Electronic Supplementary Material (ESI) for RSC Advances.

A ratiometric fluorescence sensor for HOCl based on FRET platform and application in living cells

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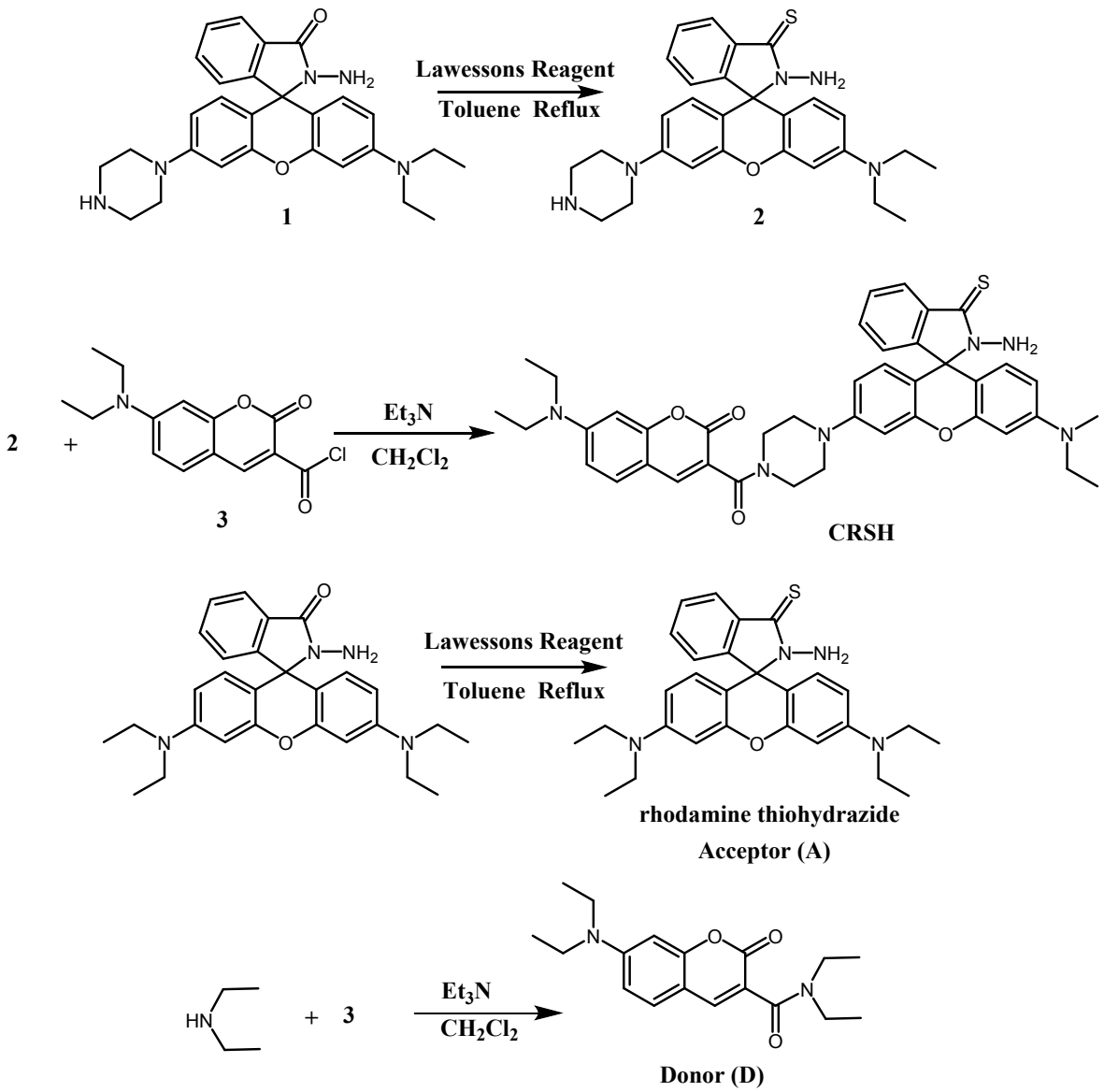


