Supporting Information

A Dual Role for Acetohydrazide in Pd-Catalyzed Controlled C(sp3)-H Acetoxylation of Aldehydes

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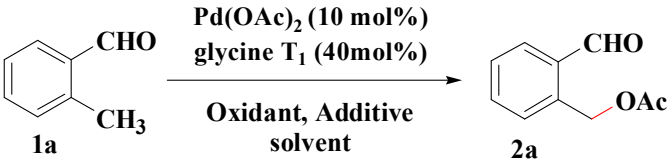
1. General Information

All the reagents were purchased from Aladdin and Alfa without further purification. The MCM-48 molecular sieve was purchased from NanJing Ji Cang Nano Technology Ltd. in China. Thin layer chromatography (TLC) was performed on pre-coated silica gel GF254 plates. The ^{1}H NMR and ^{13}C NMR spectra were measured on a 600 MHz Bruker Avance III nuclear magnetic resonance spectrometer, using $CDCl_3$ as the solvent with tetramethylsilane (TMS) as the internal standard. Chemical shifts (δ) are expressed in ppm. The structures of known compounds were further corroborated by comparing their ^{1}H NMR data with those of literature.

2. Screening reaction conditions

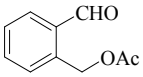
A mixture of *o*-methylbenzaldehyde **1a** (0.20 mmol), $Pd(OAc)_2$ (4.5 mg, 10 mol %), glycine (40 mol %), oxidant (0.40 mmol) and additive (0.40 mmol) in solvent (2.0 mL) were charged in a 25 mL oven dried reaction tube. The reaction mixture was heated and refluxed for 48 h at 110 °C. After cooling to room temperature, the mixture was filtered, and the filtrate was evaporated in vacuo. The residue was purified by flash column chromatography (silica gel, ethyl acetate/petroleum ether = 1:5 to 1:10 as an eluent) to a□ord the desired product **3a**.

Table S1. Screening reaction conditions

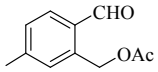


Entry	Oxidant	Additive	Solvent	Yield(%)
1	$PhI(OAc)_2$		CH_3CN	NP
2	$PhI(OAc)_2$		AcOH-Ac_2O	NP
3	$PhI(OAc)_2$		AcOH	NP
4	$PhI(OAc)_2$	LiOAc	DCE	NP
	$PhI(OAc)_2$	Ac_2O	toluene	NP
5	$PhI(OAc)_2$		C_6H_6-Ac_2O	NP
6	Oxone		AcOH	NP
7	Oxone		AcOH-Ac_2O	NP
8	MeCOOO^{t}Bu		Ac_2O	NP
9	MeCOOO^{t}Bu		Ac_2O-HFIP	NP
10	BQ		AcOH	NP
11	CH_3CO_3H		Ac_2O	NP
12	$K_2S_2O_8$		AcOH	35
13	Ag_2O		AcOH	NP
14	Ag_2CO_3		AcOH	NP
15	AgOAc		AcOH	NP
16	$Cu(OAc)_2$		AcOH	NP

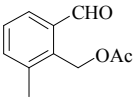
3. Characterization Data for the Products



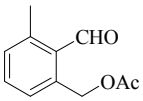
2-formylbenzyl acetate **2a**.[1] Yield: 73% (25.9 mg); ^{1}H NMR (600 MHz, Chloroform-*d*)δ 10.20 (s, 1H), 7.93-7.85 (m, 1H), 7.66-7.59 (m, 1H), 7.58-7.47 (m, 2H), 5.56 (s, 2H), 2.15 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 192.4, 170.6, 137.9, 133.9, 133.6, 133.3, 128.6, 128.4, 63.5, 20.9; MS (EI) m/z (%) 178.4(M^+, 2), 135.0(88), 118.0(100), 90.0(97), 65.0(28).



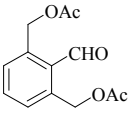
2-formyl-5-methylbenzyl acetate **2b.** Yield: 67% (25.7 mg); ^{1}H NMR (600 MHz, $CDCl_3$) δ 10.13 (s, 1H), 7.77 (d, *J* = 8.2 Hz, 1H), 7.38 – 7.30 (m, 2H), 5.52 (s, 2H), 2.45 (s, 3H), 2.15 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 192.0, 170.6, 145.1, 137.8, 133.6, 131.4, 129.5, 129.1, 63.6, 21.9, 21.0.



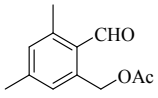
2-formyl-6-methylbenzyl acetate. **2c.** Yield: 63% (24.2 mg); ^{1}H NMR (600 MHz, $CDCl_3$) δ 10.31 (s, 1H), 7.74 (d, *J* = 7.3 Hz, 1H), 7.54 – 7.36 (m, 2H), 5.55 (s, 2H), 2.47 (s, 3H), 2.06 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 192.20, 170.77, 139.45, 136.03, 135.31, 134.85, 129.55, 129.06, 58.73, 20.81, 19.20.



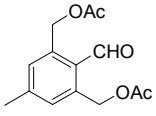
2-formyl-3-methylbenzyl acetate. **2d.** Yield: 37% (14.2 mg); ^{1}H NMR (600 MHz, Chloroform-*d*) δ 10.59 (s, 1H), 7.51-7.41 (m, 1H), 7.36 (s, 1H), 7.25-7.17 (m, 1H), 5.47 (s, 2H), 2.67 (s, 3H), 2.13 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 192.8, 170.6, 141.8, 138.4, 133.3, 131.8, 126.7, 64.3, 29.7, 21.0, 20.1.



(2-formyl-1,3-phenylene)bis(methylene) diacetate **2d'.** Yield: 24% (12.0 mg); ^{1}H NMR (600 MHz, $CDCl_3$) δ 10.53 (s, 1H), 7.61 – 7.56 (m, 1H), 7.54 – 7.48 (m, 2H), 5.48 (s, 4H), 2.13 (s, 6H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 191.9, 170.5, 138.9, 133.4, 131.7, 129.3, 63.8, 20.9.

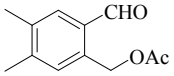


2-formyl-3,5-dimethylbenzyl acetate **2e**. Yield: 37% (15.2 mg); ^{1}H NMR (600 MHz, $CDCl_3$) δ 10.53 (s, 1H), 7.14 (s, 1H), 7.05 (s, 1H), 5.45 (s, 2H), 2.63 (s, 3H), 2.38 (s, 3H), 2.13 (s, 3H). ^{13}C NMR (150 MHz, $CDCl_3$) δ 192.2, 170.6, 144.3, 142.1, 138.5, 132.5, 129.3, 127.6, 64.4, 21.7, 21.0, 20.1.

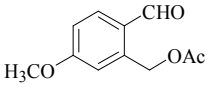


(2-formyl-5-methyl-1,3-phenylene)bis(methylene) diacetate **2e'.** Yield: 21% (11.1 mg); ^{1}H NMR (600 MHz, $CDCl_3$) δ 10.47 (s, 1H), 7.30 (s, 2H), 5.46 (s, 4H), 2.44 (s, 3H), 2.14 (s, 6H); ^{13}C NMR (151

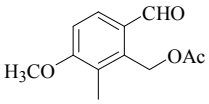
MHz, $CDCl_3$) δ 191.4, 170.5(2C), 144.6, 139.1(2C), 130.1(2C), 129.2, 63.9(2C), 21.9, 21.0(2C).



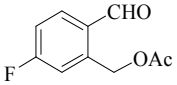
2-formyl-4,5-dimethylbenzyl acetate **2f.** Yield: 64% (26.4 mg); ^{1}H NMR (600 MHz, $CDCl_3$) δ 10.13 (s, 1H), 7.63 (s, 1H), 5.48 (s, 2H), 2.35 (s, 3H), 2.34 (s, 3H), 2.12 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 192.1, 170.7, 143.7, 137.2, 135.1, 134.3, 131.7, 130.7, 63.3, 21.0, 20.2, 19.9.



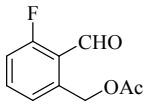
2-formyl-5-methoxybenzyl acetate **2g**.[2] Yield: 49% (20.4 mg); ^{1}H NMR (600 MHz, $CDCl_3$) δ 10.02 (s, 1H), 7.83 (d, *J* = 8.5 Hz, 1H), 7.03 (d, *J* = 2.2 Hz, 1H), 6.97 (dd, *J* = 8.5, 2.5 Hz, 1H), 5.55 (s, 2H), 3.91 (s, 3H), 2.17 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 191.0, 170.5, 164.0, 140.5, 136.4, 127.0, 114.5, 112.4, 63.5, 55.6, 20.9.



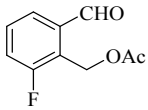
6-formyl-3-methoxy-2-methylbenzyl acetate **2h**. Yield: 52% (23.0 mg); ^{1}H NMR (600 MHz, Chloroform-*d*)δ 10.13 (s, 1H), 7.76 (d, *J* = 8.6 Hz, 1H), 6.98 (d, *J* = 8.6 Hz, 1H), 5.58 (s, 2H), 3.92 (s, 3H), 2.28 (s, 3H), 2.06 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 191.1, 170.8, 162.1, 136.3, 132.6, 128.5, 128.3, 109.9, 77.3, 77.0, 76.82, 58.8, 55.8, 20.8, 11.2.



5-fluoro-2-formylbenzyl acetate **2i**.[1] Yield: 67% (26.3 mg); ^{1}H NMR (600 MHz, Chloroform-*d*) δ 10.11 (s, 1H), 7.95-7.84 (m, 1H), 7.27-7.23 (m, 1H), 7.21-7.17 (m, 1H), 5.57 (s, 2H), 2.19 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 190.9, 170.3, 166.0(d, *J* = 257.3 Hz, 1C), 141.82 (d, *J* = 9.0 Hz, 1H), 136.47 (d, *J* = 10.0 Hz, 3H), 129.84 (d, *J* = 2.8 Hz, 1H), 115.4 (d, *J* = 23.8 Hz, 1C), 115.1 (d, *J* = 21.9 Hz, 1C), 63.0, 20.9; MS (EI) m/z (%) 153.0(M-Ac, 55), 135.9(100), 108.0(91), 77.0(31); Anal. Calcd. For $C_{10}H_9FO_3$: C, 61.22; H, 4.62; F, 9.68%. Found: C, 61.24; H, 4.60; F, 9.61%.

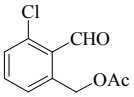


3-fluoro-2-formylbenzyl acetate **2j**.[3] Yield: 66% (26.0 mg);^{1}H NMR (600 MHz, $CDCl_3$) δ 10.52 (s, 1H), 7.63-7.55 (m, 1H), 7.32 (d, *J* = 7.8 Hz, 1H), 7.21-7.07 (m, 1H), 5.52 (s, 2H), 2.17 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 188.53 (d, *J* = 11.0 Hz, 1C), 170.45, 166.17 (d, *J* = 258.3 Hz, 1C), 140.08, 135.69 (d, *J* = 10.4 Hz, 1C), 123.19 (d, *J* = 3.4 Hz, 1C), 121.43 (d, *J* = 6.4 Hz, 1C), 115.74 (d, *J* = 21.6 Hz, 1C), 63.71, 63.69, 20.89; MS (EI) m/z (%) 153.0(M-Ac, 86), 136.0(100), 108.0(93), 95.0(45), 75.0(55); Anal. Calcd. For $C_{10}H_9FO_3$: C, 61.22; H, 4.62; F, 9.68%. Found: C, 61.21; H, 4.64; F, 9.67%.

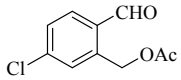


2-fluoro-6-formylbenzyl acetate **2k** Yield: 51% (20.0 mg); ^{1}H NMR (600 MHz, $CDCl_3$) δ 10.27 (s, 1H), 7.72 (d, *J* = 7.6 Hz, 1H), 7.56 – 7.51 (m, 1H), 7.39 – 7.32 (m, 1H), 5.54 (d, *J* = 1.1 Hz, 2H), 2.07 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 190.64 (d, *J* = 2.4 Hz, 1C), 170.5, 161.57 (d, *J* = 251.4 Hz, 1C), 136.38 (d, *J* = 2.4 Hz, 1C), 130.73 (d, *J* = 8.8 Hz, 1C), 127.31 (d, *J* = 3.2 Hz, 1C), 123.80 (d, *J* = 14.8

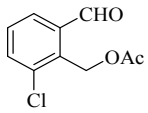
Hz, 1C), 121.14 (d, *J* = 23.4 Hz, 1C), 55.07 (d, *J* = 6.1 Hz, 1C), 20.8; MS (EI) m/z (%)153.0(M-Ac, 53), 136.0(100), 108.0(88), 83.0(31), 71.0(36); Anal. Calcd. For $C_{10}H_9FO_3$: C, 61.22; H, 4.62; F, 9.68%. Found: C, 61.20; H, 4.65; F, 9.70%.



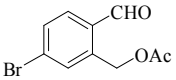
3-chloro-2-formylbenzyl acetate **2l**. Yield: 53% (22.5 mg); ^{1}H NMR (600 MHz, $CDCl_3$) δ 10.64 (s, 1H), 7.59-7.49 (m, 1H), 7.48-7.38 (m, 2H), 5.49 (s, 2H), 2.16 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 191.9, 170.4, 140.3, 139.2, 134.2, 130.1, 129.8, 126.4, 63.7, 20.8.



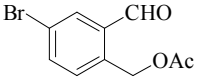
5-chloro-2-formylbenzyl acetate **2m**.[4] Yield: 56% (23.7 mg); ^{1}H NMR (600 MHz, $CDCl_3$) δ 10.14 (s, 1H), 7.81 (d, *J* = 8.2 Hz, 1H), 7.55-7.52 (m, 1H), 7.50 (dd, *J* = 8.2, 1.8 Hz, 1H), 5.54 (s, 2H), 2.18 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 191.2, 170.3, 140.6, 139.9, 134.7, 131.7, 128.5, 128.4, 62.8, 20.9.



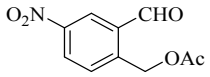
2-chloro-6-formylbenzyl acetate **2n**. Yield: 34% (14.4 mg); ^{1}H NMR (600 MHz, $CDCl_3$) δ 10.28 (s, 1H), 7.83 (d, *J* = 7.6 Hz, 1H), 7.67 (d, *J* = 7.9 Hz, 1H), 7.50 (t, *J* = 7.9 Hz, 1H), 5.65 (s, 2H), 2.08 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 190.6, 170.5, 137.0, 136.7, 134.9, 134.3, 130.2, 129.8, 58.6, 20.7.



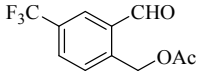
5-bromo-2-formylbenzyl acetate **2o**. Yield: 47% (24.1 mg); ^{1}H NMR (600 MHz, $CDCl_3$) δ 10.13 (s, 1H), 7.73 (d, *J* = 8.1 Hz, 1H), 7.70 (s, 1H), 7.67 (dd, *J* = 8.1, 1.5 Hz, 1H), 5.53 (s, 2H), 2.17 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 191.4, 170.4, 139.8, 134.6, 132.1, 131.6, 131.4, 129.4, 62.7, 20.9.



4-bromo-2-formylbenzyl acetate **2p**. Yield: 37% (19 mg); ^{1}H NMR (600 MHz, $CDCl_3$) δ 10.15 (s, 1H), 7.99 (d, *J* = 2.0 Hz, 1H), 7.72 (dd, *J* = 8.2, 2.0 Hz, 1H), 7.41 (d, *J* = 8.2 Hz, 1H), 5.48 (s, 2H), 2.12 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 190.6, 170.3, 136.8, 135.4, 135.3, 135.2, 130.7, 122.6, 62.8, 20.81.

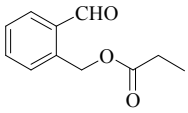


2-formyl-4-nitrobenzyl acetate **2q**. Yield: 43% (19.1 mg); ^{1}H NMR (600 MHz, $CDCl_3$) δ 10.26 (s, 1H), 8.73 (d, *J* = 2.2 Hz, 1H), 8.45 (dd, *J* = 8.5, 2.2 Hz, 1H), 7.78 (d, *J* = 8.5 Hz, 1H), 5.64 (s, 2H), 2.20 (s, 3H), -0.00 (s, 1H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 190.2, 170.2, 147.8, 144.8, 134.1, 129.2, 128.0, 127.8, 62.9, 20.8.

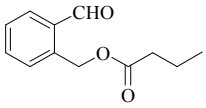


2-formyl-4-(trifluoromethyl)benzyl acetate **2r**. Yield: 31% (15.0mg); ^{1}H NMR (600 MHz, $CDCl_3$) δ 10.34 (s, 1H), 8.13 (d, *J* = 7.7 Hz, 1H), 7.96 (d, *J* = 7.8 Hz, 1H), 7.68 (t, *J* = 7.8 Hz, 1H), 5.59 (s, 2H), 2.08 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 190.06, 170.12, 136.59, 135.48, 133.91, 131.21, 130.93(q, *J* = 5.6 Hz, 1C), 129.48, 123.54 (q, *J* = 274.5 Hz, 1C), 57.99 (q, *J* = 2.5 Hz, 1C), 20.63; MS (EI) m/z (%) 203.0(M-Ac, 58), 186.0(100), 158.0(93), 138.0(43),109.0(37),89.0(17),75.0(22); Anal. Calcd. For

$C_{11}H_9F_3O_3$: C, 53.67; H, 3.68; F, 23.15%. Found: C, 53.59; H, 3.60; F, 23.21%.



propionic acid 2-formyl-benzyl ester **2s**. Yield:25% (9.7mg); ^{1}H NMR (600 MHz, $CDCl_3$) δ 10.21 (s, 1H), 7.92-7.84 (m, 1H), 7.67-7.56 (m, 1H), 7.56-7.46 (m, 2H), 5.56 (s, 2H), 2.43 (q, *J* = 7.6 Hz, 2H), 1.19 (t, *J* = 7.6 Hz, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 192.4, 173.9, 138.1, 133.9, 133.6, 133.1, 128.6, 128.4, 63.4, 27.6, 9.1.



butyric acid 2-formyl-benzyl ester **2t**. Yield:21% (8.5mg); ^{1}H NMR (600 MHz, $CDCl_3$) δ 10.21 (s, 1H), 7.91-7.82 (m, 1H), 7.66-7.56 (m, 1H), 7.56-7.43 (m, 2H), 5.56 (s, 2H), 2.38 (t, *J* = 7.4 Hz, 2H), 1.75-1.65 (m, 2H), 0.96 (t, *J* = 7.4 Hz, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 192.4, 173.1, 138.1, 133.9, 133.6, 133.1, 128.6, 128.4, 63.3, 36.2, 18.5, 13.7.

