Supporting Information

Assessing the intracellular fate of rhodium(II) complexes

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General Methods

Flash chromatography: was performed with 40-63-μm particle size silica gel.

NMR Spectroscopy: NMR data was acquired with Bruker Avance 400, Bruker Avance 500 MHz Bruker, or Avance 600 instrument. ^{1}H and ^{13}C NMR spectra were referenced relative to residual solvent or TMS.

Mass spectroscopy: ESI-MS was performed on Bruker Daltonics microTOF instrument.

Chemicals: The following chemicals were purchased and used as received: Fluorescein (avocado), tert-butyl proline (Sigma), diisopropylethylamine (Fischer), $Rh_2(OAc)_4$ (Pressure Chemical), 2,2,2-trifluoroethanol (Aldrich), Na_2SO_4 (Fischer), $MgSO_4$ (Fischer). All solvents were reagent grade. Solvents used in inert atmosphere reactions were purified and degassed by the glass contour solvent system from SG waters USA.

Synthesis of known compounds: $Rh_2(OAc)_3(tfa)$, *cis*- $Rh_2(OAc)_2(tfa)_2$,[1] **4b**,[2] **5**,[3] **8**[4], **11**,[2] ,**12**[5] were prepared according to previously reported protocols.

HPLC: HPLC was performed on a Shimadzu CBM-20A instrument with Phenomenex Jupiter 4 μ Proteo 90Å (250 mm × 15μm) and Phenomenex Jupiter 4 μ Proteo 90Å (250 mm × 4.6μm) columns. HPLC with fluorescence detection was performed on Waters Breeze instrument. To channels, 320 ex/380 em and 490

ex/520 em, were monitored simultaneously. Flow rates of 8 mL/min and 1 mL/min were used for preparative and analytical columns, respectively. Analytical and preparative HPLC were performed with gradients of acetonitrile and water.

Method 1: Sample was run on a gradient of increasing (10-90%) MeCN/H_2O from 2-20 min. The absorbance was monitored at 254, 320, 370, 490, and /or 520 nm during each run.

Method 2: Sample was run on a gradient increasing (40-90%) MeCN/H_2O from 2-20 min. The absorbance was monitored at 254, 320, 370, 490, and /or 520 nm during each run.

Surface plasmon resonance (SPR) inhibition measurements:

The inhibition STAT3 binding to phosphopeptide (P1068) by **4a-c** was determined by SPR analysis on a Biacore 3000 instrument as previously described.[6]

General microplate experiment

To a well plate, a stock soln of rhodium (II) fluorophore, 1b, 2b or 3b, (3 µL, 1 mM in DMSO) or control, the corresponding unmetalated fluorophore (1:1 fluorophore/$Rh_2(OAc)_4$), was added. The appropriate buffer (197 µL) was added to each well plate and was aspirated three times. The fluorescent emission over time of each well was read in a microplate reader. The relative fluorescence (i.e. $I_{rel}=I_b/I_a$) was used to account for fluorophore degradation. The relative intensity was fit to a first- or second-order decay equation, in order to estimate half-lives.

Seeding, pulsing, and imaging of cells

Passage 8 NIH-3T3 cells (5,000 mouse fibroblast cells, adherent) were seeded in each well of an 8-well chambered cover glass (surface area of each slide 0.7 cm\$^2$). Media of standard NIH-3T3 media (DMEM + 1% penicillin/streptomycin + 10% heat inactivated fetal bovine serum, 300 µL) was added to each well after seeding the cells and cultured using standard culture conditions (37 °C, 5% CO_2). The media was changed the next day. On the third day the old media was removed and media, the rhodium soln or the fluorophore soln was added to the respective wells. The fluorophore & rhodium solns (100 µM, 90 µL of 10 mM stock soln + 810 µL media) were freshly prepared before adding them to the chambered cover glass.

Live cell imaging without rinsing

After 0.5 h incubation, the cells were imaged.

Live cell imaging with rinsing

After 0.5 h, the solns were removed from their respective wells and either PBS (1 a-b) or medium (2 a-c) were added. The wells were imaged over the next 4 h.

Fixed cell imaging

At the desired time point, the solns were removed from their respective wells and 10% formalin (400 µL) was added. The chambered cover glass was then returned to the incubator where it remained overnight. After 72 h, the formalin solns were removed and the staining process was started (all volumes = 300 µL unless otherwise noted):

1. PBS + 0.5% Triton X for 10-15 min
2. 100 mM glycine/PBS (10 min)
3. PBS + 1% BSA (10 min)
4. 5% v/v Alexa 488 Phalloidin (30 min)
5. Wash with 1x PBS (~1 min each)
6. ProLong Gold with DAPI (1 drop + 300 µL PBS)
7. PBS (16 h)

After the staining process (14 h) the samples were imaged (with the 1xPBS still on top).

All samples were imaged using a Nikon A1-Rsi confocal system.

Phosphoflow protocols

MOLM-13 cells were plated at 1 x10^5 cells/mL in a 24-well plate. Cells were incubated with compounds for 30 min. Then cells were washed with PBS twice by centrifugation and re-incubated with fresh medium in the dark. At the end of each time point (0.5 h, 1 h, 2 h, 4 h), cells were harvested and the MFIs (mean of fluorescence intensity) were measured by flow cytometry (LSRII).

Ligand dissociation assays

A solution of bis-fluorophore complex **13** in medium (15 µM) was heated at 37 °C (Fig. S4a). This reaction was monitored by both HPLC with fluorescence detection (Fig. S4b-c) and by microplate

fluorimeter (Fig. S4d). Relative fluorescence intensity was calculated using this equation: $I_{rel} = I_{rxn} / I_{control}$ where

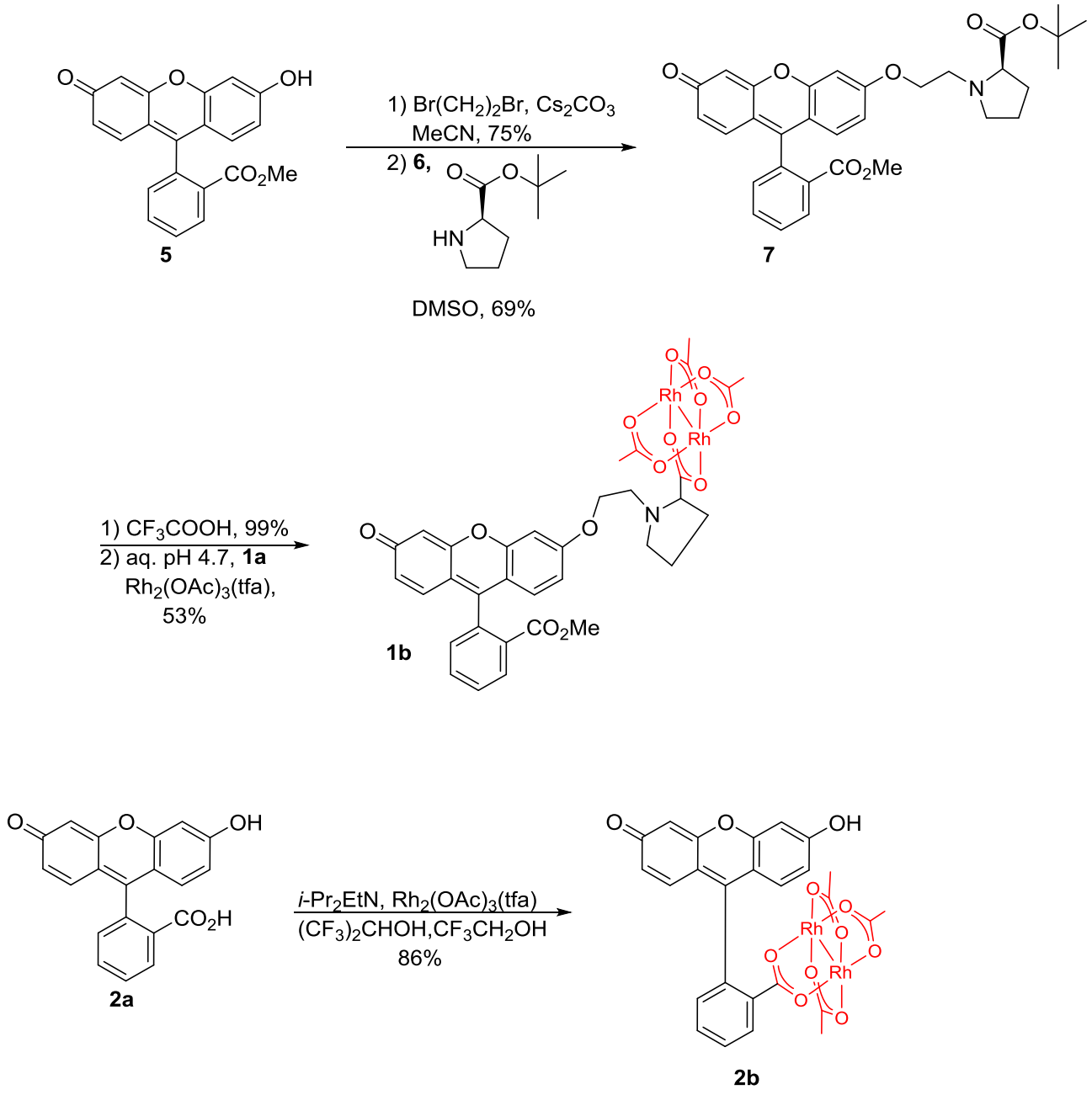
I_{rel} = relative instensity

I_{rxn} = reaction intensity

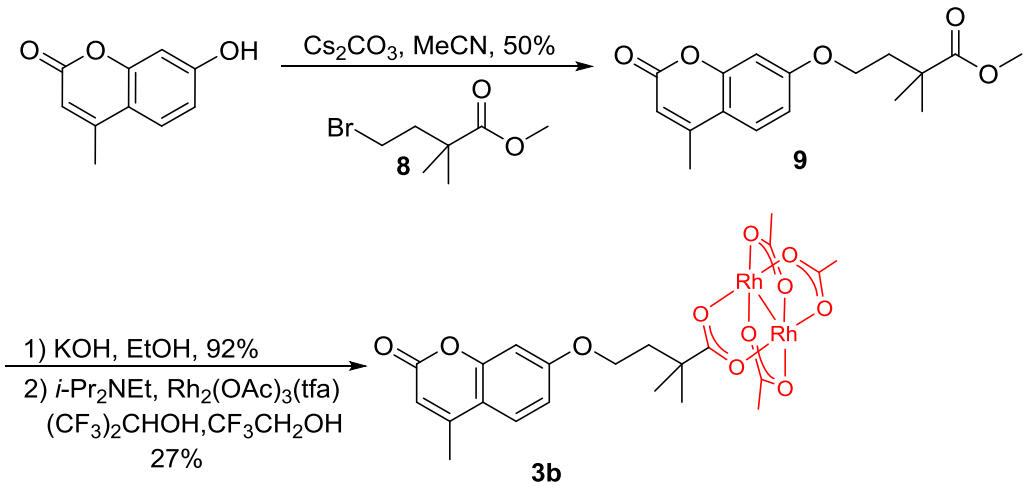
$I_{control}$ = intensity of the flourophore ligand under the same conditions

Chemical synthesis procedures and characterization

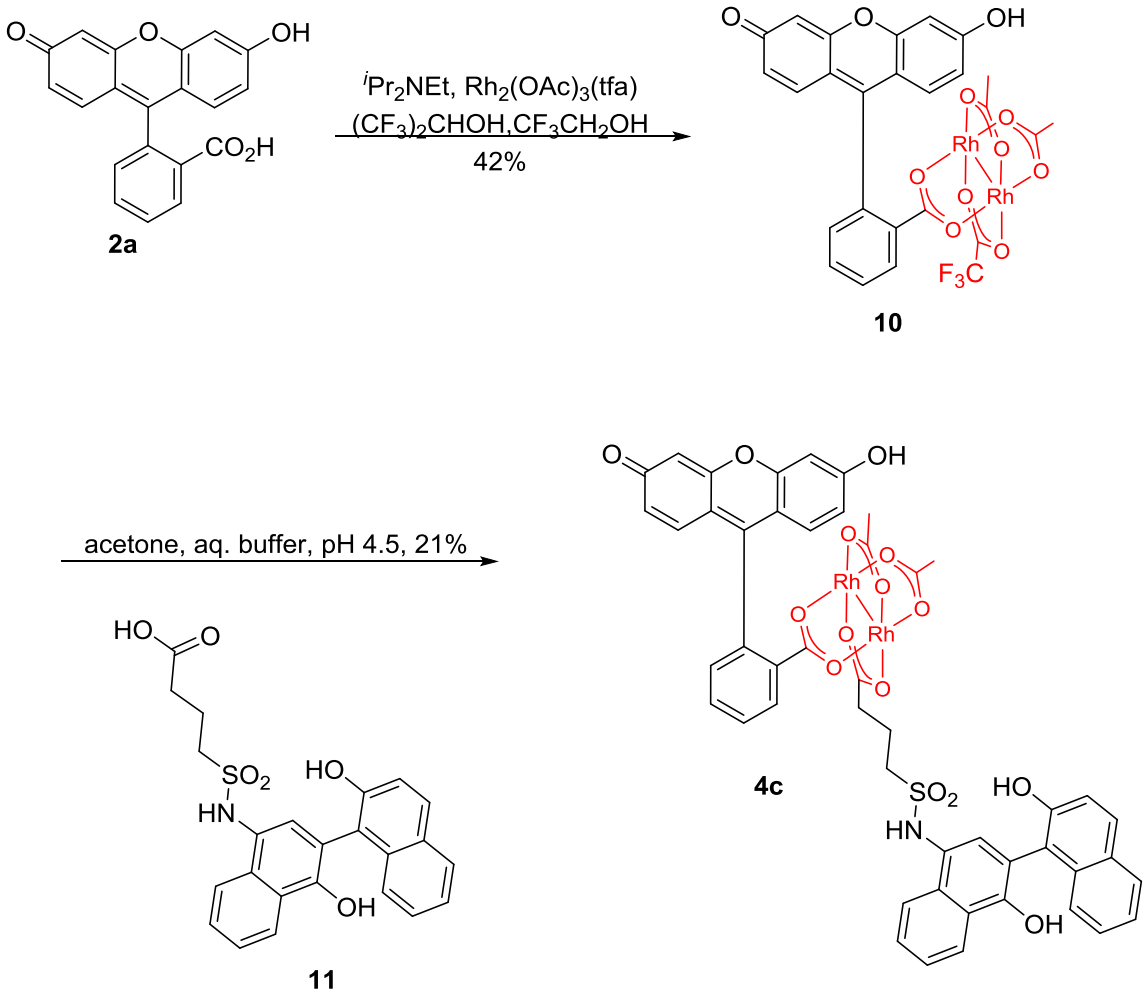
Scheme S1. The synthesis of rhodium-fluoroscein conjugates 1b and 2b.



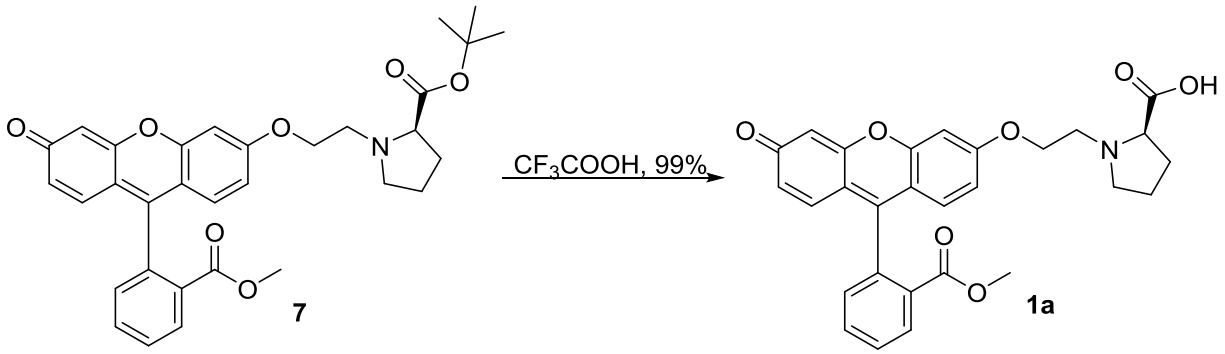
Scheme S2. Synthesis of a rhodium-coumarin conjugate 3b.



Scheme S3. Synthesis of rhodium fluorescein inhibitor 4c.



(2-((9-(2-(methoxycarbonyl)phenyl)-3-oxo-3H-xanthen-6-yl)oxy)ethyl)prolinate, 1a



To the *tert*-butyl ester, **7**, (20 mg, 0.037 mmol) 2,2,2-trifluoroacetic acid (TFA, 1 mL), was added. The reaction was stirred at 50 °C for 14 h. Afterwards, the soln was evaporated under vacuum to afford a red-orange hygroscopic solid **1a** (18 mg, 99%), isolated in sufficient purity without further purification.

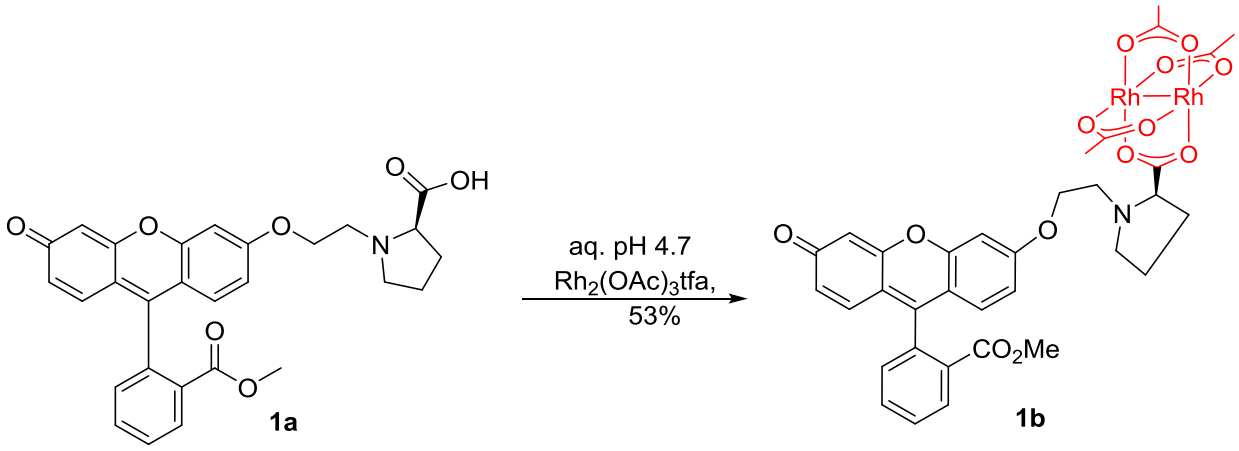
^{1}H NMR (600 MHz, D_2O) δ 8.33 (d, *J* = 7.8 Hz, 1H), 7.86 (t, *J* = 7.1 Hz, 1H), 7.82 (t, *J* = 6.5 Hz, 1H), 7.50 (t, *J* = 8.5 Hz, 3H), 7.39 (d, *J* = 7.4 Hz, 1H), 7.24 (s, 1H), 7.18 (d, *J* = 9.2 Hz, 1H), 7.07 (d, *J* = 9.2 Hz, 1H), 4.21 (m, 1H), 3.81 (m, 3H), 3.51 (d, *J* = 1.5 Hz, 3H), 3.29 (m, 1H), 2.49 (m, 1H), 2.11 (m, 3H), 1.92 (m, 1H).

MS—ESI (m/z): $[M+H]^+$ calcd for $C_{28}H_{26}NO_7$: 488.2; found: 488.2.

HPLC t_R: 13.6-14.2 min (method 1)

mp 245 °C.

Fluoroscein-rhodium conjugate, 1b



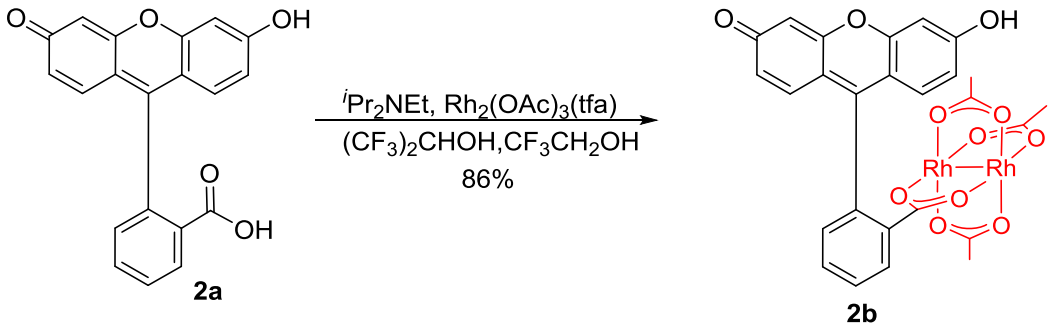
The amino acid, **1a** (4 mg, 8 µmol), was added to MES buffer (1 mL, 0.128 M, pH 4.7) along with $Rh_2(OAc)_3(tfa)$ (3 mg, 6 µmol). The reaction was heated to 50 °C. The reaction progression was monitored by HPLC. After 6 h, the reaction was cooled to rt and purified by preparative HPLC. Product fractions were collected and lyophilized to produce **1b** (2.5 mg, 53%), a hygroscopic orange solid.

^{1}H NMR (600 MHz, D_2O) δ 8.26 (d, *J* = 7.9 Hz, 1H), 7.81 (t, *J* = 7.5 Hz, 1H), 7.76 (t, *J* = 7.4 Hz, 1H), 7.32 (q, *J* = 8.0 Hz, 1H), 7.19 (m, *J* = 7.7 Hz, 3H), 6.87 (s, 1H), 6.64 (s, 2H), 4.46 (d, *J* = 11.7 Hz, 1H), 4.34 (t, *J* = 9.9 Hz, 1H), 4.25 (q, *J* = 9.2 Hz, 1H), 3.74 (m, 1H), 3.60 (t, *J* = 11.6 Hz, 2H), 3.52 (d, *J* = 7.8 Hz, 3H), 3.22 (m, 1H), 2.65 (m, 1H), 2.36 (s, 1H), 2.03 (m, 1H), 1.81-1.69 (m, 4H), 1.68-1.64 (m, 7H).

MS—ESI (m/z): $[M+H]^+$ calcd for $C_{34}H_{33}NO_{13}Rh_2$ - 896.0, found 896.1

HPLC $t_{R:}$ 14.4-15.2 min (method 1)

Dirhodium trisacetate-2-(6-hydroxy-3-oxo-3H-xanthen-9-yl)benzoate, 2b



To a scintillation vial fluorescein, **2a** (10 mg, 0.030 mmol), 2,2,2-trifluoroethanol (2 mL, TFE), and $Rh_2(OAc)_3(tfa)$ (16 mg, 0.033 mmol) were added. Diisopropylethylamine, DIEA, (30 µL, 1M in 1,1,1,3,3,3-hexafluoroisopropanol) was added to the soln. The reaction vessel was stirred at 27 °C for 14 h. It was found complete by TLC. The reaction was purified by preparative HPLC to yield **2b** (18 mg, 86%).