Scheme S1 Synthesis of CRSH

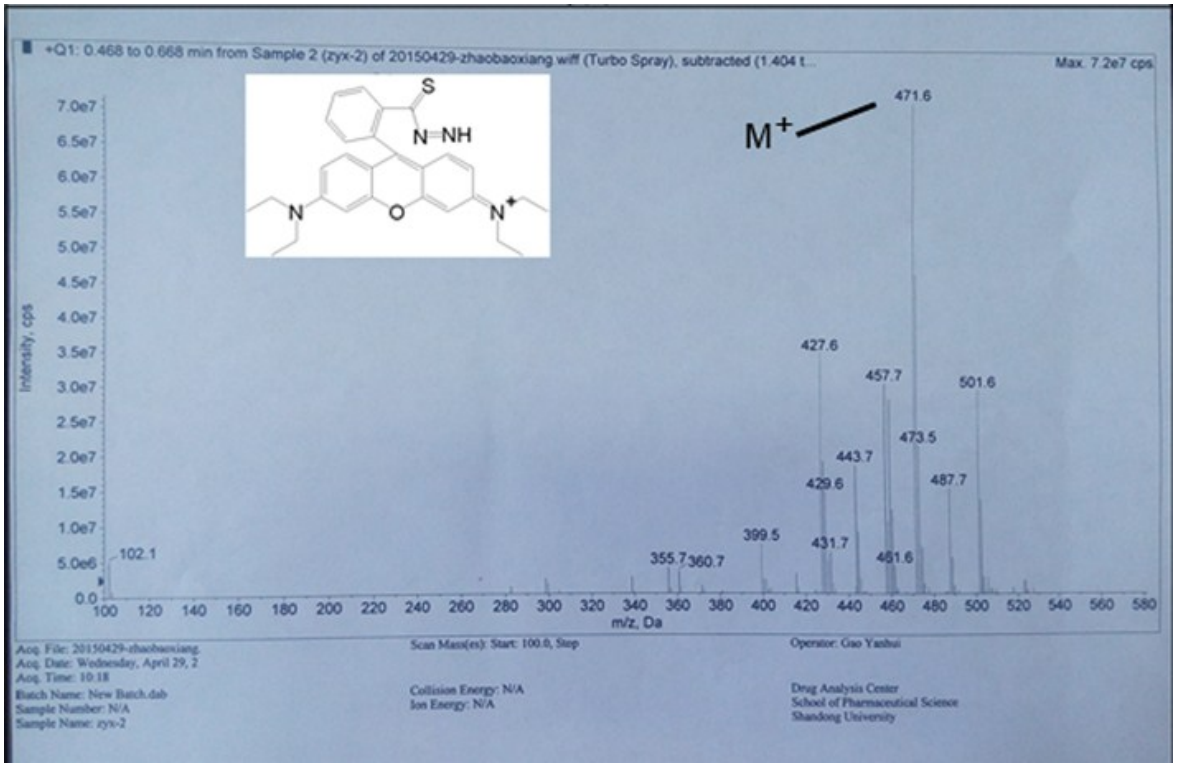


Fig. S1 HRMS spectra of one fluorescent compound separated from the reaction of rhodamine thiohydrazide and HOCl.

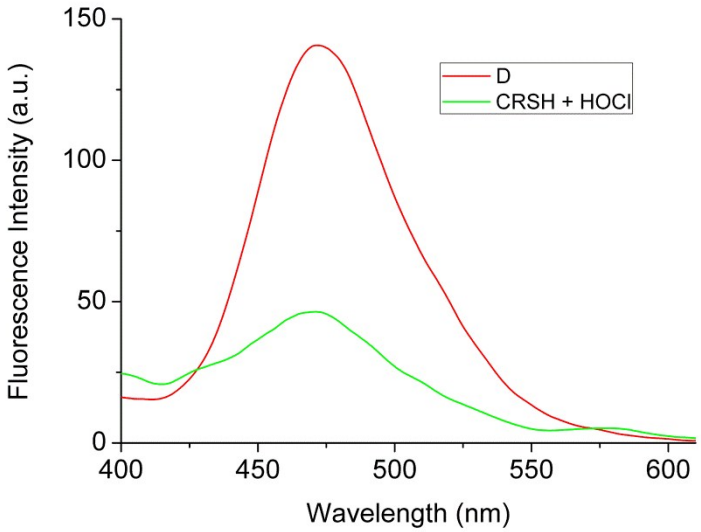


Fig. S2 The red line is the donor (1 μM) and the green line is **CRSH** (1 μM) after addition of HOCl (4 μM) Condition: NaH_2PO_4 (0.05 M, pH = 5) : EtOH = 5 : 5 (v/v), λ_{ex}: 350 nm (slit widths: 10 nm/5 nm).

Energy transfer efficiency (CRSH) = $1\text{-}F_{DA}/F_D = 1 - 46.3481/140.4140 = 67.0\%$

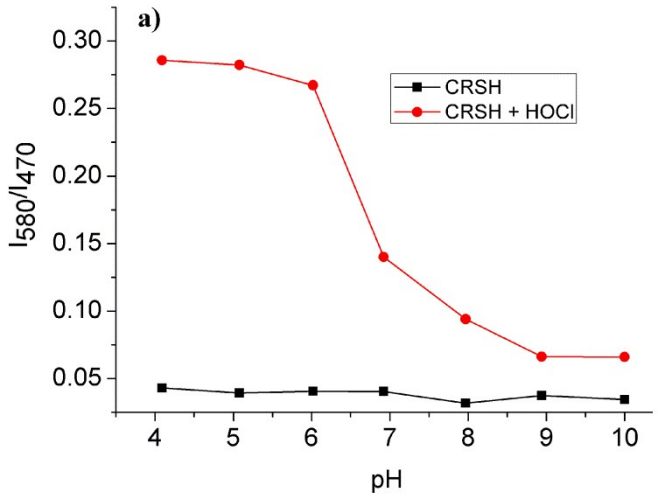


Fig. S3 pH-dependent fluorescence intensity ratio changes of CRSH, Condition: [CRSH] = 1 μM, NaH_2PO_4 (0.05 M, pH = 4-10) : EtOH (5 : 5, v/v), λ_{ex}: 350 nm (slit widths: 10 nm/10 nm), HOCl (4 μM).

