

Supplementary data

One-pot microfluidic synthesis of α -(1 $\rightarrow$ 5)-linked D-arabinofuranose trisaccharide bearing a Janus aglycone from 3-O-benzoyl β -D-arabinofuranose orthobenzoate

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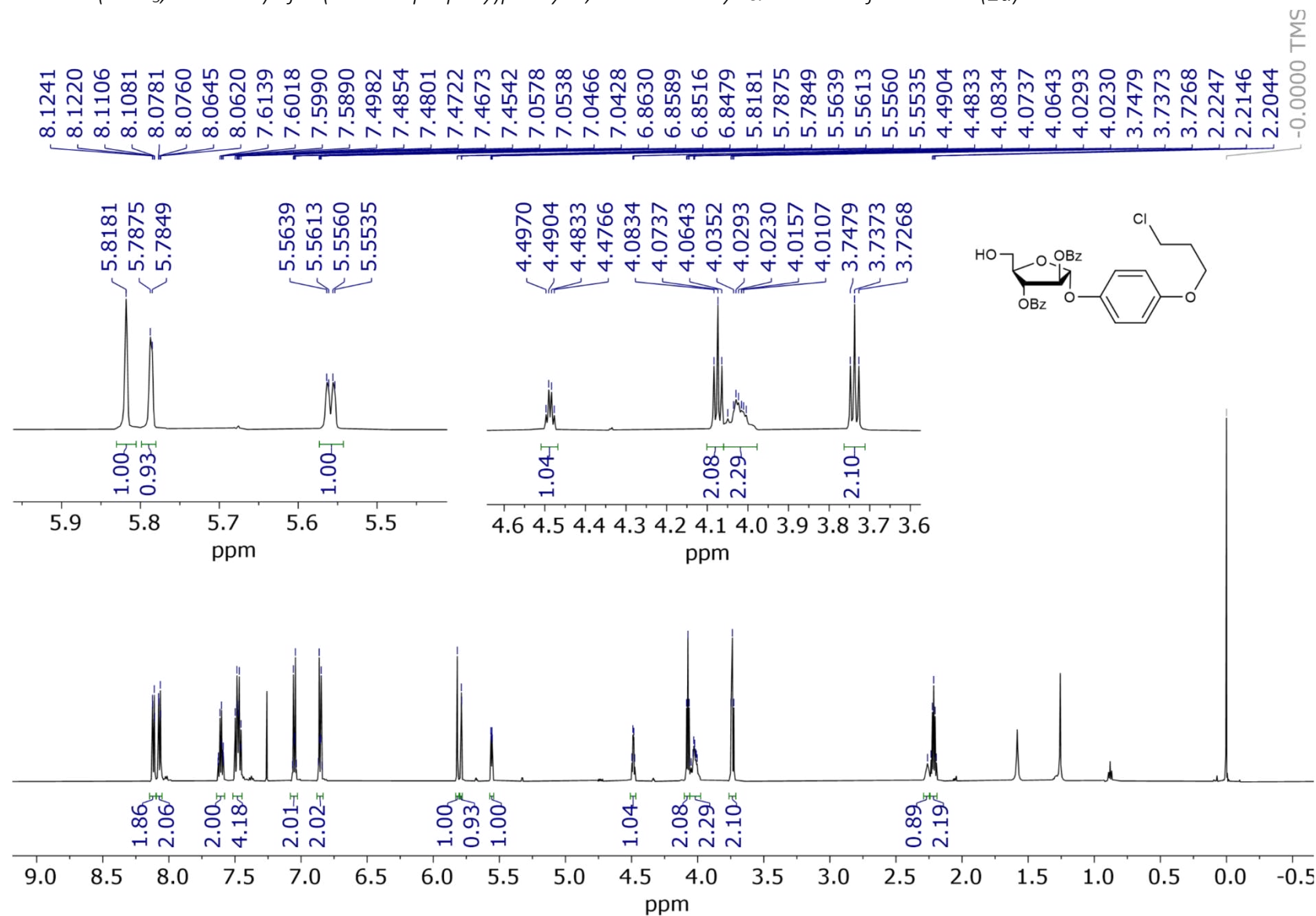
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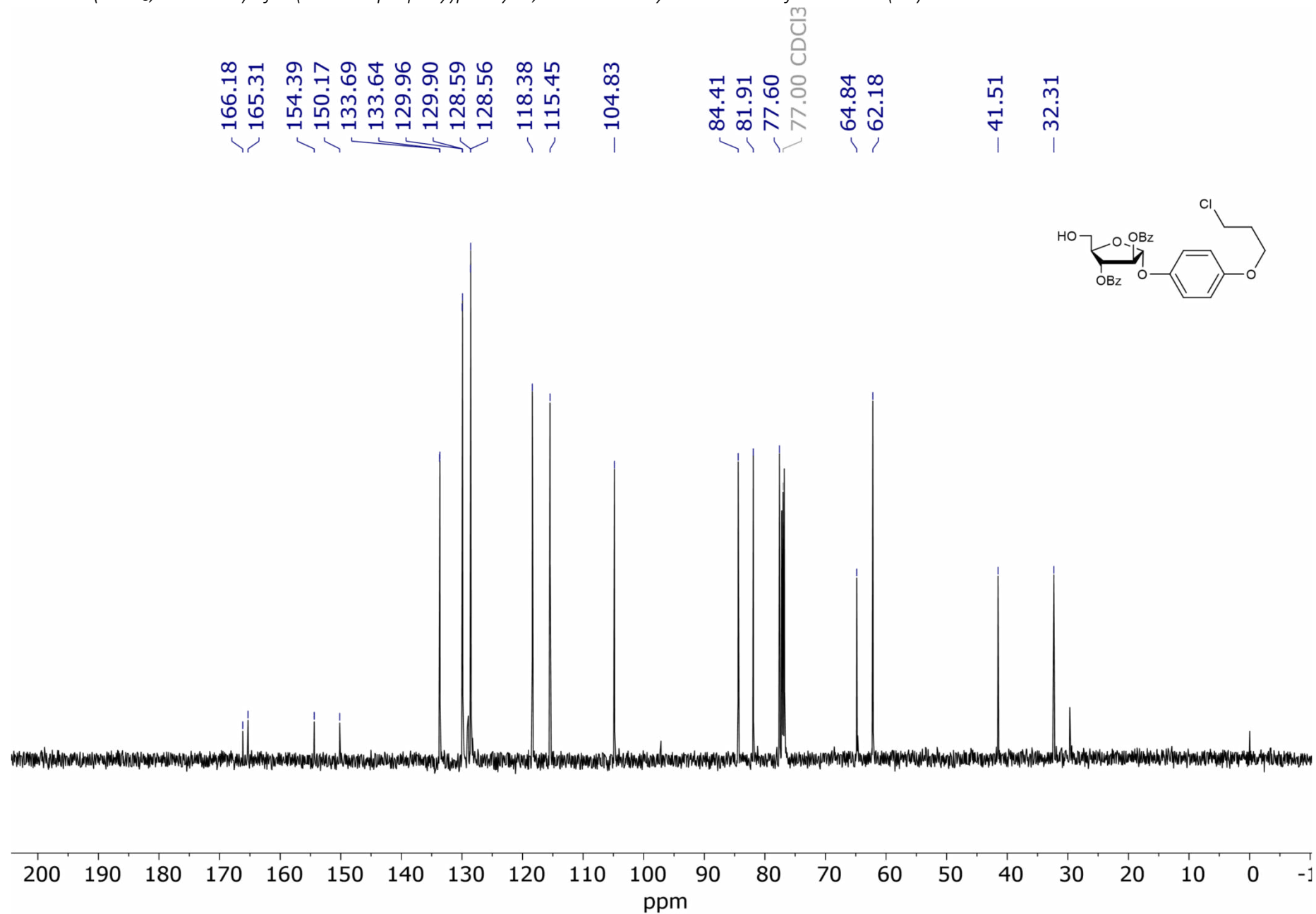
S1. Copies of NMR spectra

S.1.1. 4-(3-Chloropropoxy)phenyl 2,3-di-O-benzoyl- α -D-arabinofuranoside (2a)

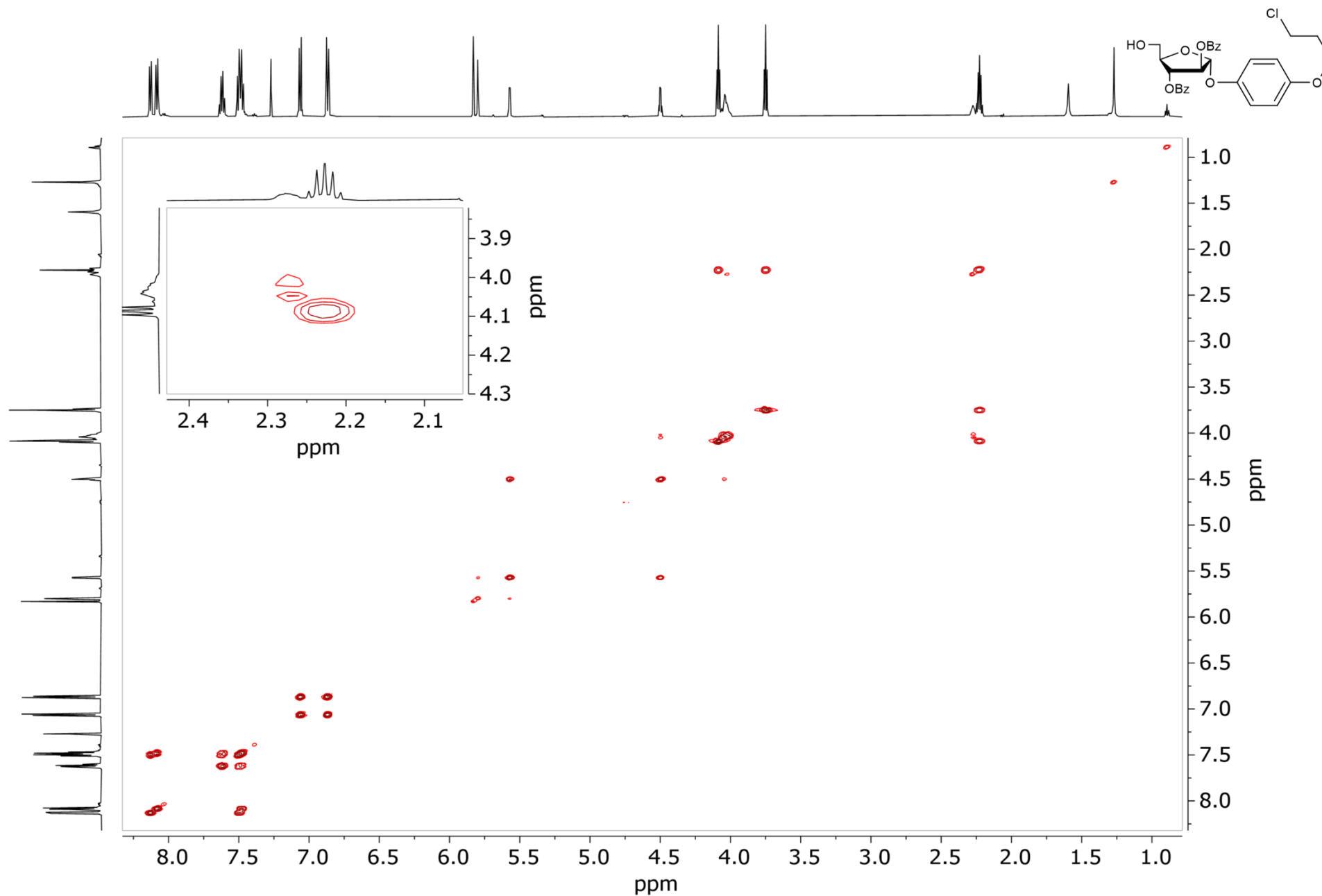
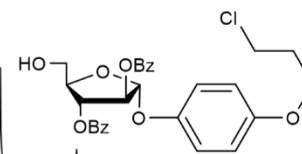
^1H NMR (CDCl_3 , 600 MHz) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- α -D-arabinofuranoside (2a)



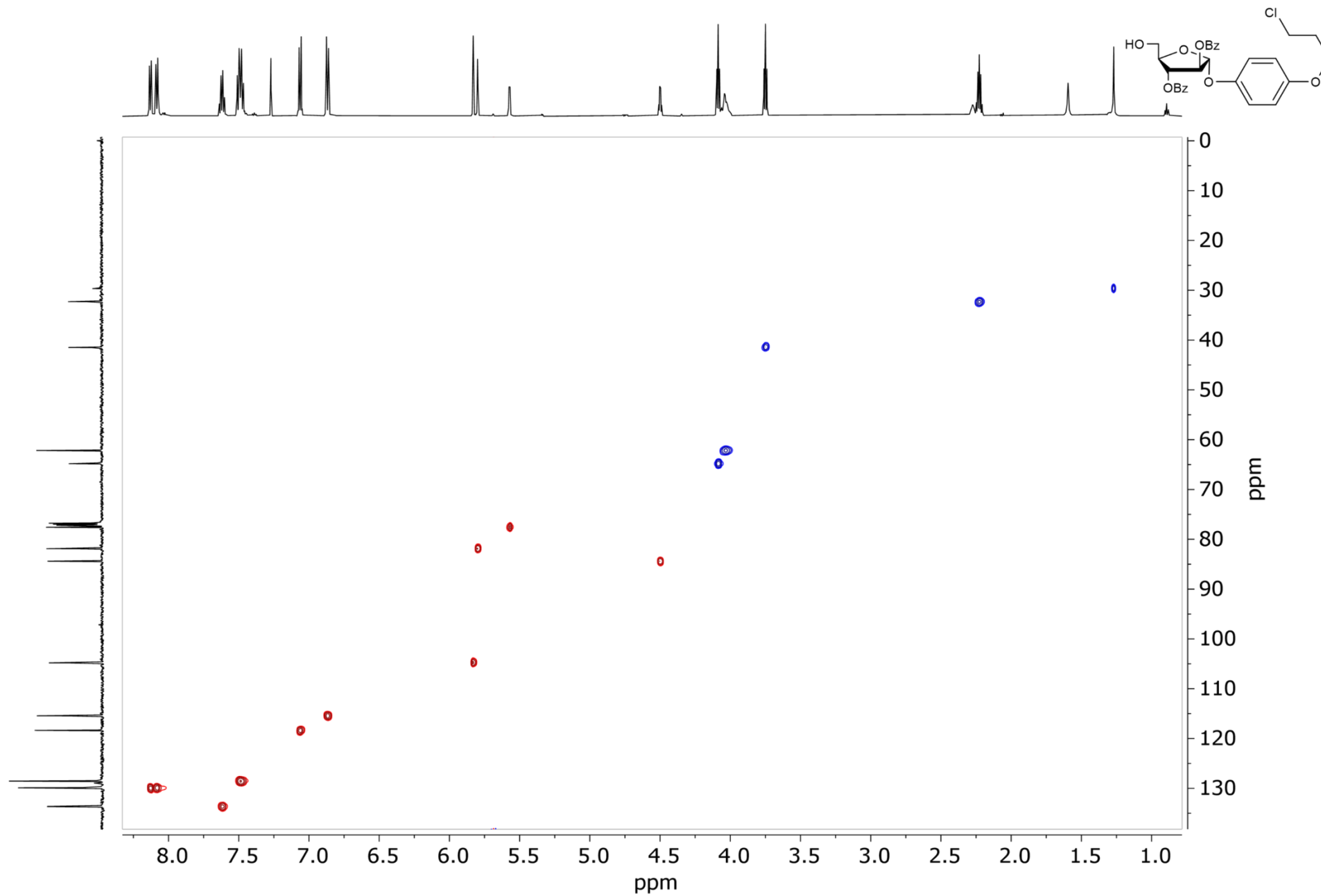
^{13}C NMR (CDCl_3 , 151 MHz) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- α -D-arabinofuranoside (**2a**)



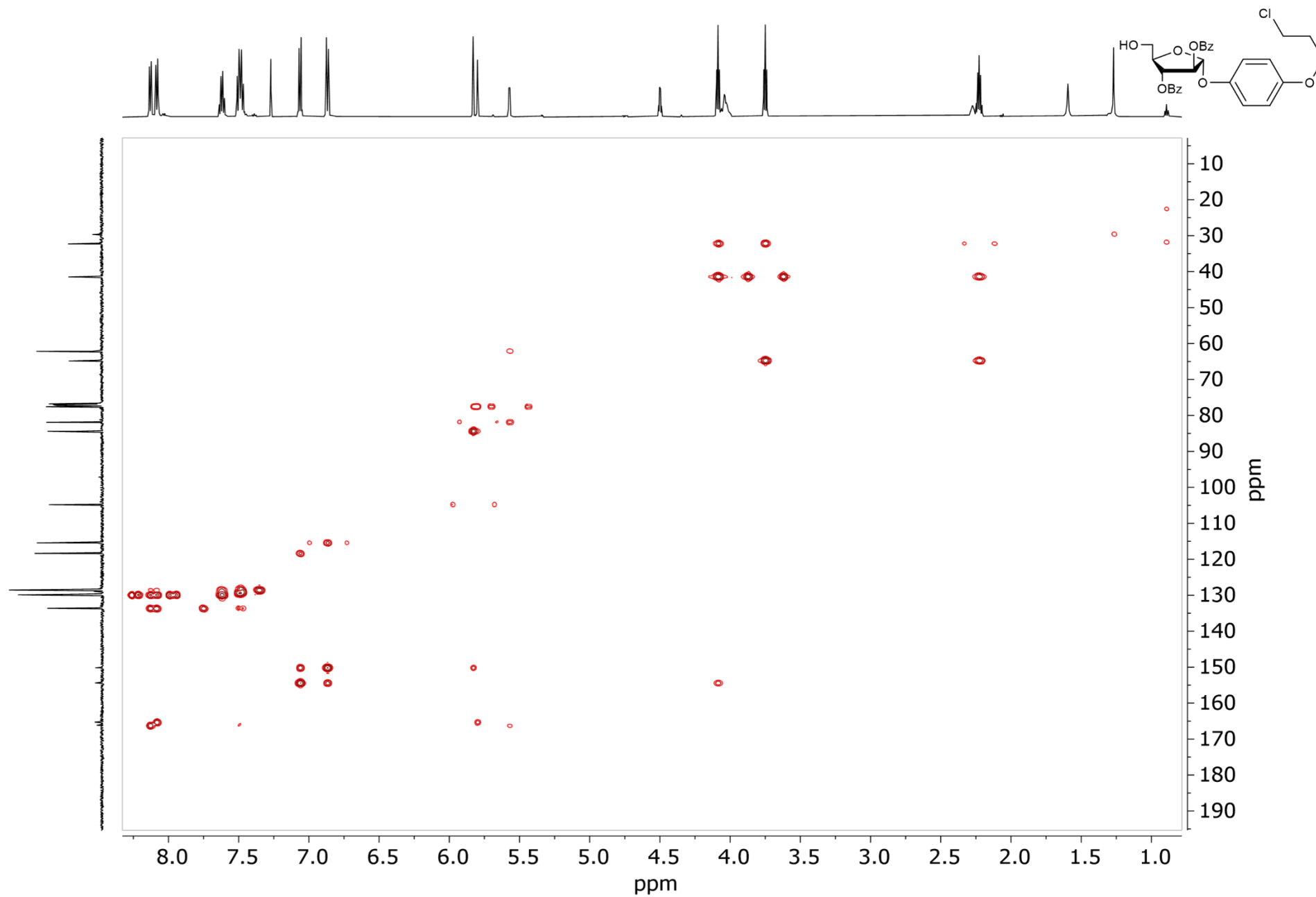
^1H - ^1H COSY (CDCl_3) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- α -D-arabinofuranoside (**2a**)



^1H - ^{13}C HSQC (CDCl_3) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- α -D-arabinofuranoside (**2a**)

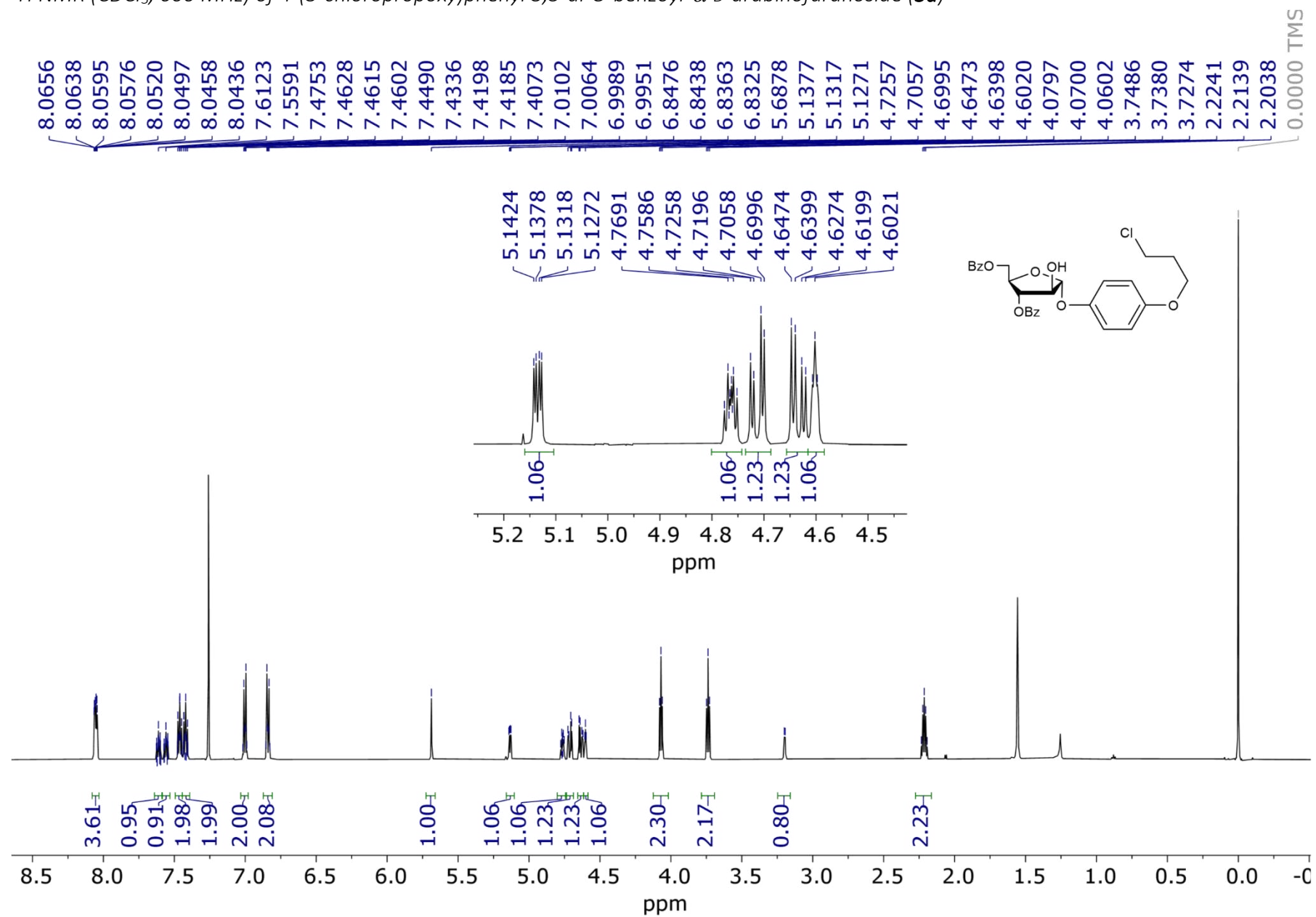


^1H - ^{13}C HMBC (CDCl_3) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- α -D-arabinofuranoside (**2a**)

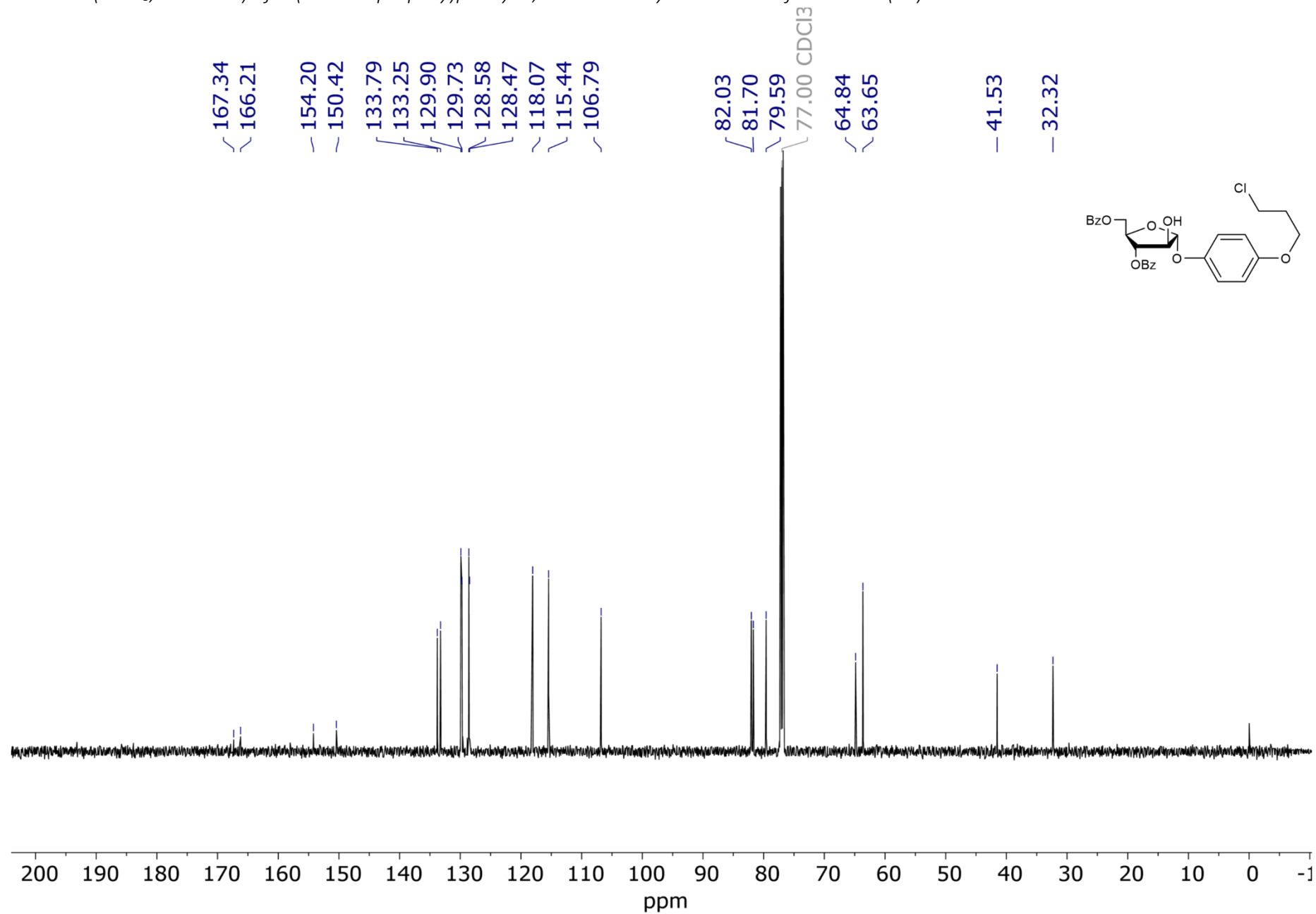


S.1.2. 4-(3-Chloropropoxy)phenyl 3,5-di-O-benzoyl- α -D-arabinofuranoside (**3a**)

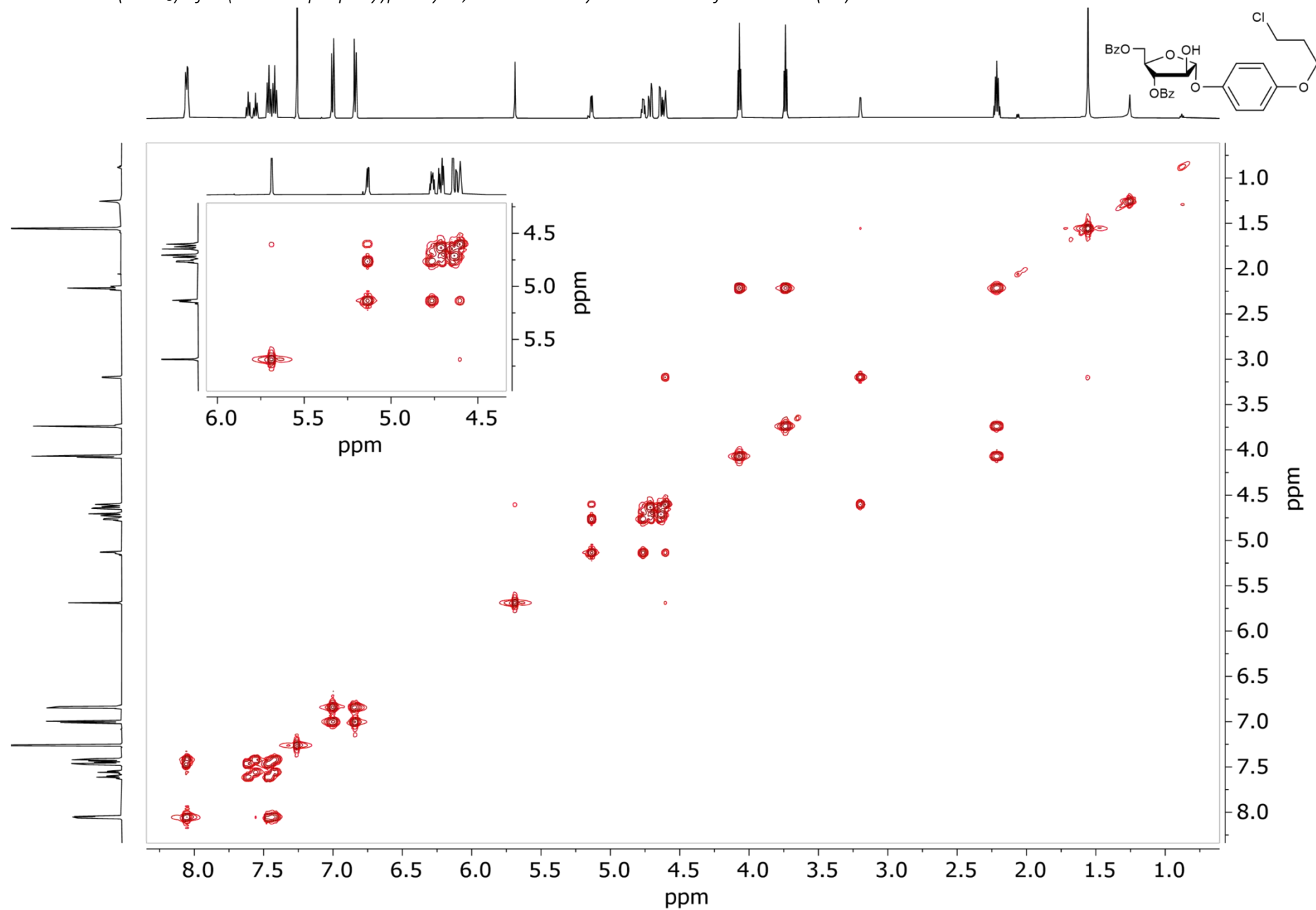
^1H NMR (CDCl_3 , 600 MHz) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- α -D-arabinofuranoside (**3a**)



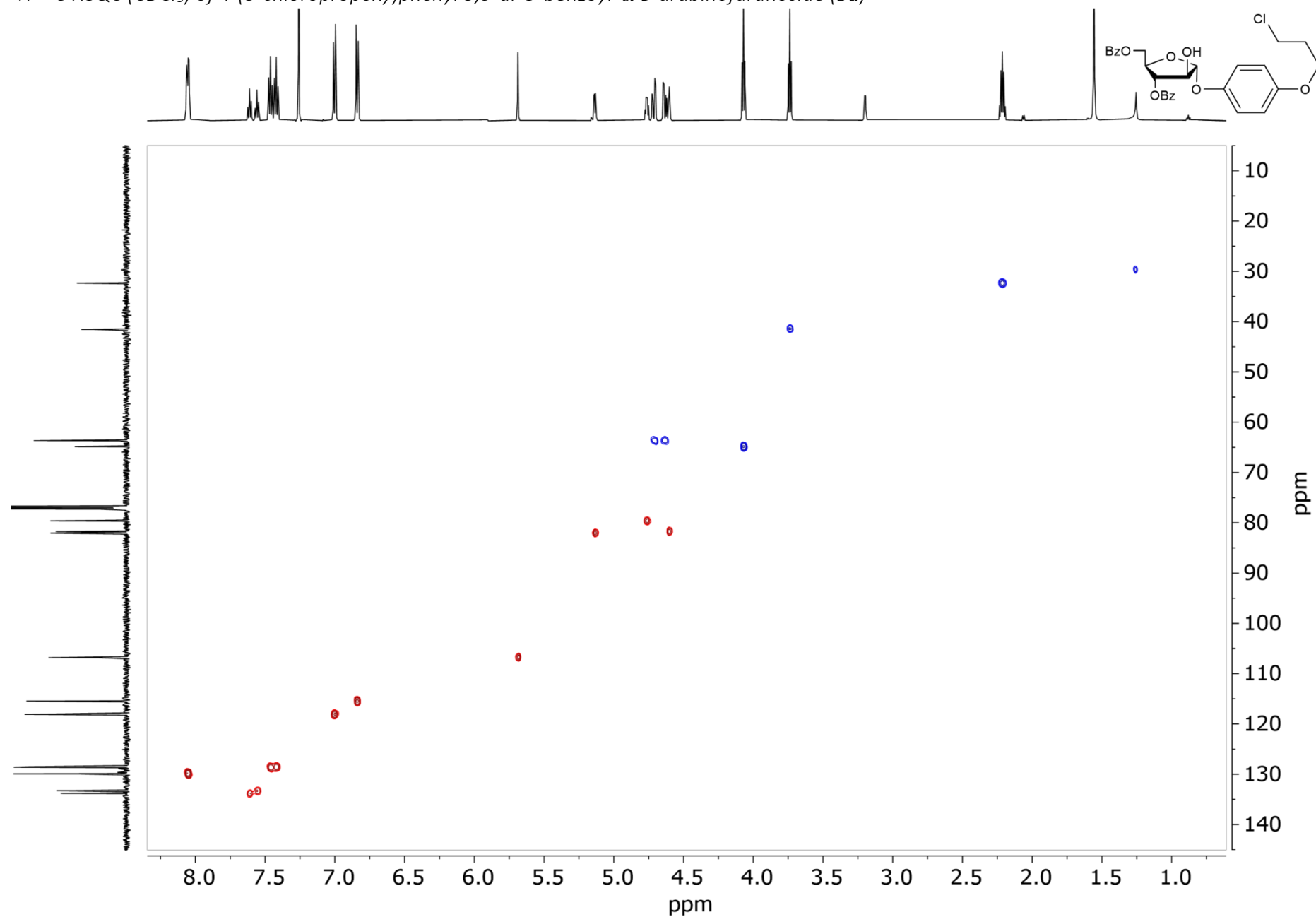
^{13}C NMR (CDCl_3 , 151 MHz) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- α -D-arabinofuranoside (**3a**)



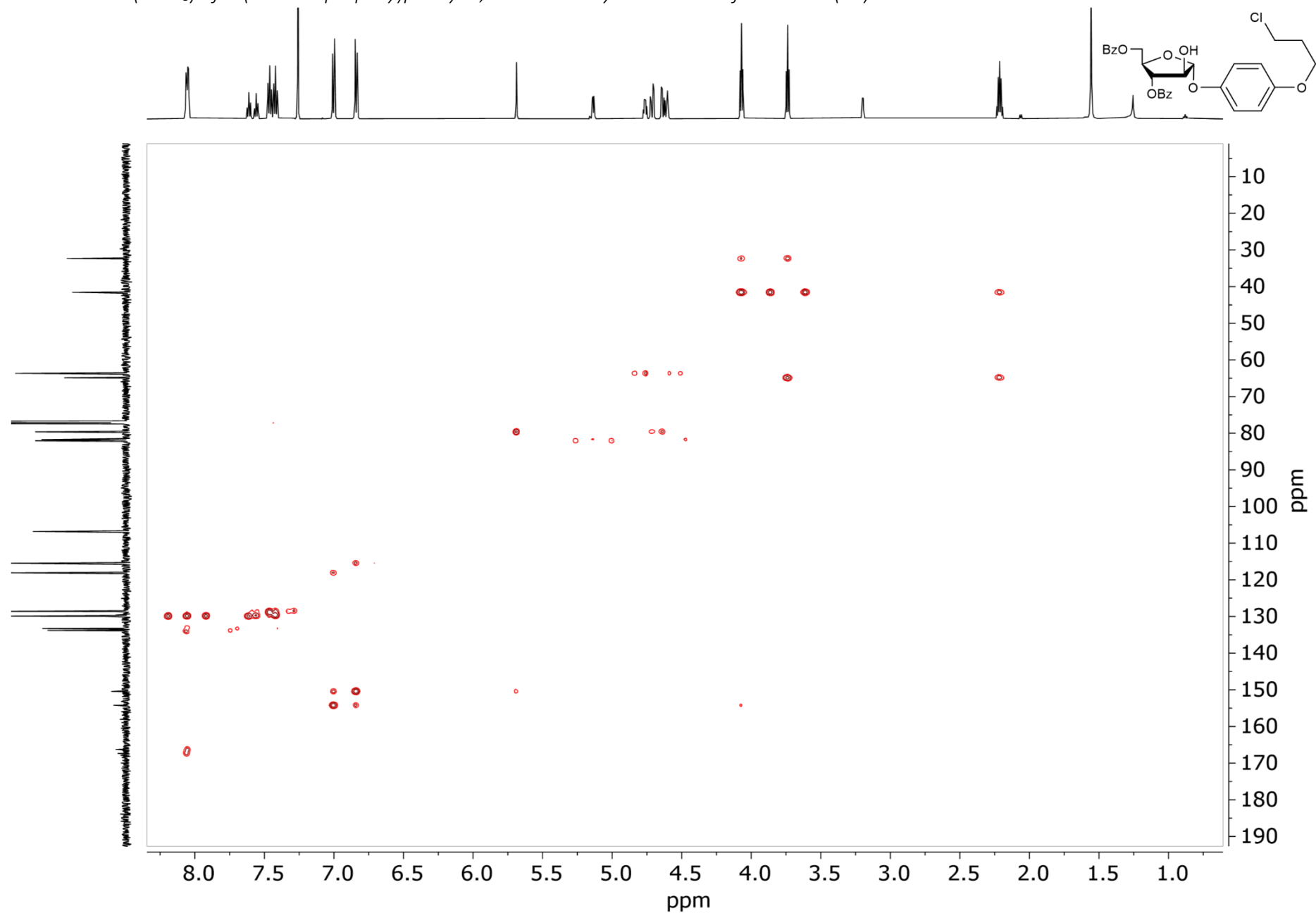
^1H - ^1H COSY (CDCl_3) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- α -D-arabinofuranoside (**3a**)



^1H - ^{13}C HSQC (CDCl_3) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- α -D-arabinofuranoside (**3a**)

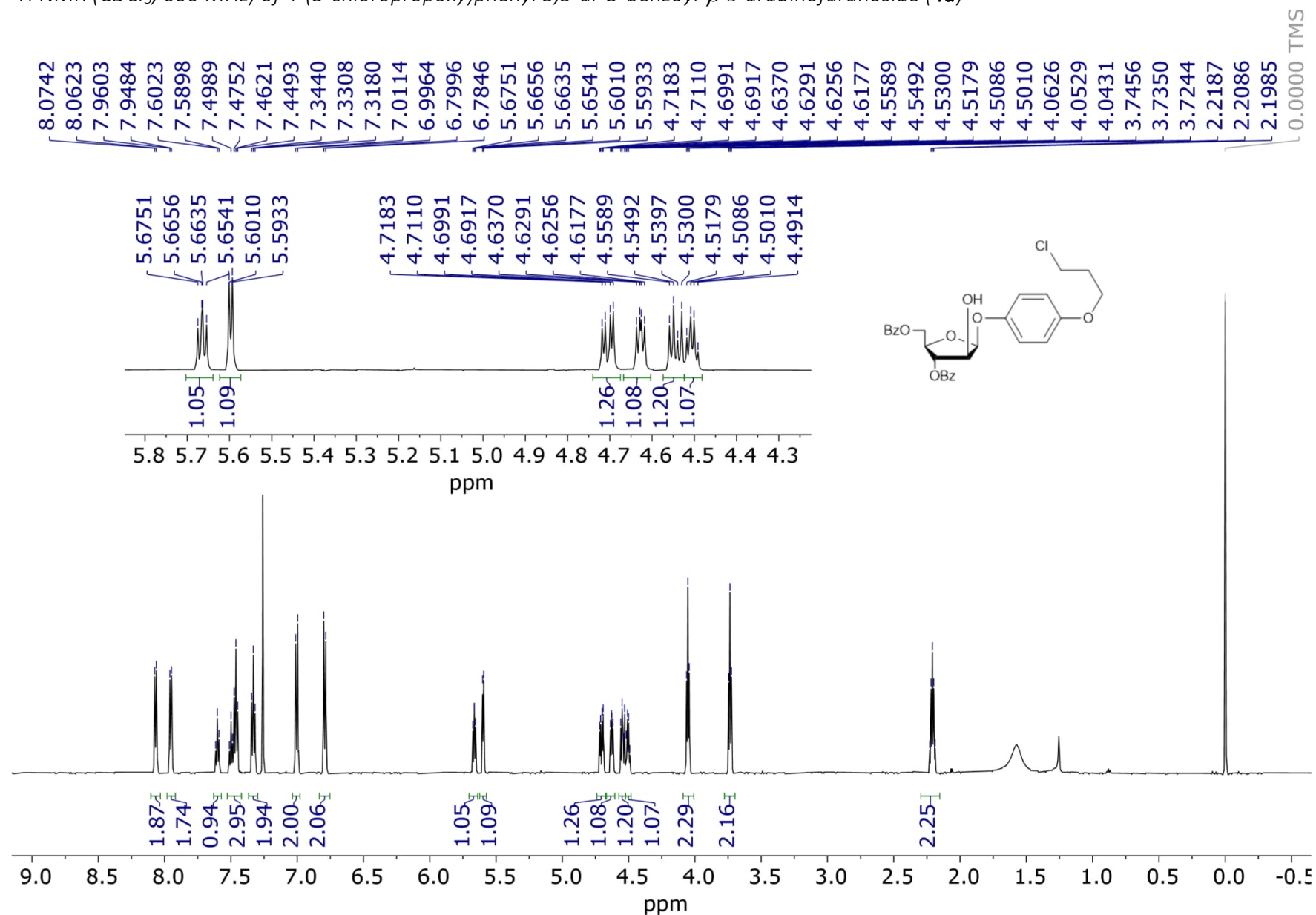


^1H - ^{13}C HMBC (CDCl_3) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- α -D-arabinofuranoside (**3a**)

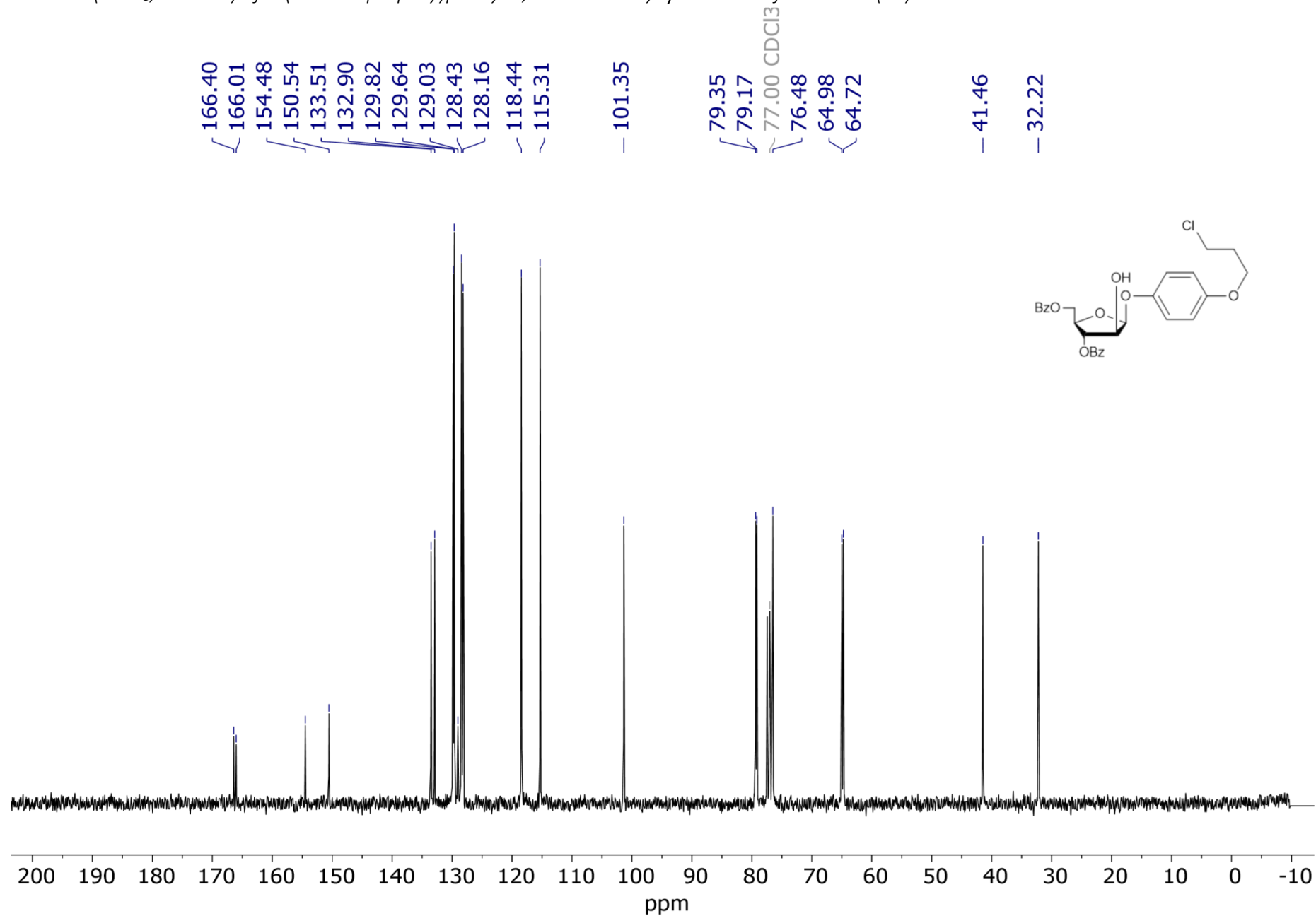


S.1.3. 4-(3-Chloropropoxy)phenyl 3,5-di-O-benzoyl- β -D-arabinofuranoside (4a)

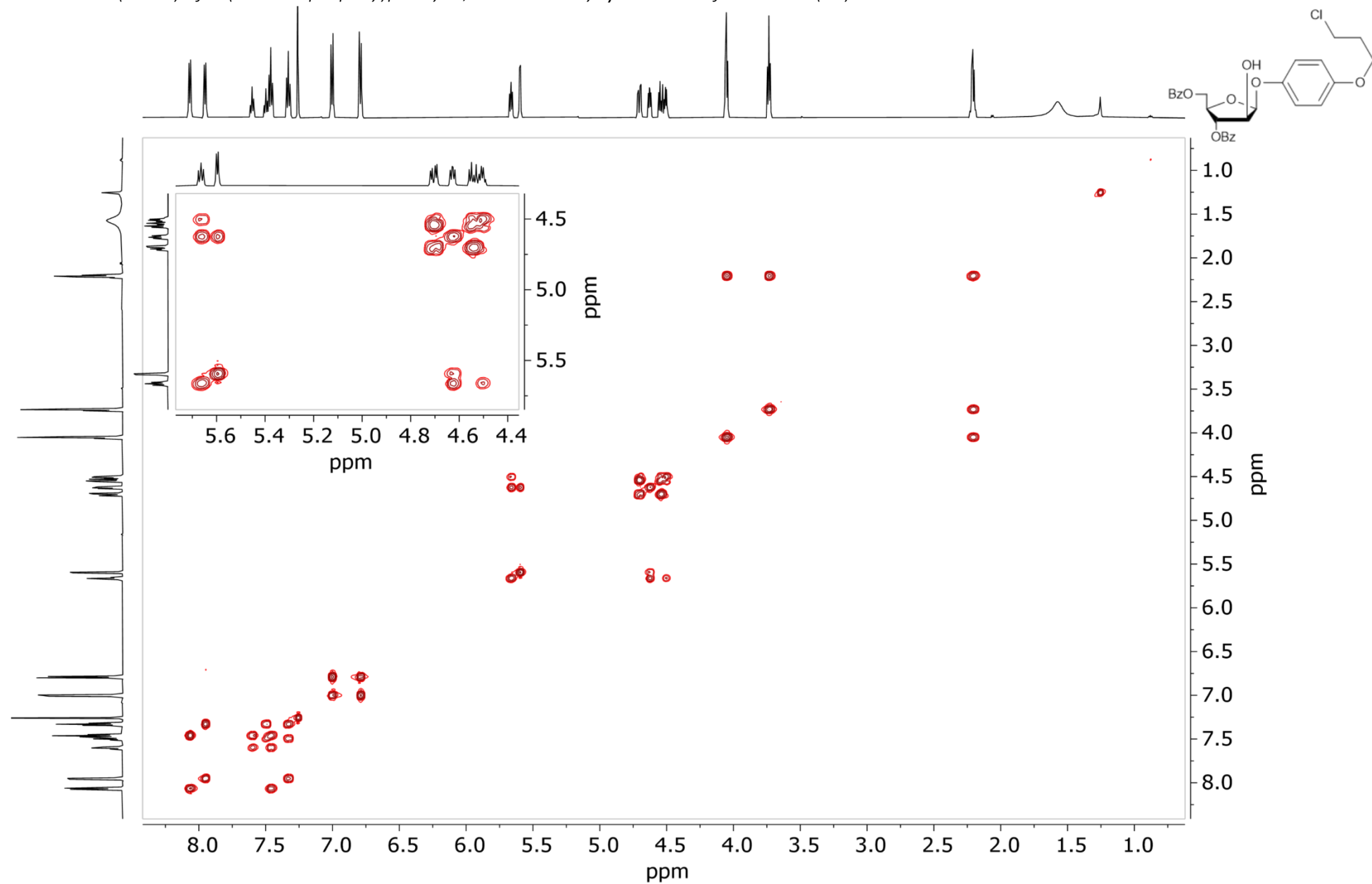
^1H NMR (CDCl_3 , 600 MHz) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- β -D-arabinofuranoside (4a)



