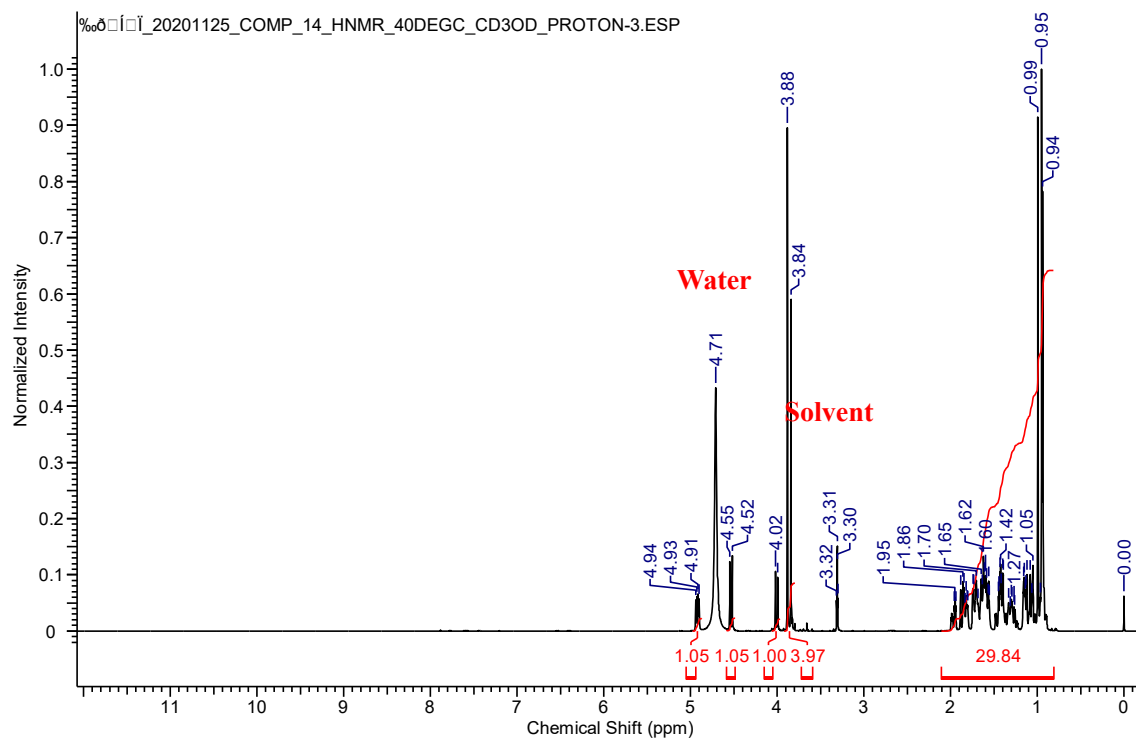
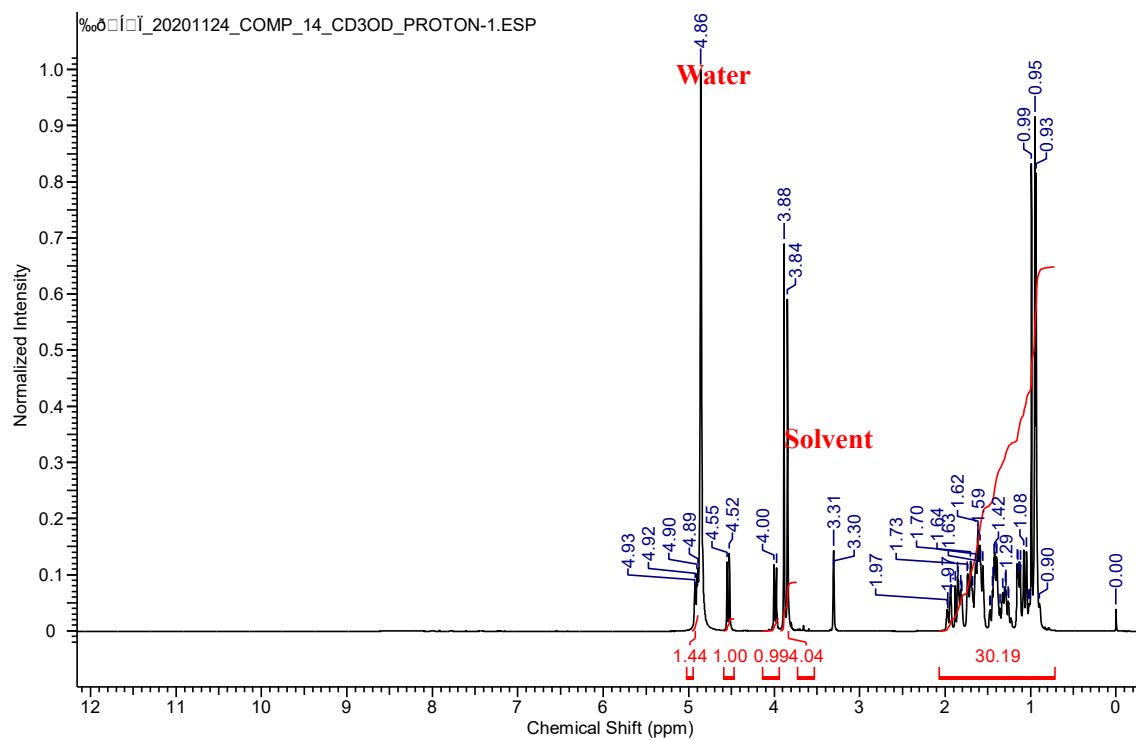


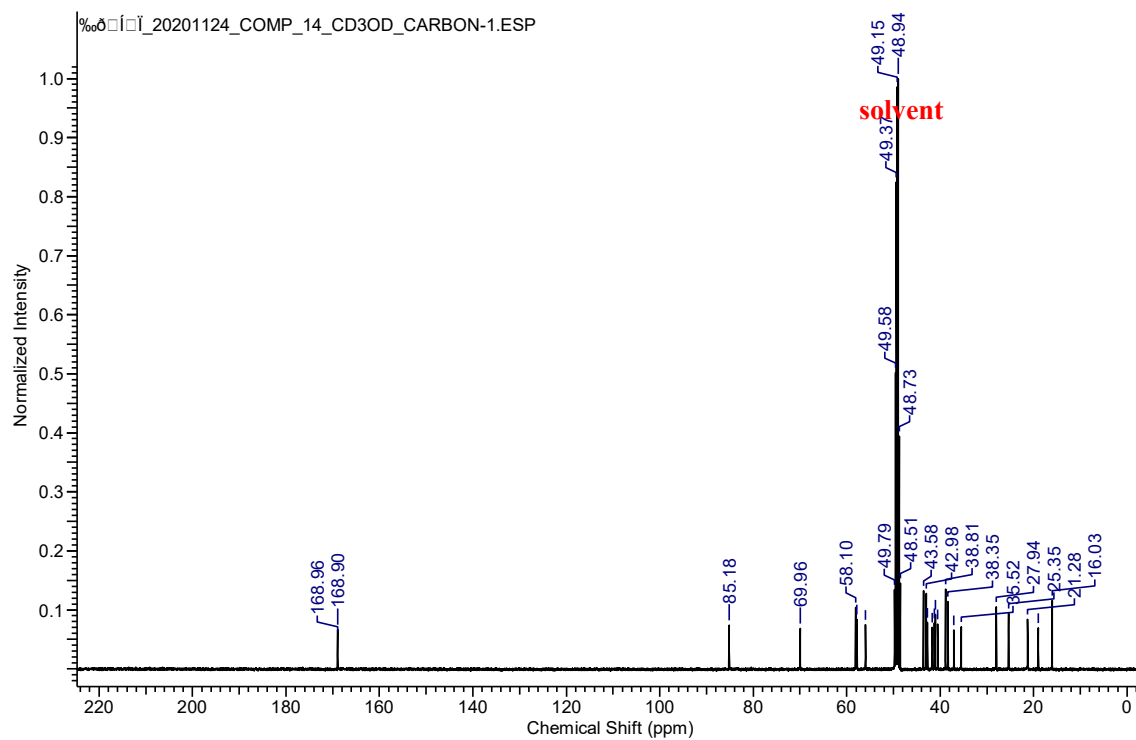
¹H-NMR (Methanol-d₄, 40°C) of compound **5**



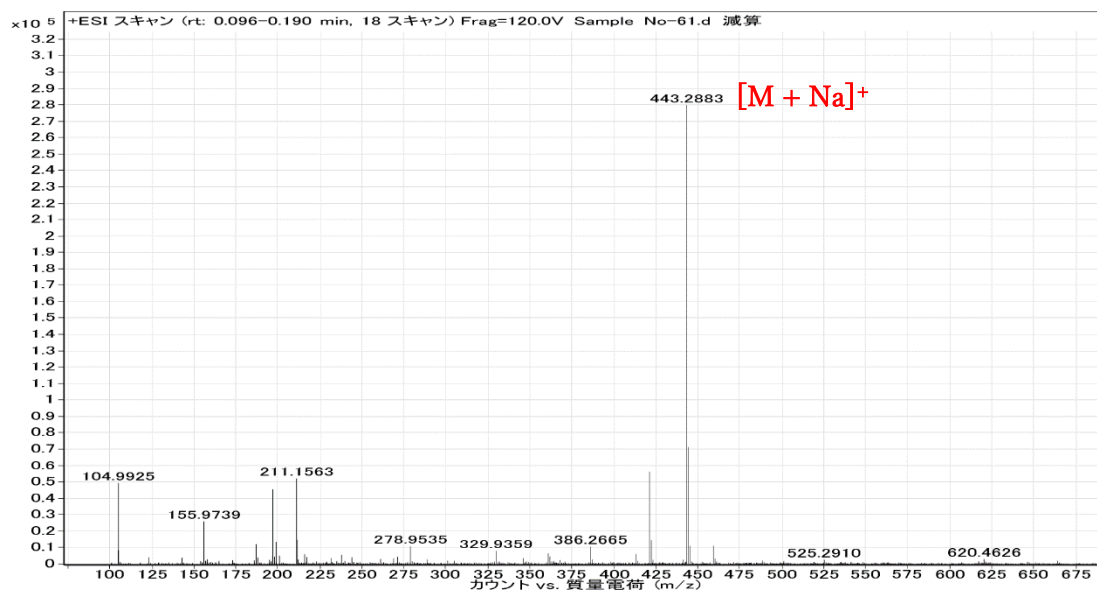
¹H-NMR (Methanol-d₄, 23°C) of compound **5**

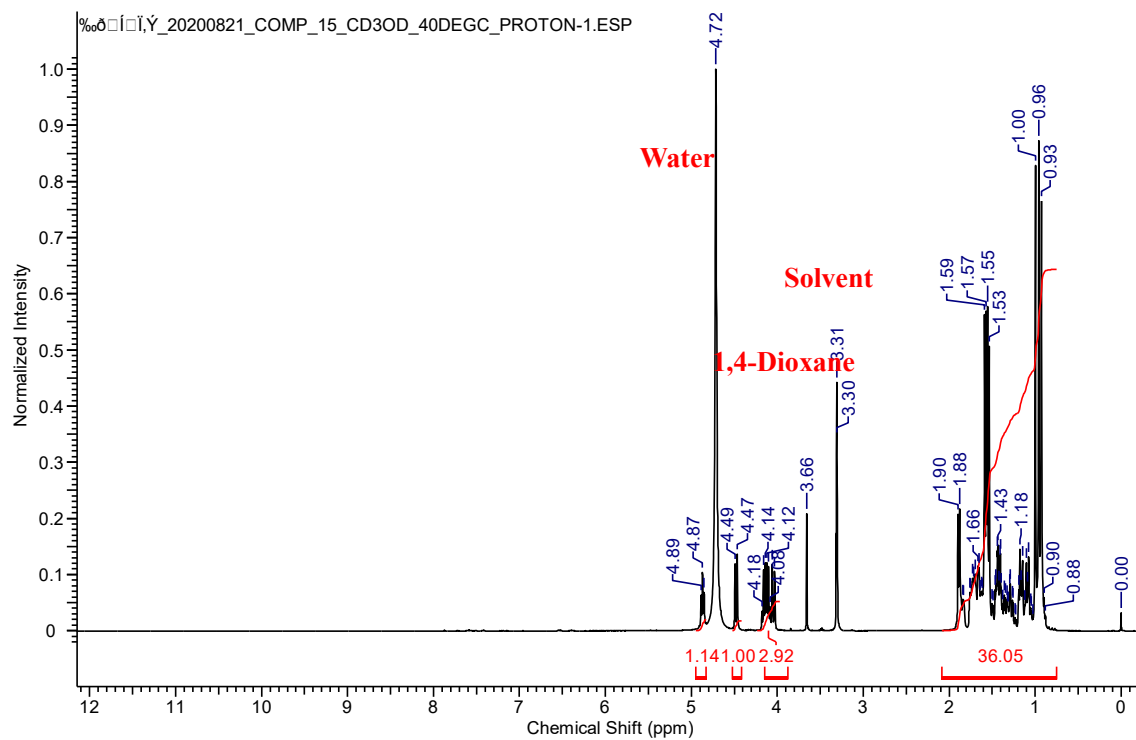
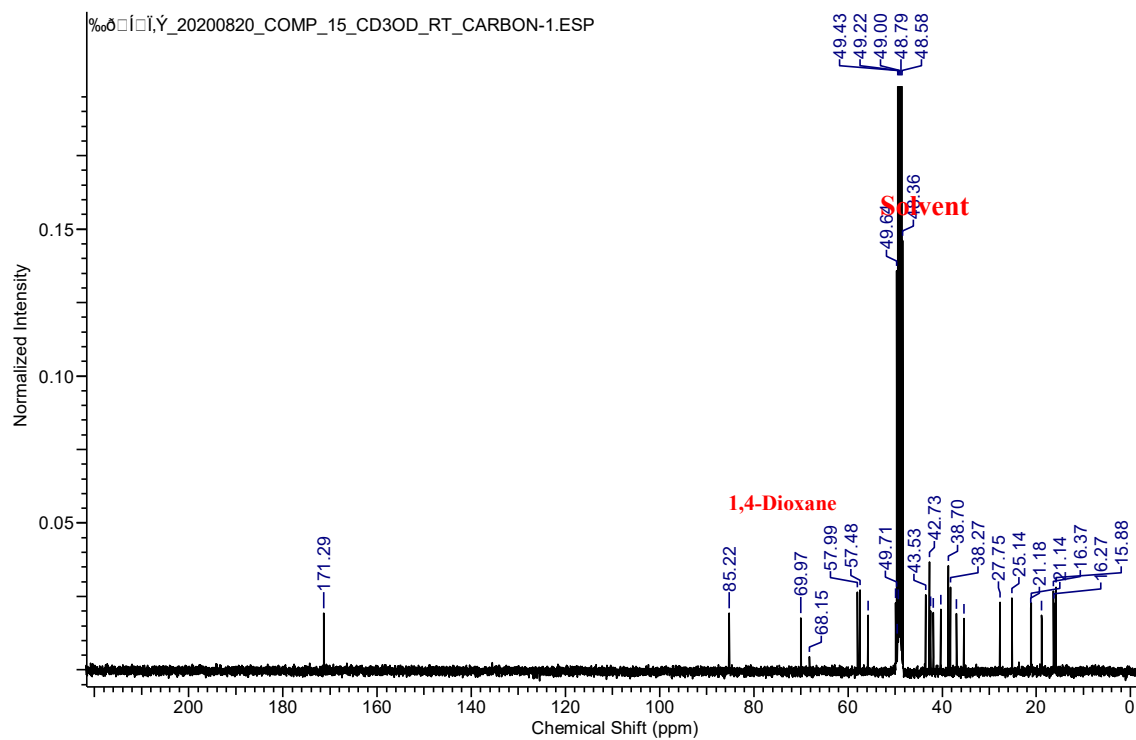


^{13}C -NMR (Methanol- d_4 , 23°C) of compound **5**

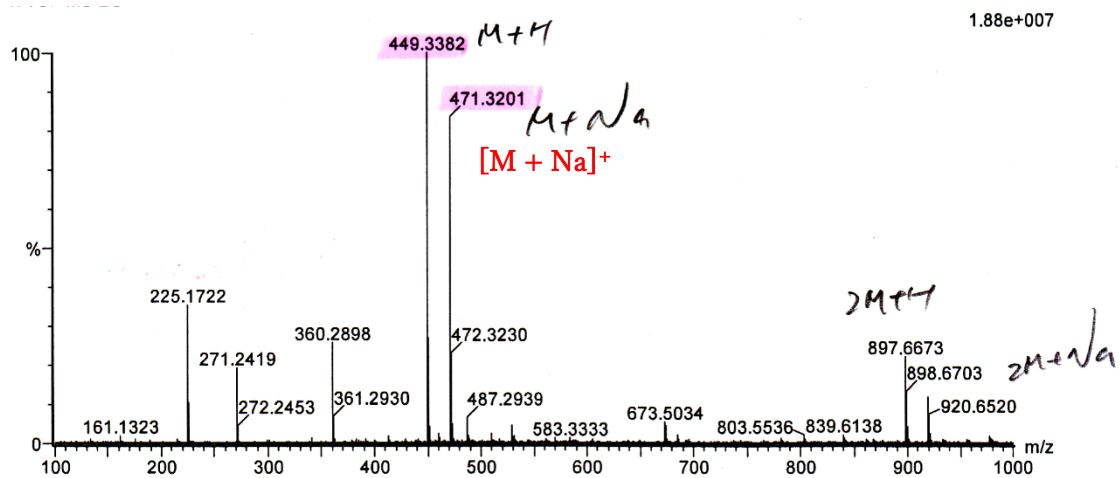


HRMS (ESI-MS) of compound **5**

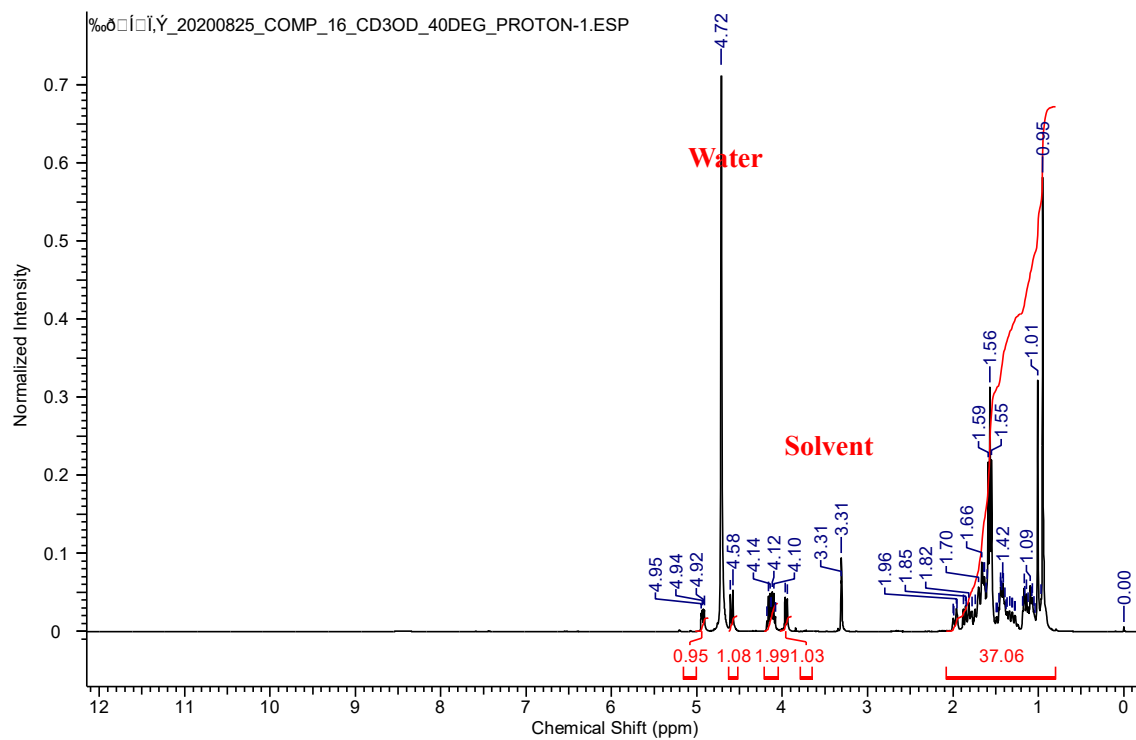


¹H-NMR (Methanol-d₄, 40°C) of compound **6**¹³C-NMR (Methanol-d₄, 21°C) of compound **6**