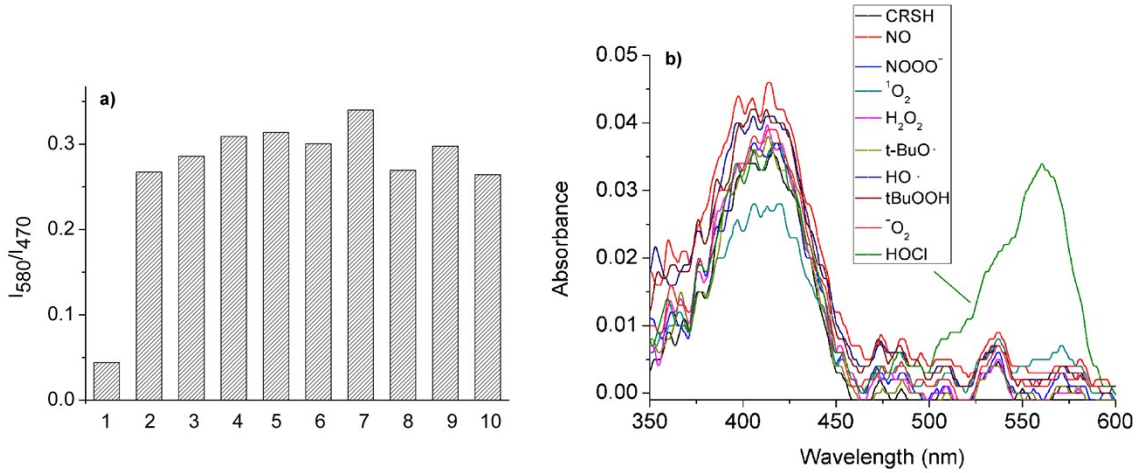


Fig. S4 (a) The ratio (I_{580}/I_{470}) of CRSH with addition of ROS/RNS. 1. free CRSH, 2. CRSH+HOCl, 3-10. CRSH+other ROS/RNS ($^1O_2$, H_2O_2, HO•, NO, $NOOO^-$, $^-O_2$, *t*-BuO•, *t*-BuOOH)+HOCl. (b) Absorption spectra of CRSH toward HOCl (4 μM), other ROS/RNS (20 μM for $HO^·$, $ONOO^-$, NO, H_2O_2, *t*-BuOOH, *t*-$BuOO^·$, $^1O_2$, $^-O_2$,), Condition: Condition: [CRSH] = 1 μM, NaH_2PO_4 (0.05 M, pH = 5) : EtOH (5 : 5, v/v).

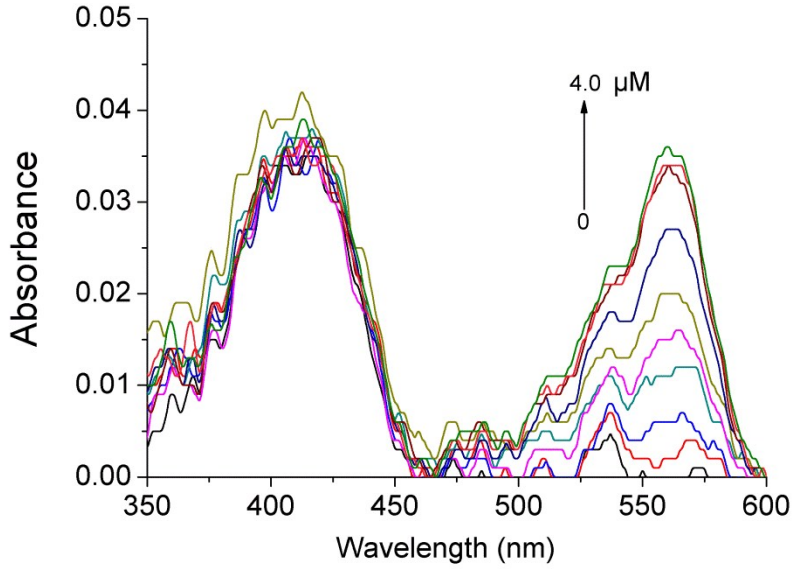


Fig. S5 Absorption spectra of CRSH upon addition of HOCl (0–4 μM), Condition: [CRSH] = 1 μM, NaH_2PO_4 (0.05 M, pH = 5) : EtOH (5 : 5, v/v).

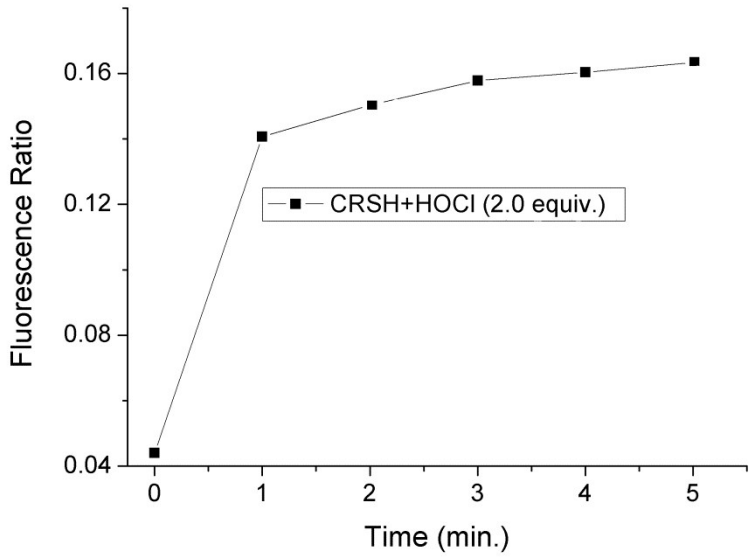


Fig. S6 Time-dependent fluorescence intensity ratio changes of CRSH, Condition: [CRSH] = 1 μM, NaH_2PO_4 (0.05 M, pH = 5) : EtOH (5 : 5, v/v), λ_{ex}: 350 nm (slit widths: 10 nm/10 nm).

