Electronic Supplementary Material (ESI) for Organic Chemistry Frontiers.

Supplementary Information

Synthesis of a biotinylated penta-α-(1→6)-D-glucoside based on the rational design of an α-stereoselective glucosyl donor

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Table S1. ^{1}H NMR signals of ring protons of selected compounds.

Compound	Residue	H-1 ($J_{1,2}$)	H-2 ($J_{2,3}$)	H-3 ($J_{3,4}$)	H-4 ($J_{4,5}$)	H-5 ($J_{5,6}$)	H-6 ($J_{6,6'}$)	H-6' ($J_{6',5}$)
28a	**α-(1-6)-Glc**	5.00	3.56	3.98	3.62	3.78	3.85	3.84
		(3.49)	(9.2)	(9.3)	(9.5)			
	β-OMP-Glc	4.83	3.54	3.68	3.70	3.54	3.82	3.74
29	**α-(1-6)-Glc**	5.06	3.52	5.69	3.70	3.86	3.85	3.85
		(3.54)	(9.6)	(9.6)				
	β-OMP-Glc	4.93	3.54	3.75	3.68	3.65	3.82	3.74
30a	**α-(1-6)-Glc**	4.93	3.54	4.00	3.57	3.98	4.52	4.33
				(9.2)			(12.0)	(4.5)
	β-OMP-Glc	4.84	3.52	3.69	3.68	3.57	3.84	3.75
		(7.86)				(5.2)	(11,6)	
30b	**β-(1-6)-Glc**	4.52	3.50	3.62	3.46	3.52	4.68	4.40
		(7.81)	(9.0)	(9.0)	(9.0)		(11.9)	(4.5)
	β-OMP-Glc	4.92	3.68	3.74	3.65	3.72	4.16	3.79
31a	**α-(1-6)-Glc**	4.96	3.45	5.62	3.60	4.01	4.53	4.30
		(3.43)	(9.6)	(9.6)			(11.5)	(4.2)
	β-OMP-Glc	4.85	3.47	3.66	3.64	3.60	3.82	3.75
32a	**α-(1-6)-Glc**	4.97	3.41	5.62	3.54	3.97	4.52	4.38
		(3.5)	(9.6)	(9.5)	(9.6)			(3.8)
	β-OMP-Glc	4.85	3.46	3.68	3.67	5.58	3.81	3.75
37a	**α-(1-6)-Glc**	5.16	3.51	5.65	3.72	3.75	3.82	3.80
		(3.6)	(10.0)	(9.6)	(9.5)			
	β-OMP-Glc	4.90	3.28	5.25	3.84	3.56	3.80	3.76
		(7.8)	(9.6)	(9.6)				
37b	**β-(1-6)-Glc**	5.00	3.59	5.23	3.67	3.29	3.91	3.79
		(7.7)	(10.0)	(9.5)				
	β-OMP-Glc	4.43	3.41	5.24	3.72	3.60	4.21	3.67
		(7.7)	(9.5)	(9.5)				
38a	**α-(1-6)-Glc**	4.97	3.68	5.55	3.45	3.77	3.82	3.80
	α-Glc	5.10	3.32	3.91	3.57	4.01	3.72	3.72
			(9.1)	(9.1)				
38b	**α-(1-6)-Glc**	4.97	3.68	5.55	3.45	3.77	3.81	3.81
	β-Glc	4.65	3.17	3.59	3.45	3.71	3.64	3.64
39a	**α-(1-6)-Glc**	5.12	3.49	5.63	3.75	3.73	3.87	3.86
	α-Glc	5.50	3.14	5.48	3.65	4.00	3.82	3.71
		(3.6)	(9.7)	(9.6)				
Compound	**Residue**	**H-1 ($J_{1,2}$)**	**H-2**	**H-3**	**H-4**	**H-5**	**H-6**	**H-6'**

			$(J_{2,3})$	$(J_{3,4})$	$(J_{4,5})$	$(J_{5,6})$	$(J_{6,6'})$	$(J_{6',5})$
39b	**α-(1-6)-Glc**	5.12	3.49	5.63	3.75	3.73	3.87	3.86
	β-Glc	4.51	2.96	3.12	3.75	3.46	3.81	3.71
		(7.5)	(9.3)					
42b	**α-(1-6)-Glc**	5.04	3.40	5.55	3.56	3.8	3.85	3.80
		(3.6)	(9.5)	(9.5)	(9.5)			
	β-(1-6)-Glc	4.30	3.22	3.55	3.67	3.36	3.77	3.72
		(7.8)		(9.1)				
	α-OC_3H_6NHTFA-Glc	4.53	3.50	3.86	3.37	3.8	4.09	3.72
		(3.2)	(9.6)					
45	**α-(1-6)-Glc**	4.83	3.4	5.56	3.54	4.05	4.55	4.41
		(3.4)	(9.6)	(9.6)	(9.6)		(12.0)	(4.1)
	α-OC_3H_6NHTFA-Glc	4.57	3.4	3.90	3.37	3.83	3.65	3.61
47	**α-(1-6)-Glc**	4.84	3.44	5.51	3.65	3.79	3.84	3.82
		(3.4)	(9.6)	(9.6)	(9.6)			
	α-OC_3H_6NHTFA-Glc	4.55	3.41	3.85	3.38	3.83	3.65	3.58
		(3.3)						
48	**α-(1-6)-Glc**	4.81	3.39	5.51	3.55	3.73	3.76	3.65
			(10.0)	(9.6)	(9.6)			
	α-OC_3H_6NHTFA-Glc	4.56	3.43	3.89	3.42	3.82	3.61	3.56
49	**α-(1-6)-Glc**	5.11	3.41	5.65	3.56	3.94	4.57	4.42
		(3.4)	(9.6)	(9.6)	(9.6)		(12.1)	(3.9)
	α-(1-6)-Glc	4.70	3.11	3.44	3.74	3.80	3.80	3.67
		(3.1)	(10.0)	(9.5)				
	α-OC_3H_6NHTFA-Glc	4.57	3.40	3.87	3.37	3.80	3.63	3.57
50	**α-(1-6)-Glc**	5.21	3.42	5.66	3.63	3.73	3.73	3.72
		(3.5)		(9.6)	(9.6)			
	α-(1-6)-Glc	4.47	3.11	5.47	3.80	3.84	3.88	3.71
		(3.4)	(9.6)	(9.6)				
	α-OC_3H_6NHTFA-Glc	4.61	3.47	3.92	3.45	3.82	3.70	3.64
		(4.0)		(9.0)				
51	**α-(1-6)-Glc**	5.19	3.48	5.70	3.60	3.97	4.61	4.47
		(3.4)		(9.6)				
	α-(1-6)-Glc	5.01	3.17	5.56	3.83	3.82	3.87	3.86
		(3.5)	(9.9)	(9.5)				
	α-(1-6)-Glc	4.75	3.11	5.44	3.76	3.80	3.74	3.60
		(3.4)	(10.0)	(9.5)				
	α-OC_3H_6NHTFA-Glc	4.57	3.42	3.90	3.43	3.79	3.64	3.58

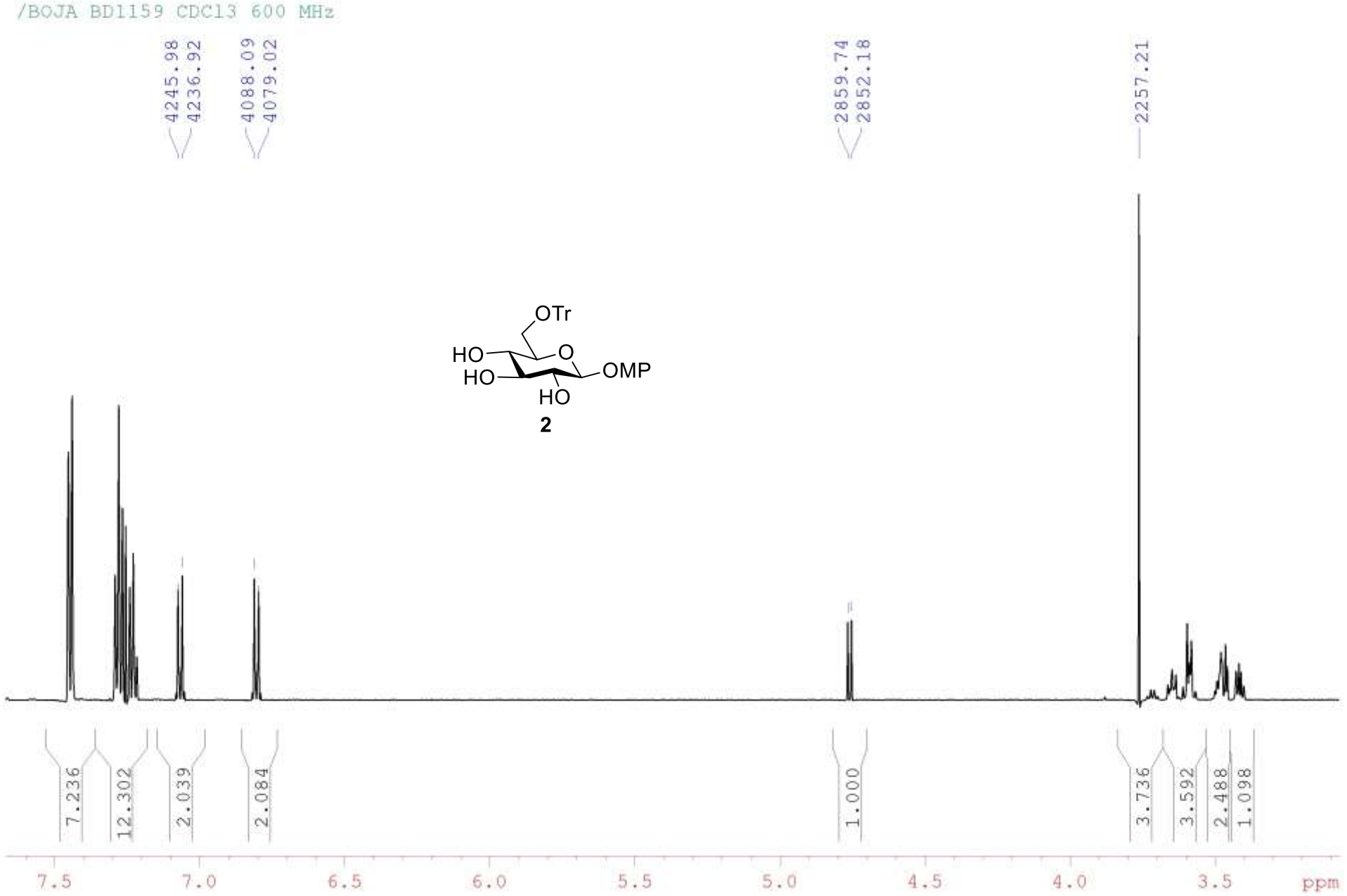
Compound	Residue	H-1 ($J_{1,2}$)	H-2 ($J_{2,3}$)	H-3 ($J_{3,4}$)	H-4 ($J_{4,5}$)	H-5 ($J_{5,6}$)	H-6 ($J_{6,6'}$)	H-6' ($J_{6',5}$)
52	**α-(1-6)-Glc**	5.15 (3.5)	3.45	5.66 (9.6)	3.64	3.69	3.75	3.68
	α-(1-6)-Glc	5.02 (3.5)	3.20 (10.0)	5.56 (9.5)	3.82	3.83	3.85	3.66
	α-(1-6)-Glc	4.76 (3.5)	3.15 (10.0)	5.44 (9.5)	3.76	3.81	3.80	3.65
	α-OC_3H_6NHTFA-Glc	4.61	3.43	3.90	3.45	3.75	3.67	3.59
53	**α-(1-6)-Glc**	5.16 (3.4)	3.48 (9.9)	5.70 (9.6)	3.60	3.97	4.61	4.46
	α-(1-6)-Glc	5.04 (3.5)	3.19 (9.9)	5.52	3.65	3.82	3.86	3.63
	α-(1-6)-Glc	5.01 (3.5)	3.15 (9.9)	5.52	3.65	3.78	3.85	3.63
	α-(1-6)-Glc	4.75 (3.4)	3.11 (10.0)	5.43 (9.5)	3.65	3.77	3.86	3.62
	α-OC_3H_6NHTFA-Glc	4.60 (3.6)	3.42 (9.4)	3.90 (9.2)	3.43	3.77	3.66	3.58

Table S2. ^{13}C NMR signals of ring carbons of selected compounds.

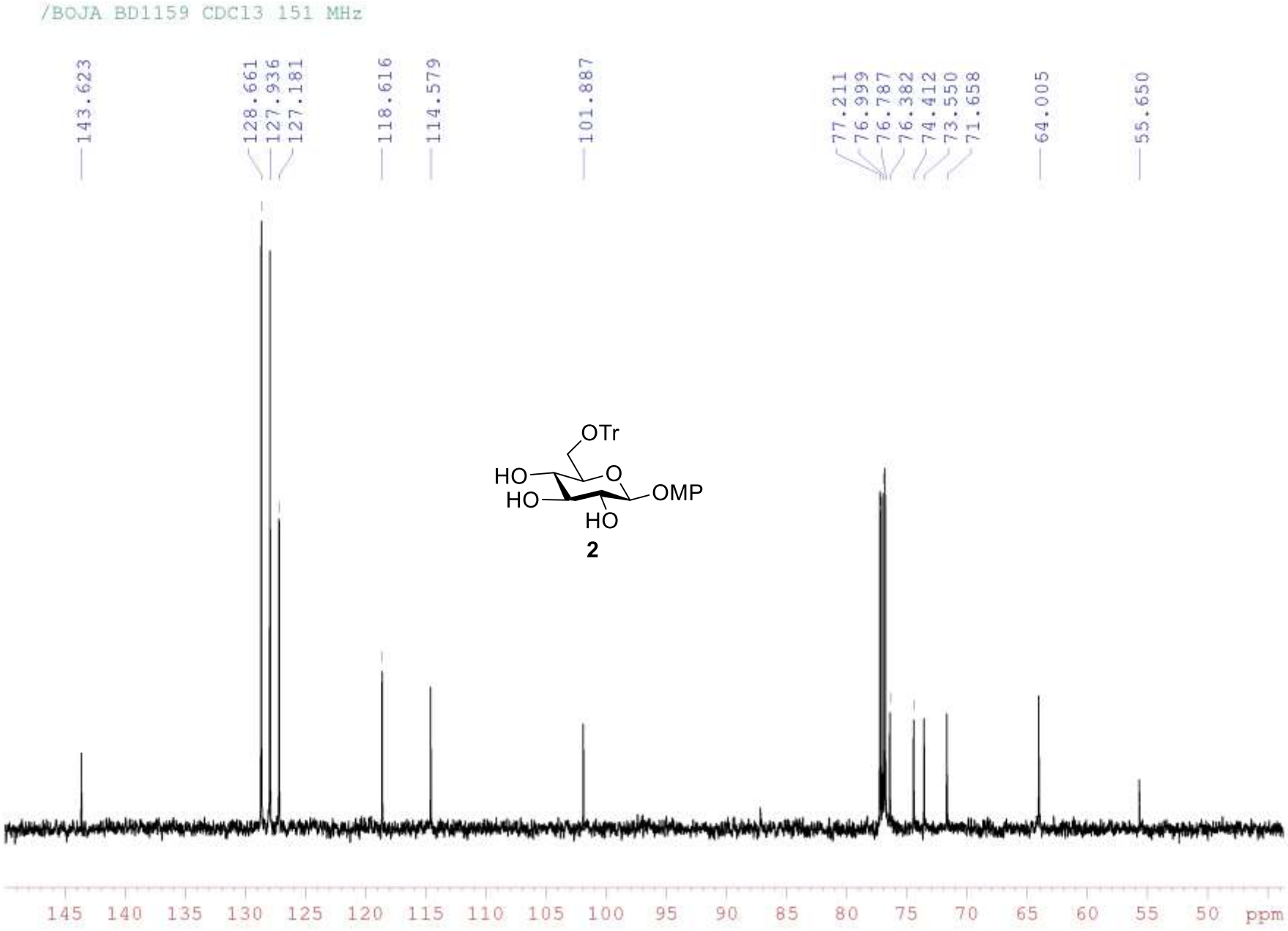
Compound	Residue	C-1	C-2	C-3	C-4	C-5	C-6
28a	**α-(1-6)-Glc**	97.0	80.5	81.9	77.9	71.7	63.0
	β-OMP-Glc	103.3	82.2	84.6	77.7	74.9	65.6
29	**α-(1-6)-Glc**	96.7	77.7	74.8	-	71.1	62.8
	β-OMP-Glc	102.8	82.0	84.5	77.5	75.0	65.7
30a	**α-(1-6)-Glc**	97.2	80.3	81.8	77.4	68.7	64.2
	β-OMP-Glc	103.2	82.2	84.6	77.7	74.7	66.2
30b	**β-(1-6)-Glc**	103.7	82.3	84.7	78.1	72.8	64.0
	β-OMP-Glc	102.2	82.0	84.6	77.7	75.4	68.4
31a	**α-(1-6)-Glc**	97.0	77.5	73.4	76.3	68.4	64.0
	β-OMP-Glc	102.6	82.0	84.5	77.2	74.4	66.3
32a	**α-(1-6)-Glc**	97.1	77.3	73.3	76.2	68.2	64.8
	β-OMP-Glc	102.6	82.0	84.5	77.5	74.8	66.3
37a	**α-(1-6)-Glc**	96.9	77.8	74.1	76.3	71.4	62.8
	β-OMP-Glc	102.9	79.3	75.3	75.4	75.2	65.0
37b	**β-(1-6)-Glc**	103.5	78.9	75.6	75.0	75.6	62.5
	β-OMP-Glc	102.6	79.9	76.4	76.1	76.2	67.8

Compound	Residue	C-1	C-2	C-3	C-4	C-5	C-6
38a	**α-(1-6)-Glc**	96.9	76.3	74.1	74.9	71.3	62.7
	α-Glc	91.2	80.2	81.7	77.8	70.6	66.2
38b	**α-(1-6)-Glc**	96.9	76.3	74.1	74.9	71.3	62.7
	β-Glc	97.4	83.2	84.5	77.8	71.3	66.1
39a	**α-(1-6)-Glc**	97.0	77.9	74.5	76.3	71.4	62.7
	α-Glc	91.0	78.1	73.3	75.4	70.9	65.4
39b	**α-(1-6)-Glc**	97.0	77.9	74.5	76.3	71.4	62.7
	β-Glc	97.3	80.6	75.0	75.6	75.0	65.4
42b	**α-(1-6)-Glc**	96.9	77.7	74.3	77.5	71.2	62.8
	β-(1-6)-Glc	103.3	82.1	84.7	76.4	75.0	65.6
	α-OC_3H_6NHTFA-Glc	97.9	79.7	82.3	78.0	70.7	67.7
45	**α-(1-6)-Glc**	96.6	76.2	73.3	76.2	68.3	64.7
	α-OC_3H_6NHTFA-Glc	97.6	80.0	82.4	78.1	70.5	66.5
47	**α-(1-6)-Glc**	96.4	77.8	74.1	76.2	71.2	62.7
	α-OC_3H_6NHTFA-Glc	97.5	79.9	82.4	78.0	70.5	66.6
48	**α-(1-6)-Glc**	96.8	77.5	73.4	75.7	70.5	61.5
	α-OC_3H_6NHTFA-Glc	97.7	79.9	82.4	78.0	70.5	66.6
49	**α-(1-6)-Glc**	96.8	77.3	73.3	76.1	68.4	64.7
	α-(1-6)-Glc	96.7	77,7	73.3	75.9	70.5	65.2
	α-OC_3H_6NHTFA-Glc	97.6	80.0	82.4	78.1	70.8	66.5
50	**α-(1-6)-Glc**	96.8	77.3	73.3	76.1	68.4	61.5
	α-(1-6)-Glc	96.7	77,7	73.3	76.0	70.5	65.2
	α-OC_3H_6NHTFA-Glc	97.6	80.0	82.5	78.1	70.8	66.5
51	**α-(1-6)-Glc**	96.9	77.4	73.3	76.2	68.5	64.7
	α-(1-6)-Glc	97.0	77.7	73.2	75.6	70.6	65.2
	α-(1-6)-Glc	96.7	77.8	73.2	75.6	70.9	65.2
	α-OC_3H_6NHTFA-Glc	97.6	80.0	82.4	78.1	70.8	66.5
52	**α-(1-6)-Glc**	97.0	77.4	73.3	75.7	70.5	61.5
	α-(1-6)-Glc	97.0	77.7	73.2	75.6	70.7	65.2
	α-(1-6)-Glc	96.8	77.7	73.2	75.6	70.7	65.2
	α-OC_3H_6NHTFA-Glc	97.6	80.0	82.4	78.8	70.6	66.4
53	**α-(1-6)-Glc**	96.9	77.4	73.4	76.2	68.5	64.7
	α-(1-6)-Glc	97.1	77.8	73.3	75.6	71.0	65.1
	α-(1-6)-Glc	97.1	77.8	73.3	75.6	71.0	65.1
	α-(1-6)-Glc	96.7	77.9	73.3	75.6	70.6	65.3
	α-OC_3H_6NHTFA-Glc	97.6	80.1	82.4	78.1	70.6	66.4

_p_-Methoxyphenyl 6-_O_-triphenylmethyl-β-D-glucopyranoside (2)



***p*-Methoxyphenyl 6-*O*-triphenylmethyl-β-D-glucopyranoside (2)**



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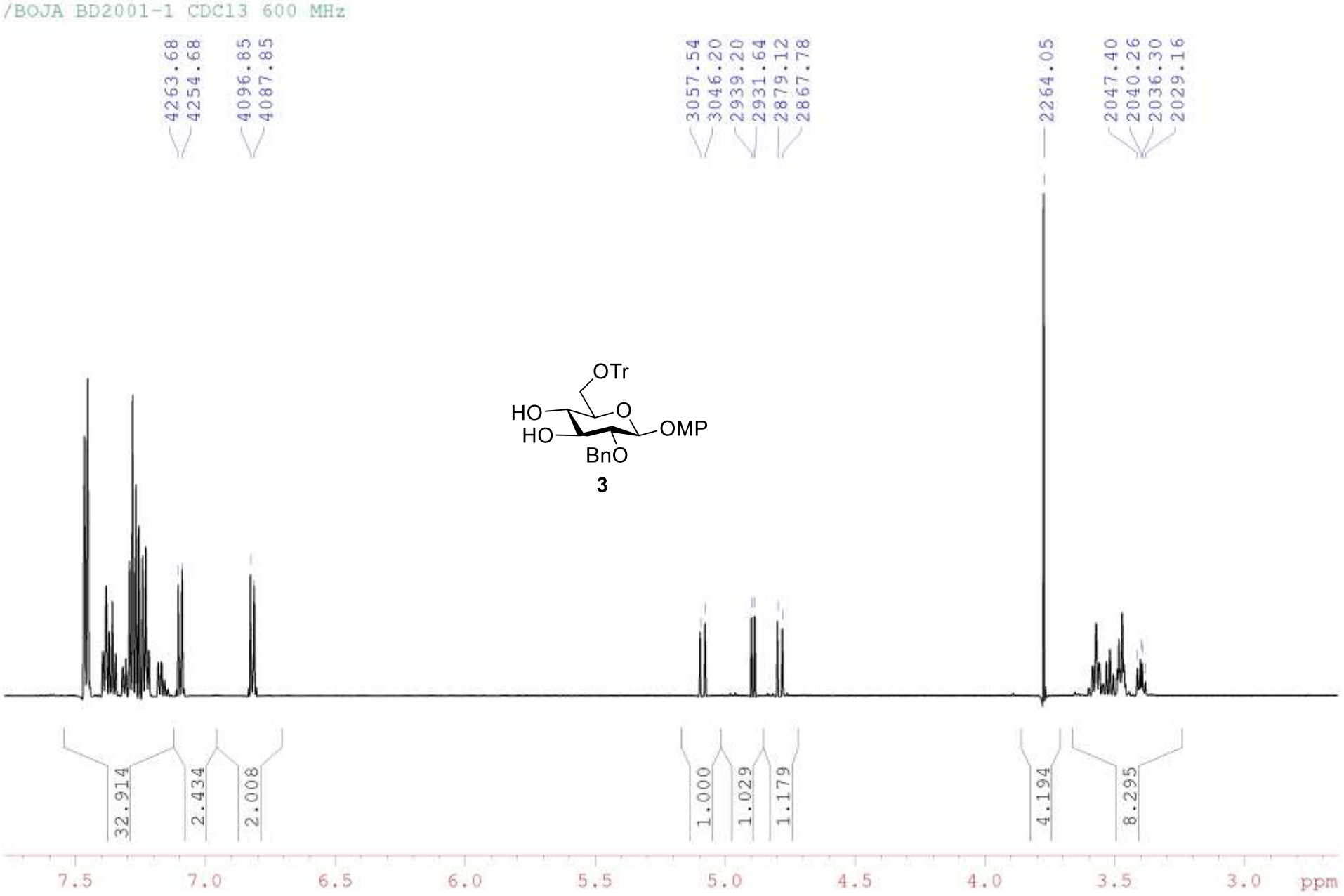

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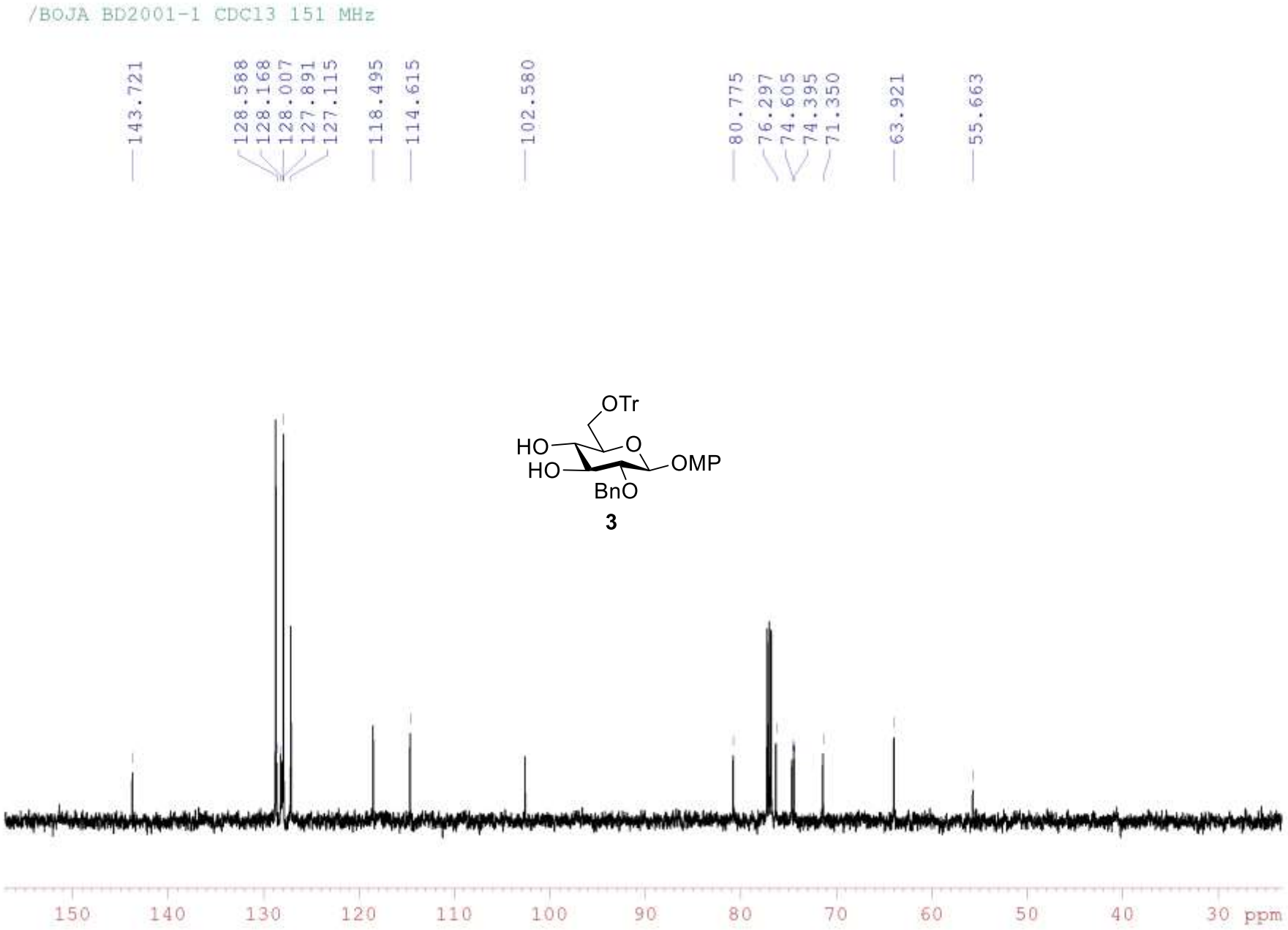

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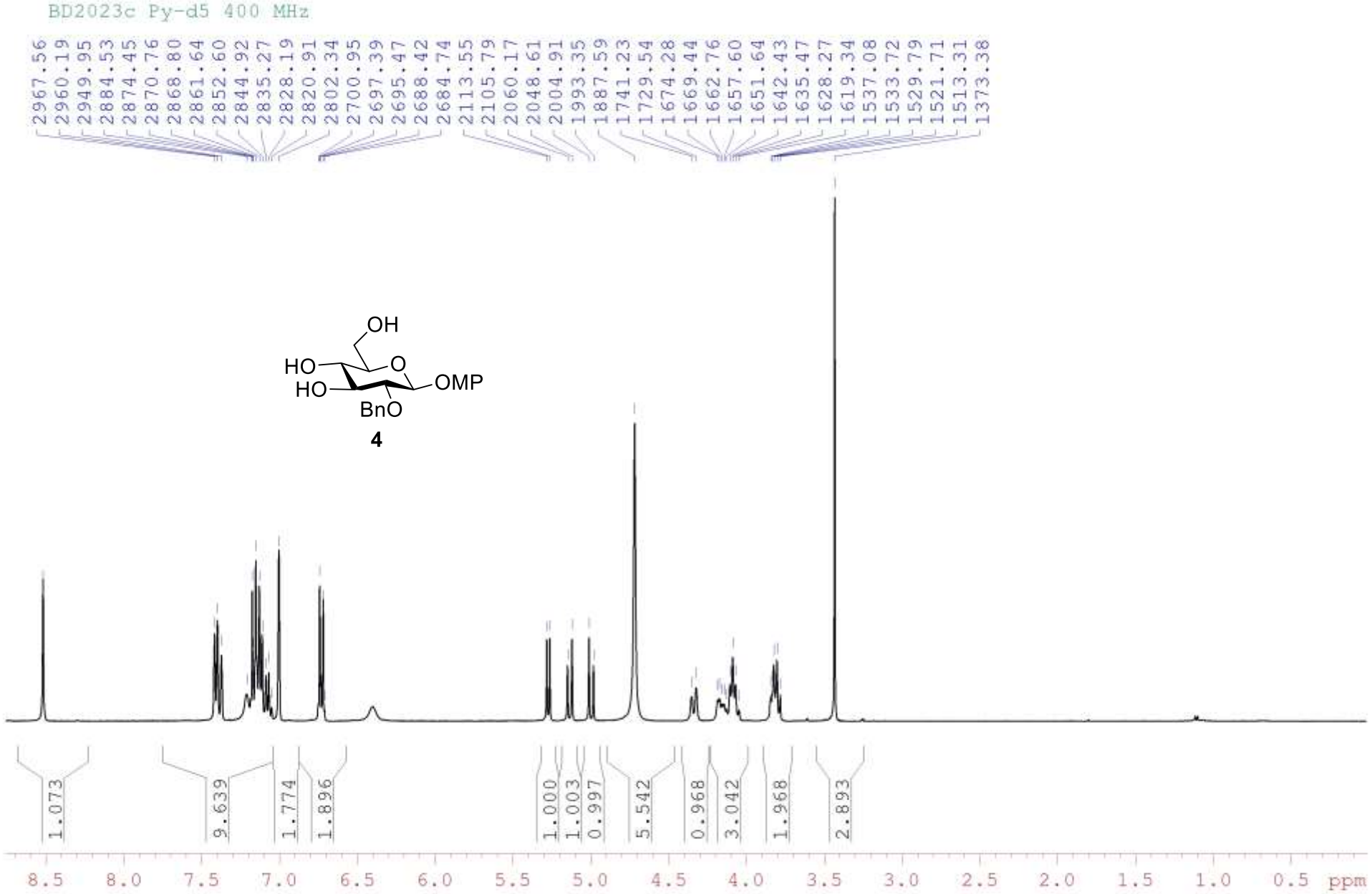

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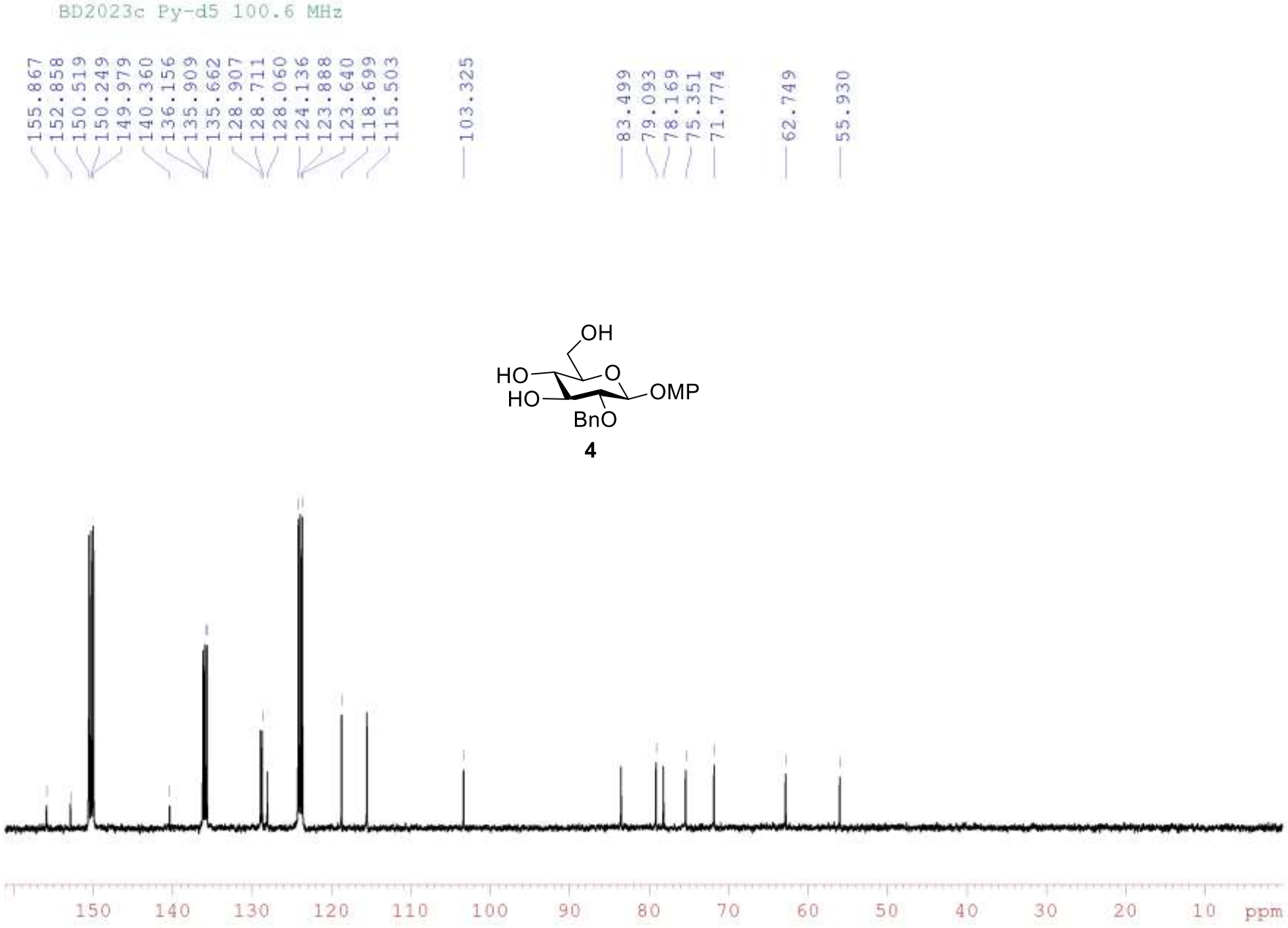

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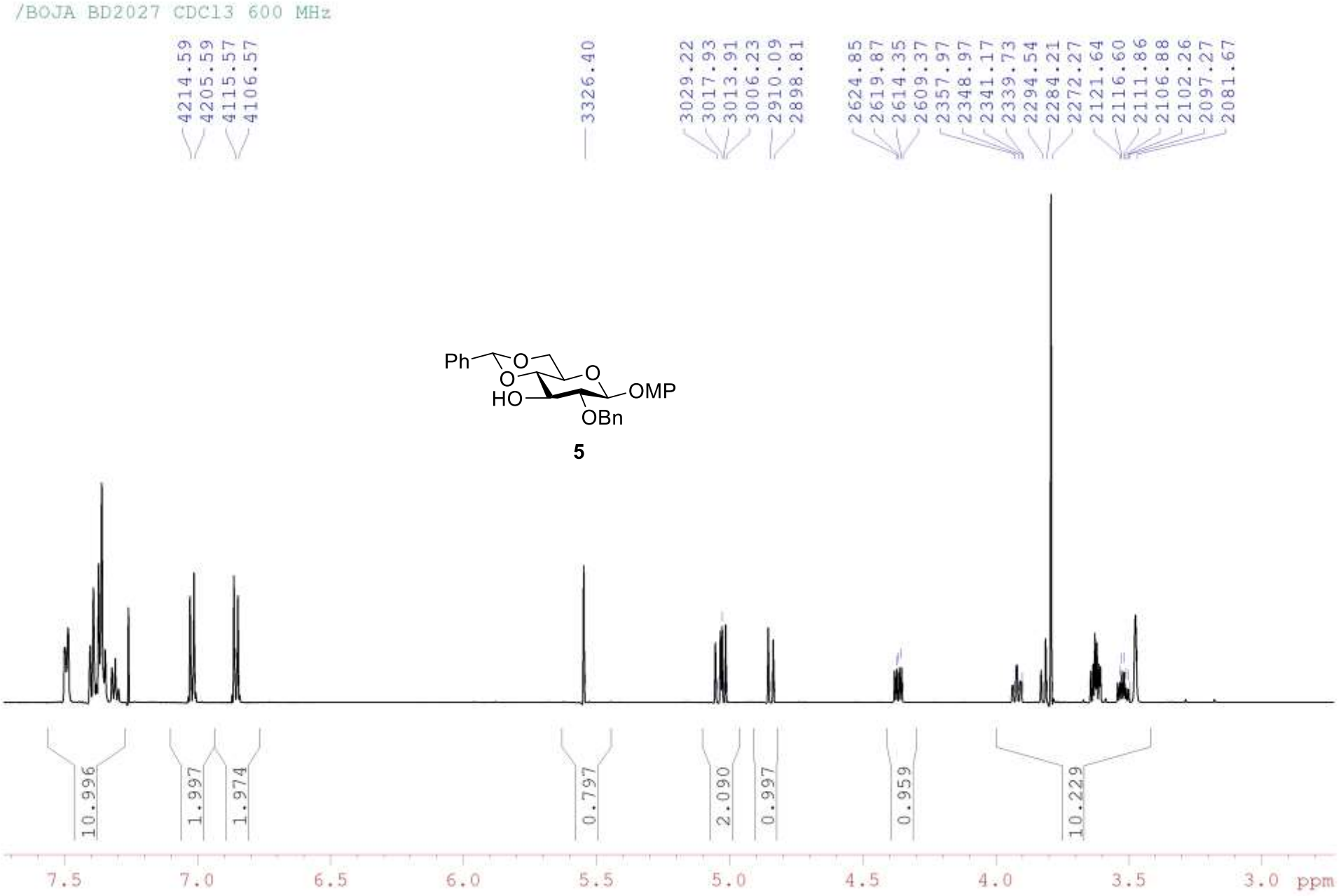

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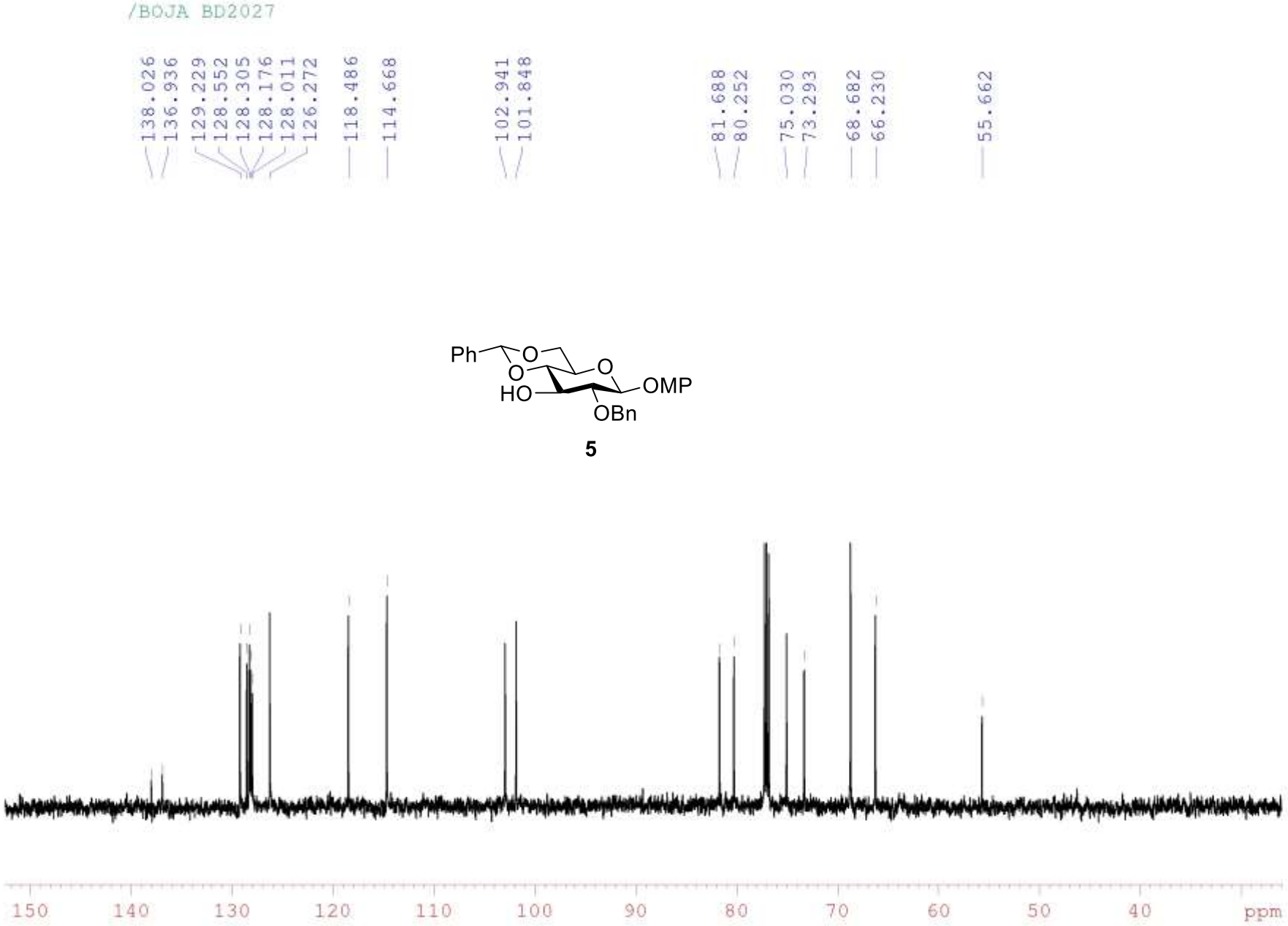

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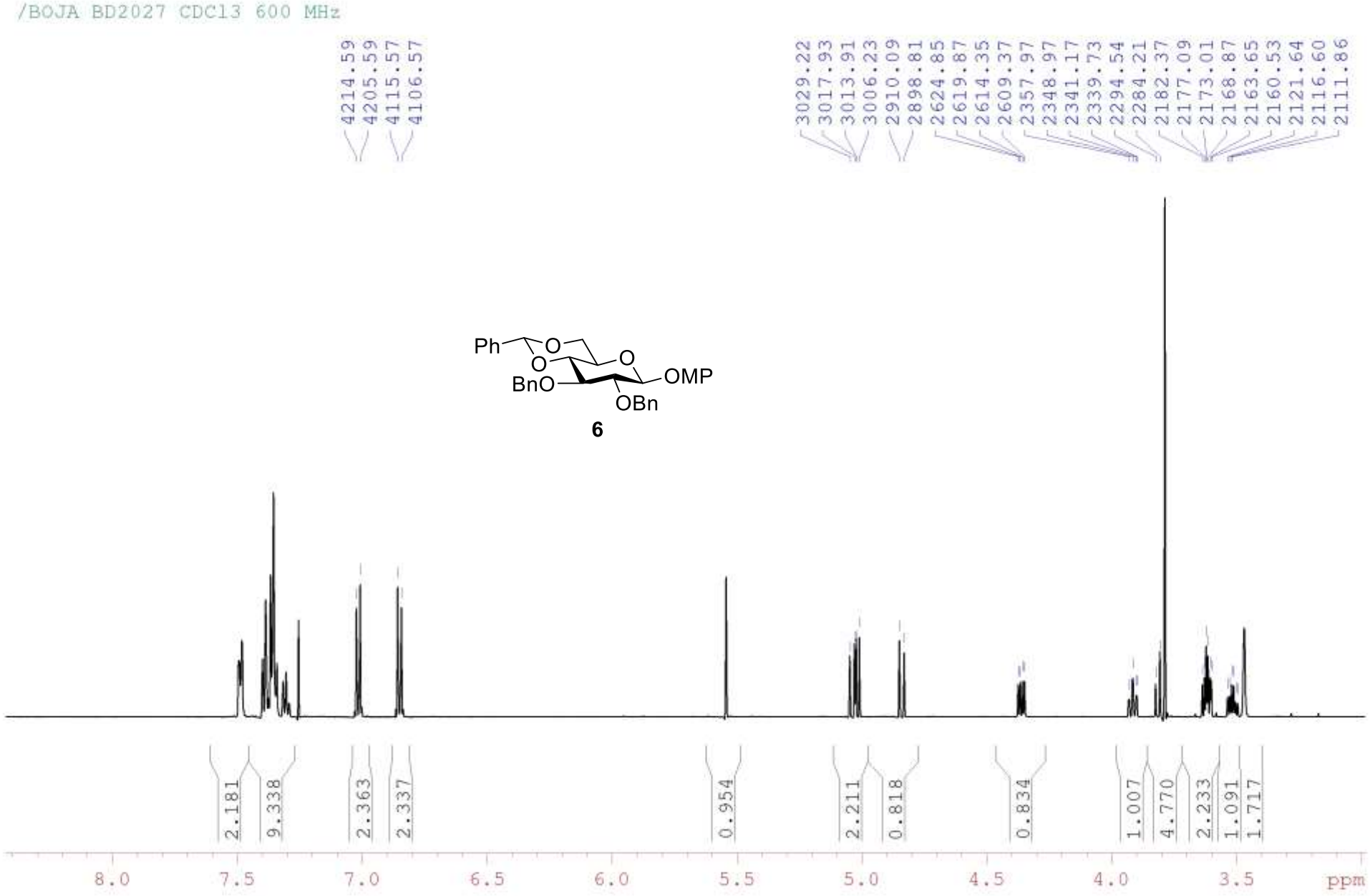

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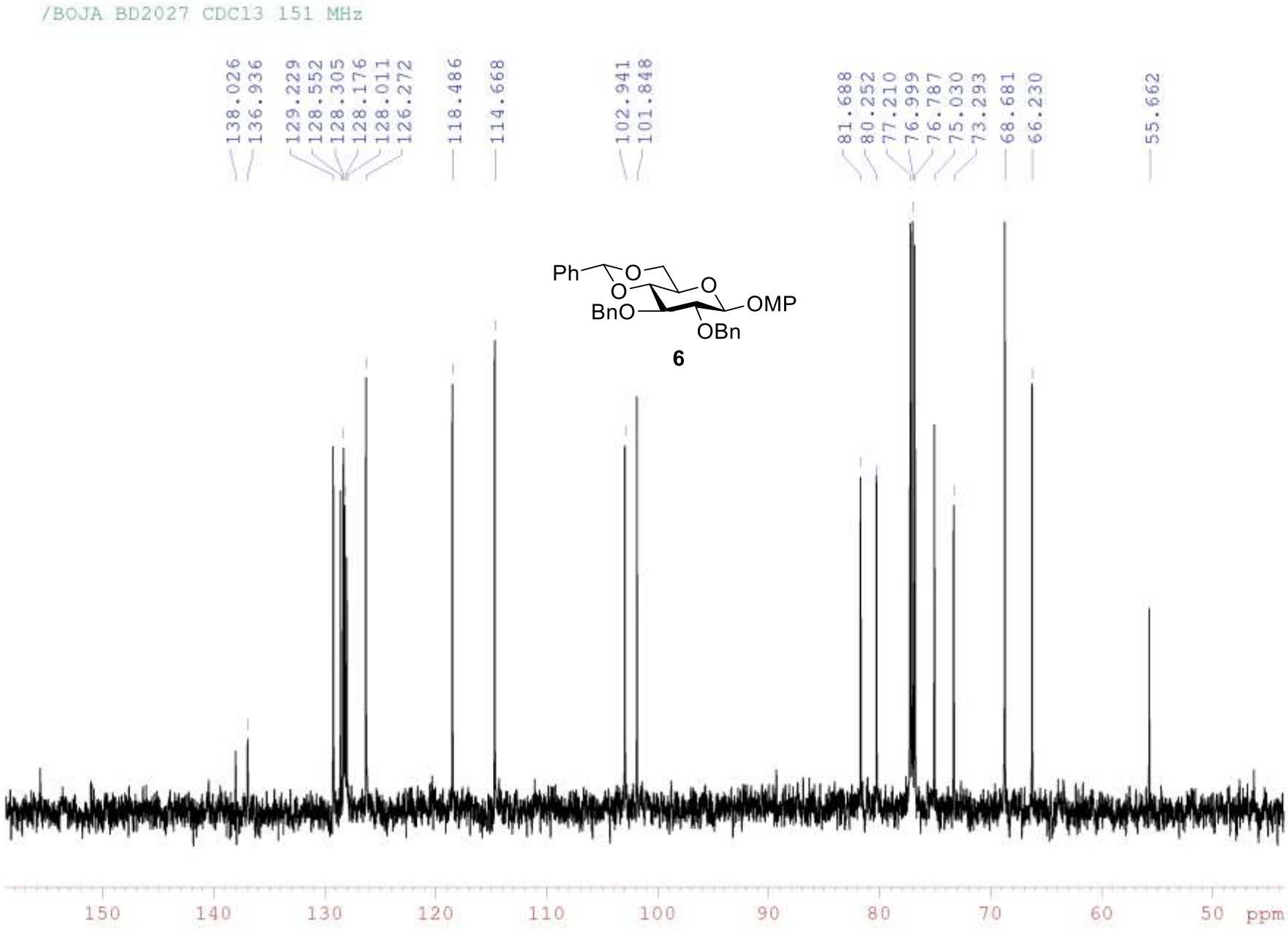

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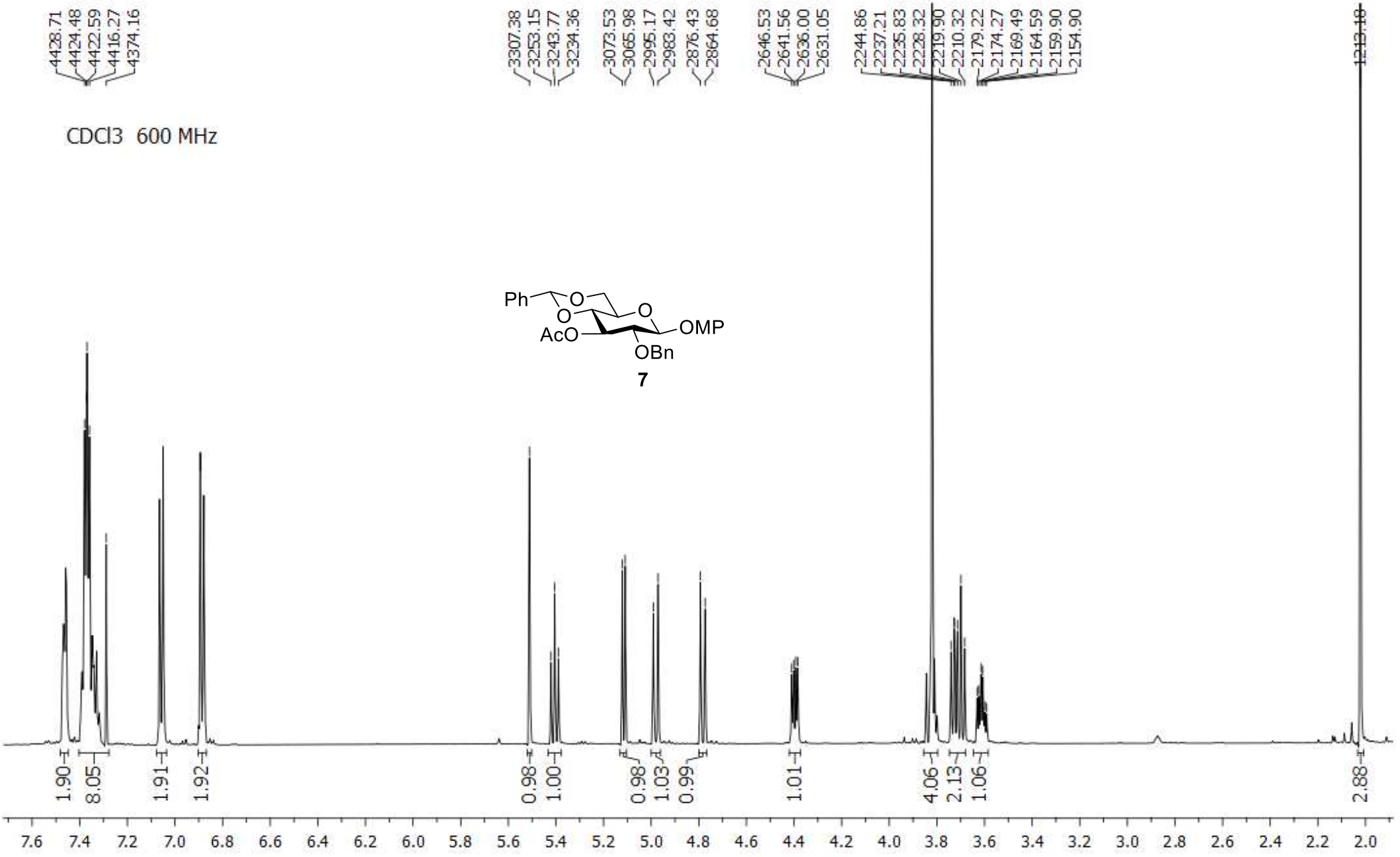

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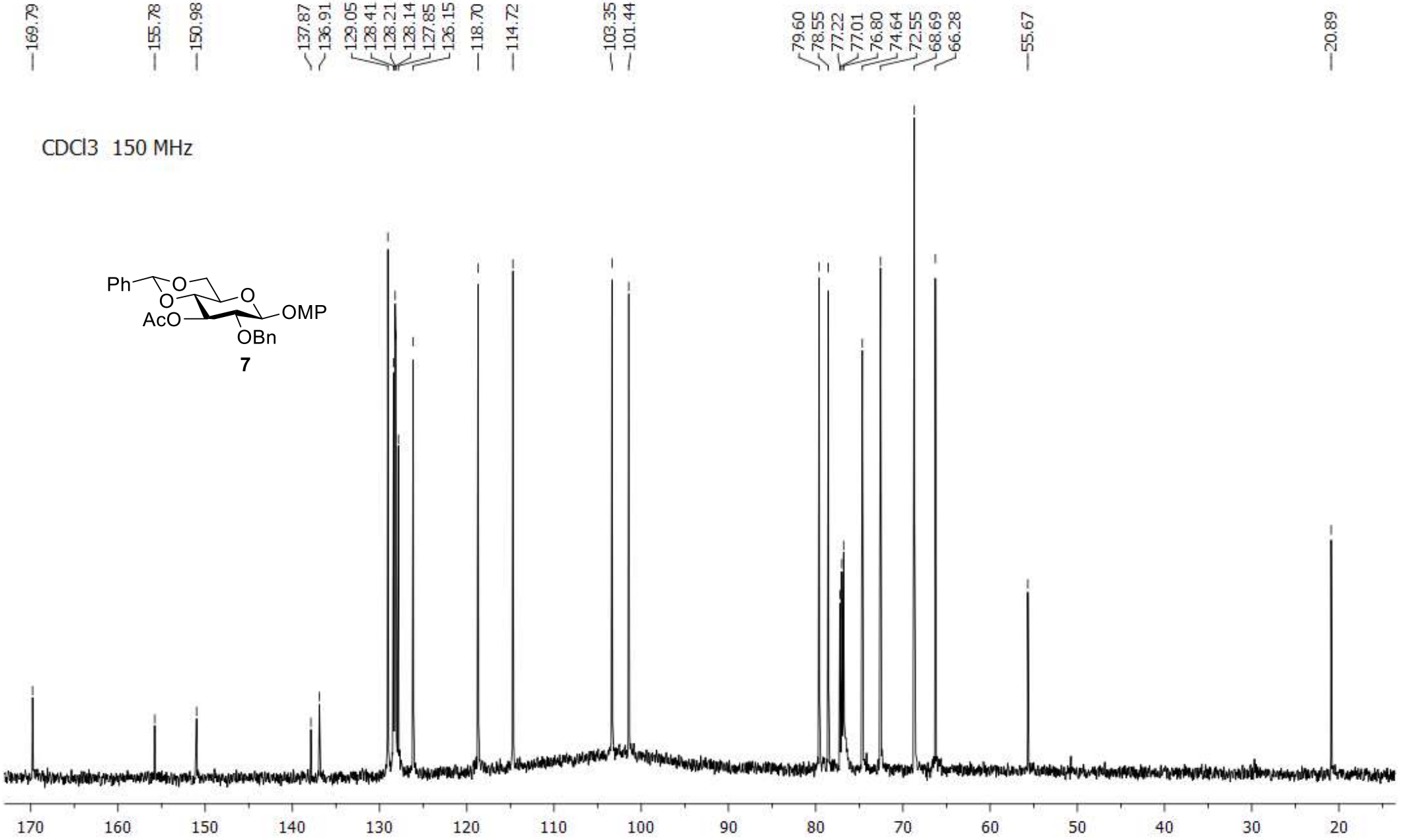