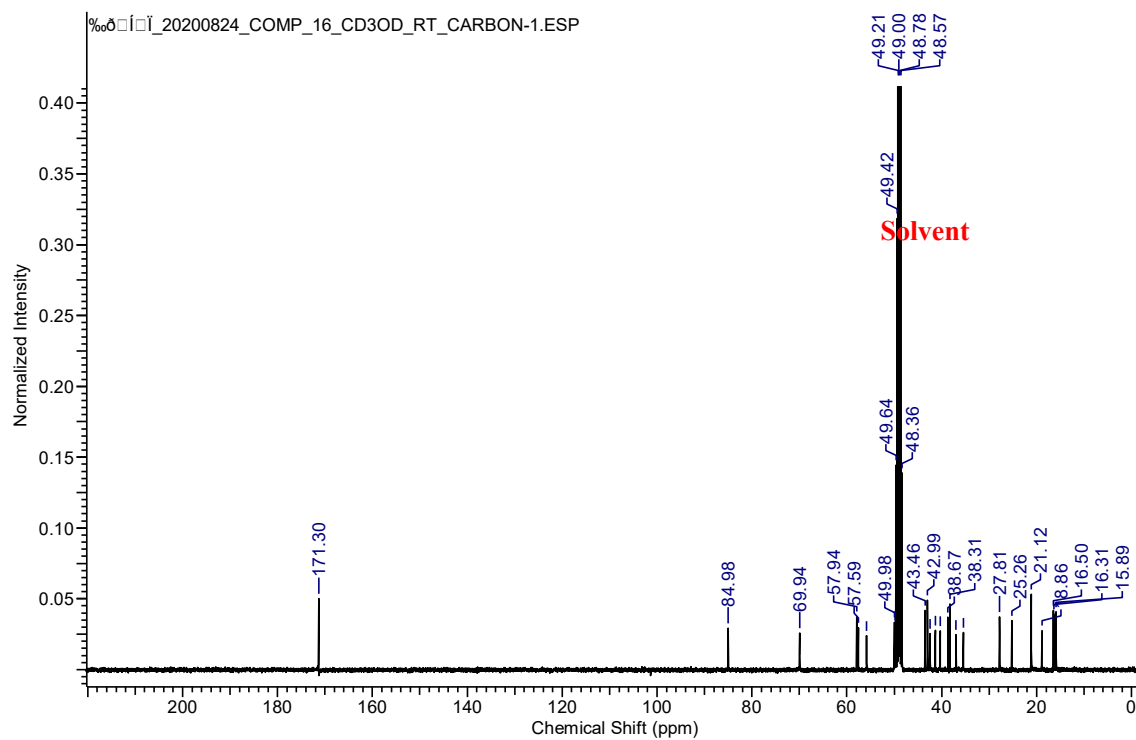
HRMS (ESI-MS) of compound 6



^1H -NMR (Methanol- d_4 , 40°C) of compound 7

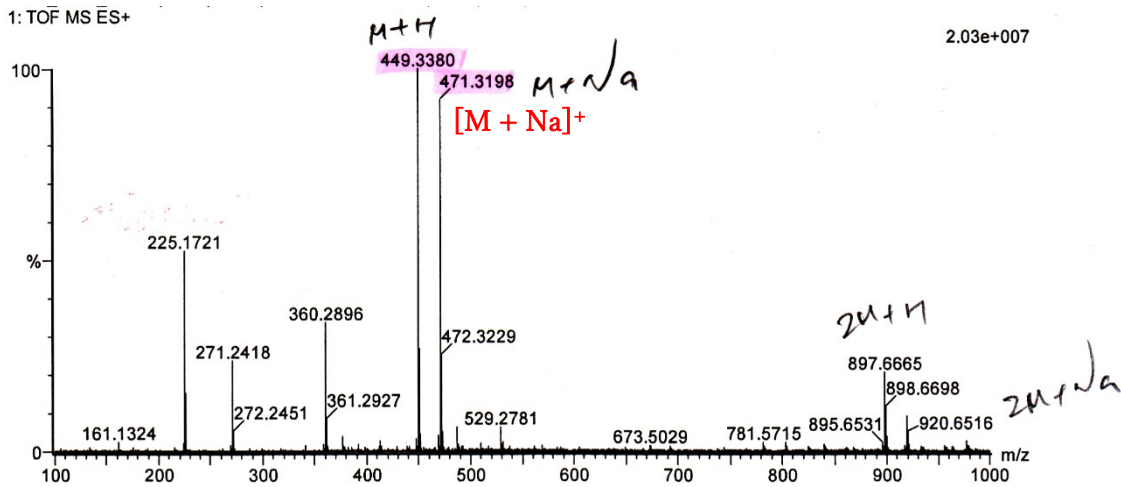


^{13}C -NMR (Methanol- d_4 , 21°C) of compound 7

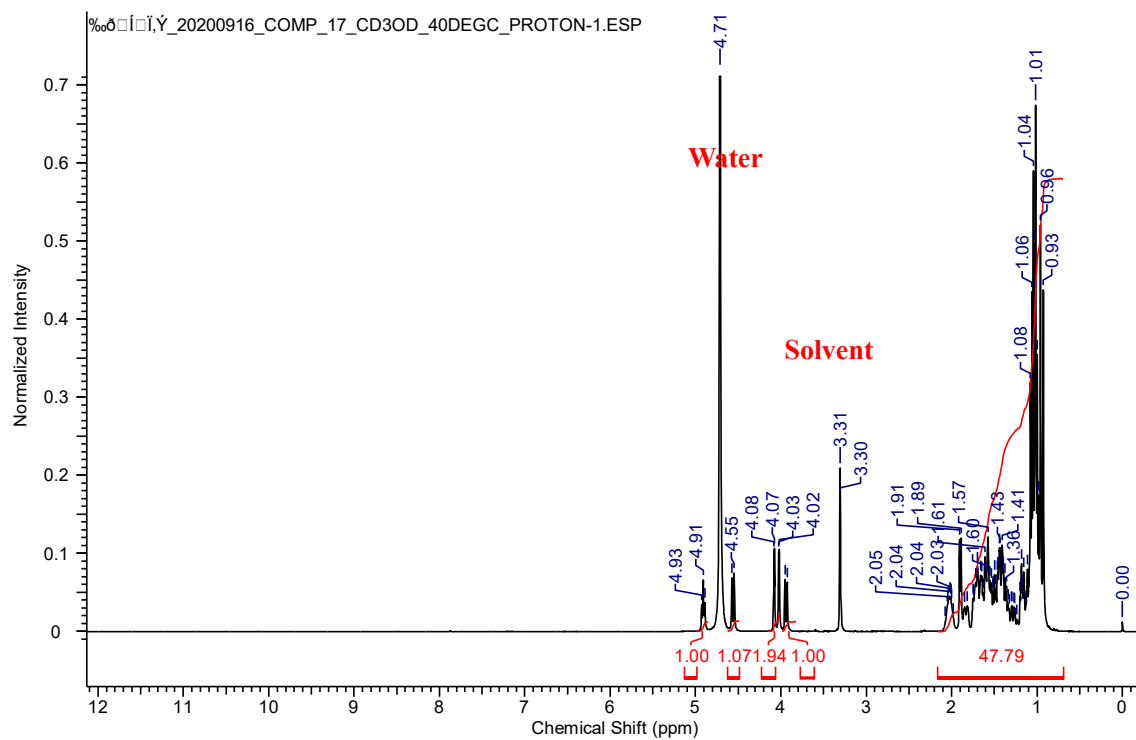


HRMS (ESI-MS) of compound 7

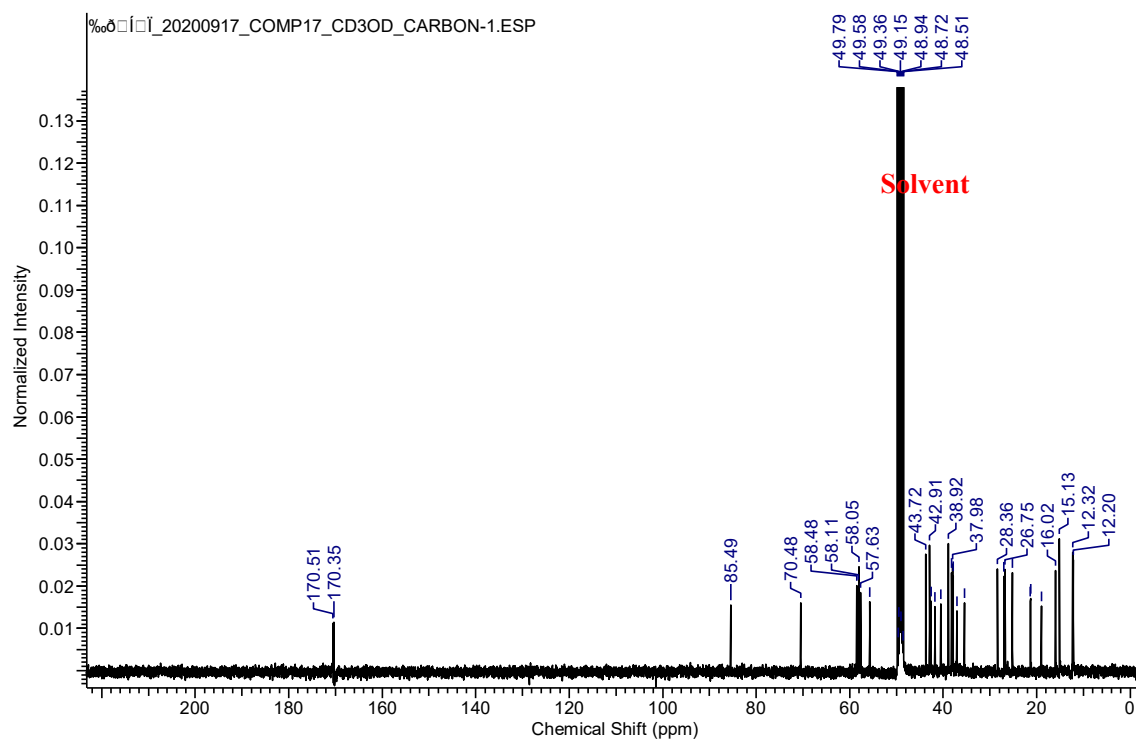
1: TOF MS ES+



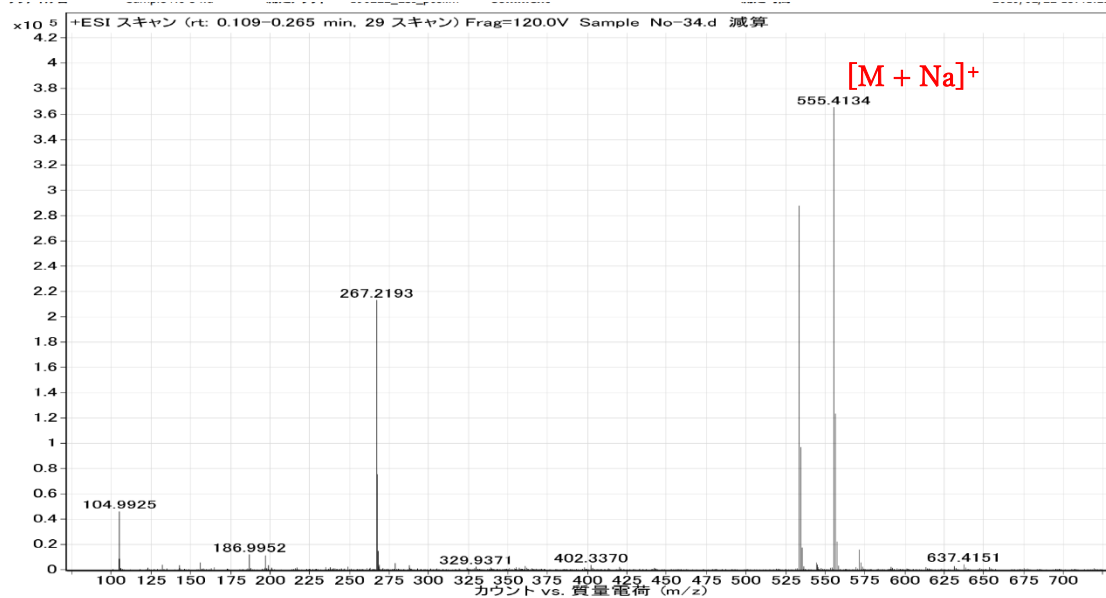
¹H-NMR (Methanol-d₄, 40°C) of compound **8**



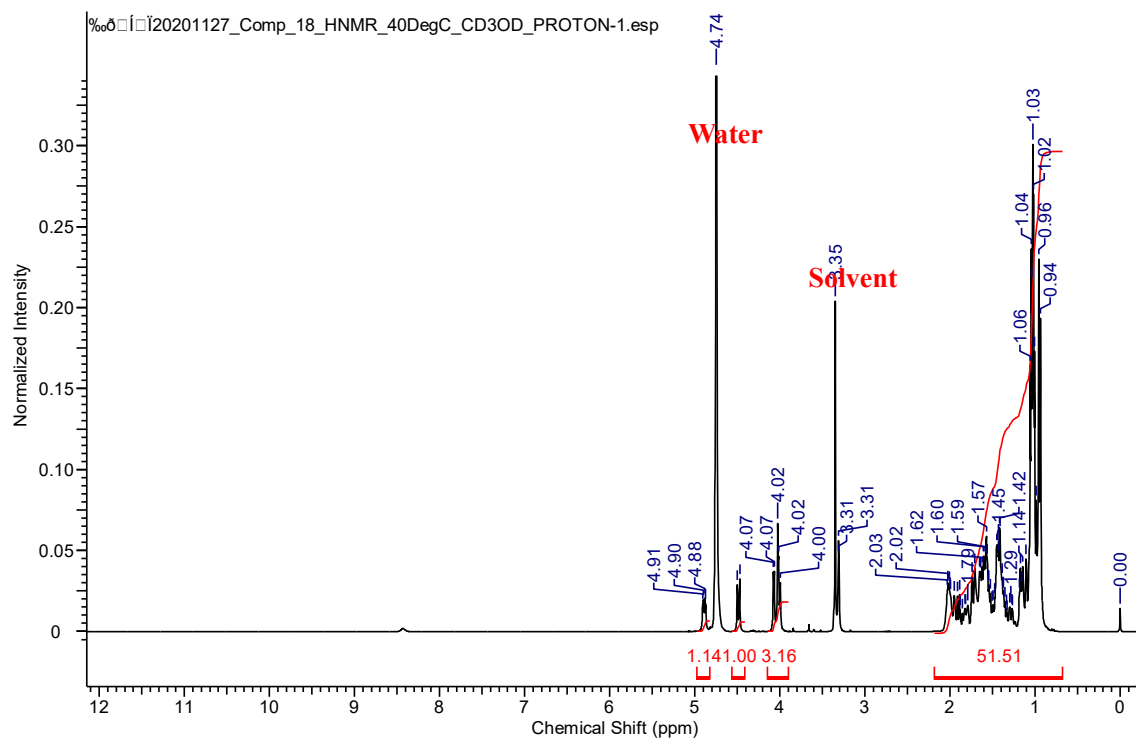
¹³C-NMR (Methanol-d₄, 21°C) of compound **8**



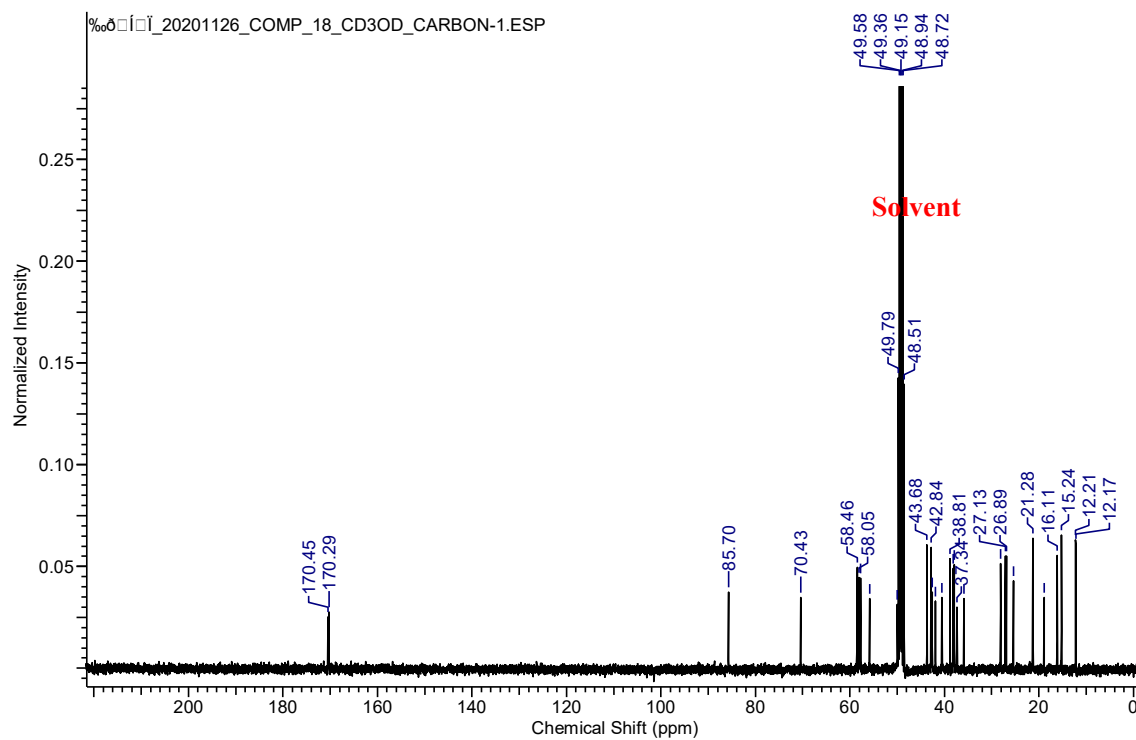
HRMS (ESI-MS) of compound 8



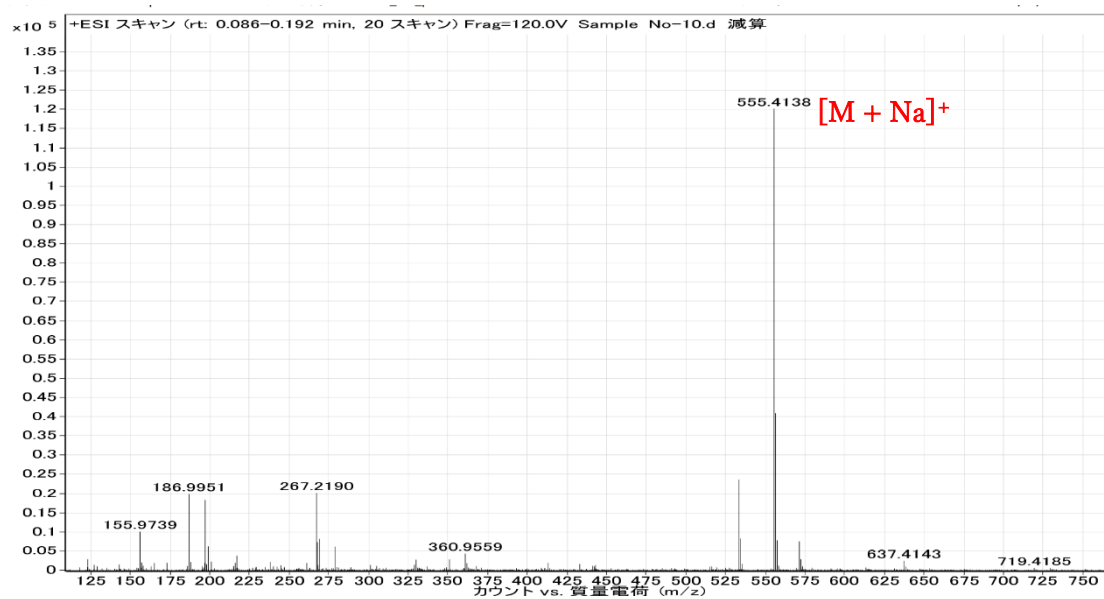
^1H -NMR (Methanol- d_4 , 40°C) of compound **9**



