

# Synthesis of 2'-Substituted 4-Bromo-2,4'-bithiazoles by Regioselective Cross-coupling Reactions

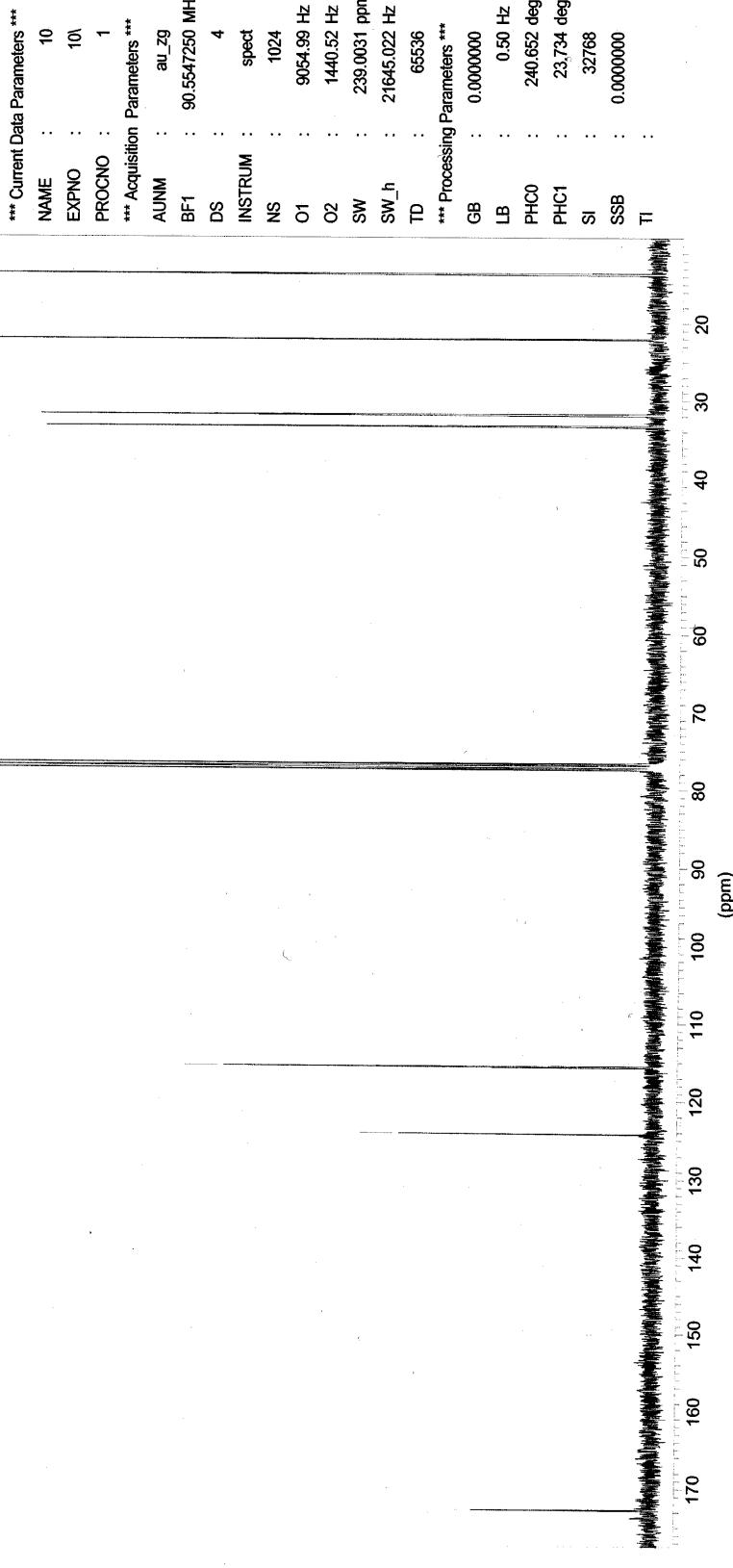
Thorsten Bach\*, and Stefan Heuser

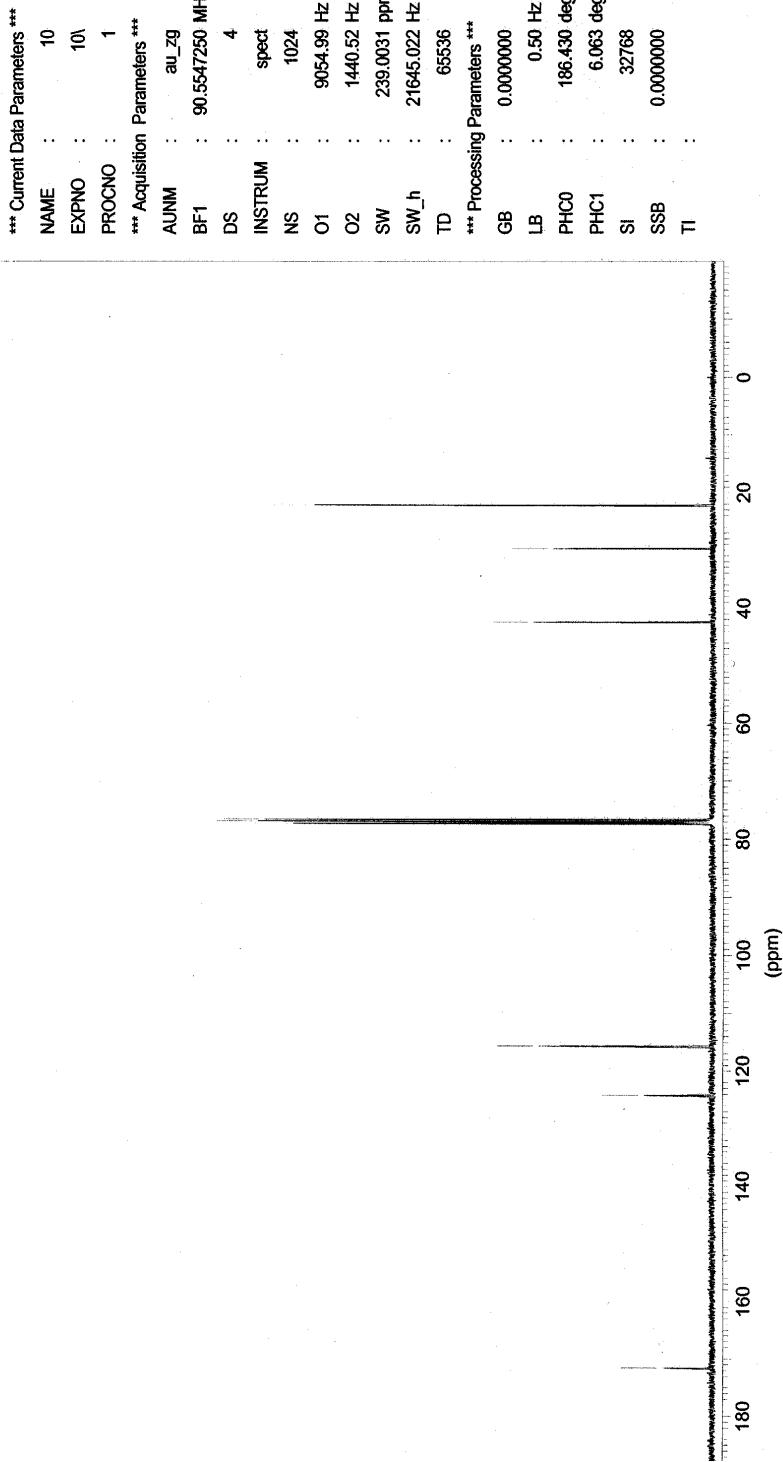
Lehrstuhl für Organische Chemie I, Technische Universität München, D-85747 Garching,  
Germany