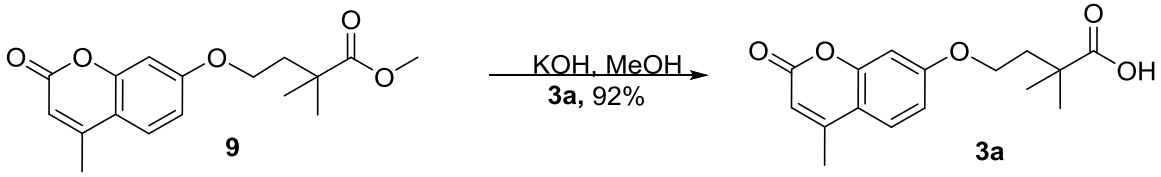
^{1}H NMR (500 MHz, CD_3CN) δ 7.94 (d, *J* = 7.5 Hz, 1H), 7.67 (t, *J* = 7.6 Hz, 1H), 7.60 (t, *J* = 7.2 Hz, 1H), 7.23 (d, *J* = 7.3 Hz, 1H), 6.72 (d, *J* = 9.4 Hz, 2H), 6.69 (s, 2H), 6.52 (d, *J* = 9.6 Hz, 2H), 1.71 (s, 3H), 1.58 (s, 6H).

^{13}C NMR (151 MHz, CD_3CN) δ 192.6, 192.1, 184.0, 172.8, 169.0, 160.2, 133.9, 133.0, 132.8, 131.4, 130.9, 130.2, 121.3, 118.4, 117.8, 103.4, 23.7, 23.6.

MS—ESI (m/z): $[M+H]^+$ calcd for $C_{26}H_{19}O_{11}Rh_{25}$ – 714.9, found 715.0

HPLC t_R:14.9-15.4 min (method 1)

2,2-dimethyl-4-((4-methyl-2-oxo-2H-chromen-7-yl)oxy)butanoic acid, 3a



A sodium hydroxide soln (300 µL, 1 M in MeOH) was added to the reaction vessel along with ester **9** (30 mg, 0.1 mmol).The vessel was heated to 60 ˚C and stirred for 4 h. Upon cooling the vessel to room temperature white precipitate began to form. After standing for 3 h the precipitate was collected via filtration, rinsed with cold ether, and dried yield **3a** (27 mg, 92%), a white solid.

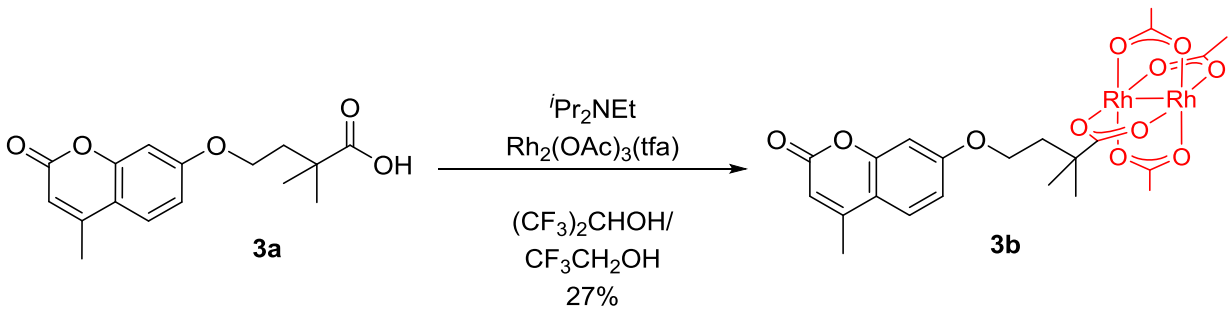
^{1}H NMR (500 MHz, Acetone) δ 7.67 (d, *J* = 8.8 Hz, 1H), 6.93 (d, *J* = 8.8 Hz, 1H), 6.89 (d, *J* = 2.5 Hz, 1H), 6.13 (d, *J* = 1.2 Hz, 1H), 4.22 (t, *J* = 7.0 Hz, 2H), 2.44 (d, *J* = 1.2 Hz, 3H), 2.11 (t, *J* = 7.0 Hz, 2H), 1.28 (s, 6H)

^{13}C NMR (126 MHz, $(CD_3)_2CO$) δ 177.8, 162.0, 160.0, 155.4, 152.9, 126.1, 113.4, 112.3, 111.4, 101.1, 65.6, 40.1, 38.6, 24.9, 17.6.

HPLC t_R: 15.6-17.8 min (method 1)

mp 178-180 ˚C.

dirhodiumtrisacetate 2,2-dimethyl-4-((4-methyl-2-oxo-2H-chromen-7-yl)oxy)butanoate, 3b



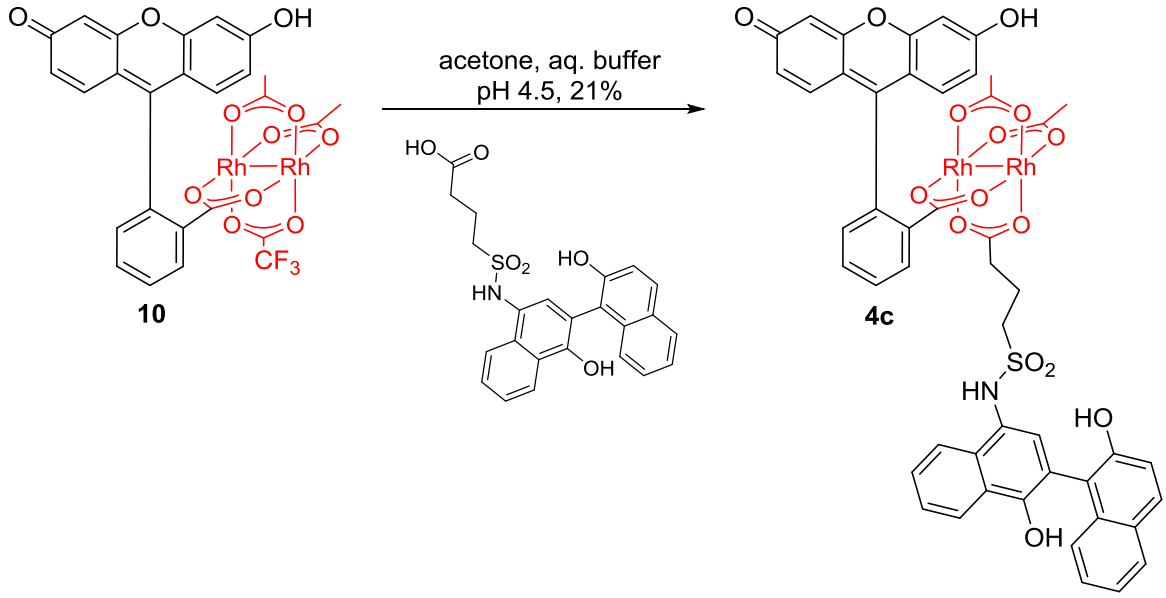
The carboxylate 2,2-dimethyl-4-((4-methyl-2-oxo-2H-chromen-7-yl)oxy) butanoic acid (**3a**) (26.7 mg, 0.092 mmol) and $Rh_2(OAc)_3(tfa)$ (40.7 mg, 0.092 mmol) were added to a screw-cap vial. TFE (460 µL, 0.2 M) was added, followed by DIEA (8.31 mg, 0.064 mmol 1.00 M $(CF_3)_2CHOH$). The reaction vessel was heated to 50 ˚C and stirred for 24 h; the reaction was monitored by TLC. Product was purified by silica gel chromatography (THF/toluene, 1:4 to 2:3). Fractions were collected and dried to yield **3b** (16.7 mg, 27%).

^{1}H NMR (500 MHz, $(CD_3)_2CO$) δ 7.67 (d, *J* = 8.7 Hz, 1H) 6.86 (dd, *J* = 8.8, 2.4 Hz, 1H) 6.75 (d, *J* = 2.2 Hz, 1H) 6.13 (d, *J* =1.3 Hz, 1H) 3.85 (m, 2H) 2.44 (d, *J* = 1.3 Hz, 3H) 1.88 (m, 2H) 1.78 (s, 3H) 1.73 (s, 6H) 1.04 (s, 6H)

^{13}C NMR (151 MHz, $(CD_3)_2CO$) δ 197.1, 190.6, 160.9, 156.3, 153.7, 127.0, 114.3, 113.0, 112.4, 102.1, 66.6, 66.5, 43.1, 40.1, 26.35, 23.3, 18.6.

HPLC t_R : 12.7-13.7 min (method 2)

***cis* inhibitor rhodium fluorescein conjugate, 4c**



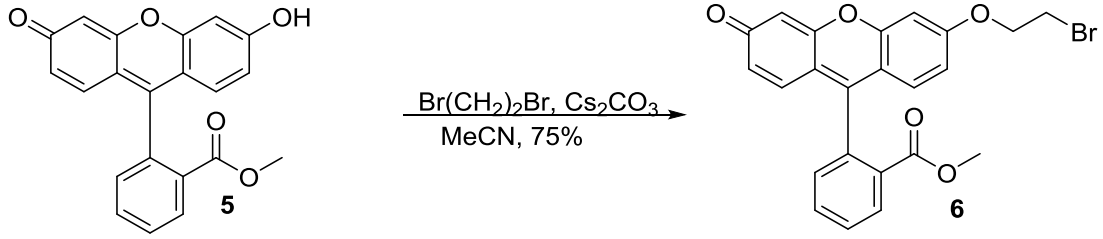
The rhodium(II) complex, **10** (15 mg, 0.023 mmol) was added to a vial containing 4-(N-(1',2-dihydroxy-[1,2'-binaphthalen]-4'-yl)sulfamoyl)butanoic acid, **11** (6 mg, 0.013 mmol) and placed under inert atmosphere (N_2). The purged soln (50:50 acetone/MES buffer pH 4.5, 25mg/mL) was added to the sealed vessel via syringe and the reaction was heated to 50 °C, and was subsequently purified by HPLC

(40-90% MeCN/H_2O). The resulting fractions were rotovaped to remove acetonitrile. The aqueous soln was lyophilized to yield **4c** (3 mg, 21 %).

MS—ESI (m/z): $[M+H]^+$ calcd for $C_{48}H_{36}NO_{15}Rh_2S$ – 1106.0, found 1105.8.

HPLC t_R: 18.8-19.4 min (method 1)

methyl 2-(6-(2-bromoethoxy)-3-oxo-3H-xanthen-9-yl) benzoate, 6



The ester **5** (400 mg, 1.15 mmol) was added to a round-bottomed flask along with Cs_2CO_3 (1,200 mg, 325 mmol). The flask was evacuated and backfilled with nitrogen. Dry acetonitrile (5 mL) and then 1,2-dibromoethane (1000 mg, 5.32 mmol) were added to the flask which was subsequently heated at 60 °C for 14 h. The reaction was complete by TLC. It was dried onto silica and purified by column chromatography (50-100% ethyl acetate in hexanes). The product fractions were collected and dried to yield **6** (397 mg, 75%), an oranges solid.

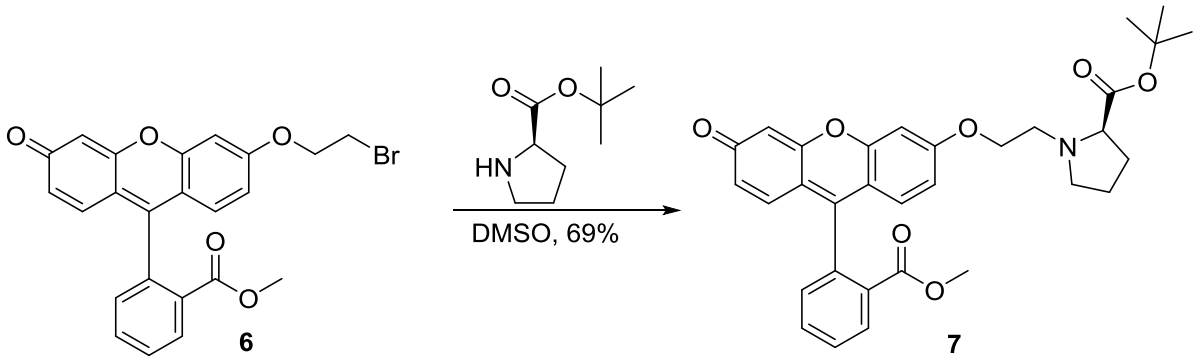
^{1}H NMR (500 MHz, CD_3CN) δ 8.24 (dd, *J* = 1.2, 7.9 Hz, 1H), 7.81 (td, *J* = 7.6 Hz, 1H), 7.74 (td, *J* = 7.7, 7.7, 1.7 Hz, 1H), 7.38 (q, *J* = 2.9 Hz, 1H), 7.05 (d, *J* = 2.5 Hz, 1H), 6.93 (d, *J* = 8.9 Hz, 1H), 6.89 (d, *J* = 9.7 Hz, 1H), 6.81 (d, *J* = 8.9 Hz, 1H), 6.39 (q, *J* = 3.8 Hz, 1H), 6.27 (d, *J* = 1.7 Hz, 1H), 4.45 (t, *J* = 5.6 Hz, 2H), 3.76 (t, *J* = 5.5 Hz, 2H), 3.60 (s, 3H).

^{13}C NMR (151 MHz, CD_3CN) δ 185.2, 166.3, 163.2, 159.5, 154.5, 150.5, 134.9, 133.5, 131.5, 131.2, 131.1, 130.8, 130.4, 130.0, 129.9, 115.9, 113.8, 105.4, 101.8, 69.3, 52.5, 49.5, 30.3.

HPLC t_R: 15-16.4 min (method 2)

mp 135-137 °C.

***tert*-butyl (2-((9-(2-(methoxycarbonyl)phenyl)-3-oxo-3H-xanthen-6-yl)oxy)ethyl)prolinate, 7**



6 **7**

The alkyl halide, **6** (60 mg, 0.13 mmol), and DMSO (1 mL) were added to a 1-dram vial. The amino ester, *tert*-Butyl proline (70 mg, 0.41 mmol), was added to the soln and the reaction vessel was heated to 70 °C. The reaction was monitored by TLC and was complete after 3 h. Once the soln was cooled to rt, aq K_2CO_3 (120 mL, 10 mg/mL) was added the aqueous layer was extracted with Et_2O (3 x 50 mL). The organic layer was dried with Na_2SO_4, filtered through cotton, and dried under vacuum. The resulting paste was sonicated in hexanes. This slurry was filtered through a frit. The solid precipitate was washed with hexanes and then collected to yield **7** (50 mg, 69%) , an orange solid.

^{1}H NMR (600 MHz, $CDCl_3$) δ 7.60 (m, *J* = 2.1 Hz, 1H), 7.18 (m, *J* = 2.0 Hz, 1H), 7.11 (m, *J* = 2.1 Hz, 1H), 6.75 (d, *J* = 7.5 Hz, 1H), 6.40 (t, *J* = 2.1 Hz, 1H), 6.26 (m, *J* = 4.1 Hz, 2H), 6.16 (m, *J* = 2.2 Hz, 1H), 5.74 (m, *J* = 2.2 Hz, 1H), 5.63 (m, *J* = 1.2 Hz, 1H), 3.59 (t, *J* = 3.8 Hz, 2H), 2.97 (t, *J* = 1.0 Hz, 3H), 2.58 (m, *J* = 3.2 Hz, 1H), 2.49 (m, *J* = 4.7 Hz, 2H), 2.30 (m, *J* = 3.0 Hz, 1H), 1.91 (m, *J* = 3.7 Hz, 2H), 1.42 (m, *J* = 3.5 Hz, 1H), 1.32 (m, *J* = 2.3 Hz, 4H), 1.20 (m, *J* = 3.2 Hz, 3H), 0.77 (q, *J* = 0.8 Hz, 9H).

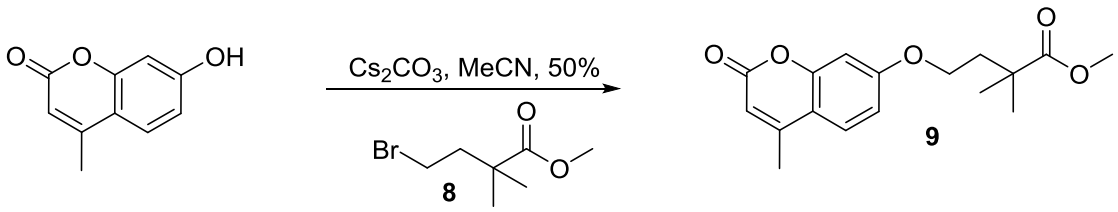
^{13}C NMR (151 MHz, $CDCl_3$) δ 185.7 , 174.2 , 166.7 , 164.4 , 160.0, 155.0, 151.4, 135.4, 133.9, 131.8, 131.6, 131.2, 130.8, 130.2, 130.2, 130.1, 115.8, 114.5, 105.7, 101.9, 81.1, 69.2, 67.3, 54.7, 53.5, 52.9, 41.3, 30.0, 28.3.

MS—ESI (m/z): $[M+H]^+$ calcd for $C_{32}H_{33}NO_7$ -544.2, found 544.1

HPLC t_R: 17.4-17.8 min (method 1)

mp 117-120 °C

methyl 2,2-dimethyl-4-((4-methyl-2-oxo-2H-chromen-7-yl)oxy)butanoate, 9



The fluorophore, 4-methyl-1-umbelliferone (800 mg, 4.6 mmol), was added to a round-bottomed flask along with Cs_2CO_3 (2.14 g, 6.6 mmol). The flask was evacuated and backfilled with nitrogen. Dry acetonitrile (11 mL) and then methyl 4-bromo-2,2-dimethylbutanoate, **8** (190 mg, 1.09 mmol), were added to the flask. The reaction vessel was heated at 70 °C for 22 h. The reaction was monitored and found complete by TLC. It was dried onto silica and purified by column chromatography (1:1 EtOAc/hexanes). The product fractions were collected and dried to yield **9** (150 mg, 50%), a white solid. mp 70-72.

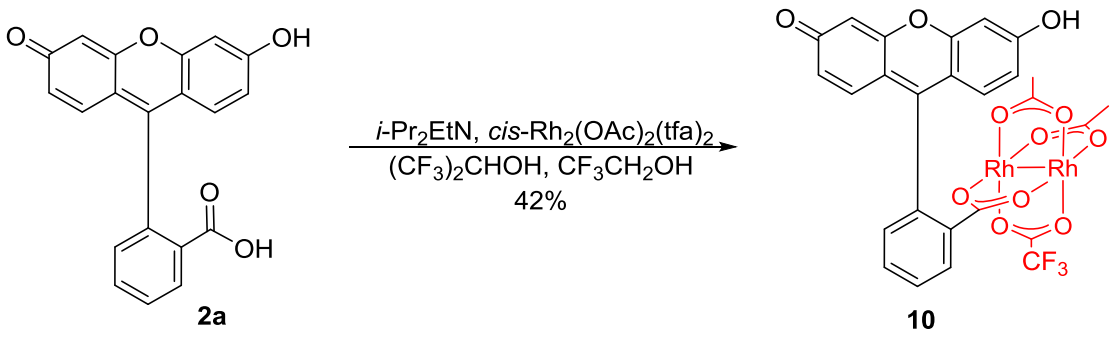
^{1}H NMR (500 MHz, CD_3OD) δ 7.69 (d, *J* = 8.7 Hz, 1H) 6.92 (dd, *J* = 9, 2.6 Hz, 1H) 6.88 (d, *J* = 2.6 Hz, 1H) 6.18 (d, *J* = 1.3 Hz, 1H) 4.15 (t, *J* = 6.4 Hz, 2H) 3.72 (s, 3H) 2.46 (d, *J* =1.3 Hz, 3H) 2.11 (t, *J* = 6.4 Hz, 2H) 1.28 (s, 6H)

^{13}C NMR (151 MHz, CD_3OD) δ 178.2 162.1, 155.1, 154.3, 125.9, 125.9, 113.4, 112.5, 110.7, 100.8, 65.2, 51.0, 40.4, 38.7, 24.4, 17.2.

GC-MS (m/z) calcd for $C_{17}H_{20}O_5$ - 304.1, found 304.1

mp 70-72 ˚C.

***cis*-dirhodium bisacetate-2,2,2-trifluoroacetate-2-(6-hydroxy-3-oxo-3H-xanthen-9-yl)benzoate, 10**



Fluorescein (40.7 mg, 0.092 mmol) and *cis*-$Rh_2(OAc)_2(tfa)_2$ (40.7 mg, 0.092 mmol) were placed in a scintillation vial along with a stir bar. The solvent, TFE (4 mL), was added to the vessel along with a DIEA (40.7 mg, 0.092 mmol, 1.00 M $(CF_3)_2CHOH$) . The reaction was heated to 50 °C. After 4 h, the reaction appeared complete by TLC and was purified via silica gel chromatography (1:19 MeOH/EtOAc). The fractions were collected and dried to yield **10** (30 mg, 42%).

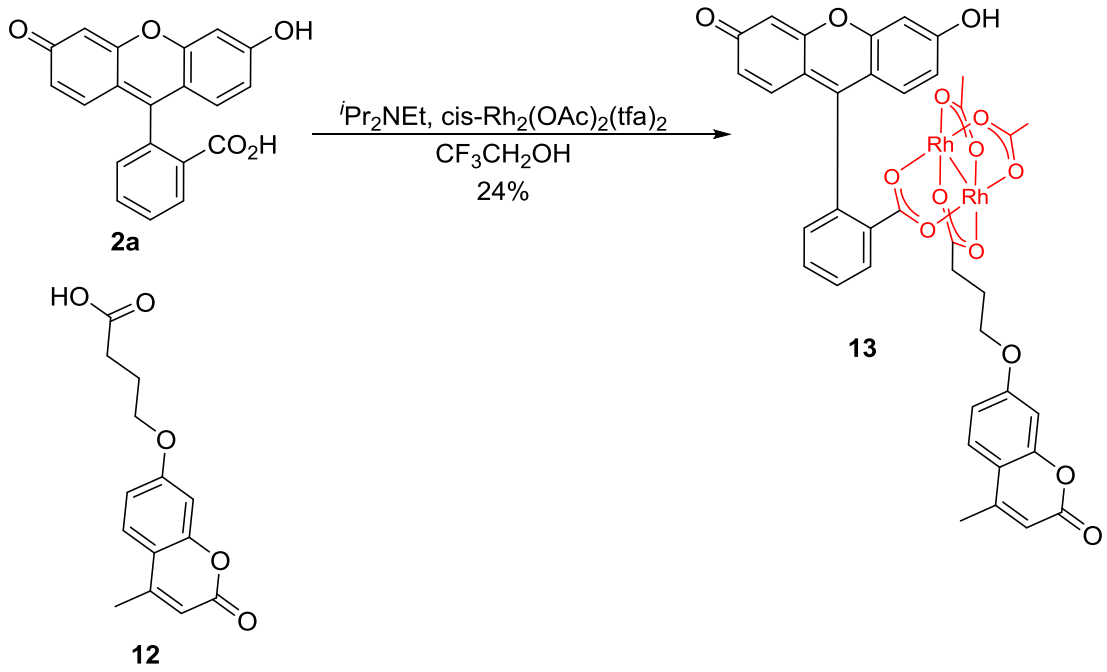
^{1}H NMR (600 MHz, CD_3OD) δ 8.03 (d, *J* = 7.7 Hz, 1H), 7.68 (t, *J* = 7.3 Hz, 1H), 7.62 (t, *J* = 7.3 Hz, 1H), 7.23 (d, *J* = 7.4 Hz, 1H), 6.88 (d, *J* = 9.2 Hz, 2H), 6.78 (s, 2H), 6.62 (q, *J* = 3.6 Hz, 2H), 1.75 (s, 3H), 1.59 (s, 3H).