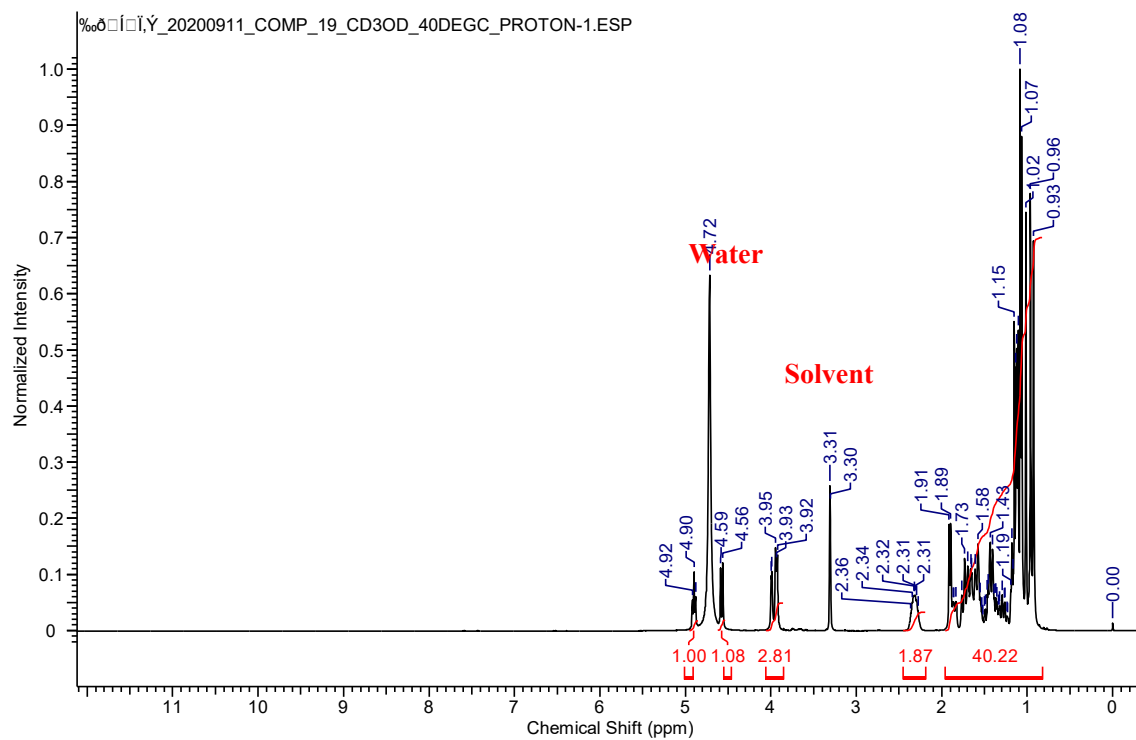
^{13}C -NMR (Methanol- d_4 , 23°C) of compound **9**



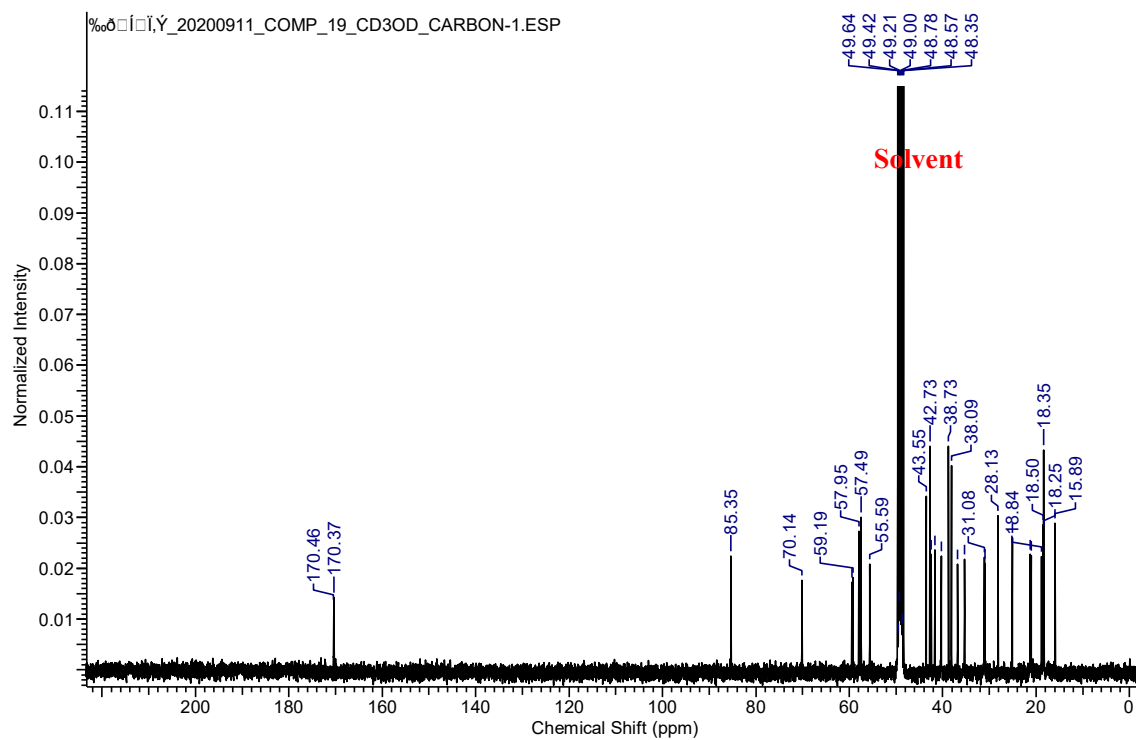
HRMS (ESI-MS) of compound 9



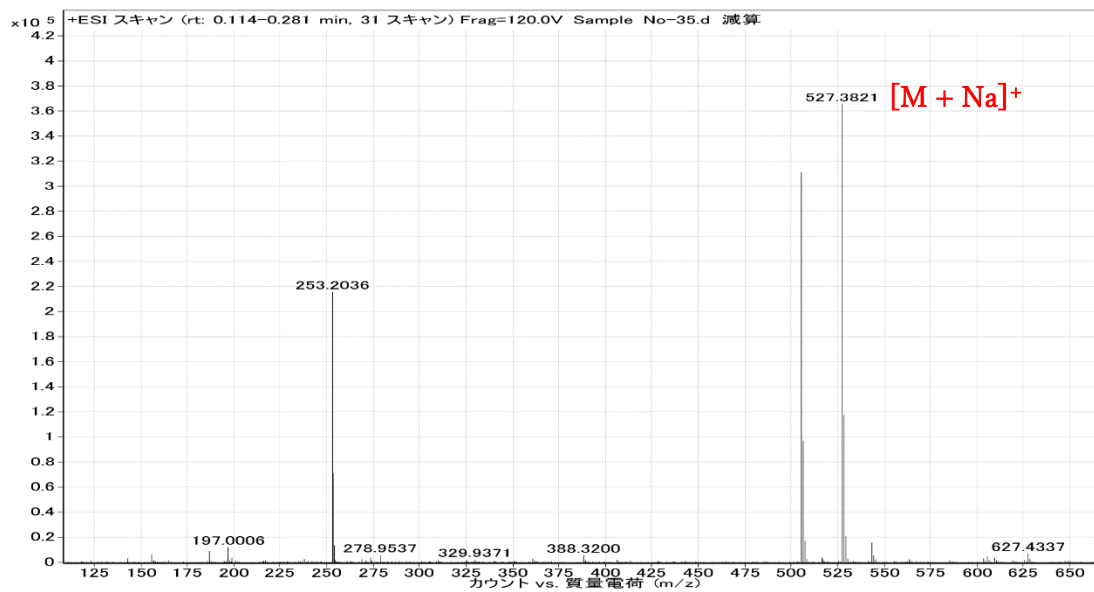
^1H -NMR (Methanol- d_4 , 40°C) of compound **10**



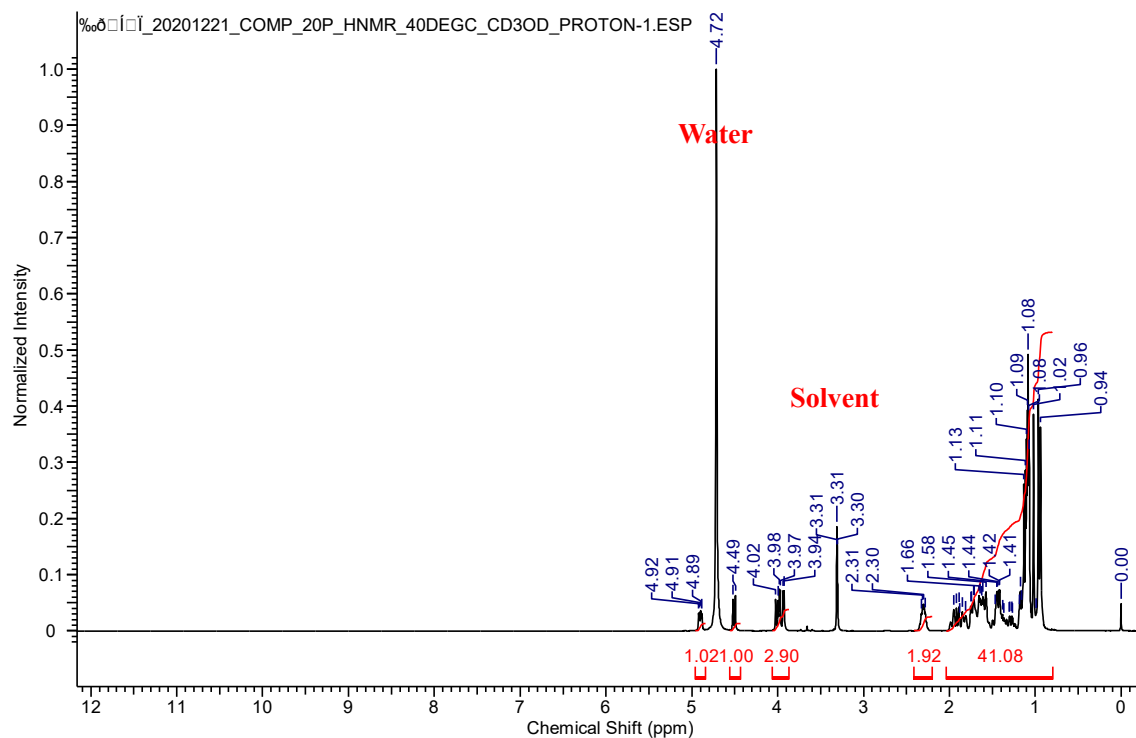
^{13}C -NMR (Methanol- d_4 , 21°C) of compound **10**



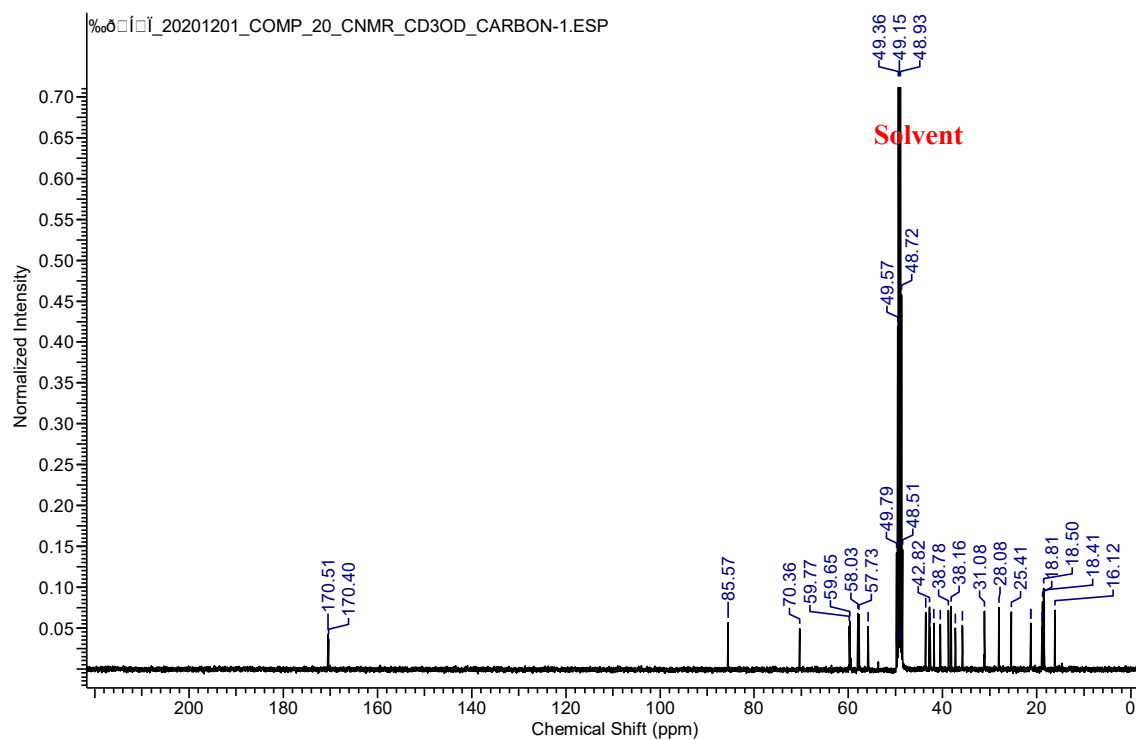
HRMS (ESI-MS) of compound 10



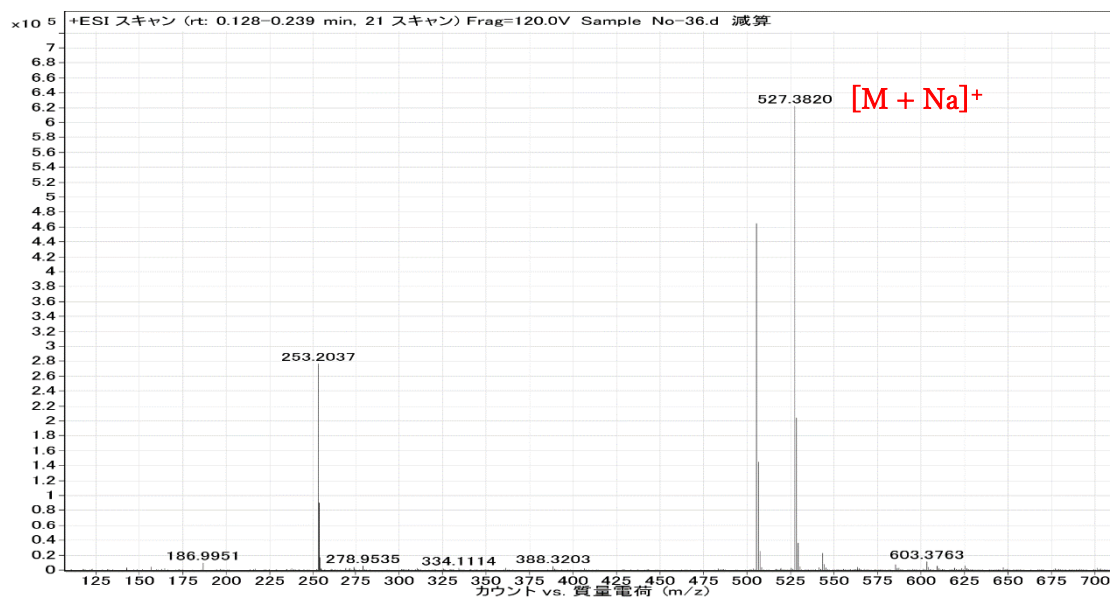
¹H-NMR (Methanol-d₄, 40°C) of compound **11**



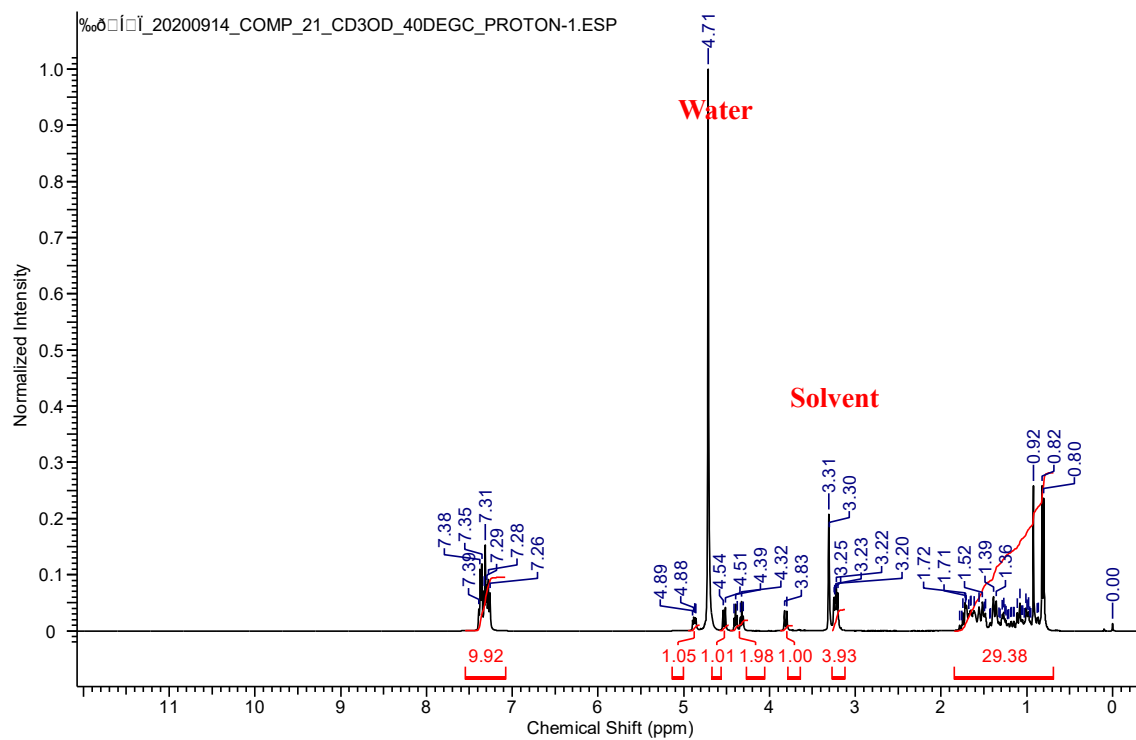
¹³C-NMR (Methanol-d₄, 22°C) of compound **11**



