Electronic Supplementary Material (ESI) for ChemComm.

Supporting Information

General experimental details	S2
General Procedures for Products	S2
The Pictures of Oxidation of α–**1**(α-Isophorone) Catalyzed by $Rh_2(esp)_2$ and $Rh_2(cap)_4$	S3
Gas Chromatography (GC) analysis of oxidation of α–**1**(α-Isophorone) catalyzed by $Rh_2(esp)_2$ and $Rh_2(OAc)_4$	S3-5
$Rh_2(esp)_2$ catalyst recycling experiment	S5
Spectroscopic Data of the Catalysts and Isolated Products	S5-10
Reference	S11-12
^1H and ^{13}C NMR Spectrum of compounds	S13-34

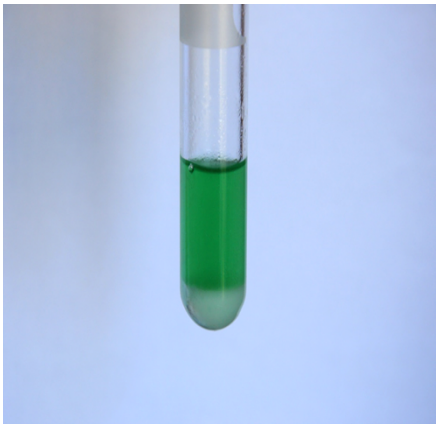
General experimental details

All reagents were obtained from commercial sources. All reactions were run under atmospheric conditions unless otherwise indicated. Yields reported are for isolated yields unless otherwise noted. [$Rh_2(cap)_4 \cdot 2CH_3CN$] was purchased from Alfa Aesar. $Rh_2(esp)_2$ was purchased from Aldrich or prepared as described.[1] The preparation of $Rh_2(MPDP)_2$ and $Rh_2(OAc)_4(IMes)$ have been previously described.[2,4] $Rh_2(MPDP)(CO_2CF_3)_2$ was prepared as Taber and co-workers described.[3] *tert*-Butyl hydroperoxide (TBHP) was purchased from Aldrich as a 5.5 M solution in decane and stored over activated 3Å molecular sieves. 70% *tert*-Butyl hydroperoxide in water (T-HYDRO) was purchased from Alfa Aesar. Gas Chromatography (GC) spectra were obtained on Agilent 7820A using DB-624 column. UV/visible spectroscopy spectra were carried out on Shimadzu UV-2450. ^1H NMR and ^{13}NMR spectra were measured on a 300 MHz or 400 MHz Bruker spectrometer using $CDCl_3$ as the solvent. Chemical shifts are given in δ relative to TMS. High resolution mass spectrometric measurements were carried out using a Bruker autoflex MALDI-TOF mass spectrometer and Waters-Q-TOF Premier (ESI).

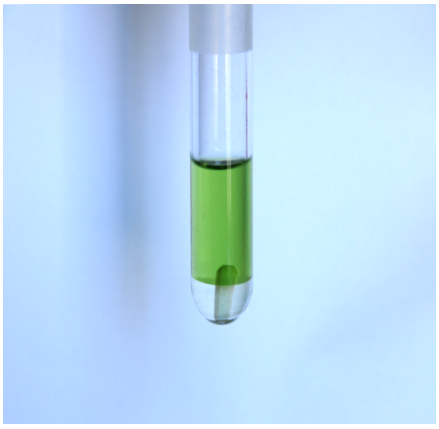
General Procedures for Products

A 10 mL tube equipped with a stir bar was charged with substrate (4 mmol) and $Rh_2(esp)_2$ (3 mg, 0.004 mmol), then sealed by a rubber plug with a needle, followed by the addition of T-HYDRO (2.84 mL, 20 mmol) via syringe. After 24 hours, saturated sodium thiosulfate solution was added to quench the reaction. The mixture was extracted with ethyl acetate (3 × 5 mL) and washed with water (2 × 10 mL). The ethyl acetate layer was separated and dried over $MgSO_4$. After evaporation of the solvent, the residue was purified by flash column chromatography (ethyl acetate/hexane) to give the desired products.

The Pictures of the Oxidation Reaction of □α-Isophorone Catalyzed by $Rh_2(esp)_2$ and $Rh_2(cap)_4$

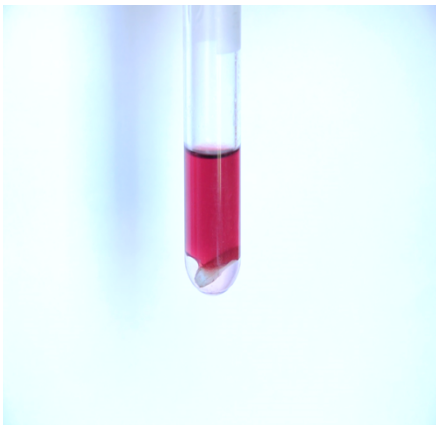


at the beginning of the reaction.

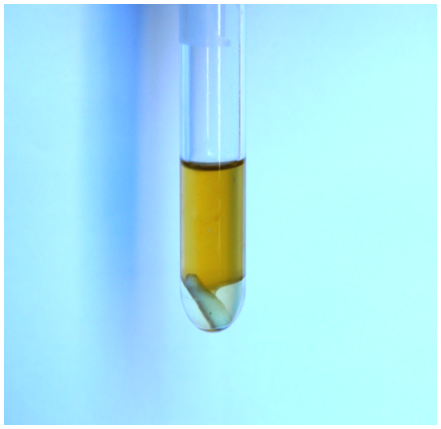


at the end of the reaction

Figure 1 the reaction catalyzed by $Rh_2(esp)_2$



at the beginning of the reaction



at the end of the reaction

Figure 2 the reaction catalyzed by $Rh_2(cap)_4$

Gas Chromatography (GC) analysis of oxidation of □α-Isophorone catalyzed by $Rh_2(esp)_2$ and $Rh_2(OAc)_4$

Gas Chromatography (GC) spectra were obtained on Agilent 7820A using DB-624 column (30 m × 0.32 mm). GC conditions: isotherm at 40 ºC (6 min); ramp at 10 ºC min^{-1} to 180 ºC; isotherm at 180 ºC (5 min).

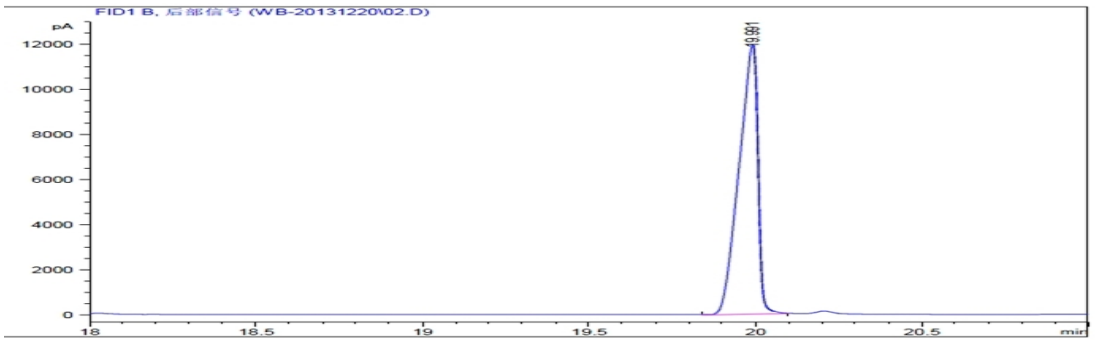


Figure 3 **α–1** (α-Isophorone) t_R = 19.99 min

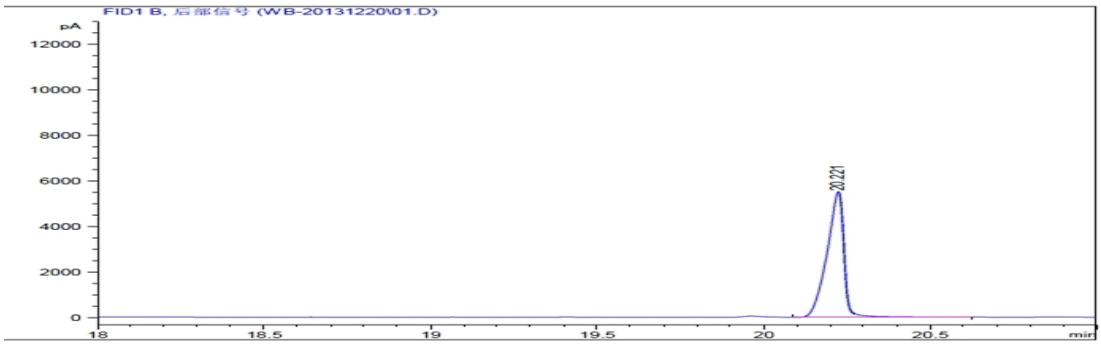


Figure 4 **2** (2,6,6-Trimethyl-cyclohex-2-ene-1,4-dione) t_R = 20.22 min

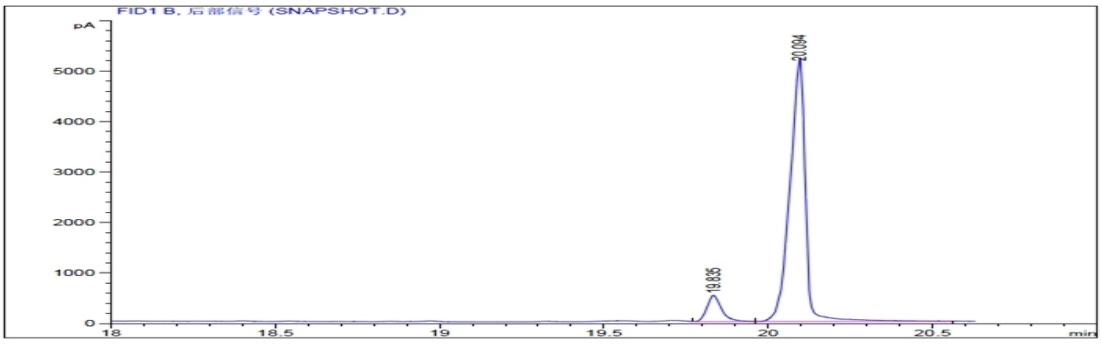


Figure 5 the reaction catalyzed by 0.1 mmol% $Rh_2(esp)_2$ under standard conditions

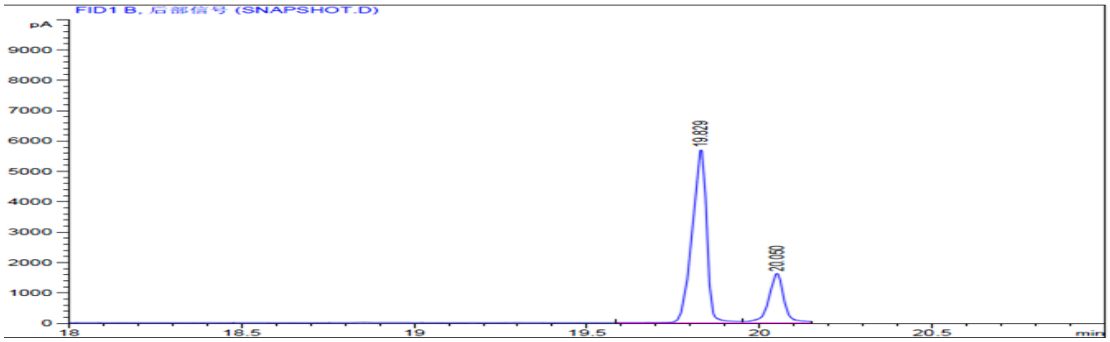


Figure 5 the reaction catalyzed by 0.1 mmol% $Rh_2(OAc)_4$ under standard conditions

The conversion of oxidation of **α–1** (α-isophorone) catalyzed by 0.1 mol% $Rh_2(esp)_2$ and $Rh_2(cap)_4$

0.1 mol% catalyst	Conversion (%)		
	6 hr	10 hr	24 hr
$Rh_2(esp)_2$	59	71	91
$Rh_2(cap)_4$	38	43	49

The conversion of oxidation of **α–1** (α-isophorone) catalyzed by 0.01 mol% $Rh_2(esp)_2$ and $Rh_2(cap)_4$

0.01 mol% catalyst	Conversion (%)		
	4 day	7 day	10 day
$Rh_2(esp)_2$	62	78	88
$Rh_2(cap)_4$	8	18	18

$Rh_2(esp)_2$ catalyst recycling experiment

Treatment of α-**1** (3.6 g, 26 mmol) under standard conditions (0.1 mol % of $Rh_2(esp)_2$, 5.0 equiv T-HYDRO, nonesolvent) afforded **2** 96% conversion and 75% yield accompanied by the 10 mg $Rh_2(esp)_2$ (50% recovery rate) recovered through chromatographic purification. *The* recovered catalyst from the first reaction was then added to α-**1** (1.8 g, 13 mmol), as well as another 5.0 equiv T-HYDRO, in order to initiate the second oxidation. When the recycling reaction finished, a 94% conversion, 77% yield of **2** resulted and the $Rh_2(esp)_2$ catalyst (6 mg, 60% recovery rate) was recovered. Further NMR study confirmed the recovered $Rh_2(esp)_2$ catalyst remained unchanged after two cycles.

Spectroscopic Data of the Catalysts and Isolated Products

$Rh_2(esp)_2$[1]: ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.09 (t, *J* = 7.5 Hz, 2H), 6.92 (s, 2H), 6.87 (dd, *J* = 7.5, 1.5 Hz, 4H), 2.66 (s, 8H), 1.03 (s, 24H). HRMS (ESI$^+$) m/z calcd for $C_{32}H_{40}O_8Rh_2$ 759.0906 ($[M+H]^+$) found 759.0913.

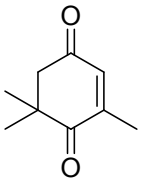
$Rh_2(MPDP)_2$[2] (acetone as the axial coordination): ^{1}H NMR (400 MHz,1% v/v d_4-MeOH in $CDCl_3$) δ 7.09 (t, *J* = 7.5 Hz, 2H), 6.86 (dd, *J* = 7.6, 1.5 Hz, 4H), 6.80 (s, 2H), 2.77 – 2.67 (m, 8H), 2.36 – 2.28 (m, 8H). HRMS (ESI$^+$) m/z calcd for $C_{24}H_{24}O_8Rh_2$ 646.9653 ($[M+H]^+$) found 646.9633.

$Rh_2(MPDP)(CO_2CF_3)_2$[3] (acetone as the axial coordination): ^1H NMR (400 MHz, 1% v/v d_4-MeOH in $CDCl_3$) δ 7.12 (t, *J* = 7.6 Hz, 1H), 6.89 (d, *J* = 7.5 Hz, 2H), 6.73 (s, 1H), 2.82 – 2.67 (m, 4H), 2.40 – 2.29 (m, 4H). HRMS (ESI$^+$) m/z calcd for $C_{16}H_{12}O_8F_6Rh_2$ 652.8619 ([M+H]$^+$) found 652.8630.

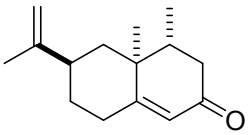
$Rh_2(OAc)_4(IMes)$[4]: ^1H NMR (400 MHz, CDCl3) δ 7.23 (s, 2H), 6.80 (s ,4H), 2.23 (s, 12H), 2.22 (s, 6H), 1.55 (s, 12H). HRMS (ESI$^+$) m/z calcd for $C_{29}H_{36}N_2O_8Rh_2$ 746.0582 ([M]$^+$) found 746.0584.

Dirhodium(II) Complex I[5] (acetone as the axial coordination): ^1H NMR (400 MHz, 3% v/v d_6-acetone in $CDCl_3$) δ 7.02 (t, *J* = 8.1 Hz, 2H), 6.46 (dd, *J* = 8.1, 2.2 Hz, 4H), 6.04 (s, 2H), 1.35 (s, 24H). HRMS (ESI$^+$) m/z calcd for $C_{28}H_{32}O_{12}Rh_2$ 767.0076 ([M+H]$^+$) found 766.8679.

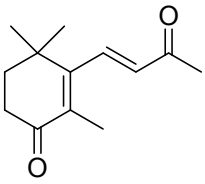
Dirhodium(II) Complex Ⅱ[5] (acetone as the axial coordination): ^1H NMR (400 MHz, 1% v/v d_4-MeOH in $CDCl_3$) δ 6.51 (s, 2H), 6.35 (s, 4H), 3.67 (s, 6H), 2.66 (m, 8H), 2.32 (m, 8H). HRMS (ESI$^+$) m/z calcd for $C_{26}H_{28}O_{10}Rh_2$ 705.9787 ([M]$^+$) found 705.9802.



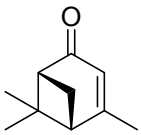
2,6,6-Trimethyl-cyclohex-2-ene-1,4-dione (2)[6]:^1H NMR (400 MHz, $CDCl_3$) δ 6.54 (s, 1H), 2.70 (s, 2H), 1.99 (s, 3H), 1.22 (s, 6H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 203.39, 197.68, 148.90, 137.02, 51.81, 45.13, 26.06, 16.78.



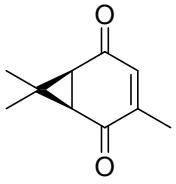
(+)-Nootkatone (4)[7]: ^1H NMR (400 MHz, $CDCl_3$) δ 5.77 (s, 1H), 4.74 (m, 1H), 4.72 (m, 1H), 1.74 (s, 3H), 1.11 (s, 3H), 0.96 (d, *J* = 6.8 Hz, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 199.66, 170.54, 149.08, 124.68, 109.23, 43.92, 42.07, 40.39, 39.33, 33.03, 31.62, 20.81, 16.85, 14.90.