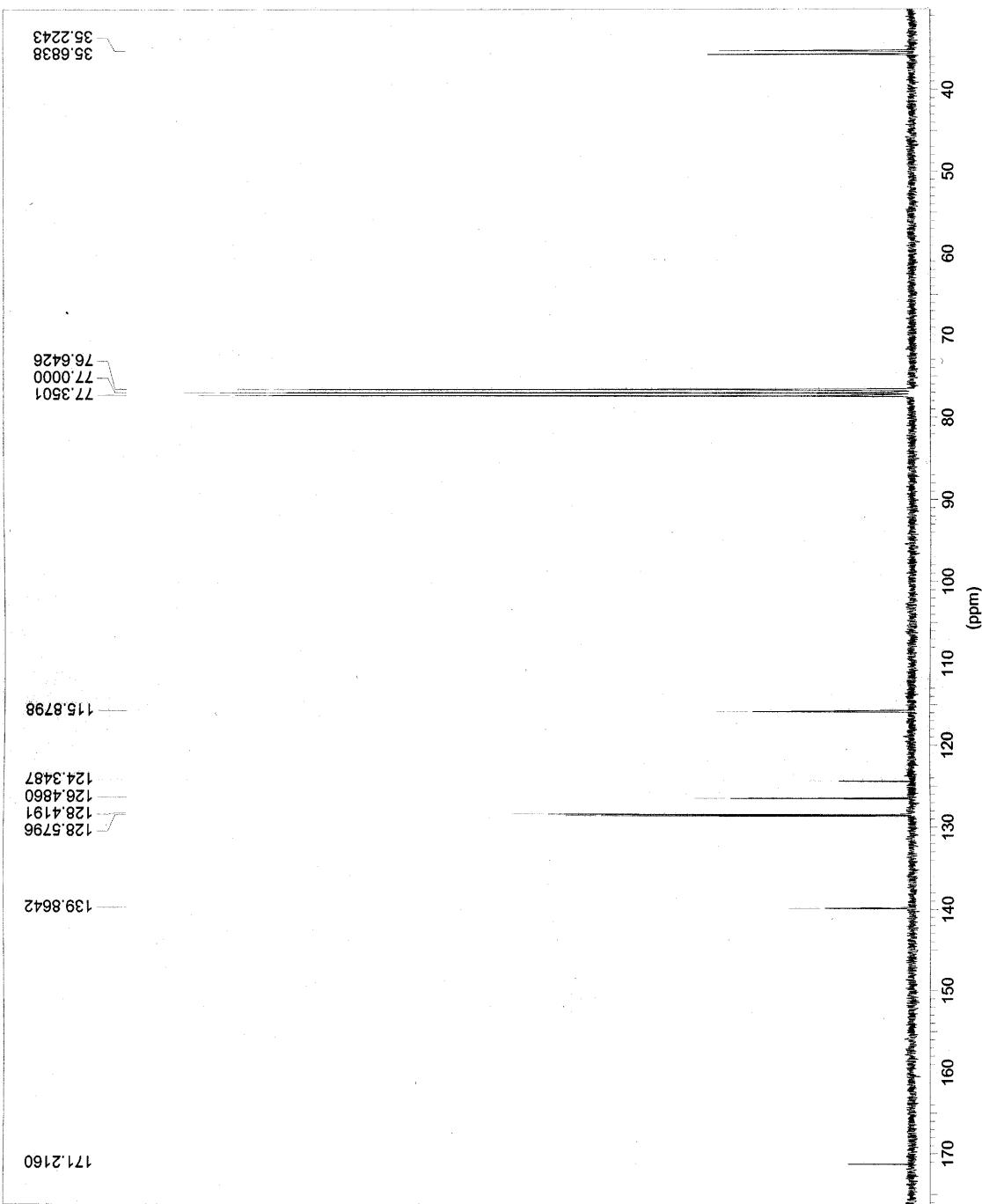
[thorsten.bach@ch.tum.de](mailto:thorsten.bach@ch.tum.de)