References:

[1] J. W. Clark-Lewis, M. M. Mahandru *Australian Journal of Chemistry* 1974, 27, 2689-2692.

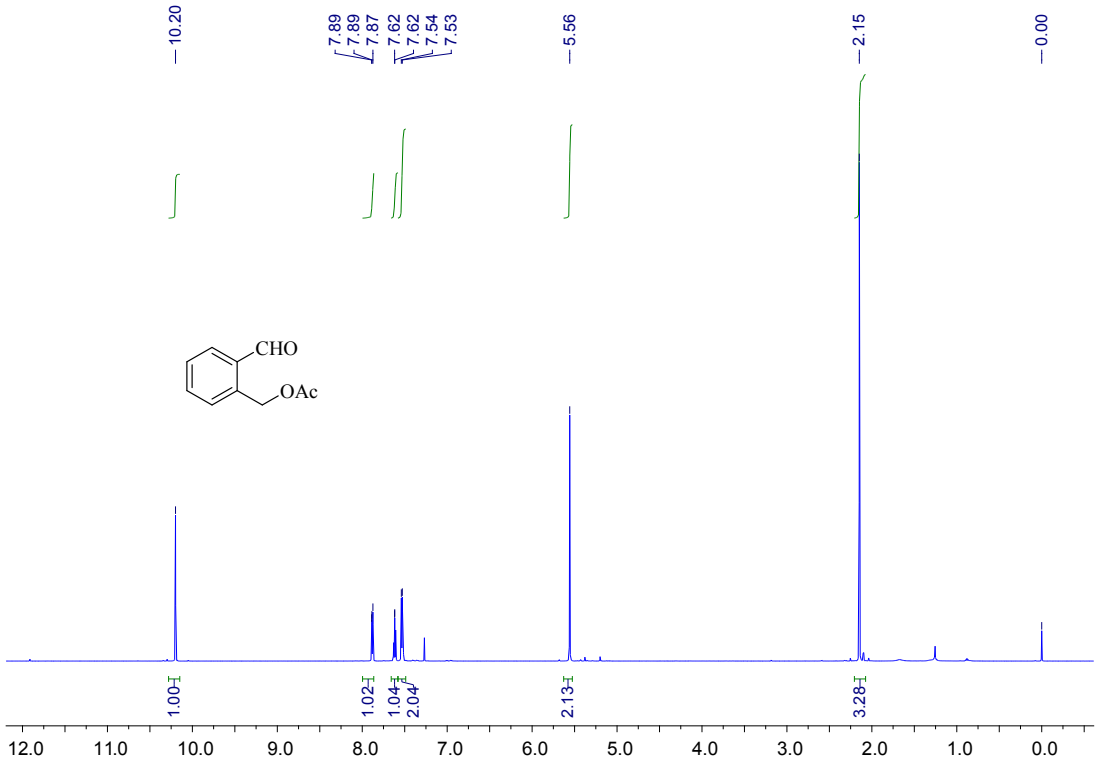
[2] CAS Registry Number: 904983-36-4.

[3] CAS Registry Number: 1824455-82-4.

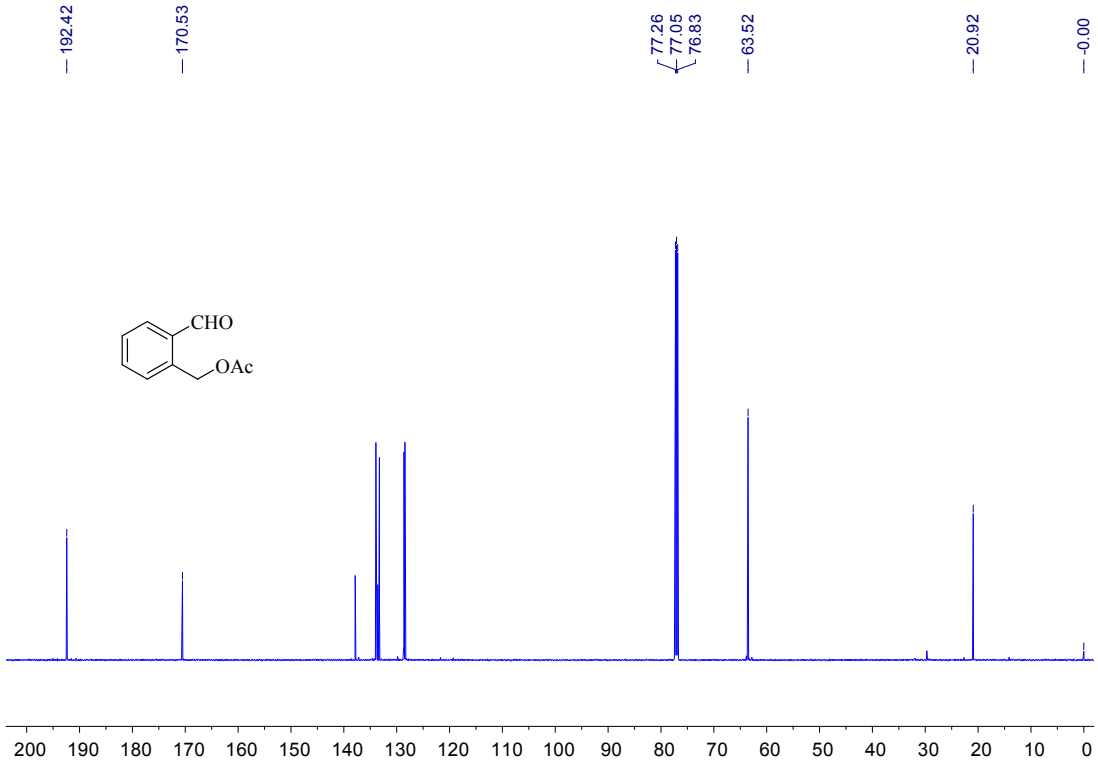
[4] CAS Registry Number: 1824624-43-2.

4. ^{1}H NMR, ^{13}C NMR and MS Spectra of the Products

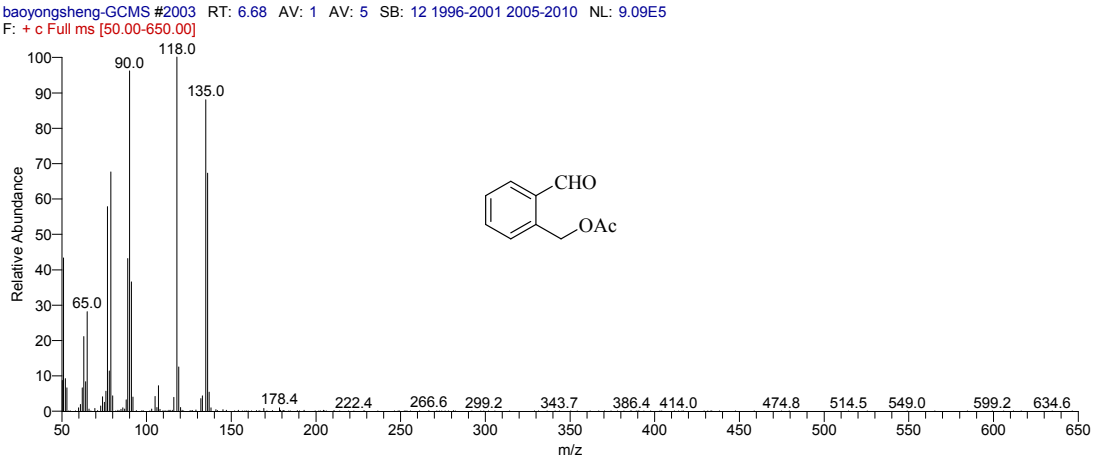
^{1}H NMR of 2-formylbenzyl acetate **2a**



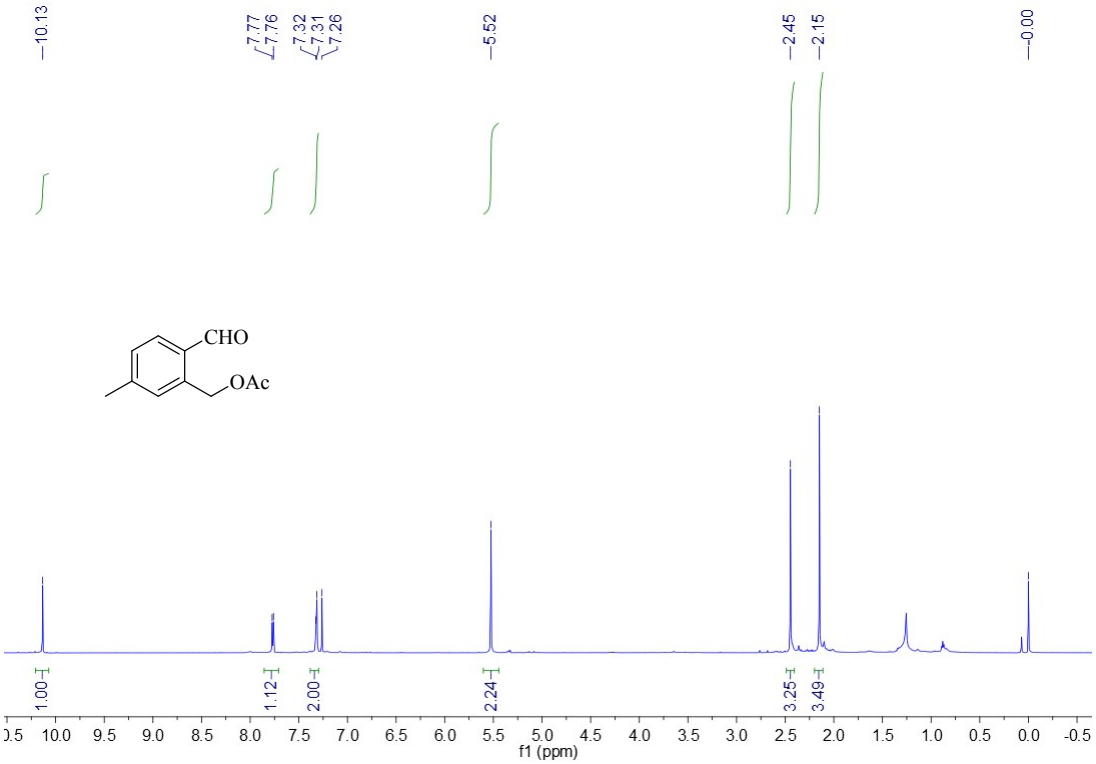
^{13}C NMR of 2-formylbenzyl acetate **2a**



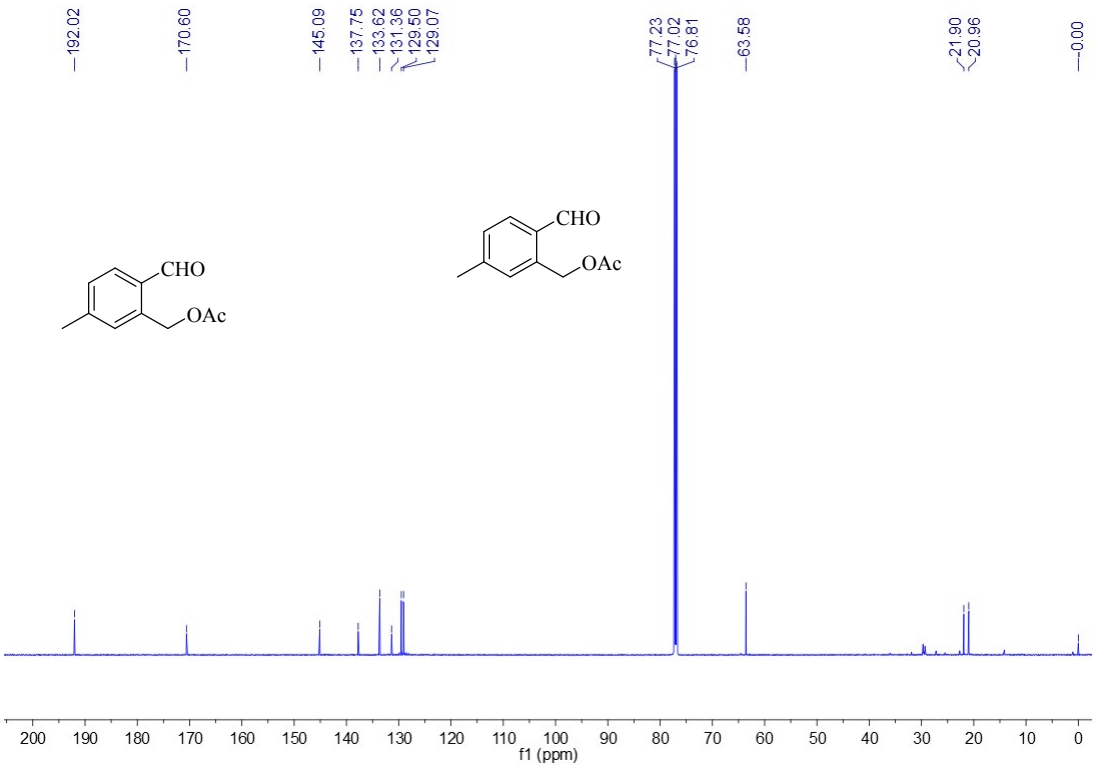
MS(EI) of 2-formylbenzyl acetate **2a**



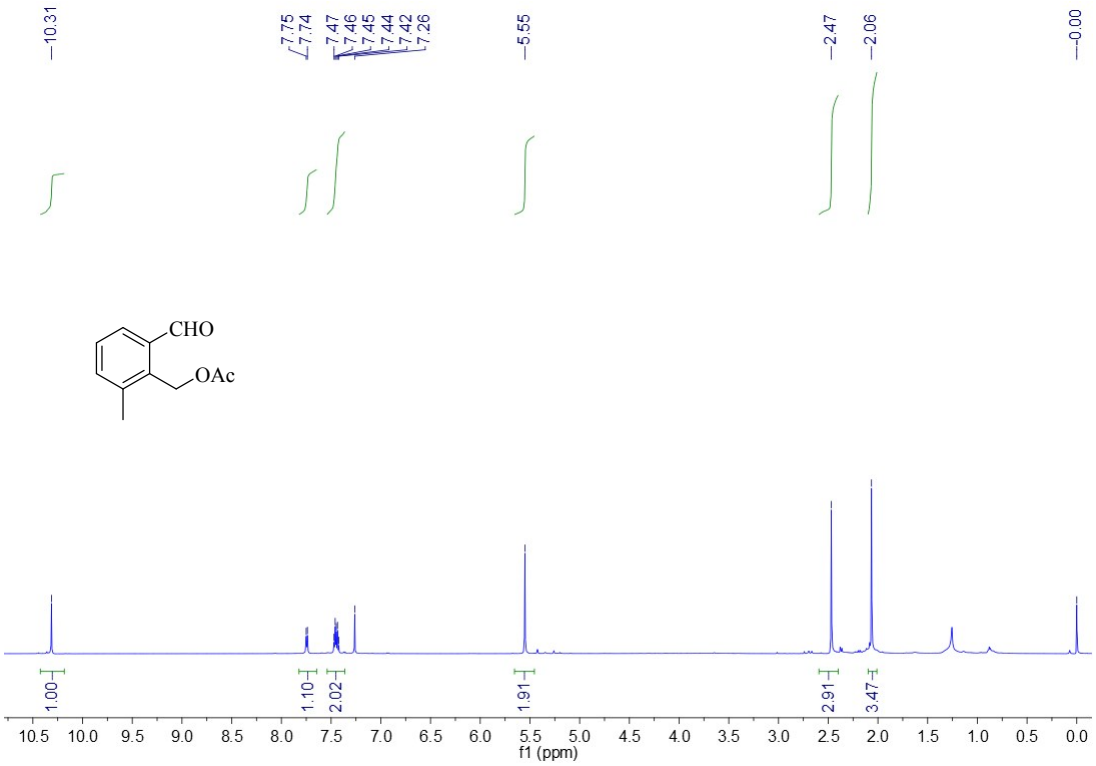
^{1}H NMR of 2-formyl-5-methylbenzyl acetate **2b**



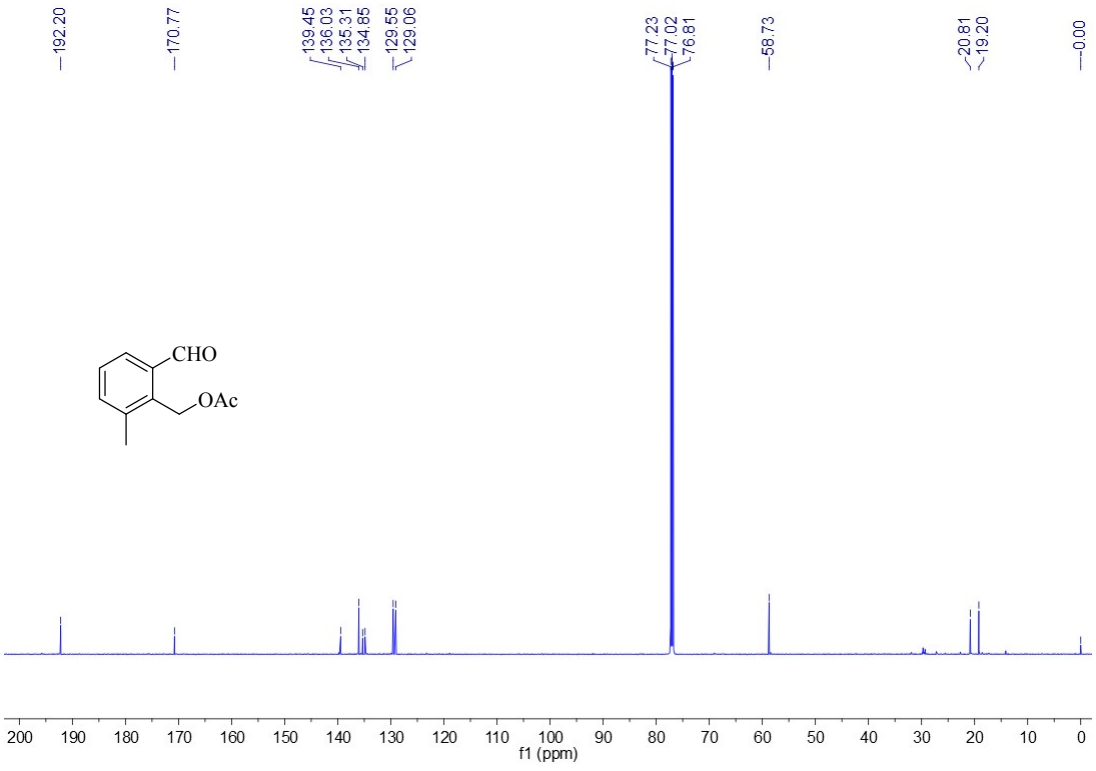
^{13}C NMR of 2-formyl-5-methylbenzyl acetate **2b**