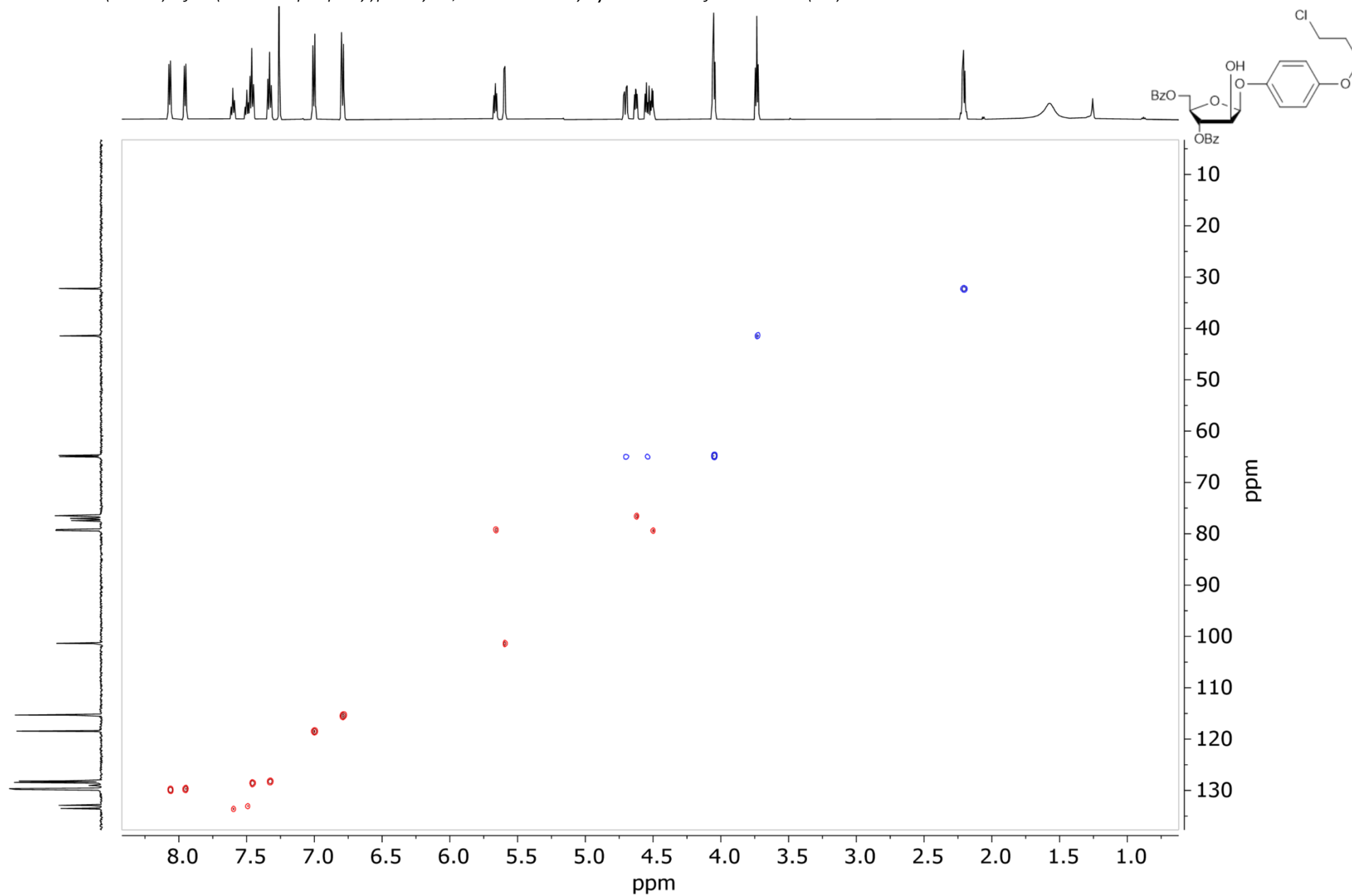
^{13}C NMR (CDCl_3 , 75 MHz) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- β -D-arabinofuranoside (**4a**)

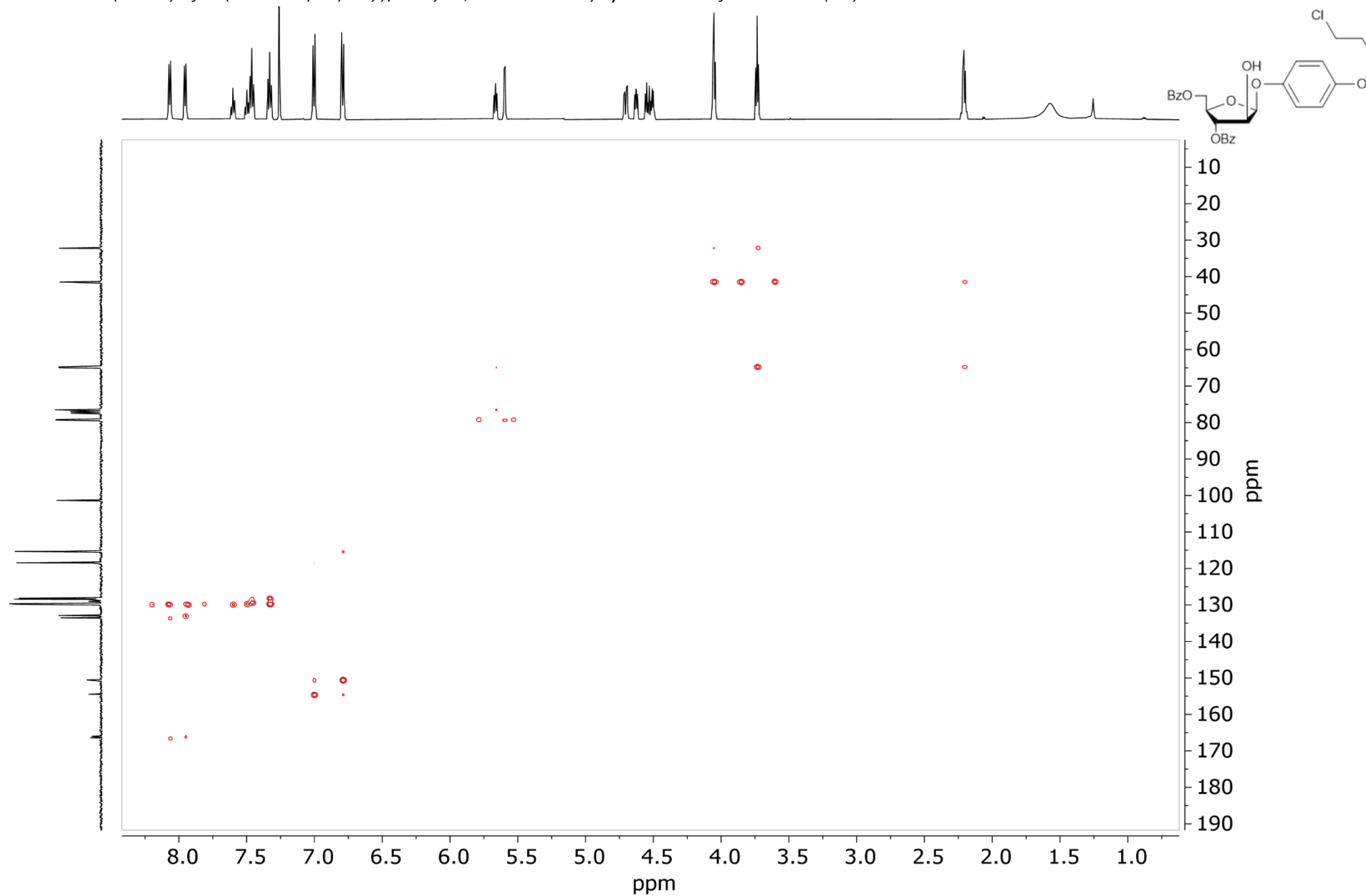


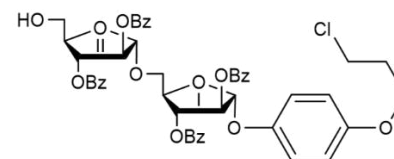
^1H - ^1H COSY (CDCl_3) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- β -D-arabinofuranoside (**4a**)



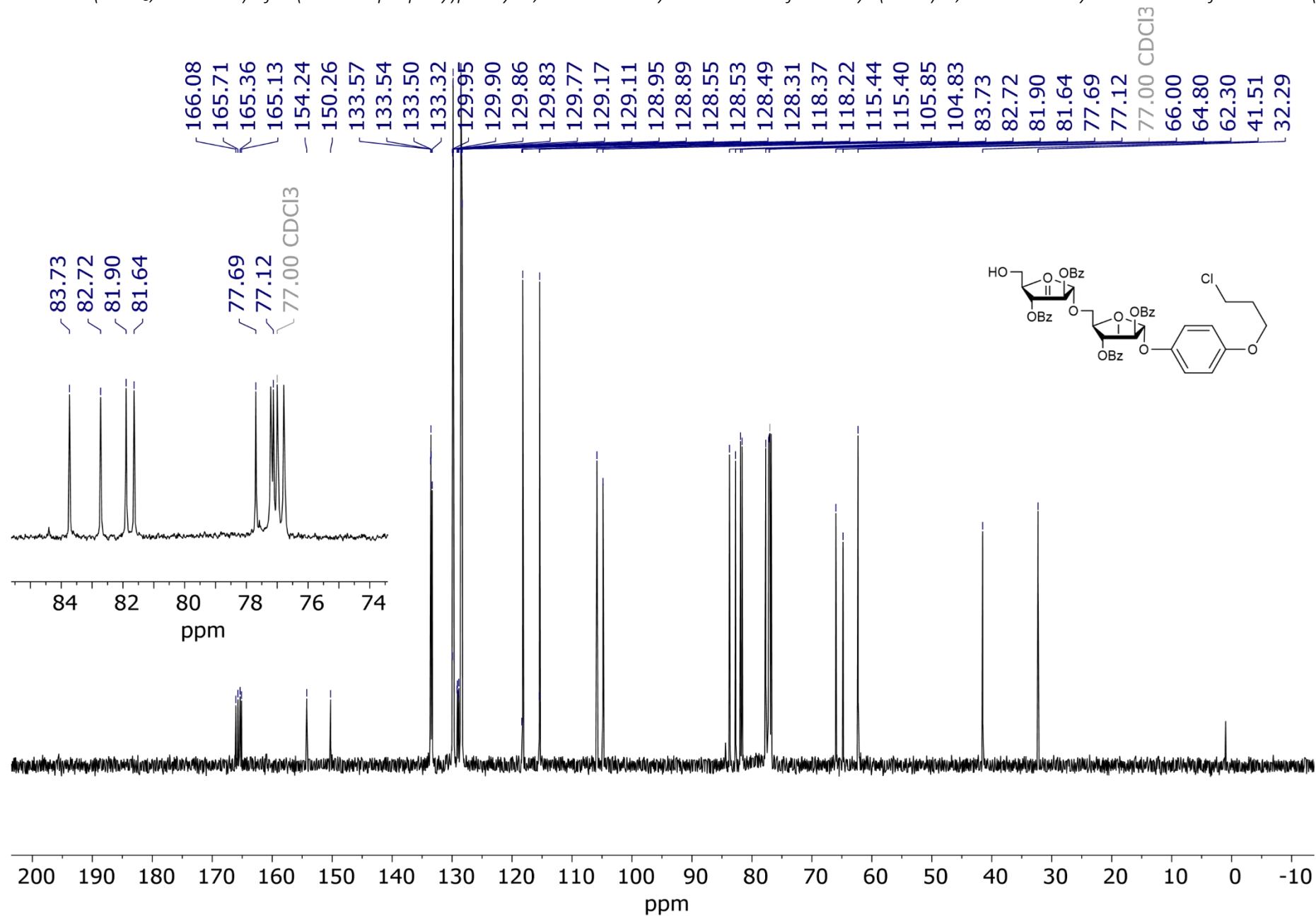
^1H - ^{13}C HSQC (CDCl_3) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- β -D-arabinofuranoside (**4a**)



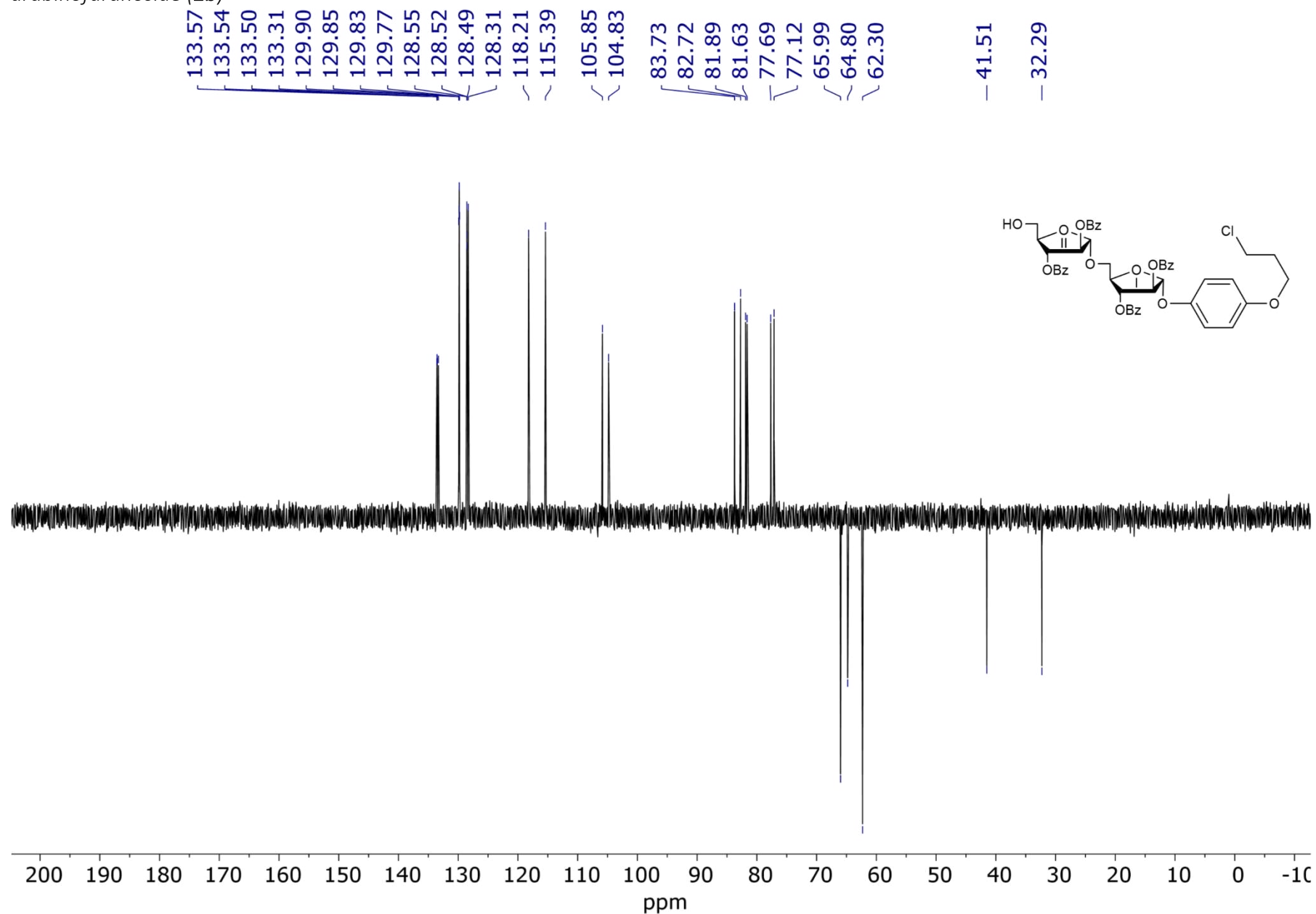
¹H-¹³C HMBC (CDCl₃) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl-β-D-arabinofuranoside (**4a**)

¹H NMR (CDCl₃, 600 MHz) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**2b**)

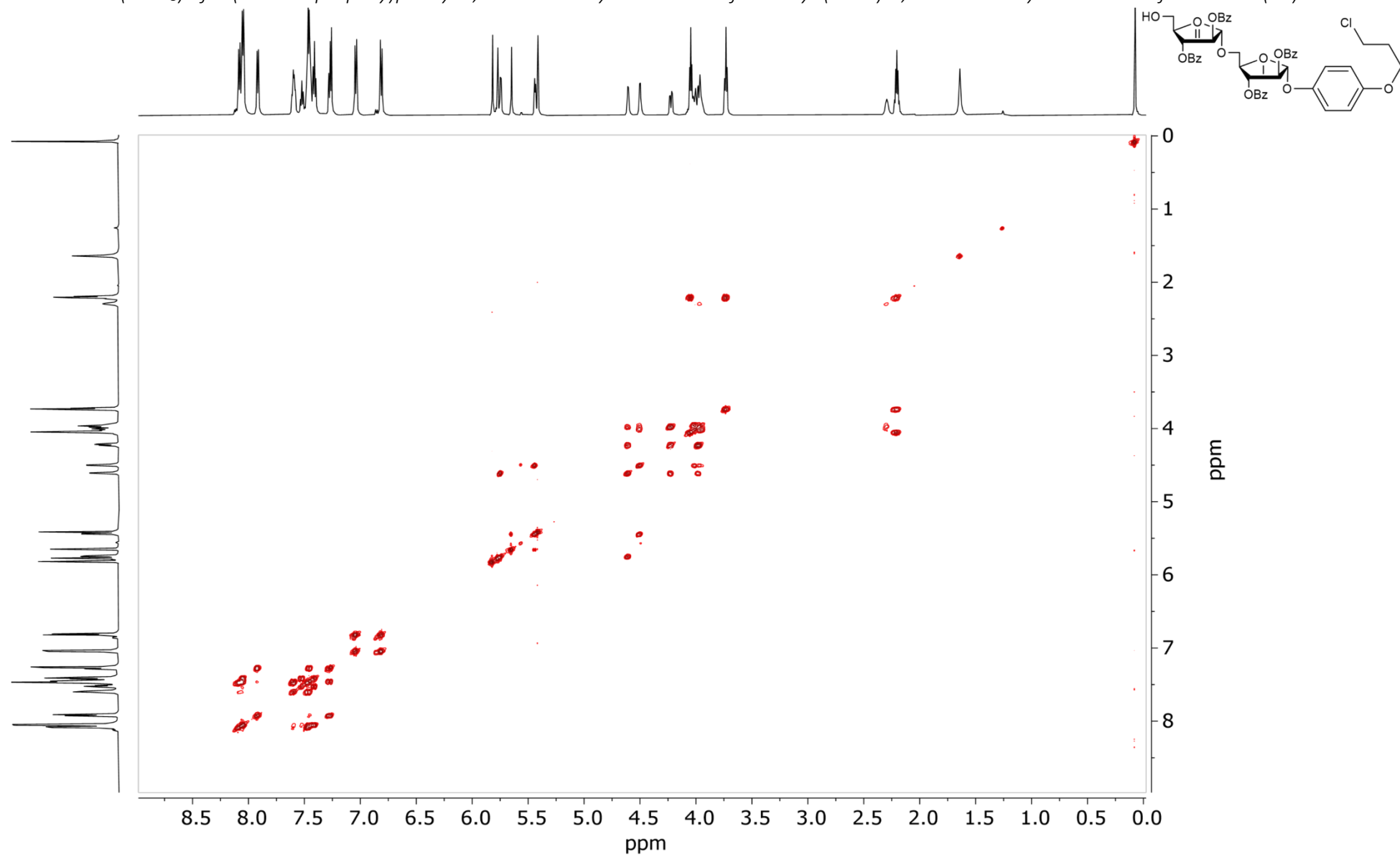
^{13}C NMR (CDCl_3 , 151 MHz) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**2b**)



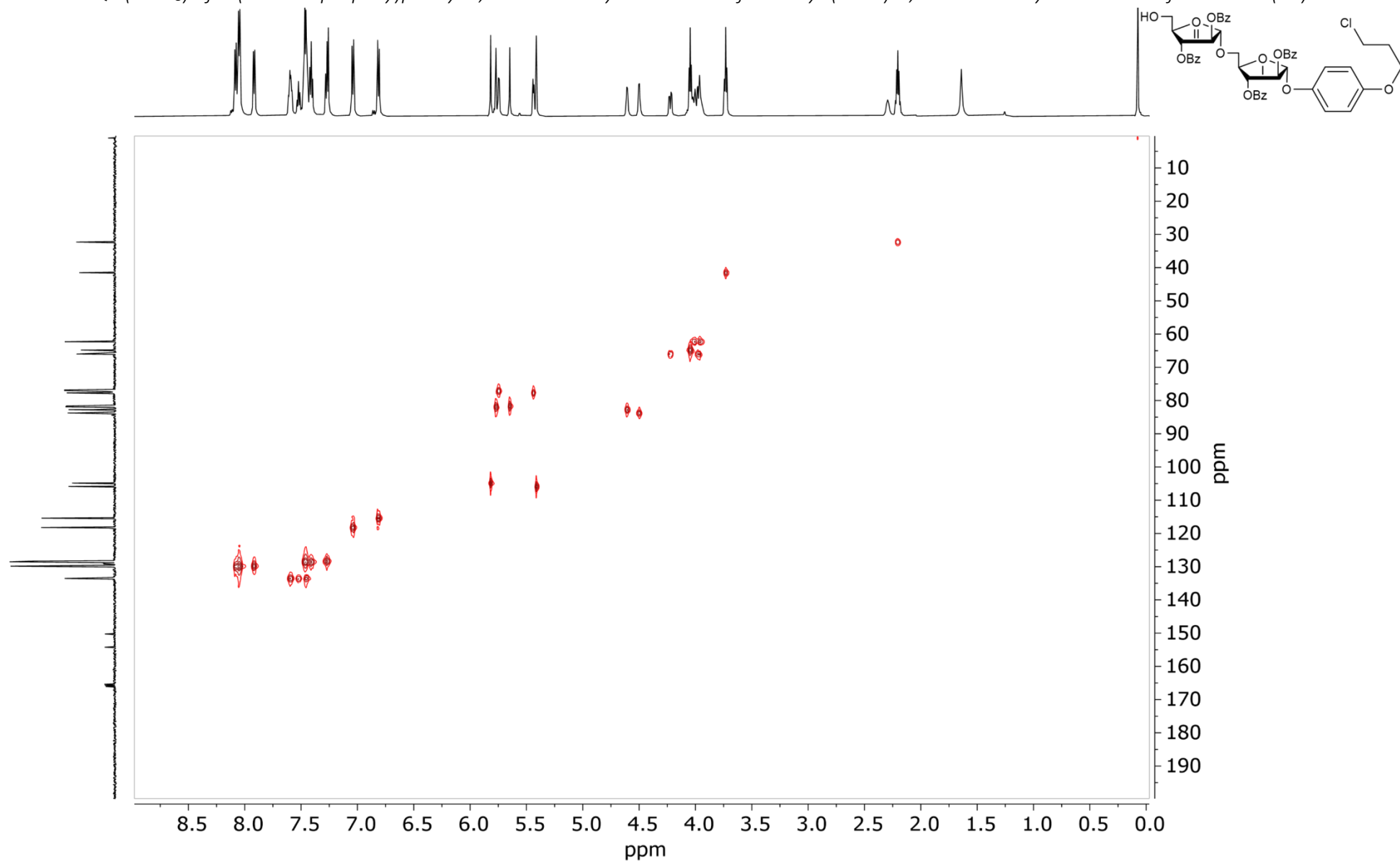
^{13}C DEPT-135 NMR (CDCl_3 , 151 MHz) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**2b**)



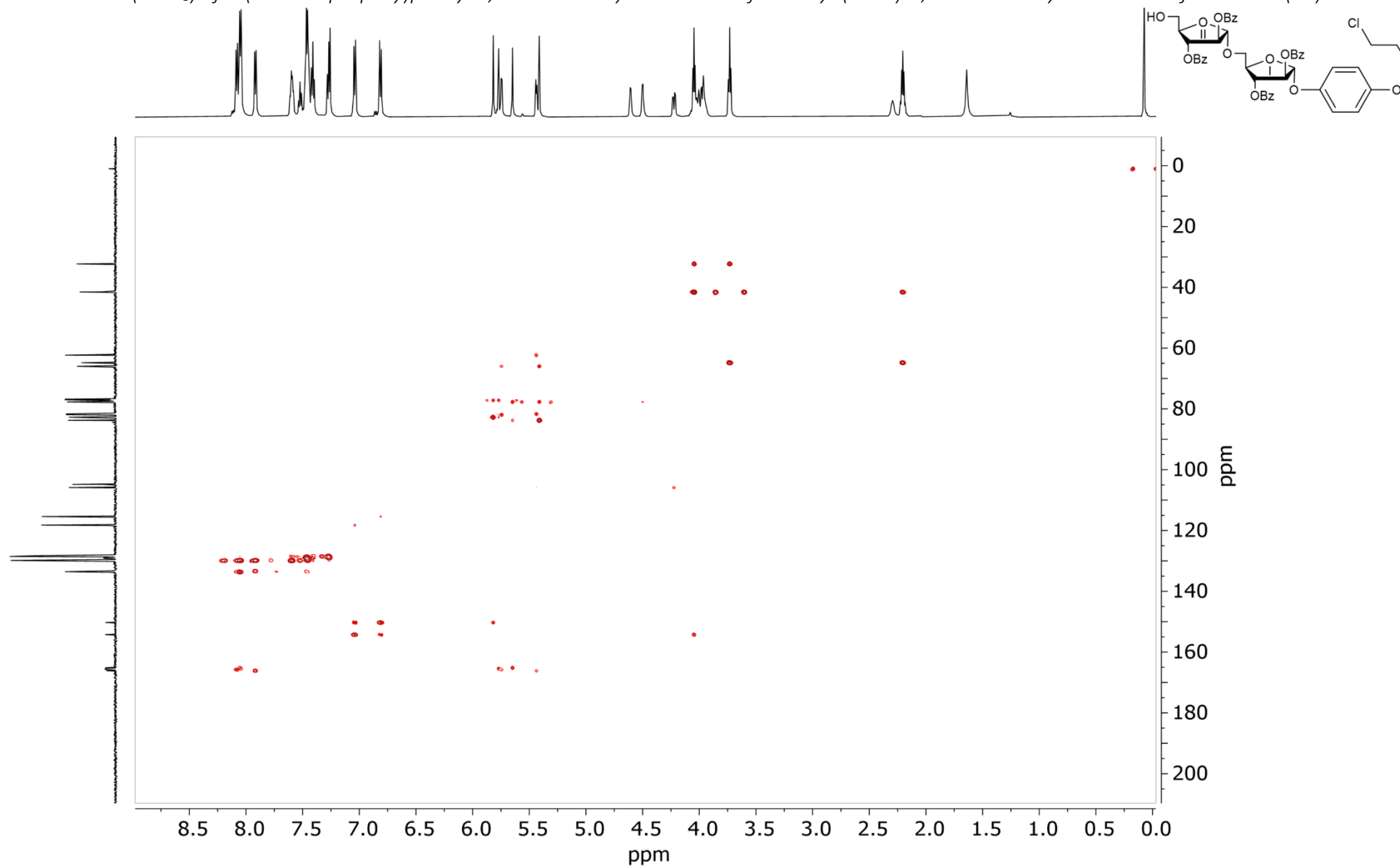
^1H - ^1H COSY (CDCl_3) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**2b**)



^1H - ^{13}C HSQC (CDCl_3) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**2b**)

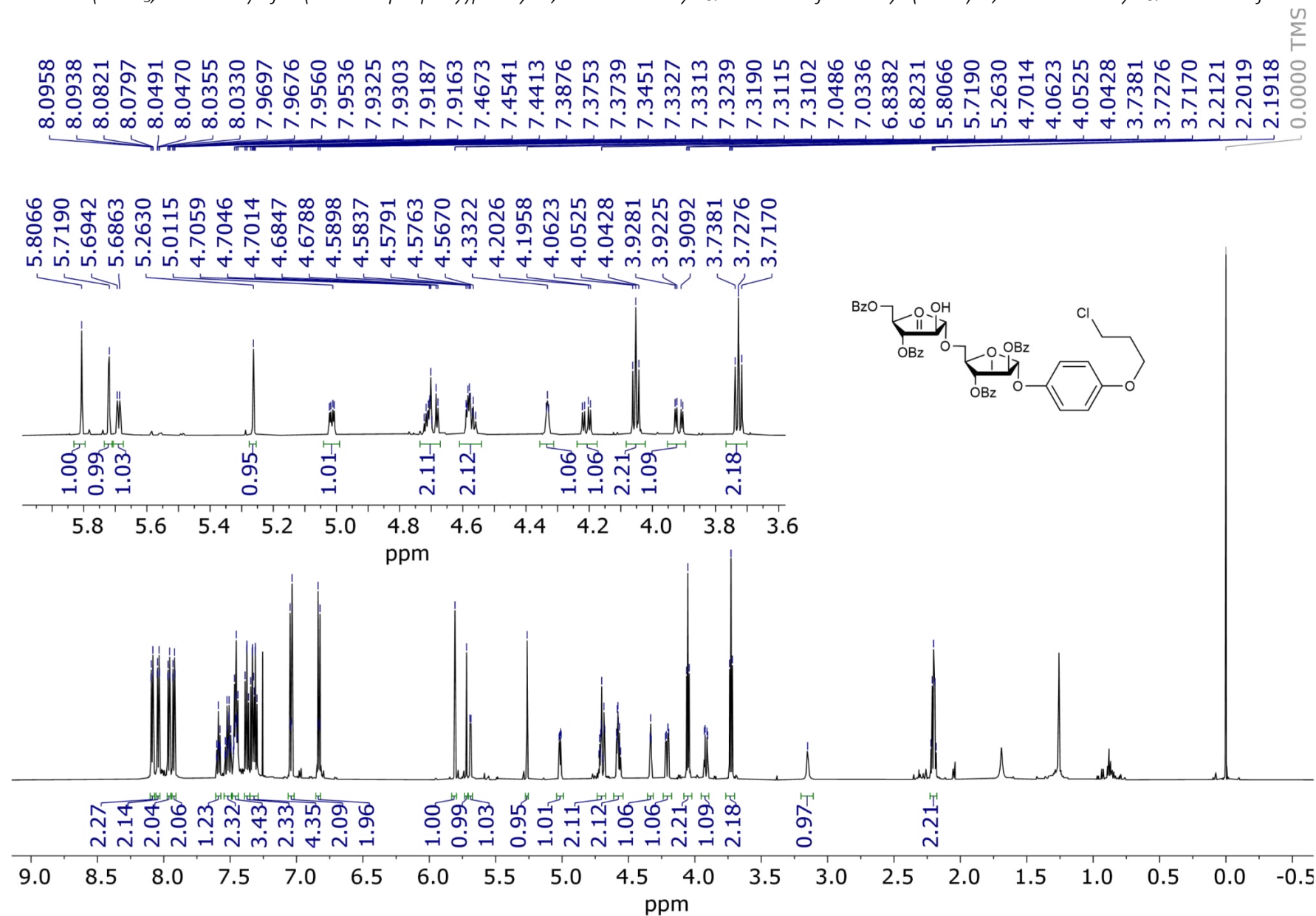


^1H - ^{13}C HMBC (CDCl_3) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**2b**)

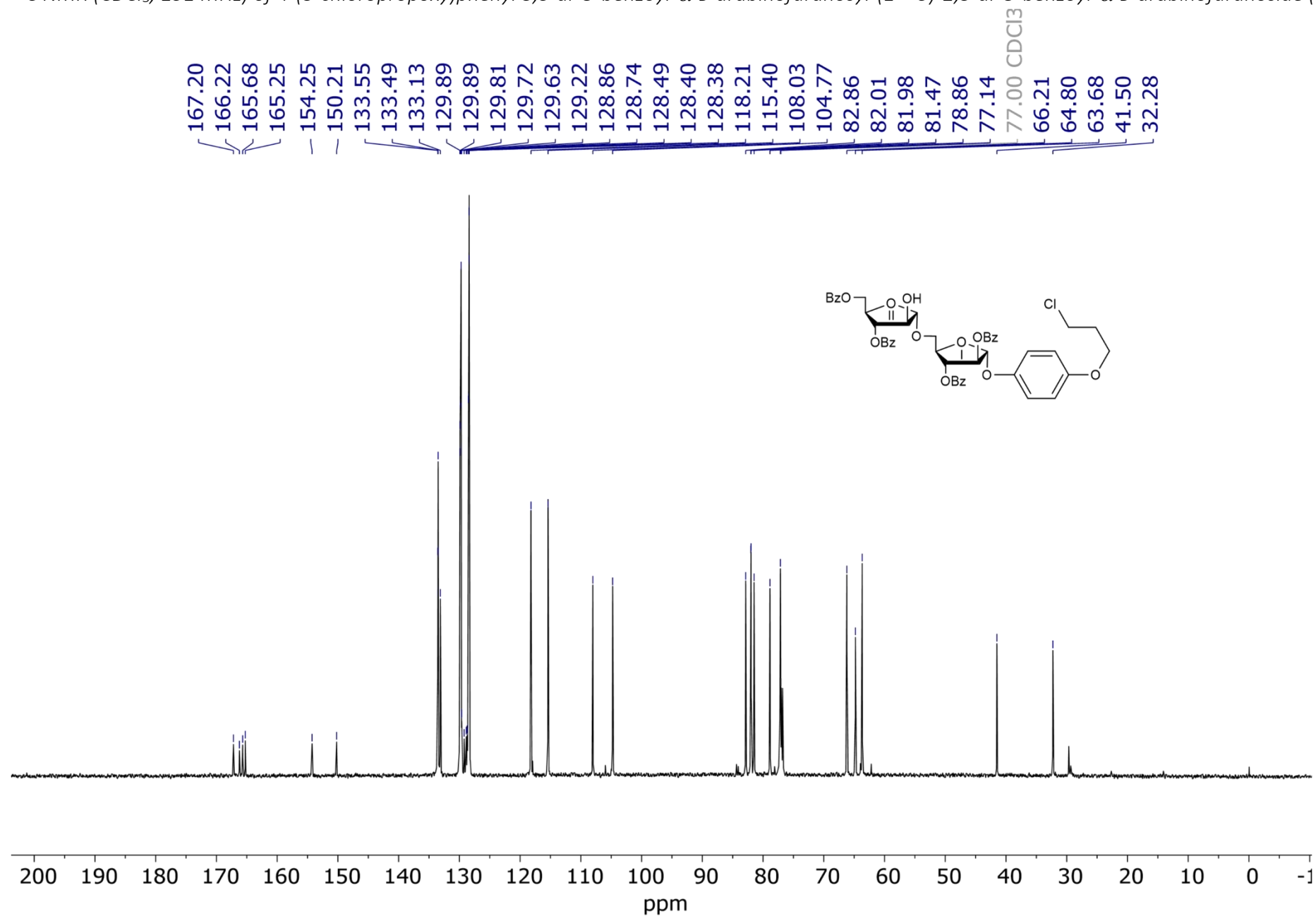


S.1.5. 4-(3-Chloropropoxy)phenyl 3,5-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**3b**)

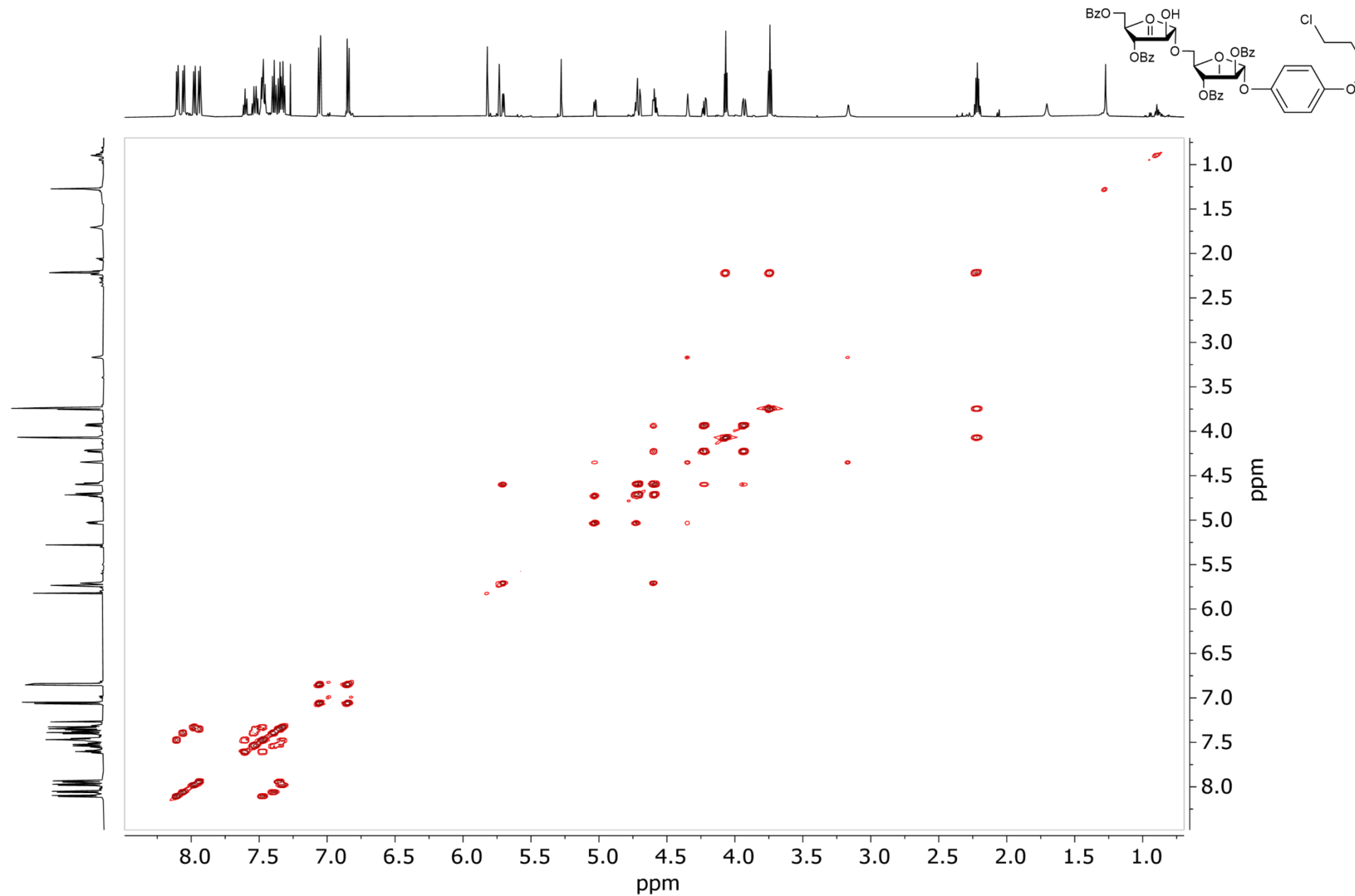
^1H NMR (CDCl_3 , 600 MHz) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**3b**)



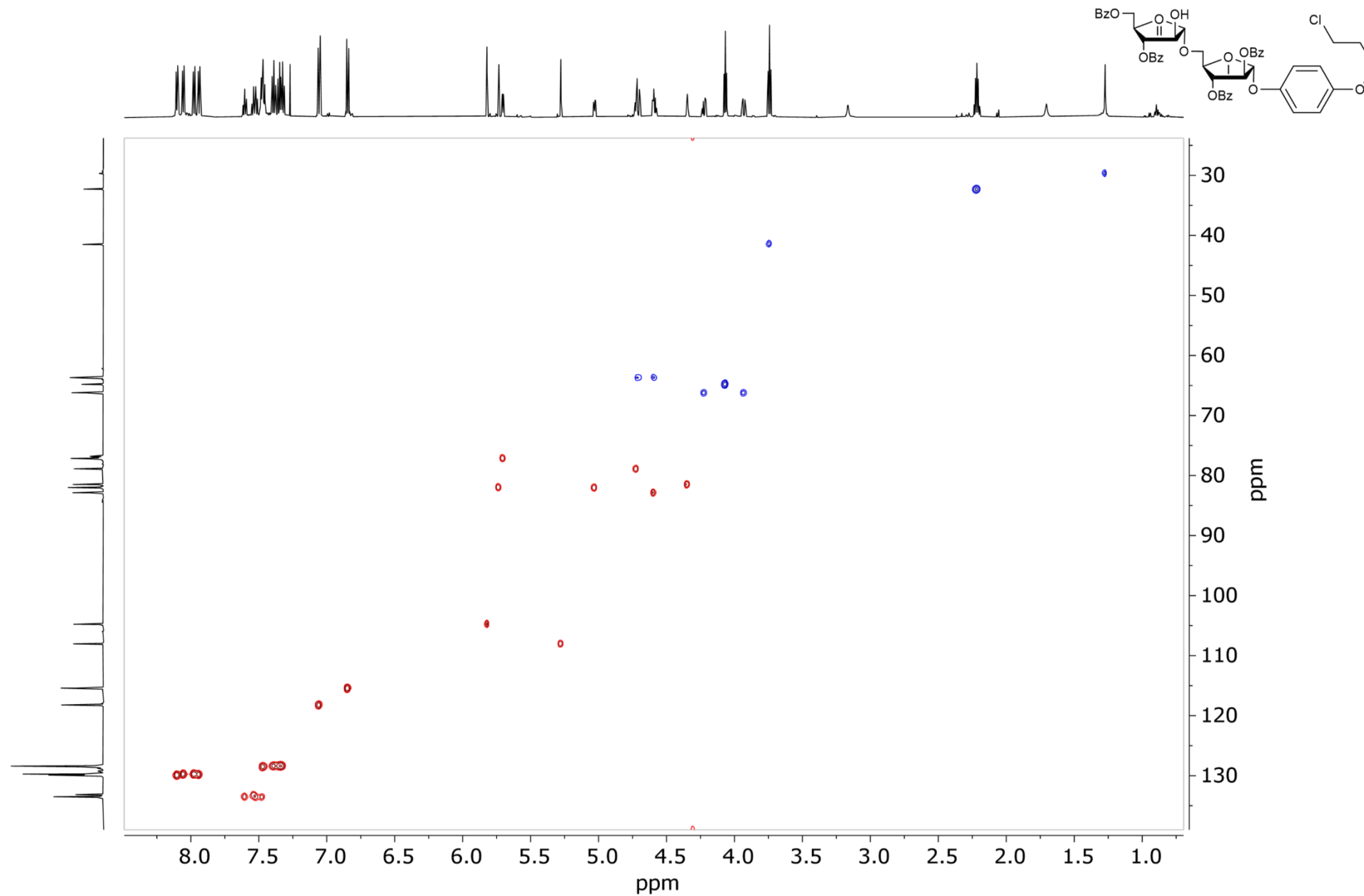
^{13}C NMR (CDCl_3 , 151 MHz) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**3b**)



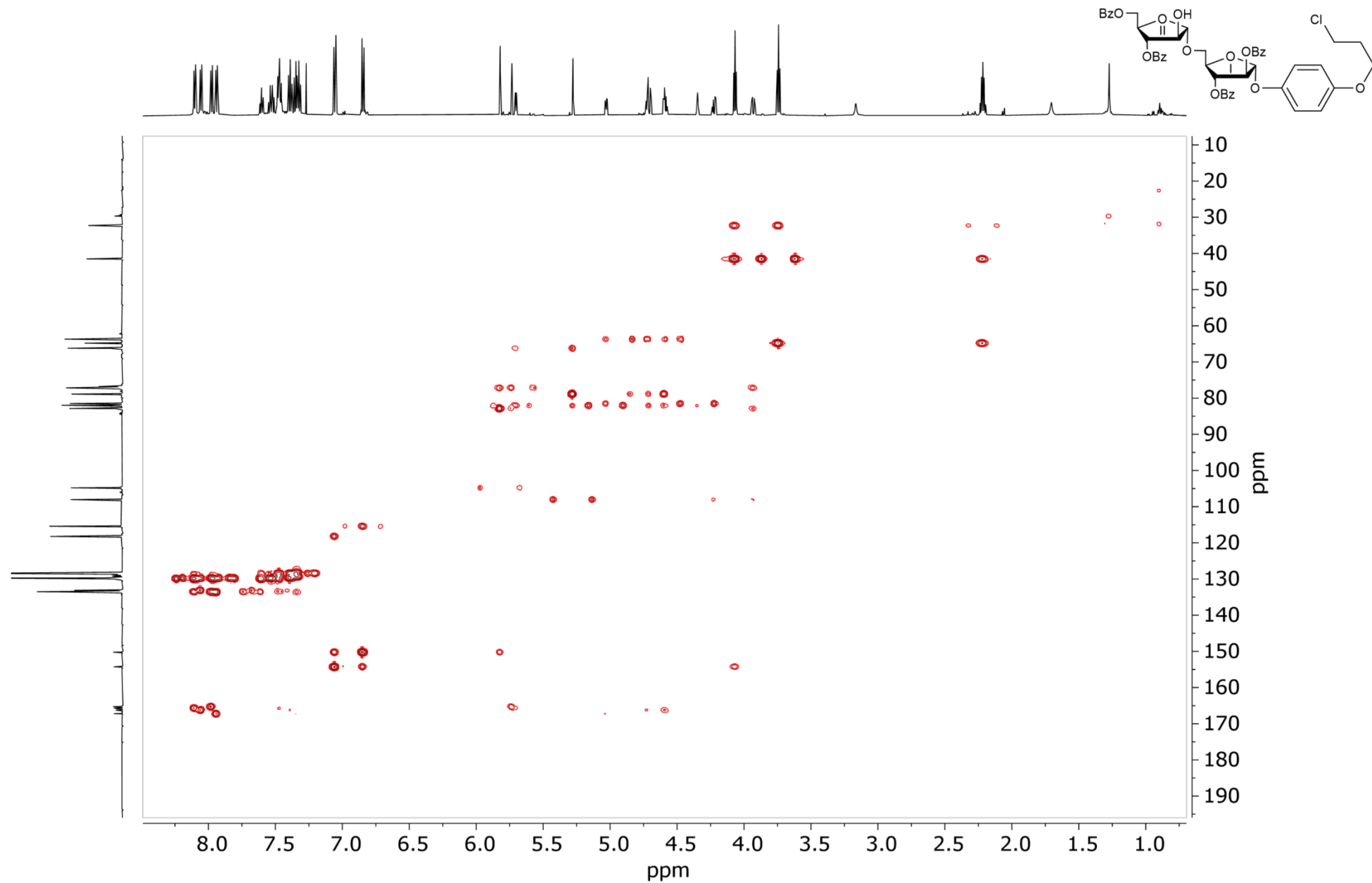
^1H - ^1H COSY (CDCl_3) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**3b**)



^1H - ^{13}C HSQC (CDCl_3) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**3b**)