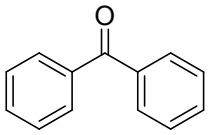
4-Oxo-β-ionone (6)[8]: ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.20 (d, *J* = 16.5 Hz, 1H), 6.19 (d, *J* = 16.4 Hz, 1H), 2.52 (t, *J* = 6.6 Hz, 2H), 2.34 (s, 3H), 1.88 (t, *J* = 7.0 Hz, 2H), 1.79 (s, 3H), 1.18 (s, 6H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 198.62, 197.46, 157.78, 140.36, 133.54, 131.41, 37.30, 35.55, 34.18, 27.97, 27.31, 13.43.



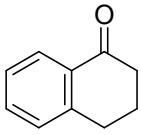
(S)-(-)-α-Verbinone (8)[9]: ^{1}H NMR (400 MHz, $CDCl_3$) δ 5.73 (m, 1H), 2.79 (m, 1H), 2.64 (dt, *J* = 6.0, 1.7 Hz, 1H), 2.41 (t, *J* = 6.5 Hz, 1H), 2.07 (d, *J* = 9.1 Hz, 1H), 2.01 (d, *J* = 1.5 Hz , 3H), 1.49 (s, 3H), 1.01 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 204.15, 170.43, 121.18, 57.60, 54.20, 49.73, 40.87, 26.59, 23.57, 22.04.



3,7,7-Trimethylbicyclo[4.1.0]hept-3-ene-2,5-dione (10)[10]: ^{1}H NMR (400 MHz, $CDCl_3$) δ 6.49 (m, 1H), 2.32 (m, 2H), 1.96 (d, *J* = 4.0 Hz, 3H), 1.32 (s, 3H), 1.31 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 194.97, 194.36, 149.97, 137.64, 39.82, 38.98, 33.55, 29.07, 16.20, 15.43.

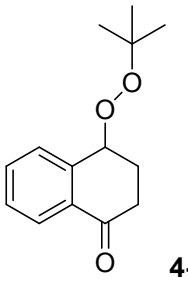


Benzophenone (12)[11]: ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.84 – 7.77 (m, 4H), 7.57-7.61 (m,2H), 7.49 (t, *J* = 7.5 Hz, 4H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 196.76, 137.60, 132.42, 130.06, 128.28.

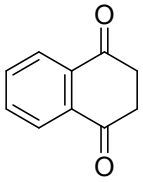


1-Tetralone (14)[12]: ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.03 (d, *J* = 7.8 Hz, 1H), 7.46 (t, *J* = 7.5 Hz, 1H), 7.29 (t, *J* = 7.8 Hz, 1H), 7.25 (d, *J* = 7.6 Hz, 1H), 2.96 (t, *J* = 6.1 Hz, 2H), 2.65 (m, 2H), 2.13

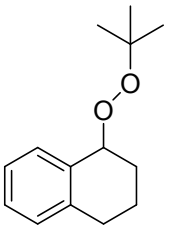
(m, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 198.40, 144.50, 133.40, 132.59, 128.78, 127.14, 126.62, 39.17, 29.70, 23.29.



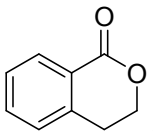
4-(*tert*-Butylperoxy)-3,4-dihydronaphthalen-1(2H)-one (15)[13]: ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.04 (d, *J* = 7.9 Hz, 1H), 7.53-7.59 (m, 2H), 7.45 (t, *J* = 7.3 Hz, 1H), 5.13 (t, *J*= 4.0 HZ, 1H), 2.93-3.01 (m, 1H), 2.52-2.62 (m, 2H), 2.28-2.36 (m, 1H), 1.24 (s, 9H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 197.74, 140.01, 133.49, 132.35, 129.74, 129.09, 127.01, 80.57, 78.16, 33.96, 26.73, 26.45.



2,3-Dihydronaphthalene-1,4-dione (16)[14]: ^{1}H NMR (300 MHz, $CDCl_3$) δ 8.04-8.07 (m, 2H), 7.73-7.76 (m, 2H), 3.09 (s, 4H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 195.98, 138.67, 135.25, 134.28, 133.94, 126.73, 126.41, 37.54.

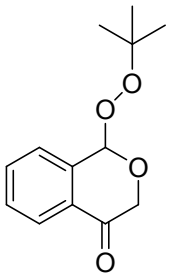


1-(*tert*-Butylperoxy)tetralin (17)[15]**:** ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.45 (d, *J* = 7.3 Hz, 1H), 7.16-7.24 (m, 2H), 7.11 (d, *J* = 7.3 Hz, 1H), 5.00 (t, *J* = 3.6 Hz, 1H), 2.82 (dt, *J* = 16.6, 4.8 Hz, 1H), 2.76 – 2.64 (m, 1H), 2.35-2.41 (m, 1H), 1.92-2.03 (m, 1H), 1.71-1.84 (m, 2H), 1.30 (s, 9H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 138.82, 133.41, 130.98, 129.03, 128.15, 125.61, 80.04, 78.79, 29.36, 27.08, 26.66, 18.10.

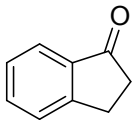


3,4-Dihydroisochromen-1-one (19)[16]: ^{1}H NMR (300 MHz, $CDCl_3$) δ 8.08 (d, *J* = 7.7 Hz, 1H), 7.53 (m, 1H), 7.38 (t, *J* = 7.8 Hz, 1H), 7.27 (d, *J* = 7.3 Hz, 1H), 4.52 (t, *J* = 6.0 Hz, 2H), 3.05 (t, *J*

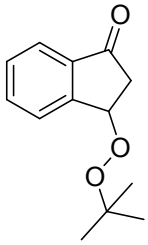
= 6.0 Hz, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 165.13, 139.55, 133.67, 130.40, 127.69, 127.24, 125.32, 67.31, 27.84.



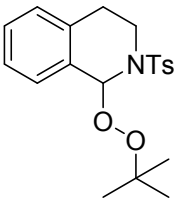
1-(*tert*-Butylperoxy)-1*H*-isochromen-4(3*H*)-one (20)[17]: ^{1}H NMR (300 MHz, $CDCl_3$) δ 8.02 (d, *J* = 6.5 Hz, 1H), 7.65 (dt, *J* = 7.5 Hz, 1.5 Hz, 1H), 7.55 (dt, *J* = 7.0 Hz,1.4 Hz, 1H), 7.42 (d, *J* = 7.1 Hz, 1H), 6.20 (s, 1H), 4.85 (d, *J* = 17.4 Hz, 1H), 4.37 (d, *J* = 17.4 Hz, 1H), 1.33 (s, 9H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 193.57, 135.97, 134.42, 130.14, 129.58, 127.14, 126.01, 99.44, 81.65, 66.26, 26.45.



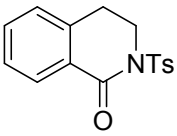
1-Indanone (22)[18]: ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.76 (d, *J* = 7.7 Hz, 1H), 7.58 (m, 1H), 7.47 (d, *J* = 7.7 Hz, 1H), 7.36 (t, *J* = 7.4 Hz, 1H), 3.14 (t, *J* = 5.6 Hz, 2H), 2.69 (m, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 207.09, 155.17, 137.09, 134.60, 127.28, 126.70, 123.72, 36.23, 25.81.



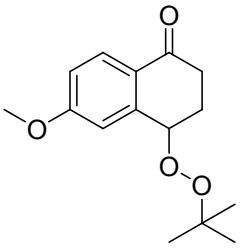
1-(t-Butylperoxy)indan-3-one (23)[19]: ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.78 (m, 2H), 7.66 (t, *J* = 7.5 Hz, 1H), 7.51 (t, *J* = 7.4 Hz, 1H), 5.65 (dd, *J* = 6.4, 2.4 Hz, 1H), 2.99 (dd, *J* = 19.2, 6.4 Hz, 1H), 2.82 (dd, *J* = 19.1, 2.5 Hz, 1H), 1.27 (s, 9H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 207.09, 155.17, 137.09, 134.60, 127.28, 126.70, 123.72, 36.23, 25.81.



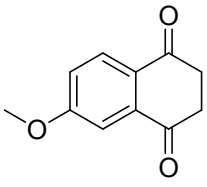
1-(tert-Butylperoxy)-2-tosyl-1,2,3,4-tetrahydroisoquinoline (25)[20]: ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.84 (d, *J* = 8.3 Hz, 2H), 7.40 (d, *J* = 8.8 Hz, 1H), 7.22-7.29 (m, 4H), 7.11 (d, *J* = 7.2 Hz, 1H), 6.55 (s, 1H), 3.80 (dd, *J* = 14.0, 4.9 Hz, 1H), 3.51-3.58(m, 1H), 2.90-2.99 (m, 1H), 2.68 (d, *J* = 20.2 Hz, 1H), 2.40 (s, 3H), 1.19 (s, 9H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 143.04, 138.13, 135.35, 130.16, 129.40, 129.27, 129.08, 127.88, 127.66, 126.32, 85.45, 80.88, 38.58, 28.16, 26.48, 21.49.



2-Tosyl-3,4-dihydroisoquinolin-1(2H)-one (26)[21]: ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.99 (d, *J* = 8.0 Hz, 1H), 7.98 (d, *J* = 8.4 Hz, 2H), 7.47 (t, *J* = 5.8 Hz, 1H), 7.33 (d, *J* = 8.6 Hz, 3H), 7.21 (d, *J* = 7.6 Hz, 1H), 4.27 – 4.20 (m, 2H), 3.13 (t, *J* = 6.2 Hz, 2H), 2.42 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 163.50, 144.76, 139.25, 136.15, 133.50, 129.43, 129.21, 128.59, 128.25, 127.41, 44.74, 28.97, 21.68.



4-(tert-Butylperoxy)-6-methoxy-3,4-dihydronaphthalen-1(2H)-one (28): ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.51 (d, *J* = 2.8 Hz, 1H), 7.44 (d, *J* = 8.5 Hz, 1H), 7.12 (dd, *J* = 8.4, 2.8 Hz, 1H), 5.08 (t, *J* = 3.6 Hz, 1H), 3.85 (s, 3H), 2.97 (m, 1H), 2.58 (m, 2H), 2.25 (m, 1H), 1.24 (s, 9H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 197.80, 160.21, 133.65, 132.43, 131.49, 121.36, 109.24, 80.45, 55.55, 33.64, 26.47. HRMS (ESI^+) m/z calcd for $C_{15}H_{12}O_4$ 265.1434 ($[M+H]^+$) found 265.1437.



6-Methoxy-2,3-dihydronaphthalene-1,4-dione (29)[22]: ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.01 (d, *J* = 8.7 Hz, 1H), 7.44 (d, *J* = 2.7 Hz, 1H), 7.22 (dd, *J* = 8.7, 2.7 Hz, 1H), 3.93 (s, 3H), 3.01-3.09 (m, 4H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 196.27, 194.80, 164.30, 137.34, 129.23, 128.92, 121.67, 108.87, 55.93, 37.75, 37.16.

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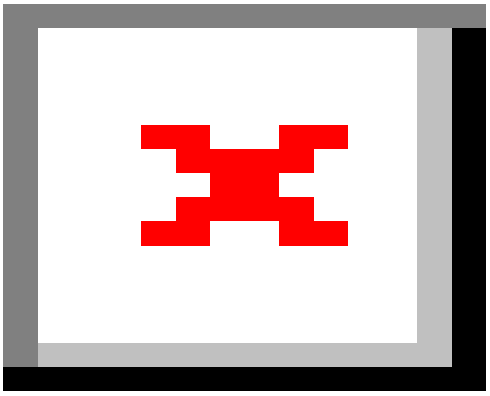
^{1}H and ^{13}C NMR Spectrum of compounds

^{1}H NMR of $Rh_2(esp)_2$

$Rh_2(esp)_2$



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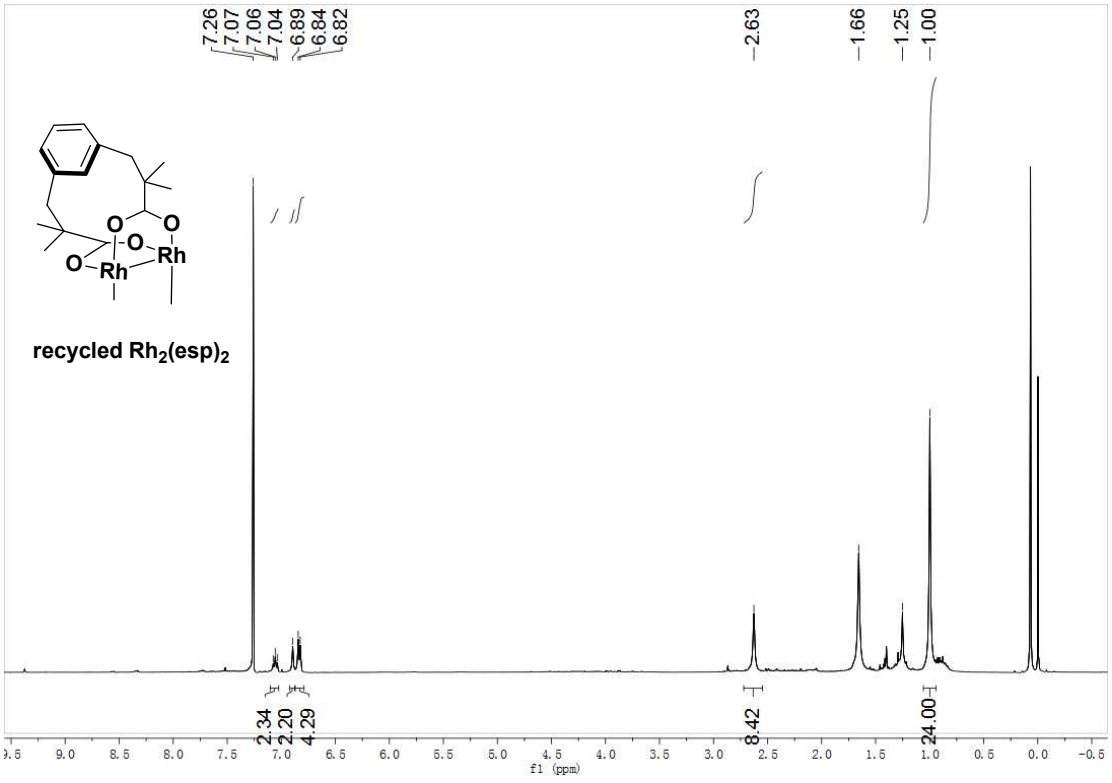

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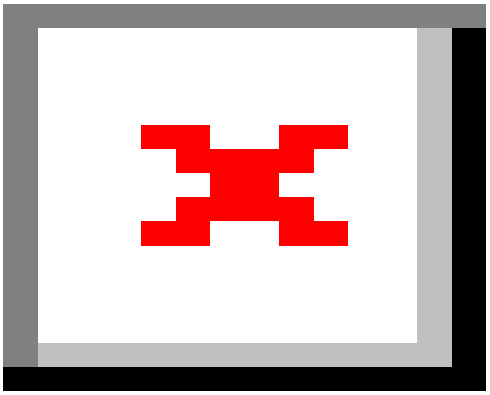

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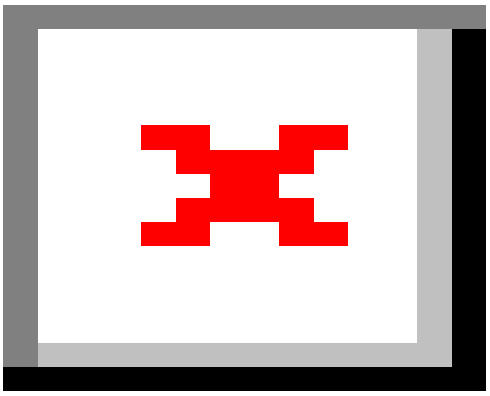