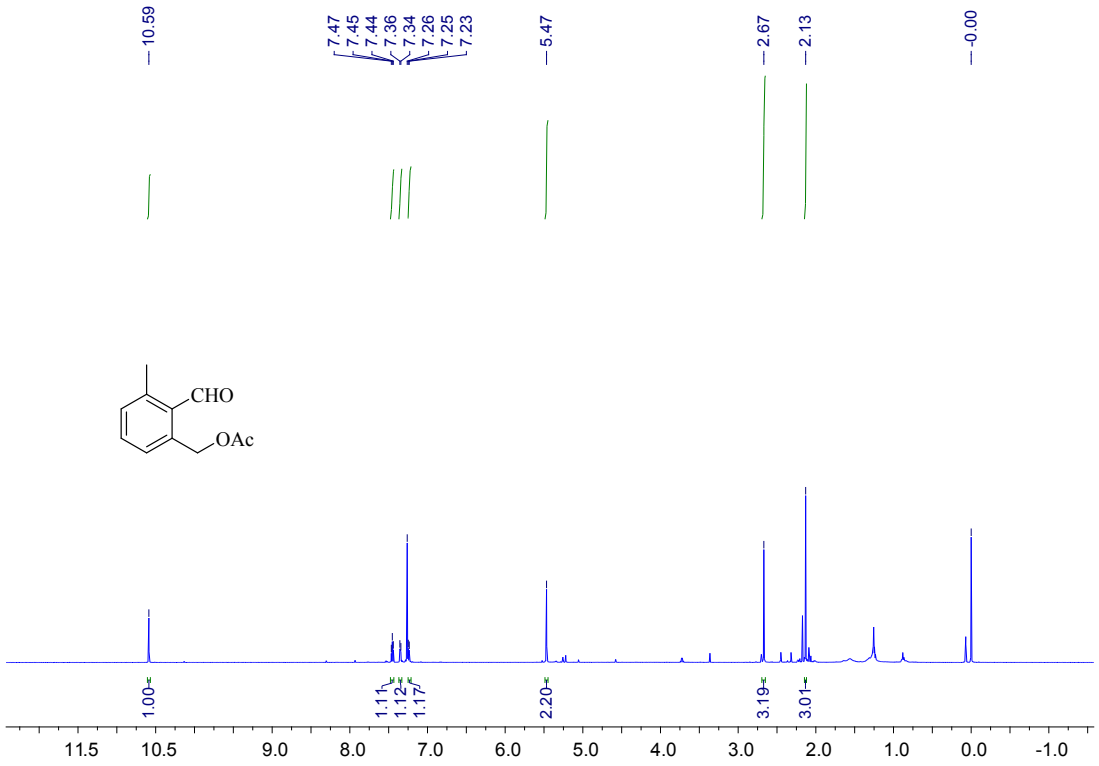
^{1}H NMR of 2-formyl-6-methylbenzyl acetate **2c**



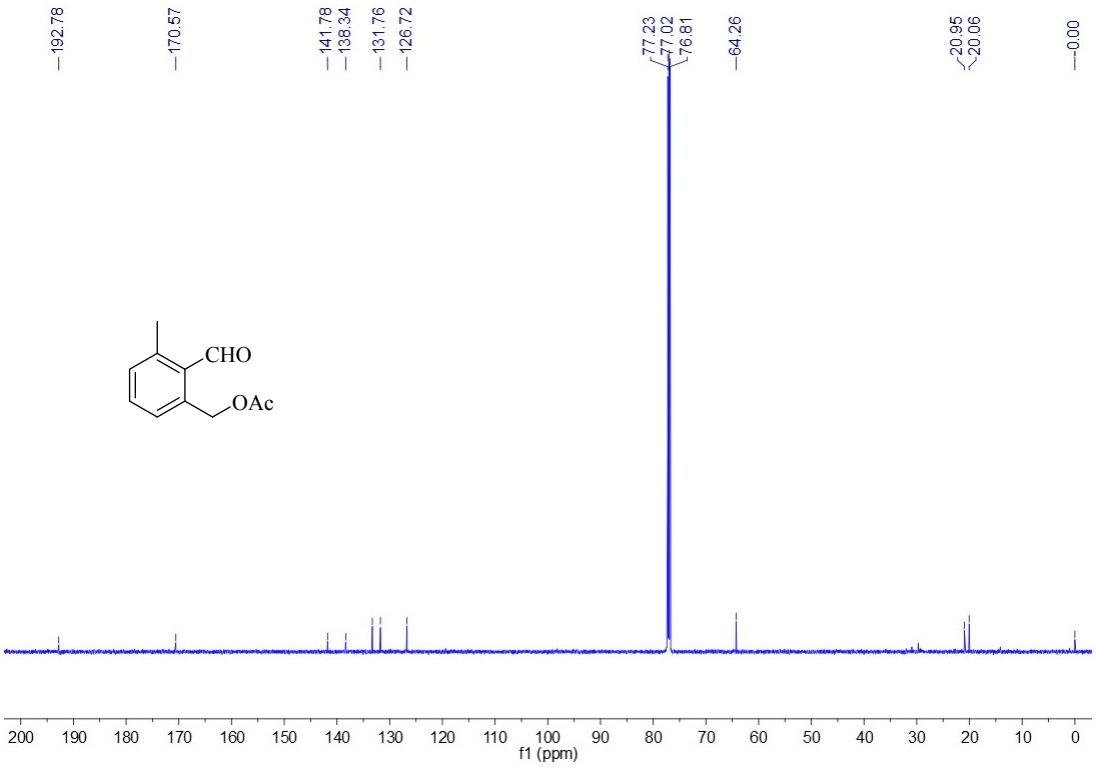
^{13}C NMR of 2-formyl-6-methylbenzyl acetate **2c**



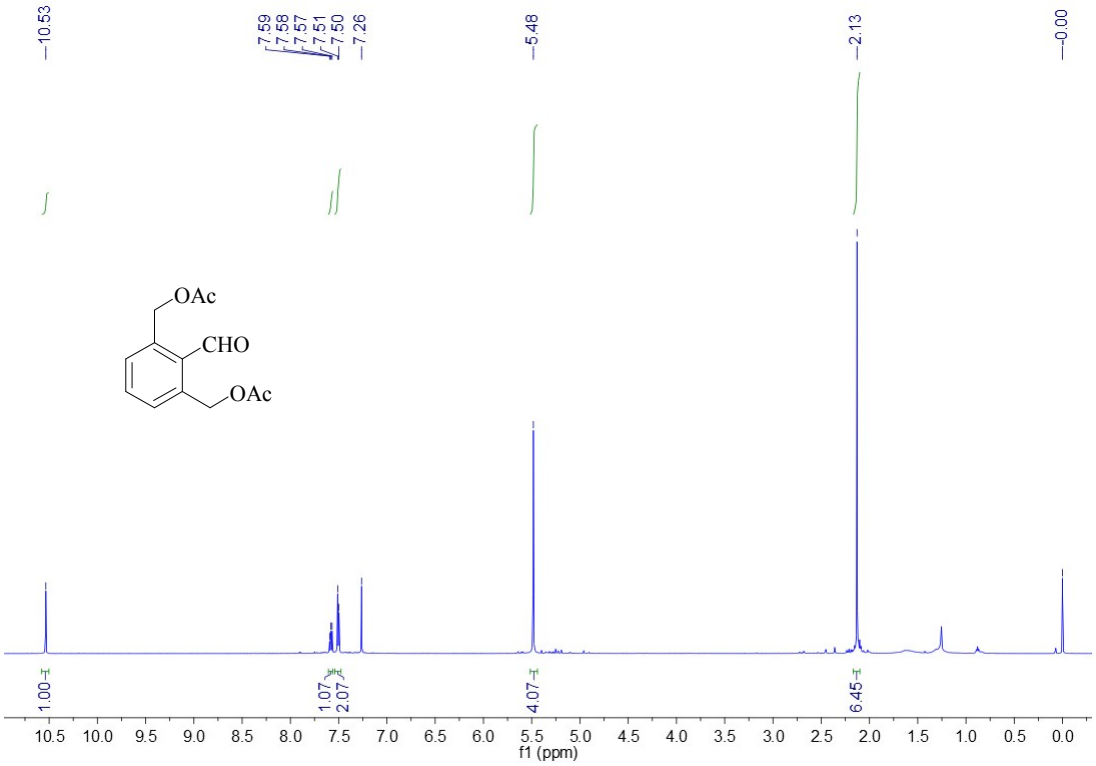
^{1}H NMR of 2-formyl-3-methylbenzyl acetate **2d**



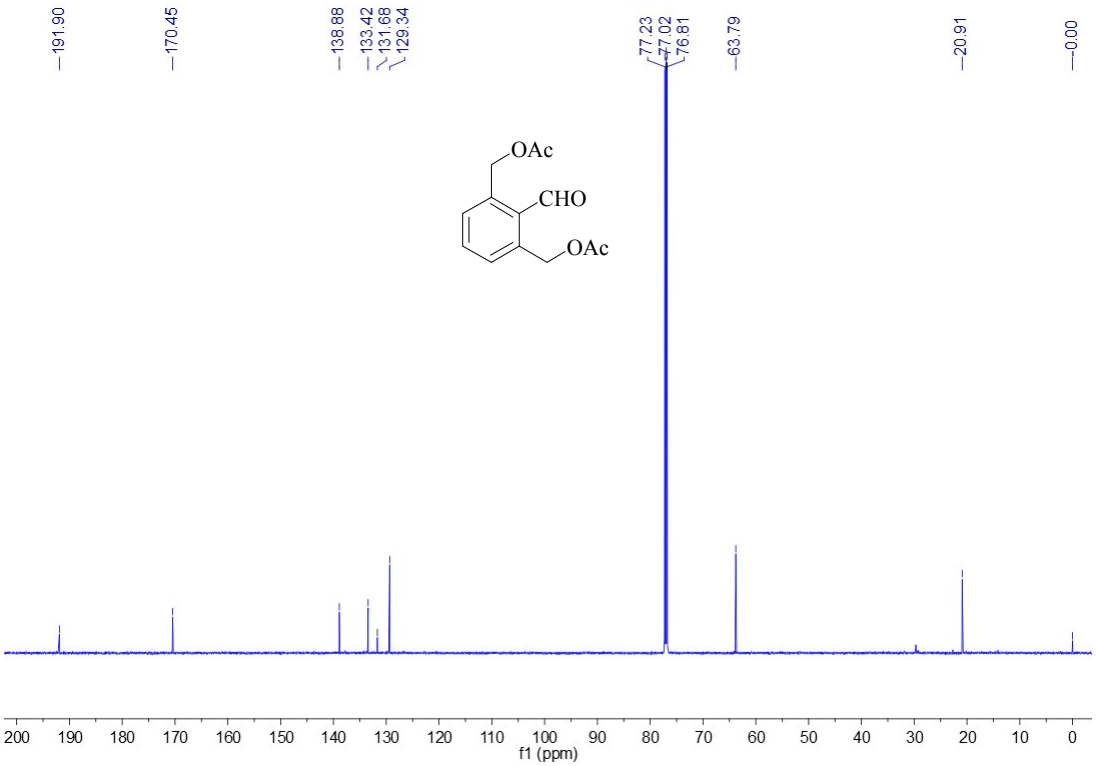
^{13}C NMR of 2-formyl-3-methylbenzyl acetate **2d**



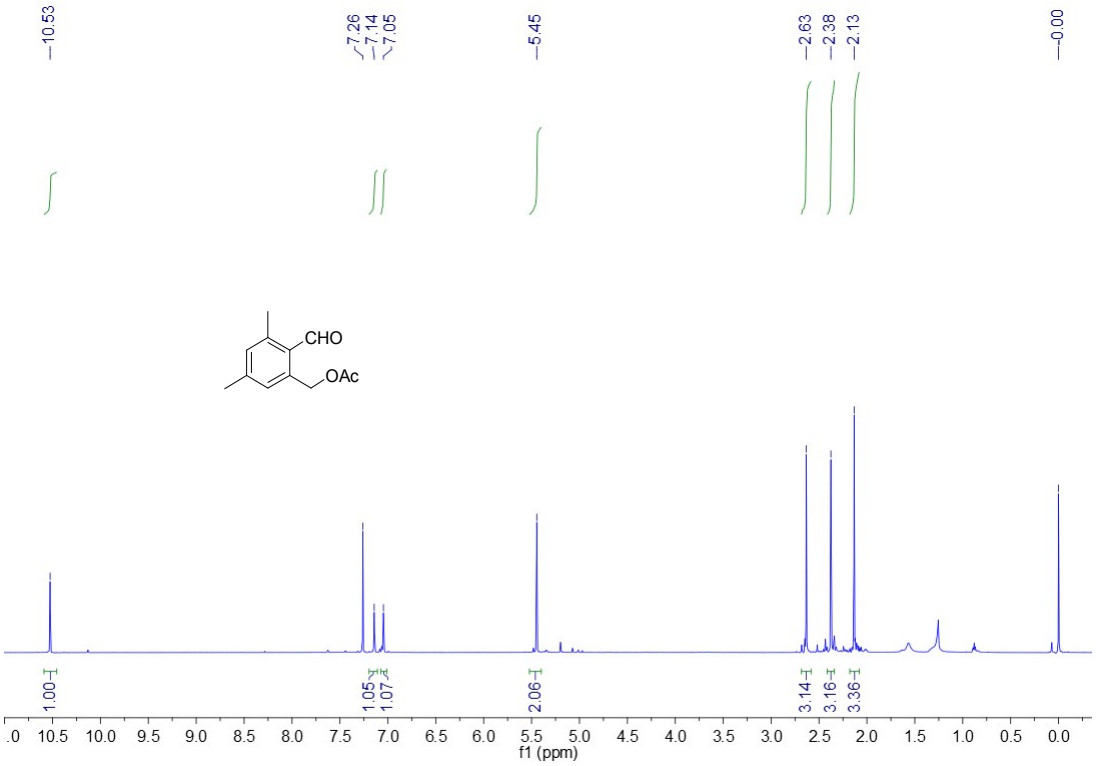
^{1}H NMR of (2-formyl-1,3-phenylene)bis(methylene) diacetate **2d'**



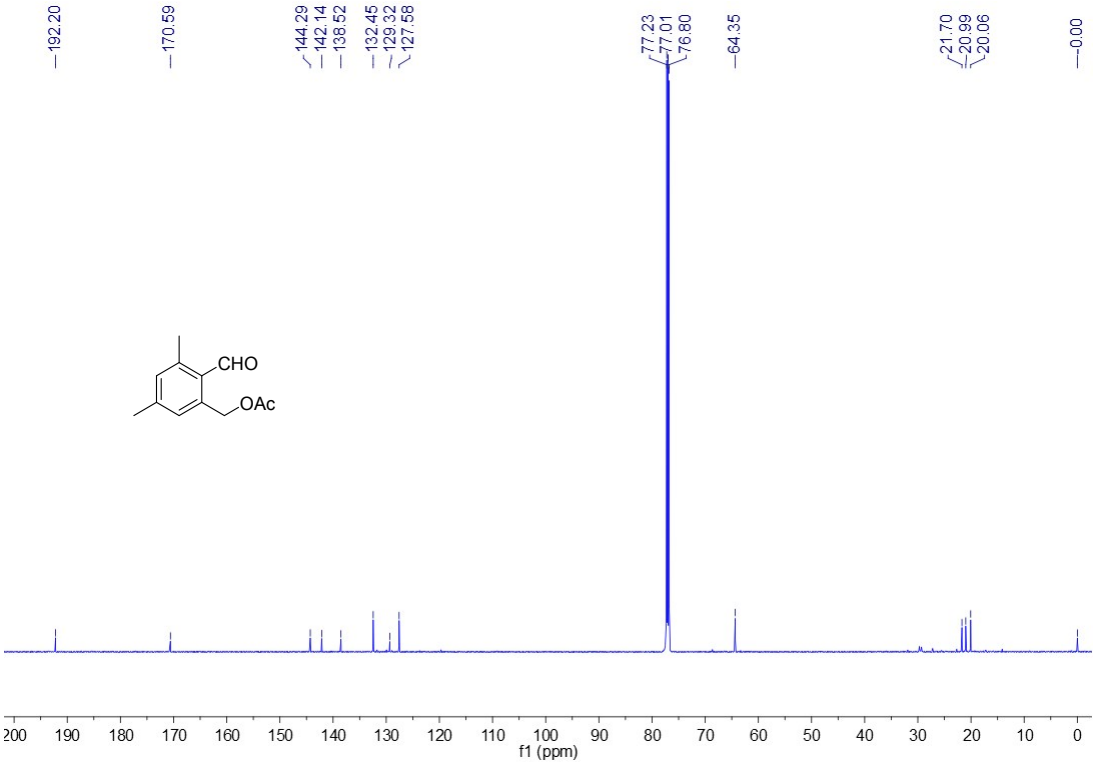
^{13}C NMR of (2-formyl-1,3-phenylene)bis(methylene) diacetate **2d'**



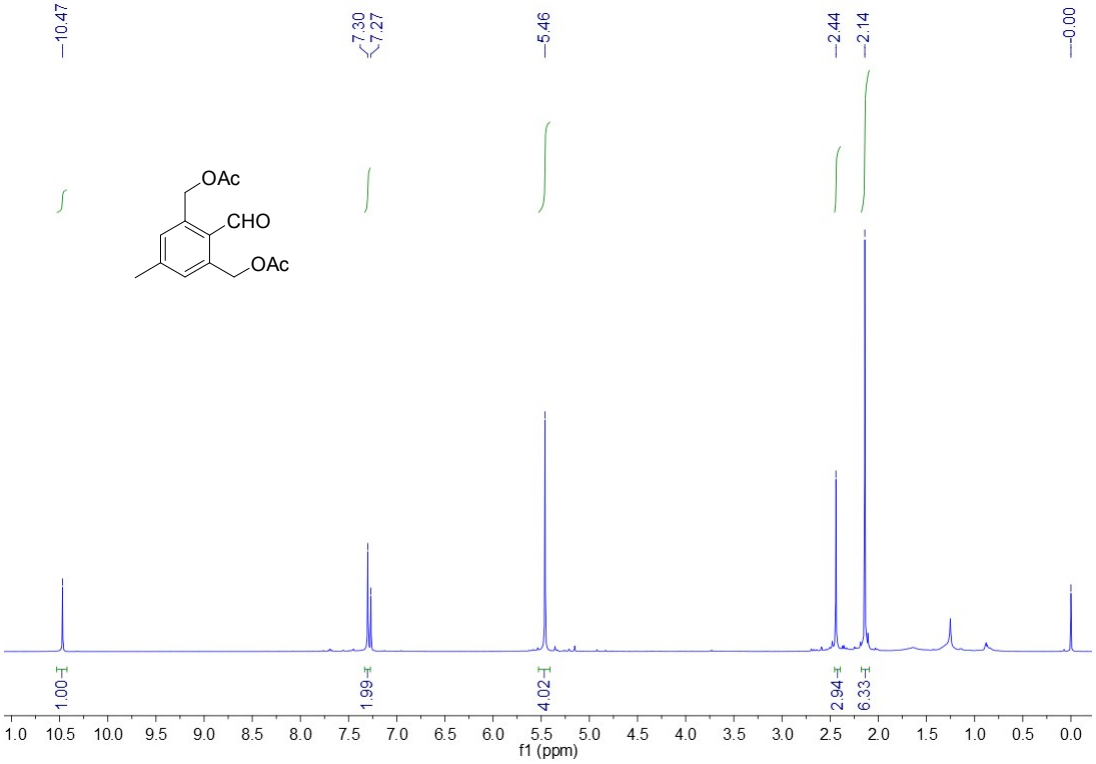
^{1}H NMR of 2-formyl-3,5-dimethylbenzyl acetate **2e**