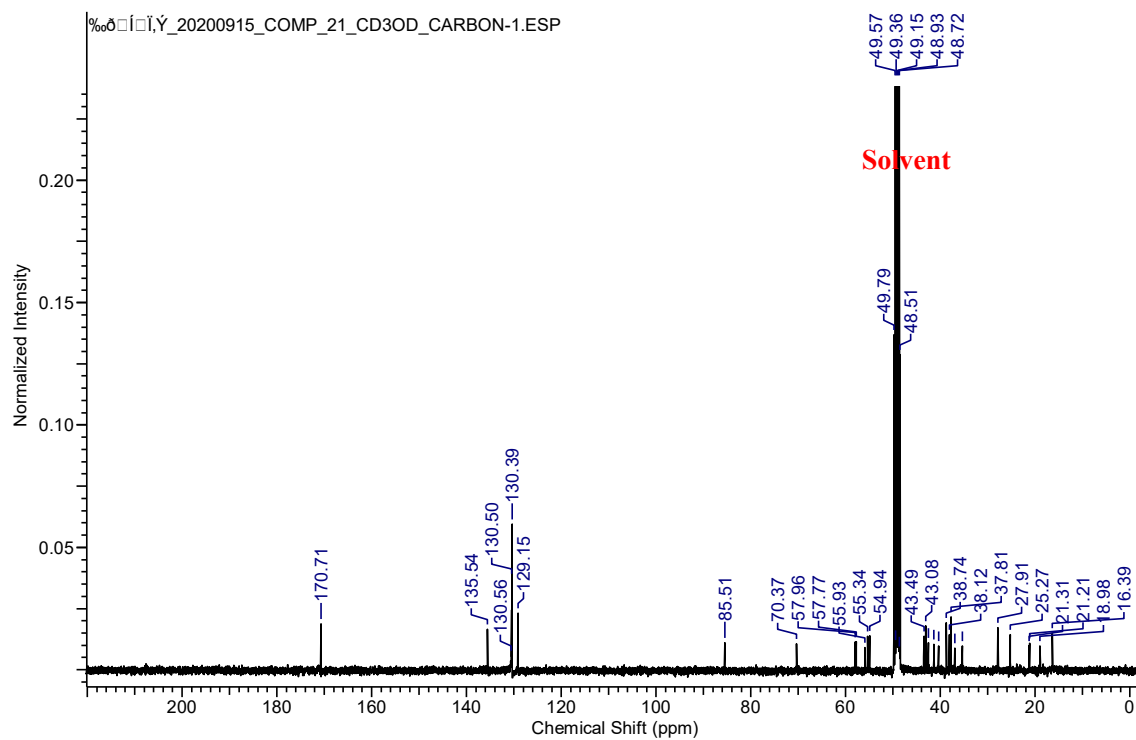
HRMS (ESI-MS) of compound 11



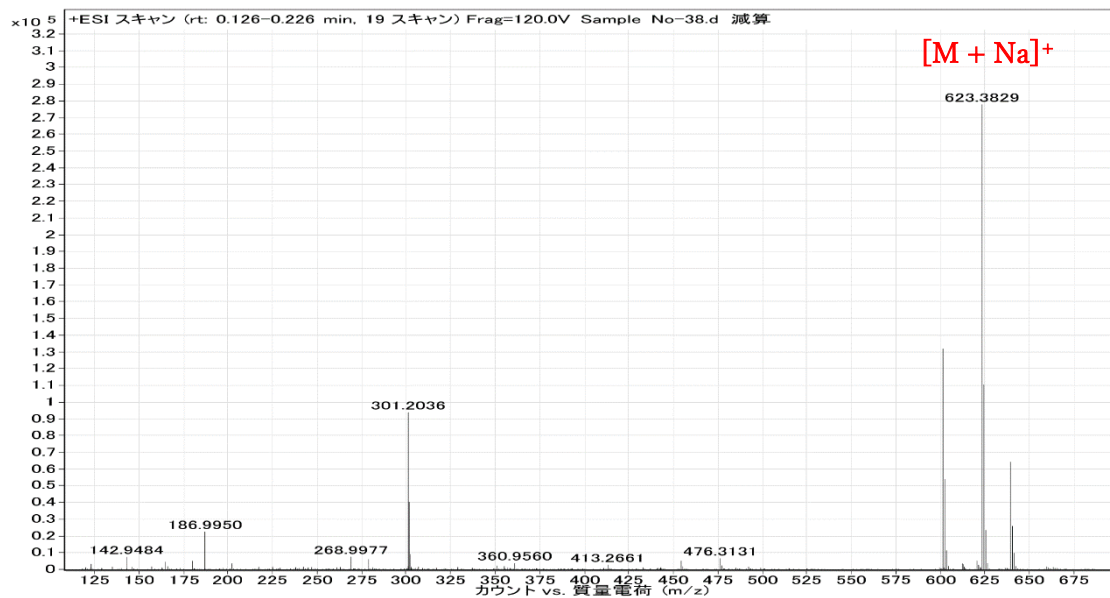
^1H -NMR (Methanol- d_4 , 40°C) of compound **12**



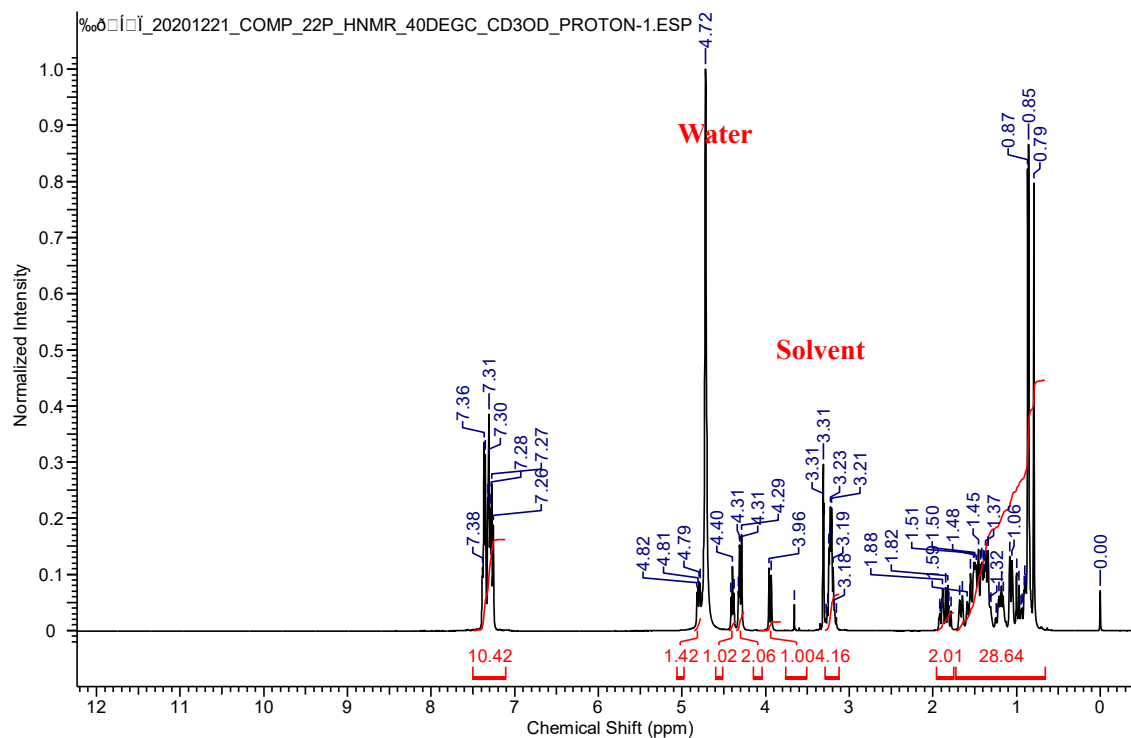
^{13}C -NMR (Methanol- d_4 , 21°C) of compound **12**



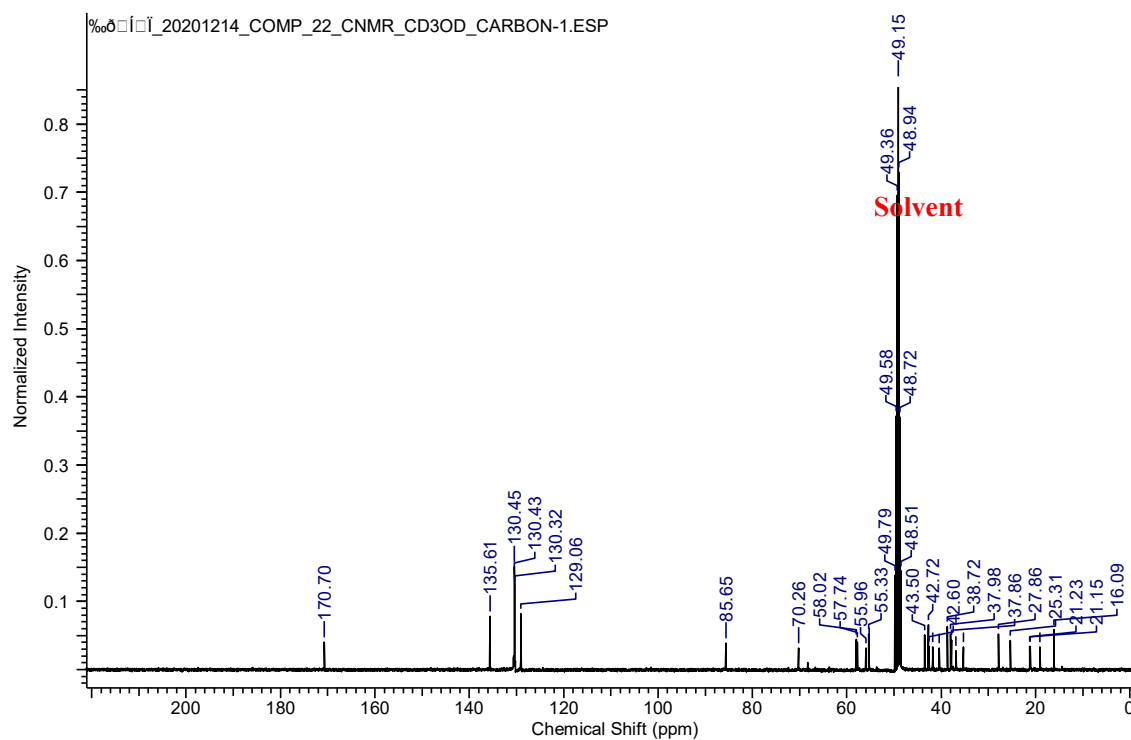
HRMS (ESI-MS) of compound **12**



^1H -NMR (Methanol- d_4 , 40°C) of compound **13**



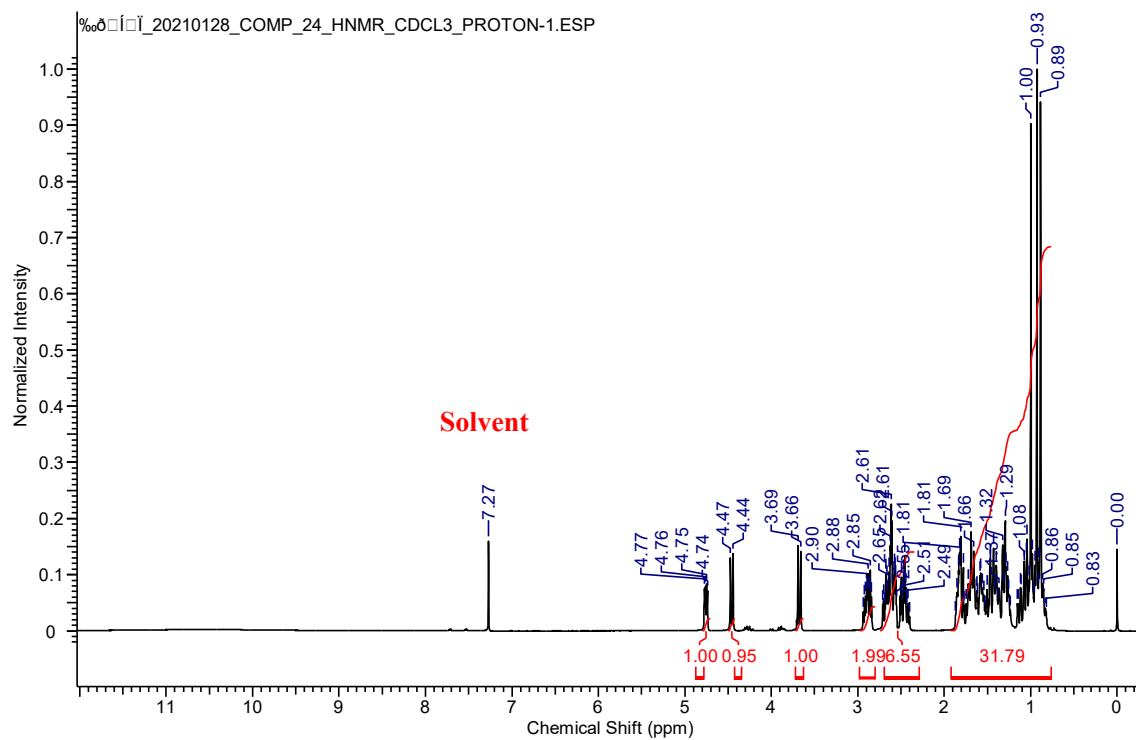
^{13}C -NMR (Methanol- d_4 , 21°C) of compound **13**



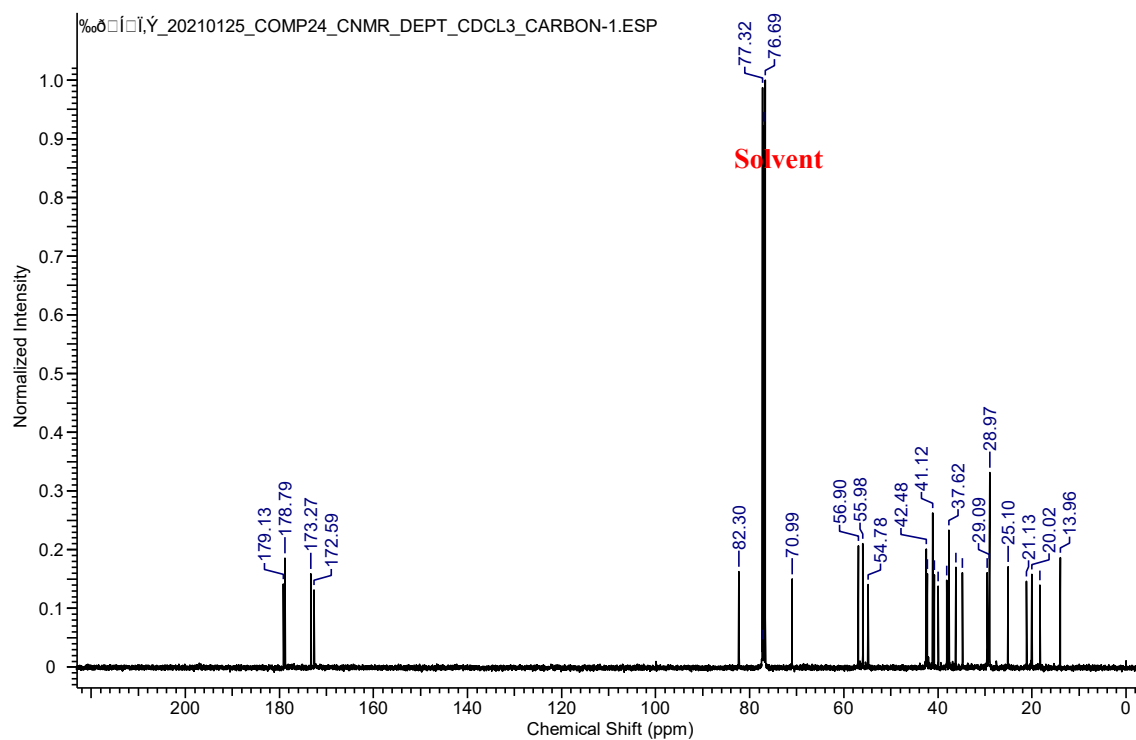
HRMS (ESI-MS) of compound **13**



¹H-NMR (Chloroform-d, 21°C) of compound **14**



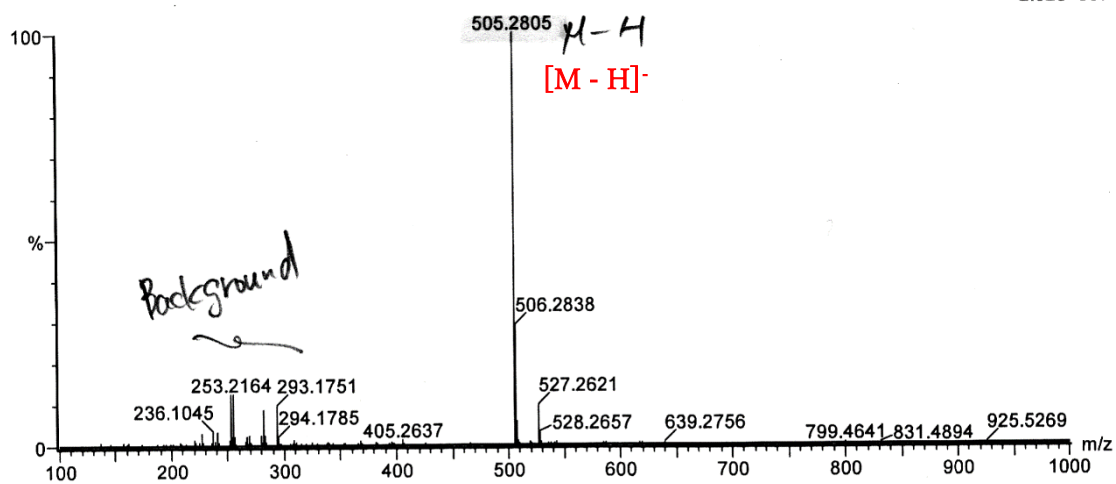
¹³C-NMR (Chloroform-d, 21°C) of compound **14**



HRMS (ESI-MS) of compound **14**

1: TOF MS ES-

2.02e+007



¹H NMR Spectrum (CD₃OD, 25 °C)

Chemical Shift (ppm): 12.00 to 0.00

Normalized Intensity: 0.00 to 1.00

Key Peaks and Integrations:

