

Synthesis and in Vitro Anticancer Activity of Novel Dehydroabietic Acid-Based Acylhydrazones

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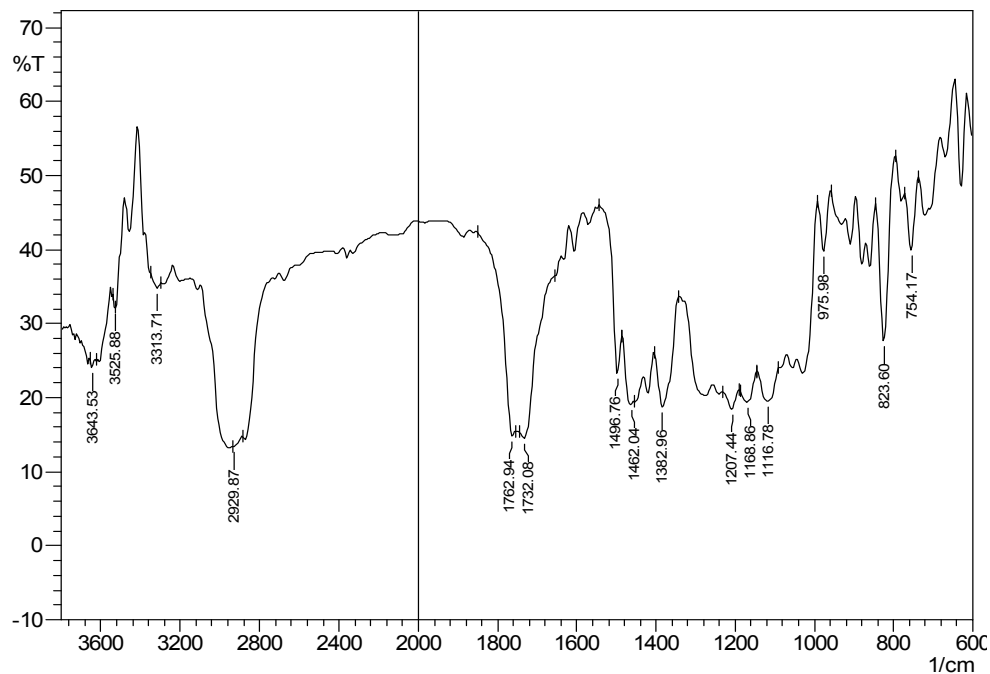


Figure S1. FTIR spectrum of dehydroabietic acid-based ethyl acetate (2)

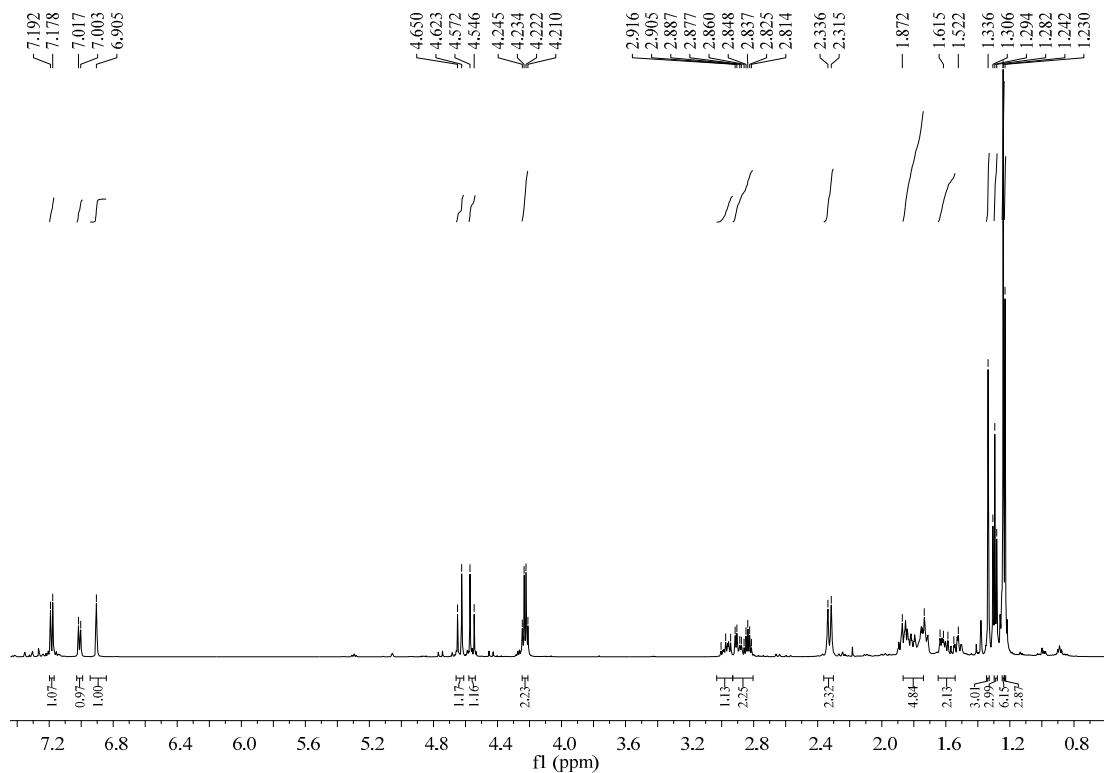


Figure S2. ¹H-NMR spectrum of dehydroabietic acid-based ethyl acetate (2) in CDCl₃

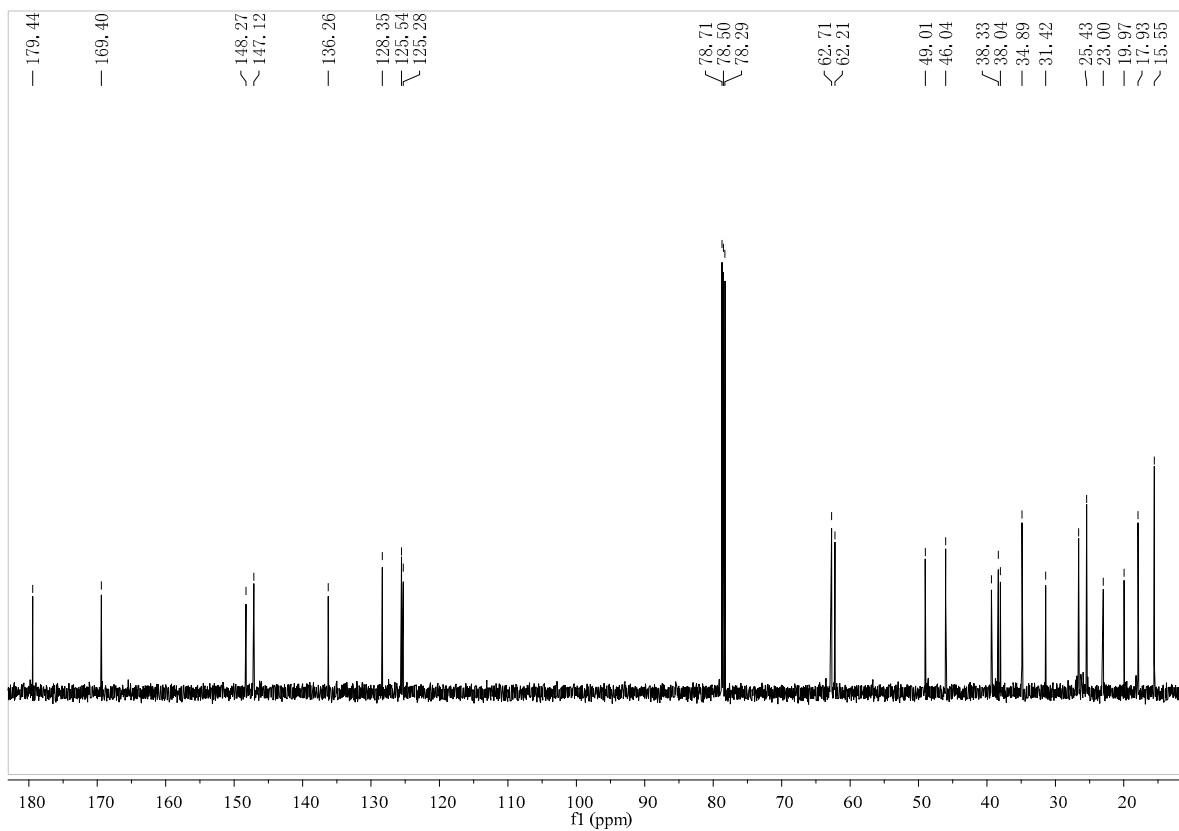


Figure S3. ^{13}C -NMR spectrum of dehydroabietic acid-based ethyl acetate (**2**) in CDCl_3

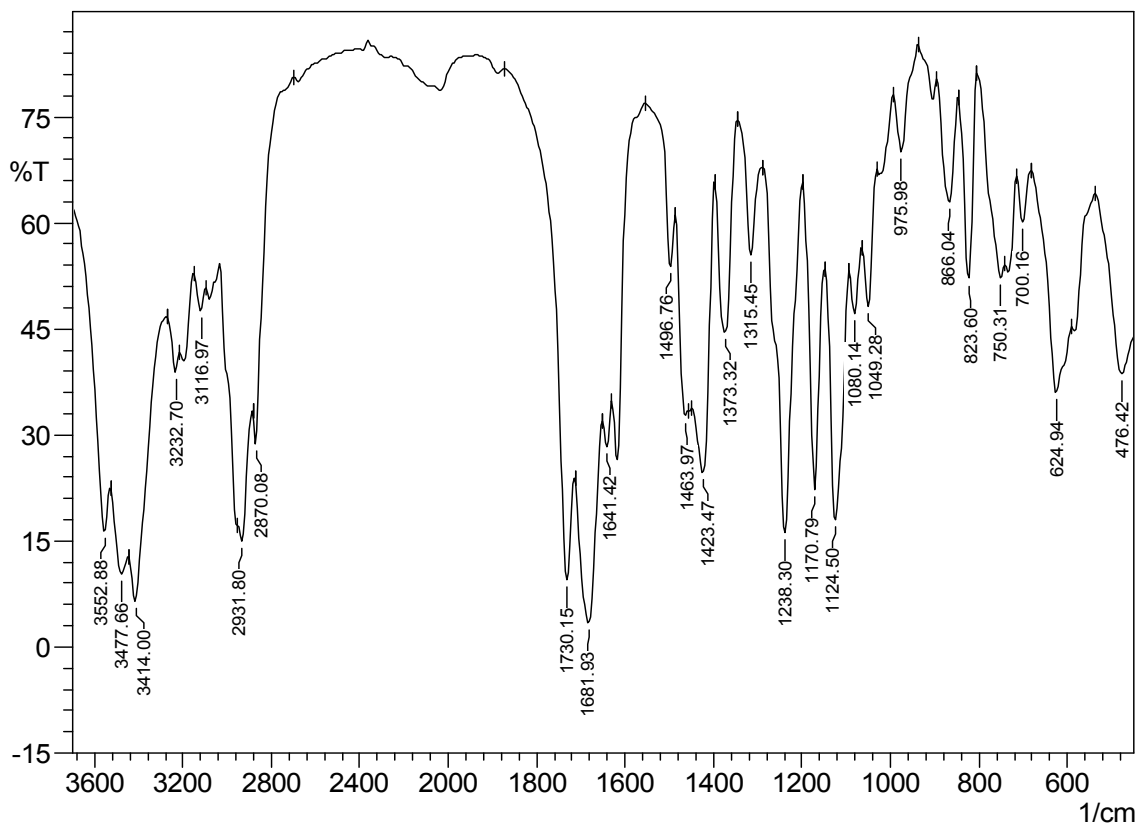


Figure S4. FTIR spectrum of dehydroabietic acid-based hydrazide (**3**)

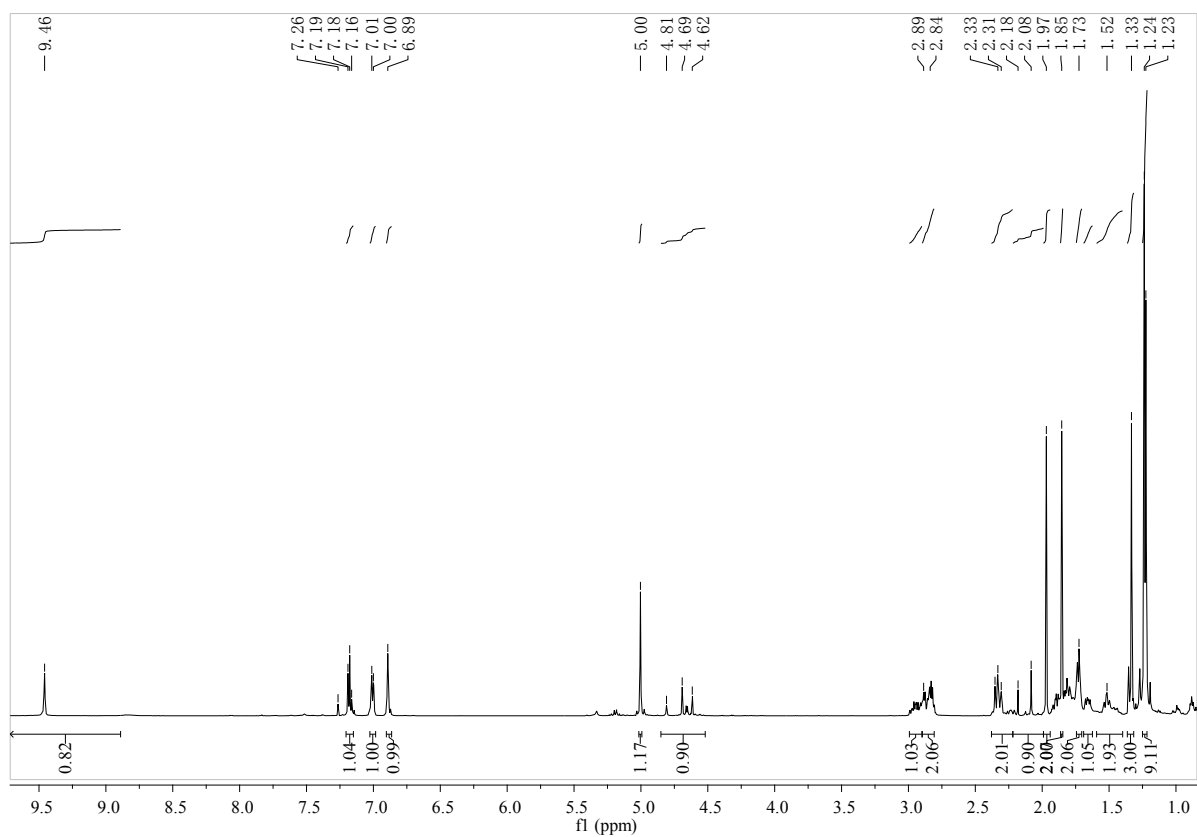


Figure S5. ^1H -NMR spectrum of dehydroabietic acid-based hydrazide (**3**) in CDCl_3

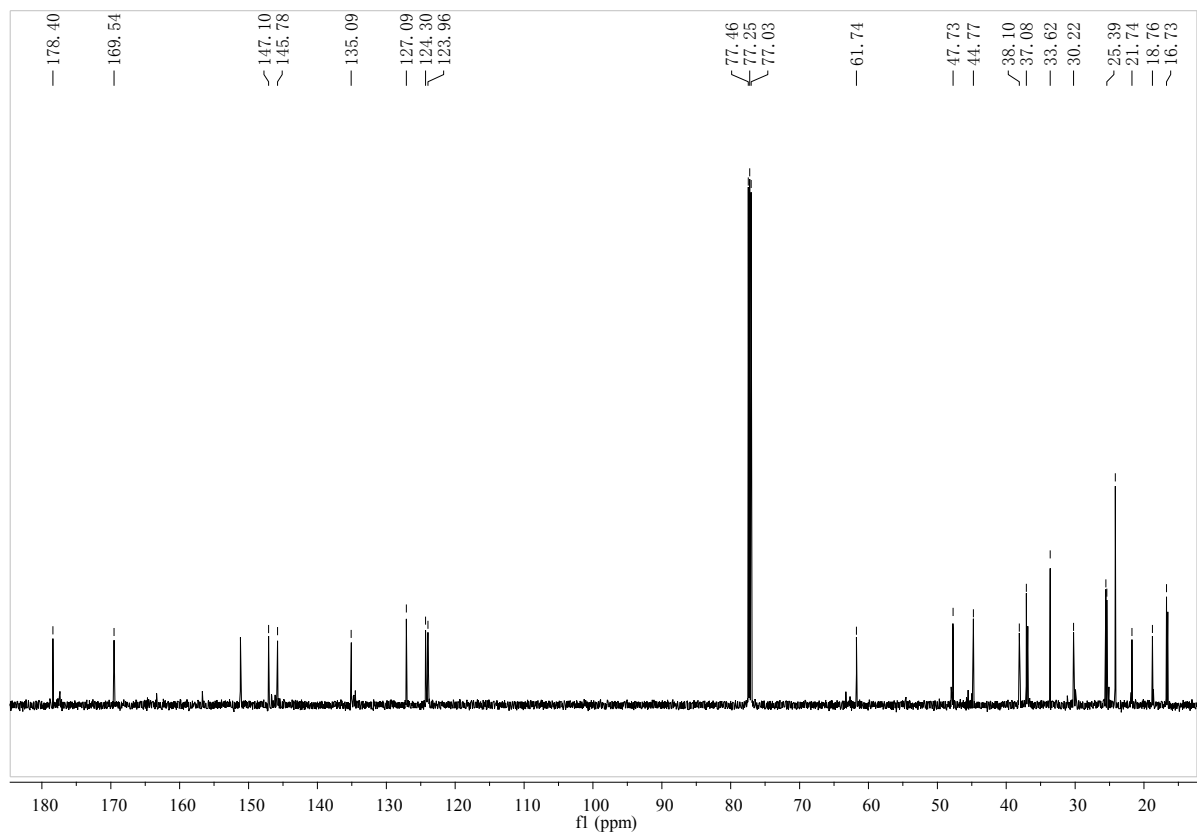


Figure S6. ^{13}C -NMR spectrum of dehydroabietic acid-based hydrazide (**3**) in CDCl_3

JN #44 RT: 0.39 AV: 1 SB: 37 0.01-0.25 , 0.87-0.94 NL: 2.08E6
T: -c ESI Q1MS [100.000-1000.000]

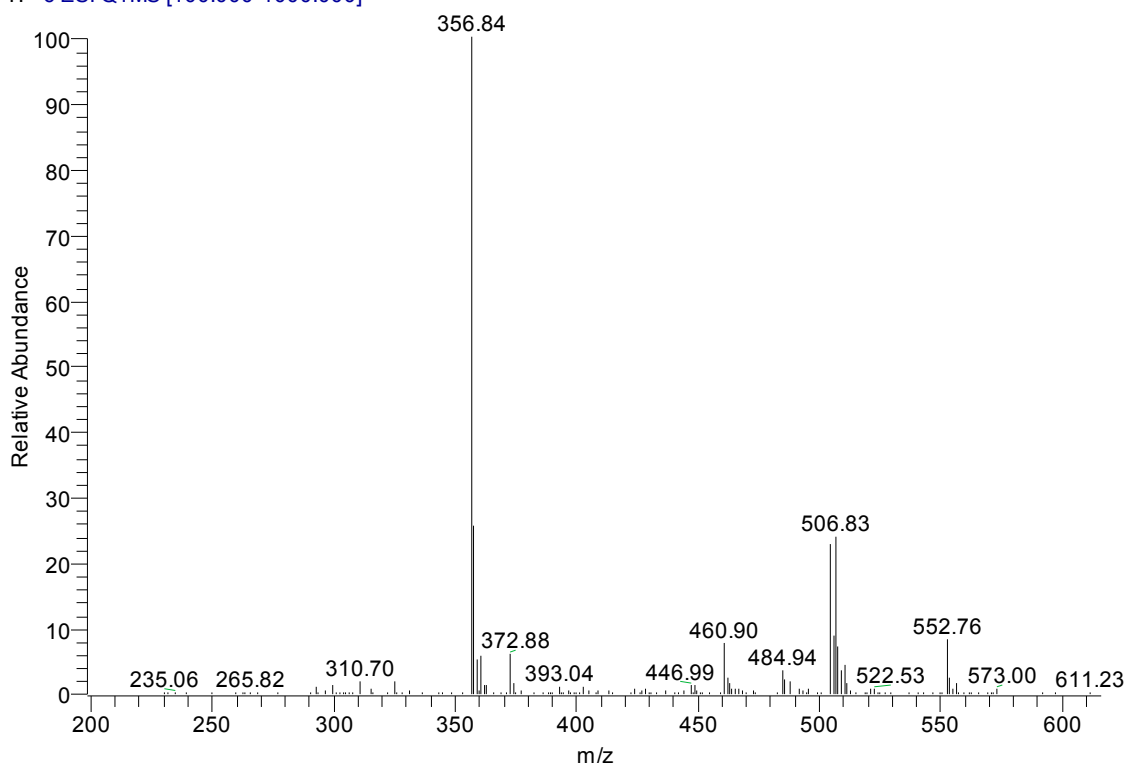


Figure S7. ESI-MS spectrum of dehydroabietic acid-based hydrazide (**3**)

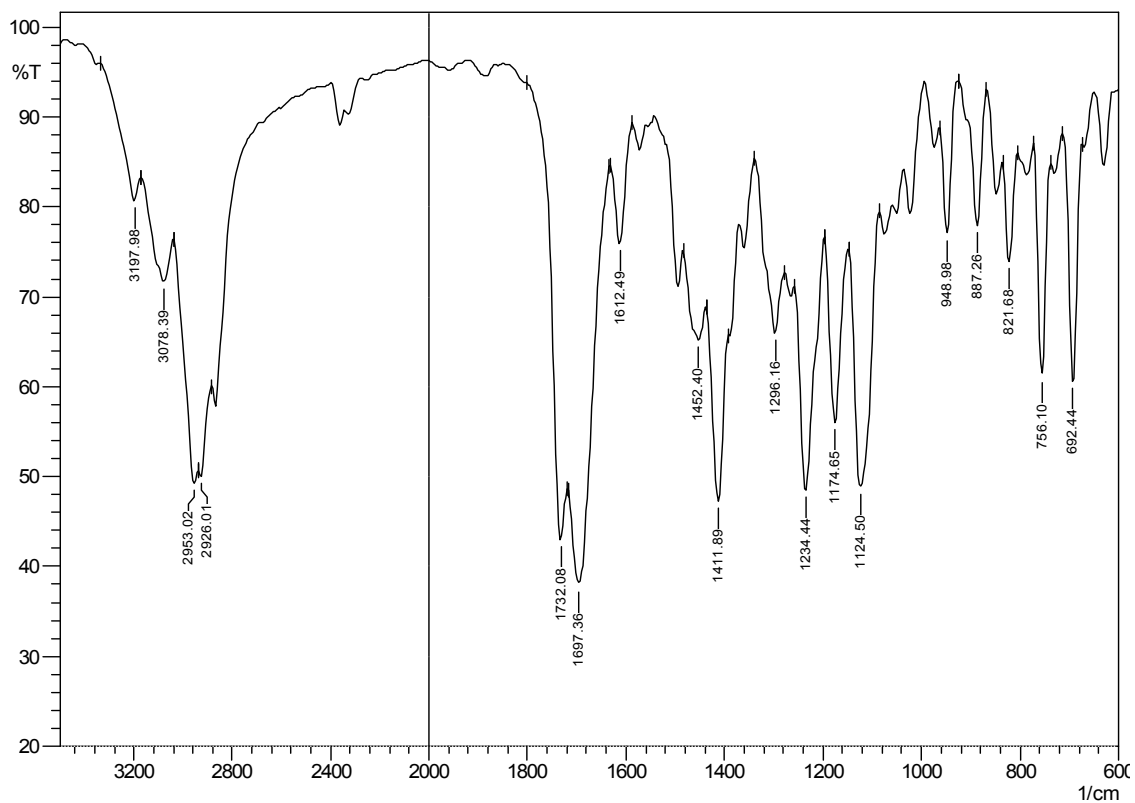


Figure S8. FTIR spectrum of the target compound (**4a**)

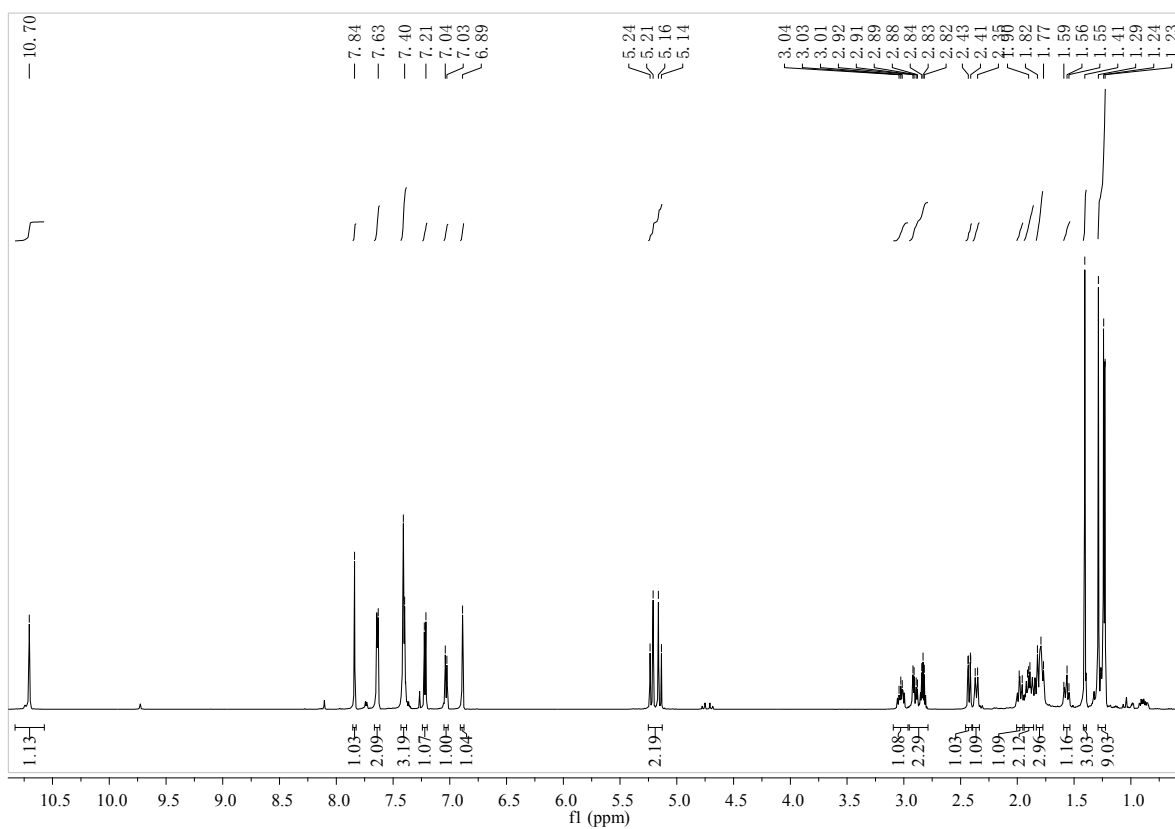


Figure S9. $^1\text{H-NMR}$ spectrum of the target compound (**4a**) in CDCl_3

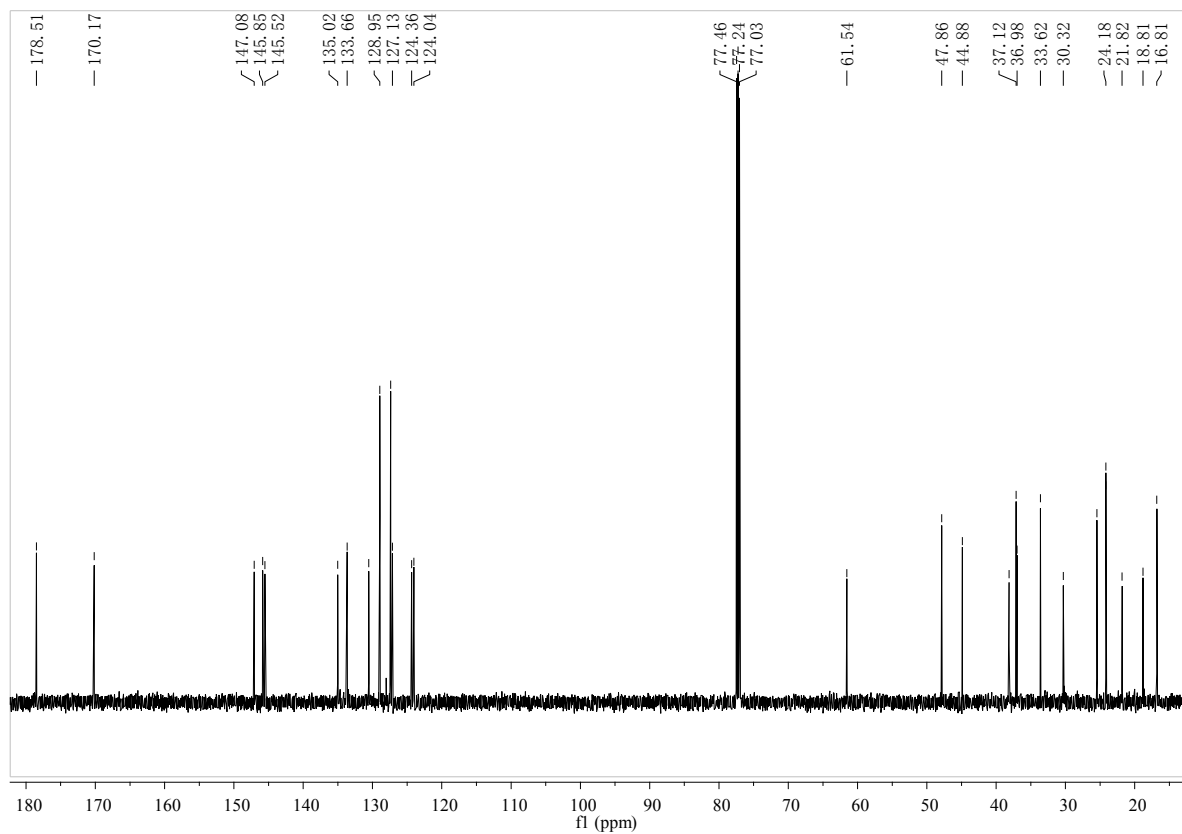


Figure S10. $^{13}\text{C-NMR}$ spectrum of the target compound (**4a**) in CDCl_3

JN-BJQ #102 RT: 0.90 AV: 1 NL: 6.10E6
T: -c ESI Q1MS [100.000-1000.000]

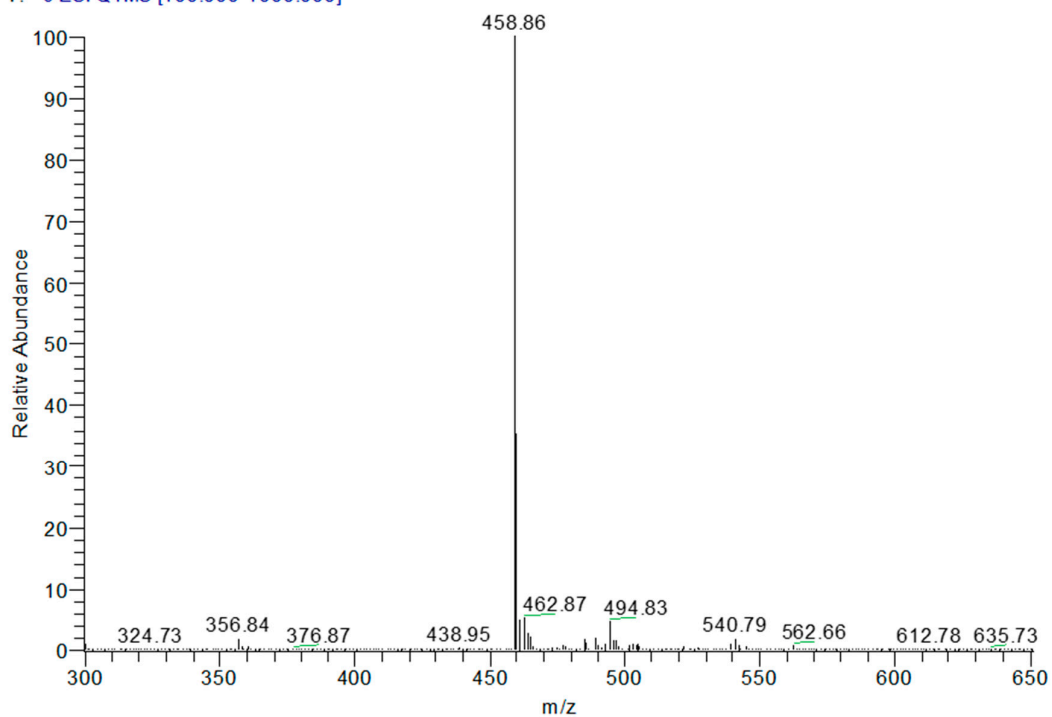


Figure S11. ESI-MS spectrum of the target compound (4a)

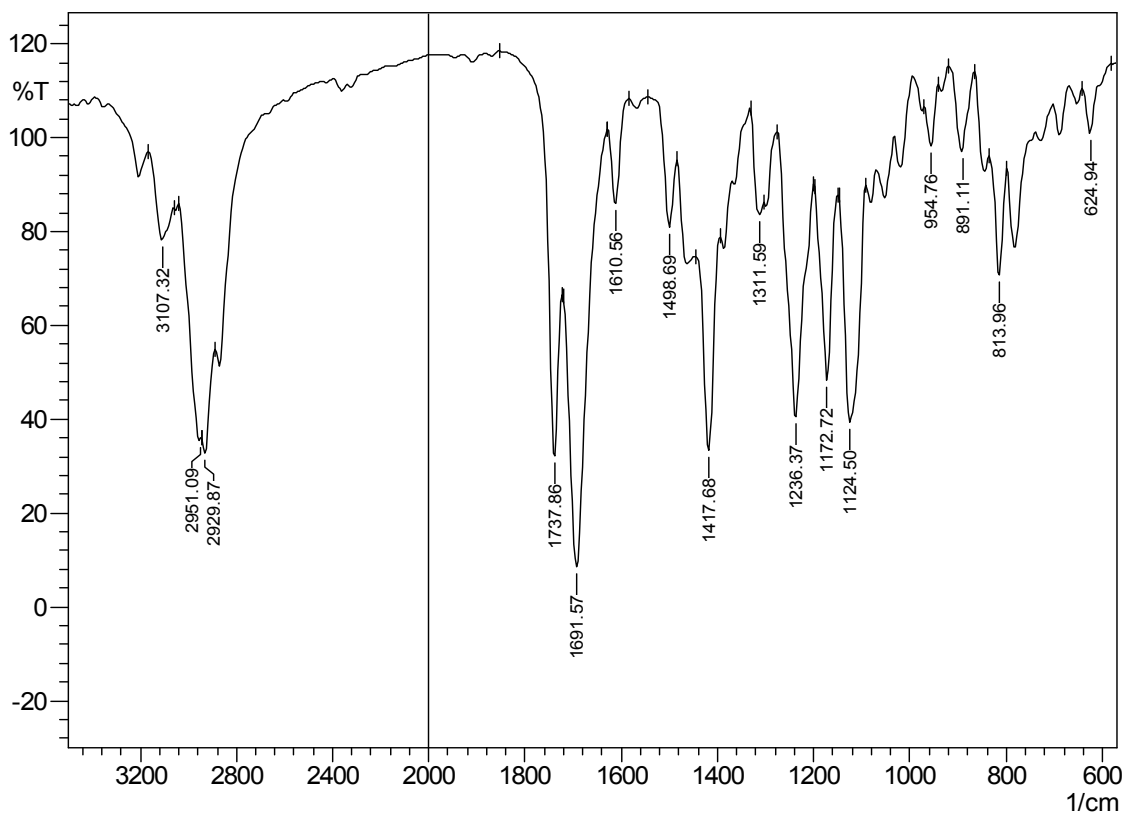


Figure S12. FTIR spectrum of the target compound (4b)