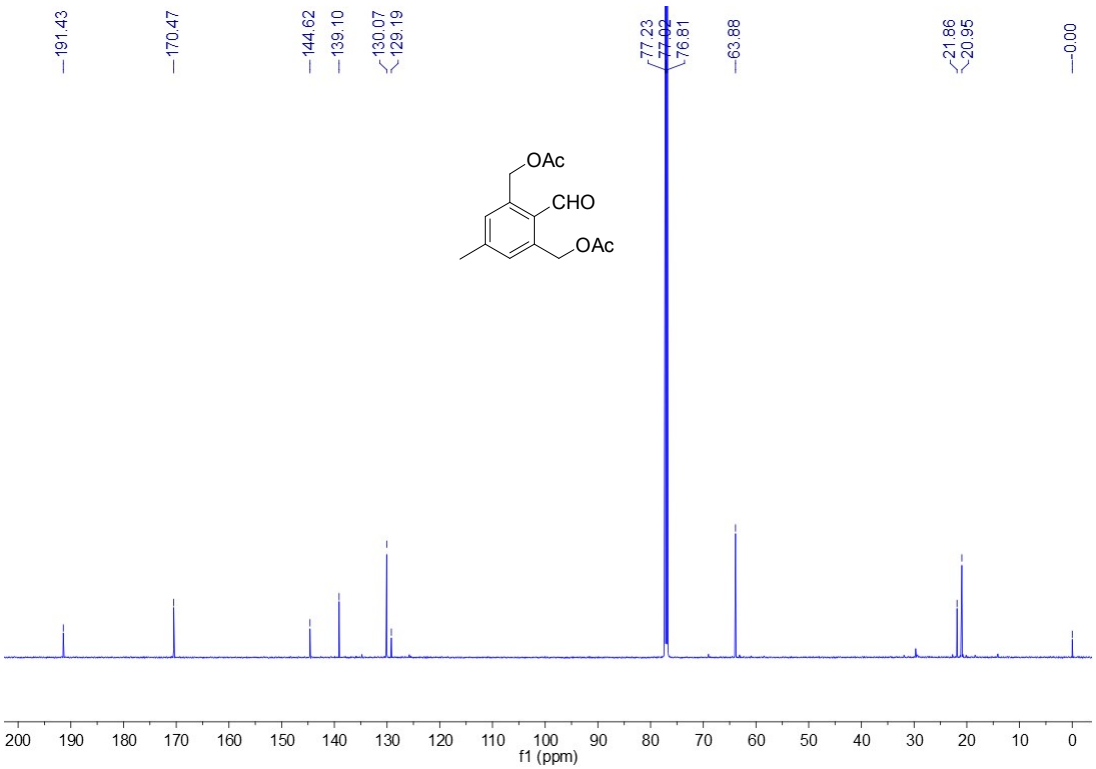
^{13}C NMR of 2-formyl-3,5-dimethylbenzyl acetate **2e**



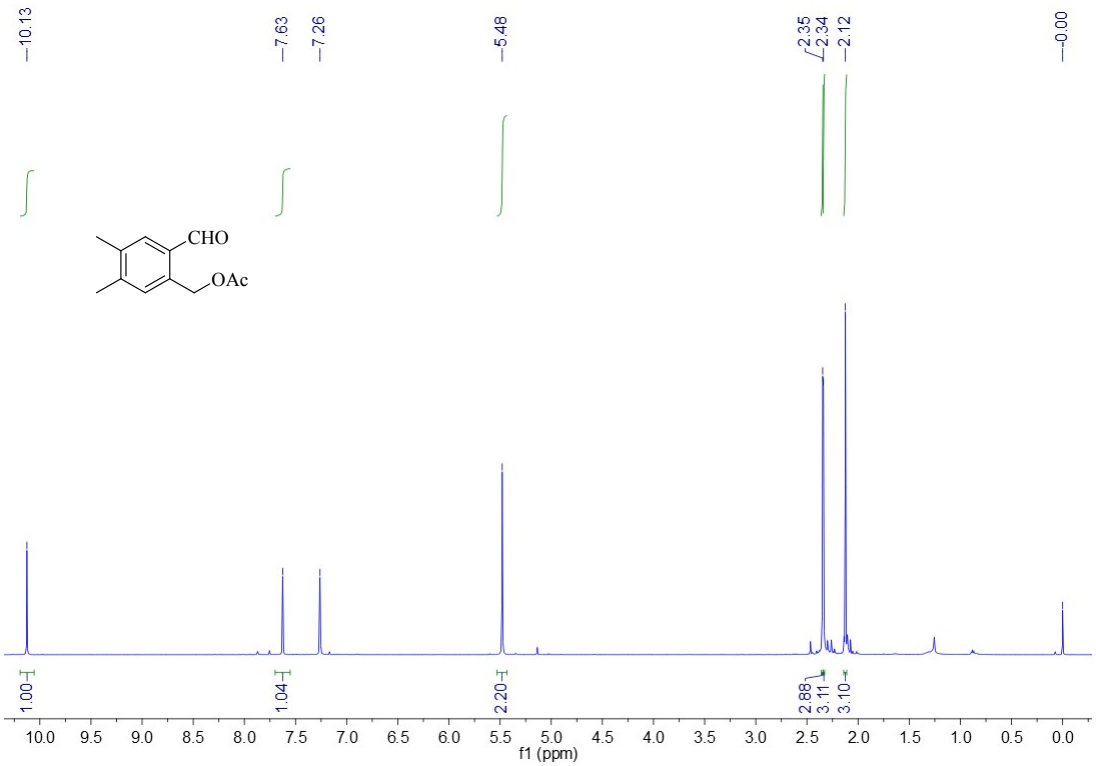
^{1}H NMR of (2-formyl-5-methyl-1,3-phenylene)bis(methylene) diacetate **2e'**



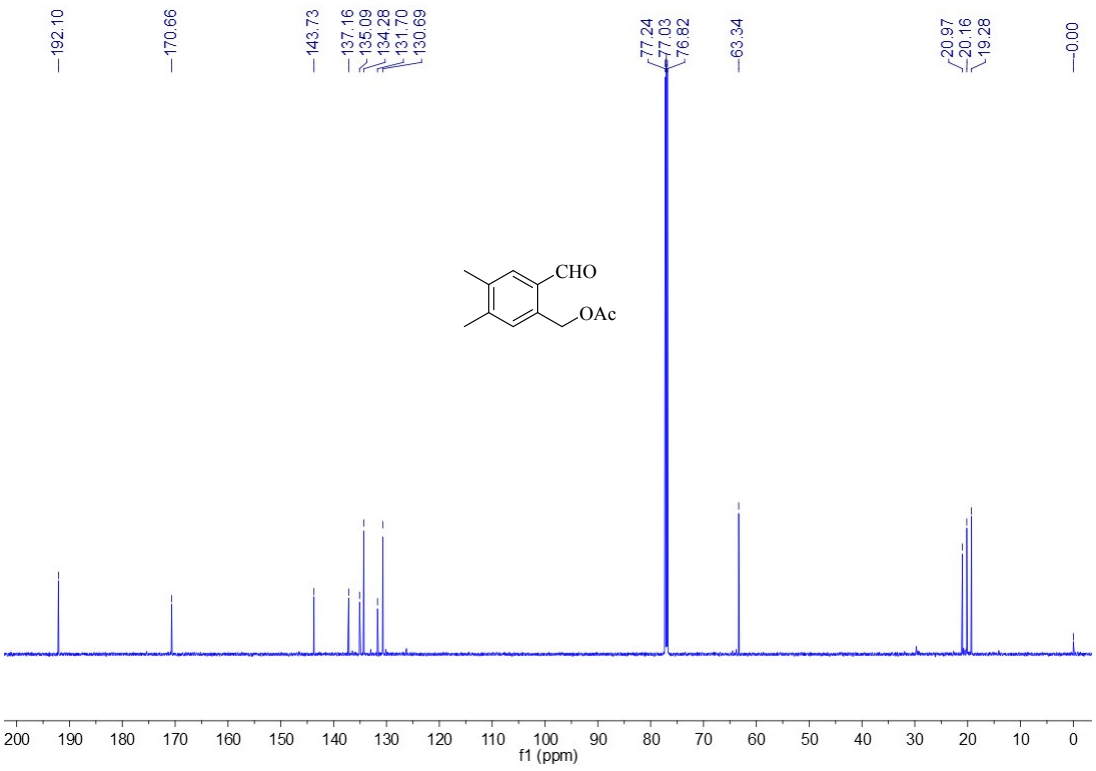
^{13}C NMR of (2-formyl-5-methyl-1,3-phenylene)bis(methylene) diacetate **2e'**



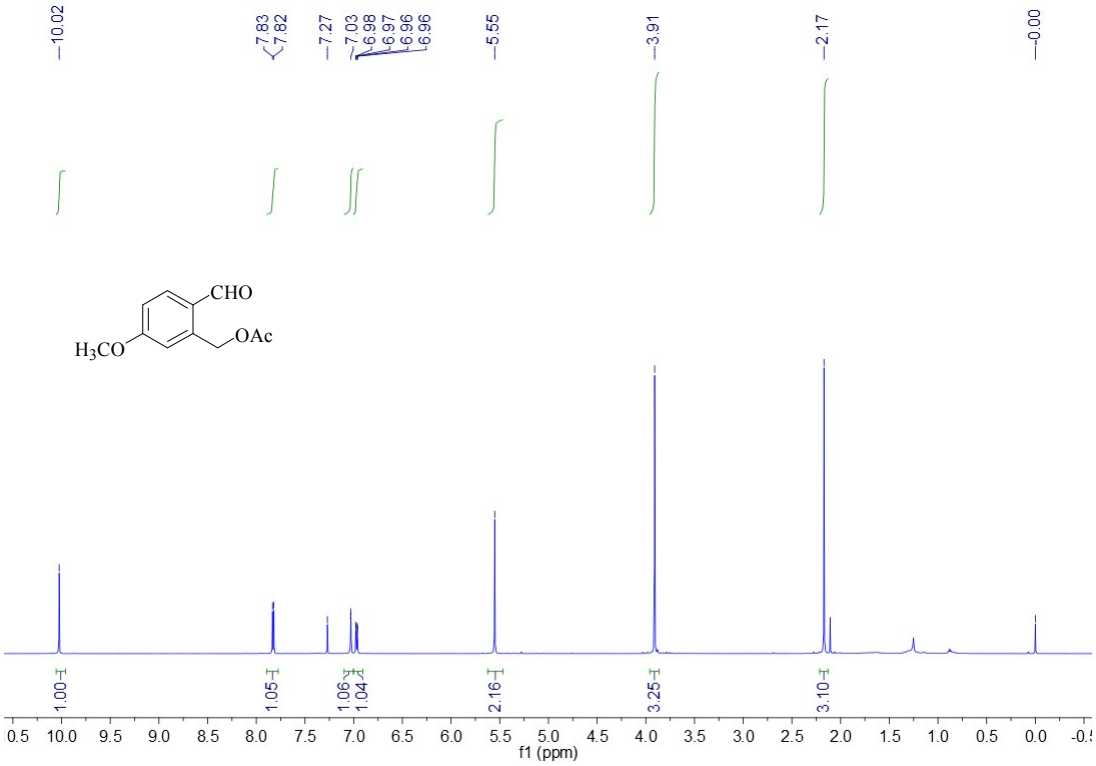
^{1}H NMR of 2-formyl-4,5-dimethylbenzyl acetate **2f**



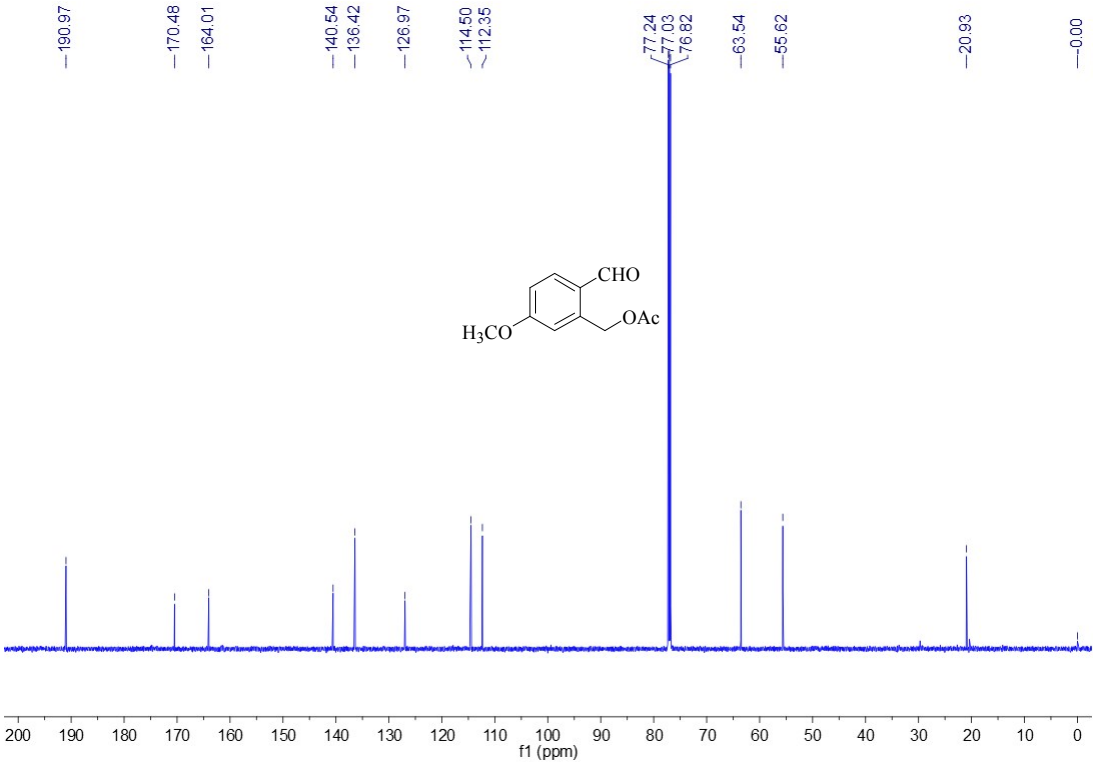
^{13}C NMR of 2-formyl-4,5-dimethylbenzyl acetate **2f**



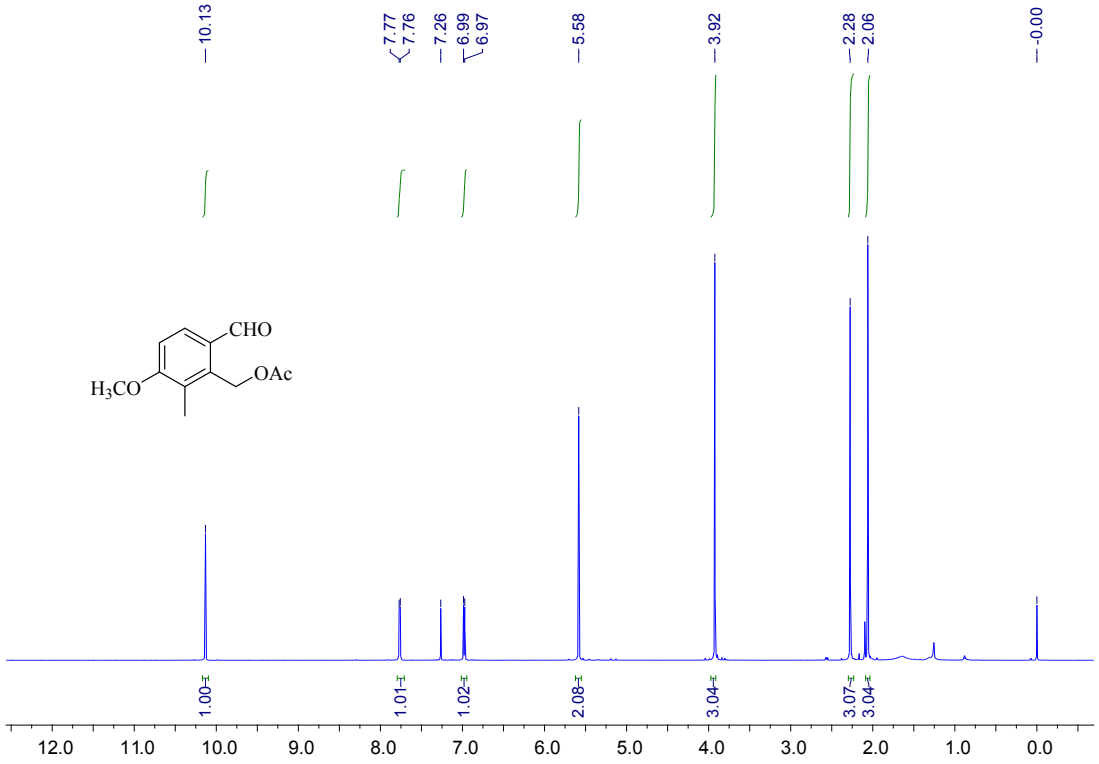
^{1}H NMR of 2-formyl-5-methoxybenzyl acetate **2g**