^{13}C NMR (151 MHz, CD_3OD) δ 193.1, 192.8, 185.6, 173.9.1 (q, *J* = 39 Hz), 163.2 (q, *J* = 35 Hz), 159.4, 157.8, 134.0, 133.8, 132.7, 132.0, 131.1, 130.7, 118.1 (q, *J* = 292 Hz), 116.2, 104.3, 23.2, 22.9.

MS (ESI) $[M+H]^+$ calcd for $C_{26}H_{19}O_{11}Rh_2$– 768.9, found 769.0

HPLC t_R: 16.6-17.4 min (method 1)

Fluorescein-coumarin rhodium conjugate, 13



Fluorescein (3 mg, 0.009 mmol), **12** (3 mg, 0.011 mmol), and *cis*-$Rh_2(OAc)_2(tfa)_2$ (5 mg, 0.009 mmol) were placed in a scintillation vial along with a stir bar. The solvent, TFE (0.2 mL), was added to the vessel along with a DIEA (25 µL, 1M TFE). The reaction was heated to 54 °C. After 12h, the reaction

appeared complete by TLC and was purified via silica gel chromatography (EtOAc). The fractions were collected and dried to yield **13** (2 mg, 24%).

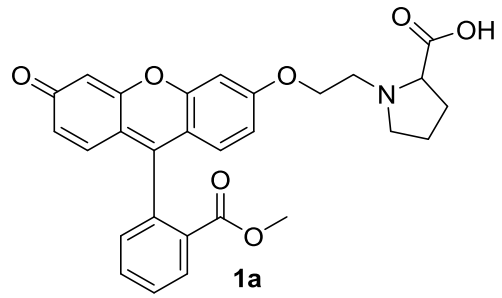
^{1}H NMR (500 MHz, $(CD_3)_2CO$) δ 8.03 (d, *J* = 7.7 Hz, 1H), 7.71 (t, *J* = 7.3 Hz, 1H), 7.66-7.59 (m, 2H), 7.33 (d, *J* = 7.4 Hz, 1H), 7.27 (s, 2H), 6.99-6.79 (m, 4H), 6.69 (dd, *J* = 2.4, 7.7 Hz, 1H), 6.62 (d, *J* = 1.9 Hz, 1H), 6.13 (d, *J* = 2.7 Hz, 1H), 3.84-3.79 (m, 2H), 2.43 (s, 3H), 2.23-2.19 (m, 2H) 1.85-1.75 (m, 2H), 1.64 (s, 3H), 1.59 (s, 3H).

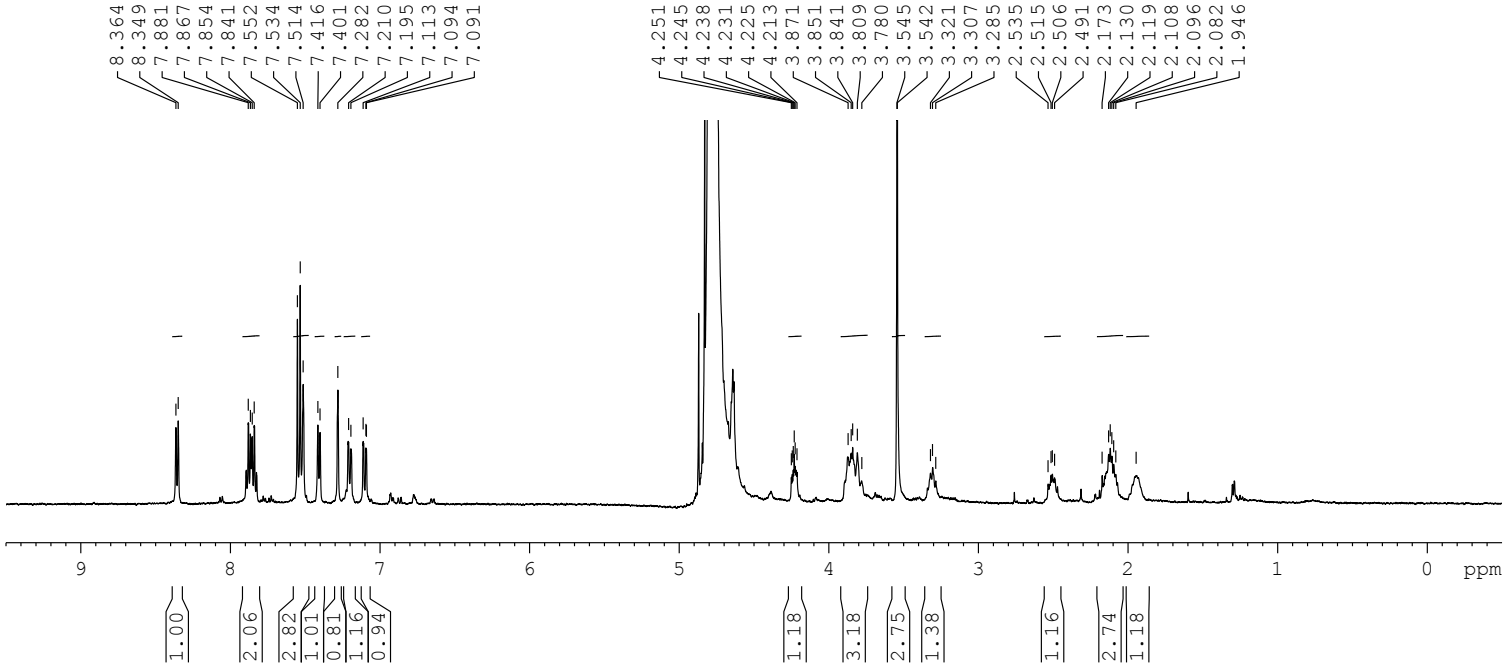
MS (ESI) $[M+H]^+$ calcd for $C_{38}H_{30}O_{14}Rh_2$– 917.0, found 917.1.

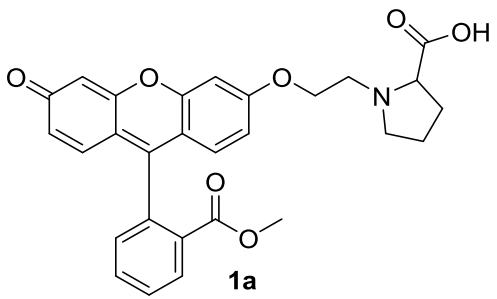
HPLC t_R: 14.3-14.9 min (method 2)

Characterization data

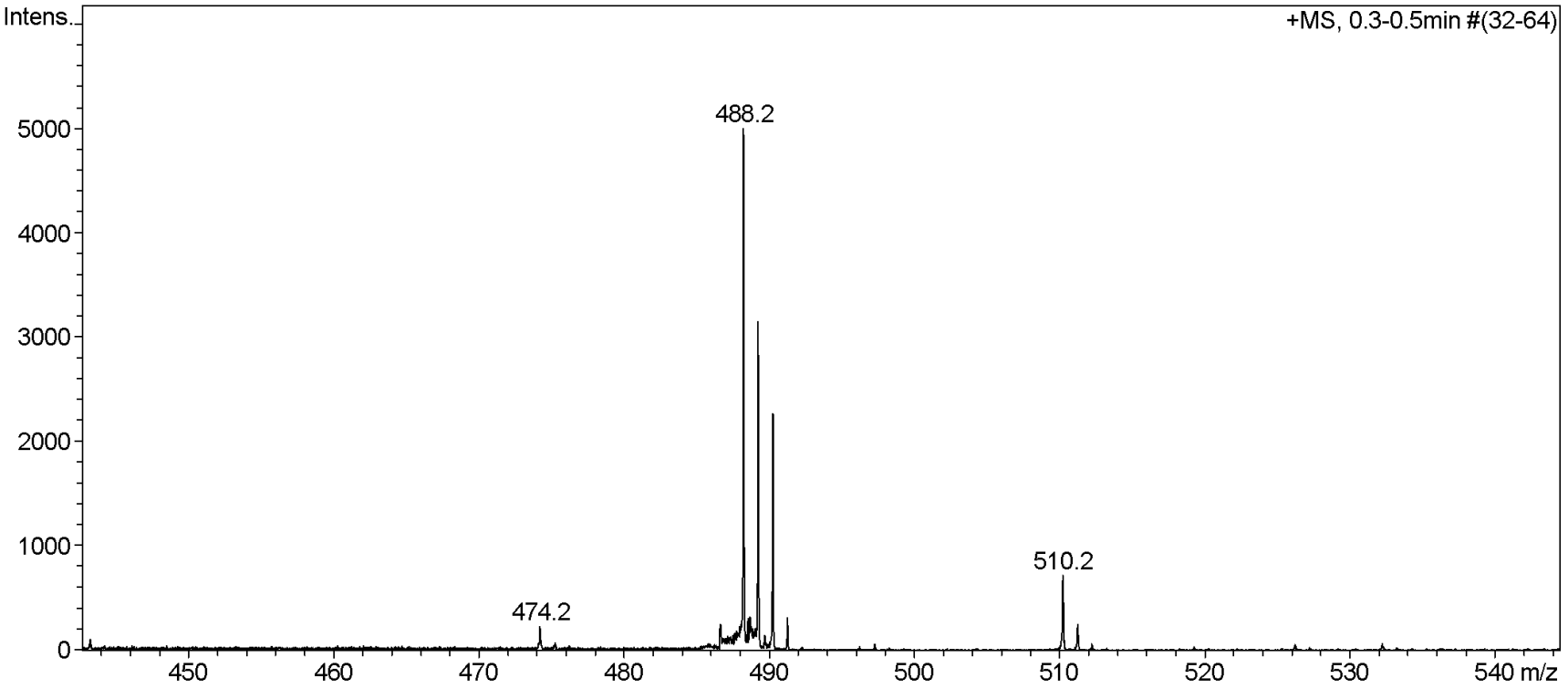
^{1}H NMR spectrum of **1a**

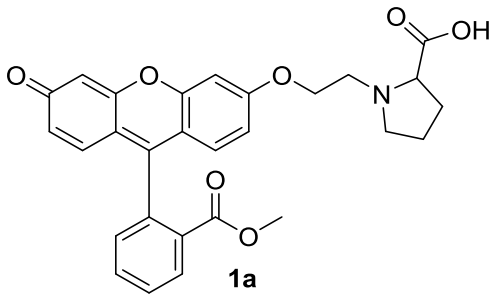




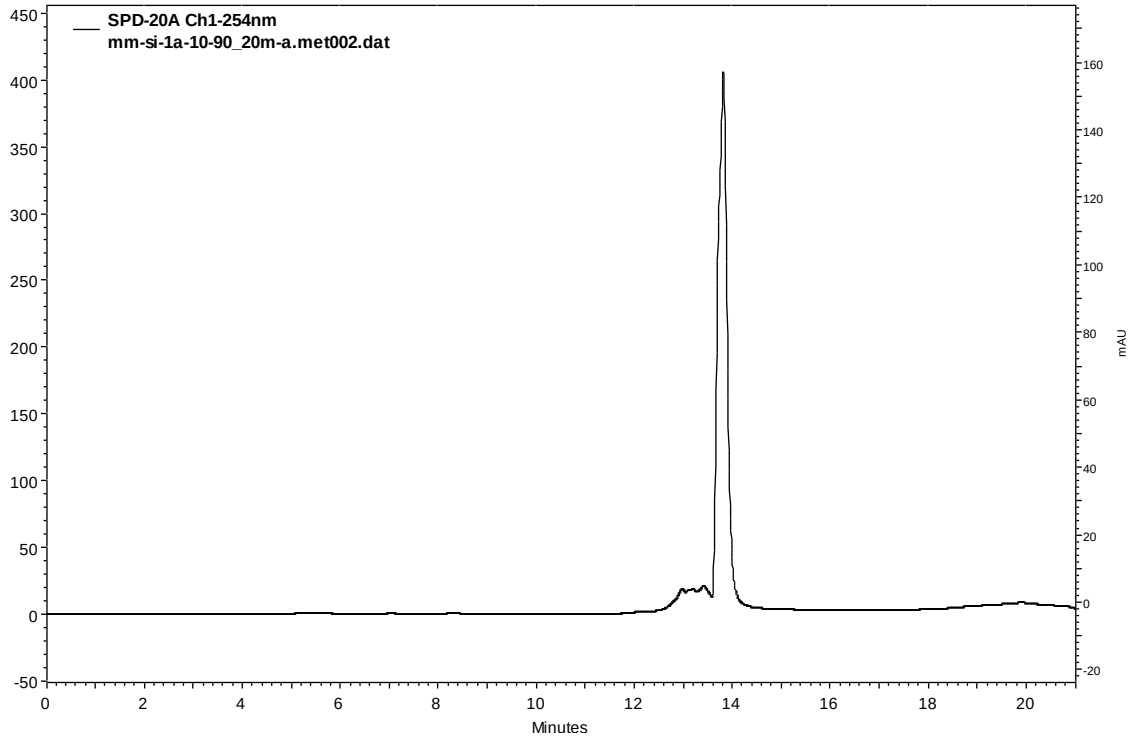

O
O
OH
O
O
N
O
O

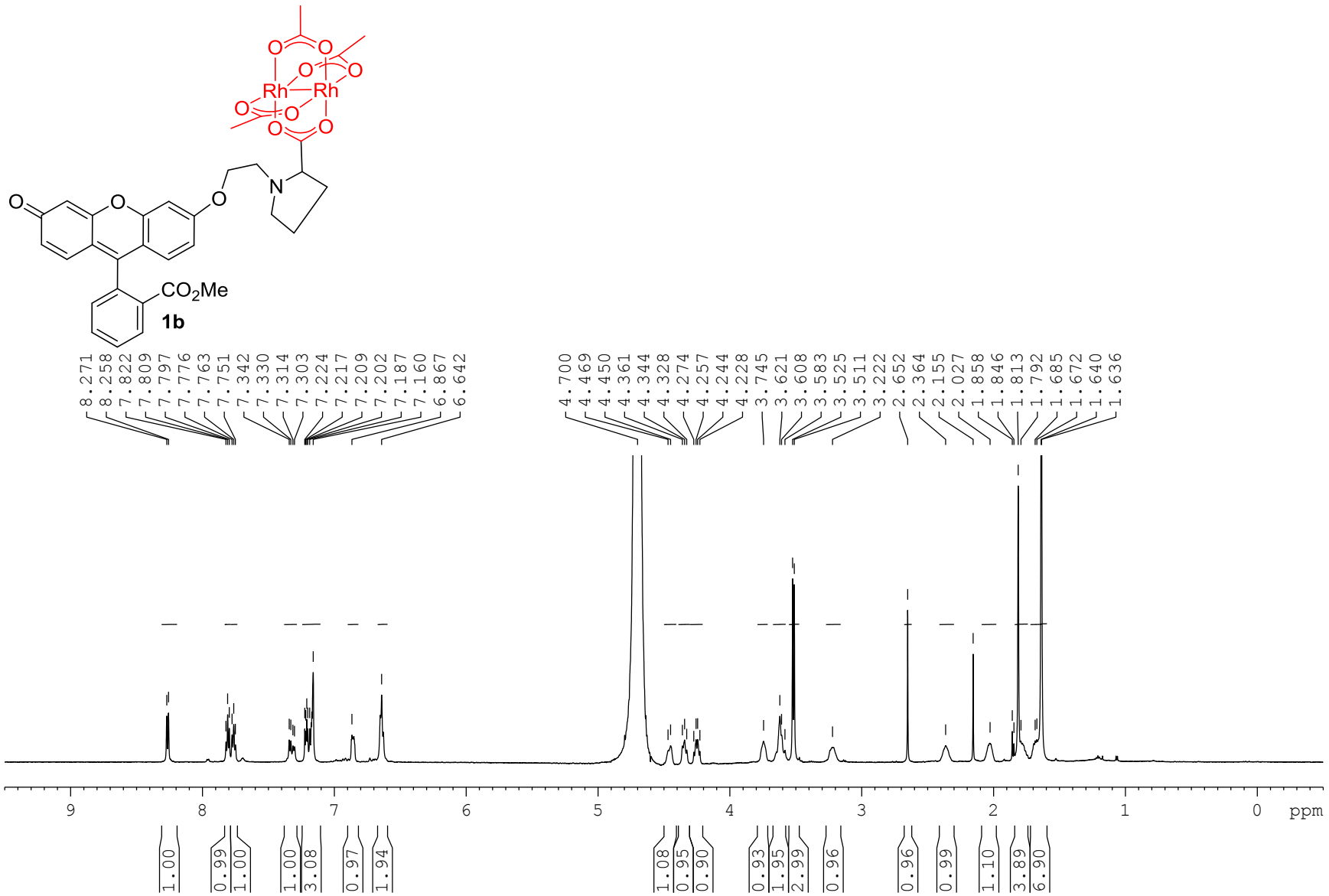
1a

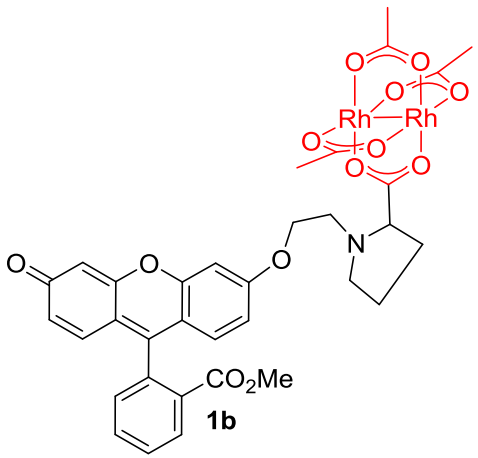

Intens.
+MS, 0.3-0.5min #(32-64)
5000
4000
3000
2000
1000
0
488.2
474.2
510.2
450
460
470
480
490
500
510
520
530
540 m/z


O
OH
O
O
O
N
O
O

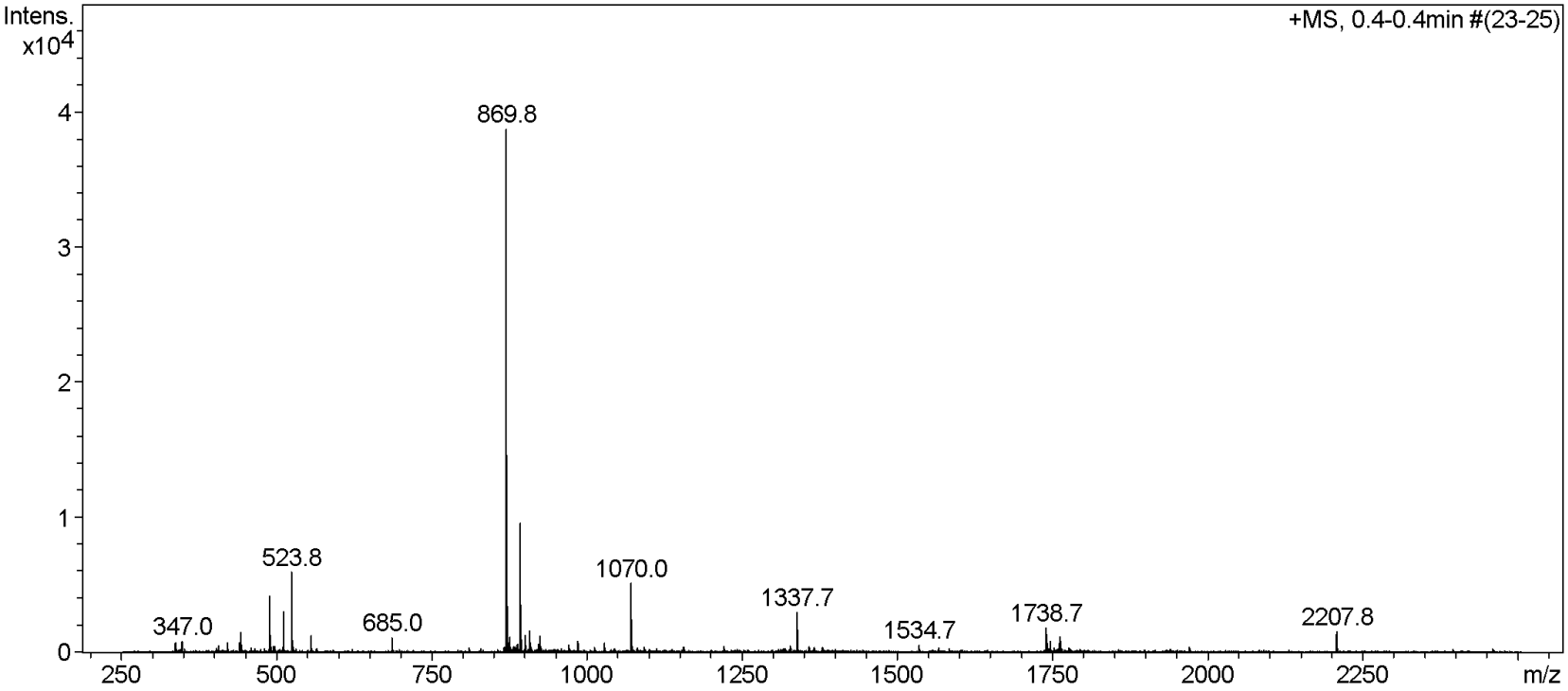
1a

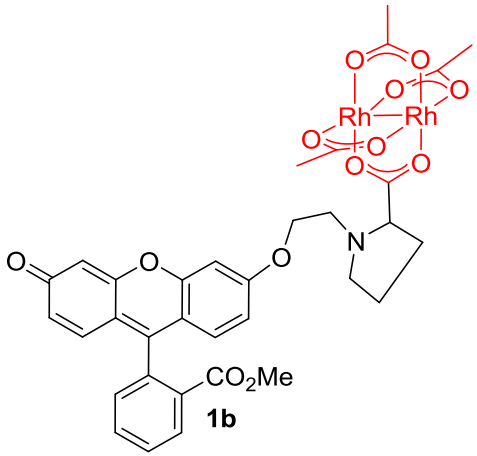

SPD-20A Ch1-254nm
mm-si-1a-10-90_20m-a.met002.dat
450
400
350
300
250
200
150
100
50
0
-50
160
140
120
100
80
60
40
20
0
-20
mAU
0
2
4
6
8
10
12
14
16
18
20
Minutes


Rh
Rh
O
N
CO2Me
1b
8.271
8.258
7.822
7.809
7.797
7.776
7.763
7.751
7.342
7.330
7.314
7.303
7.224
7.217
7.209
7.202
7.187
7.160
6.867
6.642
4.700
4.469
4.450
4.361
4.344
4.328
4.274
4.257
4.244
4.228
3.745
3.621
3.608
3.583
3.525
3.511
3.222
2.652
2.364
2.155
2.027
1.858
1.846
1.813
1.792
1.685
1.672
1.640
1.636
9
8
7
6
5
4
3
2
1
0
ppm
1.00
0.99
1.00
1.00
3.08
0.97
1.94
1.08
0.95
0.90
0.93
1.95
2.99
0.96
0.96
0.99
1.10
3.89
6.90