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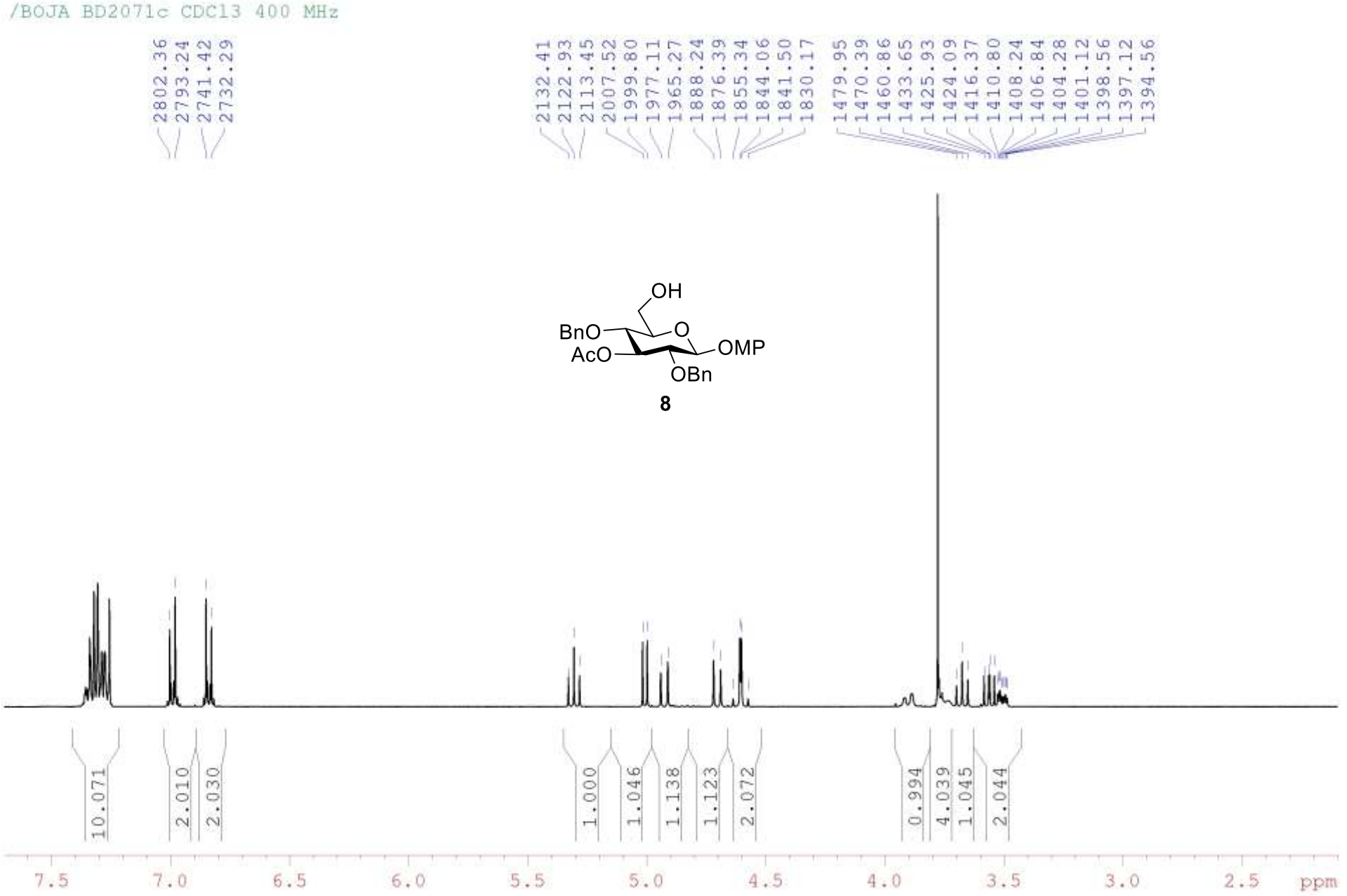

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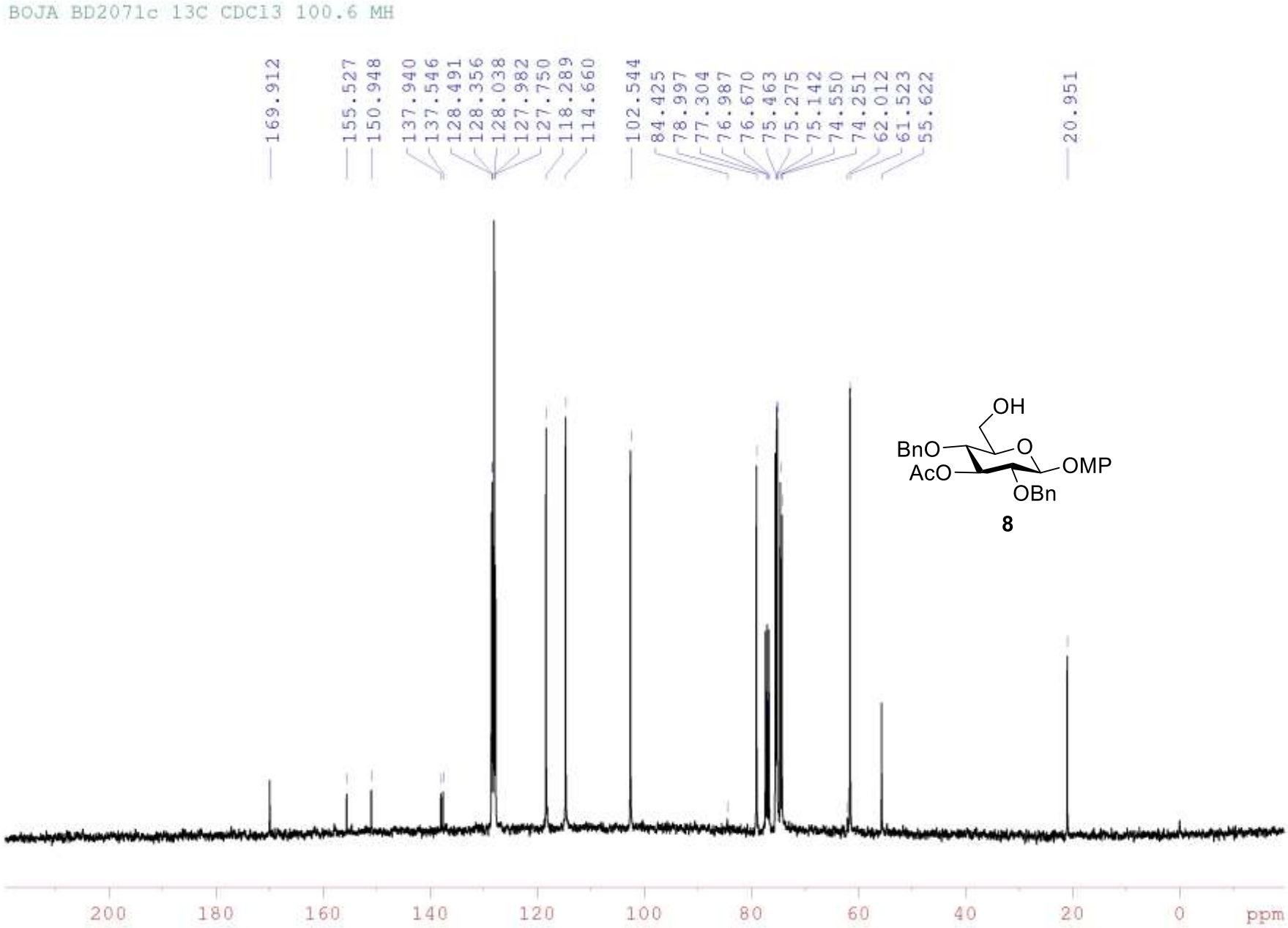

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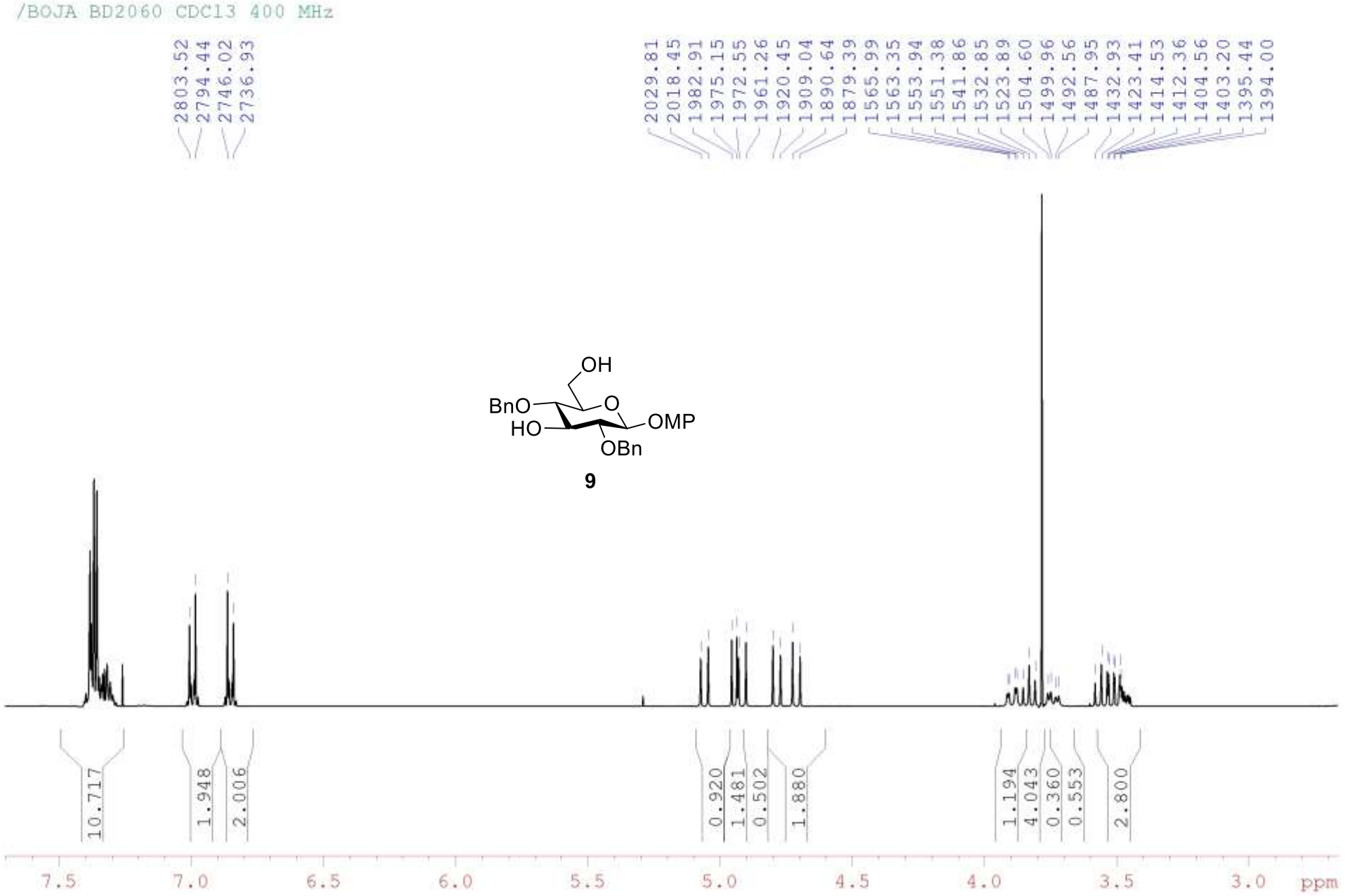

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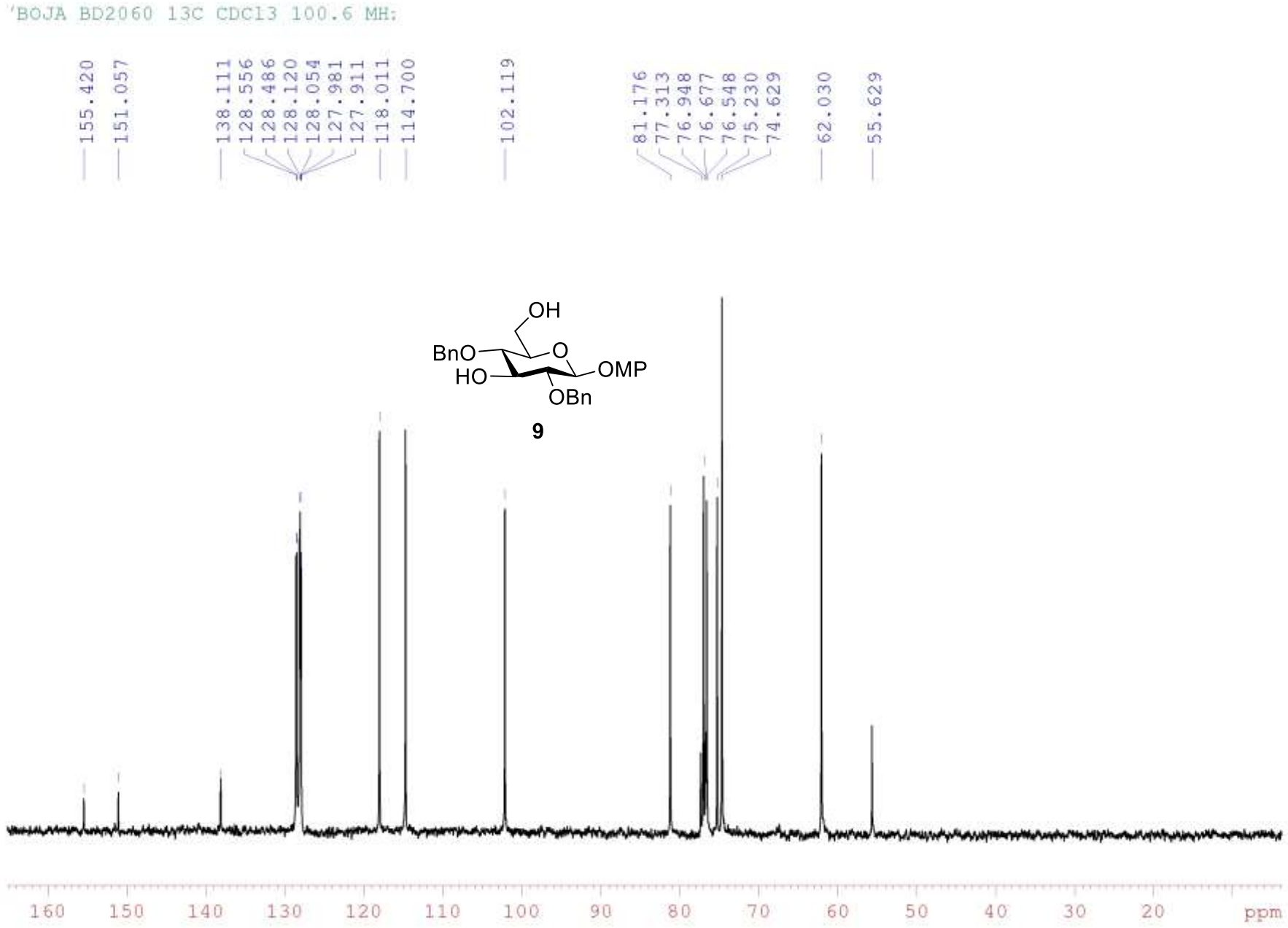
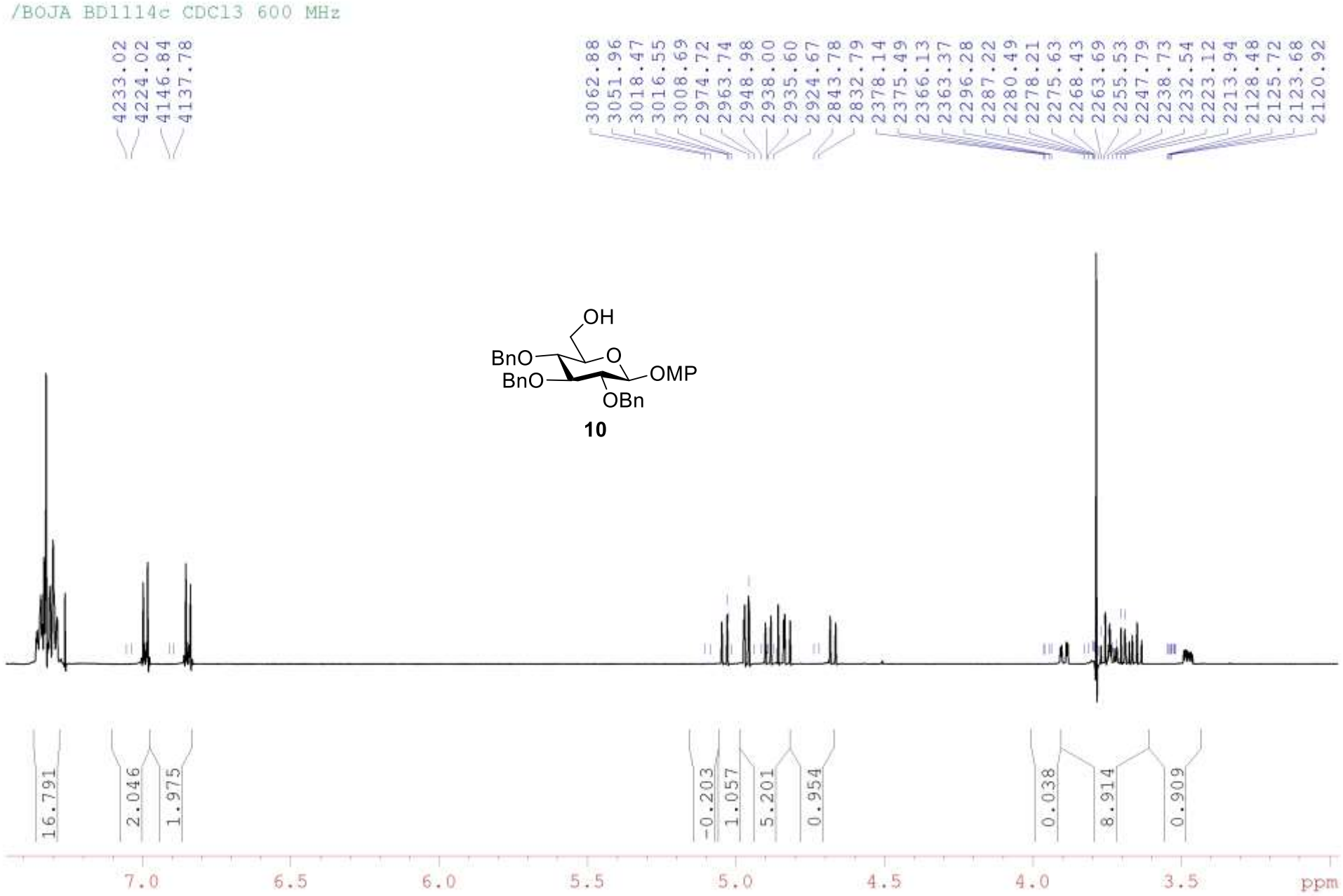
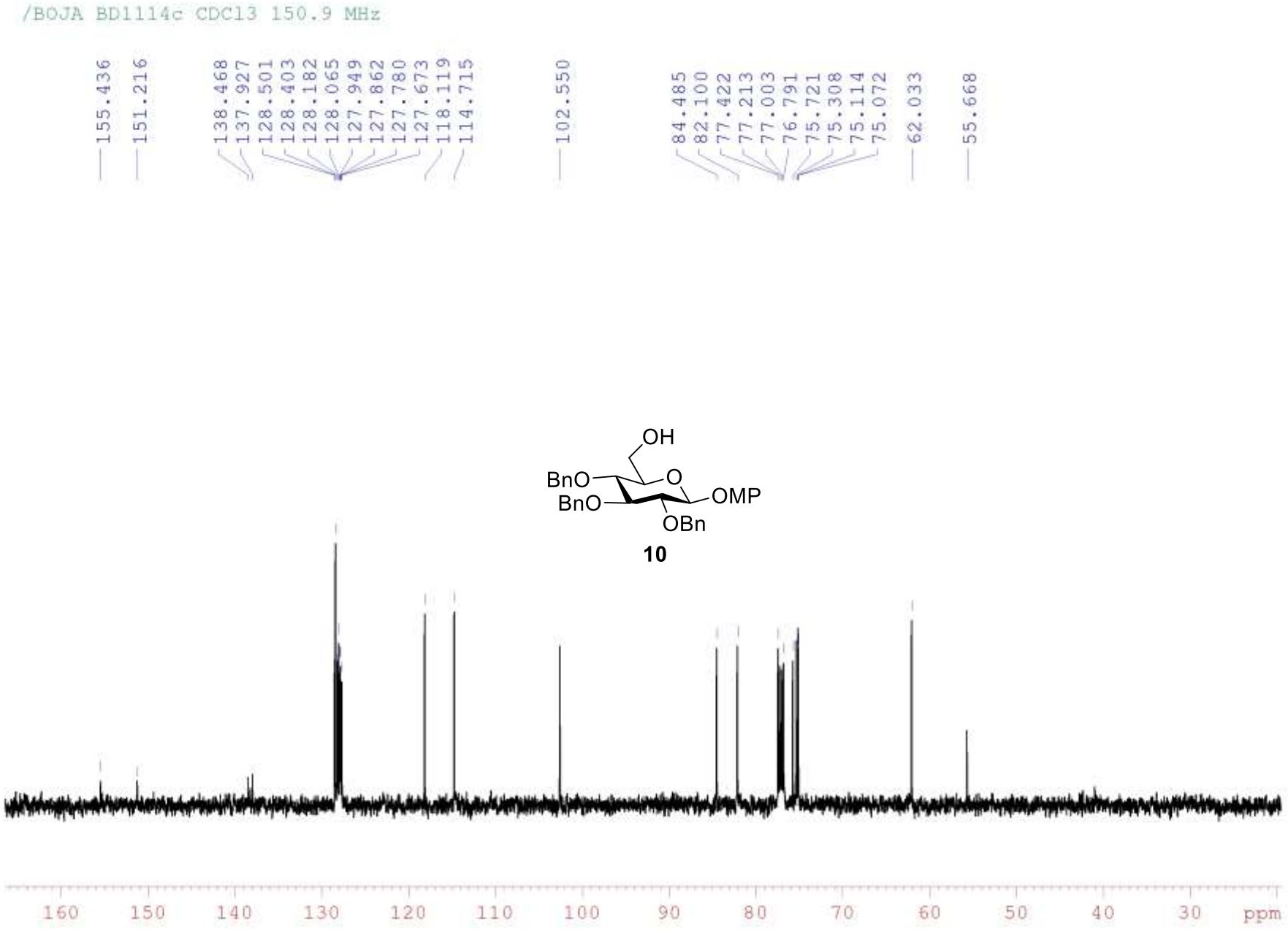


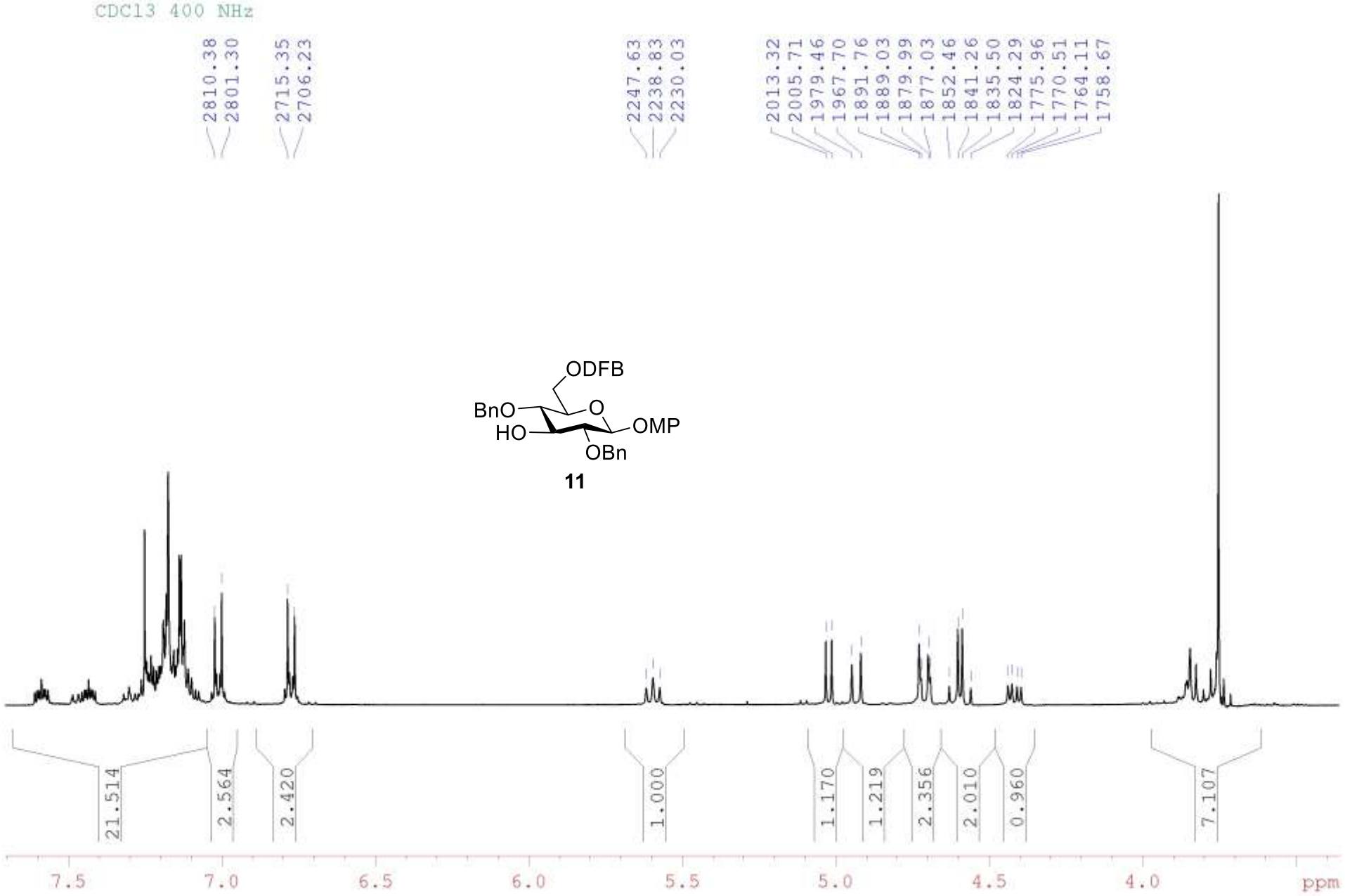
***p*-Methoxyphenyl 2,3,4-tri-*O*-benzyl-β-D-glucopyranoside (10)**



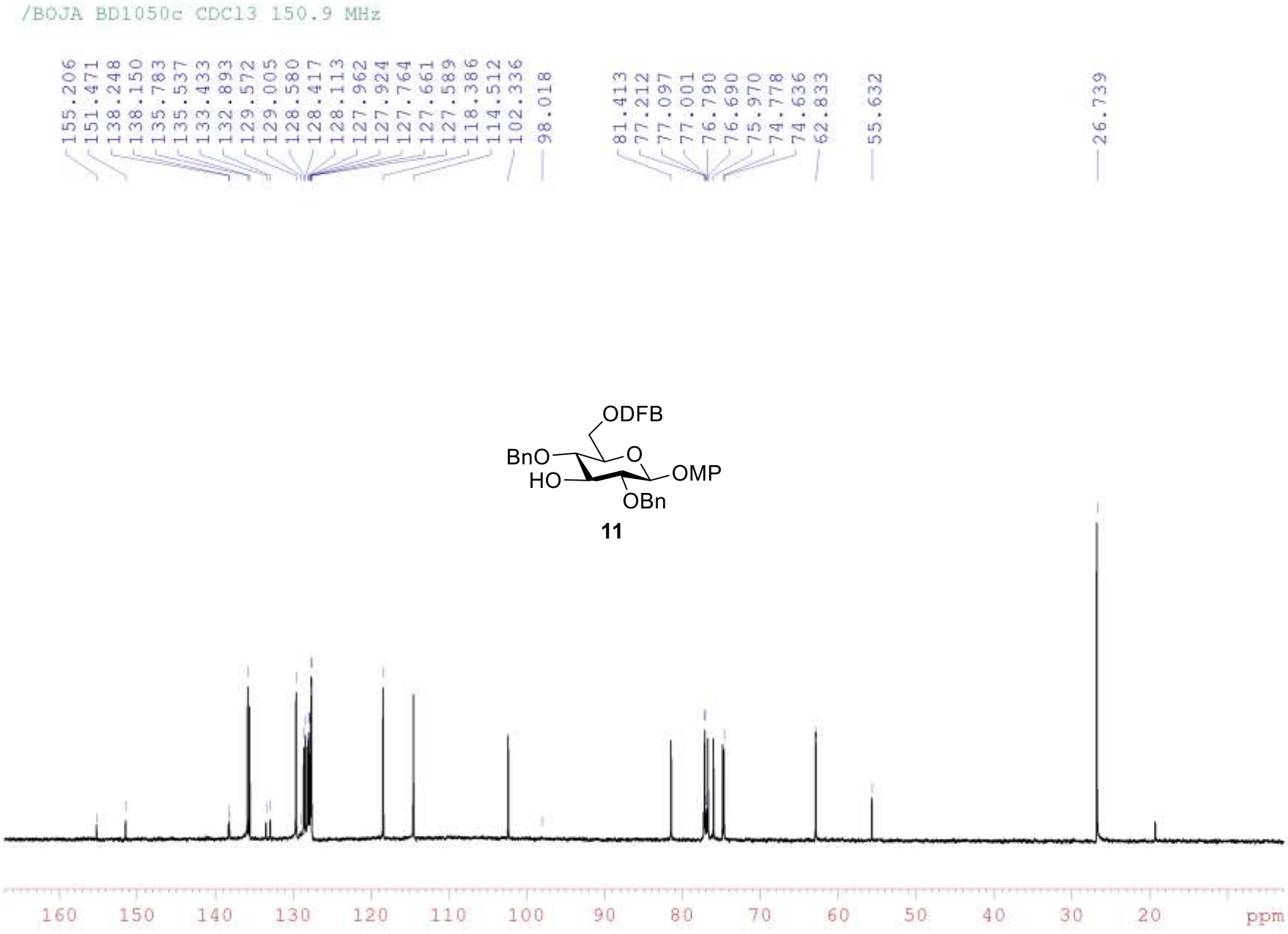
***p*-Methoxyphenyl 2,3,4-tri-*O*-benzyl-β-D-glucopyranoside (10)**



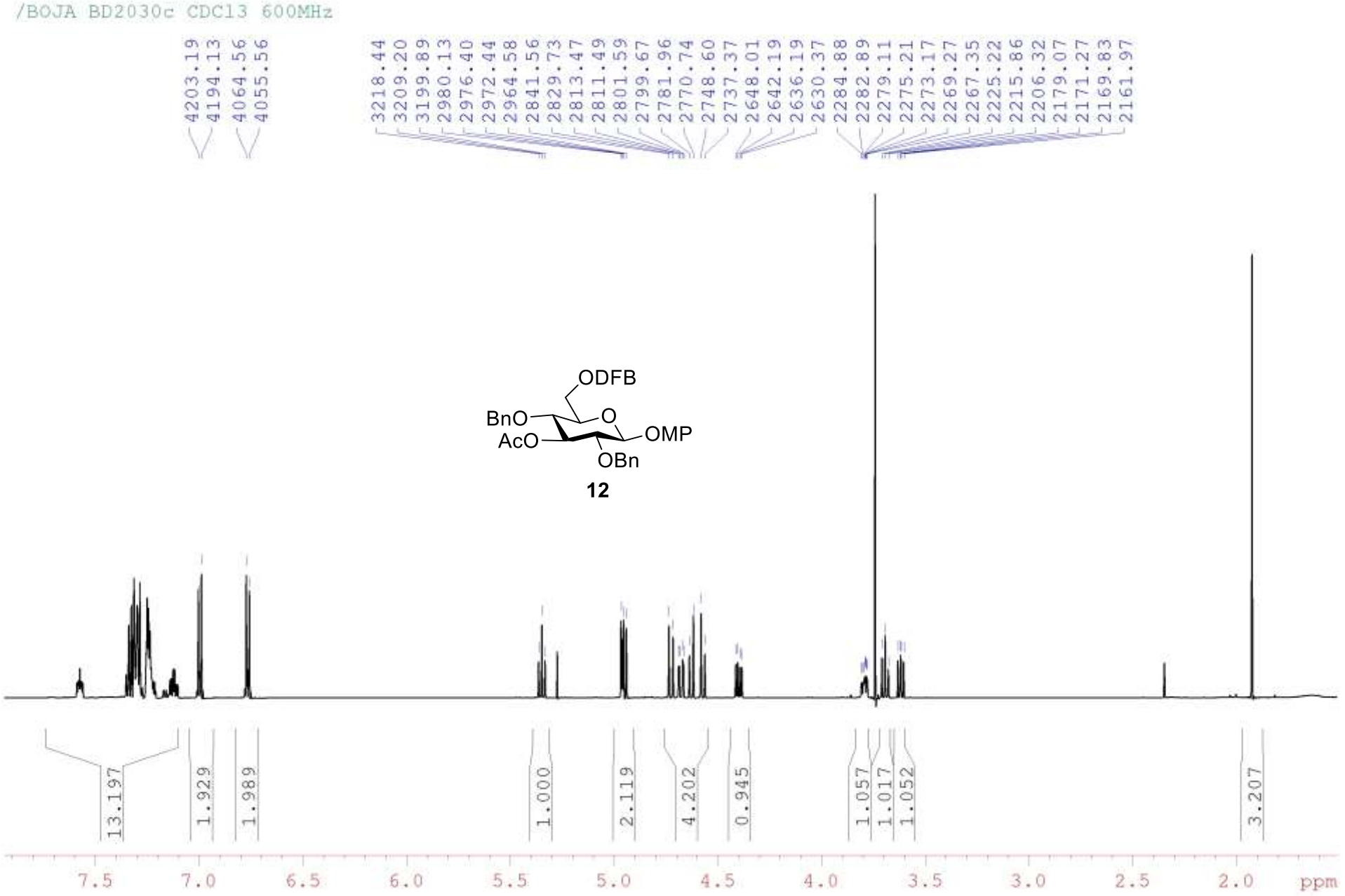
***p*-Methoxyphenyl 2,4-di-*O*-benzyl-6-*O*-(2,5-difluorobenzoyl)-β-D-glucopyranoside (11)**



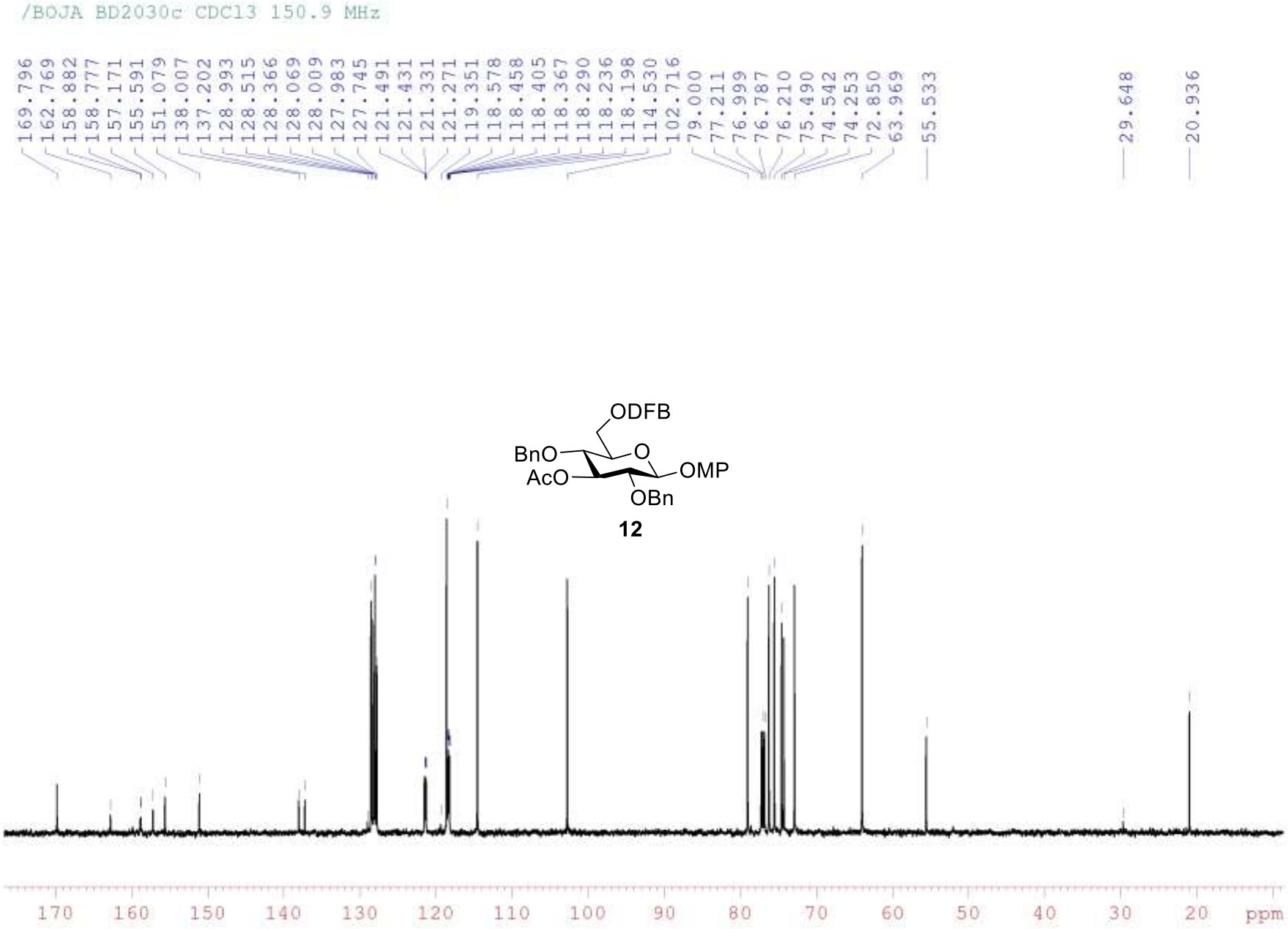
***p*-Methoxyphenyl 2,4-di-*O*-benzyl-6-*O*-(2,5-difluorobenzoyl)-β-D-glucopyranoside (11)**



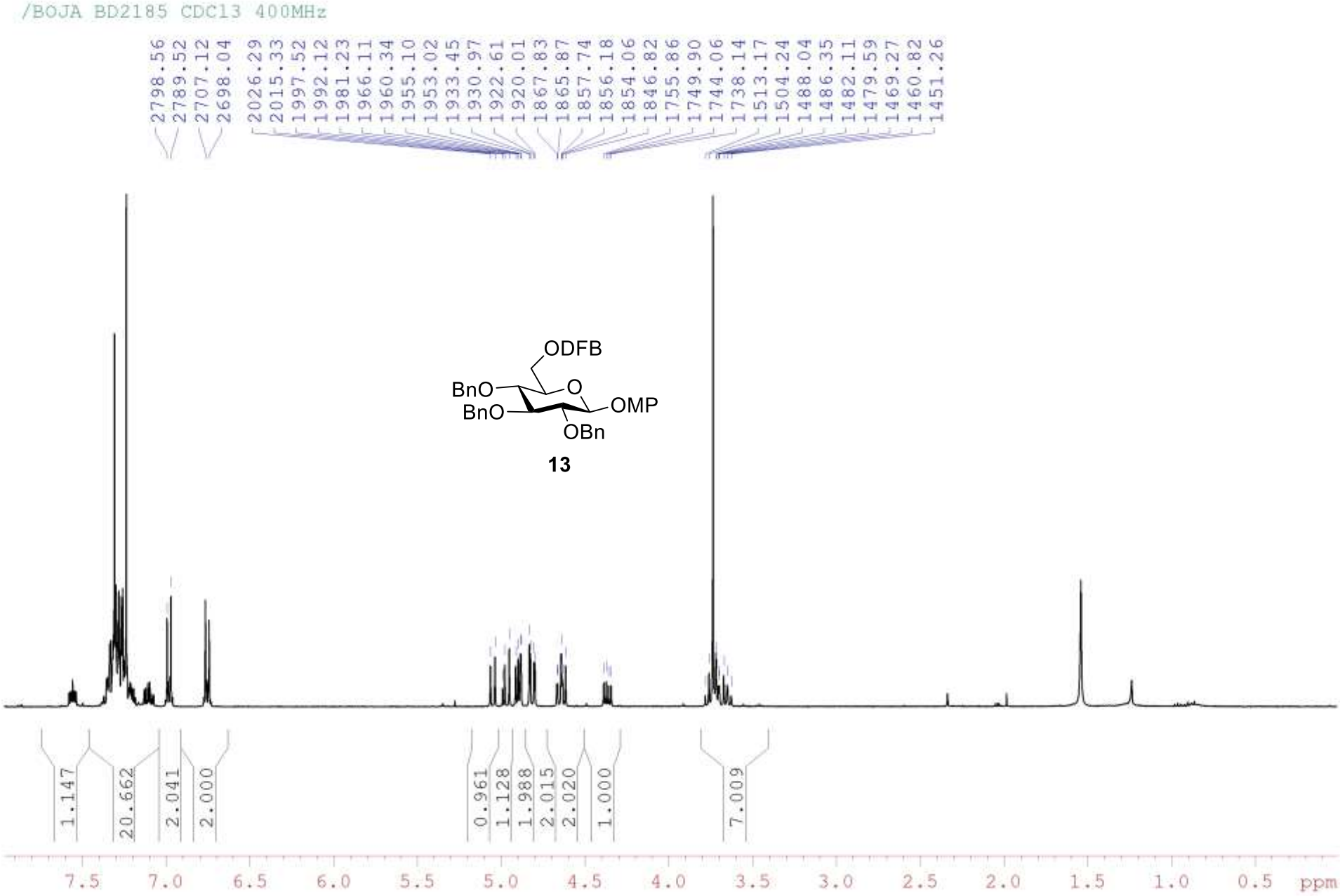
***p*-Methoxyphenyl 3-*O*-acetyl-2,4-di-*O*-benzyl-6-*O*-(2,5-difluorobenzoyl)-β-D-glucopyranoside (12)**



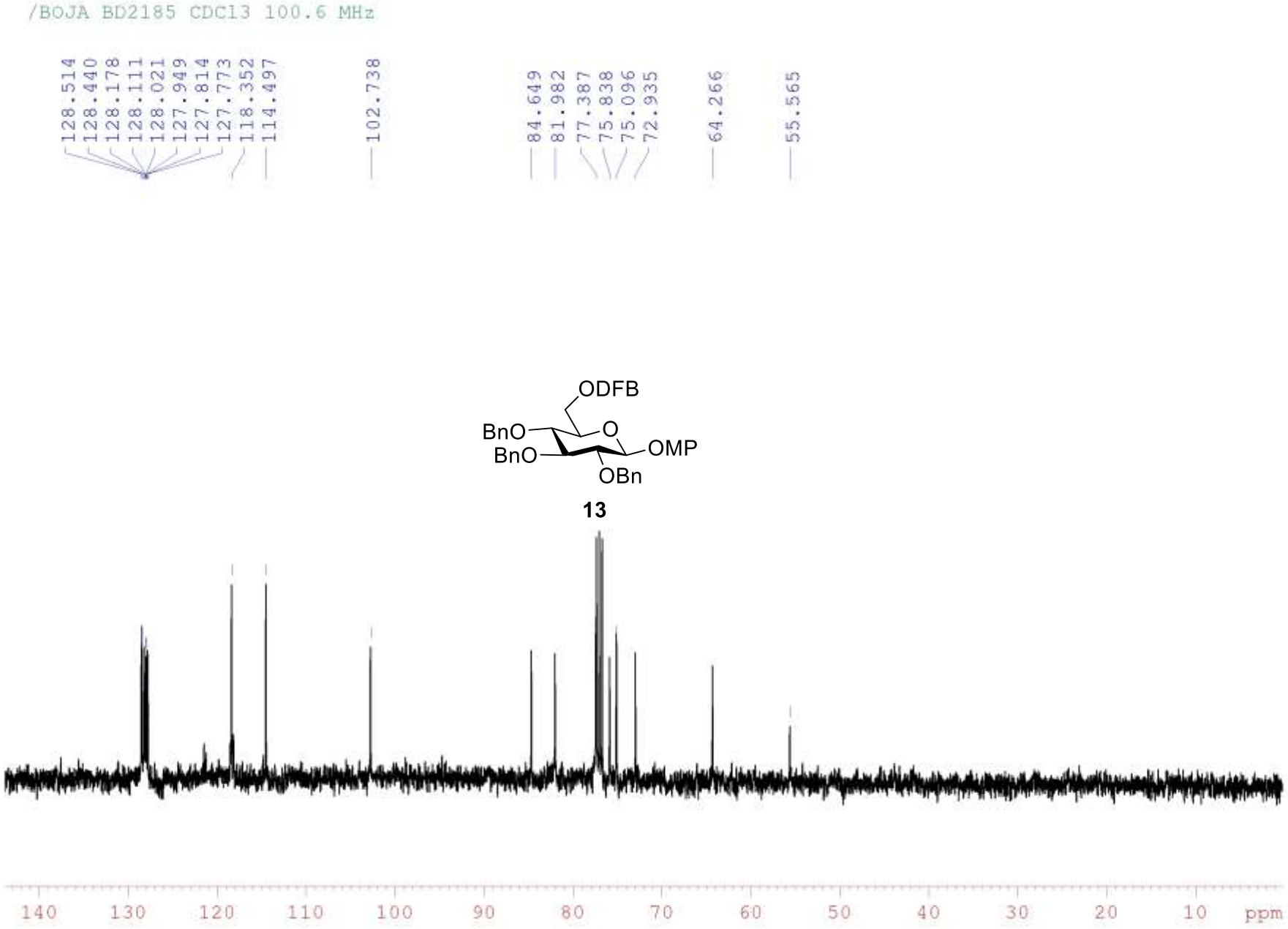
***p*-Methoxyphenyl 3-*O*-acetyl-2,4-di-*O*-benzyl-6-*O*-(2,5-difluorobenzoyl)-β-D-glucopyranoside (12)**



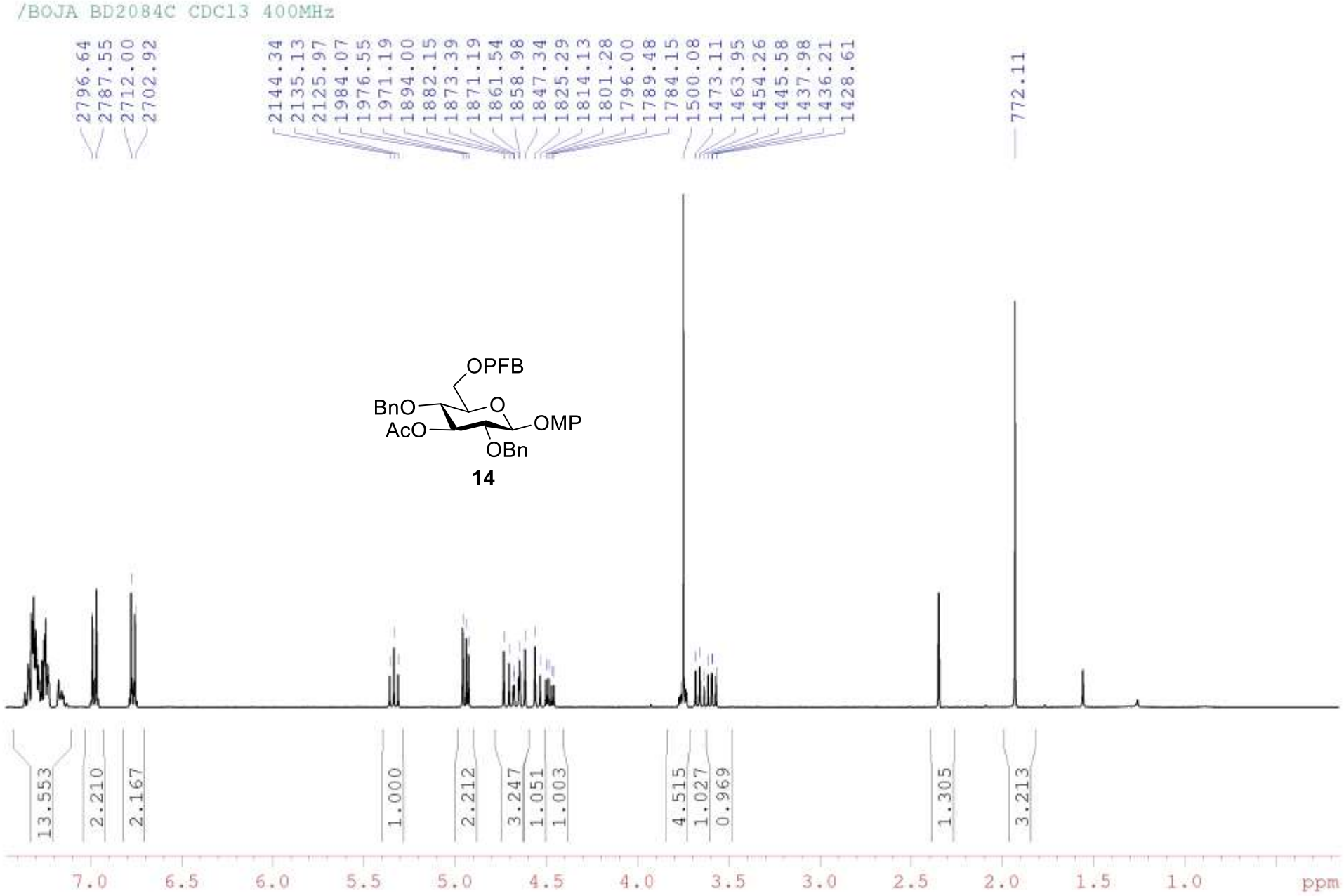
***p*-Methoxyphenyl 2,3,4-tri-*O*-benzyl-6-*O*-(2,5-difluorobenzoyl)-β-D-glucopyranoside (13)**



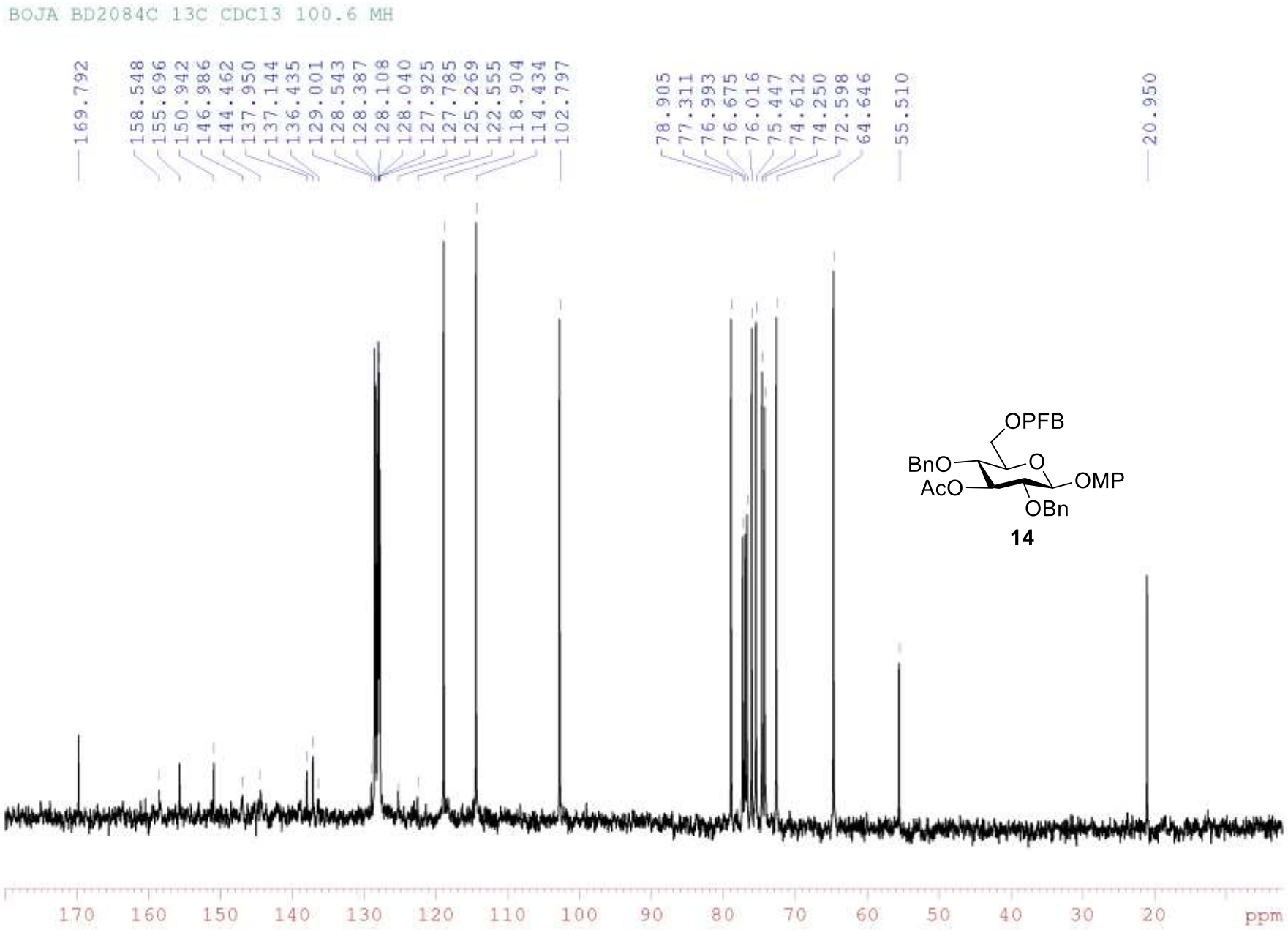
***p*-Methoxyphenyl 2,3,4-tri-*O*-benzyl-6-*O*-(2,5-difluorobenzoyl)-β-D-glucopyranoside (13)**



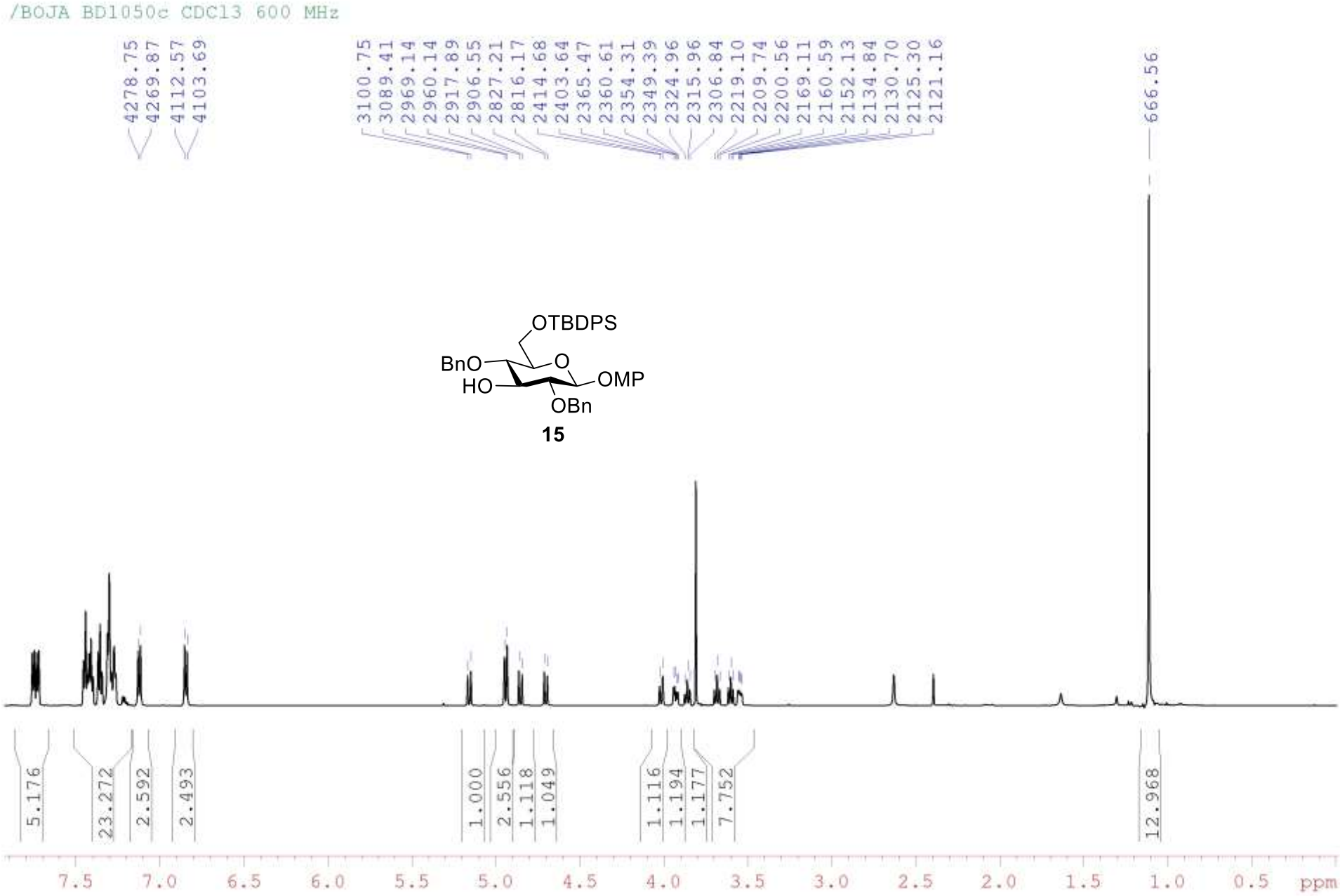
***p*-Methoxyphenyl 3-*O*-acetyl-2,4-di-*O*-benzyl-6-*O*-pentafluorobenzoyl-β-D-glucopyranoside (14)**



