



UNIVERSIDADE ESTADUAL PAULISTA
"JÚLIO DE MESQUITA FILHO"

Faculdade de Ciências Farmacêuticas

Campus de Araraquara

Programa de Pós-graduação em Ciências Farmacêuticas



**PLANEJAMENTO, SÍNTESE E AVALIAÇÃO FARMACOLÓGICA DE DERIVADOS
DE ÁCIDOS BORÔNICOS COMO INIBIDORES DA PROTEASE PRINCIPAL DE
SARS-COV-2**

VOLUME II

JULIANA ROMANO LOPES

ORIENTADOR: PROF. DR. JEAN LEANDRO DOS SANTOS

Araraquara- SP
2024



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JULIANA ROMANO LOPES

Tese apresentada ao Programa de Pós-graduação
em Ciências Farmacêuticas, Área de Pesquisa e
Desenvolvimento de Fármacos e Medicamentos,
para obtenção do título de Doutor em Ciências
Farmacêuticas.

Orientador(a): Prof. Dr. Jean Leandro dos Santos

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Orientador: Jean Leandro dos Santos.

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CERTIFICADO DE APROVAÇÃO

TÍTULO DA TESE: Planejamento, síntese e avaliação farmacológica de derivados de ácidos borônicos como inibidores da protease principal de SARS-CoV-2

AUTORA: JULIANA ROMANO LOPES

ORIENTADOR: JEAN LEANDRO DOS SANTOS

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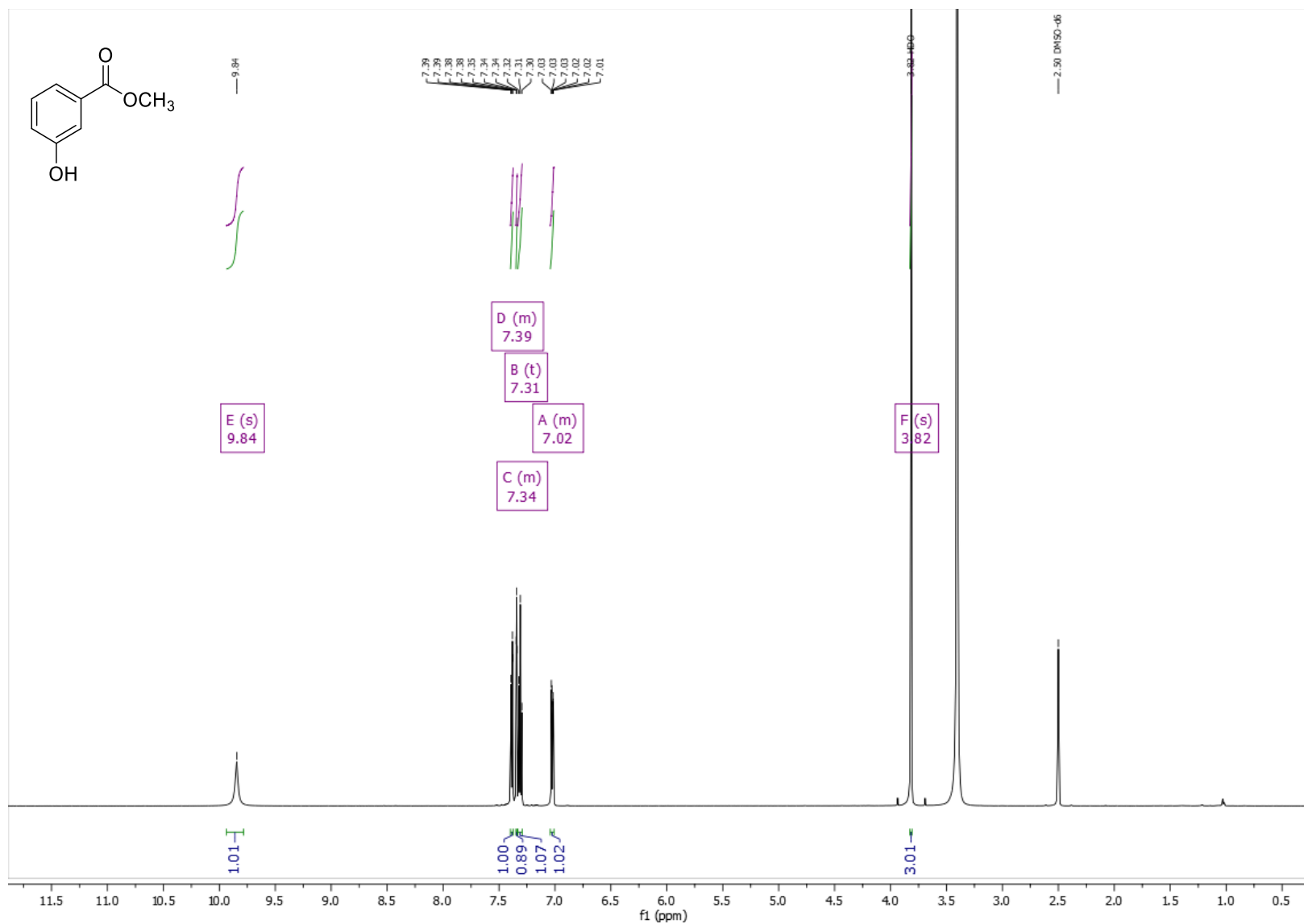
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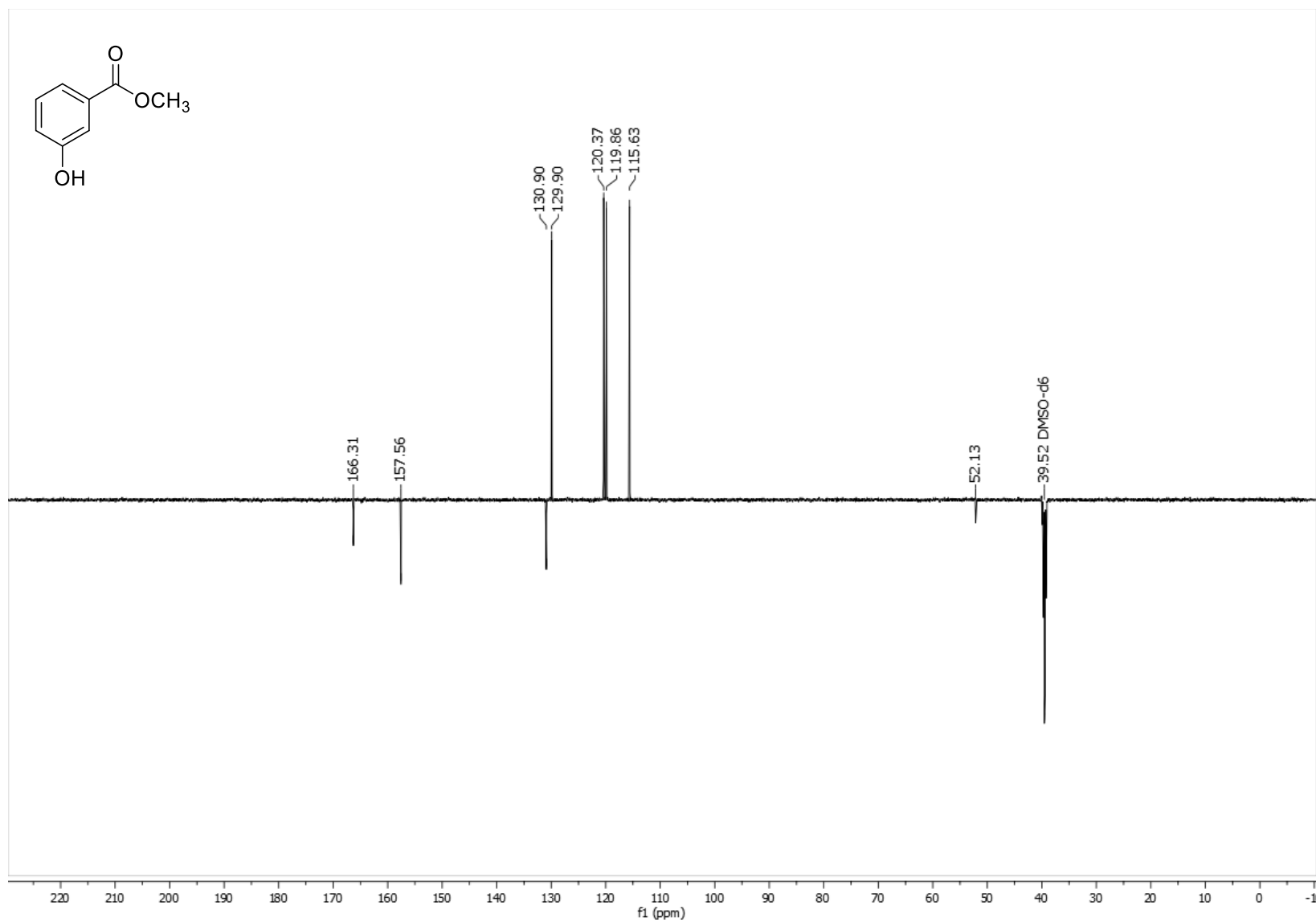
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Araraquara, 28 de março de 2024

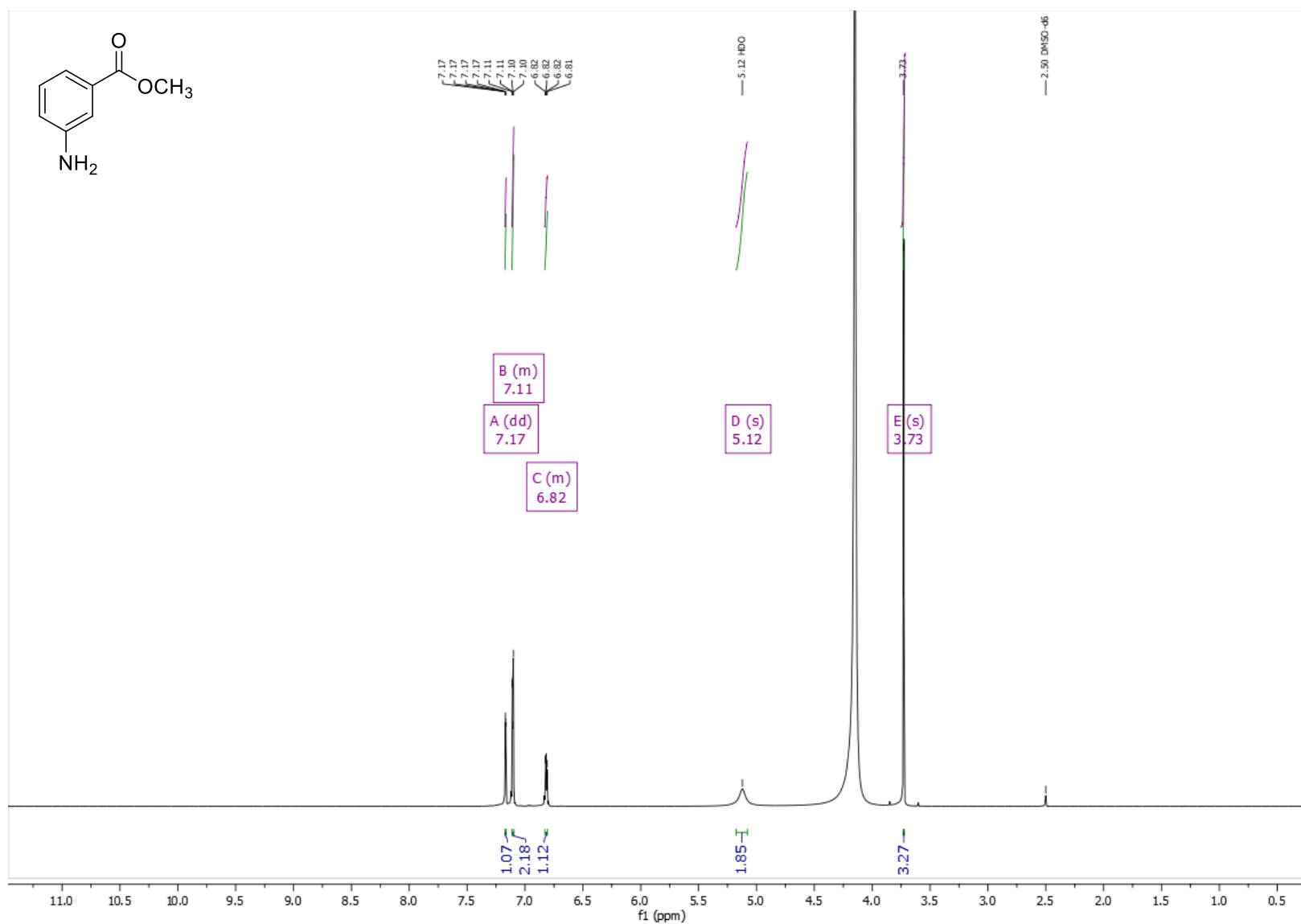
Espectro 1. RMN de ^1H (DMSO- d_6 , 600 MHz) do intermediário metil 3-hidroxibenzoato



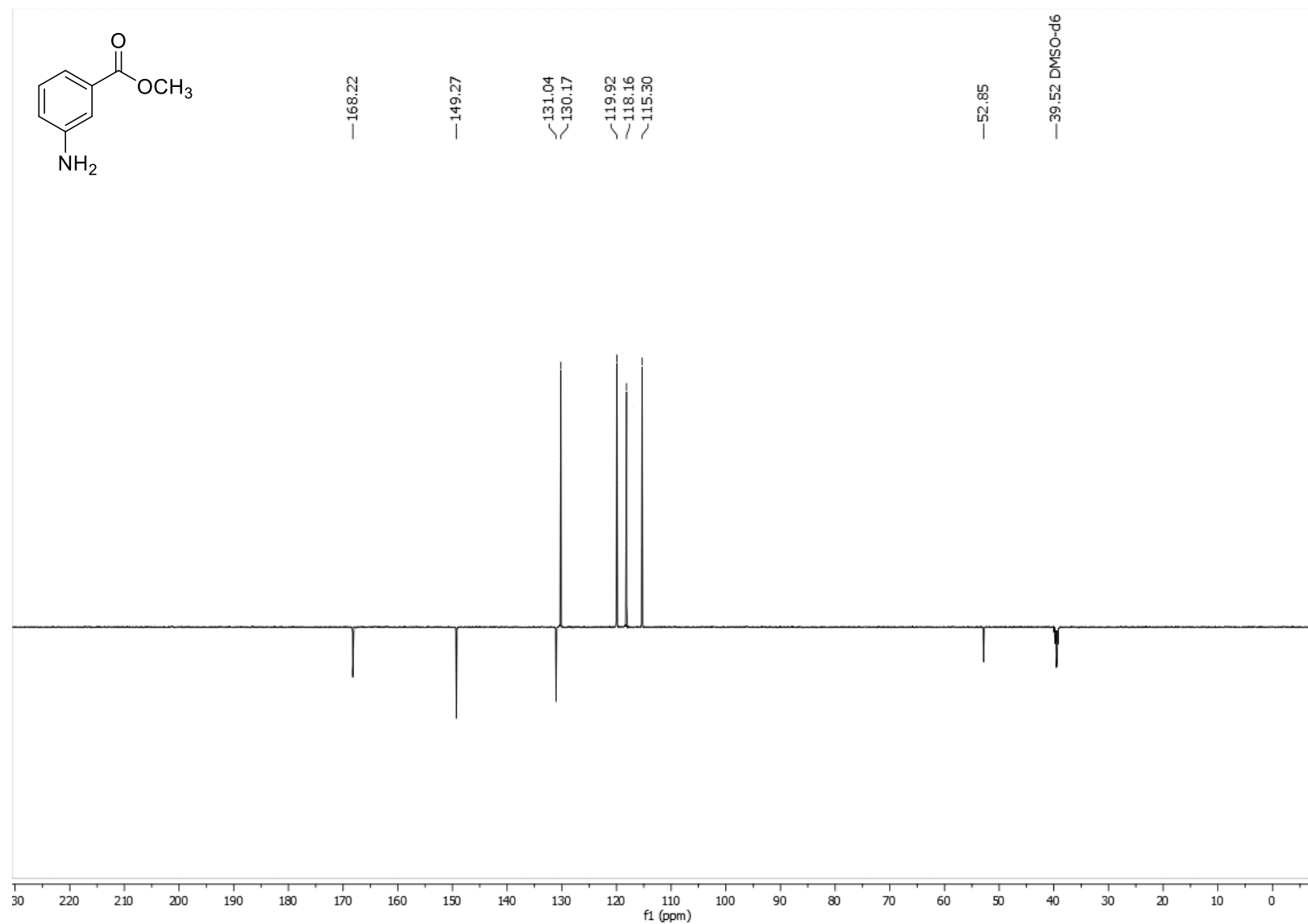
Espectro 2. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do intermediário metil 3-hidroxibenzoato



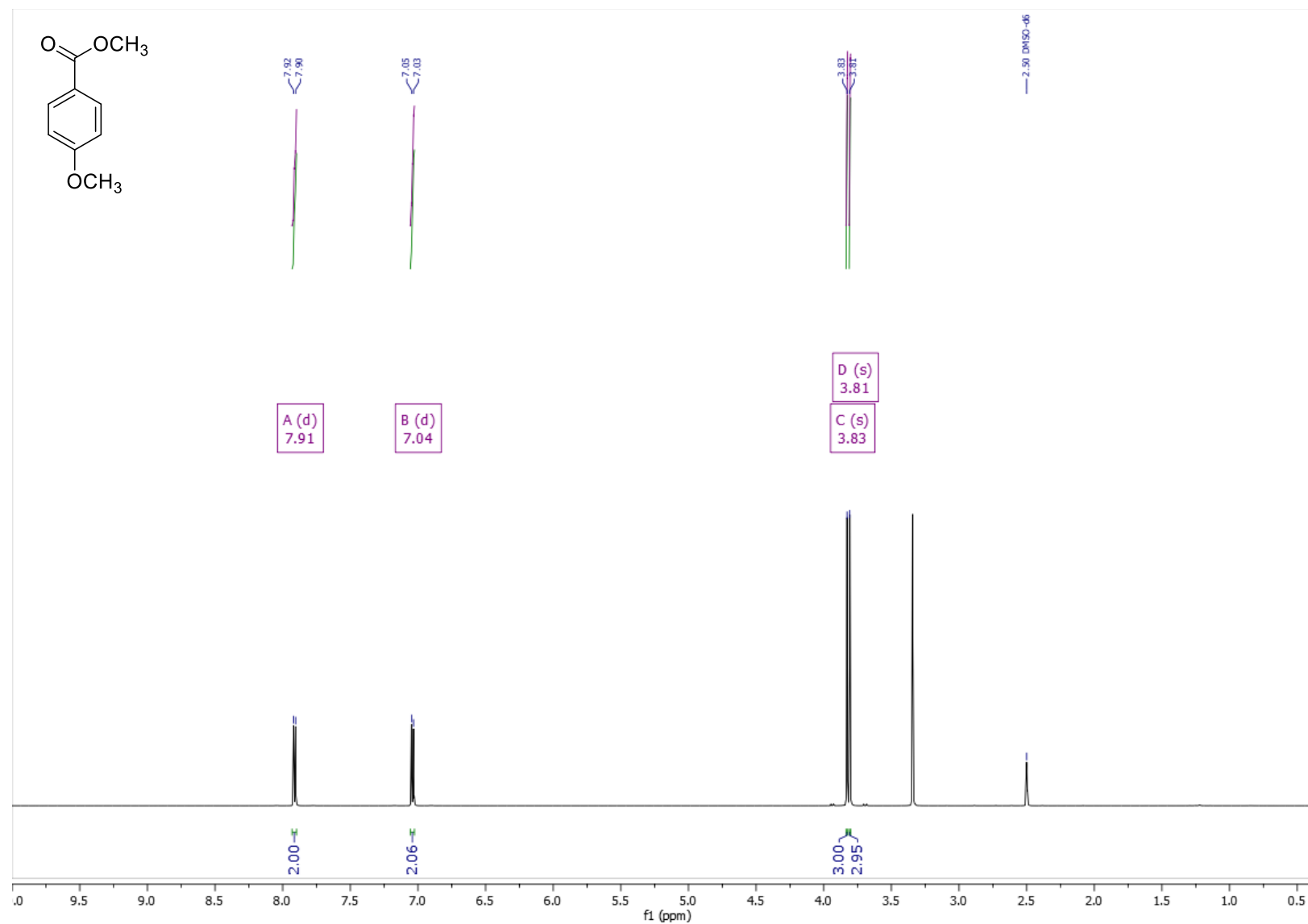
Espectro 3. RMN de ^1H (DMSO- d_6 , 600 MHz) do intermediário metil 3-aminobenzoato



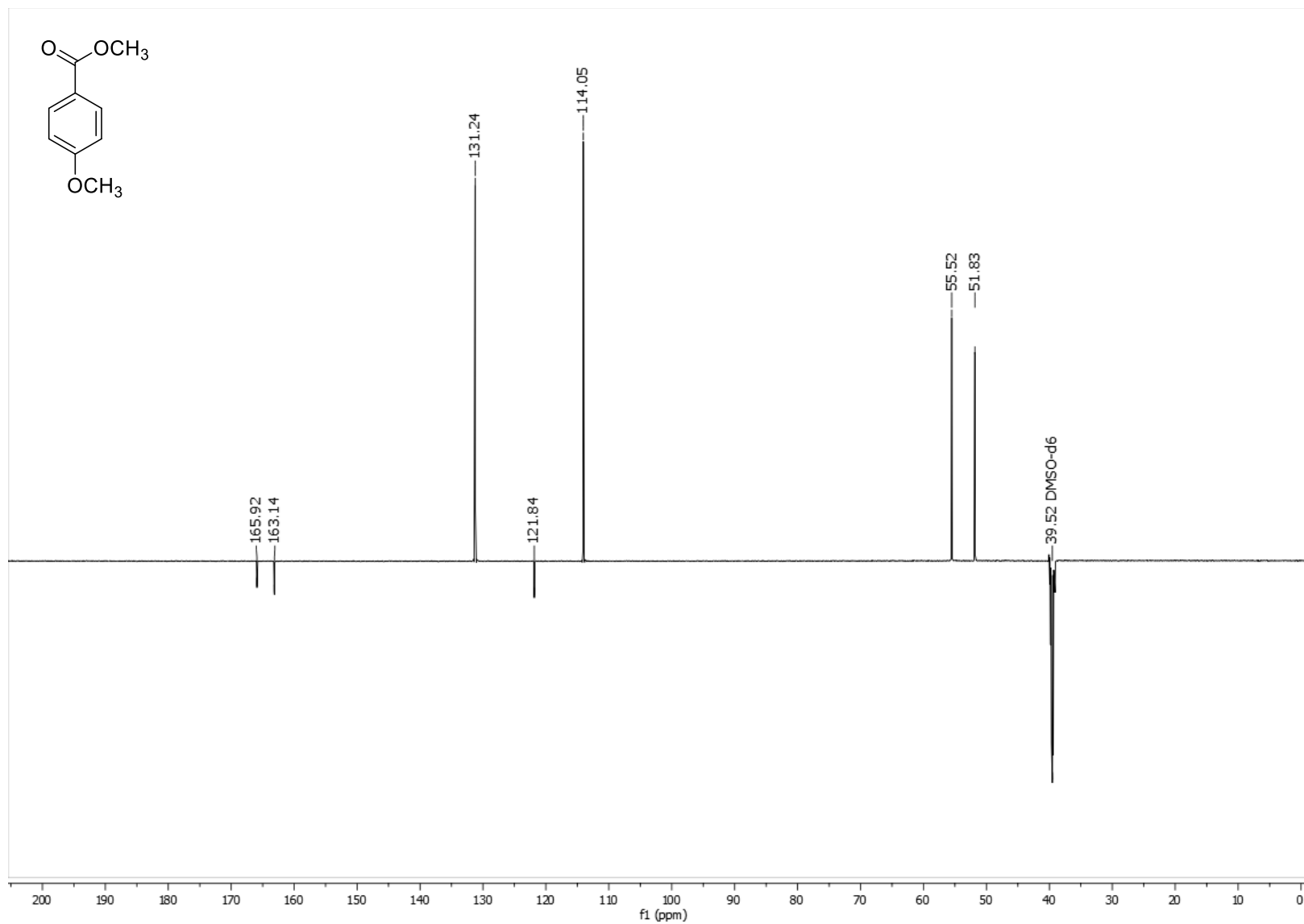
Espectro 4. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do intermediário metil 3-aminobenzoato



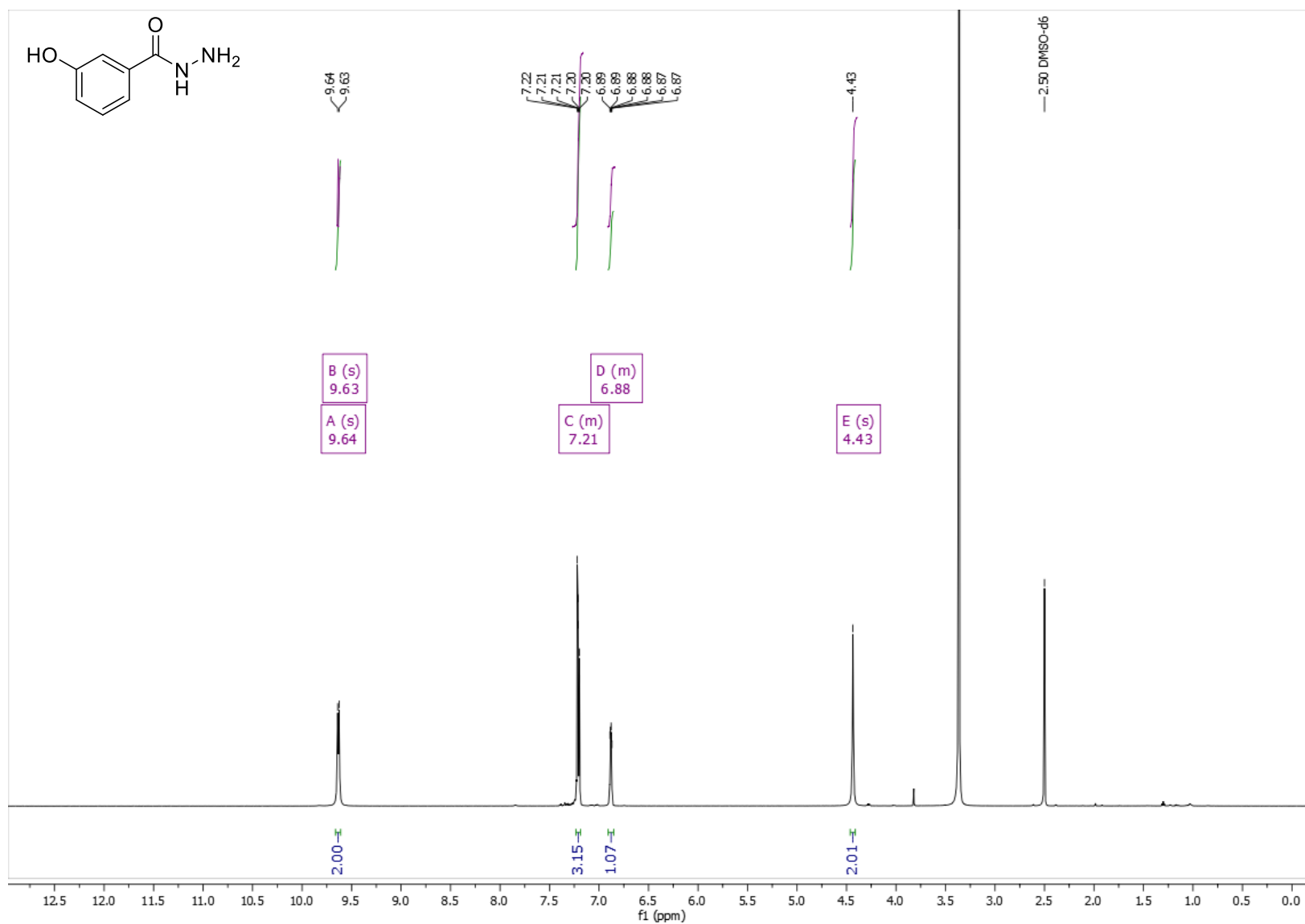
Espectro 5. RMN de ^1H (DMSO- d_6 , 600 MHz) do intermediário metil 4-metoxibenzoato



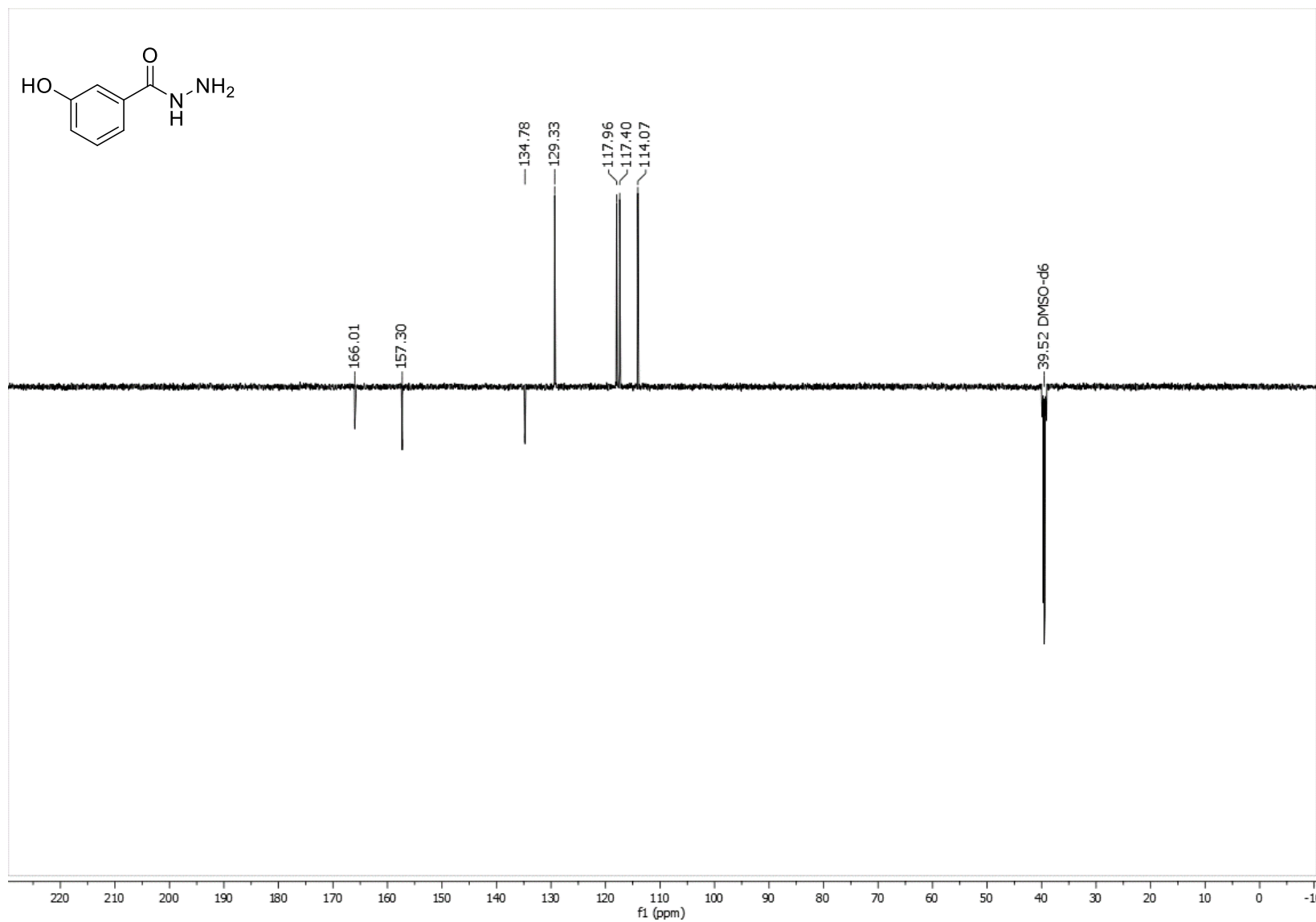
Espectro 6. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do intermediário metil 4-metoxibenzoato

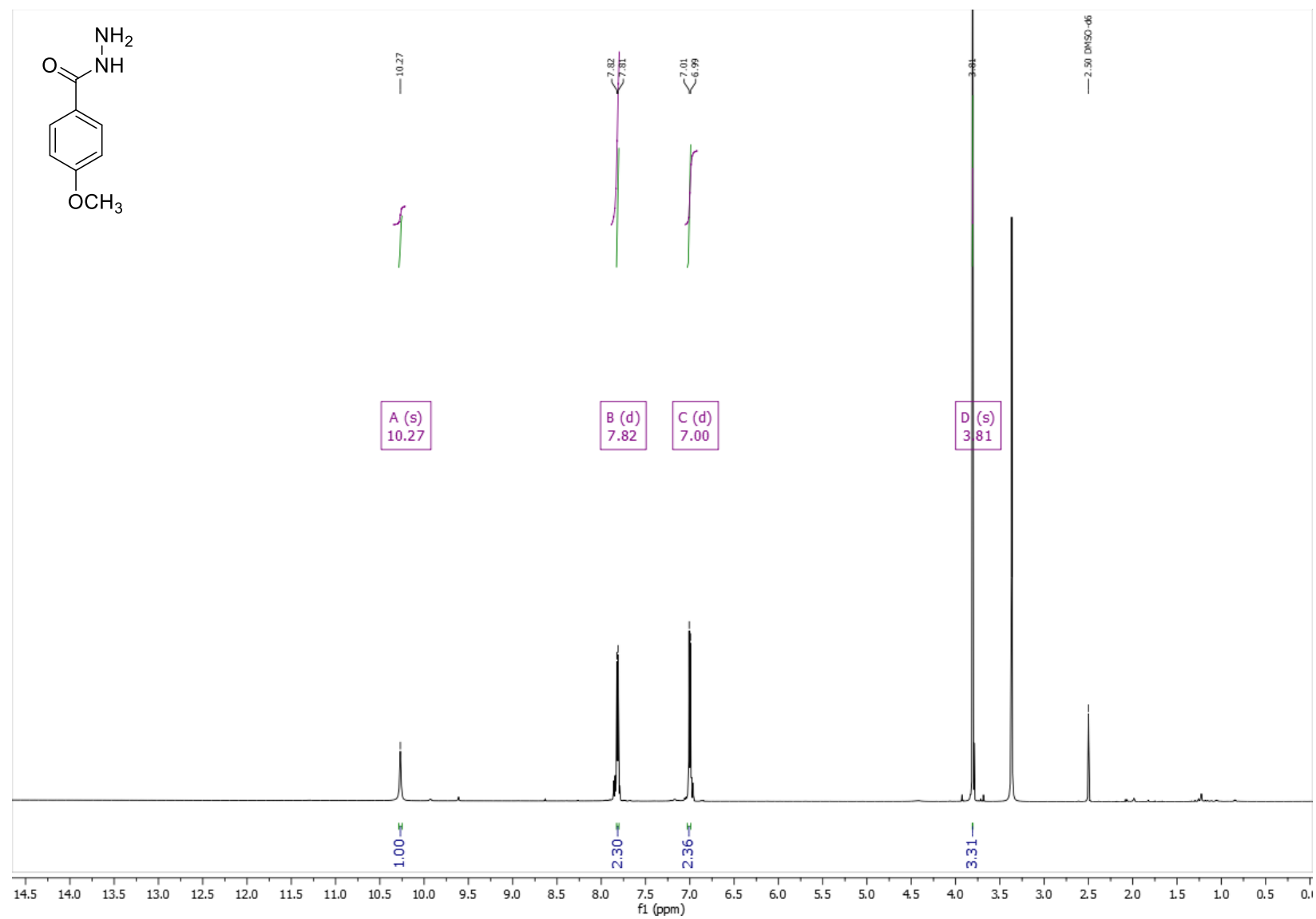


Espectro 7. RMN de ^1H (DMSO- d_6 , 600 MHz) do intermediário 3-hidroxibenzohidrazida

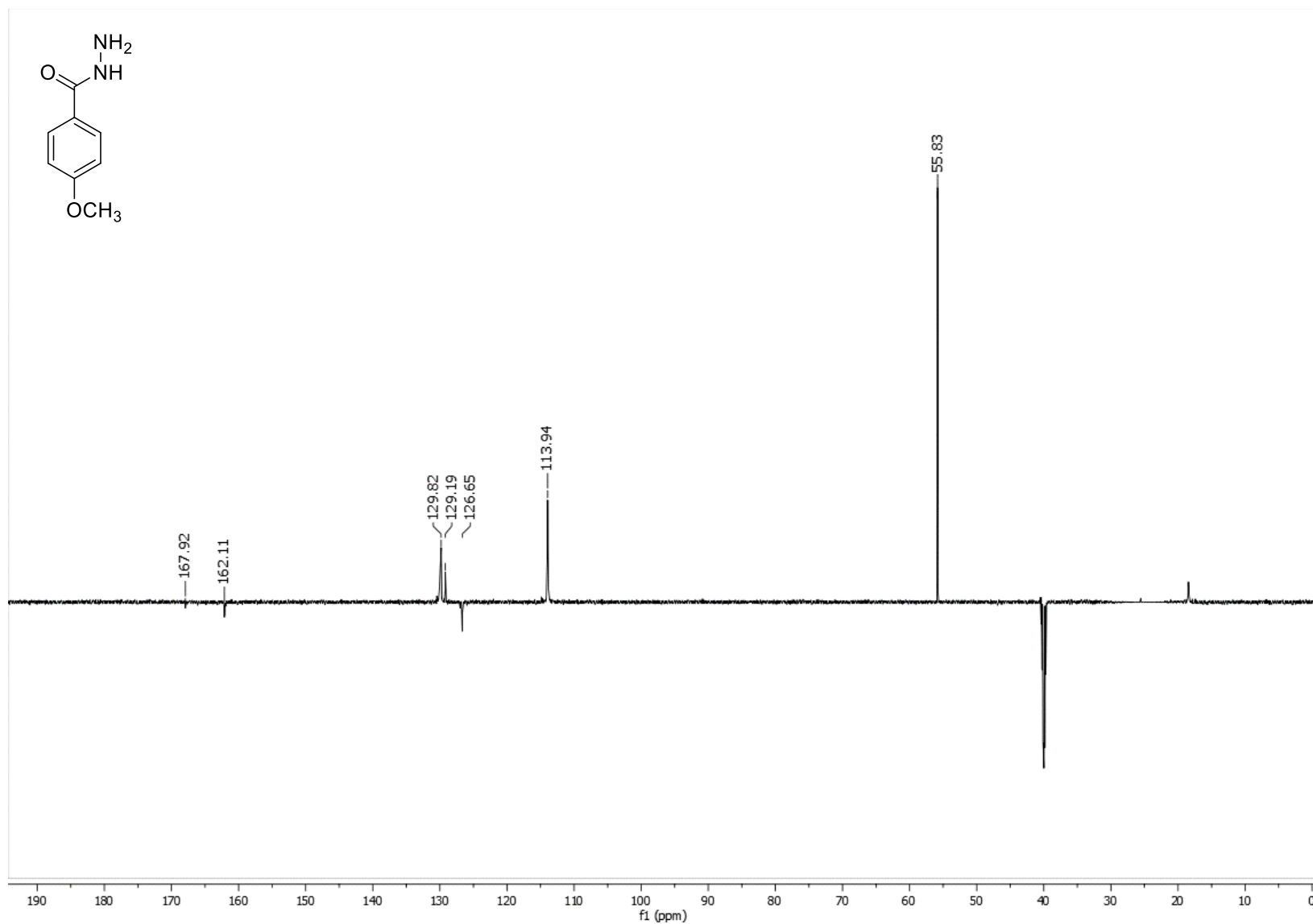


Espectro 8. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do intermediário 3-hidroxibenzohidrazida

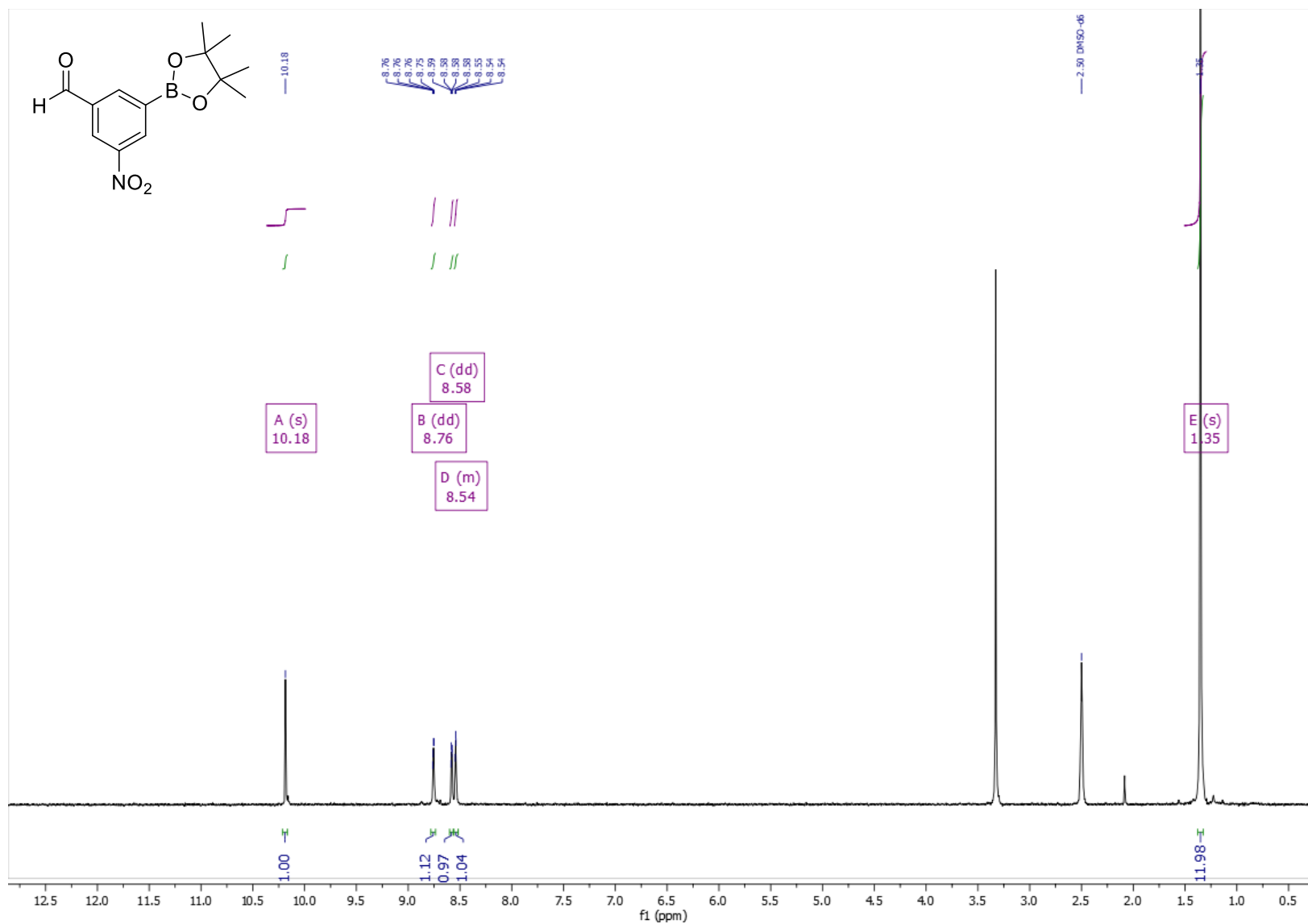


Espectro 9. RMN de ^1H (DMSO- d_6 , 600 MHz) do intermediário 4-metoxibenzohidrazida

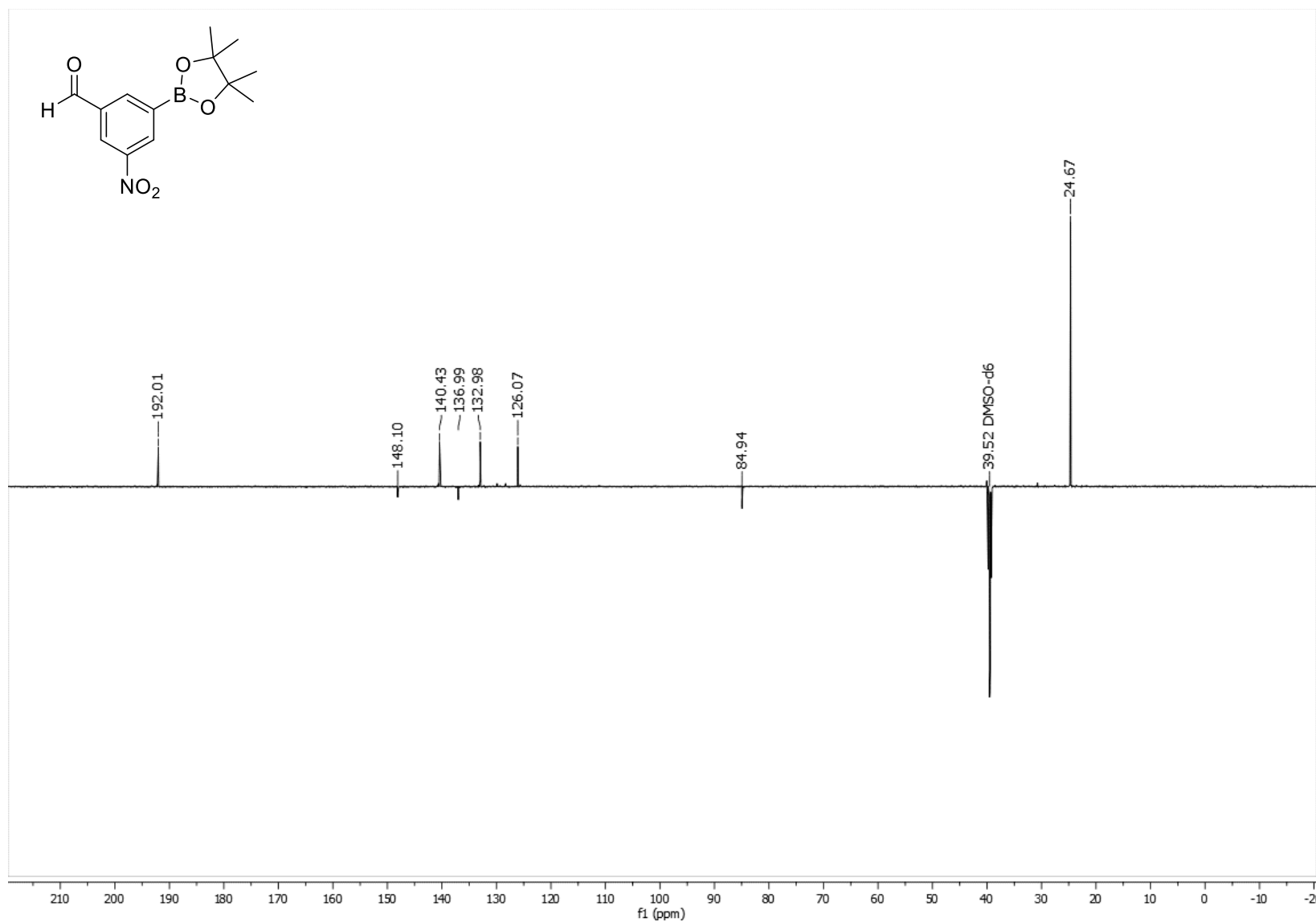
Espectro 10. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do intermediário 4-metoxibenzohidrazida