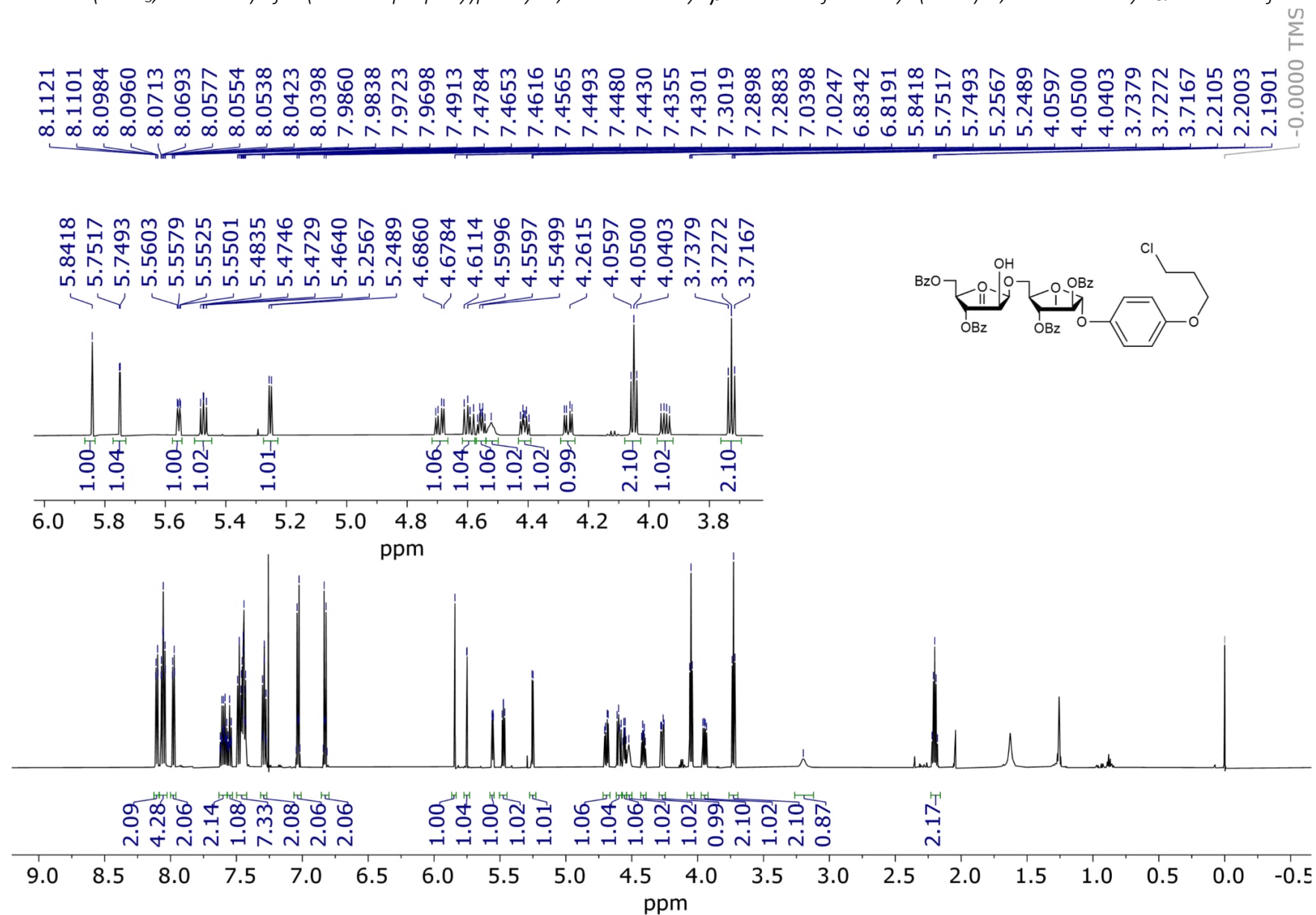


^1H - ^{13}C HMBC (CDCl_3) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**3b**)

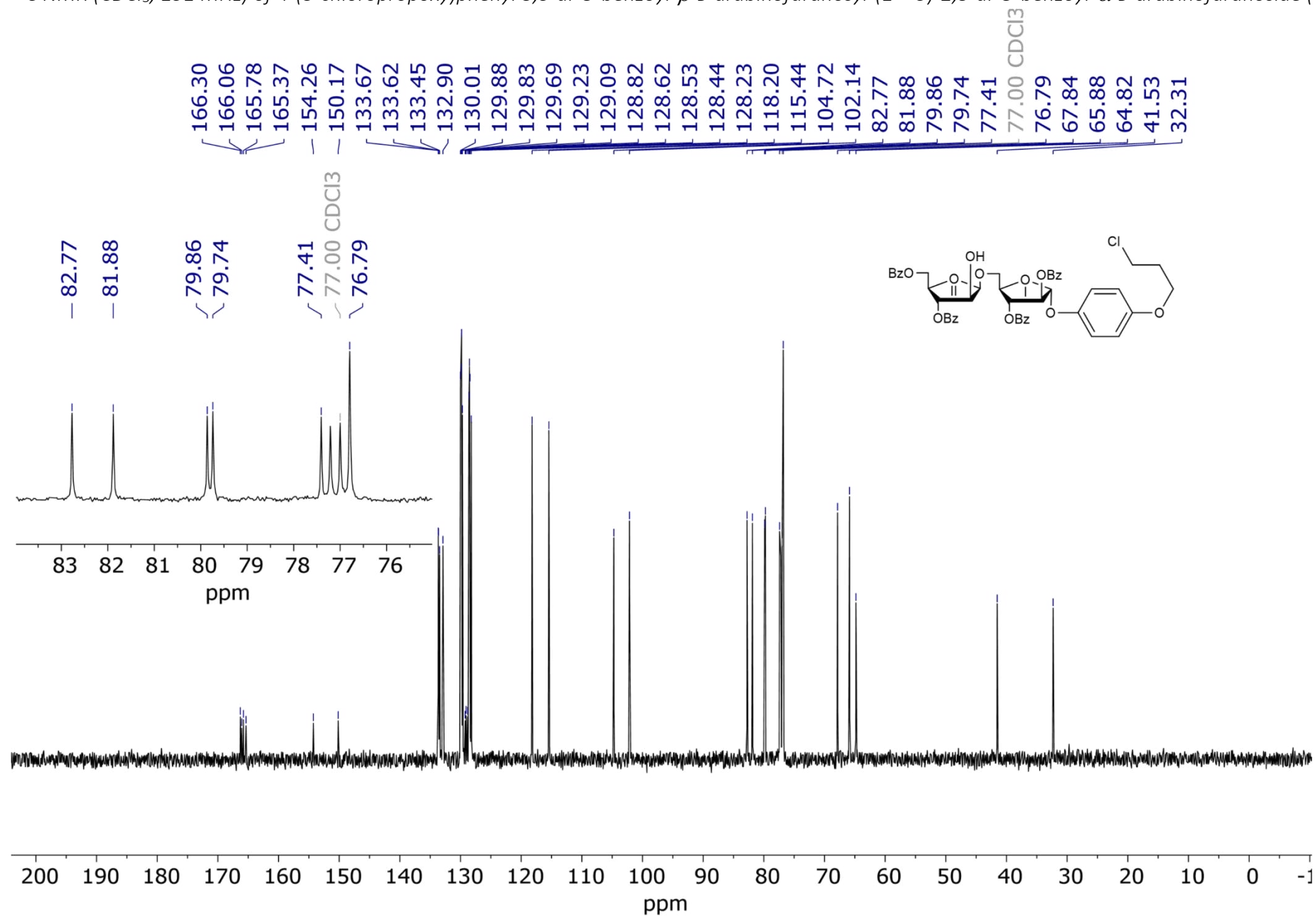


S.1.6. 4-(3-Chloropropoxy)phenyl 3,5-di-O-benzoyl- β -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**4b**)

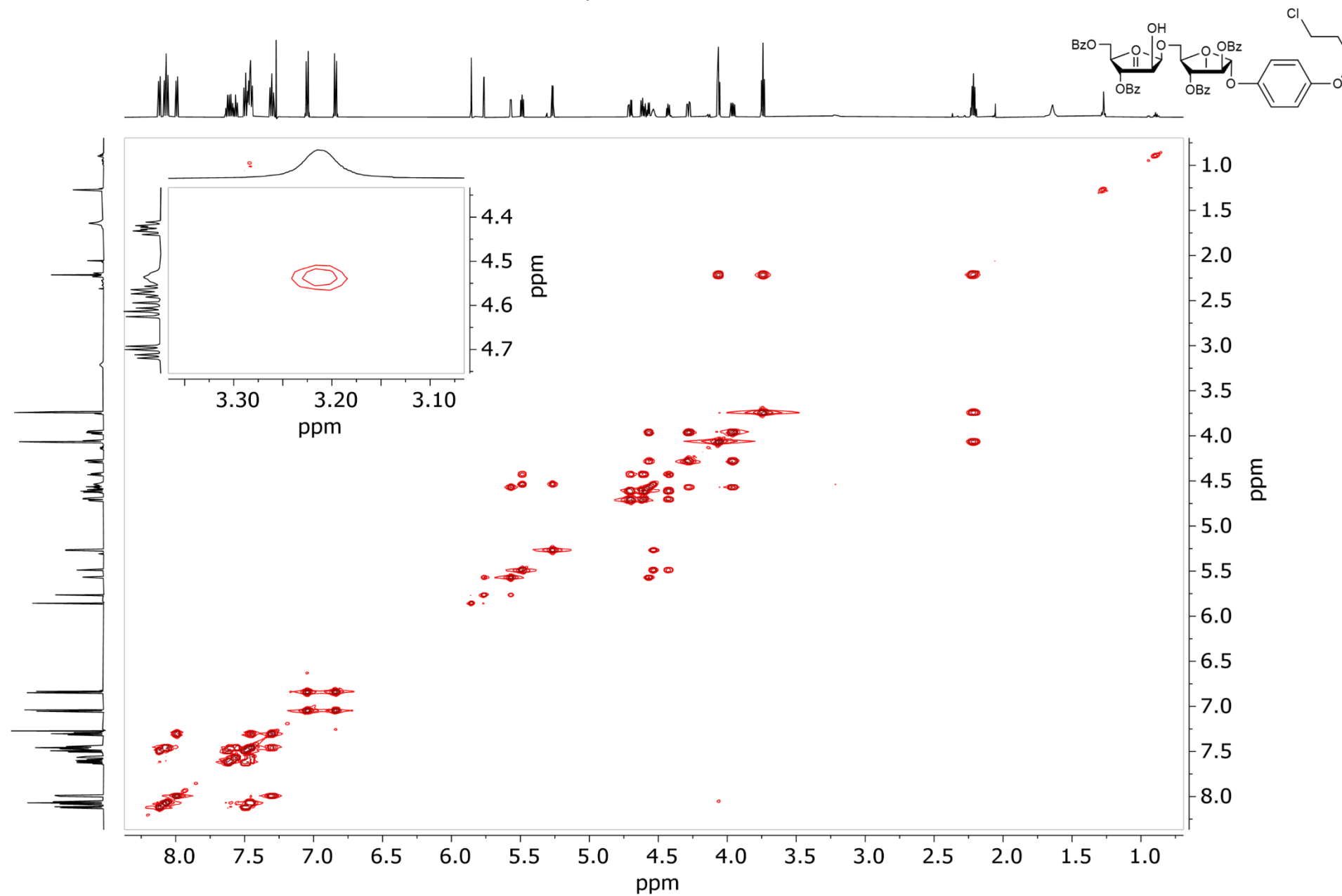
^1H NMR (CDCl_3 , 600 MHz) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- β -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**4b**)



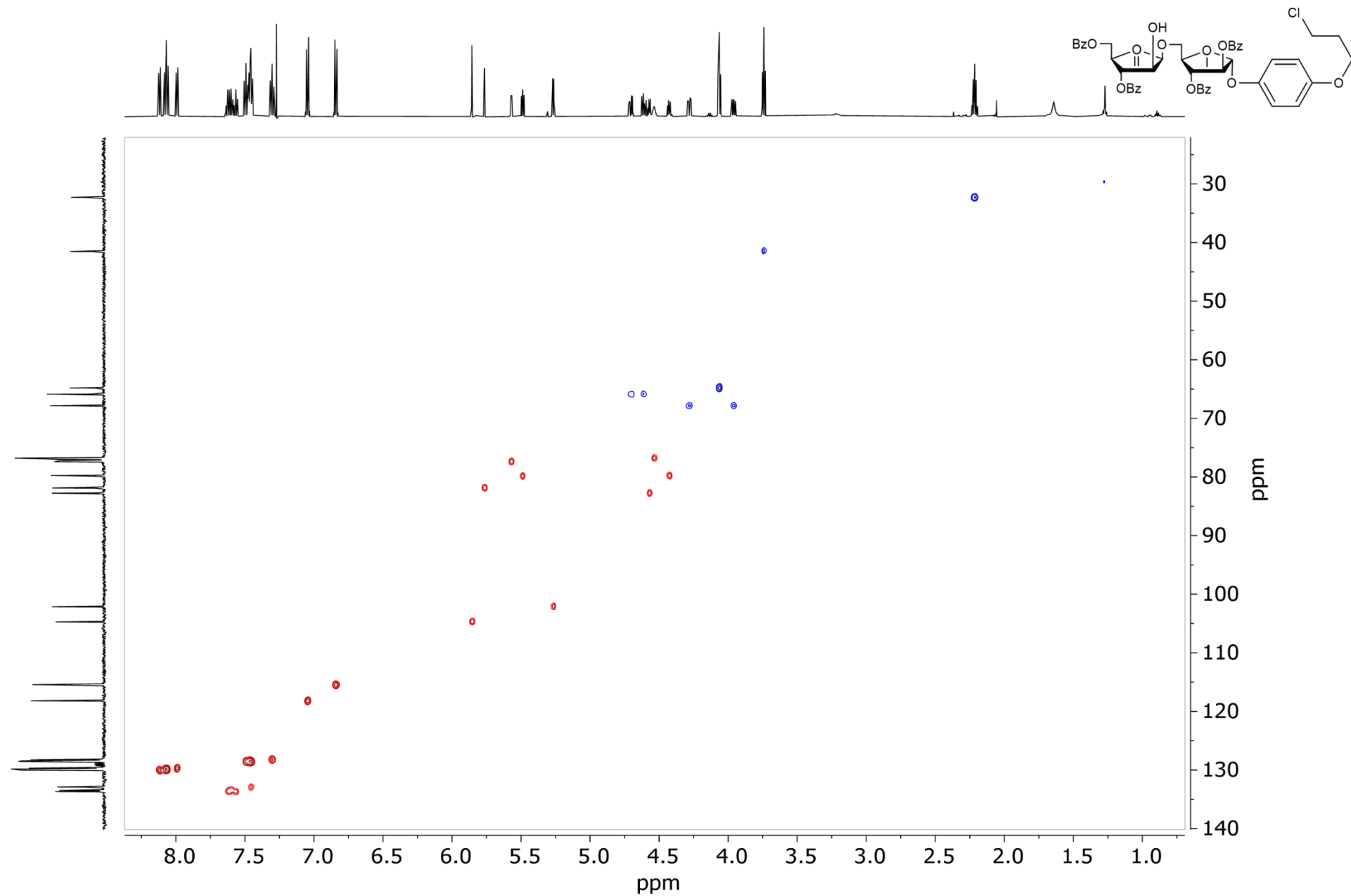
^{13}C NMR (CDCl_3 , 151 MHz) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- β -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**4b**)



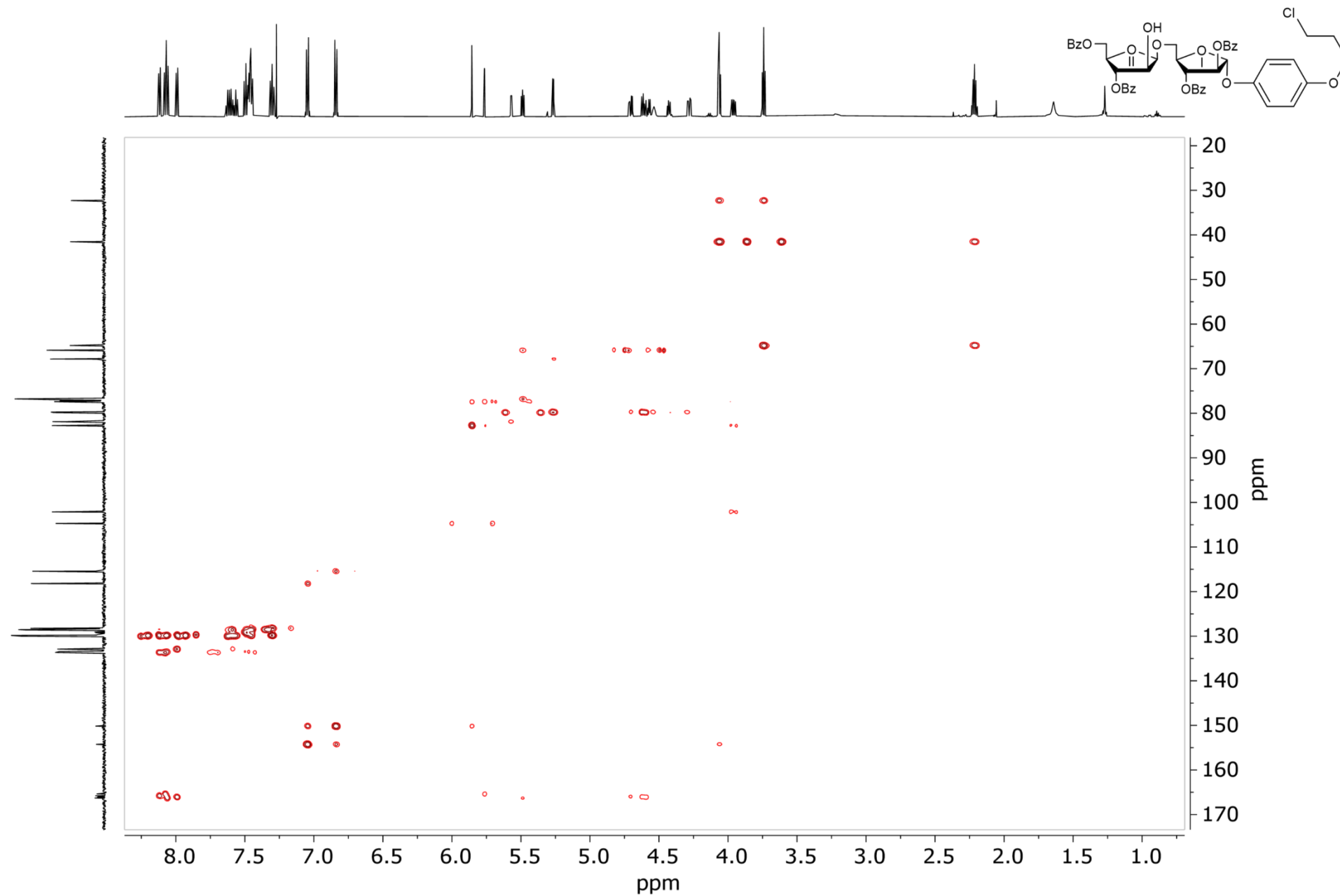
^1H - ^1H COSY (CDCl_3) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- β -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**4b**)



^1H - ^{13}C HSQC (CDCl_3) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- β -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**4b**)

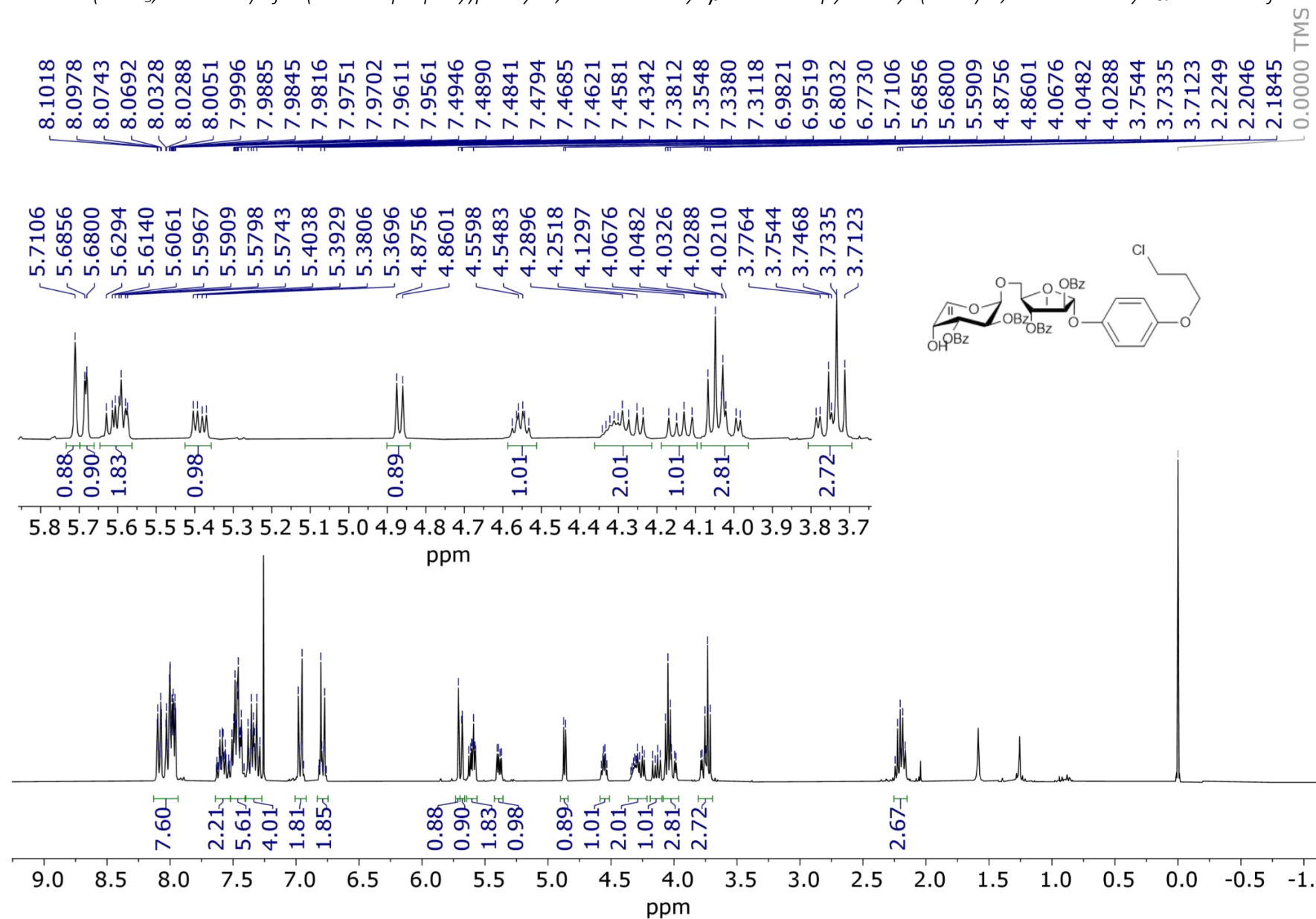


^1H - ^{13}C HMBC (CDCl_3) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- β -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**4b**)

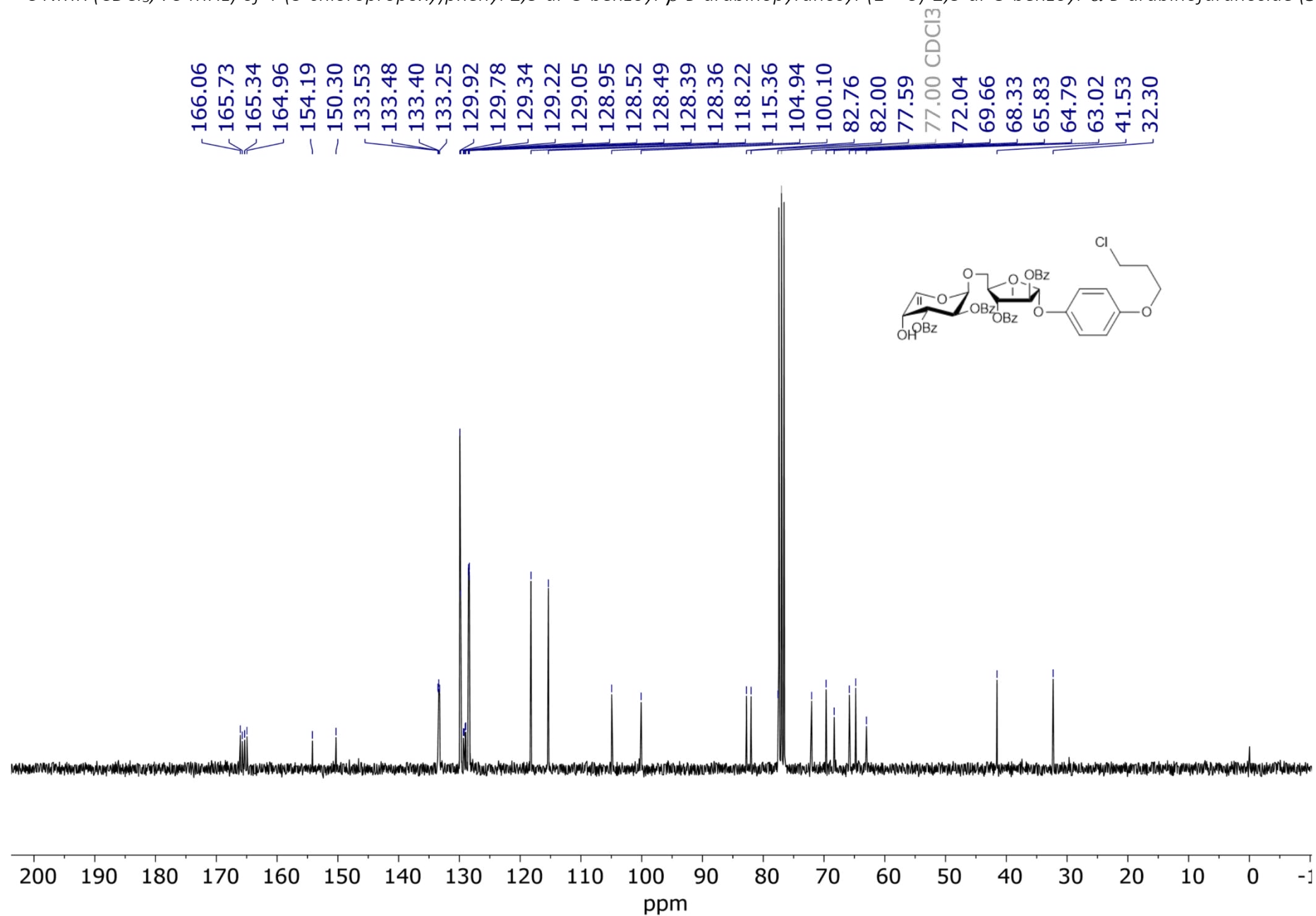


S.1.7. 4-(3-Chloropropoxy)phenyl 2,3-di-O-benzoyl- β -D-arabinopyranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (5a)

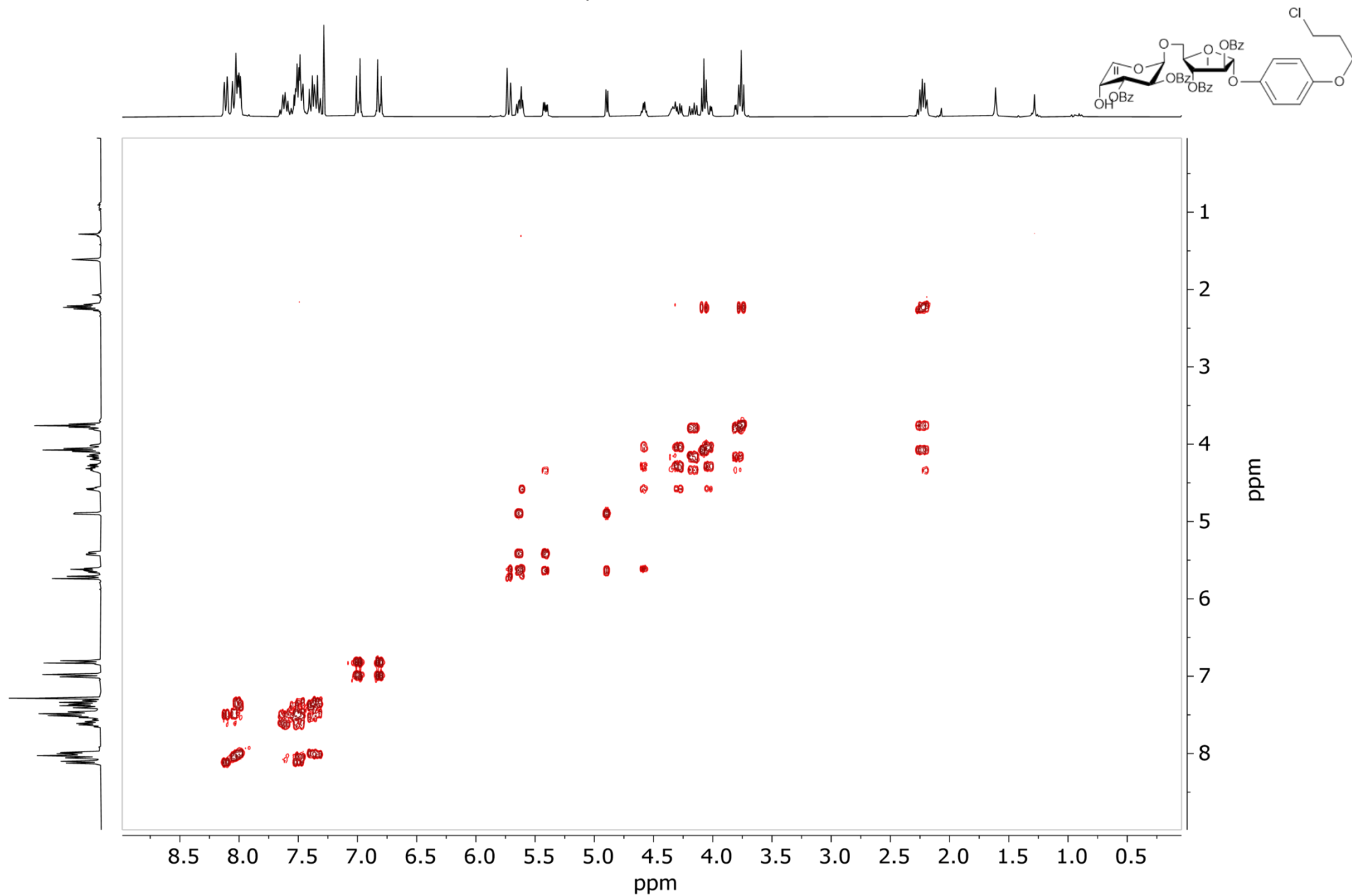
^1H NMR (CDCl_3 , 300 MHz) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- β -D-arabinopyranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (5a)



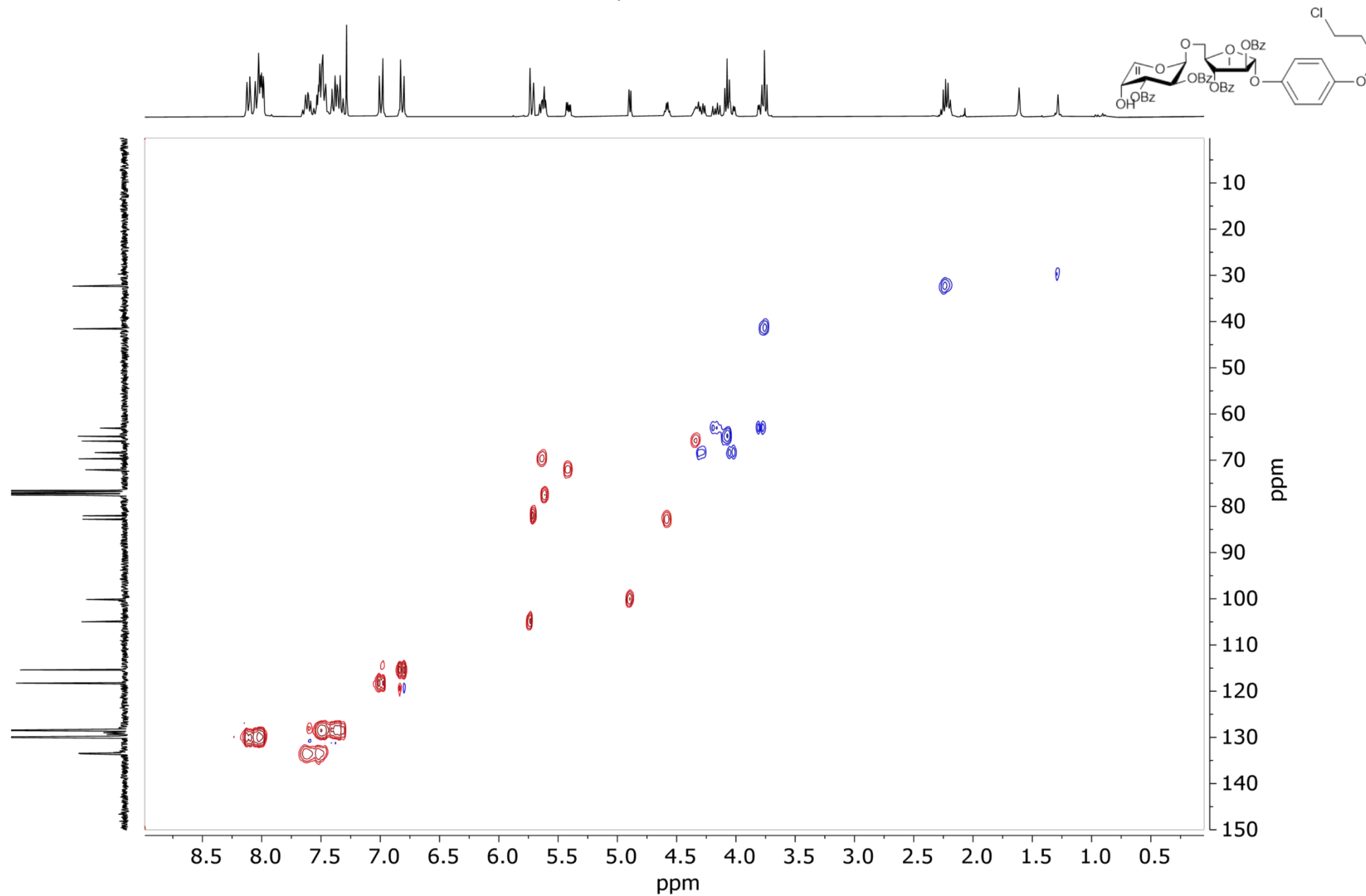
^{13}C NMR (CDCl_3 , 75 MHz) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- β -D-arabinopyranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**5a**)



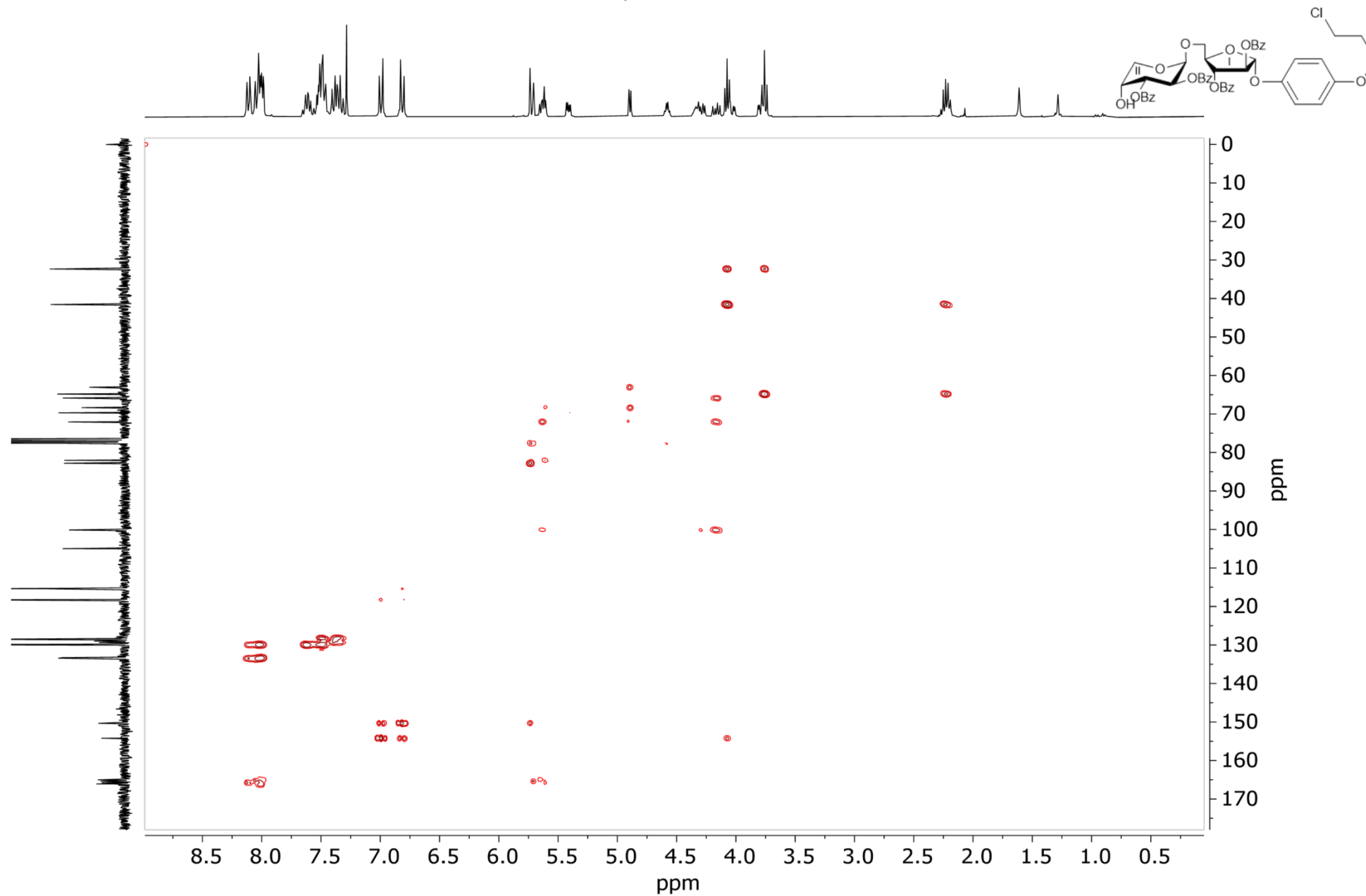
^1H - ^1H COSY (CDCl_3) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- β -D-arabinopyranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**5a**)



^1H - ^{13}C HSQC (CDCl_3) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- β -D-arabinopyranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**5a**)

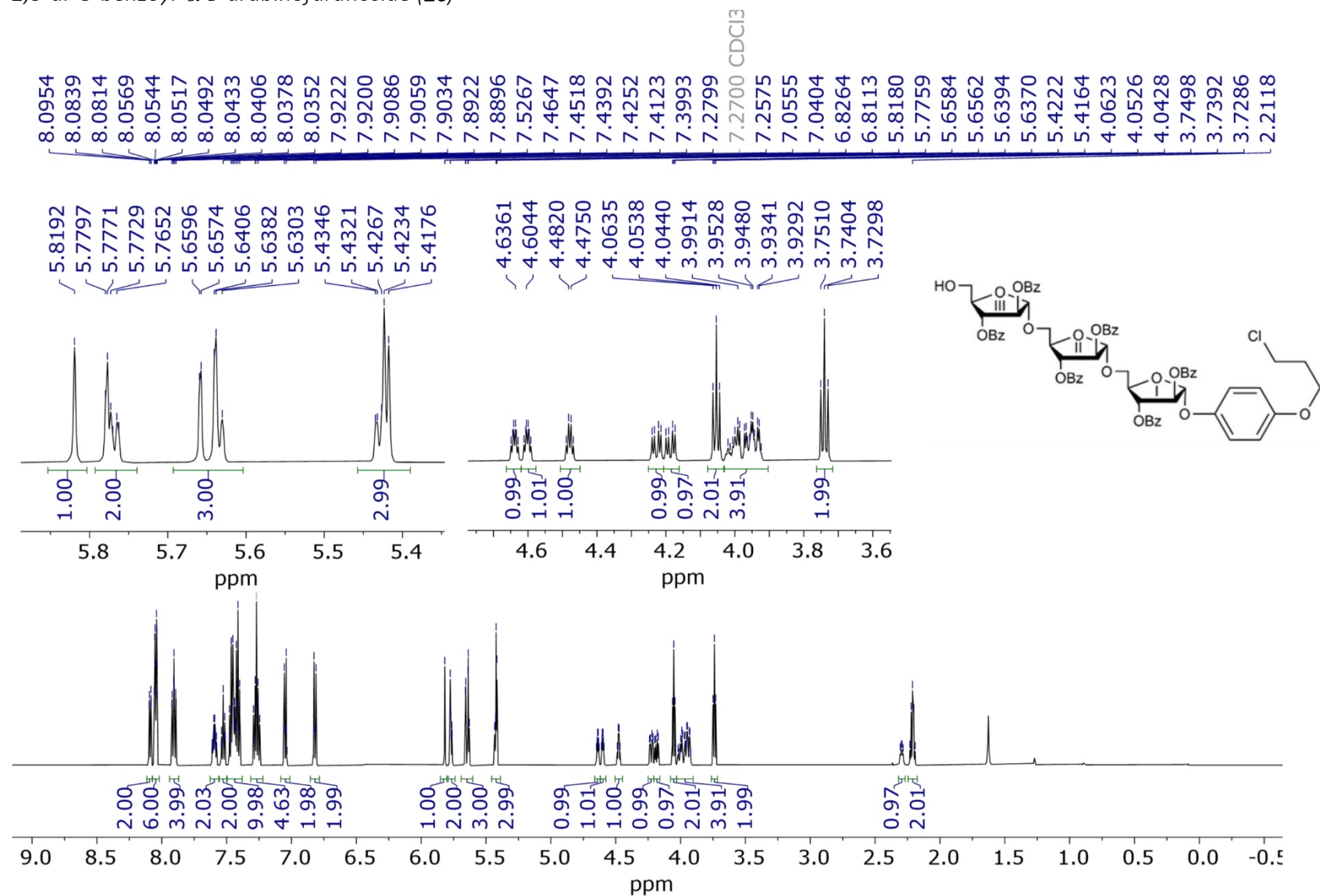


^1H - ^{13}C HMBC (CDCl_3) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- β -D-arabinopyranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**5a**)

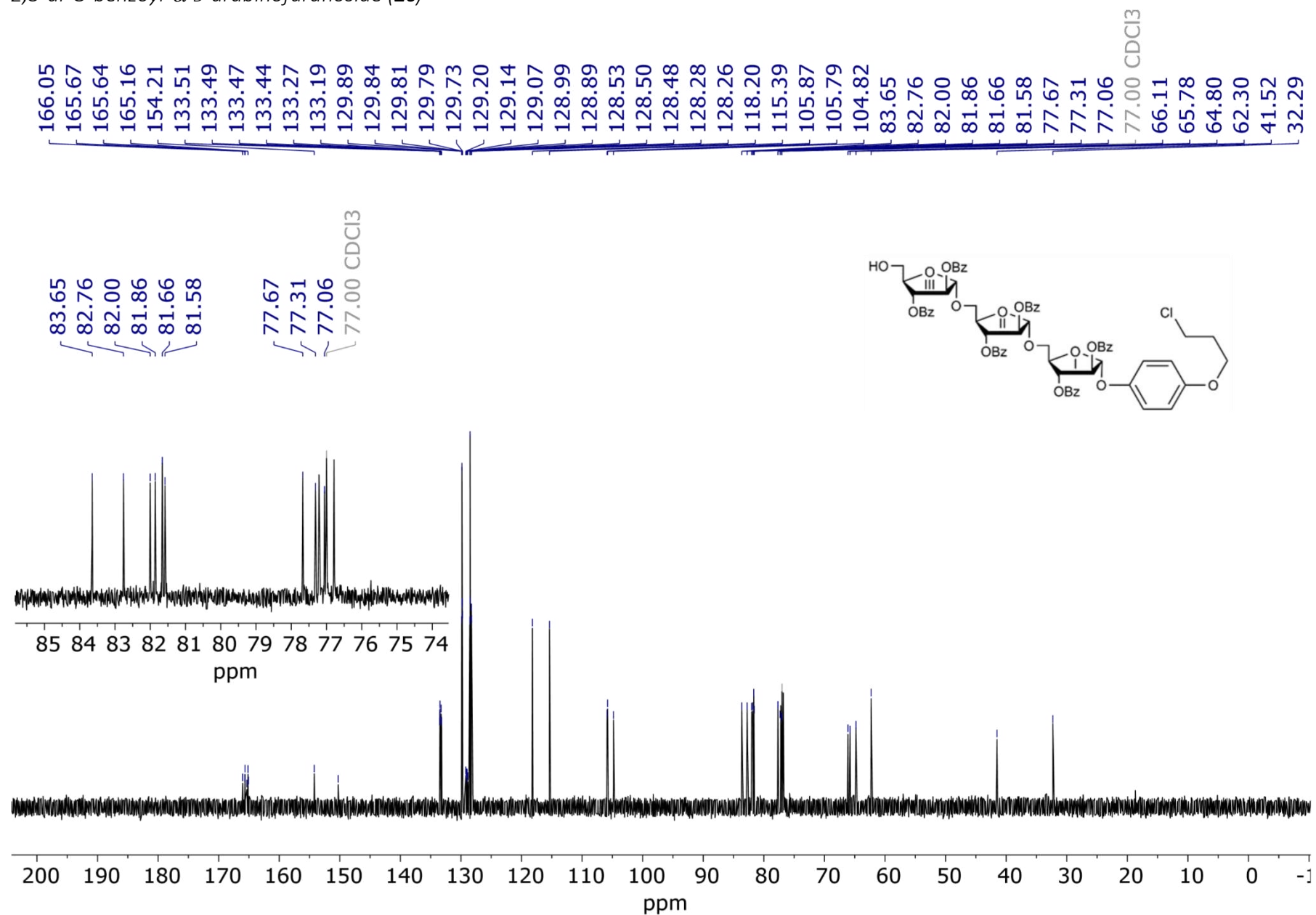


S.1.8. 4-(3-Chloropropoxy)phenyl 2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (2c)

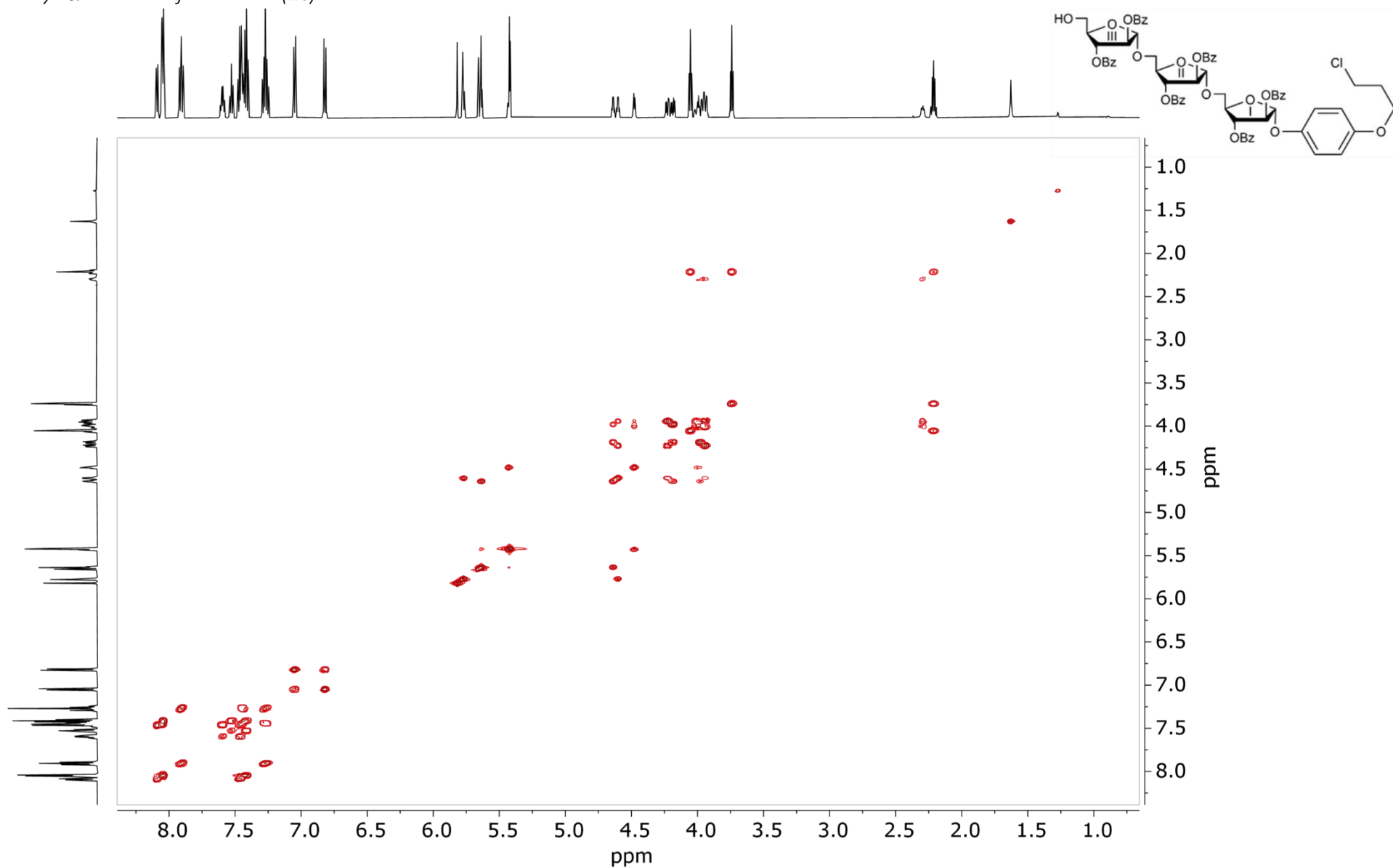
^1H NMR (CDCl_3 , 600 MHz) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (2c)



