Synthesis of halogenated reverse position *C*-Nucleosides against *Leishmania major* and *Leishmania tropica*.

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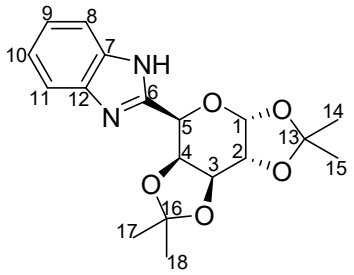
1. **2-((3a*R*,5*R*,5a*S*,8a*S*,8b*R*)-2,2,7,7-tetramethyltetrahydro-5H-bis([1,3]dioxolo) [4,5-b:4',5'-d]pyran-5-yl)-1H-benzo[d]imidazole (3a) :**

- Spectral Analysis of **(3a)**



(3a)

S. No.	H[1]-NMR	Integration	*J*-value	C[13]-NMR
Galactose pyranose ring				
1	5.655-5.645 *(d)*	1	5 Hz *(axial-equatorial)*	-CH 96.5
2	4.416-4.402 *(dd)*	1	J_1 = 2Hz *(di-equatorial)* J_2 = 4.85Hz *(axial-equatorial)*	-CH 66.1
3	4.746-4.726 *(dd)*	1	J_1= 7.4 Hz *(di-axial)* J_2= 2 Hz *(di-equatorial)*	-CH 72.58
4	4.705-4.685 *(dd)*	1	J_1 = 7.85 Hz *(di-axial)* J_2 = 2Hz *(di-equatorial)*	-CH 70.54
5	5.216-5.213 *(d)*	1	*J* =1.5 Hz (*di-equatorial*)	-CH 70.80
Benzimidazole				
6	-	-	-	-C 152.43
7	-	-	-	-
8-11	7.591 (broad signal)	4	-	-
12	-	-	-	-
Iso-propyl acetyl group				
13	-	-	-	-C 109.42
14-15	*1.427 (s) -1.353(s)*	3 each	-	$-CH_3$ 26.01 $-CH_3$ 24.88
16	-	-	-	-C 109.72
17-18	*1.547 (s)- 1.300(s)*	3 each	-	$-CH_3$ 26.2 $-CH_3$ 24.07
Imidazole				
NH (imidazole)	9.66 (rough broad)	1	-	-

Table S1: H[1]NMR and C[13] NMR of compound **(3a)** along with *J*-values.

- Single Crystal XRD of compound **(3a)**

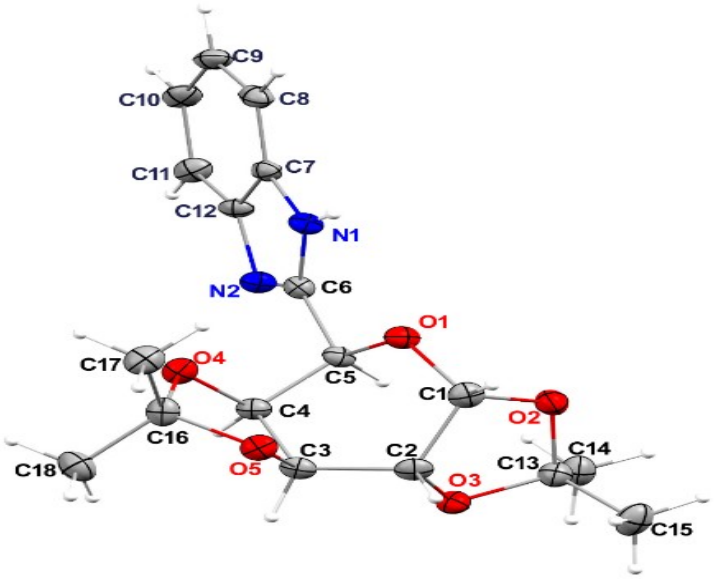


Figure S1: ORETP view of compound **(3a)** at 24 % probability.

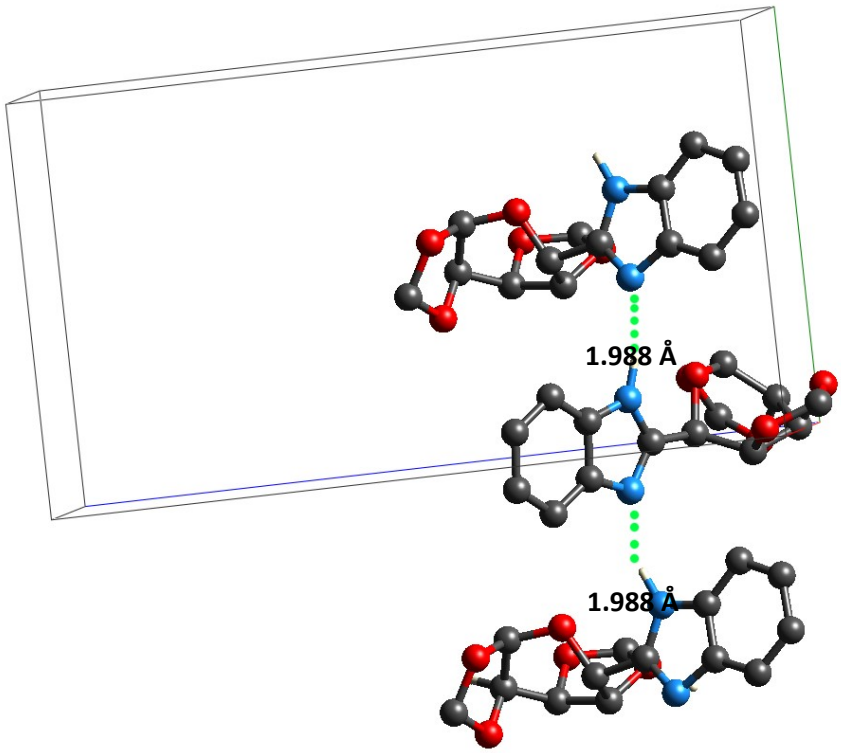


Figure S2: Hydrogen bonded imidazole ring in 1.988 Å along **a** of compound (**3a**) in a unit cell.

Identification code	UKGALH_0ma	
Empirical formula	$C_{36}\ H_{44}\ N_4\ O_{10}$	
Formula weight	692.75	
Temperature	100(2) K	
Wavelength	1.54178 Å	
Crystal system	Monoclinic	
Space group	P 21	
Unit cell dimensions	a = 9.9303(7) Å	α= 90°.
	b = 17.9109(12) Å	β= 94.298(4)°.
	c = 10.1057(7) Å	γ = 90°.
Volume	1792.4(2) $Å^3$	
Z	2	
Density (calculated)	1.284 Mg/m^3	
Absorption coefficient	0.781 mm^{-1}	
F(000)	736	
Crystal size	0.110 x 0.100 x 0.030 mm^3	
Theta range for data collection	4.387 to 68.288°.	
Index ranges	-11<=h<=11, -21<=k<=21, -12<=l<=12	
Reflections collected	41507	
Independent reflections	6527 [R(int) = 0.0799]	
Completeness to theta = 67.679°	99.9 %	
Absorption correction	Semi-empirical from equivalents	
Max. and min. transmission	0.977 and 0.919	
Refinement method	Full-matrix least-squares on F^2	
Data / restraints / parameters	6527 / 1 / 464	
Goodness-of-fit on F^2	1.064	
Final R indices [I>2sigma(I)]	R1 = 0.0374, wR2 = 0.0858	
R indices (all data)	R1 = 0.0443, wR2 = 0.0899	
Absolute structure parameter	0.27(19)	
Extinction coefficient	n/a	
Largest diff. peak and hole	0.179 and -0.249 $e.Å^{-3}$	
CCDC	2296171	

Table S2: Description of single crystal XRD analysis of compound (**3a**).

- FAB +ve high- and low-resolution mass of **(3a)**:

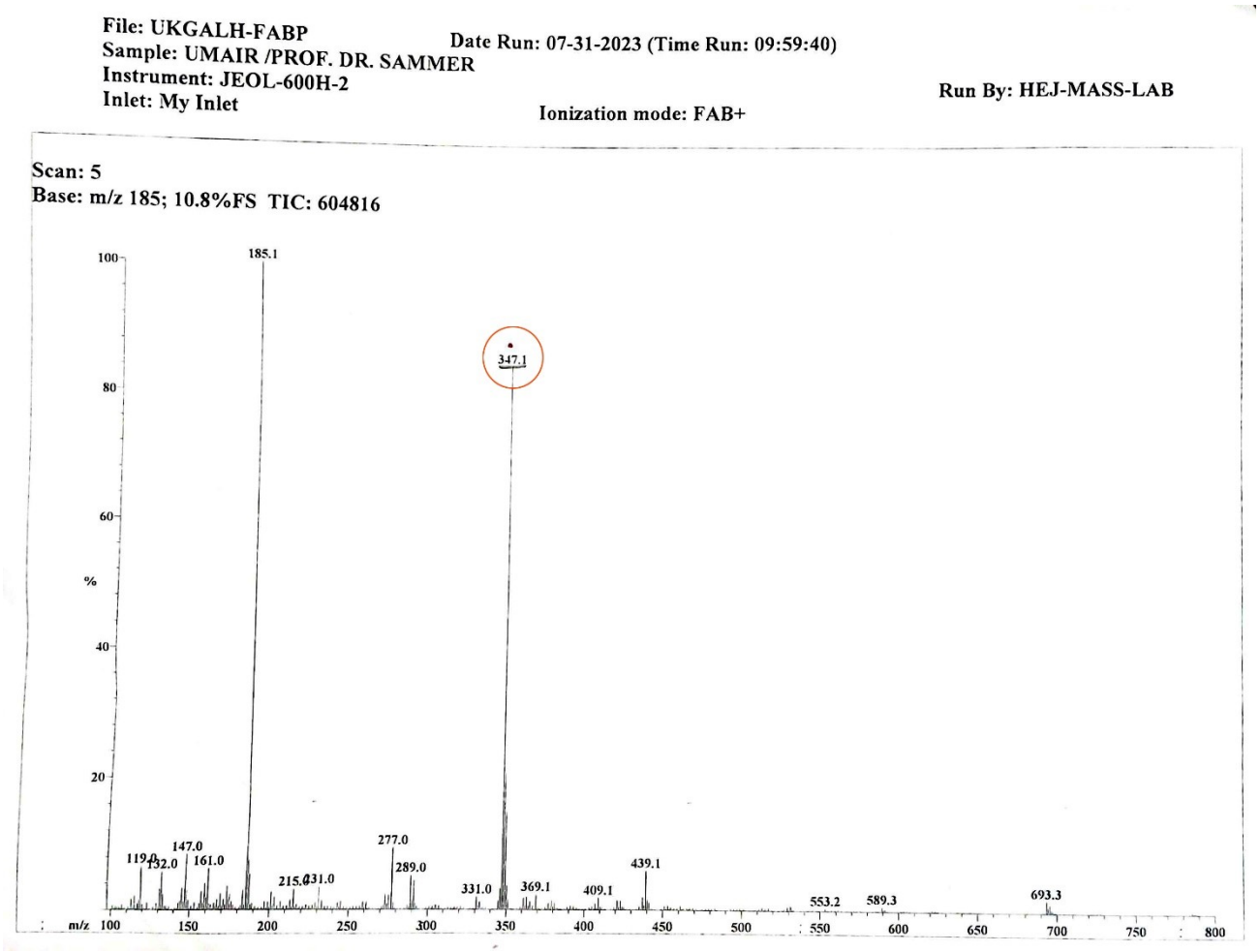
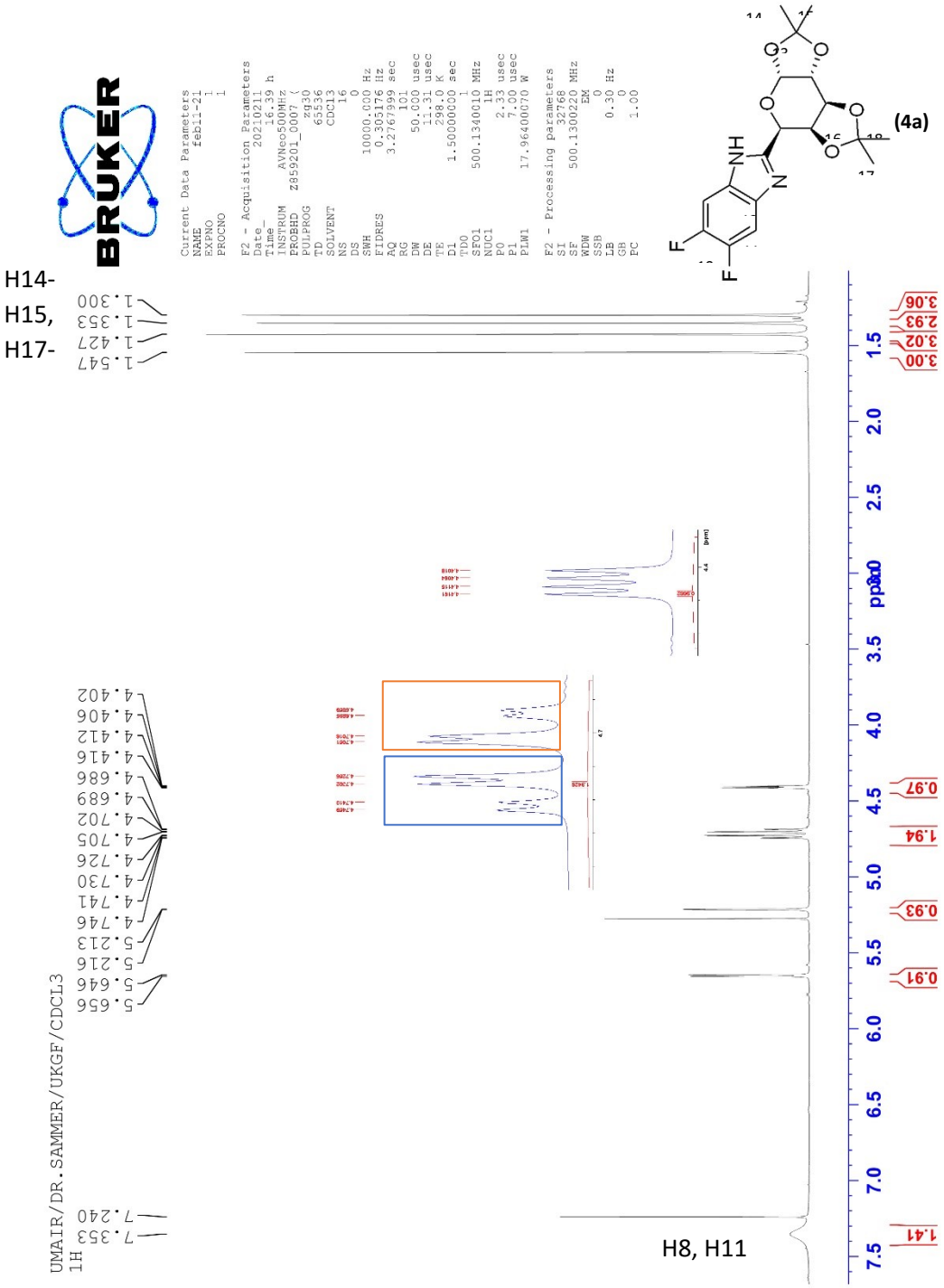


Figure-S3: Low resolution positive mode of FAB spectra of **3a**. Encircled is the *m/z* value 347.1.

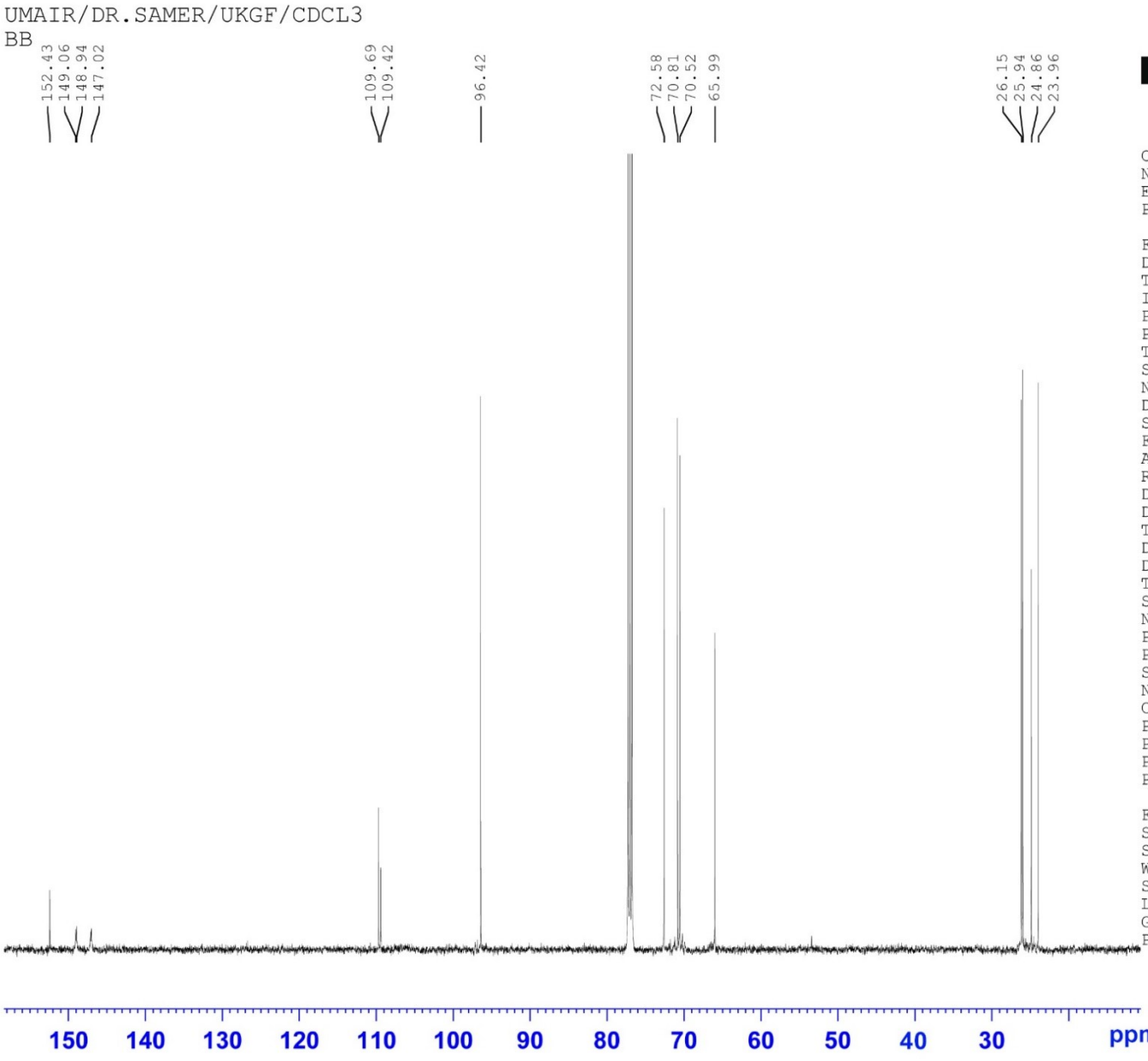
High resolution FAB (m+1) positive mode at JEOL HX 110 Mass spectrometer of compound **3a** is **347.1607,** while theoretical mass was 347.1624 which corresponds to the composition of **$C_{18}H_{23}O_5N_2$.**

2. **5,6-difluoro-2-((3a*R*,5*R*,5a*S*,8a*S*,8b*R*)-2,2,7,7-tetramethyltetrahydro-5H-bis([1,3]dioxolo)[4,5-b:4',5'-d]pyran-5-yl)-1H-benzo[d]imidazole (4a):**

- Spectral Analysis of compound **(4a)** :



[1]-NMR at 500MHz, in
mpound 5,6-difluoro-2-
,8aS,8bR)-2,2,7,7-
rahydro-5H-
lo)[4,5-b:4',5'-d]pyran-
:o[d]imidazole **(4a)**



BRUKER

Current Data Parameters
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PROCNO 1

F2 - Acquisition Parameters
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Time 21.17 h
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PULPROG zgpg
TD 32768
SOLVENT CDCl3
NS 16384
DS 4
SWH 30120.482 Hz
FIDRES 1.838408 Hz
AQ 0.5439488 sec
RG 101
DW 16.600 usec
DE 12.00 usec
TE 298.0 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 16
SFO1 125.7973986 MHz
NUC1 13C
P1 12.00 usec
PLW1 229.03999329 W
SFO2 500.2320009 MHz
NUC2 1H
CPDPRG[2 waltz65
PCPD2 80.00 usec
PLW2 18.45899963 W
PLW12 0.18459000 W
PLW13 0.09284900 W

F2 - Processing parameters
SI 16384
SF 125.7829347 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

500MHz, in
-difluoro-2-
2,2,7,7-
I-
',5'-d]pyran-
:ole **(4a)**

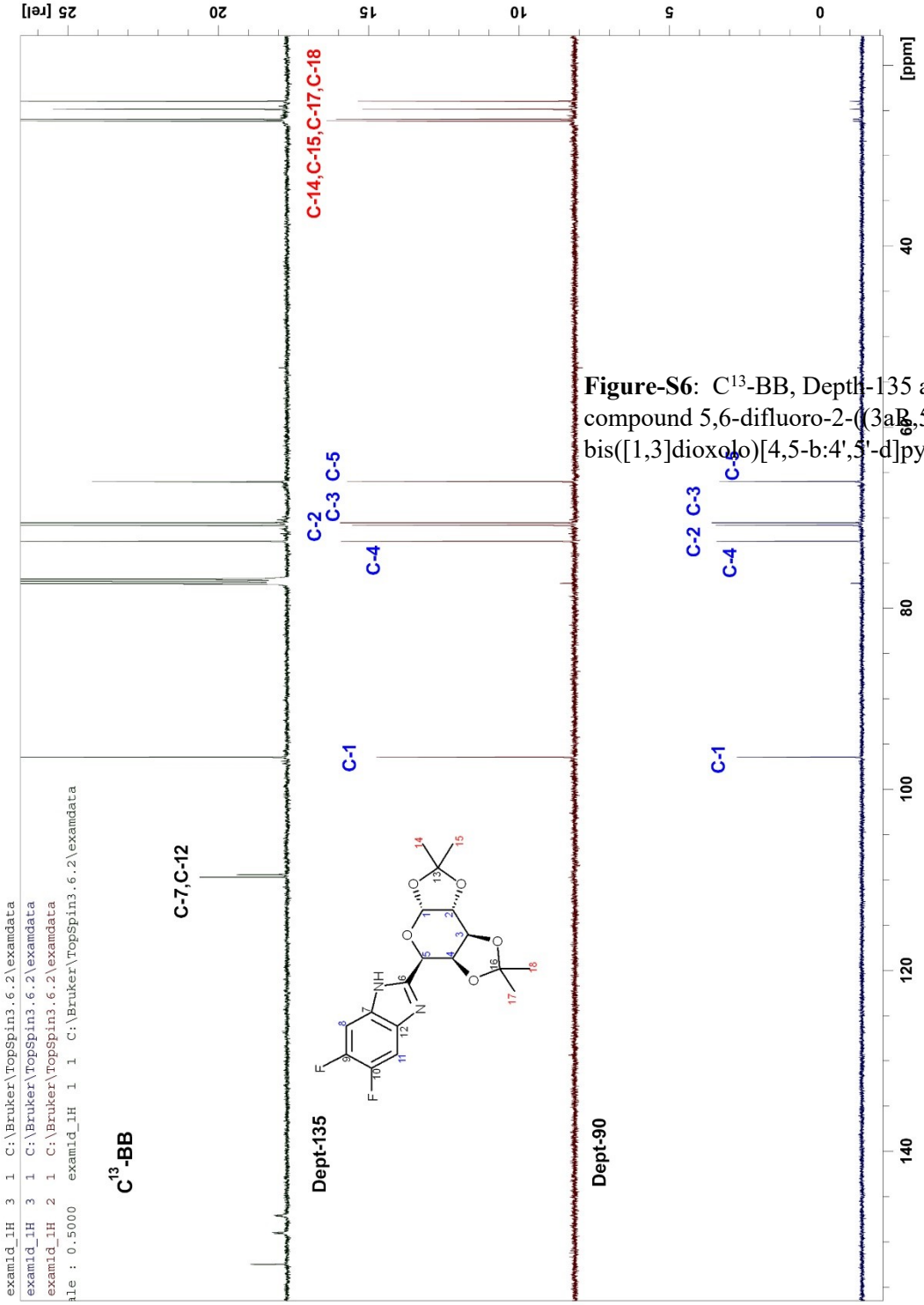


Figure-S6: C^{13}-BB, Depth-135 and Dept-90 NMR at 500MH
compound 5,6-difluoro-2-((3aR,5R,5aS,8aS,8bR)-2,2,7,7-tet
bis([1,3]dioxolo)[4,5-b:4',5'-d]pyran-5-yl)-1H-benzo[d]imida

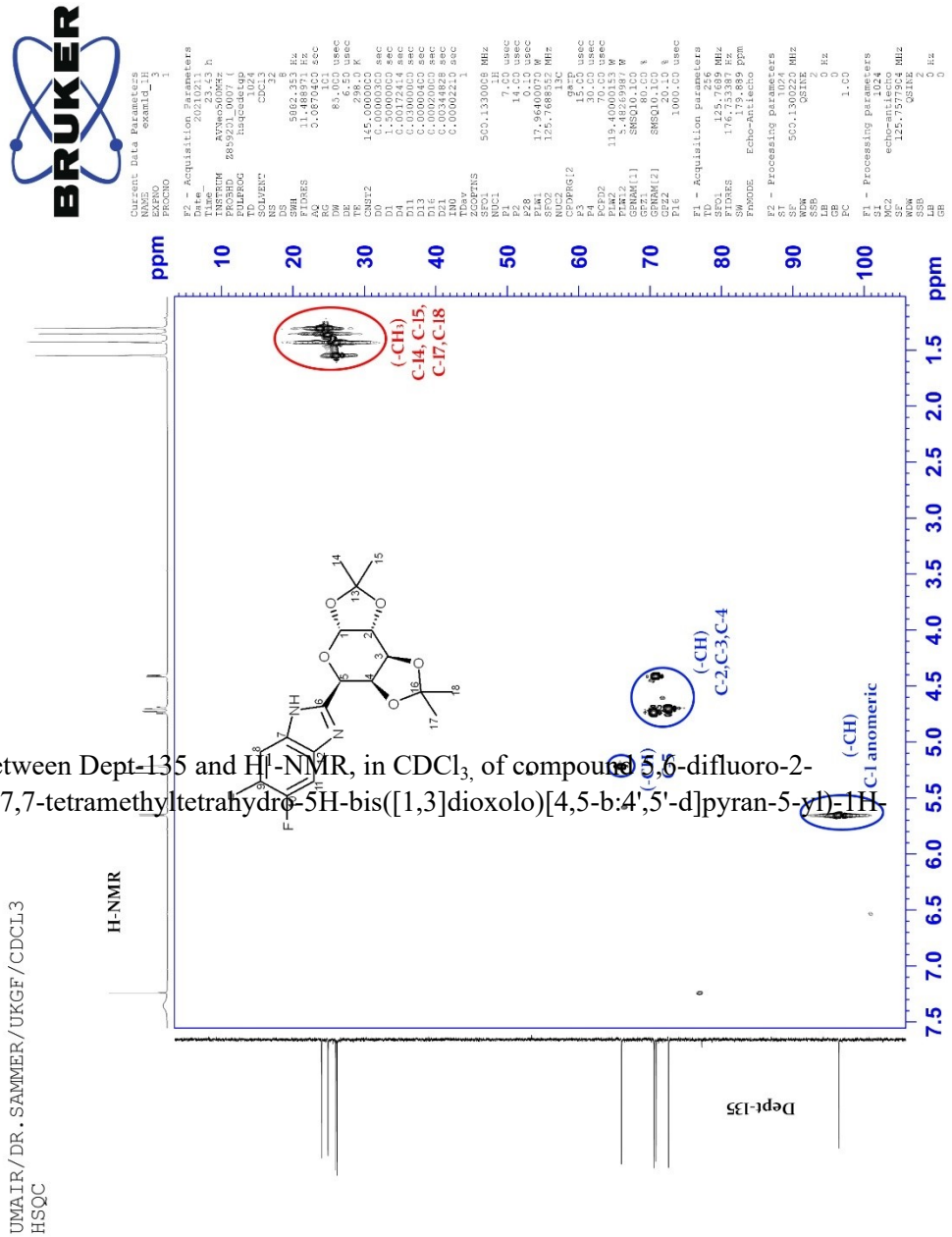


Figure-S7: HSQC NMR between Dept-135 and H-NMR, in $CDCl_3$, of compound 5,6-difluoro-2-((3aR,5R,5aS,8aS,8bR)-2,2,7,7-tetramethyltetrahydro-5H-bis([1,3]dioxolo)[4,5-b:4',5'-d]pyran-5-yl)-1H-benzo[d]imidazole **(4a)**

- Single Crystal XRD analysis of **(4a)**

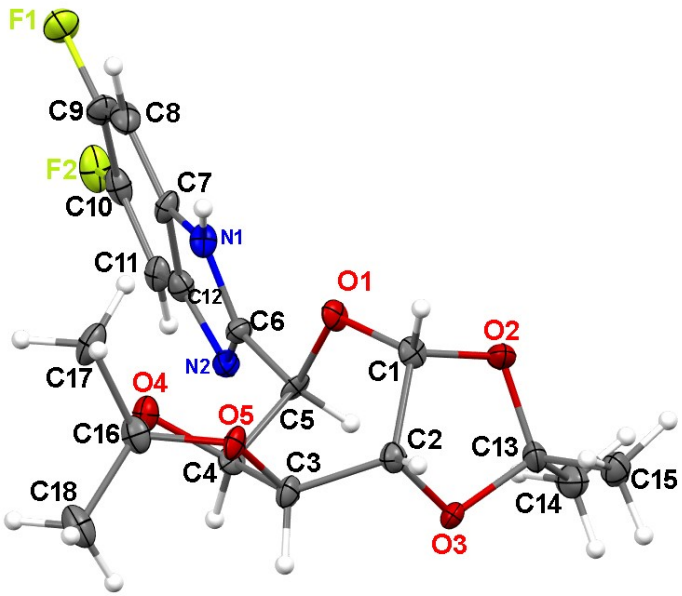


Figure-S7: ORTEP view of the compound **(4a)** at 40% probability.

