

Supplementary Information
for
Melioidosis Patient Serum-Reactive Synthetic Tetrasaccharides Bearing the
Predominant Epitopes of *Burkholderia pseudomallei* and *Burkholderia mallei*
O-Antigens

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Supplementary results

Table S1. Unsuccessful attempts to epimerize tetrasaccharide **23**.

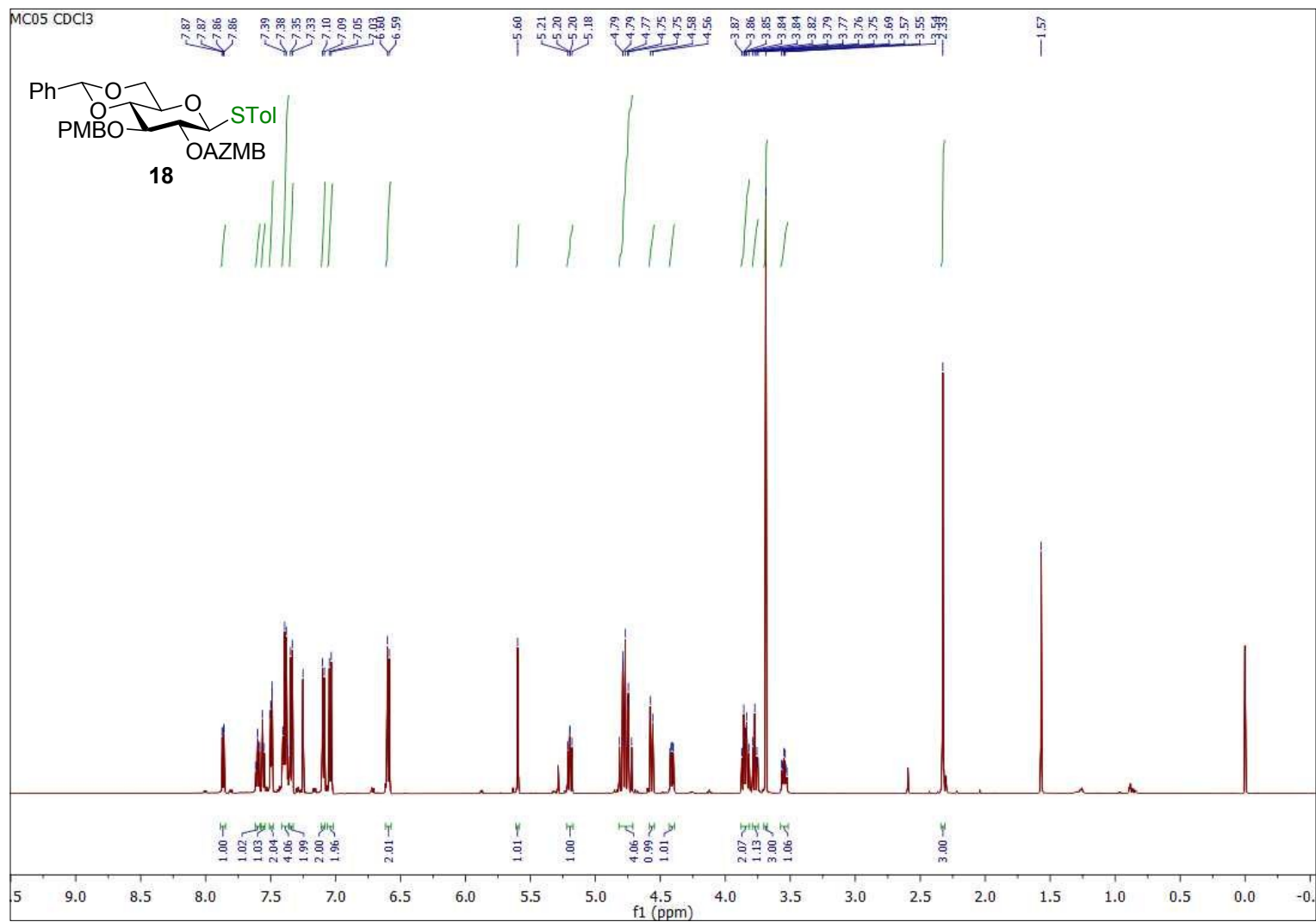
entry	oxidation reagents	solvent	temperature (°C)	yield (%)
1	DMSO, PDCP, Et ₃ N	DCM	-10 to rt	nd ^a
2	DMSO, PDCP, Et ₃ N	DCM	-78 to rt	nd ^b
3	oxalyl chloride, DMSO, Et ₃ N	DCM	-78	nd ^b
4	DMSO, Ac ₂ O	-	rt	nd ^b
5	Dess-Martin periodinane	DCE	reflux	nd ^a

^aDegradation of starting material.

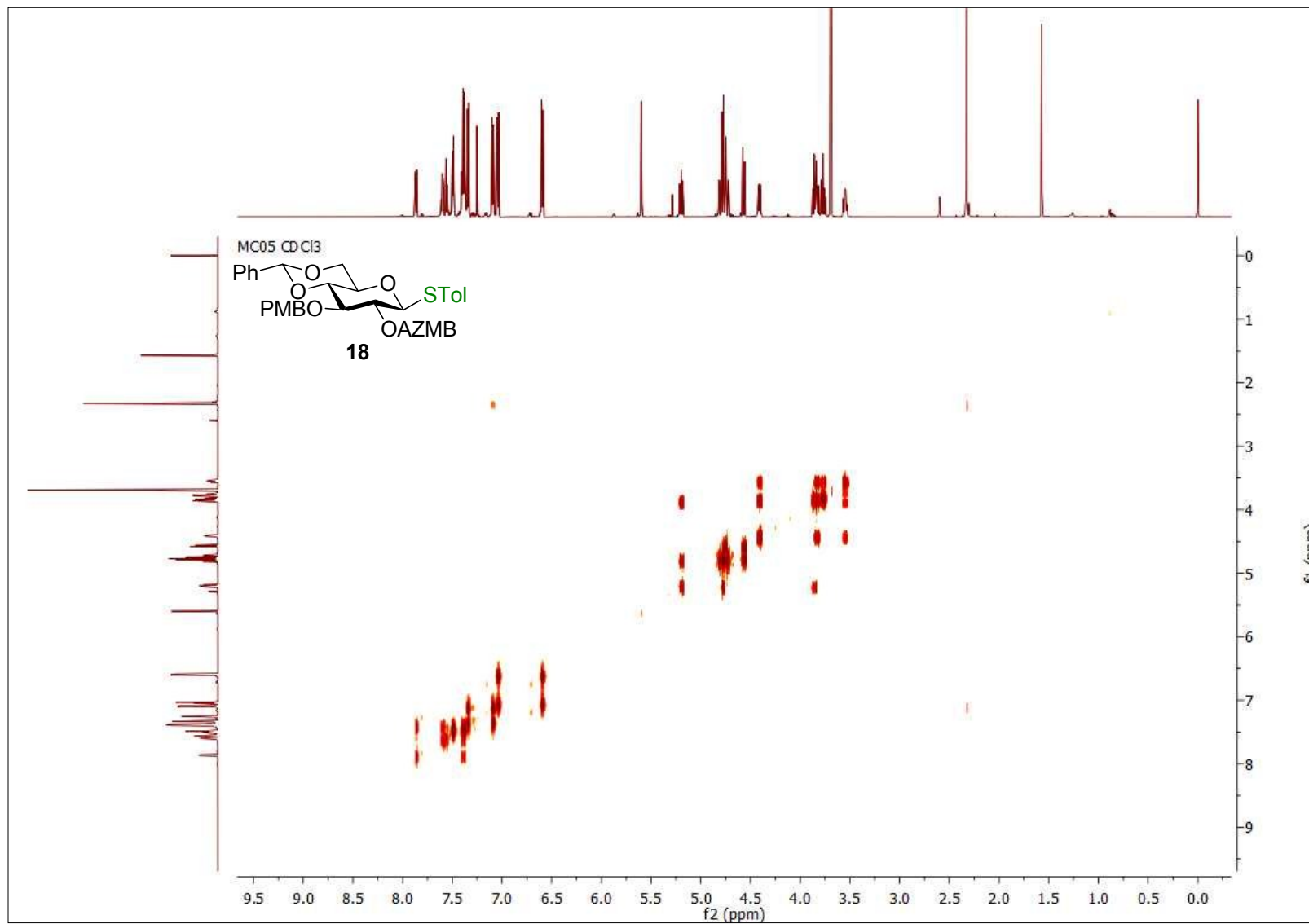
^bNo reaction.

NMR spectra

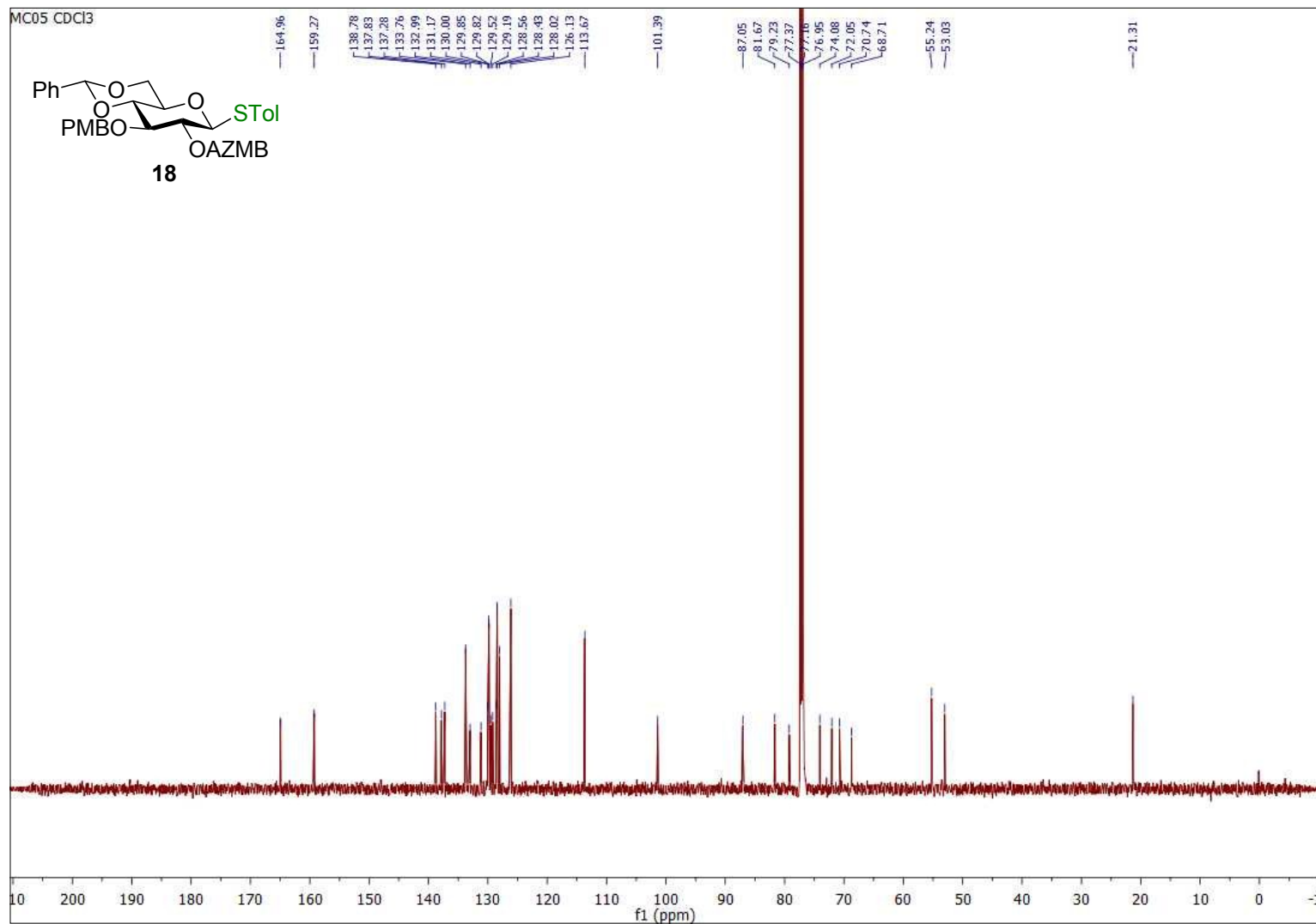
Supplementary Figure 1 | ¹H NMR spectrum (CDCl₃, 600 MHz) of compound 18



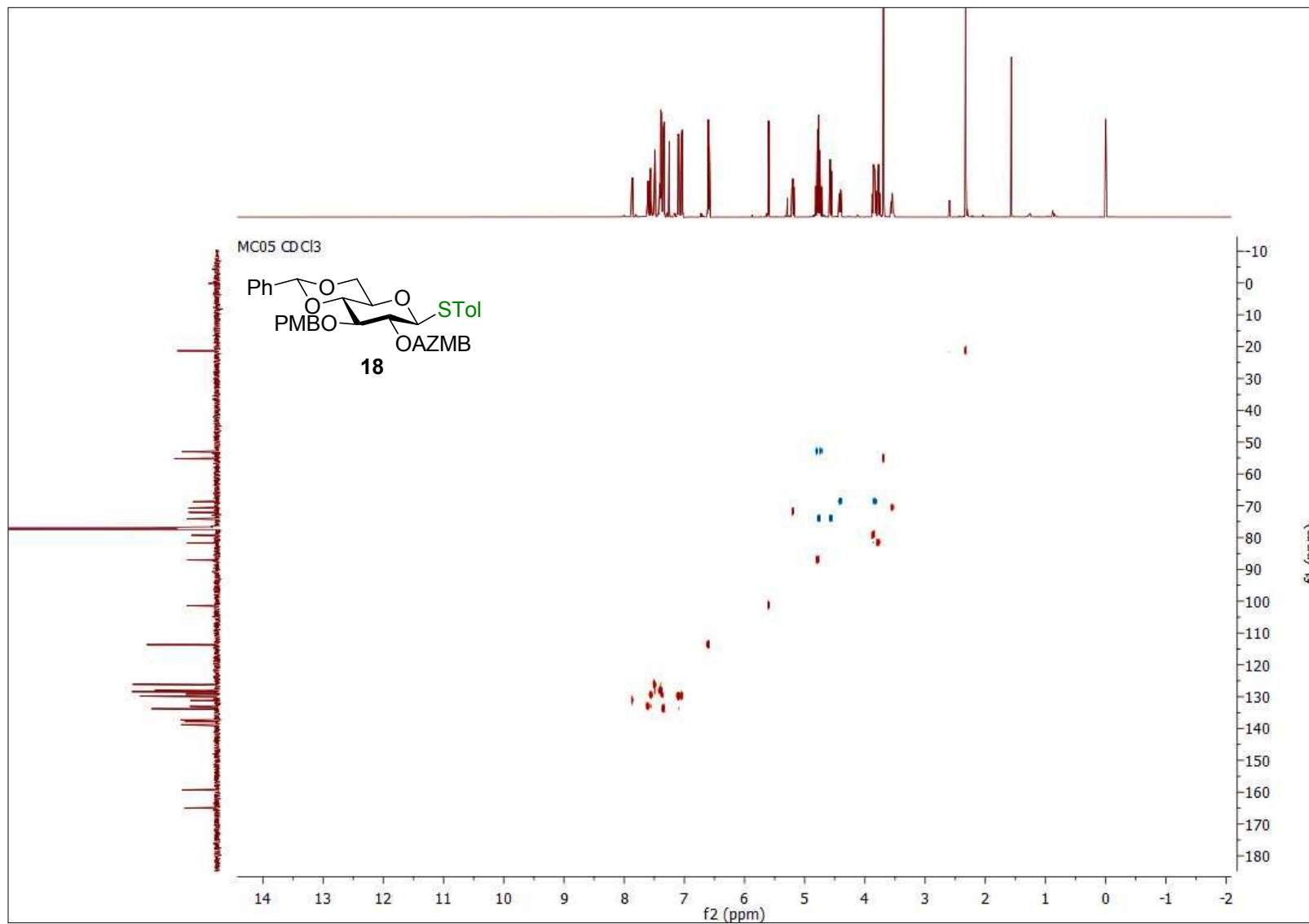
Supplementary Figure 2 | COSY NMR spectrum (CDCl₃, 600 MHz) of compound 18



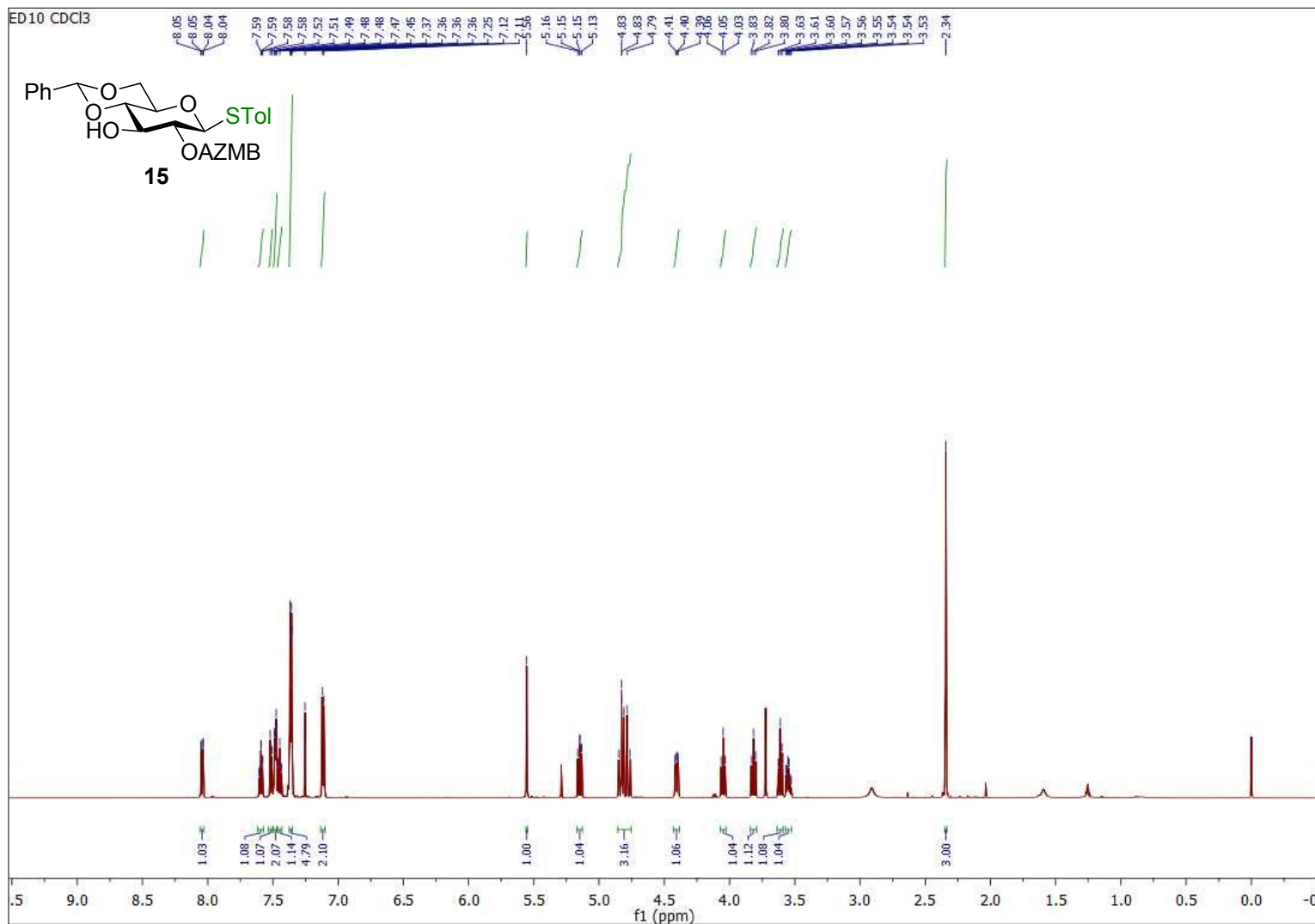
Supplementary Figure 3 | ^{13}C NMR spectrum (CDCl_3 , 150 MHz) of compound 18



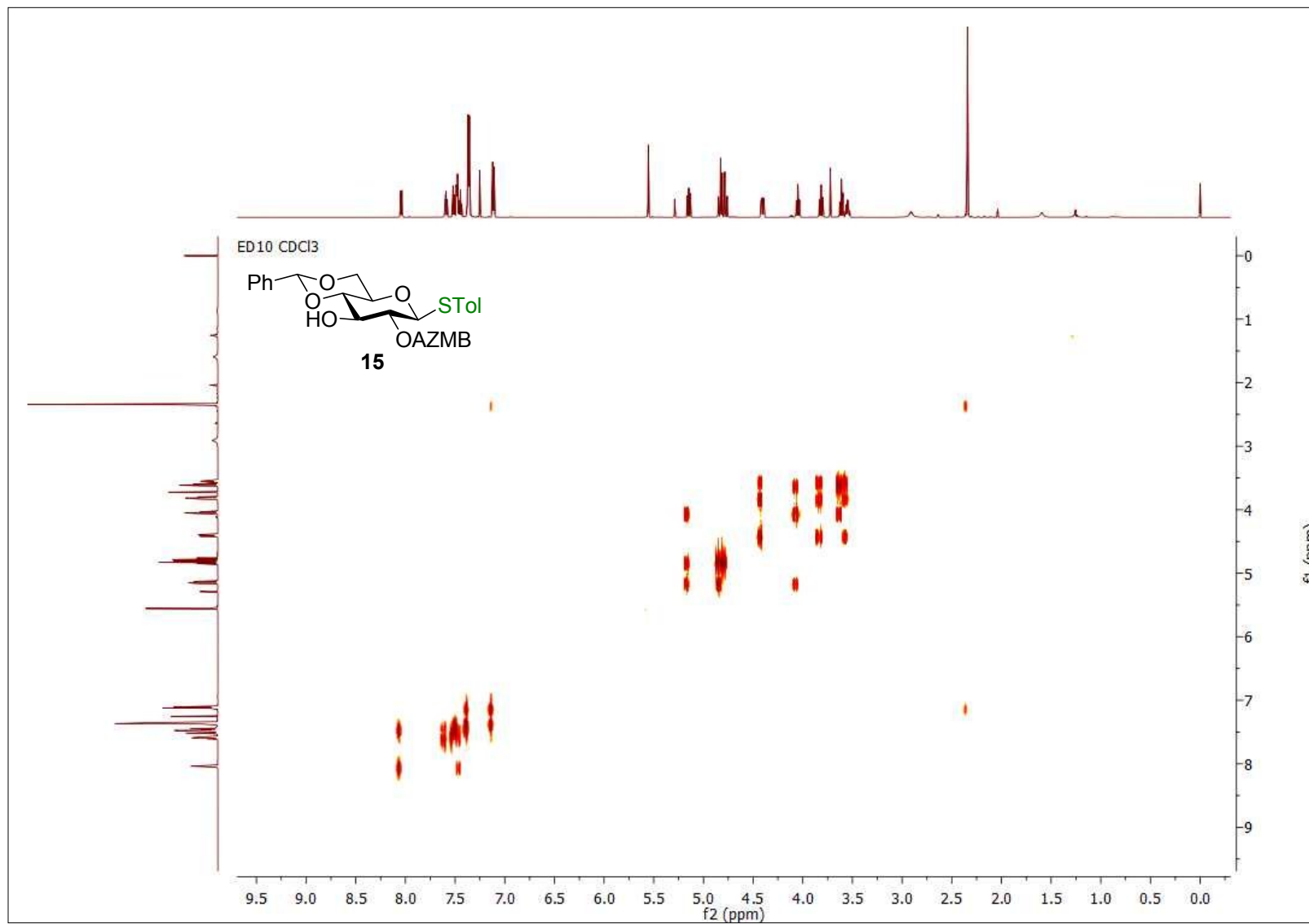
Supplementary Figure 4 | HSQC NMR spectrum (CDCl₃, 600 MHz) of compound 18



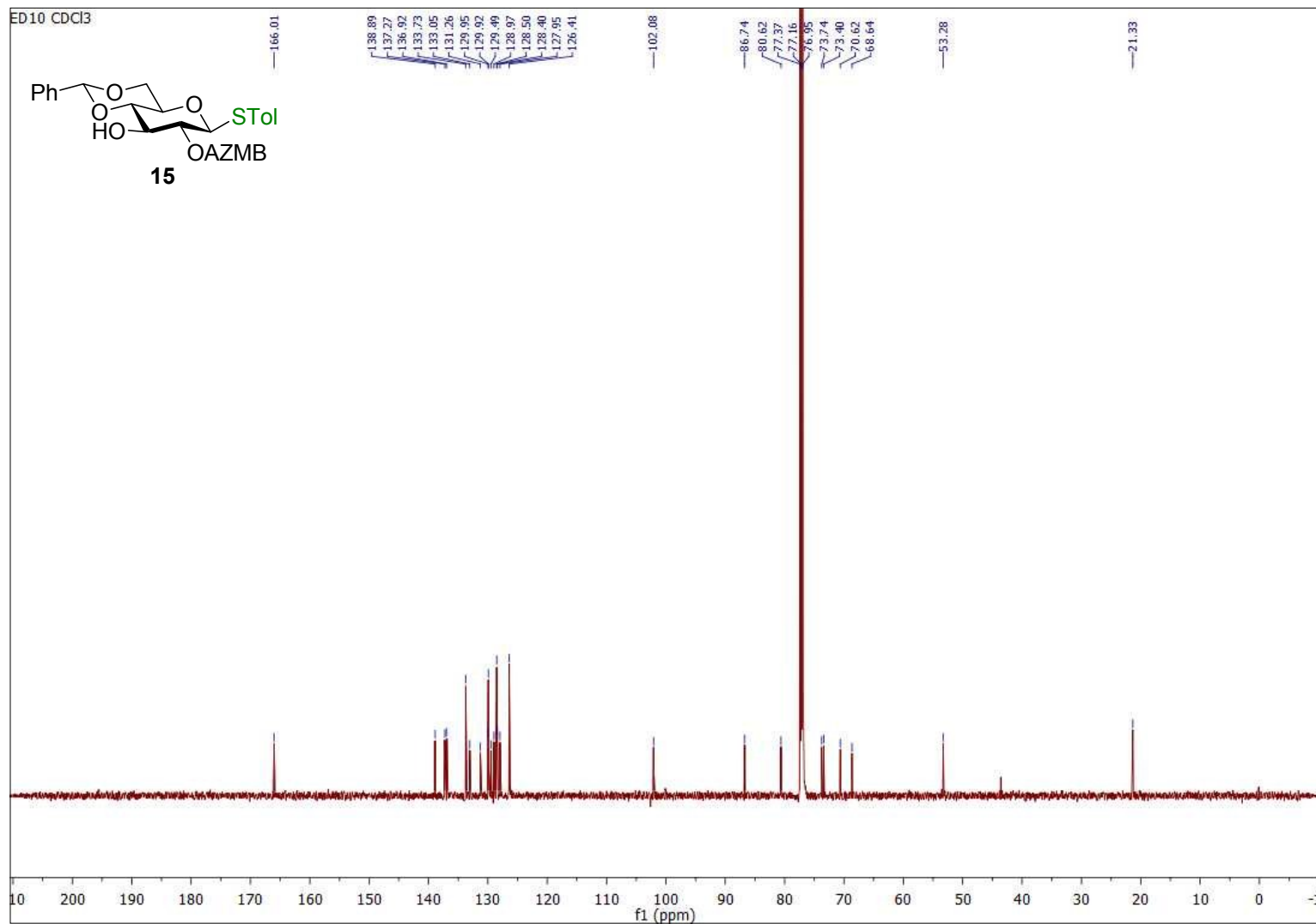
Supplementary Figure 5 | ¹H NMR spectrum (CDCl₃, 600 MHz) of compound 15



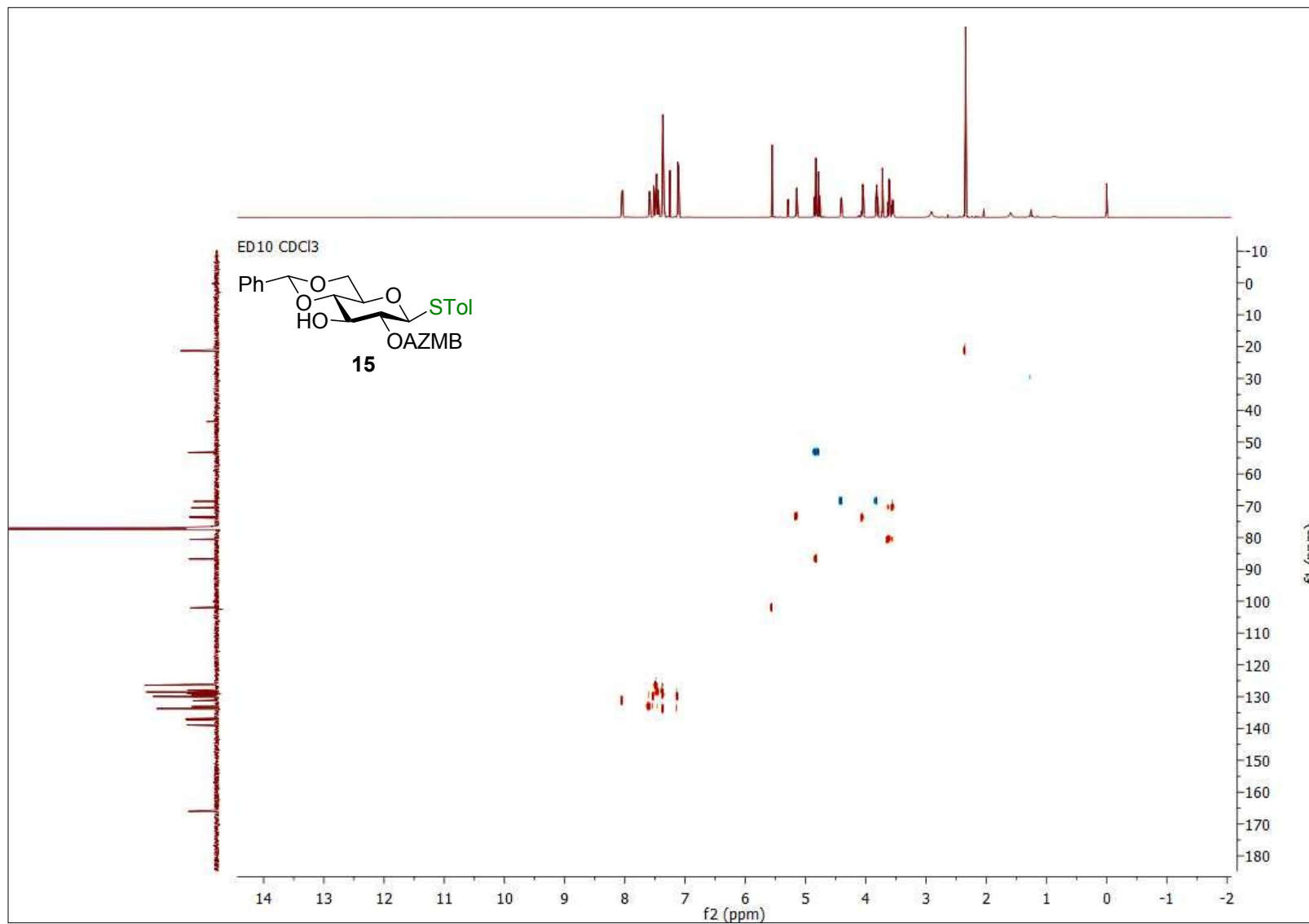
Supplementary Figure 6 | COSY NMR spectrum (CDCl₃, 600 MHz) of compound 15



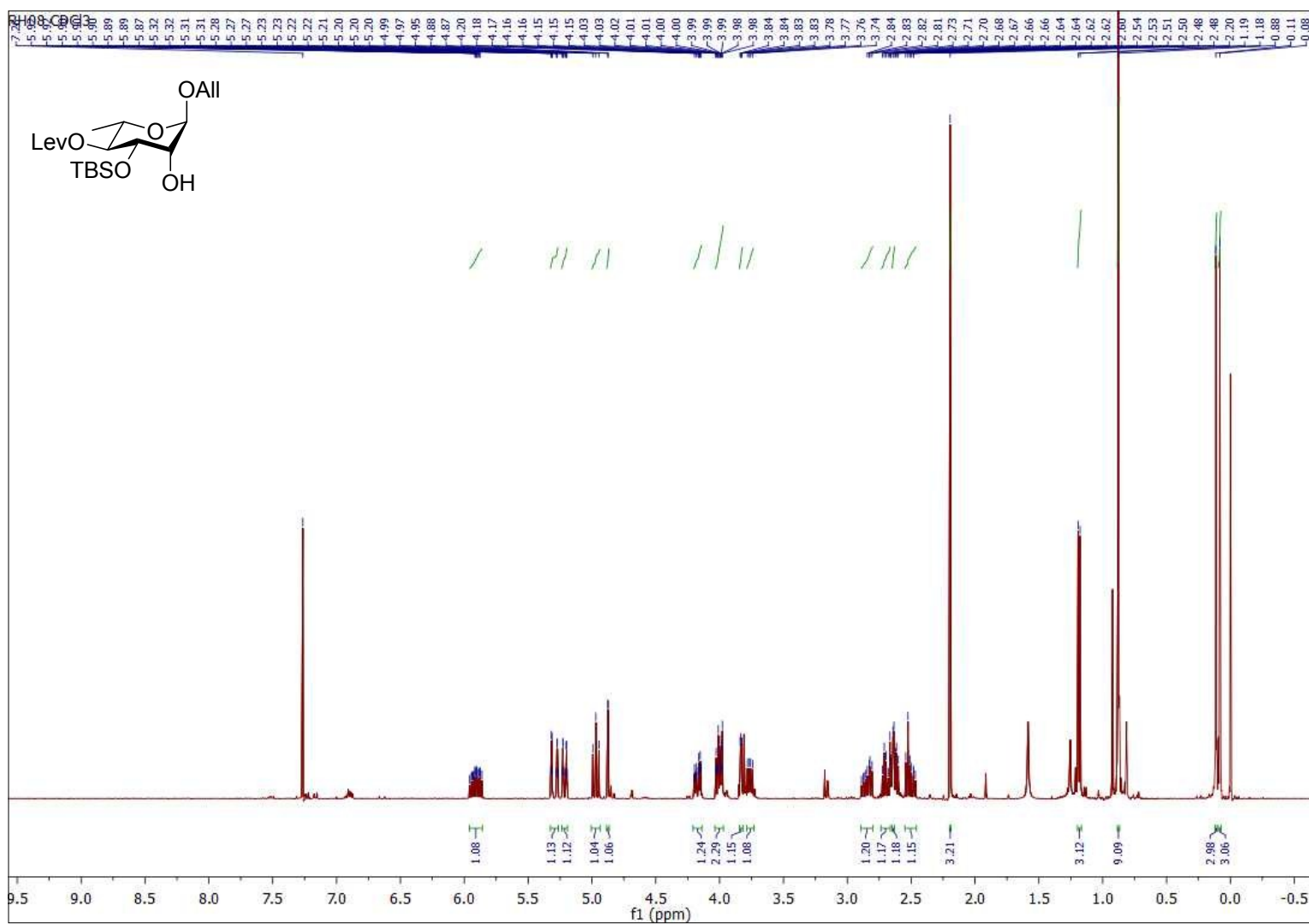
Supplementary Figure 7 | ^{13}C NMR spectrum (CDCl_3 , 150 MHz) of compound 15



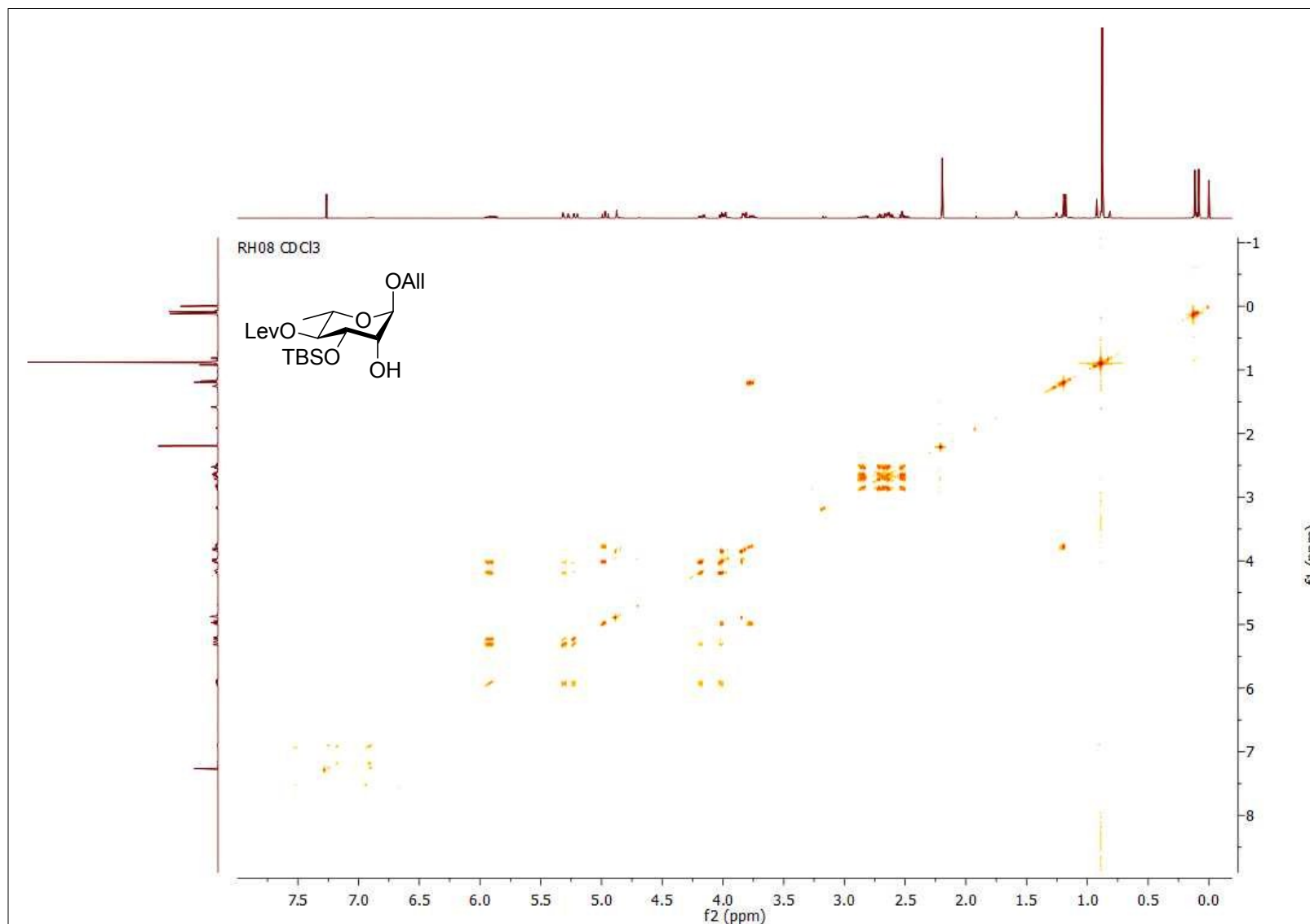
Supplementary Figure 8 | HSQC NMR spectrum (CDCl₃, 600 MHz) of compound 15



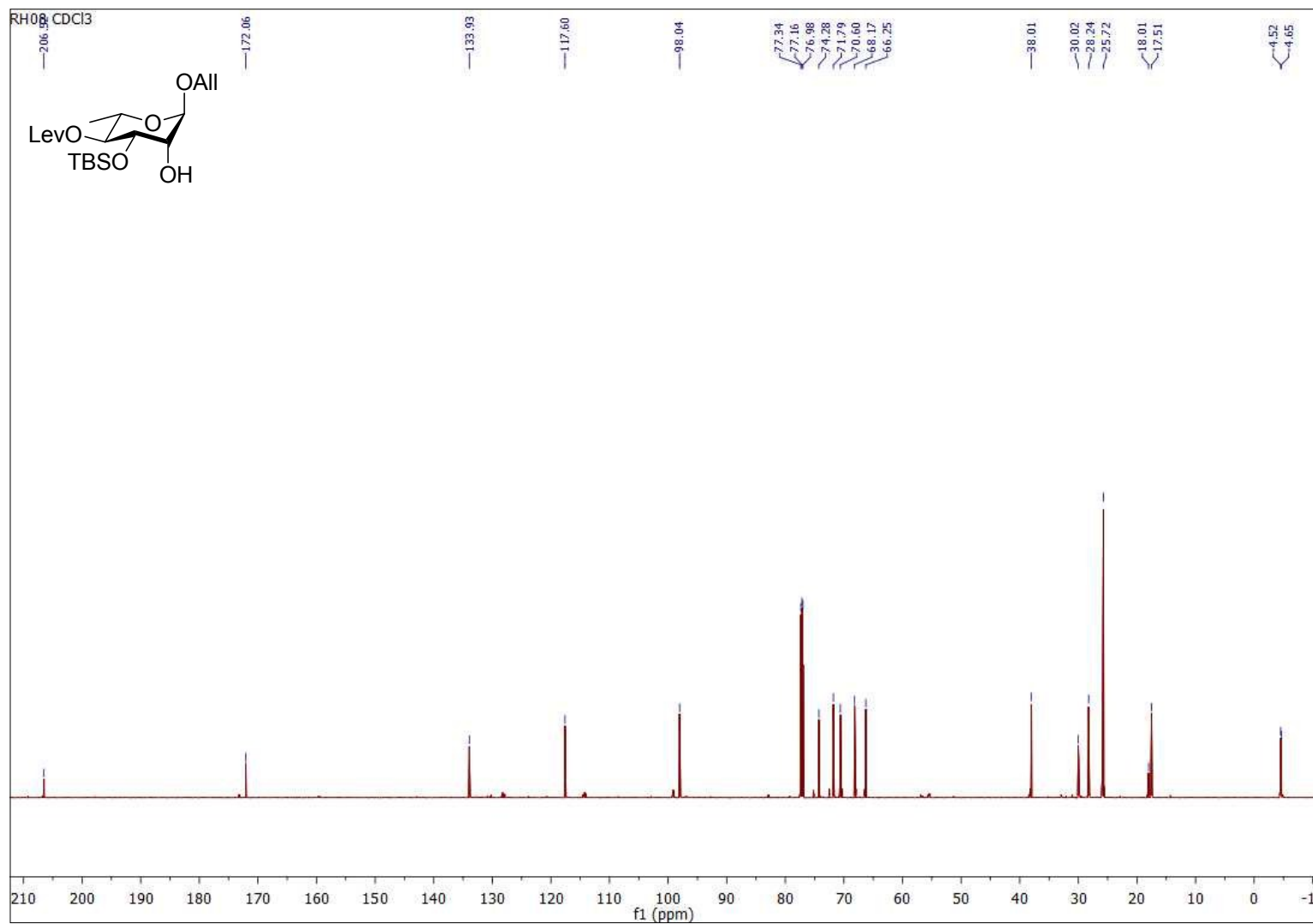
Supplementary Figure 9 | ¹H NMR spectrum (CDCl₃, 400 MHz) of allyl 3-*tert*-butyldimethylsilyl-4-*O*-levulinoyl- α -L-rhamnopyranoside



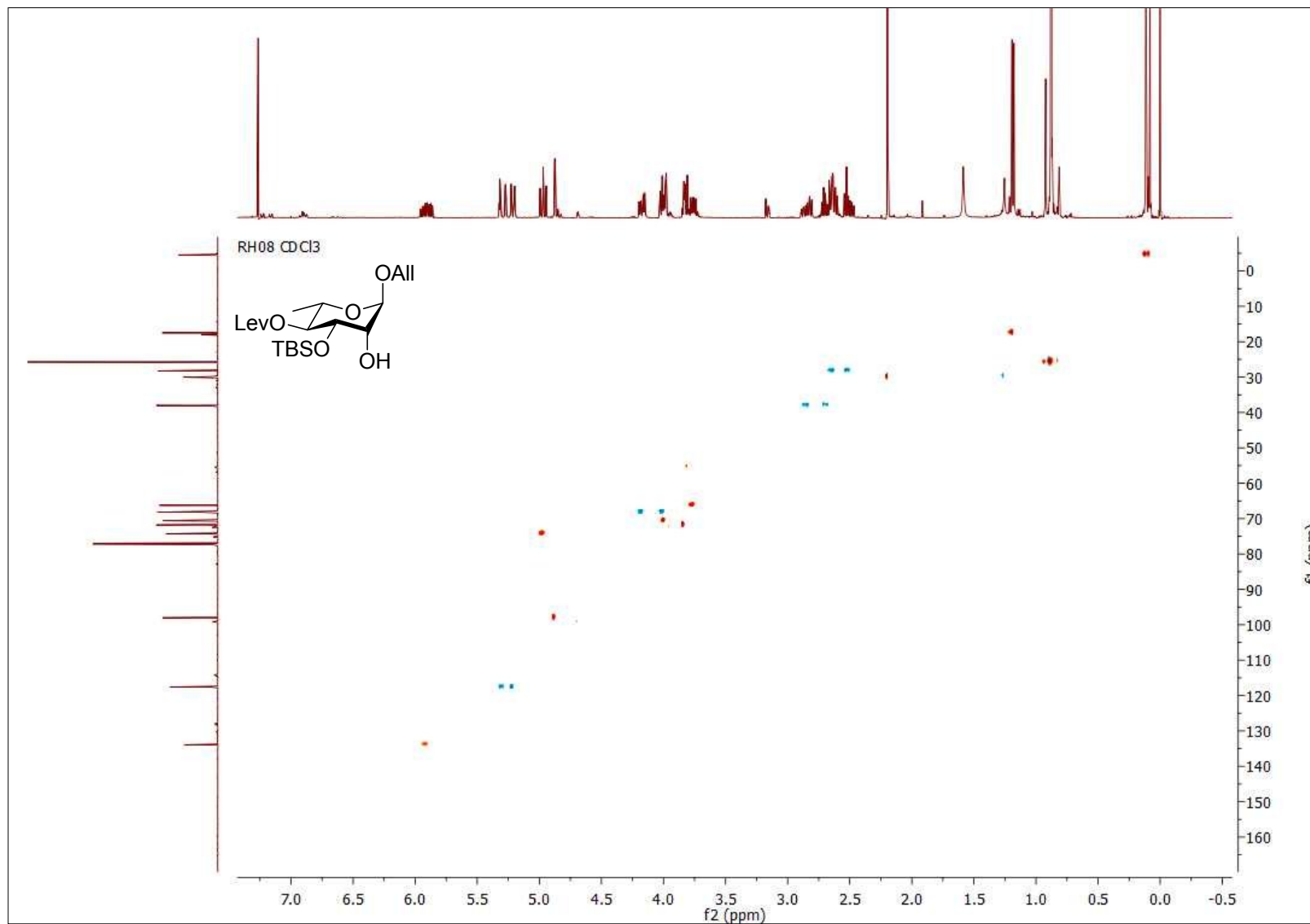
Supplementary Figure 10 | COSY NMR spectrum (CDCl₃, 400 MHz) of allyl 3-*tert*-butyldimethylsilyl-4-*O*-levulinoyl- α -L-rhamnopyranoside



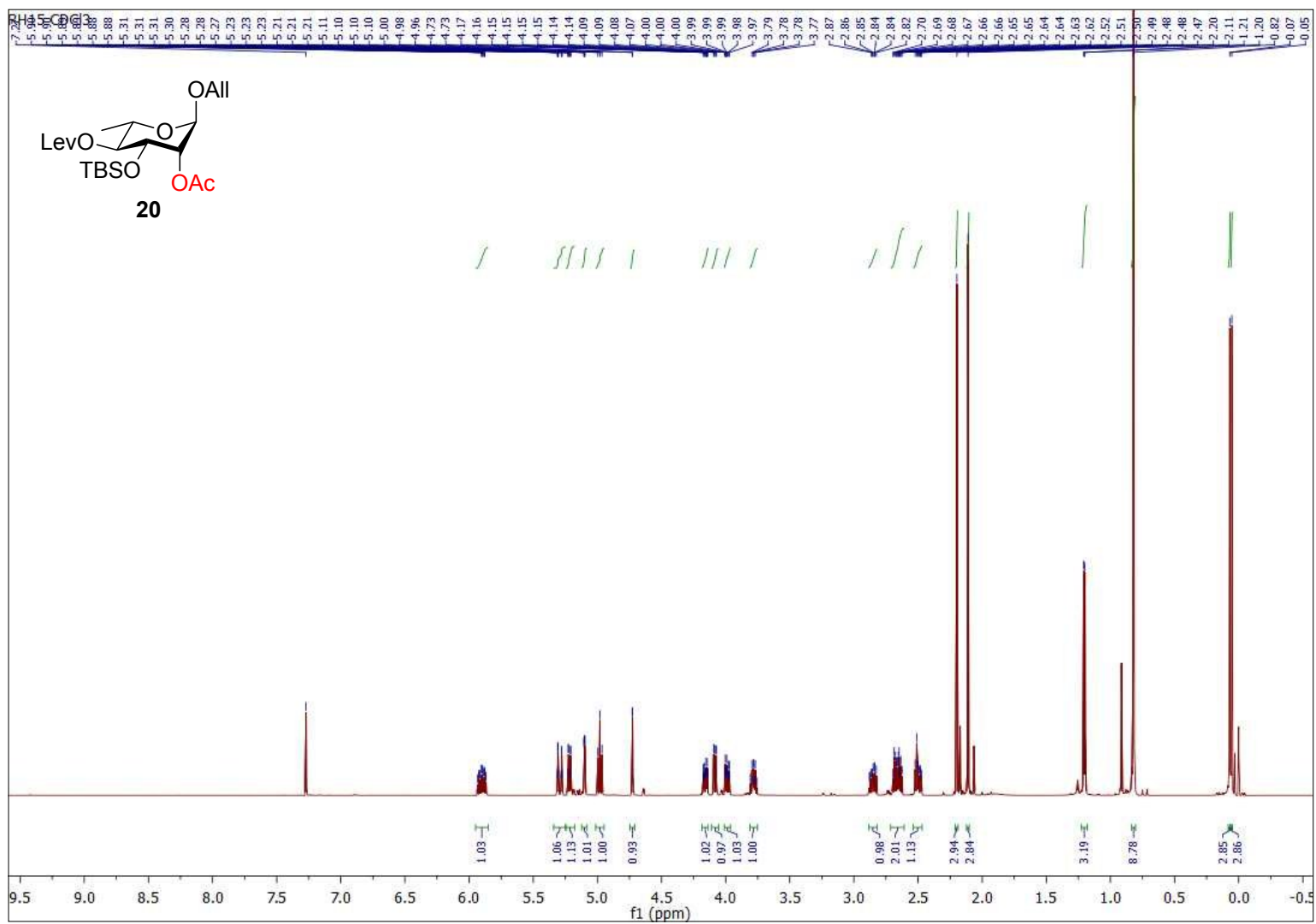
Supplementary Figure 11 | ^{13}C NMR spectrum (CDCl_3 , 100 MHz) of allyl 3-*tert*-butyldimethylsilyl-4-*O*-levulinoyl- α -L-rhamnopyranoside



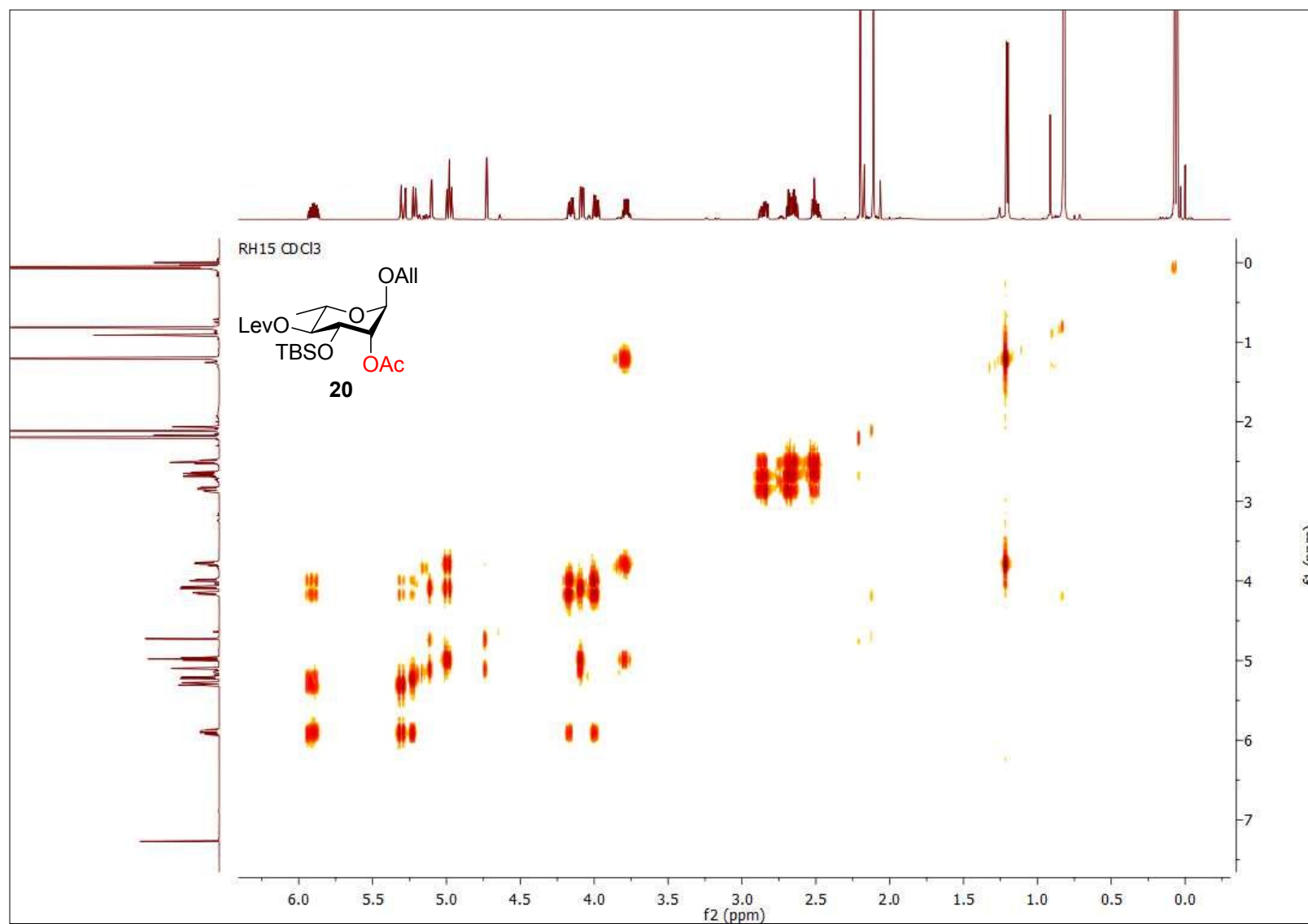
Supplementary Figure 12 | HSQC NMR spectrum (CDCl₃, 400 MHz) of allyl 3-*tert*-butyldimethylsilyl-4-*O*-levulinoyl- α -L-rhamnopyranoside



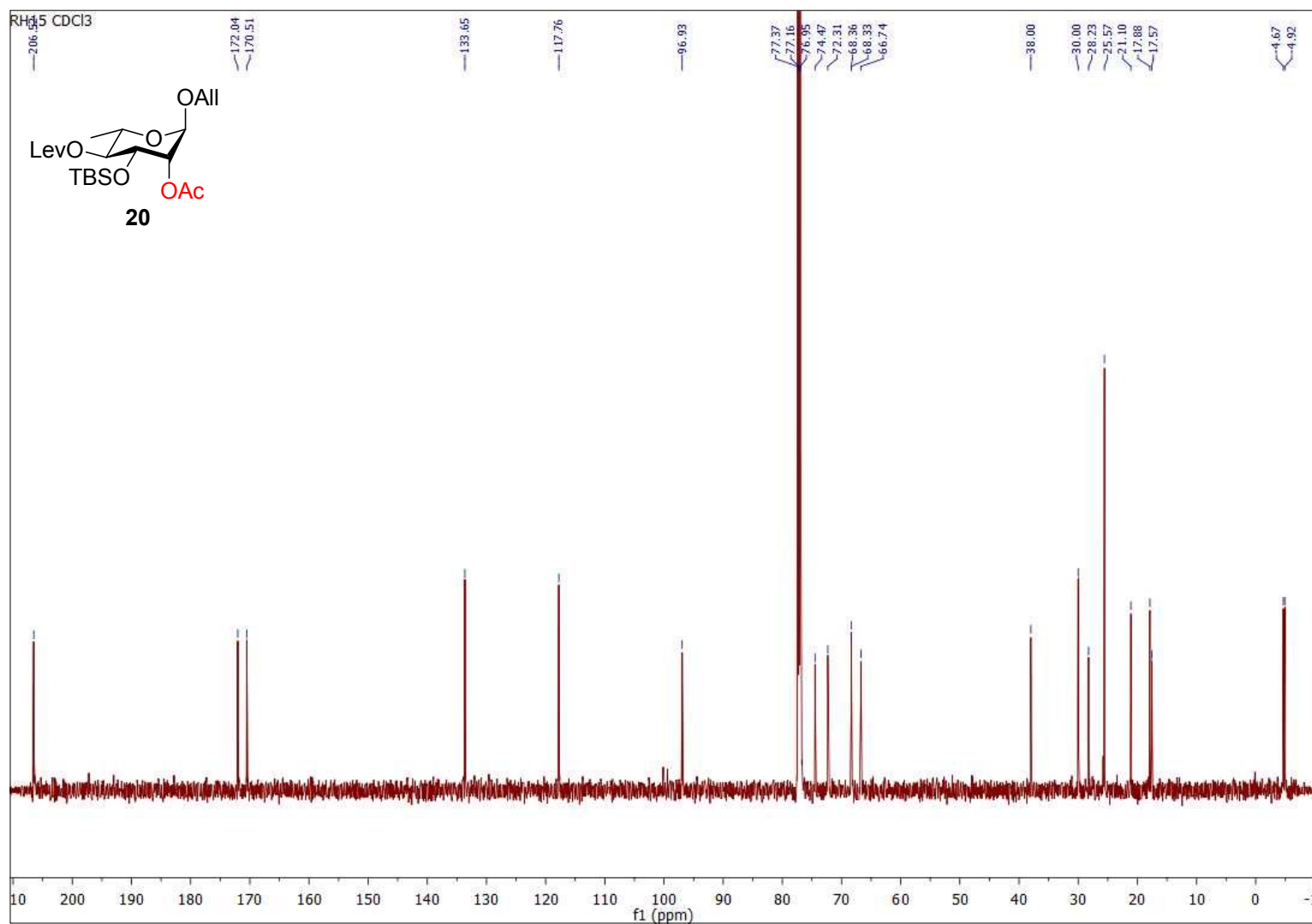
Supplementary Figure 13 | ^1H NMR spectrum (CDCl_3 , 600 MHz) of compound 20



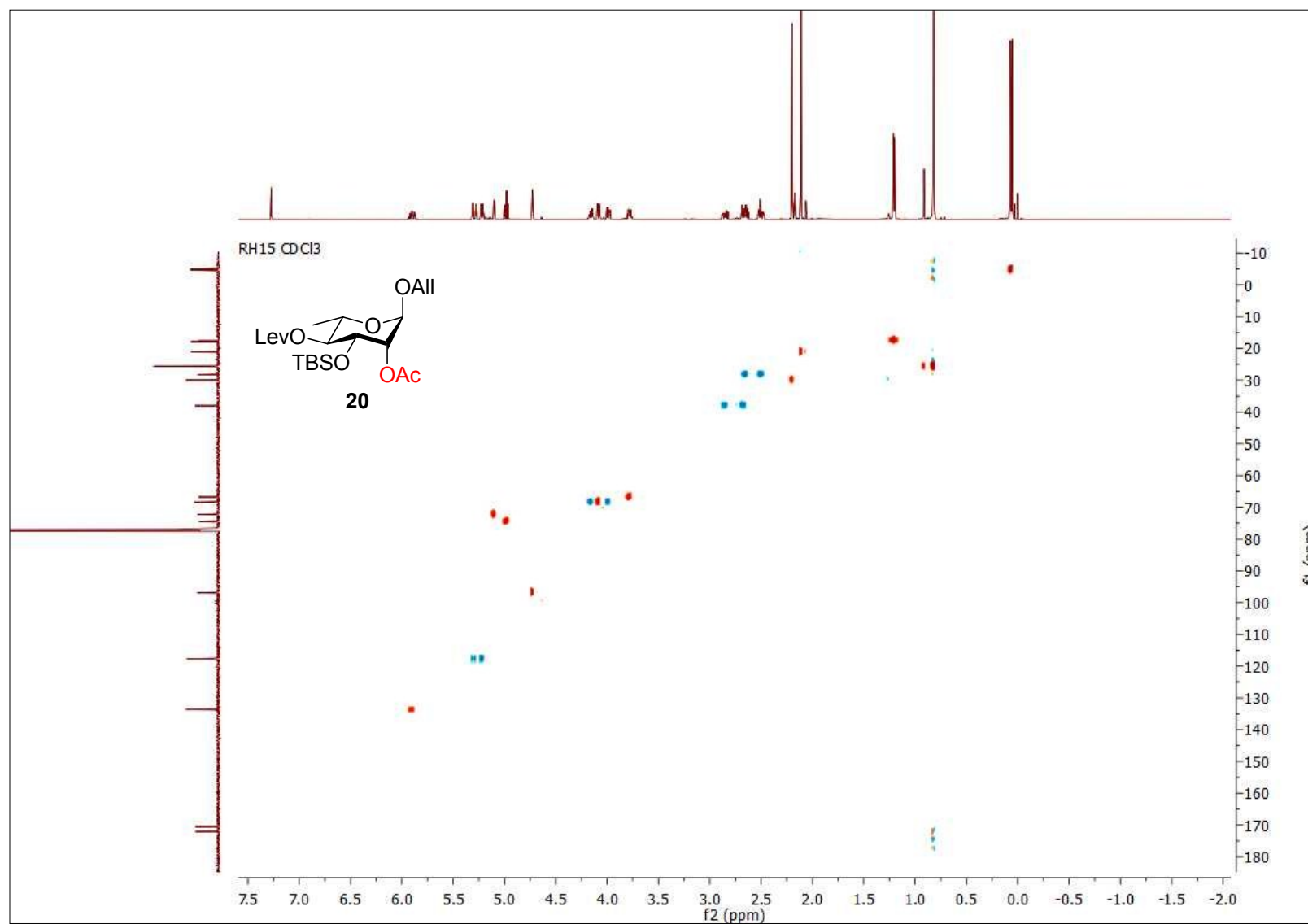
Supplementary Figure 14 | COSY NMR spectrum (CDCl₃, 600 MHz) of compound 20



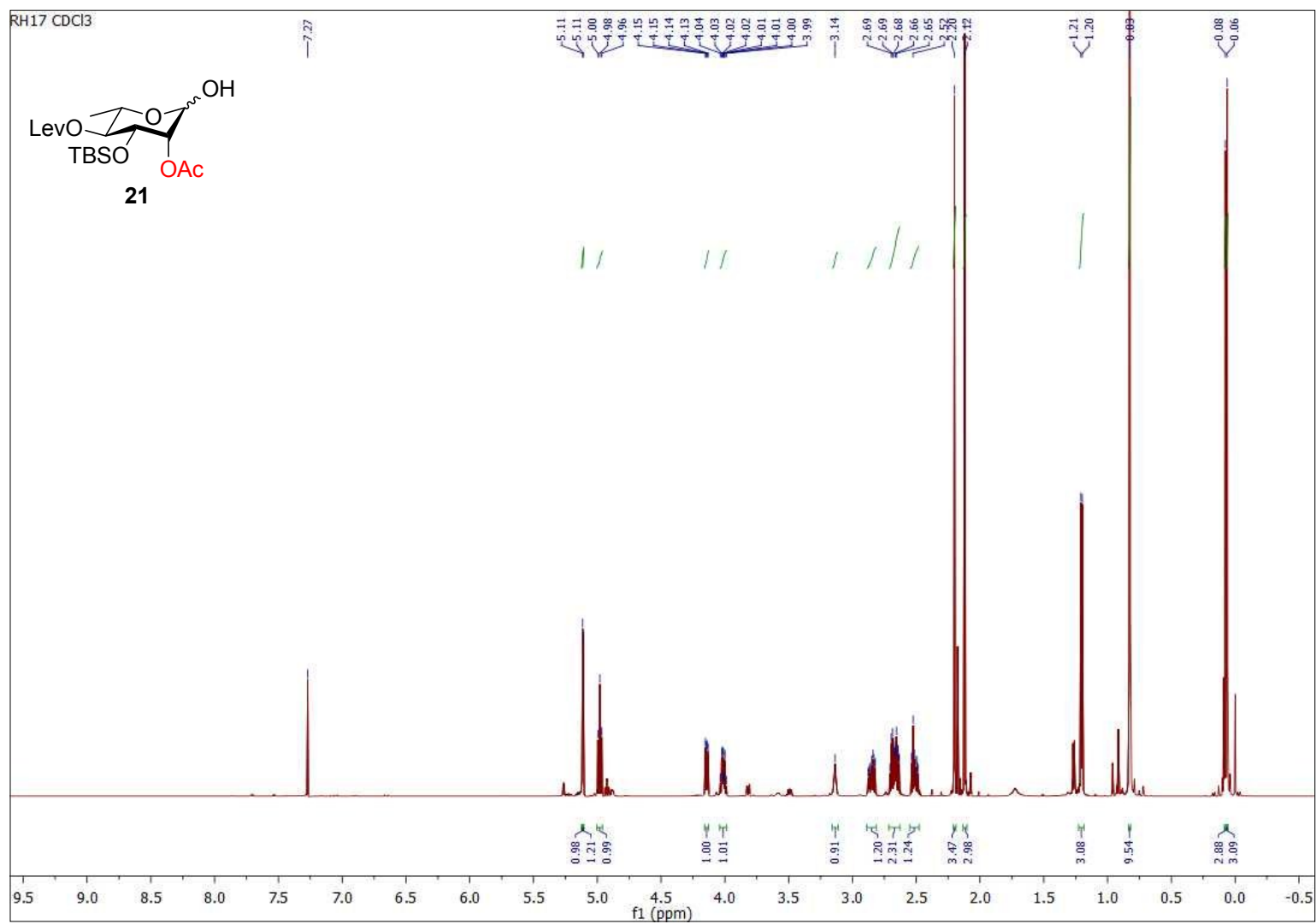
Supplementary Figure 15 | ^{13}C NMR spectrum (CDCl_3 , 150 MHz) of compound 20