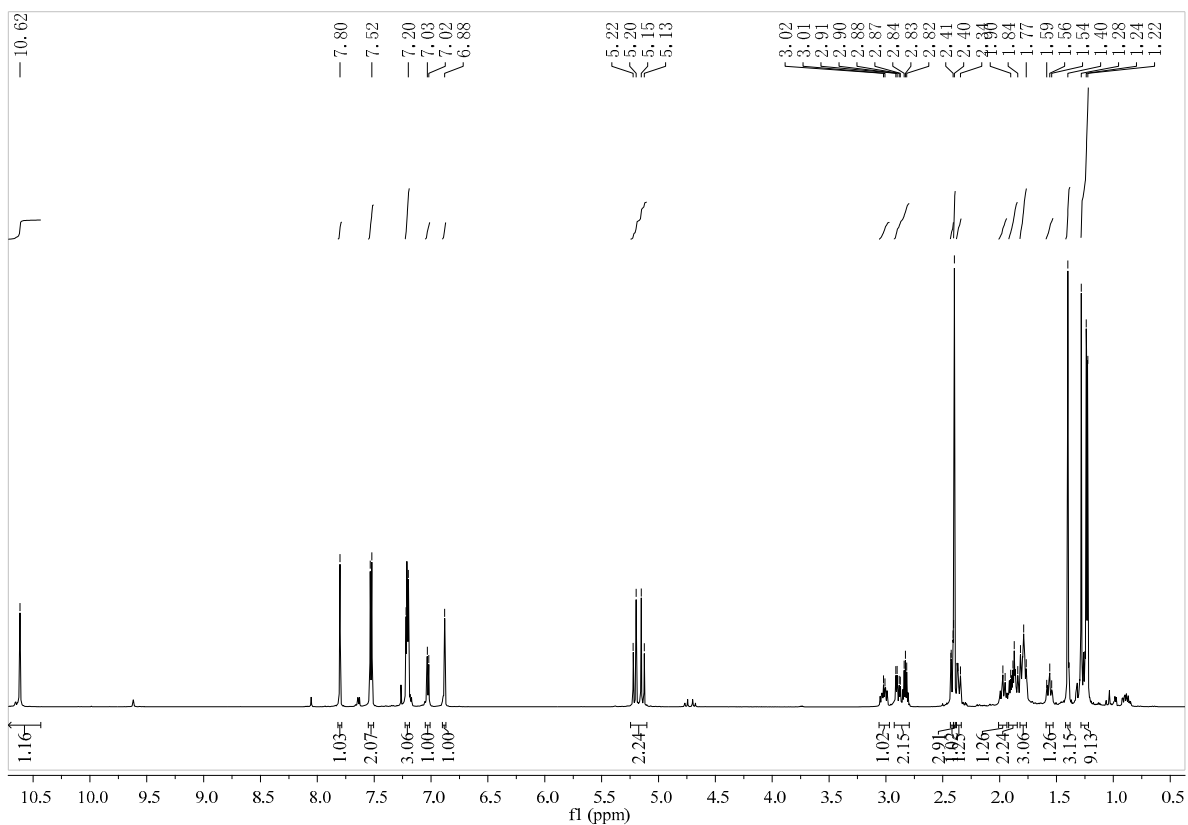


Figure S13. $^1\text{H-NMR}$ spectrum of the target compound (**4b**) in CDCl_3

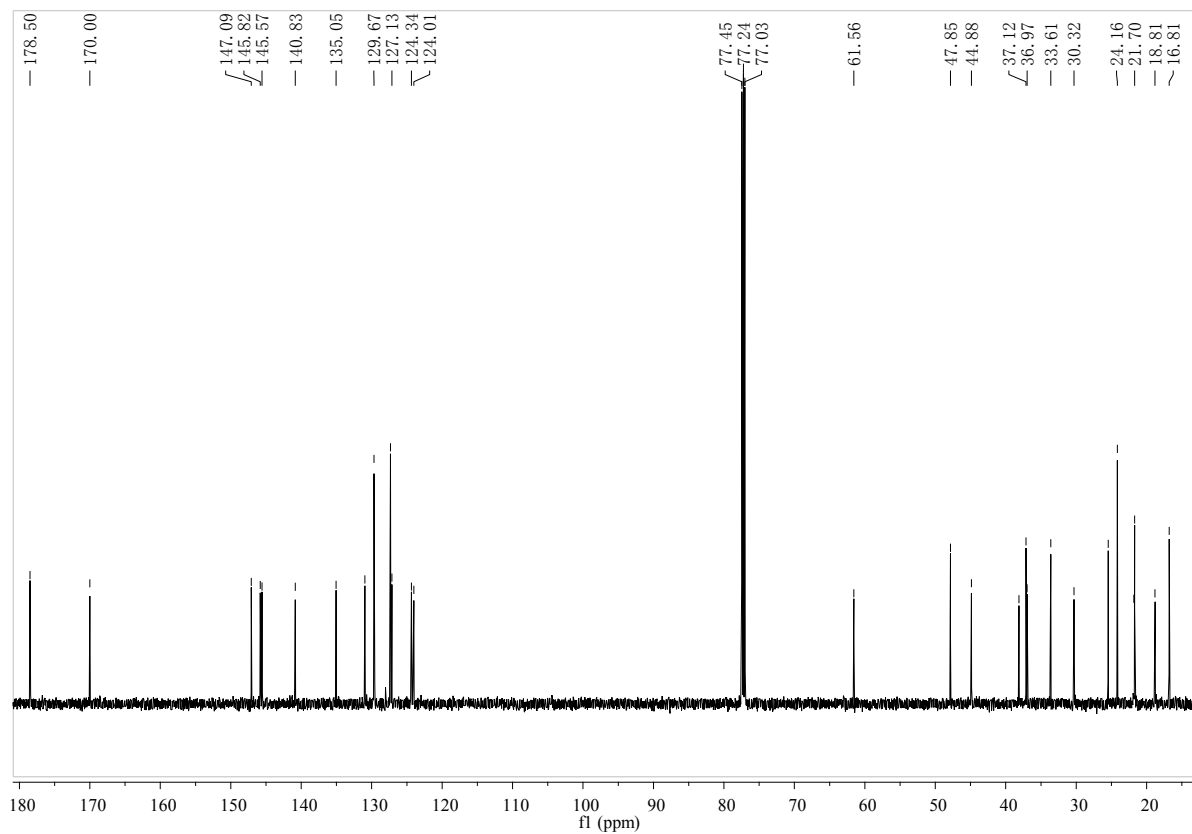


Figure S14. $^{13}\text{C-NMR}$ spectrum of the target compound (**4b**) in CDCl_3

JN-DM #73 RT: 0.64 AV: 1 NL: 6.09E6
T: -c ESI Q1MS [100.000-1000.000]

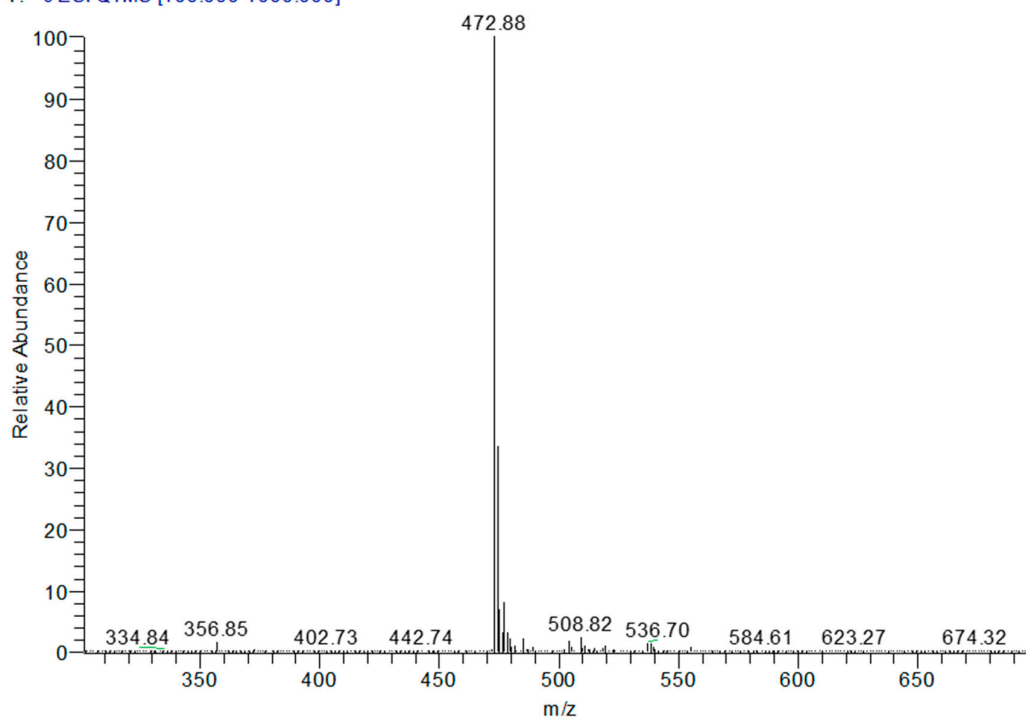


Figure S15. ESI-MS spectrum of the target compound (4b)

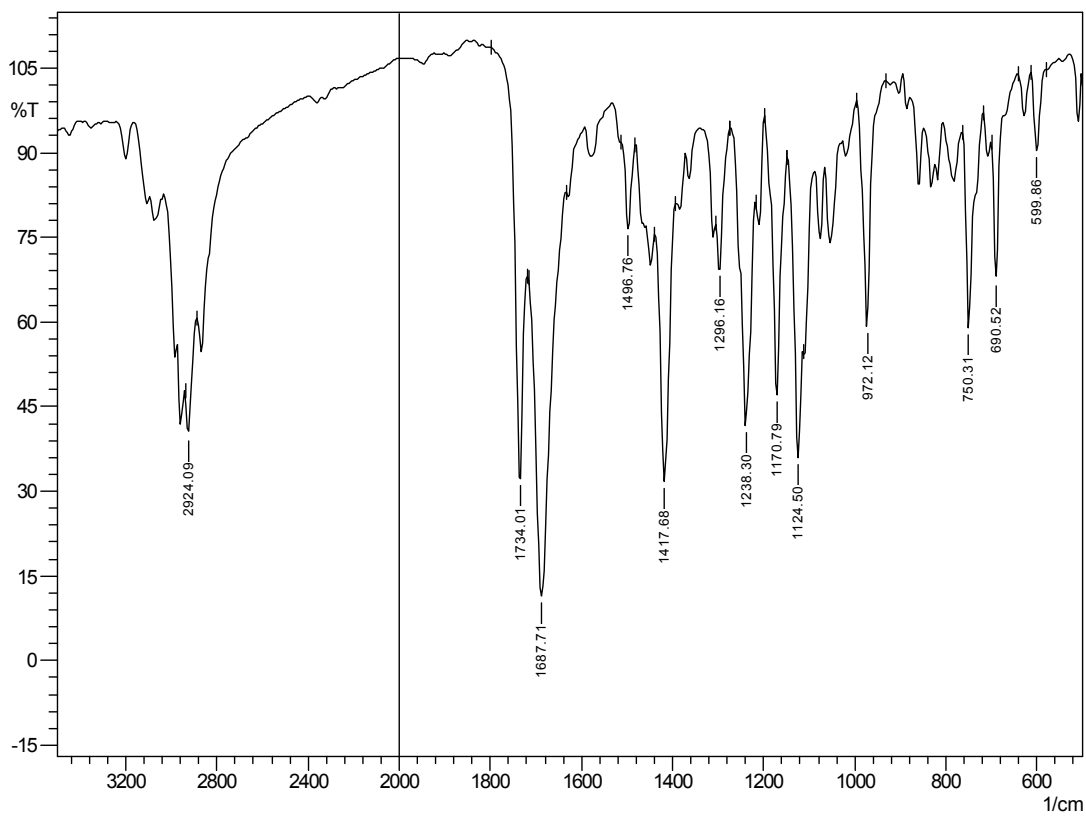


Figure S16. FTIR spectrum of the target compound (4c)

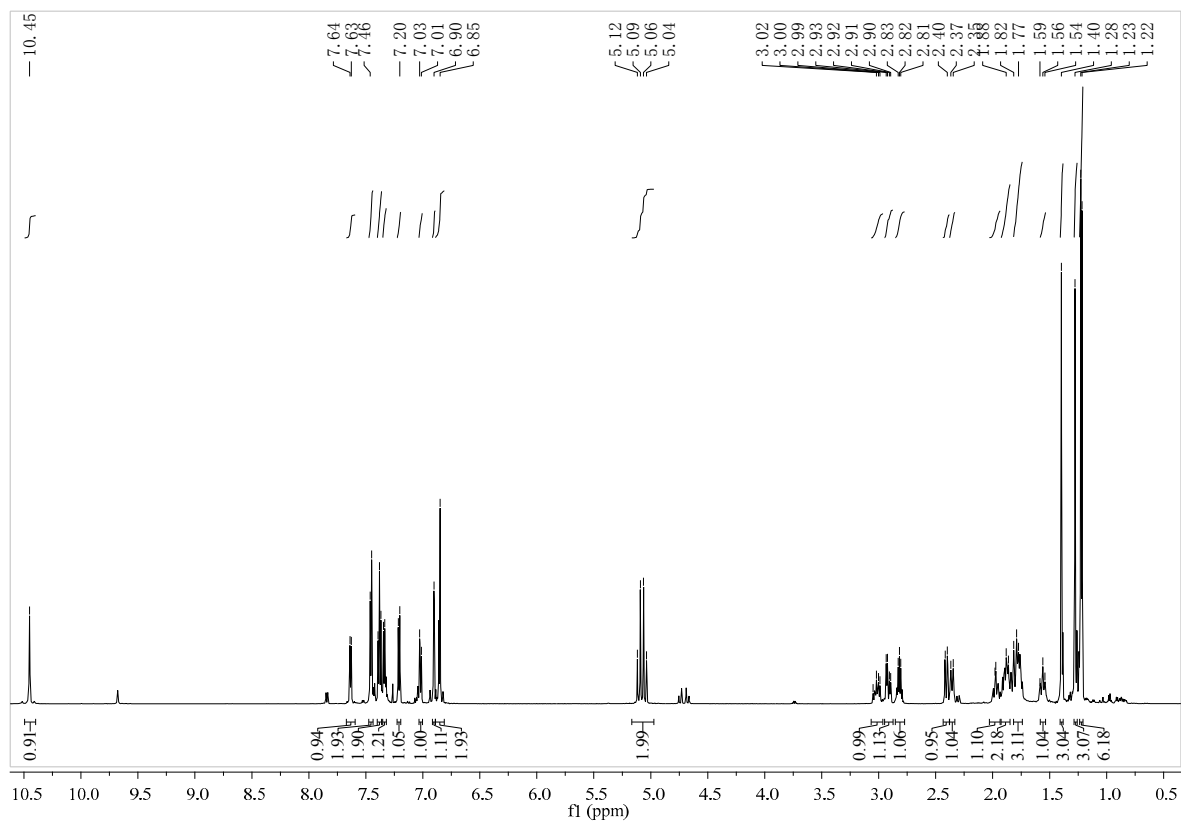


Figure S17. $^1\text{H-NMR}$ spectrum of the target compound (**4c**) in CDCl_3

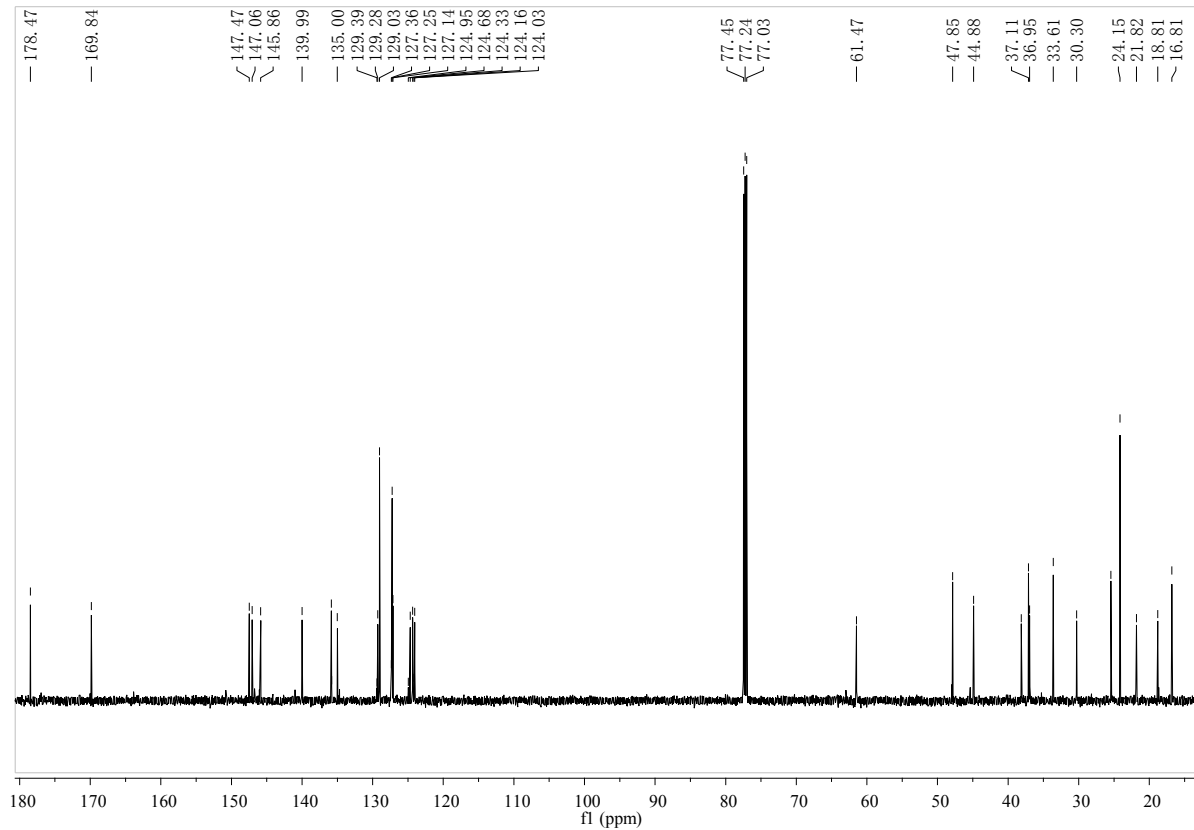


Figure S18. $^{13}\text{C-NMR}$ spectrum of the target compound (**4c**) in CDCl_3

JN-CMA #68 RT: 0.60 AV: 1 NL: 6.25E6
T: - c ESI Q1MS [100.000-1000.000]

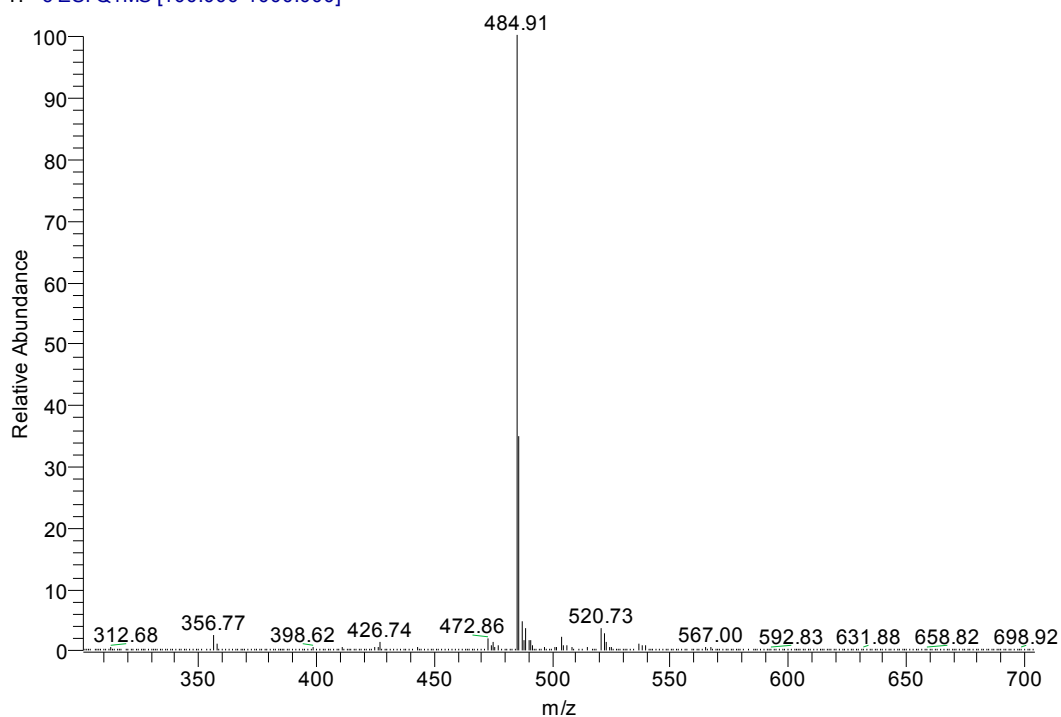


Figure S19. ESI-MS spectrum of the target compound (4c)

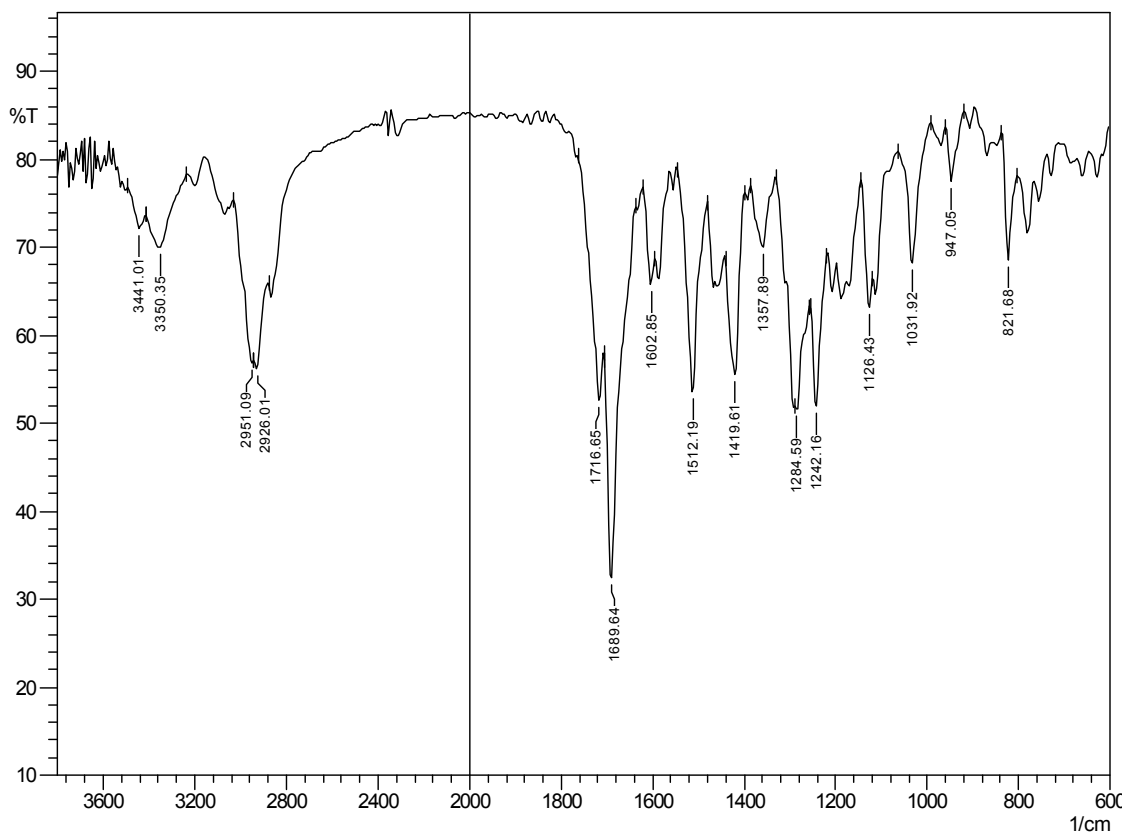


Figure S20. FTIR spectrum of the target compound (4d)

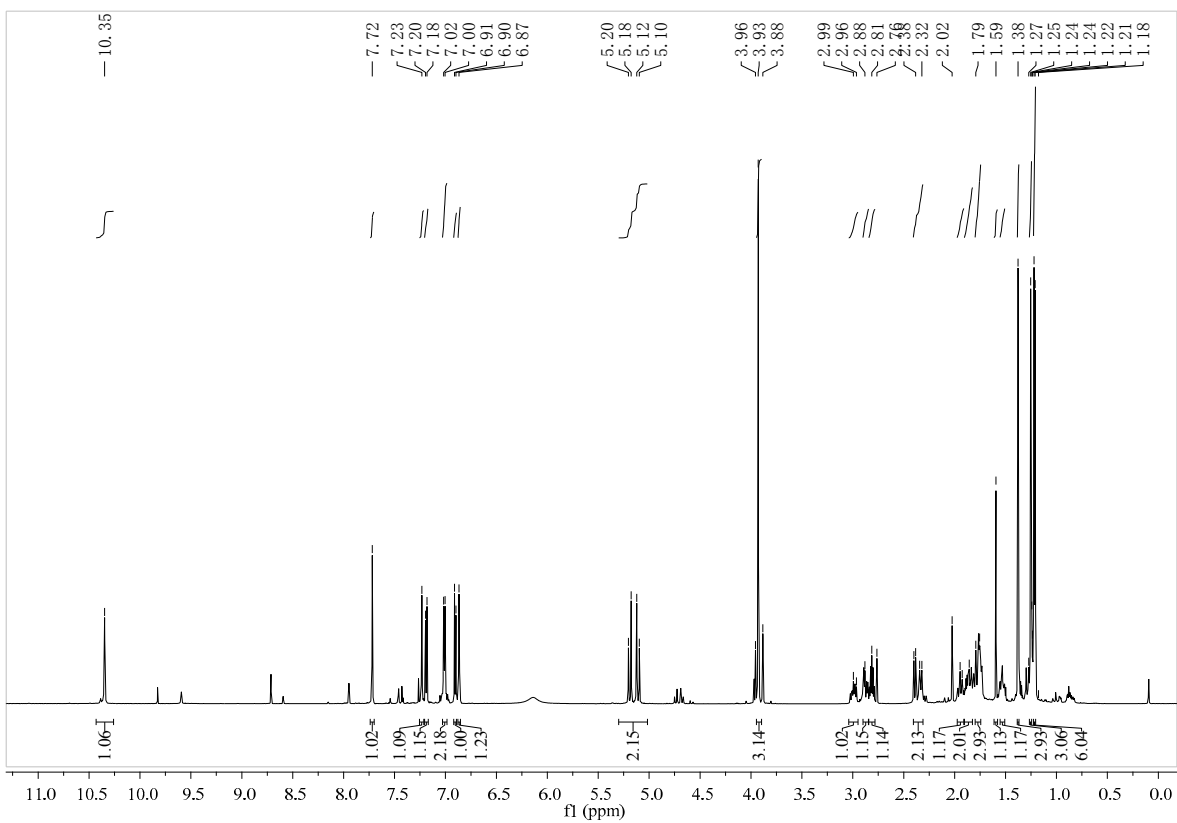


Figure S21. $^1\text{H-NMR}$ spectrum of the target compound (**4d**) in CDCl_3

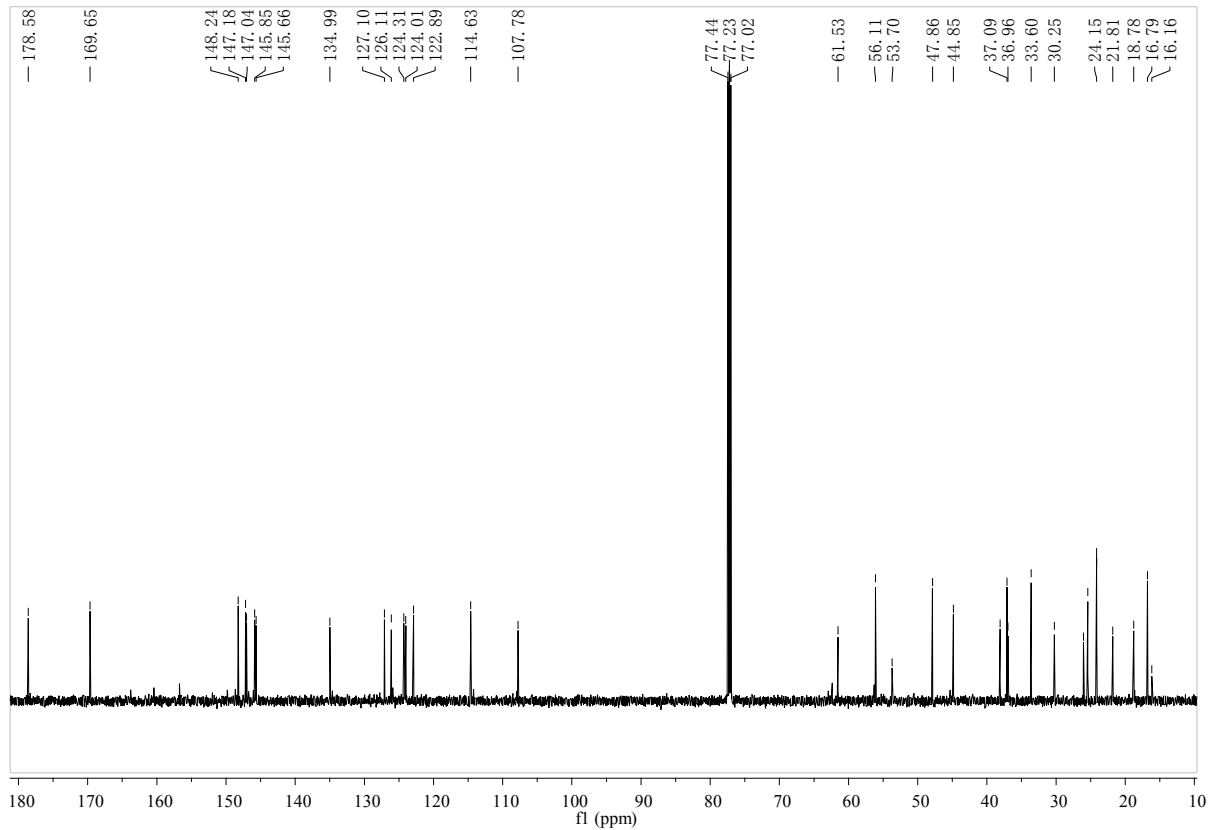


Figure S22. $^{13}\text{C-NMR}$ spectrum of the target compound (**4d**) in CDCl_3

JN-XCQ #81 RT: 0.71 AV: 1 SB: 48 0.04-0.45 NL: 4.88E6
T: - c ESI Q1MS [100.000-1000.000]

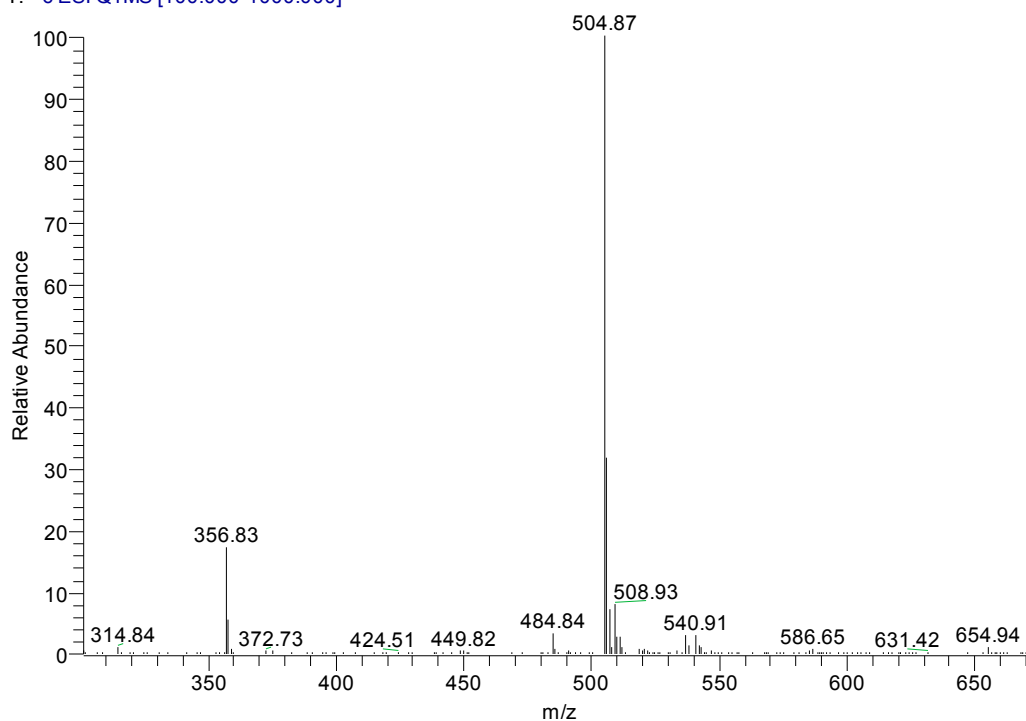


Figure S23. ESI-MS spectrum of the target compound (4d)

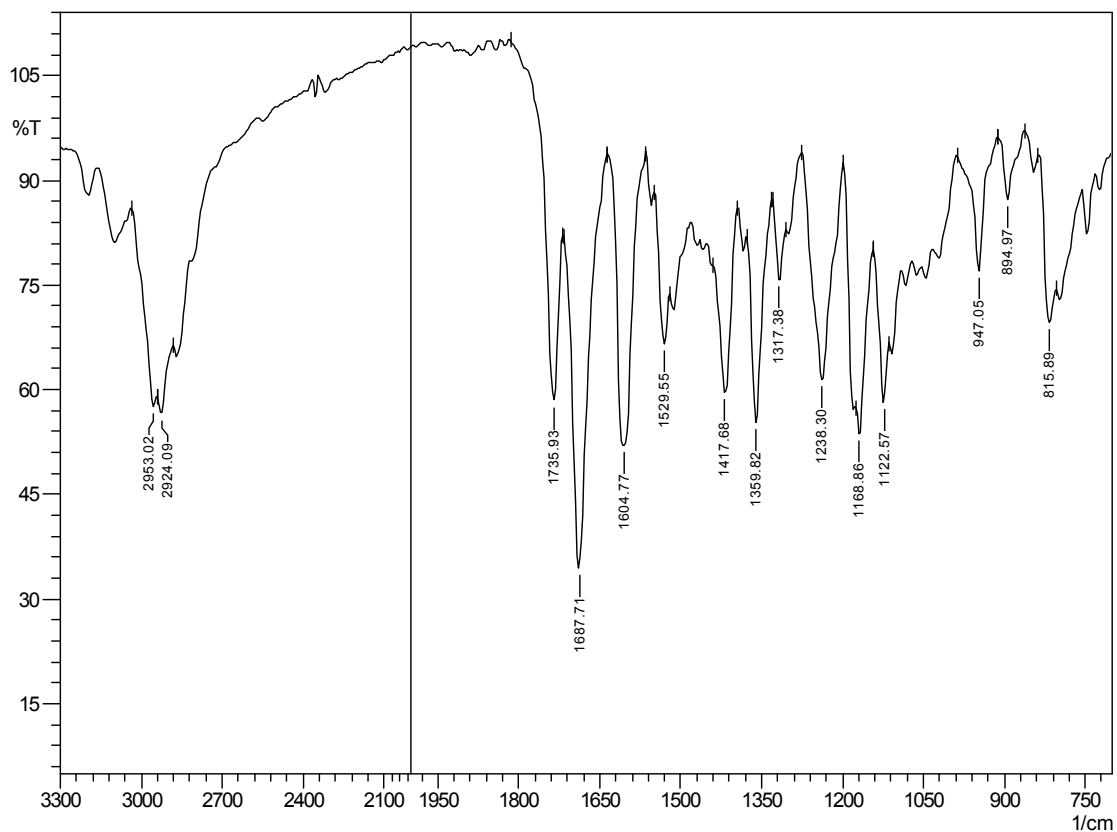


Figure S24. FTIR spectrum of the target compound (4e)

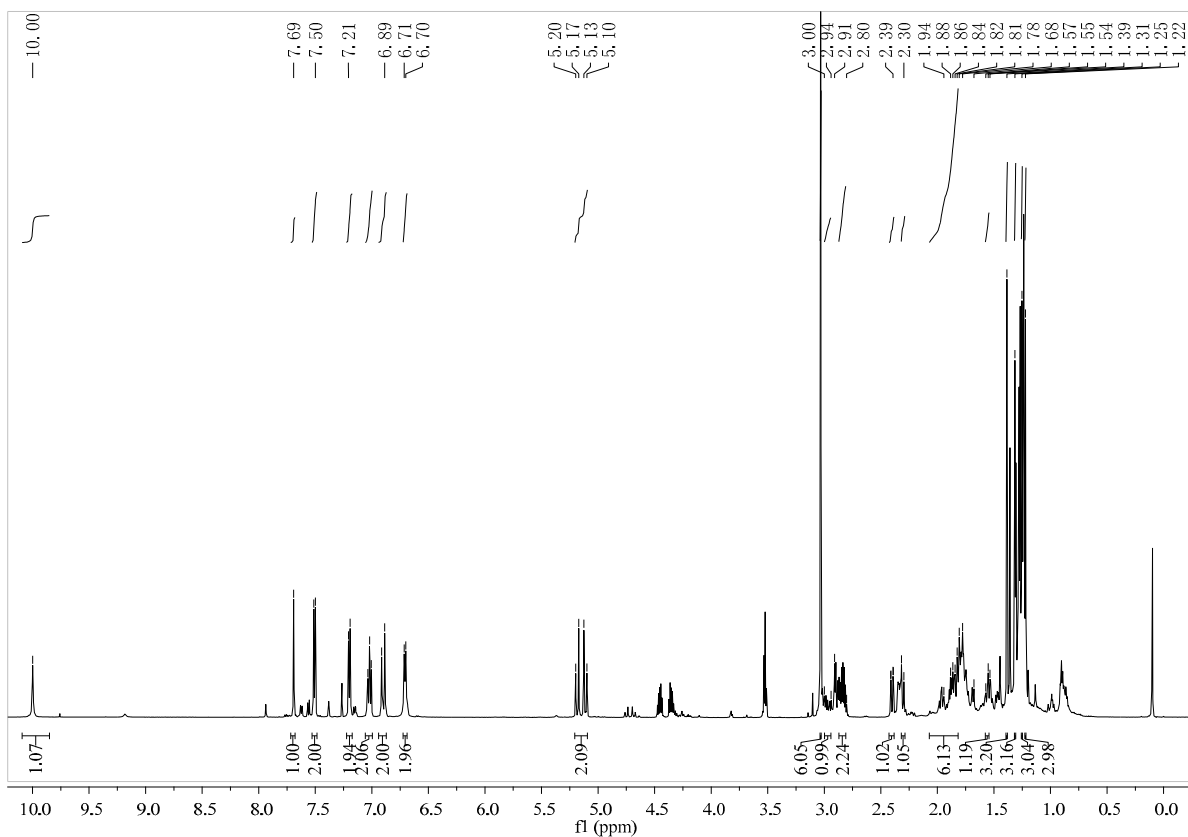


Figure S25. $^1\text{H-NMR}$ spectrum of the target compound (**4e**) in CDCl_3

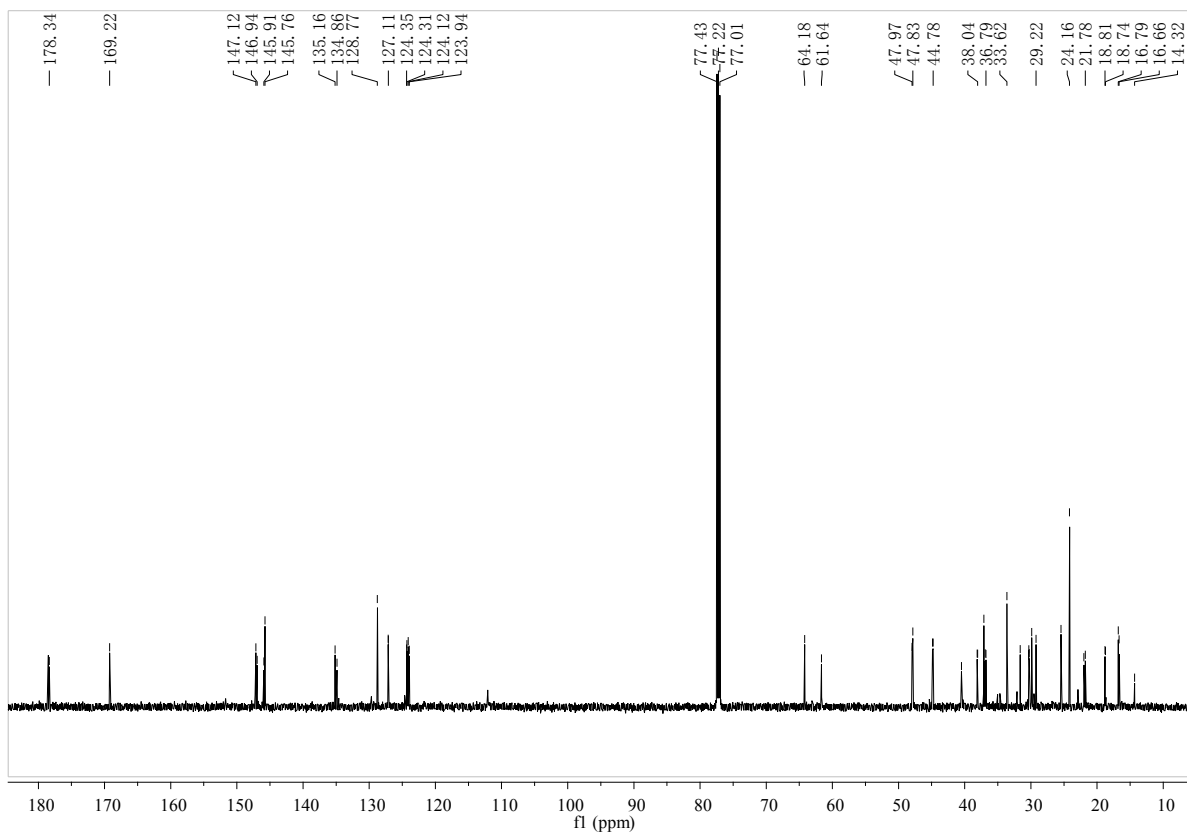


Figure S26. $^{13}\text{C-NMR}$ spectrum of the target compound (**4e**) in CDCl_3

