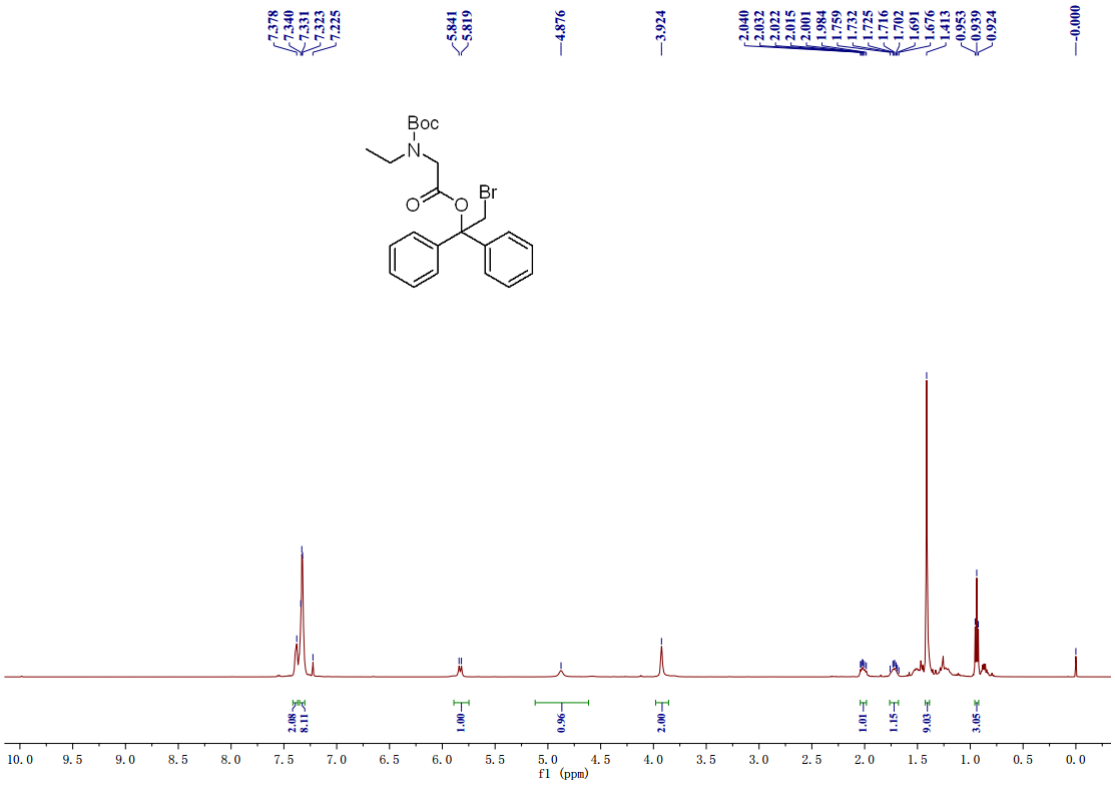


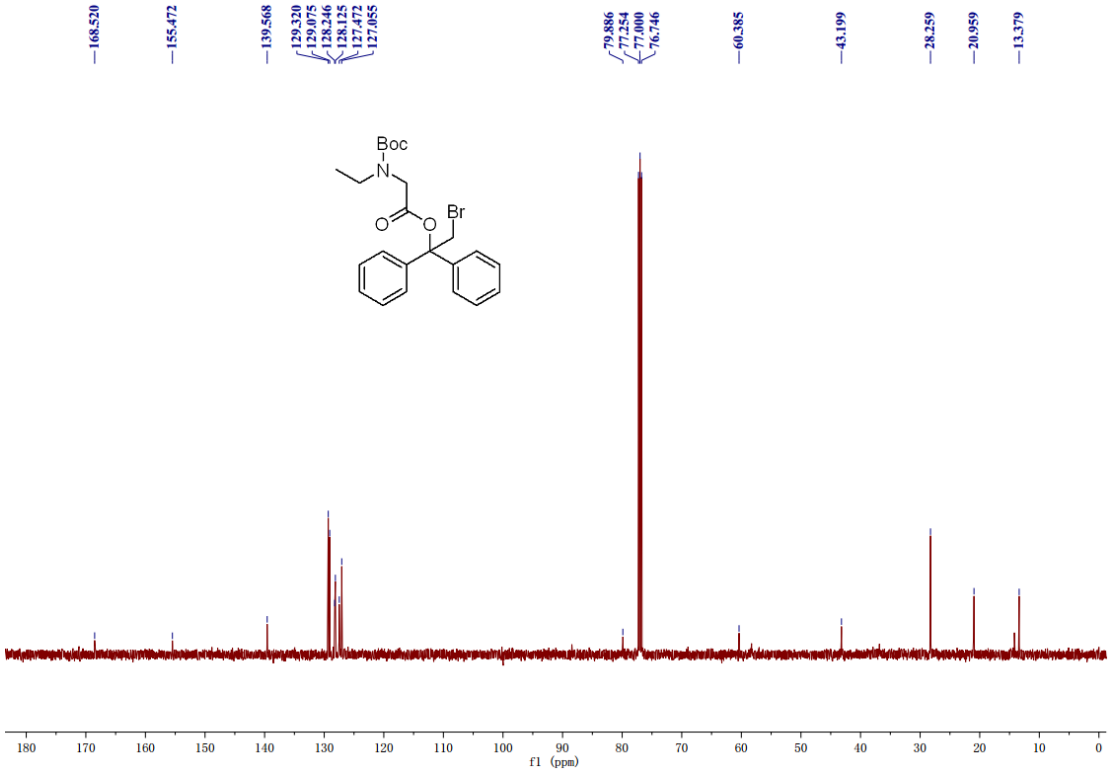
2-bromo-1,1-diphenylethyl N-(tert-butoxycarbonyl)-N-methylglycinate (4ara)



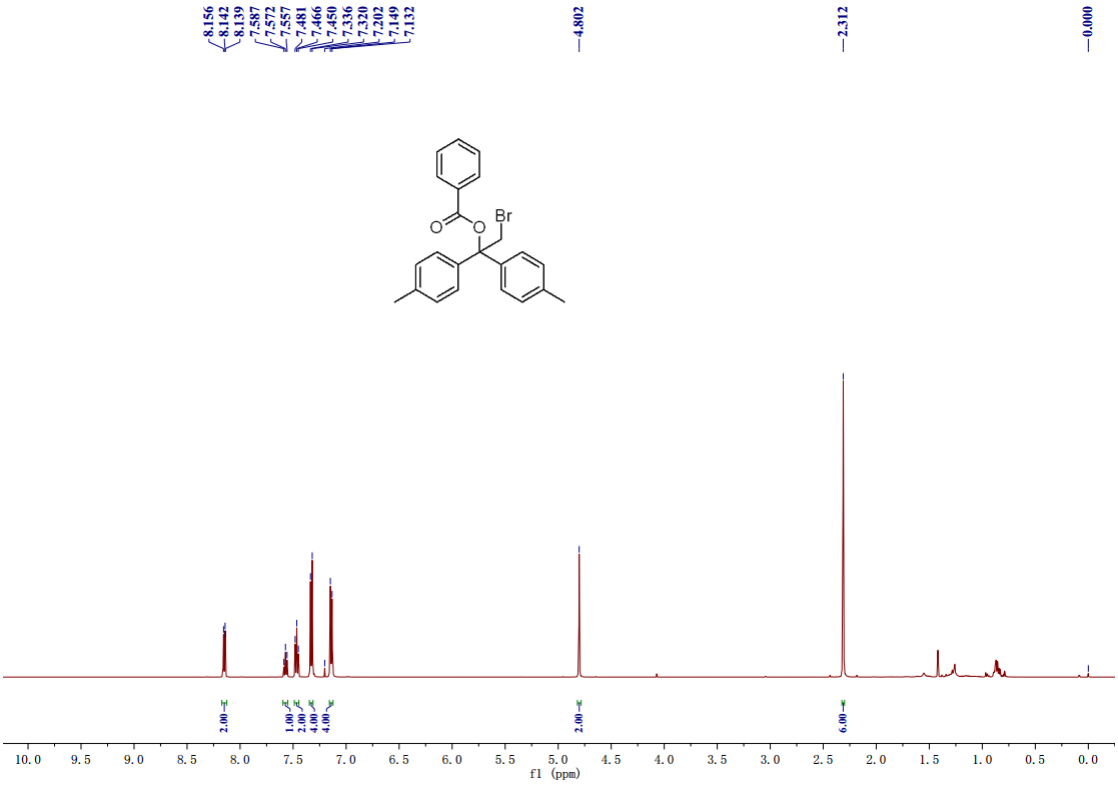


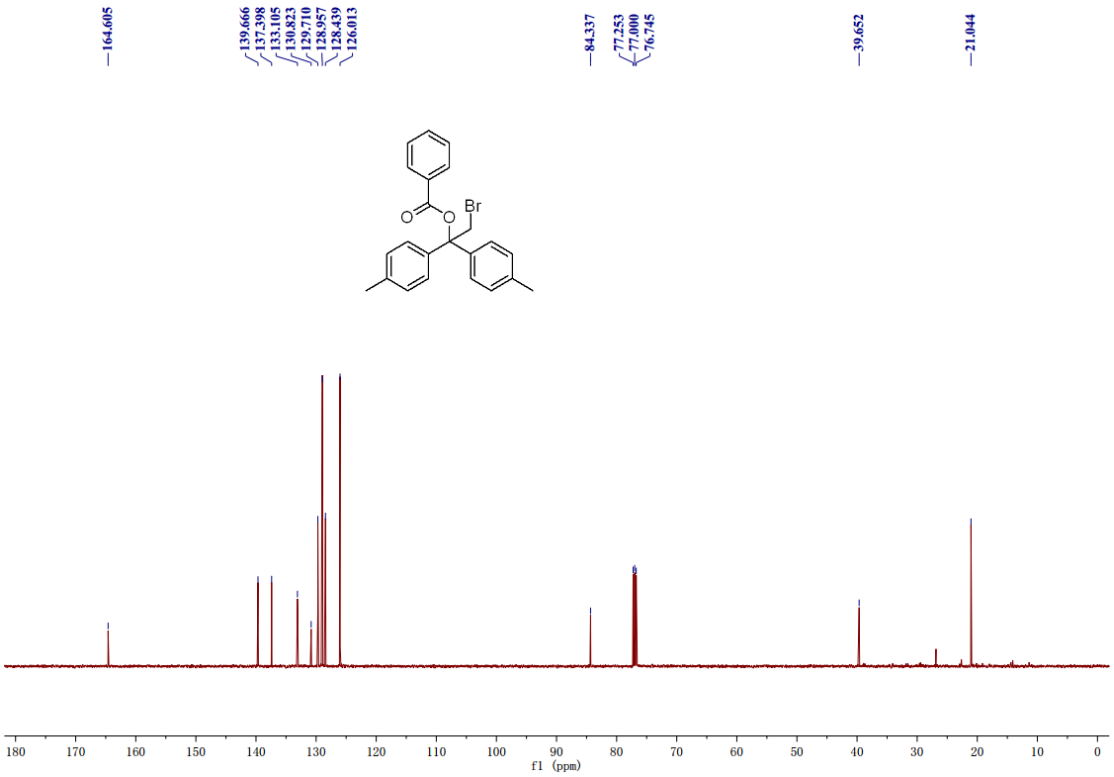
2-bromo-1,1-diphenylethyl N-(tert-butoxycarbonyl)-N-ethylglycinate (4asa)



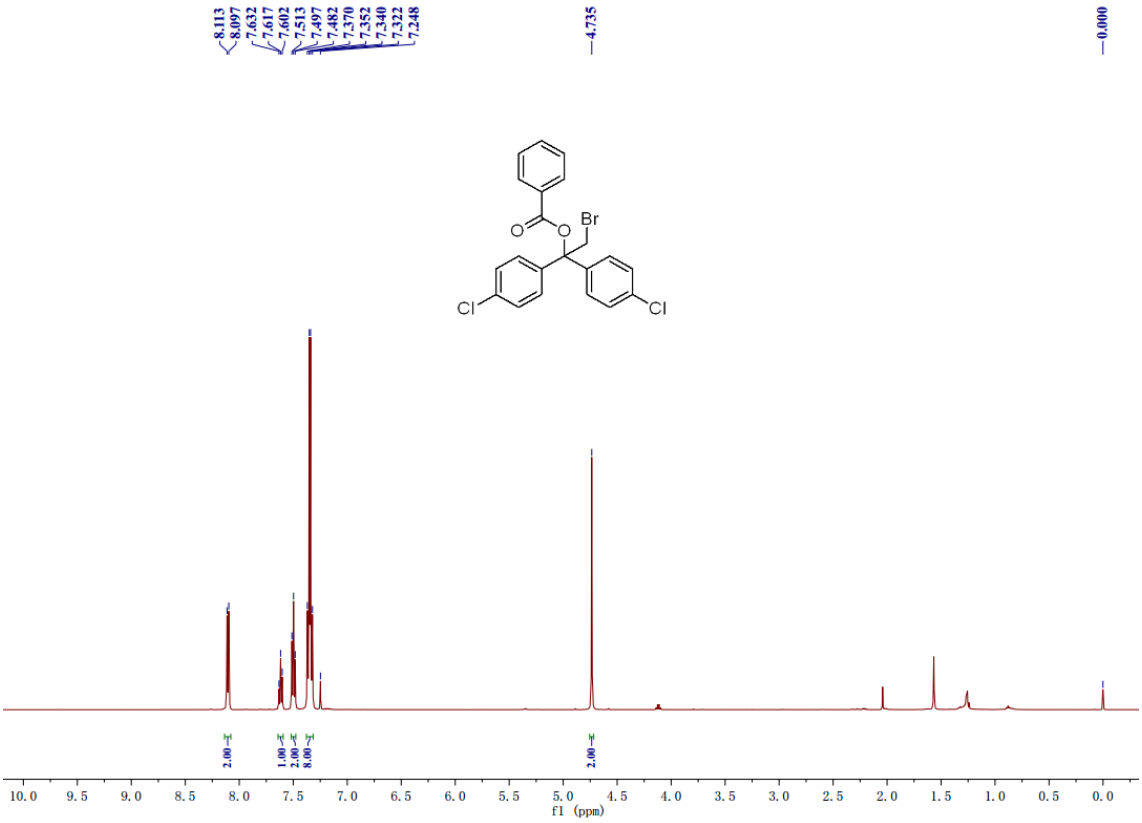


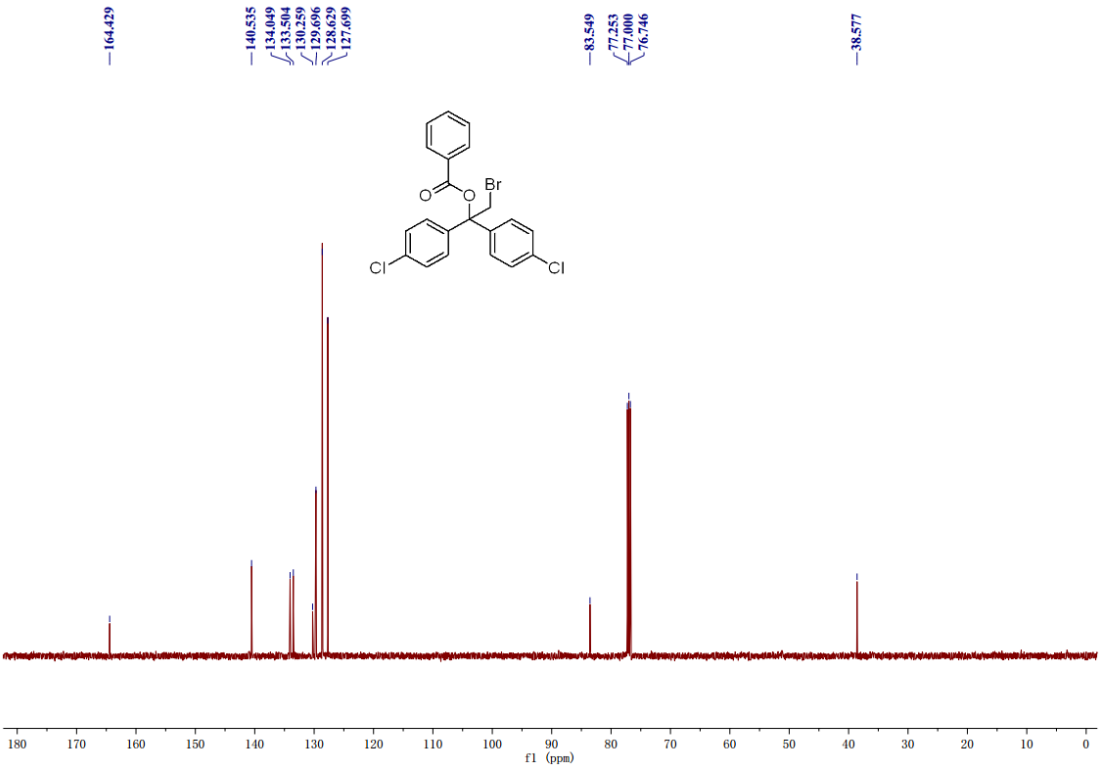
2-bromo-1,1-di-p-tolylethyl benzoate (4baa)