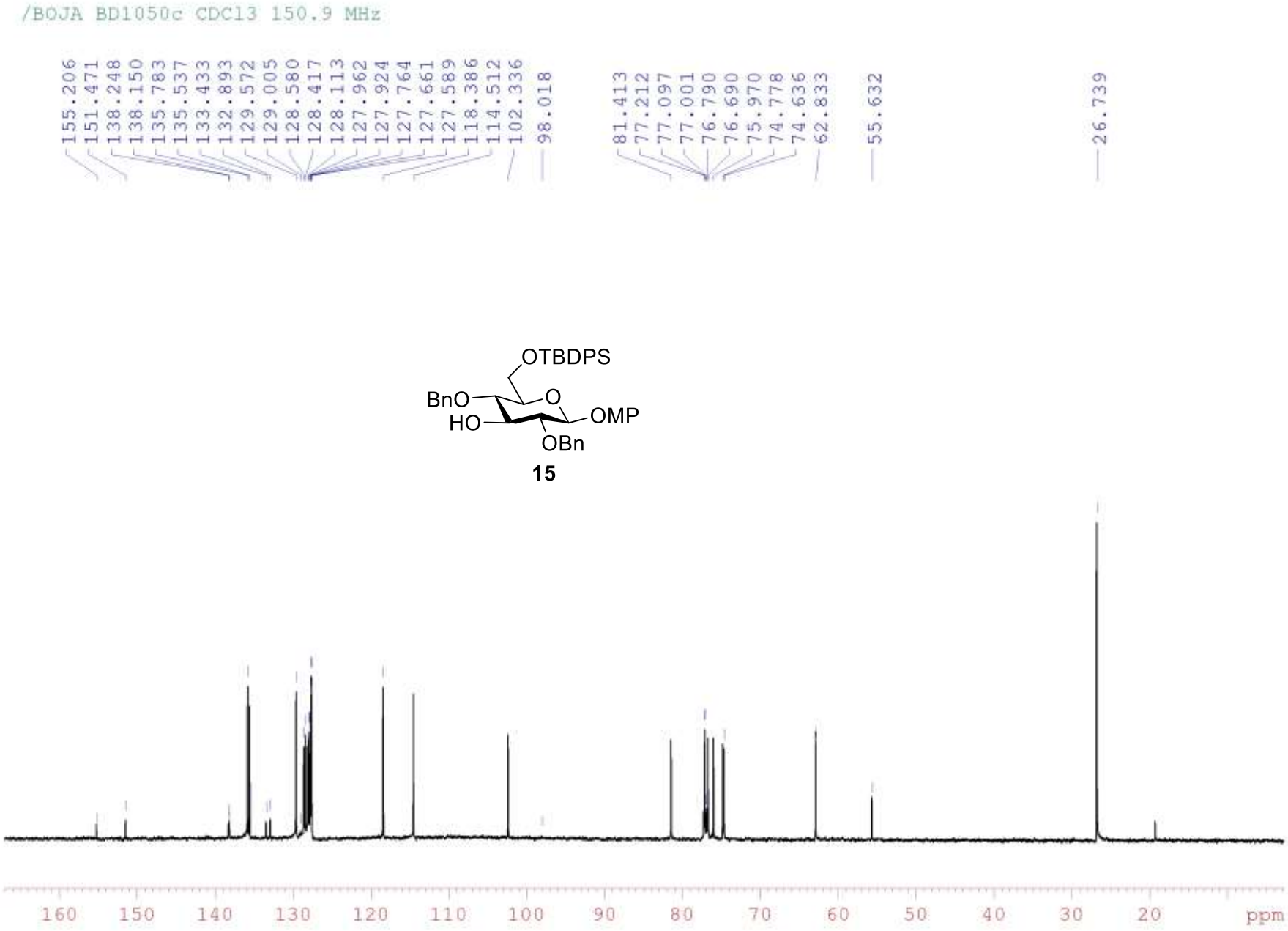
***p*-Methoxyphenyl 3-*O*-acetyl-2,4-di-*O*-benzyl-6-*O*-pentafluorobenzoyl-β-D-glucopyranoside (14)**



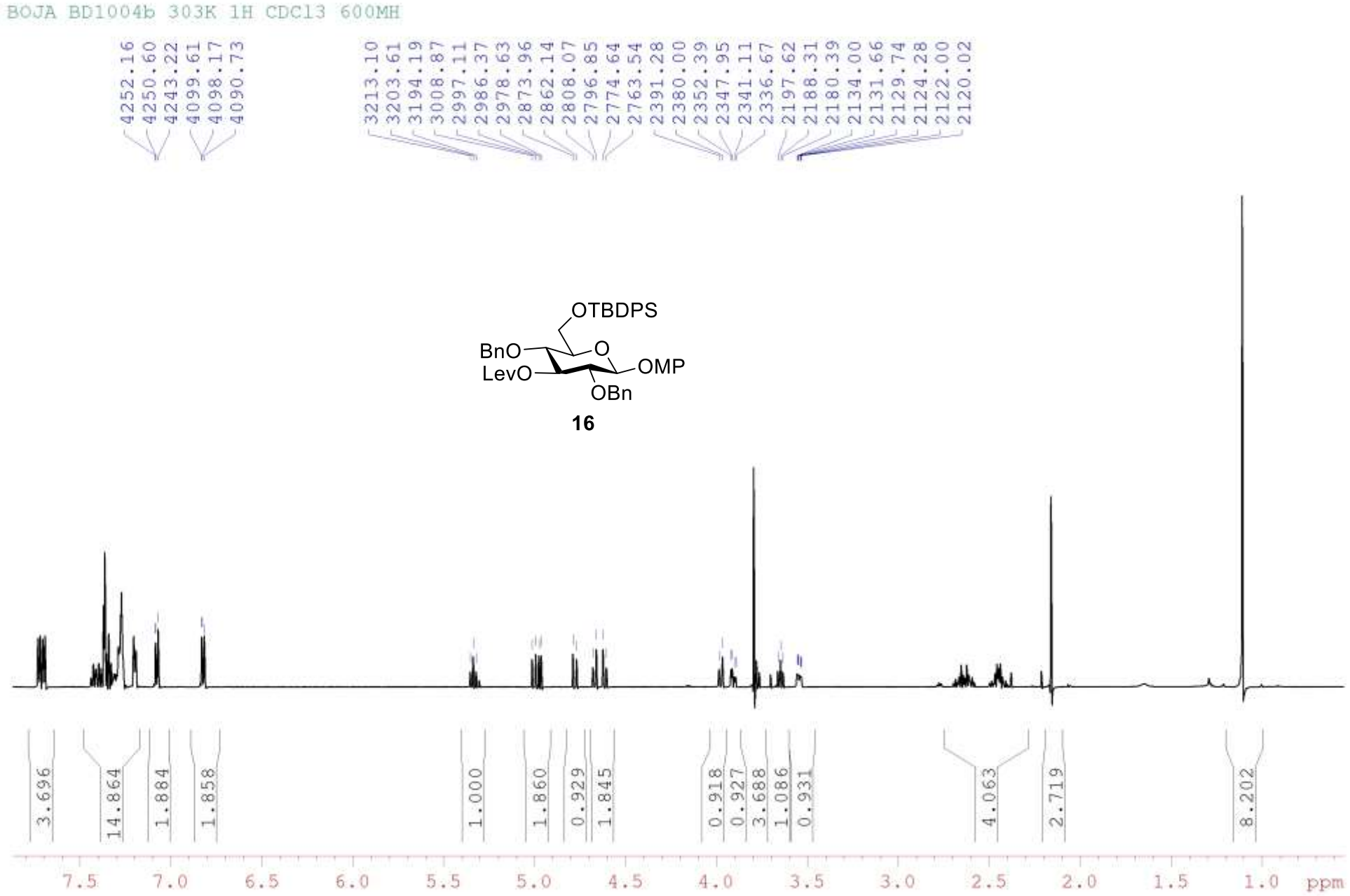
***p*-Methoxyphenyl 2,4-di-*O*-benzyl-6-*O*-*tert*-butyldiphenylsilyl-β-D-glucopyranoside (15)**



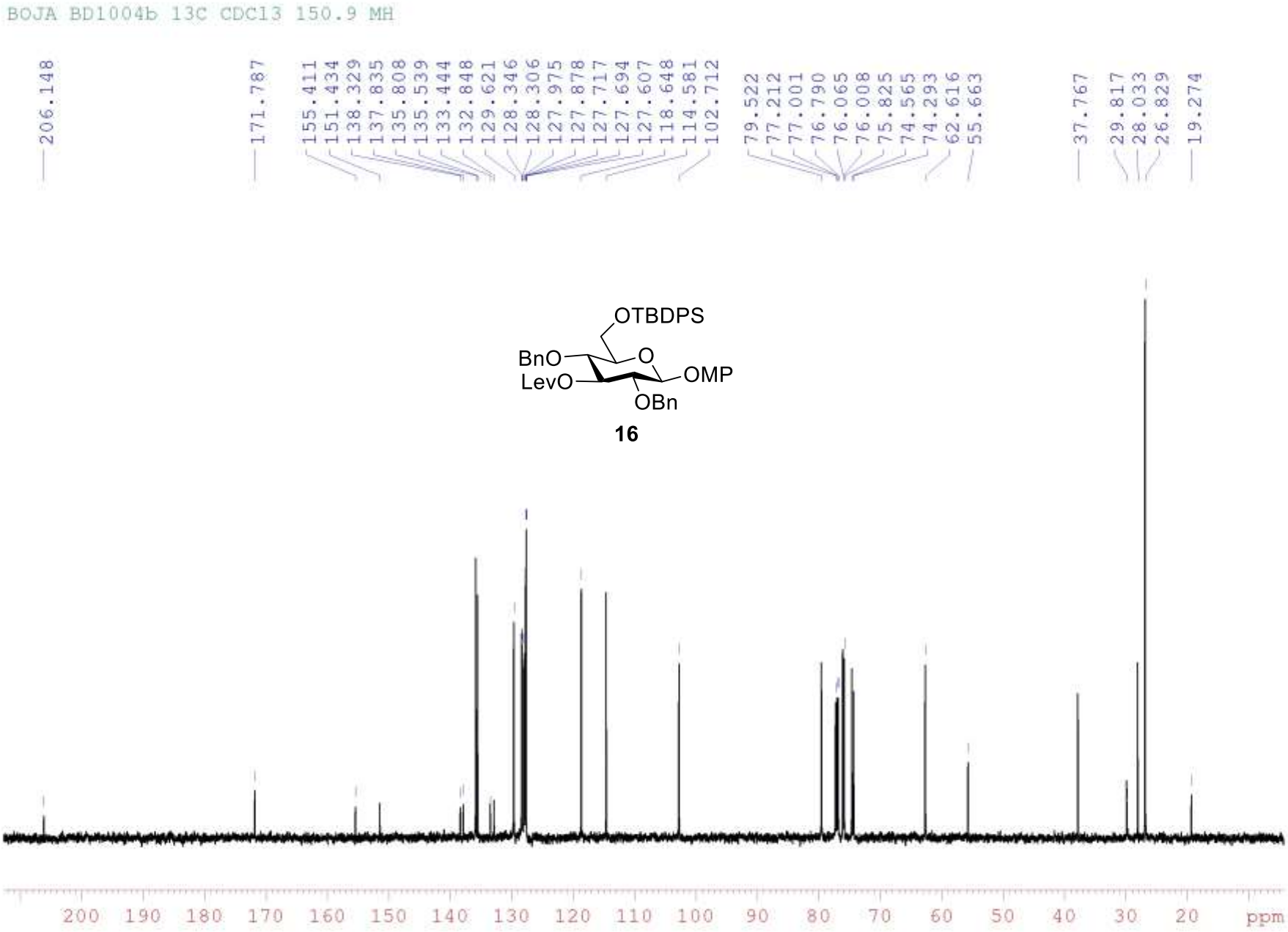
***p*-Methoxyphenyl 2,4-di-*O*-benzyl-6-*O*-*tert*-butyldiphenylsilyl-β-D-glucopyranoside (15)**



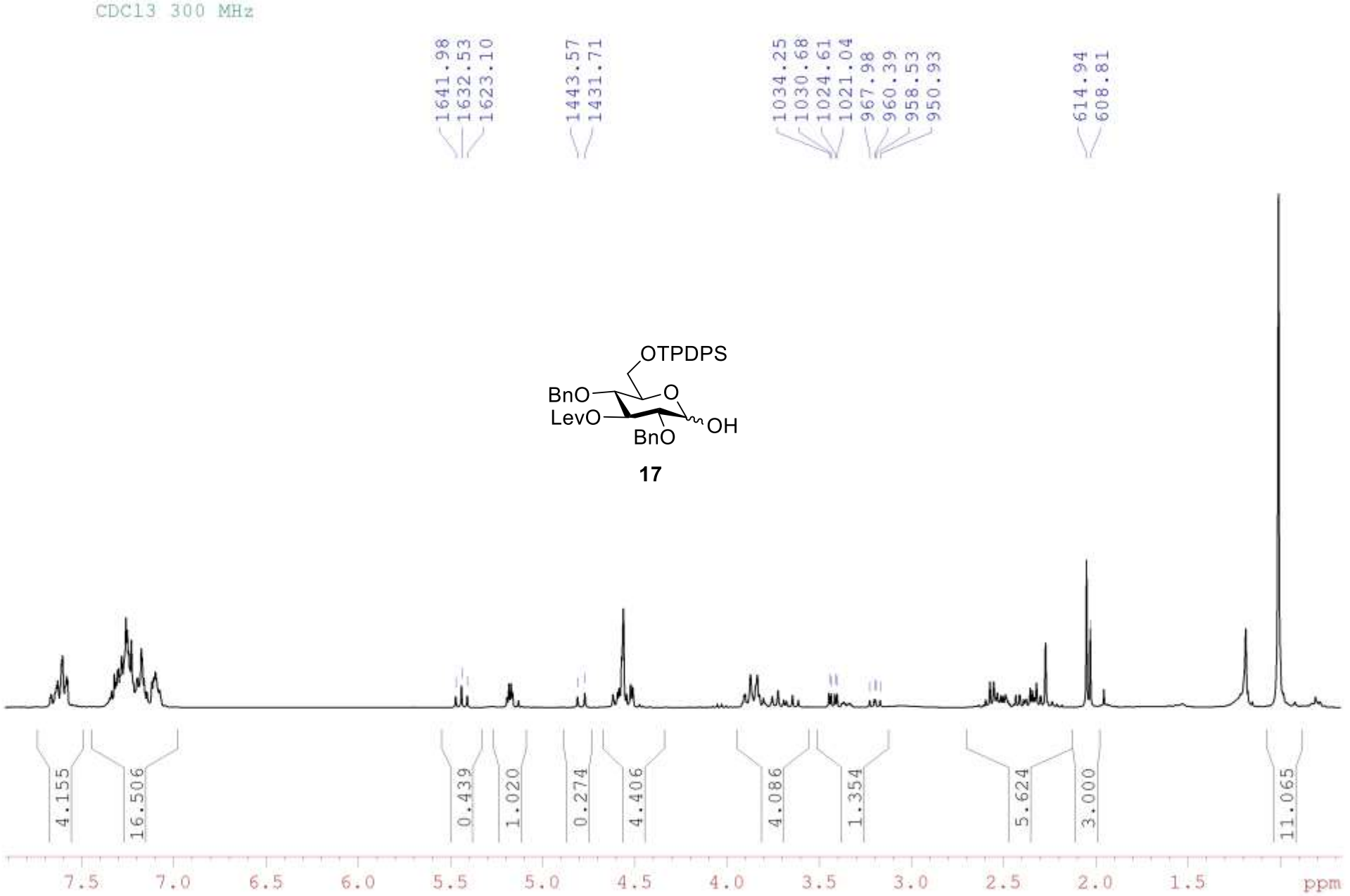
***p*-Methoxyphenyl 2,4-di-*O*-benzyl-6-*O*-*tert*-butyldiphenylsilyl-3-*O*-levulinoyl-β-D-glucopyranoside (16)**



***p*-Methoxyphenyl 2,4-di-*O*-benzyl-6-*O*-*tert*-butyldiphenylsilyl-3-*O*-levulinoyl-β-D-glucopyranoside (16)**

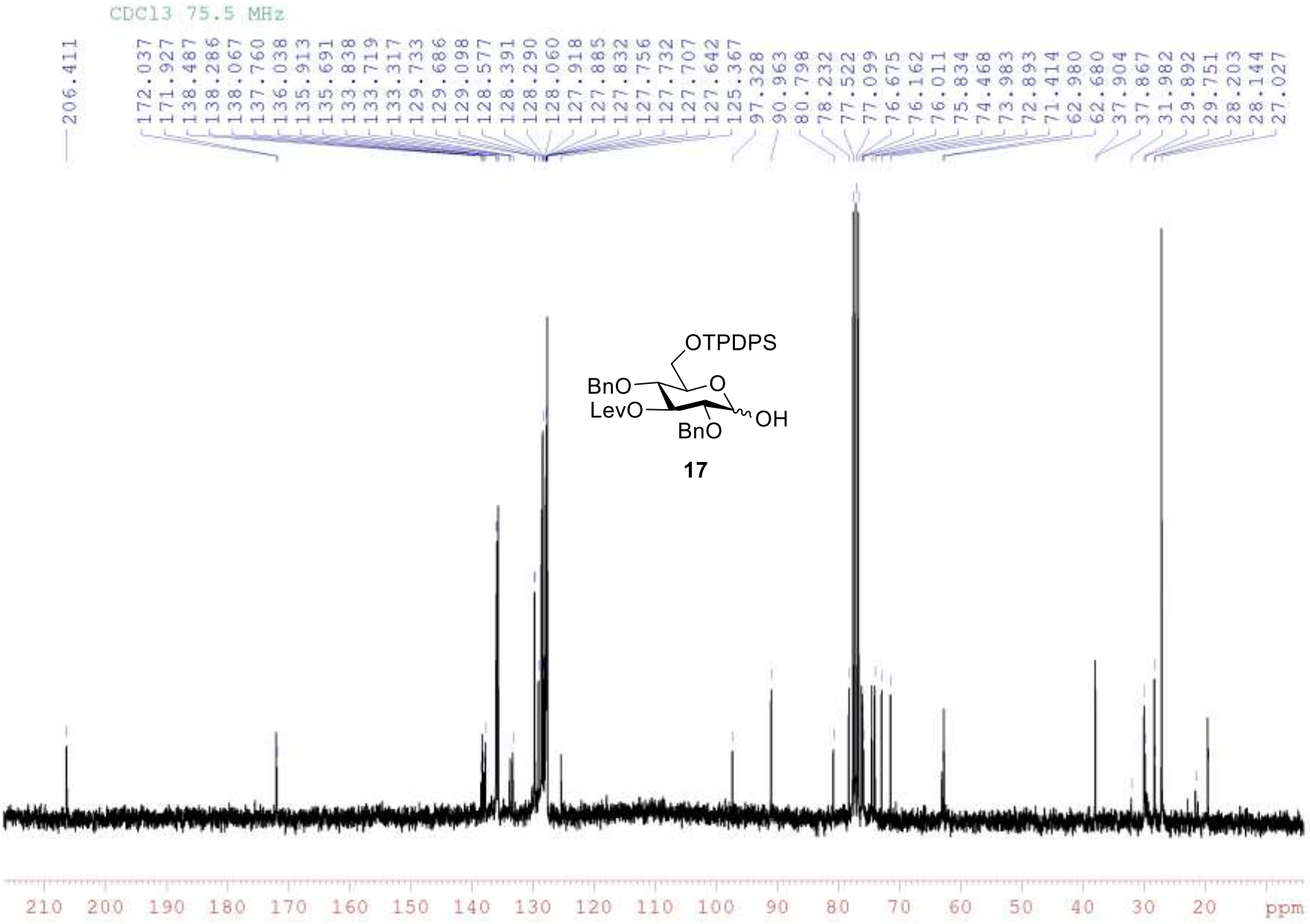


2,4-Di-*O*-benzyl-6-*O*-*tert*-butyldiphenylsilyl-3-*O*-levulinoyl-D-glucopyranose (17)

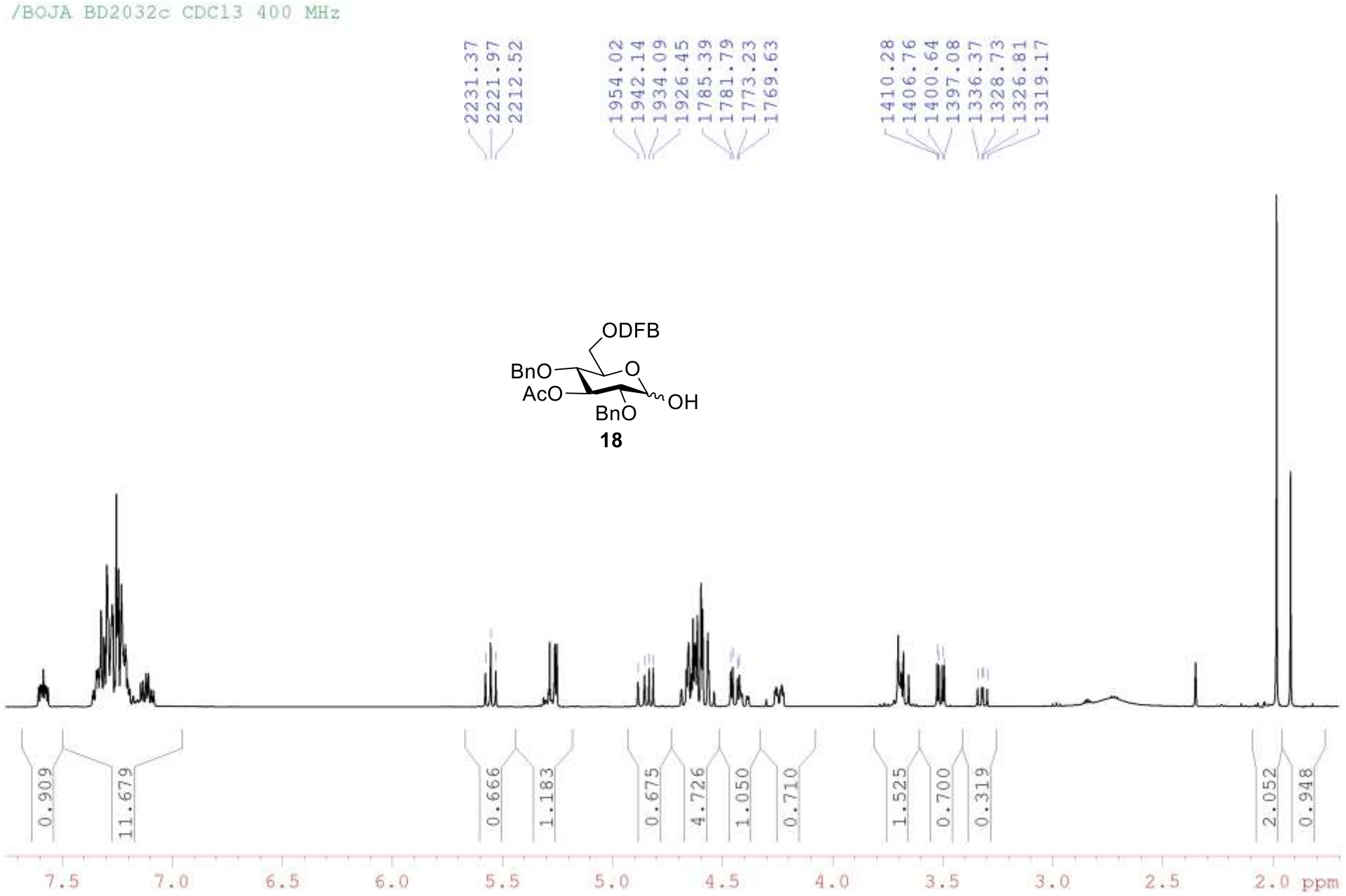


17

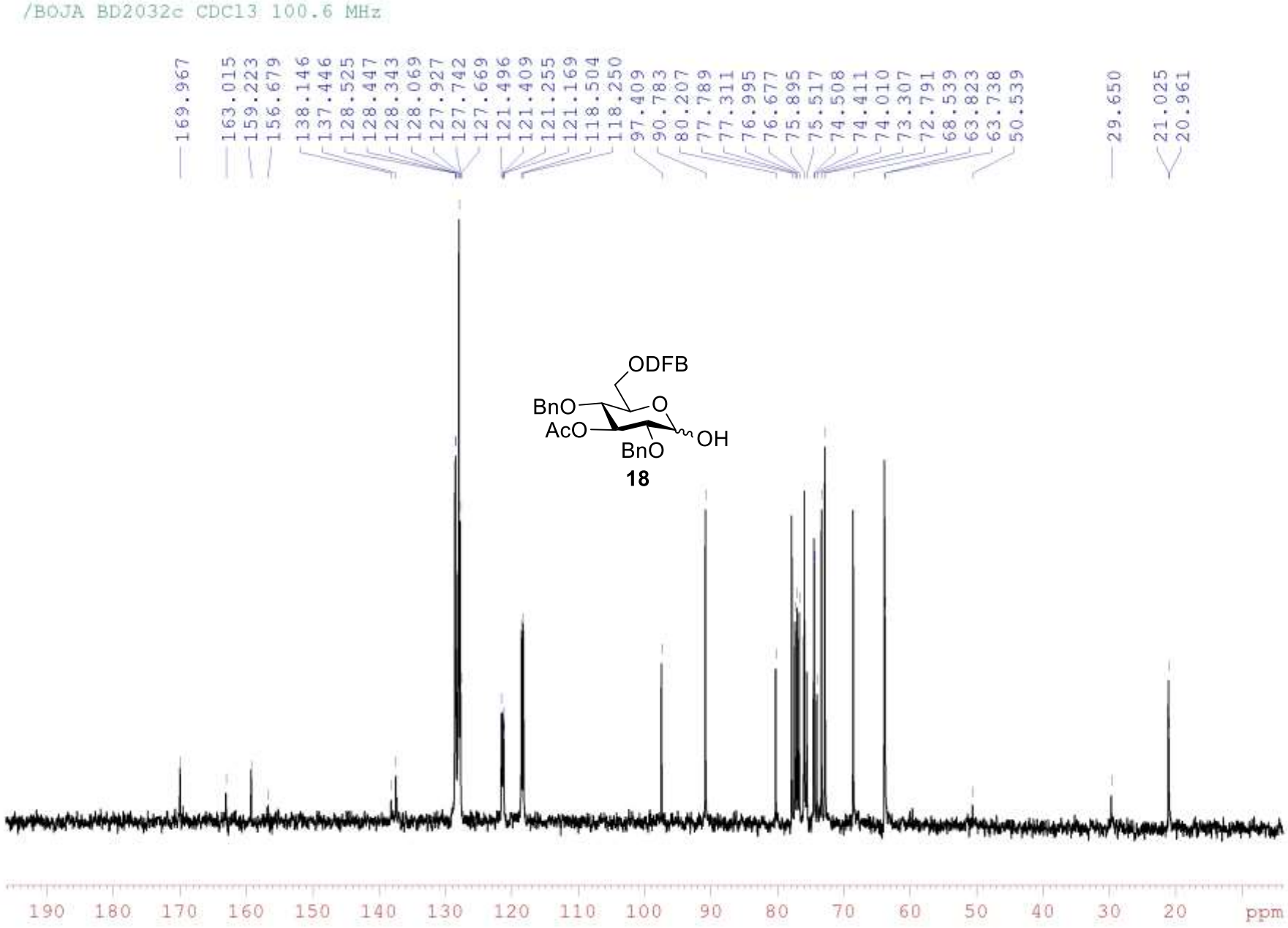
2,4-Di-*O*-benzyl-6-*O*-*tert*-butyldiphenylsilyl-3-*O*-levulinoyl-D-glucopyranose (17)



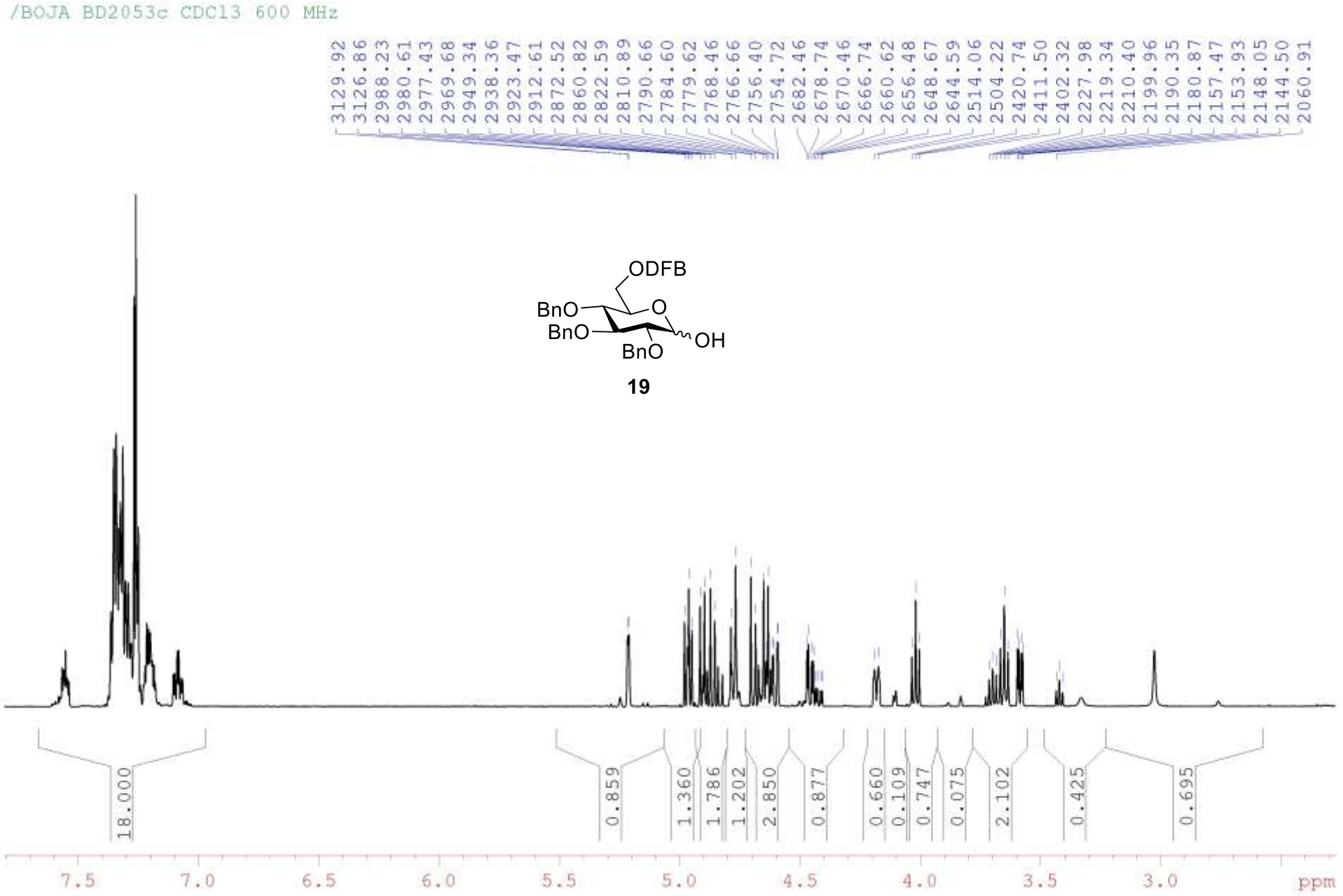
3-*O*-acetyl-2,4-di-*O*-benzyl-6-*O*-(2,5-difluorobenzoyl)-D-glucopyranose (18)



3-*O*-acetyl-2,4-di-*O*-benzyl-6-*O*-(2,5-difluorobenzoyl)-D-glucopyranose (18)

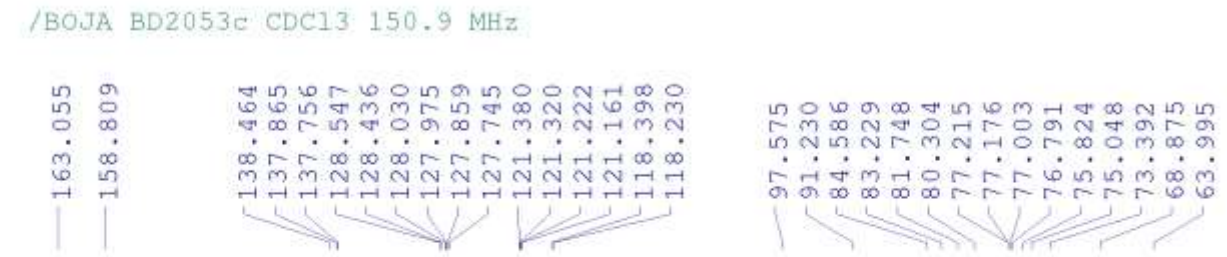


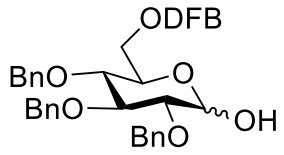
2,3,4-tri-*O*-benzyl-6-*O*-(2,5-difluorobenzoyl)-D-glucopyranose (19)



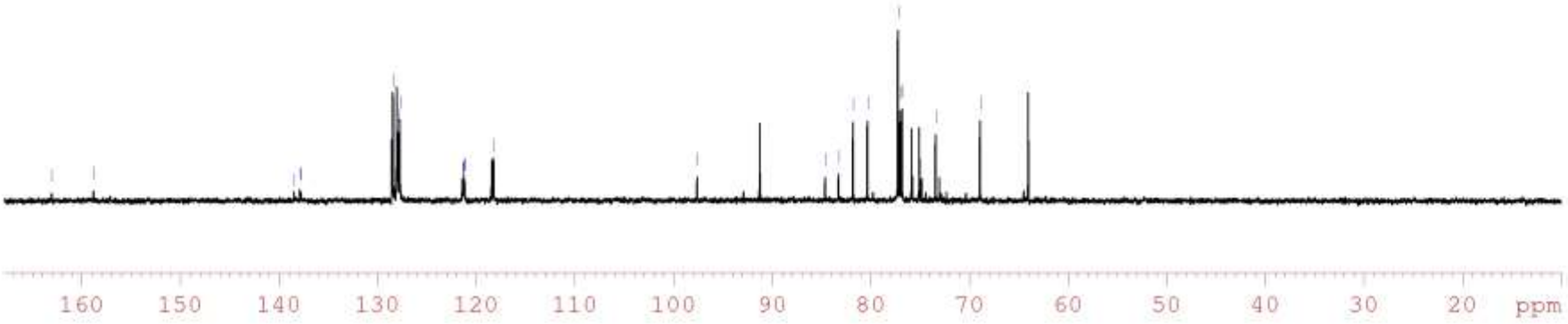
19

2,3,4-tri-*O*-benzyl-6-*O*-(2,5-difluorobenzoyl)-D-glucopyranose (19)

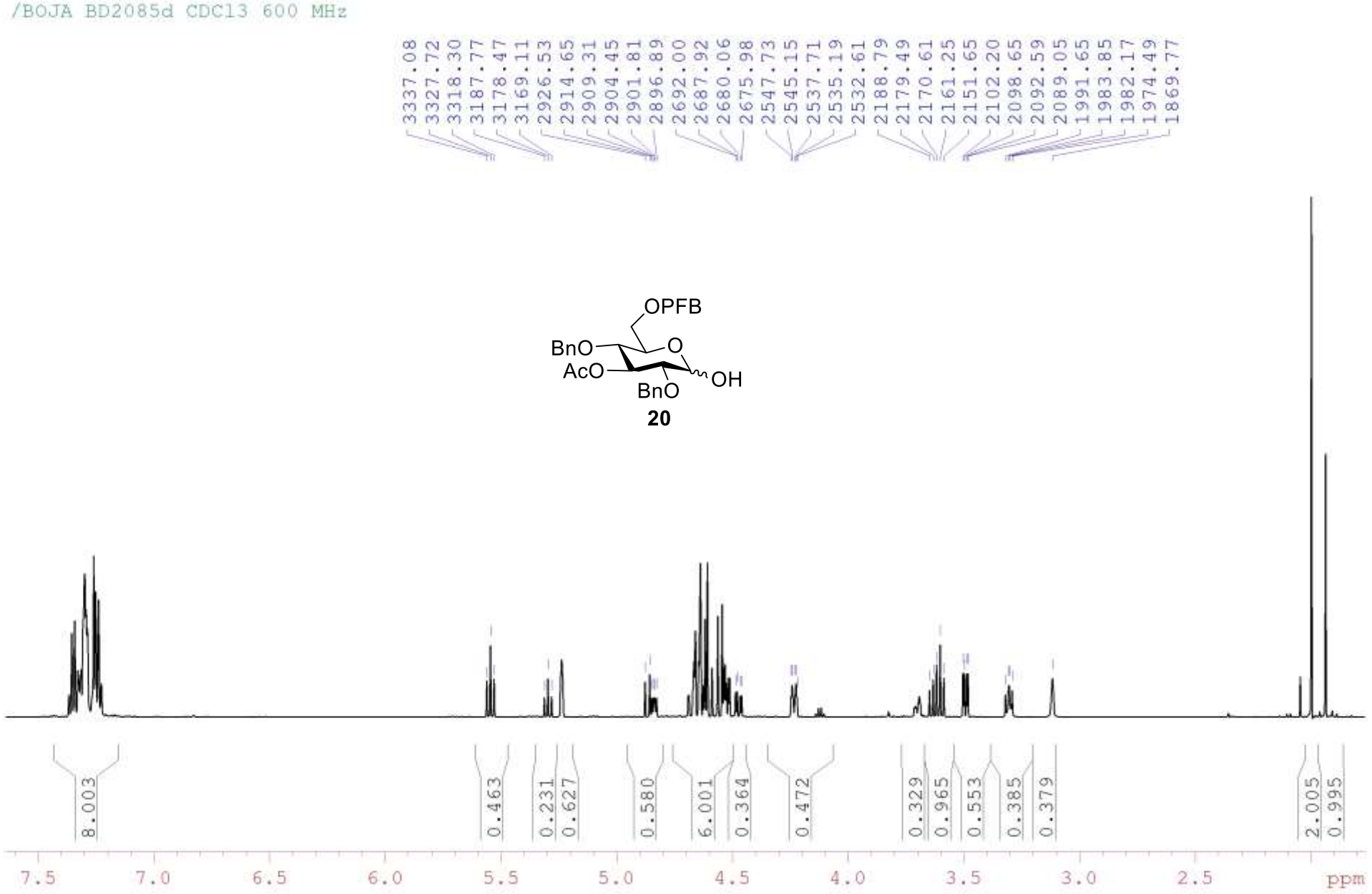




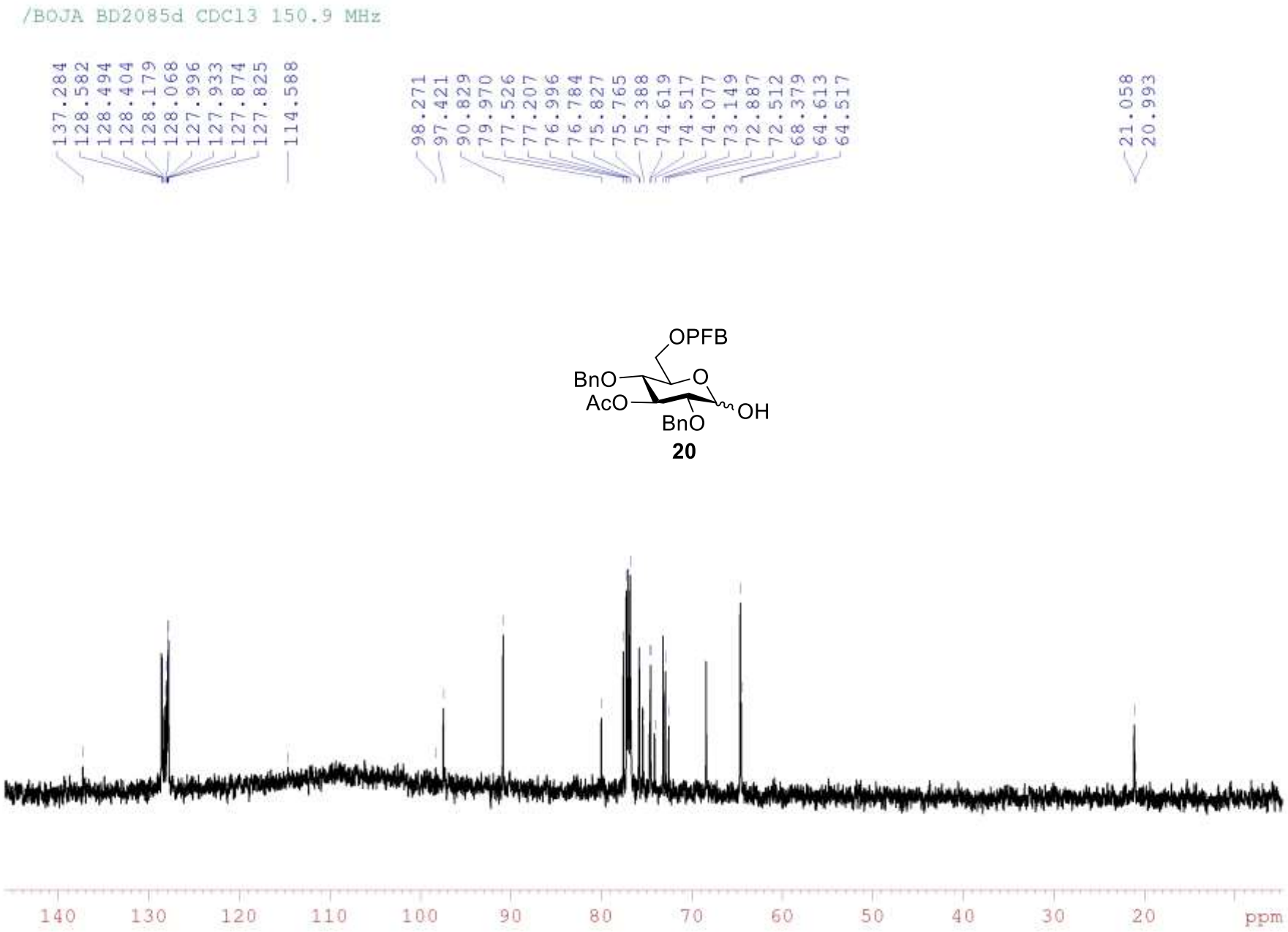
19



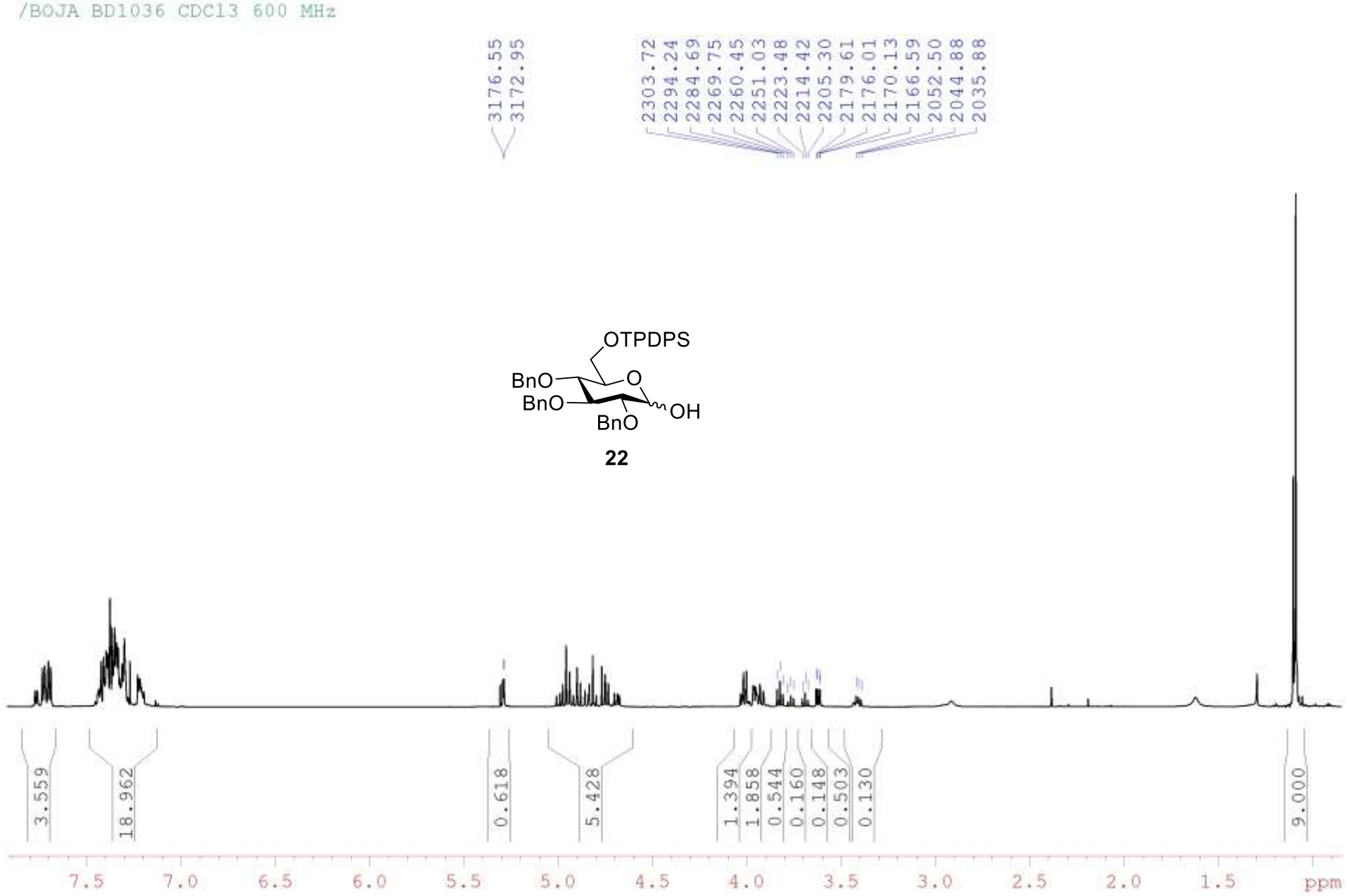
3-*O*-Acetyl-2,4-di-*O*-benzyl-6-*O*-(pentafluorobenzoyl)-D-glucopyranose (20)



3-*O*-Acetyl-2,4-di-*O*-benzyl-6-*O*-(pentafluorobenzoyl)-D-glucopyranose (20)

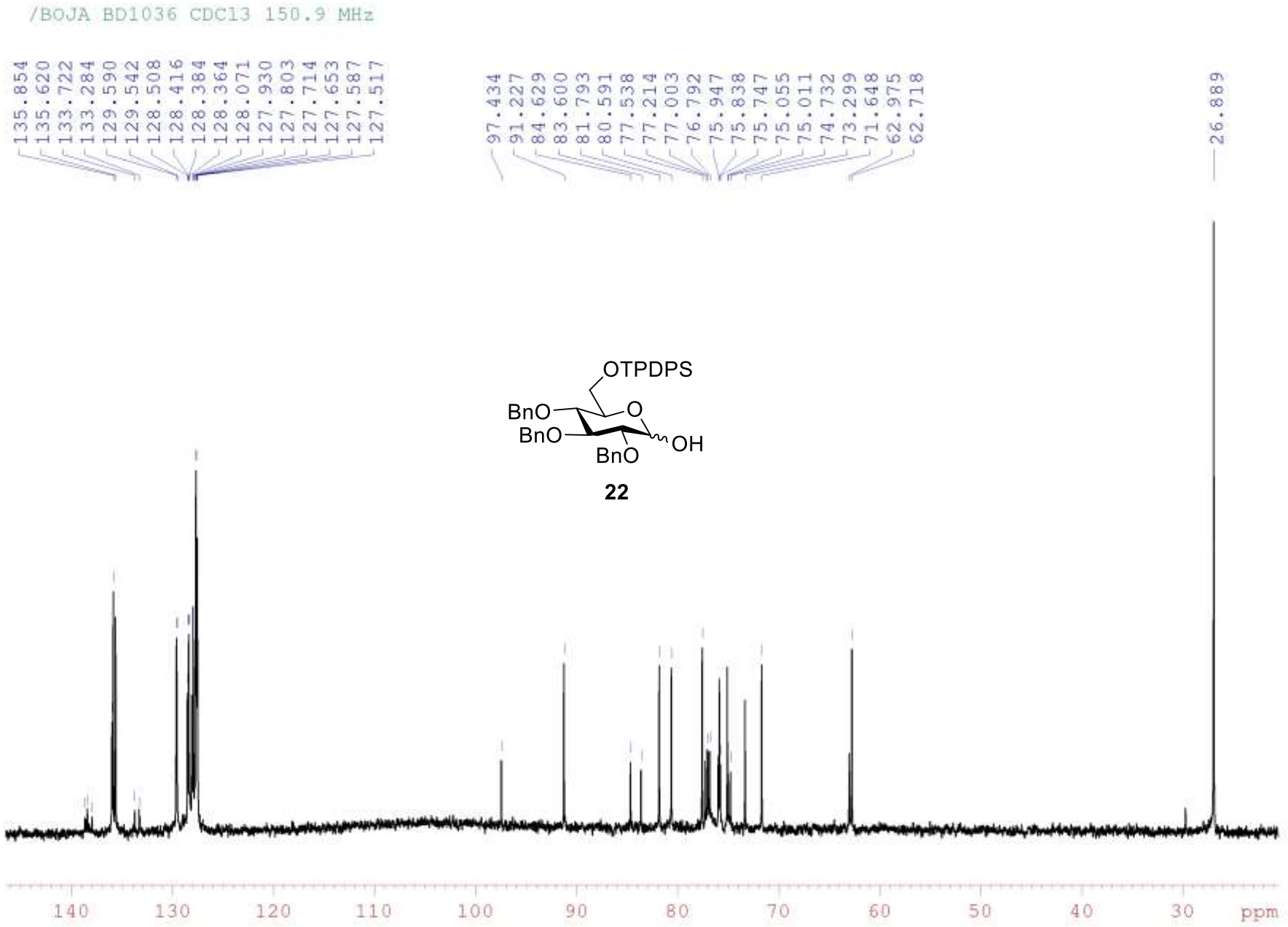


2,3,4-Tri-*O*-benzyl-6-*O*-*tert*-butyldiphenylsilyl-D-glucopyranose (22)

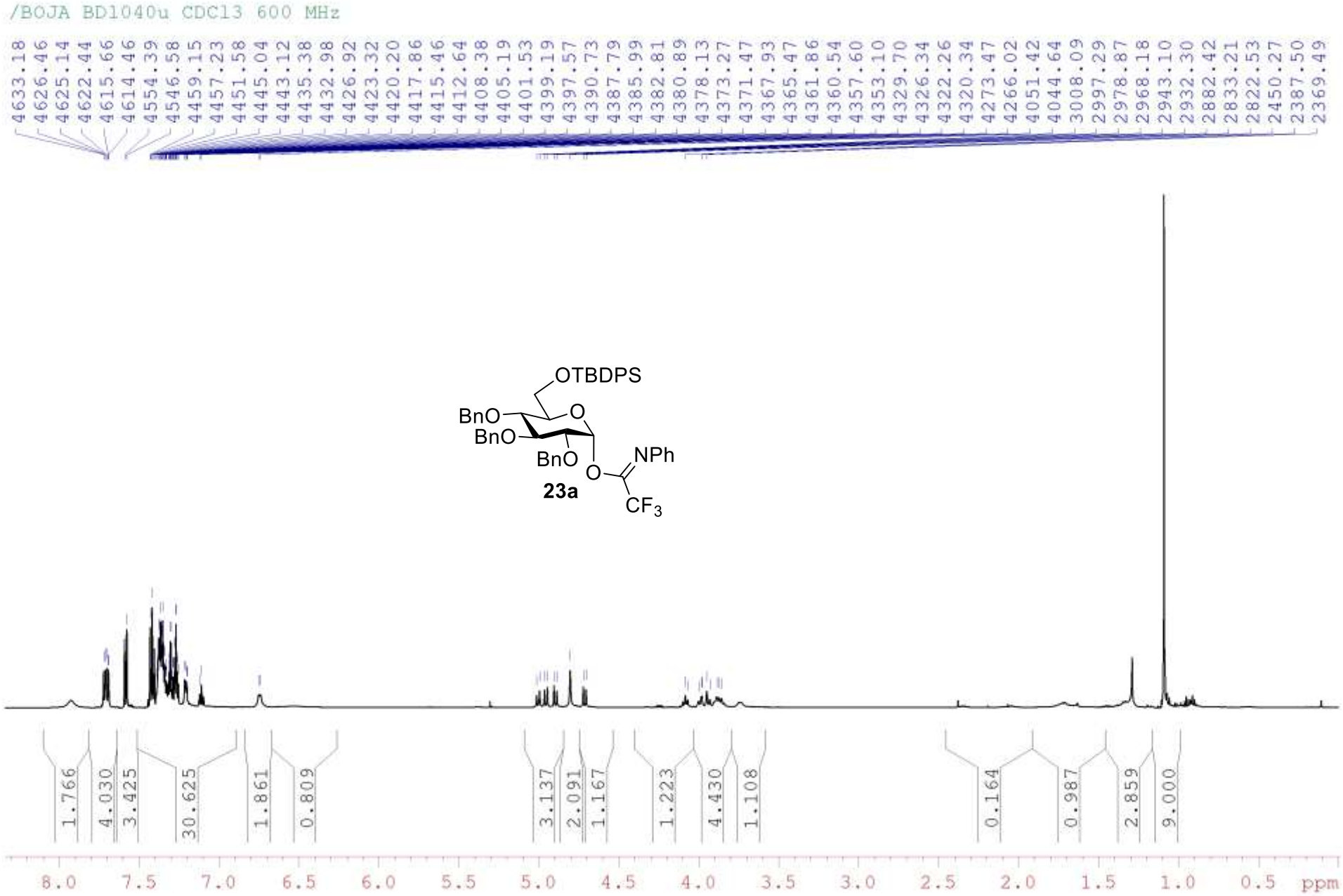


22

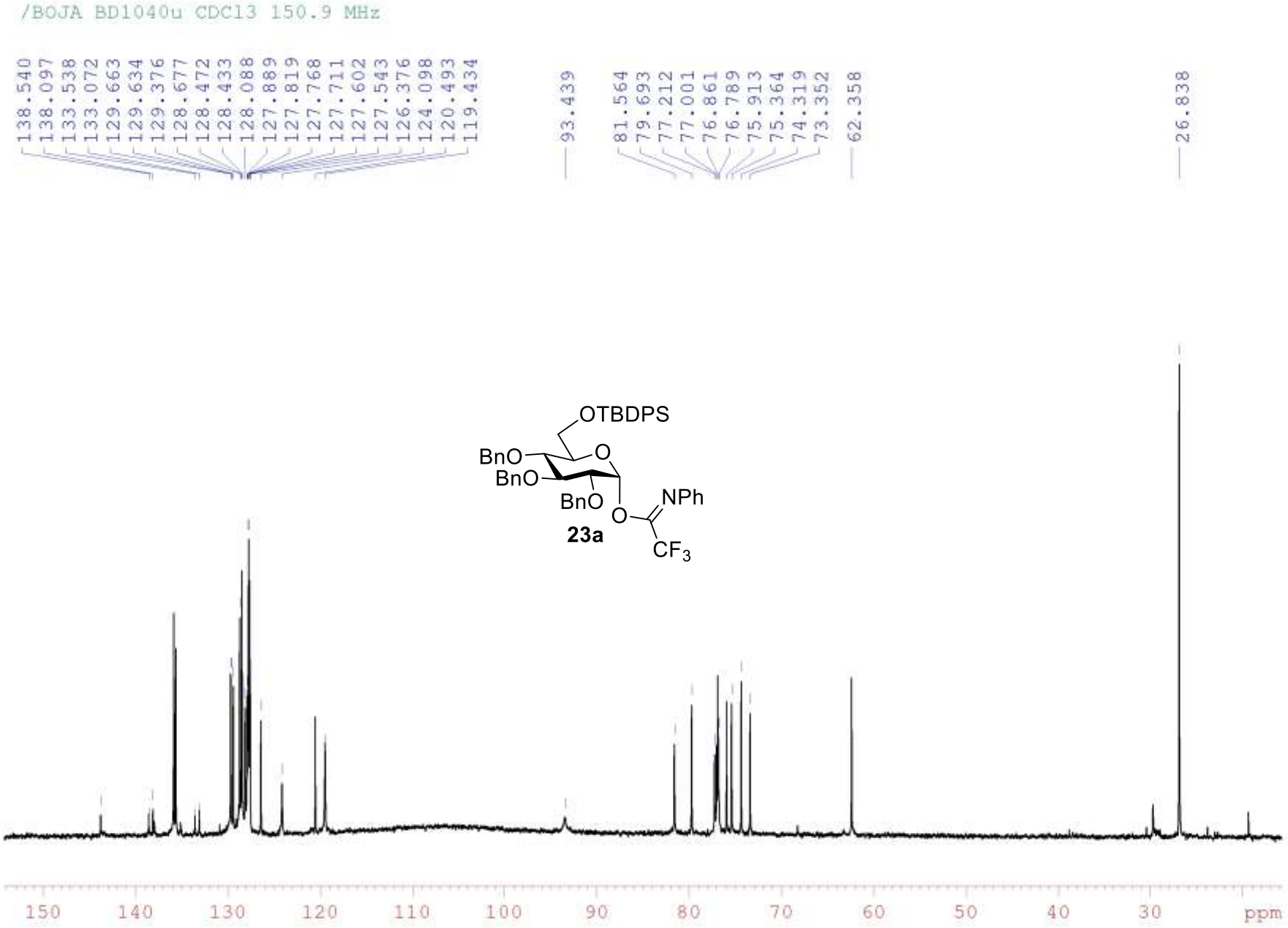
2,3,4-Tri-*O*-benzyl-6-*O*-*tert*-butyldiphenylsilyl-D-glucopyranose (22)