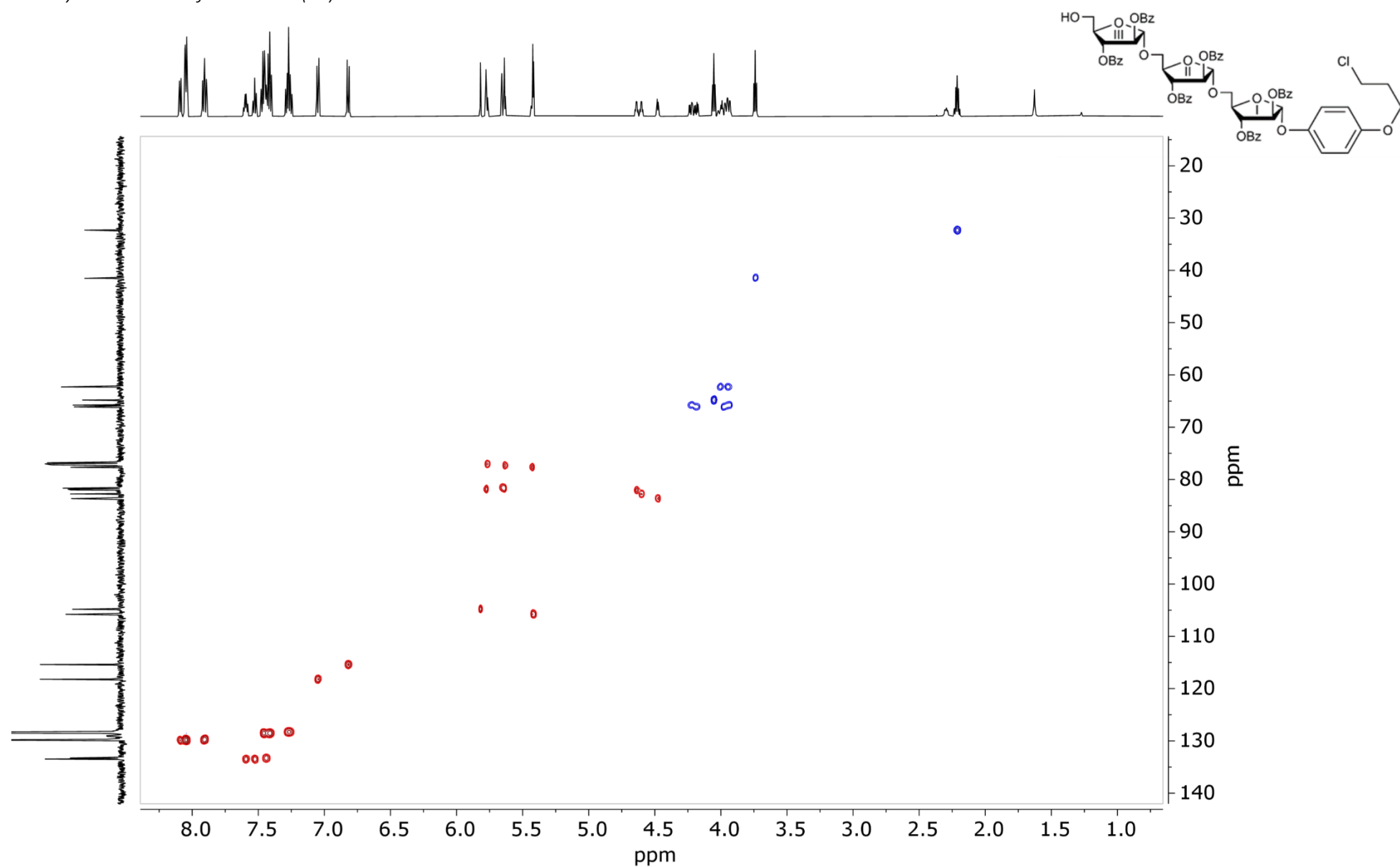
^{13}C NMR (CDCl_3 , 151 MHz) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**2c**)



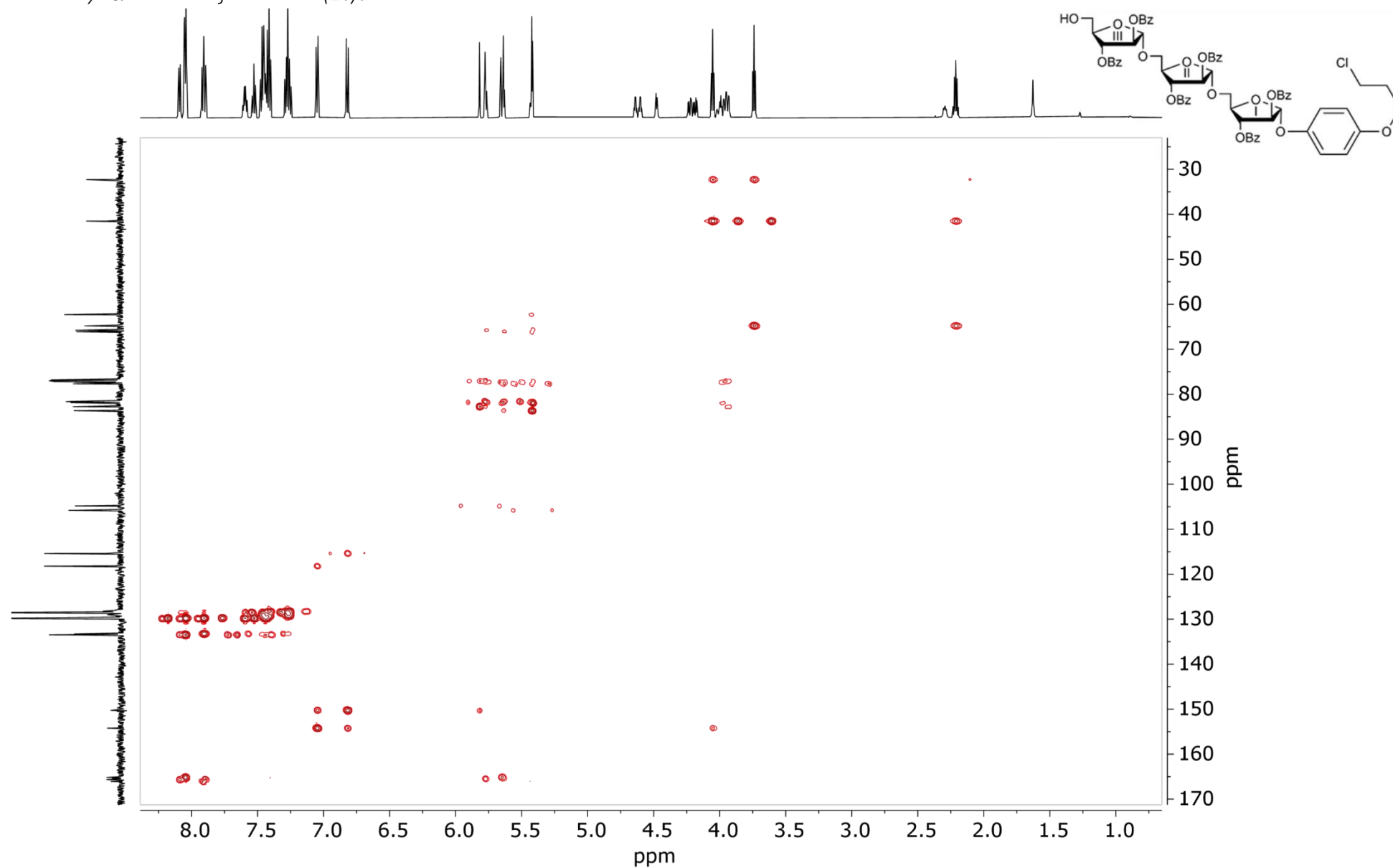
^1H - ^1H COSY (CDCl_3) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**2c**)



^1H - ^{13}C HSQC (CDCl_3) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**2c**)

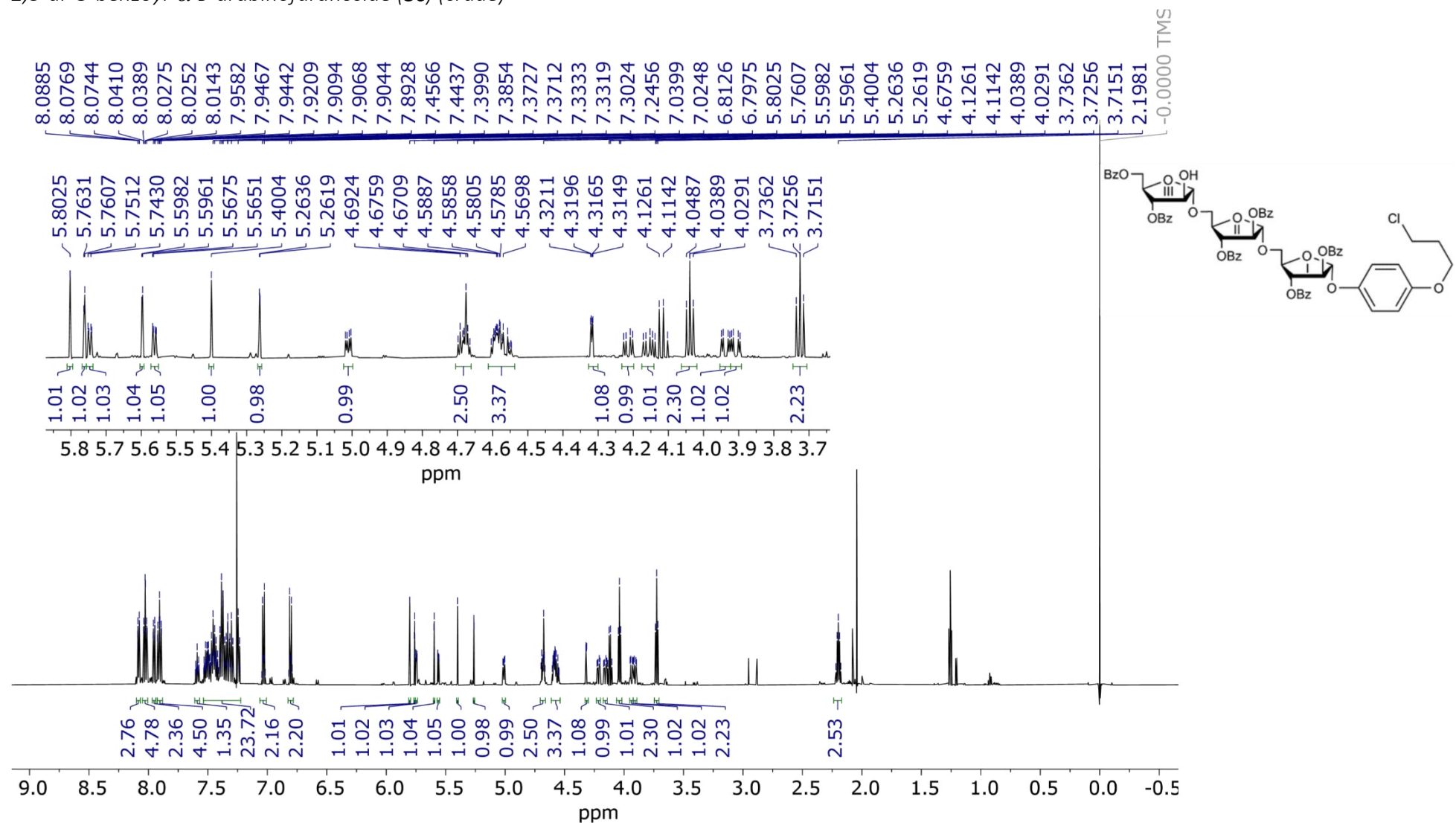


^1H - ^{13}C HMBC (CDCl_3) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**2c**)



S.1.9. 4-(3-Chloropropoxy)phenyl 3,5-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (3c)

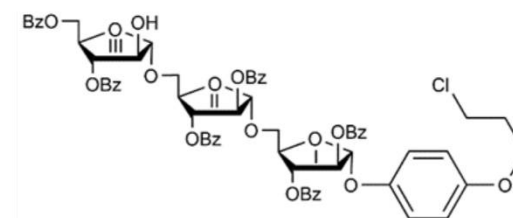
^1H NMR (CDCl_3 , 600 MHz) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (3c) (crude)



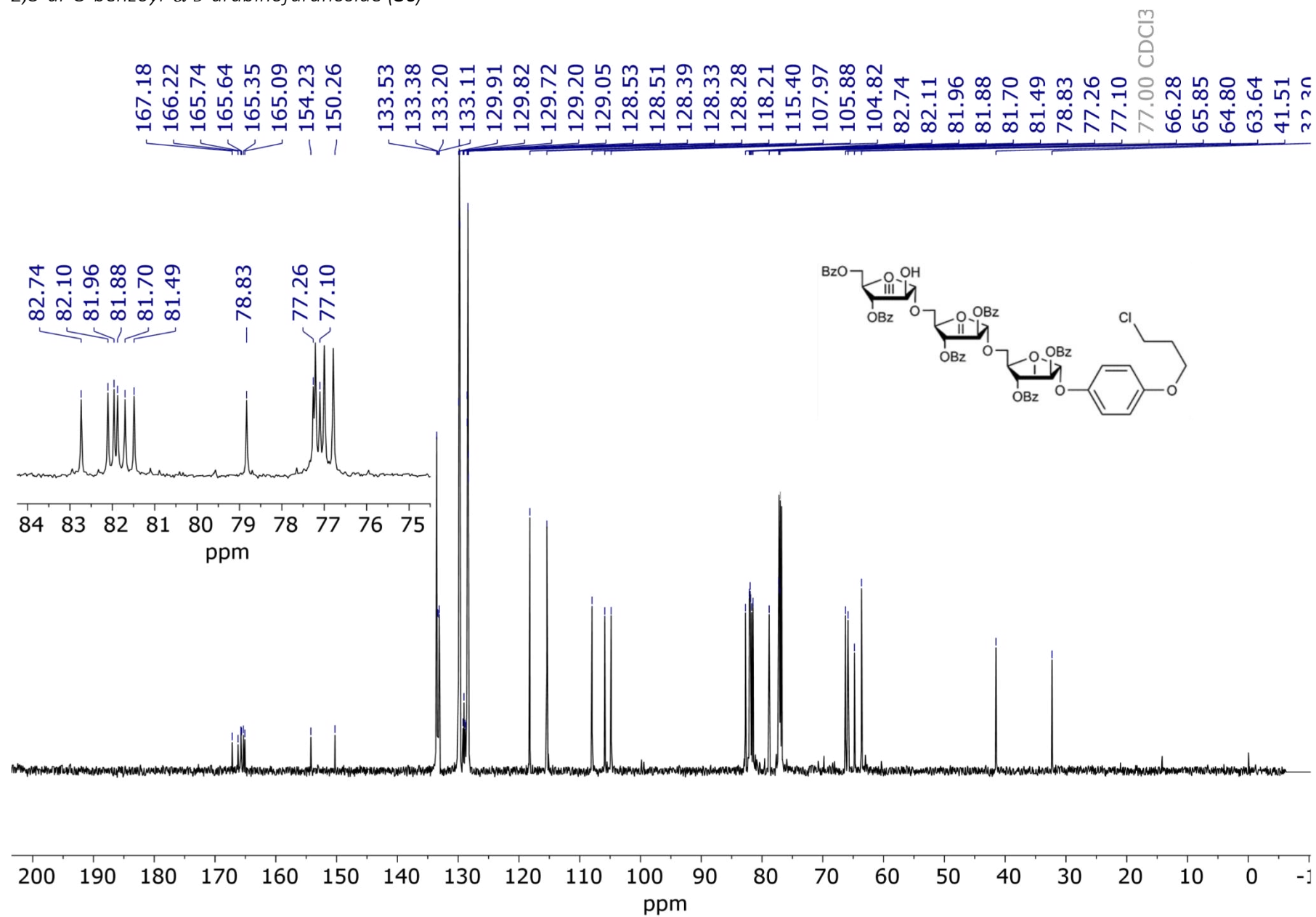
Chemical structure of compound 10: O=C1C=CC(=O)N1[C@@H]2O[C@H](CO[C@@H]3O[C@H](OC(=O)c4ccccc4)[C@H](O)[C@@H]3O)[C@H](O)[C@@H]2O

¹H NMR spectrum (CDCl₃):

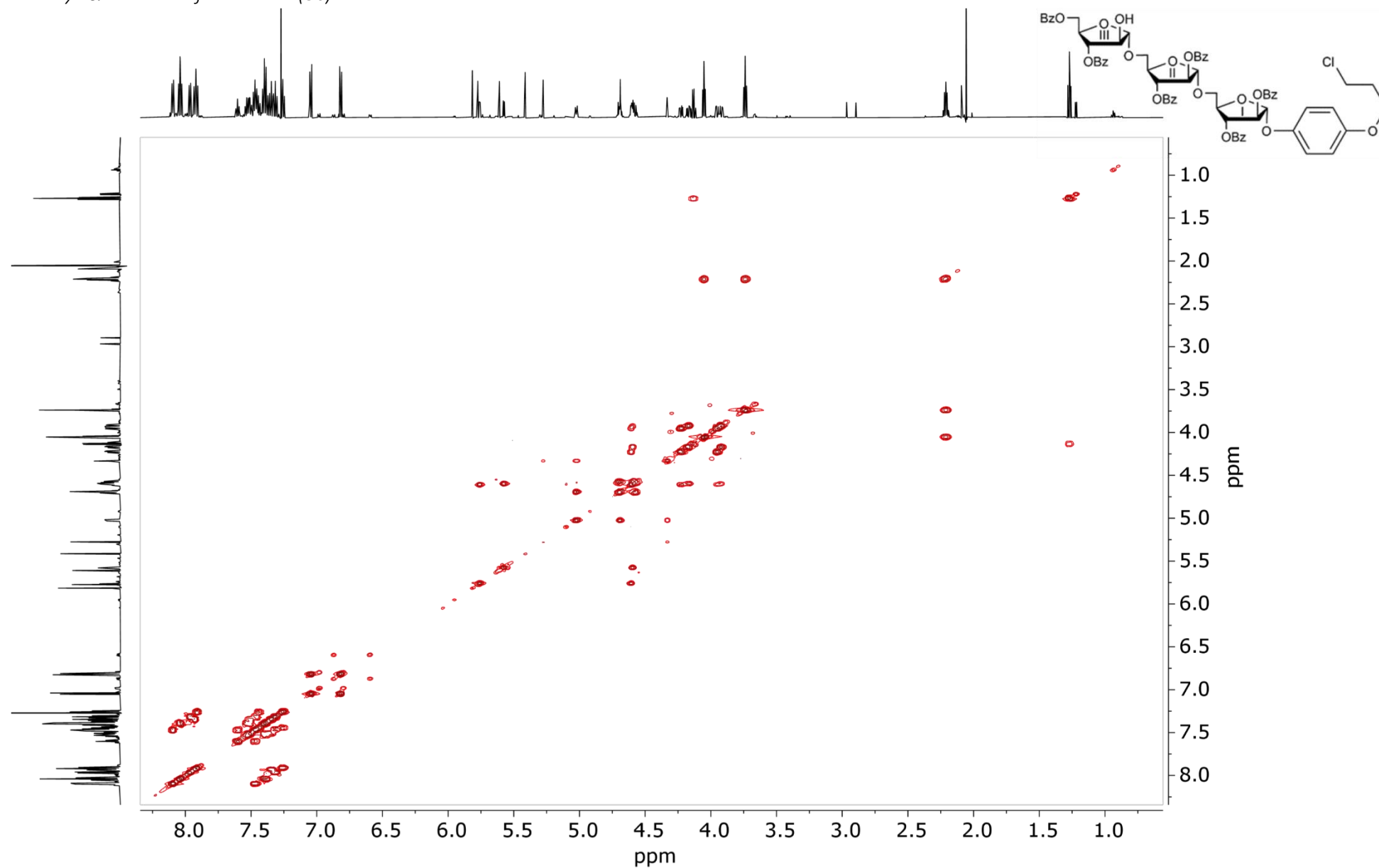
Chemical Shift (ppm)	Integration
8.0808, 8.0546, 8.0452, 8.0418, 8.0312, 8.0262, 8.0187, 7.9526, 7.9476, 7.9428, 7.9387, 7.9258, 7.9217, 7.9156, 7.9103, 7.8985, 7.5124, 7.5090, 7.4920, 7.4863, 7.4698, 7.4648, 7.4412, 7.4217, 7.4188, 7.3941, 7.3823, 7.3700, 7.3440, 7.3383, 7.3180, 7.3125, 7.2821, 7.2700 (CDCl ₃), 7.2700, 7.2559, 7.0576, 7.0273, 6.8295, 6.7992, 5.8102, 5.7688, 5.6025, 5.4090, 5.2710, 4.6807, 4.6123, 4.6103, 4.6077, 4.5984, 4.5833, 4.3269, 4.3248, 4.0707, 4.0513, 4.0318, 3.9312, 3.7580, 3.7368, 3.7159	12.07, 24.88, 2.00, 1.96, 1.00, 1.97, 0.92, 1.05, 0.96, 0.95, 0.96, 1.98, 2.95, 1.01, 1.97, 1.97, 1.96, 1.99, 0.91, 1.98



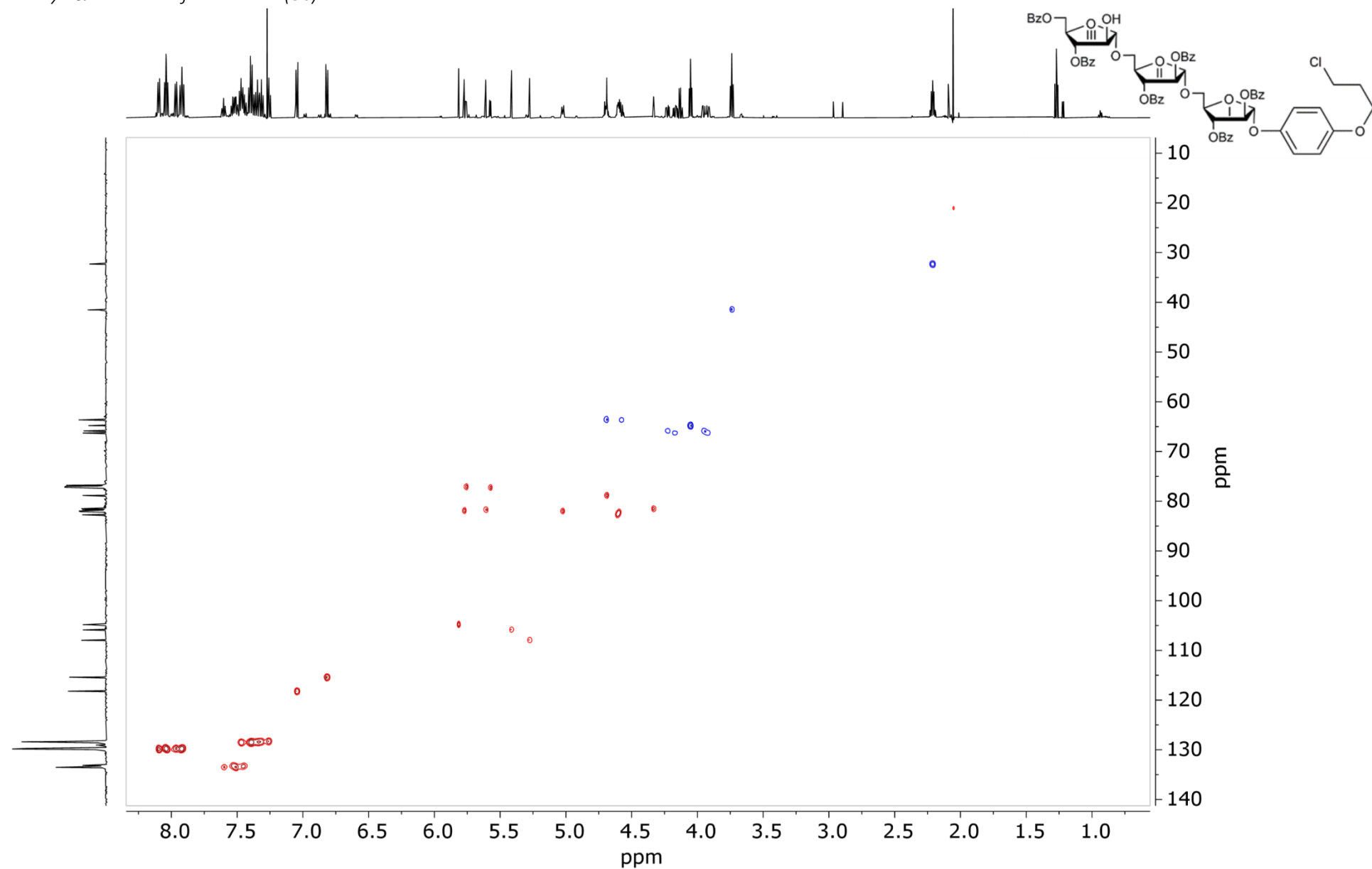
^{13}C NMR (CDCl_3 , 151 MHz) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**3c**)



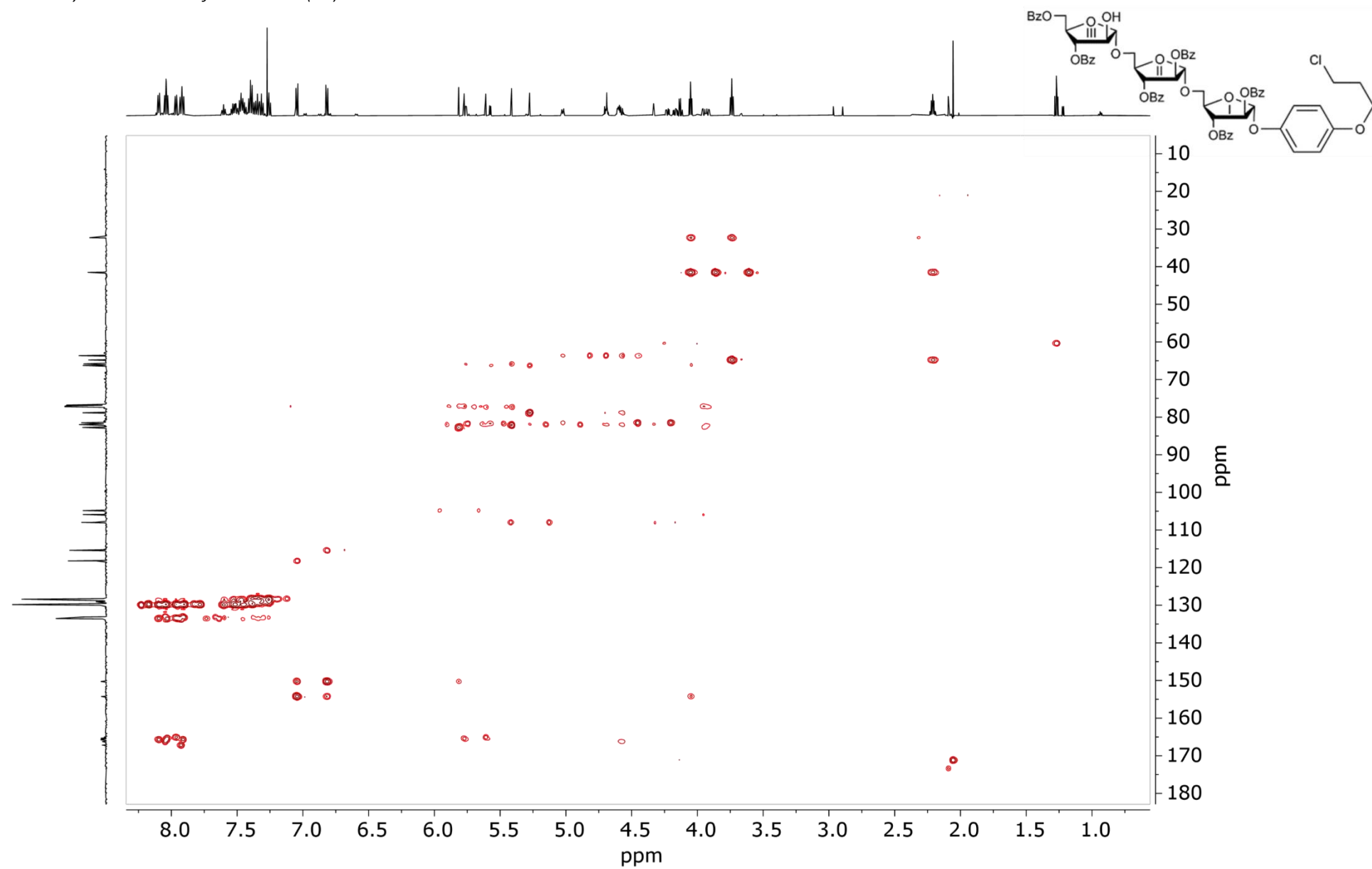
^1H - ^1H COSY (CDCl_3) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**3c**)



^1H - ^{13}C HSQC (CDCl_3) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**3c**)

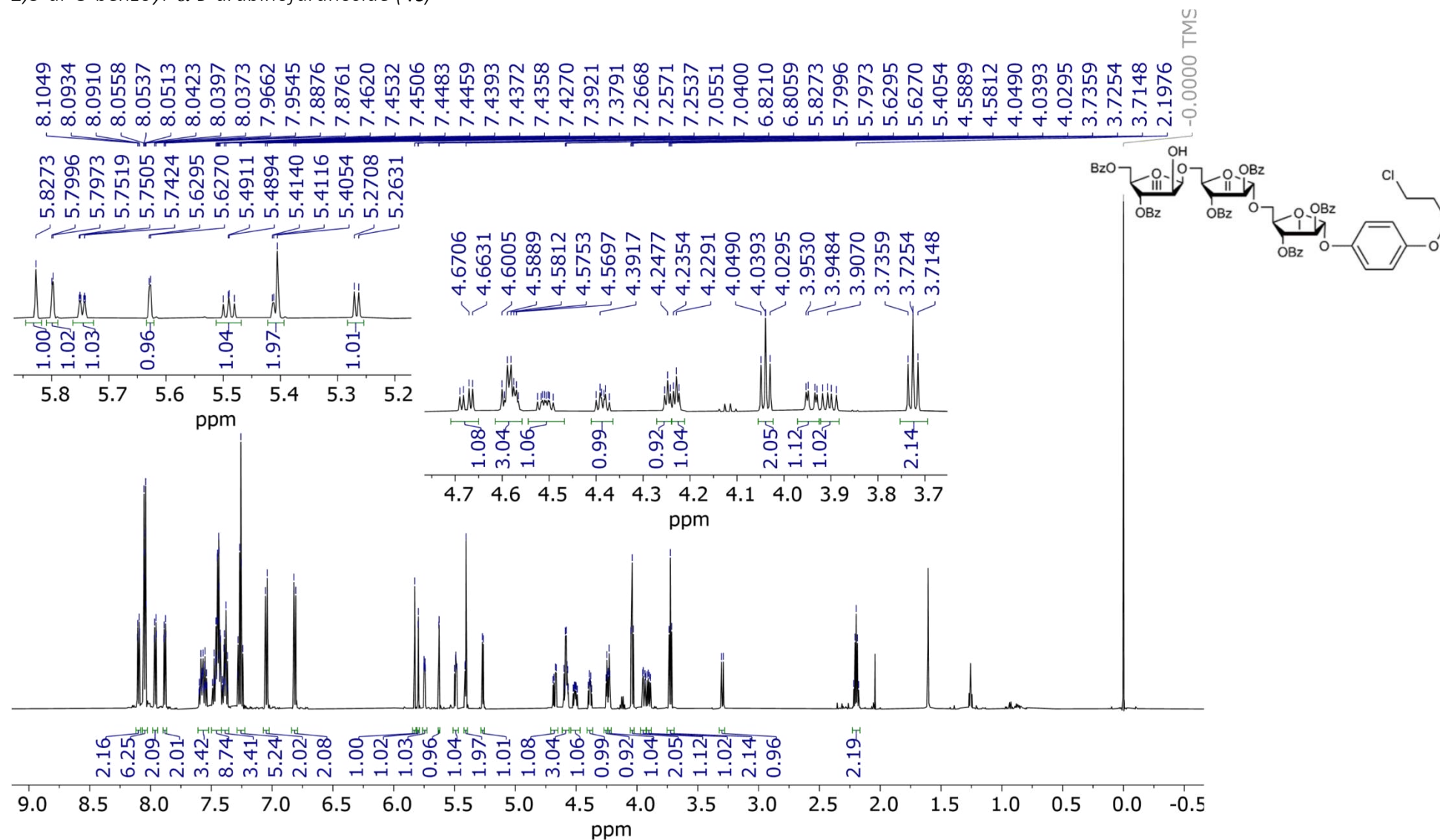


^1H - ^{13}C HMBC (CDCl_3) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**3c**)

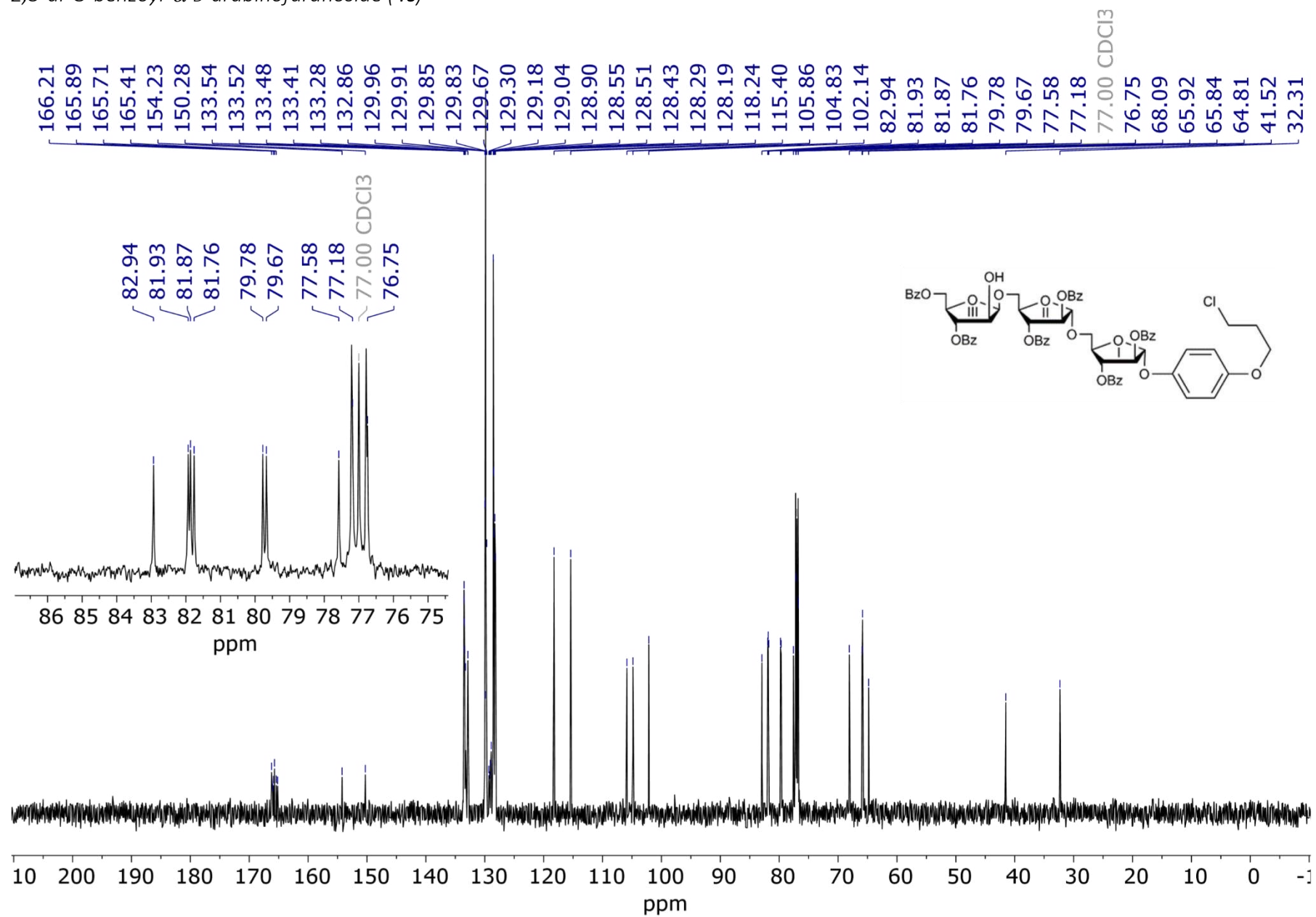


S.1.10. 4-(3-Chloropropoxy)phenyl 3,5-di-O-benzoyl- β -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**4c**)

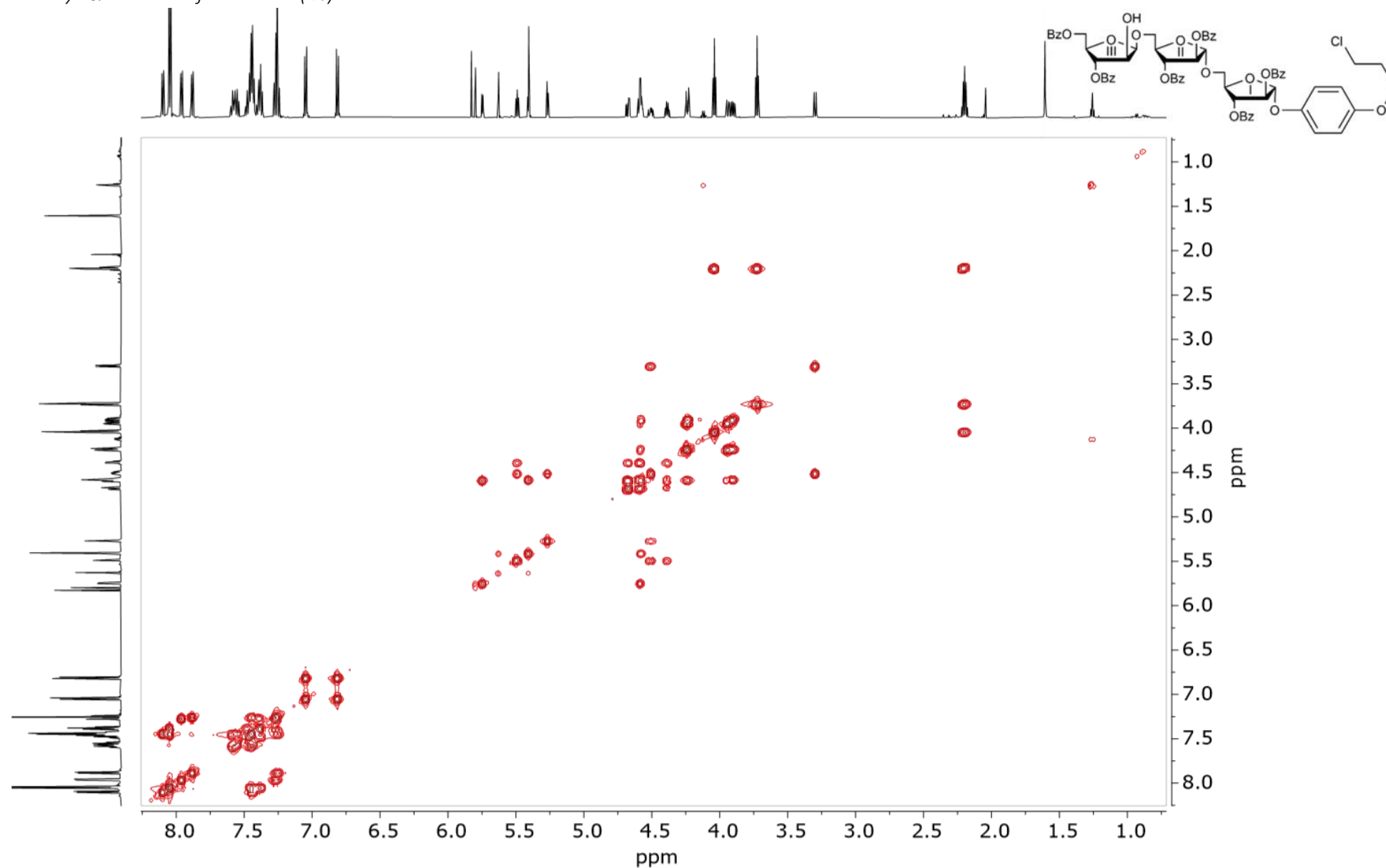
^1H NMR (CDCl_3 , 600 MHz) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- β -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**4c**)



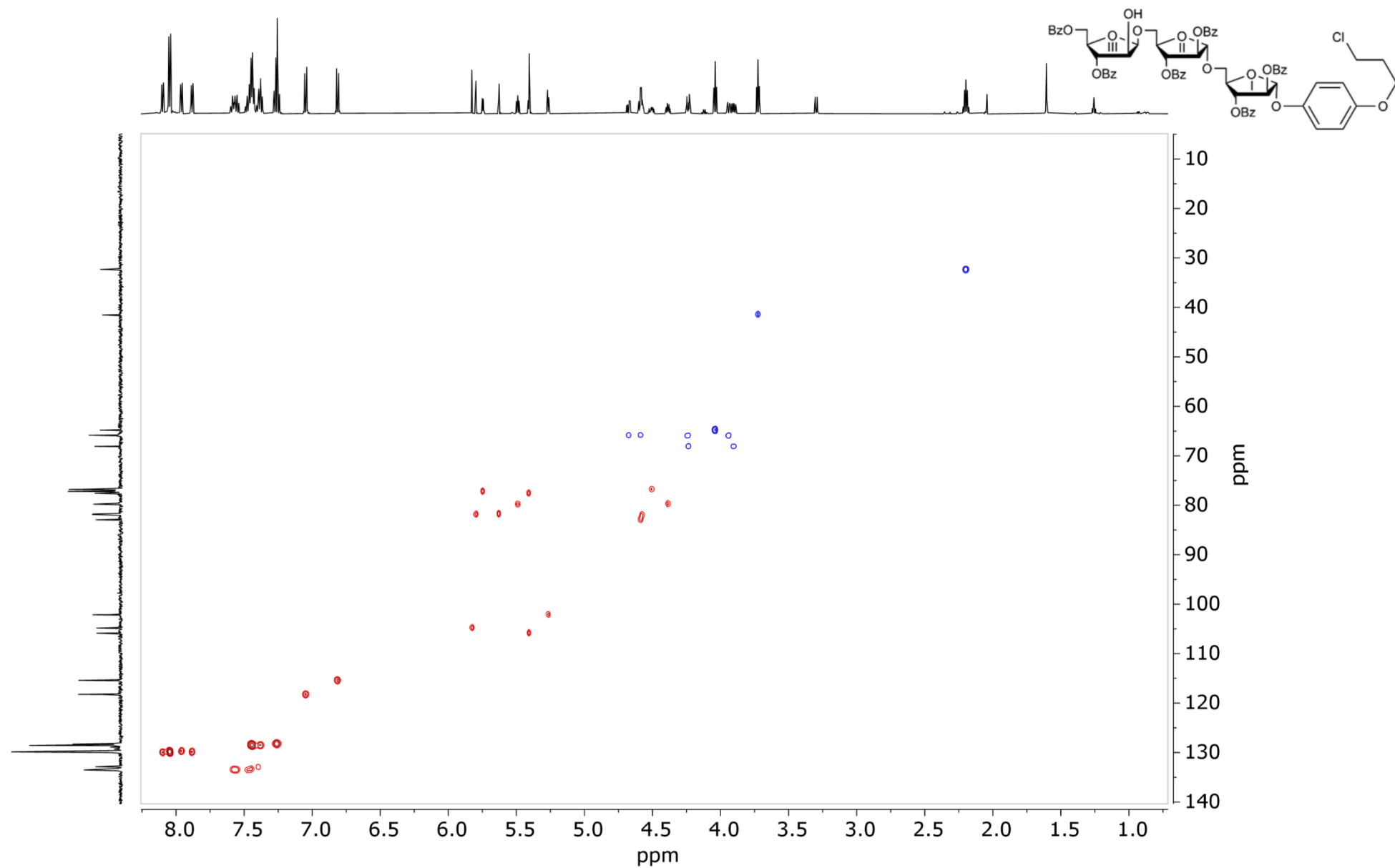
^{13}C NMR (CDCl_3 , 151 MHz) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- β -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**4c**)



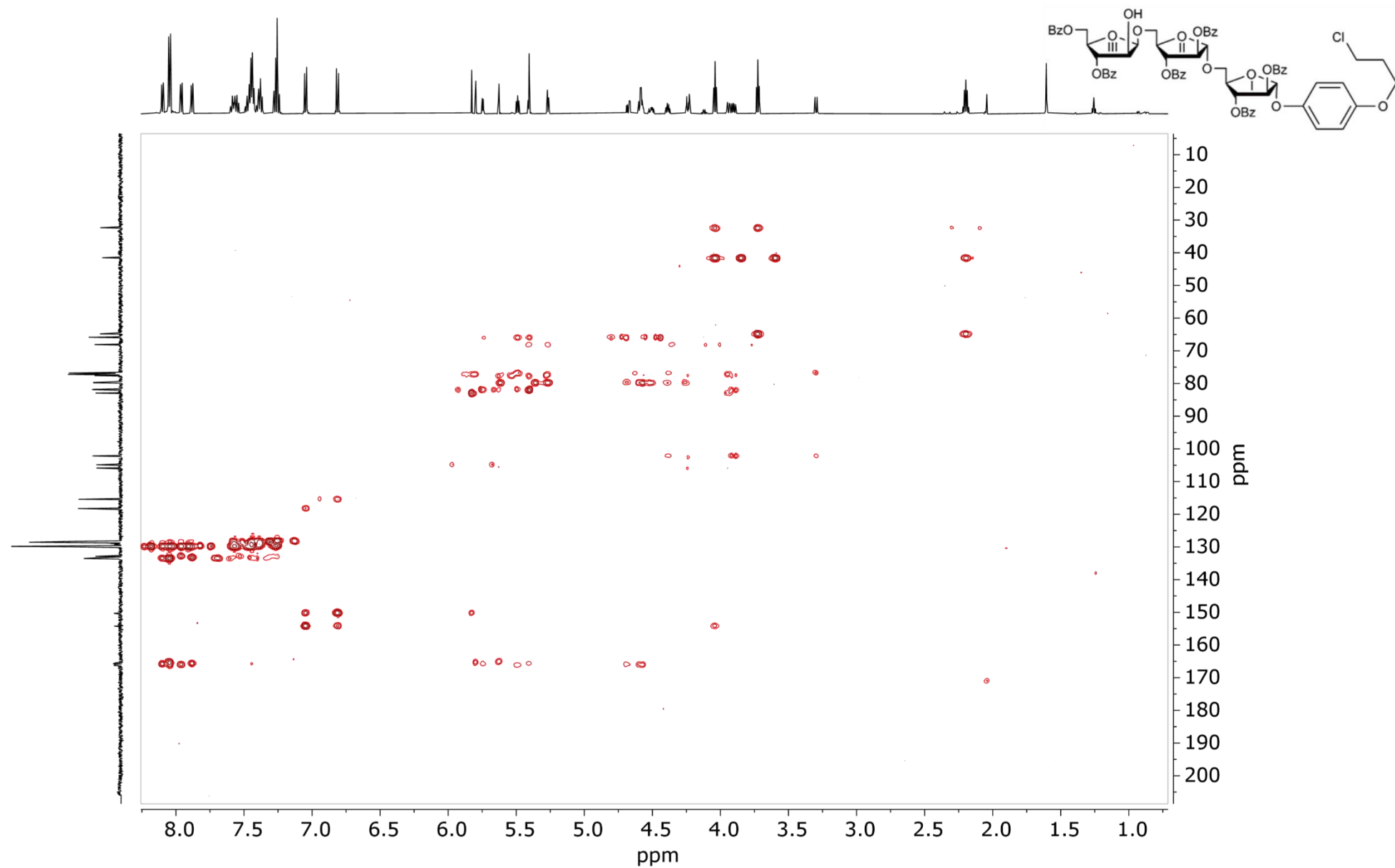
^1H - ^1H COSY (CDCl_3) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- β -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**4c**)



^1H - ^{13}C HSQC (CDCl_3) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- β -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**4c**)