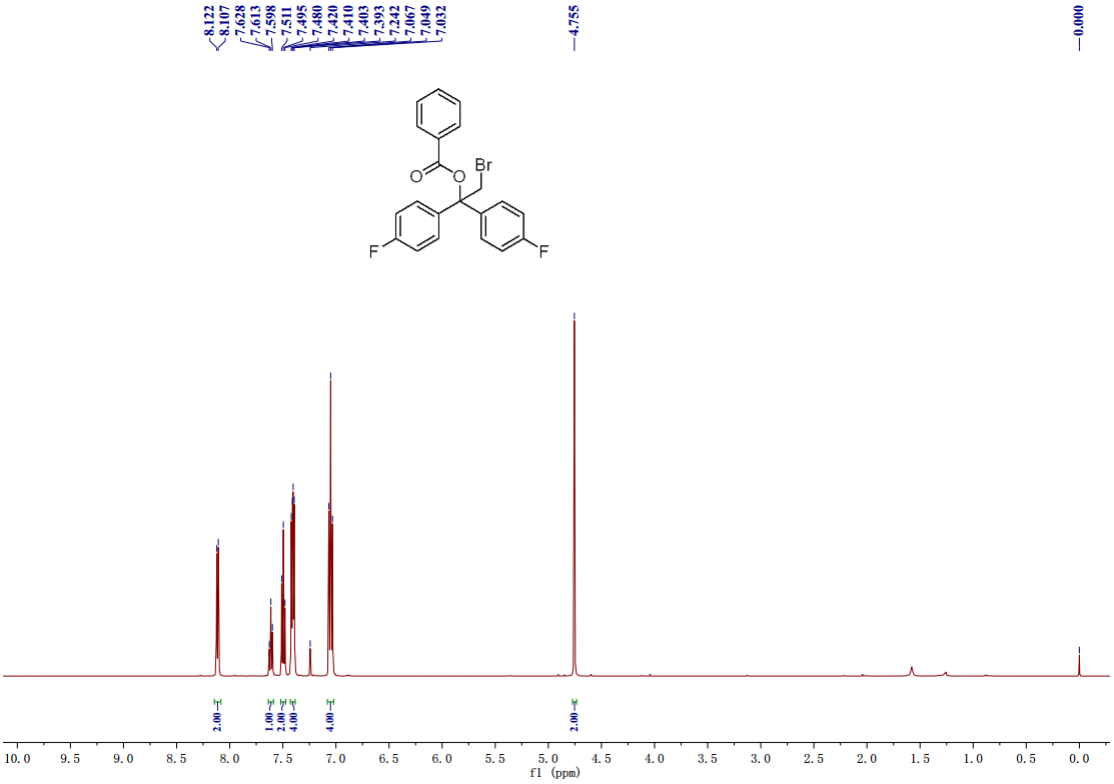


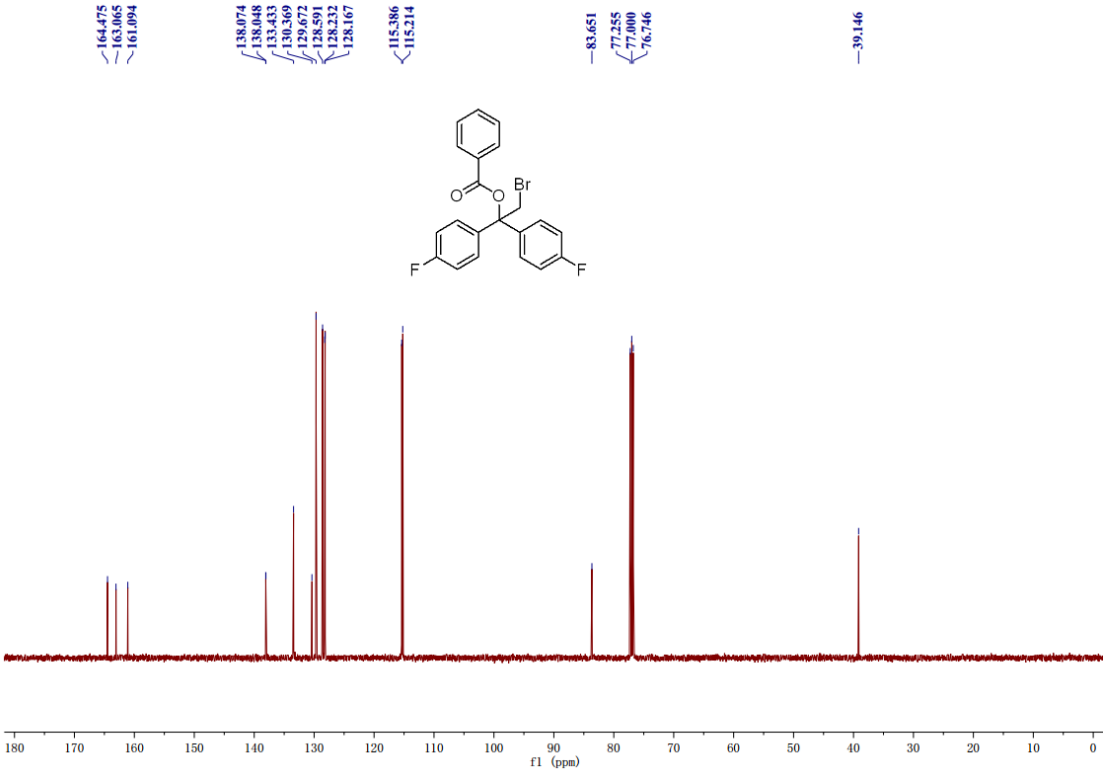
2-bromo-1,1-bis(4-chlorophenyl)ethyl benzoate (4caa)

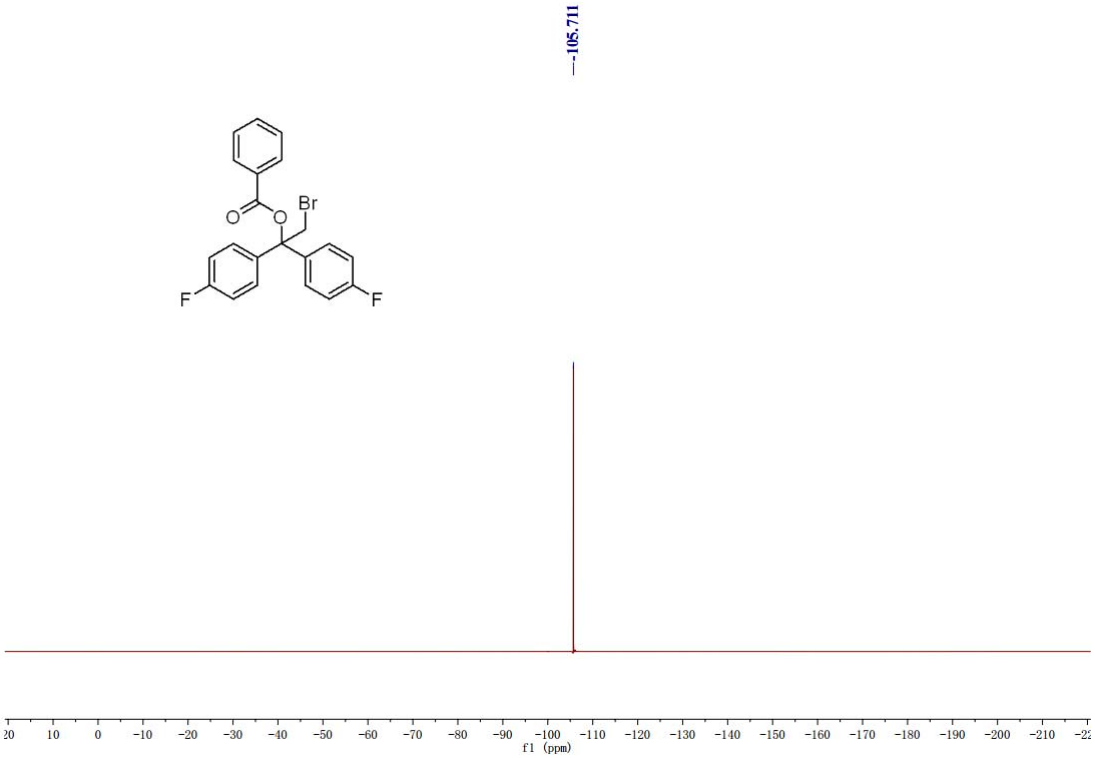




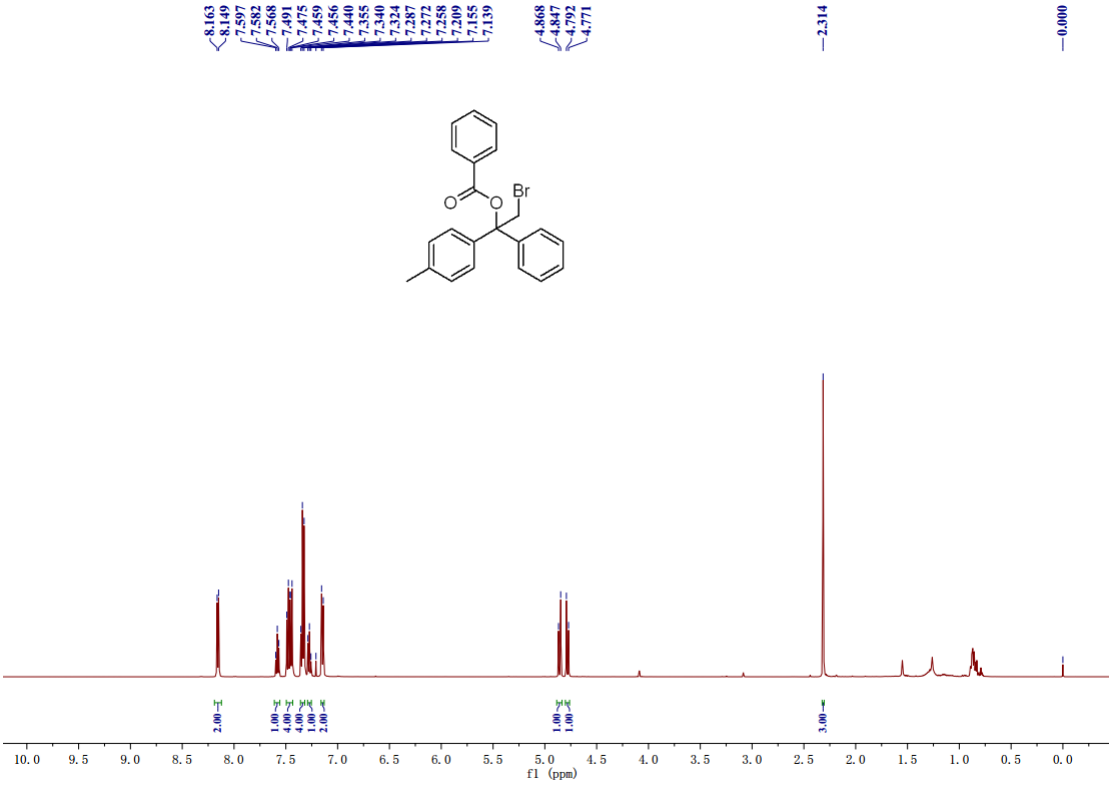
2-bromo-1,1-bis(4-fluorophenyl)ethyl benzoate (4daa)

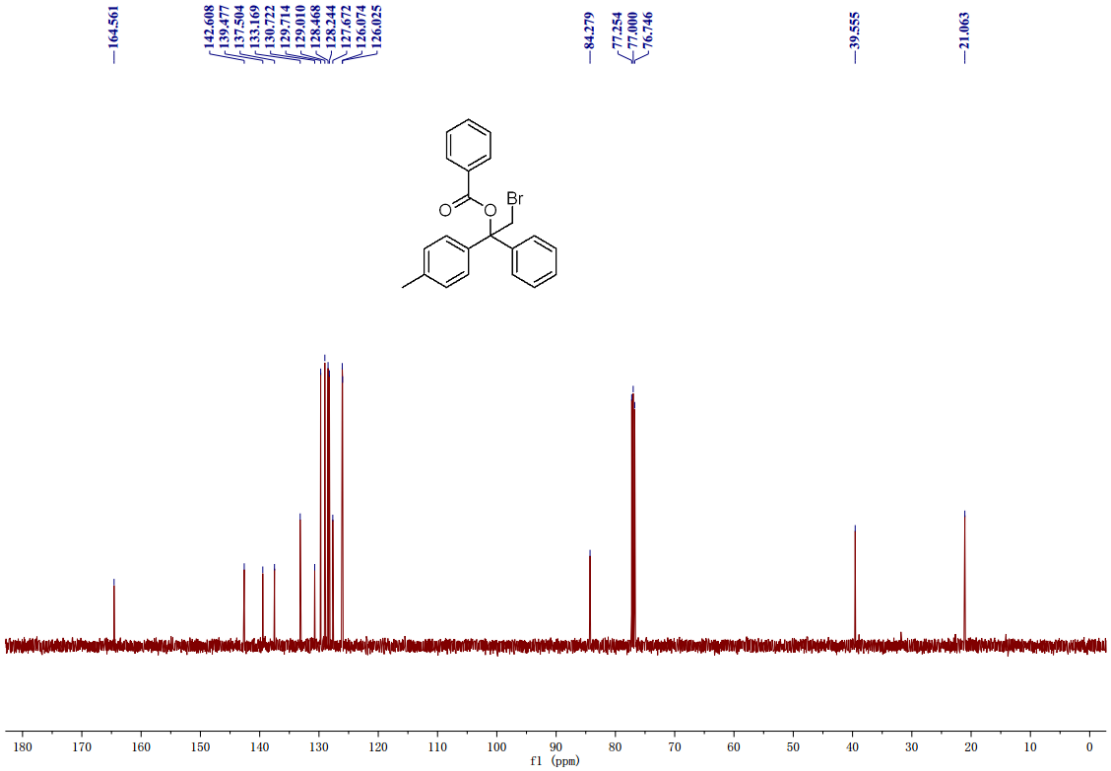




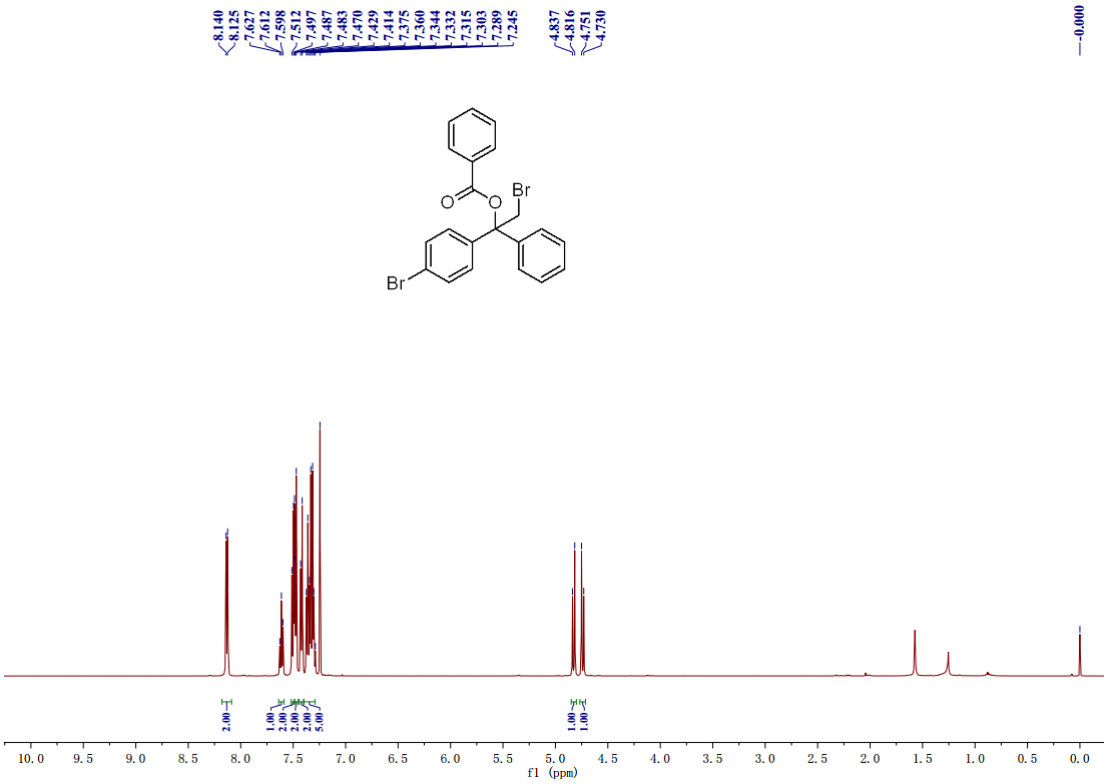

-105.711
Br
O
O
F
F
20 10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 -120 -130 -140 -150 -160 -170 -180 -190 -200 -210
f1 (ppm)