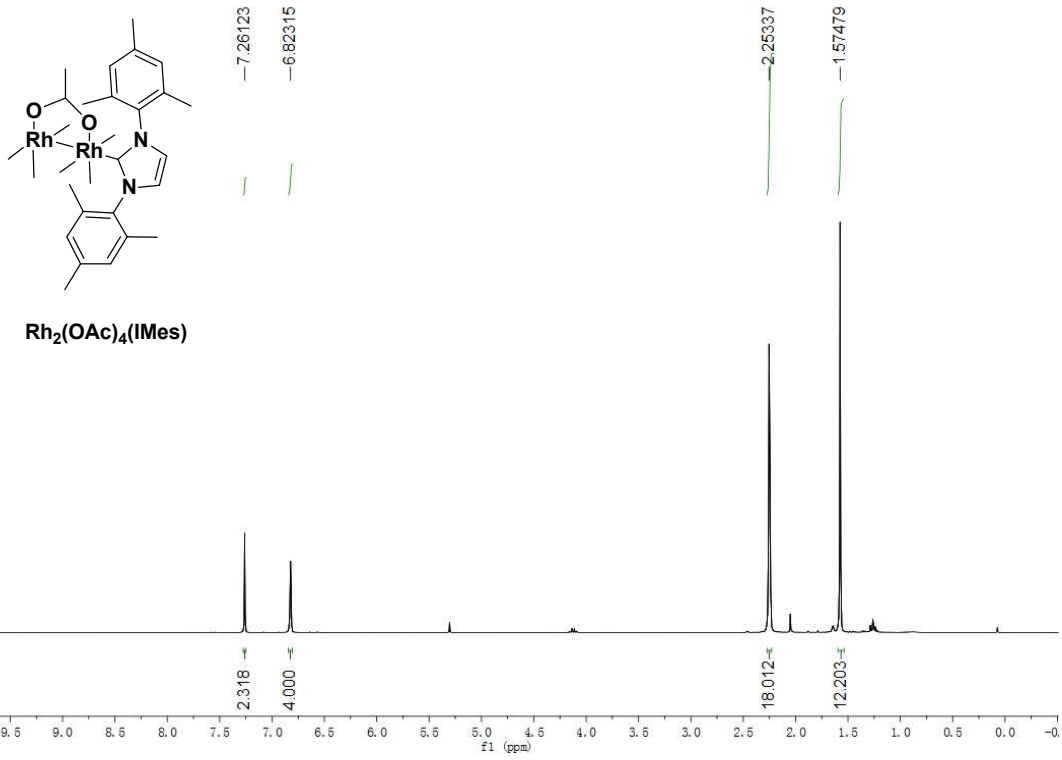
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4.000
18.012
12.203
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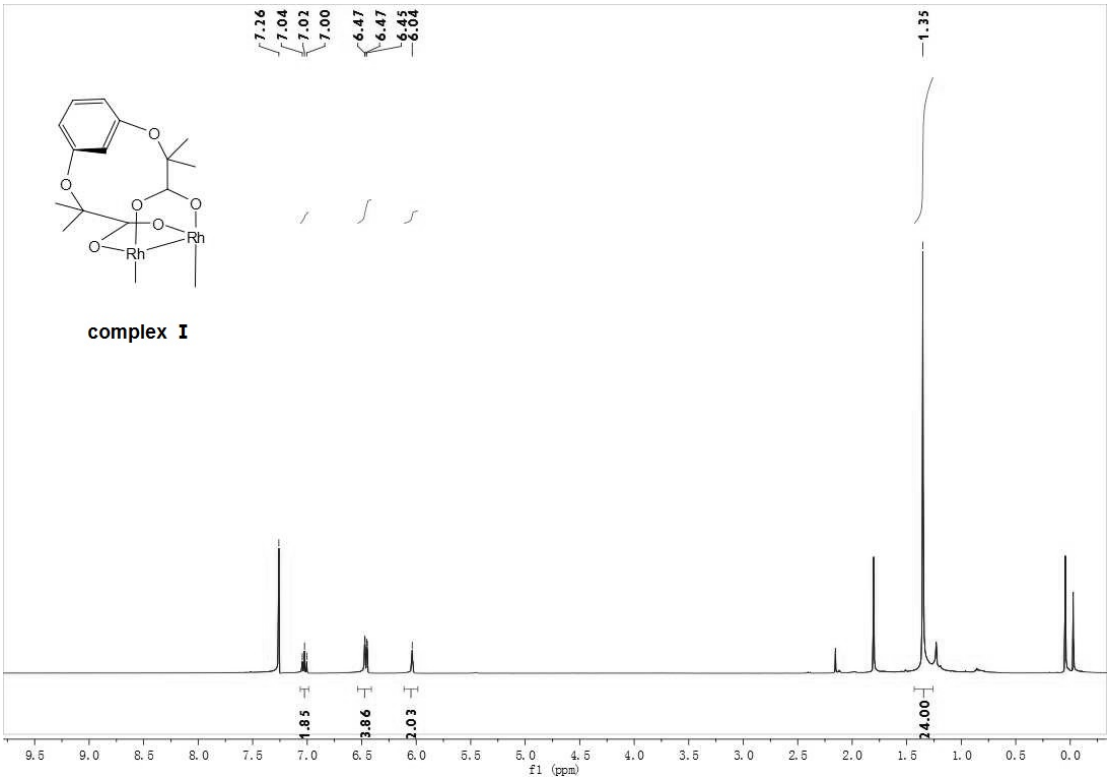
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7.04
7.02
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6.47
6.45
6.04
1.35
1.85
3.86
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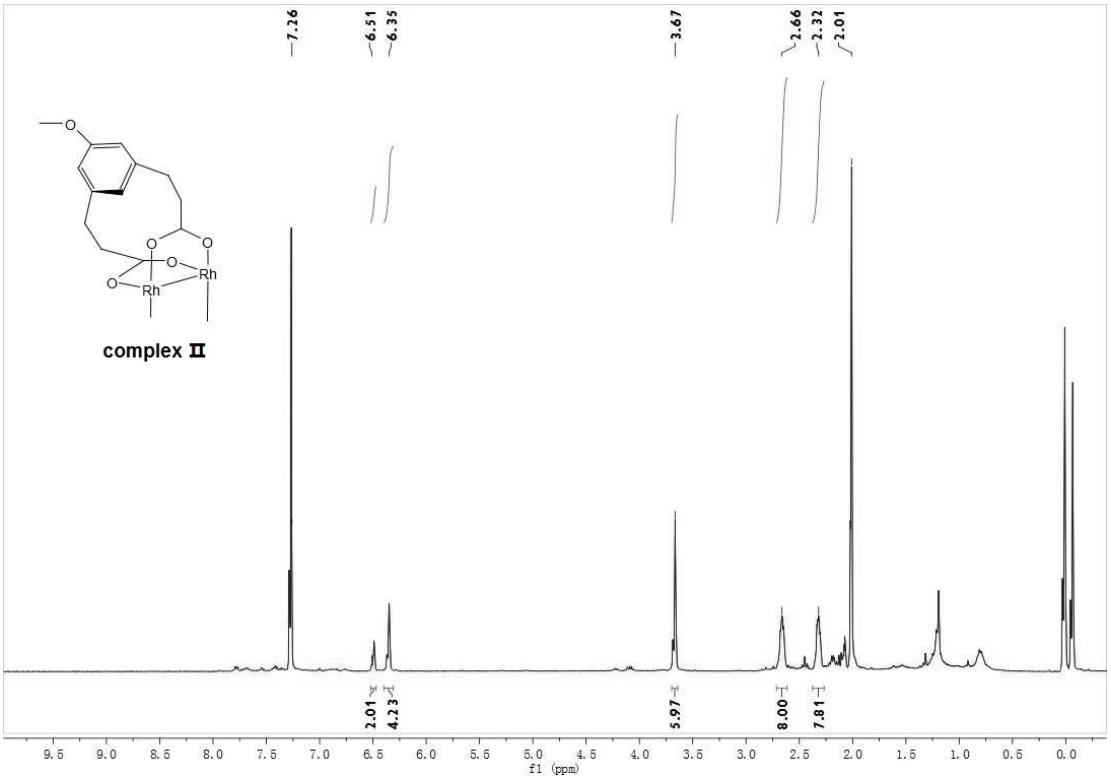
24.00
f1 (ppm)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3.67
2.66
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2.01
O
O
O
O
Rh
Rh
complex Ⅱ
2.01
4.23
5.97
8.00
7.81
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0
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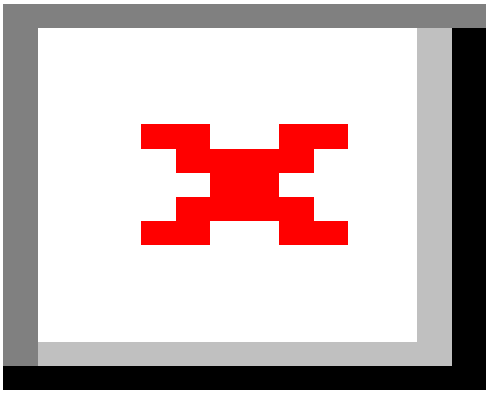