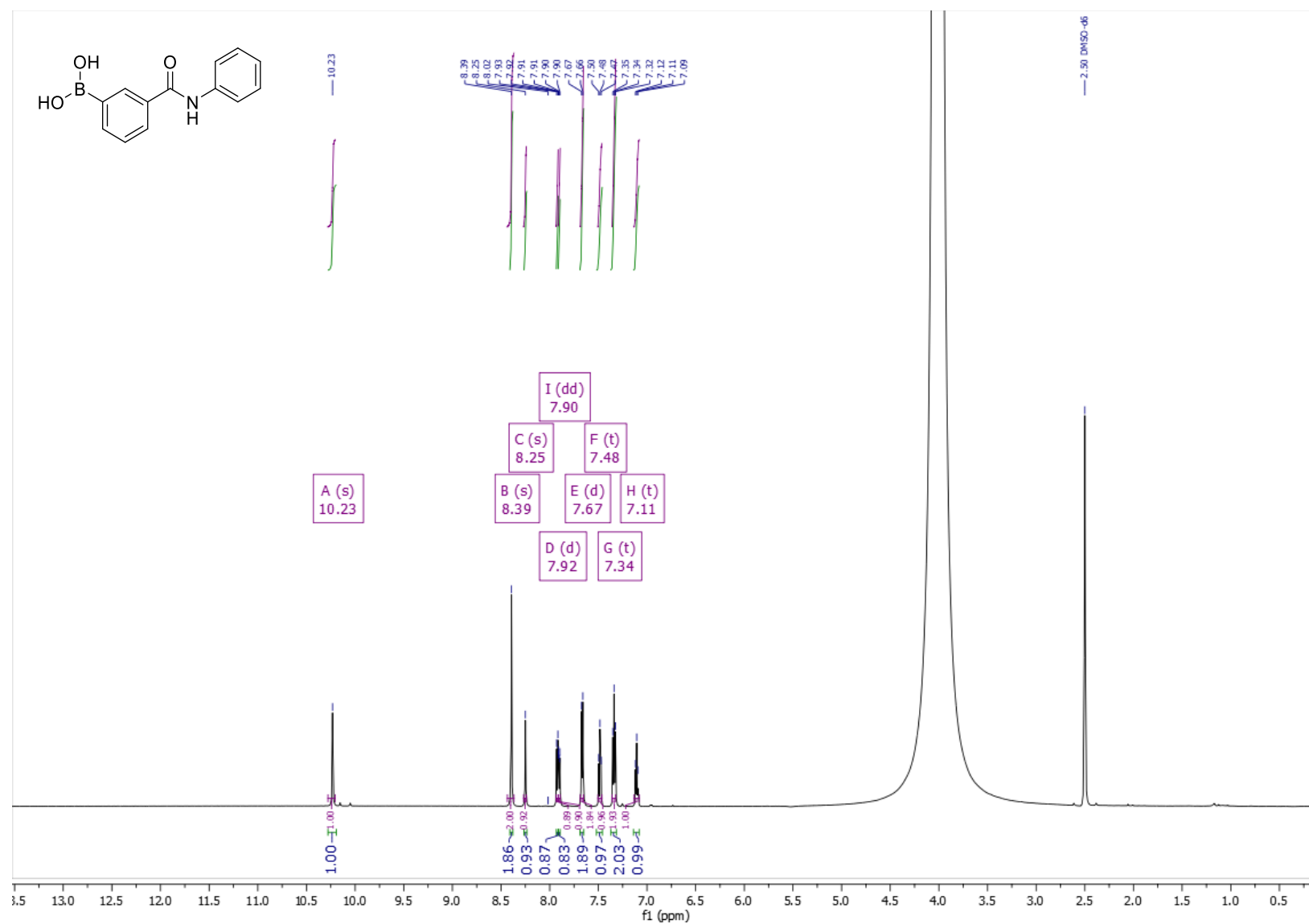


Espectro 11. RMN de ^1H (DMSO- d_6 , 600 MHz) do intermediário 3-nitro-5-(4,4,5,5-tetrametil-1,3,2-dioxaborolan-2-il)benzaldeído

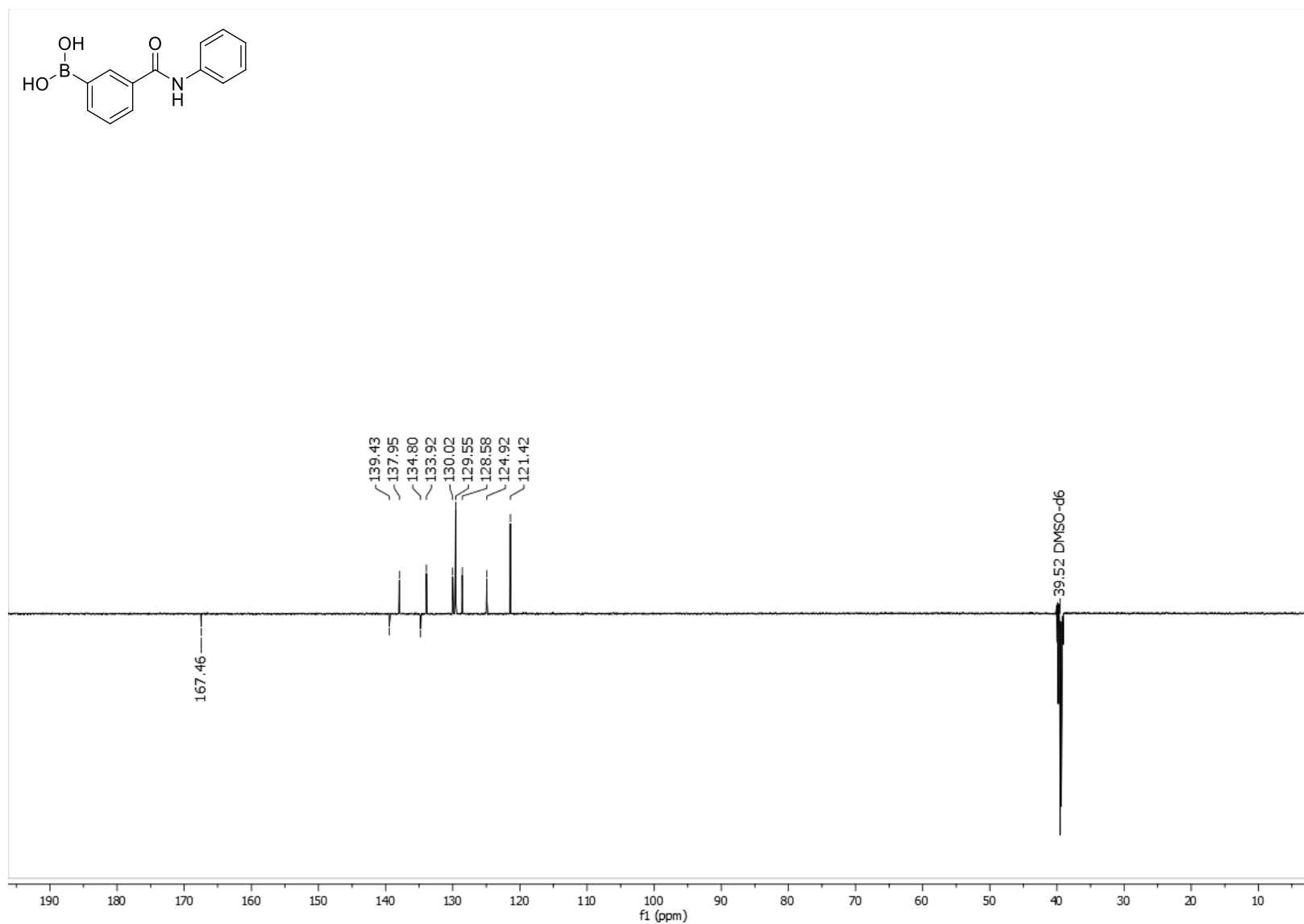


Espectro 12. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do intermediário 3-nitro-5-(4,4,5,5-tetrametil-1,3,2-dioxaborolan-2-il)benzaldeído

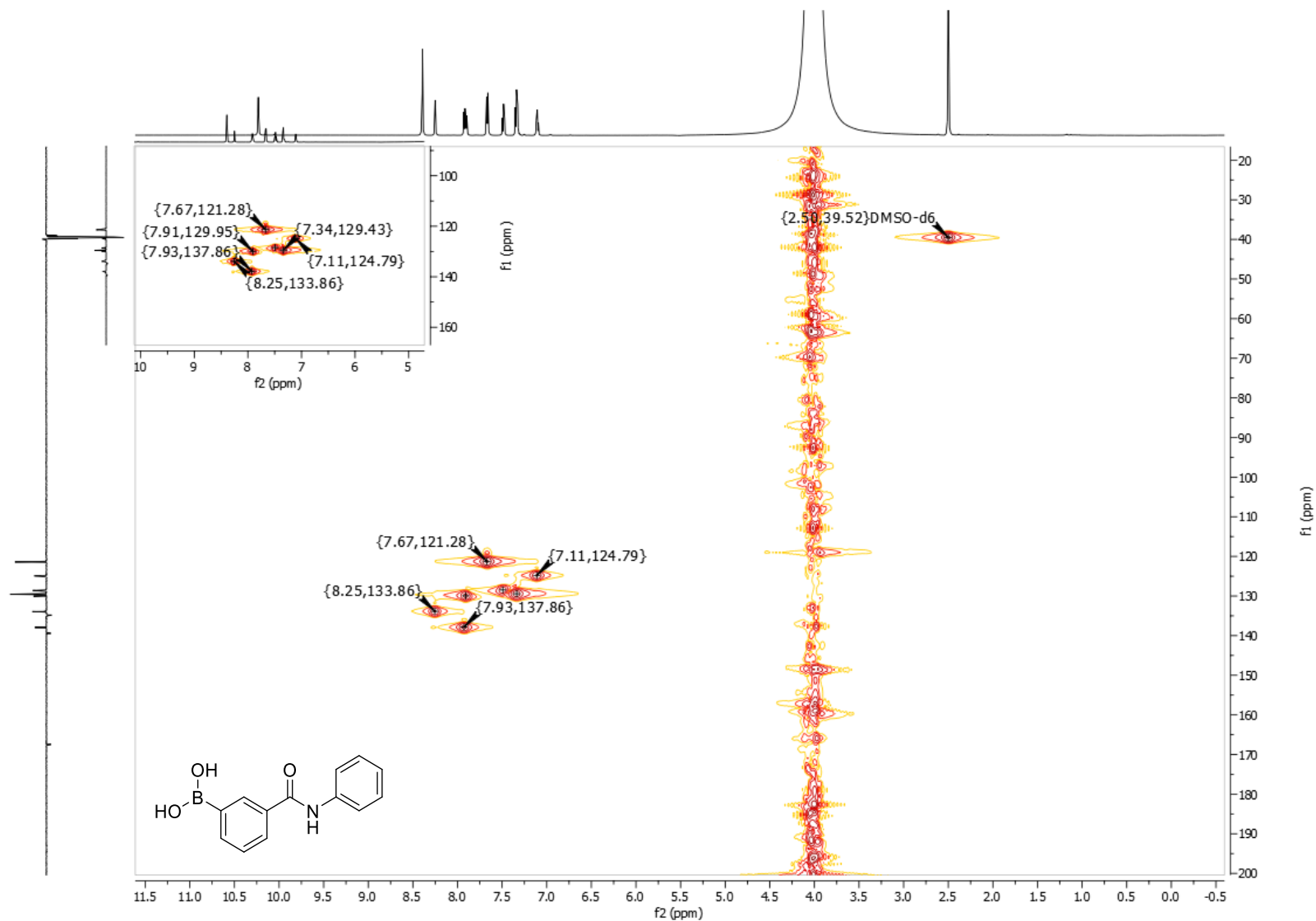


Espectro 13. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (3-(fenilcarbamoyl)fenil)borônico

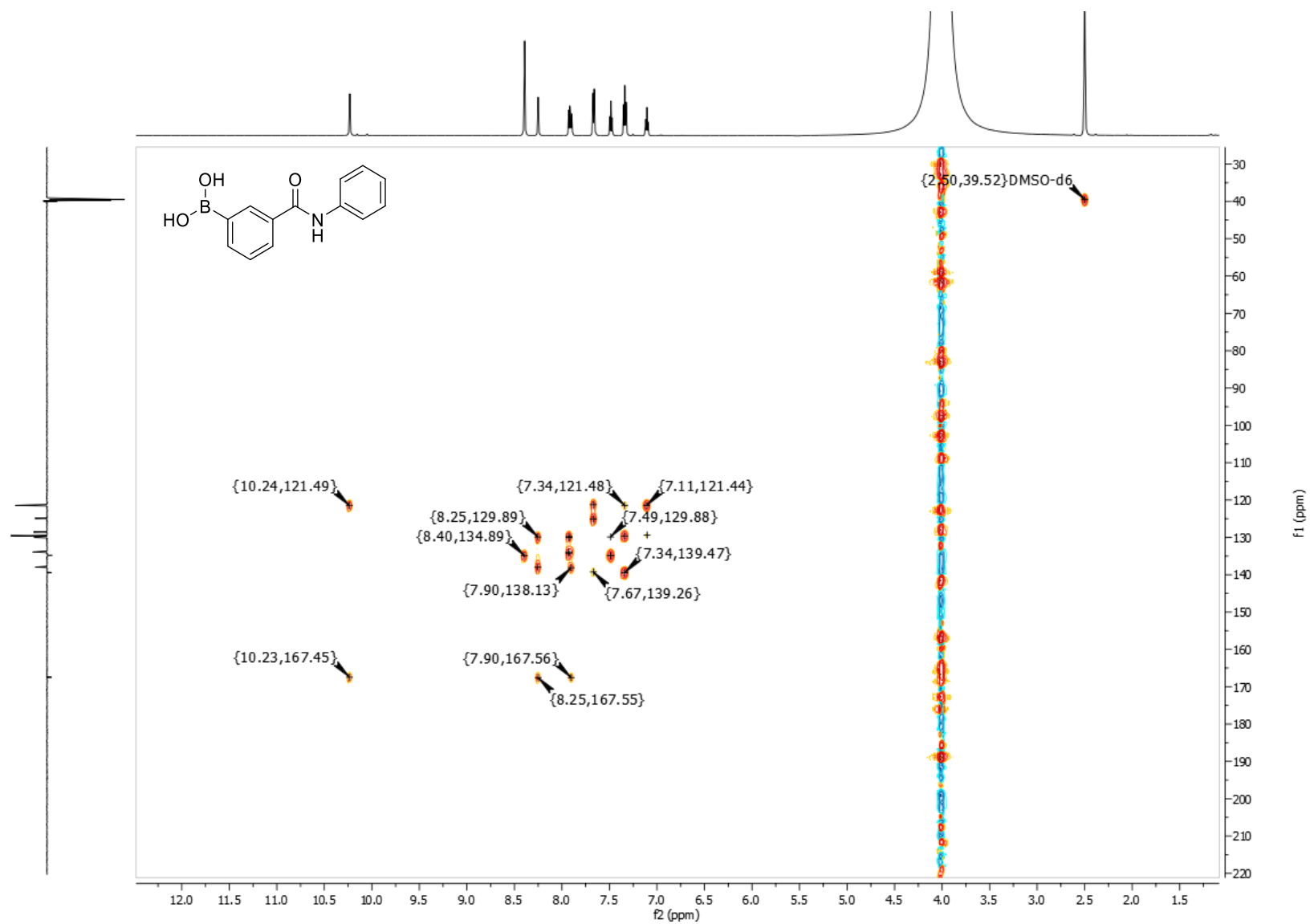
Espectro 14. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do composto ácido (3-(fenilcarbamoil)fenil)borônico



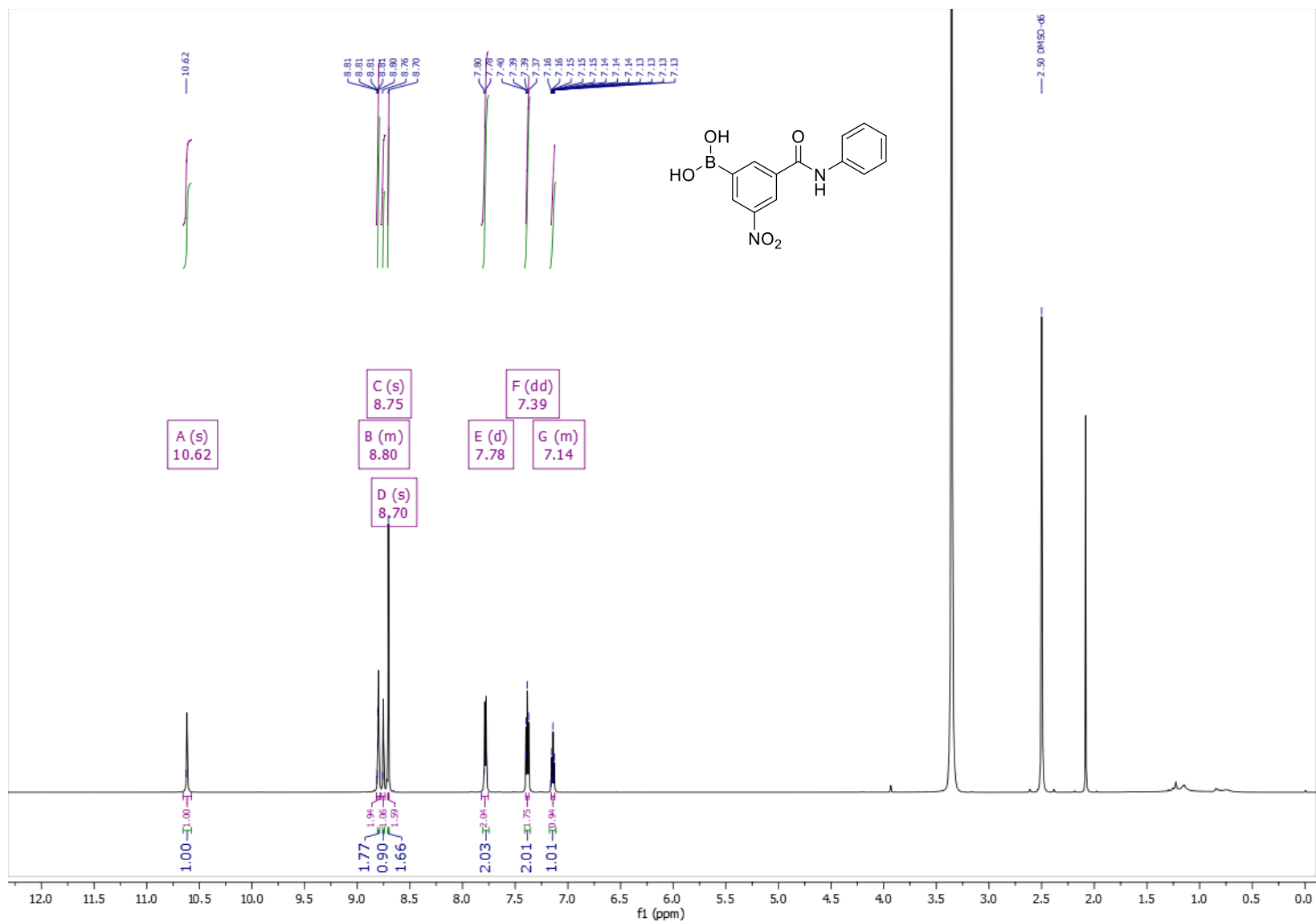
Espectro 15. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (3-(fenilcarbamoil)fenil)borônico



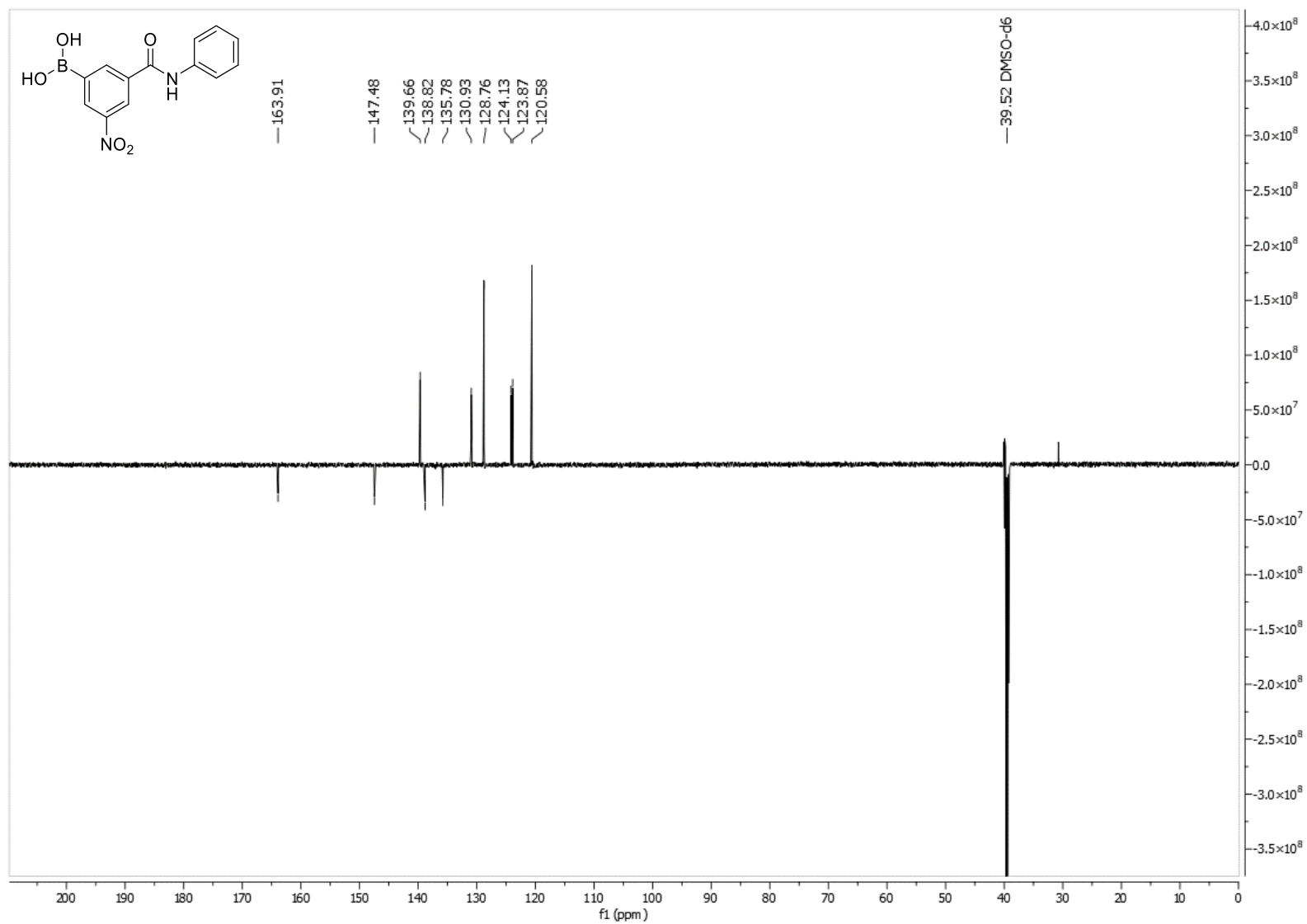
Espectro 16. Mapa de contorno de HMBC (DMSO-d₆, 600 MHz) do composto ácido (3-(fenilcarbamoi)fenil)borônico



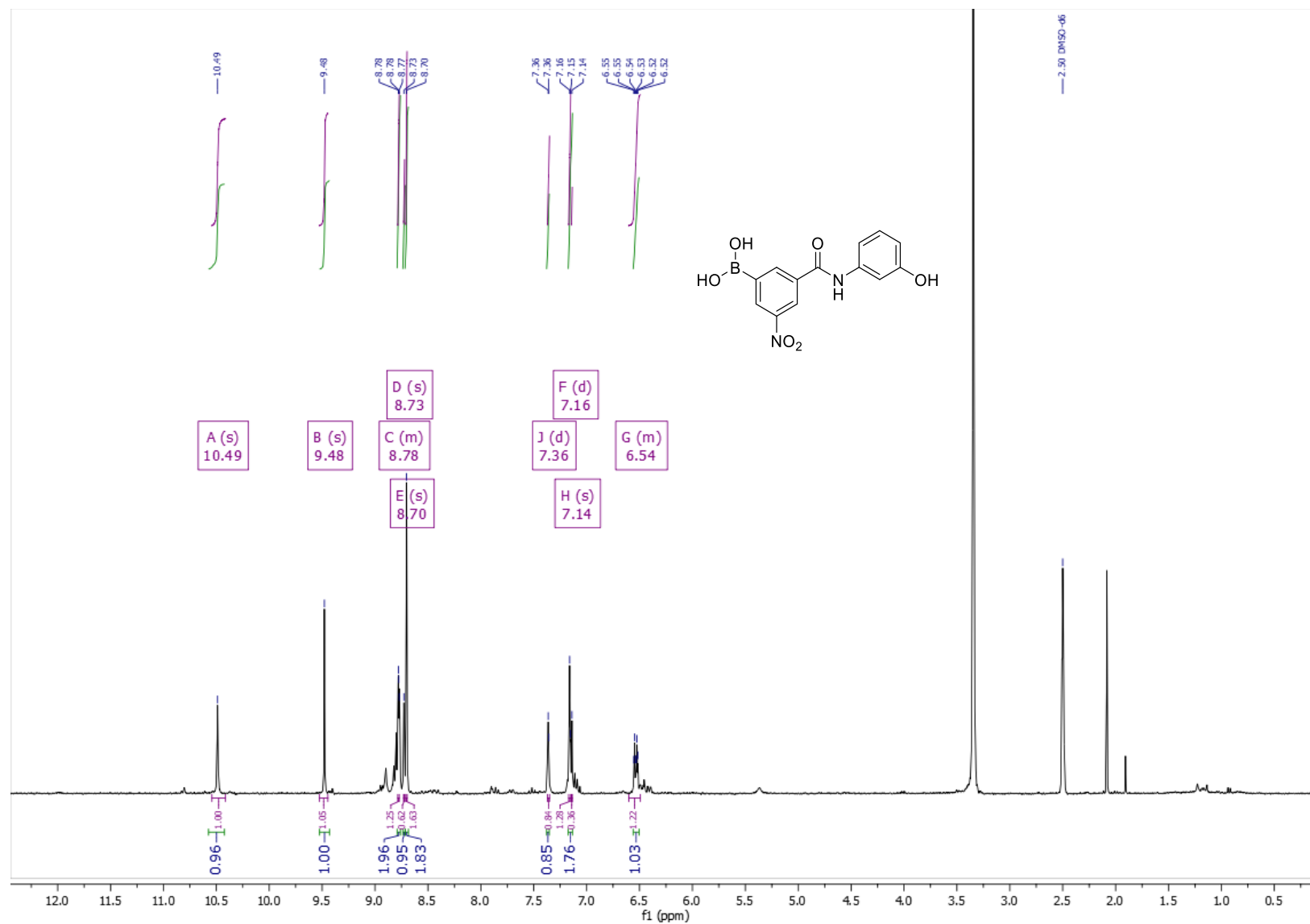
Espectro 17. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (3-nitro-5-(fenilcarbamoil)fenil)borônico



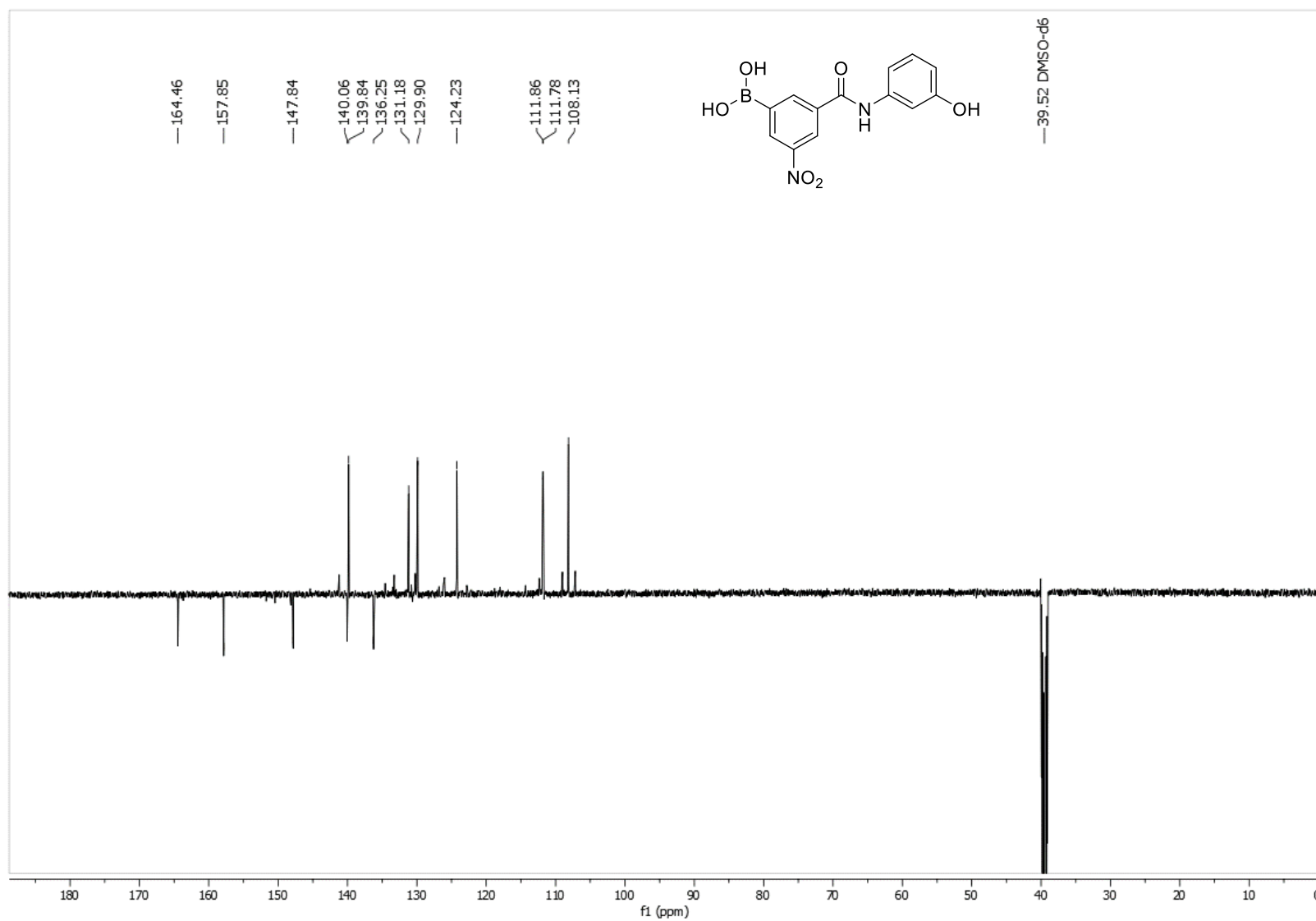
Espectro 18. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do composto ácido (3-nitro-5-(fenilcarbamoil)fenil)borônico



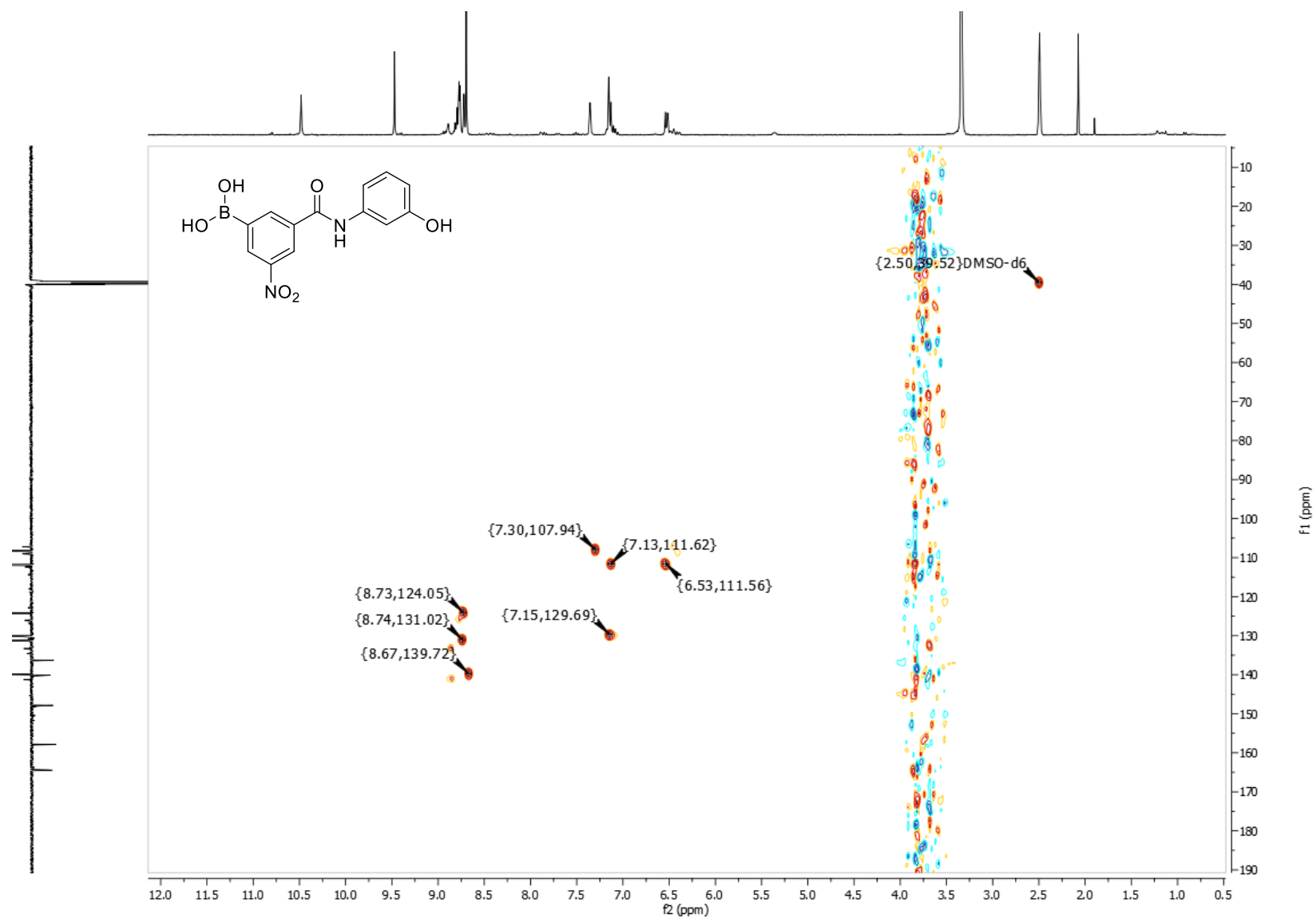
Espectro 19. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (3-((3-hidroxifenil)carbamoil)-5-nitrofenil)borônico



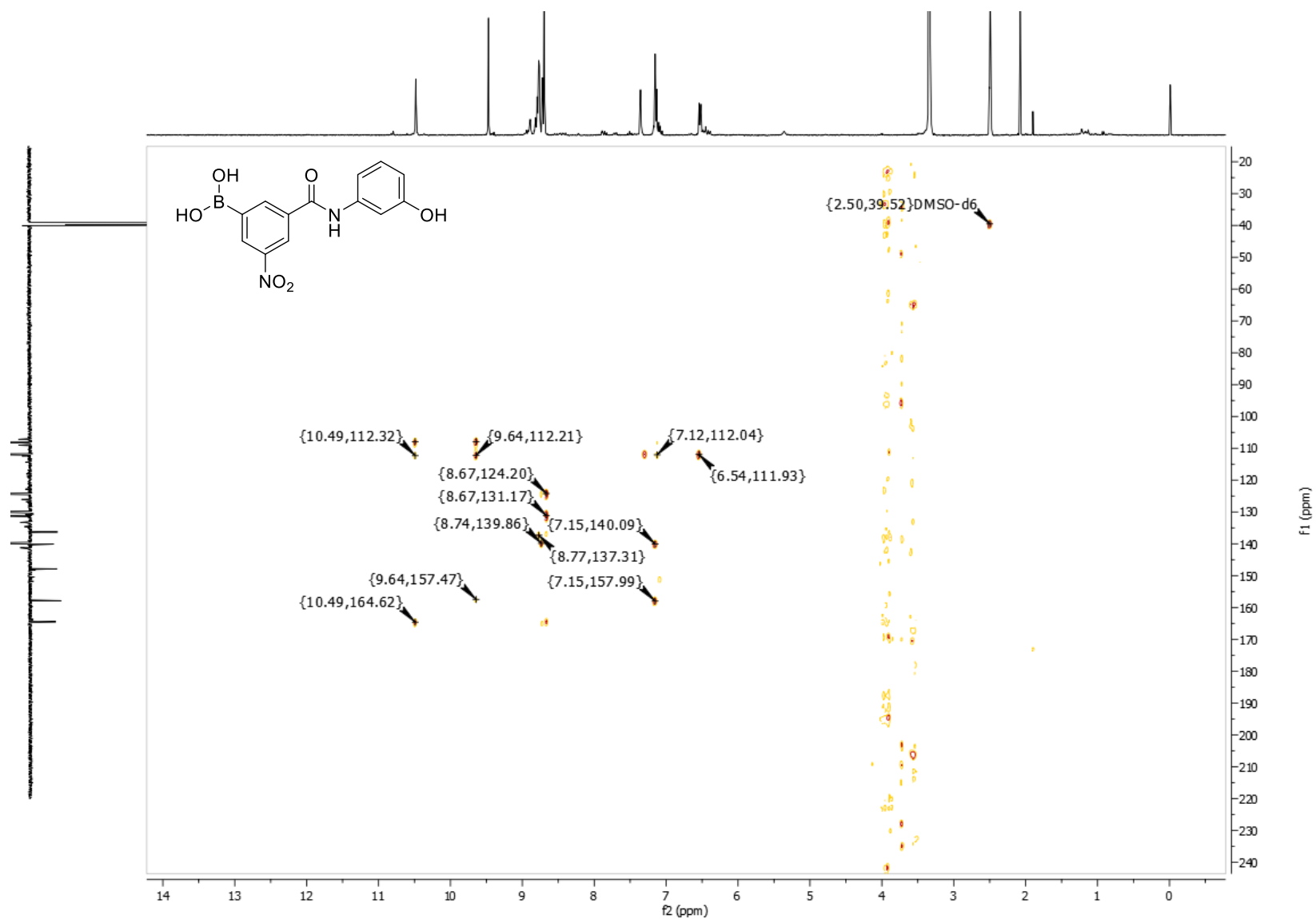
Espectro 20. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do composto ácido (3-((3-hidroxifenil)carbamoil)-5-nitrofenil)borônico



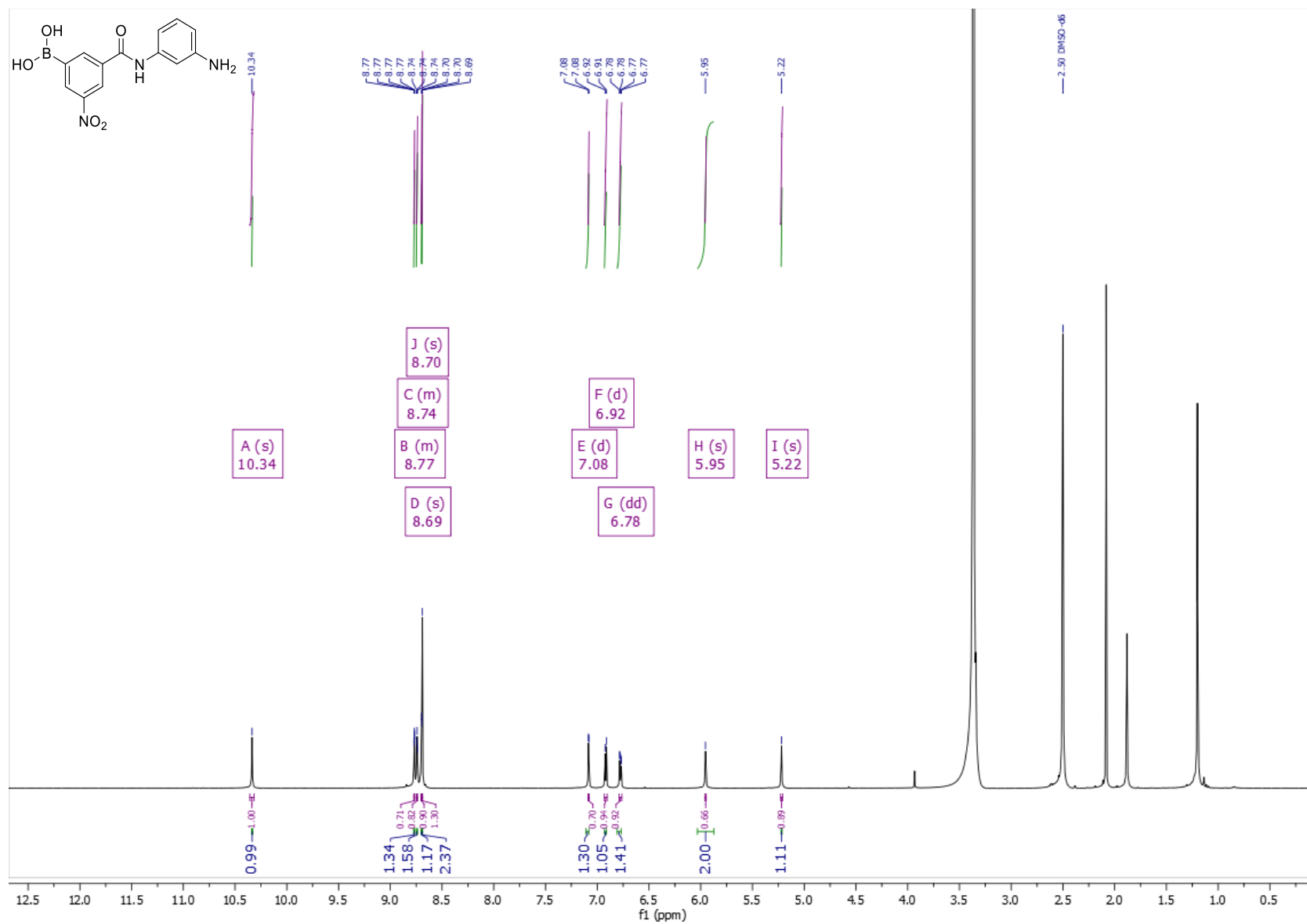
Espectro 21. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (3-((3-hidroxifenil)carbamoil)-5-nitrofenil)borônico



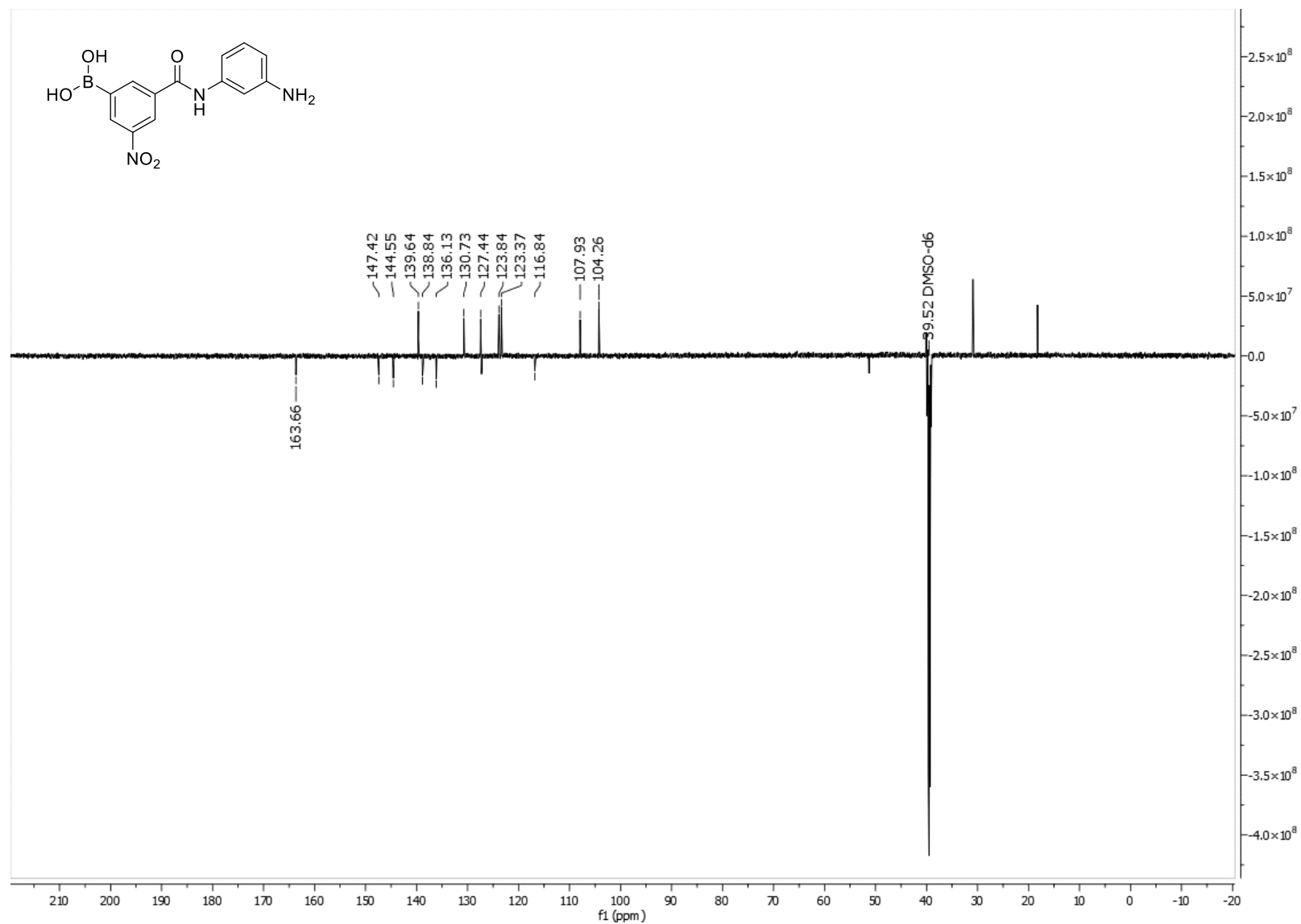
Espectro 22. Mapa de contorno de HMBC (DMSO-d₆, 600 MHz) do composto ácido (3-((3-hidroxifenil)carbamoil)-5-nitrofenil)borônico



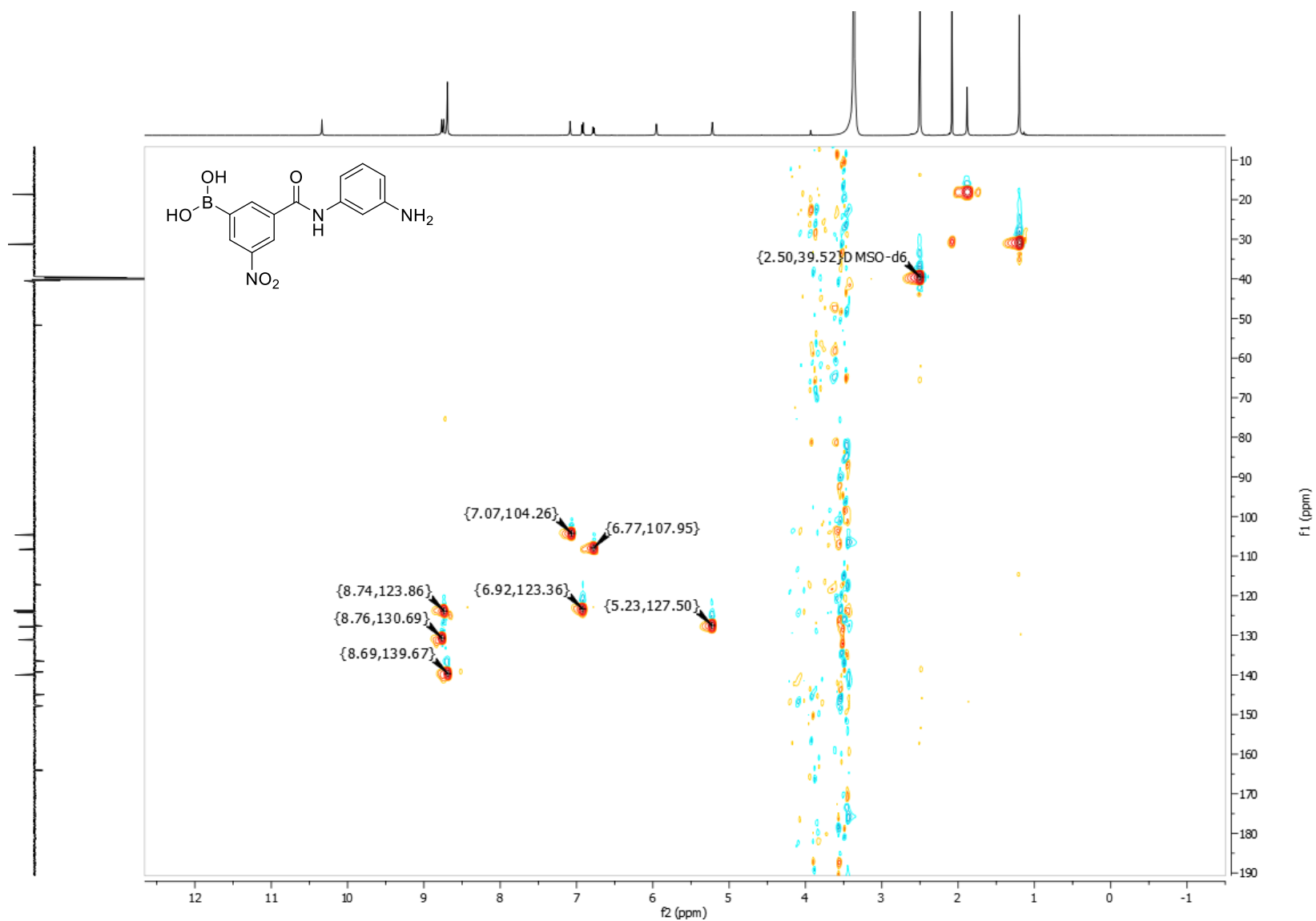
Espectro 23. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (3-((3-aminofenil)carbamoil)-5-nitrofenil)borônico



