

2

3 **Design of Antibacterial Agents: Alkyl Dihydroxybenzoates**

4 **Against *Xanthomonas citri* subsp. *citri***

5

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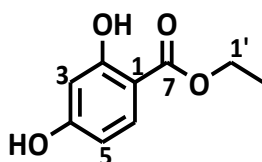
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23 Regasini)

25 1. SPECTROSCOPY DATA ANALYSES

26 The purity of compounds was measured on HPLC-PAD equipment, the analysis
27 were performed for calculations of partition coefficient, using MeOH:H₂O (3:1) as
28 isocratic mobile phase. The NMR spectra were recorded on a Bruker Avance III 14.1 T
29 (600 MHz), Bruker Avance III 9.4 T (400 MHz) and Bruker Fourier 7.1 T (300 MHz)
30 spectrometers, using CDCl₃ or DMSO-*d*₆ as solvent. The chemical shifts (δ) and coupling
31 constants (*J*) were expressed in ppm and Hz, respectively. Multiplicities were reported as
32 singlet (s), doublet (d), doublet of doublet (dd), triplet (t), quartet (q), and septet (sp).

33

34 1.1 ethyl 2,4 dihydroxybenzoate (1)



35

36 Pale yellow solid

37 **Yield:** 20 %

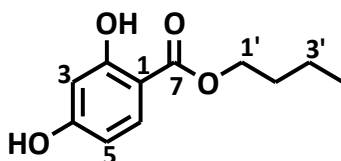
38 **Purity:** 87.6 %

39 **¹H NMR (400 MHz, CDCl₃) δ _H in ppm (multiplicity; *J* in Hz):** 11.09 (s, 2-OH), 7.77
40 (d, 8.8, H-6), 6.42 (d, 2.4, H-3), 6.39 (dd, 8.8 and 2.4, H-5), 5.92 (s; 4-OH), 4.39 (q, 7.2,
41 H-1'), 1.42 (t, 7.2, H-2')

42 **¹³C NMR (100 MHz, CDCl₃) δ _C in ppm:** 170.0 (C-7), 163.6 (C-4), 162.0 (C-2), 131.9
43 (C-3), 107.8 (C-5), 106.1 (C-1), 103.1 (C-6), 61.1 (C-1'), 14.2 (C-2')

44

45 1.2 butyl 2,4 dihydroxybenzoate (2)



46

47 White crystal

48 **Yield:** 98 %

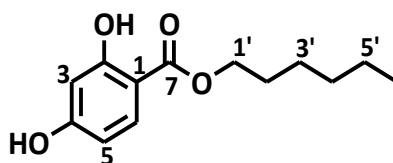
49 **Purity:** 85.6 %

50 **¹H NMR(400 MHz, CDCl₃) δ_H in ppm (multiplicity; J in Hz):** 11.09 (s, 2-OH), 7.76
51 (d, 8.4, H-6), 6.42 (d, 2.4, H-3), 6.39 (dd, 8.4 and 2.4, H-5), 5.93 (s, 4-OH), 4.34 (t, 6.4,
52 H-1'), 1.81–1.73 (H-2'), 1.54–1.45 (H-3'), 1.00 (t, 7.6, H-4')

53 **¹³C NMR (100 MHz, CDCl₃) δ_C in ppm:**170.1 (C-7), 163.6 (C-4), 162.0 (C-2), 131.9
54 (C-3), 107.8 (C-5), 106.1 (C-1), 103.1 (C-6), 64.9 (C-1'), 30.6 (C-2'), 19.2 (C-3'), 13.7
55 (C-4')

56

57 1.3 hexyl 2,4 dihydroxybenzoate (**3**)



58

59 White crystal

60 **Yield:** 92 %

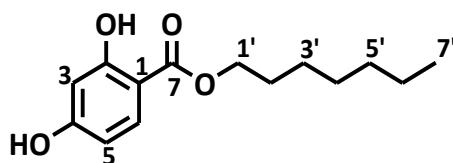
61 **Purity:** 81.7 %

62 **¹H NMR (400 MHz, CDCl₃) δ_H in ppm (multiplicity; J in Hz):** 11.08 (s, 2-OH), 7.76
63 (d, 8.8, H-6), 6.42 (d, 2.4, H-3), 6.39 (dd, 8.8 and 2.4, H-5), 5.83 (s, 4-OH), 4.33 (t, 6.8,
64 H-1'), 1.80–1.76 (H-2'), 1.47–1.36 (H-3'–H-5'), 0.93 (t, 6.8, H-6')

65 **¹³C NMR (100 MHz, CDCl₃) δ_C in ppm:** 170.1 (C-7), 163.7 (C-4), 162.0 (C-2), 131.9
66 (C-3), 107.7 (C-5), 106.1 (C-1), 103.1 (C-6), 65.2 (C-1'), 31.4, 28.6, 25.6, and 22.5 (C-
67 2'–C-5'), 14.0 (C-6')

68

69 1.4 heptyl 2,4 dihydroxybenzoate (**4**)



70

71 White crystal

72 **Yield:** 82 %

73 **Purity:** 83.8 %

74 **¹H NMR (600 MHz, CDCl₃) δ_H in ppm (multiplicity; *J* in Hz):** 11.09 (s, 2-OH), 7.76

75 (d, 9.0, H-6), 6.42 (d, 2.4, H-3), 6.40 (dd, 9.0 and 2.4, H-5), 5.90 (s, 4-OH), 4.32 (t, 6.7,

76 H-1'), 1.80–1.76 (H-2'), 1.47–1.27 (H-3'–H-6'), 0.91 (t, 6.9, CH₃)

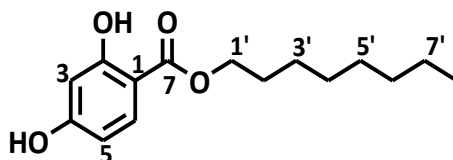
77 **¹³C NMR (150 MHz, CDCl₃) δ_C in ppm:** 170.1 (C-7), 163.7 (C-4), 161.9 (C-2), 131.9

78 (C-3), 107.7 (C-5), 106.1 (C-1), 103.1 (C-6), 65.2 (C-1'), 31.7, 28.9, 28.6, 25.9, and 22.6

79 (C-2'–C-6'), 14.1 (C-7')

80

81 1.5 octyl 2,4 dihydroxybenzoate (5)



82

83 White crystal

84 **Yield:** 82 %

85 **Purity:** 79.6 %

86 **¹H NMR (400 MHz, CDCl₃) δ_H in ppm (multiplicity; *J* in Hz):** 7.74 (d, 8.4, H-6), 6.40–

87 6.37 (H-3 and H-5), 4.31 (t, 6.4, H-1'), 1.80–1.73 (H-2'), 1.46–1.30 (H-3'–H-7'), 0.91 (t,

88 6.4, H-8')

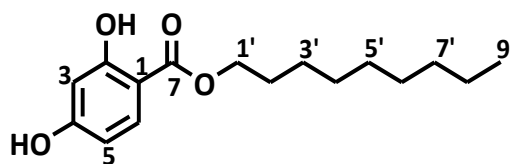
89 **¹³C NMR (100 MHz, CDCl₃) δ_C in ppm:** 170.7 (C-7), 163.6 (C-4), 162.2 (C-2), 131.9

90 (C-3), 107.9 (C-5), 106.0 (C-1), 103.1 (C-6), 65.2 (C-1'), 31.8, 29.2, 29.1, 28.6, 26.0, and

91 22.6 (C-2'–C-7'), 14.1 (H-8')

92

93 1.6 nonyl 2,4 dihydroxybenzoate (6)



94

95 White crystal

96 **Yield:** 98 %

97 **Purity:** 99.0 %

98 **¹H NMR (600 MHz, CDCl₃) δ_H in ppm (multiplicity; J in Hz):** 11.08 (s, 2-OH), 7.76

99 (d, 8.8, H-6), 6.42 (d, 2.4, H-3), 6.39 (dd, 8.8 and 2.4, H-5), 5.83 (s, 4-OH), 4.35 (t, 6.7,

100 H-1'), 1.81–1.76 (H-2'), 1.47–1.29 (H-3'–H-8'), 0.90 (t, 6.8, H-9')

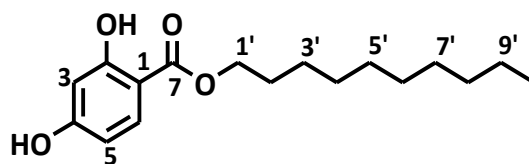
101 **¹³C NMR (100 MHz, CDCl₃) δ_C in ppm:** 170.1 (C-7), 163.6 (C-4), 162.0 (C-2), 131.9

102 (C-3), 107.8 (C-5), 106.1 (C-1), 103.1 (C-6), 65.2 (C-1'), 31.9, 29.5, 29.2, 28.6, 26.0, and

103 22.7 (C-2'–C-8'), 14.1 (C-9')

104

105 1.7 decyl 2,4 dihydroxybenzoate (7)



106

107 Pale yellow solid

108 **Yield:** 95 %

109 **Purity:** 99.5 %

110 **¹H NMR (400 MHz, CDCl₃) δ_H in ppm (multiplicity; J in Hz):** 11.08 (s, 2-OH), 7.76

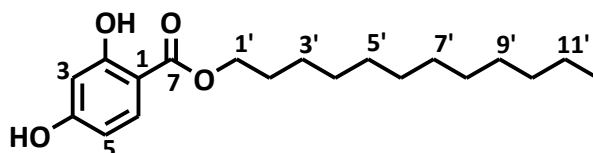
111 (d, 8.4 Hz, H-6), 6.42 (d, 2.4, H-3), 6.39 (dd, 8.4 and 2.4, H-5), 5.65 (s, 4-OH), 4.33 (t,

112 6.4, H-1'), 1.81–1.74 (H-2'), 1.47–1.29 (H-3'–H-9'), 0.90 (t, 6.8, H-10')

113 ¹³C NMR (100 MHz, CDCl₃) δ_C in ppm: 170.1 (C-7), 163.6 (C-4), 162.0 (C-2), 131.9
114 (C-3), 107.8 (C-5), 106.1 (C-1), 103.1 (C-6), 65.3 (C-1'), 31.9, 29.5, 29.3, 29.2, 28.6,
115 26.0, and 22.7 (C-2'–C-9'), 14.1 (C-10')

116

117 1.8 dodecyl 2,4 dihydroxybenzoate (**8**)



118

119 White crystal

120 **Yield:** 99 %

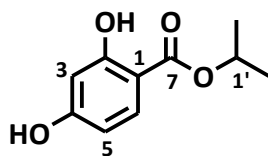
121 **Purity:** > 99.9 %

122 ¹H NMR (300 MHz, CDCl₃) δ_H in ppm (multiplicity; *J* in Hz): 11.07 (s, 2-OH), 7.75
123 (d, 8.4, H-6), 6.41 (d, 2.1, H-3) 6.38 (dd, 8.4 and 2.1, H-5), 5.68 (s, 4-OH), 4.31 (t, 6.6,
124 H-1'), 1.81–1.72 (H-2'), 1.43–1.27 (H-3'–H-11'), 0.89 (t, 6.6, H-12')

125 ¹³C NMR (100 MHz, CDCl₃) δ_C in ppm: 170.1 (C-7), 163.7 (C-4), 162.0 (C-2), 131.8
126 (C-3), 107.8 (C-5), 106.1 (C-1), 103.1 (C-6), 65.2 (C-1'), 31.9, 29.7, 29.6, 29.5, 29.4,
127 29.3, 29.2, 28.6, 26.0, and 22.7 (C-2'–C-11'), 14.1 (C-12')

128

129 1.9 isopropyl 2,4 dihydroxybenzoate (**9**)



130

131 Brown oil

132 **Yield:** 68 %

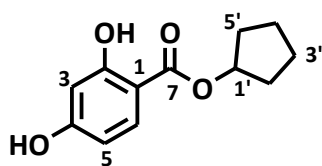
133 **Purity:** 93.2 %

134 **¹H NMR (600 MHz, CDCl₃) δ_H in ppm (multiplicity; J in Hz):** 11.21 (s, 2-OH), 7.75
135 (d, 9.0, H-6), 6.42 (d, 2.4, H-3), 6.39 (dd, 9.0 and 2.4, H-5), 5.27 (sp, 6.6, H-1'), 1.39 (d,
136 6.6, H-2')

137 **¹³C NMR (150 MHz, CDCl₃) δ_C in ppm:** 169.7 (C-7), 163.6 (C-4), 162.0 (C-2), 131.9
138 (C-3), 107.8 (C-5), 106.3 (C-1), 103.0 (C-6), 68.9 (C-1'), 21.9 (C-2')

139

140 1.10 cyclopentyl 2,4 dihydroxybenzoate (**10**)



141

142 White crystal

143 **Yield:** 40 %

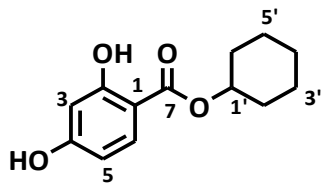
144 **Purity:** > 99.9 %

145 **¹H NMR (600 MHz, CDCl₃) δ_H in ppm (multiplicity; J in Hz):** 11.17 (s, 2-OH), 7.72
146 (d, 8.4, H-6), 6.41 (d, 2.4, H-3), 6.38 (dd, 8.4 and 2.4, H-5), 5.44– 5.41 (H-1'), 2.03–1.59
147 (H-2'–H-5')

148 **¹³C NMR (150 MHz, CDCl₃) δ_C in ppm:** 169.5 (C-7), 163.7 (C-4), 161.9 (C-2), 131.9
149 (C-3), 107.7 (C-5), 106.5 (C-1), 103.1 (C-6), 73.5 (C-1'), 31.6 (C-2' and C-5'), 23.6 (C-
150 3' and C-4')

151

152 1.11 cyclohexyl 2,4 dihydroxybenzoate (**11**)



153

154 Brown oil

155 **Yield:** 92 %

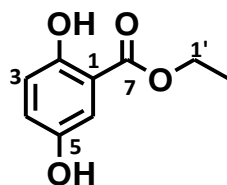
156 **Purity:** > 99.9%

157 **¹H NMR (600 MHz, CDCl₃) δ_H in ppm (multiplicity; J in Hz):** 11.18 (s, 2-OH), 7.78
158 (d, 8.4, H-6), 6.42 (d, 2.4, H-3), 6.39 (dd, 8.4 and 2.4, H-5), 5.83 (s, 4-OH), 5.07– 5.02
159 (H-1'), 1.97–1.34 (H-2'–H-6')

160 **¹³C NMR (150 MHz, CDCl₃) δ_C in ppm:** 169.5 (C-7), 163.7 (C-4), 161.9 (C-2), 131.9
161 (C-3), 107.7 (C-5), 106.5 (C-1), 103.1 (C-6), 73.5 (C-1'), 31.6 (C-2' and C-6'), 25.4 (C-
162 4'), 23.6 (C-3' and C-5')

163

164 1.13 ethyl 2,5 dihydroxybenzoate (**13**)



165

166 Pale yellow crystal

167 **Yield:** 32 %

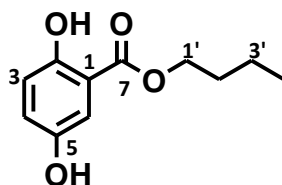
168 **Purity:** 98.3 %

169 **¹H NMR (400 MHz, CDCl₃) δ_H in ppm (multiplicity; J in Hz):** 10.44 (s, 2-OH), 7.32
170 (d, 3.2, H-6), 7.03 (dd, 8.8 and 3.2, H-4), 6.89 (d, 8.8, H-3), 4.41 (q, 7.2, H-1'), 1.42 (t,
171 7.2, H-2')

172 **¹³C NMR (100 MHz, CDCl₃) δ_C in ppm:** 169.8 (C-7), 155.8 (C-2), 147.7 (C-5), 123.9
173 (C-4), 118.5 (C-3), 114.8 (C-6), 112.4 (C-1), 61.5 (C-1'), 14.2 (C-2')

174

175 1.14 butyl 2,5 dihydroxybenzoate (**14**)



176

177 Pale yellow crystal

178 **Yield:** 87 %

179 **Purity:** 82.0 %

180 **¹H NMR (400 MHz, CDCl₃) δ_H in ppm (multiplicity; *J* in Hz):** 10.44 (s, 2-OH), 7.31

181 (d, 2.8, H-6), 7.03 (dd, 8.8 and 2.8, H-4), 6.90 (d, 8.8, H-3), 4.90 (s; 5-OH), 4.36 (t, 6.8,

182 H-1'), 1.81–1.74 (H-2'), 1.54–1.45 (H-3'), 1.01 (t, 7.2, H-4')

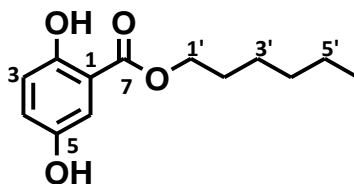
183 **¹³C NMR (100 MHz, CDCl₃) δ_C in ppm:** 169.8 (C-7), 155.9 (C-2), 147.7 (C-5), 123.9

184 (C-4), 118.5 (C-3), 114.7 (C-6), 112.5 (C-1), 65.3 (C-1'), 30.6 (C-2'), 19.2 (C-3'), 13.7

185 (C-4')

186

187 1.15 hexyl 2,5 dihydroxybenzoate (**15**)



188

189 Pale yellow oil

190 **Yield:** 67 %

191 **Purity:** 80.1 %

192 **¹H NMR (400 MHz, CDCl₃) δ_H in ppm (multiplicity; *J* in Hz):** 10.44 (s, 2-OH), 7.31

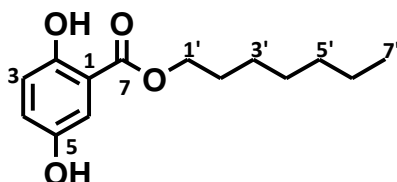
193 (d, 3.2, H-6), 7.03 (dd, 9.2 and 3.2, H-4), 6.89 (d, 9.2, H-3), 4.35 (t, 6.8, H-1'), 1.83–1.75

194 (H-2'), 1.48–1.36 (H-3'–H-5'), 0.93 (t, 6.8, H-6')

195 ^{13}C NMR (100 MHz, CDCl_3) δ_{C} in ppm: 169.8 (C-7), 155.9 (C-2), 147.7 (C-5), 123.9
196 (C-4), 118.5 (C-3), 114.7 (C-6), 112.5 (C-1), 65.6 (C-1'), 31.4, 28.5, 25.6, and 22.5 (C-
197 2'-C-5'), 14.0 (C-6')

198

199 1.16 heptyl 2,5 dihydroxybenzoate (**16**)



200

201 Pale yellow crystal

202 **Yield:** 40 %

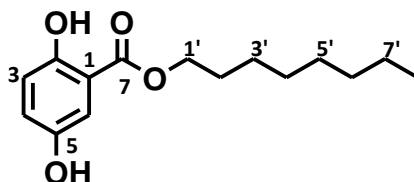
203 **Purity:** 99.3 %

204 ^1H NMR (600 MHz, CDCl_3) δ_{H} in ppm (multiplicity; J in Hz): 10.45 (s, 2-OH), 7.31
205 (d, 3.0, H-6), 7.03 (dd, 9.0 and 3.0, H-4), 6.90 (d, 9.0, H-3), 4.35 (t, 6.7, H-1'), 1.81–1.77
206 (H-2'), 1.48–1.27 (H-3'–H-6'), 0.92 (t, 6.9, H-7')

207 ^{13}C NMR (150 MHz, CDCl_3) δ_{C} in ppm: 169.8 (C-7), 155.9 (C-2), 147.6 (C-5), 123.9
208 (C-4), 118.5 (C-3), 114.7 (C-6), 112.5 (C-1), 65.6 (C-1'), 31.7, 28.9, 28.6, 25.9, and 22.6
209 (C-2'–C6'), 14.1 (C-7')

210

211 1.17 octyl 2,5 dihydroxybenzoate (**17**)



212

213 Pale yellow crystal

214 **Yield:** 95 %

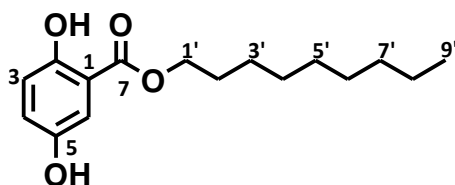
215 **Purity:** 79.8 %

216 **¹H NMR (400 MHz, CDCl₃) δ_H in ppm (multiplicity; J in Hz):** 10.45 (s, 2-OH), 7.31
217 (d, 3.2, H-6), 7.03 (dd, 9.2 and 3.2, H-4), 6.90 (d, 9.2, H-3), 4.35 (t, 6.8, H-1'), 1.82–1.75
218 (H-2'), 1.49–1.31 (H-3'–H-7'), 0.91 (t, 6.8, H-8')

219 **¹³C NMR (100 MHz, CDCl₃) δ_C in ppm:** 169.8 (C-7), 155.9 (C-2), 147.7 (C-5), 123.9
220 (C-4), 118.5 (C-3), 114.8 (C-6), 112.5 (C-1), 65.7 (C-1'), 31.8, 29.2, 29.1, 28.5, 26.0, and
221 22.6 (C-2'–C7'), 14.1 (C-8')

222

223 1.18 nonyl 2,5 dihydroxybenzoate (**18**)



224

225 Pale yellow crystal

226 **Yield:** 99 %

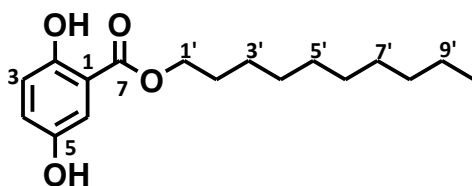
227 **Purity:** > 99.9 %

228 **¹H NMR (600 MHz, CDCl₃) δ_H in ppm (multiplicity; J in Hz):** 10.46 (s, 2-OH), 7.31
229 (d, 3.0, H-6), 7.03 (dd, 9.0 and 3.0, H-4), 6.90 (d, 9.0, H-3), 4.35 (t, 6.7, H-1'), 1.81–1.76
230 (H-2'), 1.47–1.29 (H-3'–H-8'), 0.90 (t, 6.8, H-9')

231 **¹³C NMR (150 MHz, CDCl₃) δ_C in ppm:** 169.9 (C-7), 155.8 (C-2), 147.7 (C-5), 123.9
232 (C-4), 118.5 (C-3), 114.7 (C-6), 112.5 (C-1), 65.7 (C-1'), 31.9, 29.5, 29.3, 28.5, 26.0, and
233 22.7 (C-2'–C-8'), 14.1 (C-9')

234

235 1.19 decyl 2,5 dihydroxybenzoate (**19**)



236

237 Pale yellow crystal

238 **Yield:** 70 %

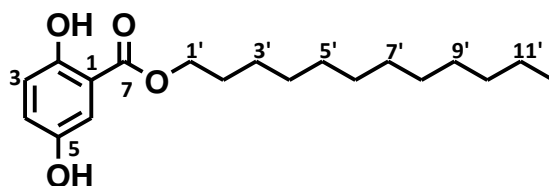
239 **Purity:** 76.5 %

240 **^1H NMR (400 MHz, CDCl_3) δ_{H} in ppm (multiplicity; J in Hz):** 10.44 (s, 2-OH), 7.31
241 (d, 3.2, H-6), 7.02 (dd, 9.2 and 3.2, H-4), 6.90 (d, 9.2, H-3), 4.84 (s, 5-OH), 4.35 (t, 6.4,
242 H-1'), 1.82–1.75 (H-2'), 1.47–1.30 (H-3'–H-9'), 0.90 (t, 6.8, H-10')

243 **^{13}C NMR (100 MHz, CDCl_3) δ_{C} in ppm:** 169.8 (C-7), 155.9 (C-2), 147.7 (C-5), 123.9
244 (C-4), 118.5 (C-3), 114.8 (C-6), 112.5 (C-1), 65.6 (C-1'), 31.9, 29.6, 29.5, 29.3, 29.2,
245 28.5, 26.0, and 22.7 (C-2'–C-9'), 14.1 (C-10')

246

247 1.20 dodecyl 2,5 dihydroxybenzoate (**20**)



248

249 Pale yellow crystal

250 **Yield:** 99 %

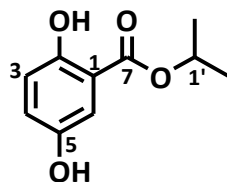
251 **Purity:** > 99.9 %

252 **^1H NMR (300 MHz, CDCl_3) δ_{H} in ppm (multiplicity; J in Hz):** 10.43 (s, 2-OH), 7.30
253 (d, 3.3, H-6), 7.02 (dd, 8.7 and 3.3, H-4), 6.89 (d, 8.7, H-3), 4.34 (t, 6.6, H-1'), 1.82–1.73
254 (H-2'), 1.42–1.27 (H-3'–H-11'), 0.89 (t, 6.3, H-12')

255 **^{13}C NMR (100 MHz, CDCl_3) δ_{C} in ppm:** 169.8 (C-7), 155.9 (C-2), 147.7 (C-5), 123.9
256 (C-4), 118.5 (C-3), 114.7 (C-6), 112.5 (C-1), 65.6 (C-1'), 31.9, 29.7, 29.6, 29.5, 29.3,
257 29.2, 28.6, 26.0, and 22.7 (C-2'–C-11'), 14.1 (C-12')

258

259 1.21 isopropyl 2,5 dihydroxybenzoate (**21**)



260

261 Pale yellow solid

262 **Yield:** 80 %

263 **Purity:** > 99.9 %

264 **¹H NMR (400 MHz, CDCl₃) δ_H in ppm (multiplicity; *J* in Hz):** 10.51 (s, 2-OH), 7.31

265 (d, 3.2, H-6), 7.02 (dd, 9.2 and 3.2, H-4), 6.89 (d, 9.2, H-3), 5.29 (sp, 6.4, H-1')

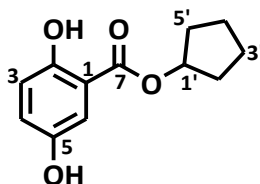
266 6.4, H-2')

267 **¹³C NMR (150 MHz, CDCl₃) δ_C in ppm:** 169.3 (C-7), 155.9 (C-2), 147.6 (C-5), 123.8

268 (C-4), 118.4 (C-3), 114.8 (C-6), 112.8 (C-1), 69.4 (C-1'), 21.8 (C-2')

269

270 1.22 cyclopentyl 2,5 dihydroxybenzoate (**22**)



271

272 White solid

273 **Yield:** 75 %

274 **Purity:** > 99.9 %

275 **¹H NMR (300 MHz, CDCl₃) δ_H in ppm (multiplicity; *J* in Hz):** 10.50 (s, 2-OH), 7.27

276 (d, 3.0, H-6), 7.00 (dd, 9.0 and 3.0, H-4), 6.88 (d, 9.0, H-3), 5.45–5.41 (H-1')

277 OH), 1.97–1.67 (H-2'–H-5')

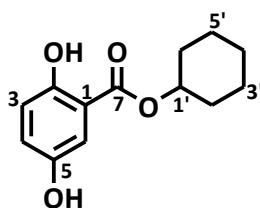
278 **¹³C NMR (150 MHz, CDCl₃) δ_C in ppm:** 169.5 (C-7), 155.9 (C-2), 147.5 (C-5), 123.7

279 (C-4), 118.4 (C-3), 114.8 (C-6), 112.8 (C-1), 78.6 (C-1'), 32.7 (C-2' and C-5'), 23.8 (C-

280 3' and C-4')

281

282 1.23 cyclohexyl 2,5 dihydroxybenzoate (**23**)



283

284 Pale yellow solid

285 **Yield:** 75 %

286 **Purity:** > 99.9 %

287 **¹H NMR (300 MHz, CDCl₃) δ_H in ppm (multiplicity; *J* in Hz):** 10.51 (s, 2-OH), 7.32

288 (d, 3.0, H-6), 7.01 (dd, 9.0 and 3.0, H-4), 6.88 (d, 9.0, H-3), 5.10–5.02 (H-1'), 1.93–1.26

289 (H-2'–H-6')

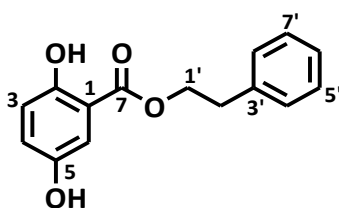
290 **¹³C NMR (150 MHz, CDCl₃) δ_C in ppm:** 169.2 (C-7), 155.9 (C-2), 147.6 (C-5), 123.8

291 (C-4), 118.4 (C-3), 114.8 (C-6), 112.9 (C-1), 74.0 (C-1'), 31.5 (C-2' and C-6'), 25.3 (C-

292 3' and C-5'), 23.5 (C-4')

293

294 1.24 phenylethyl 2,5 dihydroxybenzoate (**24**)



295

296 Pale yellow oil

297 **Yield:** 7 %

298 **Purity:** > 99.9 %

299 **¹H NMR (400 MHz, CDCl₃) δ_H in ppm (multiplicity; *J* in Hz):** 10.33 (s, 2-OH),

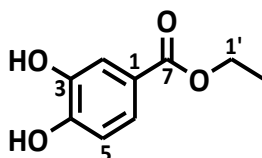
300 7.38–7.28 (H-4'–H-8'), 7.26 (d, 3.2, H-6), 7.02 (dd, 8.8 and 3.2, H-4), 6.90 (d, 8.8, H-3),

301 4.69 (s, 5-OH), 4.55 (t, 6.8, H-1'), 3.12 (t, 6.8, H-2')

302 ^{13}C NMR (150 MHz, CDCl_3) δ_{C} in ppm: 169.6 (C-7), 156.0 (C-2), 147.6 (C-5), 137.4
303 (C-3'), 128.9 (C-5' and C-7'), 128.7 (C-4' and C-8'), 126.8 (C-6'), 124.1 (C-4), 118.5
304 (C-3), 114.7 (C-6), 112.2 (C-1), 65.9 (C-1'), 35.0 (C-2')

305

306 1.25 ethyl 3,4 dihydroxybenzoate (**25**)



307

308 Pale yellow solid

309 **Yield:** 90 %

310 **Purity:** 99.1 %

311 ^1H NMR (400 MHz, $\text{DMSO-}d_6$) δ_{H} in ppm (multiplicity; J in Hz): 7.35 (d, 2.4, H-2),

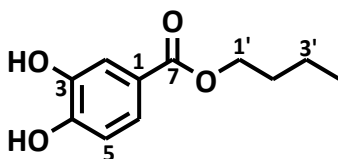
312 7.31 (dd, 8.4 and 2.4, H-6), 6.80 (d, 8.4, H-5), 4.31 (q, 7.2, H-1'), 1.27 (t, 7.2, H-2')

313 ^{13}C NMR (100 MHz, $\text{DMSO-}d_6$) δ_{C} in ppm: 166.2 (C-7), 150.8 (C-4), 145.5 (C-3),

314 122.2 (C-6), 121.2 (C-1), 116.7 (C-5), 115.7 (C-2), 60.5 (C-1'), 14.7 (C-2')

315

316 1.26 butyl 3,4 dihydroxybenzoate (**26**)



317

318 Pale yellow solid

319 **Yield:** 98 %

320 **Purity:** 99.1 %

321 ^1H NMR (400 MHz, CDCl_3) δ_{H} in ppm (multiplicity; J in Hz): 7.67 (H-2), 7.58 (dd,

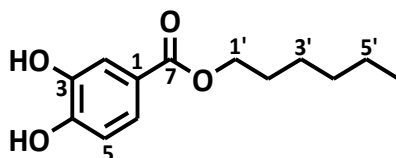
322 8.4 and 1.6, H-6), 6.93 (d, 8.4, H-5), 4.31 (t, 6.8, H-1'), 1.79–1.72 (H-2'), 1.53–1.44 (H-

323 3'), 0.99 (t, 5.4, H-4')

324 ^{13}C NMR (100 MHz, CDCl_3) δ_{C} in ppm: 167.1 (C-7), 148.9 (C-4), 143.1 (C-3), 123.7
325 (C-6), 122.7 (C-1), 116.6 (C-5), 114.8 (C-2), 65.0 (C-1'), 30.7 (C-2'), 19.3 (C-3'), 13.8
326 (C-4')

327

328 1.27 hexyl 3,4 dihydroxybenzoate (**27**)



329

330 Pale yellow crystal

331 **Yield:** 87 %

332 **Purity:** 99.1 %

333 ^1H NMR (400 MHz, $\text{DMSO-}d_6$) δ_{H} in ppm (multiplicity; J in Hz): 7.35 (d, 2.4, H-2),

334 7.31 (dd, 2.4 and 8.0, H-5), 6.81 (d, 8.0, H-6), 4.18 (t, 6.4, H-1'), 1.70–1.63 (H-2'), 1.39–

335 1.30 (H-3'–H-5'), 0.87 (t, 7.2, H-6')

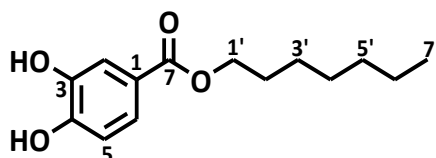
336 ^{13}C NMR (100 MHz, $\text{DMSO-}d_6$) δ_{C} in ppm: 166.2 (C-7), 150.9 (C-4), 145.5 (C-3),

337 122.2 (C-6), 121.1 (C-1), 116.6 (C-5), 115.7 (C-2), 64.4 (C-1'), 31.4, 28.7, 25.6, and 22.5

338 (C-2'–C-5'), 14.4 (C-6')

339

340 1.28 heptyl 3,4 dihydroxybenzoate (**28**)



341

342 White crystal

343 **Yield:** 96 %

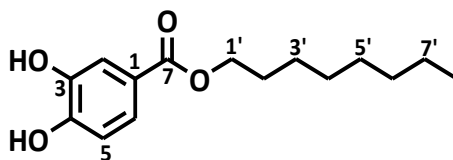
344 **Purity:** 98.5 %

345 **¹H NMR (600 MHz, DMSO-*d*₆) δ_H in ppm (multiplicity; *J* in Hz):** 9.80 (s, 4-OH), 9.39
346 (s, 3-OH), 7.35 (d, 1.8, H-2), 7.31 (dd, 8.4 and 1.8, H-6), 6.81 (d, 8.4, H-5), 4.17 (t, 6.5,
347 H-1'), 1.68–1.63, (H-2'), 1.38–1.26 (H-3'–H-6'), 0.86 (t, 6.9, H-7')

348 **¹³C NMR (150 MHz, DMSO-*d*₆) δ_C in ppm:** 166.2 (C-7), 150.8 (C-4), 145.5 (C-3),
349 122.2 (C-6), 121.2 (C-1), 116.6 (C-5), 115.8 (C-2), 64.5 (C-1'), 31.7, 28.8, 28.7, 26.0,
350 and 22.5 (C-2'–C-6'), 14.4 (C-7')

351

352 1.29 octyl 3,4 dihydroxybenzoate (**29**)



353

354 White crystal

355 **Yield:** 76 %

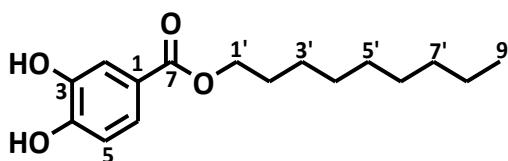
356 **Purity:** 98.5 %

357 **¹H NMR (400 MHz, CDCl₃) δ_H in ppm (multiplicity; *J* in Hz):** 7.70 (d, 2.0, H-2), 7.58
358 (dd, 8.4 and 2.0, H-6), 6.93 (d, 8.4, H-5), 4.30 (t, 6.8, H-1'), 1.80–1.73 (H-2'), 1.48–1.30
359 (H-3'–H-7'), 0.90 (t, 6.8, H-8')