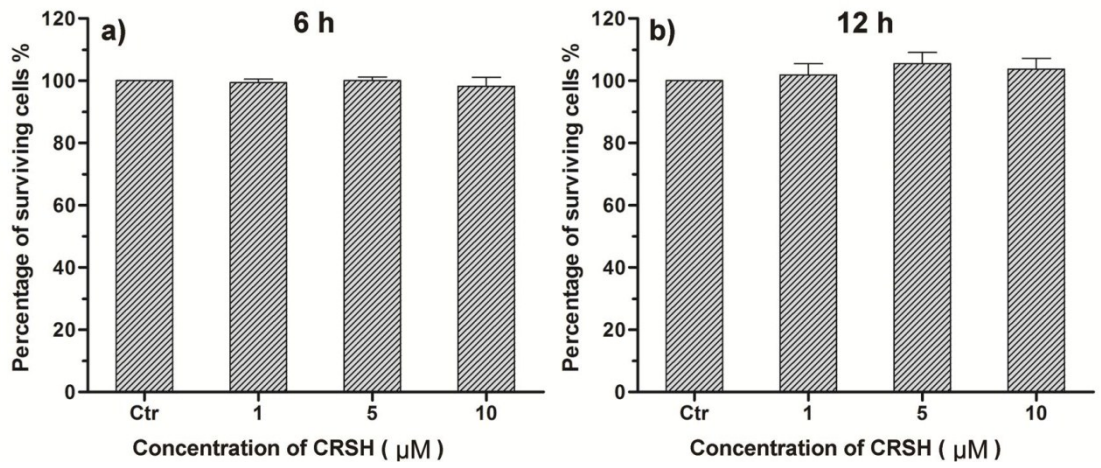
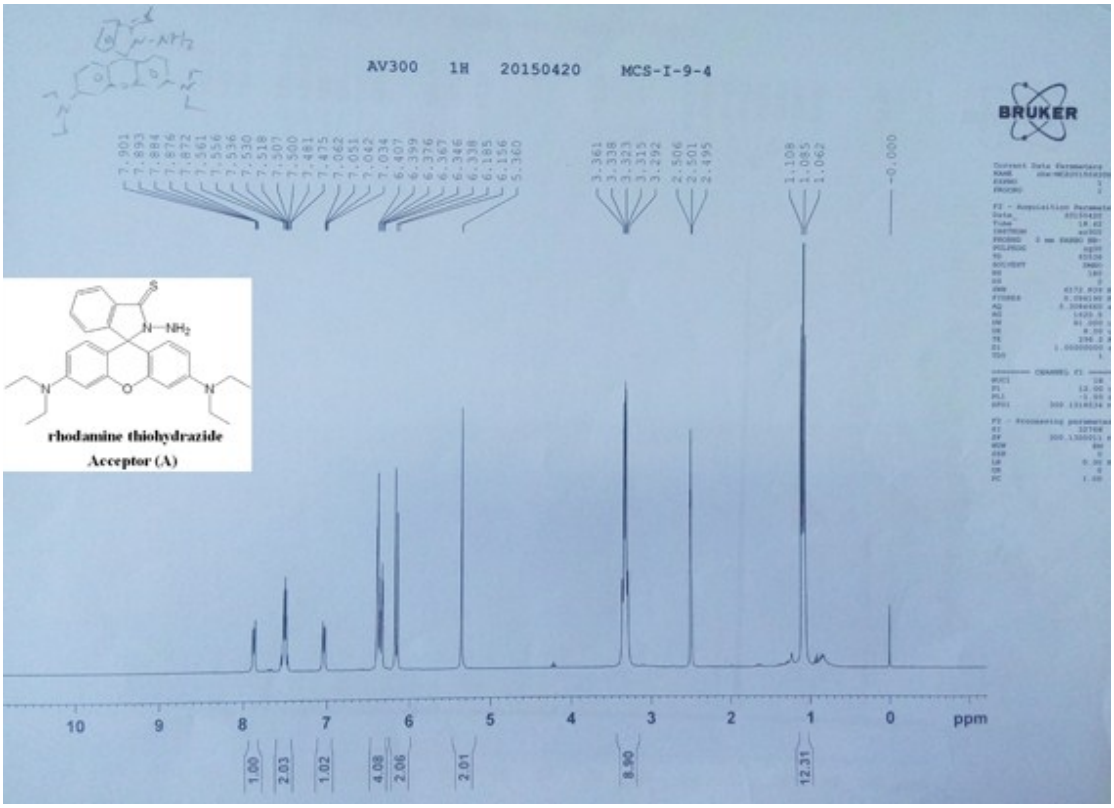
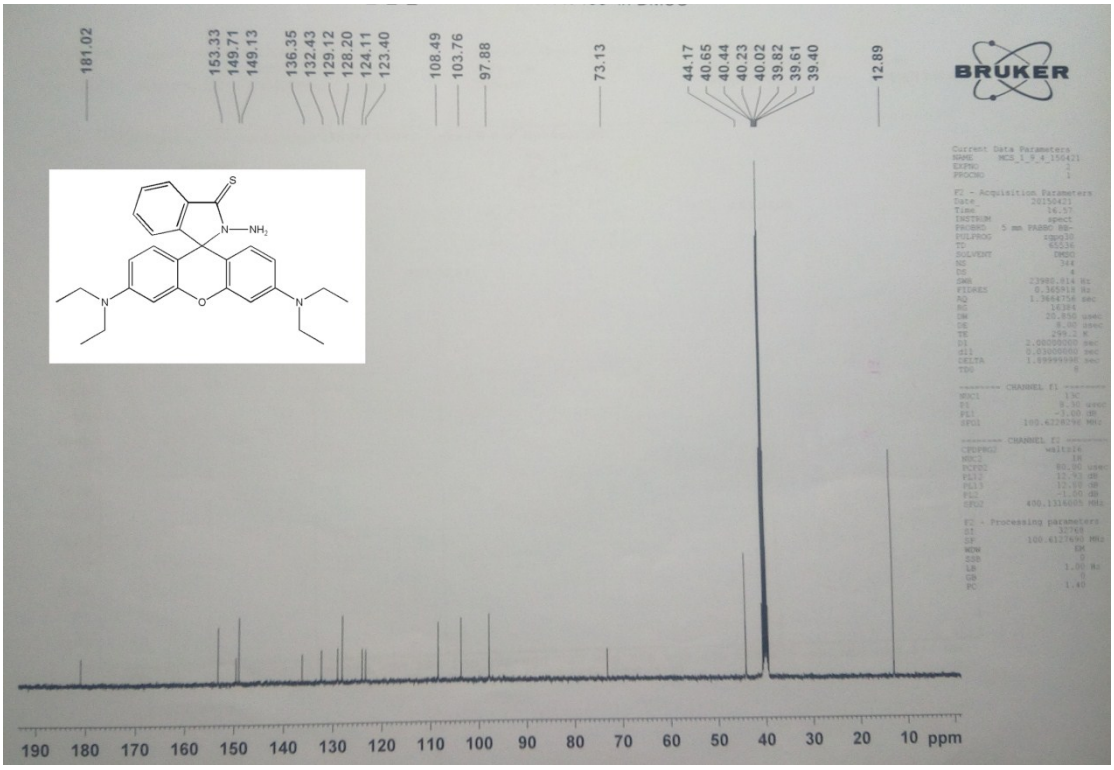


Fig. S7 Viability of RAW264.7 cells after treatment with CRSH for 6 h (a), 12 h (b) at the different concentration (1, 5, 10 μM).