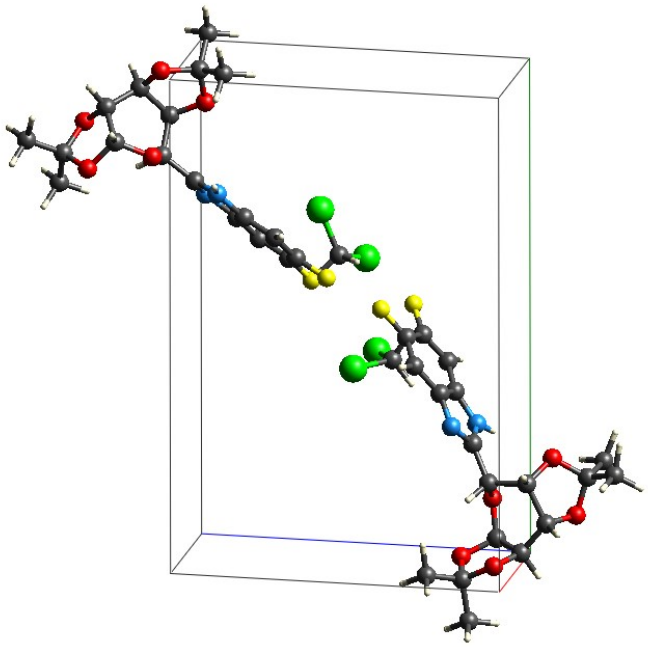


Figure S8: Crystal packing of compound (**4a**) in a unit cell, with two DCM molecules in unit cell.

Identification code	**4a**	
Empirical formula	$C_{19}\ H_{22}\ Cl_2\ F_2\ N_2\ O_5$	
Formula weight	467.28	
Temperature	100(2) K	
Wavelength	1.54178 Å	
Crystal system	Monoclinic	
Space group	P 21	
Unit cell dimensions	a = 10.0713(12) Å	α= 90°.
	b = 17.542(2) Å	β= 106.352(7)°.
	c = 12.5246(15) Å	γ = 90°.
Volume	2123.2(4) $Å^3$	
Z	4	
Density (calculated)	1.462 Mg/m^3	
Absorption coefficient	3.215 mm^{-1}	
F(000)	968	
Crystal size	0.310 x 0.310 x 0.024 mm^3	
Theta range for data collection	3.678 to 68.288°.	
Index ranges	-12<=h<=12, -21<=k<=21, -15<=l<=15	
Reflections collected	40977	
Independent reflections	7405 [R(int) = 0.1428]	
Completeness to theta = 67.679°	99.6 %	
Refinement method	Full-matrix least-squares on F^2	
Data / restraints / parameters	7405 / 1 / 550	
Goodness-of-fit on F^2	1.053	
Final R indices [I>2sigma(I)]	R1 = 0.0825, wR2 = 0.1923	
R indices (all data)	R1 = 0.1147, wR2 = 0.2122	
Absolute structure parameter	0.128(14)	
Extinction coefficient	0.0050(7)	
Largest diff. peak and hole	1.299 and -0.975 $e.Å^{-3}$	
CCDC	2300614	

Table S3: Crystal packing of compound (**4a**) in a unit cell, with two DCM molecules in unit cell.

3. **5,6-dicl**
bis([1,3

- Spectra

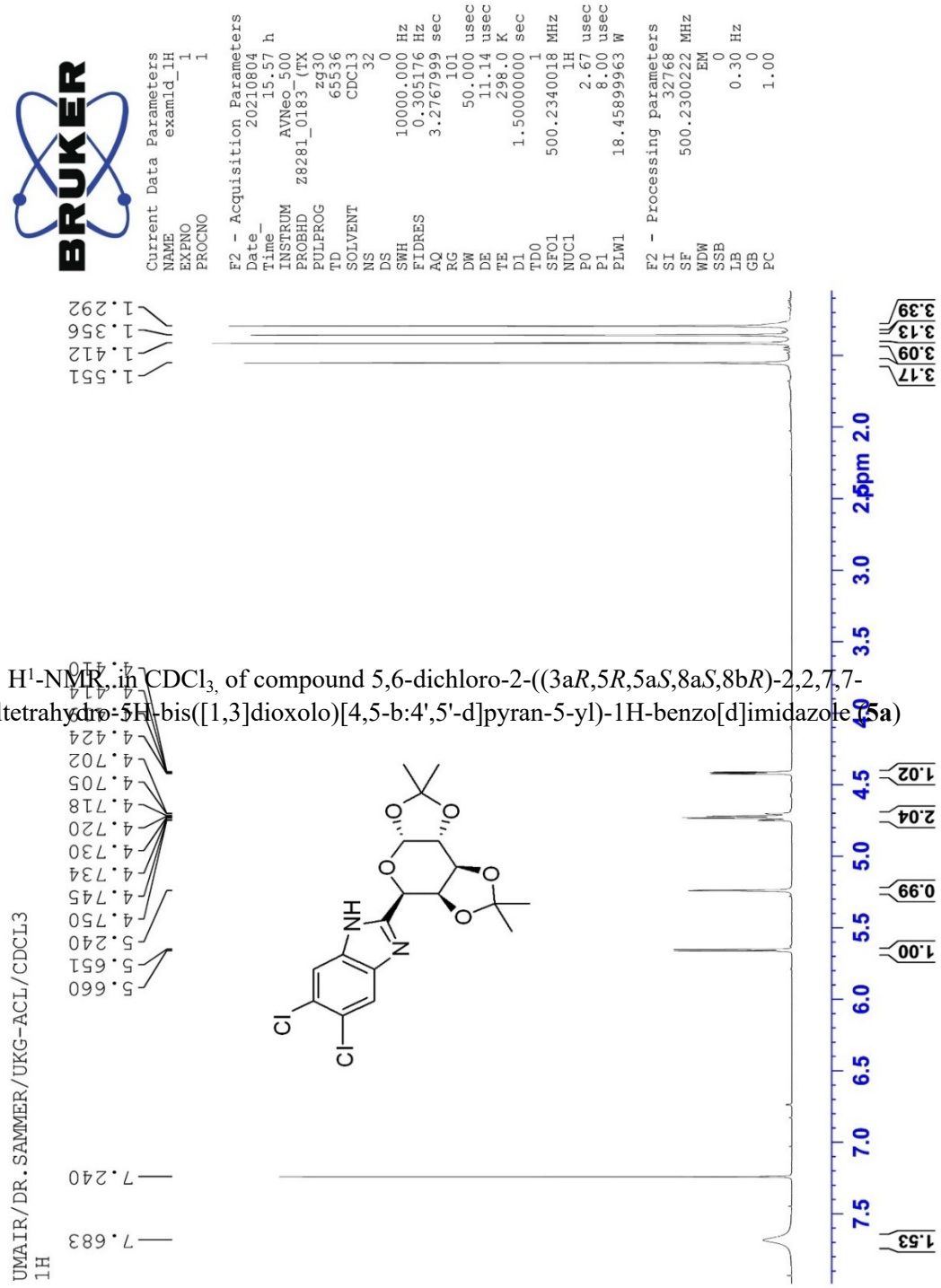


Figure-S9: H^1-NMR, in $CDCl_3$, of compound 5,6-dichloro-2-((3a*R*,5*R*,5a*S*,8a*S*,8b*R*)-2,2,7,7-tetramethyltetrahydro-5H-bis([1,3]dioxolo)[4,5-b:4',5'-d]pyran-5-yl)-1H-benzo[d]imidazole (**5a**)

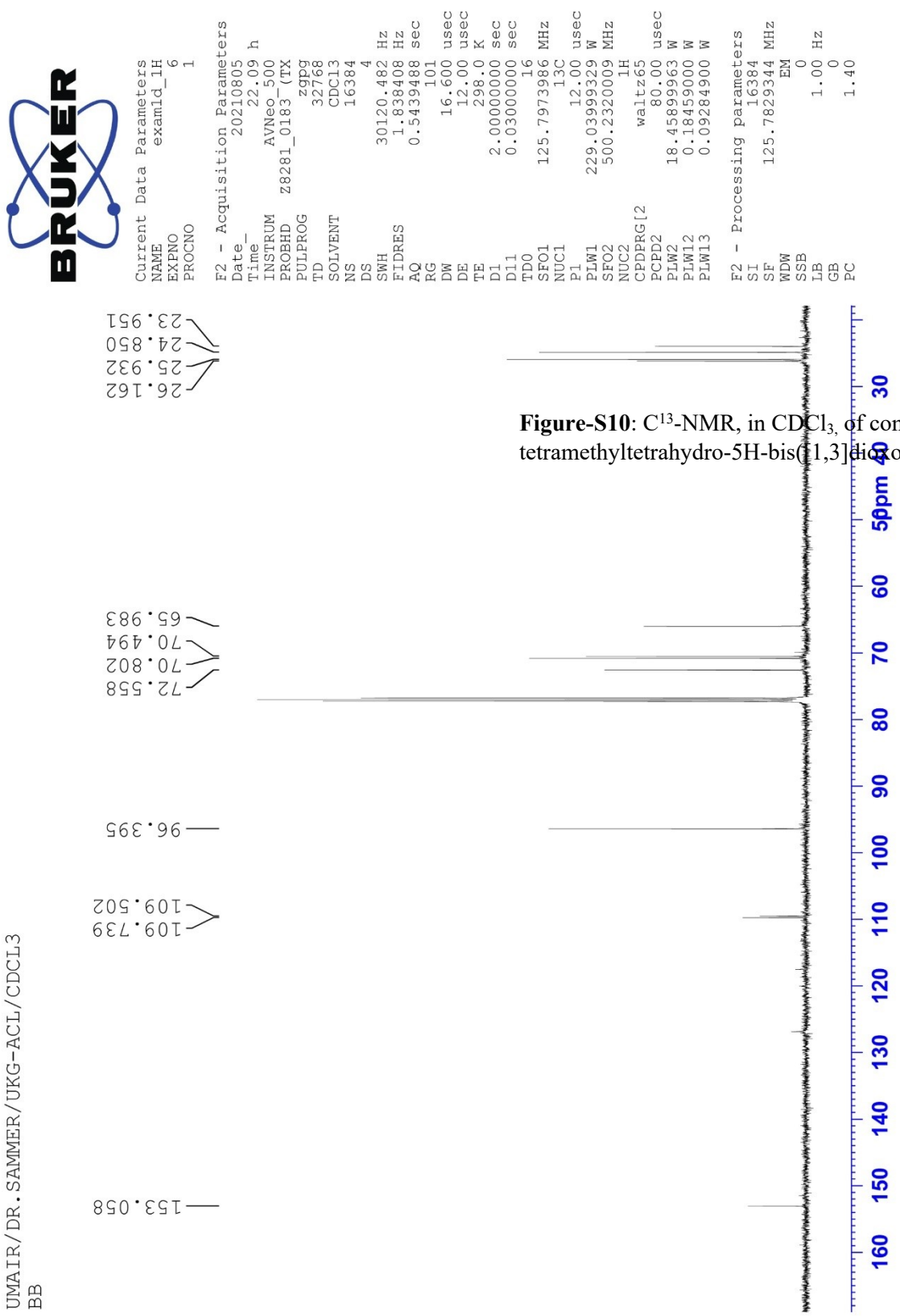


Figure-S10: C^{13}-NMR, in $CDCl_3$, of compound 5,6-dichloro-2-((
tetramethyltetrahydro-5H-bis([1,3]dioxolo)[4,5-b:4',5'-d]pyran-5

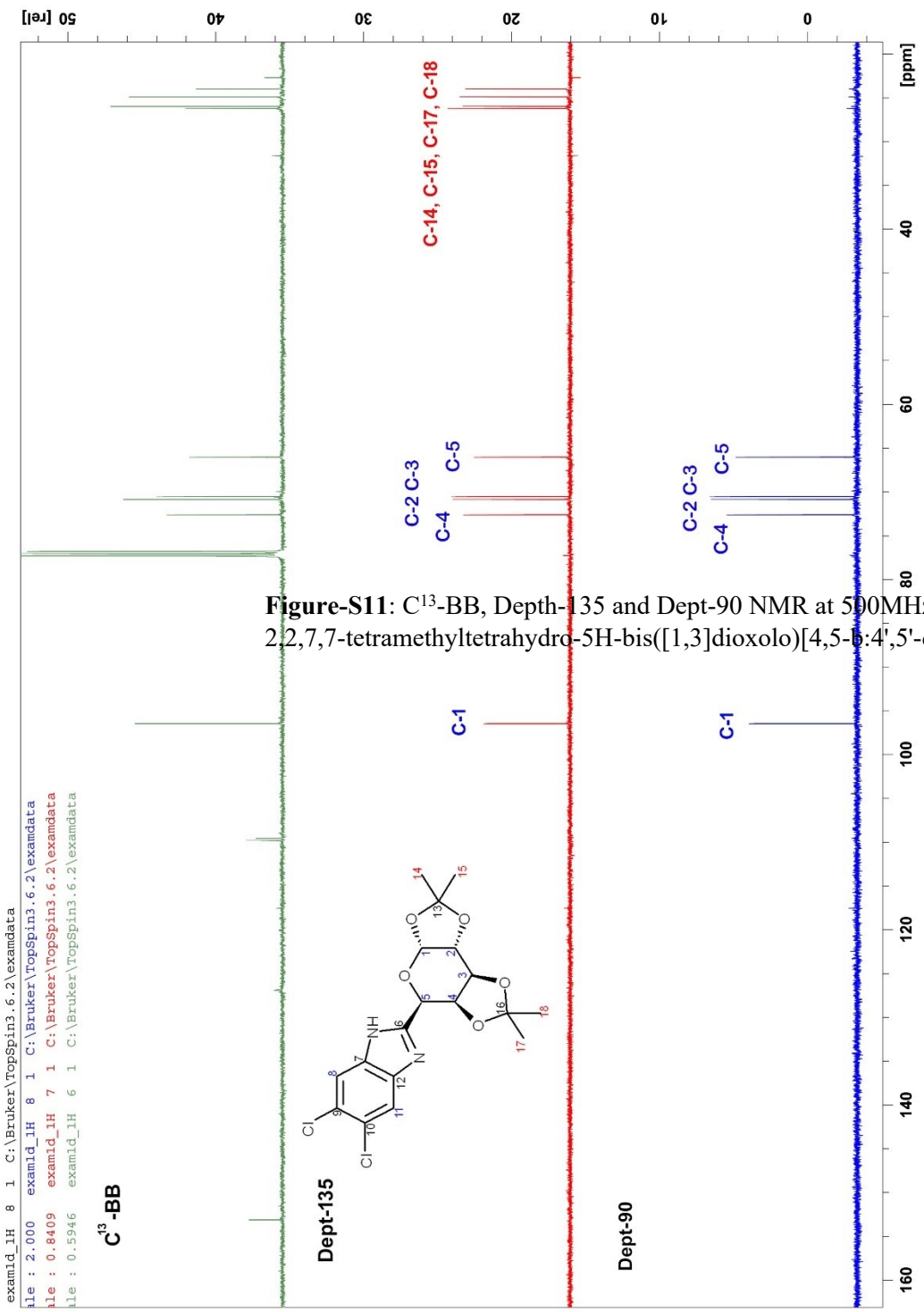


Figure-S11: C^{13}-BB, Depth-135 and Dept-90 NMR at 500MHz 5,6-dich
2,2,7,7-tetramethyltetrahydro-5H-bis([1,3]dioxolo)[4,5-b:4',5'-d]pyran-5

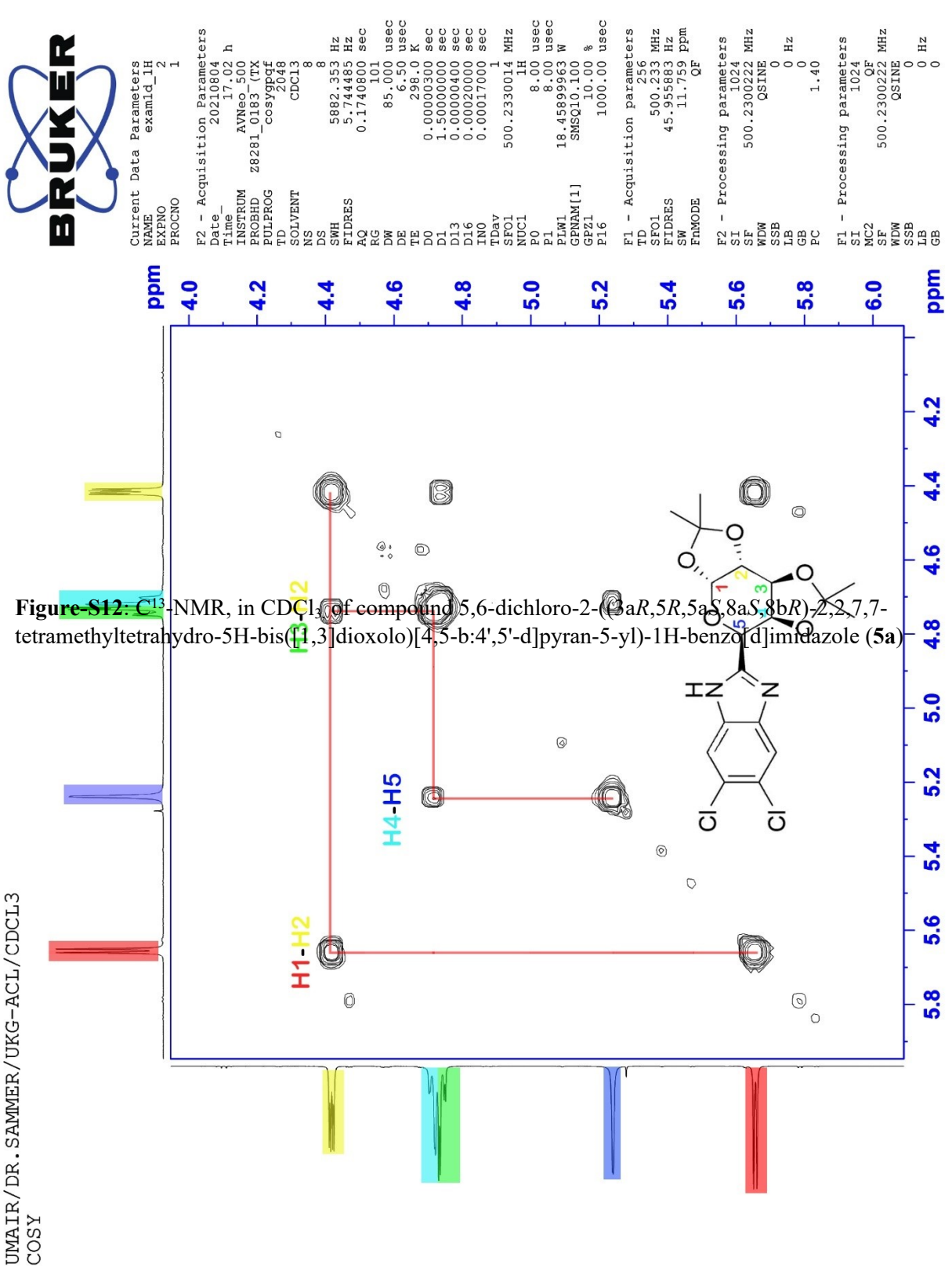


Figure-S12: C^{13}-NMR, in $CDCl_3$ of compound 5,6-dichloro-2-((3a*R*,5*R*,5a*S*,8a*S*,8b*R*)-2,2,7,7-tetramethyltetrahydro-5H-bis([1,3]dioxolo)[4,5-b:4',5'-d]pyran-5-yl)-1H-benzo[d]imidazole (**5a**)

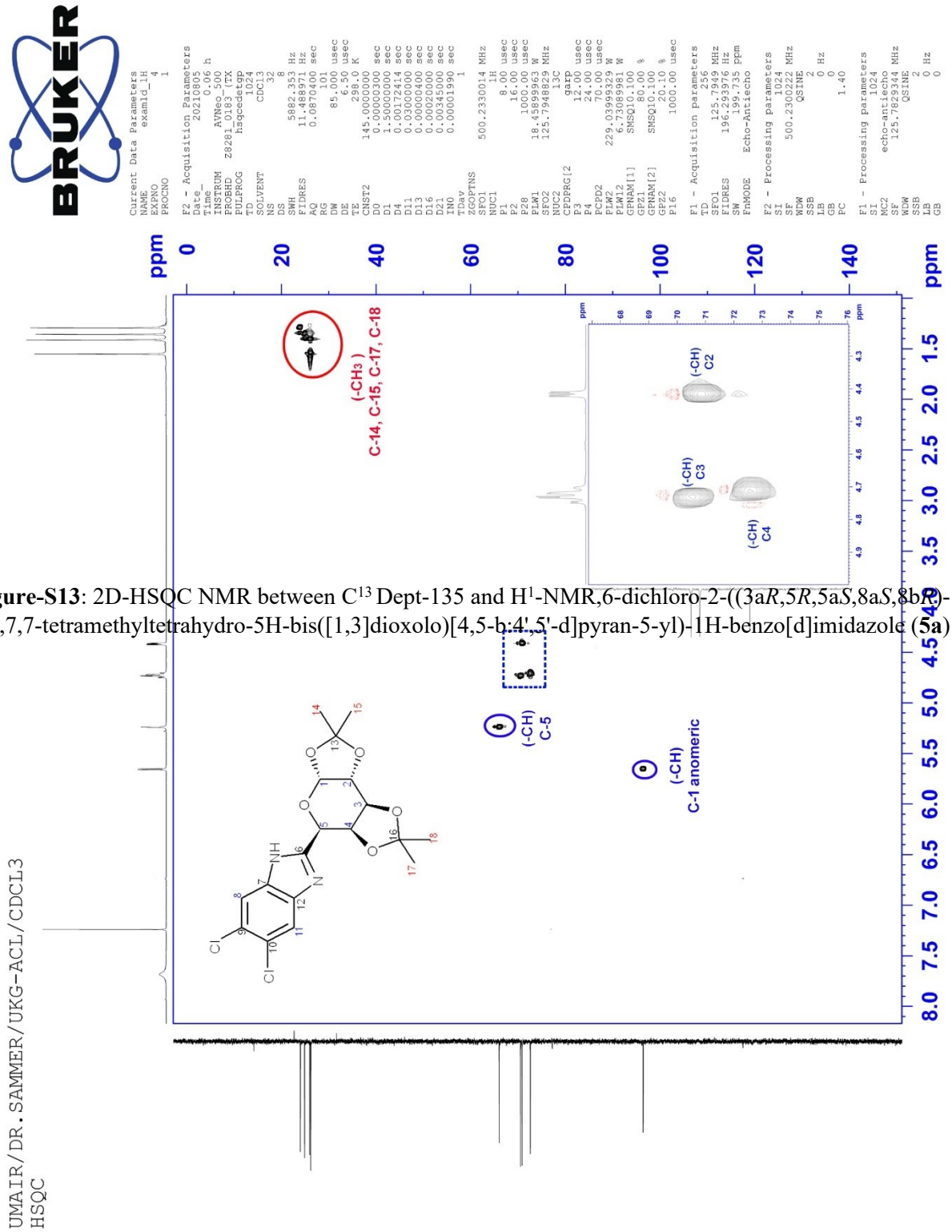


Figure-S13: 2D-HSQC NMR between C^{13} Dept-135 and H^{1}-NMR,6-dichloro-2-((3a*R*,5*R*,5a*S*,8a*S*,8b*R*)-2,2,7,7-tetramethyltetrahydro-5H-bis([1,3]dioxolo)[4,5-b:4',5'-d]pyran-5-yl)-1H-benzo[d]imidazole (**5a**)

- FAB +ve low- and high- resolution Mass spectrometery of compound **(5a)** :

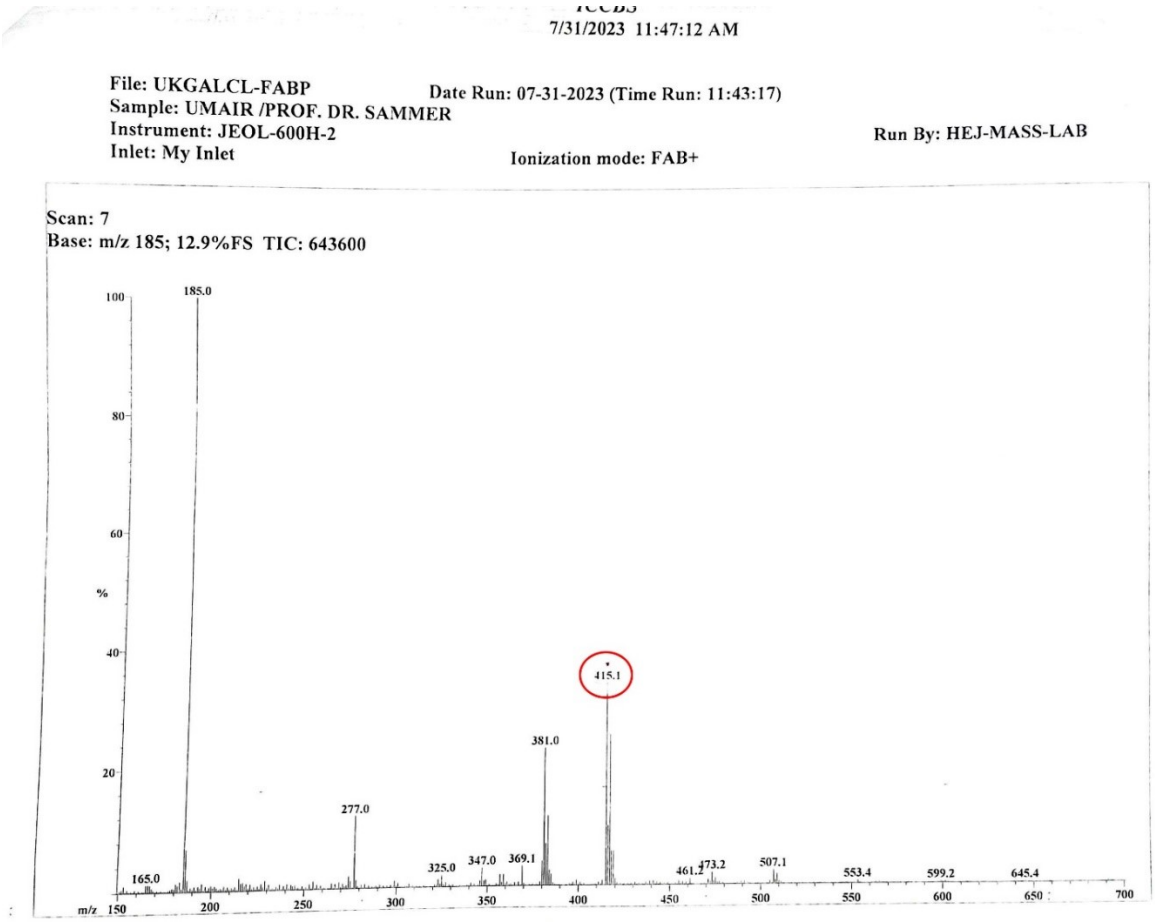


Figure-S14: Low resolution positive mode of FAB spectra of **5a**. Encircled is the *m/z* value 415.1.