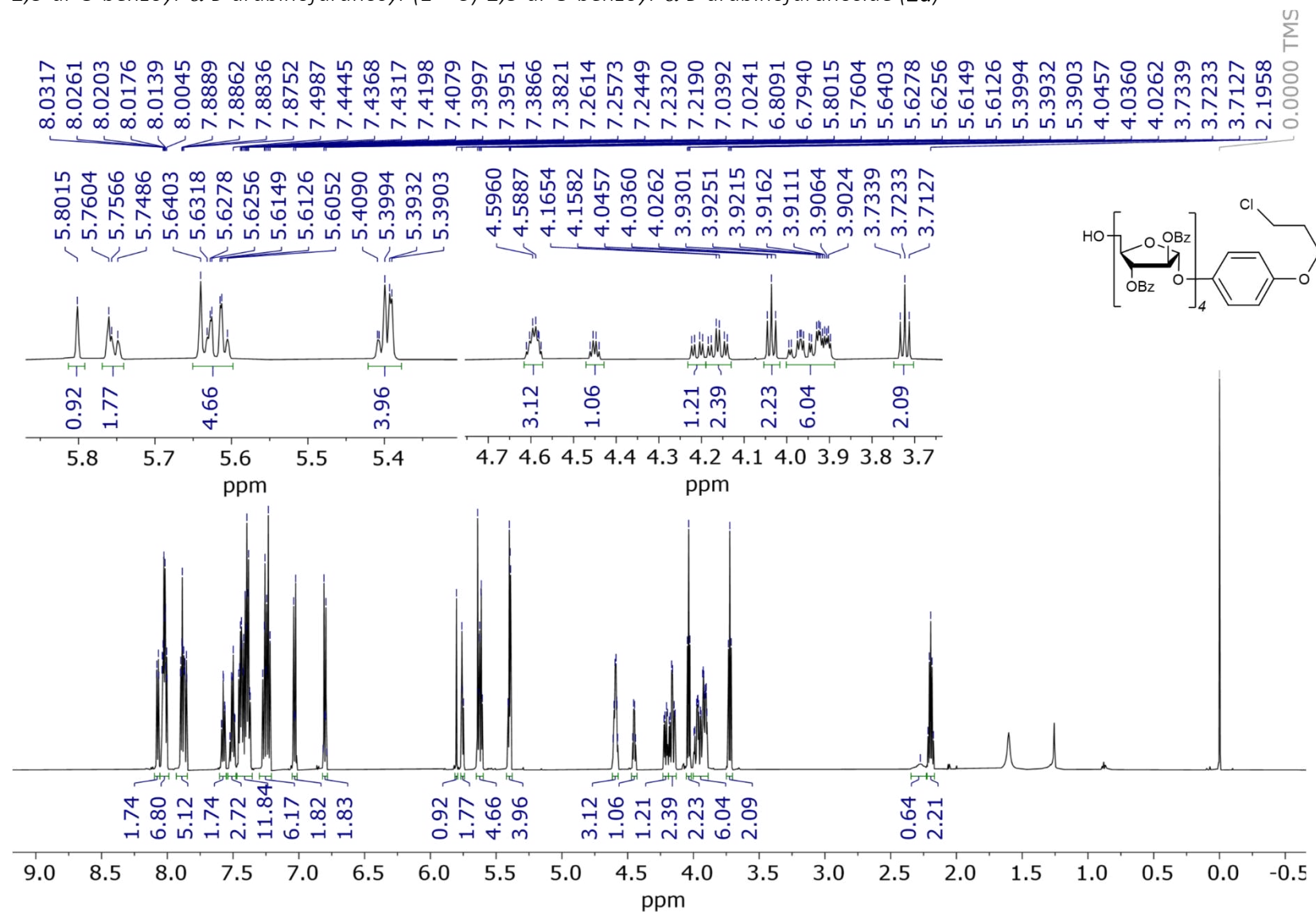


^1H - ^{13}C HMBC (CDCl_3) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- β -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**4c**)

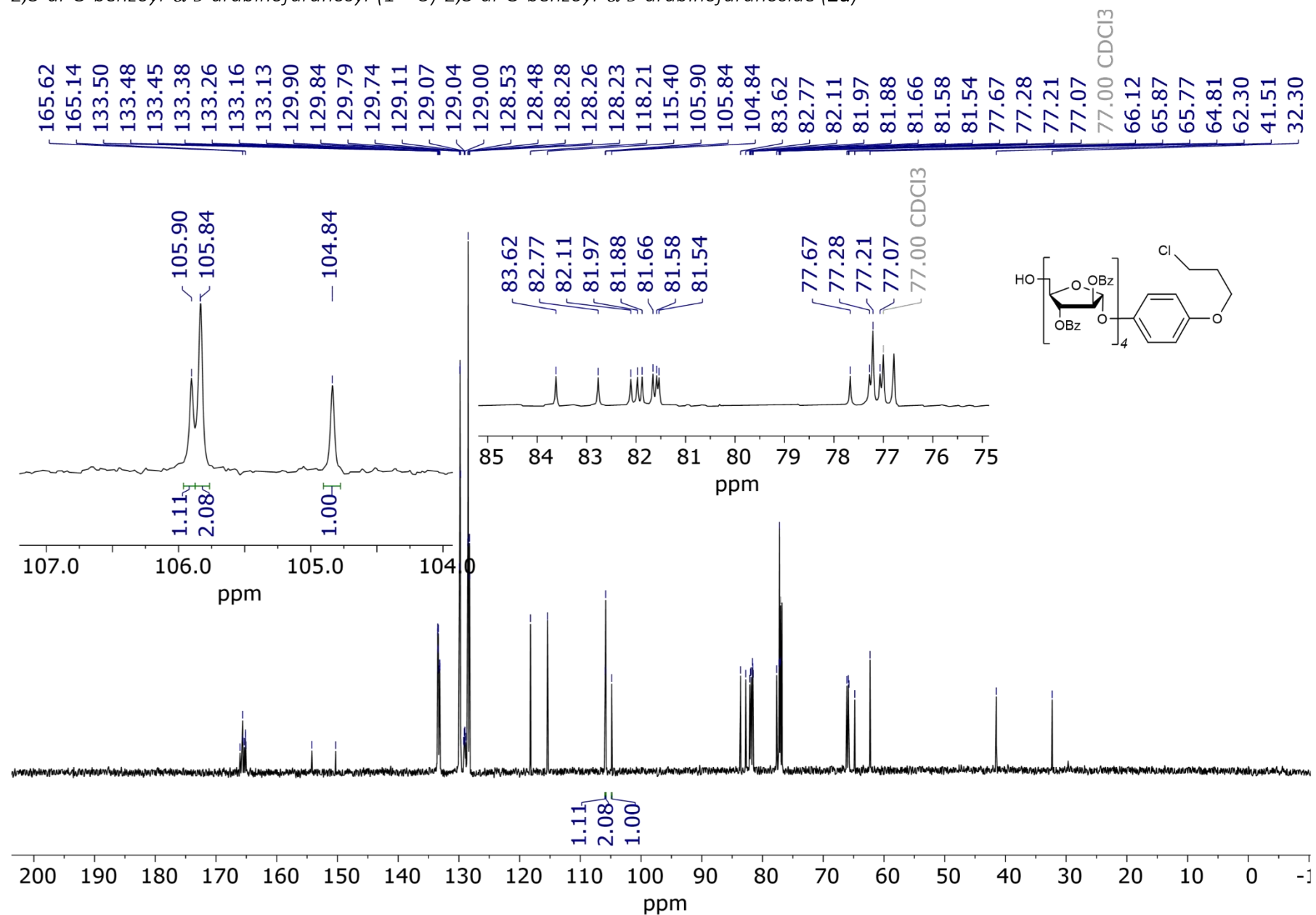


S.1.11. 4-(3-Chloropropoxy)phenyl 2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (2d)

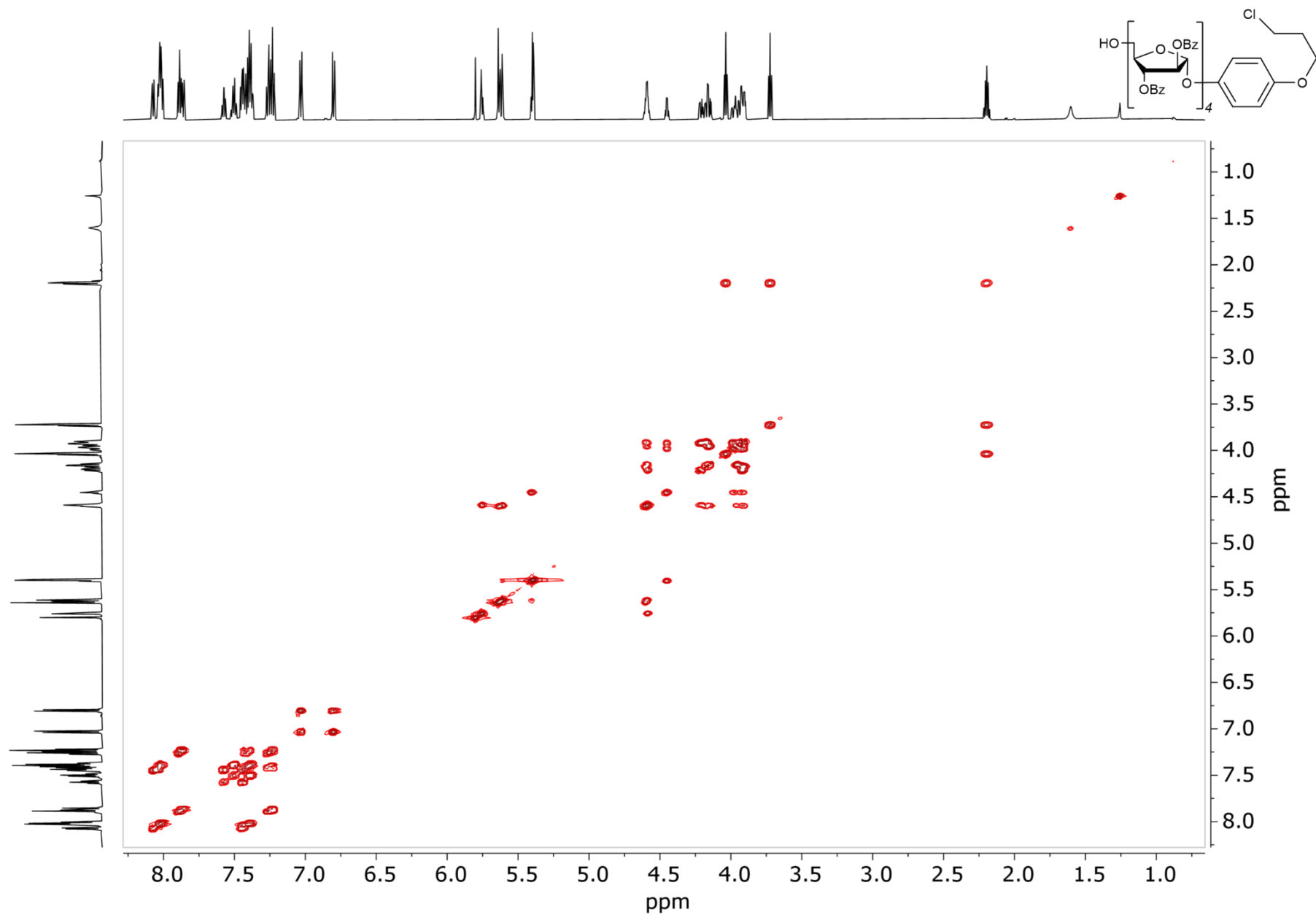
^1H NMR (CDCl_3 , 600 MHz) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (2d)



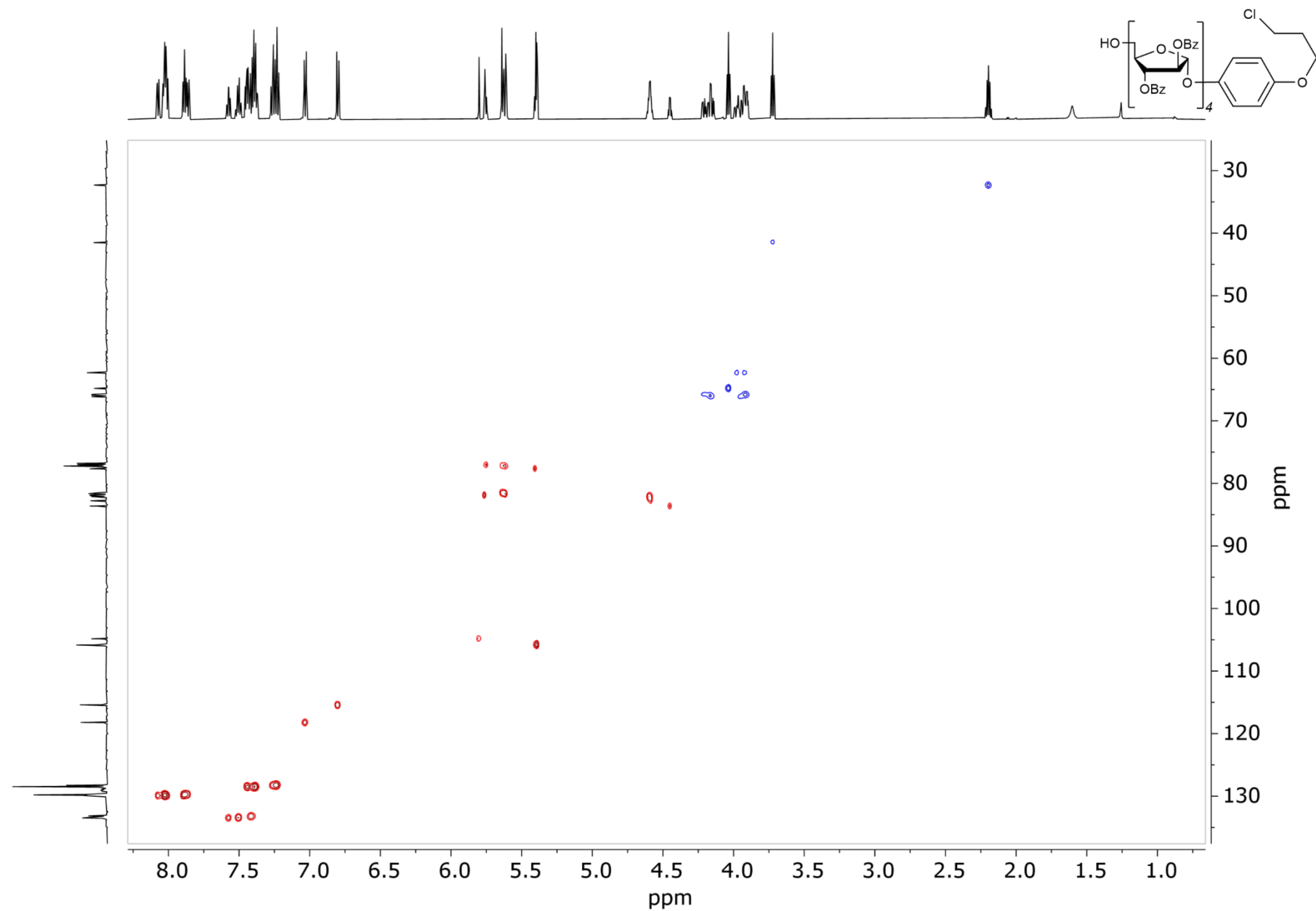
^{13}C NMR (CDCl_3 , 151 MHz) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**2d**)



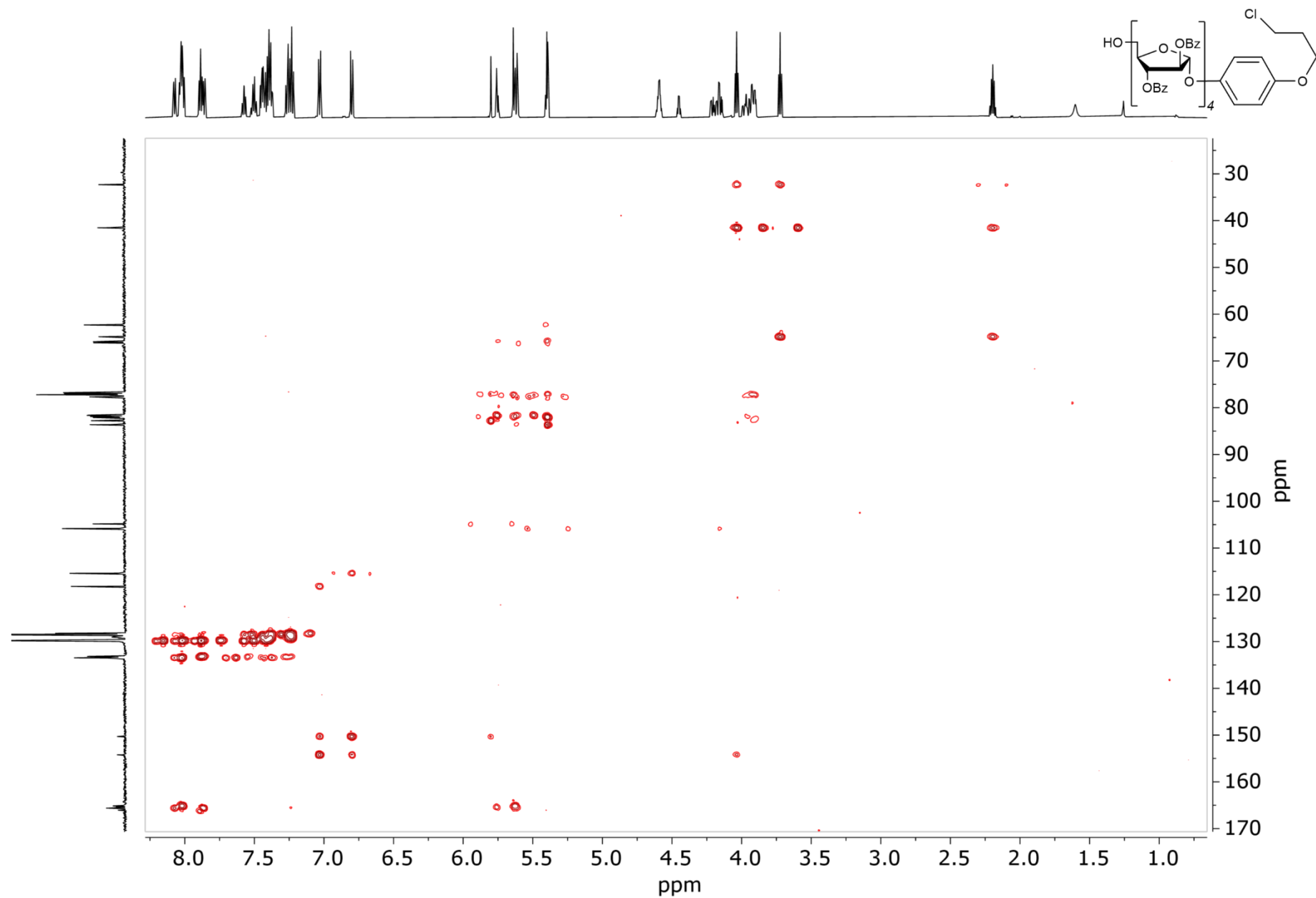
^1H - ^1H COSY (CDCl_3) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**2d**)



^1H - ^{13}C HSQC (CDCl_3) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**2d**)

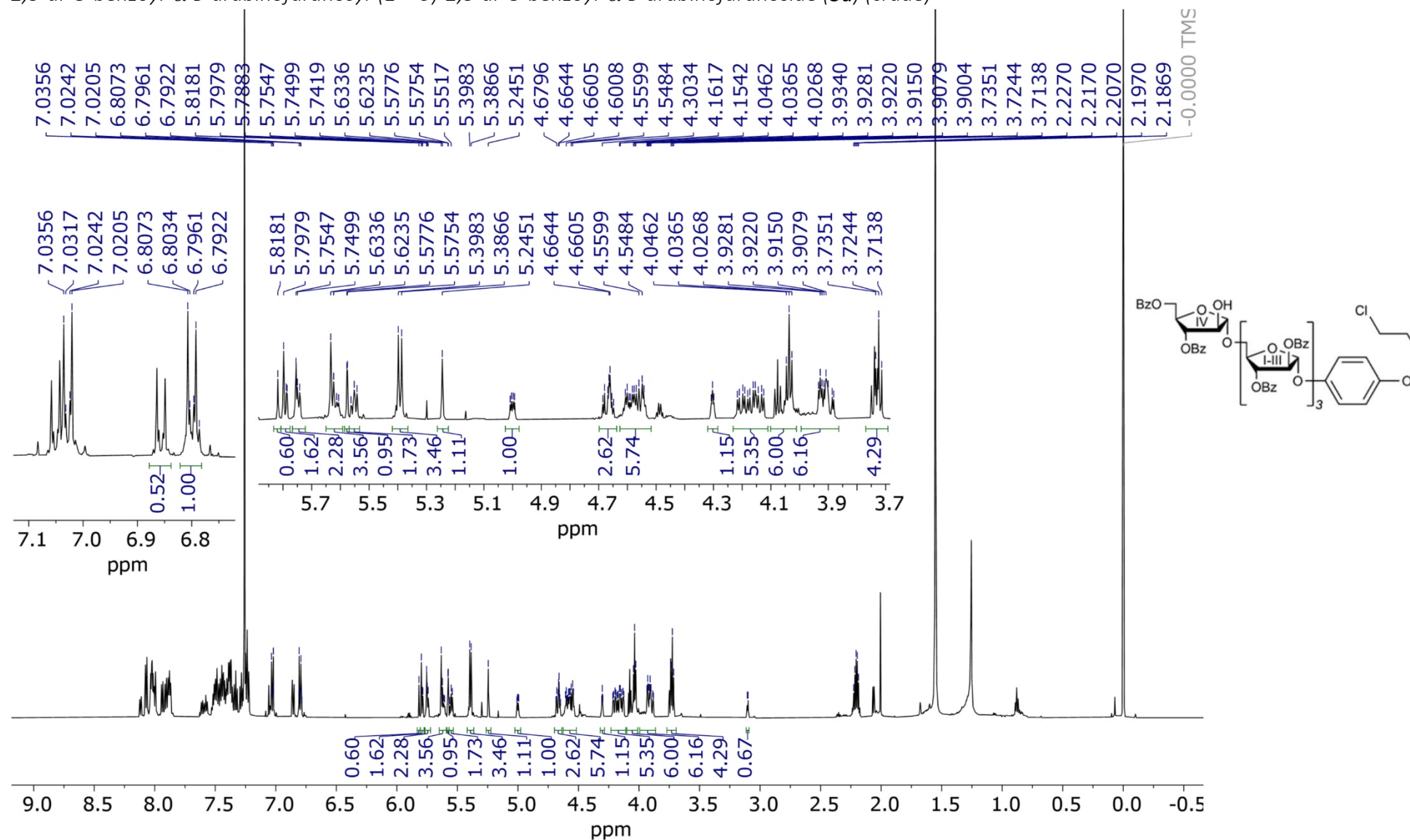


^1H - ^{13}C HMBC (CDCl_3) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**2d**)

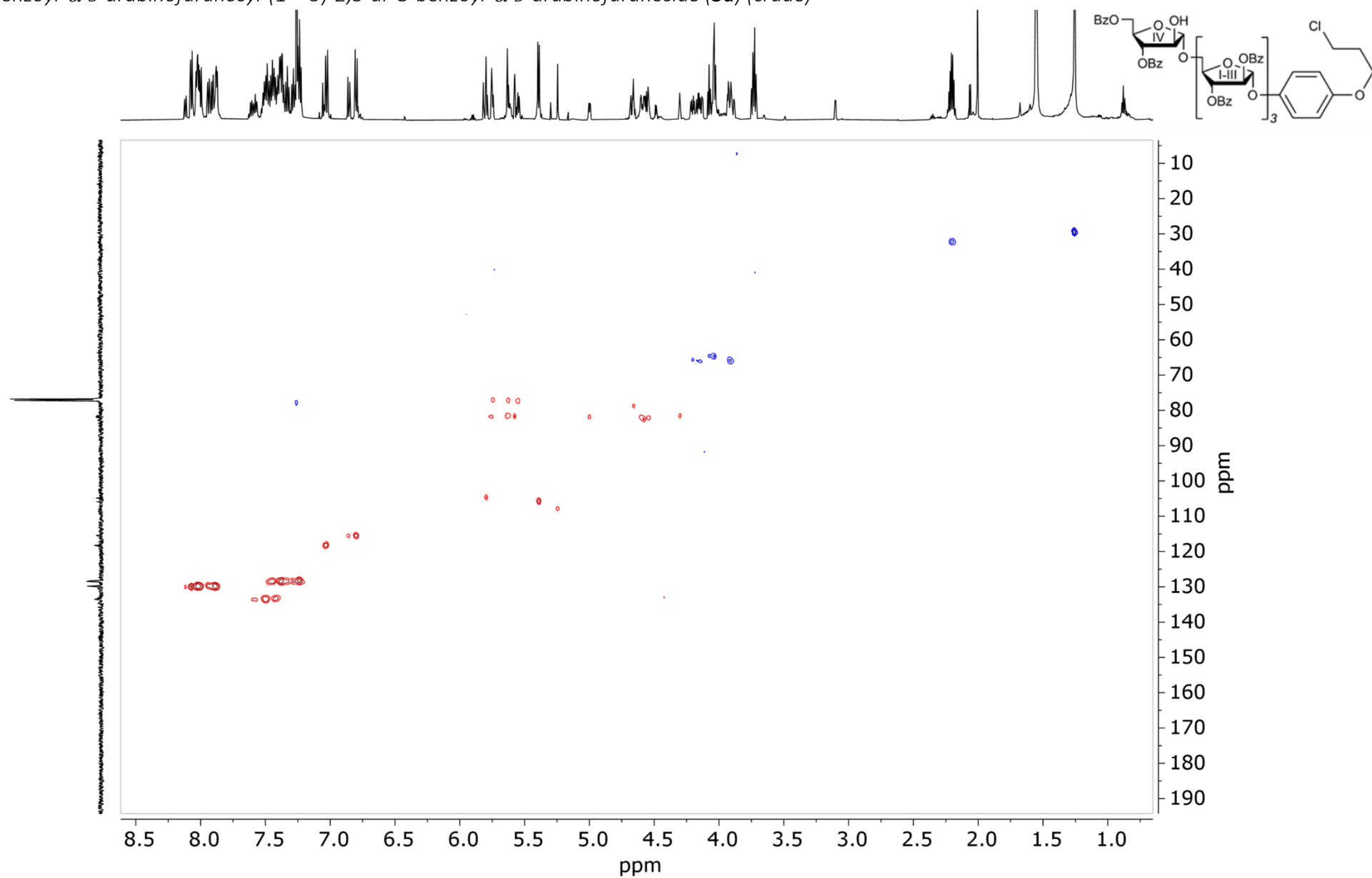


S.1.12. 4-(3-Chloropropoxy)phenyl 3,5-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (3d) (crude)

^1H NMR (CDCl_3 , 600 MHz) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (3d) (crude)

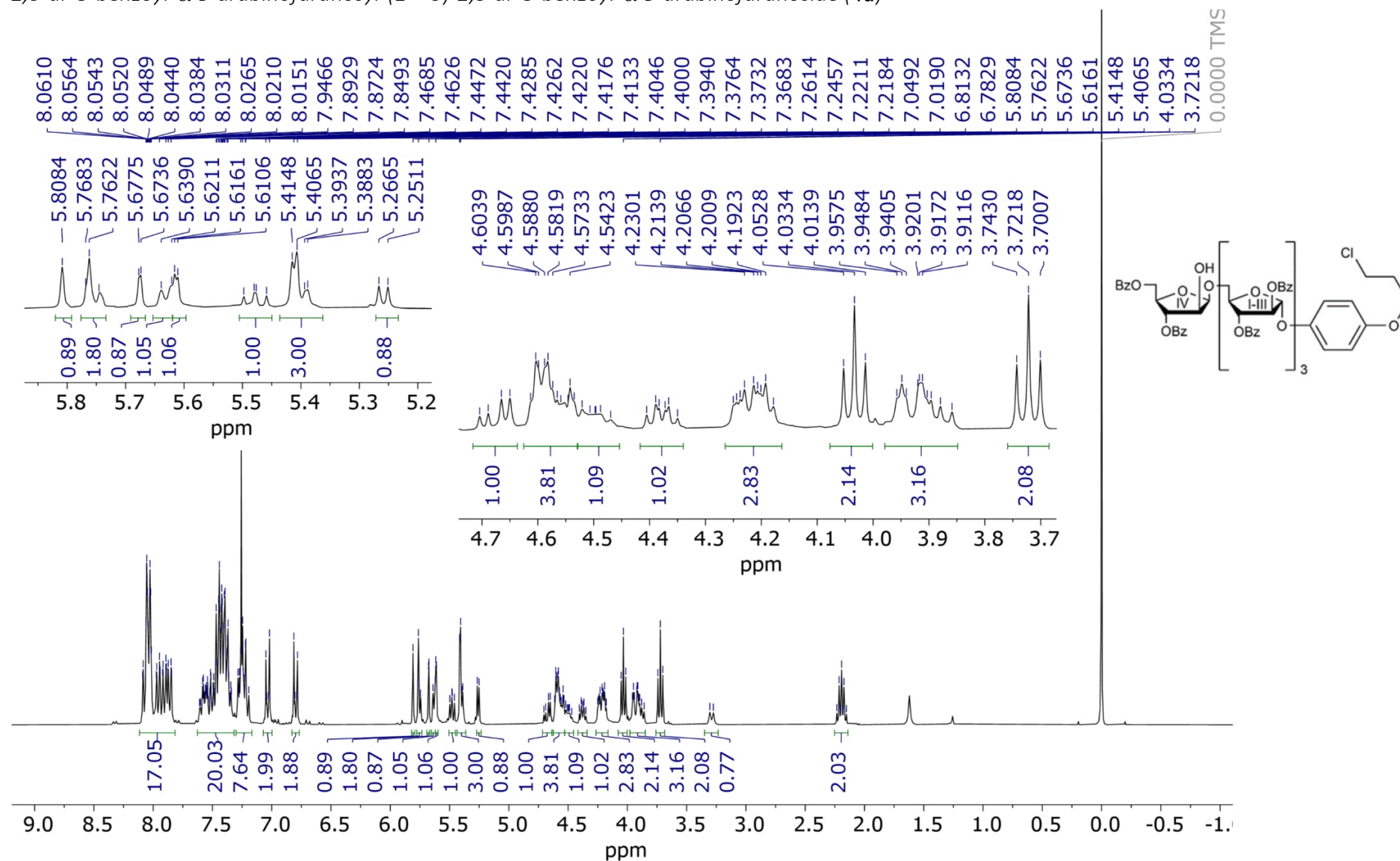


^1H - ^{13}C HSQC (CDCl_3) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**3d**) (crude)

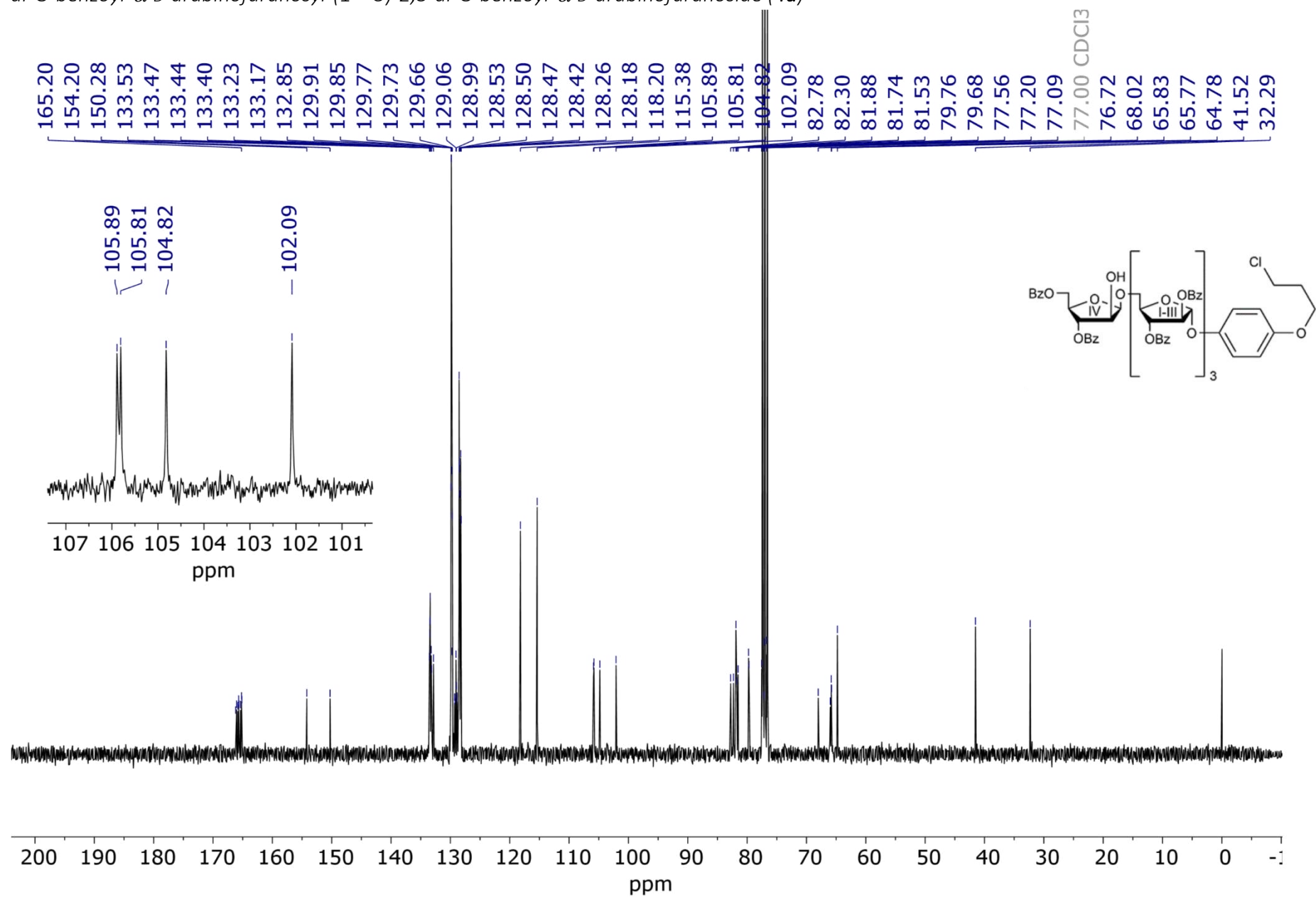


S.1.13. 4-(3-Chloropropoxy)phenyl 3,5-di-O-benzoyl- β -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (4d)

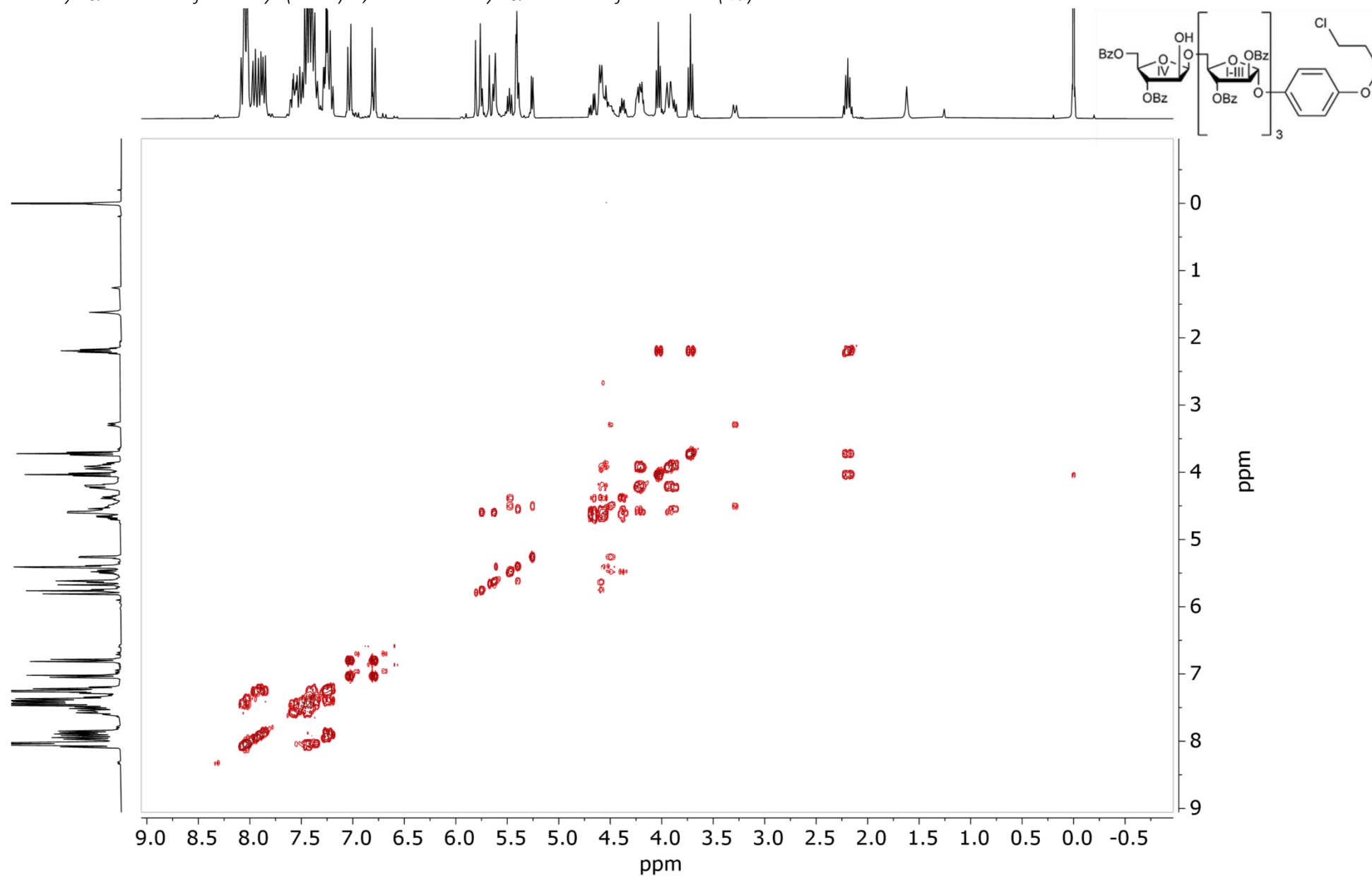
^1H NMR (CDCl_3 , 300 MHz) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- β -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (4d)



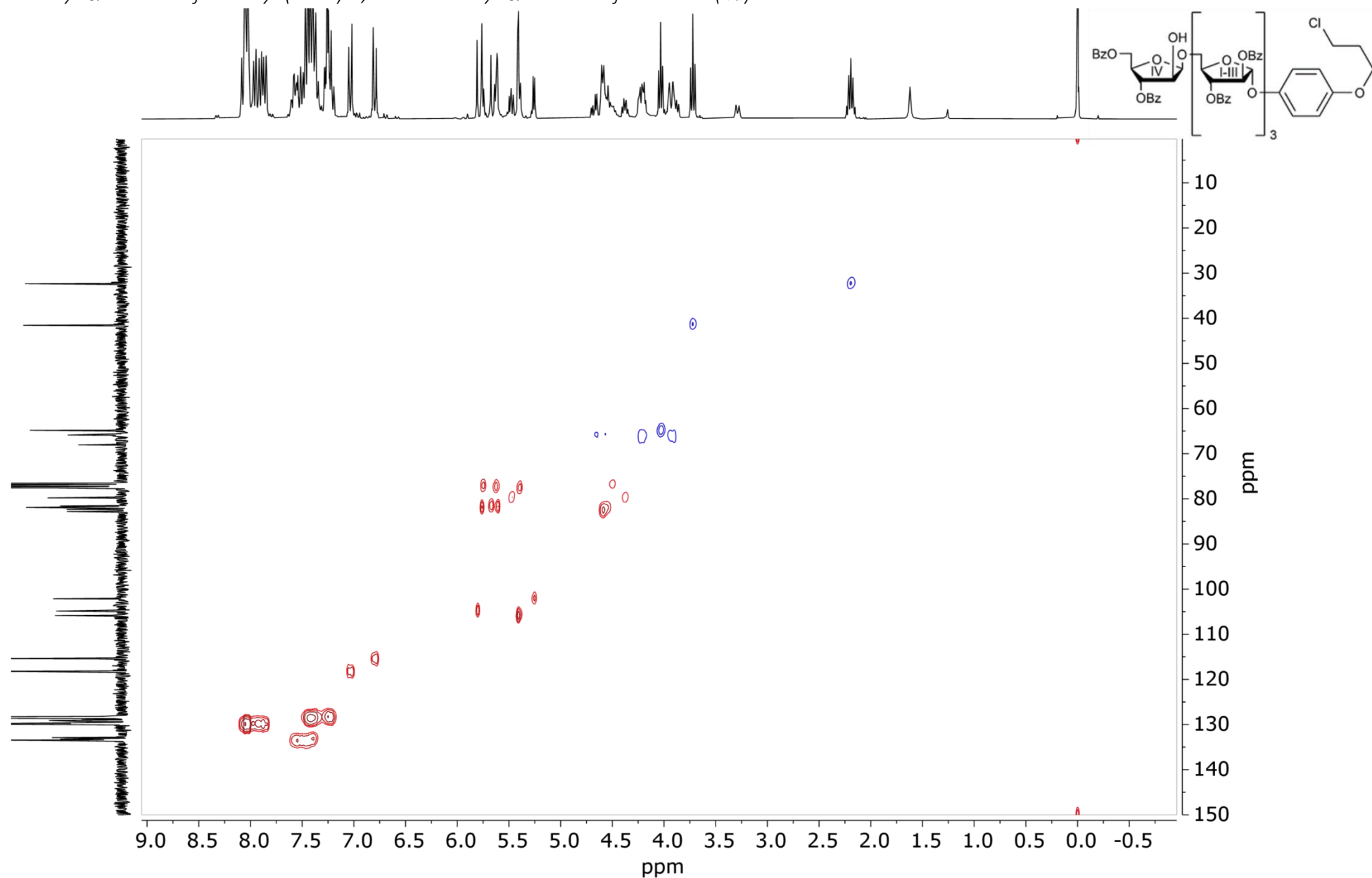
^{13}C NMR (CDCl_3 , 75 MHz) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- β -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**4d**)



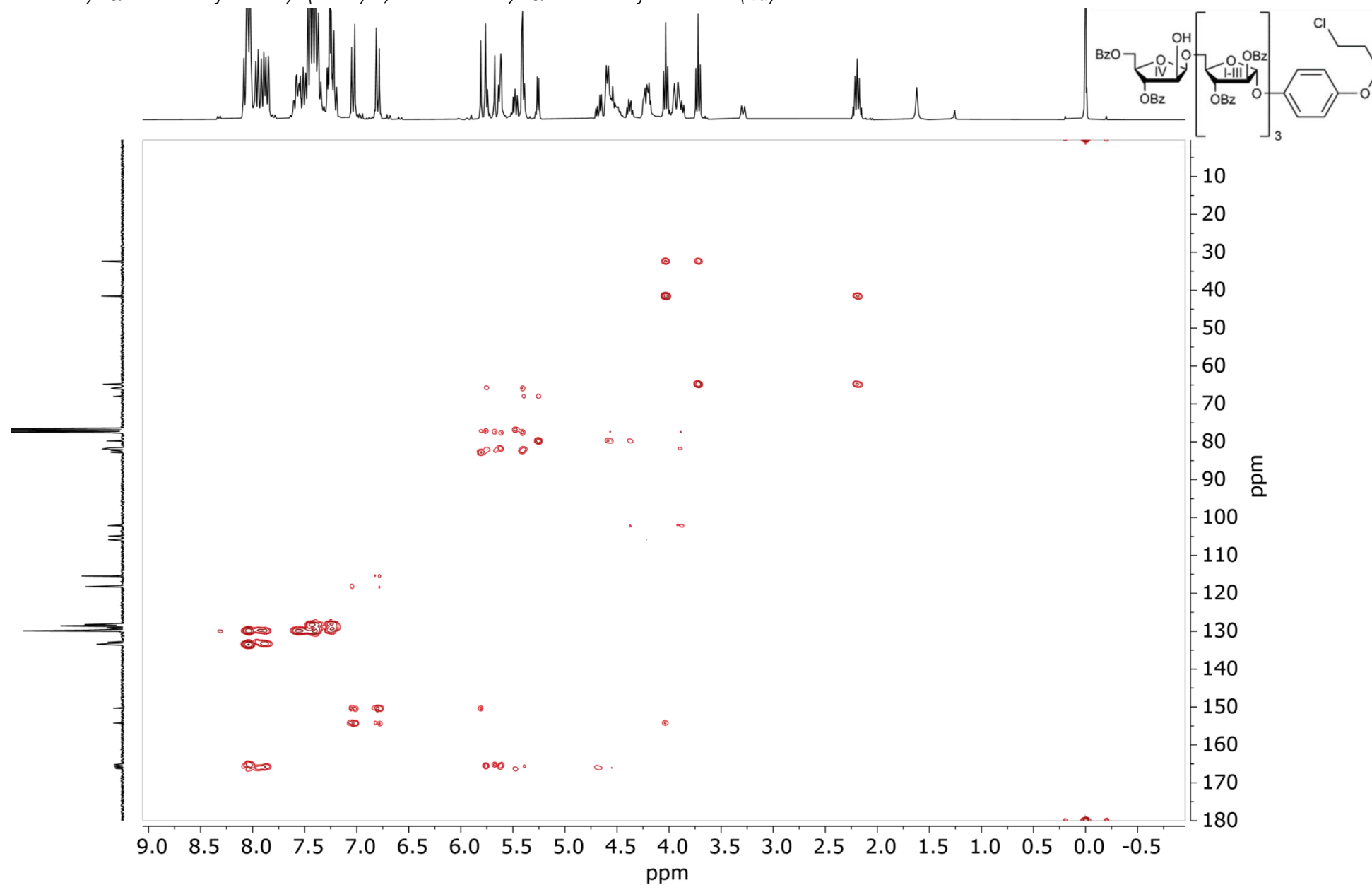
^1H - ^1H COSY (CDCl_3) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- β -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**4d**)



^1H - ^{13}C HSQC (CDCl_3) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- β -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**4d**)

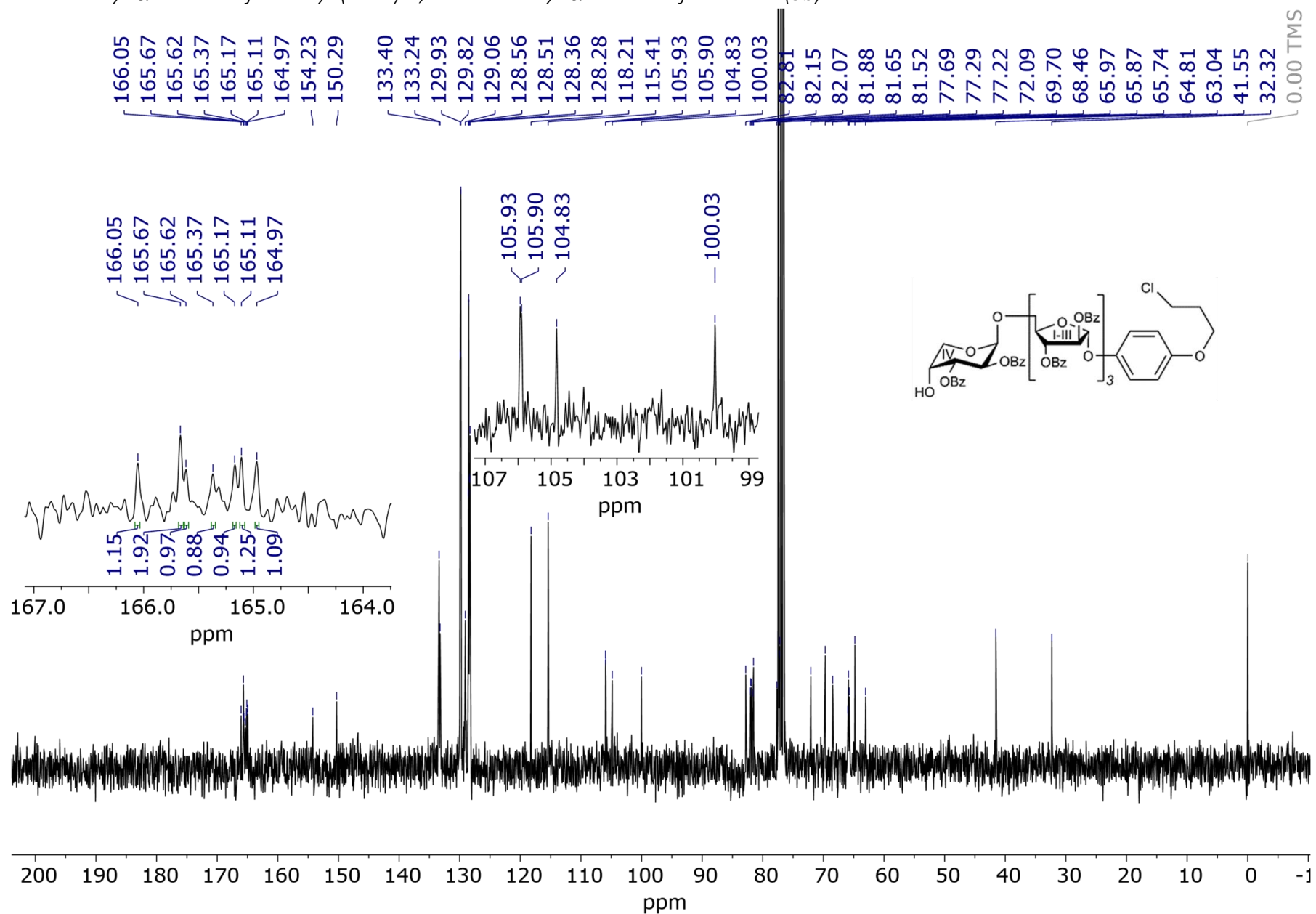


^1H - ^{13}C HMBC (CDCl_3) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- β -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**4d**)

