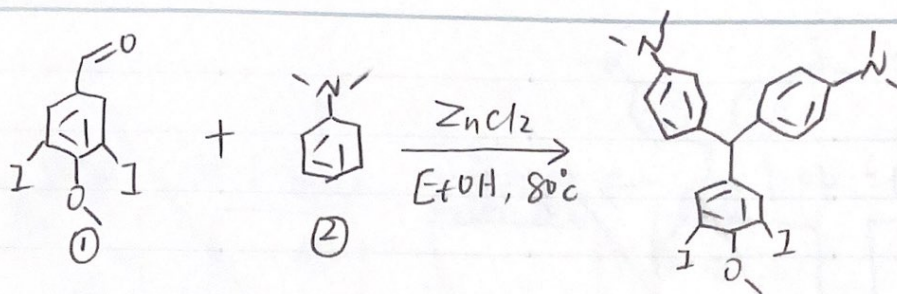
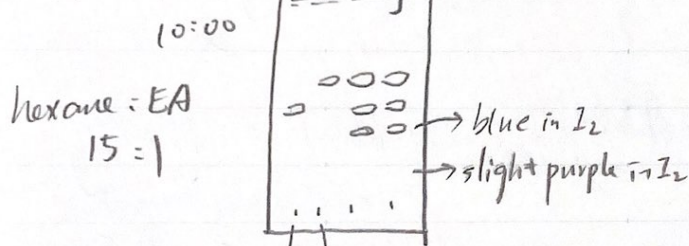


23/7



	MW	eq	mmol	amount
①	388	1	1.52	590.4 mg
②	121	2.2	3.35	405 mg (~440 mg)
ZnCl <sub>2</sub>	136.3	2.2	3.35	456 mg
EtOH				810 ml

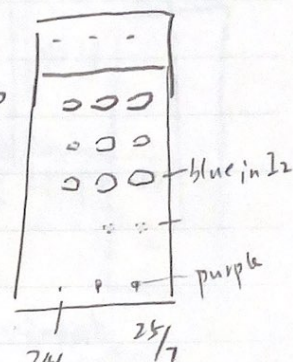
14:10 mix all, slight pink, heat up to 80°C  
 24/7: 9:00 in dark green.



25/7 16:00

hexane:EA

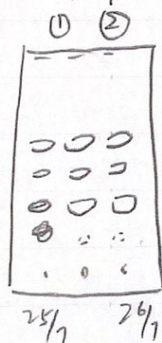
15:1



turn to 24/7 70°C

26/7: 9:00

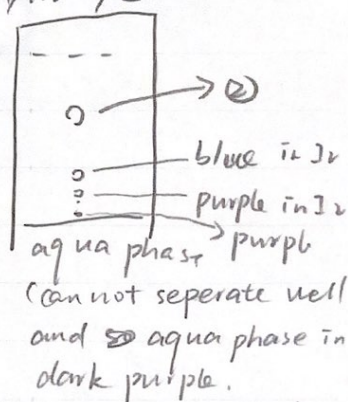
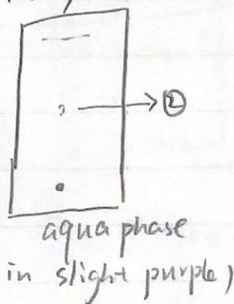
hexane:EA  
 15:1



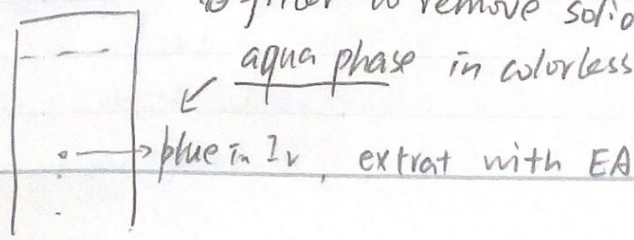
stop reaction, remove most solvent.

1. H<sub>2</sub>O/EA

→ 2. HCl/H<sub>2</sub>O/EA



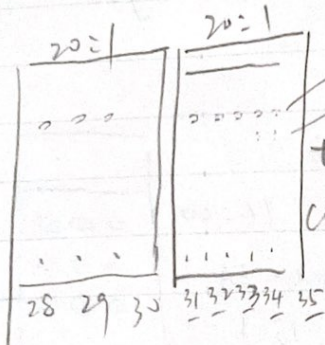
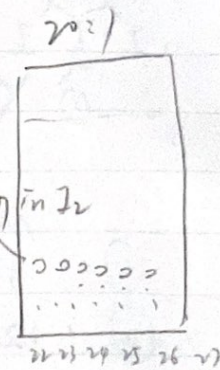
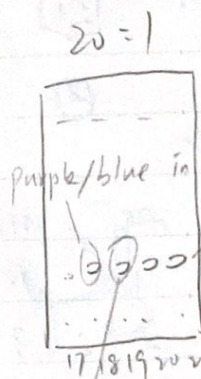
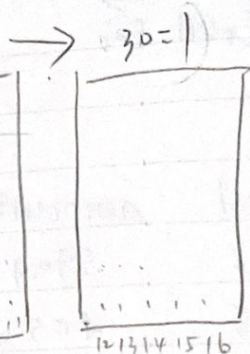
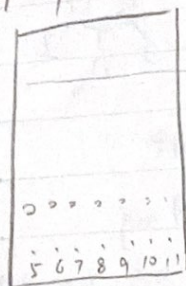
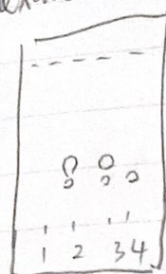
3. → add 1M NaOH to HCl/H<sub>2</sub>O/EA, stirring, filter to remove solid.





purification.

hexane: EA = 40:1



mg in 12  
purple in 12

tube 24 for NMR  $m = 18.4212 - 18.4059$   
collect tube 18 - 33 = 15.3 mg

$$m = 93.8014 - 93.6667 = 134.7 \text{ mg}$$

dissolve well in DCM

not well in acetone, EA, hexane

X

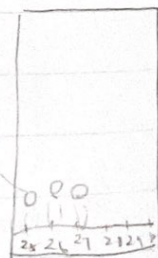
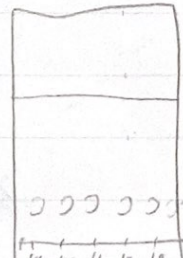
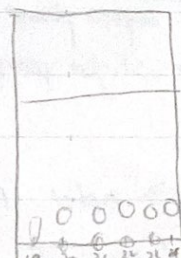
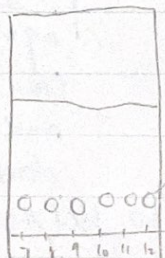
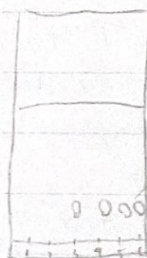
$$= 150 \text{ mg}$$

NMR in chloroform-d (not pure)

MS

28/7

30:1 hexane: EA



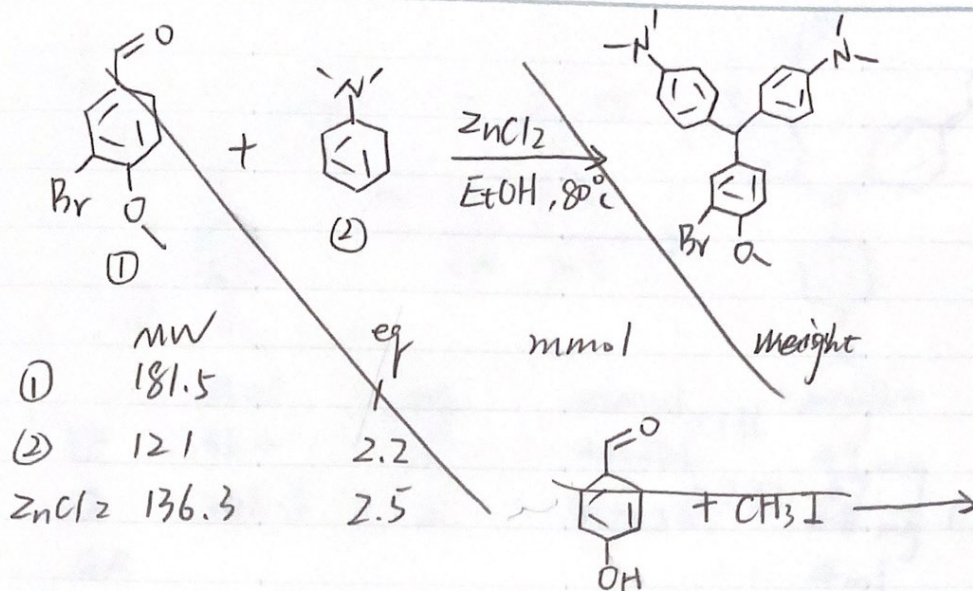
tube 21-23 for NMR  $18.5519 - 18.5420 = 9.9 \text{ mg}$   
slight yellow solid.

$$19 - 27: m = 18.4316 - 18.3998 = 91.8 \text{ mg}$$

3476  
918

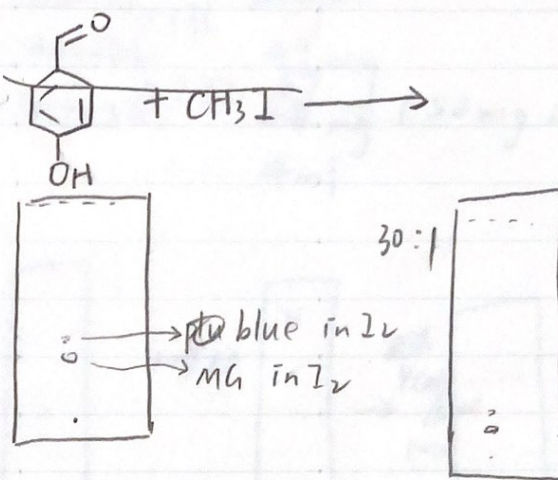


2/17



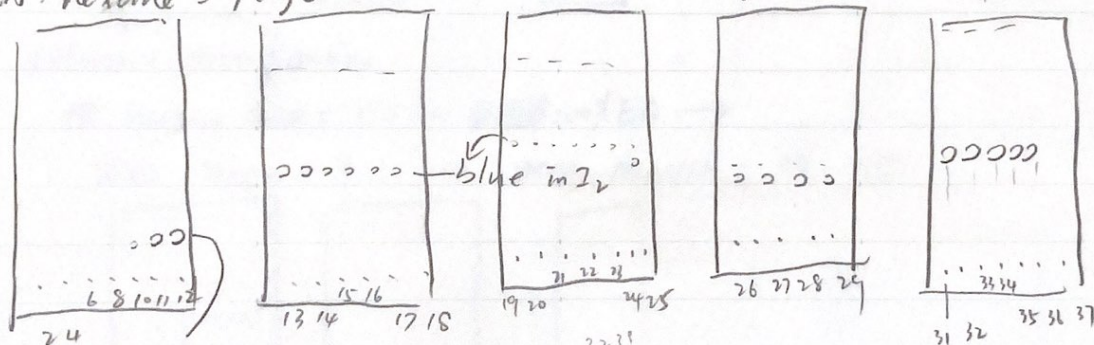
MGM Me 2021.1.7. recollected.