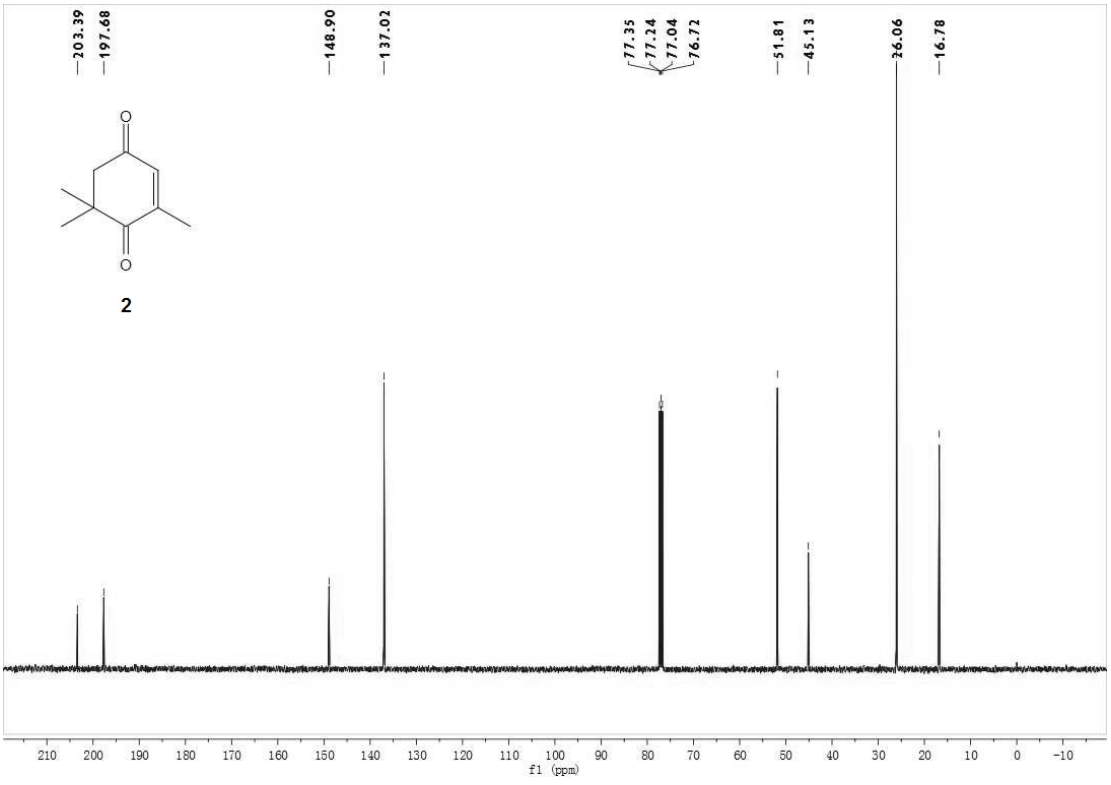
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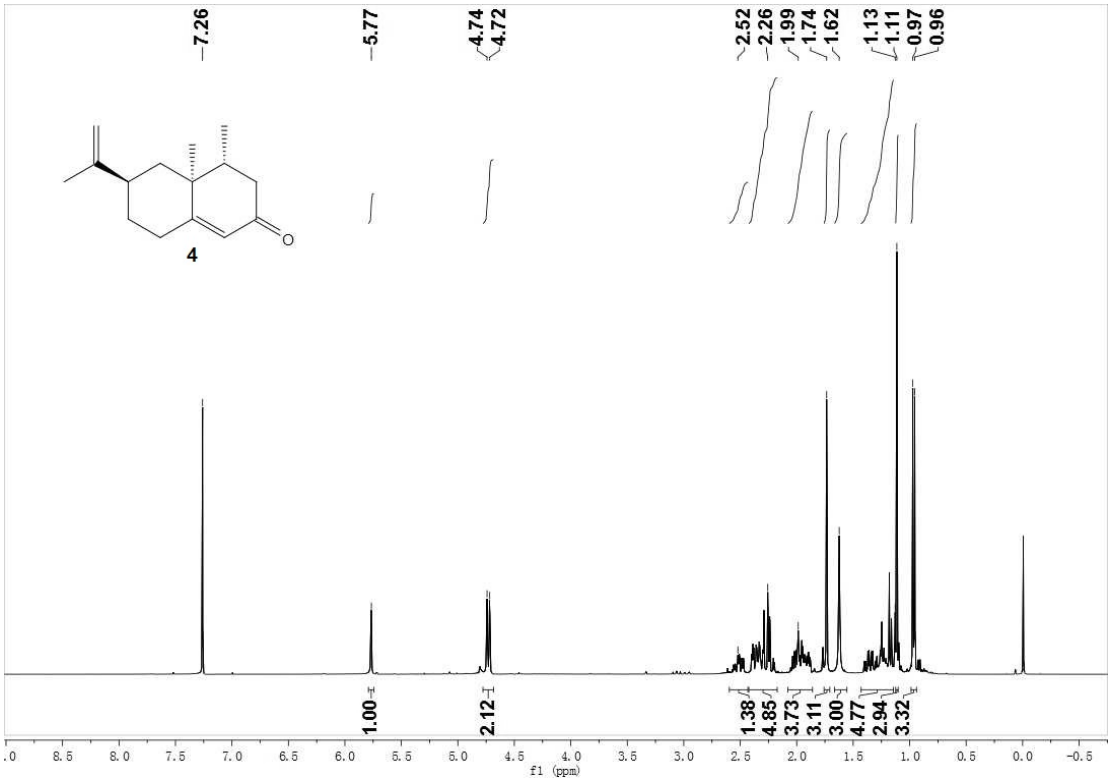
77.35
77.24
77.04
76.72
51.81
45.13
26.06
16.78
O
O
2
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)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2.26
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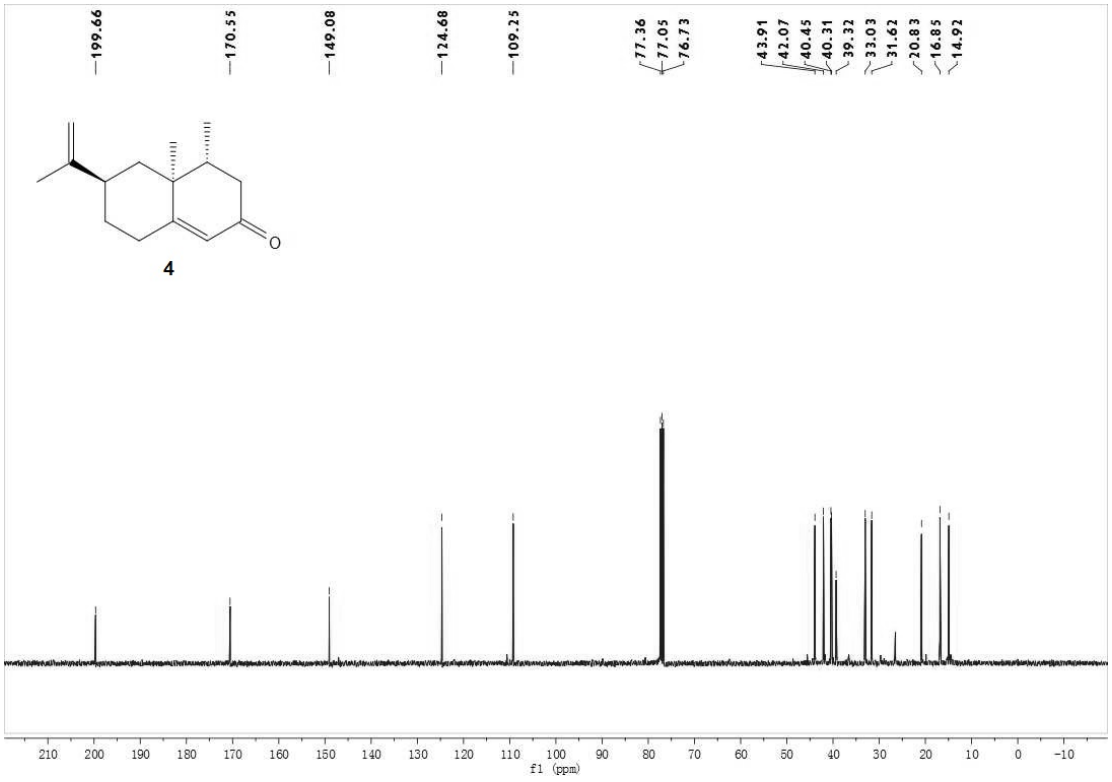
1.74
1.62
1.13
1.11
0.97
0.96
4
1.00
2.12
1.38
4.85
3.73
3.11
3.00
4.77
2.94
3.32
f1 (ppm)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149.08
124.68
109.25
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77.05
76.73
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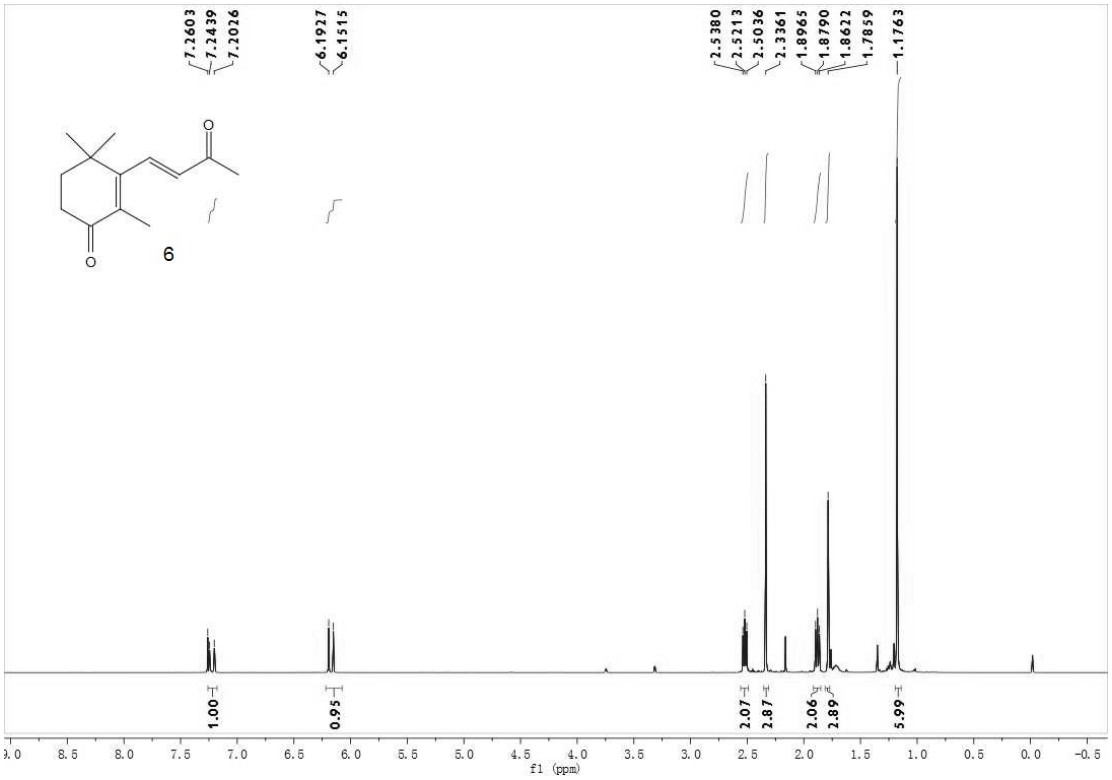
31.62
20.83
16.85
14.92
4
f1 (ppm)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2.5213
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2.3361
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1.8790
1.8622
1.7859
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O
O
6
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0.95
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2.06
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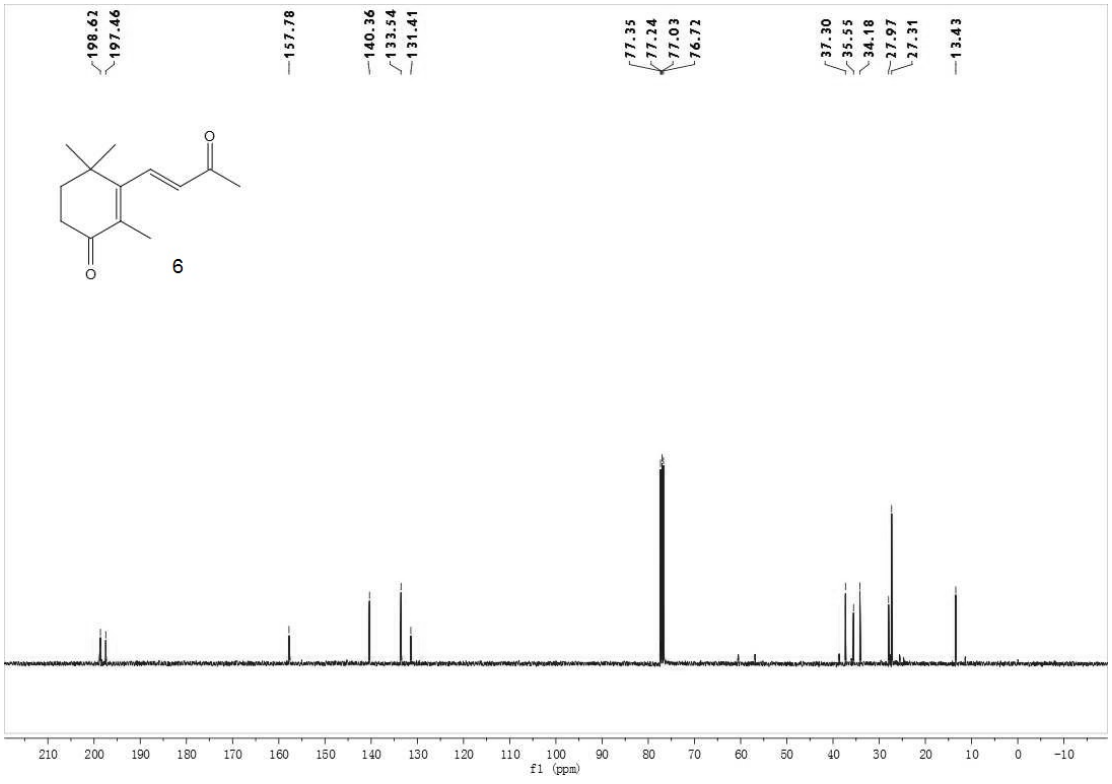
5.99
f1 (ppm)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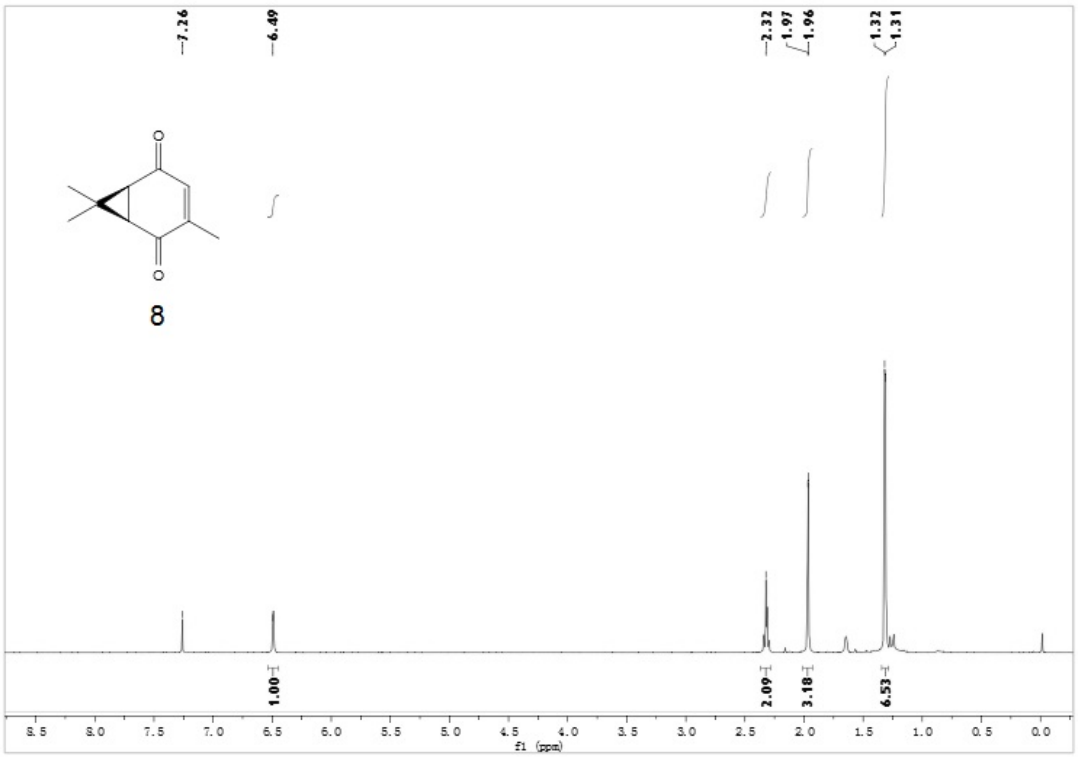
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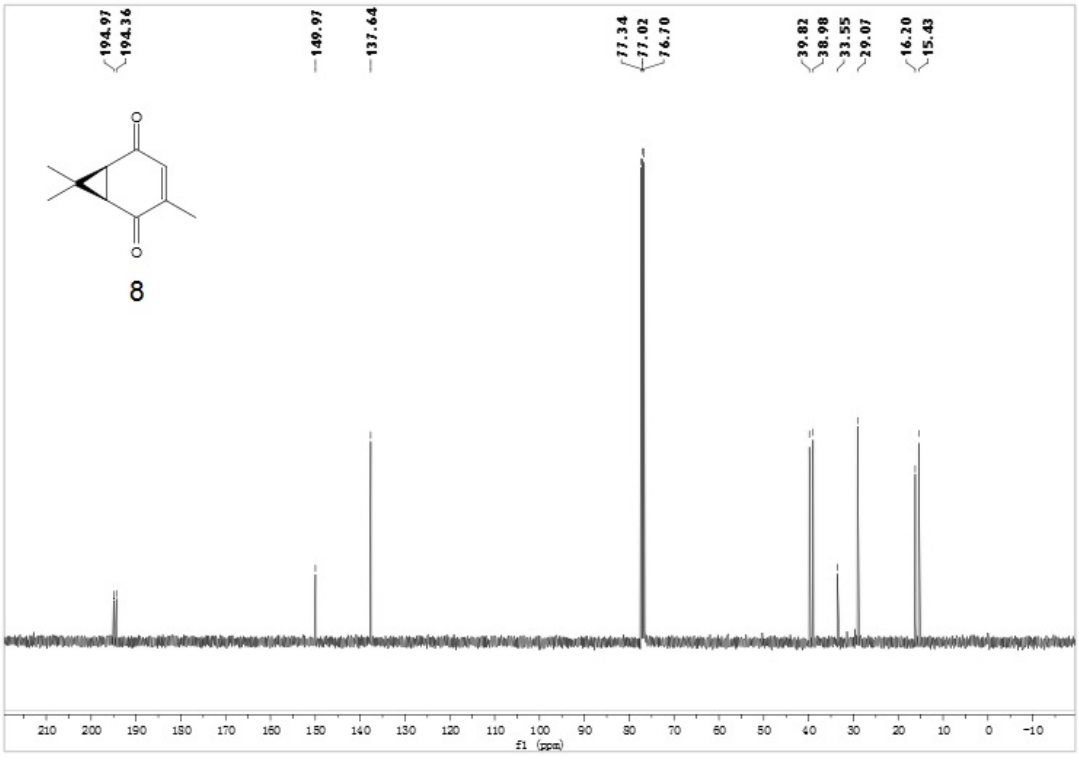
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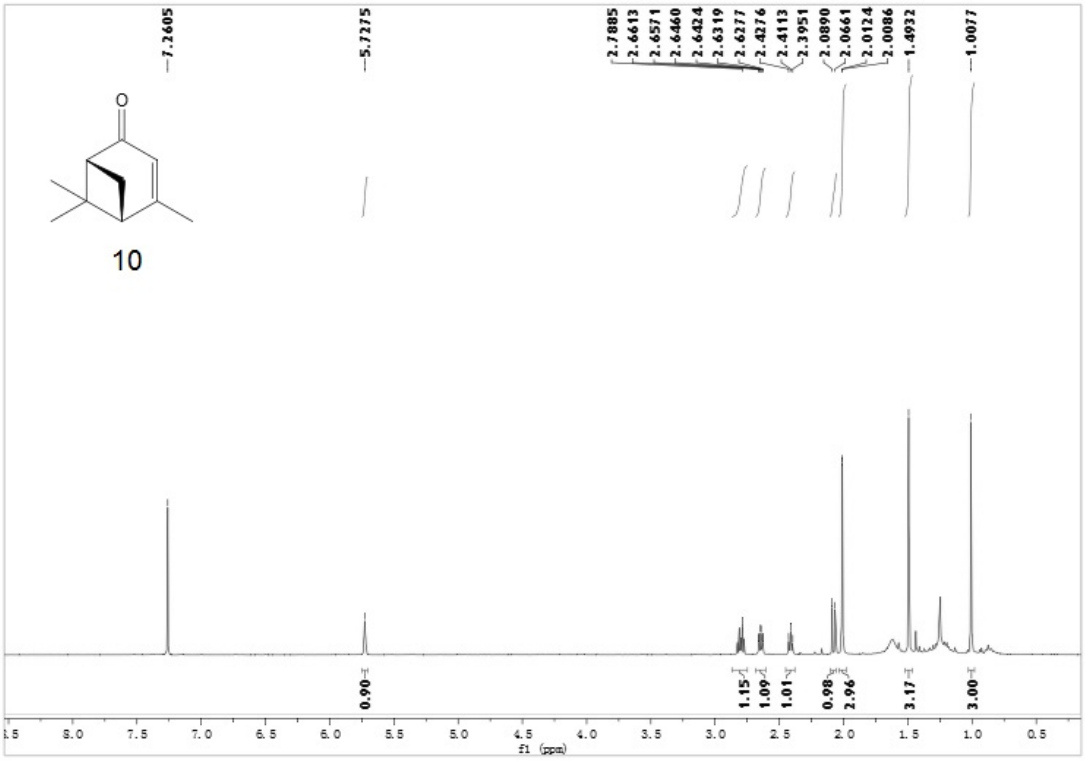
f1 (ppm)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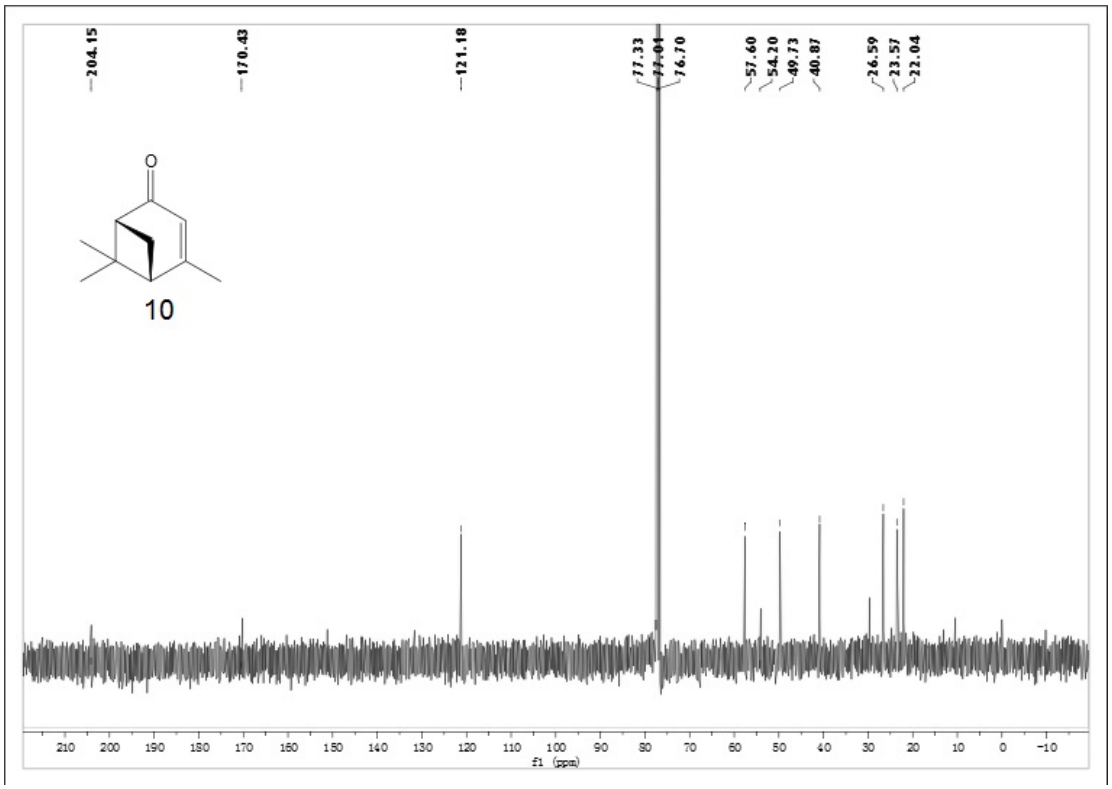
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23.57
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O
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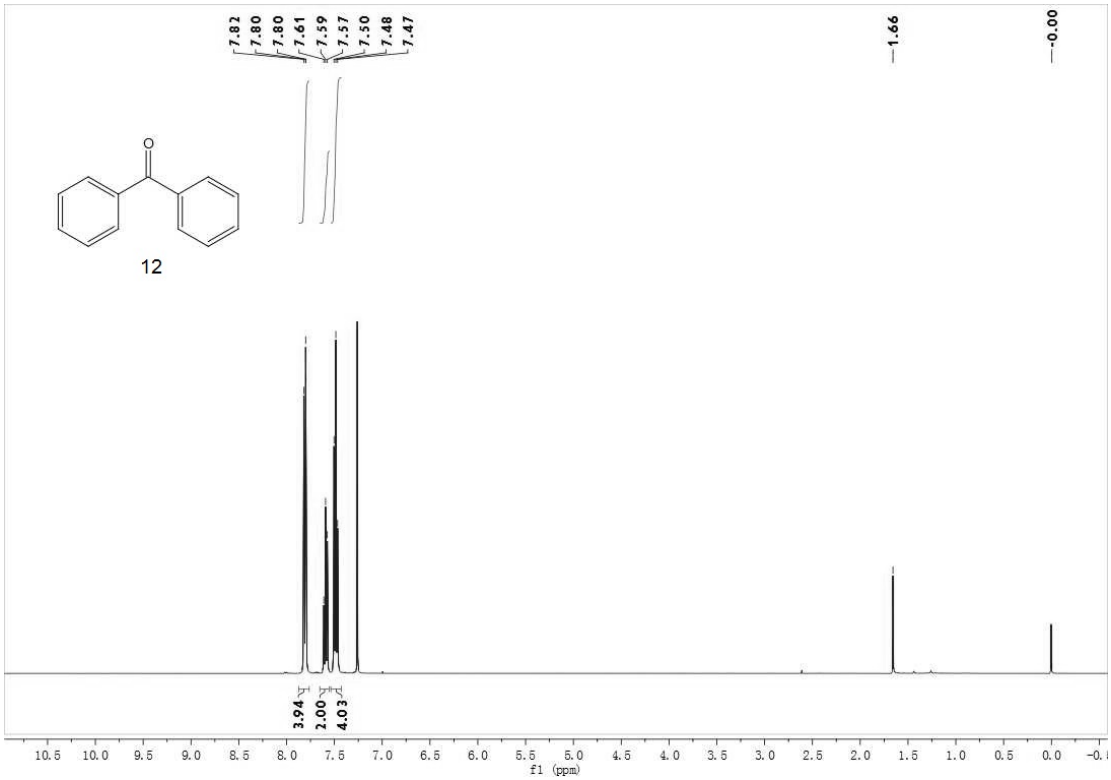