JN-NN #388 RT: 3.44 AV: 1 SB: 58 0.07-0.58 NL: 2.50E5
T: - c ESI Q1MS [100.000-1000.000]

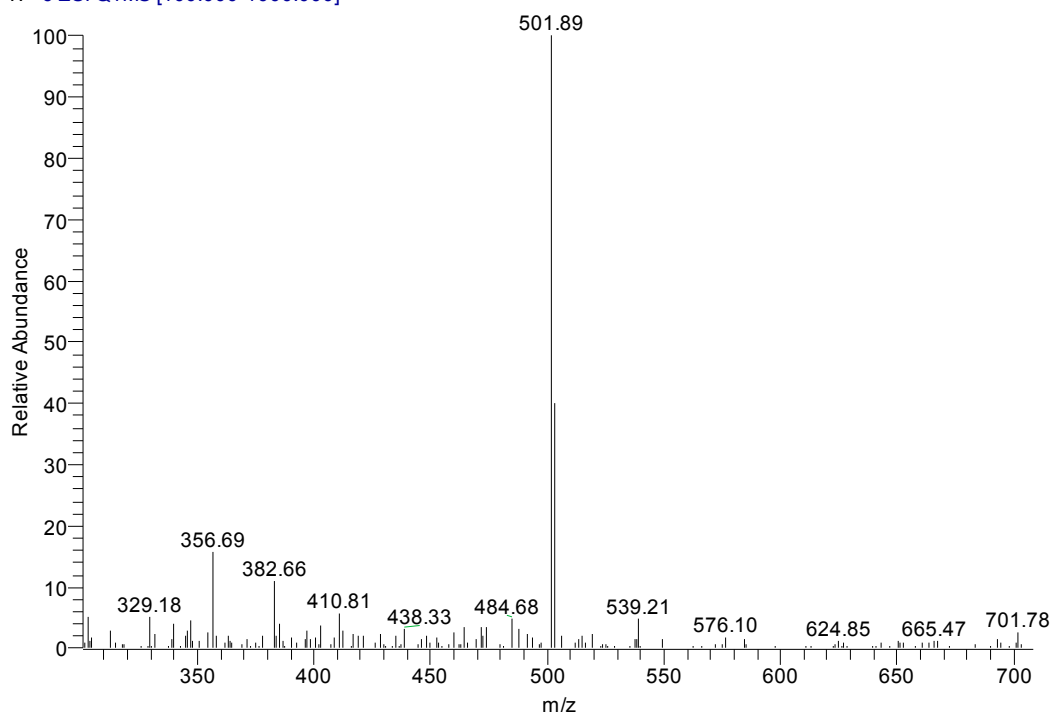


Figure S27. ESI-MS spectrum of the target compound (4e)

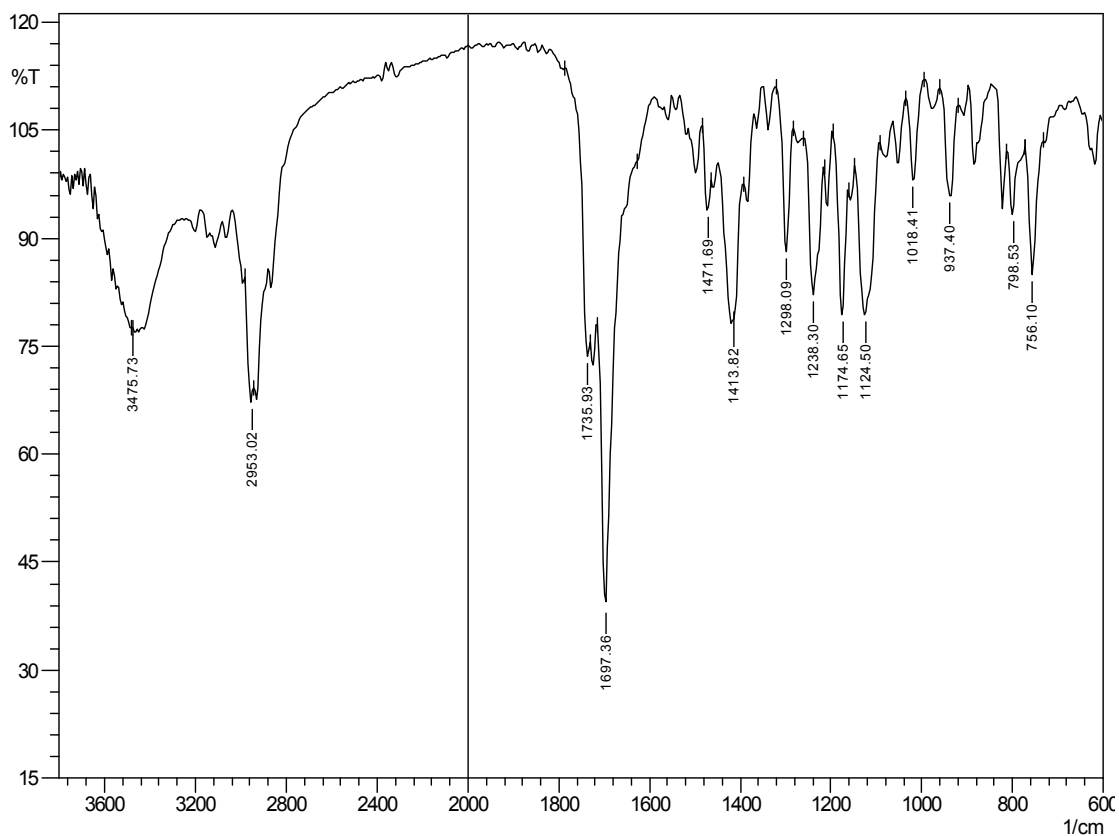


Figure S28. FTIR spectrum of the target compound (4f)

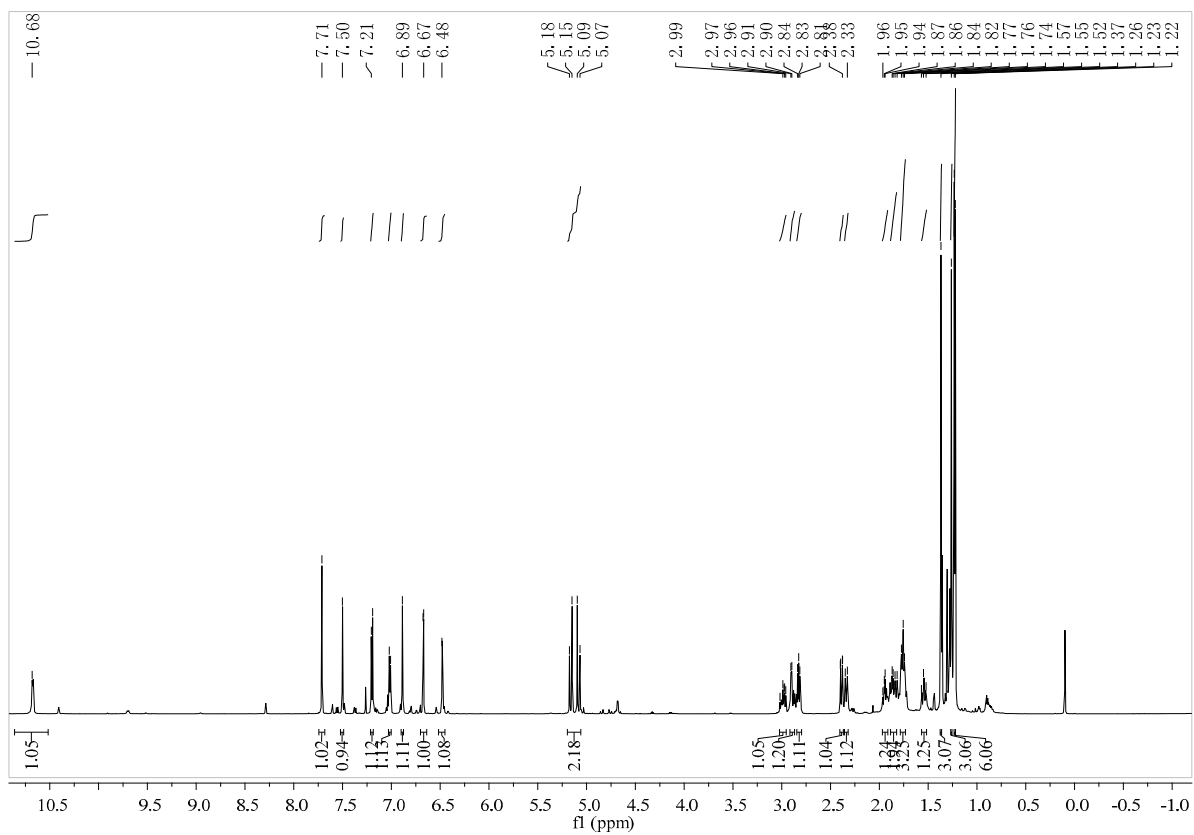


Figure S29. $^1\text{H-NMR}$ spectrum of the target compound (**4f**) in CDCl_3

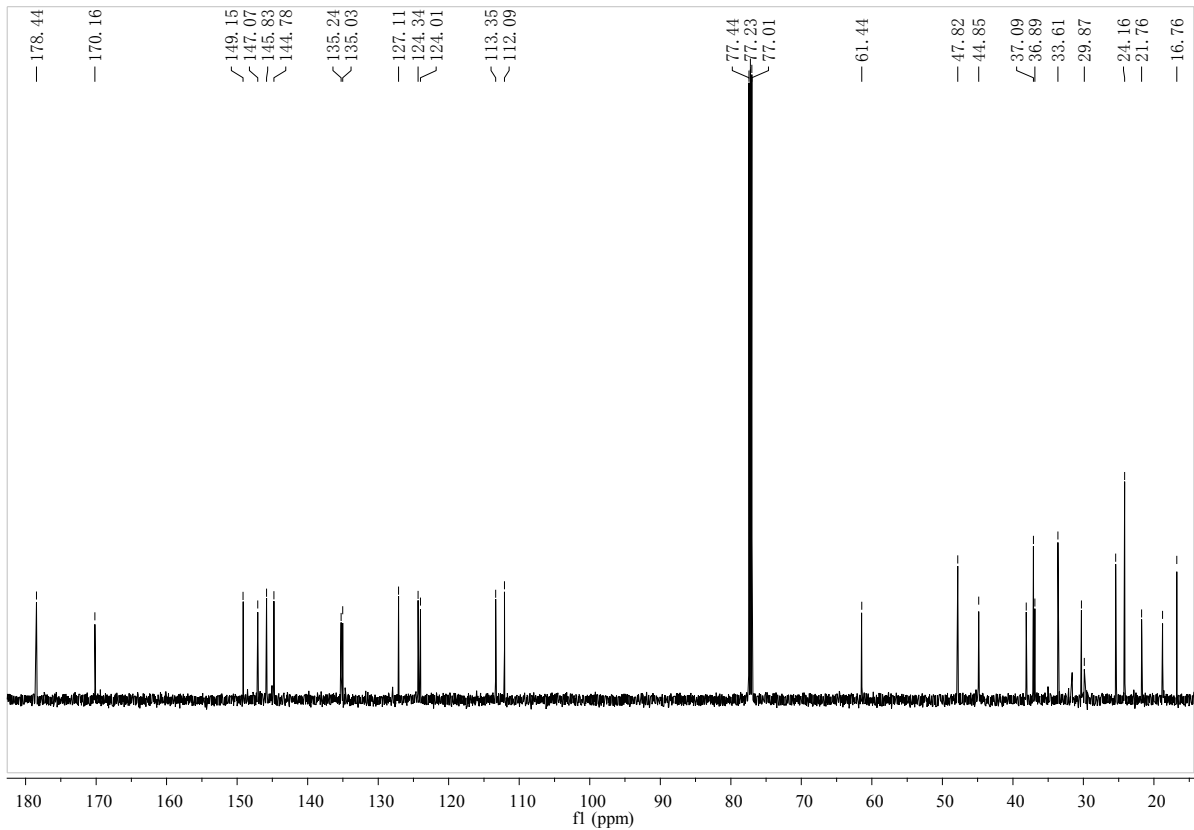


Figure S30. $^{13}\text{C-NMR}$ spectrum of the target compound (**4f**) in CDCl_3

JN-THF #54 RT: 0.48 AV: 1 SB: 28 0.02-0.26 NL: 6.73E6
T: -c ESI Q1MS [100.000-1000.000]

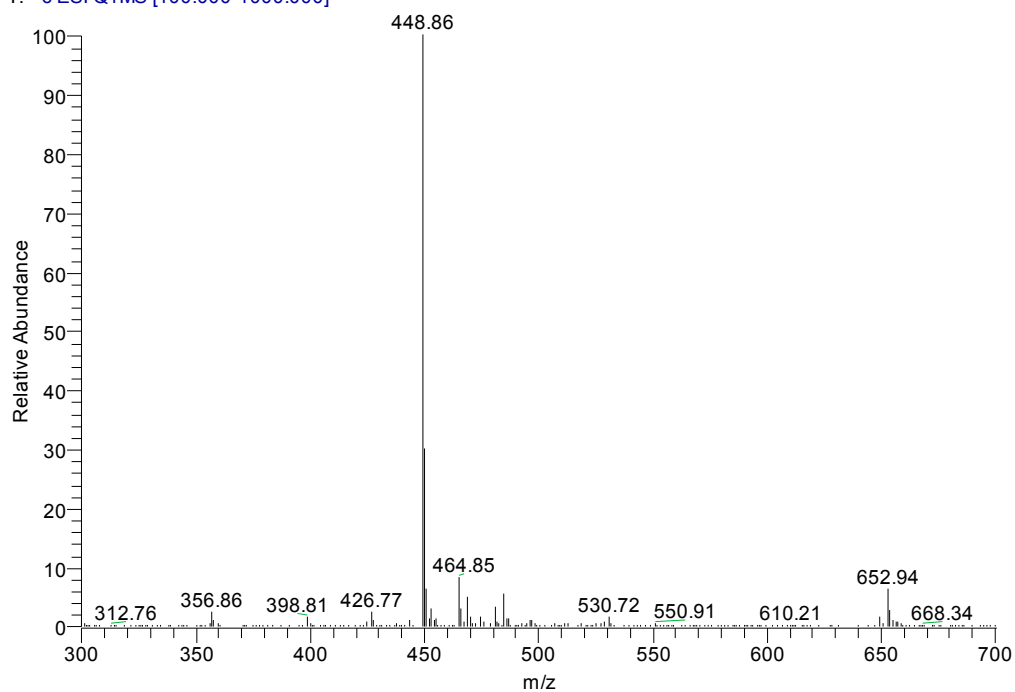


Figure S31. ESI-MS spectrum of the target compound (4f)

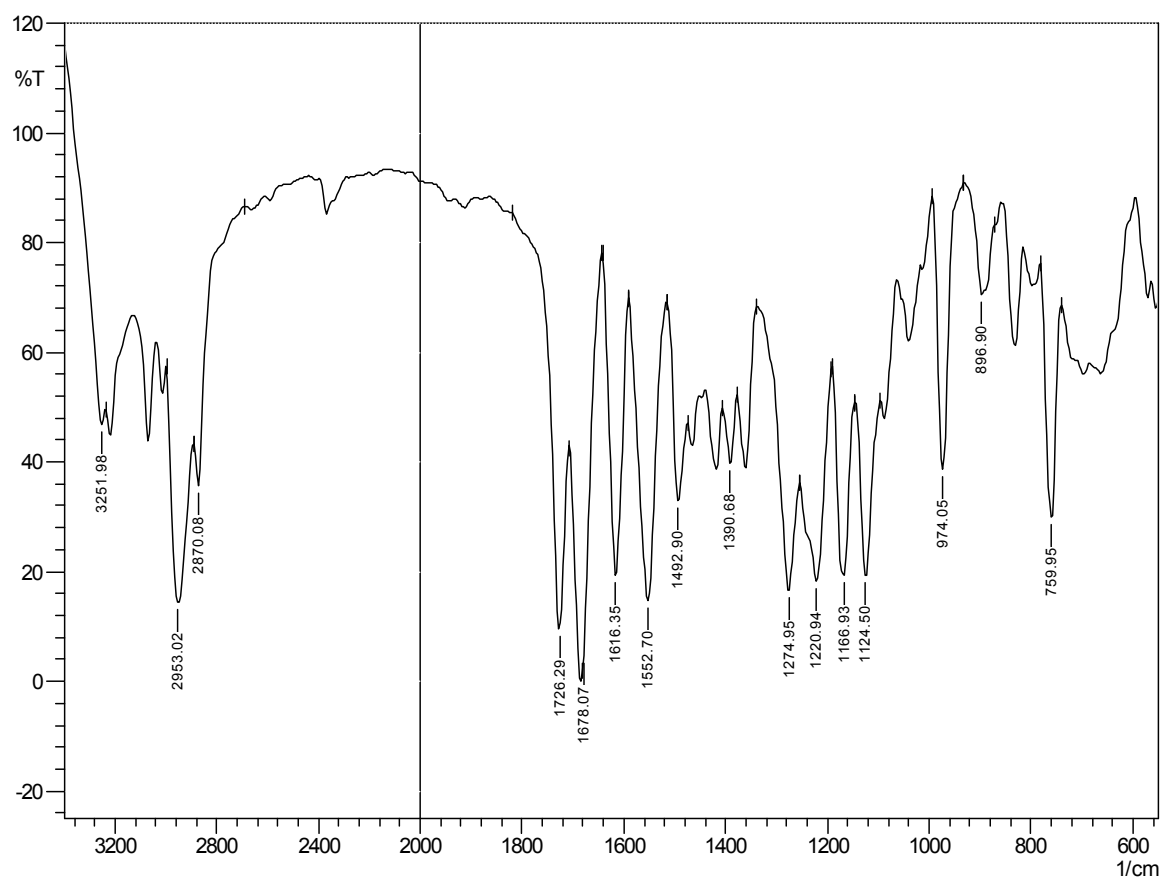


Figure S32. FTIR spectrum of the target compound (4g)

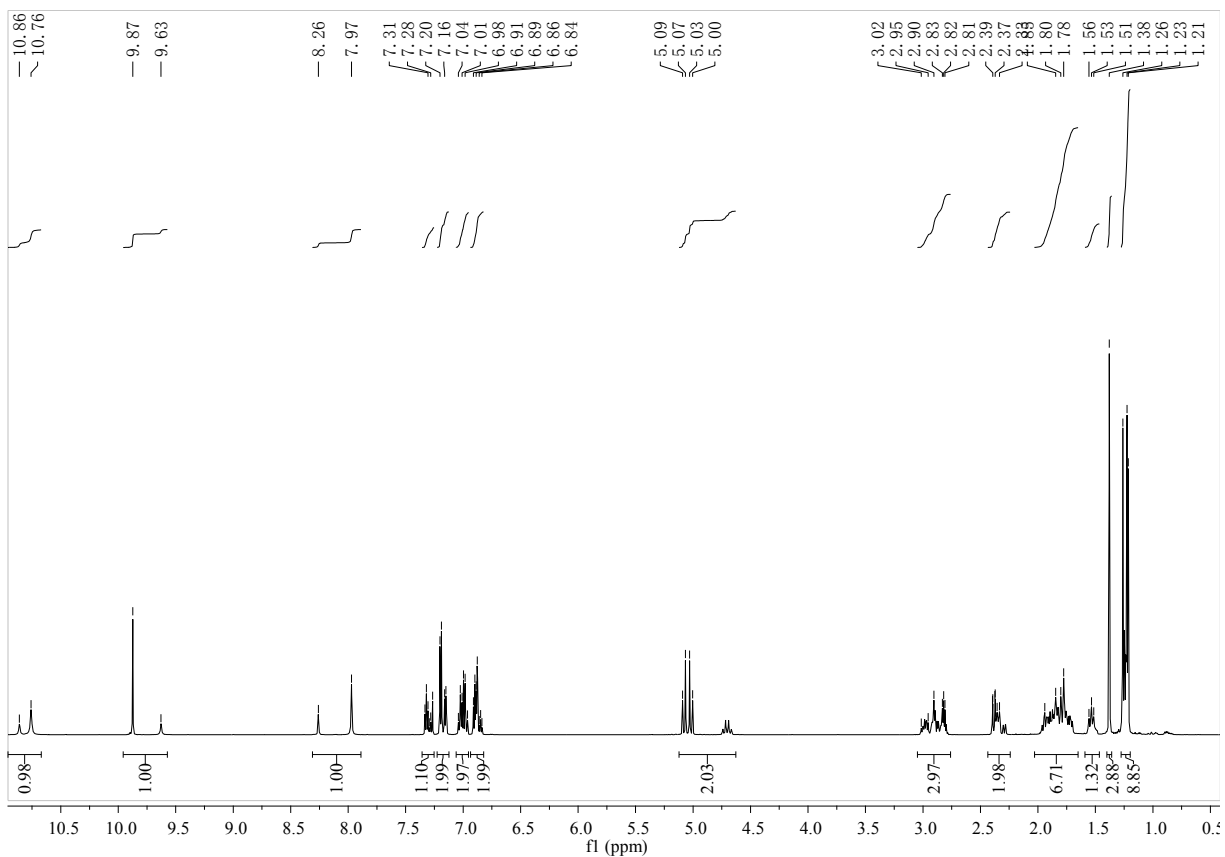


Figure S33. $^1\text{H-NMR}$ spectrum of the target compound (**4g**) in CDCl_3

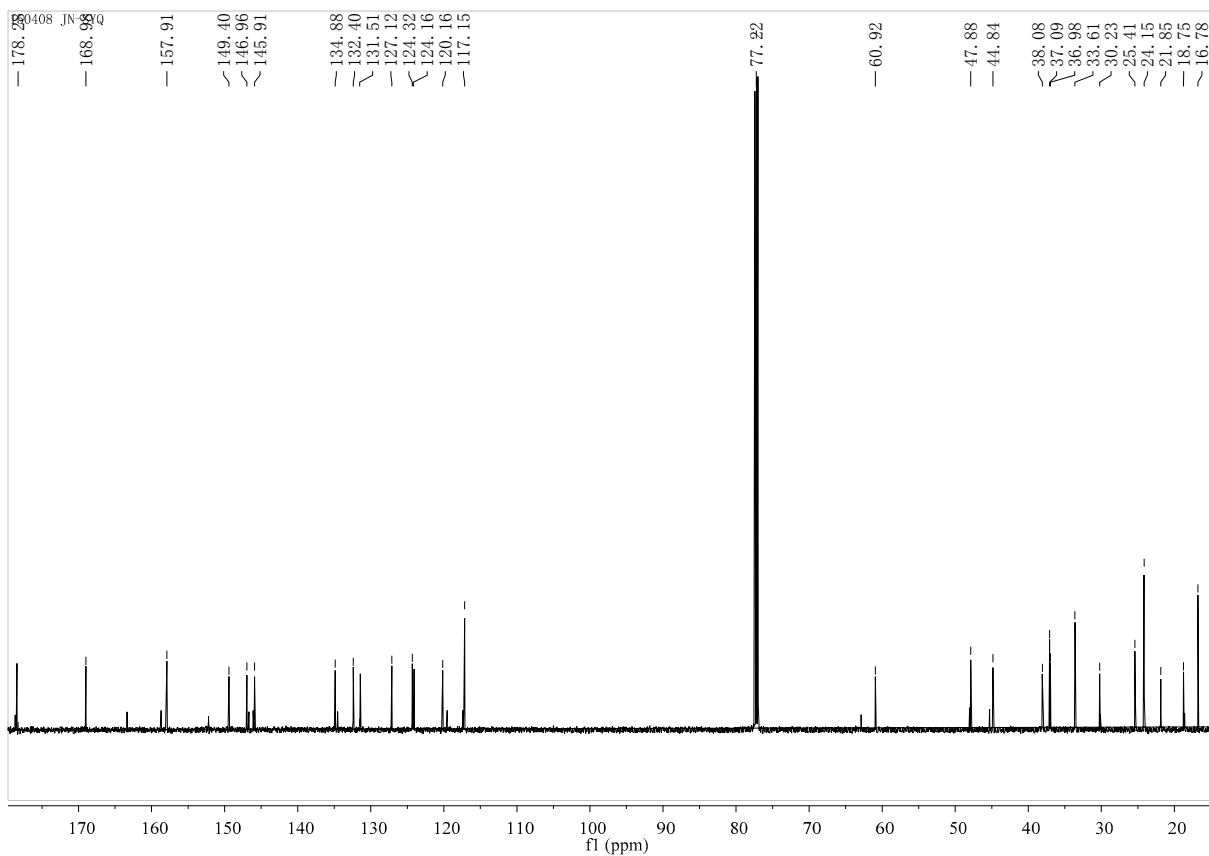


Figure S34. $^{13}\text{C-NMR}$ spectrum of the target compound (**4g**) in CDCl_3

JN-SYQ #77 RT: 0.68 AV: 1 NL: 7.07E6
T: - c ESI Q1MS [100.000-1000.000]

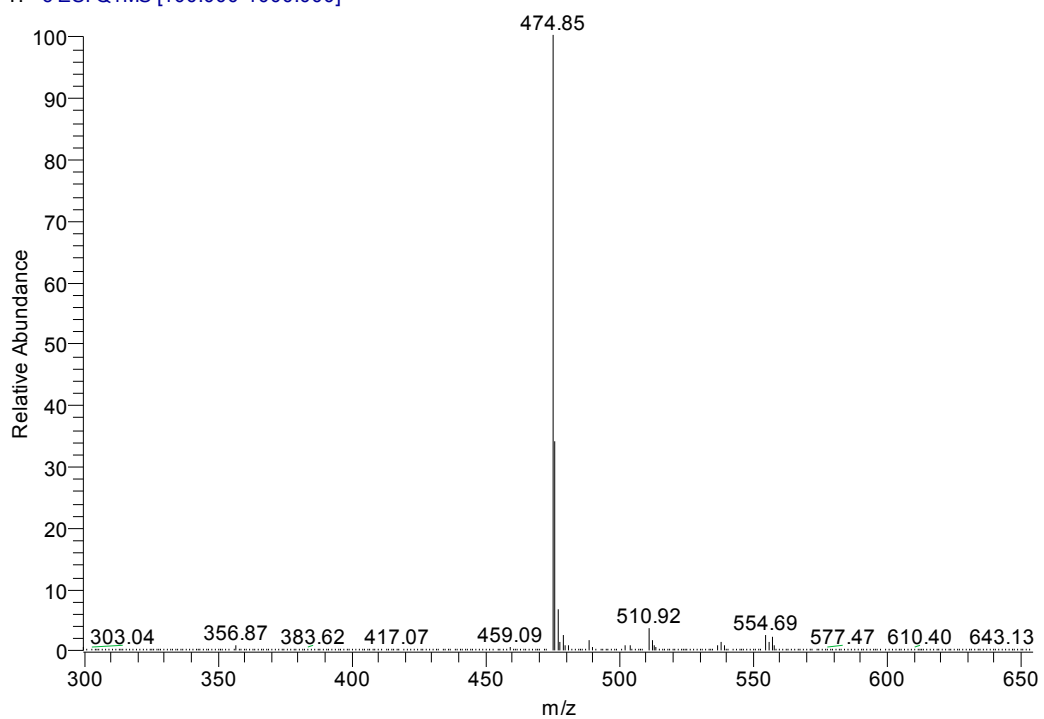


Figure S35. ESI-MS spectrum of the target compound (4g)

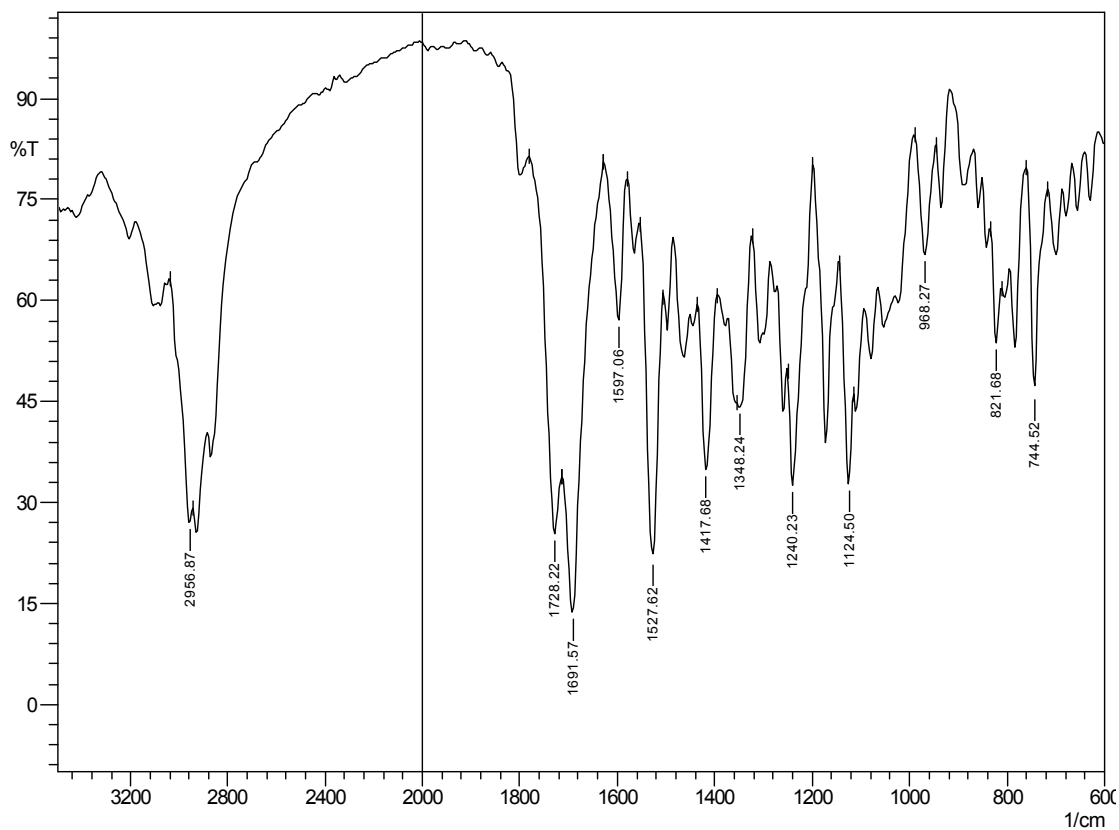


Figure S36. FTIR spectrum of the target compound (4h)

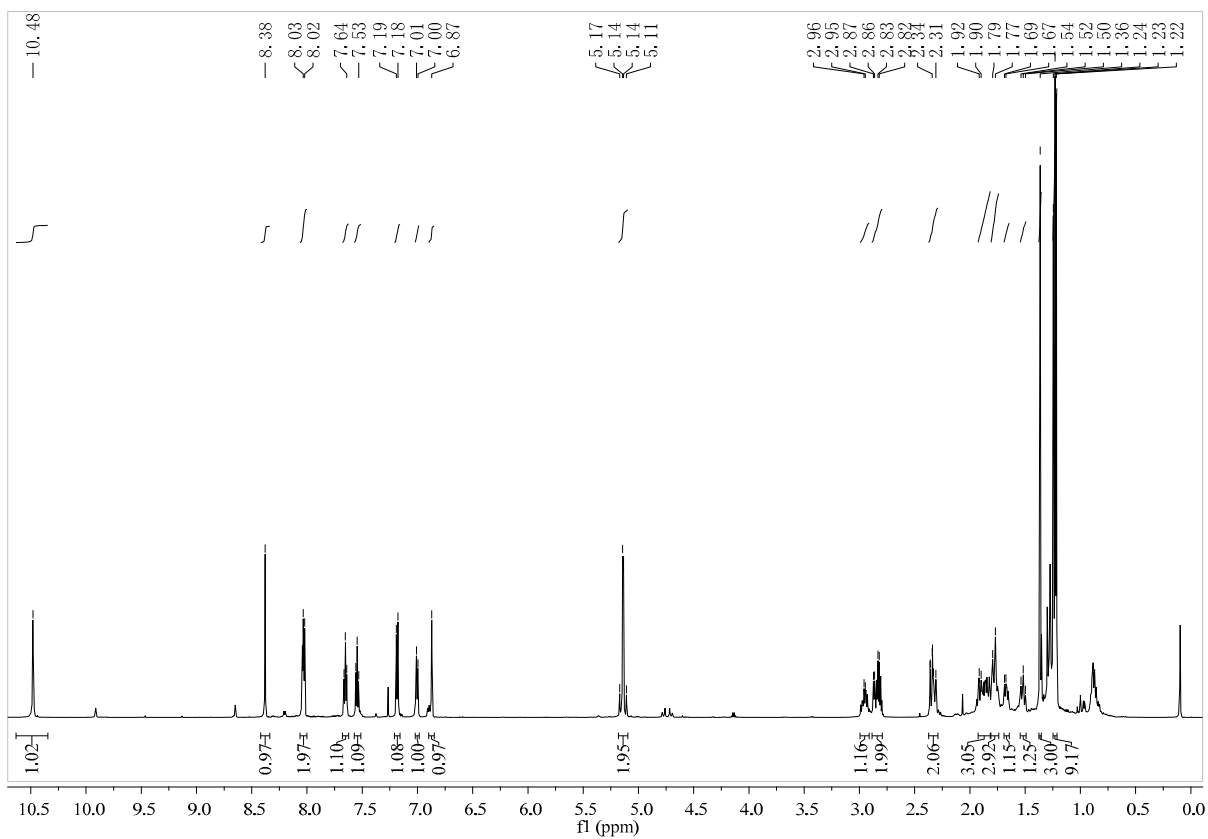


Figure S37. $^1\text{H-NMR}$ spectrum of the target compound (**4h**) in CDCl_3

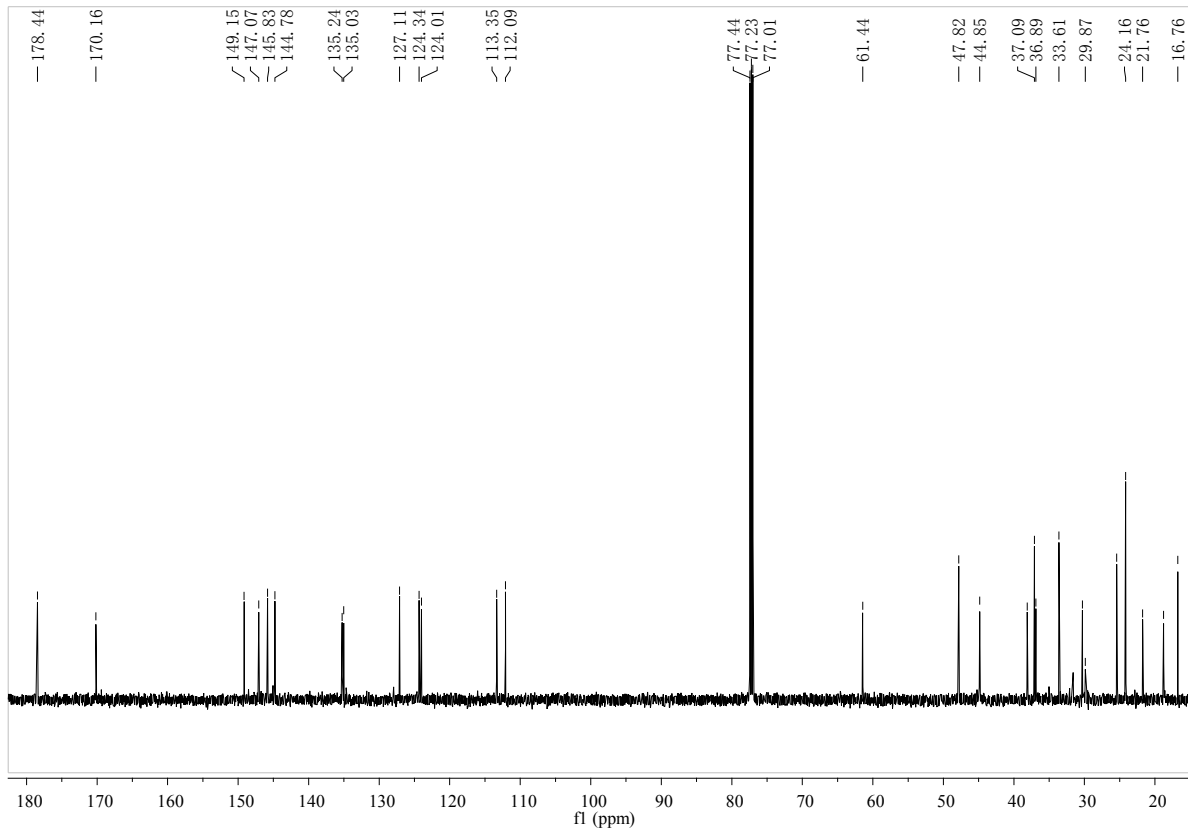


Figure S38. $^{13}\text{C-NMR}$ spectrum of the target compound (**4h**) in CDCl_3

JN-2-NO #88 RT: 0.78 AV: 1 NL: 6.94E6
T: - c ESI Q1MS [100.000-1000.000]