EA: hexane  
1:15



column purification

EA: hexane = 1:30



blue in  $I_2$

$$m = 18.3239 - 18.2744 = 49.5 \text{ mg}$$

collect 25-36 (dark green oil after overnight dry)

(OK!) 32.31 for NMR or MS (oil after vacuum oven dry overnight)

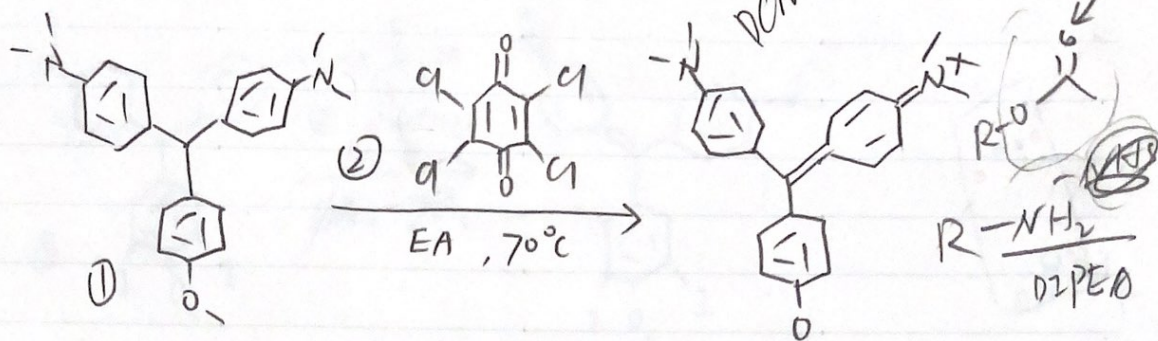
13.14 for NMR

colorless

$$m = 18.6589 - 18.16405 = 18.494 \text{ mg}$$

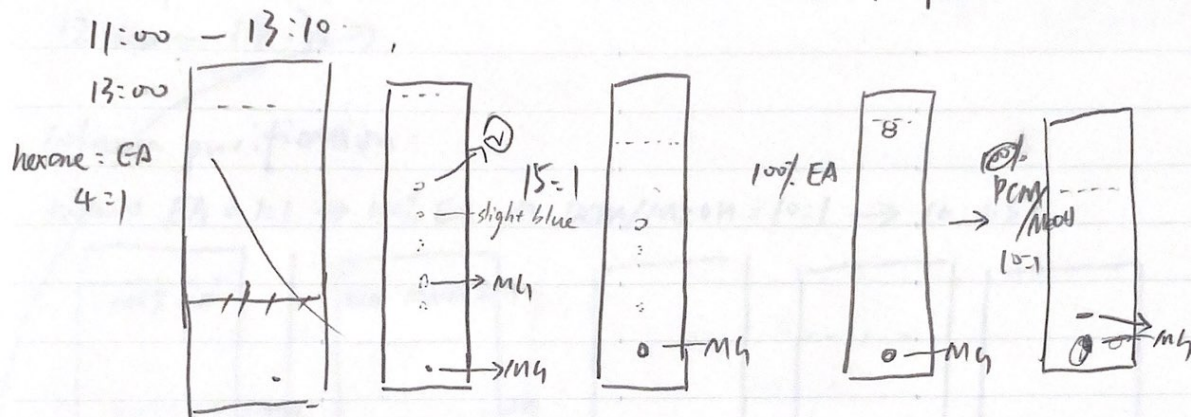
28/7

TEA



	MW	eq	mmol	weight
①	360	1	0.136	49 mg
②	245.8	2	0.272	67 mg
EA				4 ml

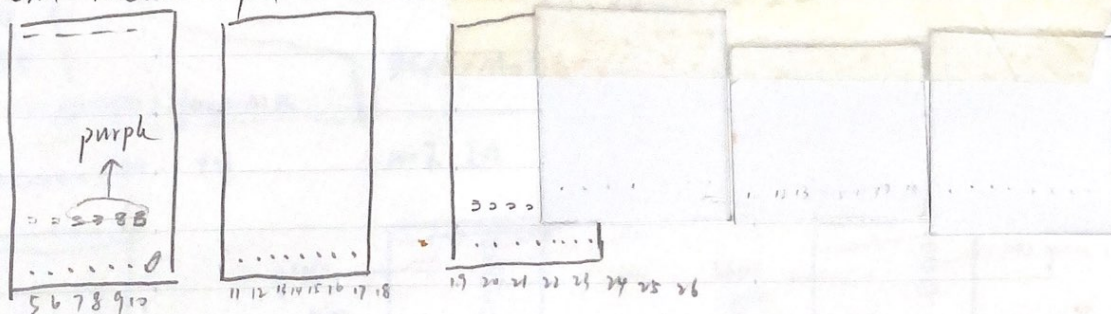
(52 mg in alcohol)



column purification:

① hexane: EA = 1:1 → 100% EA →

DCM: MeOH = 9:1 → DCM: MeOH = 10:1.5



collect 19-26 for NMR 18.5604 - 18.5358 = 24.6 mg

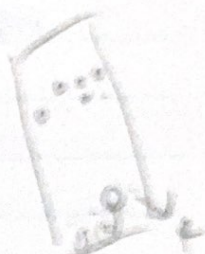
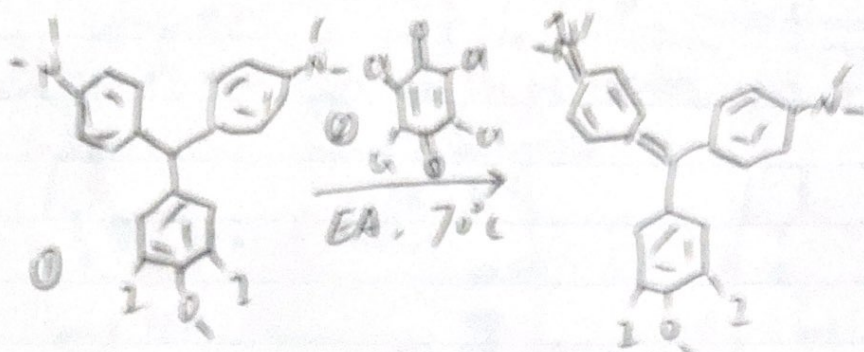
collect 12-18 m = 18.4567 - 18.4390 = 17.7 mg

color: MG

24.6 + 17.7 = 42.3



29/7

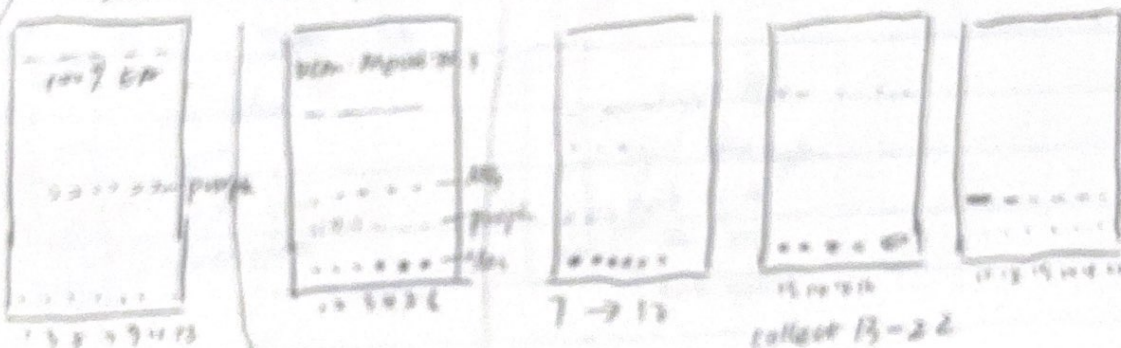


	mw	eq	mmol	weight
①	612.3	1	0.084	51.6 mg
②	245.8	2	0.168	41.2 mg (50 mg)
EA				4 ml

12:00 - 14:30 →

column purification

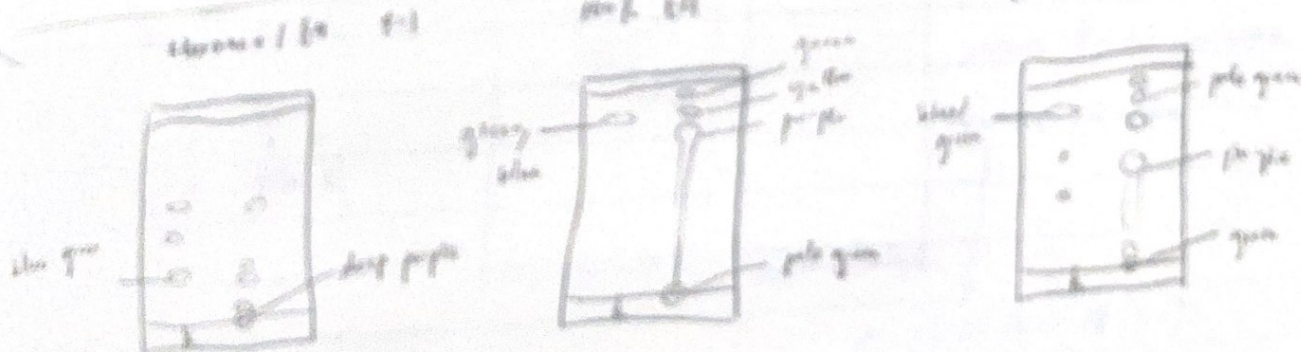
hexane/EA = 1:1 → 100% EA → DCM/MeOH = 10:1 → 10:1.5



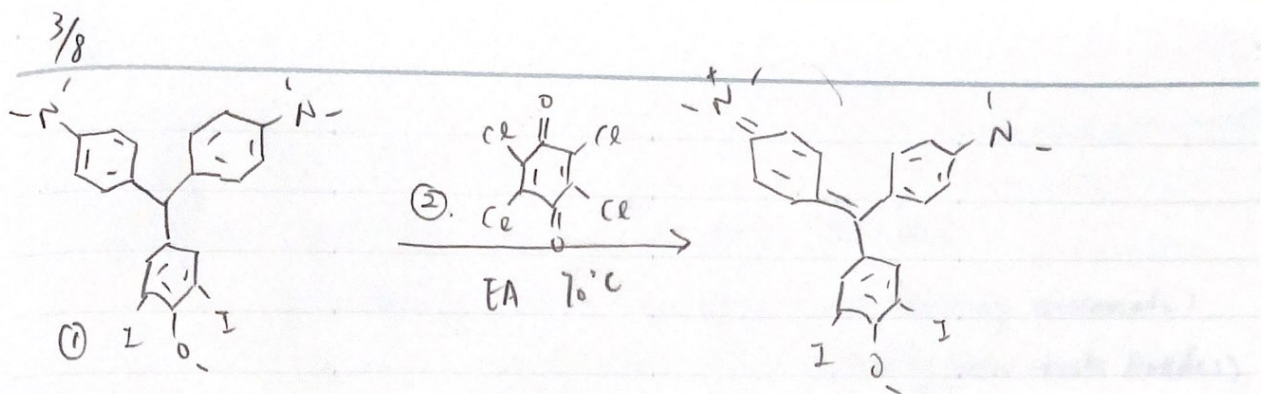
hexane/EA  
Tubes 8, 9, 10 (purple) for NMR