f1 (ppm)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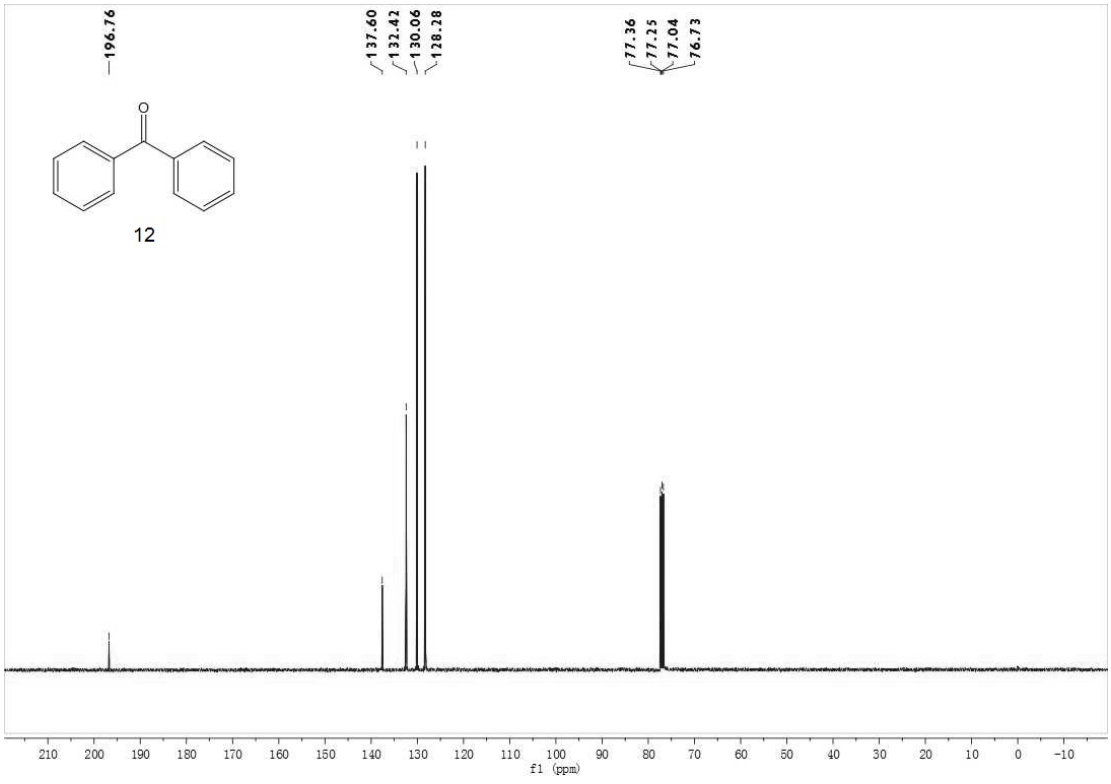
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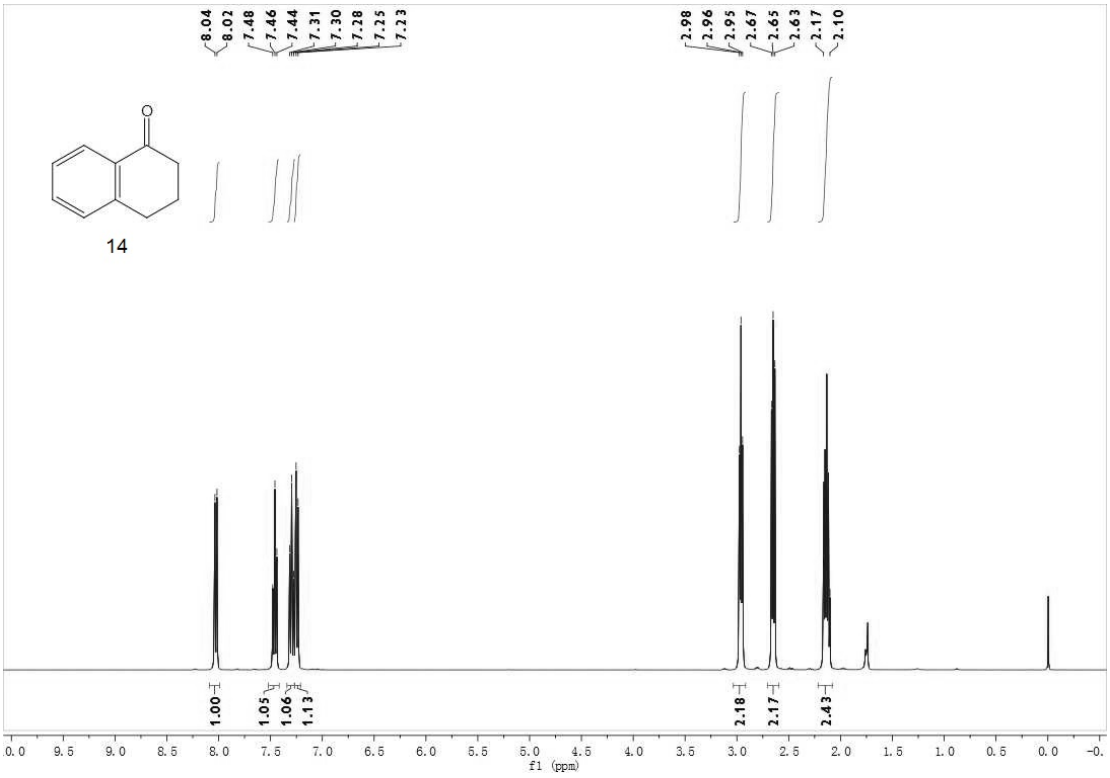
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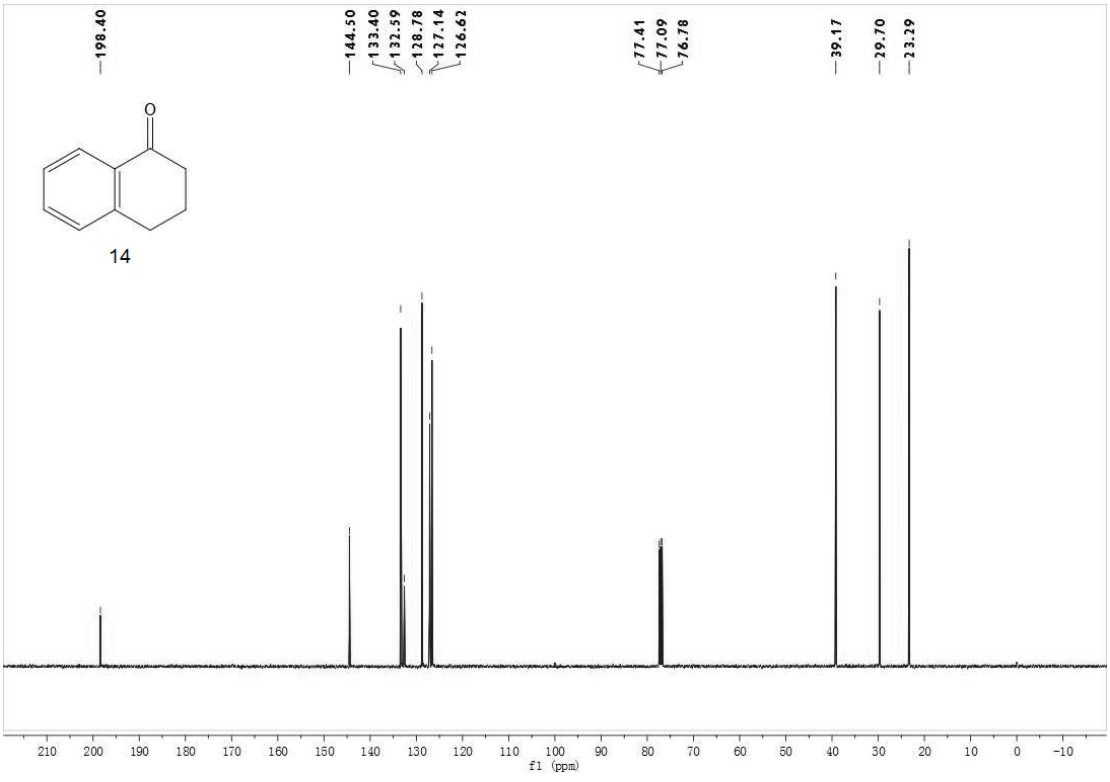
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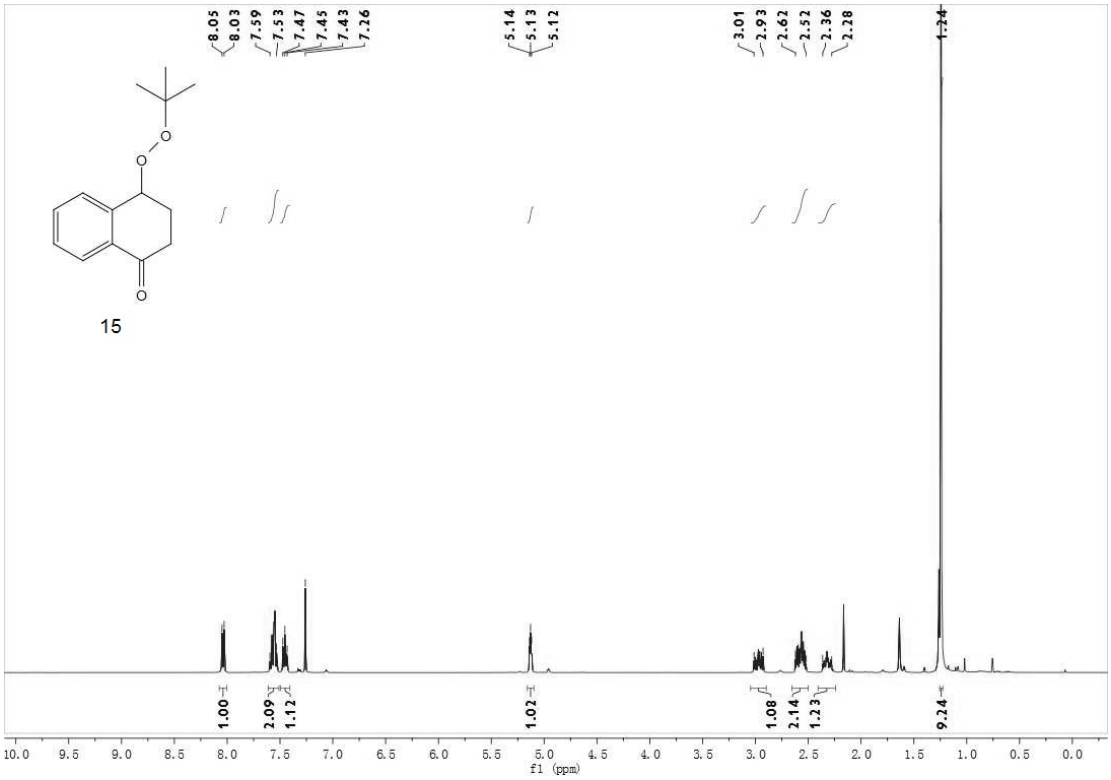
f1 (ppm)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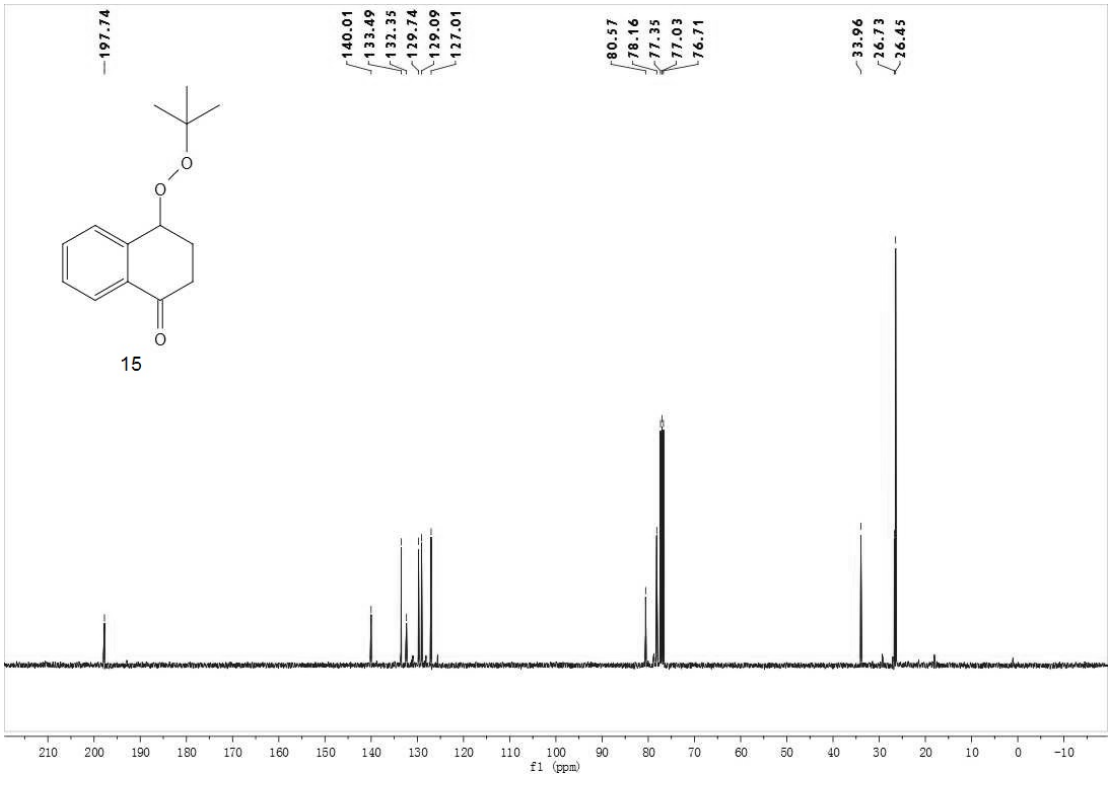
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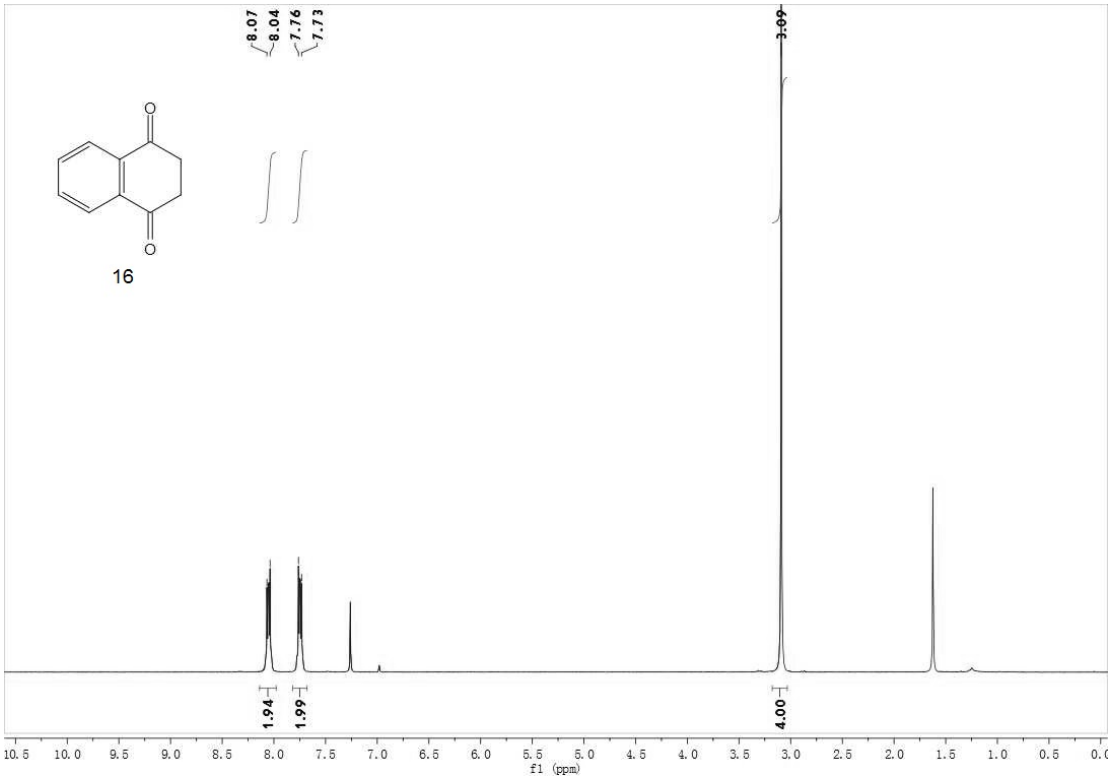
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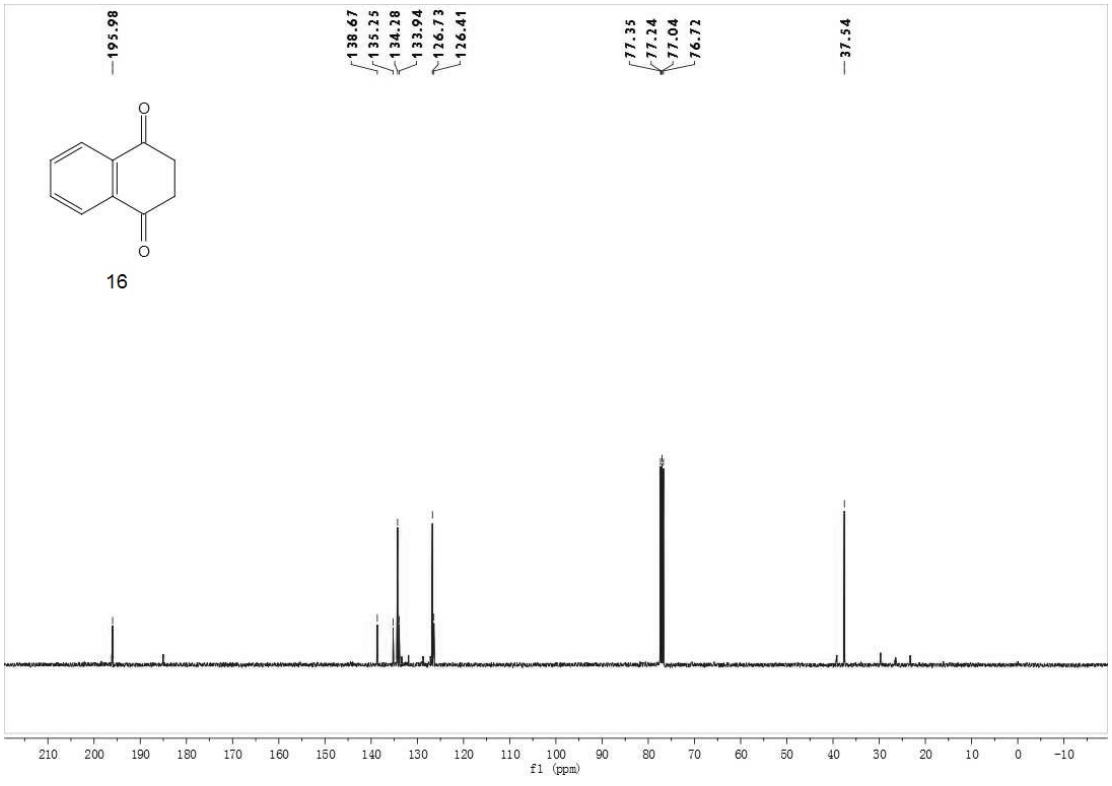
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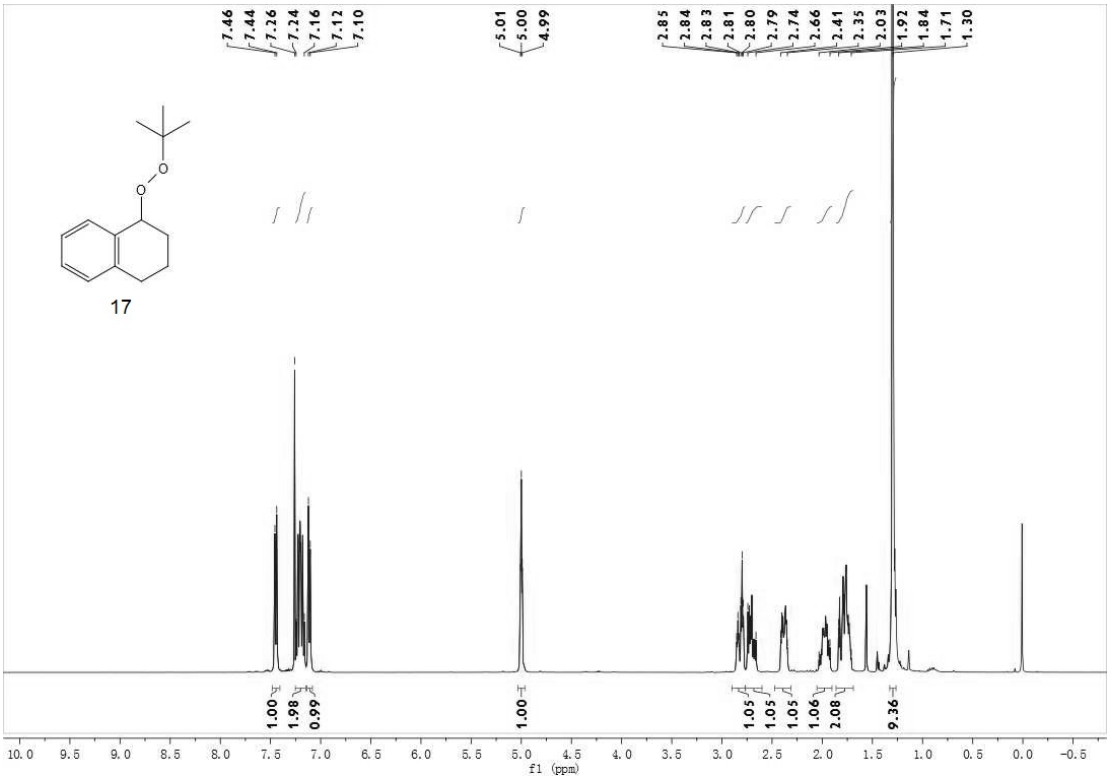
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7.24
7.16
7.12
7.10
5.01
5.00
4.99
2.85
2.84
2.83
2.81
2.80
2.79
2.74
2.66
2.41
2.35
2.03
1.92
1.84
1.71
1.30
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1.00
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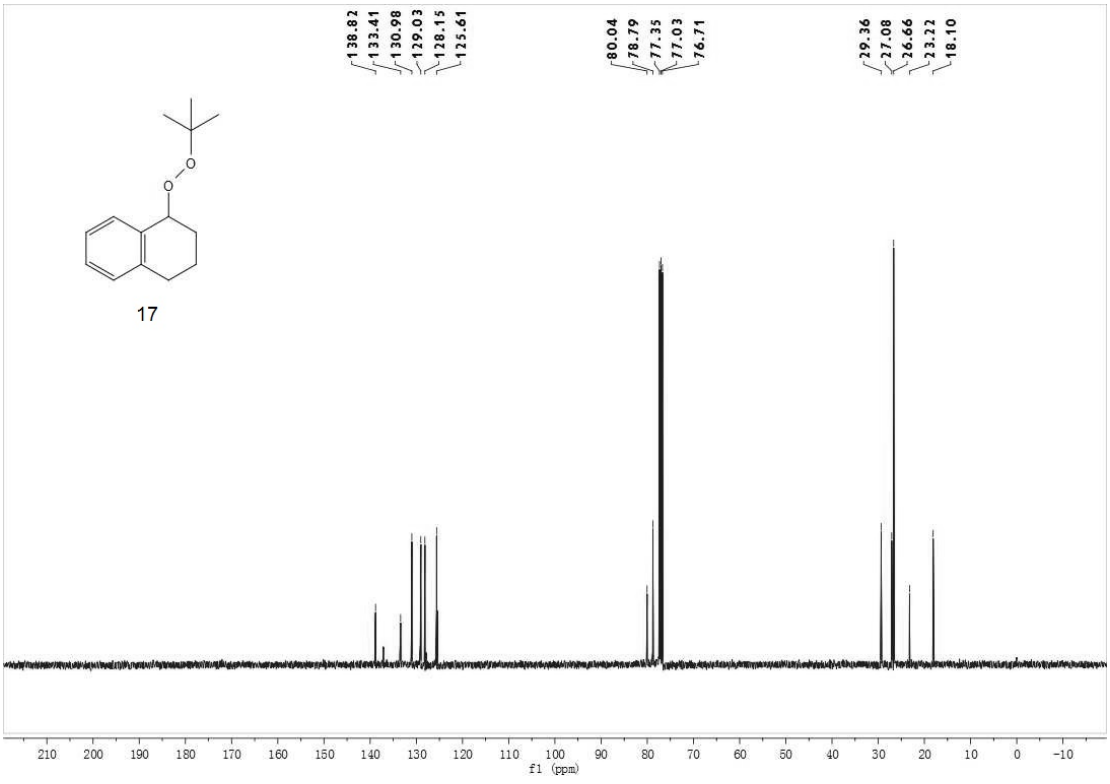
1.05
1.05
1.06
2.08
9.36
f1 (ppm)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128.15
125.61
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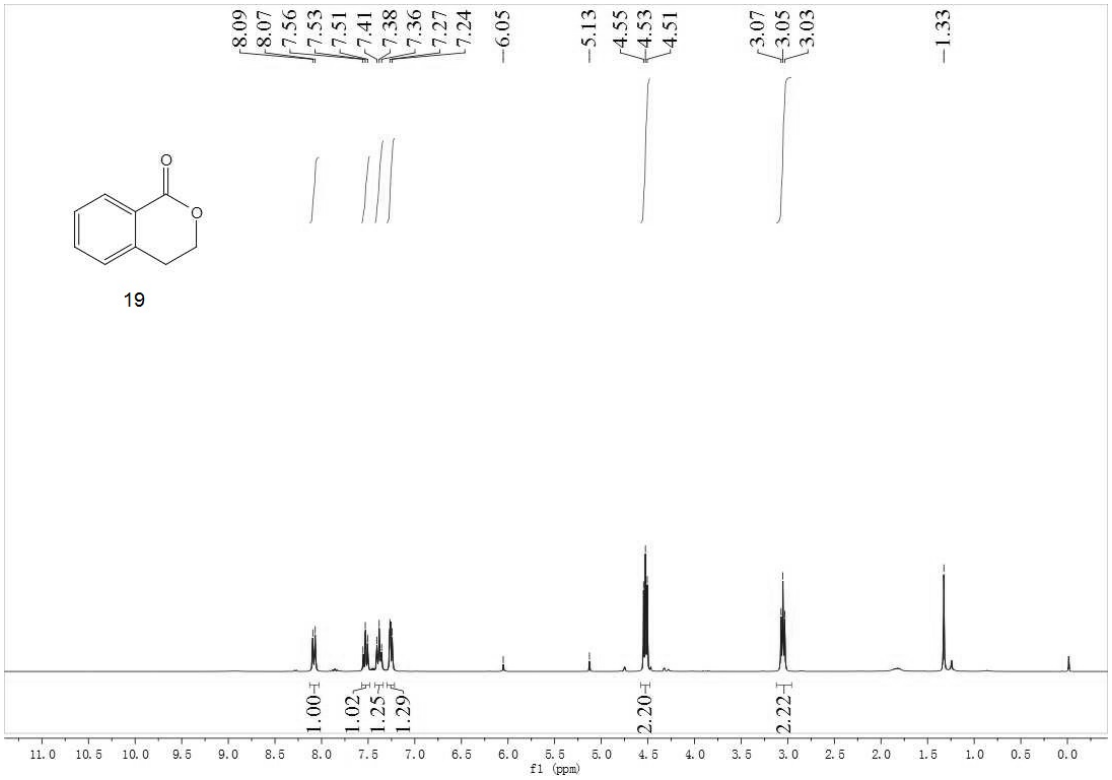
77.03
76.71
29.36
27.08
26.66
23.22
18.10
17
f1 (ppm)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7.51
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7.38
7.36
7.27
7.24
6.05
5.13
4.55
4.53
4.51
3.07
3.05
3.03
1.33
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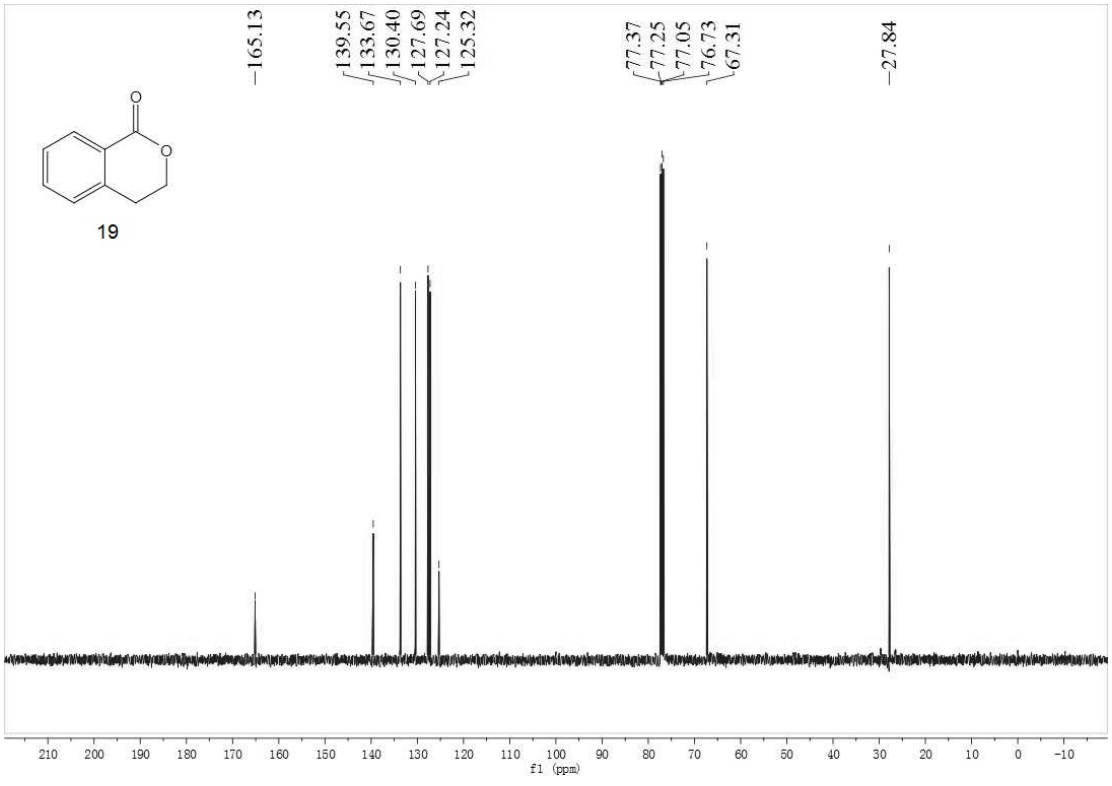
1.00
1.02
1.25
1.29
2.20
2.22
f1 (ppm)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139.55
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127.24
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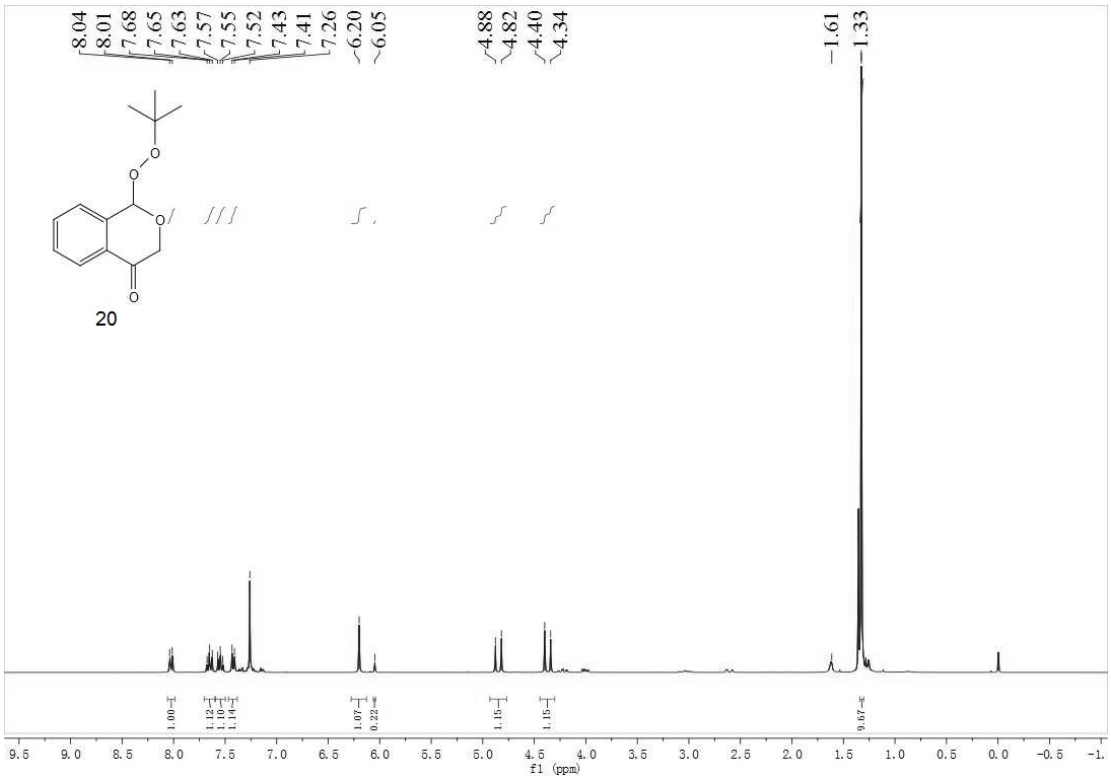
77.37
77.25
77.05
76.73
67.31
27.84
19
f1 (ppm)


