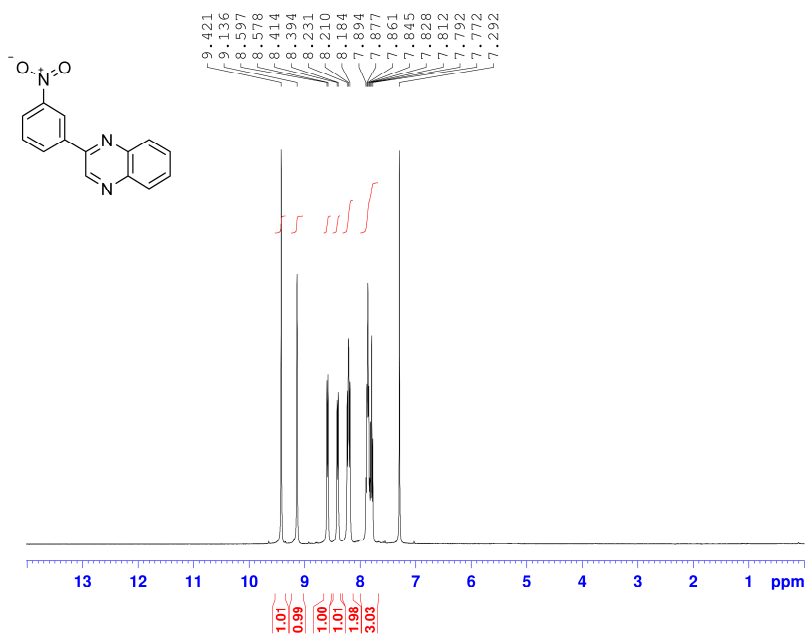


## ((Supplementary data))

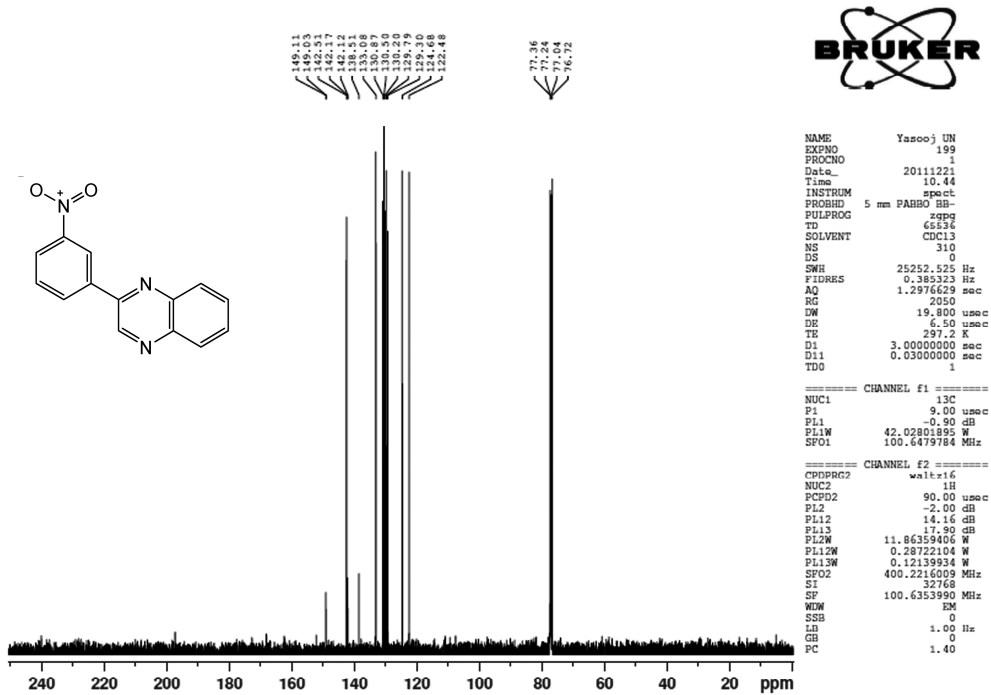
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz)