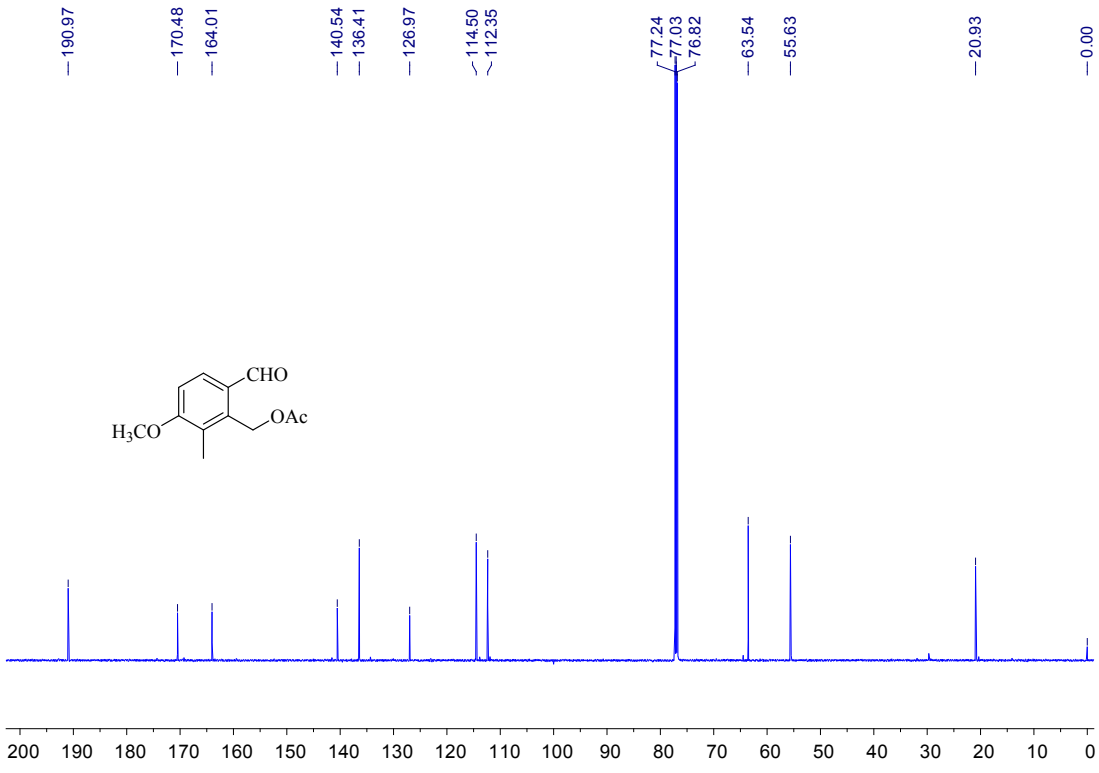
^{13}C NMR of 2-formyl-5-methoxybenzyl acetate **2g**



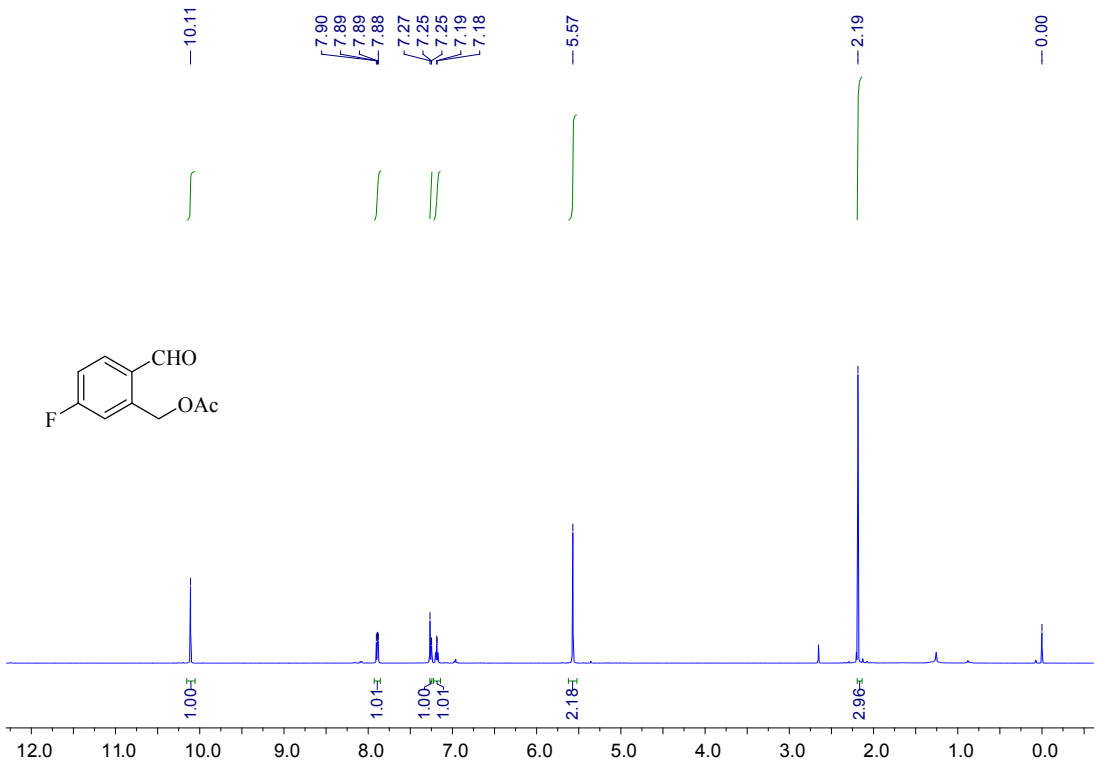
^{1}H NMR of 6-formyl-3-methoxy-2-methylbenzyl acetate **2h**



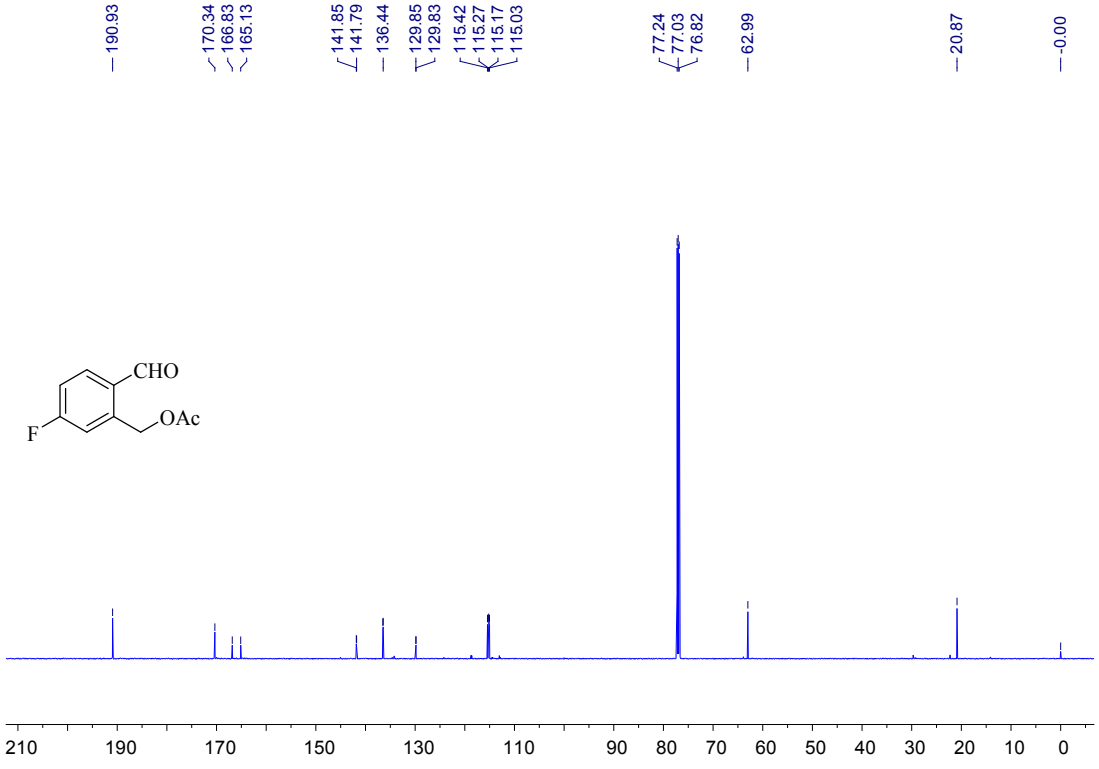
^{13}C NMR of 6-formyl-3-methoxy-2-methylbenzyl acetate **2h**



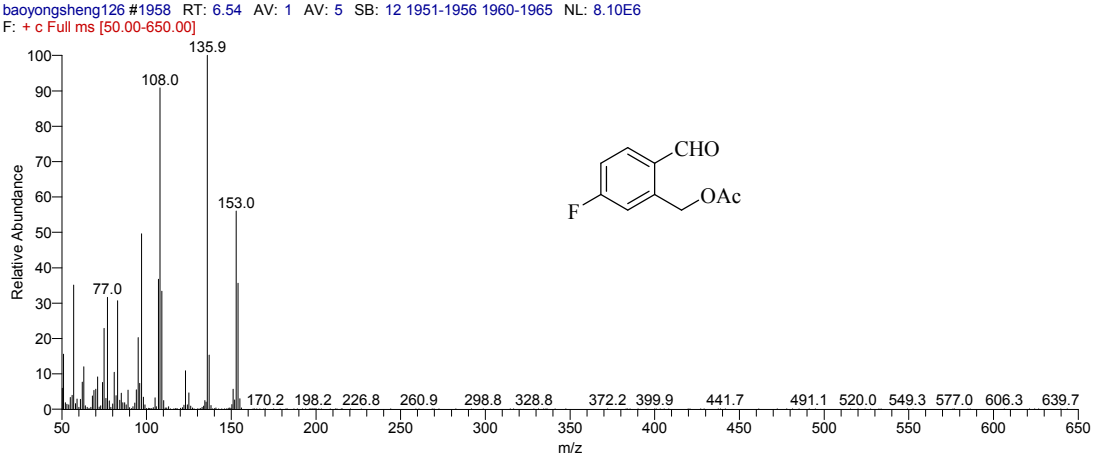
^{1}H NMR of 5-fluoro-2-formylbenzyl acetate **2i**



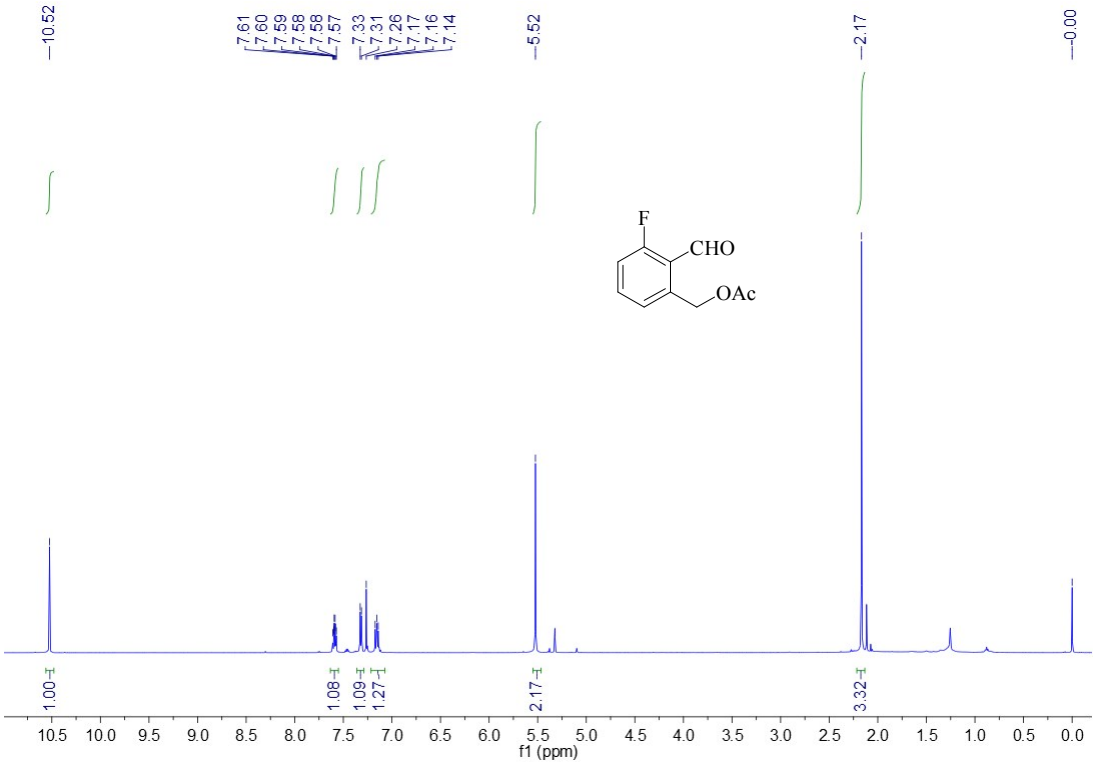
^{13}C NMR of 5-fluoro-2-formylbenzyl acetate **2i**



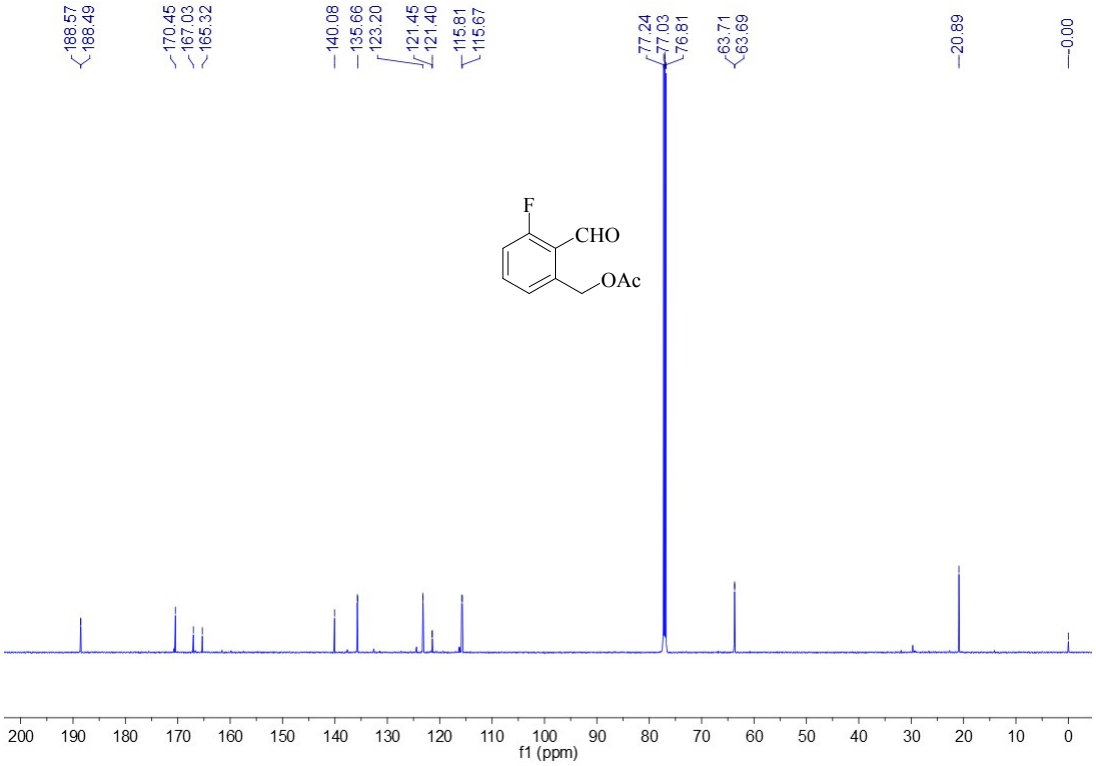
MS(EI) of 5-fluoro-2-formylbenzyl acetate **2i**



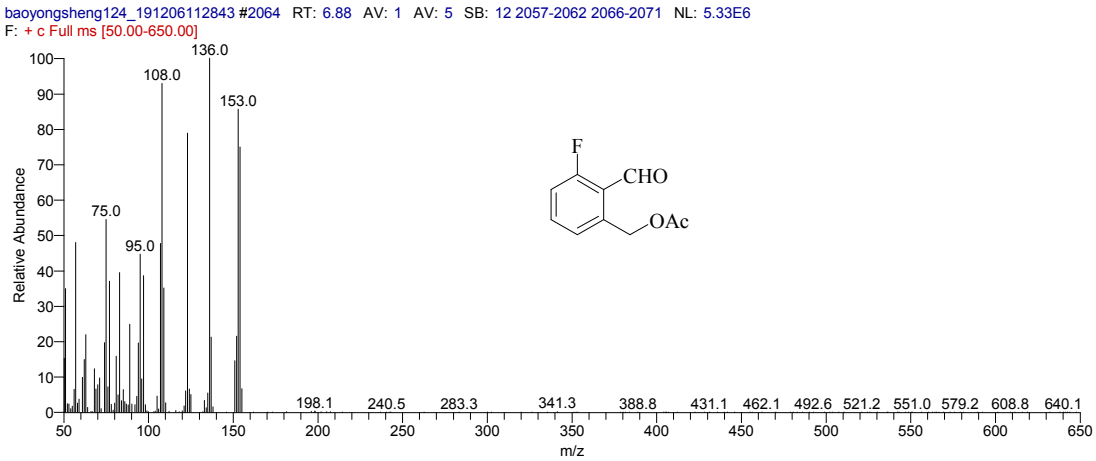
^{1}H NMR of 3-fluoro-2-formylbenzyl acetate **2j**



