

# SUPPORTING INFORMATION

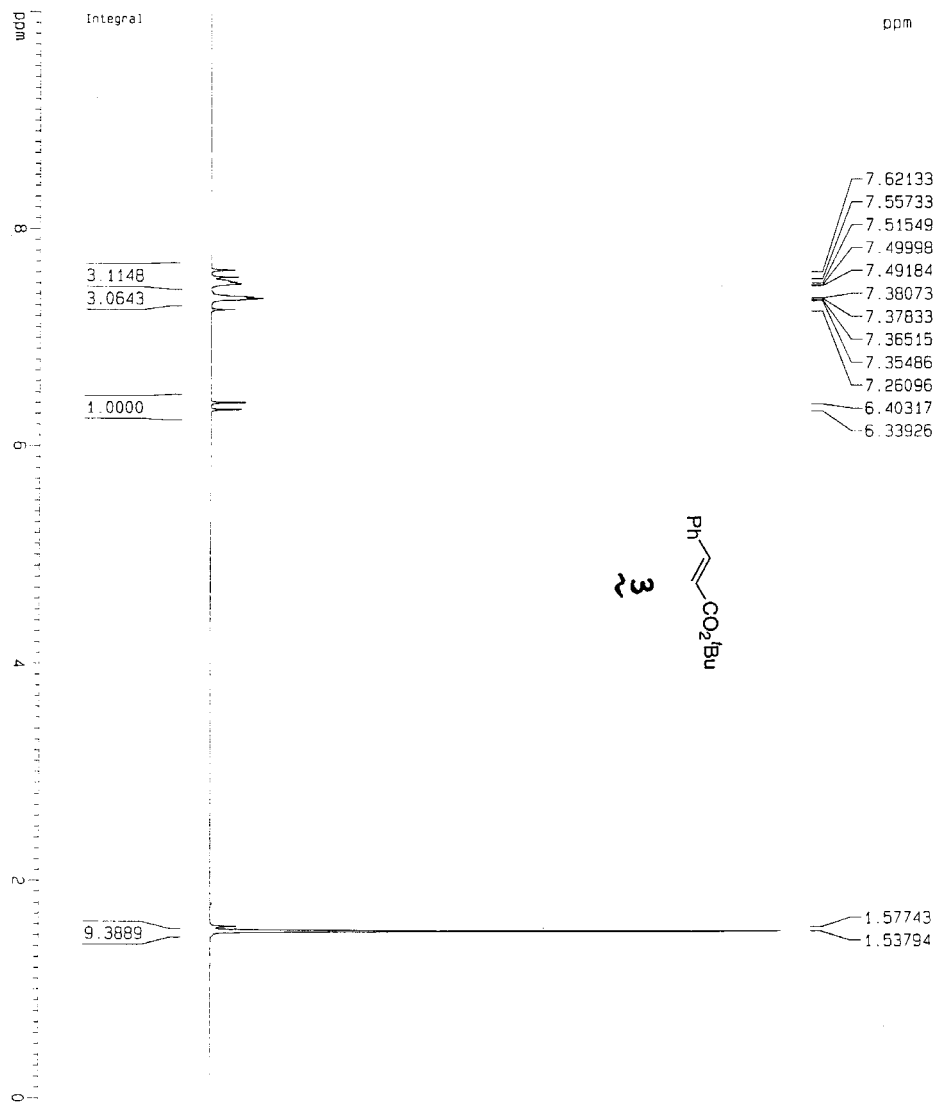
## Oxygen Promoted Pd(II) Catalysis for the Coupling of Organoboron Compounds and Olefins

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### ***Representative Experimental Procedure :***

*tert*-Butyl acrylate **1** (64 mg, 0.5 mmol, 1 equiv.) was dissolved in DMF (2.5 mL, 0.2 M solution), and stirred at room temperature. To the clear solution, was added phenylboronic acid (74 mg, 0.6 mmol, 1.2 equiv.) followed by a single addition of Na<sub>2</sub>CO<sub>3</sub> (106 mg, 1.0 mmol, 2 equiv.) and Pd(OAc)<sub>2</sub> (11 mg, 0.05 mmol, 0.1 equiv.). The reaction flask was fitted with an oxygen balloon, heated to 50 °C, and stirred for 3 h. The mixture was then diluted with ethyl acetate (20 mL), and washed with aqueous NaCl solution (3 X 10 mL). The organic layer was dried over anhydrous Na<sub>2</sub>SO<sub>4</sub> and filtered. The filtrate was concentrated *in vacuo*, and subjected to flash chromatography (30 g of SiO<sub>2</sub>). Elution with hexanes (100 mL), then 10:1 hexanes/EtOAc afforded *tert*-butyl *trans*-cinnamate (89 mg, 87%).



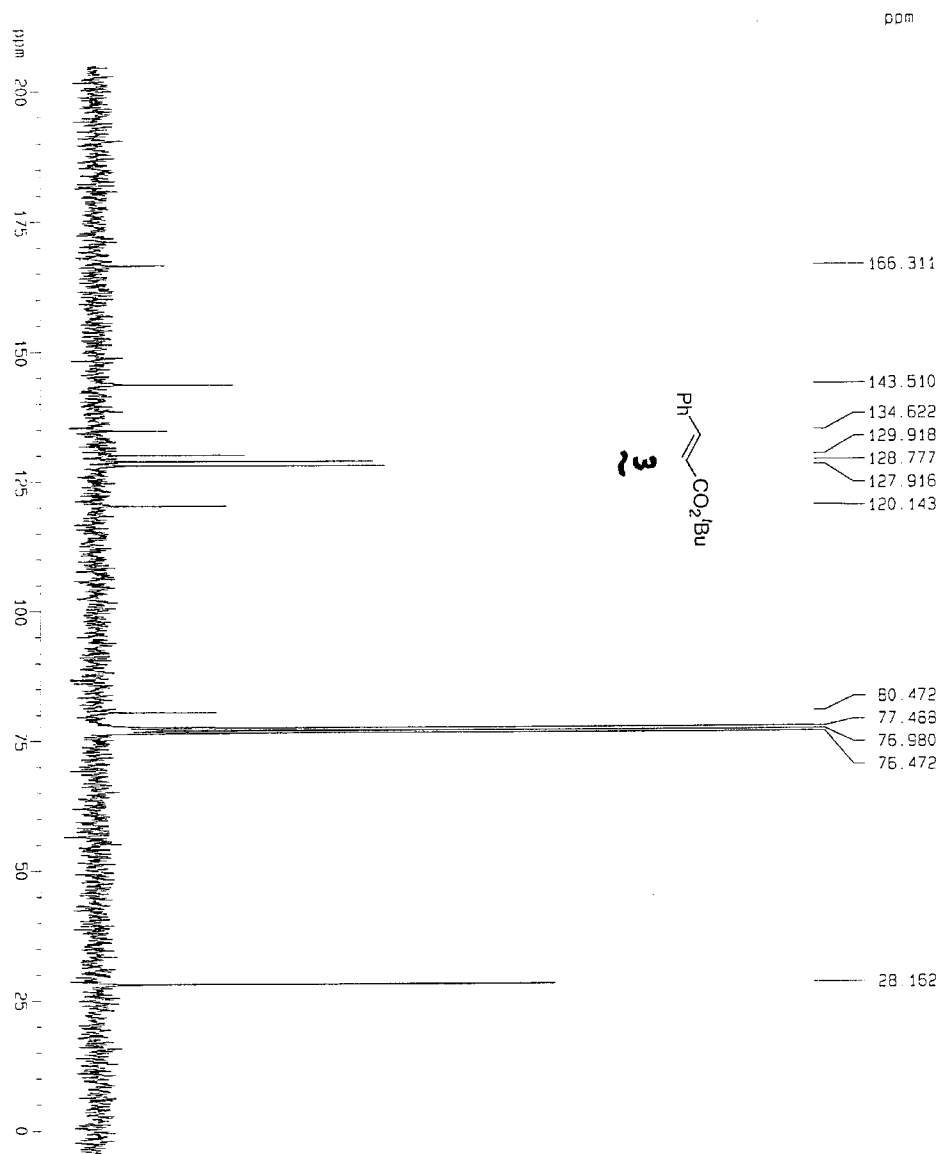
Current Data Parameters  
NAME proton  
EXPNO 1  
PROCNO 1