DCM/MeOH (4-12) purify again,

EA/Hexane 1:1





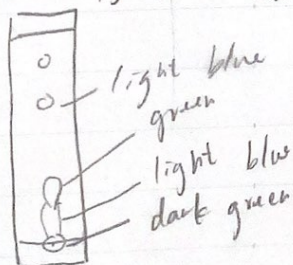


	MW	eq	mmol	
①	612.3	1	0.0544	33.3 mg
②	295.8	2	(0.1087)	18.3828 - 18.3495 = 0.0333g
EA	2.58 mL			(0.02671 g)
				0.0151
				<del>1.0756</del> 0.0605
				<del>1.0668</del> 0.0517g

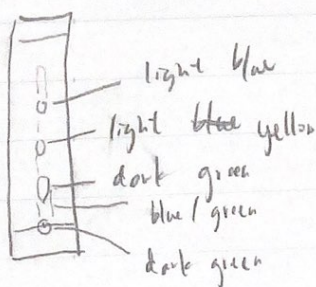
12:19 - 2:10 No stirring

2:10 - 4:10 stirring ~ 70°C

2:10 15:1 Hexane: EA



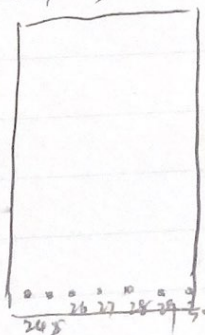
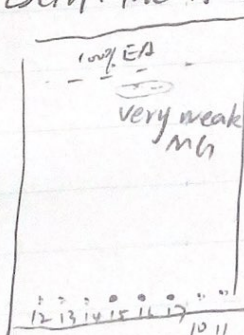
3:05



column purification:

100% EA → DCM: MeOH = 20:1 → DCM: MeOH = 10:1

1 2 Mix R



collect 18-23 for NMR

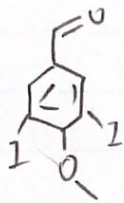
collect 15-30

$$m = 18.5170 - 18.5072$$

$$= 10 \text{ mg}$$



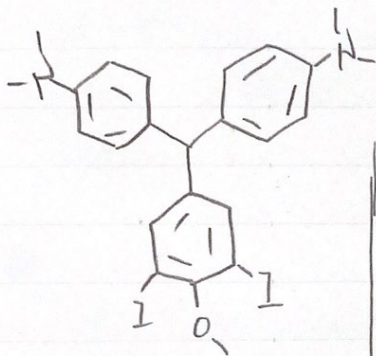
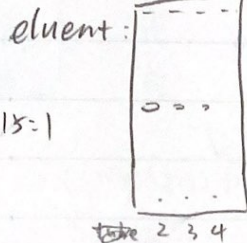
5/8



purify with silica pag for MS

(based on MS, impurity is not starting materials)

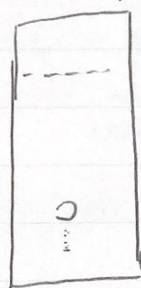
elution: hexane:EA = 15:1 (directly from stock bottles)




26/7 for NMR tube, not pure in NMR-H<sub>2</sub>O, should be

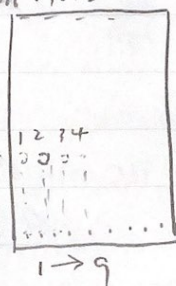
purify again (~20mg)

starting material

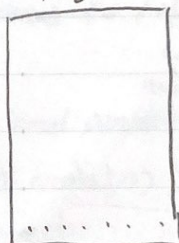


no  in TLC

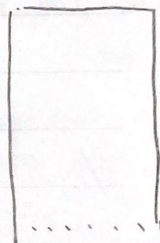
eluent: 1:15



1:8



1:1

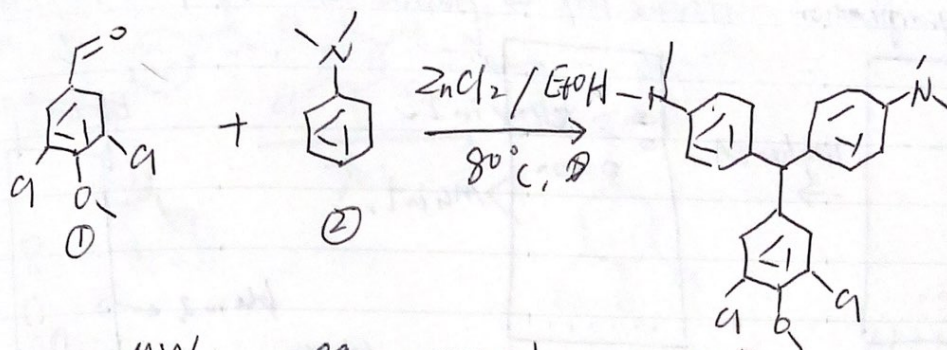


collect 2 and 3 for NMR





2022.1.17



	MW	eq	mmol	amount
①	205.04	1	0.244	50 mg (55 mg)
②	121.18	2.2	0.536	65 mg (100 mg) (almost colorless)
EtOH (from dry box without sieve)				1 ml
$\text{ZnCl}_2$	136.3	2.5	0.61	83 mg (100 mg)

10:15: mix all, heat up, solution is in slight yellow (color of ①)

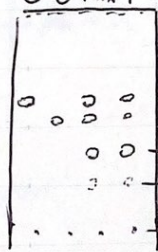
11:45 to  $75^\circ\text{C}$ , 12:00 to  $85^\circ\text{C}$ . 15:00 solution in brown color.

20:00  $82^\circ\text{C}$ , dark purple

1.18 19:30

hexane:EA  
98:1

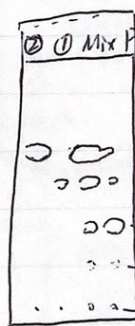
① Mix P



Mg in 2v  
Mg in 2v  
purple

1.20 9:30

hexane:EA  
19:1

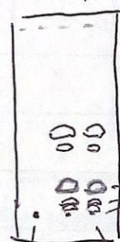


Mg in 2v  
Mg in 2v  
purple

Extraction test:

0.5 ml DCM, 50 ml Reaction, 0.5 ml  $\text{H}_2\text{O}$

hexane:EA  
19:1



H2O  
DCM

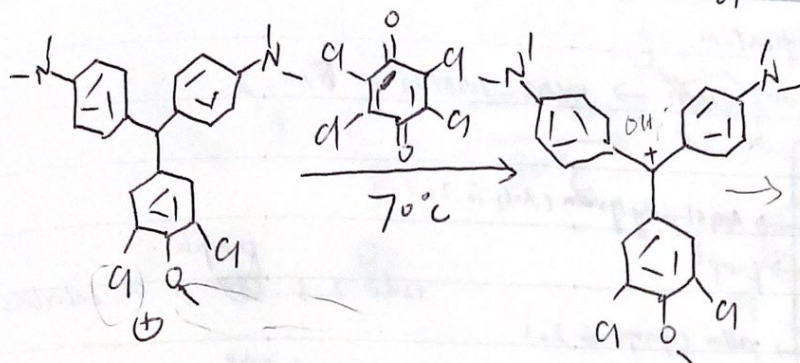
Large scale extraction: 5.5 ml DCM, 1 ml Reaction, 50 ml  $\text{H}_2\text{O}$  (x4), NaCl x2

Then 30 ml DCM. ~~Rear~~ + 20 ml NaCl (Final Extraction). Dry in  $\text{Na}_2\text{SO}_4$



20/1

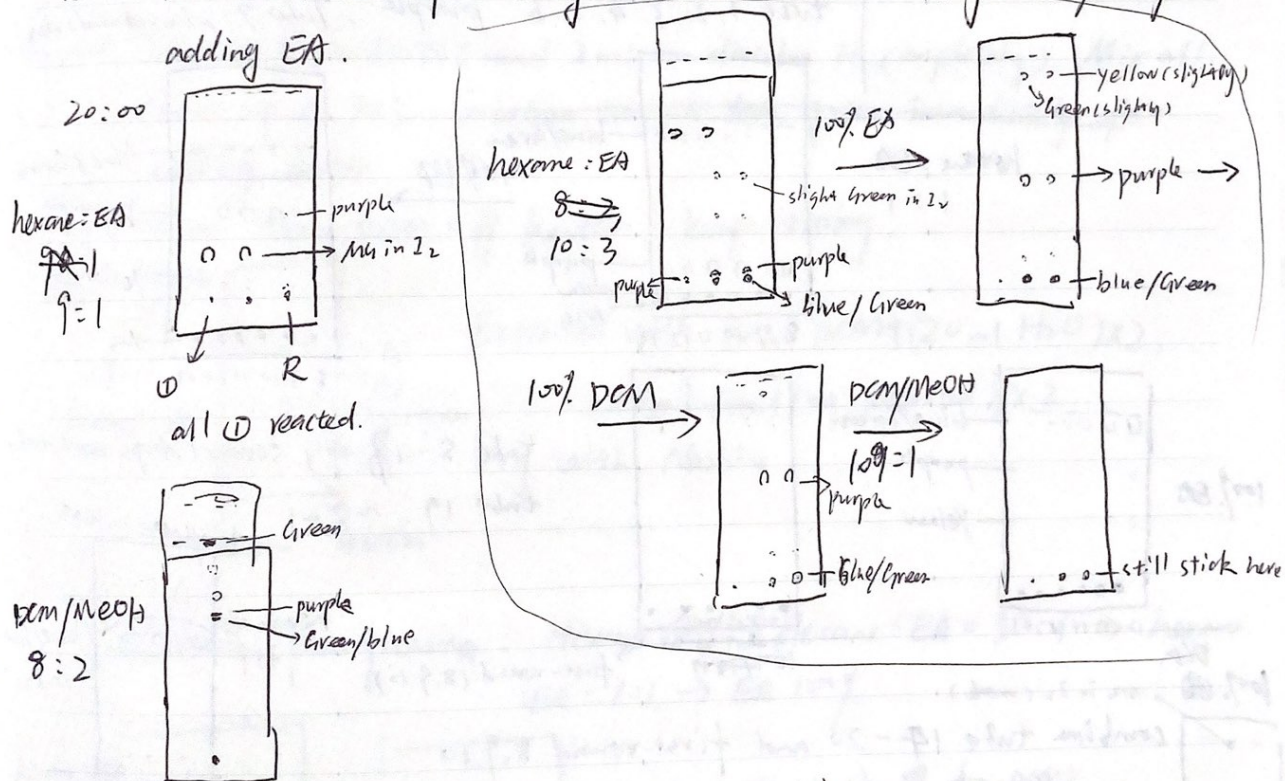
②

$$\begin{array}{r} 360 \\ + 69 \\ \hline 34.5 \\ \times 2 \\ \hline 690 \end{array}$$


	MW	eq	mmol	amount
①	429	1	0.0769	33mg
②	245.8	2	0.154	38mg (40mg)
EA				20ml

Reaction: 18:00 - 20:00, 70-75°C

18:00 Mix all, heat up, stirring. Solution turn to dark green right after adding EA.