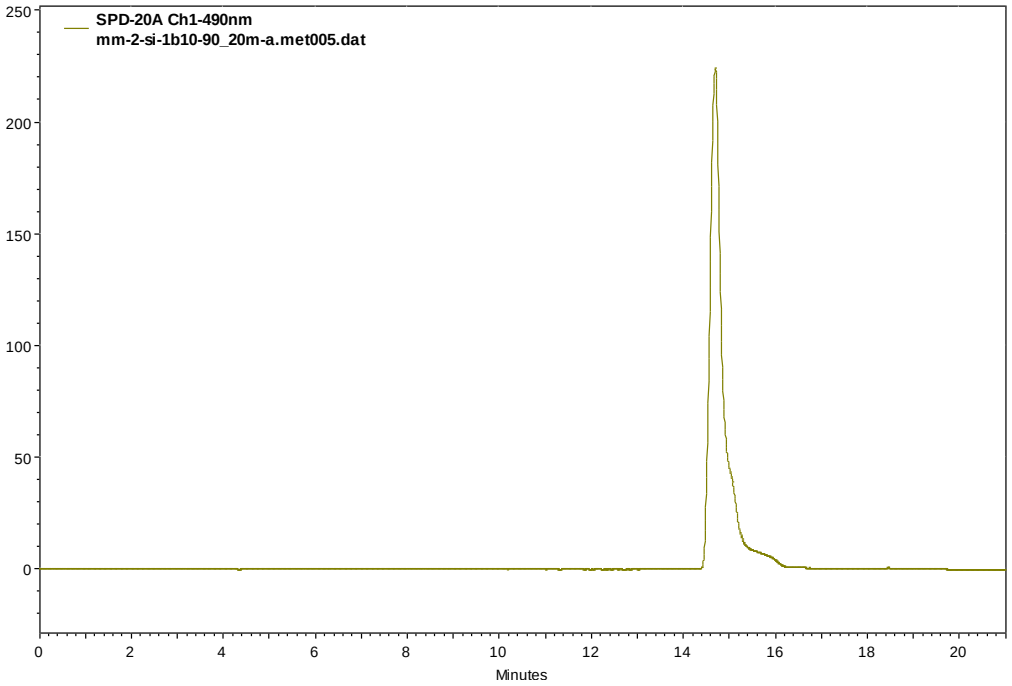

O
O
Rh
Rh
O
O
O
O
O
O
O
N
O
O
CO2Me

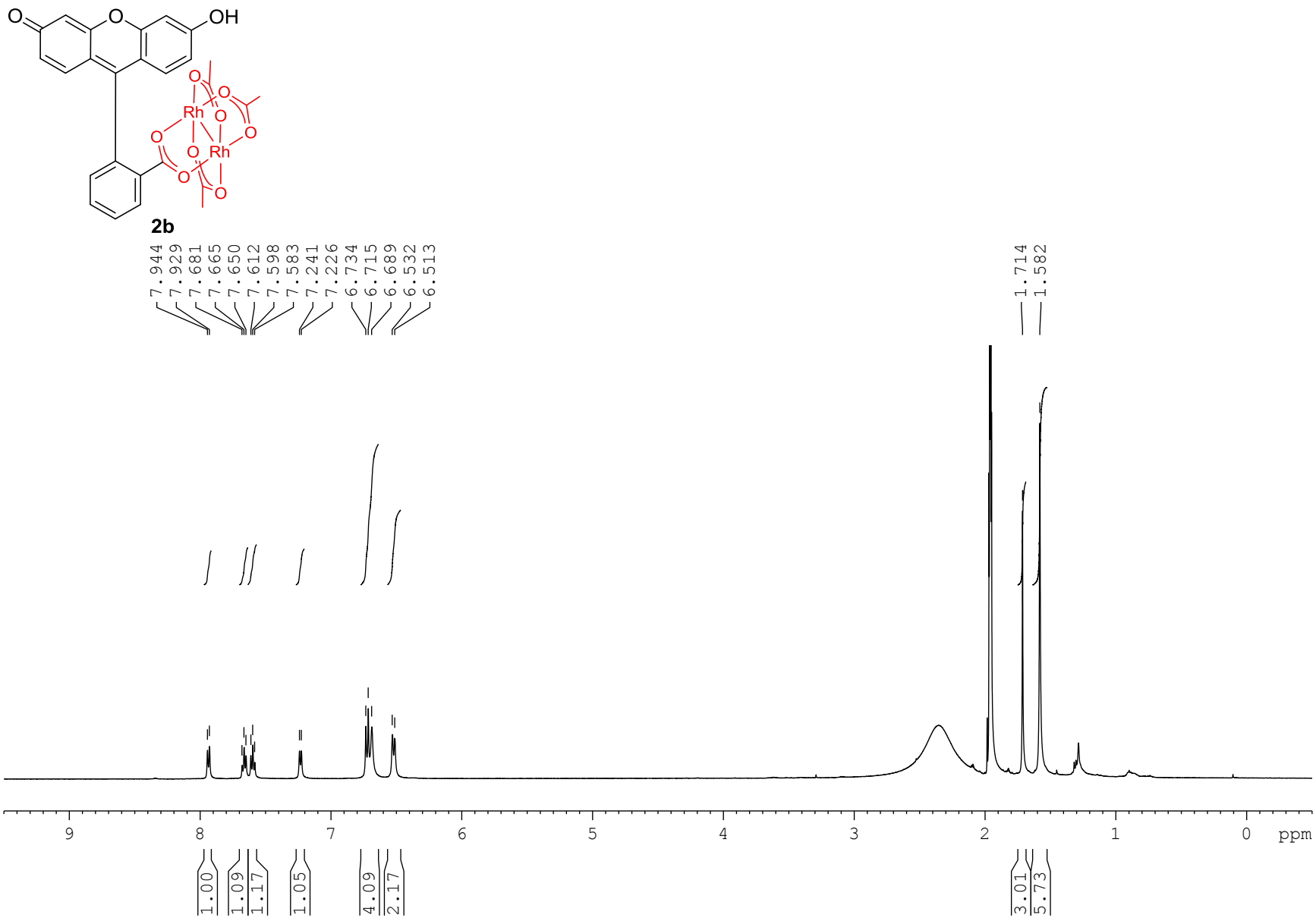
1b

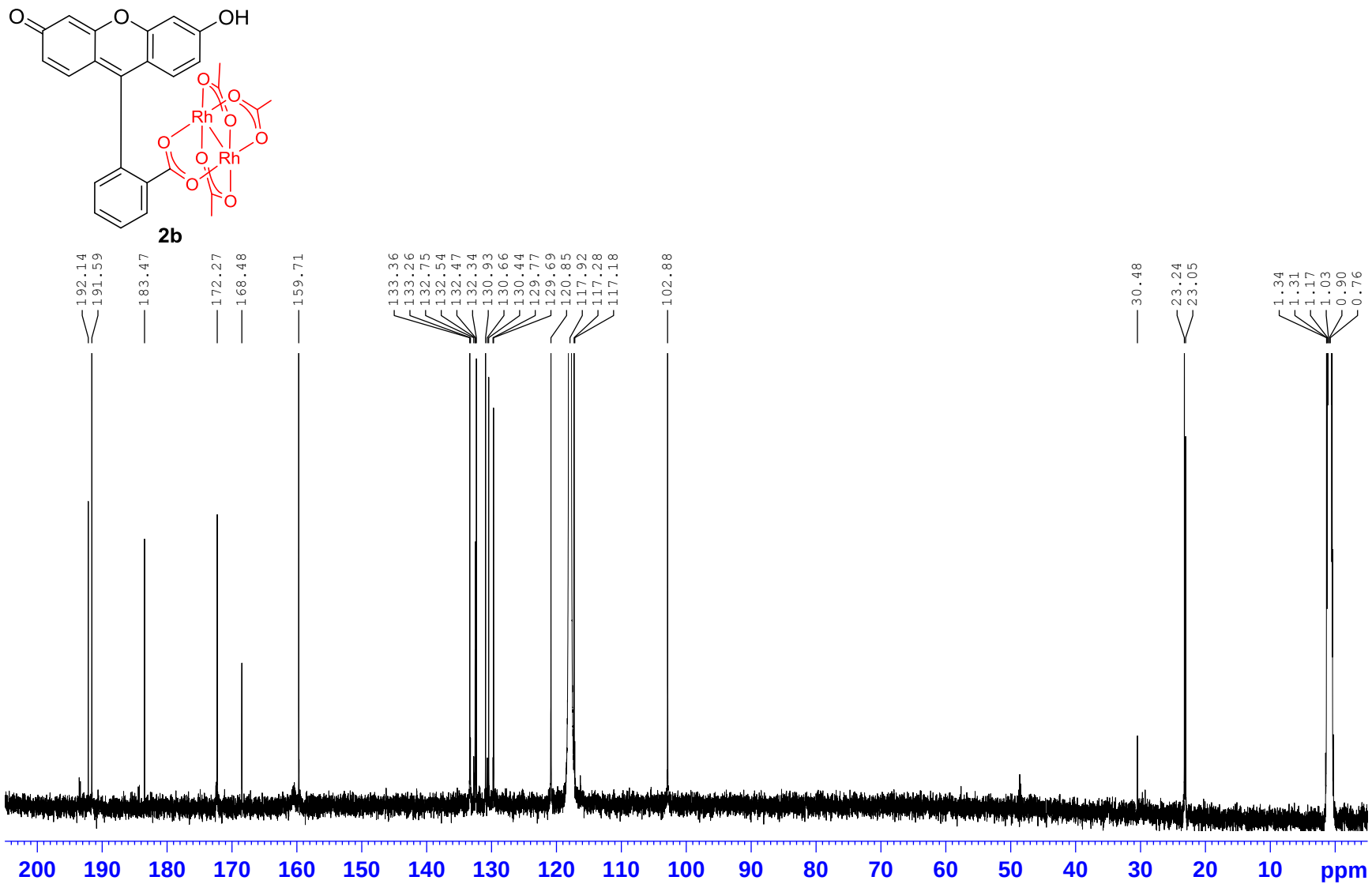

Intens.
x10^4
+MS, 0.4-0.4min #(23-25)
4
3
2
1
0
869.8
523.8
1070.0
1337.7
347.0
685.0
1534.7
1738.7
2207.8
250
500
750
1000
1250
1500
1750
2000
2250
m/z

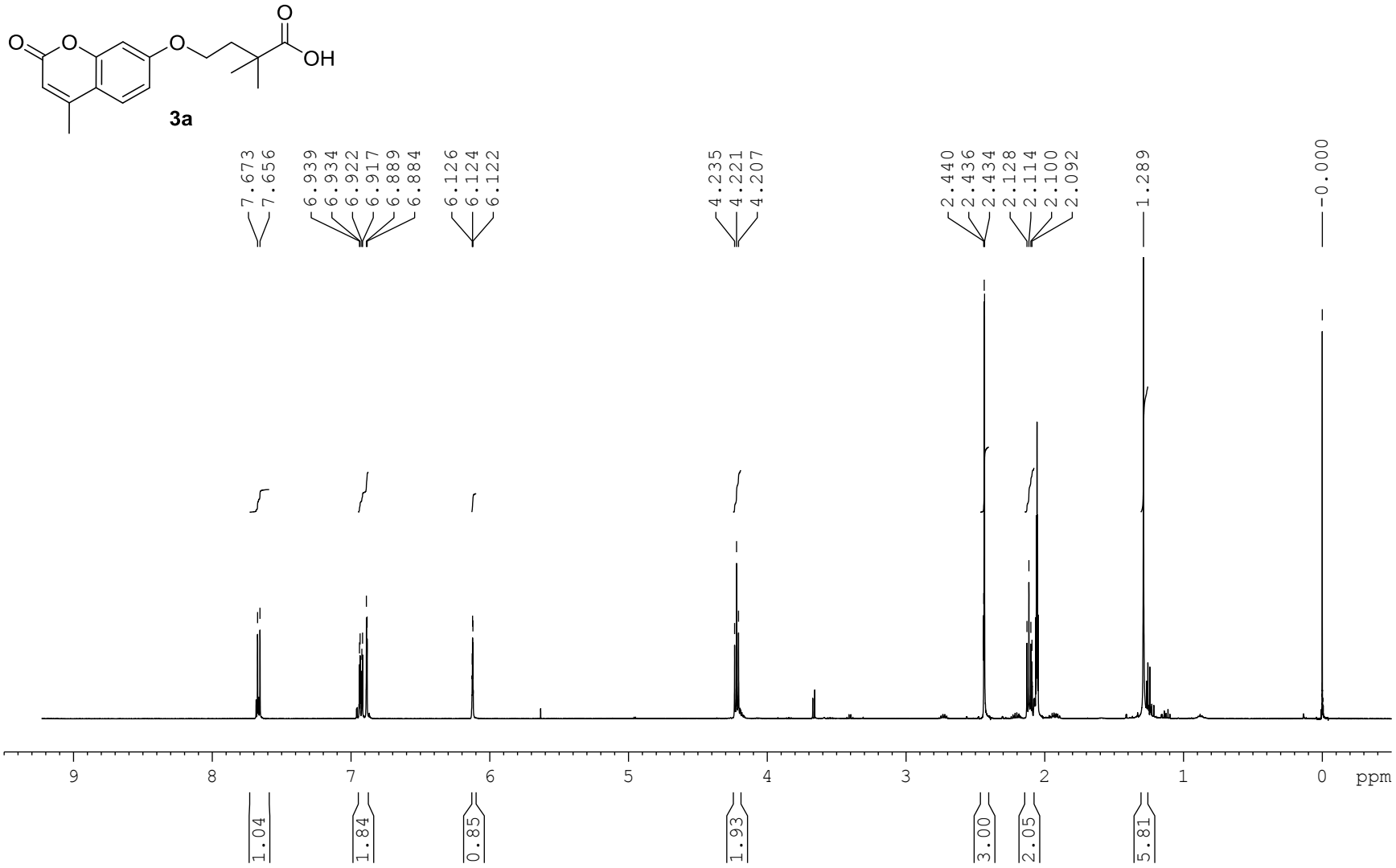

Rh
Rh
O
N
CO2Me

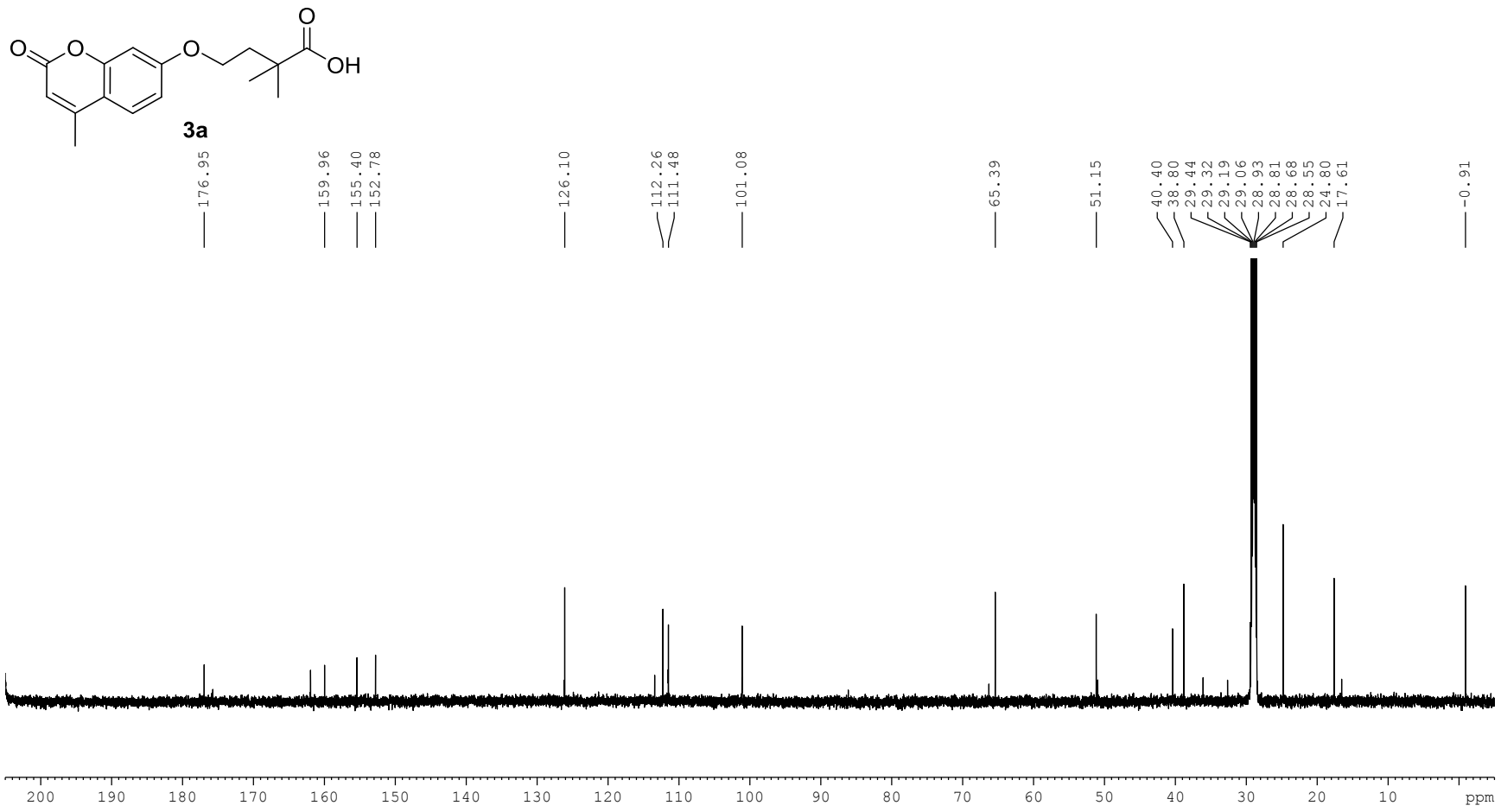
1b

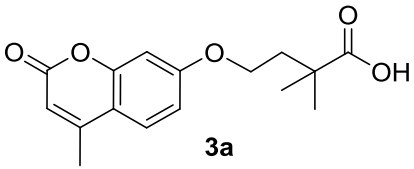

SPD-20A Ch1-490nm
mm-2-si-1b10-90_20m-a.met005.dat
250
200
150
100
50
0
0
2
4
6
8
10
12
14
16
18
20
Minutes


2b
7.944
7.929
7.681
7.665
7.650
7.612
7.598
7.583
7.241
7.226
6.734
6.715
6.689
6.532
6.513
1.714
1.582
9
8
7
6
5
4
3
2
1
0
ppm
1.00
1.09
1.17
1.05
4.09
2.17
3.01
5.73

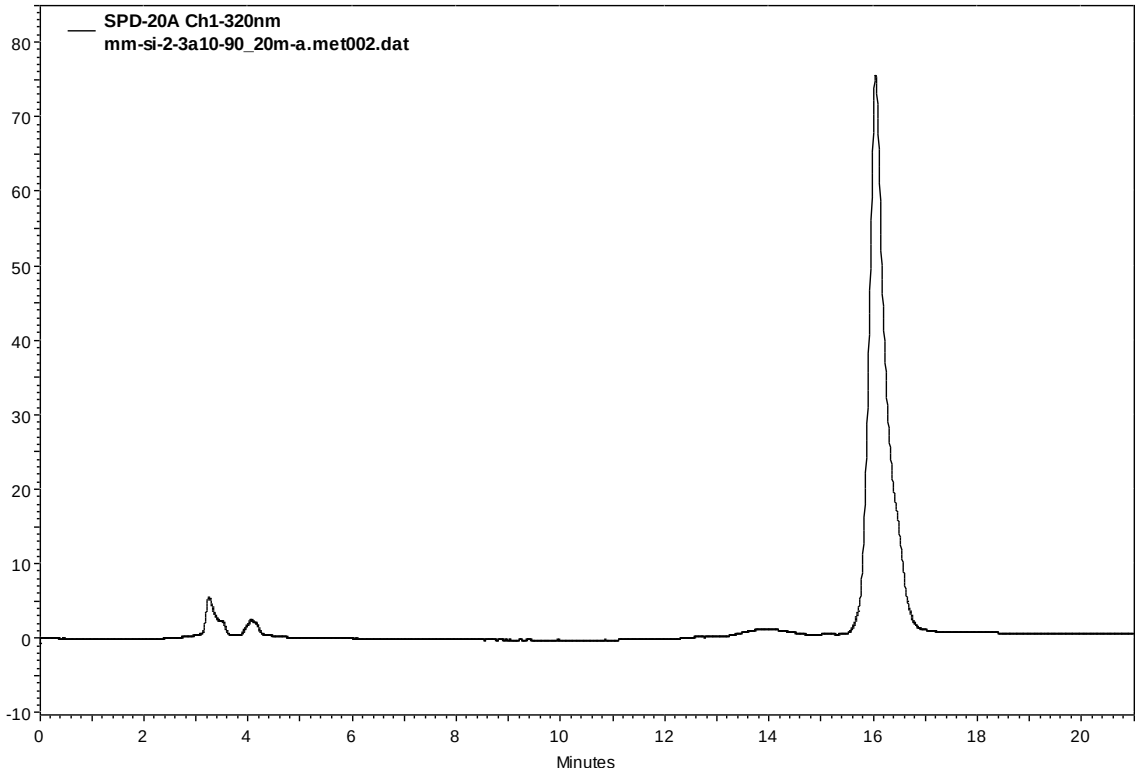

2b
192.14
191.59
183.47
172.27
168.48
159.71
133.36
133.26
132.75
132.54
132.47
132.34
130.93
130.66
130.44
129.77
129.69
120.85
117.92
117.28
117.18
102.88
30.48
23.24
23.05
1.34
1.31
1.17
1.03
0.90
0.76
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
ppm