360 **¹³C NMR (100 MHz, CDCl₃) δ_C in ppm:** 167.3 (C-7), 148.9 (C-4), 143.2 (C-3), 123.7
361 (C-6), 122.6 (C-1), 116.7 (C-5), 114.8 (C-2), 65.4 (C-1'), 31.8, 29.2, 29.1, 28.7, 26.0, and
362 22.6 (C-2'–C-7'), 14.1 (C-8')

363

364 1.30 nonyl 3,4 dihydroxybenzoate (**30**)



365

366 White solid

367 **Yield:** 98 %

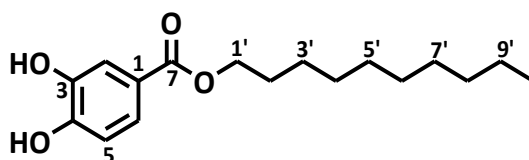
368 **Purity:** 97.9 %

369 **¹H NMR (300 MHz, CDCl₃) δ_H in ppm (multiplicity; *J* in Hz):** 7.67 (d, 2.1, H-2), 7.58
370 (dd, 8.4 and 2.1, H-6), 6.92 (d, 8.4, H-5), 6.42 (s, 4-OH), 6.15 (s, 3-OH), 4.29 (t, 6.7, H-
371 1'), 1.78–1.71 (H-2'), 1.44–1.28 (H-3'–H-8'), 0.89 (t, 6.7, H-9')

372 **¹³C NMR (150 MHz, DMSO-*d*₆) δ_C in ppm:** 166.2 (C-7), 150.8 (C-4), 145.5 (C-3),
373 122.2 (C-6), 121.2 (C-1), 116.6 (C-5), 115.7 (C-2), 64.5 (C-1'), 31.7, 29.4, 29.2, 29.1,
374 28.7, 26.0, and 22.6 (C-2'–C-8'), 14.1 (C-9')

375

376 1.31 decyl 3,4 dihydroxybenzoate (**31**)



377

378 White solid

379 **Yield:** 95 %

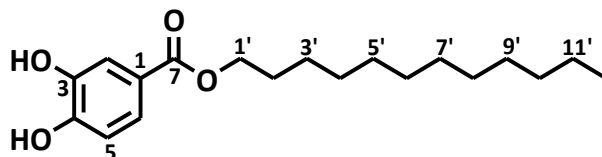
380 **Purity:** 91.3 %

381 **¹H NMR (400 MHz, CDCl₃) δ_H in ppm (multiplicity; *J* in Hz):** 7.68–7.67 (H-2), 7.59
382 (dd, 8.4 and 1.6, H-6), 6.93 (d, 8.4, H-5), 4.30 (t, 6.8, H-1'), 1.80–1.73 (H-2'), 1.48–1.29
383 (H-3'–H-9'), 0.90 (t, 6.8, H-10')

384 **¹³C NMR (100 MHz, CDCl₃) δ_C in ppm:** 166.9 (C-7), 148.8 (C-4), 143.1 (C-3), 123.7
385 (C-6), 121.5 (C-1), 116.6 (C-5), 114.8 (C-2), 65.3 (C-1'), 31.9, 29.5, 29.3, 28.7, 26.0, and
386 22.7 (C-2'–C-9'), 14.1 (C-10')

387

388 1.32 dodecyl 3,4 dihydroxybenzoate (**32**)



389

390 White solid

391 **Yield:** 82 %

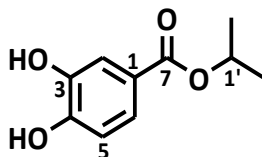
392 **Purity:** > 99.9 %

393 **¹H NMR (300 MHz, CDCl₃) δ_H in ppm (multiplicity; *J* in Hz):** 9.78 (s, 4-OH), 9.36 (s,
394 3-OH), 7.34 (d, 2.1, H-2), 7.29 (dd, 8.1 and 2.1, H-6), 6.79 (d, 8.1, H-5), 4.16 (t, 6.3, H-
395 1'), 1.67–1.60 (H-2'), 1.38–1.23 (H-3'–H-11'), 0.84 (t, 6.3, H-12')

396 **¹³C NMR (100 MHz, CDCl₃) δ_C in ppm:** 166.5 (C-7), 152.9 (C-4), 148.6 (C-3), 123.5
397 (C-6), 123.2 (C-1), 112.0 (C-5), 110.2 (C-2), 65.0 (C-1'), 31.9, 29.7, 29.6, 29.5, 29.3,
398 29.2, 28.8, 26.1, and 22.7 (C-2'–C-11'), 14.1 (C-12')

399

400 1.33 isopropyl 3,4 dihydroxybenzoate (**33**)



401

402 White solid

403 **Yield:** 56 %

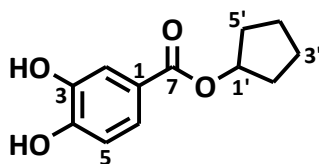
404 **Purity:** > 99.9 %

405 **¹H NMR (300 MHz, DMSO-*d*₆) δ_H in ppm (multiplicity; *J* in Hz):** 9.75 (s, 4-OH), 9.34
406 (s, 3-OH), 7.34 (d, 2.1, H-2), 7.28 (dd, 8.4 and 2.1, H-6), 6.79 (d, 8.4, H-5), 5.04 (h, 6.3,
407 H-1'), 1.26 (d, 6.3, H-2')

408 **¹³C NMR (150 MHz, DMSO-*d*₆) δ_C in ppm:** 165.6 (C-7), 150.7 (C-4), 145.5 (C-3),
409 122.1 (C-6), 121.6 (C-1), 116.6 (C-5), 115.7 (C-2), 67.7 (C-1') 22.2 (C-2')

410

411 1.34 cyclopentyl 3,4 dihydroxybenzoate (**34**)



412

413 White solid

414 **Yield:** 68 %

415 **Purity:** > 99.9 %

416 **¹H NMR (300 MHz, DMSO-*d*₆) δ_H in ppm (multiplicity; *J* in Hz):** 9.75 (s, 4-OH), 9.34

417 (s, 3-OH), 7.32 (d, 2.1, H-2), 7.27 (dd, 8.1 and 2.1, H-6), 6.78 (d, 8.1, H-5), 5.23–5.20

418 (H-1'), 1.89–1.59 (H-2'–H-5')

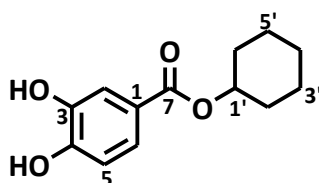
419 **¹³C NMR (150 MHz, DMSO-*d*₆) δ_C in ppm:** 165.9 (C-7), 150.7 (C-4), 145.4 (C-3),

420 122.1 (C-6), 121.6 (C-1), 116.6 (C-5), 115.7 (C-2), 76.9 (C-1'), 32.8 (C-2' and C-5'),

421 23.8 (C-3' and C-4')

422

423 1.35 cyclohexyl 3,4 dihydroxybenzoate (**35**)



424

425 White crystal

426 **Yield:** 74 %

427 **Purity:** > 99.9 %

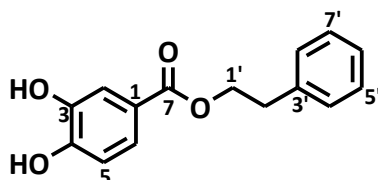
428 **¹H NMR (600 MHz, DMSO-*d*₆) δ_H in ppm (multiplicity; *J* in Hz):** 7.36 (d, 1.8, H-2),

429 7.31 (dd, 8.4 and 1.8, H-6), 6.80 (d, 8.4, H-5), 4.86–4.82 (H-1'), 1.52–1.30 (H-2'–H-6')

430 ^{13}C NMR (150 MHz, DMSO- d_6) δ_{C} in ppm: 165.5 (C-7), 150.7 (C-4), 145.5 (C-3),
431 122.2 (C-6), 121.6 (C-1), 116.7 (C-5), 115.7 (C-2), 72.1 (C-1'), 31.6 (C-2' and C-6'),
432 25.4 (C-4'), 23.5 (C-3' and C-5')

433

434 1.36 phenylethyl 3,4 dihydroxybenzoate (**36**)



435

436 White crystal

437 **Yield:** 21 %

438 **Purity:** > 99.9 %

439 ^1H NMR (300 MHz, DMSO- d_6) δ_{H} in ppm (multiplicity; J in Hz): 7.32–7.18 (H-2, H-
440 6 and H-4'–H-8'), 6.78 (d, 8.4, H-5), 4.37 (t, 6.6, H-1'), 2.98 (t, 6.6 Hz, H-2')

441 ^{13}C NMR (150 MHz, DMSO- d_6) δ_{C} in ppm: 166.1 (C-7), 150.9 (C-4), 145.5 (C-3),
442 138.7 (C-3'), 129.4 (C-5' and C-7'), 128.8 (C-4' and C-8'), 126.8 (C-6'), 122.2 (C-6),
443 121.0 (C-1), 116.7 (C-5), 115.7 (C-2), 65.2 (C-1'), 35.0 (C-2').

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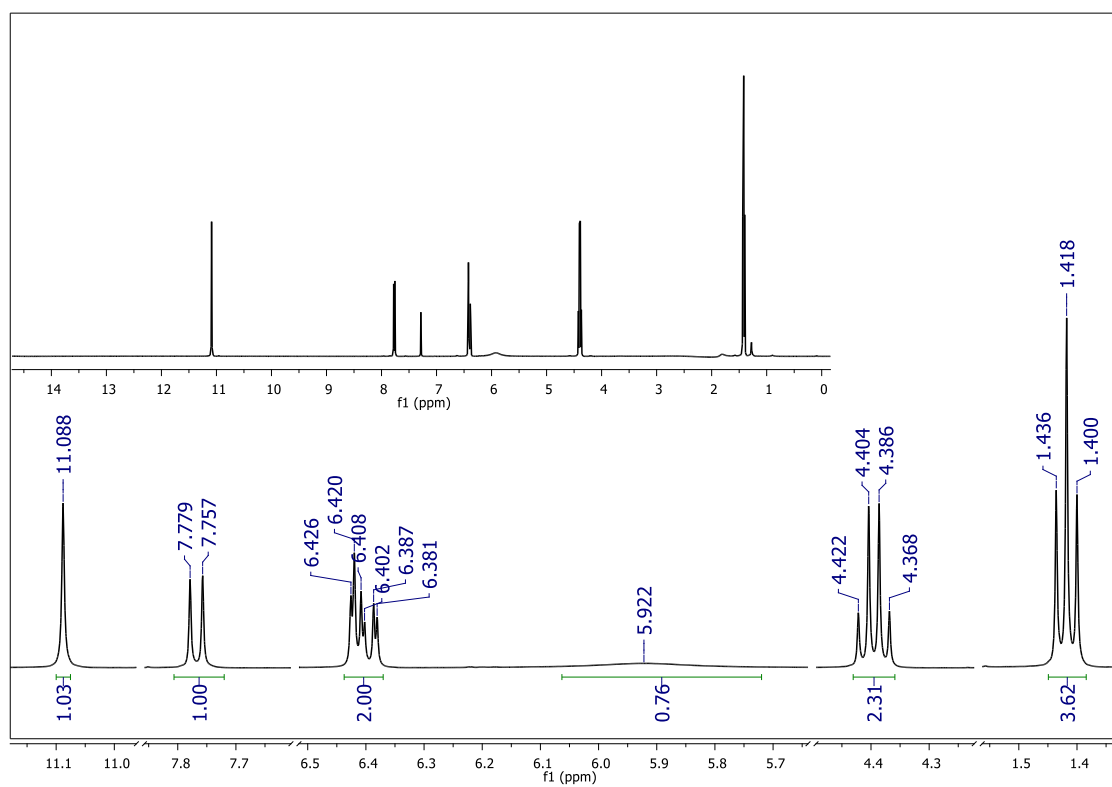
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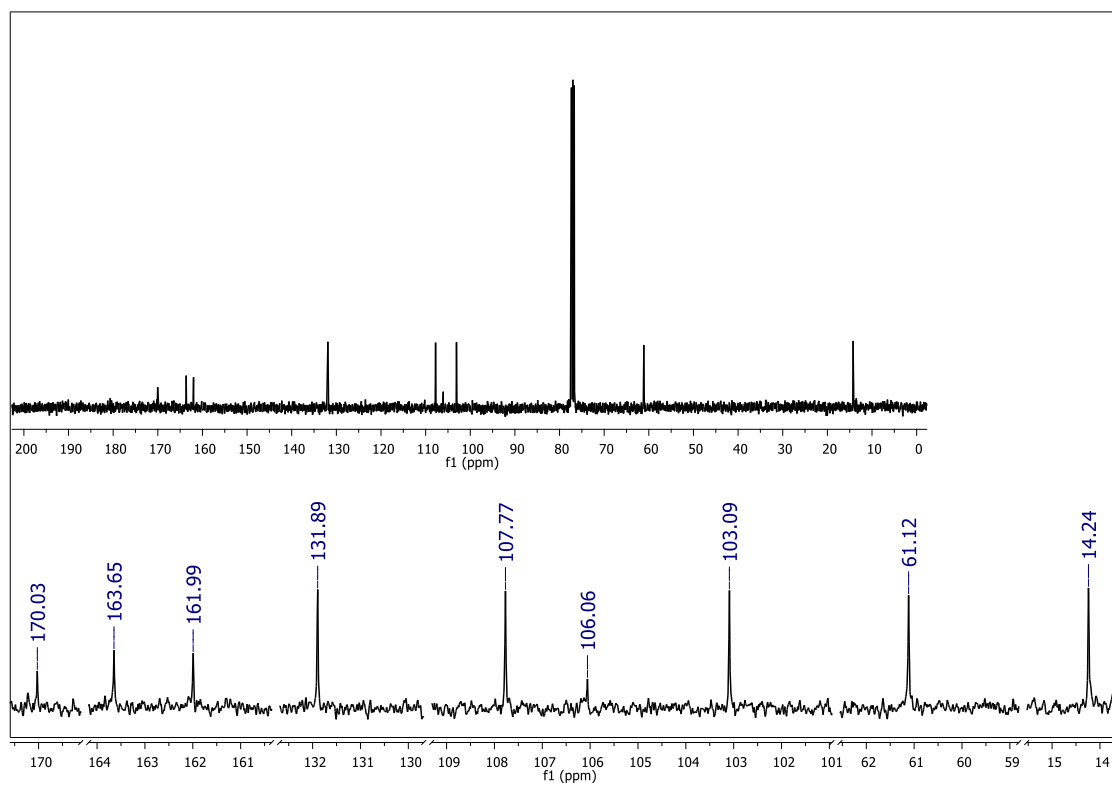
453 **Figure S1. I)** ^1H NMR spectrum of compound **1** (400 MHz – CDCl_3)



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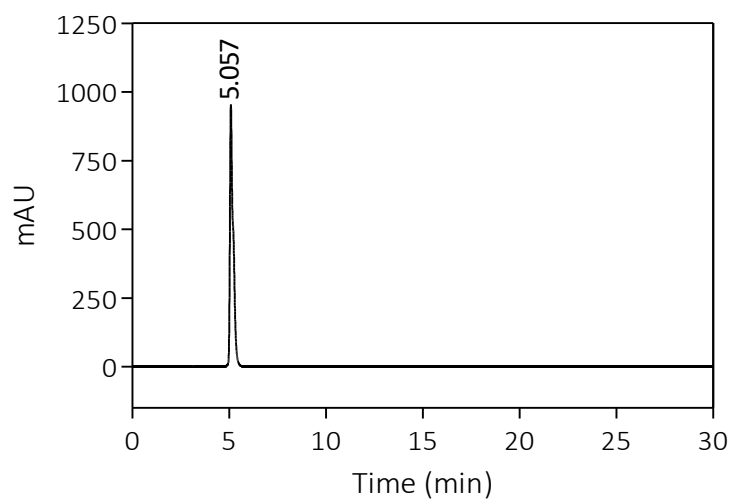
456 **Figure S1. II)** ^{13}C NMR spectrum of compound **1** (100 MHz – CDCl_3)



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459 **Figure S1. III) HPLC chromatogram of compound 1**



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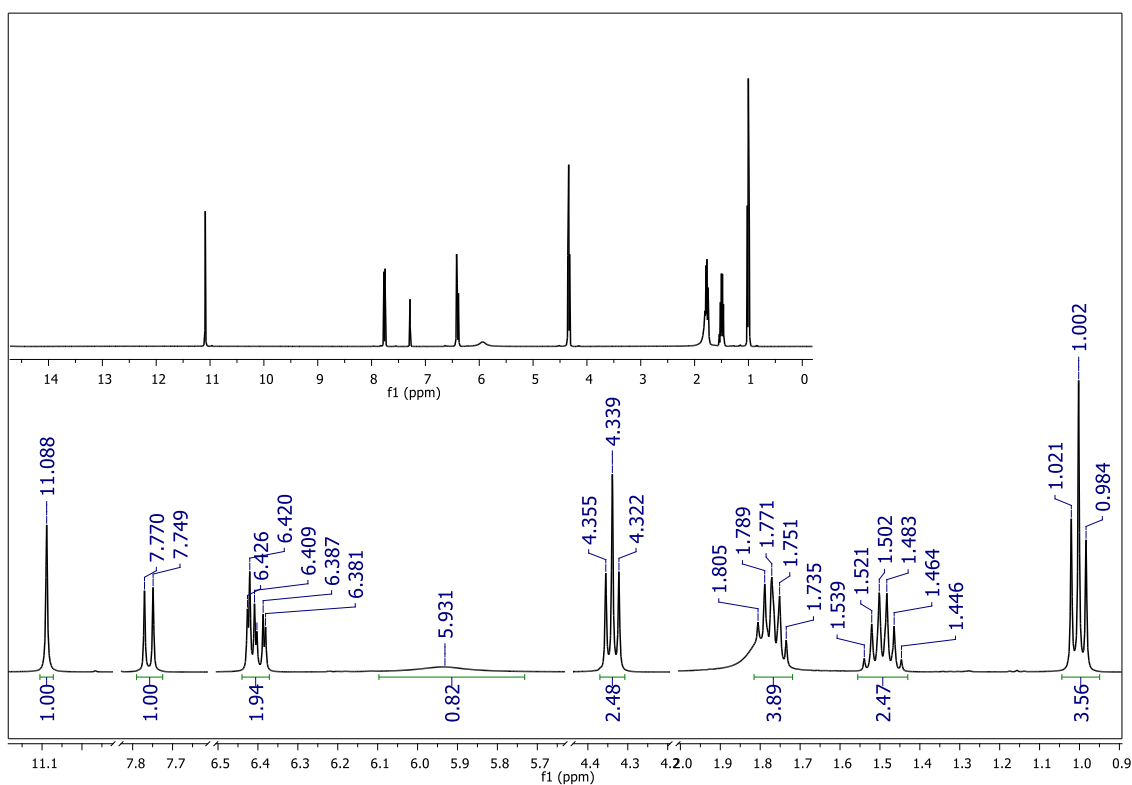
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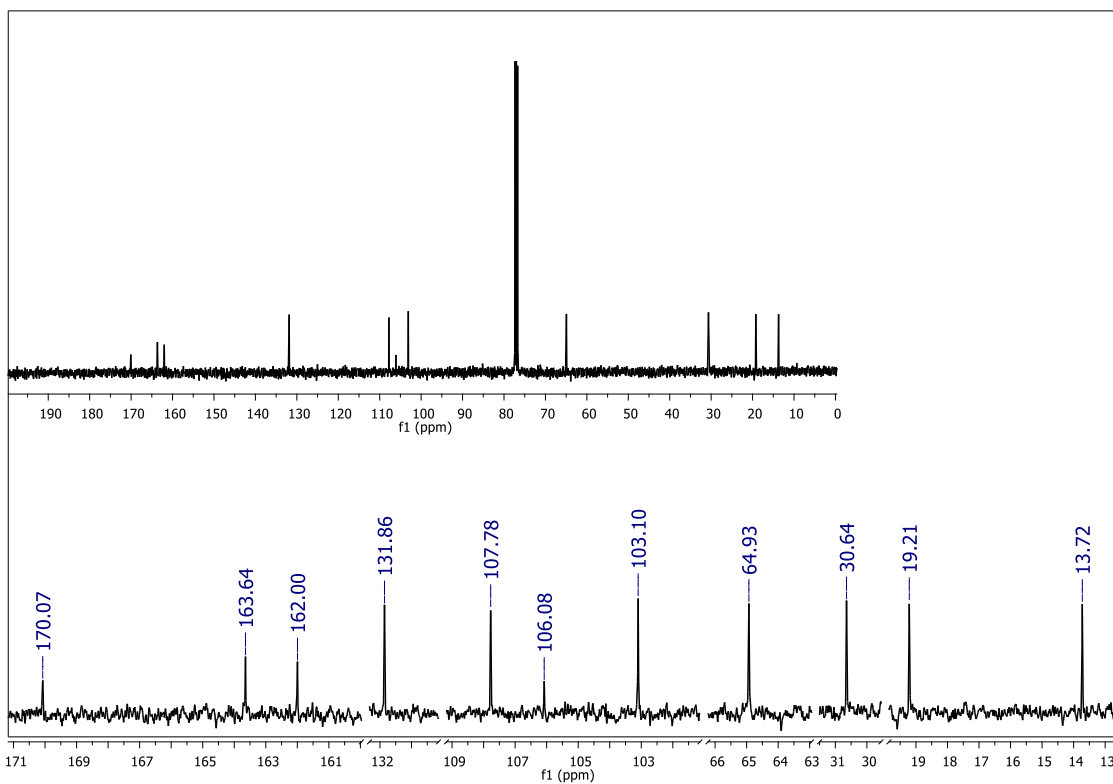
476

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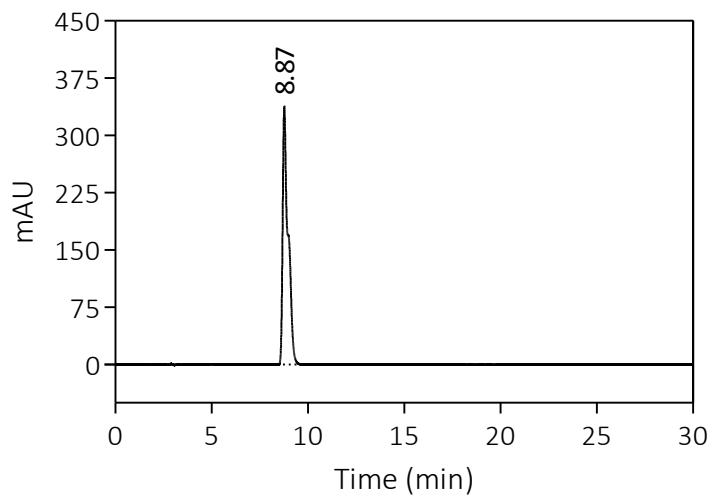
478 **Figure S2. I)** ^1H NMR spectrum of compound **2** (400 MHz – CDCl_3)



481 **Figure S2. II)** ^{13}C NMR spectrum of compound **2** (100 MHz – CDCl_3)



484 **Figure S2. III)** HPLC chromatogram of compound **2**



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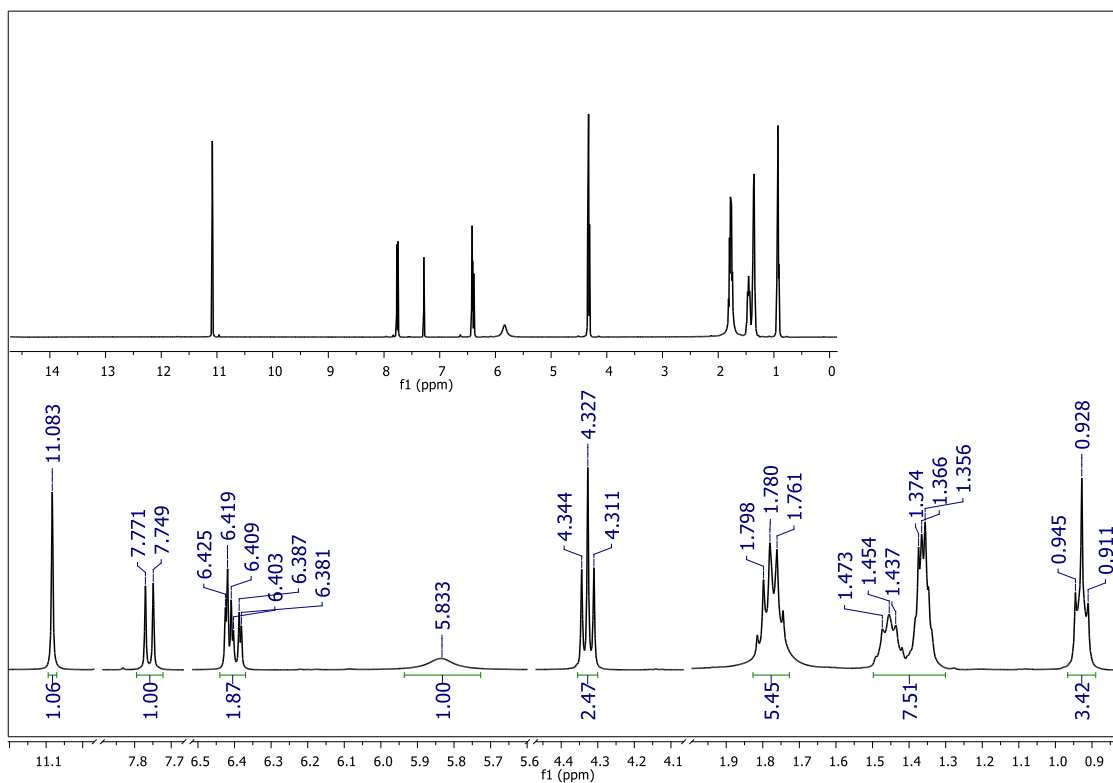
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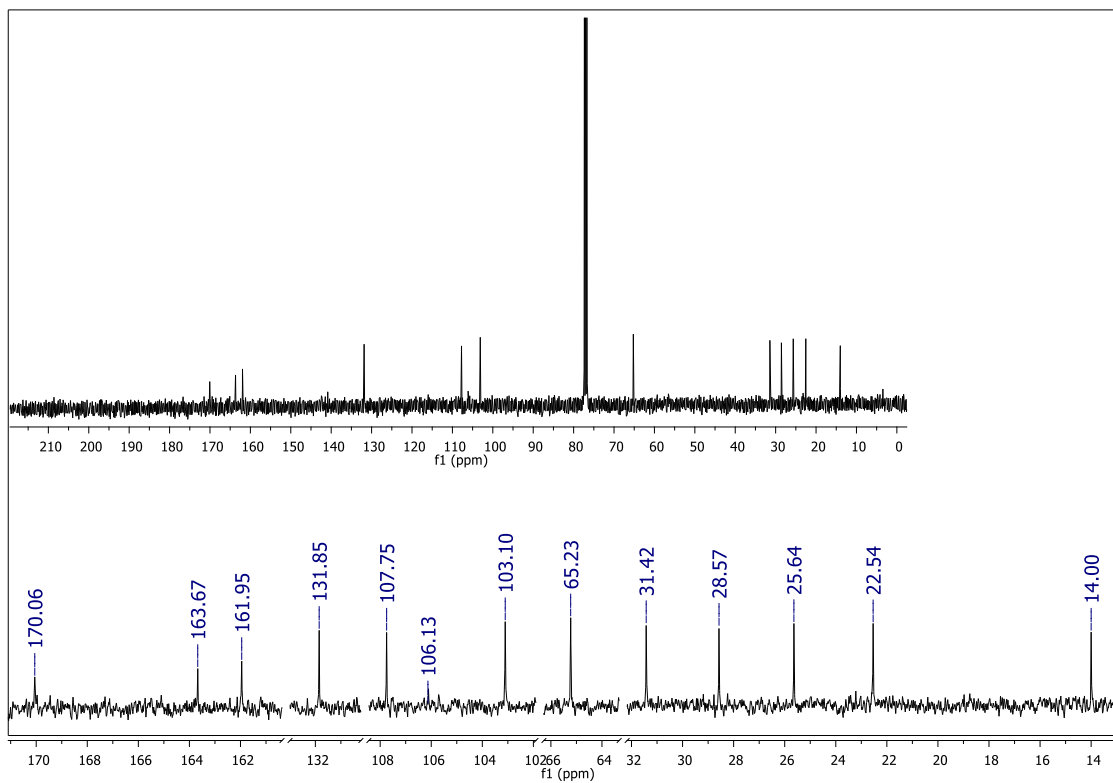
503 **Figure S3. I)** ^1H NMR spectrum of compound **3** (400 MHz – CDCl_3)



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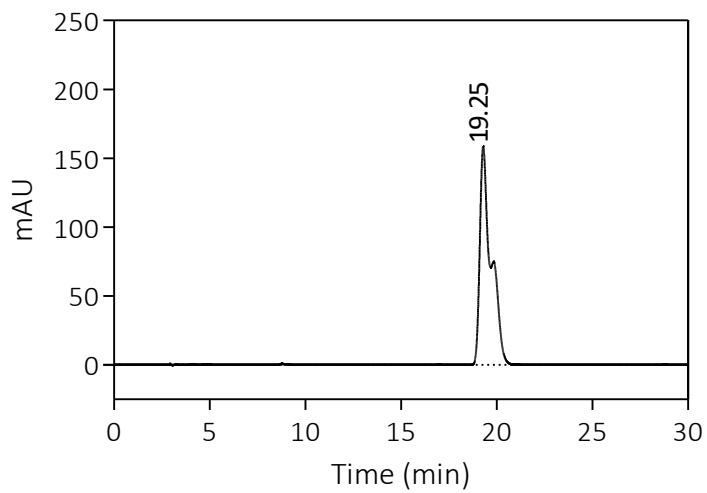
506 **Figure S3. II)** ^{13}C NMR spectrum of compound **3** (100 MHz – CDCl_3)



507

508

509 **Figure S3.** III) HPLC chromatogram of compound **3**



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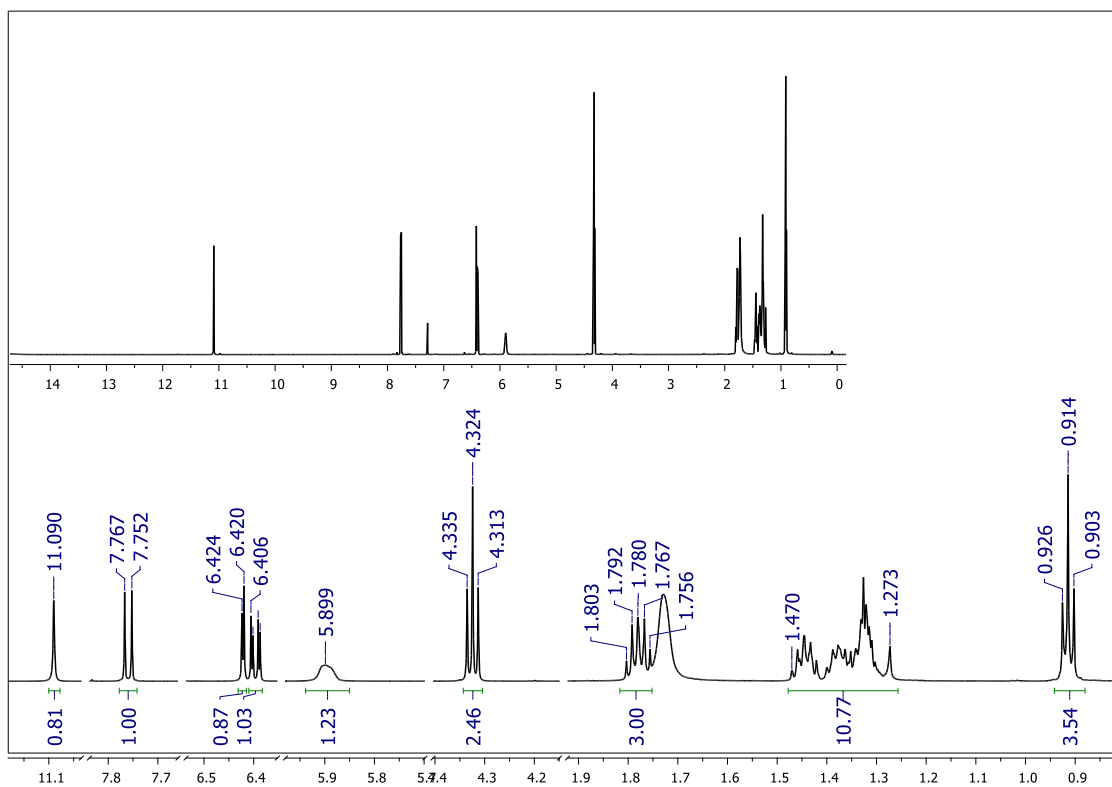
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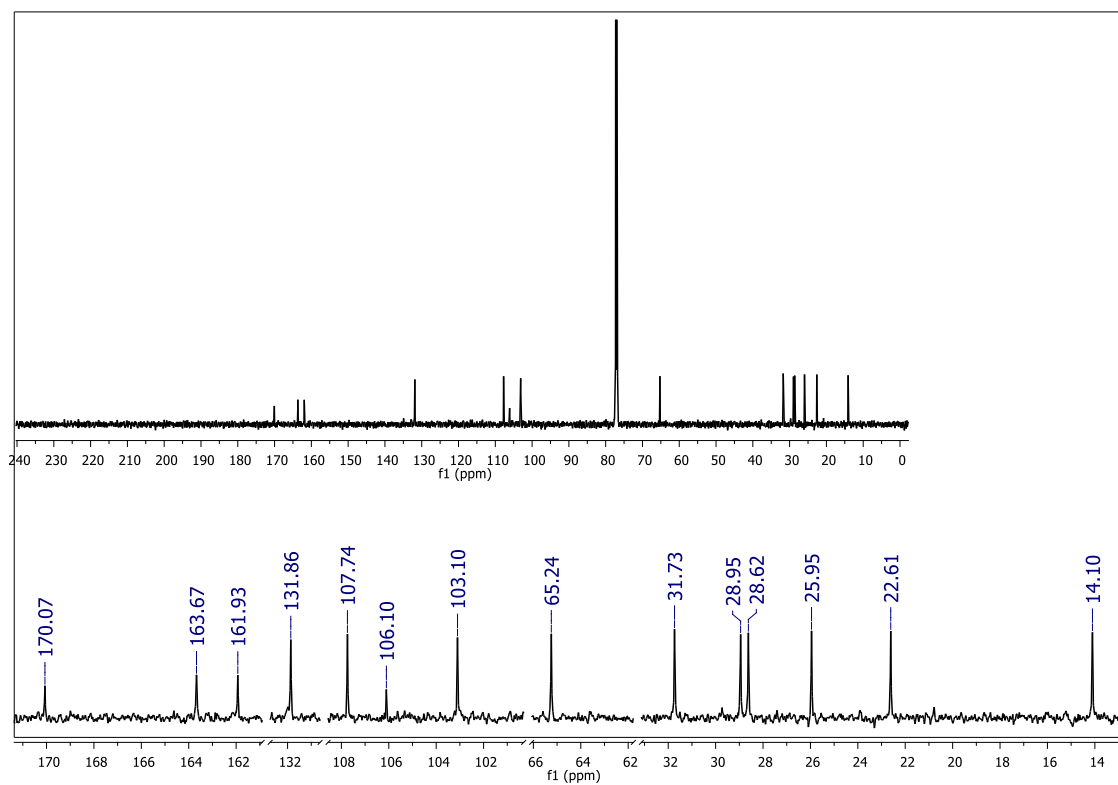
528 **Figure S4. I)** ^1H NMR spectrum of compound **4** (600 MHz – CDCl_3)