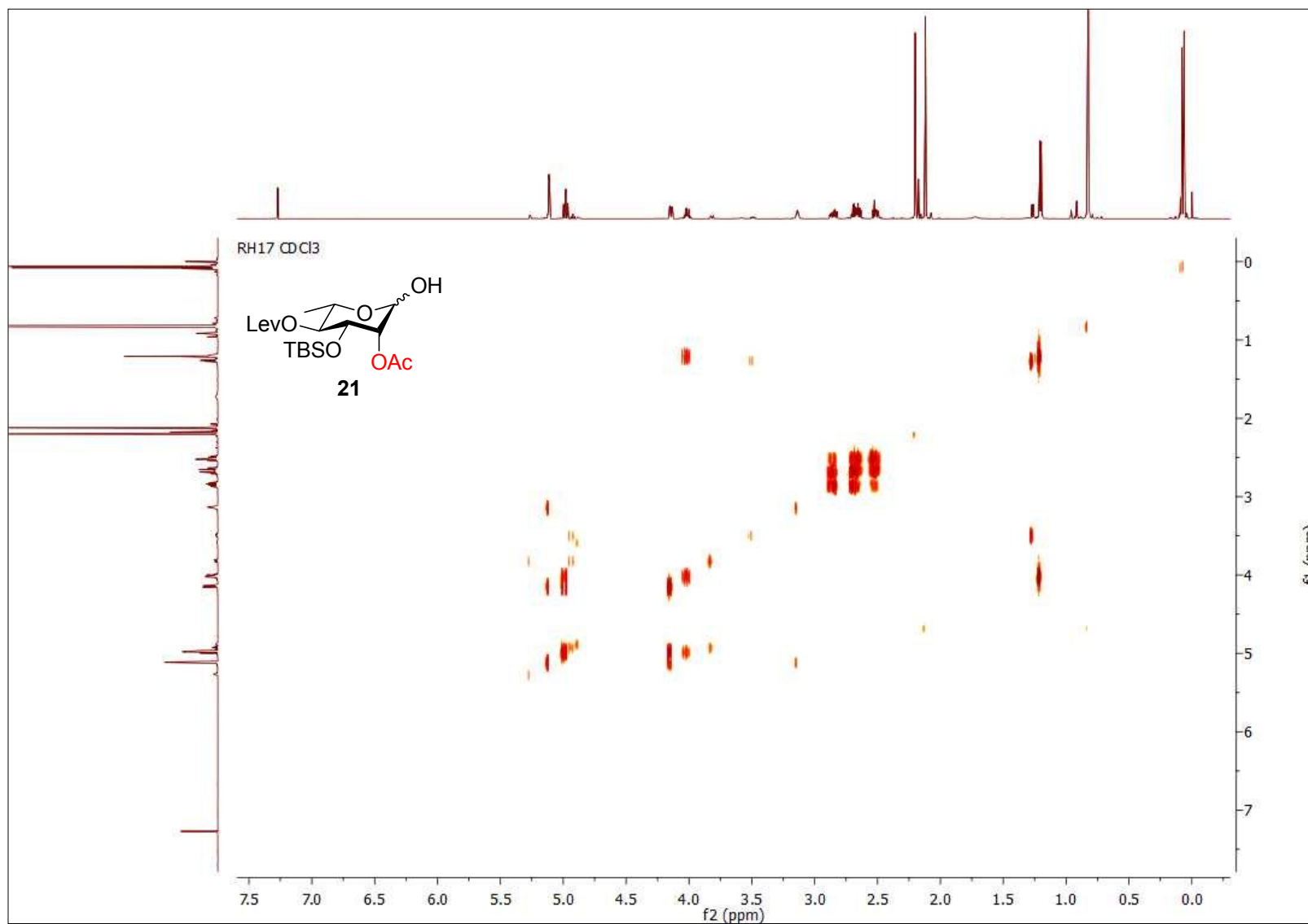
Supplementary Figure 16 | HSQC NMR spectrum (CDCl₃, 600 MHz) of compound 20



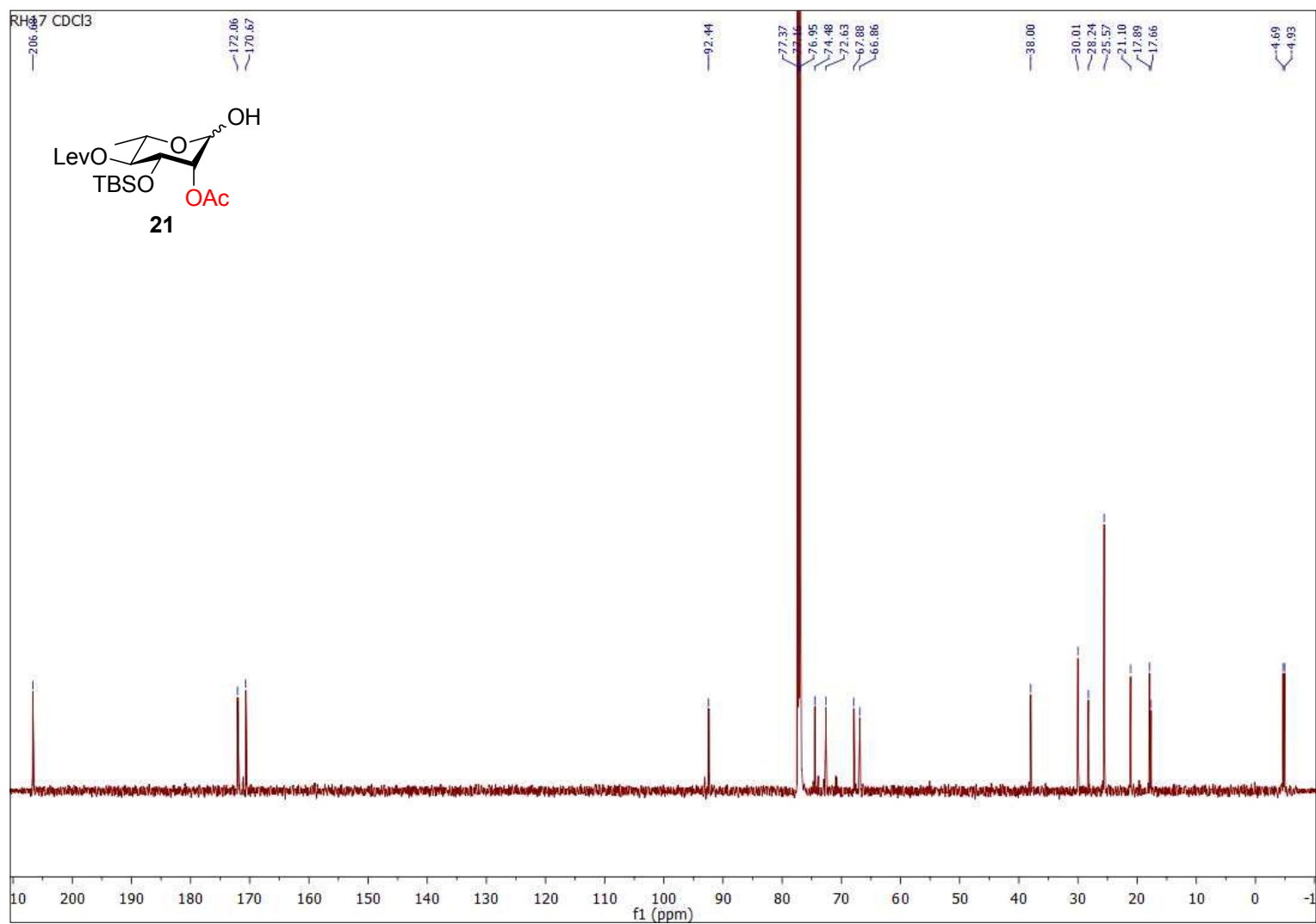
Supplementary Figure 17 | ^1H NMR spectrum (CDCl_3 , 600 MHz) of compound 21



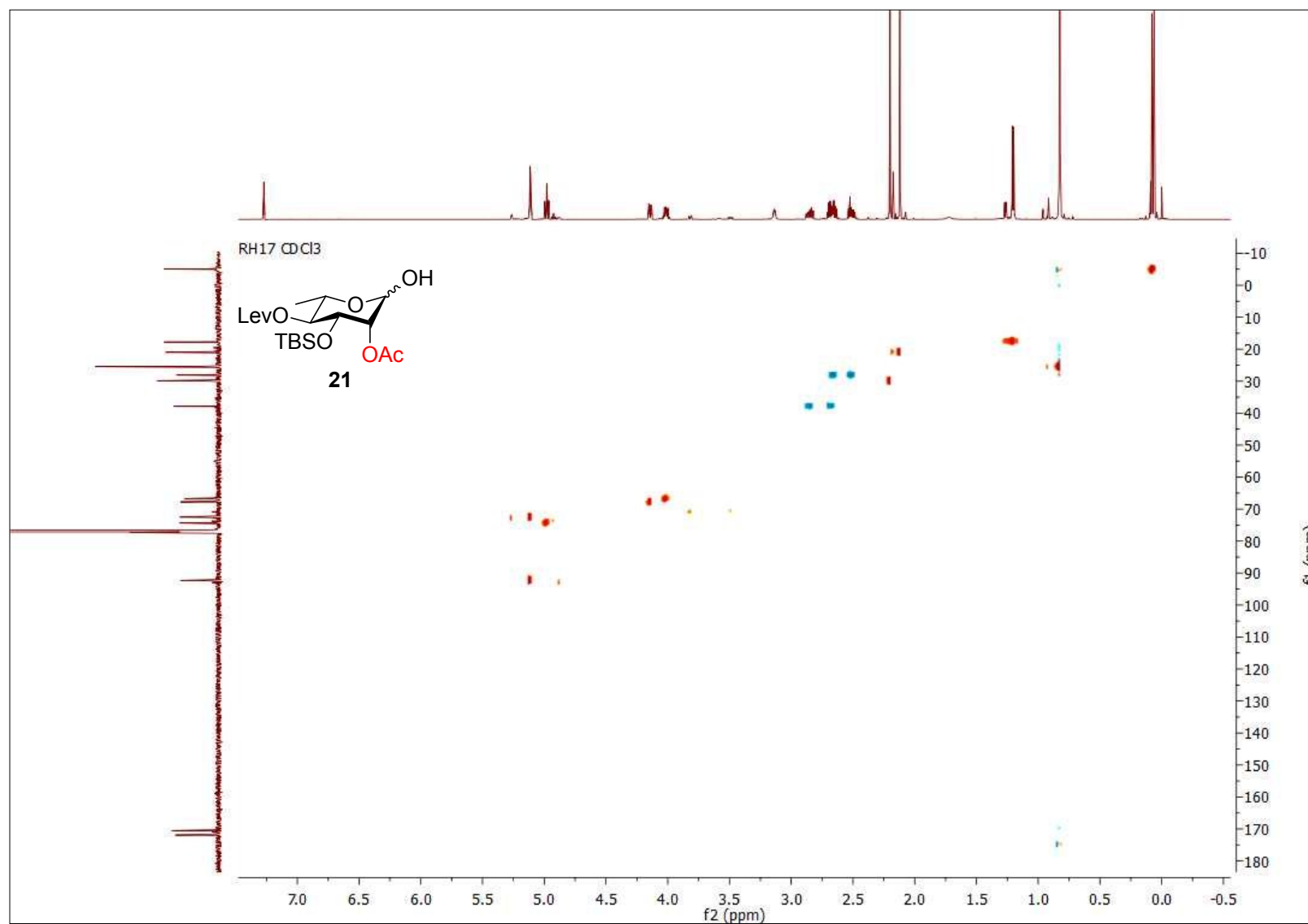
Supplementary Figure 18 | COSY NMR spectrum (CDCl₃, 600 MHz) of compound 21



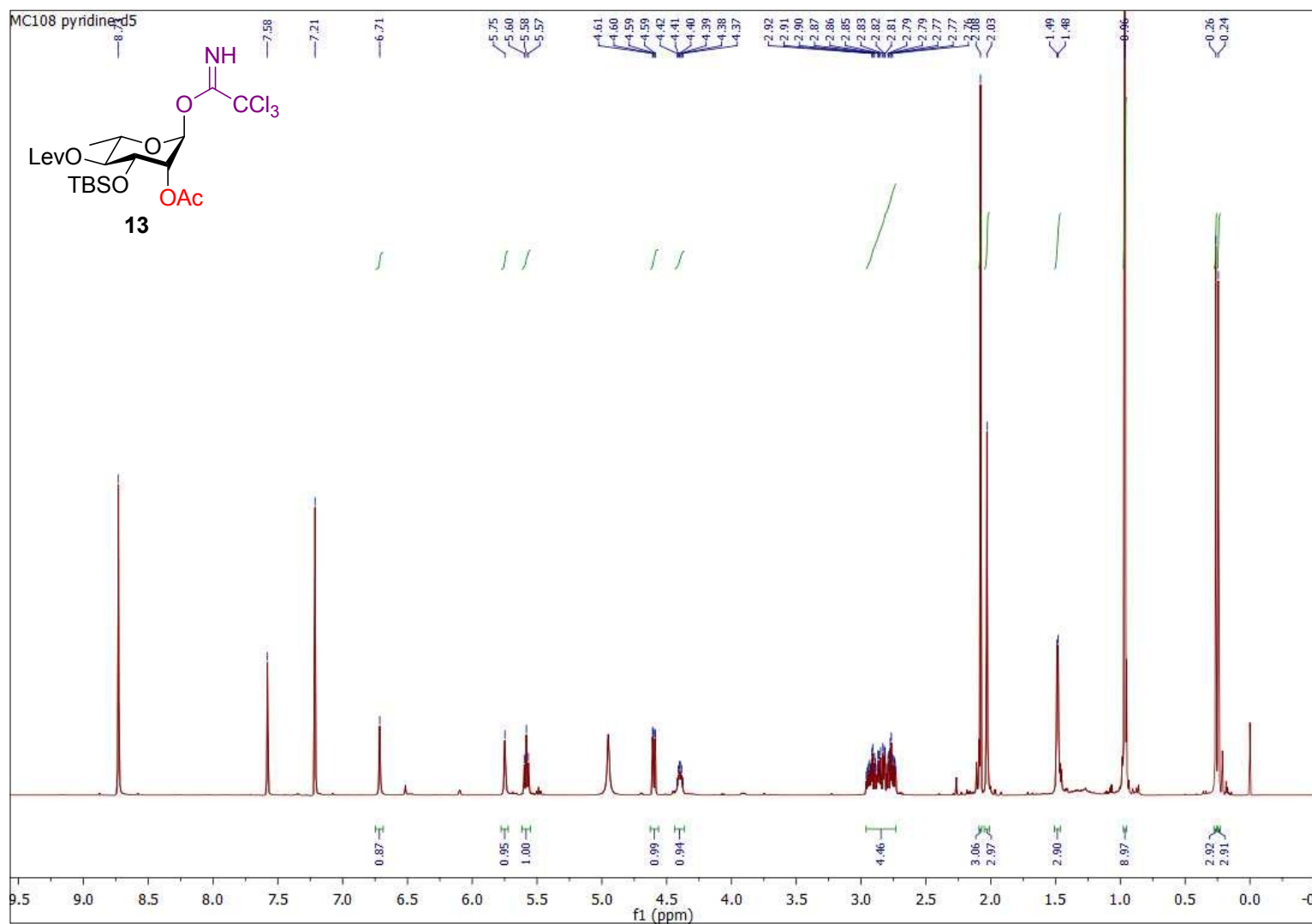
Supplementary Figure 19 | ^{13}C NMR spectrum (CDCl_3 , 150 MHz) of compound 21



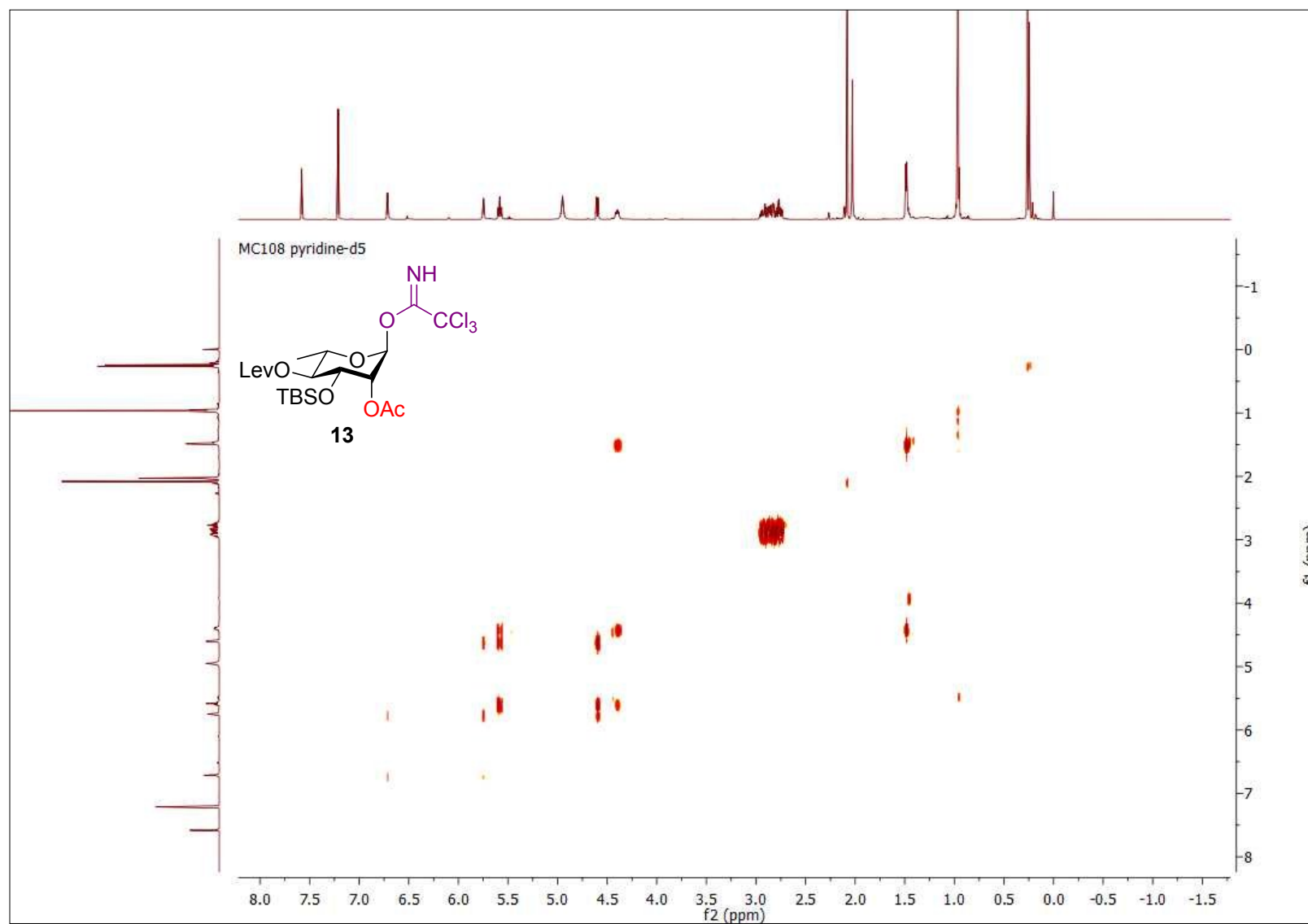
Supplementary Figure 20 | HSQC NMR spectrum (CDCl₃, 600 MHz) of compound 21



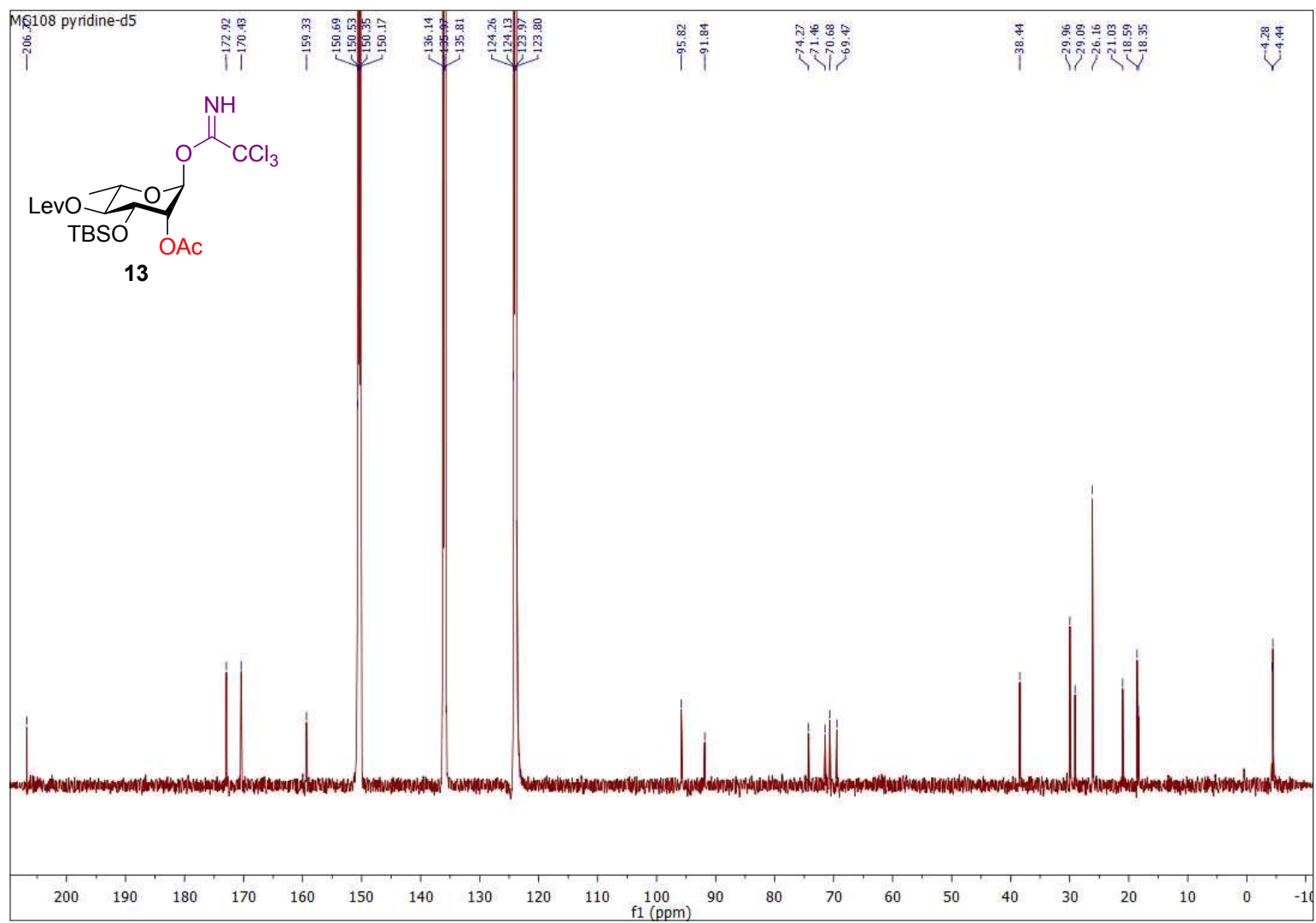
Supplementary Figure 21 | ¹H NMR spectrum (pyridine-d₅, 600 MHz) of compound 13



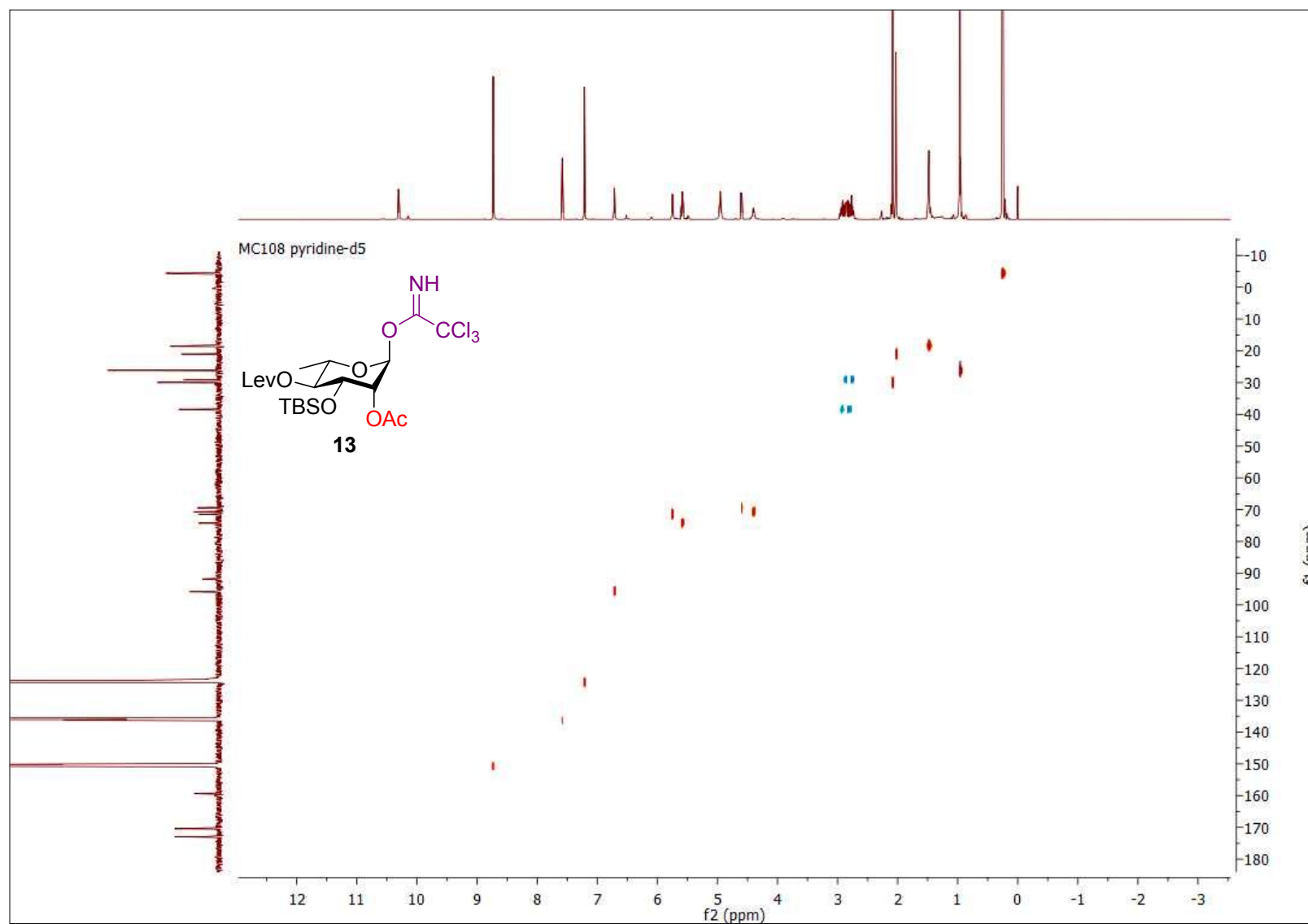
Supplementary Figure 22 | COSY NMR spectrum (pyridine-d₅, 600 MHz) of compound 13



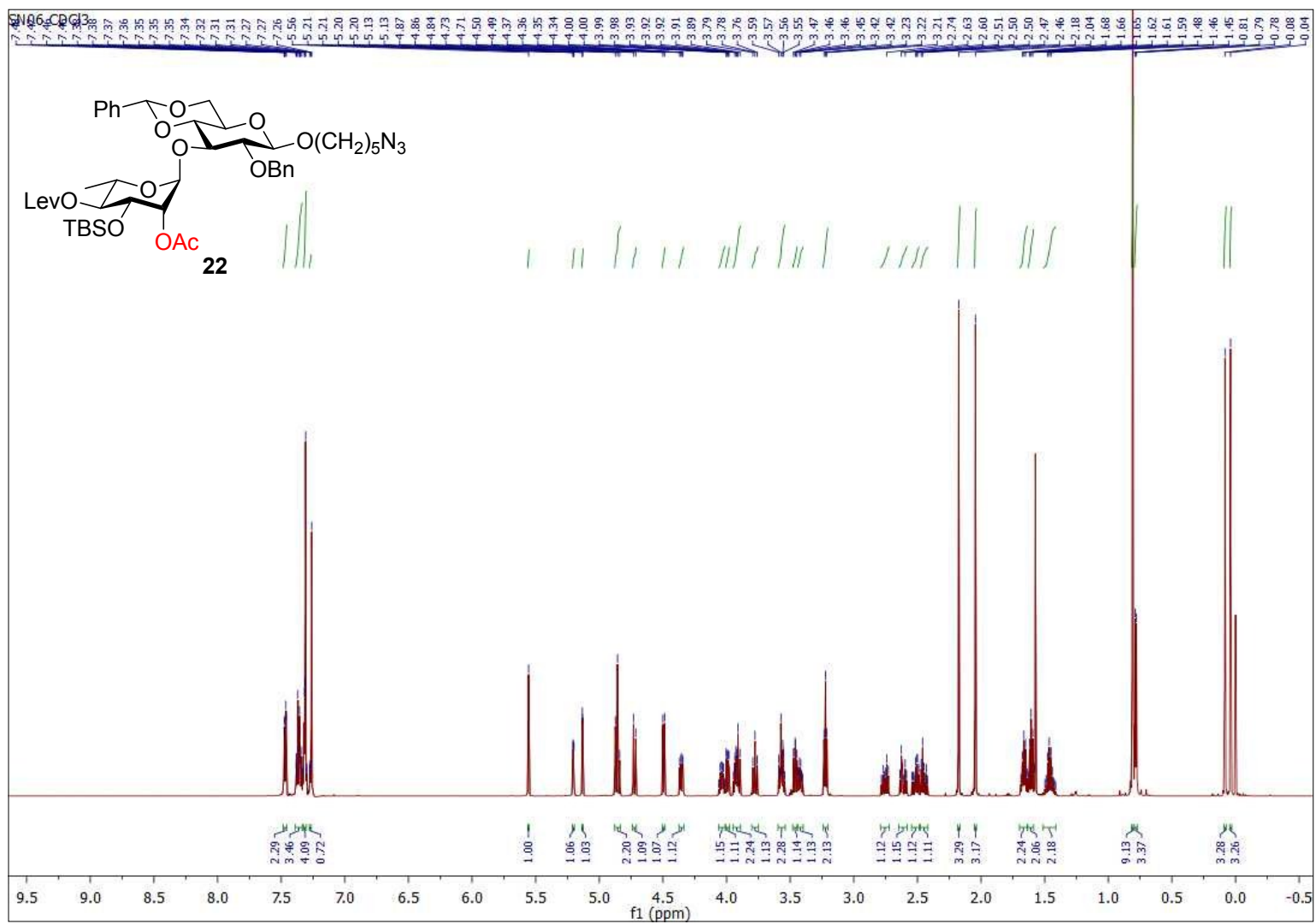
Supplementary Figure 23 | ^{13}C NMR spectrum (pyridine- d_5 , 150 MHz) of compound 13



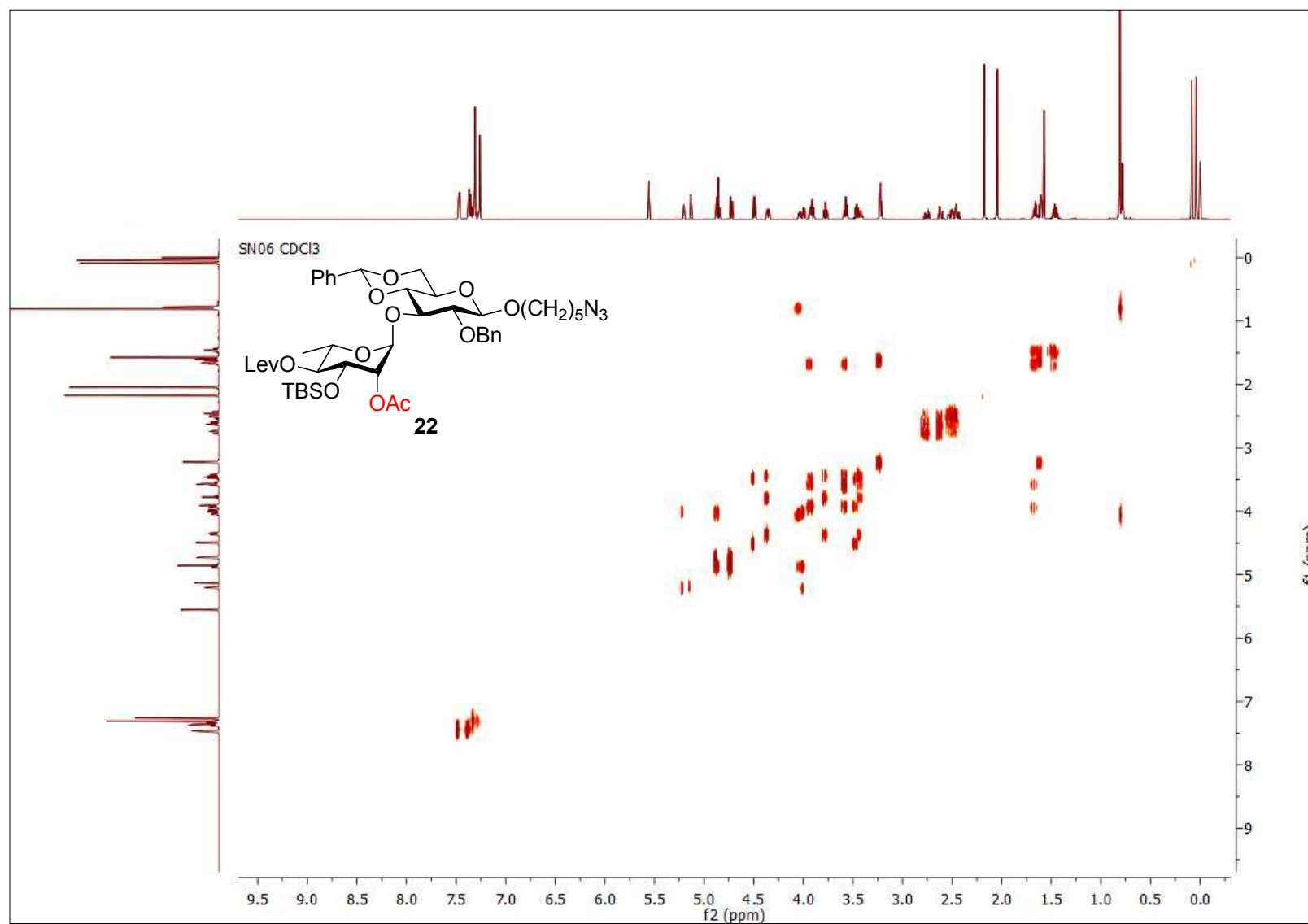
Supplementary Figure 24 | HSQC NMR spectrum (pyridine-d₅, 600 MHz) of compound 13



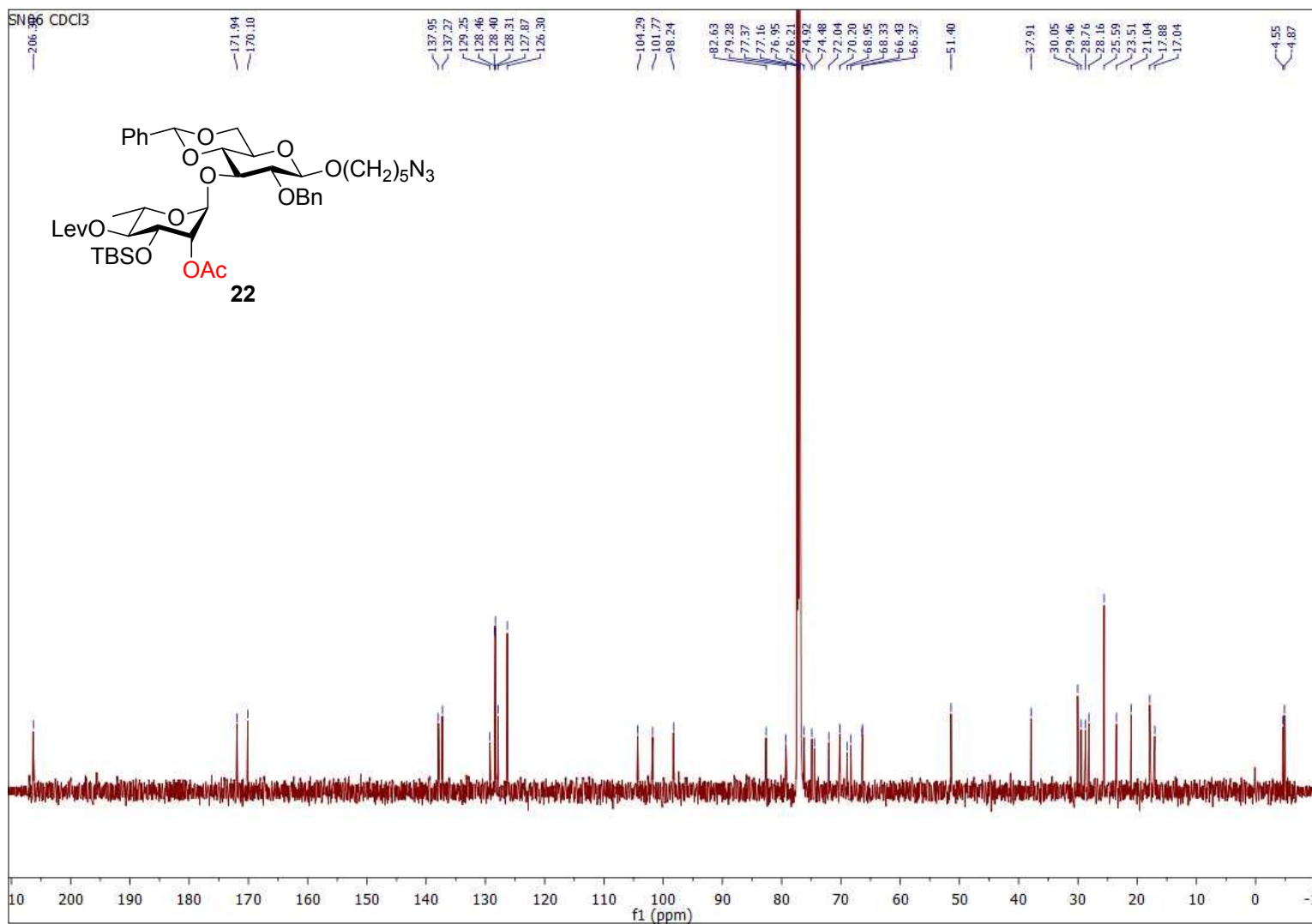
Supplementary Figure 25 | ^1H NMR spectrum (CDCl_3 , 600 MHz) of compound 22



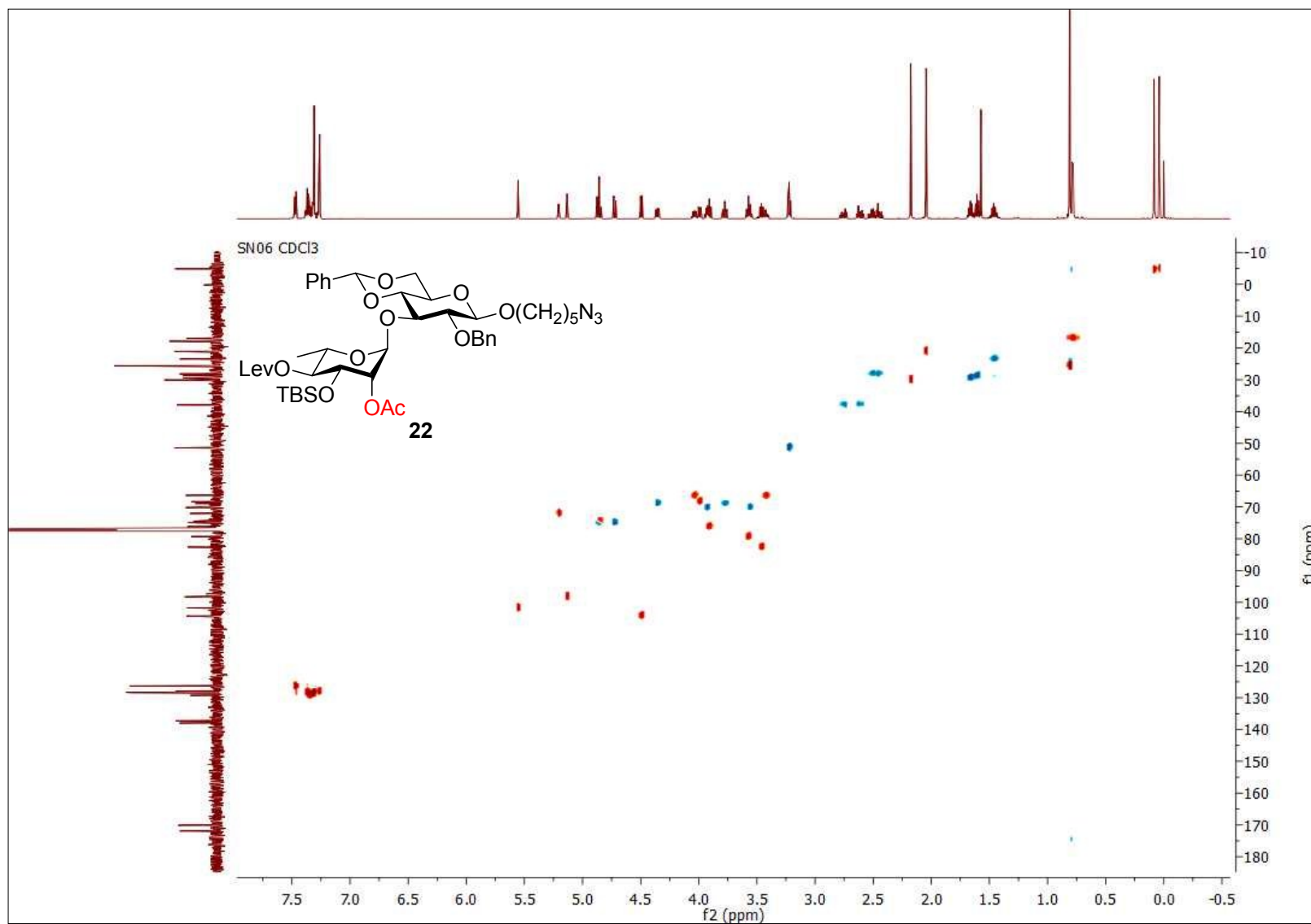
Supplementary Figure 26 | COSY NMR spectrum (CDCl₃, 600 MHz) of compound 22



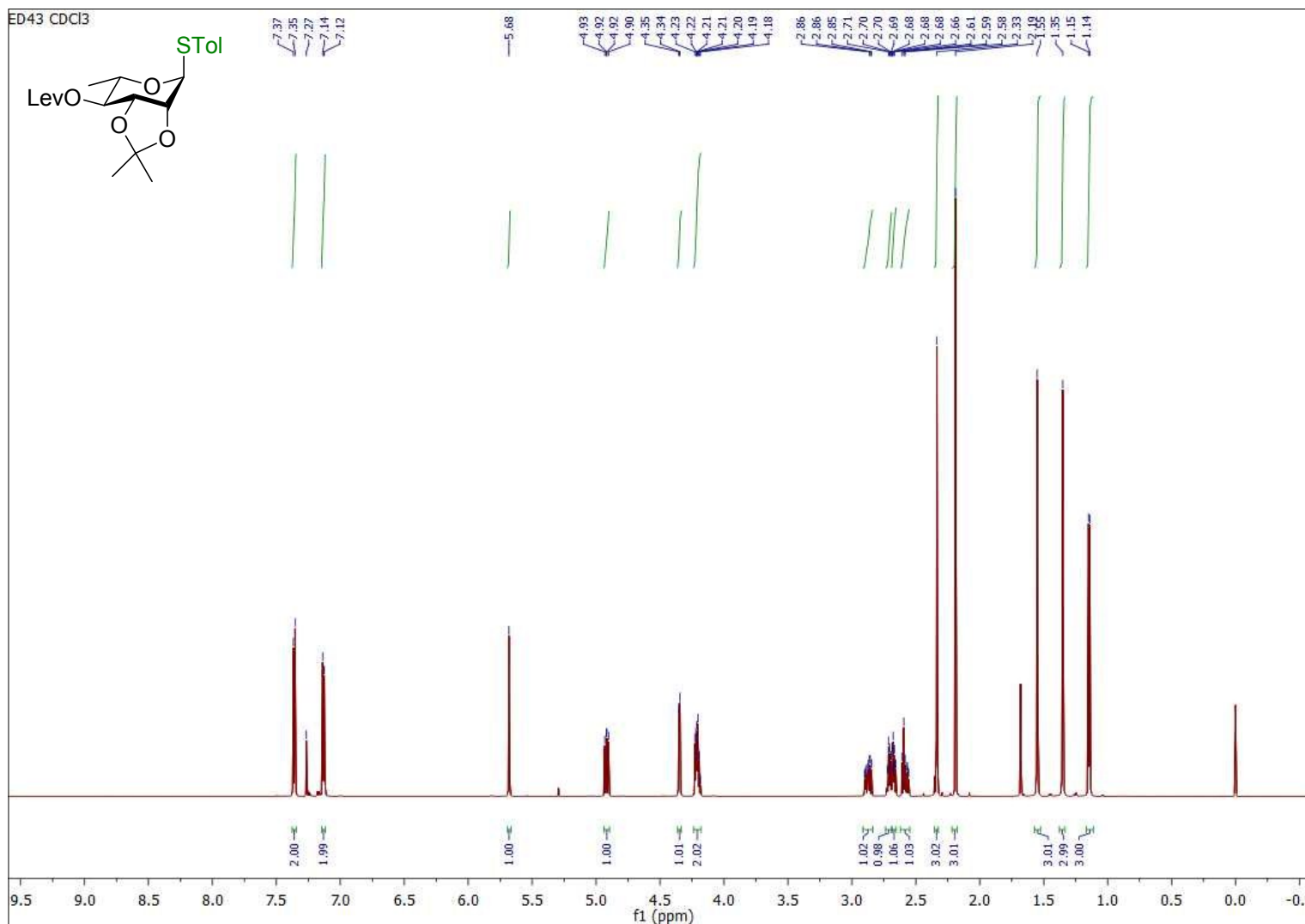
Supplementary Figure 27 | ^{13}C NMR spectrum (CDCl_3 , 150 MHz) of compound 22



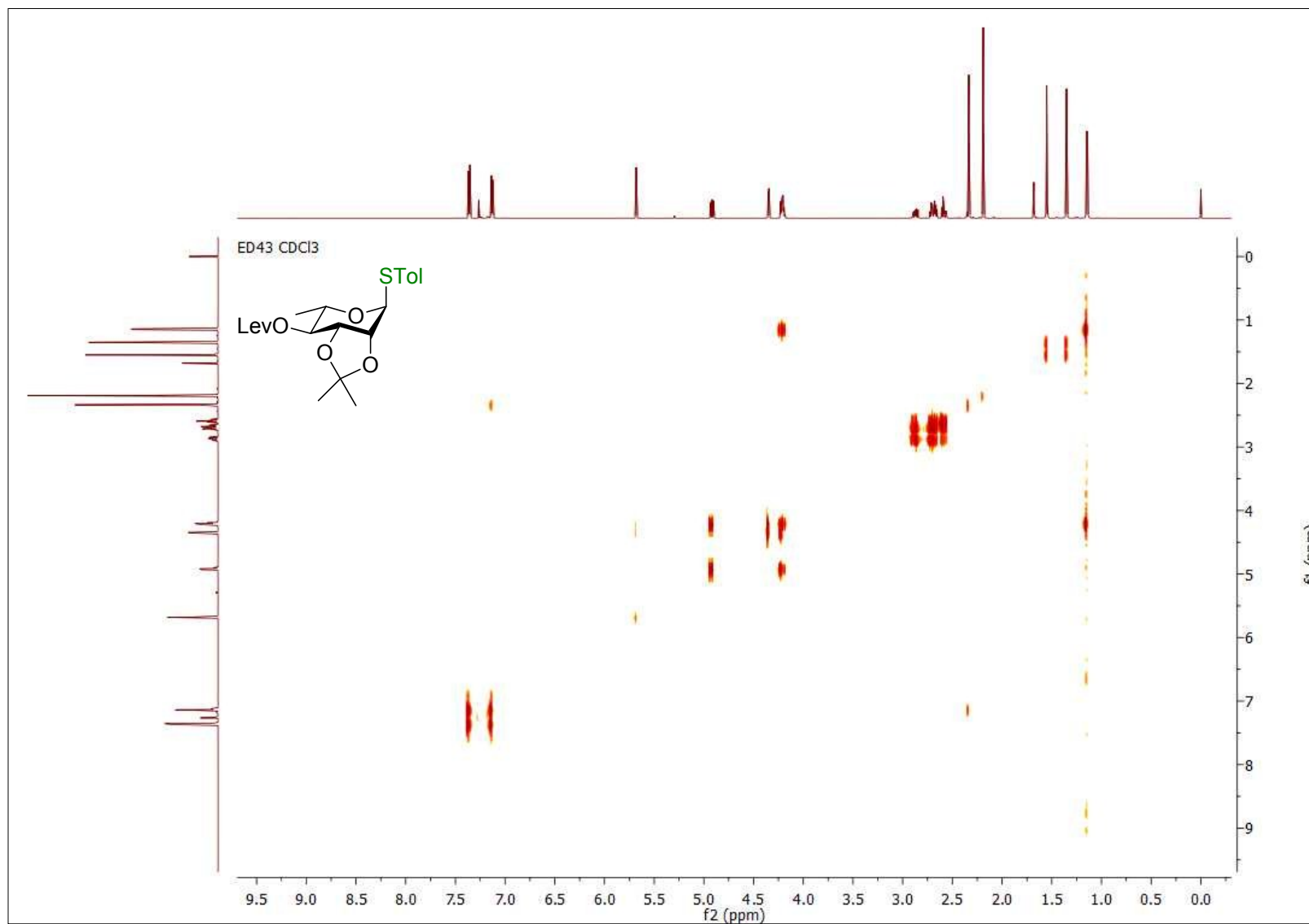
Supplementary Figure 28 | HSQC NMR spectrum (CDCl₃, 600 MHz) of compound 22



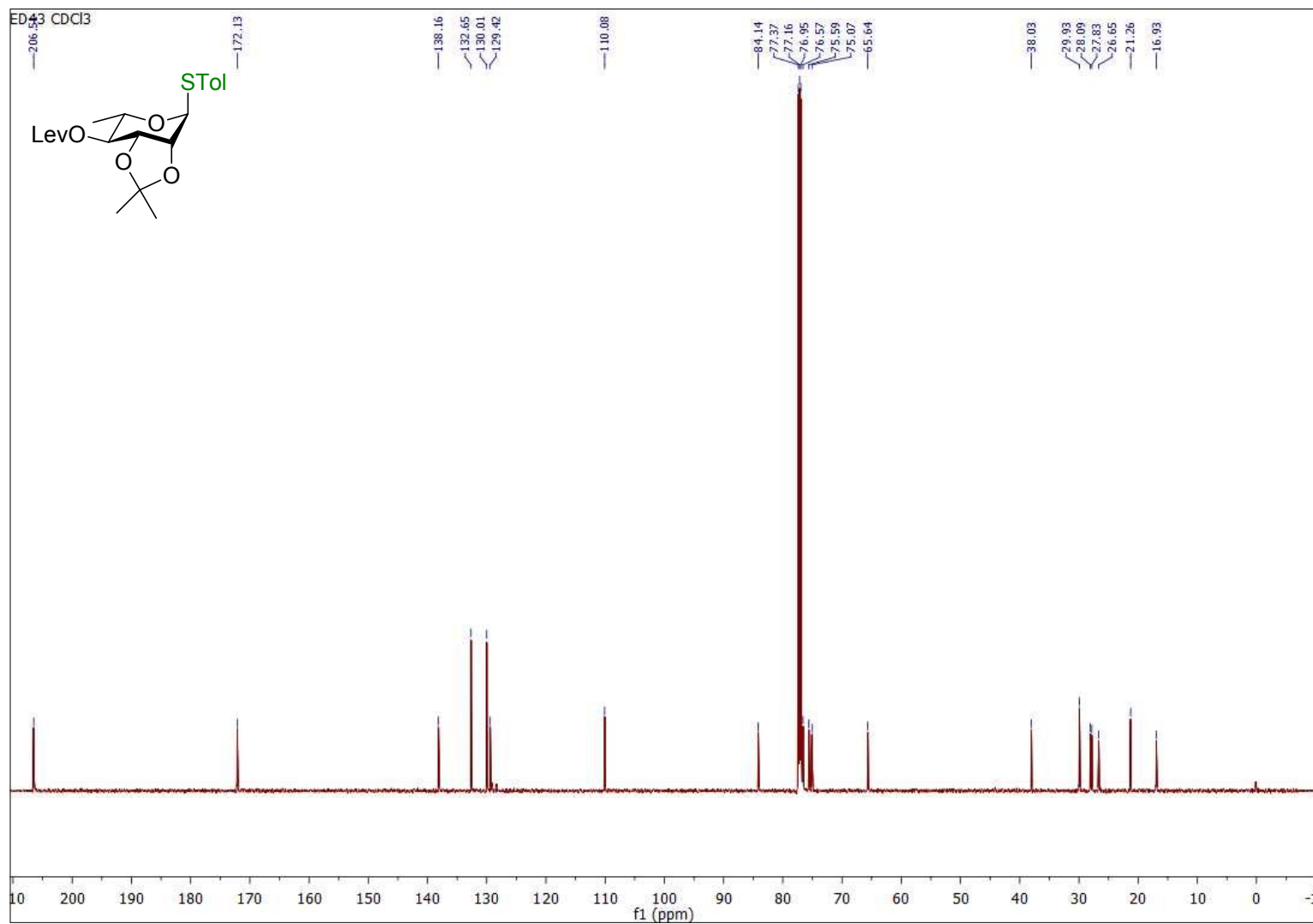
Supplementary Figure 29 | ^1H NMR spectrum (CDCl_3 , 600 MHz) of *para*-methylphenyl 4-*O*-levulinoyl-2,3-*O*-isopropylidene-1-thio- α -L-rhamnopyranoside



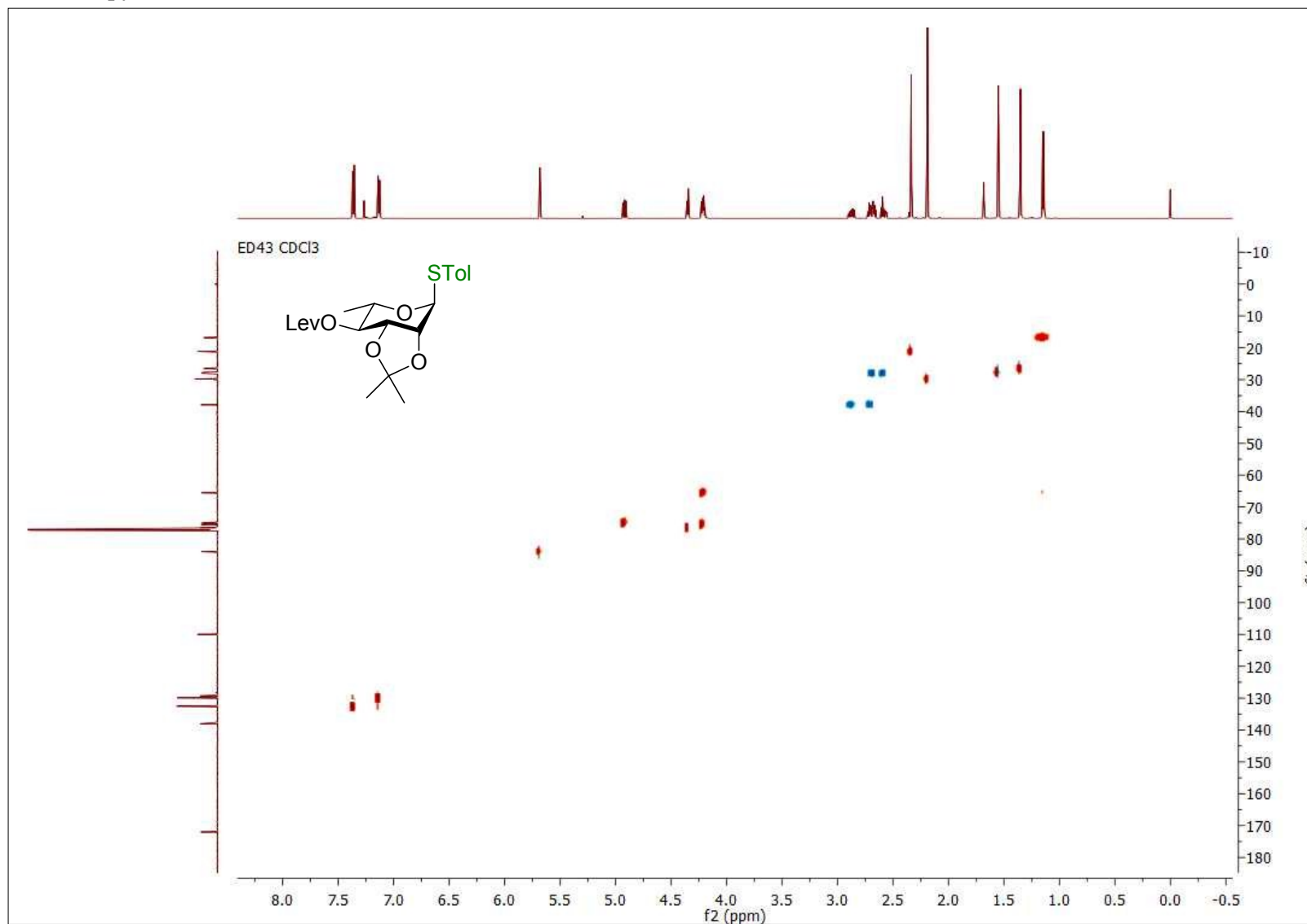
Supplementary Figure 30 | COSY NMR spectrum (CDCl₃, 600 MHz) of *para*-methylphenyl 4-*O*-levulinoyl-2,3-*O*-isopropylidene-1-thio- α -L-rhamnopyranoside



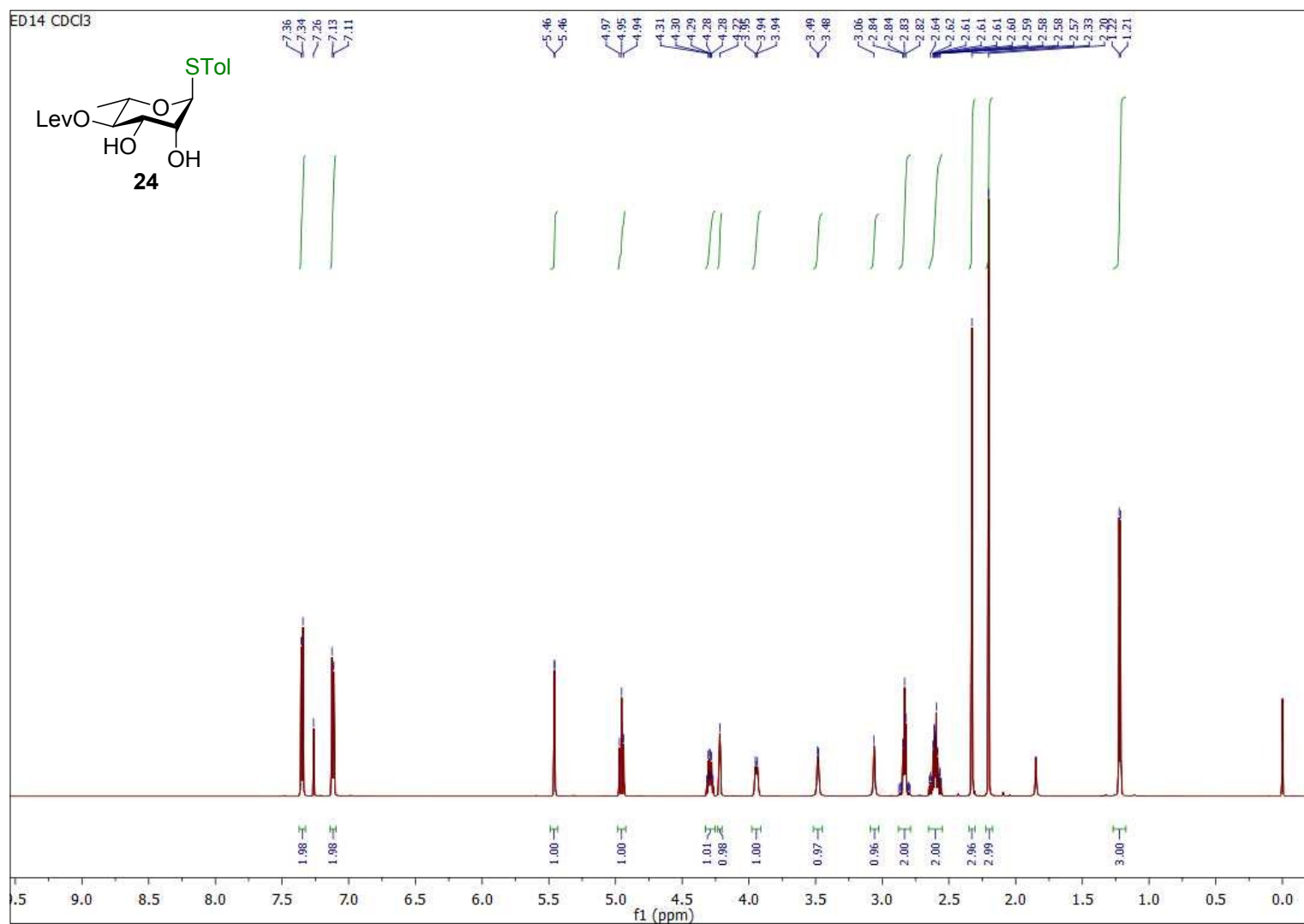
Supplementary Figure 31 | ^{13}C NMR spectrum (CDCl_3 , 150 MHz) of *para*-methylphenyl 4-*O*-levulinoyl-2,3-*O*-isopropylidene-1-thio- α -L-rhamnopyranoside



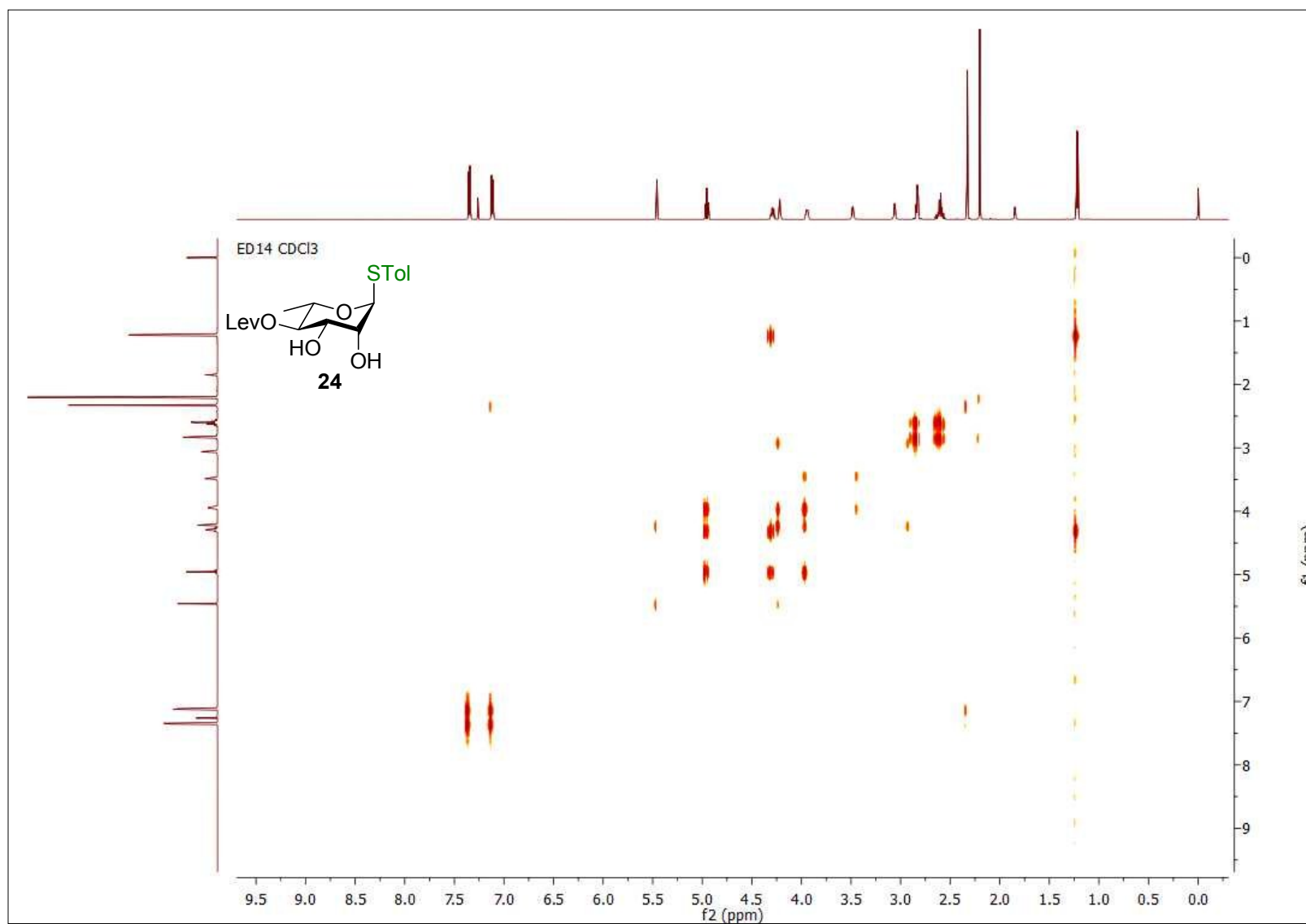
Supplementary Figure 32 | HSQC NMR spectrum (CDCl₃, 600 MHz) of *para*-methylphenyl 4-*O*-levulinoyl-2,3-*O*-isopropylidene-1-thio- α -L-rhamnopyranoside