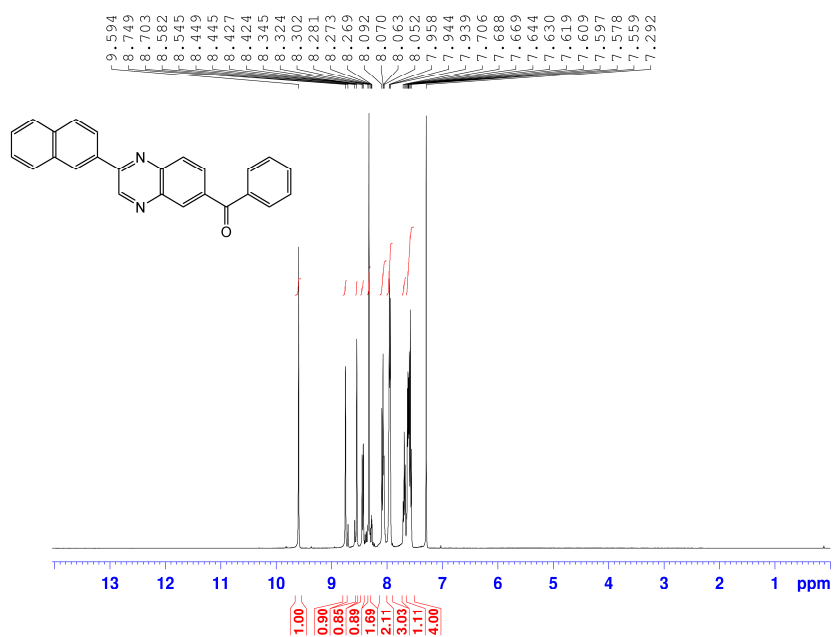
```
NAME      Yasooj UN
EXPNO     198
PROCNO    1
Date_     20111221
Time      10.41
INSTRUM   spect
PROBHD    5 mm PABBO BB-
PULPROG   zg30
TD        65536
SOLVENT   CDCl3
NS        43
DS        0
SWH       8012.820 Hz
FIDRES    0.122266 Hz
AQ        4.0894966 sec
RG        2050
DW        62.400 usec
DE        6.50 usec
TE        297.1 K
D1        6.0000000 sec
TDO       1

----- CHANNEL f1 -----
NUC1      1H
P1        14.00 usec
PL1       -2.00 dB
PL1W      11.86359406 W
SFO1      400.2236020 MHz
SI        32768
SF        400.2200000 MHz
WDW       EM
SSB       0
LB        0.30 Hz
GB        0
PC        1.00
```

### $^{13}\text{C}$ NMR (CDCl<sub>3</sub>, 100 MHz)



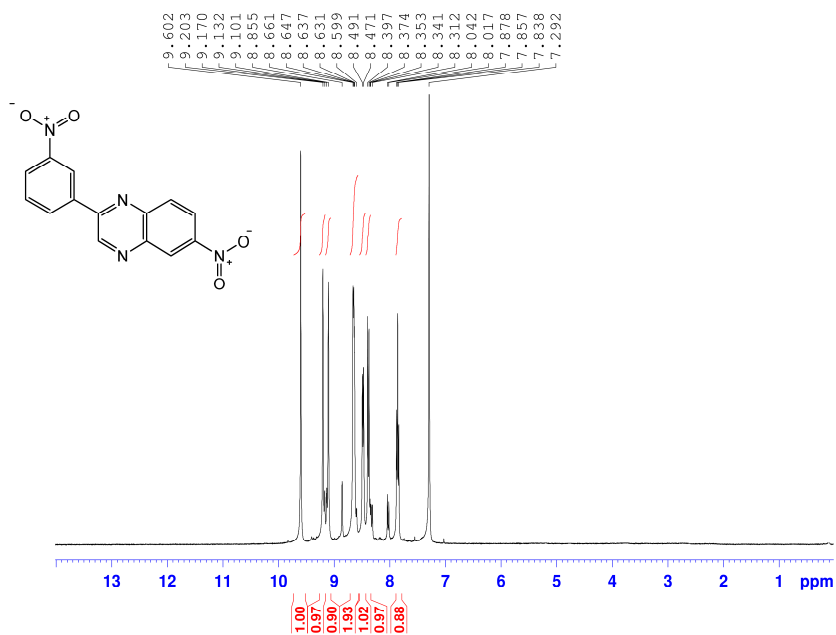
### <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz)



```
NAME          Yasooj UN
EXPNO         201
PROCNO        1
Date_         20111221
Time          11.12
INSTRUM       spect
PROBHD        5 mm PABBO BB-
PULPROG       zg30
TD            65536
SOLVENT       CDCl3
NS            64
DS            0
SWH           8012.820 Hz
FIDRES        0.122266 Hz
AQ            4.0894966 sec
RG            2050
DW            62.400 usec
DE            6.50 usec
TE            297.4 K
D1            6.0000000 sec
TD0           1
```

```
===== CHANNEL f1 =====
NUC1          1H
P1            14.00 usec
PL1          -2.00 dB
PL1W         11.86359406 N
SFO1         400.2236020 MHz
SI           32768
SF           400.2200000 MHz
WDW          EM
SSB          0
LB           0.30 Hz
GB           0
PC           1.00
```