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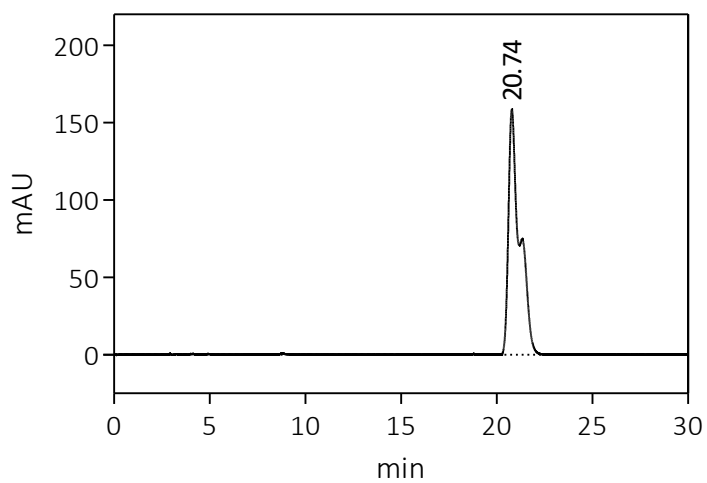
531 **Figure S4. II)** ^{13}C NMR spectrum of compound **4** (150 MHz – CDCl_3)



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534 **Figure S4.** III) HPLC chromatogram of compound **4**



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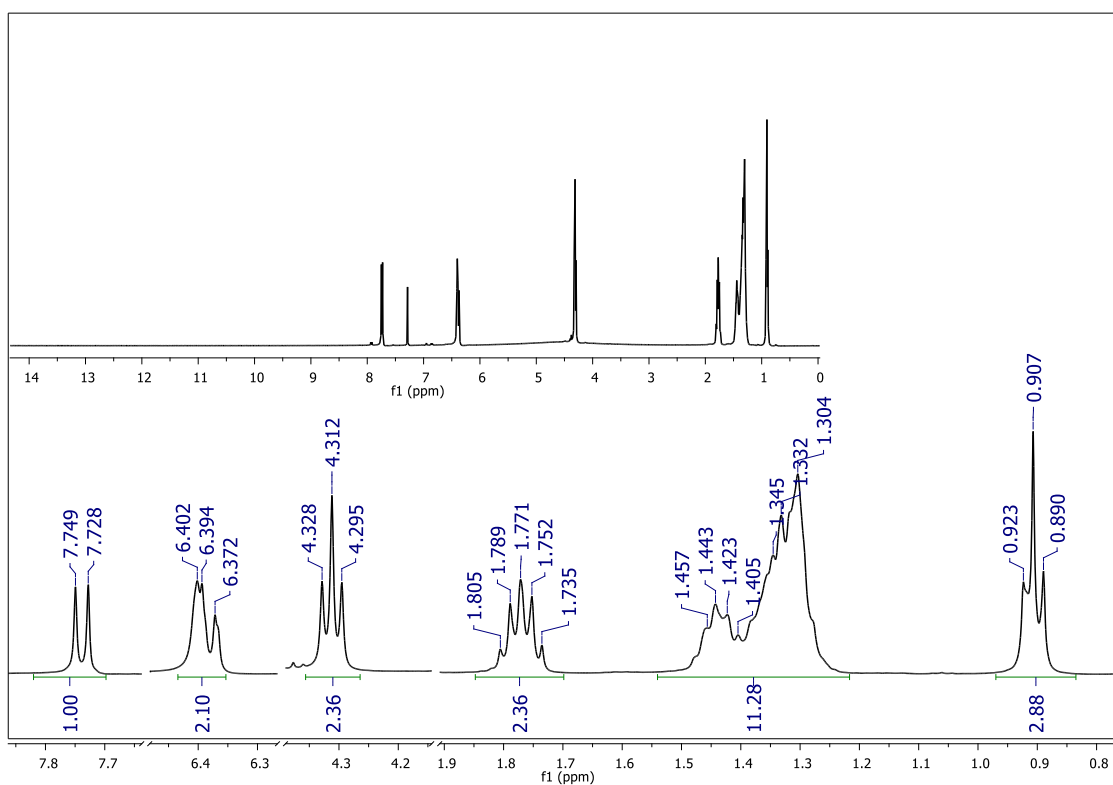
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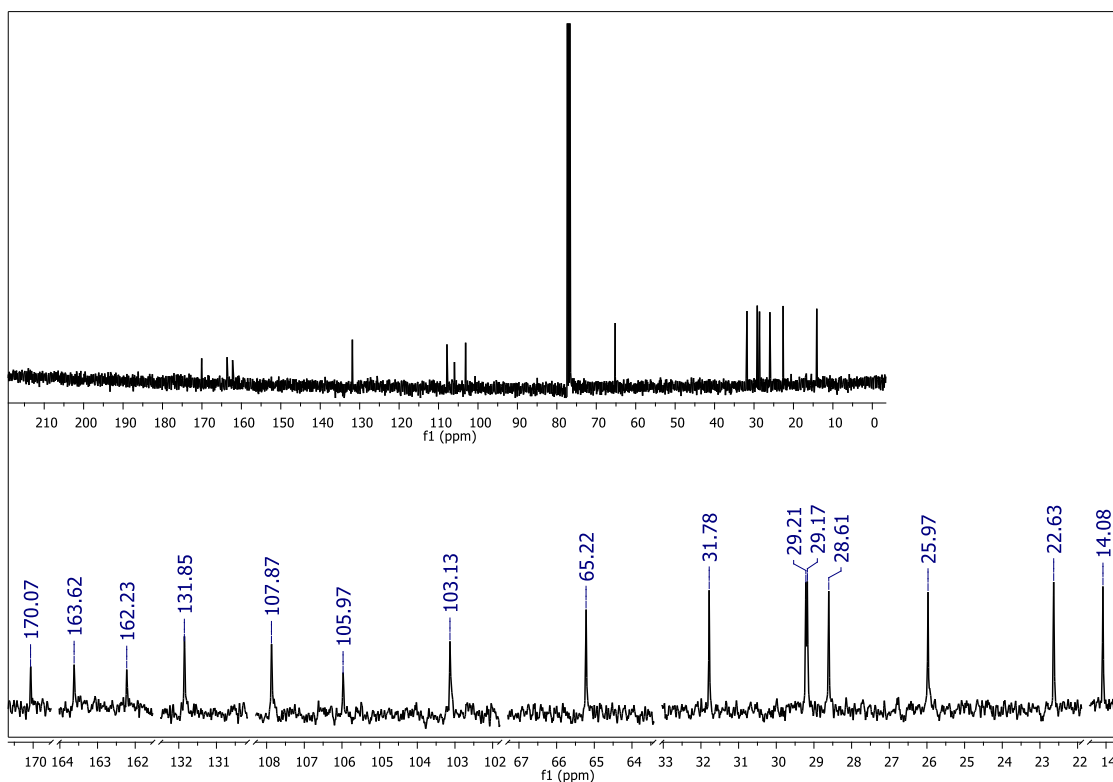
553 **Figure S5. I)** ^1H NMR spectrum of compound **5** (400 MHz – CDCl_3)



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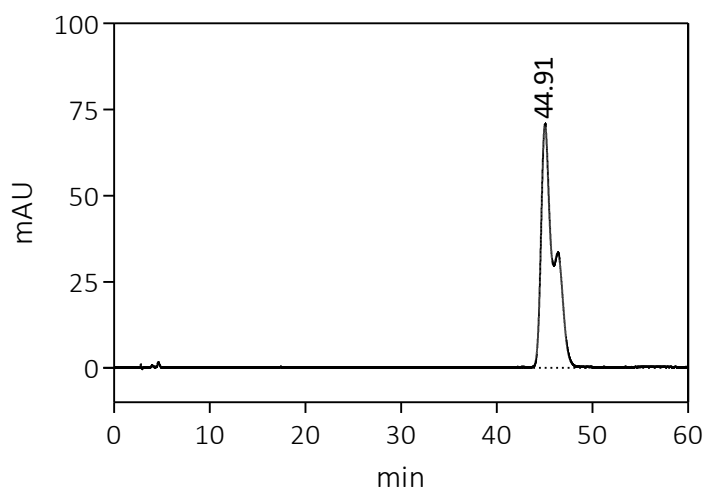
556 **Figure S5. II)** ^{13}C NMR spectrum of compound **5** (100 MHz – CDCl_3)



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559 **Figure S5. III)** HPLC chromatogram of compound **5**



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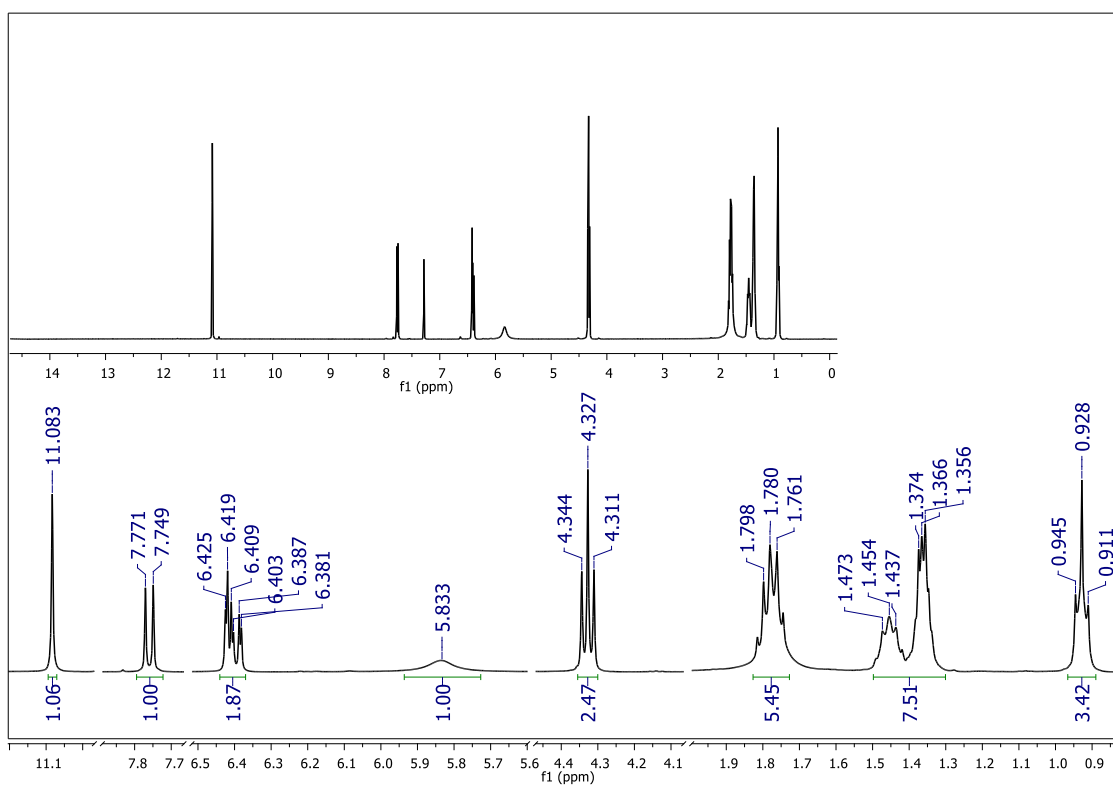
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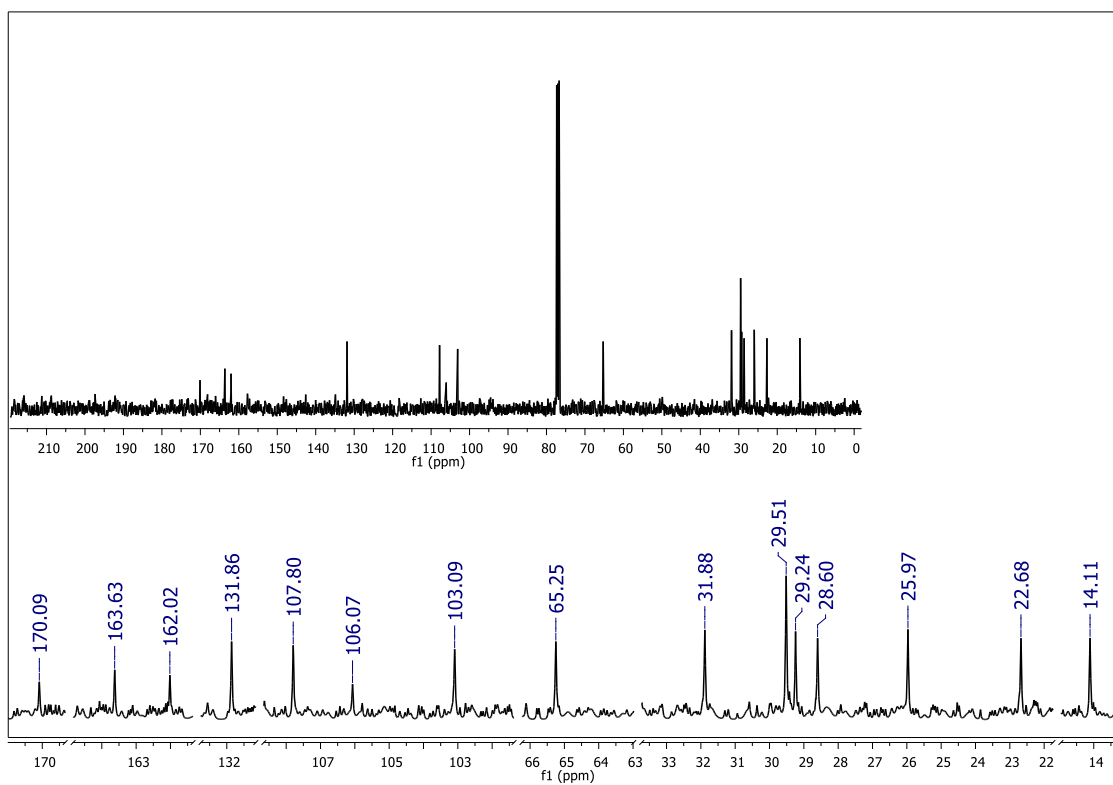
578 **Figure S6. I)** ^1H NMR spectrum of compound **6** (400 MHz – CDCl_3)



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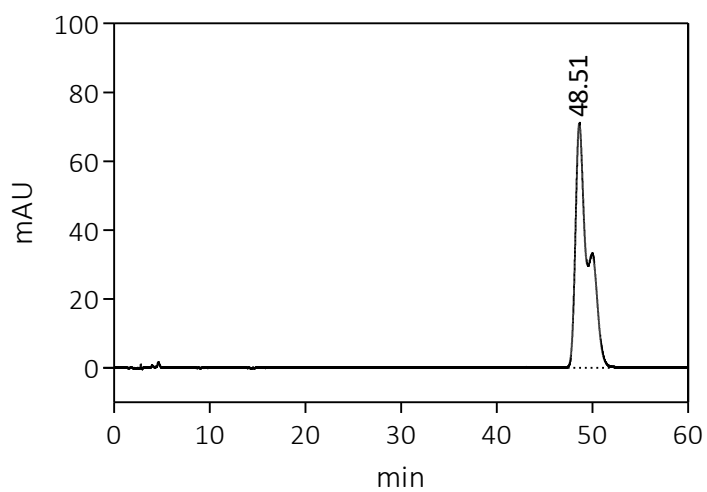
581 **Figure S6. II)** ^{13}C NMR spectrum of compound **6** (100 MHz – CDCl_3)



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584 **Figure S6. III)** HPLC chromatogram of compound **6**



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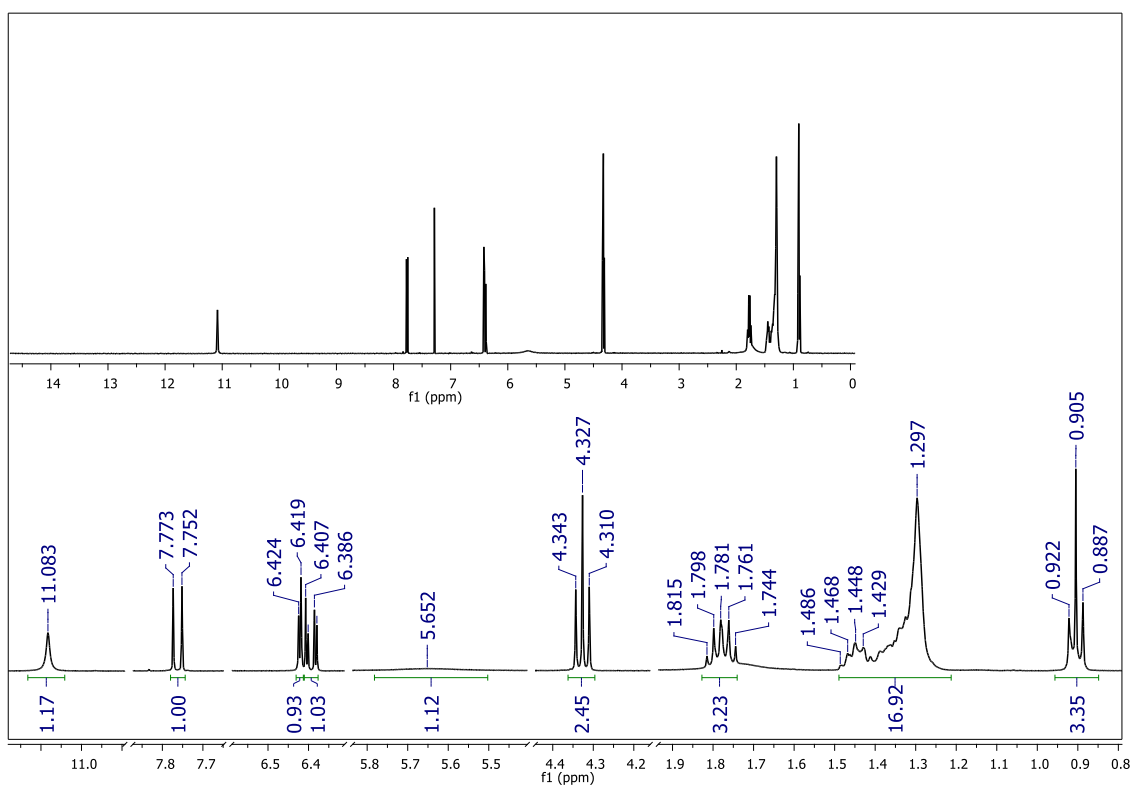
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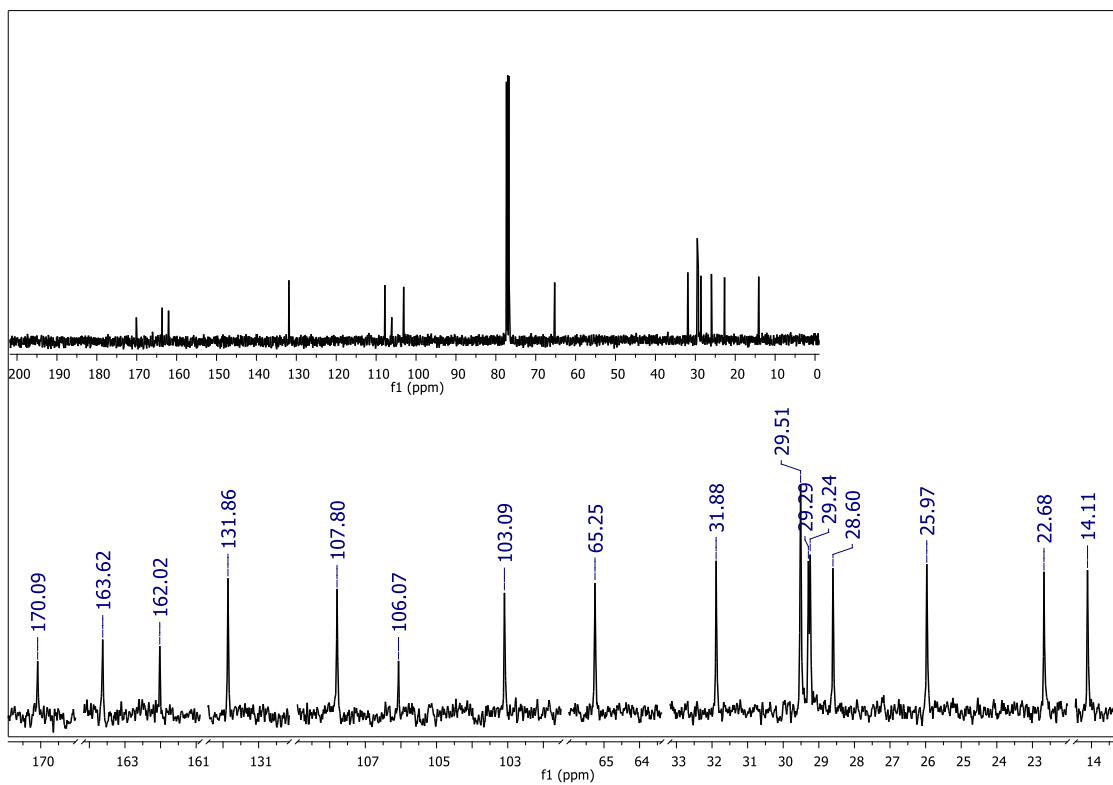
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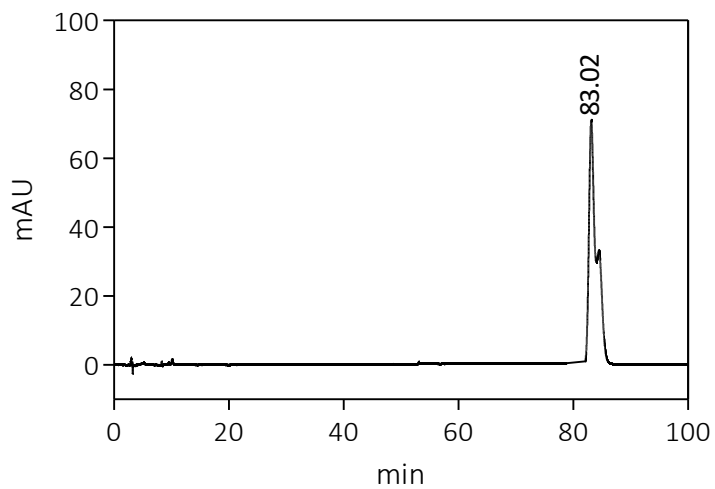
603 **Figure S7. I)** ^1H NMR spectrum of compound **7** (400 MHz – CDCl_3)



606 **Figure S7. II)** ^{13}C NMR spectrum of compound **7** (100 MHz – CDCl_3)



609 **Figure S7. III)** HPLC chromatogram of compound **7**



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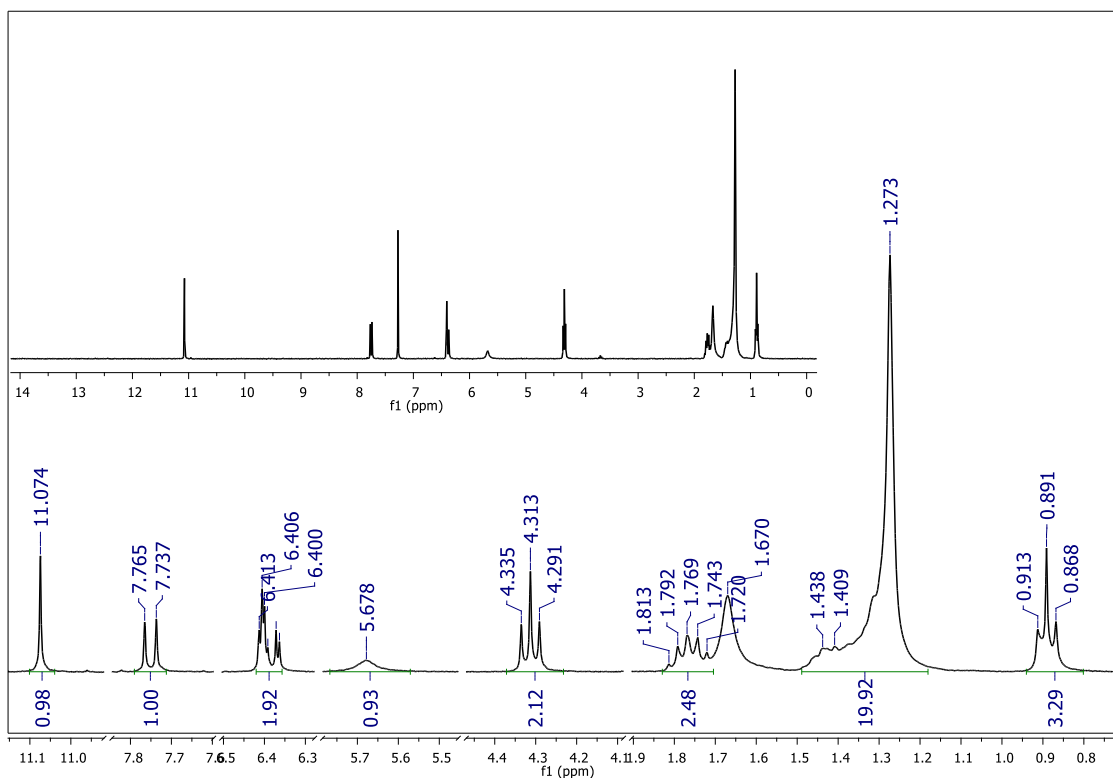
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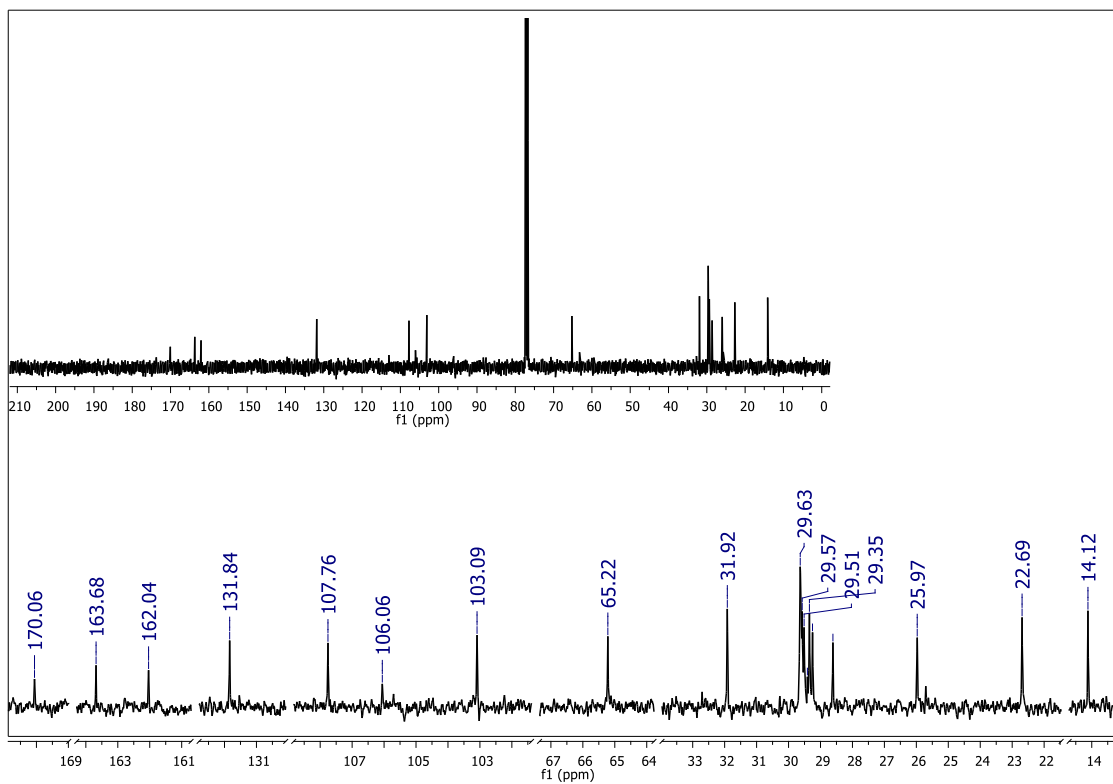
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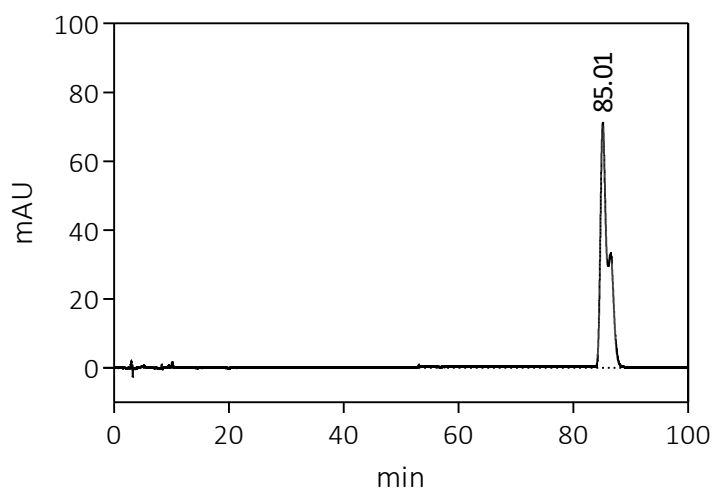
628 **Figure S8. I)** ^1H NMR spectrum of compound **8** (300 MHz – CDCl_3)



631 **Figure S8. II)** ^{13}C NMR spectrum of compound **8** (100 MHz – CDCl_3)



634 **Figure S8.** III) HPLC chromatogram of compound **8**



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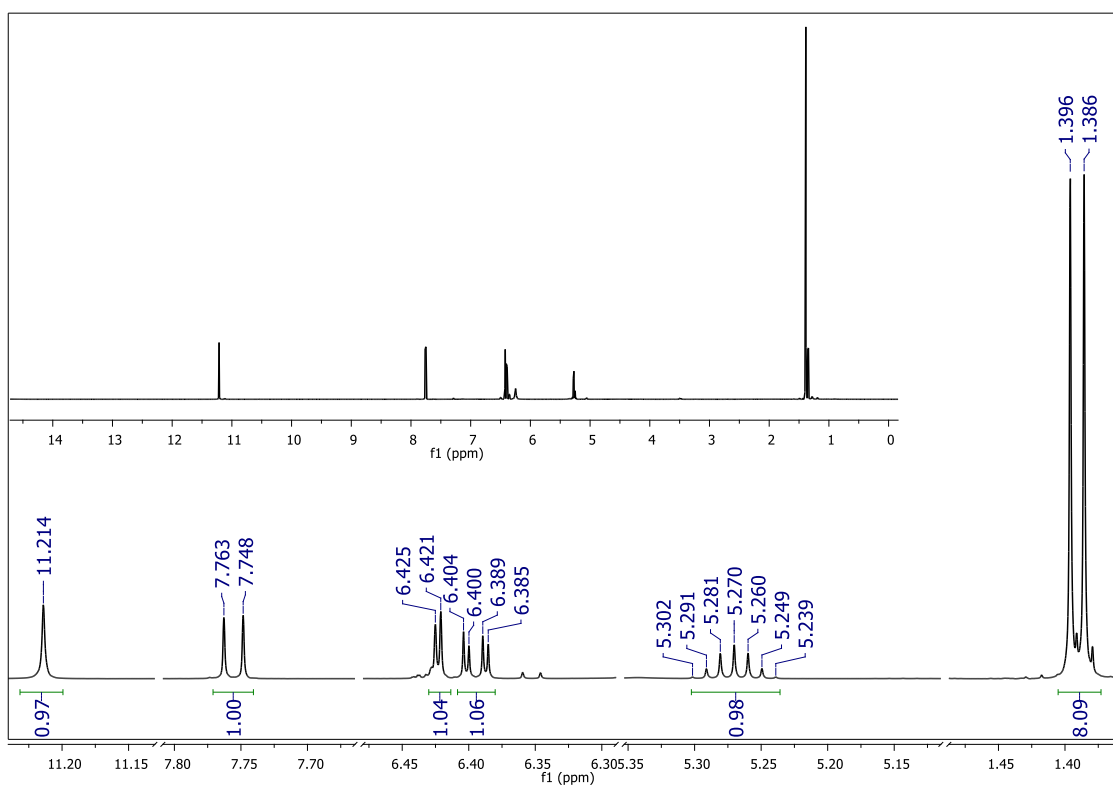
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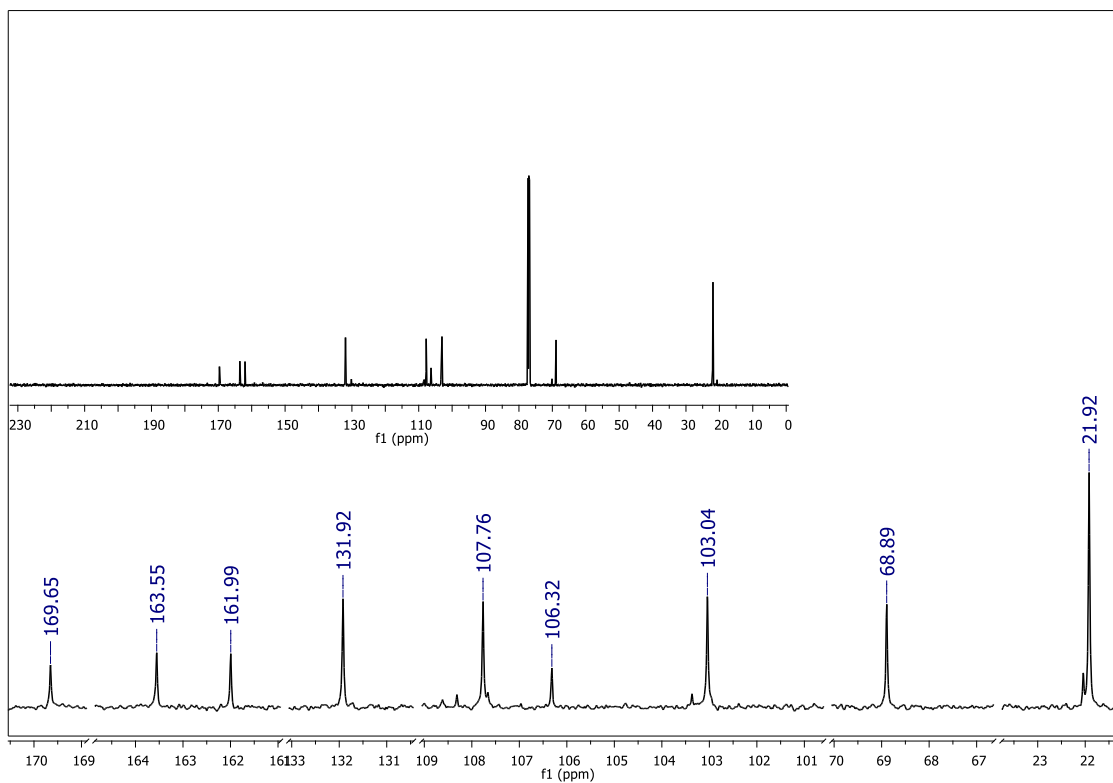
653 **Figure S9. I)** ^1H NMR spectrum of compound **9** (600 MHz – CDCl_3)