F2 - Acquisition Parameters  
Date\_ 20021030  
Time 11.02  
INSTRUM spect  
PROBHD 5 mm BBI X Y  
PULPROG zg30  
TD 32768  
SOLVENT CDCl3  
NS 8  
DS 2  
SWH 3063.726 Hz  
FIDRES 0.093497 Hz  
AQ 5.3477874 sec  
RG 362  
DM 163.200 usec  
DE 6.00 usec  
TE 300.0 K  
D1 1.0000000 sec

===== CHANNEL f1 =====  
NUC1 1H  
P1 10.70 usec  
PL1 0.00 dB  
SF01 250.1315008 MHz

F2 - Processing parameters  
SI 16384  
SF 250.130072 MHz  
WDW EM  
SSB 0  
LB 0.30 Hz  
GB 0  
PC 1.00

1D NMR plot parameters  
CK 20.00 cm  
F1P 10.000 ppm  
f1 2901.30 Hz  
F2P -0.500 ppm  
f2 -125.07 Hz  
PRGCM 0.52500 ppm/cm  
HZCM 131.31825 Hz/cm



Current Data Parameters:

NAME	VALUE
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters:

Date_	Time
2002.03.11	9.17

INSTRUM spect

PROBHD 5 mm BBI X Y

PULPROG zgpg30

TD 32768

SOLVENT CDCl3

NS 1116

DS 4

SWH 13227.514 Hz

FIDRES 0.403677 Hz

AQ 1.2386804 sec

RG 5160.6

DW 37.800 usec

DE 6.00 usec

TE 300.0 K

D1 3.00000000 sec

D11 0.03000000 sec

D12 0.00000000 sec

===== CHANNEL f1 =====

NUC1	13C
P1	12.50 usec
PL1	0.00 dB
SFO1	62.9015035 MHz

===== CHANNEL f2 =====

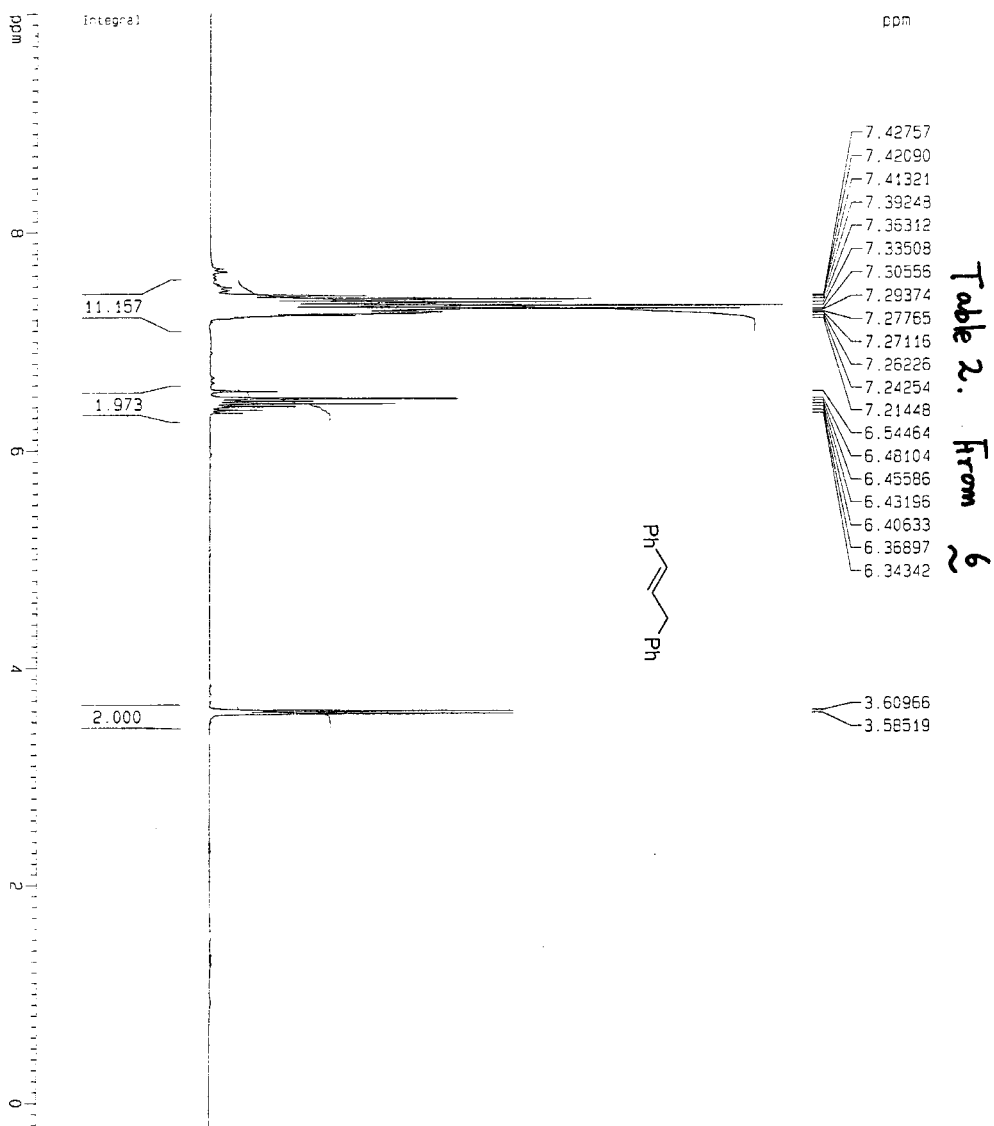
CPDPRG2	WALTZ16
NUC2	1H
PCPD2	130.00 usec
PL2	3.00 dB
PL12	30.00 dB
PL13	32.00 dB
SFO2	250.1310005 MHz