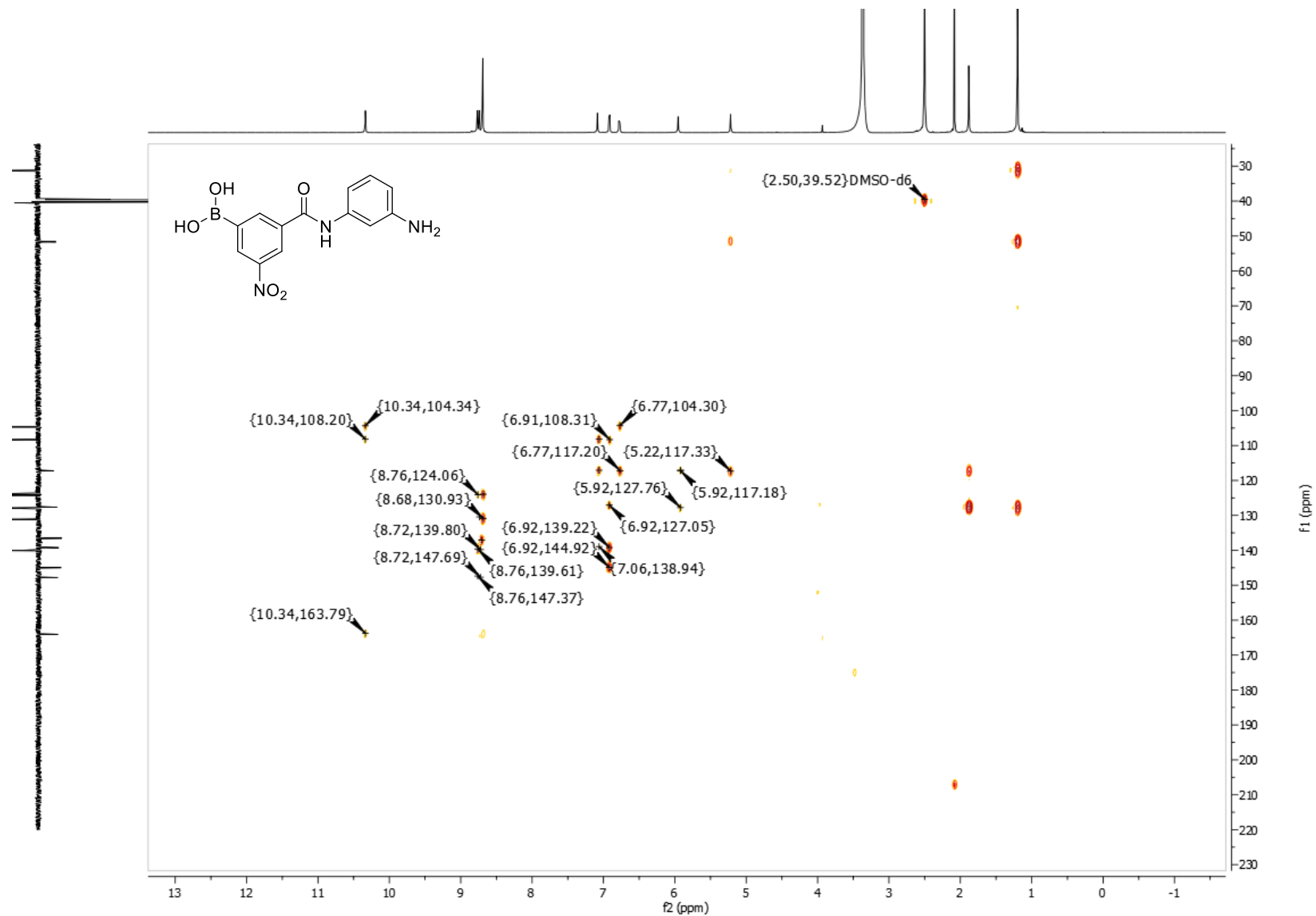
Espectro 24. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do composto ácido (3-((3-aminofenil)carbamoil)-5-nitrofenil)borônico



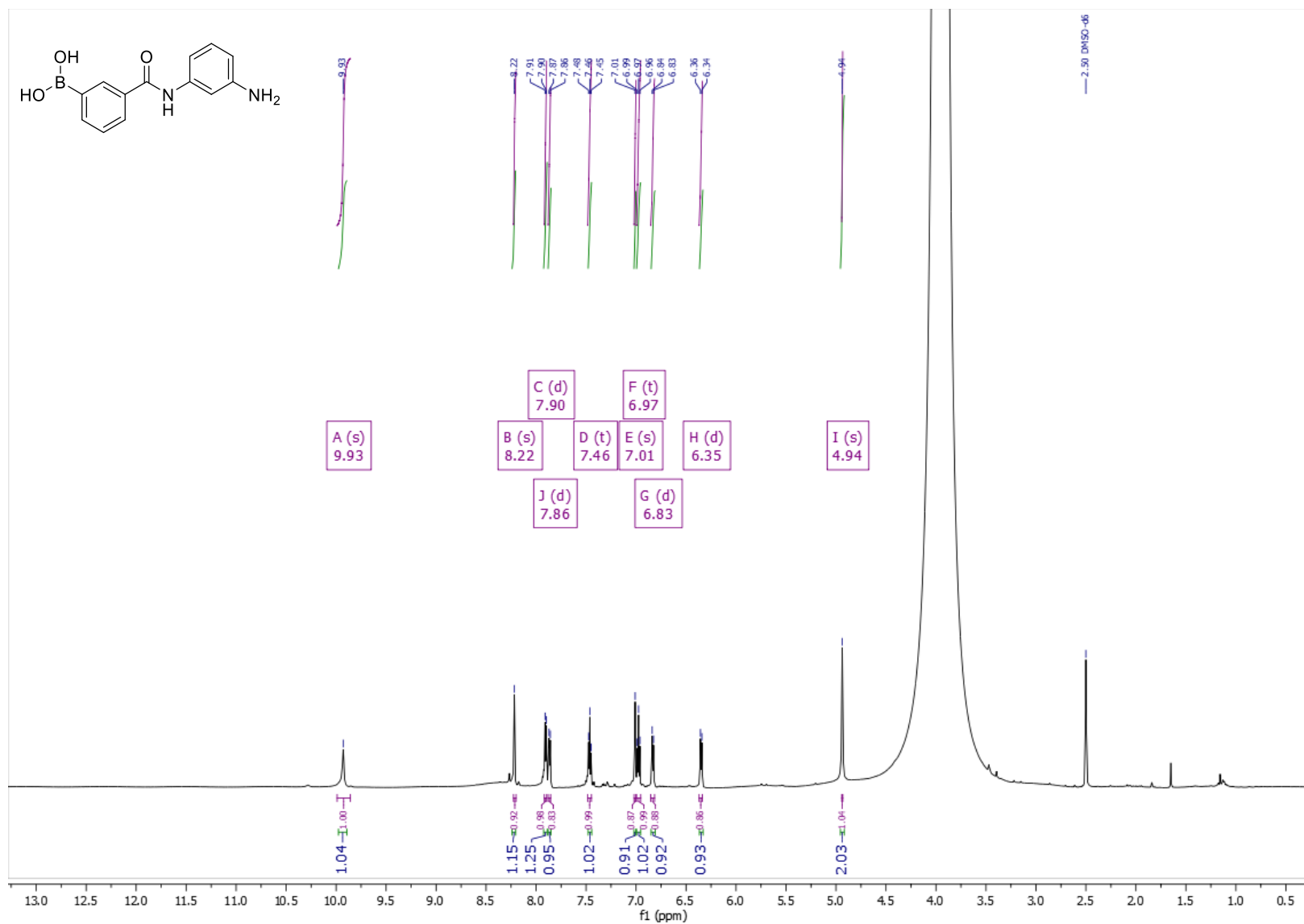
Espectro 25. Mapa de contorno de HSCQ (DMSO-d6, 600 MHz) do composto ácido (3-((3-aminofenil)carbamoil)-5-nitrofenil)borônico

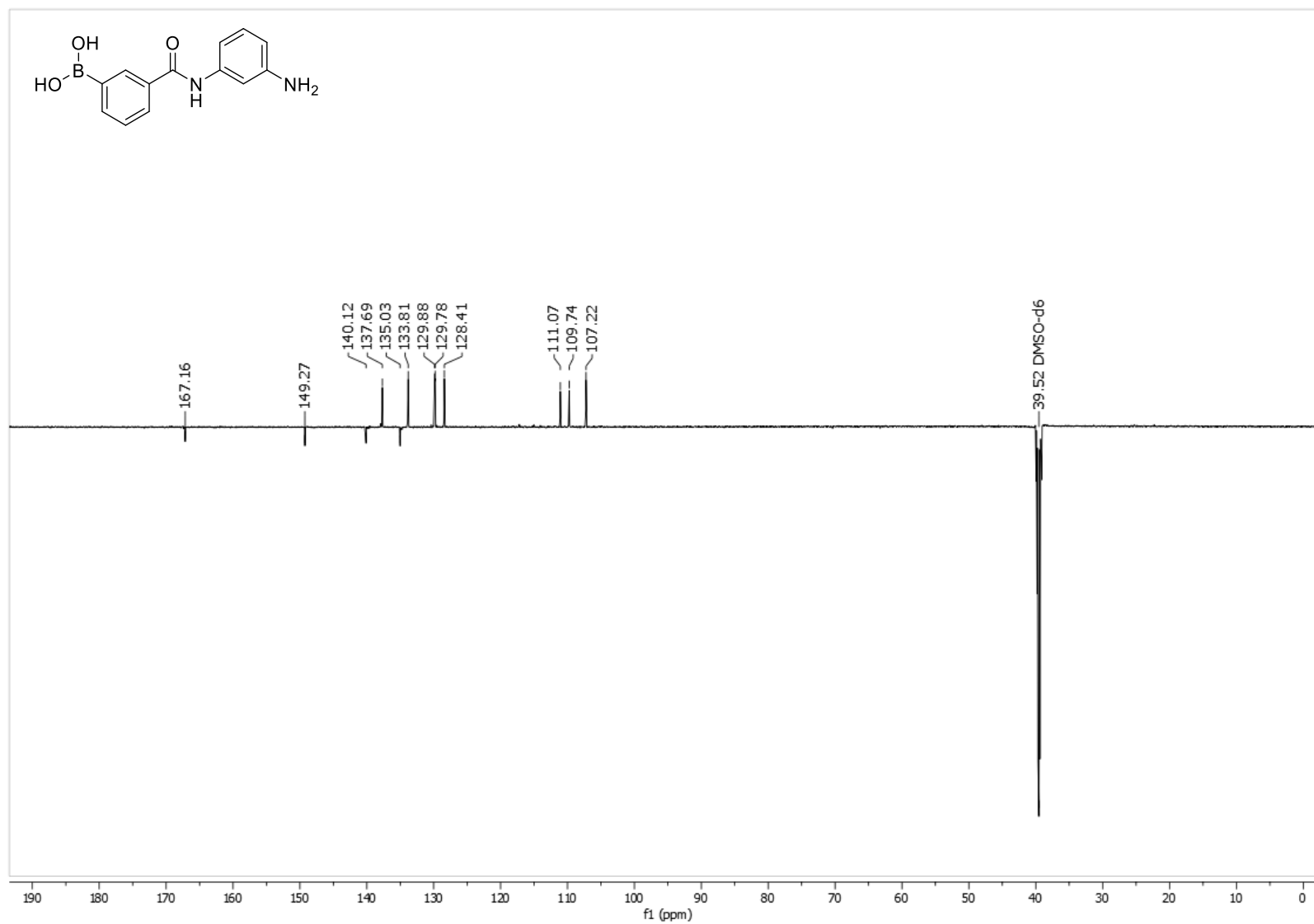


Espectro 26. Mapa de contorno de HSCQ (DMSO-d₆, 600 MHz) do composto ácido (3-((3-aminofenil)carbamoil)-5-nitrofenil)borônico

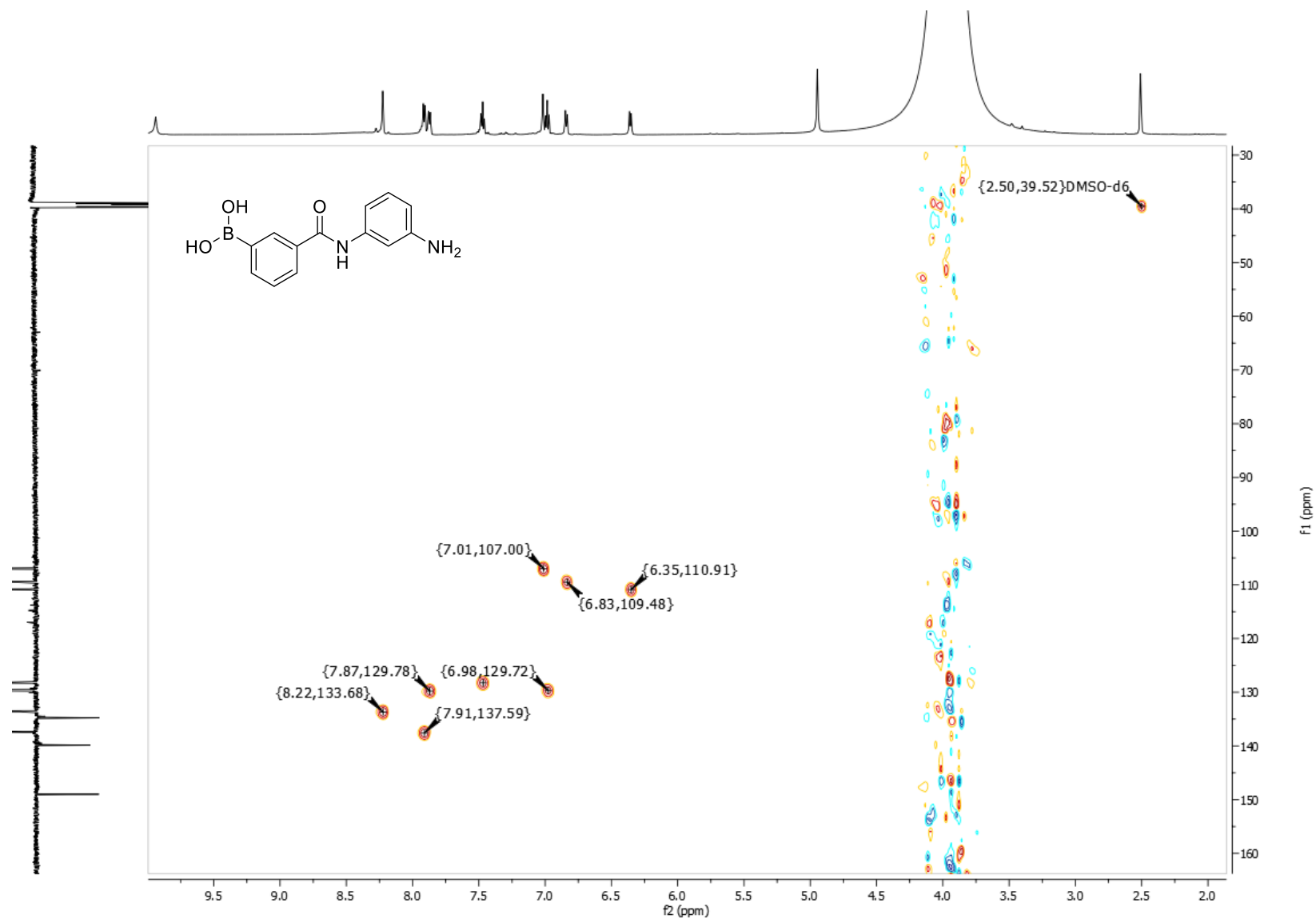


Espectro 27. RMN de ^1H (DMSO- d_6 , 150 MHz) do composto ácido (3-((3-aminofenil)carbamoil)fenil)borônico

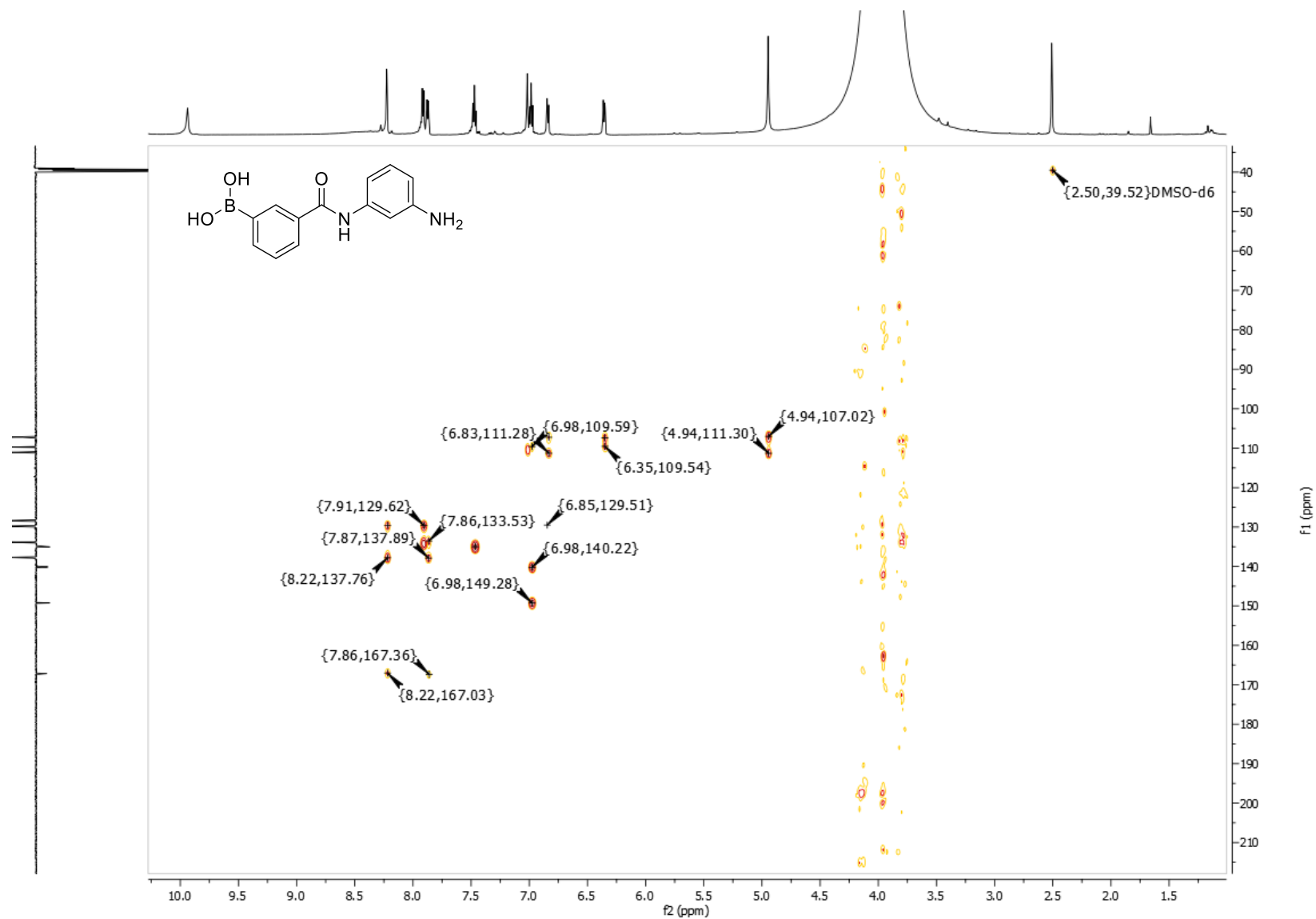


Espectro 28. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do composto ácido (3-((3-aminofenil)carbamoil)fenil)borônico

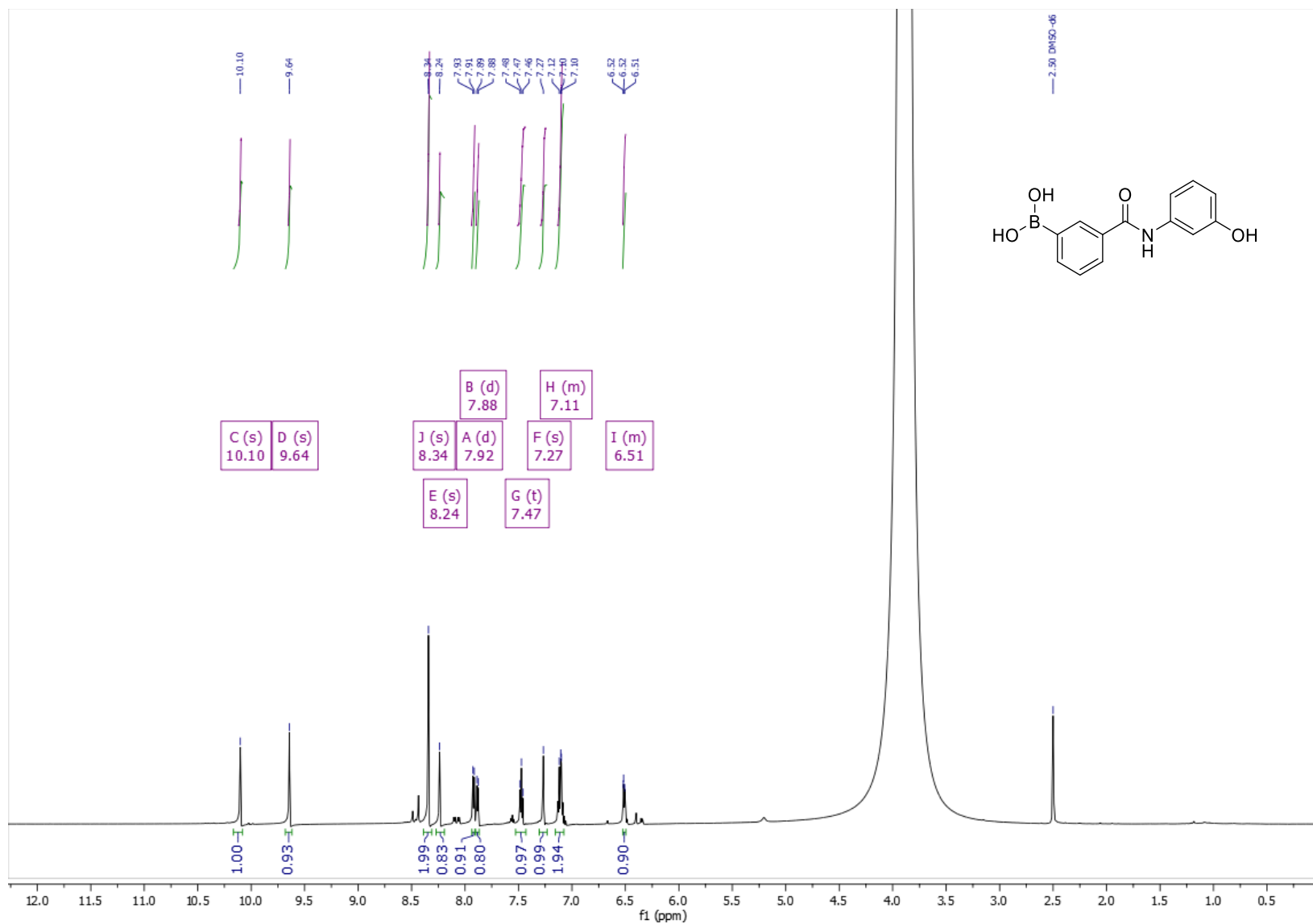
Espectro 29. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (3-((3-aminofenil)carbamoil)fenil)borônico

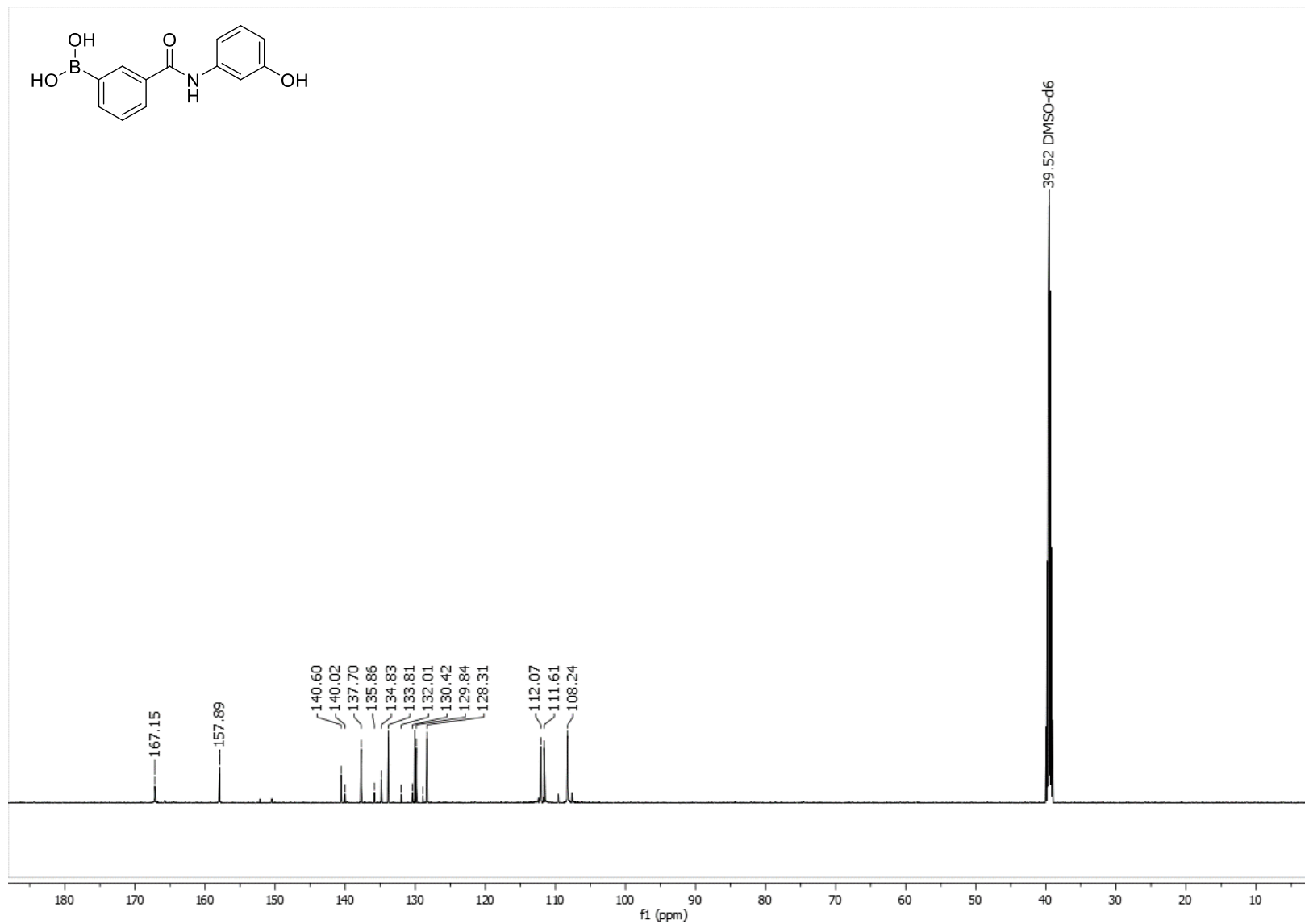


Espectro 30. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (3-((3-aminofenil)carbamoil)fenil)borônico

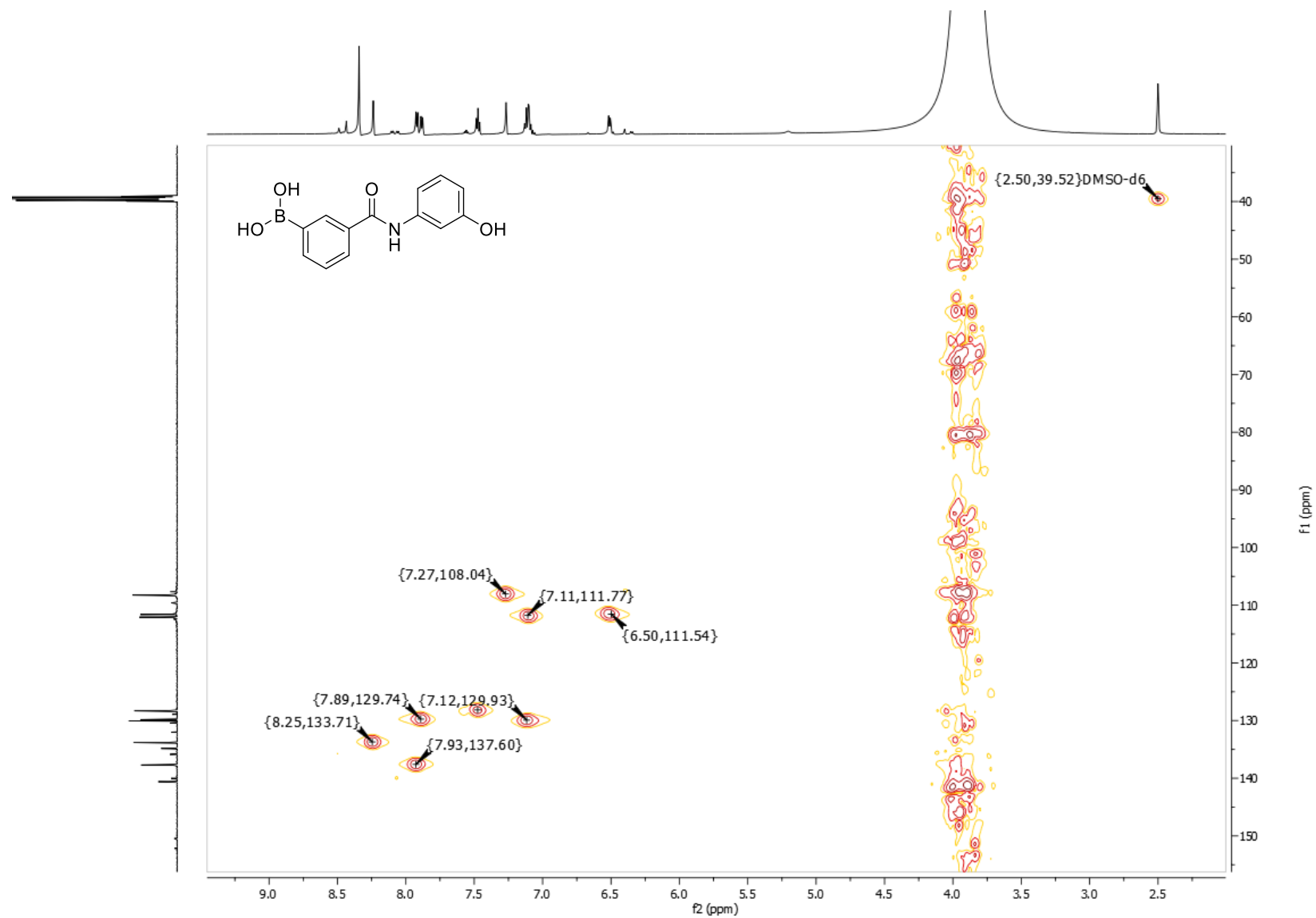


Espectro 31. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (3-((3-hidroxifenil)carbamoil)fenil)borônico

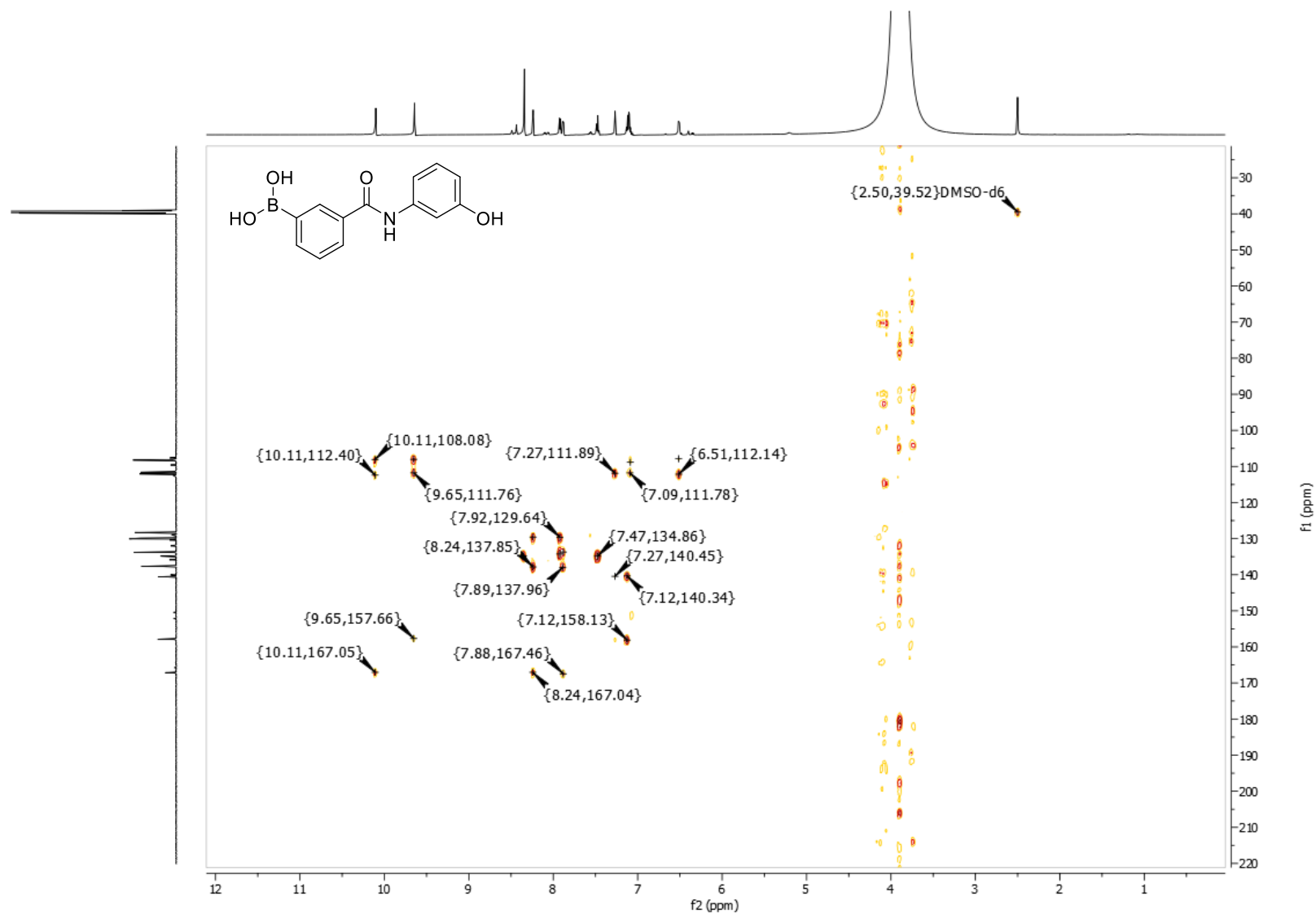


Espectro 32. RMN de ^{13}C (DMSO- d_6 , 150 MHz) do composto ácido (3-((3-hidroxifenil)carbamoil)fenil)borônico

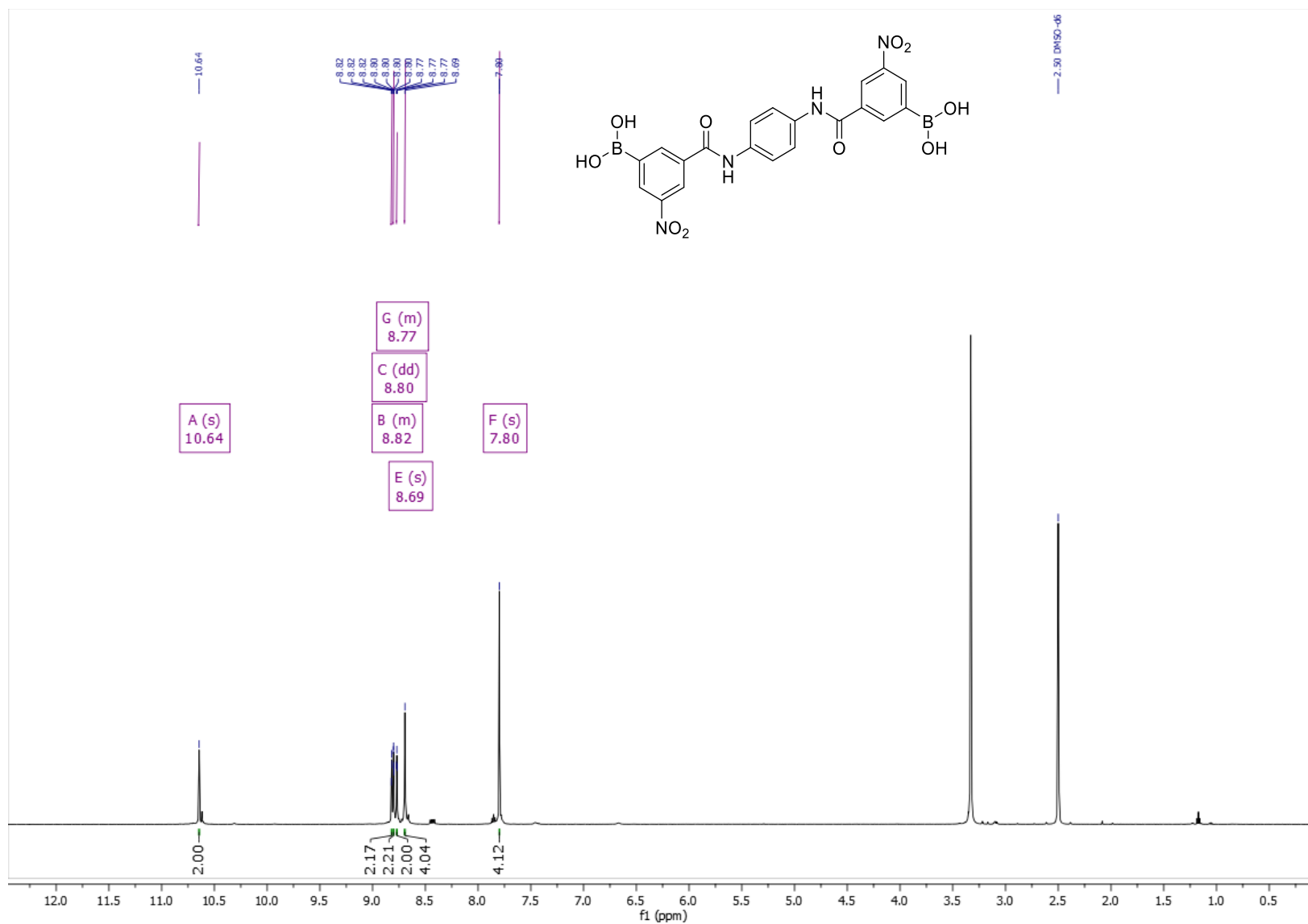
Espectro 33. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (3-((3-hidroxifenil)carbamoil)fenil)borônico



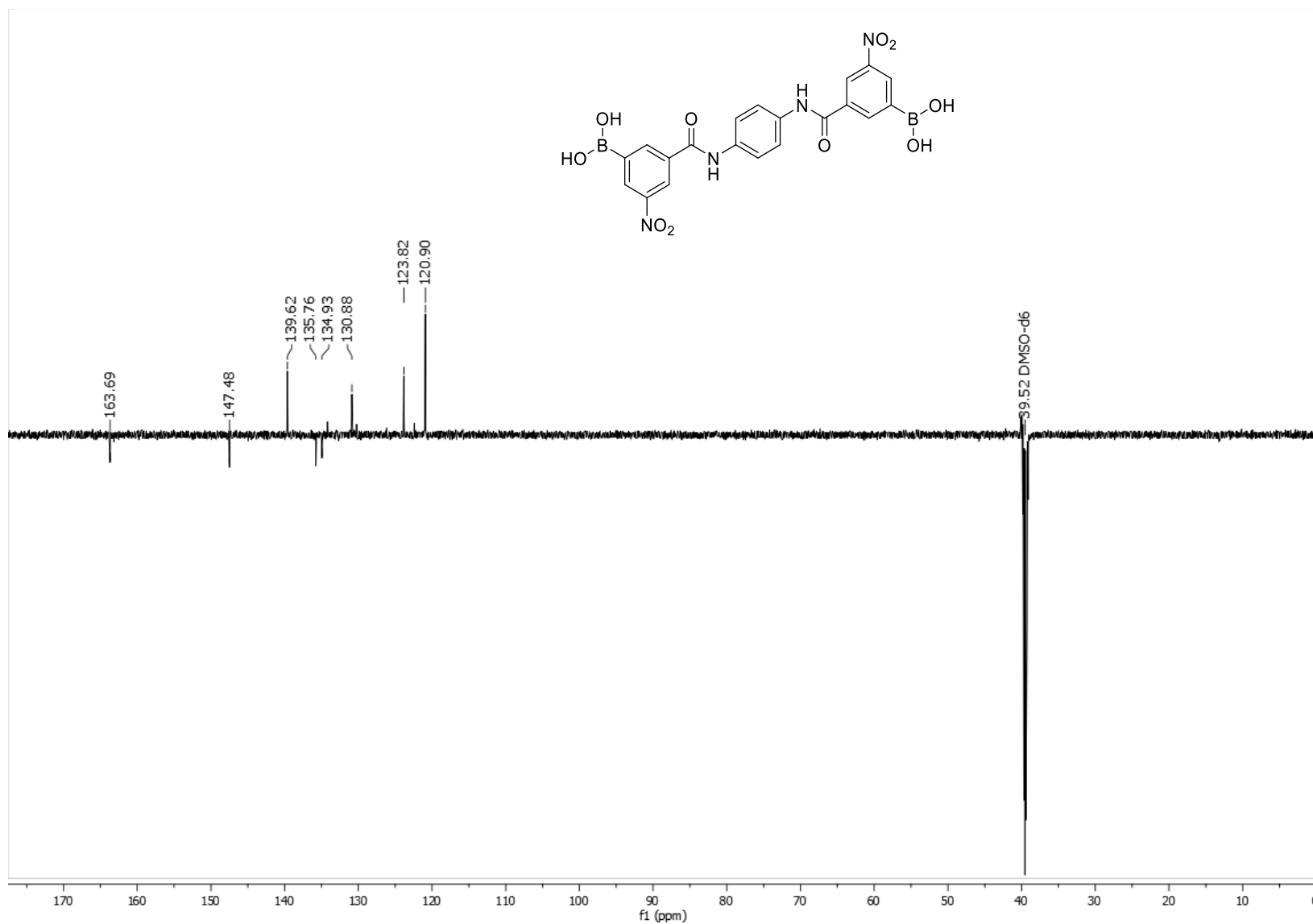
Espectro 34. Mapa de contorno de HMBC (DMSO-d₆, 600 MHz) do composto ácido (3-((3-hidroxifenil)carbamoil)fenil)borônico



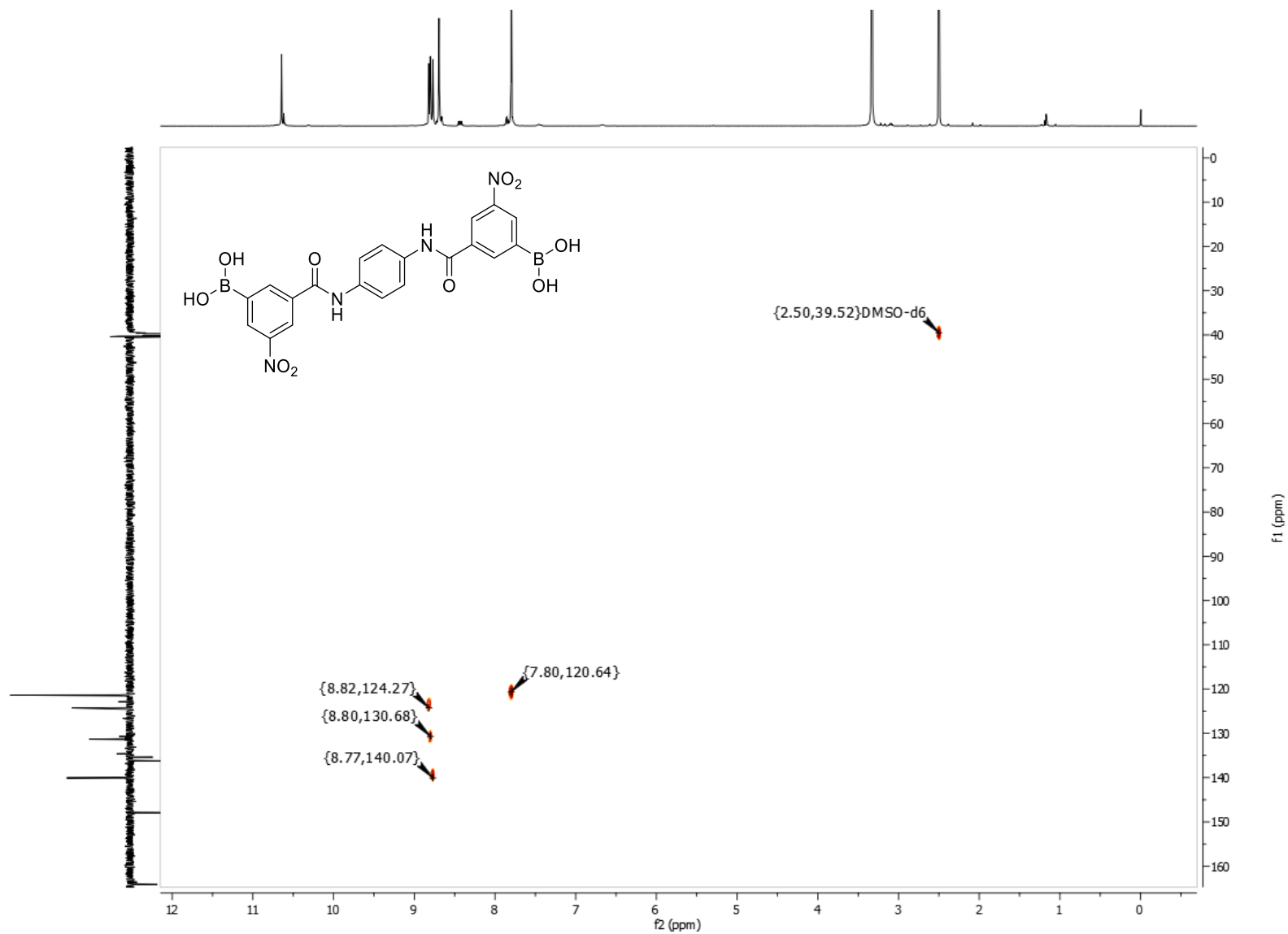
Espectro 35. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (((1,4-fenilenobis(azanodiil))bis(carbonil))bis(5-nitro-3,1-fenileno))diborônico



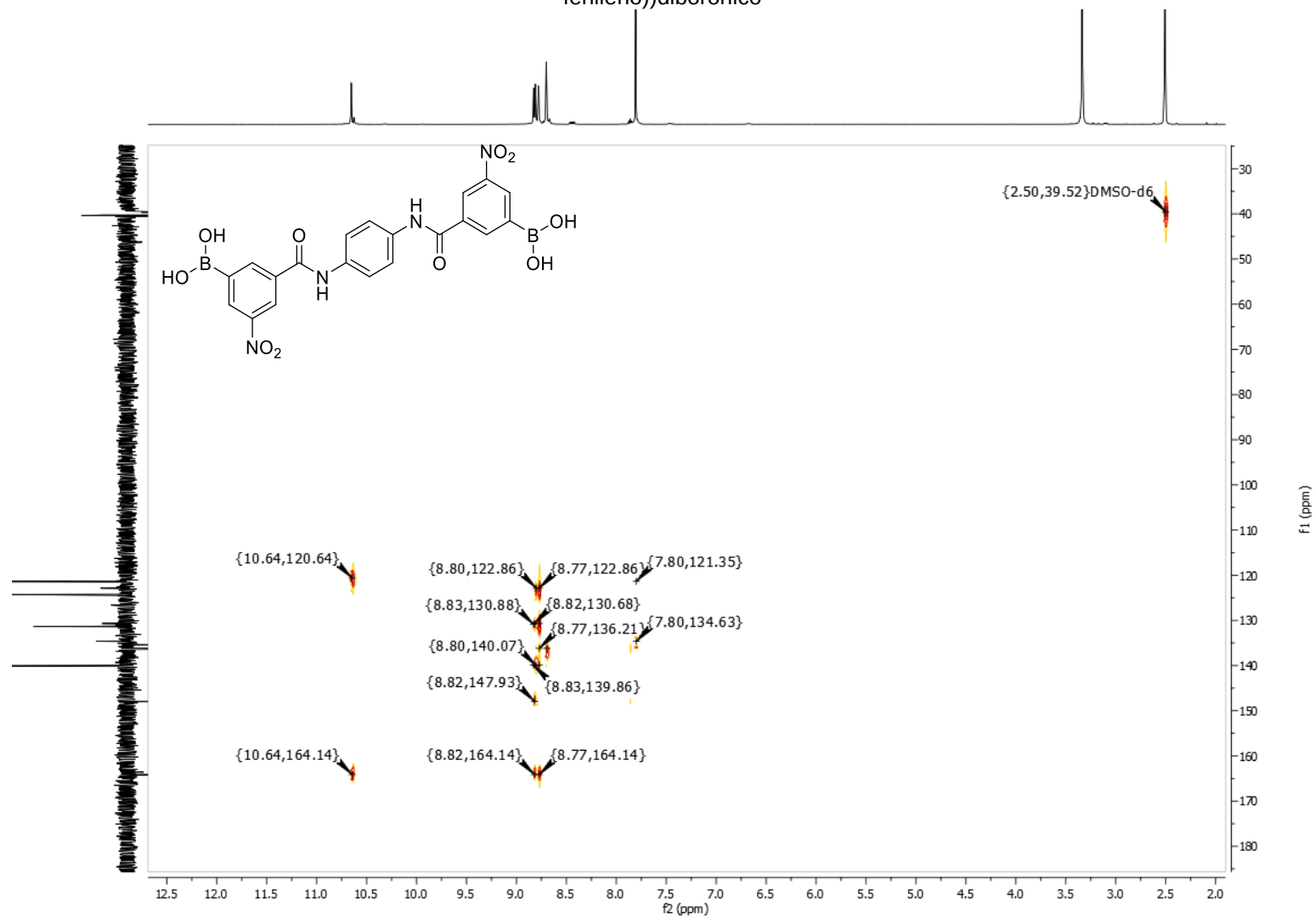
Espectro 36. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do composto ácido (((1,4-fenilenobis(azanodiil))bis(carbonil))bis(5-nitro-3,1-fenileno))diborônico