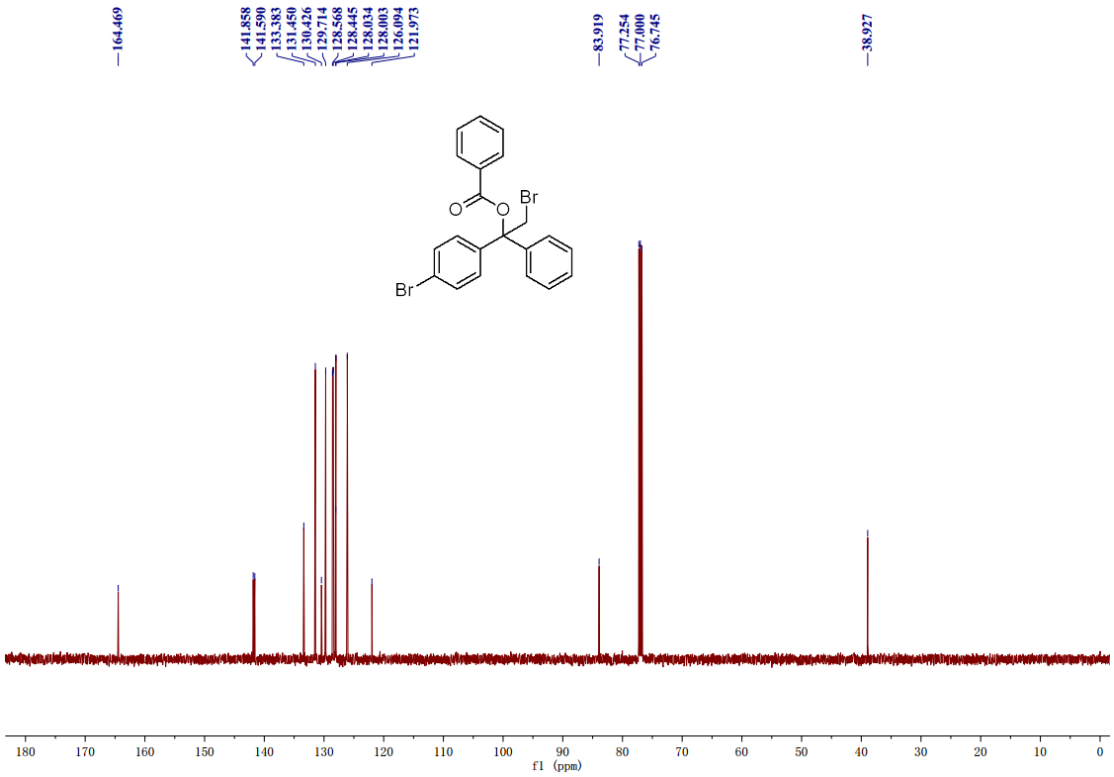
2-bromo-1-phenyl-1-(p-tolyl)ethyl benzoate (4eaa)



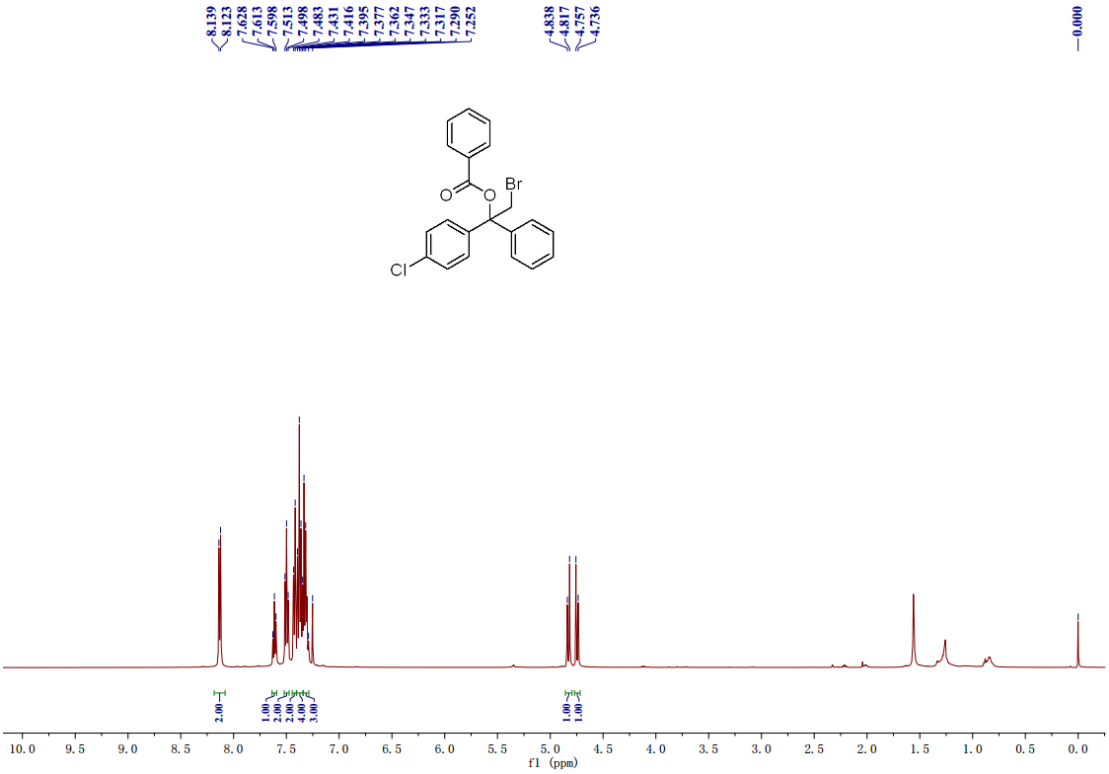


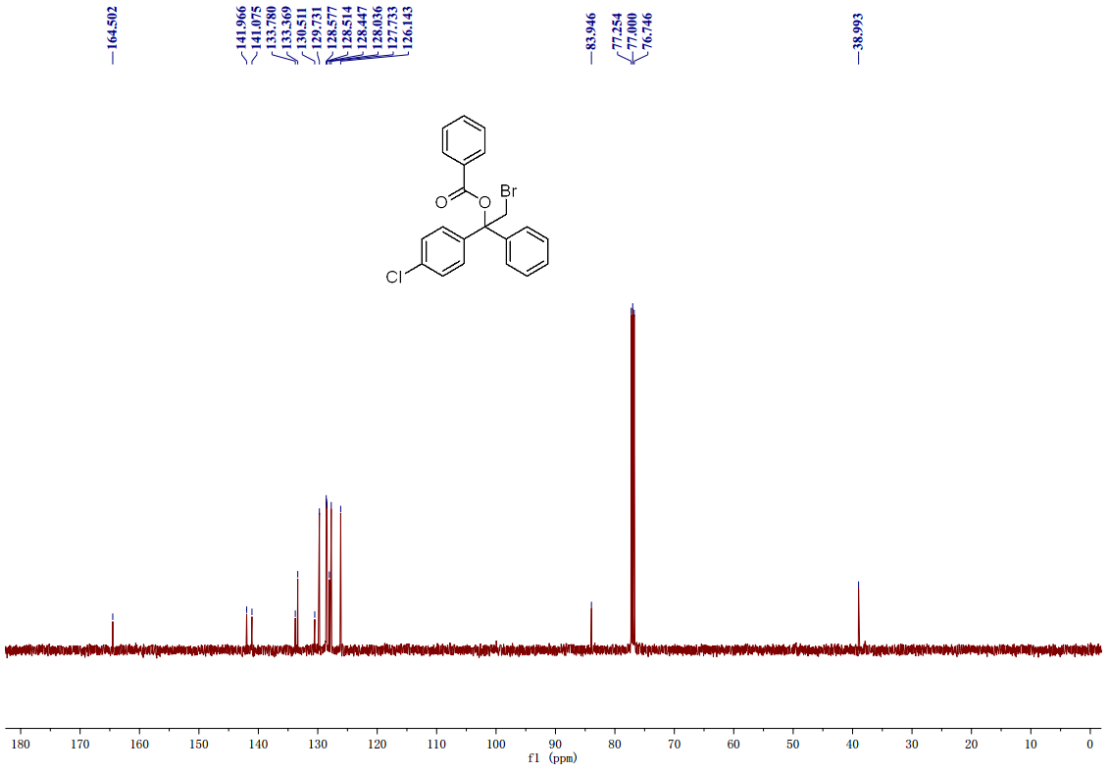
2-bromo-1-(4-bromophenyl)-1-phenylethyl benzoate (4faa)



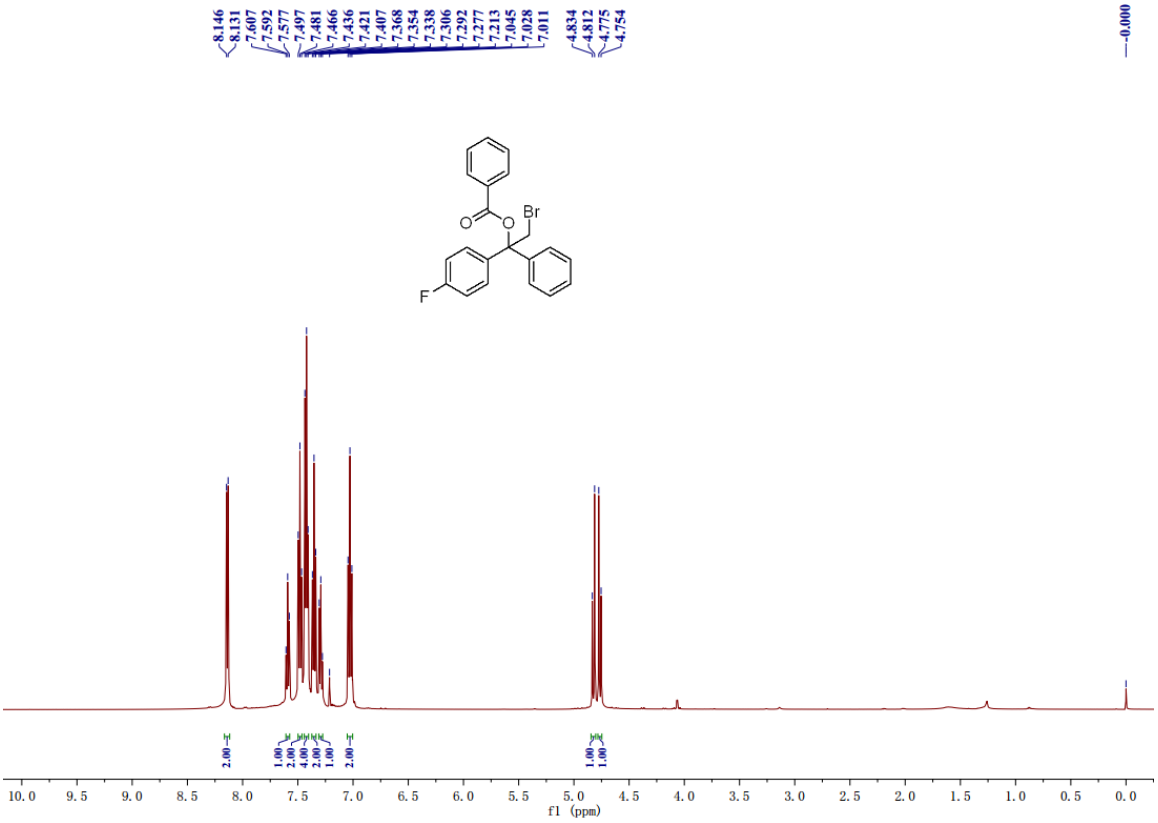


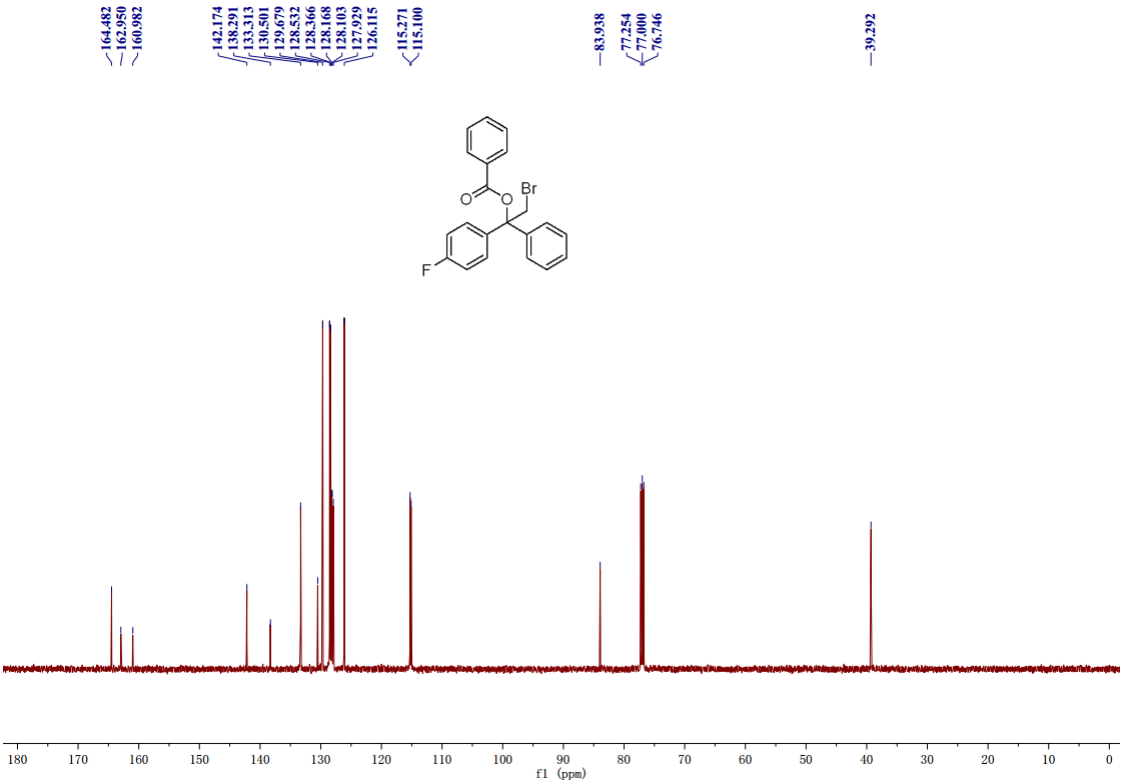
2-bromo-1-(4-chlorophenyl)-1-phenylethyl benzoate (4gaa)

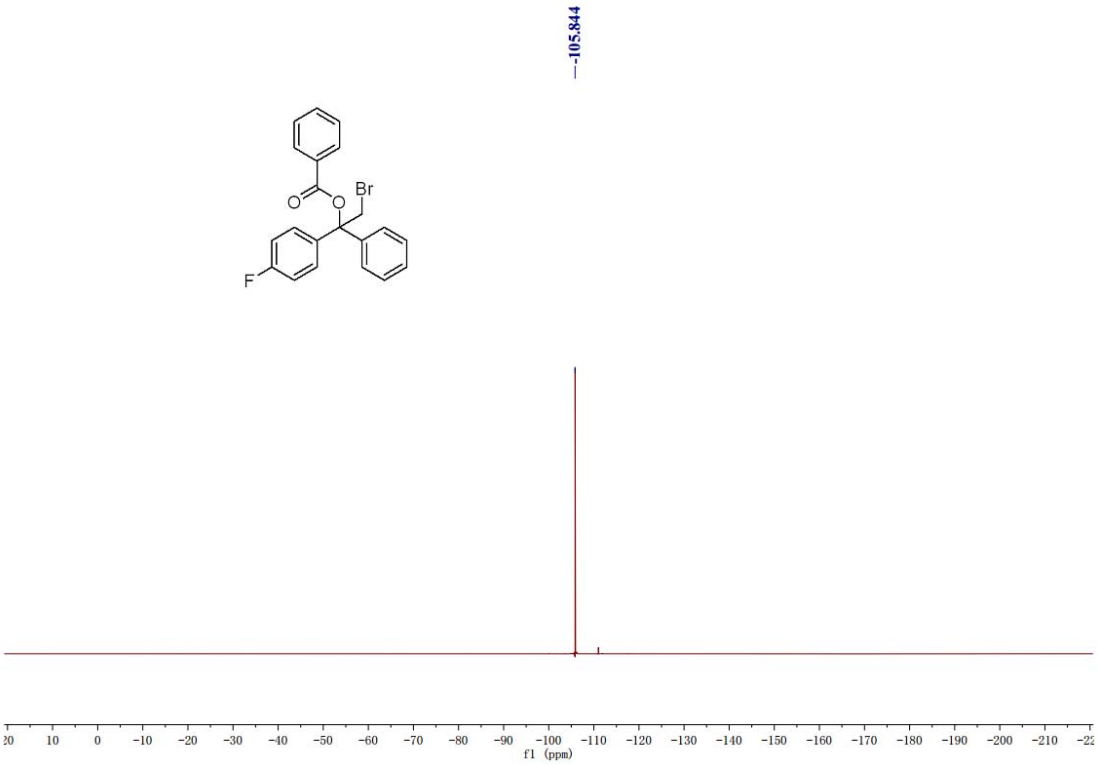




2-bromo-1-(4-fluorophenyl)-1-phenylethyl benzoate (4haa)