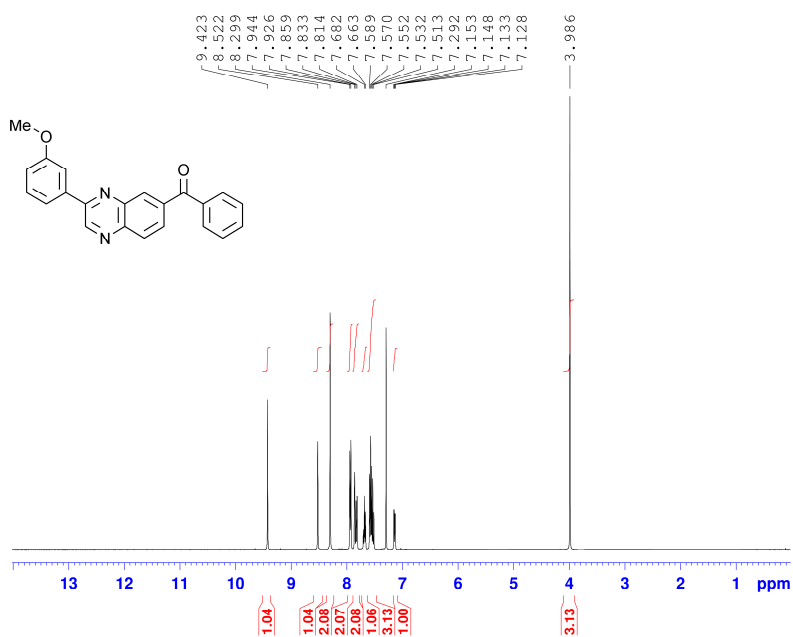
### <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz)



NAME Yasooj UN  
EXPNO 203  
PROCNO 1  
Date\_ 20111221  
Time 11:48  
INSTRUM spect  
PROBHD 5 mm PABBO BB-  
PULPROG zg30  
TD 65536  
SOLVENT CDCl3  
NS 32  
DS 0  
SWH 8012.820 Hz  
FIDRES 0.122266 Hz  
AQ 4.0894966 sec  
RG 2050  
DW 62.400 usec  
DE 6.50 usec  
TE 297.4 K  
D1 6.0000000 sec  
TD0 1

===== CHANNEL f1 =====  
NUC1 1H  
P1 14.00 usec  
PL1 -2.00 dB  
PL1W 11.86359406 W  
SFO1 400.2236020 MHz  
SI 32768  
SF 400.2200000 MHz  
WDW EM  
SSB 0  
LB 0.30 Hz  
GB 0  
PC 1.00