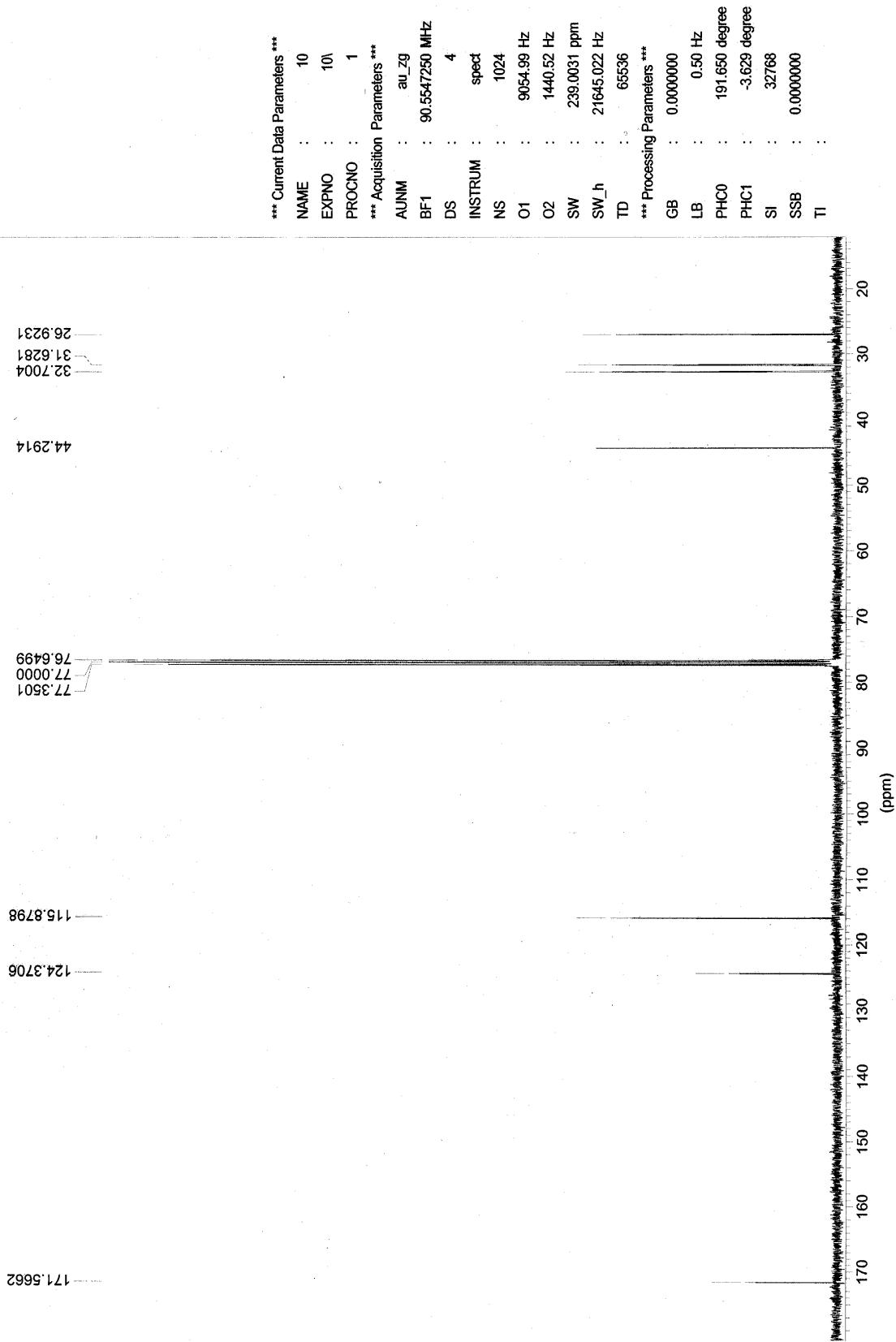
## Page

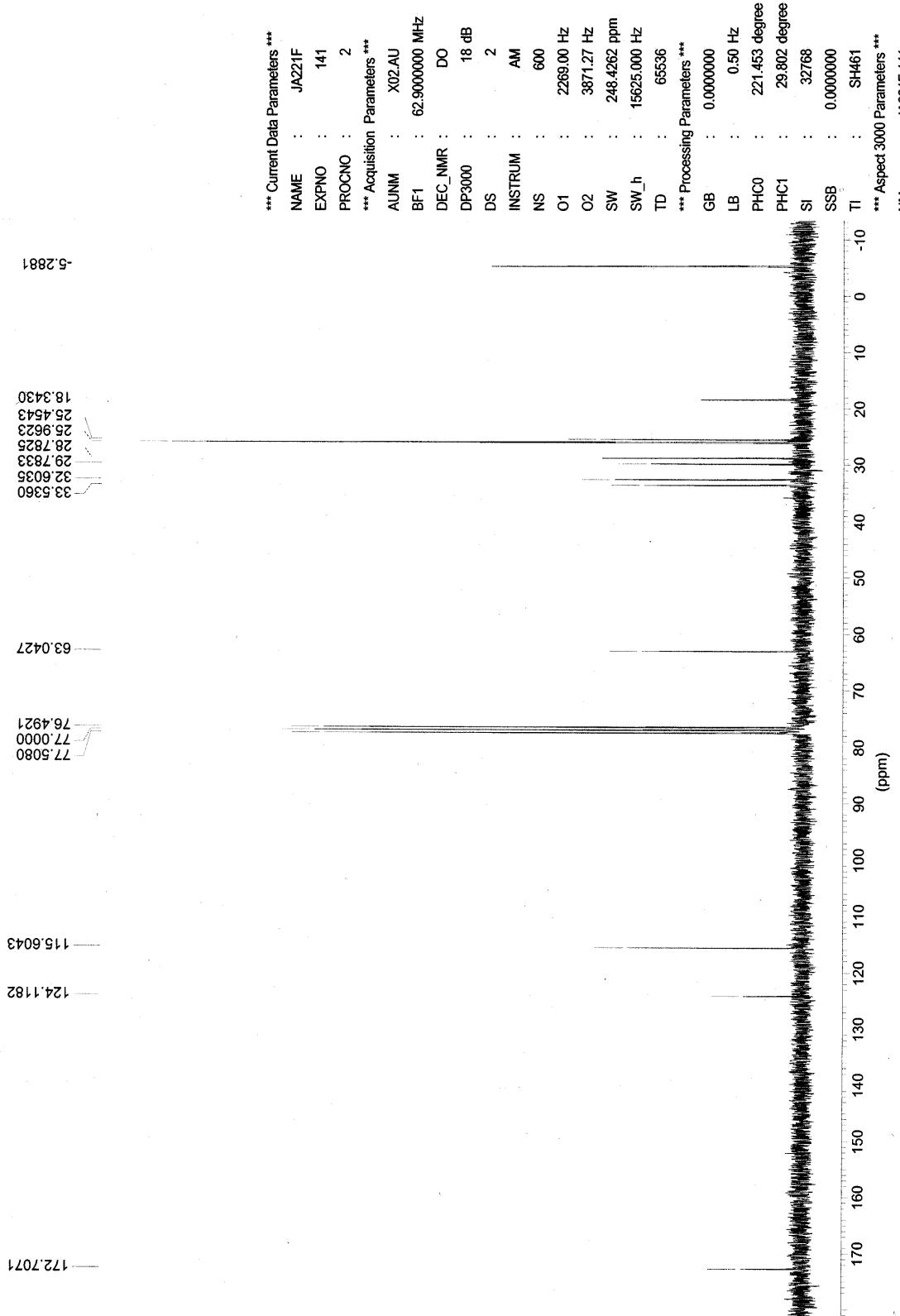
- 2      4-Bromo-2-butylthiazole (**3a**).
- 3      4-Bromo-2-*i*-butylthiazole (**3b**).
- 4      4-Bromo-2-phenylethylthiazole (**3c**).
- 5      4-Bromo-2-(4-chlorobutyl)-thiazole (**3d**).
- 6      4-Bromo-2-[6-(*t*-butyldimethylsiloxy)-hexyl]-thiazole (**3e**).
- 7      4-Bromo-2-*i*-propylthiazole (**3f**).
- 8      4-Bromo-2-*s*-butylthiazole (**3g**).
- 9      4-Bromo-2-phenylthiazole (**3h**).
- 10     4-Bromo-2-(3,3-dimethyl-1-butynyl)-thiazole (**3i**).
- 11     4-Bromo-2-phenylethynylthiazole (**3j**).
- 12     4-Bromo-2'-butyl-2,4'-bithiazole (**1a**).
- 13     4-Bromo-2'-*i*-butyl-2,4'-bithiazole (**1b**).
- 14     4-Bromo-2'-phenylethyl-2,4'-bithiazole (**1c**).
- 15     4-Bromo-2'-(4-chlorobutyl)-2,4'-bithiazole (**1d**).
- 16     4-Bromo-2'-[6-(*t*-butyldimethylsiloxy)-hexyl]-2,4'-bithiazole (**1e**).
- 17     4-Bromo-2'-*i*-propyl-2,4'-bithiazole (**1f**).
- 18     4-Bromo-2'-*s*-butyl-2,4'-bithiazole (**1g**).
- 19     4-Bromo-2'-phenyl-2,4'-bithiazole (**1h**).
- 20     4-Bromo-2'-(3,3-dimethyl-but-1-ynyl)-2,4'-bithiazole (**1i**).
- 21     4-Bromo-2'-phenylethynyl-2,4'-bithiazole (**1j**).