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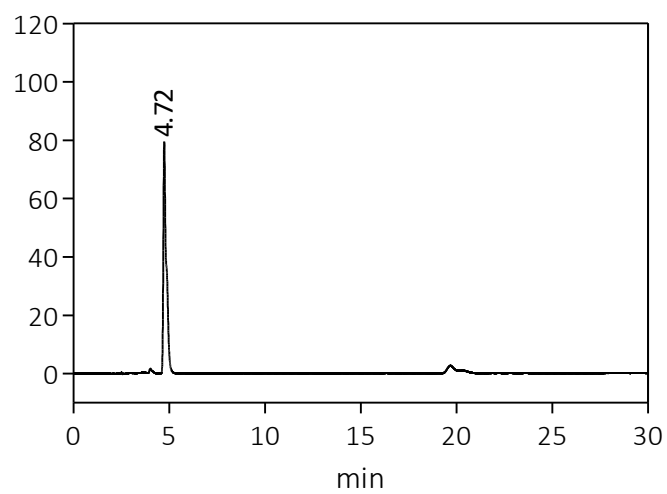
656 **Figure S9. II)** ^{13}C NMR spectrum of compound **9** (150 MHz – CDCl_3)



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659 **Figure S9.** III) HPLC chromatogram of compound **9**



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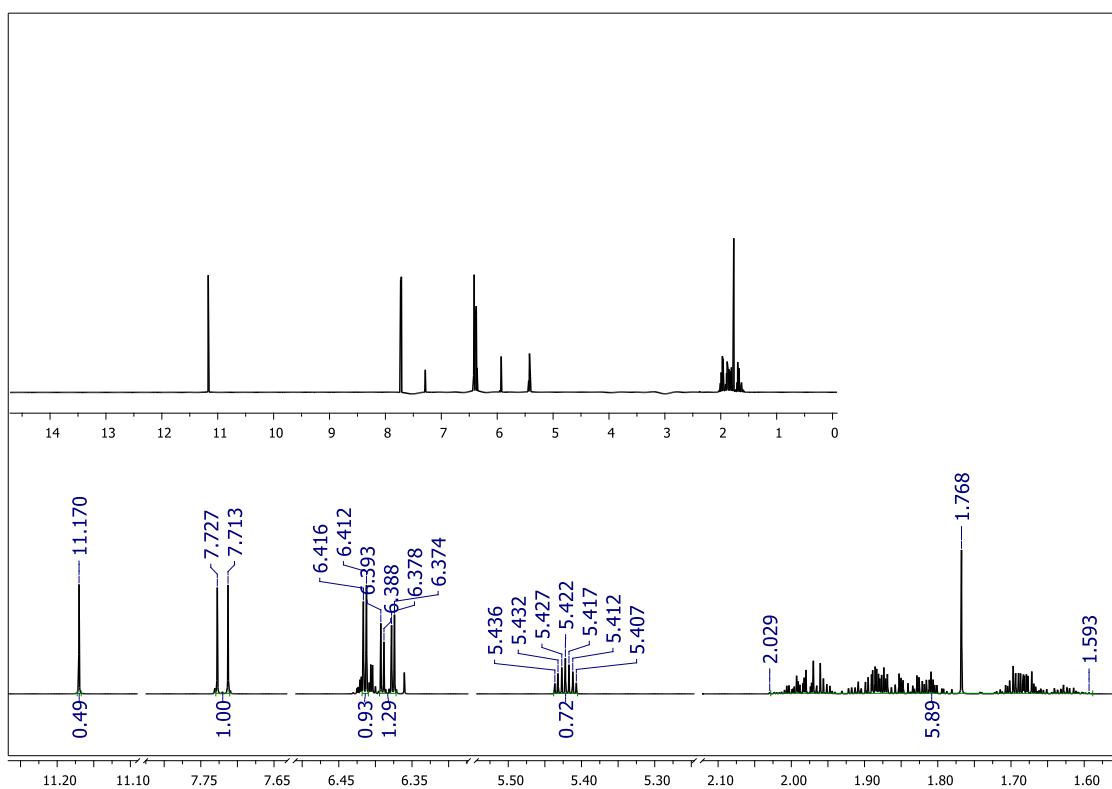
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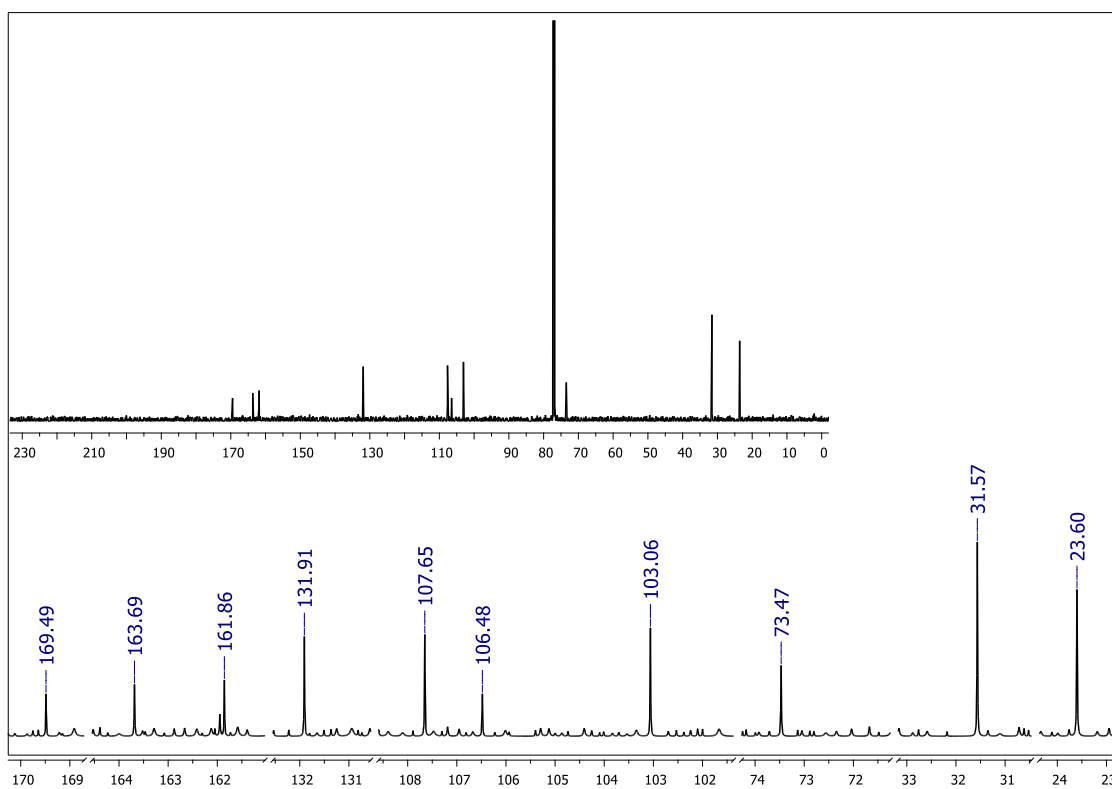
678 **Figure S10. I)** ^1H NMR spectrum of compound **10** (600 MHz – CDCl_3)



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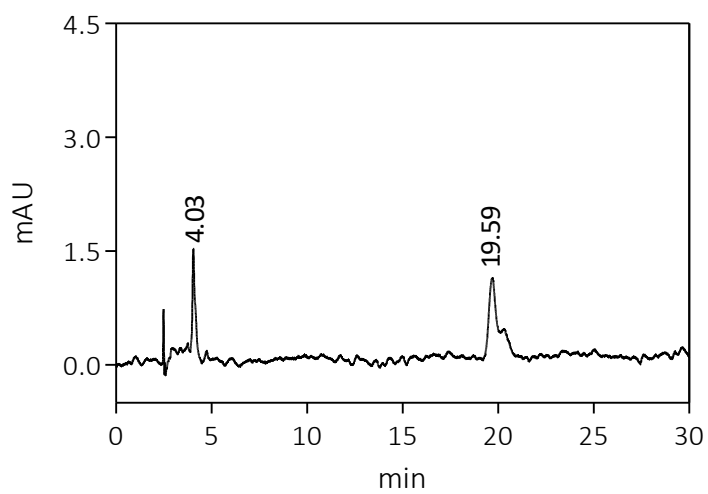
681 **Figure S10. II)** ^{13}C NMR spectrum of compound **10** (150 MHz – CDCl_3)



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684 **Figure S10.** III) HPLC chromatogram of compound **10**



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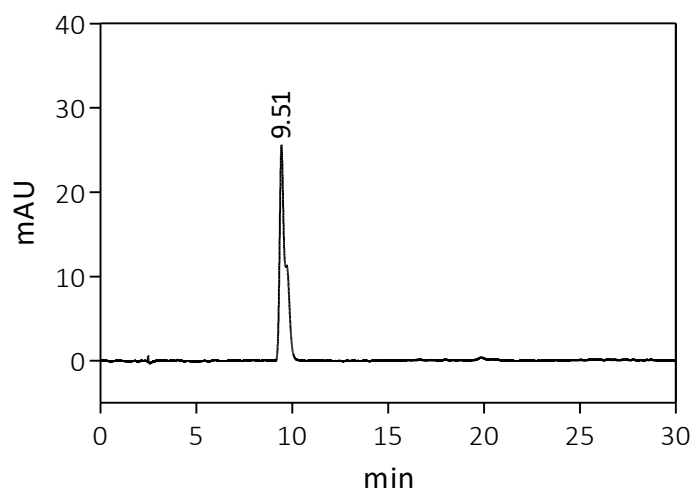
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709 **Figure S11.** III) HPLC chromatogram of compound **11**



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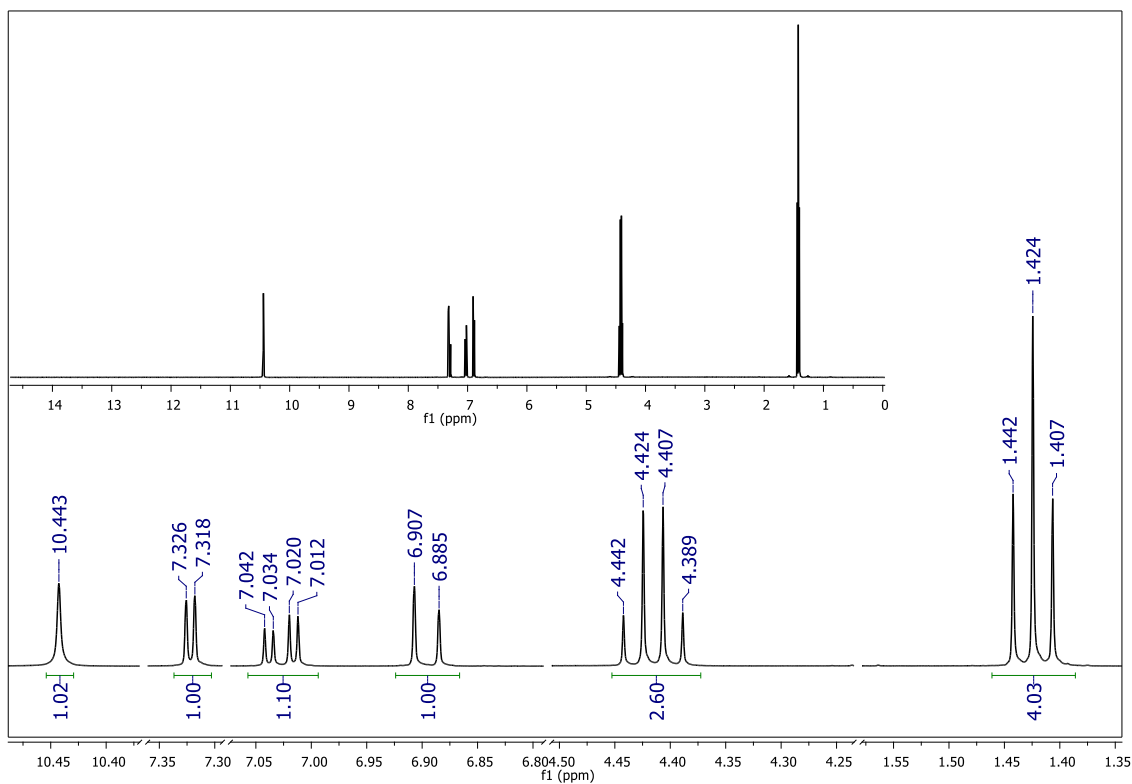
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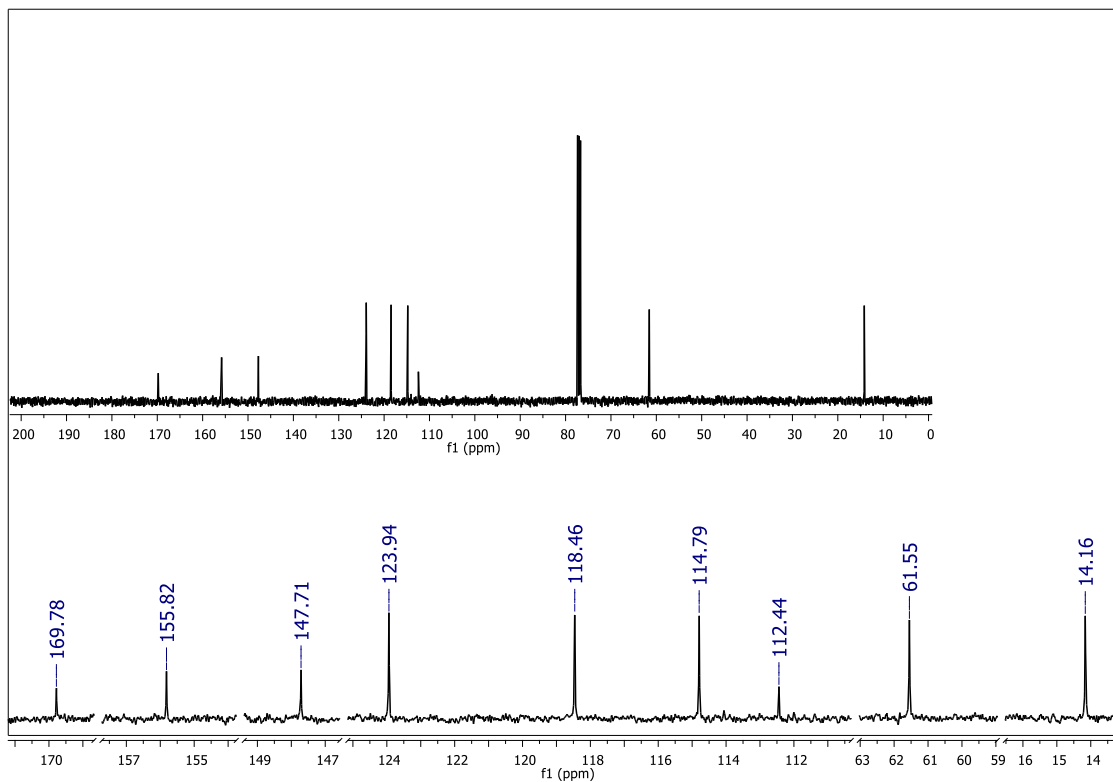
728 **Figure S13. I)** ^1H NMR spectrum of compound **13** (400 MHz – CDCl_3)



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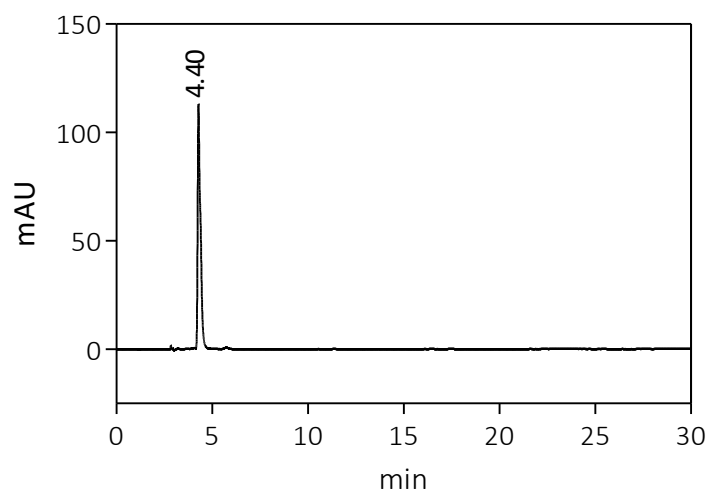
731 **Figure S13. II)** ^{13}C NMR spectrum of compound **13** (100 MHz – CDCl_3)



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734 **Figure S13.** III) HPLC chromatogram of compound **13**



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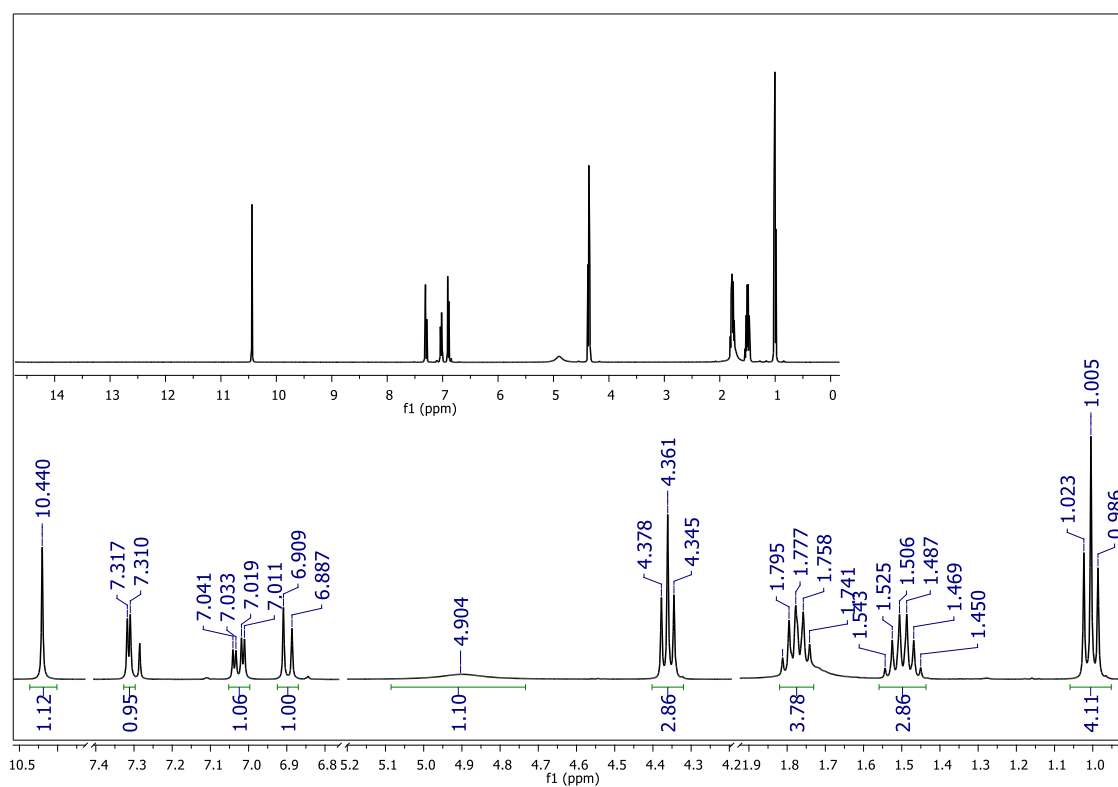
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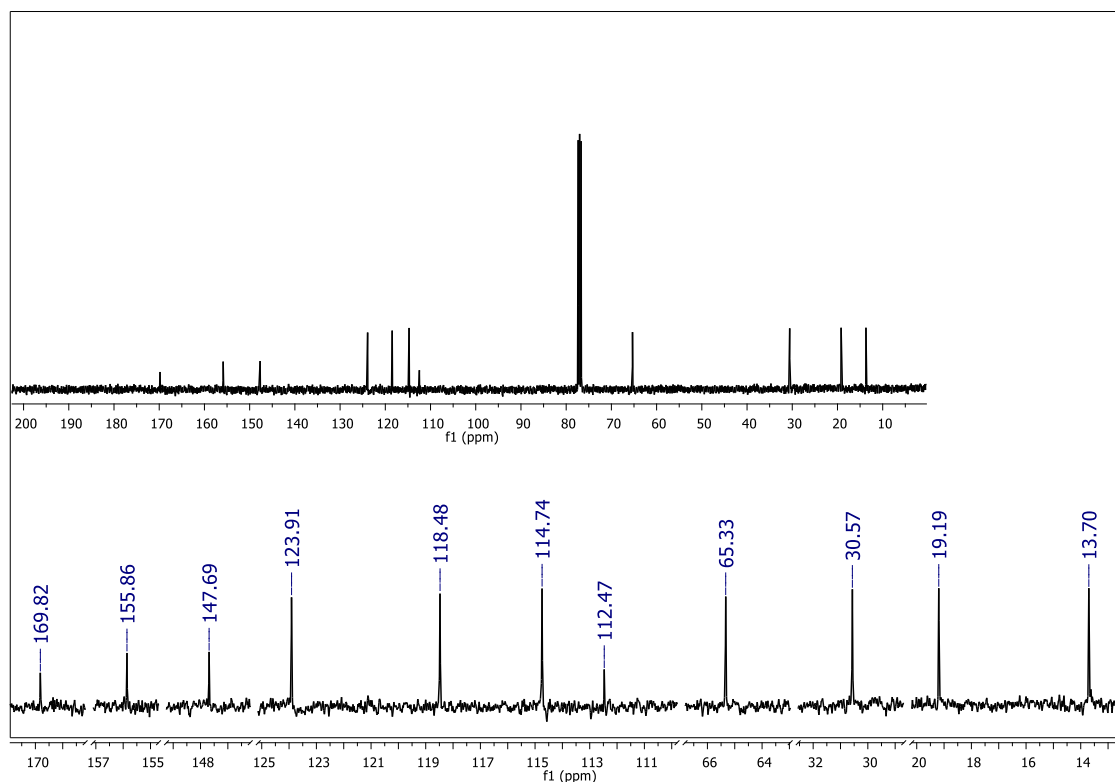
753 **Figure S14. I)** ^1H NMR spectrum of compound **14** (400 MHz – CDCl_3)



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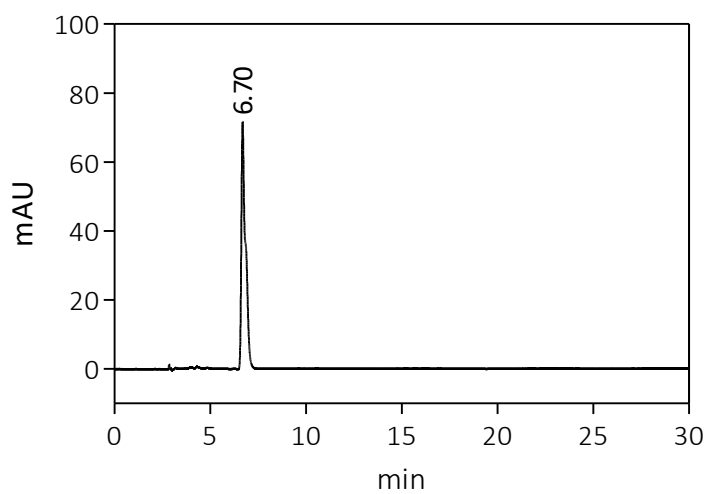
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756 **Figure S14. II)** ^{13}C NMR spectrum of compound **14** (100 MHz – CDCl_3)



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758 **Figure S14.** III) HPLC chromatogram of compound **14**



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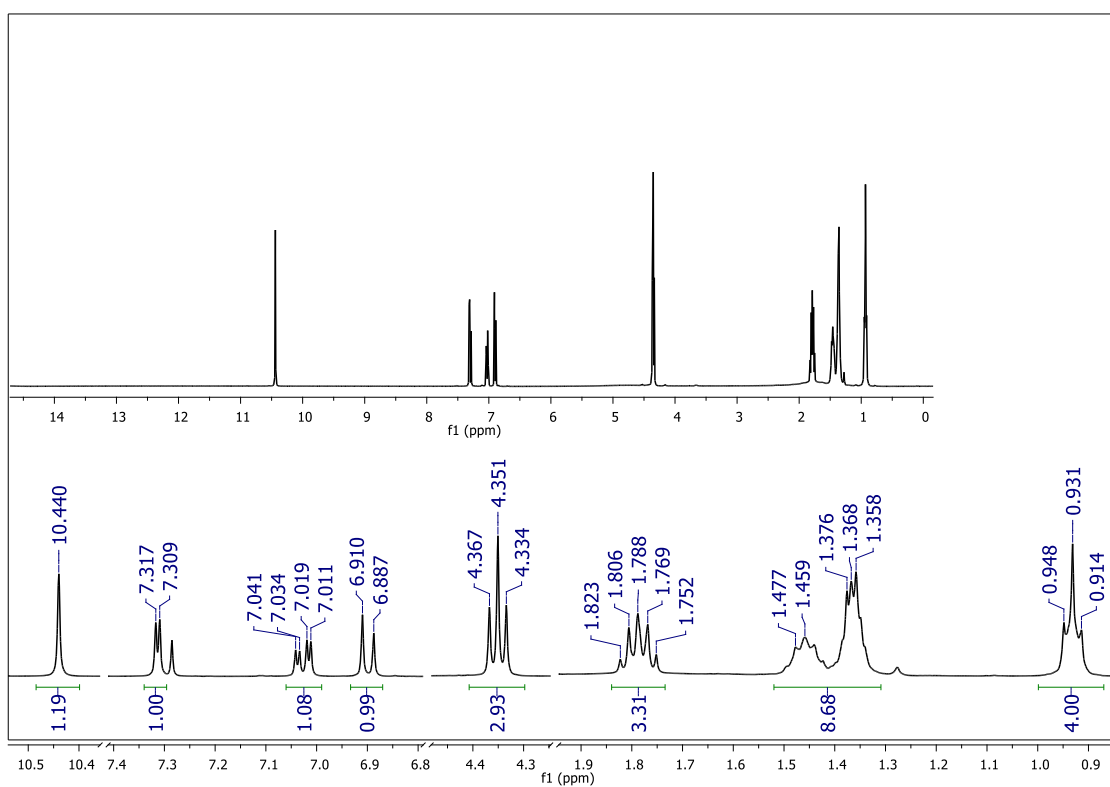
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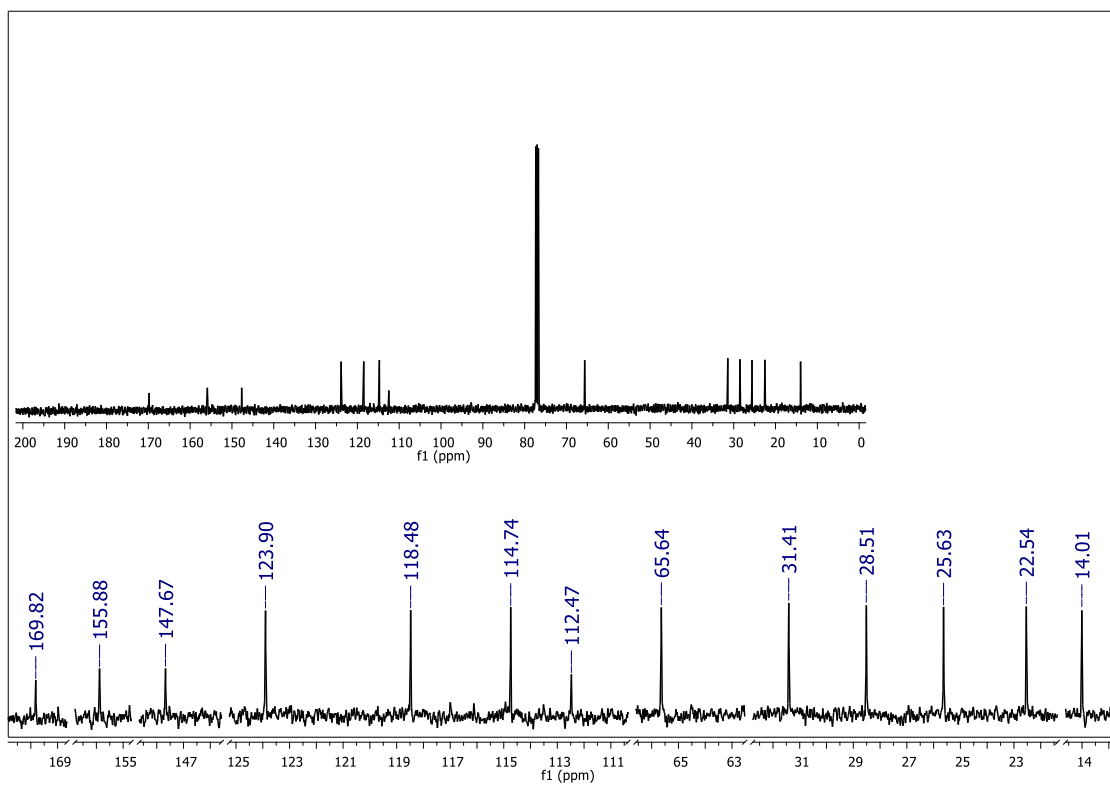
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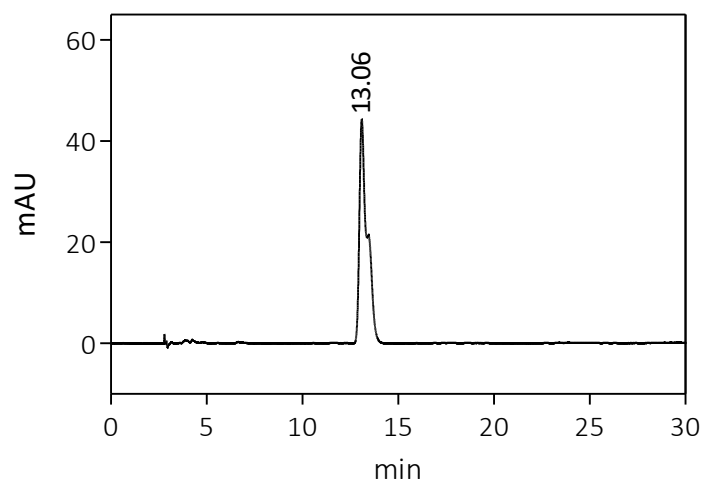
777 **Figure S15. I)** ^1H NMR spectrum of compound **15** (400 MHz – CDCl_3)



780 **Figure S15. II)** ^{13}C NMR spectrum of compound **15** (100 MHz – CDCl_3)



782 **Figure S15.** III) HPLC chromatogram of compound **15**



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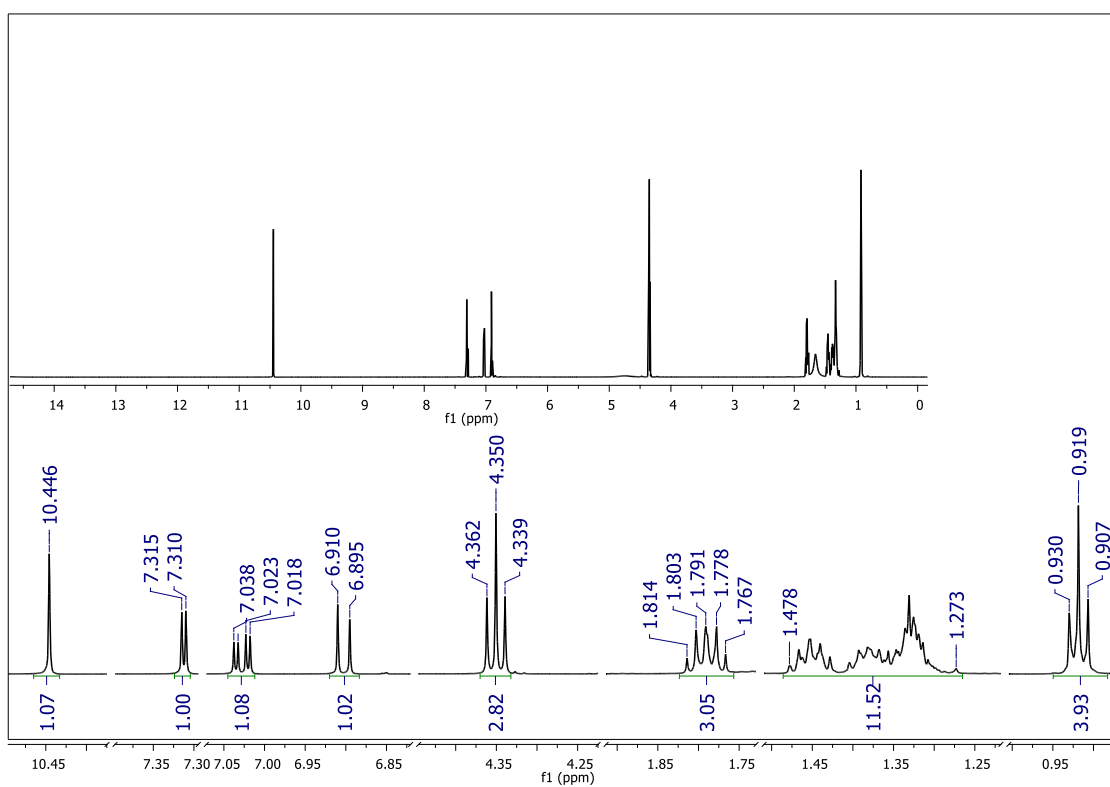
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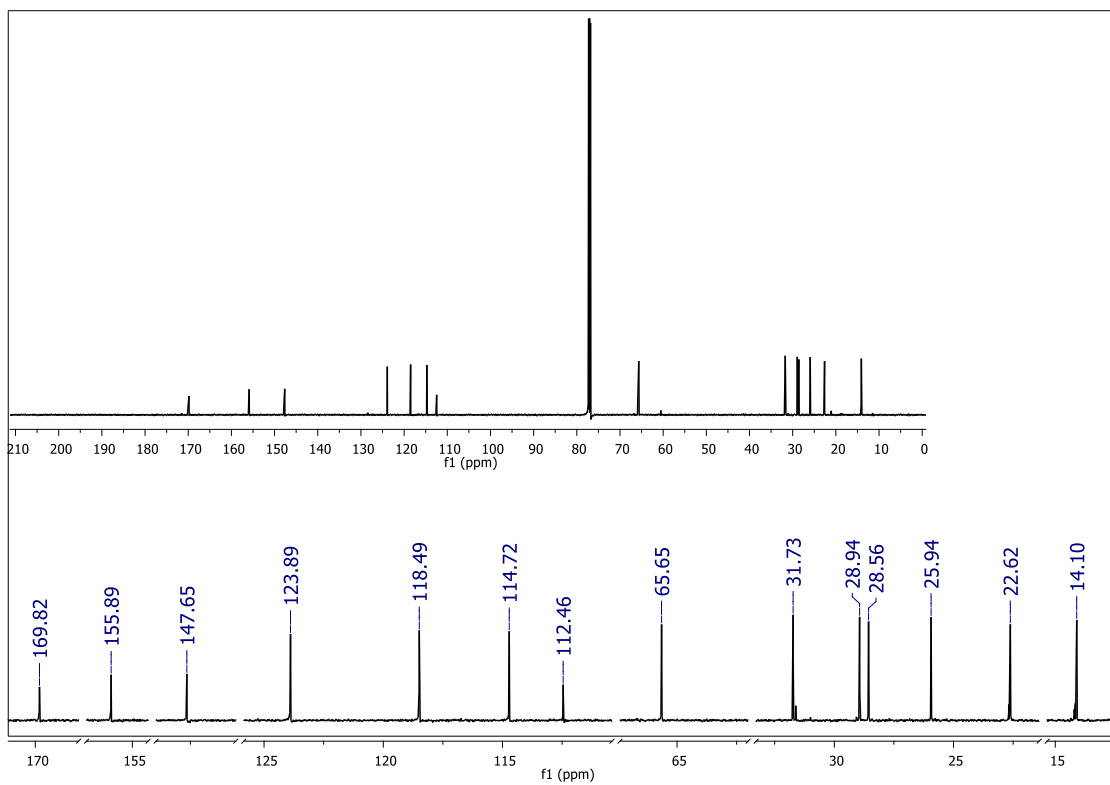
800 **Figure S16. I)** ^1H NMR spectrum of compound **16** (600 MHz – CDCl_3)