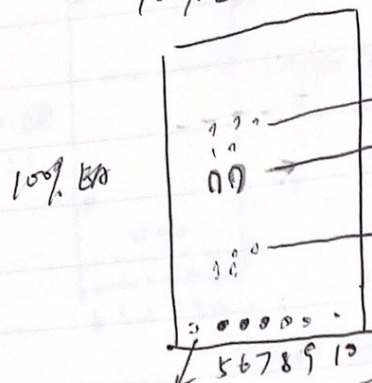


Keep reaction solution in freezer overnight



24/1 silica gel purification

100% EA → 100% DCM → DCM:MeOH = 8/10:2



remain in  
vial bottle

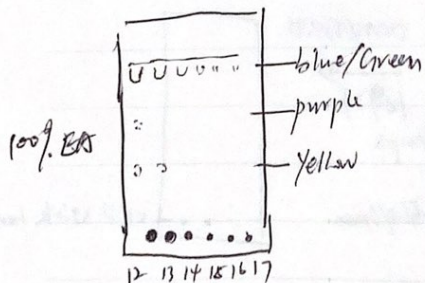
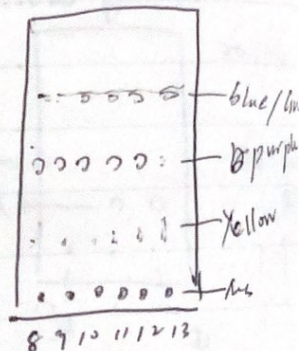
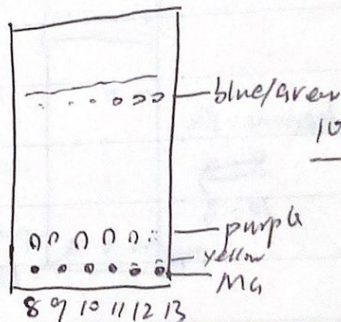
collect 8, 9, 10.

purify 5, 6, 7 again: ~~dry~~ dry loading  
most concentrated

100% EA → DCM:MeOH = 80:20

tube 1, 2, 3, 4, 5, 6: purple, Tube 7: almost colorless

hexane:EA  
1:1



DCM  
100% EA  
Mh in 22 (weak)

combine tube 14-20 and first-round 8, 9, 10

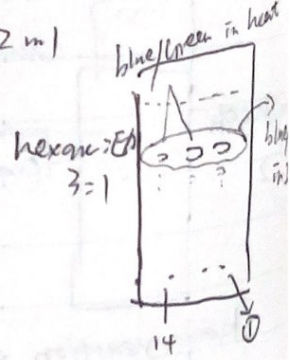
$$m = 18.2235 - 18.17031 \text{ g} = 20.4 \text{ mg}$$

NMR in CDCl<sub>3</sub> (cannot dissolve very well in CDCl<sub>3</sub>)

CD<sub>3</sub>ODC<sub>2</sub>H<sub>5</sub> show more peaks than in CDCl<sub>3</sub>

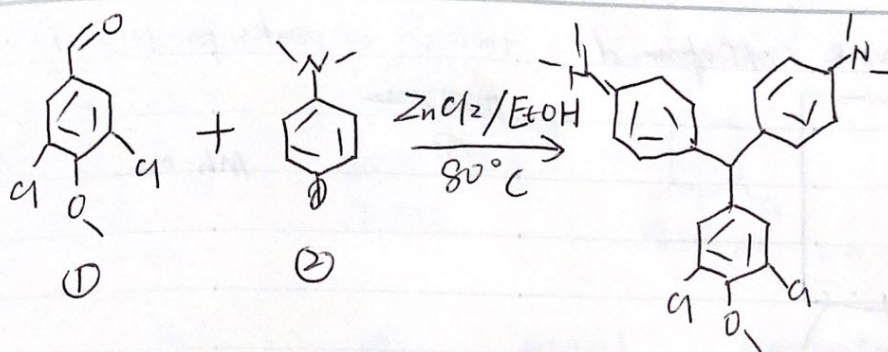
Then use CDCl<sub>3</sub> again in higher conc. (13C more peaks than in CD<sub>3</sub>OD)  
combine all again for TLC  
(1H one overlap with solvent peak 7.26)

tube 8-18 only several drops each  
tube 19: ~ 2 ml





70/1



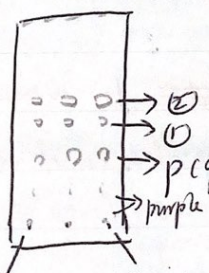
	MW	eq	mmol	amount
①	205.04	1	0.73	150mg (155mg)
②	121.18	2.2	1.61	195mg (214mg)
ZnCl <sub>2</sub>	136.3	3	2.20	300mg (316mg)
EtOH				2.5 <del>2.8</del> ml

16:00 Dissolve ① in EtOH (need 2ml to dissolve it completely). Mix all.  
Heat up to 70°C. Solution turn to dark green immediately after adding EtOH

22/1 18:00 ~~turn~~ turn off heater, keep stirring.

24/1 9:00

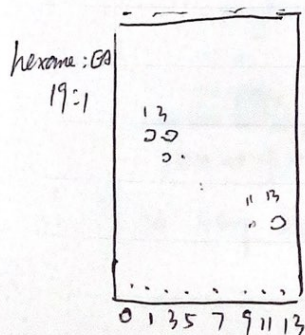
19:1  
hexane: Et



1:1 Reaction Reaction

Extracted with 30 ml DCM + (20 ml H<sub>2</sub>O) x 2,  
(20 ml NaCl (aq. saturated)) x 2  
Dry with Na<sub>2</sub>SO<sub>4</sub>.

Column purification: Hexane 100% → Hexane:EA = 30:1 → hexane  
:EA = 1:1 → EA 100%



collect ⑫. ⑬. for NMR

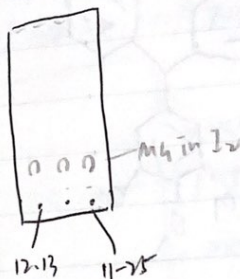
11 → 25<sup>except 12.13</sup>, store in -20°C freezer  
m = 18.0534g - 18.0431g = 10.3mg

m = 18.6907g - 18.6259g = 64.8mg



"12, 13" for NMR (chloroform-d): two set of peaks for 'H ~ 1:0.9

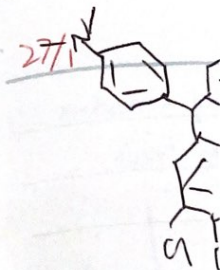
hexane:EA  
19:1



~~multiple peaks~~  
or

MH-OH

MH



2022.1.25

2:30 combine all and 100 mg ZnCl<sub>2</sub>, 2ml EtOH, ~~75-80~~ 85°C, 1h to 1.26. 2:00. Then turn to R.T. or 2h.

①

②

EtO

2022.1.27 9:00 8ml DCM, (4ml H<sub>2</sub>O) x 4, (4ml NaCl aqua) x 2 for extraction/washing

15:

Dry in Na<sub>2</sub>SO<sub>4</sub>. Then remove solvent for NMR

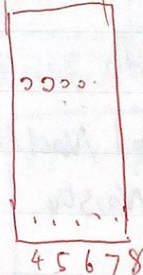
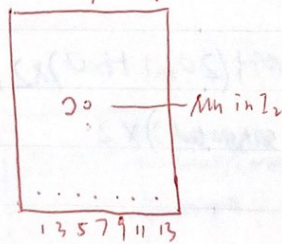
18:

NMR: two set of peaks, but might not be MH-OH. because it shows the central H (C-H)

19:

hexan

column purification: hexane:EA = 20:1 → 5:1



4 ~~sets~~ for NMR

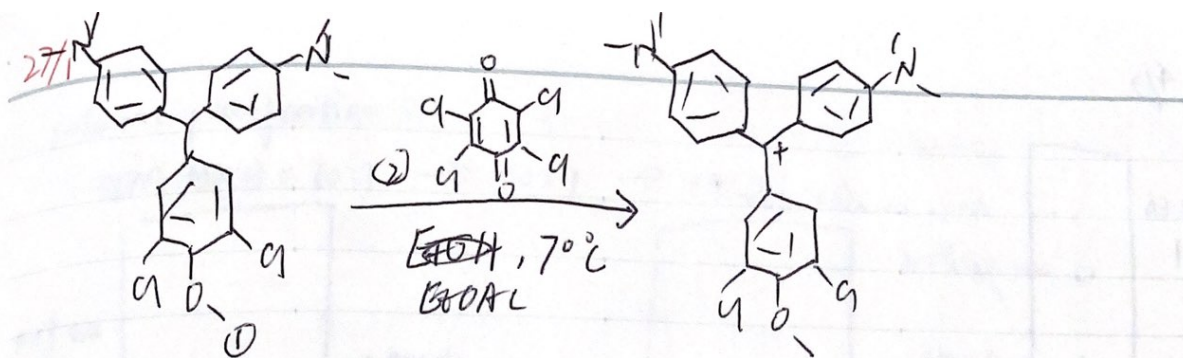
3 sets of peaks and only one is MH and one or two looks like MH-OH.

So just combine all and set ~ 1mg aside for MS. others for next step.

4-8

$$m = 18.1069g - 18.1043g = 63.8mg$$



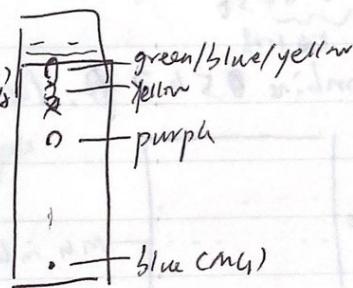
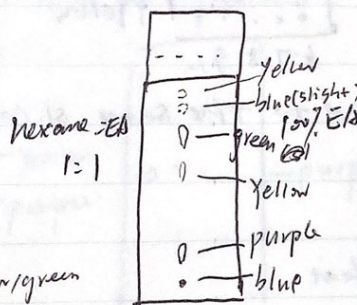
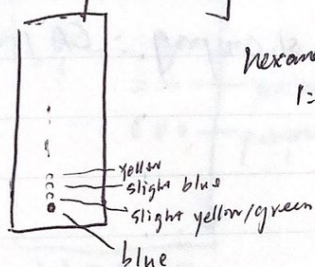


	MW	eq	mmol	amount
①	429	1	0.149	63.8
②	245.8	2	0.297	73.1 mg
EtOH				4ml

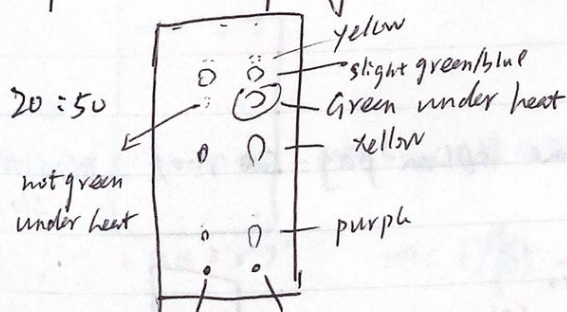
15:25 = mix all, solution turns to dark green immediately. heat up to 70°C