High resolution FAB (m+1) positive mode at JEOL HX 110 Mass spectrometer of compound **5a** is **415.0808,** while theoretical mass was 415.0828 which corresponds to the composition of **$C_{18}H_{21}O_5N_2Cl_2$.**

4. **Spectra**
tetrame
benzo[d

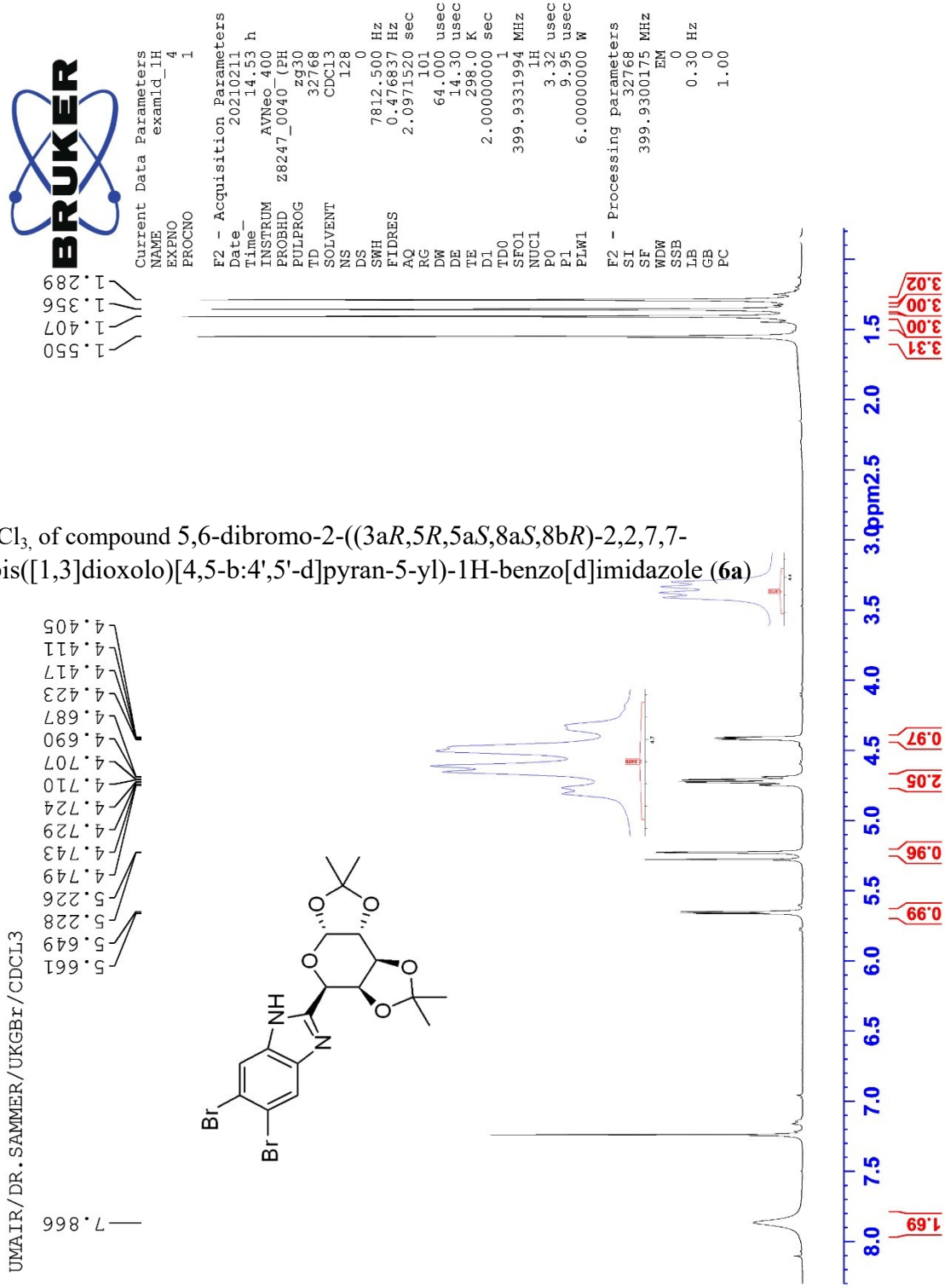


Figure-S15: H^1-NMR, in $CDCl_3$, of compound 5,6-dibromo-2-((3a*R*,5*R*,5a*S*,8a*S*,8b*R*)-2,2,7,7-tetramethyltetrahydro-5H-bis([1,3]dioxolo)[4,5-b:4',5'-d]pyran-5-yl)-1H-benzo[d]imidazole (**6a**)

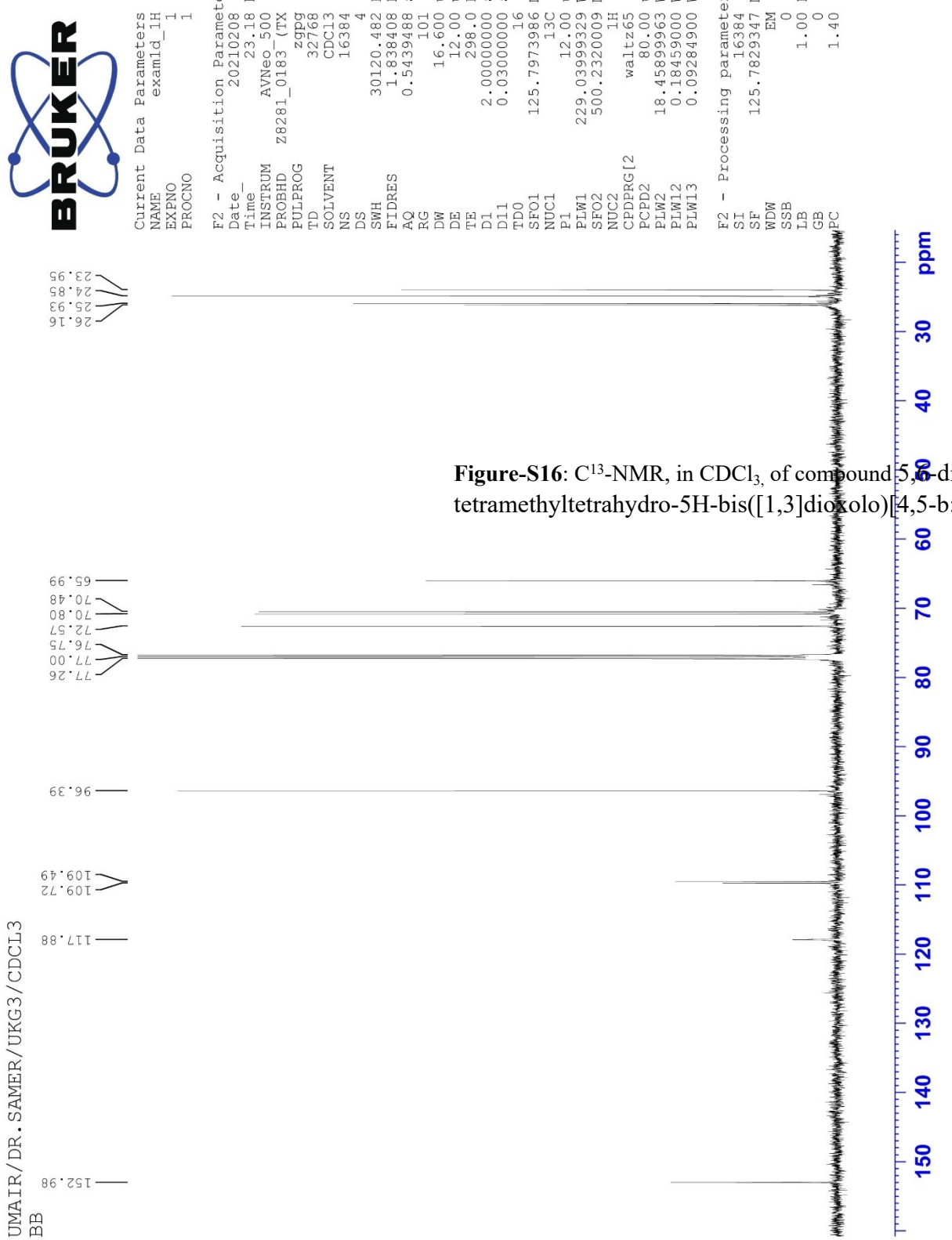


Figure-S16: C^{13}-NMR, in $CDCl_3$, of compound 5,6-dibromo-2-((3a*R*,5
tetramethyltetrahydro-5H-bis([1,3]dioxolo)[4,5-b:4',5'-d]pyran-5-y

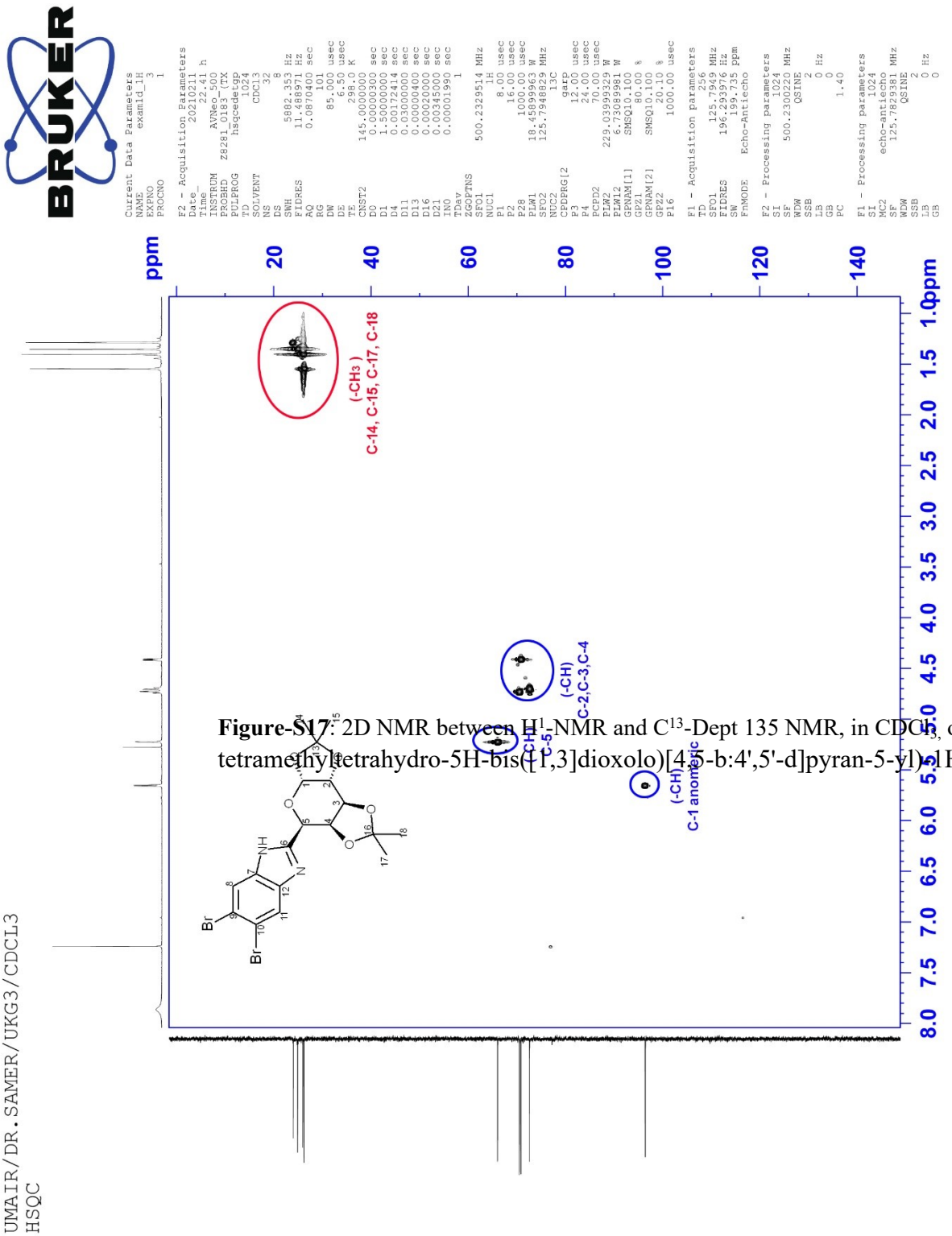


Figure-S17: 2D NMR between H^1-NMR and C^{13}-Dept 135 NMR, in $CDCl_3$, of com
tetramethyltetrahydro-5H-bis([1,3]dioxolo)[4,5-b:4',5'-d]pyran-5-yl)-1H-ben

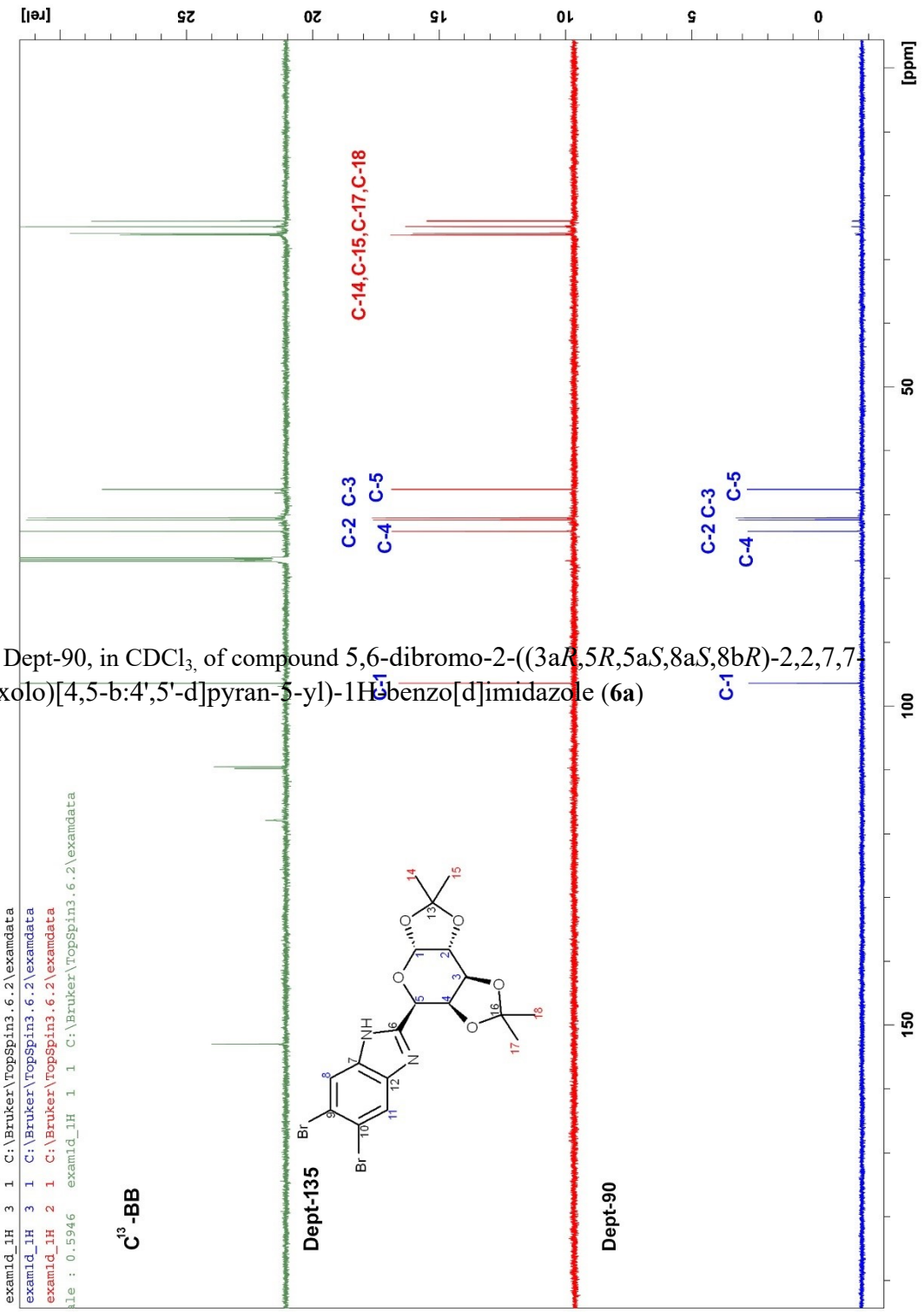


Figure-S18: C^{13} NMR BB, Dept-135 and Dept-90, in $CDCl_3$, of compound 5,6-dibromo-2-((3a*R*,5*R*,5a*S*,8a*S*,8b*R*)-2,2,7,7-tetramethyltetrahydro-5H-bis([1,3]dioxolo)[4,5-b:4',5'-d]pyran-5-yl)-1H-benzo[d]imidazole (**6a**)

- FAB +ve low- and high- resolution Mass spectrometery of compound (6a)

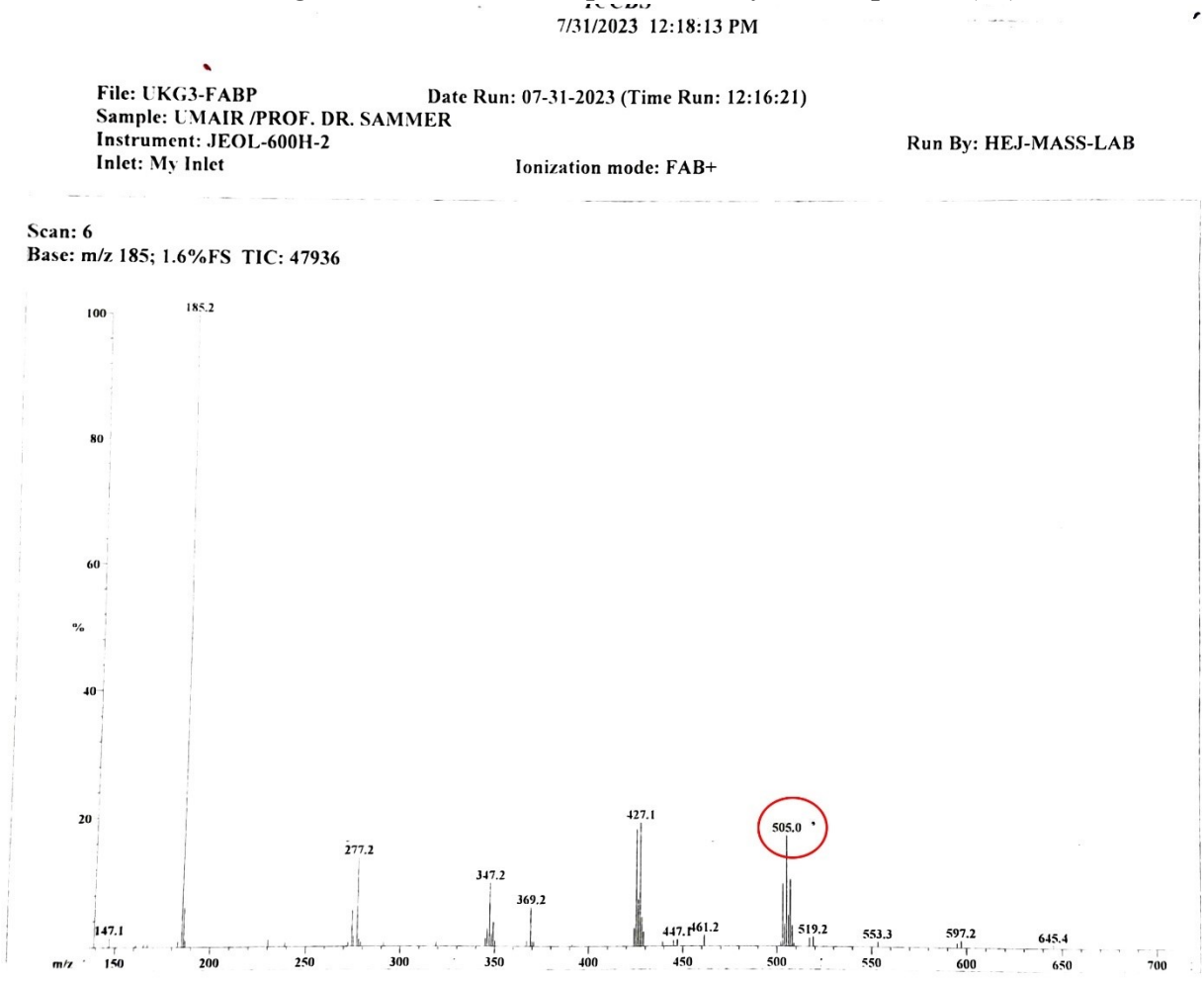


Figure-S19: Low resolution positive mode of FAB spectra of **6a**. Encircled is the ***m/z* value 505.0**.

High resolution FAB positive mode at JEOL HX 110 Mass spectrometer of compound **6a** is **504.0808,** while theoretical mass was 504.1828 which corresponds to the composition of **$C_{18}H_{21}O_5N_2Br_2$.**

5. 5-bromo-2-((3aR,5R,5aS,8aS,8bR)-2,2,7,7-tetramethyltetrahydro-5H-bis([1,3]dioxolo)[4,5-b:4',5'-d]pyran-5-yl)-1H-benzo[d]imidazole (7a):

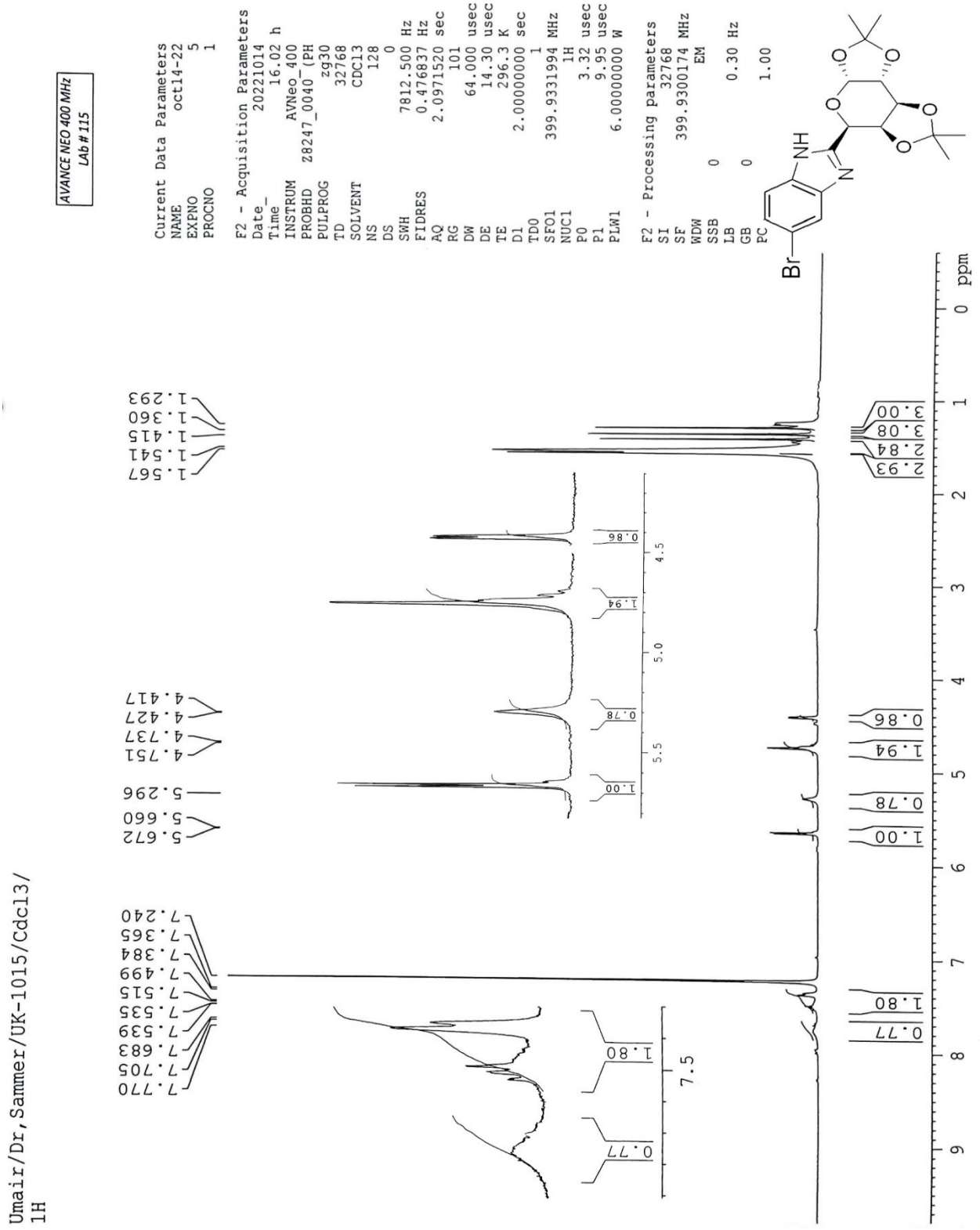


Figure-S20: H^1 NMR, in $CDCl_3$, of compound 5-bromo-2-((3aR,5R,5aS,8aS,8bR)-2,2,7,7-tetramethyltetrahydro-5H-bis([1,3]dioxolo)[4,5-b:4',5'-d]pyran-5-yl)-1H-benzo[d]imidazole (**7a**):

- Mass spectrometery of compound **(7a)**

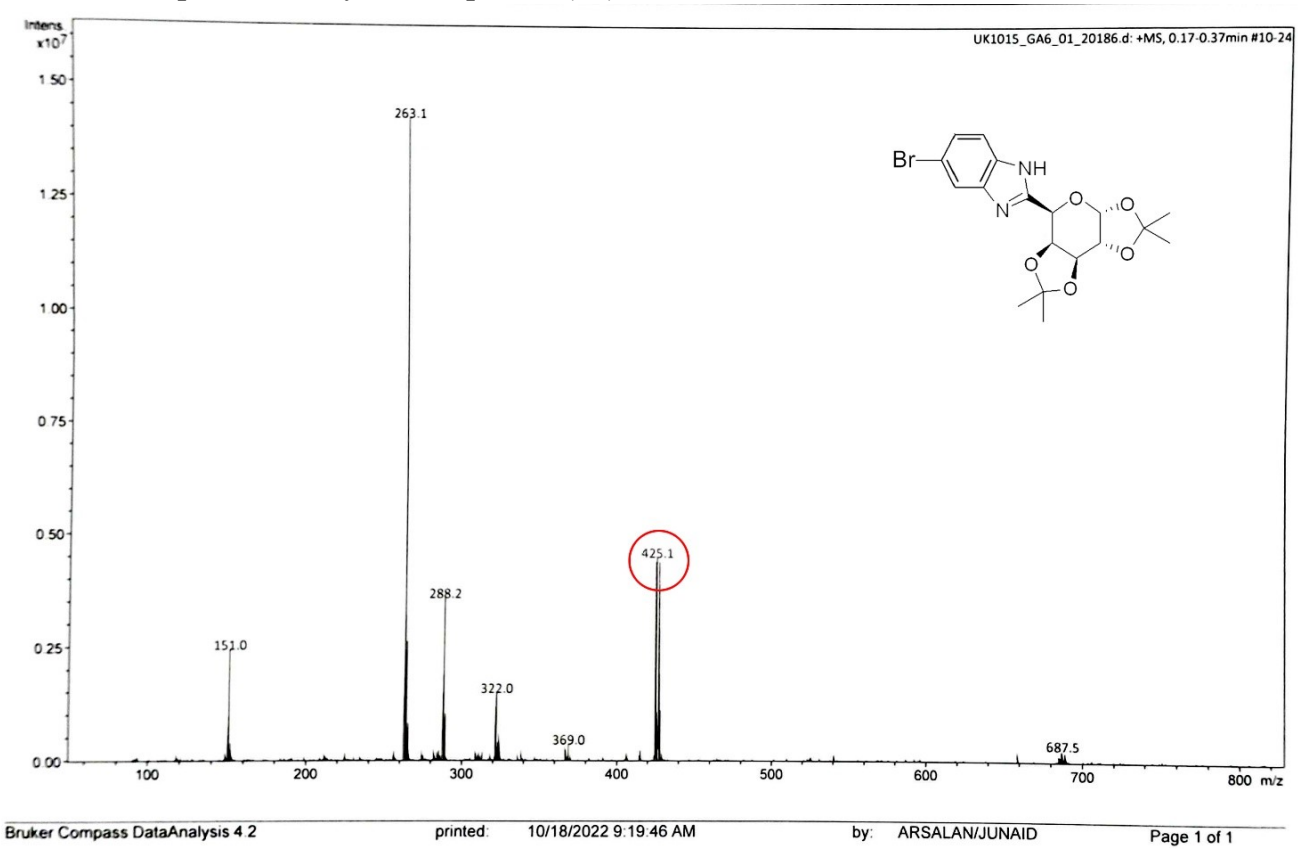
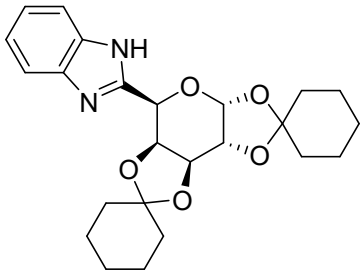