F2 - Processing parameters:

SF	32768
SF	62.9592425 MHz
WDM	FM
SSB	0
LB	3.00 Hz
GB	0
PC	1.40

F2 - NMR file parameters:

EX	20.00 cm
F10 <td>2735.000 rpm</td>	2735.000 rpm
F11 <td>1762.401 Hz</td>	1762.401 Hz
F12 <td>5.000 rpm</td>	5.000 rpm
F13 <td>114.40 Hz</td>	114.40 Hz
PRPCH2 <td>11.000000 rpm/cm</td>	11.000000 rpm/cm
HZ/CM <td>103.8476 Hz/cm</td>	103.8476 Hz/cm



Current Data Parameters

NAME	PROTON
EXNO	1
PRICNO	1

F2 - Acquisition Parameters

Date	Time
20021101	13.04

INSTRUM spect

PULPROG 5 mm BBI X Y

TD 32768

SOLVENT CDCl3

NS 6

DS 4

SWH 3132.832 Hz

FIDRES 0.095606 Hz

AQ 5.2290226 sec

RG 181

DW 159.600 usec

DE 6.00 usec

TE 300.0 K

D1 1.0000000 sec

===== CHANNEL f1 =====

NUC1 1H

P1 6.50 usec

PL1 3.00 dB

SFO1 250.1315008 MHz

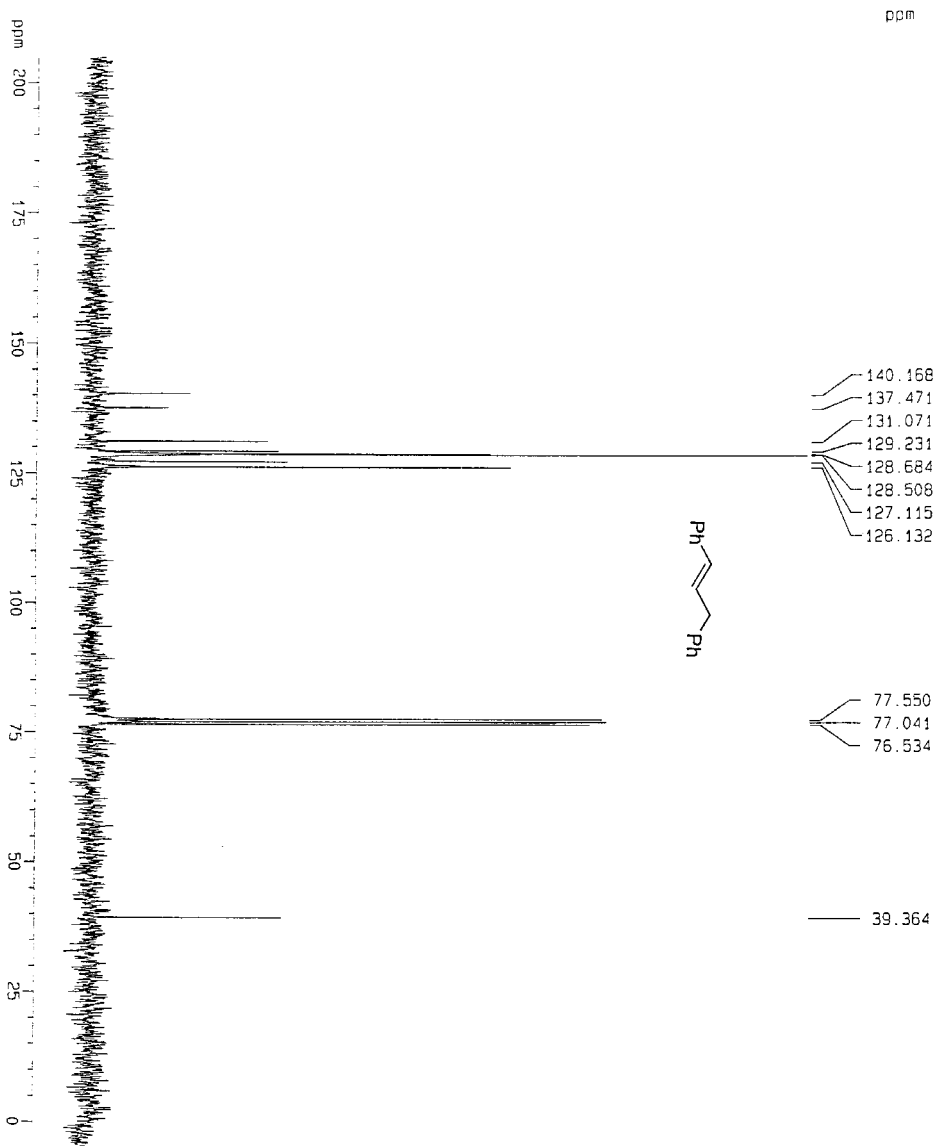
F2 - Processing parameters

SI	16384
SF	250.1300072 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

1D NMR plot parameters

CX	20.00 cm
F1P	10.000 ppm
F1	2501.36 Hz
F2P	-0.500 ppm
F2	-125.07 Hz
PPHCKM	0.52500 ppm/cm
HZ/CM	131.31825 Hz/cm

Table 2. From 6



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Current Data Parameters
NAME          carbon
EXPNO         1
PROCNO        1

F2 - Acquisition Parameters
Date_         20021101
Time          13.07
INSTRUM       spect
PROBHD        5 mm BBI X Y
PULPROG       zgpg30
TD            32768
SOLVENT       CDCl3
NS            320
DS            4
SWH           13227.514 Hz
FIDRES       0.403572 Hz
AQ           1.2386604 sec
RG            8192
DW           37.600 usec
DE           6.00 usec
TE           300.0 K
D1           3.00000000 sec
D11          0.03000000 sec
D12          0.00020000 sec