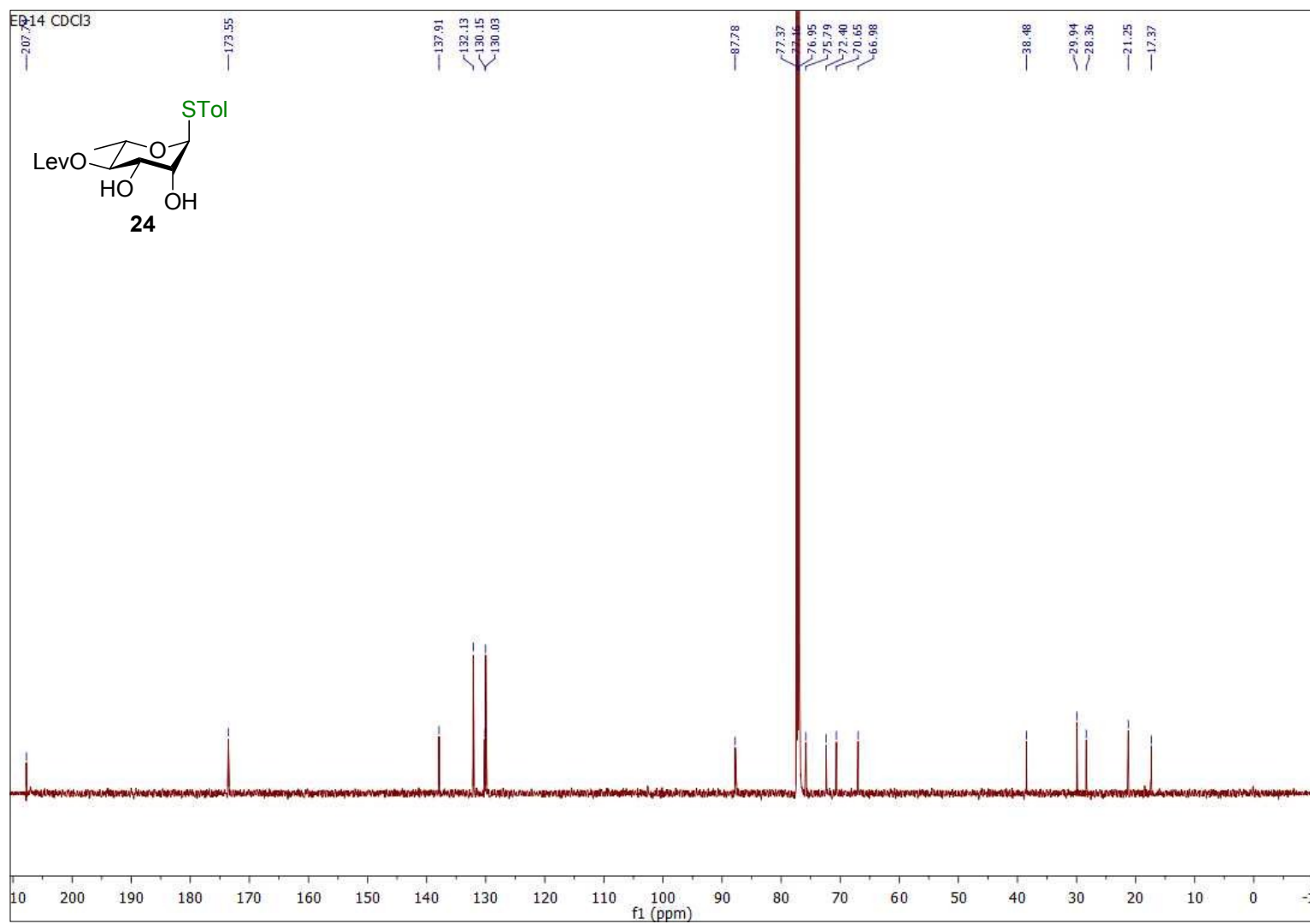
Supplementary Figure 33 | ^1H NMR spectrum (CDCl_3 , 600 MHz) of compound 24



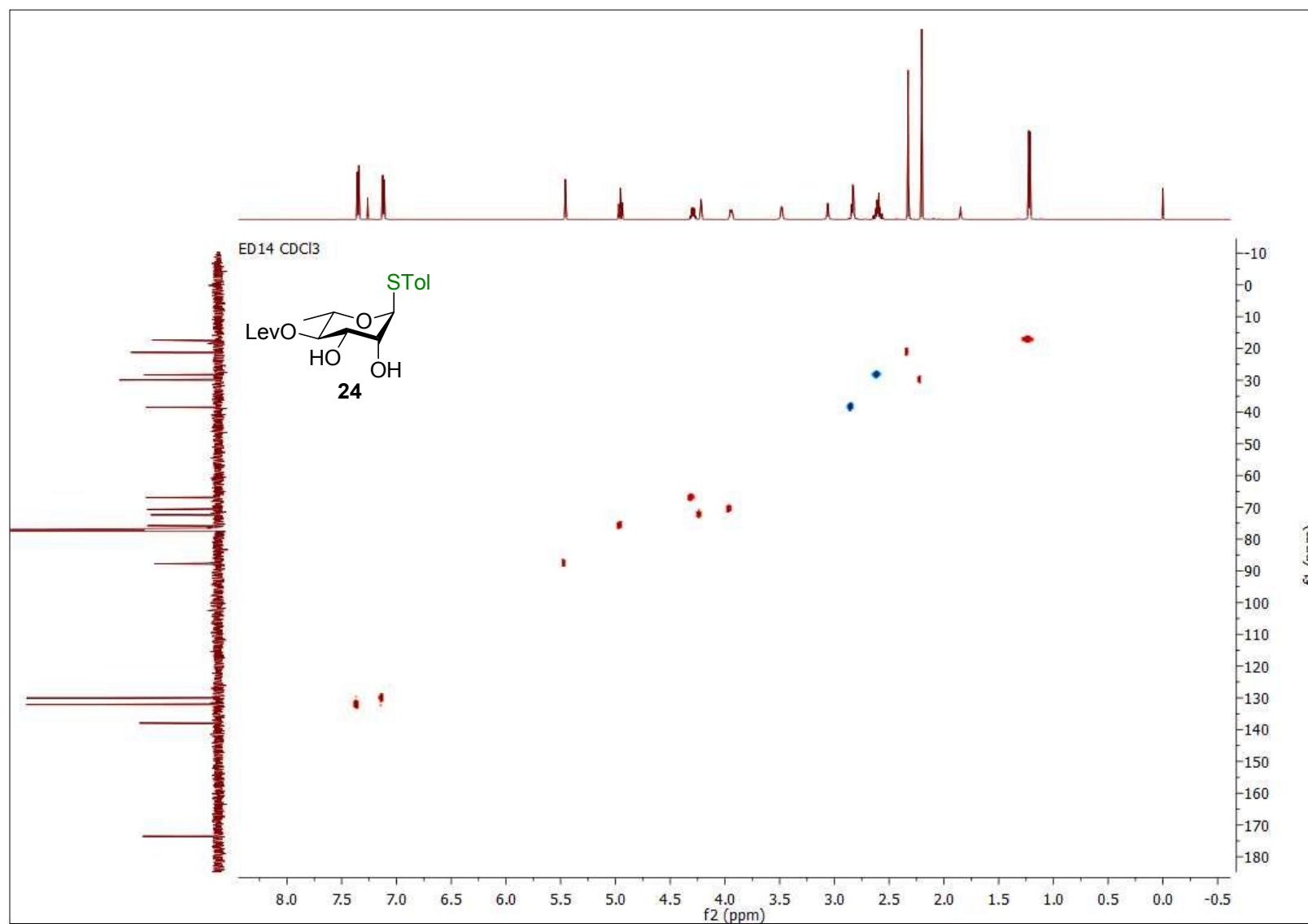
Supplementary Figure 34 | COSY NMR spectrum (CDCl₃, 600 MHz) of compound 24



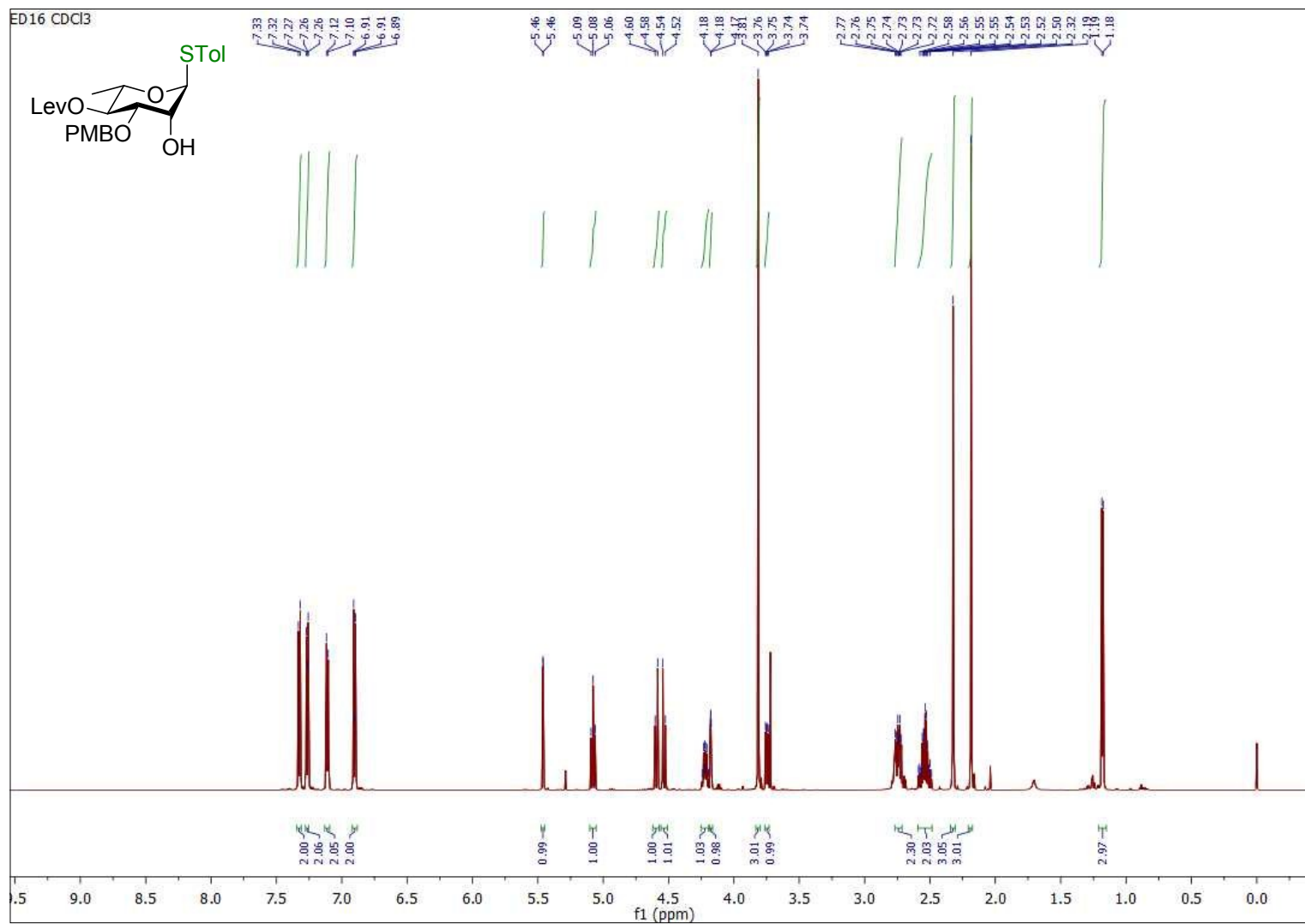
Supplementary Figure 35 | ^{13}C NMR spectrum (CDCl_3 , 150 MHz) of compound 24



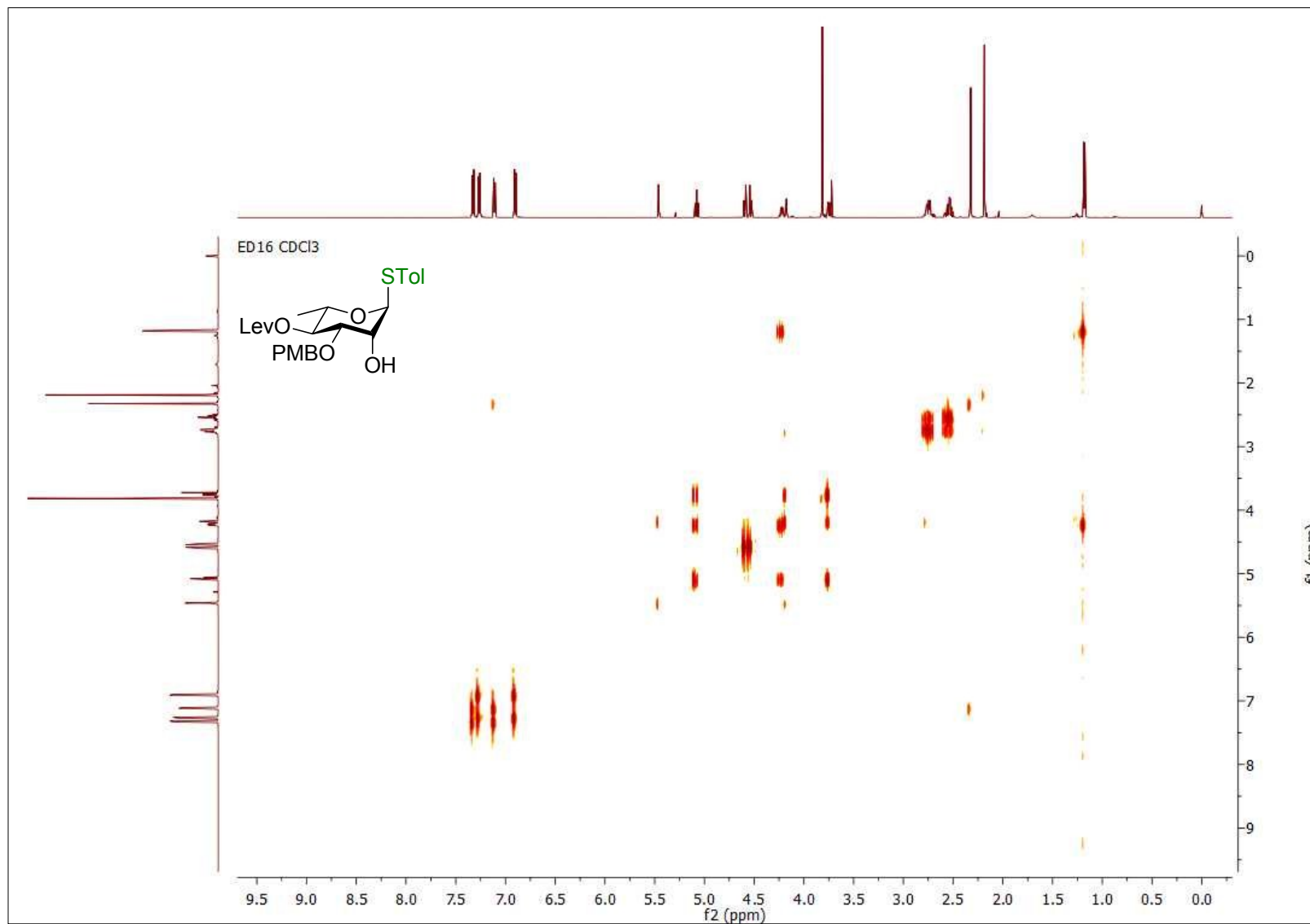
Supplementary Figure 36 | HSQC NMR spectrum (CDCl₃, 600 MHz) of compound 24



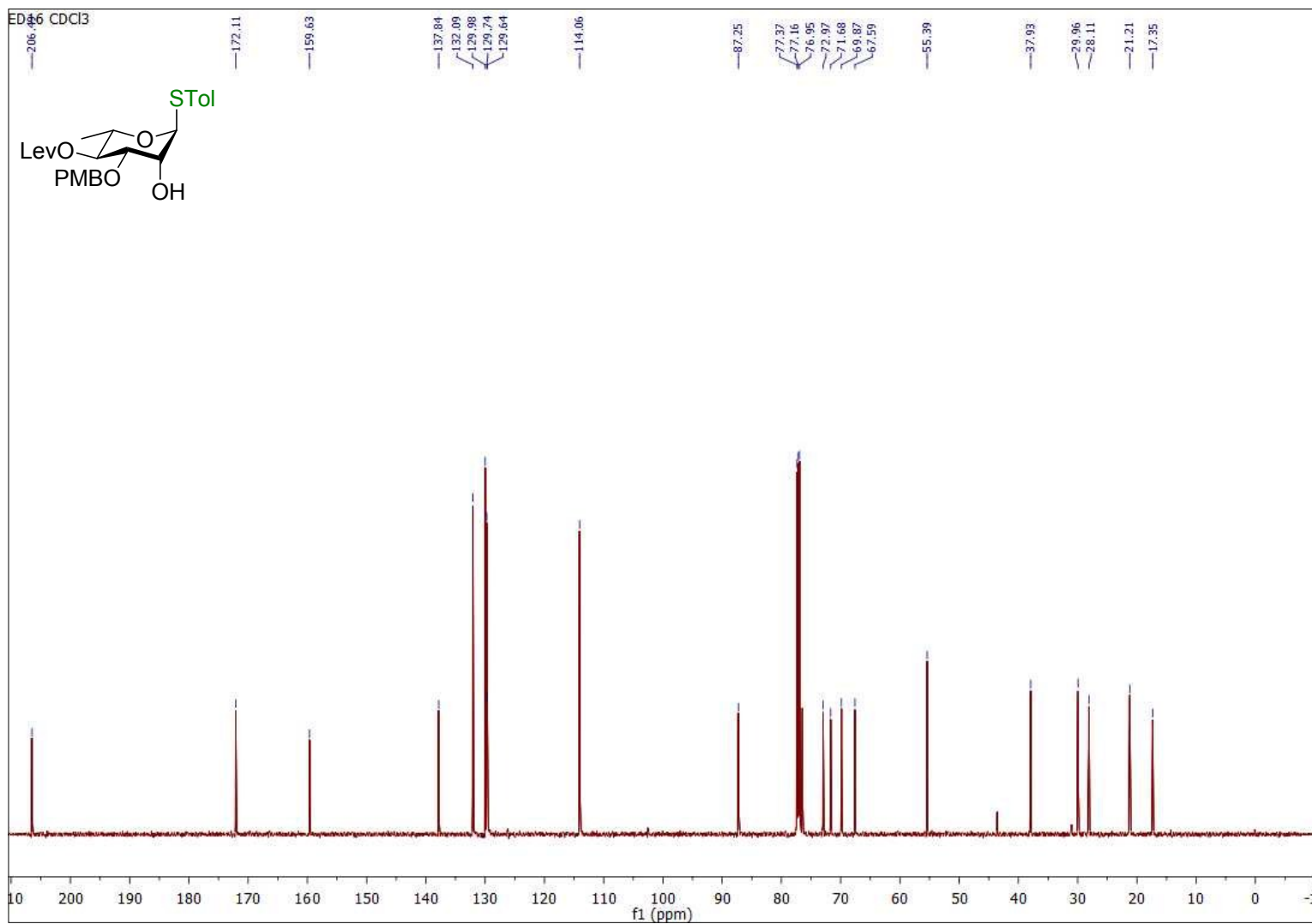
Supplementary Figure 37 | ^1H NMR spectrum (CDCl_3 , 600 MHz) of *para*-methylphenyl 4-*O*-levulinoyl-3-*O*-*para*-methoxybenzyl-1-thio- α -L-rhamnopyranoside



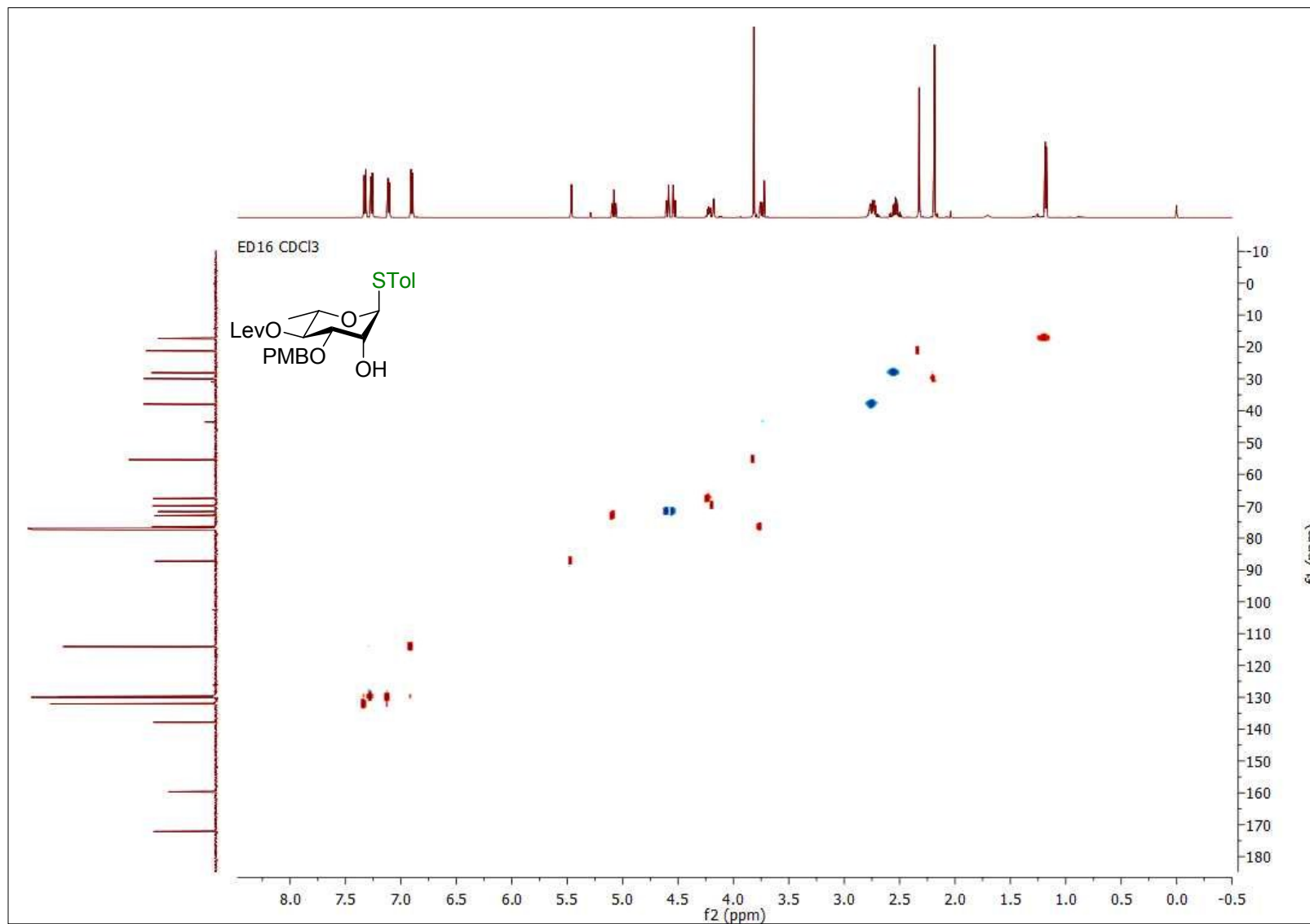
Supplementary Figure 38 | COSY NMR spectrum (CDCl₃, 600 MHz) of *para*-methylphenyl 4-*O*-levulinoyl-3-*O*-*para*-methoxybenzyl-1-thio- α -L-rhamnopyranoside



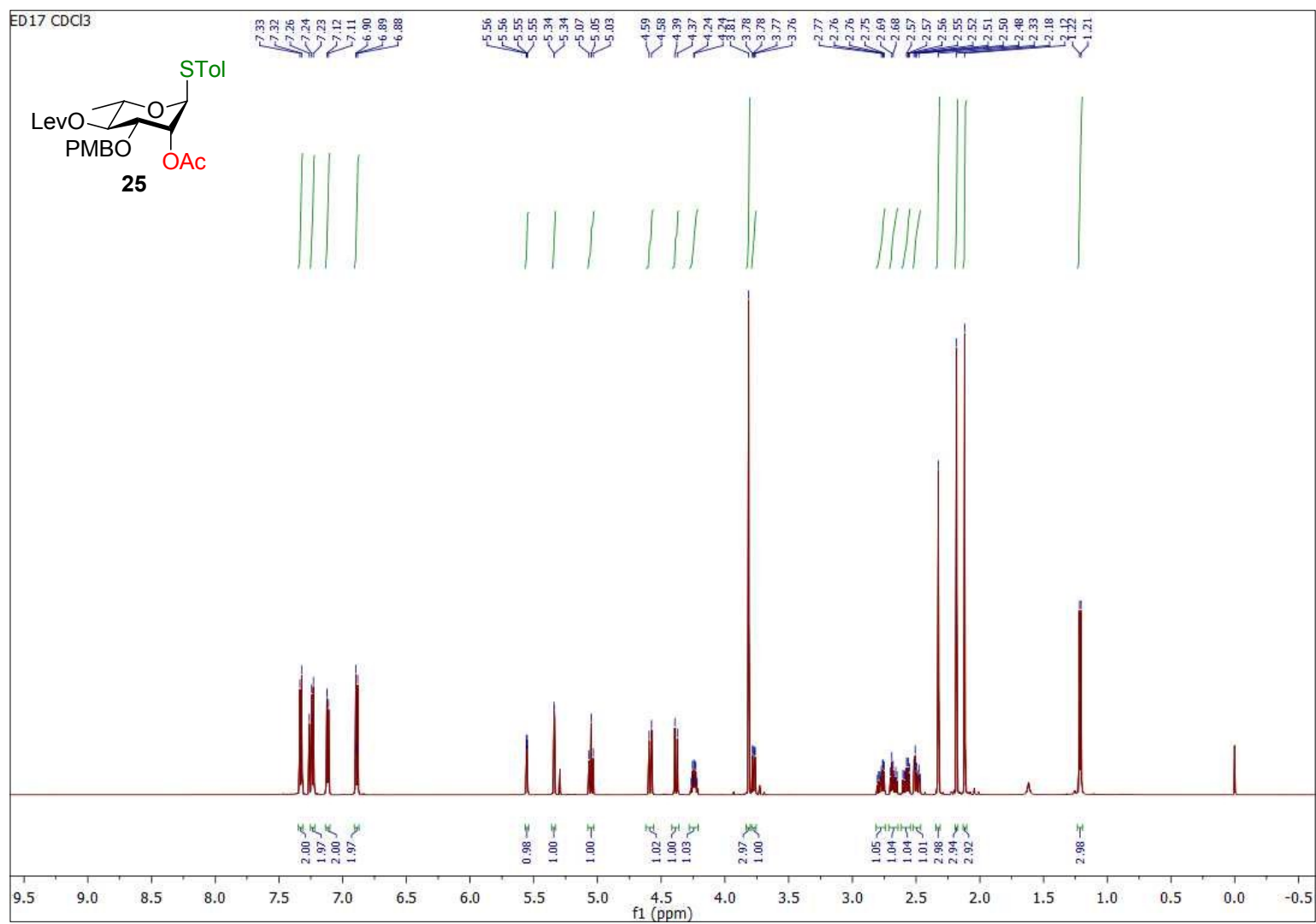
Supplementary Figure 39 | ^{13}C NMR spectrum (CDCl_3 , 150 MHz) of *para*-methylphenyl 4-*O*-levulinoyl-3-*O*-*para*-methoxybenzyl-1-thio- α -L-rhamnopyranoside



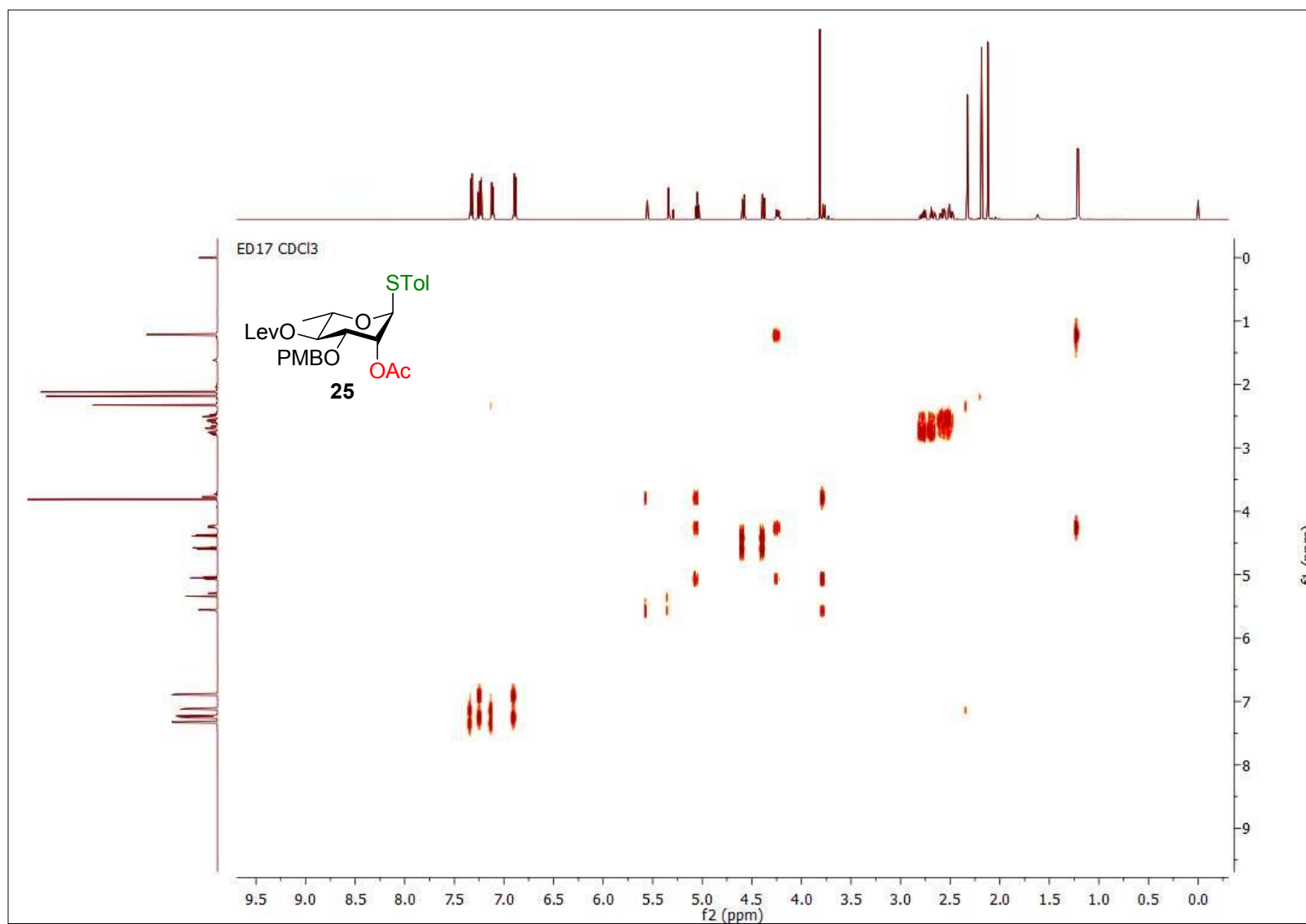
Supplementary Figure 40 | HSQC NMR spectrum (CDCl_3 , 600 MHz) of *para*-methylphenyl 4-*O*-levulinoyl-3-*O*-*para*-methoxybenzyl-1-thio- α -L-rhamnopyranoside



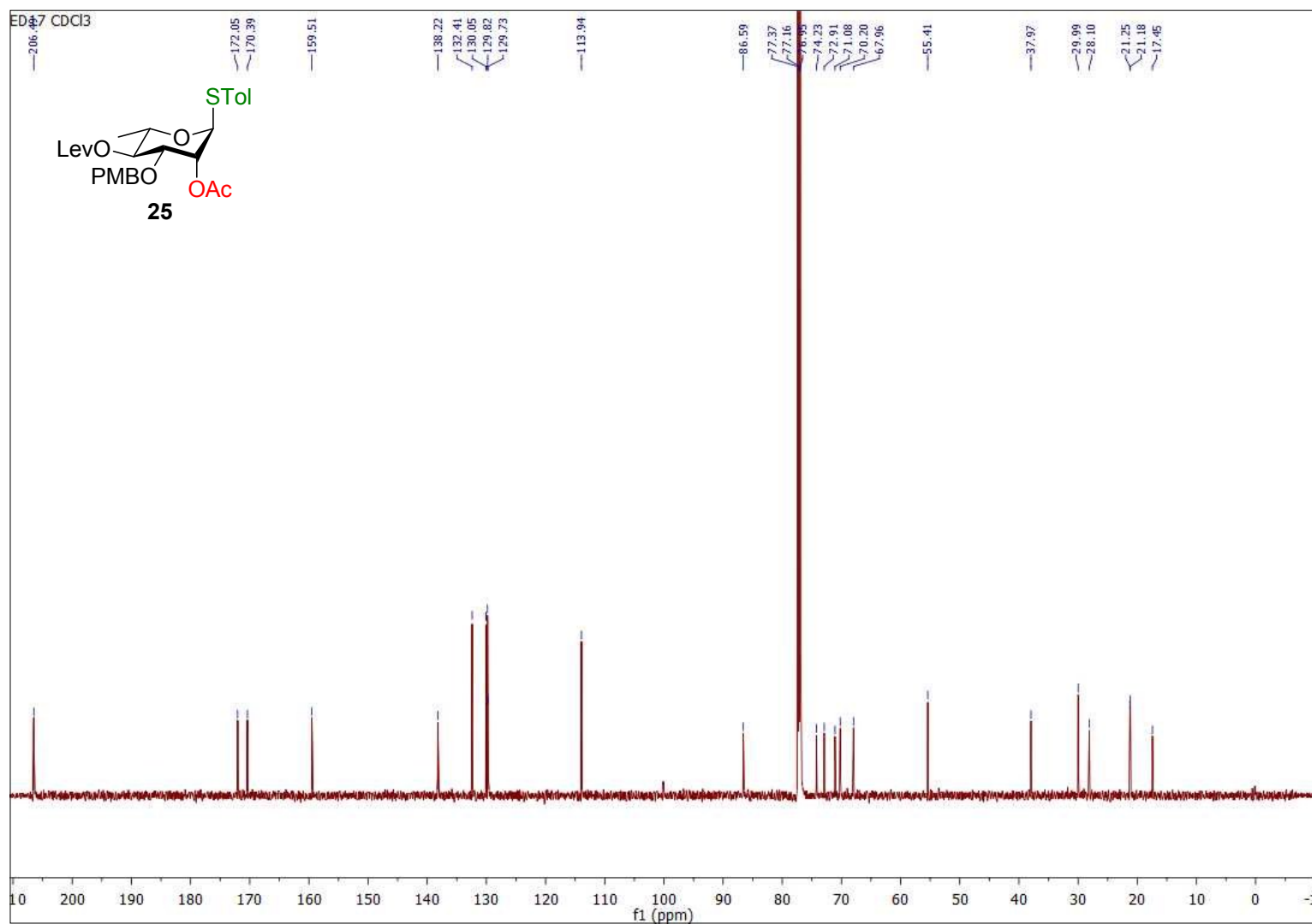
Supplementary Figure 41 | ¹H NMR spectrum (CDCl₃, 600 MHz) of compound 25



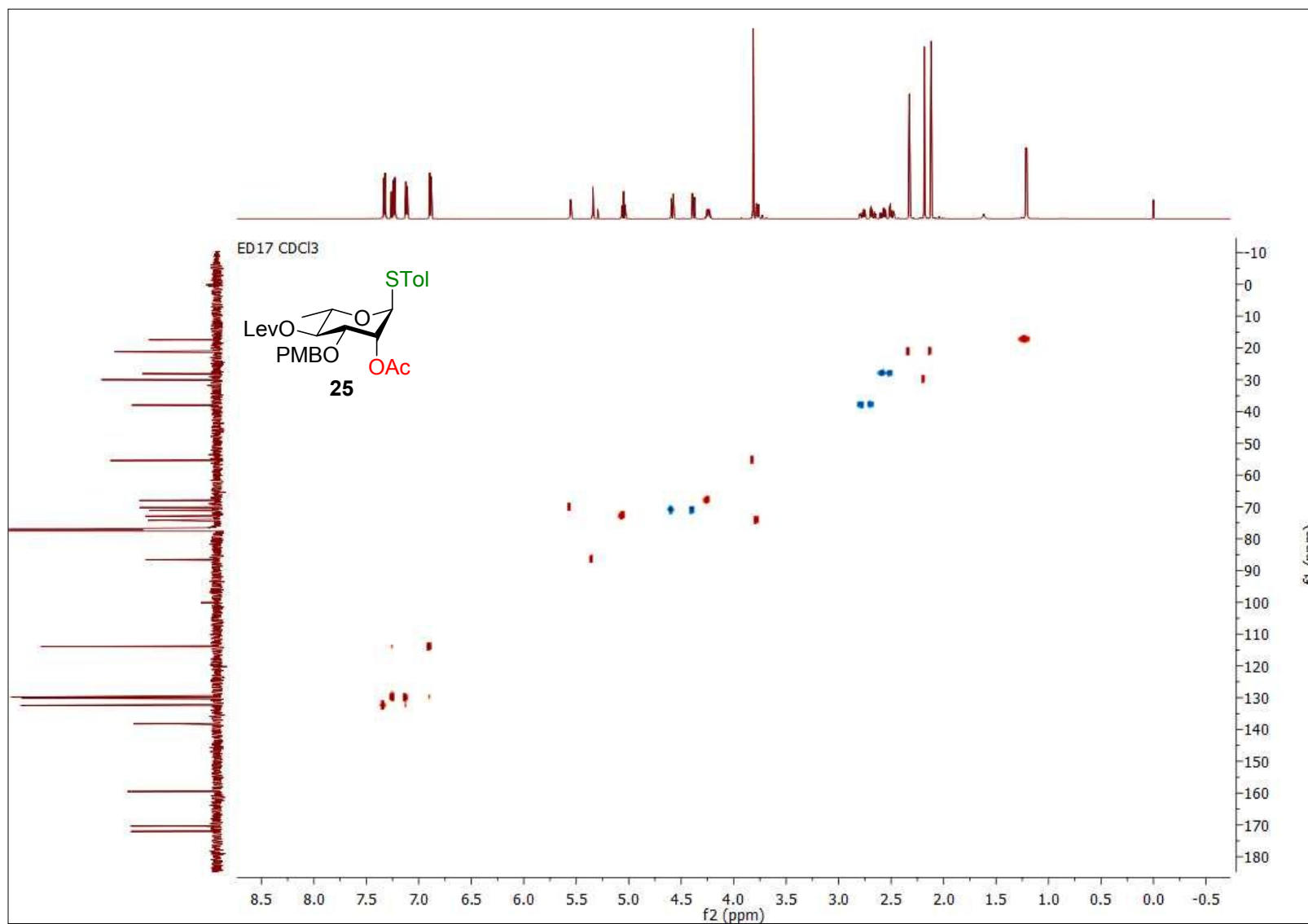
Supplementary Figure 42 | COSY NMR spectrum (CDCl₃, 600 MHz) of compound 25



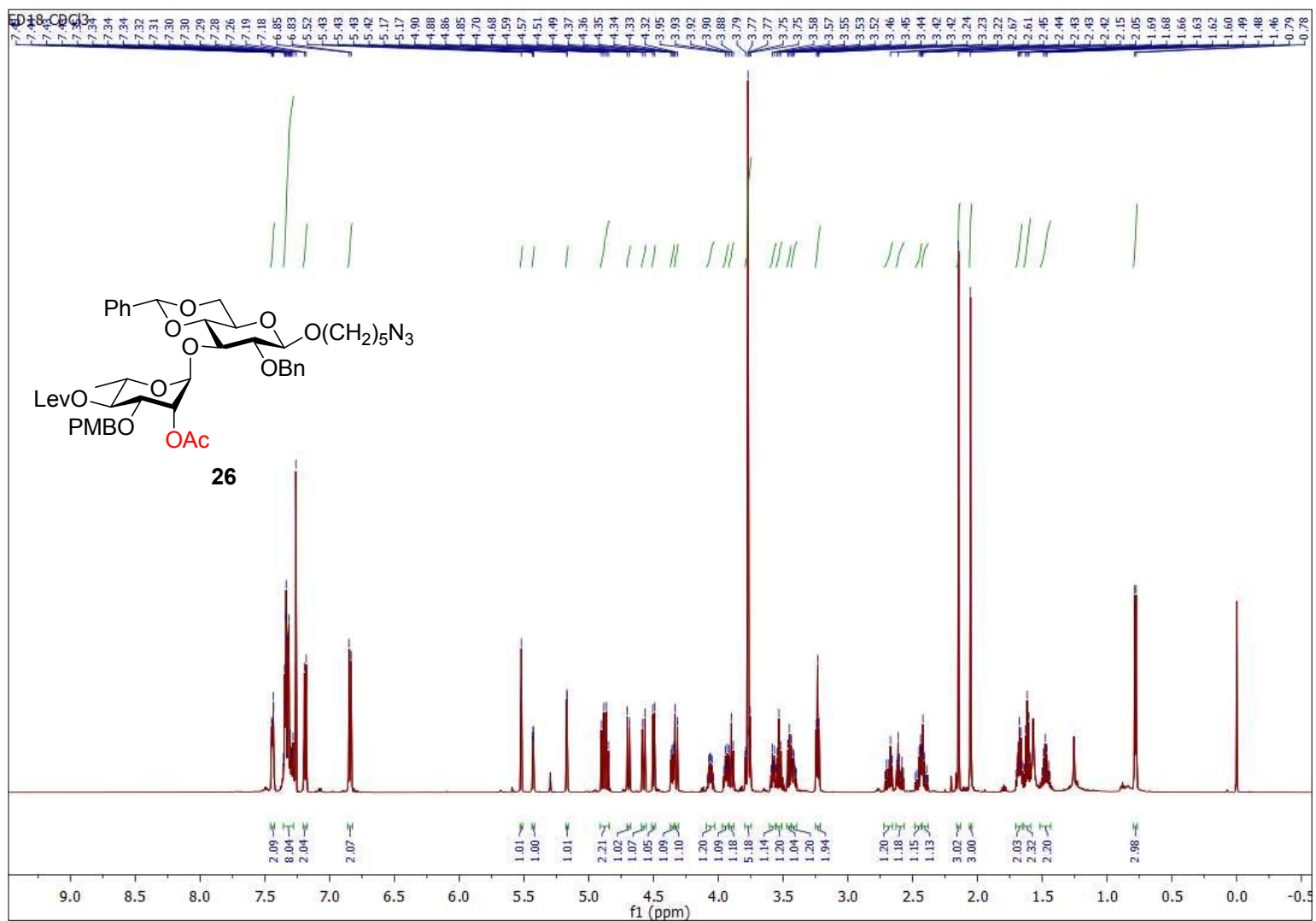
Supplementary Figure 43 | ^{13}C NMR spectrum (CDCl_3 , 150 MHz) of compound 25



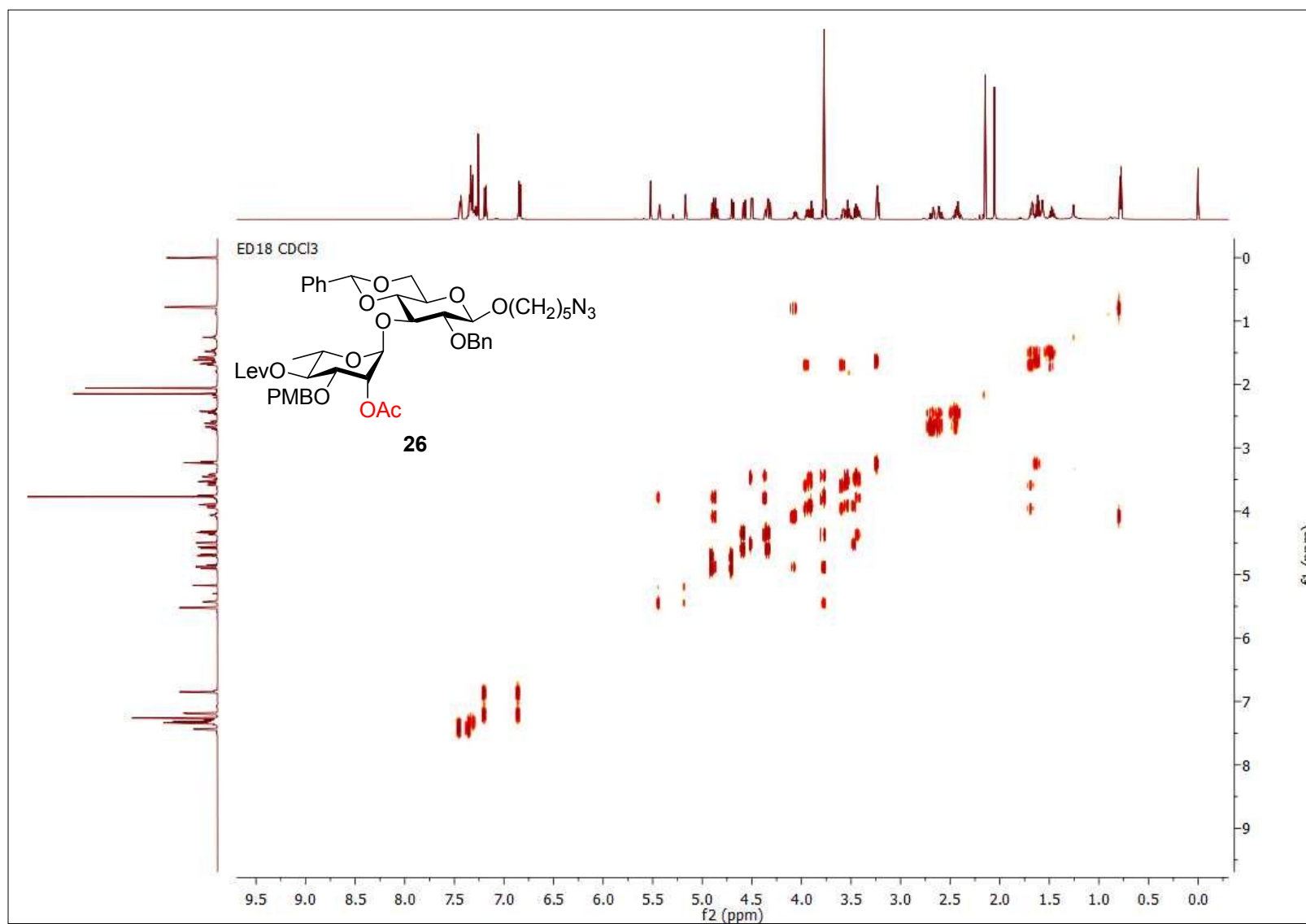
Supplementary Figure 44 | HSQC NMR spectrum (CDCl₃, 600 MHz) of compound 25



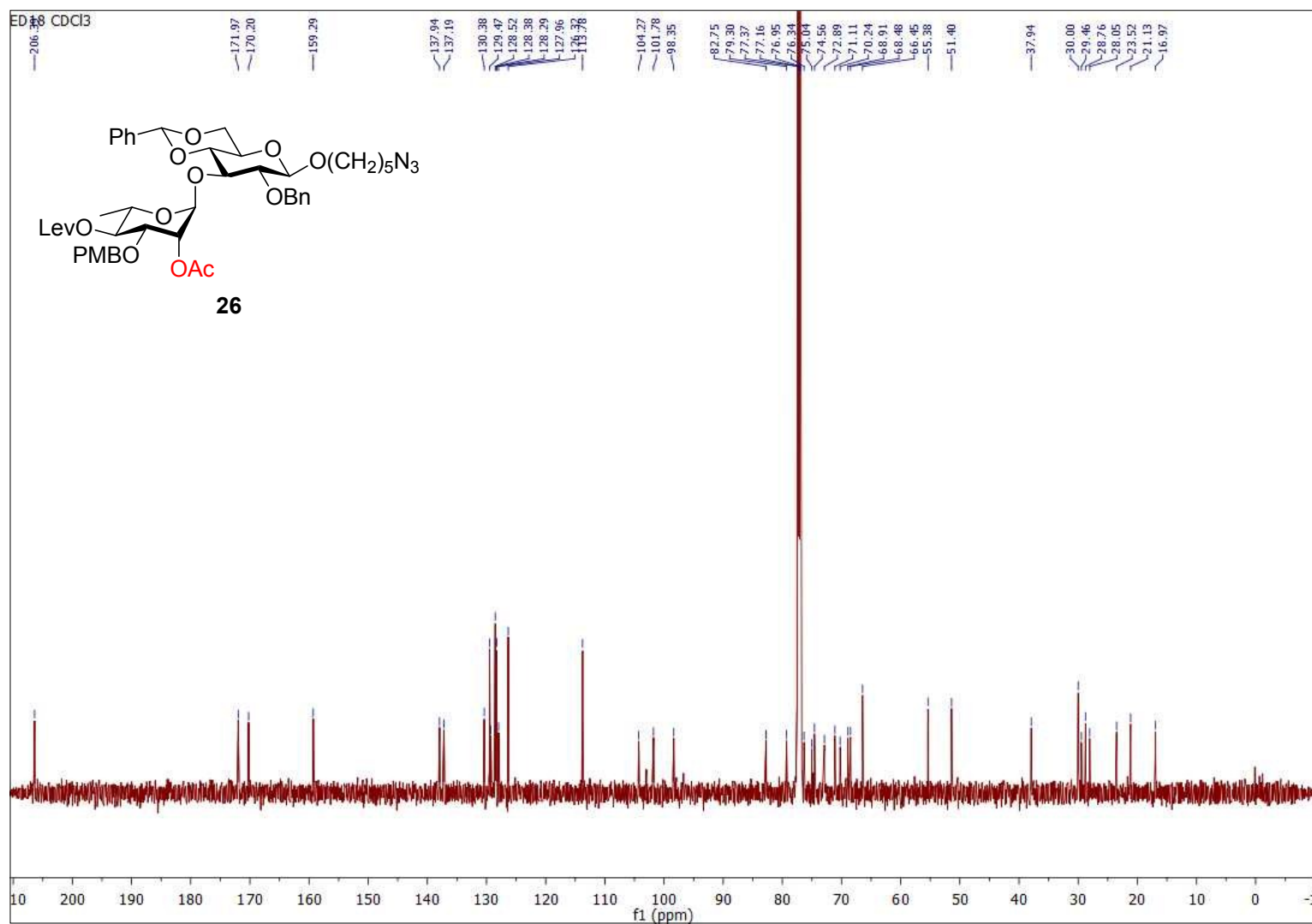
Supplementary Figure 45 | ^1H NMR spectrum (CDCl_3 , 600 MHz) of compound 26



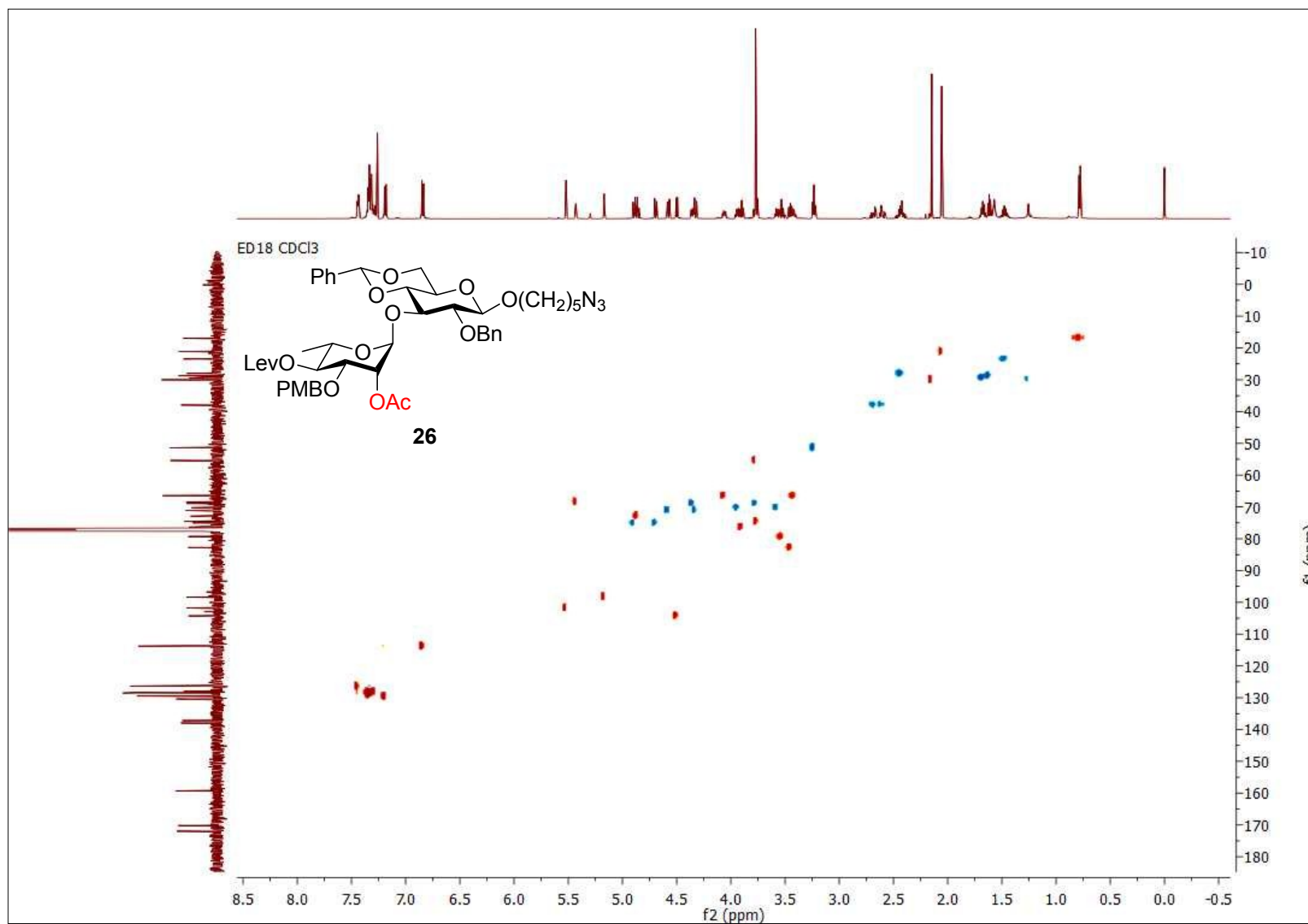
Supplementary Figure 46 | COSY NMR spectrum (CDCl₃, 600 MHz) of compound 26



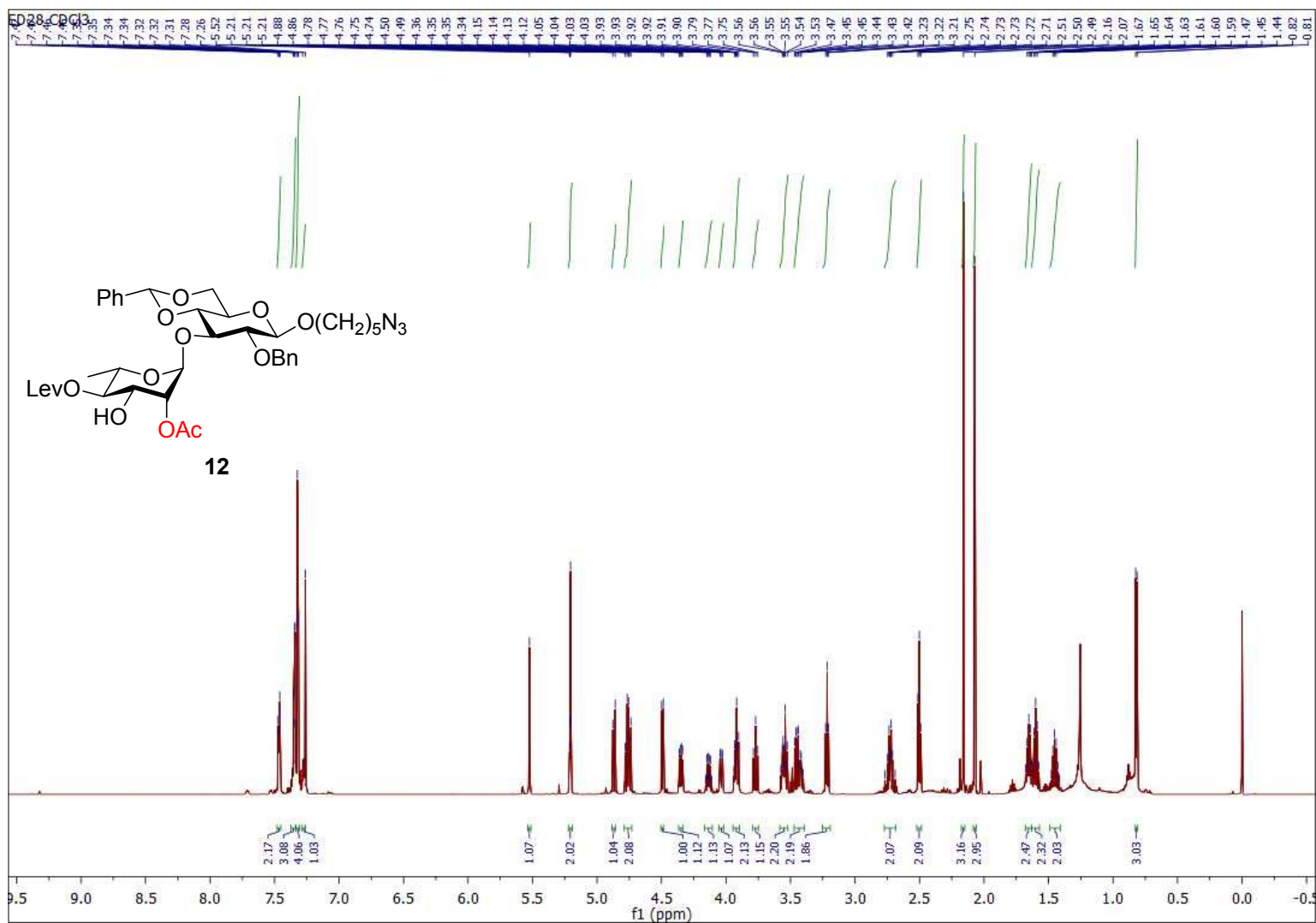
Supplementary Figure 47 | ^{13}C NMR spectrum (CDCl_3 , 150 MHz) of compound 26



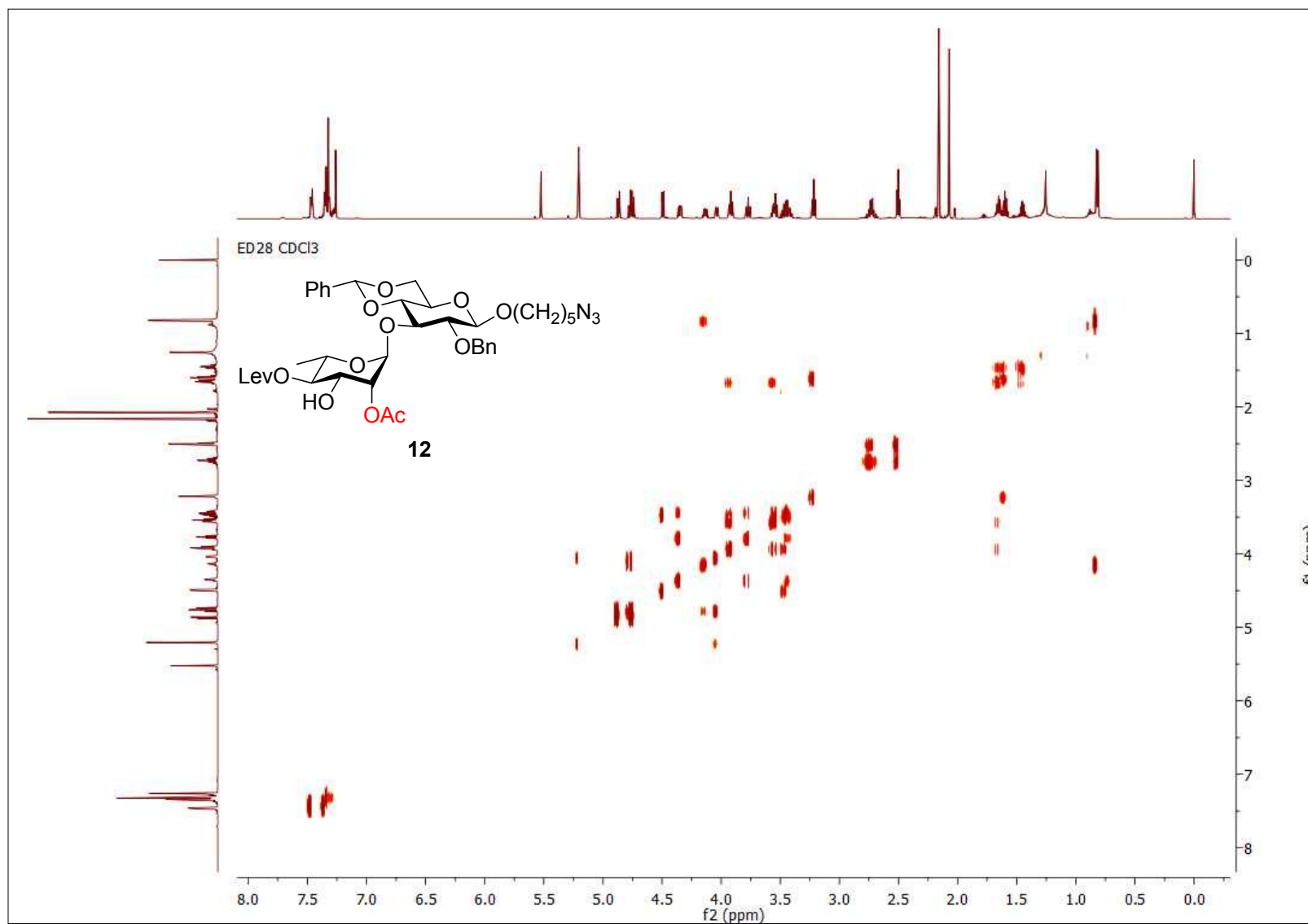
Supplementary Figure 48 | HSQC NMR spectrum (CDCl₃, 600 MHz) of compound 26



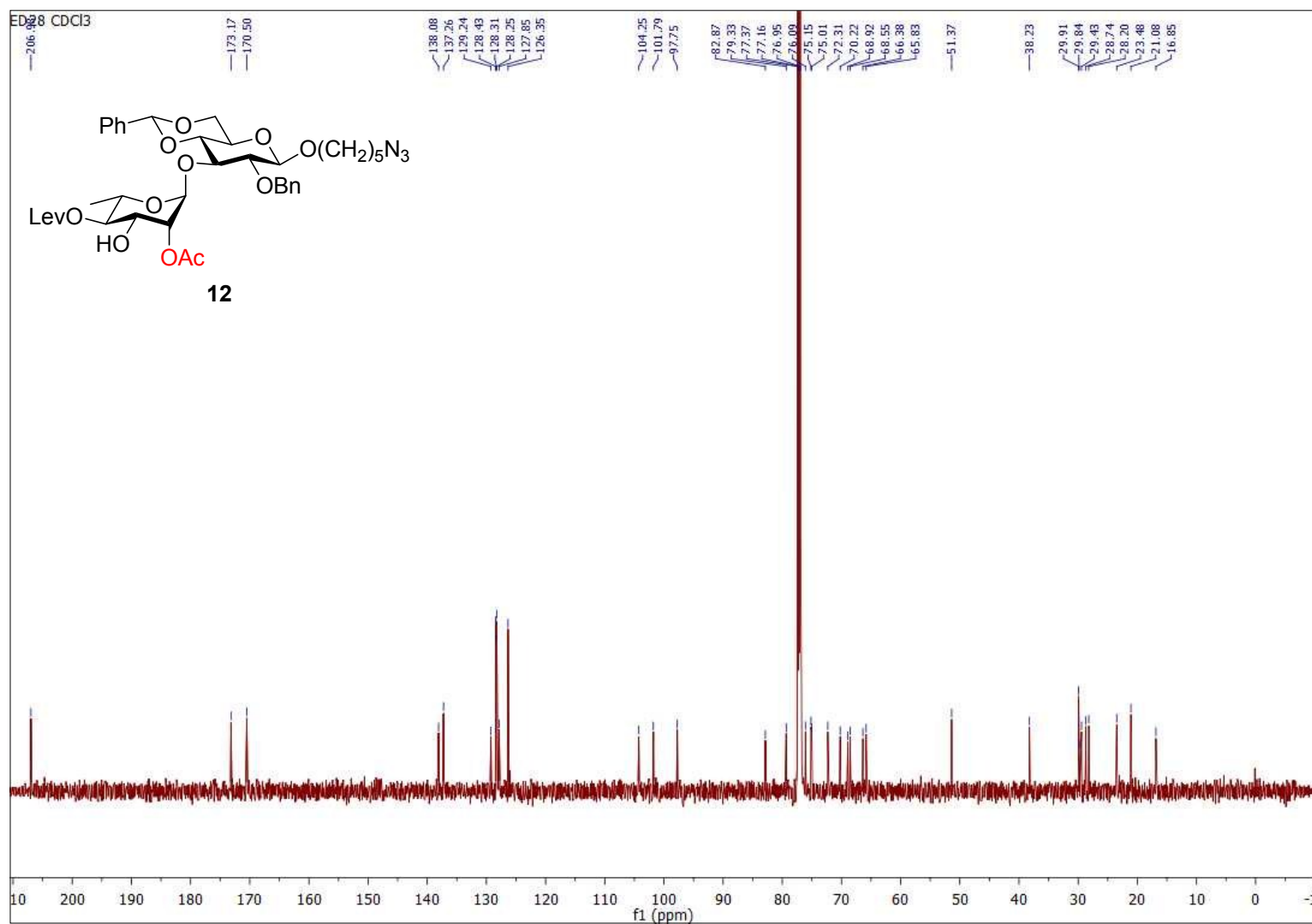
Supplementary Figure 49 | ^1H NMR spectrum (CDCl_3 , 600 MHz) of compound 12