18:00 = stop heating

19:00  
hexane:EA  
10:1



19:20 heat up again to 70°C ~~stop heating~~



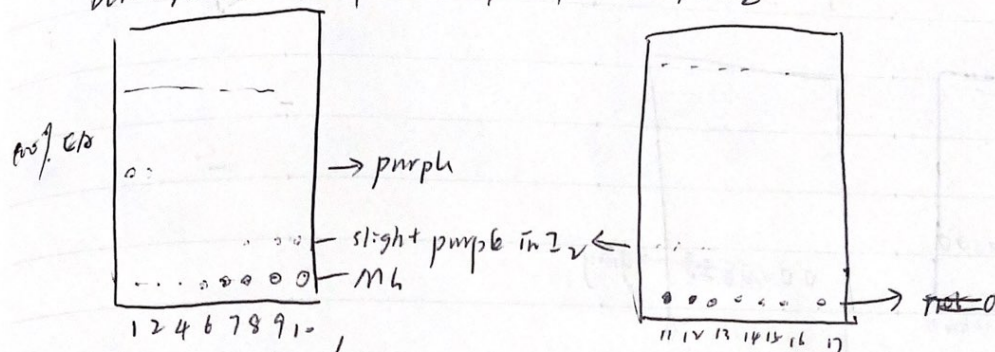
19:00 sample  
spotted on TLC  
plate at 19:10

20:50 sample

21:00 stop heating, ~~but~~ keep no stirring, keep in -20°C

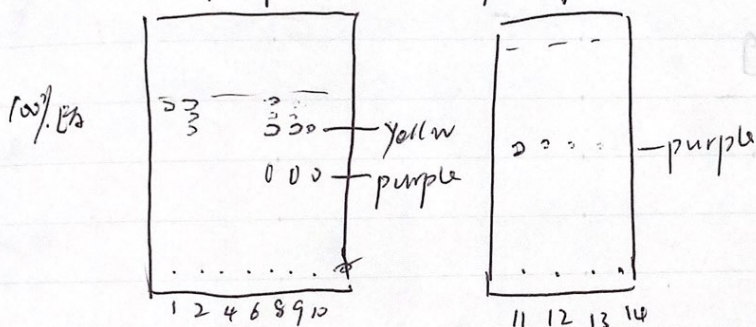
column purification :

DCM: MeOH = 30:1  $\rightarrow$  10:1  $\rightarrow$  10:2

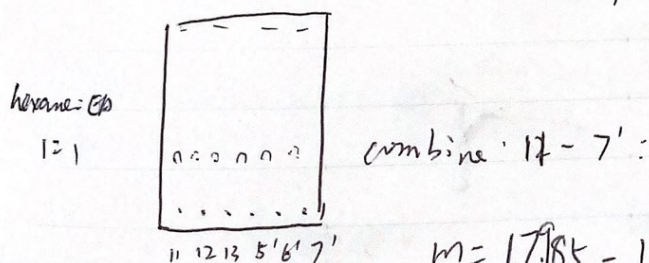


combine 9  $\rightarrow$  17 (should be many chemicals in it)  
~~m = 17.985 - 17.967 g = 18 mg~~

combine purple, column purification : DCM 100%  $\rightarrow$  DCM: MeOH = 40:1



load 8, 9, 10 to column and purified again

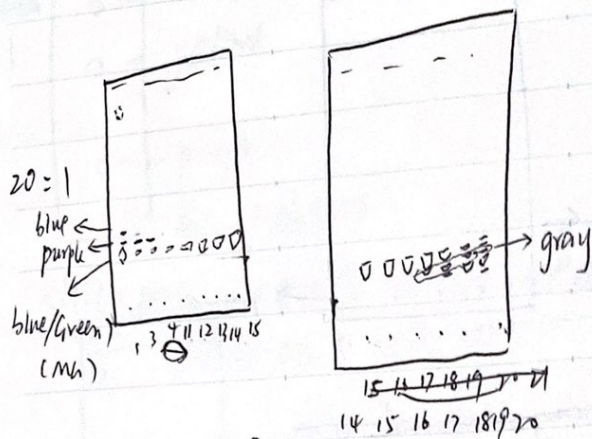


m = 17.985 - 17.967 = 18 mg NMR  $^{13}\text{C}$  OK

purple fraction : without  $\text{O}-\text{CH}_3$  in  $^1\text{H NMR}$ , might be  $\text{MgCl}_2\text{OH}$  but not  $\text{MgCl}_2\text{OMe}$



16/2/2022 purify again DCM 100%  $\rightarrow$  DCM:MeOH = 40:1  $\rightarrow$  20:1  $\rightarrow$  10:1

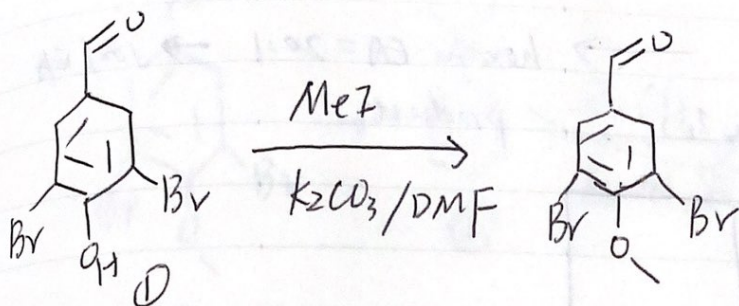


collect 14, 15, 16, 17

$$m = 18.3147 - 18.2881 \text{ g}$$

$$= 26.6 \text{ mg}$$

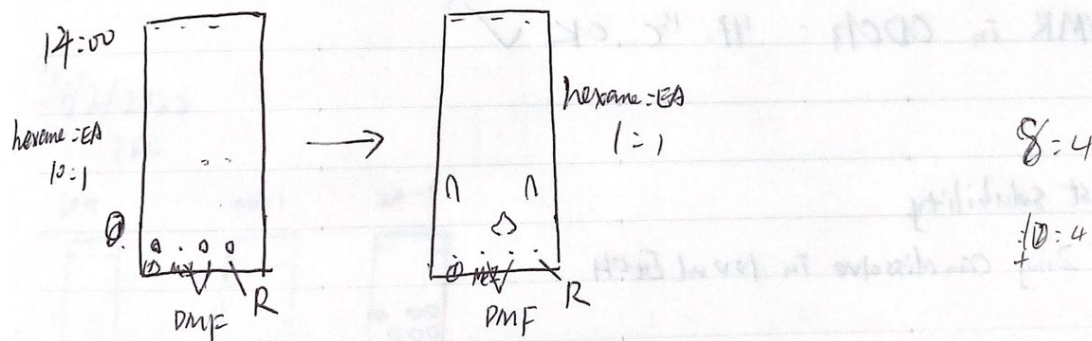
9/2/2022



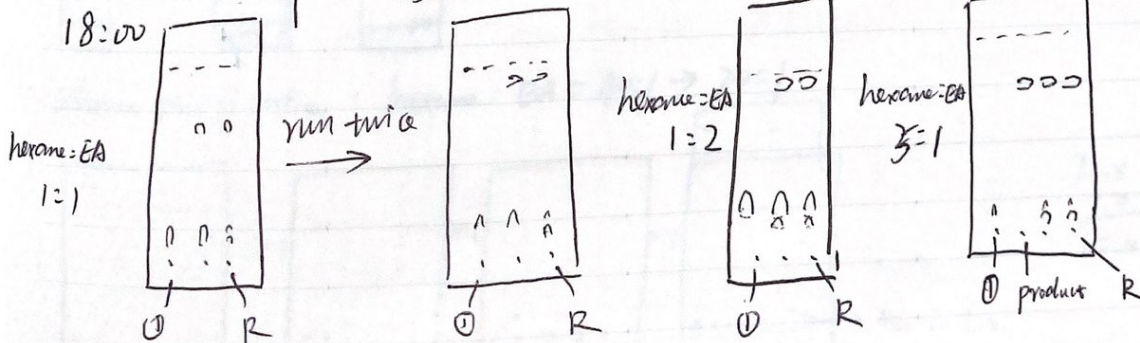
	MW	eq	mmol	amount
1	198	1	2.525	500 mg
MeI	141.9	1.1	2.778	394 mg
$K_2CO_3$	138.2	1.5	3.788	523 mg
DMF				2.5 ml + 0.5 ml

wrongly use the  $K_2CO_3$

9:30 mix all and stir in 40°C oil bath. solution turn to slight yellow-brown to a little bit darker.



14:10 heat up to 65°C



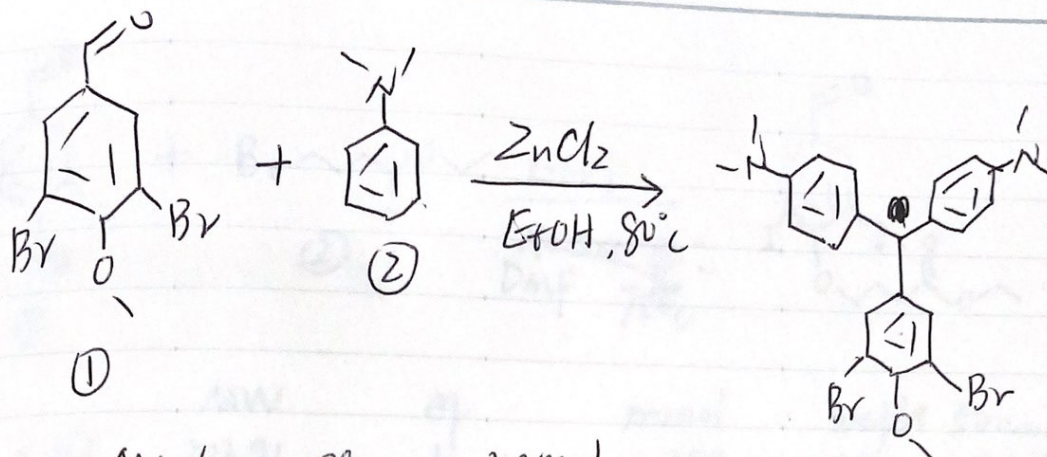
- 18:30 1) Extract with DCM, wash with H<sub>2</sub>O four times vapour
- 2) Dry with  $Na_2SO_4$ . Remove solvent (many brown goes out) at
- 3) Column purification