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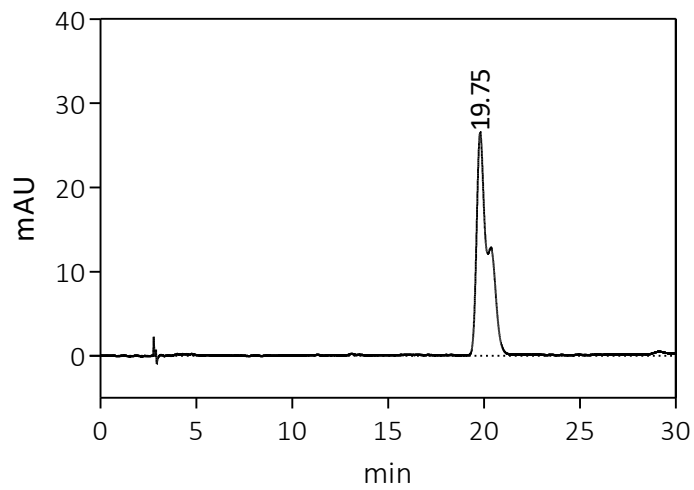
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803 **Figure S16. II)** ^{13}C NMR spectrum of compound **16** (150 MHz – CDCl_3)



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805 **Figure S16.** III) HPLC chromatogram of compound **16**



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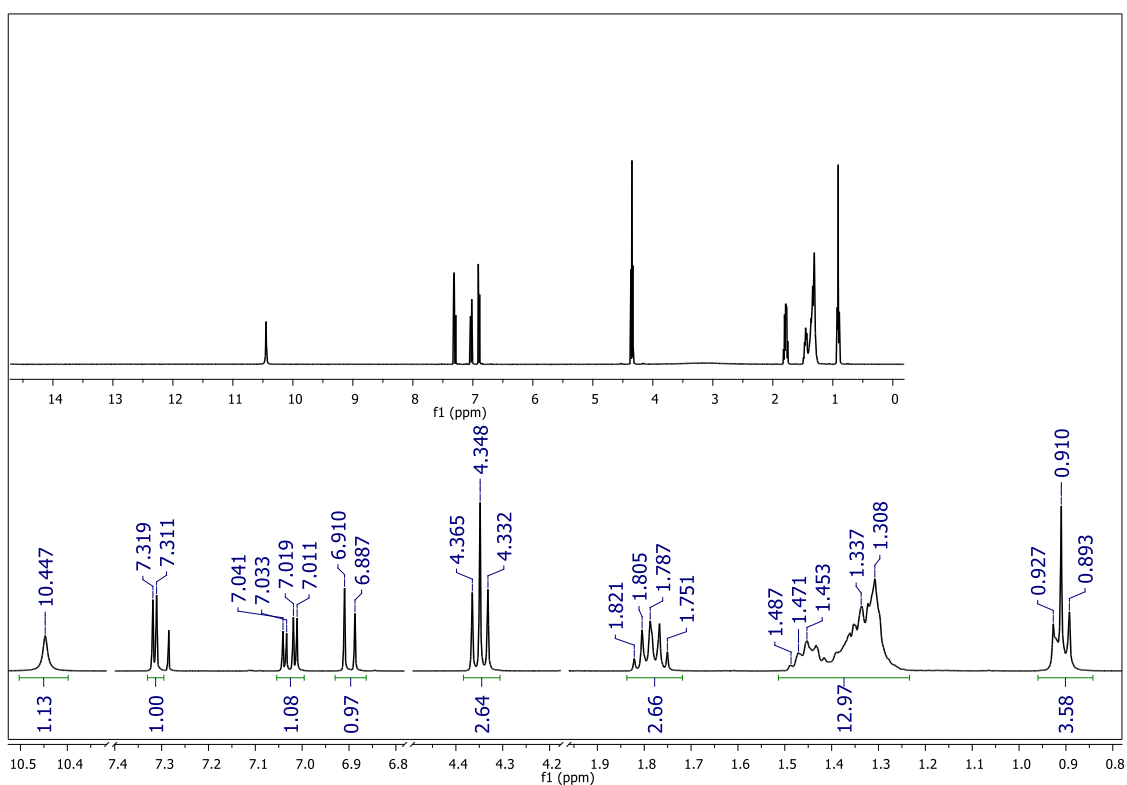
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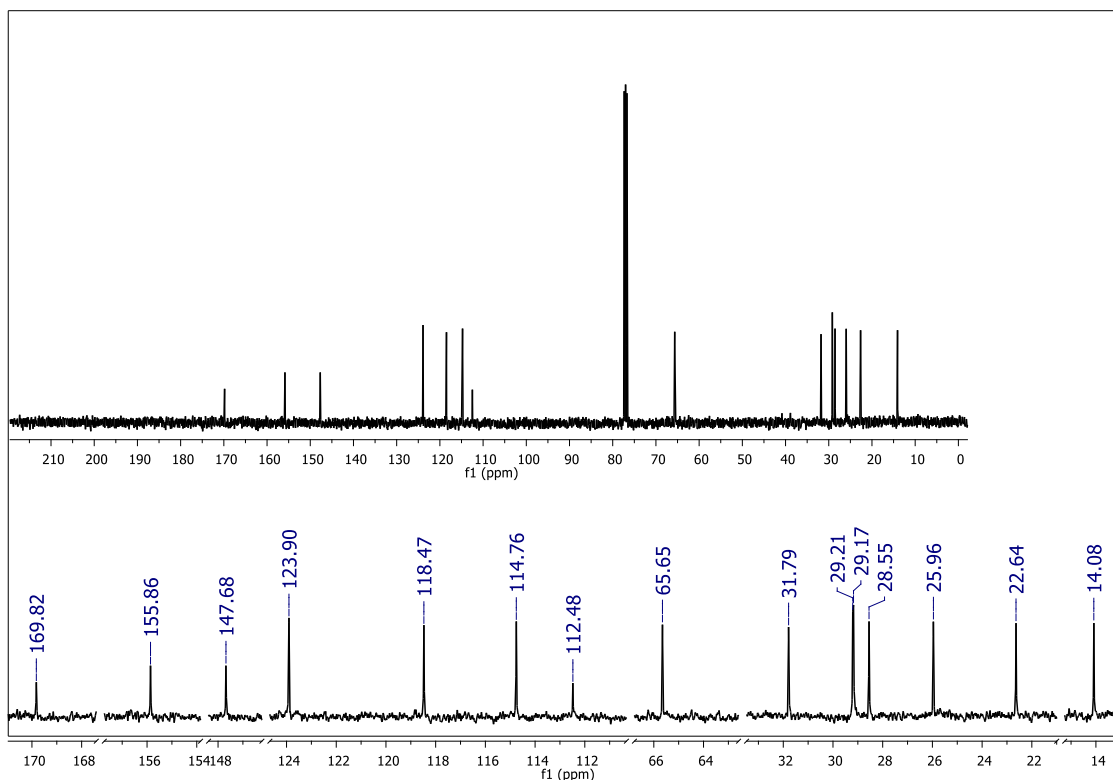
823 **Figure S17. I)** ^1H NMR spectrum of compound **17** (400 MHz – CDCl_3)



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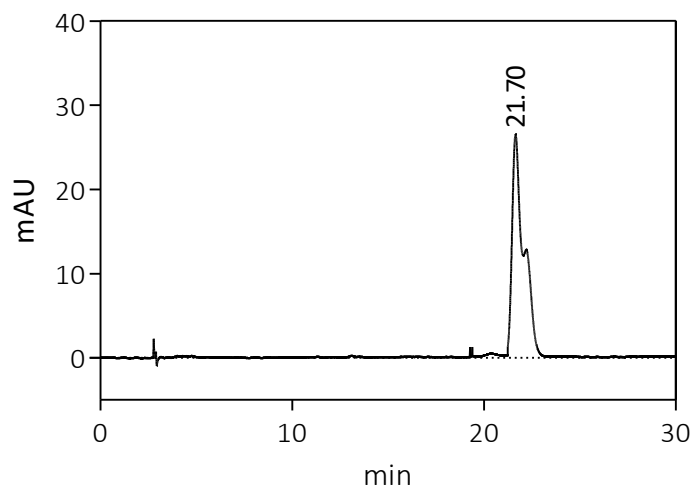
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826 **Figure S17. II)** ^{13}C NMR spectrum of compound **17** (100 MHz – CDCl_3)



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828 **Figure S17.** III) HPLC chromatogram of compound **17**



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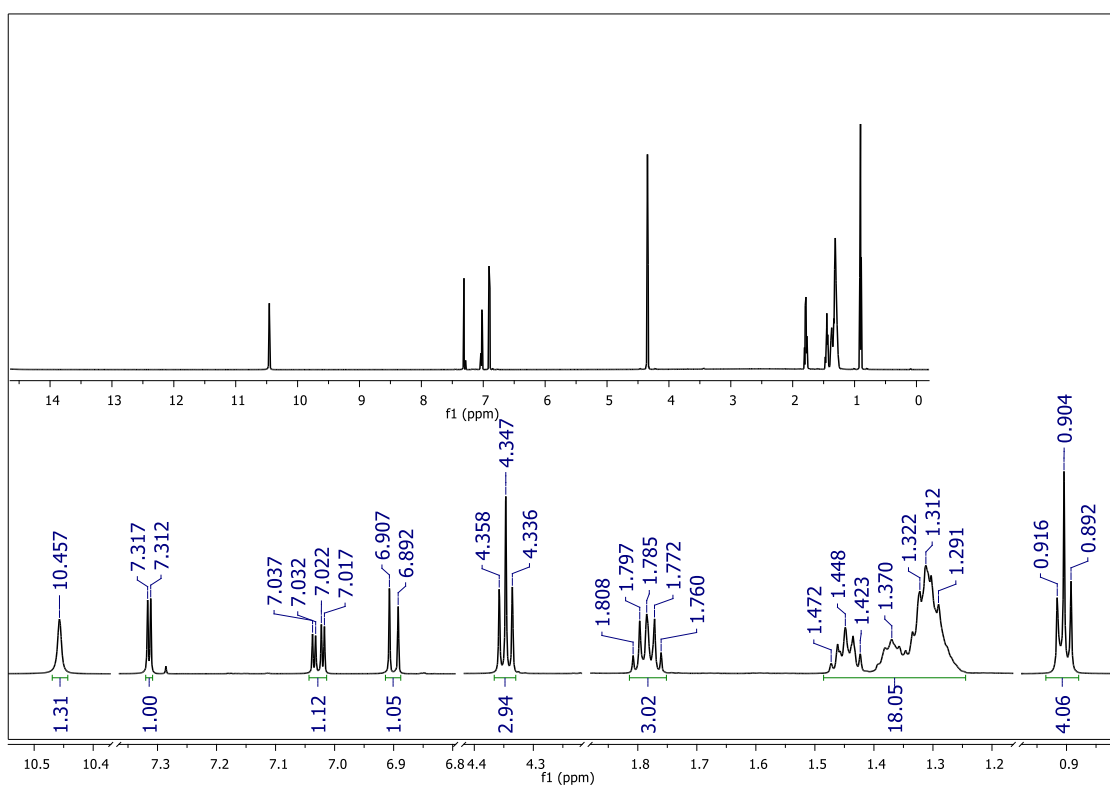
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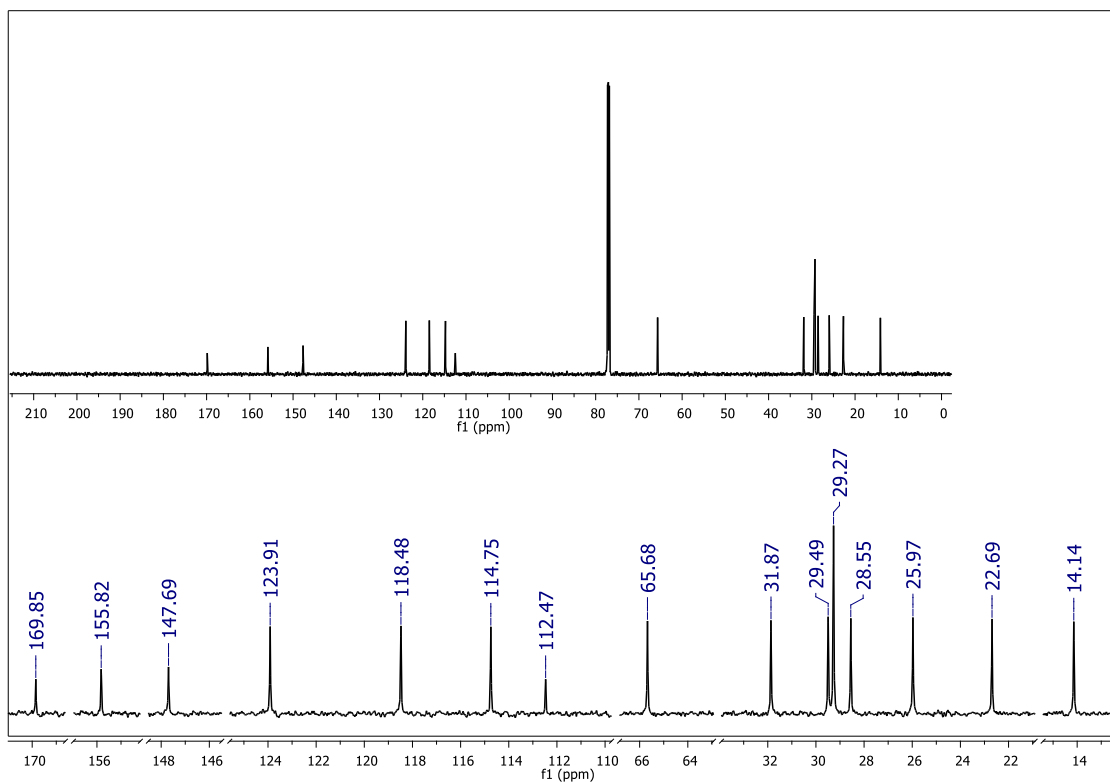
846 **Figure S18. I)** ^1H NMR spectrum of compound **18** (600 MHz – CDCl_3)



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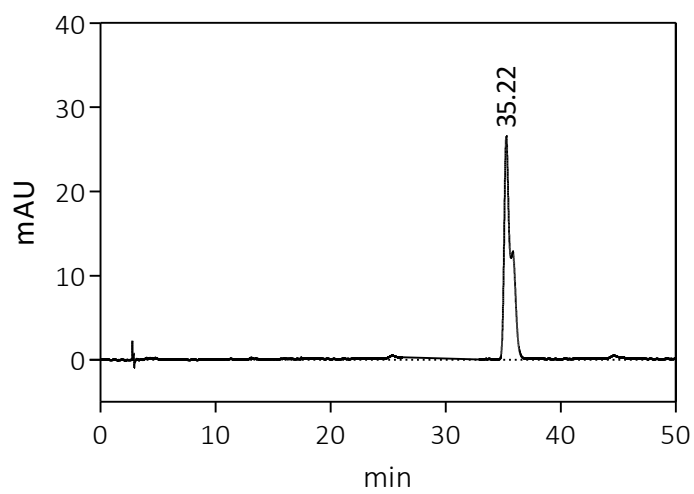
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849 **Figure S18. II)** ^{13}C NMR spectrum of compound **18** (100 MHz – CDCl_3)



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851 **Figure S18.** III) HPLC chromatogram of compound **18**



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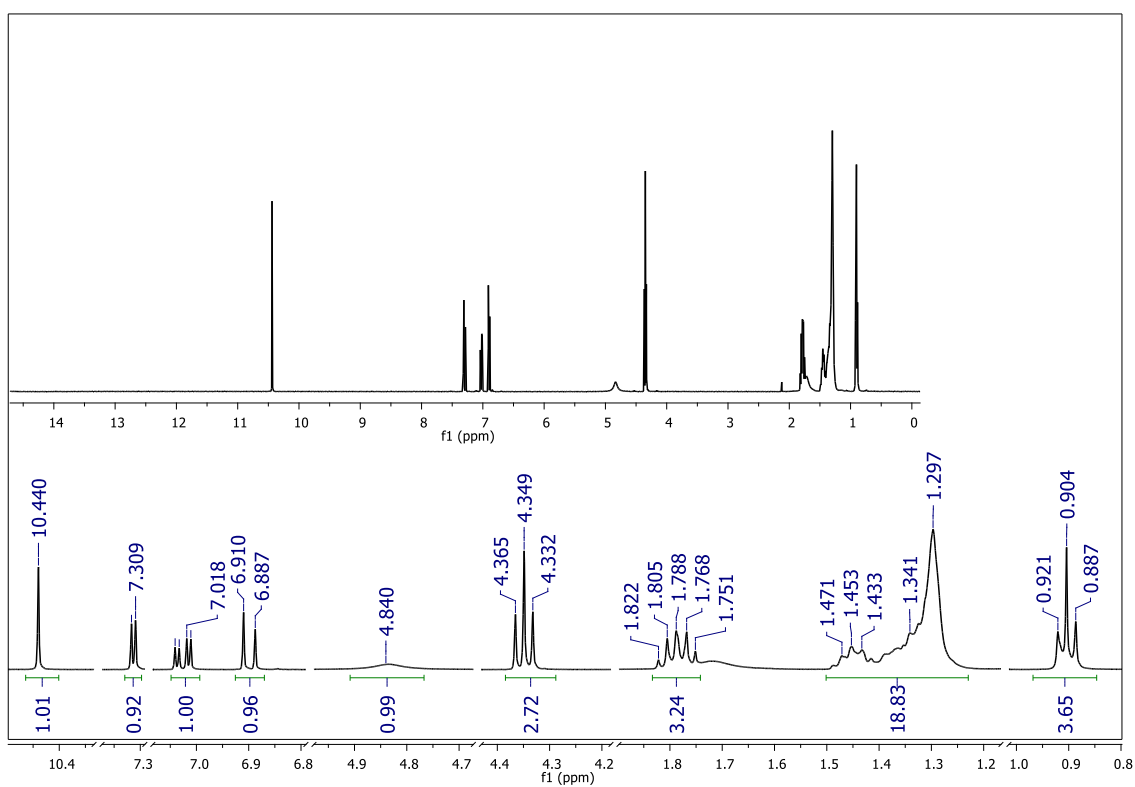
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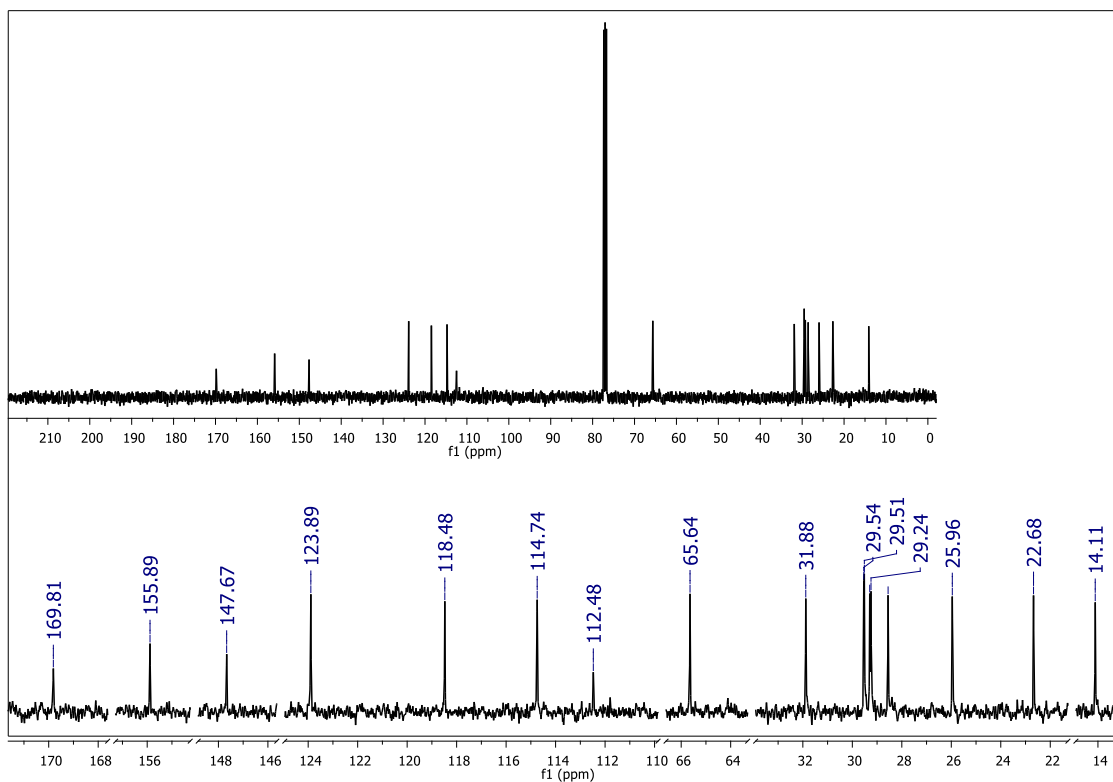
869 **Figure S19. I)** ^1H NMR spectrum of compound **19** (400 MHz – CDCl_3)



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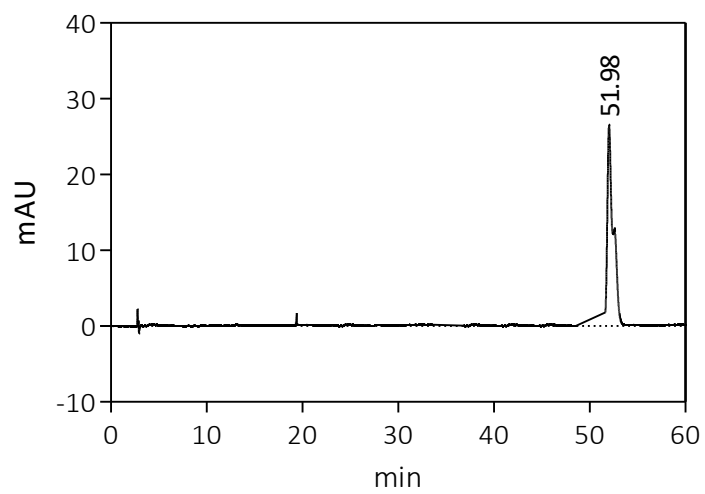
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872 **Figure S19. II)** ^{13}C NMR spectrum of compound **19** (100 MHz – CDCl_3)



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874 **Figure S19.** III) HPLC chromatogram of compound **19**



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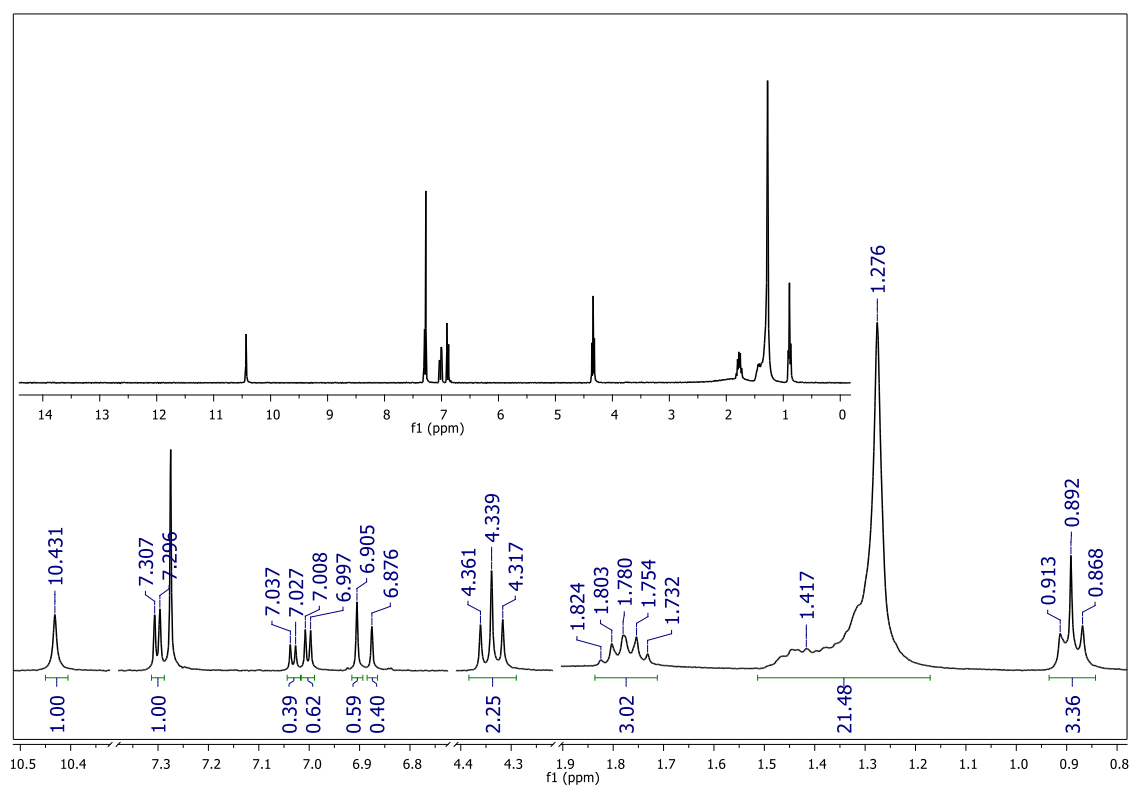
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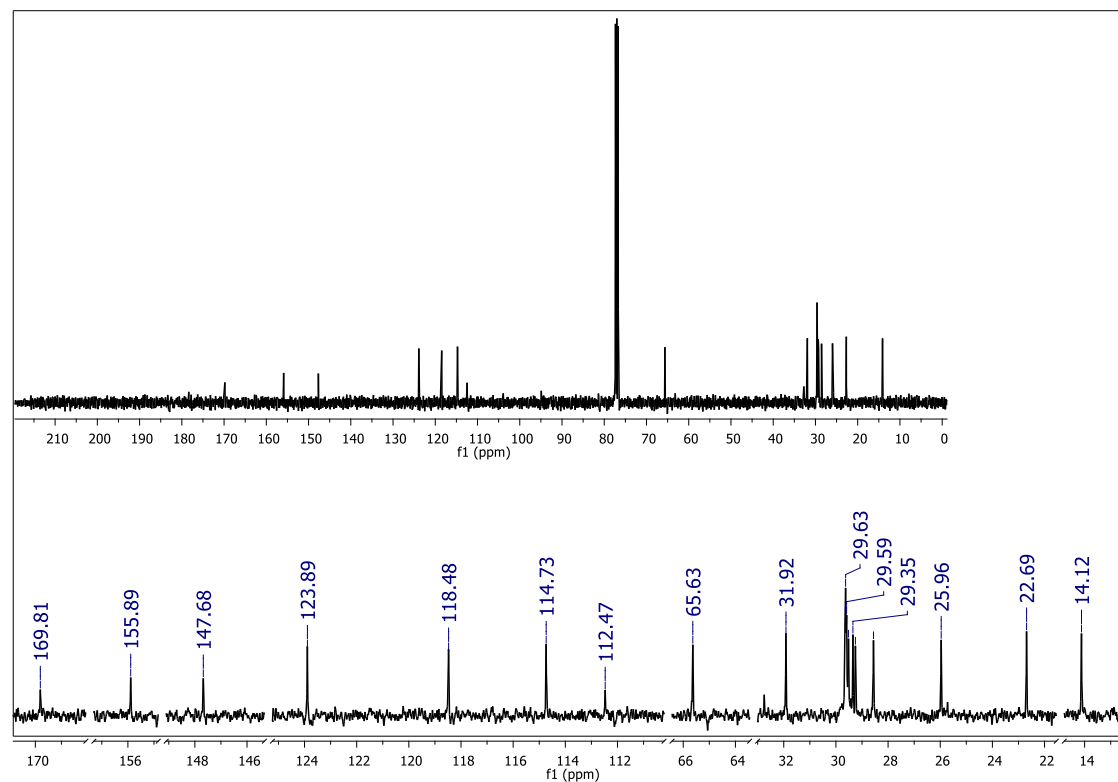
892 **Figure S20. I)** ^1H NMR spectrum of compound **20** (300 MHz – CDCl_3)



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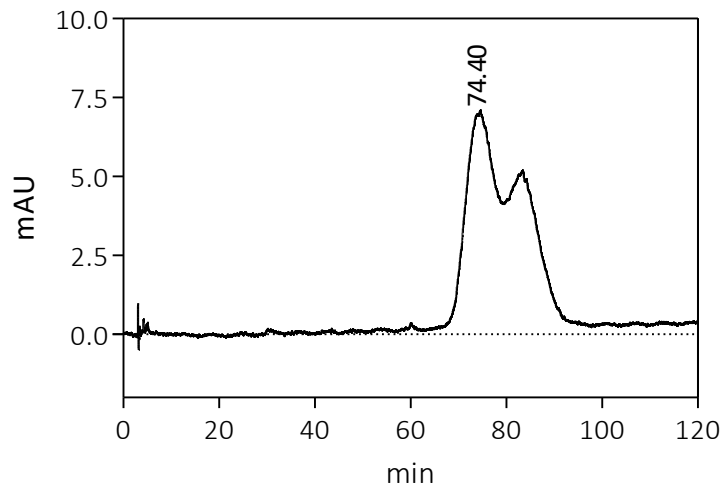
895 **Figure S20. II)** ^{13}C NMR spectrum of compound **20** (100 MHz – CDCl_3)



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897 **Figure S20.** III) HPLC chromatogram of compound **20**

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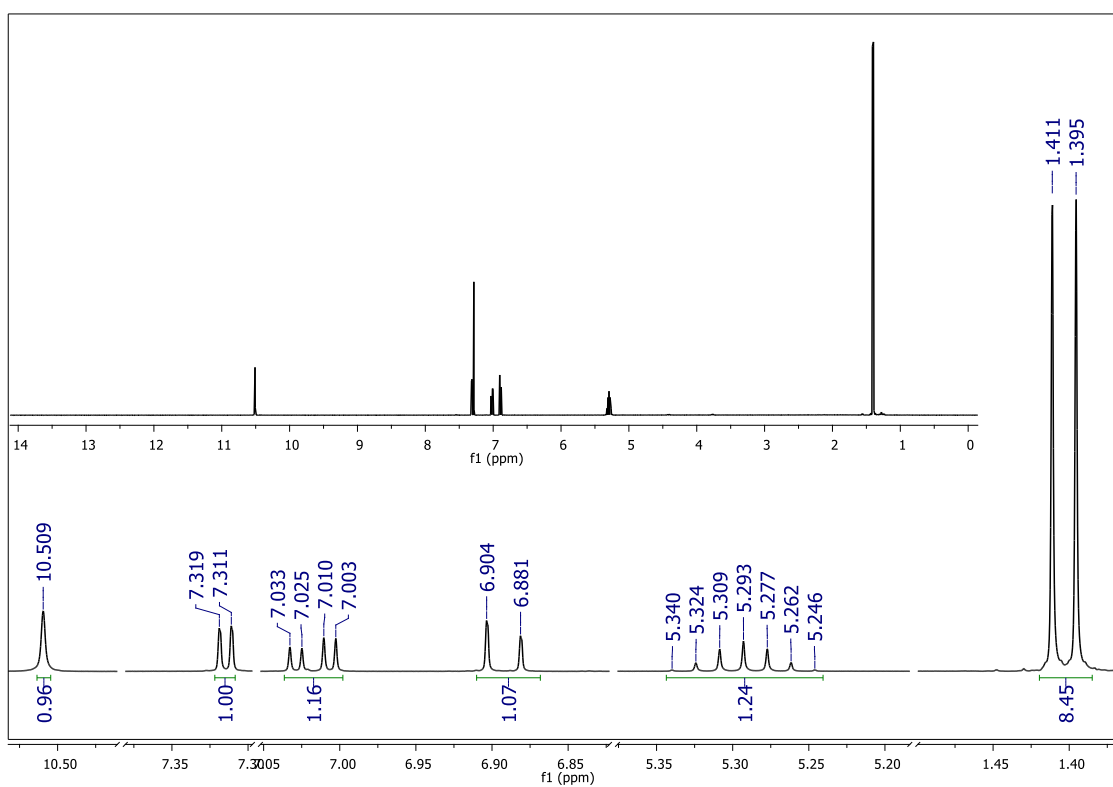
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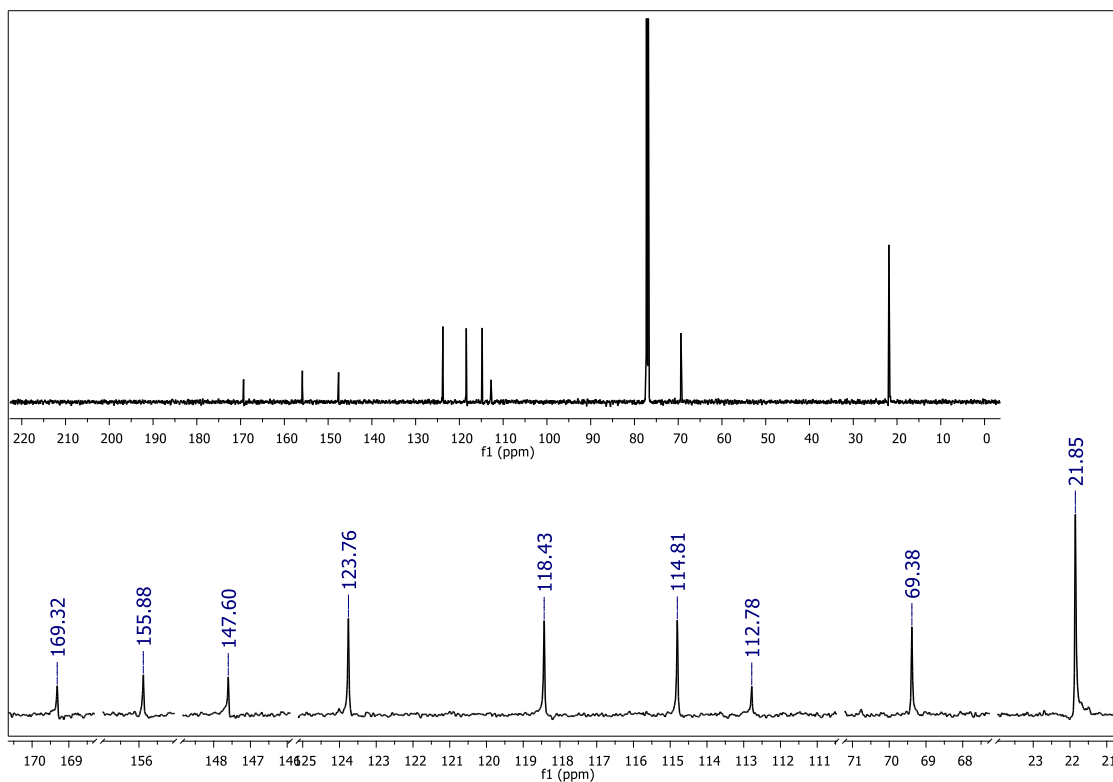
915 **Figure S21. I)** ^1H NMR spectrum of compound **21** (400 MHz – CDCl_3)