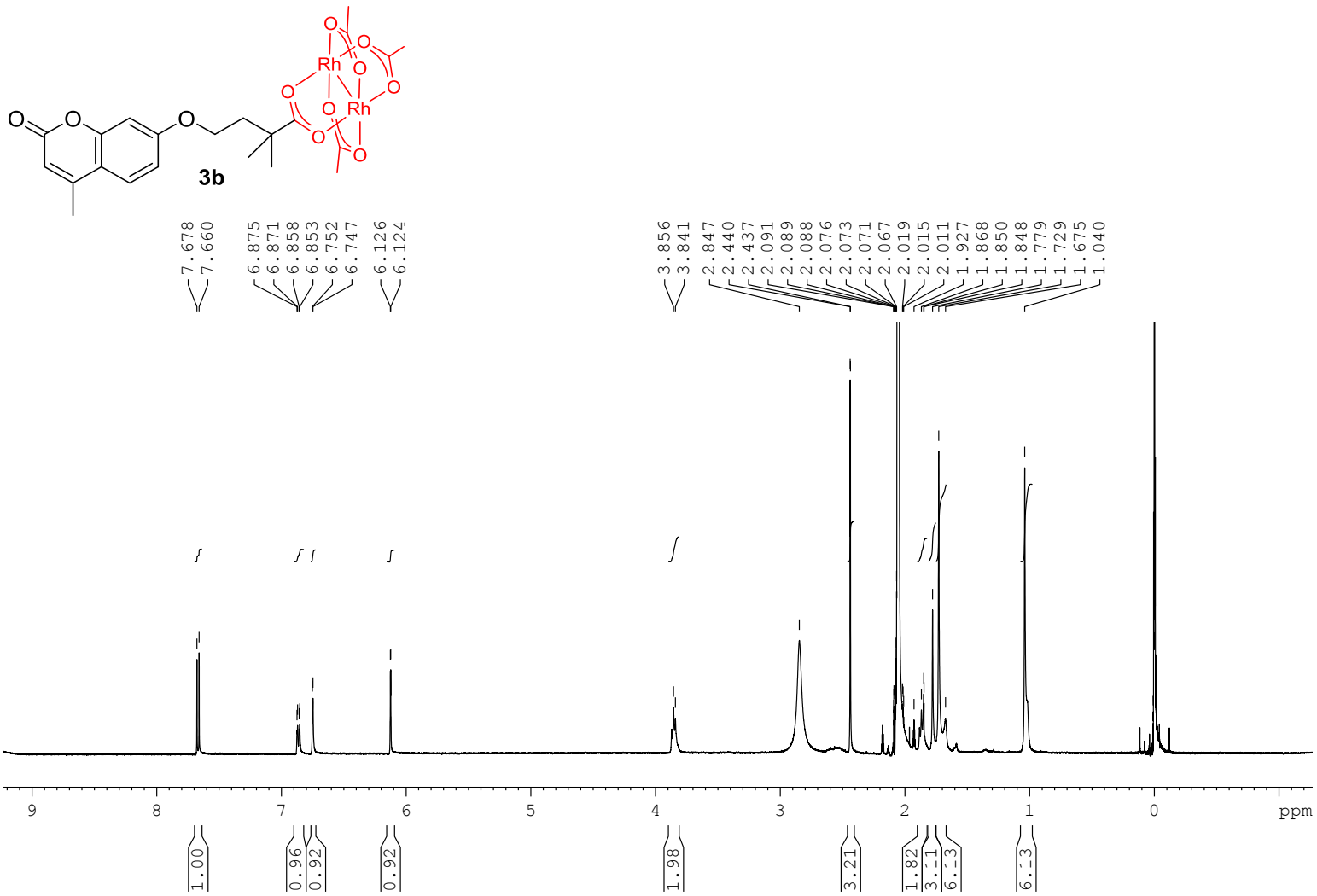

O
O
O
O
OH
3a
7.673
7.656
6.939
6.934
6.922
6.917
6.889
6.884
6.126
6.124
6.122
4.235
4.221
4.207
2.440
2.436
2.434
2.128
2.114
2.100
2.092
1.289
-0.000
9
8
7
6
5
4
3
2
1
0
ppm
1.04
1.84
0.85
1.93
3.00
2.05
5.81

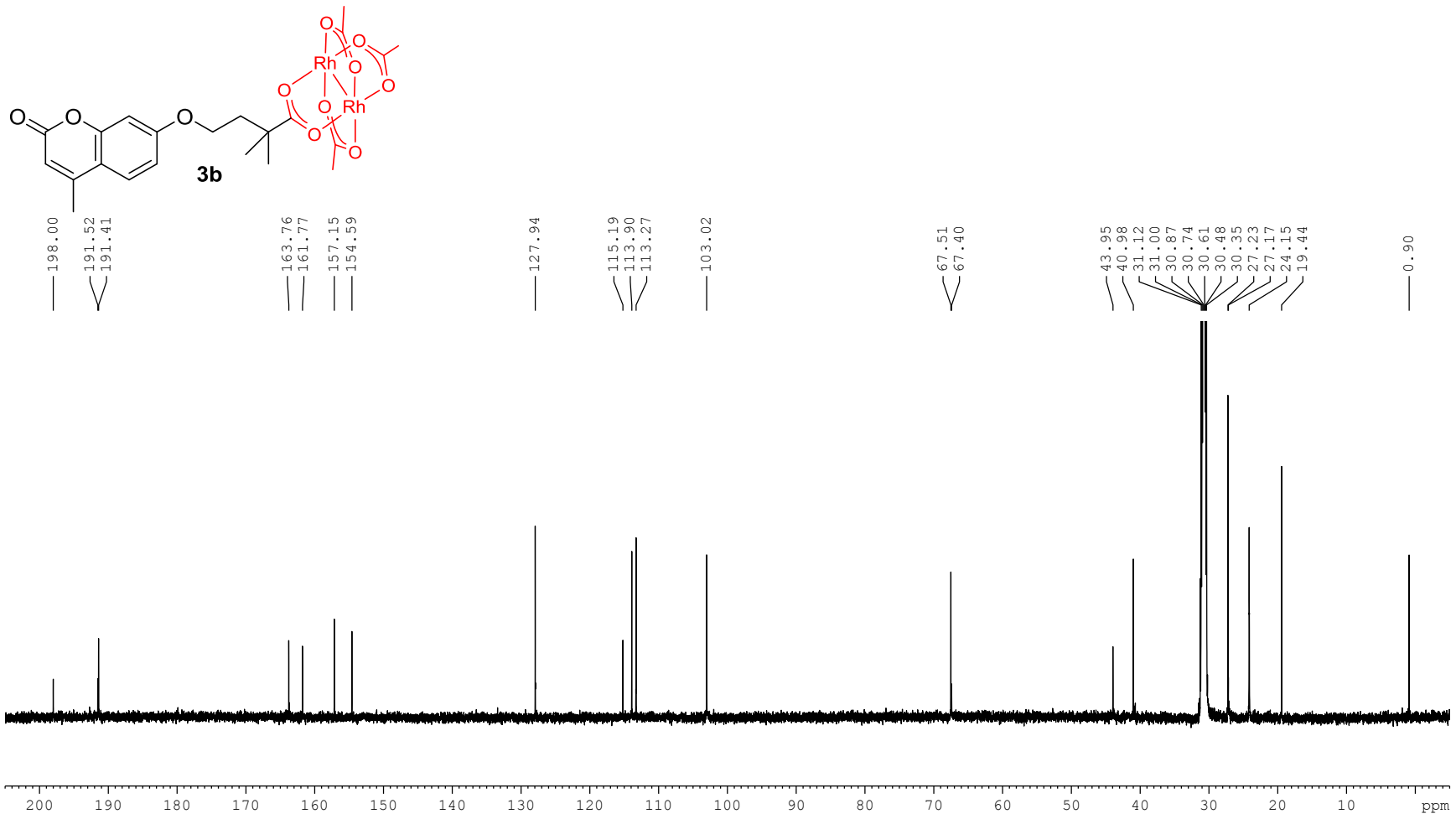

O
O
O
O
OH
3a
176.95
159.96
155.40
152.78
126.10
112.26
111.48
101.08
65.39
51.15
40.40
38.80
29.44
29.32
29.19
29.06
28.93
28.81
28.68
28.55
24.80
17.61
-0.91
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
ppm

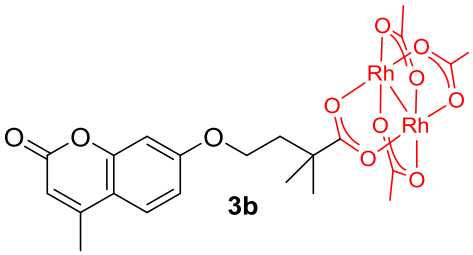

O
O
O
O
OH

3a

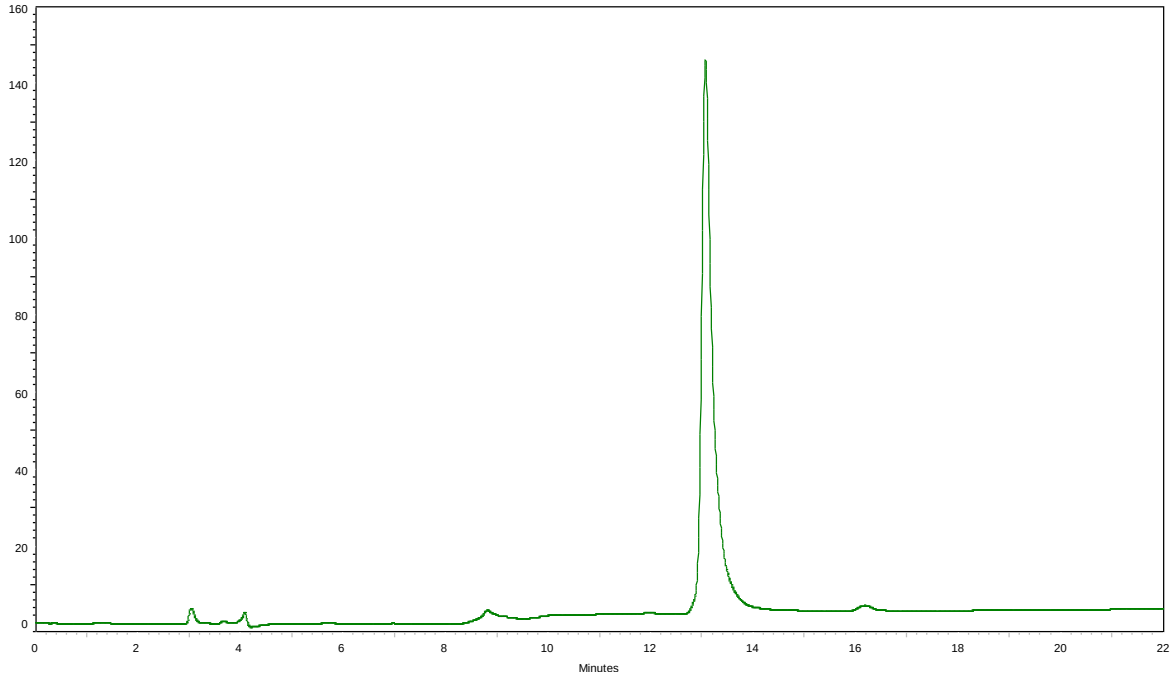

SPD-20A Ch1-320nm
mm-si-2-3a10-90_20m-a.met002.dat
80
70
60
50
40
30
20
10
0
-10
0
2
4
6
8
10
12
14
16
18
20
Minutes

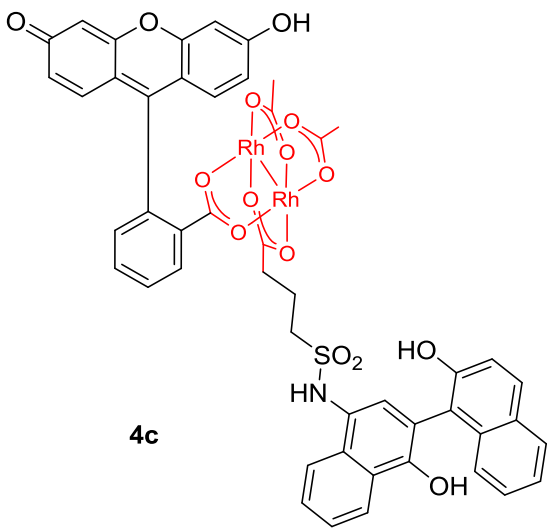

3b
7.678
7.660
6.875
6.871
6.858
6.853
6.752
6.747
6.126
6.124
3.856
3.841
2.847
2.440
2.437
2.091
2.089
2.088
2.076
2.073
2.071
2.067
2.019
2.015
2.011
1.927
1.868
1.850
1.848
1.779
1.729
1.675
1.040
9
8
7
6
5
4
3
2
1
0
ppm
1.00
0.96
0.92
0.92
1.98
3.21
1.82
3.11
6.13
6.13


3b
198.00
191.52
191.41
163.76
161.77
157.15
154.59
127.94
115.19
113.90
113.27
103.02
67.51
67.40
43.95
40.98
31.12
31.00
30.87
30.74
30.61
30.48
30.35
27.23
27.17
24.15
19.44
0.90
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
ppm

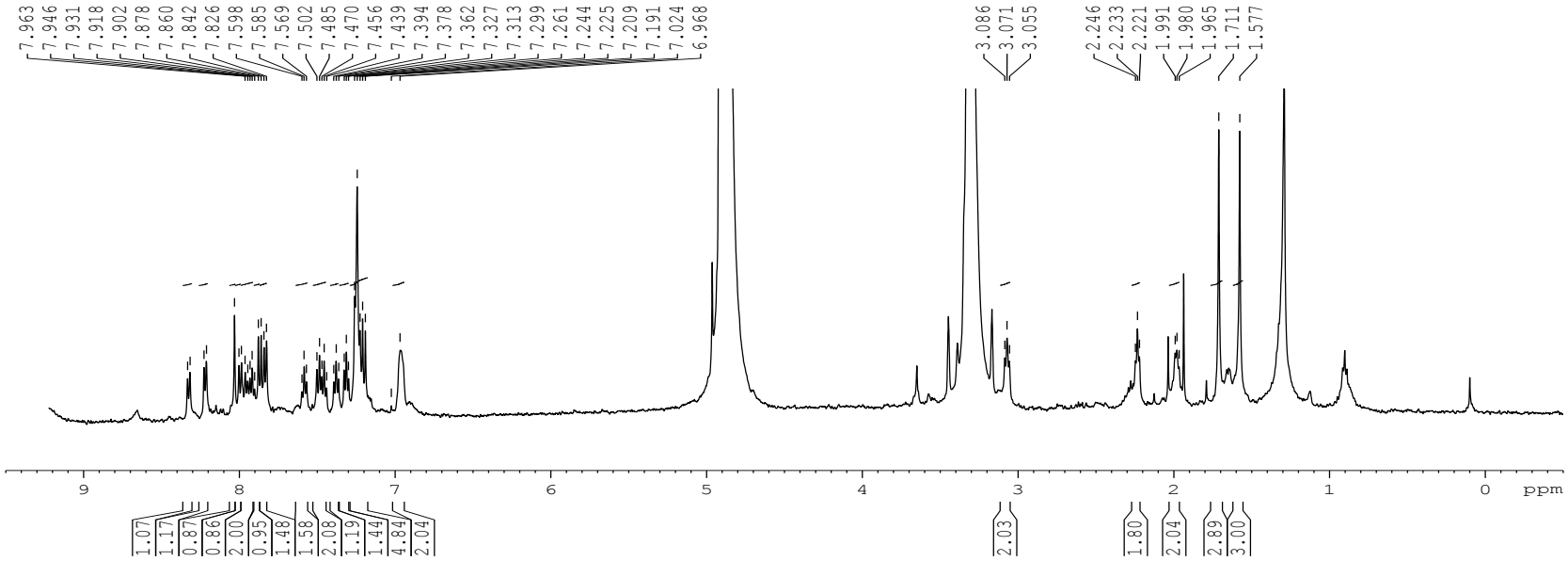

O
O
O
Rh
Rh
O
O
O
O
O
O
O

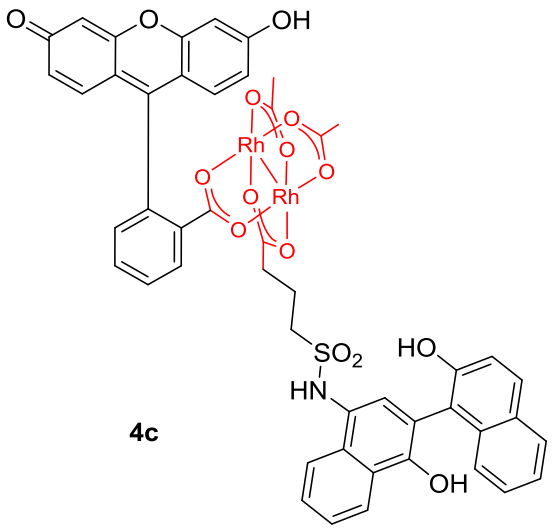
3b


160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
14
16
18
20
22
Minutes

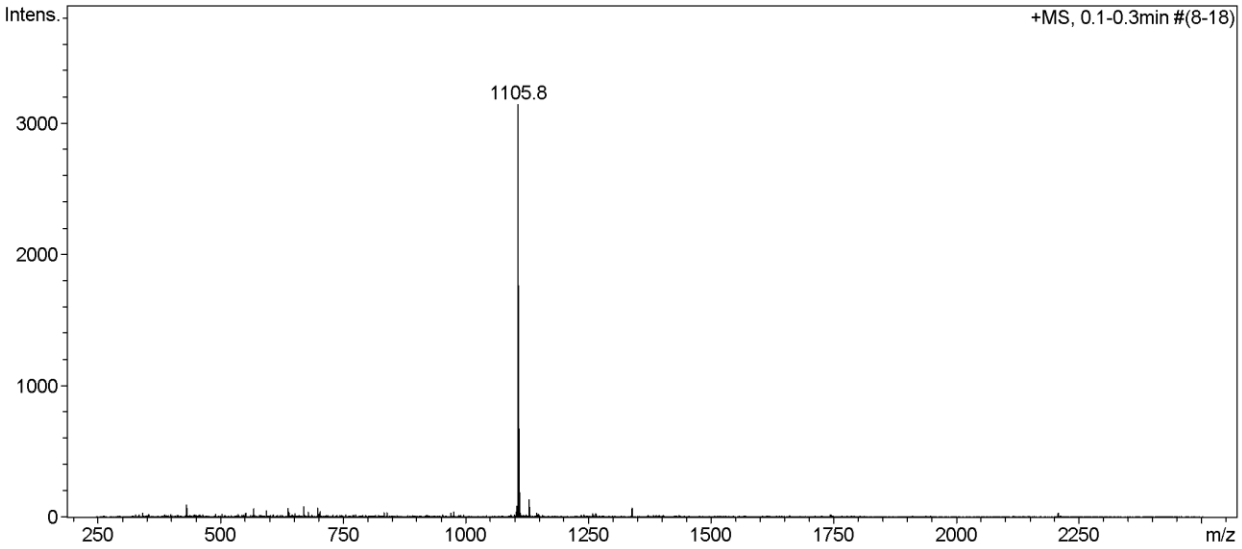

O
O
OH
Rh
Rh
O
SO2
HN
HO
OH

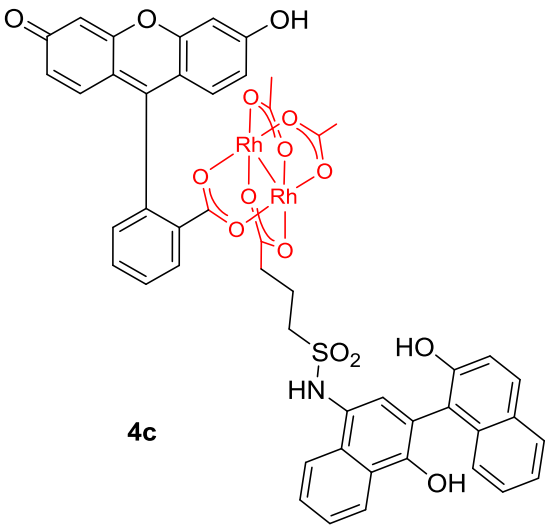
4c


7.963
7.946
7.931
7.918
7.902
7.878
7.860
7.842
7.826
7.598
7.585
7.569
7.502
7.485
7.470
7.456
7.439
7.394
7.378
7.362
7.327
7.313
7.299
7.261
7.244
7.225
7.209
7.191
7.024
6.968
3.086
3.071
3.055
2.246
2.233
2.221
1.991
1.980
1.965
1.711
1.577
9
8
7
6
5
4
3
2
1
0
ppm
1.07
1.17
0.87
0.86
2.00
0.95
1.48
1.58
2.08
1.19
1.44
4.84
2.04
2.03
1.80
2.04
2.89
3.00

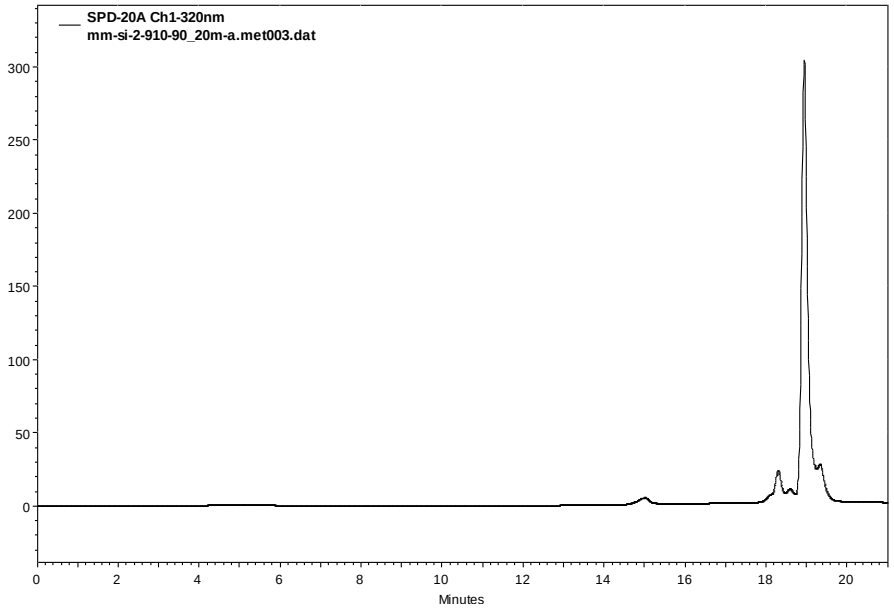

O
O
OH
Rh
Rh
O
SO2
HN
HO
OH

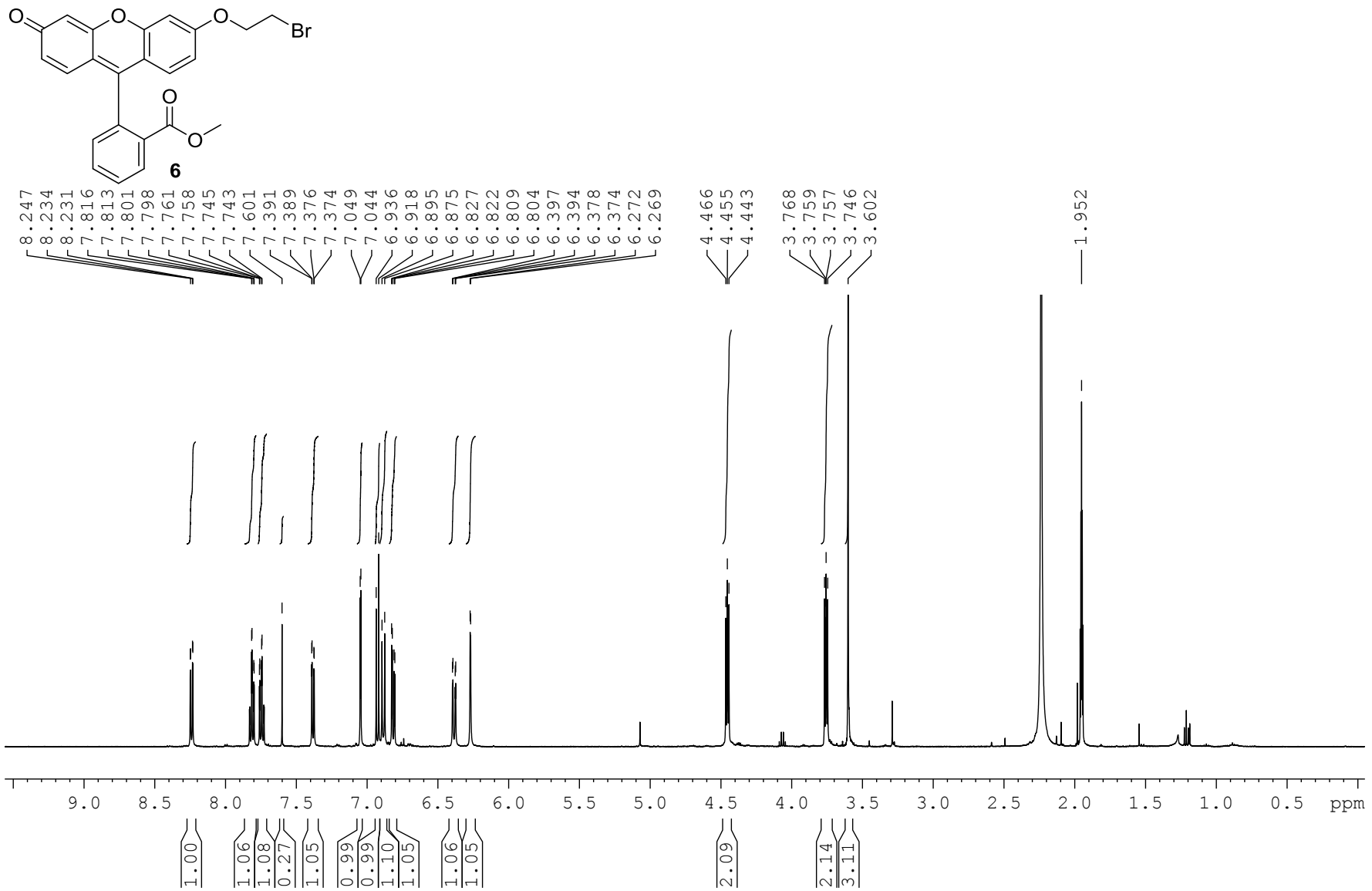
4c


Intens.
+MS, 0.1-0.3min #(8-18)
1105.8
3000
2000
1000
0
250
500
750
1000
1250
1500
1750
2000
2250
m/z