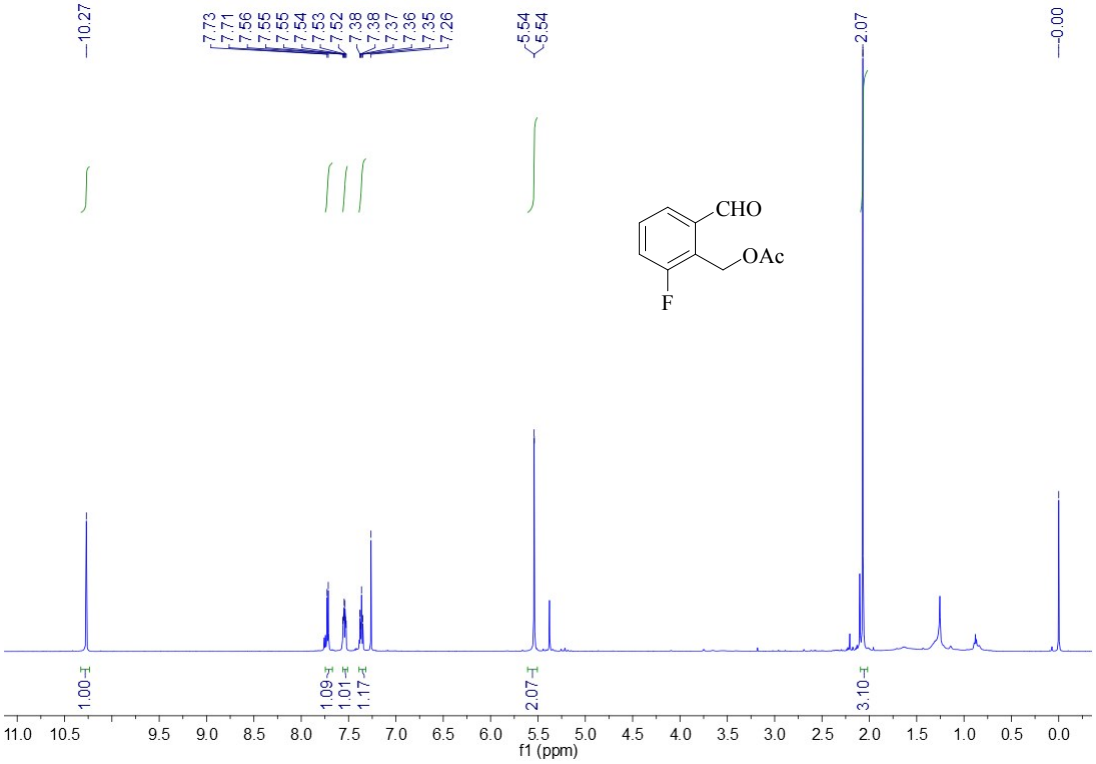
^{13}C NMR of 3-fluoro-2-formylbenzyl acetate **2j**



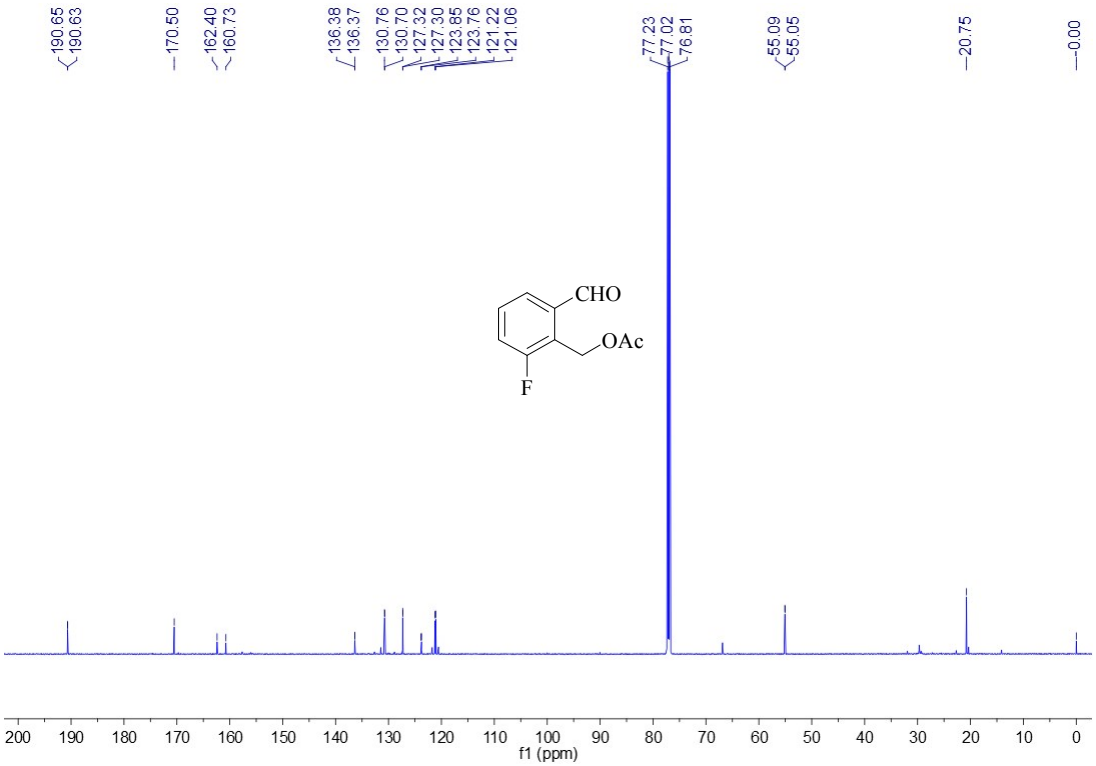
MS(EI) of 3-fluoro-2-formylbenzyl acetate **2j**



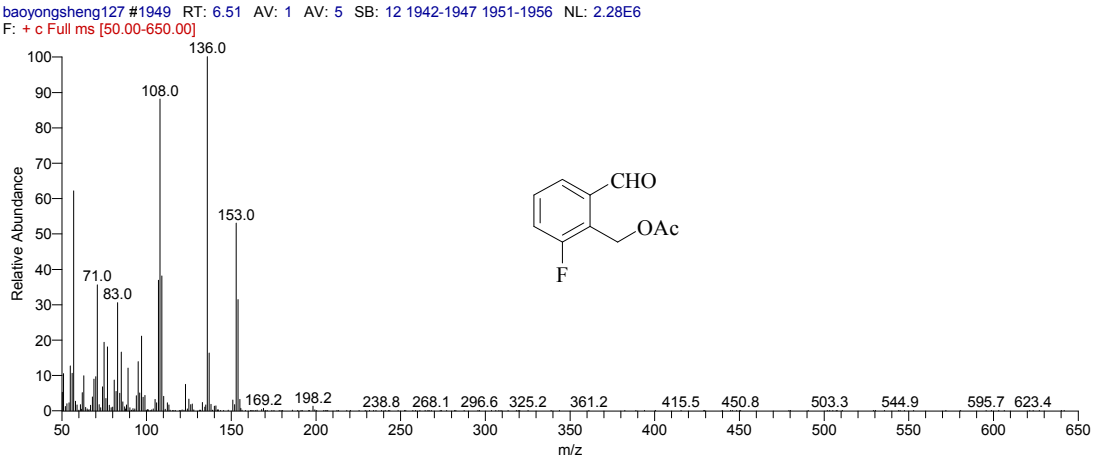
^{1}H NMR of 2-fluoro-6-formylbenzyl acetate **2k**



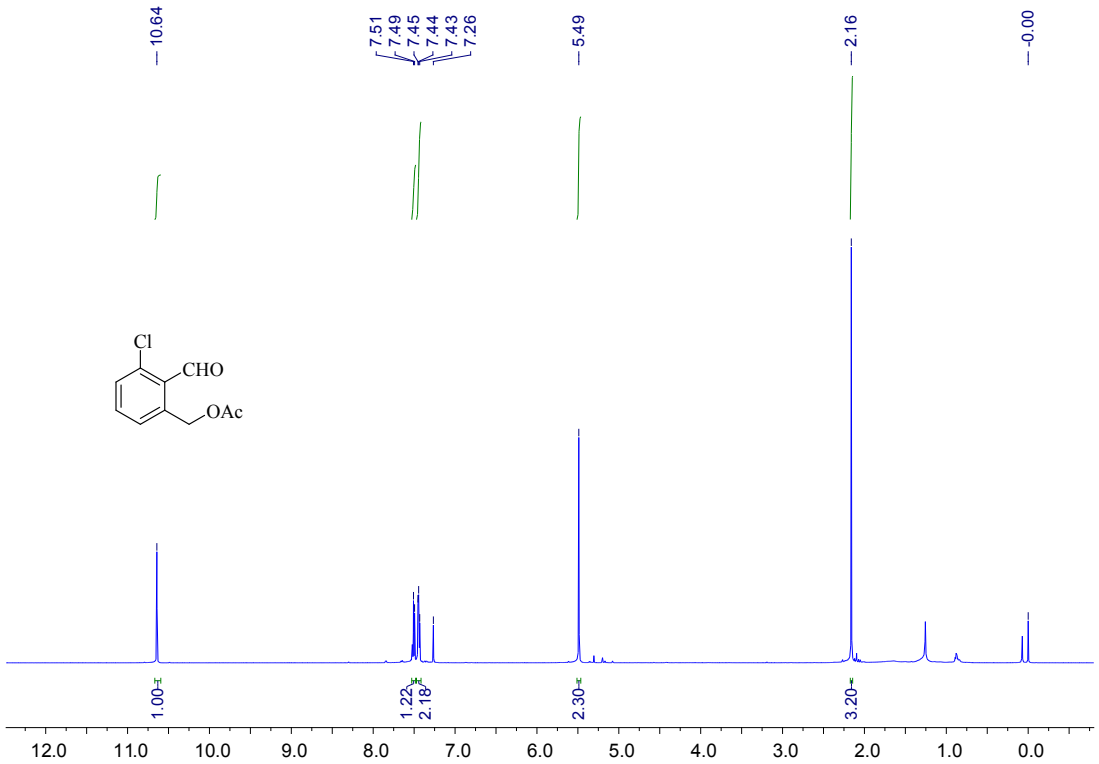
^{13}C NMR of 2-fluoro-6-formylbenzyl acetate **2k**



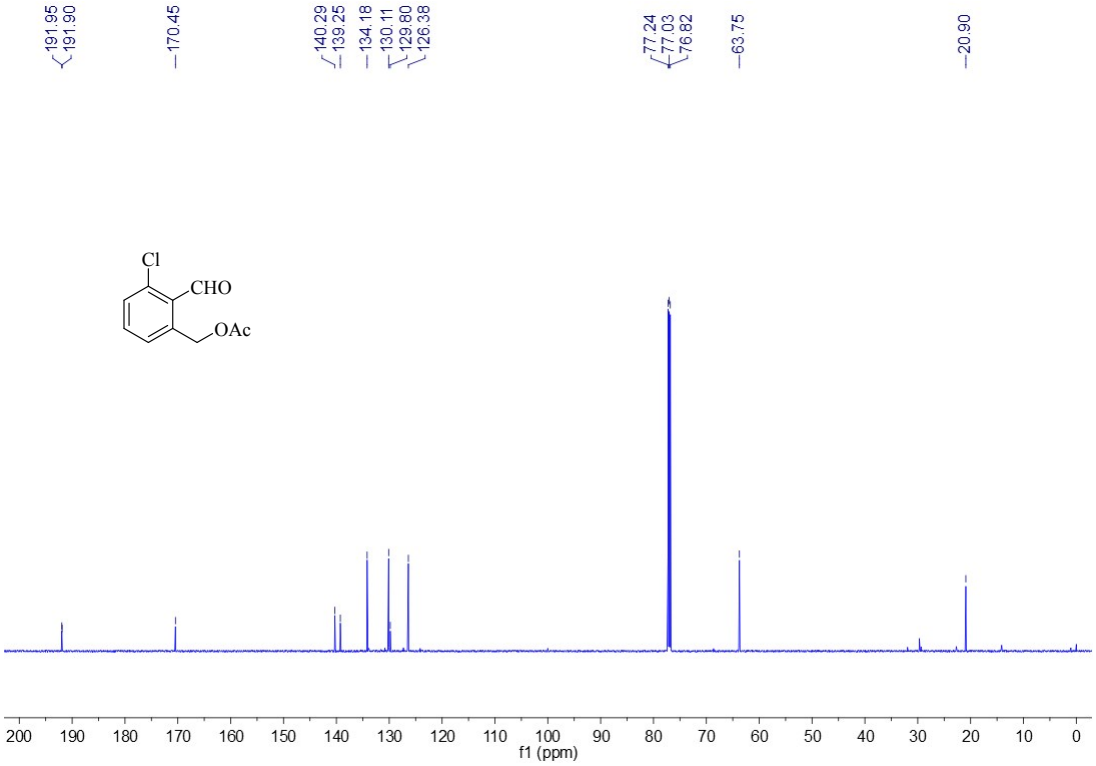
MS(EI) of 2-fluoro-6-formylbenzyl acetate **2k**



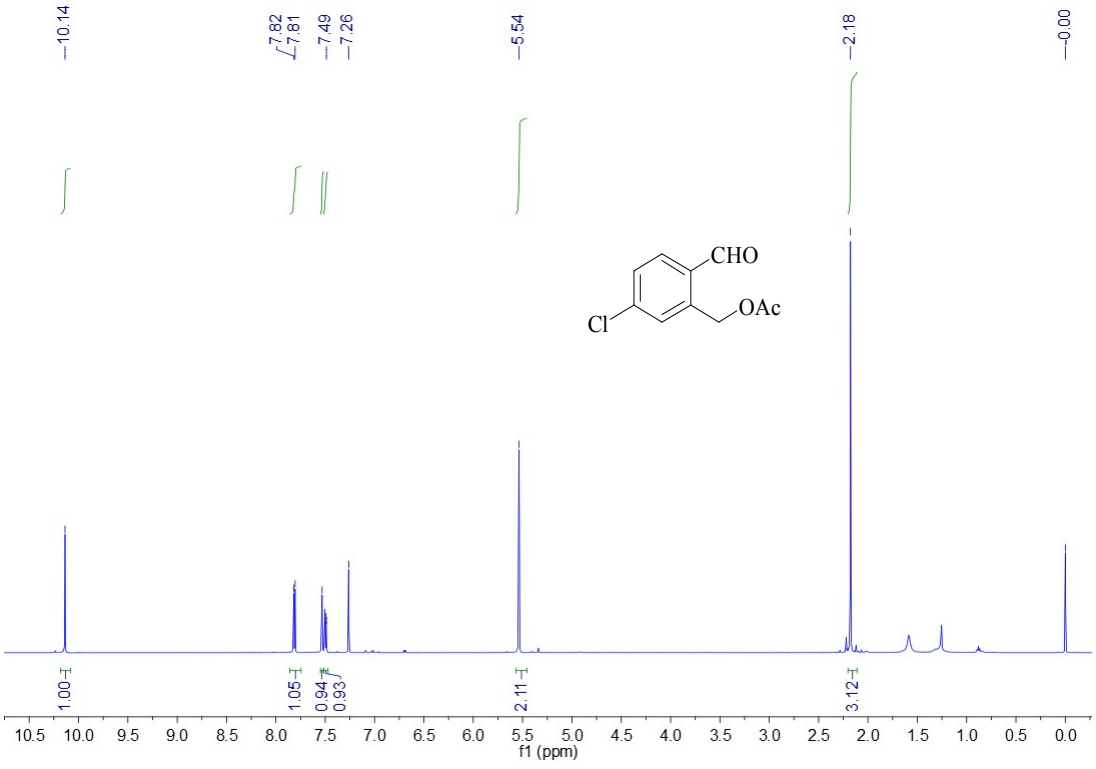
^{1}H NMR of 3-chloro-2-formylbenzyl acetate **2l**



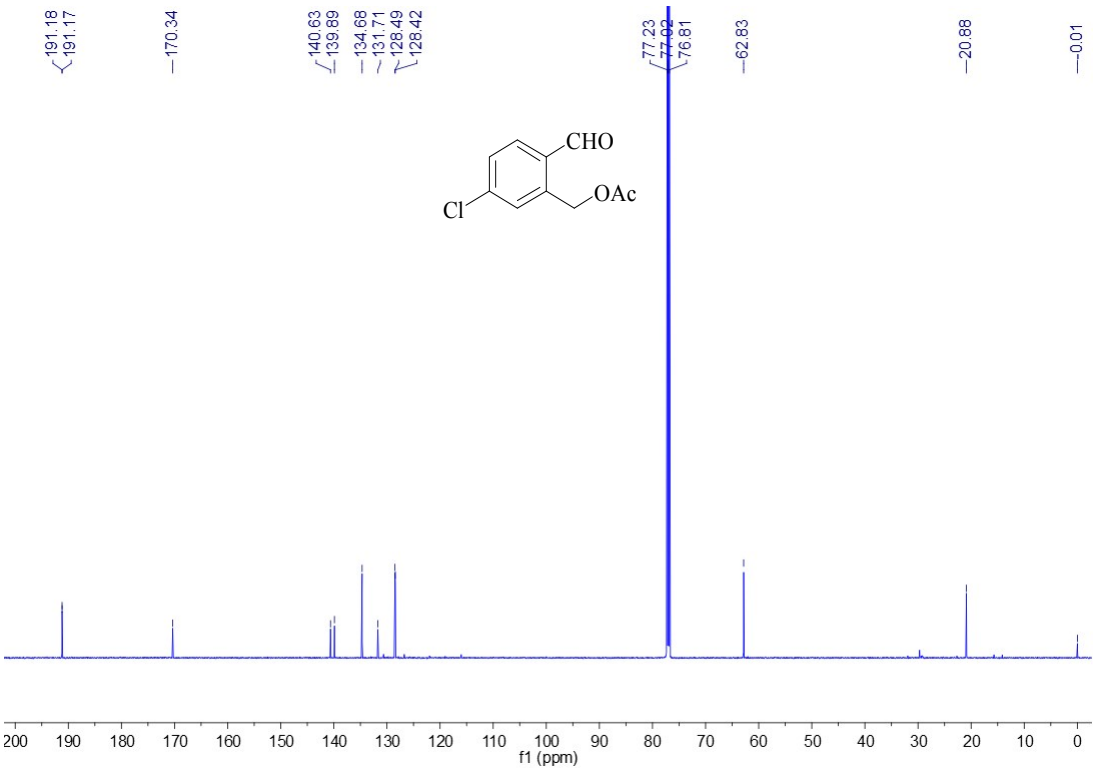
^{13}C NMR of 3-chloro-2-formylbenzyl acetate **2l**