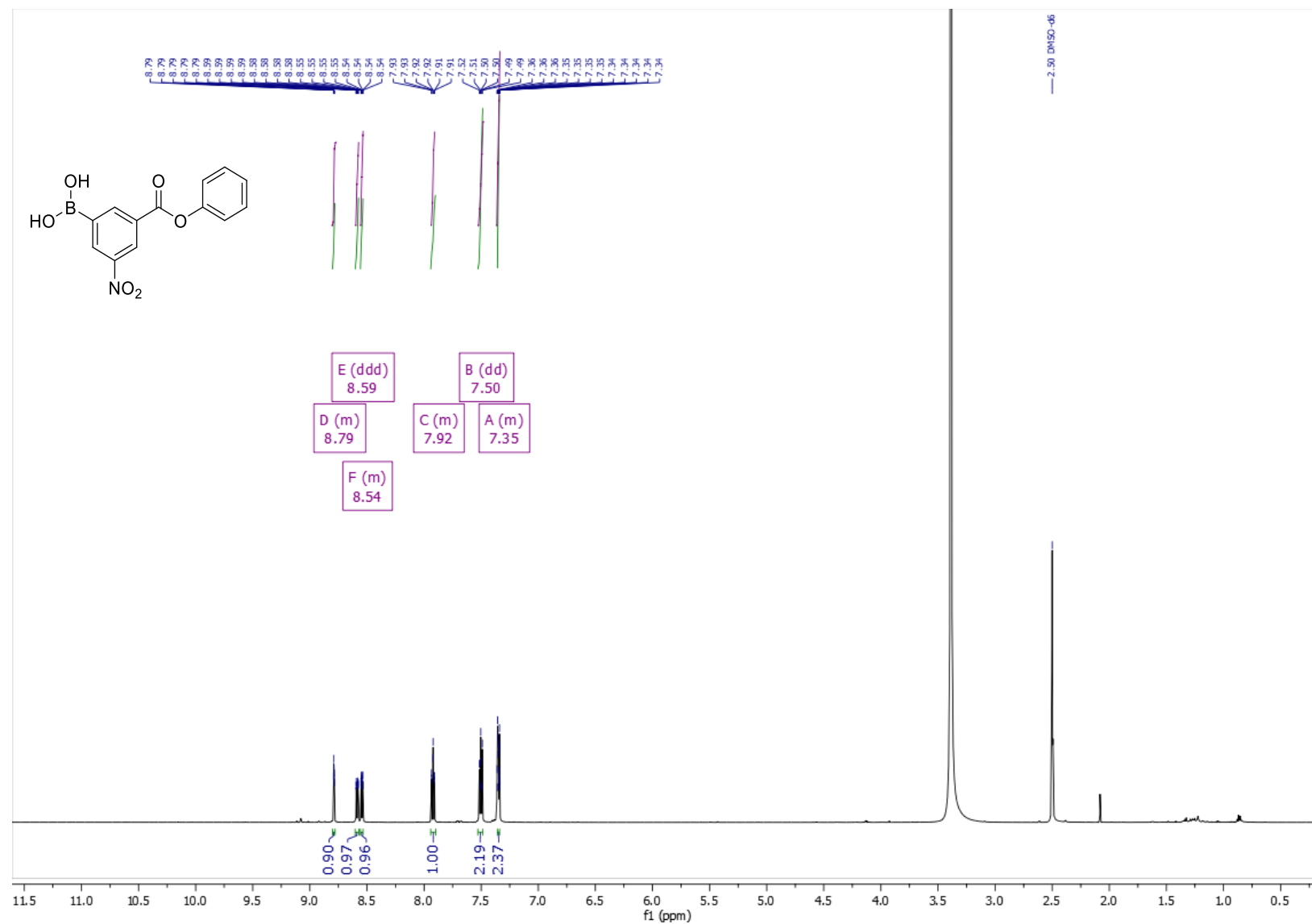
Espectro 37. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (((1,4-fenilenobis(azanodiil))bis(carbonil))bis(5-nitro-3,1-fenileno))diborônico



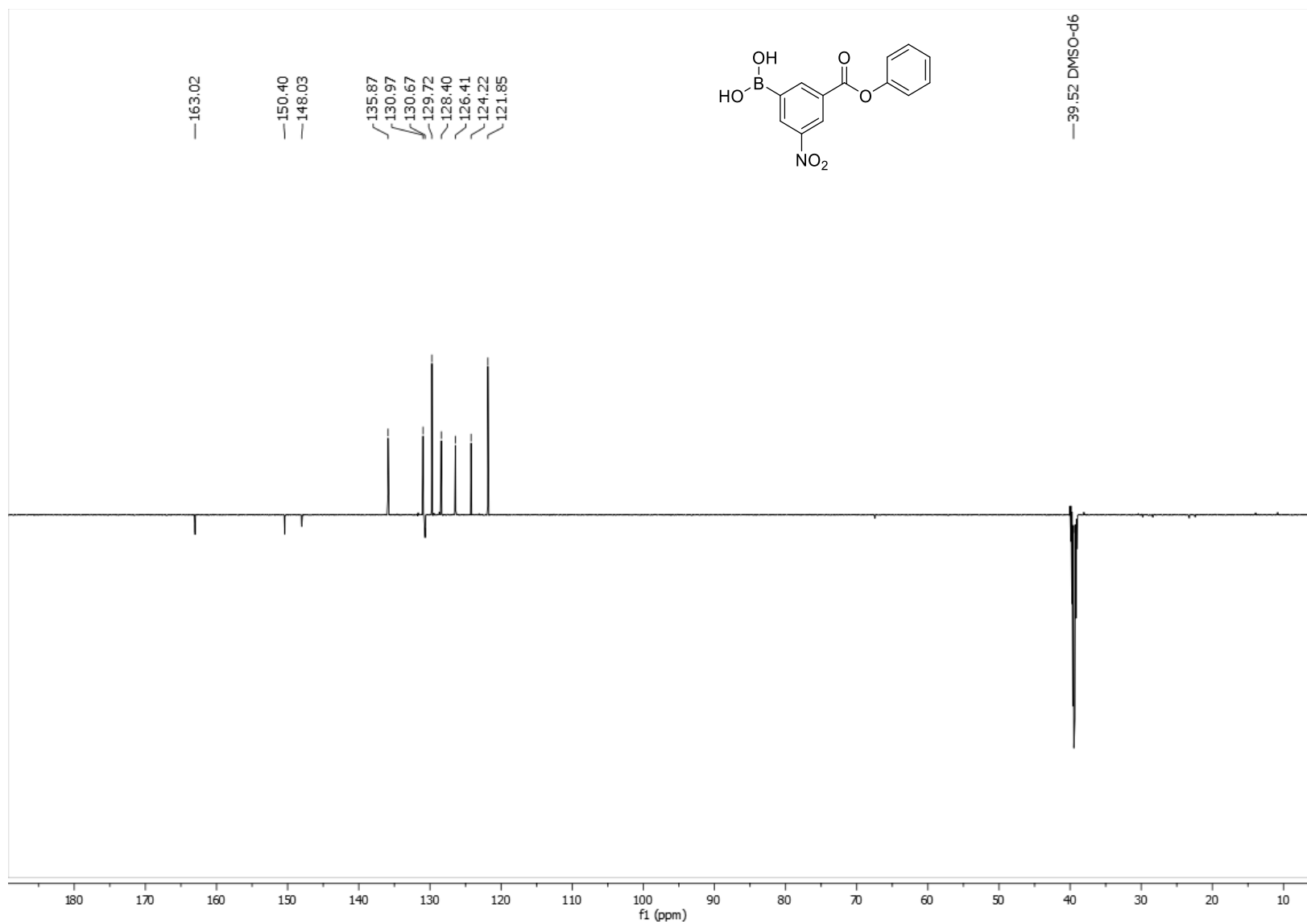
Espectro 38. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (((1,4-fenilenobis(azanodiil))bis(carbonil))bis(5-nitro-3,1-fenileno))diborônico



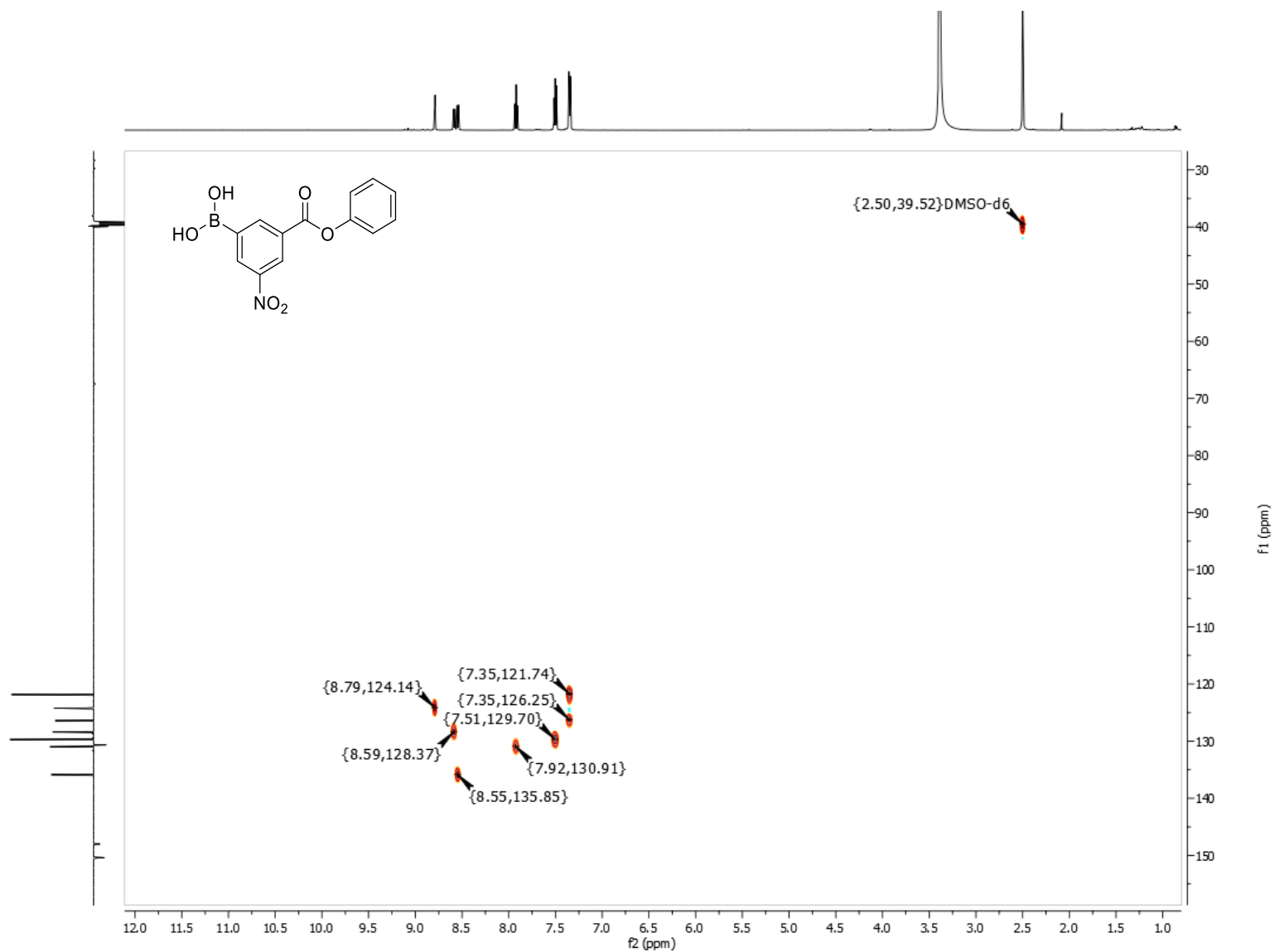
Espectro 39. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (3-nitro-5-(fenoxycarbonil)fenil)borônico



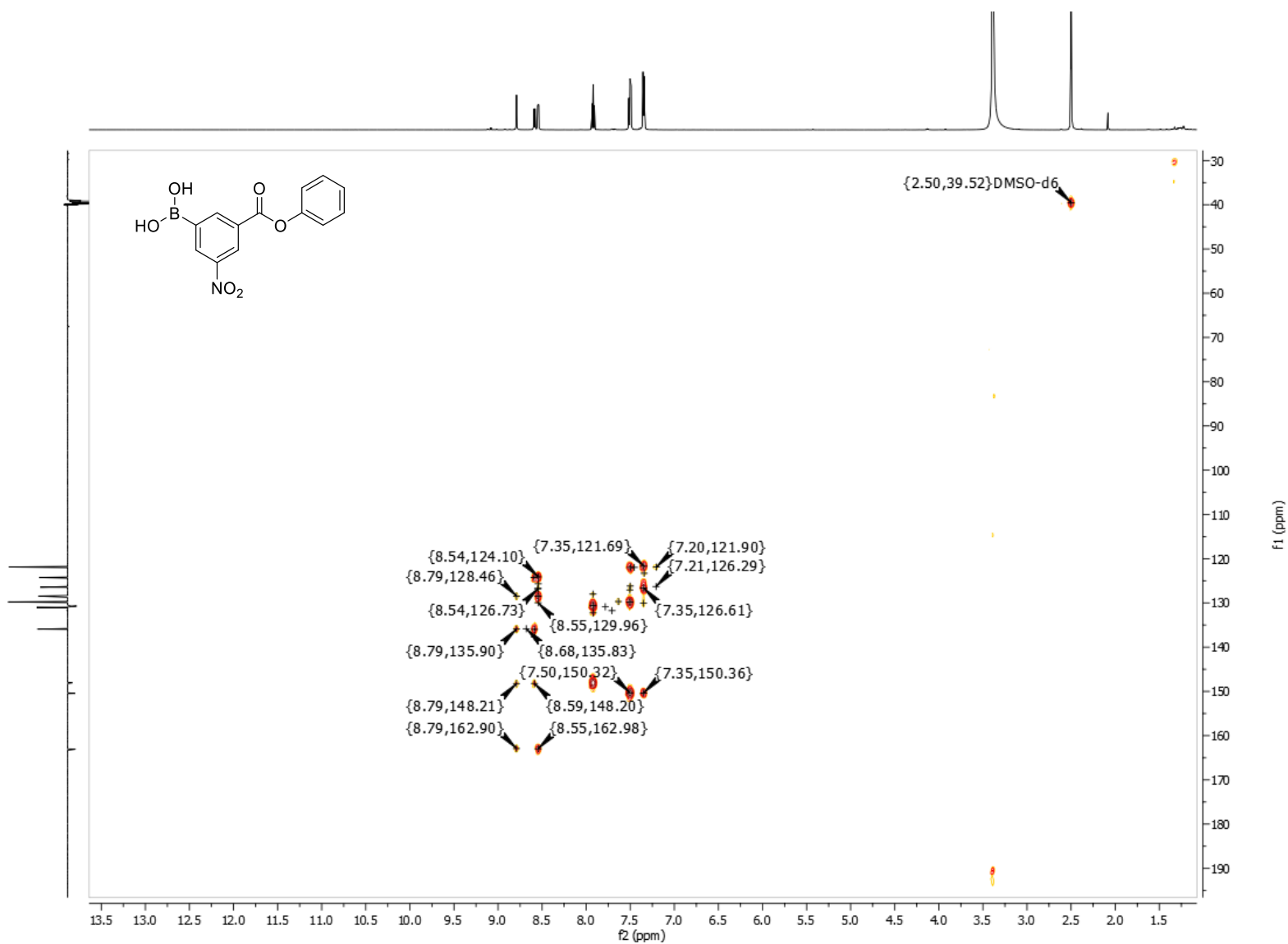
Espectro 40. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do composto ácido (3-nitro-5-(fenoxycarbonil)fenil)borônico



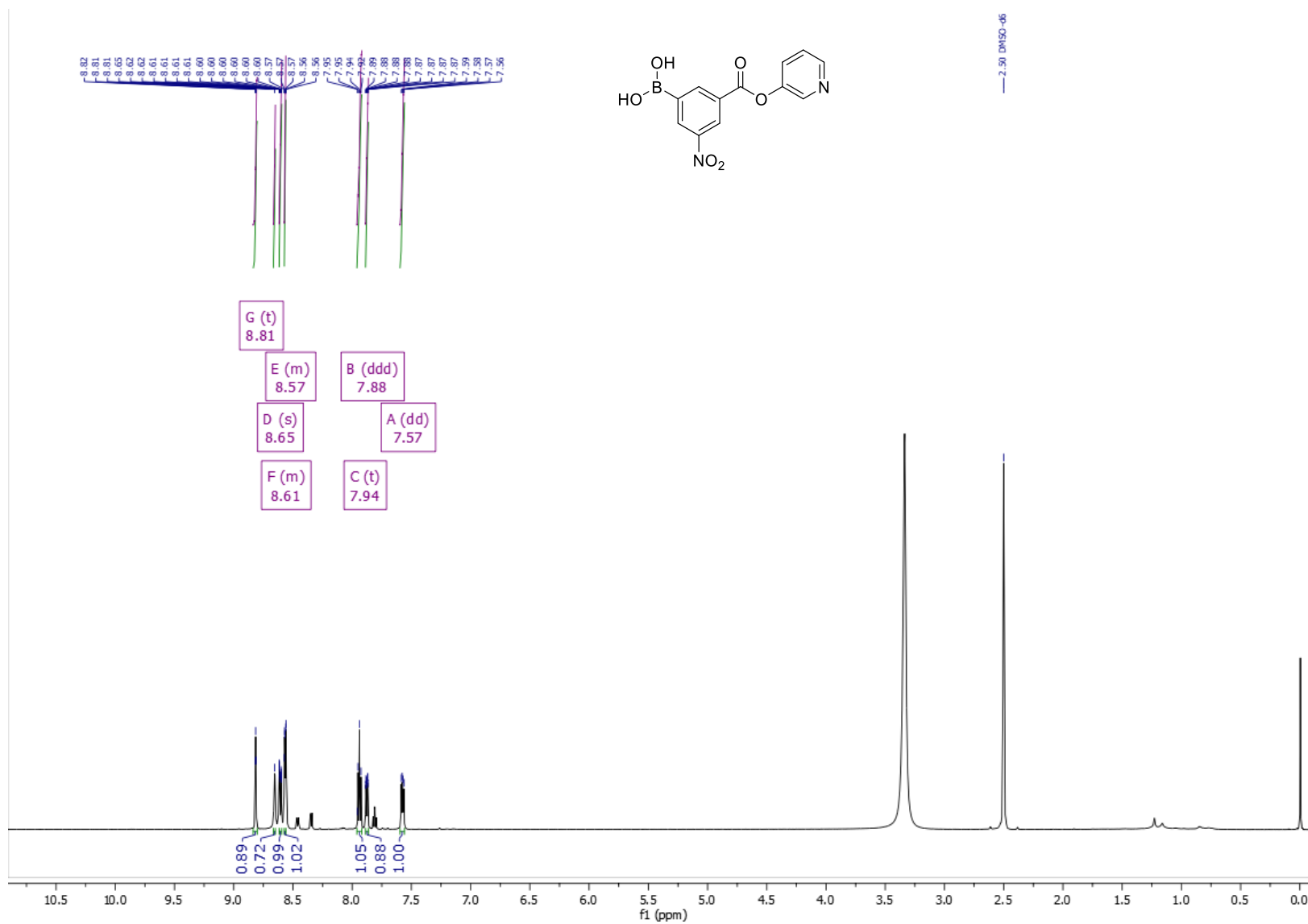
Espectro 41. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (3-nitro-5-(fenoxicarbonil)fenil)borônico



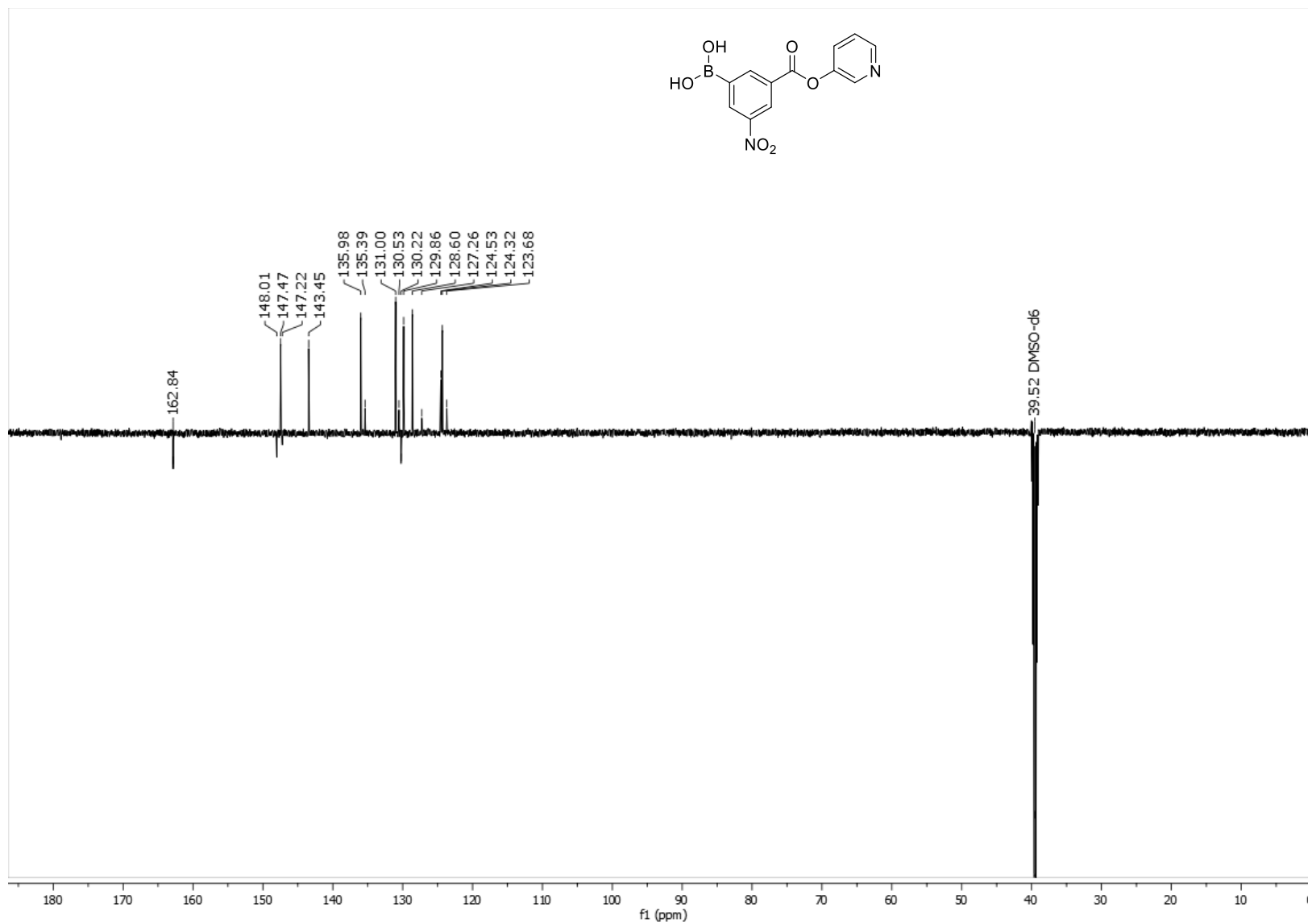
Espectro 42. Mapa de contorno de HMBC (DMSO-d₆, 600 MHz) do composto ácido (3-nitro-5-(fenoxycarbonil)fenil)borônico



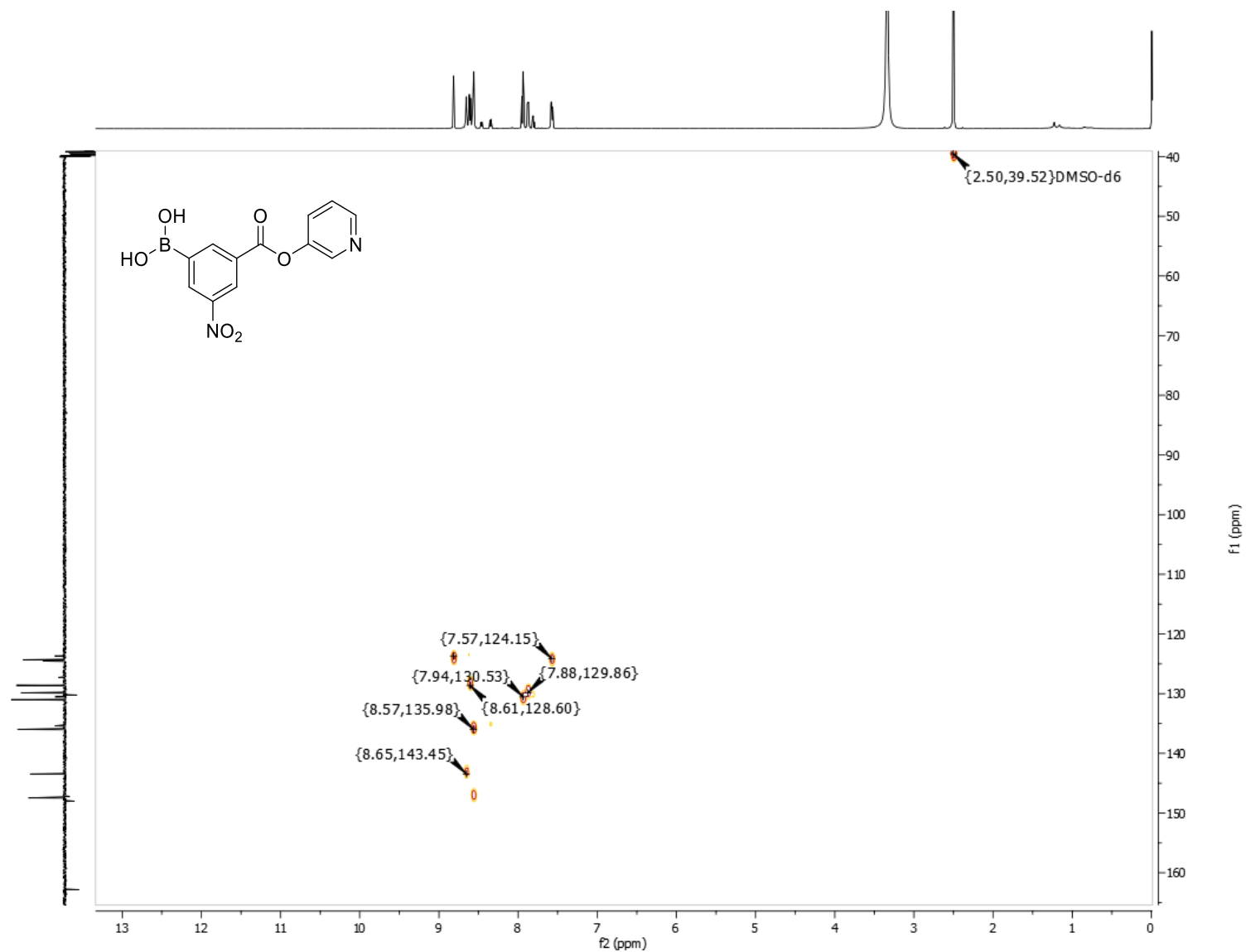
Espectro 43. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (3-nitro-5-((piridin-3-iloxi)carbonil)fenil)borônico



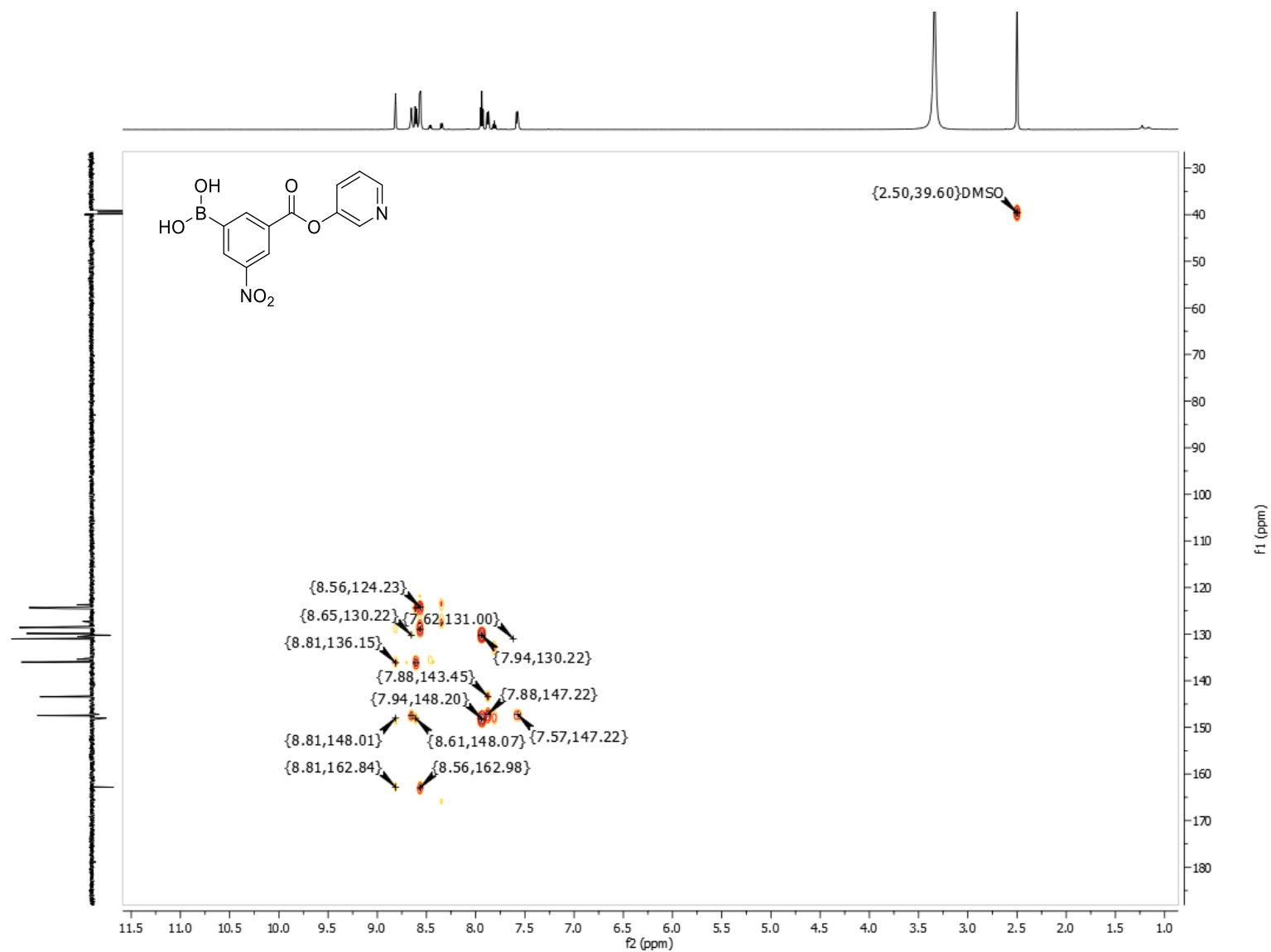
Espectro 44. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do composto ácido (3-nitro-5-((piridin-3-iloxi)carbonil)fenil)borônico



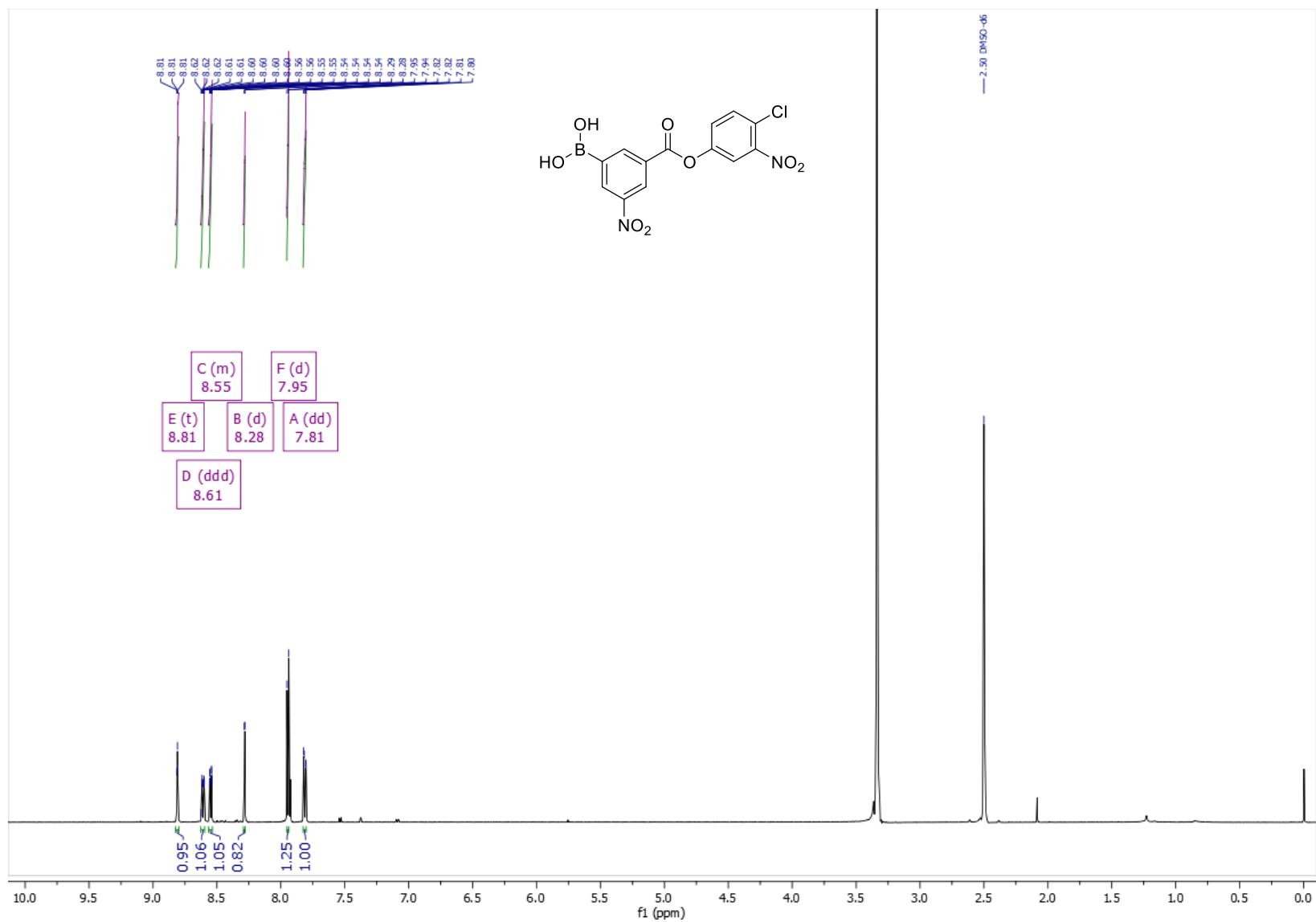
Espectro 45. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (3-nitro-5-((piridin-3-iloxi)carbonil)fenil)borônico



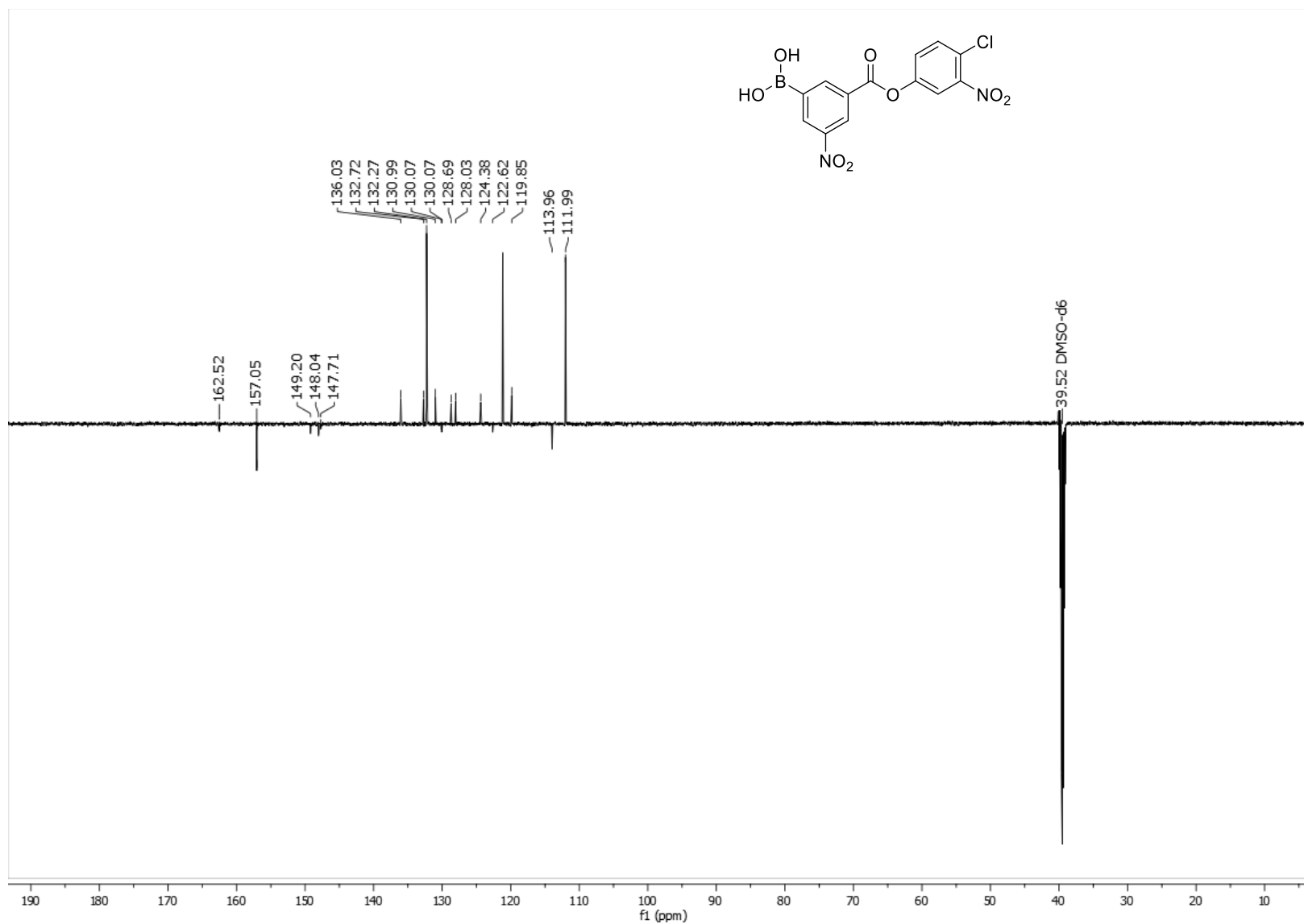
Espectro 46. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (3-nitro-5-((piridin-3-iloxi)carbonil)fenil)borônico



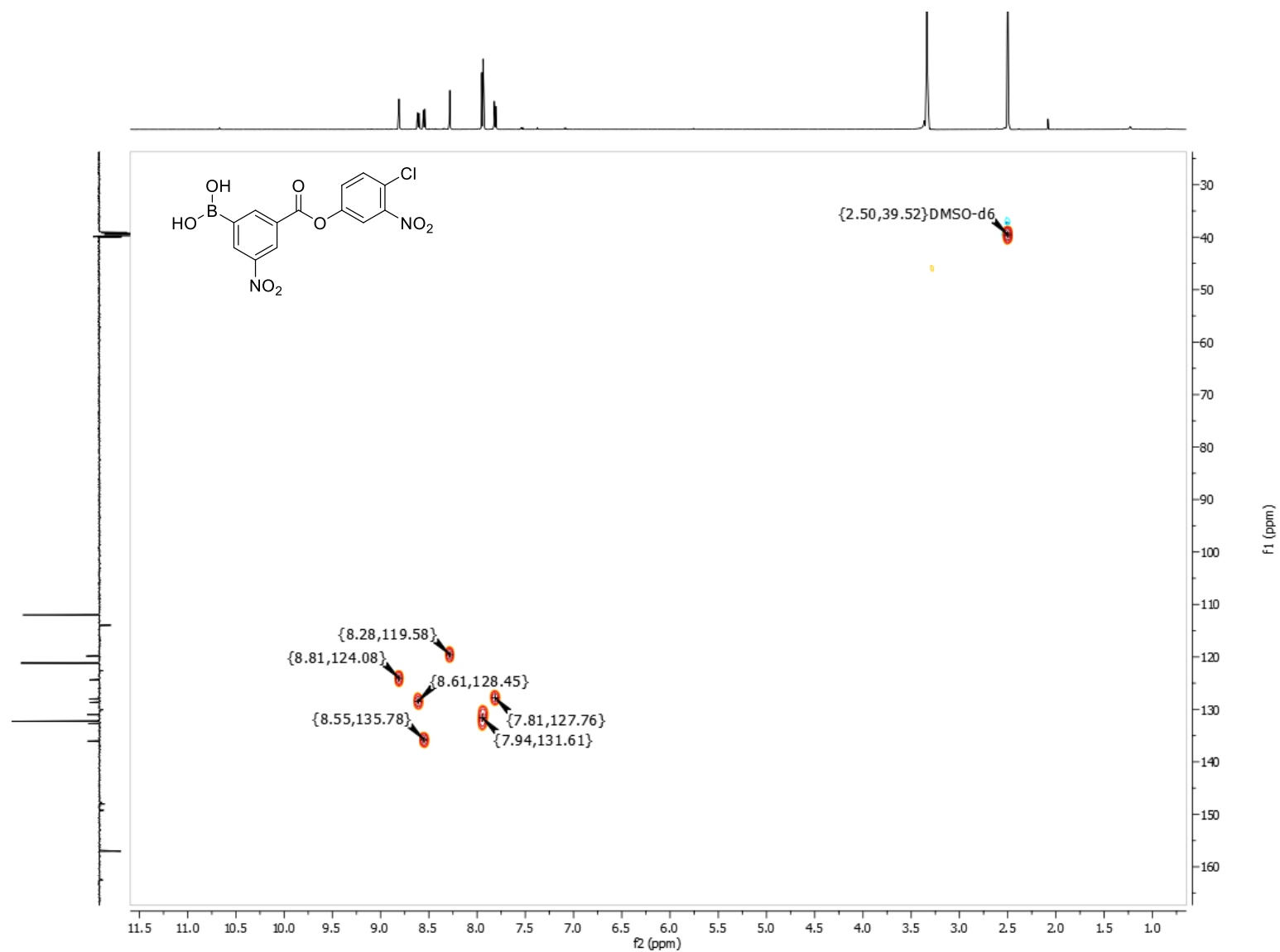
Espectro 47. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (3-((4-cloro-3-nitrofenoxi)carbonil)-5-nitrofenil)borônico



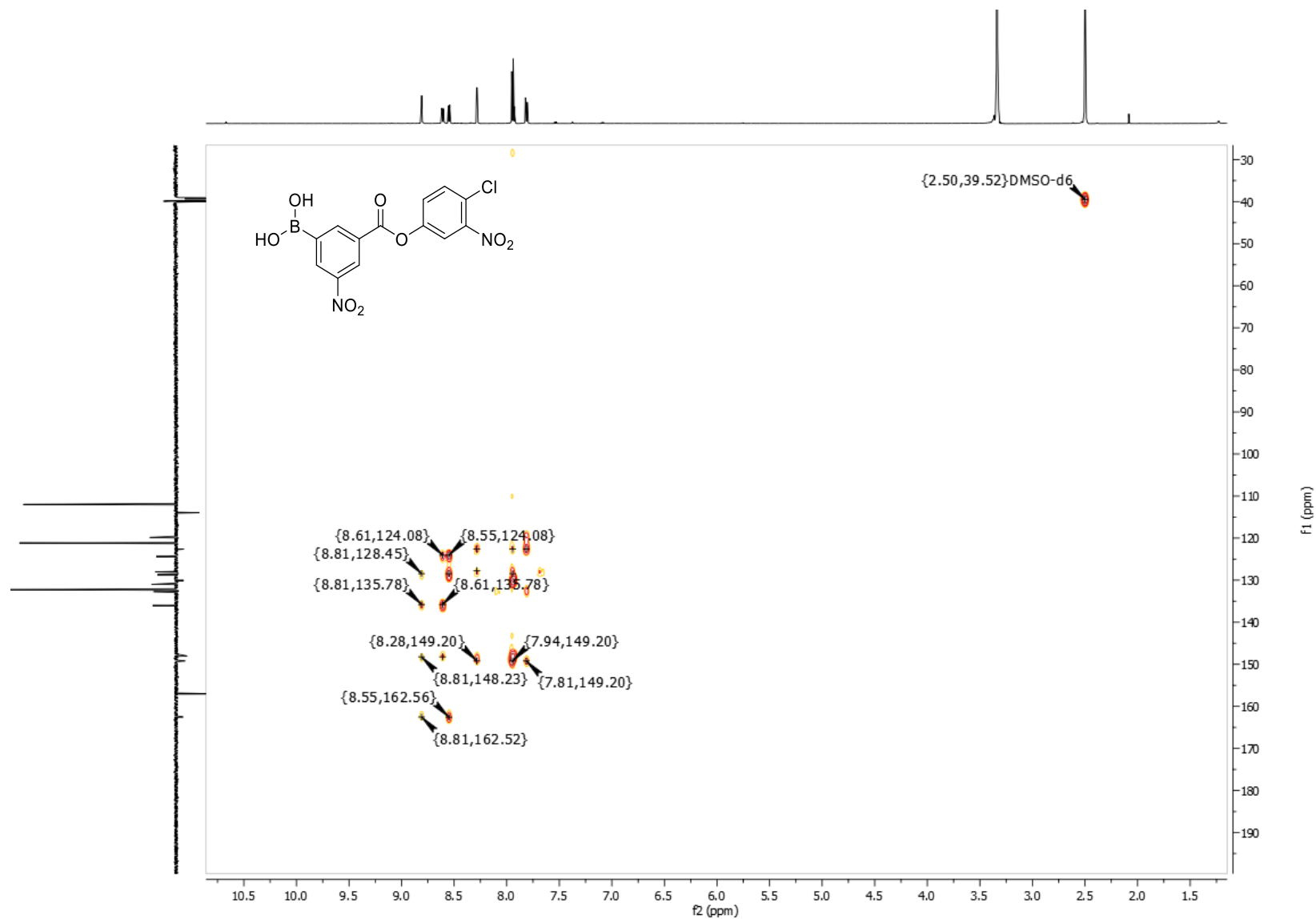
Espectro 48. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do composto ácido (3-((4-cloro-3-nitrofenoxi)carbonil)-5-nitrofenil)borônico

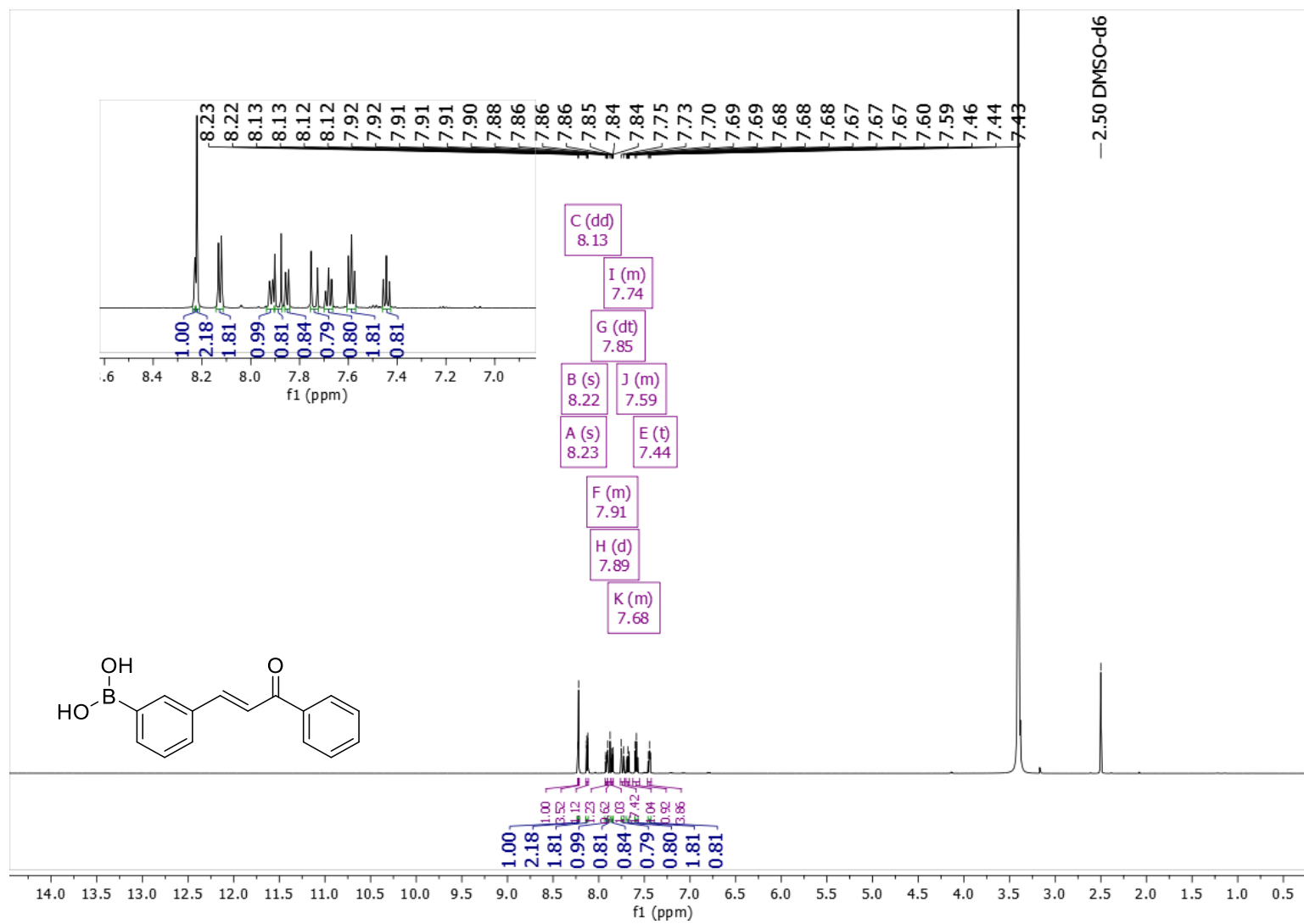


Espectro 49. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (3-((4-cloro-3-nitrofenoxi)carbonil)-5-nitrofenil)borônico