O
O
OH
Rh
Rh
O
SO2
HN
HO
OH

4c


SPD-20A Ch1-320nm
mm-si-2-910-90_20m-a.met003.dat
300
250
200
150
100
50
0
0
2
4
6
8
10
12
14
16
18
20
Minutes


O
O
O
Br
O
O
6
8.247
8.234
8.231
7.816
7.813
7.801
7.798
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7.758
7.745
7.743
7.601
7.391
7.389
7.376
7.374
7.049
7.044
6.936
6.918
6.895
6.875
6.827
6.822
6.809
6.804
6.397
6.394
6.378
6.374
6.272
6.269
4.466
4.455
4.443
3.768
3.759
3.757
3.746
3.602
1.952
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
ppm
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1.06
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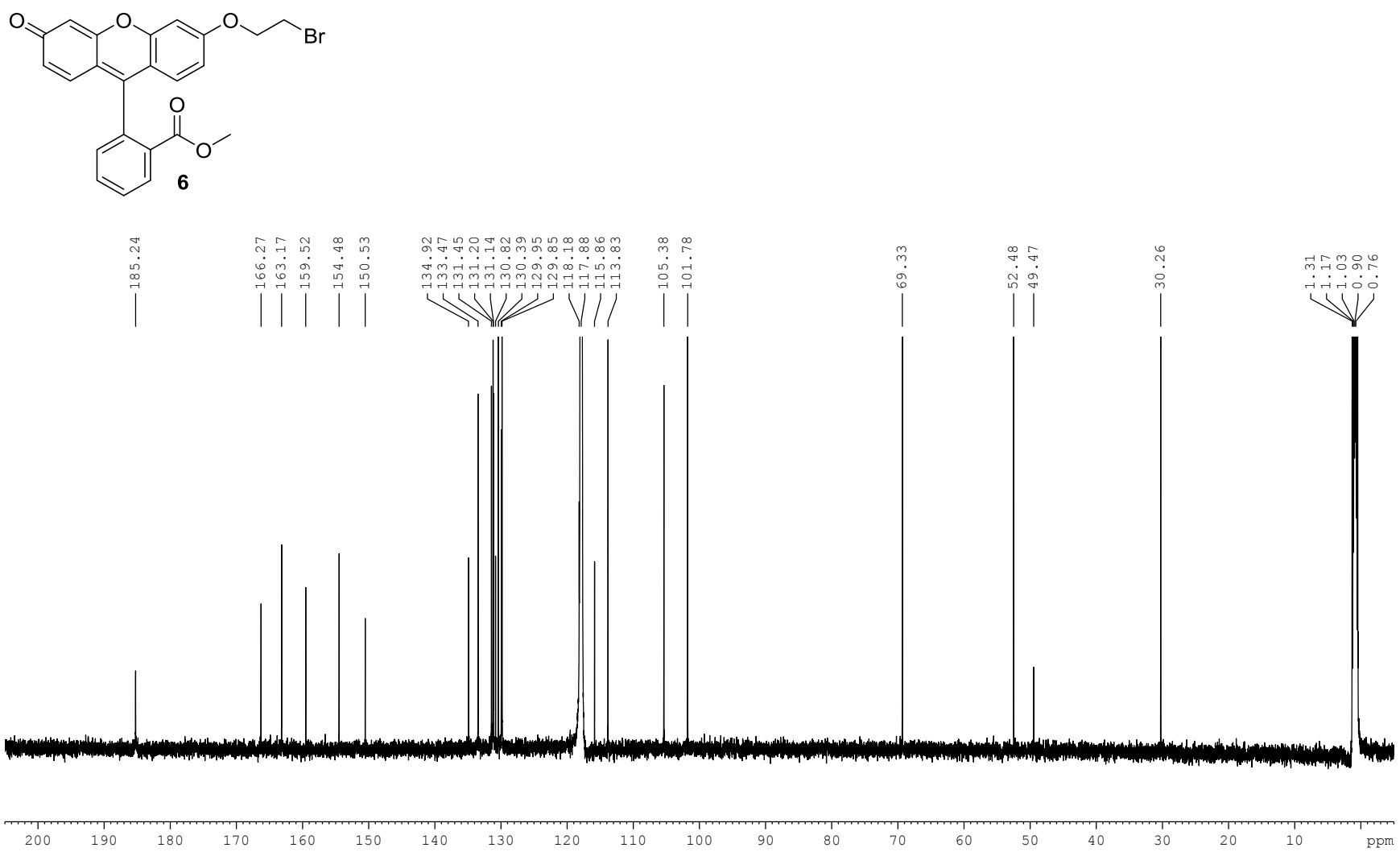
2.14
3.11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O
O
Br
O
O
6
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150.53
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133.47
131.45
131.20
131.14
130.82
130.39
129.95
129.85
118.18
117.88
115.86
113.83
105.38
101.78
69.33
52.48
49.47
30.26
1.31
1.17
1.03
0.90
0.76
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10
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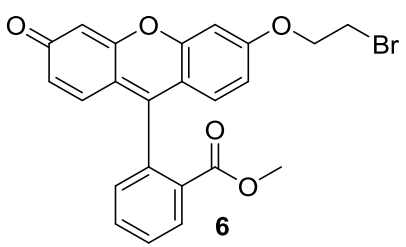
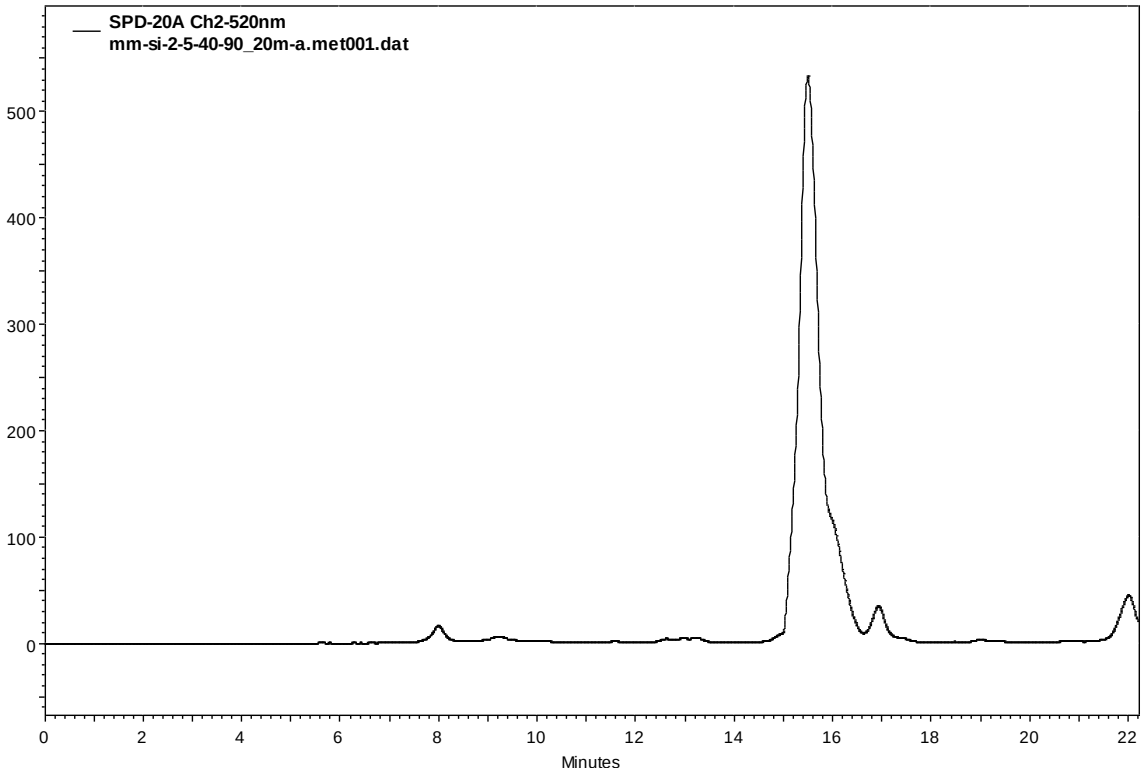

O
O
O
Br
O
O

6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200
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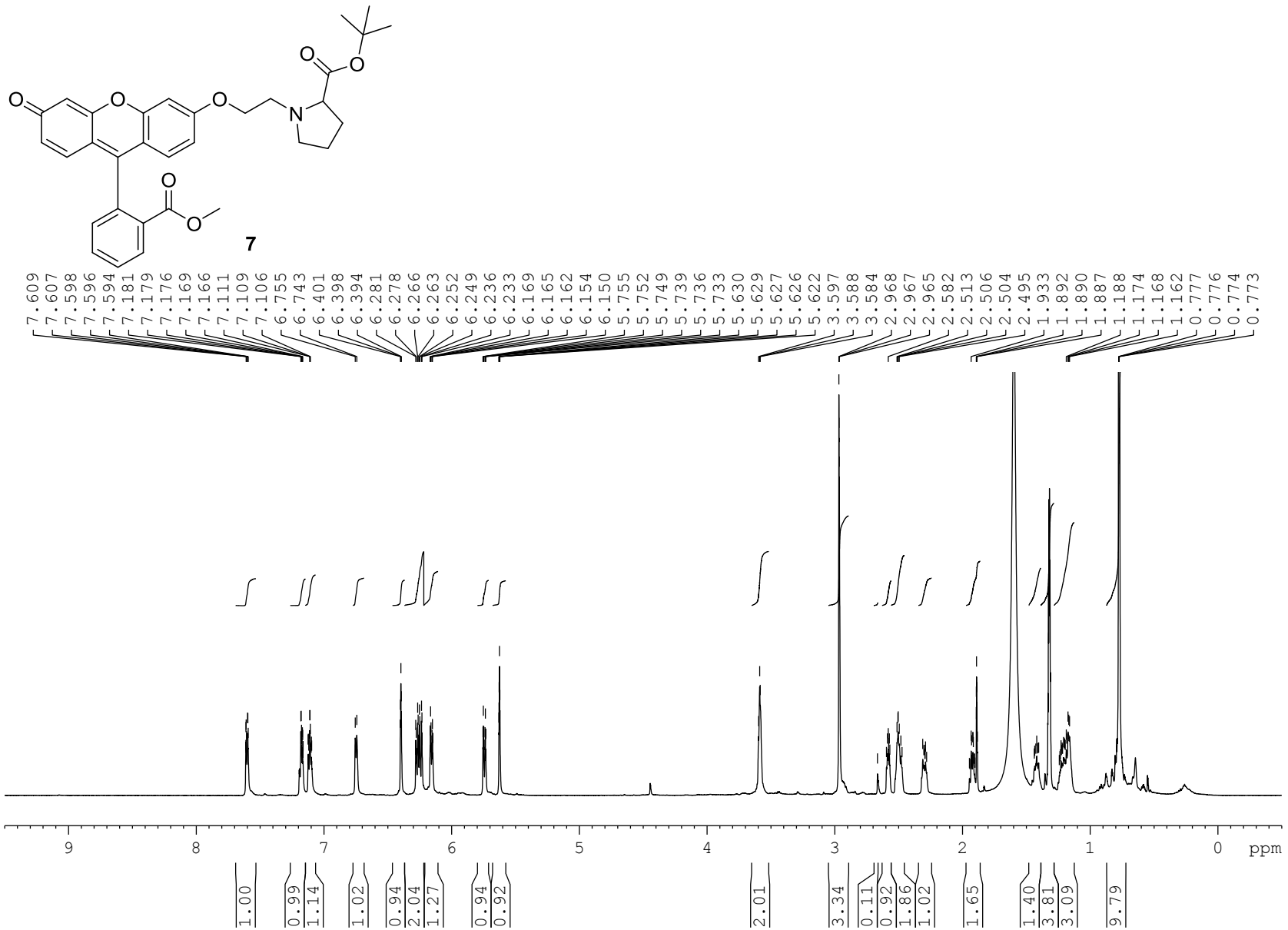
0
2
4
6
8
10
12
14
16
18
20
22
Minutes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7.598
7.596
7.594
7.181
7.179
7.176
7.169
7.166
7.111
7.109
7.106
6.755
6.743
6.401
6.398
6.394
6.281
6.278
6.266
6.263
6.252
6.249
6.236
6.233
6.169
6.165
6.162
6.154
6.150
5.755
5.752
5.749
5.739
5.736
5.733
5.630
5.629
5.627
5.626
5.622
3.597
3.588
3.584
2.968
2.967
2.965
2.582
2.513
2.506
2.504
2.495
1.933
1.892
1.890
1.887
1.188
1.174
1.168
1.162
0.777
0.776
0.774
0.773
9
8
7
6
5
4
3
2
1
0
ppm
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0.99
1.14
1.02
0.94
2.04
1.27
0.94
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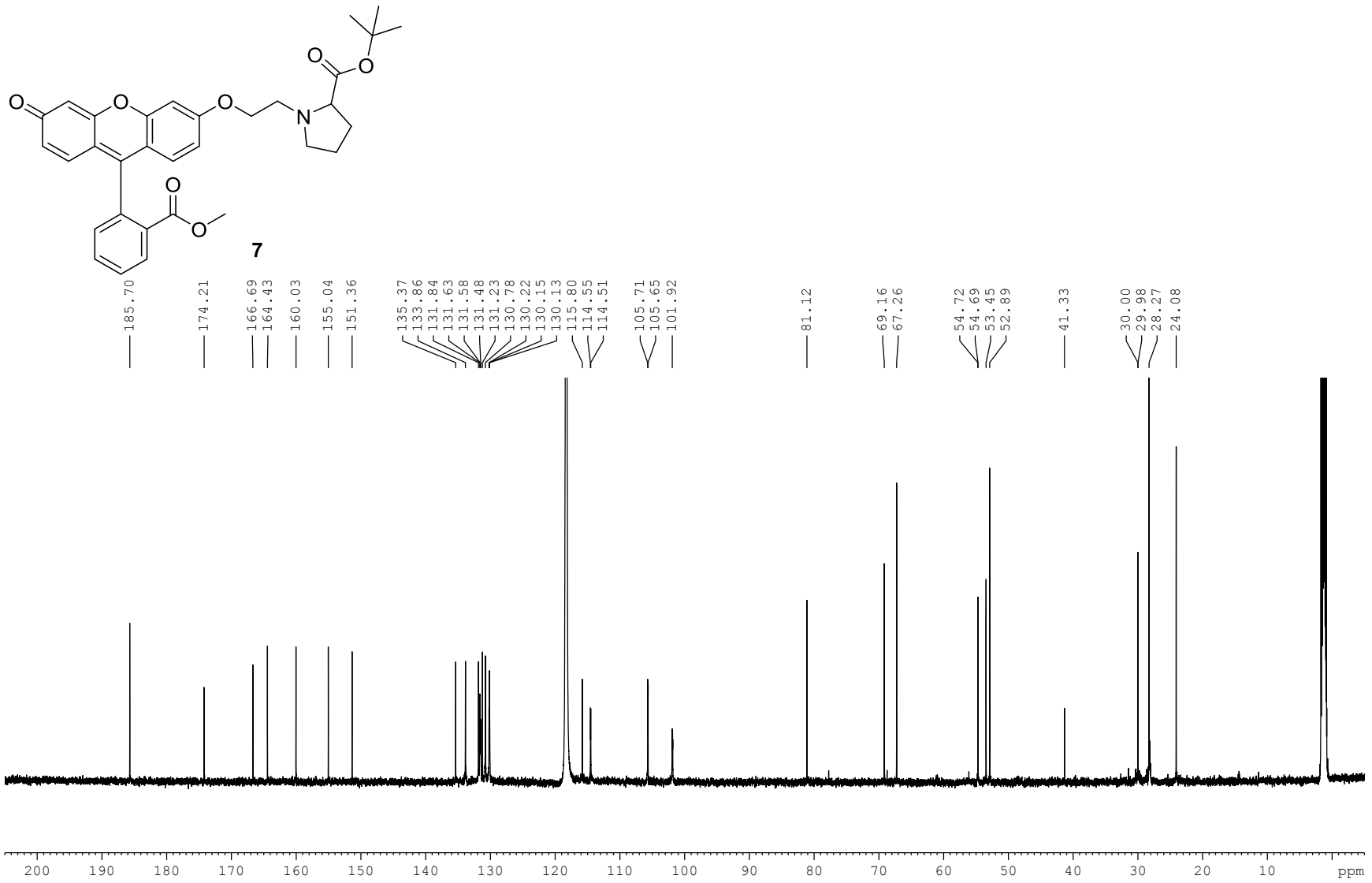
3.09
9.79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131.84
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131.58
131.48
131.23
130.78
130.22
130.15
130.13
115.80
114.55
114.51
105.71
105.65
101.92
81.12
69.16
67.26
54.72
54.69
53.45
52.89
41.33
30.00
29.98
28.27
24.08
200
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150
140
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120
110
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70
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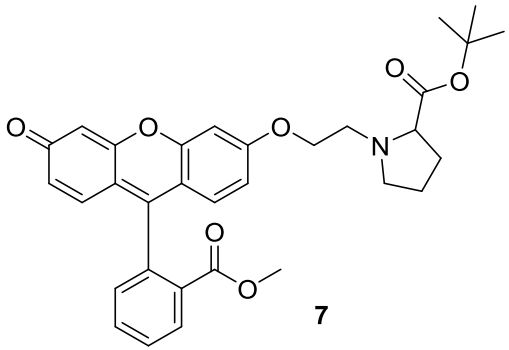
20
10
ppm



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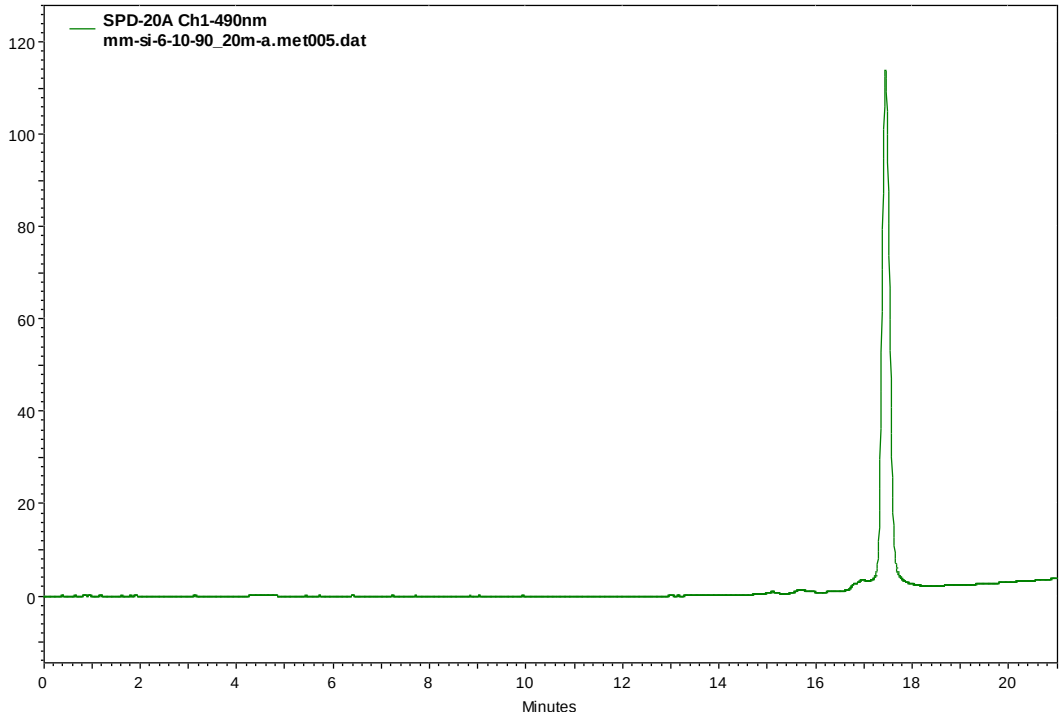
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80
60
40
20
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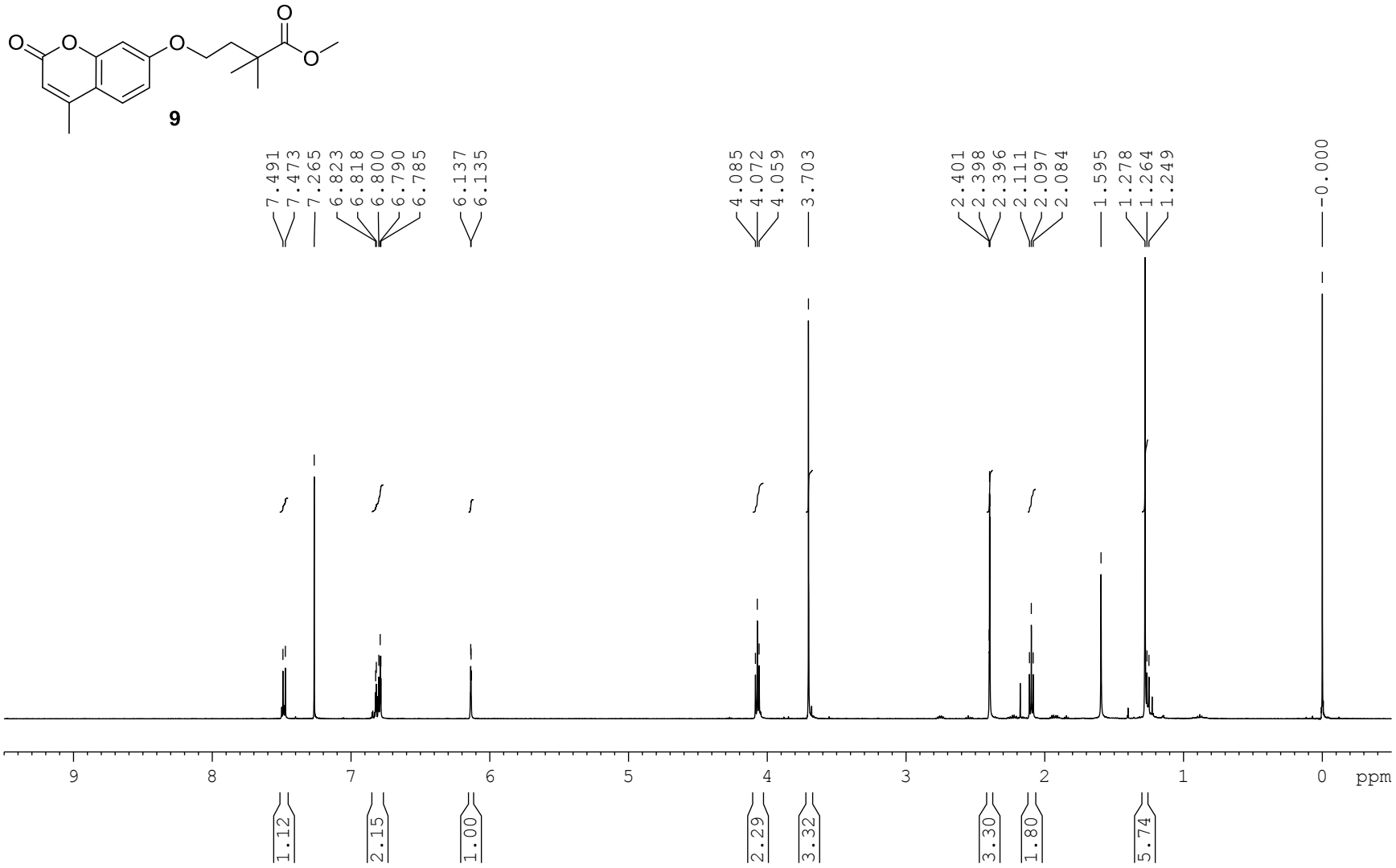
0
2
4
6
8
10
12
14
16
18
20
Minutes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7.473
7.265
6.823
6.818
6.800
6.790
6.785
6.137
6.135
4.085
4.072
4.059
3.703
2.401
2.398
2.396
2.111
2.097
2.084
1.595
1.278
1.264
1.249
-0.000
9
8
7
6
5
4
3
2
1
0
ppm
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2.15
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2.29
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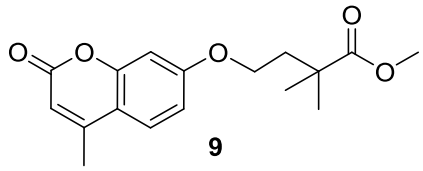
3.30
1.80
5.74