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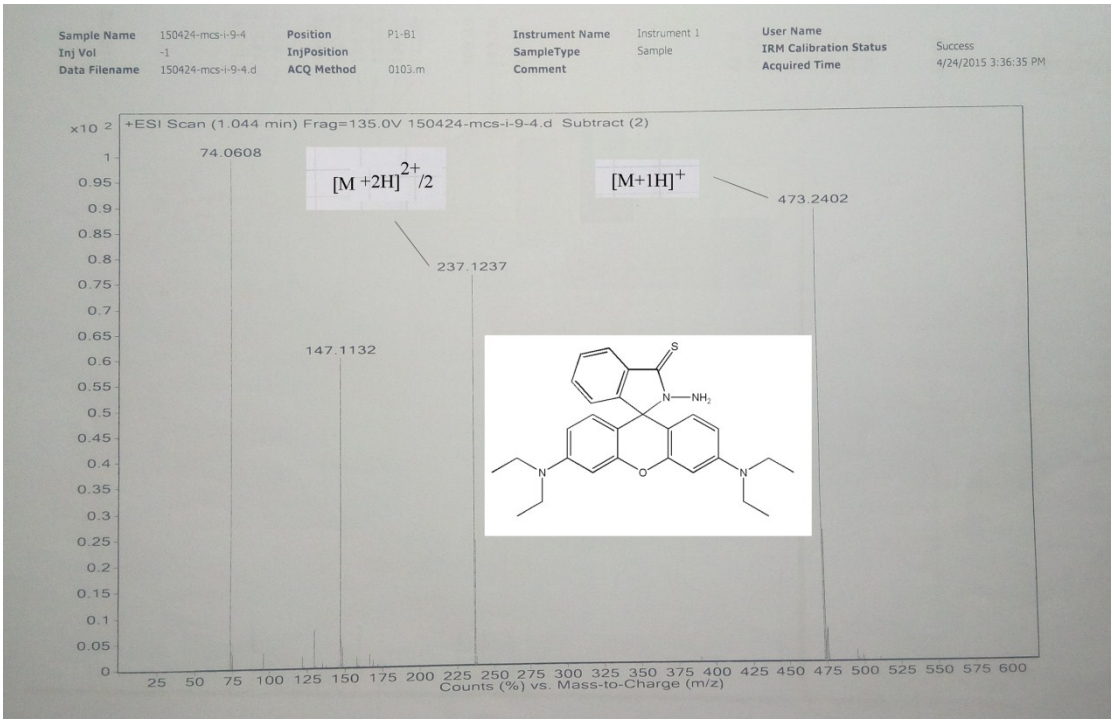
153.33
149.71
149.13
136.35
132.43
129.12
128.20
124.11
123.40
108.49
103.76
97.88
73.13
44.17
40.65
40.44
40.23
40.02
39.82
39.61
39.40
12.89
BRUKER
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm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InjPosition
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Instrument Name Instrument 1
SampleType Sample
Comment
User Name
IRM Calibration Status Success
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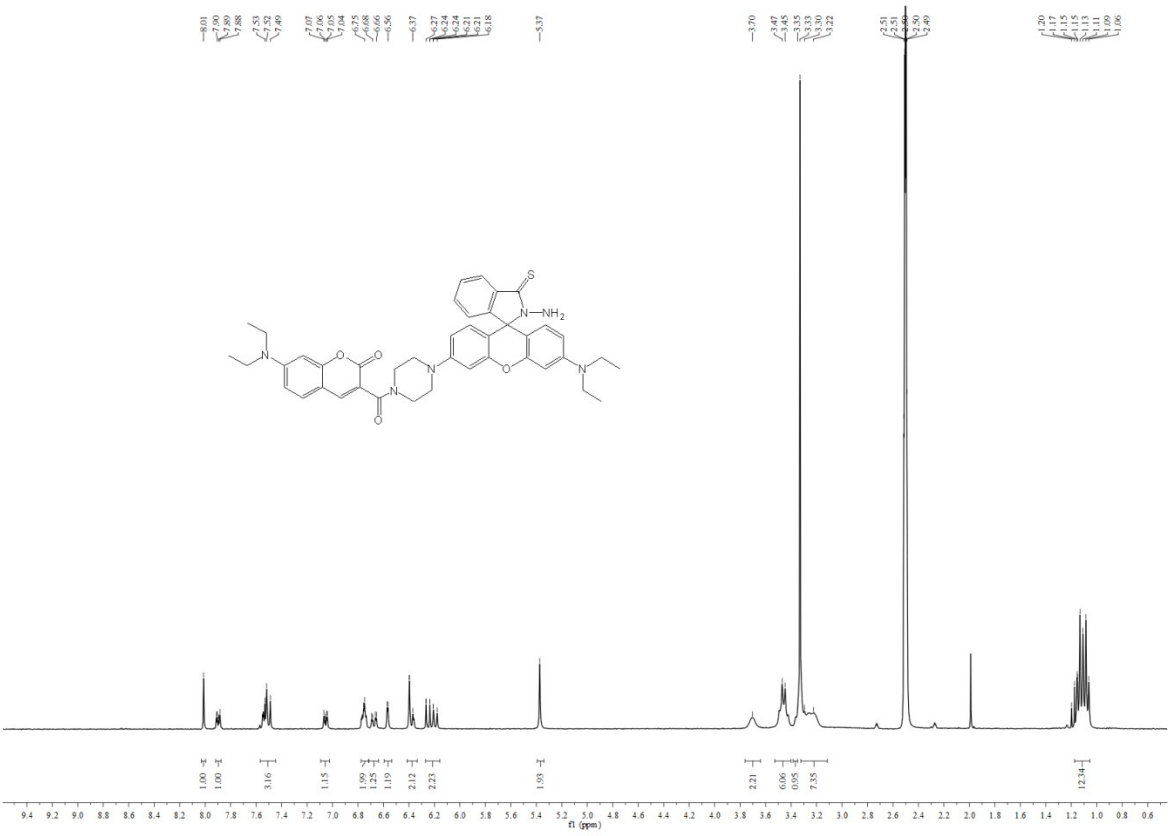