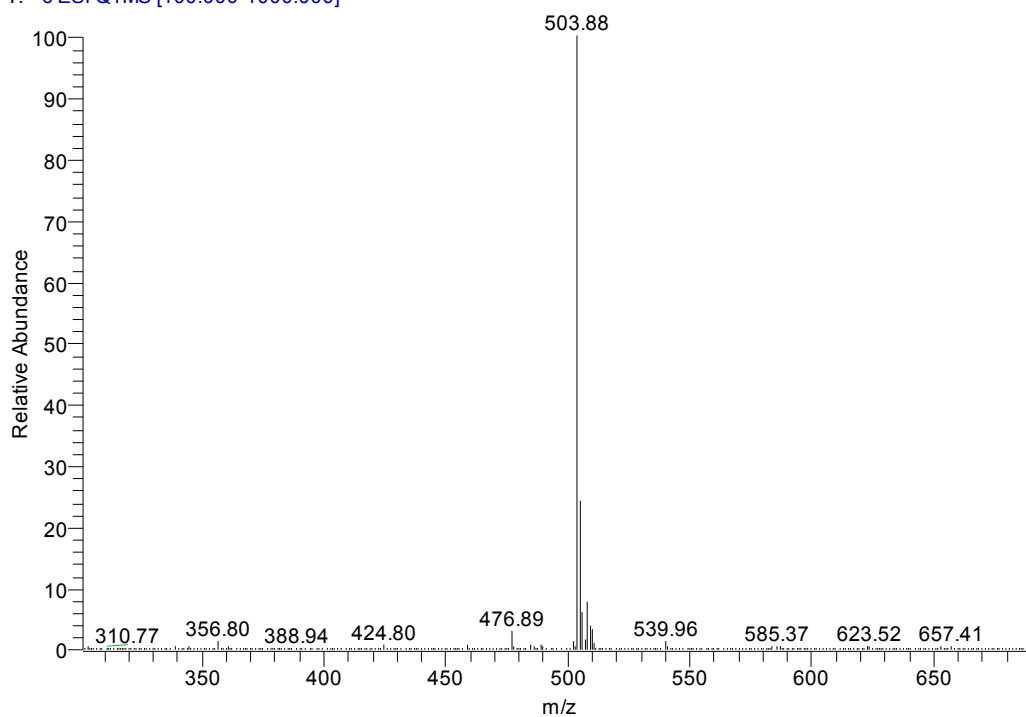


Figure S39. ESI-MS spectrum of the target compound (4h)

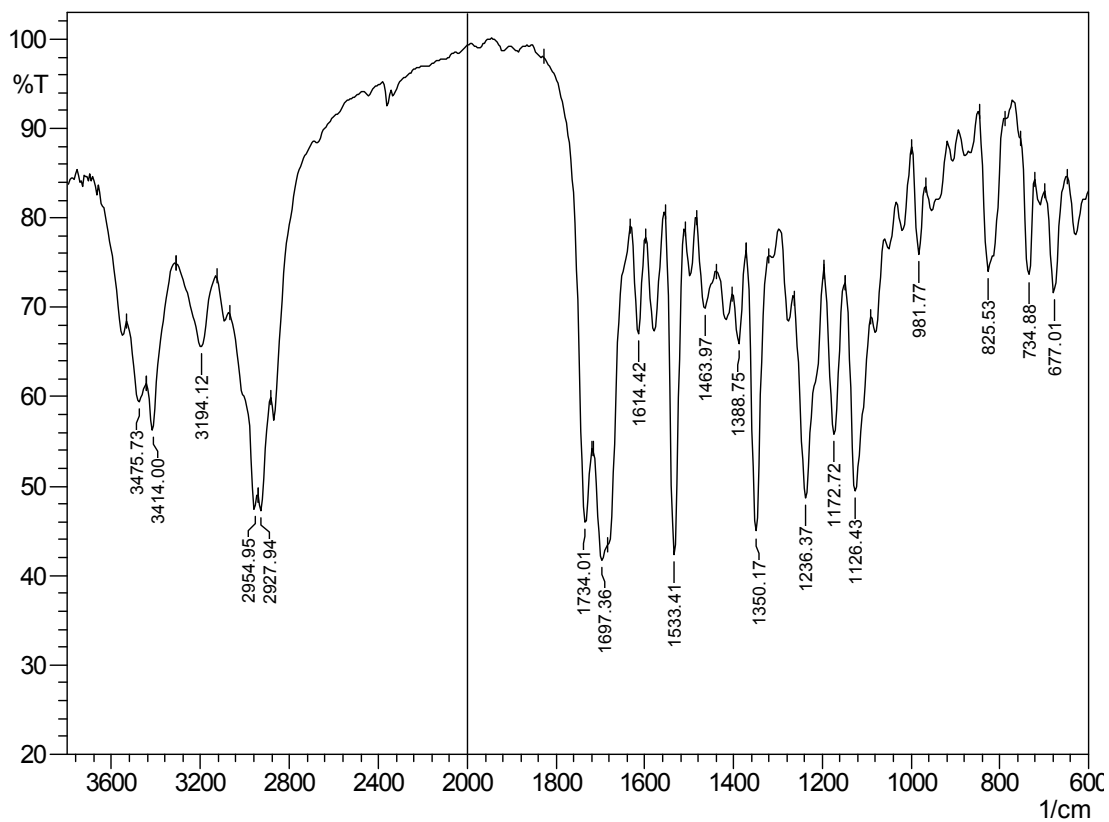


Figure S40. FTIR spectrum of the target compound (4i)

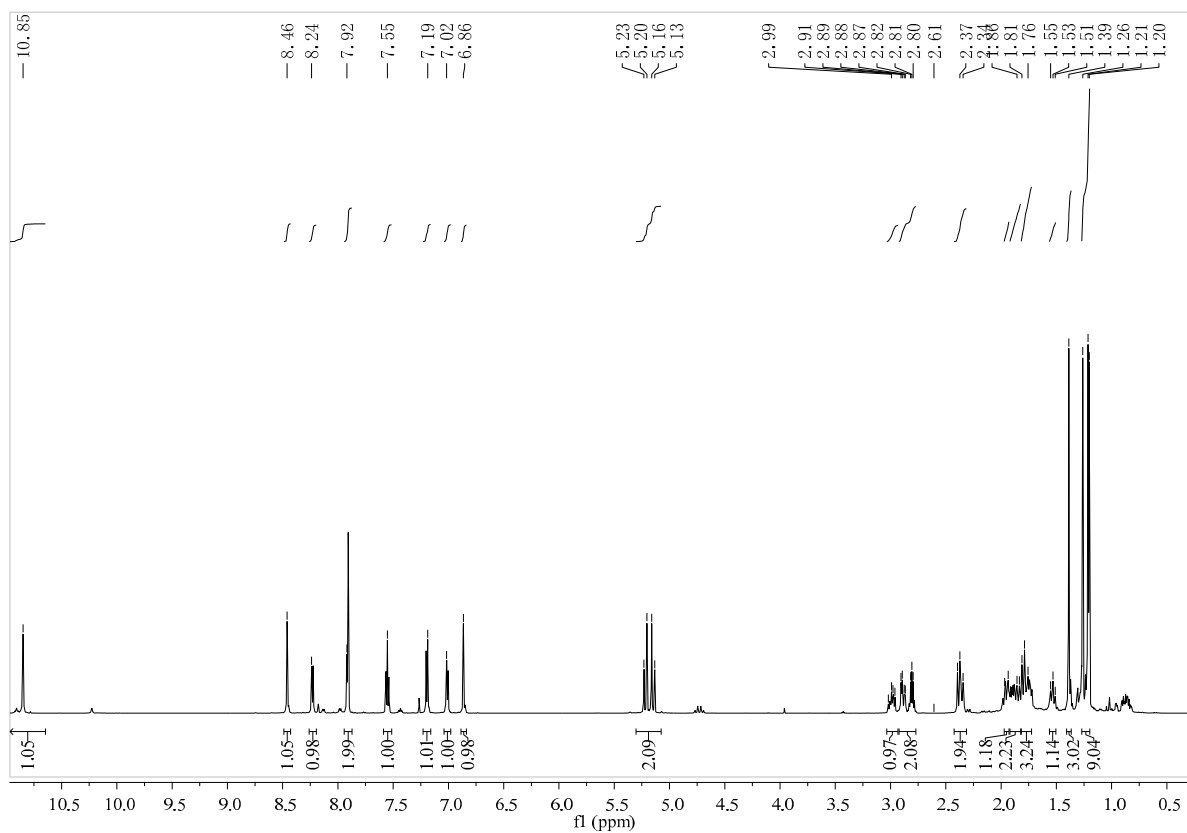


Figure S41. $^1\text{H-NMR}$ spectrum of the target compound (**4i**) in CDCl_3

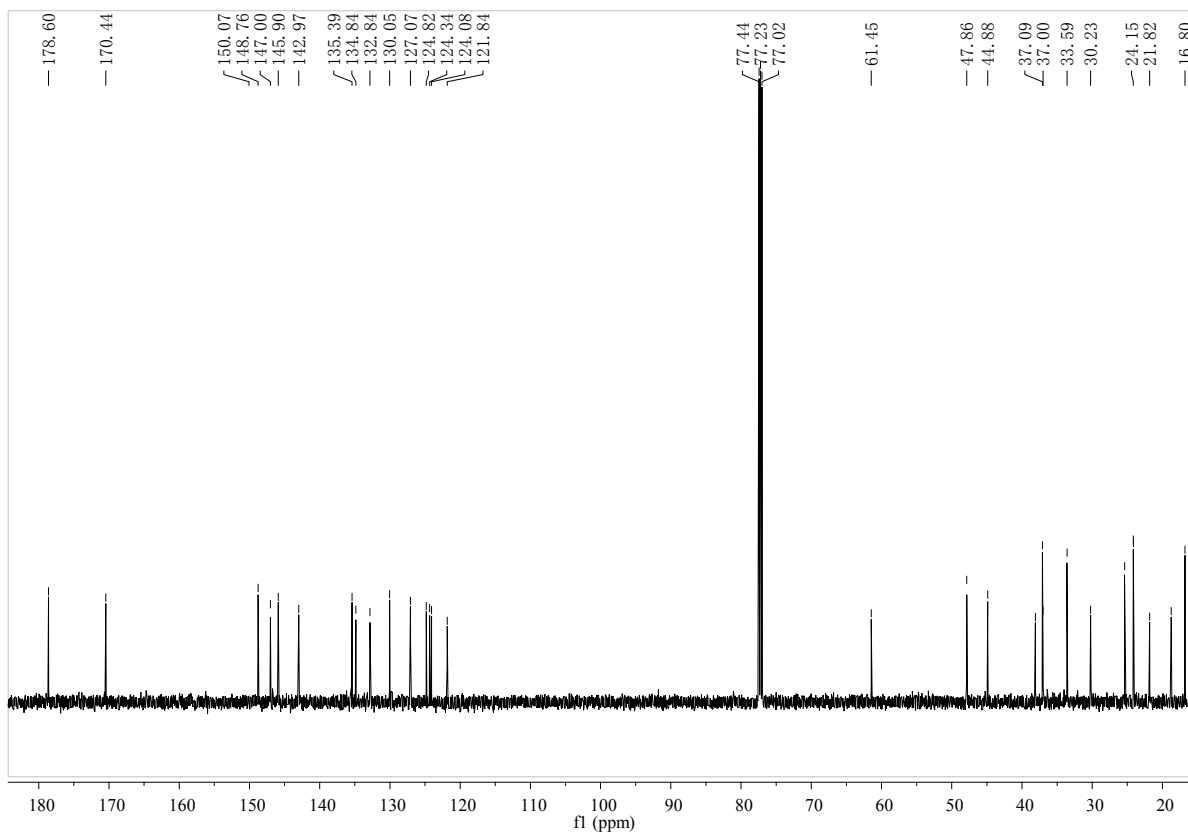


Figure S42. $^{13}\text{C-NMR}$ spectrum of the target compound (**4i**) in CDCl_3

JN-JXJ #95 RT: 0.84 AV: 1 SB: 123 1.64-2.25, 0.00-0.46 NL: 8.31E5
T: - c ESI Q1MS [100.000-1000.000]

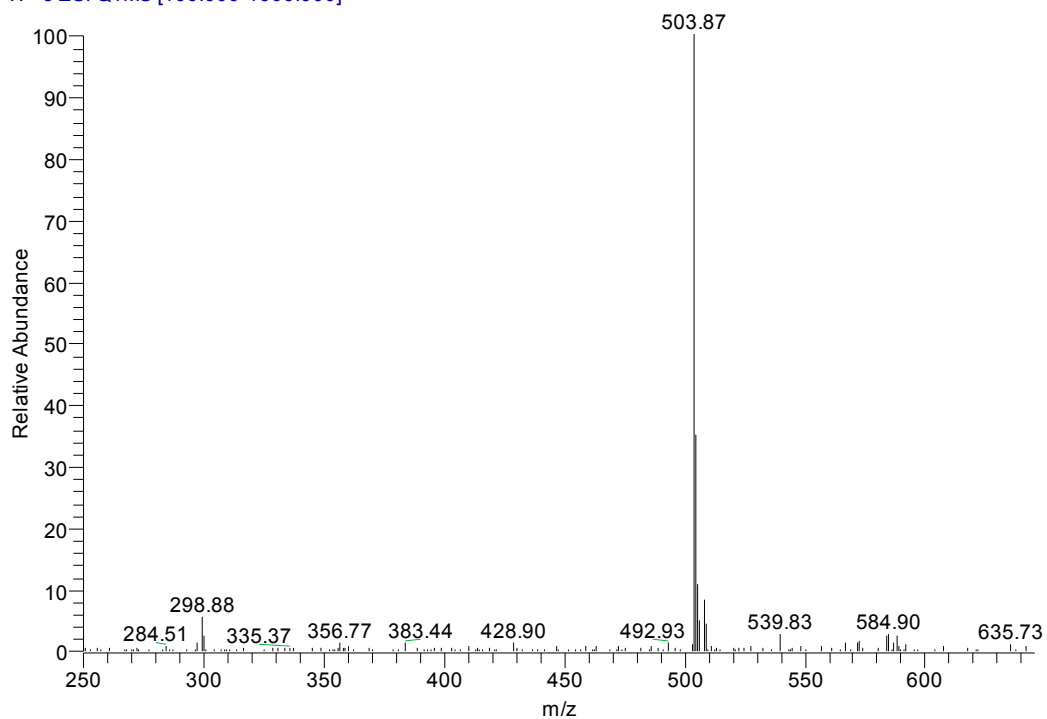


Figure S43. ESI-MS spectrum of the target compound (4i)

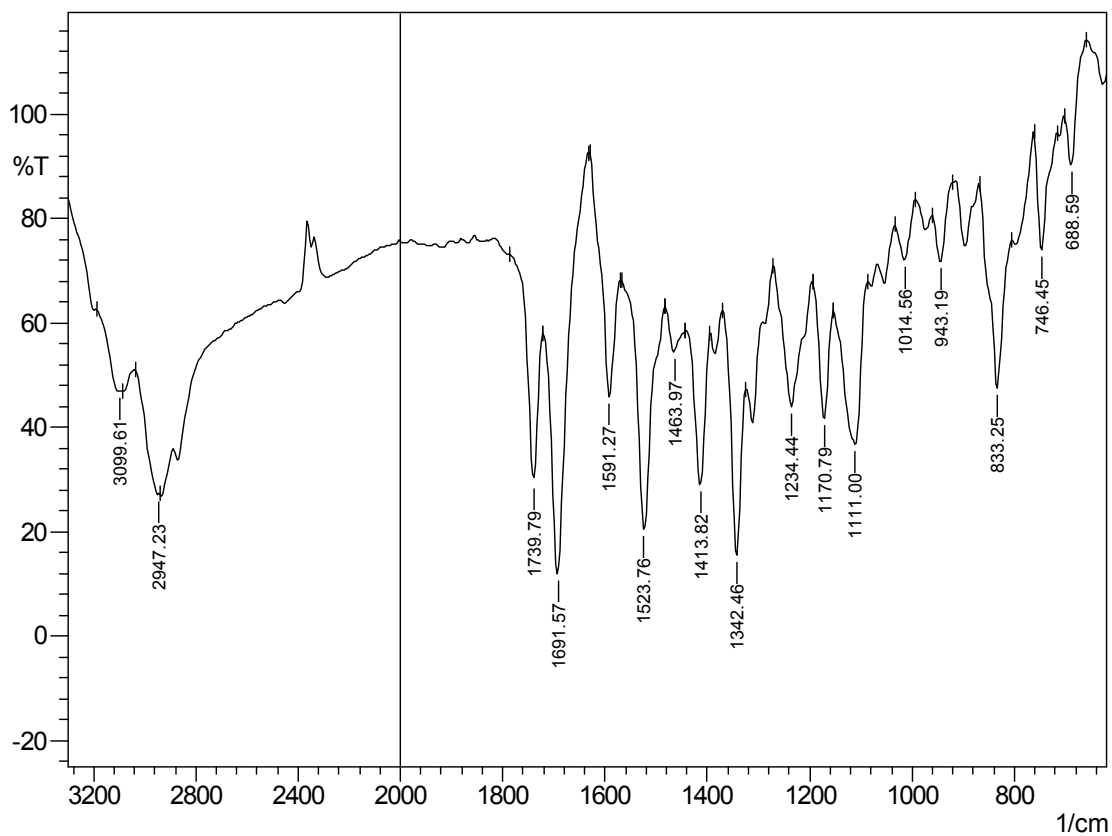


Figure S44. FTIR spectrum of the target compound (4j)

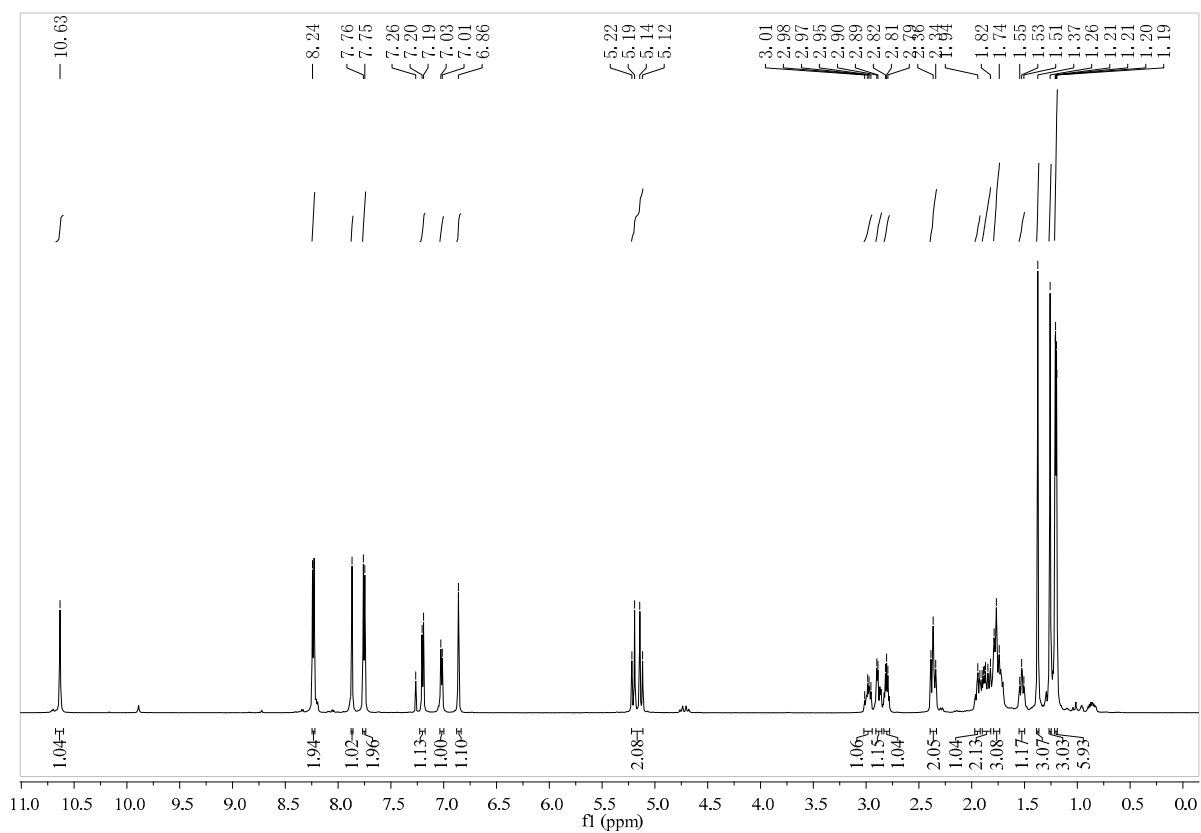


Figure S45. $^1\text{H-NMR}$ spectrum of the target compound (**4j**) in CDCl_3

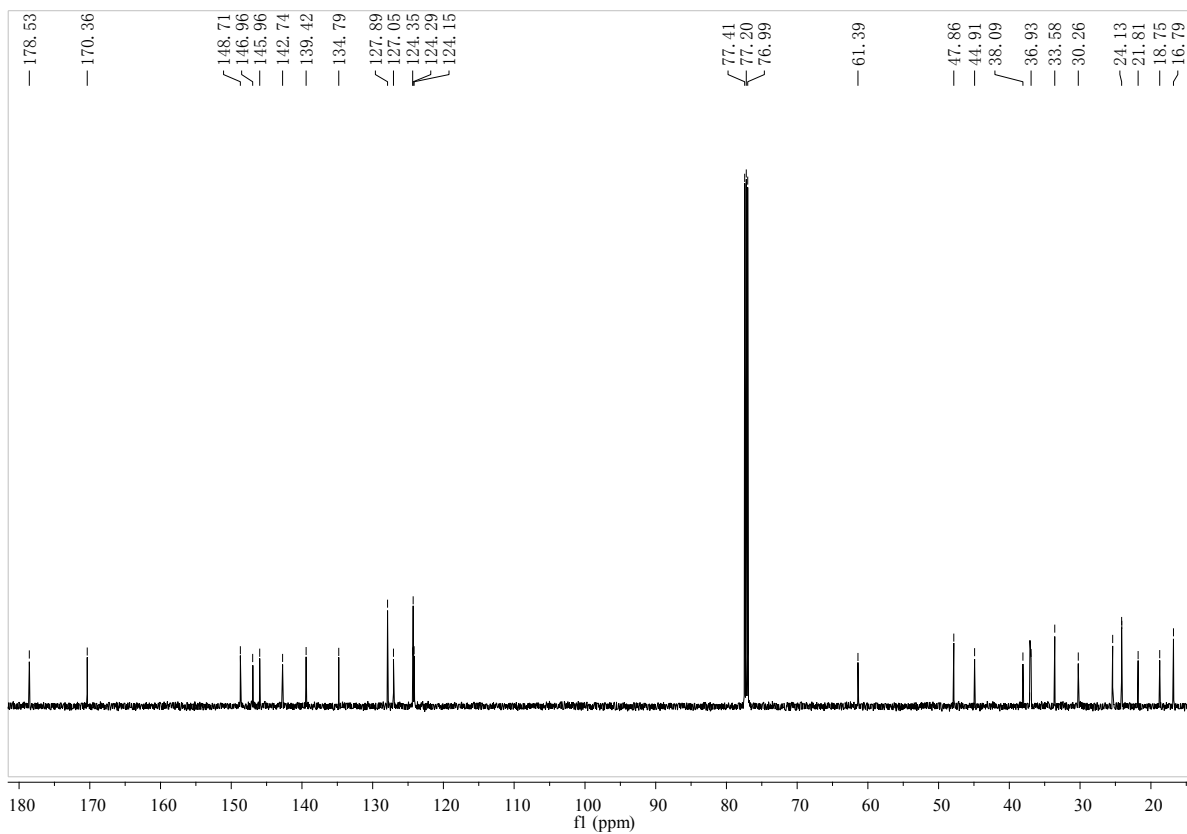


Figure S46. $^{13}\text{C-NMR}$ spectrum of the target compound (**4j**) in CDCl_3

JN-DXJ #131 RT: 1.16 AV: 1 SB: 75 0.05-0.71 NL: 1.62E6
T: - c ESI Q1MS [100.000-1000.000]

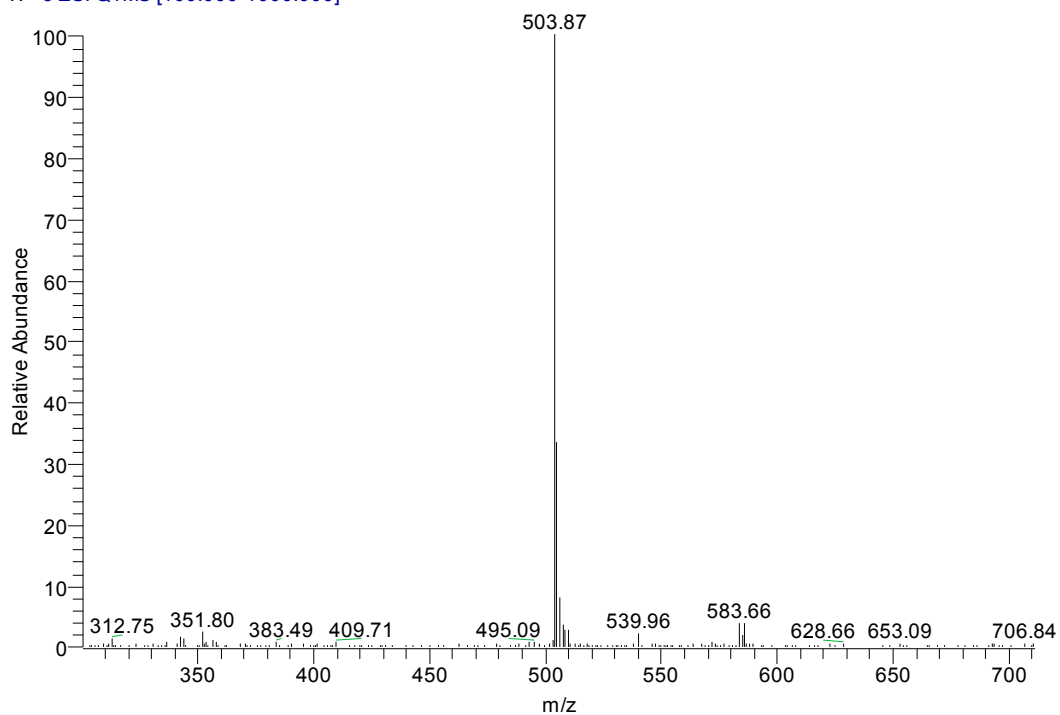


Figure S47. ESI-MS spectrum of the target compound (4j)

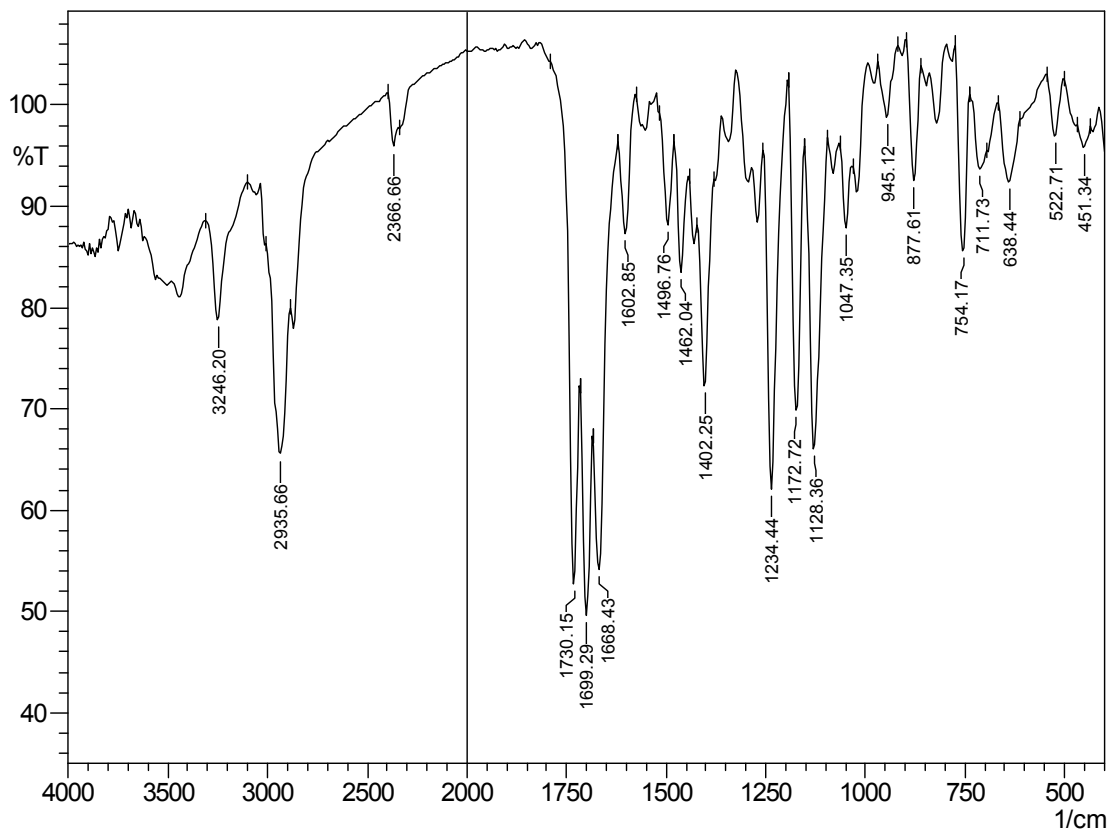


Figure S48. FTIR spectrum of the target compound (4k)

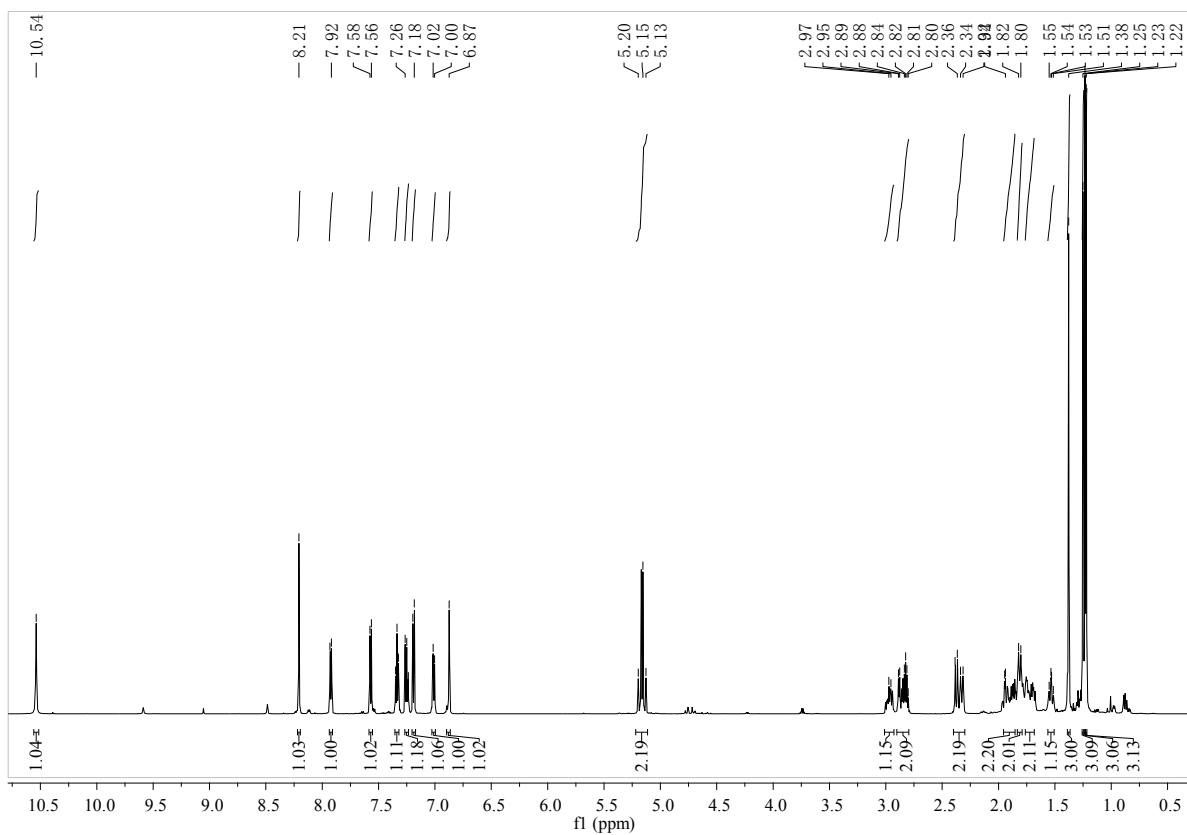


Figure S49. $^1\text{H-NMR}$ spectrum of the target compound (**4k**) in CDCl_3

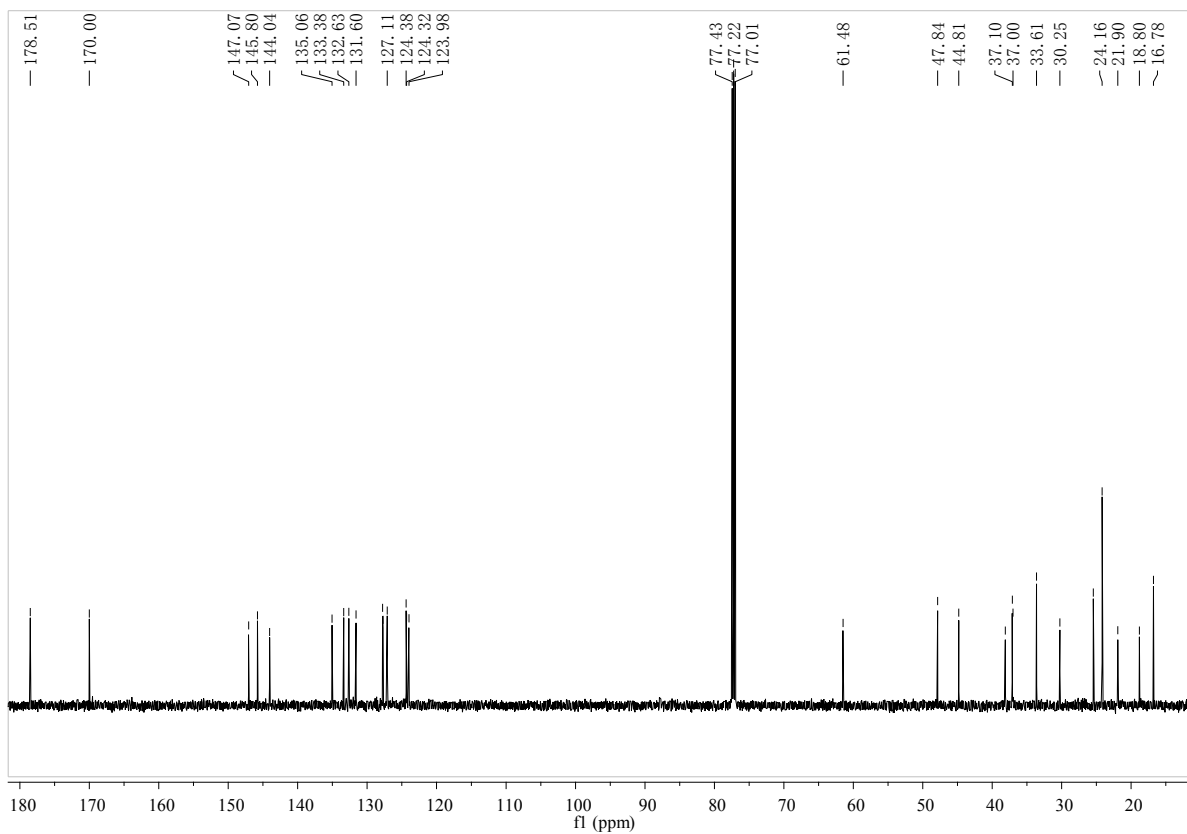


Figure S50. $^{13}\text{C-NMR}$ spectrum of the target compound (**4k**) in CDCl_3

JN-2-BR #74 RT: 0.65 AV: 1 SB: 43 0.00-0.37 NL: 2.15E6
T: - c ESI Q1MS [100.000-1000.000]

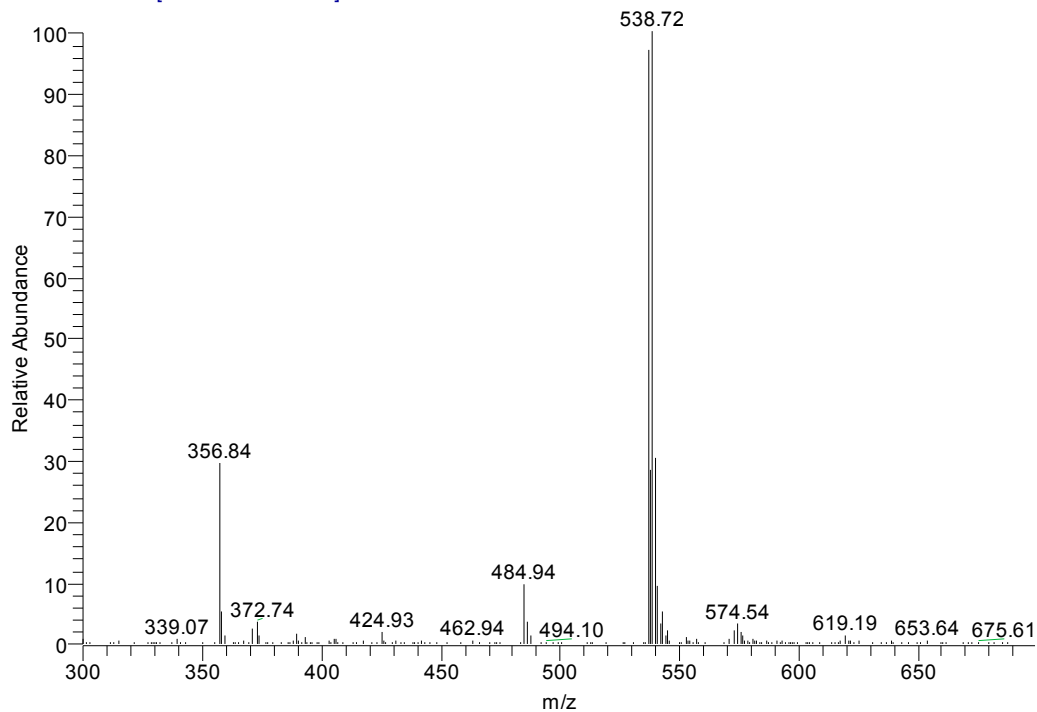


Figure S51. ESI-MS spectrum of the target compound (4k)