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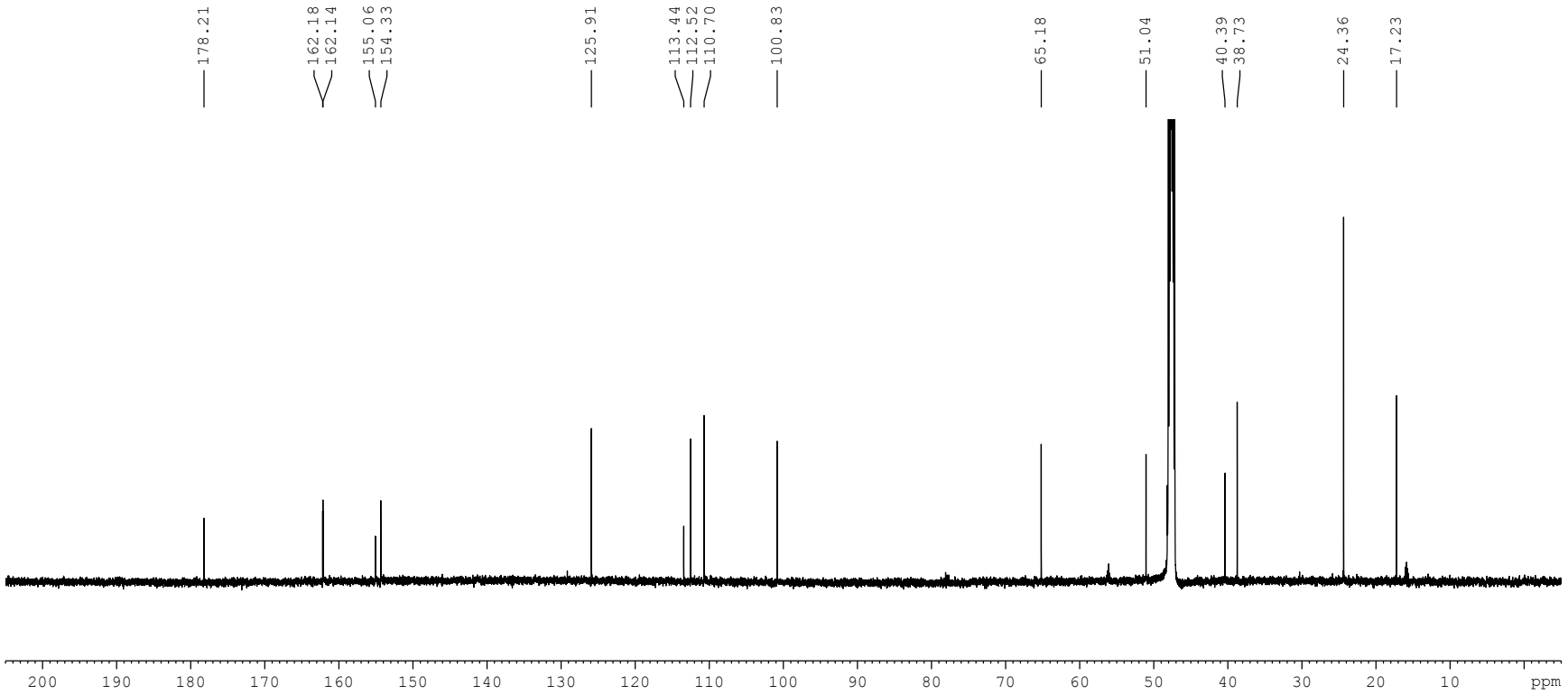
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162.14
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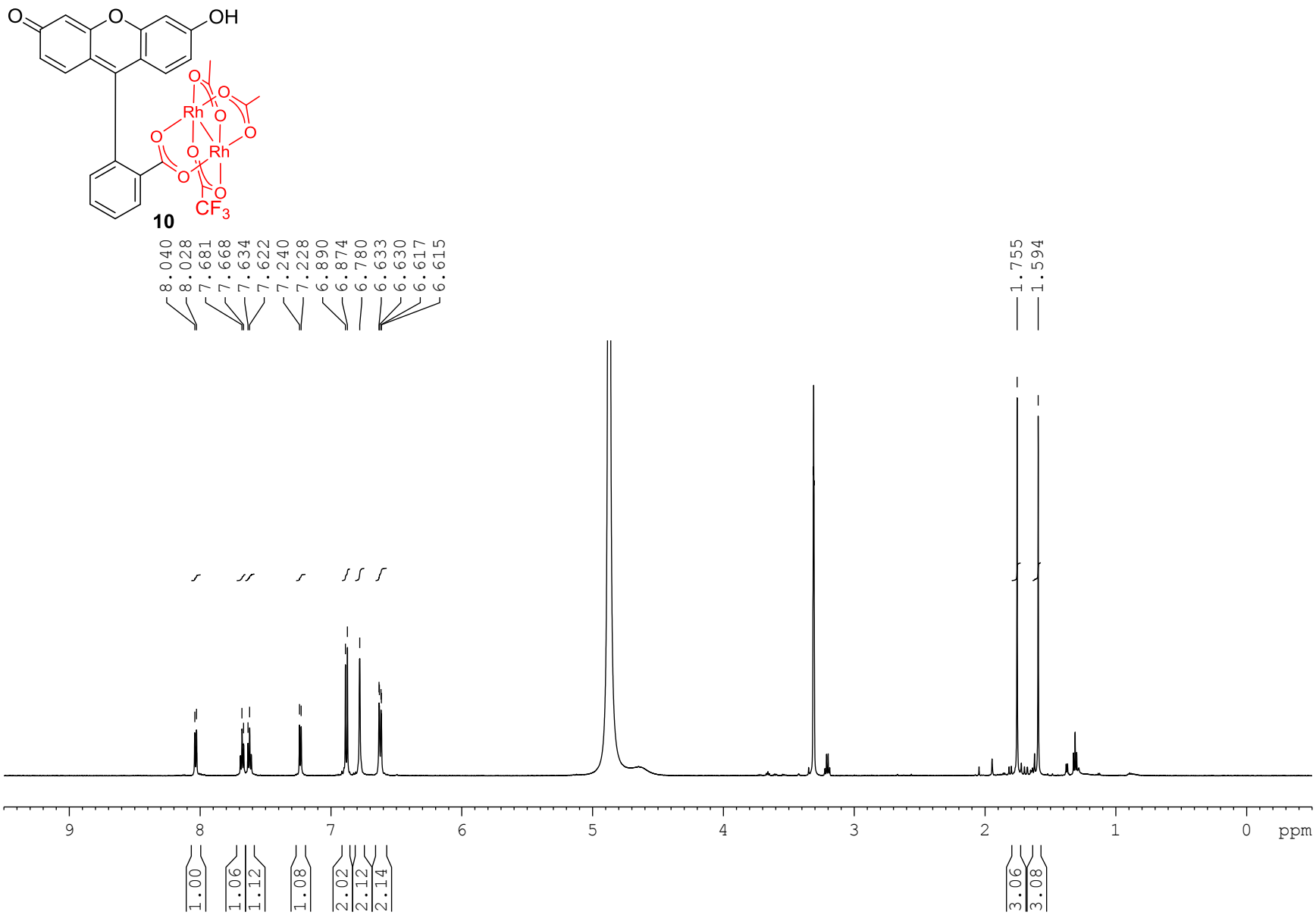
154.33
125.91
113.44
112.52
110.70
100.83
65.18
51.04
40.39
38.73
24.36
17.23
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
ppm


O
O
OH
Rh
Rh
O
CF3
10
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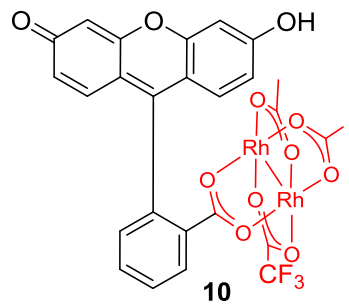
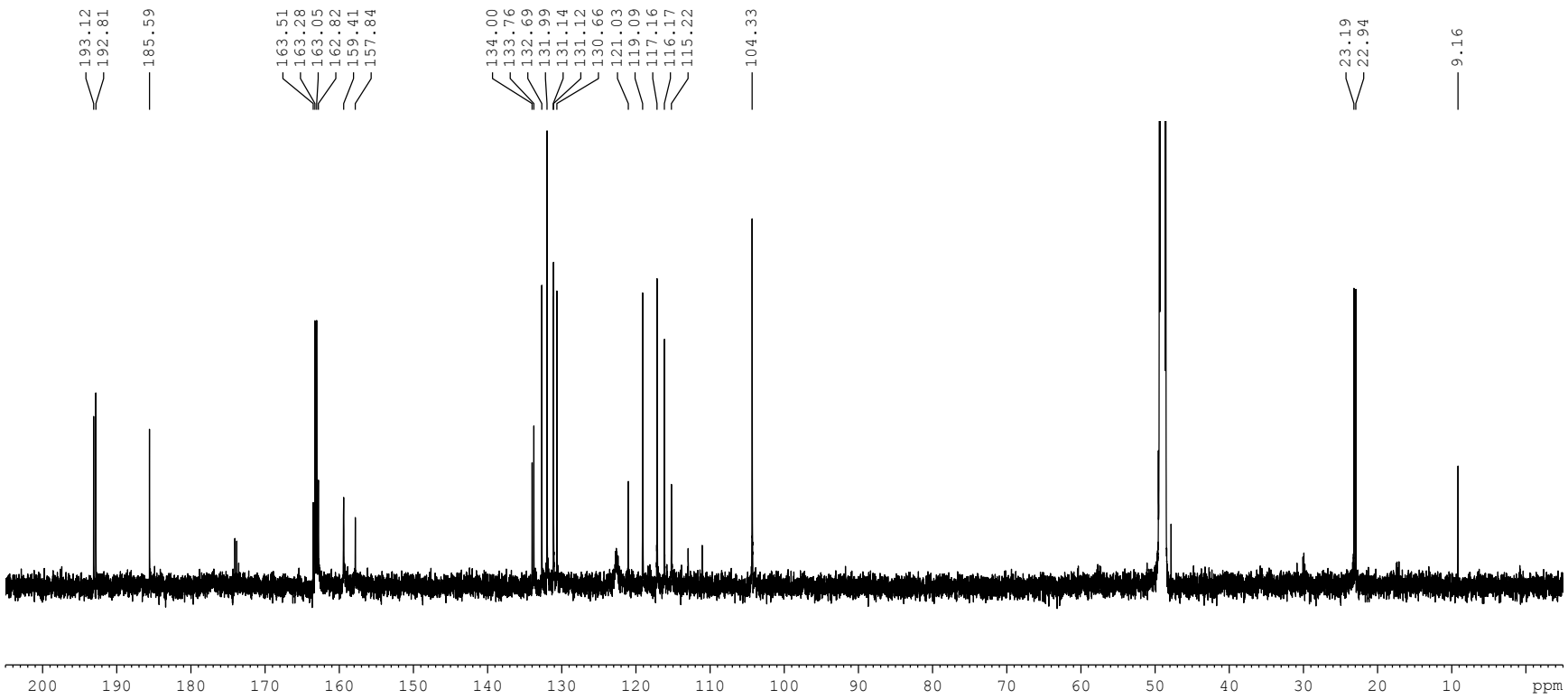
7.681
7.668
7.634
7.622
7.240
7.228
6.890
6.874
6.780
6.633
6.630
6.617
6.615
1.755
1.594
9
8
7
6
5
4
3
2
1
0
ppm
1.00
1.06
1.12
1.08
2.02
2.12
2.14
3.06
3.08


O
O
OH
Rh
Rh
O
O
O
O
O
O
O
O
O
CF3

10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163.28
163.05
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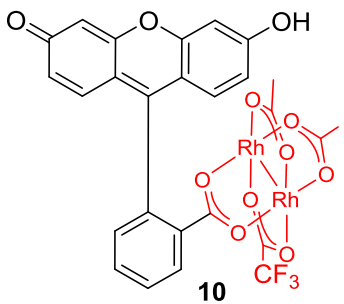
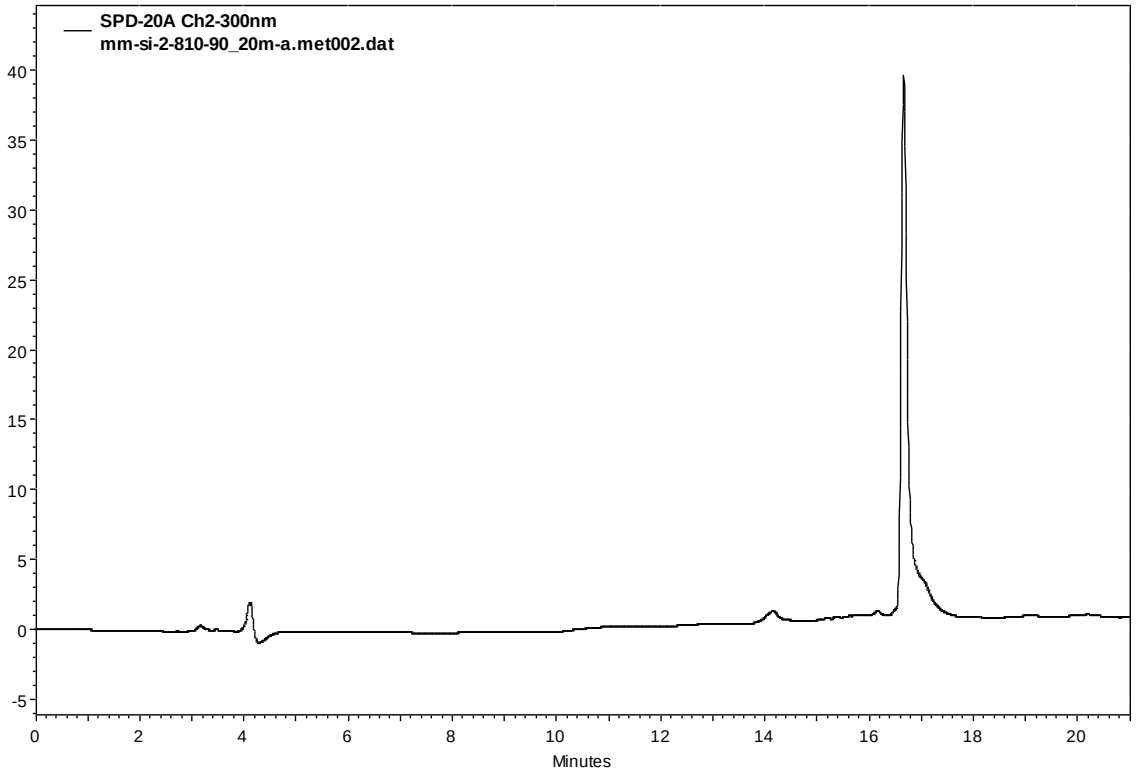
159.41
157.84
134.00
133.76
132.69
131.99
131.14
131.12
130.66
121.03
119.09
117.16
116.17
115.22
104.33
23.19
22.94
9.16
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
ppm


O
O
OH
Rh
Rh
O
O
O
O
O
O
O
O
O
CF3

10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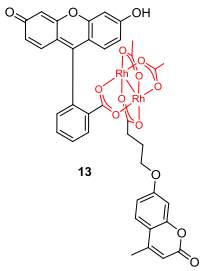
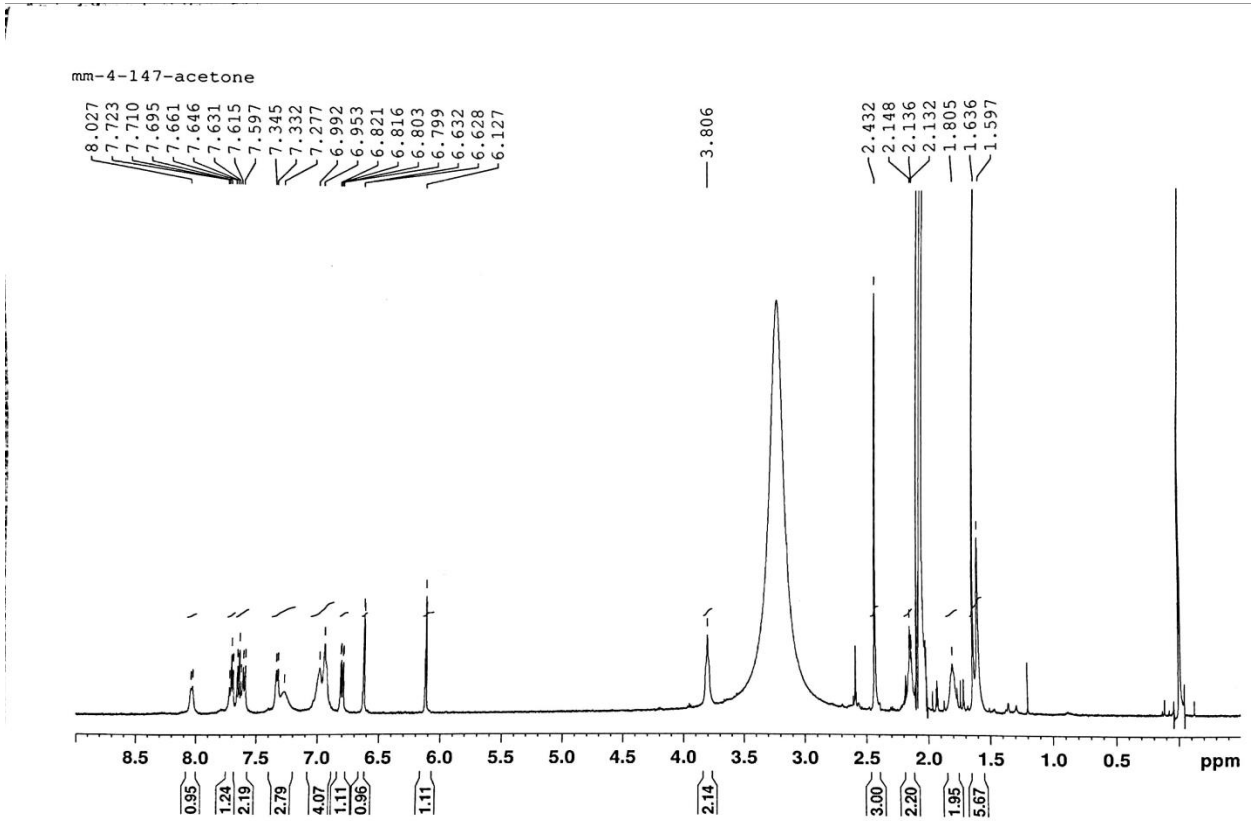
35
30
25
20
15
10
5
0
-5
0
2
4
6
8
10
12
14
16
18
20
Minutes