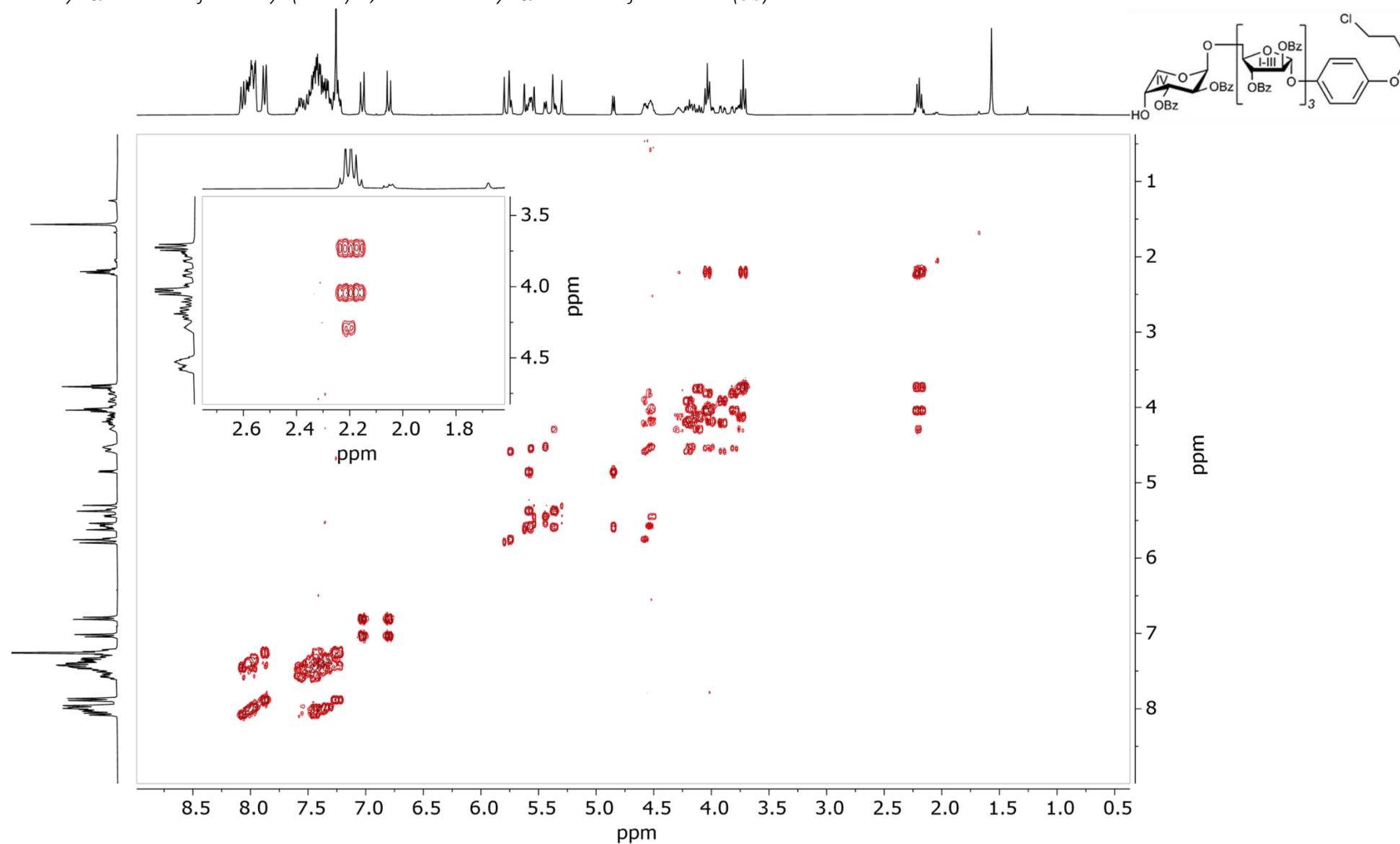


¹H NMR (CDCl₃, 300 MHz) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl-β-D-arabinopyranosyl-(1→5)-2,3-di-O-benzoyl-α-D-arabinofuranosyl-(1→5)-2,3-di-O-benzoyl-α-D-arabinofuranosyl-(1→5)-2,3-di-O-benzoyl-α-D-arabinofuranoside (**5b**)

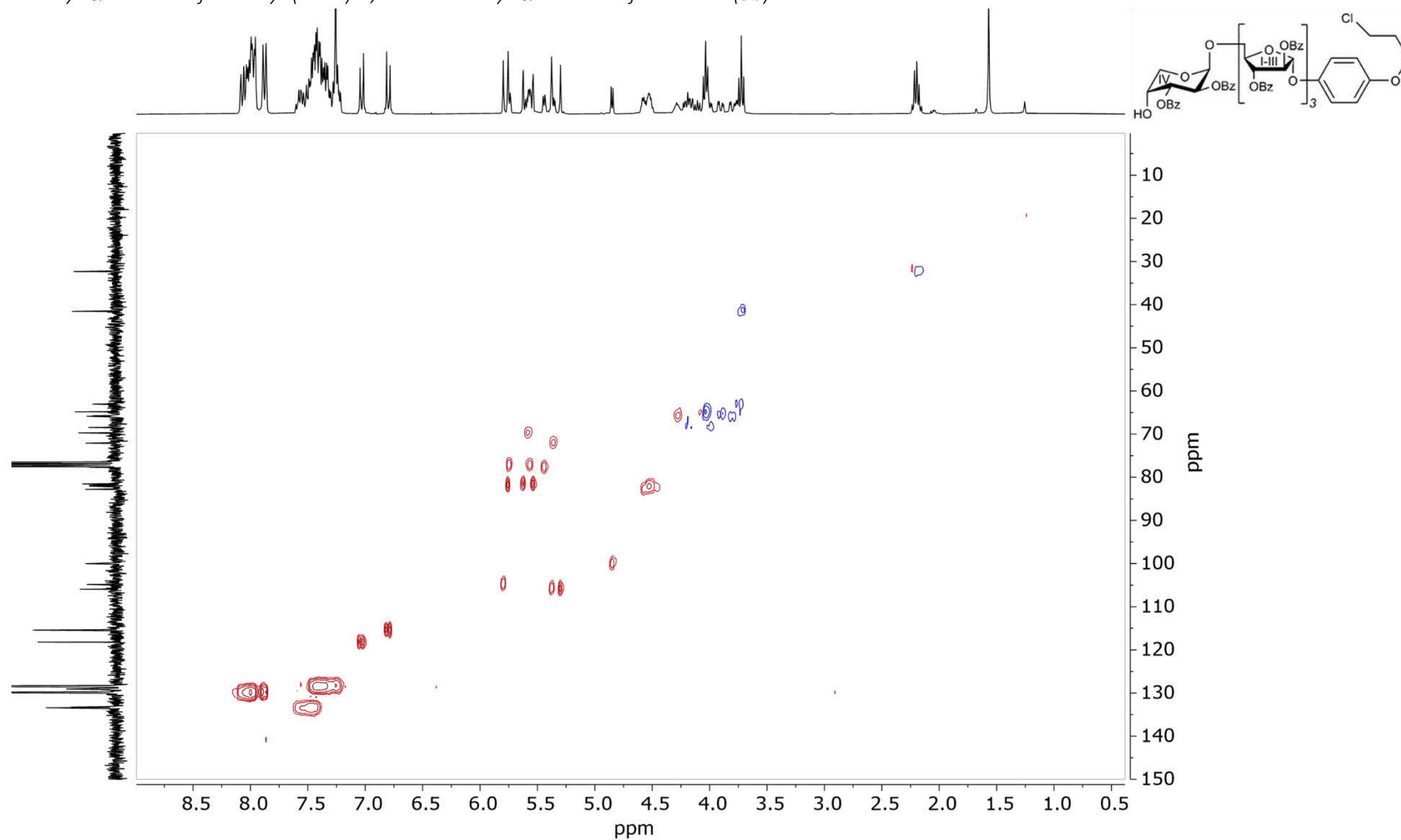
^{13}C NMR (CDCl_3 , 75 MHz) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- β -D-arabinopyranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**5b**)



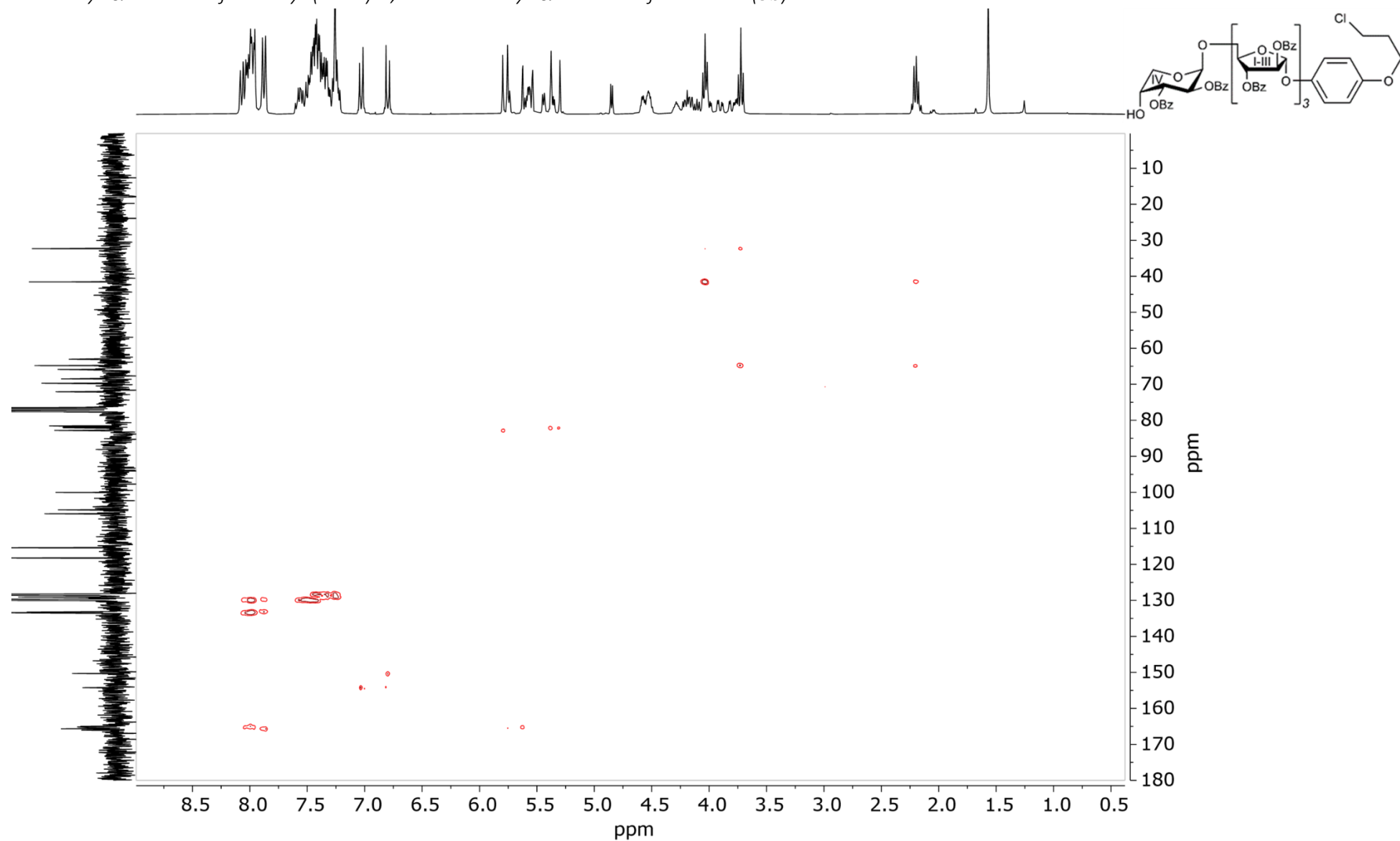
^1H - ^1H COSY (CDCl_3) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- β -D-arabinopyranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**5b**)



^1H - ^{13}C HSQC (CDCl_3) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- β -D-arabinopyranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**5b**)

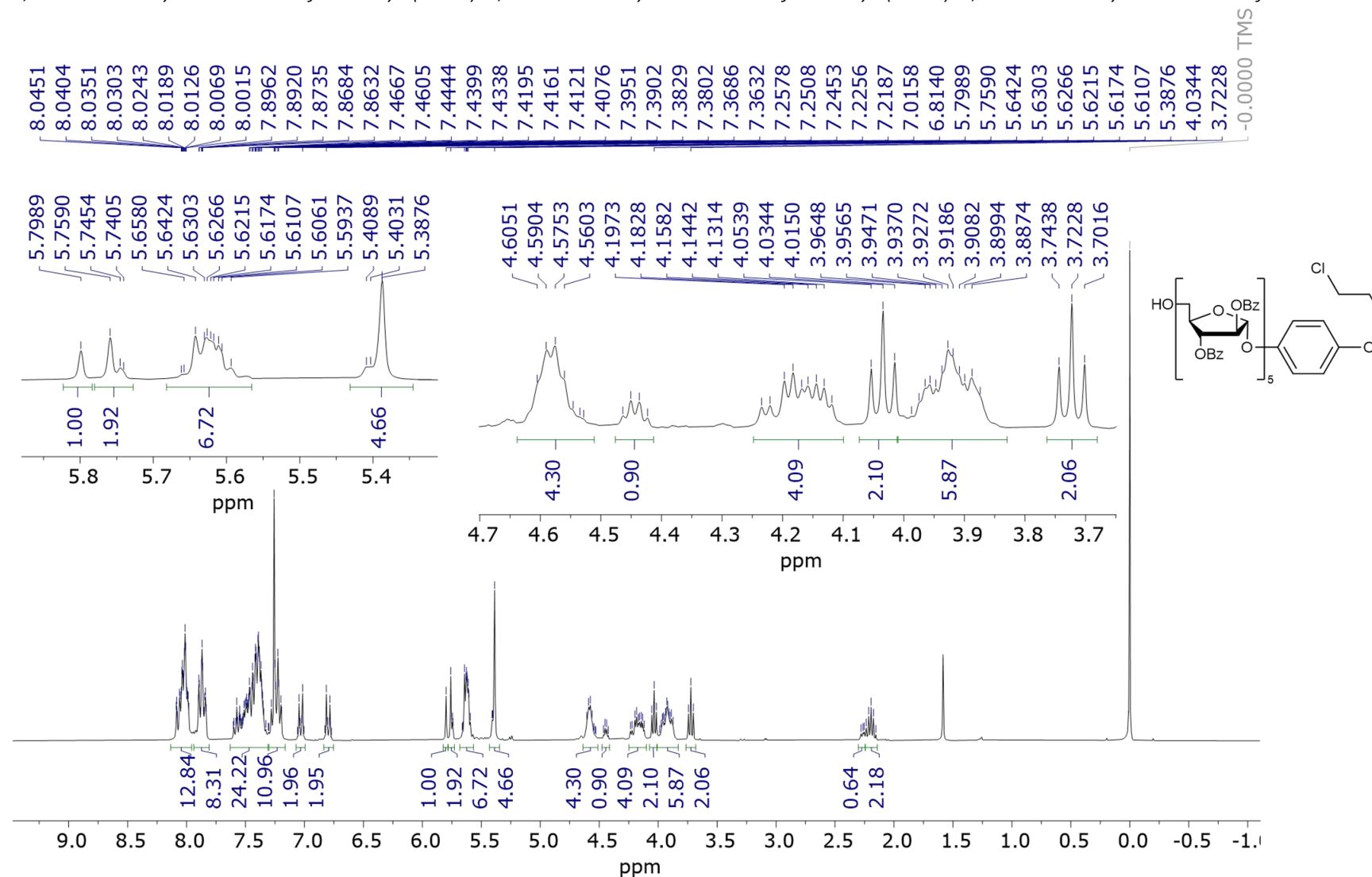


^1H - ^{13}C HMBC (CDCl_3) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- β -D-arabinopyranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**5b**)

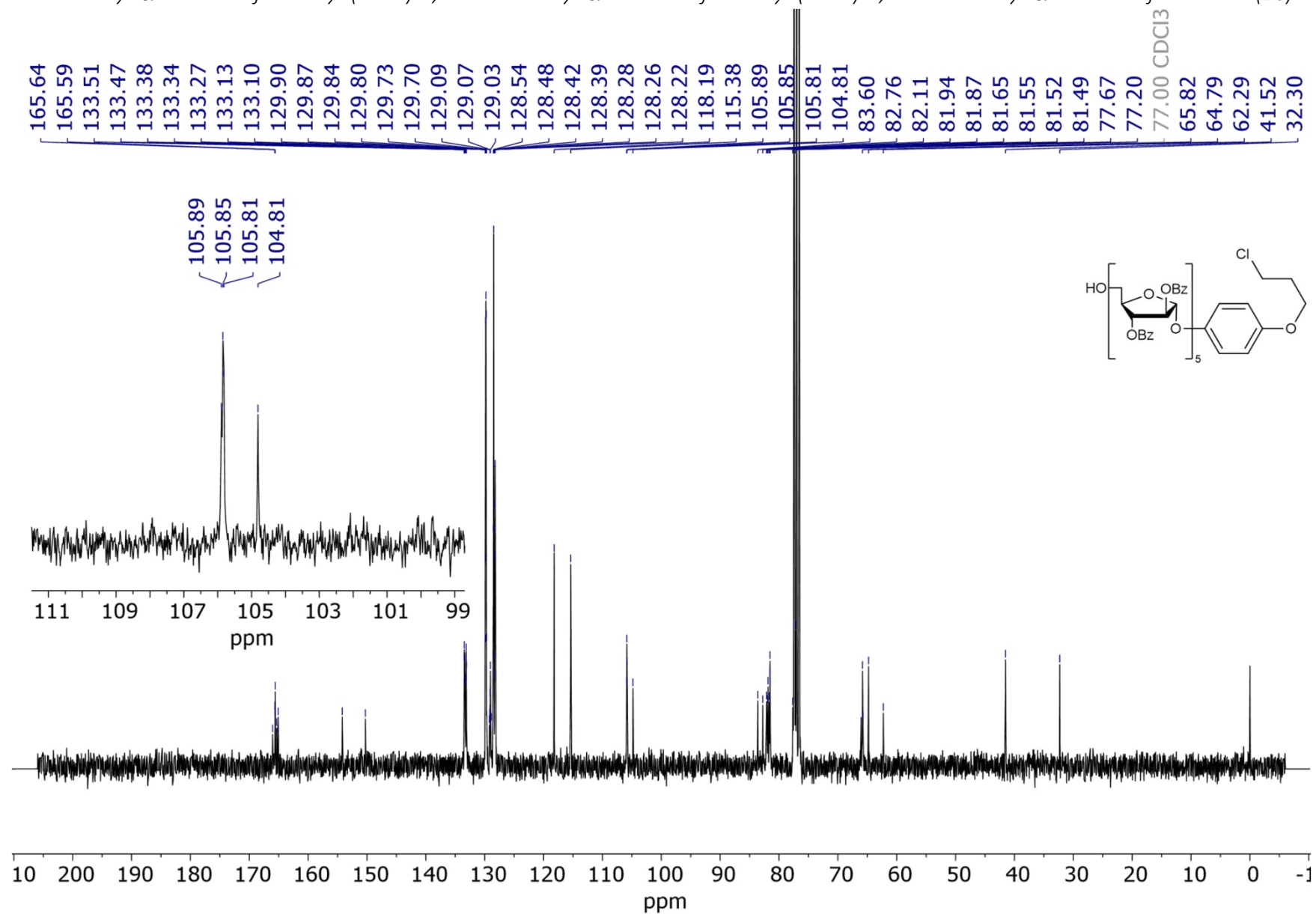


S.1.15. 4-(3-Chloropropoxy)phenyl 2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (2e)

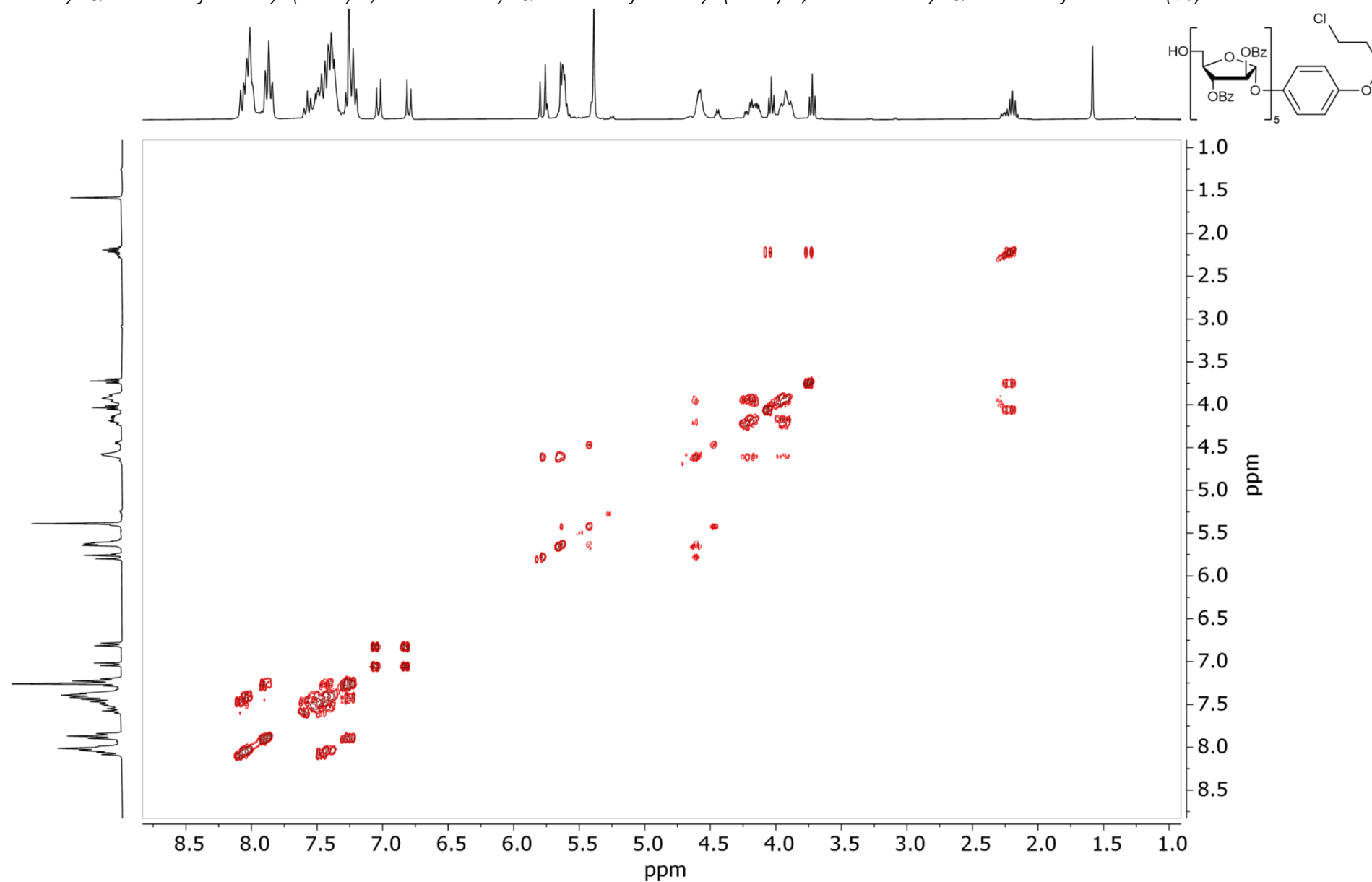
^1H NMR (CDCl_3 , 300 MHz) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (2e)



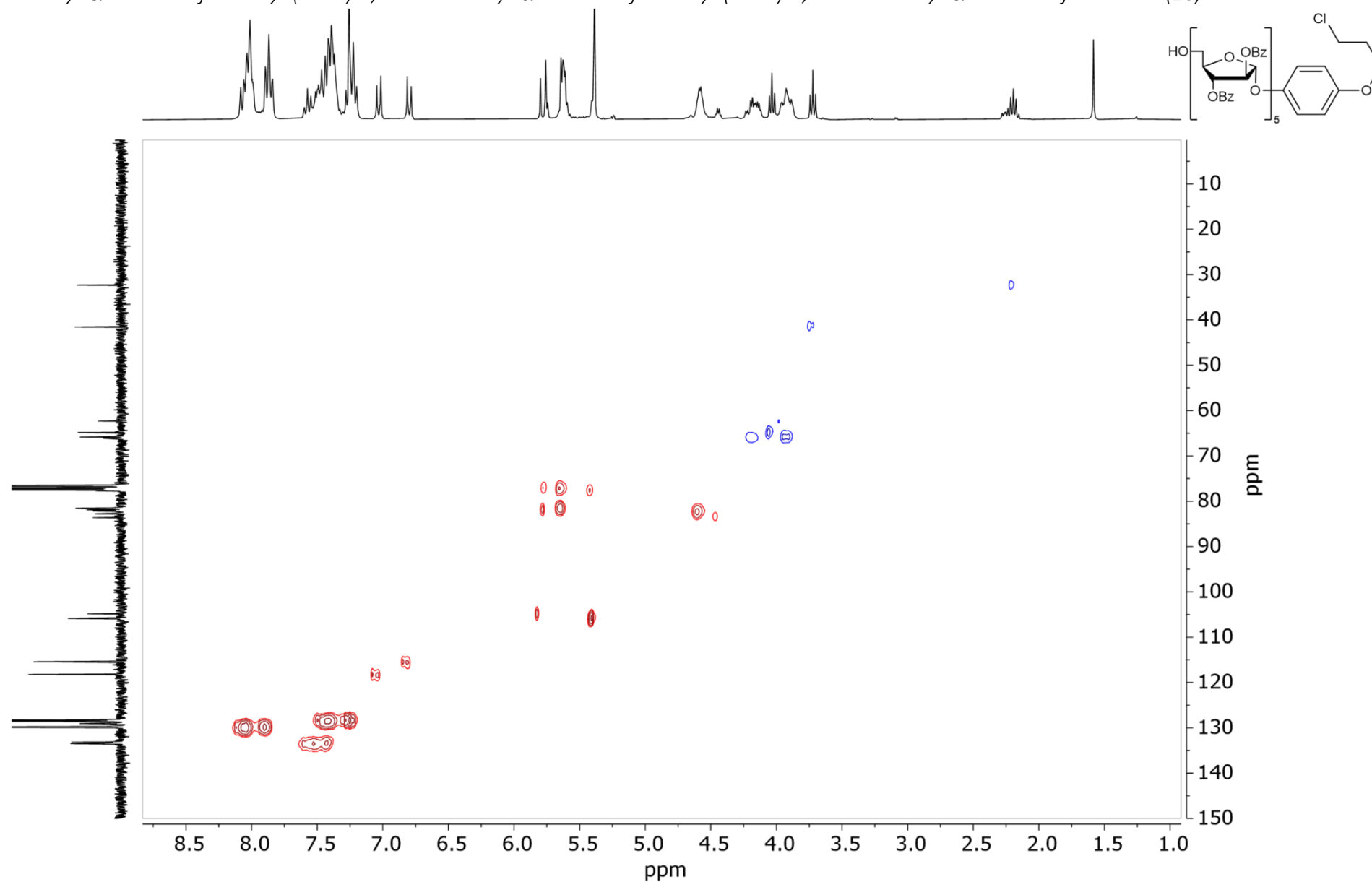
^{13}C NMR (CDCl_3 , 75 MHz) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**2e**)



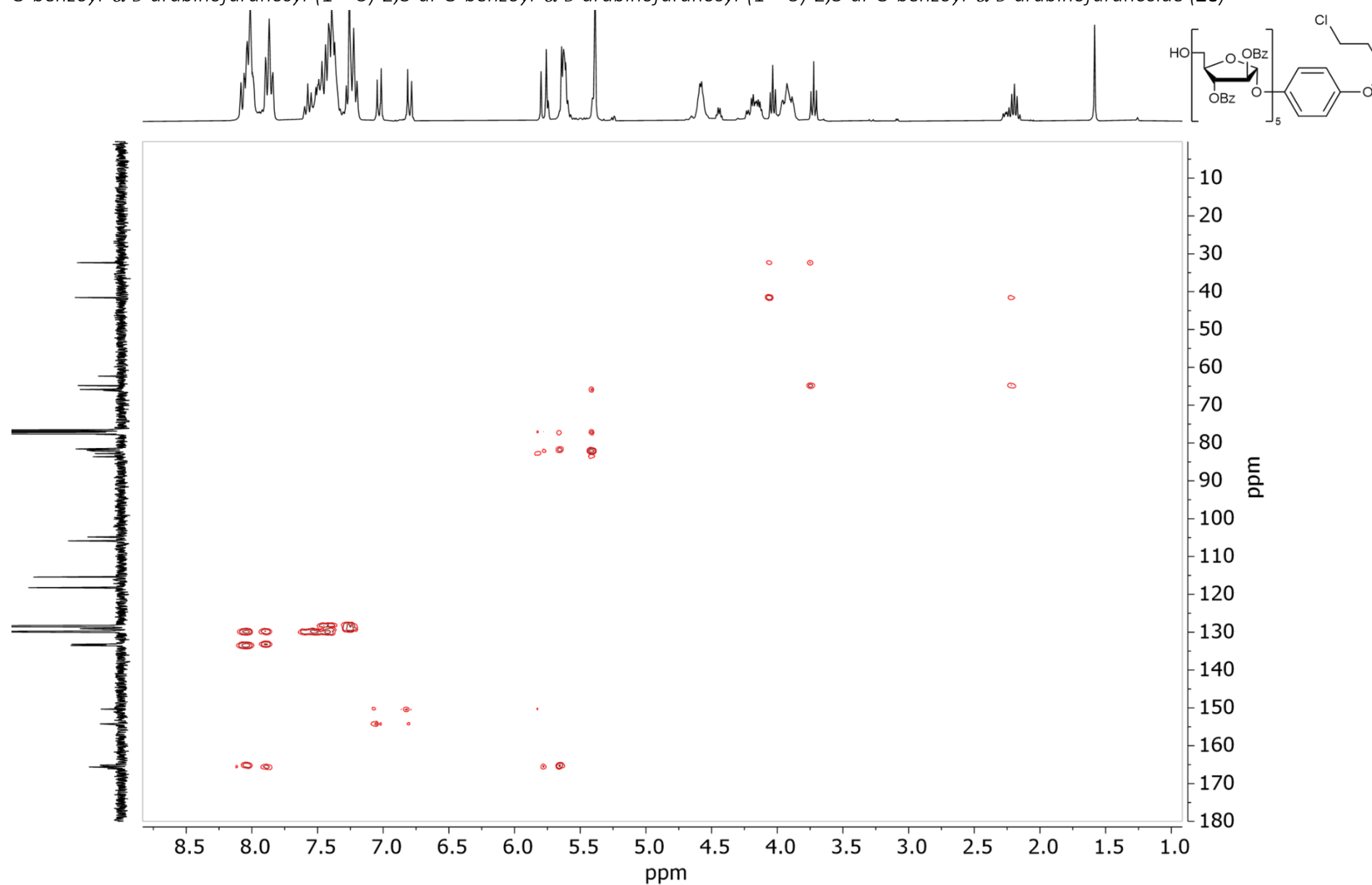
^1H - ^1H COSY (CDCl_3) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**2e**)



^1H - ^{13}C HSQC (CDCl_3) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**2e**)

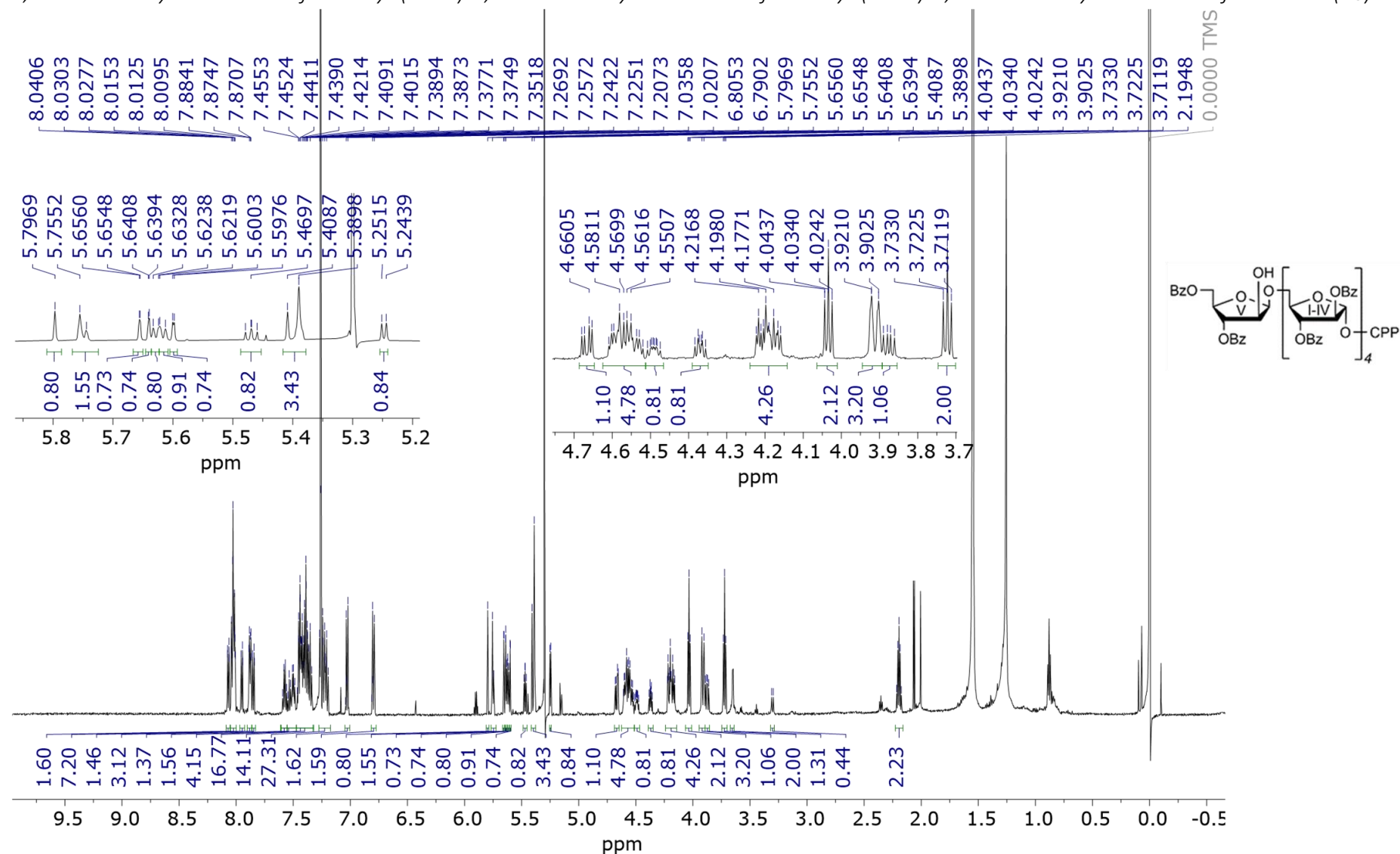


^1H - ^{13}C HMBC (CDCl_3) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**2e**)

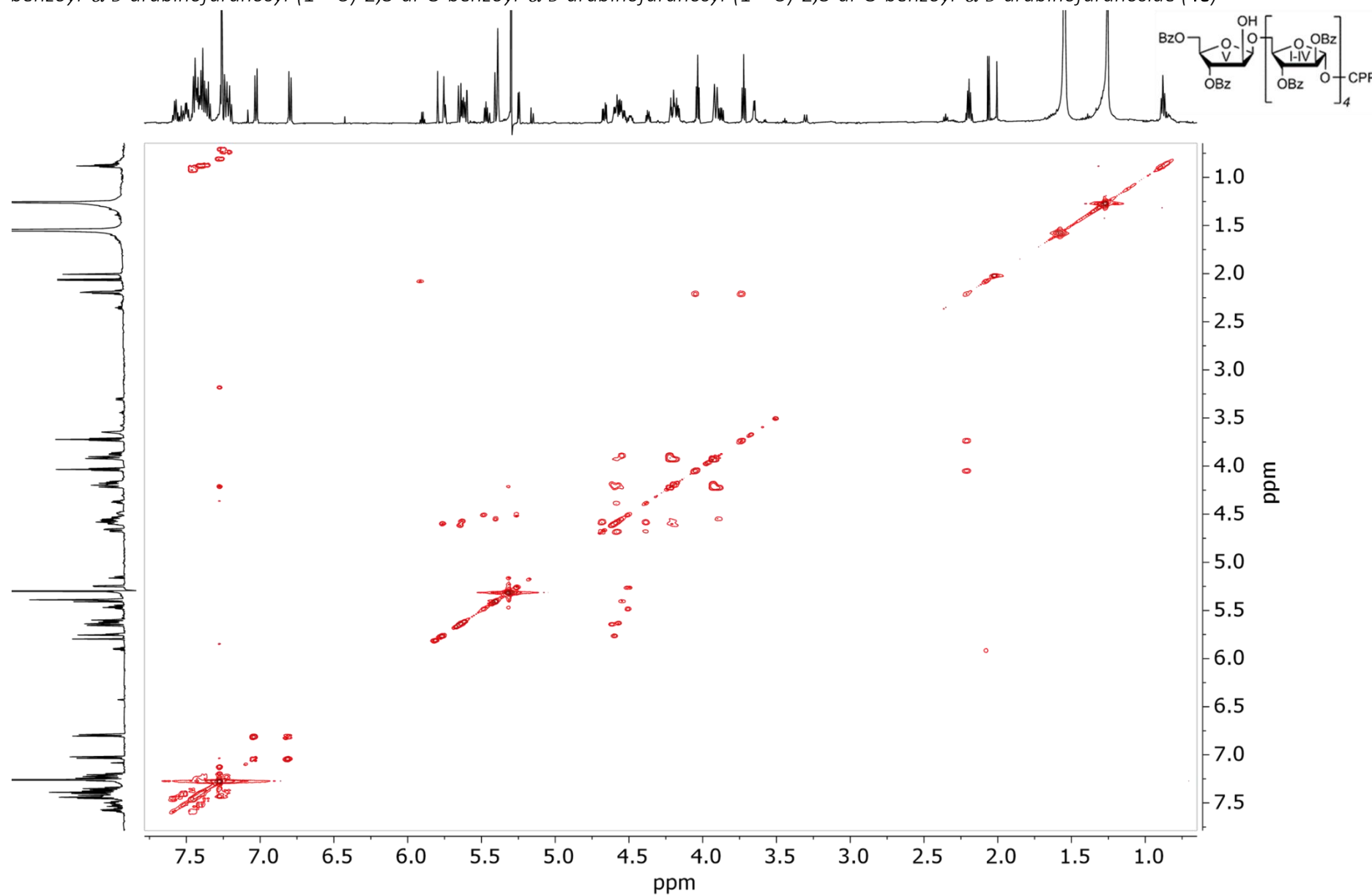


S.1.16. 4-(3-Chloropropoxy)phenyl 3,5-di-O-benzoyl- β -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (4e)

^1H NMR (CDCl_3 , 600 MHz) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- β -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (4e)

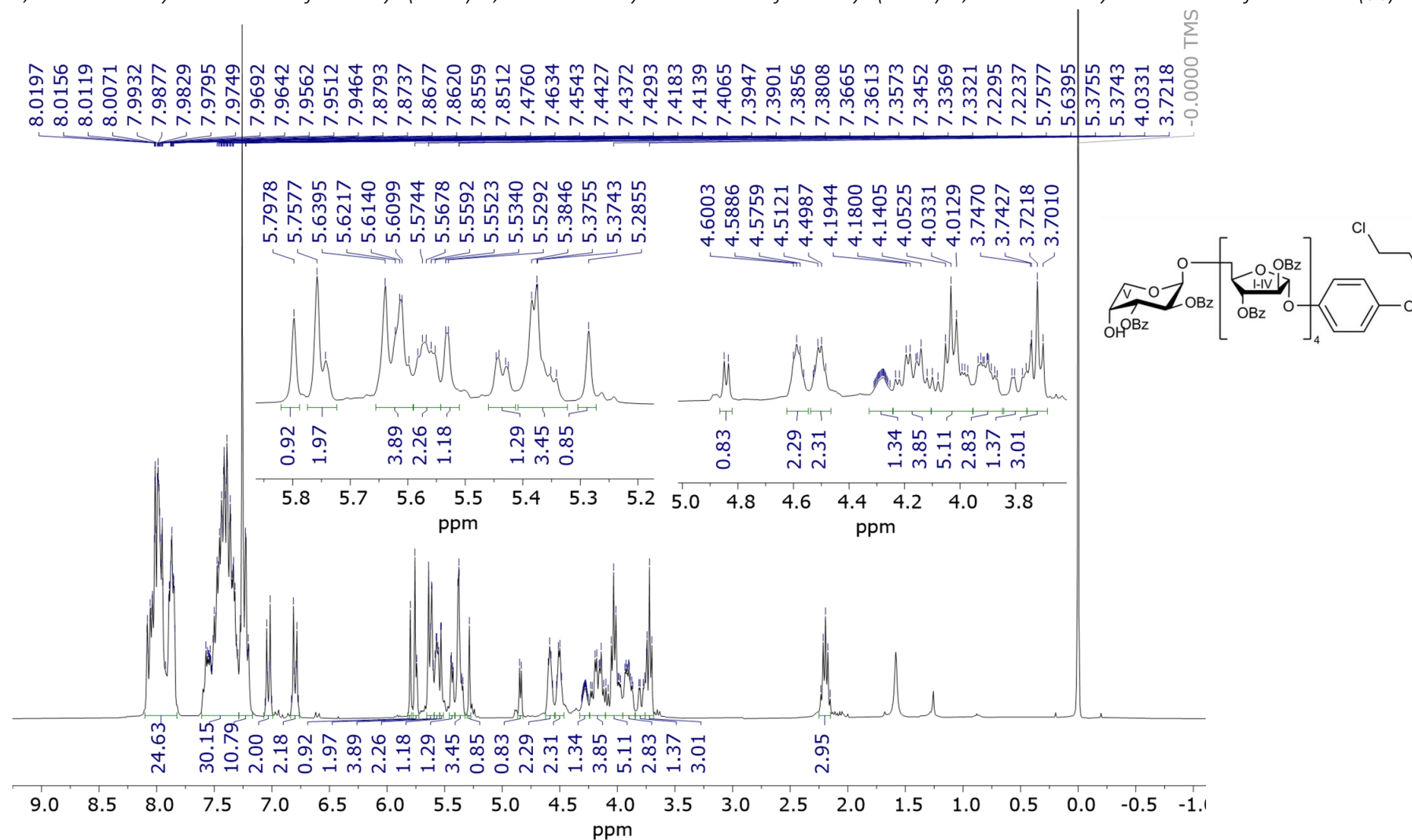


^1H - ^1H COSY (CDCl_3) of 4-(3-chloropropoxy)phenyl 3,5-di-O-benzoyl- β -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**4e**)



S.1.17. 4-(3-Chloropropoxy)phenyl 2,3-di-O-benzoyl- β -D-arabinopyranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (5c)

^1H NMR (CDCl_3 , 300 MHz) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- β -D-arabinopyranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (5c)



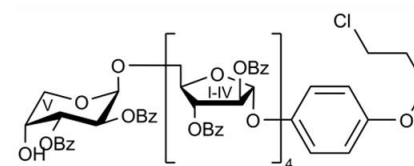
Chemical Structure: The structure shows a polymer chain with a repeating unit of 1,4-benzylidene-2,3,6-tri-O-benzyl-2-deoxy-2,5-dideoxy-D-glucopyranoside. The units are linked by 1,4-glycosidic bonds. The anomeric carbon (C1) is labeled 'V' and the other carbons are labeled 'I-IV'.