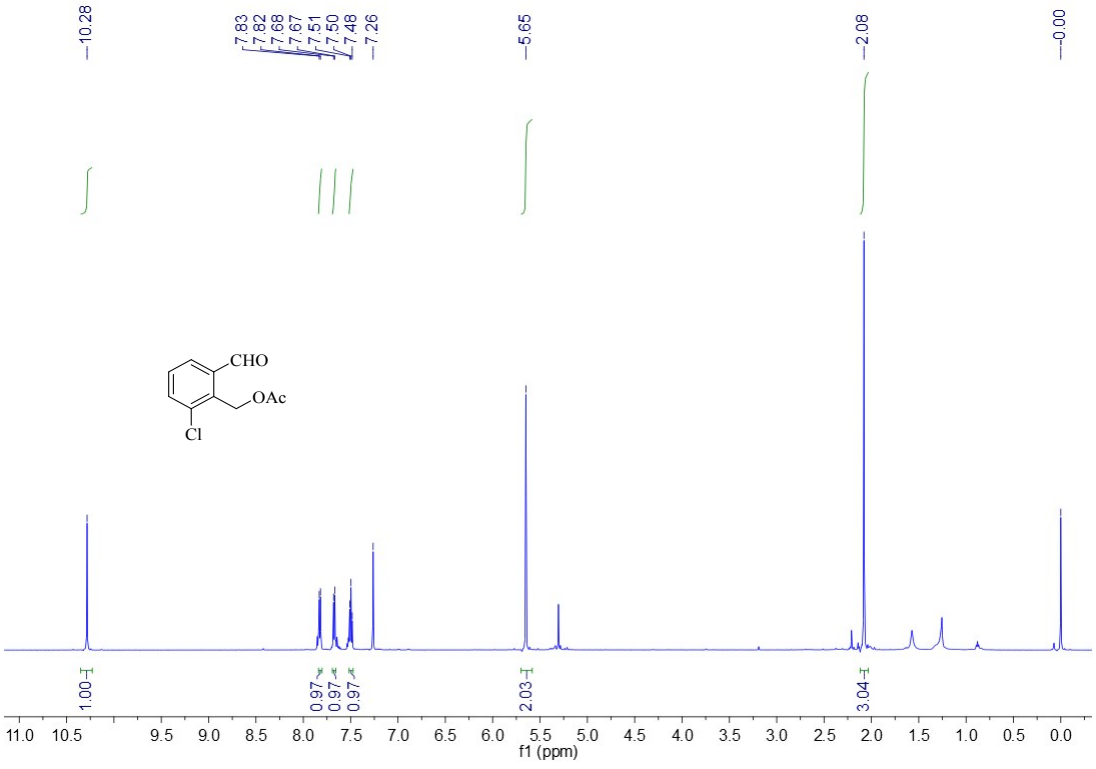
^{1}H NMR of 5-chloro-2-formylbenzyl acetate **2m**



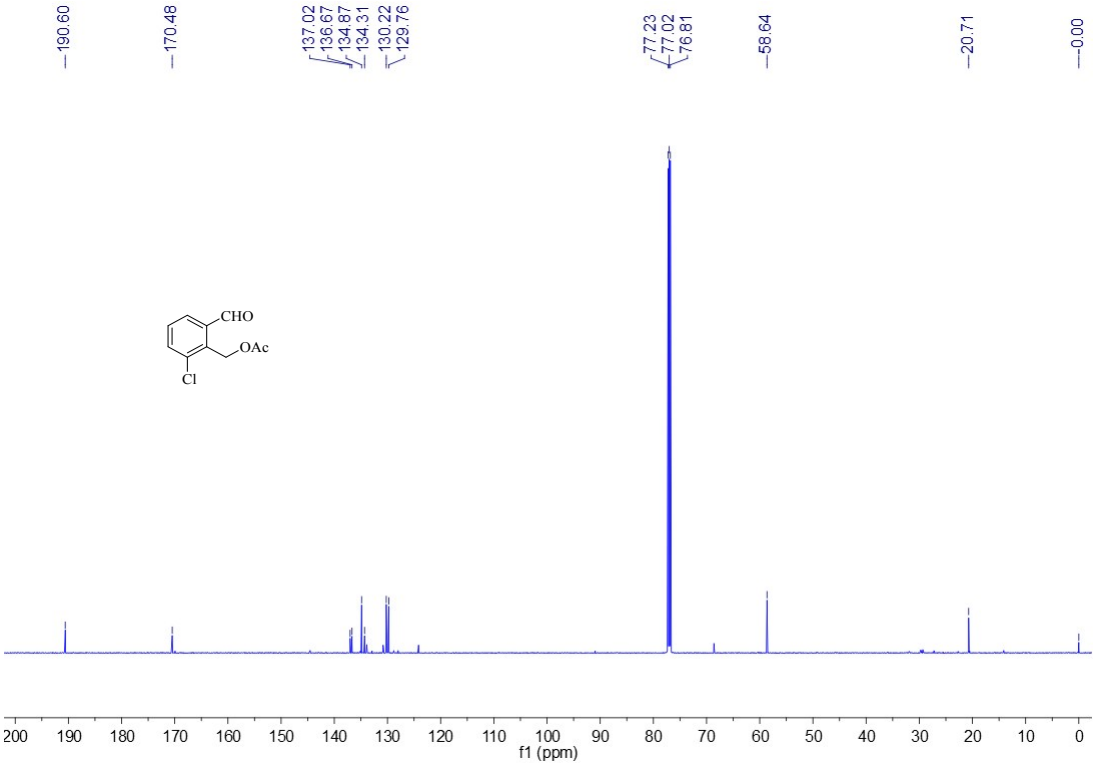
^{13}C NMR of 5-chloro-2-formylbenzyl acetate **2m**.



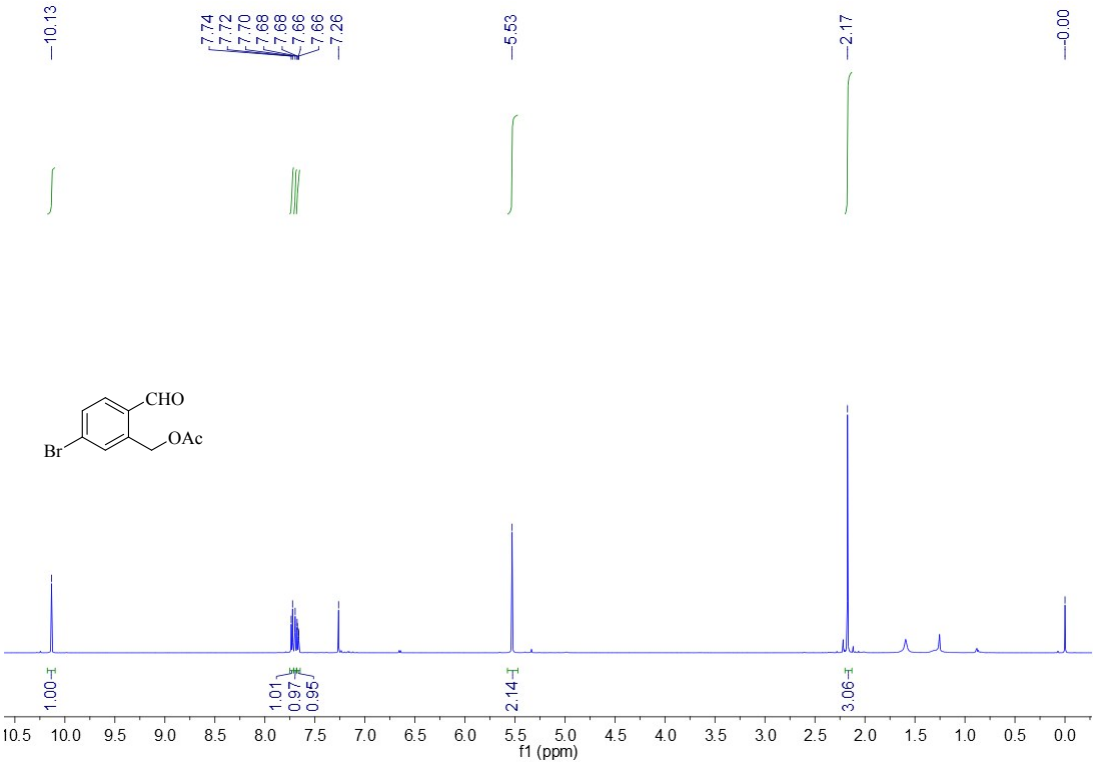
^{1}H NMR of 2-chloro-6-formylbenzyl acetate **2n**



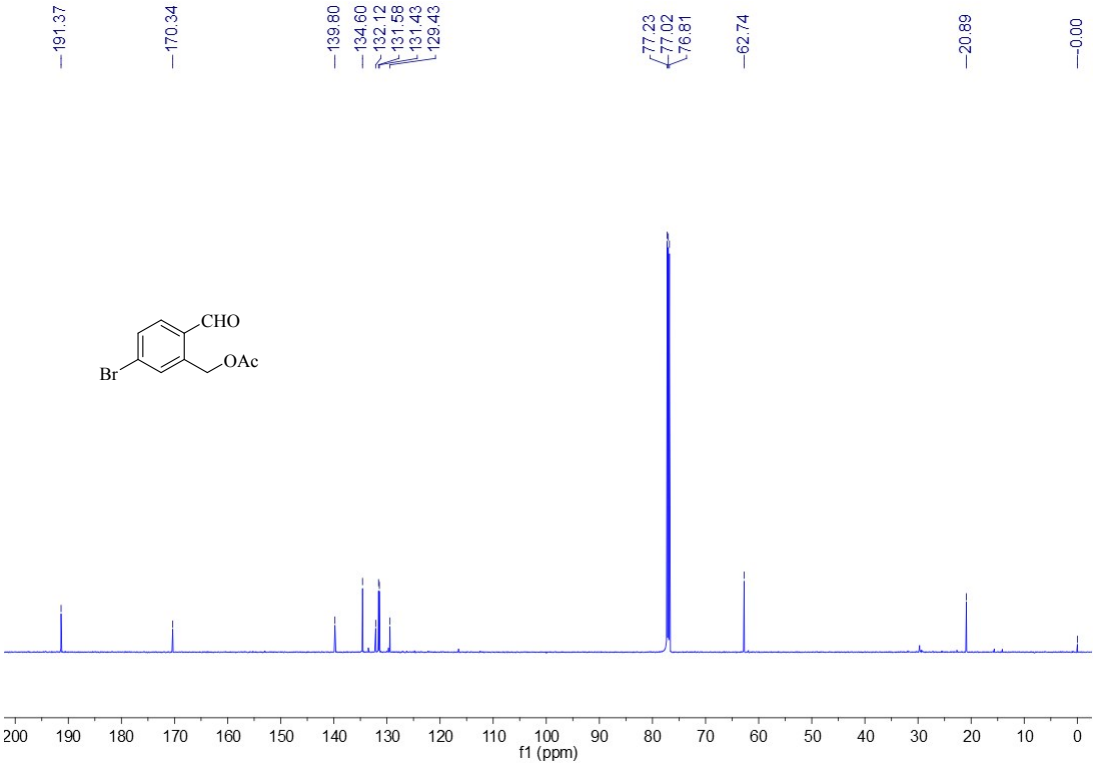
^{13}C NMR of 2-chloro-6-formylbenzyl acetate **2n**



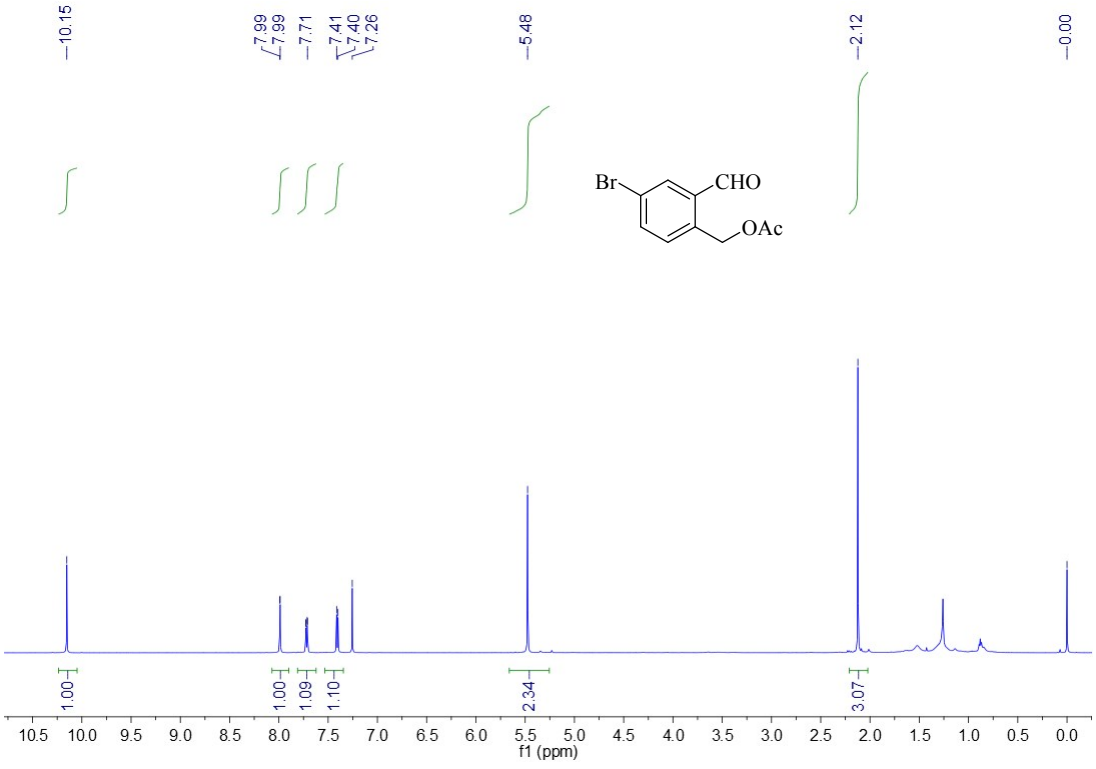
^{1}H NMR of 5-bromo-2-formylbenzyl acetate **2o**



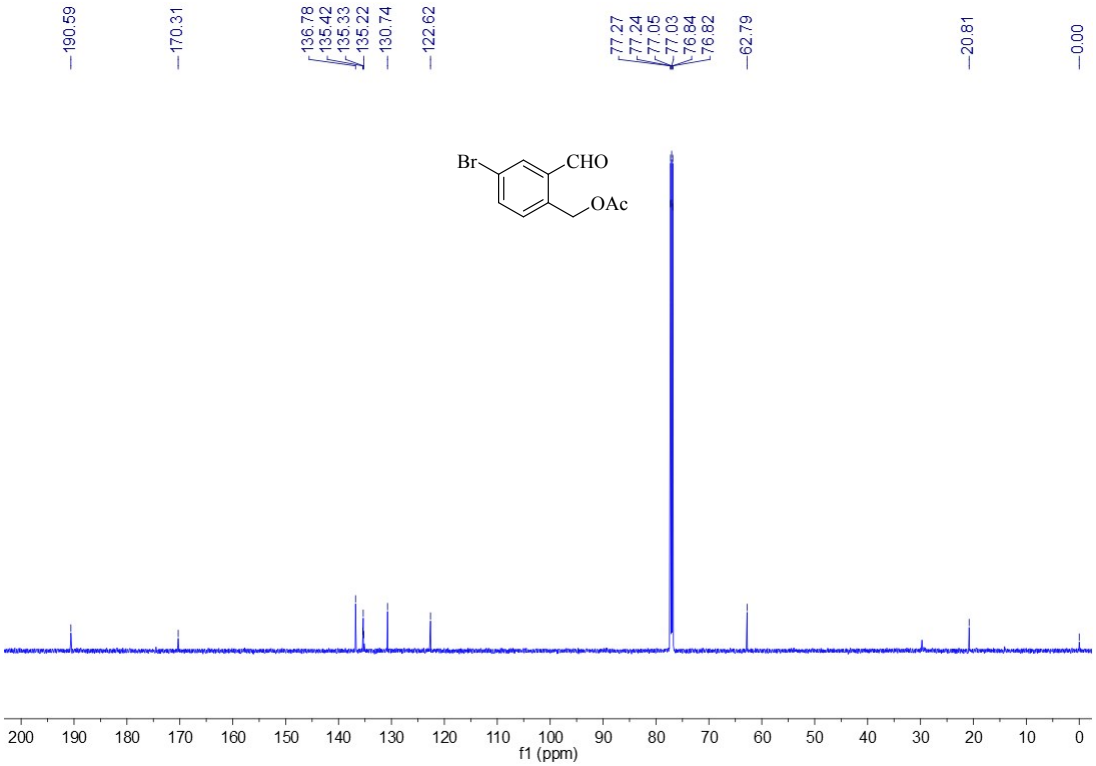
^{13}C NMR of 5-bromo-2-formylbenzyl acetate **2o**



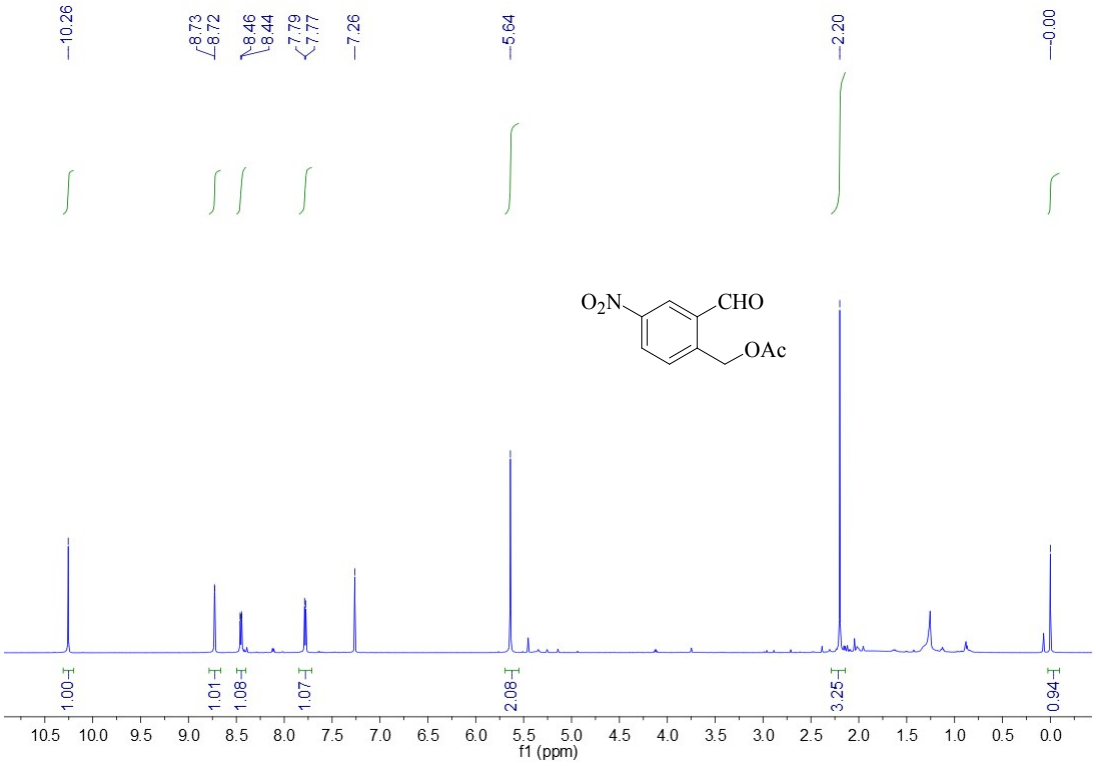
^{1}H NMR of 4-bromo-2-formylbenzyl acetate **2p**