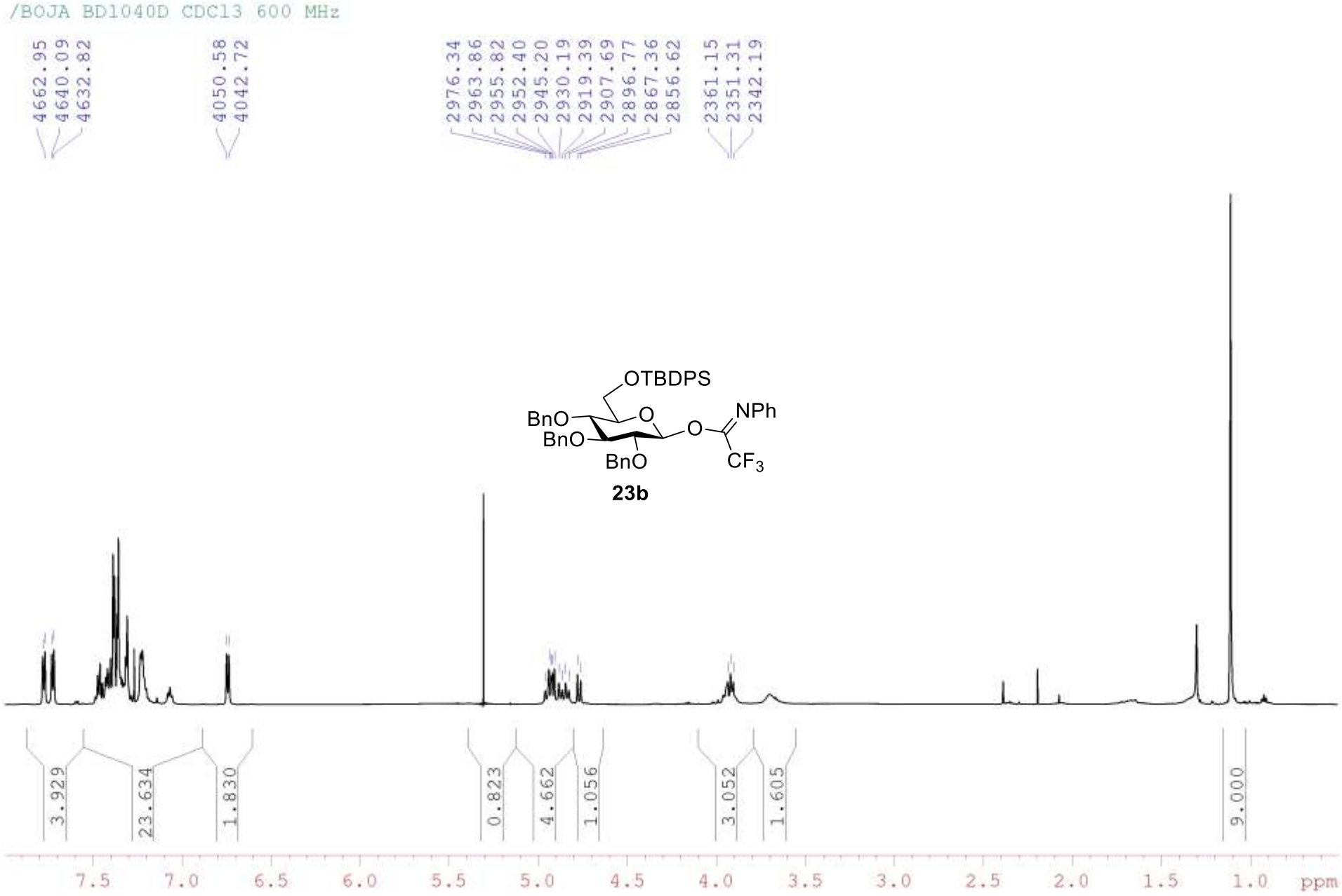
O-(2,3,4-Tri-*O*-benzyl-6-*O*-*tert*-butyldiphenylsilyl-α-D-glucopyranosyl) N-phenyltrifluoroacetimidate (23)



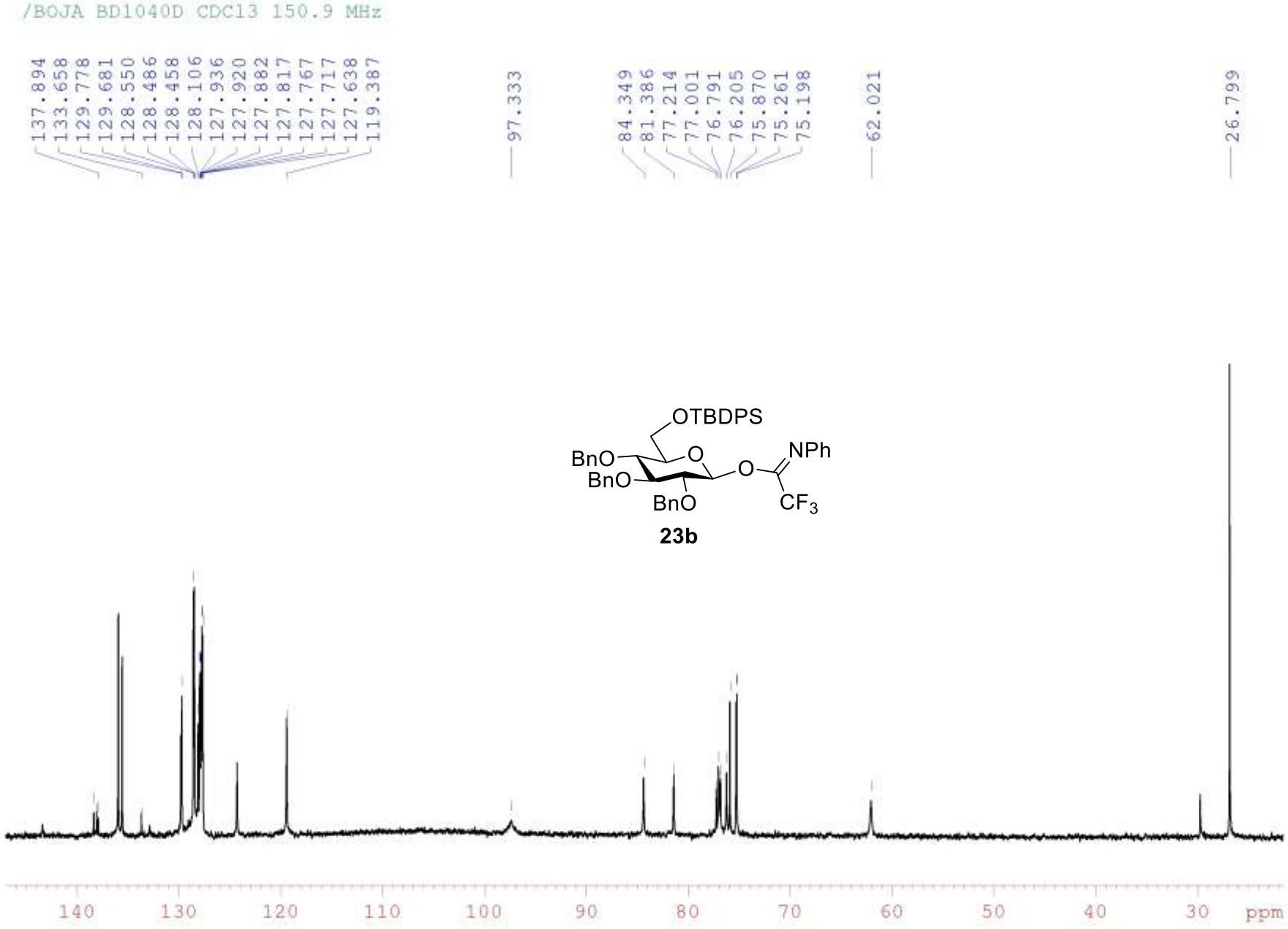
O-(2,3,4-Tri-*O*-benzyl-6-*O*-*tert*-butyldiphenylsilyl-α-D-glucopyranosyl) N-phenyltrifluoroacetimidate (23)



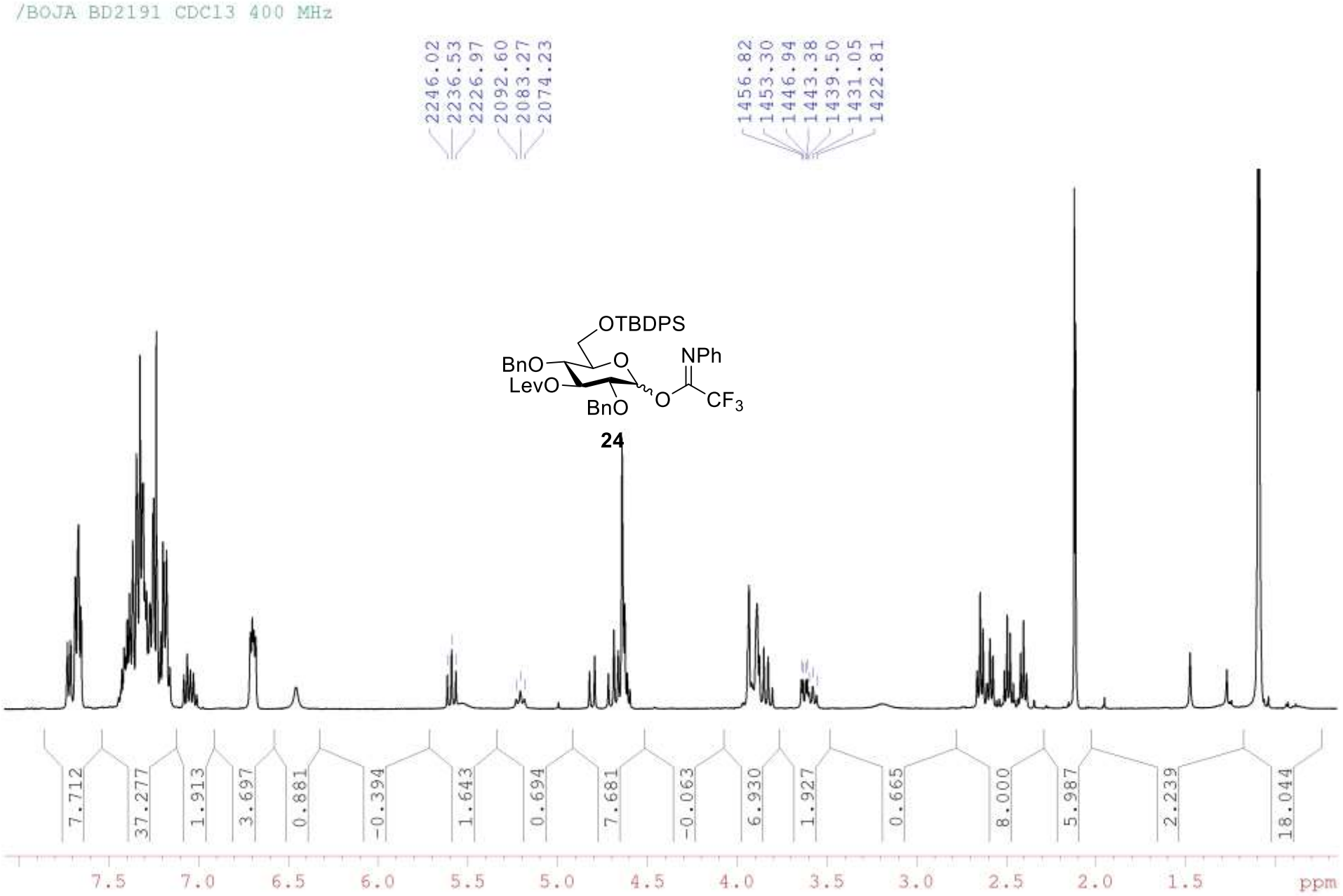
O-(2,3,4-Tri-*O*-benzyl-6-*O*-*tert*-butyldiphenylsilyl-β-D-glucopyranosyl) N-phenyltrifluoroacetimidate (23)



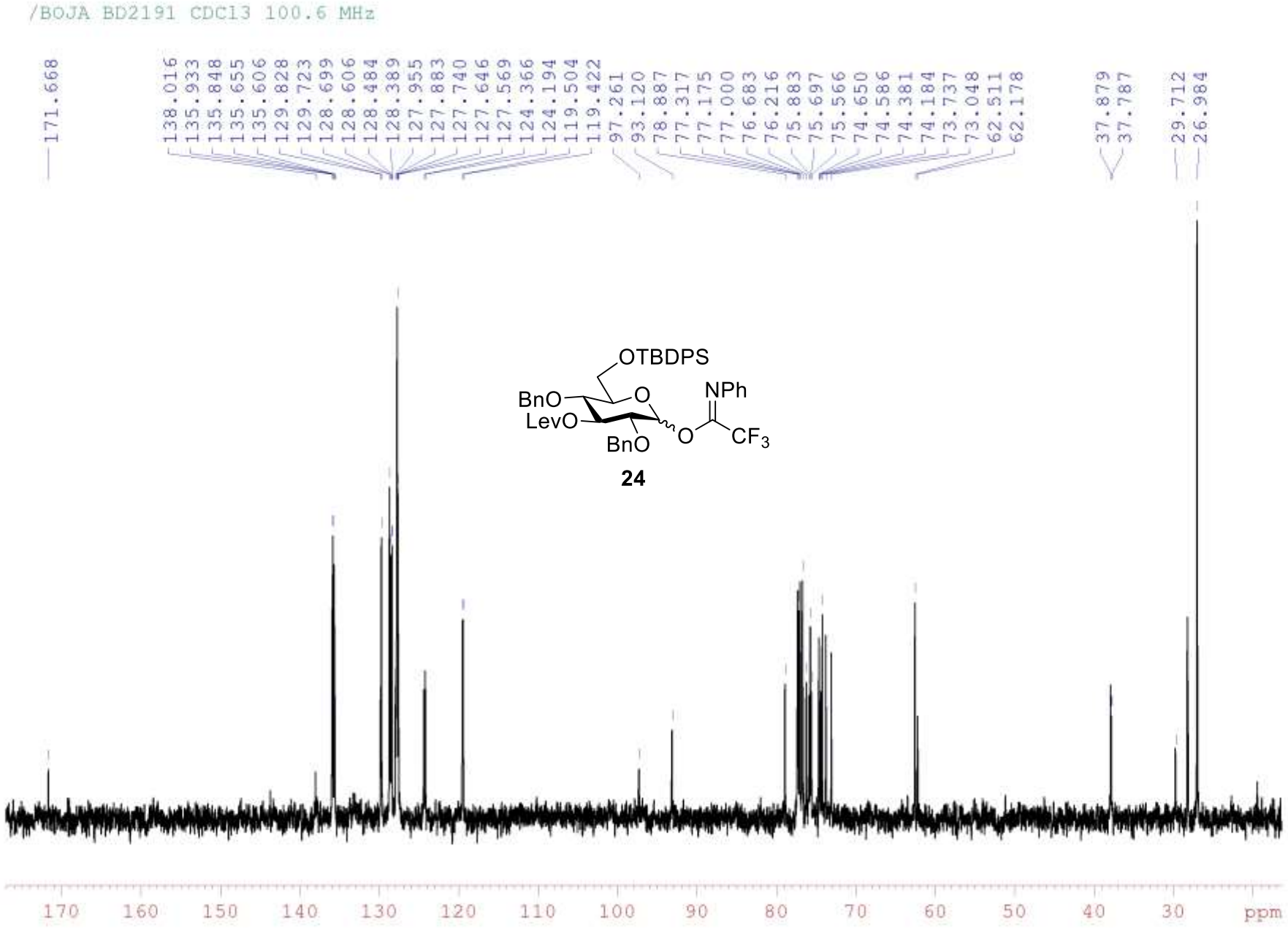
O-(2,3,4-Tri-*O*-benzyl-6-*O*-*tert*-butyldiphenylsilyl-D-glucopyranosyl) N-phenyltrifluoroacetimidate (23)



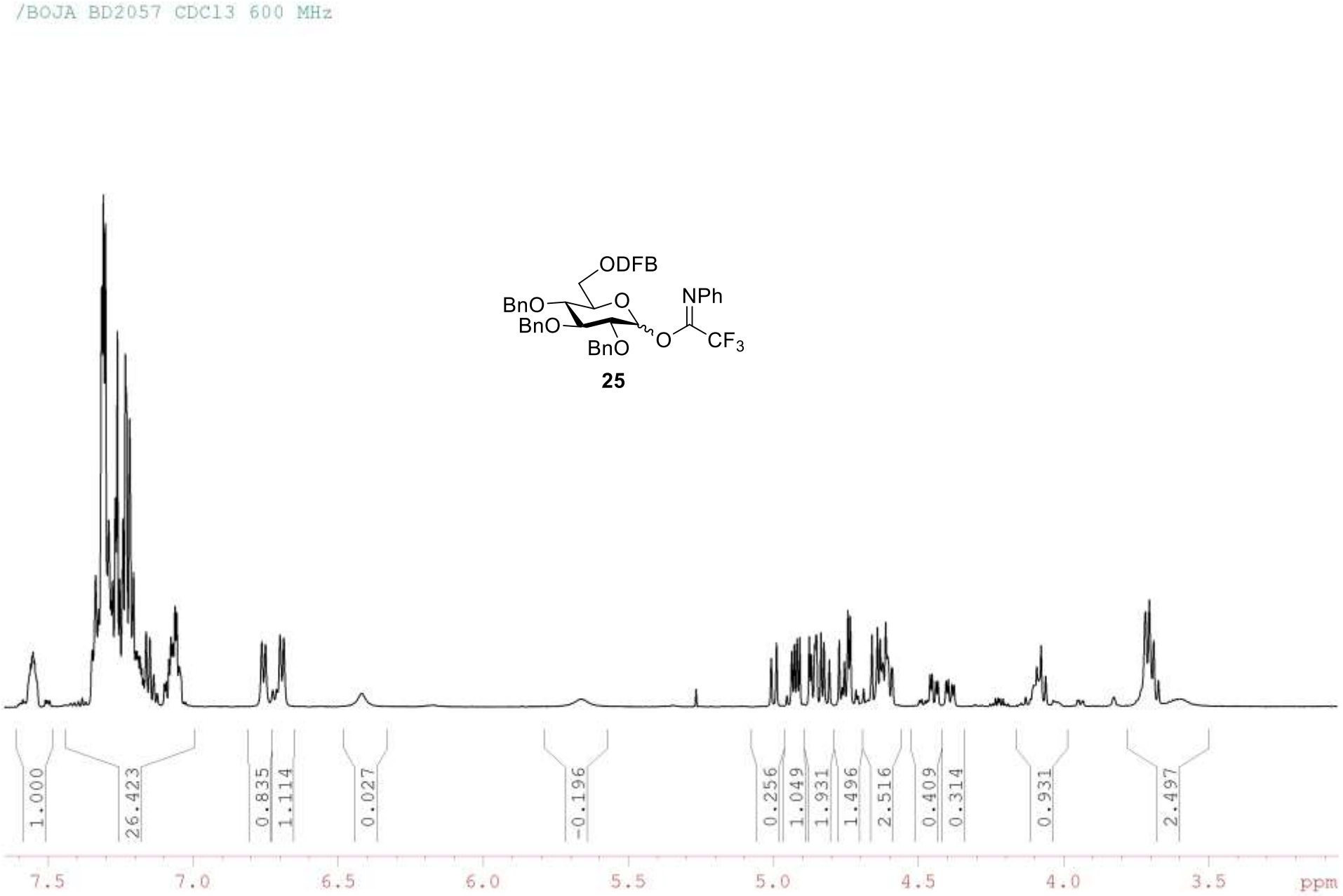
O-(2,4-Di-*O*-benzyl-6-*O*-*tert*-butyldiphenylsilyl-3-*O*-levulinoyl-D-glucopyranosyl) N-phenyltrifluoroacetimidate (24)



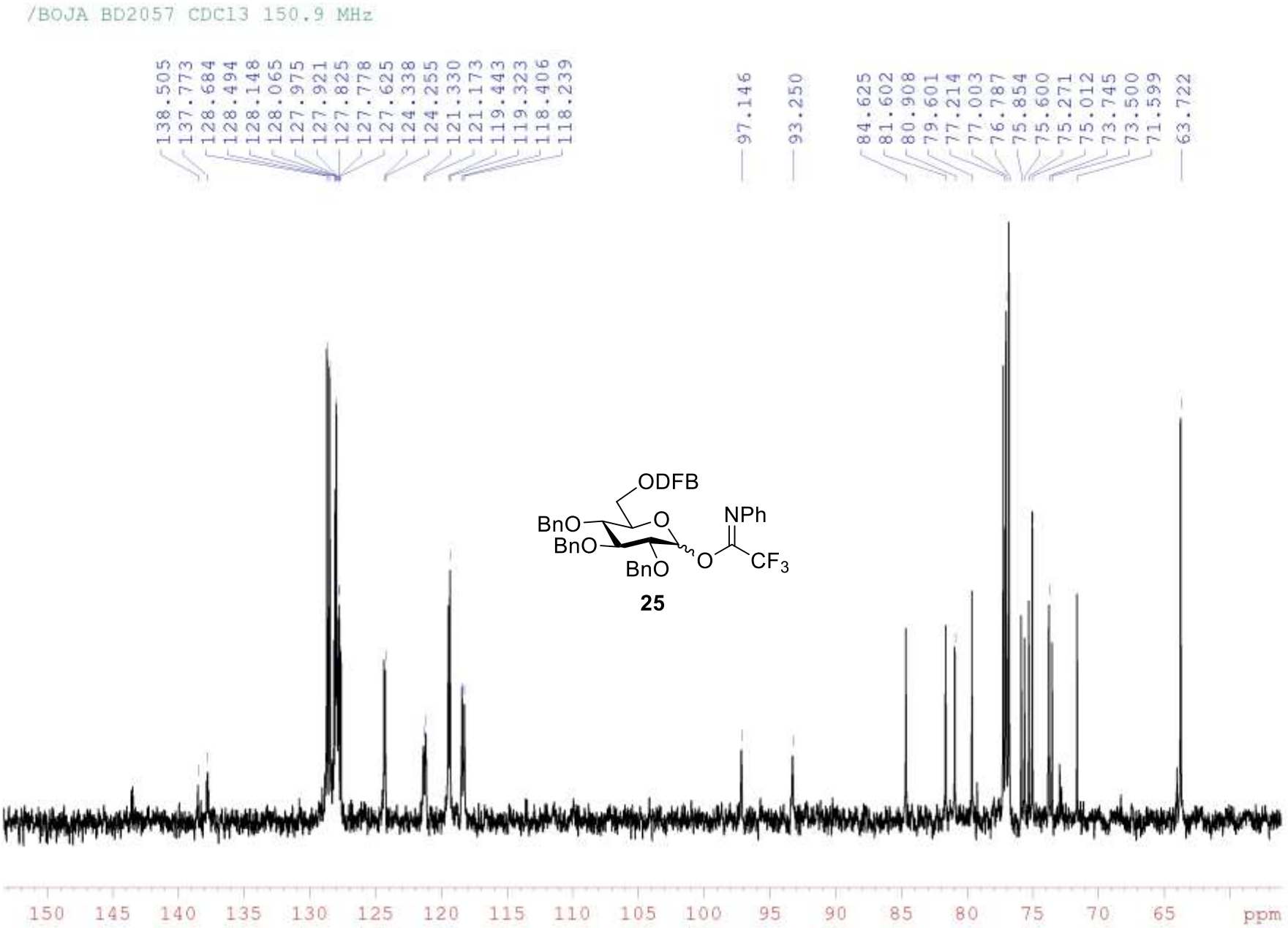
O-(2,4-Di-*O*-benzyl-6-*O*-*tert*-butyldiphenylsilyl-3-*O*-levulinoyl-D-glucopyranosyl) N-phenyltrifluoroacetimidate (24)



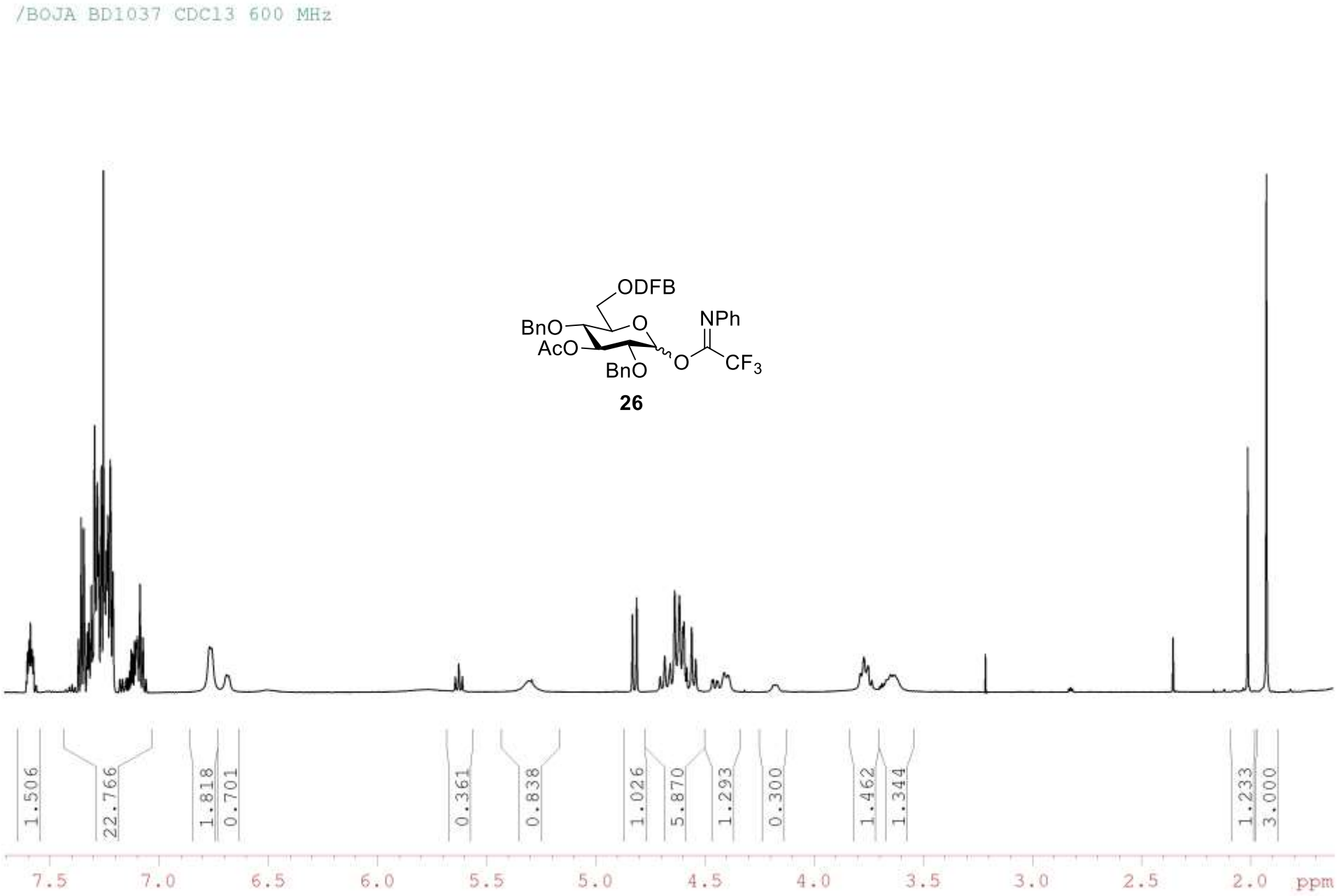
O-(2,3,4-tri-*O*-benzyl-6-*O*-(2,5-difluorobenzoyl)-D-glucopyranosyl) N-phenyltrifluoroacetimidate (25)



O-(2,3,4-tri-*O*-benzyl-6-*O*-(2,5-difluorobenzoyl)-D-glucopyranosyl) N-phenyltrifluoroacetimidate (25)

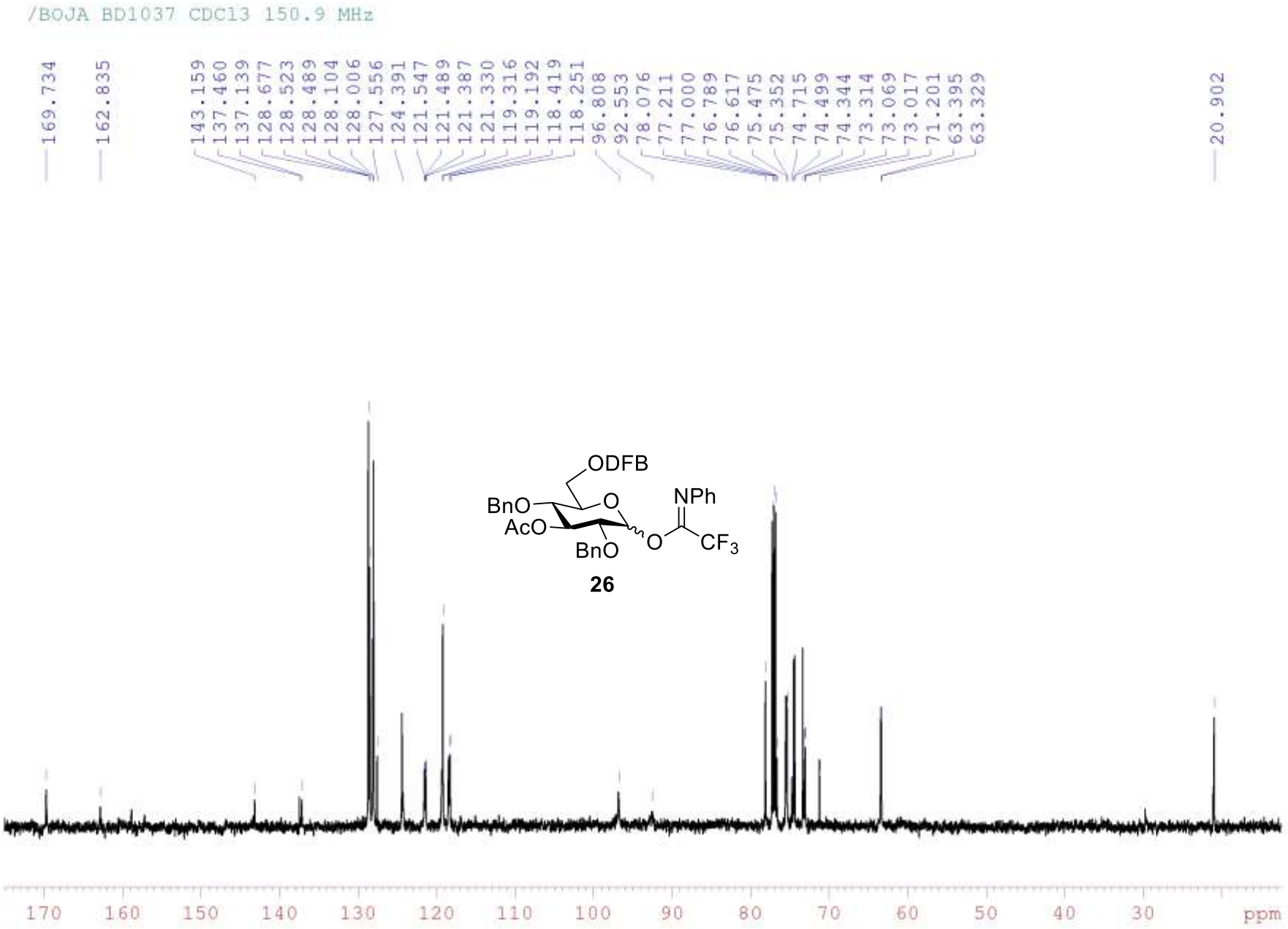


O-(3-*O*-Acetyl-2,4-di-*O*-benzyl-6-*O*-(2,5-difluorobenzoyl)-D-glucopyranosyl) N-phenyltrifluoroacetimidate (26)

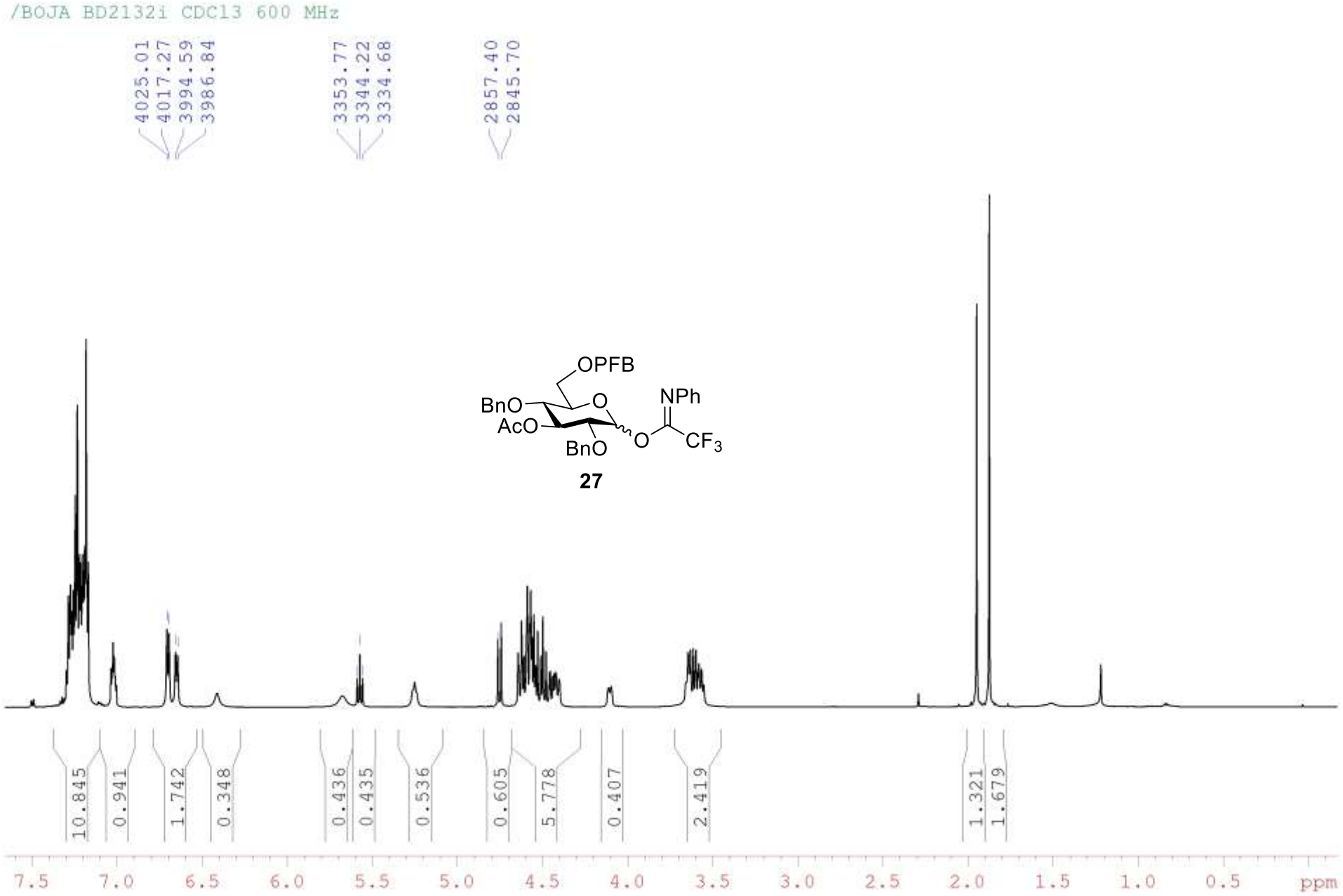


26

O-(3-*O*-Acetyl-2,4-di-*O*-benzyl-6-*O*-(2,5-difluorobenzoyl)-D-glucopyranosyl) N-phenyltrifluoroacetimidate (26)

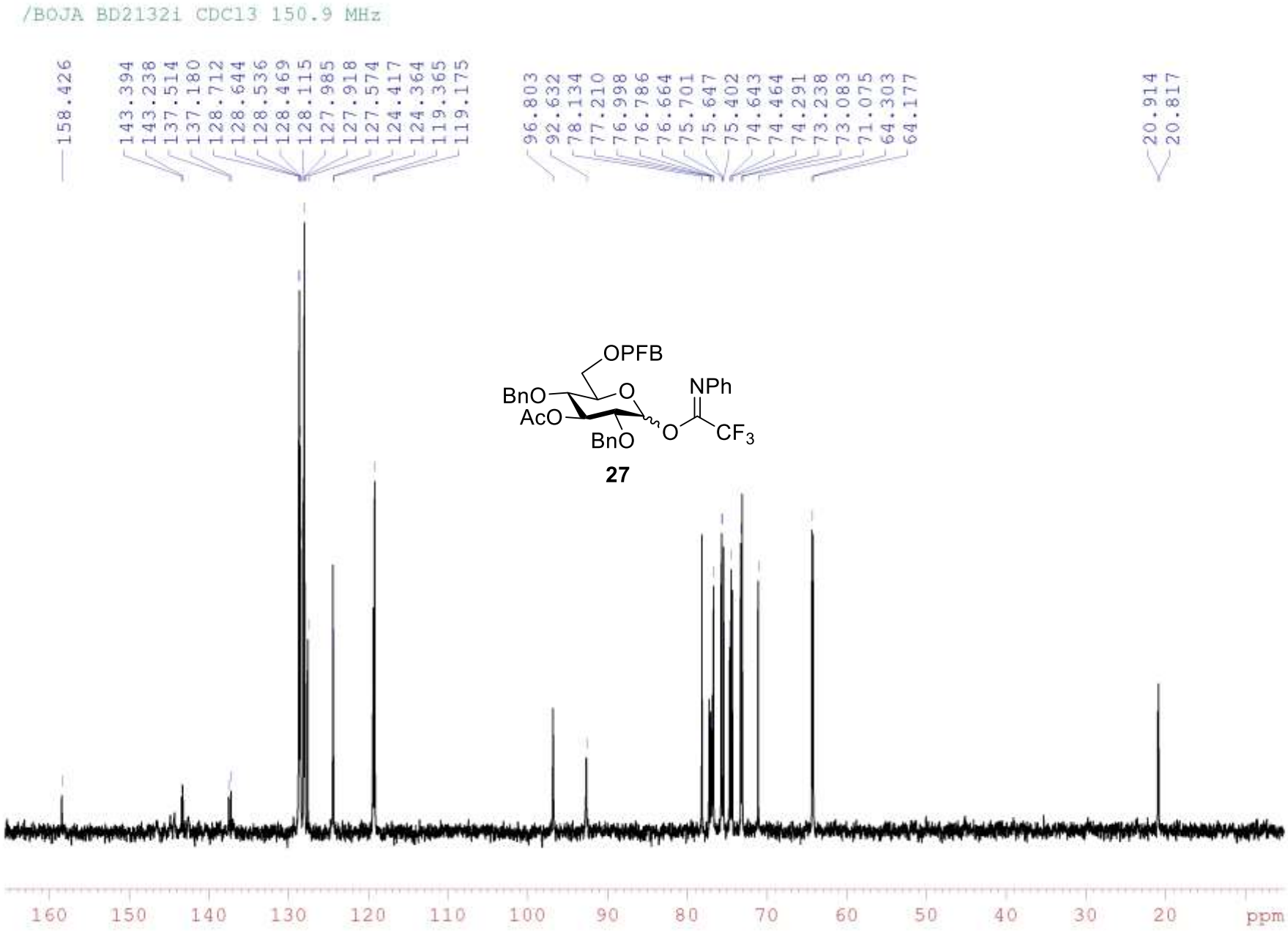


O-(3-*O*-Acetyl-2,4-di-*O*-benzyl-6-*O*-pentafluorobenzoyl-D-glucopyranosyl) N-phenyltrifluoroacetimidate (27)

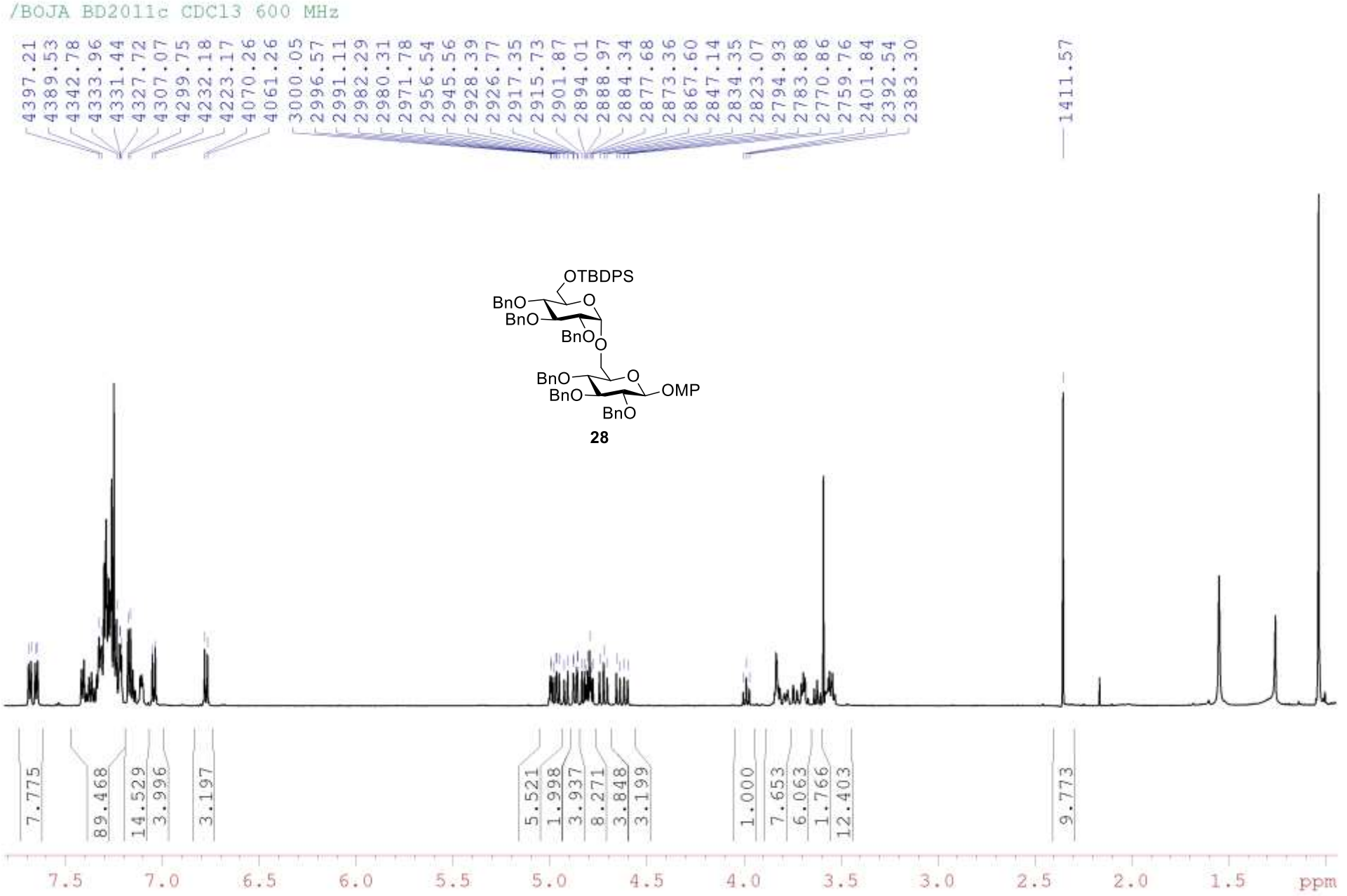


27

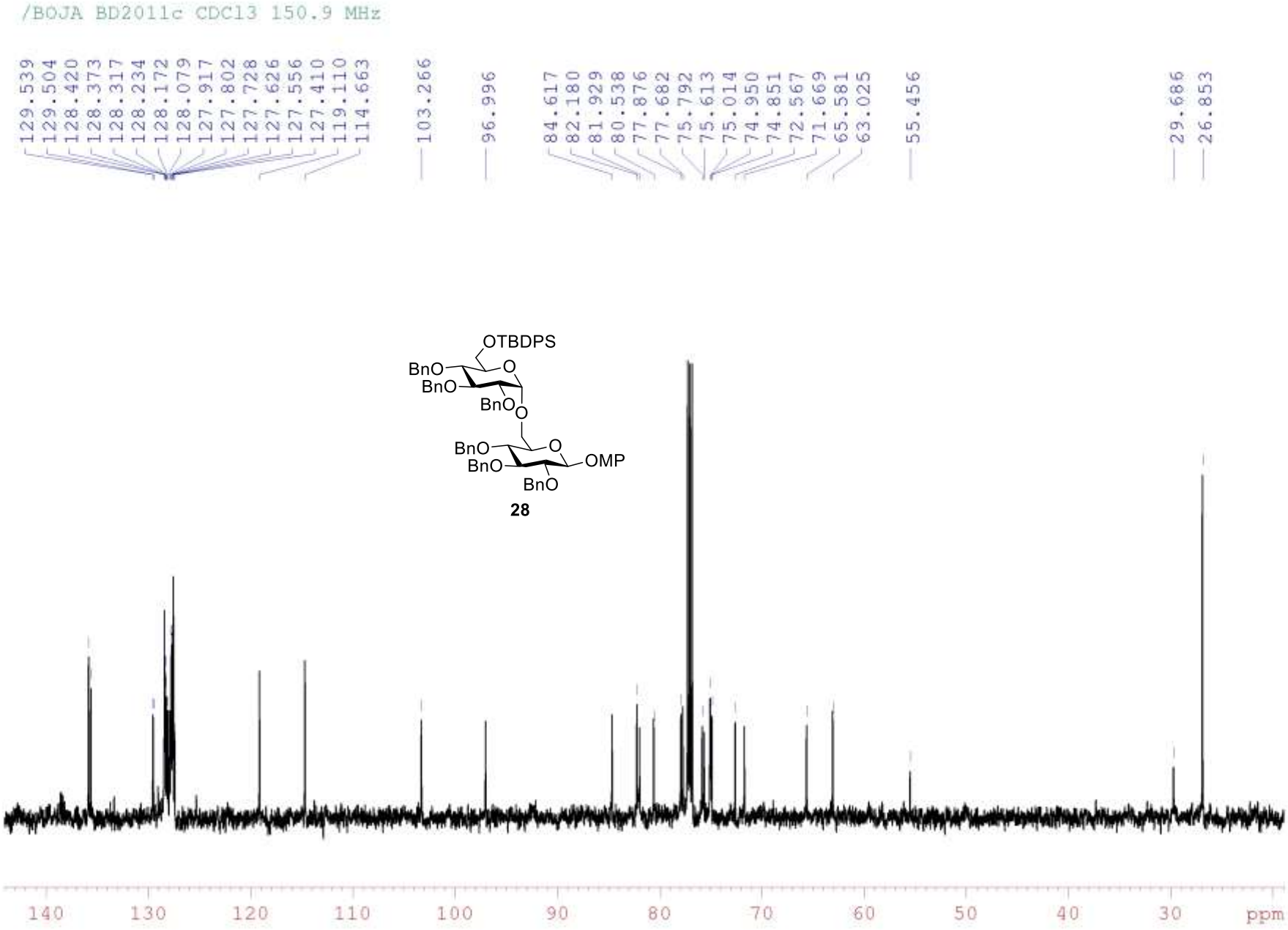
O-(3-*O*-Acetyl-2,4-di-*O*-benzyl-6-*O*-pentafluorobenzoyl-D-glucopyranosyl) N-phenyltrifluoroacetimidate (27)



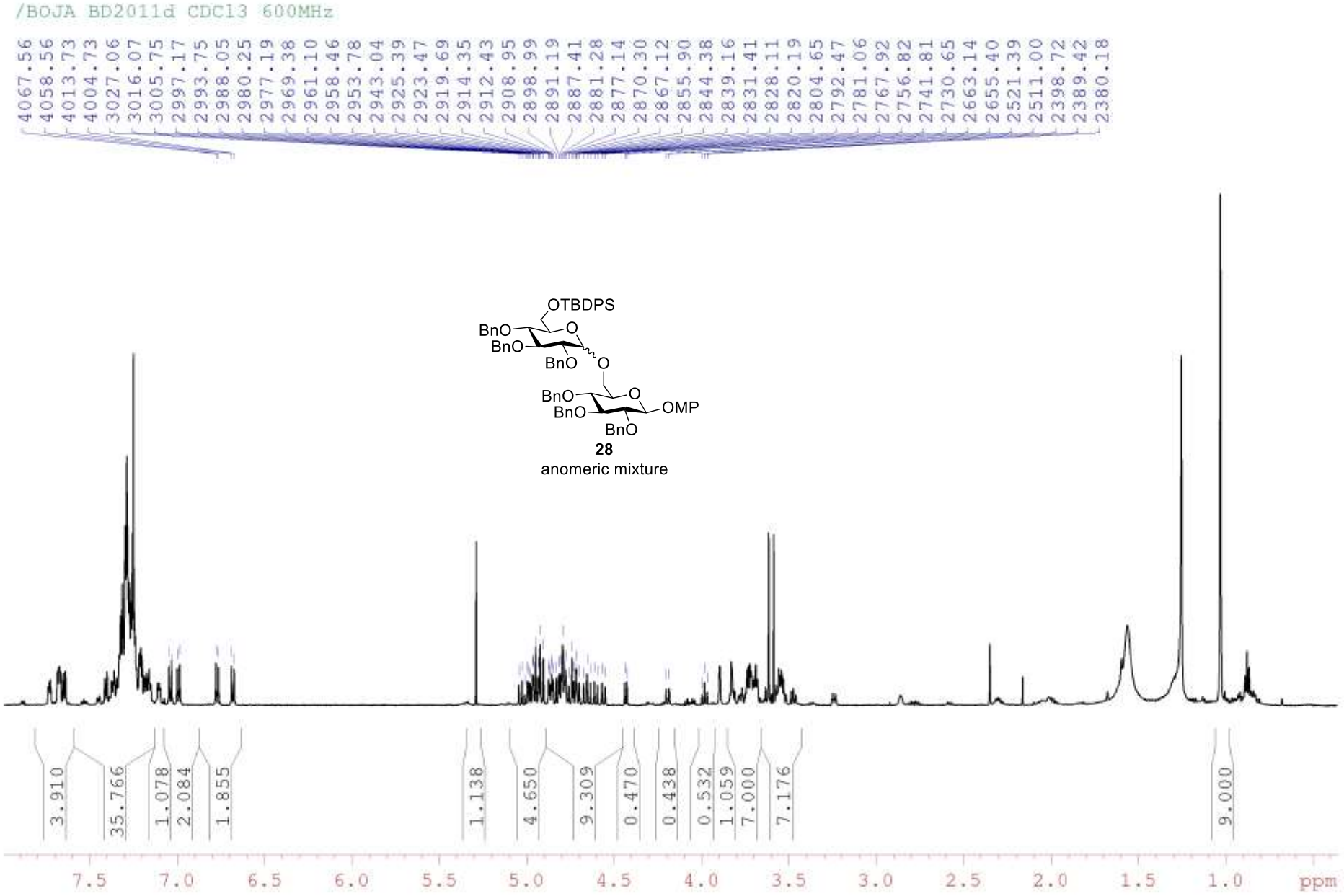
***p*-Methoxyphenyl 2,3,4-tri-*O*-benzyl-6-*O*-*tert*-butyldiphenylsilyl-α-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-β-D-glucopyranoside (28α)**



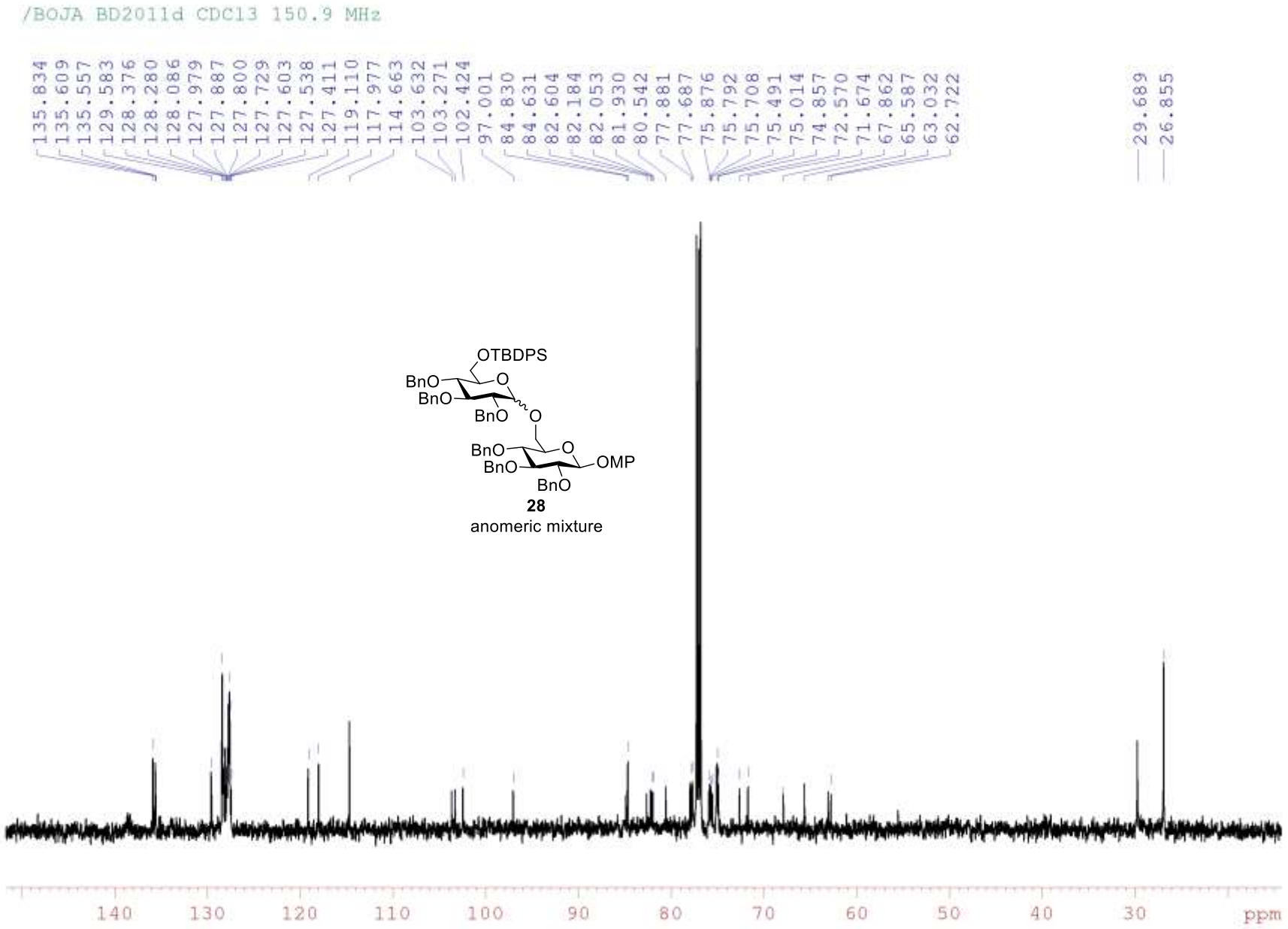
***p*-Methoxyphenyl 2,3,4-tri-*O*-benzyl-6-*O*-*tert*-butyldiphenylsilyl-α-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-β-D-glucopyranoside (28α)**