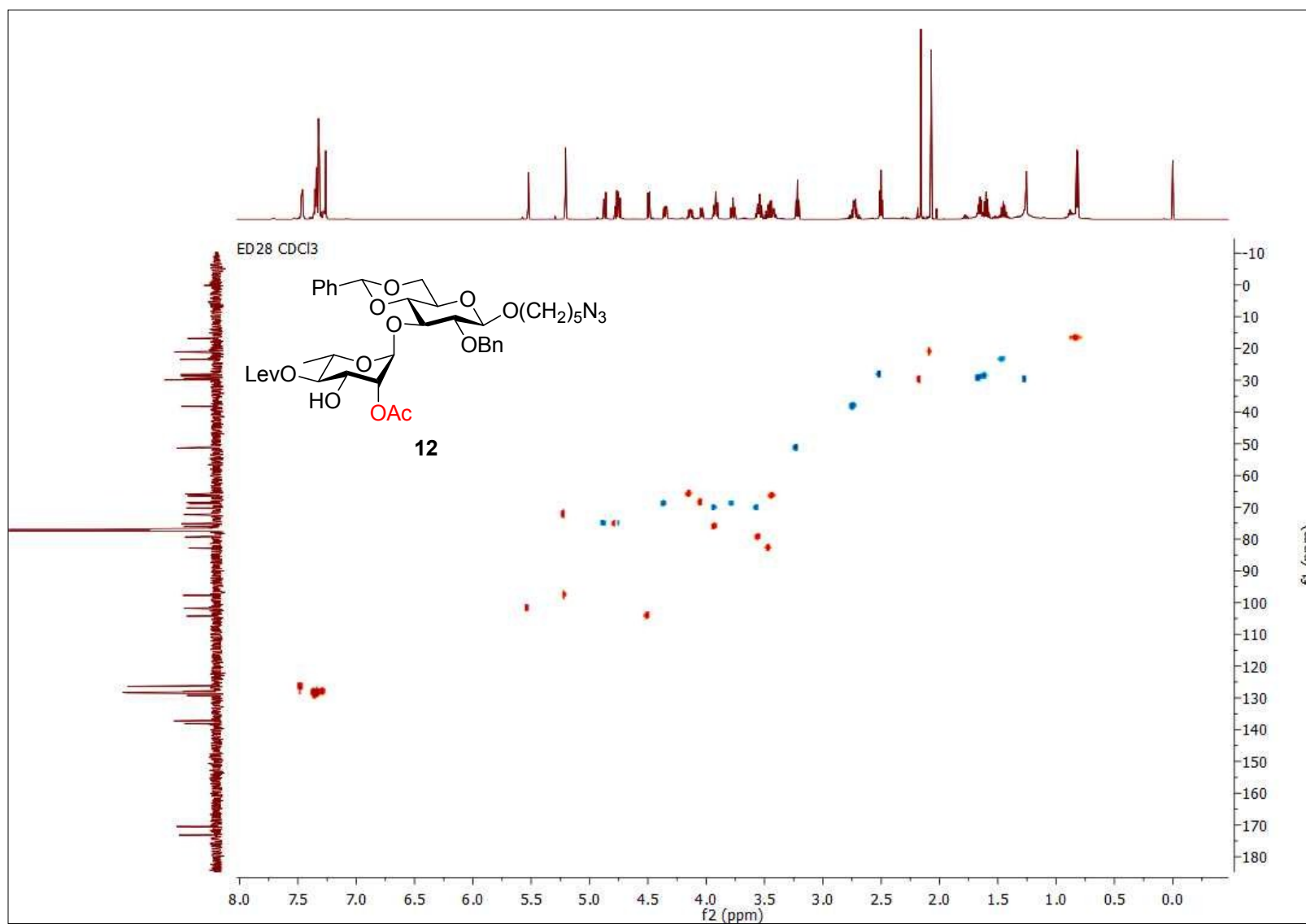
Supplementary Figure 50 | COSY NMR spectrum (CDCl₃, 600 MHz) of compound 12



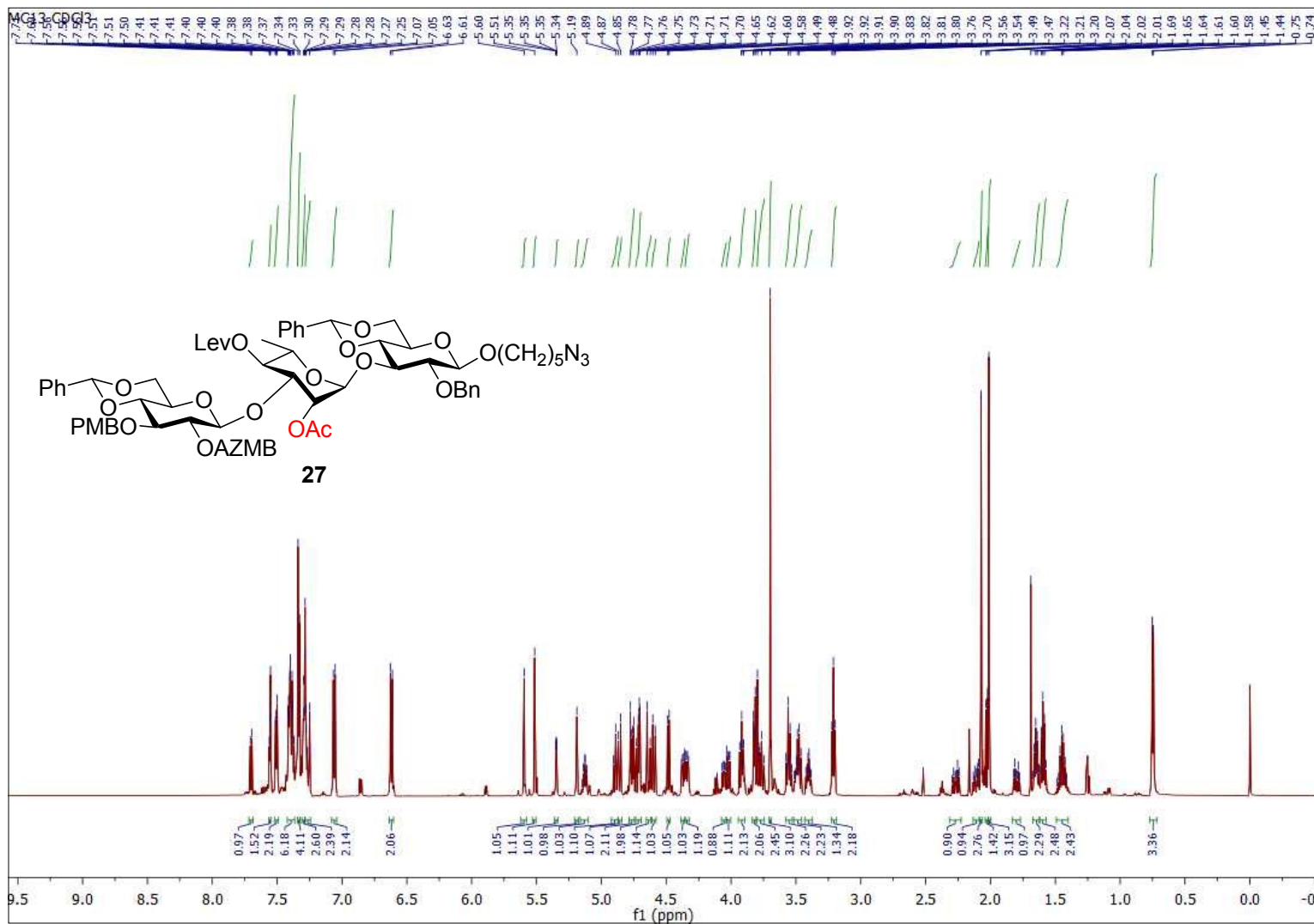
Supplementary Figure 51 | ^{13}C NMR spectrum (CDCl_3 , 150 MHz) of compound 12



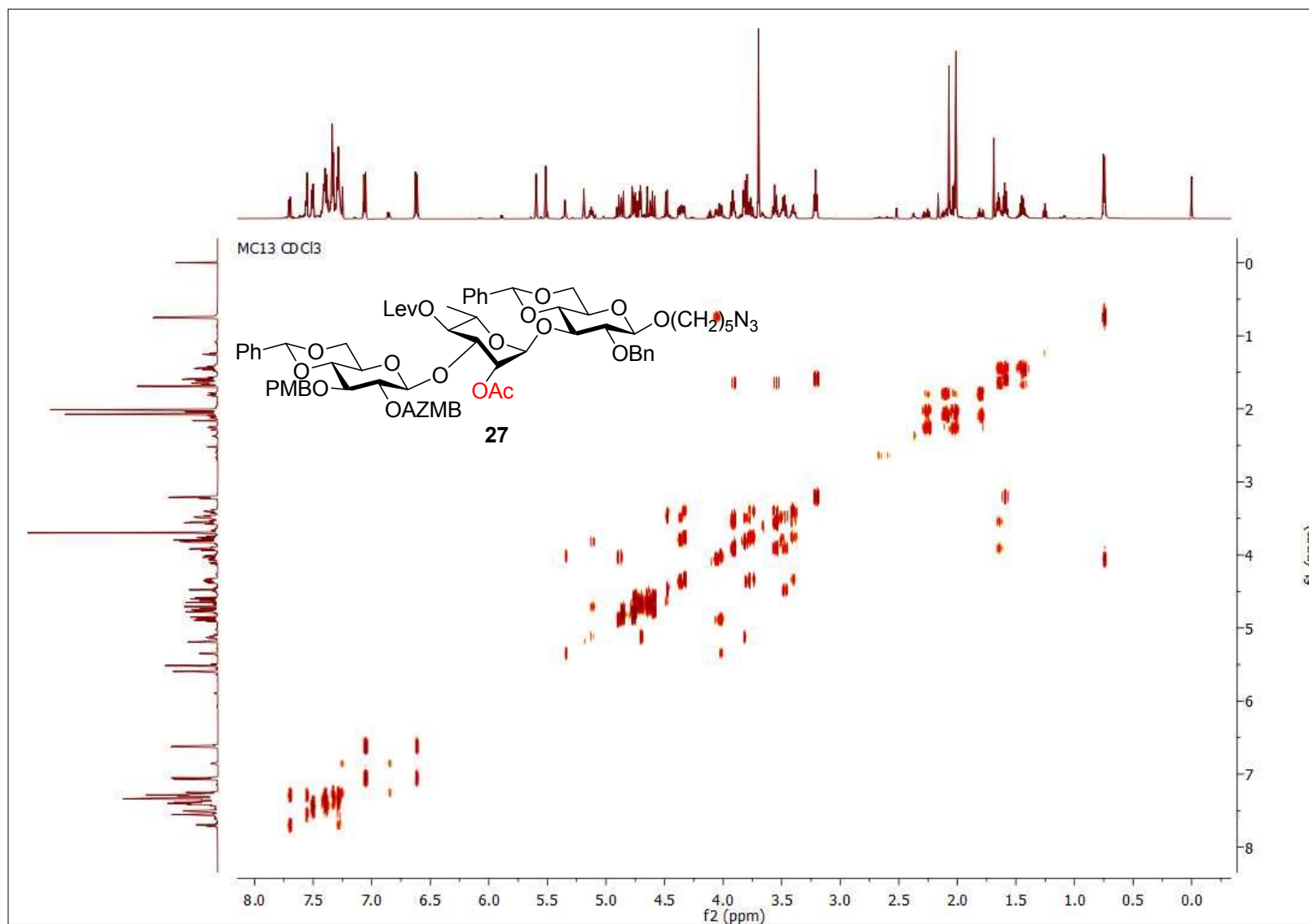
Supplementary Figure 52 | HSQC NMR spectrum (CDCl₃, 600 MHz) of compound 12



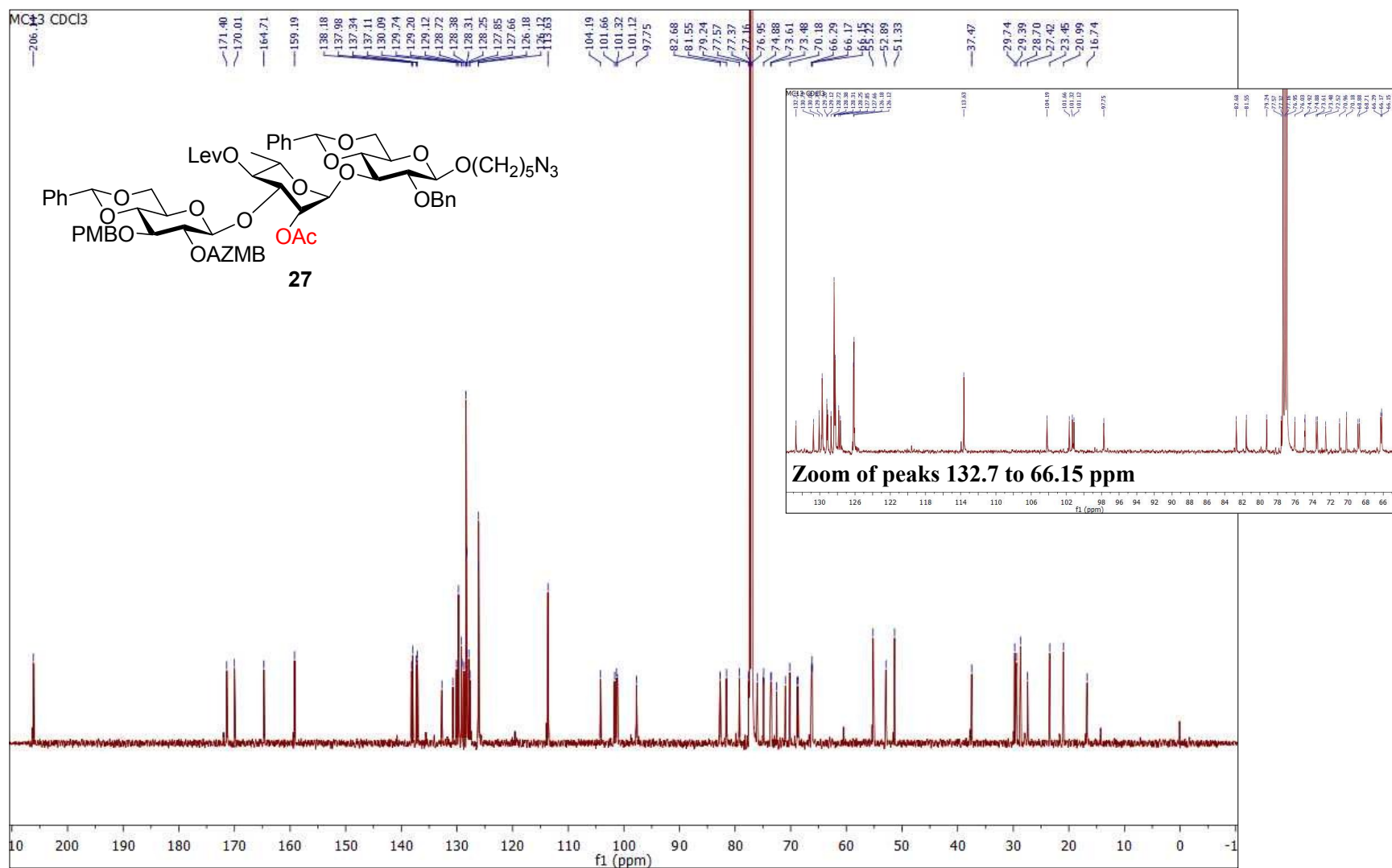
Supplementary Figure 53 | ^1H NMR spectrum (CDCl_3 , 600 MHz) of compound 27 (+ 10% of unknown inseparable impurity)



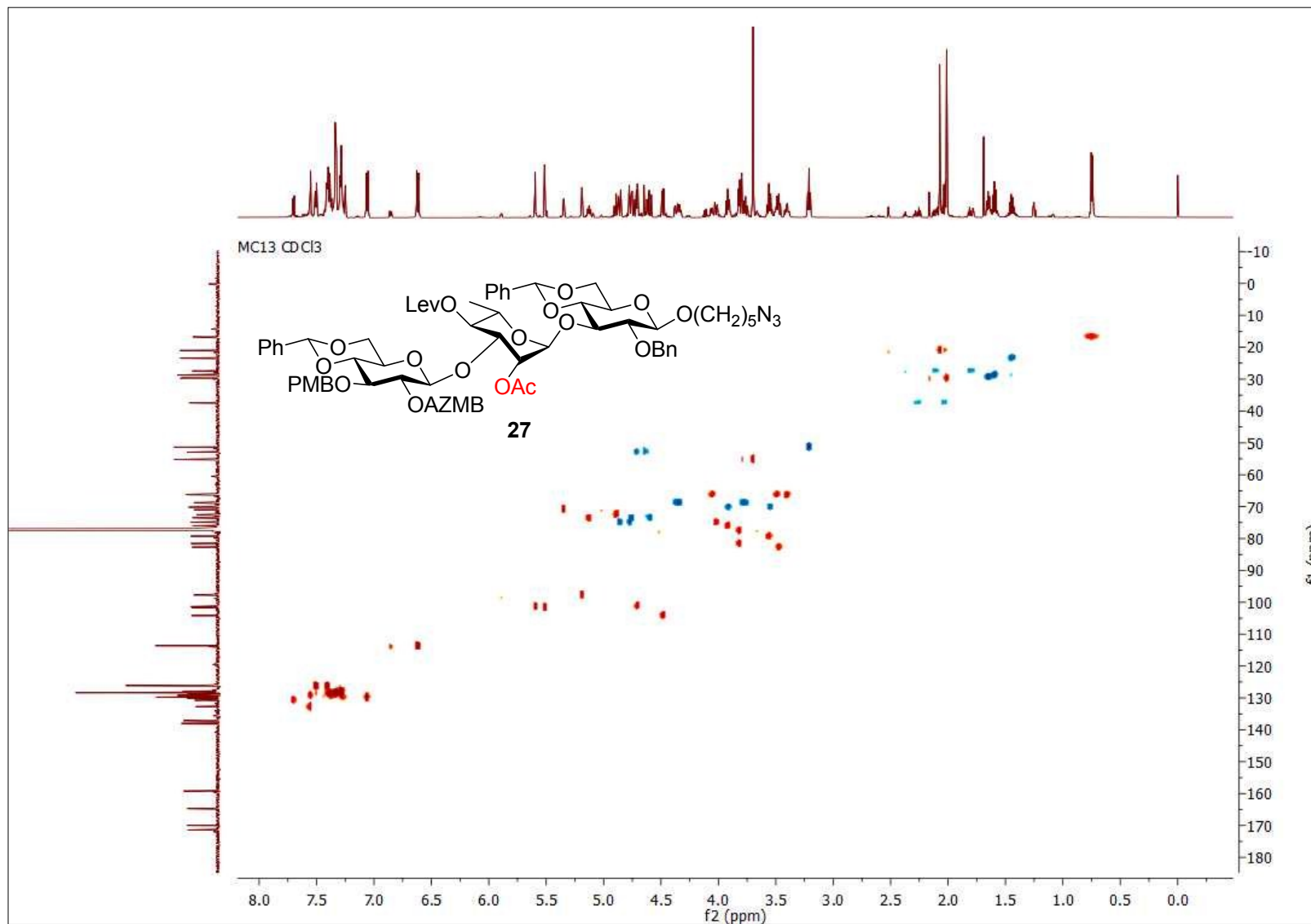
Supplementary Figure 54 | COSY NMR spectrum (CDCl₃, 600 MHz) of compound 27 (+ 10% of unknown inseparable impurity)



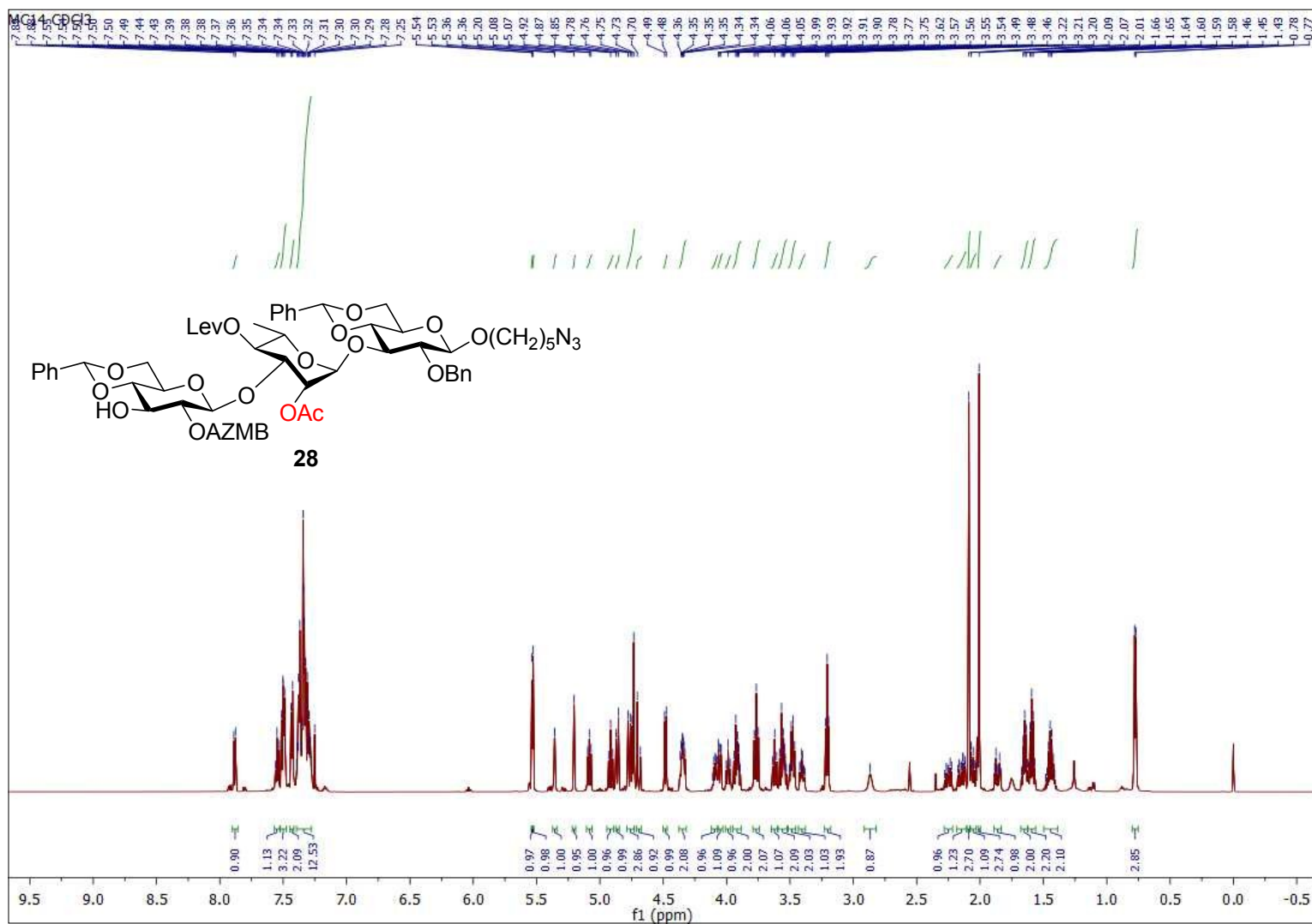
Supplementary Figure 55 | ^{13}C NMR spectrum (CDCl_3 , 150 MHz) of compound 27 (+ 10% of unknown inseparable impurity)



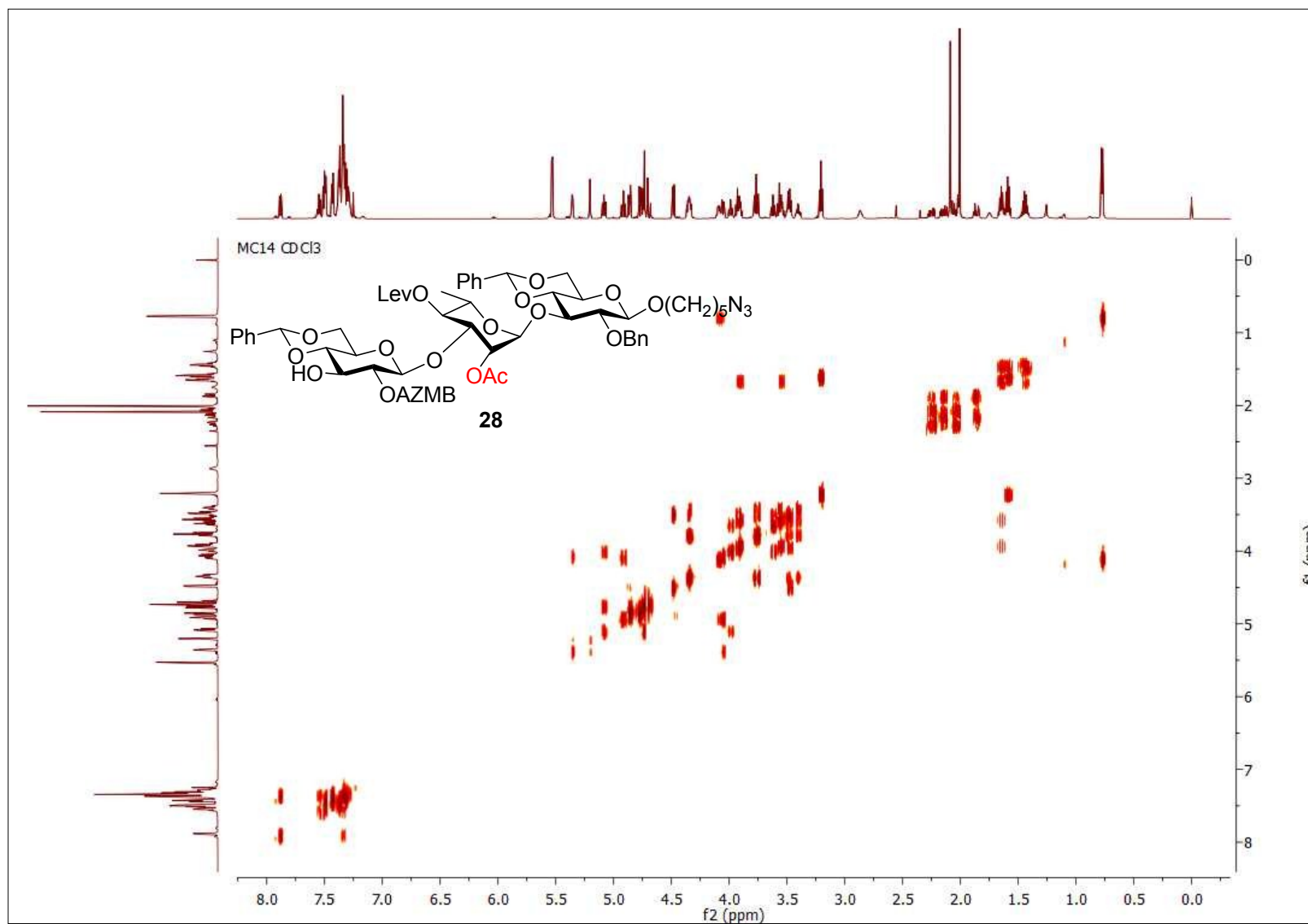
Supplementary Figure 56 | HSQC NMR spectrum (CDCl₃, 600 MHz) of compound 27 (+ 10% of unknown inseparable impurity)



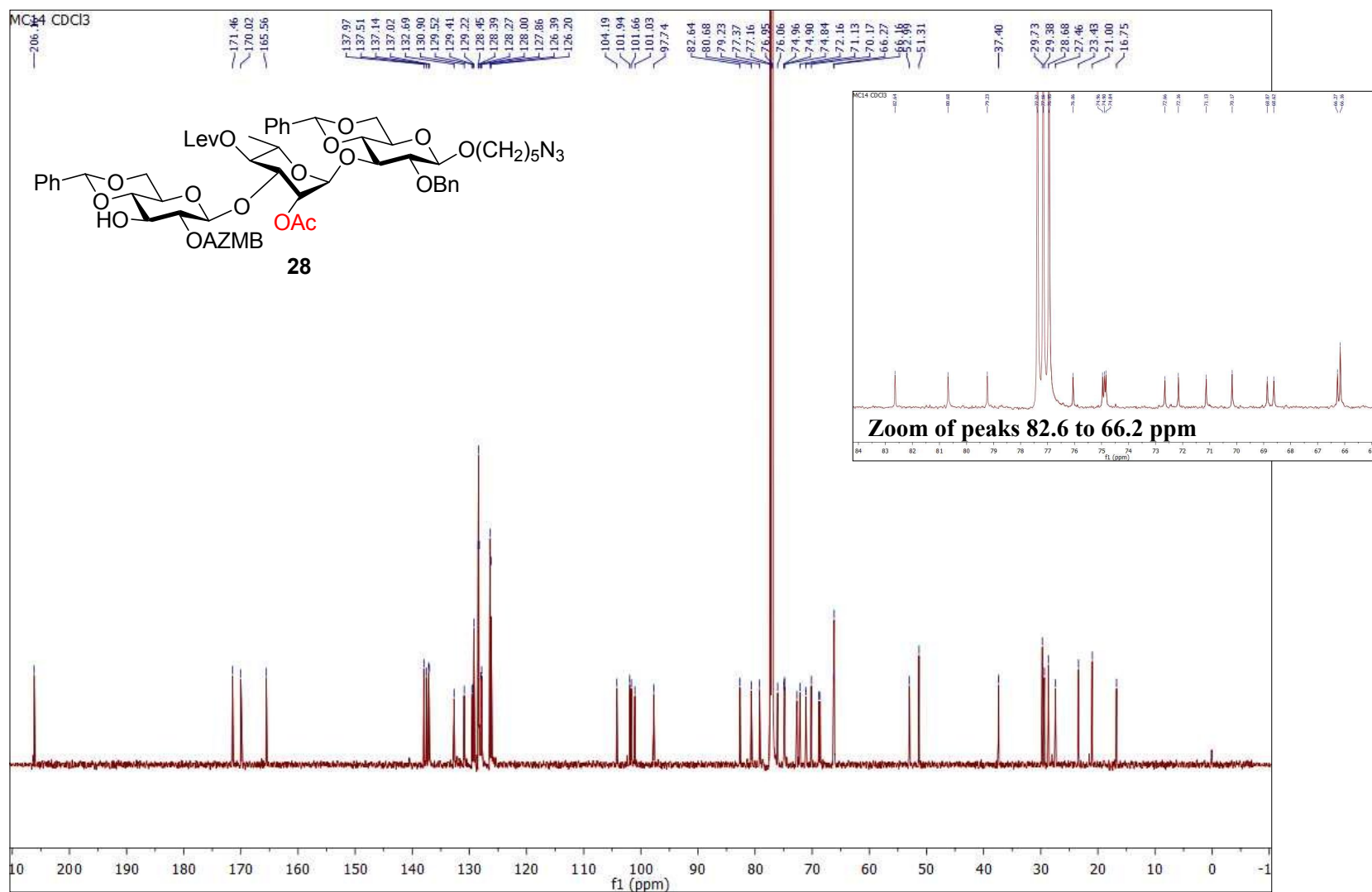
Supplementary Figure S7 | ¹H NMR spectrum (CDCl₃, 600 MHz) of compound 28



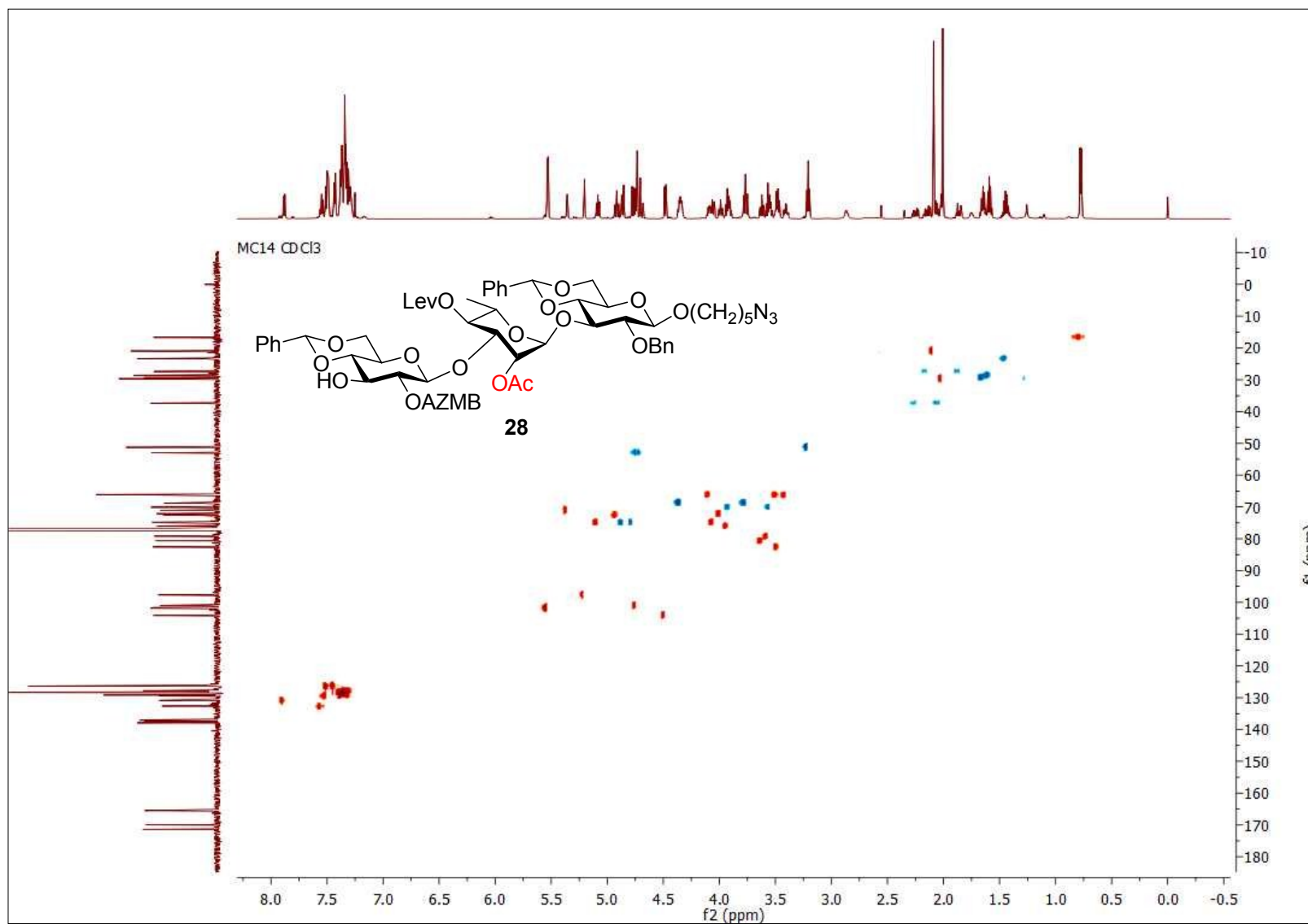
Supplementary Figure 58 | COSY NMR spectrum (CDCl₃, 600 MHz) of compound 28



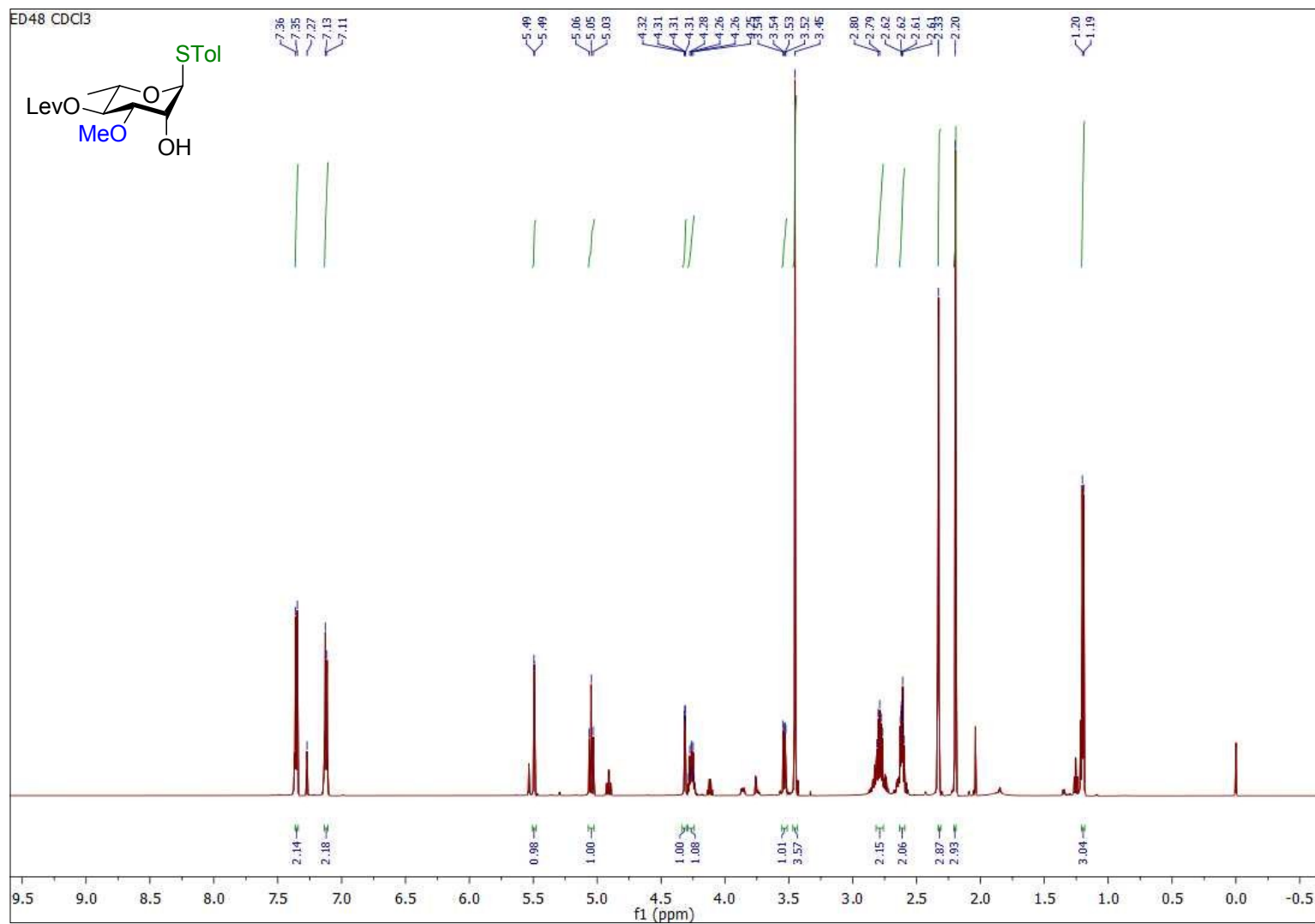
Supplementary Figure 59 | ^{13}C NMR spectrum (CDCl_3 , 150 MHz) of compound 28



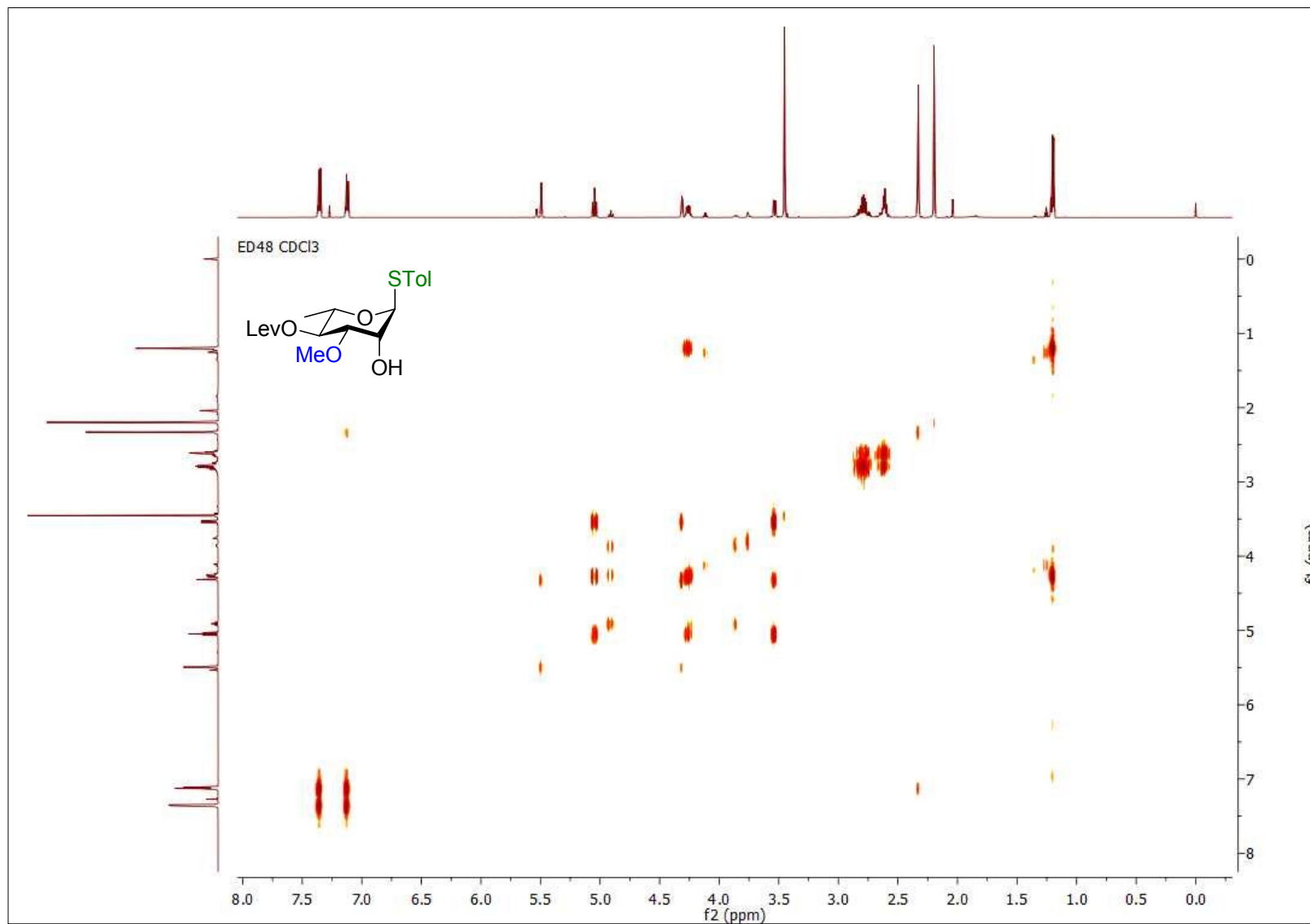
Supplementary Figure 60 | HSQC NMR spectrum (CDCl₃, 600 MHz) of compound 28



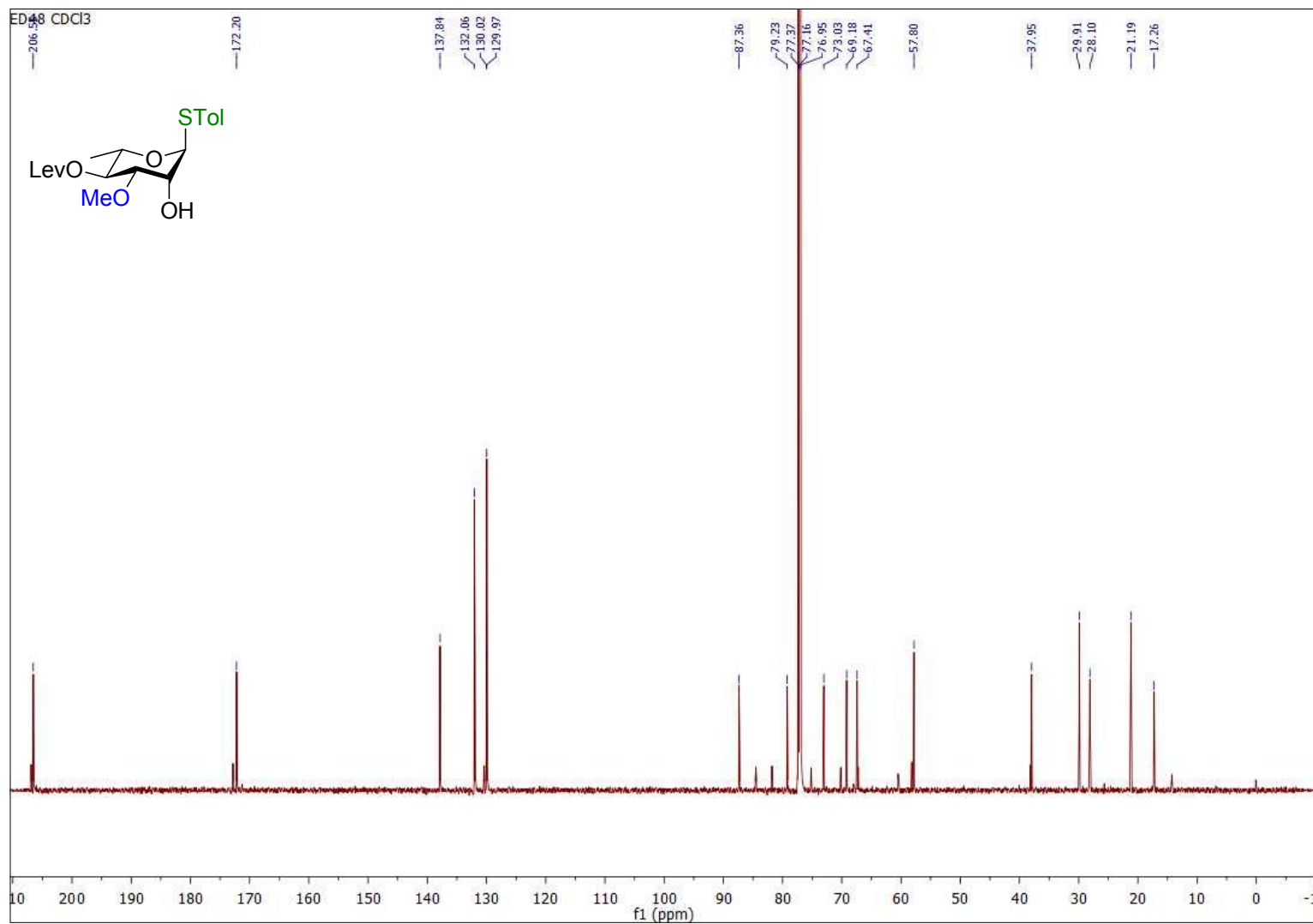
Supplementary Figure 61 | ^1H NMR spectrum (CDCl_3 , 600 MHz) of *para*-methylphenyl 4-*O*-levulinoyl-3-*O*-methyl-1-thio- α -L-rhamnopyranoside



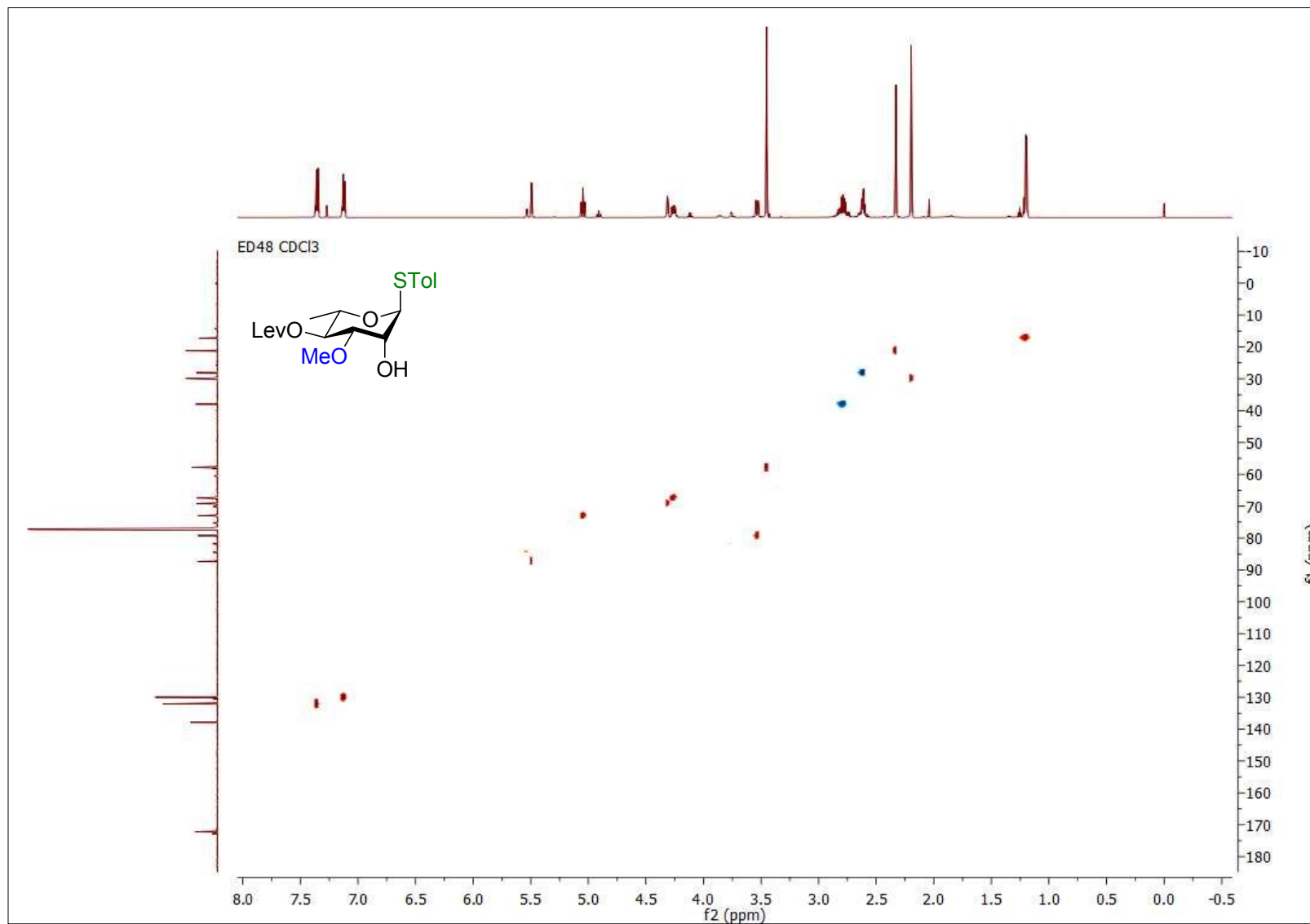
Supplementary Figure 62 | COSY NMR spectrum (CDCl₃, 600 MHz) of *para*-methylphenyl 4-*O*-levulinoyl-3-*O*-methyl-1-thio- α -L-rhamnopyranoside



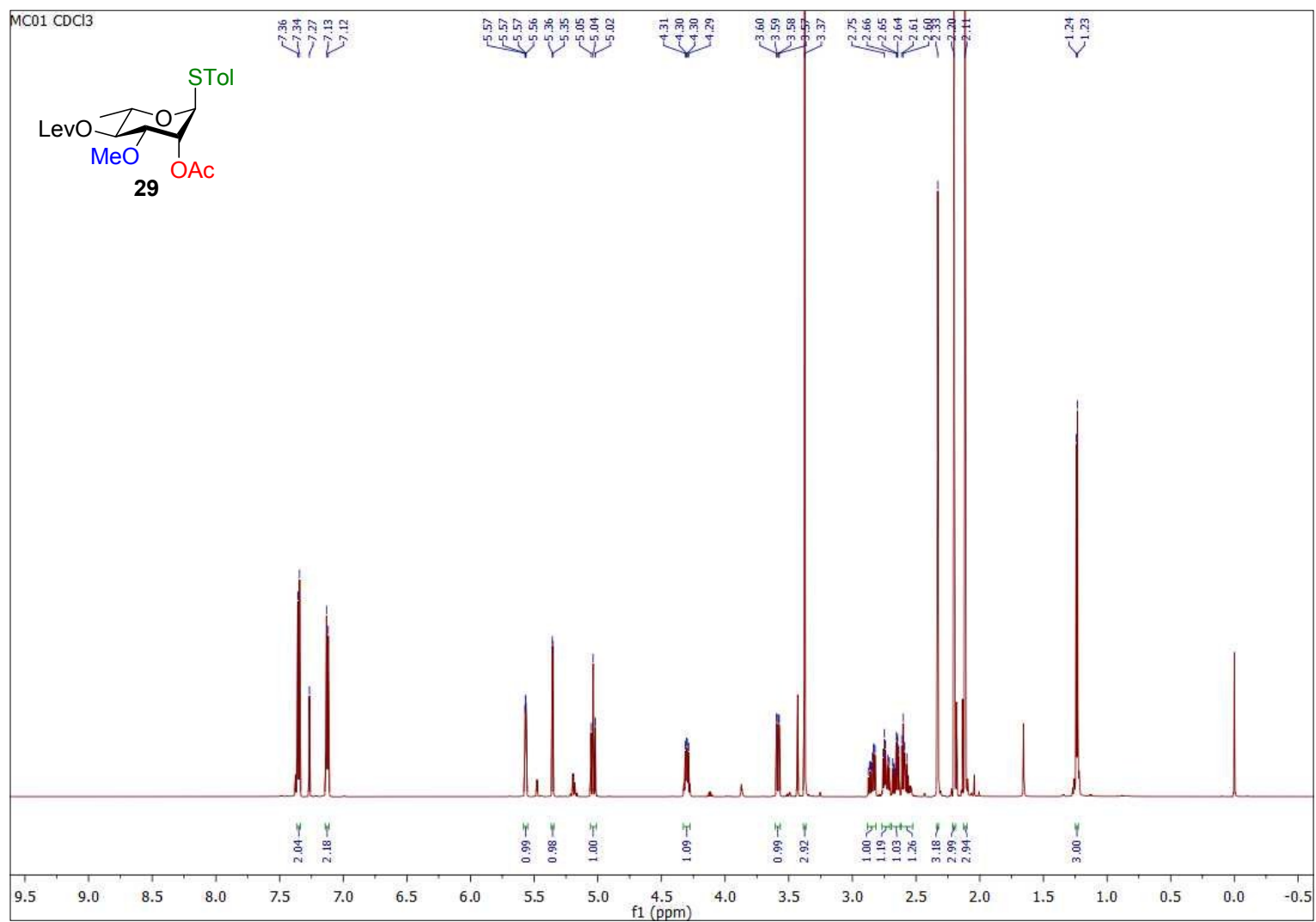
Supplementary Figure 63 | ^{13}C NMR spectrum (CDCl_3 , 150 MHz) of *para*-methylphenyl 4-*O*-levulinoyl-3-*O*-methyl-1-thio- α -L-rhamnopyranoside



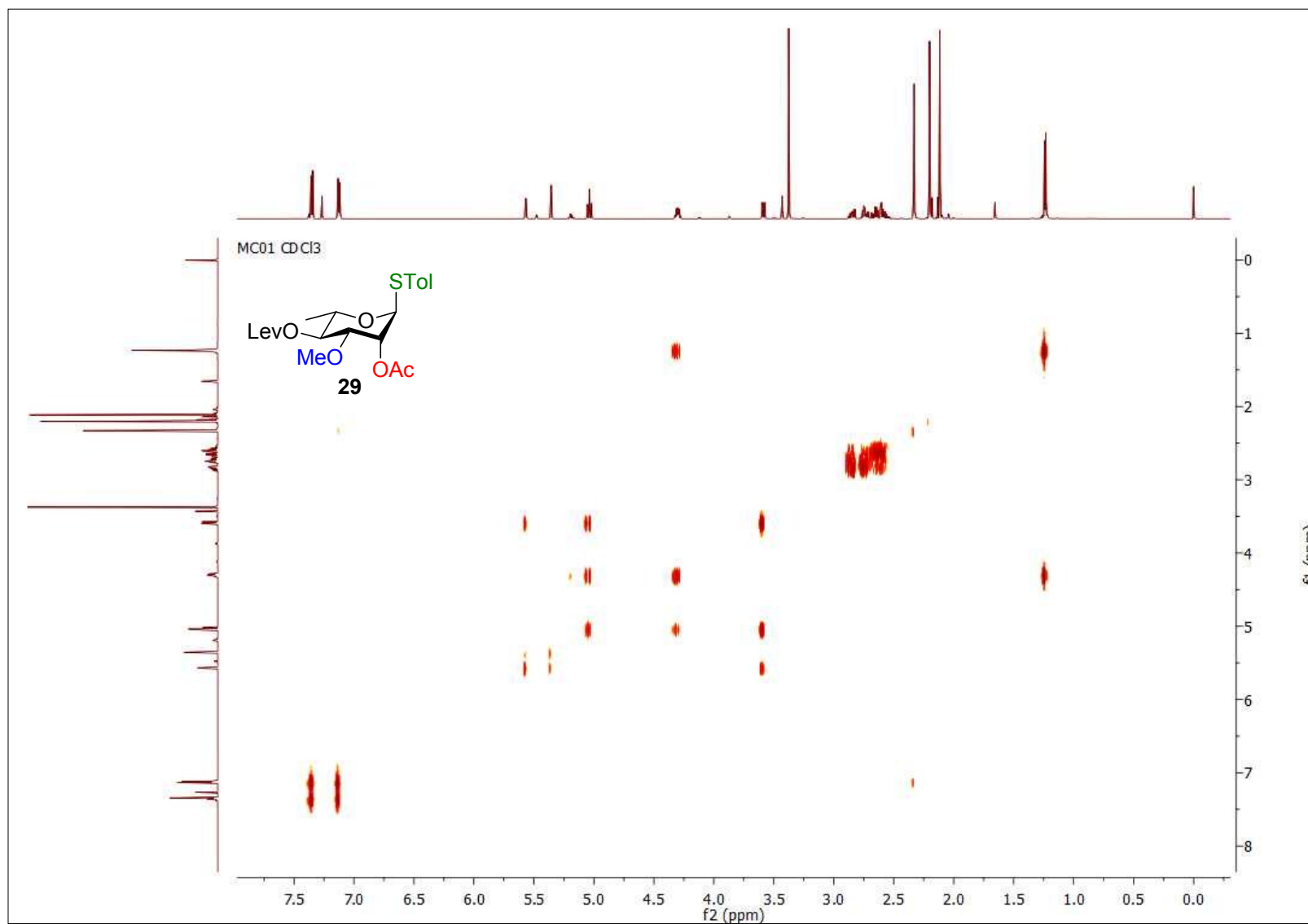
Supplementary Figure 64 | HSQC NMR spectrum (CDCl₃, 600 MHz) of *para*-methylphenyl 4-*O*-levulinoyl-3-*O*-methyl-1-thio- α -L-rhamnopyranoside



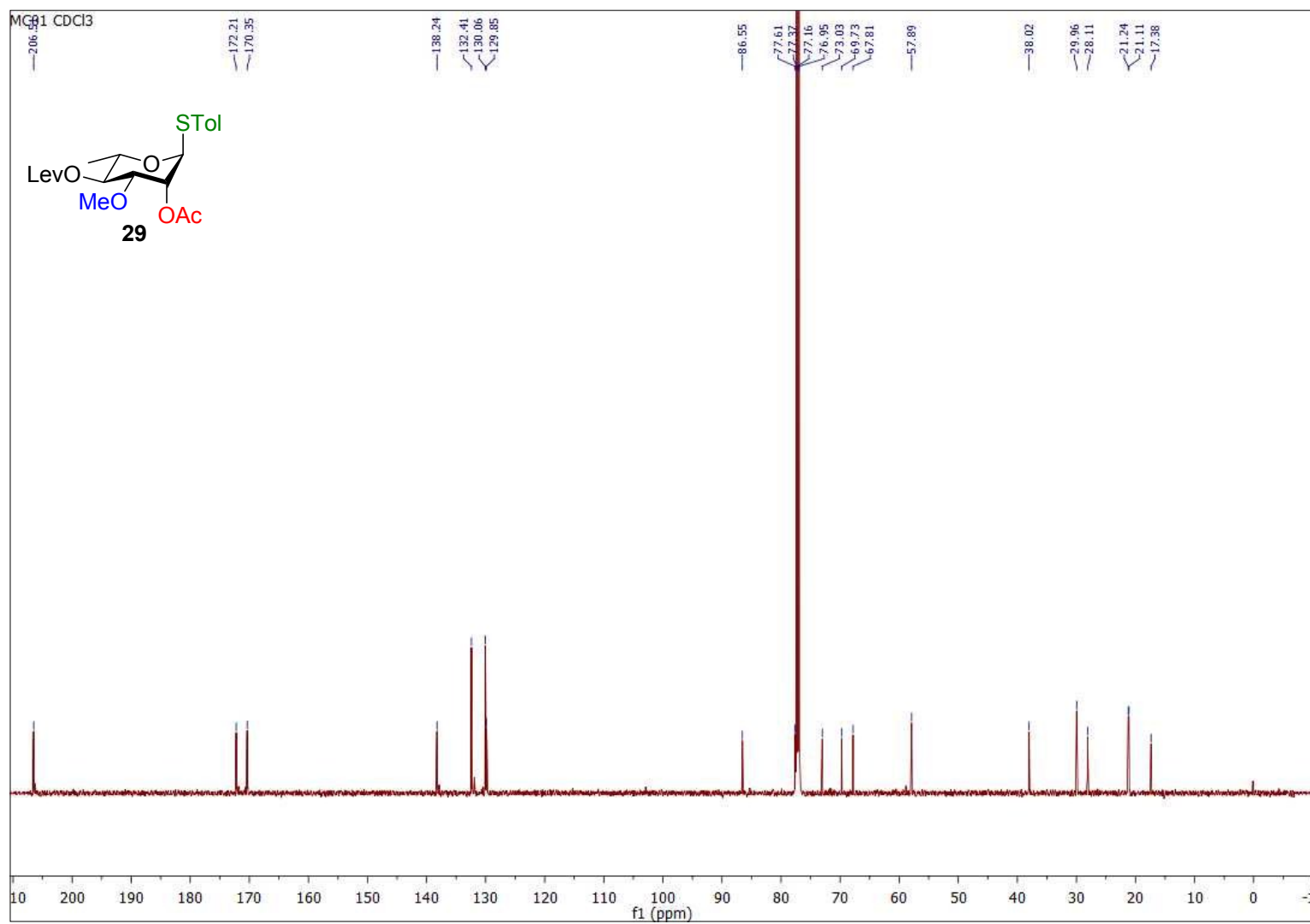
Supplementary Figure 65 | ^1H NMR spectrum (CDCl_3 , 600 MHz) of compound 29



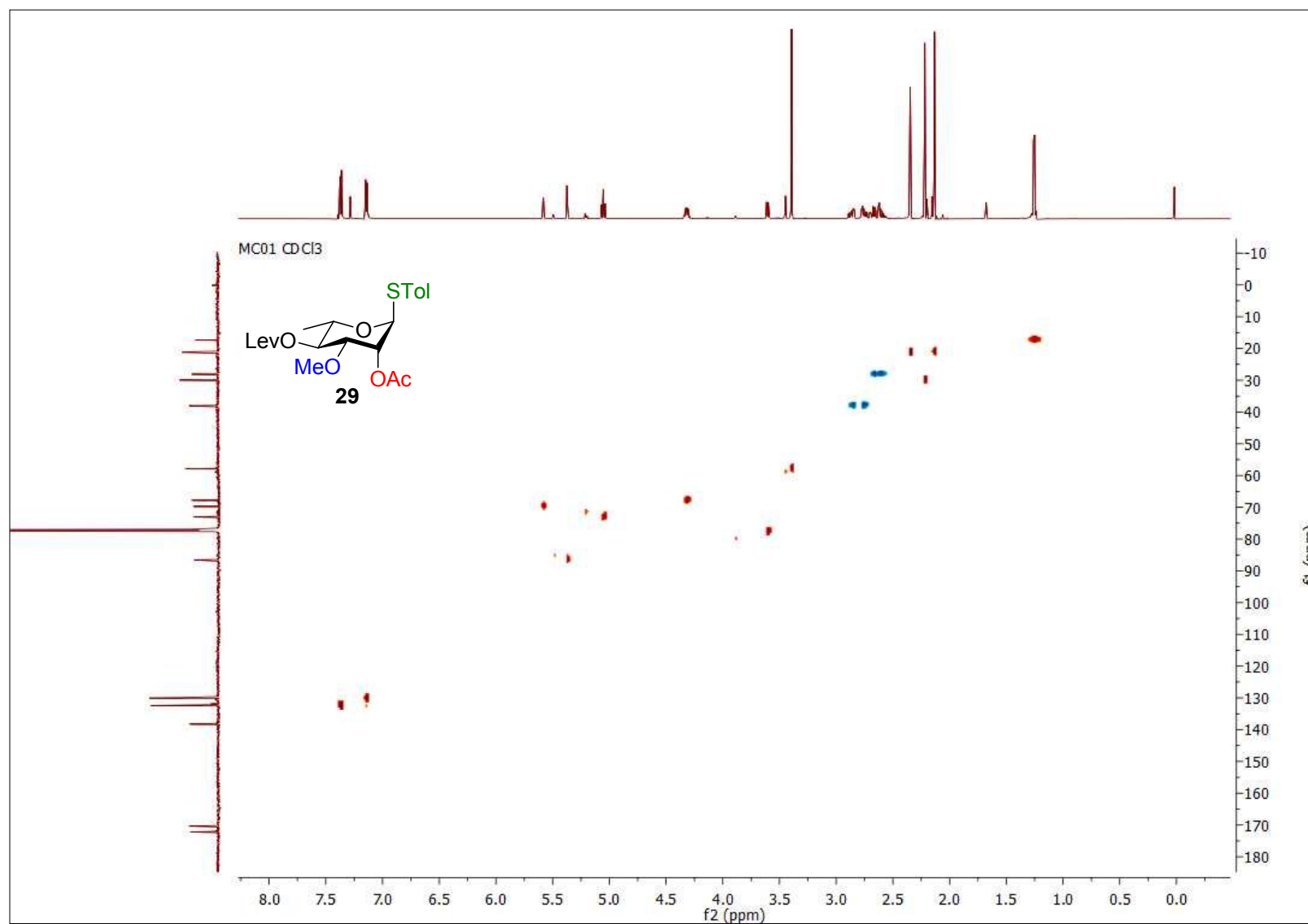
Supplementary Figure 66 | COSY NMR spectrum (CDCl₃, 600 MHz) of compound 29