8.04
8.01
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7.63
7.57
7.55
7.52
7.43
7.41
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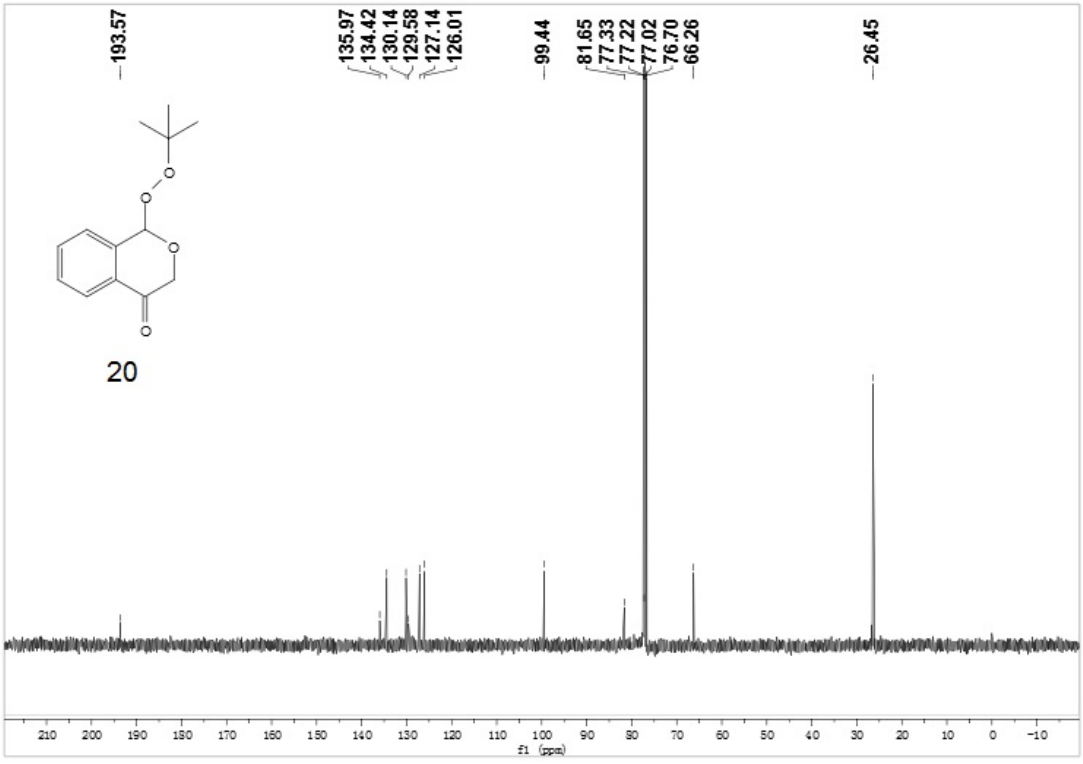
6.20
6.05
4.88
4.82
4.40
4.34
1.61
1.33
20
f1 (ppm)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134.42
130.14
129.58
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126.01
99.44
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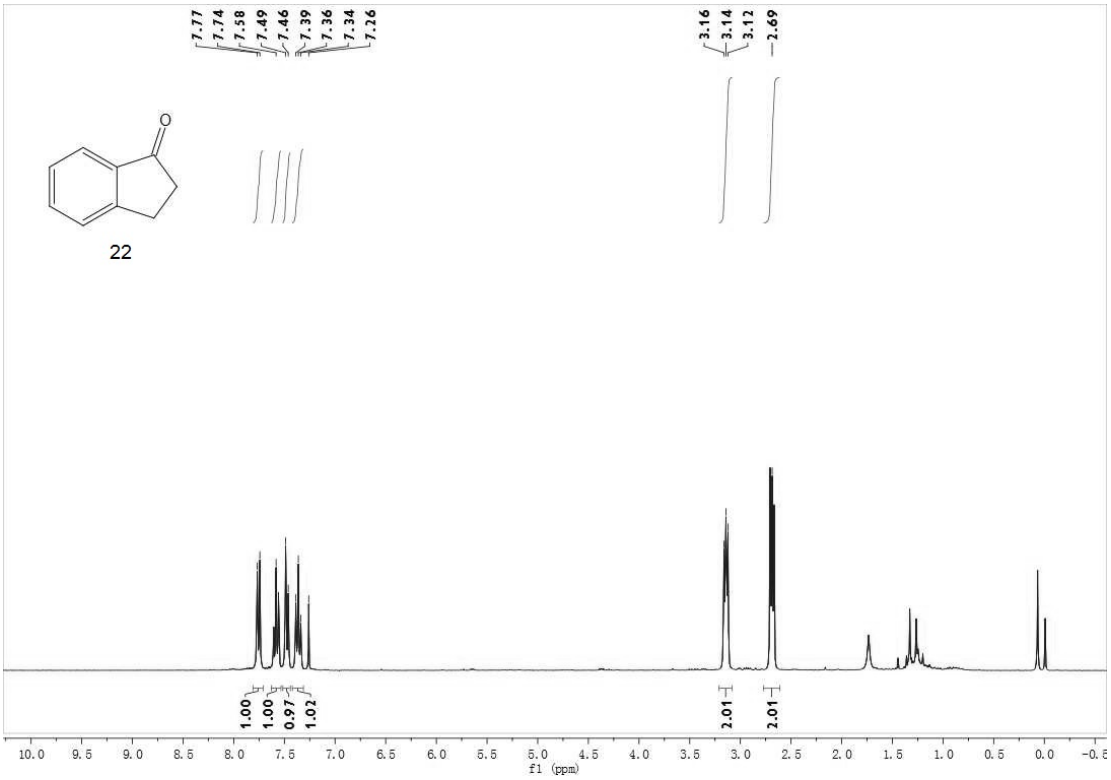
77.22
77.02
76.70
66.26
26.45
20
f1 (ppm)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7.58
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7.46
7.39
7.36
7.34
7.26
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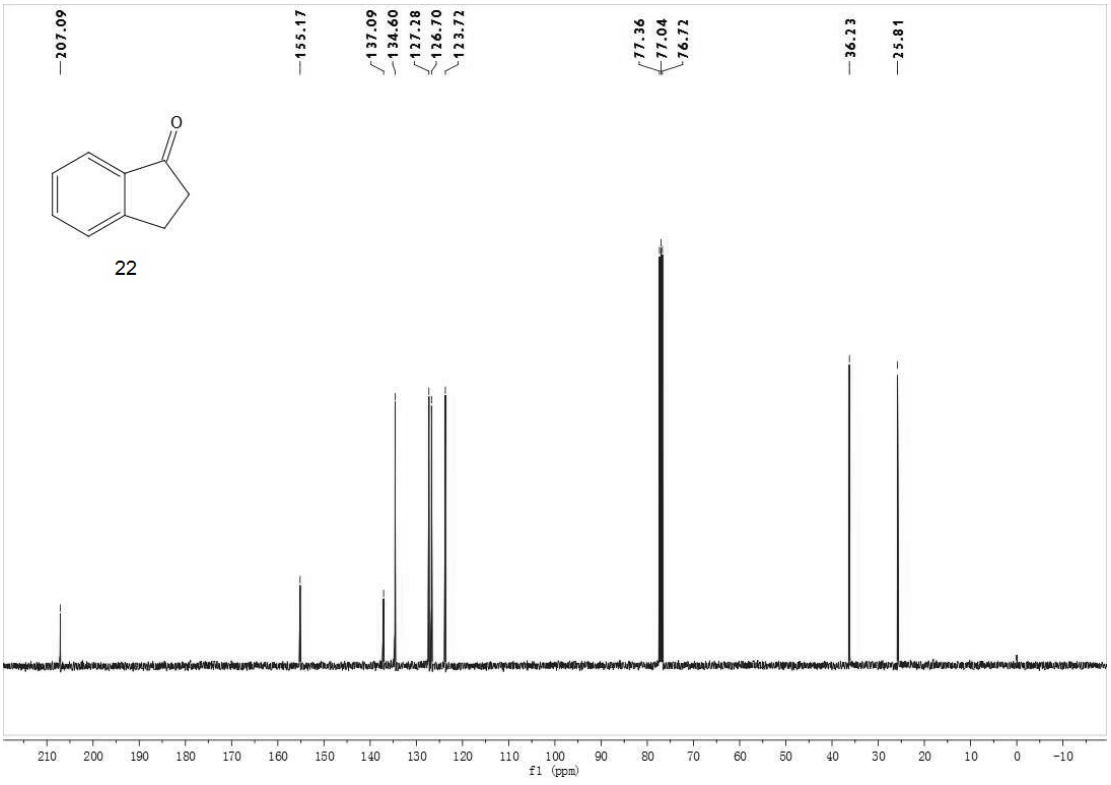
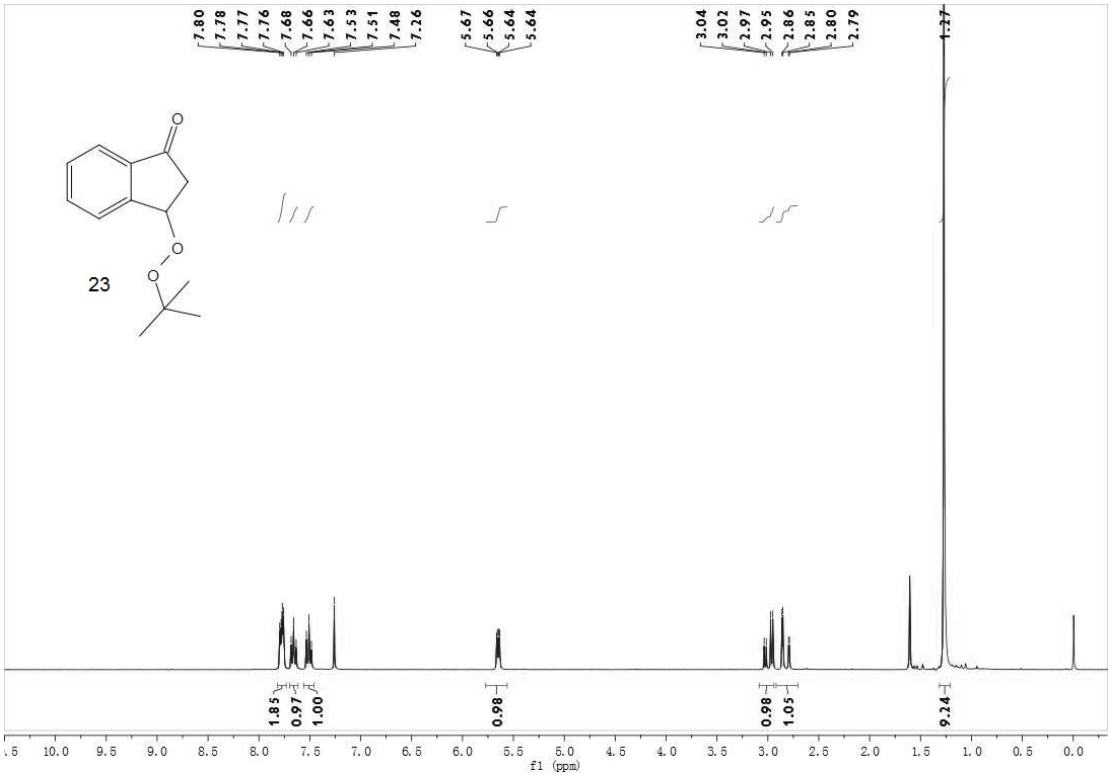
2.69
O
22
1.00
1.00
0.97
1.02
2.01
2.01
f1 (ppm)