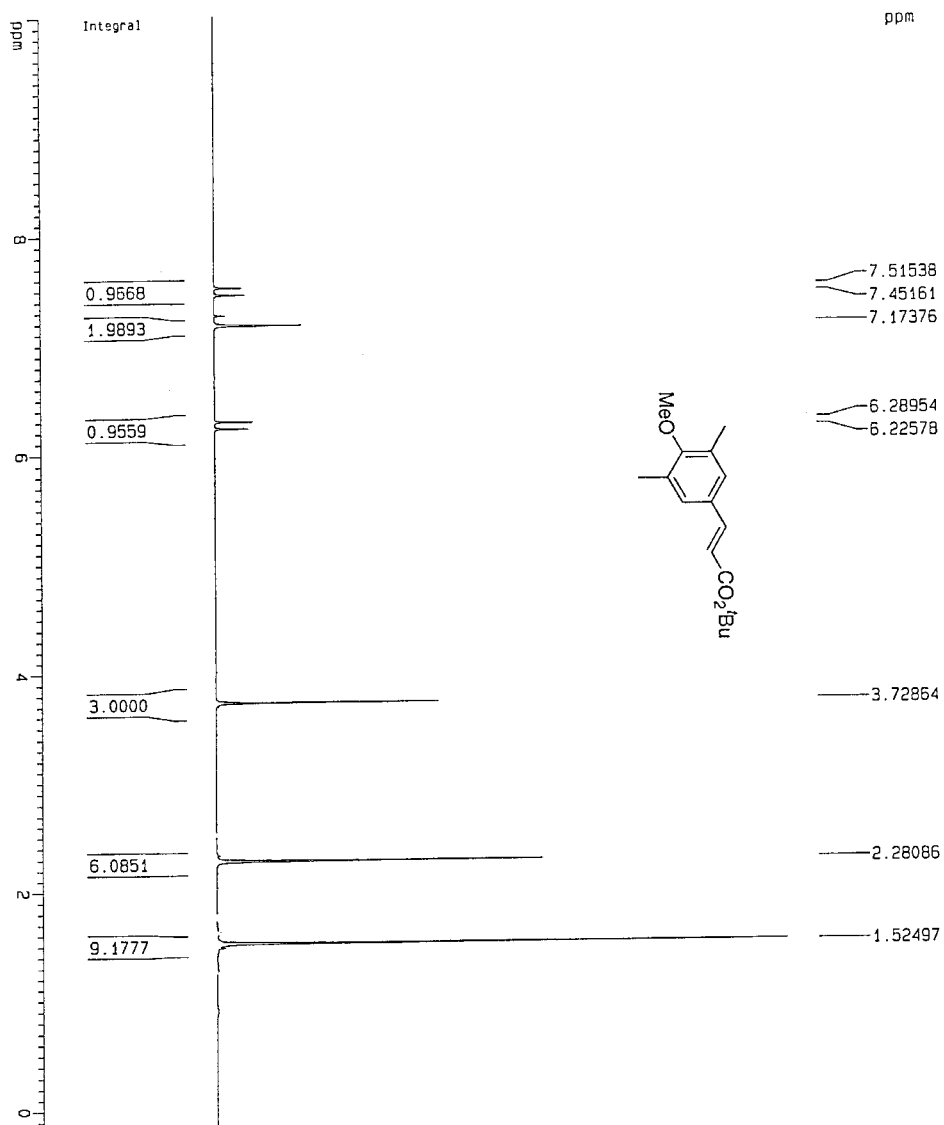
===== CHANNEL f1 =====
NUC1          13C
P1           12.50 usec
PL1          0.00 dB
SI 01        62.9015035 MHz

===== CHANNEL f2 =====
CPDPRG2      waltz16
NUC2          1H
PCPD2        120.00 usec
PL2          3.00 dB
PL12         30.00 dB
PL13         32.00 dB
SFO2         250.1310005 MHz

F2 - Processing parameters
S1           32768
SF           62.8952425 MHz
WON          LM
SSB          0
LB           3.00 Hz
GB           0
PC           1.40