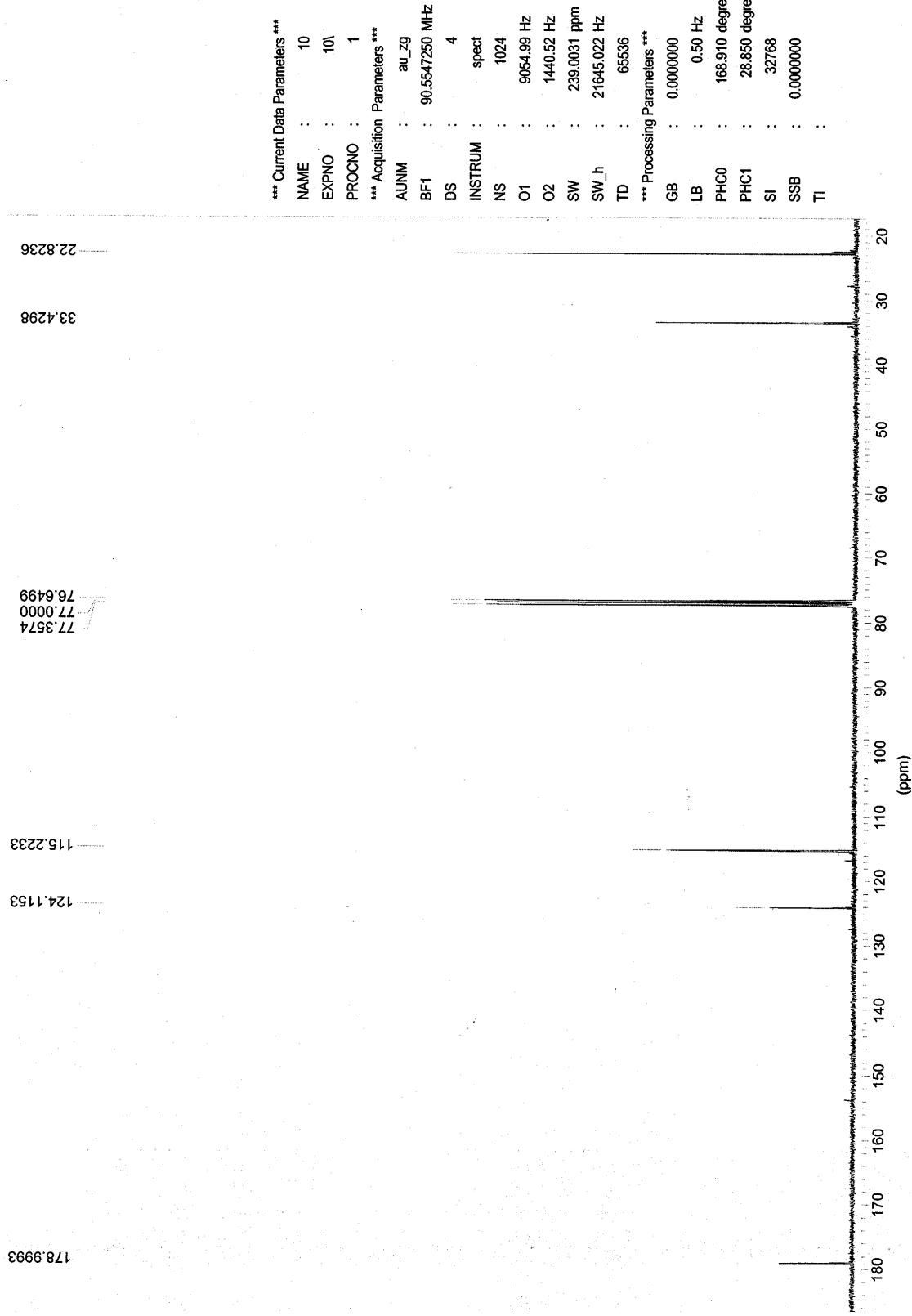


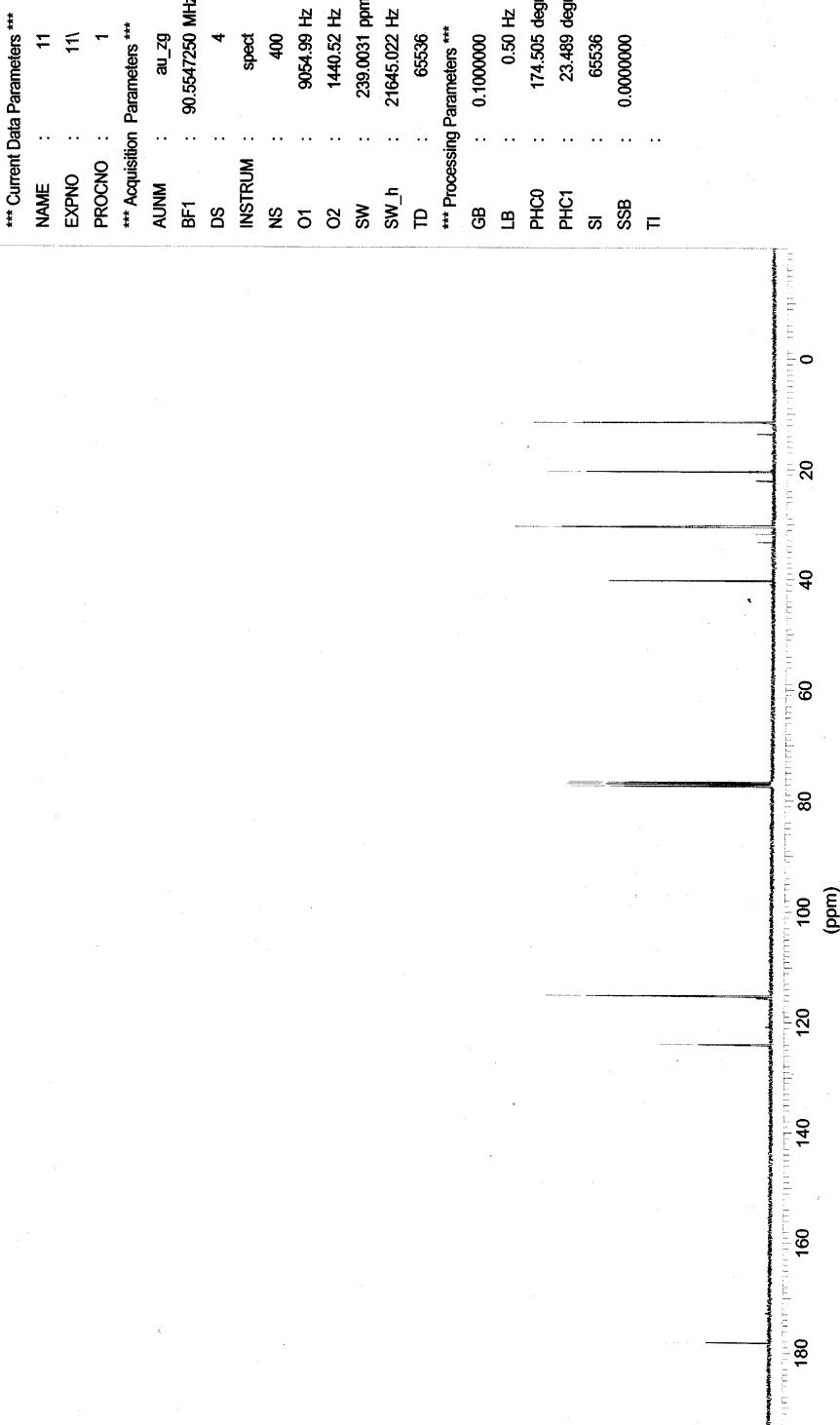


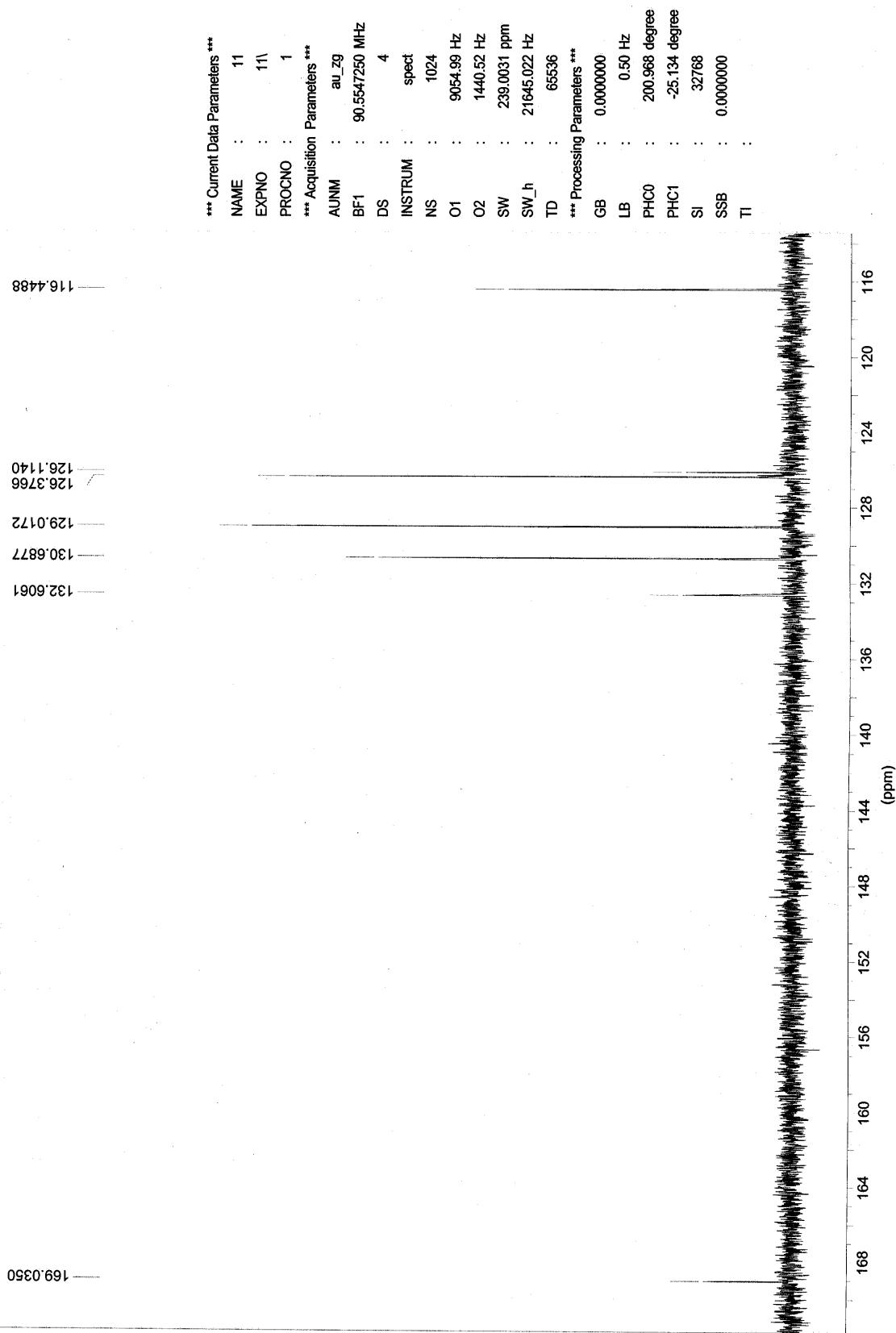












30.5120  
30.2494  
28.2726

72.0981

105.4851

117.6232

125.1730

150.4558

\*\*\* Current Data Parameters \*\*\*  
NAME : 11  
EXPNO : 11  
PROGNO : 1  
\*\*\* Acquisition Parameters \*\*\*  
AUNM : au\_2g  
BF1 : 90.5547250 MHz  
DS : 4  
INSTRUM : spect  
NS : 1024  
O1 : 9054.99 Hz  
O2 : 1440.52 Hz  
SW : 239.0031 ppm  
SW\_h : 21645.022 Hz  
TD : 65536  
\*\*\* Processing Parameters \*\*\*  
GB : 0.000000  
LB : 0.50 Hz  
PHC0 : 190.230 degree  
PHC1 : -4.910 degree  
SI : 32768  
SSB : 0.000000  
TI :



—149.6660  
—132.0351  
—129.9343  
—128.6067  
—125.9077  
—120.8818  
—118.7955  
—96.5479  
—81.5278

## \*\*\* Current Data Parameters \*\*\*

NAME : 10  