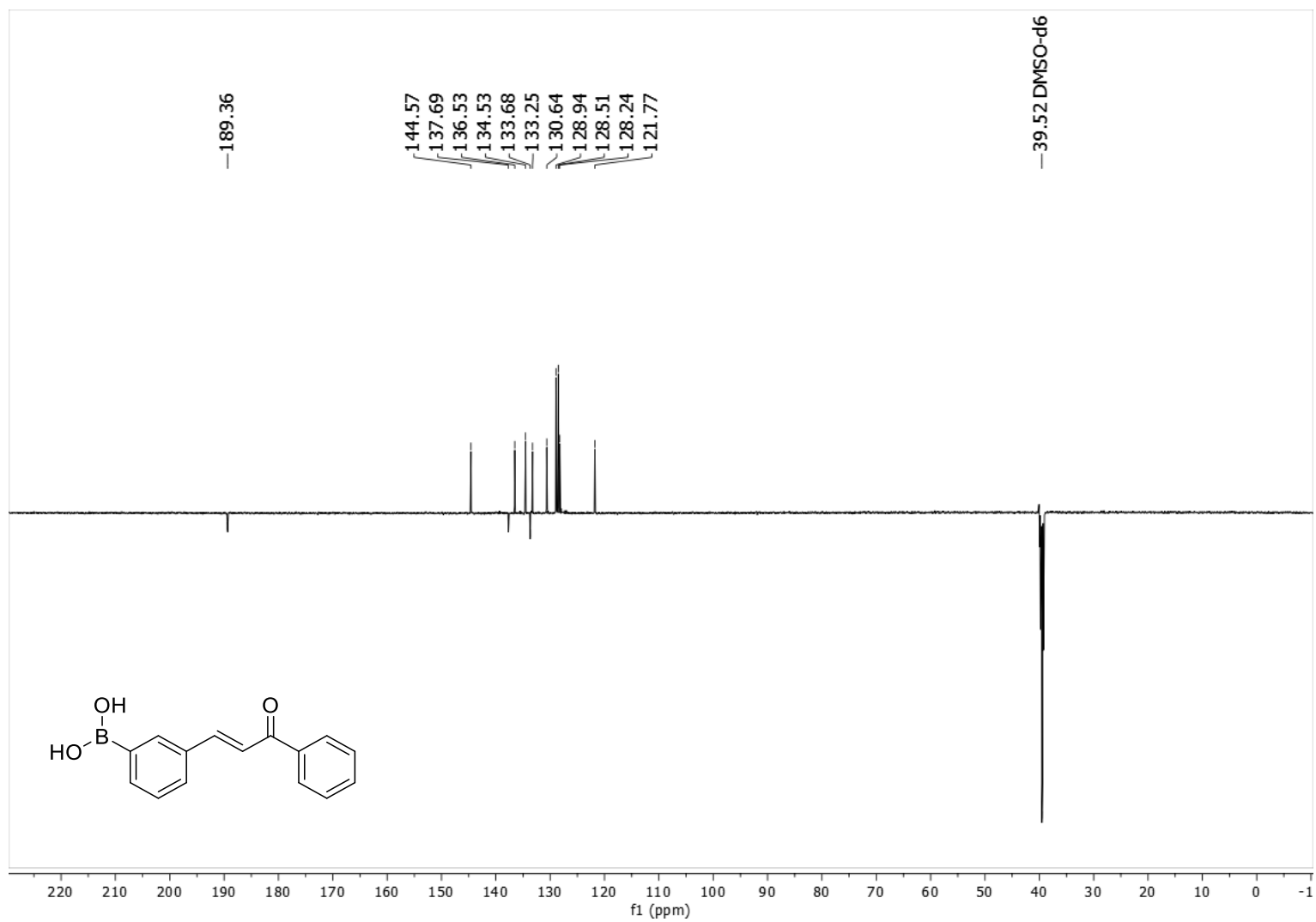


Espectro 50. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (3-((4-cloro-3-nitrofenoxi)carbonil)-5-nitrofenil)borônico

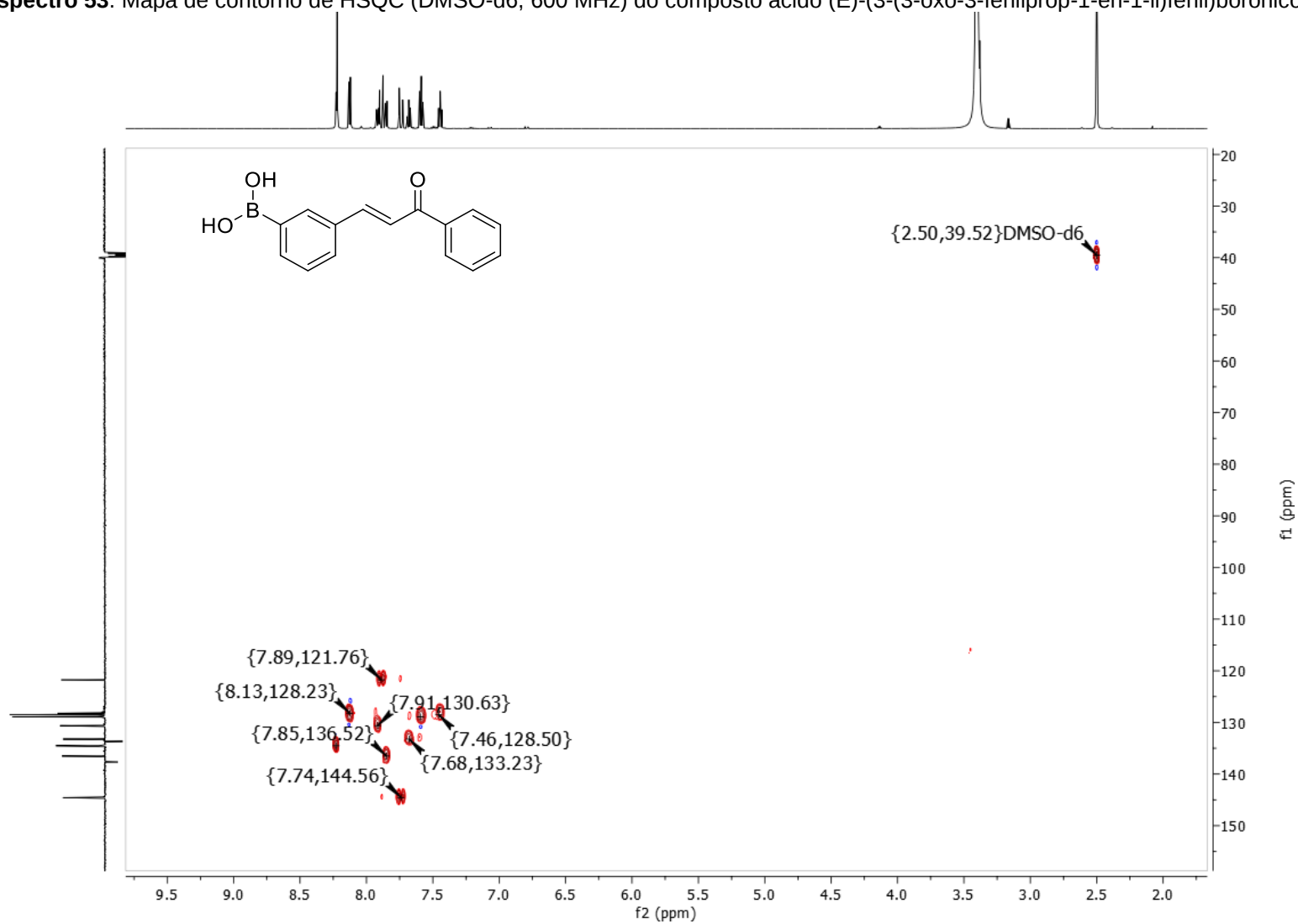




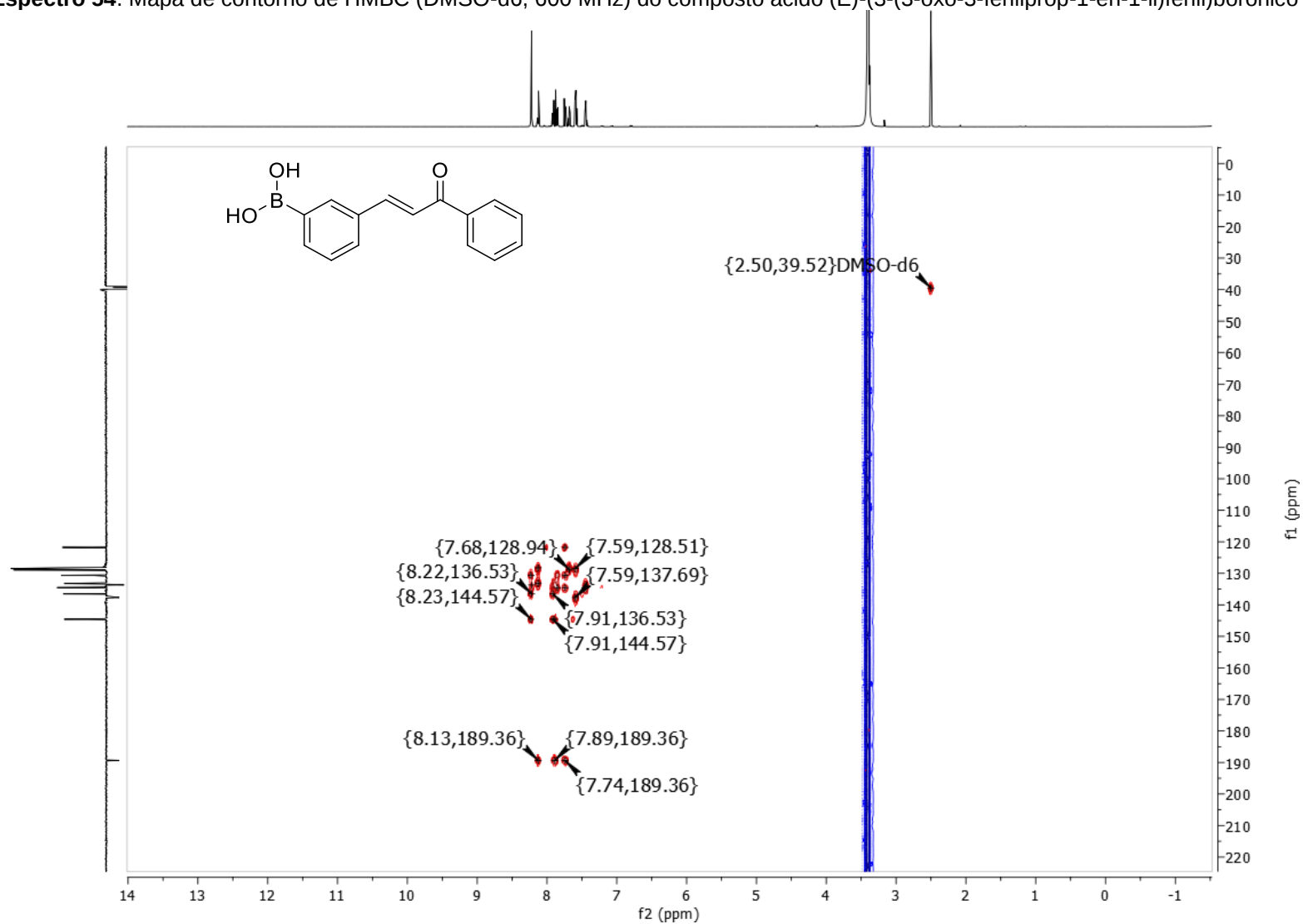
Espectro 52. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do composto ácido (*E*)-(3-(3-oxo-3-fenilprop-1-en-1-il)fenil)borônico



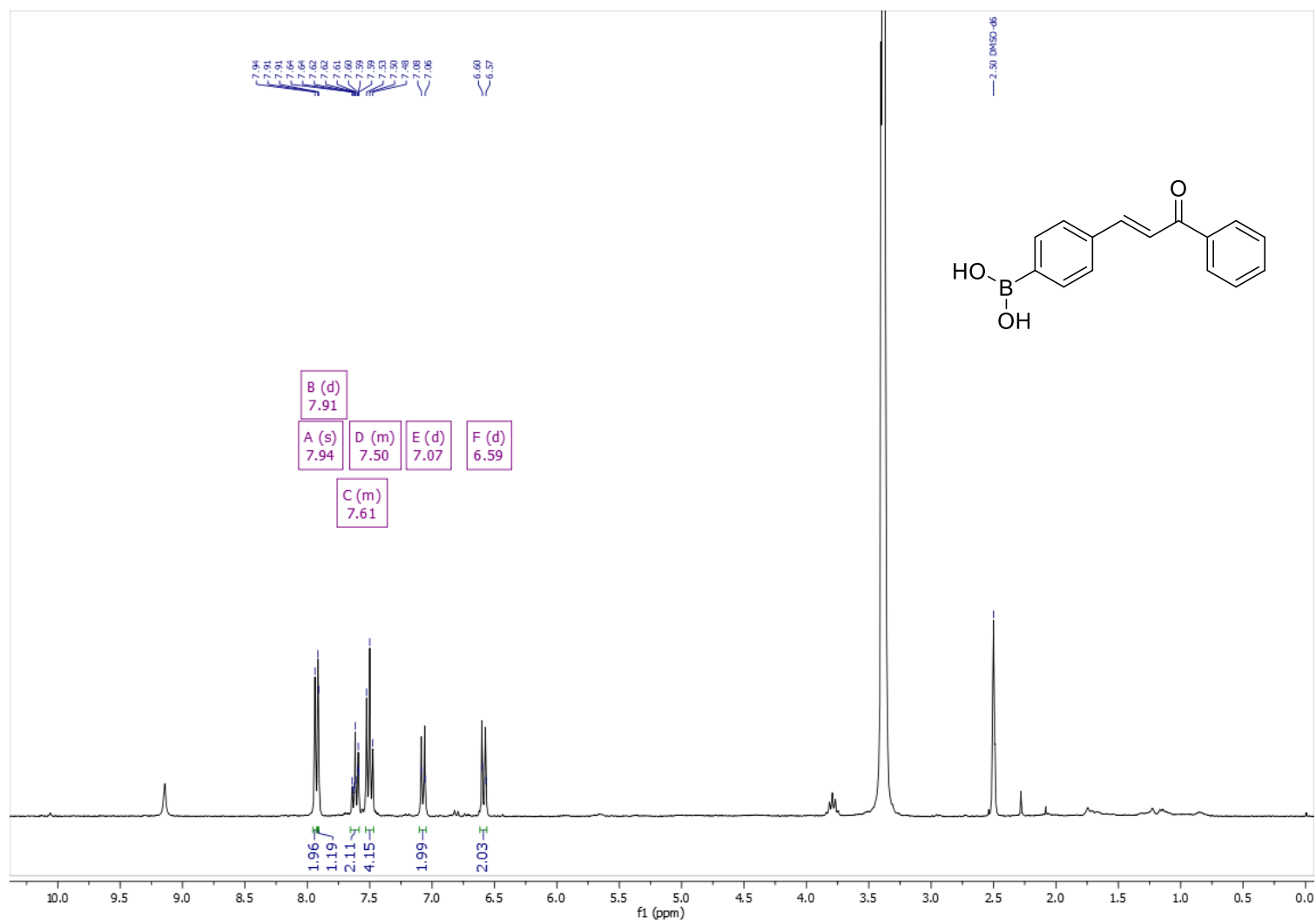
Espectro 53. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (E)-(3-(3-oxo-3-fenilprop-1-en-1-il)fenil)borônico



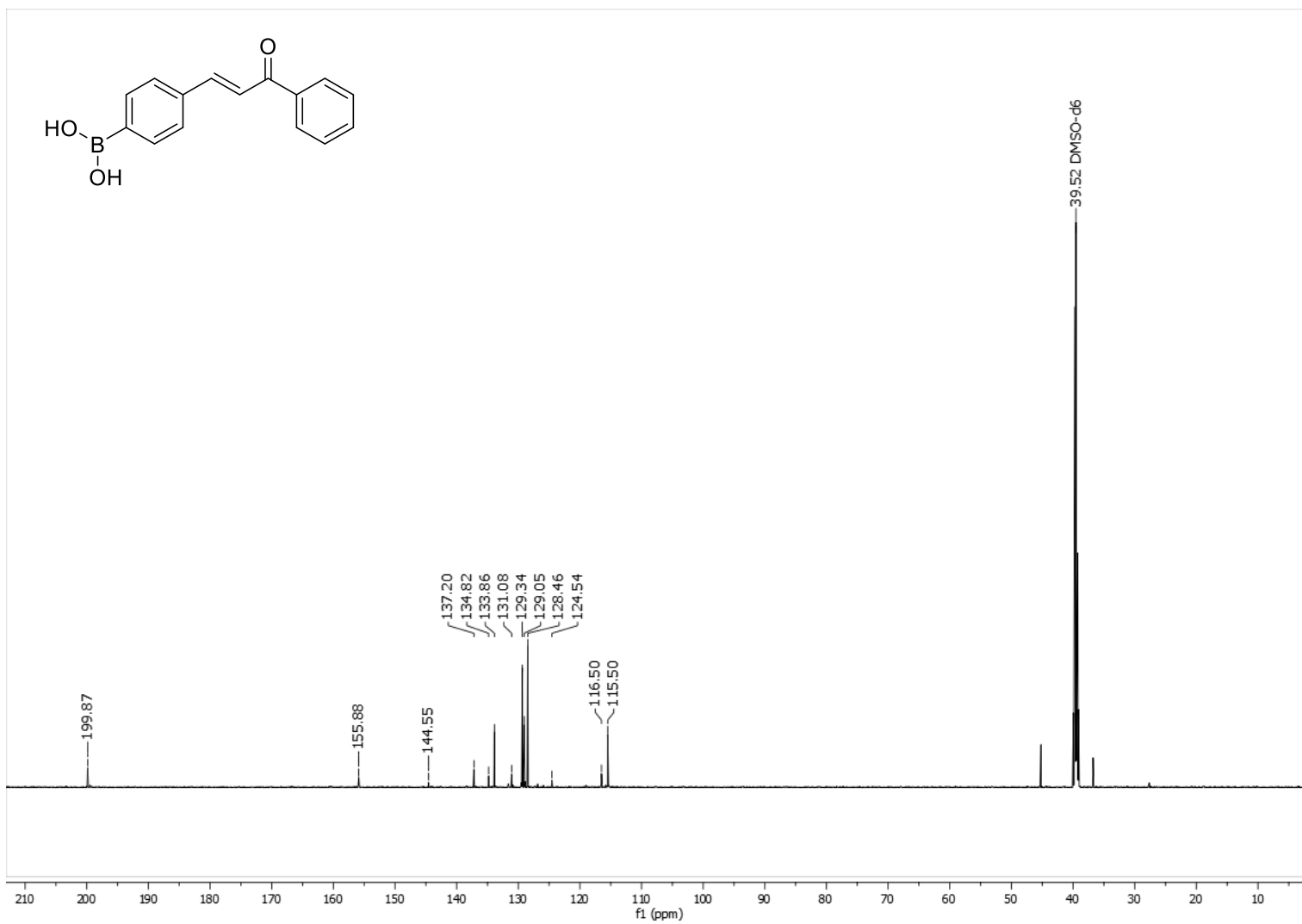
Espectro 54. Mapa de contorno de HMBC (DMSO-d₆, 600 MHz) do composto ácido (E)-(3-(3-oxo-3-fenilprop-1-en-1-il)fenil)borônico



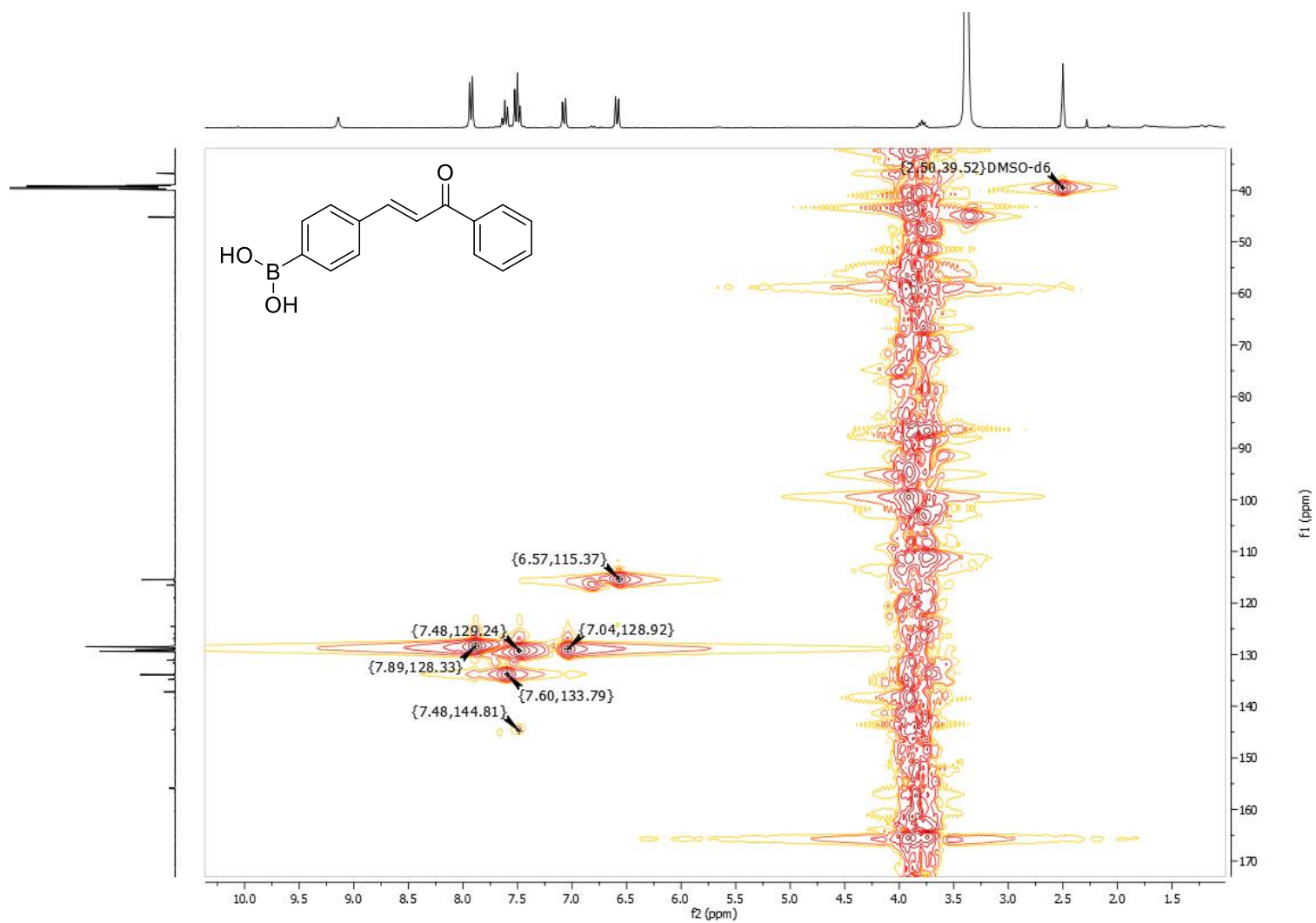
Espectro 55. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (*E*)-(4-(3-oxo-3-fenilprop-1-en-1-il)fenil)borônico



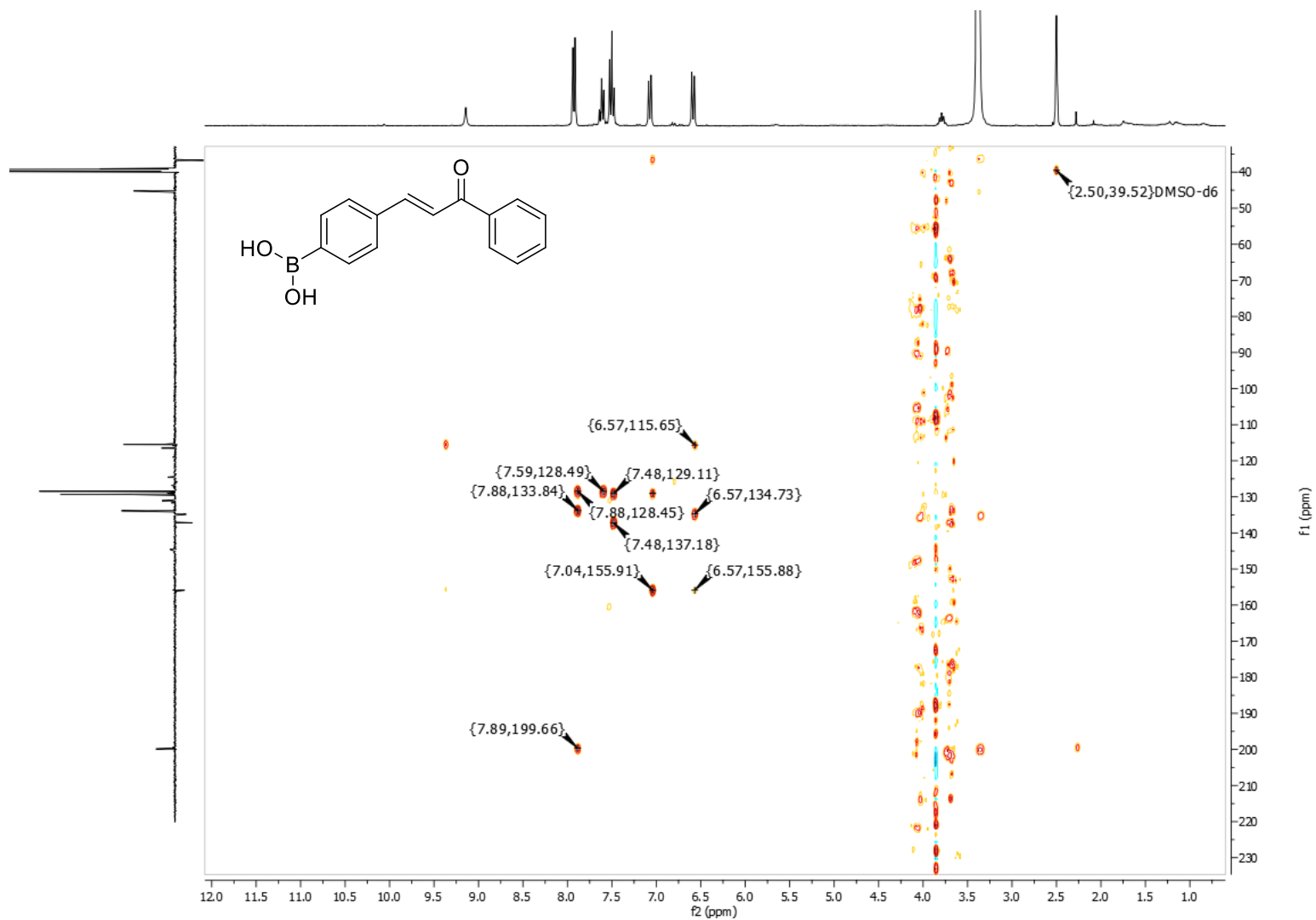
Espectro 56. RMN de ^{13}C (DMSO- d_6 , 150 MHz) do composto ácido (*E*)-(4-(3-oxo-3-fenilprop-1-en-1-il)fenil)borônico



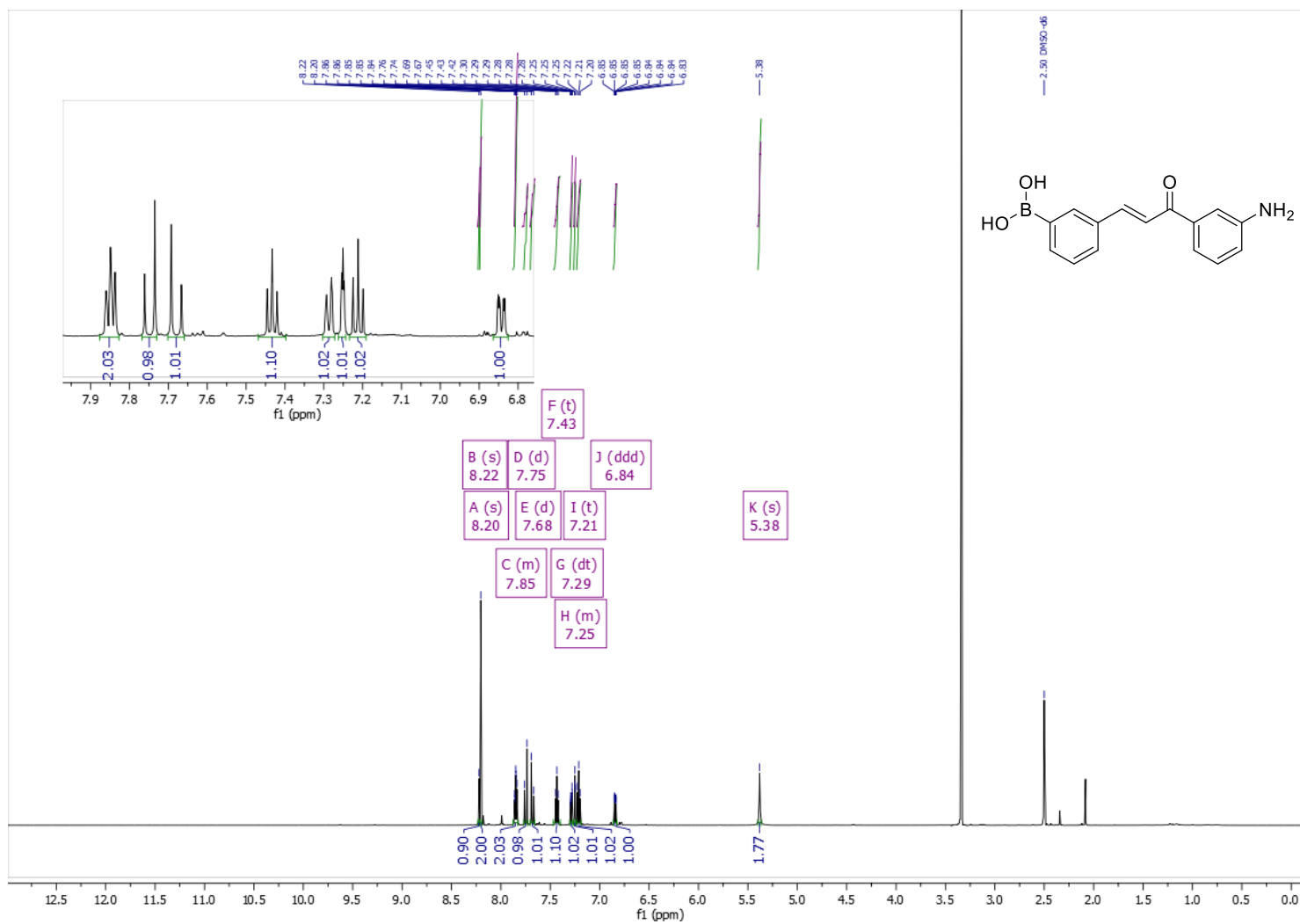
Espectro 57. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (E)-(4-(3-oxo-3-fenilprop-1-en-1-il)fenil)borônico



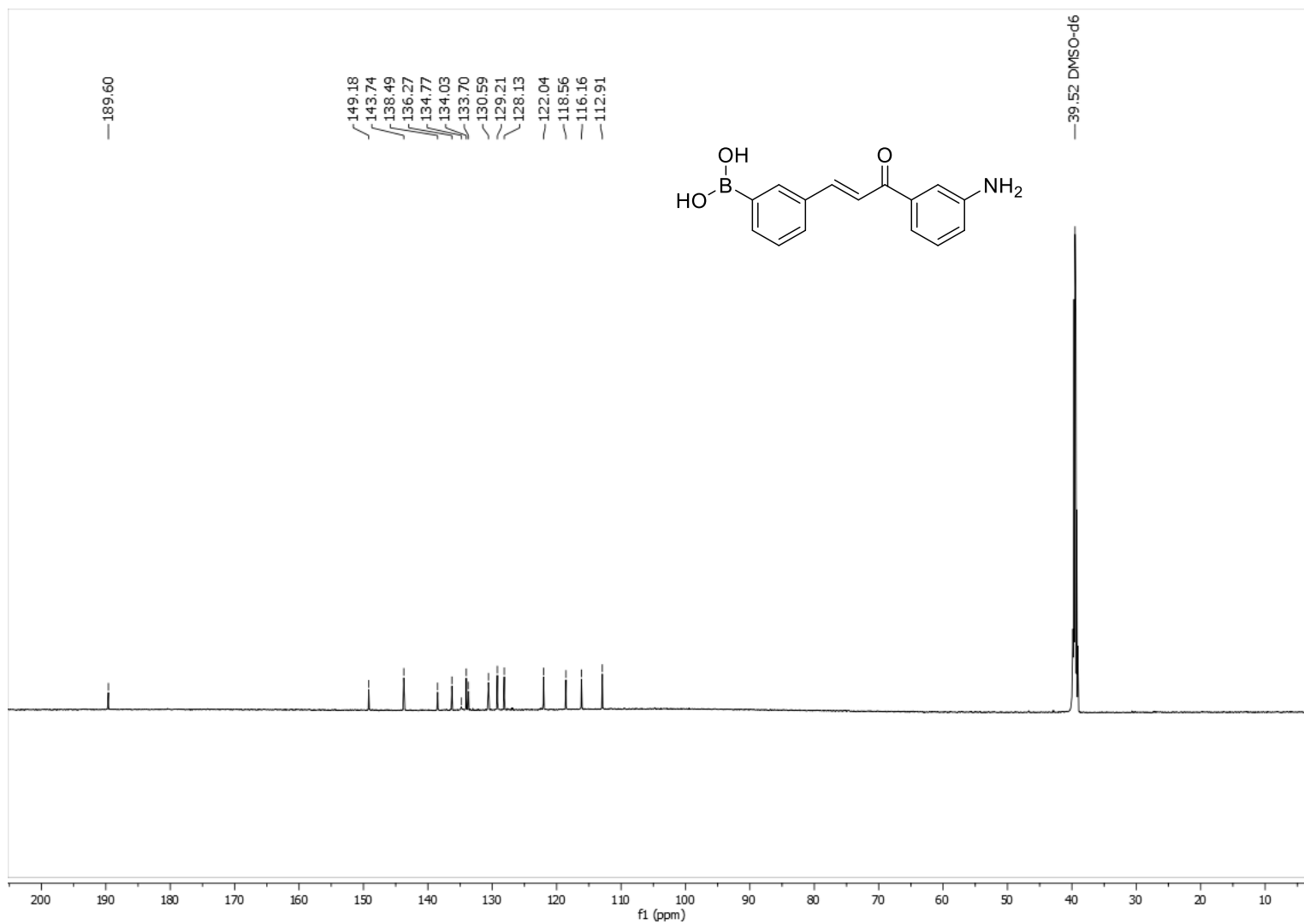
Espectro 58. Mapa de contorno de HMBC (DMSO-d₆, 600 MHz) do composto ácido (E)-4-(3-oxo-3-fenilprop-1-en-1-il)fenilborônico



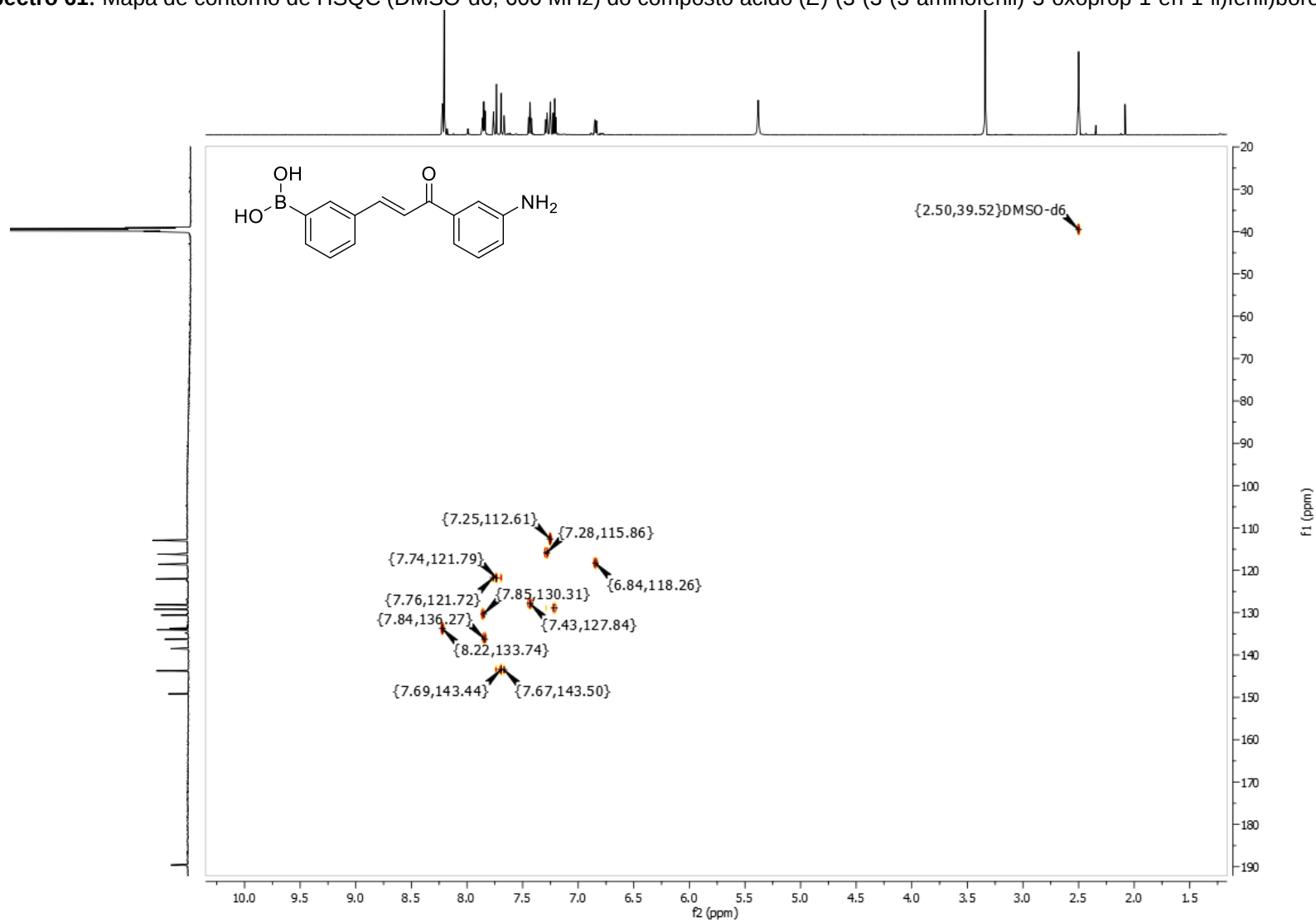
Espectro 59. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (*E*)-(3-(3-(3-aminofenil)-3-oxoprop-1-en-1-il)fenil)borônico



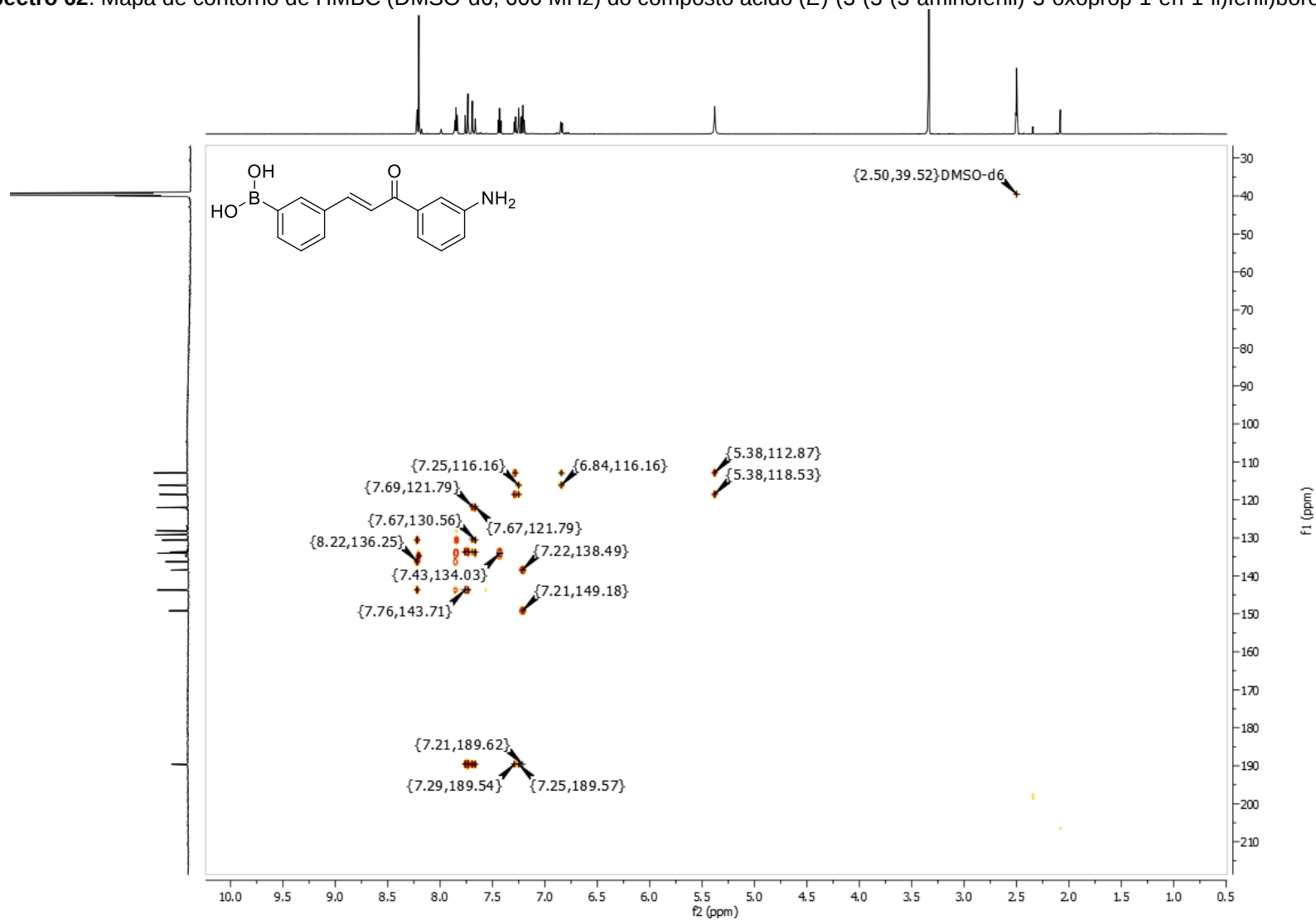
Espectro 60. RMN de ^{13}C (DMSO- d_6 , 150 MHz) do composto ácido (*E*)-(3-(3-(3-aminofenil)-3-oxoprop-1-en-1-il)fenil)borônico



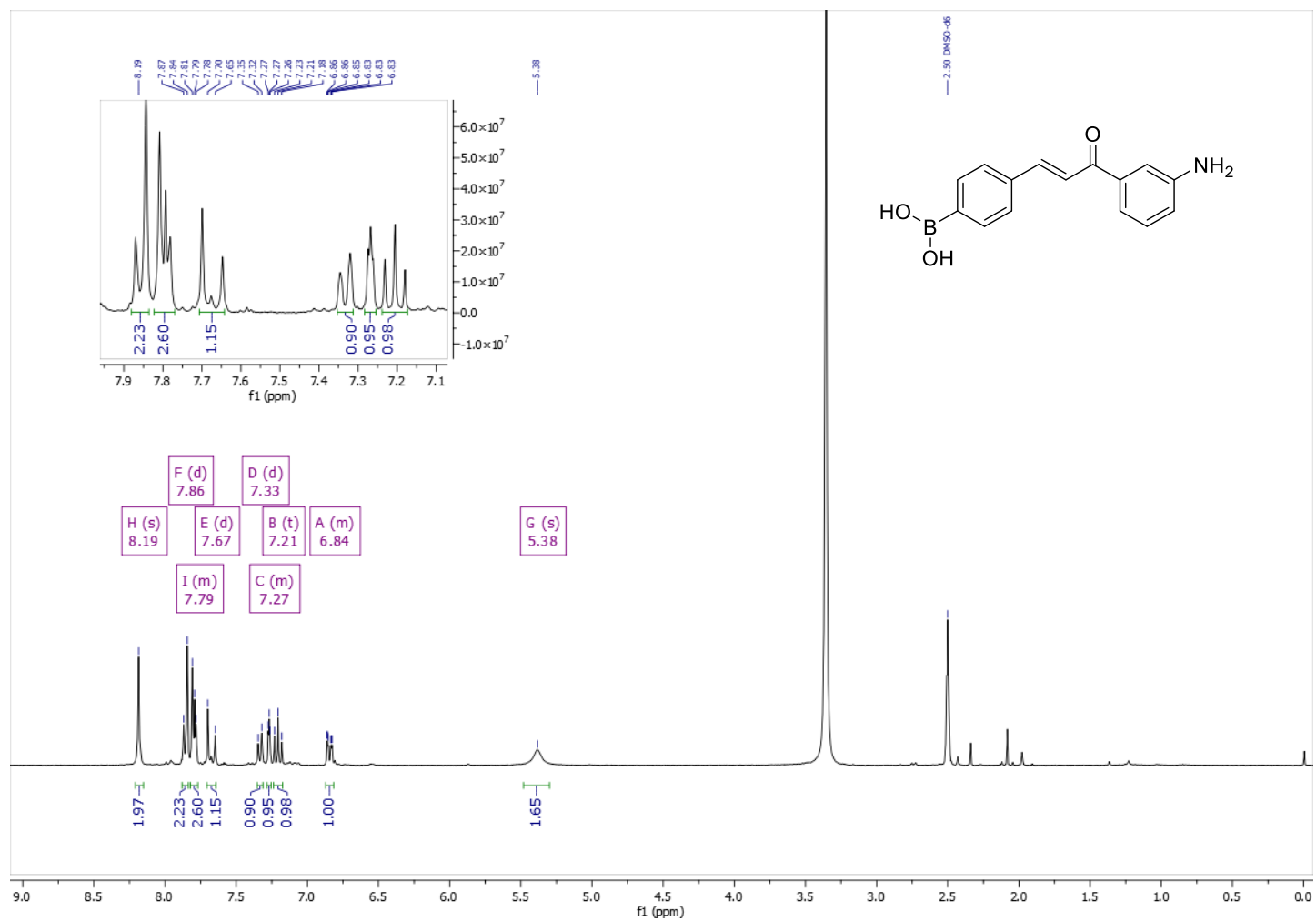
Espectro 61. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (*E*)-(3-(3-(3-aminofenil)-3-oxoprop-1-en-1-il)fenil)borônico