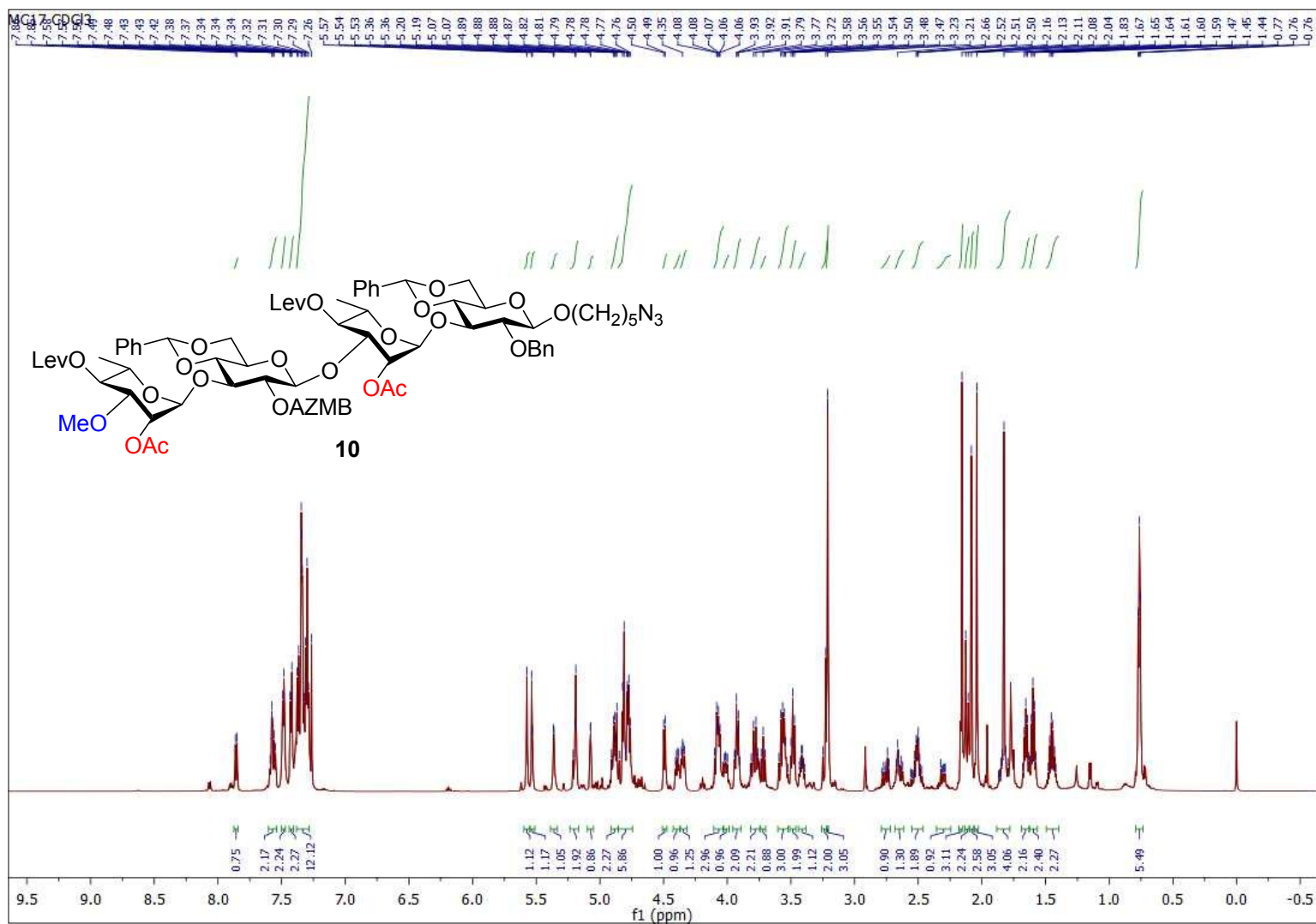
Supplementary Figure 67 | ^{13}C NMR spectrum (CDCl_3 , 150 MHz) of compound 29



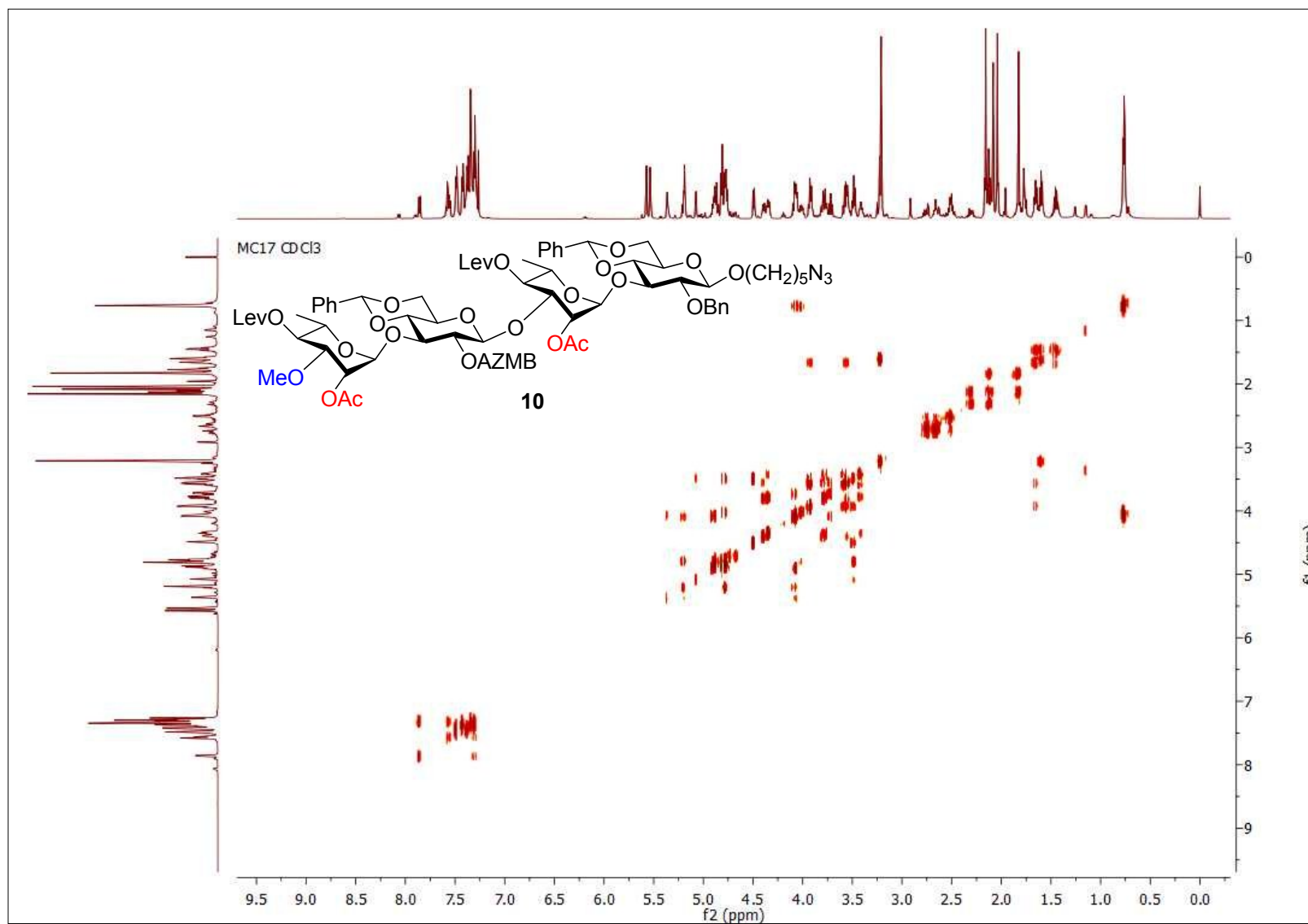
Supplementary Figure 68 | HSQC NMR spectrum (CDCl₃, 600 MHz) of compound 29



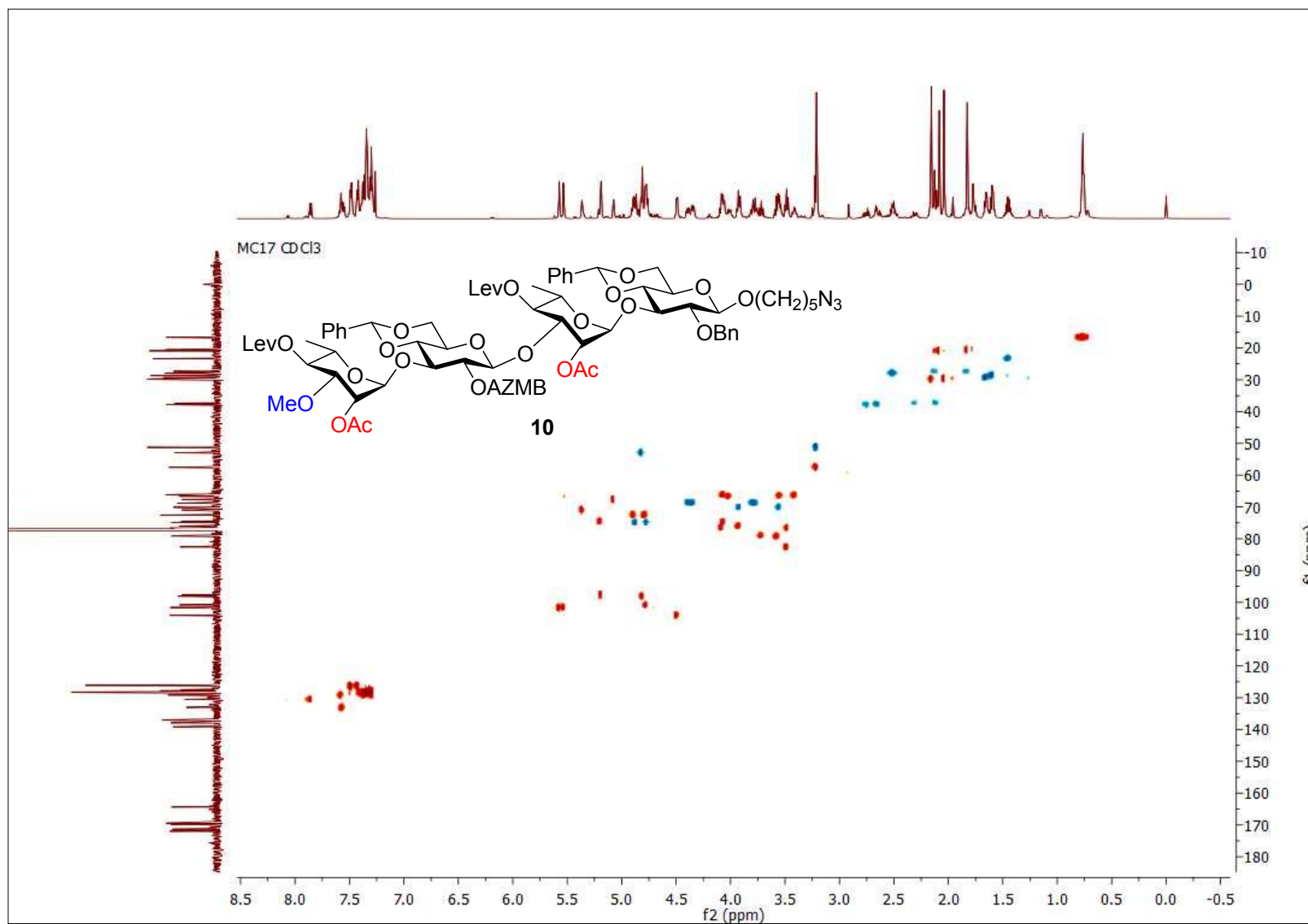
Supplementary Figure 69 | ^1H NMR spectrum (CDCl_3 , 600 MHz) of compound 10 (+ 12% of unknown inseparable impurity)



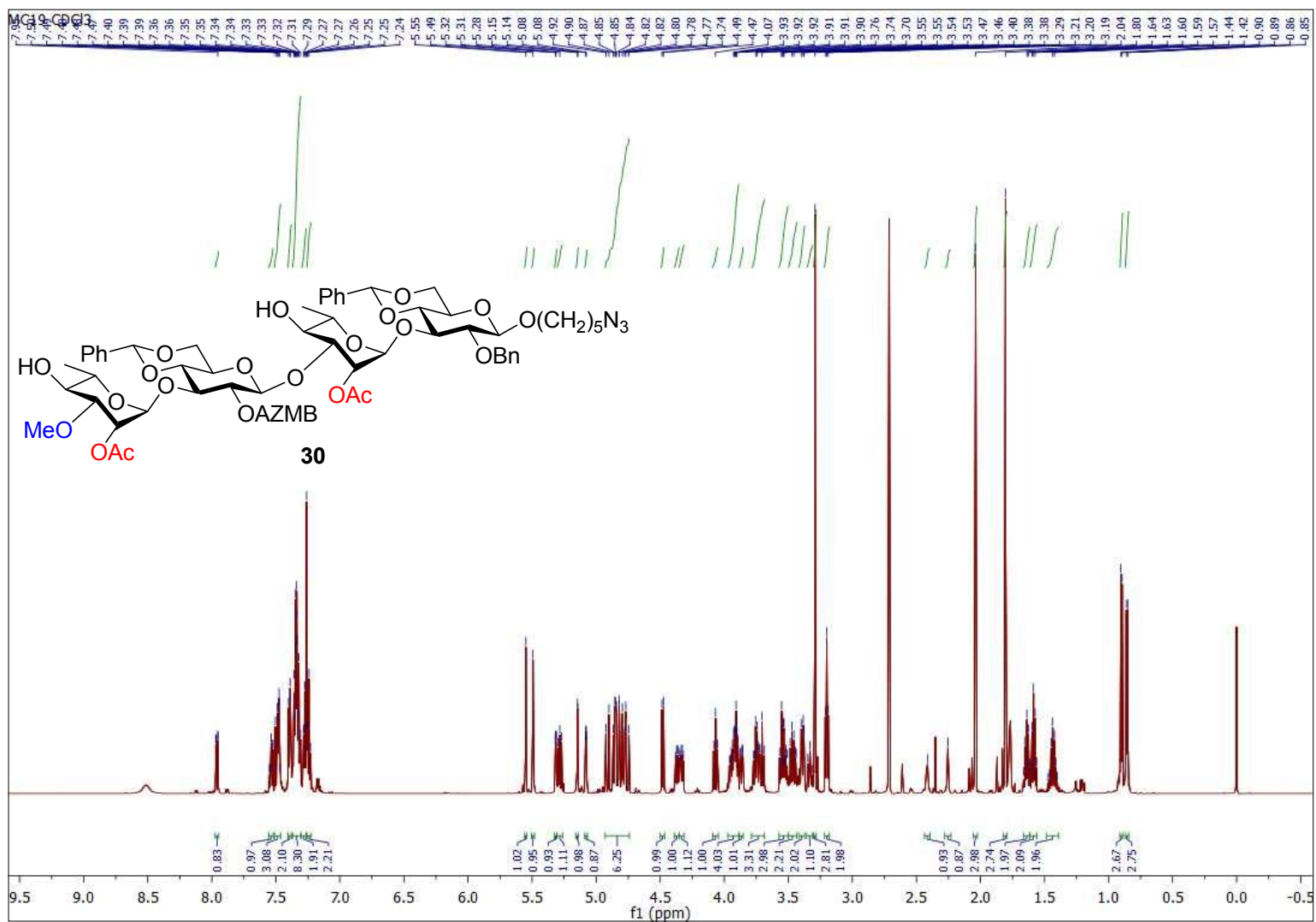
Supplementary Figure 70 | COSY NMR spectrum (CDCl₃, 600 MHz) of compound 10 (+ 12% of unknown inseparable impurity)



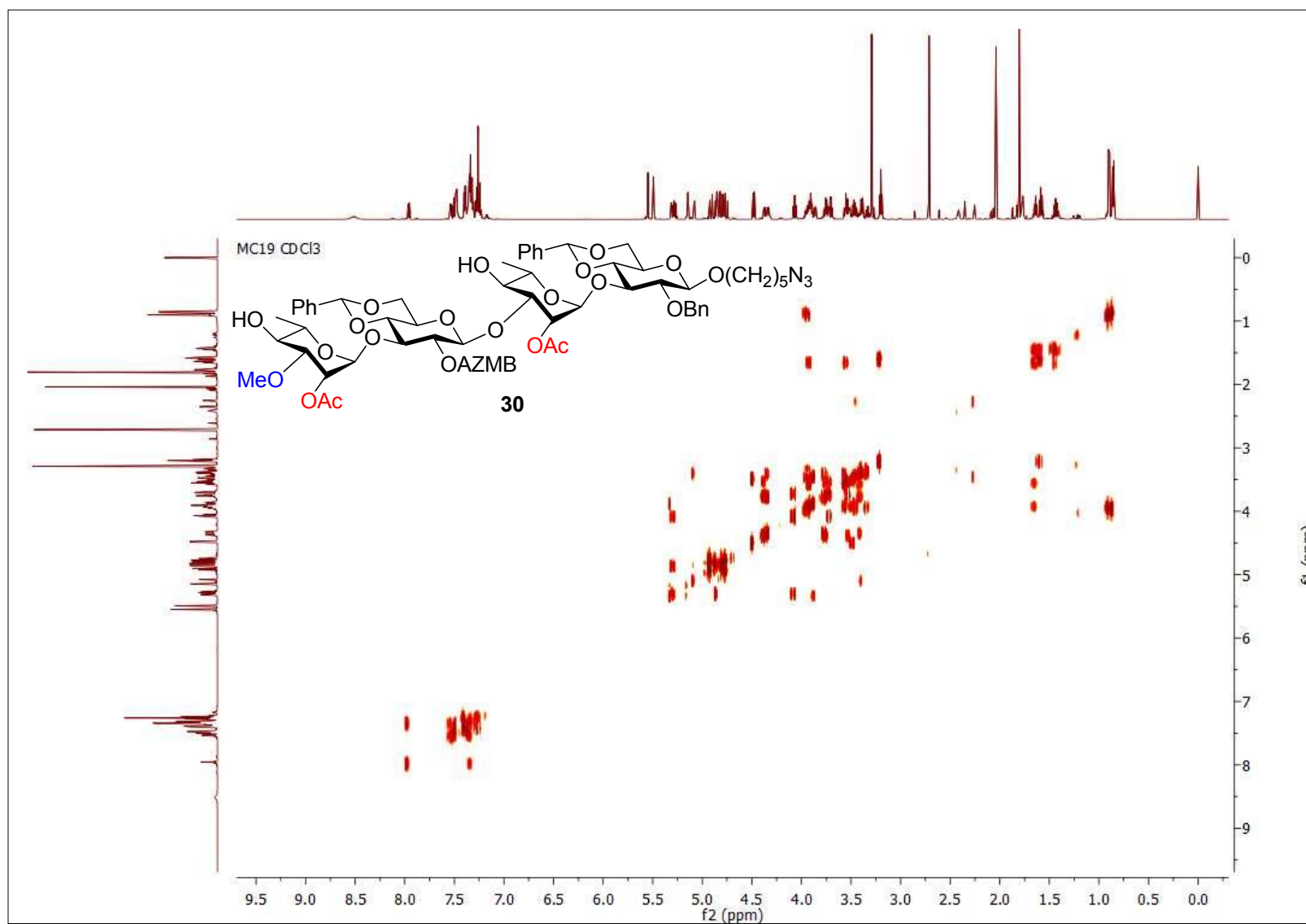
Supplementary Figure 72 | HSQC NMR spectrum (CDCl₃, 600 MHz) of compound 10 (+ 12% of unknown inseparable impurity)



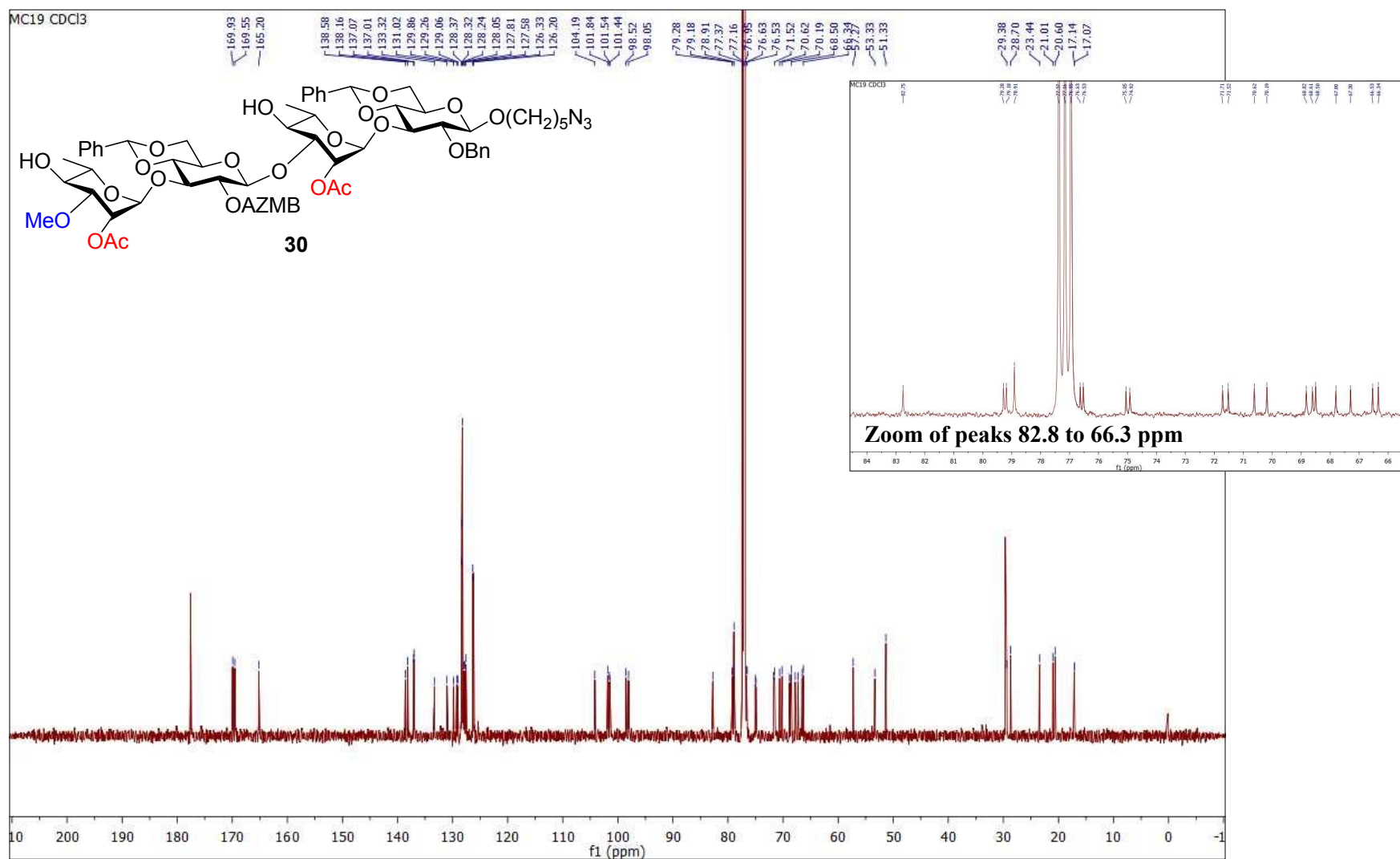
Supplementary Figure 73 | ^1H NMR spectrum (CDCl_3 , 600 MHz) of compound 30



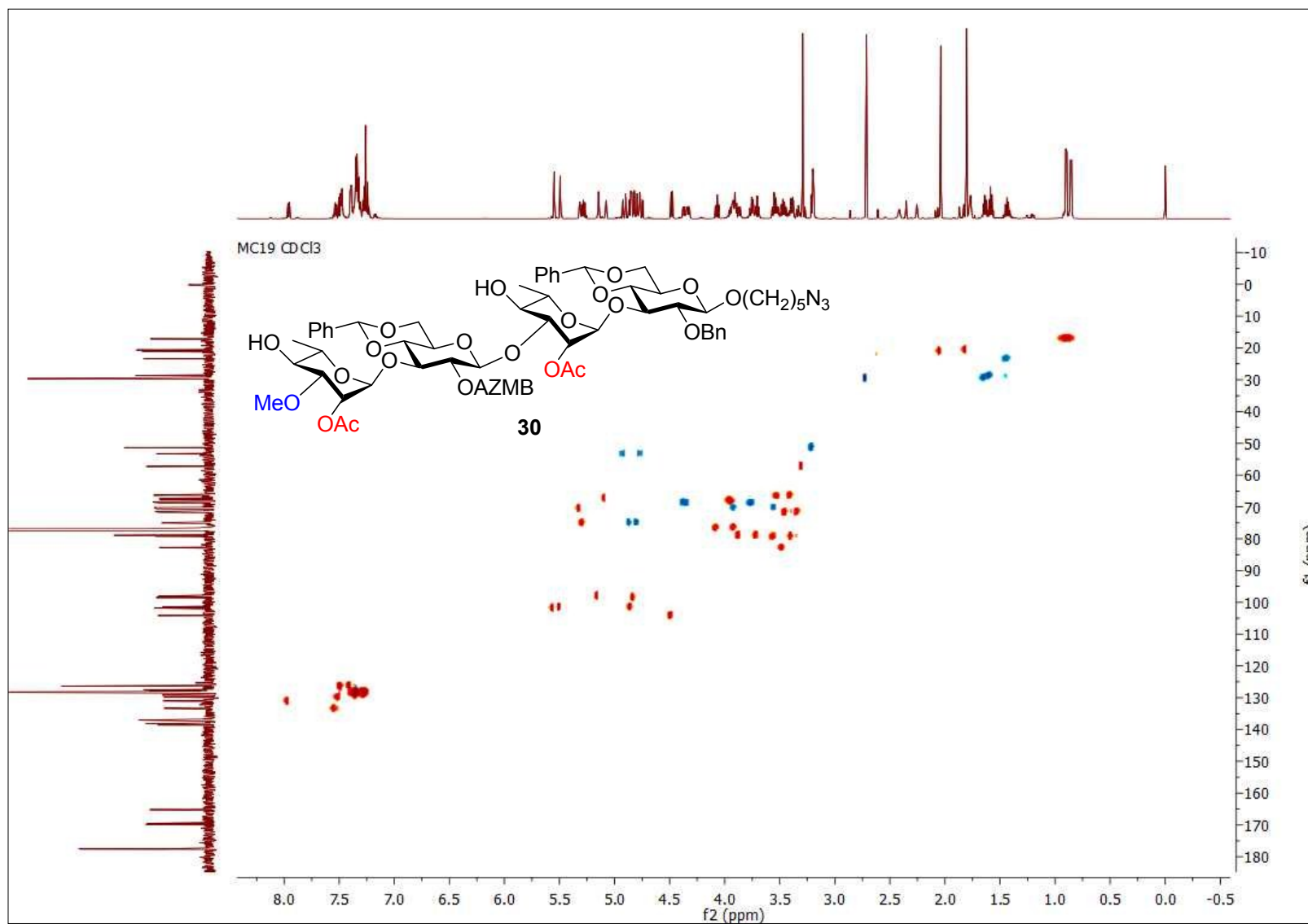
Supplementary Figure 74 | COSY NMR spectrum (CDCl₃, 600 MHz) of compound 30



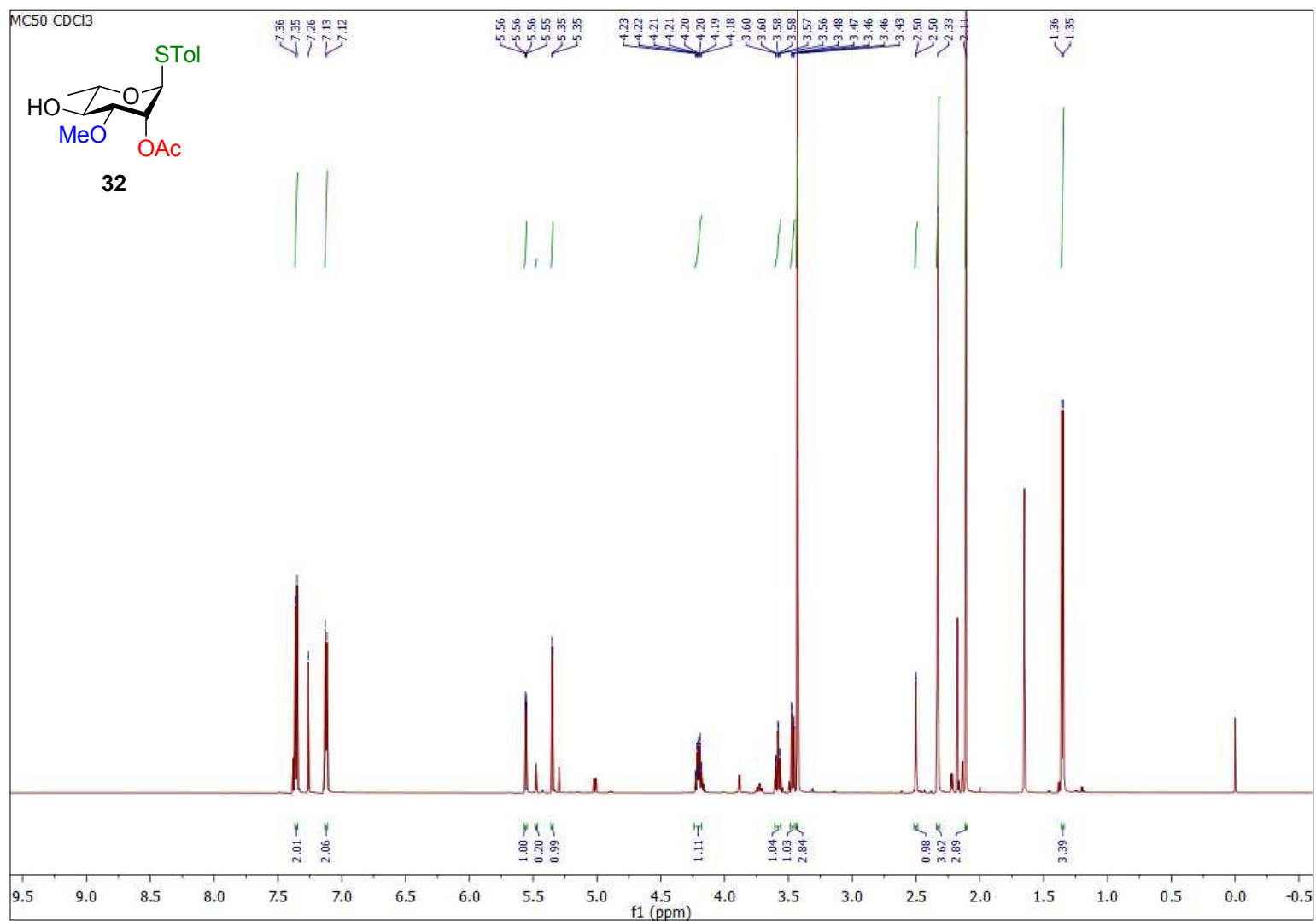
Supplementary Figure 75 | ^{13}C NMR spectrum (CDCl_3 , 150 MHz) of compound 30



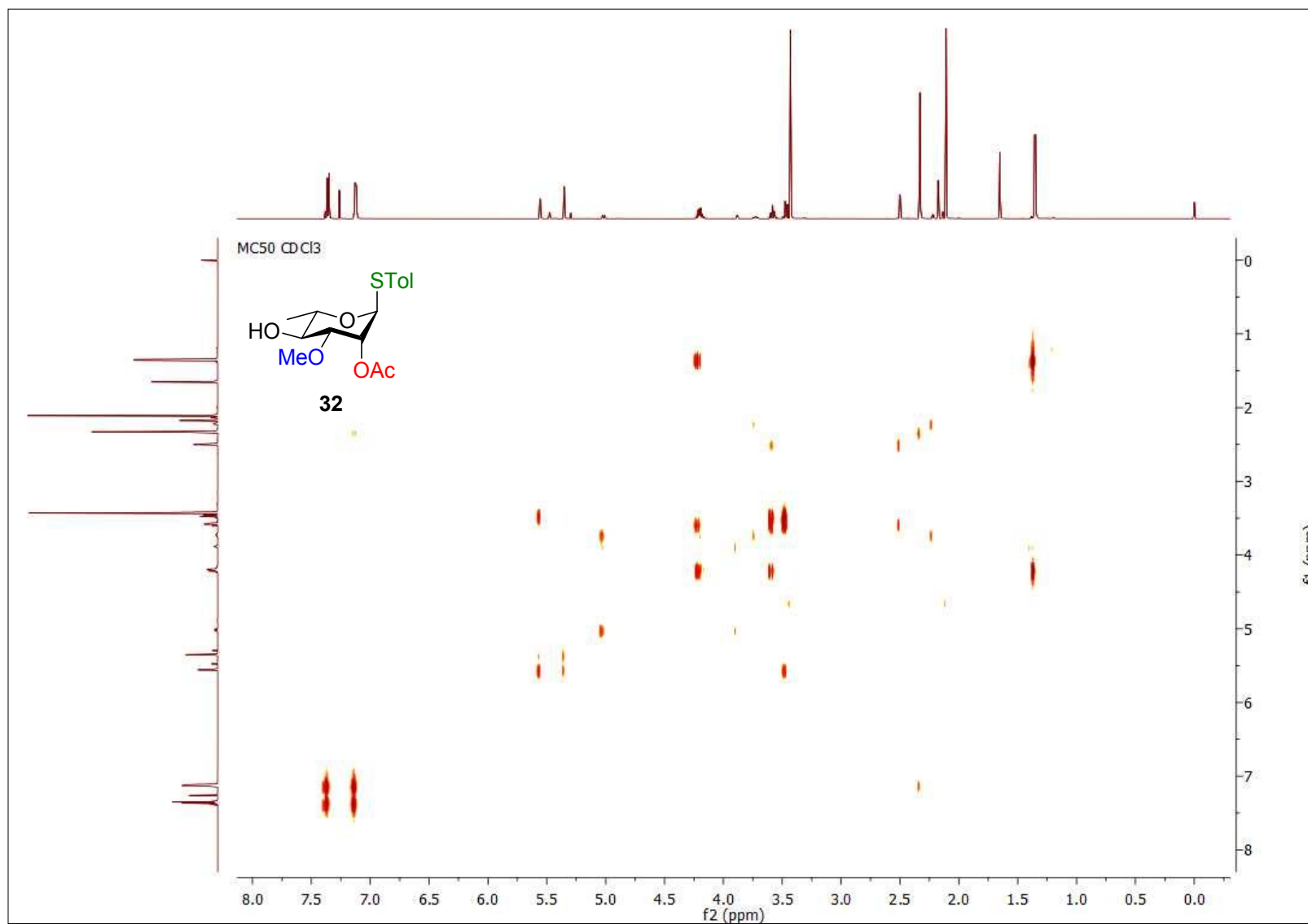
Supplementary Figure 76 | HSQC NMR spectrum (CDCl₃, 600 MHz) of compound 30



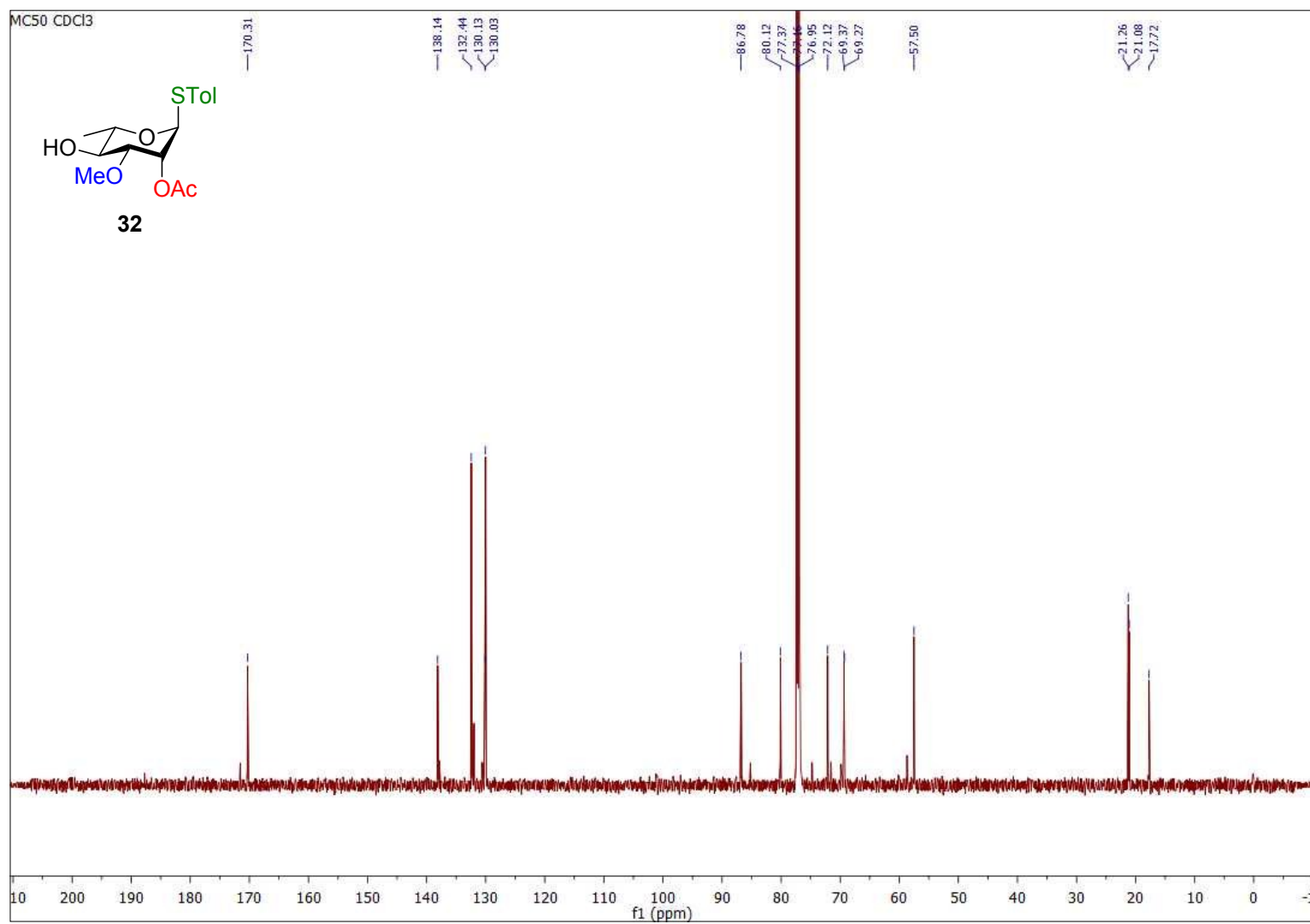
Supplementary Figure 77 | ^1H NMR spectrum (CDCl_3 , 600 MHz) of compound 32



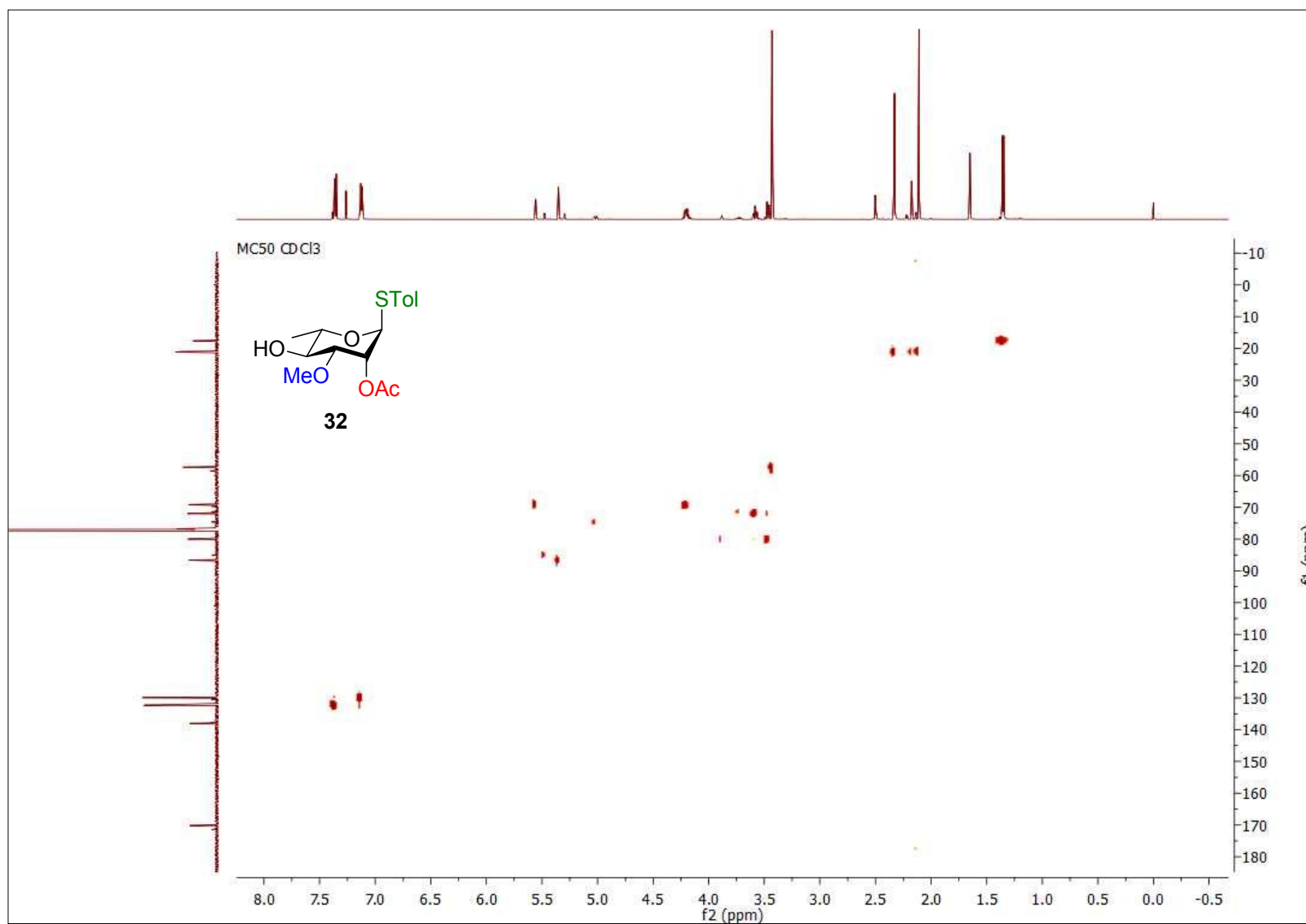
Supplementary Figure 78 | COSY NMR spectrum (CDCl₃, 600 MHz) of compound 32



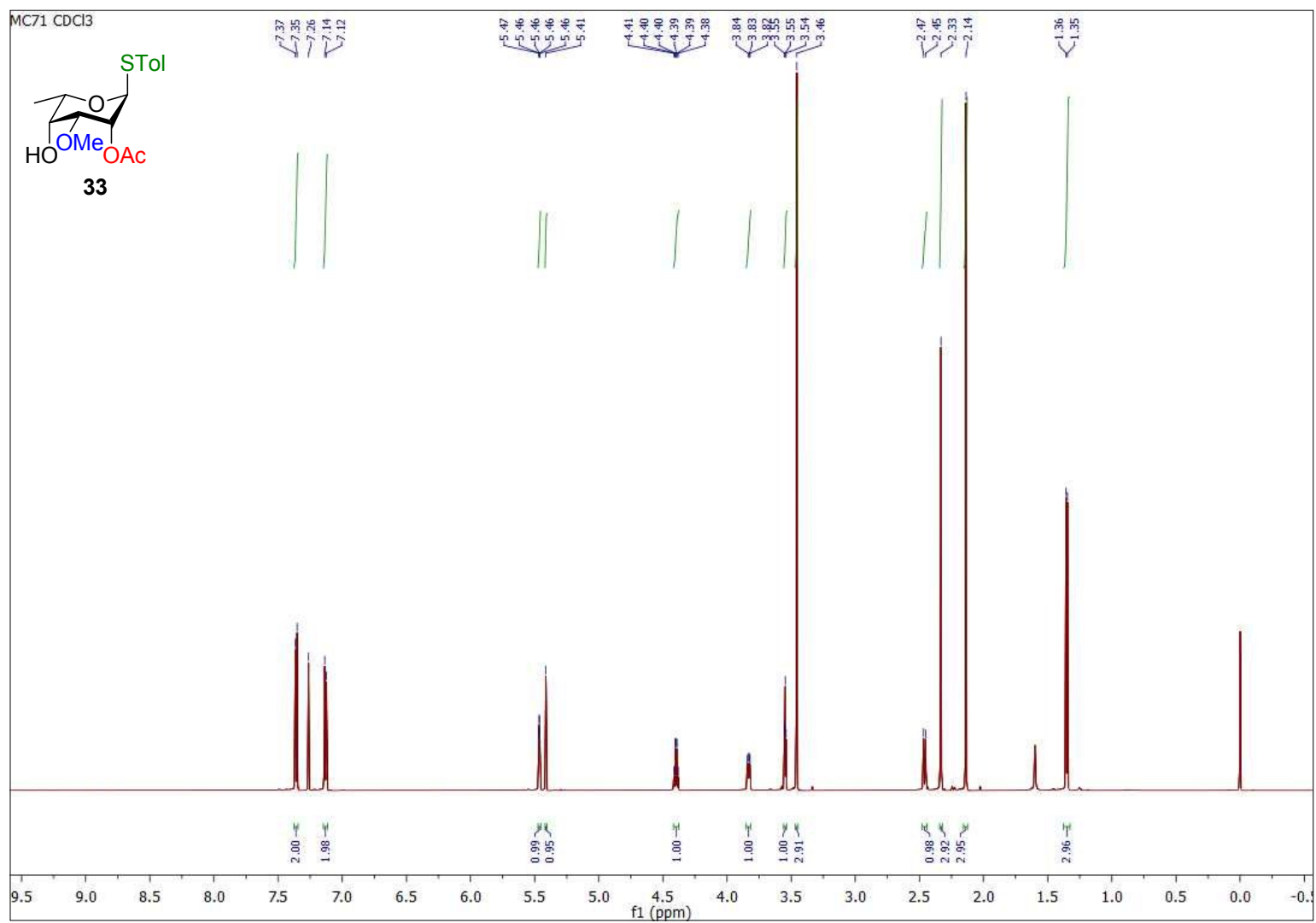
Supplementary Figure 79 | ^{13}C NMR spectrum (CDCl_3 , 150 MHz) of compound 32



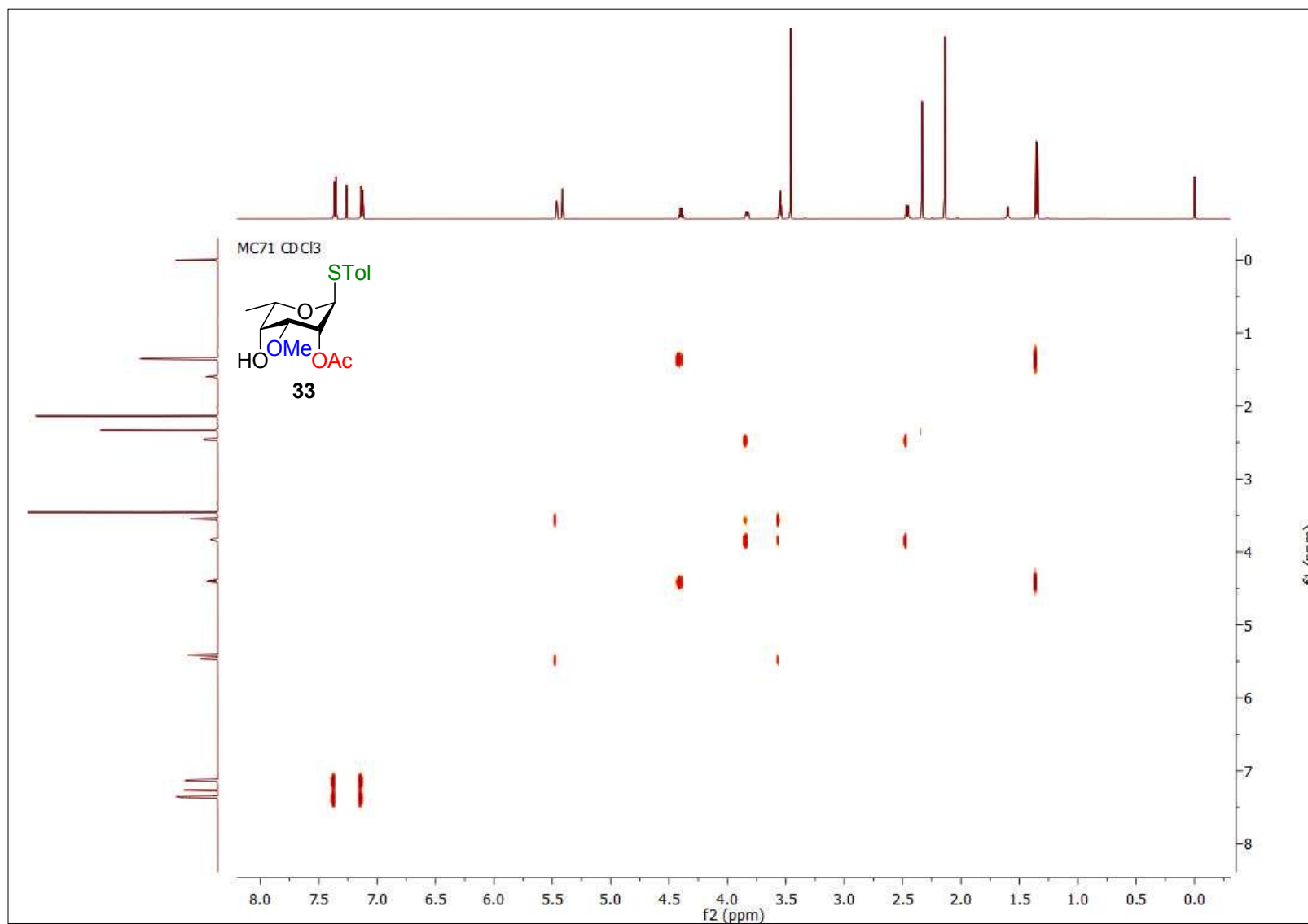
Supplementary Figure 80 | HSQC NMR spectrum (CDCl₃, 600 MHz) of compound 32



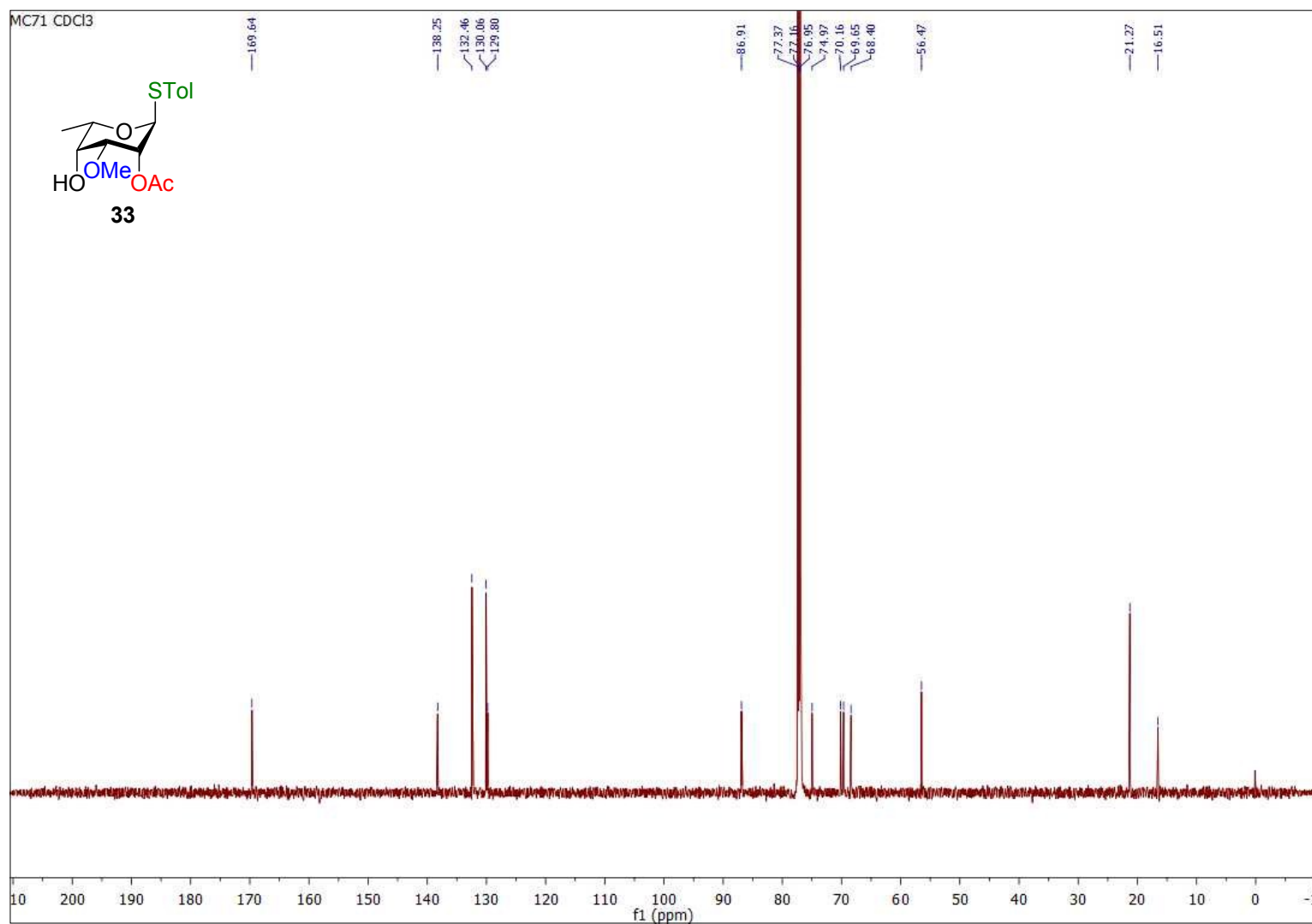
Supplementary Figure 81 | ^1H NMR spectrum (CDCl_3 , 600 MHz) of compound 33



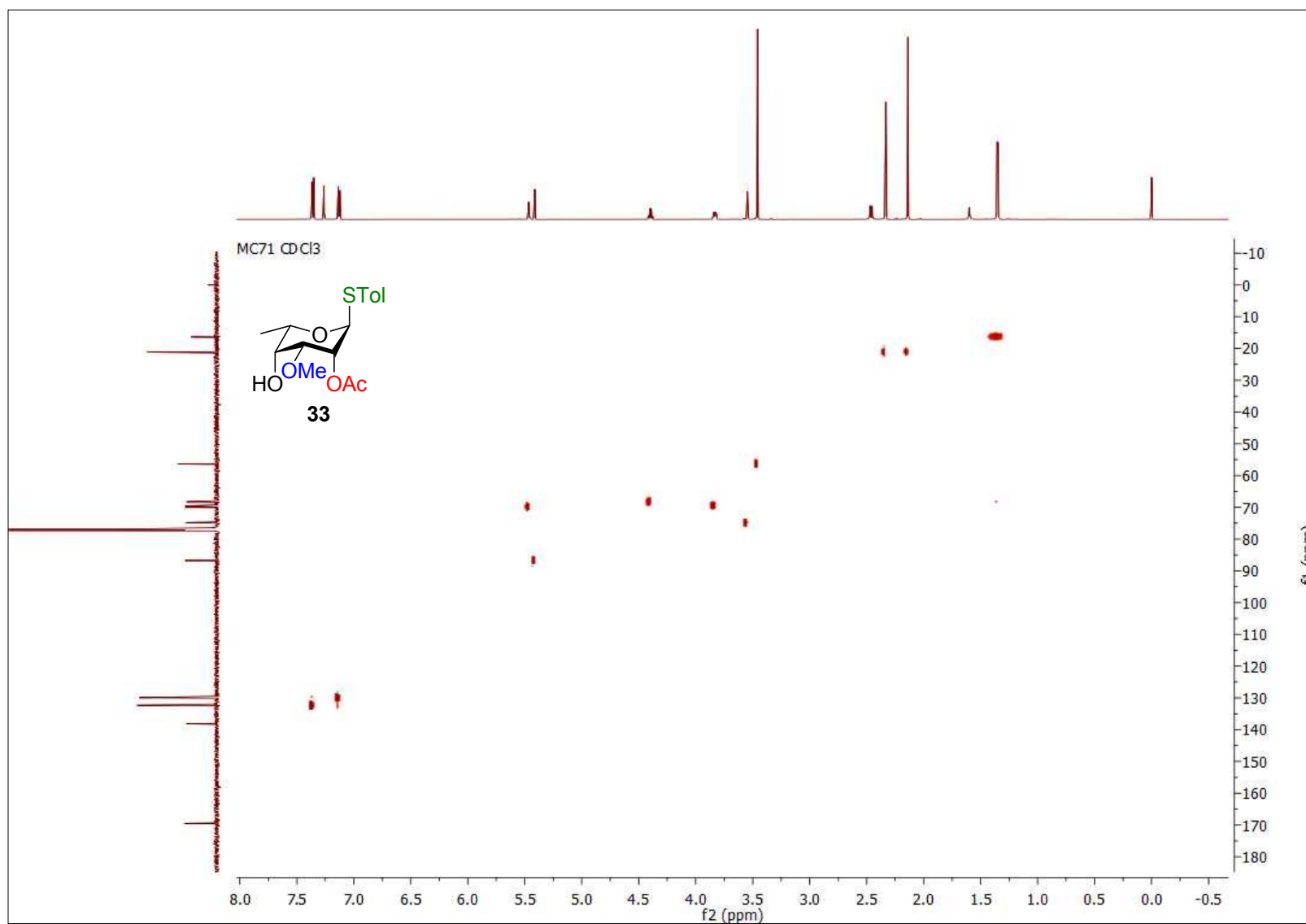
Supplementary Figure 82 | COSY NMR spectrum (CDCl₃, 600 MHz) of compound 33



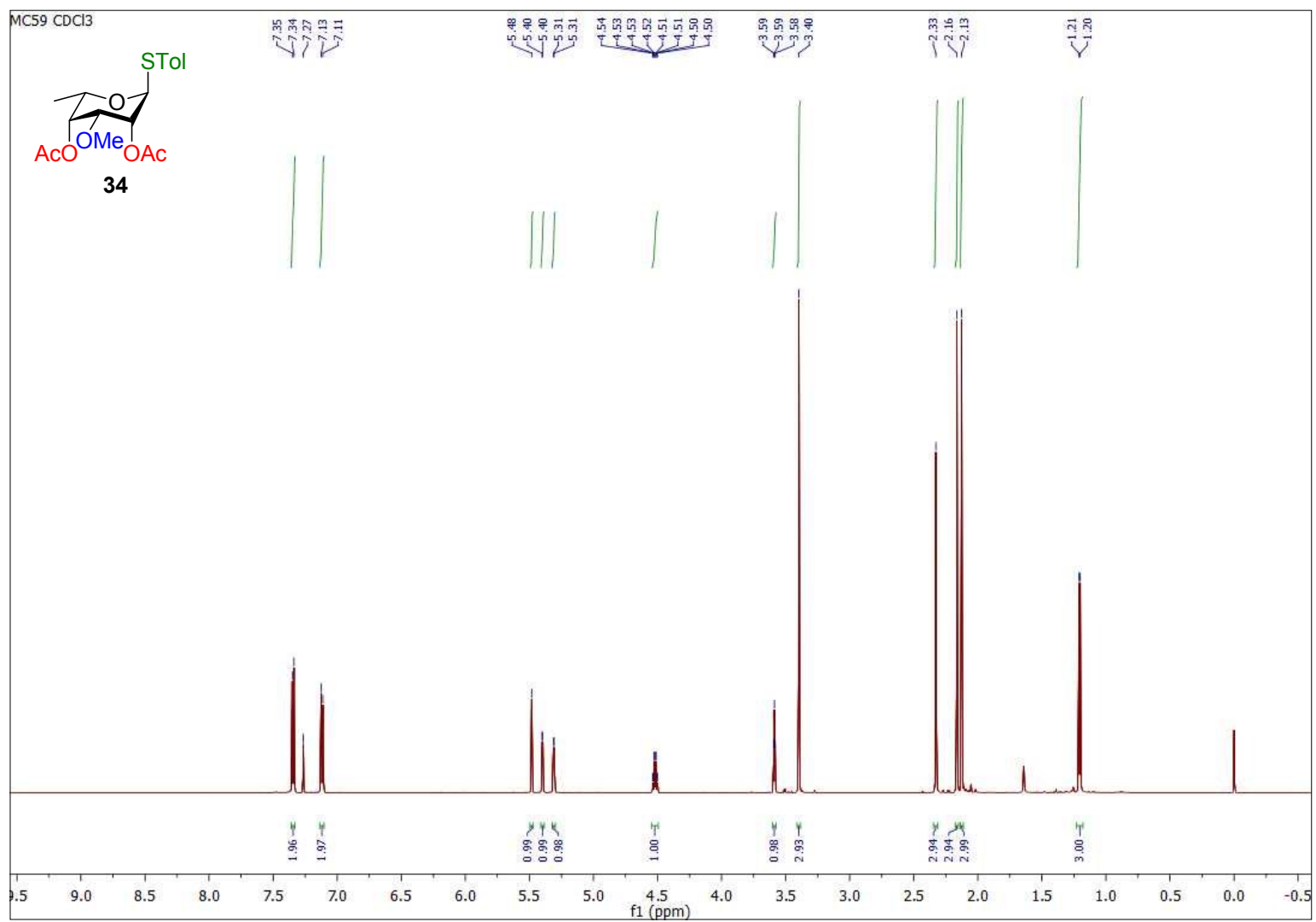
Supplementary Figure 83 | ^{13}C NMR spectrum (CDCl_3 , 150 MHz) of compound 33



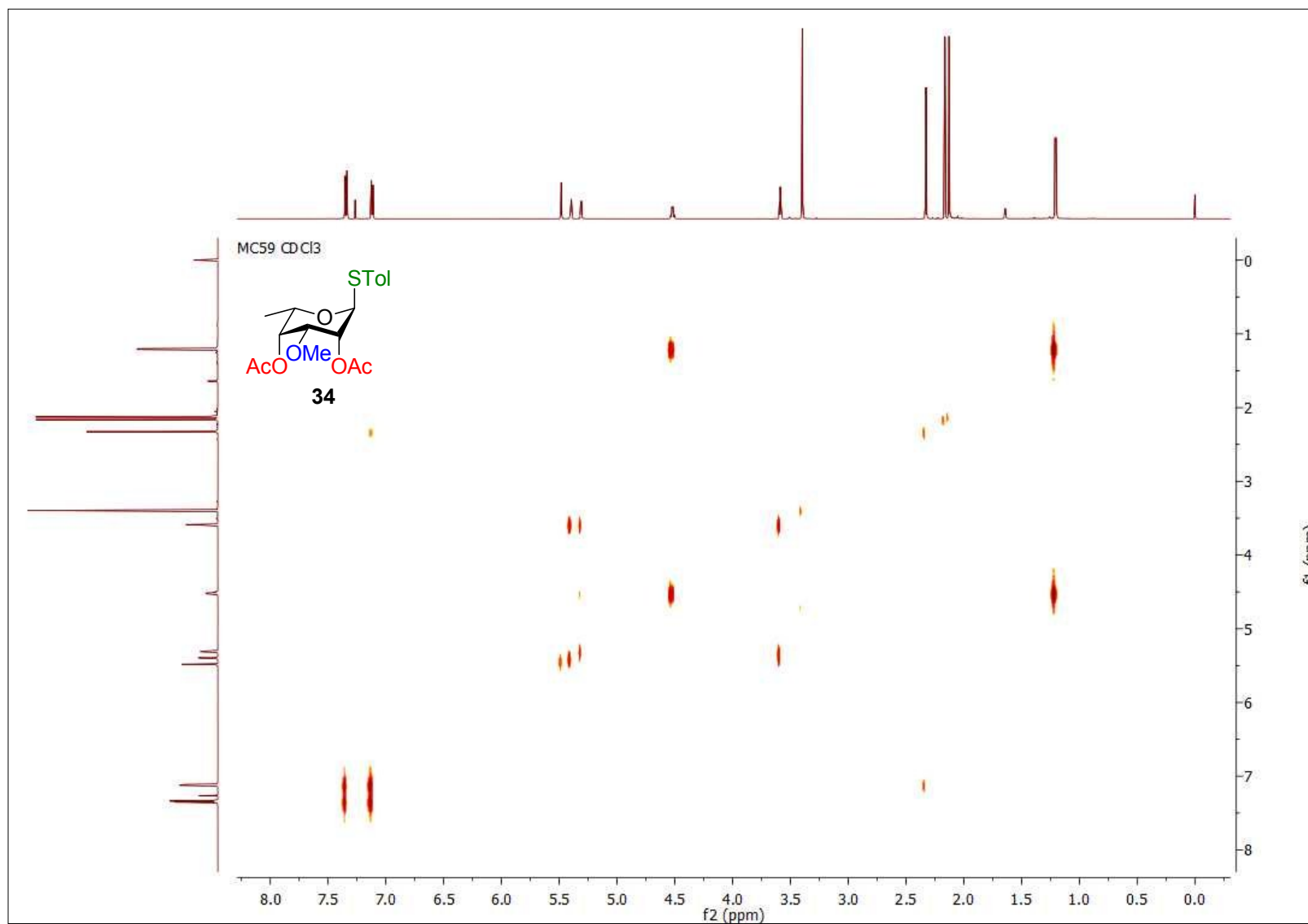
Supplementary Figure 84 | HSQC NMR spectrum (CDCl₃, 600 MHz) of compound 33