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Br
O
O
F
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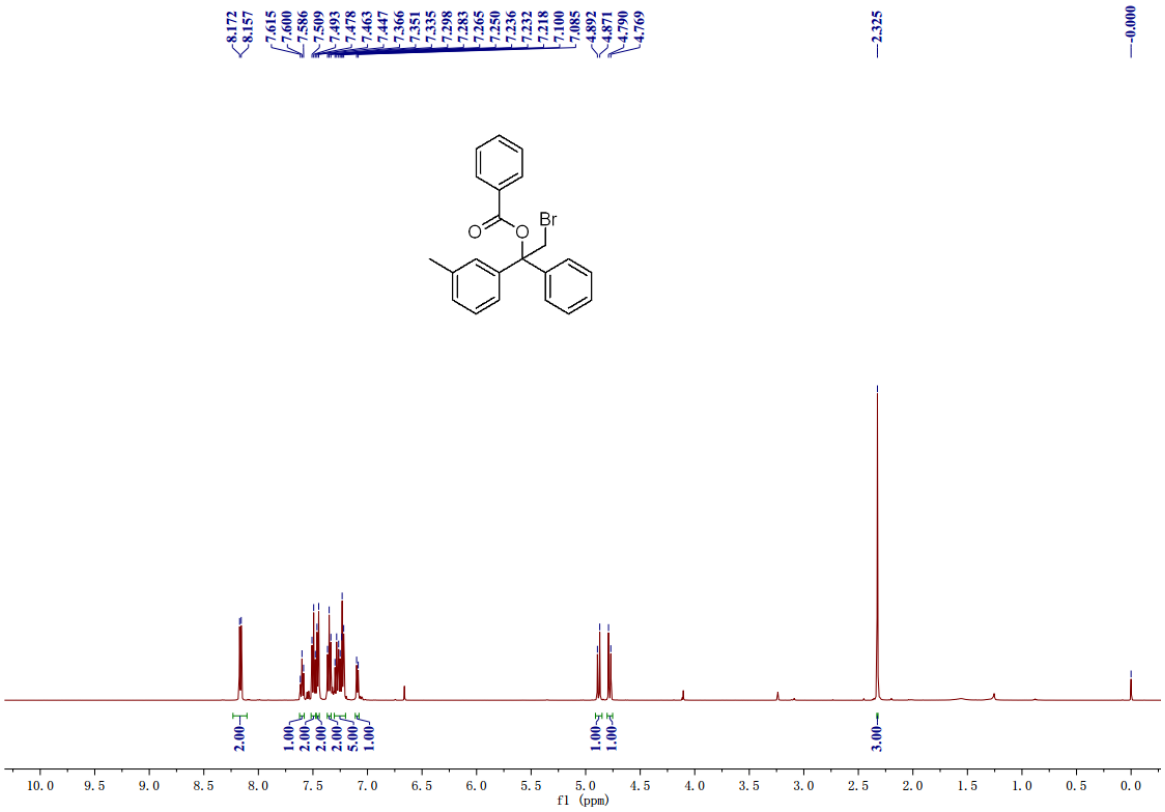
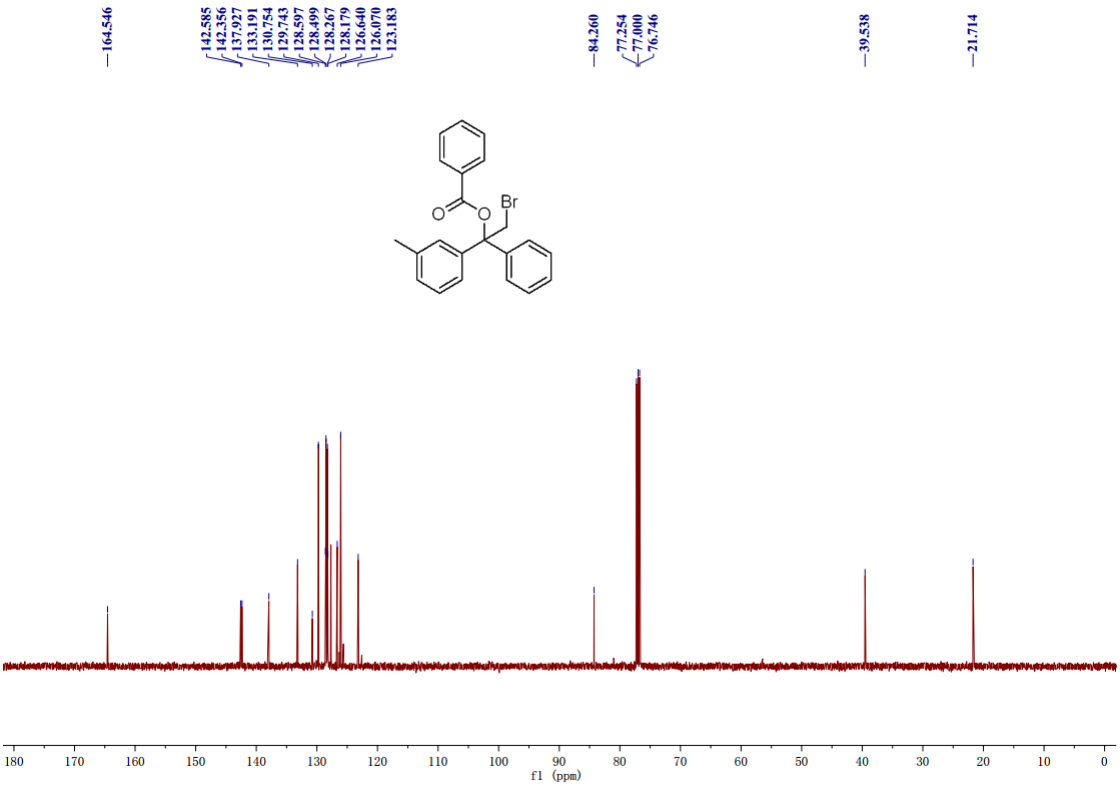
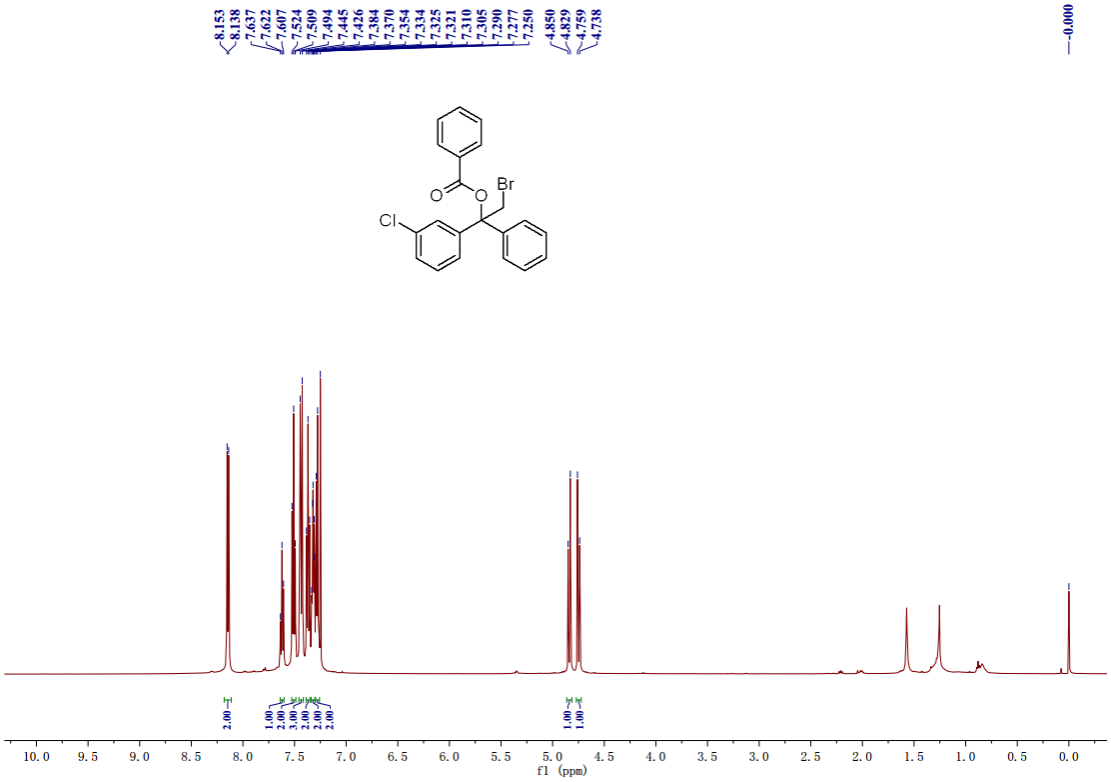
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

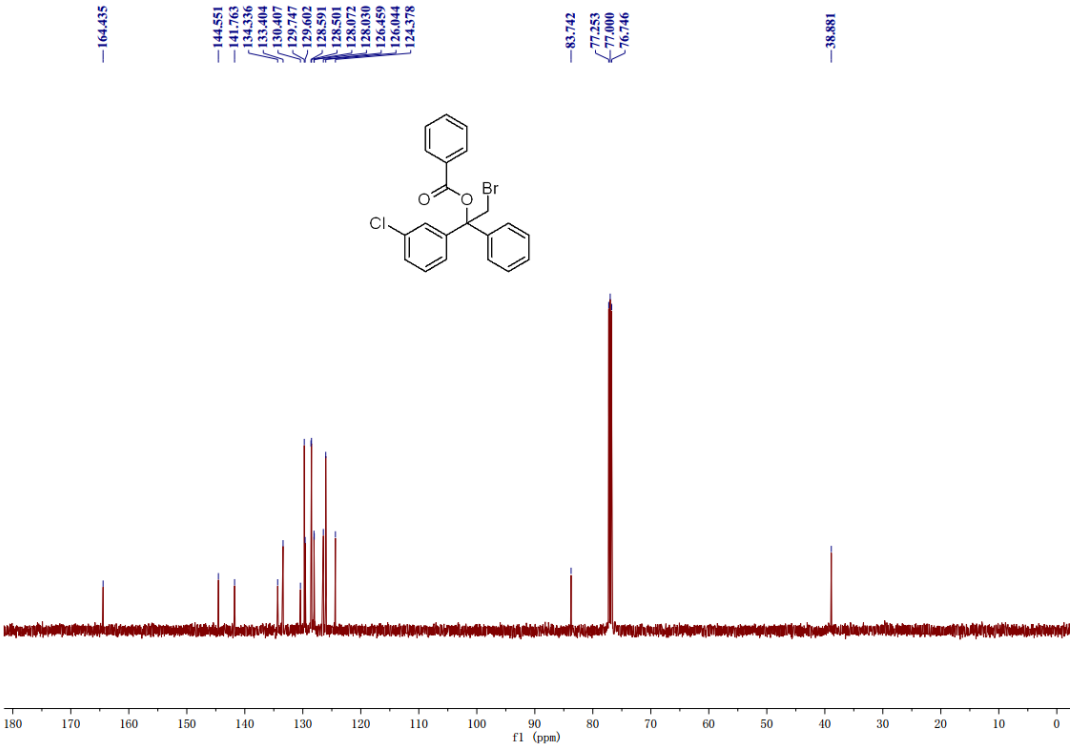
2-bromo-1-phenyl-1-(m-tolyl)ethyl benzoate (4iaa)



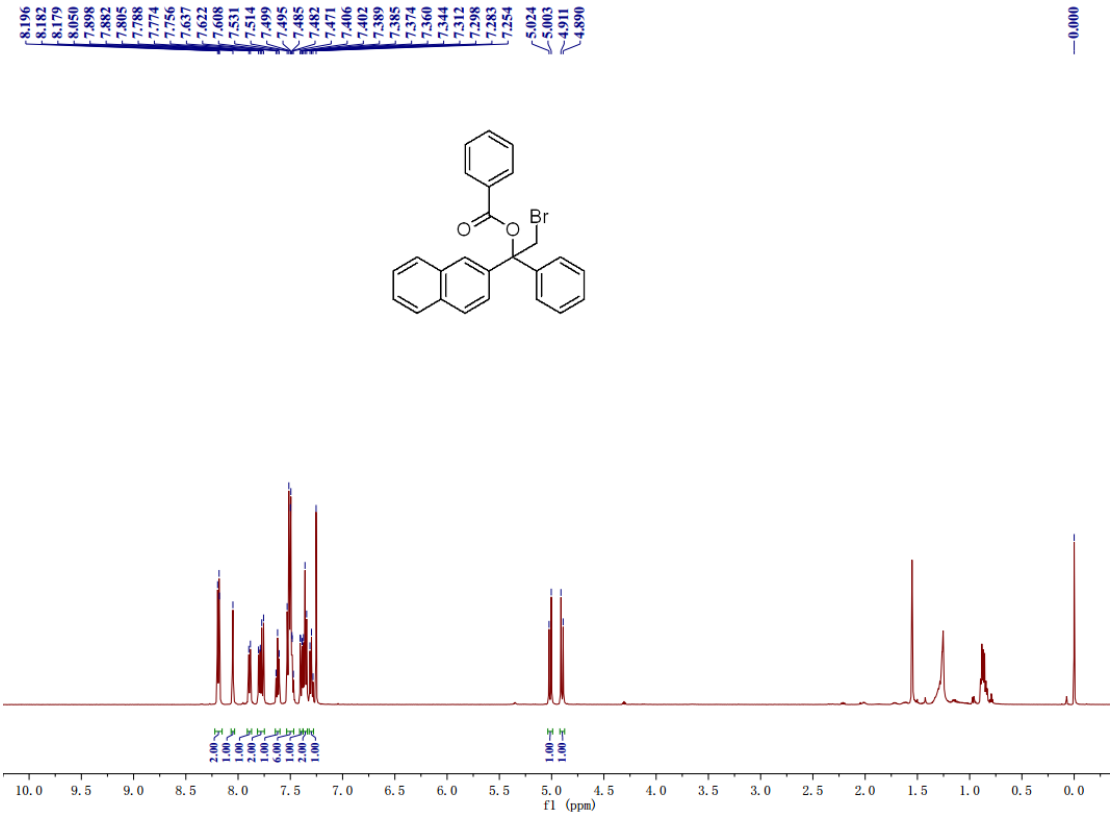


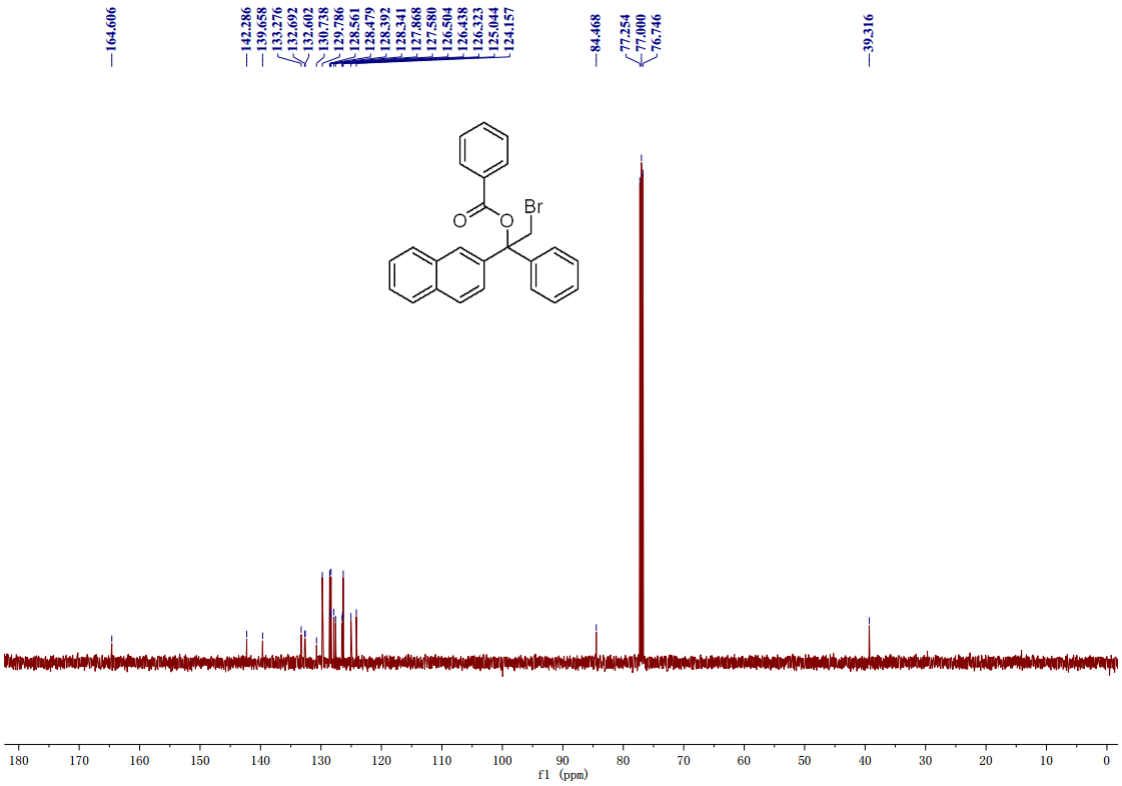
2-bromo-1-(3-chlorophenyl)-1-phenylethyl benzoate (4jaa)