10/2/2022

178  
+14

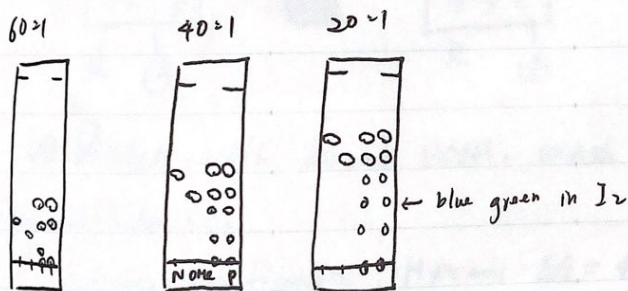
CH<sub>2</sub>



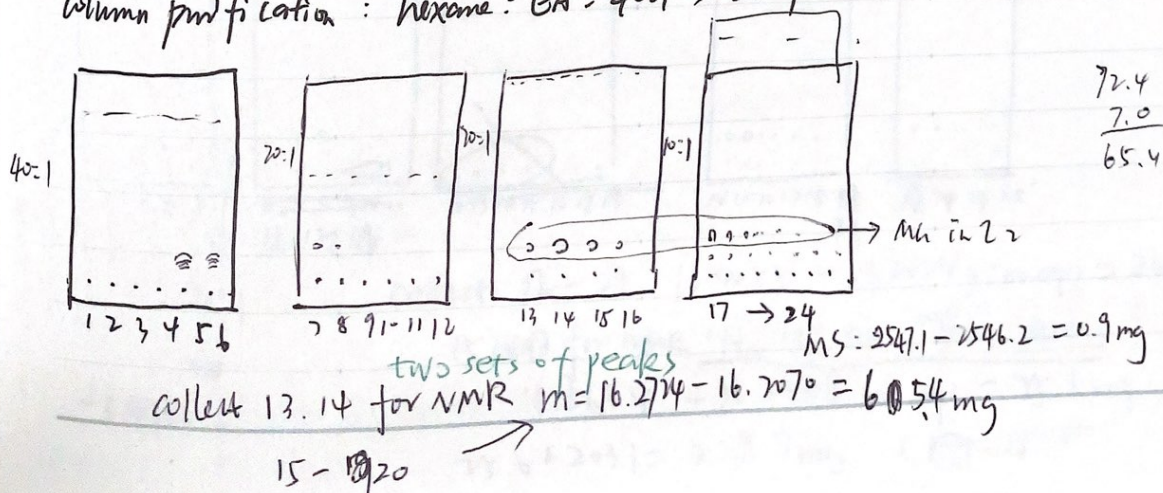
	MW	eq	mmol	amount
①	216	1	0.926	200 mg $\times 0.75 = 150$
②	121.18	2.2	2.04	247 mg $\times 0.75 = 185$
ZnCl <sub>2</sub>	136.3	3	2.78	379 mg $\times 0.75 = 285$
EtOH				2 ml

10:45 mix all, heat up to 75°C

14/2/2022  
TLC:

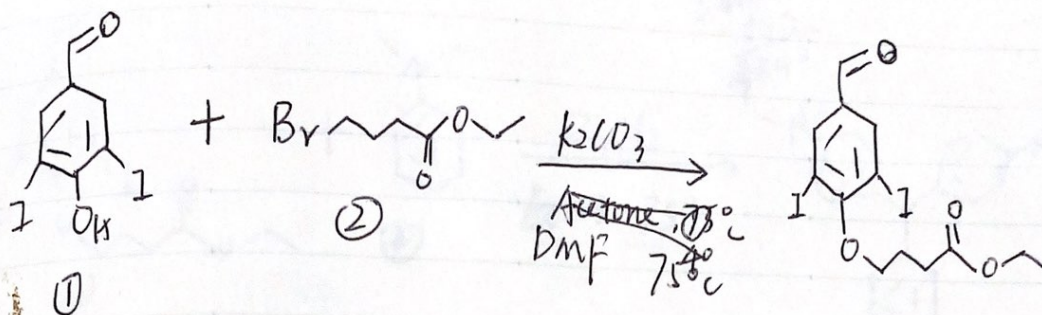


column purification: hexane:EA = 40:1  $\rightarrow$  20:1



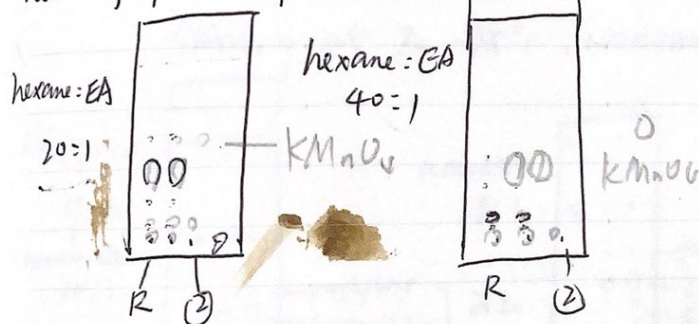


11/2/2022



	MW	eq	mmol	weight
①	373.91	1	0.298134	11.1mg
②	195.05	1.1	0.327147	63.8mg (72mg)
K <sub>2</sub> CO <sub>3</sub>	138.205	2	0.596294	82.4mg 406mg
<del>Acetone</del> DMF				230 ml

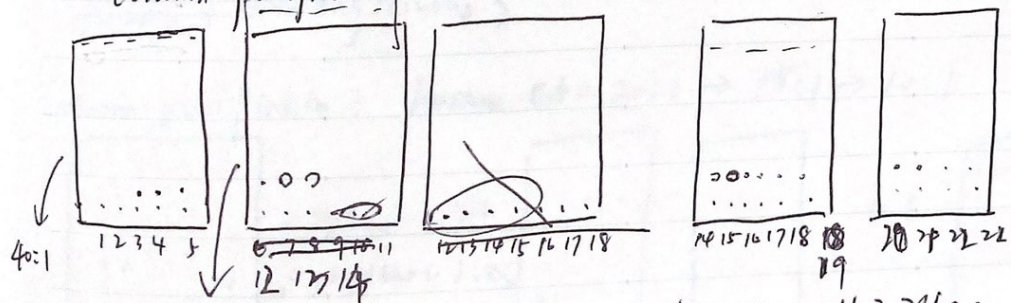
20:00 mix all, stirring at 75°C-70°C  
next day 9:00, stop



Diluted with 20 ml DCM, wash x3 with H<sub>2</sub>O, x1 with aqueous NaOH.

Dry with Na<sub>2</sub>SO<sub>4</sub>.

Column purification: Hexane:EA = 40:1 → 20:1



collect 12-22 16.4055 - 16.2024g (no cap) = 203.1mg

15.44 for NMR <sup>1</sup>H, <sup>13</sup>C OK (with DCM, hexane)

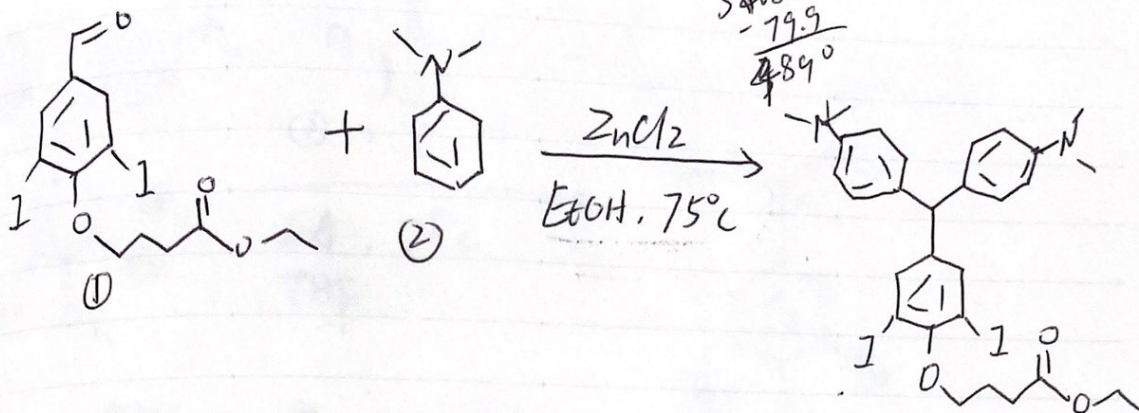
16.5664 - 16.5408 (no cap) = 25.6mg

25.6 + 203.1 = 228.7mg

-5.4983 =



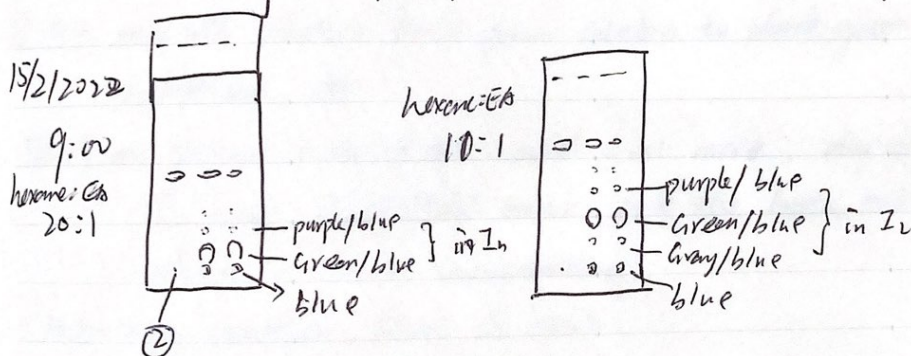
12/2/2022



373.7  
+195  
568.9  
-79.9  
489.0

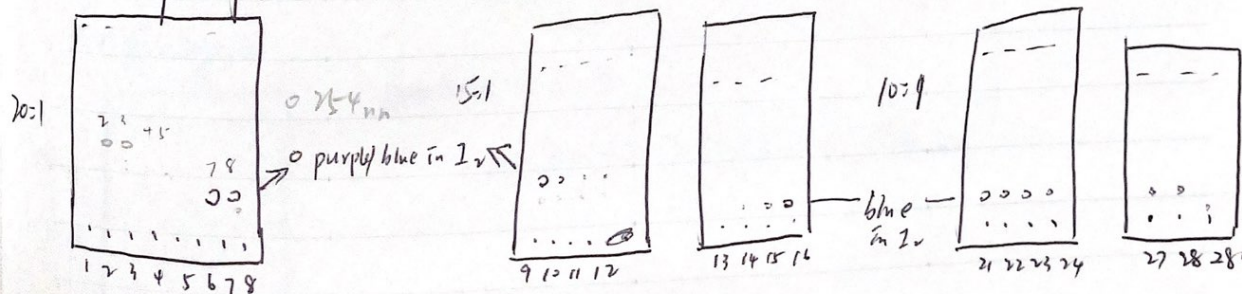
	MW	eq	mmol	weight
①	489	1	0.409	200mg
②	121.18	2.2	0.8900	109mg
ZnCl <sub>2</sub>	136.3	3	1.227	167mg
EtOH				2ml

10:00 mix all, sonicate 2min (① cannot dissolved in EtOH)  
Stirring at 70-75°C, covered with thin foil



stop reaction. extract with 10ml H<sub>2</sub>O (very slow vacuum) when  
~~filtrate~~ removing Narsap).

Column purification: hexane:EA = 20:1 → 15:1 → 10:1



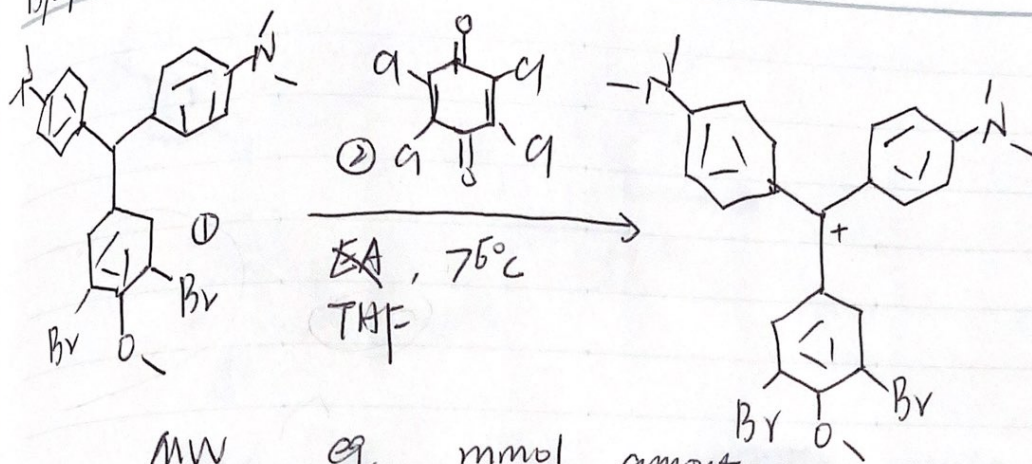
17.18 for NMR

-5.5084

colorless oil combine 16-28 16.3285 - 16.2022 = 125.3mg



15/2/2022



	MW	eq	mmol	amount
①	518.29	1	0.126	65.4mg
②	245.8	2	0.252	62mg
EA				
THF				2ml

① only slightly dissolved in EA. ① can dissolve very well in THF.