Figure-S21: LR-ESI MS positive of 5-bromo-2-((3aR,5R,5aS,8aS,8bR)-2,2,7,7-tetramethyltetrahydro-5H-bis([1,3]dioxolo)[4,5-b:4',5'-d]pyran-5-yl)-1H-benzo[d]imidazole (**7a**):

High resolution FAB positive mode (m+1) + ve mode at JEOL HX 110 Mass spectrometer of compound **7a** is **425.0808,** while theoretical mass was 425.1808 which corresponds to the composition of **$C_{18}H_{22}BrN_2O_5$.**

6. **2-((3a'*R*,5'*R*,5a'*S*,8a'*S*,8b'*R*)-tetrahydro-5'H-dispiro[cyclohexane-1,2'-bis([1,3]dioxolo)[4,5-b:4',5'-d]pyran-7',1''-cyclohexan]-5'-yl)-1H-benzo[d]imidazole (3b)**



(3b)

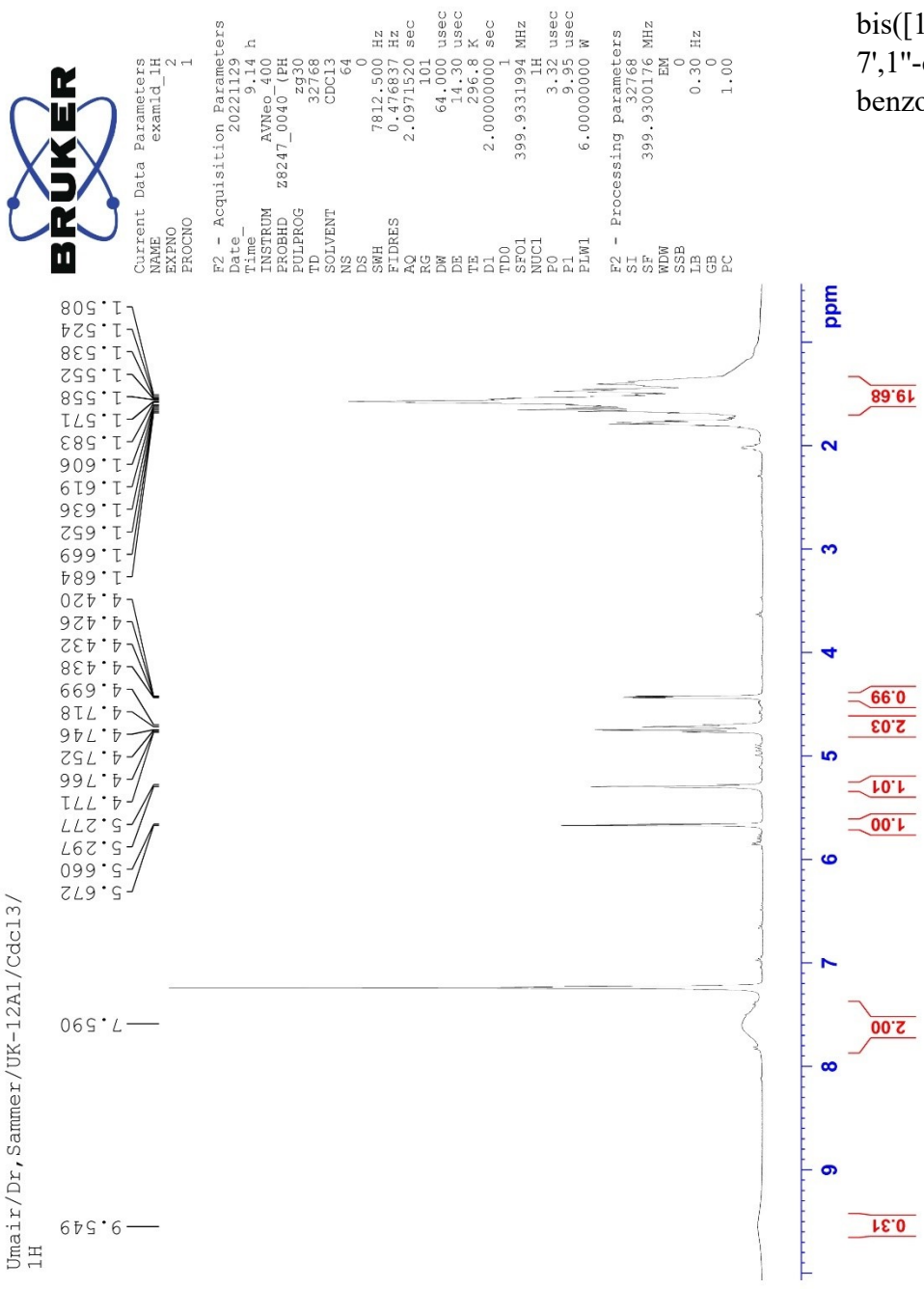


Figure-S22: H^1-NMR at 500MHz $CDCl_3$, of compound 2-((3a'*R*,5'*R*,5a'*S*,8a'*S*,8b'*R*)-tetrahy 5'H-dispiro[cyclohexane-1,2'-bis([1,3]dioxolo)[4,5-b:4',5'-d]p 7',1''-cyclohexan]-5'-yl)-1H-benzo[d]imidazole

- FAB +ve low- and high- resolution Mass spectrometery of compound **(3b)**

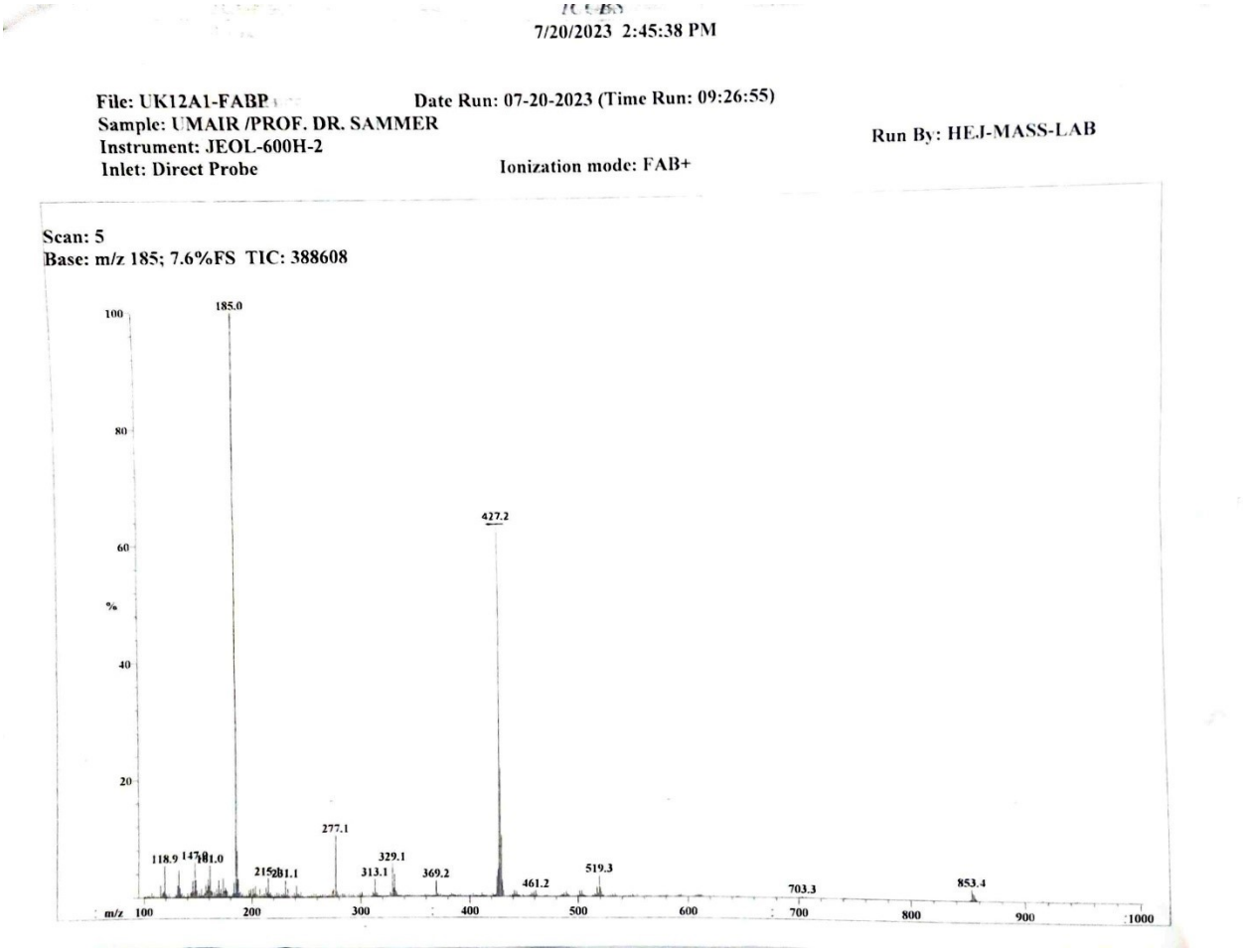
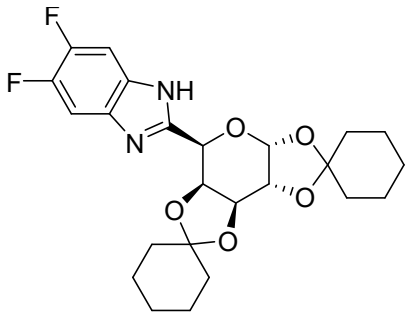


Figure S23: Low resolution FAB (+ve) of compound (**3b**) having m/z= 427.2

High resolution FAB (m+1) positive mode at JEOL HX 110 Mass spectrometer of compound **3b** is **427.2233,** while theoretical mass was 427.2233 which corresponds to the composition of **$C_{24}H_{31}N_2O_5$.**

7. **5,6-difluoro-2-((3a'*R*,5'*R*,5a'*S*,8a'*S*,8b'*R*)-tetrahydro-5'H-dispiro[cyclohexane-1,2'-bis([1,3]dioxolo)[4,5-b:4',5'-d]pyran-7',1''-cyclohexan]-5'-yl)-1H-benzo[d]imidazole (4b)**



(4b)

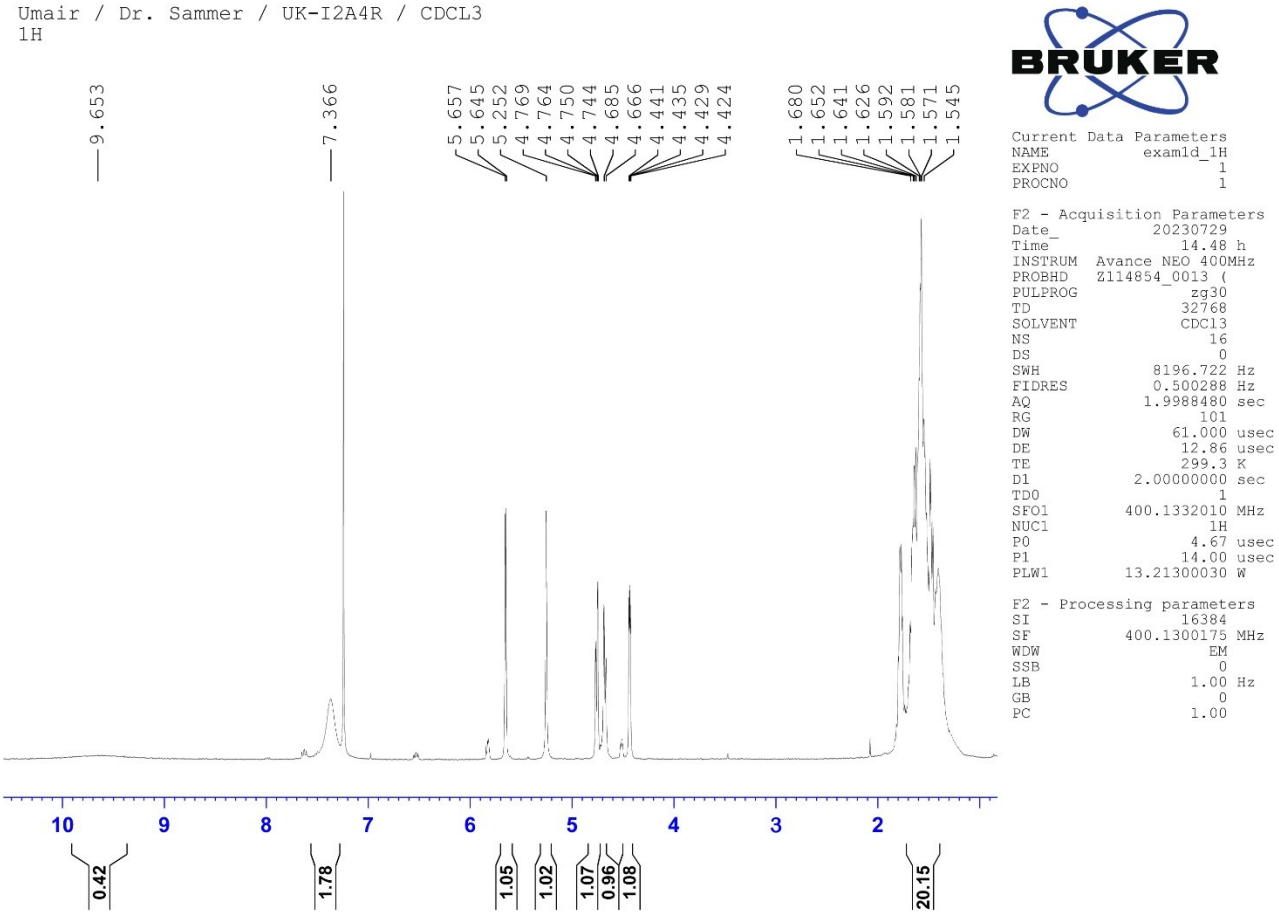


Figure-S24: H^1-NMR, in $CDCl_3$, of compound 5,6-difluoro-2-((3a'R,5'R,5a'S,8a'S,8b'R)-tetrahydro-5'H-dispiro[cyclohexane-1,2'-bis([1,3]dioxolo)[4,5-b:4',5'-d]pyran-7',1''-cyclohexan]-5'-yl)-1H-benzo[d]imidazole (**4b**)

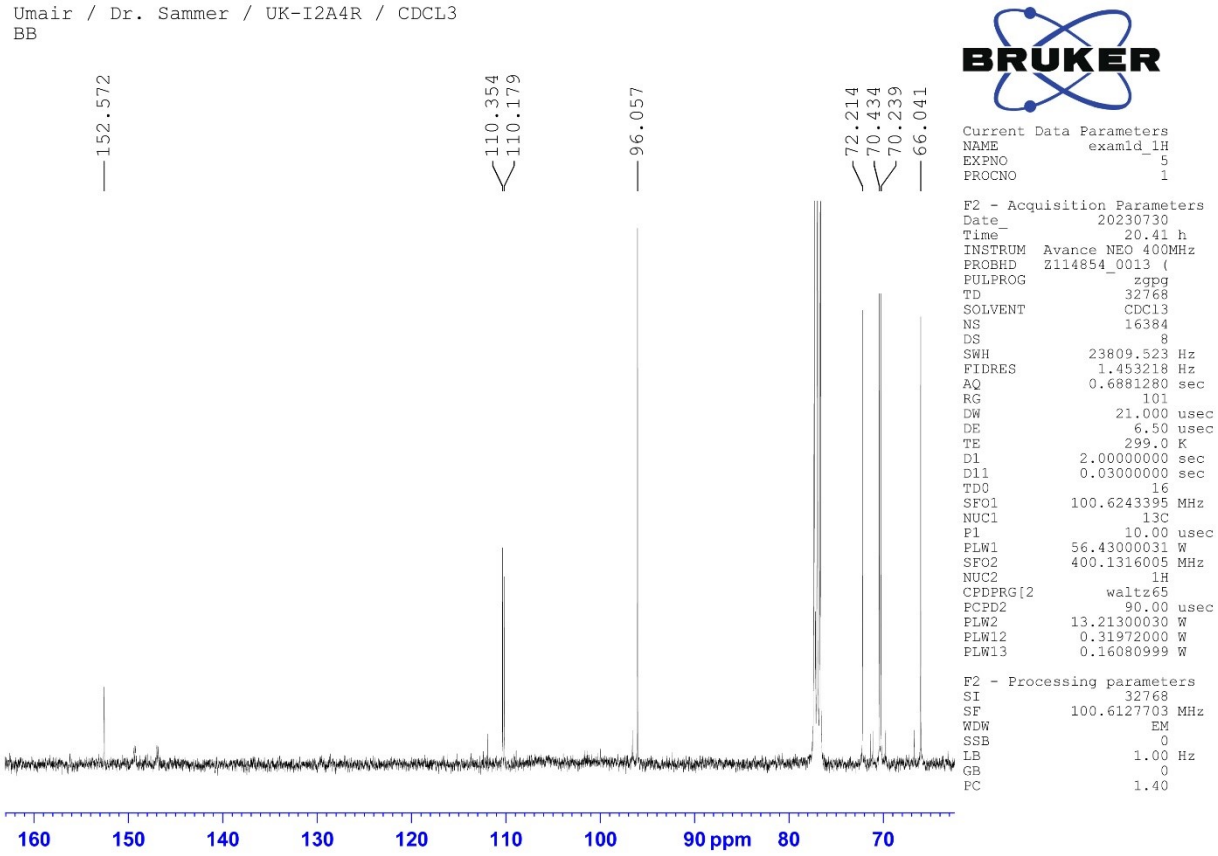


Figure-S25: C^{13}-NMR, in $CDCl_3$, of compound 5,6-difluoro-2-((3a'R,5'R,5a'S,8a'S,8b'R)-tetrahydro-5'H-dispiro[cyclohexane-1,2'-bis([1,3]dioxolo)[4,5-b:4',5'-d]pyran-7',1''-cyclohexan]-5'-yl)-1H-benzo[d]imidazole (**4b**)

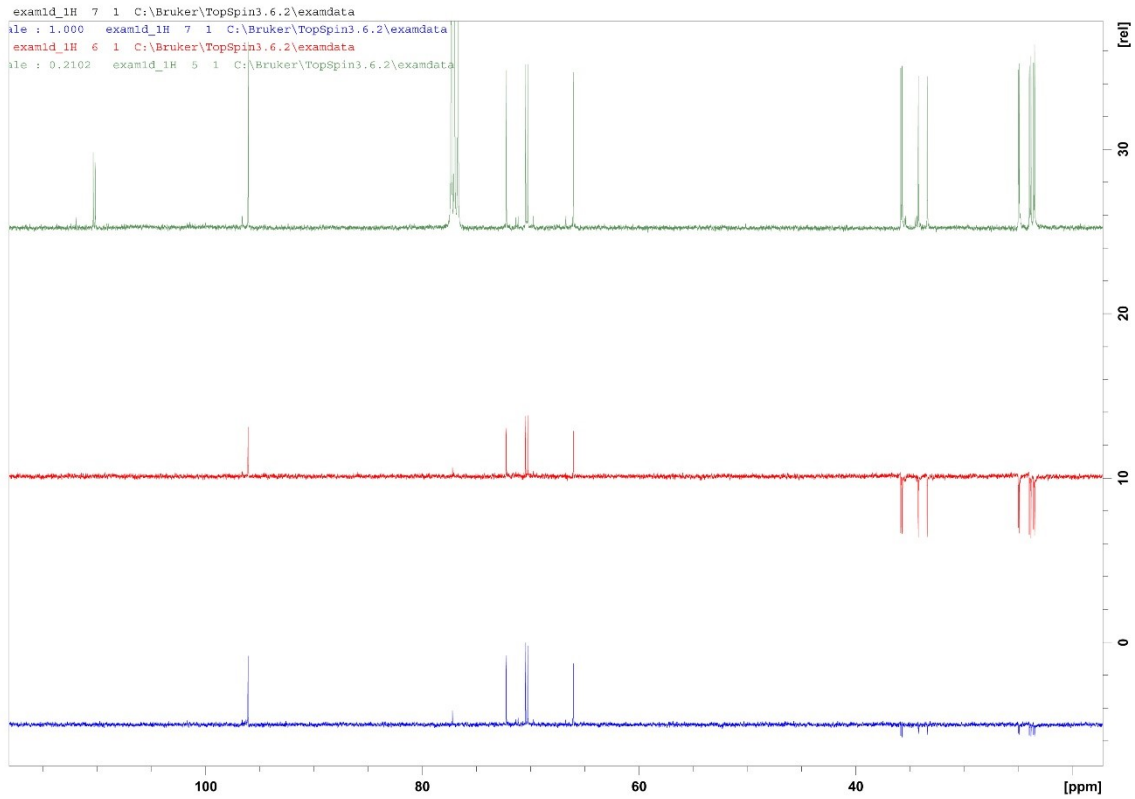


Figure-S26: C^{13}-NMR (BB, Dept-135, Dept-90), in $CDCl_3$, of compound 5,6-difluoro-2-((3a'R,5'R,5a'S,8a'S,8b'R)-tetrahydro-5'H-dispiro[cyclohexane-1,2'-bis([1,3]dioxolo)[4,5-b:4',5'-d]pyran-7',1''-cyclohexan]-5'-yl)-1H-benzo[d]imidazole (**4b**)

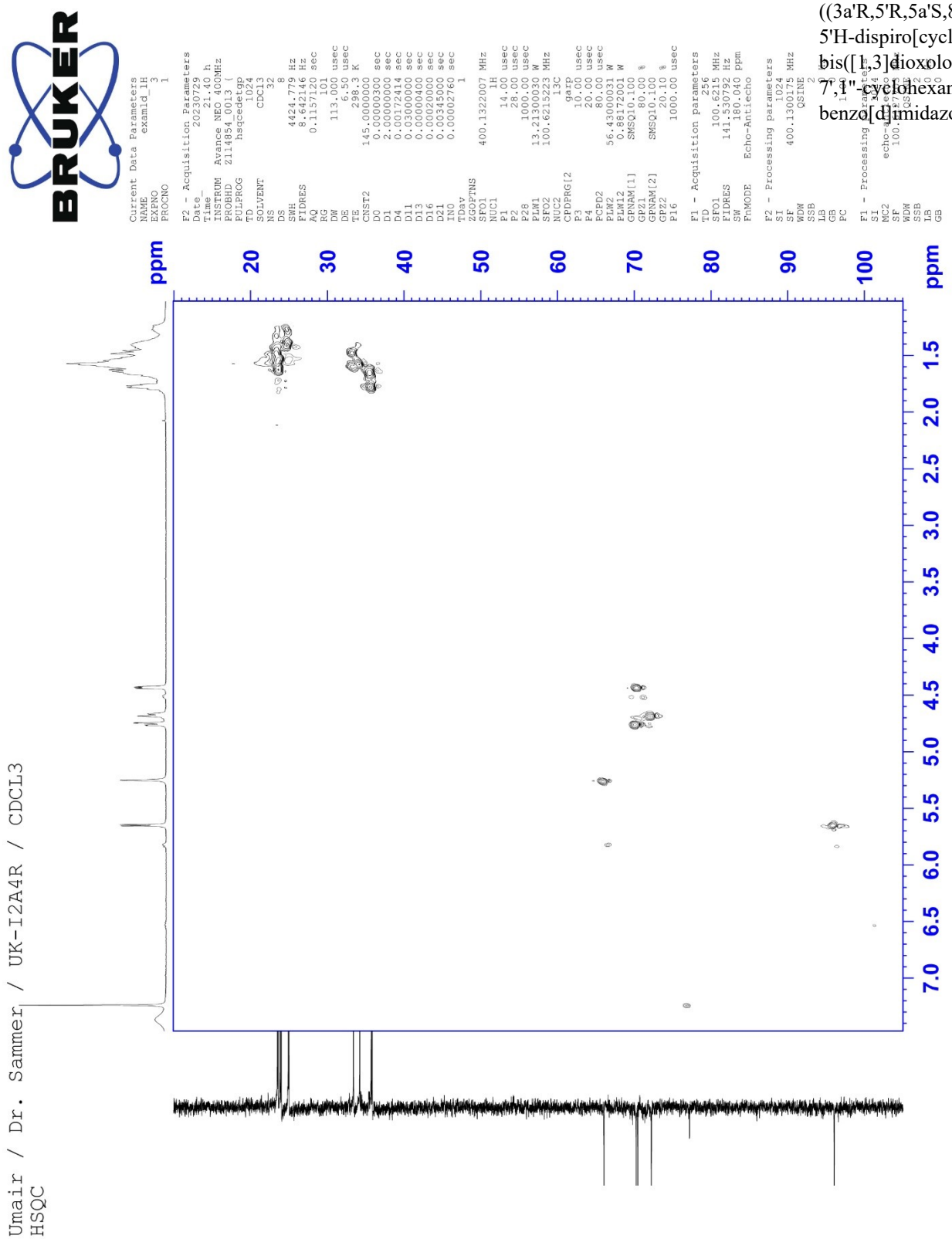


Figure-S27: 2D HSQC [H^1-NMR and C^{13}-NMR (Dept-135)], in $CDCl_3$, of compound 5,6-difluoro-2-((3a'R,5'R,5a'S,8a'S,8b'R)-tetrahydro-5'H-dispiro[cyclohexane-1,2'-bis([1,3]dioxolo)[4,5-b:4',5'-d]pyran-7',1''-cyclohexan]-5'-yl)-1H-benzo[d]imidazole (**4b**)

- FAB +ve mood low and high resolution of compound 4b

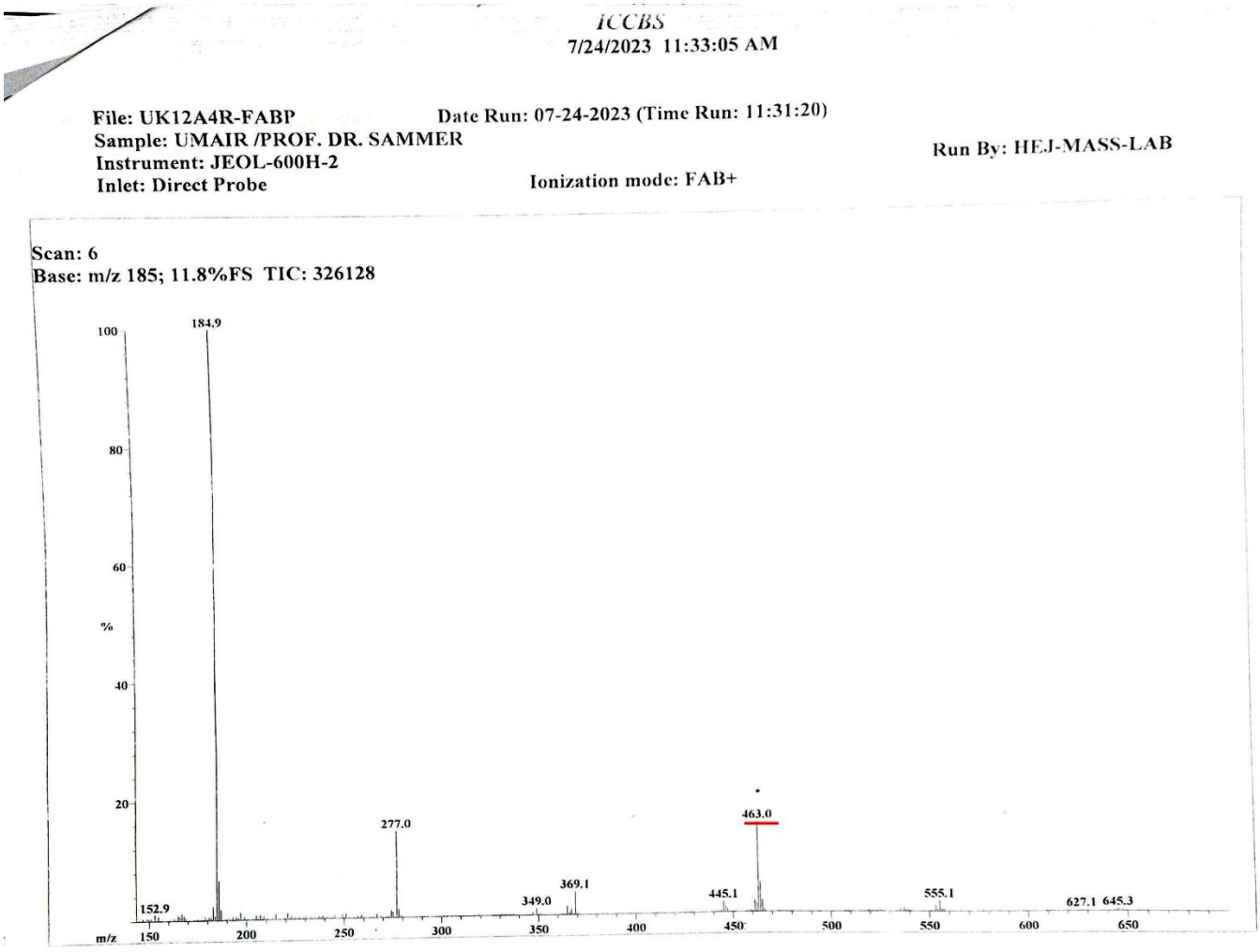
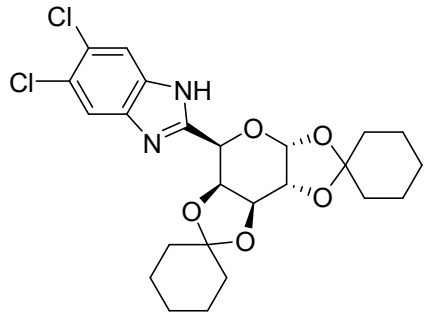