10 NMR plot parameters:
CX           20.00 cm
FID          2315.000 ppm
F1           132627.481 Hz
F2          -314.48 Hz
PRGCM        11.00000 ppm/cm
HZCM         651.84706 Hz/cm
  
```

# Table 3. From 11



Current Data Parameters  
NAME proton  
EXPNO 1  
PROCNO 1

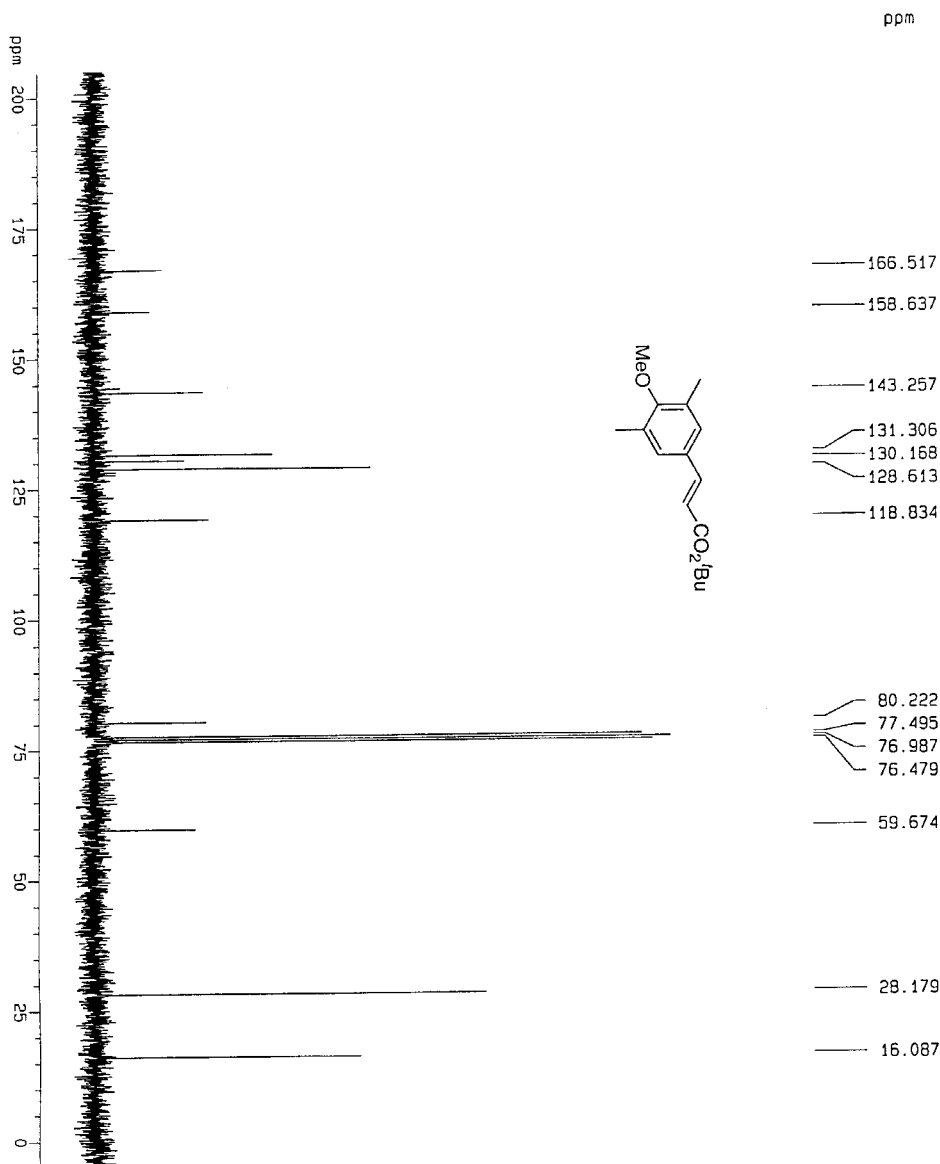
F2 - Acquisition Parameters  
Date\_ 20021122  
Time 9.19  
INSTRUM spect  
PROBHD 5 mm BBI X Y  
PULPROG zg30  
TD 32768  
SOLVENT CDCl3  
NS 8  
DS 2  
SWH 3053.726 Hz  
FIDRES 0.093497 Hz  
AQ 5.3477674 sec  
RG 128  
DM 163.200 usec  
DE 6.00 usec  
TE 300.0 K  
D1 1.00000000 sec

===== CHANNEL f1 =====  
NUC1 1H  
P1 10.70 usec  
PL1 0.00 dB  
SF01 250.1315008 MHz

F2 - Processing parameters  
SI 16384  
SF 250.130072 MHz  
WDW EM  
SSB 0  
LB 0.30 Hz  
GB 0  
PC 1.00

10 NMR plot parameters  
CX 20.00 cm  
F1P 10.000 ppm  
F1 2501.30 Hz  
F2P -125.07 Hz  
F2 0.52500 ppm/cm  
HZCM 131.31825 Hz/cm

Table 3. From 11



Current Data Parameters  
NAME carbon  
EXPNO 1  
PROCNO 1

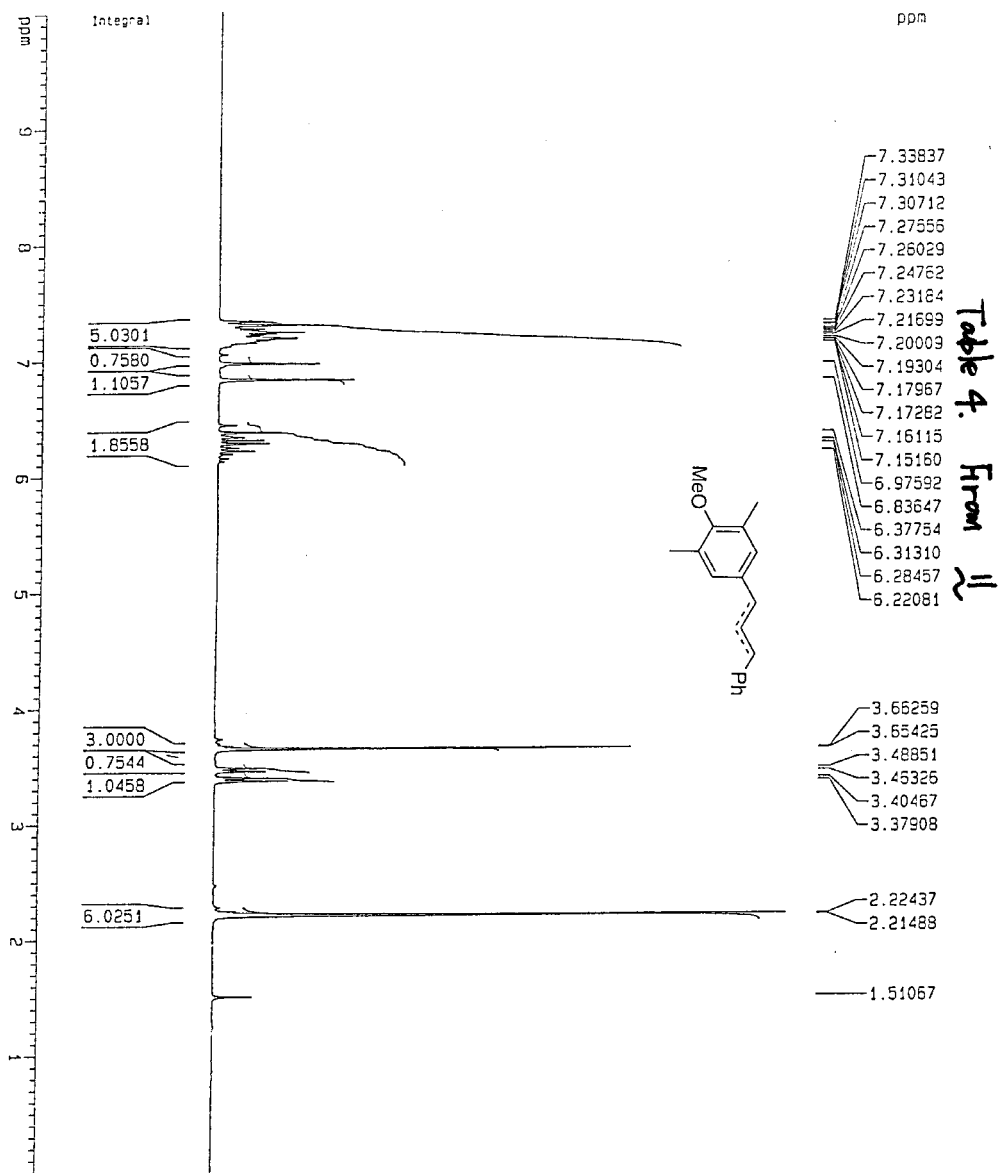
F2 - Acquisition Parameters  
Date\_ 20021123  
Time 11:14  
INSTRUM spect  
PROBHD 5 mm BBI X Y  
PULPROG zgpg30  
TD 32768  
SOLVENT CDCl3  
NS 550  
DS 4  
SMH 13227.514 Hz  
FIDRES 0.403672 Hz  
AQ 1.2386804 sec  
RG 6502  
DM 37.800 usec  
DE 5.00 usec  
TE 300.0 K  
D1 3.00000000 sec  
D11 0.03000000 sec  
D12 0.0002000 sec

===== CHANNEL f1 =====  
NUC1 13C  
P1 12.50 usec  
PL1 0.00 dB  