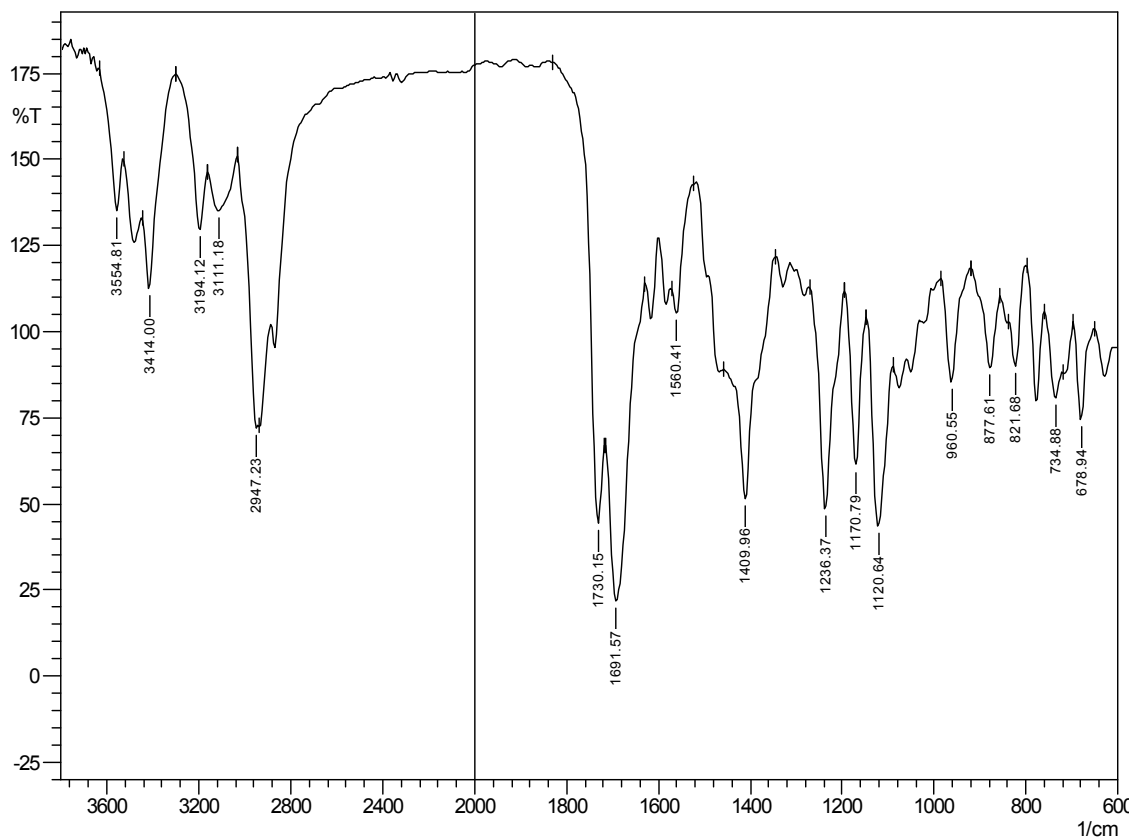


Figure S52. FTIR spectrum of the target compound (4l)

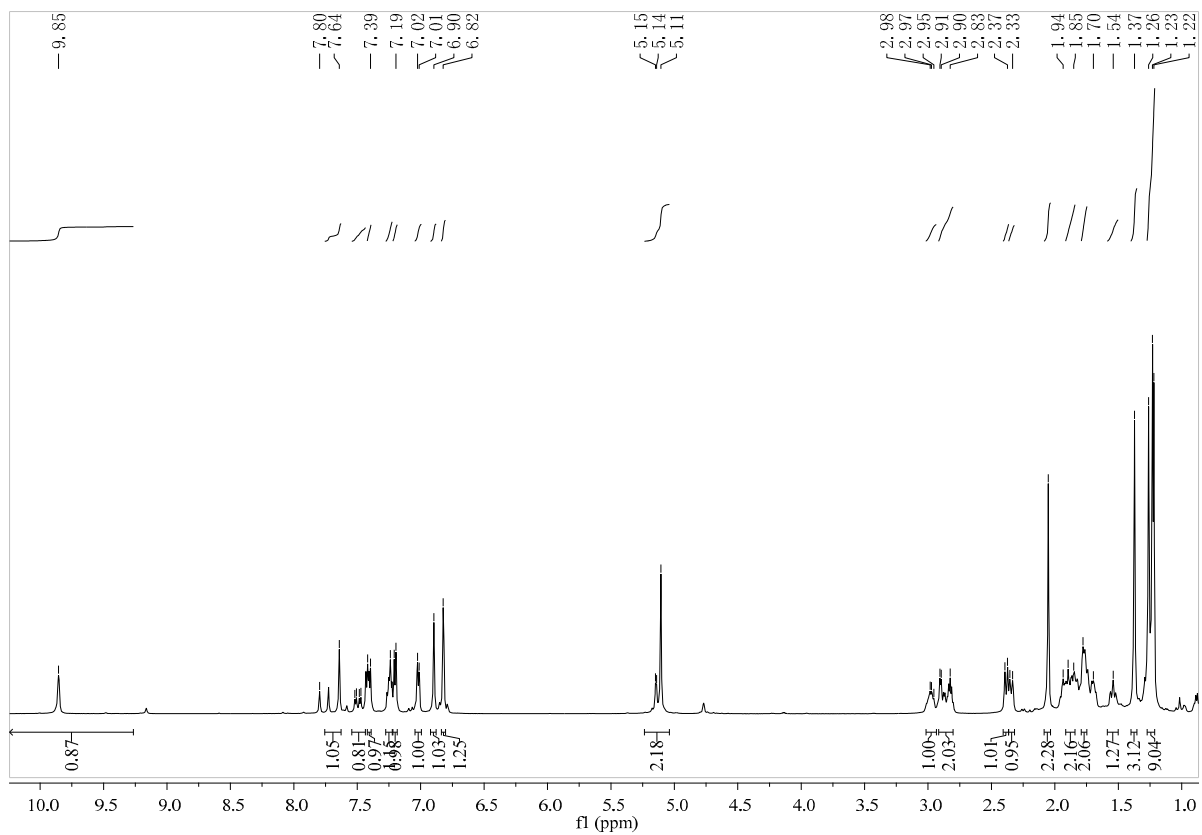


Figure S53. ^1H -NMR spectrum of the target compound (**4**) in CDCl_3

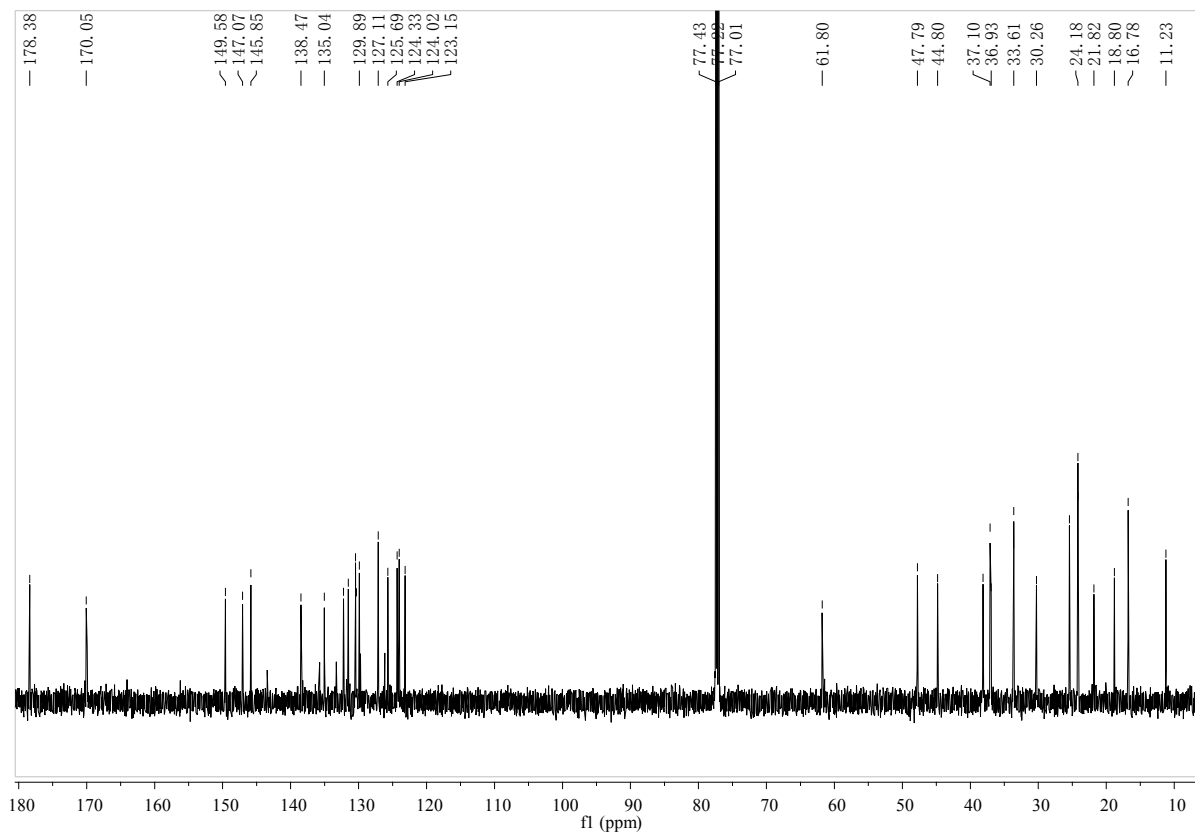


Figure S54. ^{13}C -NMR spectrum of the target compound (**4**) in CDCl_3

JN-3-BR #68 RT: 0.60 AV: 1 SB: 91 1.31-1.76, 0.01-0.34 NL: 7.70E5
T: - c ESI Q1MS [100.000-1000.000]

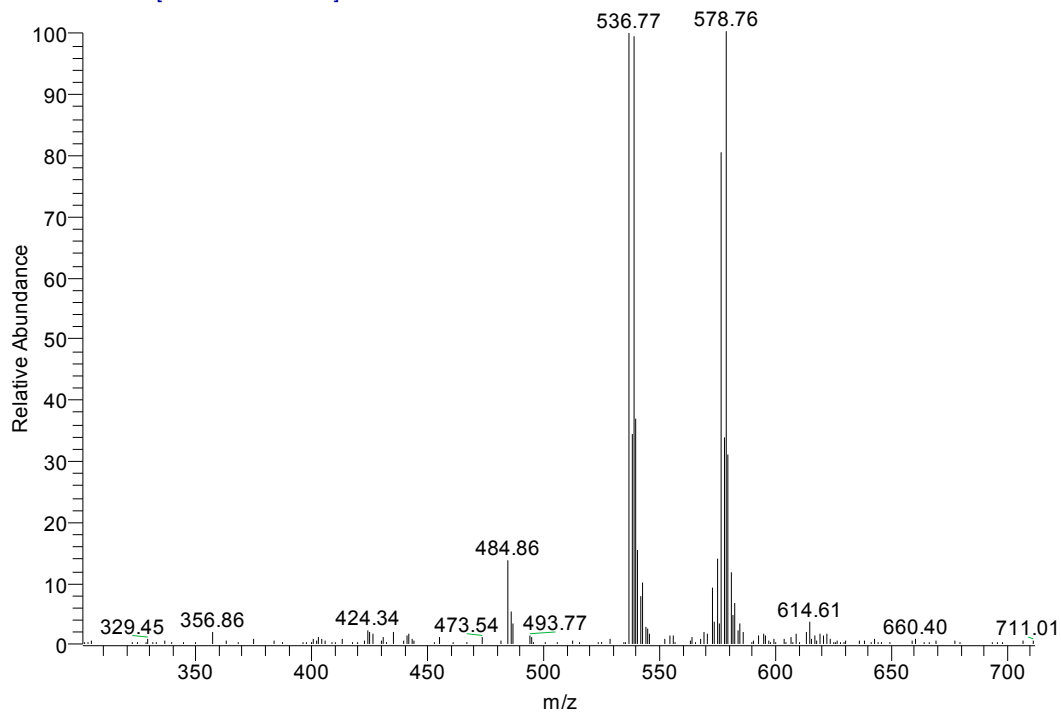


Figure S55. ESI-MS spectrum of the target compound (4l)

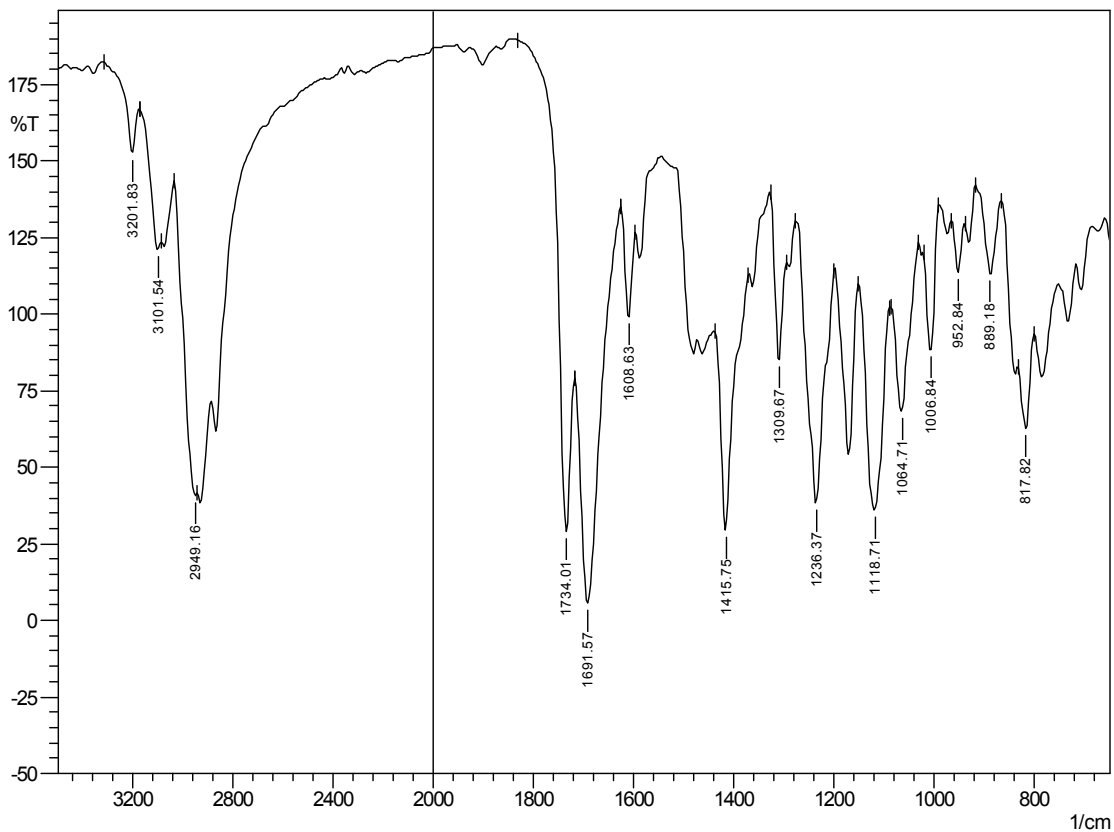


Figure S56. FTIR spectrum of the target compound (4m)

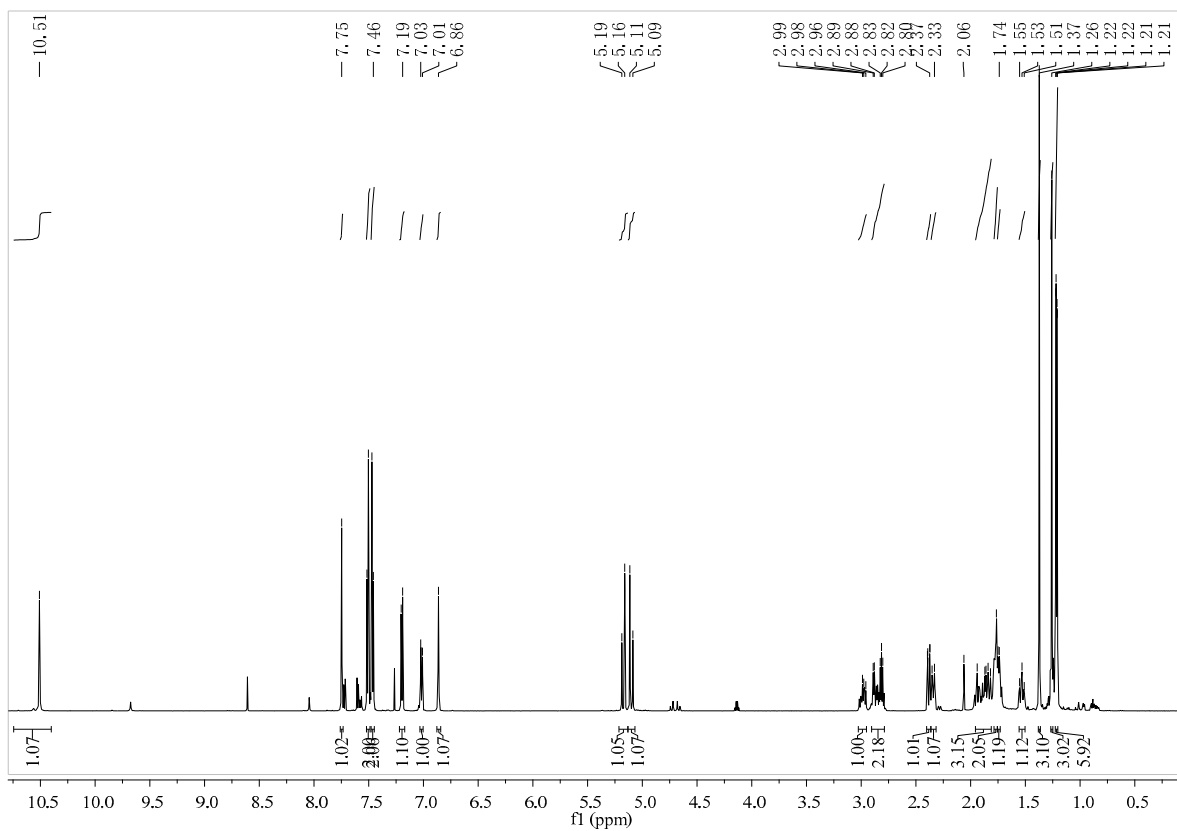


Figure S57. $^1\text{H-NMR}$ spectrum of the target compound (**4m**) in CDCl_3

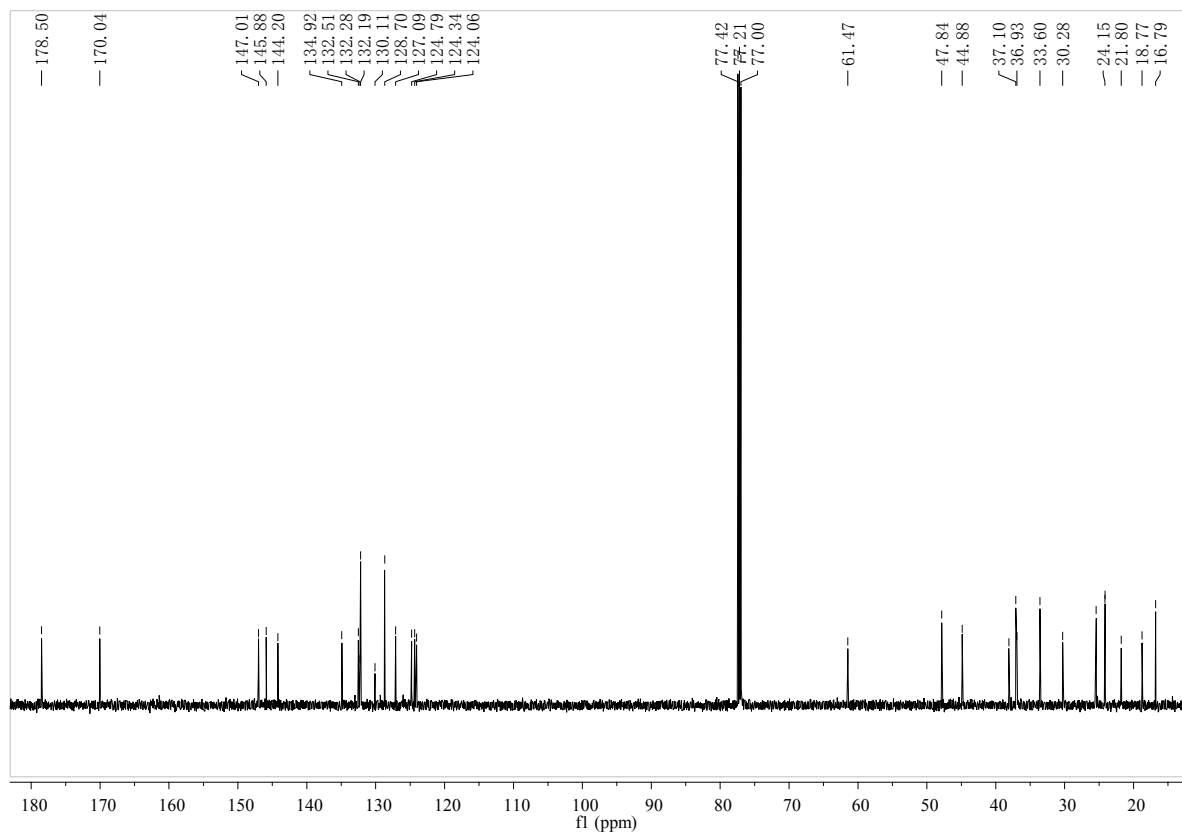


Figure S58. $^{13}\text{C-NMR}$ spectrum of the target compound (**4m**) in CDCl_3

JN-DX#97 RT: 0.86 AV: 1 NL: 2.20E6
T: - c ESI Q1MS [100.000-1000.000]

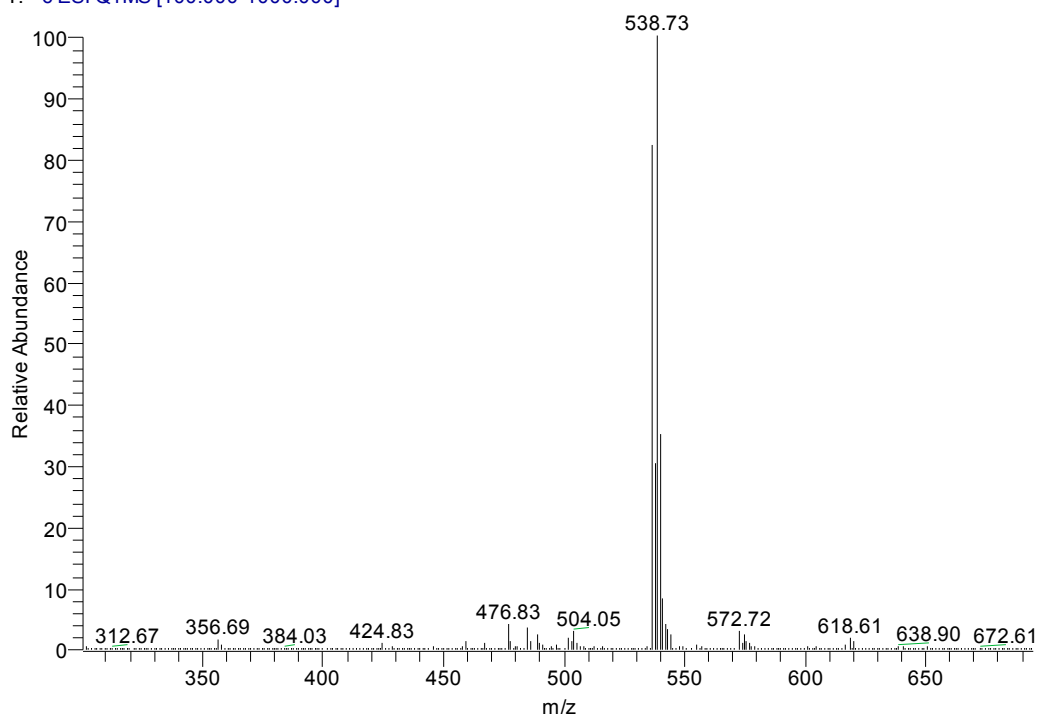


Figure S59. ESI-MS spectrum of the target compound (4m)

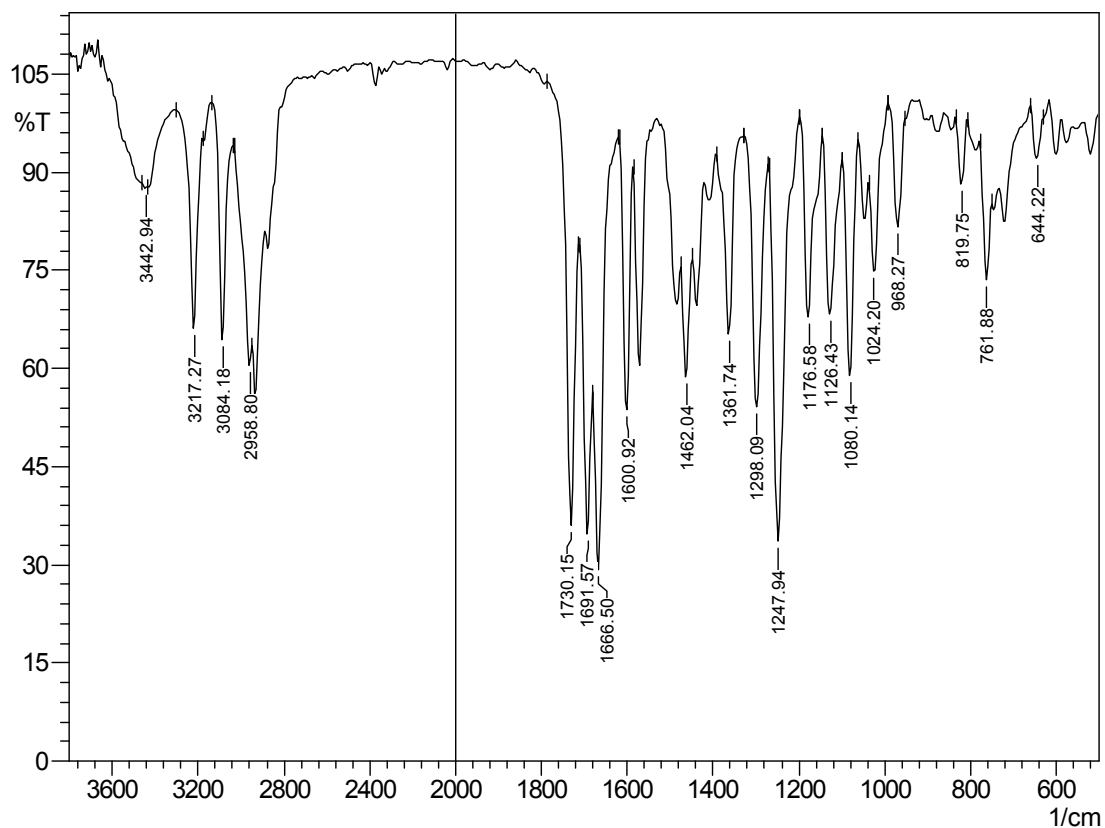


Figure S60. FTIR spectrum of the target compound (4n)

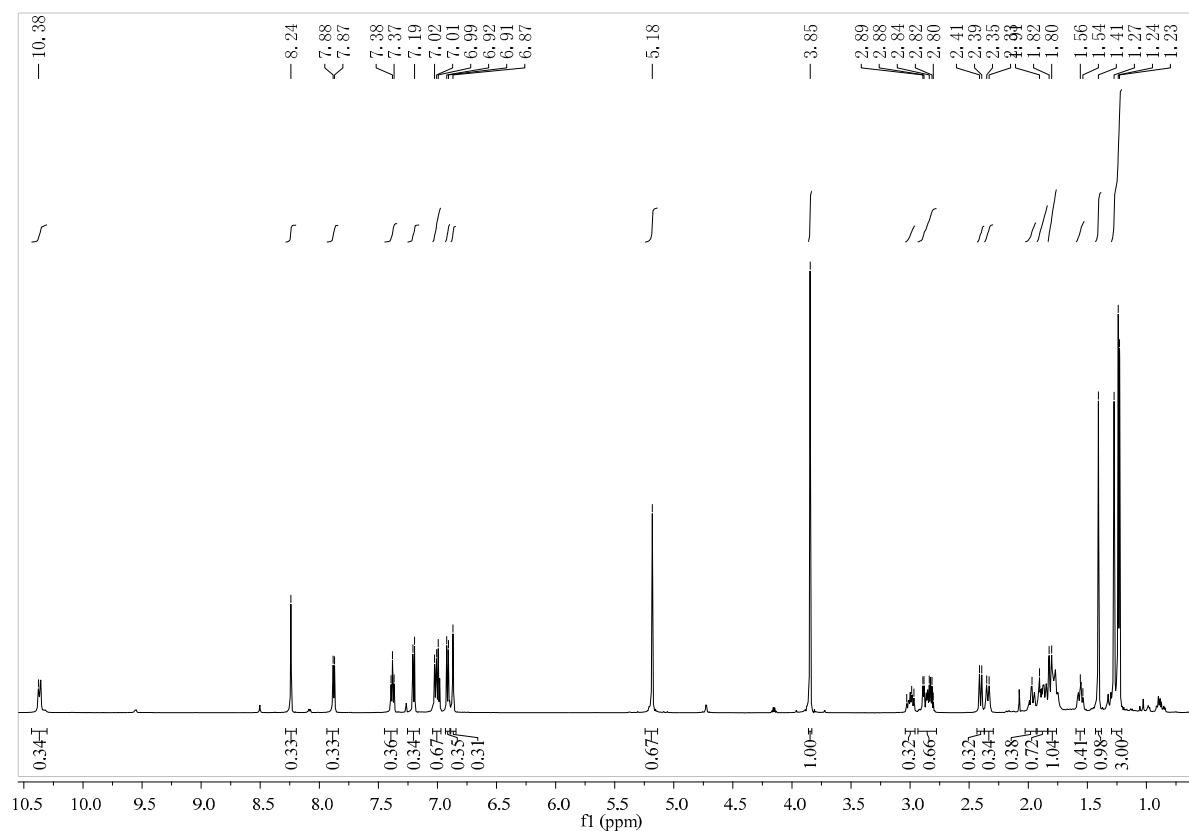


Figure S61. ¹H-NMR spectrum of the target compound (**4n**) in CDCl₃

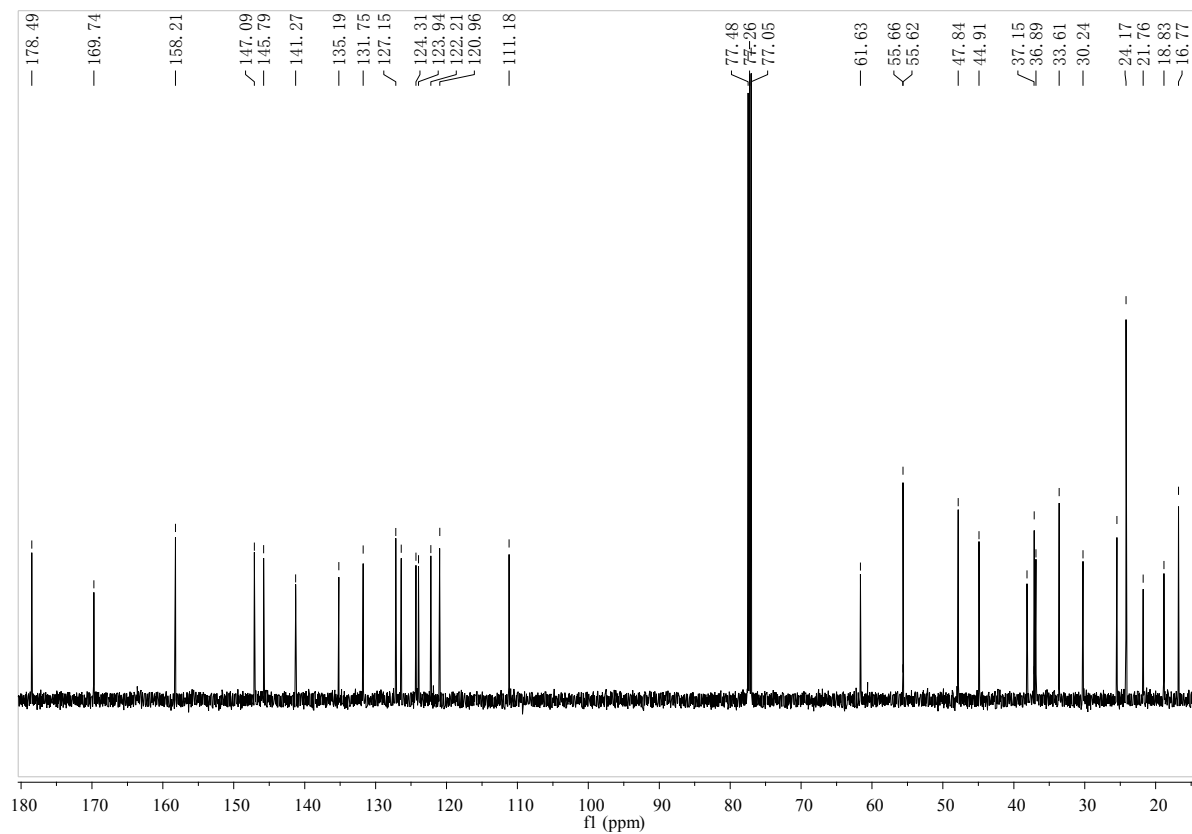


Figure S62. ¹³C-NMR spectrum of the target compound (**4n**) in CDCl₃

JN-2-JYJ #141 RT: 1.25 AV: 1 NL: 5.46E6
T: - c ESI Q1MS [100.000-1000.000]

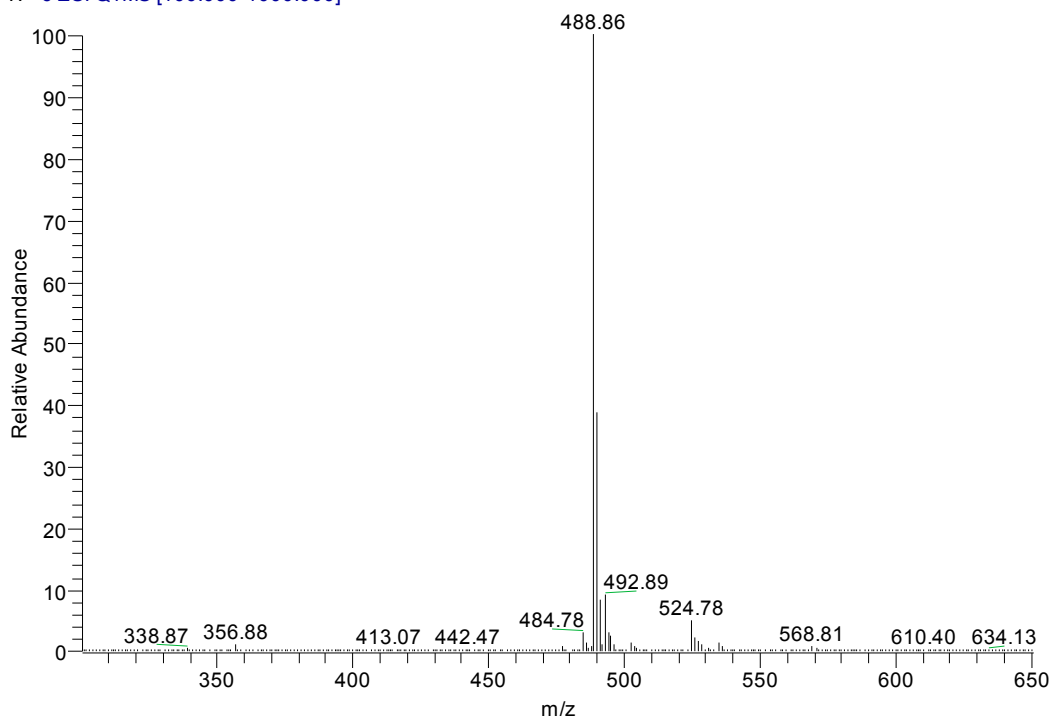


Figure S63. ESI-MS spectrum of the target compound (4n)

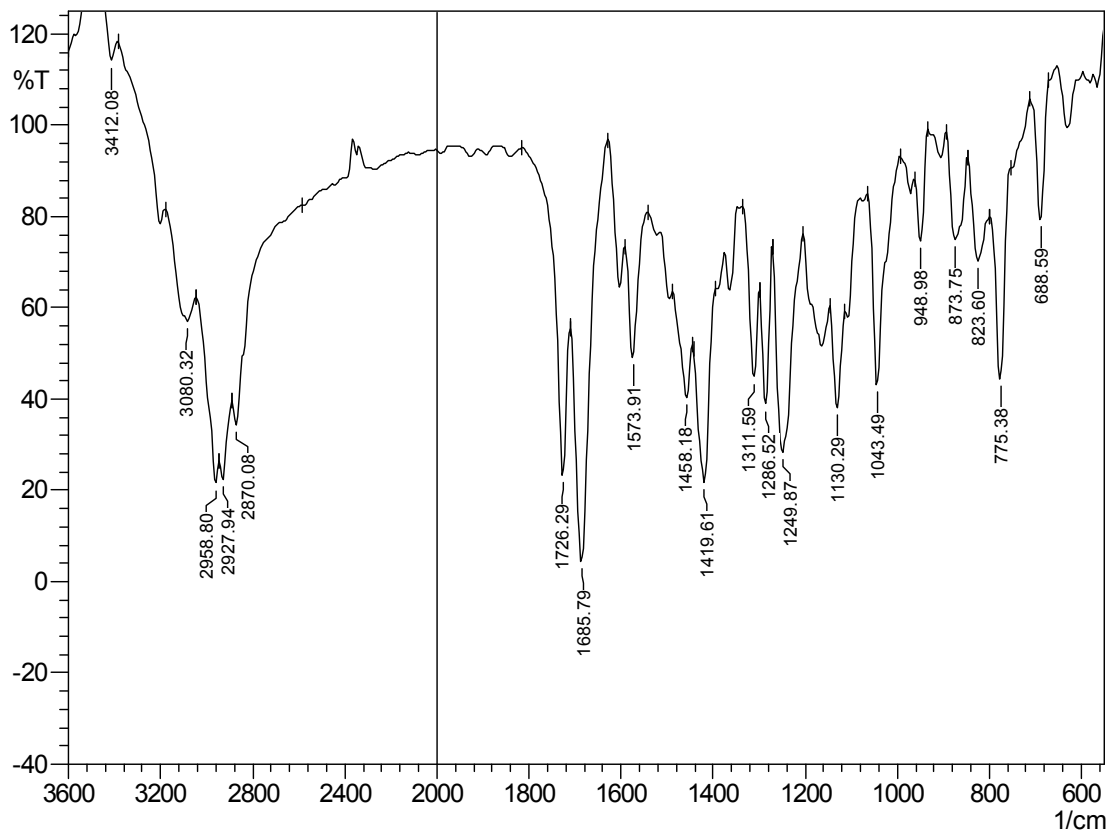


Figure S64. FTIR spectrum of the target compound (4o)