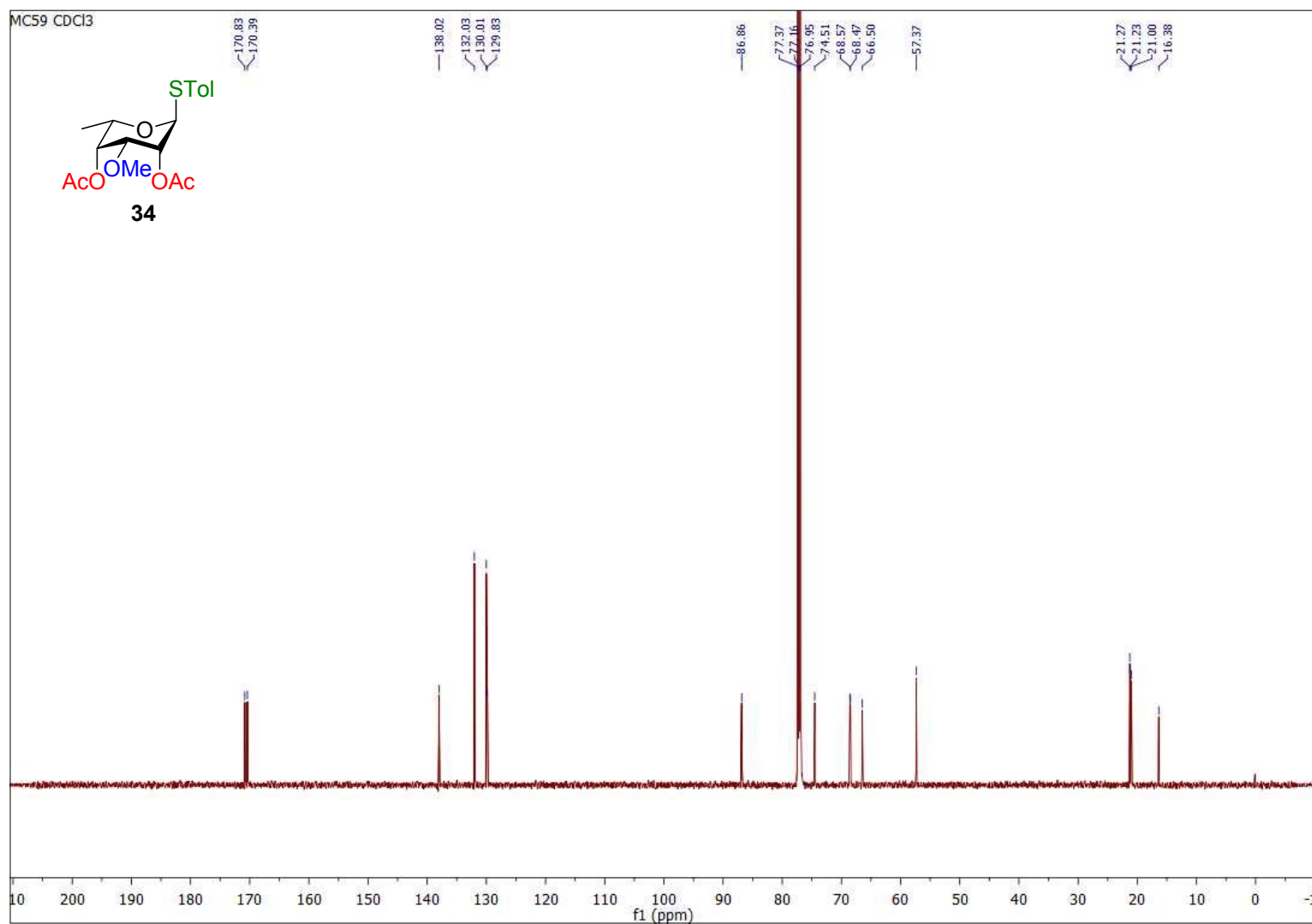
Supplementary Figure 85 | ^1H NMR spectrum (CDCl_3 , 600 MHz) of compound 34



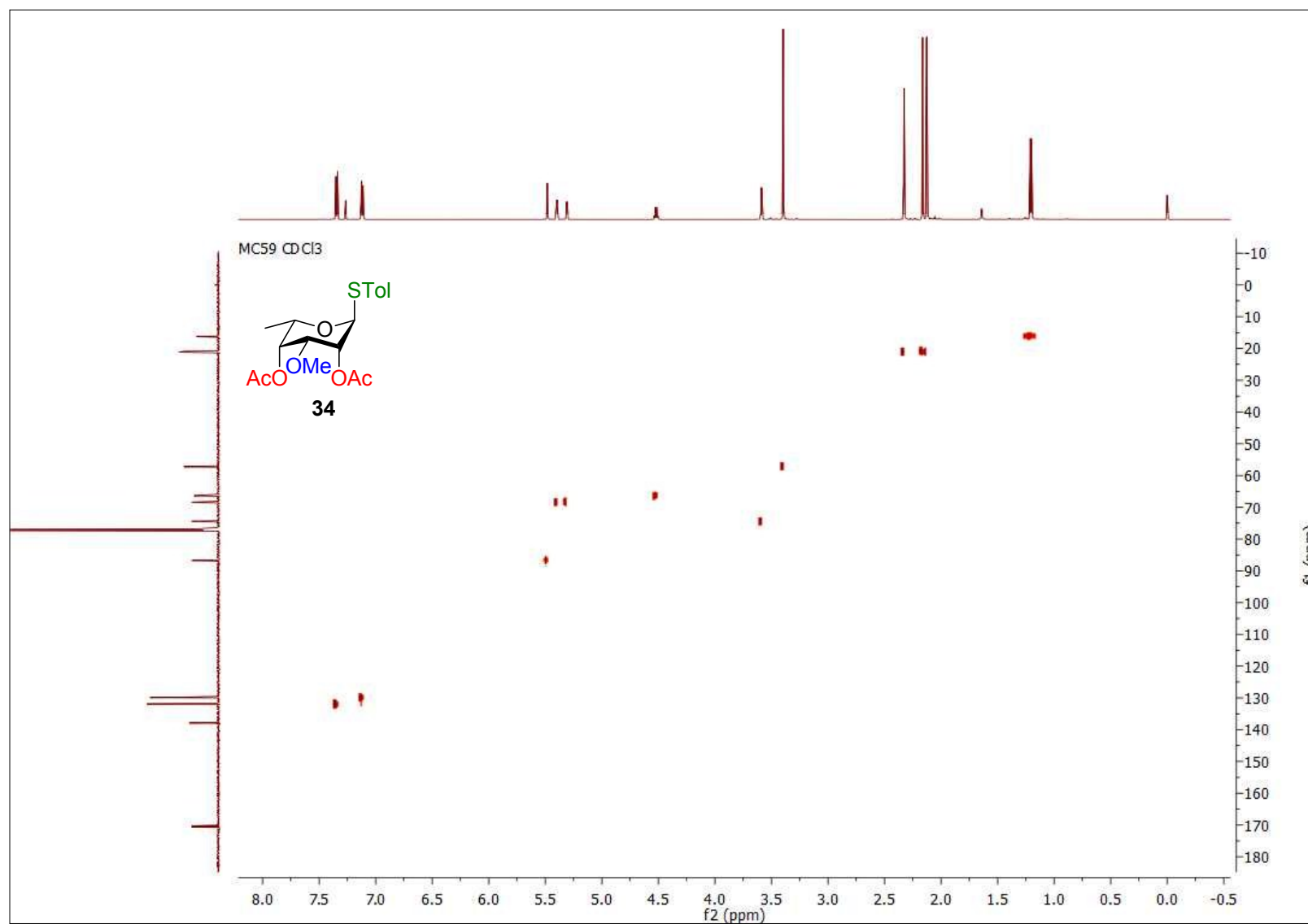
Supplementary Figure 86 | COSY NMR spectrum (CDCl₃, 600 MHz) of compound 34



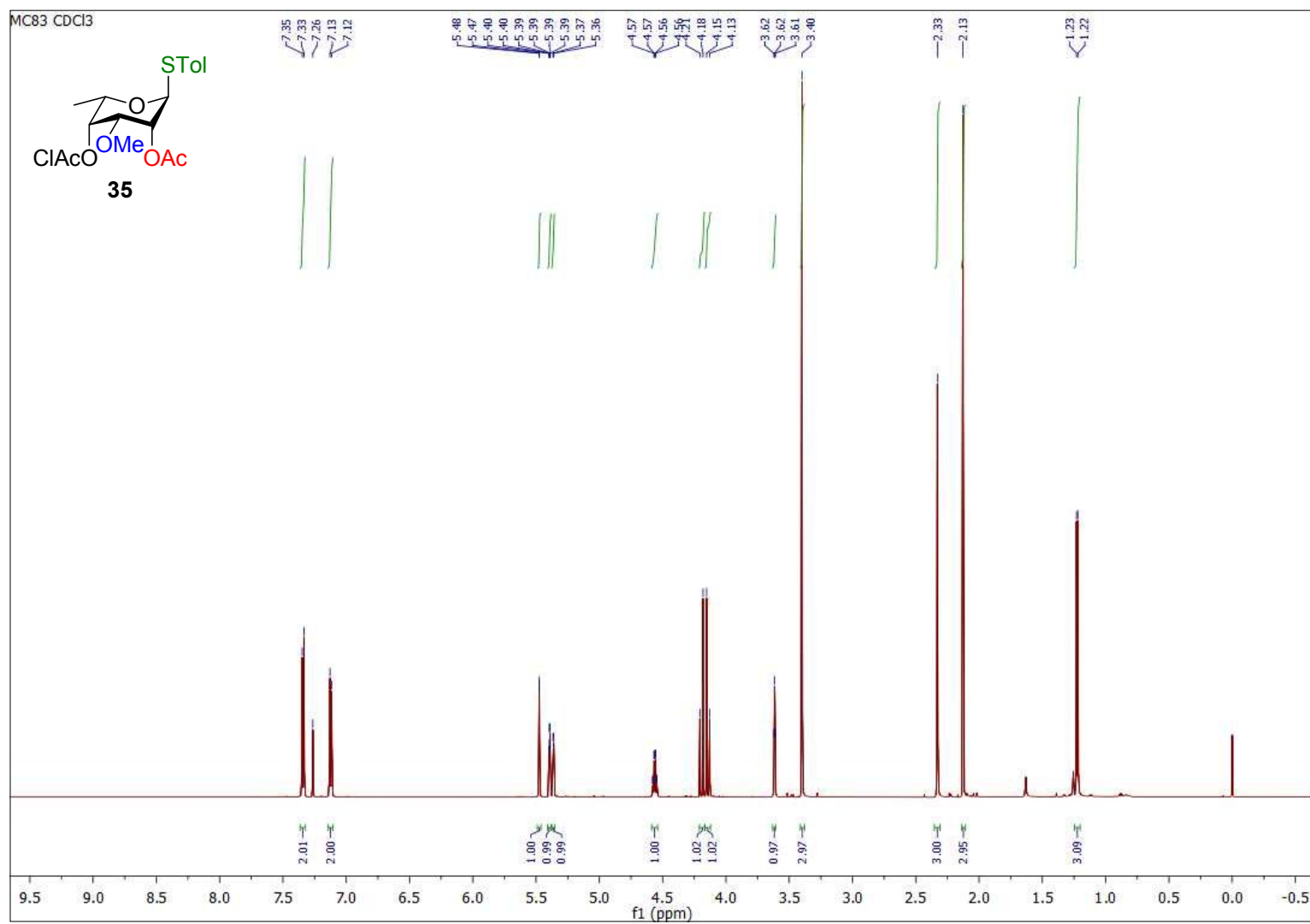
Supplementary Figure 87 | ^{13}C NMR spectrum (CDCl_3 , 150 MHz) of compound 34



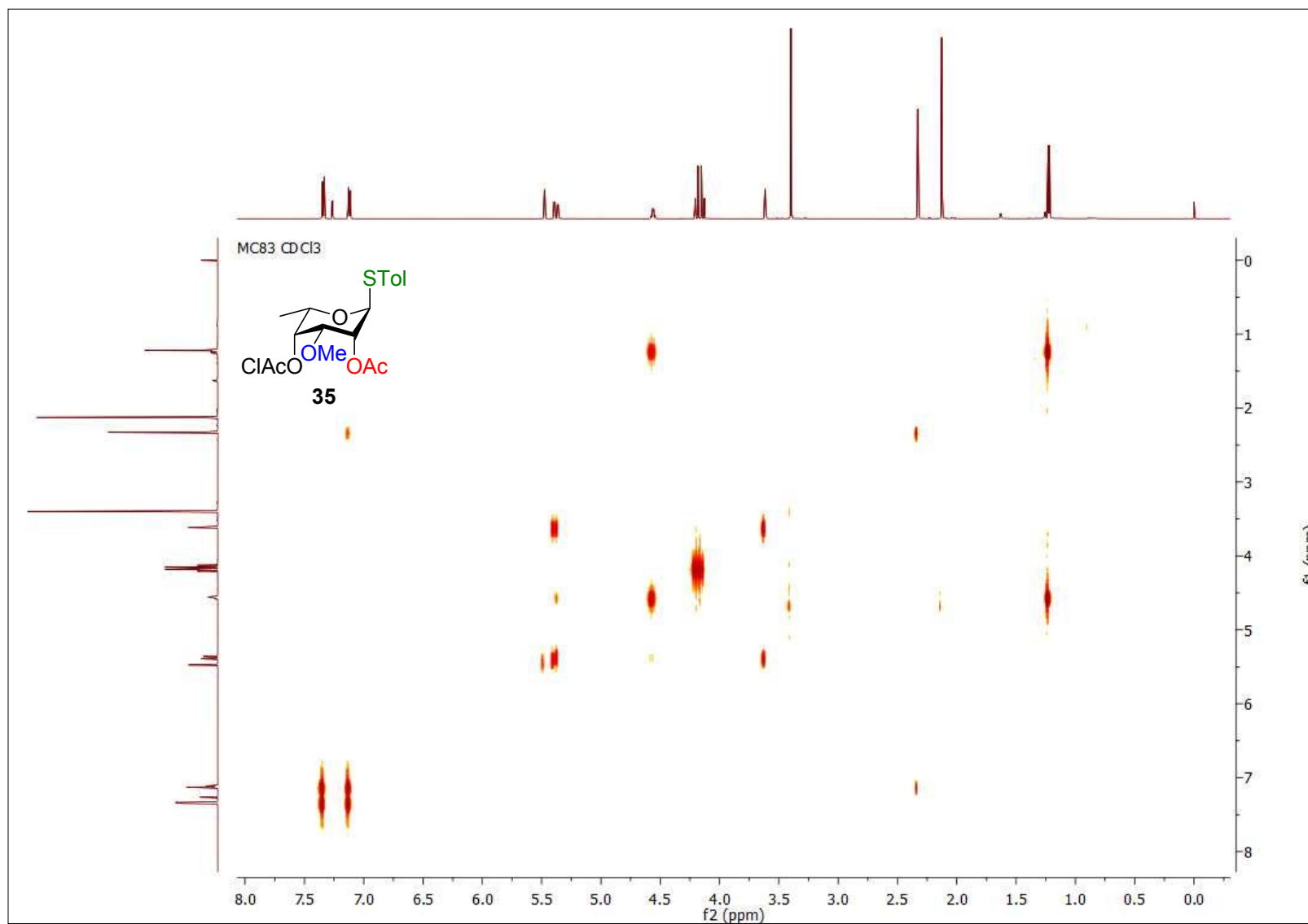
Supplementary Figure 88 | HSQC NMR spectrum (CDCl₃, 600 MHz) of compound 34



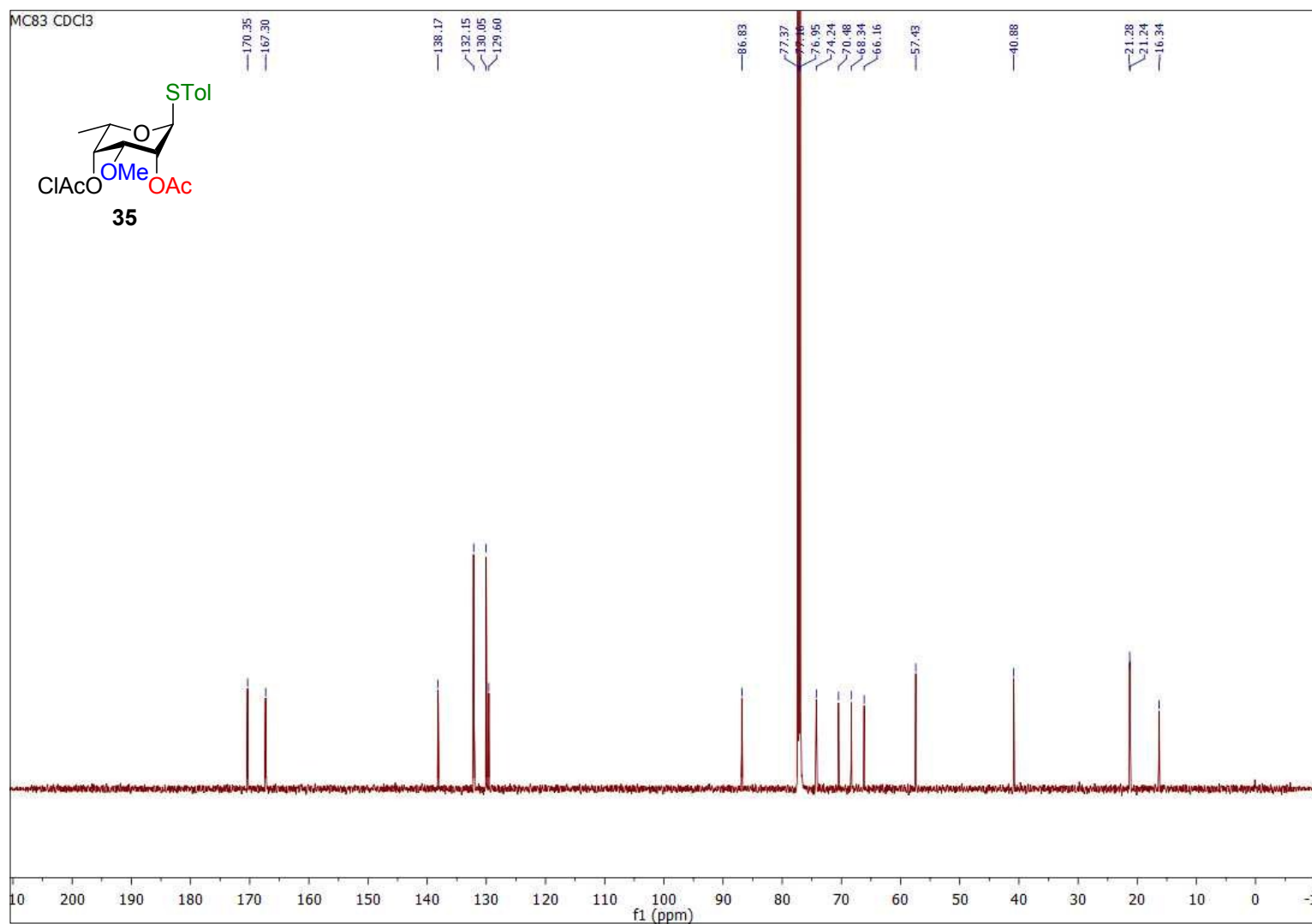
Supplementary Figure 89 | ¹H NMR spectrum (CDCl₃, 600 MHz) of compound 35



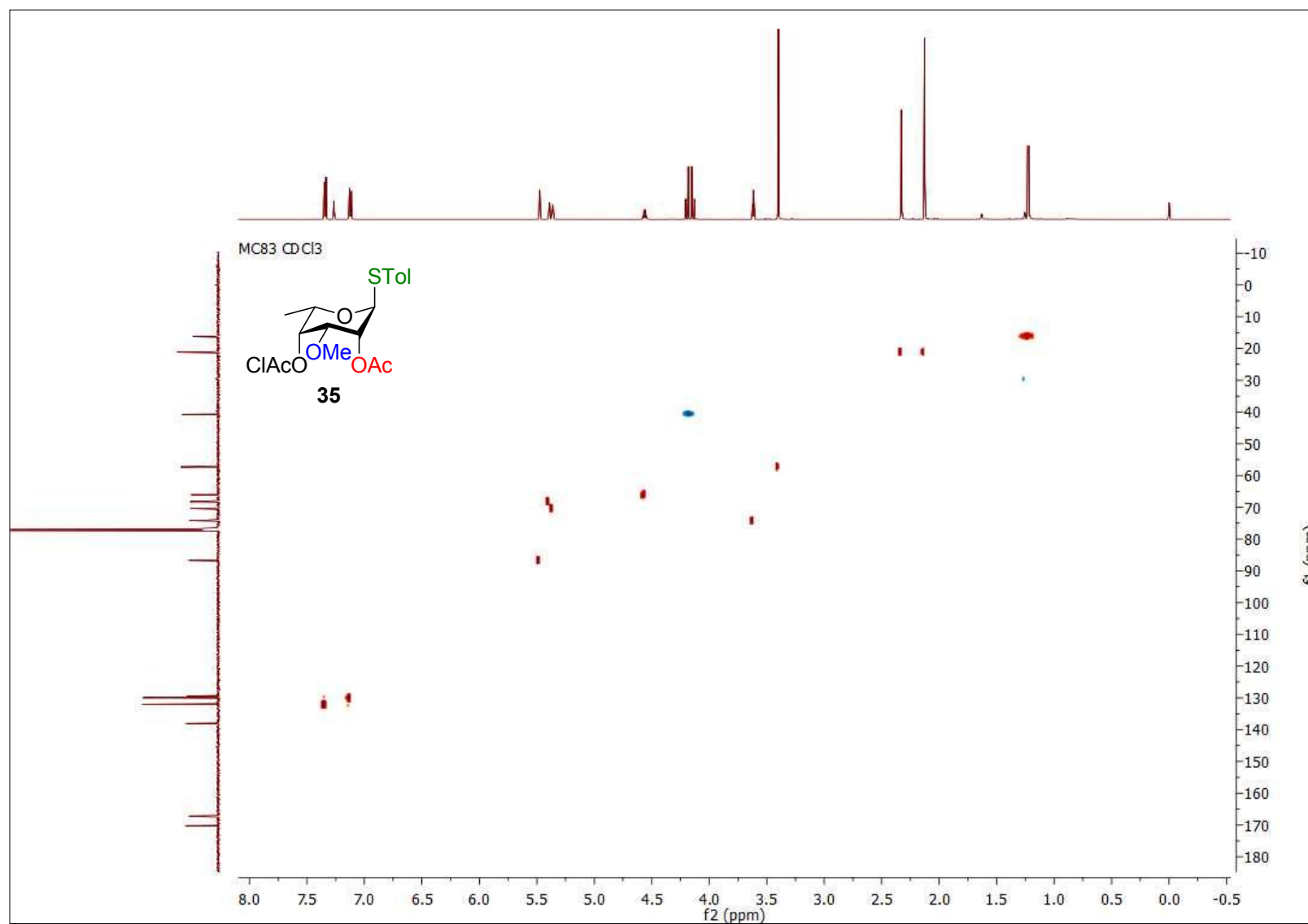
Supplementary Figure 90 | COSY NMR spectrum (CDCl₃, 600 MHz) of compound 35



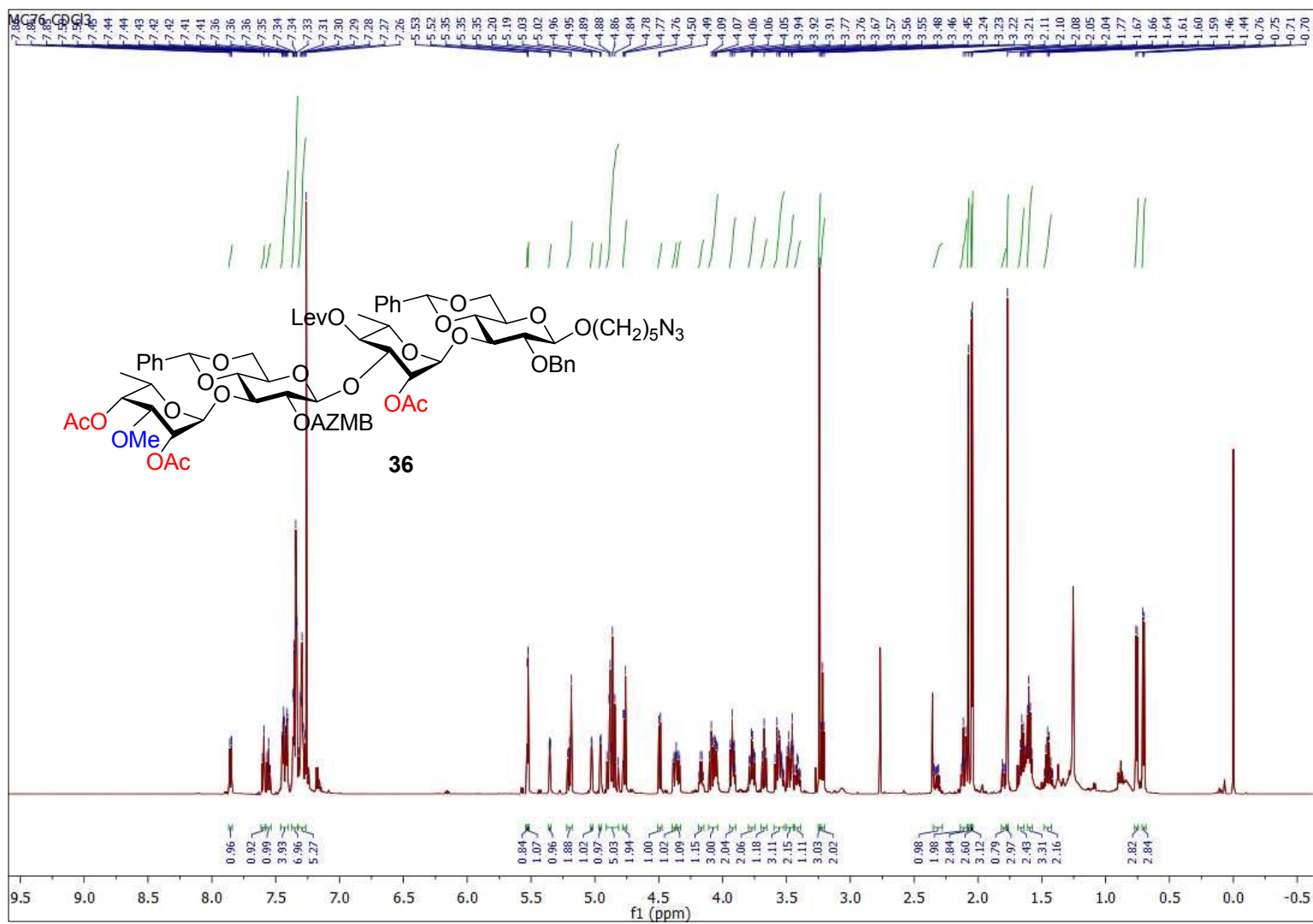
Supplementary Figure 91 | ^{13}C NMR spectrum (CDCl_3 , 150 MHz) of compound 35



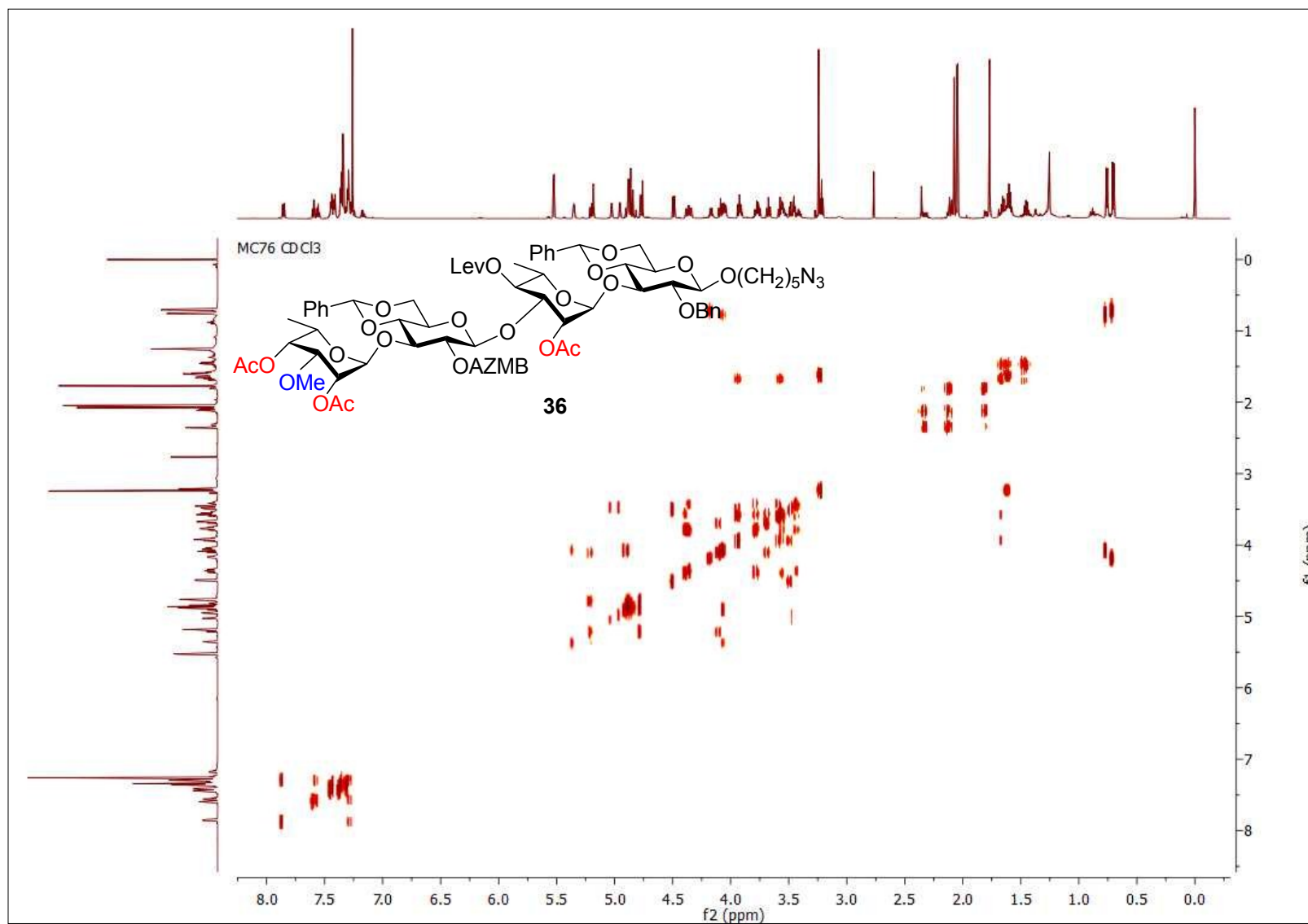
Supplementary Figure 92 | HSQC NMR spectrum (CDCl₃, 600 MHz) of compound 35



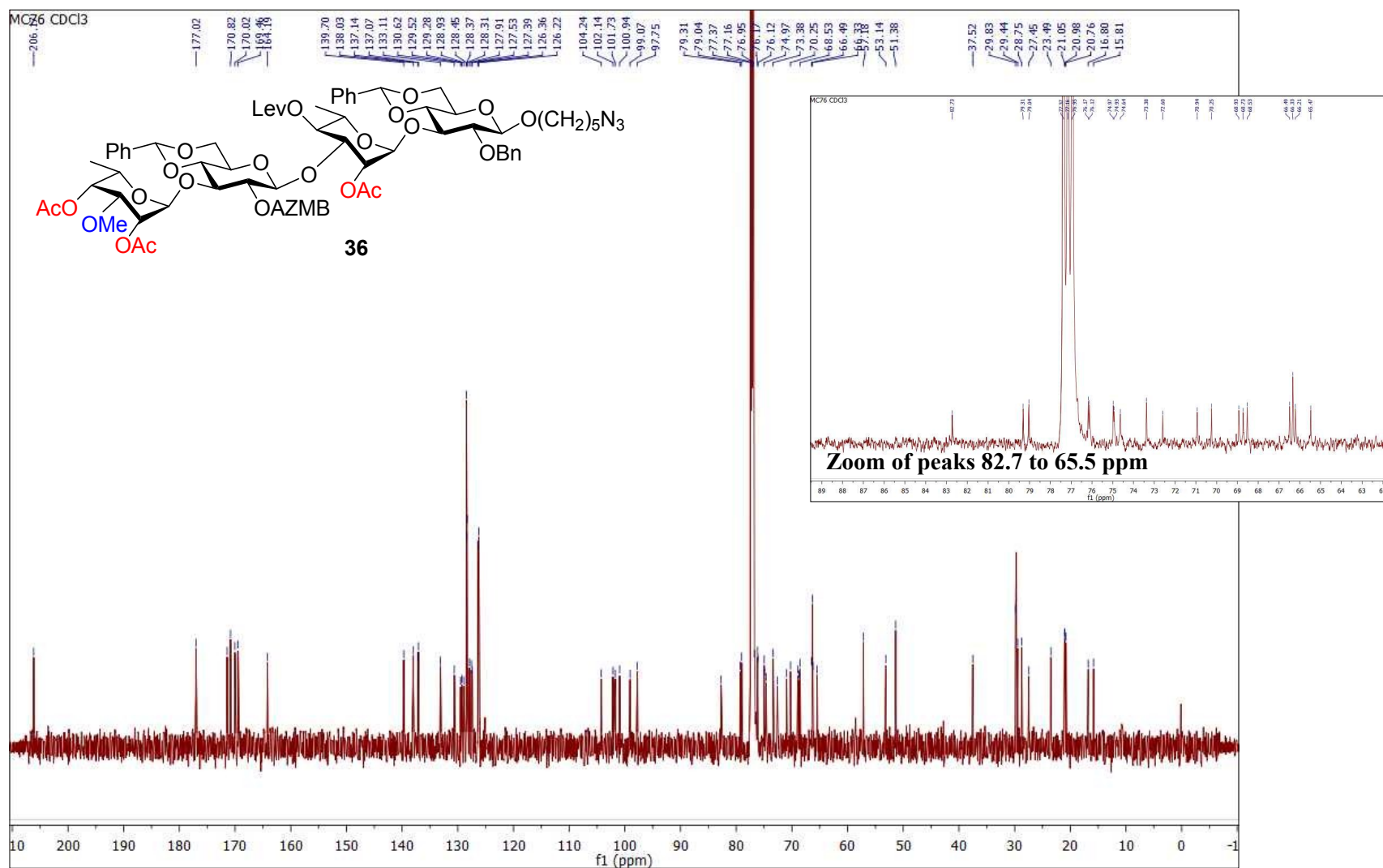
Supplementary Figure 93 | ^1H NMR spectrum (CDCl_3 , 600 MHz) of compound 36



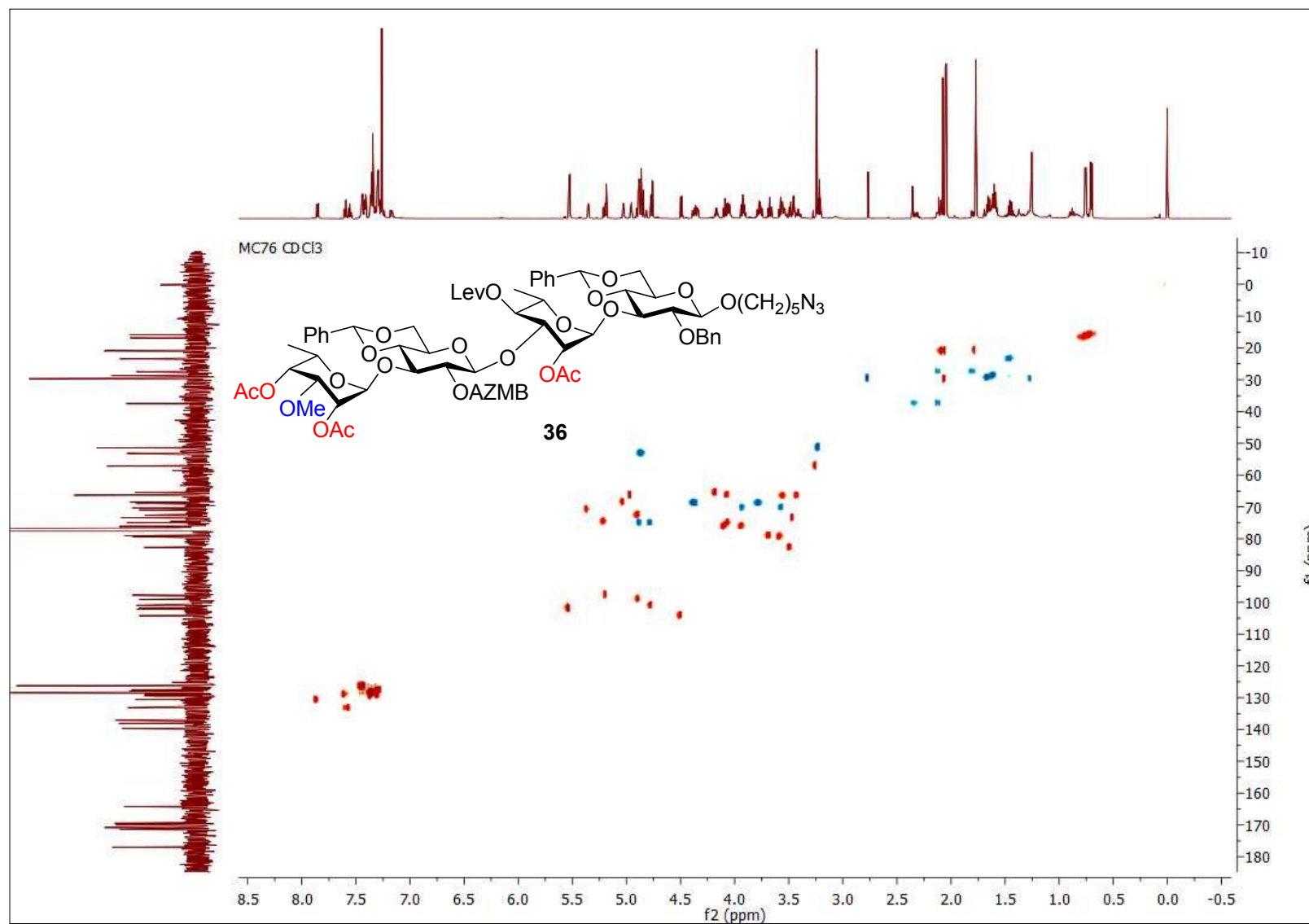
Supplementary Figure 94 | COSY NMR spectrum (CDCl₃, 600 MHz) of compound 36



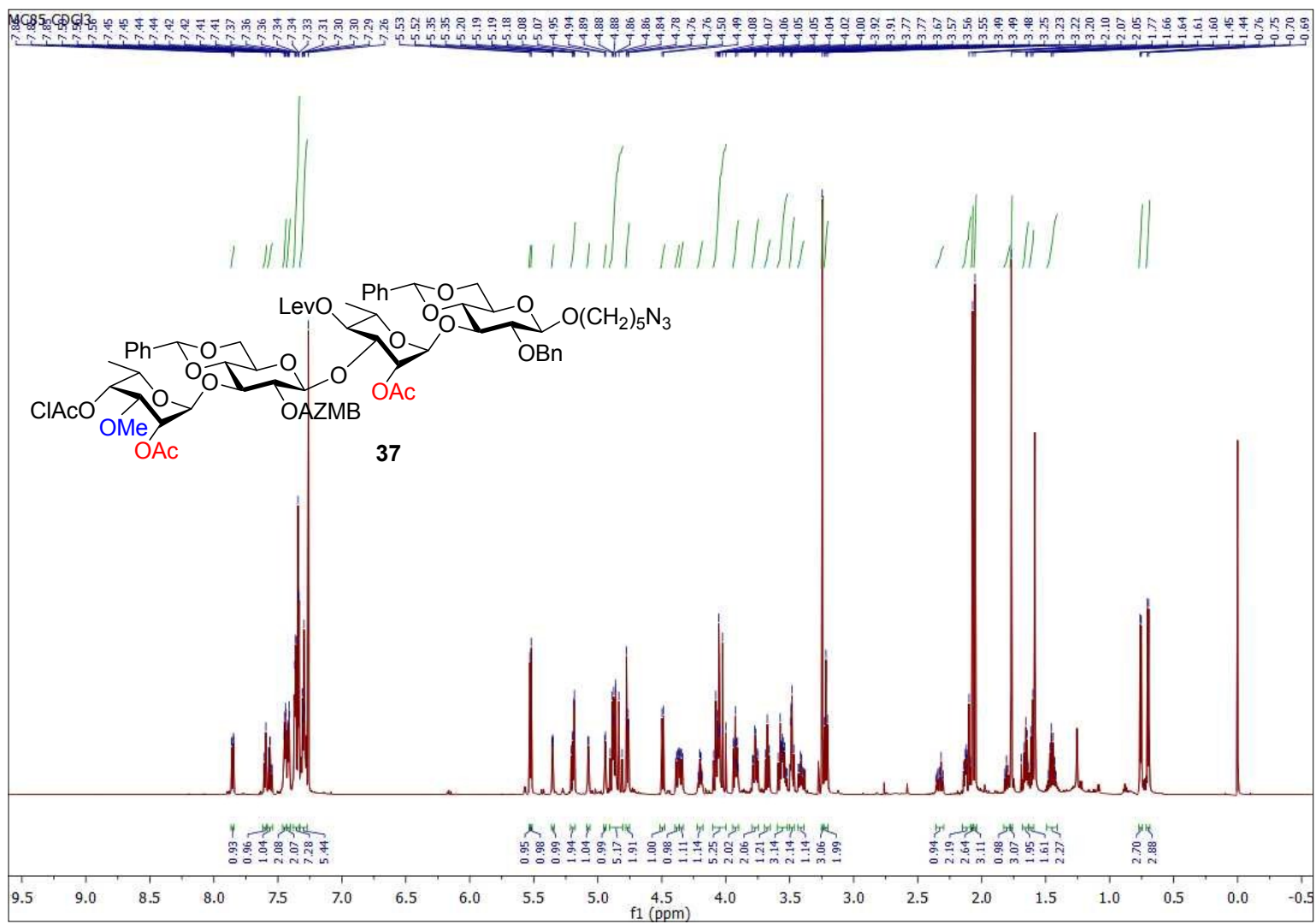
Supplementary Figure 95 | ^{13}C NMR spectrum (CDCl_3 , 150 MHz) of compound 36



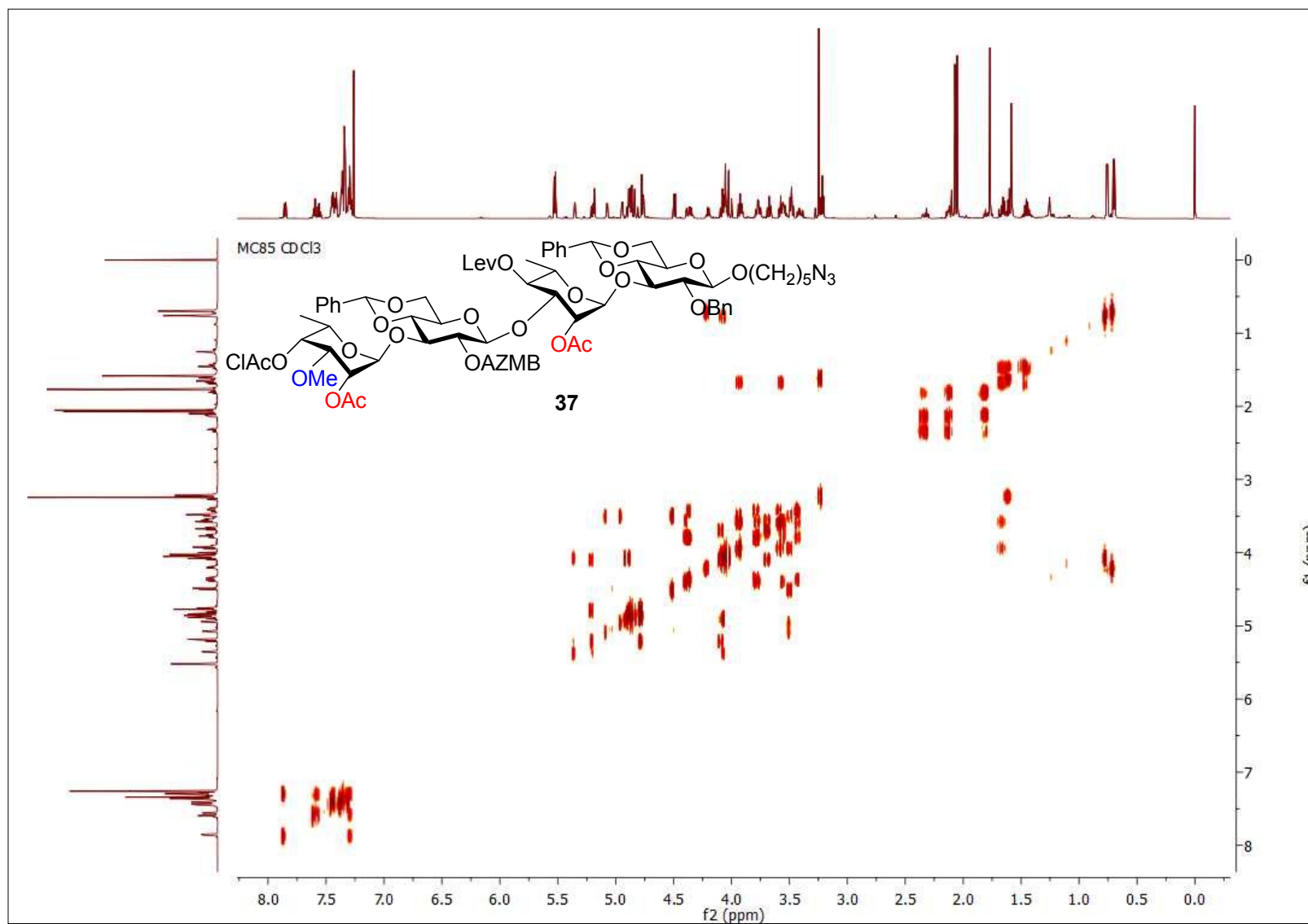
Supplementary Figure 96 | HSQC NMR spectrum (CDCl₃, 600 MHz) of compound 36



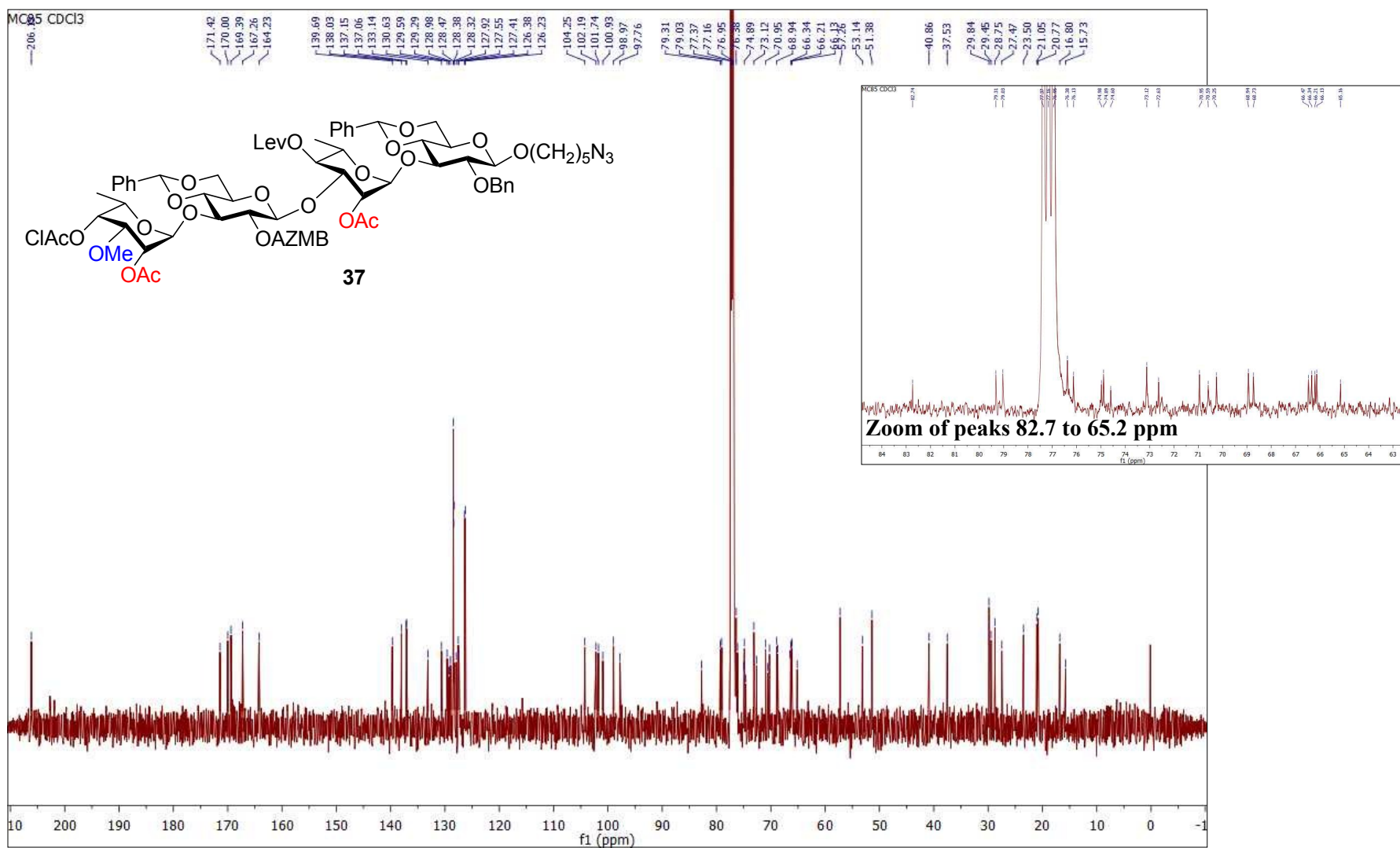
Supplementary Figure 97 | ¹H NMR spectrum (CDCl₃, 600 MHz) of compound 37



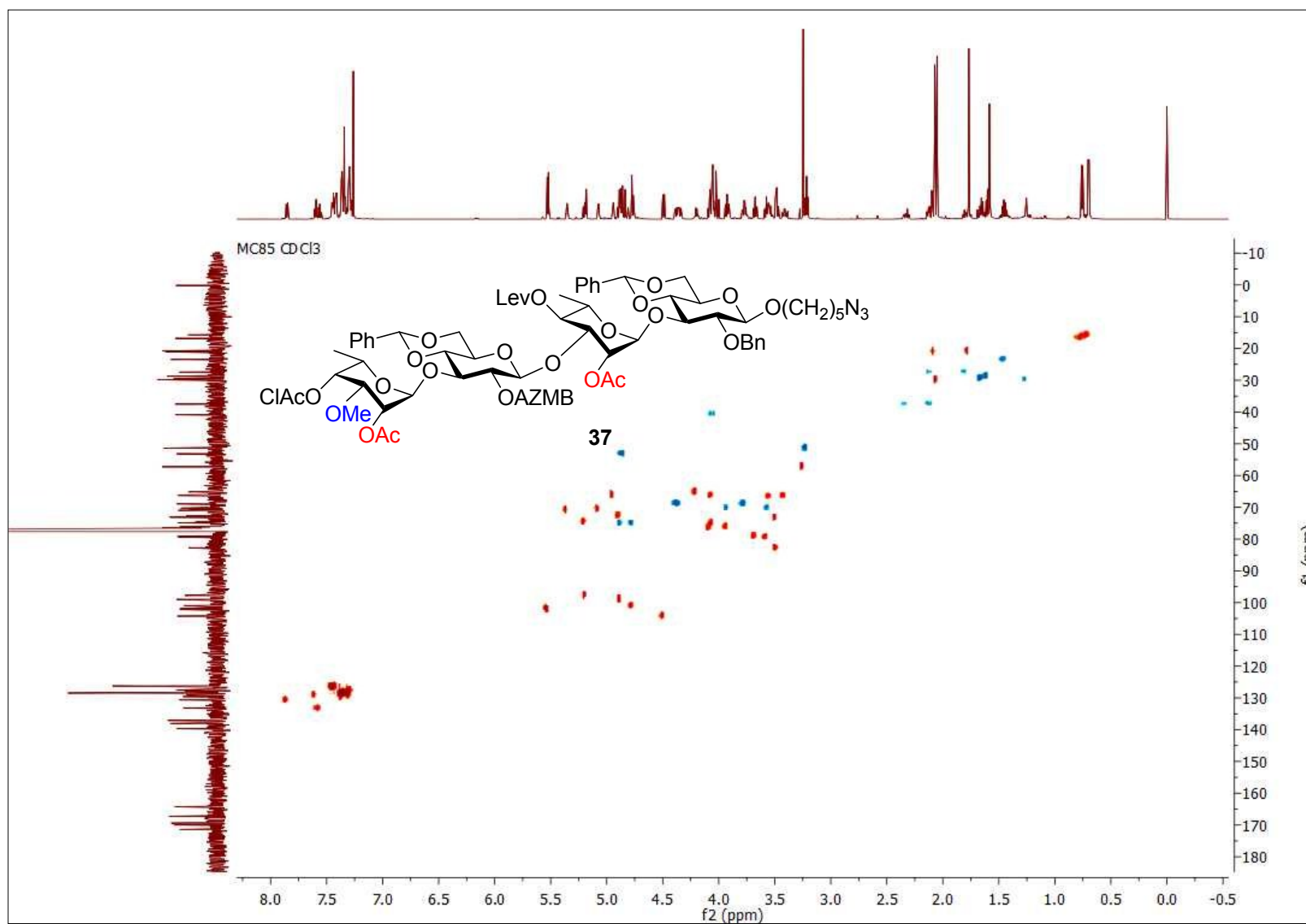
Supplementary Figure 98 | COSY NMR spectrum (CDCl₃, 600 MHz) of compound 37



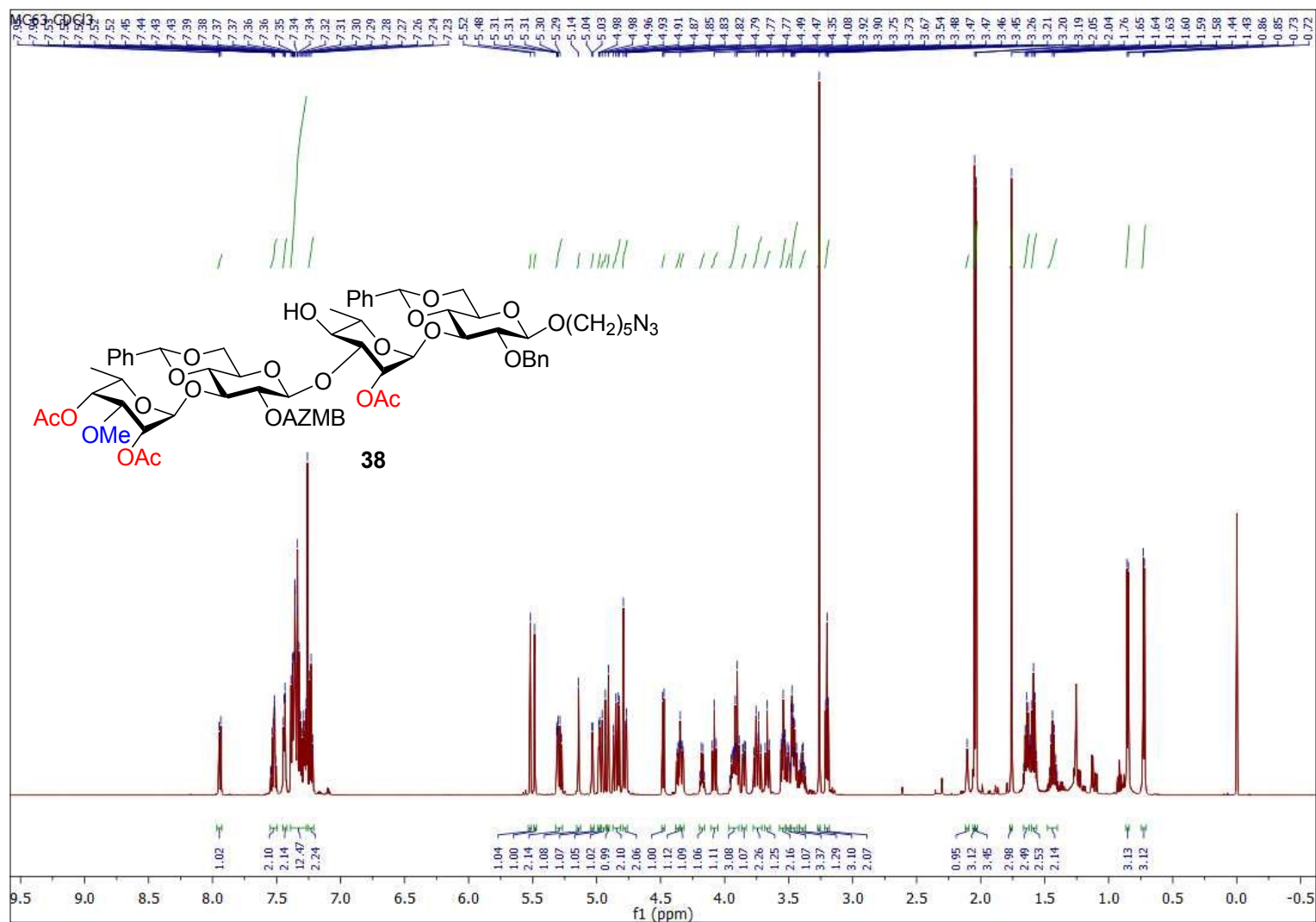
Supplementary Figure 99 | ^{13}C NMR spectrum (CDCl_3 , 150 MHz) of compound 37



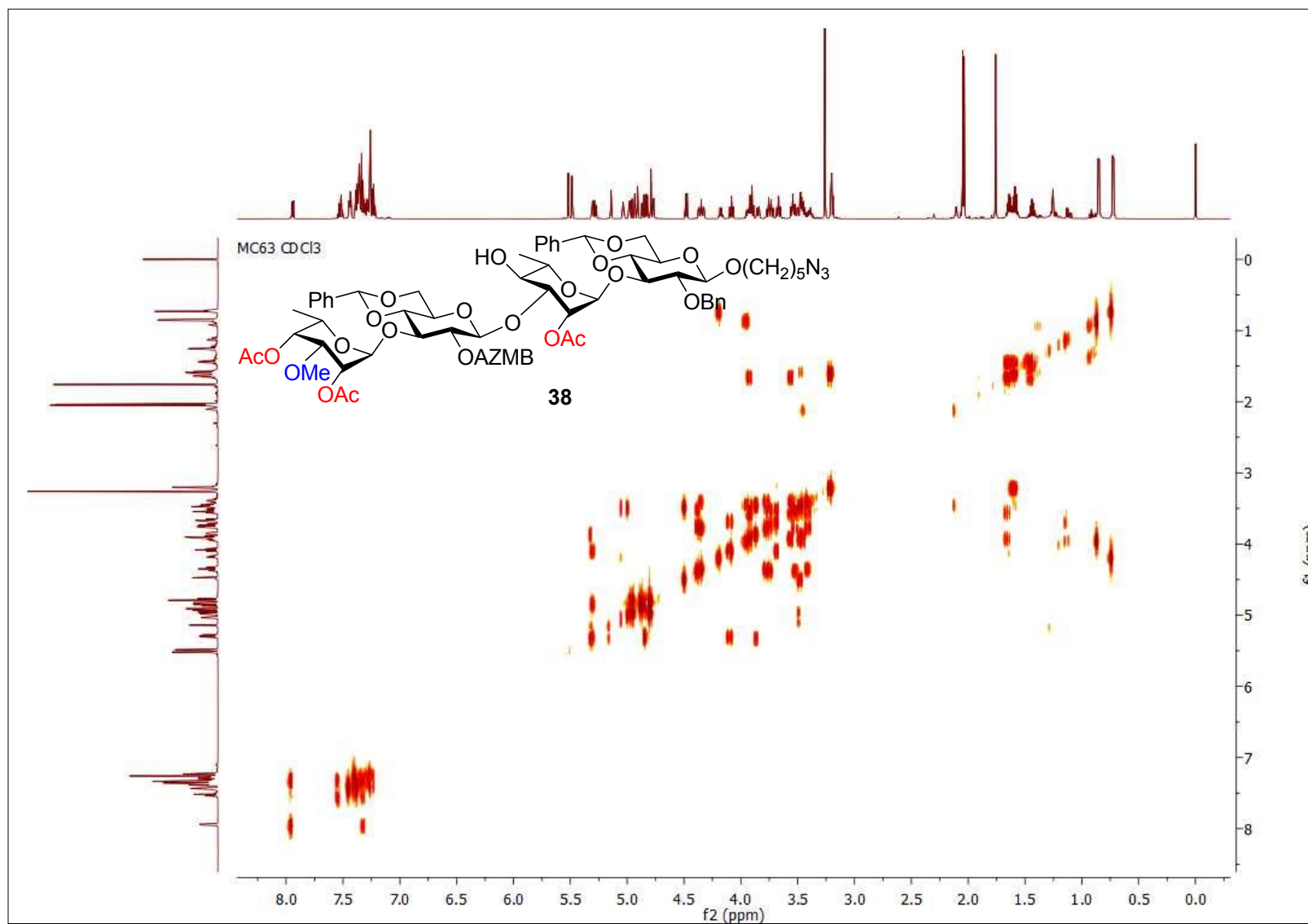
Supplementary Figure 100 | HSQC NMR spectrum (CDCl₃, 600 MHz) of compound 37



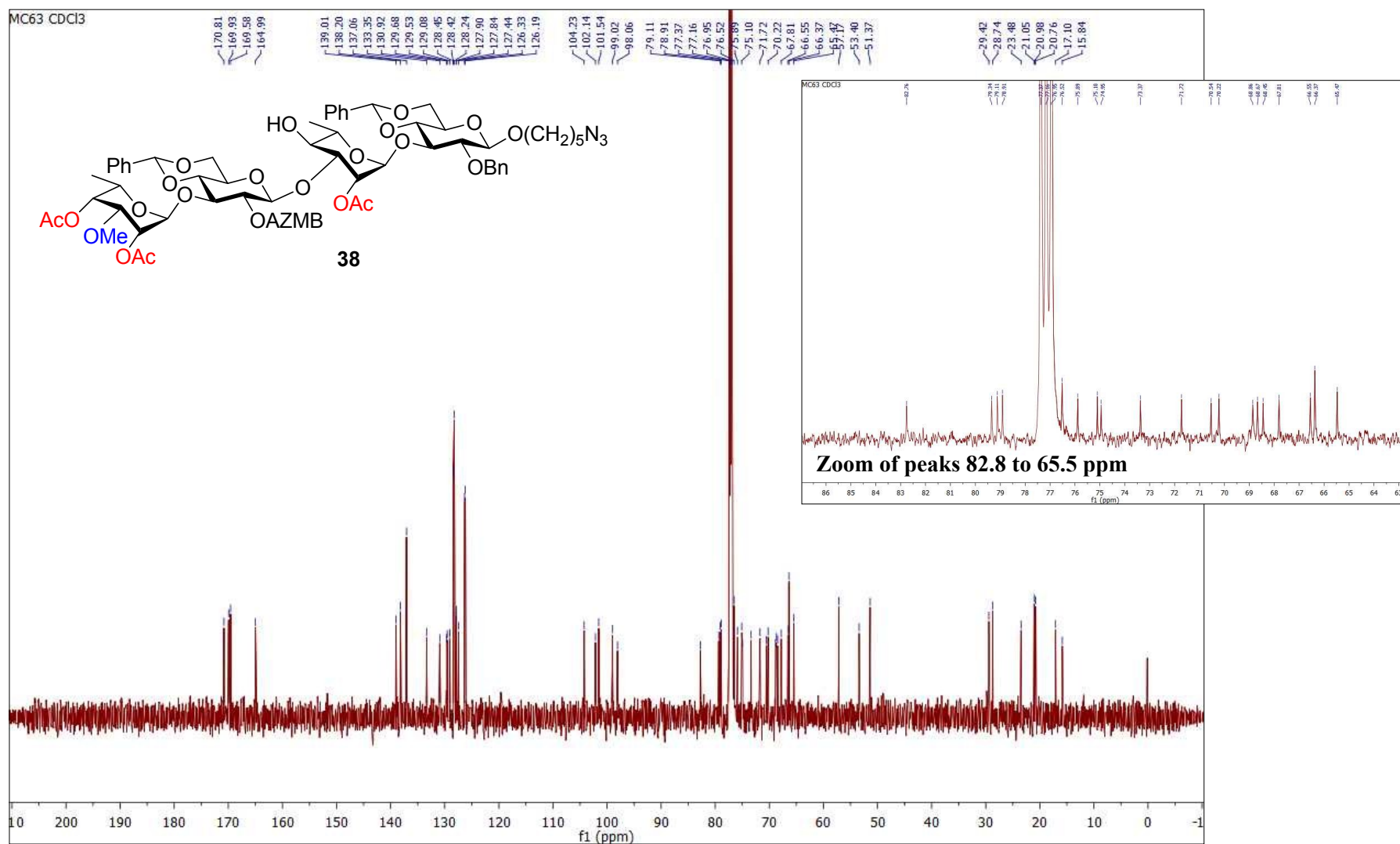
Supplementary Figure 101 | ^1H NMR spectrum (CDCl_3 , 600 MHz) of compound 38