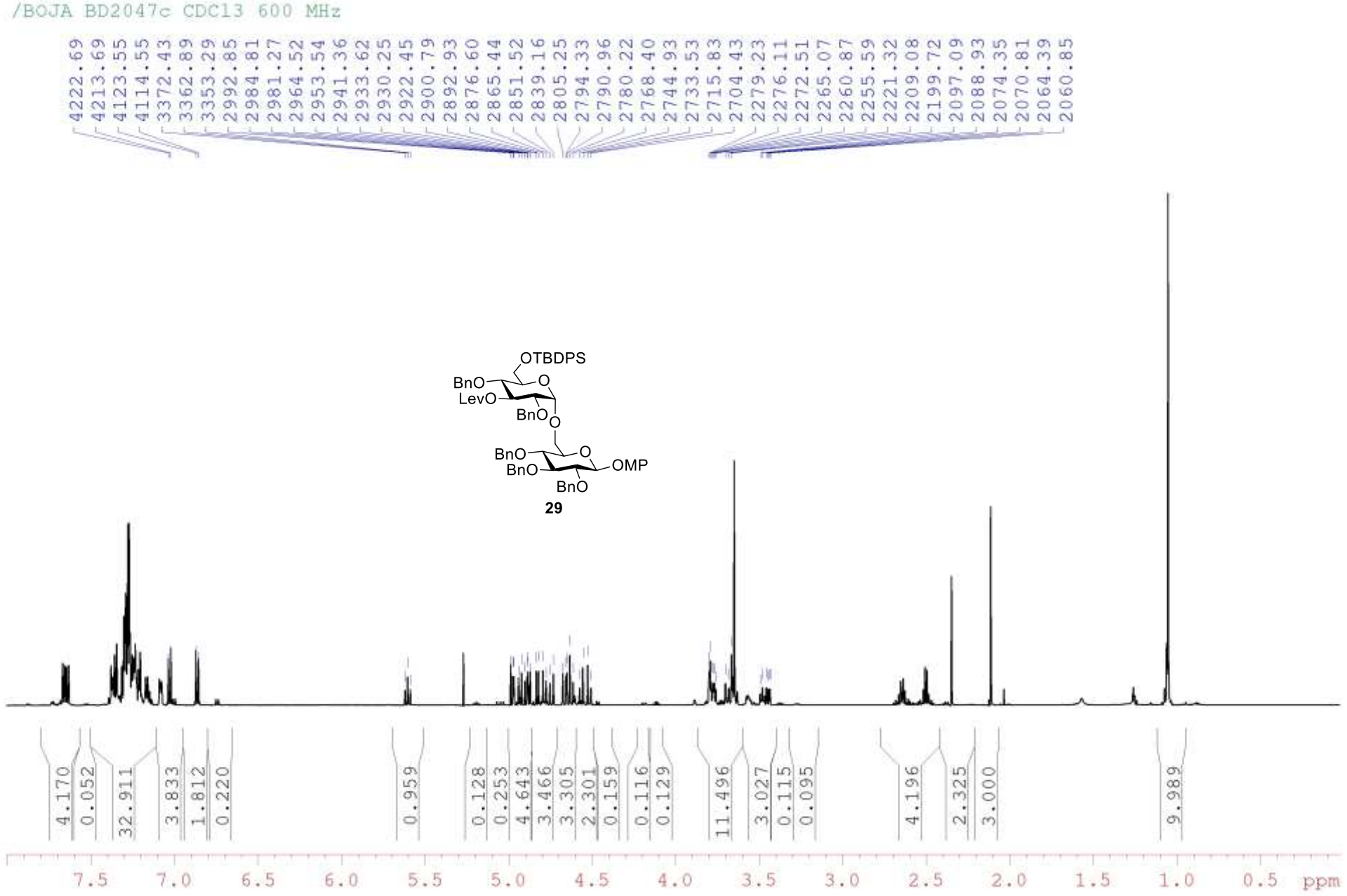
***p*-Methoxyphenyl 2,3,4-tri-*O*-benzyl-6-*O*-*tert*-butyldiphenylsilyl-α-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-β-D-glucopyranoside (28α) and *p*-methoxyphenyl 2,3,4-tri-*O*-benzyl-6-*O*-*tert*-butyldiphenylsilyl-β-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-β-D-glucopyranoside (28β)**



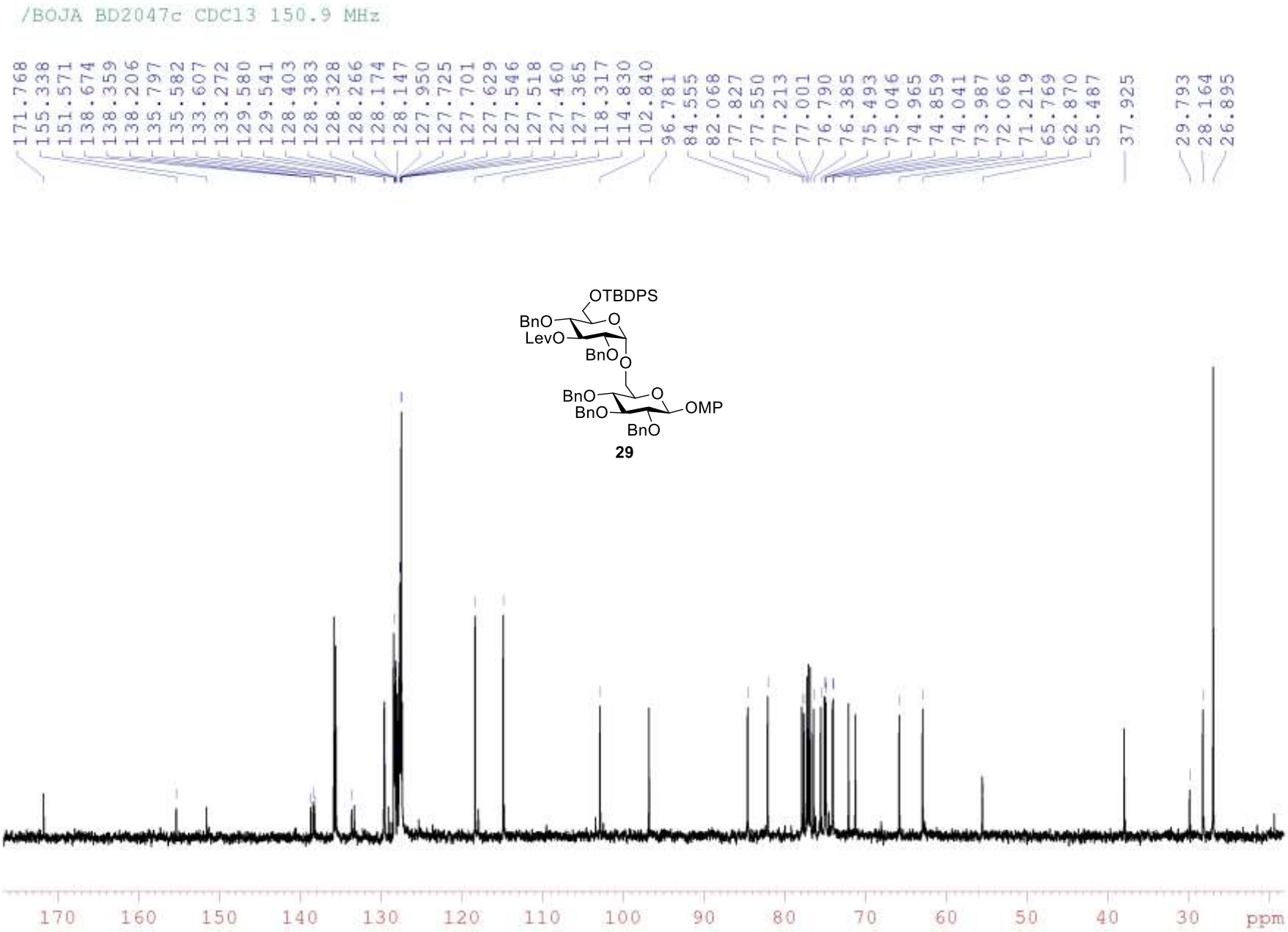
***p*-Methoxyphenyl 2,3,4-tri-*O*-benzyl-6-*O*-*tert*-butyldiphenylsilyl-α-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-β-D-glucopyranoside (28α) and *p*-methoxyphenyl 2,3,4-tri-*O*-benzyl-6-*O*-*tert*-butyldiphenylsilyl-β-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-β-D-glucopyranoside (28β)**



***p*-Methoxyphenyl 2,4-di-O-benzyl-6-O-*tert*-butyldiphenylsilyl-3-O-levulinoyl-α-D-glucopyranosyl-(1→6)-2,3,4-tri-O-benzyl-β-D-glucopyranoside (29)**

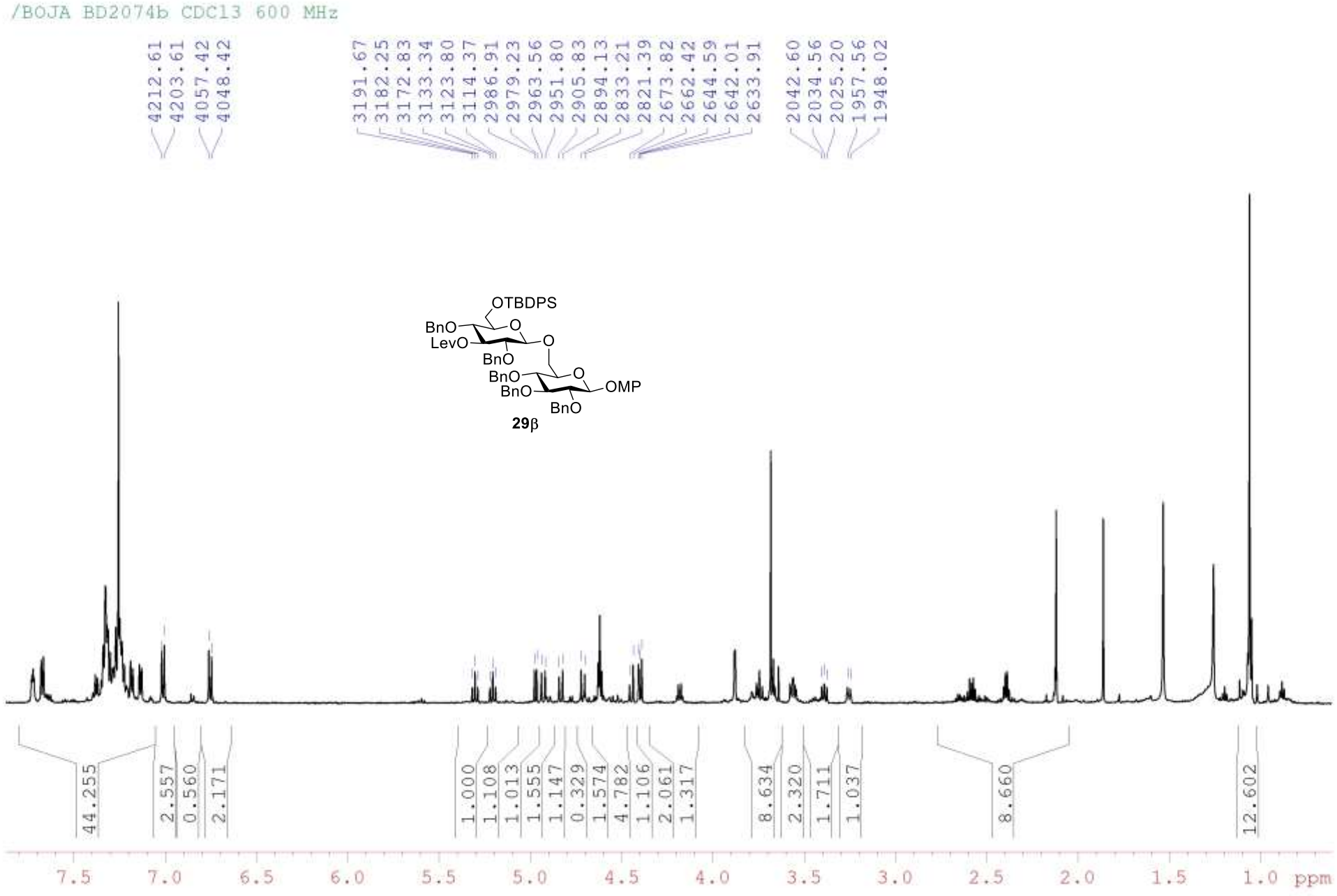


***p*-Methoxyphenyl 2,4-di-O-benzyl-6-O-*tert*-butyldiphenylsilyl-3-O-levulinoyl-α-D-glucopyranosyl-(1→6)-2,3,4-tri-O-benzyl-β-D-glucopyranoside (29)**

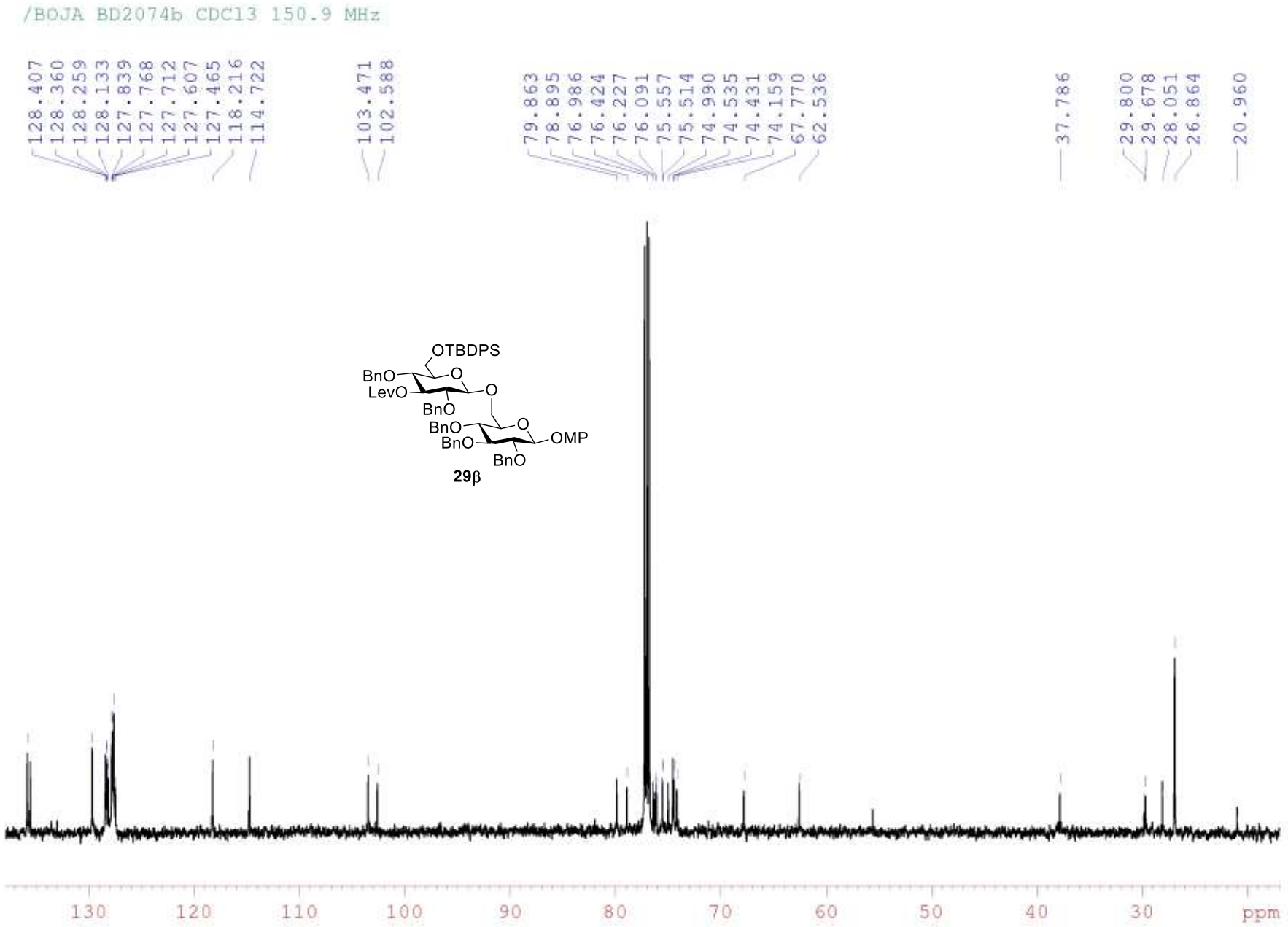


29

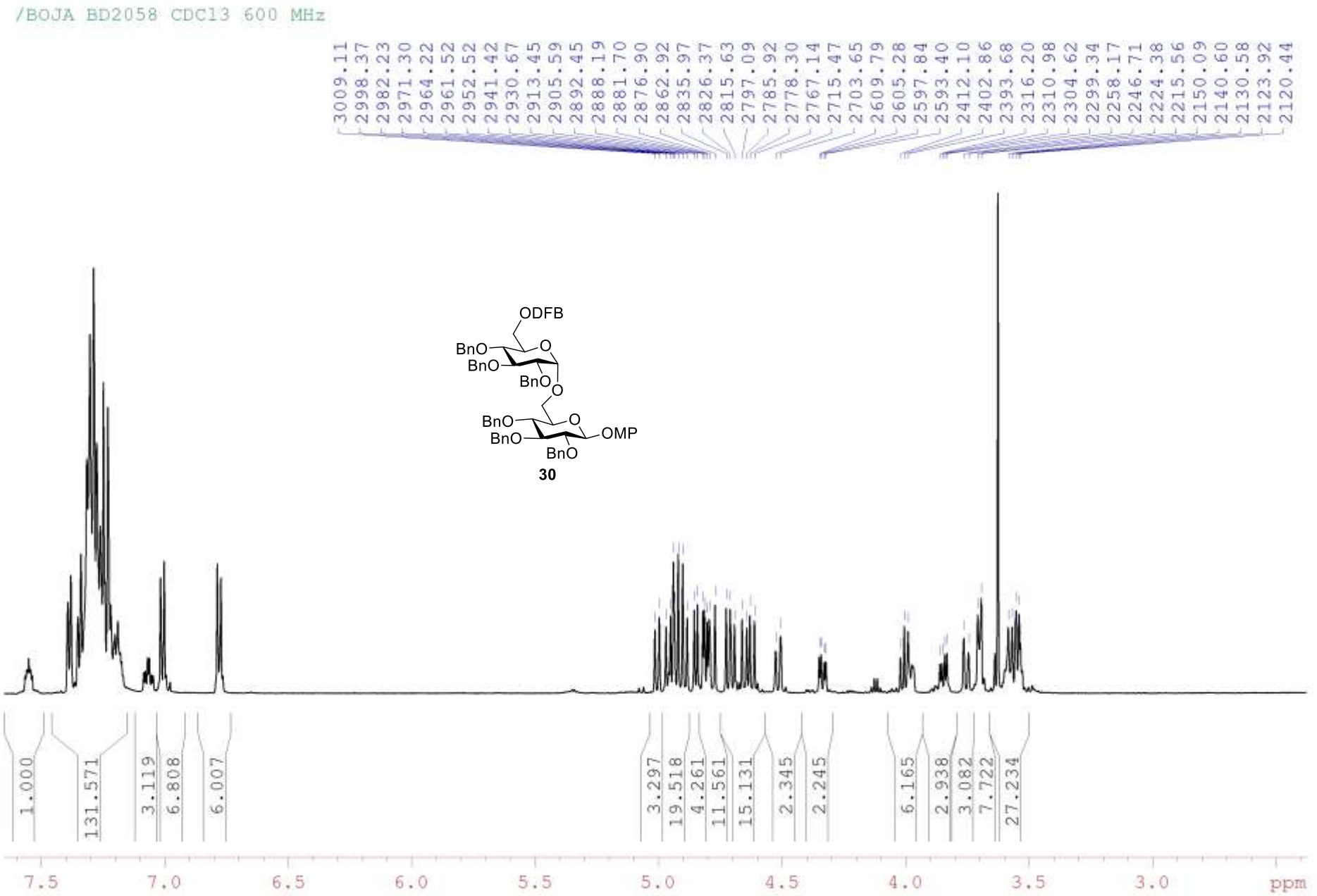
Methoxyphenyl 2,4-di-O-benzyl-6-O-*tert*-butyldiphenylsilyl-3-O-levulinoyl-β-D-glucopyranosyl-(1→6)-2,3,4-tri-O-benzyl-β-D-glucopyranoside (29β)



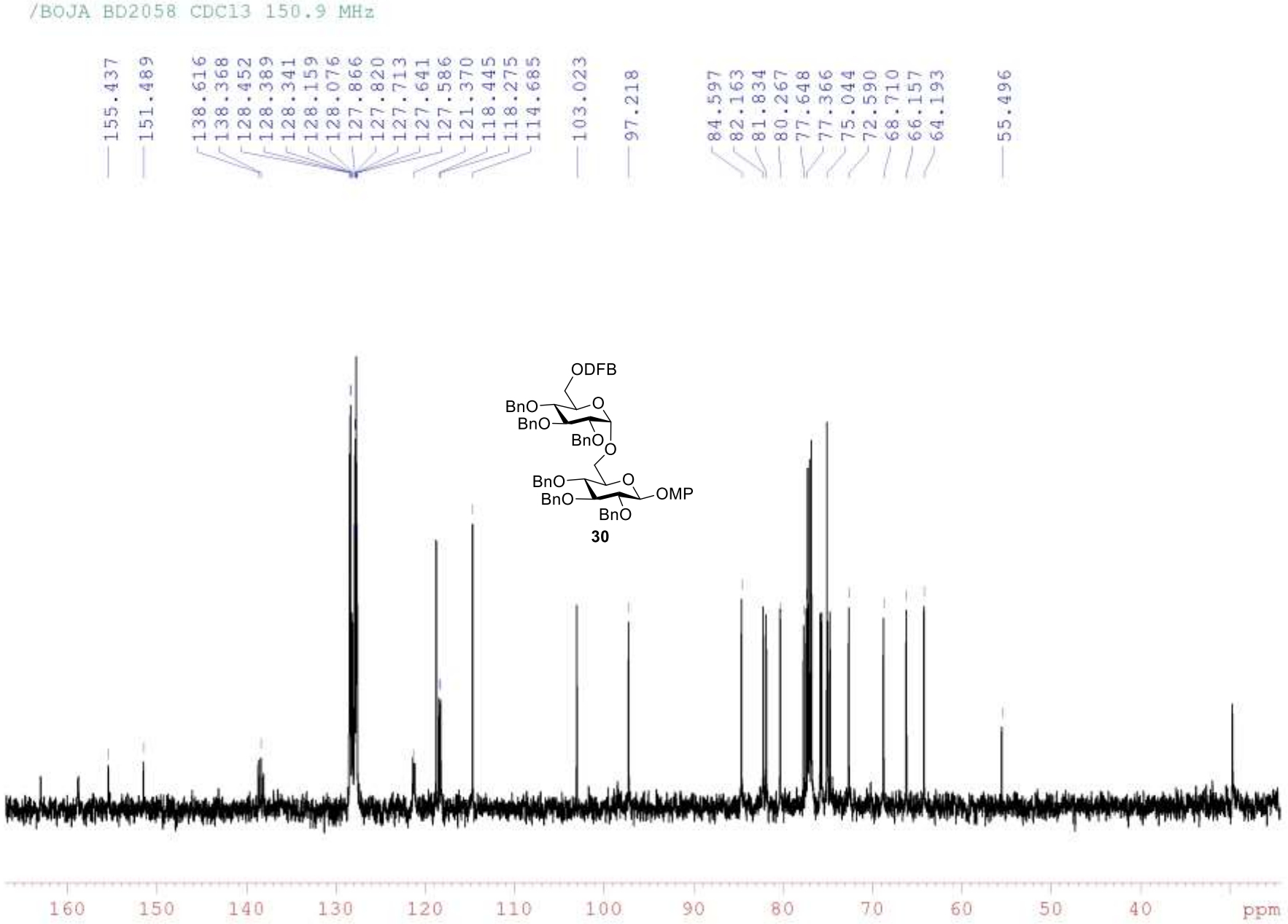
Methoxyphenyl 2,4-di-O-benzyl-6-O-*tert*-butyldiphenylsilyl-3-O-levulinoyl-β-D-glucopyranosyl-(1→6)-2,3,4-tri-O-benzyl-β-D-glucopyranoside (29β)



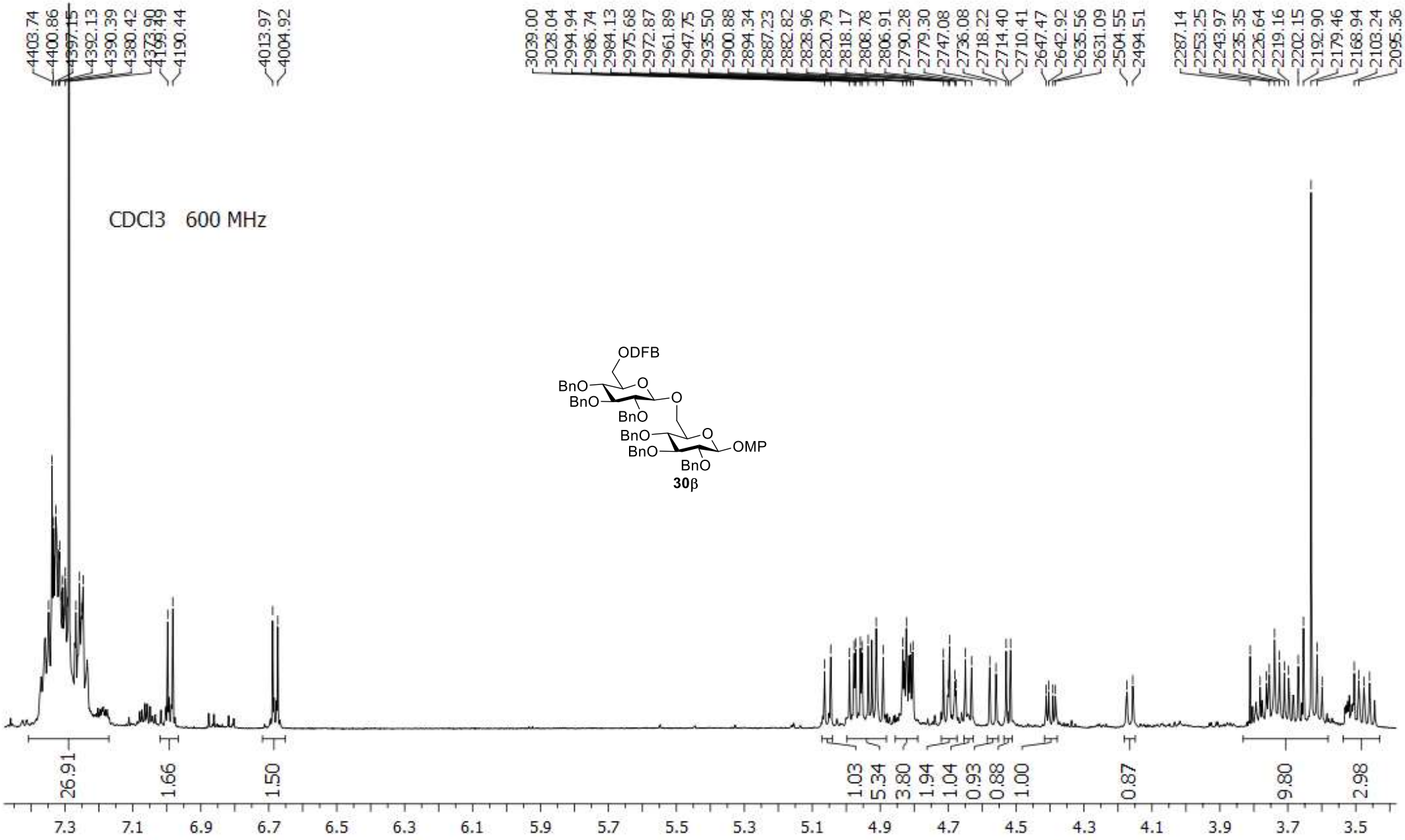
***p*-Methoxyphenyl 2,3,4-tri-*O*-benzyl-6-*O*-(2,5-difluorobenzoyl)-α-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-β-D-glucopyranoside (30α)**



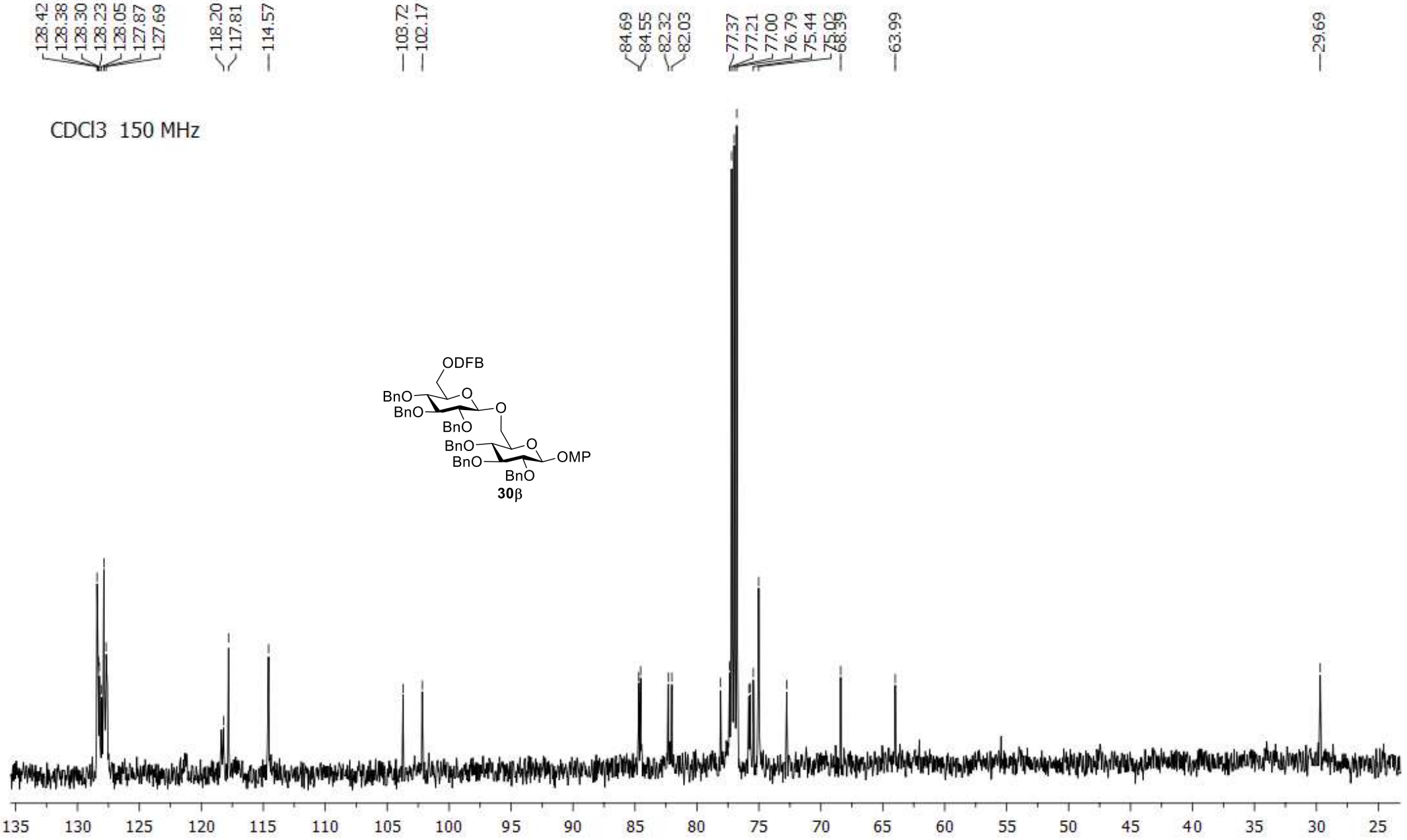
***p*-Methoxyphenyl 2,3,4-tri-*O*-benzyl-6-*O*-(2,5-difluorobenzoyl)-α-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-β-D-glucopyranoside (30α)**



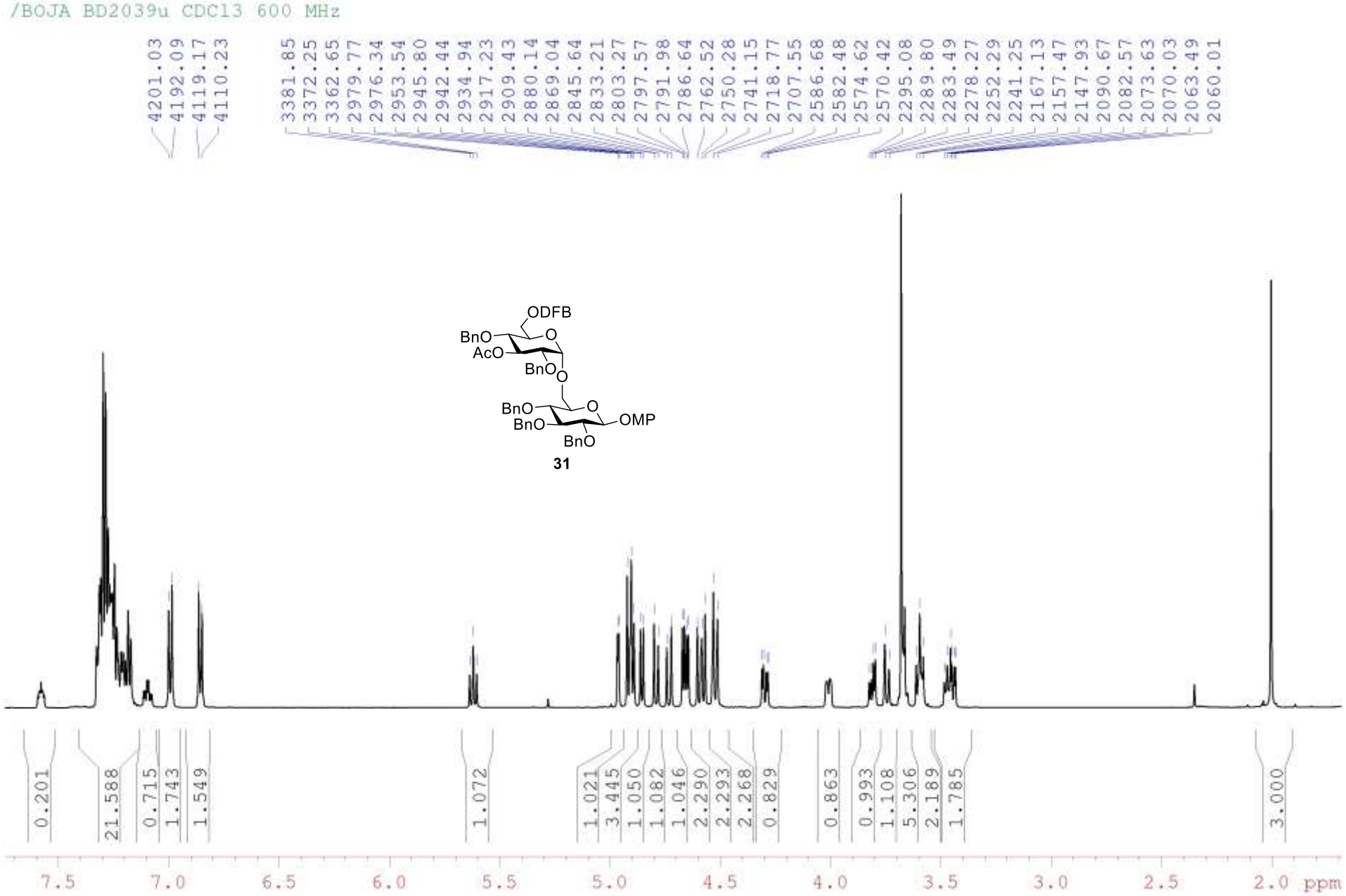
***p*-Methoxyphenyl 2,3,4-tri-*O*-benzyl-6-*O*-(2,5-difluorobenzoyl)-β-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-β-D-glucopyranoside (30β)**



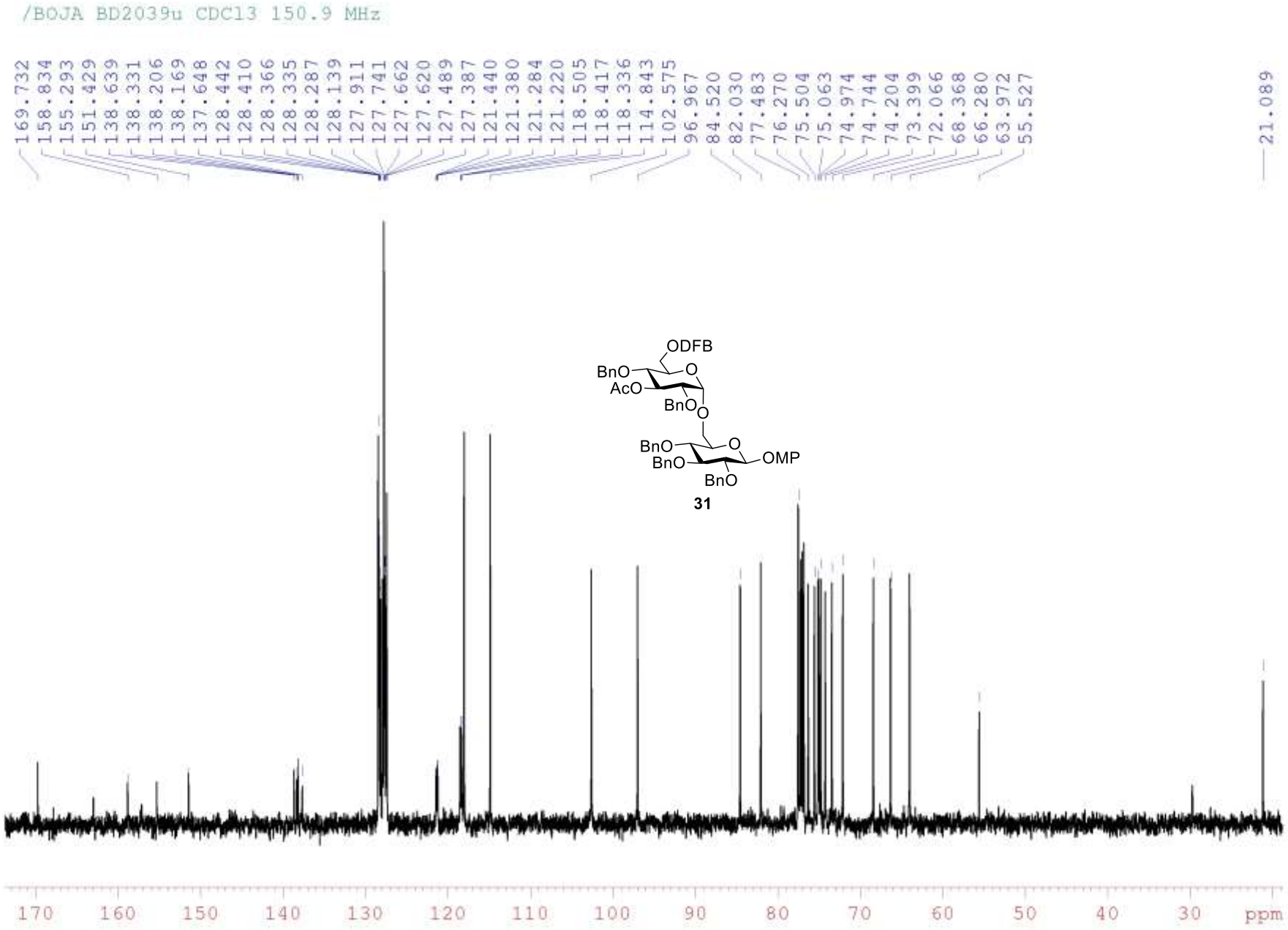
***p*-Methoxyphenyl 2,3,4-tri-*O*-benzyl-6-*O*-(2,5-difluorobenzoyl)-β-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-β-D-glucopyranoside (30β)**



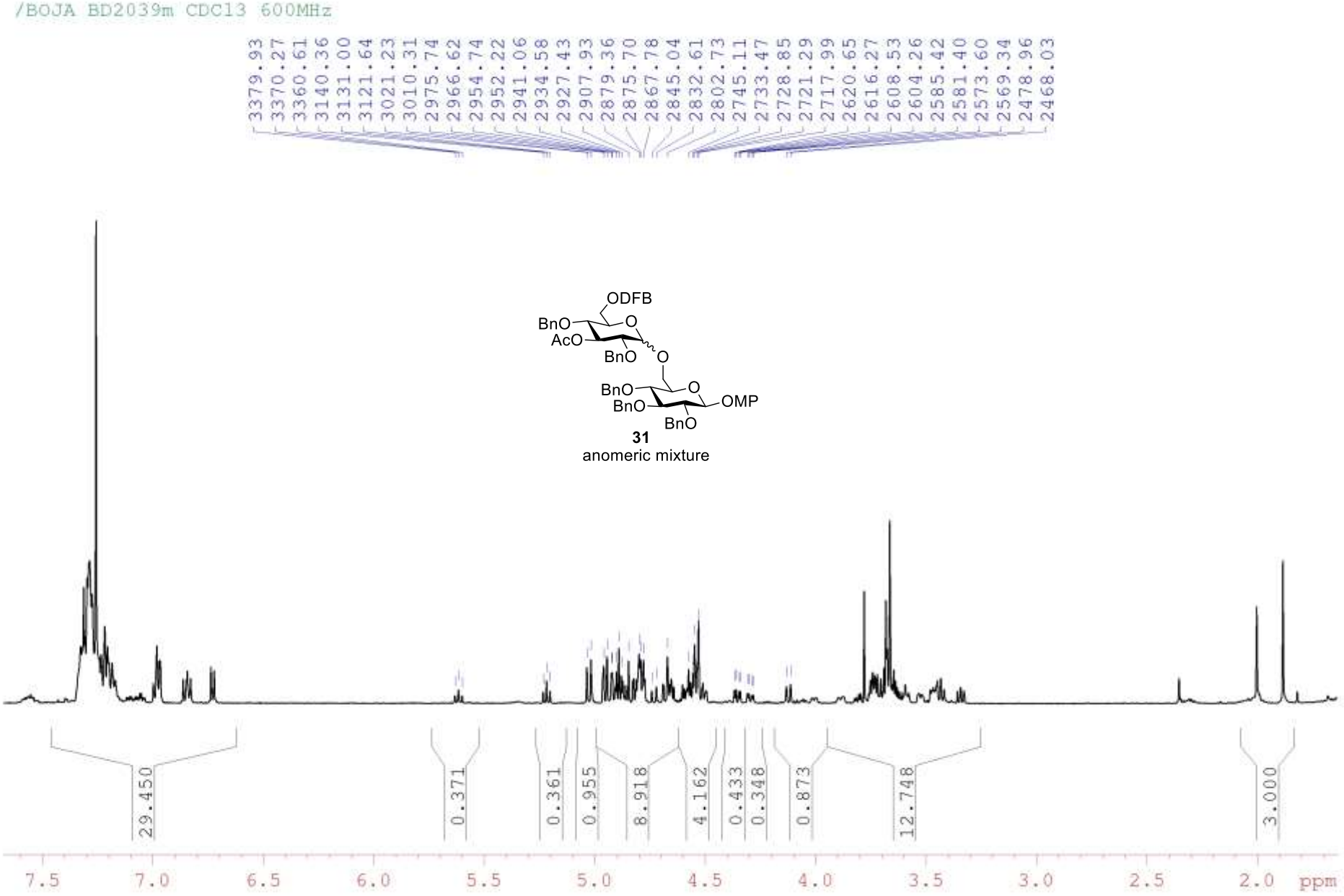
***p*-Methoxyphenyl 3-*O*-acetyl-2,4-di-*O*-benzyl-6-*O*-(2,5-difluorobenzoyl)-α-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-β-D-glucopyranoside (31α)**



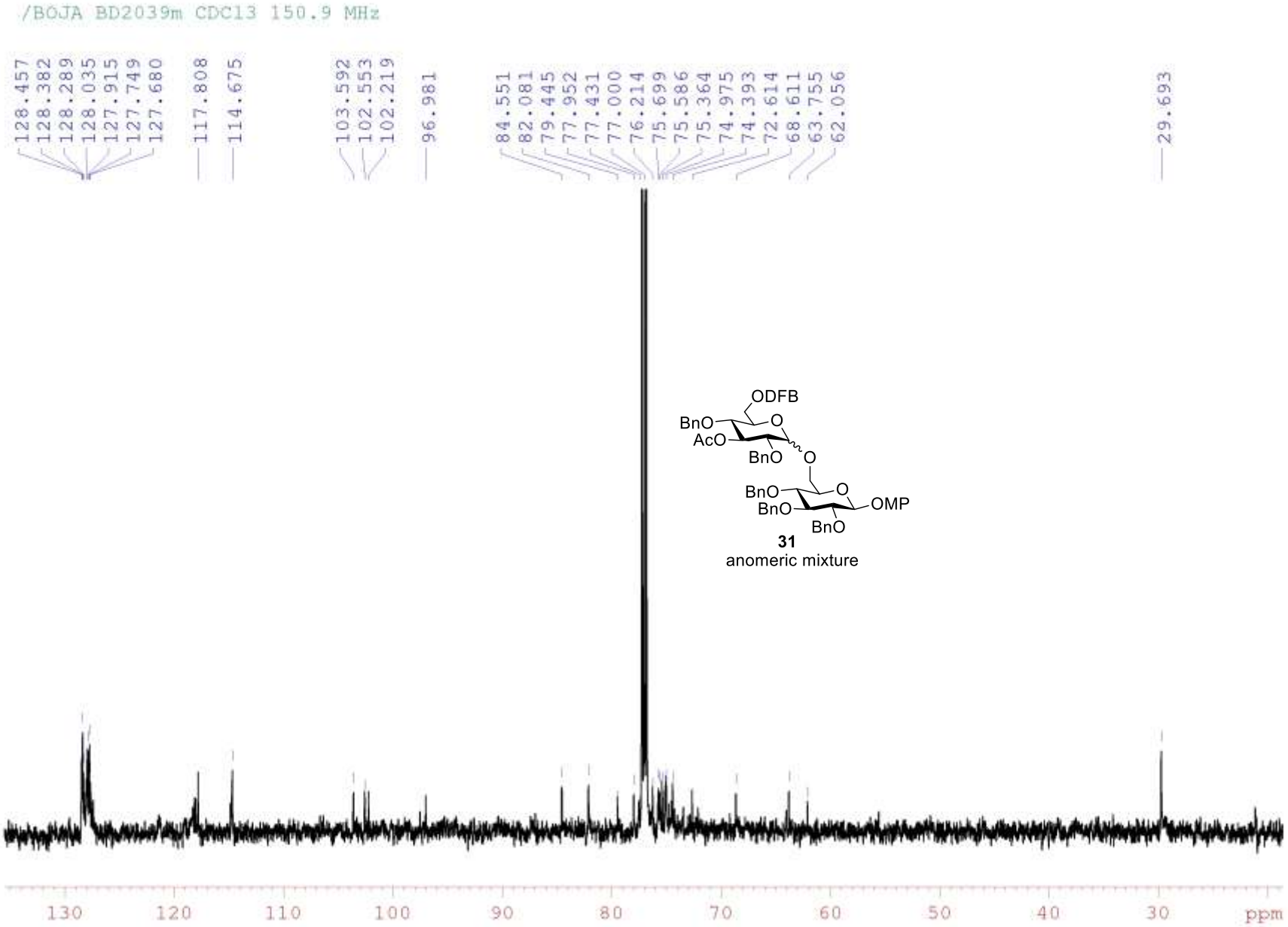
***p*-Methoxyphenyl 3-*O*-acetyl-2,4-di-*O*-benzyl-6-*O*-(2,5-difluorobenzoyl)-α-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-β-D-glucopyranoside (31α)**



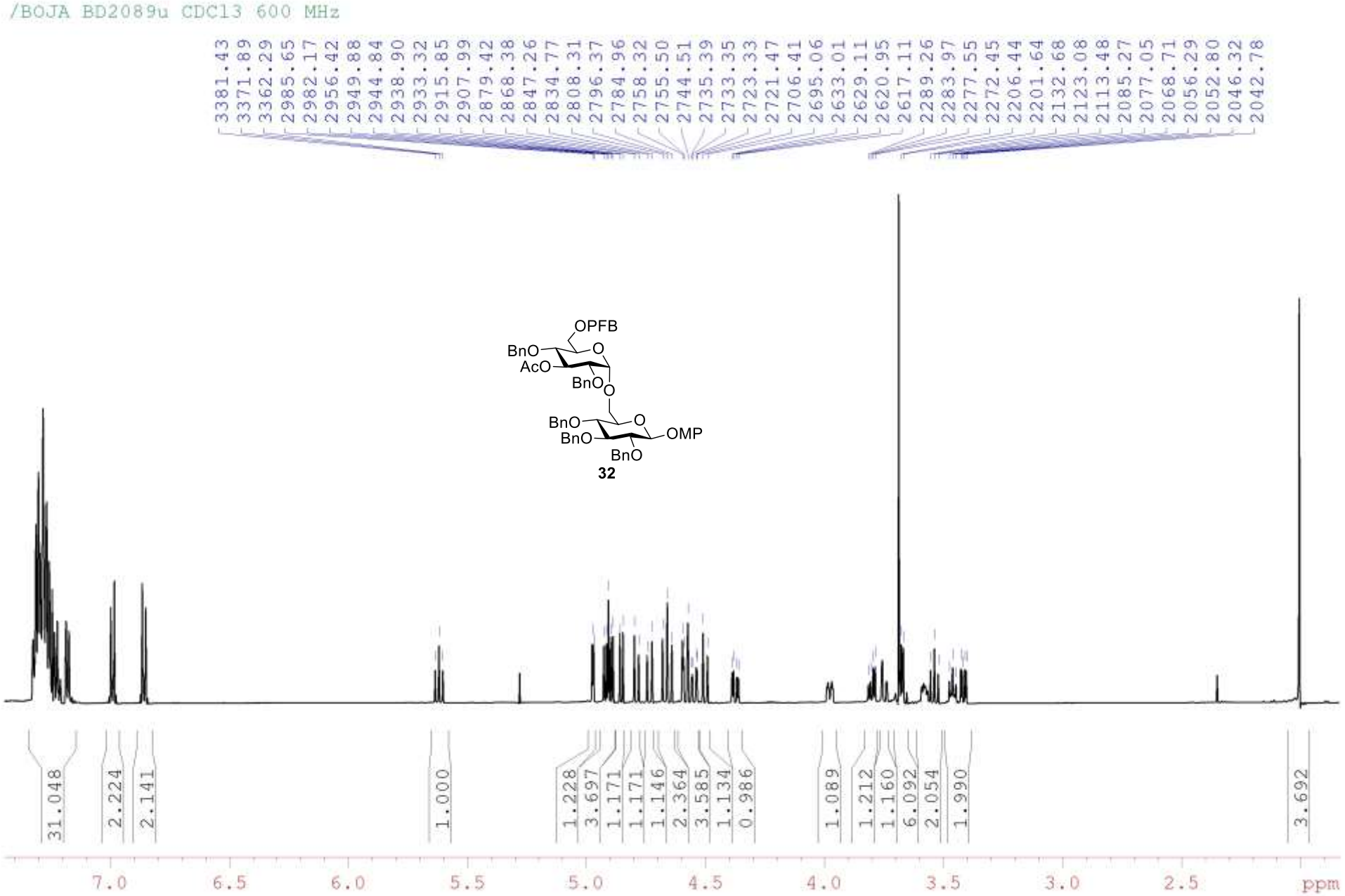
***p*-Methoxyphenyl 3-*O*-acetyl-2,4-di-*O*-benzyl-6-*O*-(2,5-difluorobenzoyl)-α-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-β-D-glucopyranoside (31α) and *p*-methoxyphenyl 3-*O*-acetyl-2,4-di-*O*-benzyl-6-*O*-(2,5-di-fluorobenzoyl)-β-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-β-D-glucopyranoside (31β)**



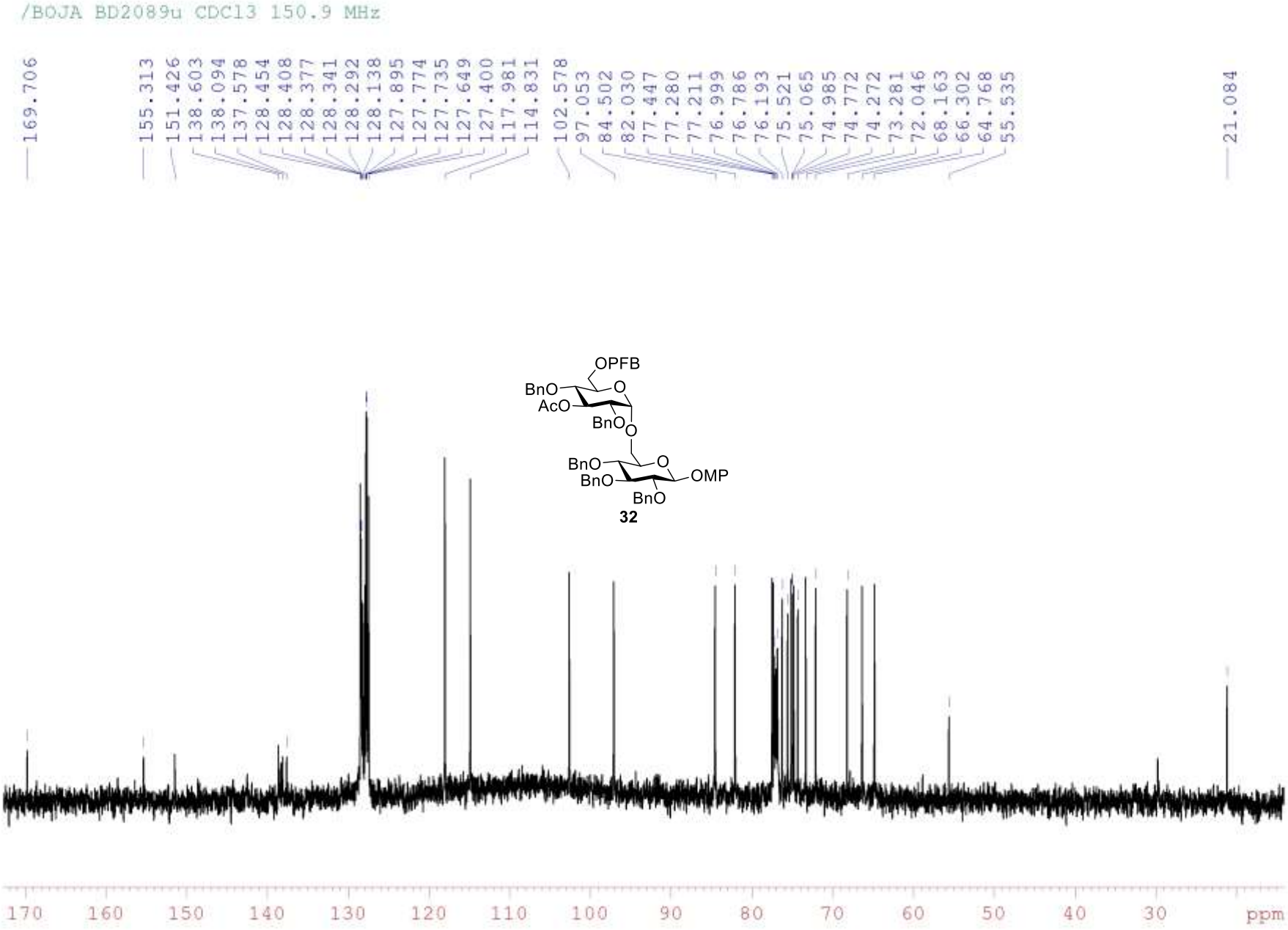
***p*-Methoxyphenyl 3-*O*-acetyl-2,4-di-*O*-benzyl-6-*O*-(2,5-difluorobenzoyl)-α-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-β-D-glucopyranoside (31α) and *p*-methoxyphenyl 3-*O*-acetyl-2,4-di-*O*-benzyl-6-*O*-(2,5-di-fluorobenzoyl)-β-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-β-D-glucopyranoside (31β)**