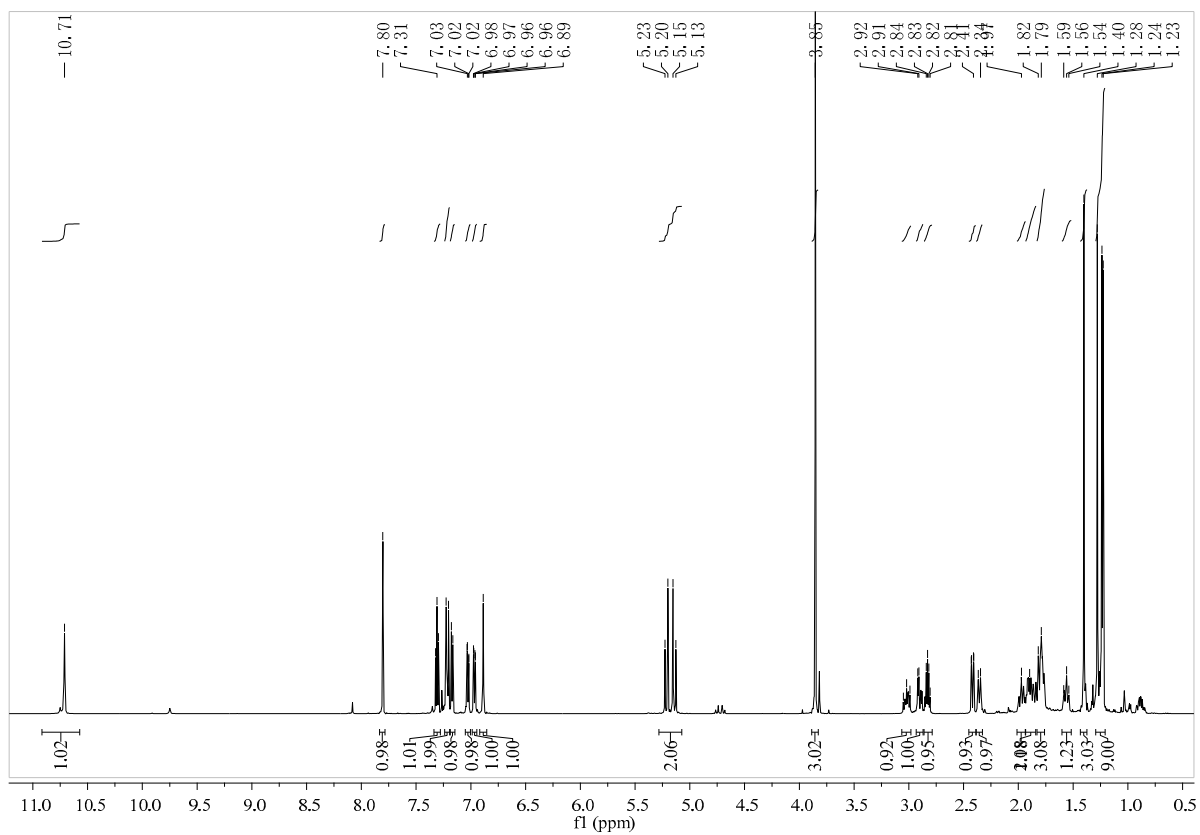


Figure S65. $^1\text{H-NMR}$ spectrum of the target compound (**4o**) in CDCl_3

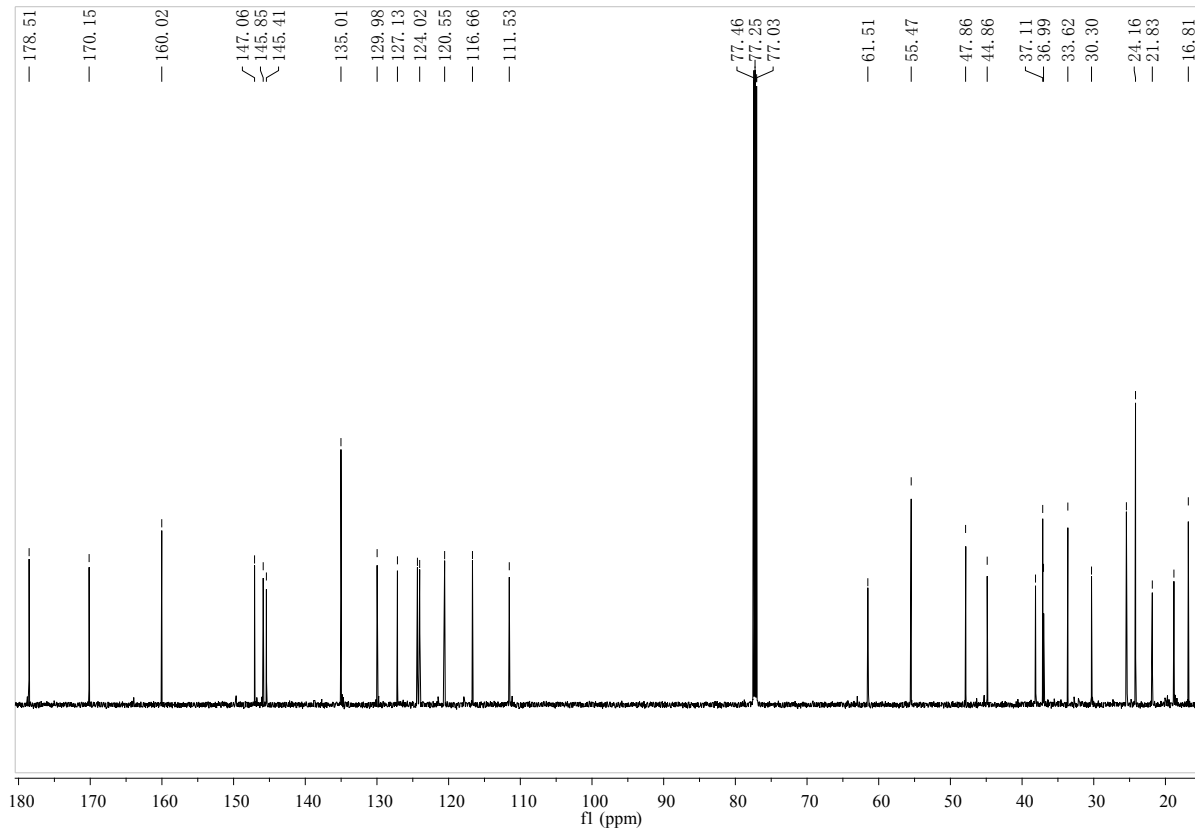


Figure S66. $^{13}\text{C-NMR}$ spectrum of the target compound (**4o**) in CDCl_3

JN-3-JYJ #70 RT: 0.62 AV: 1 SB: 37 0.01-0.33 NL: 1.32E6
T: - c ESI Q1MS [100.000-1000.000]

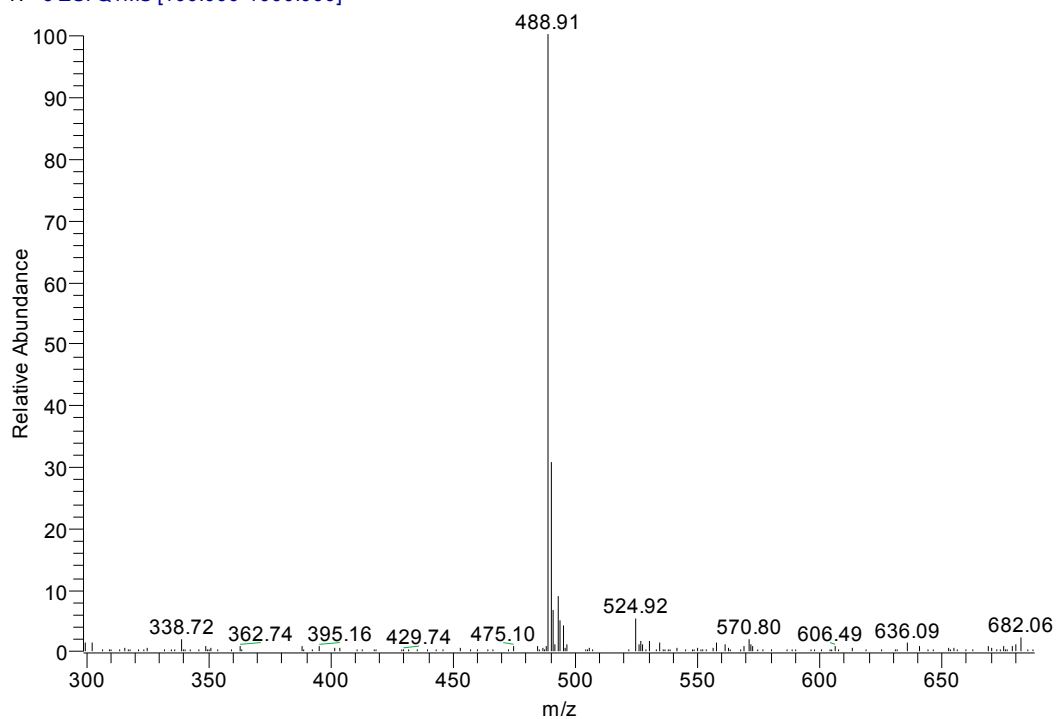


Figure S67. ESI-MS spectrum of the target compound (4o)

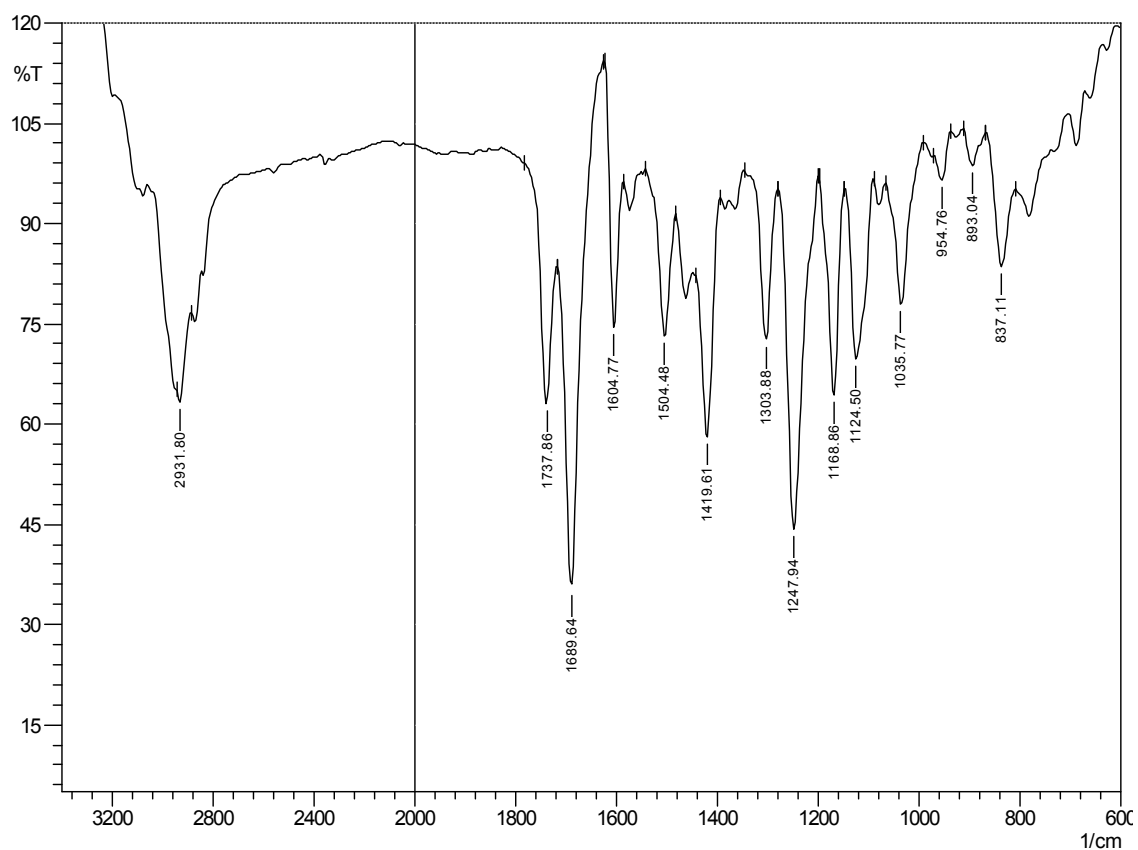


Figure S68. FTIR spectrum of the target compound (4p)

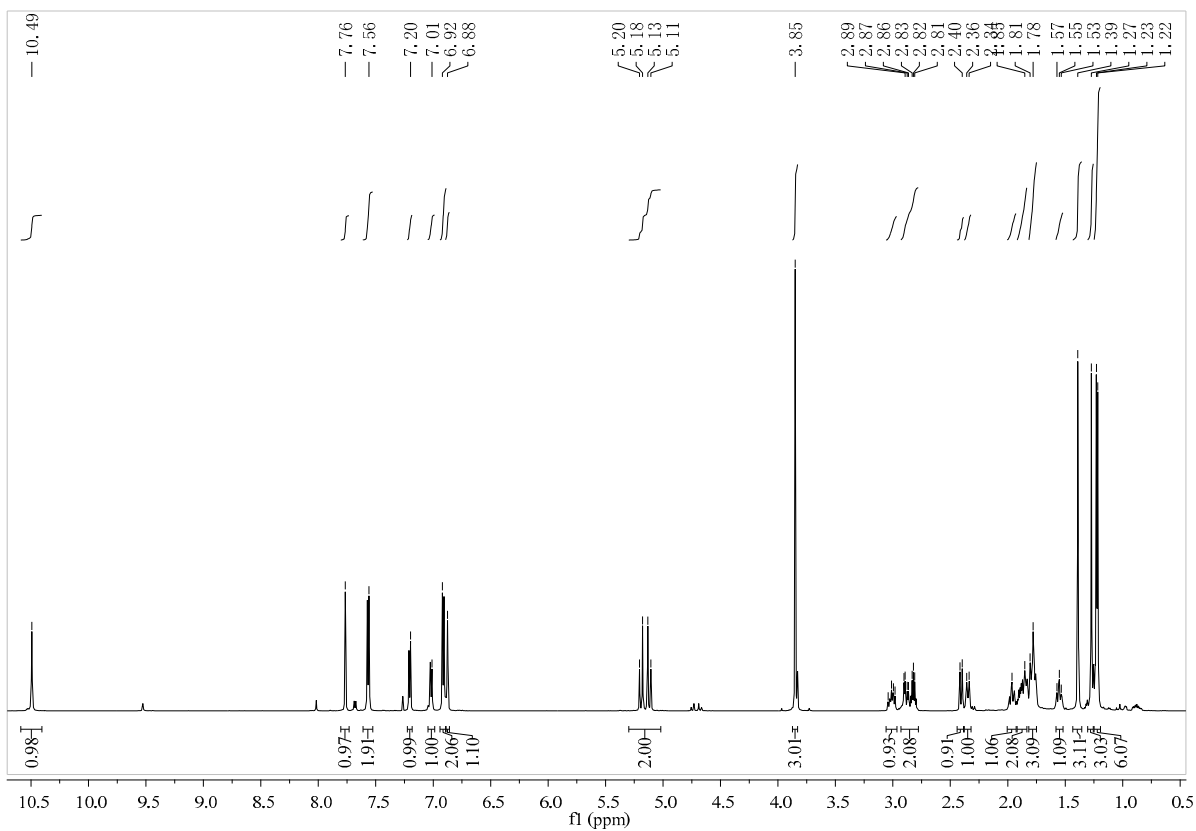


Figure S69. $^1\text{H-NMR}$ spectrum of the target compound (**4p**) in CDCl_3

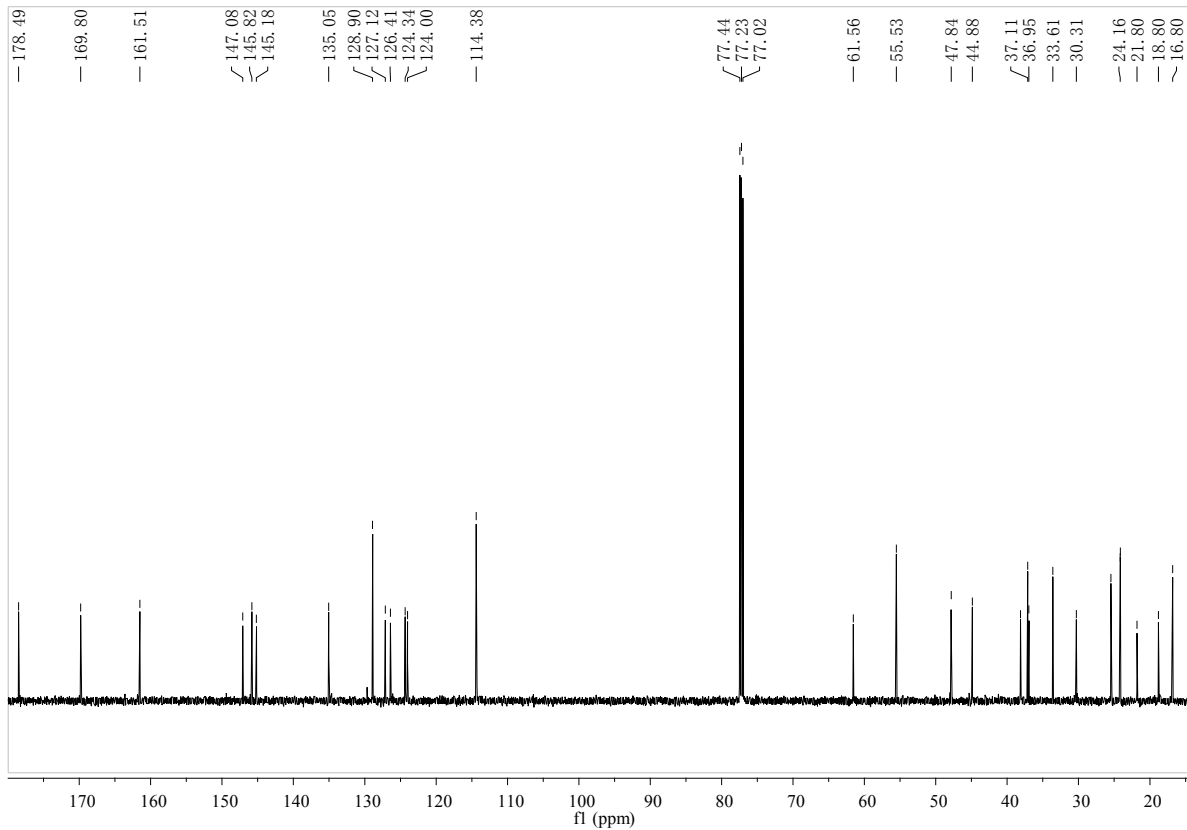


Figure S70. $^{13}\text{C-NMR}$ spectrum of the target compound (**4p**) in CDCl_3

JN-DJYJ #53 RT: 0.46 AV: 1 NL: 4.44E6
T: - c ESI Q1MS [100.000-1000.000]

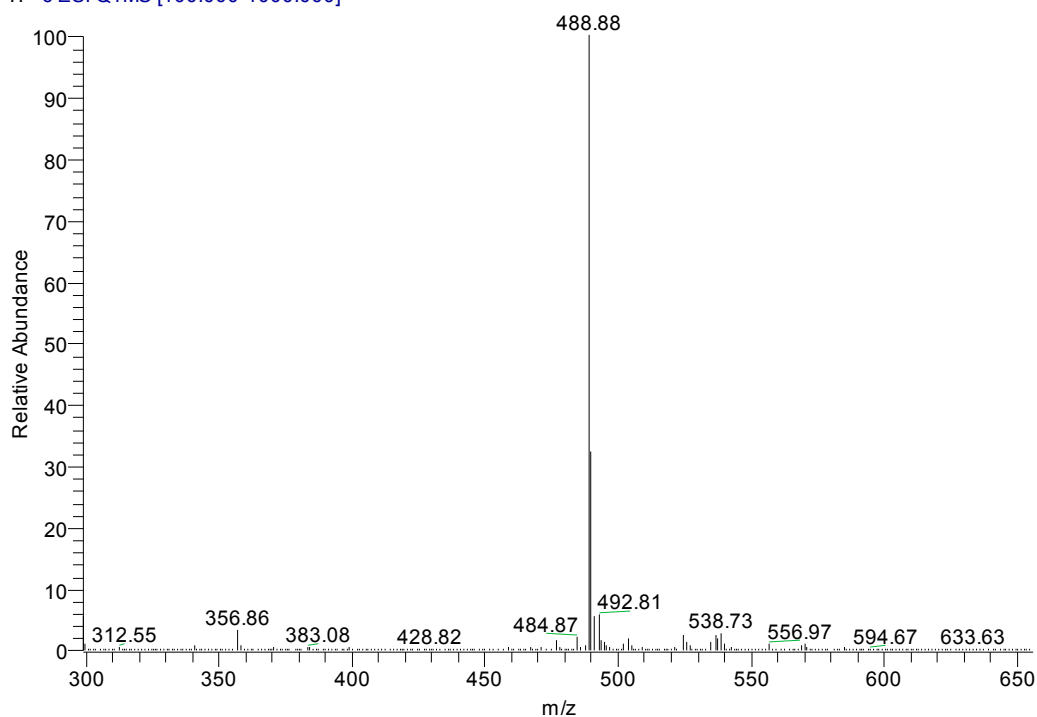


Figure S71. ESI-MS spectrum of the target compound (4p)

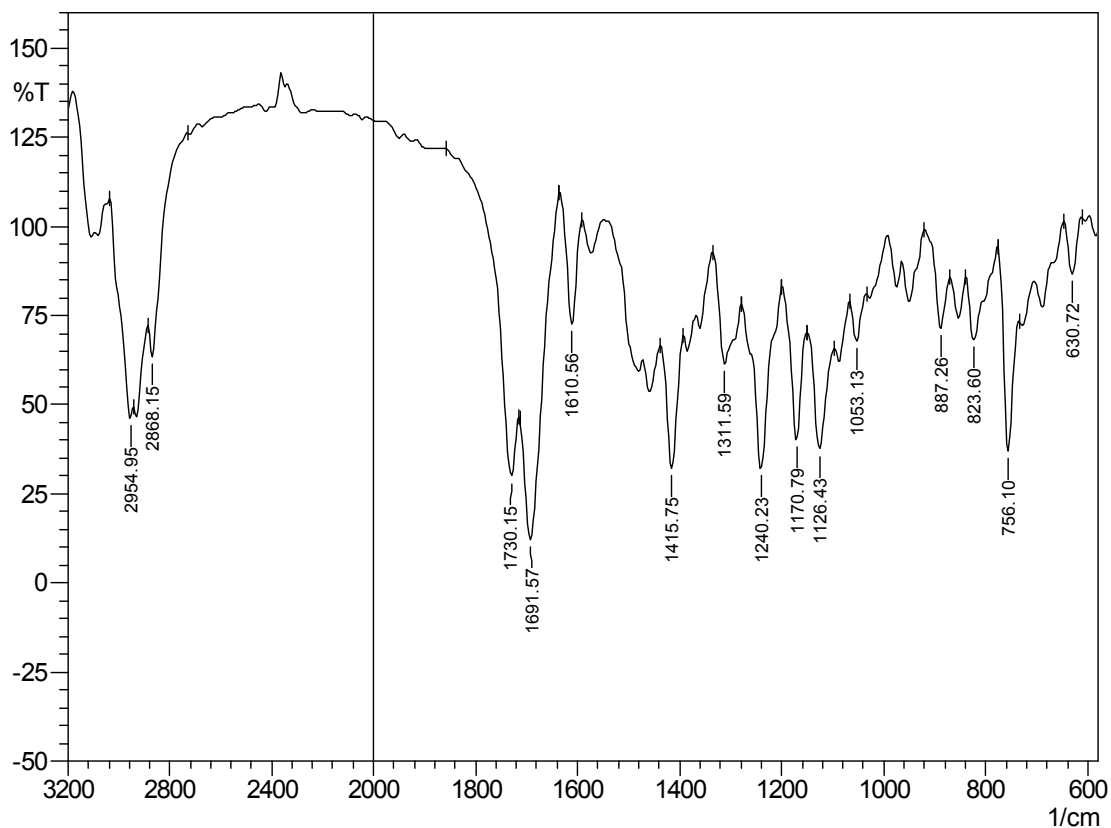


Figure S72. FTIR spectrum of the target compound (4q)

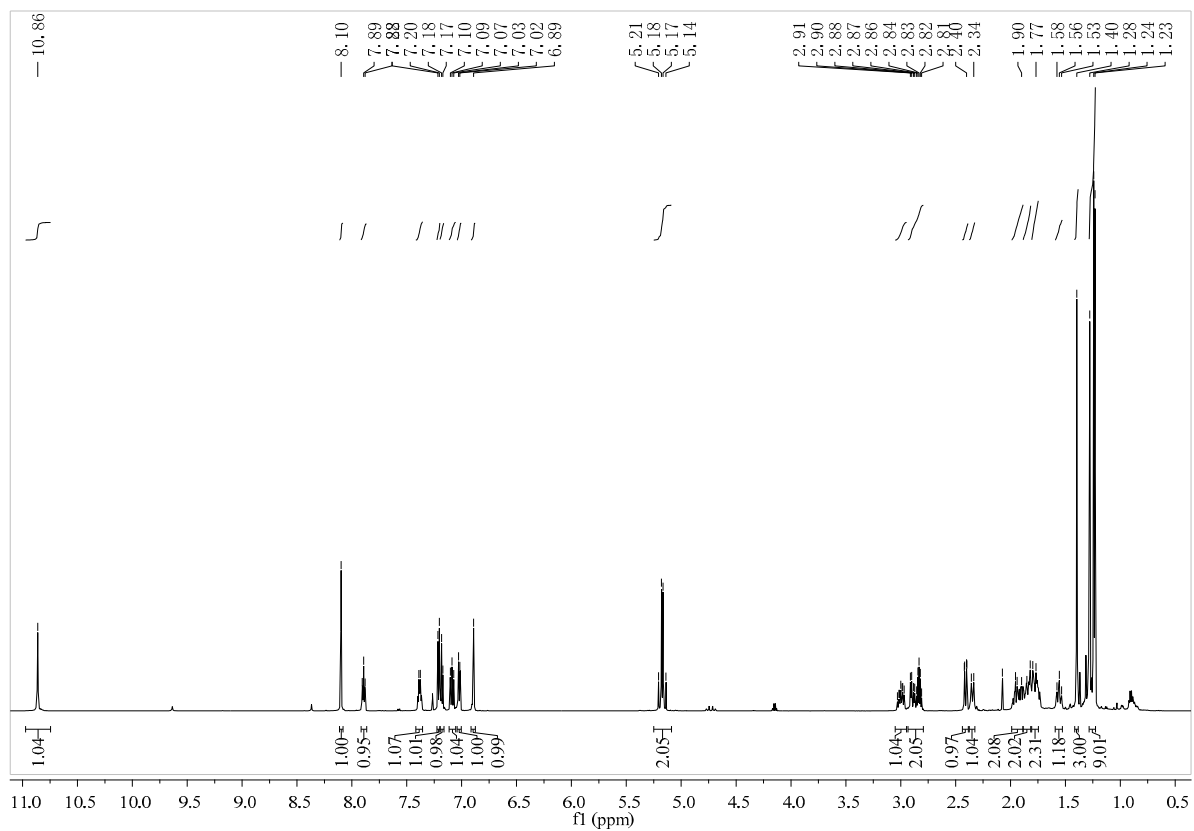


Figure S73. $^1\text{H-NMR}$ spectrum of the target compound (**4q**) in CDCl_3

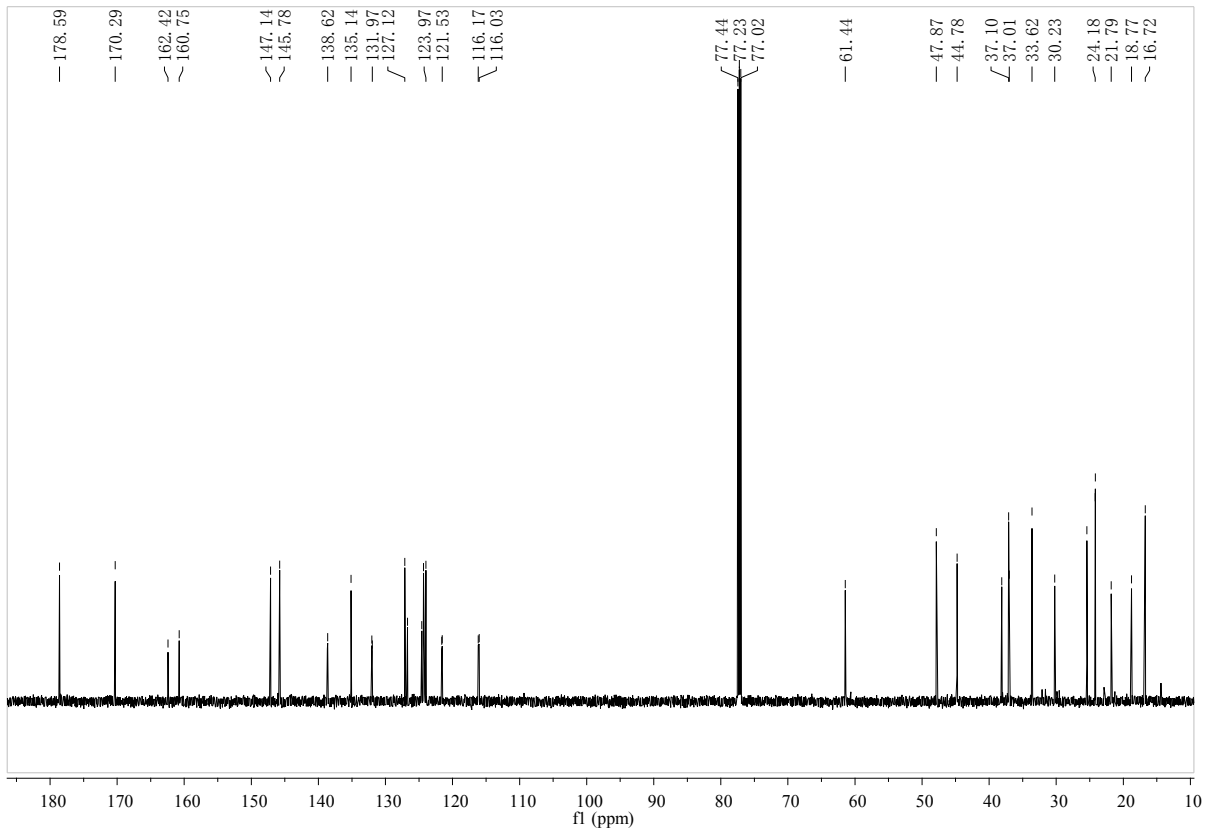


Figure S74. $^{13}\text{C-NMR}$ spectrum of the target compound (**4q**) in CDCl_3

JN-2-F #71 RT: 0.63 AV: 1 SB: 42 0.01-0.37 NL: 4.66E6
T: - c ESI Q1MS [100.000-1000.000]

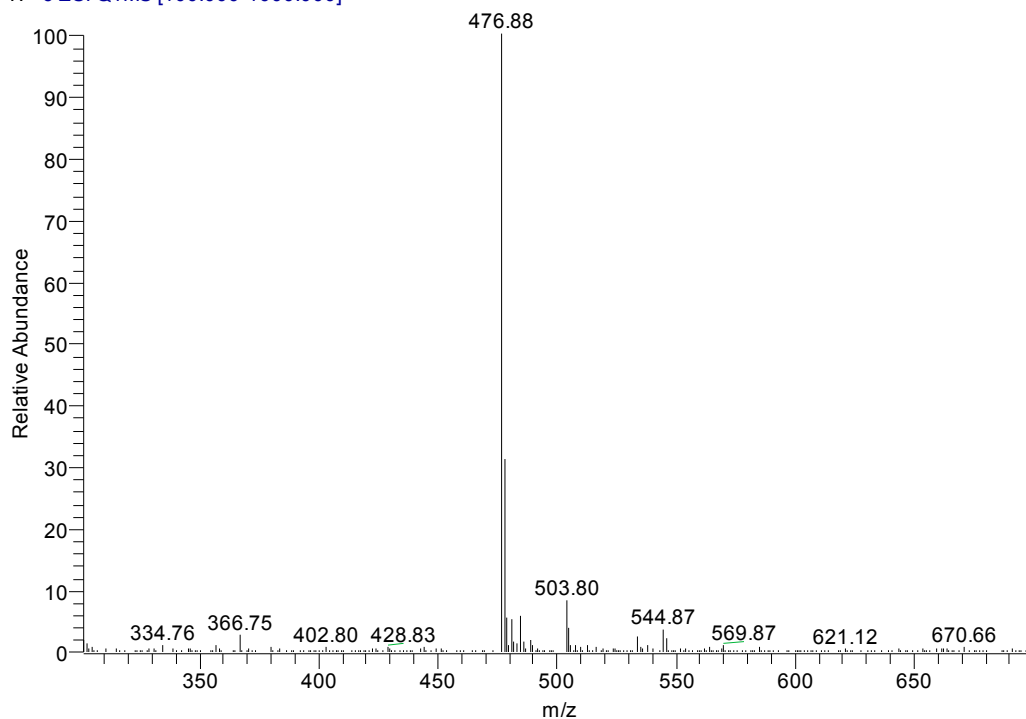


Figure S75. ESI-MS spectrum of the target compound (4q)

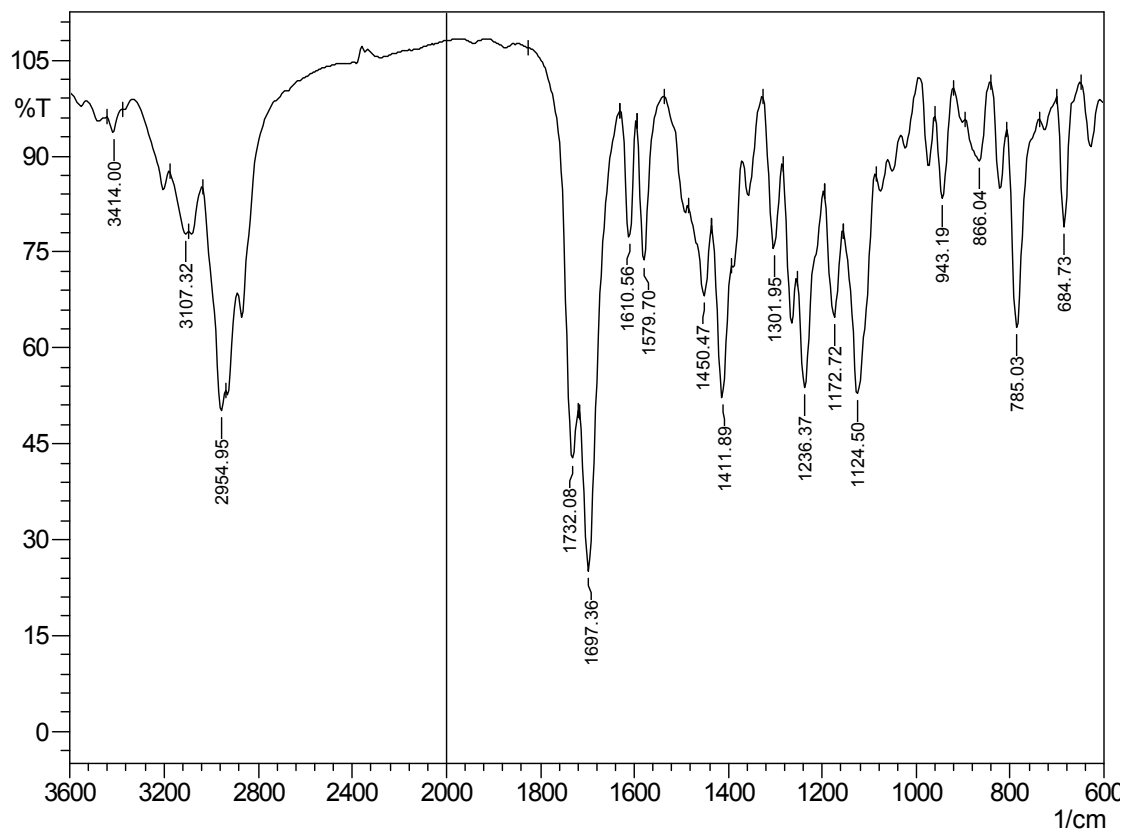


Figure S76. FTIR spectrum of the target compound (4r)