OH
Rh
Rh
13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7.646
7.631
7.615
7.597
7.345
7.332
7.277
6.992
6.953
6.821
6.816
6.803
6.799
6.632
6.628
6.127
3.806
2.432
2.148
2.136
2.132
1.805
1.636
1.597
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
ppm
0.95
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4.07
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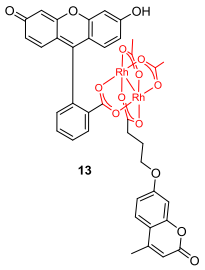
0.96
1.11
2.14
3.00
2.20
1.95
5.67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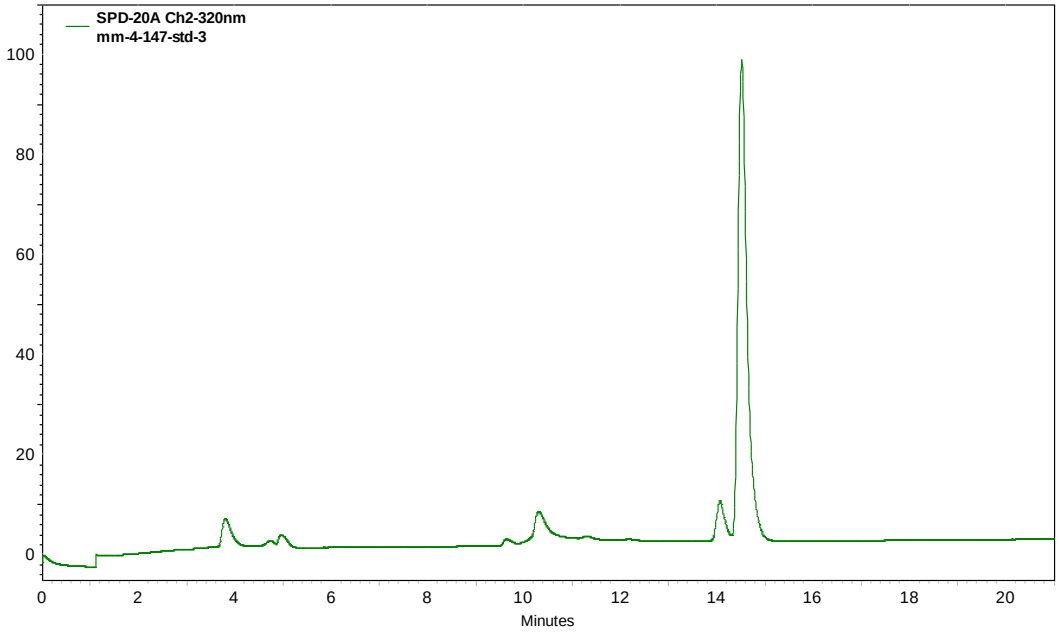
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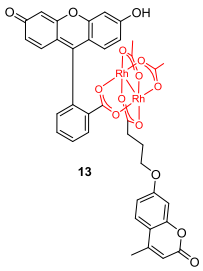
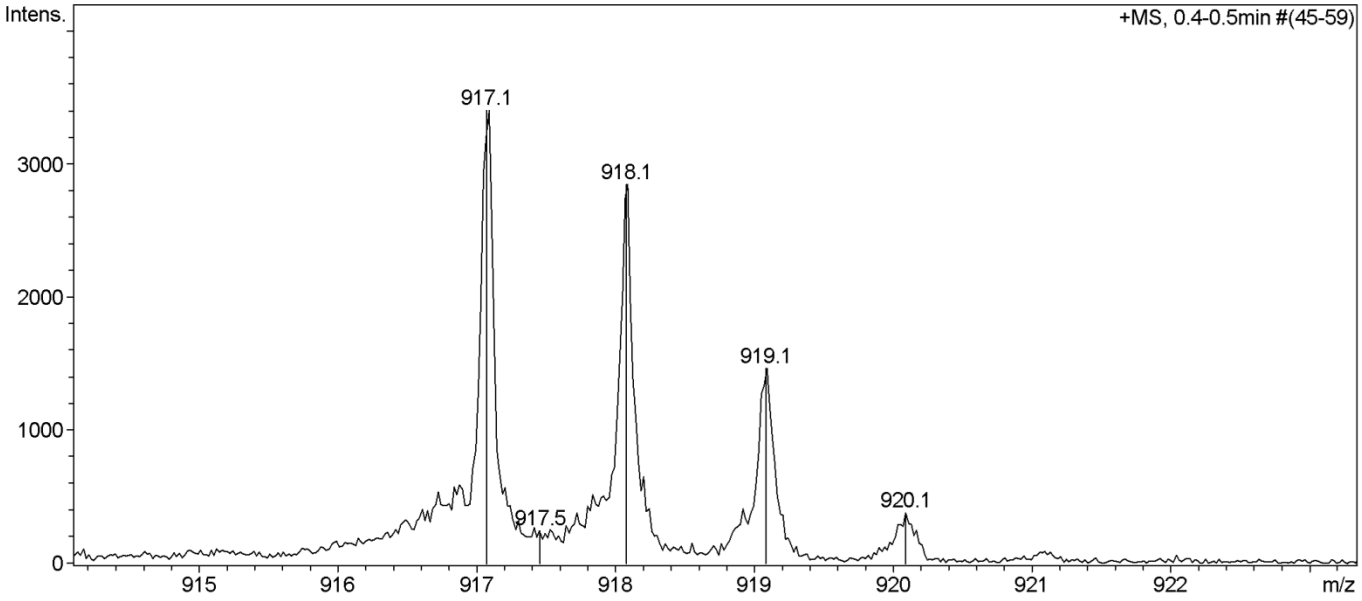
60
40
20
0
0
2
4
6
8
10
12
14
16
18
20
Minutes


13


Intens.
+MS, 0.4-0.5min #(45-59)
917.1
918.1
919.1
920.1
917.5
3000
2000
1000
0
915
916
917
918
919
920
921
922
m/z

Supplemental figures

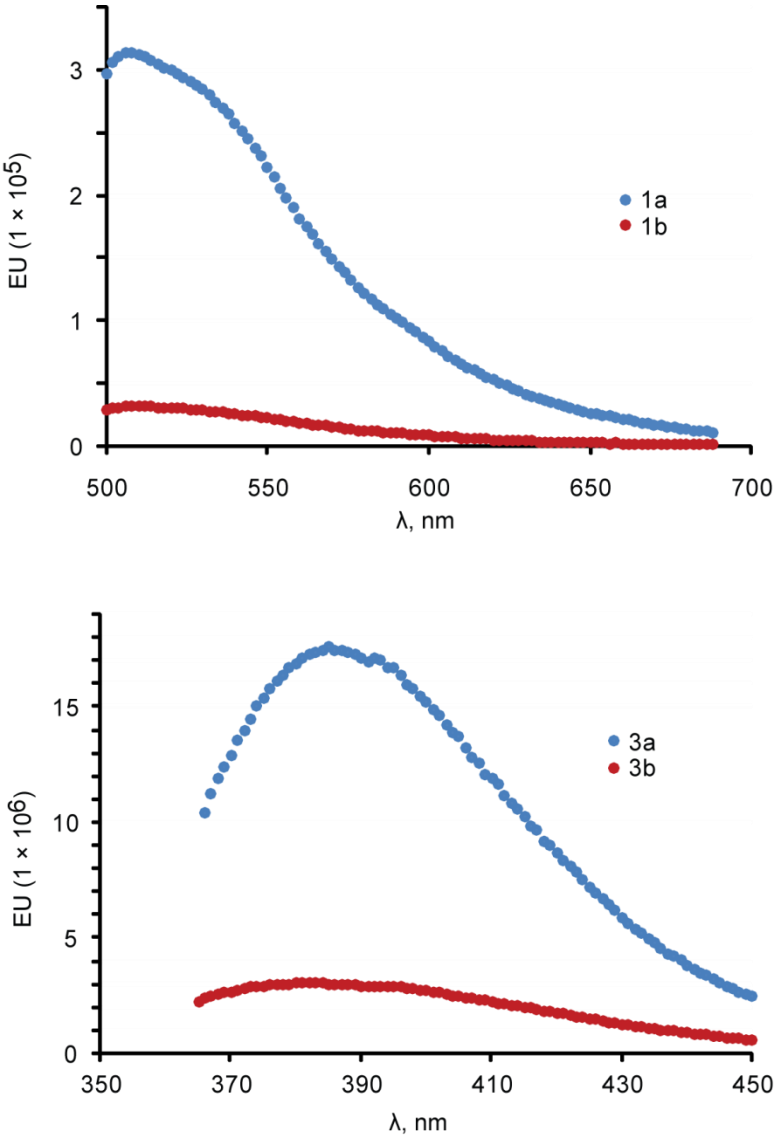


Figure S1. Fluorescence emission spectra of **1a-b** (λ_{ex} = 480 nm) and **3a-b** (λ_{ex} = 320 nm).

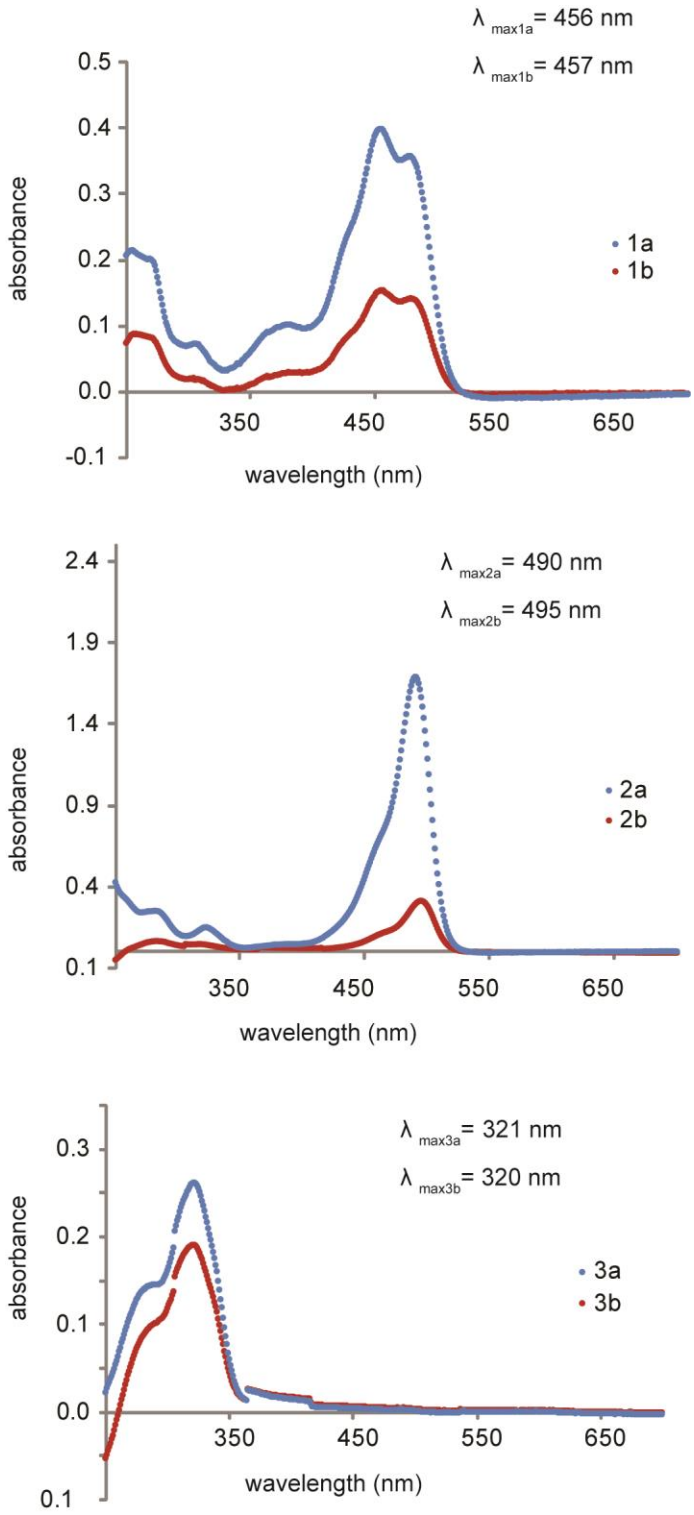
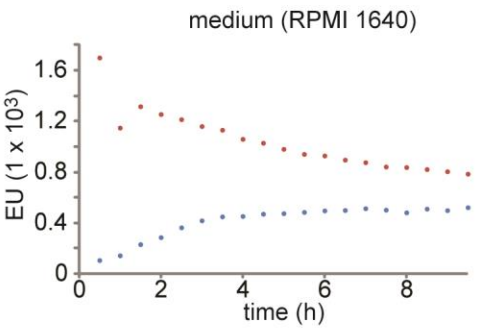
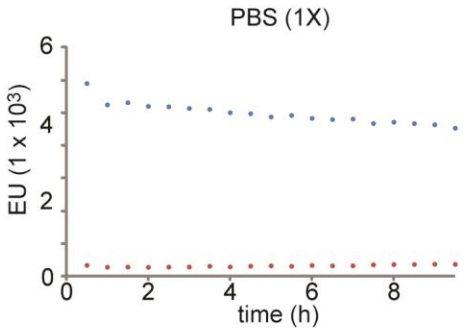
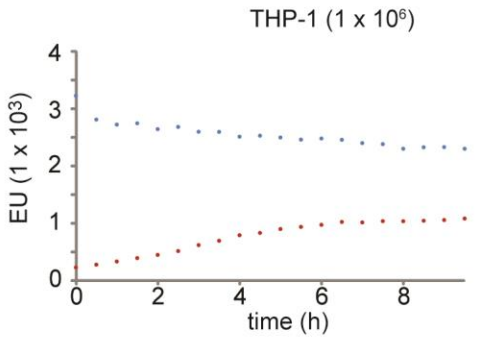
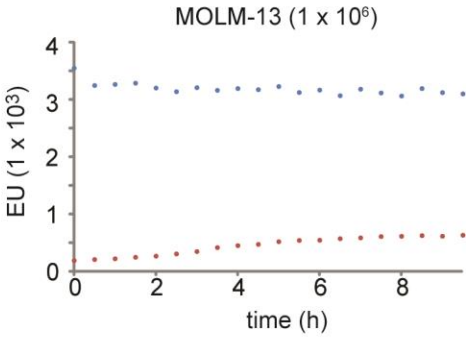


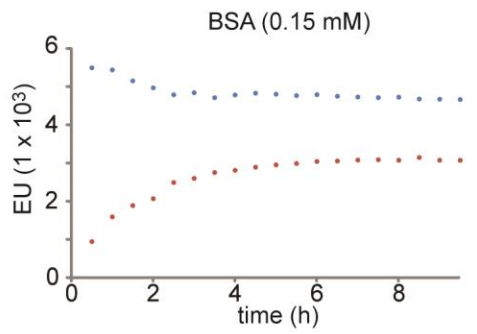
Figure S2. Absorption spectra of **1a-b** (15 µM in PBS), **2a-b** (3 µM in PBS), and **3a-b** (15 µM in PBS).

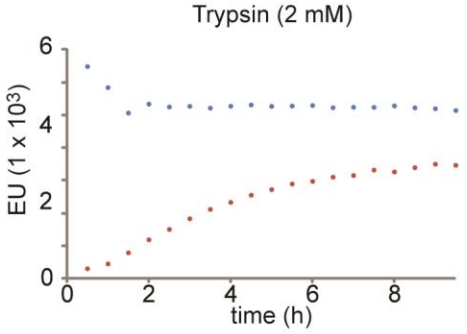

medium (RPMI 1640)
EU (1 x 10³)
time (h)

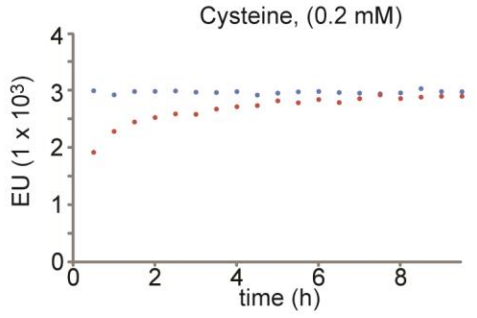

PBS (1X)
EU (1 x 10³)
time (h)

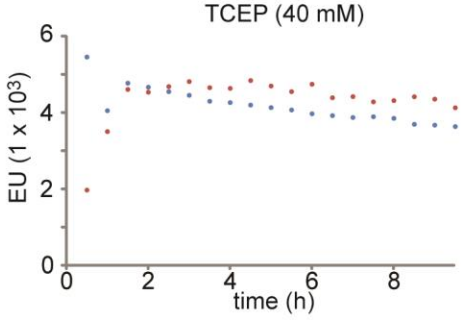

THP-1 (1 x 10⁶)
EU (1 x 10³)
time (h)


MOLM-13 (1 x 10⁶)
EU (1 x 10³)
time (h)


BSA (0.15 mM)
EU (1 x 10³)
time (h)


Trypsin (2 mM)
EU (1 x 10³)
time (h)


Cysteine, (0.2 mM)
EU (1 x 10³)
time (h)


TCEP (40 mM)
EU (1 x 10³)
time (h)

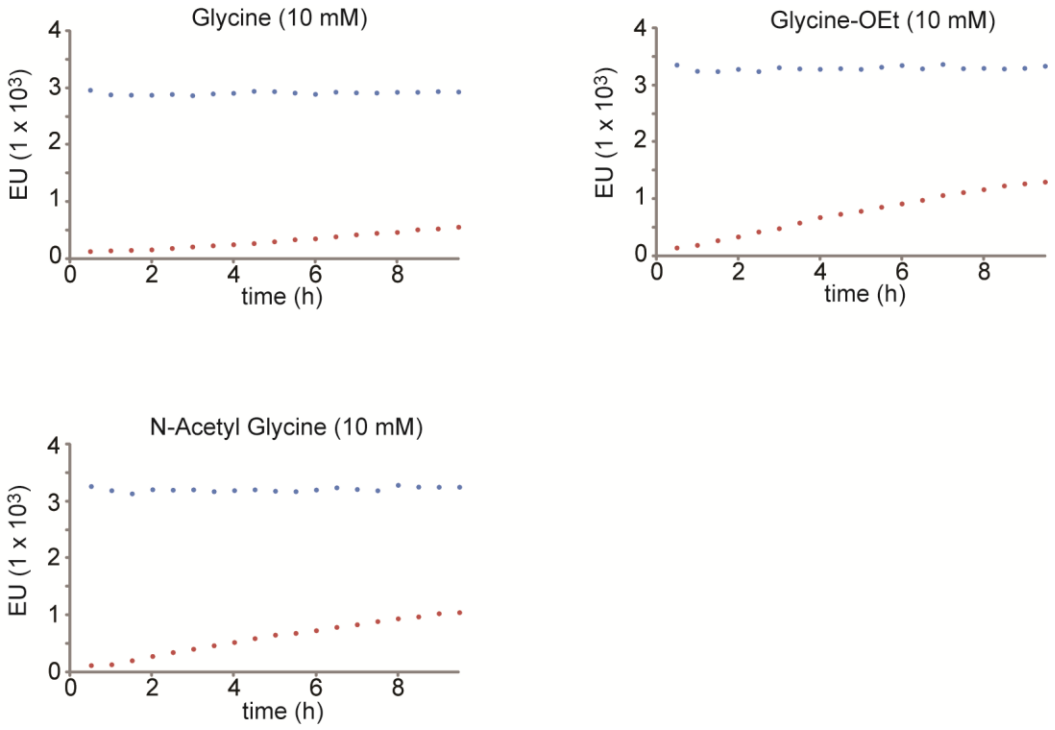


Figure S3. Time dependence of fluorescence emission, used to calculate $t_{1/2}$ in Figure 2a. Data shown for various solutions of **1b** (15 µM, red data points) and **1a** + Rh_2OAc_4 (15 µM each, blue data points).

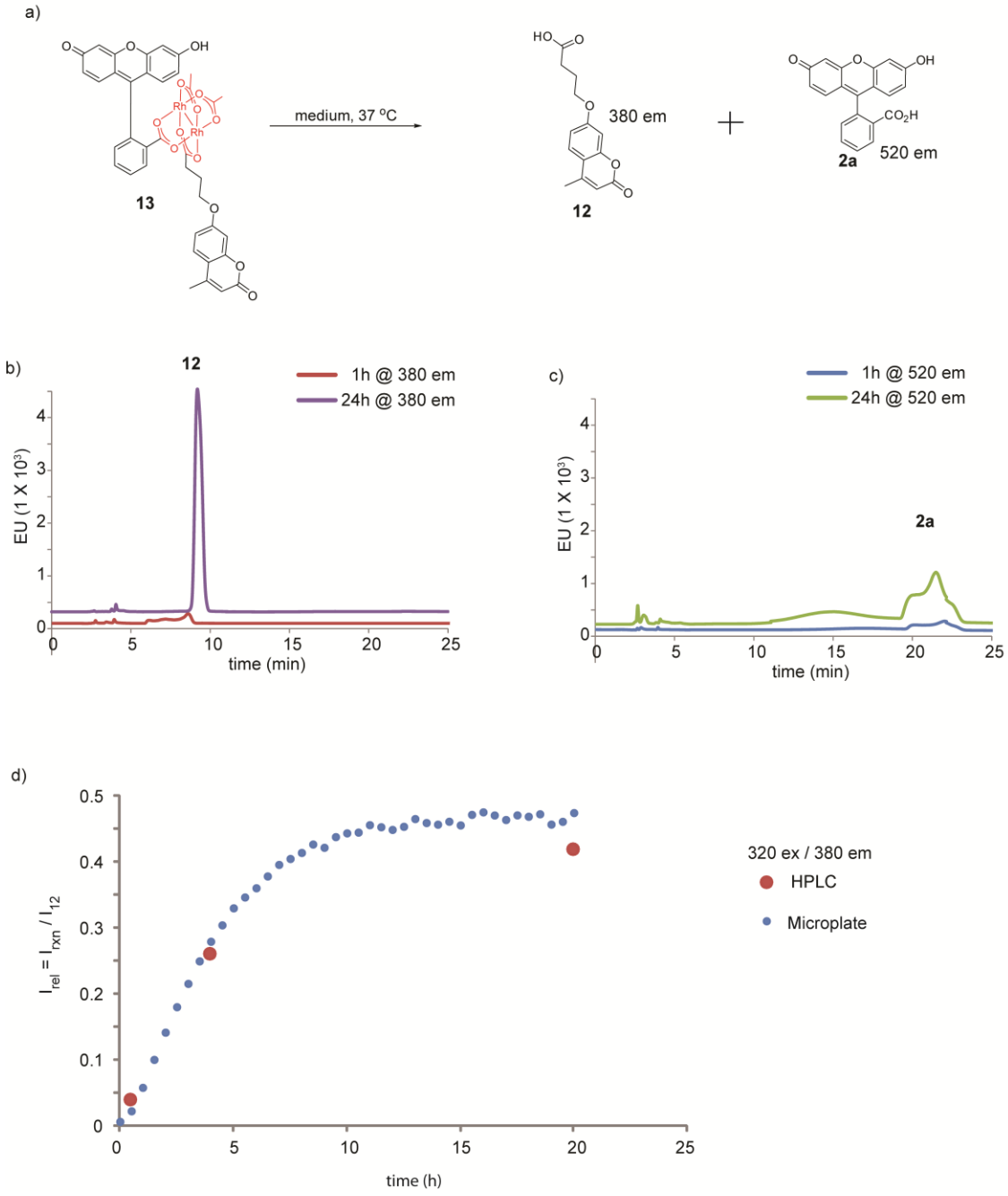


Figure S4. a) Cartoon depiction of complex decomposition in medium. b) HPLC traces of **13** reacting with medium at 1 and 24 h (b)380 em (c) 520 em d) The relative intensity vs. time as measured by microplate fluorimeter and HPLC.

(1) Lou, Y.; Remarchuk, T. P.; Corey, E. J. *J. Am. Chem. Soc.* **2005**, *127*, 14223.

(2) Minus, M. B.; Liu, W.; Vohidov, F.; Kasembeli, M. M.; Long, X.; Krueger, M. J.; Stevens, A.; Kolosov, M. I.; Tweardy, D. J.; Sison, E. A. R.; Redell, M. S.; Ball, Z. T. *Angew. Chem. Int. Ed.***2015**, *54*, 13085.

(3) Adamczyk, M.; Grote, J.; Moore, J. A. *Bioconjugate Chem.* **1999**, *10*, 544.

(4) Schering Corpration; 2011; Vol. WO2011046771 A1.

(5) Fonseca, A. S. C.; Gonçalves, M. S. T.; Costa, S. P. G. *Tetrahedron* **2012**, *68*, 8024.

(6) Xu, X.; Kasembeli, M. M.; Jiang, X.; Tweardy, B. J.; Tweardy, D. J. *PLOS One* **2009**, *4*, e4783.