207.09
155.17
137.09
134.60
127.28
126.70
123.72
77.36
77.04
76.72
36.23
25.81
O
22
f1 (ppm)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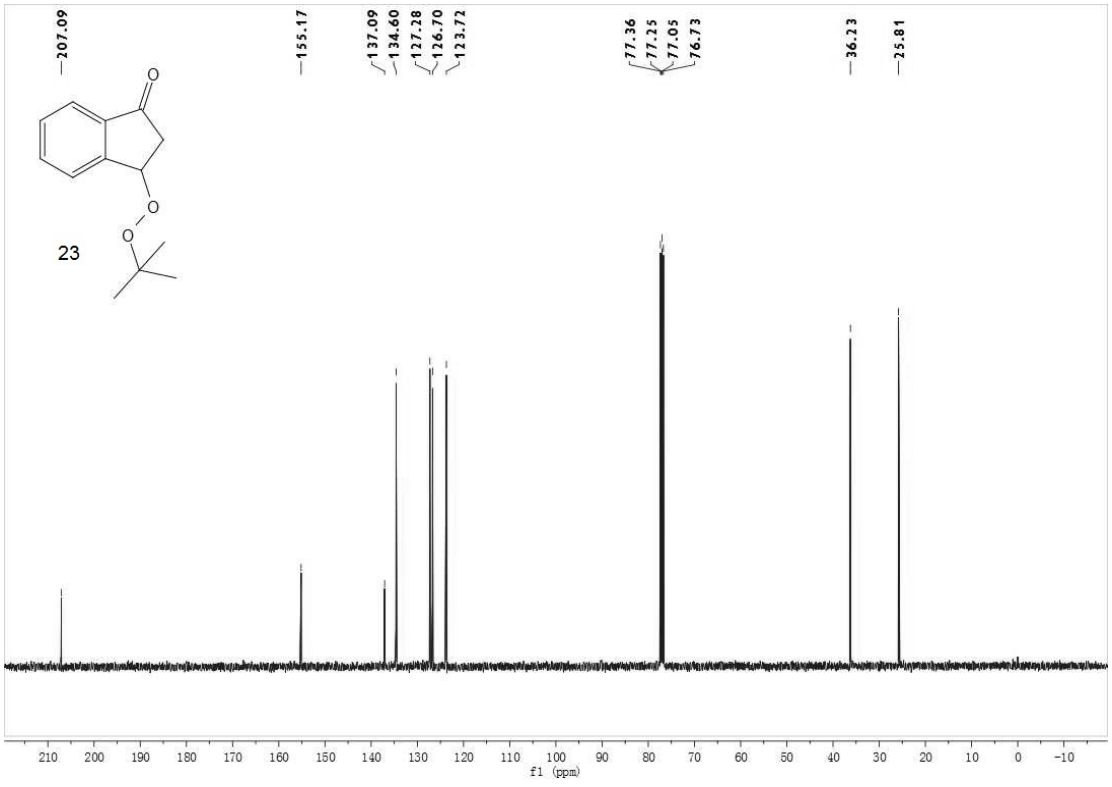
7.66
7.63
7.53
7.51
7.48
7.26
5.67
5.66
5.64
5.64
3.04
3.02
2.97
2.95
2.86
2.85
2.80
2.79
1.27
23
1.85
0.97
1.00
0.98
0.98
1.05
9.24
f1 (ppm)