Figure S28: LR-FAB (+ve) shows the m/z value of 463.0 of compound (**4b**)

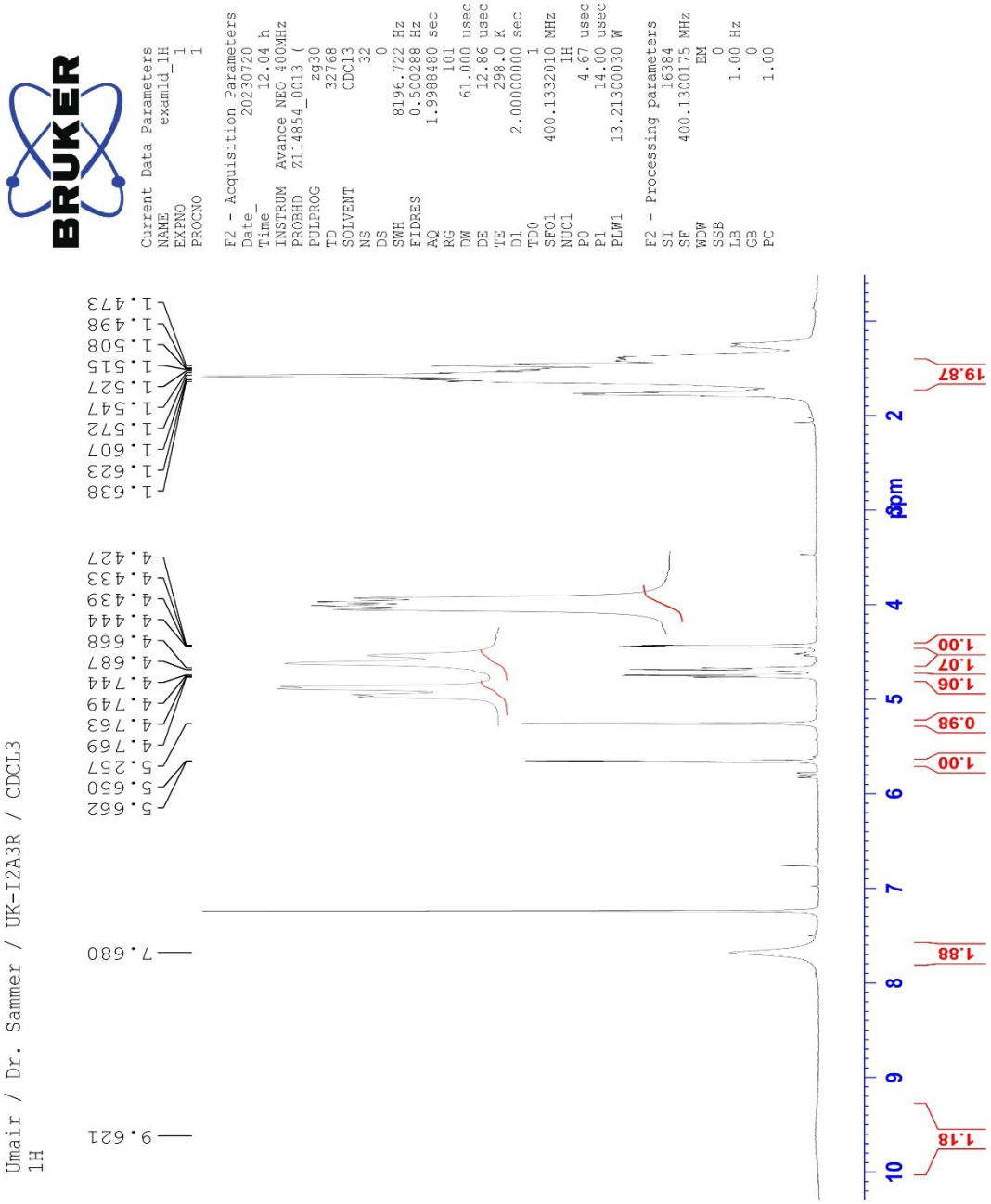
High resolution FAB positive mode at JEOL HX 110 Mass spectrometer of compound **4b** is **463.2059**, while theoretical mass was 463.2045 which corresponds to the composition of **$C_{24}H_{29}N_2O_5F_2$.**

8. 5,6-dichloro-2-((3a'*R*,5'*R*,5a'*S*,8a'*S*,8b'*R*)-tetrahydro-5'H-dispiro[cyclohexane-1,2'-bis([1,3]dioxolo)[4,5-b:4',5'-d]pyran-7',1''-cyclohexan]-5'-yl)-1H-benzo[d]imidazole (5b):



(5b)

Figure-S29: H[1]-NMR at 5
$CDCl_3$, of compound 5,6-di
((3a'*R*,5'*R*,5a'*S*,8a'*S*,8b'*R*)-te
dispiro[cyclohexane-1,2'-
bis([1,3]dioxolo)[4,5-b:4',5'
7',1''-cyclohexan]-5'-yl)-1H
benzo[d]imidazole (**5b**)



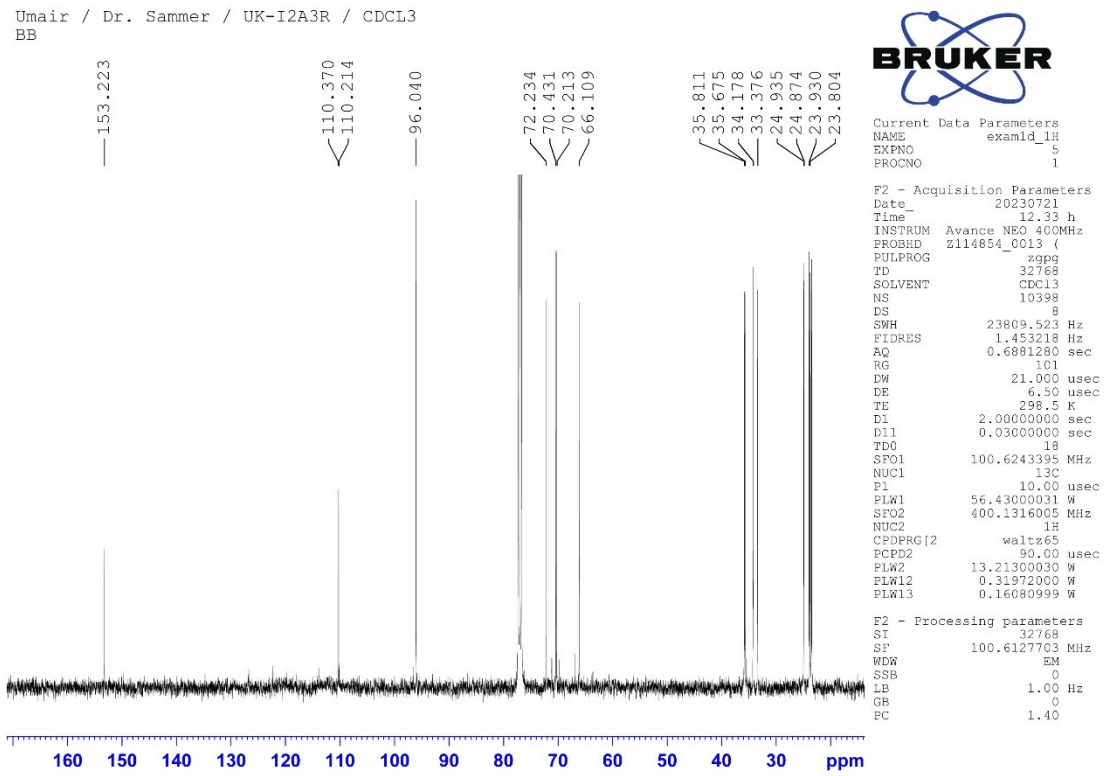


Figure-S30: C^{13}-NMR Broad band, in $CDCl_3$, of compound 5,6-dichloro-2-((3a'*R*,5'*R*,5a'*S*,8a'*S*,8b'*R*)-tetrahydro-5'H-dispiro[cyclohexane-1,2'-bis([1,3]dioxolo)[4,5-b:4',5'-d]pyran-7',1"-cyclohexan]-5'-yl)-1H-benzo[d]imidazole (**5b**)

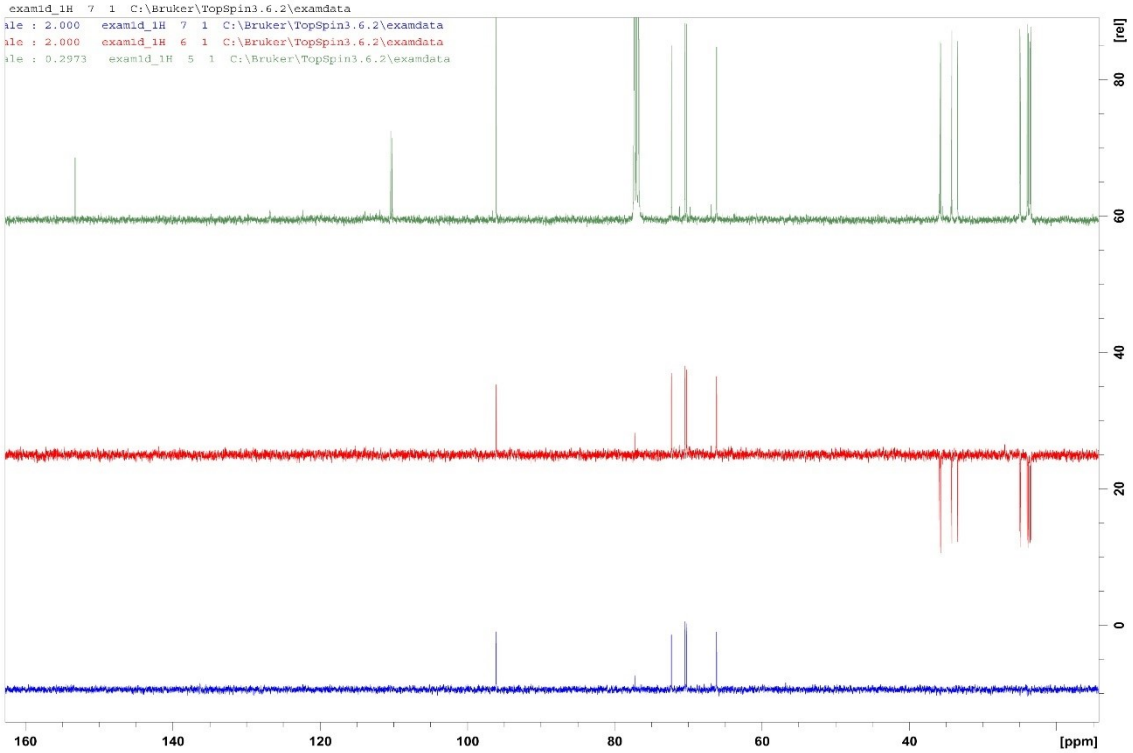


Figure-S31: C^{13}-NMR BB, Dept-135, Dept-90, in $CDCl_3$, of compound 5,6-dichloro-2-((3a'*R*,5'*R*,5a'*S*,8a'*S*,8b'*R*)-tetrahydro-5'H-dispiro[cyclohexane-1,2'-bis([1,3]dioxolo)[4,5-b:4',5'-d]pyran-7',1"-cyclohexan]-5'-yl)-1H-benzo[d]imidazole (**5b**)

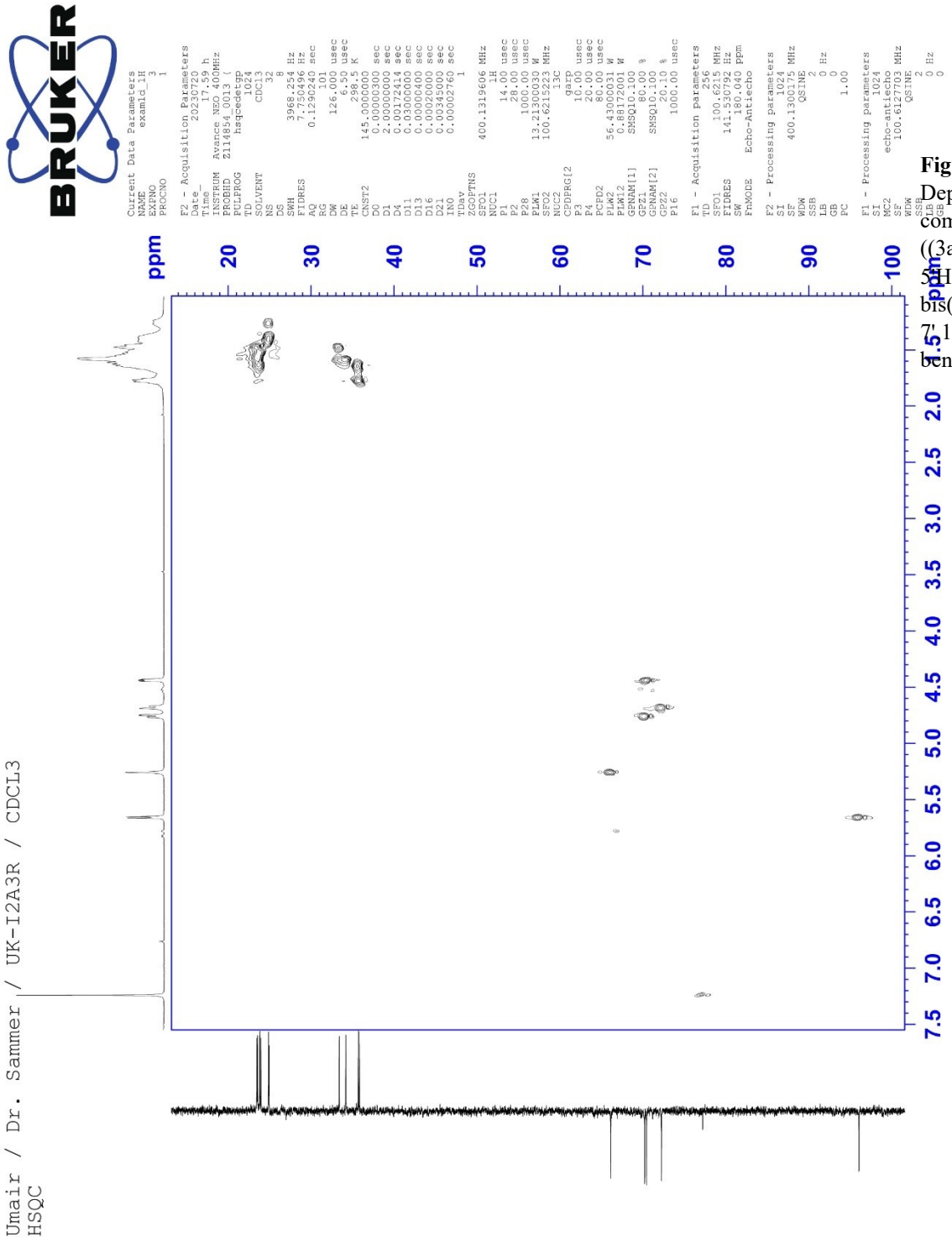


Figure-S32: 2D HSQC N
Dept-135 and H^1-NMR), in
compound 5,6-d
((3a'*R*,5'*R*,5a'*S*,8a'*S*,8b'*R*)-tetr
5'H-dispiro[cyclohexane-1,2'
bis([1,3]dioxolo)[4,5-b:4',5'-
7',1"-cyclohexan]-5'-yl)-1H-
benzo[d]imidazole (**5b**)

- Single crystal XRD analysis of compound **5a**

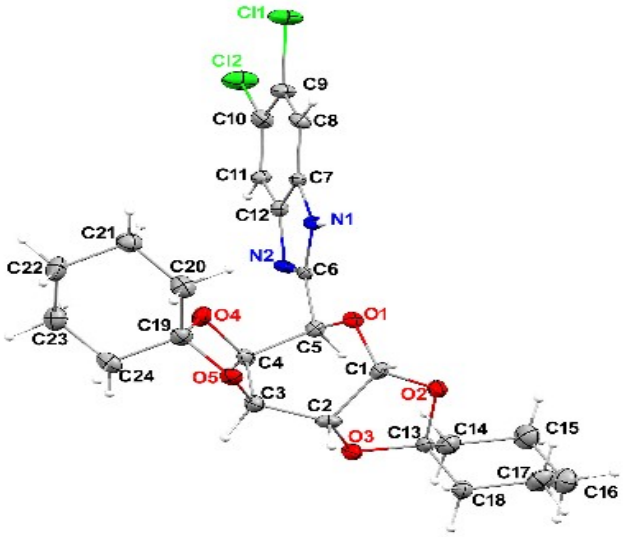


Figure-S33: ORTEP view of compound **5b**.

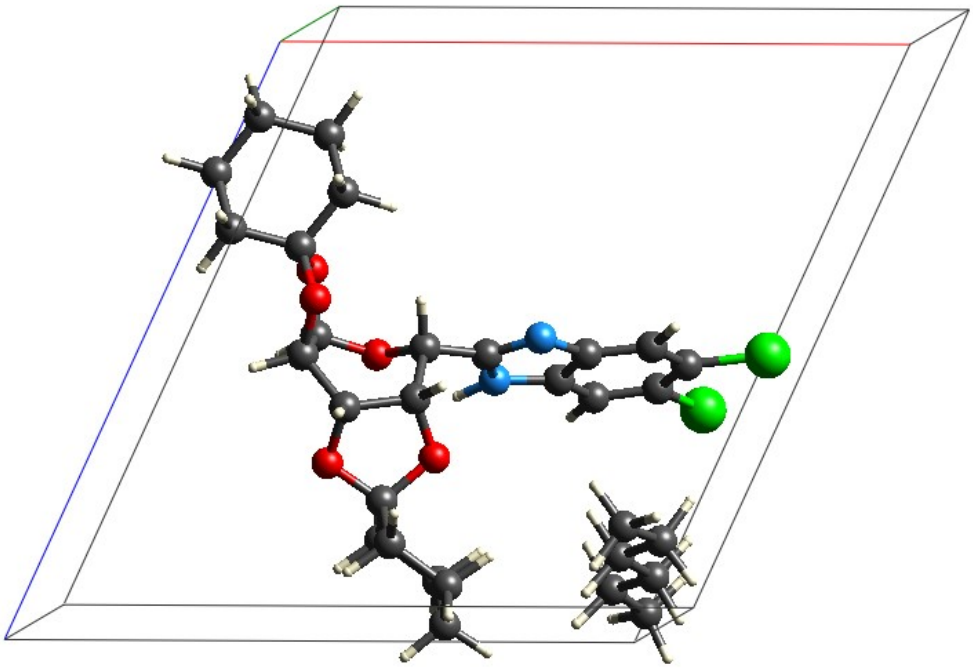


Figure-S34: Compound **5b** crystallized with *n*-hexane in unit cell, crystallized with one hexane molecule in unit cell.

Identification code	UK12A3	
Empirical formula	C_{24} H_{29} Cl_2 N_2 O_5	
Formula weight	1163.11	
Temperature	100(2) K	
Wavelength	1.54178 Å	
Crystal system	Monoclinic	
Space group	P 21	
Unit cell dimensions	a = 13.3850(7) Å	α= 90°.
	b = 17.9218(10) Å	β= 114.647(3)°.
	c = 13.9875(8) Å	γ = 90°.
Volume	3049.7(3) $Å^3$	
Z	2	
Density (calculated)	1.267 Mg/m^3	
Absorption coefficient	2.239 mm^{-1}	
F(000)	1240	
Crystal size	0.32 x 0.22 x 0.15 mm^3	
Theta range for data collection	3.476 to 68.243°.	
Index ranges	-16<=h<=16, -21<=k<=21, -16<=l<=16	
Reflections collected	36114	
Independent reflections	11081 [R(int) = 0.2431]	
Completeness to theta = 67.679°	99.9 %	
Refinement method	Full-matrix least-squares on F^2	
Data / restraints / parameters	11081 / 1 / 714	
Goodness-of-fit on F^2	0.974	
Final R indices [I>2sigma(I)]	R1 = 0.0677, wR2 = 0.1269	
R indices (all data)	R1 = 0.1386, wR2 = 0.1545	
Absolute structure parameter	0.071(17)	
Extinction coefficient	n/a	
Largest diff. peak and hole	0.414 and -0.399 $e.Å^{-3}$	
CCDC	2296170	

Table S4: Crystal data and structure refinement for (**5b)**

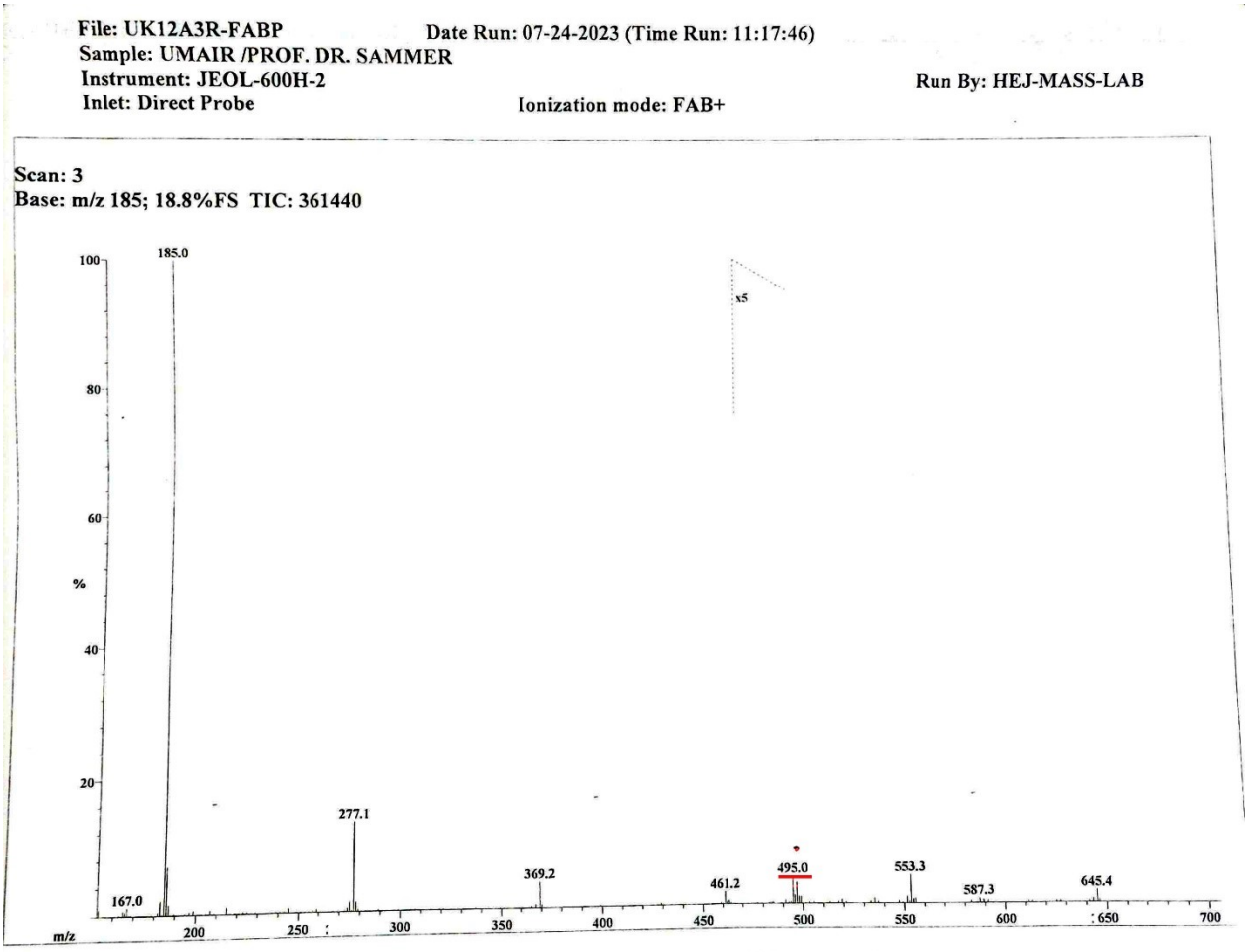
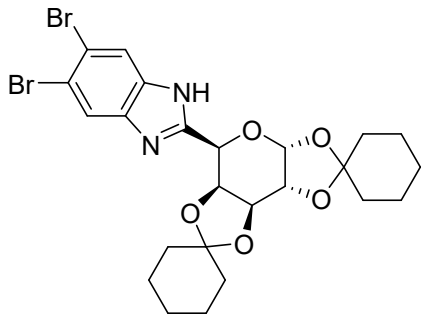


Figure S35: LR-FAB (+ve) shows the m/z value of 495.0 of compound (**5b**)

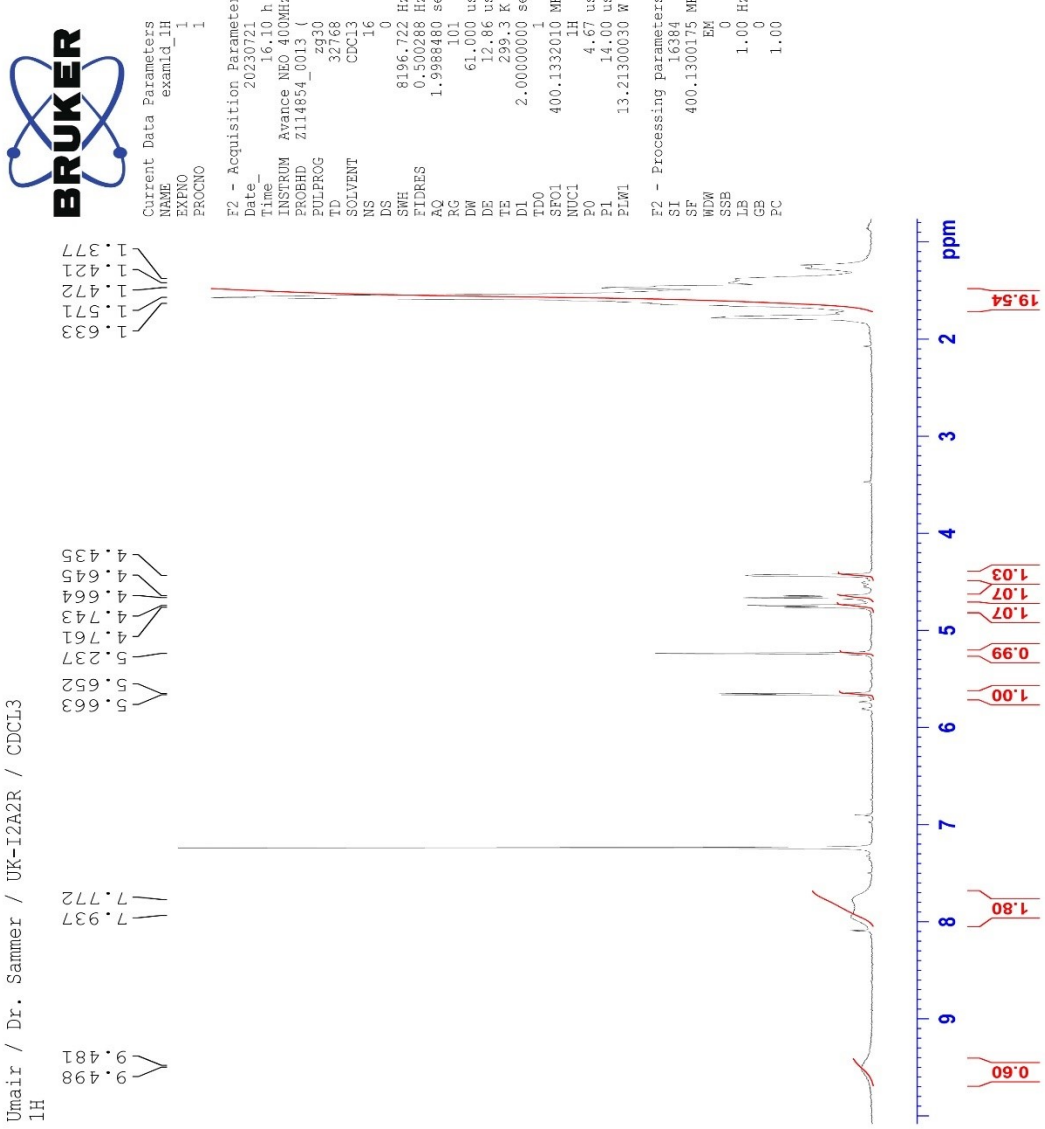
High resolution FAB positive mode at JEOL HX 110 Mass spectrometer of compound **5b** is **495.1475**, while theoretical mass was 495.1454 which corresponds to the composition of **$C_{24}H_{29}N_2O_5Cl_2$.**