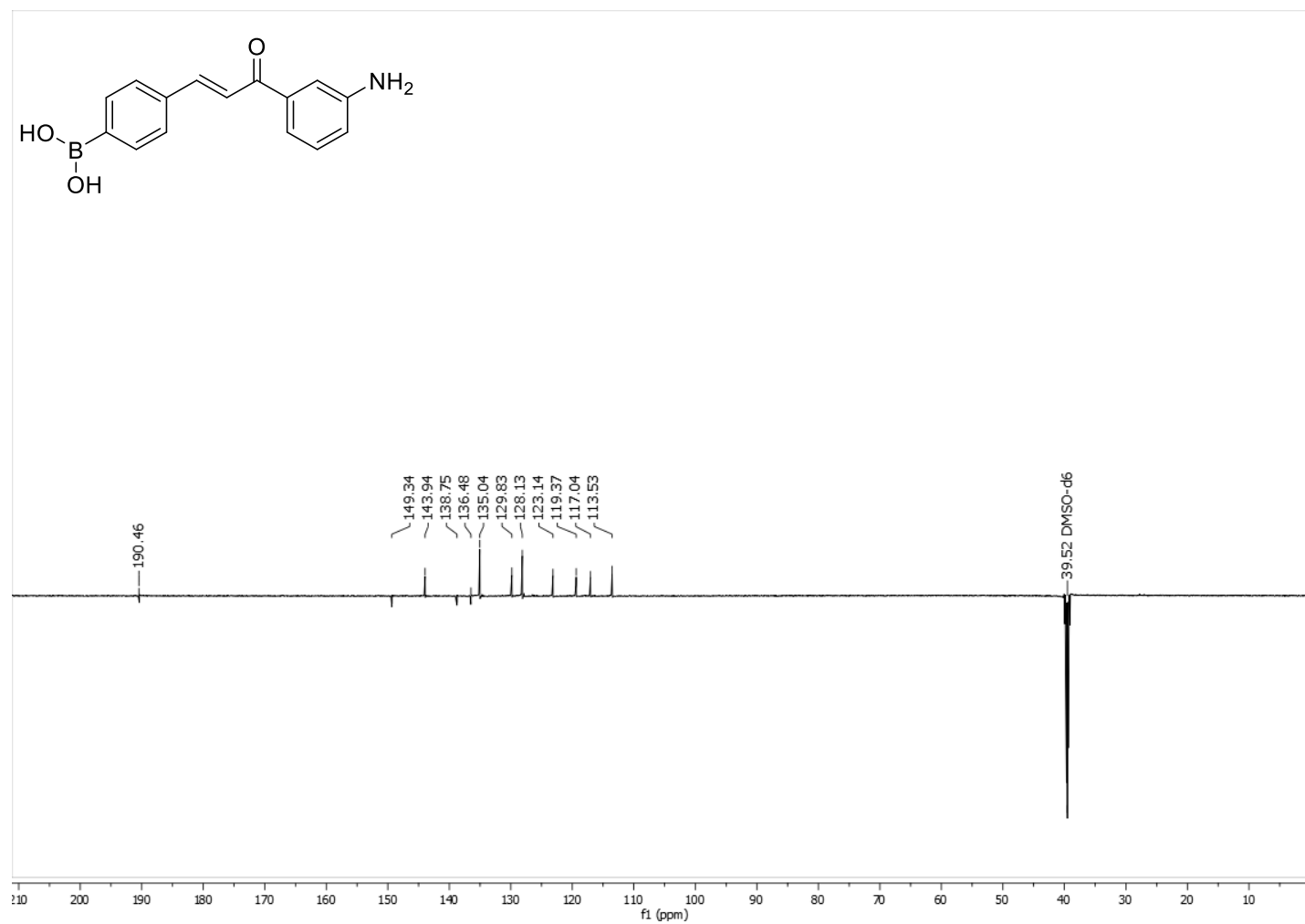
Espectro 62. Mapa de contorno de HMBC (DMSO-d₆, 600 MHz) do composto ácido (*E*)-(3-(3-(3-aminofenil)-3-oxoprop-1-en-1-il)fenil)borônico



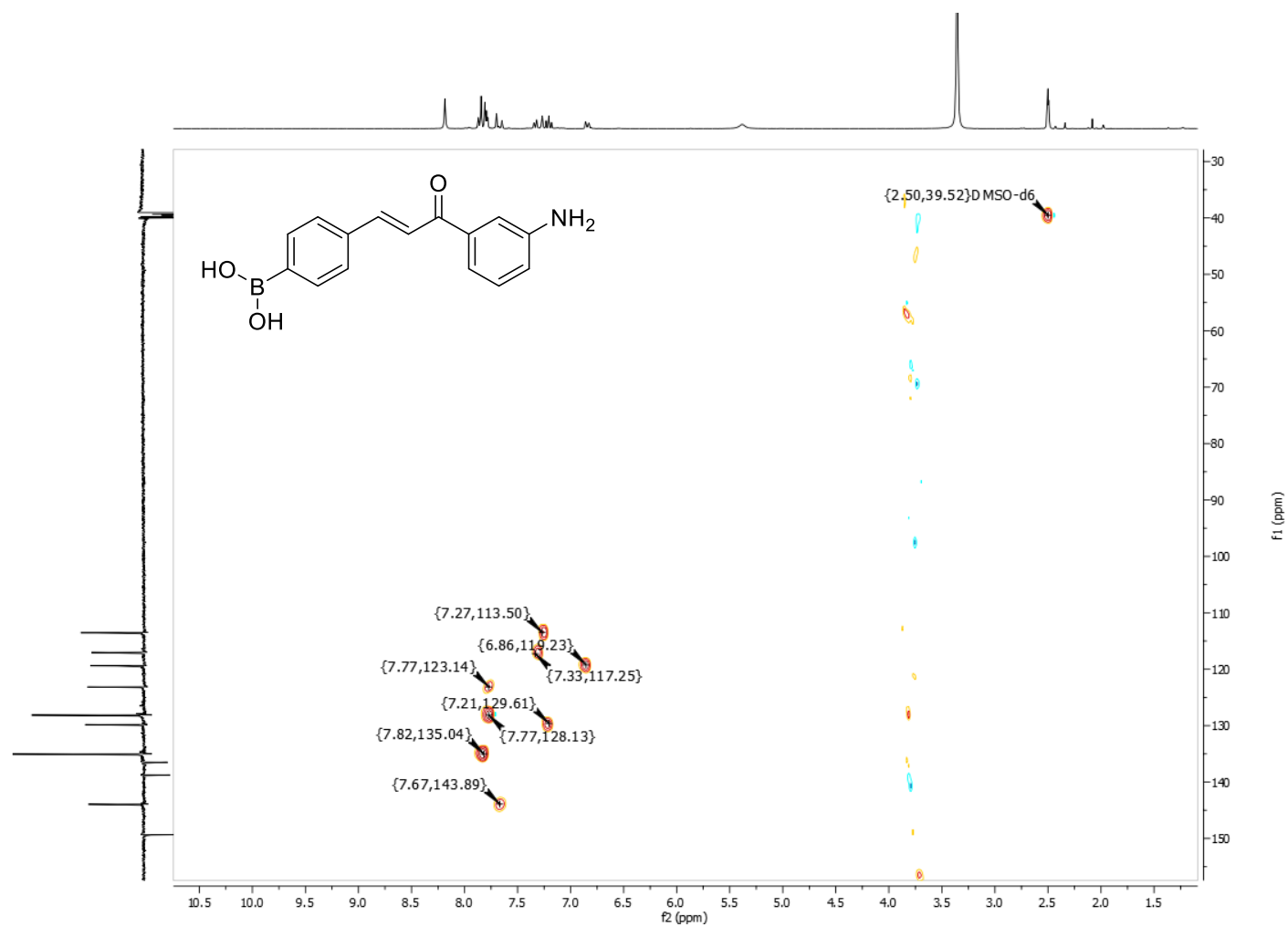
Espectro 63. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (*E*)-(4-(3-(3-aminofenil)-3-oxoprop-1-en-1-il)fenil)borônico



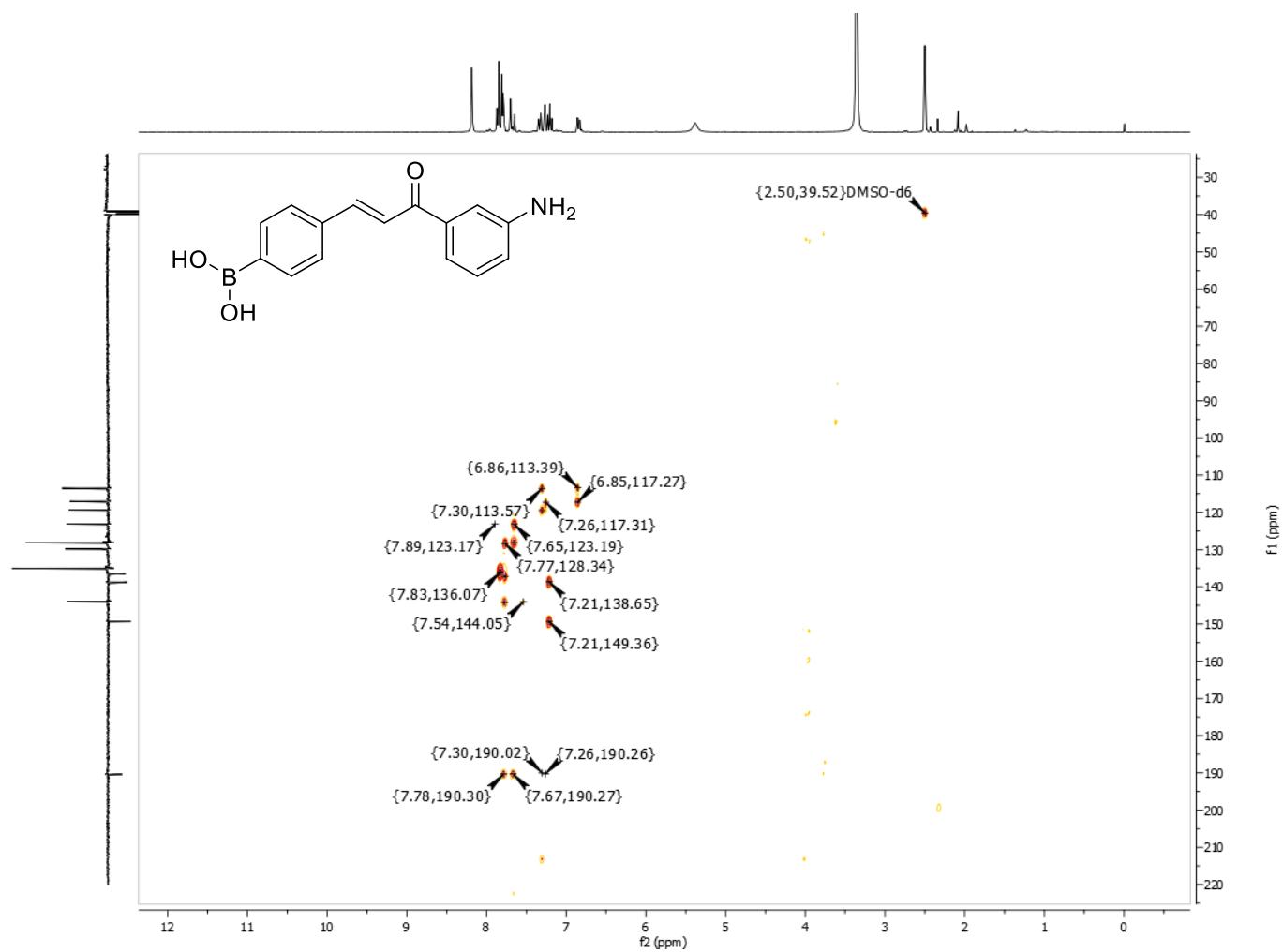
Espectro 64. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do composto ácido (*E*)-(4-(3-(3-aminofenil)-3-oxoprop-1-en-1-il)fenil)borônico



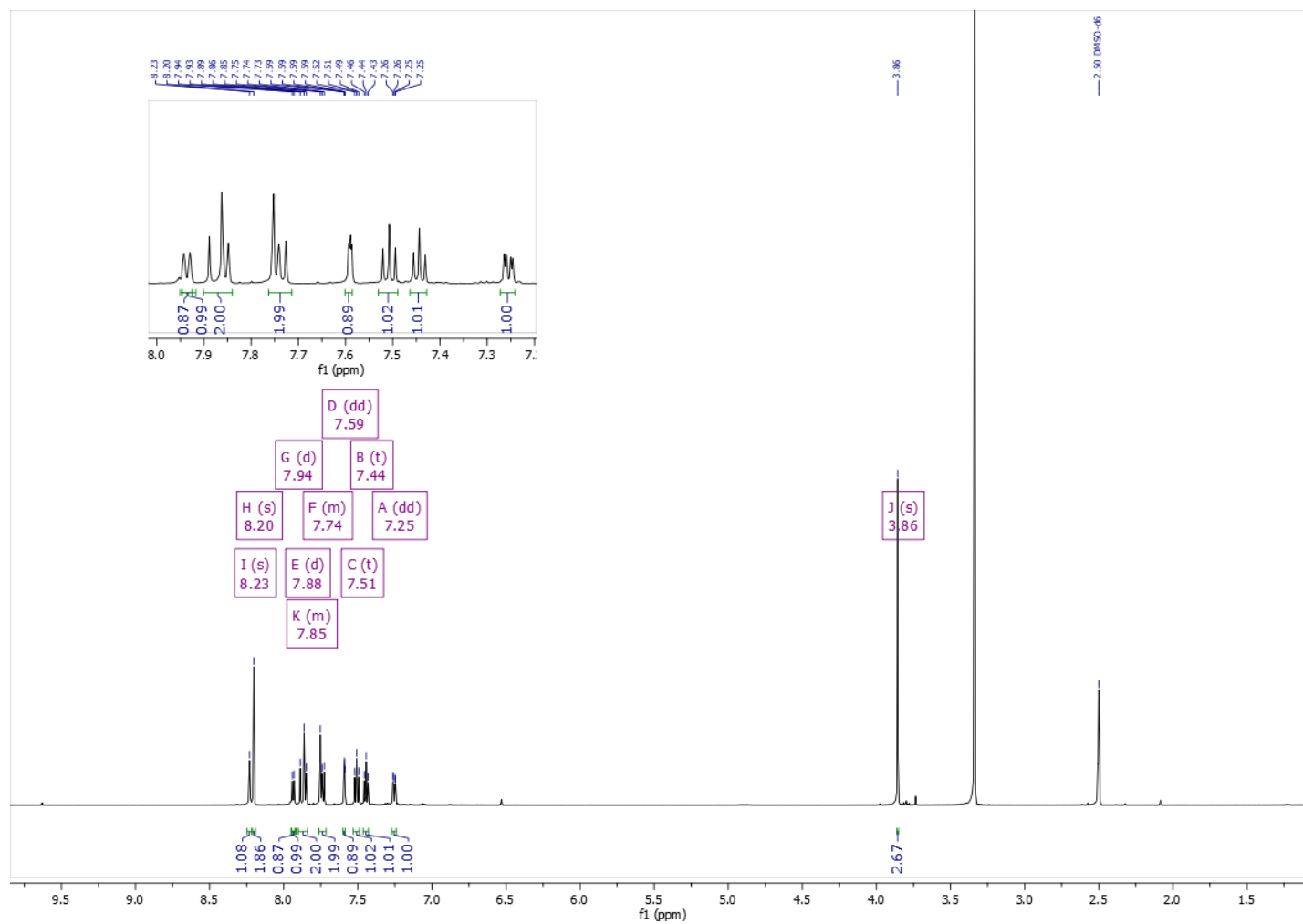
Espectro 65. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (*E*)-(4-(3-(3-aminofenil)-3-oxoprop-1-en-1-il)fenil)borônico



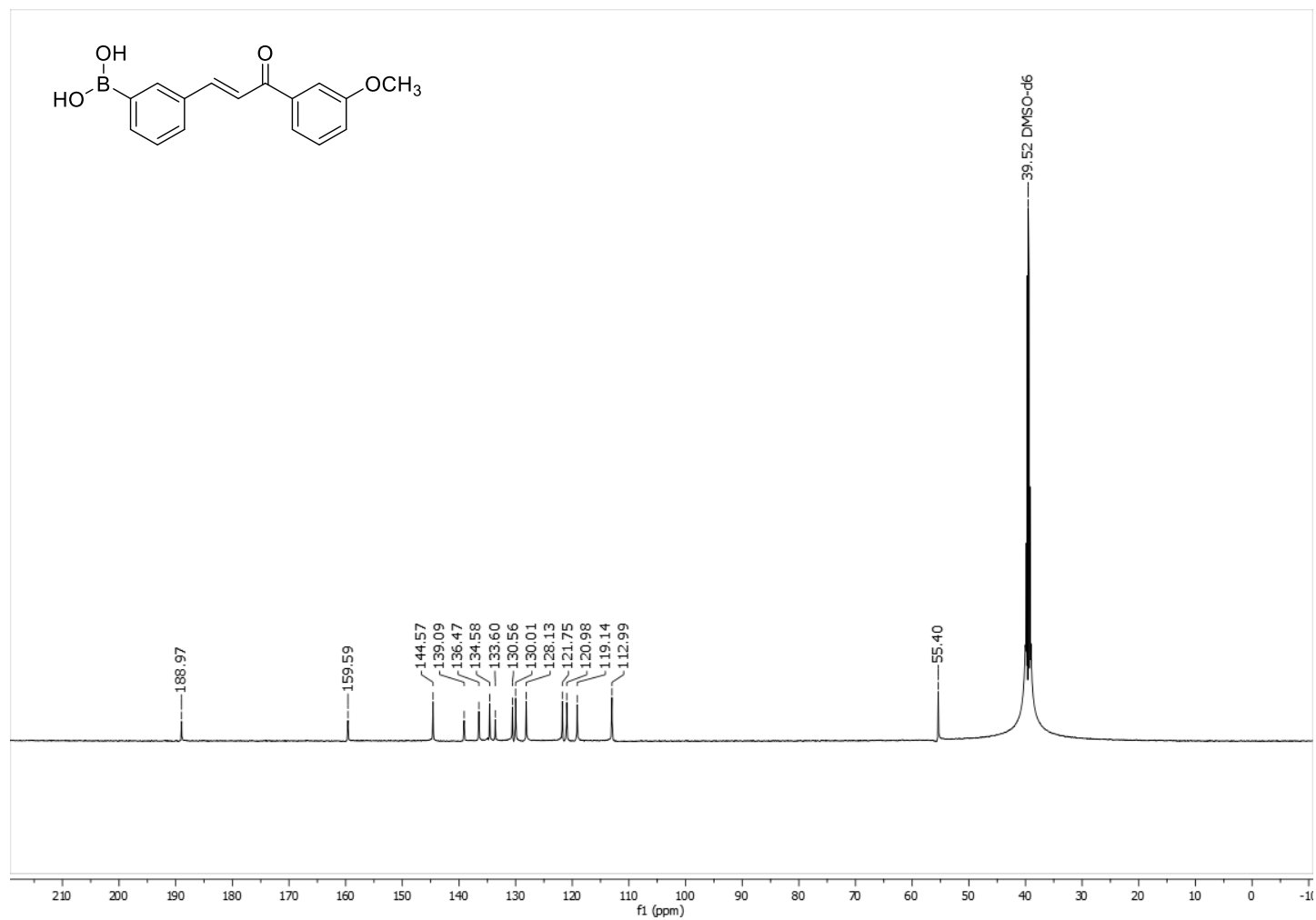
Espectro 66. Mapa de contorno de HMBC (DMSO-d₆, 600 MHz) do composto ácido (*E*)-(4-(3-(3-aminofenil)-3-oxoprop-1-en-1-il)fenil)borônico



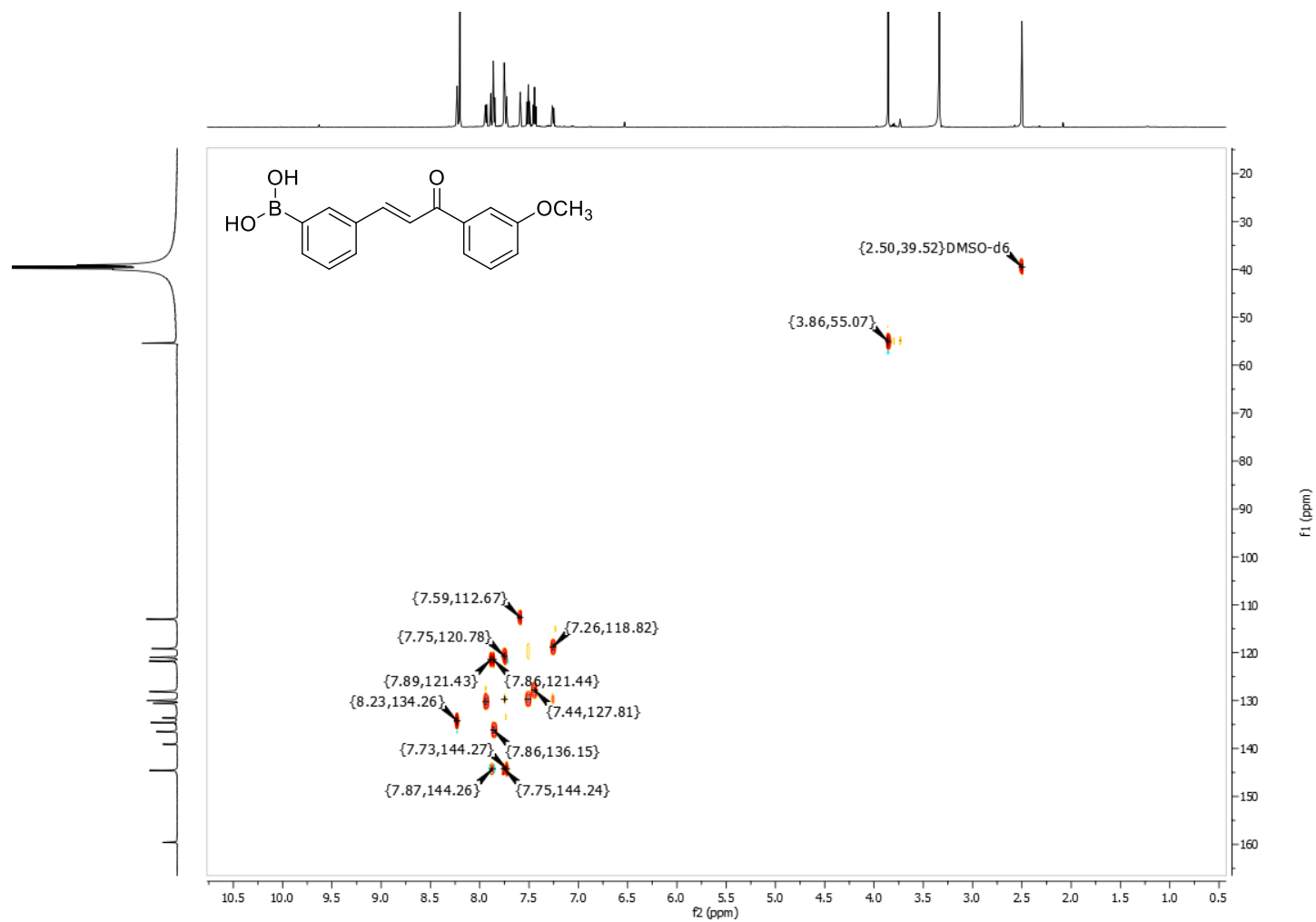
Espectro 67. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (E)-(3-(3-(3-metoxifenil)-3-oxoprop-1-en-1-il)fenil)borônico



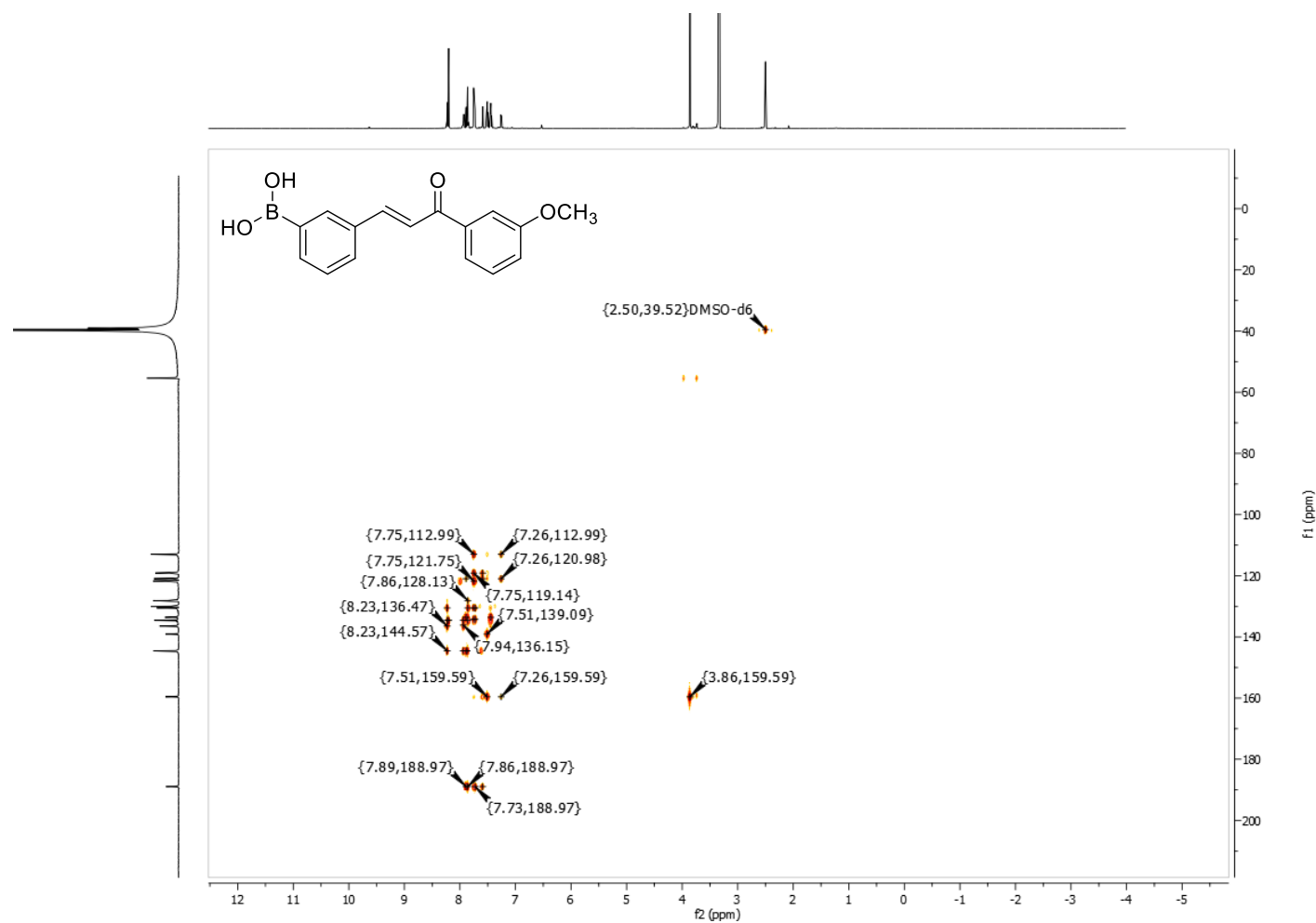
Espectro 68. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do composto ácido (*E*)-(3-(3-(3-metoxifenil)-3-oxoprop-1-en-1-il)fenil)borônico



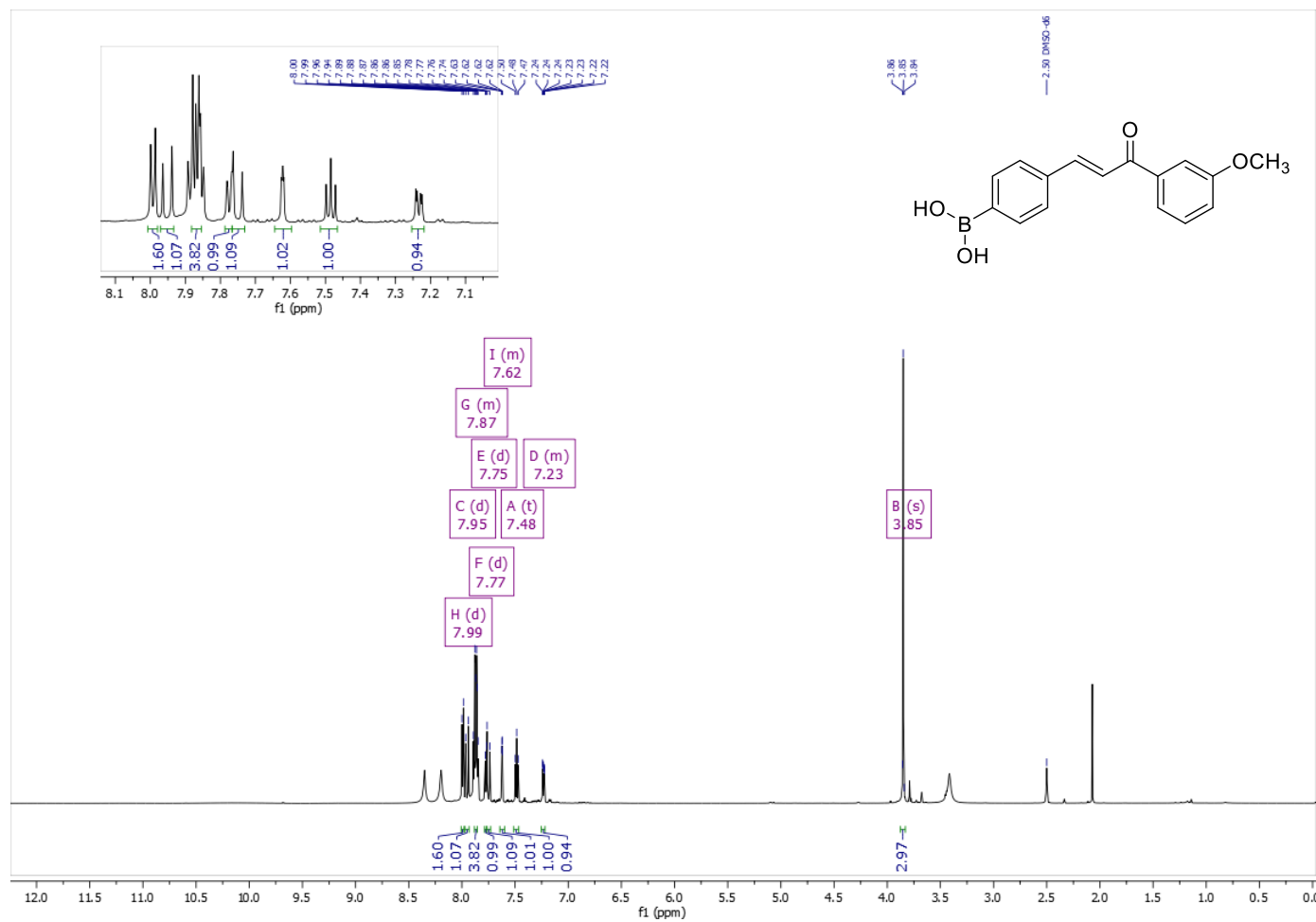
Espectro 69. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (*E*)-(3-(3-(3-metoxifenil)-3-oxoprop-1-en-1-il)fenil)borônico



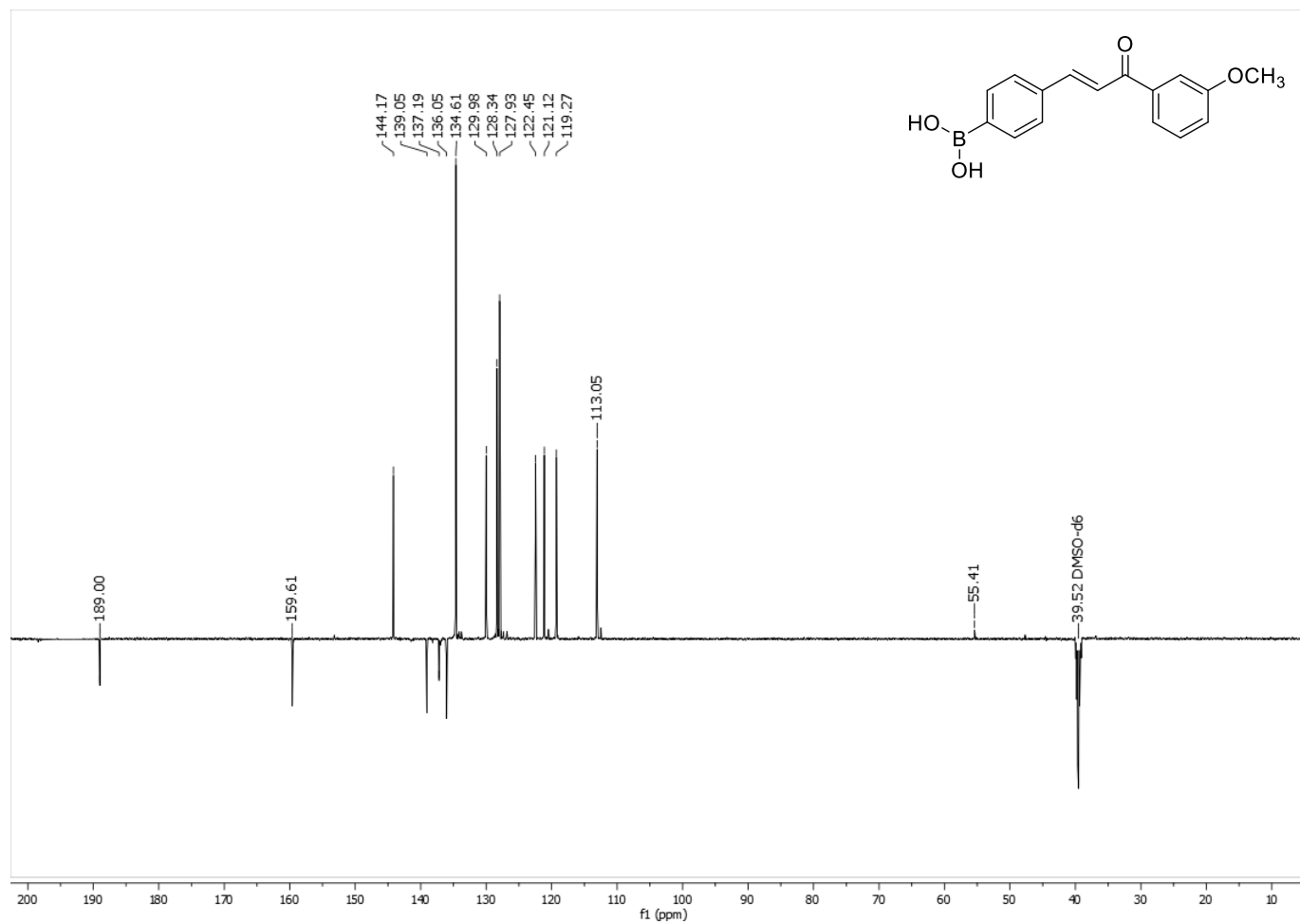
Espectro 70. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (*E*)-(3-(3-(3-metoxifenil)-3-oxoprop-1-en-1-il)fenil)borônico



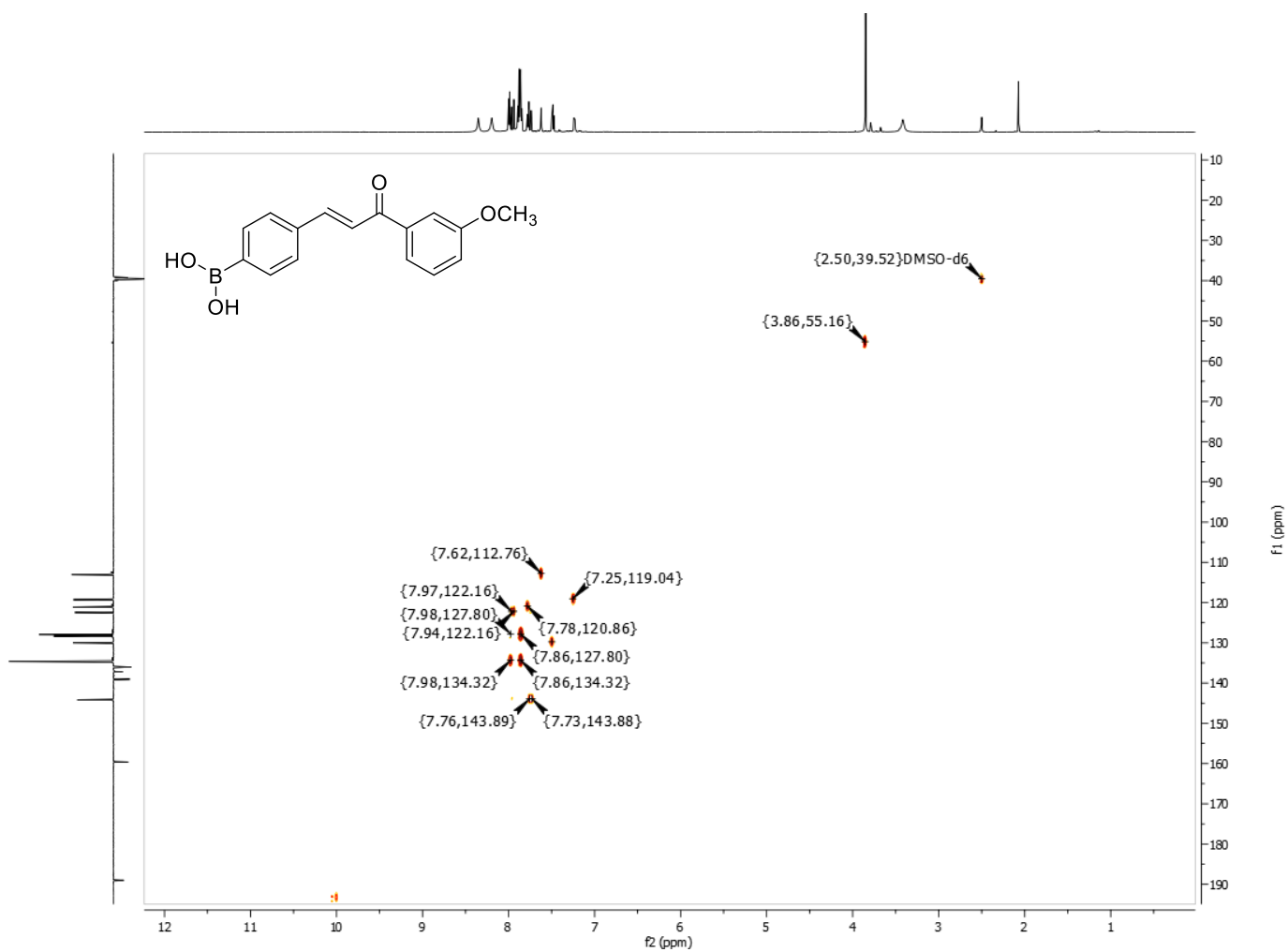
Espectro 71. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (*E*)-(4-(3-(3-metoxifenil)-3-oxoprop-1-en-1-il)fenil)borônico



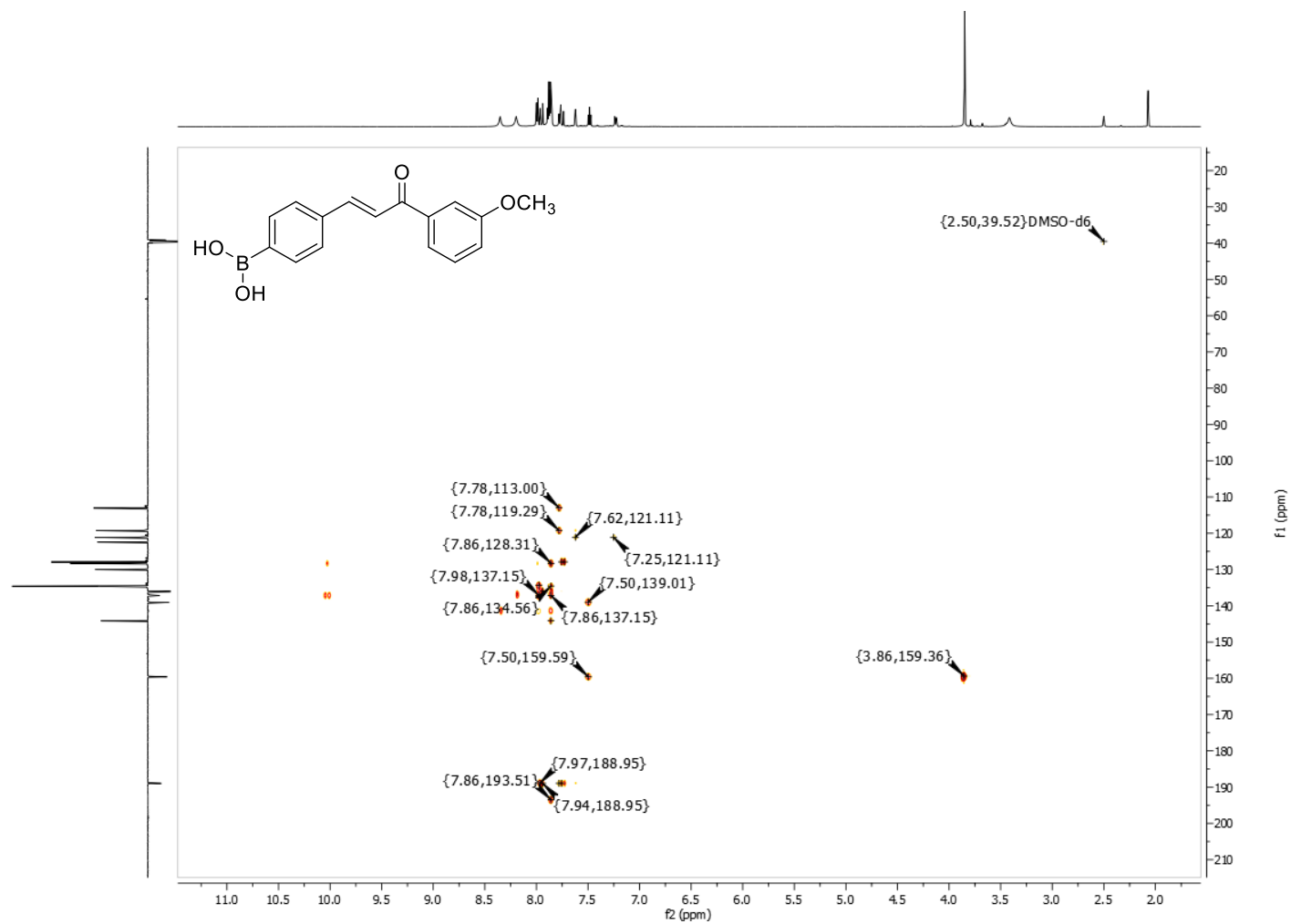
Espectro 72. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do composto ácido (*E*)-(4-(3-(3-metoxifenil)-3-oxoprop-1-en-1-il)fenil)borônico



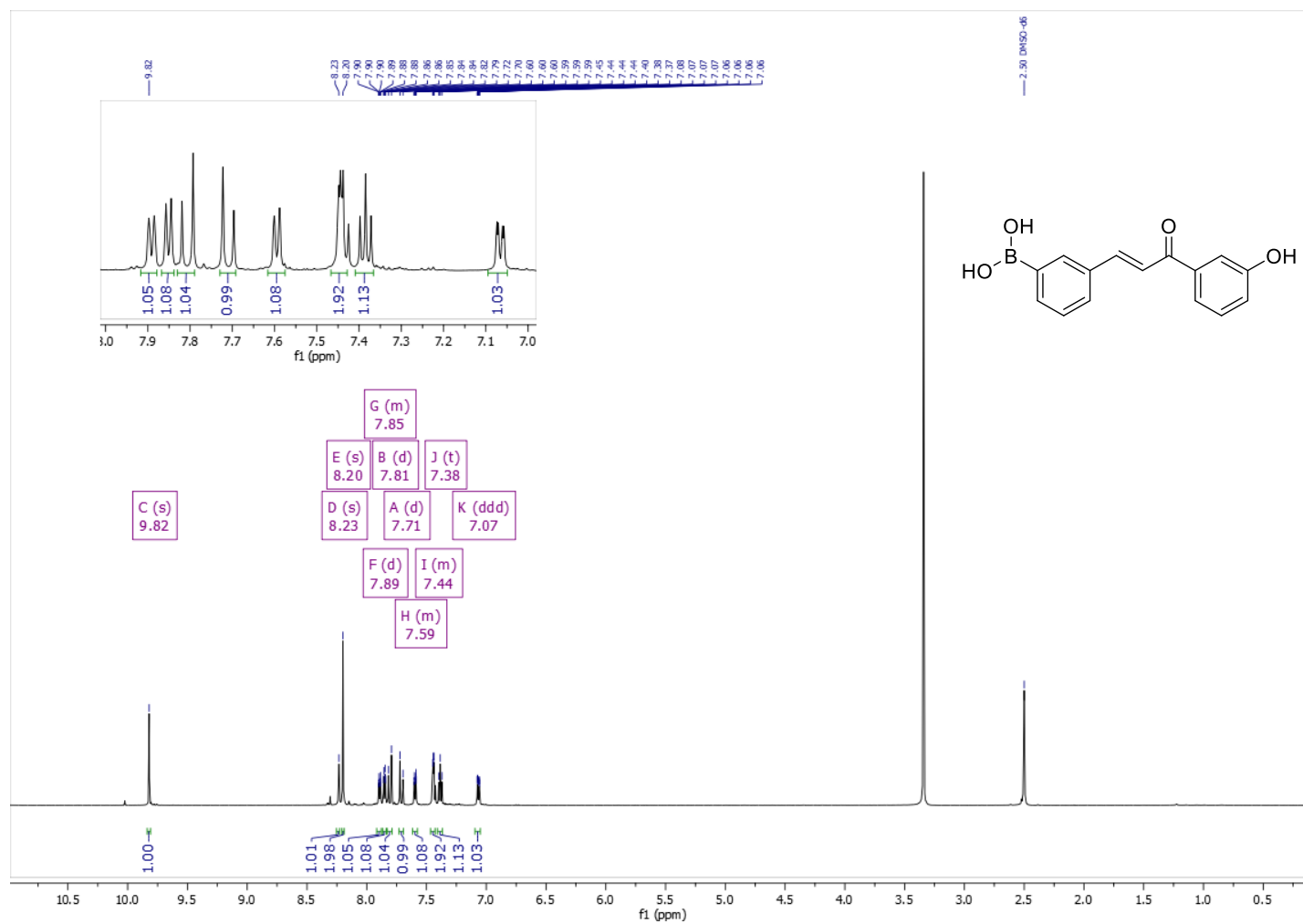
Espectro 73. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (*E*)-(4-(3-(3-metoxifenil)-3-oxoprop-1-en-1-il)fenil)borônico



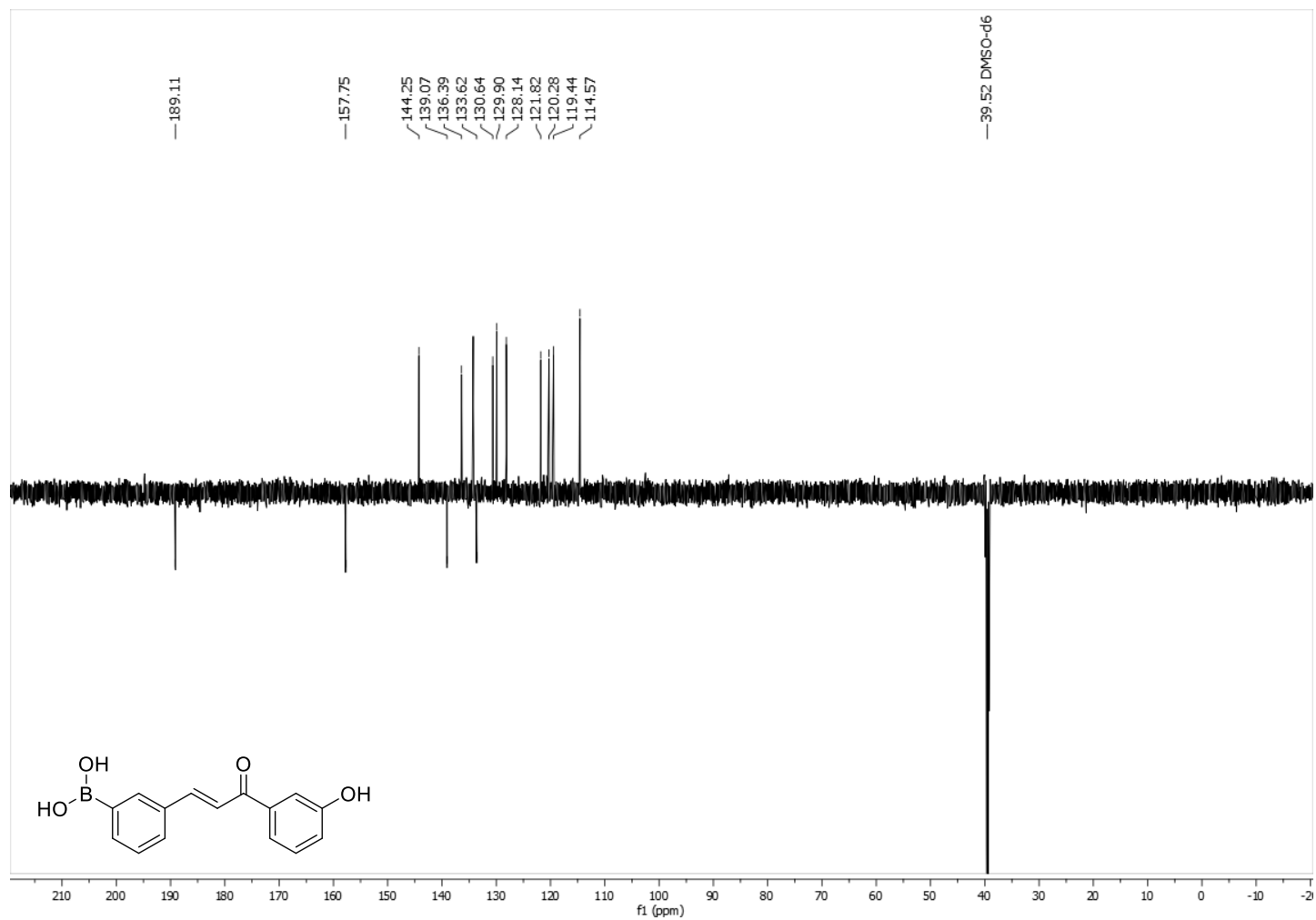
Espectro 74. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (*E*)-(4-(3-(3-metoxifenil)-3-oxoprop-1-en-1-il)fenil)borônico