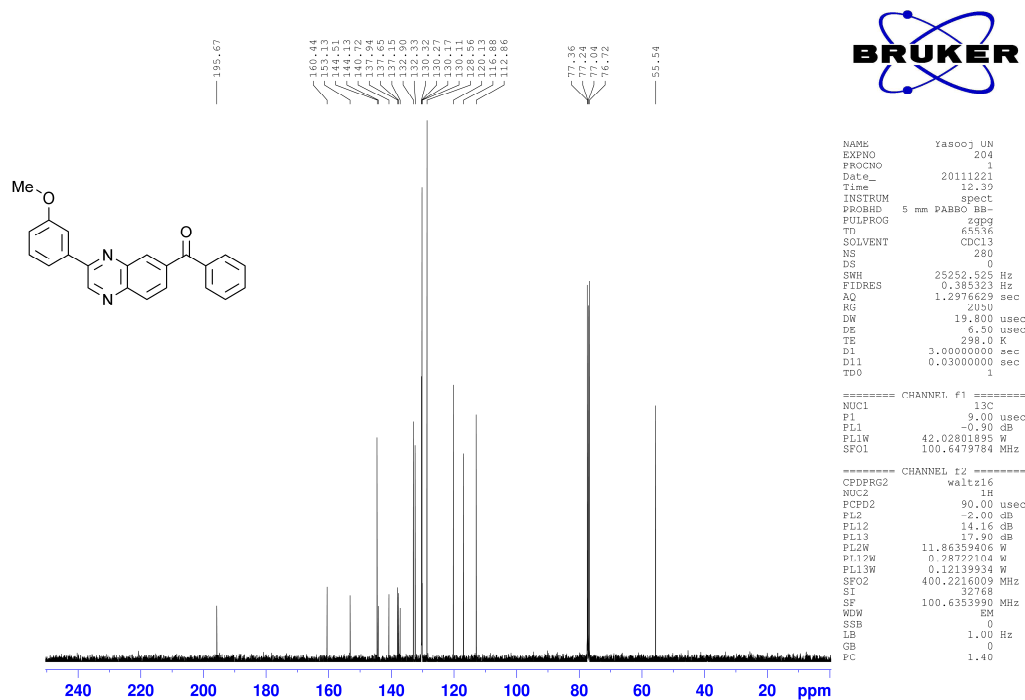
$^1\text{H}$  NMR ( $\text{CDCl}_3$ , 400 MHz)



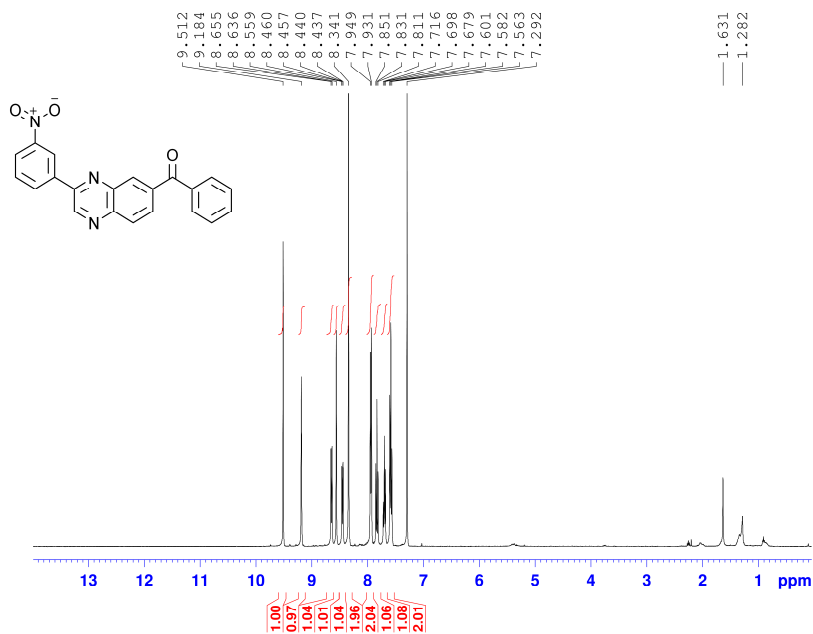
```
NAME      Yasooj UN
EXPNO     205
PROCNO    1
Date_     20111221
Time      12.34
INSTRUM   spect
PROBHD    5 mm PABBO BBI
PULPROG   zg30
TD         65536
SOLVENT   CDCl3
NS         32
DS         0
SWH        8012.820 Hz
FIDRES     0.122266 Hz
AQ         4.0894966 sec
RG         2050
DW         62.400 usec
DE         6.50 usec
TE         297.6 K
D1         6.0000000 sec
TD0        1

----- CHANNEL f1 -----
NUC1      1H
P1         14.00 usec
PL1        -2.00 dB
PL1W       11.86359406 W
SF01       400.2236020 MHz
SI         32768
SF         400.2200000 MHz
WDW        EM
SSB        0
LB         0.30 Hz
GB         0
PC         1.00
```