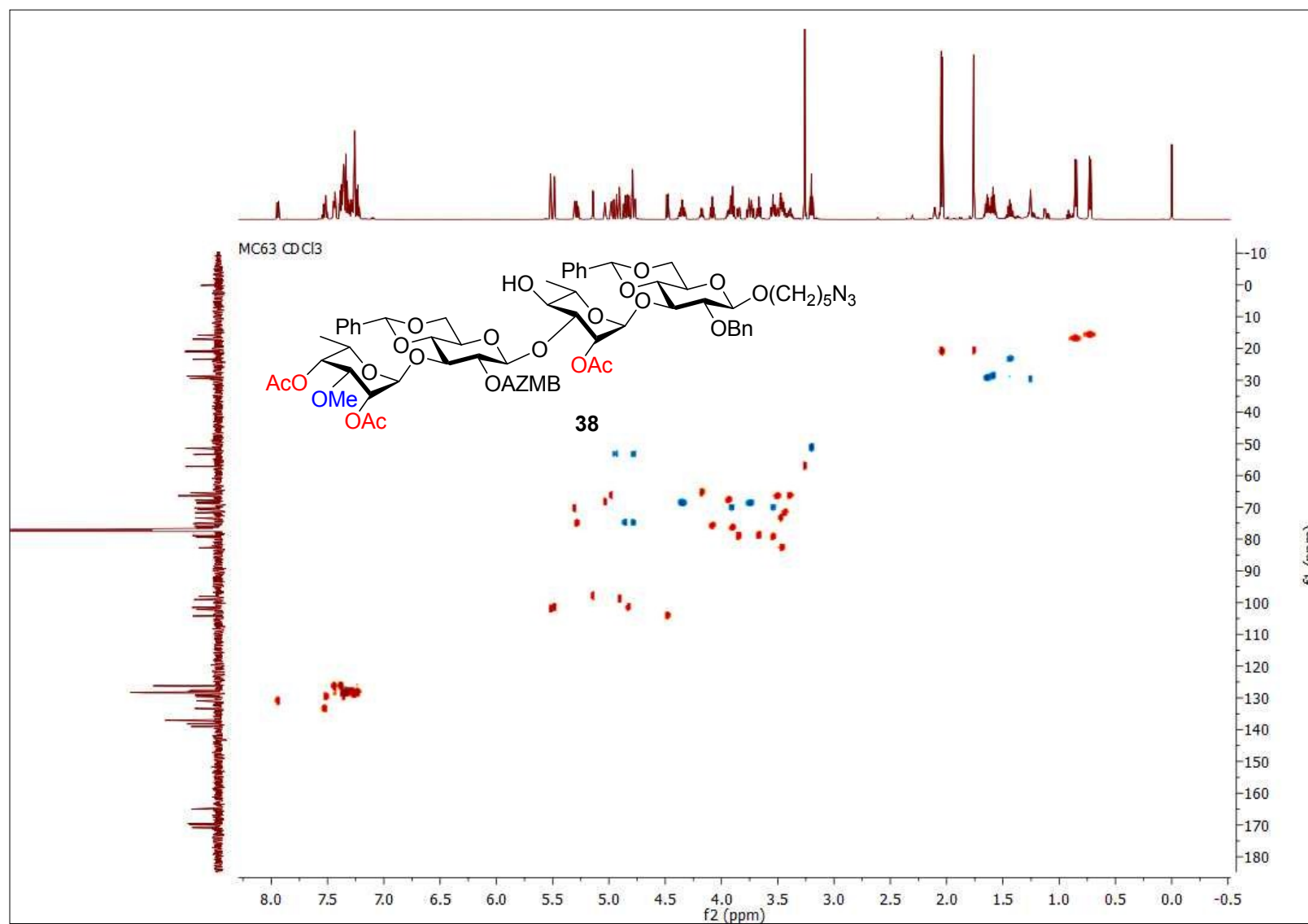
Supplementary Figure 102 | COSY NMR spectrum (CDCl₃, 600 MHz) of compound 38



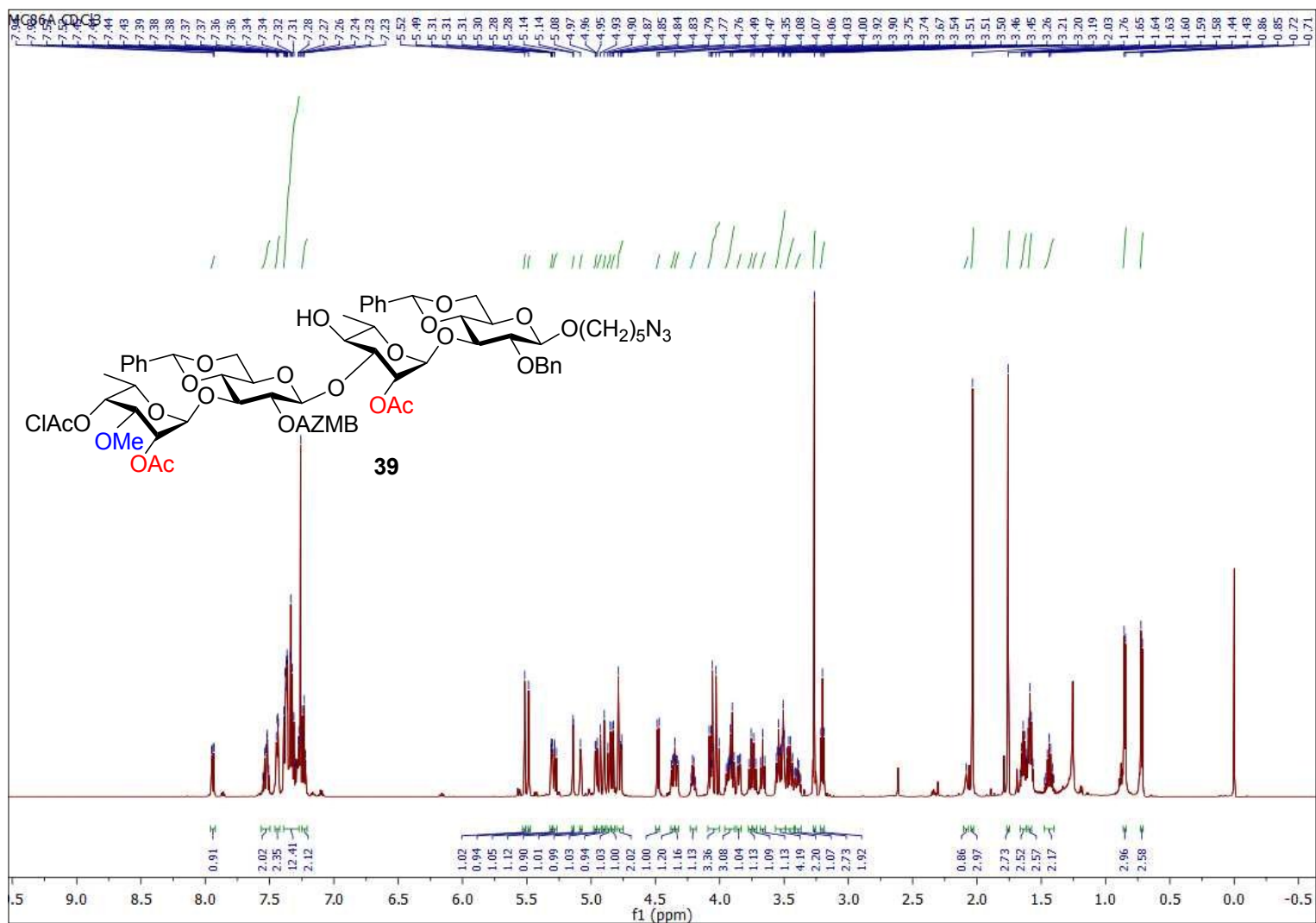
Supplementary Figure 103 | ^{13}C NMR spectrum (CDCl_3 , 150 MHz) of compound 38



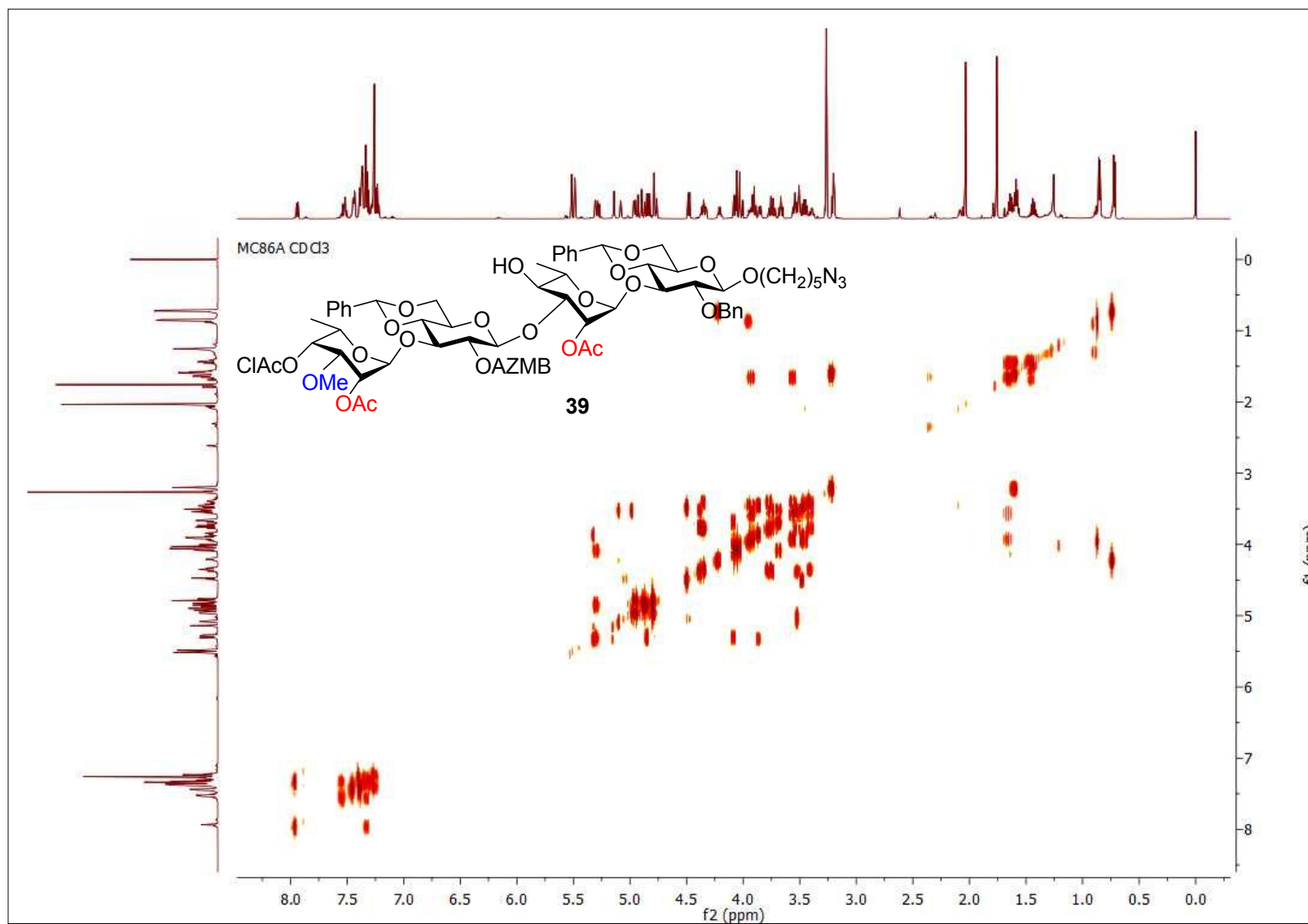
Supplementary Figure 104 | HSQC NMR spectrum (CDCl₃, 600 MHz) of compound 38



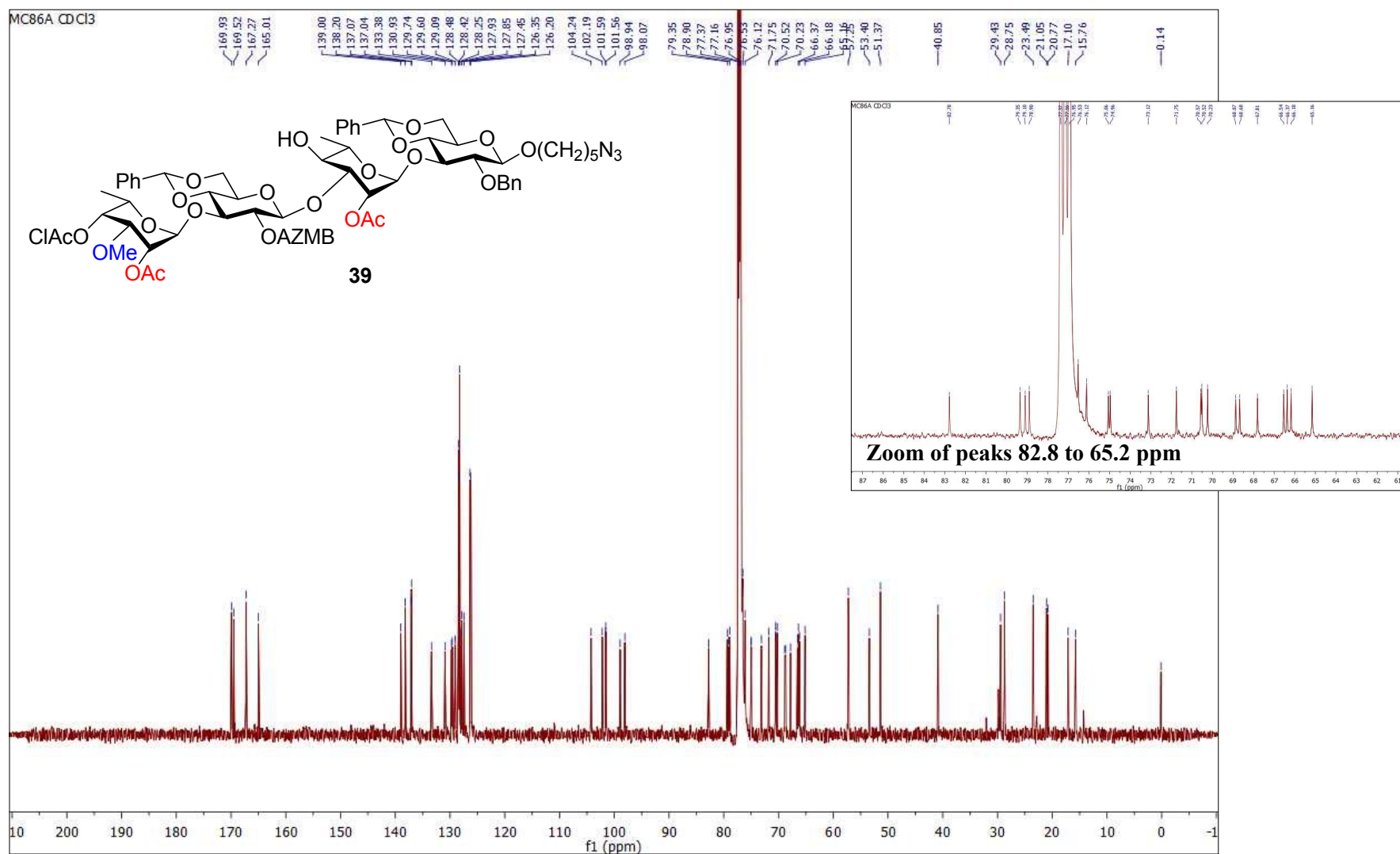
Supplementary Figure 105 | ^1H NMR spectrum (CDCl_3 , 600 MHz) of compound 39



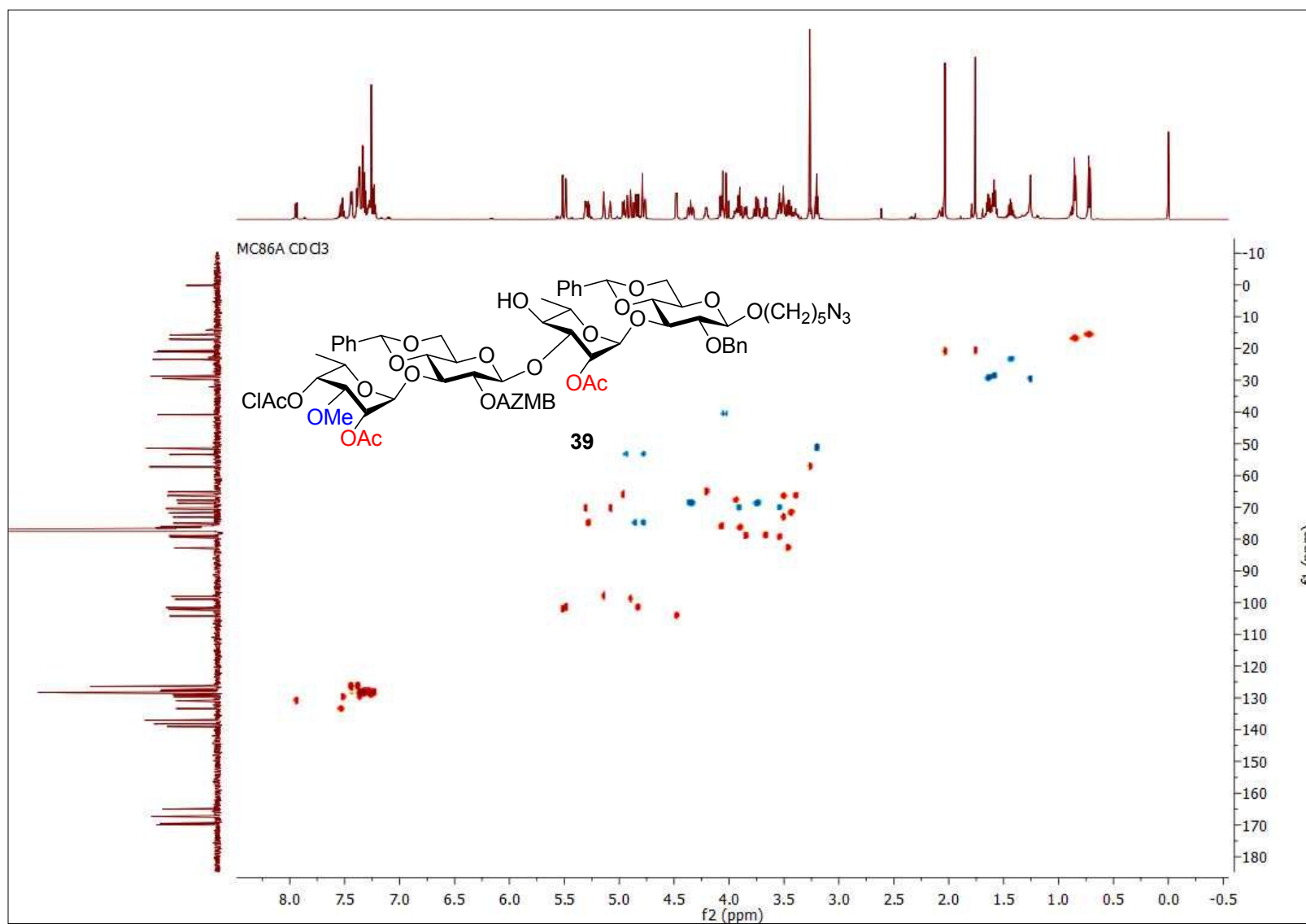
Supplementary Figure 106 | COSY NMR spectrum (CDCl₃, 600 MHz) of compound 39



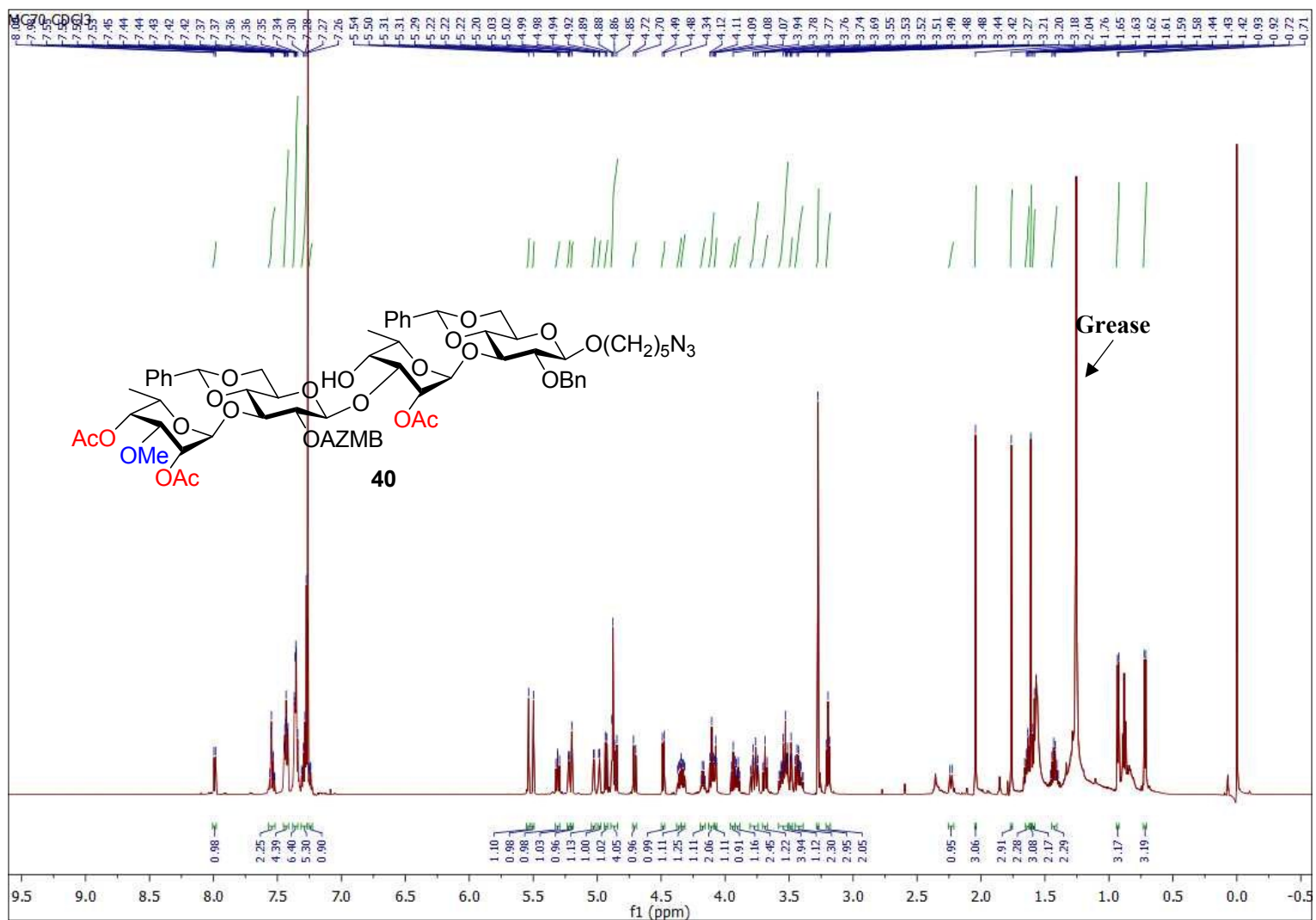
Supplementary Figure 107 | ^{13}C NMR spectrum (CDCl_3 , 150 MHz) of compound 39



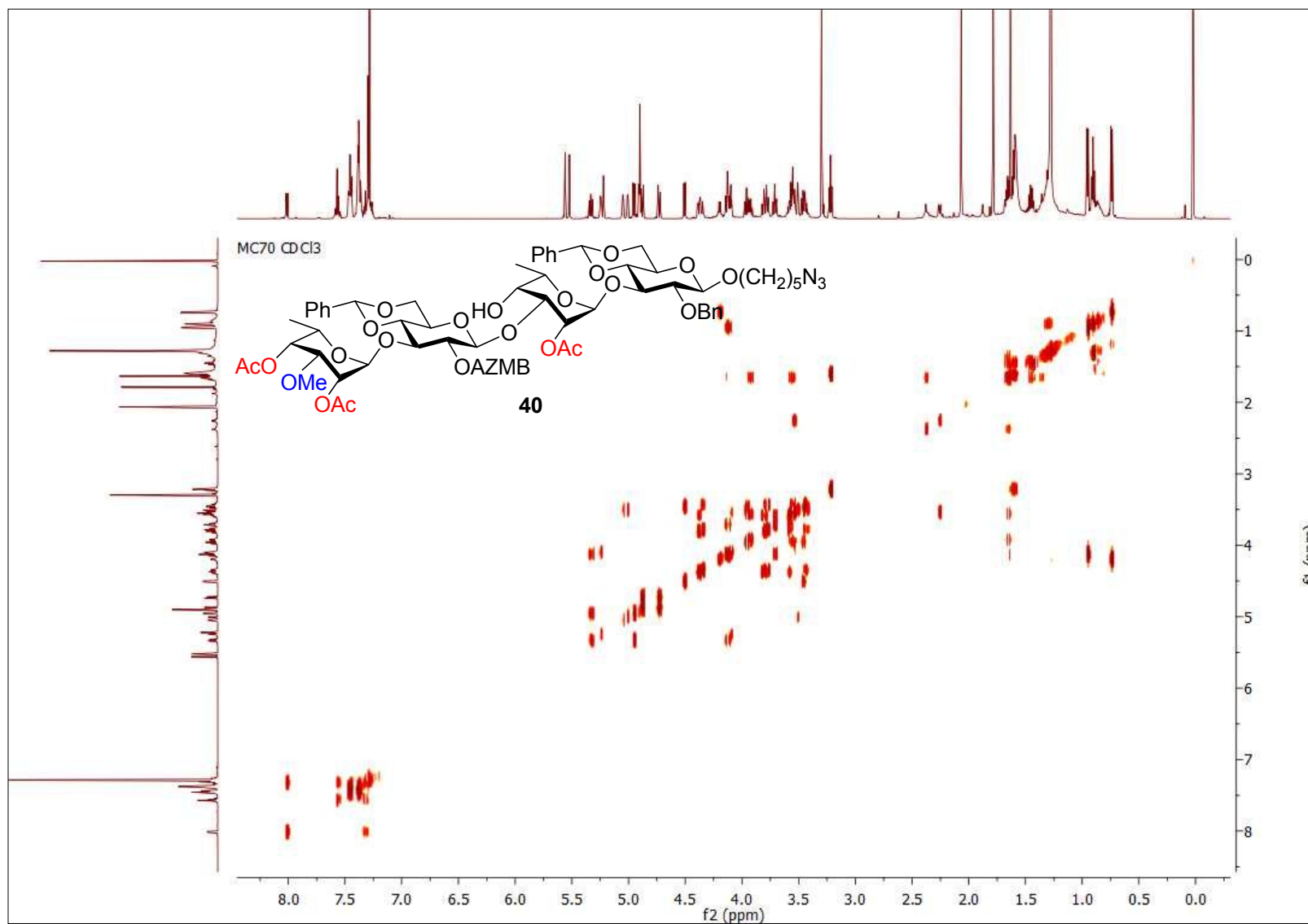
Supplementary Figure 108 | HSQC NMR spectrum (CDCl₃, 600 MHz) of compound 39



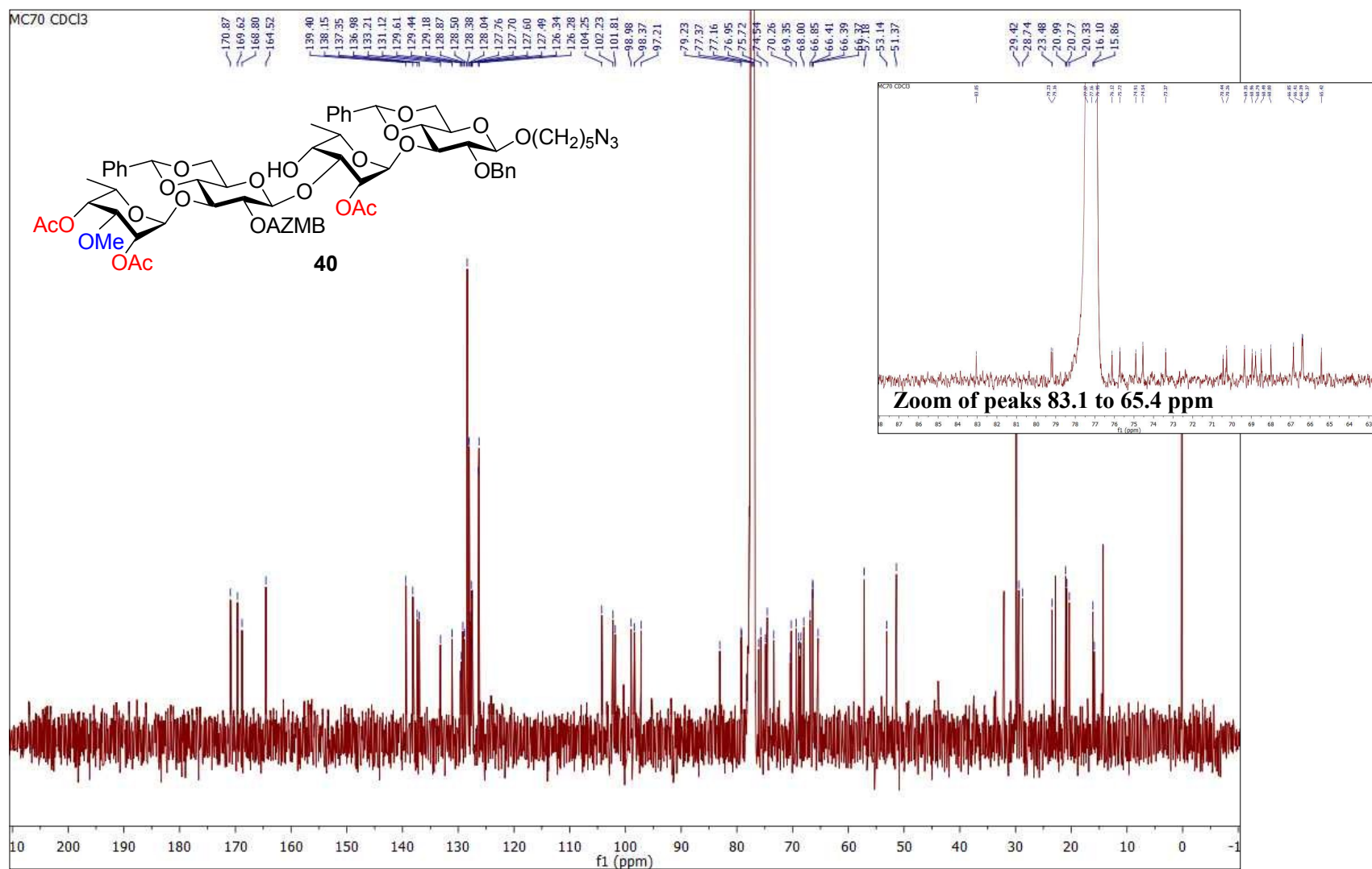
Supplementary Figure 109 | ^1H NMR spectrum (CDCl_3 , 600 MHz) of compound 40



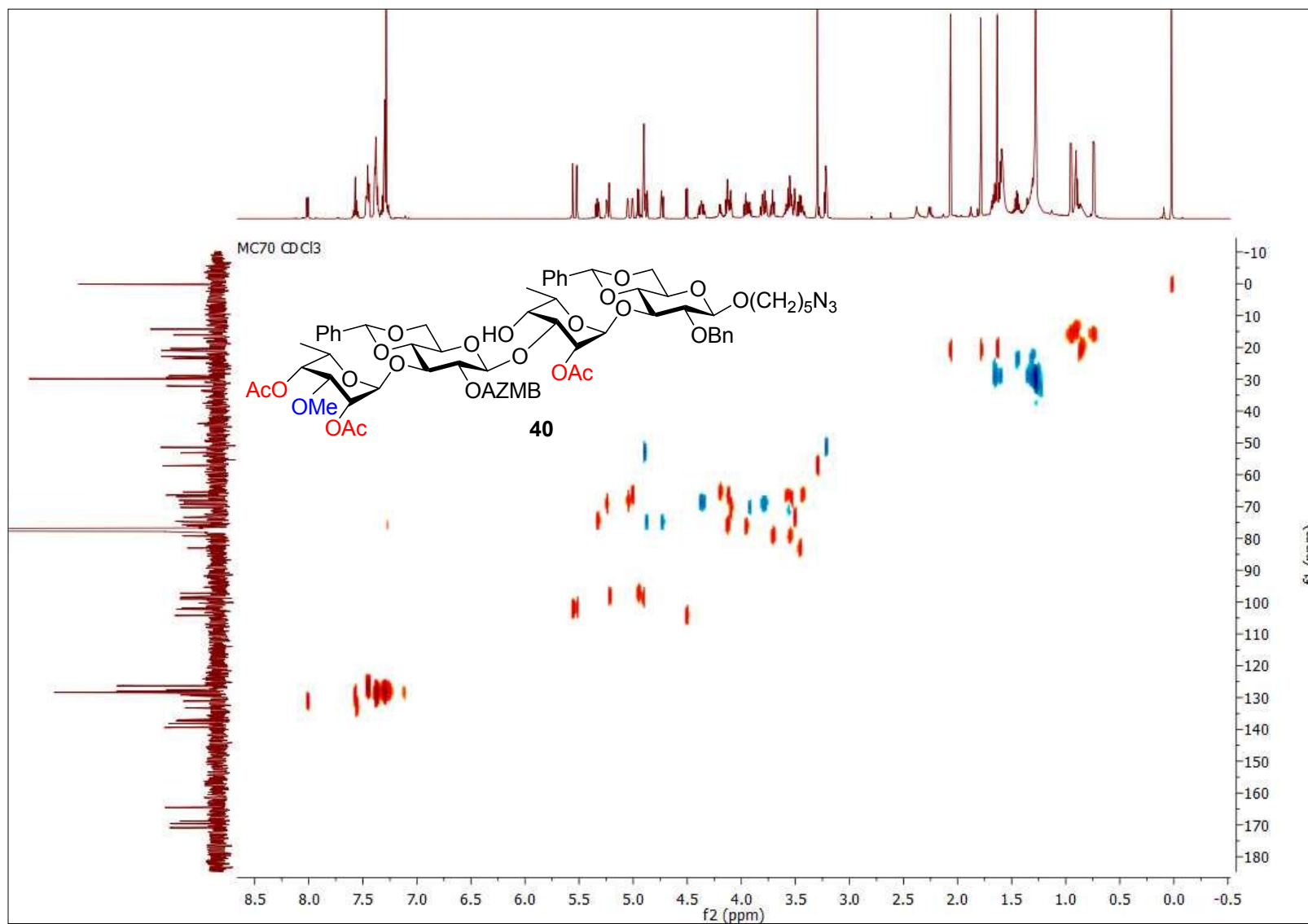
Supplementary Figure 110 | COSY NMR spectrum (CDCl₃, 600 MHz) of compound 40



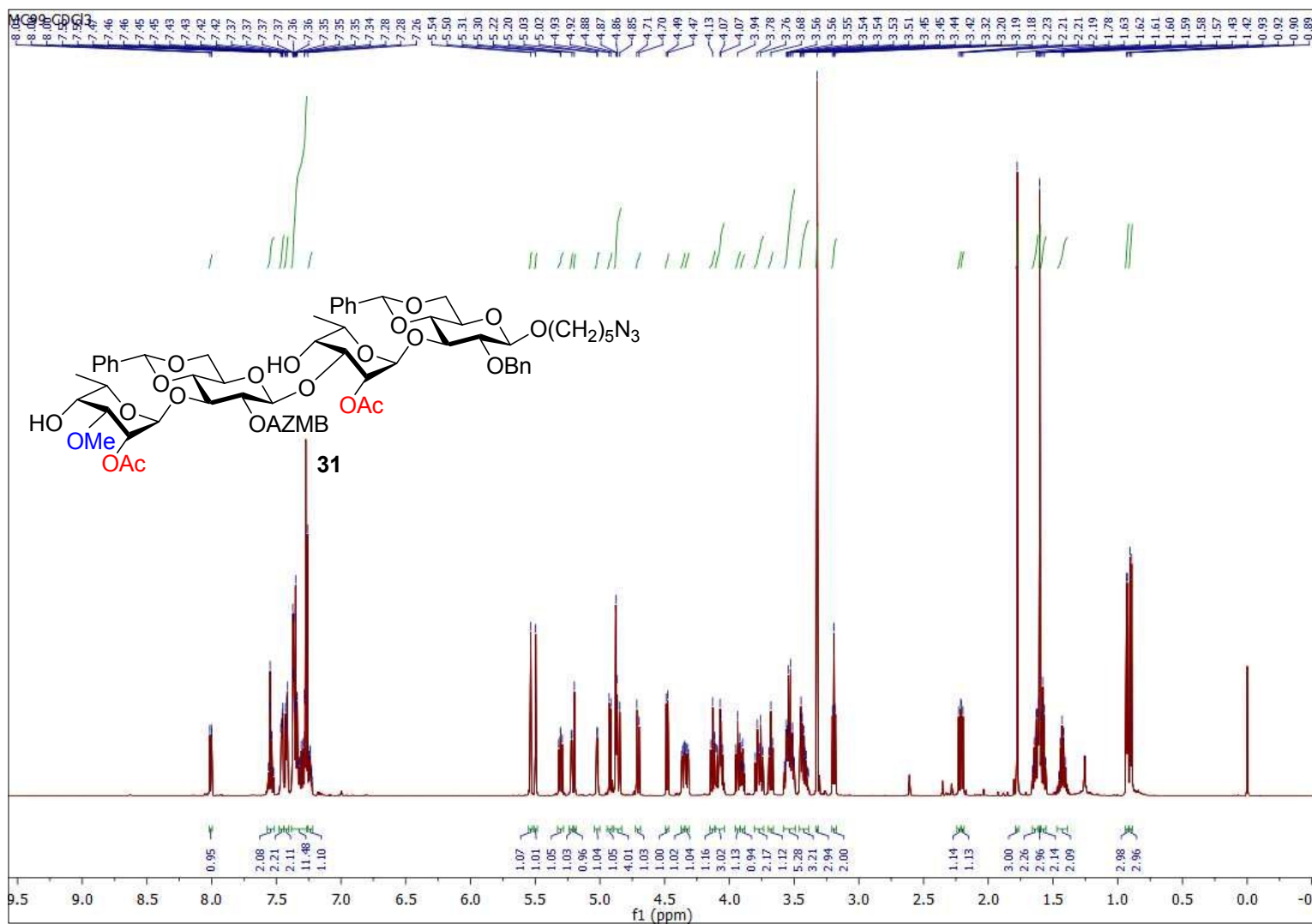
Supplementary Figure 111 | ^{13}C NMR spectrum (CDCl_3 , 150 MHz) of compound 40



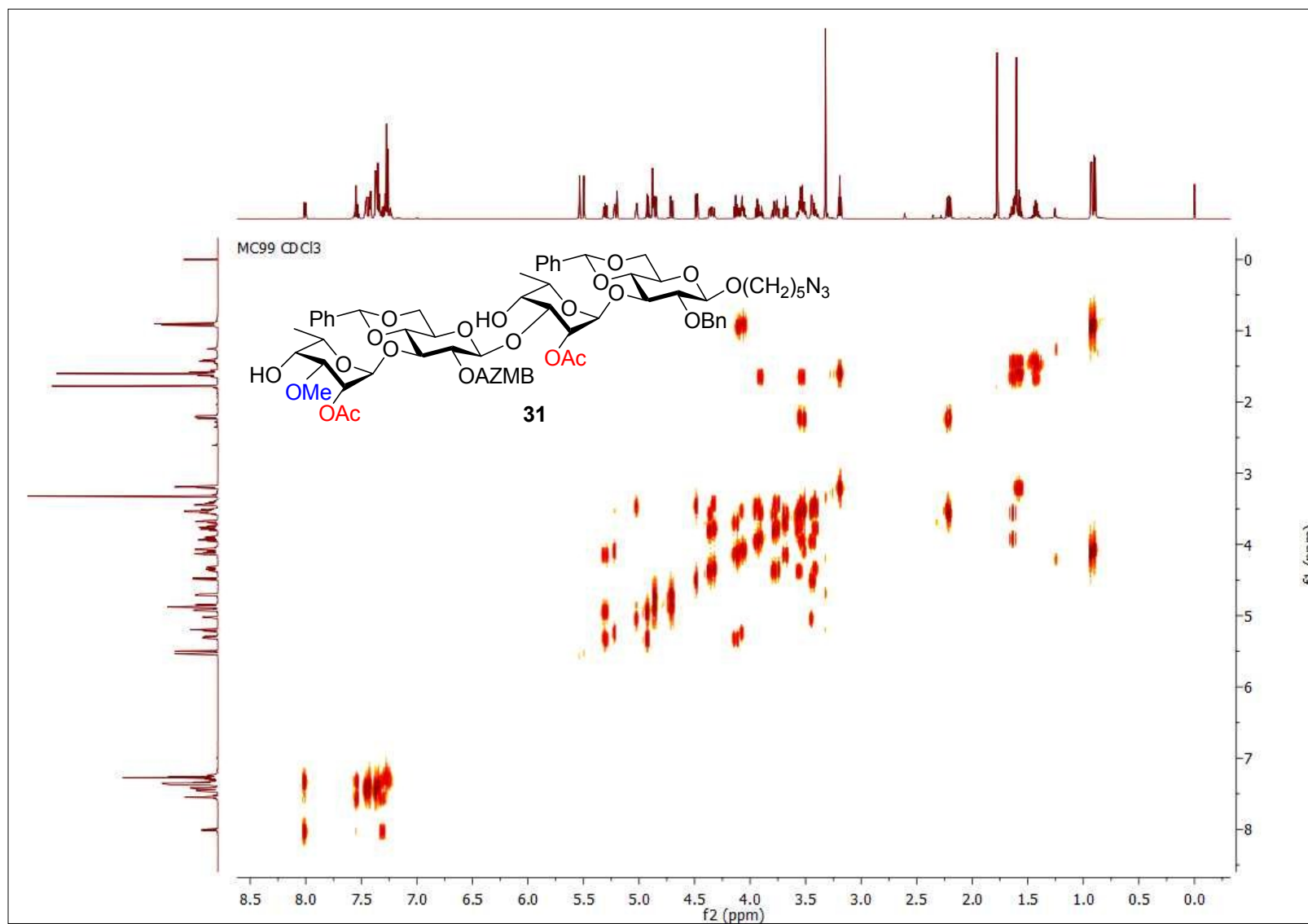
Supplementary Figure 112 | HSQC NMR spectrum (CDCl₃, 600 MHz) of compound 40



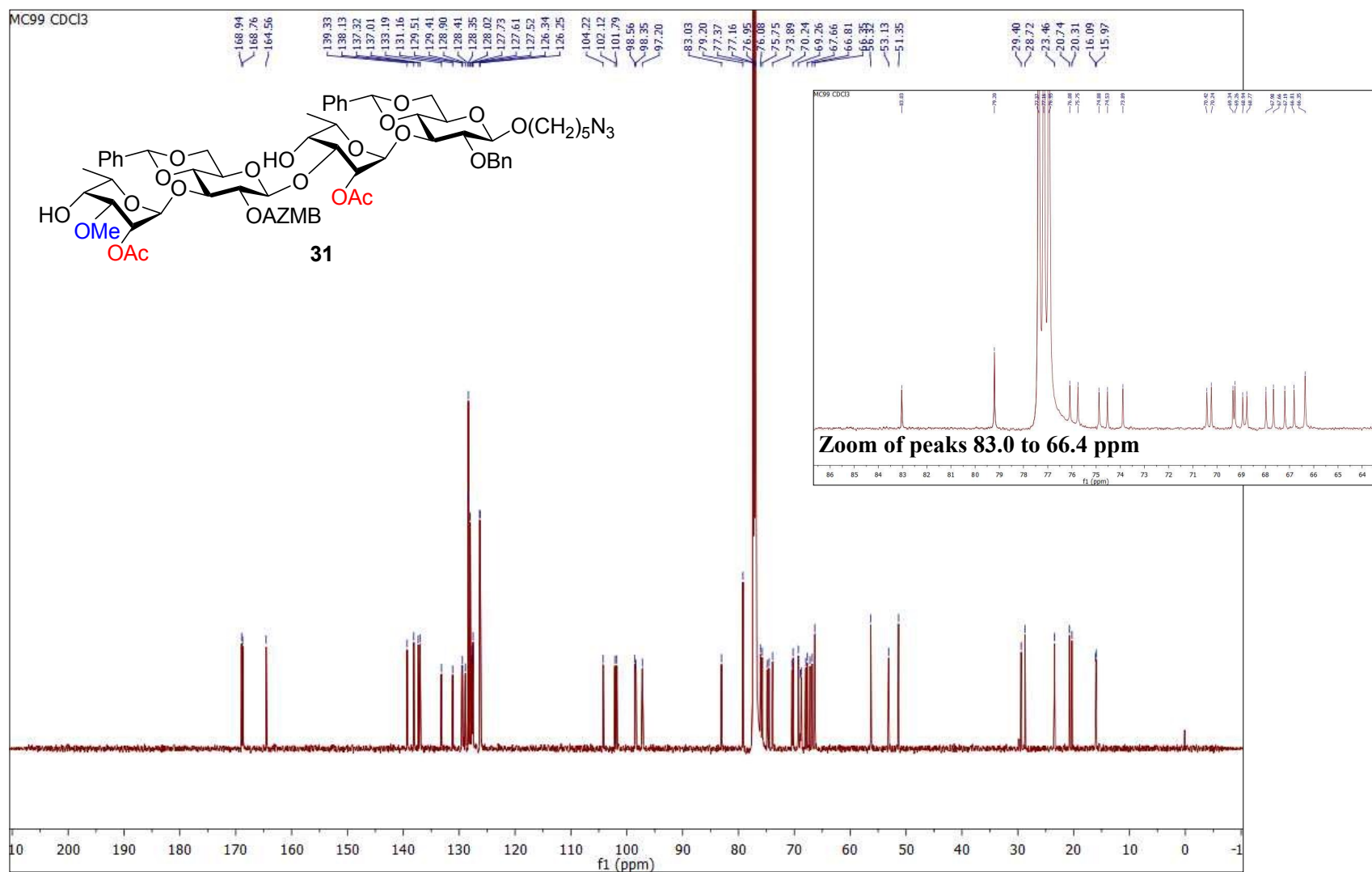
Supplementary Figure 113 | ^1H NMR spectrum (CDCl_3 , 600 MHz) of compound 31



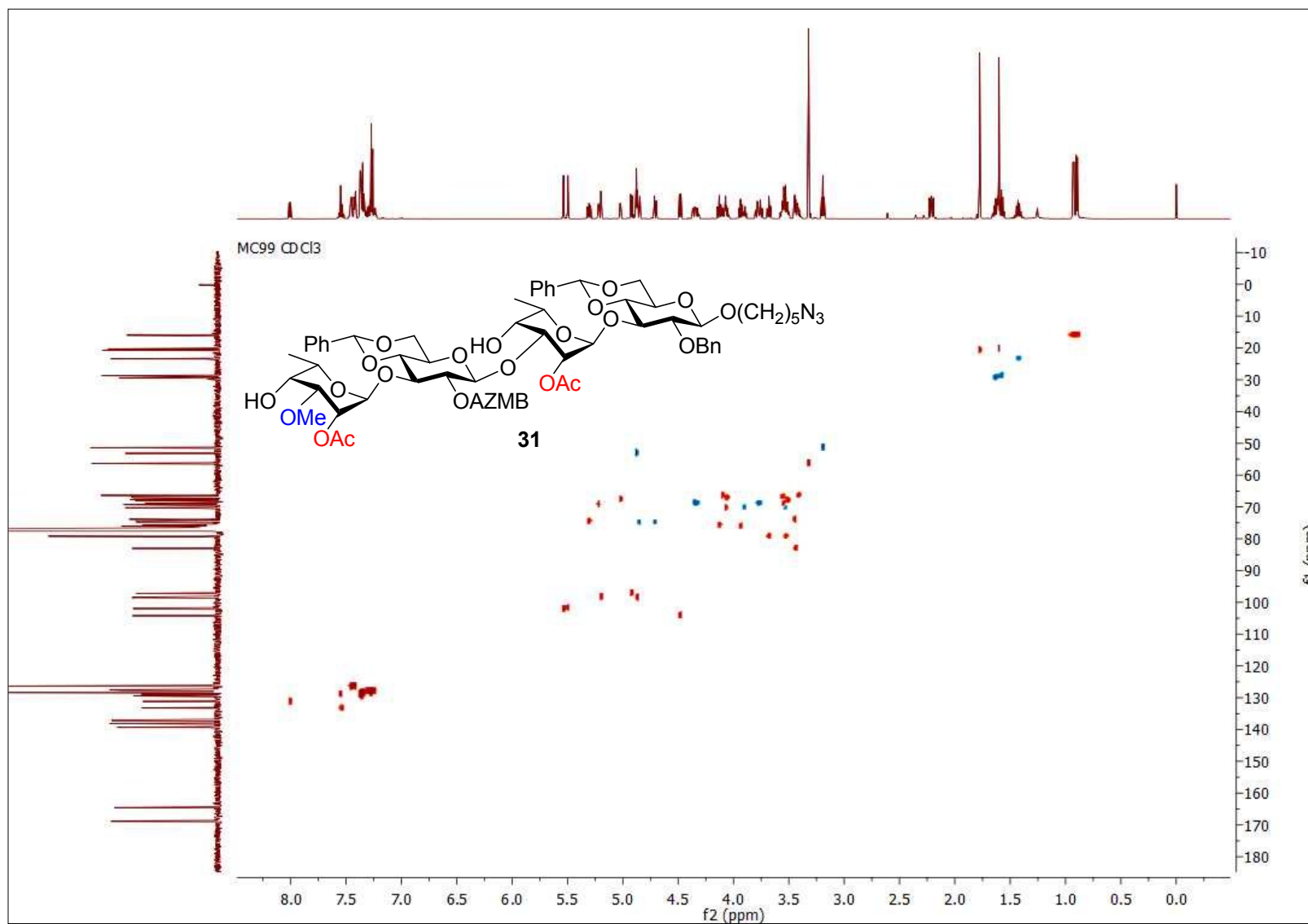
Supplementary Figure 114 | COSY NMR spectrum (CDCl₃, 600 MHz) of compound 31



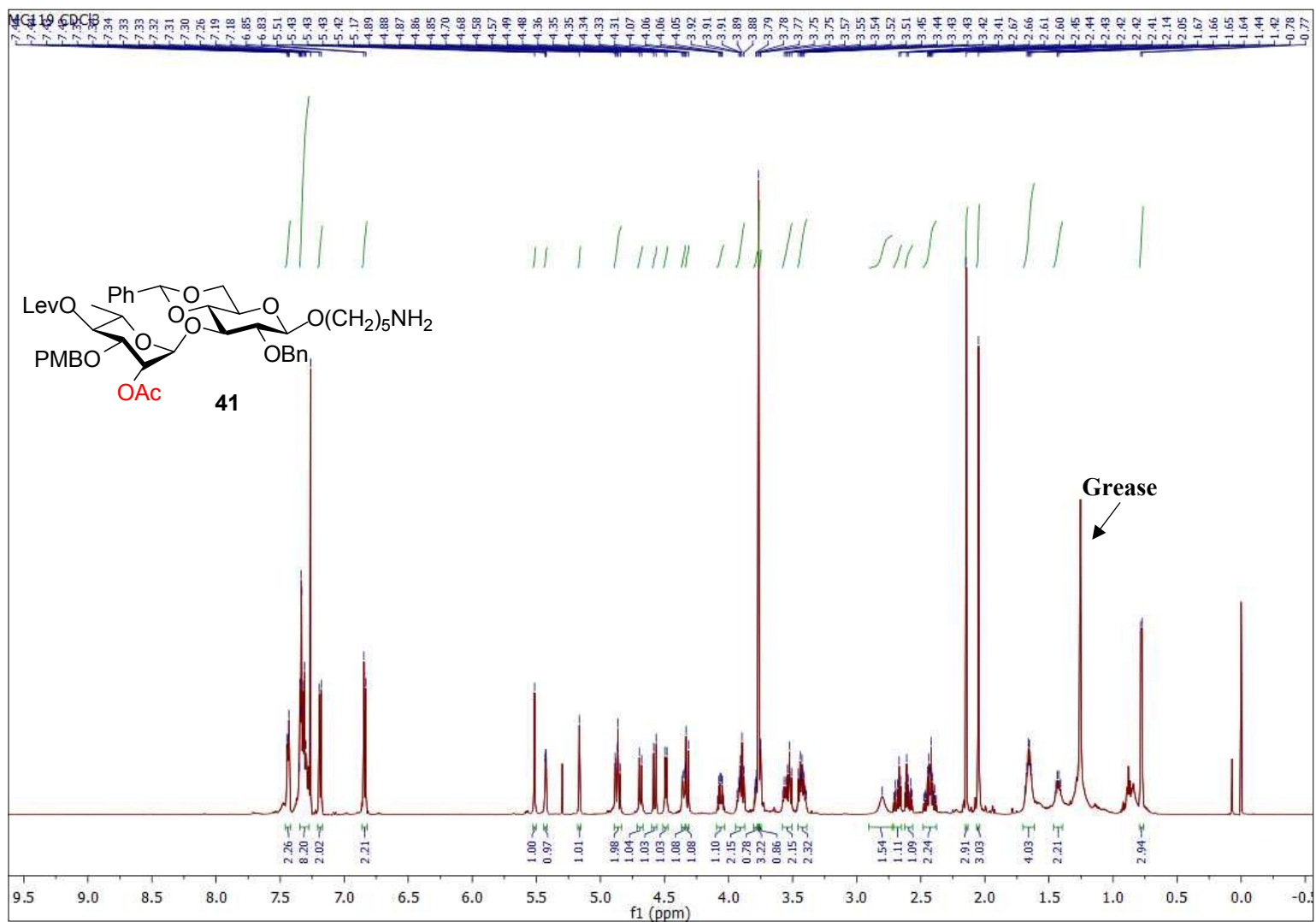
Supplementary Figure 115 | ^{13}C NMR spectrum (CDCl_3 , 150 MHz) of compound 31



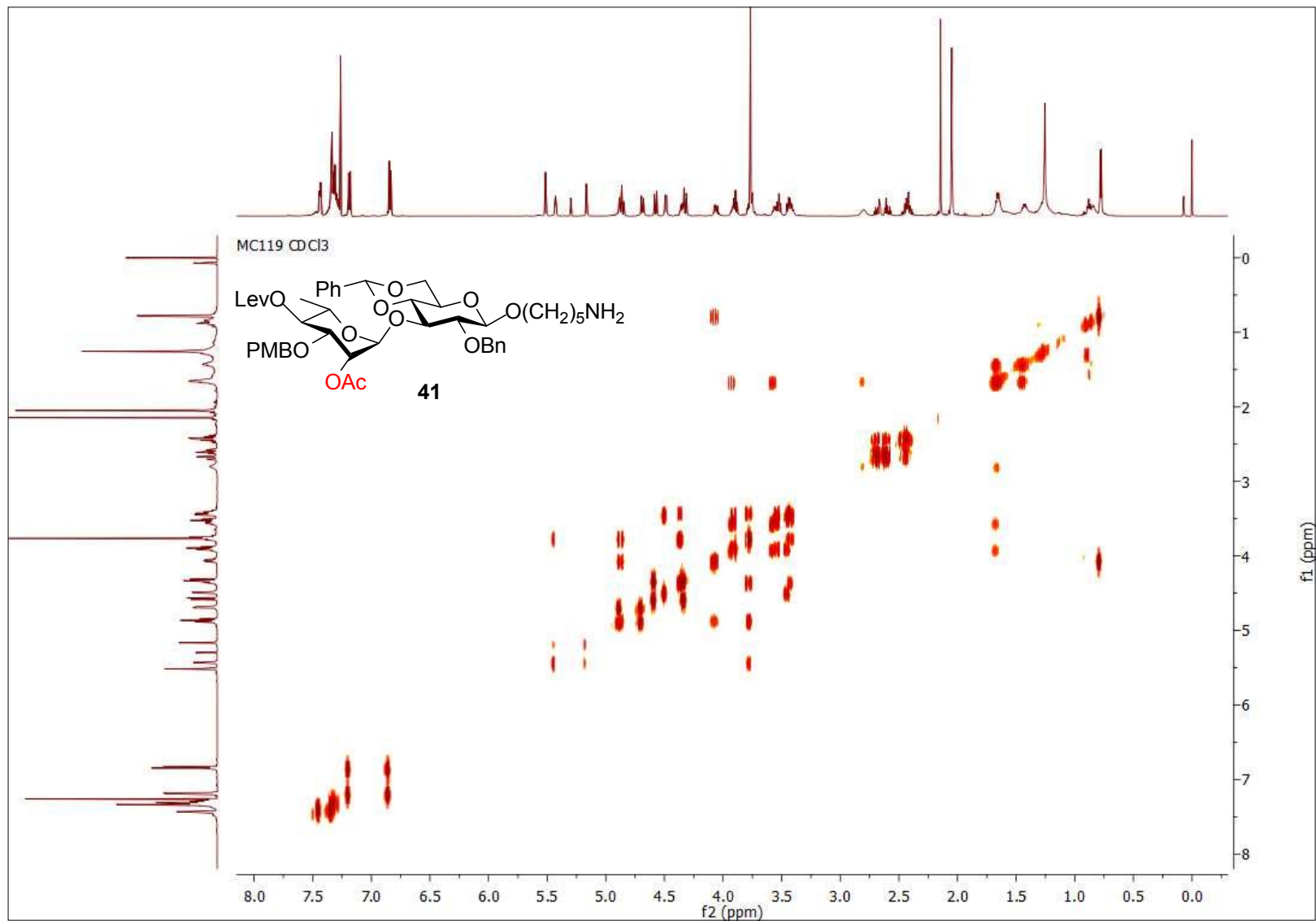
Supplementary Figure 116 | HSQC NMR spectrum (CDCl₃, 600 MHz) of compound 31



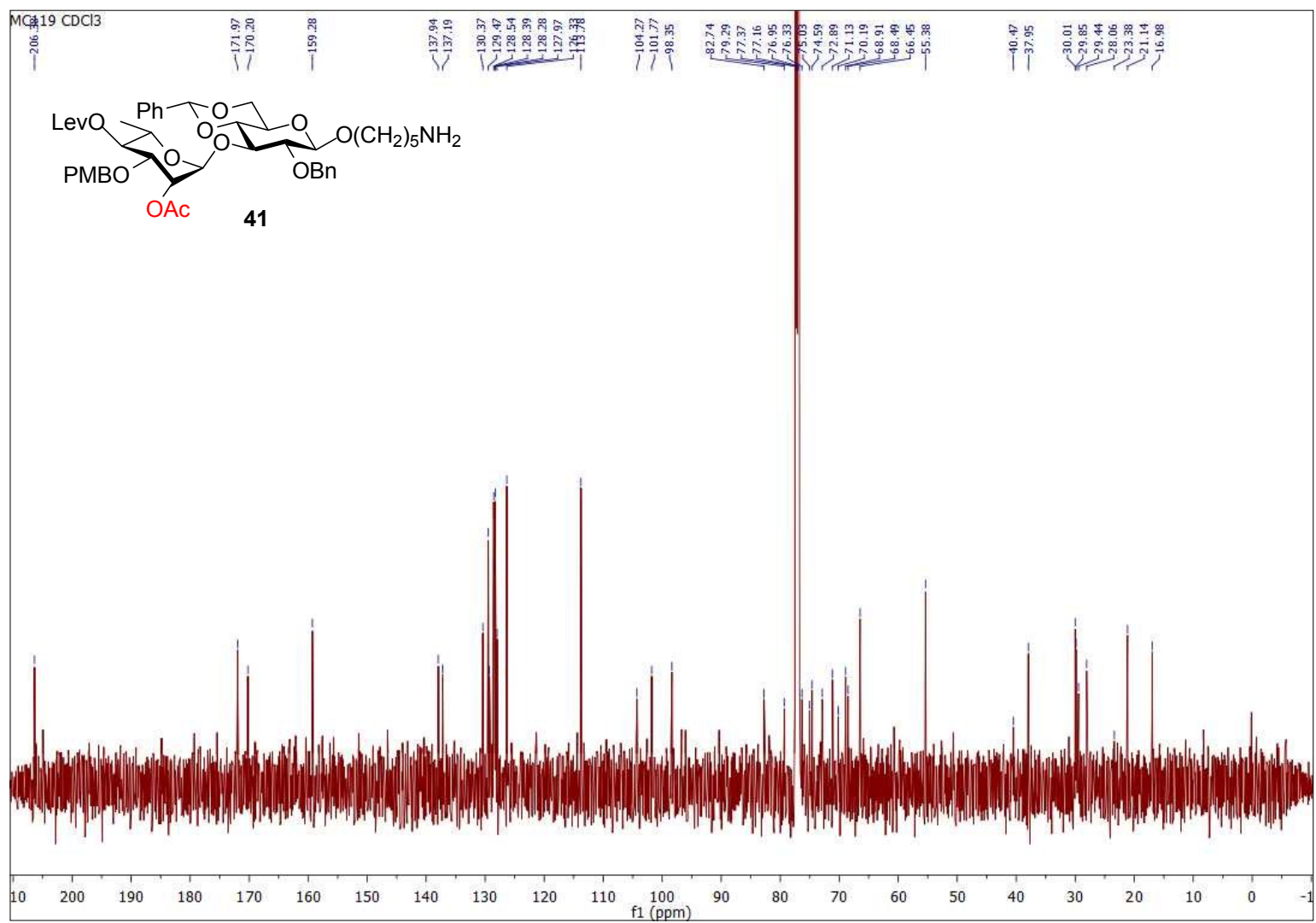
Supplementary Figure 117 | ^1H NMR spectrum (CDCl_3 , 600 MHz) of compound 41



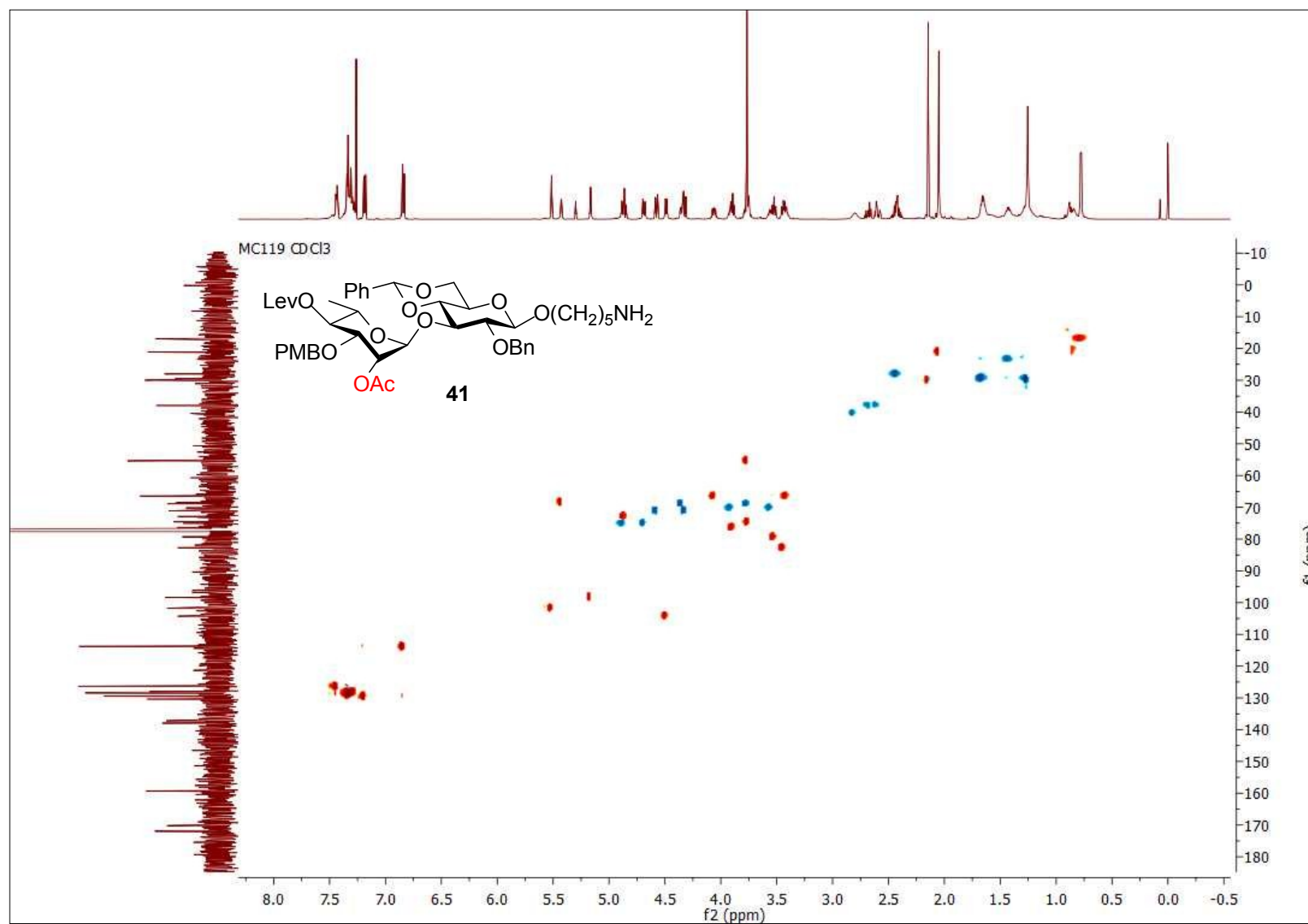
Supplementary Figure 118 | COSY NMR spectrum (CDCl₃, 600 MHz) of compound 41