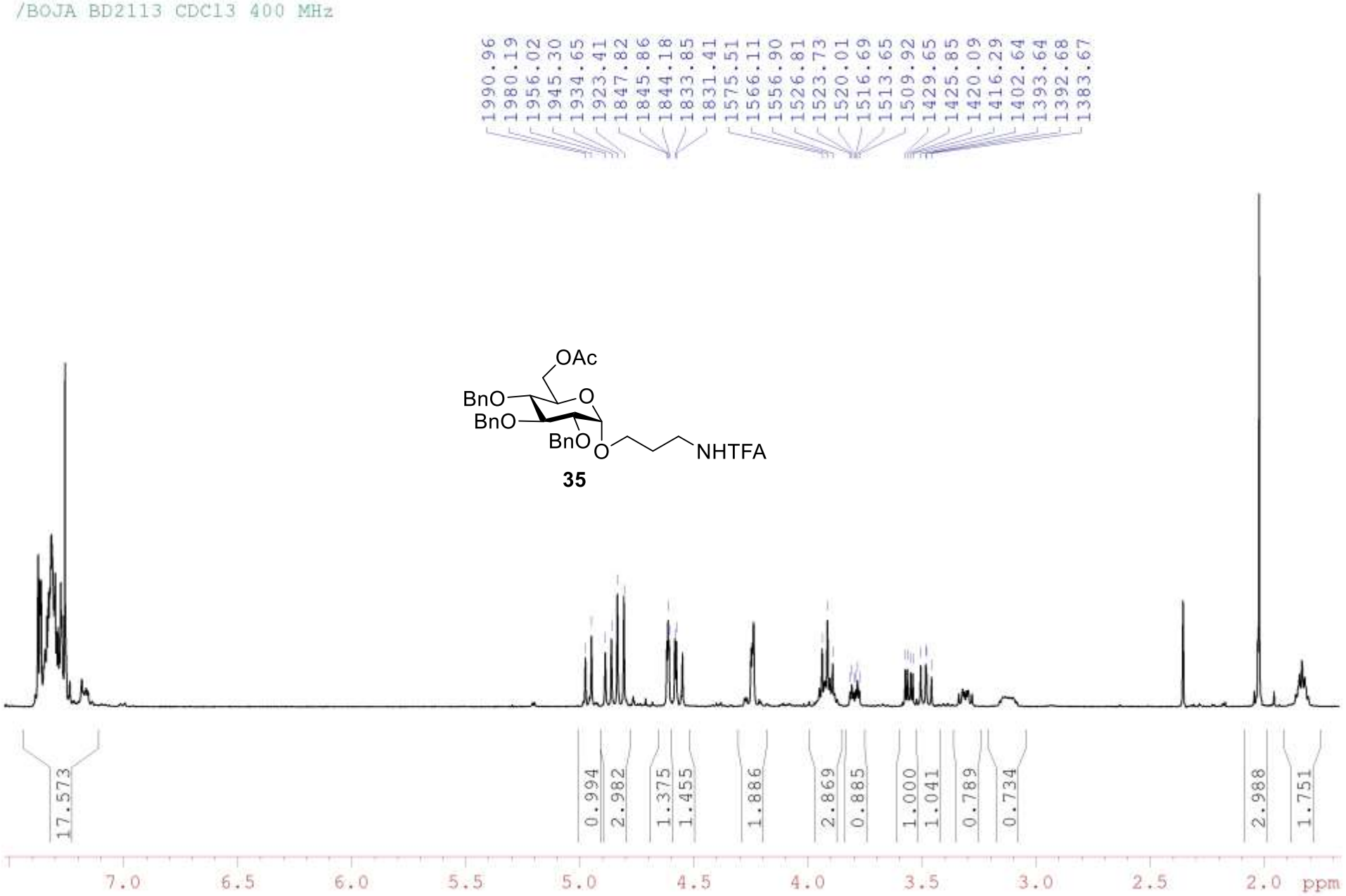
***p*-Methoxyphenyl 3-*O*-acetyl-2,4-di-*O*-benzyl-6-*O*-pentafluorobenzoyl-α-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-β-D-glucopyranoside (32α)**



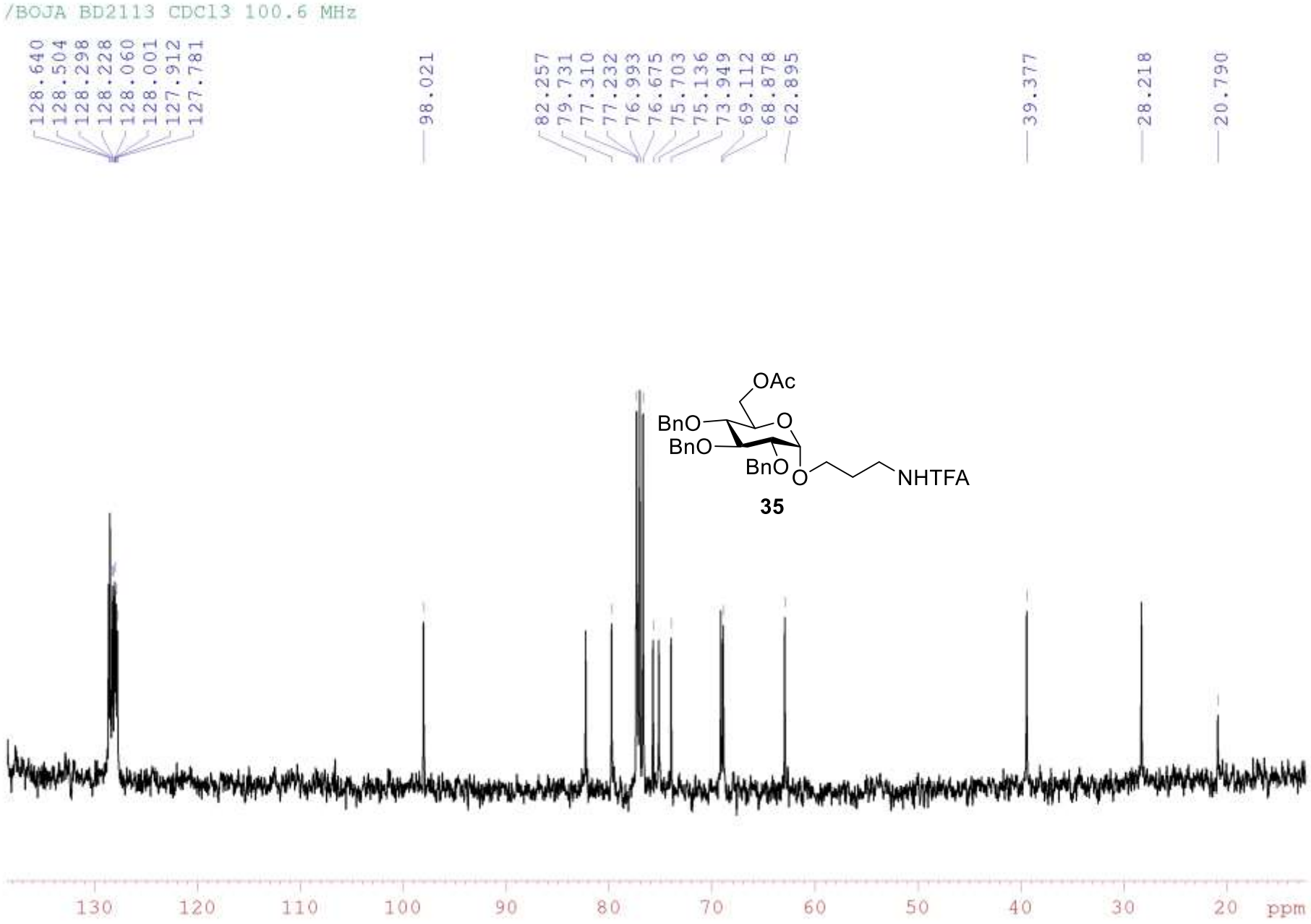
***p*-Methoxyphenyl 3-*O*-acetyl-2,4-di-*O*-benzyl-6-*O*-pentafluorobenzoyl-α-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-β-D-glucopyranoside (32α)**



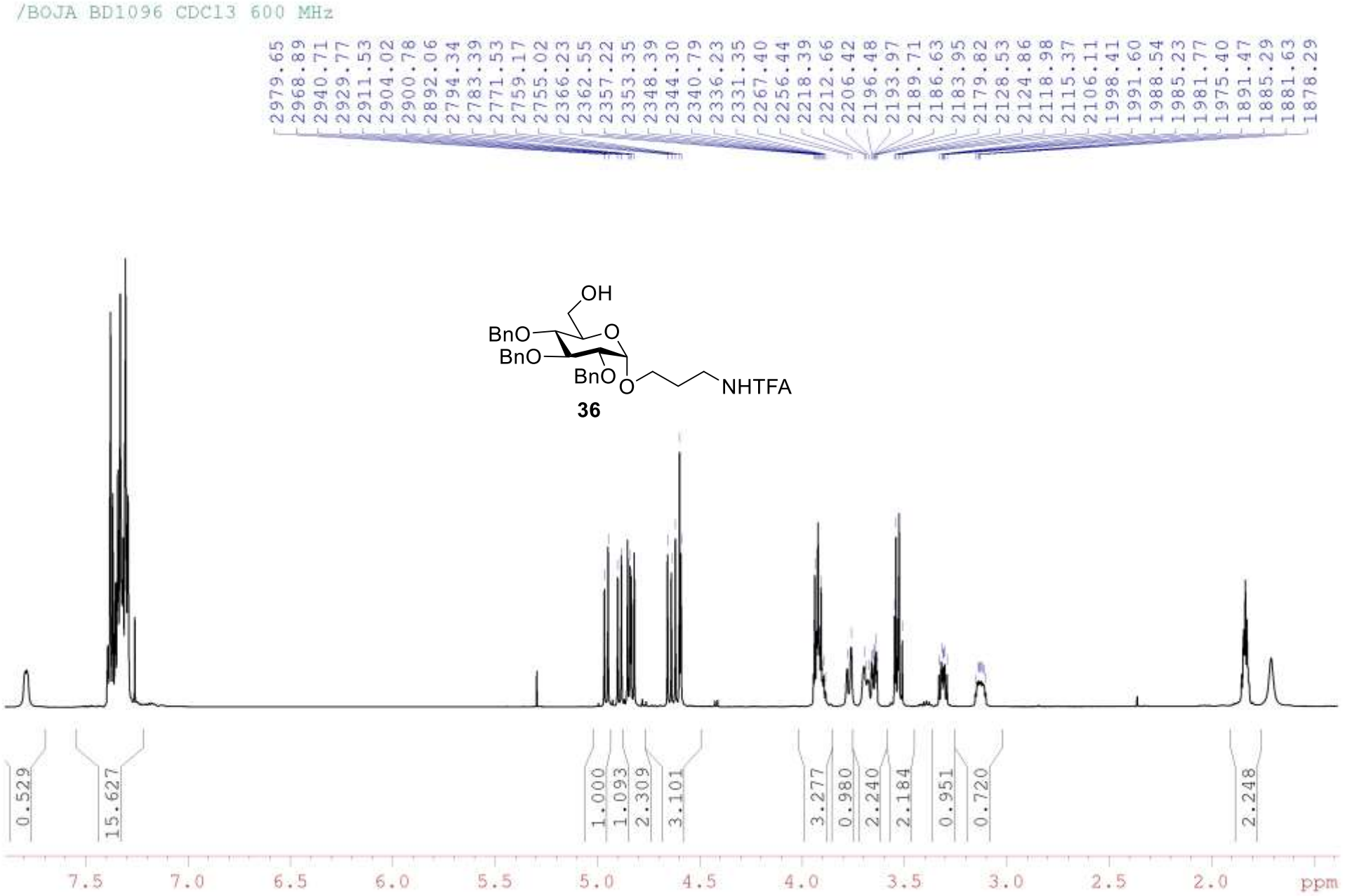
3-Trifluoroacetamidopropyl 2,3,4-tri-*O*-benzyl-6-*O*-acetyl-α-D-glucopyranoside (35)



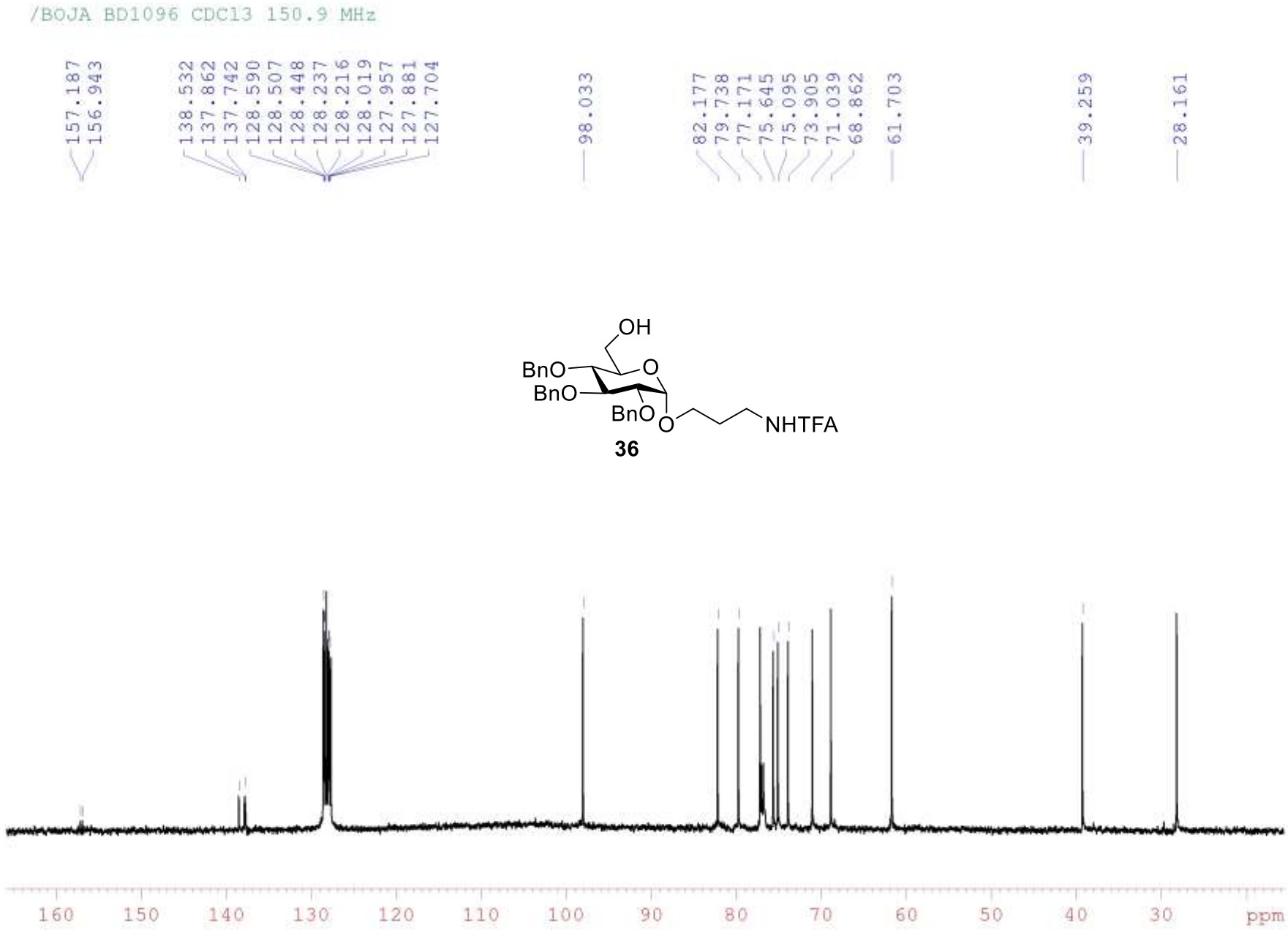
3-Trifluoroacetamidopropyl 2,3,4-tri-*O*-benzyl-6-*O*-acetyl-α-D-glucopyranoside (35)



3-Trifluoroacetamidopropyl 2,3,4-tri-*O*-benzyl-α-D-glucopyranoside (36)

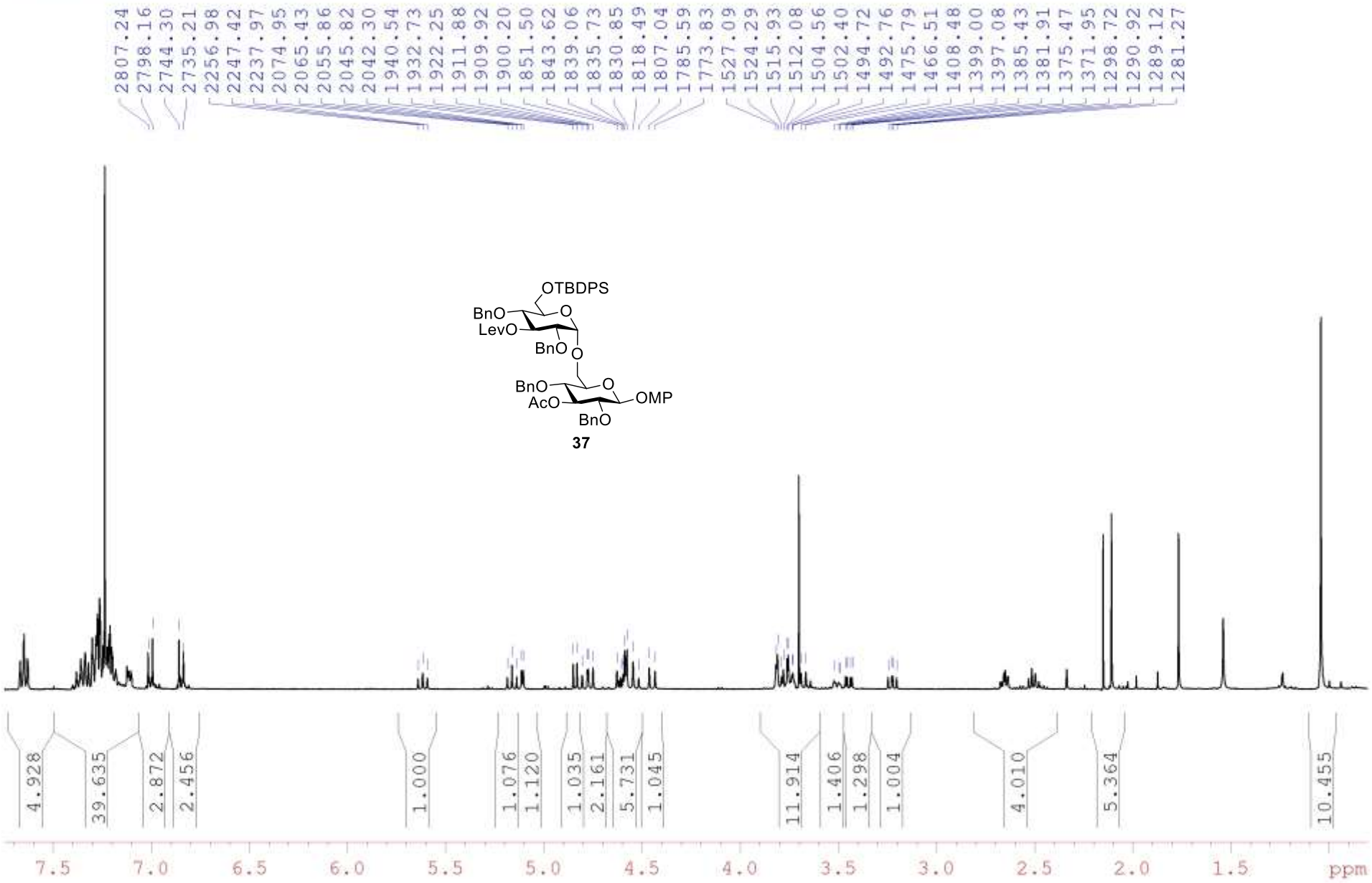


3-Trifluoroacetamidopropyl 2,3,4-tri-*O*-benzyl-α-D-glucopyranoside (36)

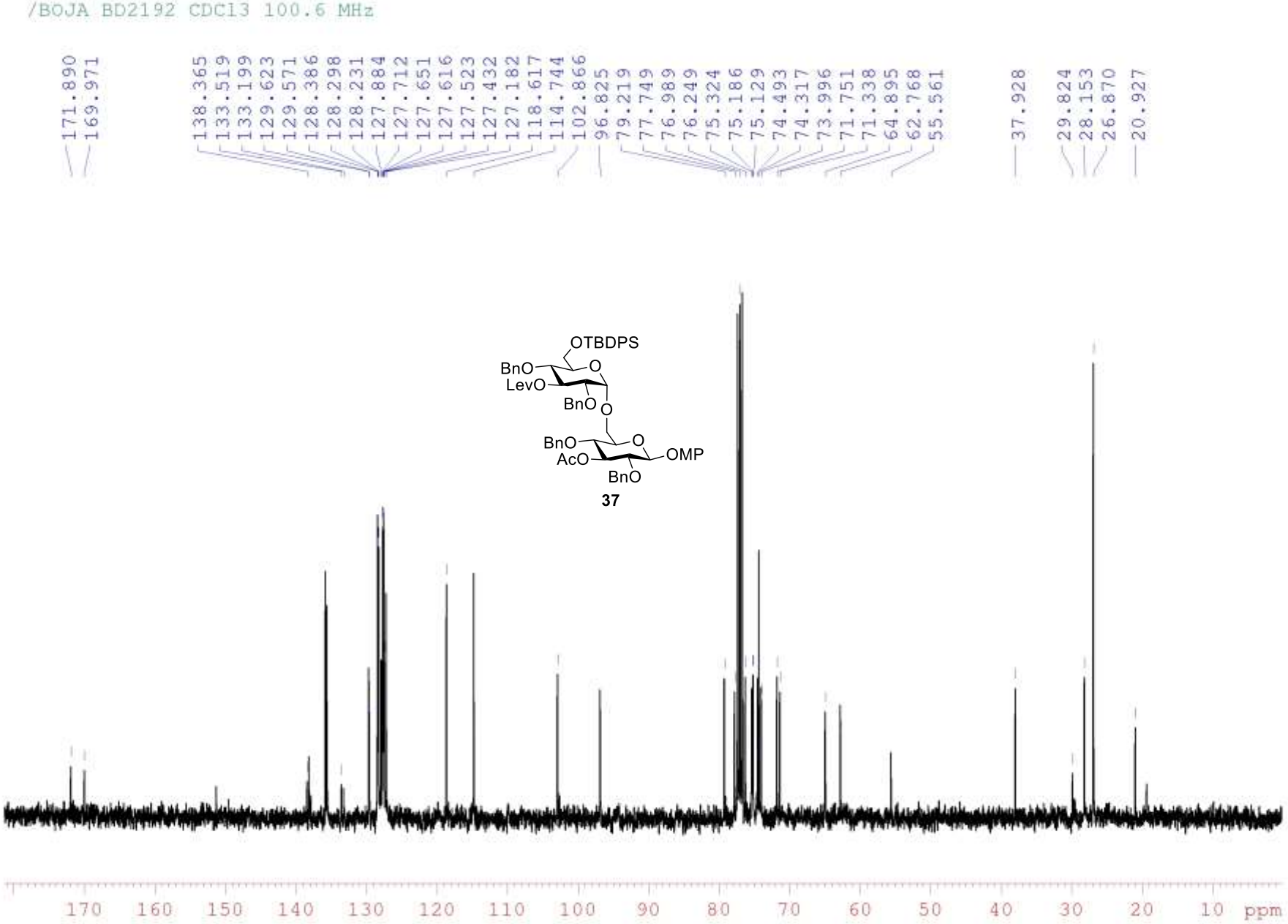


36

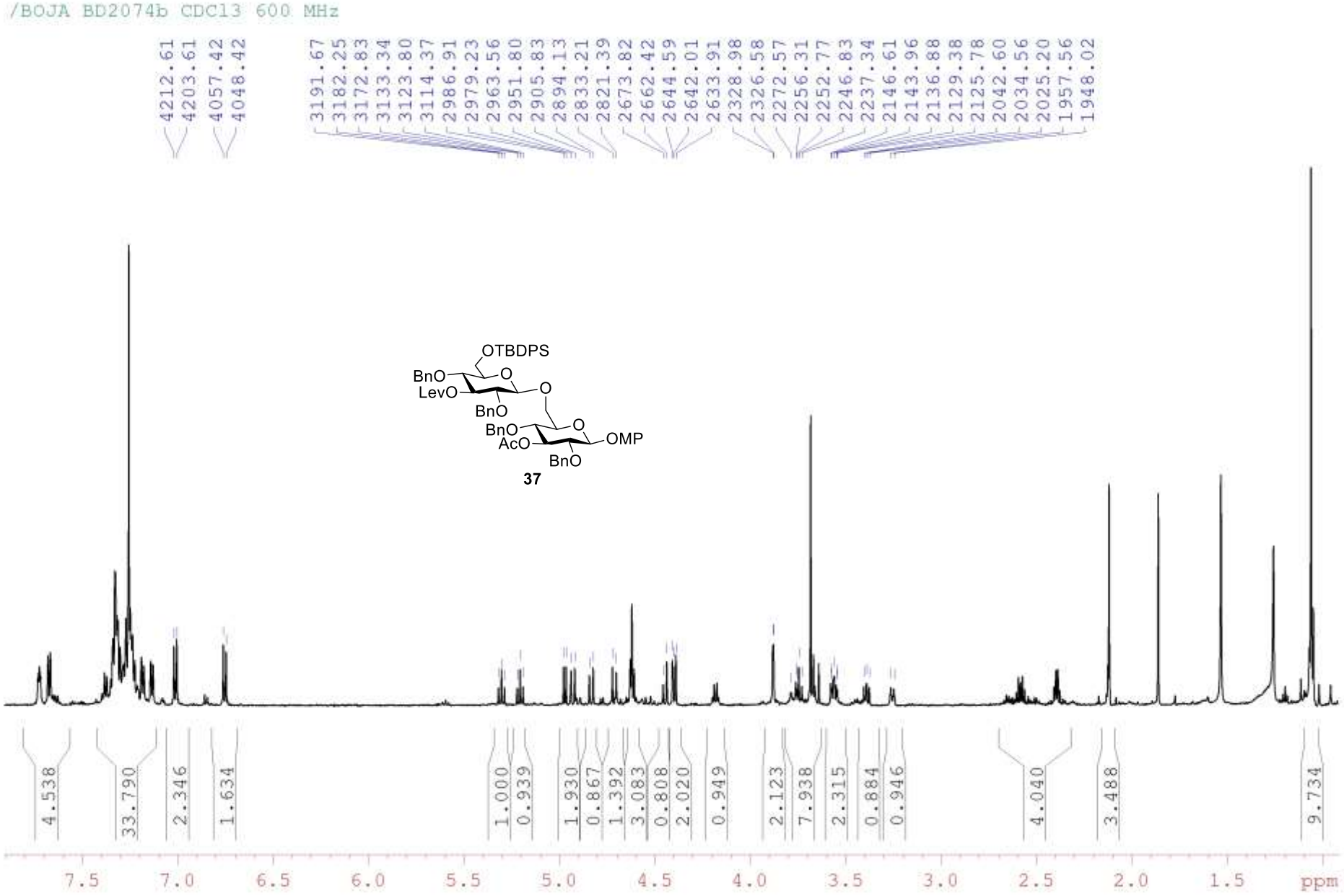
***p*-Methoxyphenyl 2,4-di-O-benzyl-6-O-*tert*-butyldiphenylsilyl-3-O-levulinoyl-α-glucopyranosyl-(1→6)-3-*O*-acetyl-2,4-di-O-benzyl-β-D-glucopyranoside (37)**



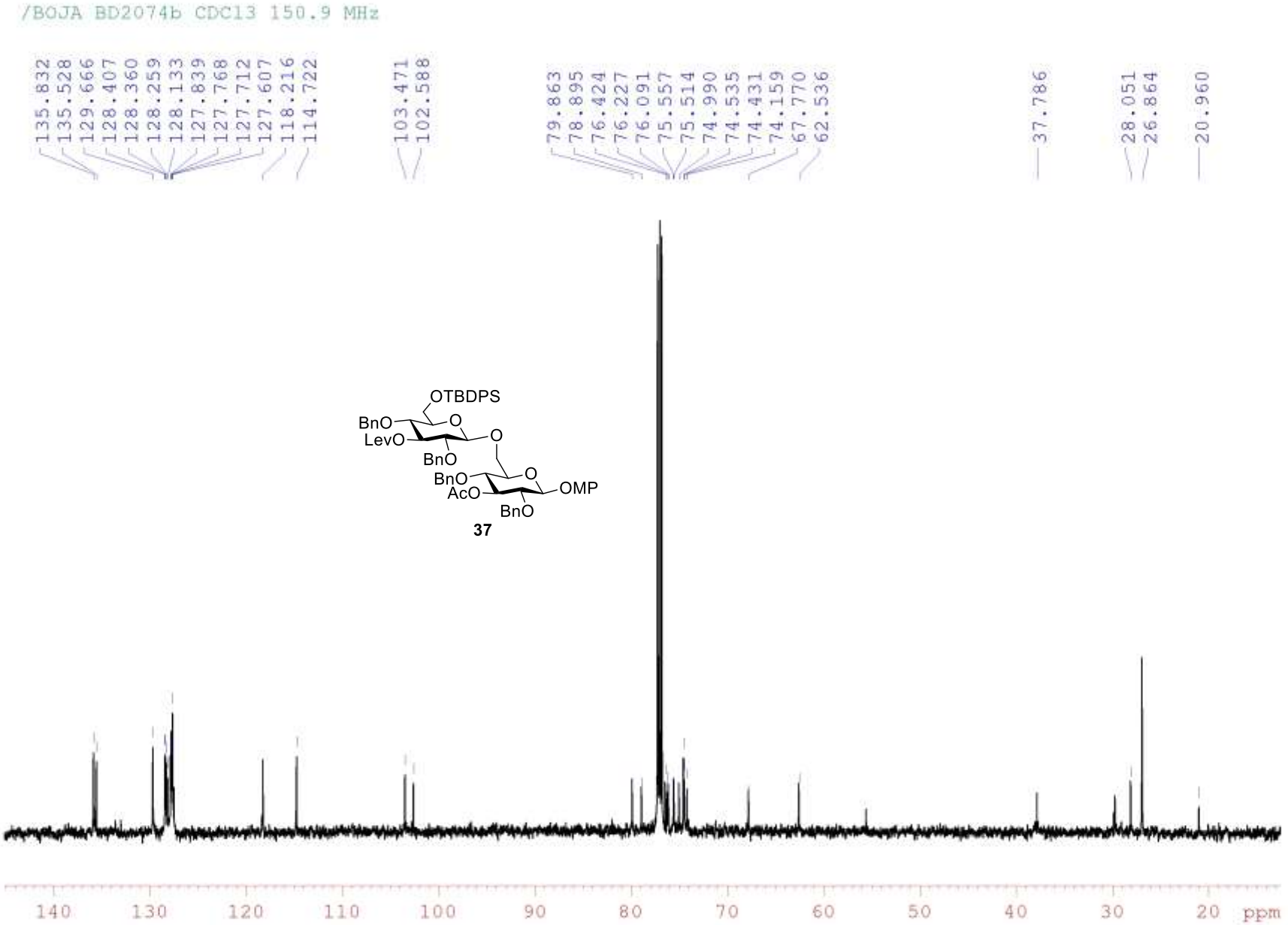
***p*-Methoxyphenyl 2,4-di-O-benzyl-6-O-*tert*-butyldiphenylsilyl-3-O-levulinoyl-α-glucopyranosyl-(1→6)-3-*O*-acetyl-2,4-di-O-benzyl-β-D-glucopyranoside (37)**



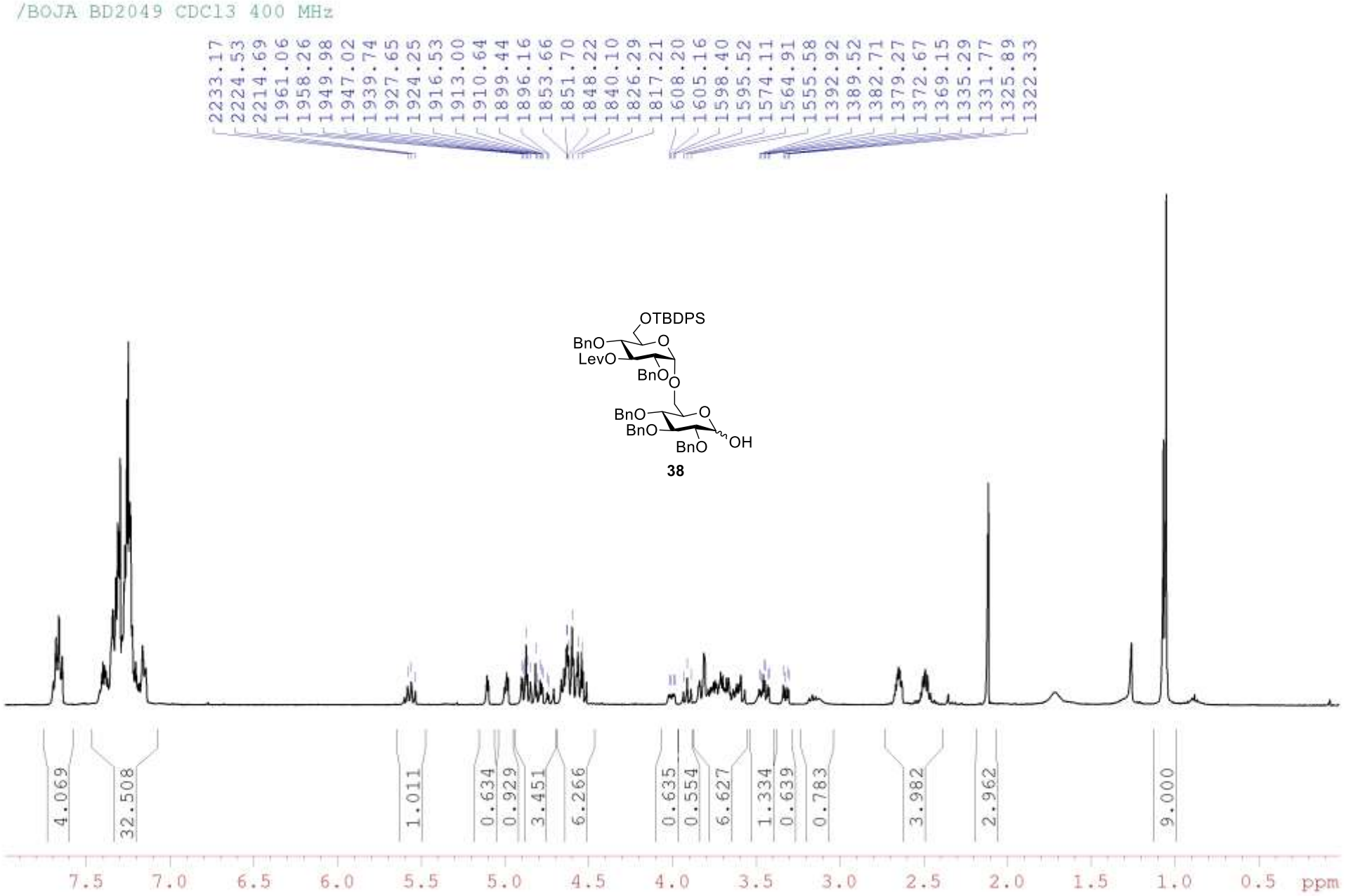
***p*-methoxyphenyl 2,4-di-O-benzyl-6-O-*tert*-butyldiphenylsilyl-3-O-levulinoyl-β-D-glucopyranosyl-(1→6)-3-*O*-acetyl-2,4-di-O-benzyl-β-D-glucopyranoside (37β)**



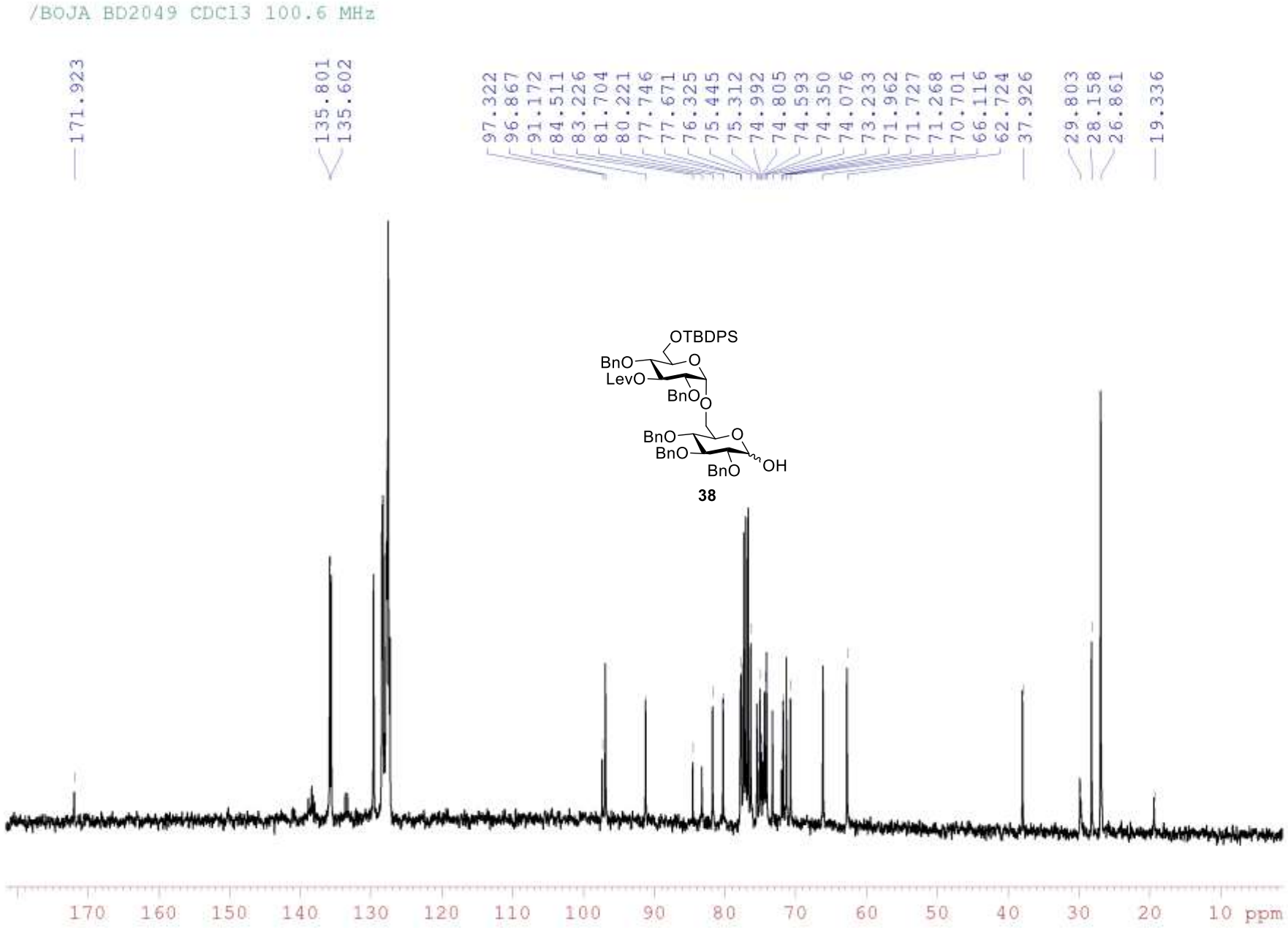
***p*-methoxyphenyl 2,4-di-O-benzyl-6-O-*tert*-butyldiphenylsilyl-3-O-levulinoyl-β-D-glucopyranosyl-(1→6)-3-*O*-acetyl-2,4-di-O-benzyl-β-D-glucopyranoside (37β)**



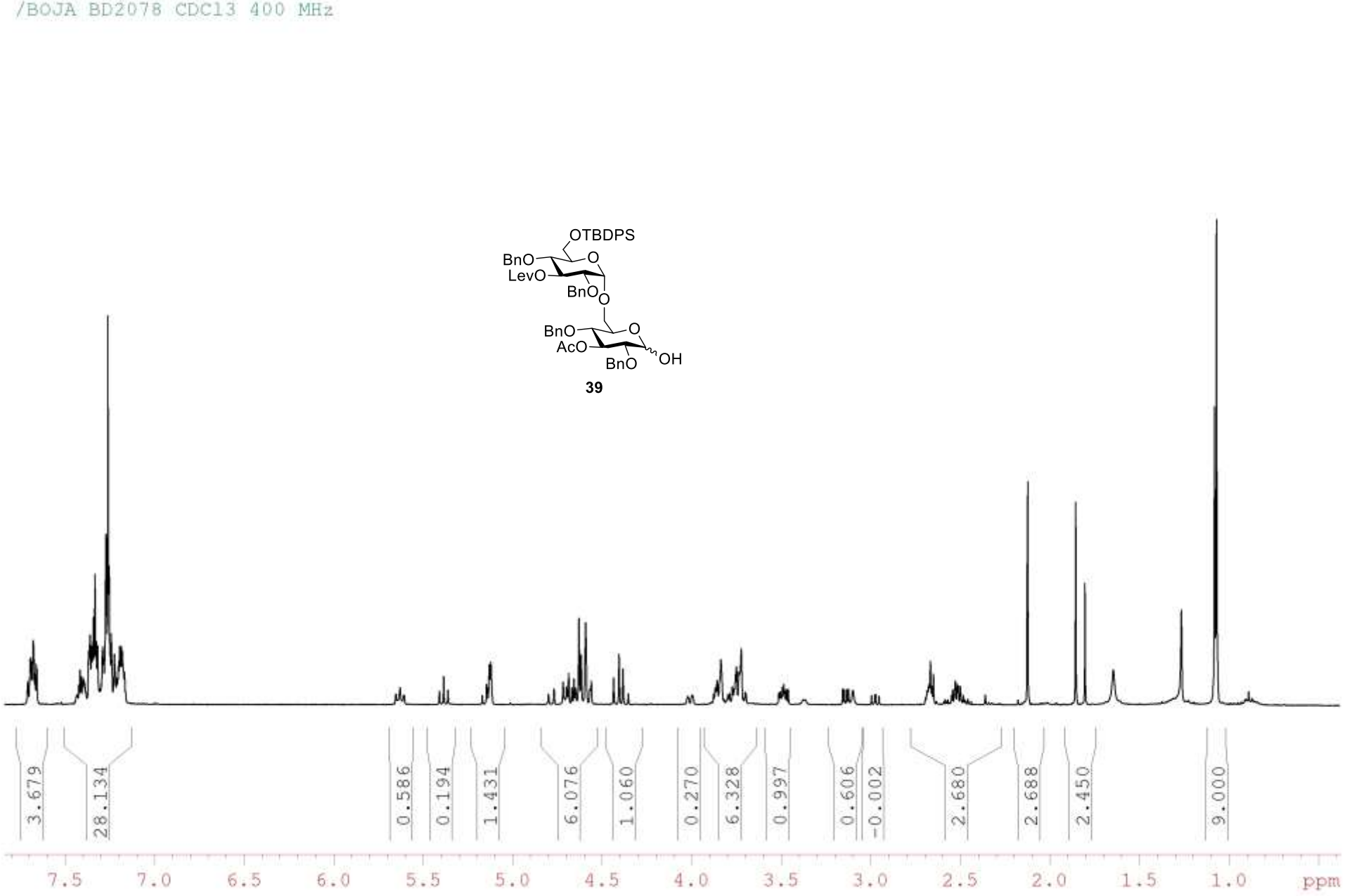
12,4-di-O-benzyl-6-O-*tert*-butyldiphenylsilyl-3-O-levulinoyl-α-D-glucopyranosyl-(1→6)-2,3,4-tri-O-benzyl-D-glucopyranose (38)



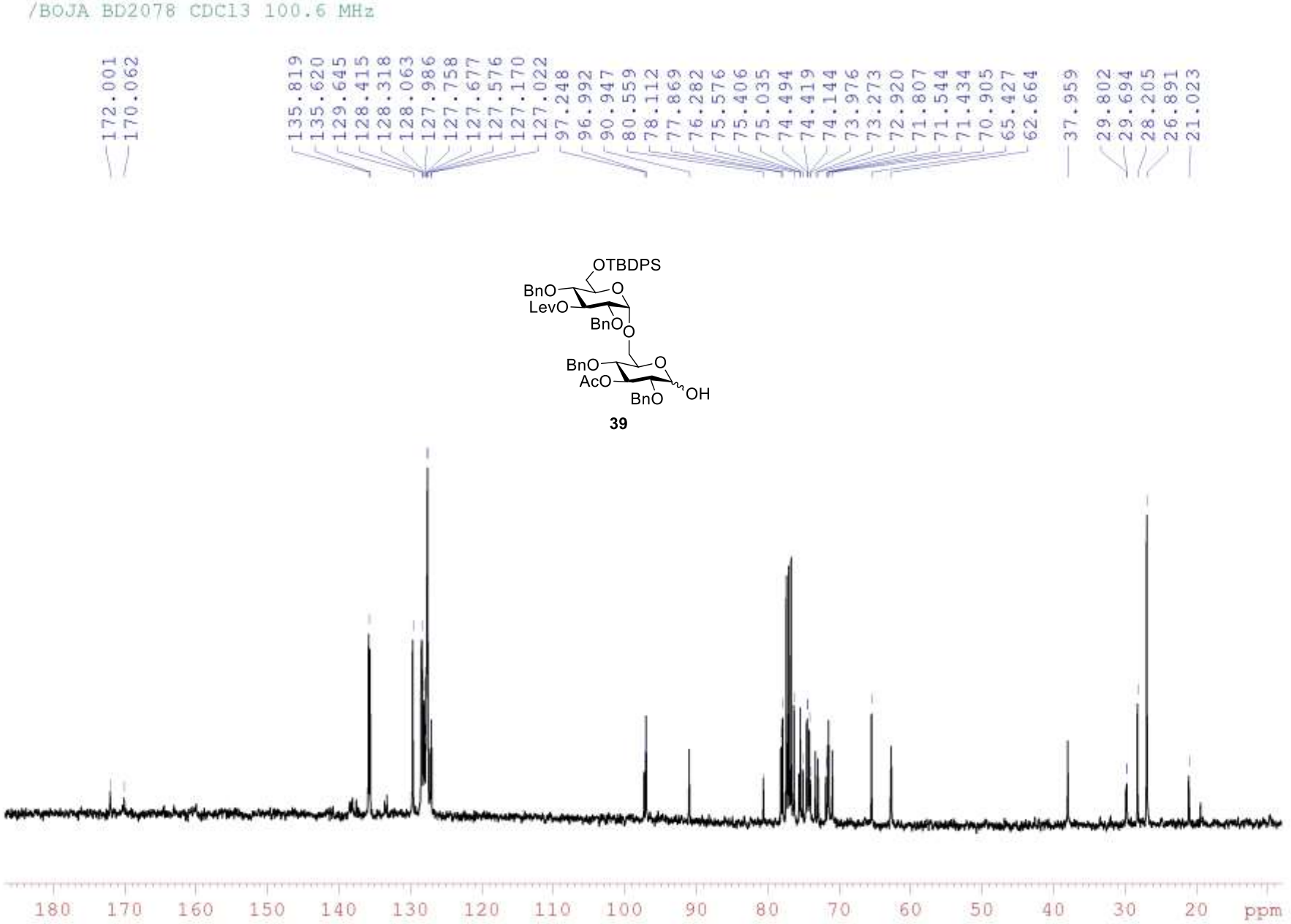
2,4-di-O-benzyl-6-O-*tert*-butyldiphenylsilyl-3-O-levulinoyl-α-D-glucopyranosyl-(1→6)-2,3,4-tri-O-benzyl-D-glucopyranose (38)



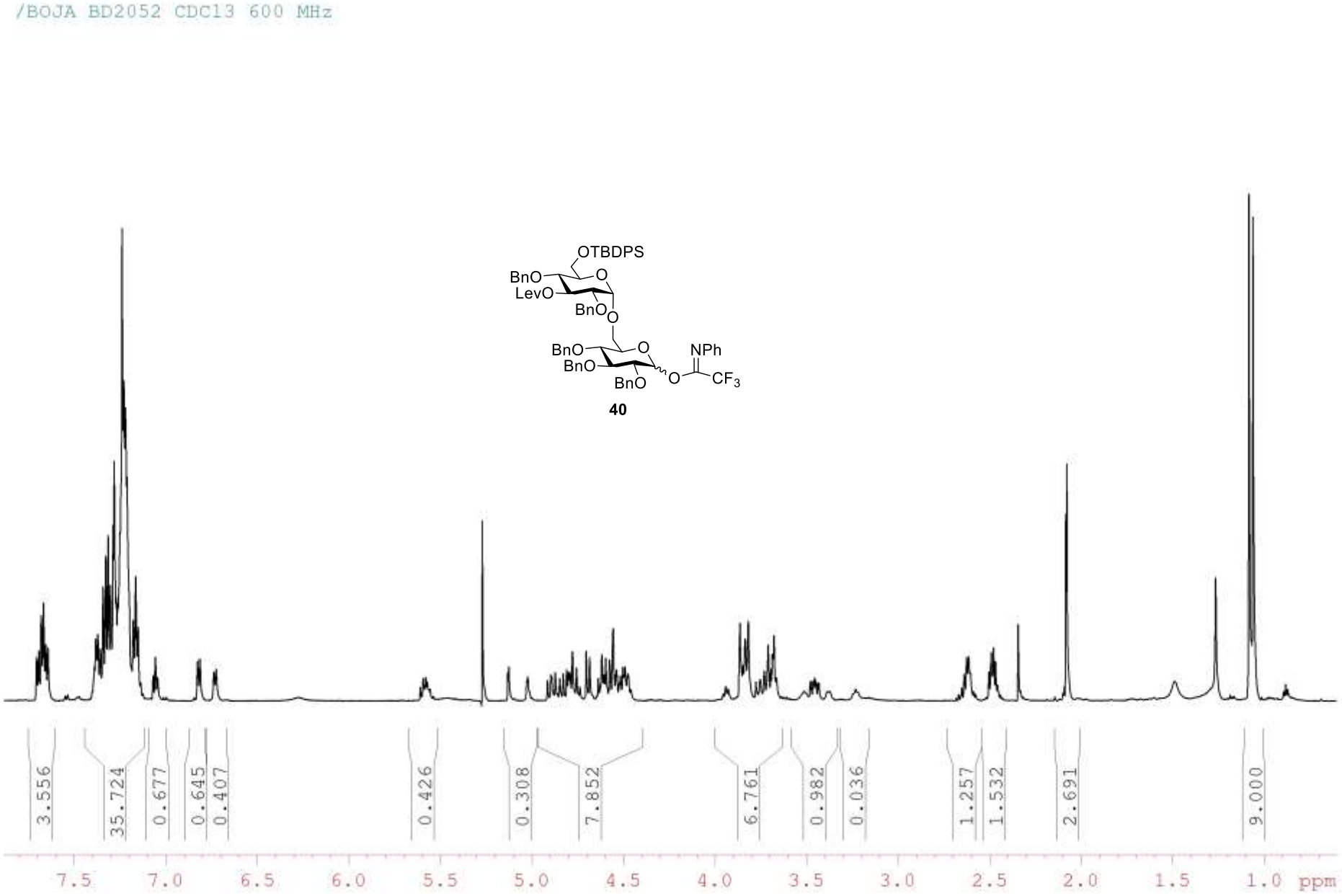
2,4-di-O-benzyl-6-O-*tert*-butyldiphenylsilyl-3-O-levulinoyl-α-glucopyranosyl-(1→6)-3-*O*-acetyl-2,4-di-O-benzyl-D-glucopyranose (39)



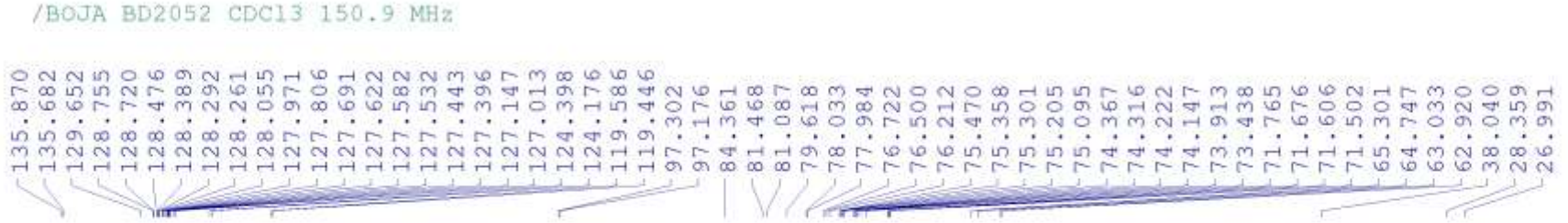
2,4-di-O-benzyl-6-O-*tert*-butyldiphenylsilyl-3-O-levulinoyl-α-glucopyranosyl-(1→6)-3-*O*-acetyl-2,4-di-O-benzyl-D-glucopyranose (39)

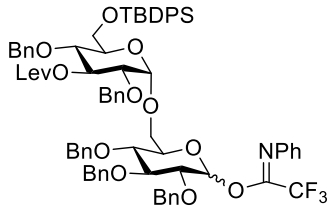


O-(2,4-di-O-benzyl-6-O-*tert*-butyldiphenylsilyl-3-O-levulinoyl-α-glucopyranosyl-(1→6)-3-*O*-acetyl-2,4-di-O-benzyl-D-glucopyranosyl) *N*-lphenyltrifluoroacetimidate (40)

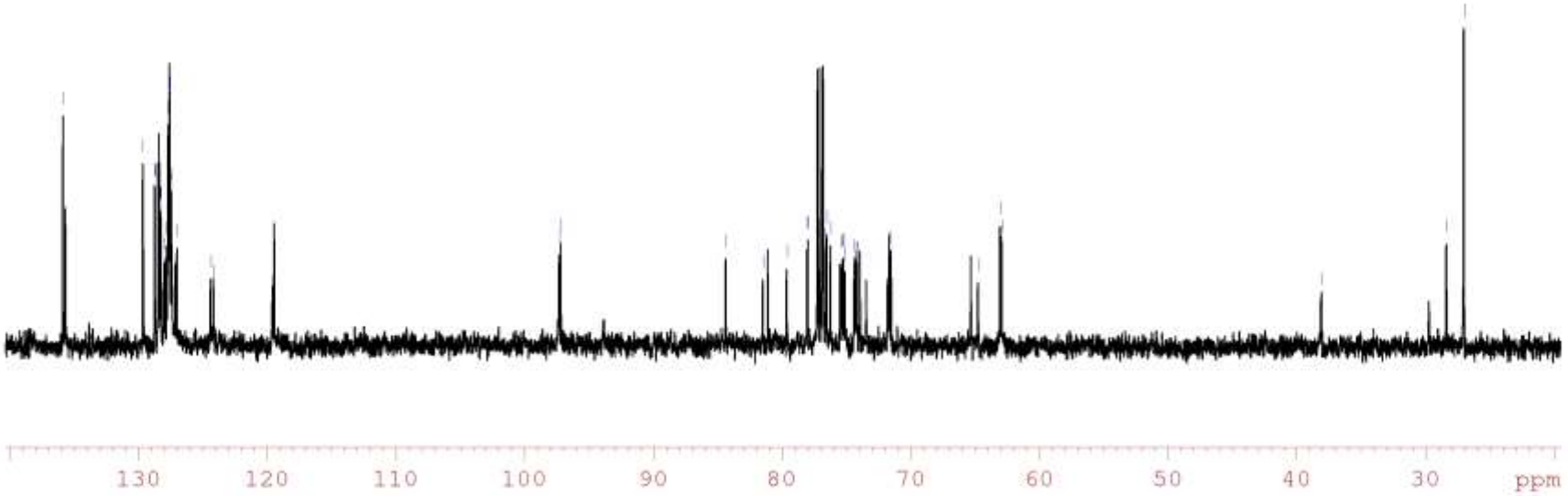


O-(2,4-di-O-benzyl-6-O-*tert*-butyldiphenylsilyl-3-O-levulinoyl-α-glucopyranosyl-(1→6)-3-*O*-acetyl-2,4-di-O-benzyl-D-glucopyranosyl) *N*-phenyltrifluoroacetimidate (40)