+ESI Scan (1.044 min) Frag=135.0V 150424-mcs-i-9-4.d Subtract (2)
74.0608
[M +2H]2+/2
237.1237
147.1132
[M+1H]+
473.2402
Counts (%) vs. Mass-to-Charge (m/z)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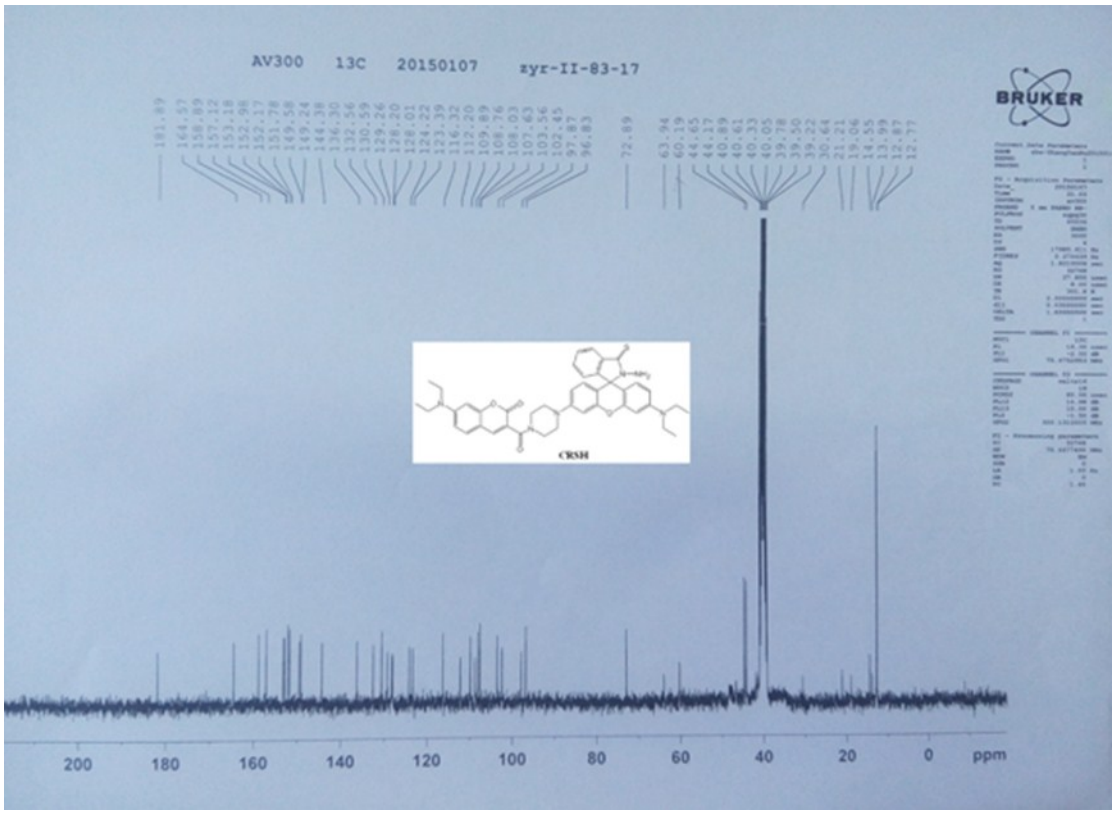
7.90
7.89
7.88
7.53
7.52
7.49
7.07
7.06
7.05
7.04
6.75
6.68
6.66
6.56
6.37
6.27
6.24
6.24
6.21
6.18
5.37
3.70
3.47
3.45
3.35
3.33
3.30
3.22
2.51
2.51
2.50
2.50
2.49
1.20
1.17
1.15
1.15
1.13
1.11
1.09
1.06
S
N—NH2
O
N
O
O
N
N
O
N
1.00
1.00
3.16
1.15
1.99
1.25
1.19
2.12
2.23
1.93
2.21
6.06
0.95
7.35
12.34
f1 (ppm)