9. Spectral properties of 5,6-dibromo-2-((3a'R,5'R,5a'S,8a'S,8b'R)-tetrahydro-5'H-dispiro[cyclohexane-1,2'-bis([1,3]dioxolo)[4,5-b:4',5'-d]pyran-7',1''-cyclohexan]-5'-yl)-1H-benzo[d]imidazole (6b)



(6b)

Figure-S36: H[1]-NMR at
$CDCl_3$, of compound 5,6-d
((3a'*R*,5'*R*,5a'*S*,8a'*S*,8b'*R*)-
dispiro[cyclohexane-1,2'-
bis([1,3]dioxolo)[4,5-b:4',
7',1''-cyclohexan]-5'-yl)-1
benzo[d]imidazole (**6b**)



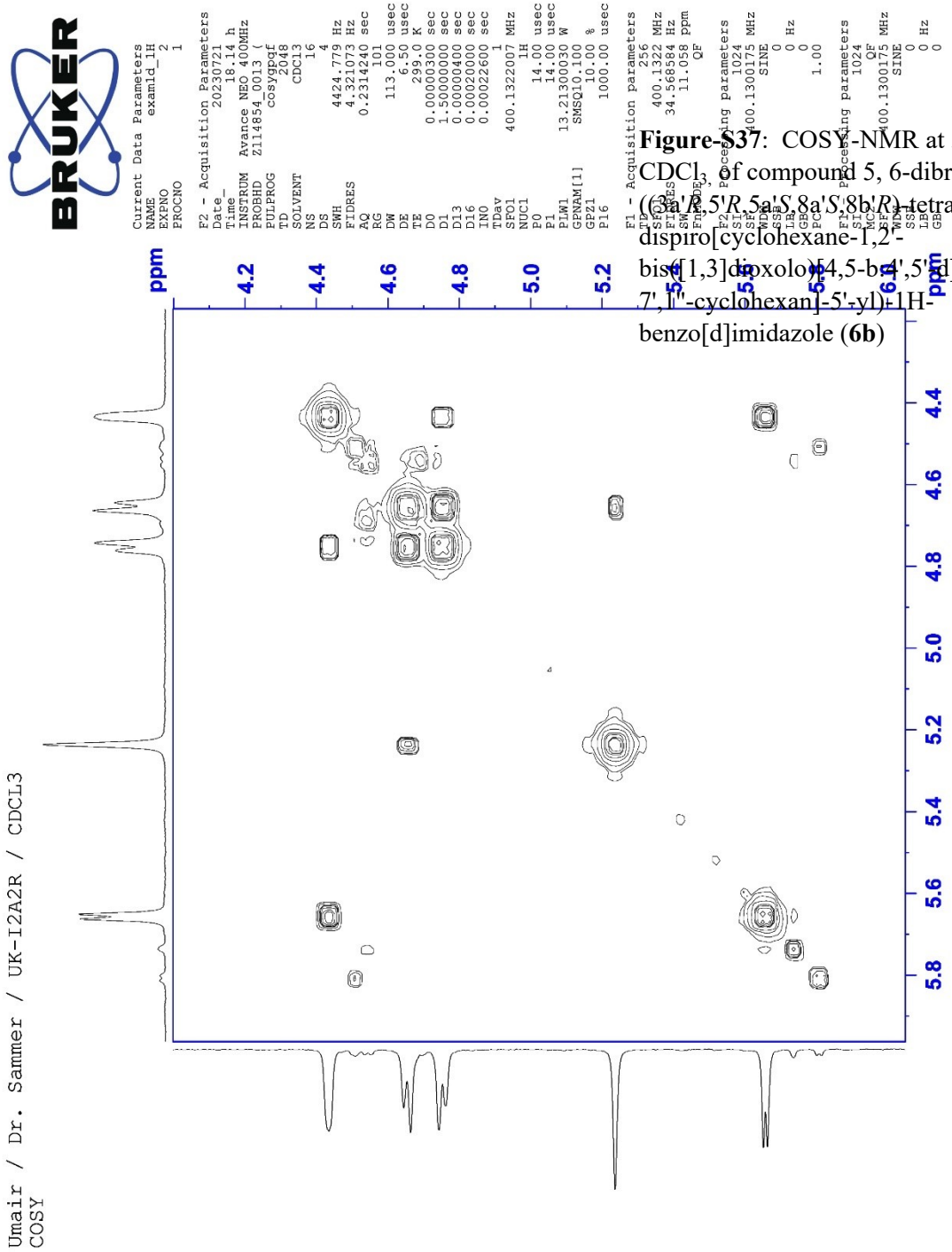


Figure-S37: COSY-NMR at 500MHz, in $CDCl_3$, of compound 5, 6-dibromo-2-((3a'*R*,5'*R*,5a'*S*,8a'*S*,8b'*R*)-tetrahydro-5'H-dispiro[cyclohexane-1,2'-bis[1,3]dioxolo[4,5-b:4',5'-d]pyran-7',1''-cyclohexan]-5'-yl)-1H-benzo[d]imidazole (**6b**)

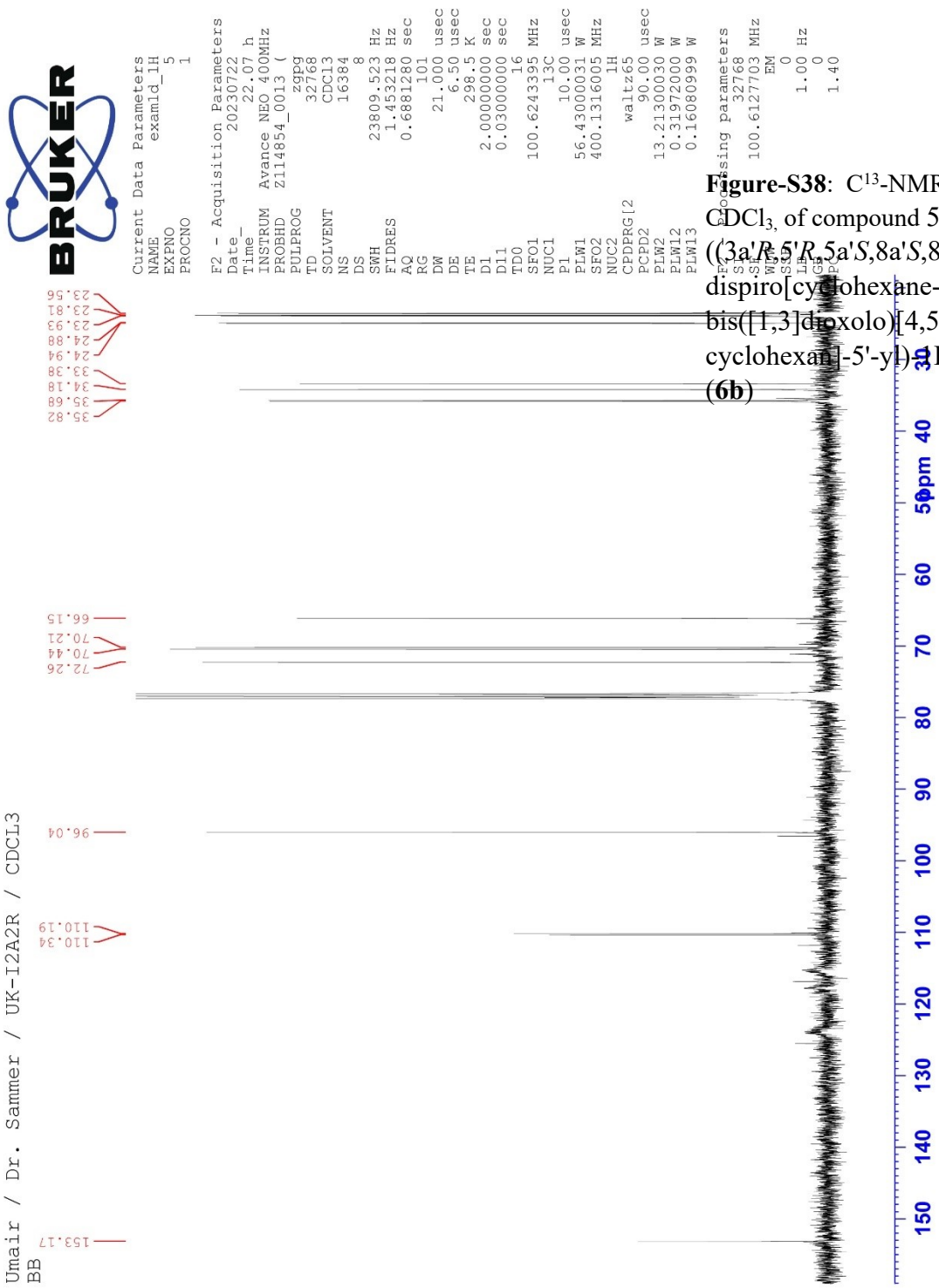


Figure-S38: C^{13}-NMR BB at 5
$CDCl_3$, of compound 5, 6-dibro
((3a'*R*,5'*R*,5a'*S*,8a'*S*,8b'*R*)-tetr
dispiro[cyclohexane-1,2'-
bis([1,3]dioxolo)[4,5-b:4',5'-d
cyclohexan]-5'-yl)-1*H*-benzo
(**6b**)

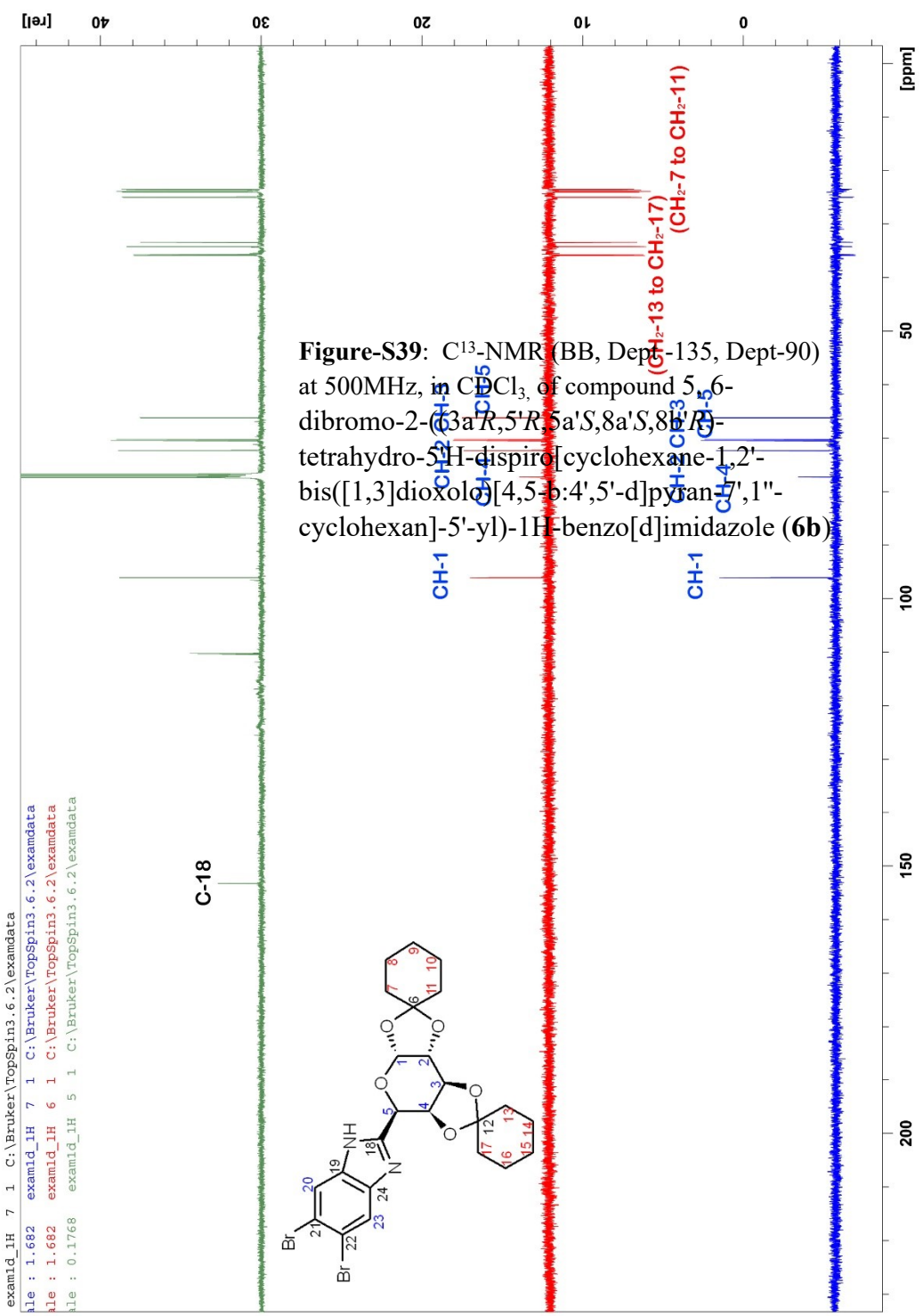


Figure-S39: C^{13}-NMR (BB, Dept-135, Dept-90) at 500MHz, in $CDCl_3$, of compound 5, 6-dibromo-2-((3a*R*,5'*R*,5a'*S*,8a'*S*,8b'*R*)-tetrahydro-5'H-dispiro[cyclohexane-1,2'-bis([1,3]dioxolo[4,5-b:4',5'-d]pyran-7',1''-cyclohexan]-5'-yl)-1H-benzo[d]imidazole (**6b**)

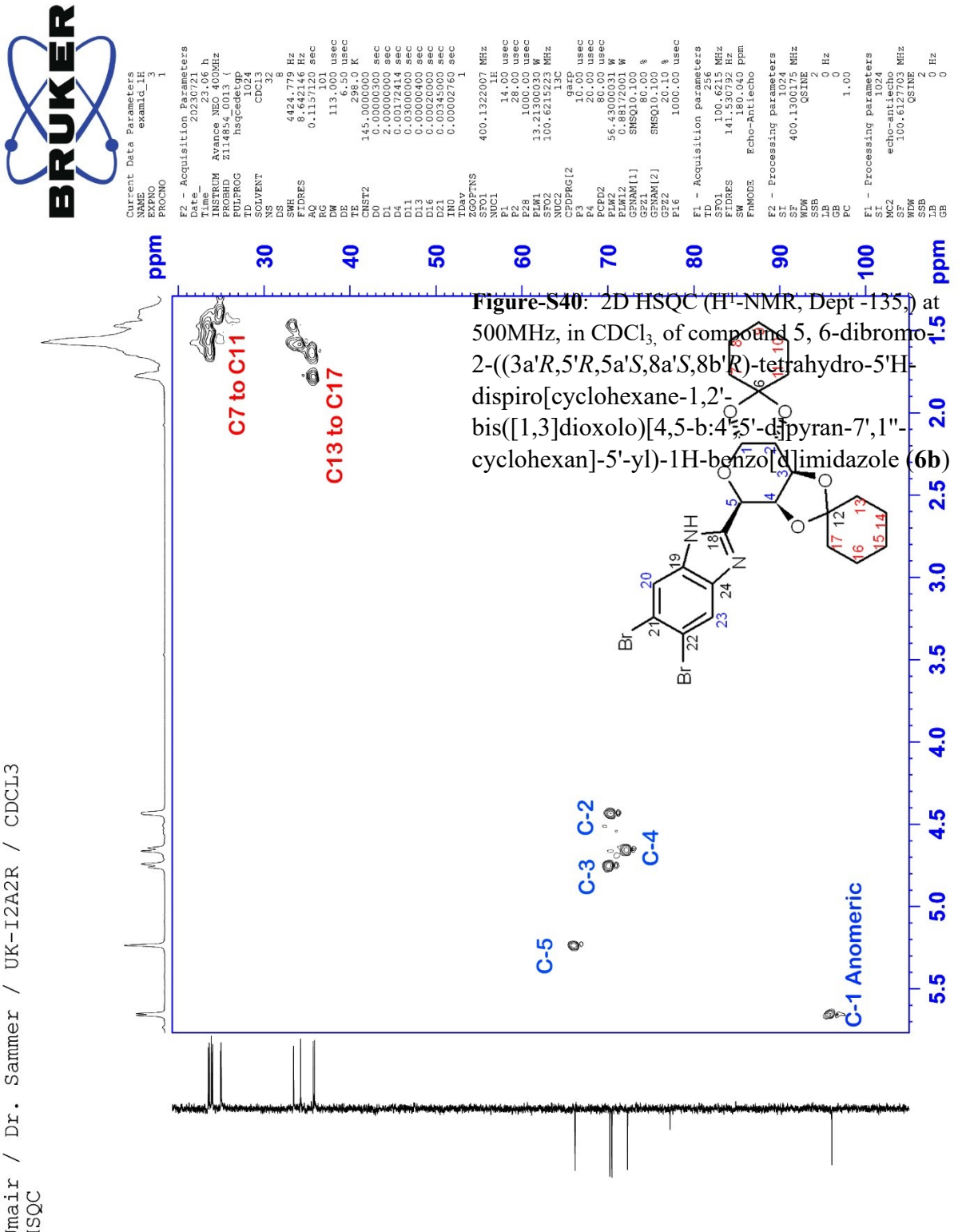


Figure-S40: 2D HSQC (H¹-NMR, Dept -135,) at 500MHz, in $CDCl_3$, of compound 5, 6-dibromo-2-((3a'*R*,5'*R*,5a'*S*,8a'*S*,8b'*R*)-tetrahydro-5'H-dispiro[cyclohexane-1,2'-bis([1,3]dioxolo)[4,5-b:4',5'-d]pyran-7',1''-cyclohexan]-5'-yl)-1H-benzo[d]imidazole (**6b**)

- Single Crystal XRD analysis of compound **6b**:

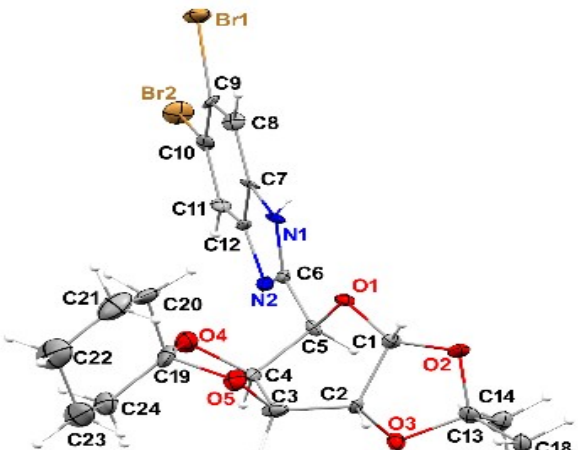


Figure-S41: ORTEP view of compound **6b**.

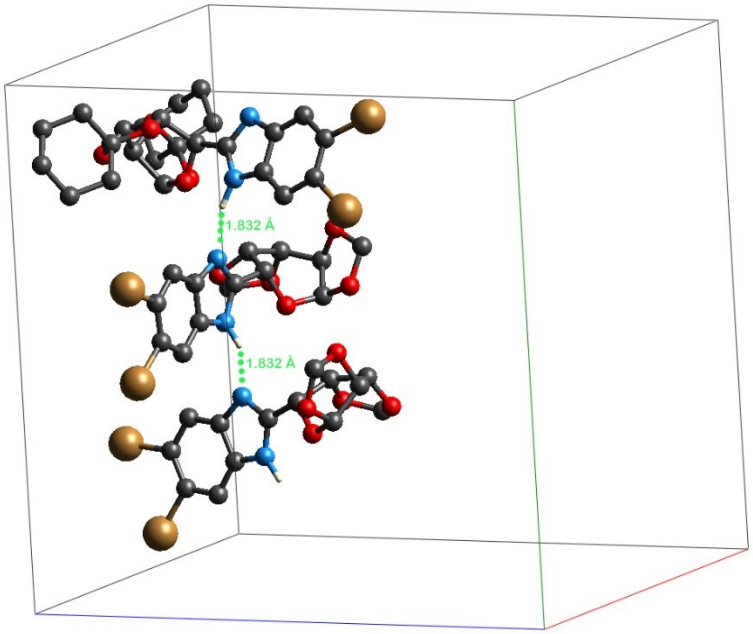
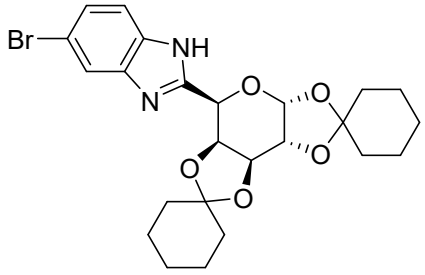


Figure-S42: Compound **6b** hydrogen bonded with a bond length of 1.832 Å in a unit cell.

Identification code	UK12A2	
Empirical formula	$C_{48}\ H_{53}\ Br_4\ N_4\ O_{10}$	
Formula weight	1165.58	
Temperature	100(2) K	
Wavelength	1.54178 Å	
Crystal system	Orthorhombic	
Space group	P 21 21 21	
Unit cell dimensions	a = 15.5001(5) Å	α= 90°.
	b = 18.3458(6) Å	β= 90°.
	c = 19.5228(6) Å	γ = 90°.
Volume	5551.5(3) $Å^3$	
Z	4	
Density (calculated)	1.395 Mg/m^3	
Absorption coefficient	3.983 mm^{-1}	
F(000)	2356	
Crystal size	0.140 x 0.050 x 0.010 mm^3	
Theta range for data collection	3.306 to 68.230°.	
Index ranges	-18<=h<=18, -22<=k<=22, -23<=l<=23	
Reflections collected	93810	
Independent reflections	10156 [R(int) = 0.2207]	
Completeness to theta = 67.679°	100.0 %	
Refinement method	Full-matrix least-squares on F^2	
Data / restraints / parameters	10156 / 0 / 599	
Goodness-of-fit on F^2	1.077	
Final R indices [I>2sigma(I)]	R1 = 0.0713, wR2 = 0.1882	
R indices (all data)	R1 = 0.0941, wR2 = 0.2042	
Absolute structure parameter	0.000(15)	
Extinction coefficient	n/a	
Largest diff. peak and hole	3.353 and -0.589 $e.Å^{-3}$	
CCDC	2296464	

Table S5: Crystal data and structure refinement for **6b**

10. 5-bromo-2-((3a'R,5'R,5a'S,8a'S,8b'R)-tetrahydro-5'H-dispiro[cyclohexane-1,2'-bis([1,3]dioxolo)[4,5-b:4',5'-d]pyran-7',1''-cyclohexan]-5'-yl)-1H-benzo[d]imidazole (7b) :



(7b)

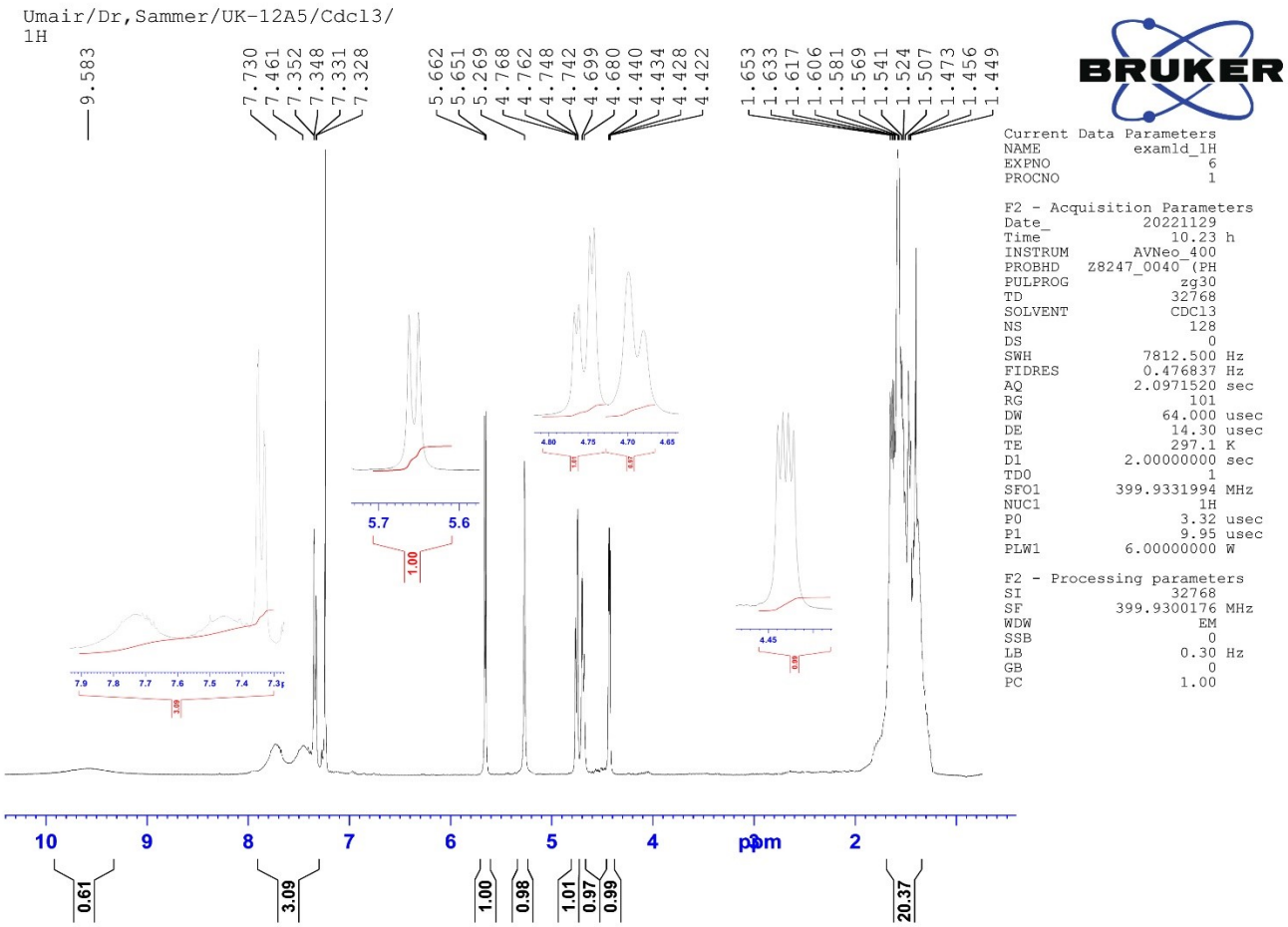


Figure-S36: H^1-NMR, in $CDCl_3$, of compound 5-bromo-2-((3a'R,5'R,5a'S,8a'S,8b'R)-tetrahydro-5'H-dispiro[cyclohexane-1,2'-bis([1,3]dioxolo)[4,5-b:4',5'-d]pyran-7',1''-cyclohexan]-5'-yl)-1H-benzo[d]imidazole (**7b**)