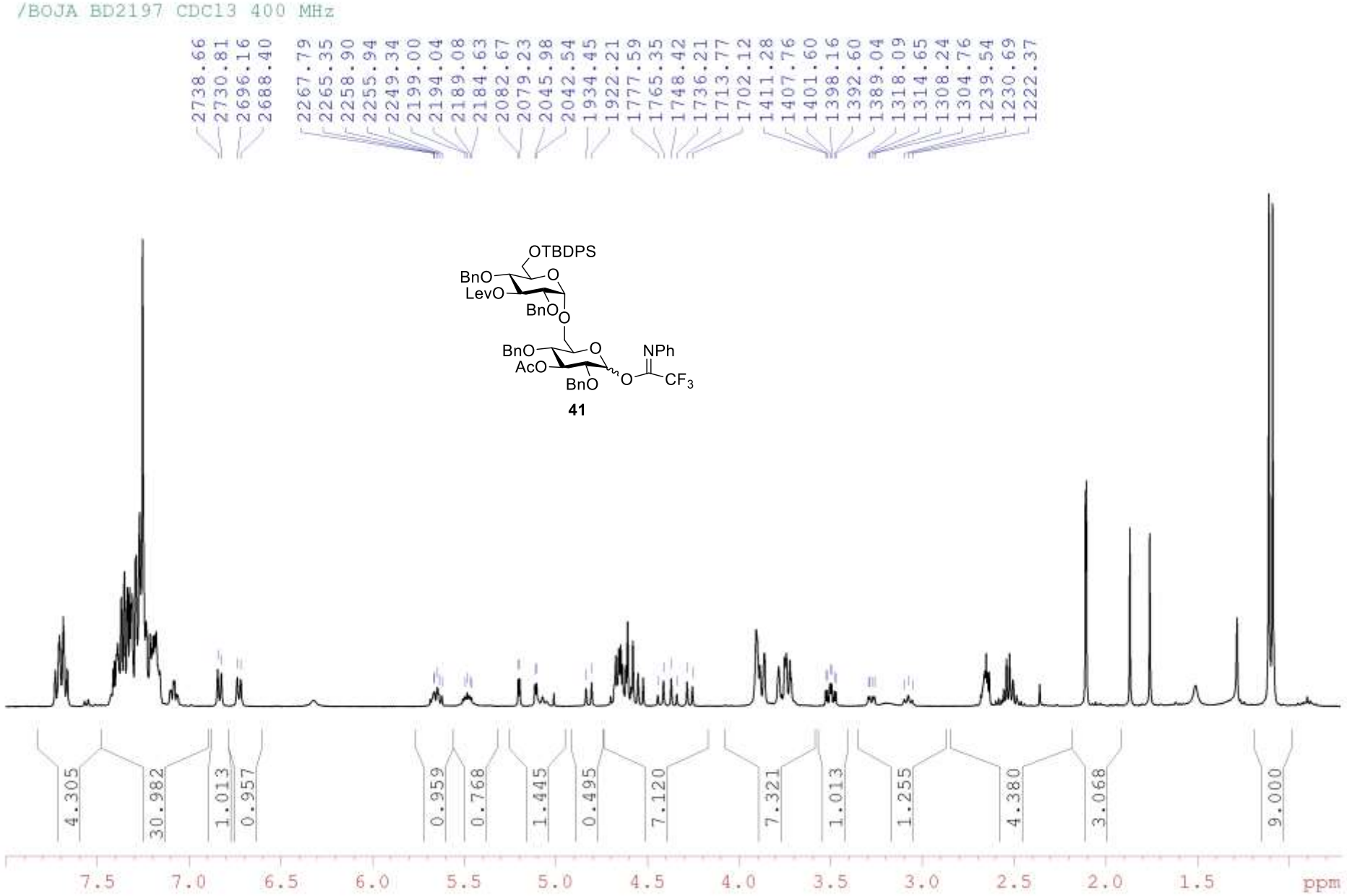




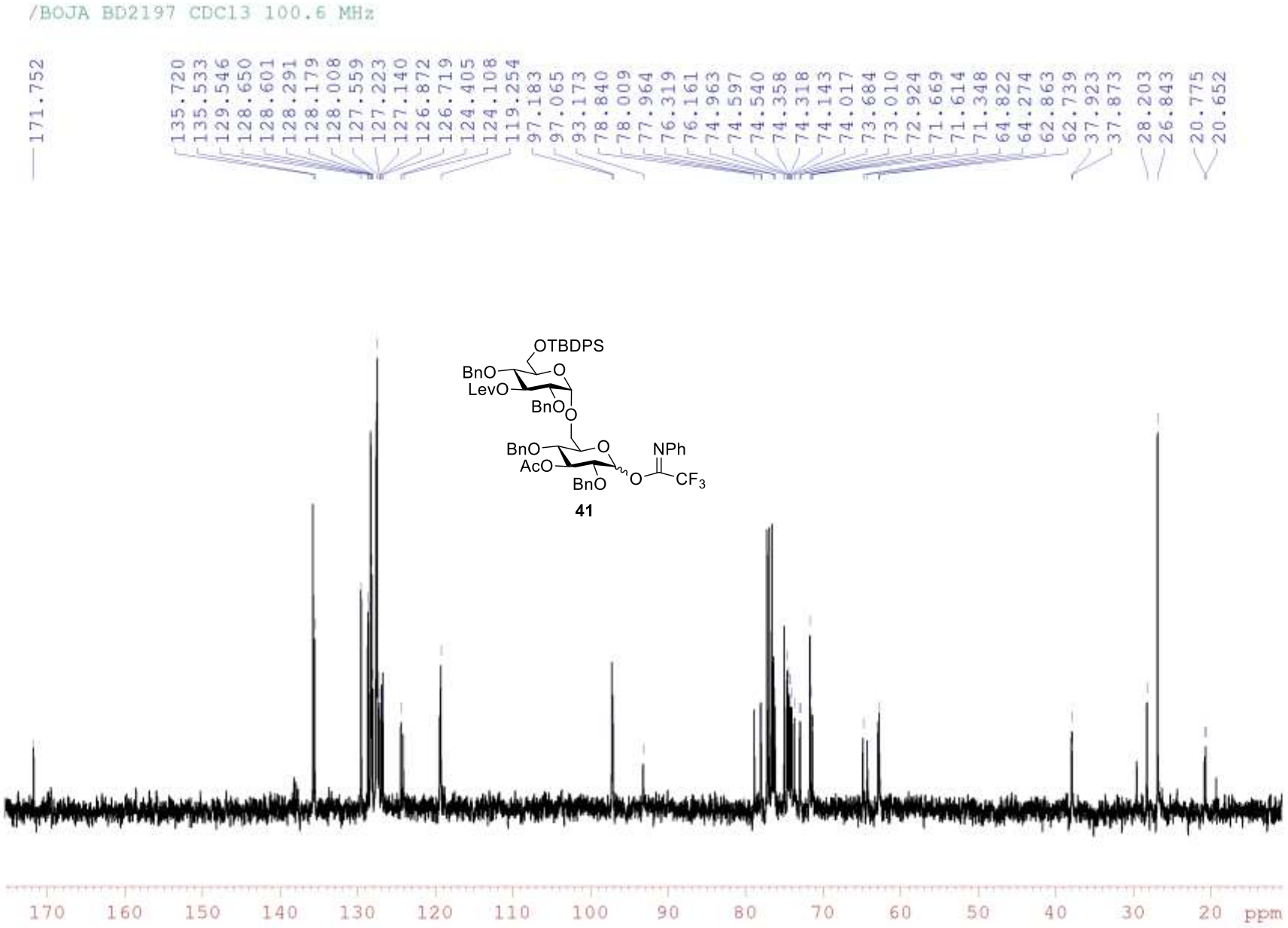
40



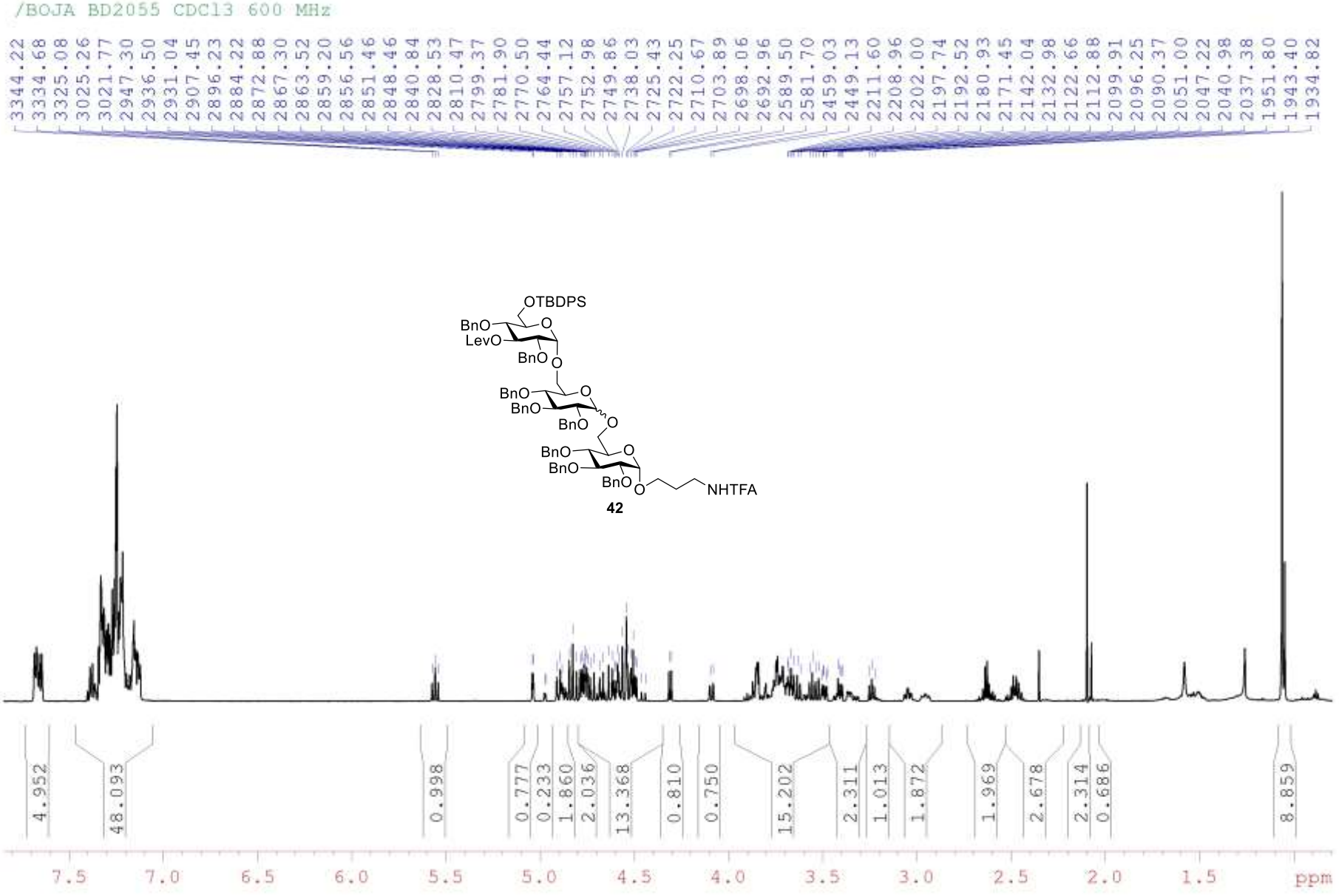
O-(2,4-di-*O*-benzyl-6-*O*-*tert*-butyldiphenylsilyl-3-*O*-levulinoyl-α-glucopyranosyl-(1→6)-3-*O*-acetyl-2,4-di-O-benzyl-D-glucopyranosyl) *N*-phenyltrifluoroacetimidate (41)



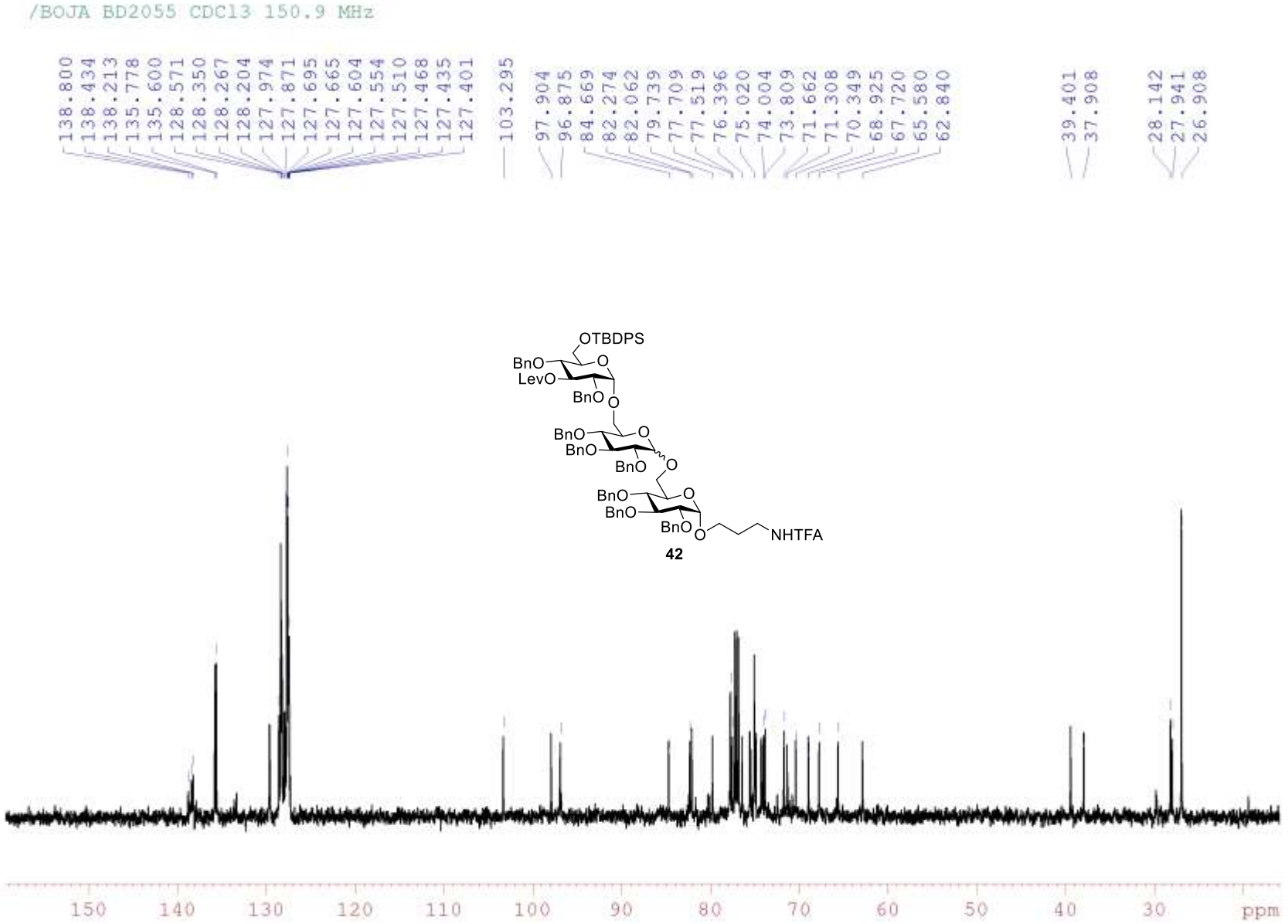
O-(2,4-di-*O*-benzyl-6-*O*-*tert*-butyldiphenylsilyl-3-*O*-levulinoyl-α-glucopyranosyl-(1→6)-3-*O*-acetyl-2,4-di-O-benzyl-D-glucopyranosyl) *N*-phenyltrifluoroacetimidate (41)



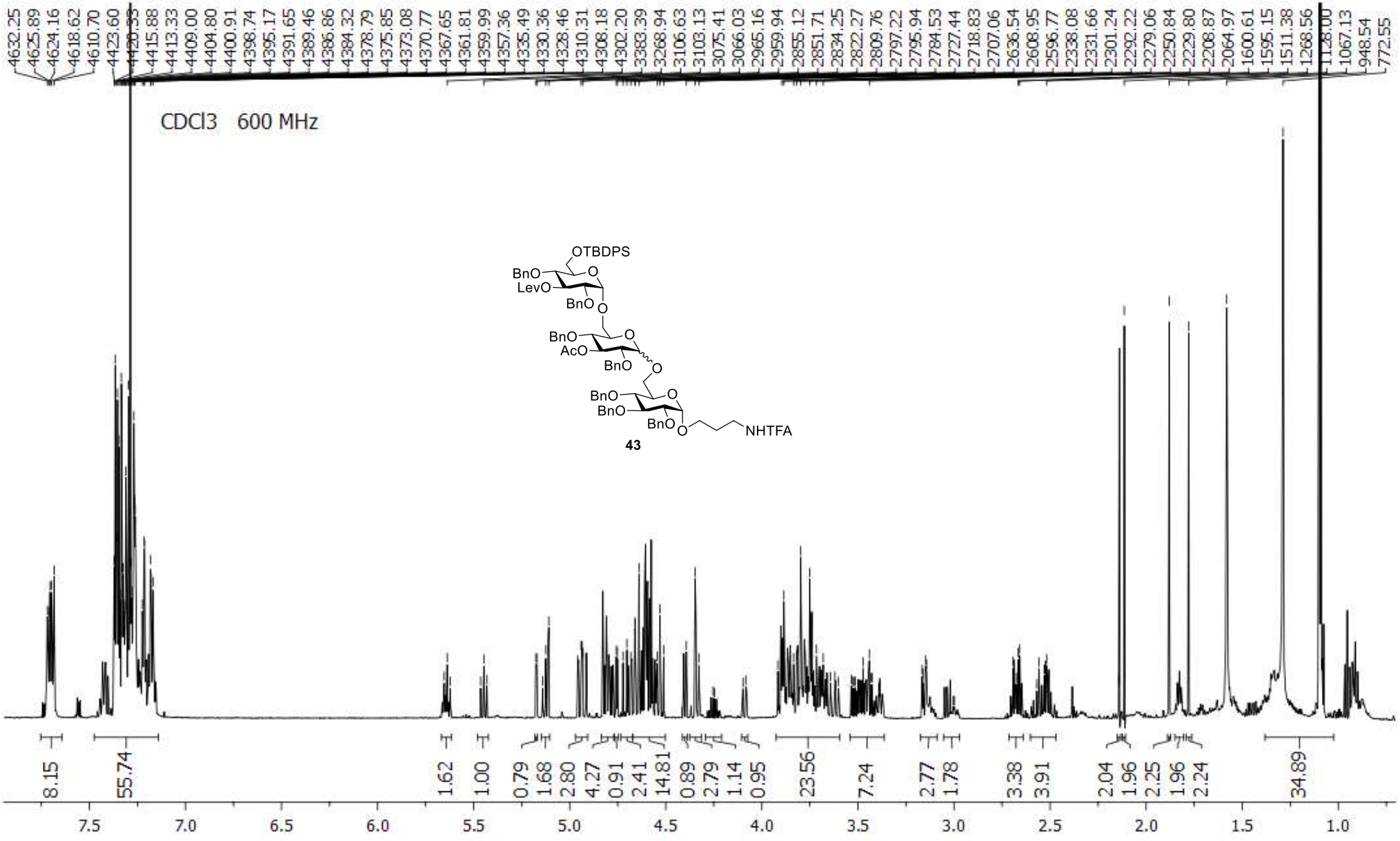
Mixture of 3-trifluoroacetamidopropyl 2,4-di-O-benzyl-6-*O*-*tert*-butyldiphenylsilyl-3-*O*-levulinoyl-α-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-α-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-α-D-glucopyranoside and 3-trifluoroacetamidopropyl 2,4-di-*O*-benzyl-6-*O*-*tert*-butyldiphenylsilyl-3-*O*-levulinoyl-α-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-β-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-α-D-glucopyranoside (42)



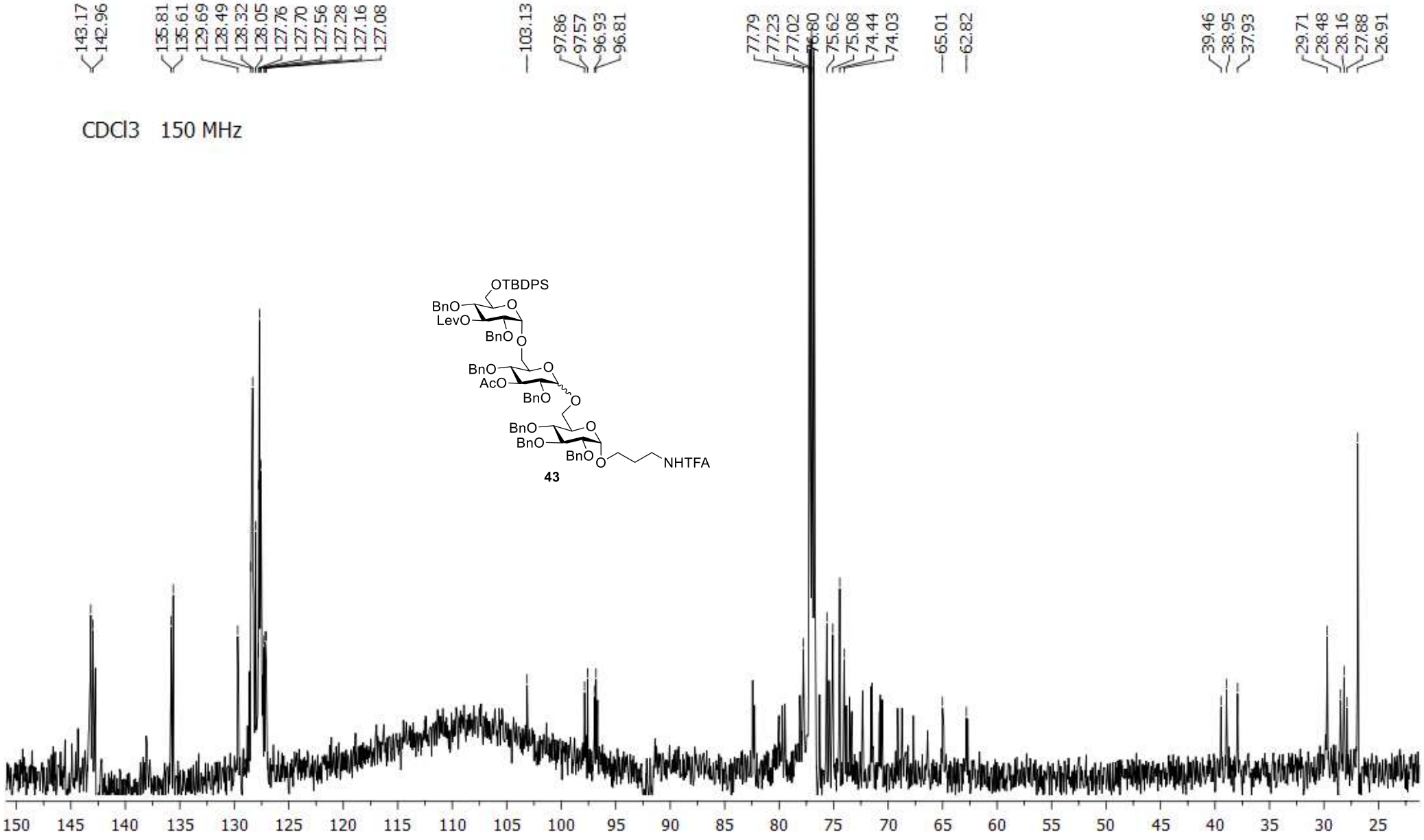
Mixture of 3-trifluoroacetamidopropyl 2,4-di-O-benzyl-6-*O*-*tert*-butyldiphenylsilyl-3-*O*-levulinoyl-α-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-α-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-α-D-glucopyranoside and 3-trifluoroacetamidopropyl 2,4-di-*O*-benzyl-6-*O*-*tert*-butyldiphenylsilyl-3-*O*-levulinoyl-α-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-β-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-α-D-glucopyranoside (42)



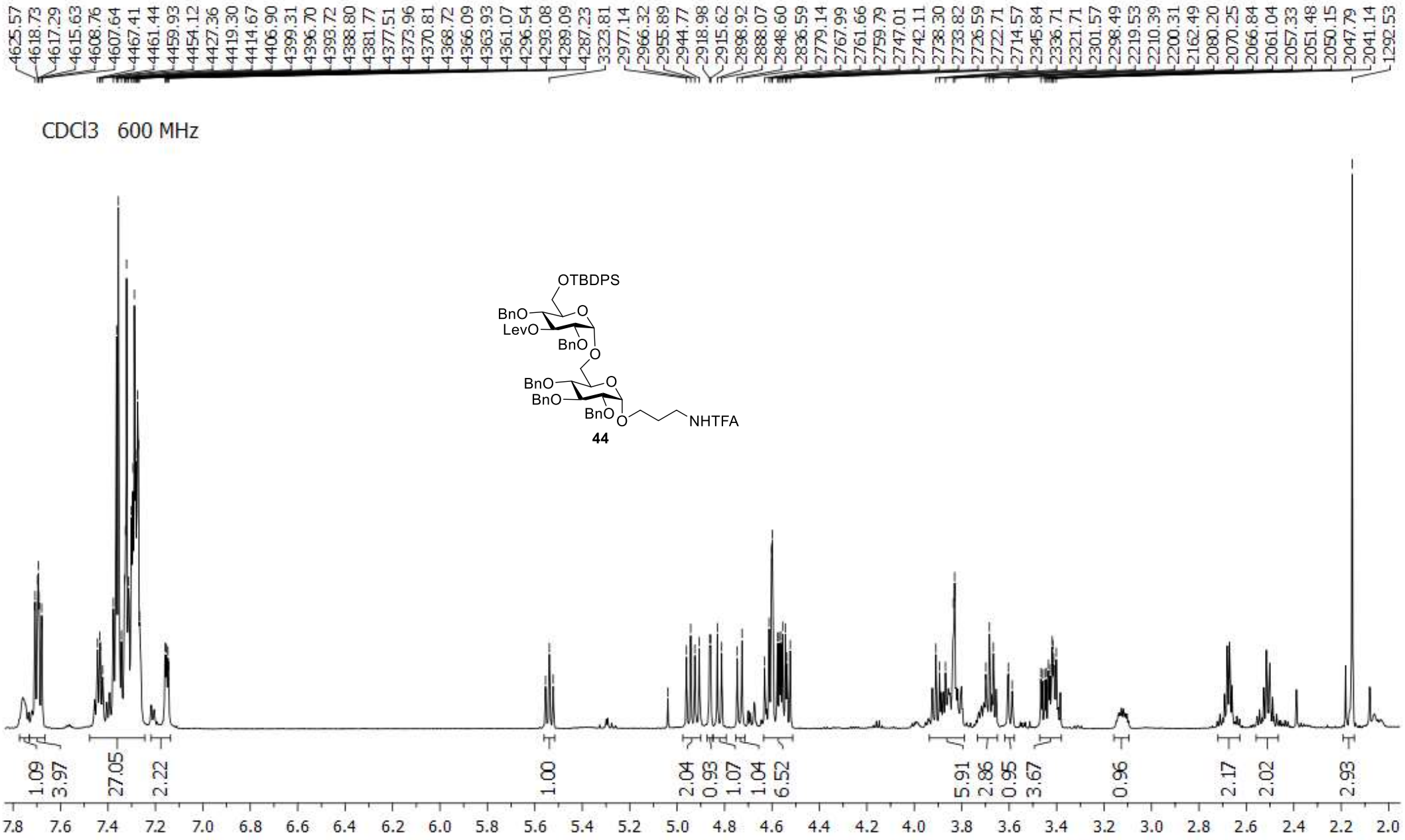
Mixture of 3-Trifluoroacetamidopropyl 2,4-di-O-benzyl-6-O-*tert*-butyldiphenylsilyl-3-O-levulinoyl-α-glucopyranosyl-(1→6)-3-*O*-acetyl-2,4-di-O-benzyl-α-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-α-D-glucopyranoside (43α) and 3-trifluoroacetamidopropyl 2,4-di-O-benzyl-6-O-*tert*-butyldiphenylsilyl-3-O-levulinoyl-α-glucopyranosyl-(1→6)-3-*O*-acetyl-2,4-di-O-benzyl-β-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-α-D-glucopyranoside (43β)



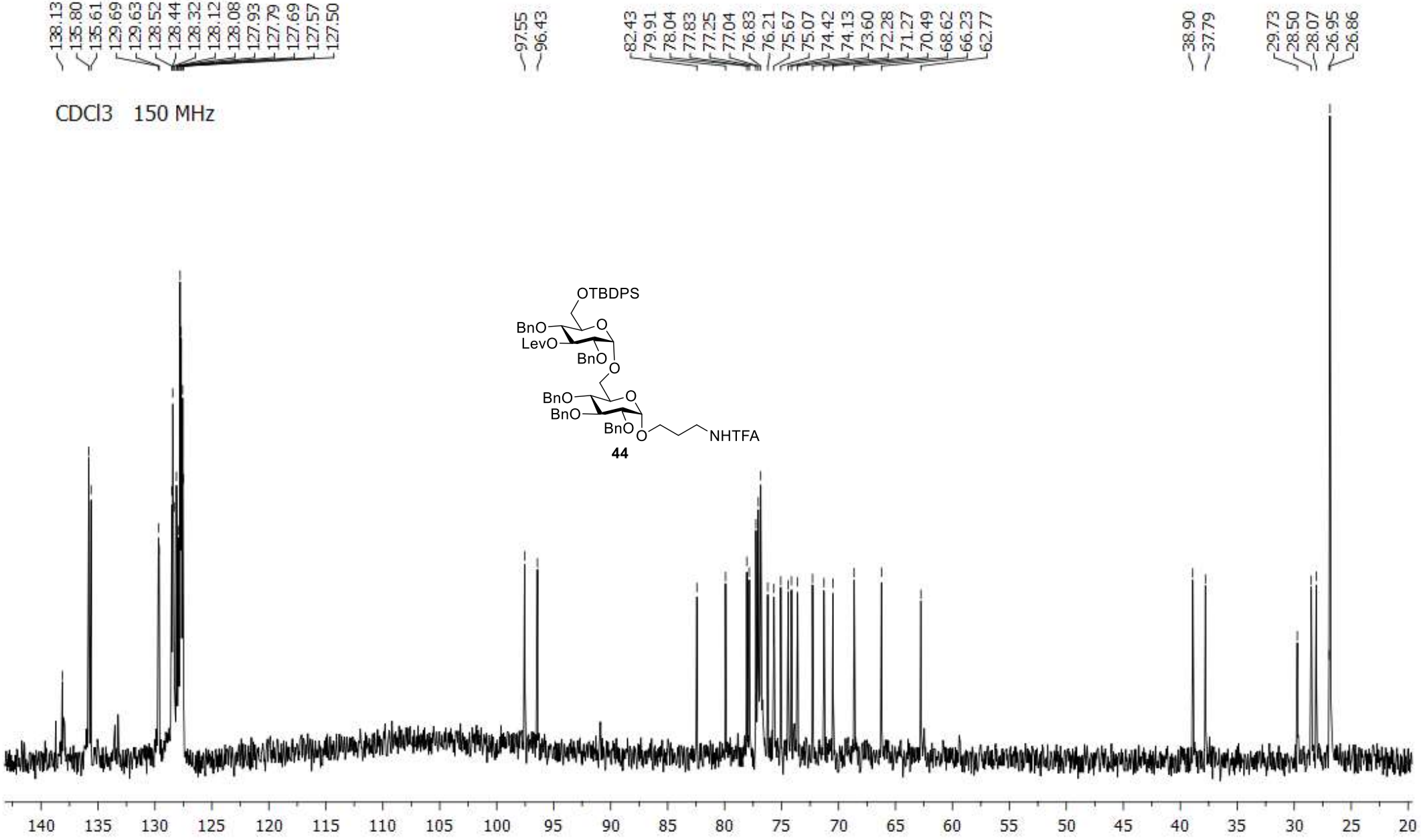
Mixture of 3-Trifluoroacetamidopropyl 2,4-di-O-benzyl-6-O-*tert*-butyldiphenylsilyl-3-O-levulinoyl-α-glucopyranosyl-(1→6)-3-*O*-acetyl-2,4-di-O-benzyl-α-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-α-D-glucopyranoside (43α) and 3-trifluoroacetamidopropyl 2,4-di-O-benzyl-6-O-*tert*-butyldiphenylsilyl-3-O-levulinoyl-α-glucopyranosyl-(1→6)-3-*O*-acetyl-2,4-di-O-benzyl-β-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-α-D-glucopyranoside (43β)



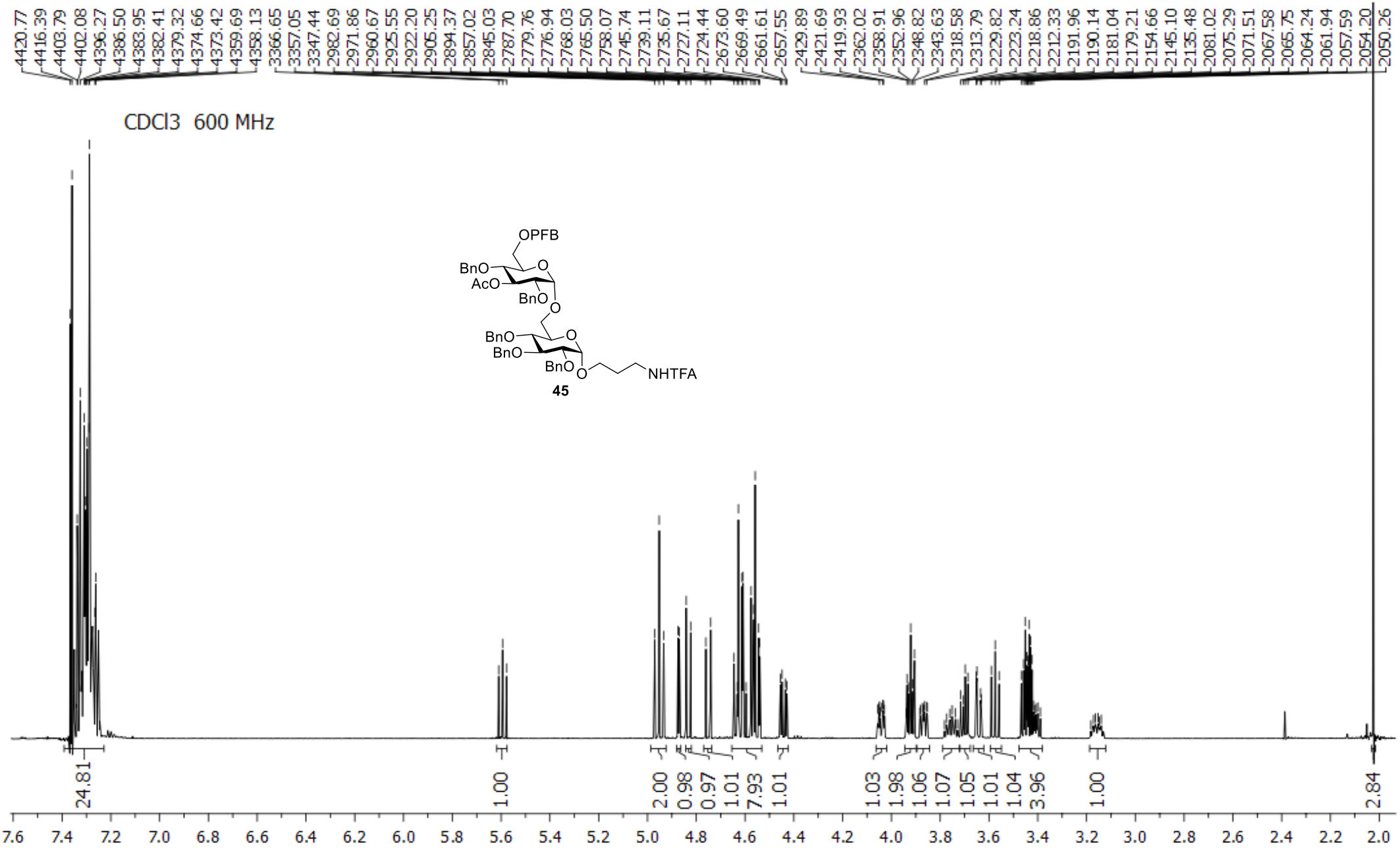
3-Trifluoroacetamidopropyl 2,4-di-O-benzyl-6-O-*tert*-butyldiphenylsilyl-3-O-levulinoyl-α-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-α-D-glucopyranoside (44)



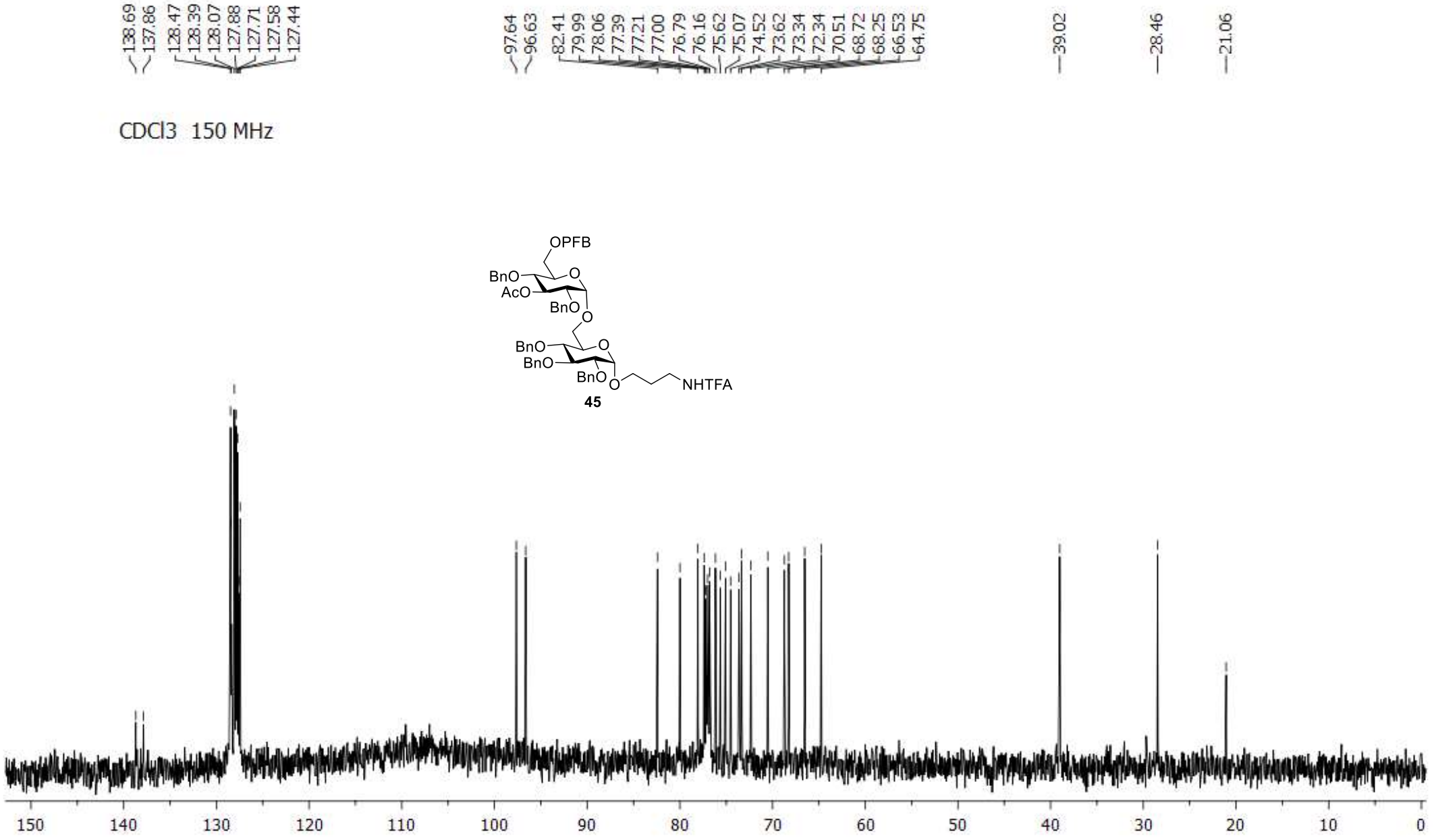
3-Trifluoroacetamidopropyl 2,4-di-O-benzyl-6-O-*tert*-butyldiphenylsilyl-3-O-levulinoyl-α-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-α-D-glucopyranoside (44)



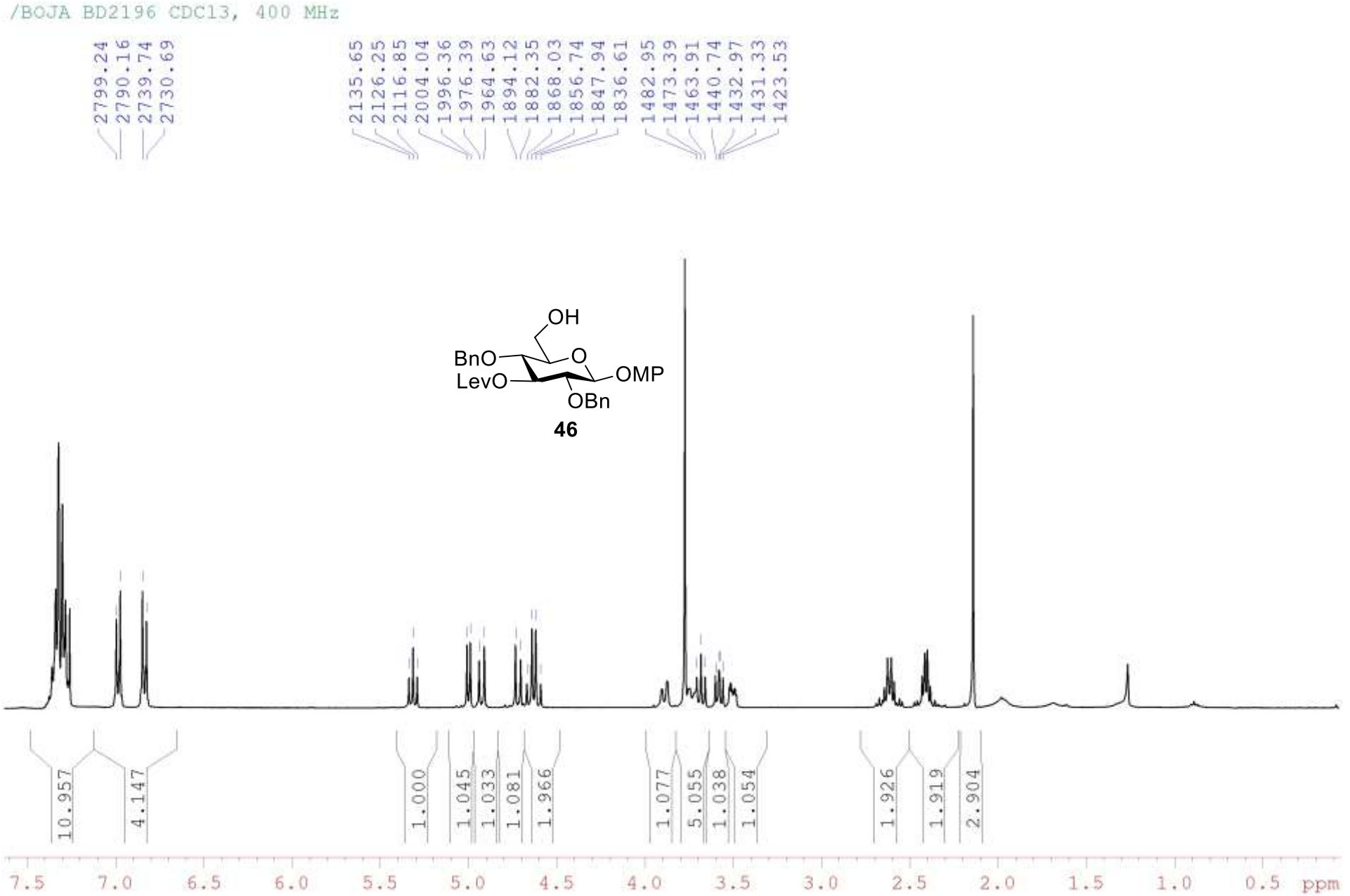
3-Trifluoroacetamidopropyl 3-O-acetyl-2,4-di-O-benzyl-6-O-pentafluorobenzoyl-α-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-α-D-glucopyranoside (45)



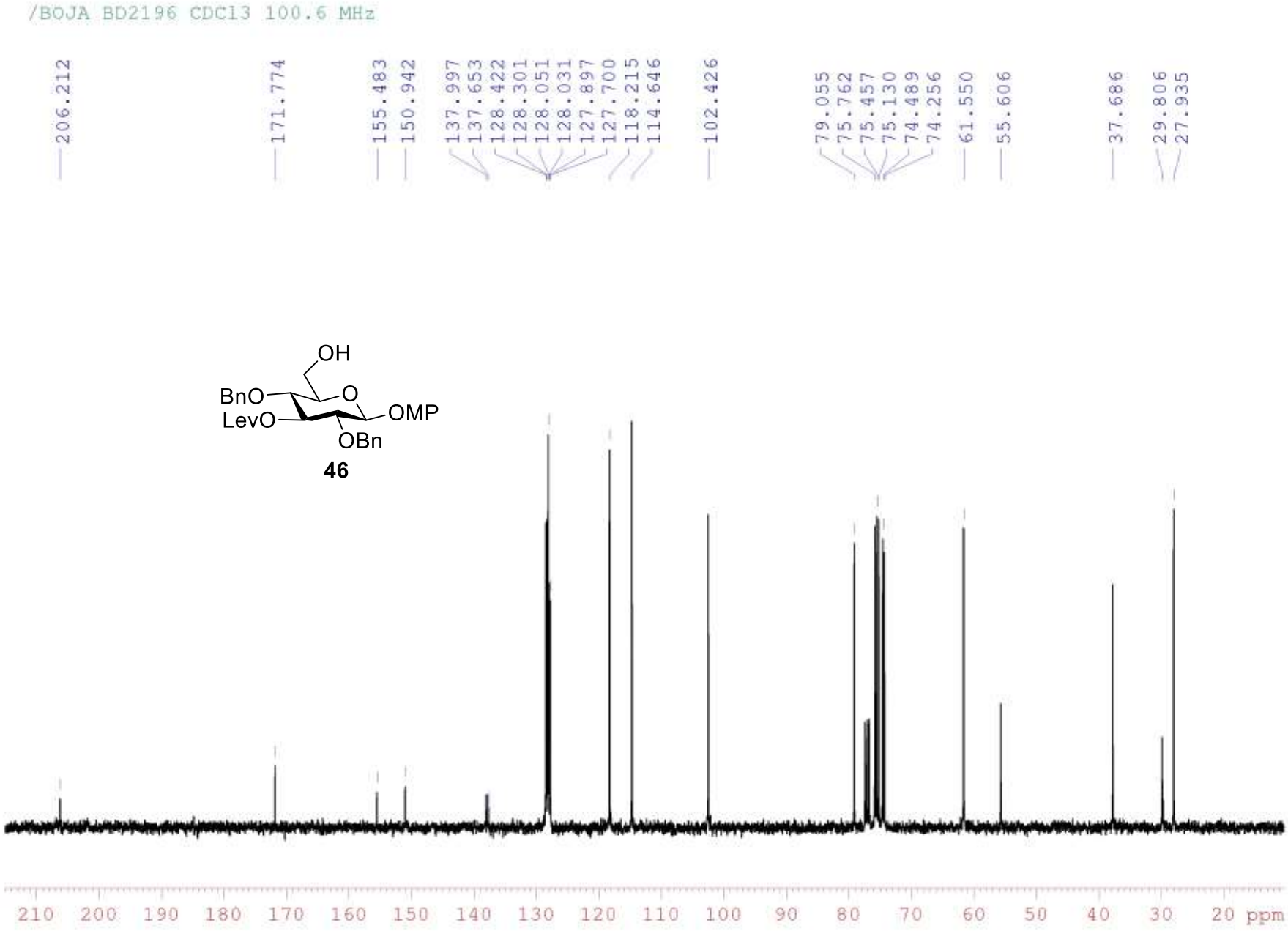
3-Trifluoroacetamidopropyl 3-O-acetyl-2,4-di-O-benzyl-6-O-pentafluorobenzoyl-α-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-α-D-glucopyranoside (45)



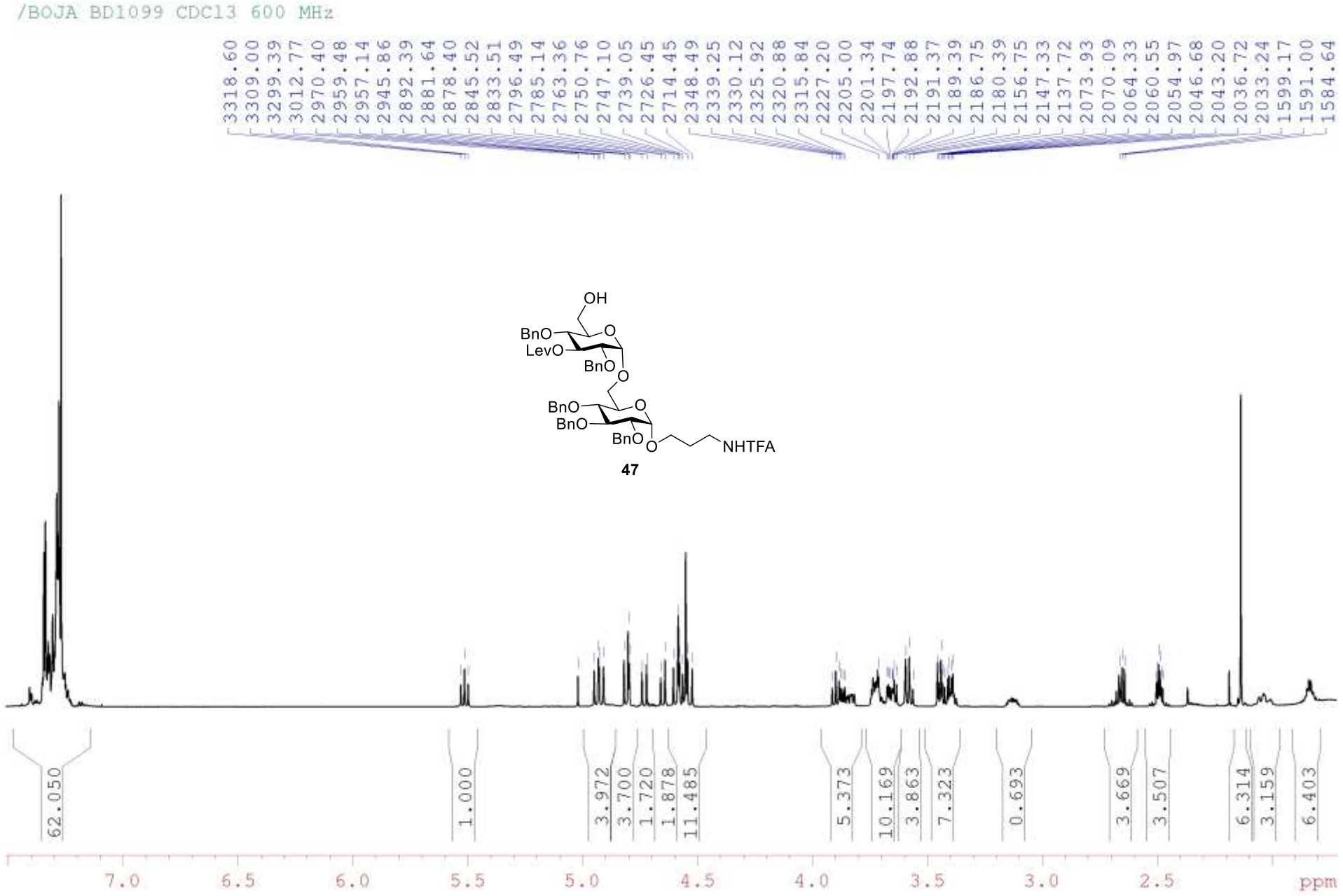
***p*-Methoxyphenyl 2,4-di-*O*-benzyl-3-*O*-levulinoyl-β-D-glucopyranoside (46)**



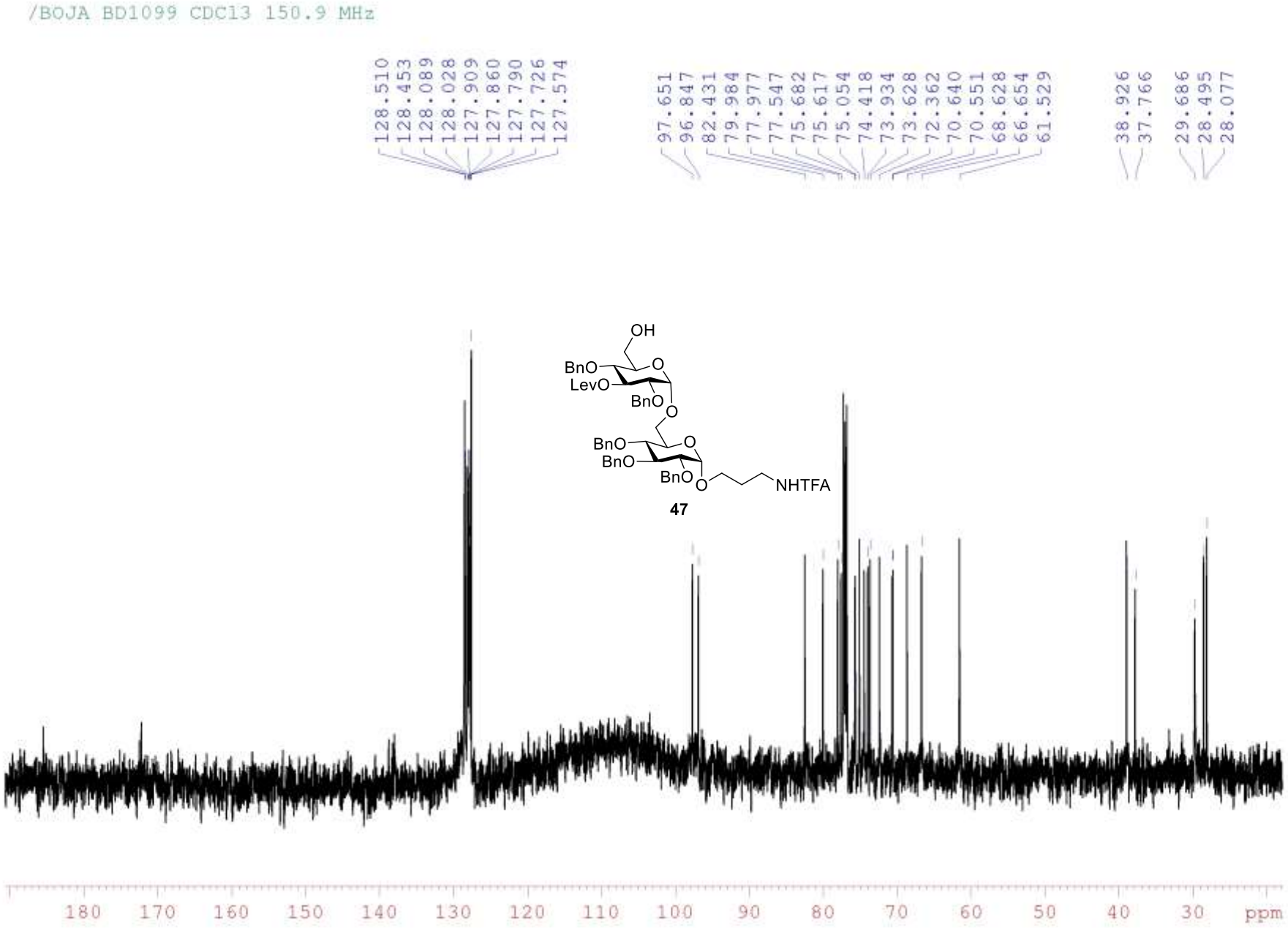
***p*-Methoxyphenyl 2,4-di-*O*-benzyl-3-*O*-levulinoyl-β-D-glucopyranoside (46)**



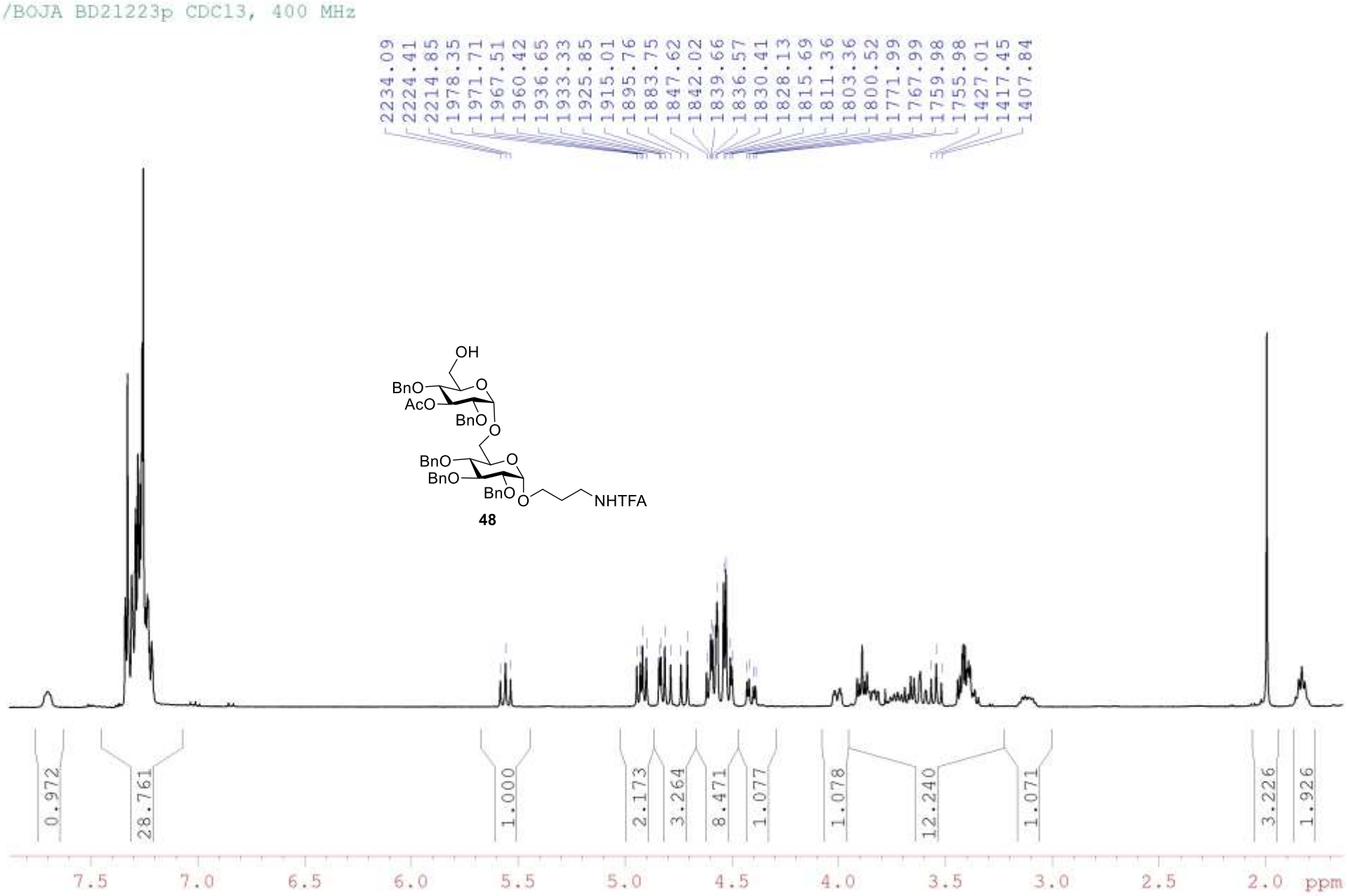
3-Trifluoroacetamidopropyl 2,4-di-O-benzyl-3-O-levulinoyl-α-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-α-D-glucopyranoside (47)