17:40 mix all, solution turn from colorless to dark green after adding ②.  
heat up. do

18:00 found it dried out, add 2ml more, dry within 10 min.

So add 2ml THF more, put the bottle ~~out~~ on the metal block which in lower temperature.

20:10 stop reaction, store in  $-20^{\circ}\text{C}$

21/2/2022

column purification: DCM 100%  $\rightarrow$  DCM:MeOH = 30:1  $\rightarrow$  10:1

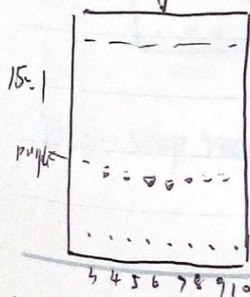
NMR not very pure

17/2/2022

Purify again.

combine 6.7.8.9

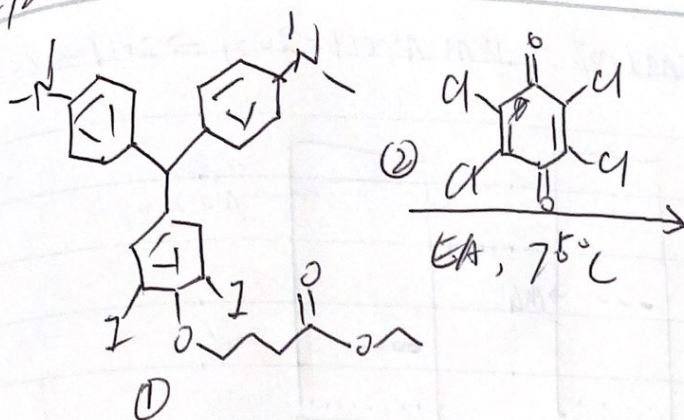
$$m = 18.6268 - 18.5942 = 32.6 \text{ mg}$$



1.23 purple



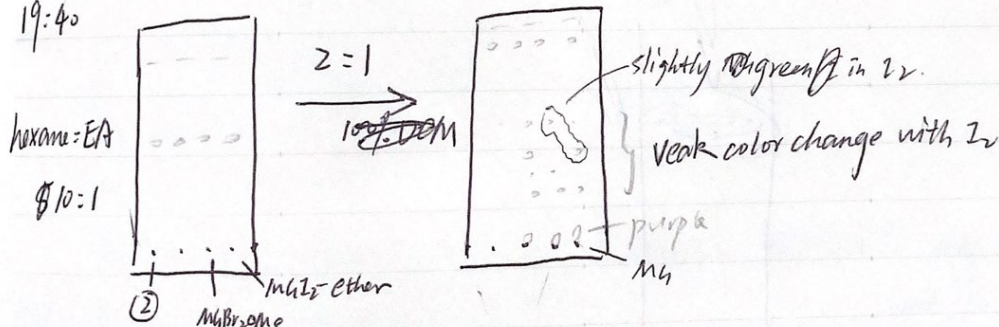
15/2/2022



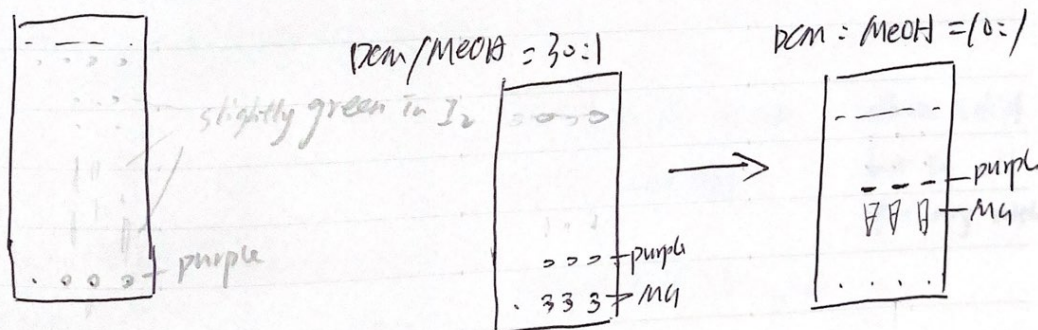
	MW	eq	mmol	<del>amount</del>	weight
①	712.41	1	0.176		125.3mg
②	245.8	2	0.352		86.5mg
EA					2.5ml

17:40 mix all, solution turn from colorless to dark green after adding ②  
heat up, 18:00 - in 75°C

19:40



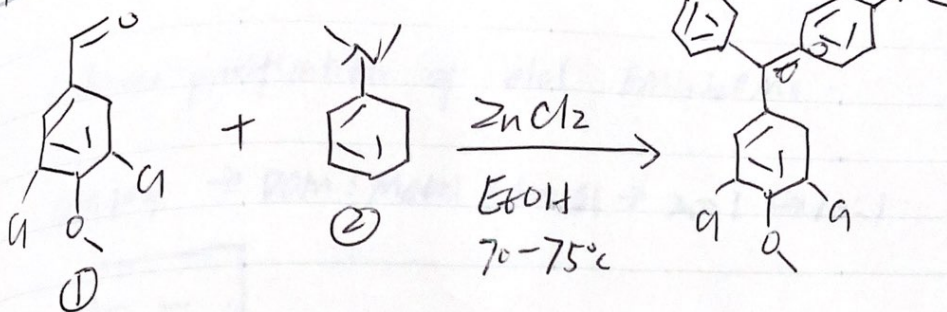
100%  
DCM



20:10 stop reaction, store in -20°C



19/2/2022



	MW	eq	mmol	weight
①	205.04	1	0.284	71 mg
②	121.18	2.5	0.710	86 mg
$ZnCl_2$	136.3	3	0.852	116 <del>mg</del>
$EtOH$				0.8 ml

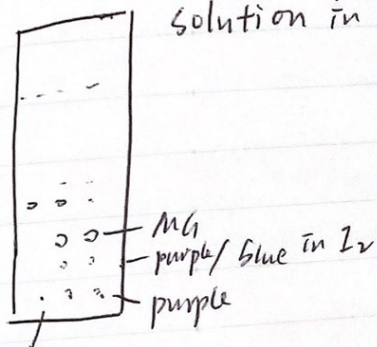
10:00 mix all, heat up

22/2 solution in purple

14:00

hexane:EA

20:1



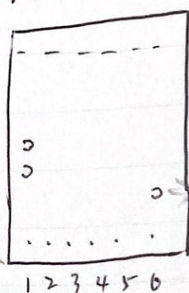
①

Extract with  $DCM/H_2O$  (x3), Aqueous  $NaCl$  (x1), dry with  $Na_2SO_4$   
Save in  $-20^\circ C$  freezer

25/2 Column Purification

hexane:EA = 30:1  $\rightarrow$  20:1

20:1



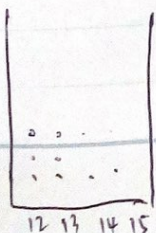
tube 7.8 for NMR  
-38.199g

white solid  
but in oil  
after dry with  $Na_2SO_4$

collect 6 - 13 (with 7.8)

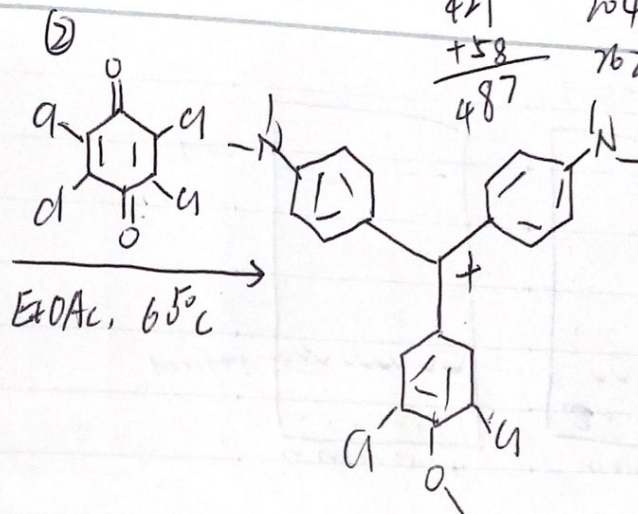
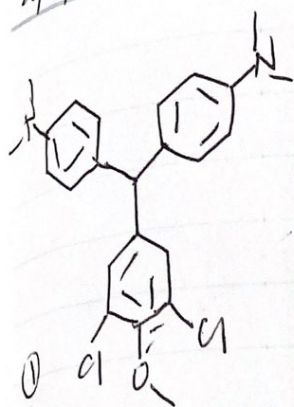
$18.2036 - 18.0994 = 104.2 \text{ mg}$  oil

the oil still in colorless without cap  
while solution/ $CDCl_3$  turn to slight green after  
5 hrs.





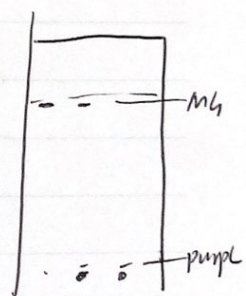
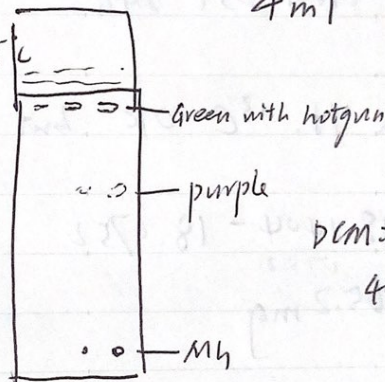
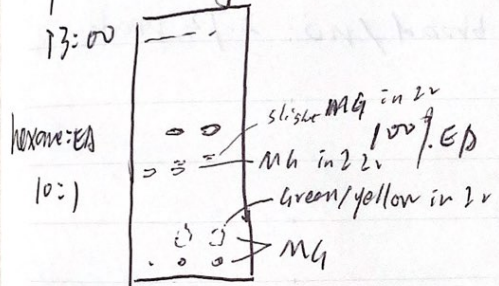
7/2/2022



$$\begin{array}{r} 429 \\ + 58 \\ \hline 487 \end{array} \quad \begin{array}{r} 204 + 58 \\ \hline 262 \end{array}$$