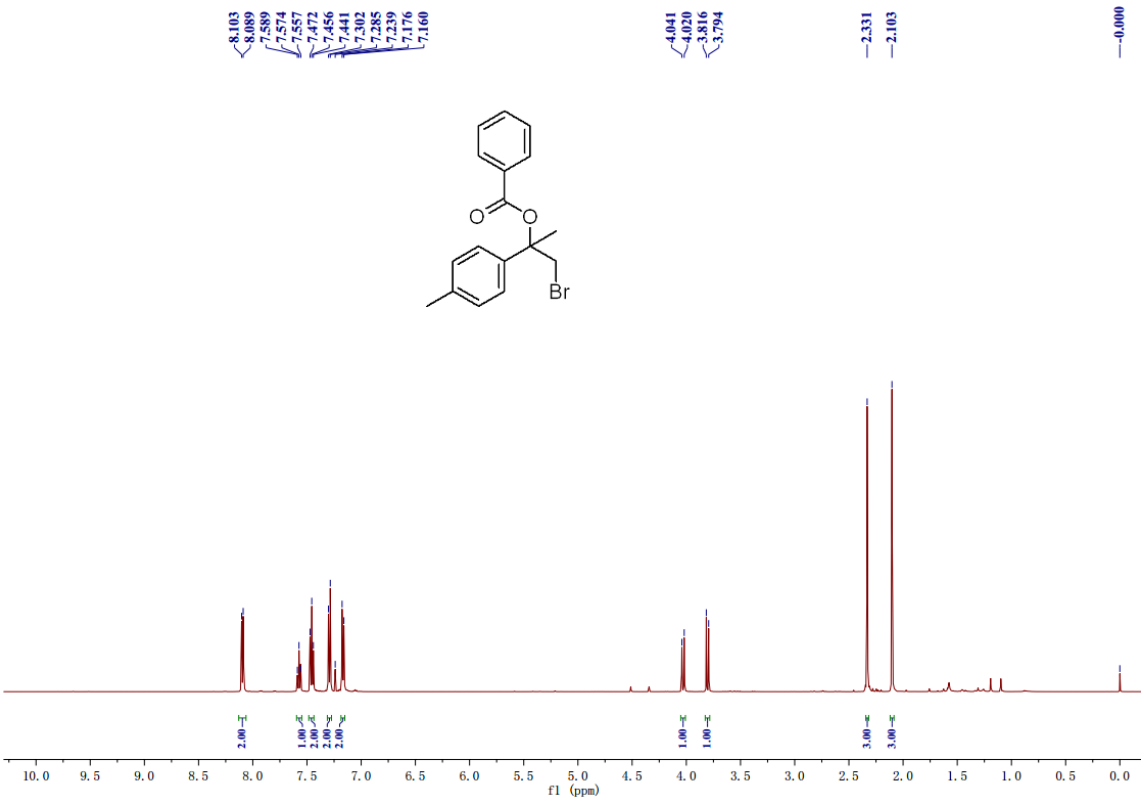


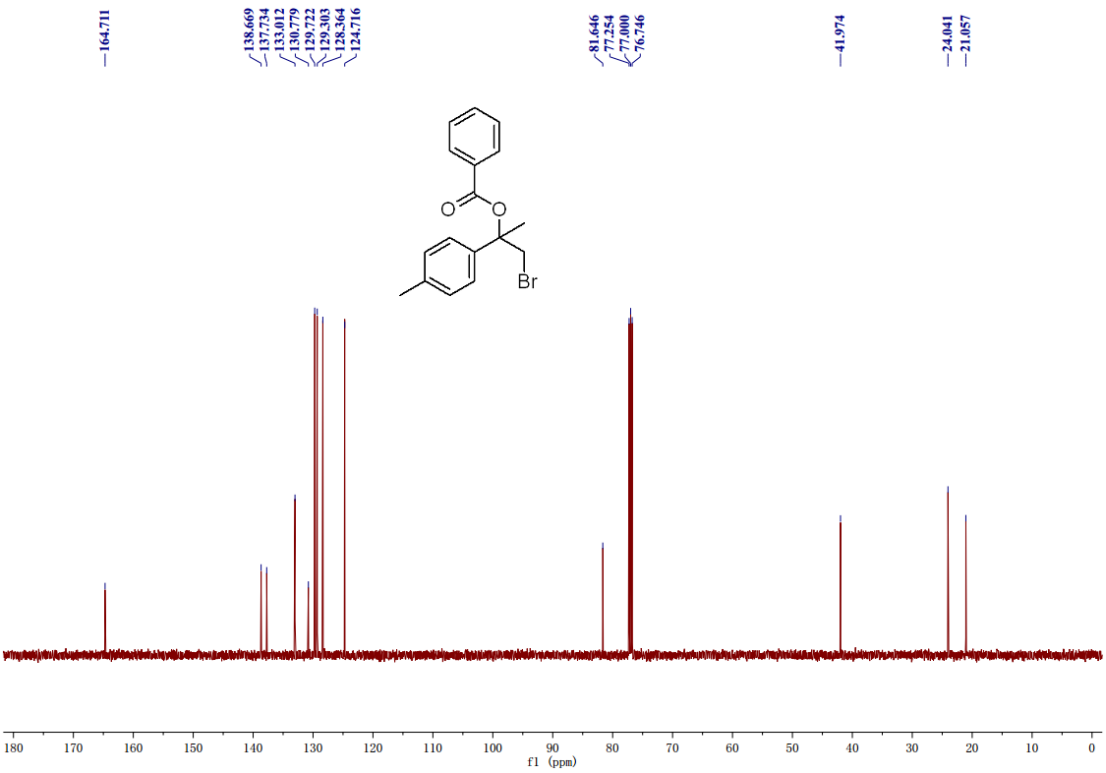
2-bromo-1-(naphthalen-2-yl)-1-phenylethyl benzoate (4kaa)



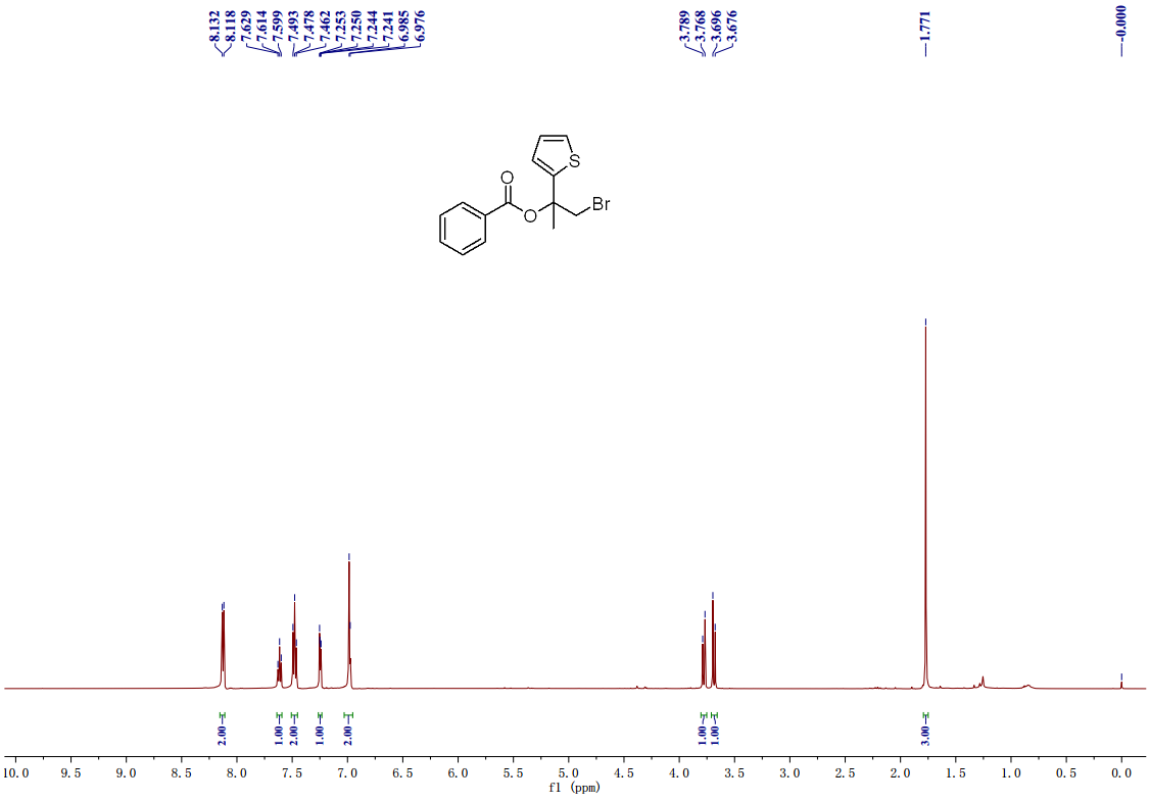


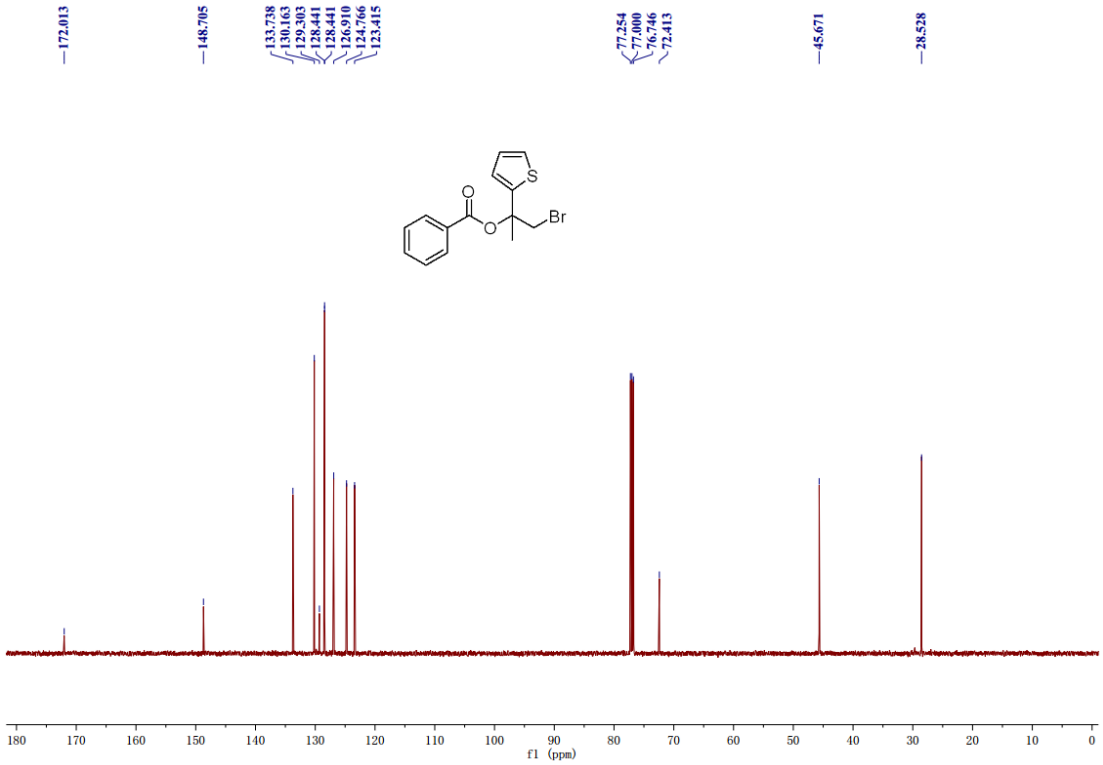
1-bromo-2-(p-tolyl)propan-2-yl benzoate (4laa)



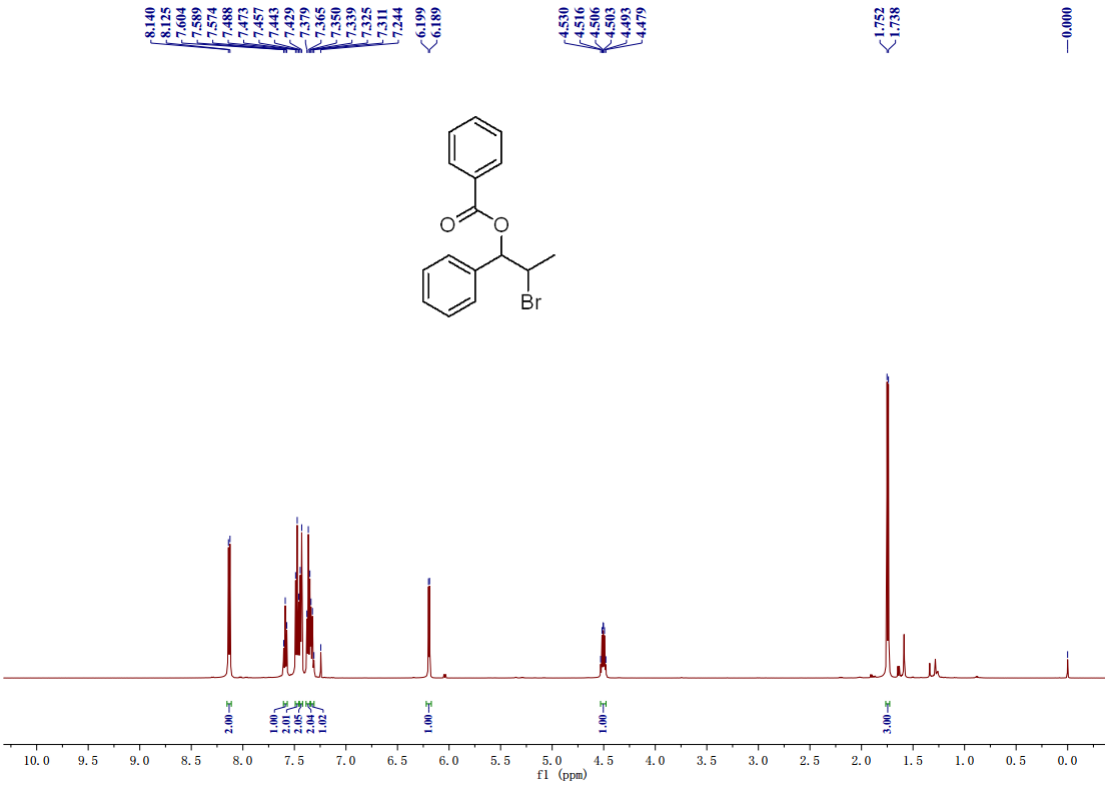


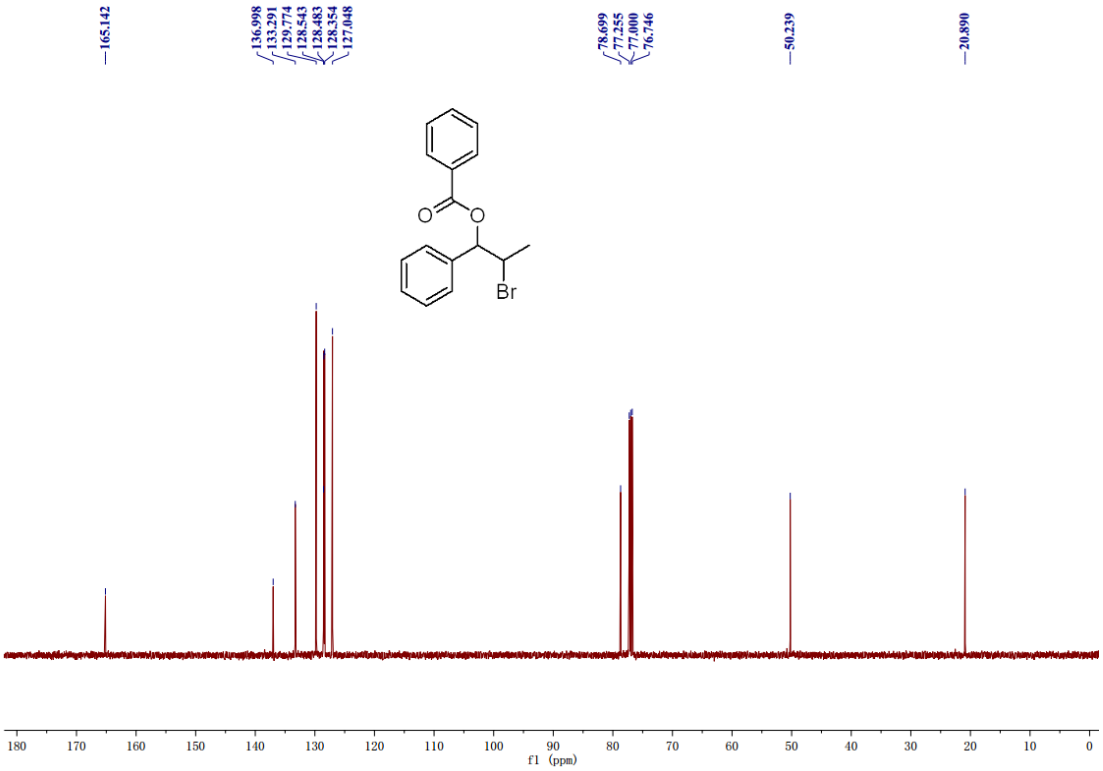
1-bromo-2-(thiophen-2-yl)propan-2-yl benzoate (4maa)