### <sup>13</sup>C NMR (CDCl<sub>3</sub>, 100 MHz)



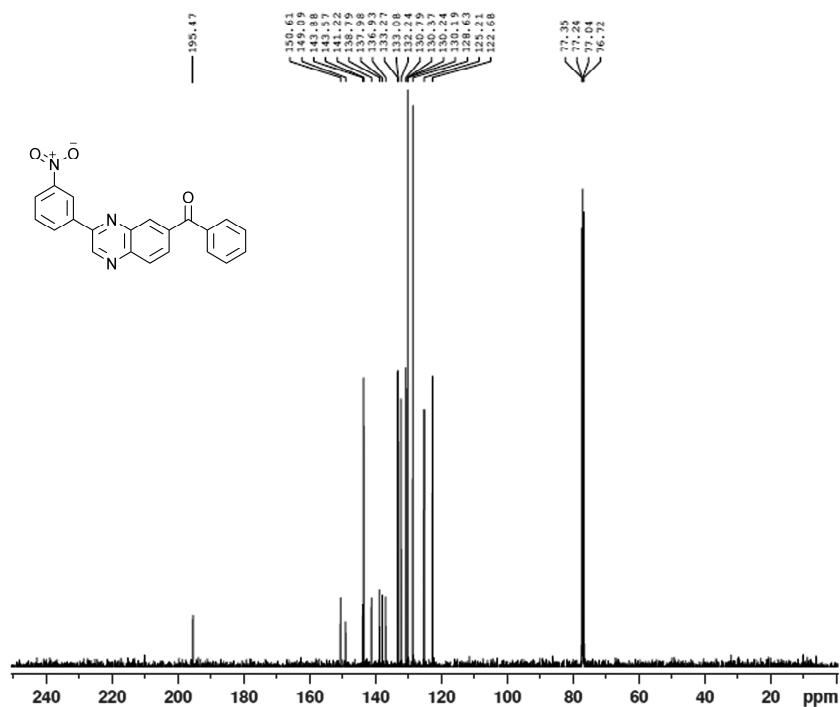
### <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz)



```
NAME      Yasooj UN
EXPNO     207
PROCNO    1
Date_     20111221
Time      16.38
INSTRUM   spect
PROBHD    5 mm PABBO BBI
PULPROG   zg30
TD         65536
SOLVENT   CDCl3
NS         32
DS         0
SWH        8012.820 Hz
FIDRES     0.122266 Hz
AQ         4.0894966 sec
RG         2050
DW         62.400 usec
DE         6.50 usec
TE         297.7 K
D1         6.0000000 sec
TD0        1

----- CHANNEL f1 -----
NUC1      1H
P1        14.00 usec
PL1       -2.00 dB
PL1W      11.86359406 W
SF01      400.2236020 MHz
SI        32768
SF        400.2200000 MHz
WDW       EM
SSB       0
LB        0.30 Hz
GB        0
PC        1.00
```