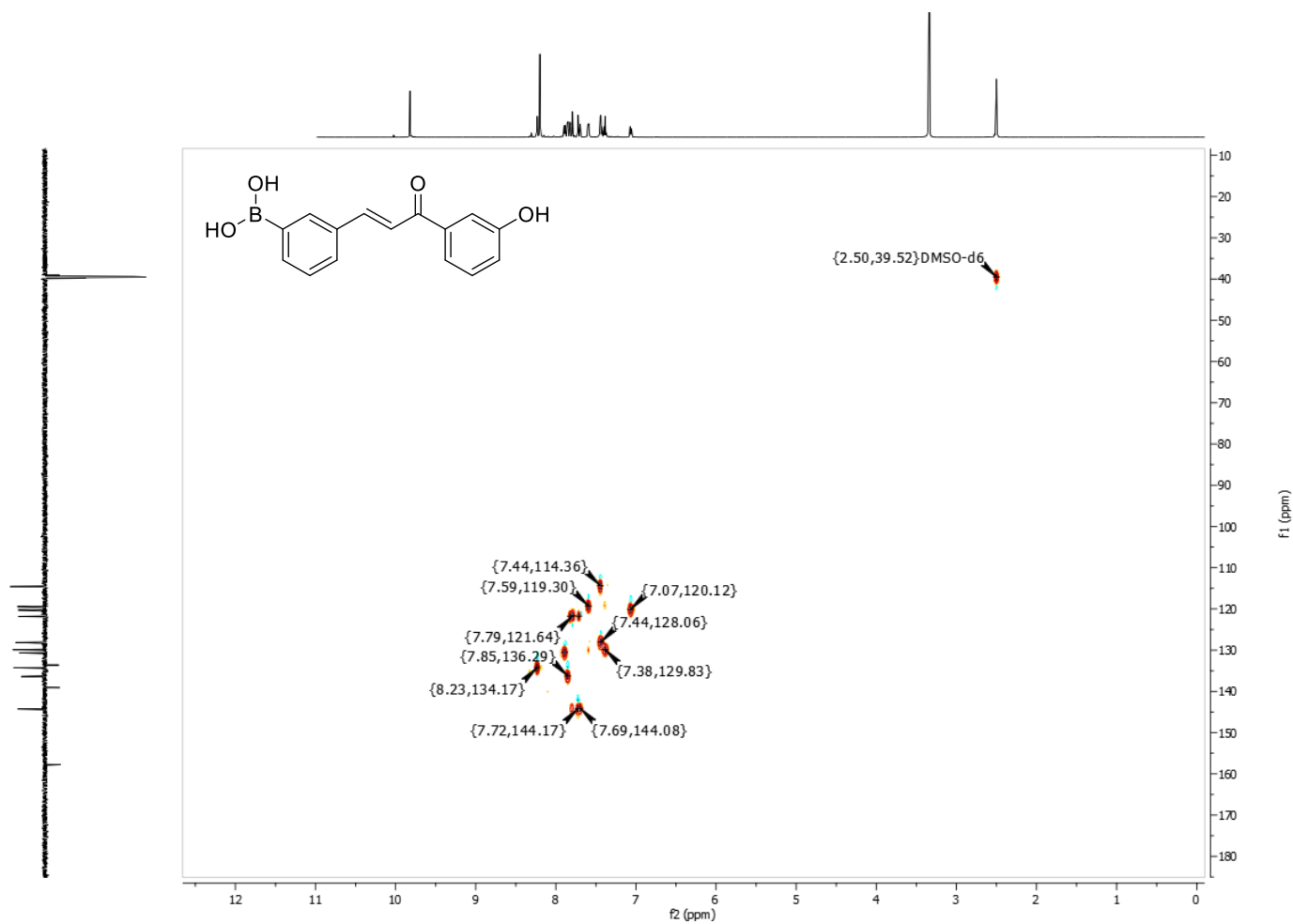
Espectro 75. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (*E*)-(3-(3-(3-hidroxifenil)-3-oxoprop-1-en-1-il)fenil)borônico



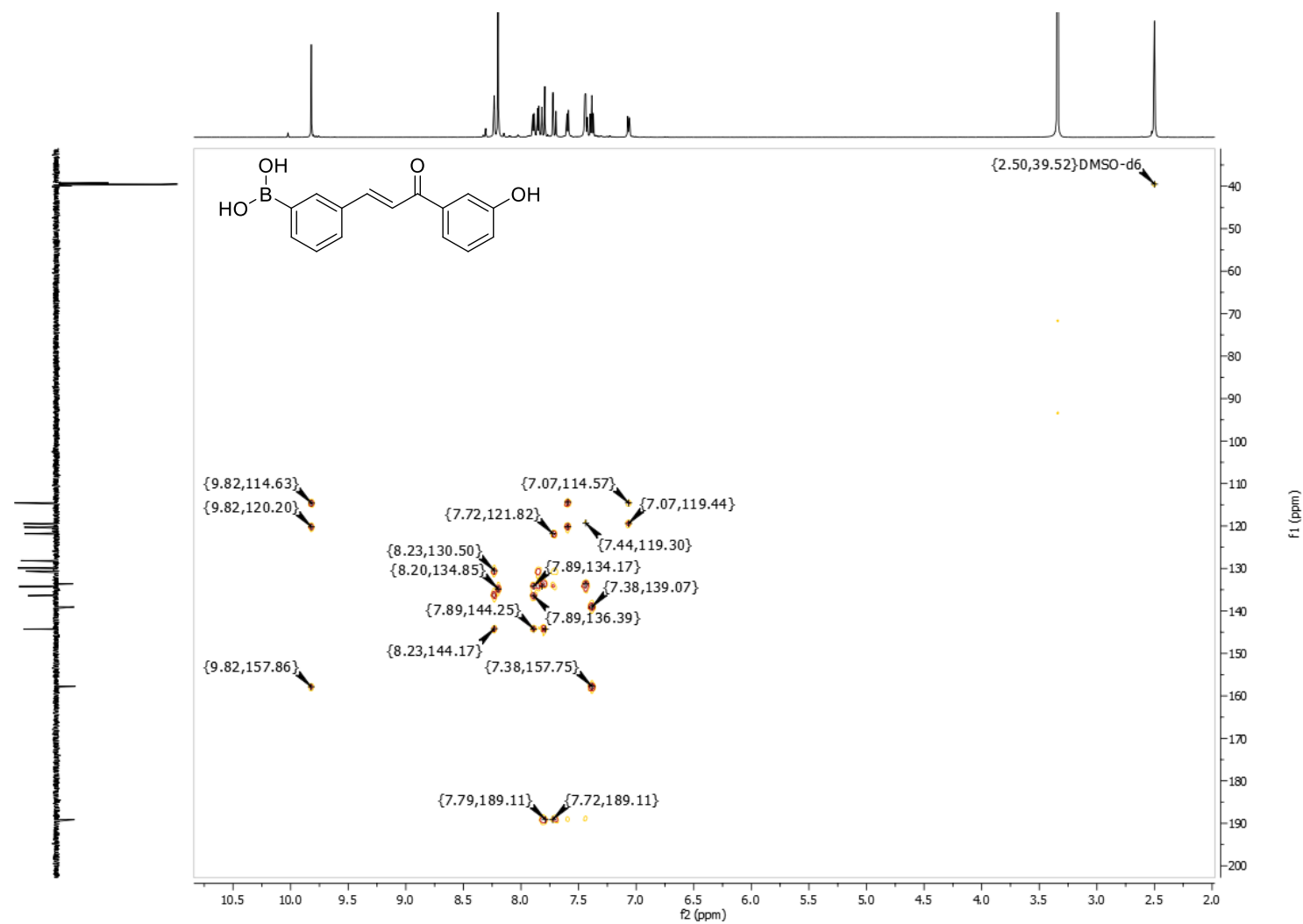
Espectro 76. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do composto ácido (*E*)-(3-(3-(3-hidroxifenil)-3-oxoprop-1-en-1-il)fenil)borônico



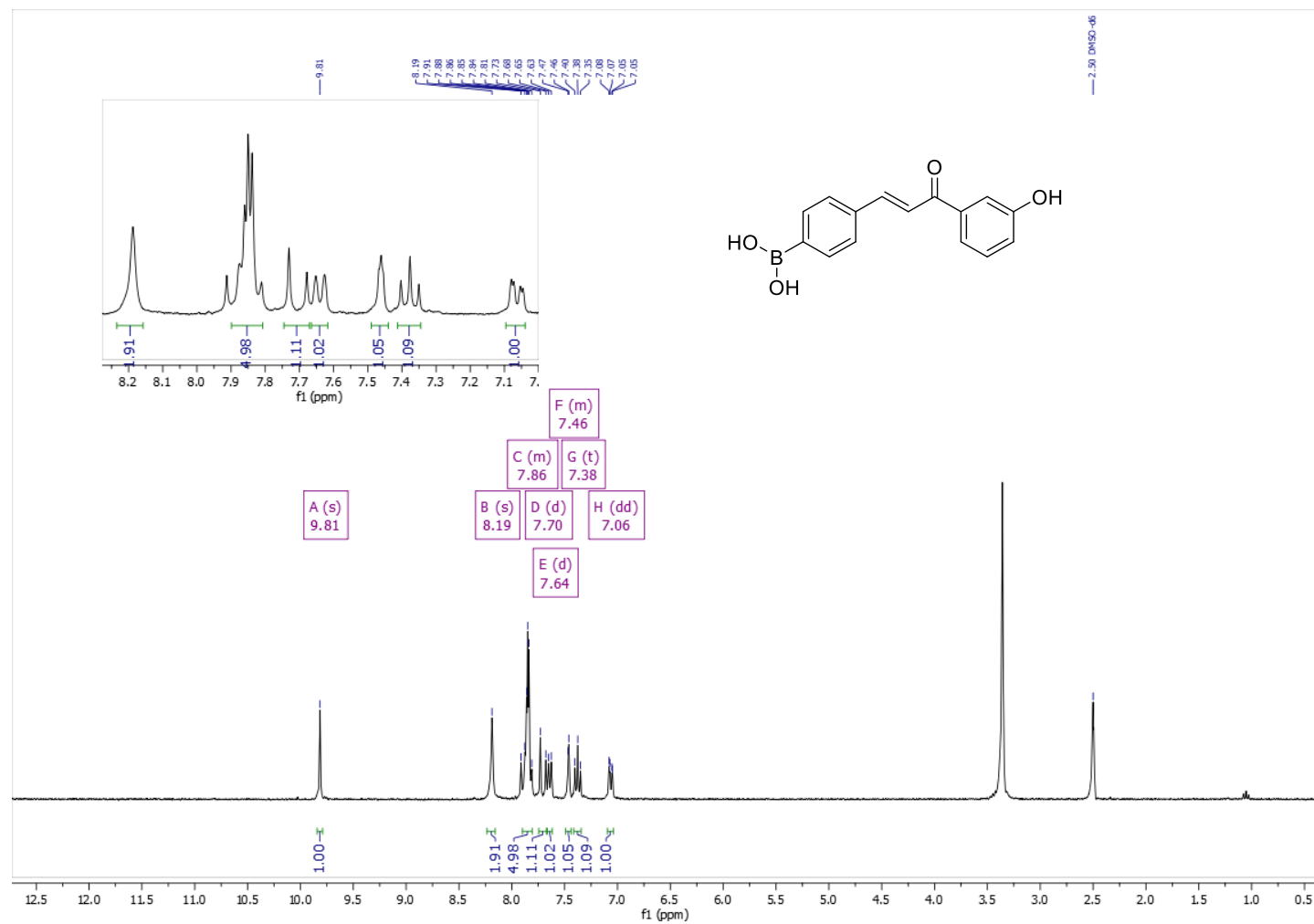
Espectro 77. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (*E*)-(3-(3-(3-hidroxifenil)-3-oxoprop-1-en-1-il)fenil)borônico



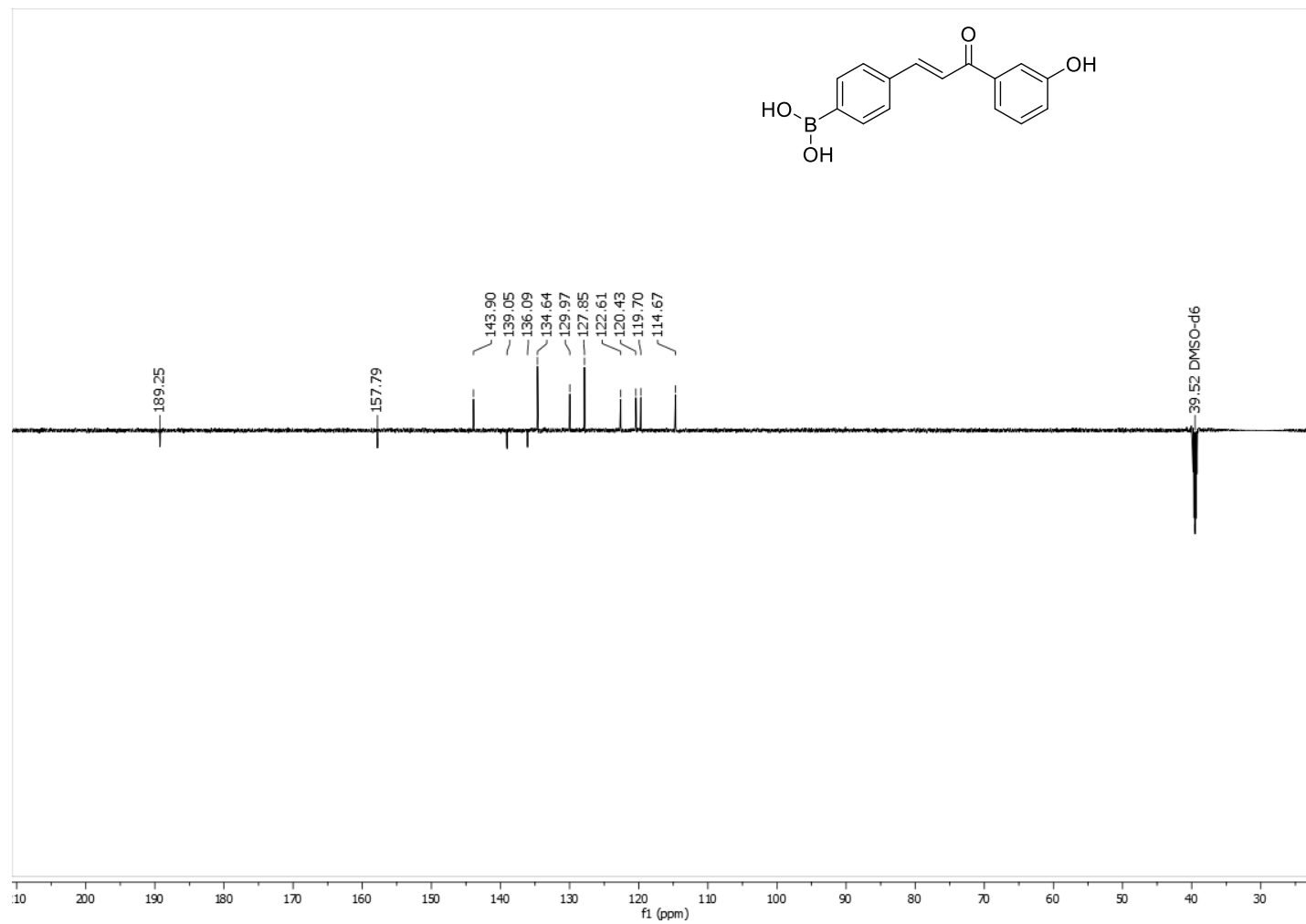
Espectro 78. Mapa de contorno de HMBC (DMSO-d₆, 600 MHz) do composto ácido (*E*)-(3-(3-(3-hidroxifenil)-3-oxoprop-1-en-1-il)fenil)borônico



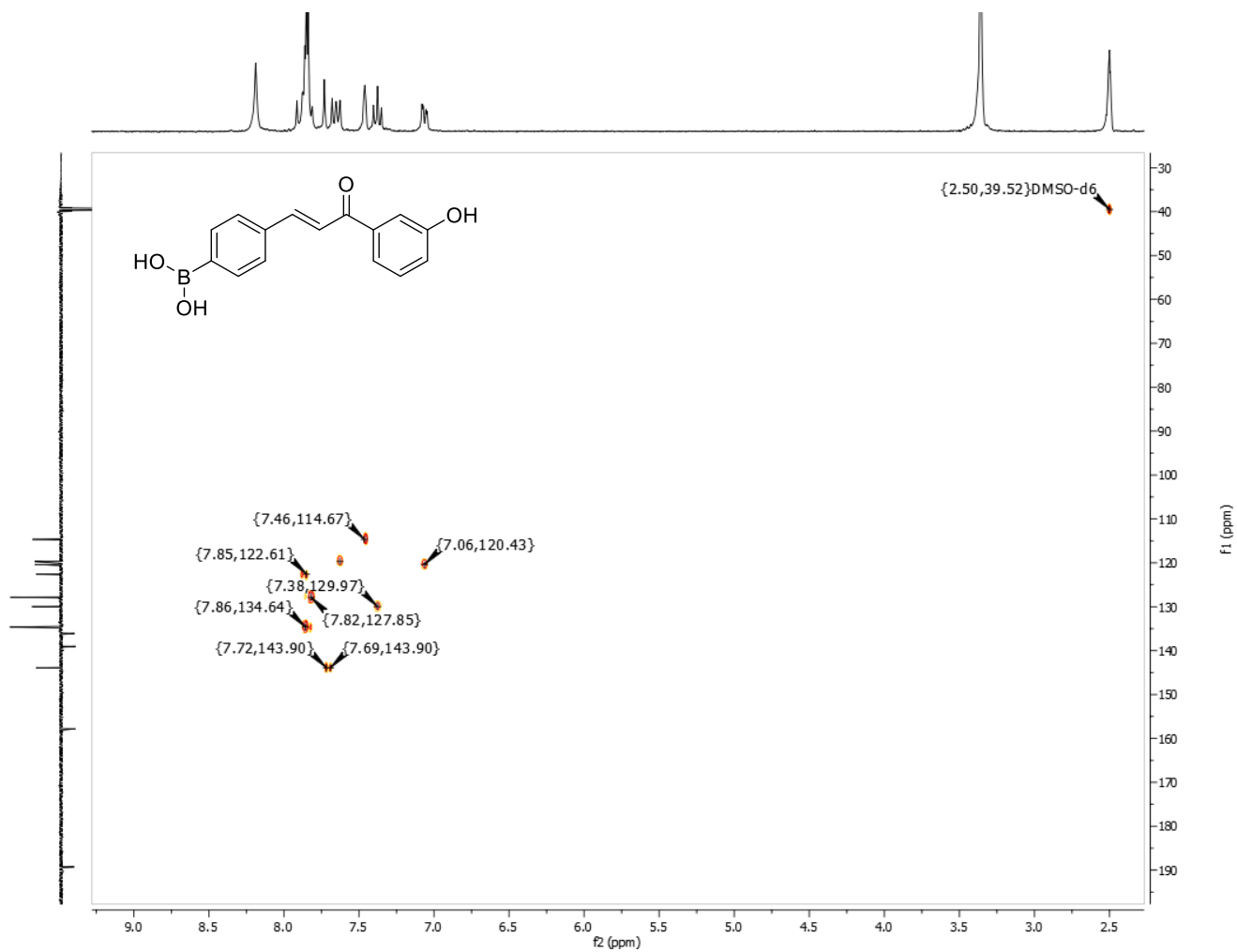
Espectro 79. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (*E*)-(4-(3-(3-hidroxifenil)-3-oxoprop-1-en-1-il)fenil)borônico



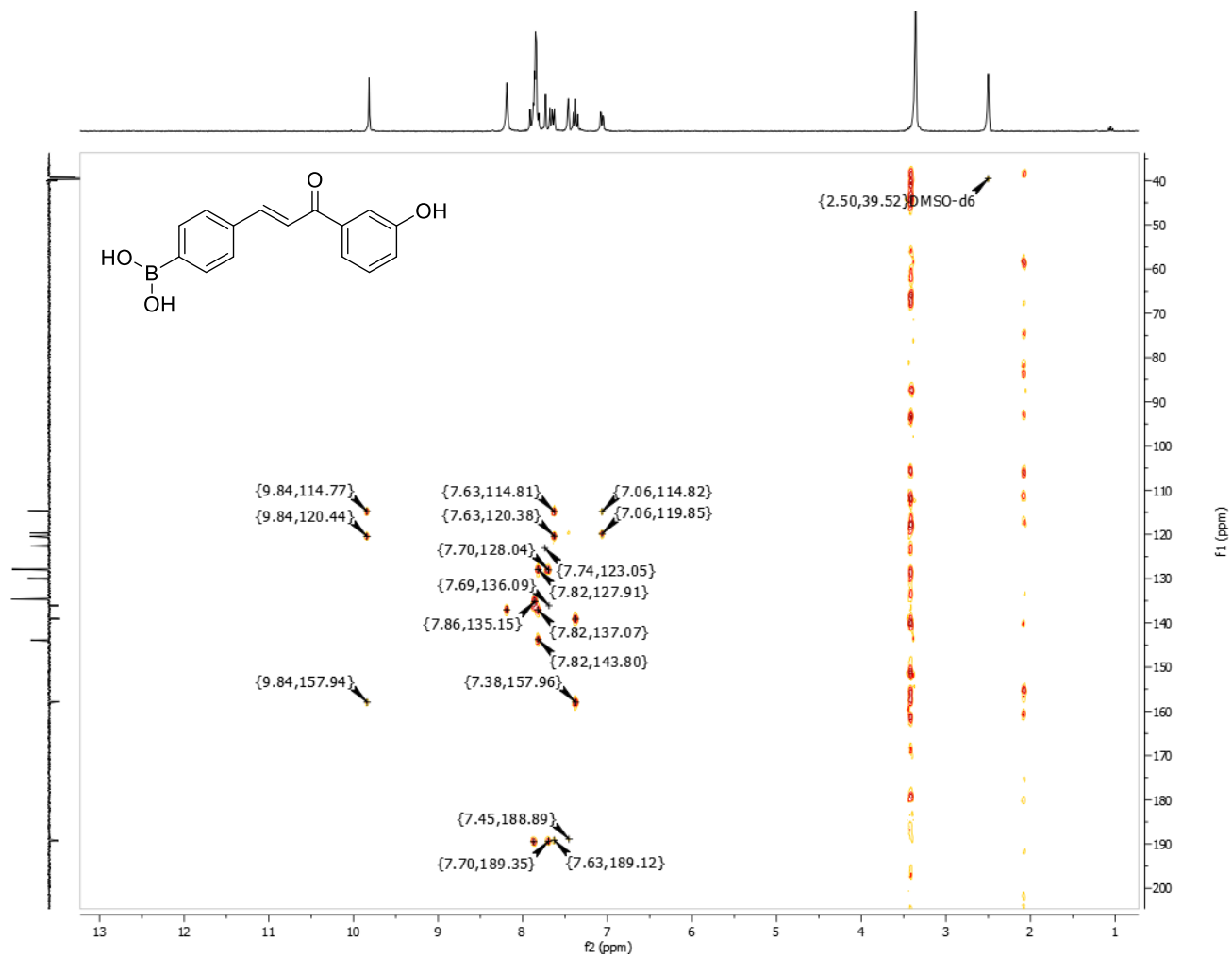
Espectro 80. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do composto ácido (*E*)-(4-(3-(3-hidroxifenil)-3-oxoprop-1-en-1-il)fenil)borônico



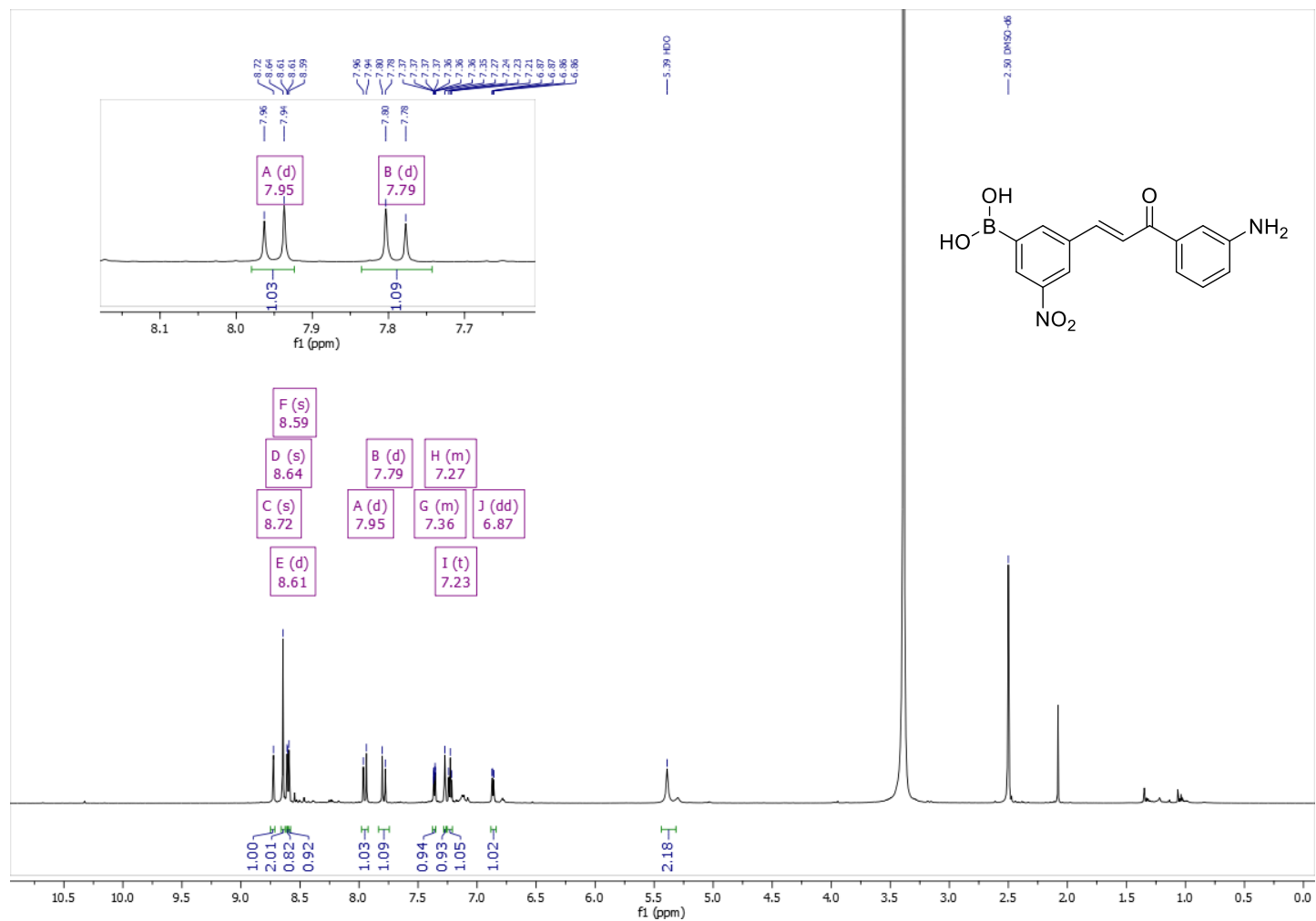
Espectro 81. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (*E*)-(4-(3-(3-hidroxifenil)-3-oxoprop-1-en-1-il)fenil)borônico



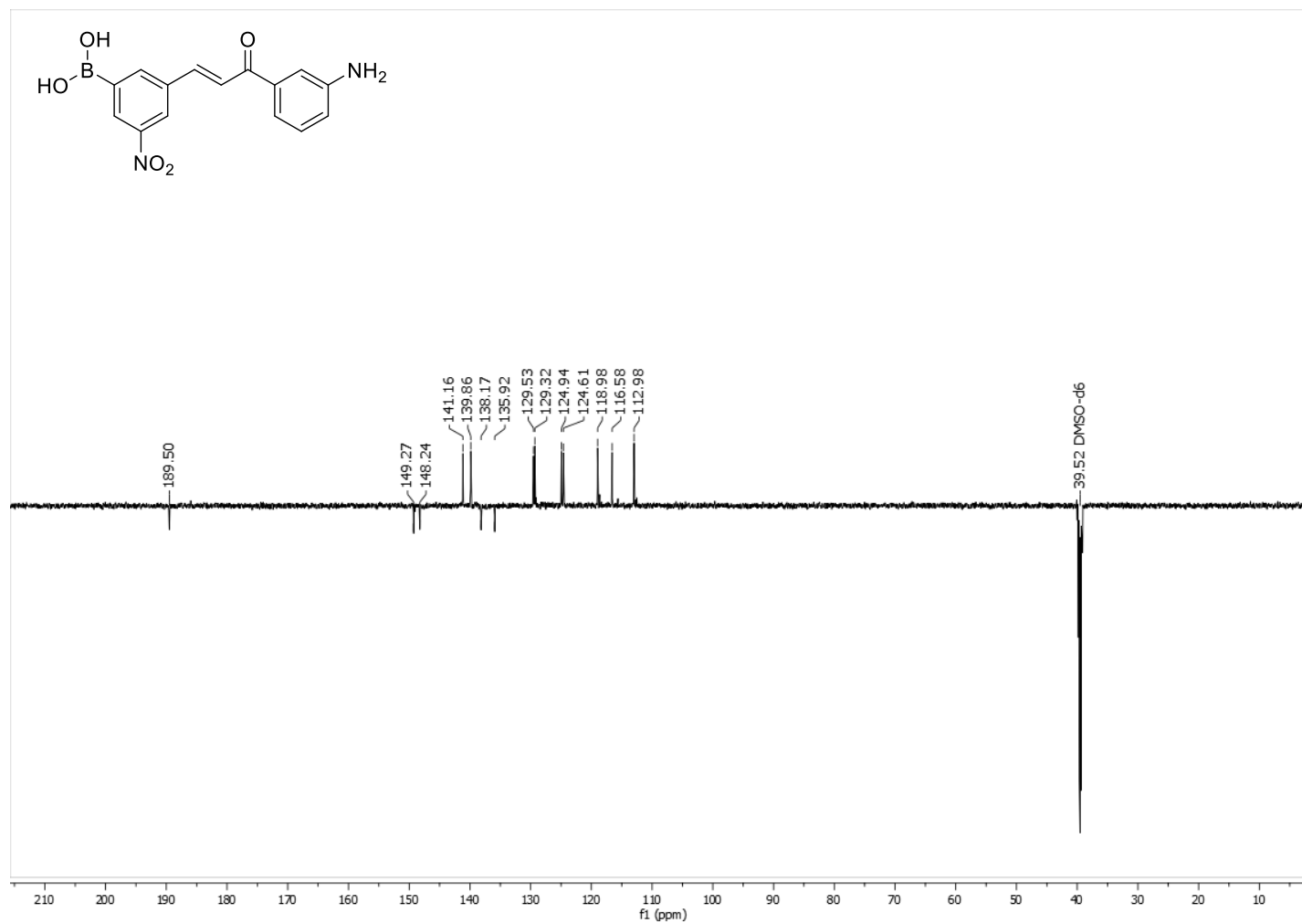
Espectro 82. Mapa de contorno de HMBC (DMSO-d₆, 600 MHz) do composto ácido (*E*)-(4-(3-(3-hidroxifenil)-3-oxoprop-1-en-1-il)fenil)borônico



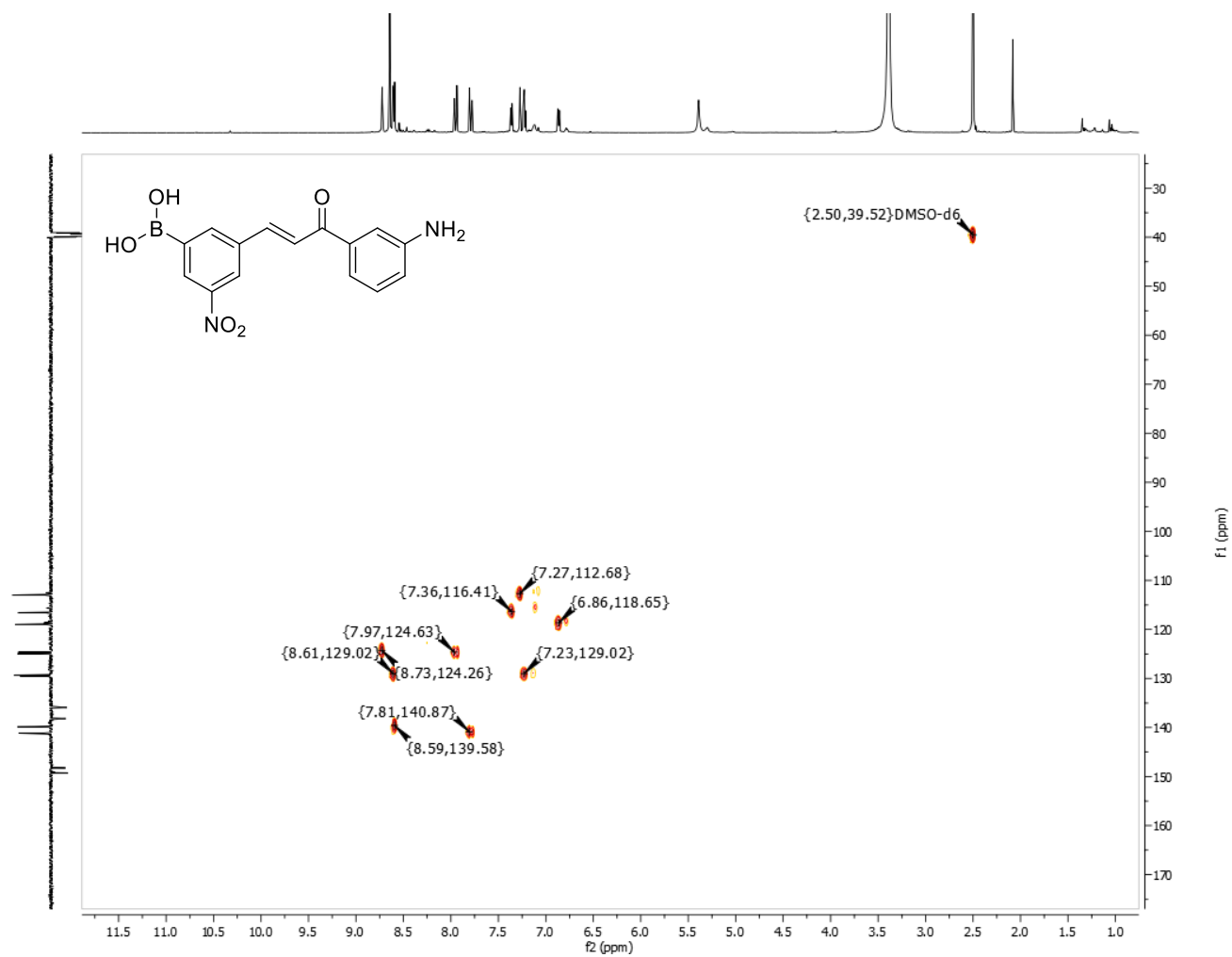
Espectro 83. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (*E*)-(3-(3-(3-aminofenil)-3-oxoprop-1-en-1-il)-5-nitrofenil)borônico



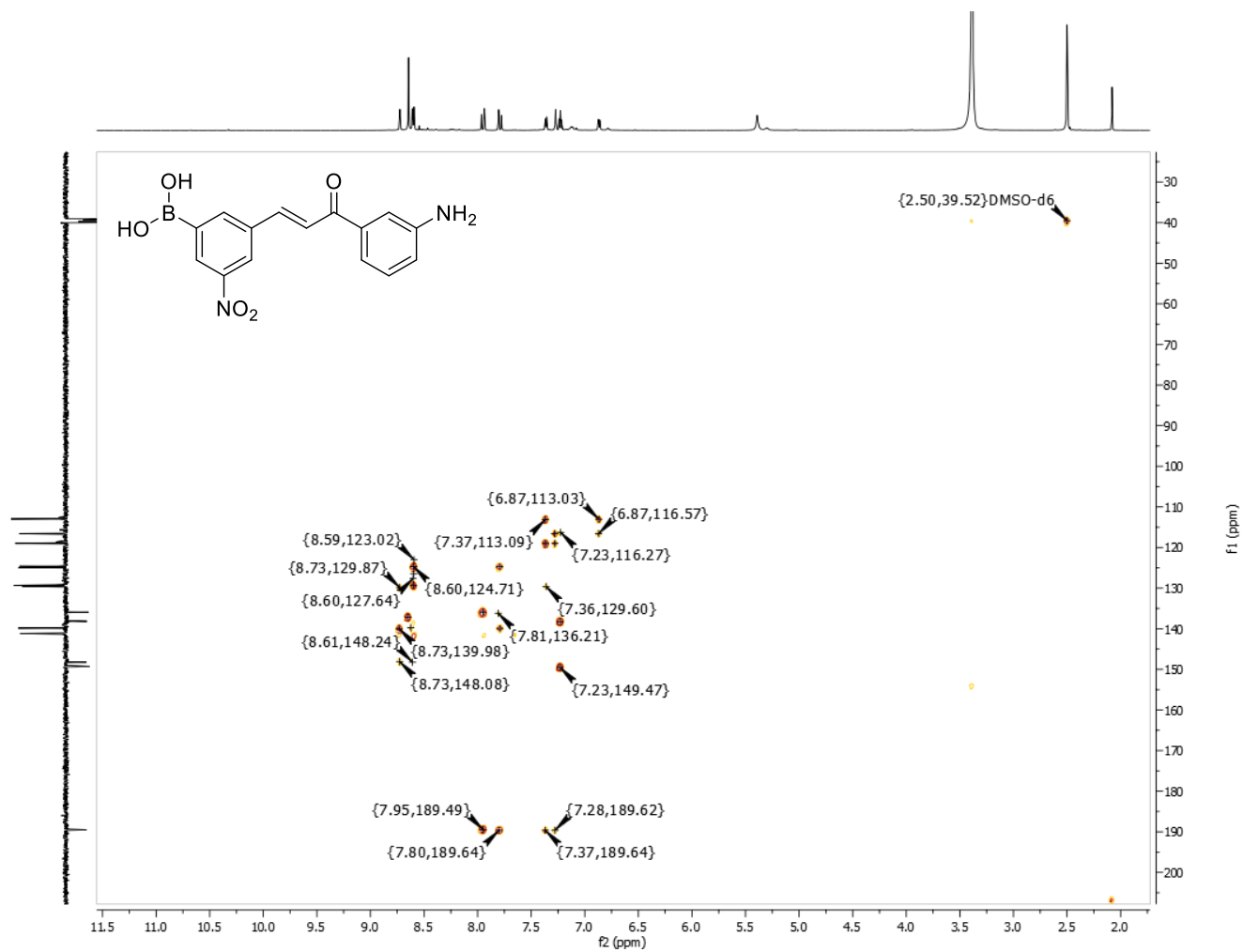
Espectro 84. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do composto ácido (*E*)-(3-(3-(3-aminofenil)-3-oxoprop-1-en-1-il)-5-nitrofenil)borônico



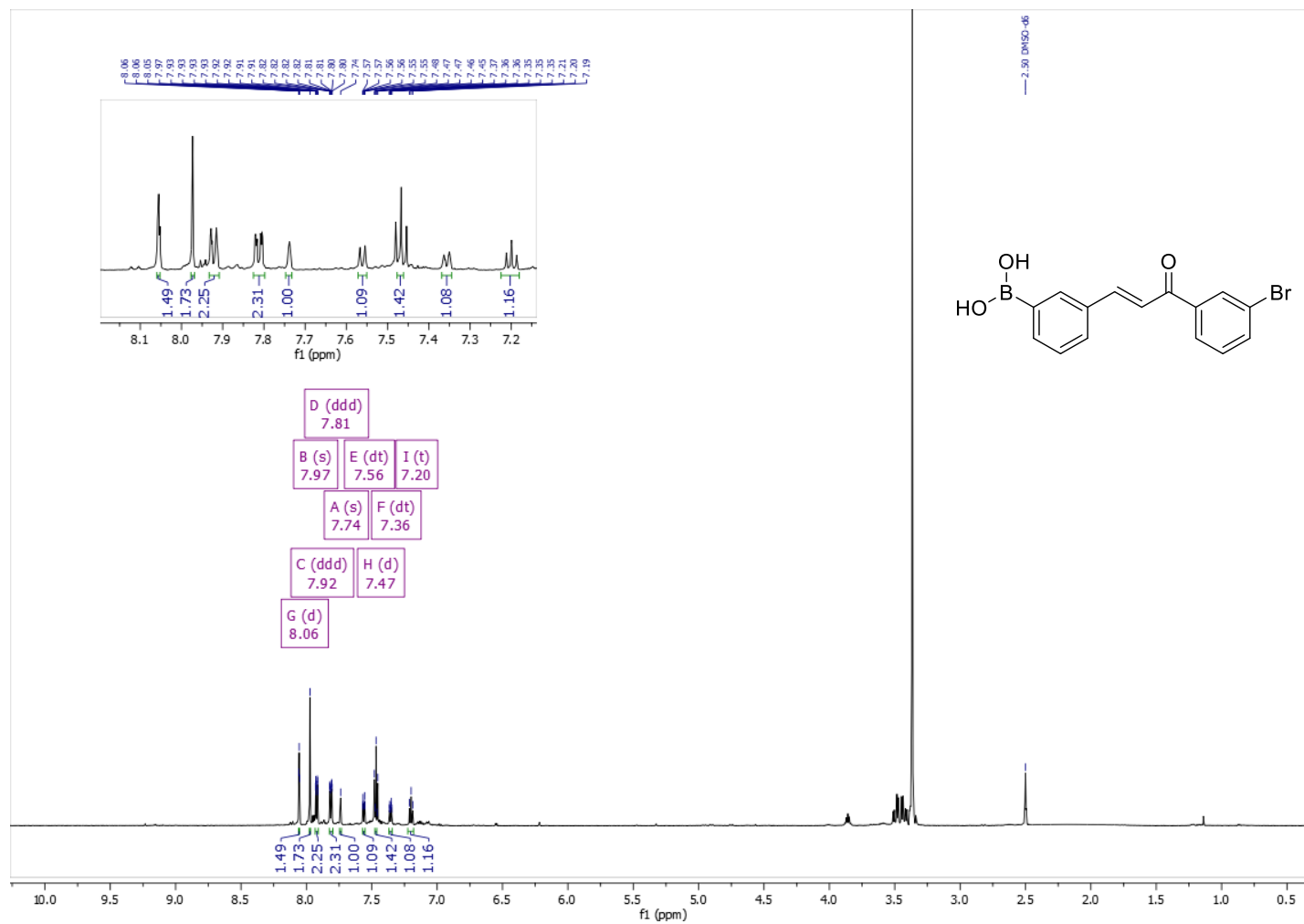
Espectro 85. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (*E*)-(3-(3-(3-aminofenil)-3-oxoprop-1-en-1-il)-5-nitrofenil)borônico



Espectro 86. Mapa de contorno de HMBC (DMSO-d₆, 600 MHz) do composto ácido (*E*)-(3-(3-(3-aminofenil)-3-oxoprop-1-en-1-il)-5-nitrofenil)borônico



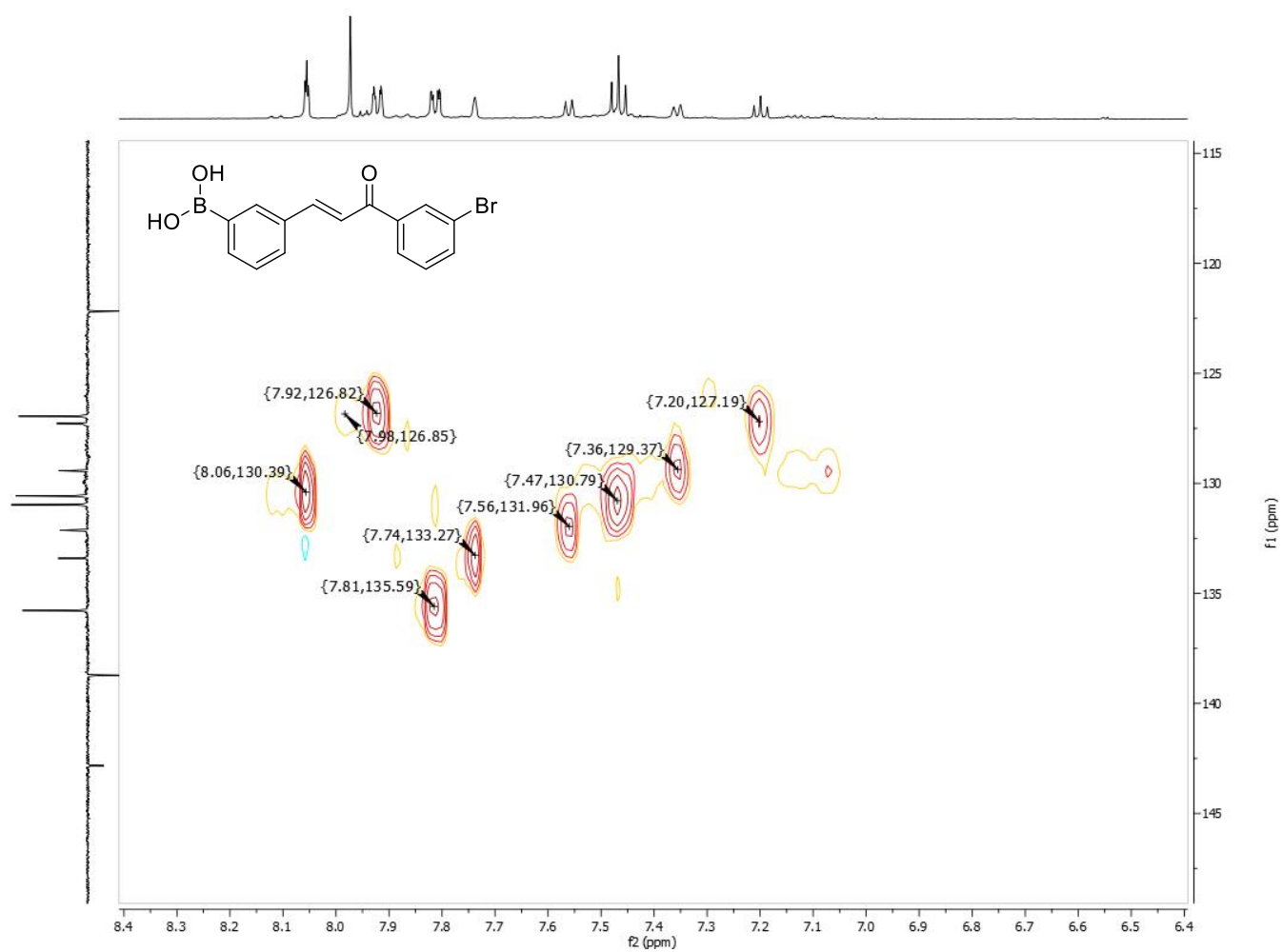
Espectro 87. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (*E*)-(3-(3-(3-bromofenil)-3-oxoprop-1-en-1-il)fenil)borônico