SF01 62.5015035 MHz

===== CHANNEL f2 =====  
CROSSPC2 waltz16  
NUC2 1H  
PCPD2 130.00 usec  
PL2 3.00 dB  
PL12 30.00 dB  
PL13 32.00 dB  
SF02 250.1310005 MHz

F2 - Processing parameters  
S1 32768  
SF 62.8952425 MHz  
MDM EM  
SSB 0  
LB 1.00 Hz  
GB 0  
PC 1.40

10 NMR plot parameters  
CX 20.00 cm  
F1P 215.000 ppm  
F1 1352.40 Hz  
F2P -5.000 ppm  
F2 -314.48 Hz  
PRGCM 11.00000 ppm/cm  
HZCM 691.84756 Hz/cm



Current Data Parameters

NAME	PROTON
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters

Date_	Time
20021122	15.24

INSTRUM 5 mm BBI X Y

PROBHD 5 mm BBI X Y

PULPROG zgpg

TD 32768

SOLVENT CDCl3

NS 6

DS 4

SWH 3132.032 Hz

FIDRES 0.095006 Hz

AQ 5.2200226 sec

HQ 203.2

DE 159.600 usec

TE 300.0 K

D1 1.0000000 sec

===== QIANMCL f1 =====

NUC1 1H

P1 7.72 usec

PL1 3.00 dB

SFO1 250.1315000 MHz

F2 - Processing parameters

SF	SI
250.1300242 MHz	16384

WDW EM

SSB 0

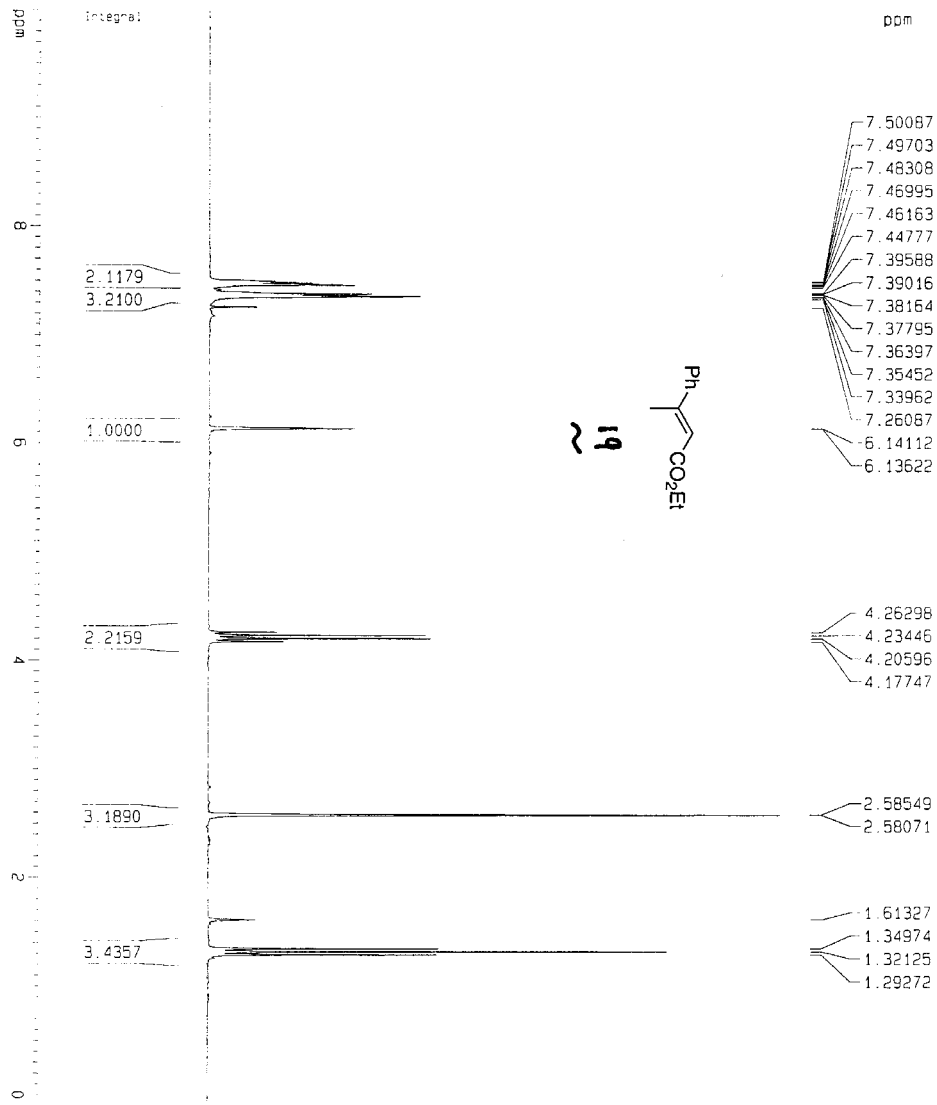
LB 0.30 Hz

GB 0

PC 1.00

1D NMR plot parameters

CX	F1P	F2P	PPMCM	HZCM
20.00 ppm	2501.30 Hz	0.000 ppm	0.50000 ppm/cm	125.06501 Hz/cm



Current Data Parameters

NAME	PROTON
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters

Date_	Time	INSTRUM	PROBHD	PULPROG	TD	SOLVENT	NS	DS	SWH	FIDRES	AQ	RG	DM	DE	TE	D1
20021107	14.16	SPECT	5 mm BBI X Y	zgpg30	32768	CDCl3	6	2	3063.726 Hz	0.693497 Hz	5.3477876 sec	203.2	163.200 usec	6.00 usec	300.0 K	1.00000000 sec

===== CHANNEL f1 =====