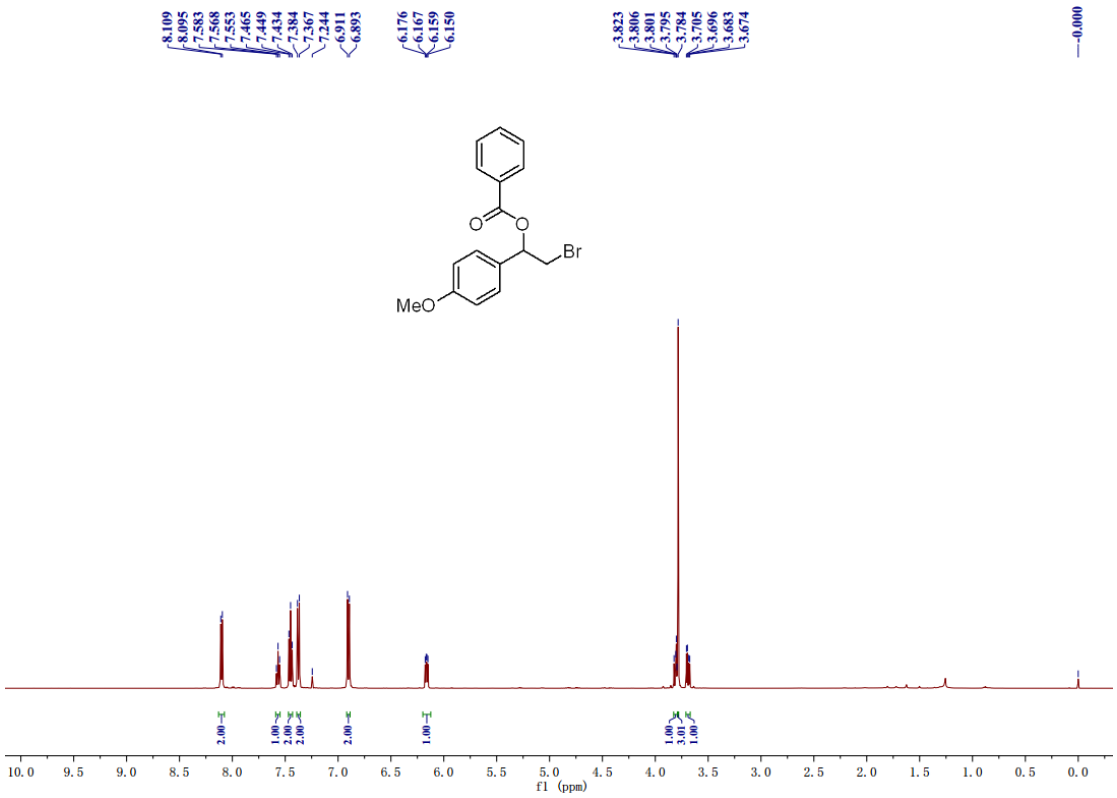


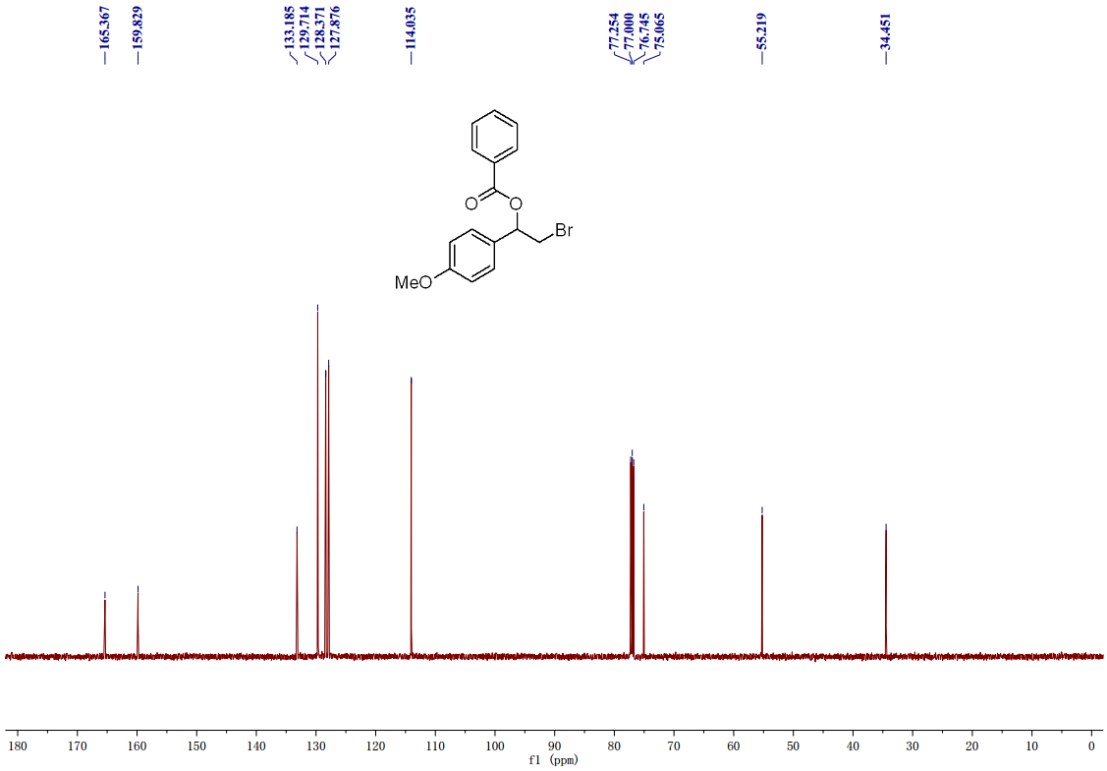
2-bromo-1-phenylpropyl benzoate (4naa)



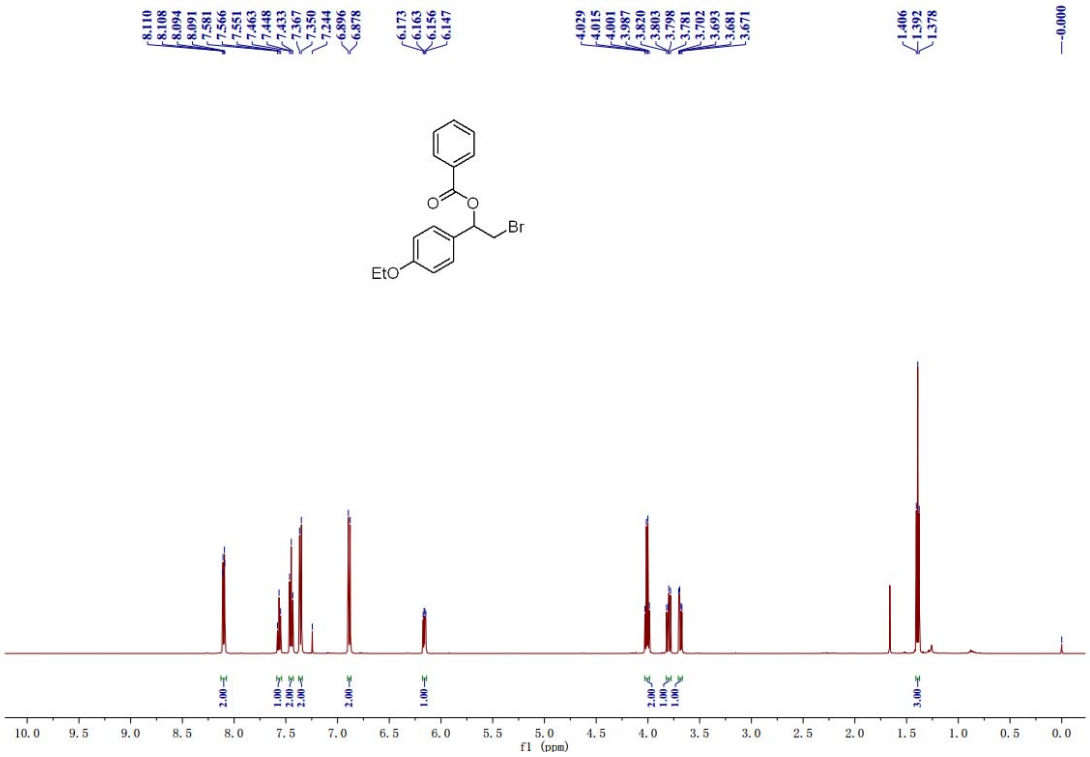


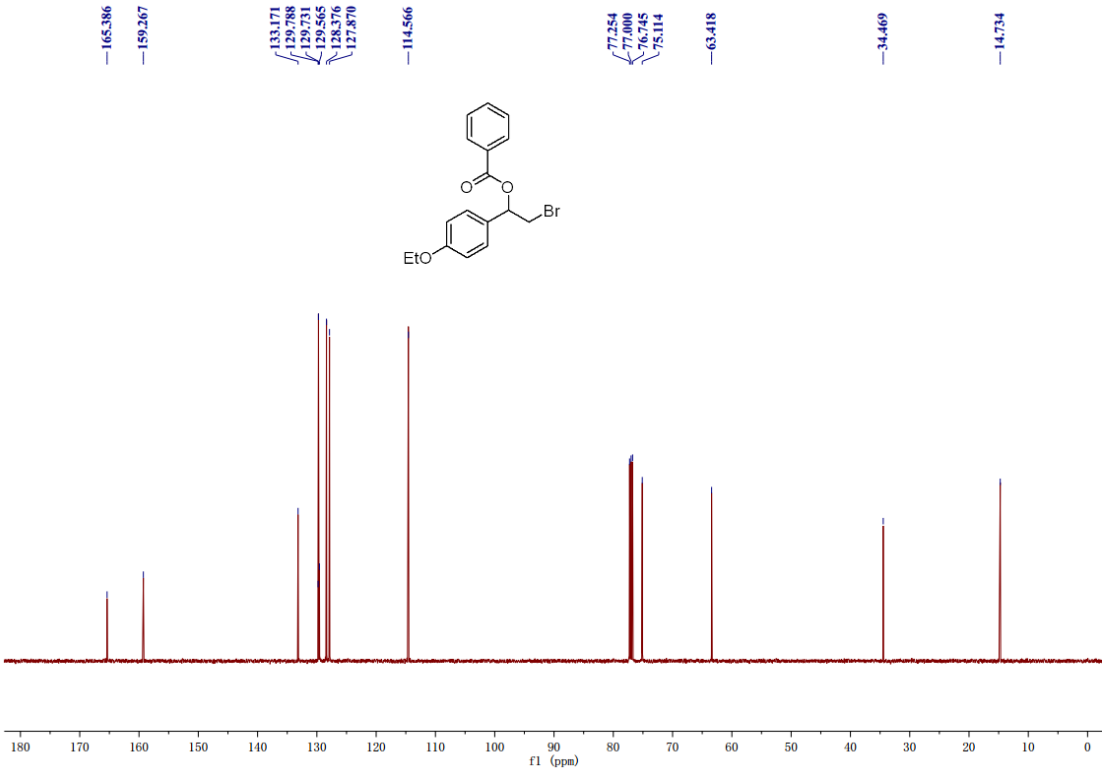
2-bromo-1-(4-methoxyphenyl)ethyl benzoate (4oaa)



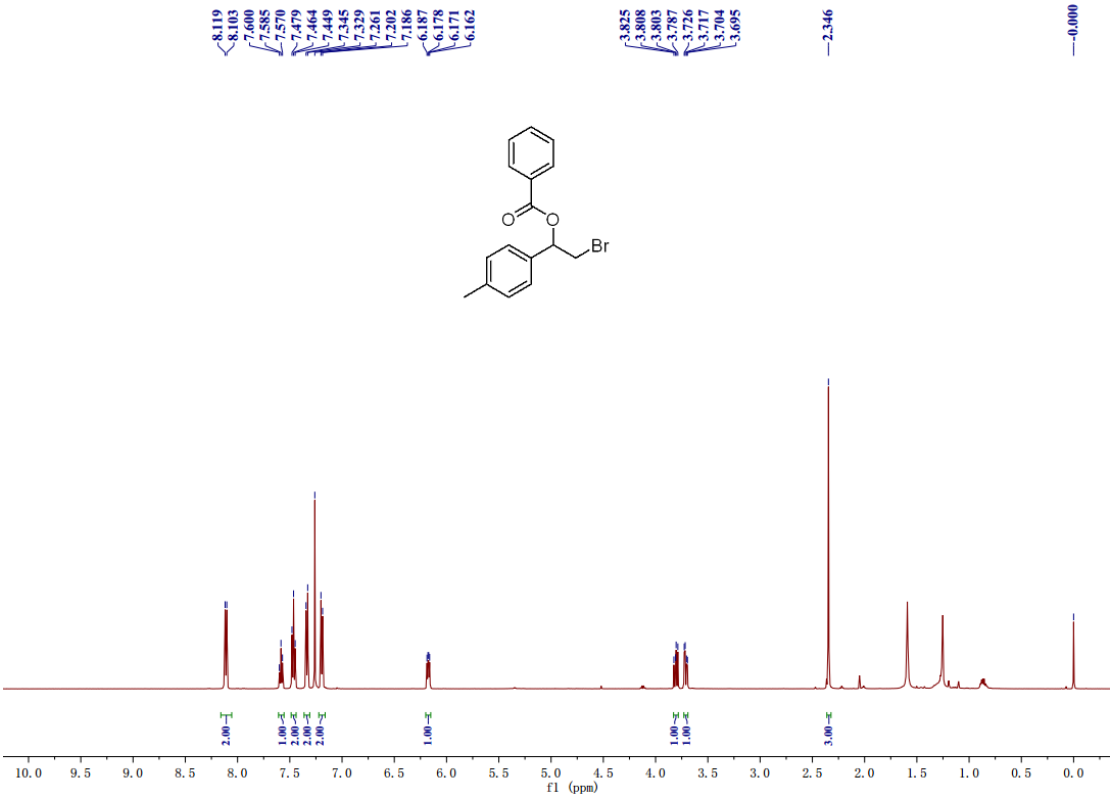


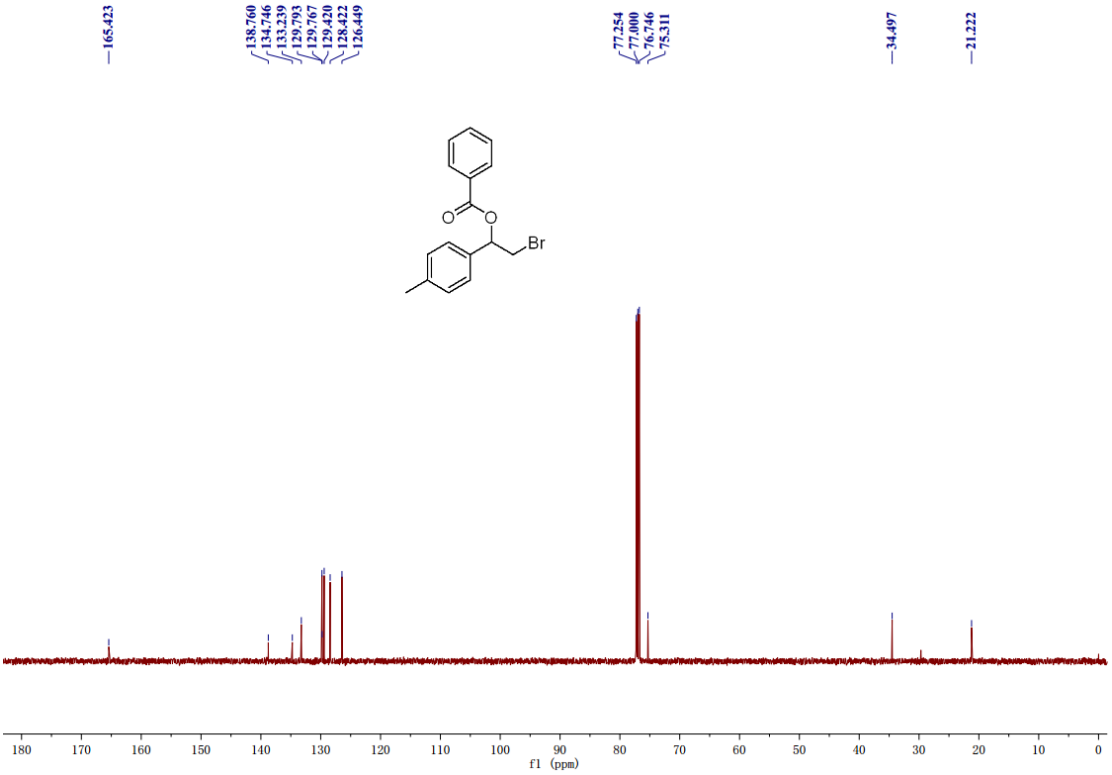
2-bromo-1-(4-ethoxyphenyl)ethyl benzoate (4paa)