AV300 13C 20150107 zyr-II-83-17
BRUKER
CRSH
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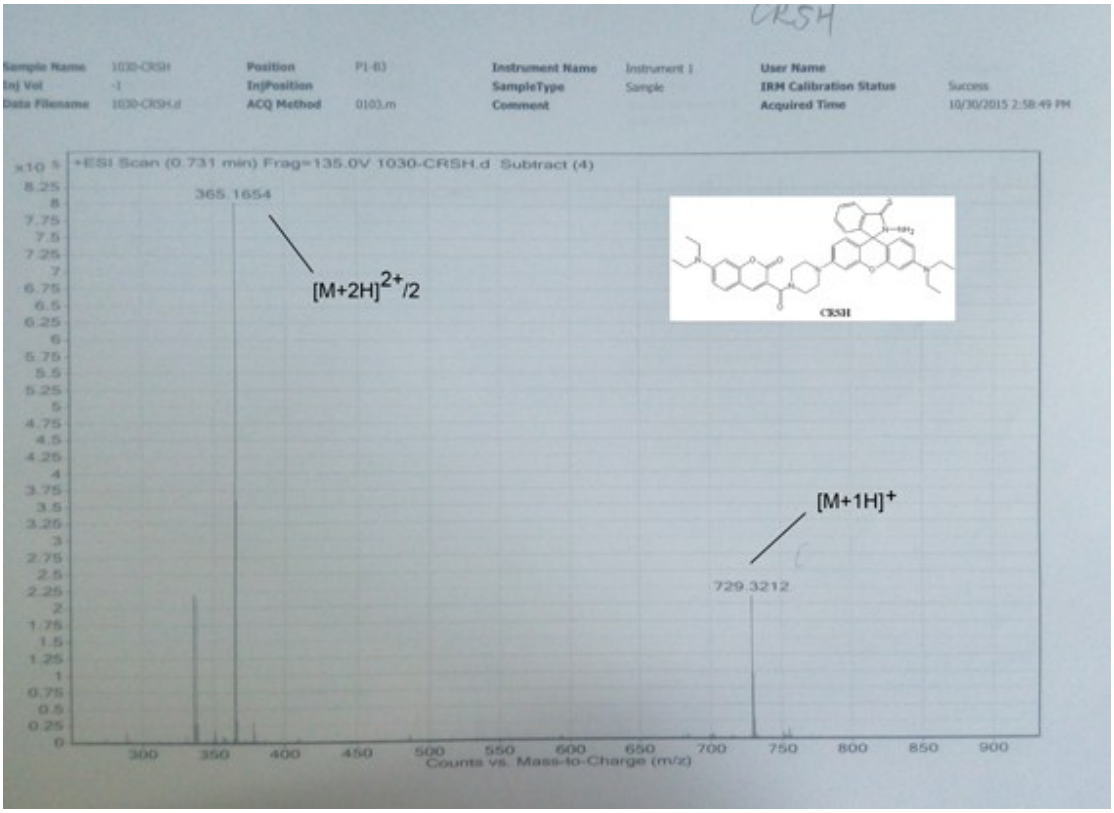
180
160
140
120
100
80
60
40
20
0
ppm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Instrument Name Instrument 1
User Name
Inj Vol -1
InjPosition
SampleType Sample
IRM Calibration Status Success
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ACQ Method 0103.m
Comment
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+ESI Scan (0.731 min) Frag=135.0V 1030-CRSH.d Subtract (4)
x10 5
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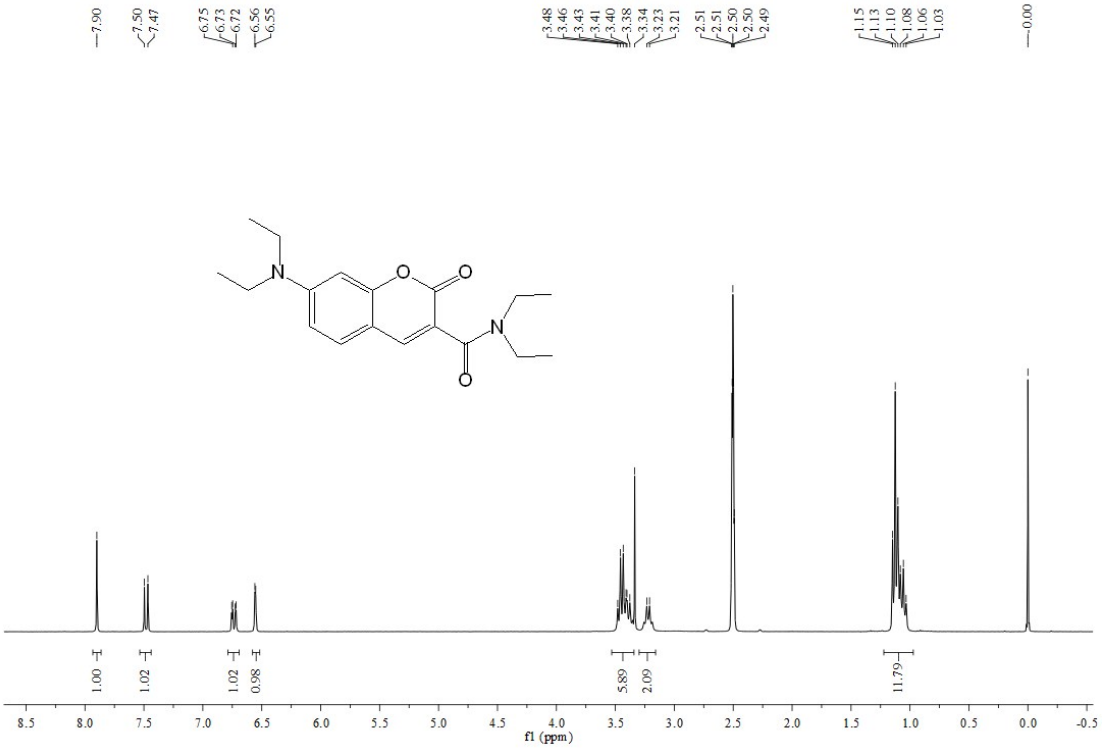
[M+2H]2+/2
[M+1H]+
729.3212
CRSH
Counts vs. Mass-to-Charge (m/z)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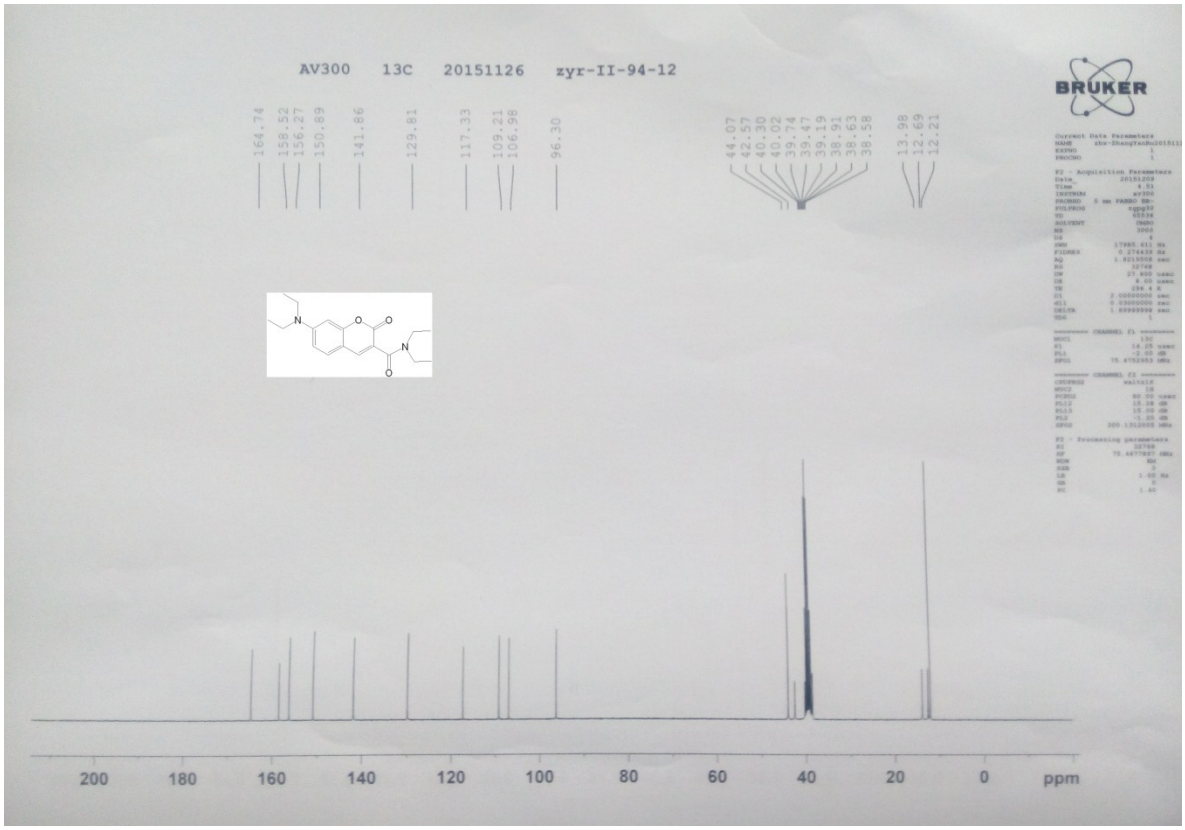
7.50
7.47