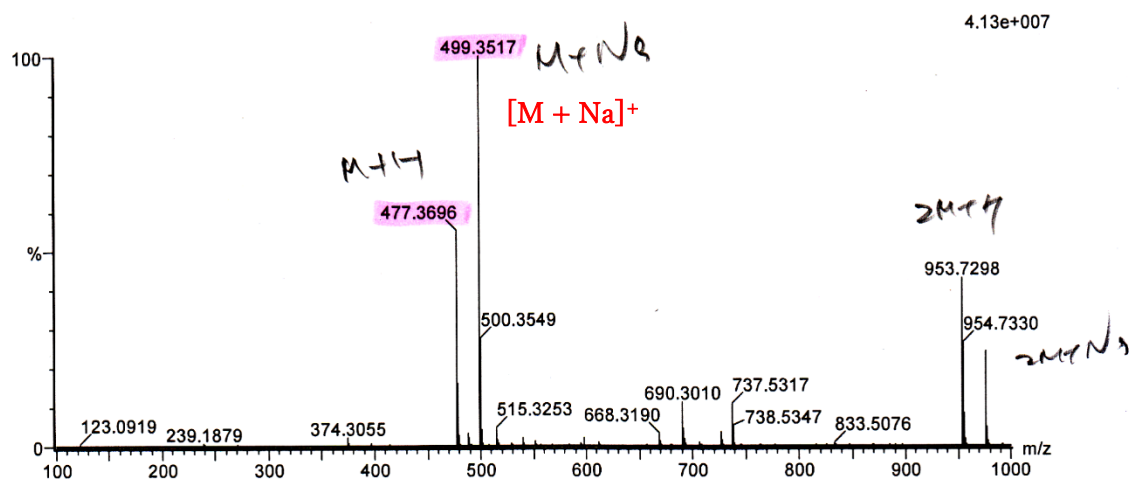
Chemical Shift (ppm)	Integration
~4.80 (Water)	1.07
~4.40 (Solvent)	1.00
~4.30	0.99
~3.30	3.99
~2.35 / 2.32	12.13
~1.00	31.29

¹³C NMR Spectrum (ppm)

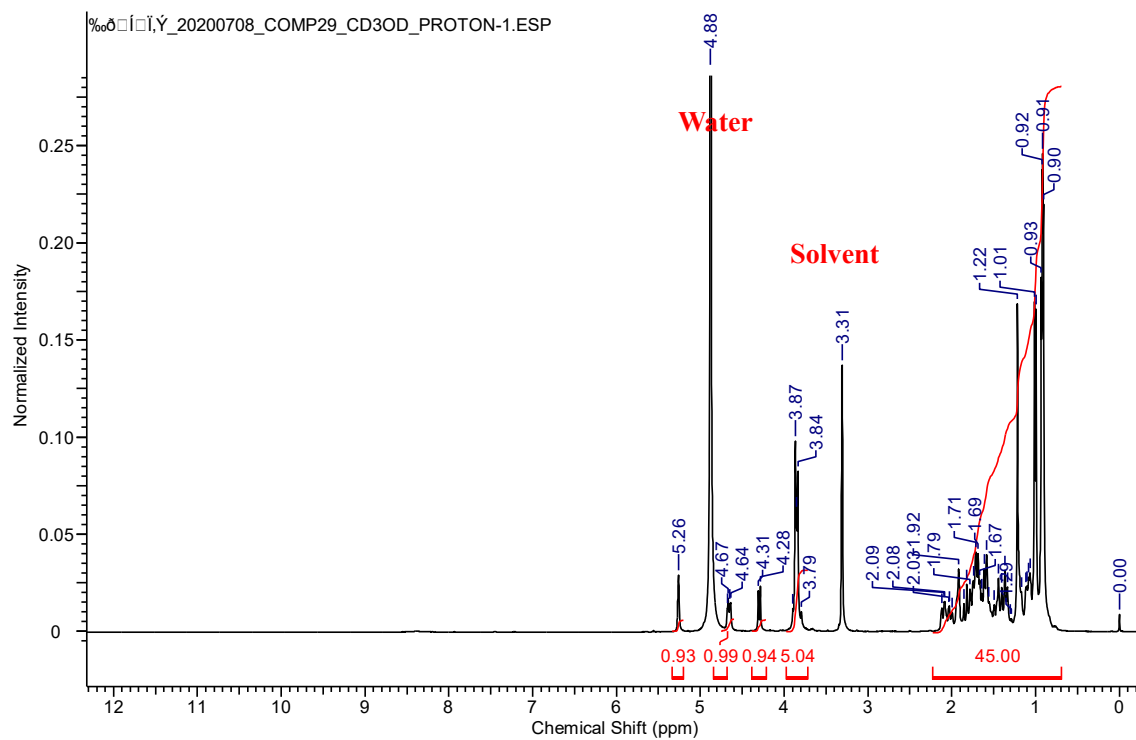
Chemical Shift (ppm): 171.79, 83.29, 68.24, 60.71, 60.54, 58.07, 57.73, 49.42, 49.21, 49.00, 48.78, 48.57, 45.31, 43.49, 42.70, 38.72, 38.17, 35.60, 28.07, 25.35, 21.16, 18.93, 15.86.

Peak at 49.00 ppm is labeled **Solvent**.

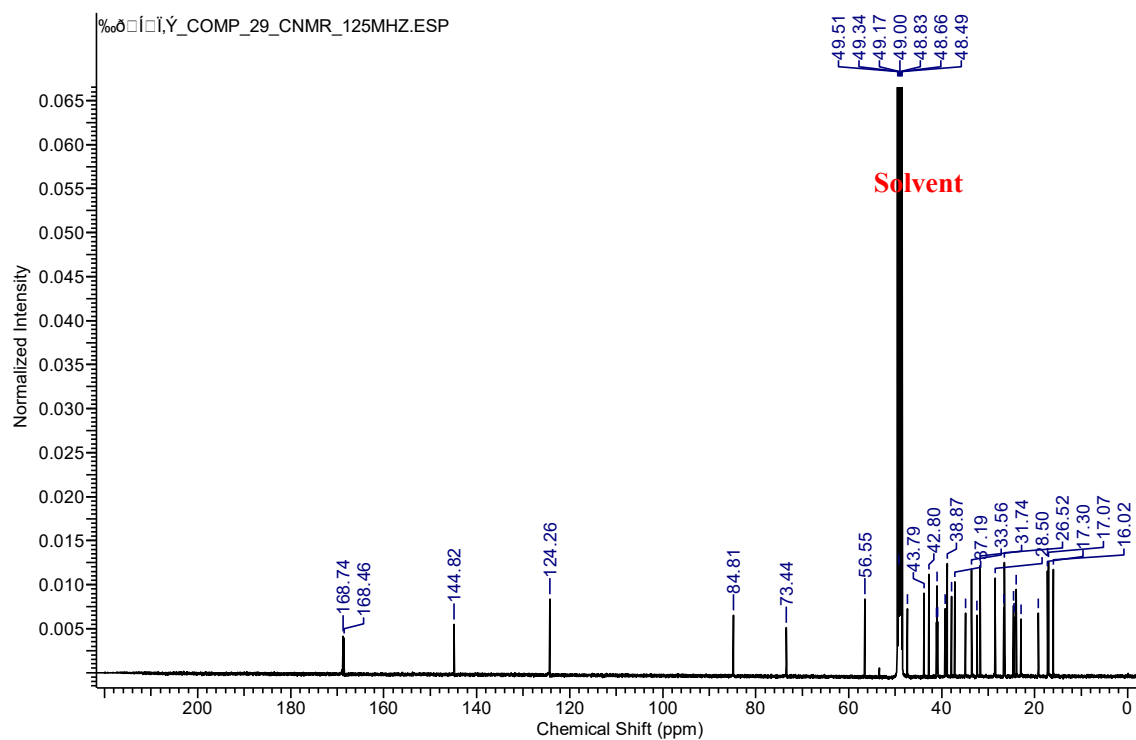
HRMS (ESI-MS) of compound **15**



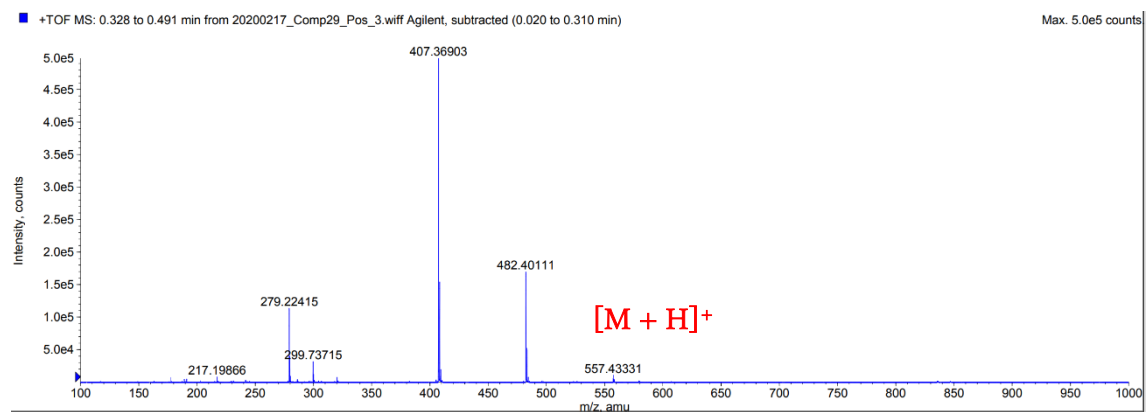
^1H -NMR (Methanol- d_4 , 21°C) of compound **19**



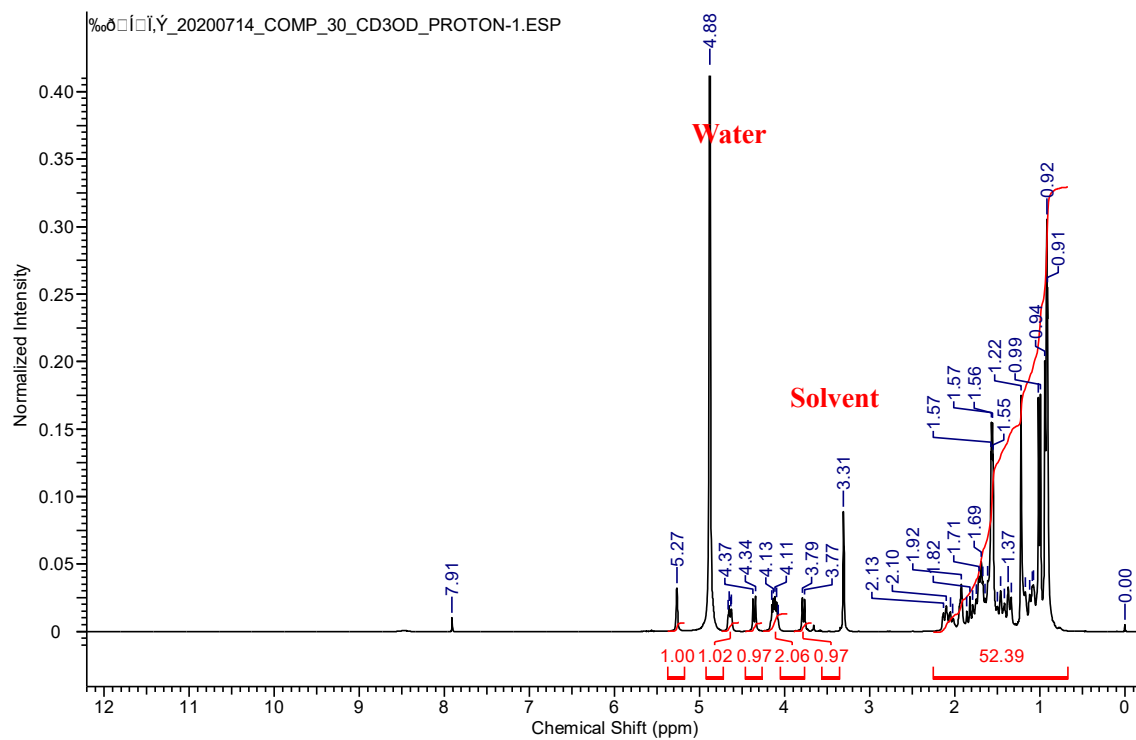
^{13}C -NMR (125 MHz, Methanol- d_4 , 21°C) of compound **19**



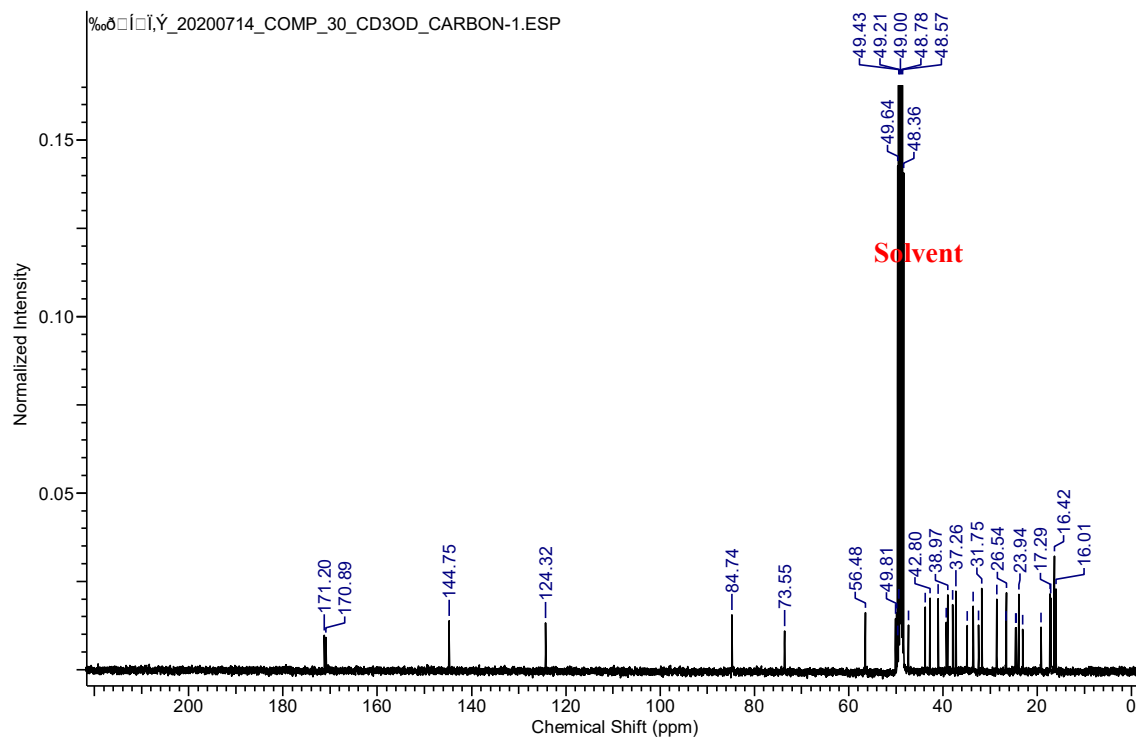
HRMS (ESI-MS) of compound **19**



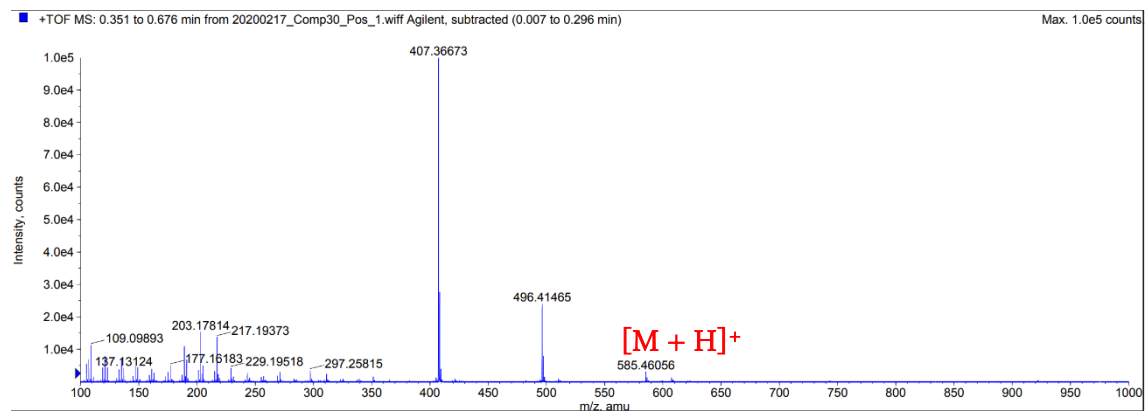
¹H-NMR (Methanol-d₄, 21°C) of compound **20**



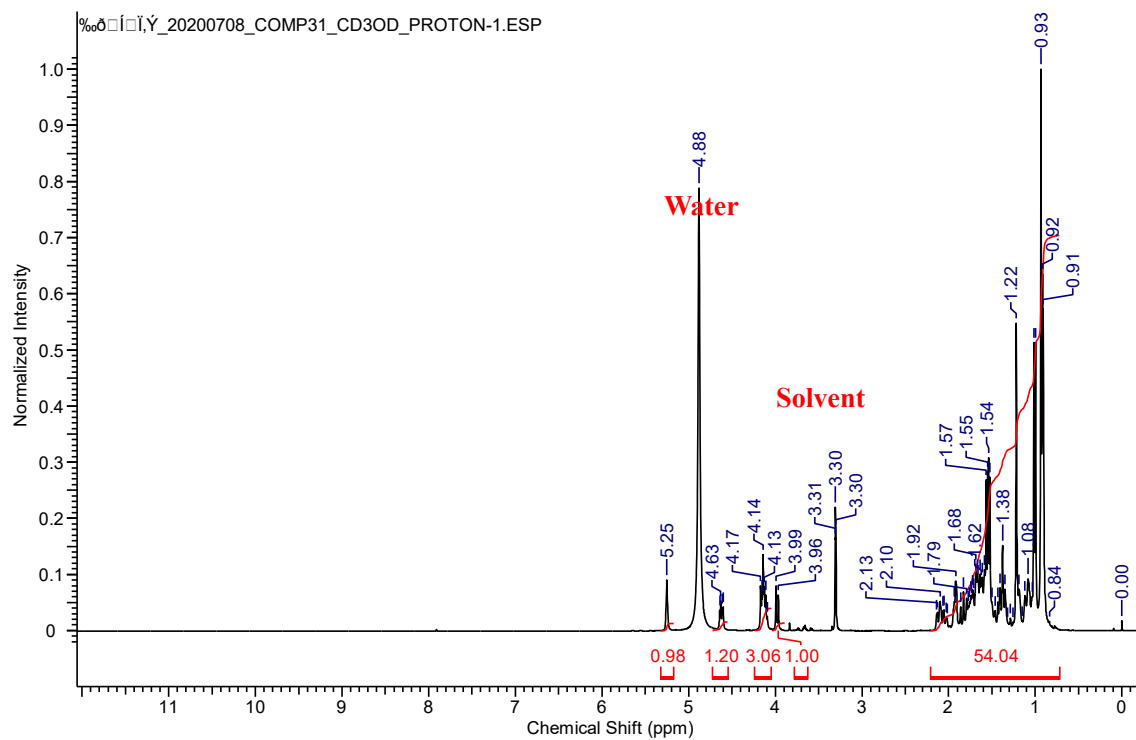
¹³C-NMR (Methanol-d₄, 21°C) of compound **20**