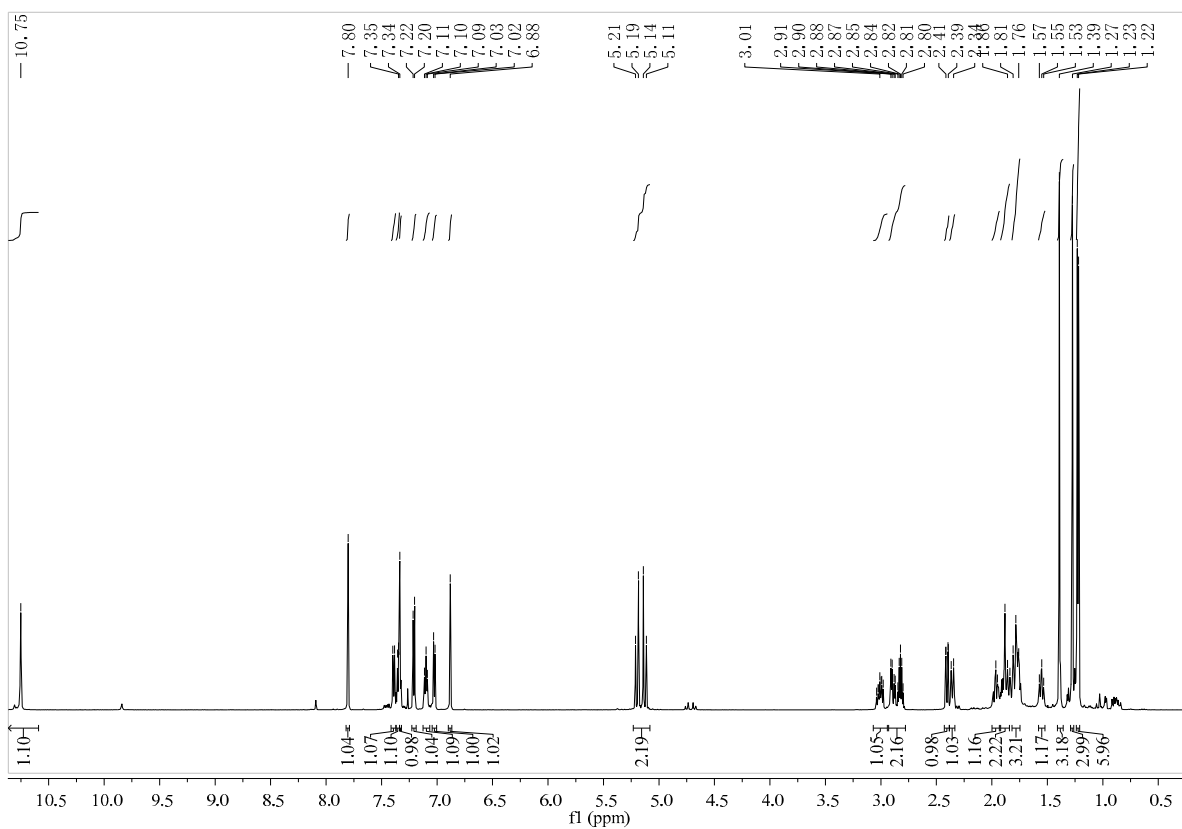


Figure S77. $^1\text{H-NMR}$ spectrum of the target compound (**4r**) in CDCl_3

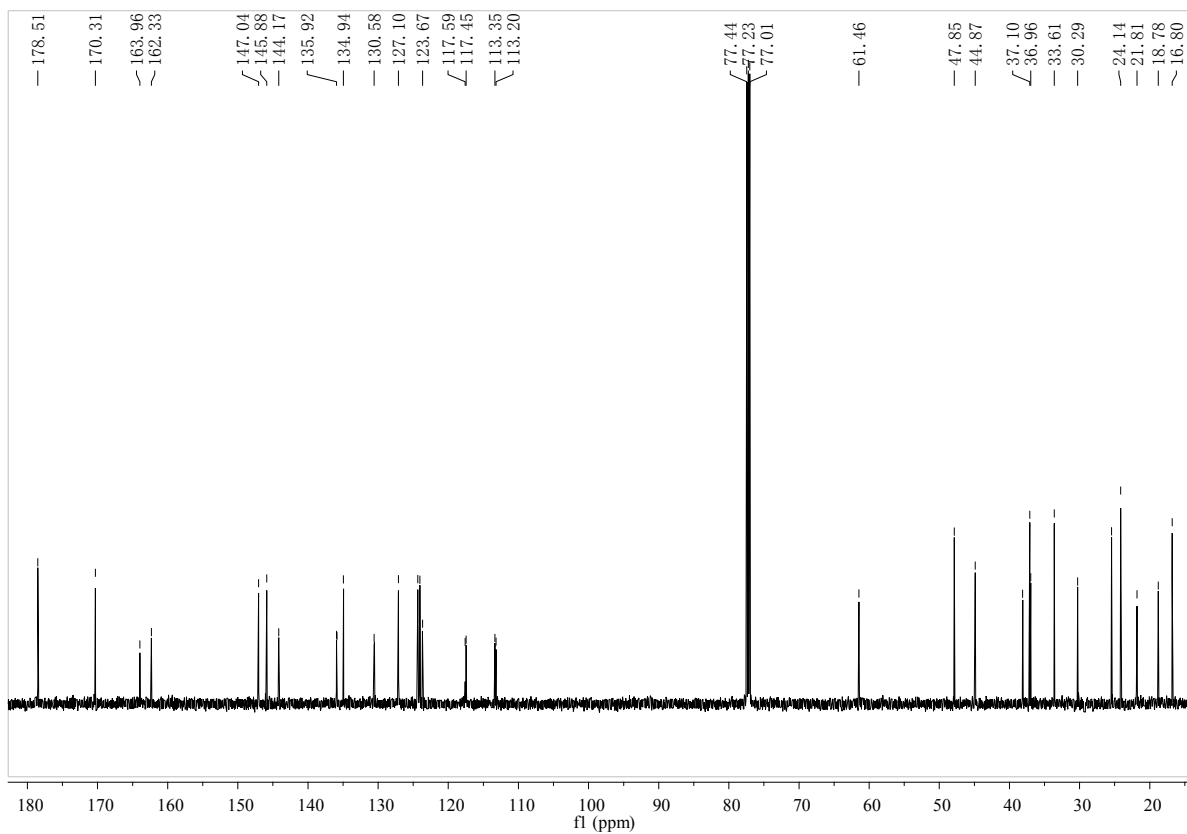


Figure S78. $^{13}\text{C-NMR}$ spectrum of the target compound (**4r**) in CDCl_3

JN-3F #75 RT: 0.66 AV: 1 NL: 6.01E6
T: - c ESI Q1MS [100.000-1000.000]

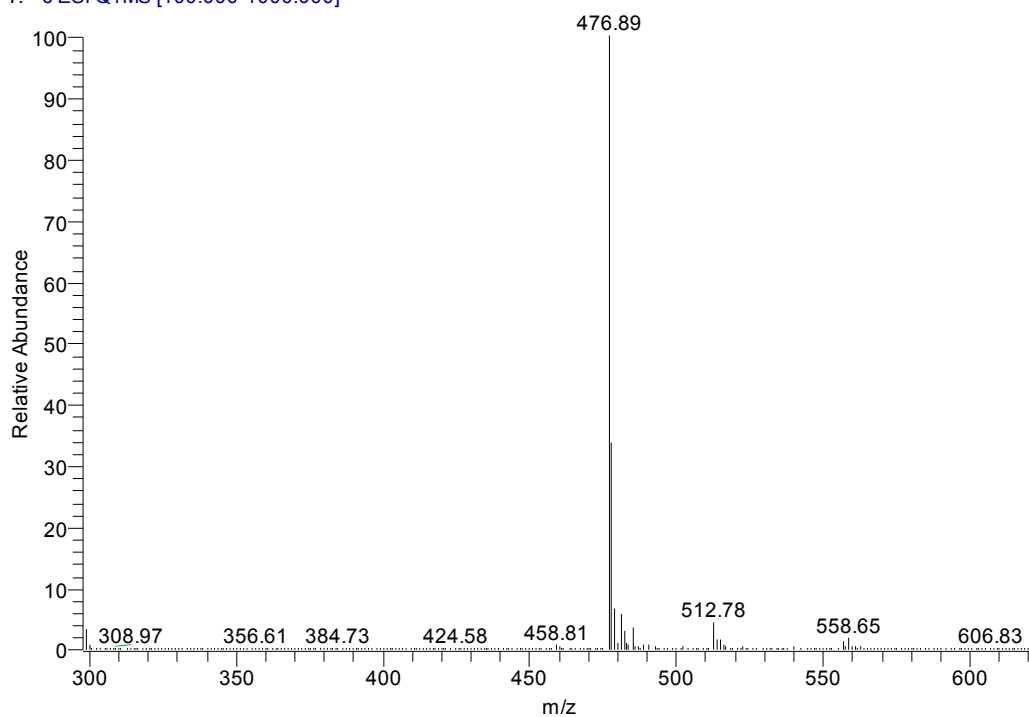


Figure S79. ESI-MS spectrum of the target compound (4r)

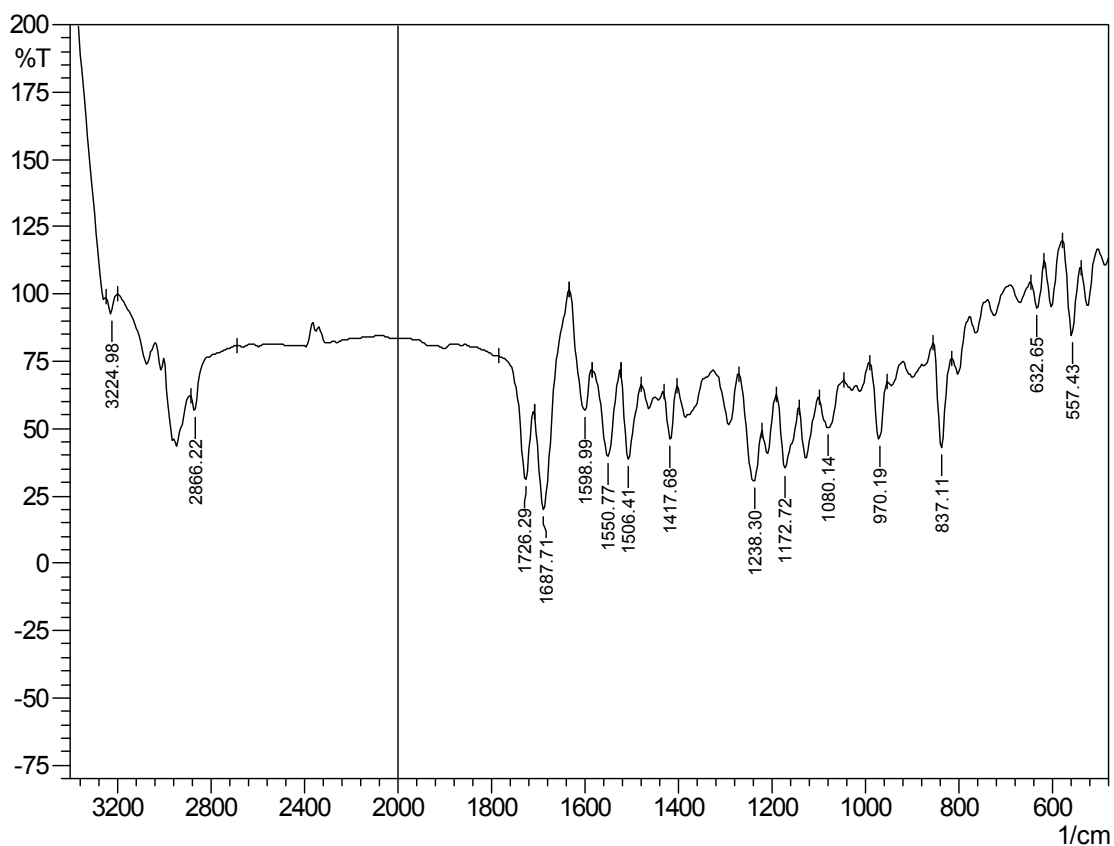


Figure S80. FTIR spectrum of the target compound (4s)

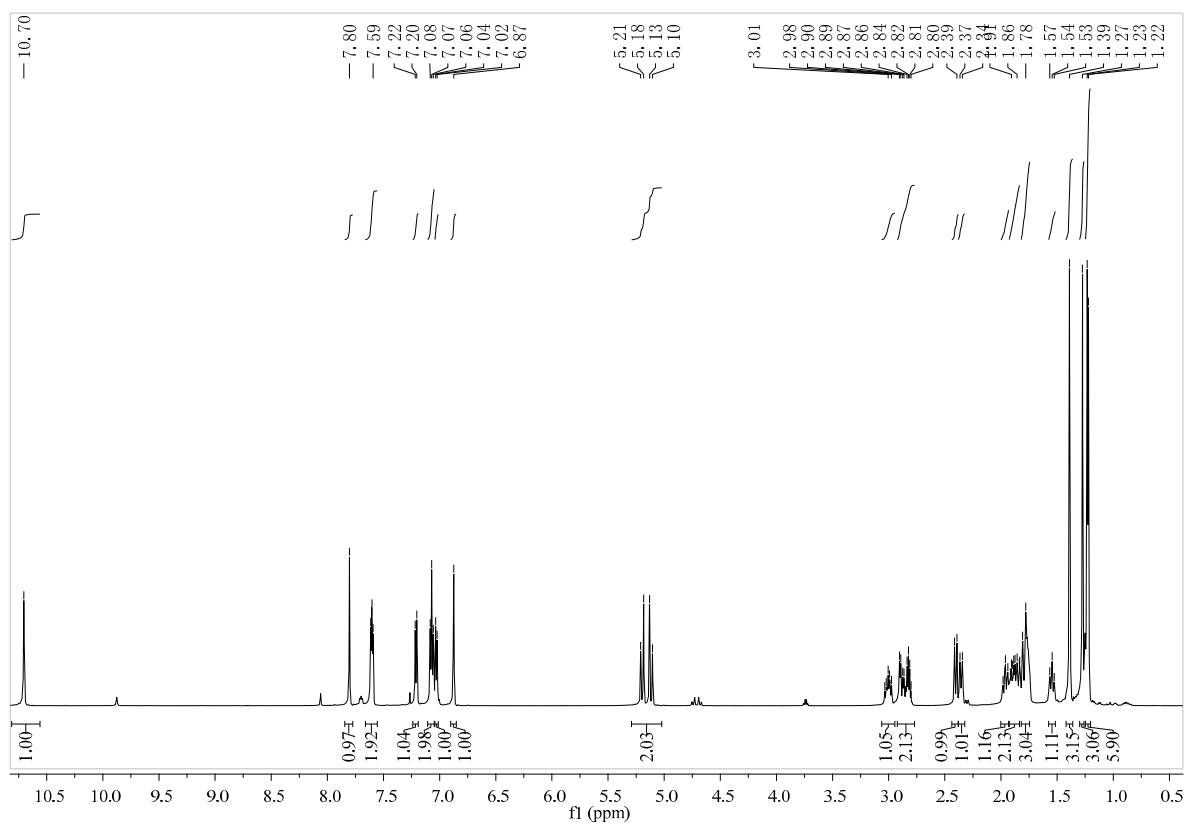


Figure S81. $^1\text{H-NMR}$ spectrum of the target compound (**4s**) in CDCl_3

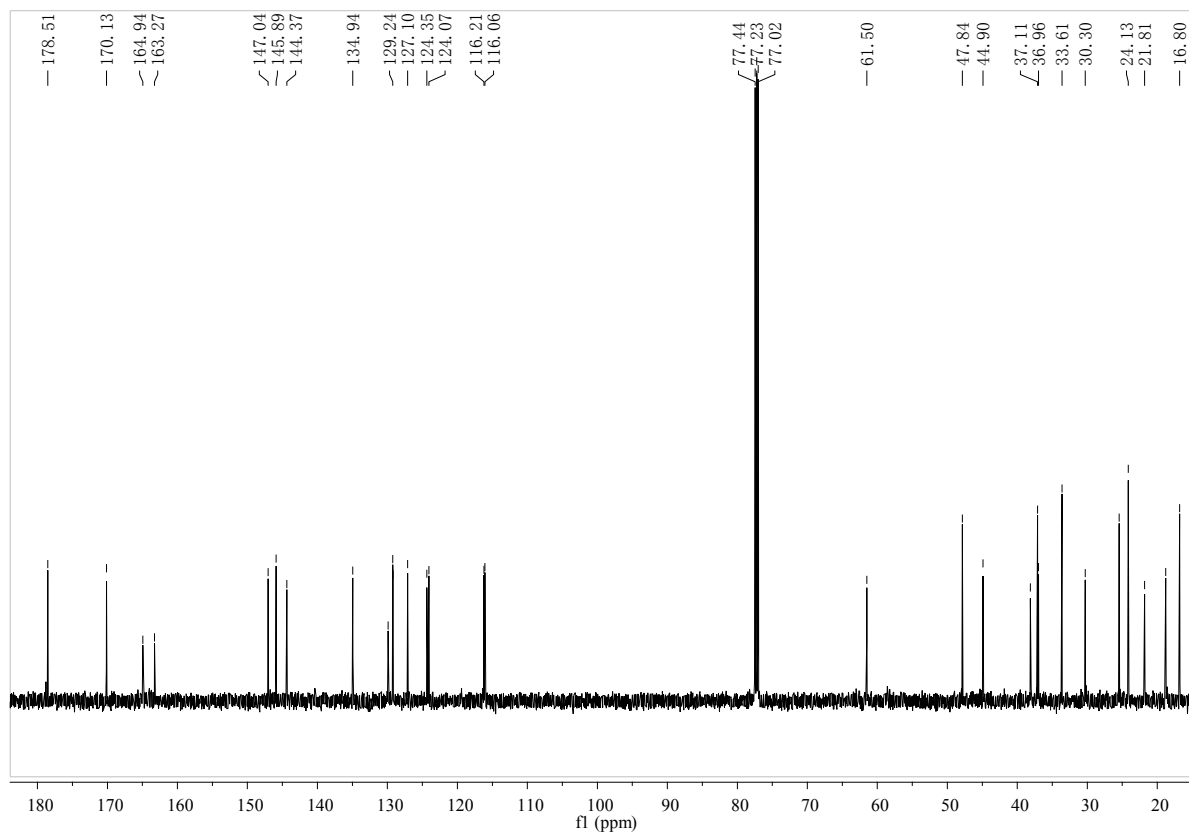


Figure S82. $^{13}\text{C-NMR}$ spectrum of the target compound (**4s**) in CDCl_3

JN-4-F #92 RT: 0.82 AV: 1 NL: 9.75E5
T: - c ESI Q1MS [100.000-1000.000]

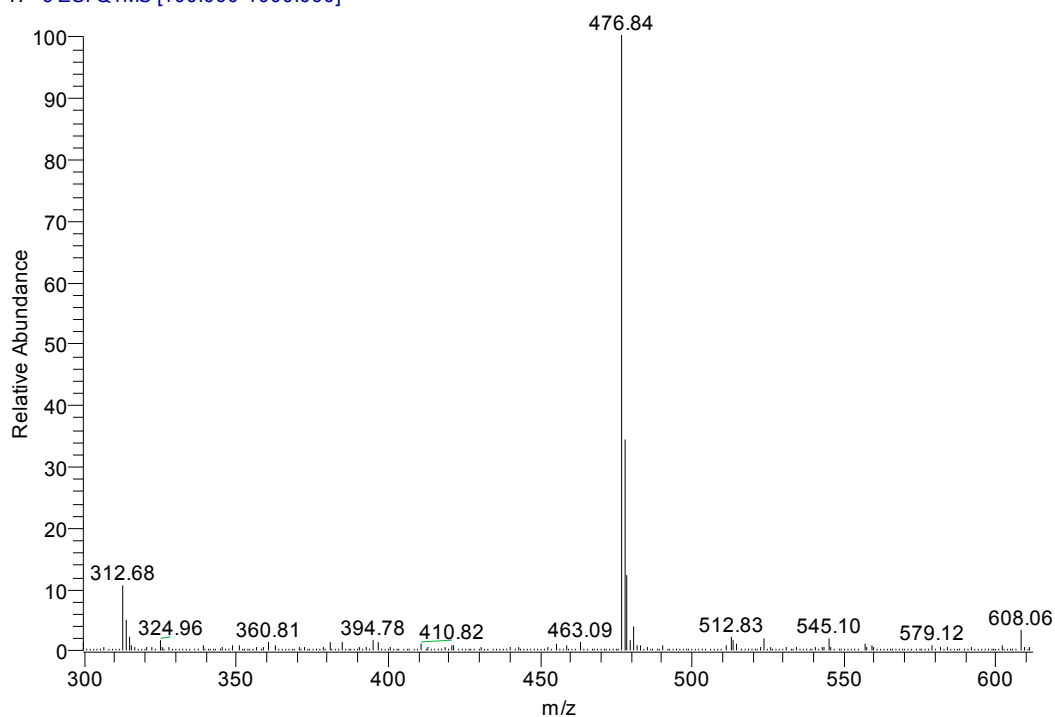


Figure S83. ESI-MS spectrum of the target compound (4s)

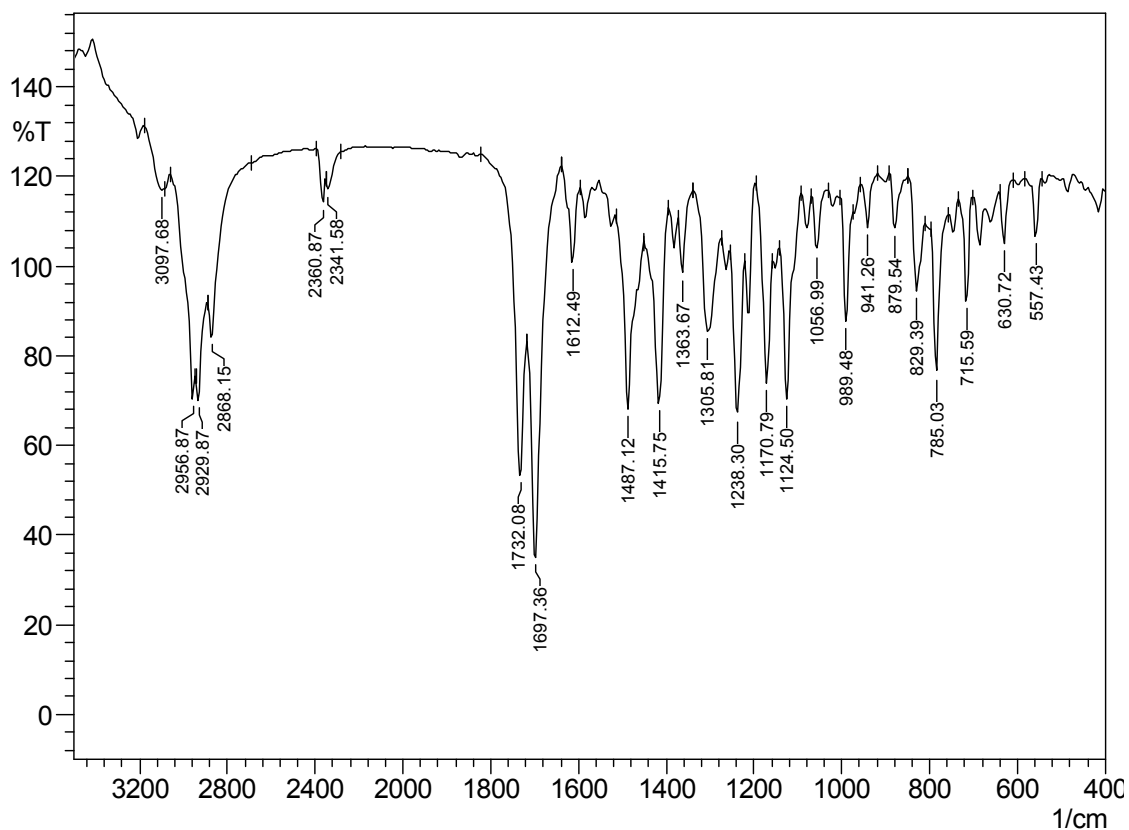


Figure S84. FTIR spectrum of the target compound (4t)

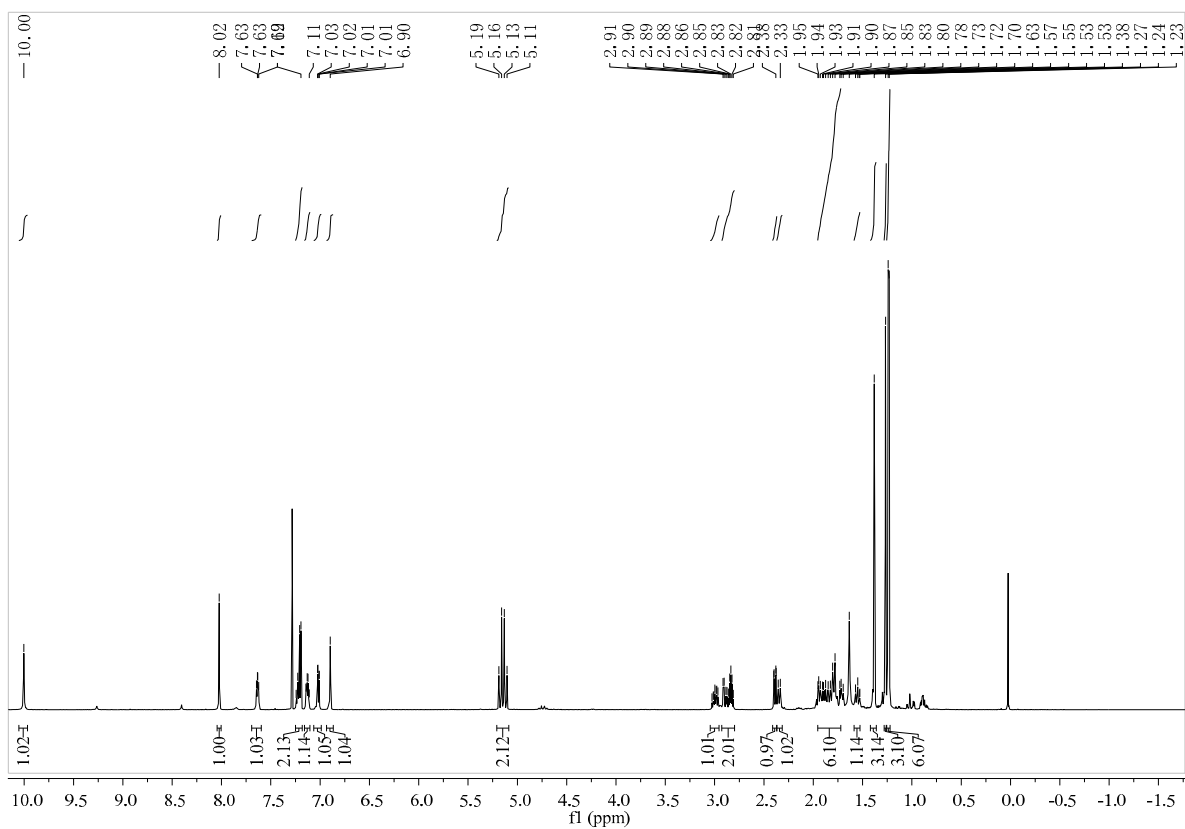


Figure S85. $^1\text{H-NMR}$ spectrum of the target compound (**4t**) in CDCl_3

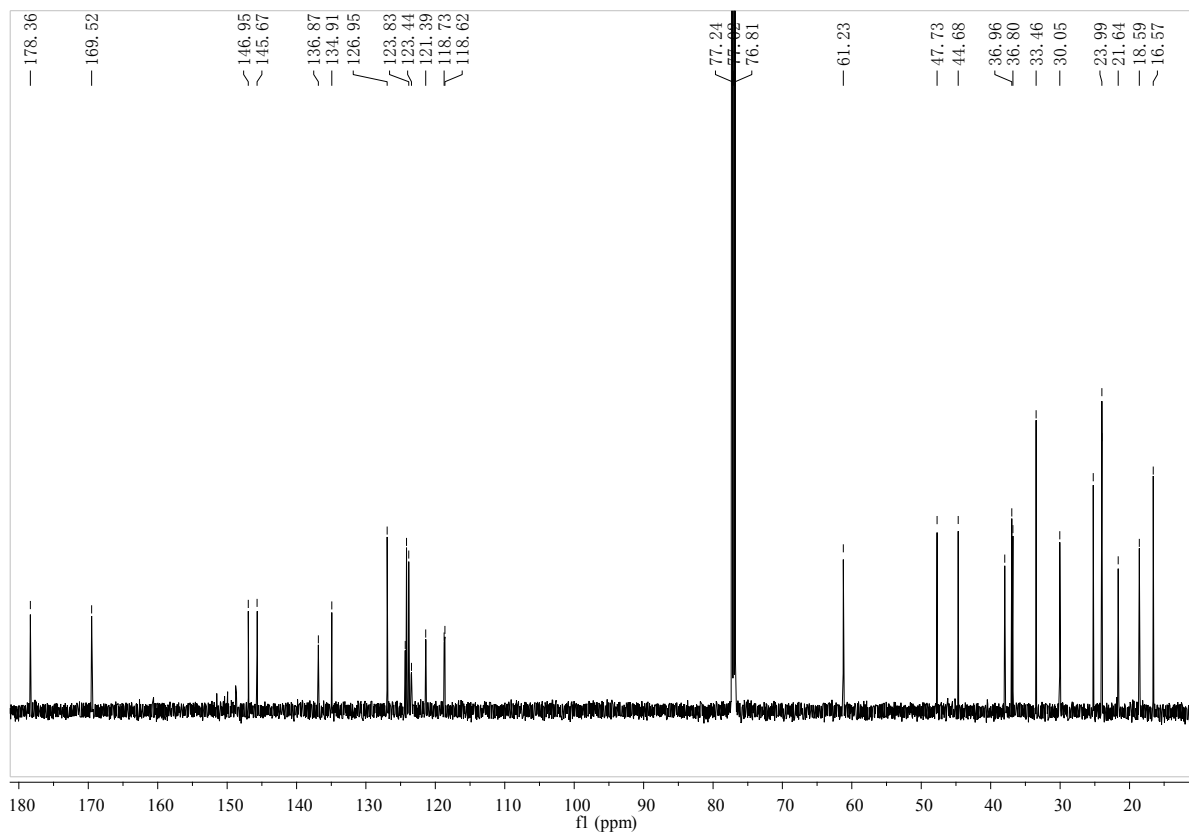


Figure S86. $^{13}\text{C-NMR}$ spectrum of the target compound (**4t**) in CDCl_3

<Spectrum>

Line#:1 R.Time:0.417(Scan#:26)
MassPeaks:14
RawMode:Single 0.417(26) BasePeak:495.1(543574)
BG Mode:None Segment 1 - Event 1

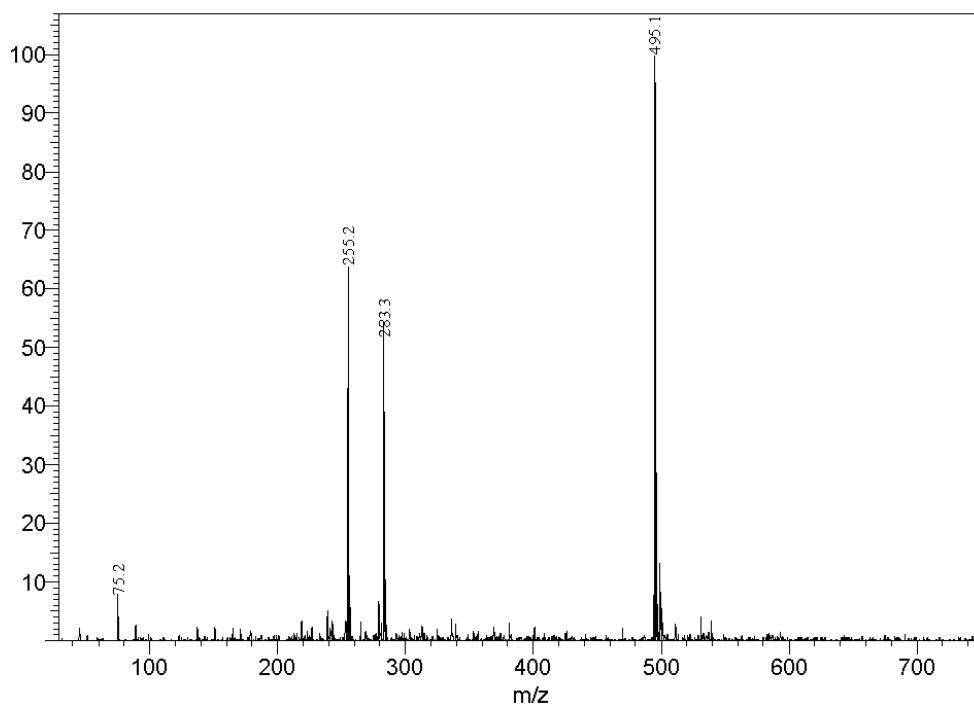


Figure S87. ESI-MS spectrum of the target compound (4t)

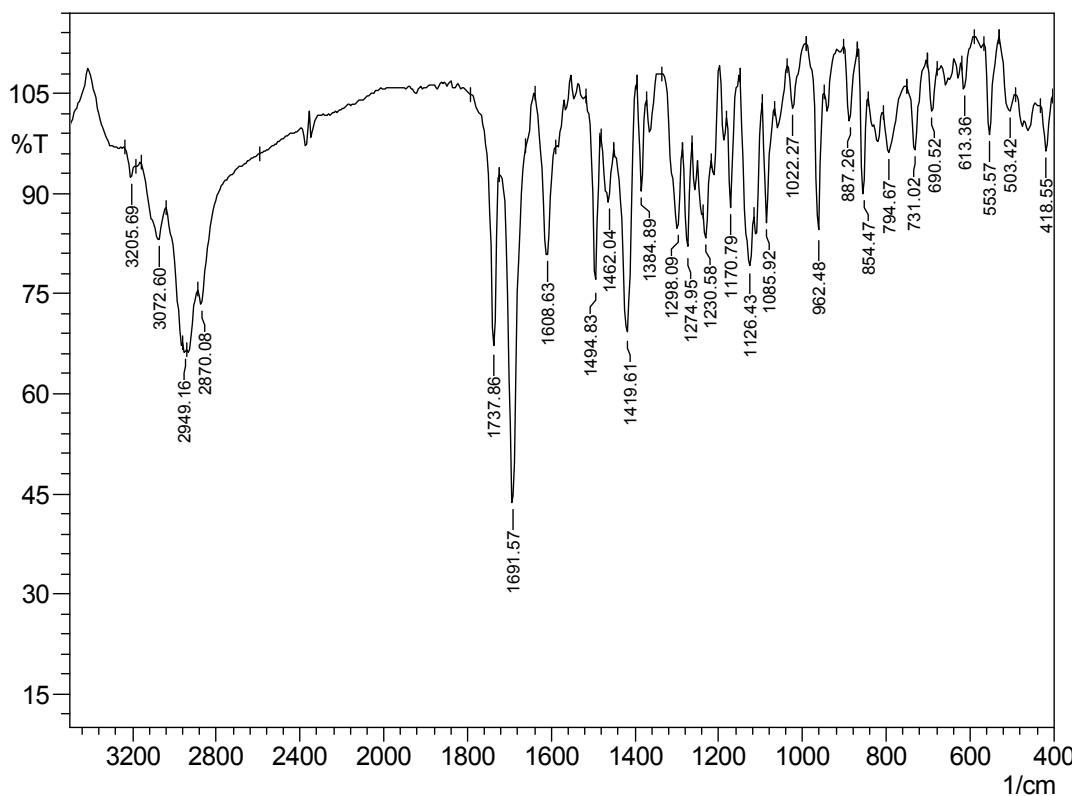


Figure S88. FTIR spectrum of the target compound (4u)

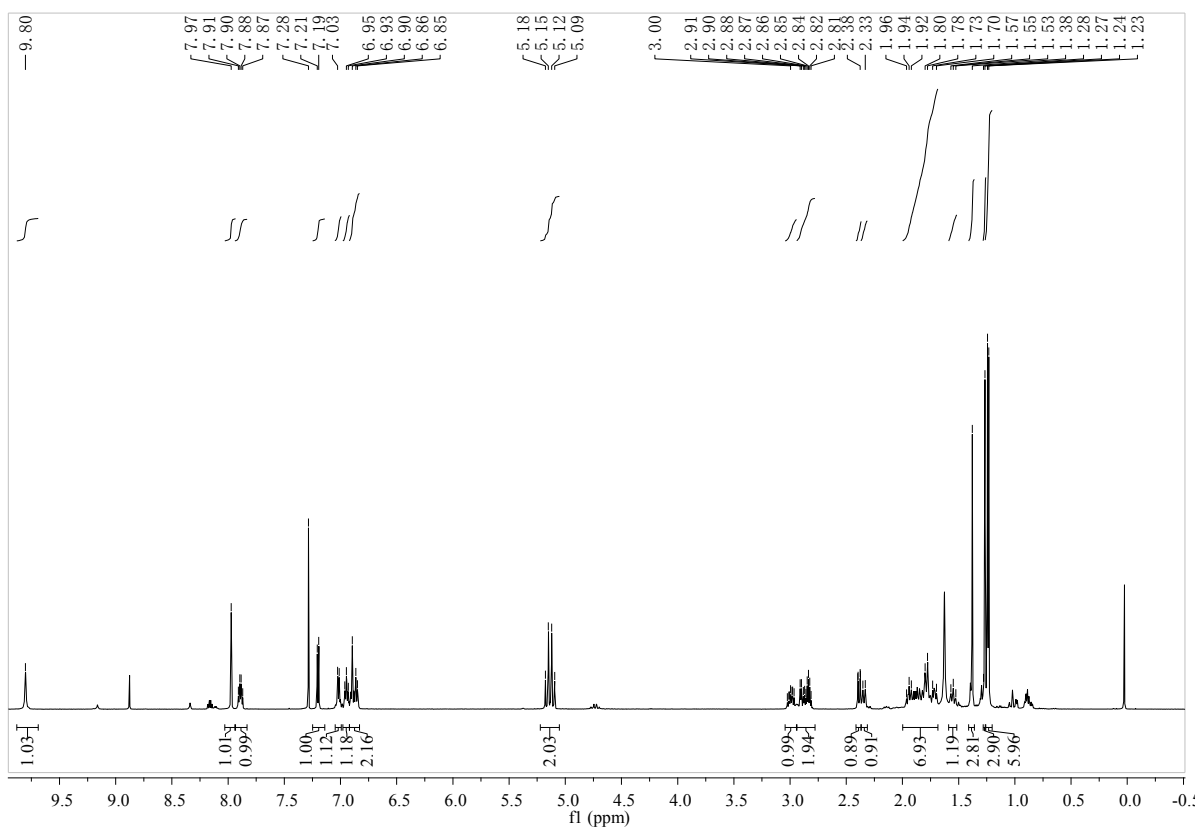


Figure S89. $^1\text{H-NMR}$ spectrum of the target compound (**4u**) in CDCl_3

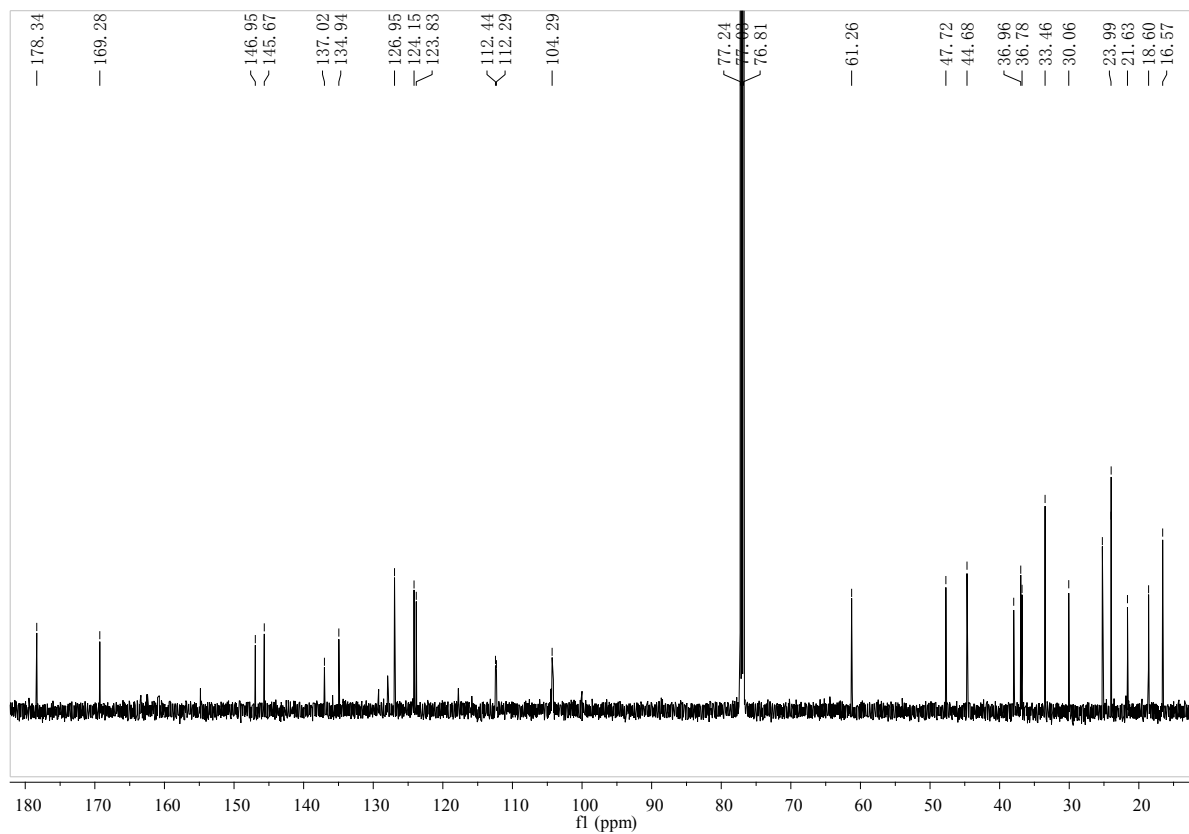


Figure S90. $^{13}\text{C-NMR}$ spectrum of the target compound (**4u**) in CDCl_3