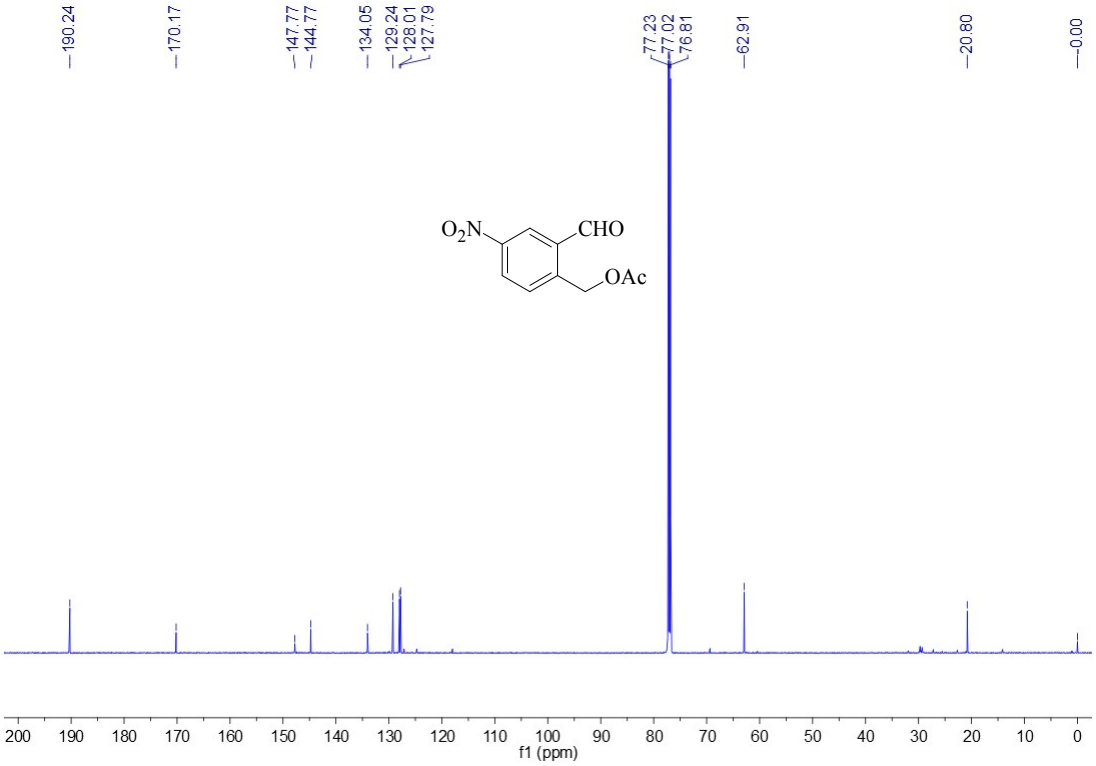
^{13}C NMR of 4-bromo-2-formylbenzyl acetate **2p**



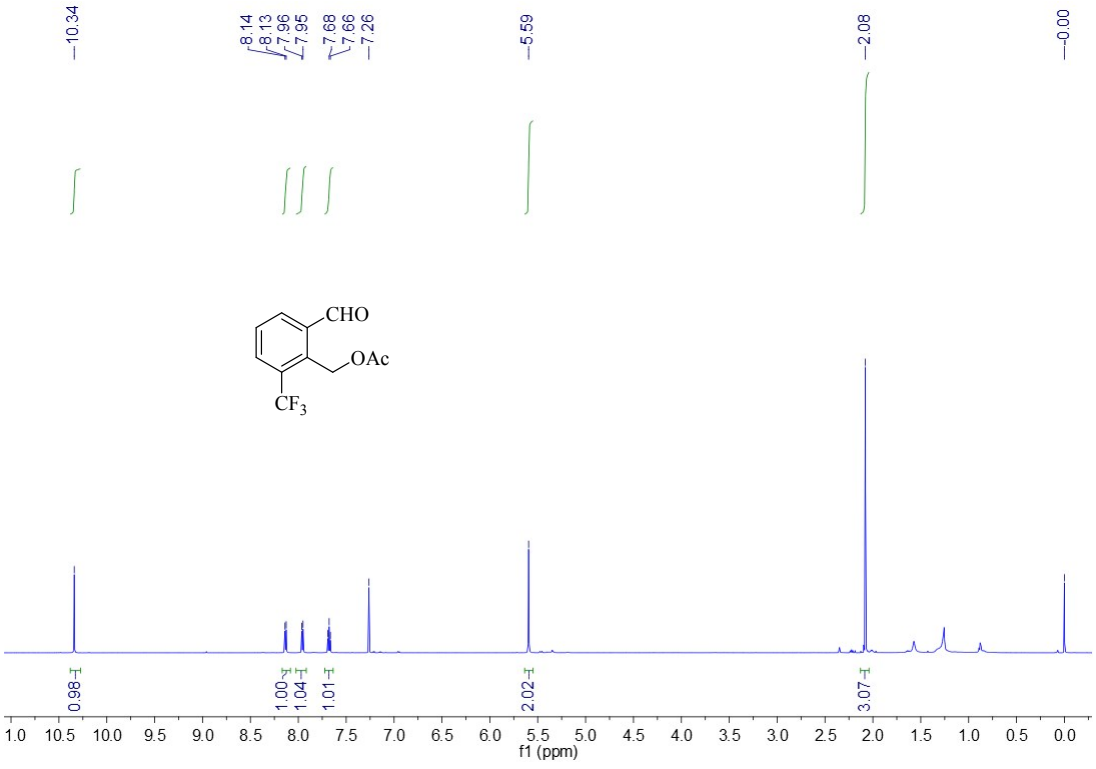
^{1}H NMR of 2-formyl-4-nitrobenzyl acetate **2q**



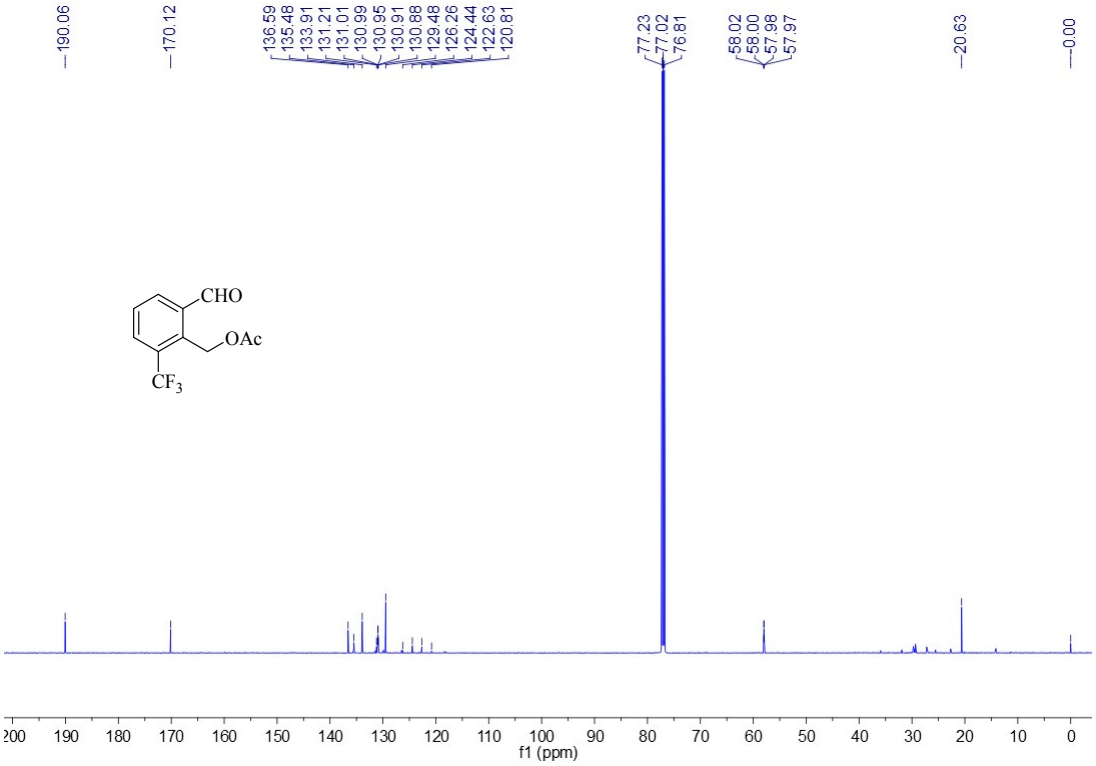
^{13}C NMR of 2-formyl-4-nitrobenzyl acetate **2q**



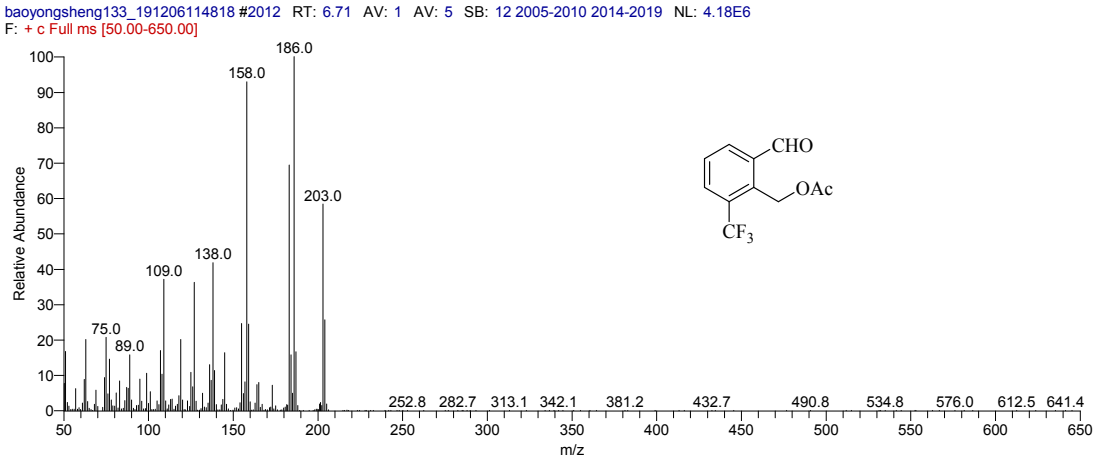
^{1}H NMR of 2-formyl-6-(trifluoromethyl)benzyl acetate **2r**



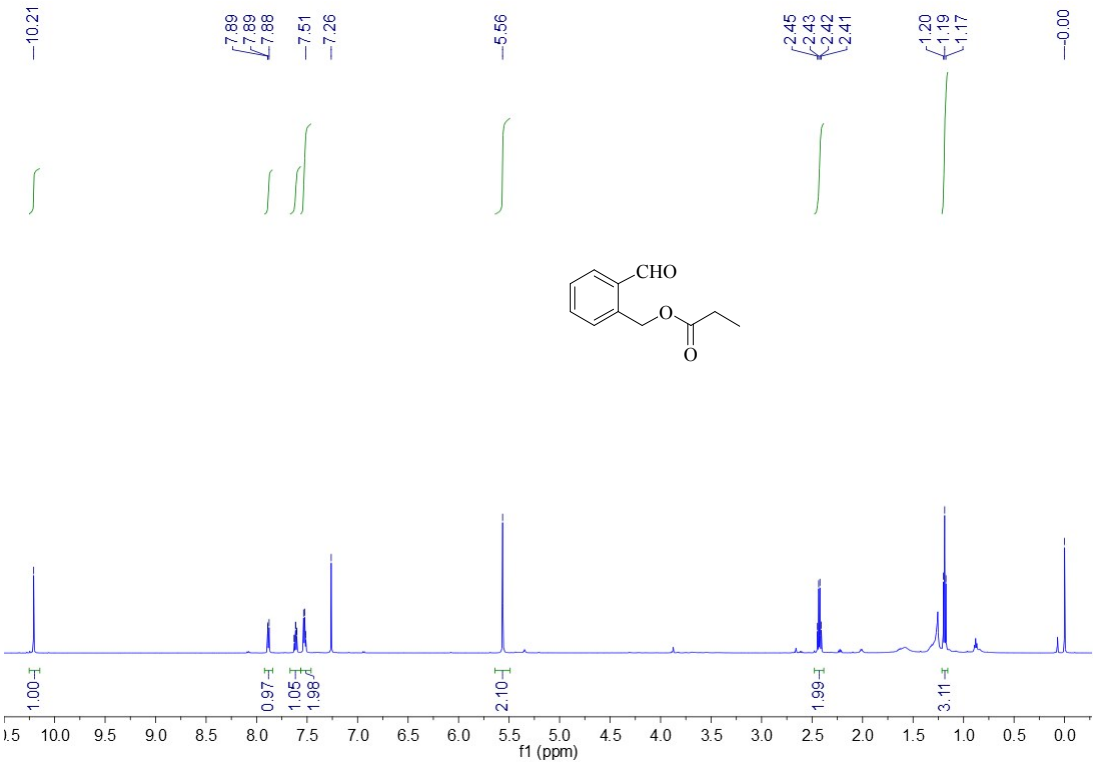
^{13}C NMR of 2-formyl-6-(trifluoromethyl)benzyl acetate **2r**



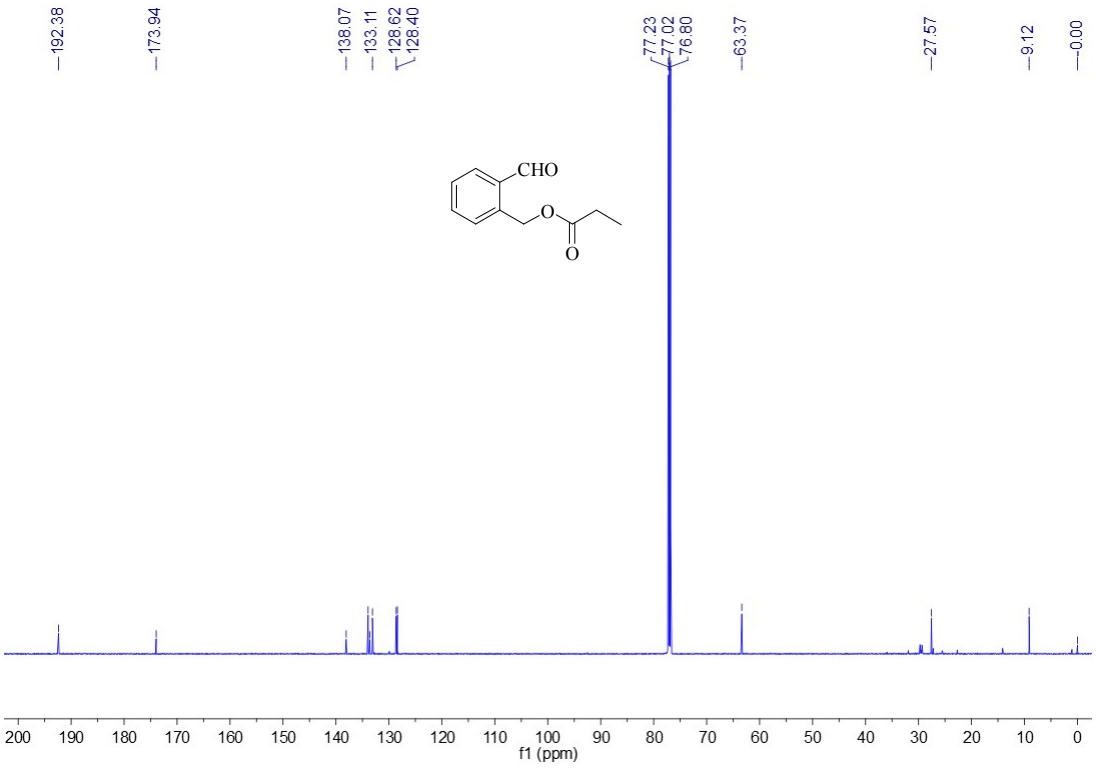
MS(EI) of 2-formyl-4-(trifluoromethyl)benzyl acetate **2r**



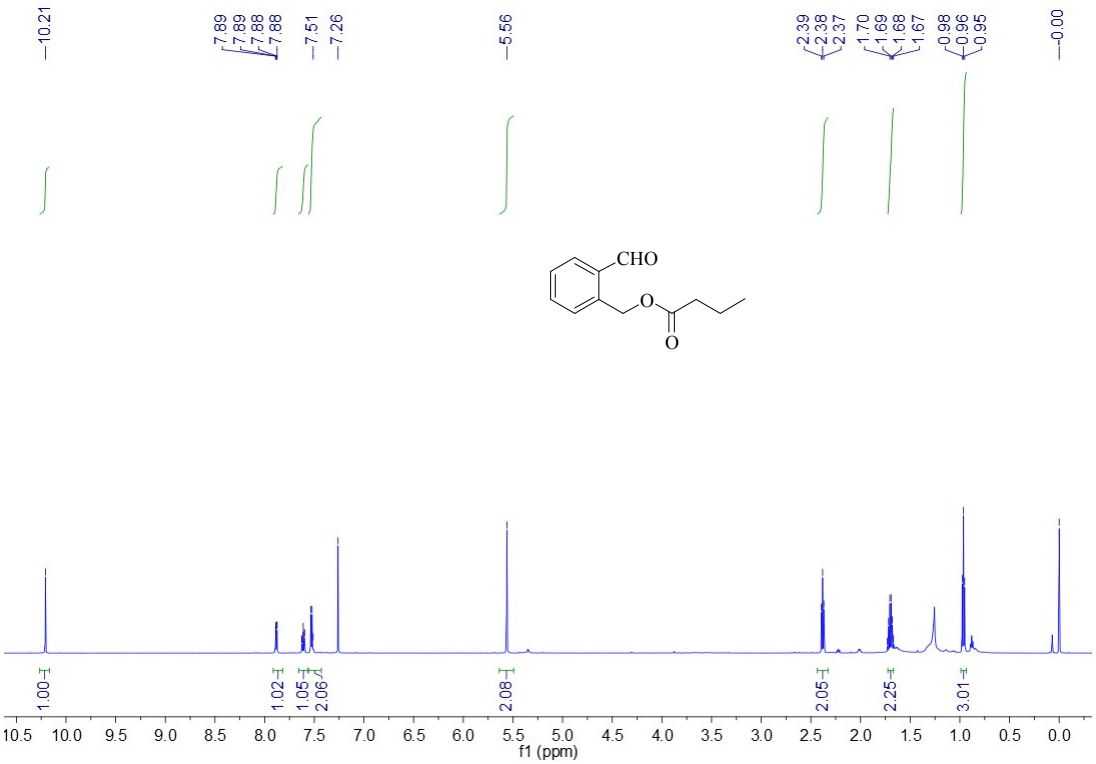
^{1}H NMR of propionic acid 2-formyl-benzyl ester **2s**



^{13}C NMR of propionic acid 2-formyl-benzyl ester **2s**



^{1}H NMR of butyric acid 2-formyl-benzyl ester **2t**



^{13}C NMR of butyric acid 2-formyl-benzyl ester **2t**