EXPNO : 10  
PROCNO : 1

## \*\*\* Acquisition Parameters \*\*\*

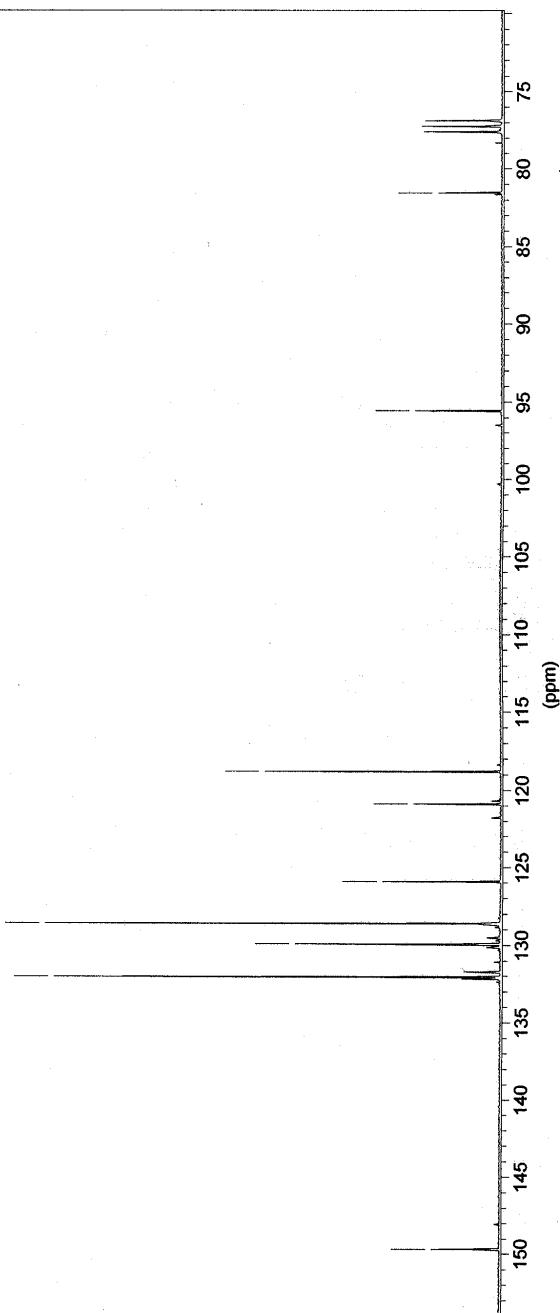
AUINM : au zg  
BF1 : 90.5547250 MHz  
DS : 4  
INSTRUM : spect

NS : 1024  
O1 : 9054.99 Hz  
O2 : 1440.52 Hz  
SW : 239.0031 ppm  
SW\_h : 21645.022 Hz

TD : 65536  
T1 : 75

## \*\*\* Processing Parameters \*\*\*

GB : 0.000000  
LB : 0.50 Hz  
PHC0 : 180.202 degree  
PHC1 : 13.931 degree  
SI : 32768  
SSB : 0.000000  
T1 : 75



\*\*\* Current Data Parameters \*\*\*

NAME	:	11
EXPNO	:	11
PROCNO	:	1
*** Acquisition Parameters ***		
AJNM	:	au zg
BF1	:	90.5547250 MHz
DS	:	4
INSTRUM	:	spect
NS	:	1024
O1	:	9054.99 Hz
O2	:	1440.52 Hz
SW	:	239.0031 ppm
SW_h	:	21645.022 Hz
TD	:	65536
*** Processing Parameters ***		
GB	:	0.000000
LB	:	0.50 Hz
PHC0	:	184.660 degree
PHC1	:	7.532 degree
SI	:	32768
SSB	:	0.000000
TI	:	