	MW	eq	mmol	weight
①	429	1	0.242	104 mg
②	245.8	2	0.485	119 mg
ExOAc				4 ml

11:00 stirring at 55°C, to 65°C



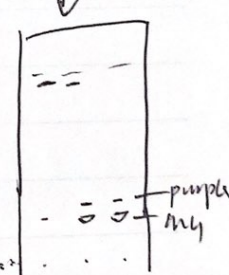
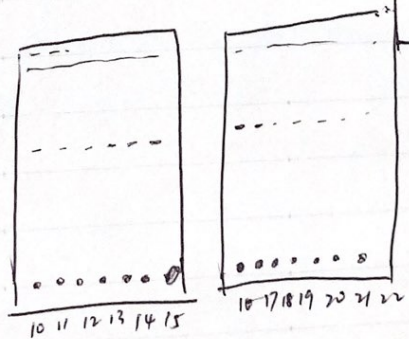
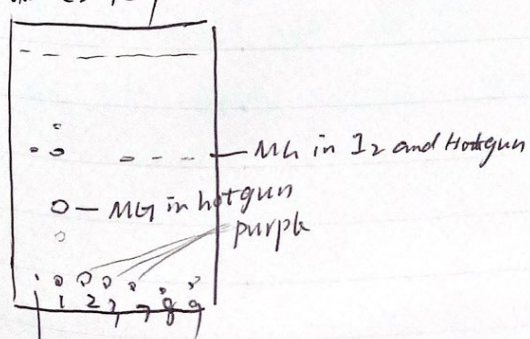
13:15 stop reaction.

column purification:

note: ~~test~~ rinse the bottle with DCM (~2ml) and then load to column

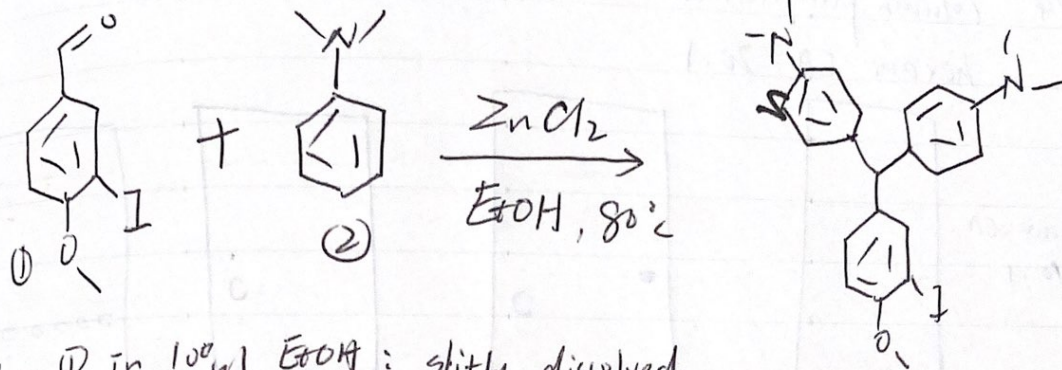
load solution to column  $\Rightarrow$  10% EA  $\Rightarrow$  DCM:MeOH = 30:1

EA:hexane = 1:4





25/4/2022

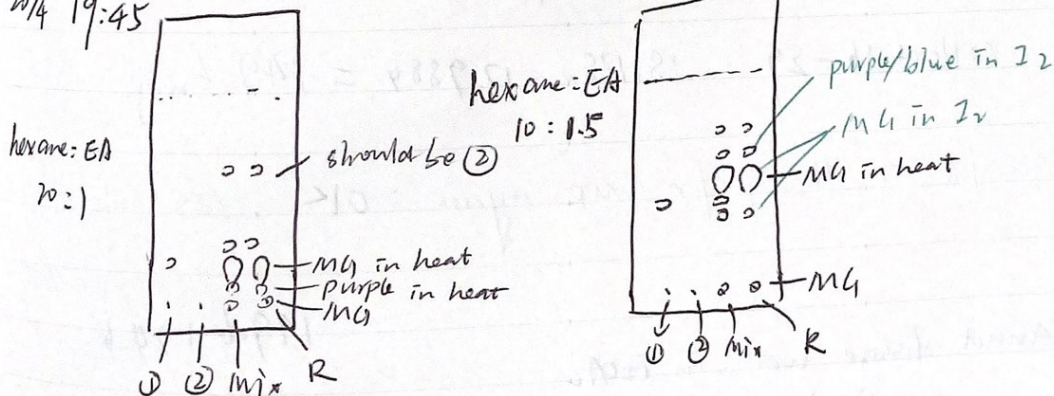


1.7mg ① in 100 $\mu$ l EtOH: slightly dissolved.

	MW	eq	mmol	amount
①	262.04	1	0.3816	100 mg X2
②	121.18	2.5	0.954	115.6 mg X2
$ZnCl_2$	136.3	3	1.1448	156 mg X2
EtOH				1 ml X2

12:30 heat up to  $80^\circ C$

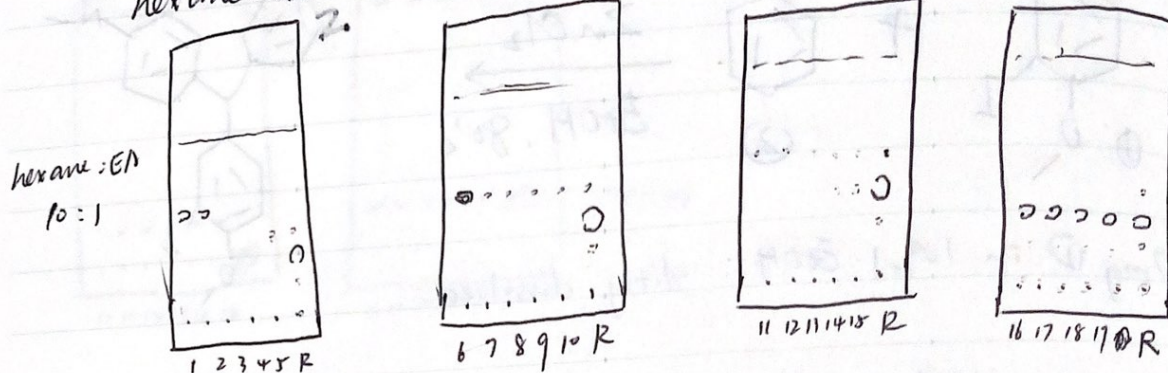
28/4 19:45



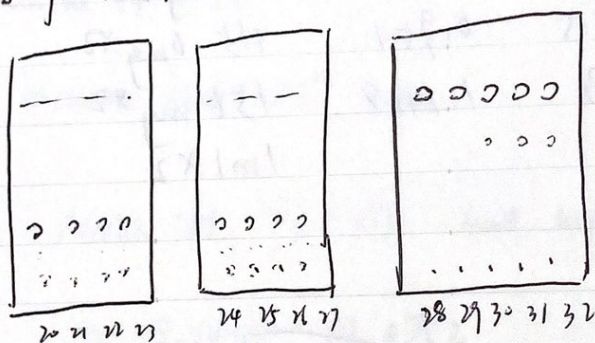
Extract with DCM/ $H_2O$  (20ml/20ml), Aqueous NaCl X1  
dry with  $Na_2SO_4$  powder. remove solvent, save in  $-20^\circ C$  overnight



28/4 column purification  
 hexane:EA = 20:1



tube 18 for NMR  $m = 16.3442 - 16.3196$  ('H OK)  
 $-2.5 = 24.6 - 2.5 = 22.1$   
 (13C 12, 20, 26 ppm?)



collect 16-29.  $18.1380 - 17.9884 = 149.6$  mg

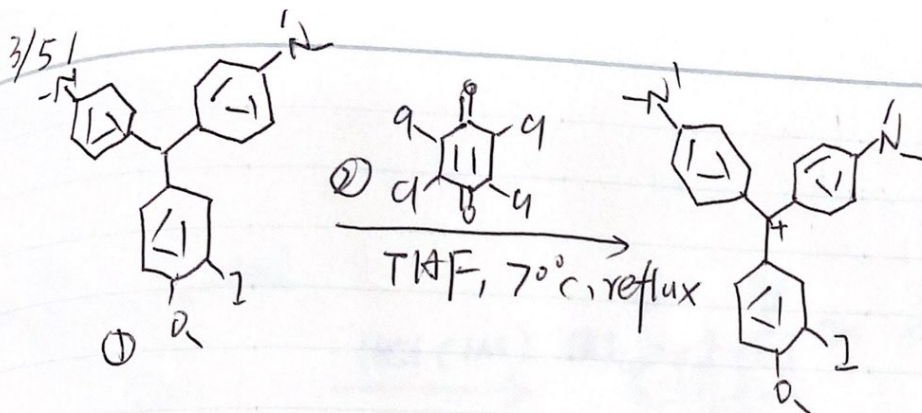
3/5 Sample in 16-29 for NMR again: OK, MS OK

cannot dissolve well in EtOAc  
 can dissolve in THF

$$149.6 + 24.6 = 174.2 \text{ mg}$$

5.3  
 4.67

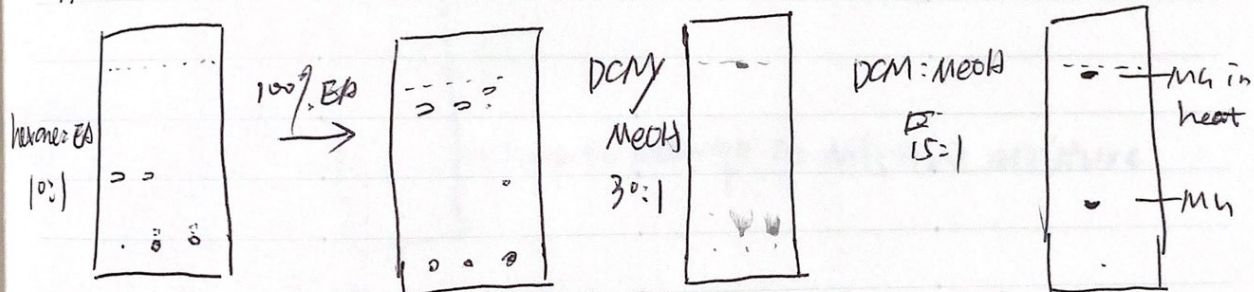




	MW	eq	mmol	amount
①	487	1	0.2558	2.5 mg 24.6 + 100 mg
②	245.8	2	0.5117	125.8 mg
THF				4 ml

2:45 - 4:55

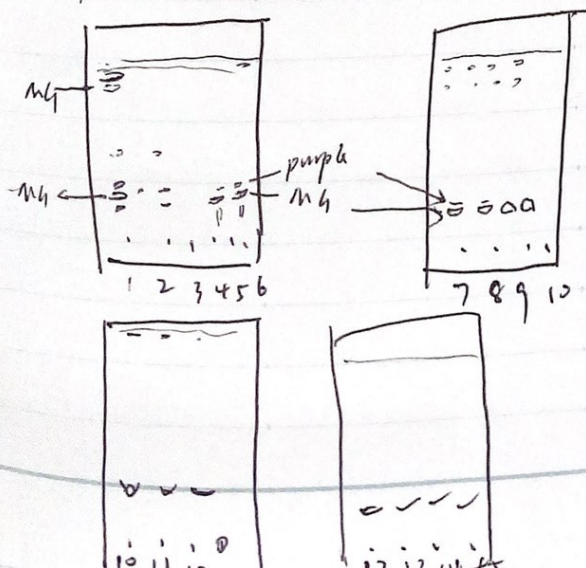
17:00



remove solvent

column purification

100% DCM → DCM:MeOH = 20:1



collect 9.0 - 15

to two bottles

$$m_1 = 18.11844 - 18.0434 = 0.07504$$

$$m_2 = 18.2891 - 18.1858 = 0.1033$$

= 43.3 mg (for NMR, OK MS, OK)

$$71.0 + 43.3 = 114.3$$