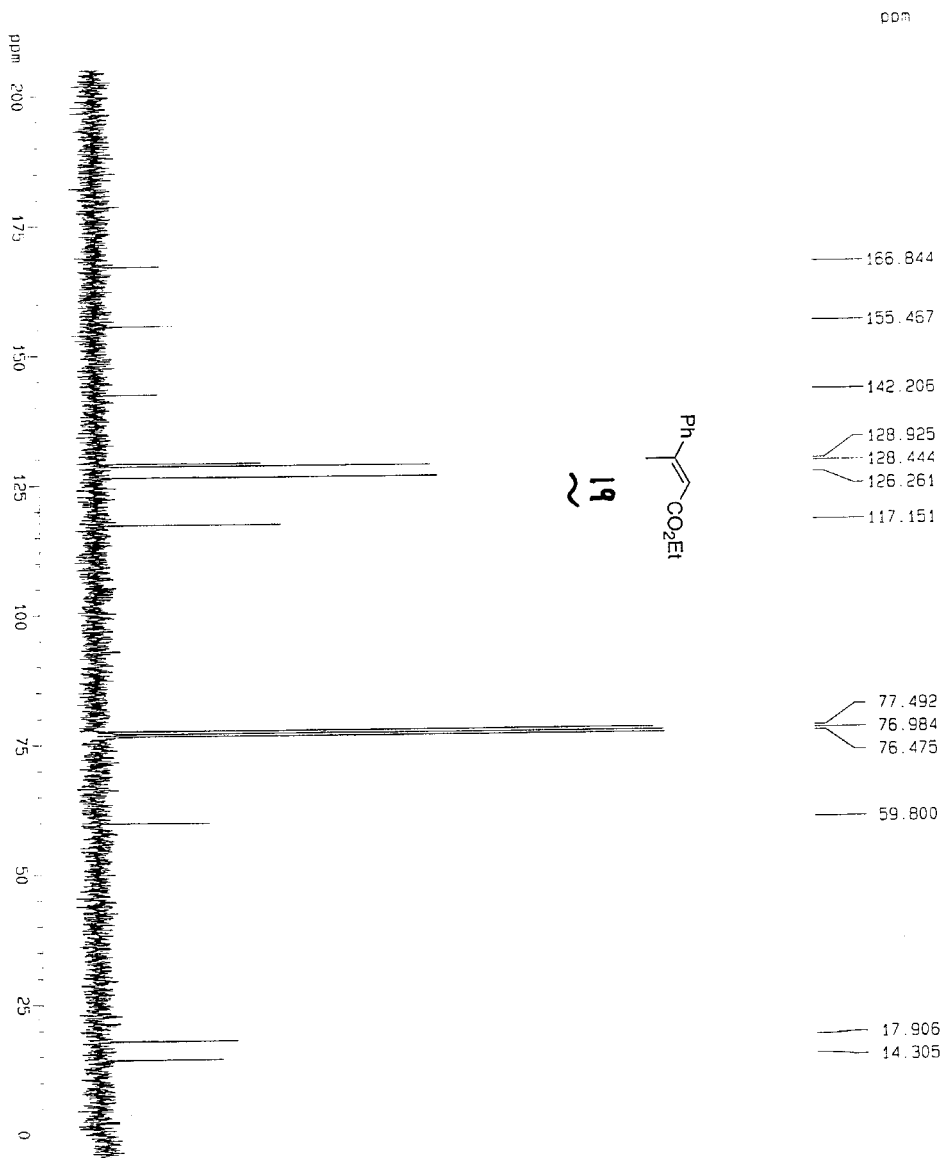
NUC1	HI
P1	10.70 usec
PL1	0.00 dB
SFO1	250.1315008 MHz

F2 - Processing parameters

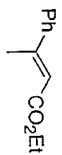
SI	16384
SF	250.1300072 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

1D NMR plot parameters

EX	20.00 cm
F1P	10.000 ppm
Z1	250.130 Hz
F2P	0.500 ppm
F2	125.07 Hz
PPMK	0.52500 ppm/cm
ACQ	131.51873 Hz/cm



166.844
155.467
142.206
128.925
128.444
126.261
117.151
77.492
76.984
76.475
59.800
17.906
14.305



19

Current Data Parameters

NAME	Carbon
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters

Date_	20071107
Time	20.39
INSTRUM	spect
PROBHD	5 mm HPL X Y
PULPROG	zgpg30
TD	32768
SOLVENT	CDCl3
NS	466
DS	4
SWH	13277.514 Hz
FIDRES	0.403167 Hz
AQ	1.2346804 sec
RG	5160.6
DM	37.800 usec
DE	6.00 usec
TE	300.0 K
D1	3.00000000 sec
D11	0.03000000 sec
D12	0.0002000 sec

===== CHANNEL f1 =====

NUC1	13C
P1	12.50 usec
PL1	0.00 dB
SFO1	62.5015035 MHz

===== CHANNEL f2 =====

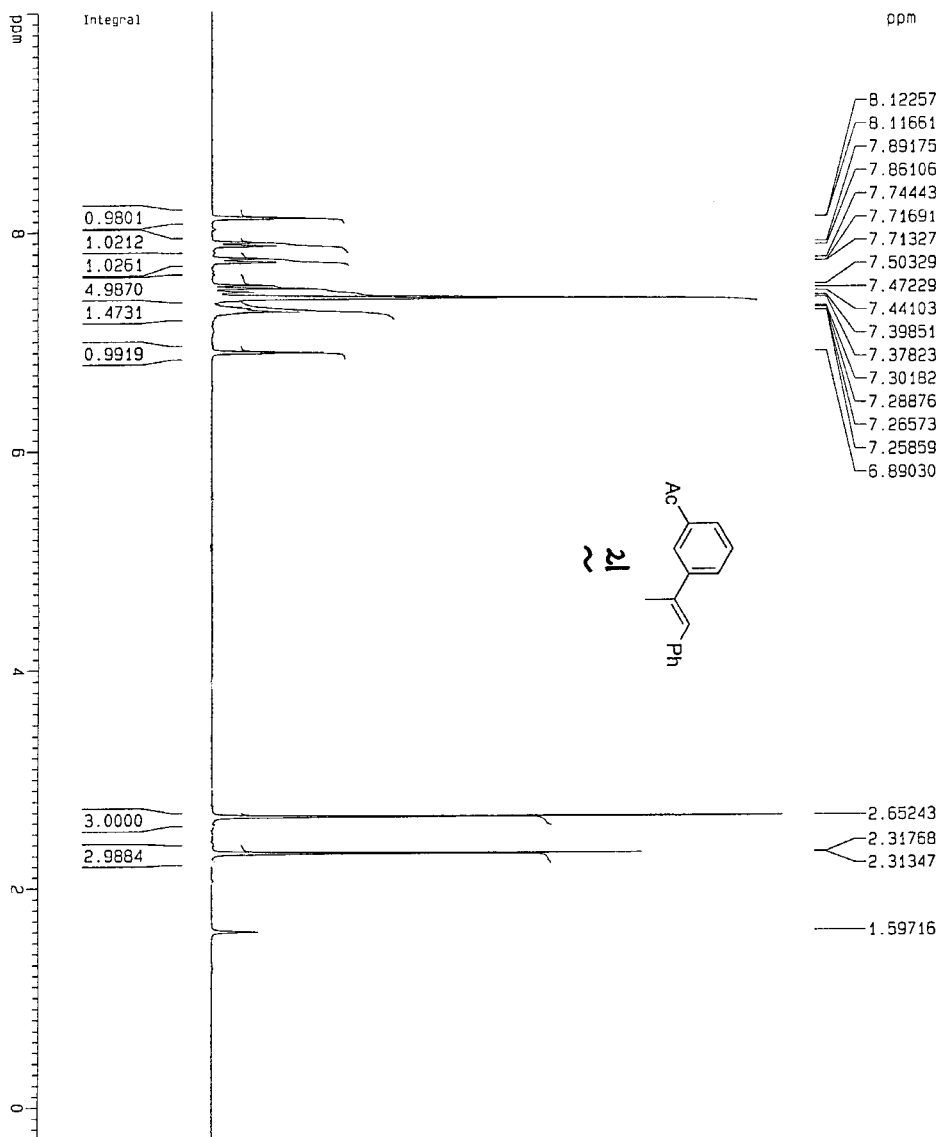
CPOPRG2	waltz16
NUC2	1H
PCPRG2	130.00 usec
PL2	3.00 dB
PL12	30.00 dB
PL13	30.00 dB
SFO2	250.1310005 MHz

F2 - Processing parameters

SF	32768
SI	62.8753425 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

10 best fit parameters

CH	20.00 Hz
FX	2715.000 ppm
F1	134.2744 Hz
F2	11.000 kHz
F3	14.44 Hz
PRGPRG	11.00000 Hz/cm
WALTZ	60.00000 Hz/cm



Current Data Parameters

NAME	proton
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters

Date_	20021123
Time	13.58