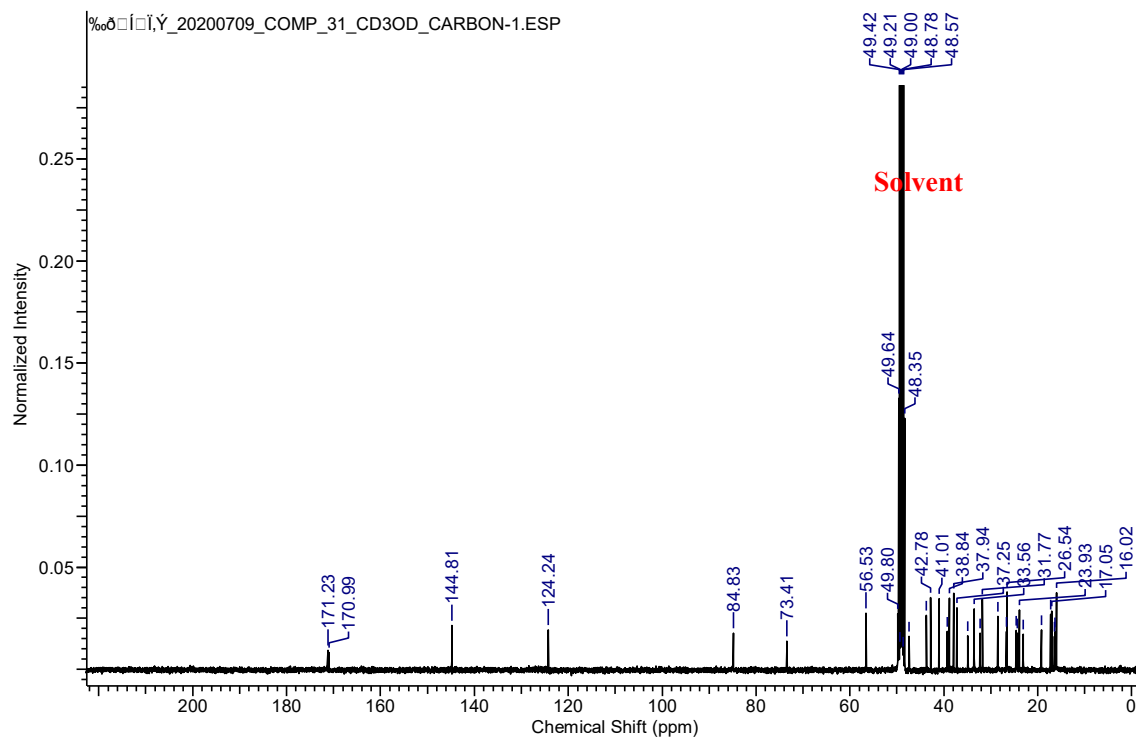
HRMS (ESI-MS) of compound **20**



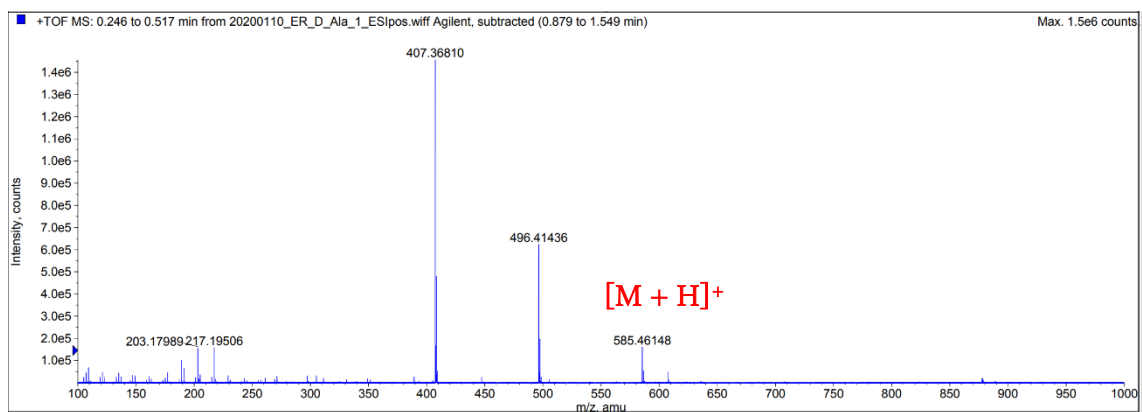
¹H-NMR (Methanol-d₄, 21°C) of compound **21**



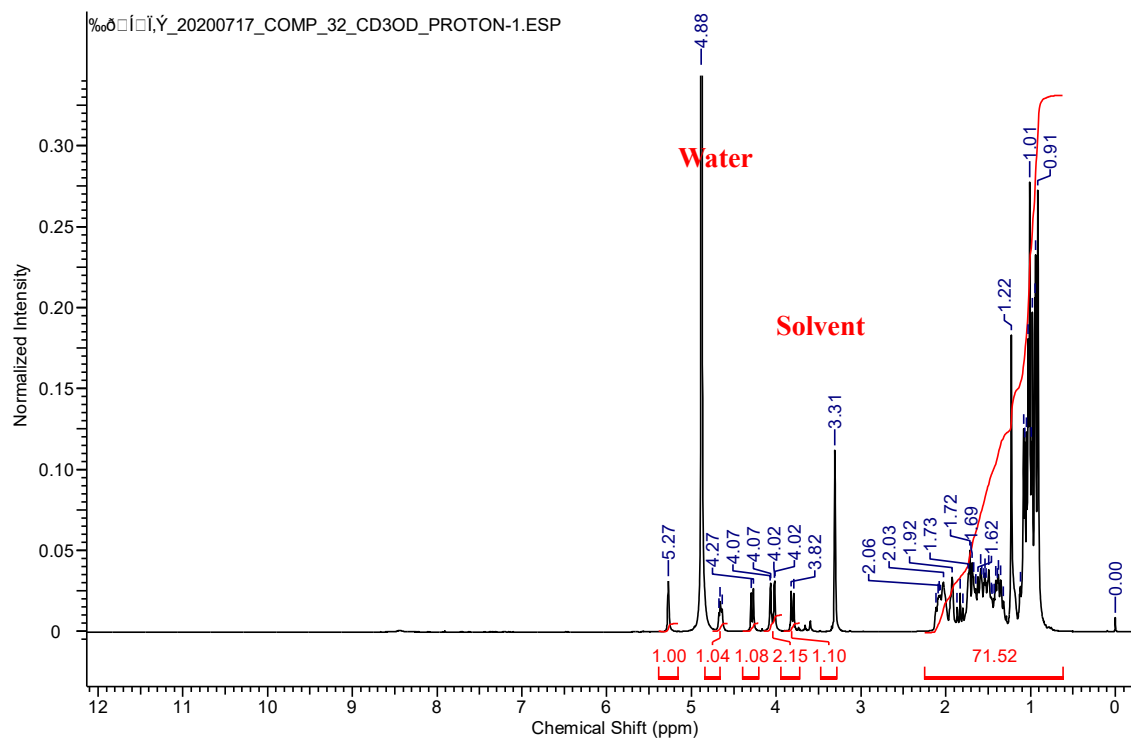
¹³C-NMR (Methanol-d₄, 21°C) of compound **21**



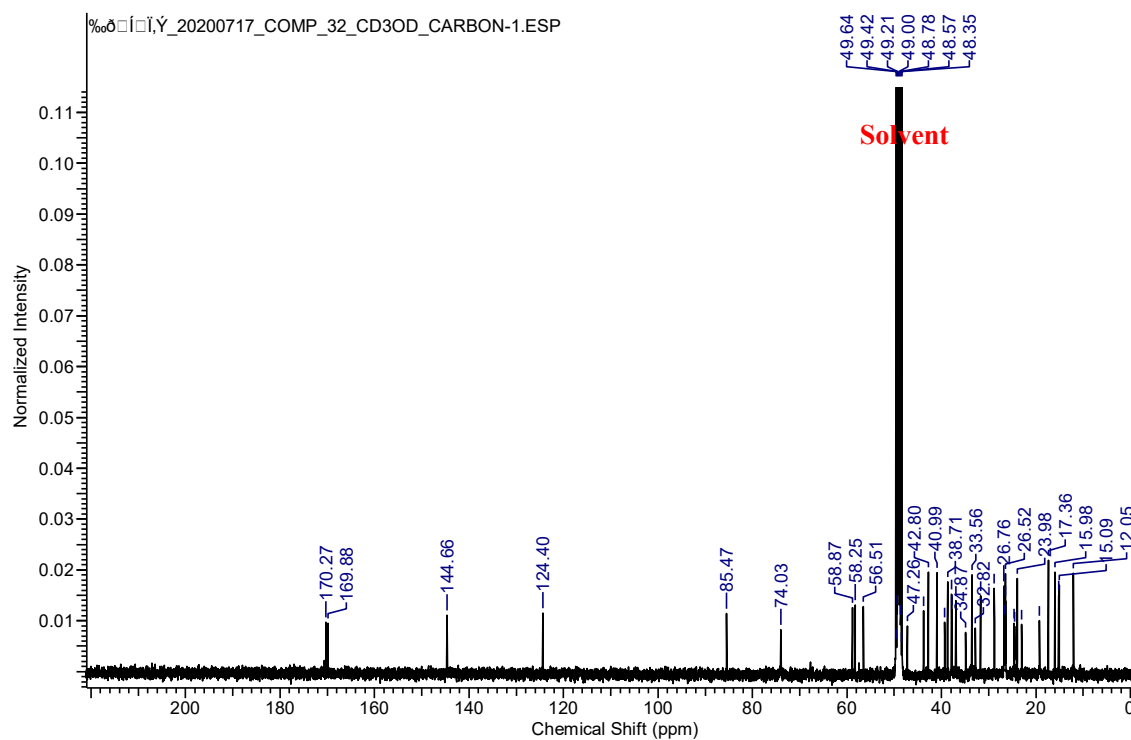
HRMS (ESI-MS) of compound **21**



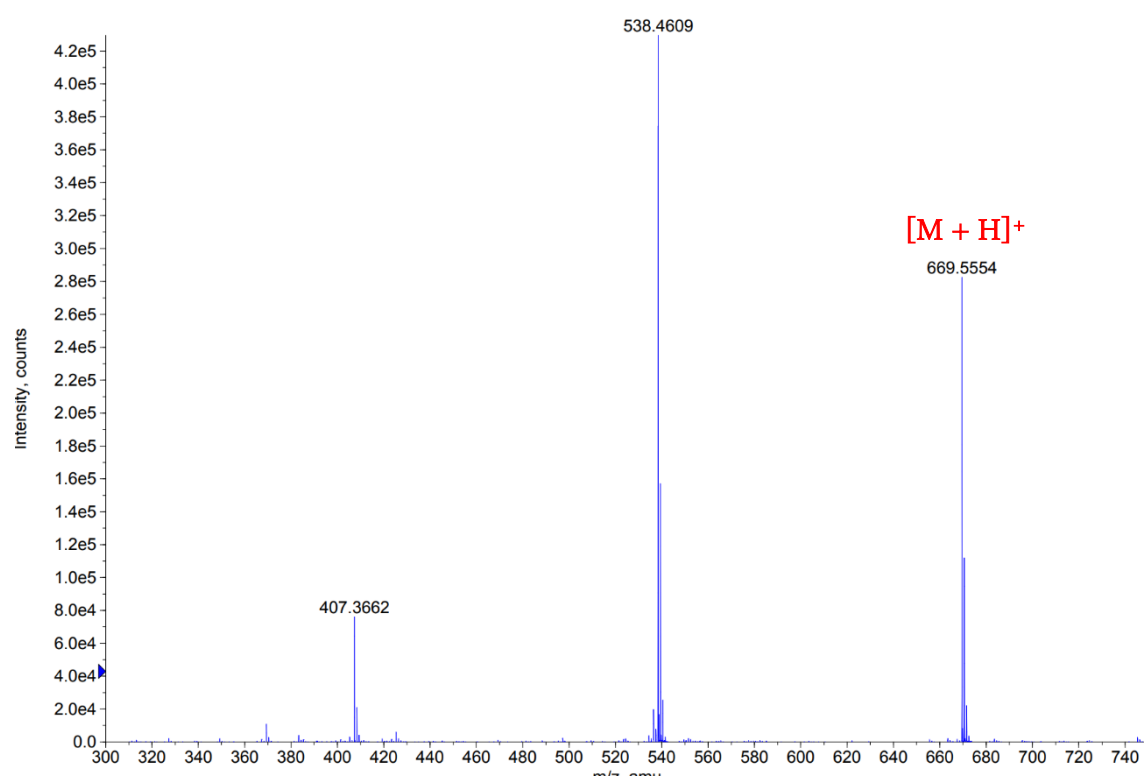
^1H -NMR (Methanol- d_4 , 21°C) of compound **22**



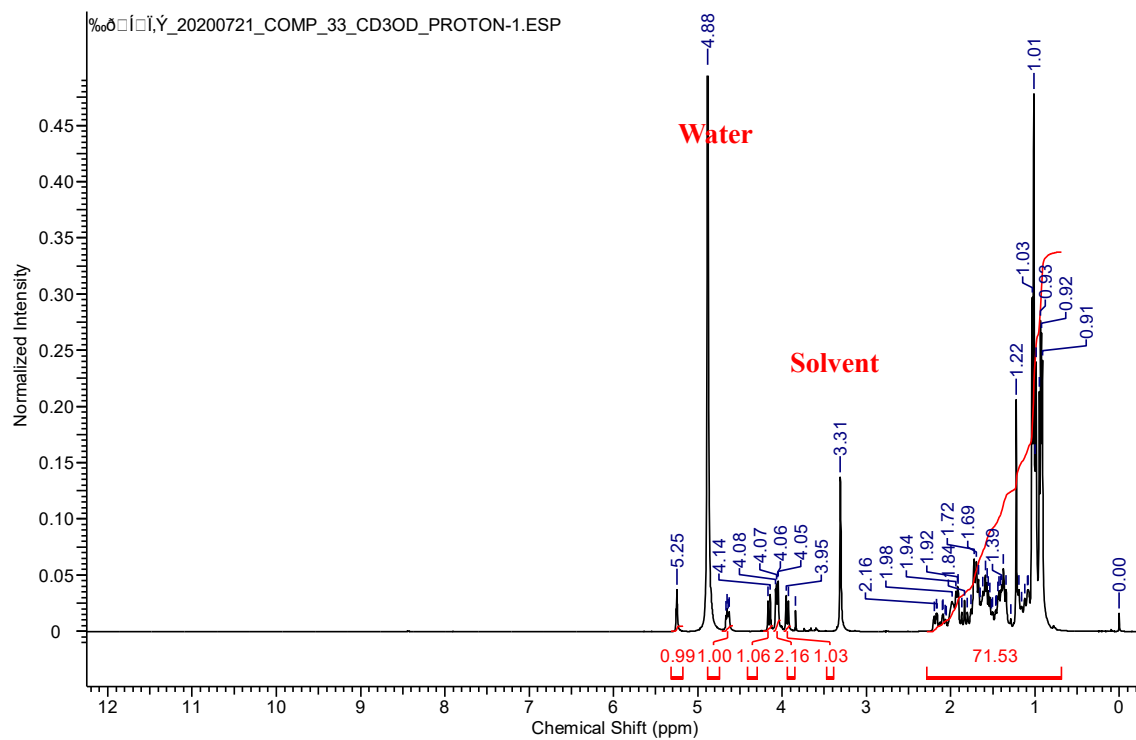
^{13}C -NMR (Methanol- d_4 , 21°C) of compound **22**



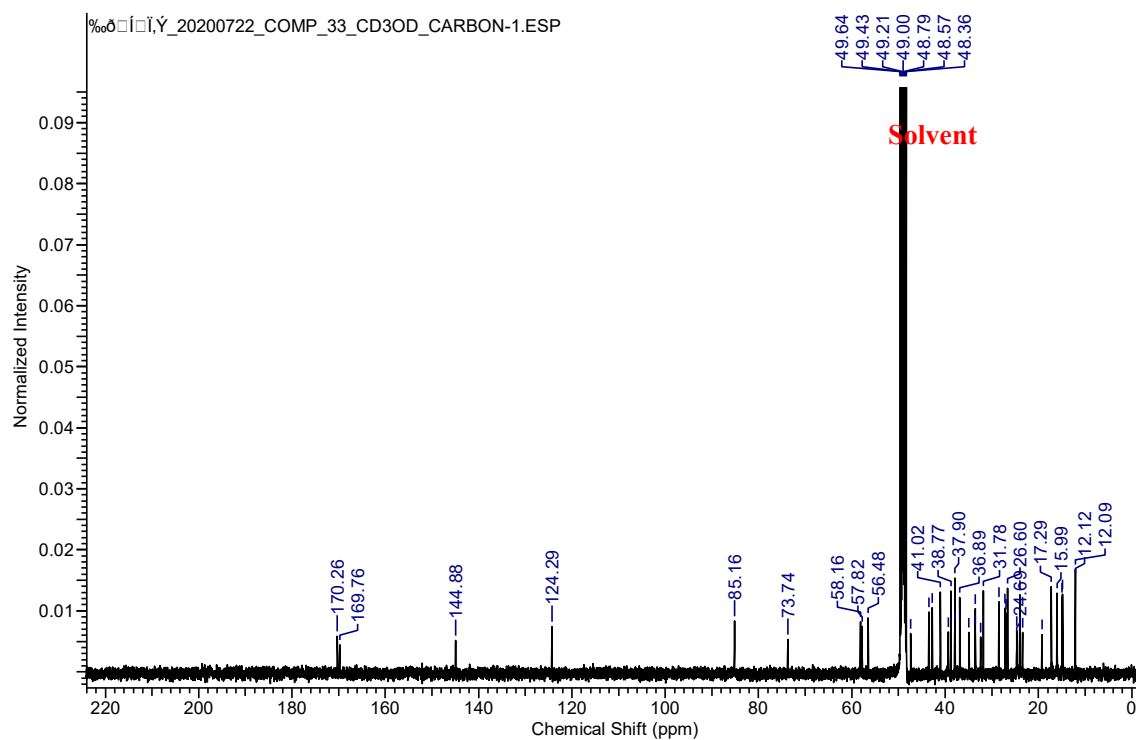
HRMS (ESI-MS) of compound **22**



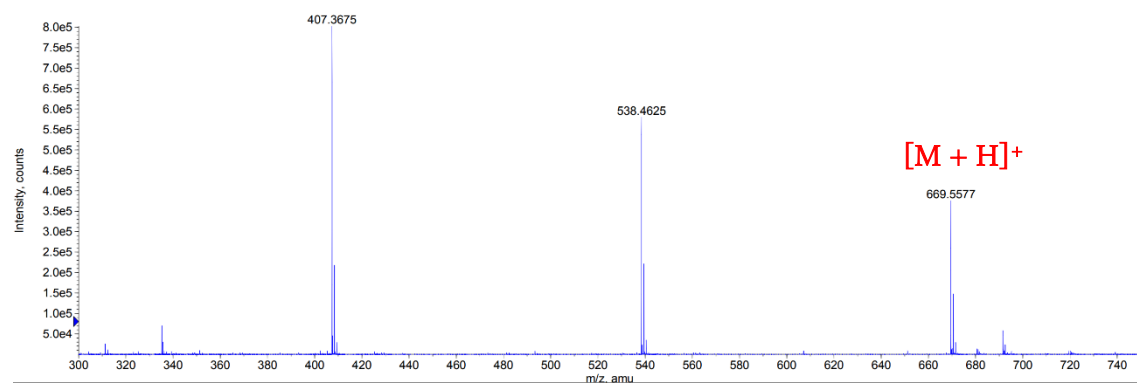
¹H-NMR (Methanol-d₄, 21°C) of compound **23**