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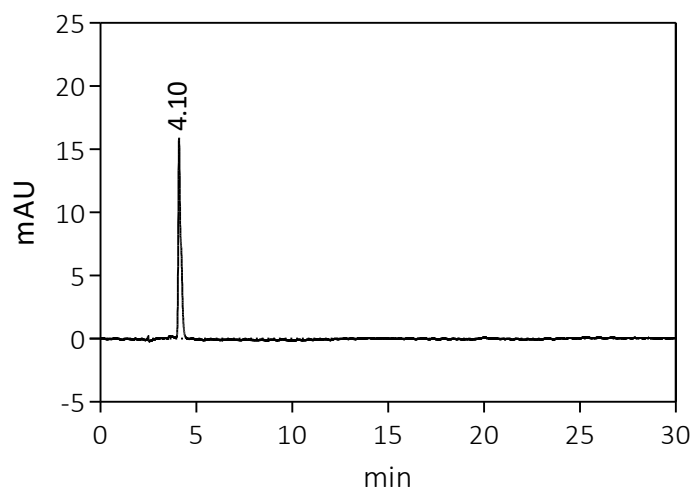
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918 **Figure S21. II)** ^{13}C NMR spectrum of compound **21** (150 MHz – CDCl_3)



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920 **Figure S21.** III) HPLC chromatogram of compound **21**



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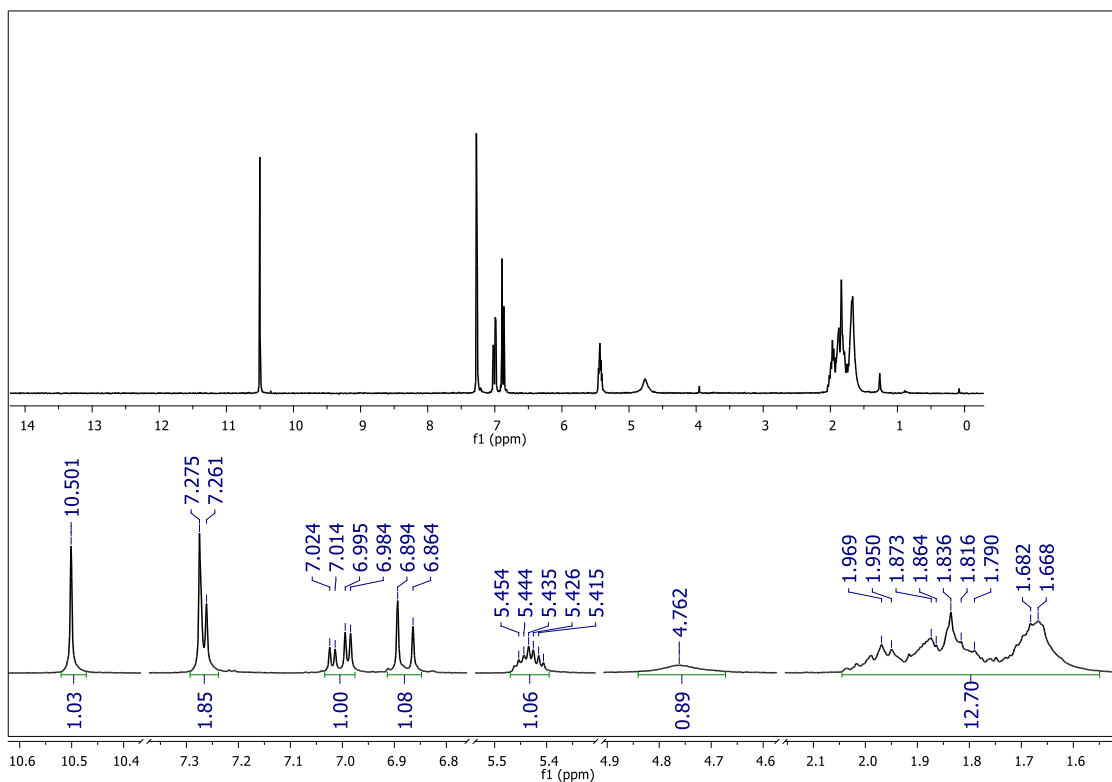
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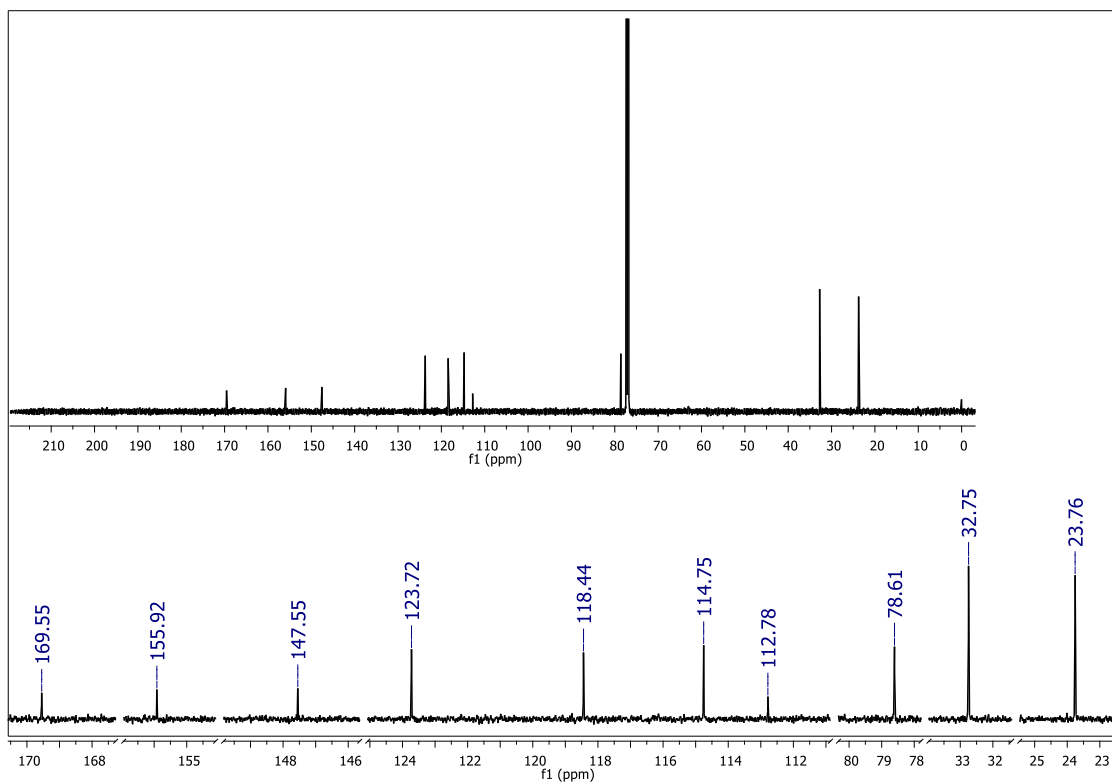
938 **Figure S22. I)** ^1H NMR spectrum of compound **22** (300 MHz – CDCl_3)



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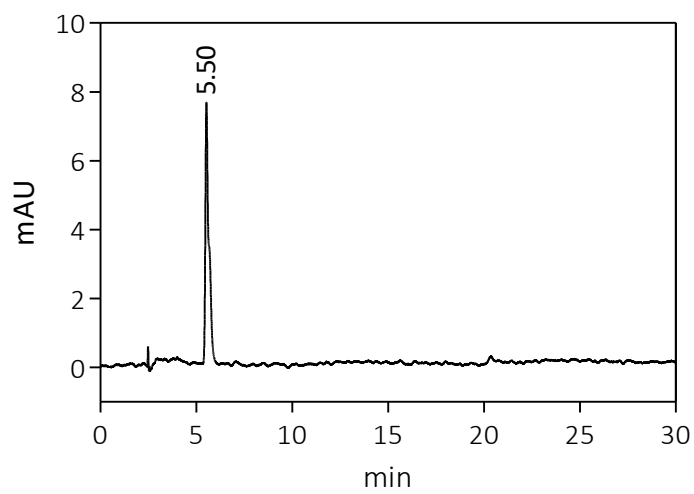
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941 **Figure S22. II)** ^{13}C NMR spectrum of compound **22** (150 MHz – CDCl_3)



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943 **Figure S22.** III) HPLC chromatogram of compound **22**



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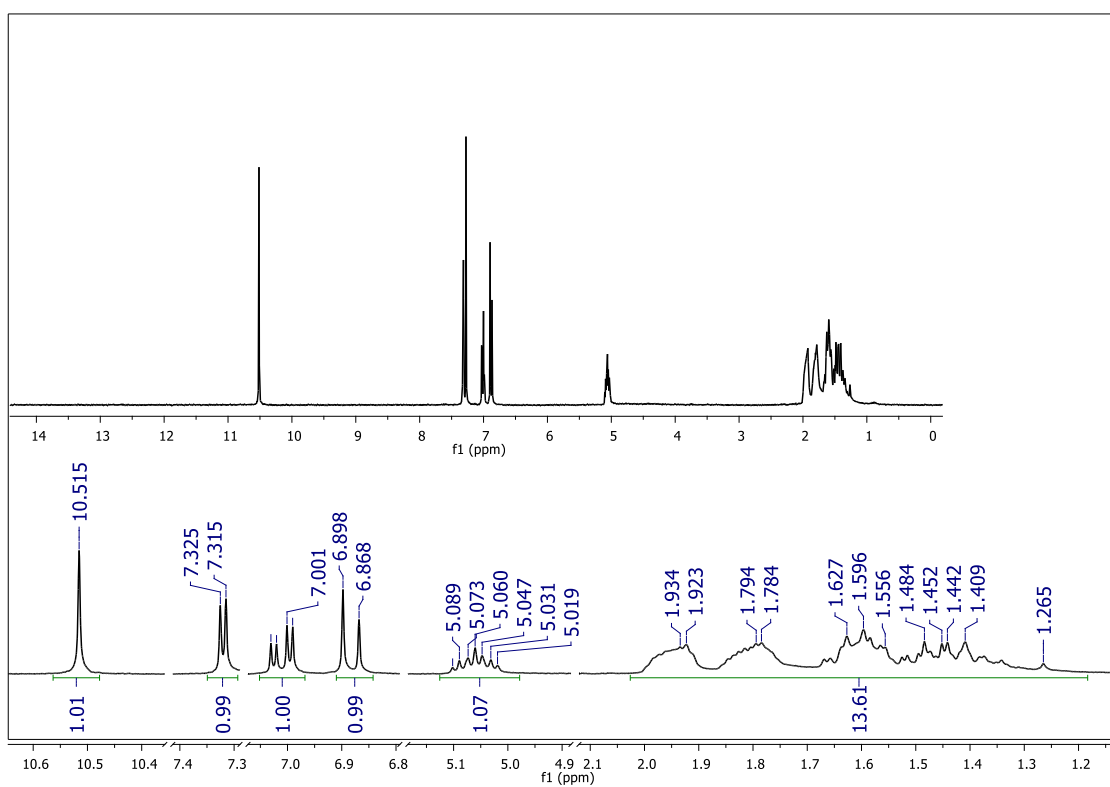
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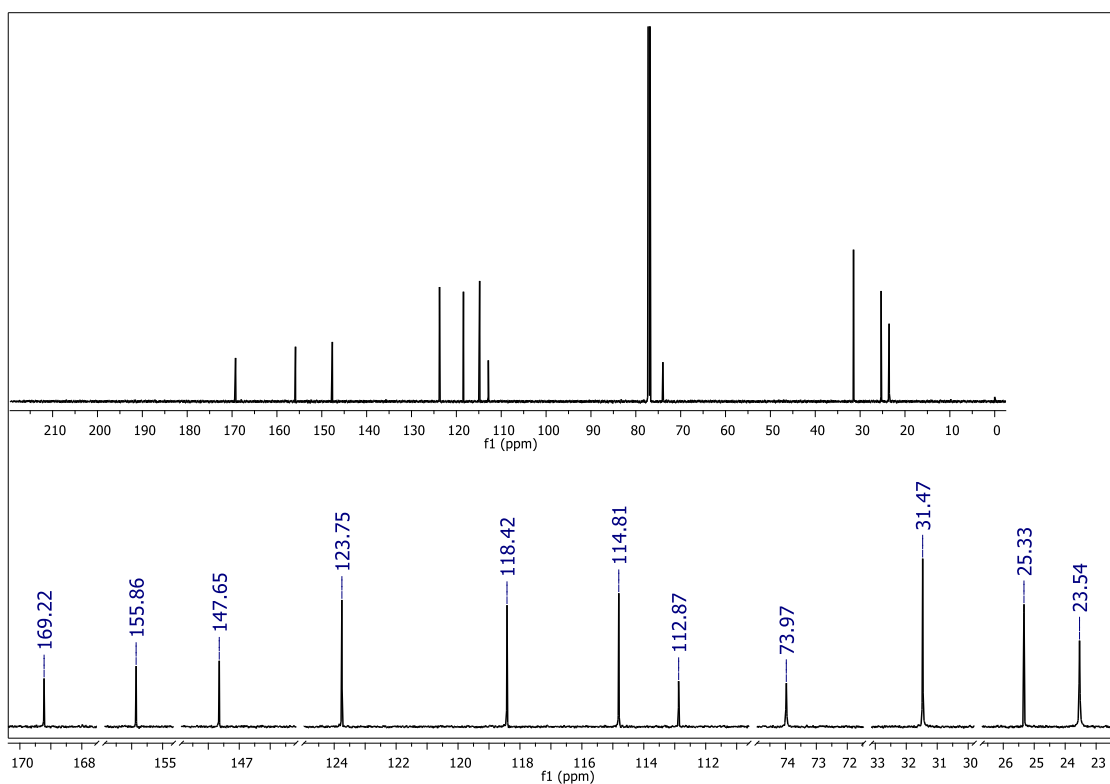
961 **Figure S23. I)** ^1H NMR spectrum of compound **23** (300 MHz – CDCl_3)



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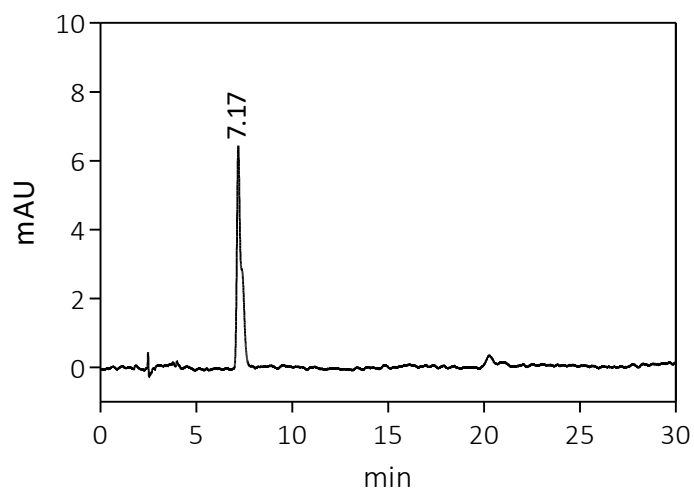
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964 **Figure S23. II)** ^{13}C NMR spectrum of compound **23** (150 MHz – CDCl_3)



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966 **Figure S23.** III) HPLC chromatogram of compound **23**



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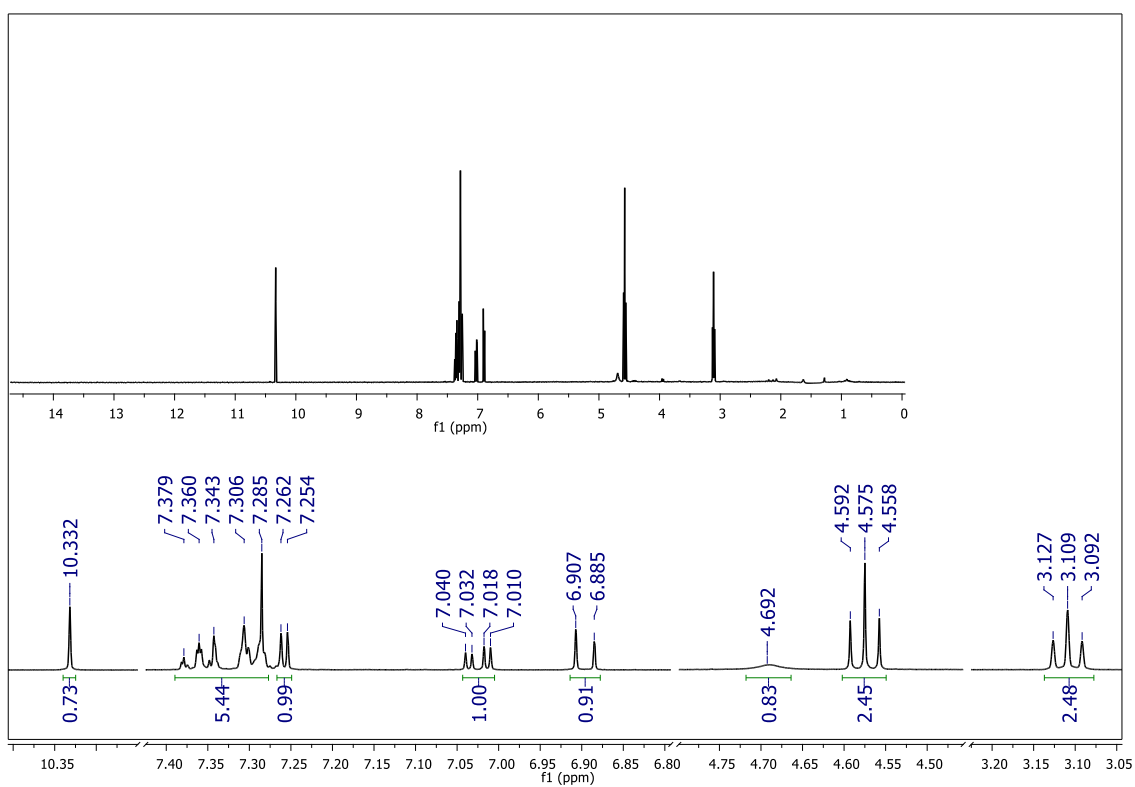
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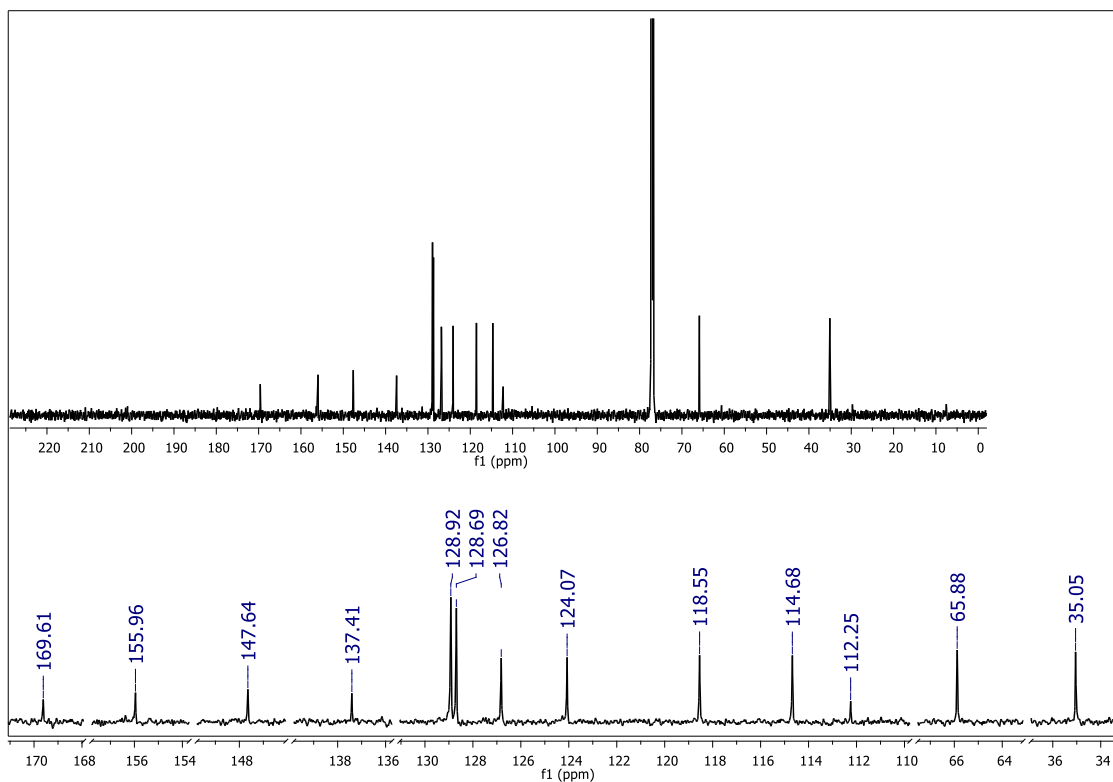
984 **Figure S24. I)** ^1H NMR spectrum of compound **24** (400 MHz – CDCl_3)



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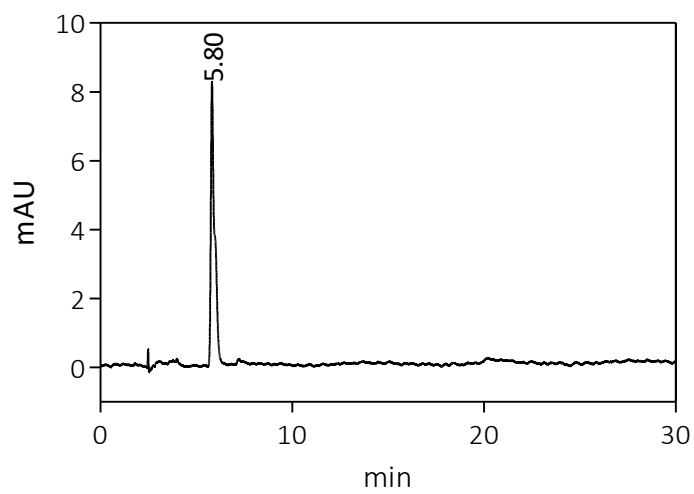
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987 **Figure S24. II)** ^{13}C NMR spectrum of compound **24** (150 MHz – CDCl_3)



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989 **Figure S24.** III) HPLC chromatogram of compound **24**



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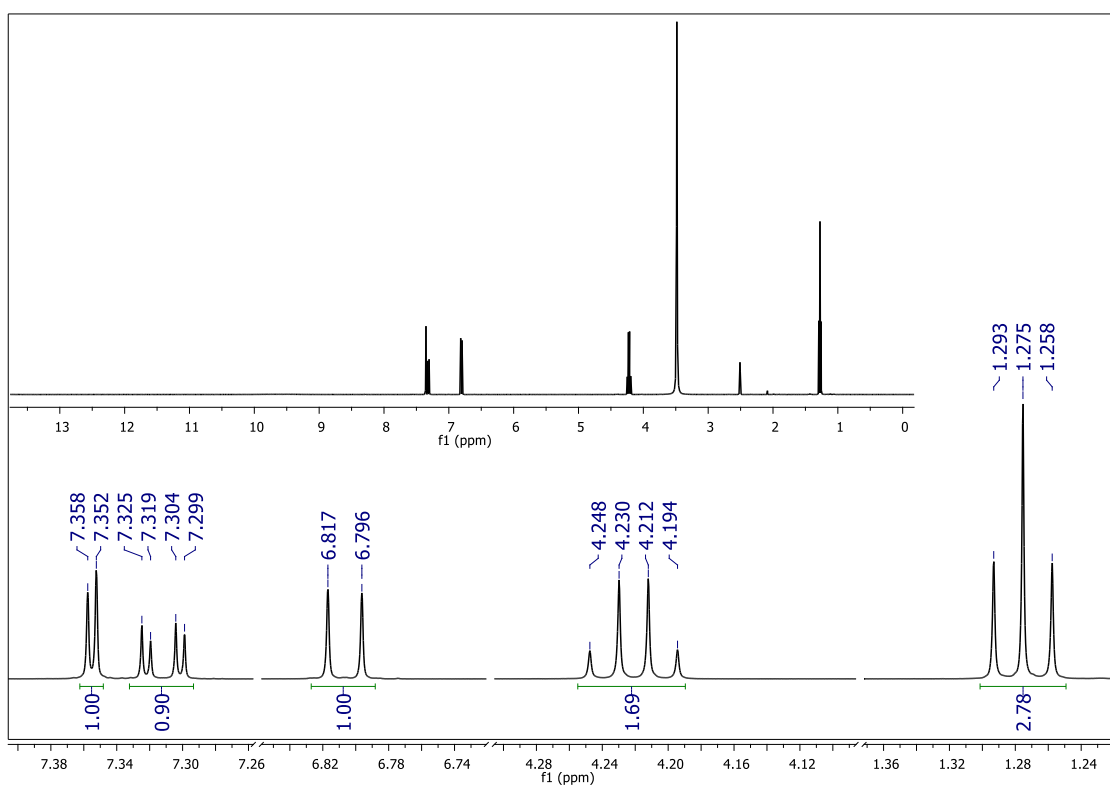
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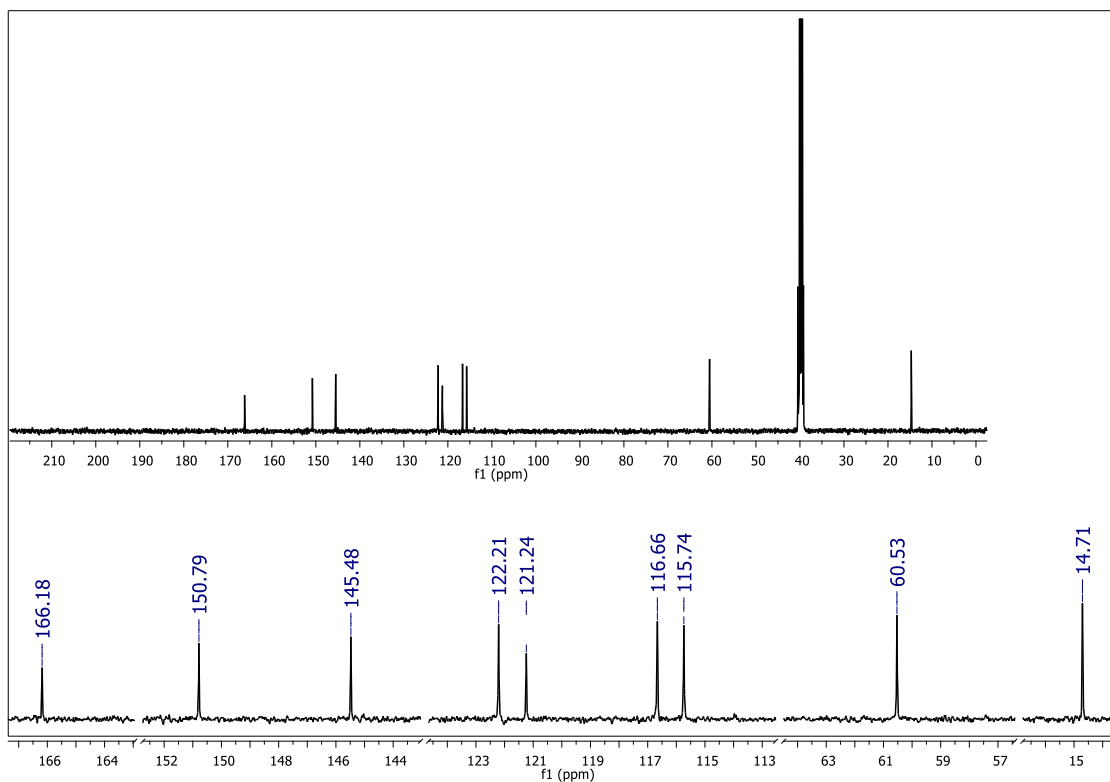
1007 **Figure S25. I)** ^1H NMR spectrum of compound **25** (400 MHz – $\text{DMSO-}d_6$)



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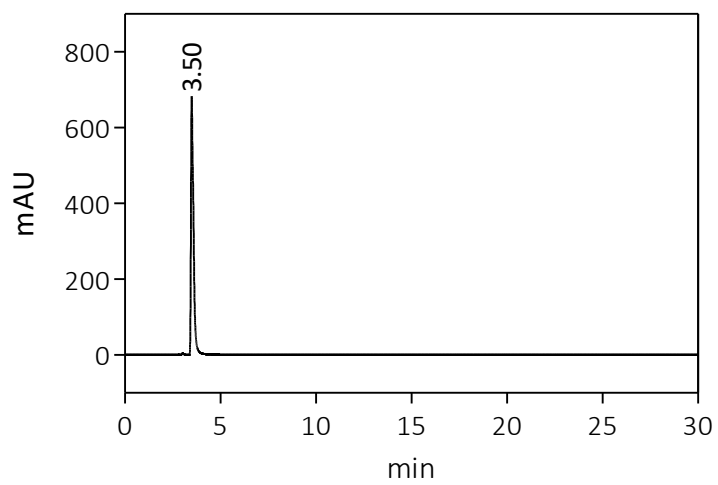
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1010 **Figure S25. II)** ^{13}C NMR spectrum of compound **25** (100 MHz – $\text{DMSO-}d_6$)



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1012 **Figure S25.** III) HPLC chromatogram of compound **25**



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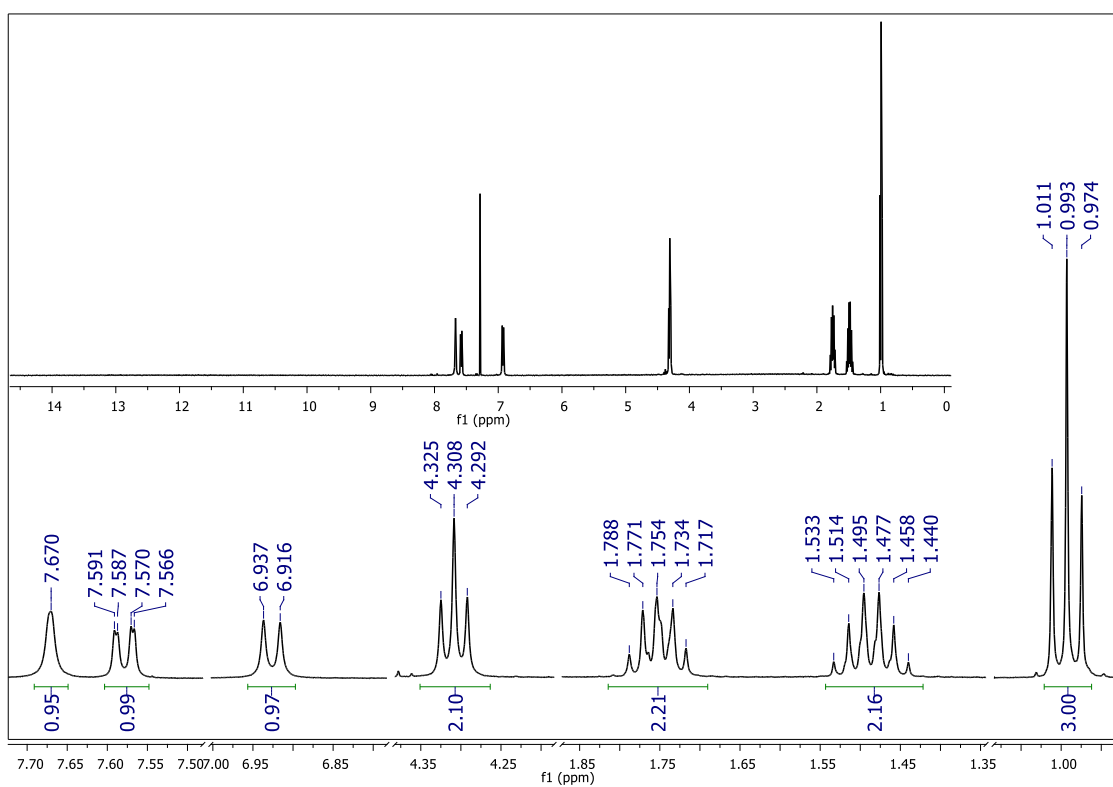
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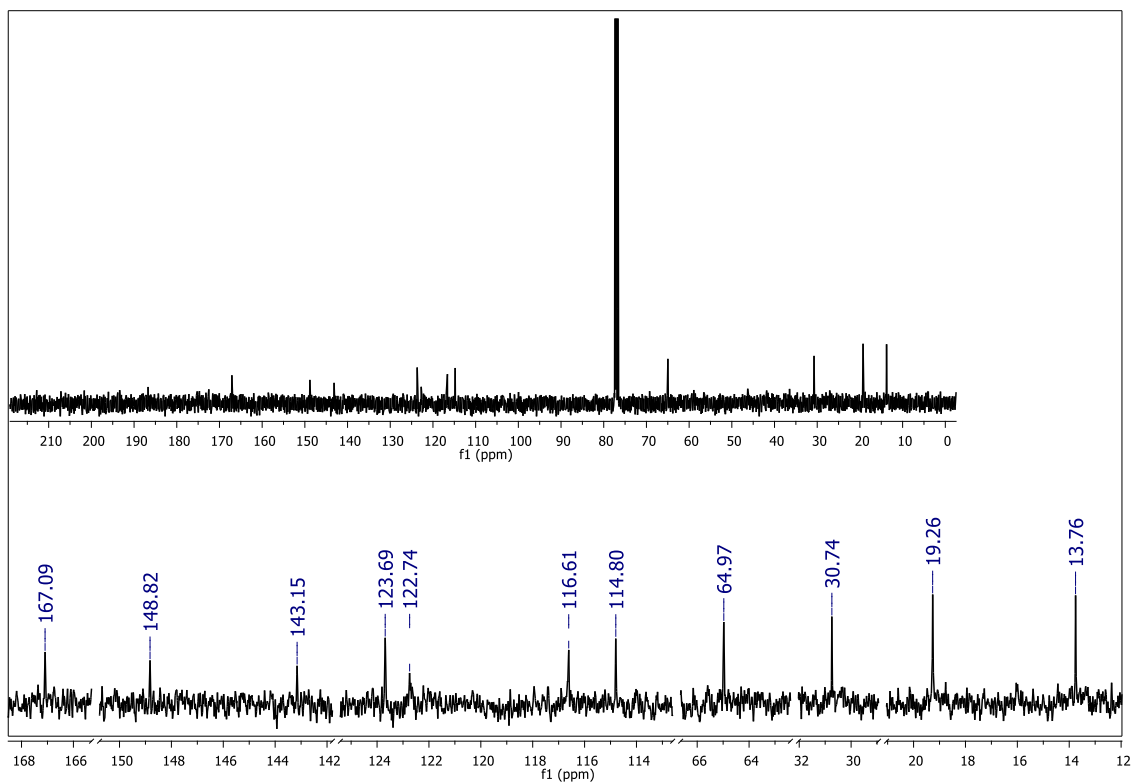
1030 **Figure S26. I)** ^1H NMR spectrum of compound **26** (400 MHz – CDCl_3)