INSTRUM	spect
PROBHD	5 mm BBI X Y
PULPROG	zg30
TD	32768
SOLVENT	CDCl3
NS	6
DS	4
SWH	3132.832 Hz
FIDRES	0.095606 Hz
AQ	5.229226 sec
R6	362
DM	159.600 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

===== CHANNEL f1 =====

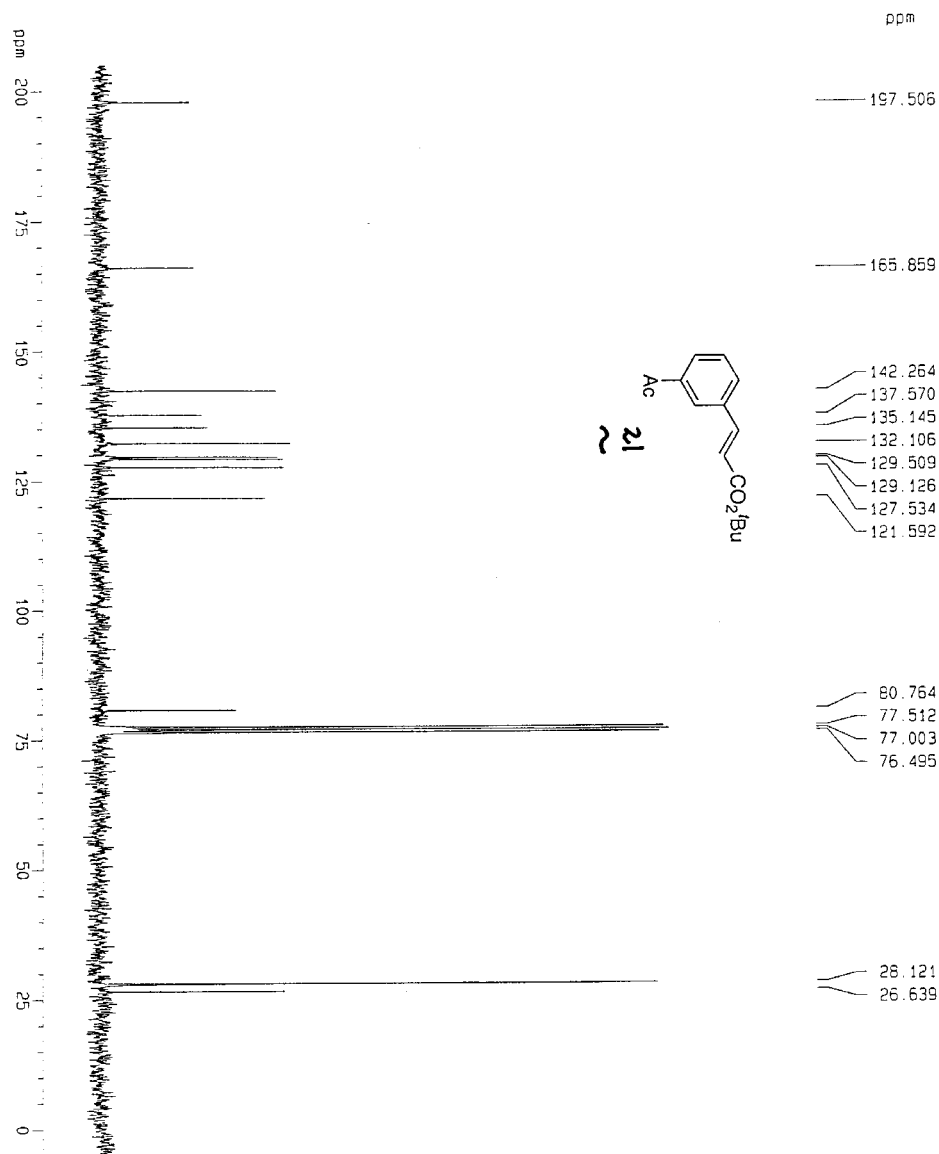
NUC1	<sup>1</sup> H
P1	6.50 usec
PL1	3.00 dB
SFO1	250.1315008 MHz

F2 - Processing parameters

SI	16384
SF	250.130072 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

1D NMR plot parameters

CX	20.00 cm
F1P	10.000 ppm
F1	2501.30 Hz
F2P	-0.500 ppm
F2	-125.07 Hz
PPMCM	0.52500 ppm/cm
HZCM	131.31825 Hz/cm



Current Data Parameters

NAME	VALUE	UNIT
EXPNO	1	
PROCNO	1	

F2 - Acquisition Parameters

Date_	Time	INSTRUM	PROBHD	PULPROG	TD	SOLVENT	NS	DS	SWH	FIDRES	AQ	RG	DM	DE	TE	D1	D11	D12
20021101	15.02	spect	5 mm BRL X Y	ZGPG30	32768	CDCl3	909	4	13271.514 Hz	0.405672 Hz	1.238600 sec	5160.6	37.800 usec	6.00 usec	300.0 K	3.00000000 sec	0.03000000 sec	0.0002000 sec

===== CHANNEL f1 =====

NUC1	P1	PL1	SF01
<sup>13</sup> C	12.50 usec	0.00 dB	62.5015035 MHz

===== CHANNEL f2 =====

CPDPRG2	NUC2	P2	PL2	SF02
zgpg30	<sup>13</sup> C	130.00 usec	0.00 dB	250.1310005 MHz

F2 - Processing parameters

SI	SF	WDW	SSB	LB	GB	PC
32768	62.5015035 MHz	EM	0	3.00 Hz	0	1.40

10 NMR plot parameters

CX	F1P	F2P	WDW	SSB	LB	GB	PC
20.00 cm	215.000 ppm	135.000 Hz	EM	0	3.00 Hz	0	1.40

===== CHANNEL f1 =====

CPDPRG2	NUC2	P2	PL2	SF02
zgpg30	<sup>13</sup> C	130.00 usec	0.00 dB	250.1310005 MHz