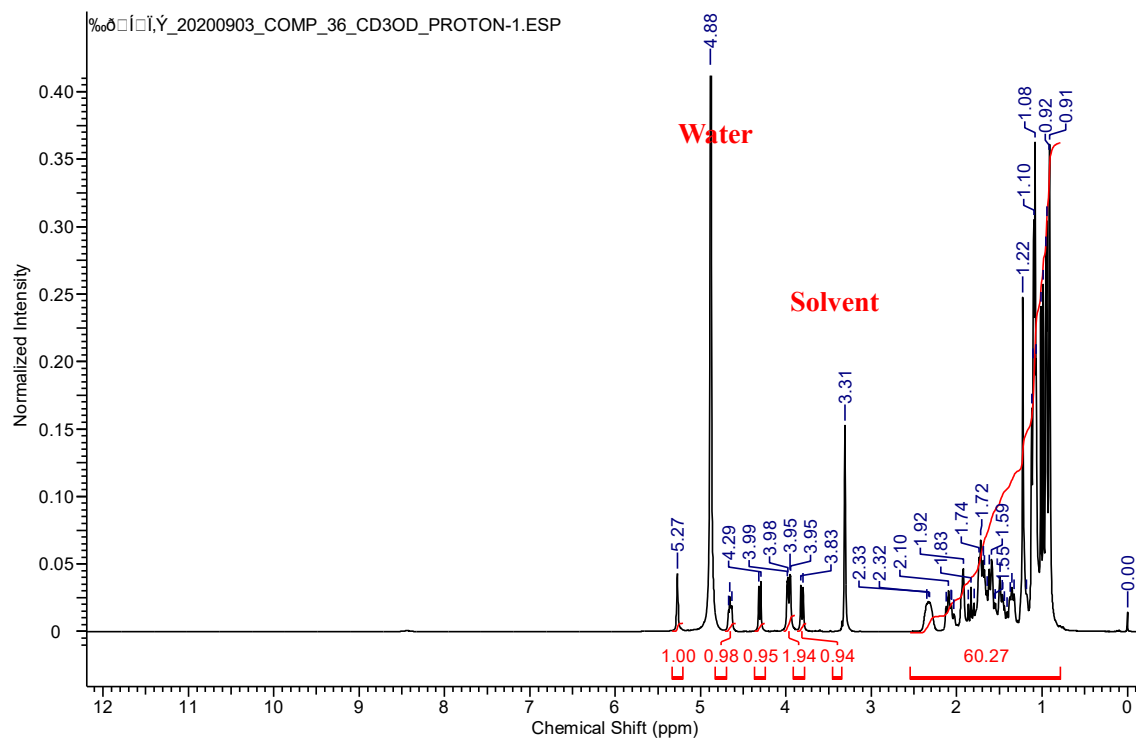
¹³C-NMR (Methanol-d₄, 21°C) of compound **23**



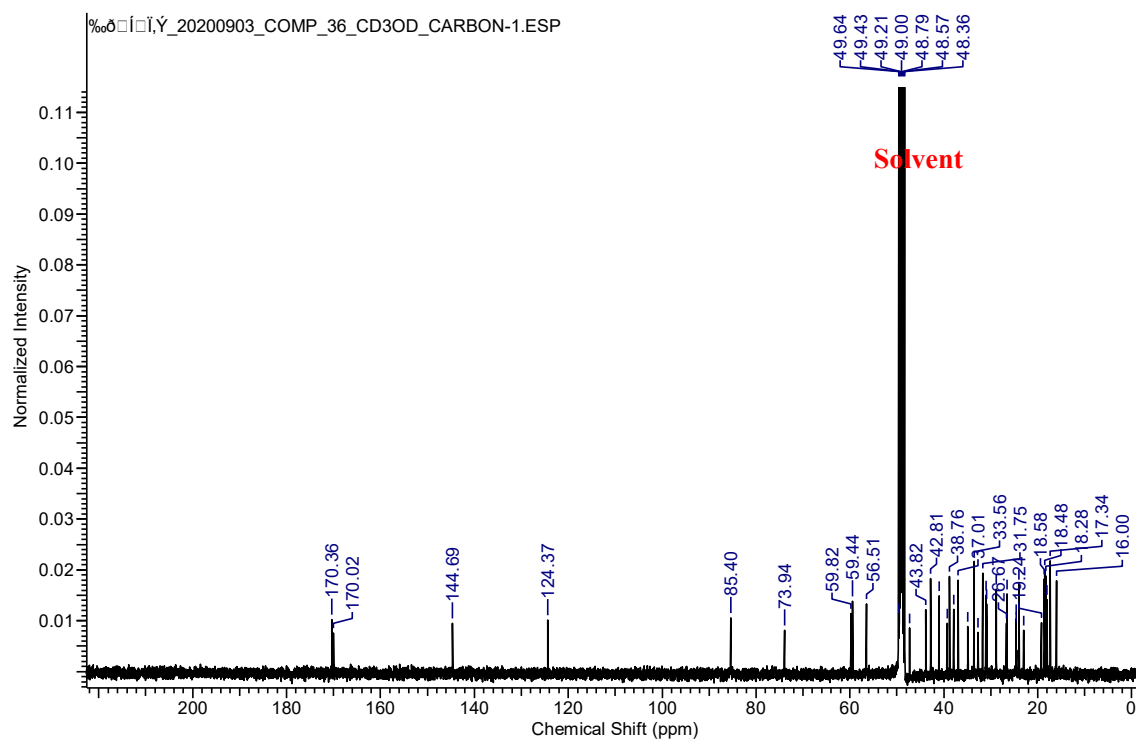
HRMS (ESI-MS) of compound **23**



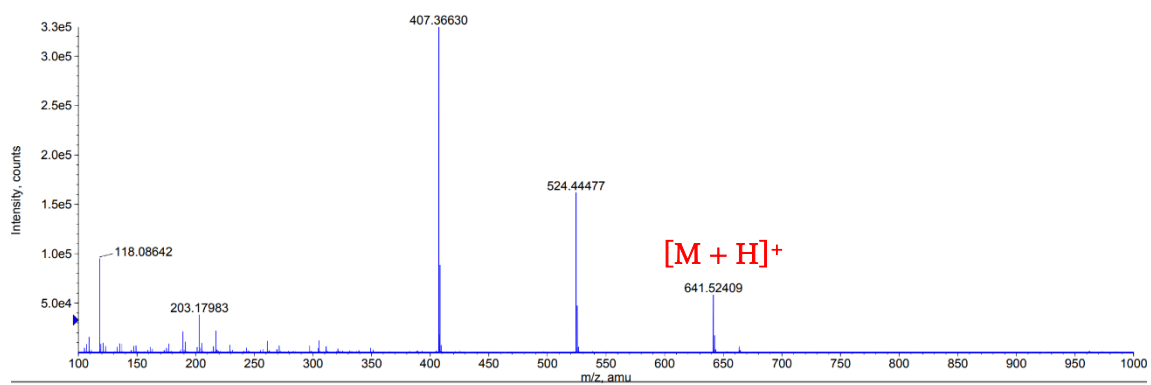
¹H-NMR (Methanol-d₄, 21°C) of compound **24**



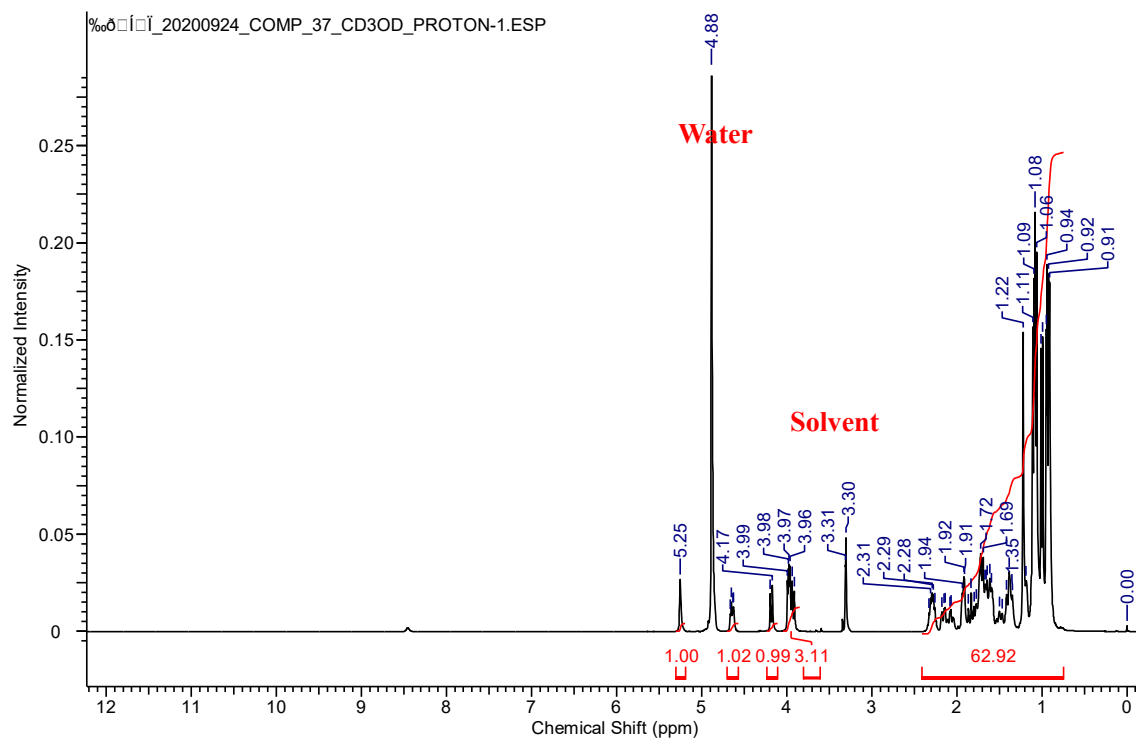
¹³C-NMR (Methanol-d₄, 21°C) of compound **24**



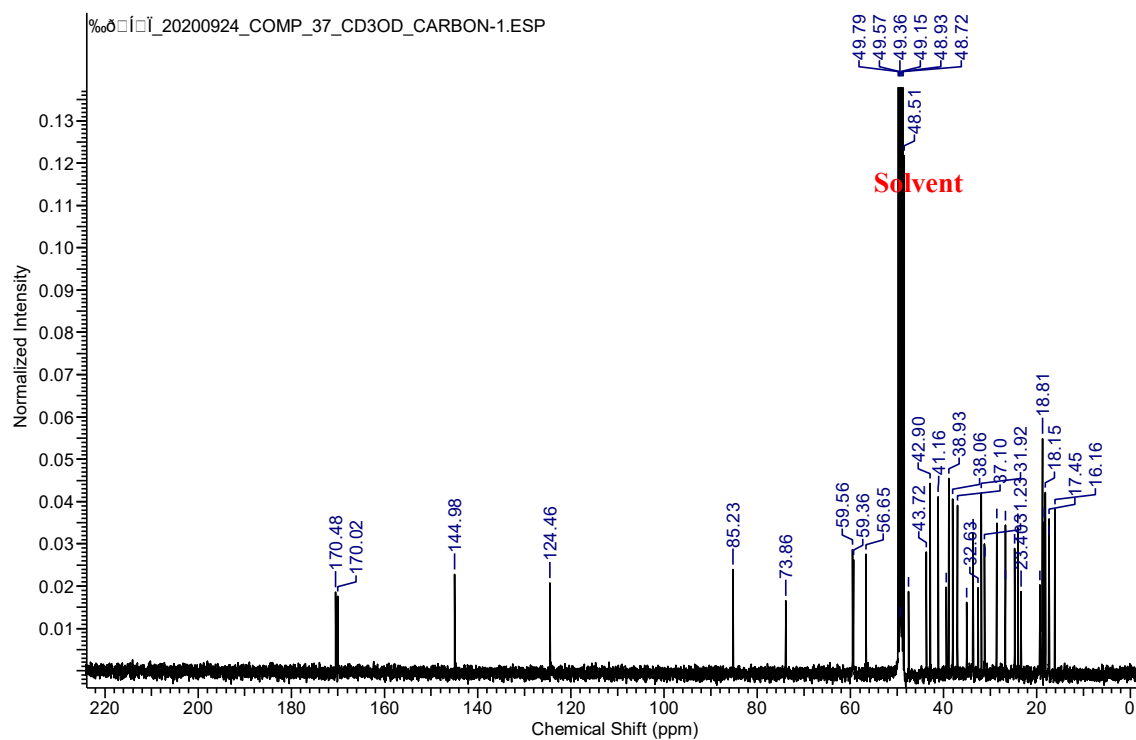
HRMS (ESI-MS) of compound **24**



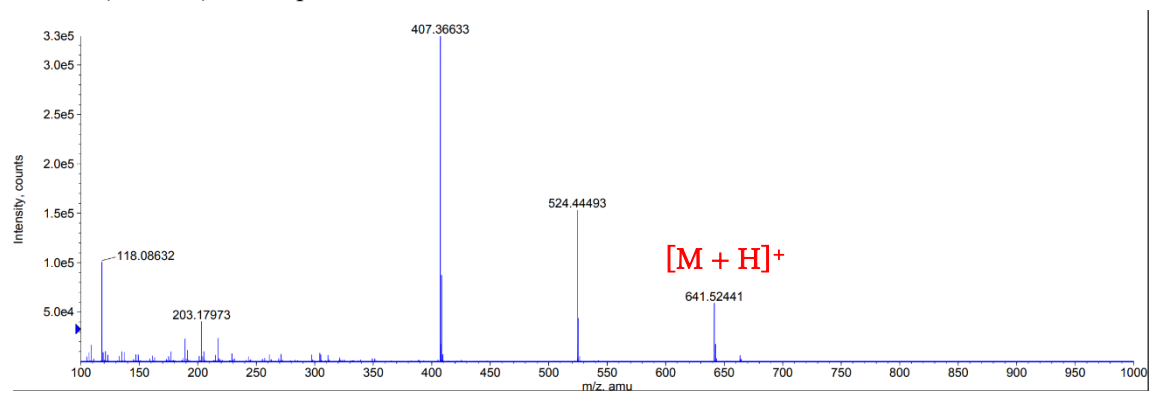
^1H -NMR (Methanol- d_4 , 21°C) of compound **25**



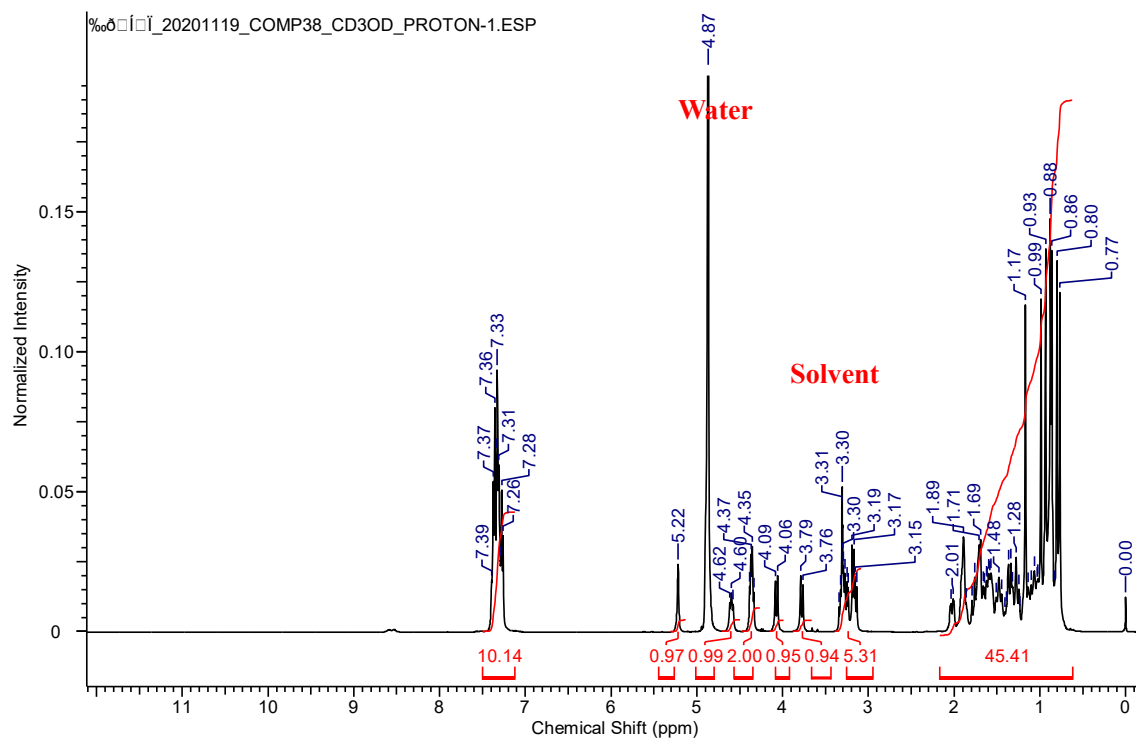
^{13}C -NMR (Methanol- d_4 , 21°C) of compound **25**



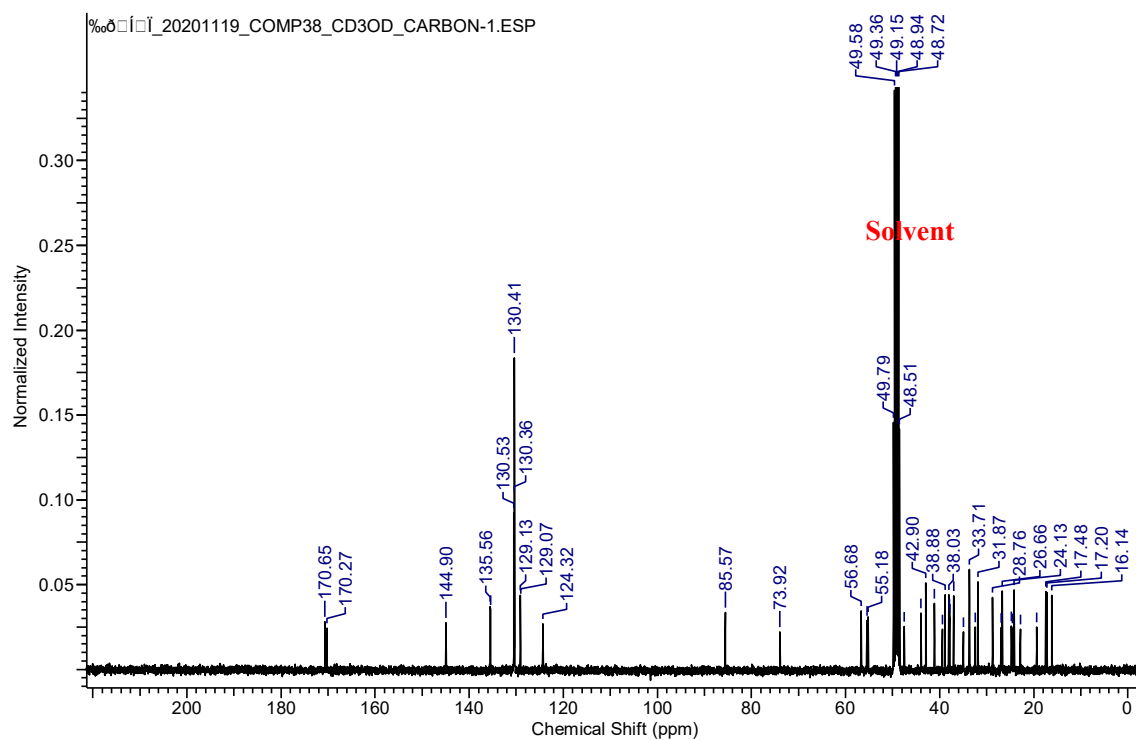
HRMS (ESI-MS) of compound **25**



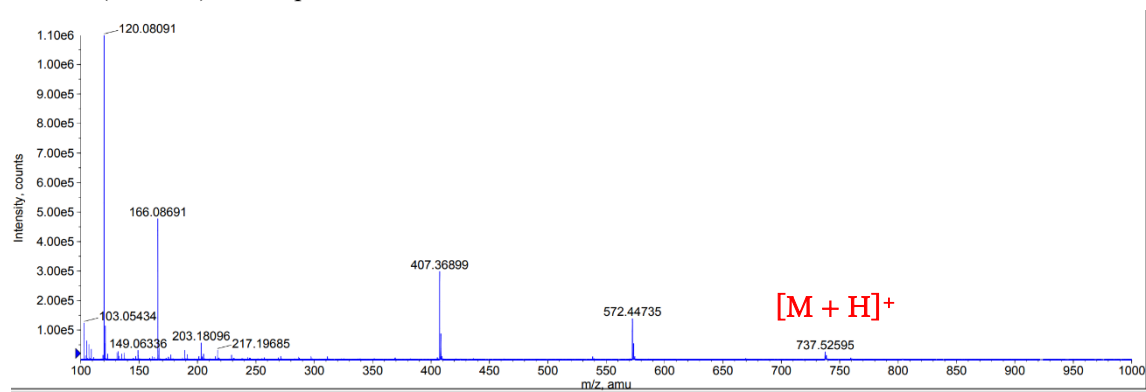
¹H-NMR (Methanol-d₄, 22°C) of compound **26**