13.6981  
22.1963  
31.9417  
33.1016

76.6499  
77.0000  
77.3501

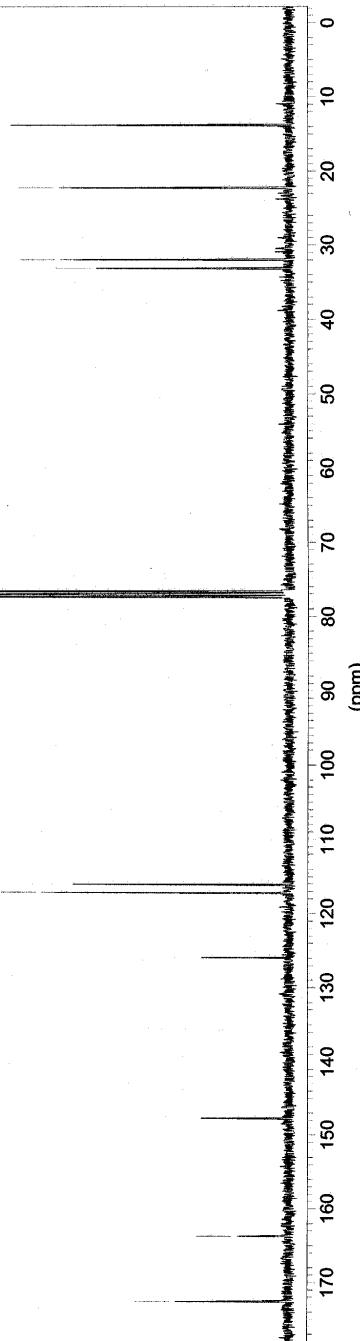
116.0184  
117.1345

125.9171

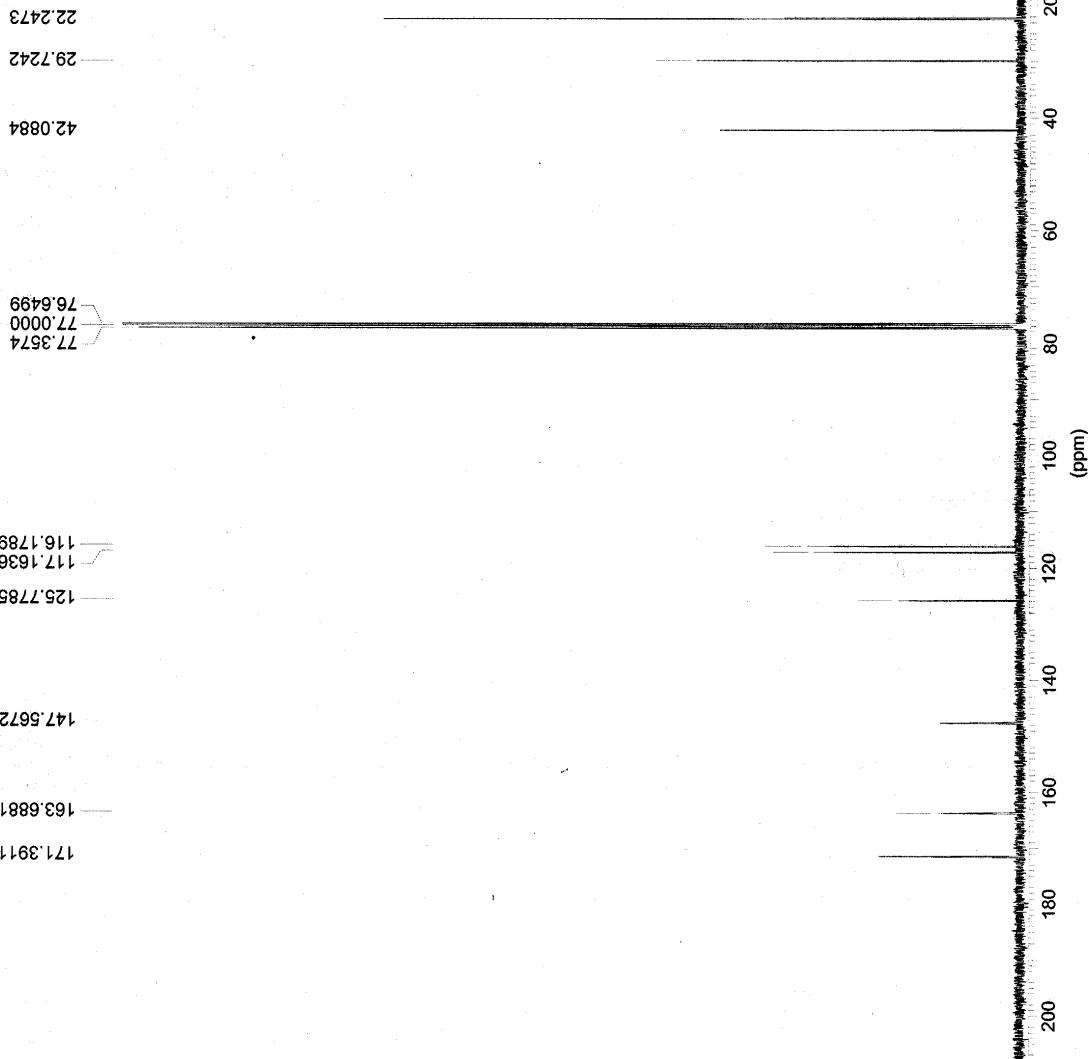
147.6912

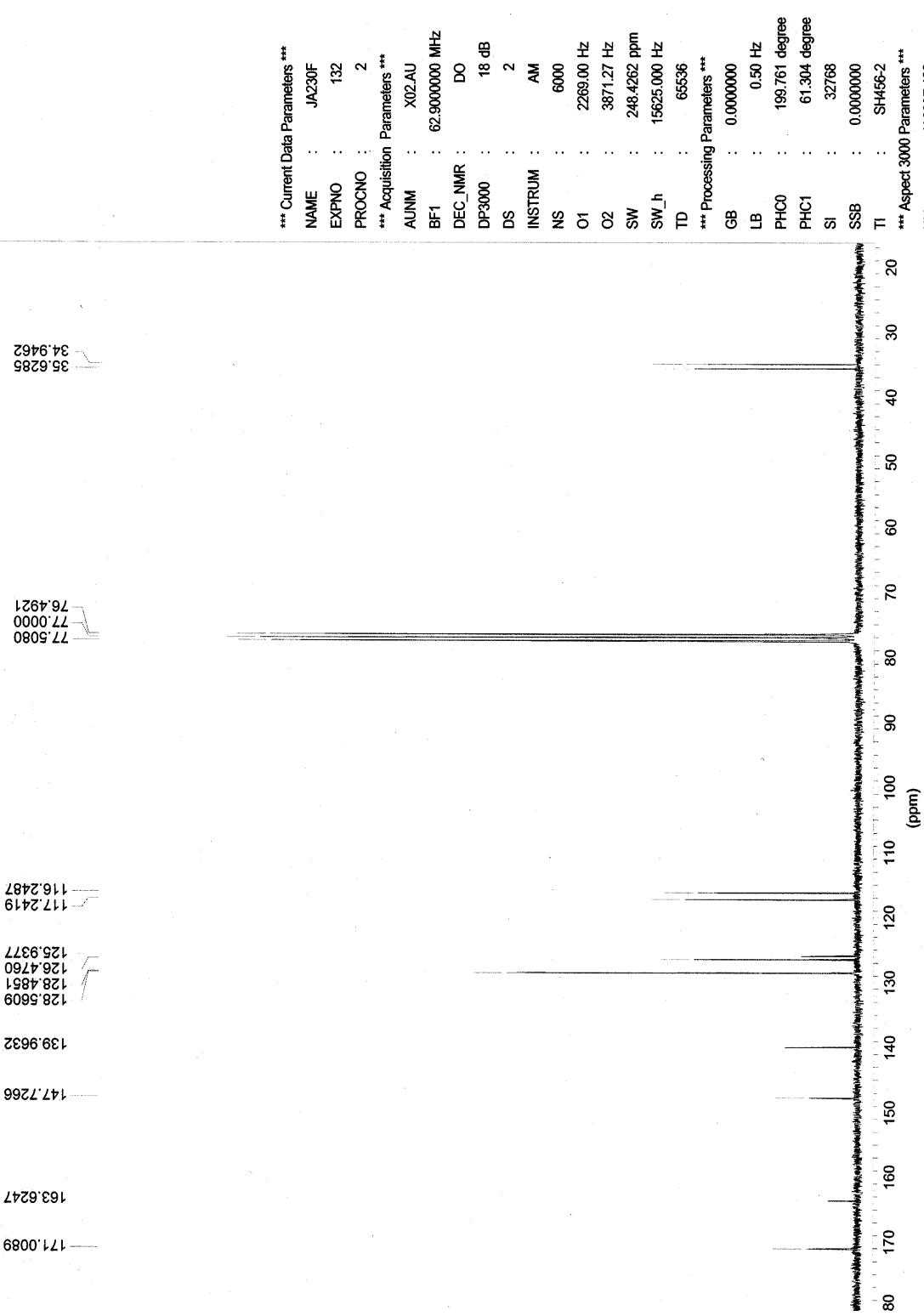
163.7173

172.5728

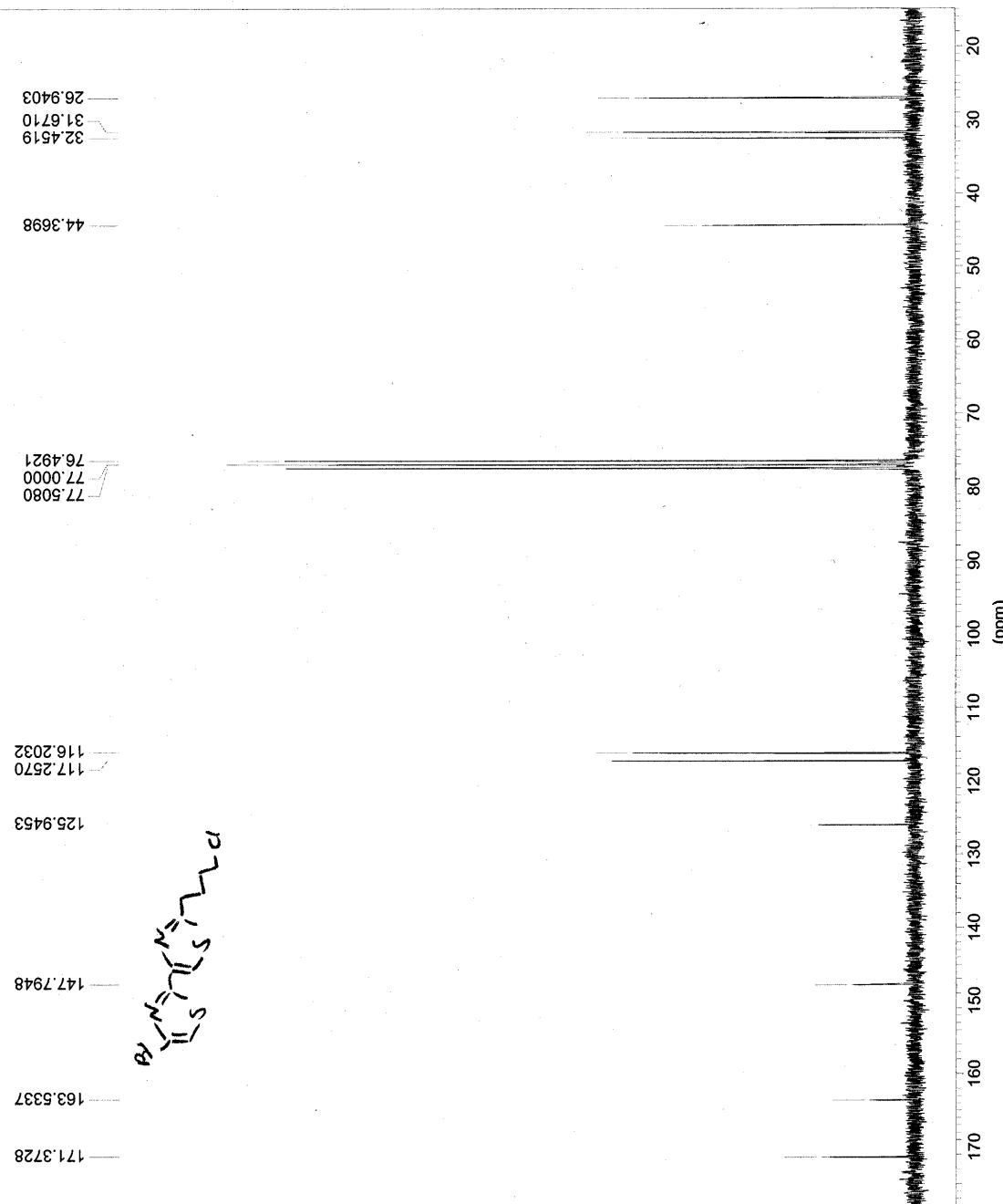


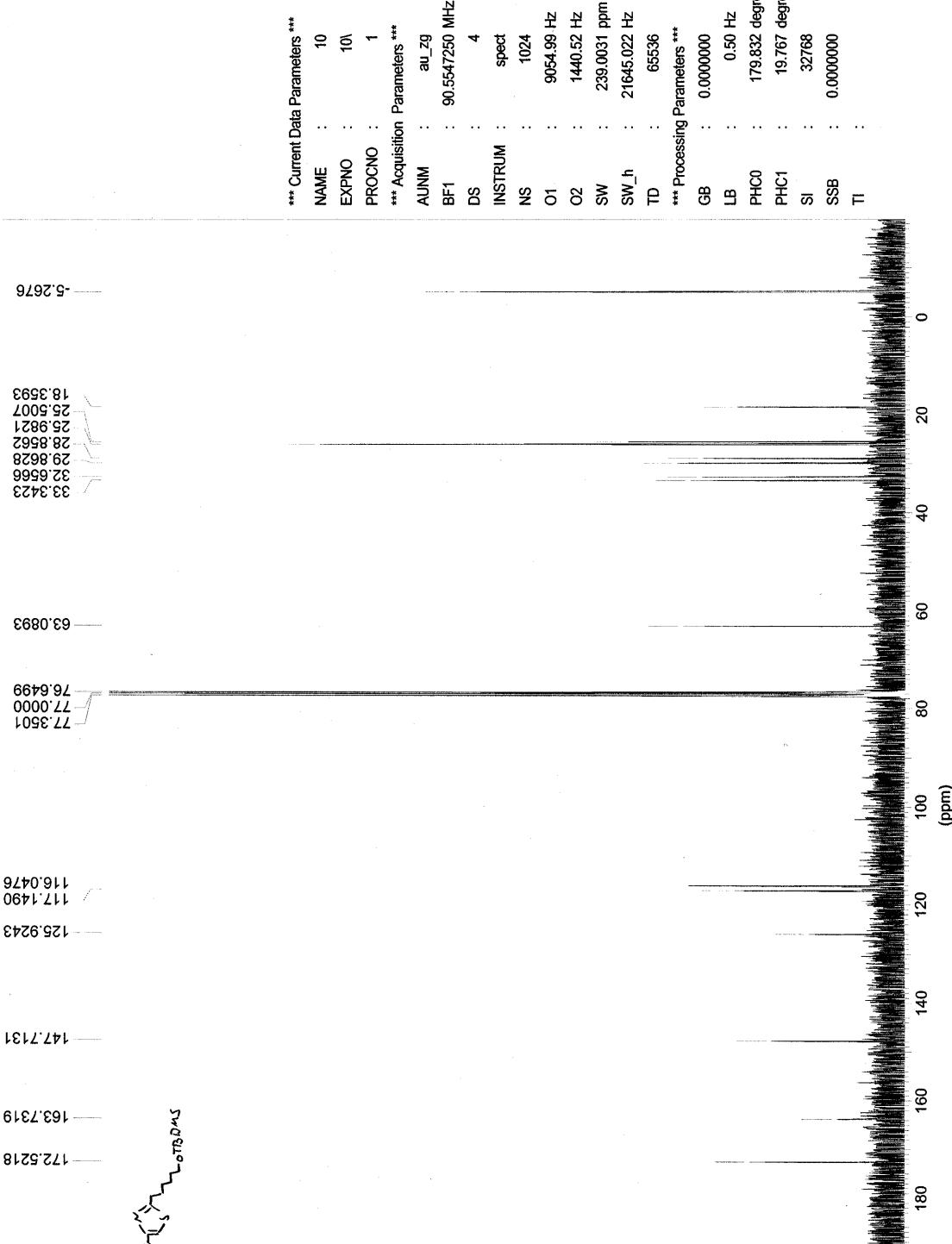
\*\*\* Current Data Parameters \*\*\*  
NAME : 10  
EXPNO : 10\\  
PROCNO : 1  
\*\*\* Acquisition Parameters \*\*\*  
AUNM : au zg  
BF1 : 90.5547250 MHz  
DS : 4  
INSTRUM : spect  
NS : 1024  
O1 : 9054.99 Hz  
O2 : 1440.52 Hz  
SW : 239.0031 ppm  
SW\_h : 21645.022 Hz  
TD : 65536  
\*\*\* Processing Parameters \*\*\*  
GB : 0.000000  
LB : 0.50 Hz  
PHC0 : 202.033 degree  
PHC1 : 1.843 degree  
SI : 32768  
SSB : 0.000000  
T1 :