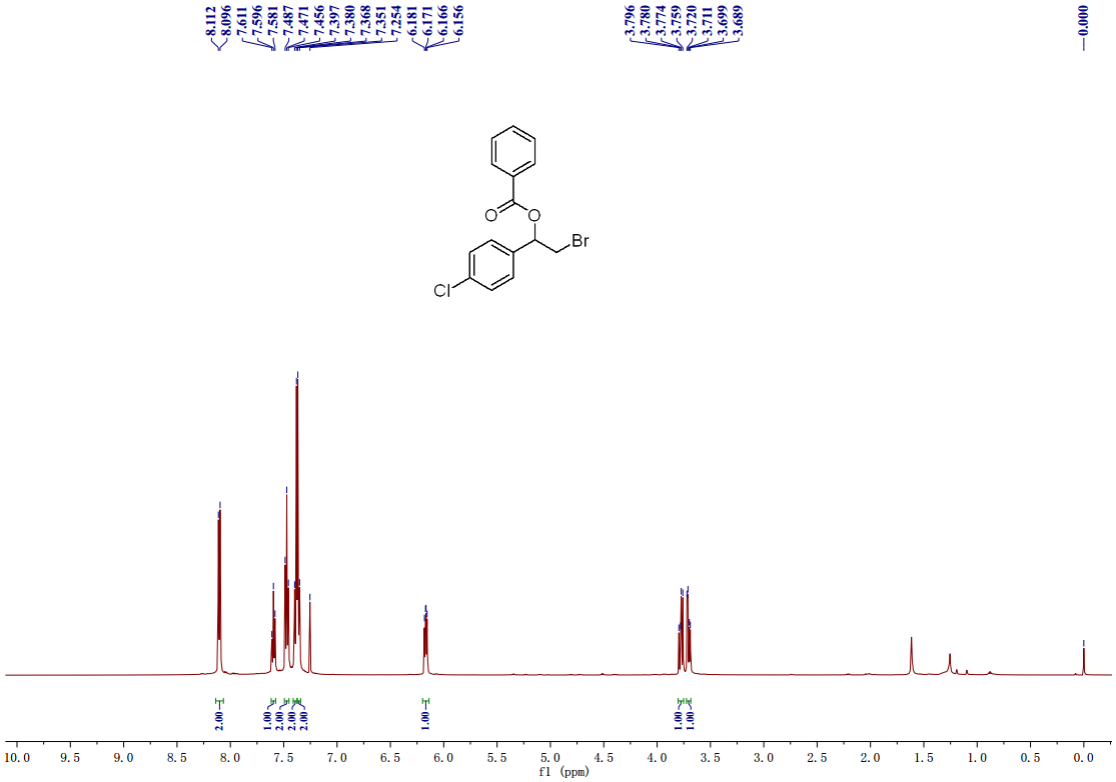


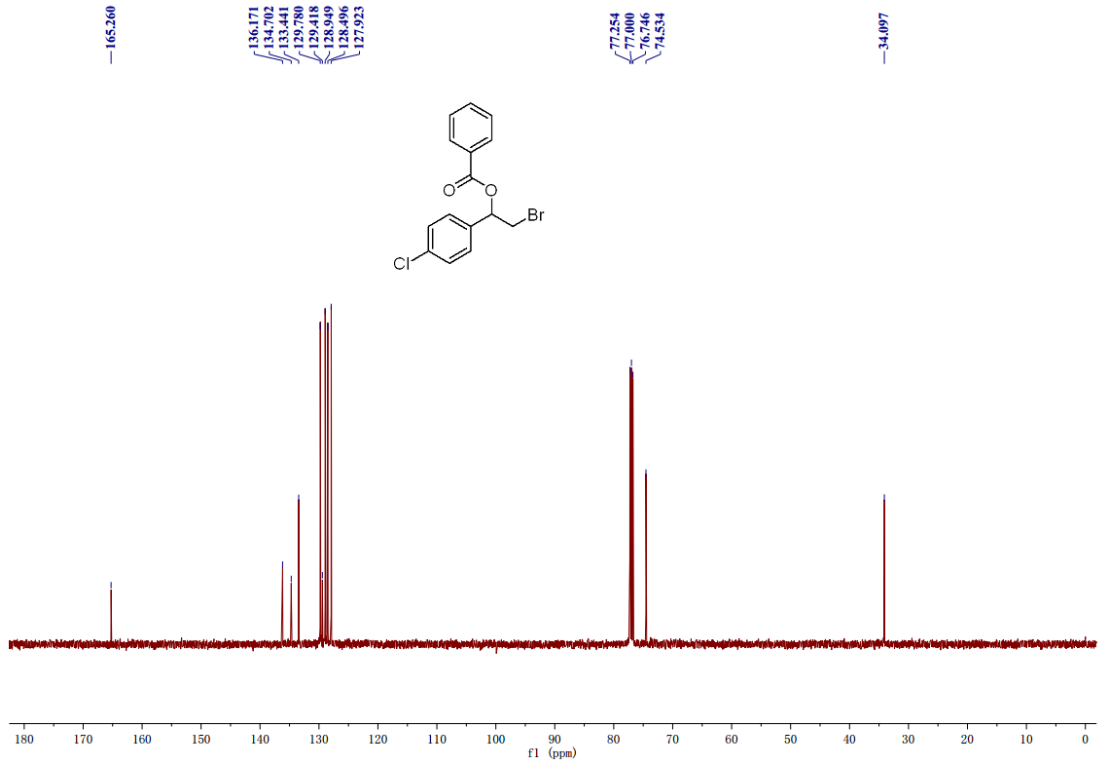
2-bromo-1-(p-tolyl)ethyl benzoate (4qaa)



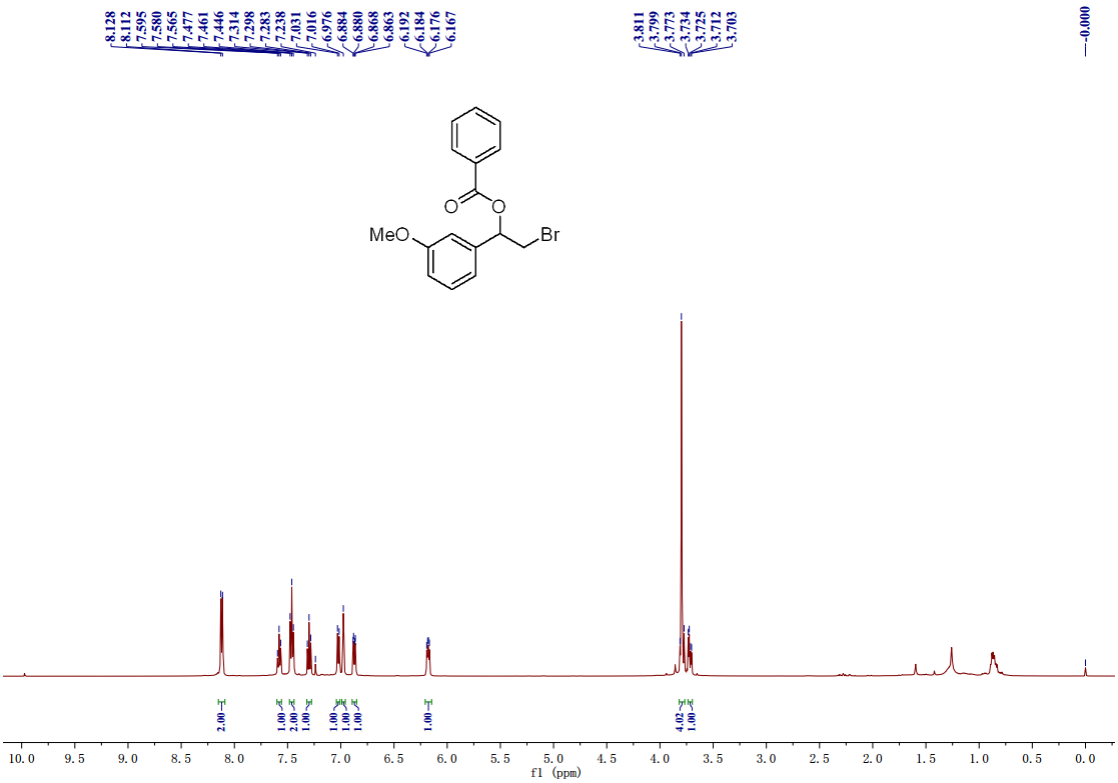


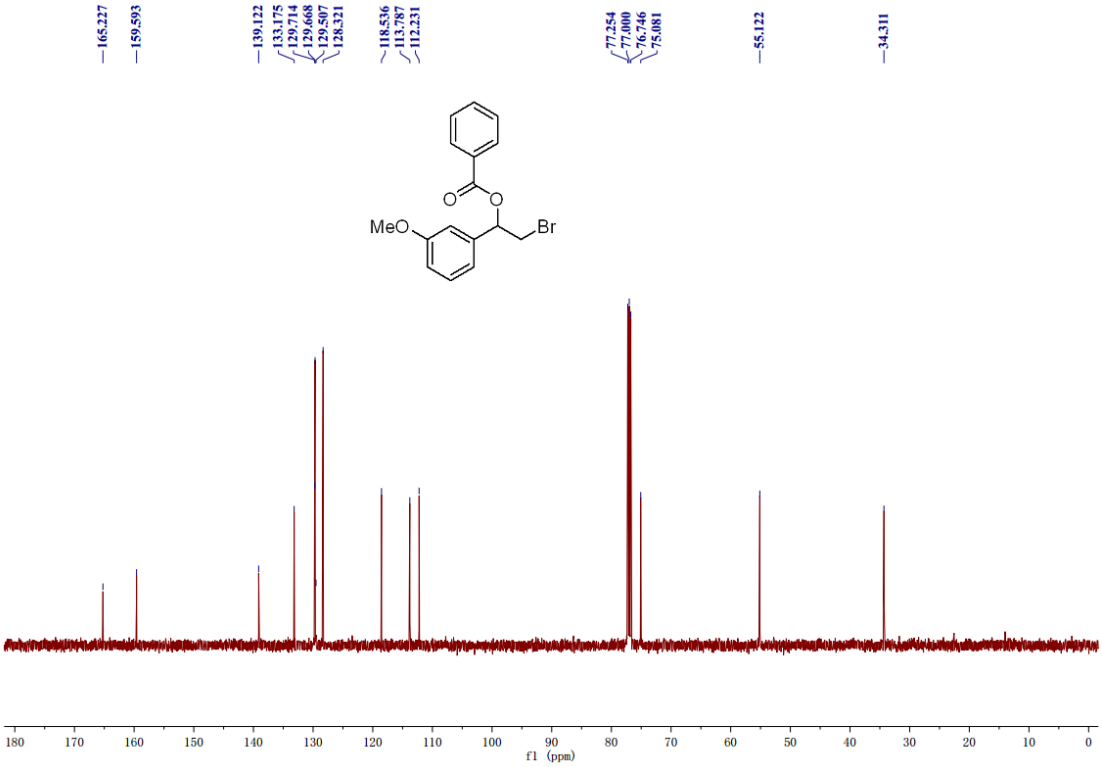
2-bromo-1-(4-chlorophenyl)ethyl benzoate (4raa)



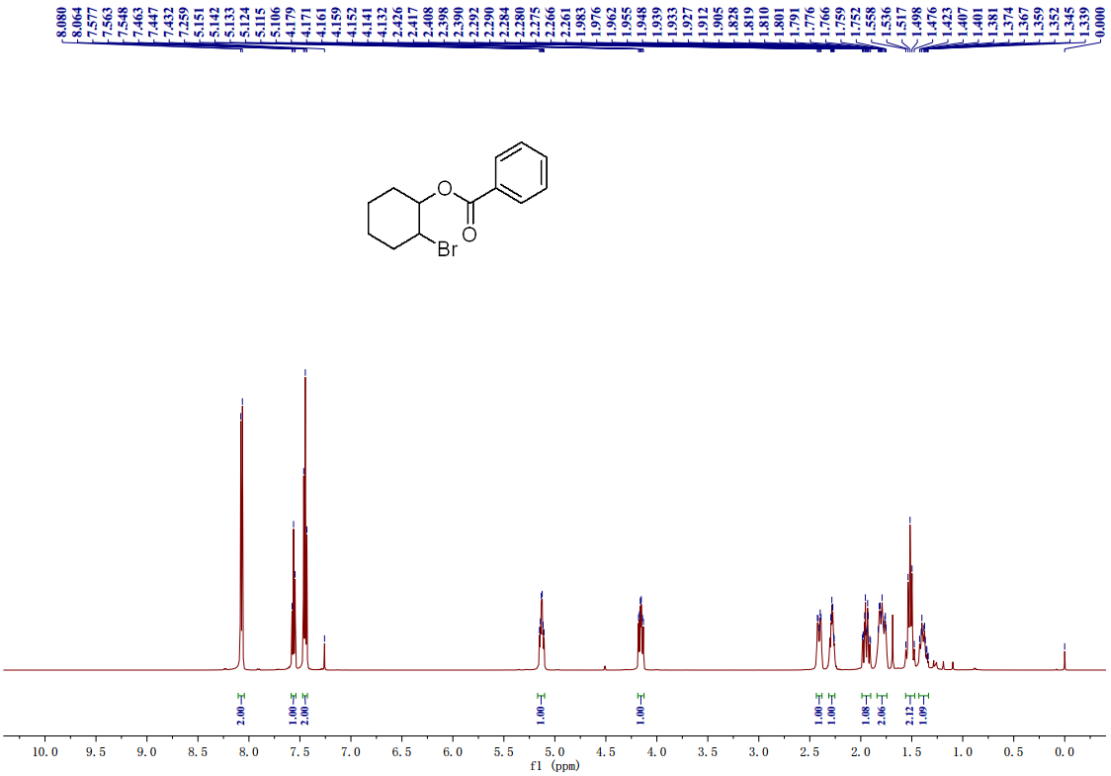


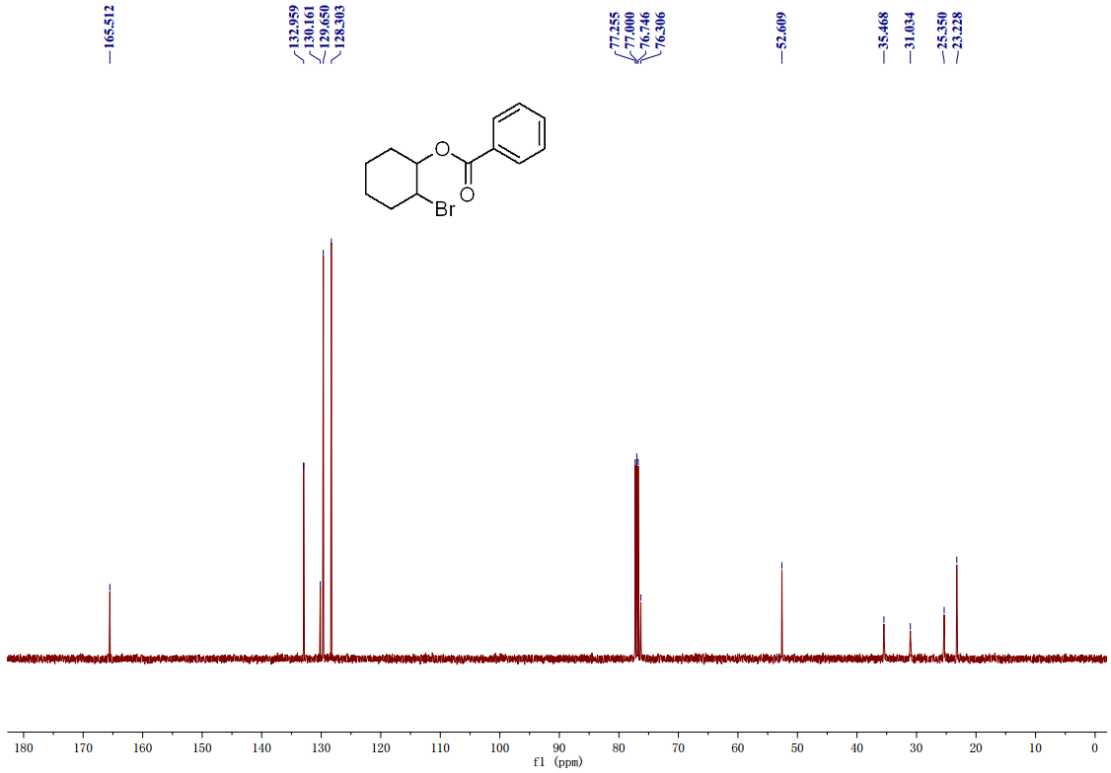
2-bromo-1-(3-methoxyphenyl)ethyl benzoate (4saa)