13C NMR Spectrum (ppm):

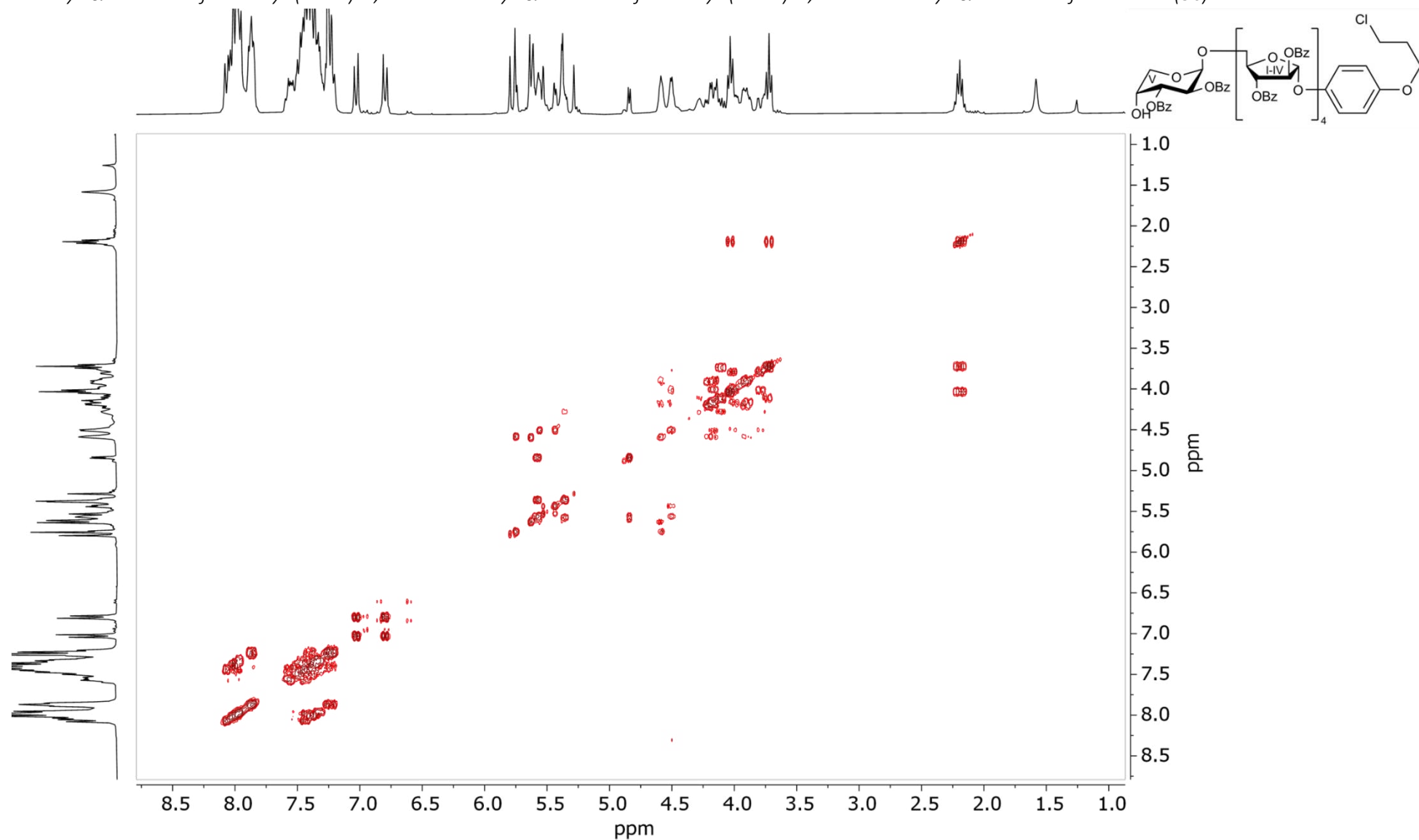
- 165.66, 165.57, 133.52, 133.47, 133.38, 133.23, 133.15, 133.12, 129.94, 129.92, 129.89, 129.86, 129.81, 129.75, 129.10, 129.06, 128.55, 128.50, 128.46, 128.43, 128.41, 128.38, 128.34, 128.26, 118.21, 115.40, 105.95, 105.93, 105.83, 104.83, 100.01, 104.83, 82.77, 82.16, 82.11, 82.04, 81.89, 81.63, 81.54, 81.49, 77.67, 77.21, 77.08, 72.08, 69.69, 65.86, 64.80, 41.54, 32.31, 0.00 TMS

Inset Spectrum (164.0-167.0 ppm):

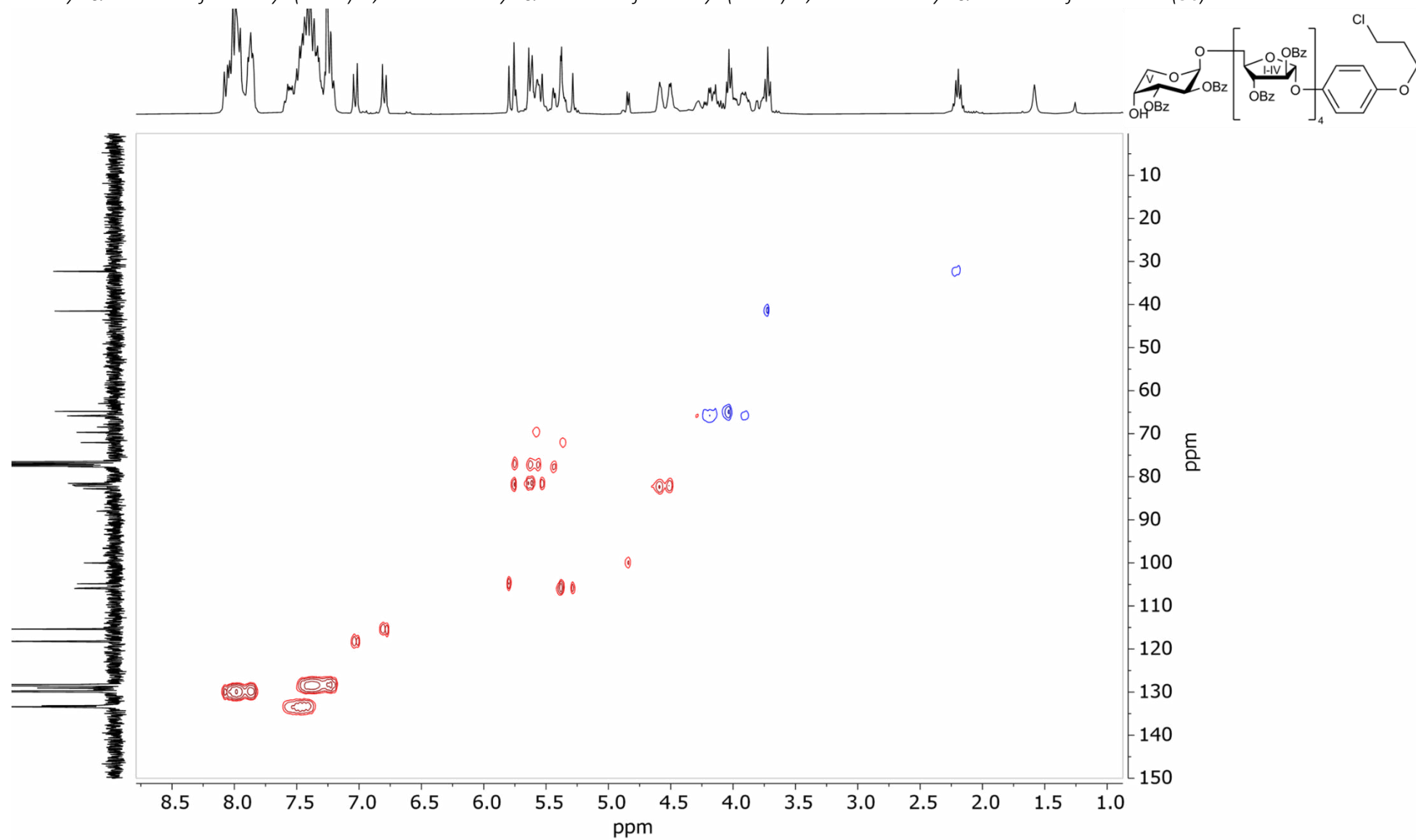
- 166.04, 165.66, 165.60, 165.57, 165.36, 165.15, 165.11, 165.08, 164.96
- 1.24, 1.83, 0.86, 1.19, 1.00, 1.08, 1.25, 0.99, 0.94



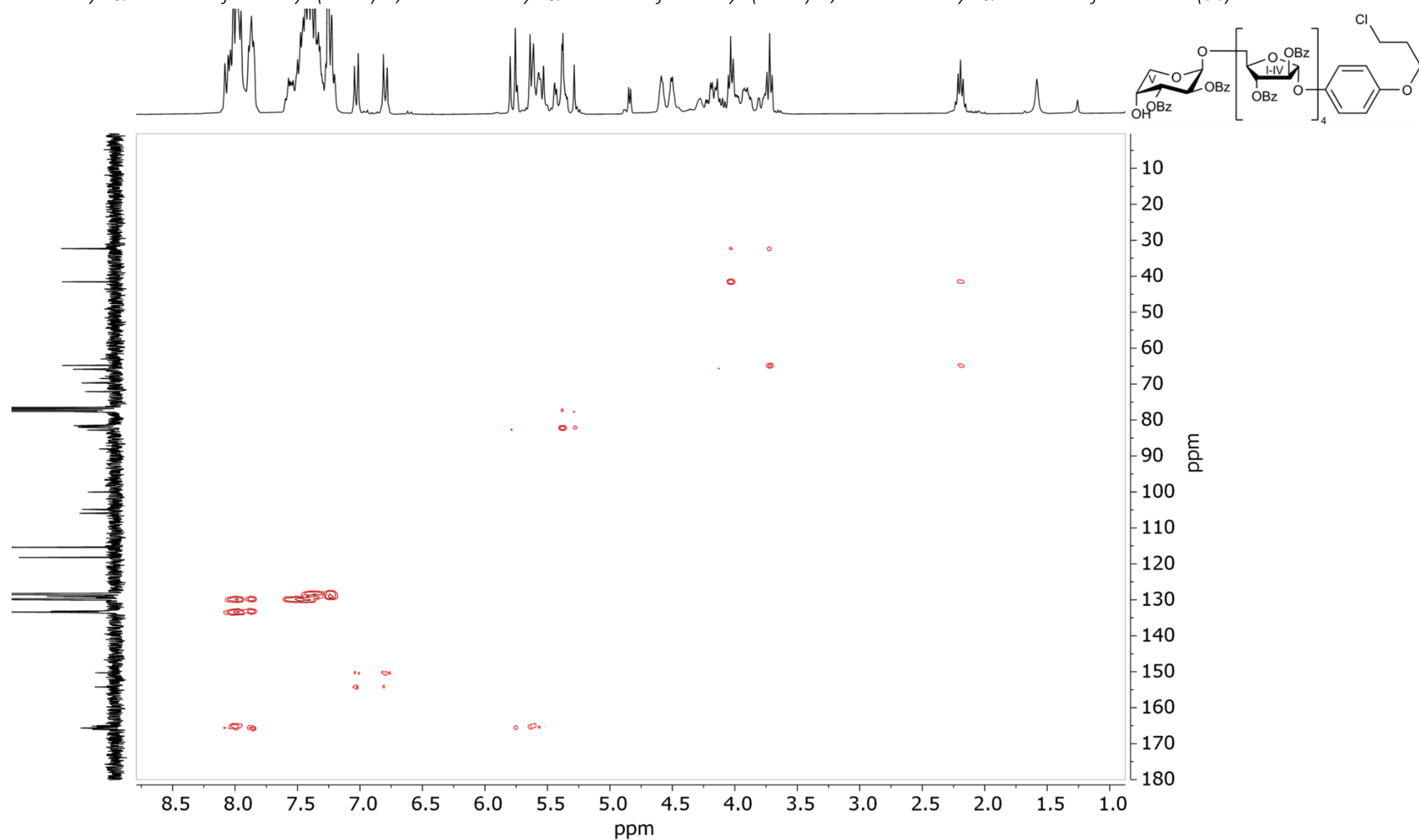
^1H - ^1H COSY (CDCl_3) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- β -D-arabinopyranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**5c**)



^1H - ^{13}C HSQC (CDCl_3) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- β -D-arabinopyranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**5c**)

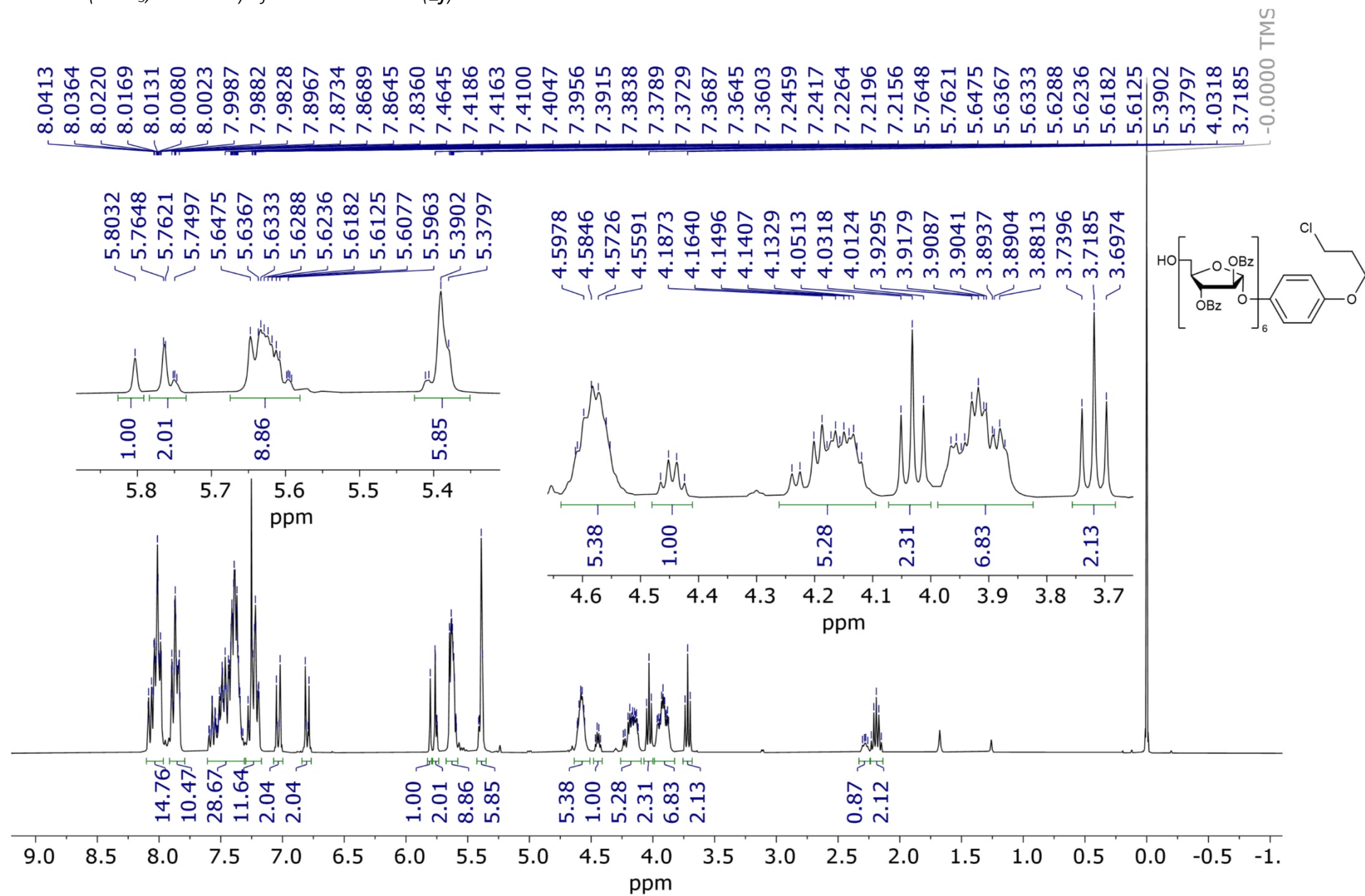


^1H - ^{13}C HMBC (CDCl_3) of 4-(3-chloropropoxy)phenyl 2,3-di-O-benzoyl- β -D-arabinopyranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranosyl-(1 $\rightarrow$ 5)-2,3-di-O-benzoyl- α -D-arabinofuranoside (**5c**)

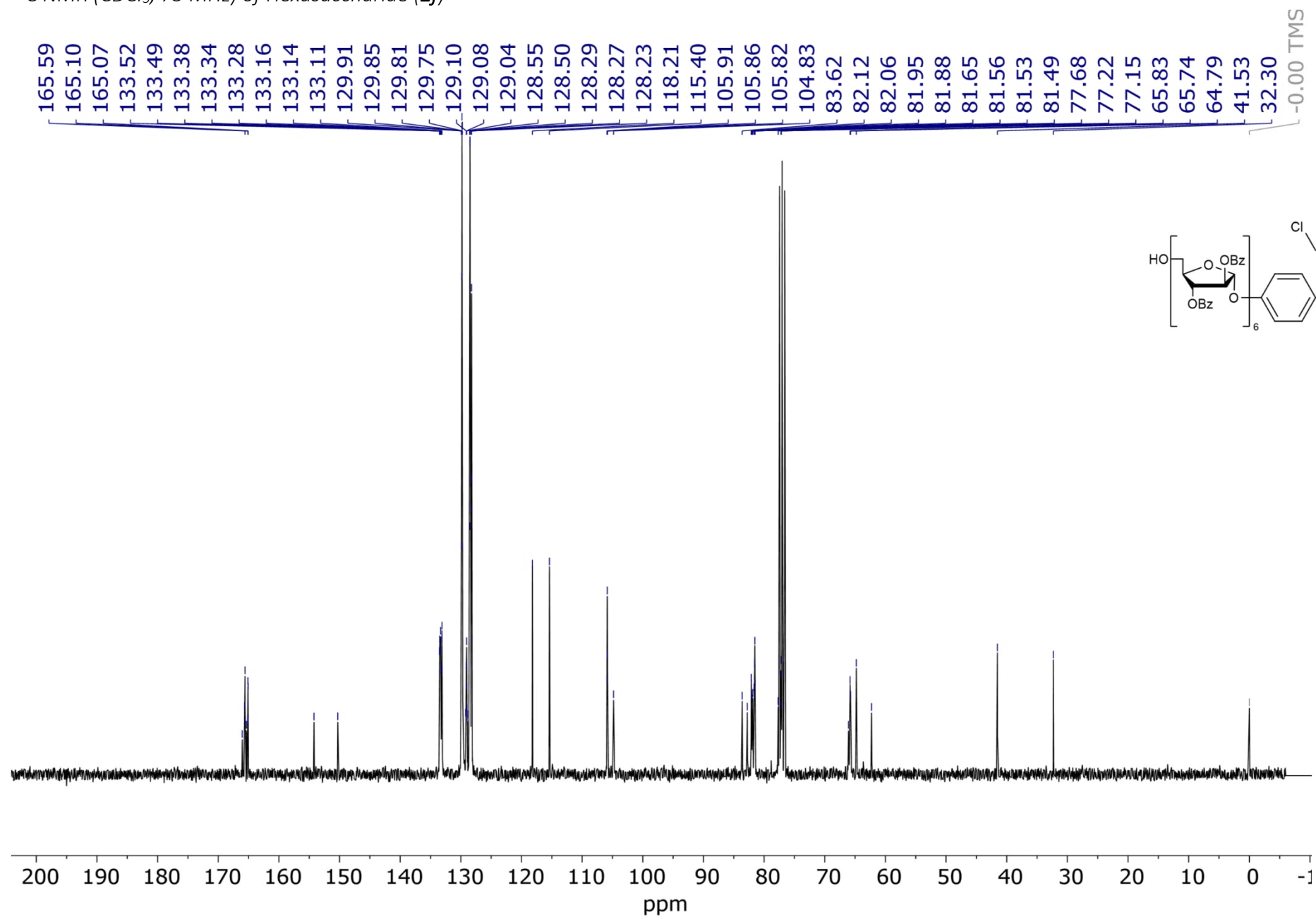


S.1.18. Hexasaccharide (2f)

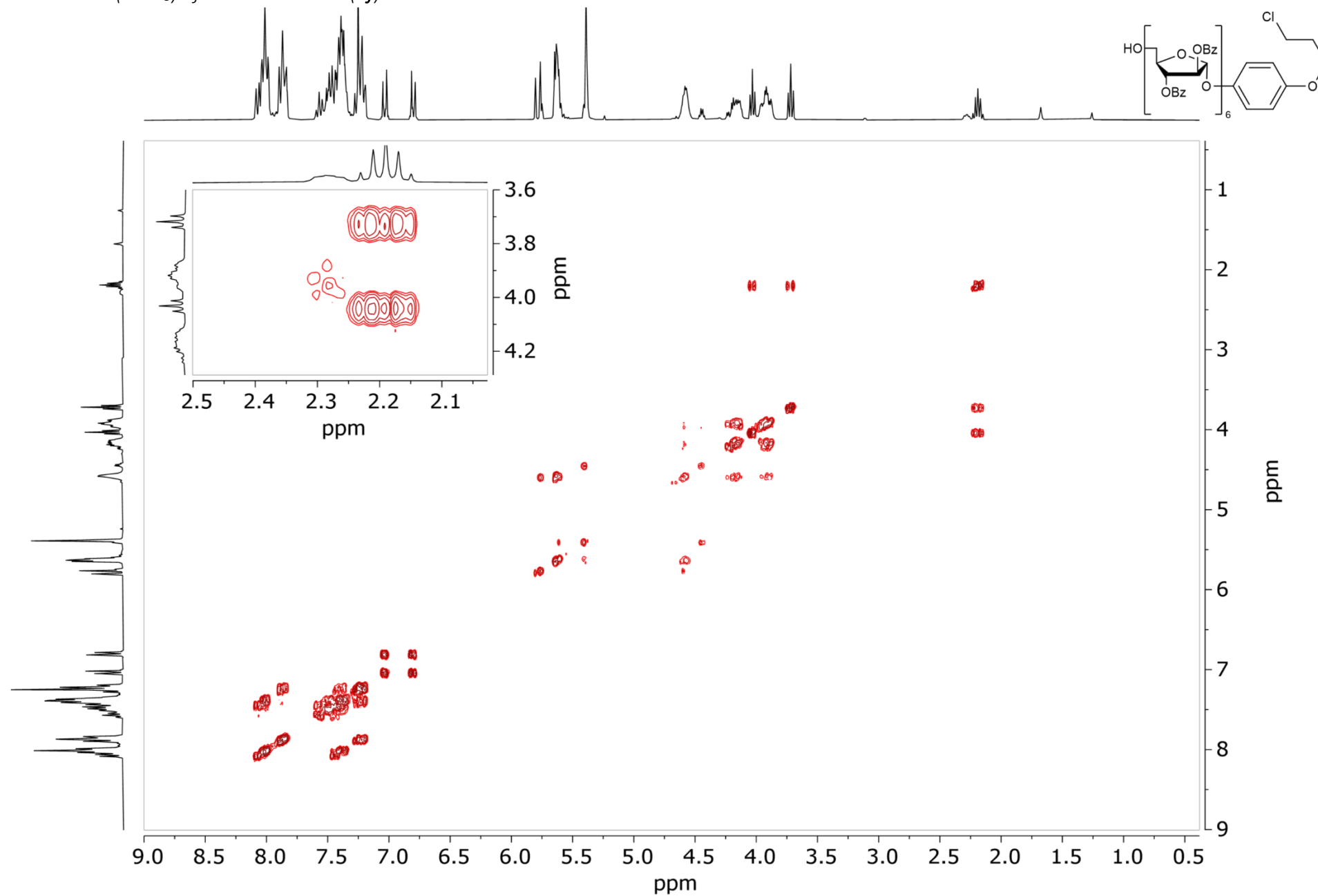
^1H NMR (CDCl_3 , 300 MHz) of Hexasaccharide (2f)



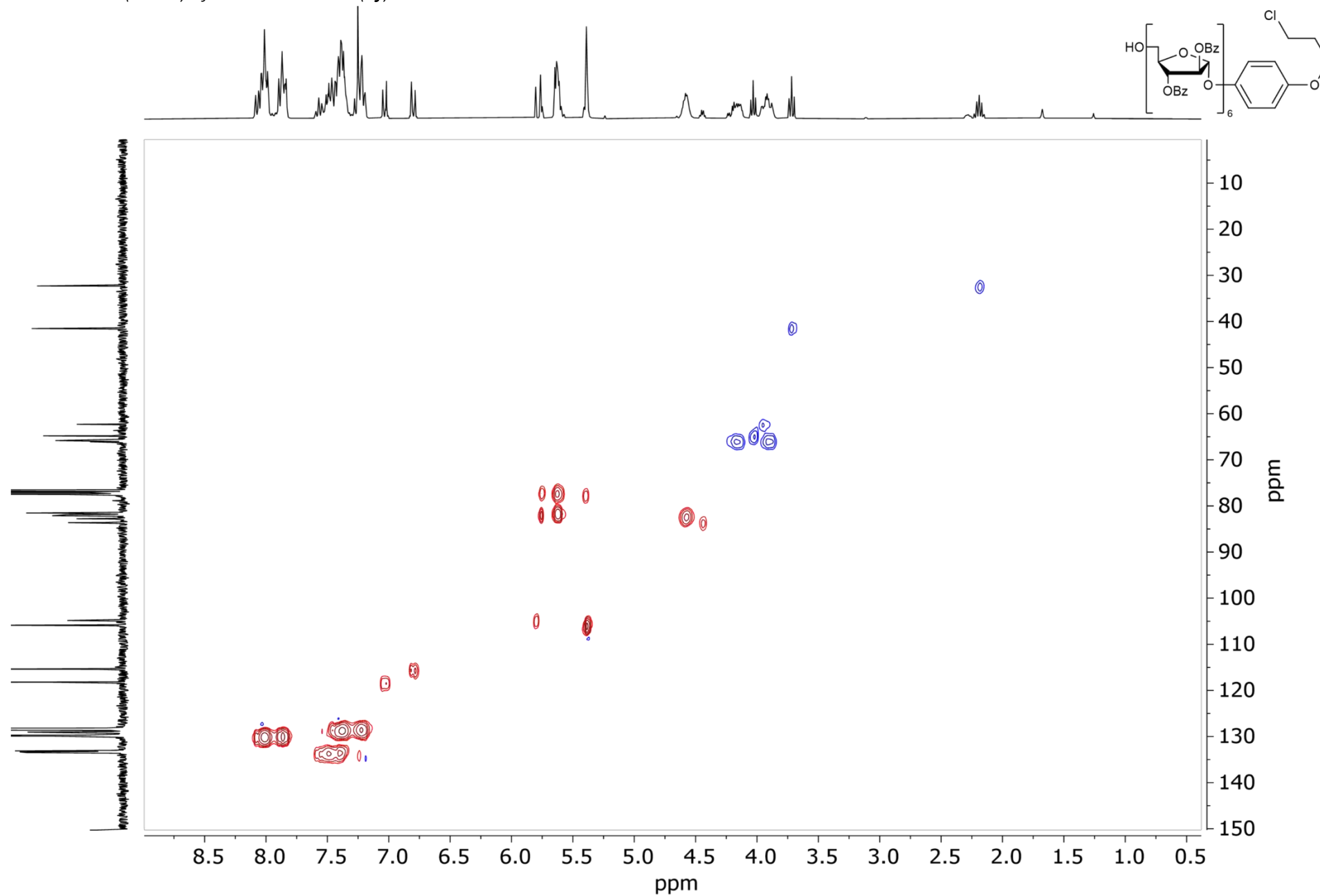
^{13}C NMR (CDCl_3 , 75 MHz) of Hexasaccharide (**2f**)



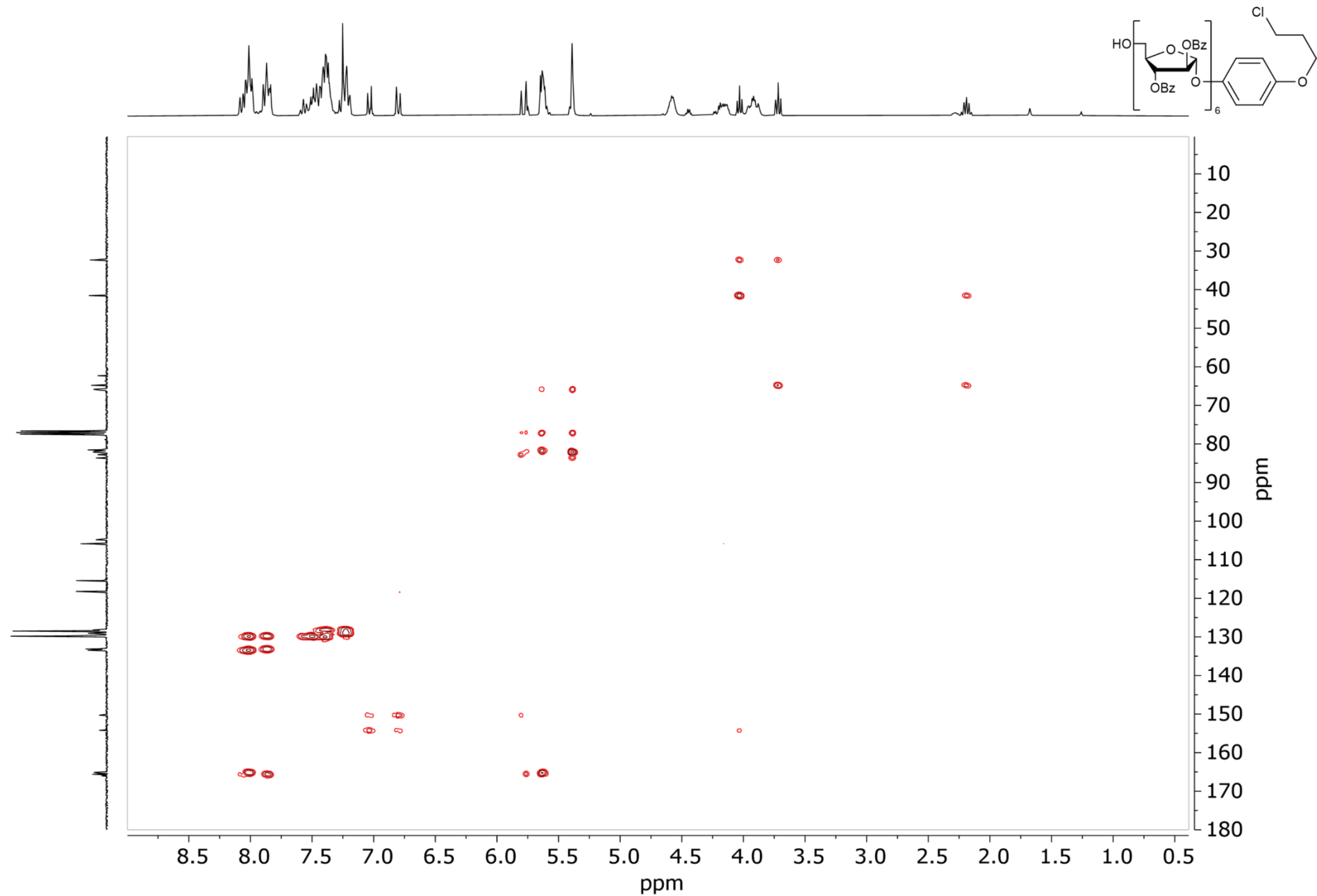
^1H - ^1H COSY (CDCl_3) of Hexasaccharide (**2f**)



^1H - ^{13}C HSQC (CDCl_3) of Hexasaccharide (**2f**)

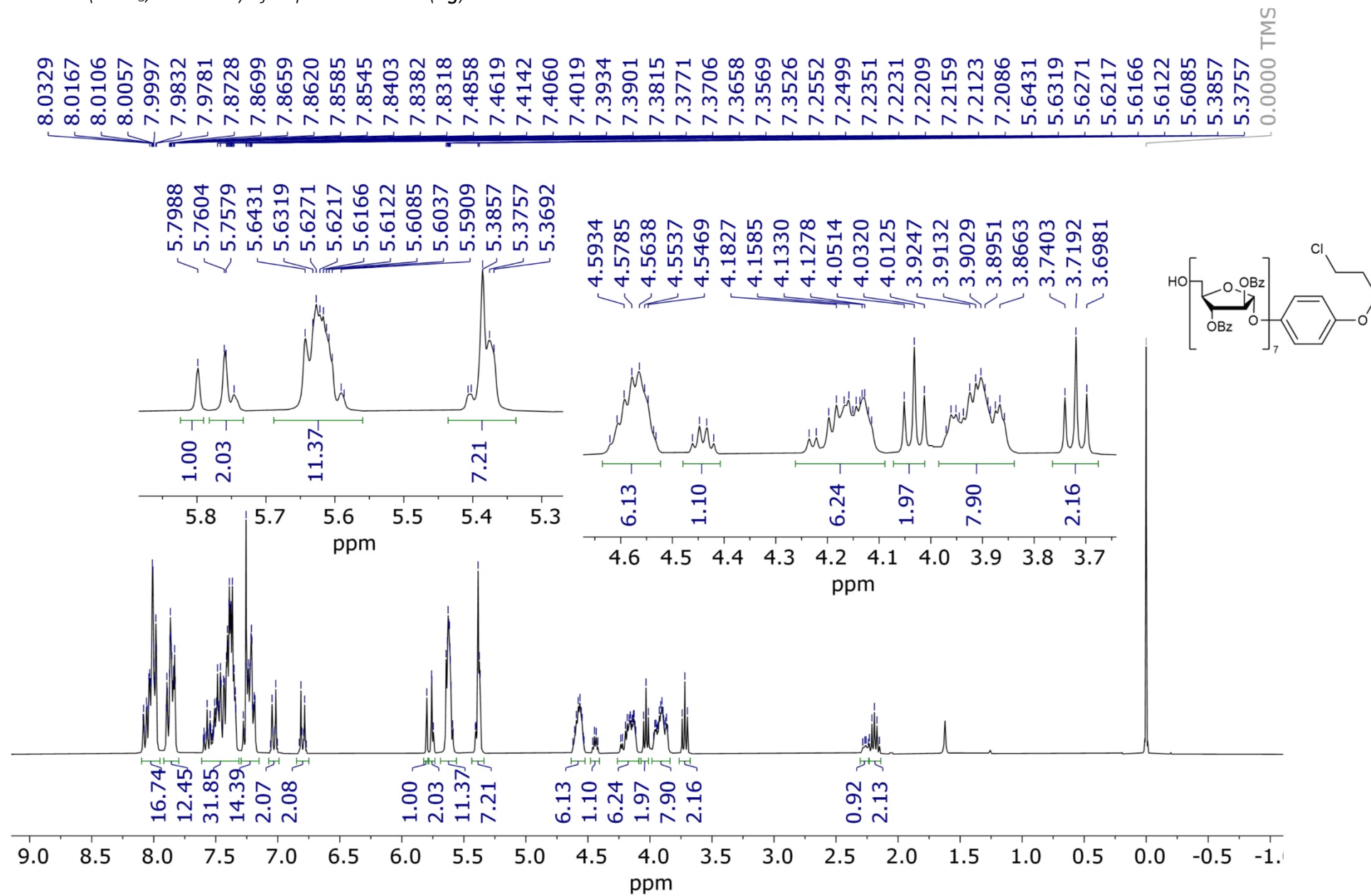


^1H - ^{13}C HMBC (CDCl_3) of Hexasaccharide (**2f**)

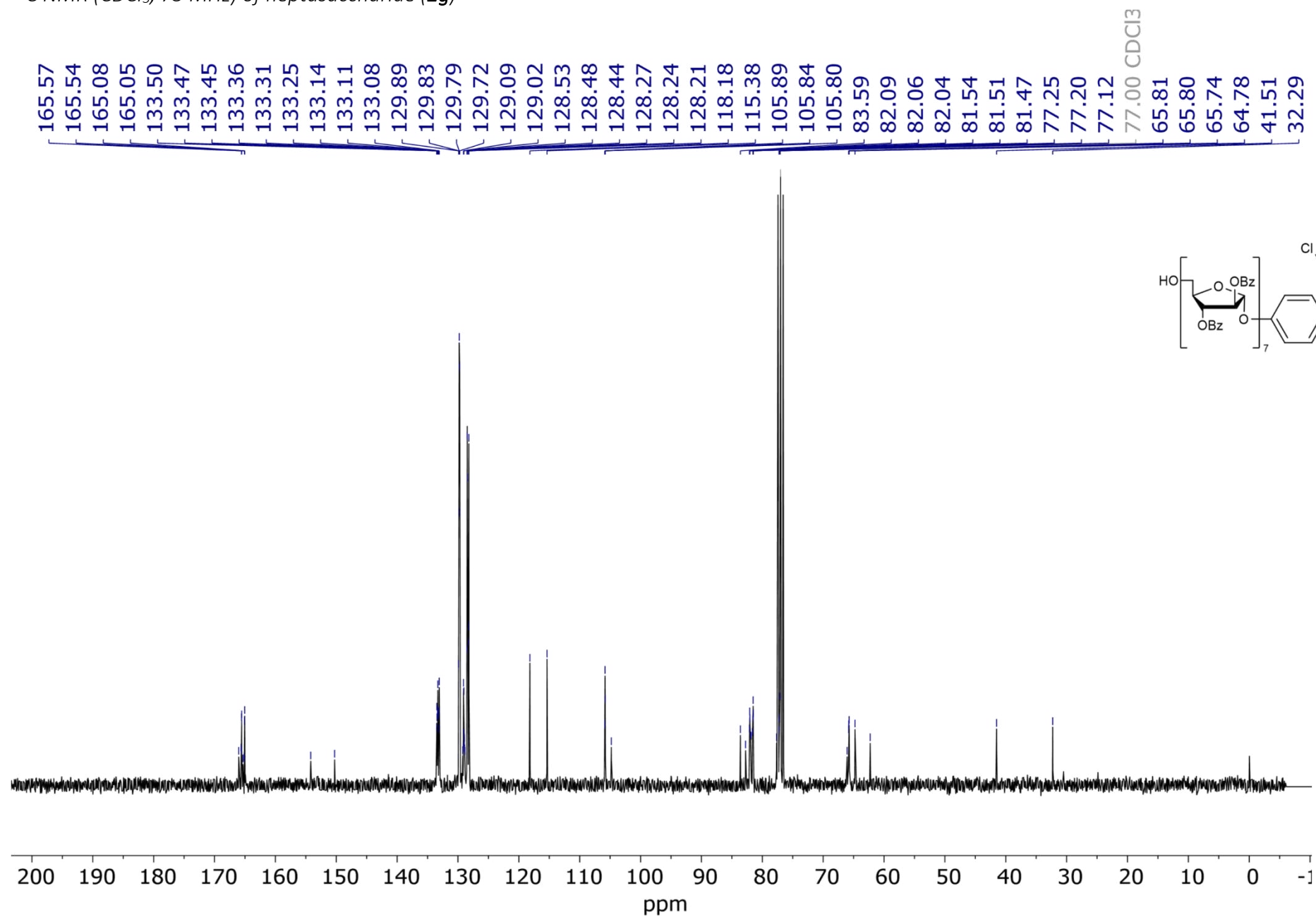


S.1.19. Heptasaccharide (2g)

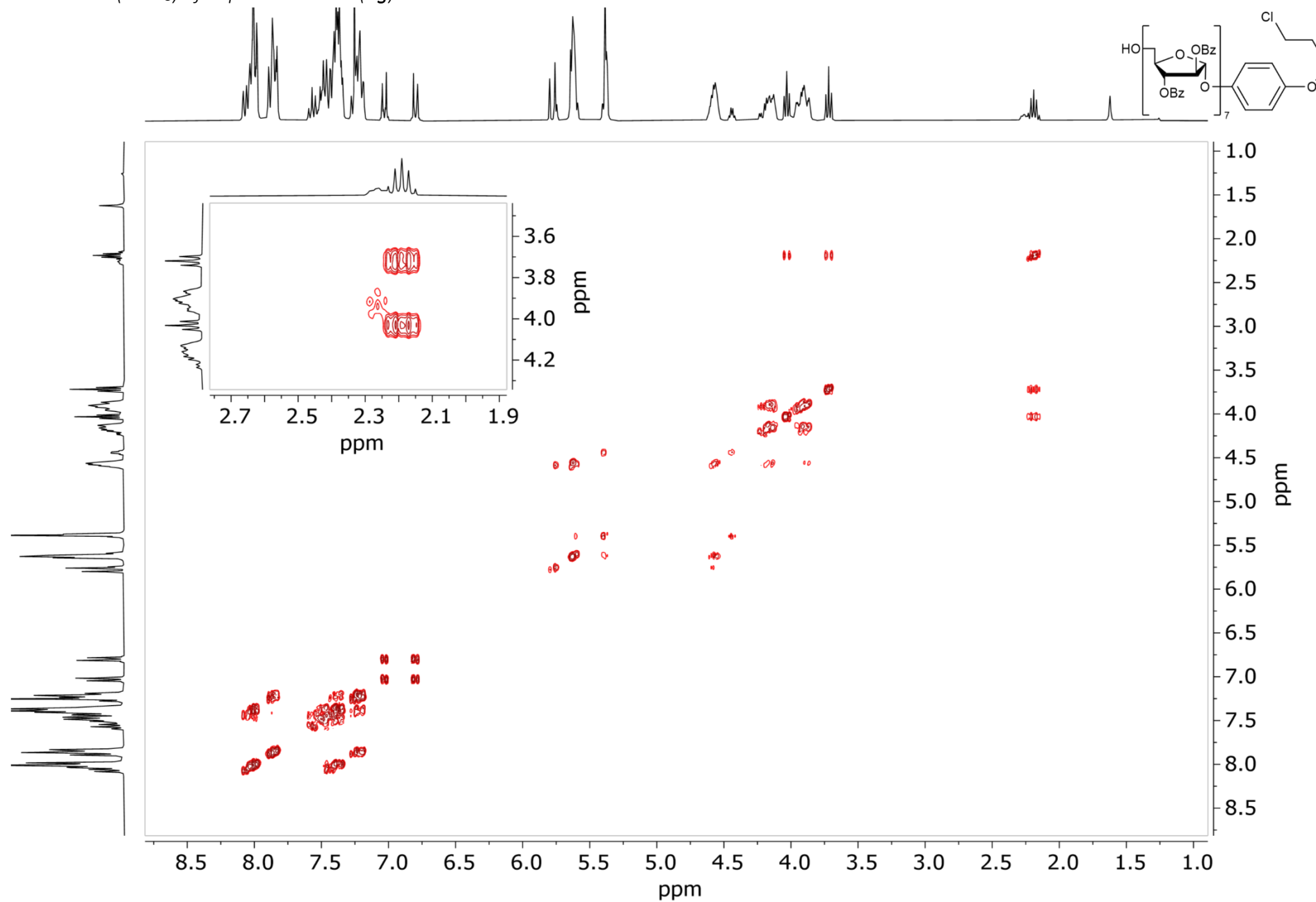
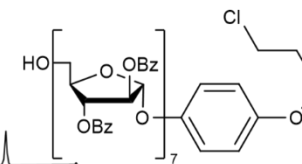
^1H NMR (CDCl_3 , 300 MHz) of heptasaccharide (2g)



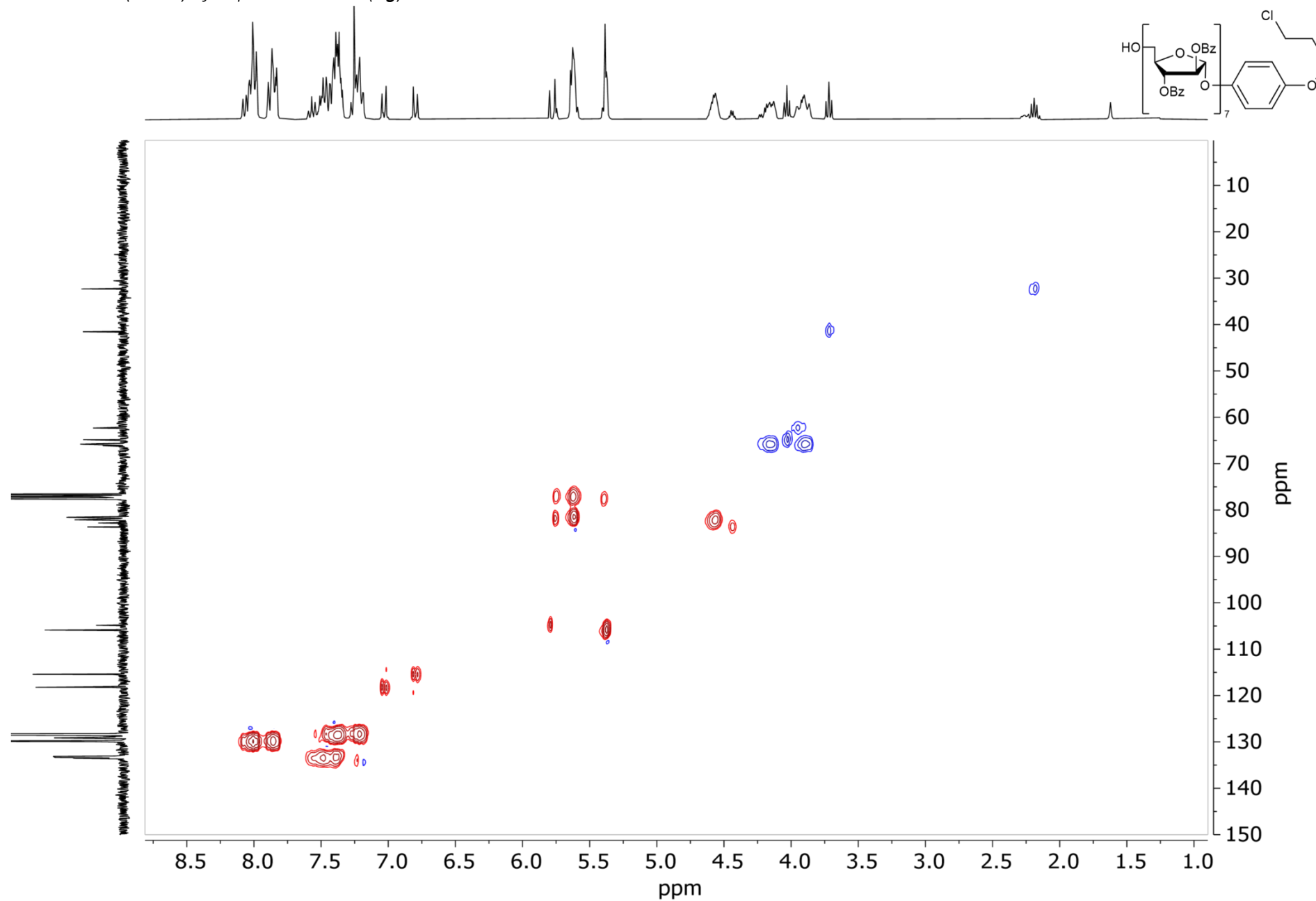
^{13}C NMR (CDCl_3 , 75 MHz) of heptasaccharide (**2g**)



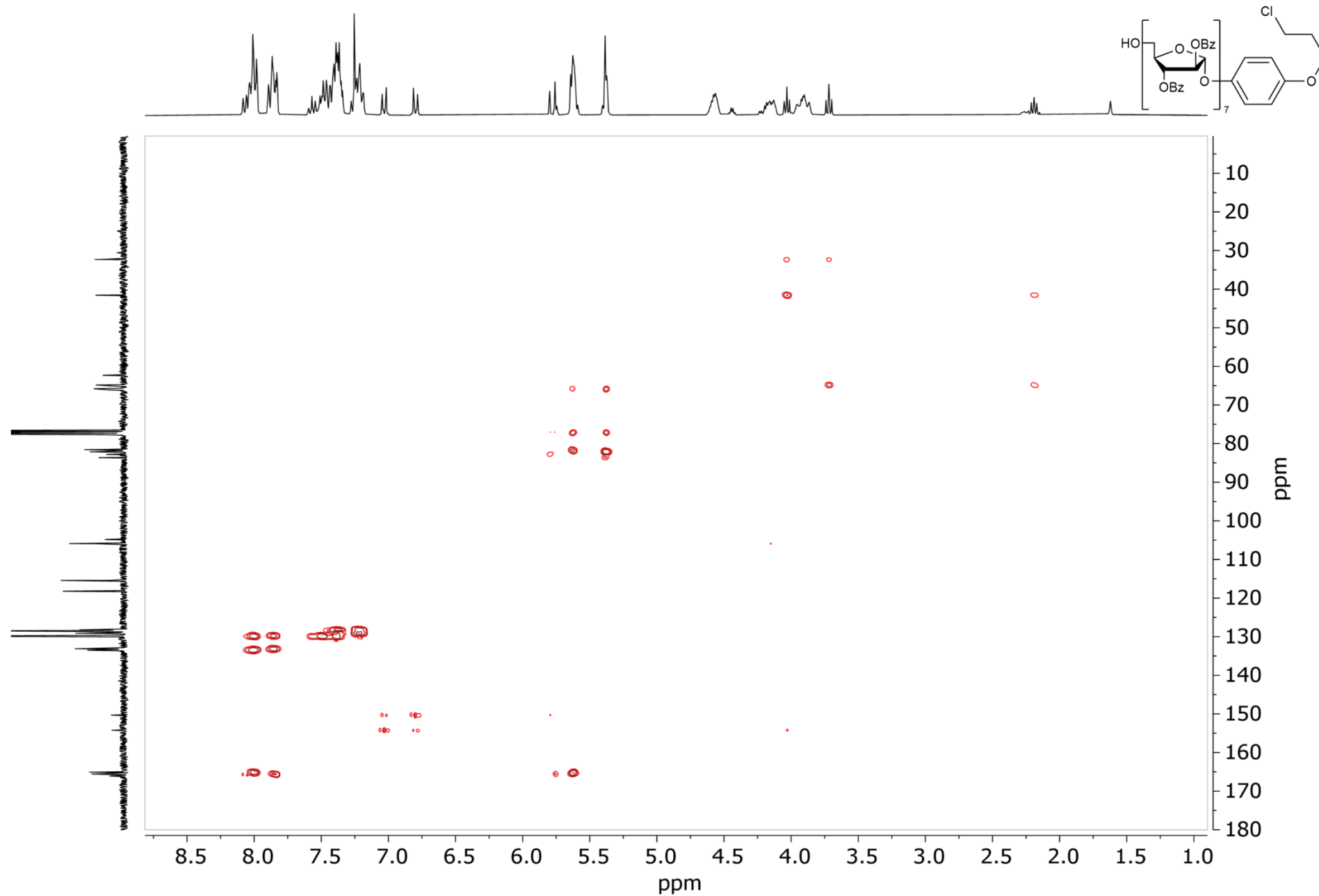
^1H - ^1H COSY (CDCl_3) of heptasaccharide (**2g**)



^1H - ^{13}C HSQC (CDCl_3) of heptasaccharide (**2g**)

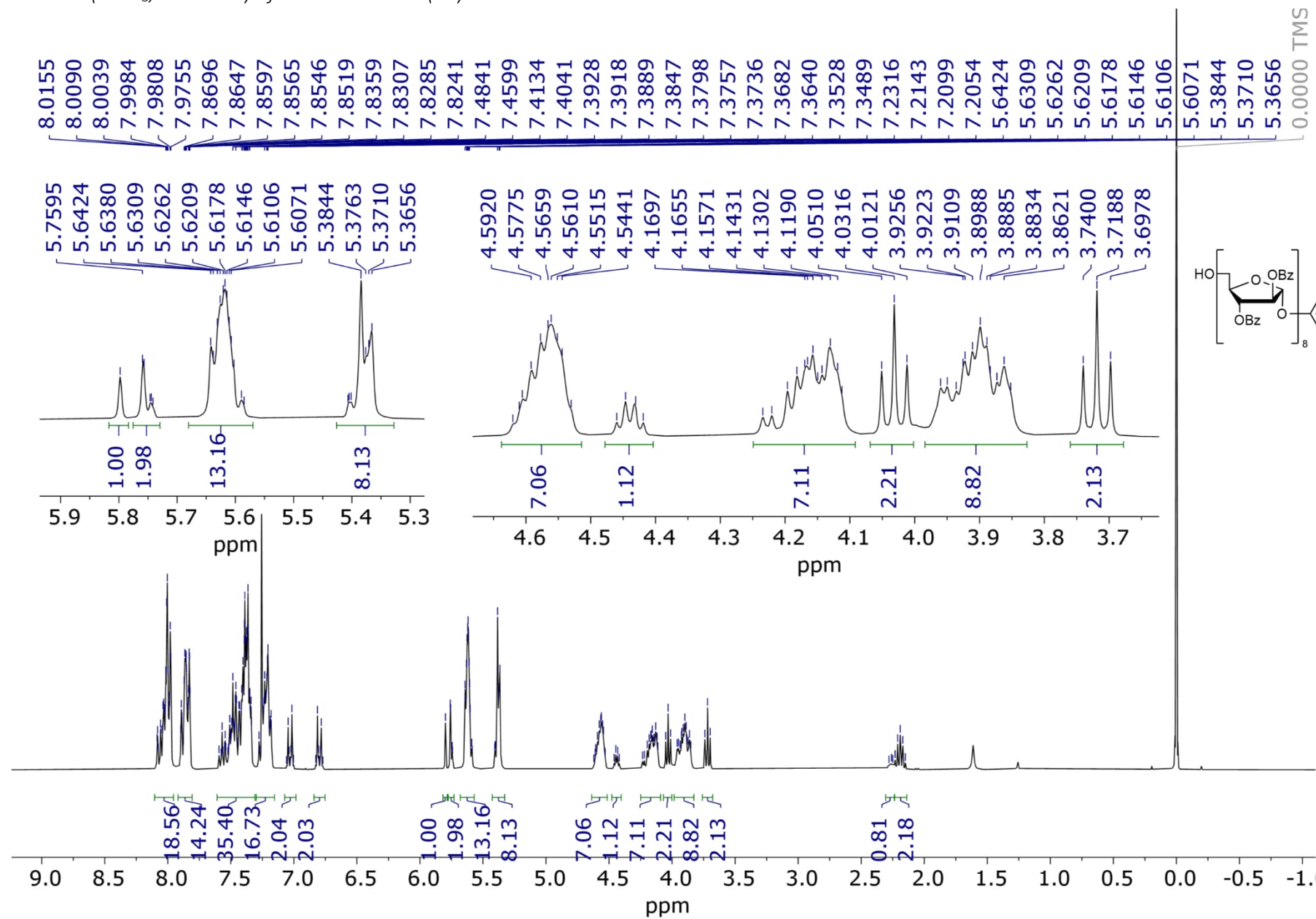


^1H - ^{13}C HMBC (CDCl_3) of heptasaccharide (**2g**)