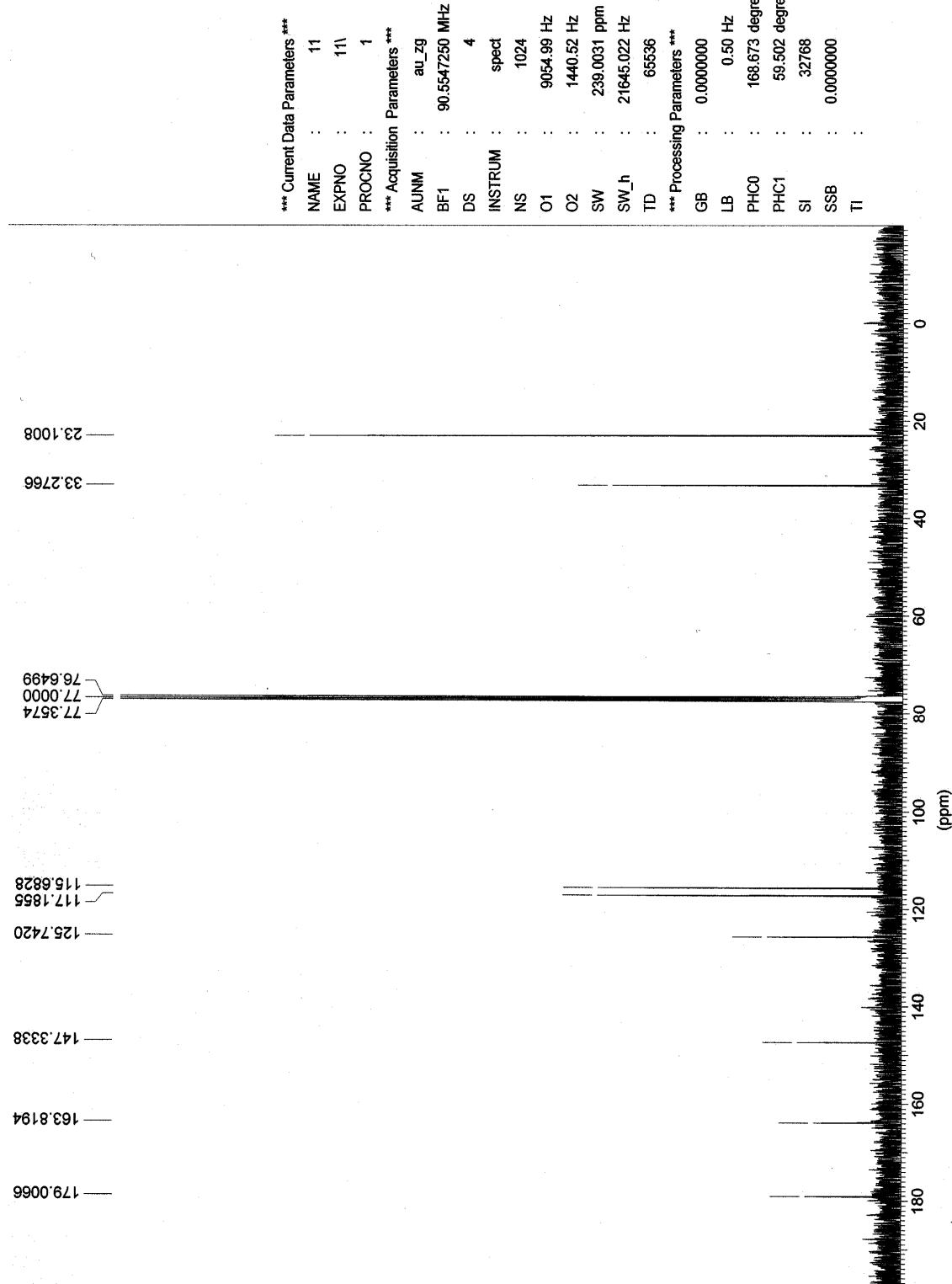




*** Current Data Parameters ***		
NAME	:	JA220F
EXPNO	:	131
PROGNO	:	2
*** Acquisition Parameters ***		
AUNM	:	X02.AU
BF1	:	62.900000 MHz
DEC_NMR	:	DO
DP3000	:	18 dB
DS	:	2
INSTRUM	:	AM
NS	:	1200
O1	:	2269.00 Hz
O2	:	3871.27 Hz
SW	:	248.4262 ppm
SW_h	:	15625.000 Hz
TD	:	65536
*** Processing Parameters ***		
GB	:	0.000000
LB	:	0.50 Hz
PHC0	:	201.111 deg
PHC1	:	60.400 deg
SI	:	32768
SSB	:	0.000000
T1	:	SH445-1
*** Aspect 3000 Parameters ***		



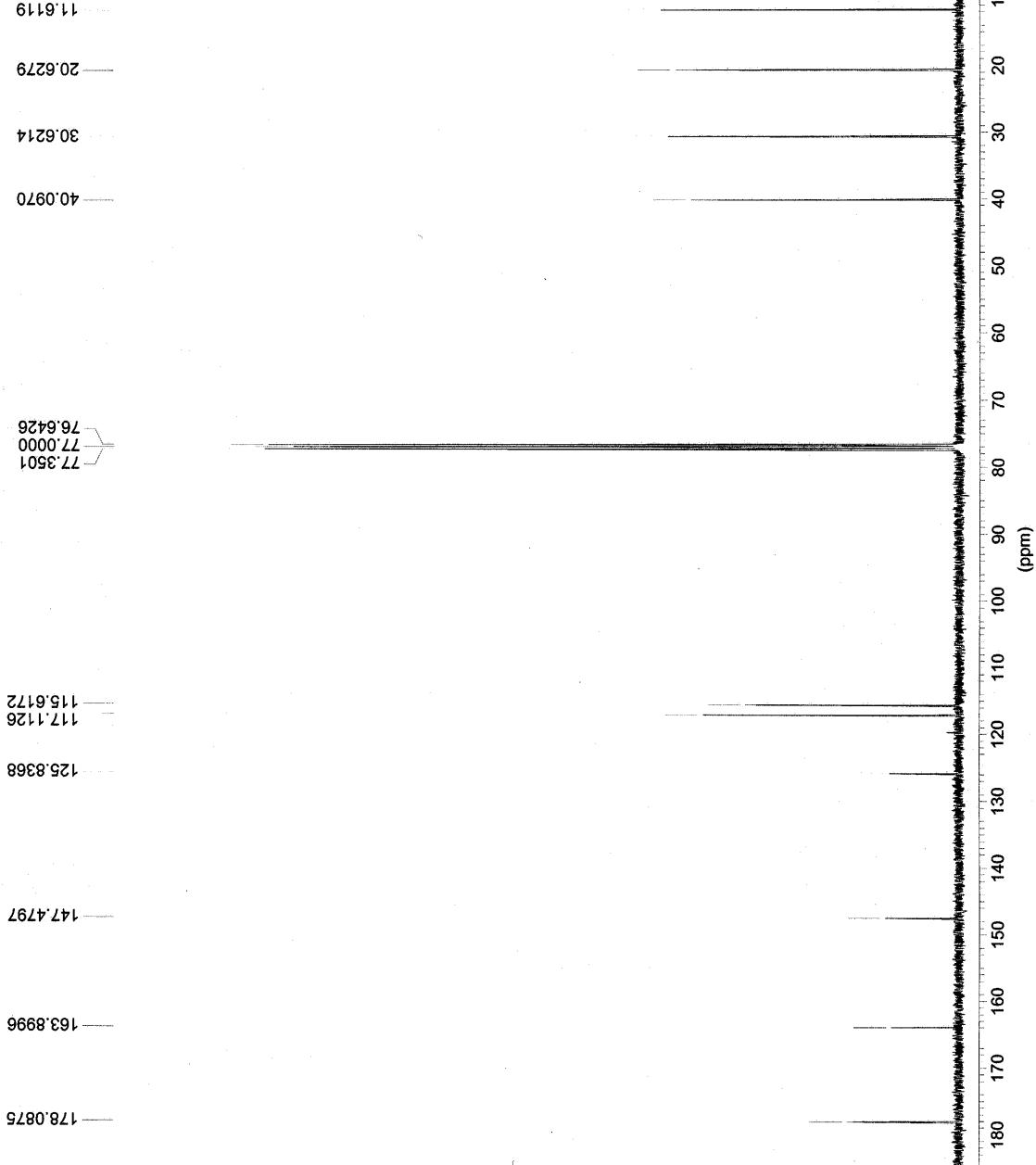


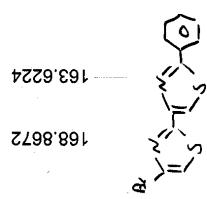


```

*** Current Data Parameters ***
NAME : 11
EXPNO : 111
PROCNO : 1
*** Acquisition Parameters ***
AUNM : au_zg
BF1 : 90.5547250 MHz
DS : 4
INSTRUM : spect
NS : 1024
O1 : 9054.99 Hz
O2 : 1440.52 Hz
SW : 239.0031 ppm
SW_h : 21645.022 Hz
TD : 65536
*** Processing Parameters ***
GB : 0.000000
LB : 0.50 Hz
PHC0 : 188.601 degree
PHC1 : 1.928 degree
SI : 32768
SSB : 0.000000
T1 :

```





148.9969

163.6224  
168.8672

132.8250  
130.6585  
129.0537  
126.1195  
126.0046

117.5429  
116.4925

77.3501  
77.0000  
76.6499