- FAB +ve mood low and high resolution of compound 7b

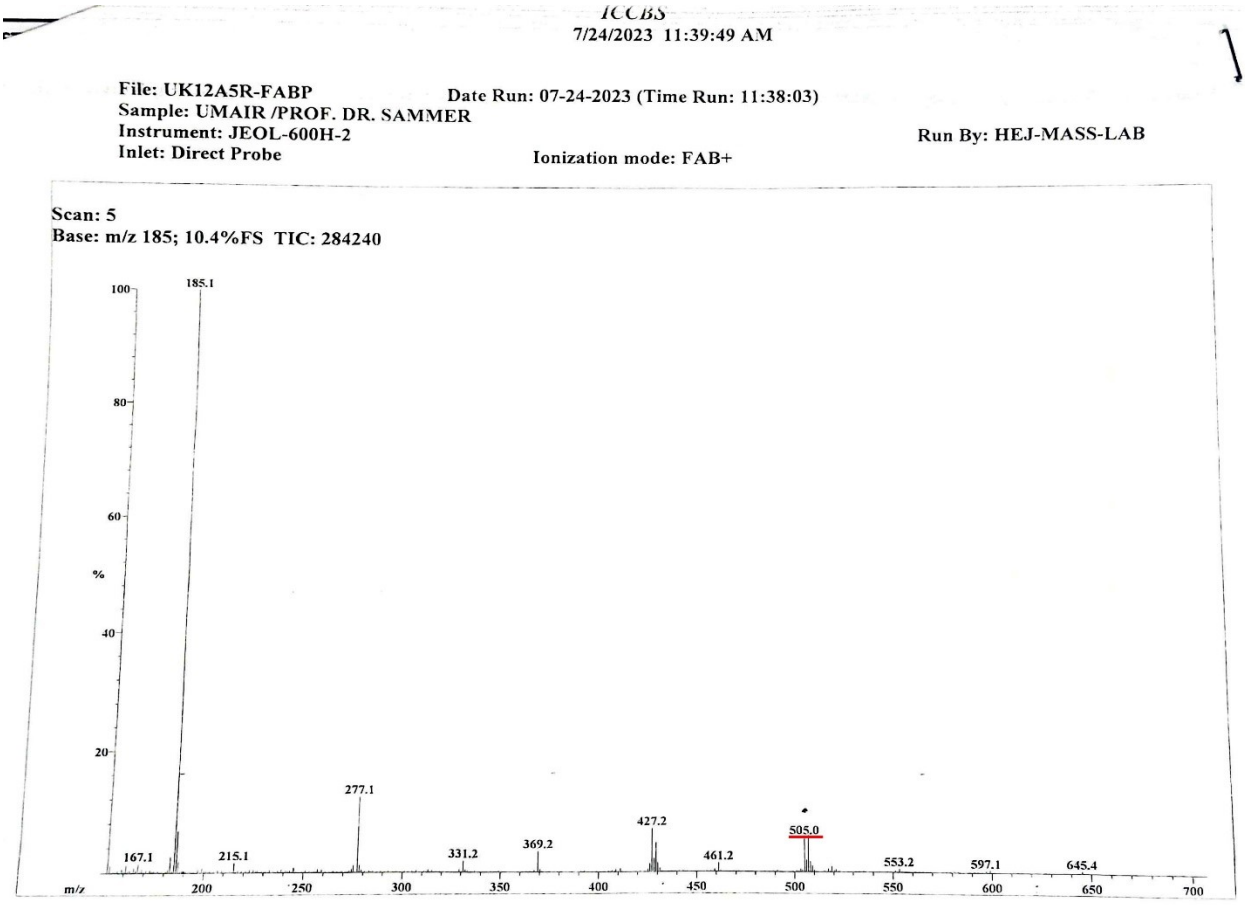


Figure S37: LR-FAB (+ve) shows the m/z value of 505.0 of compound (**7b**)

High resolution FAB positive mode at JEOL HX 110 Mass spectrometer of compound **7b** is **505.1338**, while theoretical mass was 505.1362 which corresponds to the composition of **$C_{24}H_{30}N_2O_5Br$.**

UPLC chromatogram of compound 7b

Data File C:\CHEM32\1\DATA\UMAIR\UMAIR 2024-02-13 14-56-21\081-0201.D
Sample Name: UK-12A-5

```
======================================================================
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Acq. Instrument : UPLC 1                           Location : Vial 81
Injection Date  : 13/02/2024 3:19:50 pm                Inj :   1
                                                  Inj Volume : 5.000 µl
Sequence File   : C:\Chem32\1\DATA\UMAIR\UMAIR 2024-02-13 14-56-21\UMAIR.S
Method          : C:\CHEM32\1\DATA\UMAIR\UMAIR 2024-02-13 14-56-21\UMAIR.M (Sequence
                  Method)
Last changed    : 13/02/2024 2:56:19 pm by junaid
Method Info     : column:  C-4 (4.6 X 250mm) 5 um 300A MN
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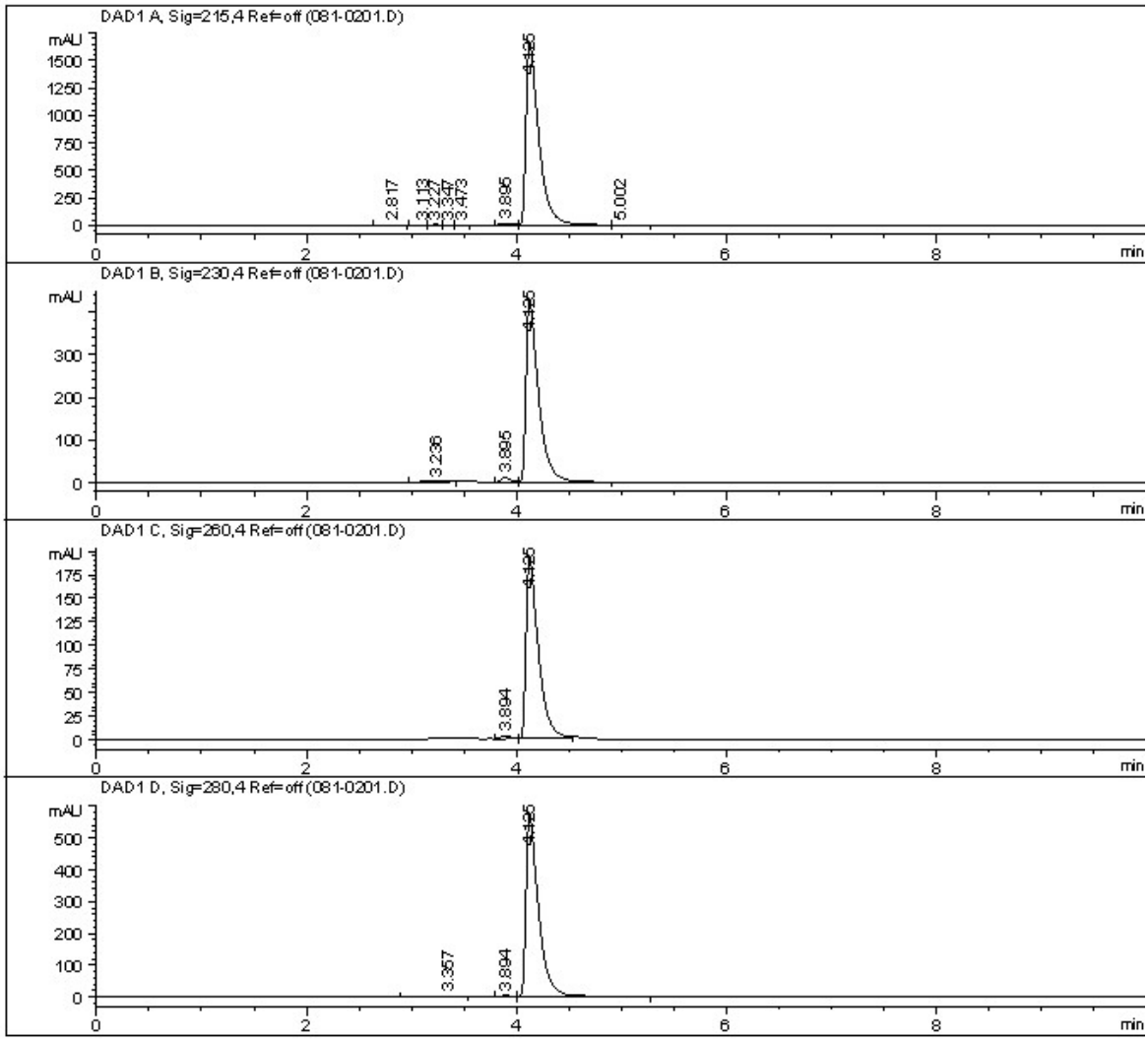



```
======================================================================
                Area Percent Report with Performance
======================================================================

Multiplier:                    :      1.0000
Dilution:                      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
```

Data File C:\CHEM32\1\DATA\UMAIR\UMAIR 2024-02-13 14-56-21\081-0201.D
Sample Name: UK-12A-5

Signal 1: DAD1 A, Sig=215,4 Ref=off

RetTime [min]	k'	Area [mAU*s]	Height [mAU]	Symm.	Width [min]	Plates	Resol ution	Select ivity
2.817	-	27.24686	3.57714	0.81	0.1076	3786	-	-
3.113	-	22.65406	3.09987	2.35	0.1061	4767	1.63	1.11
3.227	-	23.71906	3.42440	1.23	-	-	-	1.04
3.347	-	12.06933	2.06440	1.15	-	-	-	1.04
3.473	-	6.58936	1.11123	1.70	-	-	-	1.04
3.895	-	106.71966	17.55243	0.67	0.0926	9795	-	1.12
4.125	-	1.41496e4	1666.28442	0.35	0.1235	6190	1.25	1.06
5.002	-	15.68651	1.63637	0.70	0.1551	5759	3.70	1.21

Signal 2: DAD1 B, Sig=230,4 Ref=off

RetTime [min]	k'	Area [mAU*s]	Height [mAU]	Symm.	Width [min]	Plates	Resol ution	Select ivity
3.236	-	26.43633	1.49282	2.00	0.3322	525	-	-
3.895	-	61.07037	10.56910	0.72	0.0889	10628	1.84	1.20
4.125	-	3547.29810	429.25229	0.36	0.1202	6531	1.29	1.06

Signal 3: DAD1 C, Sig=260,4 Ref=off

RetTime [min]	k'	Area [mAU*s]	Height [mAU]	Symm.	Width [min]	Plates	Resol ution	Select ivity
3.894	-	16.64886	3.13515	0.83	0.0852	11572	-	-
4.125	-	1547.11841	192.96204	0.37	0.1193	6624	1.32	1.06

Signal 4: DAD1 D, Sig=280,4 Ref=off

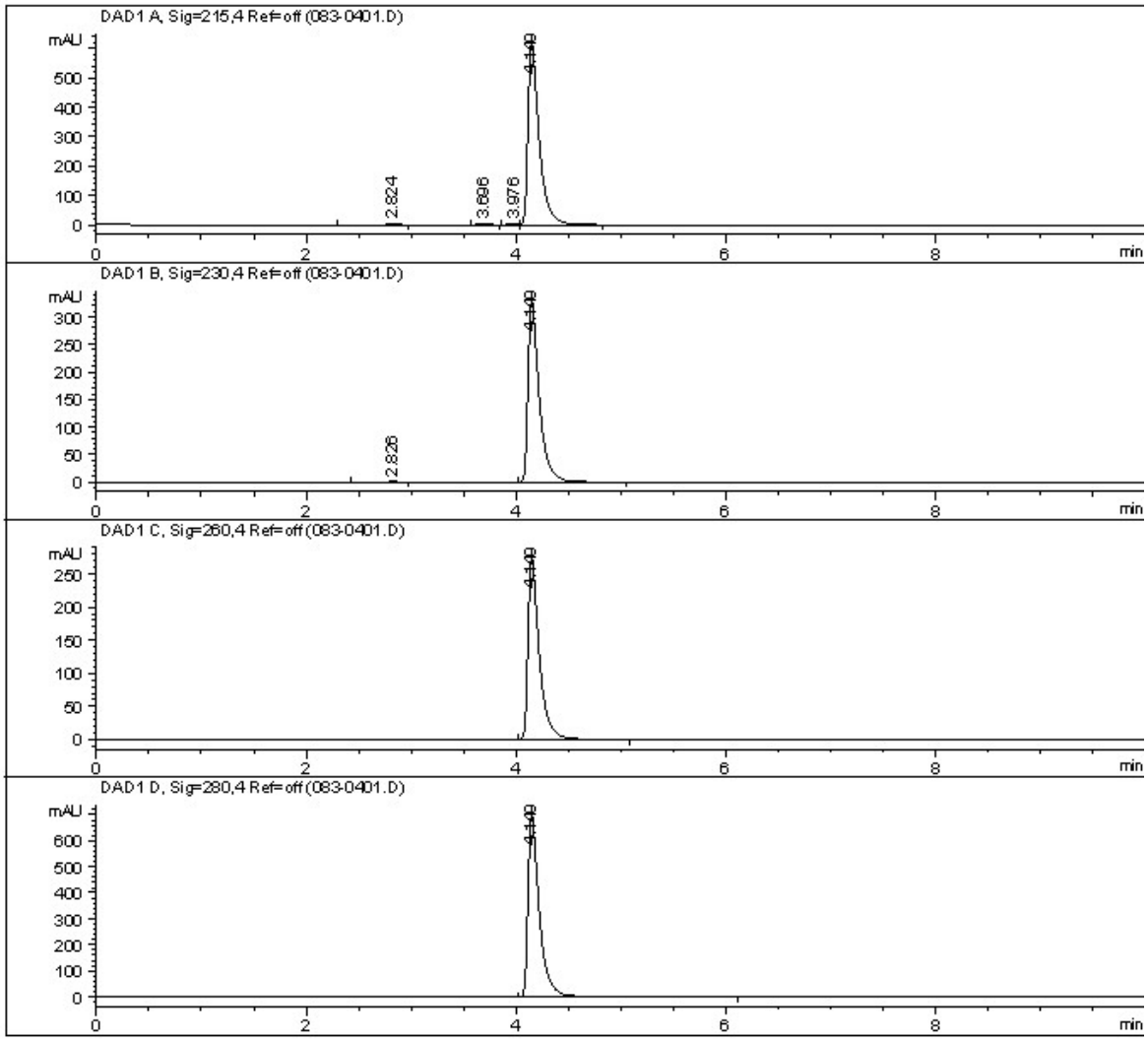
RetTime [min]	k'	Area [mAU*s]	Height [mAU]	Symm.	Width [min]	Plates	Resol ution	Select ivity
3.357	-	19.16838	1.02615	2.36	0.3100	648	-	-
3.894	-	20.14855	3.67532	0.74	0.0852	11572	1.60	1.16
4.125	-	4737.69678	575.70844	0.36	0.1189	6669	1.33	1.06

*** End of Report ***

UPLC chromatogram of compound 4b

Data File C:\CHEM32\1\DATA\UMAIR\UMAIR 2024-02-13 14-56-21\083-0401.D
Sample Name: UK-12A-4

```
======================================================================
Acq. Operator   : junaid                        Seq. Line :   4
Acq. Instrument : UPLC 1                         Location : Vial 83
Injection Date  : 13/02/2024 3:43:32 pm              Inj :   1
                                                Inj Volume : 5.000 µl
Sequence File   : C:\Chem32\1\DATA\UMAIR\UMAIR 2024-02-13 14-56-21\UMAIR.S
Method          : C:\CHEM32\1\DATA\UMAIR\UMAIR 2024-02-13 14-56-21\UMAIR.M (Sequence
                  Method)
Last changed    : 13/02/2024 2:56:19 pm by junaid
Method Info     : column:  C-4 (4.6 X 250mm) 5 um 300A MN
```

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======================================================================
                Area Percent Report with Performance
======================================================================

Multiplier:                    :      1.0000
Dilution:                      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
```

Data File C:\CHEM32\1\DATA\UMAIR\UMAIR 2024-02-13 14-56-21\083-0401.D
Sample Name: UK-12A-4

Signal 1: DAD1 A, Sig=215,4 Ref=off

RetTime [min]	k'	Area [mAU*s]	Height [mAU]	Symm.	Width [min]	Plates	Resolution	Selectivity
2.824	-	42.40036	4.24094	1.45	0.1133	3446	-	-
3.696	-	21.82827	3.42733	0.89	0.0983	7815	4.84	1.31
3.976	-	21.88741	3.79497	1.12	0.0995	8837	1.66	1.08
4.149	-	4616.23145	623.58173	0.44	0.1059	8494	0.99	1.04

Signal 2: DAD1 B, Sig=230,4 Ref=off

RetTime [min]	k'	Area [mAU*s]	Height [mAU]	Symm.	Width [min]	Plates	Resolution	Selectivity
2.826	-	9.74197	1.08728	1.19	0.1133	3446	-	-
4.149	-	2469.94141	333.21481	0.43	0.1057	8529	7.10	1.47

Signal 3: DAD1 C, Sig=260,4 Ref=off

RetTime [min]	k'	Area [mAU*s]	Height [mAU]	Symm.	Width [min]	Plates	Resolution	Selectivity
4.149	-	2058.89551	277.60541	0.43	0.1058	8507	-	-

Signal 4: DAD1 D, Sig=280,4 Ref=off

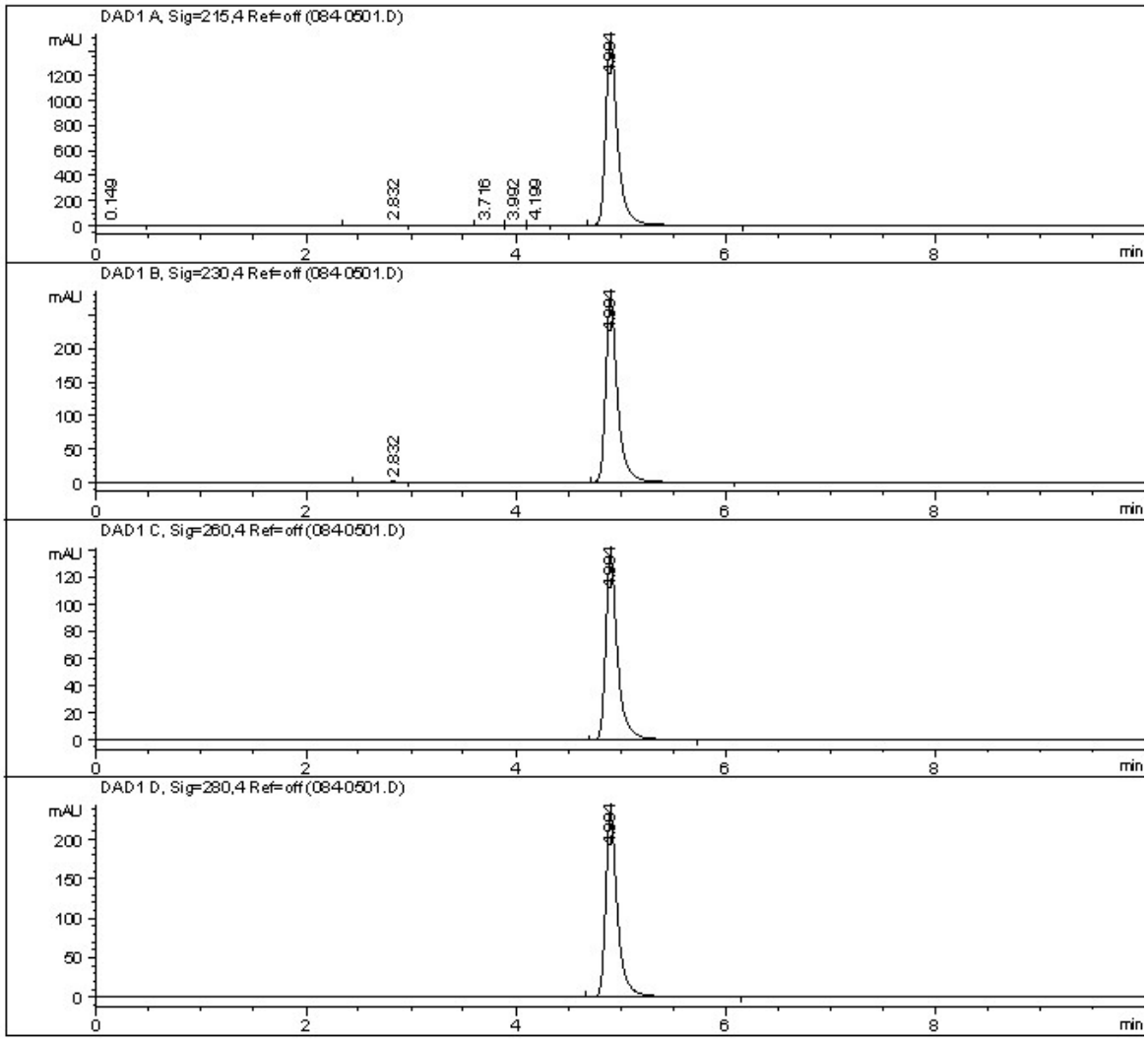
RetTime [min]	k'	Area [mAU*s]	Height [mAU]	Symm.	Width [min]	Plates	Resolution	Selectivity
4.149	-	5274.24707	706.34021	0.43	0.1061	8468	-	-

*** End of Report ***

UPLC chromatogram of compound 5b

Data File C:\CHEM32\1\DATA\UMAIR\UMAIR 2024-02-13 14-56-21\084-0501.D
Sample Name: UK-12A-3

Acq. Operator	: junaid	Seq. Line	: 5
Acq. Instrument	: UPLC 1	Location	: Vial 84
Injection Date	: 13/02/2024 3:55:25 pm	Inj	: 1
		Inj Volume	: 5.000 µl
Sequence File	: C:\Chem32\1\DATA\UMAIR\UMAIR 2024-02-13 14-56-21\UMAIR.S		
Method	: C:\CHEM32\1\DATA\UMAIR\UMAIR 2024-02-13 14-56-21\UMAIR.M (Sequence Method)		
Last changed	: 13/02/2024 2:56:19 pm by junaid		
Method Info	: column: C-4 (4.6 X 250mm) 5 um 300A MN		



Area Percent Report with Performance

Multiplier:	:	1.0000
Dilution:	:	1.0000

Use Multiplier & Dilution Factor with ISTDs

Data File C:\CHEM32\1\DATA\UMAIR\UMAIR 2024-02-13 14-56-21\084-0501.D
Sample Name: UK-12A-3

Signal 1: DAD1 A, Sig=215,4 Ref=off

RetTime [min]	k'	Area [mAU*s]	Height [mAU]	Symm.	Width [min]	Plates	Resolution	Selectivity
0.149	-	16.68434	1.14176	0.67	0.2367	2	-	-
2.832	-	35.10935	4.42344	1.25	0.0983	4599	9.41	19.07
3.716	-	16.69746	2.59213	0.63	0.0914	9138	5.48	1.31
3.992	-	11.49987	1.79916	0.76	0.0944	9904	1.74	1.07
4.199	-	10.46346	1.53487	1.10	0.1057	8745	1.21	1.05
4.904	-	1.18122e4	1472.91748	0.61	0.1140	10255	3.77	1.17

Signal 2: DAD1 B, Sig=230,4 Ref=off

RetTime [min]	k'	Area [mAU*s]	Height [mAU]	Symm.	Width [min]	Plates	Resolution	Selectivity
2.832	-	8.44363	1.08245	1.20	0.1975	1140	-	-
4.904	-	2162.31494	273.87820	0.62	0.1120	10640	7.87	1.73

Signal 3: DAD1 C, Sig=260,4 Ref=off

RetTime [min]	k'	Area [mAU*s]	Height [mAU]	Symm.	Width [min]	Plates	Resolution	Selectivity
4.904	-	1057.20068	135.24602	0.62	0.1109	10838	-	-

Signal 4: DAD1 D, Sig=280,4 Ref=off

RetTime [min]	k'	Area [mAU*s]	Height [mAU]	Symm.	Width [min]	Plates	Resolution	Selectivity
4.904	-	1829.39355	233.40300	0.62	0.1109	10844	-	-

*** End of Report ***

UPLC chromatogram of compound 6b

Data File C:\CHEM32\1\DATA\UMAIR\UMAIR 2024-02-13 14-56-21\086-0701.D
Sample Name: UK-GACDB

```
======================================================================
Acq. Operator   : junaid                        Seq. Line :   7
Acq. Instrument : UPLC 1                         Location : Vial 86
Injection Date  : 13/02/2024 4:19:10 pm               Inj :   1
                                                Inj Volume : 5.000 µl
Sequence File   : C:\Chem32\1\DATA\UMAIR\UMAIR 2024-02-13 14-56-21\UMAIR.S
Method          : C:\CHEM32\1\DATA\UMAIR\UMAIR 2024-02-13 14-56-21\UMAIR.M (Sequence
                  Method)
Last changed    : 13/02/2024 2:56:19 pm by junaid
Method Info     : column:  C-4 (4.6 X 250mm) 5 um 300A MN
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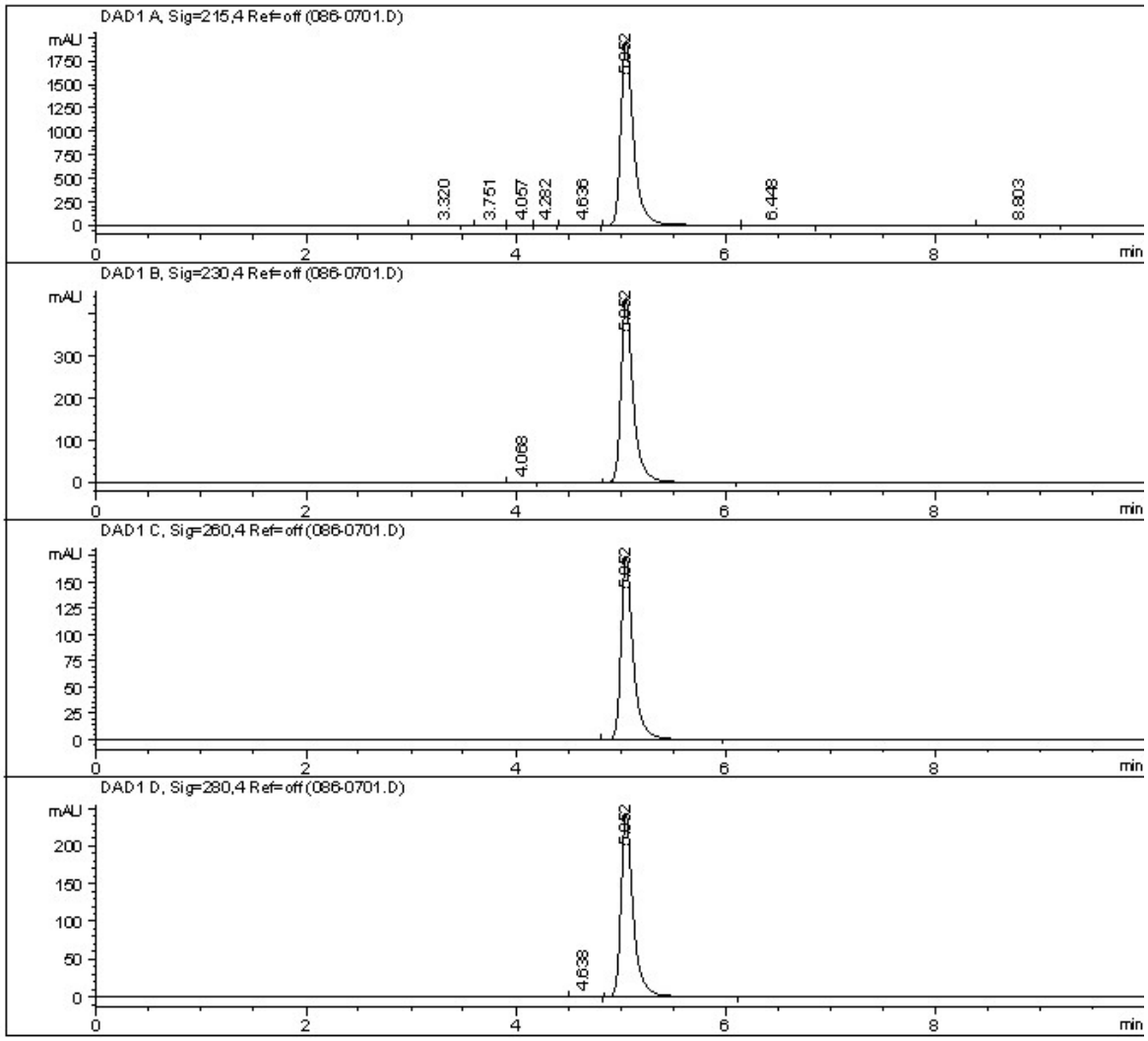


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======================================================================
               Area Percent Report with Performance
======================================================================

Multiplier:                    :      1.0000
Dilution:                      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
```