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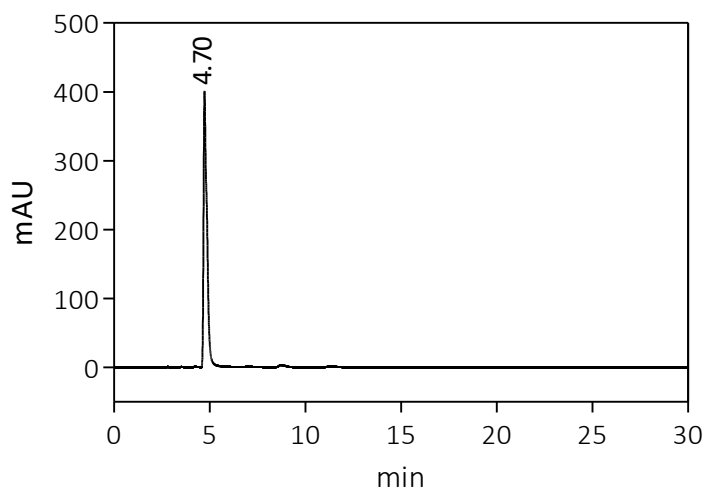
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1033 **Figure S26. II)** ^{13}C NMR spectrum of compound **26** (100 MHz – CDCl_3)



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1035 **Figure S26.** III) HPLC chromatogram of compound **26**



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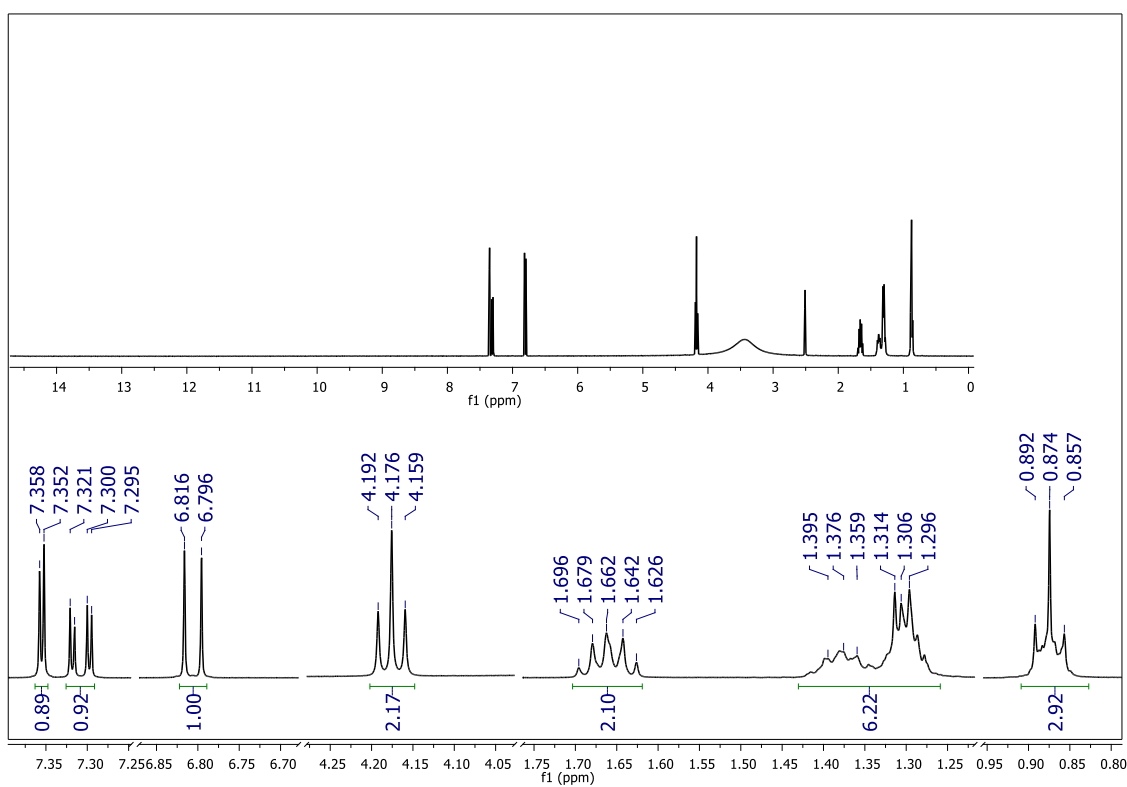
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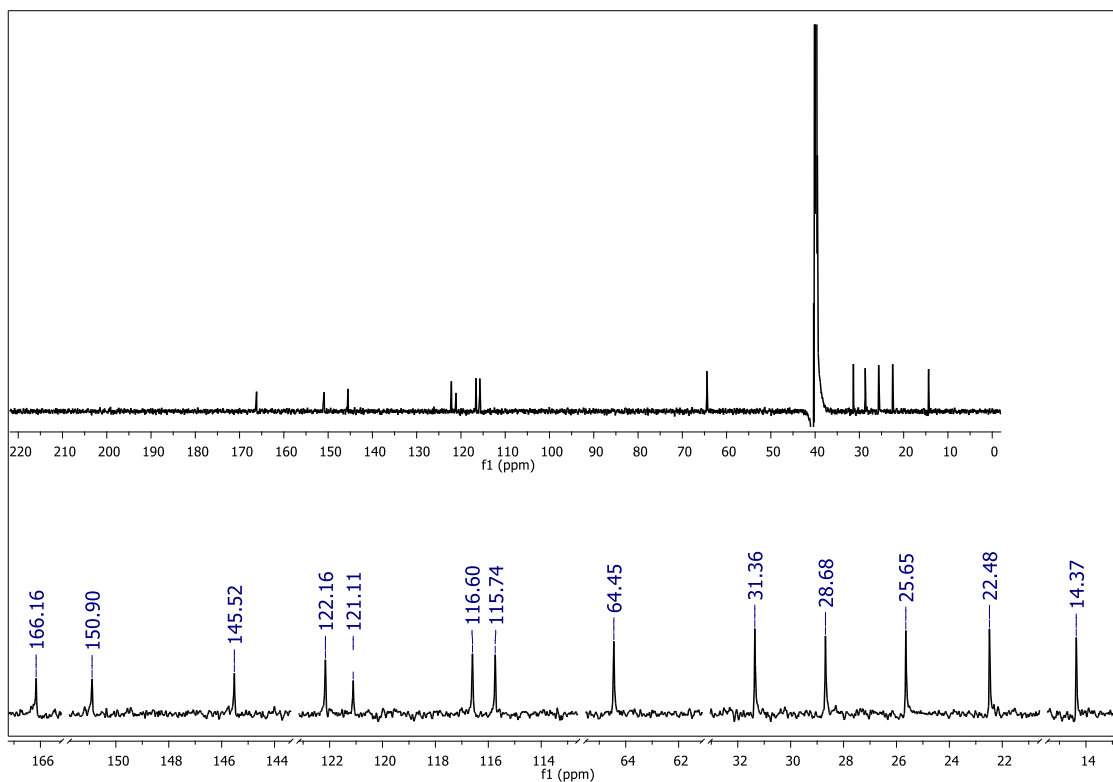
1053 **Figure S27. I)** ^1H NMR spectrum of compound **27** (400 MHz – $\text{DMSO-}d_6$)



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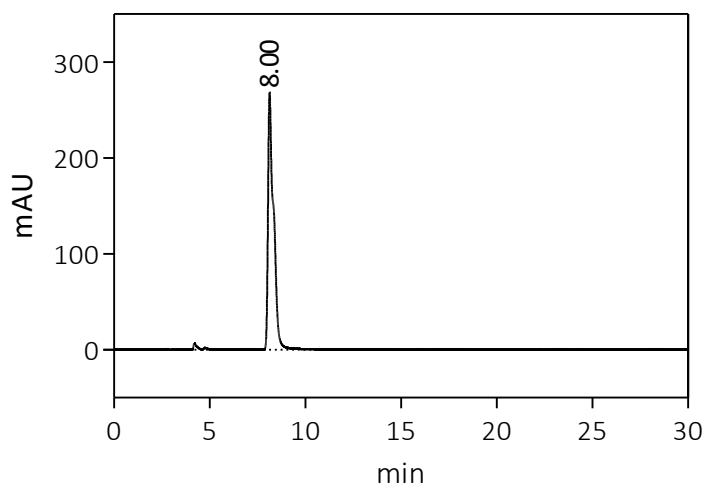
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1056 **Figure S27. II)** ^{13}C NMR spectrum of compound **27** (150 MHz – $\text{DMSO-}d_6$)



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1058 **Figure S27.** III) HPLC chromatogram of compound **27**



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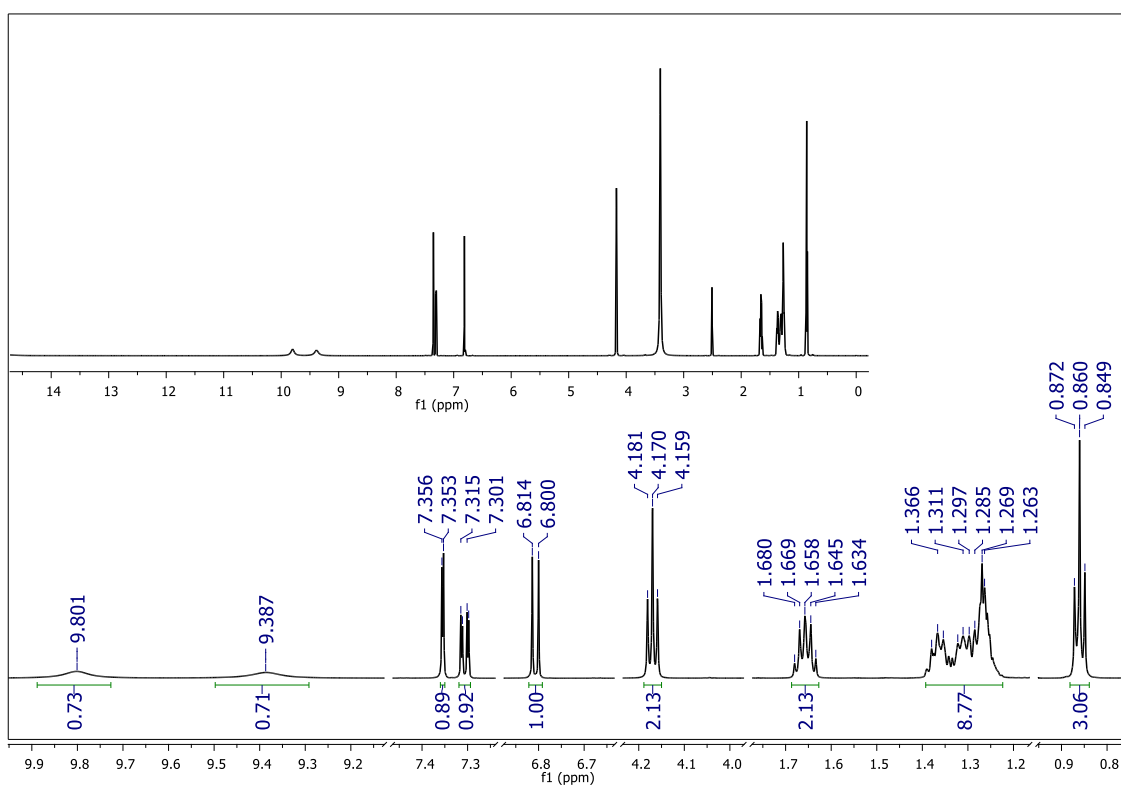
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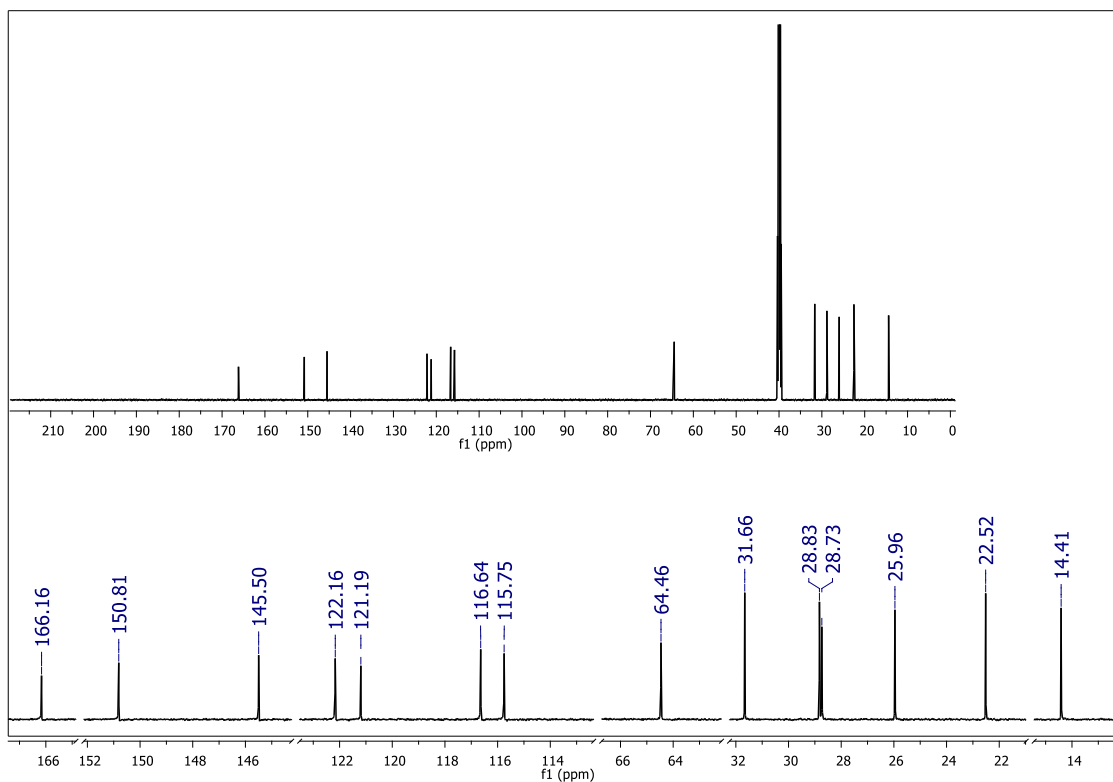
1076 **Figure S28. I)** ^1H NMR spectrum of compound **28** (600 MHz – $\text{DMSO-}d_6$)



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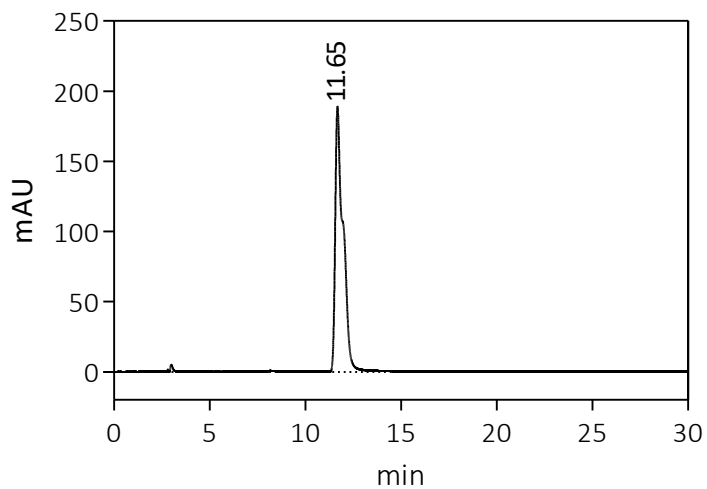
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1079 **Figure S28. II)** ^{13}C NMR spectrum of compound **28** (150 MHz – $\text{DMSO-}d_6$)



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1081 **Figure S28.** III) HPLC chromatogram of compound **28**



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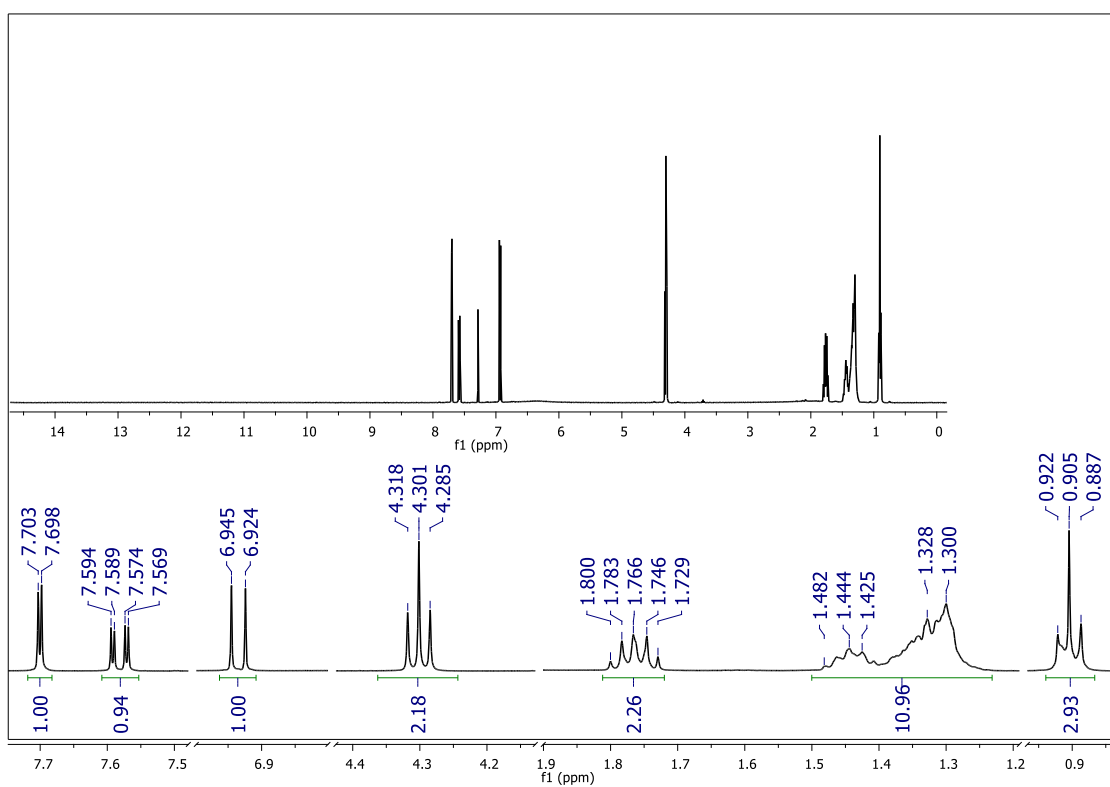
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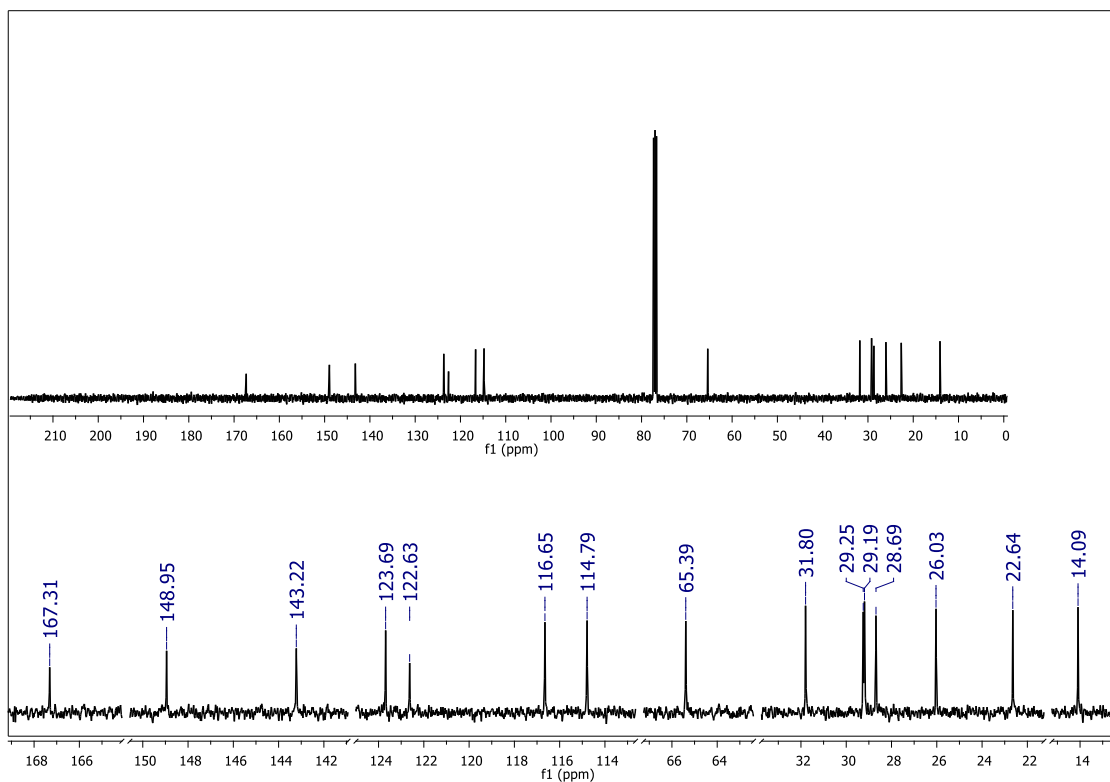
1099 **Figure S29. I)** ^1H NMR spectrum of compound **29** (400 MHz – CDCl_3)



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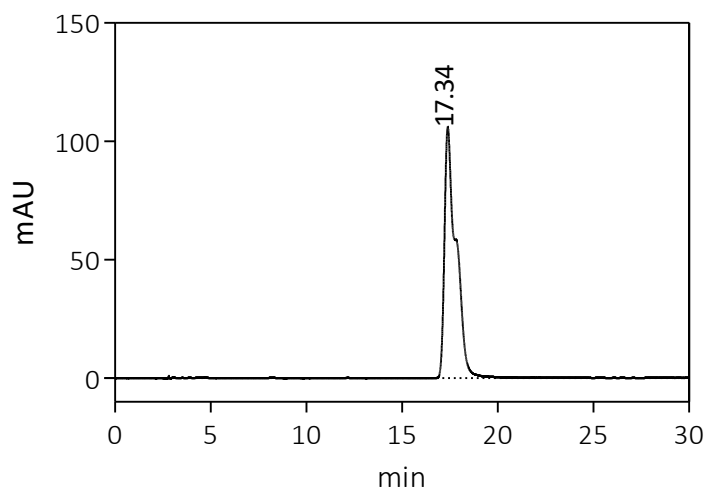
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1102 **Figure S29. II)** ^{13}C NMR spectrum of compound **29** (100 MHz – CDCl_3)



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1104 **Figure S29.** III) HPLC chromatogram of compound **29**



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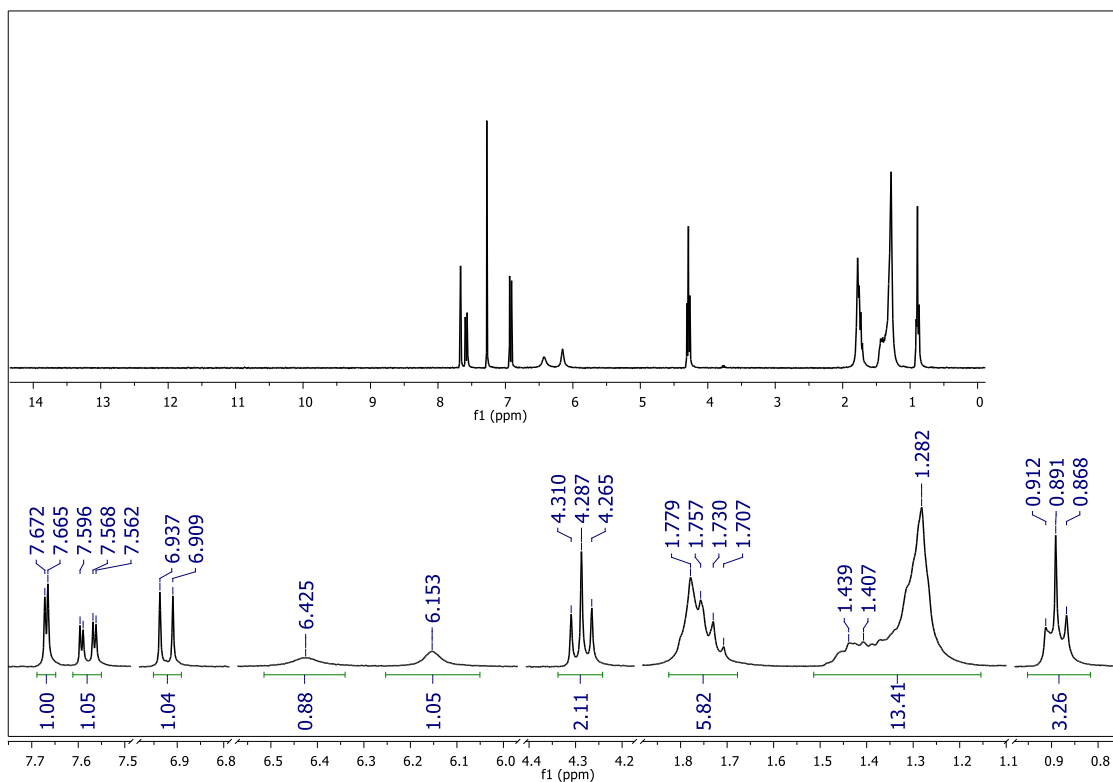
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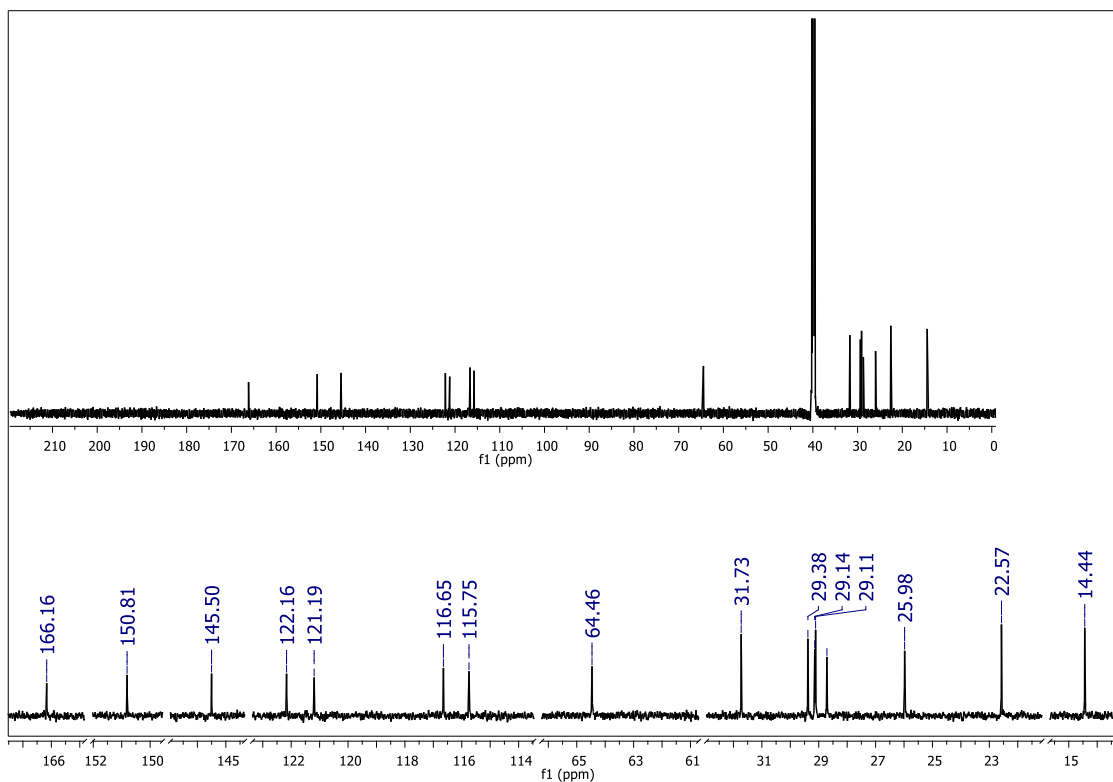
1122 **Figure S30. I)** ^1H NMR spectrum of compound **30** (300 MHz – CDCl_3)



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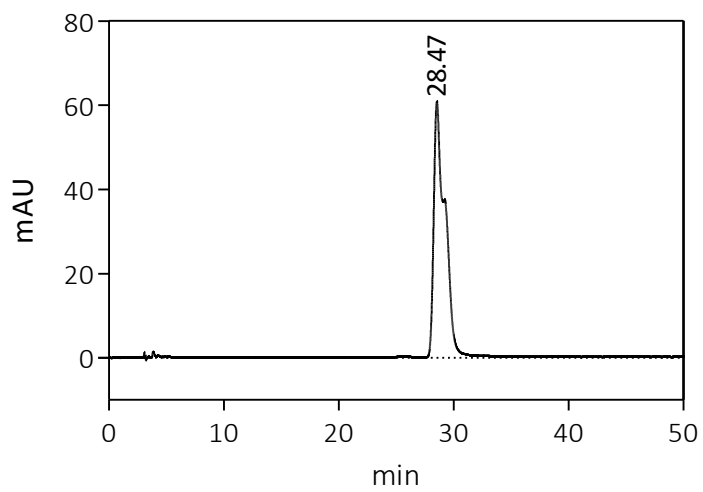
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1125 **Figure S30. II)** ^{13}C NMR spectrum of compound **30** (150 MHz – $\text{DMSO}-d_6$)



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1127 **Figure S30.** III) HPLC chromatogram of compound **30**



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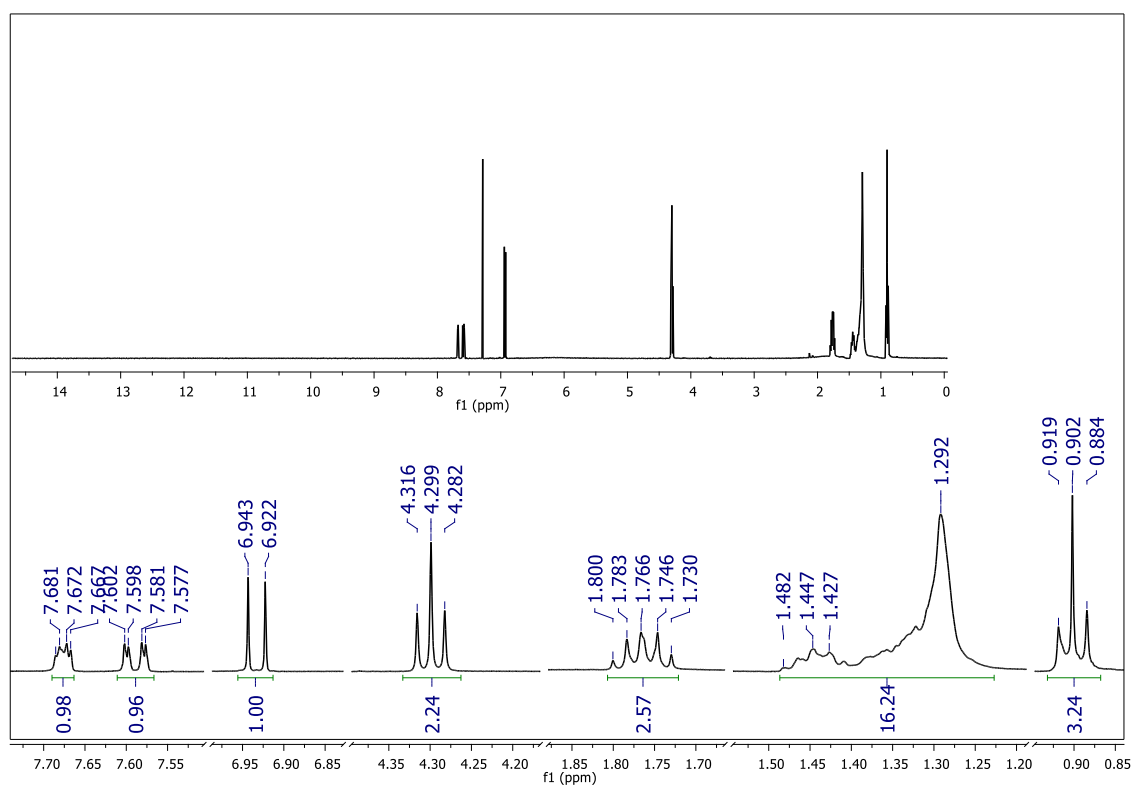
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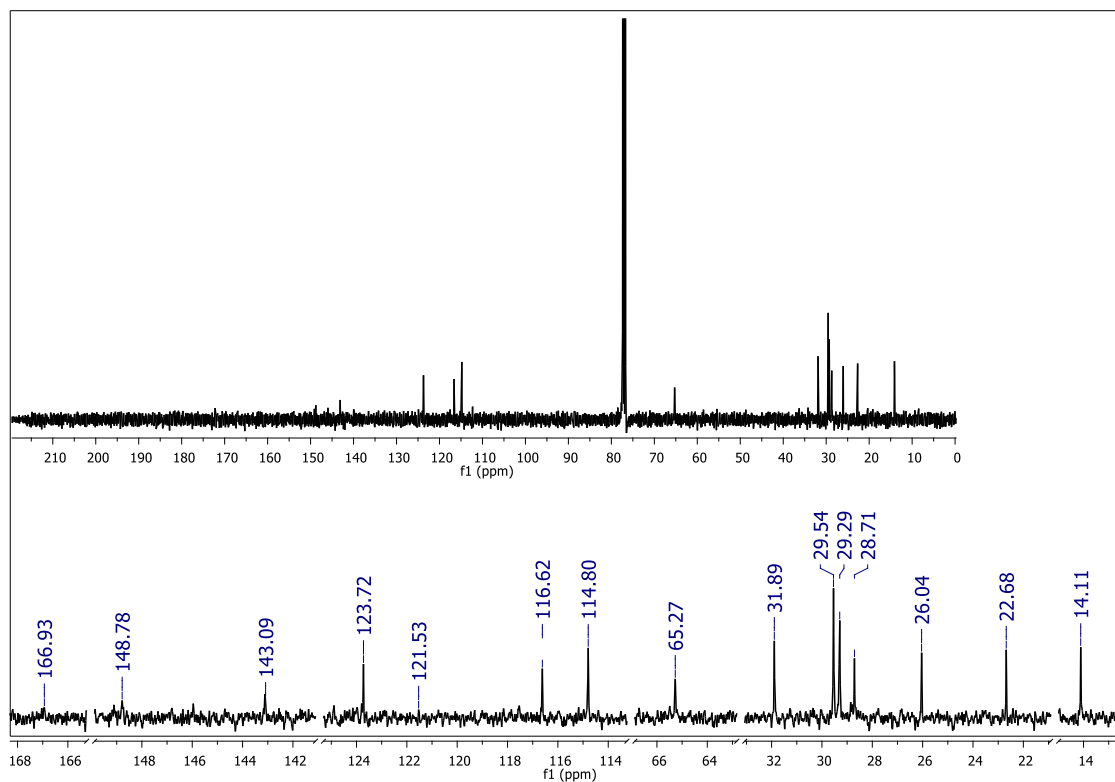
1145 **Figure S31. I)** ^1H NMR spectrum of compound **31** (400 MHz – CDCl_3)



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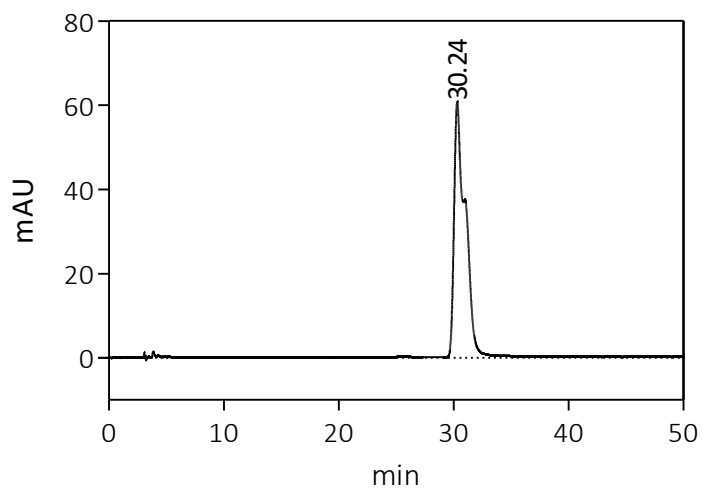
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1148 **Figure S31. II)** ^{13}C NMR spectrum of compound **31** (100 MHz – CDCl_3)