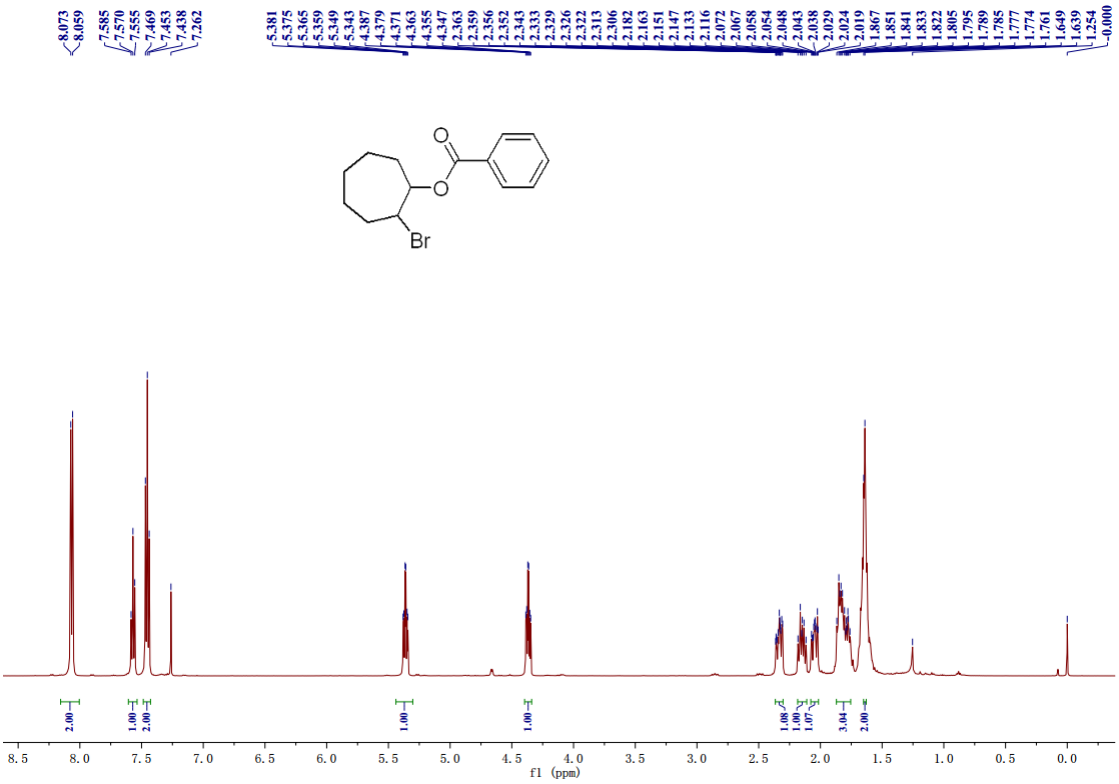


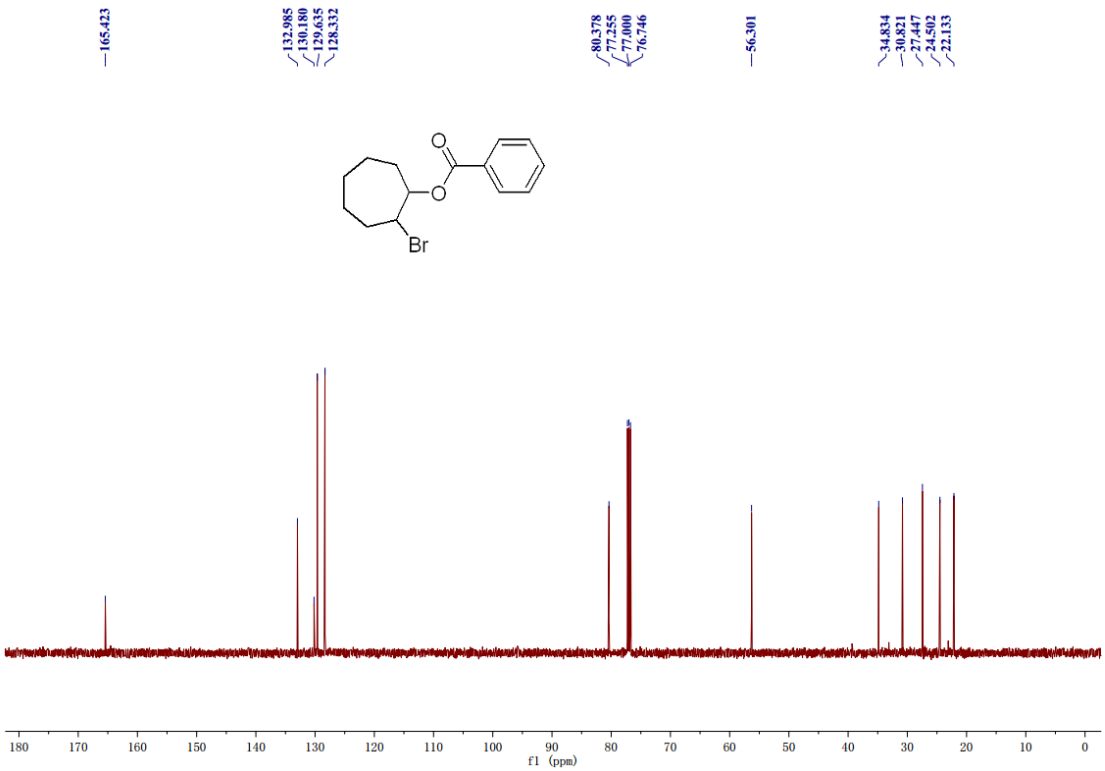
2-bromocyclohexyl benzoate (4taa)



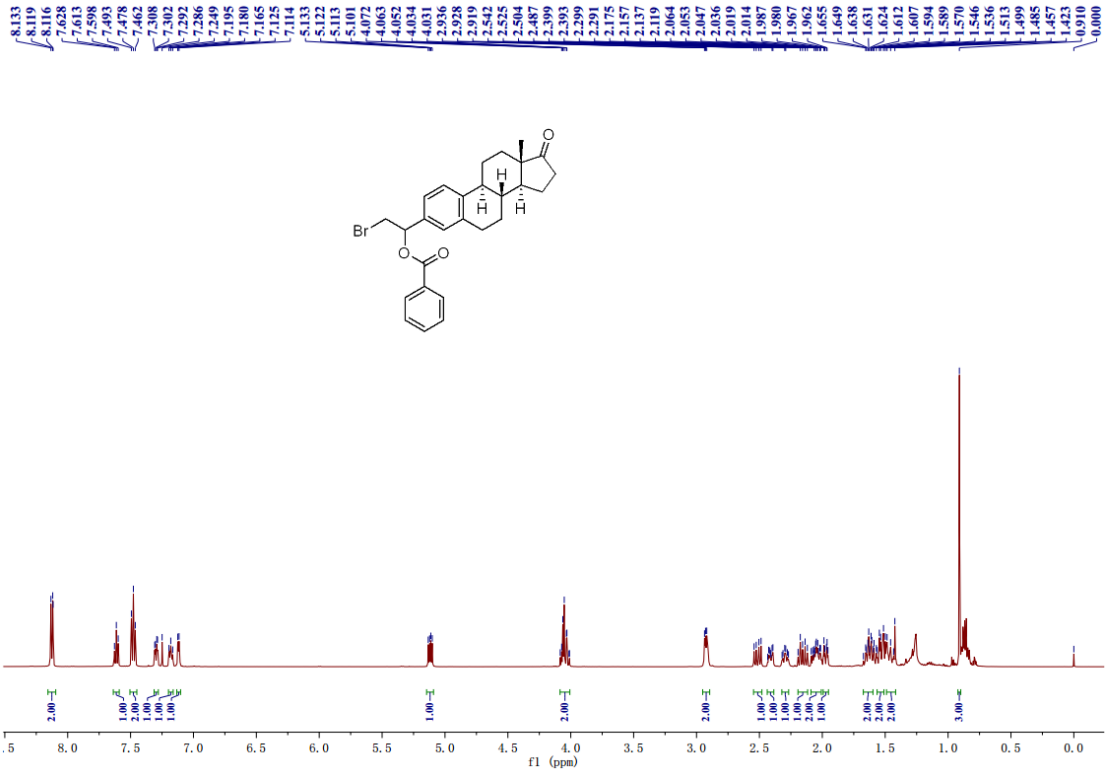


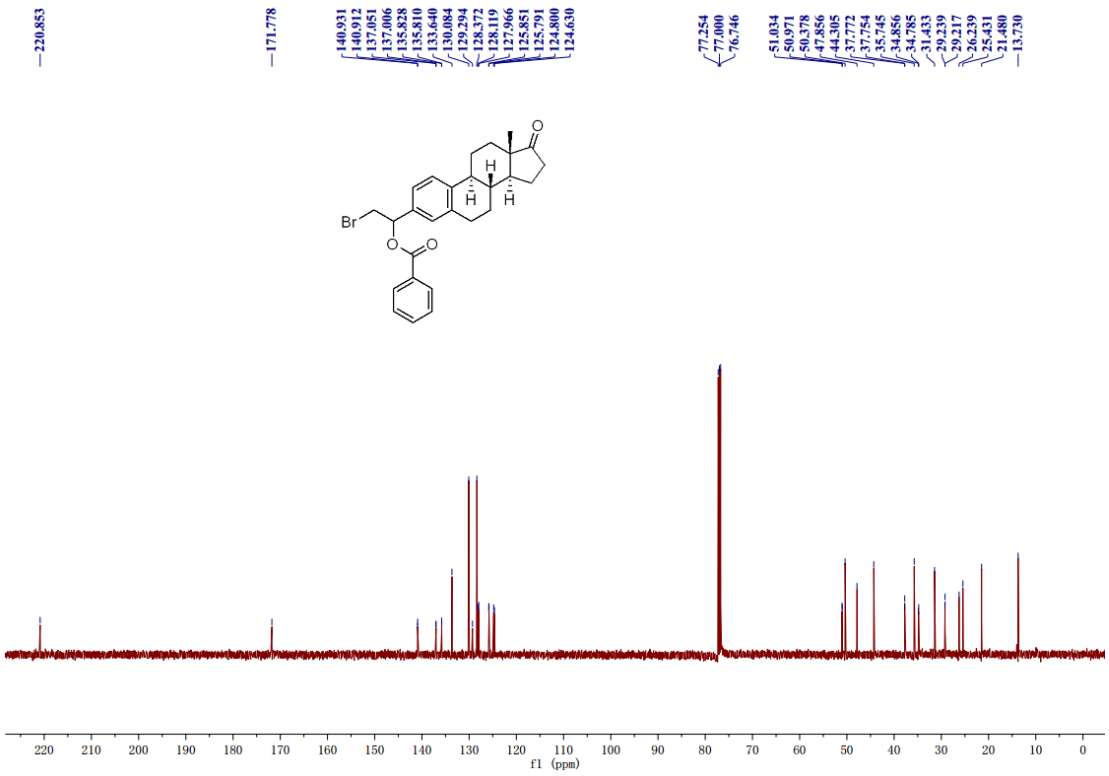
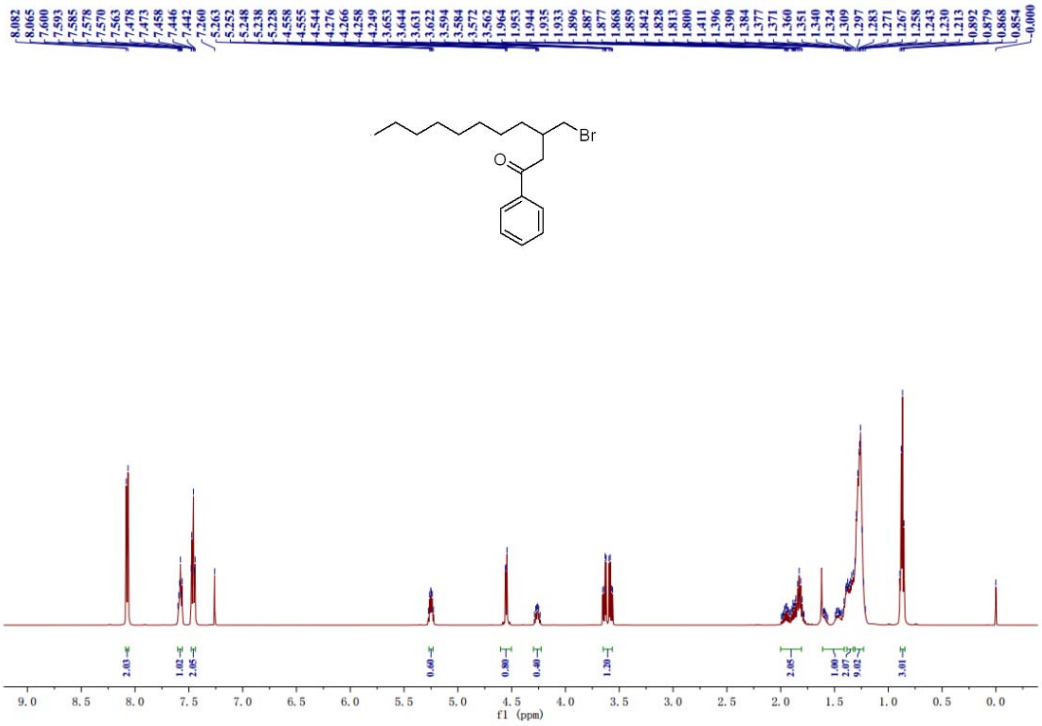
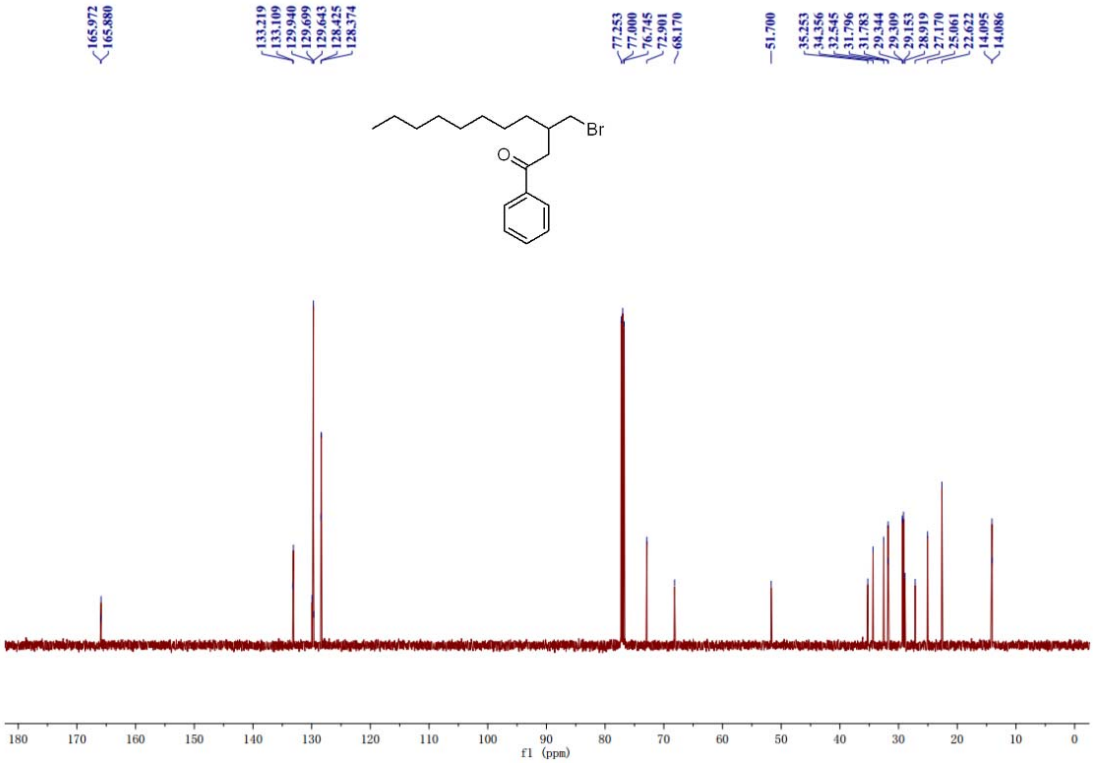
2-bromocycloheptyl benzoate (4uaa)





2-bromo-1-((8R,9S,13S,14S)-13-methyl-17-oxo-7,8,9,11,12,13,14,15,16,17-decahydro-6H-cyclopenta[a]phenanthren-3-yl)ethyl benzoate (4vaa)





1-bromodecan-2-yl benzoate (4waa)