<sup>13</sup>C NMR (CDCl<sub>3</sub>, 100 MHz)



```
NAME Yascoj UN
EXPNO 206
PROCNO 1
Date_ 20111221
Time 16.50
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg
TD 65536
SOLVENT CDCl3
NS 330
DS 0
SWH 25252.525 Hz
FIDRES 0.385323 Hz
AQ 1.2976629 sec
RG 2050
EW 19.800 usec
DE 6.50 usec
TE 298.1 K
D1 3.0000000 sec
D11 0.0300000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 13C
P1 9.00 usec
PL1 -0.90 dB
PL1W 42.02801895 W
SF01 100.6479784 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
P12 -2.00 dB
PL12 14.16 dB
PL13 17.00 dB
PL1W 11.86359406 W
PL12W 0.28722104 W
PL13W 0.12139934 W
SF02 400.2216009 MHz
SI 32768
SP 100.6353990 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
```



**(5g):**  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$ (ppm): 9.42 (s, 1H), 9.13 (s, 1H), 8.58 (d, 1H,  $J = 7.6$  Hz), 8.40 (d, 1H,  $J = 8$ Hz), 8.21 (t, 2H,  $J = 8.4$  Hz), 7.89-7.77 (m, 3H).  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$ (ppm): 149.11, 149.03, 142.51, 142.17, 142.12, 138.51, 133.08, 130.87, 130.50, 130.20, 129.79, 129.30, 124.68, 122.48.

**(5a):**  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$ (ppm): 9.59 (s, 1H), 8.74 (s, 1H), 8.58 (s, 1H), 8.43 (dd, 1H,  $J = 8.6, 1.6$  Hz), 8.32 (s, 2H), 8.09-8.05 (m, 2H), 7.95-7.93 (m, 3H), 7.68 (t, 1H,  $J = 7.6$  Hz), 7.64-7.55 (m, 4H).  
 $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$ (ppm): 195.68, 153.21, 145.21, 144.58, 144.28, 140.63, 137.89, 137.18, 134.44, 133.56, 133.37, 132.95, 132.68, 132.39, 130.34, 130.18, 130.09, 129.25, 129.05, 128.57, 127.89, 127.70, 126.89, 124.41.

**(5f):**  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$ (ppm): 9.60 (s, 1H), 9.20 (s, 1H), 9.10 (s, 1H), 8.66-8.59 (m, 2H), 8.48 (d, 1H,  $J = 8$  Hz), 8.38 (d, 1H,  $J = 8$  Hz), 7.85 (t, 1H,  $J = 8.4$  Hz).  
 $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$ (ppm): 151.68, 149.13, 148.07, 145.35, 144.67, 140.94, 137.33, 133.36, 131.44, 130.53, 125.76, 124.31, 122.63, 119.99.

**(5c):**  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$ (ppm): 9.42 (s, 1H), 8.52 (s, 1H), 8.292(s, 2H), 7.93 (d, 2H,  $J = 7.2$  Hz), 7.83 (t, 2H,  $J = 7.6$  Hz), 7.67 (d, 1H,  $J = 7.6$  Hz), 7.58-7.51 (m, 3H), 7.14 (dd, 1H,  $J = 8, 2$  Hz), 3.98 (s, 3H).  
 $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$ (ppm): 195.67, 160.44, 153.13, 144.51, 144.13, 140.72, 137.94, 137.65, 137.15, 132.90, 132.33, 130.32, 130.27, 130.17, 130.11, 128.56, 120.13, 116.88, 112.86, 55.54.

**(5e):**  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$ (ppm): 9.51 (s, 1H), 9.18 (s, 1H), 8.64 (d, 1H,  $J = 7.6$  Hz), 8.55 (s, 1H), 8.43 (dd, 1H,  $J = 8, 1.2$  Hz), 8.34 (s, 2H), 7.94 (d, 2H,  $J = 7.2$  Hz), 7.83 (t, 1H,  $J = 8$  Hz), 7.69 (t, 1H, 7.2 Hz), 7.58 (t, 2H, 7.6 Hz).  
 $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$ (ppm): 195.47, 150.61, 149.09, 143.88, 143.57, 141.22, 138.79, 137.98, 136.93, 133.27, 133.08, 133.24, 130.79, 130.37, 130.24, 130.19, 128.63, 125.21, 122.68.