6.75
6.73
6.72
6.56
6.55
3.48
3.46
3.43
3.41
3.40
3.38
3.34
3.23
3.21
2.51
2.51
2.50
2.50
2.49
1.15
1.13
1.10
1.08
1.06
1.03
0.00
1.00
1.02
1.02
0.98
5.89
2.09
11.79
f1 (ppm)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BRUKER
164.74
158.52
156.27
150.89
141.86
129.81
117.33
109.21
106.98
96.30
44.07
42.57
40.30
40.02
39.74
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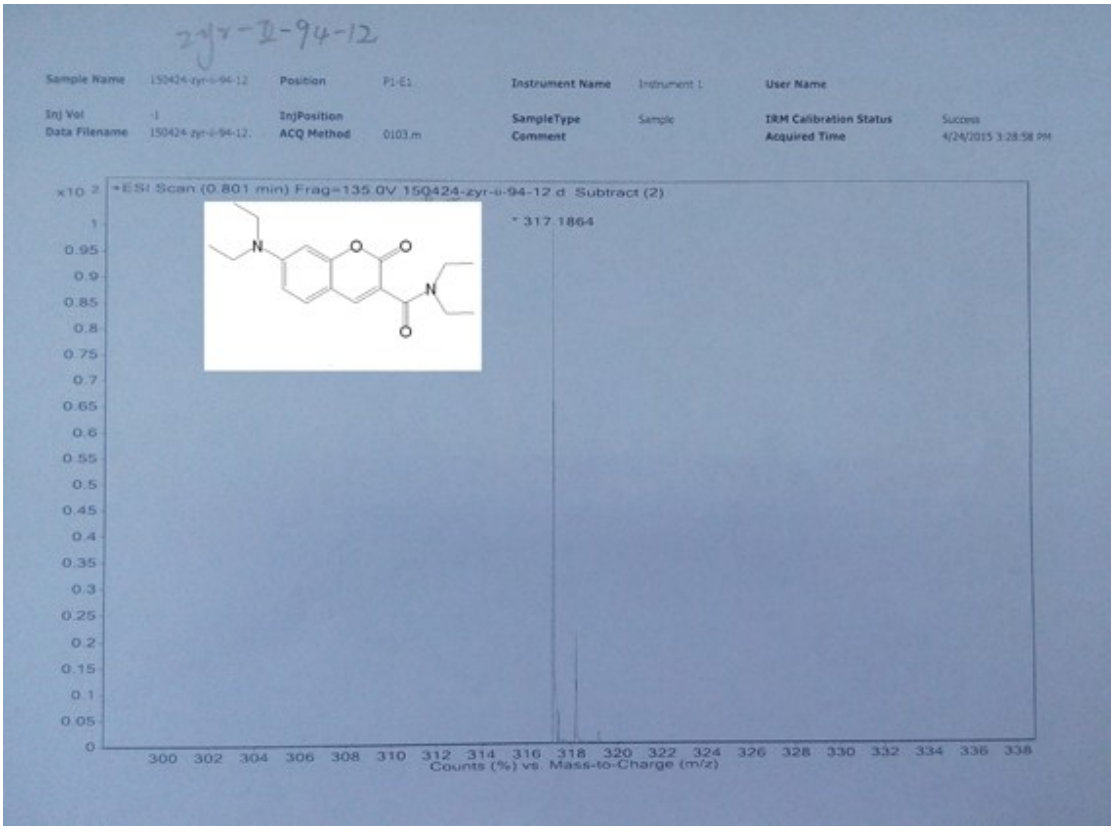
38.63
38.58
13.98
12.69
12.21
200 180 160 140 120 100 80 60 40 20 0 ppm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Inj Vol 1
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InjPosition
ACQ Method 0103.m
SampleType Sample
Comment
IRM Calibration Status Success
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317.1864
Counts (%) vs. Mass-to-Charge (m/z)