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1150 **Figure S31.** III) HPLC chromatogram of compound **31**



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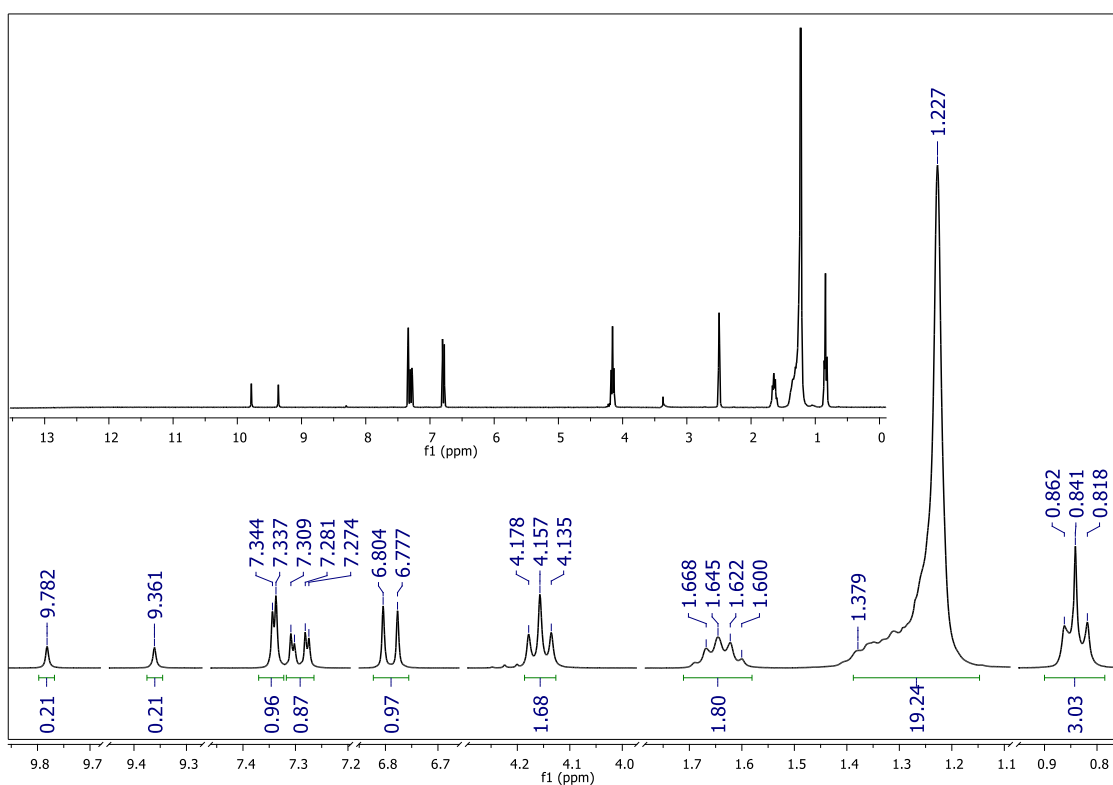
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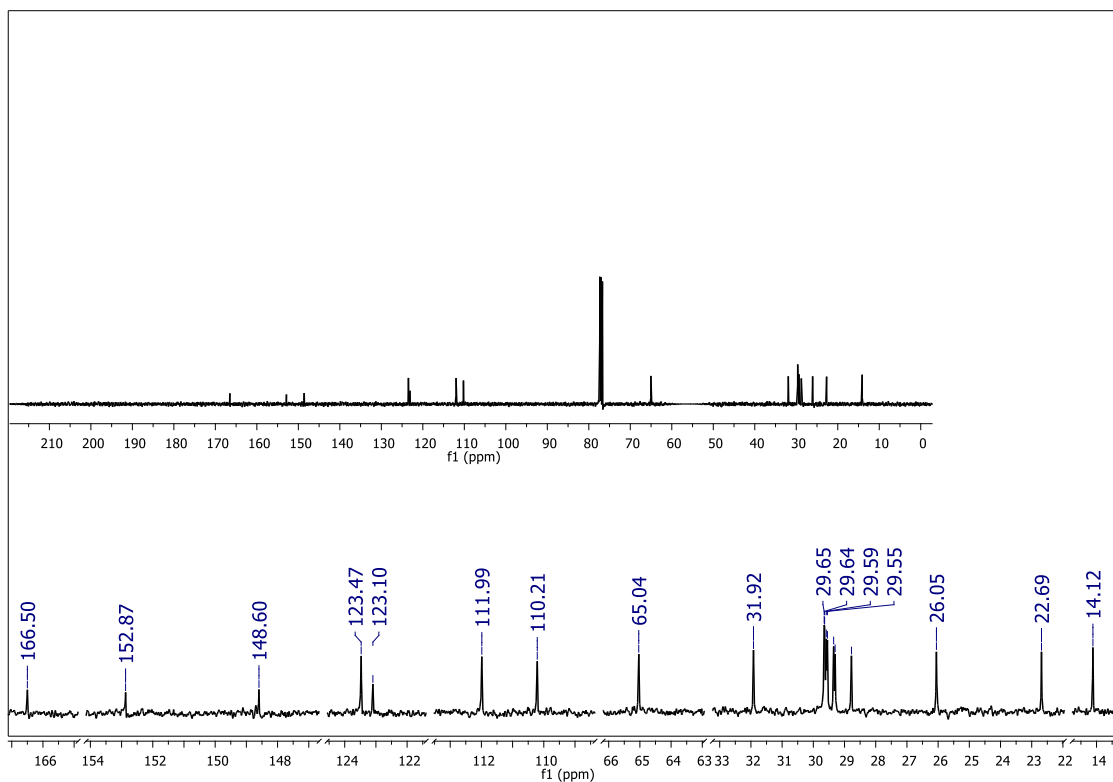
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1168 **Figure S32. I)** ^1H NMR spectrum of compound **32** (300 MHz – CDCl_3)

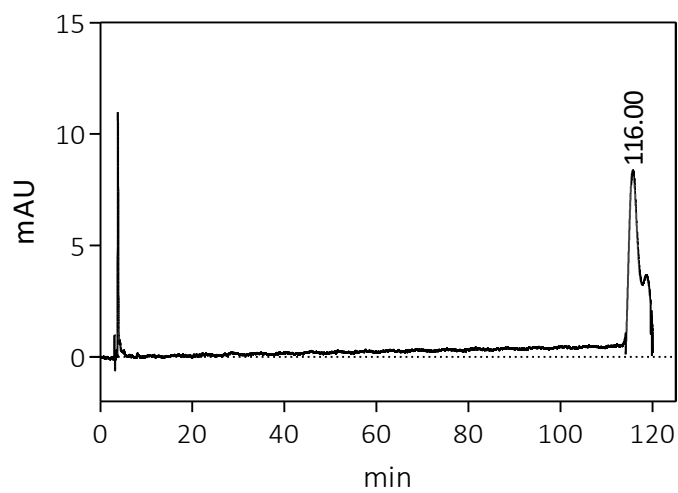


1171 **Figure S32. II)** ^{13}C NMR spectrum of compound **32** (100 MHz – CDCl_3)



1173 **Figure S32.** III) HPLC chromatogram of compound **32**

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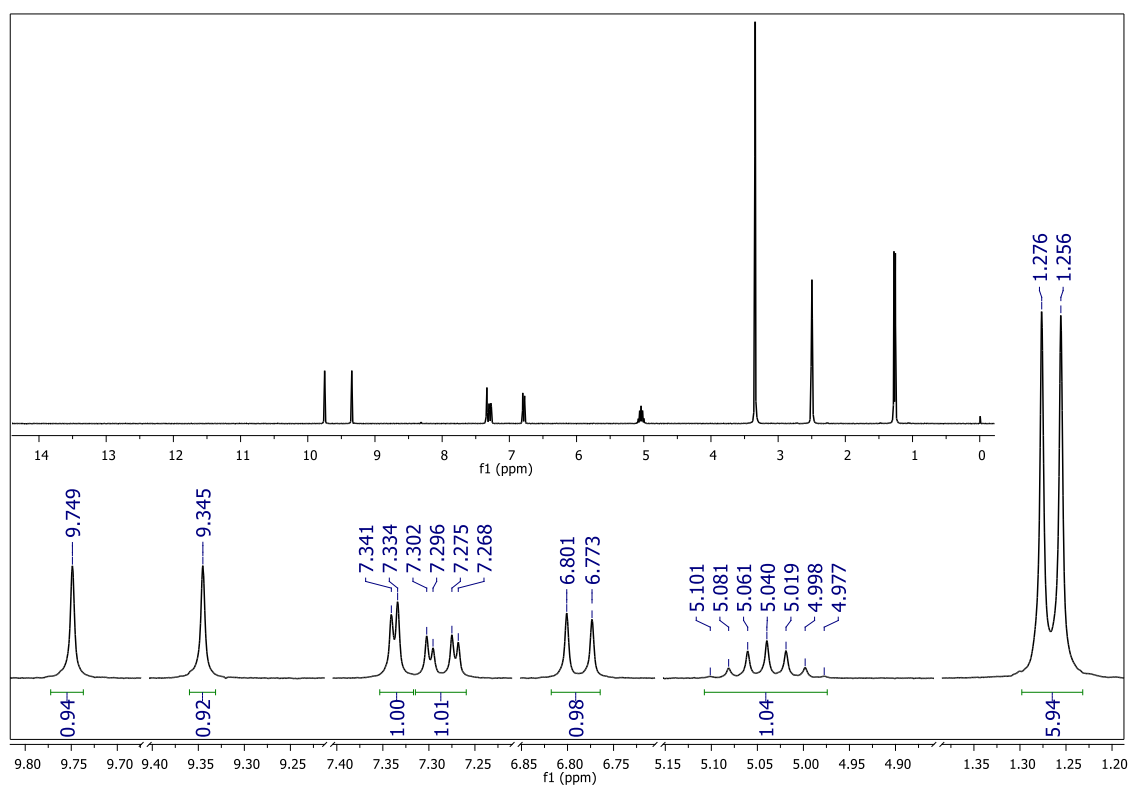
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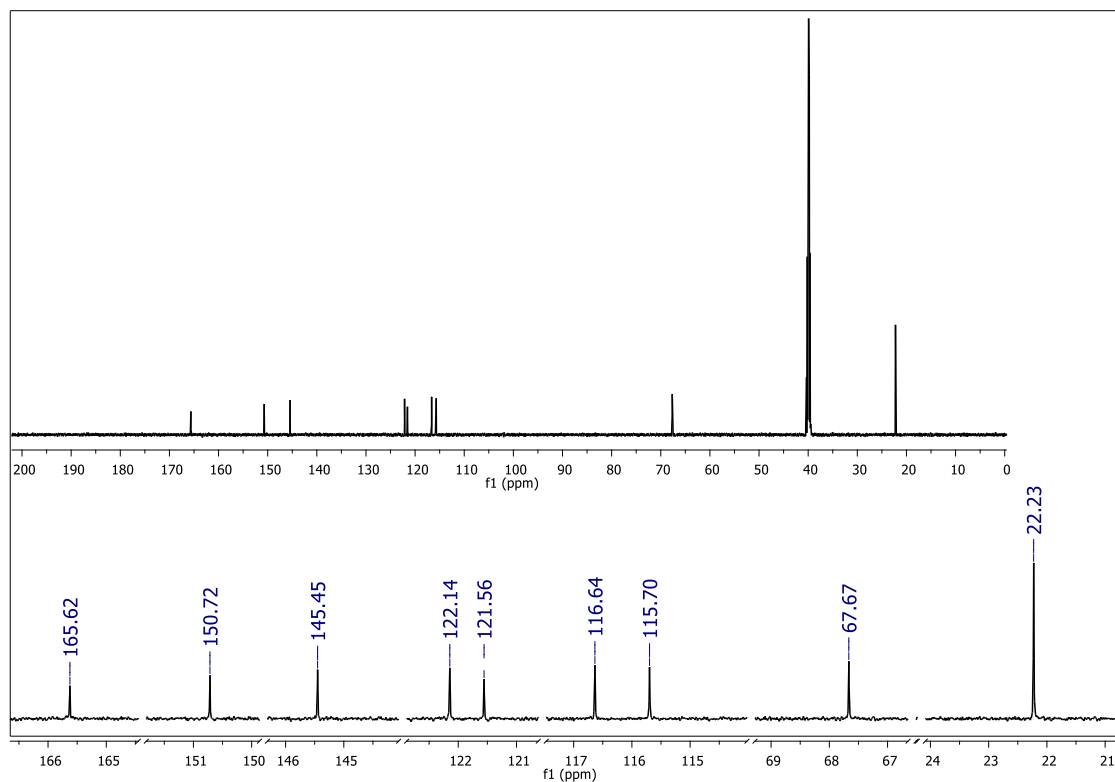
1191 **Figure S33. I)** ^1H NMR spectrum of compound **33** (300 MHz – $\text{DMSO-}d_6$)



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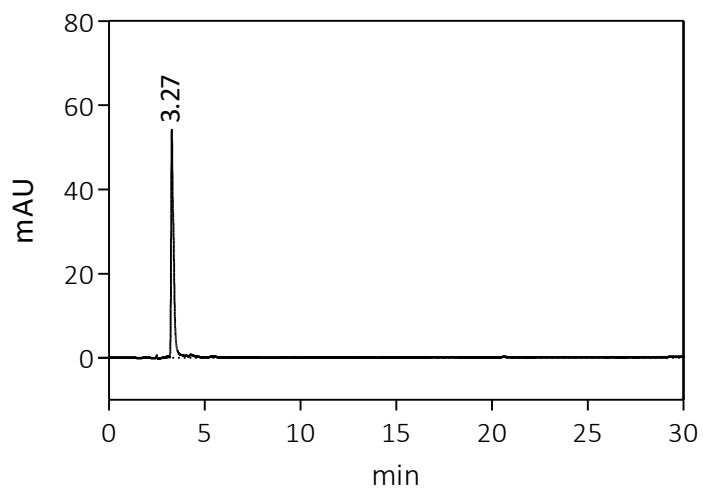
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1194 **Figure S33. II)** ^{13}C NMR spectrum of compound **33** (150 MHz – $\text{DMSO-}d_6$)



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1196 **Figure S33.** III) HPLC chromatogram of compound **33**



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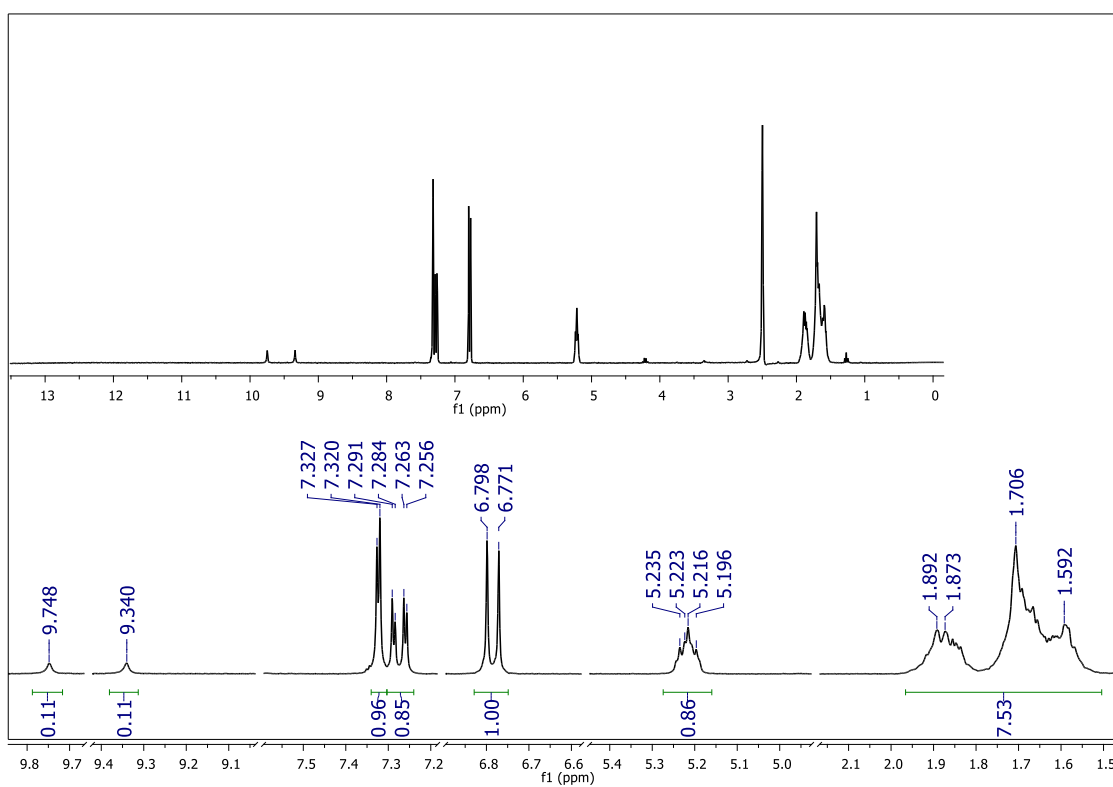
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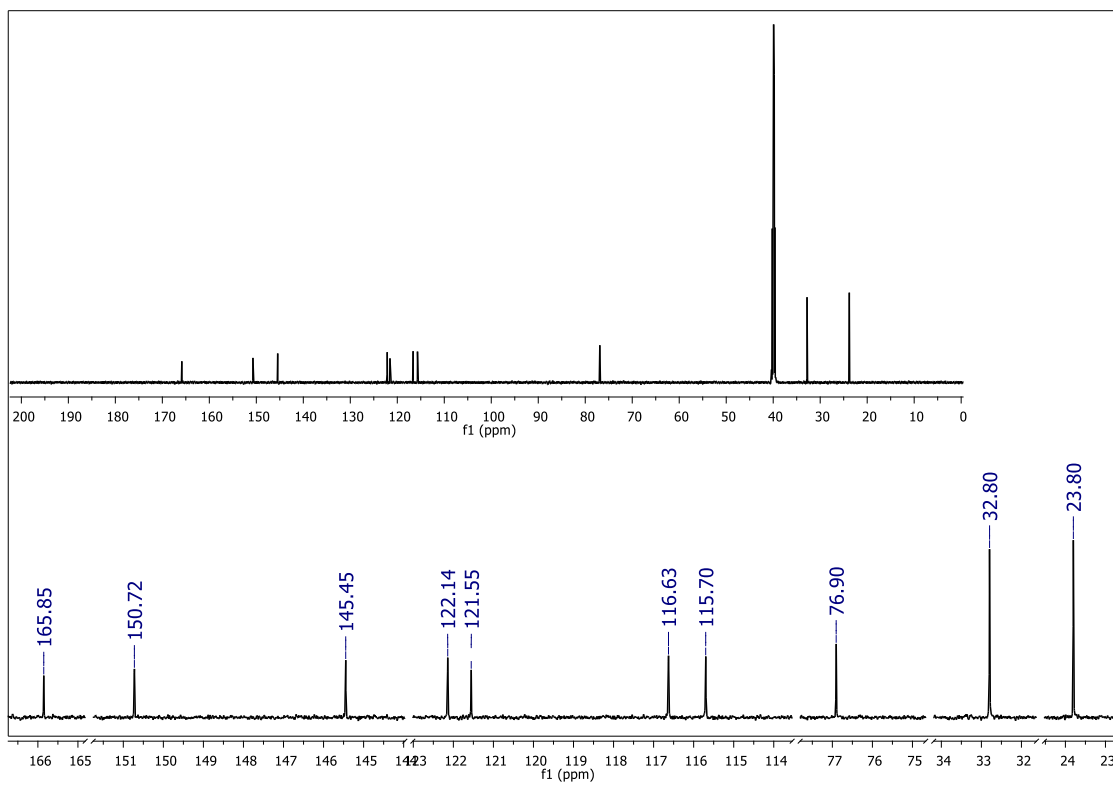
1214 **Figure S34. I)** ^1H NMR spectrum of compound **34** (300 MHz – $\text{DMSO-}d_6$)



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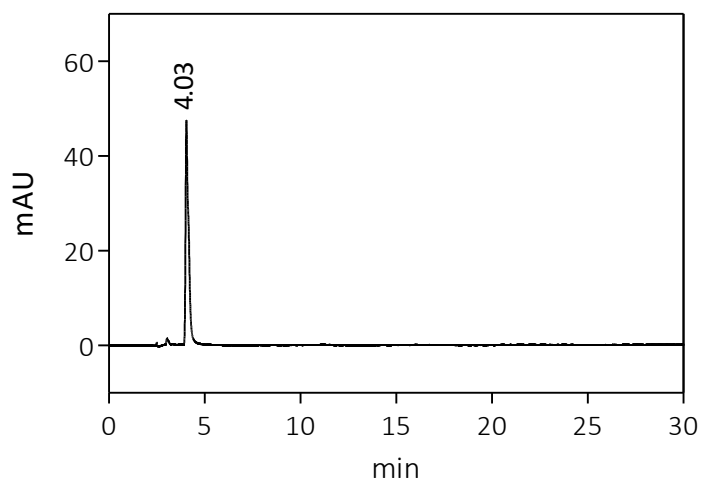
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1217 **Figure S34. II)** ^{13}C NMR spectrum of compound **34** (150 MHz – $\text{DMSO-}d_6$)



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1219 **Figure S34.** III) HPLC chromatogram of compound **34**



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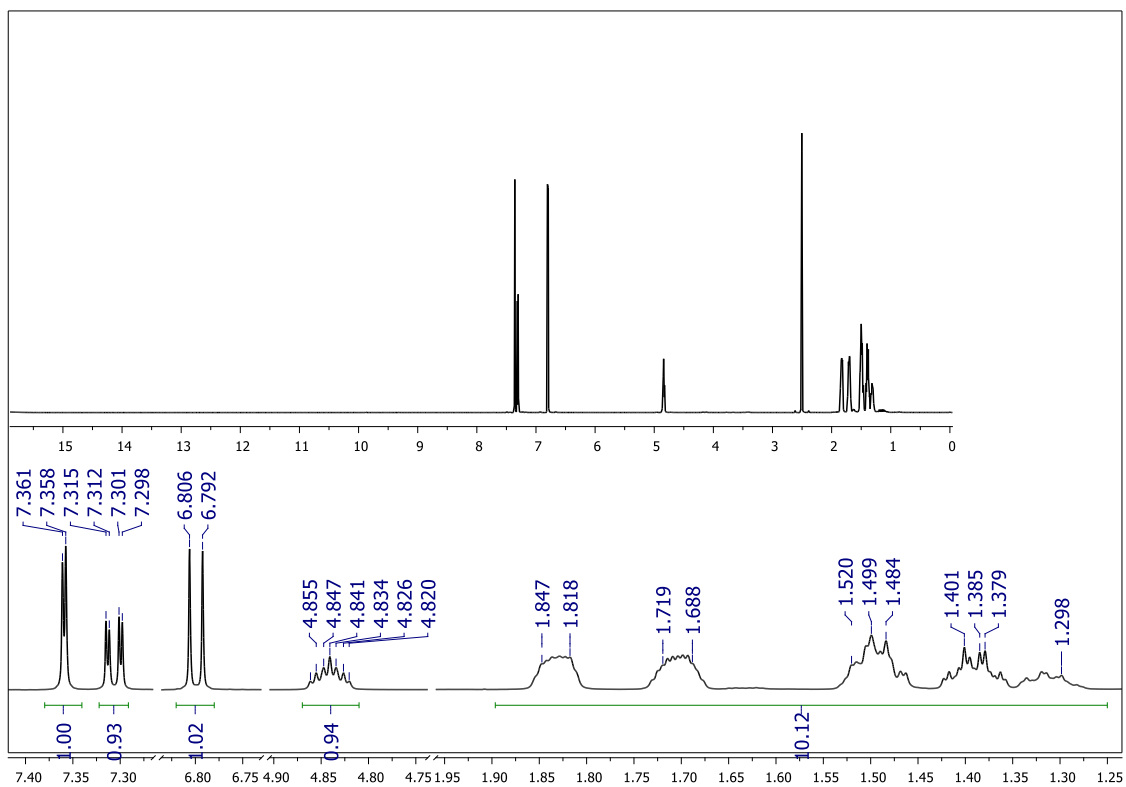
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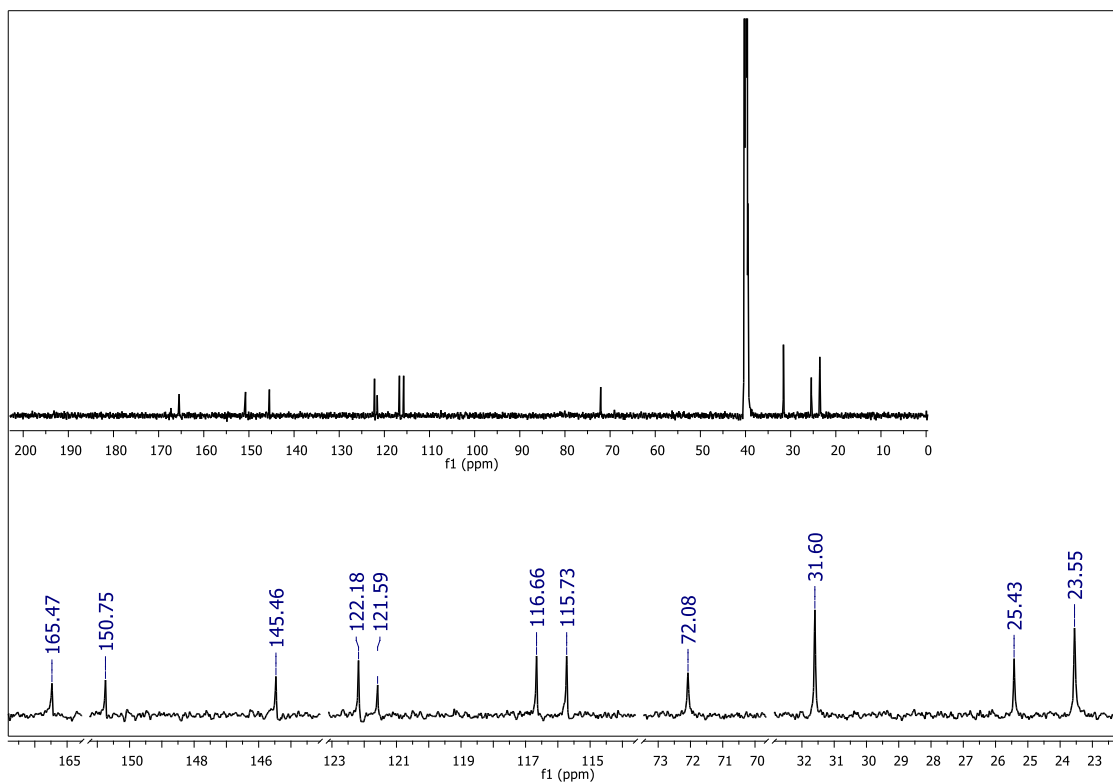
1237 **Figure S35. I)** ^1H NMR spectrum of compound **35** (600 MHz – $\text{DMSO-}d_6$)



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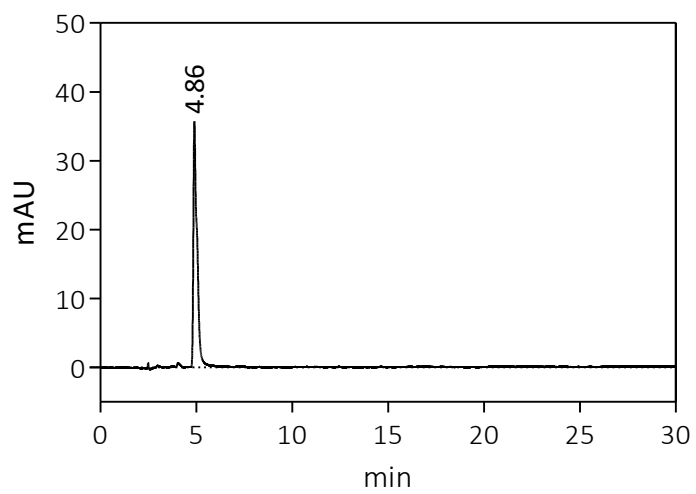
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1240 **Figure S35. II)** ^{13}C NMR spectrum of compound **35** (150 MHz – $\text{DMSO-}d_6$)



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1242 **Figure S35.** III) HPLC chromatogram of compound **35**



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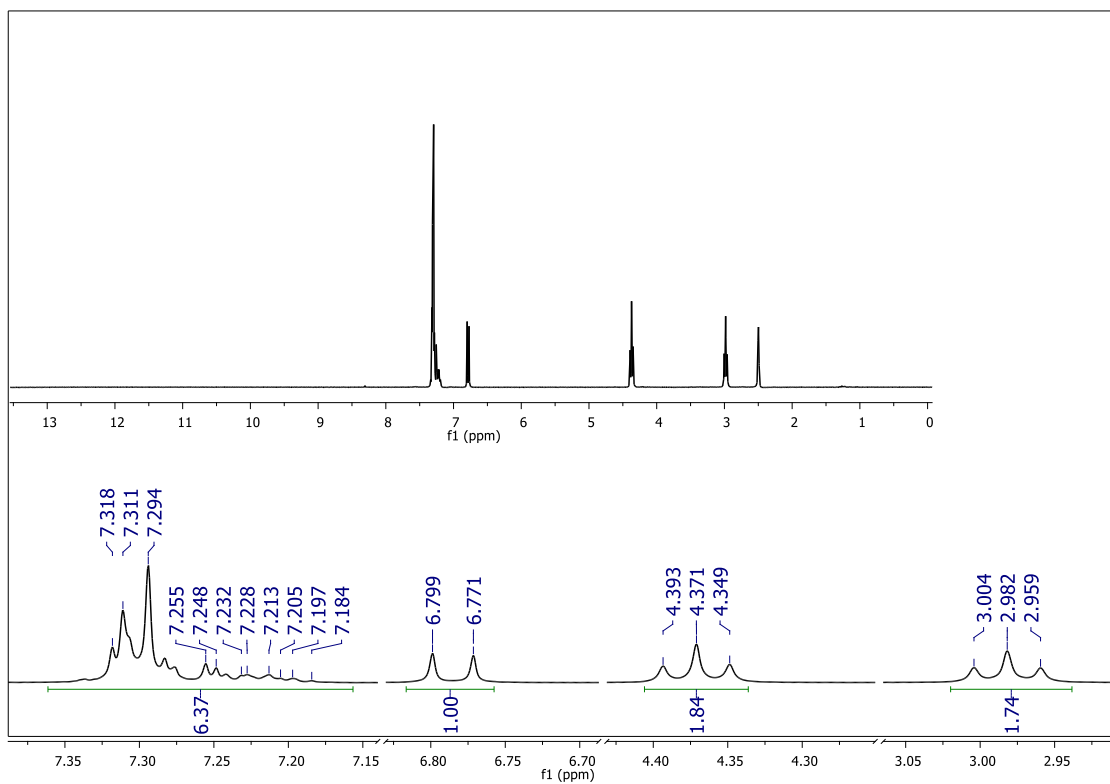
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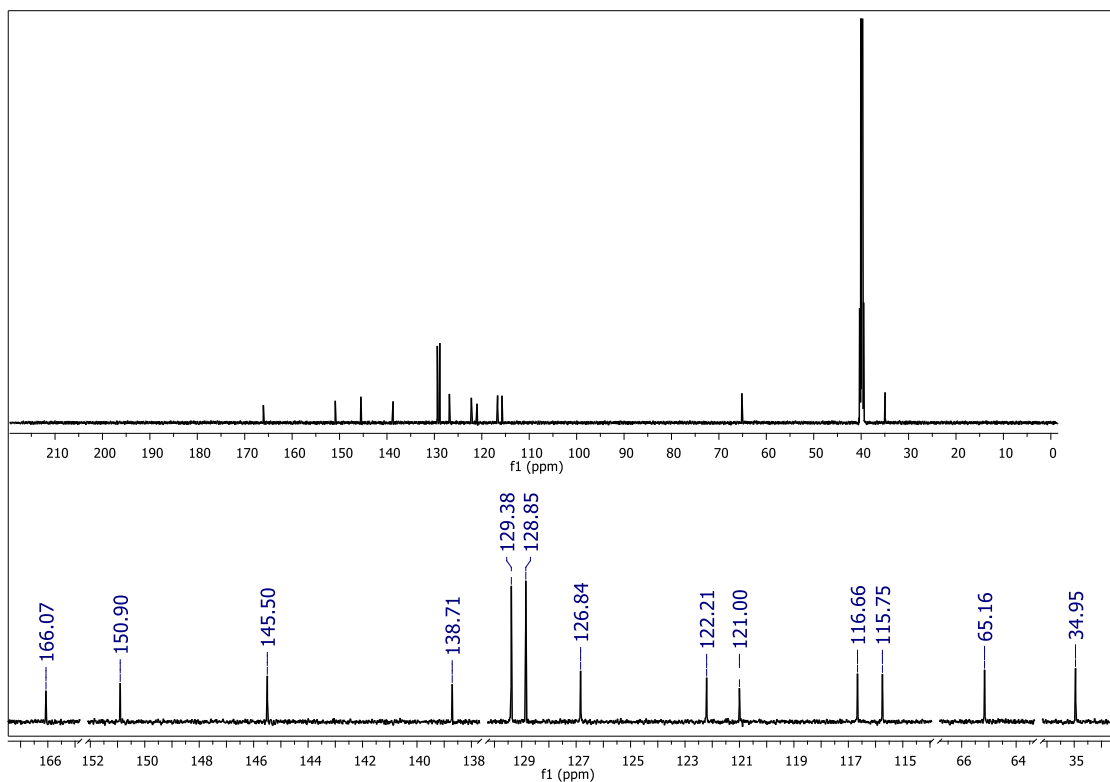
1260 **Figure S36. I)** ^1H NMR spectrum of compound **36** (300 MHz – $\text{DMSO-}d_6$)



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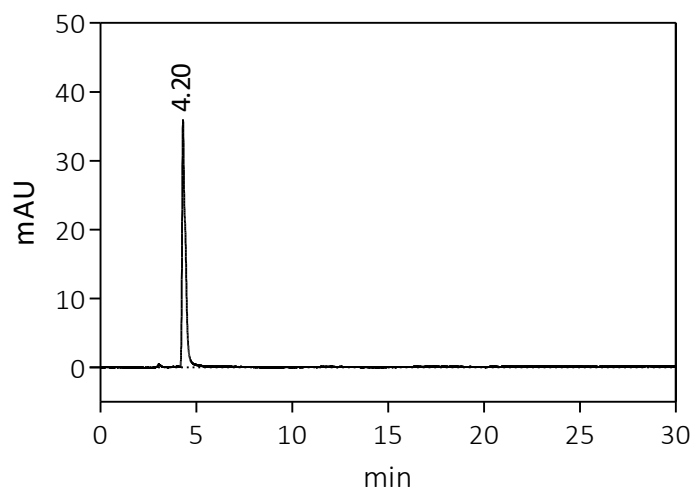
1262

1263 **Figure S36. II)** ^{13}C NMR spectrum of compound **36** (150 MHz – $\text{DMSO-}d_6$)



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1265 **Figure S36.** III) HPLC chromatogram of compound **36**



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