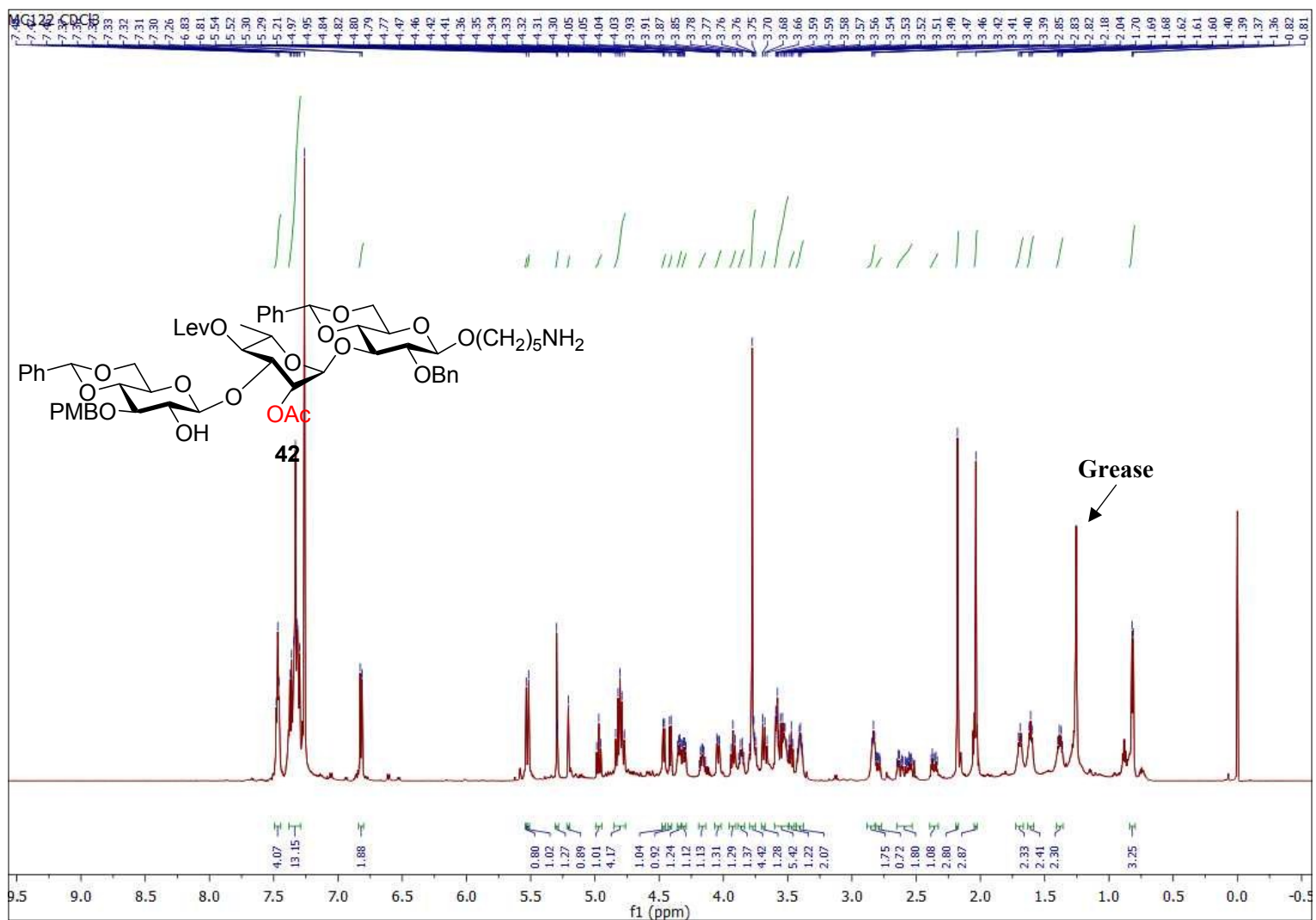
Supplementary Figure 119 | ^{13}C NMR spectrum (CDCl_3 , 150 MHz) of compound 41



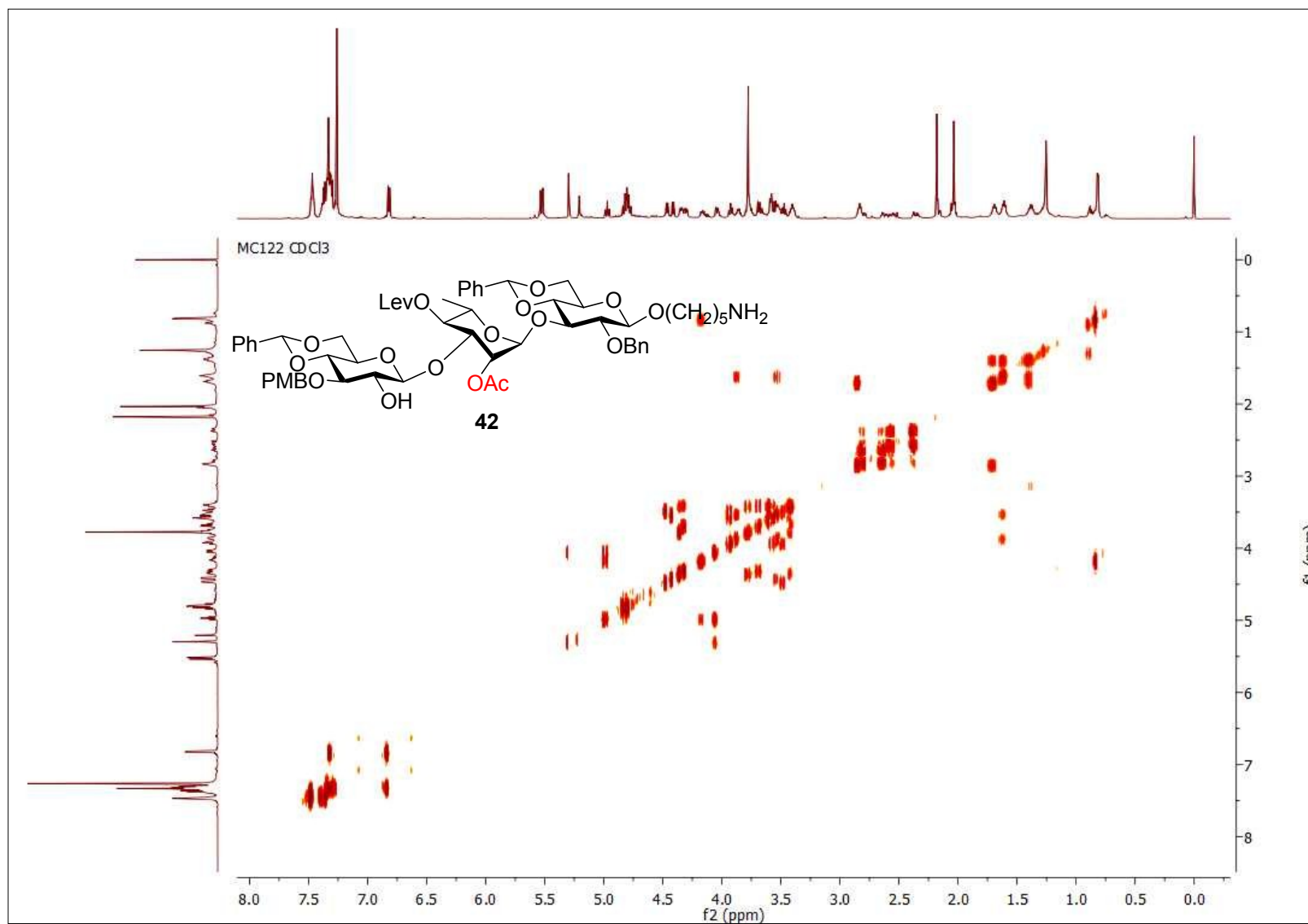
Supplementary Figure 120 | HSQC NMR spectrum (CDCl₃, 600 MHz) of compound 41



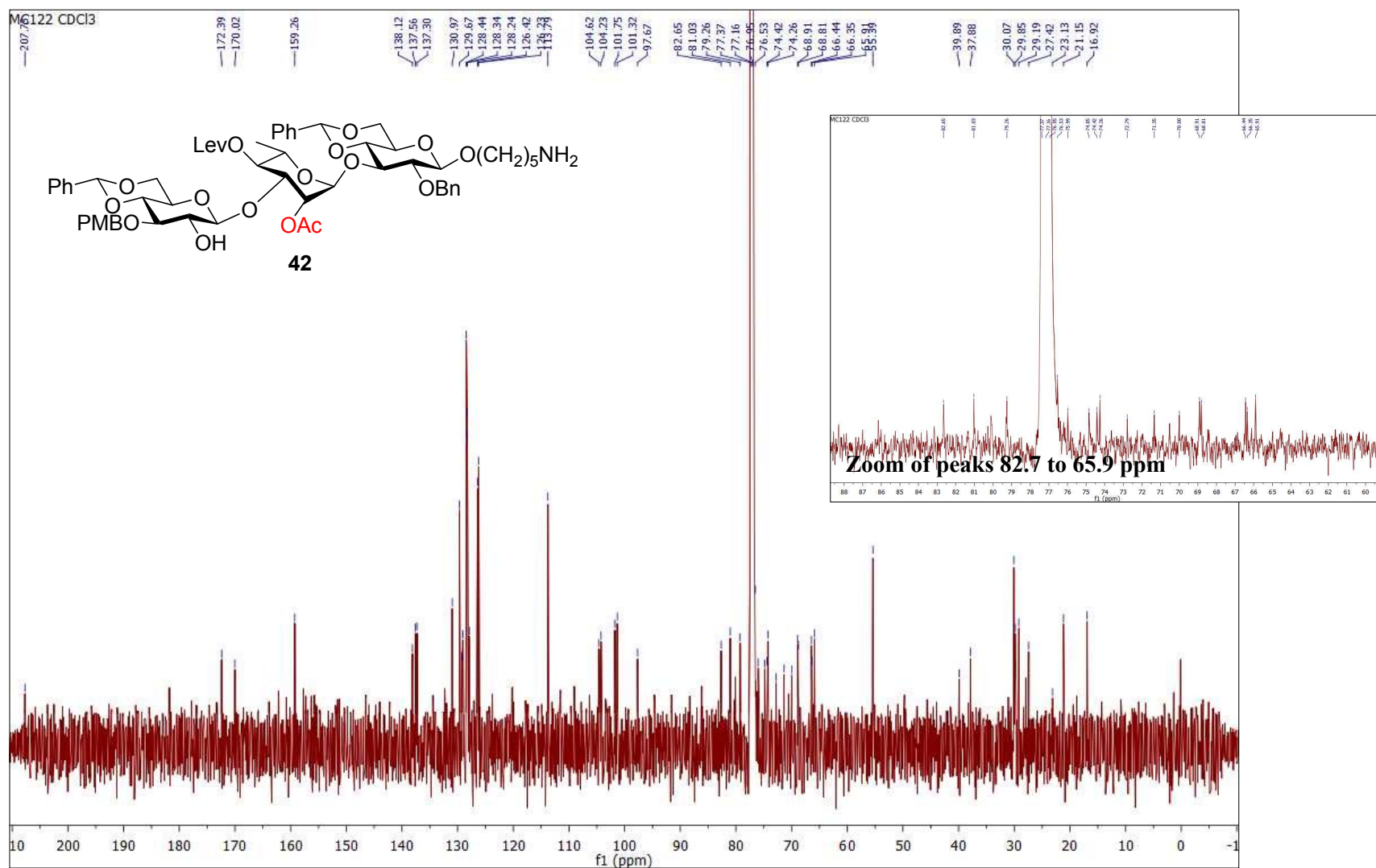
Supplementary Figure 121 | ^1H NMR spectrum (CDCl_3 , 600 MHz) of compound 42



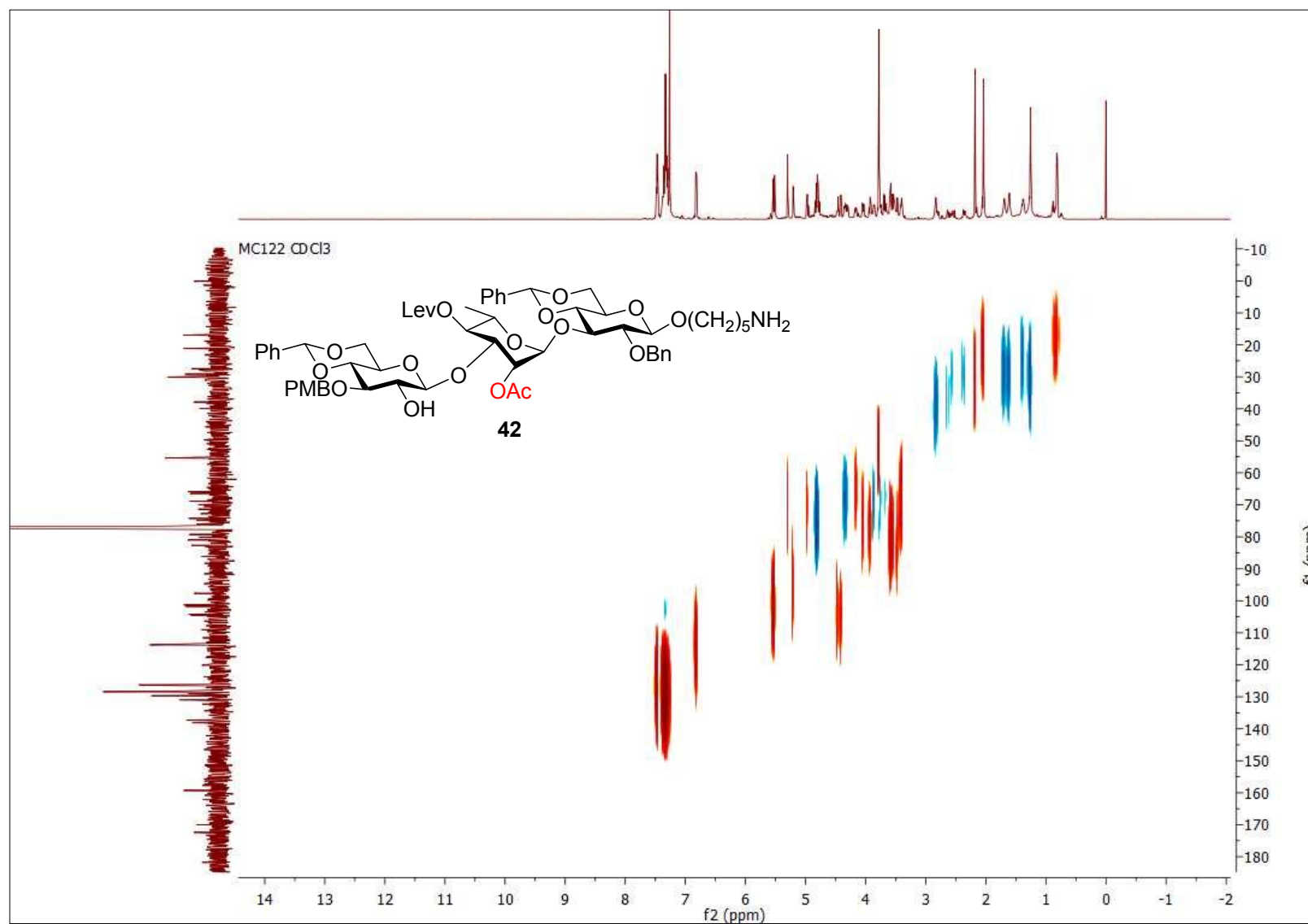
Supplementary Figure 122 | COSY NMR spectrum (CDCl₃, 600 MHz) of compound 42



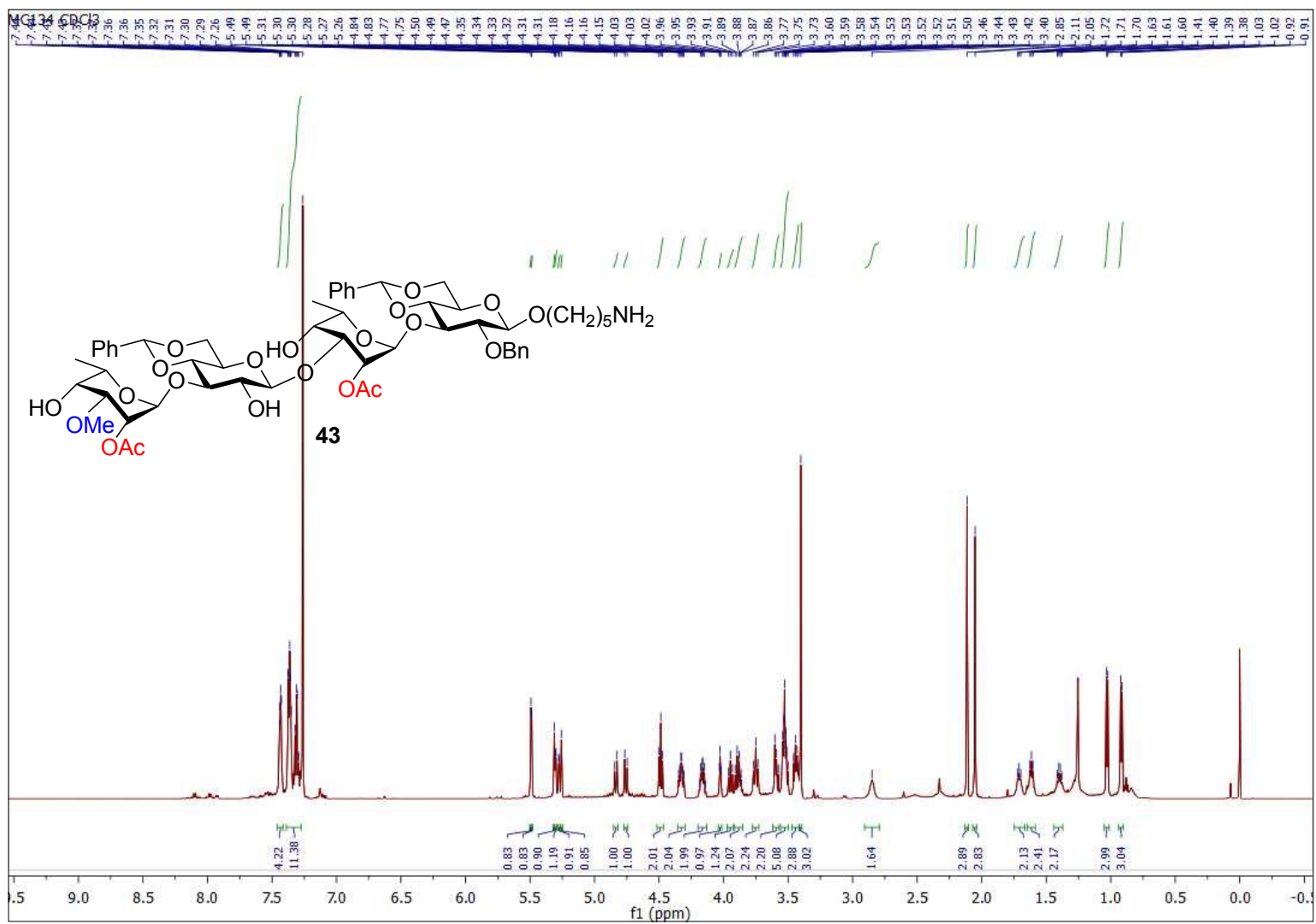
Supplementary Figure 123 | ^{13}C NMR spectrum (CDCl_3 , 150 MHz) of compound 42



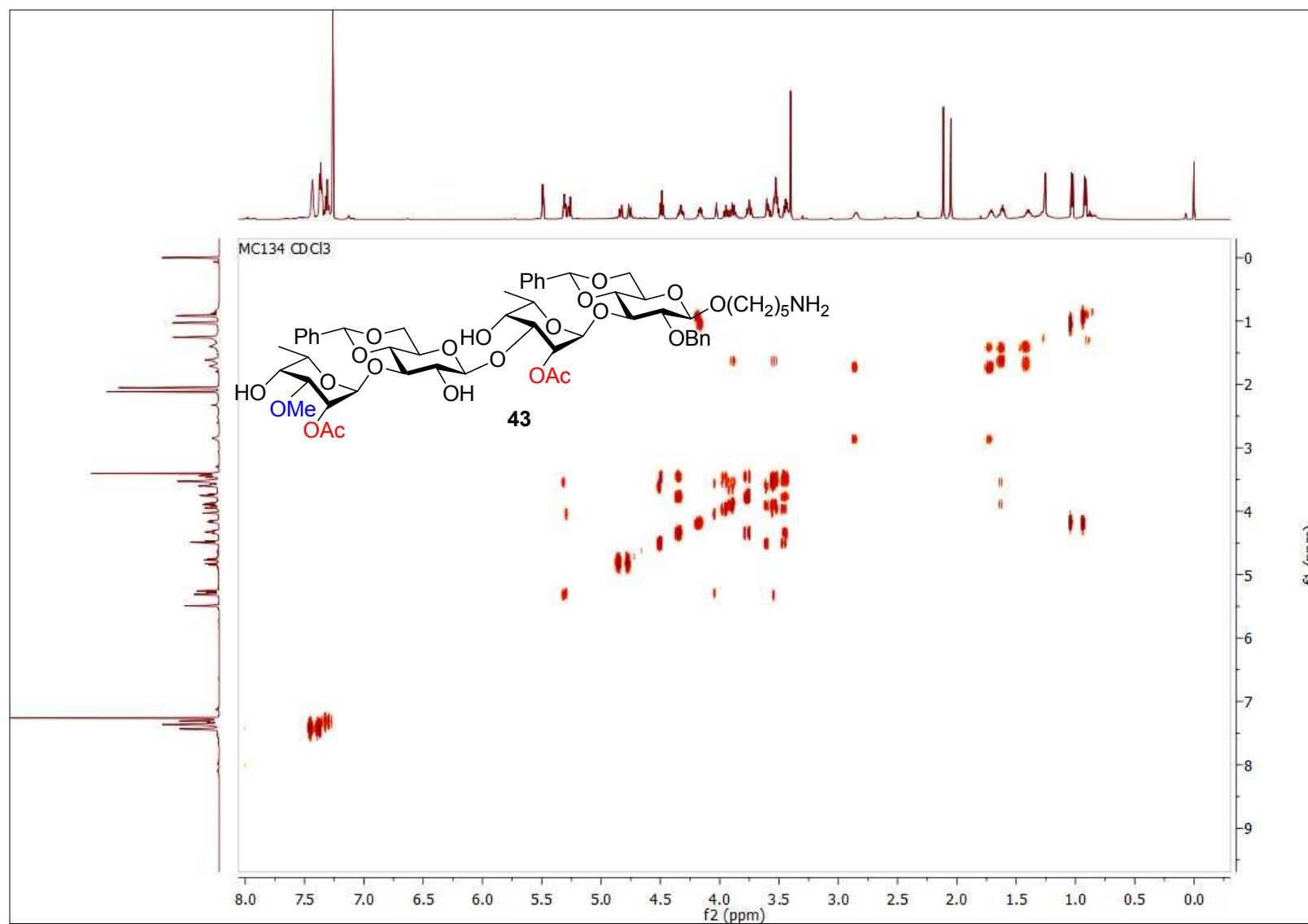
Supplementary Figure 124 | HSQC NMR spectrum (CDCl₃, 600 MHz) of compound 42



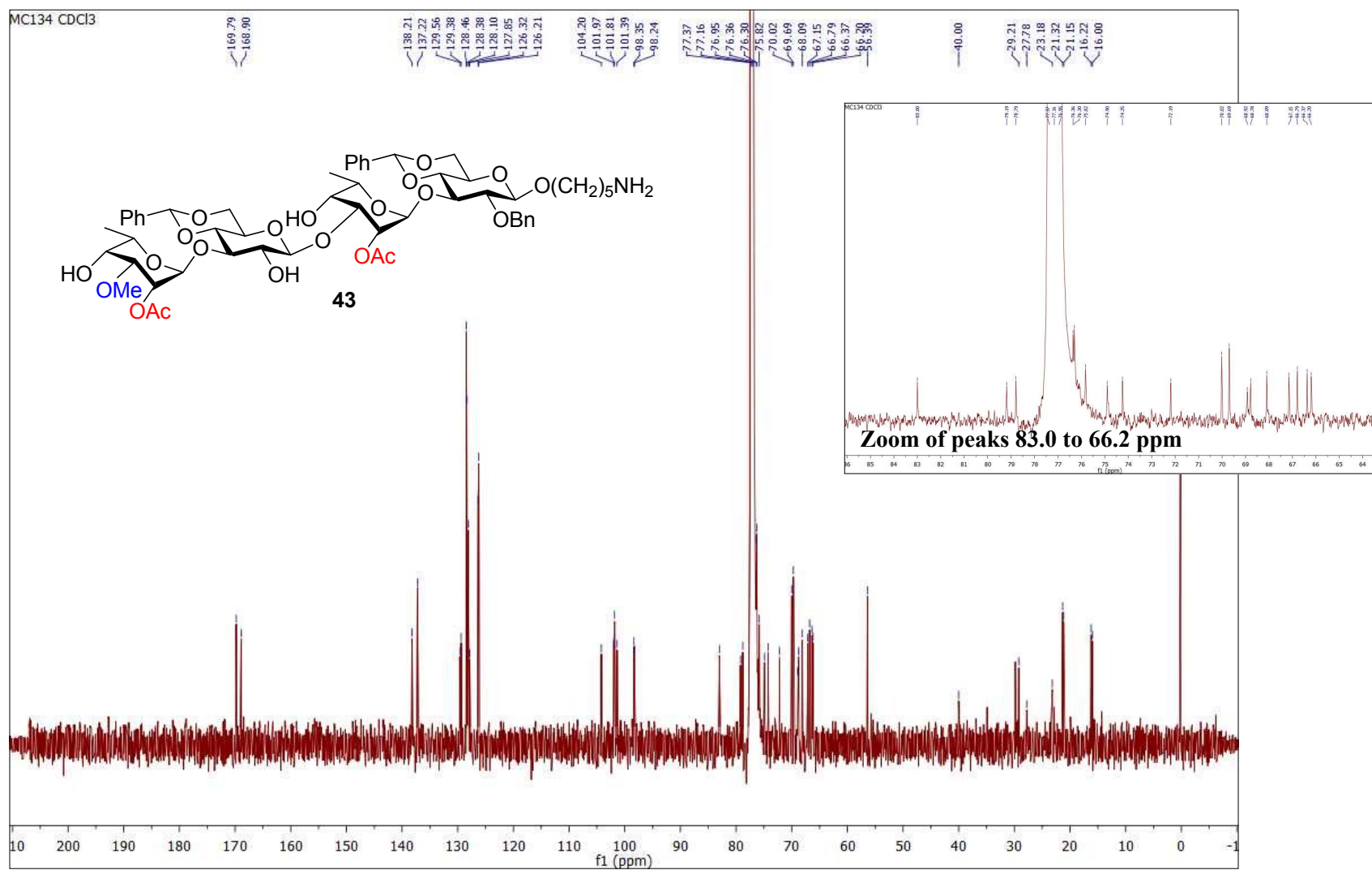
Supplementary Figure 125 | ^1H NMR spectrum (CDCl_3 , 600 MHz) of compound 43



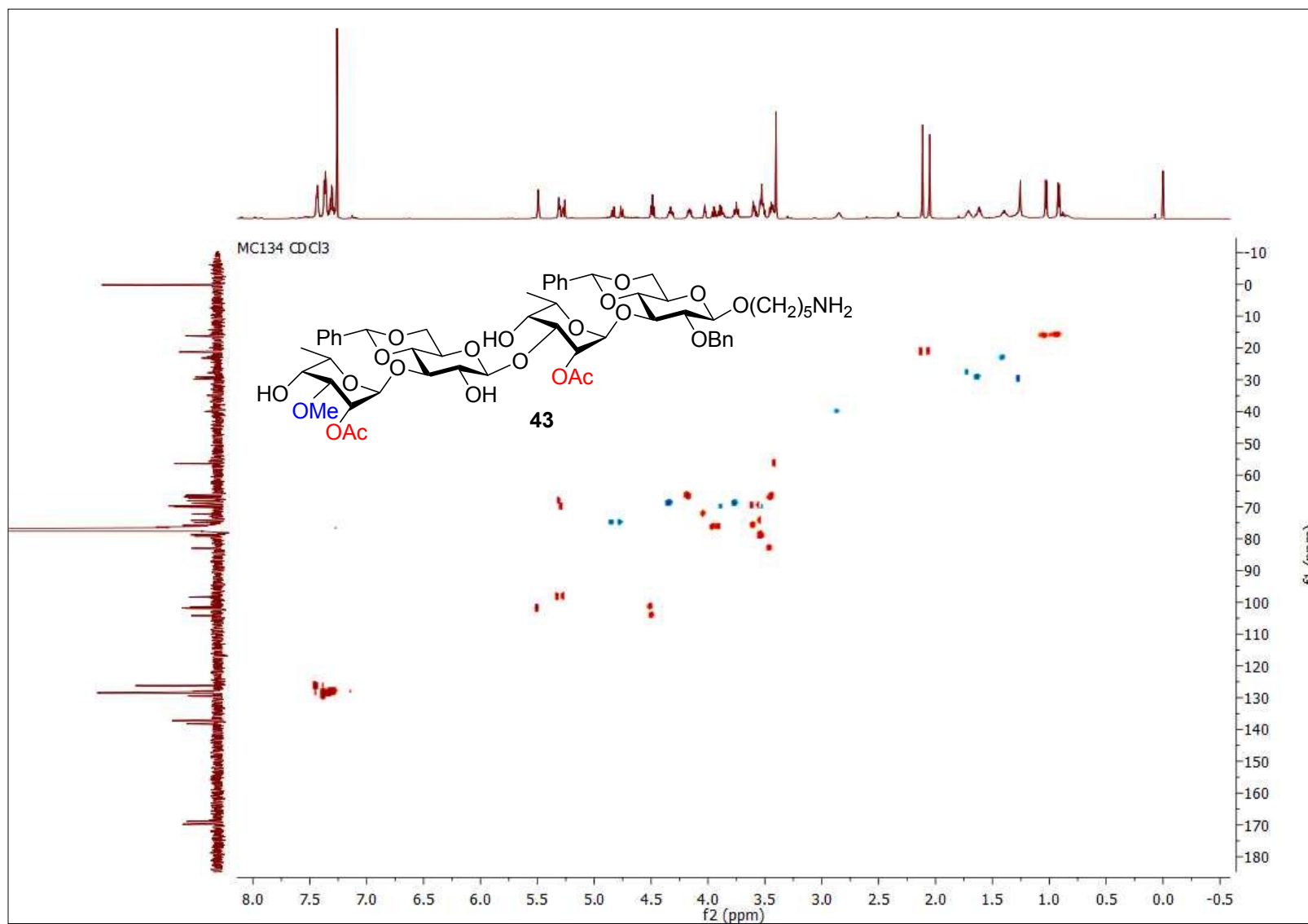
Supplementary Figure 126 | COSY NMR spectrum (CDCl₃, 600 MHz) of compound 43



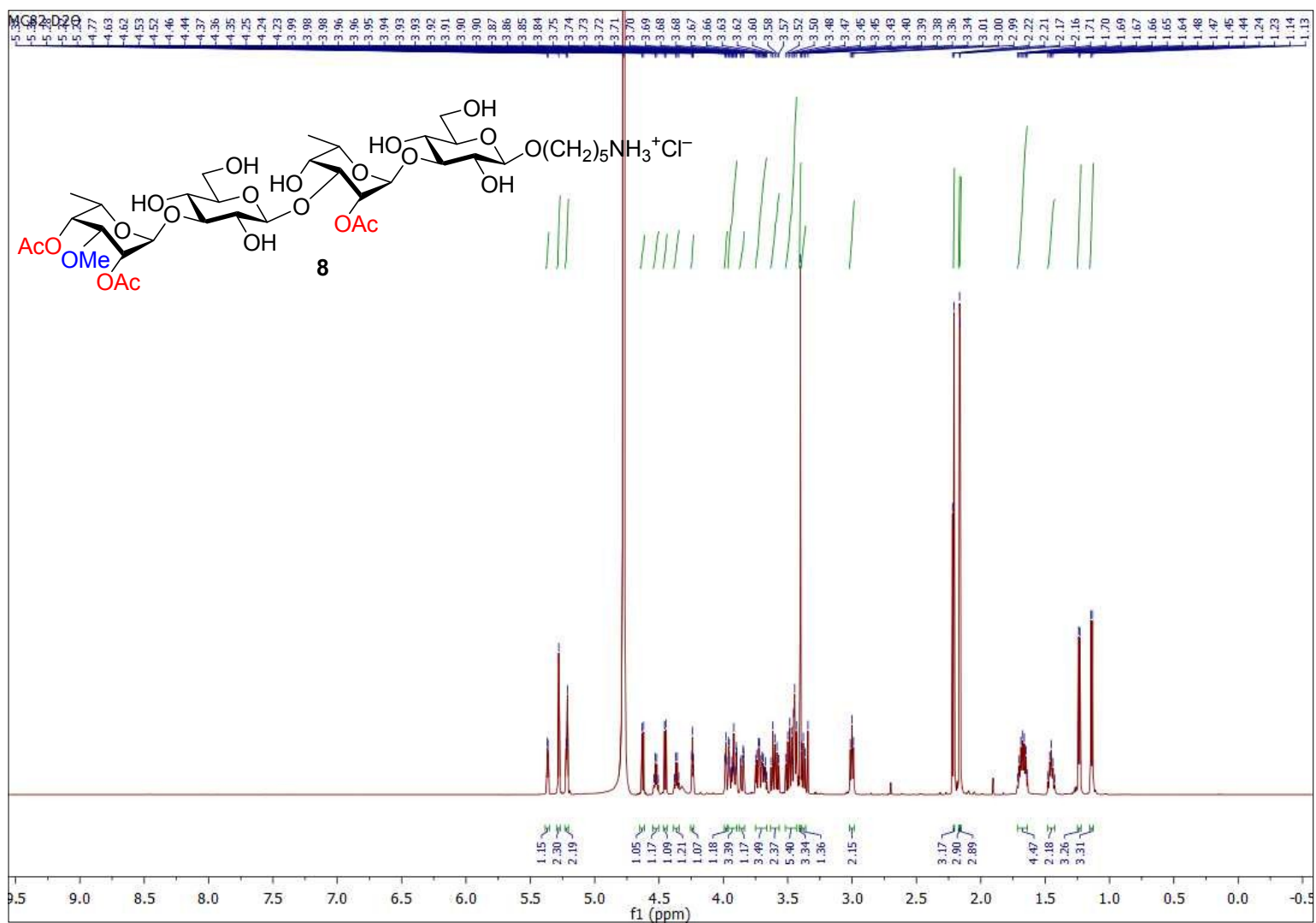
Supplementary Figure 127 | ^{13}C NMR spectrum (CDCl_3 , 150 MHz) of compound 43



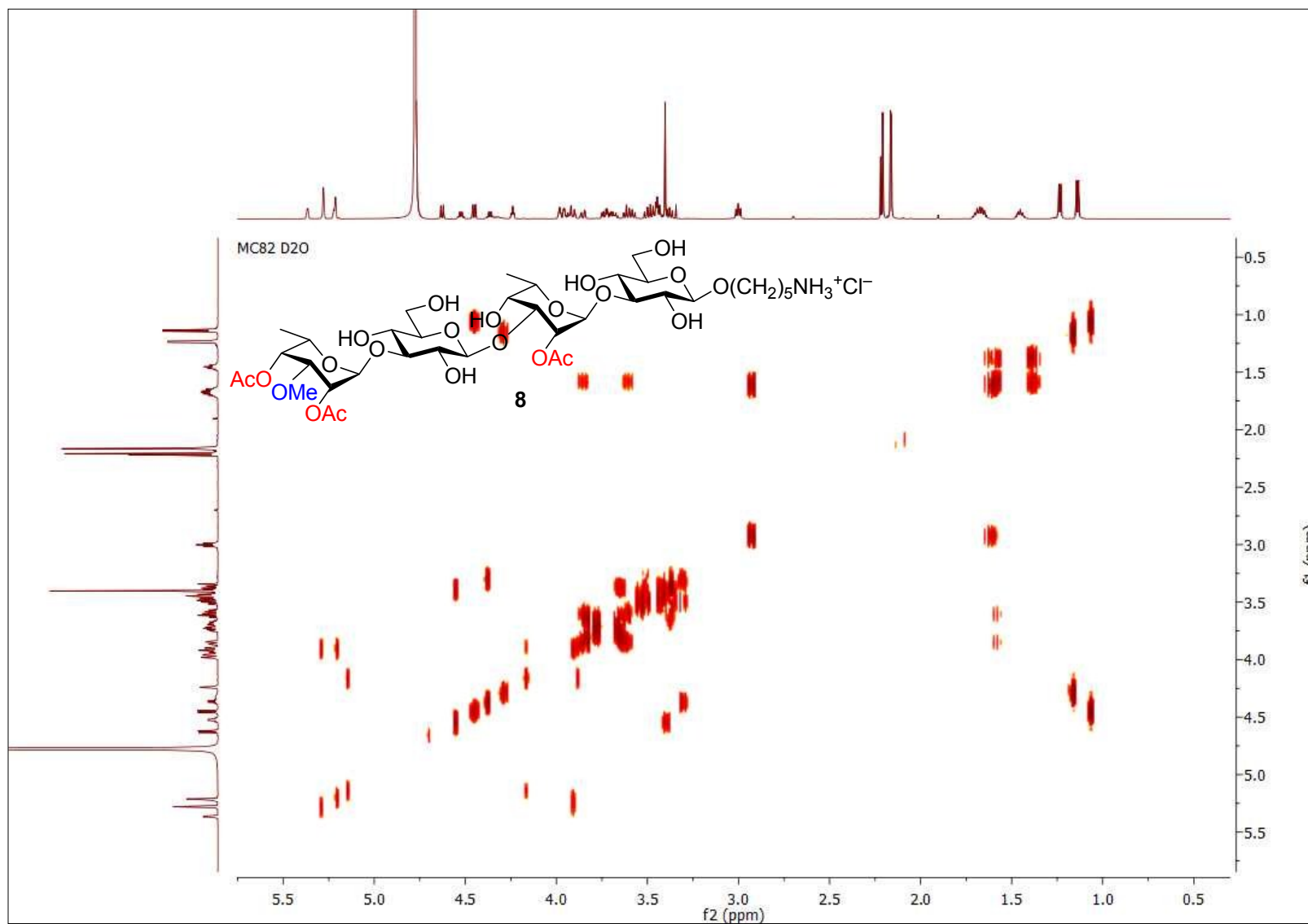
Supplementary Figure 128 | HSQC NMR spectrum (CDCl₃, 600 MHz) of compound 43



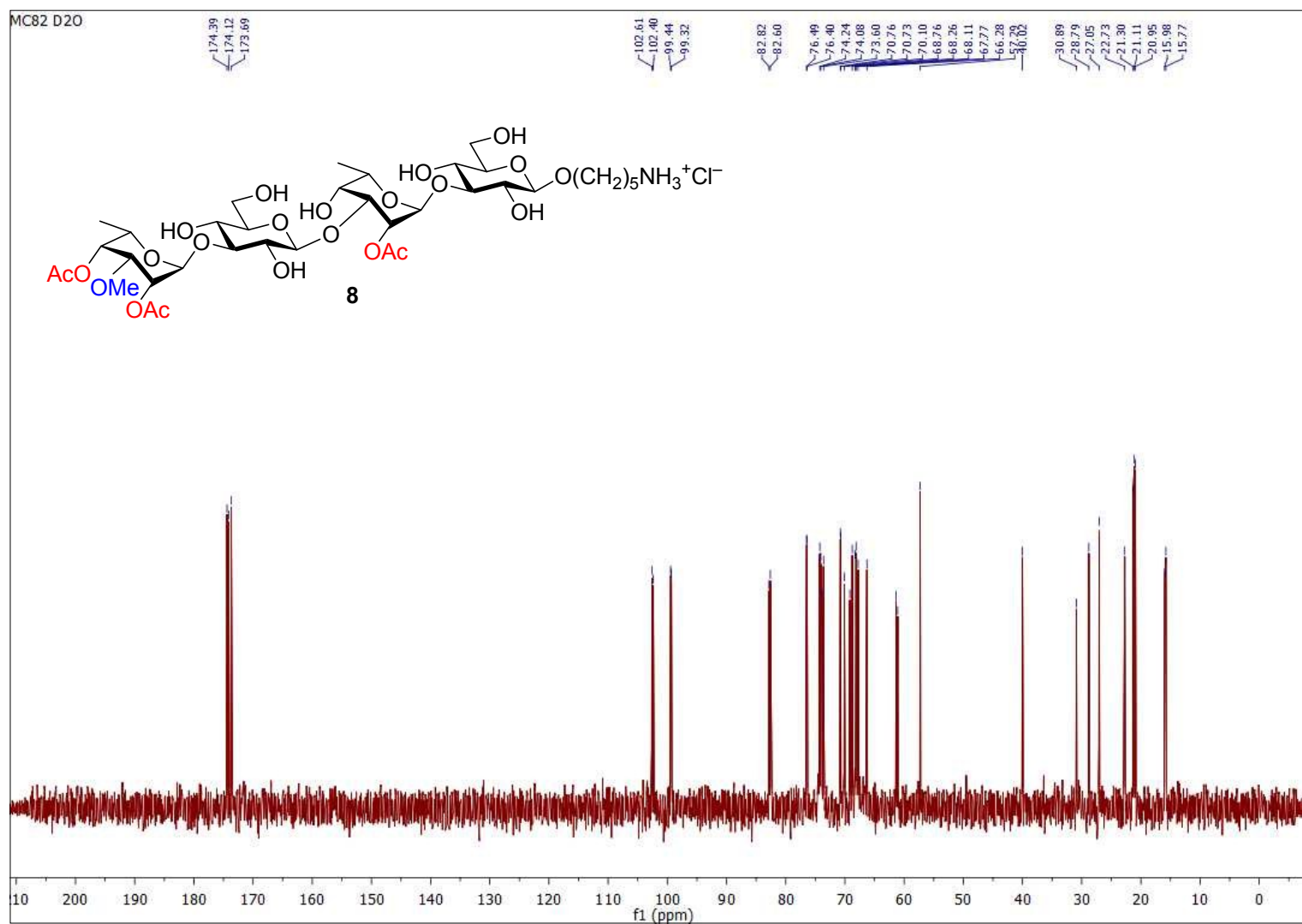
Supplementary Figure 129 | ^1H NMR spectrum (D_2O , 600 MHz) of compound 8



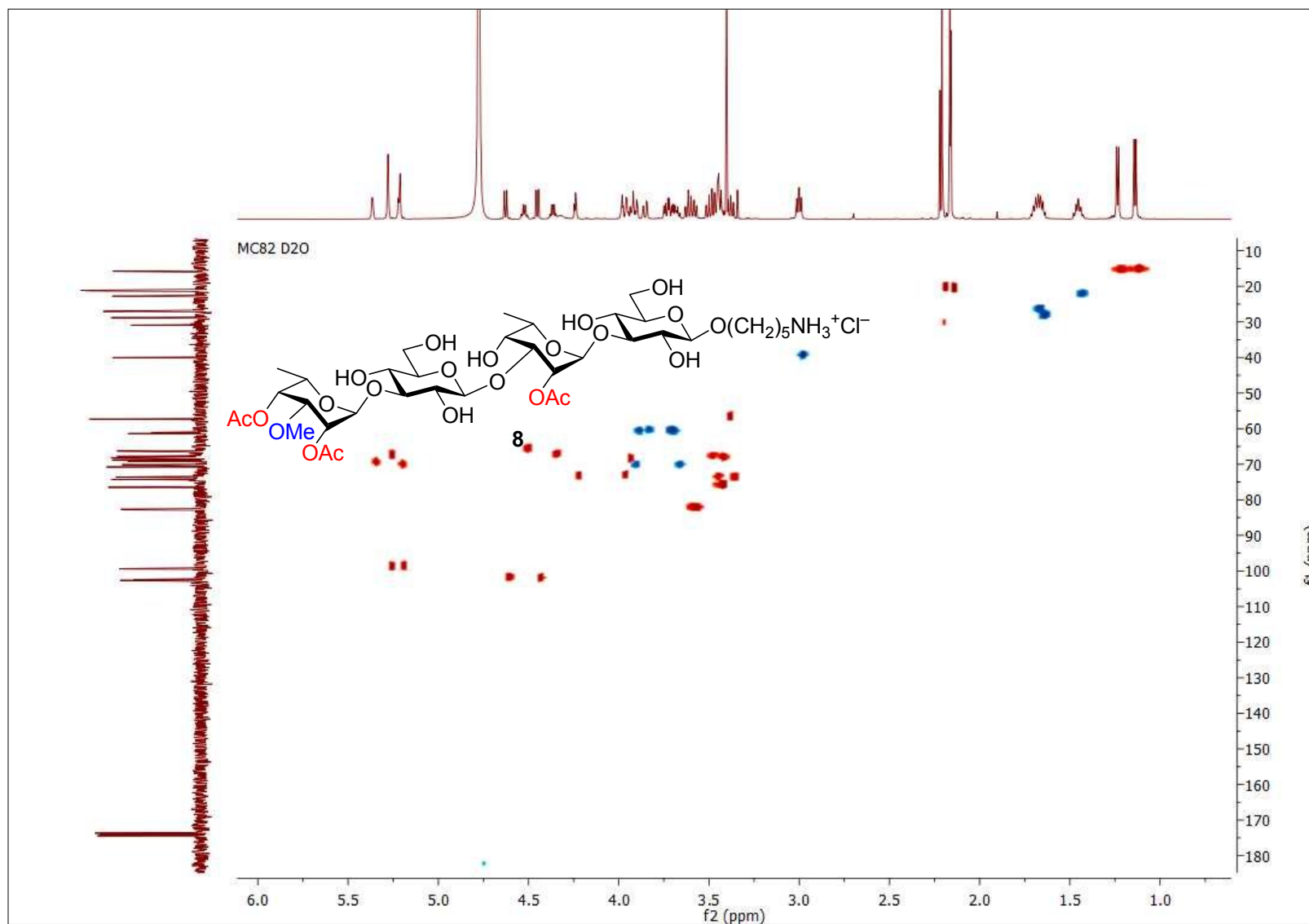
Supplementary Figure 130 | COSY NMR spectrum (D₂O, 600 MHz) of compound 8



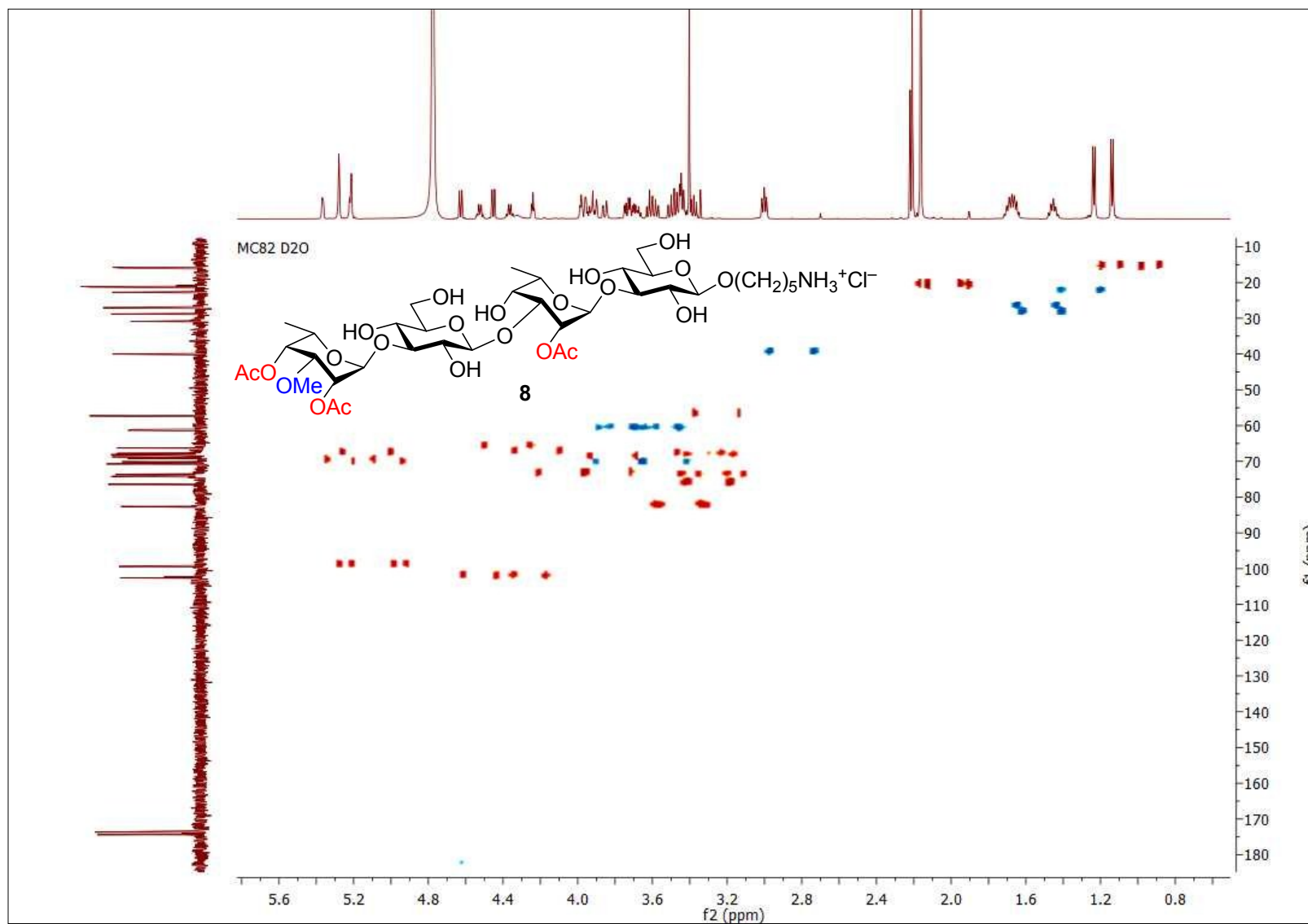
Supplementary Figure 131 | ^{13}C NMR spectrum (D_2O , 150 MHz) of compound 8



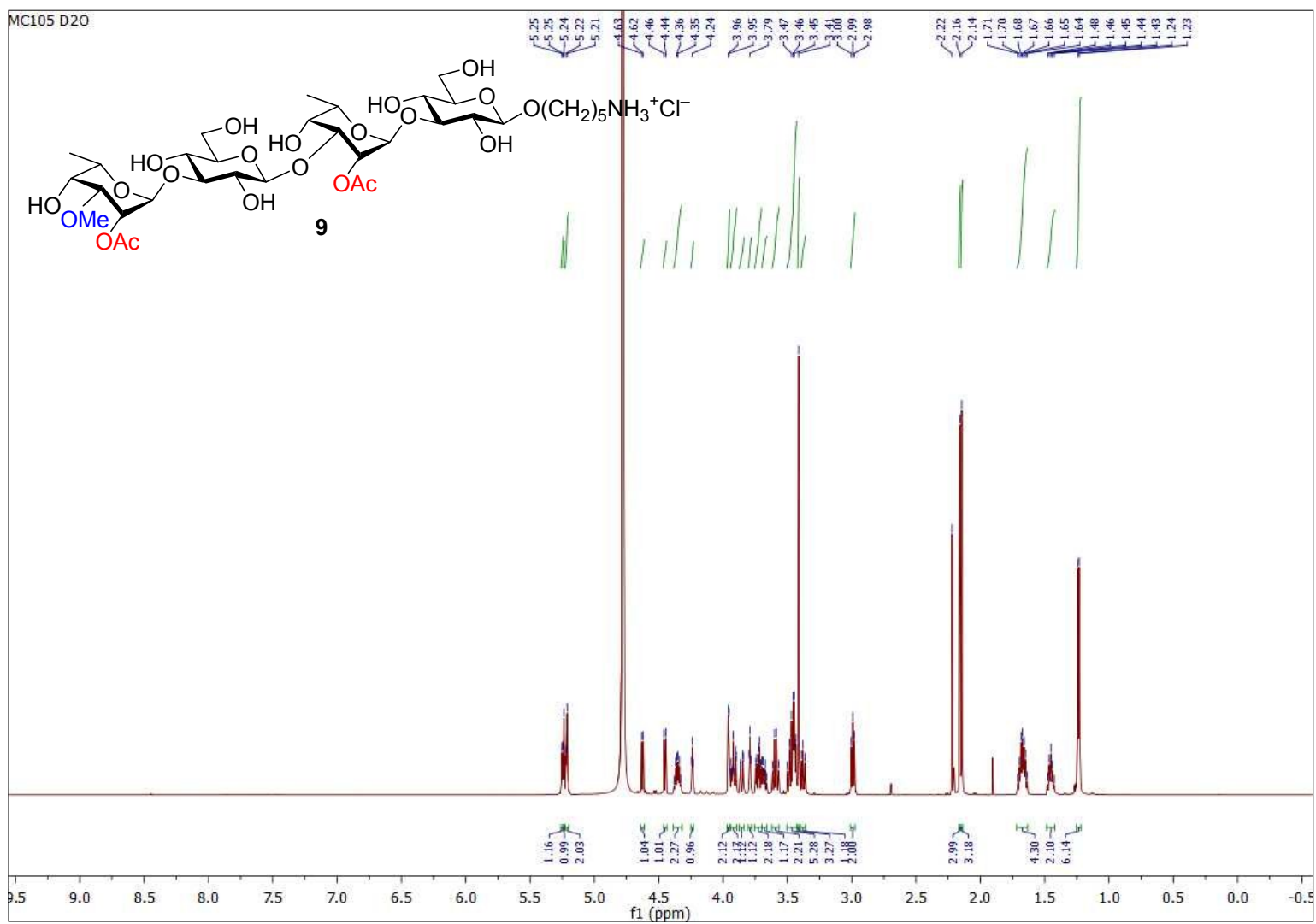
Supplementary Figure 132 | HSQC NMR spectrum (D₂O, 600 MHz) of compound 8



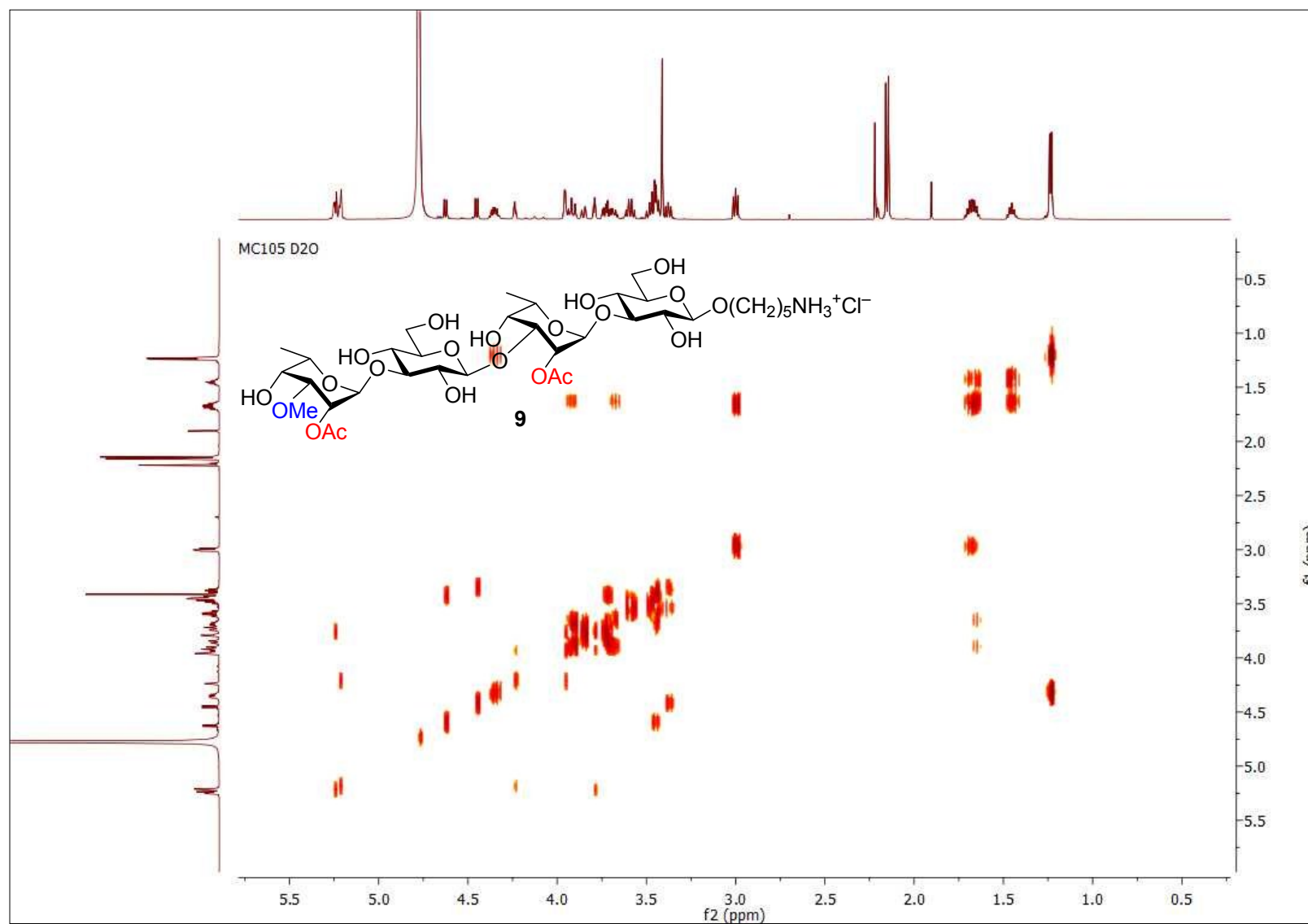
Supplementary Figure 133 | Undecoupled HSQC NMR spectrum (D₂O, 600 MHz) of compound 8



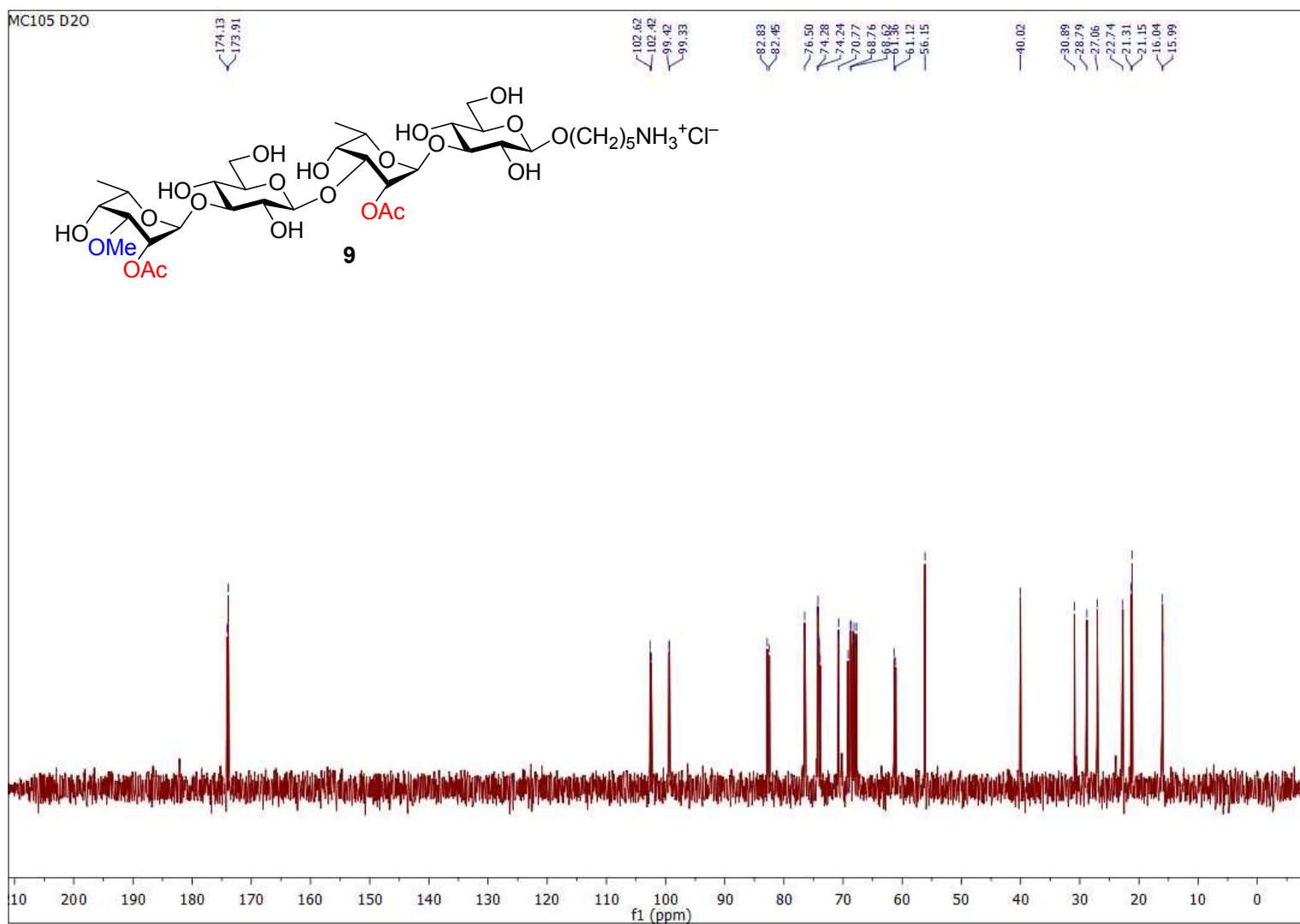
Supplementary Figure 134 | ¹H NMR spectrum (D₂O, 600 MHz) of compound 9



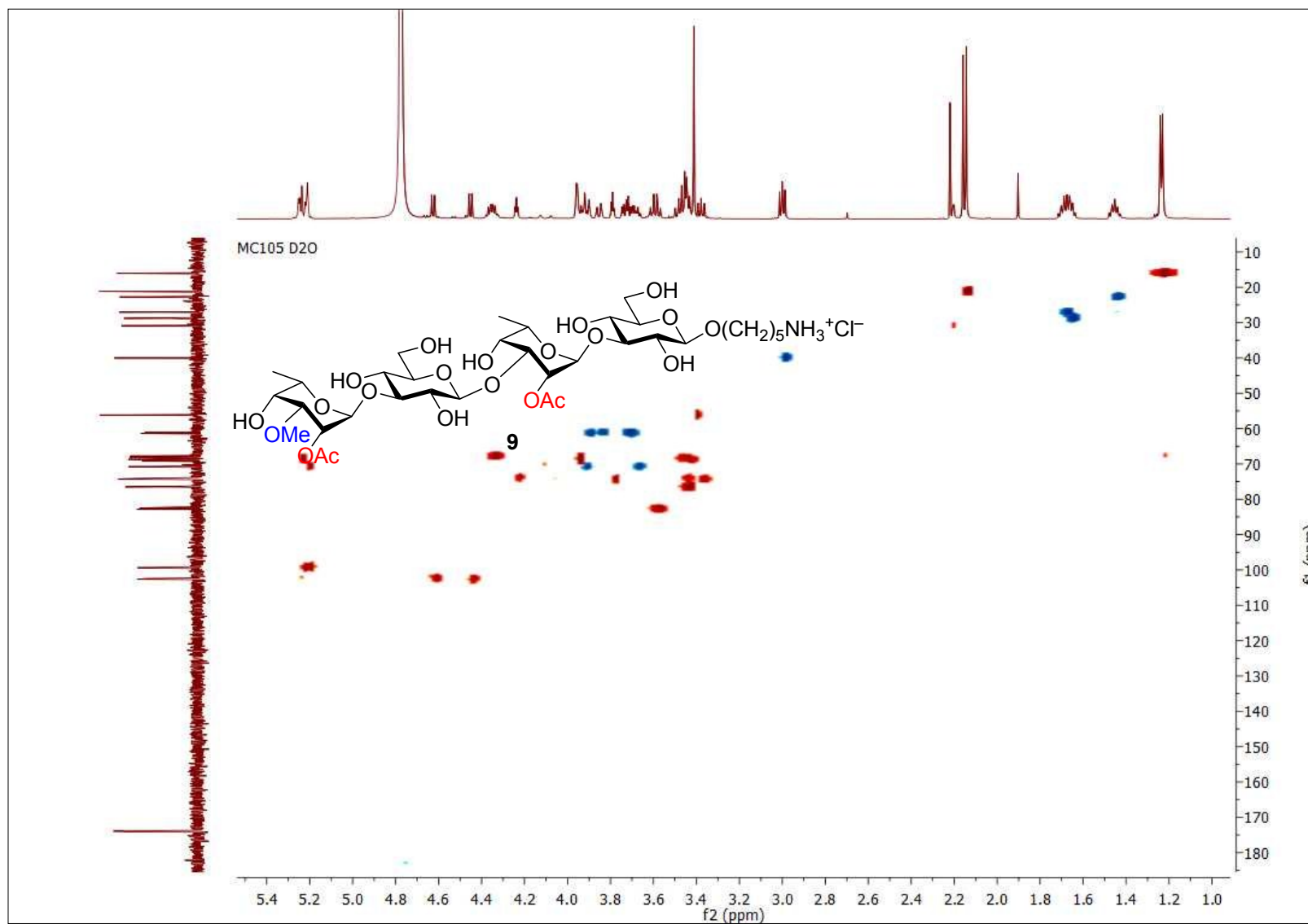
Supplementary Figure 135 | COSY NMR spectrum (D₂O, 600 MHz) of compound 9



Supplementary Figure 136 | ^{13}C NMR spectrum (D_2O , 150 MHz) of compound 9



Supplementary Figure 137 | HSQC NMR spectrum (D₂O, 600 MHz) of compound 9



Supplementary references

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2. M. N. Burtnick, C. Heiss, A. M. Schuler, P. Azadi and P. J. Brett, *Front. Cell. Infect. Mi.*, 2012, **2**, 148.
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