<Spectrum>

Line#:1 R.Time:0.417(Scan#:26)
MassPeaks:8
RawMode:Single 0.417(26) BasePeak:255.2(1106908)
BG Mode:None Segment 1 - Event 1

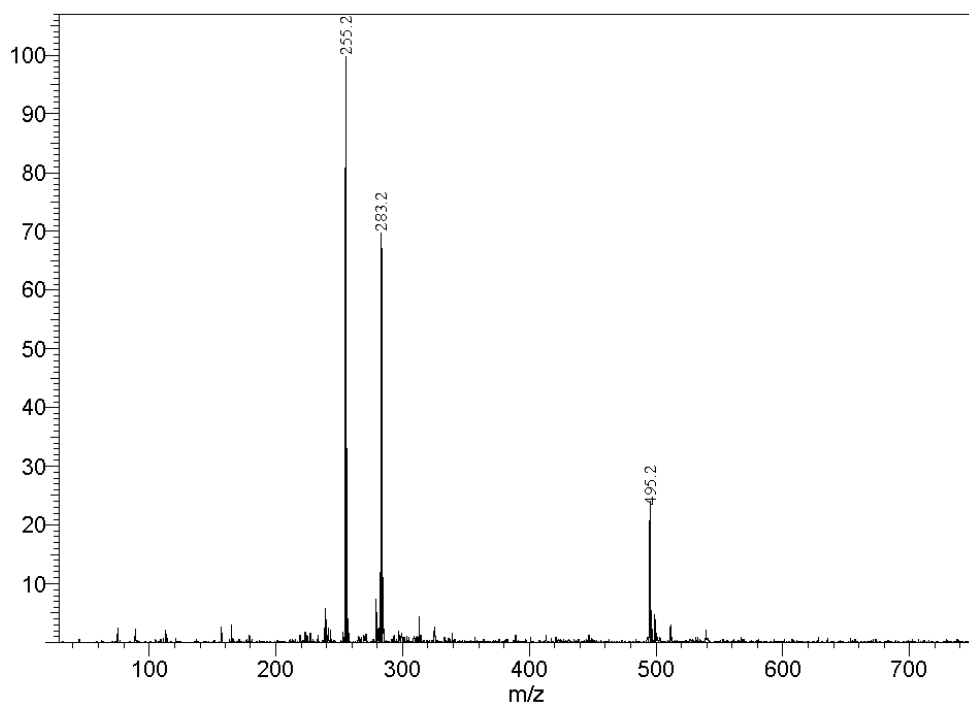


Figure S91. ESI-MS spectrum of the target compound (4u)

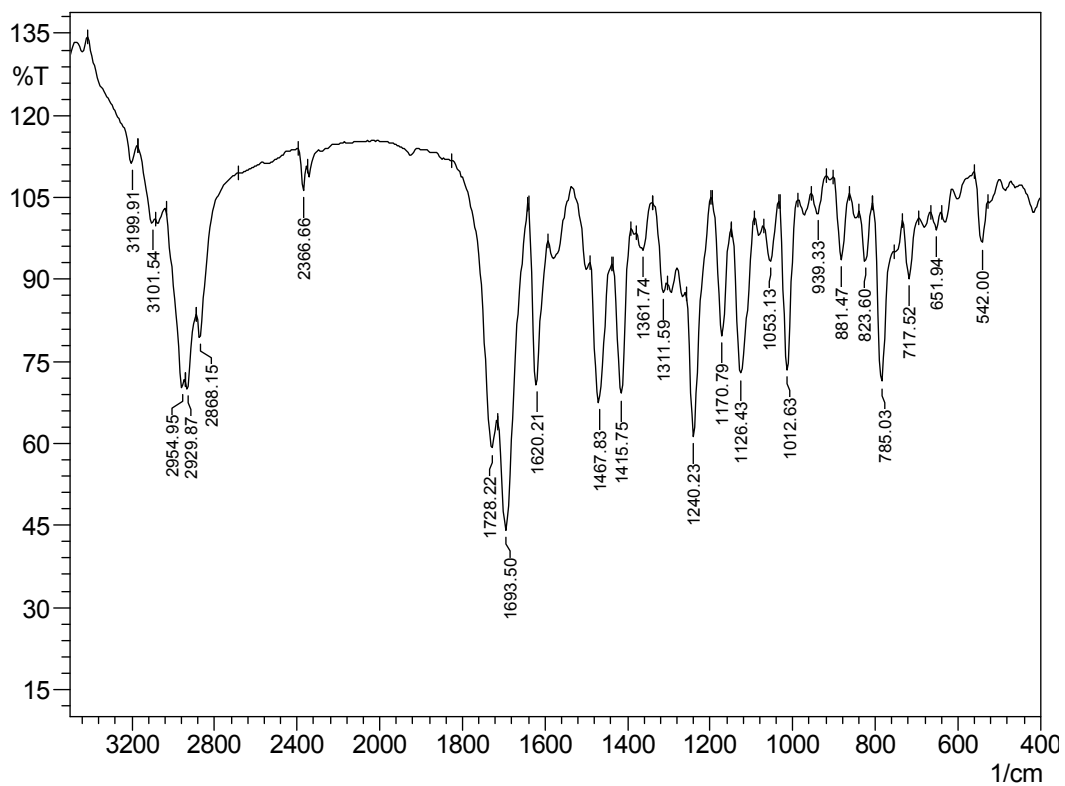


Figure S92. FTIR spectrum of the target compound (4v)

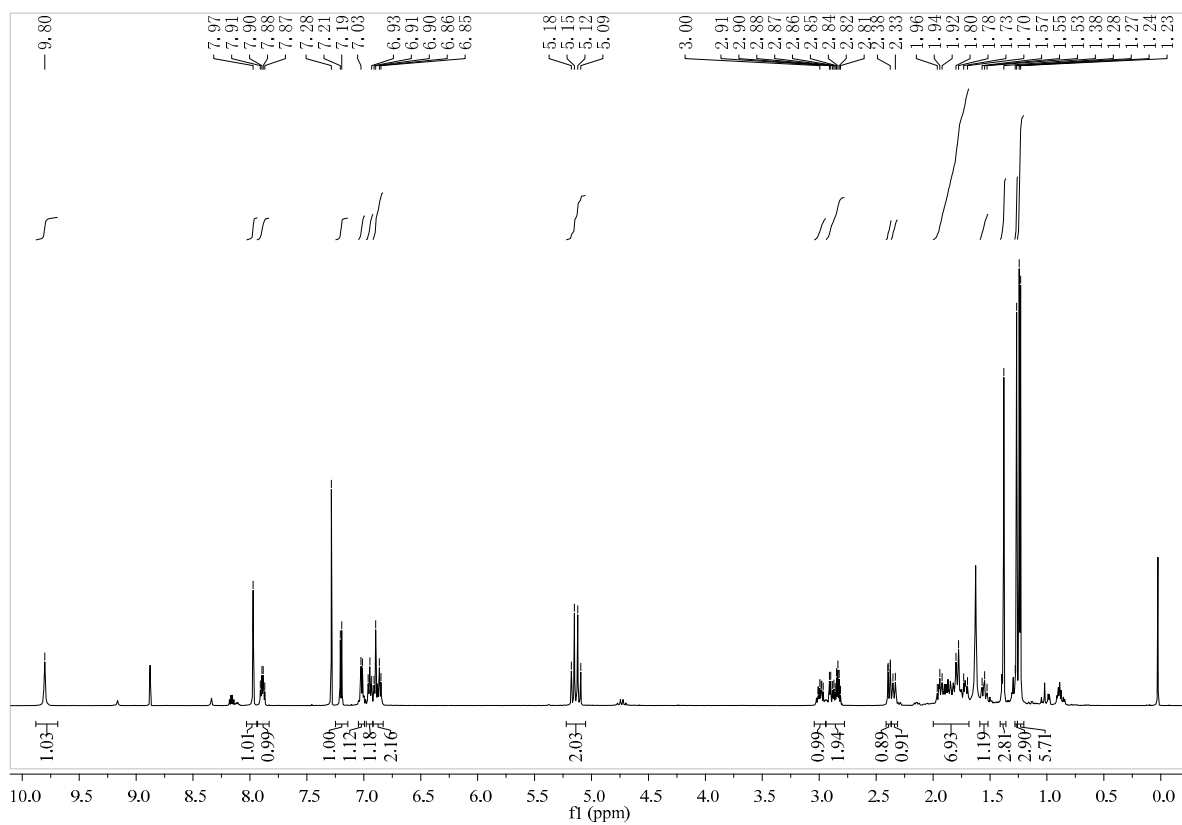


Figure S93. $^1\text{H-NMR}$ spectrum of the target compound (**4v**) in CDCl_3

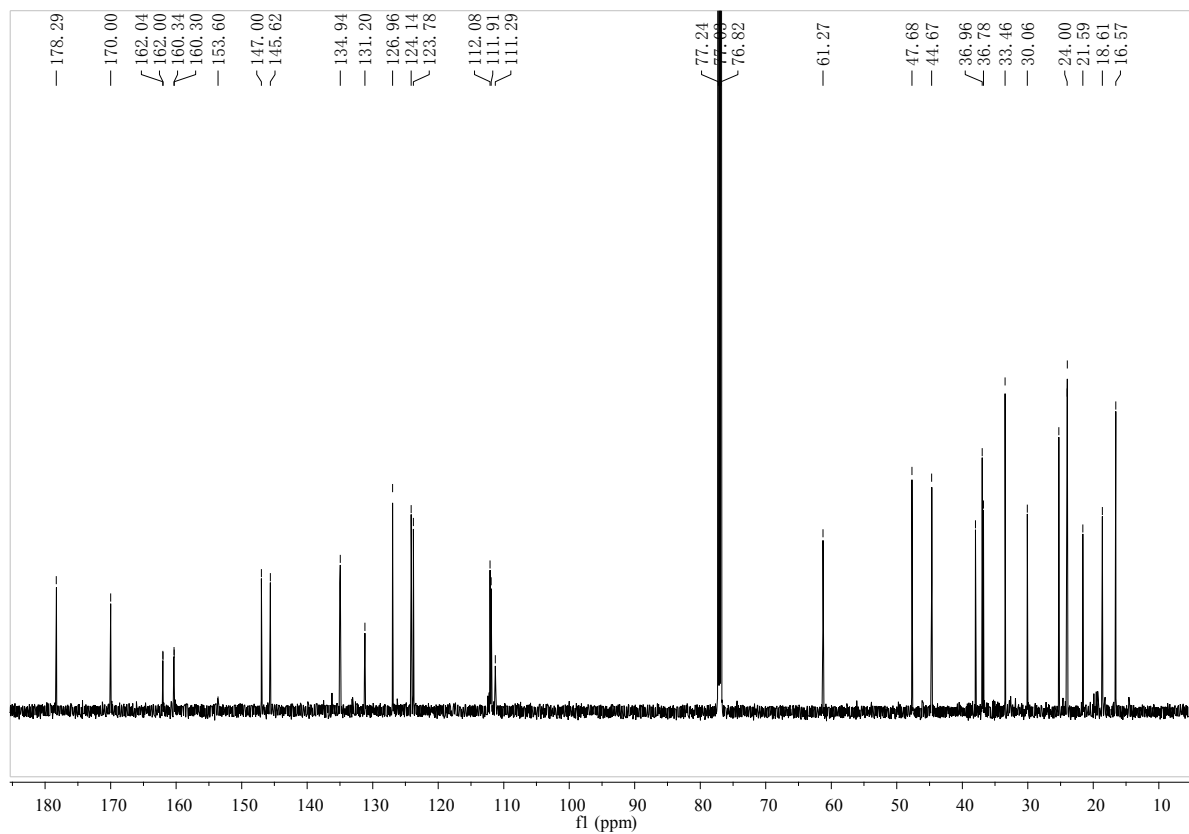


Figure S94. $^{13}\text{C-NMR}$ spectrum of the target compound (**4v**) in CDCl_3

<Spectrum>

Line#:1 R.Time:0.417(Scan#:26)
MassPeaks:13
RawMode:Single 0.417(26) BasePeak:495.1(417737)
BG Mode:None Segment 1 - Event 1

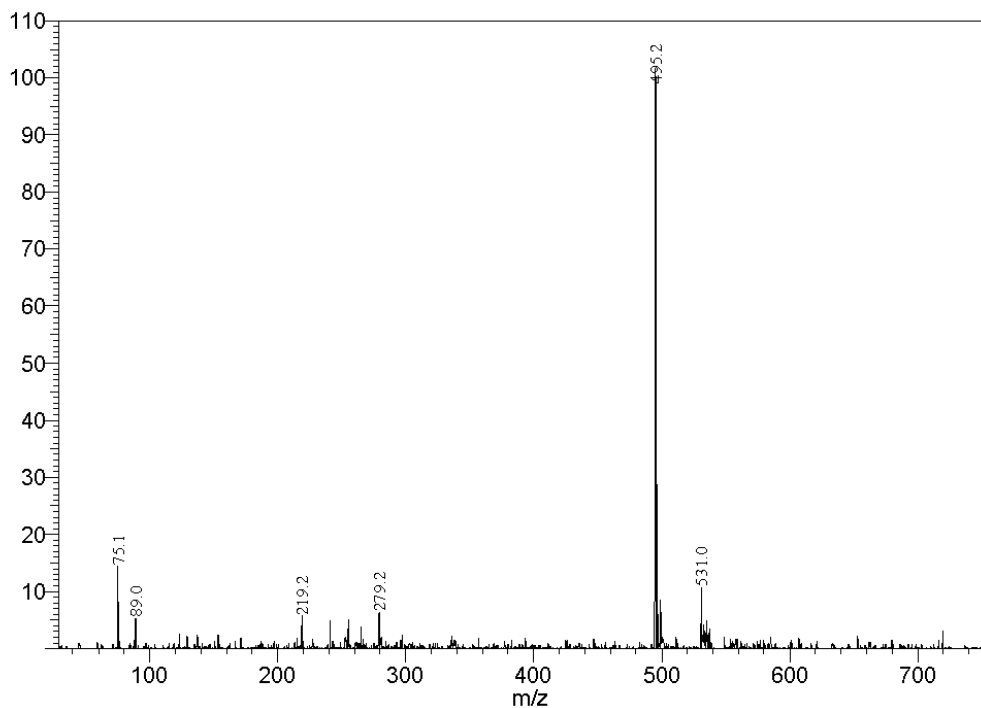


Figure S95. ESI-MS spectrum of the target compound (4v)

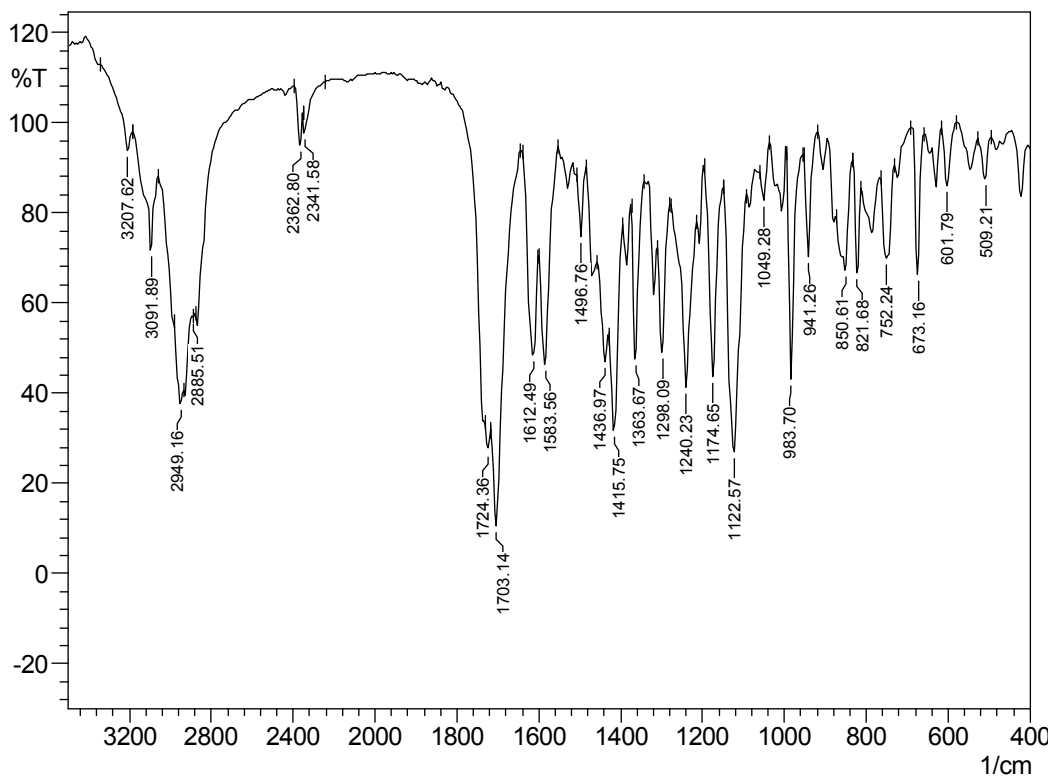


Figure S96. FTIR spectrum of the target compound (4w)

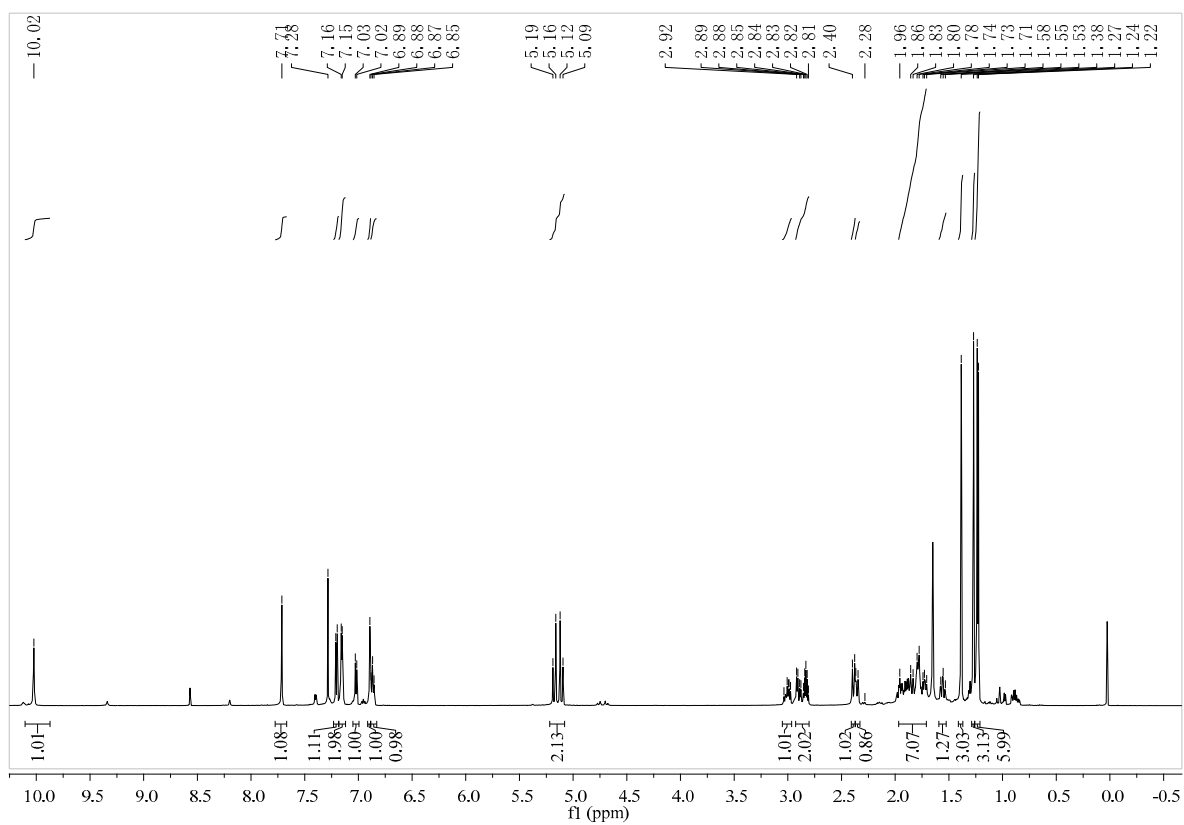


Figure S97. $^1\text{H-NMR}$ spectrum of the target compound (**4w**) in CDCl_3

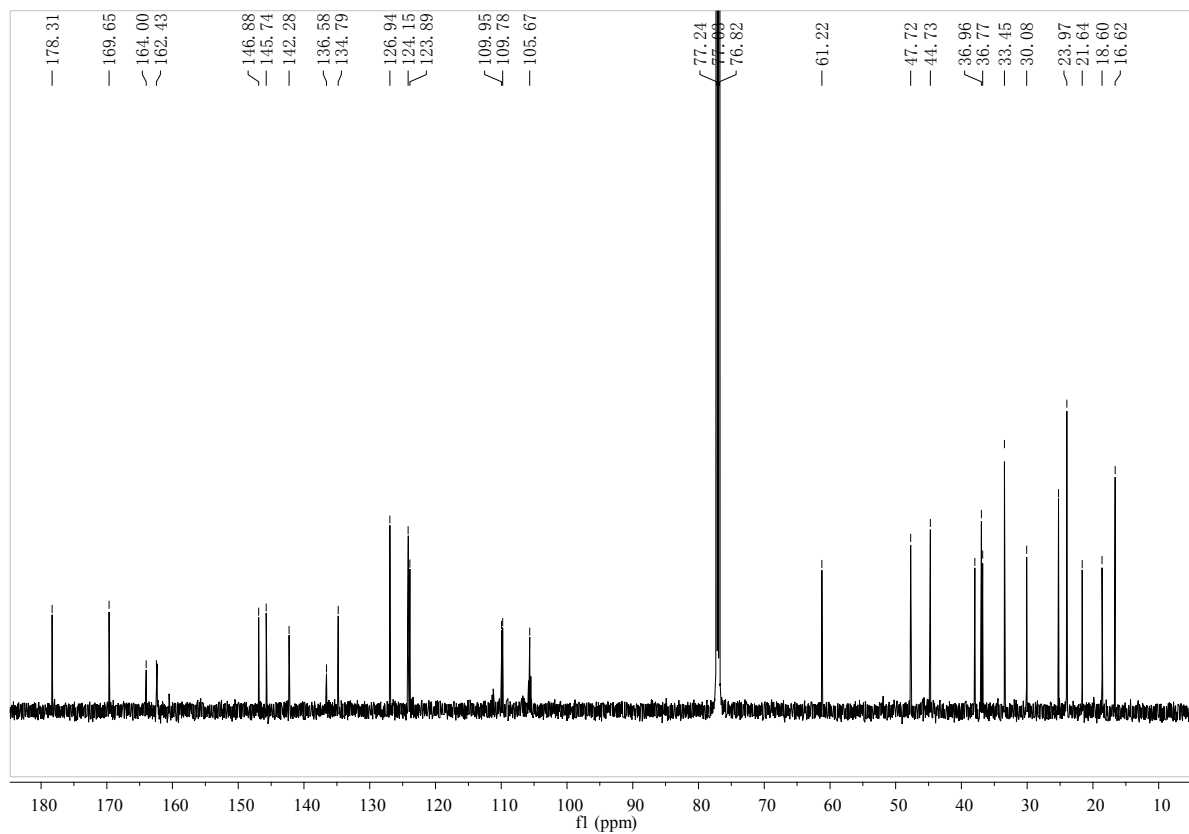


Figure S98. $^{13}\text{C-NMR}$ spectrum of the target compound (**4w**) in CDCl_3

<Spectrum>

Line#:1 R.Time:0.450(Scan#:28)
MassPeaks:13
RawMode:Single 0.450(28) BasePeak:495.1(354149)
BG Mode:None Segment 1 - Event 1

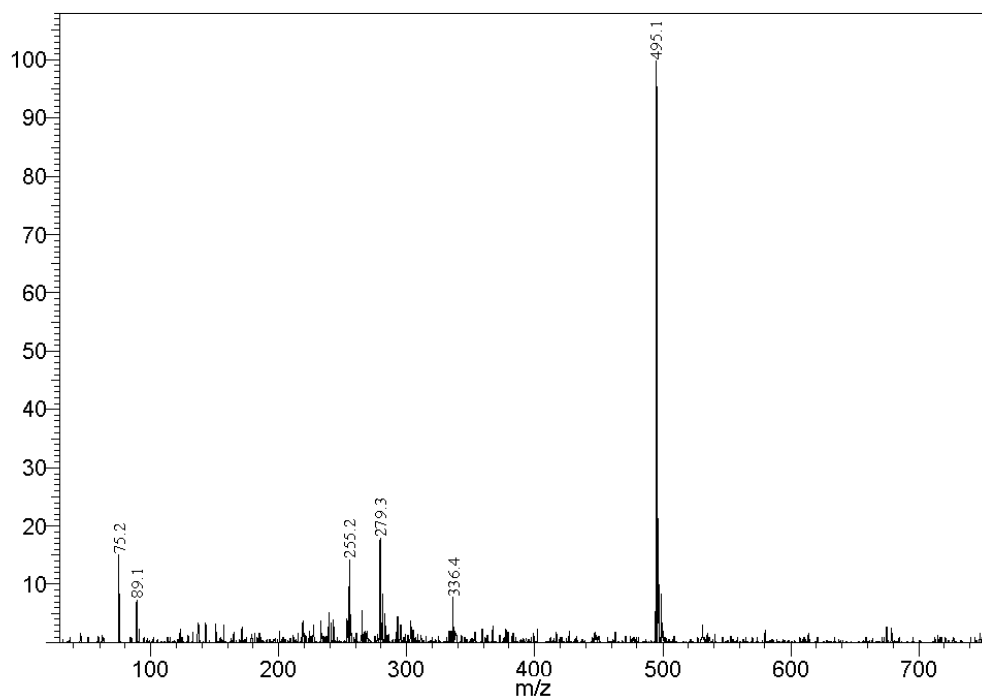


Figure S99. ESI-MS spectrum of the target compound (4w)

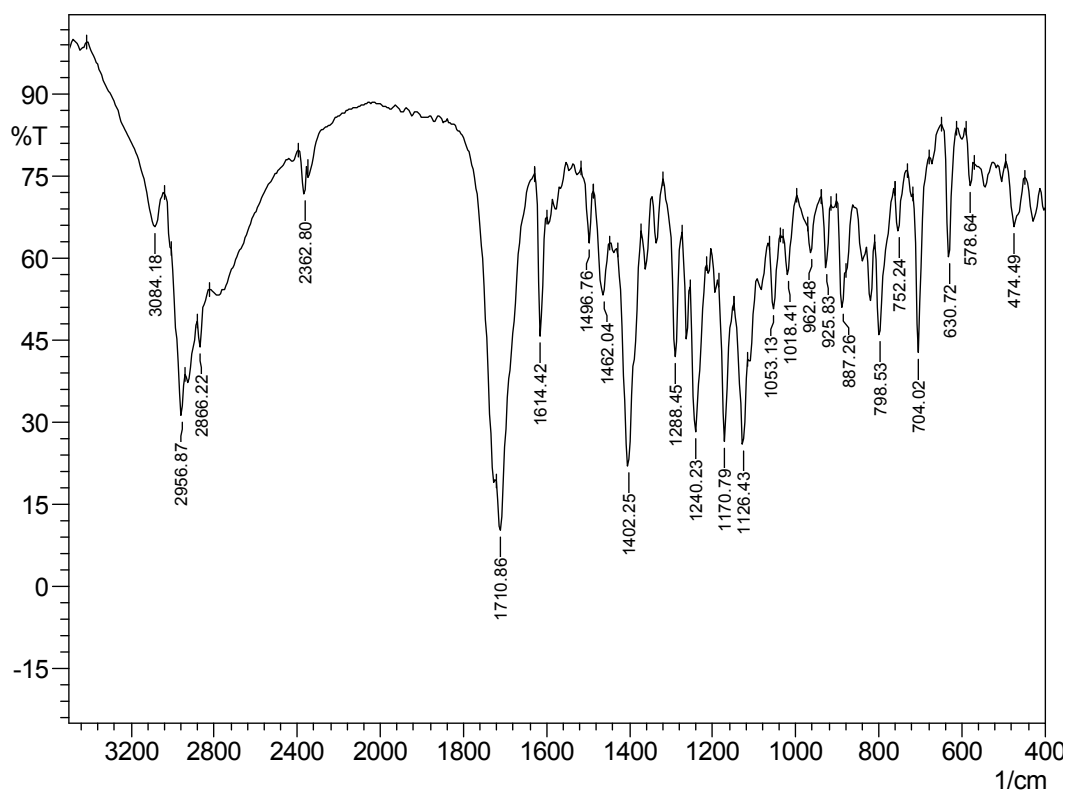


Figure S100. FTIR spectrum of the target compound (4x)

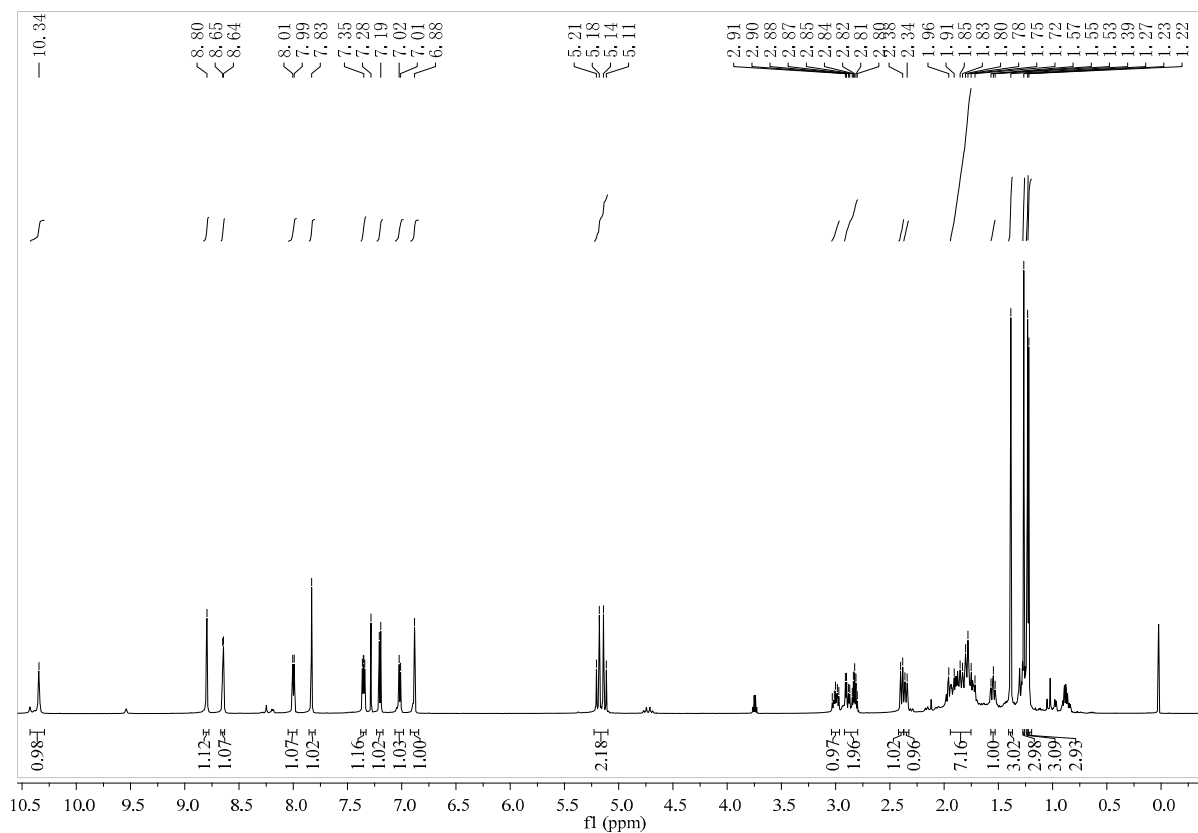


Figure S101. ^1H -NMR spectrum of the target compound (**4x**) in CDCl_3

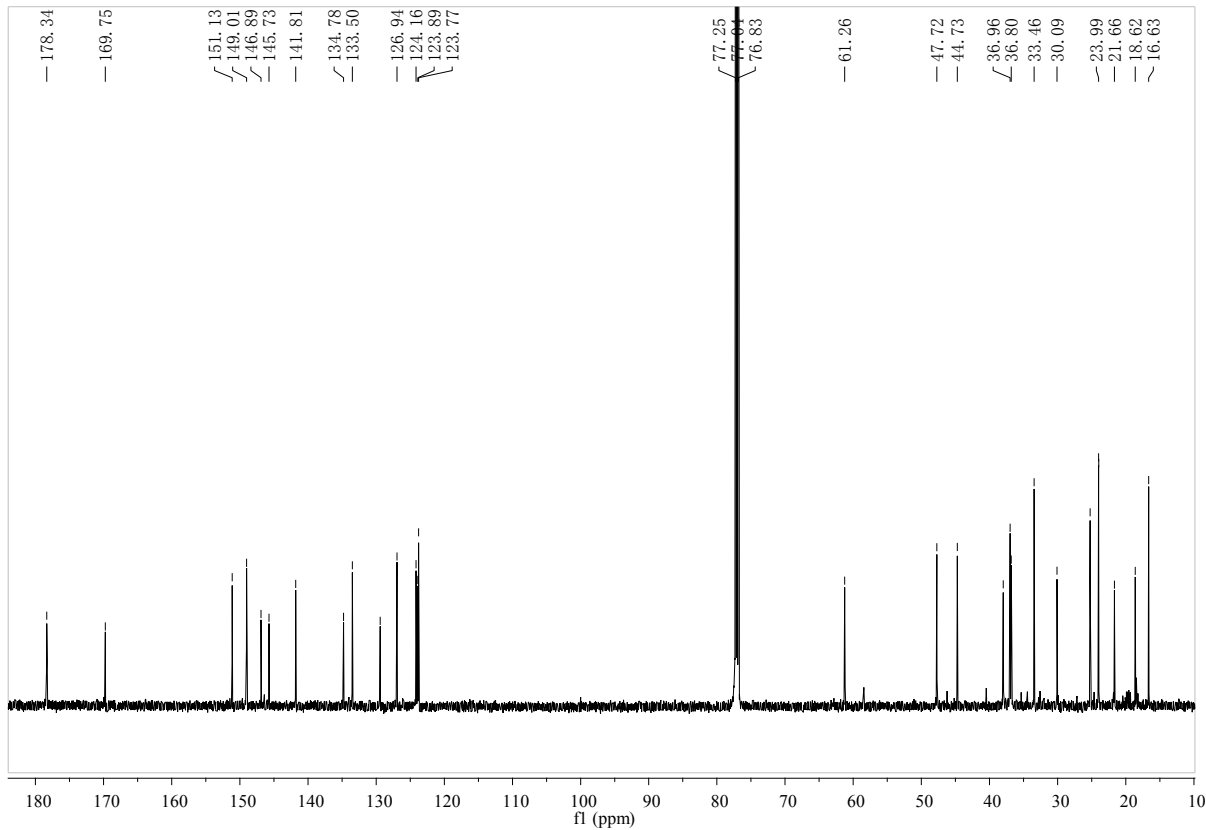


Figure S102. ^{13}C -NMR spectrum of the target compound (**4x**) in CDCl_3

<Spectrum>

Line#:1 R.Time:0.417(Scan#:26)
MassPeaks:15
RawMode:Single 0.417(26) BasePeak:460.2(332240)
BG Mode:None Segment 1 - Event 1

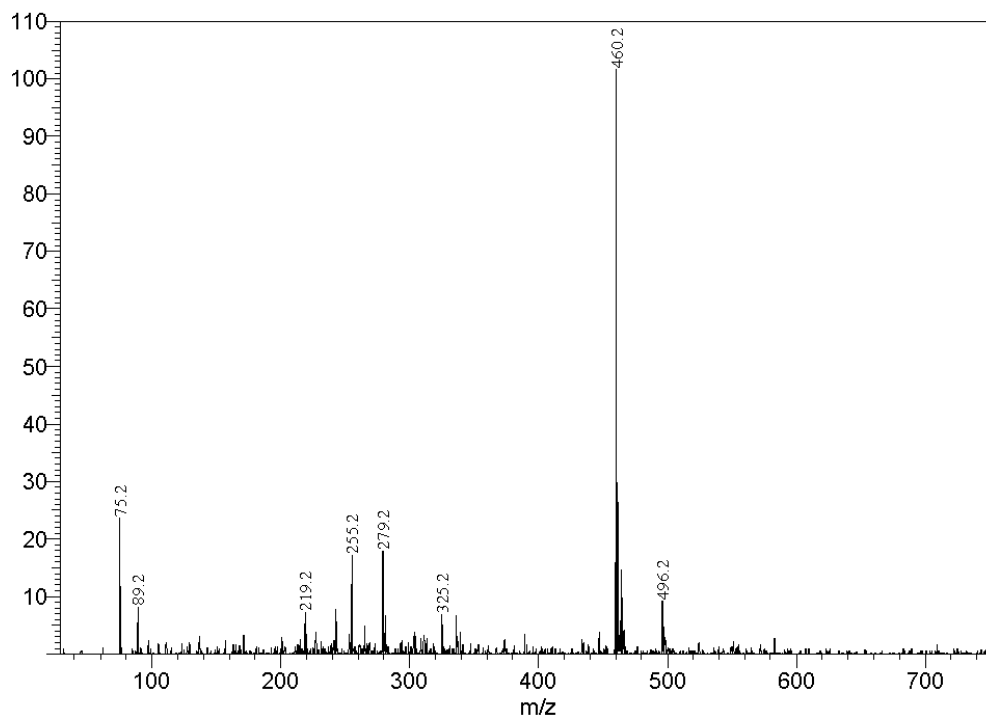


Figure S103. ESI-MS spectrum of the target compound (4x)