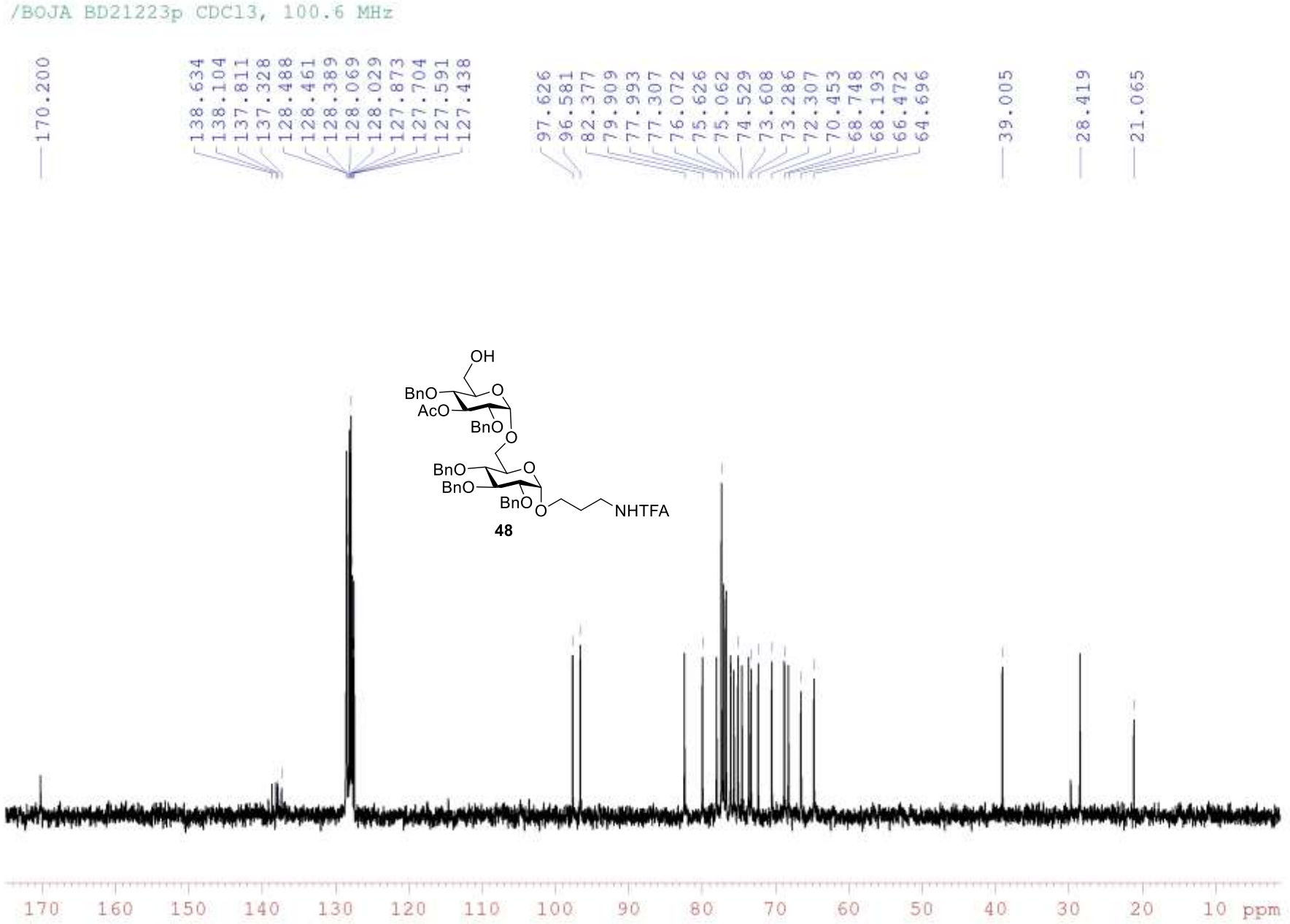
3-Trifluoroacetamidopropyl 2,4-di-O-benzyl-3-O-levulinoyl-α-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-α-D-glucopyranoside (47)



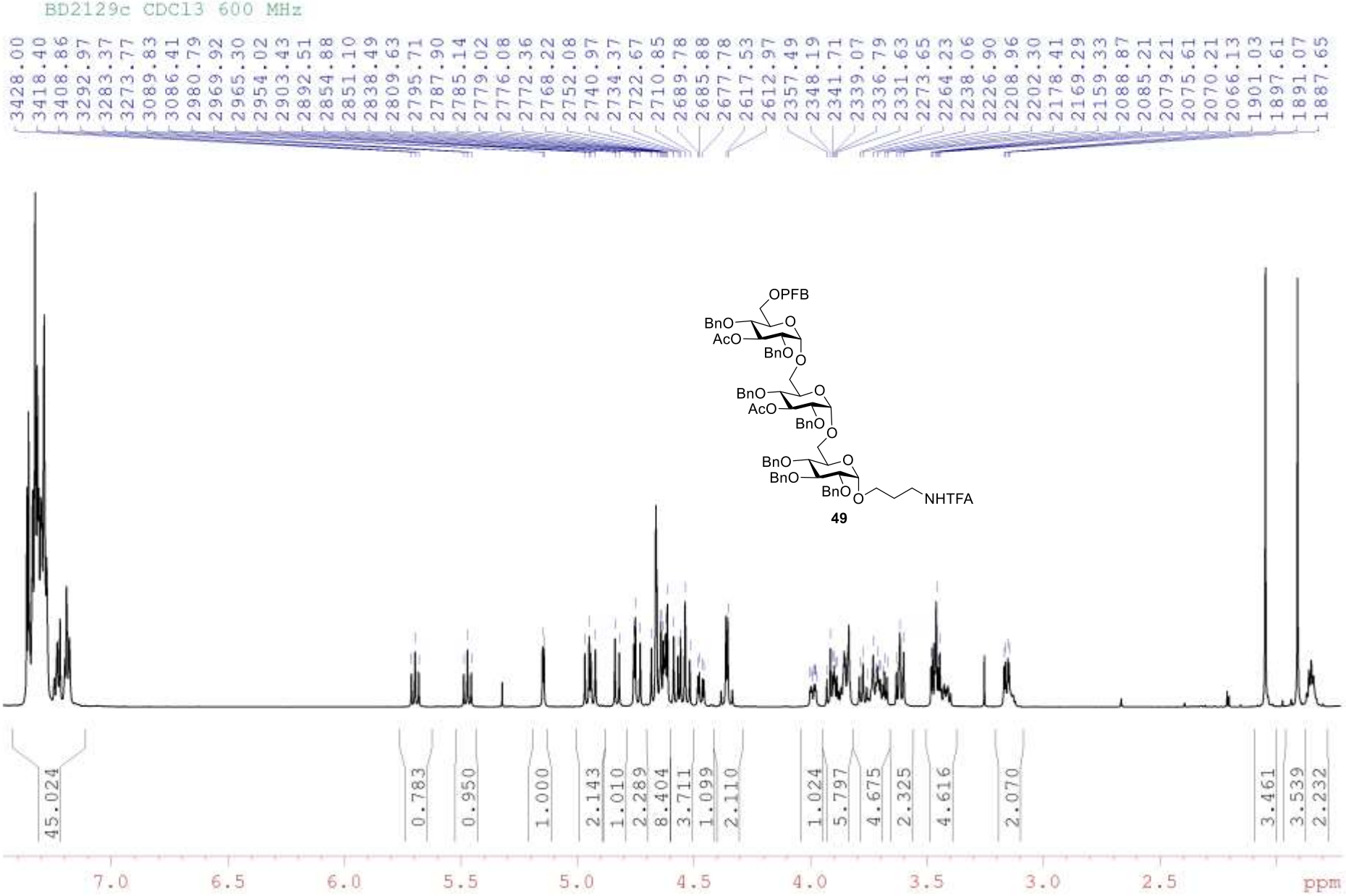
3-Trifluoroacetamidopropyl 3-O-acetyl-2,4-di-O-benzyl-α-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-α-D-glucopyranoside (48)



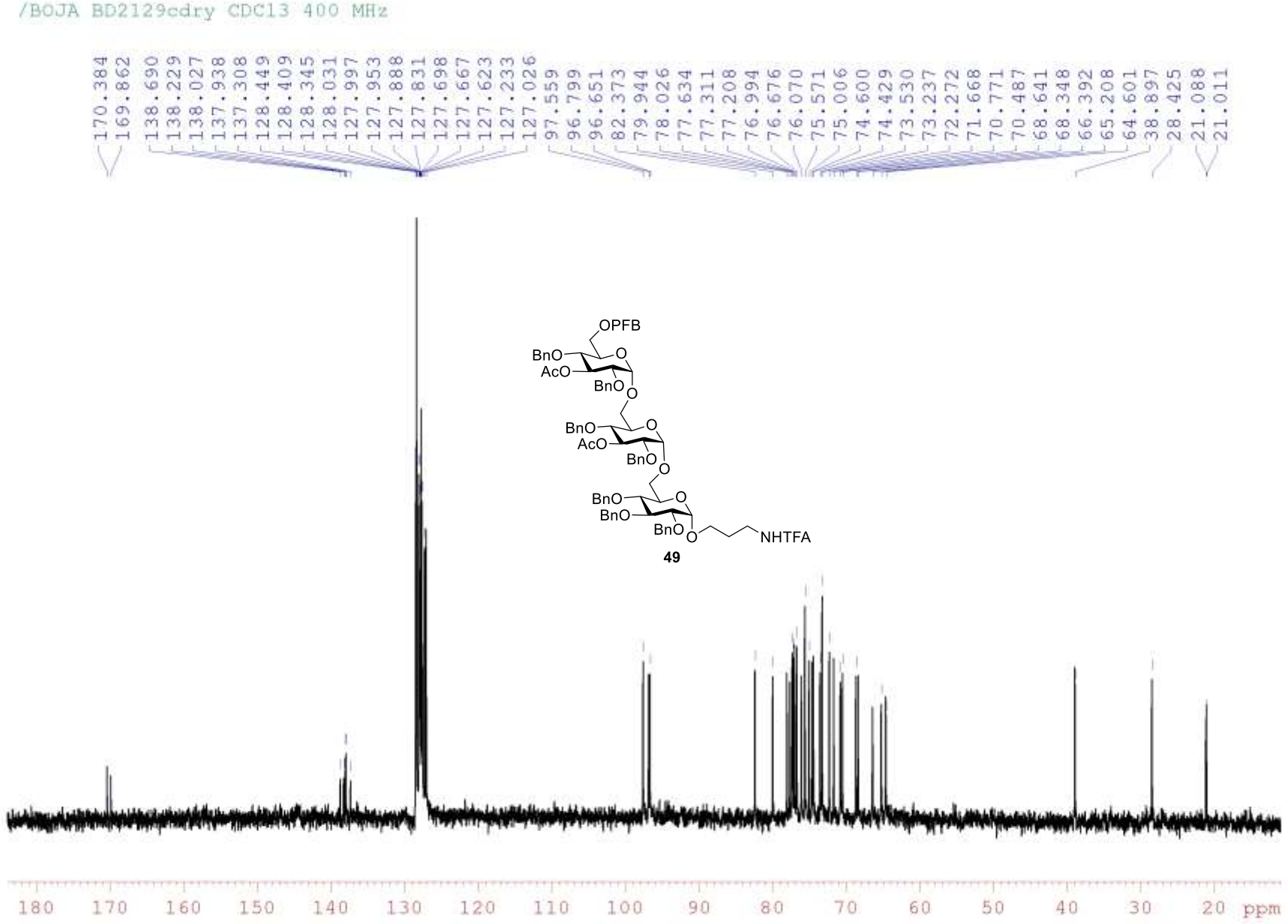
3-Trifluoroacetamidopropyl 3-O-acetyl-2,4-di-O-benzyl-α-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-α-D-glucopyranoside (48)



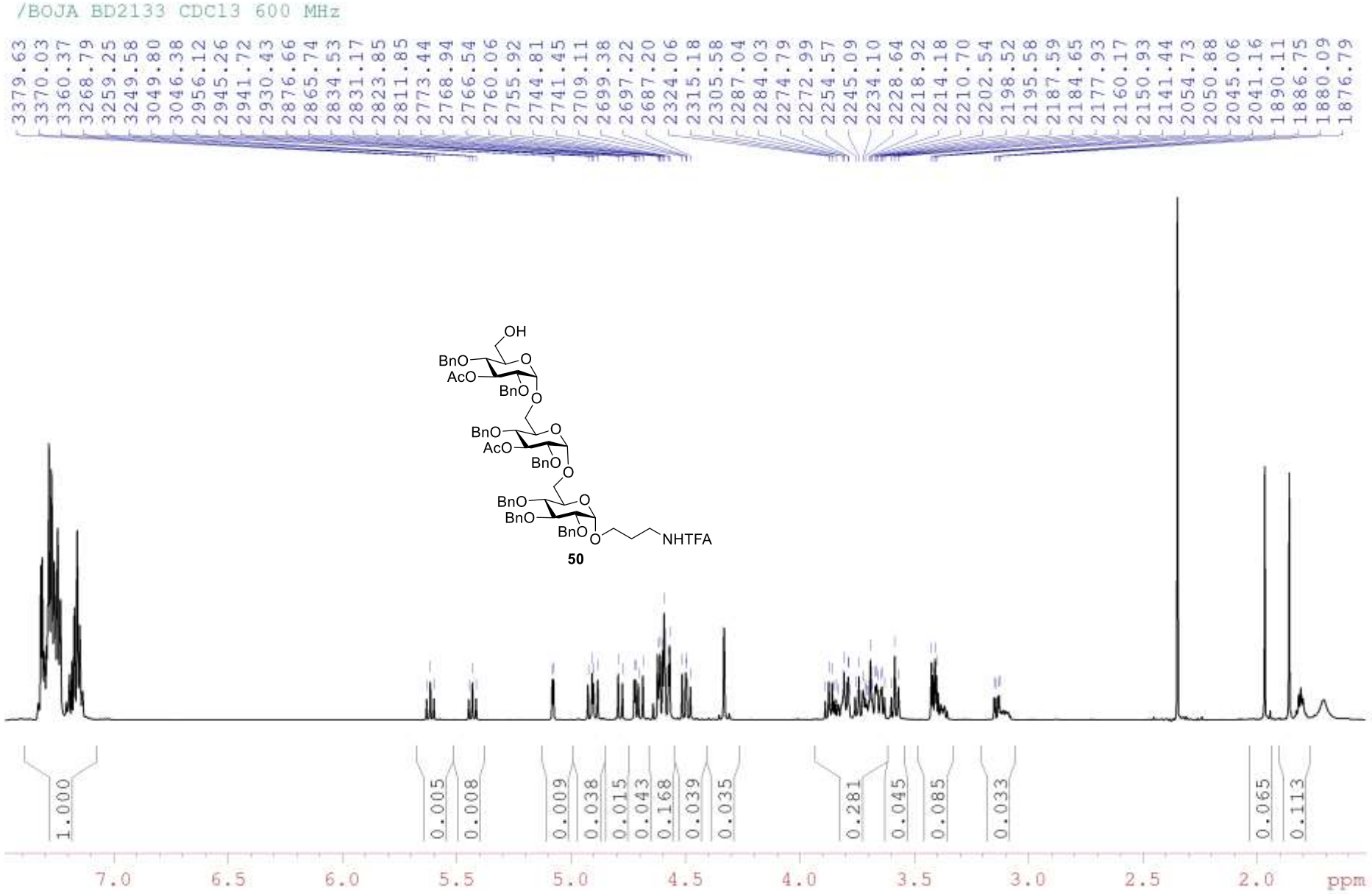
***O*-3-Trifluoroacetaminopropyl 3-*O*-acetyl-2,4-di-*O*-benzyl-6-*O*-pentafluorobenzoyl-α-D-glucopyranosyl-(1→6)-3-*O*-acetyl-2,4-di-*O*-benzyl-α-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-α-D-glucopyranoside (49)**



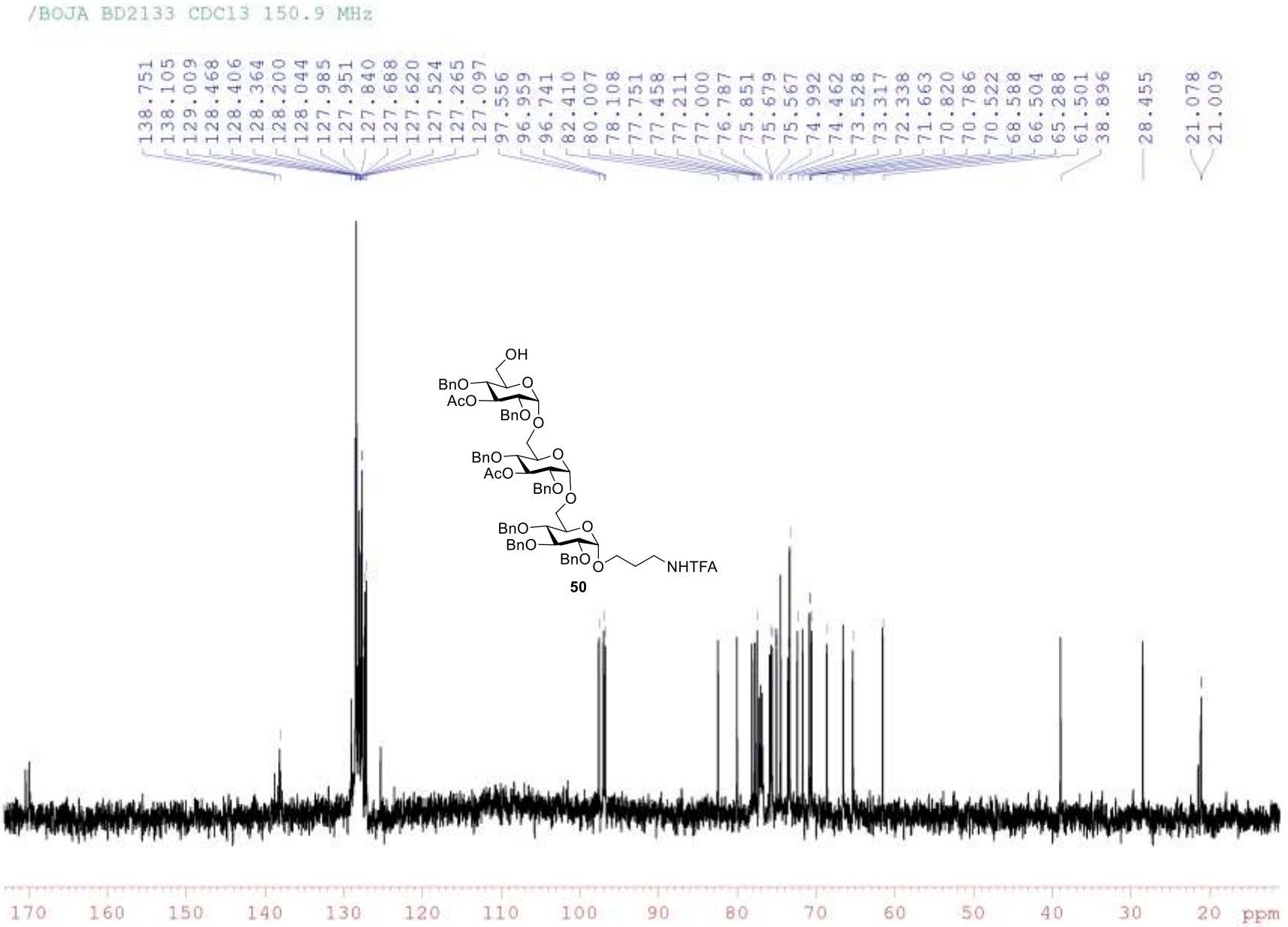
***O*-3-Trifluoroacetaminopropyl 3-*O*-acetyl-2,4-di-*O*-benzyl-6-*O*-pentafluorobenzoyl-α-D-glucopyranosyl-(1→6)-3-*O*-acetyl-2,4-di-*O*-benzyl-α-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-α-D-glucopyranoside (49)**



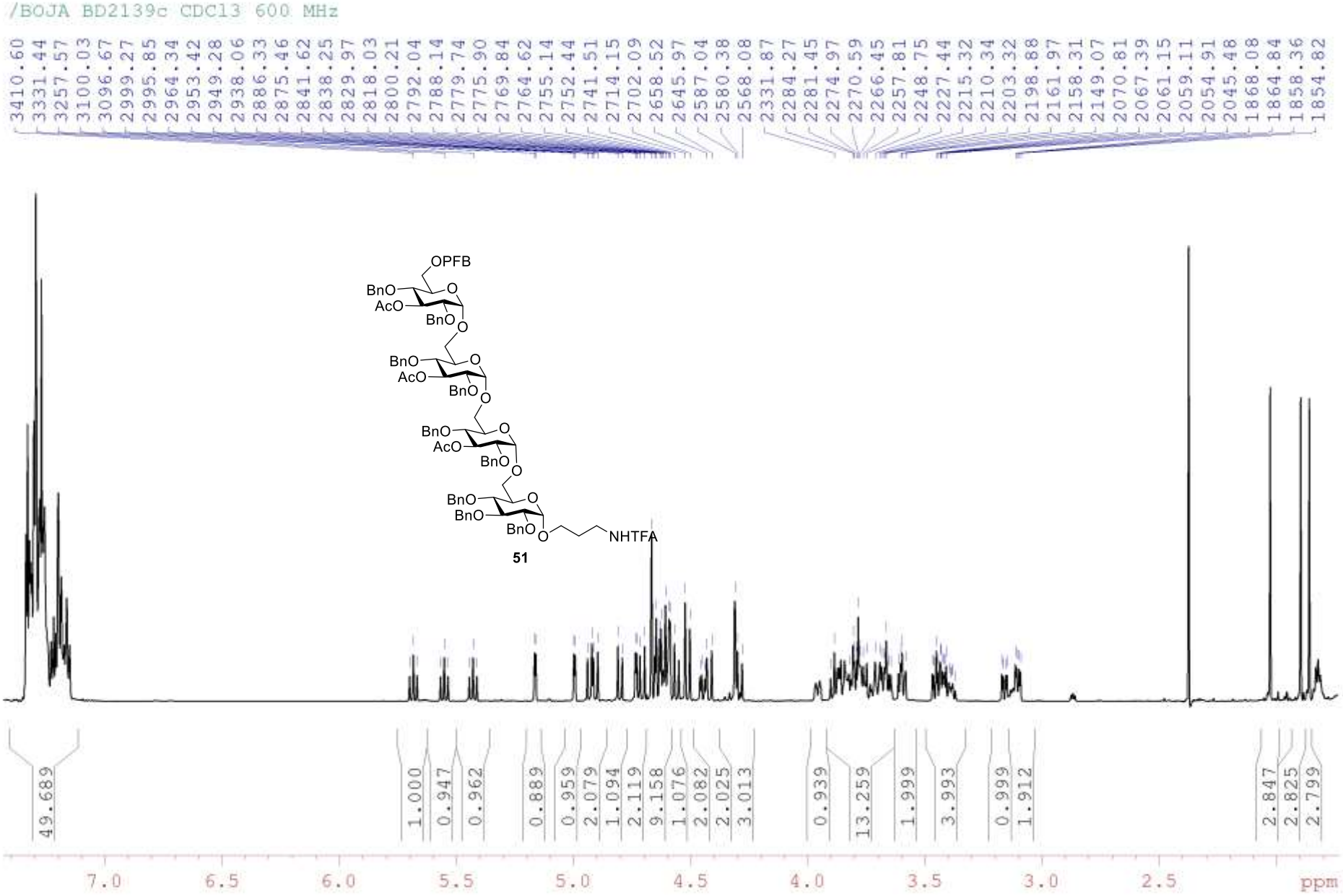
***O*-3-Trifluoroacetaminopropyl 3-*O*-acetyl-2,4-di-*O*-benzyl-α-D-glucopyranosyl-(1→6)-3-*O*-acetyl-2,4-di-*O*-benzyl-α-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-α-D-glucopyranoside (50)**



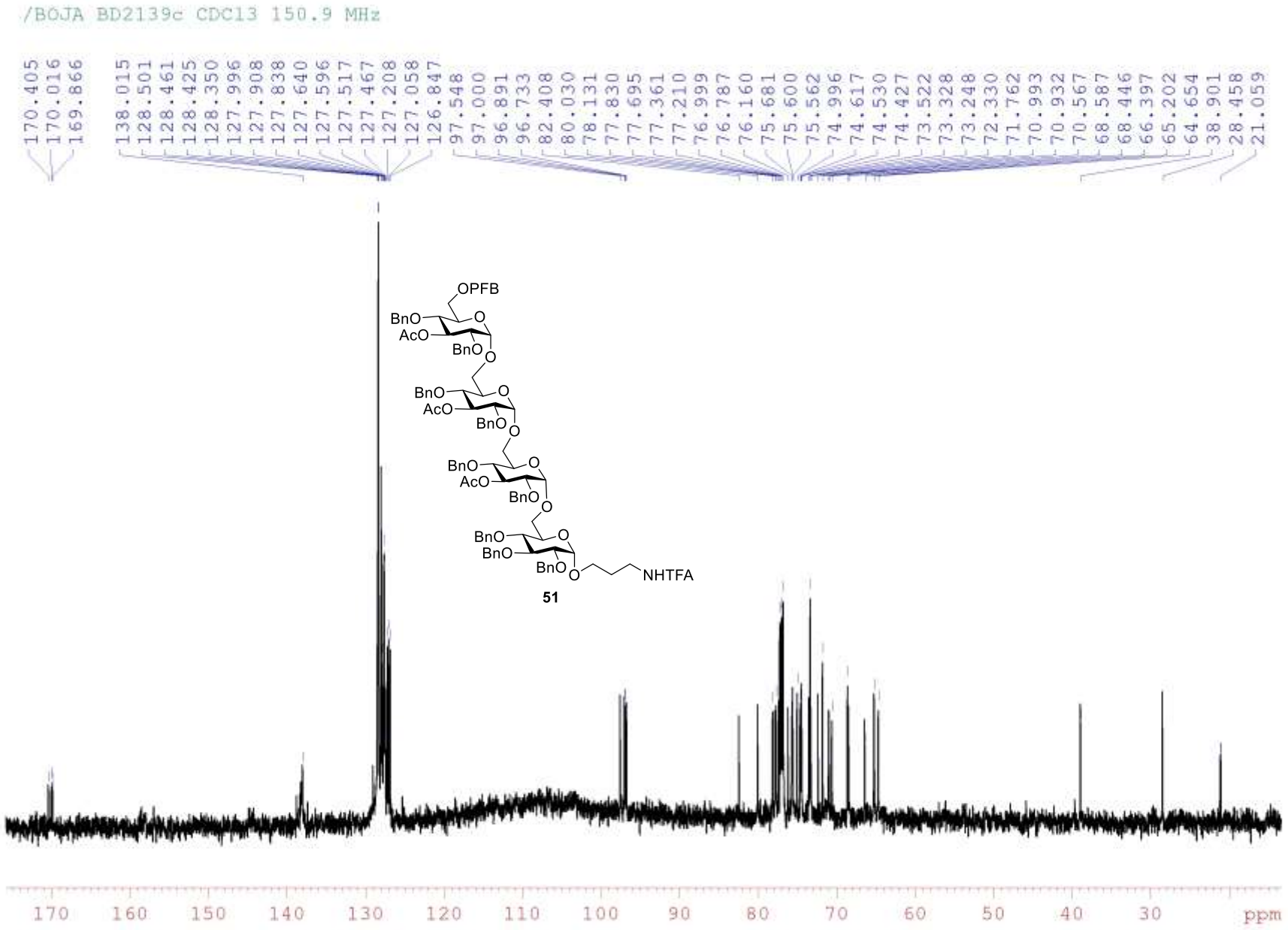
***O*-3-Trifluoroacetaminopropyl 3-*O*-acetyl-2,4-di-*O*-benzyl-α-D-glucopyranosyl-(1→6)-3-*O*-acetyl-2,4-di-*O*-benzyl-α-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-α-D-glucopyranoside (50)**



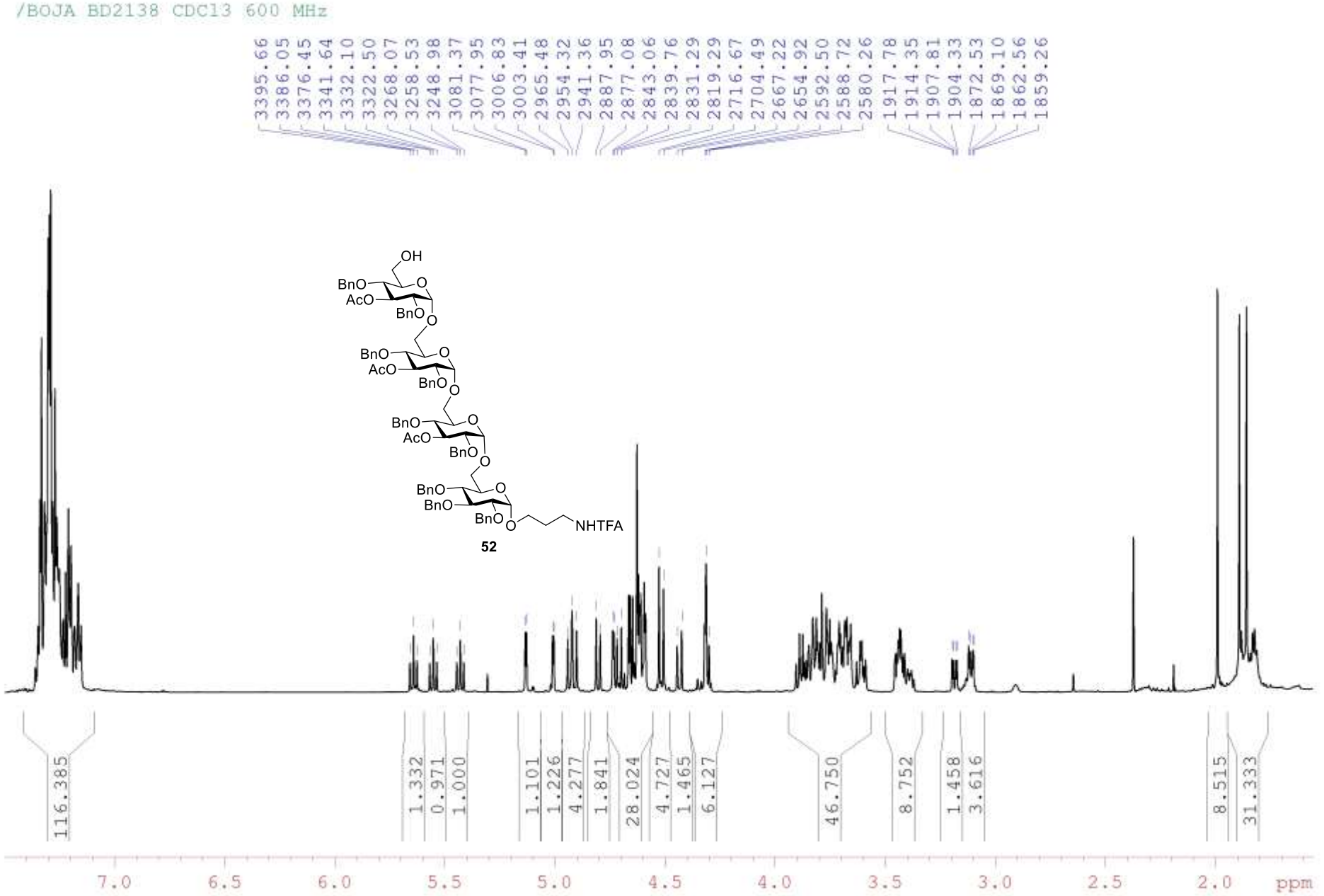
***O*-3-Trifluoroacetaminopropyl 3-*O*-acetyl-2,4-di-*O*-benzyl-6-*O*-pentafluorobenzoyl-α-D-glucopyranosyl-(1→6)-3-*O*-acetyl-2,4-di-*O*-benzyl-α-D-glucopyranosyl-(1→6)-3-*O*-acetyl-2,4-di-*O*-benzyl-α-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-α-D-glucopyranoside (51)**



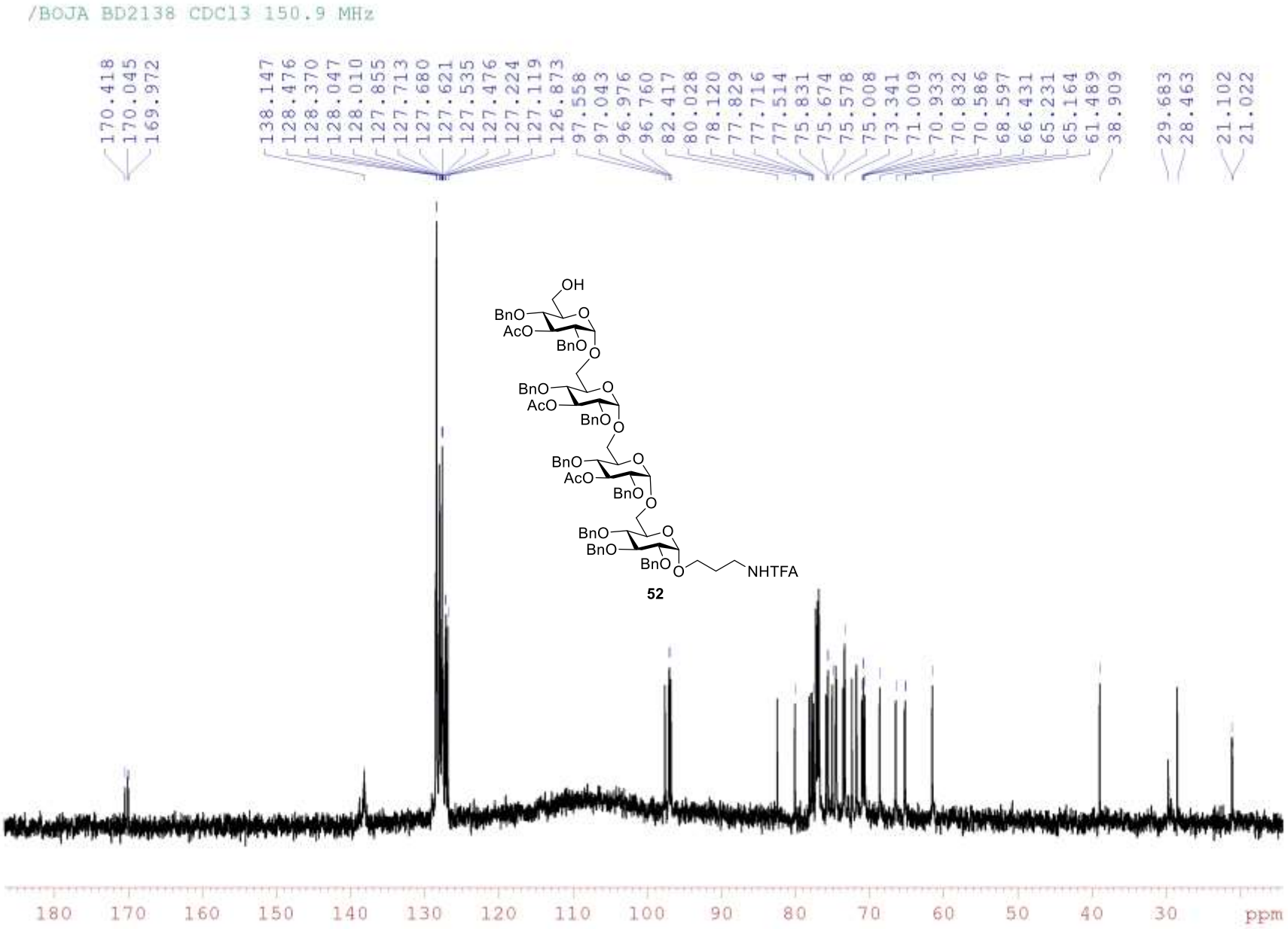
***O*-3-Trifluoroacetaminopropyl 3-*O*-acetyl-2,4-di-*O*-benzyl-6-*O*-pentafluorobenzoyl-α-D-glucopyranosyl-(1→6)-3-*O*-acetyl-2,4-di-*O*-benzyl-α-D-glucopyranosyl-(1→6)-3-*O*-acetyl-2,4-di-*O*-benzyl-α-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-α-D-glucopyranoside (51)**



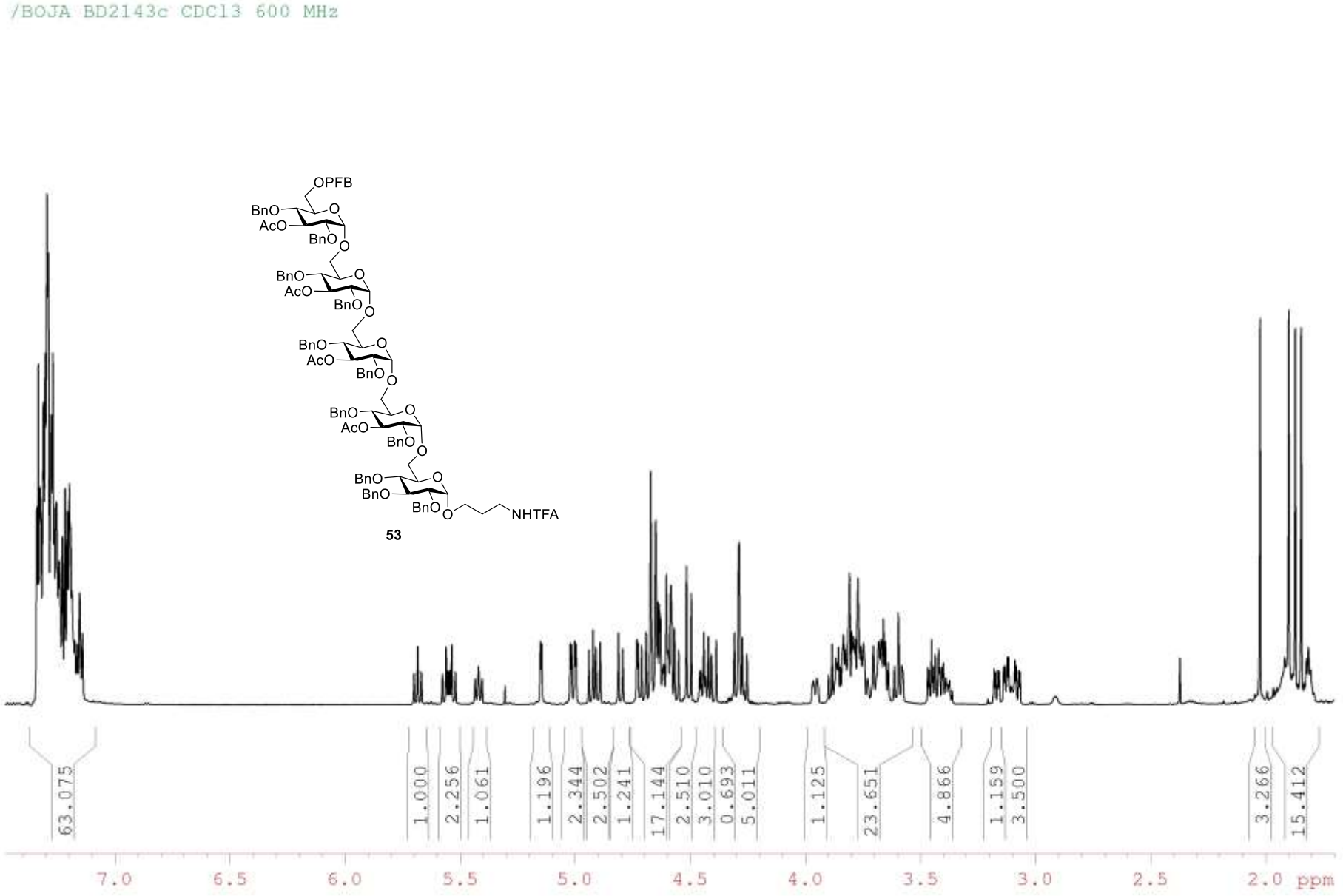
***O*-3-Trifluoroacetaminopropyl 3-*O*-acetyl-2,4-di-*O*-benzyl-α-D-glucopyranosyl-(1→6)-3-*O*-acetyl-2,4-di-*O*-benzyl-α-D-glucopyranosyl-(1→6)-3-*O*-acetyl-2,4-di-*O*-benzyl-α-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-α-D-glucopyranoside (52)**



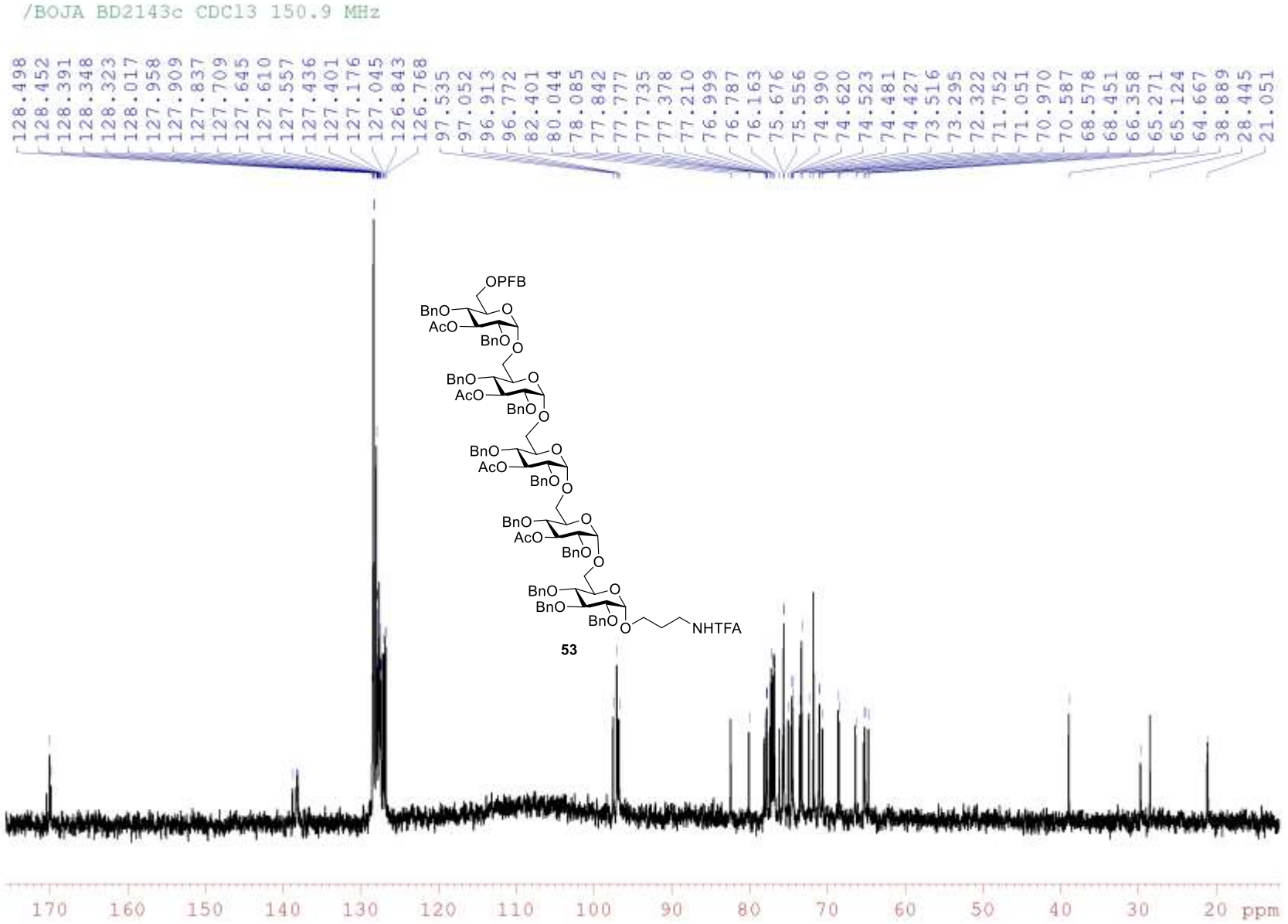
***O*-3-Trifluoroacetaminopropyl 3-*O*-acetyl-2,4-di-*O*-benzyl-α-D-glucopyranosyl-(1→6)-3-*O*-acetyl-2,4-di-*O*-benzyl-α-D-glucopyranosyl-(1→6)-3-*O*-acetyl-2,4-di-*O*-benzyl-α-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-α-D-glucopyranoside (52)**



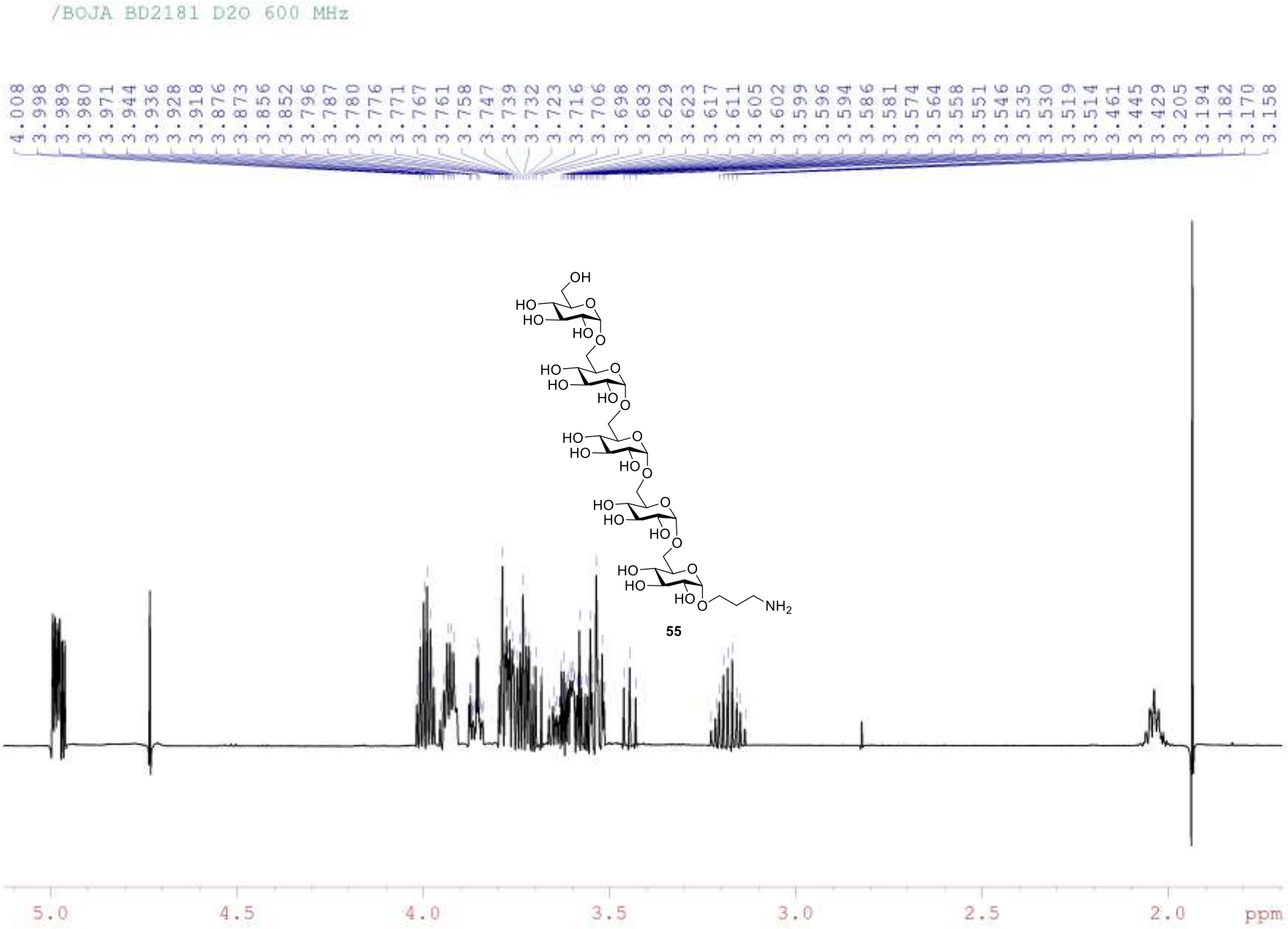
***O*-3-Trifluoroacetaminopropyl 3-*O*-acetyl-2,4-di-*O*-benzyl-6-*O*-pentafluorobenzoyl-α-D-glucopyranosyl-(1→6)-3-*O*-acetyl-2,4-di-*O*-benzyl-α-D-glucopyranosyl-(1→6)-3-*O*-acetyl-2,4-di-*O*-benzyl-α-D-glucopyranosyl-(1→6)-3-*O*-acetyl-2,4-di-*O*-benzyl-α-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-α-D-glucopyranoside (53)**



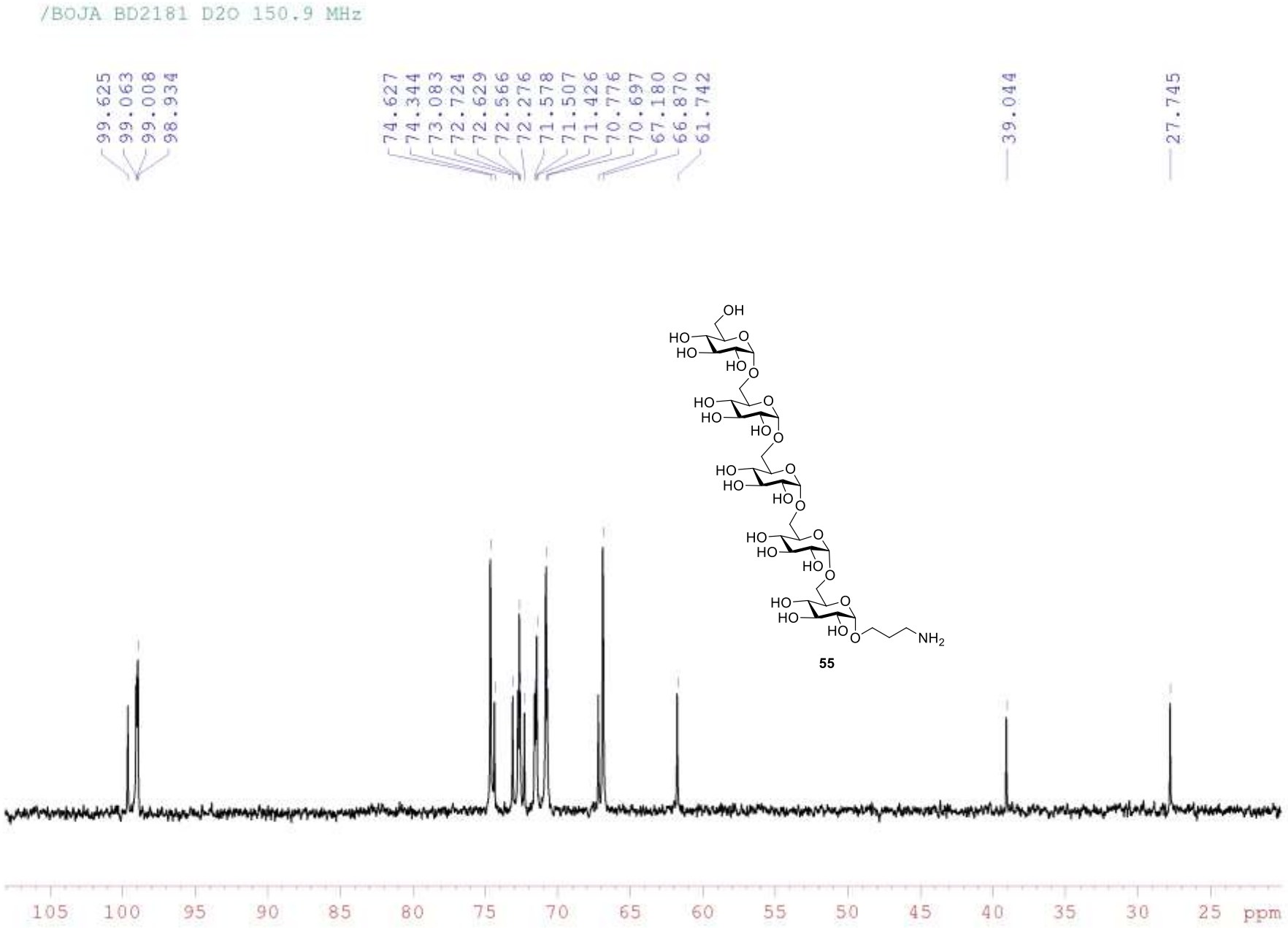
***O*-3-Trifluoroacetaminopropyl 3-*O*-acetyl-2,4-di-*O*-benzyl-6-*O*-pentafluorobenzoyl-α-D-glucopyranosyl-(1→6)-3-*O*-acetyl-2,4-di-*O*-benzyl-α-D-glucopyranosyl-(1→6)-3-*O*-acetyl-2,4-di-*O*-benzyl-α-D-glucopyranosyl-(1→6)-3-*O*-acetyl-2,4-di-*O*-benzyl-α-D-glucopyranosyl-(1→6)-2,3,4-tri-*O*-benzyl-α-D-glucopyranoside (53)**



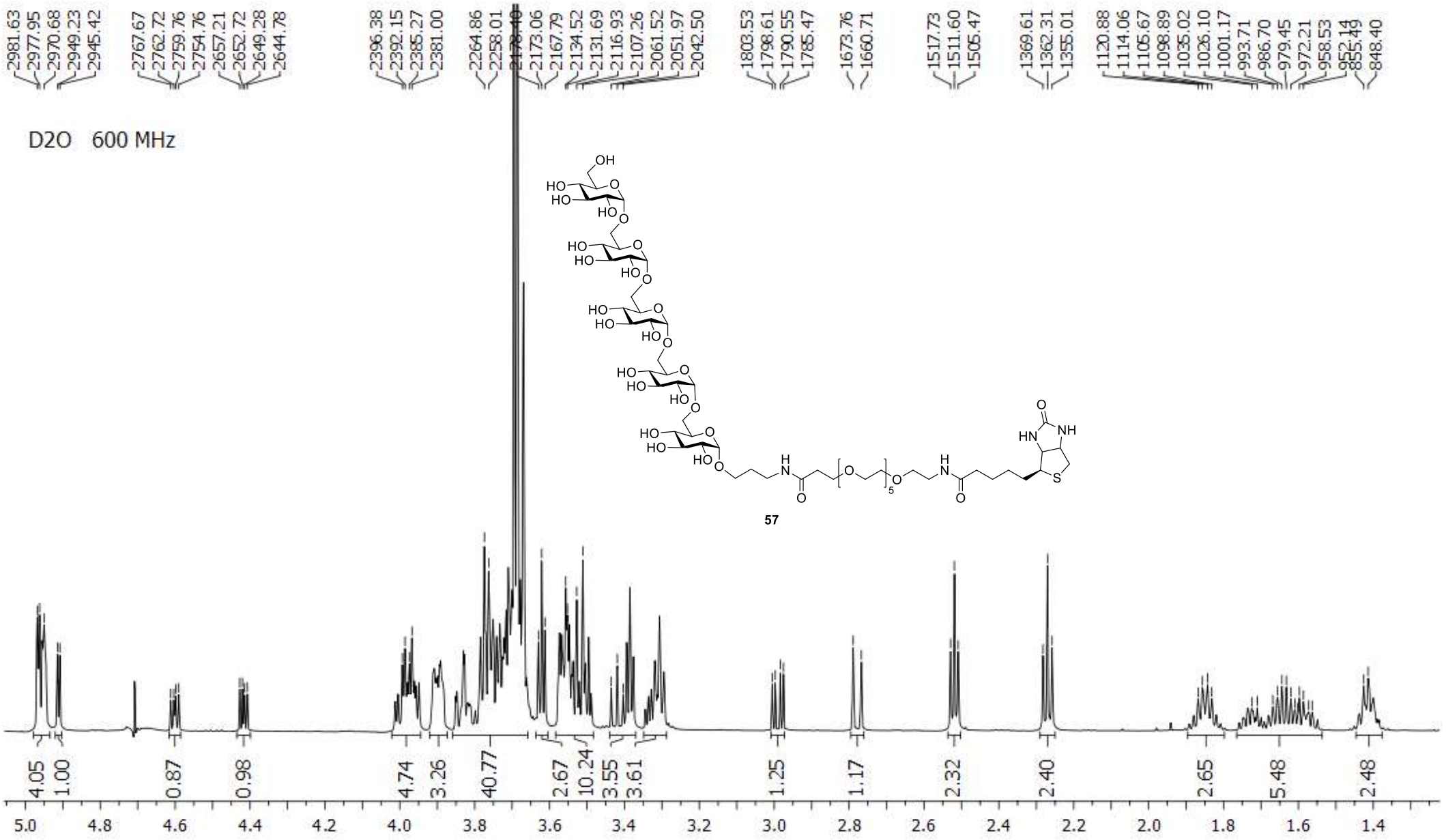
3-Aminopropyl α-D-glucopyranosyl-(1→6)-α-D-glucopyranosyl-(1→6)-α-D-glucopyranosyl-(1→6)-α-D-glucopyranosyl-(1→6)-α-D-glucopyranoside (55)



3-Aminopropyl α-D-glucopyranosyl-(1→6)-α-D-glucopyranosyl-(1→6)-α-D-glucopyranosyl-(1→6)-α-D-glucopyranosyl-(1→6)-α-D-glucopyranoside (55)



Conjugate of the pentasaccharide with biotin (57)



Conjugate of the pentasaccharide with biotin (57)