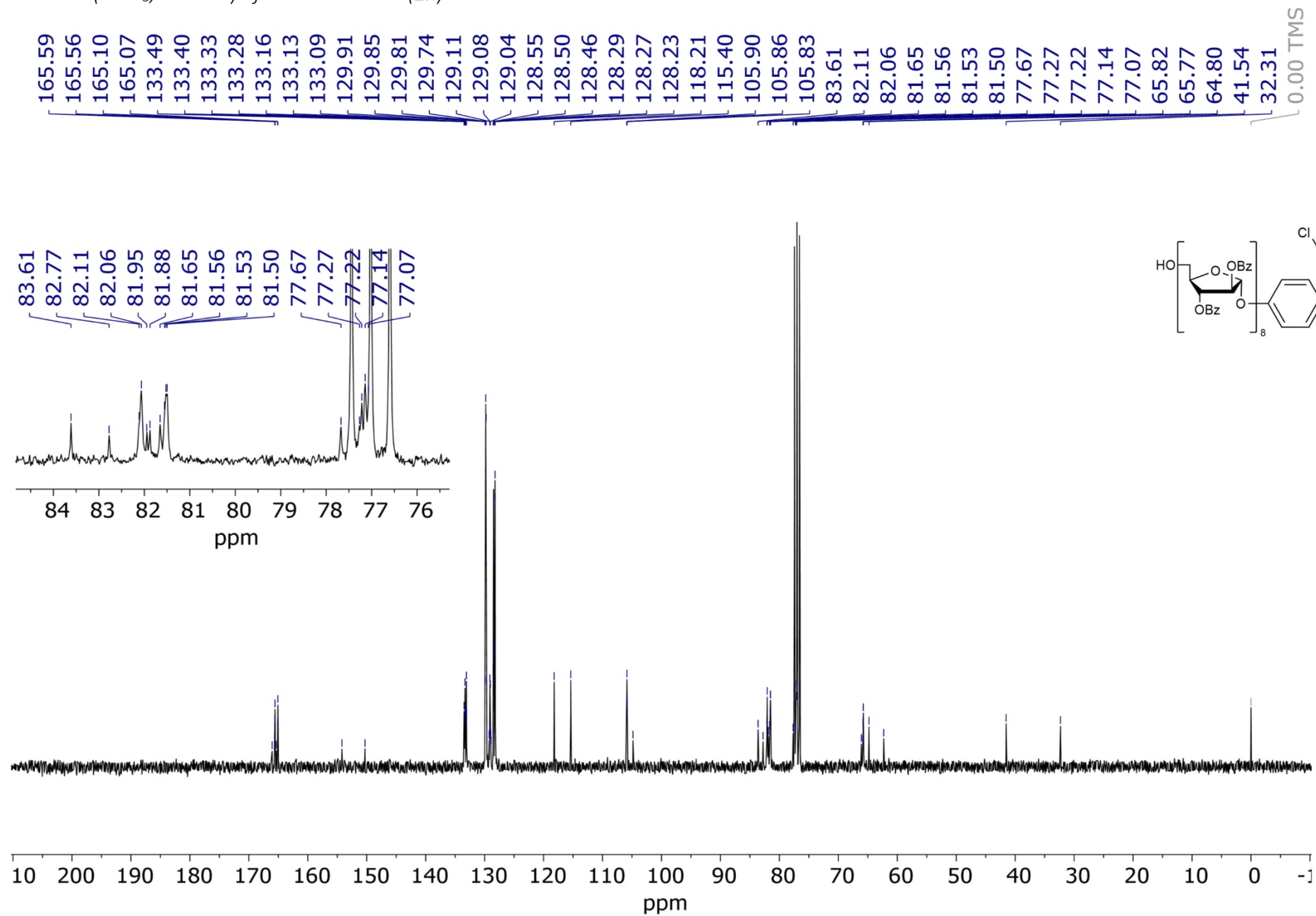


S.1.20. Octasaccharide (2h)

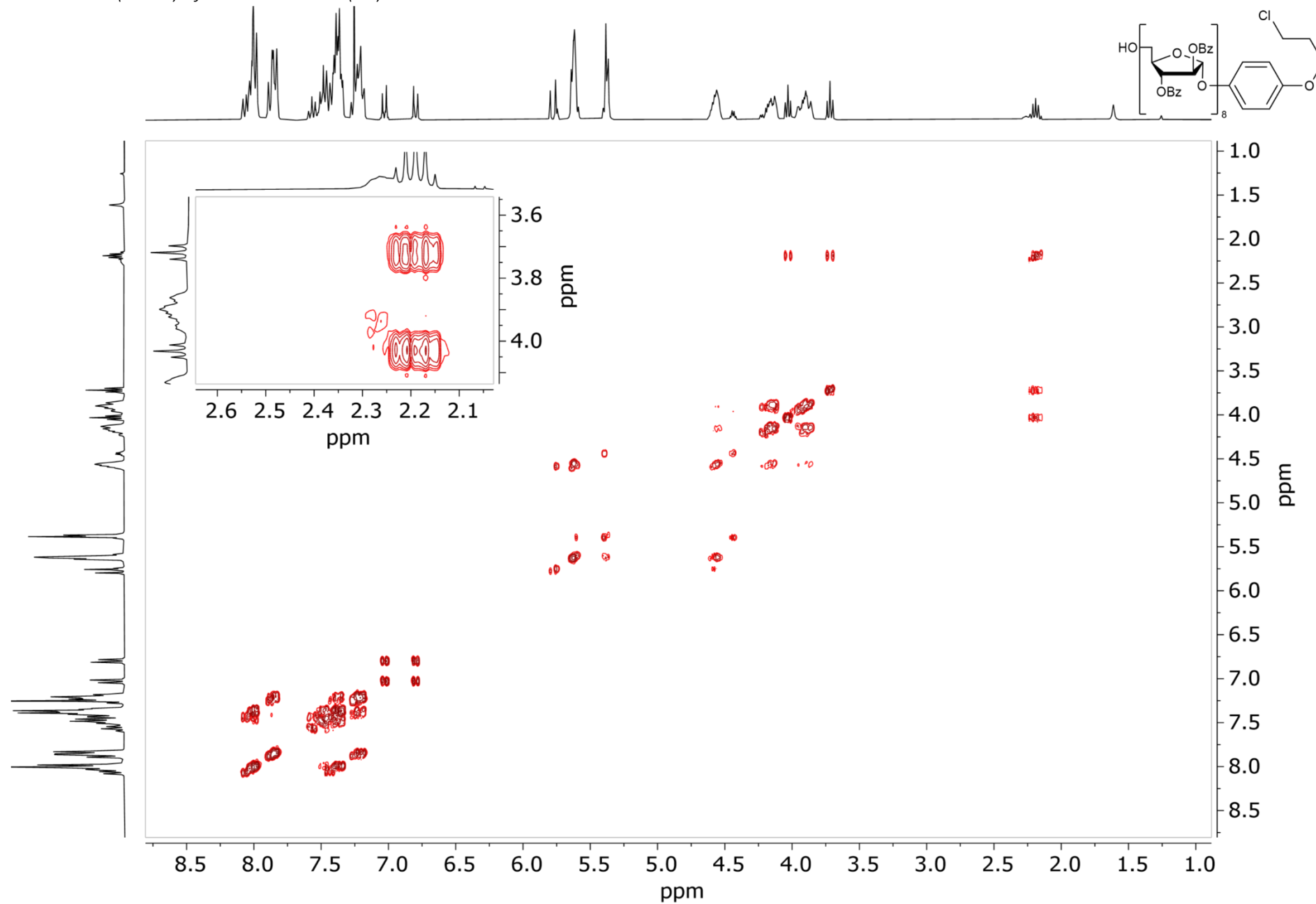
^1H NMR (CDCl_3 , 300 MHz) of octasaccharide (2h)



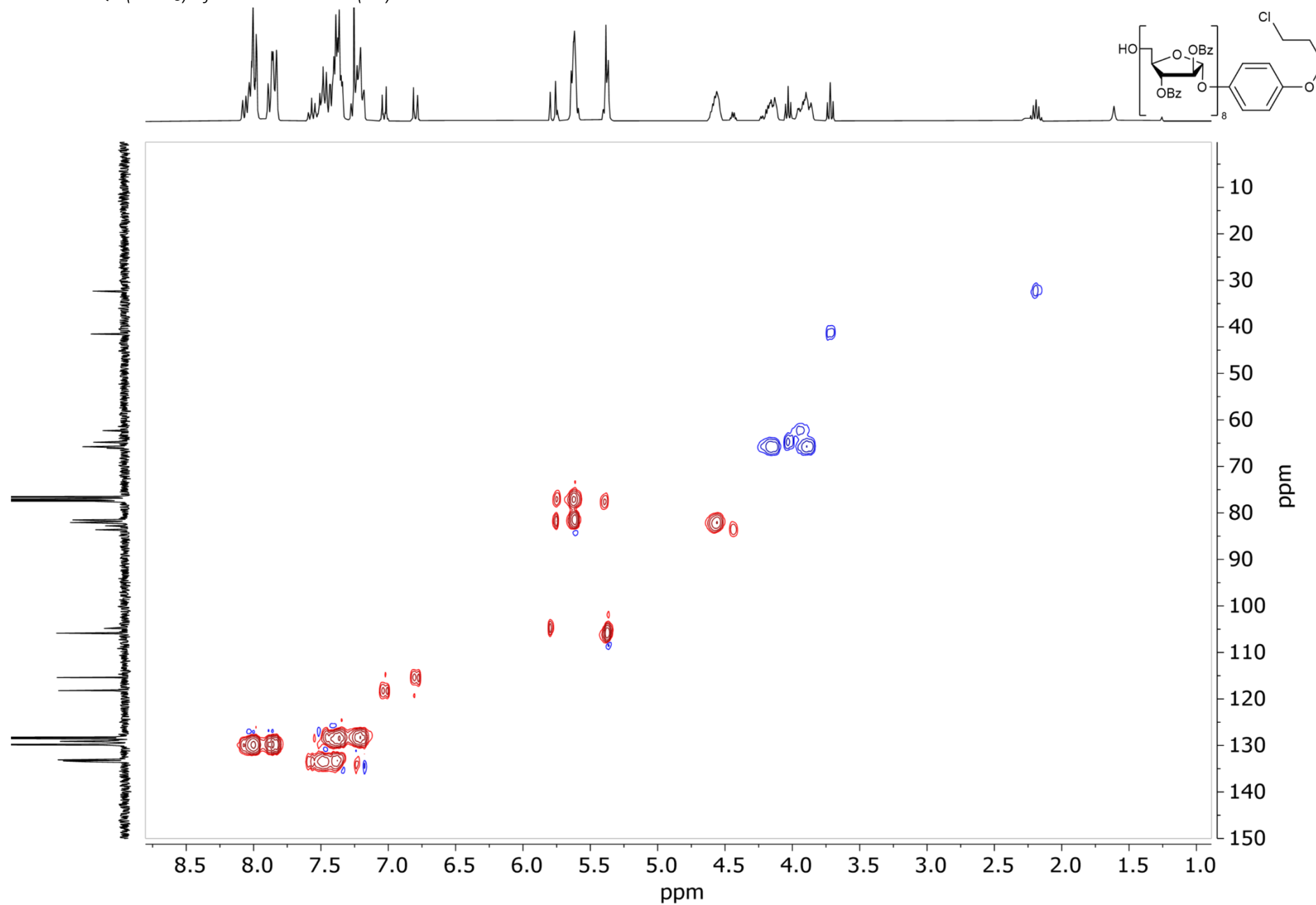
^{13}C NMR (CDCl_3 , 75 MHz) of octasaccharide (**2h**)



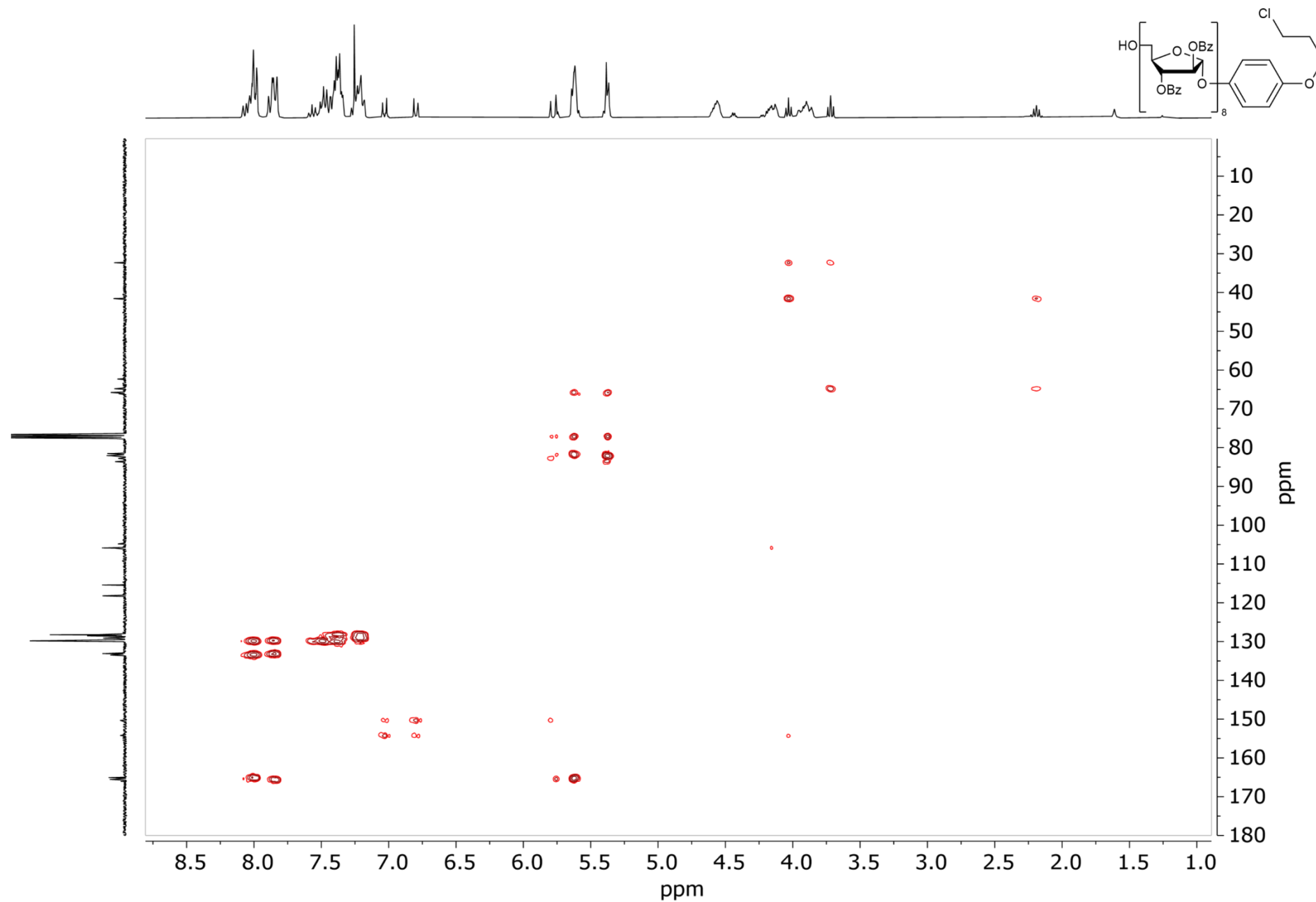
^1H - ^1H COSY (CDCl_3) of octasaccharide (**2h**)



^1H - ^{13}C HSQC (CDCl_3) of octasaccharide (**2h**)

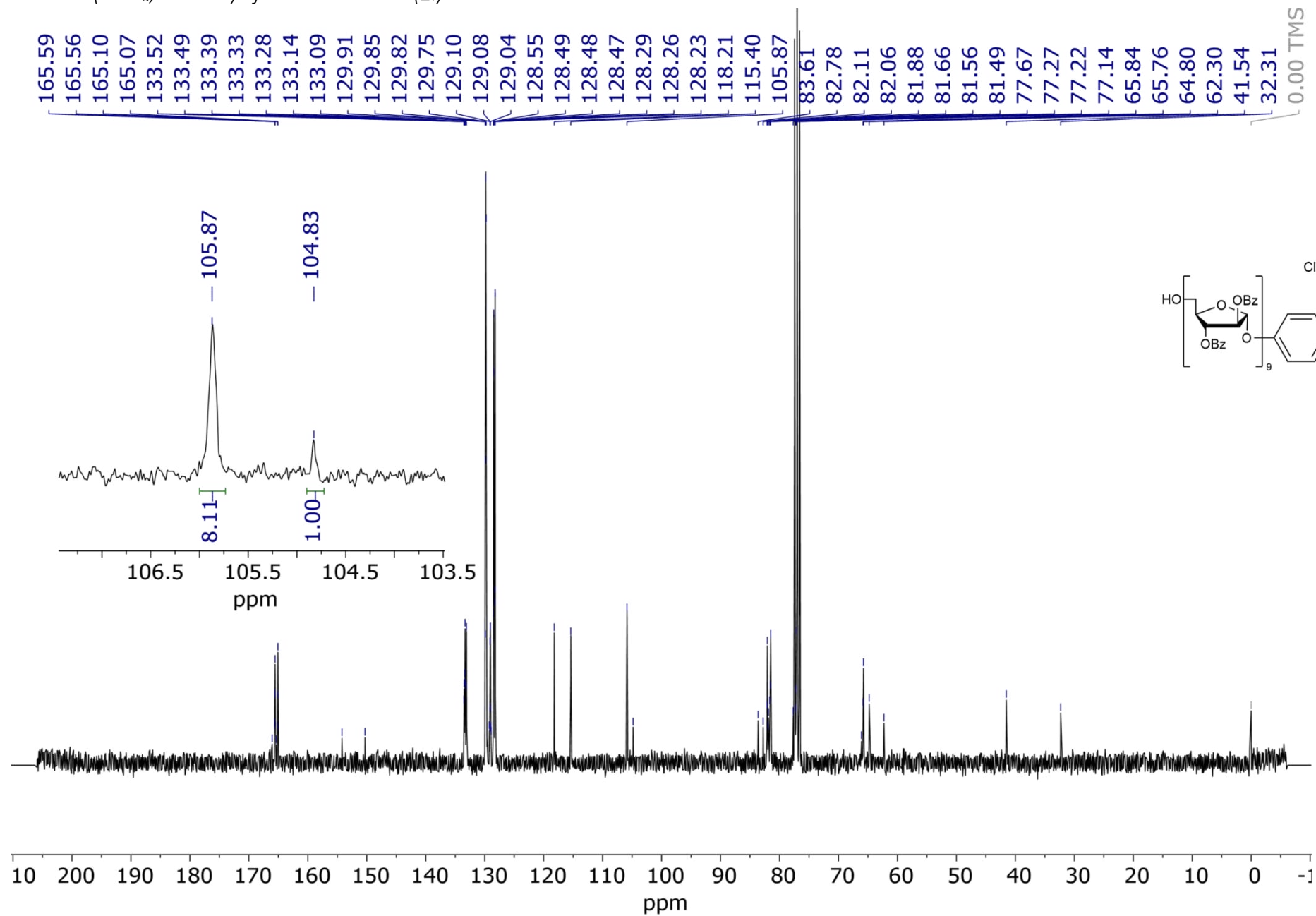


^1H - ^{13}C HMBC (CDCl_3) of octasaccharide (**2h**)

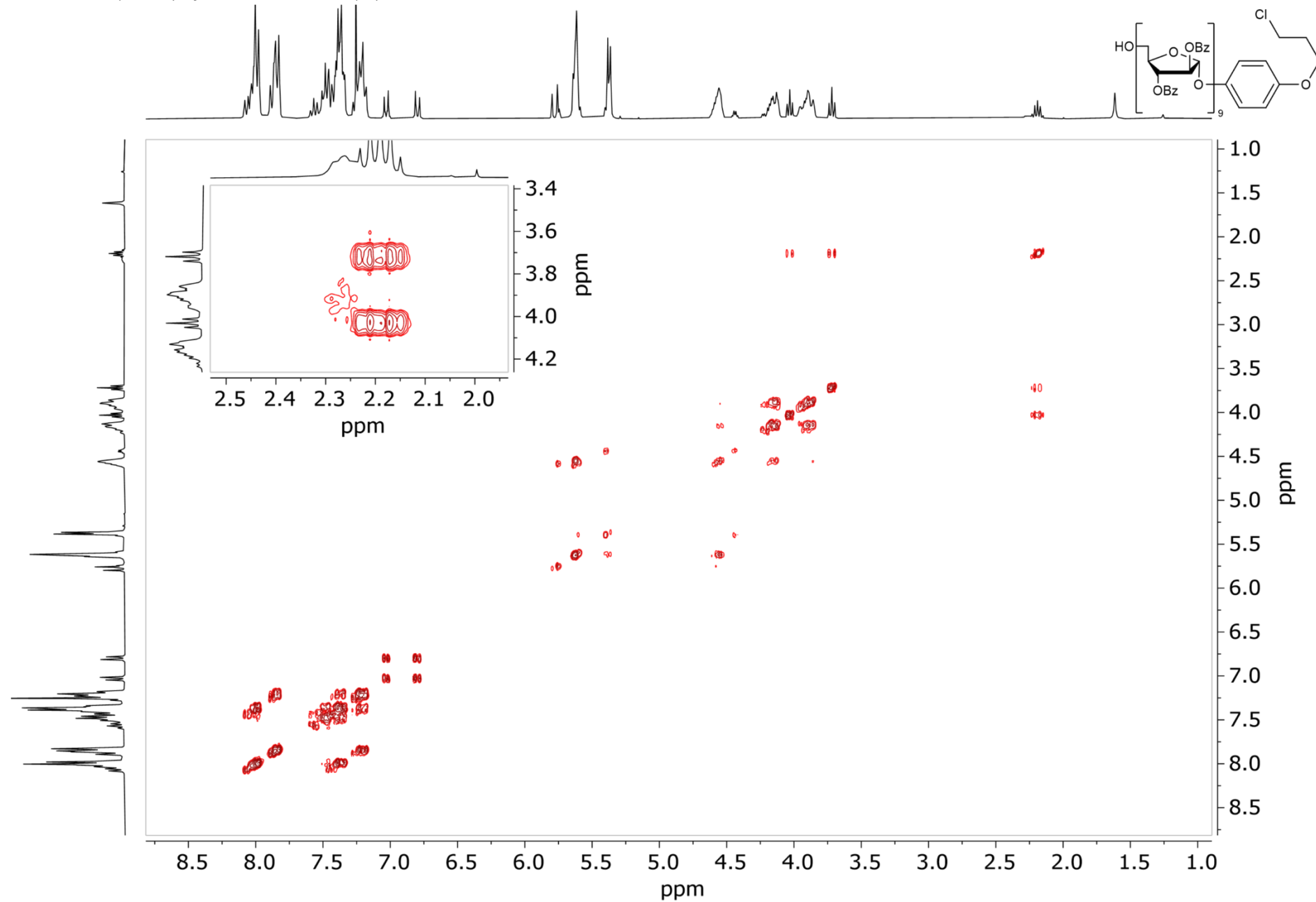


^1H NMR (CDCl_3 , 300 MHz) of nonasaccharide (**2i**)

^{13}C NMR (CDCl_3 , 75 MHz) of nonasaccharide (**2i**)

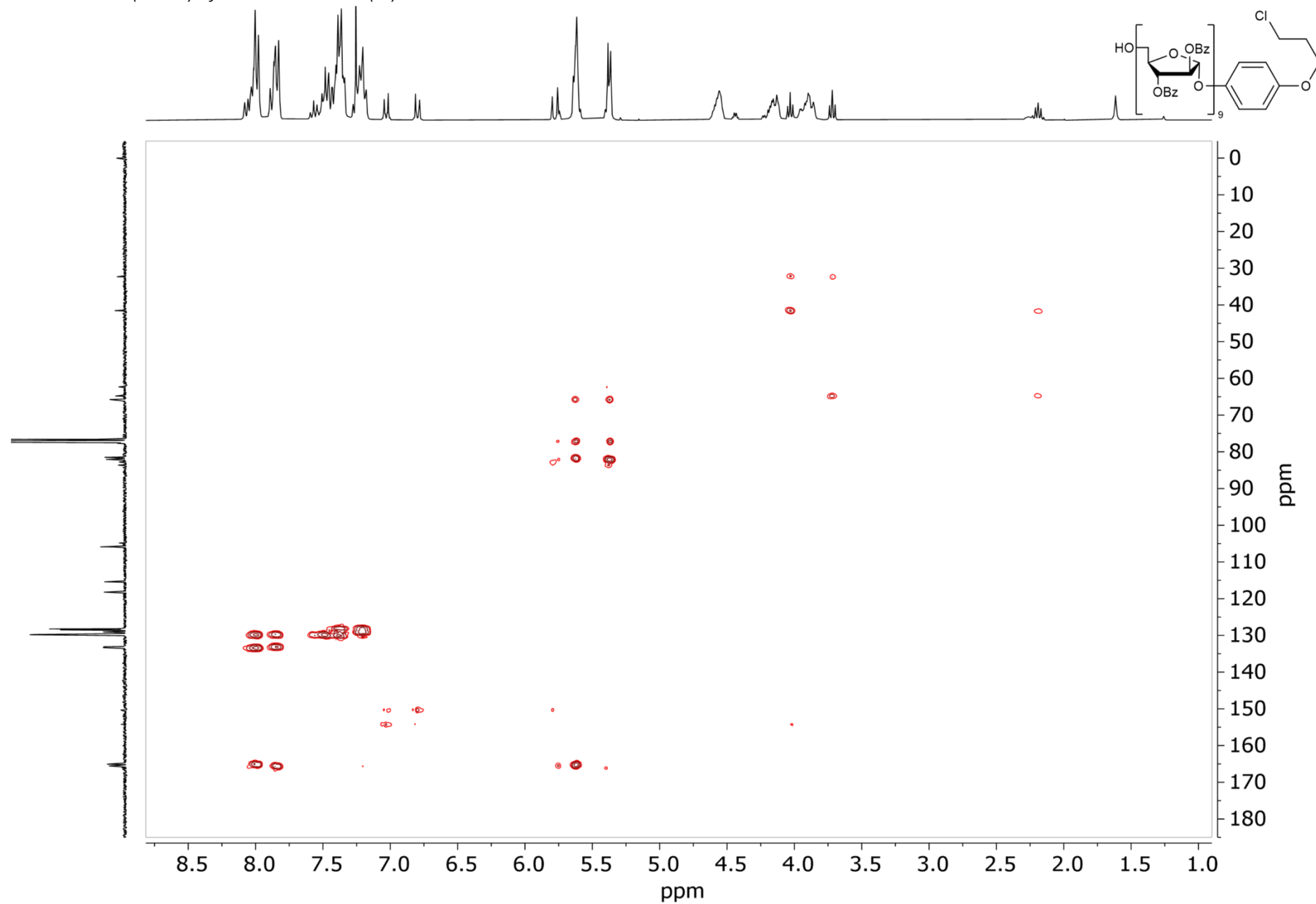


^1H - ^1H COSY (CDCl_3) of nonasaccharide (**2i**)



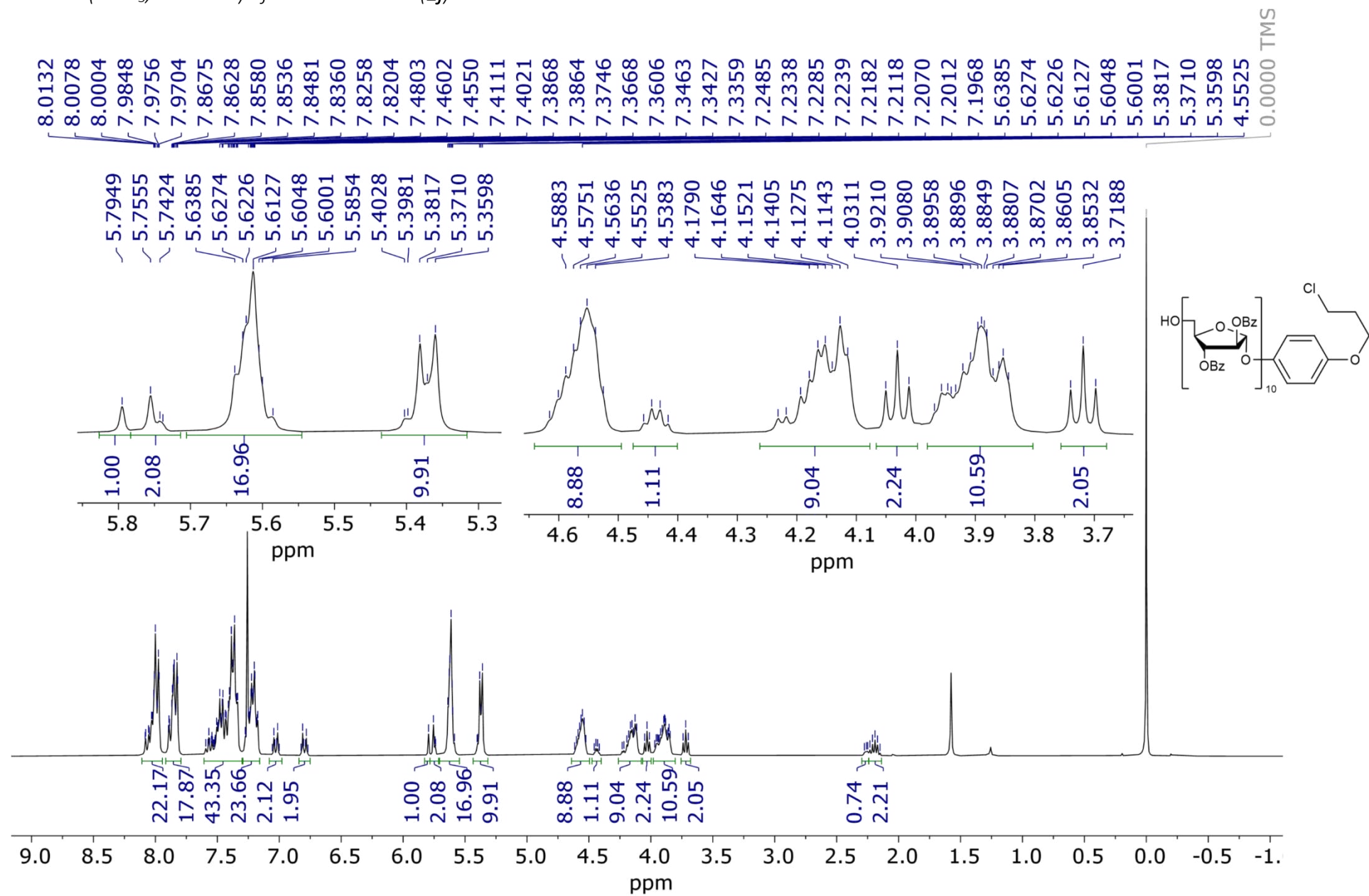
The figure displays a 2D NMR spectrum, specifically a ¹H-¹³C HSQC (Heteronuclear Single Quantum Coherence) experiment, for the polymer poly(4-chlorobenzyl 2,3-bis(benzyloxy)butyrate). The horizontal axis represents the ¹H chemical shift in ppm, ranging from 1.0 to 8.5. The vertical axis represents the ¹³C chemical shift in ppm, ranging from 0 to 150. The 1D ¹H NMR spectrum is projected along the top, and the 1D ¹³C NMR spectrum is projected along the left side. The 2D plot shows several cross-peaks, with red contours indicating positive correlations and blue contours indicating negative correlations. Key cross-peaks are observed in the aromatic region (6.5-8.5 ppm ¹H, 120-140 ppm ¹³C), the benzyloxy methylene region (4.5-5.5 ppm ¹H, 60-70 ppm ¹³C), and the butyrate region (1.5-2.5 ppm ¹H, 17-20 ppm ¹³C). A chemical structure of the polymer repeat unit is shown in the top right corner, featuring a 4-chlorobenzyl group and two benzyloxy protecting groups on the butyrate chain.

^1H - ^{13}C HMBC (CDCl_3) of nonasaccharide (**2i**)

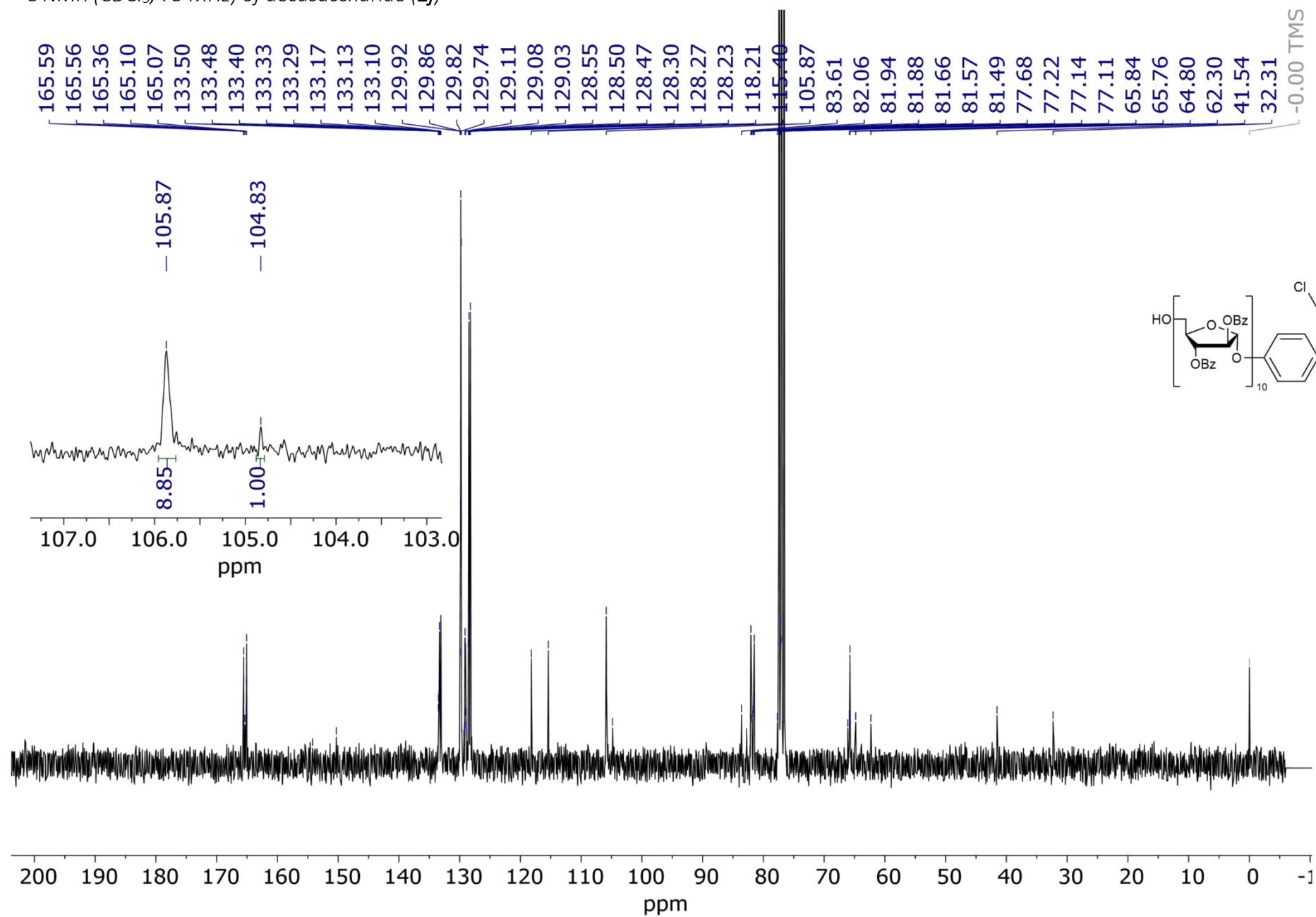


S.1.22. Decasaccharide (2j)

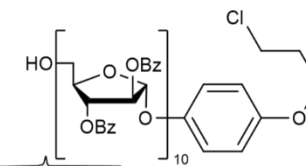
^1H NMR (CDCl_3 , 300 MHz) of decasaccharide (2j)



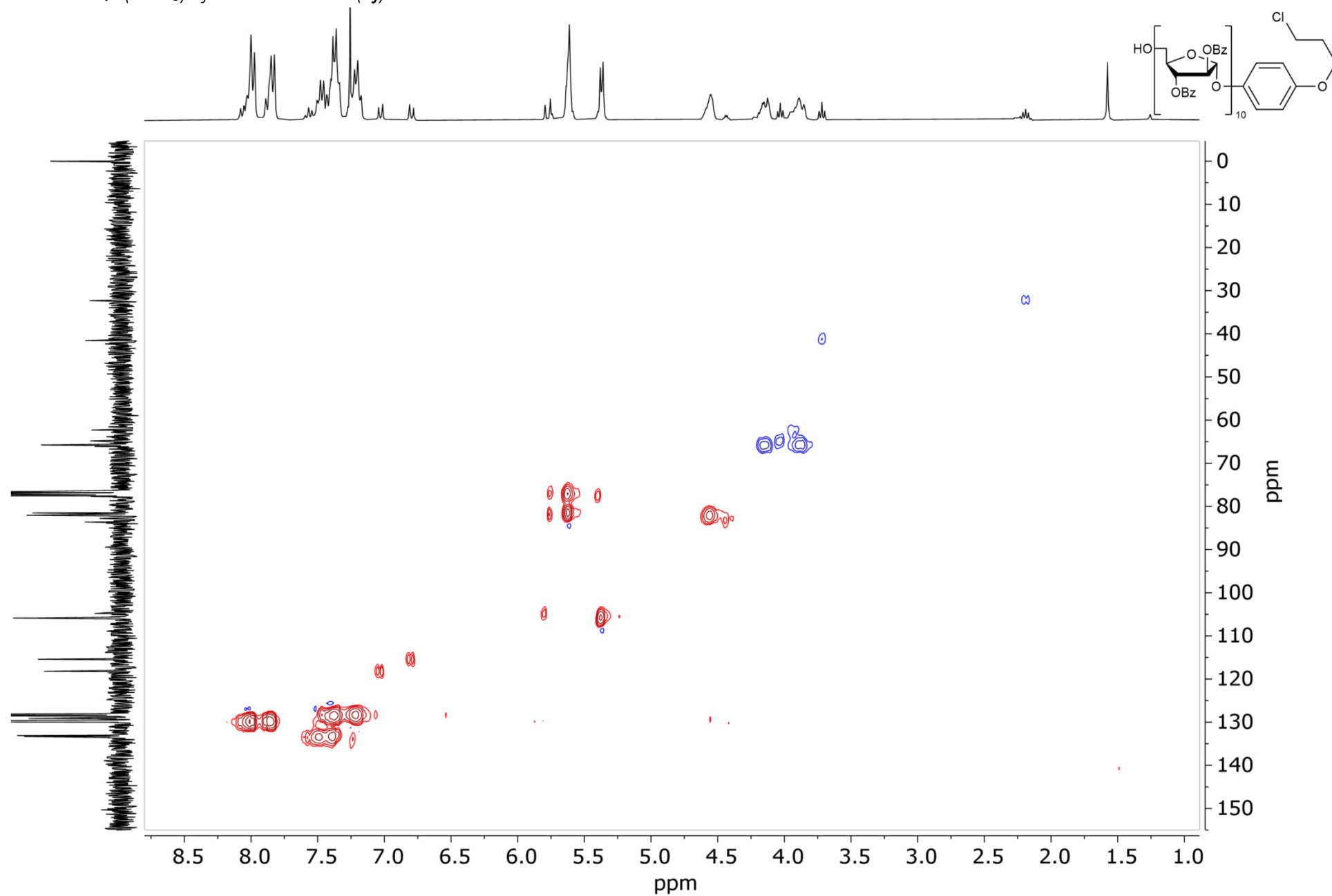
^{13}C NMR (CDCl_3 , 75 MHz) of decasaccharide (2j)



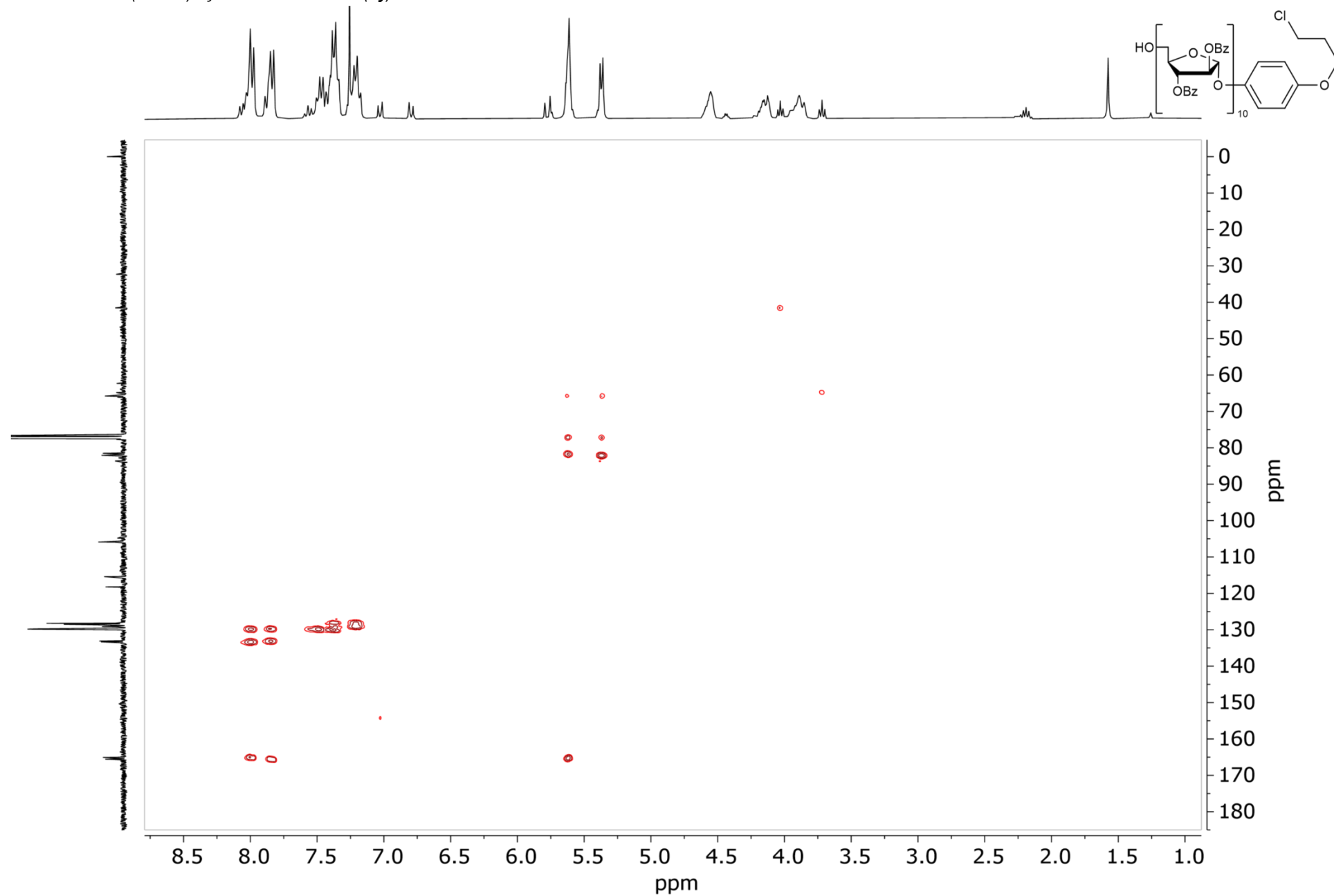
The figure displays a 2D COSY NMR spectrum of a polymer. The horizontal axis represents the ^1H chemical shift in ppm, ranging from 1.0 to 8.5. The vertical axis represents the ^1H chemical shift in ppm, ranging from 1.0 to 8.5. The 1D ^1H NMR spectrum is shown as a projection along the top and left edges of the 2D plot. The 2D plot shows several cross-peaks indicating scalar coupling between protons. Key correlations include: aromatic protons (6.5-7.5 ppm) with the benzylic methylene protons (3.5-4.5 ppm); the benzylic methylene protons (3.5-4.5 ppm) with the methine protons (4.0-4.5 ppm); and the methine protons (4.0-4.5 ppm) with the methoxy protons (3.7-3.9 ppm). An inset in the upper left corner provides a zoomed-in view of the aromatic region (2.0-2.6 ppm) and the benzylic methylene region (3.6-4.2 ppm), highlighting the cross-peaks between these two sets of protons. The chemical structure of the polymer repeat unit is shown in the top right corner, featuring a 4-(chloromethyl)phenyl group attached to a polymer backbone.



^1H - ^{13}C HSQC (CDCl_3) of decasaccharide (**2j**)

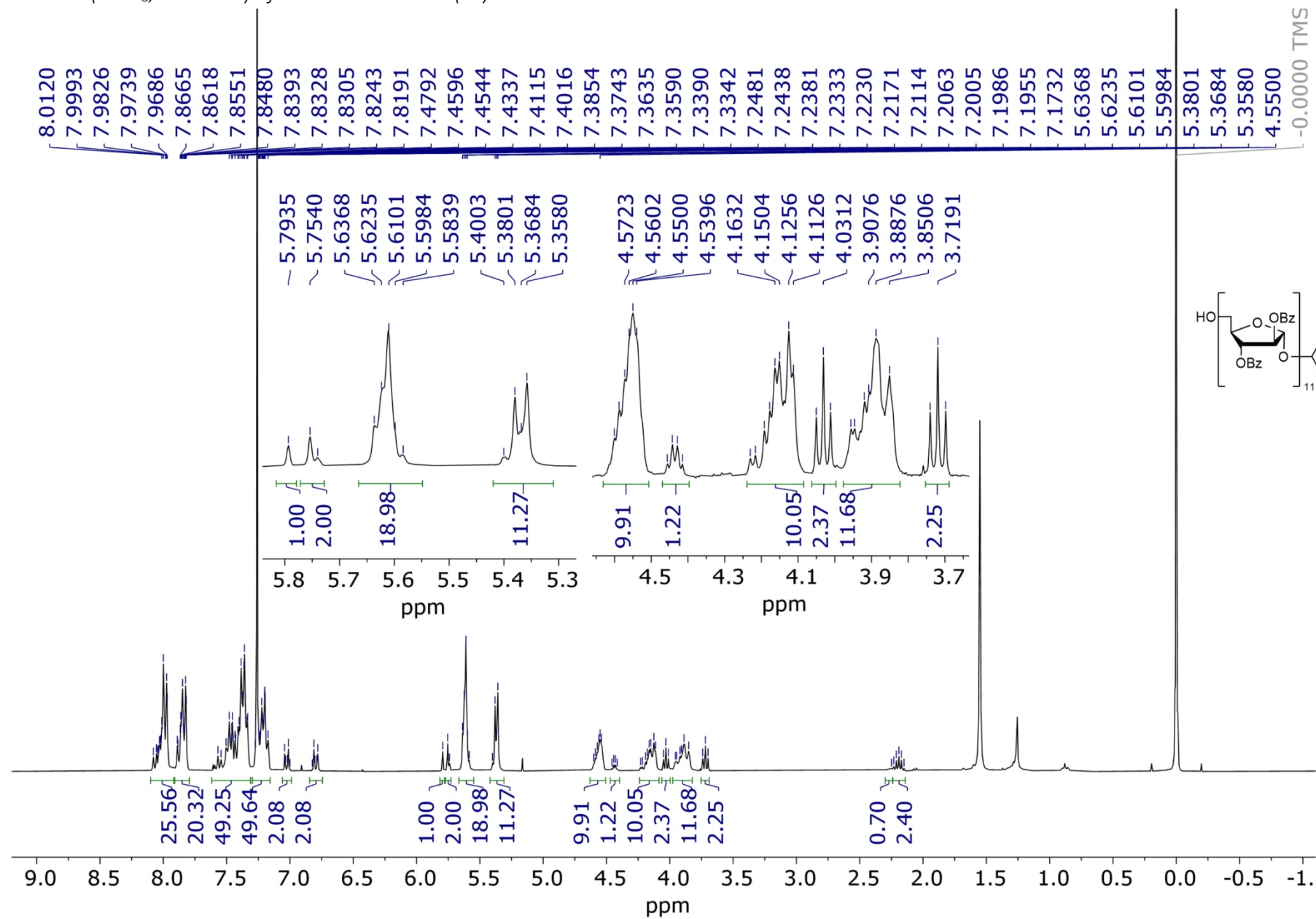


^1H - ^{13}C HMBC (CDCl_3) of decasaccharide (**2j**)



S.1.23. Undecasaccharide (2k)

^1H NMR (CDCl_3 , 300 MHz) of undecasaccharide (2k)



^1H - ^1H COSY (CDCl_3) of undecasaccharide (**2k**)