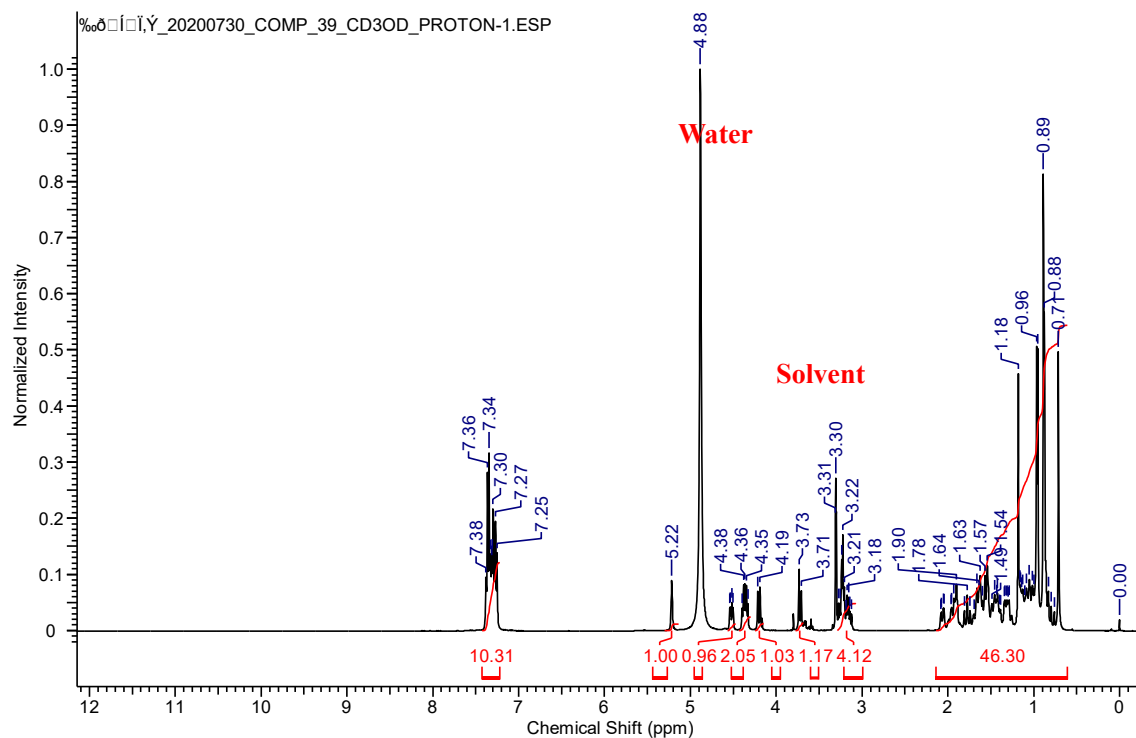
¹³C-NMR (Methanol-d₄, 22°C) of compound **26**



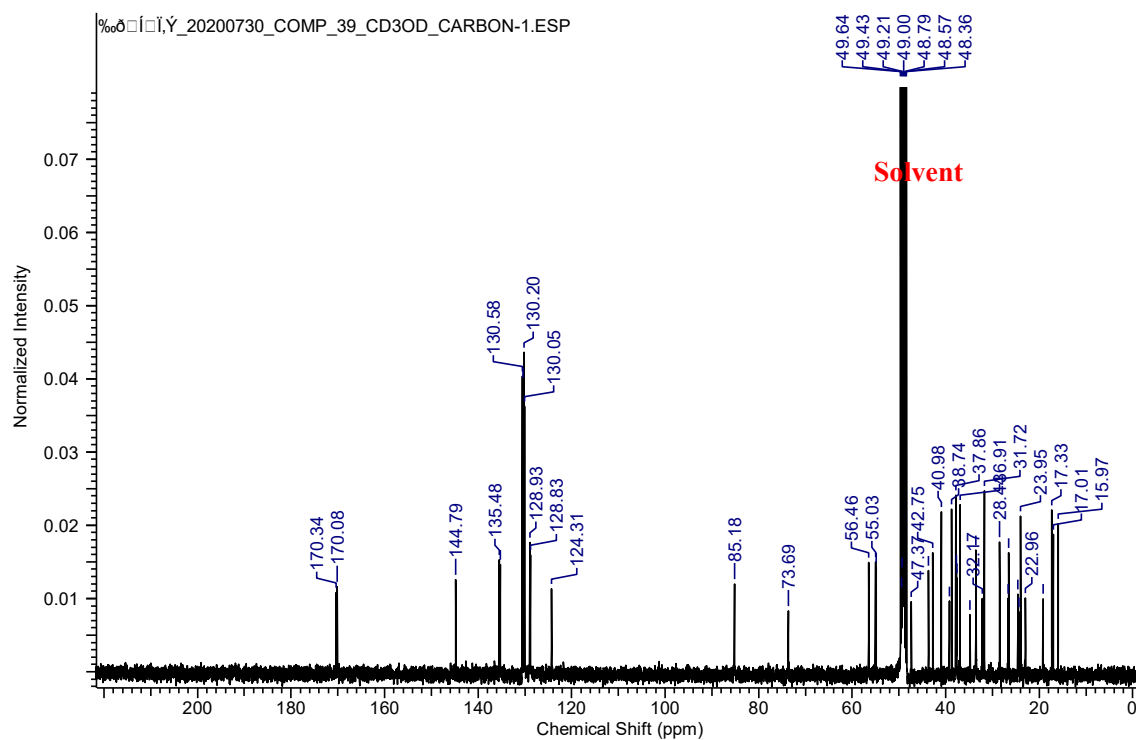
HRMS (ESI-MS) of compound 26



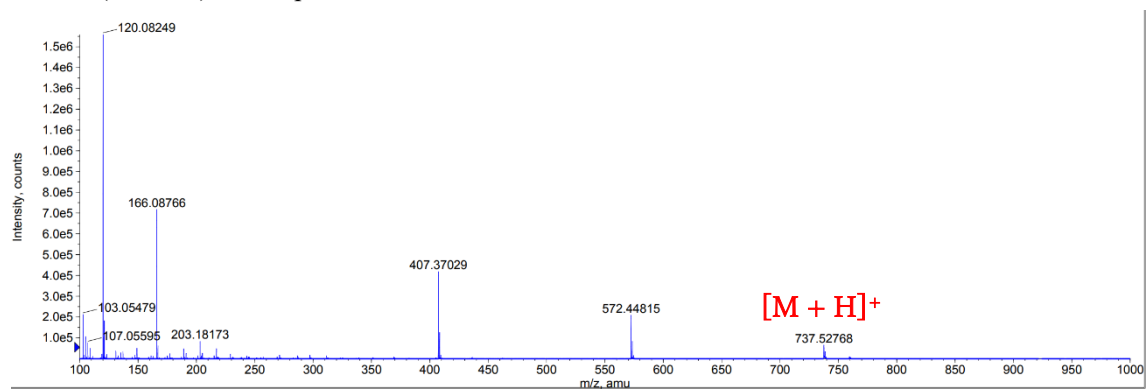
¹H-NMR (Methanol-d₄, 21°C) of compound **27**



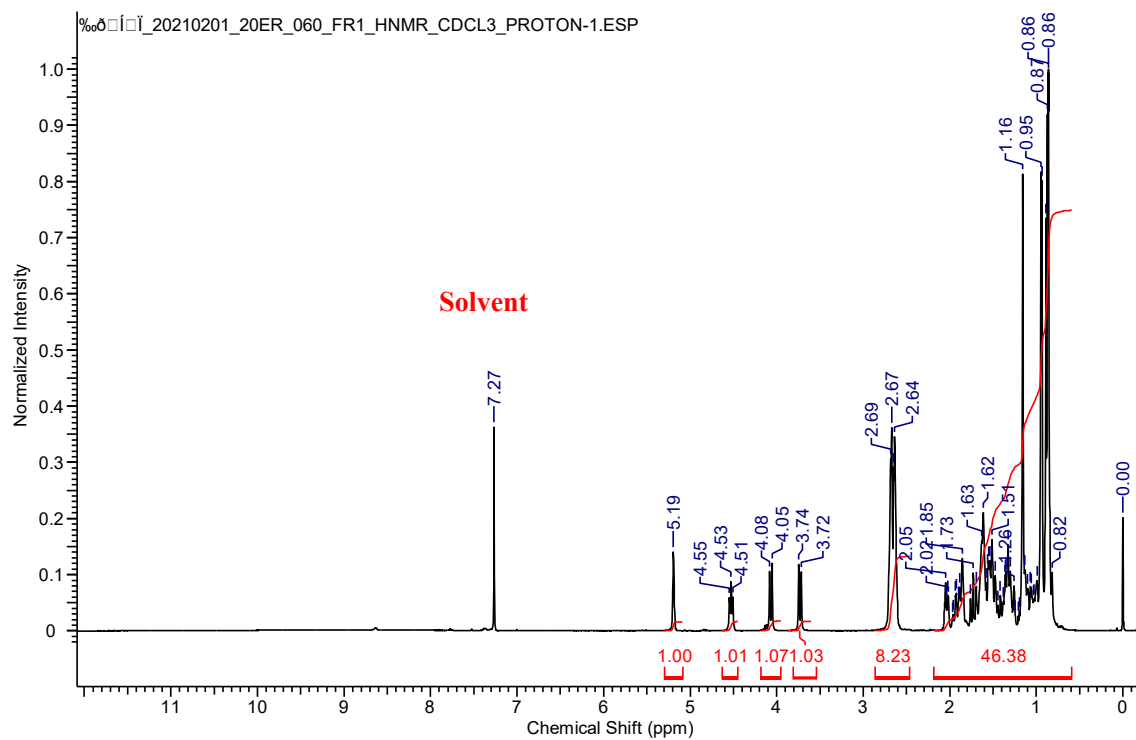
¹³C-NMR (Methanol-d₄, 21°C) of compound **27**



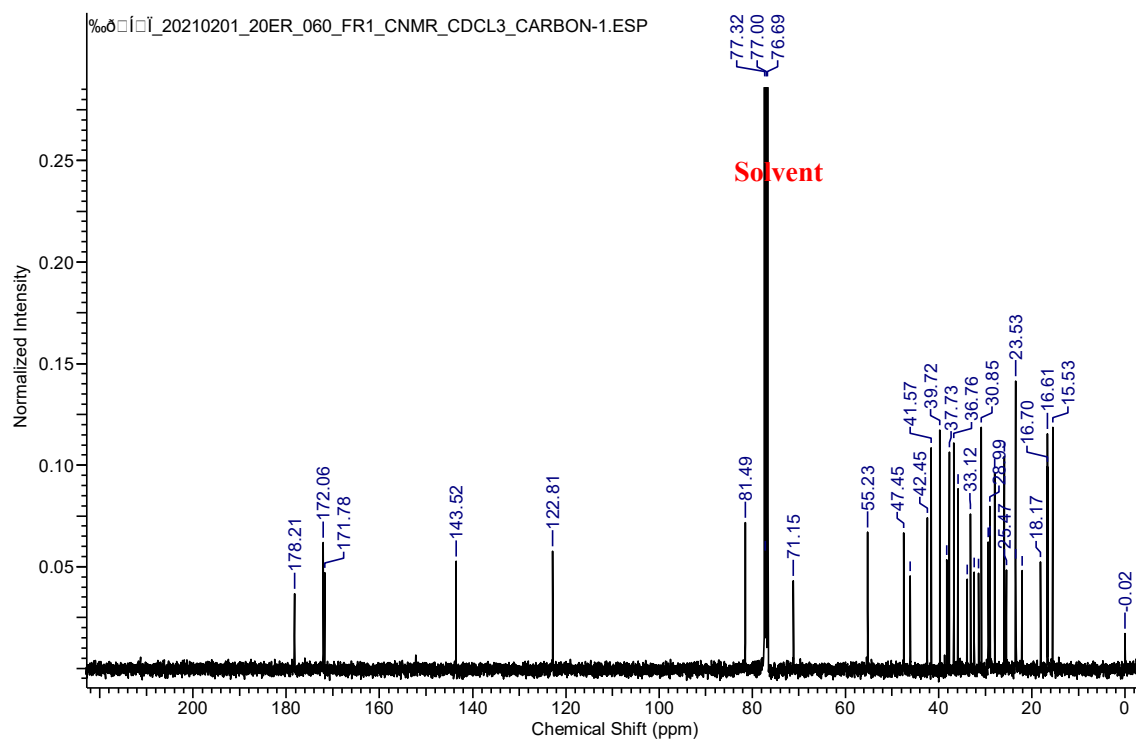
HRMS (ESI-MS) of compound **27**



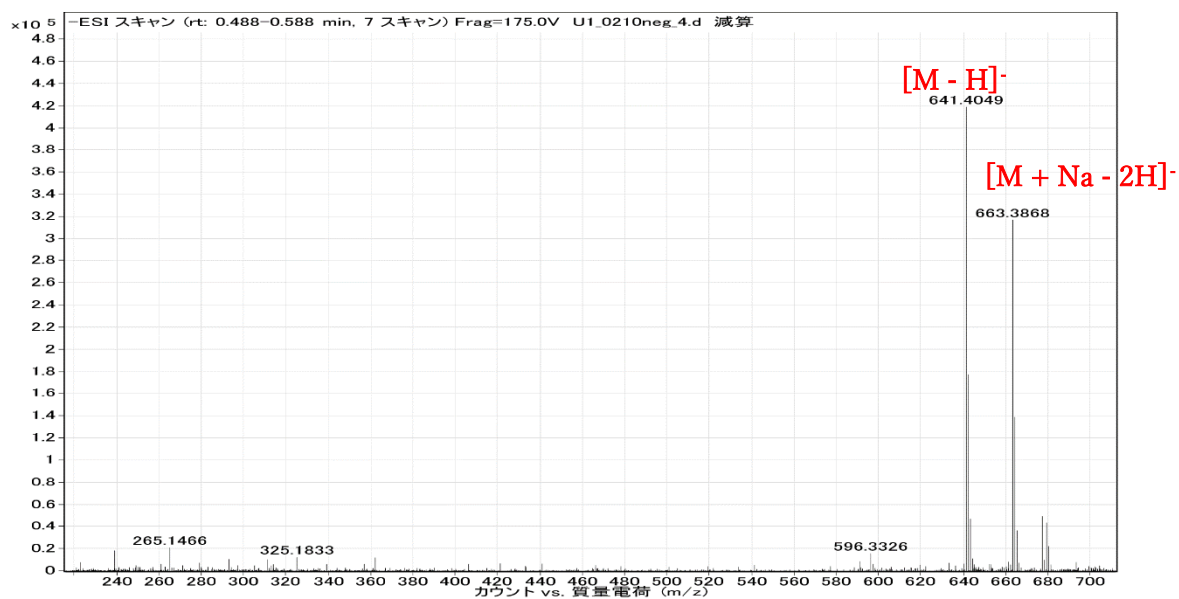
¹H-NMR (Chloroform-d, 21°C) of compound **28**



¹³C-NMR (Chloroform-d, 22°C) of compound **28**

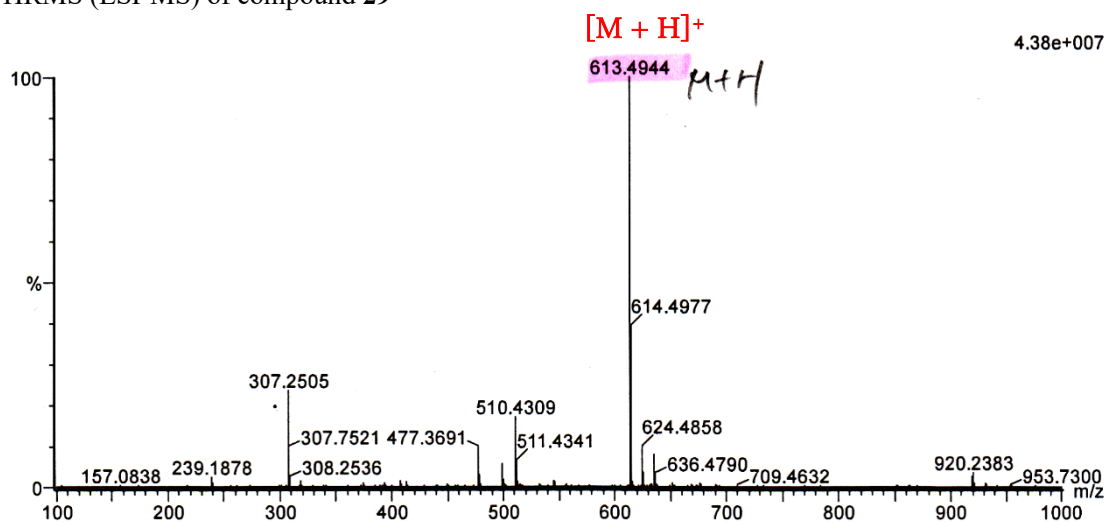


HRMS (ESI-MS) of compound **28**



¹³C NMR spectrum (400 MHz, CDCl₃) of compound 1. The x-axis represents the chemical shift in ppm, ranging from 0 to 200. The y-axis represents the normalized intensity, ranging from 0 to 0.55. The spectrum shows several peaks, with the solvent peak at 49.00 ppm labeled "Solvent" in red. Other peaks are labeled with their chemical shifts: 171.69, 171.46, 145.00, 124.13, 82.65, 71.87, 60.81, 60.53, 56.64, 49.64, 49.57, 48.57, 48.78, 49.21, 49.00, 48.81, 42.80, 41.02, 38.81, 37.11, 31.80, 26.61, 24.65, 23.98, 17.35, and 17.24.

HRMS (ESI-MS) of compound **29**



Apoptosis inducing effect by compound 8