207.09
155.17
137.09
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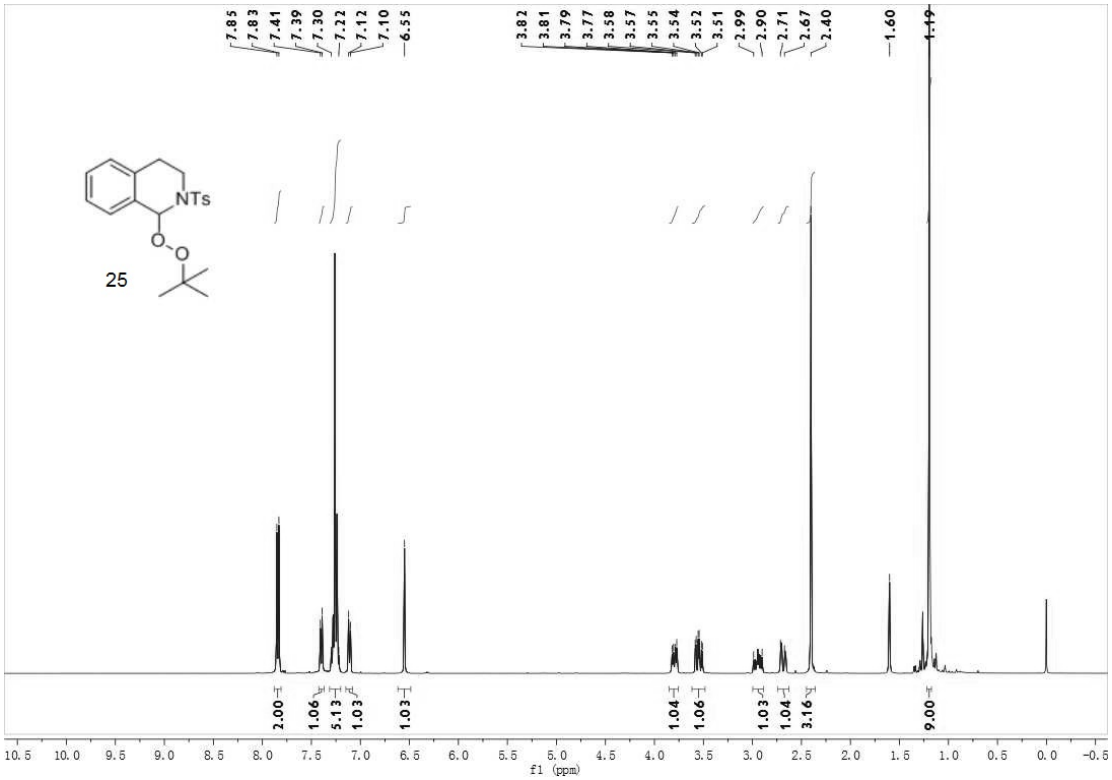
126.70
123.72
77.36
77.25
77.05
76.73
36.23
25.81
23
f1 (ppm)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7.83
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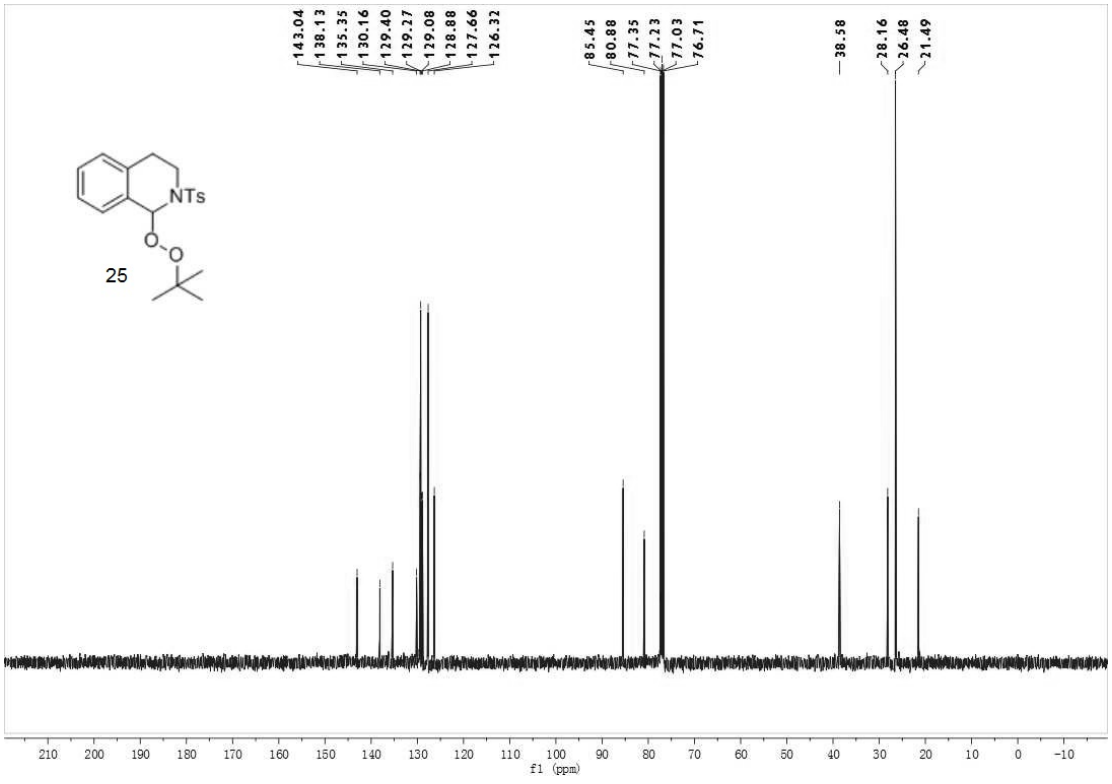
7.39
7.30
7.22
7.12
7.10
6.55
3.82
3.81
3.79
3.77
3.58
3.57
3.55
3.54
3.52
3.51
2.99
2.90
2.71
2.67
2.40
1.60
1.19
NTs
O
O
25
2.00
1.06
5.13
1.03
1.03
1.04
1.06
1.03
1.04
3.16
9.00
f1 (ppm)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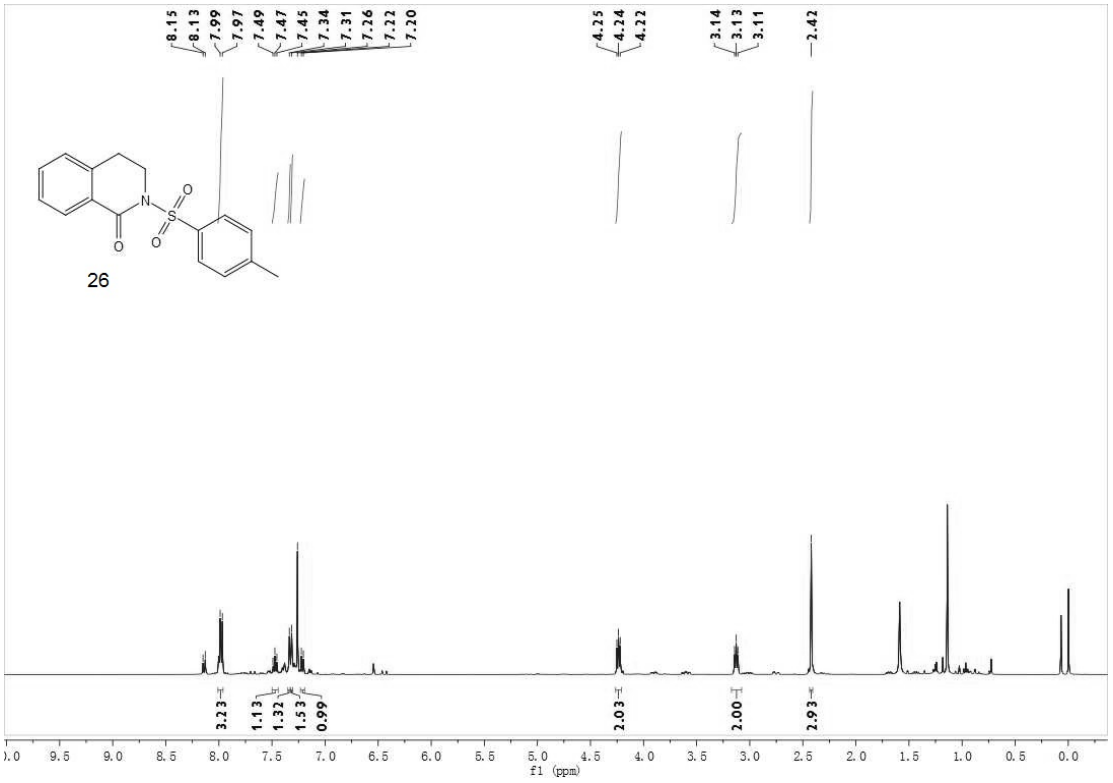
135.35
130.16
129.40
129.27
129.08
128.88
127.66
126.32
85.45
80.88
77.35
77.23
77.03
76.71
38.58
28.16
26.48
21.49
NTs
O
O
25
f1 (ppm)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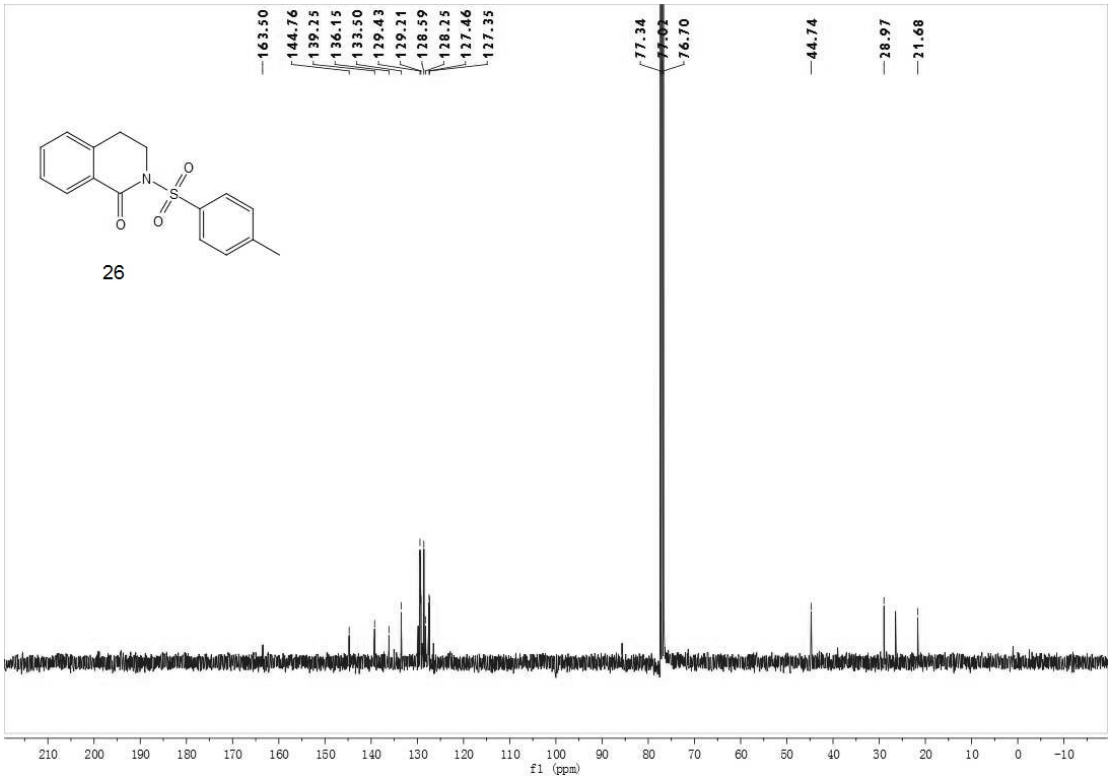
7.49
7.47
7.45
7.34
7.31
7.26
7.22
7.20
4.25
4.24
4.22
3.14
3.13
3.11
2.42
26
3.23
1.13
1.32
1.53
0.99
2.03
2.00
2.93
f1 (ppm)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144.76
139.25
136.15
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129.43
129.21
128.59
128.25
127.46
127.35
77.34
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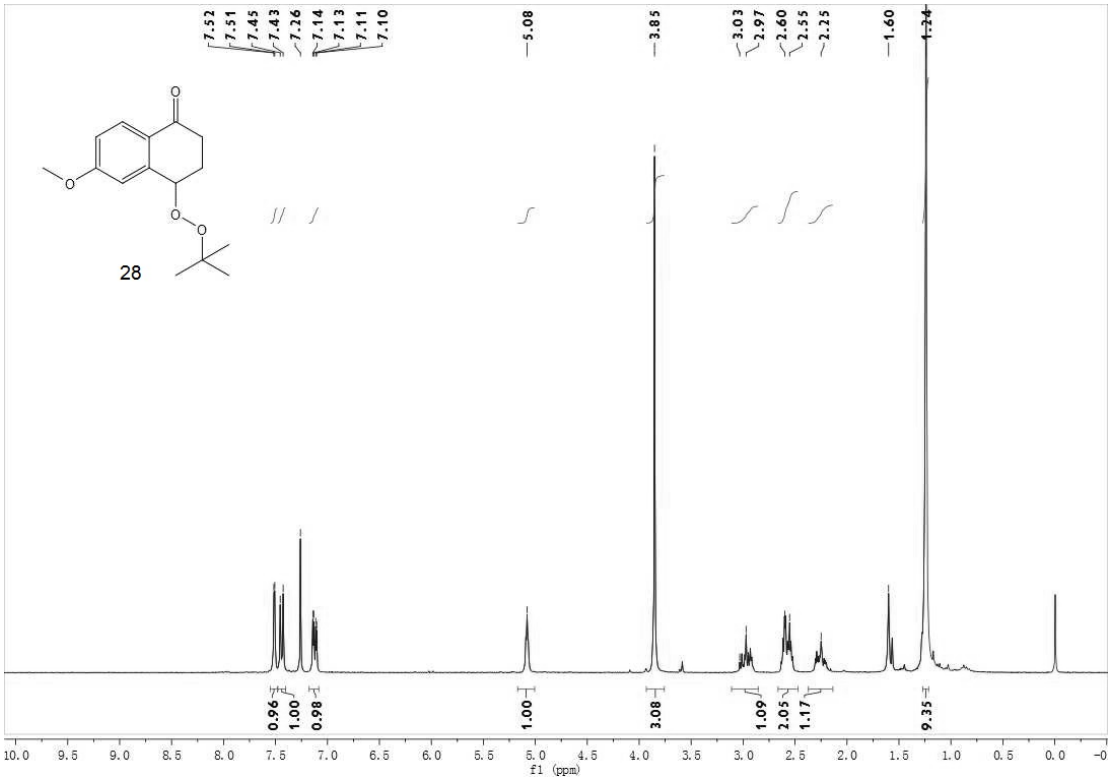
76.70
44.74
28.97
21.68
26
f1 (ppm)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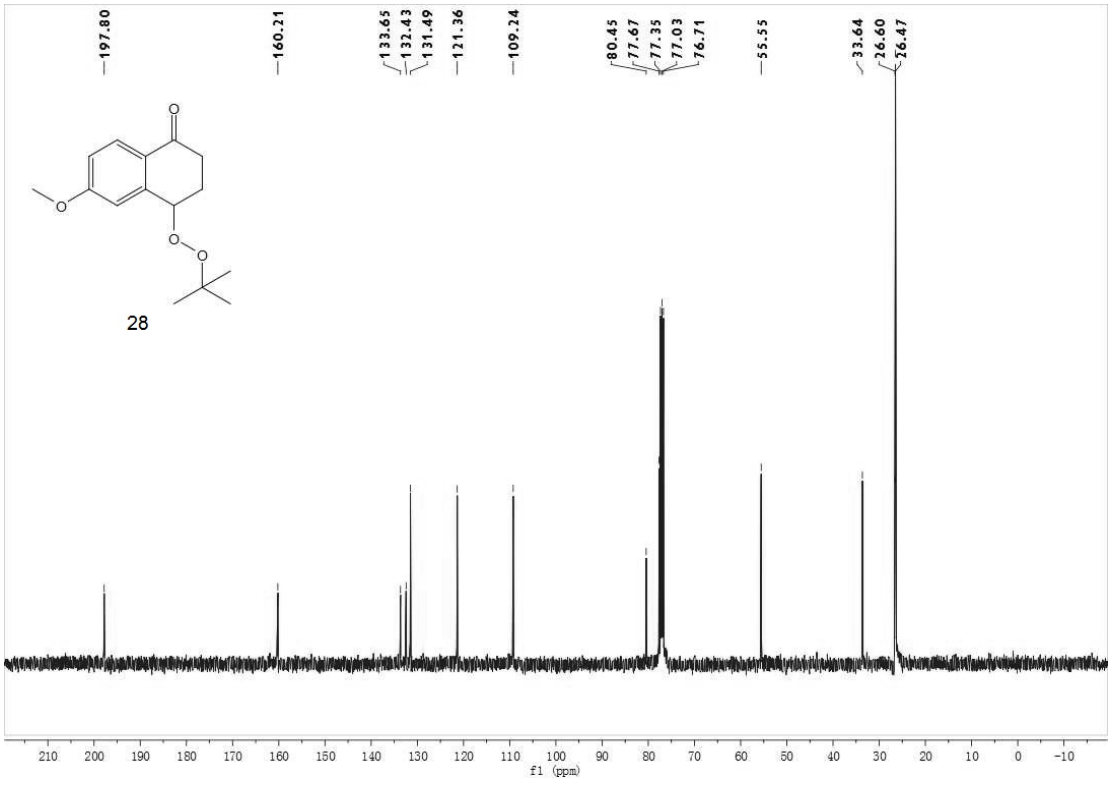
7.14
7.13
7.11
7.10
5.08
3.85
3.03
2.97
2.60
2.55
2.25
1.60
1.24
28
0.96
1.00
0.98
1.00
3.08
1.09
2.05
1.17
9.35
f1 (ppm)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131.49
121.36
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80.45
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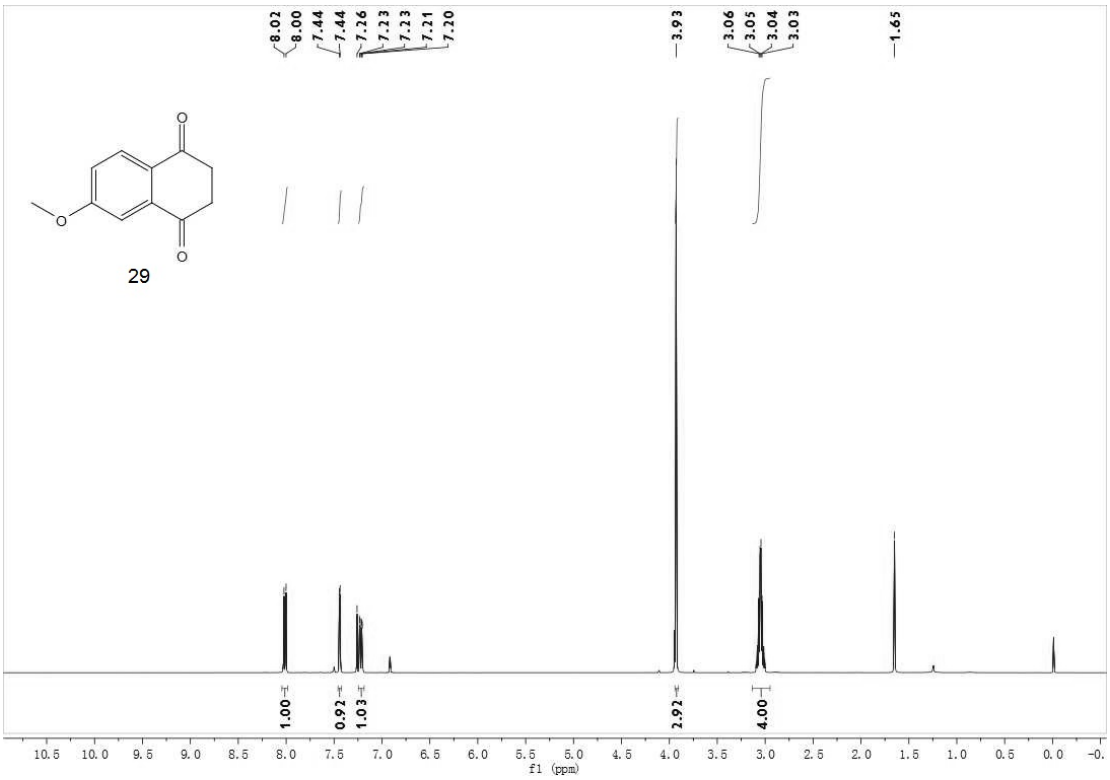
77.35
77.03
76.71
55.55
33.64
26.60
26.47
28
f1 (ppm)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8.00
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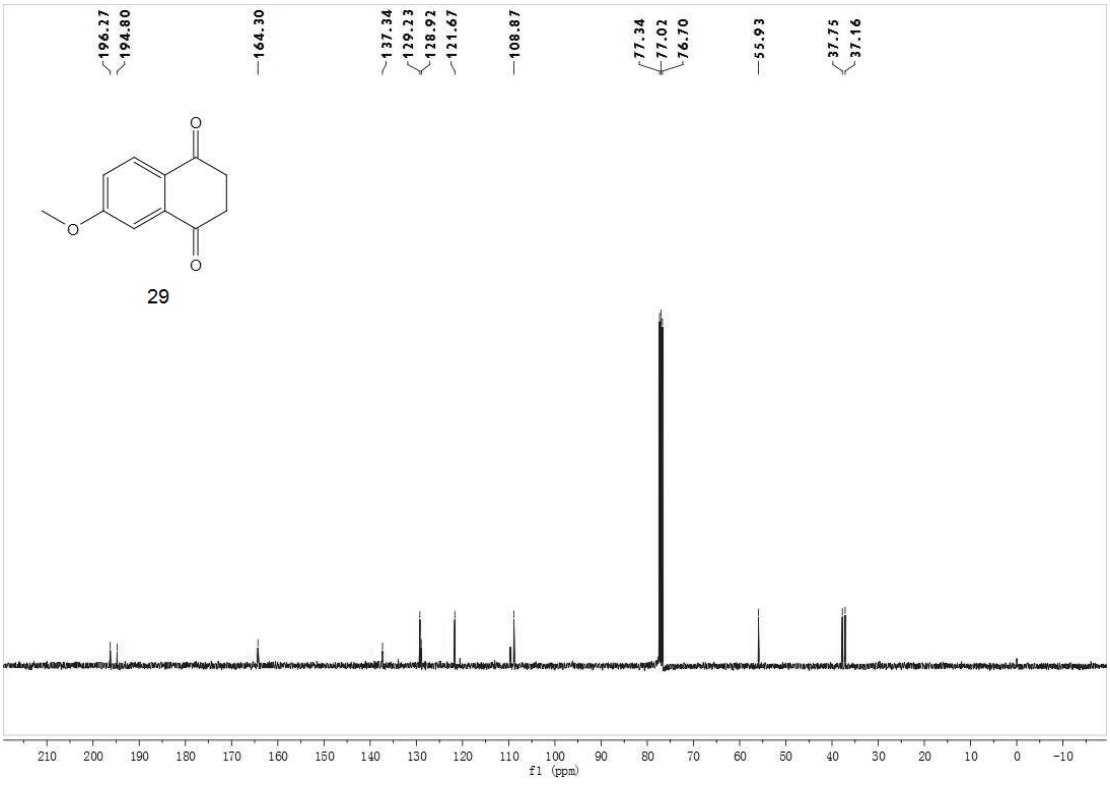
7.44
7.26
7.23
7.23
7.21
7.20
3.93
3.06
3.05
3.04
3.03
1.65
O
O
O
29
1.00
0.92
1.03
2.92
4.00
f1 (ppm)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194.80
164.30
137.34
129.23
128.92
121.67
108.87
77.34
77.02
76.70
55.93
37.75
37.16
O
O
O
29
f1 (ppm)