Data File C:\CHEM32\1\DATA\UMAIR\UMAIR 2024-02-13 14-56-21\086-0701.D
Sample Name: UK-GACDB

Signal 1: DAD1 A, Sig=215,4 Ref=off

RetTime [min]	k'	Area [mAU*s]	Height [mAU]	Symm.	Width [min]	Plates	Resolution	Selectivity
3.320	-	31.57682	1.51030	4.45	0.3017	671	-	-
3.751	-	13.58976	1.83765	0.64	0.1057	6984	1.24	1.13
4.057	-	21.92994	2.33251	1.54	0.1527	3905	1.39	1.08
4.282	-	8.10556	1.08677	1.40	0.1297	6033	0.94	1.06
4.636	-	24.56827	3.42490	0.94	0.1029	11242	1.79	1.08
5.052	-	1.67492e4	1956.52368	0.62	0.1226	9408	2.17	1.09
6.448	-	21.08078	1.73713	0.87	0.1600	8994	5.80	1.28
8.803	-	26.10264	1.51557	1.07	0.2622	6239	6.55	1.37

Signal 2: DAD1 B, Sig=230,4 Ref=off

RetTime [min]	k'	Area [mAU*s]	Height [mAU]	Symm.	Width [min]	Plates	Resolution	Selectivity
4.068	-	7.43790	1.04434	1.46	0.1167	6731	-	-
5.052	-	3525.97095	433.83145	0.62	0.1152	10660	4.99	1.24

Signal 3: DAD1 C, Sig=260,4 Ref=off

RetTime [min]	k'	Area [mAU*s]	Height [mAU]	Symm.	Width [min]	Plates	Resolution	Selectivity
5.052	-	1407.99158	174.68004	0.63	0.1142	10845	-	-

Signal 4: DAD1 D, Sig=280,4 Ref=off

RetTime [min]	k'	Area [mAU*s]	Height [mAU]	Symm.	Width [min]	Plates	Resolution	Selectivity
4.638	-	6.87752	1.05156	0.79	0.0990	12158	-	-
5.052	-	1962.68347	243.15976	0.63	0.1144	10815	2.28	1.09

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*** End of Report ***

UPLC chromatogram of compound 3a

Data File C:\CHEM32\1\DATA\UMAIR\UMAIR 2024-02-13 14-56-21\087-0801.D
Sample Name: UK-GALH

```
======================================================================
Acq. Operator   : junaid                          Seq. Line :   8
Acq. Instrument : UPLC 1                           Location : Vial 87
Injection Date  : 13/02/2024 4:31:03 pm                Inj :   1
                                                  Inj Volume : 5.000 µl
Sequence File   : C:\Chem32\1\DATA\UMAIR\UMAIR 2024-02-13 14-56-21\UMAIR.S
Method          : C:\CHEM32\1\DATA\UMAIR\UMAIR 2024-02-13 14-56-21\UMAIR.M (Sequence
                  Method)
Last changed    : 13/02/2024 2:56:19 pm by junaid
Method Info     : column:  C-4 (4.6 X 250mm) 5 um 300A MN
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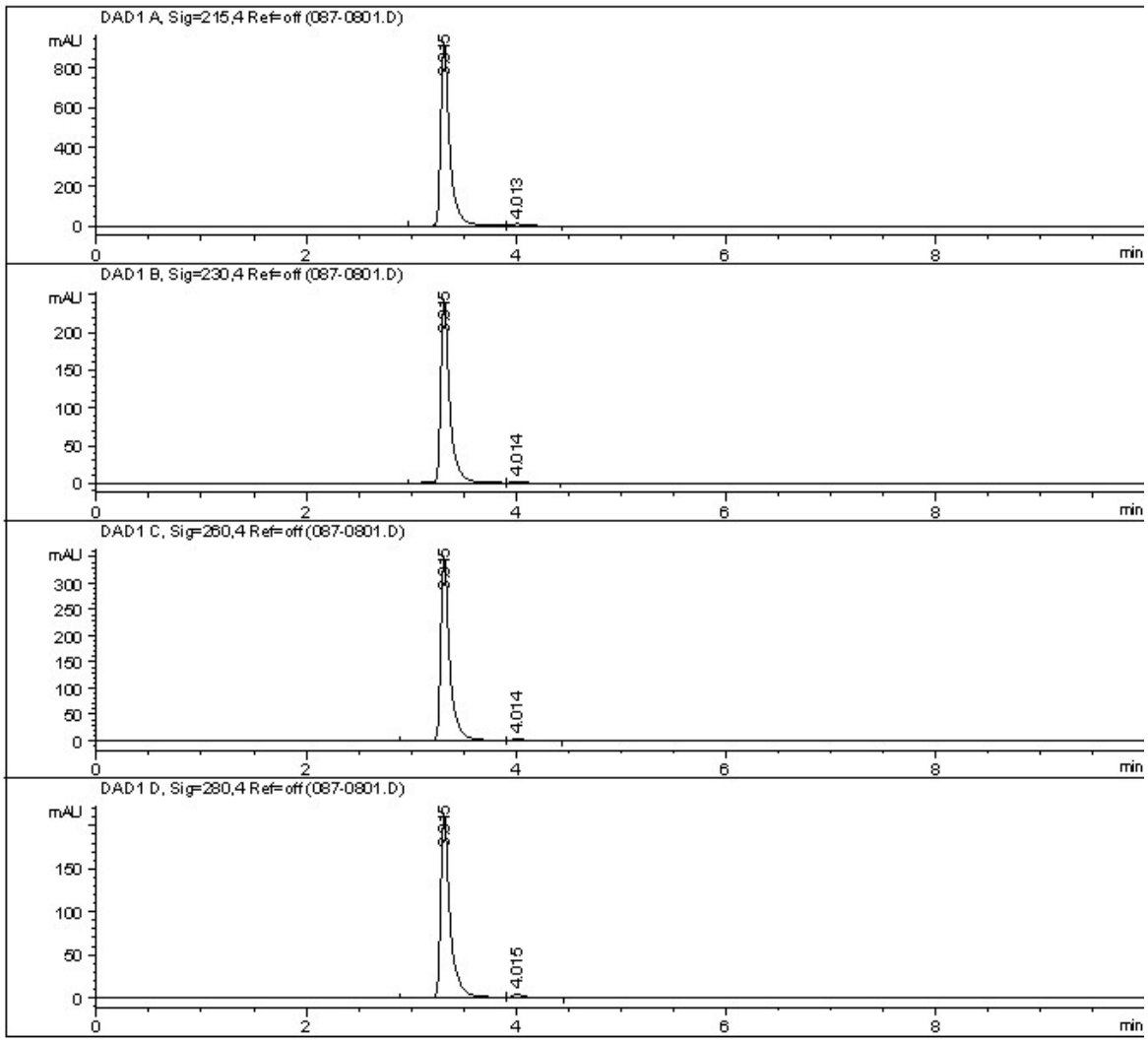


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======================================================================
               Area Percent Report with Performance
======================================================================

Multiplier:                 :      1.0000
Dilution:                   :      1.0000
Use Multiplier & Dilution Factor with ISTDs
```

Data File C:\CHEM32\1\DATA\UMAIR\UMAIR 2024-02-13 14-56-21\087-0801.D
Sample Name: UK-GALH

Signal 1: DAD1 A, Sig=215,4 Ref=off

RetTime [min]	k'	Area [mAU*s]	Height [mAU]	Symm.	Width [min]	Plates	Resol ution	Select ivity
3.315	-	5585.14697	931.62054	0.53	0.0818	9093	-	-
4.013	-	97.37994	11.36841	0.60	0.1073	7752	4.34	1.21

Signal 2: DAD1 B, Sig=230,4 Ref=off

RetTime [min]	k'	Area [mAU*s]	Height [mAU]	Symm.	Width [min]	Plates	Resol ution	Select ivity
3.315	-	1463.15112	243.15395	0.54	0.0816	9124	-	-
4.014	-	24.47080	2.81728	0.62	0.1111	7228	4.26	1.21

Signal 3: DAD1 C, Sig=260,4 Ref=off

RetTime [min]	k'	Area [mAU*s]	Height [mAU]	Symm.	Width [min]	Plates	Resol ution	Select ivity
3.315	-	2071.30249	350.07733	0.53	0.0814	9182	-	-
4.014	-	29.21347	3.90823	0.68	0.1000	8923	4.53	1.21

Signal 4: DAD1 D, Sig=280,4 Ref=off

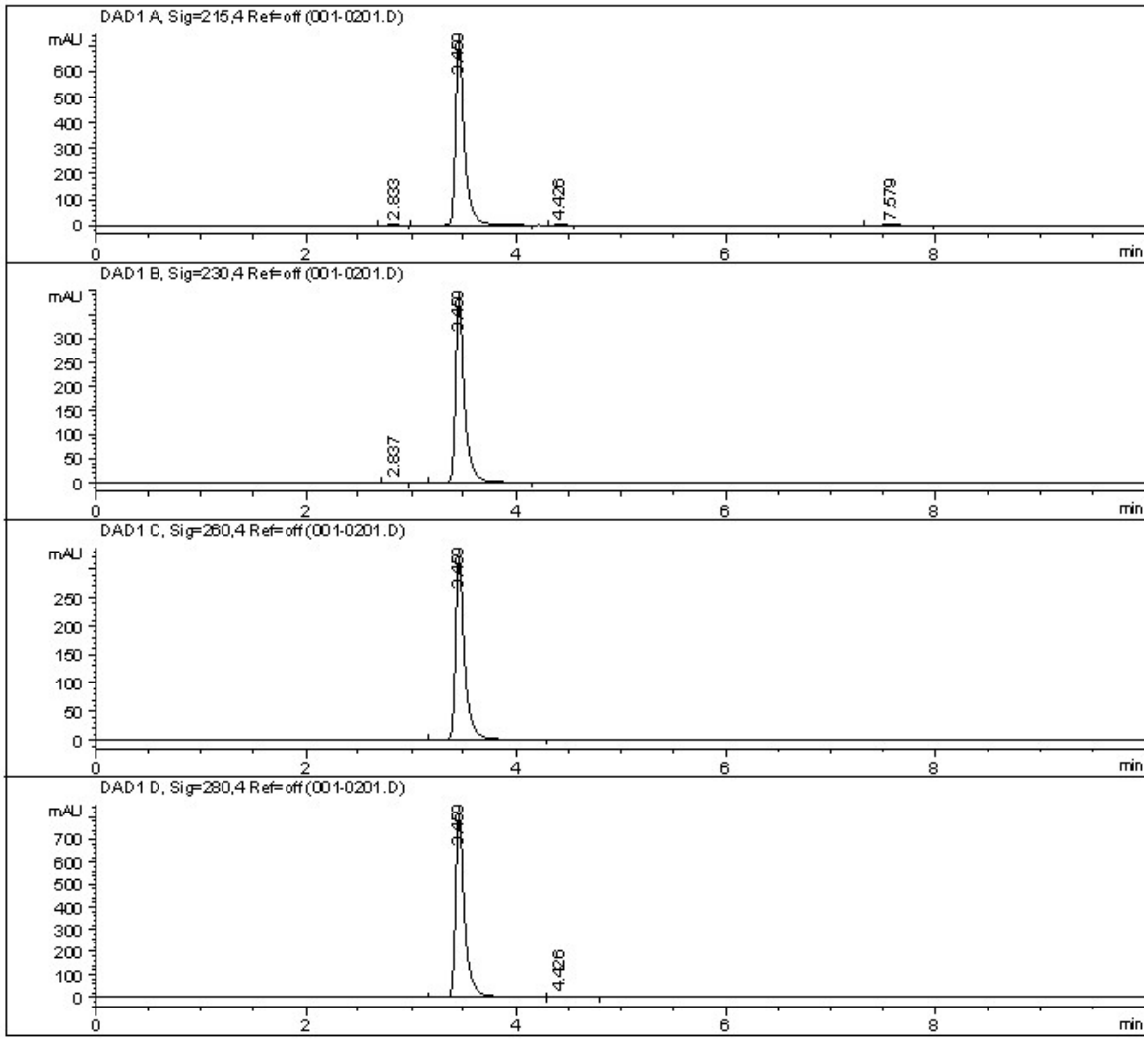
RetTime [min]	k'	Area [mAU*s]	Height [mAU]	Symm.	Width [min]	Plates	Resol ution	Select ivity
3.315	-	1324.80798	213.58643	0.51	0.0840	8626	-	-
4.015	-	30.22739	4.01984	0.65	0.0987	9169	4.50	1.21

*** End of Report ***

UPLC chromatogram of compound 4a

Data File C:\CHEM32\1\DATA\UMAIR\UMAIR 2024-02-12 15-47-36\001-0201.D
Sample Name: UKG-ALF2

Acq. Operator	: junaid	Seq. Line	: 2
Acq. Instrument	: UPLC 1	Location	: Vial 1
Injection Date	: 12/02/2024 3:59:50 pm	Inj	: 1
		Inj Volume	: 5.000 µl
Sequence File	: C:\Chem32\1\DATA\UMAIR\UMAIR 2024-02-12 15-47-36\UMAIR.S		
Method	: C:\CHEM32\1\DATA\UMAIR\UMAIR 2024-02-12 15-47-36\UMAIR.M (Sequence Method)		
Last changed	: 12/02/2024 3:47:29 pm by junaid		
Method Info	: column: C-4 (4.6 X 250mm) 5 um 300A MN		



Area Percent Report with Performance

Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Data File C:\CHEM32\1\DATA\UMAIR\UMAIR 2024-02-12 15-47-36\001-0201.D
Sample Name: UKG-ALF2

Signal 1: DAD1 A, Sig=215,4 Ref=off

RetTime [min]	k'	Area [mAU*s]	Height [mAU]	Symm.	Width [min]	Plates	Resolution	Selectivity
2.833	-	27.59914	3.92927	0.73	0.1017	4303	-	-
3.459	-	4310.45410	716.11633	0.57	0.0828	9668	3.98	1.22
4.426	-	11.62718	1.82169	1.01	0.0989	11101	6.25	1.28
7.579	-	19.86694	1.71173	0.88	0.1778	10071	13.39	1.71

Signal 2: DAD1 B, Sig=230,4 Ref=off

RetTime [min]	k'	Area [mAU*s]	Height [mAU]	Symm.	Width [min]	Plates	Resolution	Selectivity
2.837	-	6.65760	1.00267	0.73	0.1011	4350	-	-
3.459	-	2252.34741	381.79037	0.57	0.0829	9655	3.97	1.22

Signal 3: DAD1 C, Sig=260,4 Ref=off

RetTime [min]	k'	Area [mAU*s]	Height [mAU]	Symm.	Width [min]	Plates	Resolution	Selectivity
3.459	-	1904.16602	321.97821	0.56	0.0831	9610	-	-

Signal 4: DAD1 D, Sig=280,4 Ref=off

RetTime [min]	k'	Area [mAU*s]	Height [mAU]	Symm.	Width [min]	Plates	Resolution	Selectivity
3.459	-	4816.05811	813.93890	0.56	0.0830	9631	-	-
4.426	-	14.36475	1.91712	0.74	0.1044	9952	6.06	1.28

*** End of Report ***

UPLC chromatogram of compound 5a

Data File C:\CHEM32\1\DATA\UMAIR\UMAIR 2024-02-13 14-56-21\085-0601.D
Sample Name: UK-GACL-2

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======================================================================
Acq. Operator   : junaid                        Seq. Line :   6
Acq. Instrument : UPLC 1                         Location : Vial 85
Injection Date  : 13/02/2024 4:07:17 pm              Inj :   1
                                                Inj Volume : 5.000 µl
Sequence File   : C:\Chem32\1\DATA\UMAIR\UMAIR 2024-02-13 14-56-21\UMAIR.S
Method          : C:\CHEM32\1\DATA\UMAIR\UMAIR 2024-02-13 14-56-21\UMAIR.M (Sequence
                  Method)
Last changed    : 13/02/2024 2:56:19 pm by junaid
Method Info     : column:  C-4 (4.6 X 250mm) 5 um 300A MN
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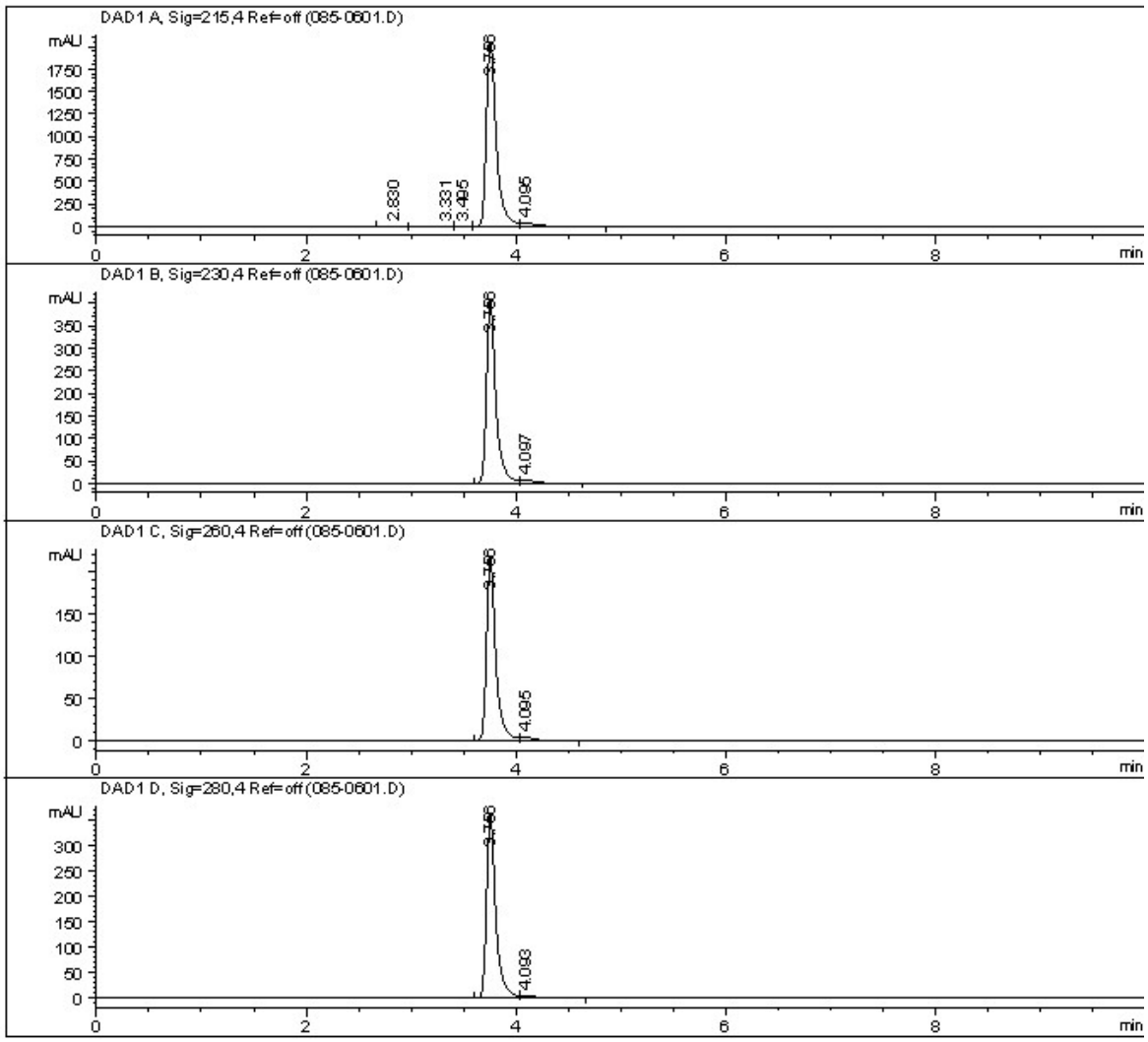


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======================================================================
               Area Percent Report with Performance
======================================================================

Multiplier:                 :      1.0000
Dilution:                   :      1.0000
Use Multiplier & Dilution Factor with ISTDs
```

Data File C:\CHEM32\1\DATA\UMAIR\UMAIR 2024-02-13 14-56-21\085-0601.D
Sample Name: UK-GACL-2

Signal 1: DAD1 A, Sig=215,4 Ref=off

RetTime [min]	k'	Area [mAU*s]	Height [mAU]	Symm.	Width [min]	Plates	Resolution	Selectivity
2.830	-	16.91151	2.55702	0.81	0.0950	4928	-	-
3.331	-	48.86526	2.40011	4.06	0.3520	497	1.32	1.18
3.495	-	23.30044	2.38794	0.93	-	-	-	1.05
3.756	-	1.35003e4	2047.88220	0.61	0.0946	8714	-	1.07
4.095	-	400.53870	42.69287	0.44	0.1251	5931	1.81	1.09

Signal 2: DAD1 B, Sig=230,4 Ref=off

RetTime [min]	k'	Area [mAU*s]	Height [mAU]	Symm.	Width [min]	Plates	Resolution	Selectivity
3.756	-	2491.60254	407.10132	0.62	0.0872	10265	-	-
4.097	-	67.26482	7.98565	0.55	0.1269	5779	1.87	1.09

Signal 3: DAD1 C, Sig=260,4 Ref=off

RetTime [min]	k'	Area [mAU*s]	Height [mAU]	Symm.	Width [min]	Plates	Resolution	Selectivity
3.756	-	1316.99841	217.63165	0.63	0.0860	10552	-	-
4.095	-	29.52357	3.45678	0.50	0.1225	6186	1.91	1.09

Signal 4: DAD1 D, Sig=280,4 Ref=off

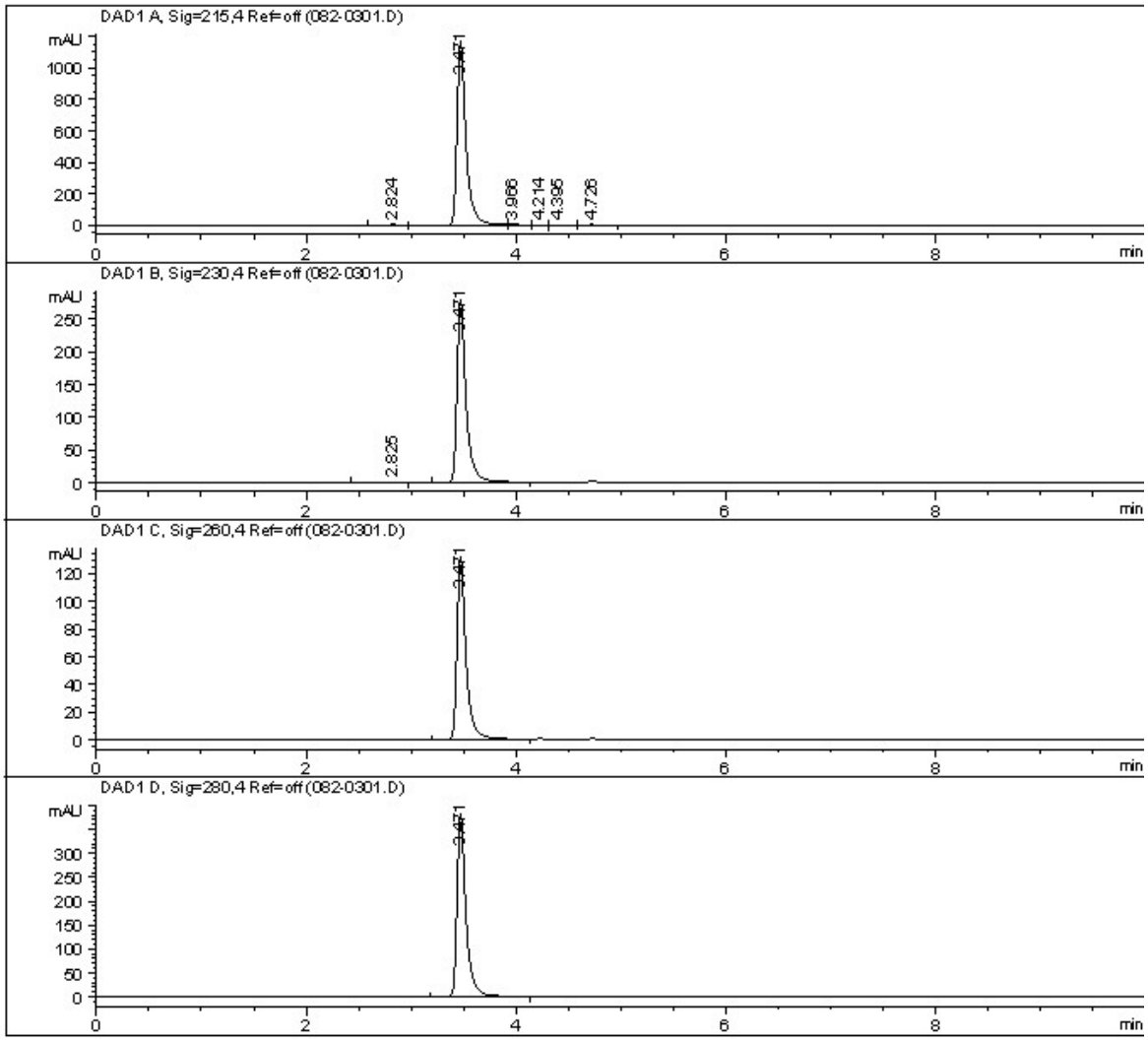
RetTime [min]	k'	Area [mAU*s]	Height [mAU]	Symm.	Width [min]	Plates	Resolution	Selectivity
3.756	-	2188.78882	361.14264	0.63	0.0862	10500	-	-
4.093	-	42.85130	4.84483	0.42	0.1204	6406	1.92	1.09

*** End of Report ***

UPLC chromatogram of compound 7a

Data File C:\CHEM32\1\DATA\UMAIR\UMAIR 2024-02-13 14-56-21\082-0301.D
Sample Name: UK-GALBR

Acq. Operator	: junaid	Seq. Line	: 3
Acq. Instrument	: UPLC 1	Location	: Vial 82
Injection Date	: 13/02/2024 3:31:42 pm	Inj	: 1
		Inj Volume	: 5.000 µl
Sequence File	: C:\Chem32\1\DATA\UMAIR\UMAIR 2024-02-13 14-56-21\UMAIR.S		
Method	: C:\CHEM32\1\DATA\UMAIR\UMAIR 2024-02-13 14-56-21\UMAIR.M (Sequence Method)		
Last changed	: 13/02/2024 2:56:19 pm by junaid		
Method Info	: column: C-4 (4.6 X 250mm) 5 um 300A MN		



Area Percent Report with Performance

Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Data File C:\CHEM32\1\DATA\UMAIR\UMAIR 2024-02-13 14-56-21\082-0301.D
Sample Name: UK-GALBR

Signal 1: DAD1 A, Sig=215,4 Ref=off

RetTime [min]	k'	Area [mAU*s]	Height [mAU]	Symm.	Width [min]	Plates	Resolution	Selectivity
2.824	-	30.33011	4.30497	0.88	0.1000	4426	-	-
3.471	-	7008.73242	1169.25415	0.57	0.0836	9564	4.14	1.23
3.966	-	35.88287	4.02049	0.33	0.1546	3648	2.45	1.14
4.214	-	14.61916	1.82261	0.83	-	-	-	1.06
4.395	-	8.54136	1.04321	1.00	0.1440	5157	-	1.04
4.726	-	20.46066	2.68093	0.81	0.1167	9093	1.49	1.08

Signal 2: DAD1 B, Sig=230,4 Ref=off

RetTime [min]	k'	Area [mAU*s]	Height [mAU]	Symm.	Width [min]	Plates	Resolution	Selectivity
2.825	-	7.67525	1.04858	0.97	0.1963	1149	-	-
3.471	-	1663.11353	280.86484	0.56	0.0831	9668	2.71	1.23

Signal 3: DAD1 C, Sig=260,4 Ref=off

RetTime [min]	k'	Area [mAU*s]	Height [mAU]	Symm.	Width [min]	Plates	Resolution	Selectivity
3.471	-	778.96527	132.36870	0.57	0.0829	9725	-	-

Signal 4: DAD1 D, Sig=280,4 Ref=off

RetTime [min]	k'	Area [mAU*s]	Height [mAU]	Symm.	Width [min]	Plates	Resolution	Selectivity
3.471	-	2252.70557	383.80142	0.57	0.0826	9799	-	-

*** End of Report ***