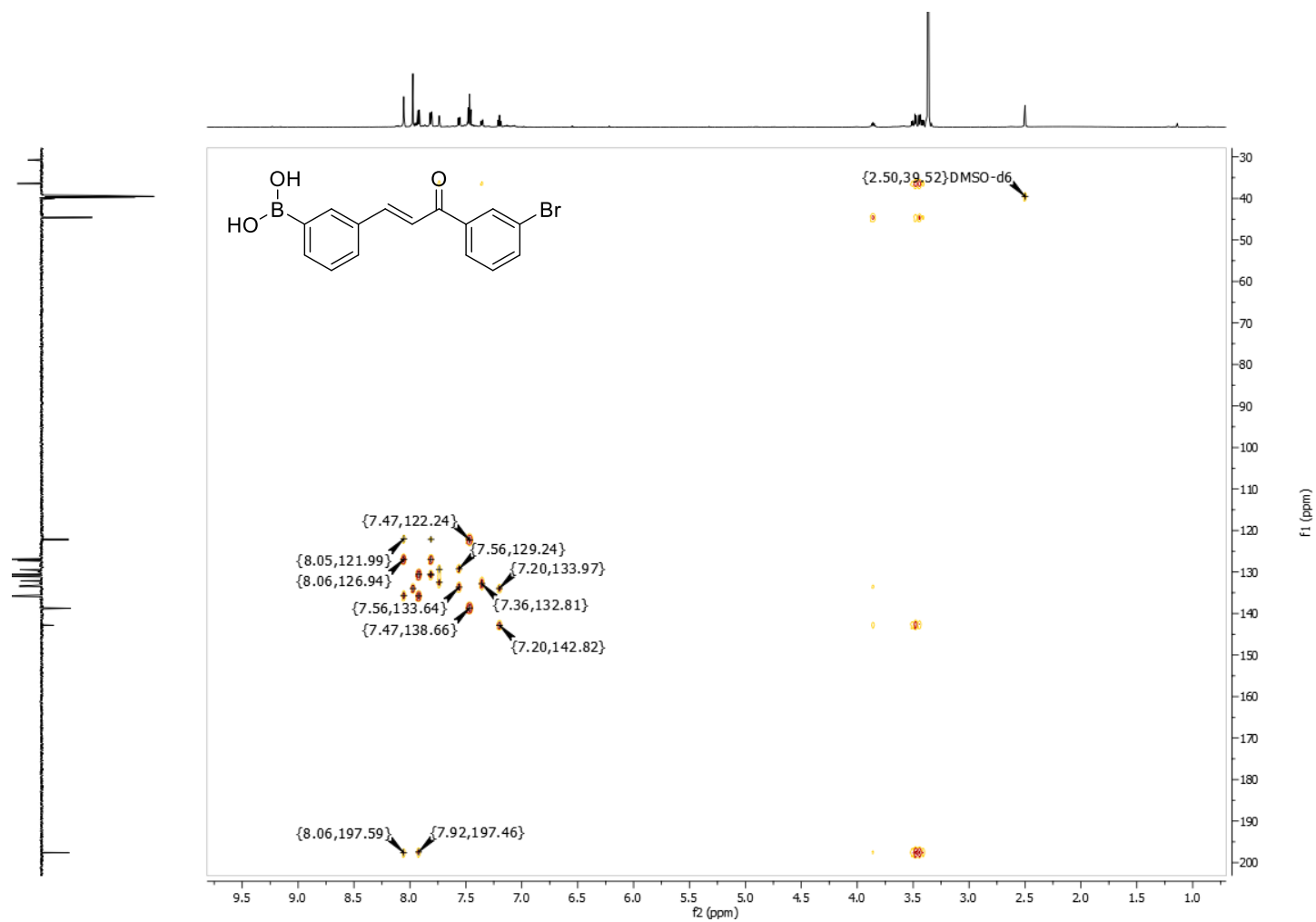
Espectro 88. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do composto ácido (*E*)-(3-(3-(3-bromofenil)-3-oxoprop-1-en-1-il)fenil)borônico



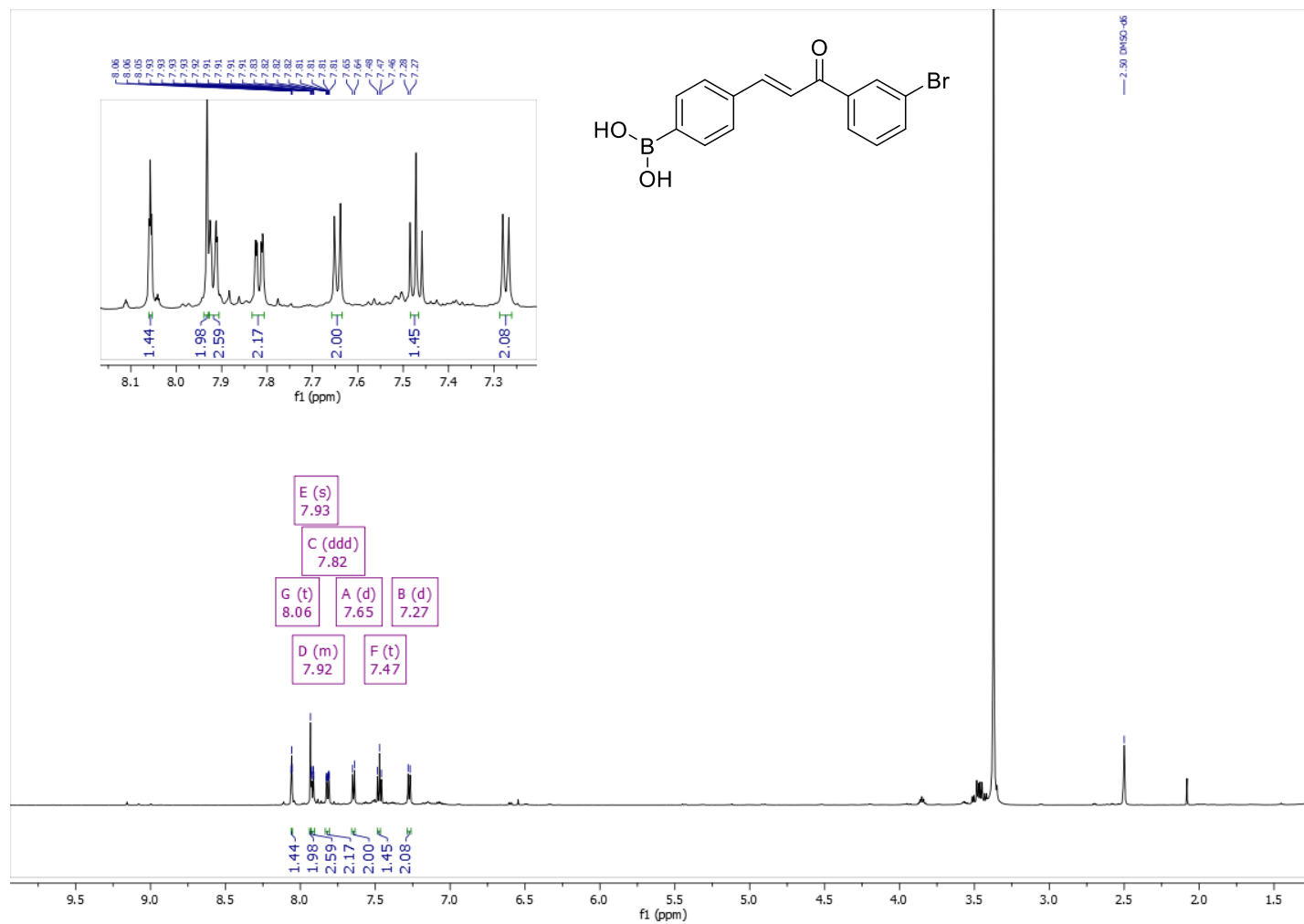
Espectro 89. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (*E*)-(3-(3-(3-bromofenil)-3-oxoprop-1-en-1-il)fenil)borônico



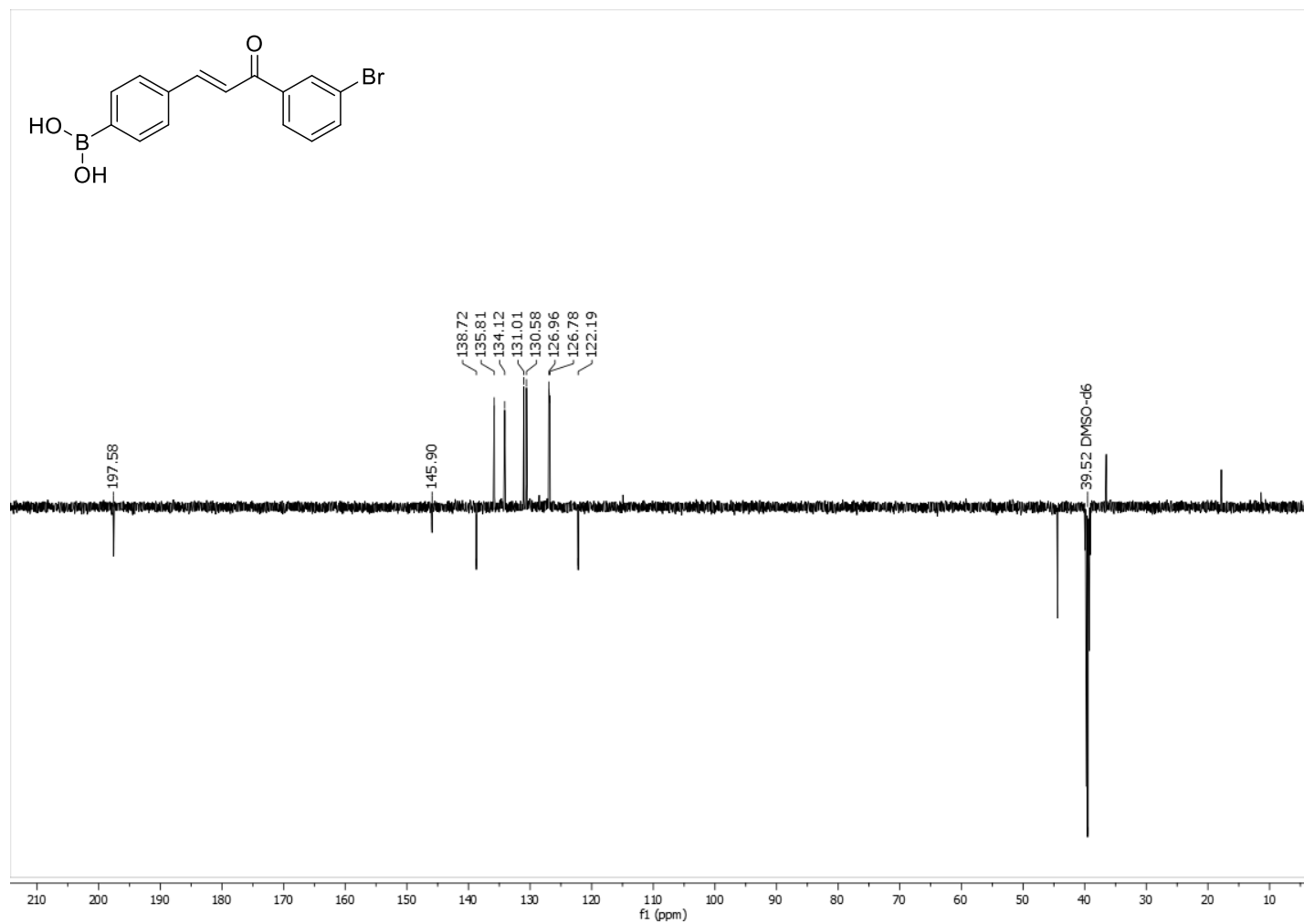
Espectro 90. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (*E*)-(3-(3-(3-bromofenil)-3-oxoprop-1-en-1-il)fenil)borônico



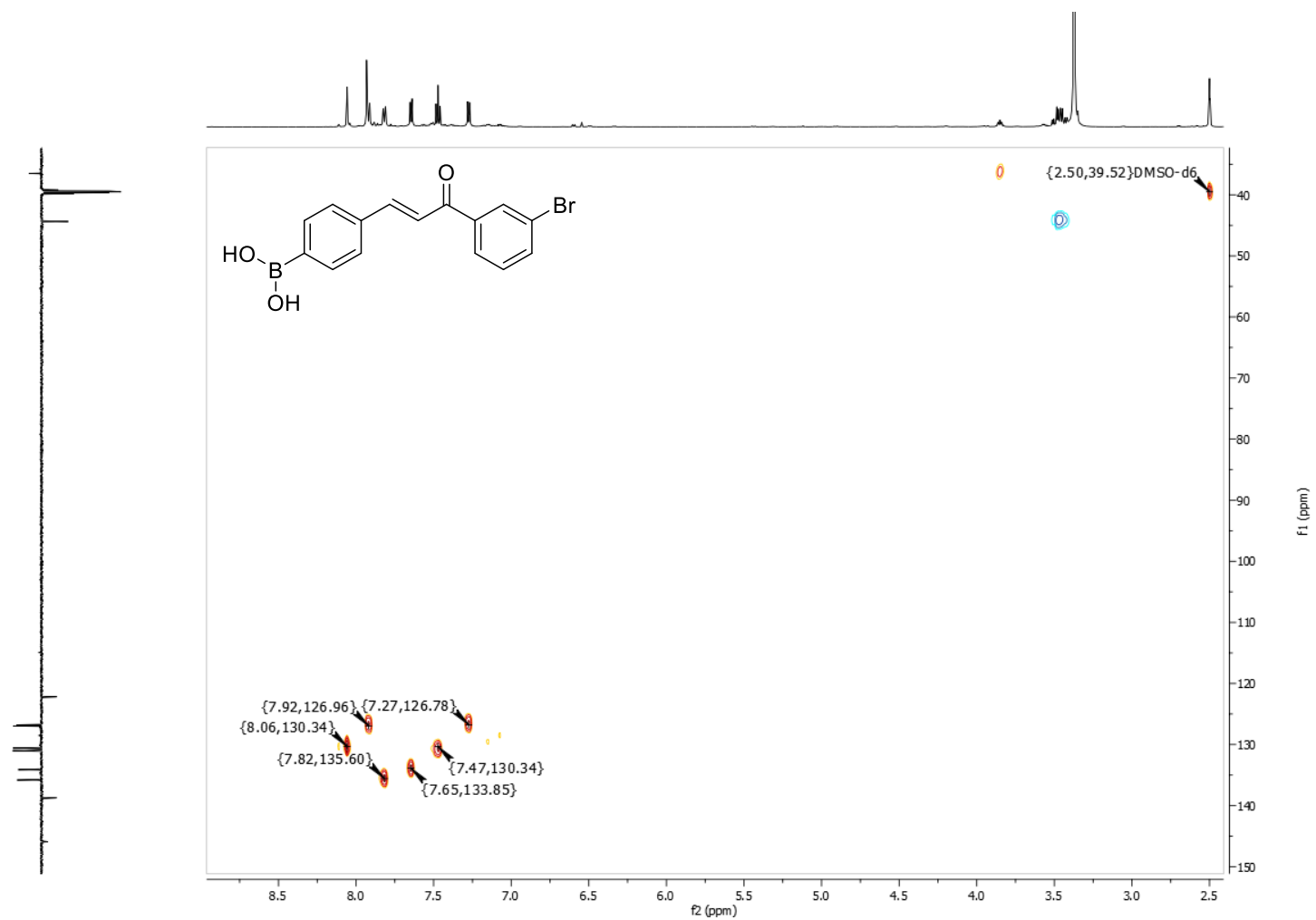
Espectro 91. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (*E*)-(4-(3-(3-bromofenil)-3-oxoprop-1-en-1-il)fenil)borônico



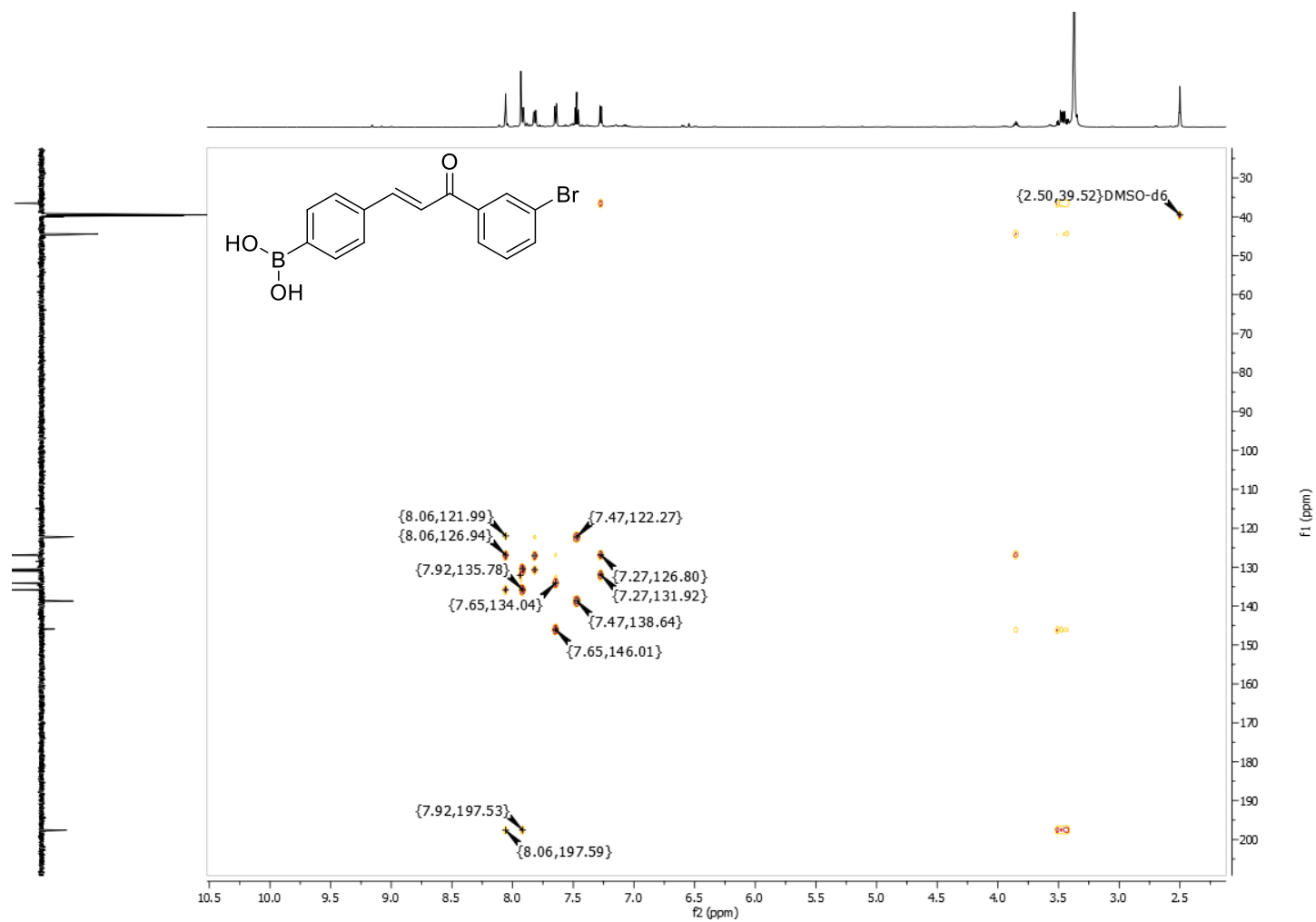
Espectro 92. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do composto ácido (*E*)-(4-(3-(3-bromofenil)-3-oxoprop-1-en-1-il)fenil)borônico



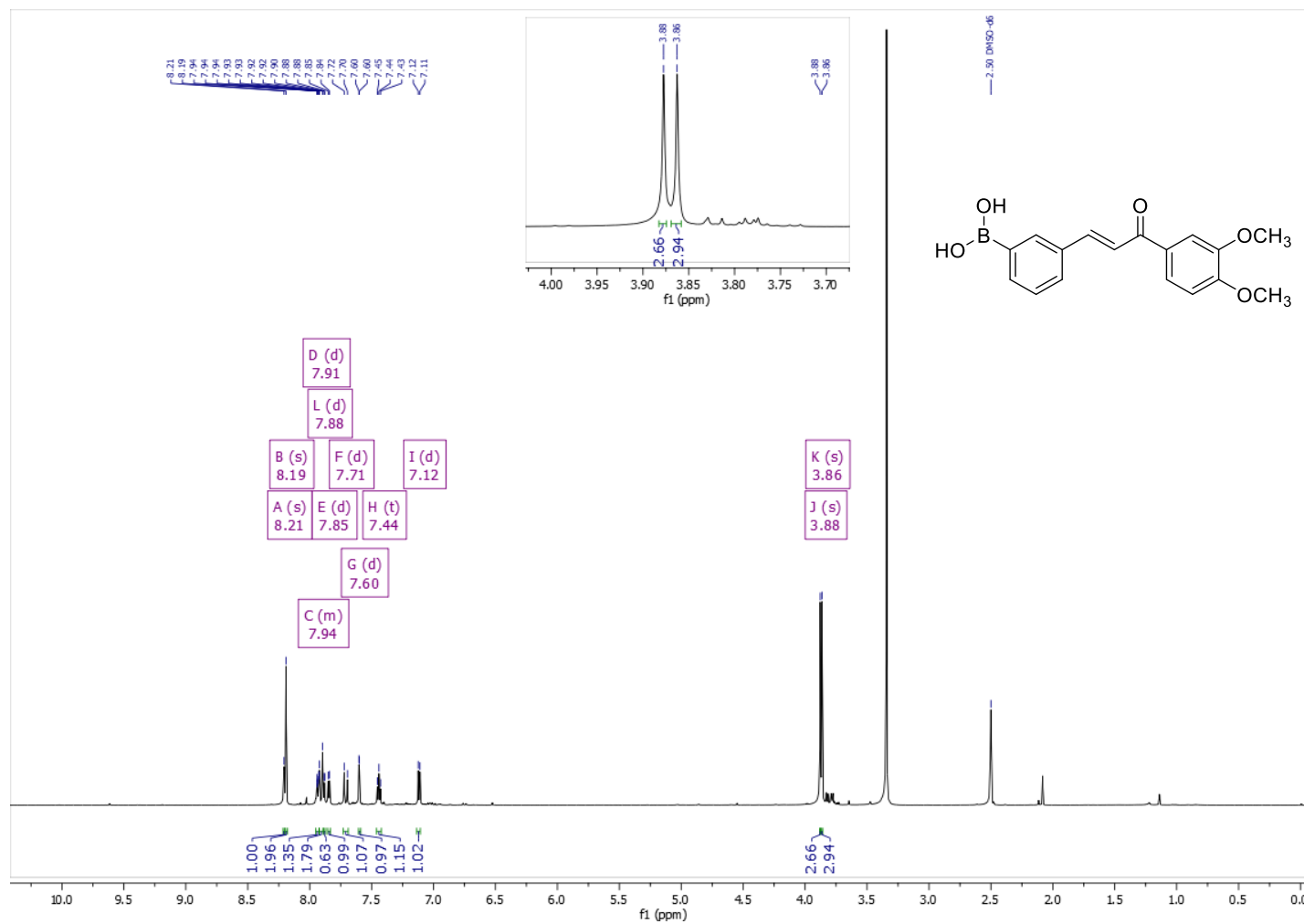
Espectro 93. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (*E*)-(4-(3-(3-bromofenil)-3-oxoprop-1-en-1-il)fenil)borônico



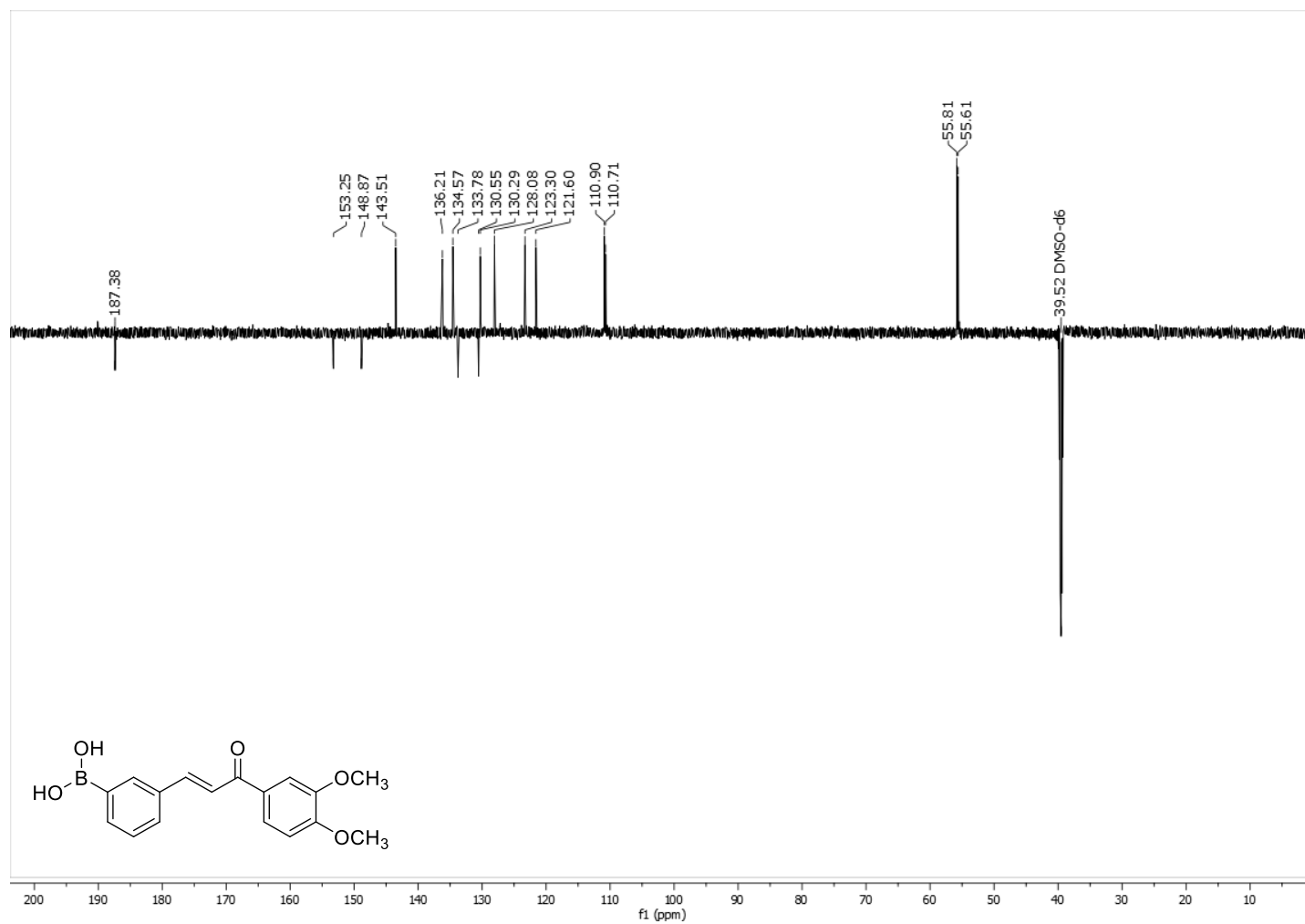
Espectro 94. Mapa de contorno de HMBC (DMSO-d6, 600 MHz) do composto ácido (*E*)-(4-(3-(3-bromofenil)-3-oxoprop-1-en-1-il)fenil)borônico



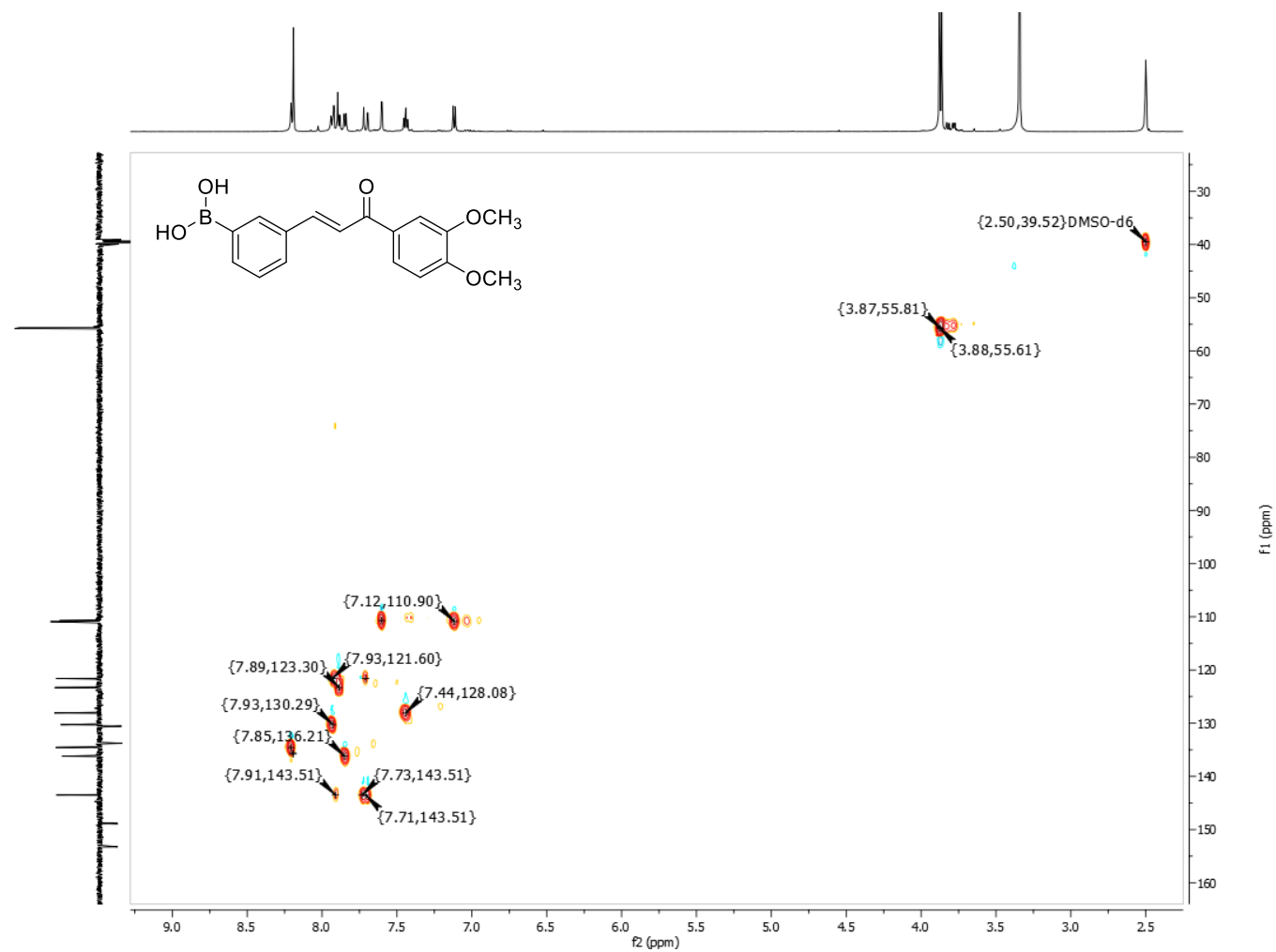
Espectro 95. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (*E*)-(3-(3-(3,4-dimetoxifenil)-3-oxoprop-1-en-1-il)fenil)borônico



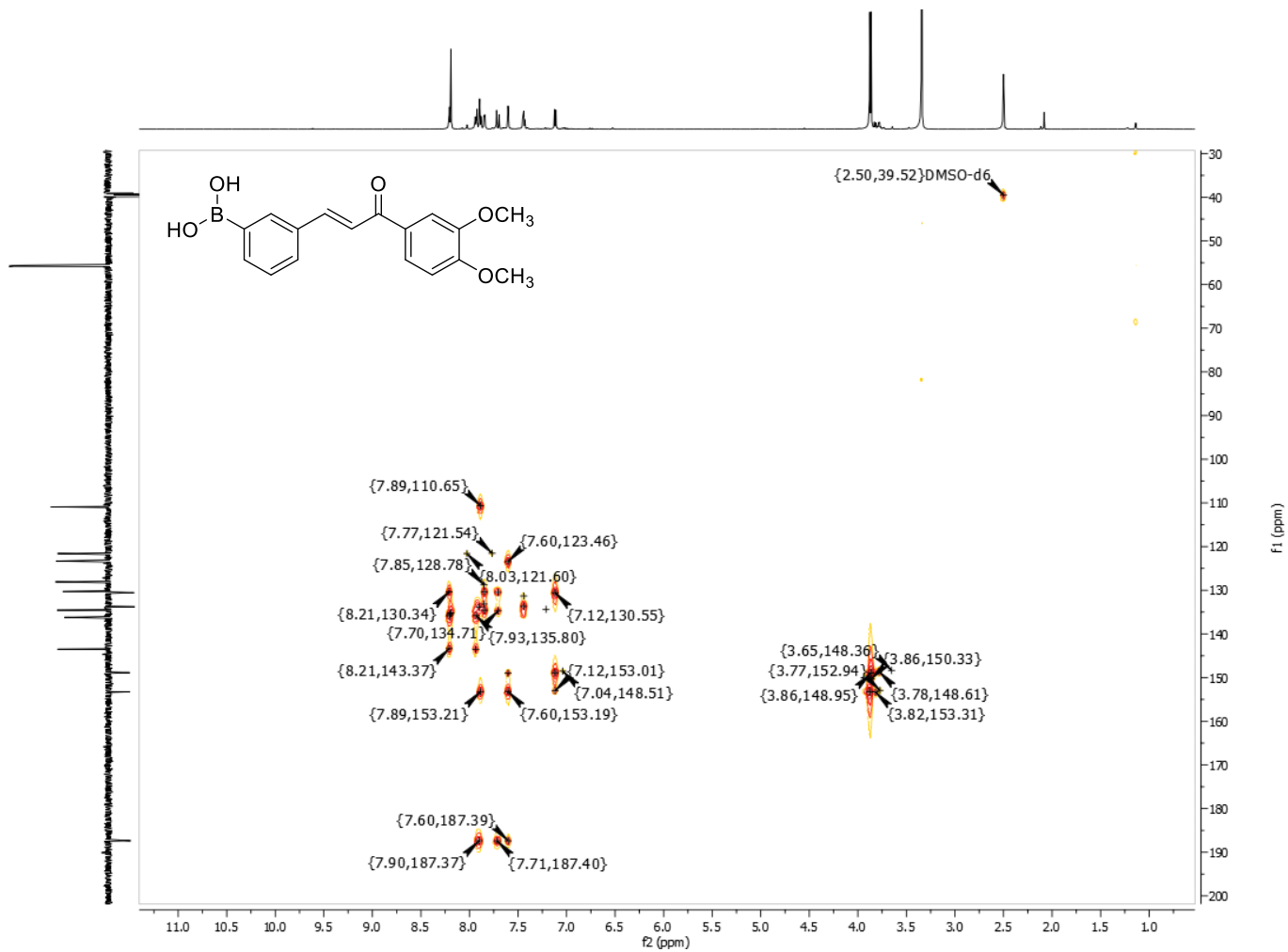
Espectro 96. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do composto ácido (*E*)-(3-(3-(3,4-dimetoxifenil)-3-oxoprop-1-en-1-il)fenil)borônico



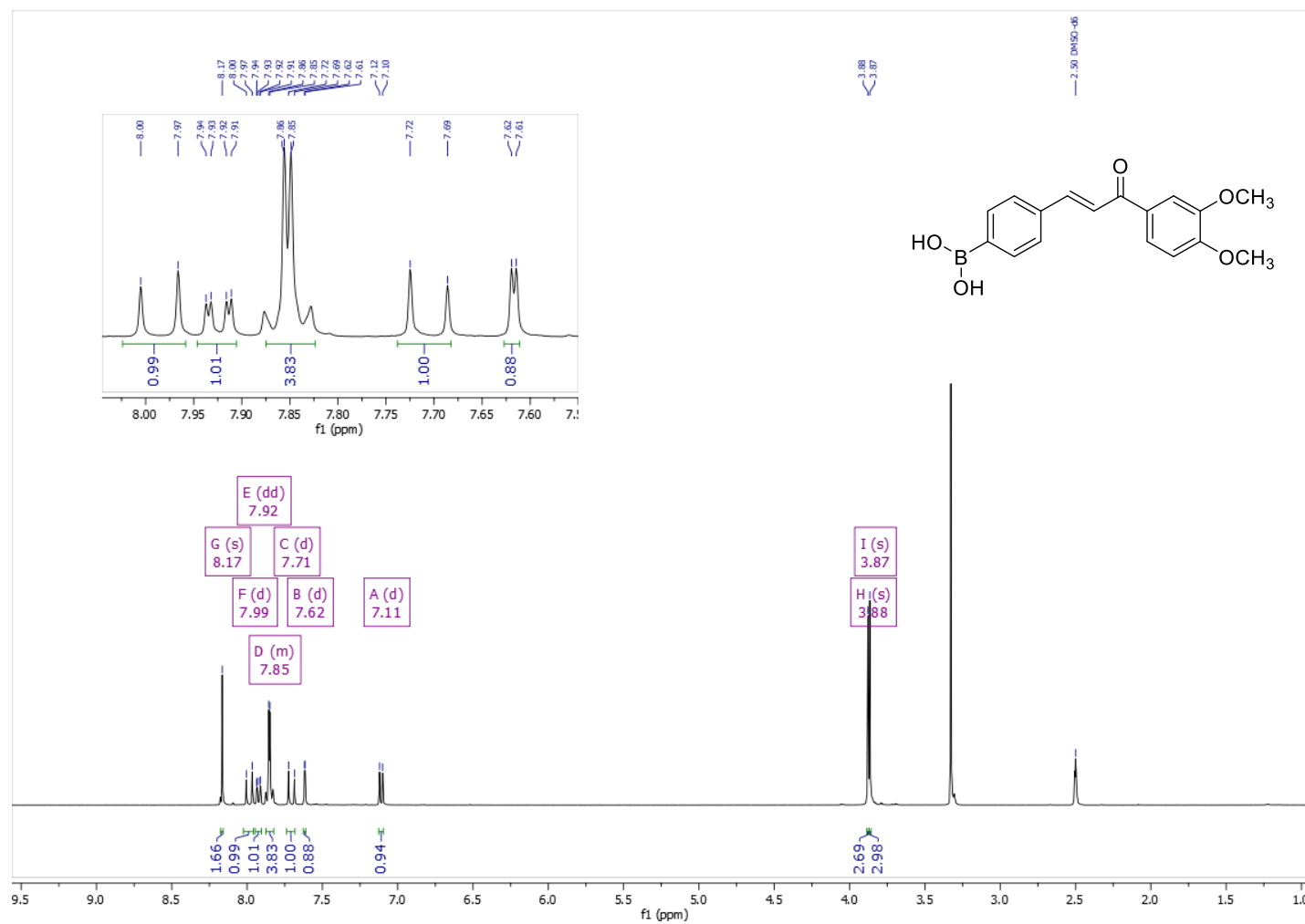
Espectro 97. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (*E*)-(3-(3-(3,4-dimetoxifenil)-3-oxoprop-1-en-1-il)fenil)borônico



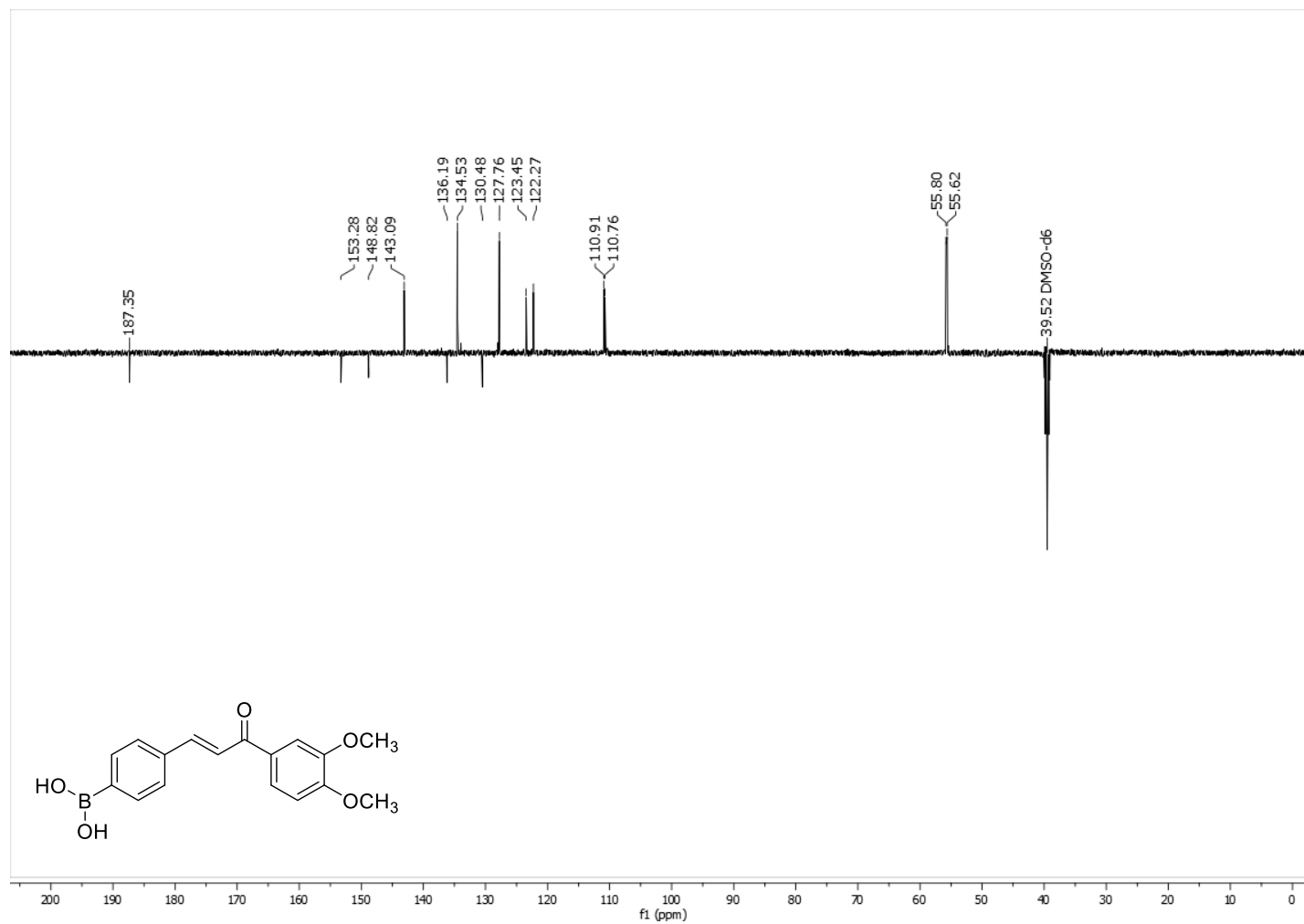
Espectro 98. Mapa de contorno de HMBC (DMSO-d₆, 600 MHz) do composto ácido (*E*)-(3-(3-(3,4-dimetoxifenil)-3-oxoprop-1-en-1-il)fenil)borônico



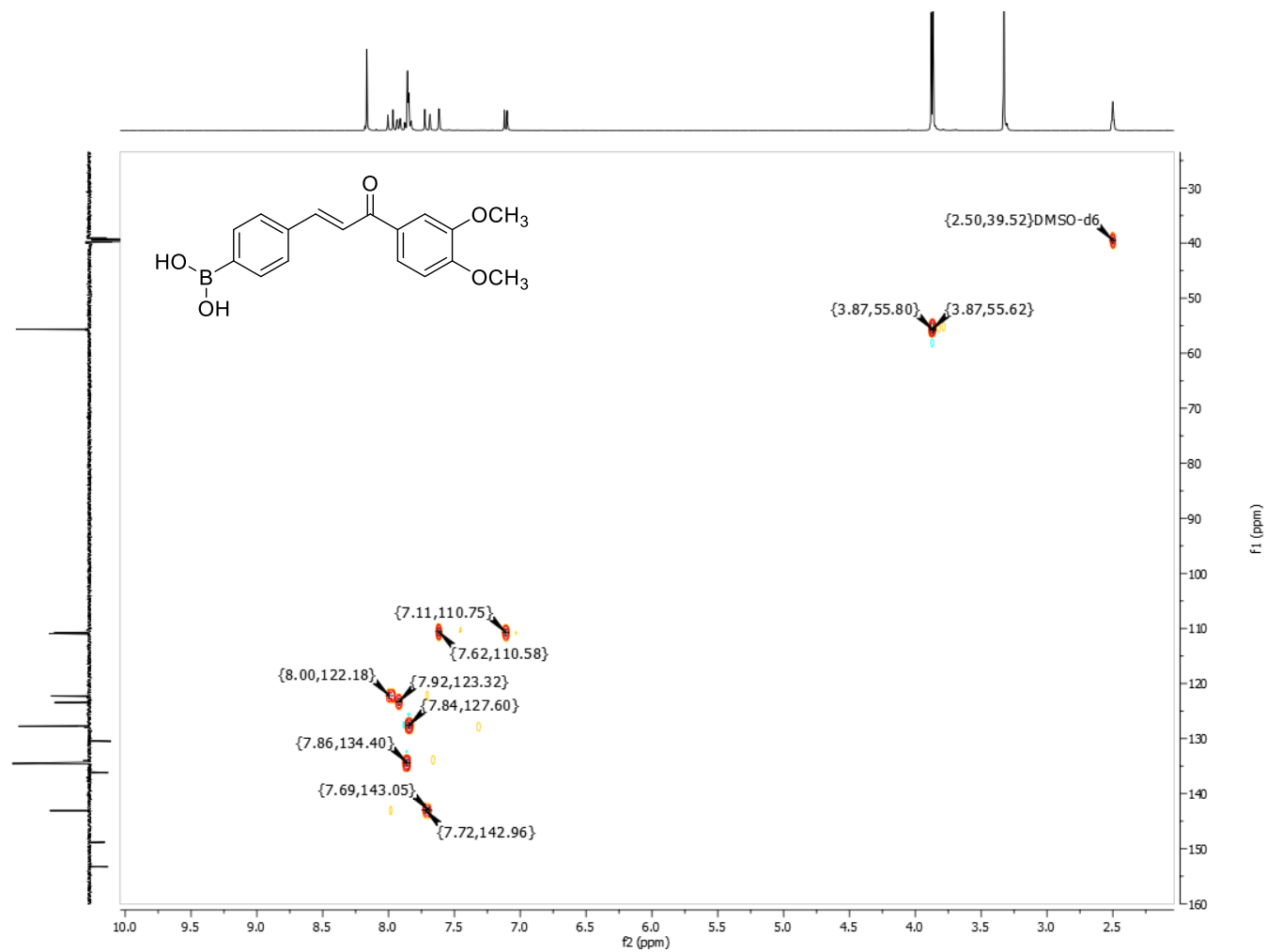
Espectro 99. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (*E*)-(4-(3-(3,4-dimetoxifenil)-3-oxoprop-1-en-1-il)fenil)borônico



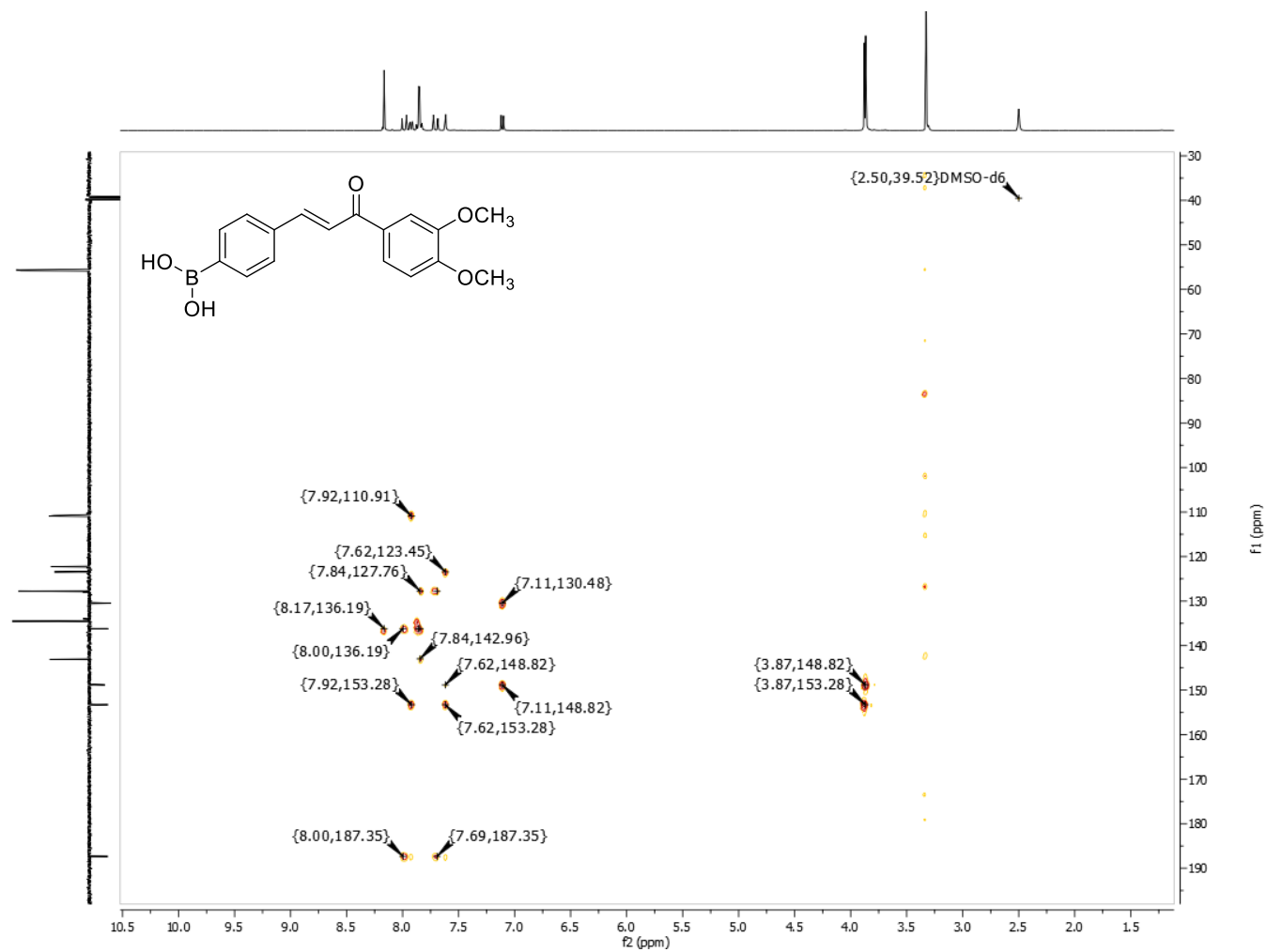
Espectro 100. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do composto ácido (*E*)-(4-(3-(3,4-dimetoxifenil)-3-oxoprop-1-en-1-il)fenil)borônico



Espectro 101. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (*E*)-(4-(3-(3,4-dimetoxifenil)-3-oxoprop-1-en-1-il)fenil)borônico



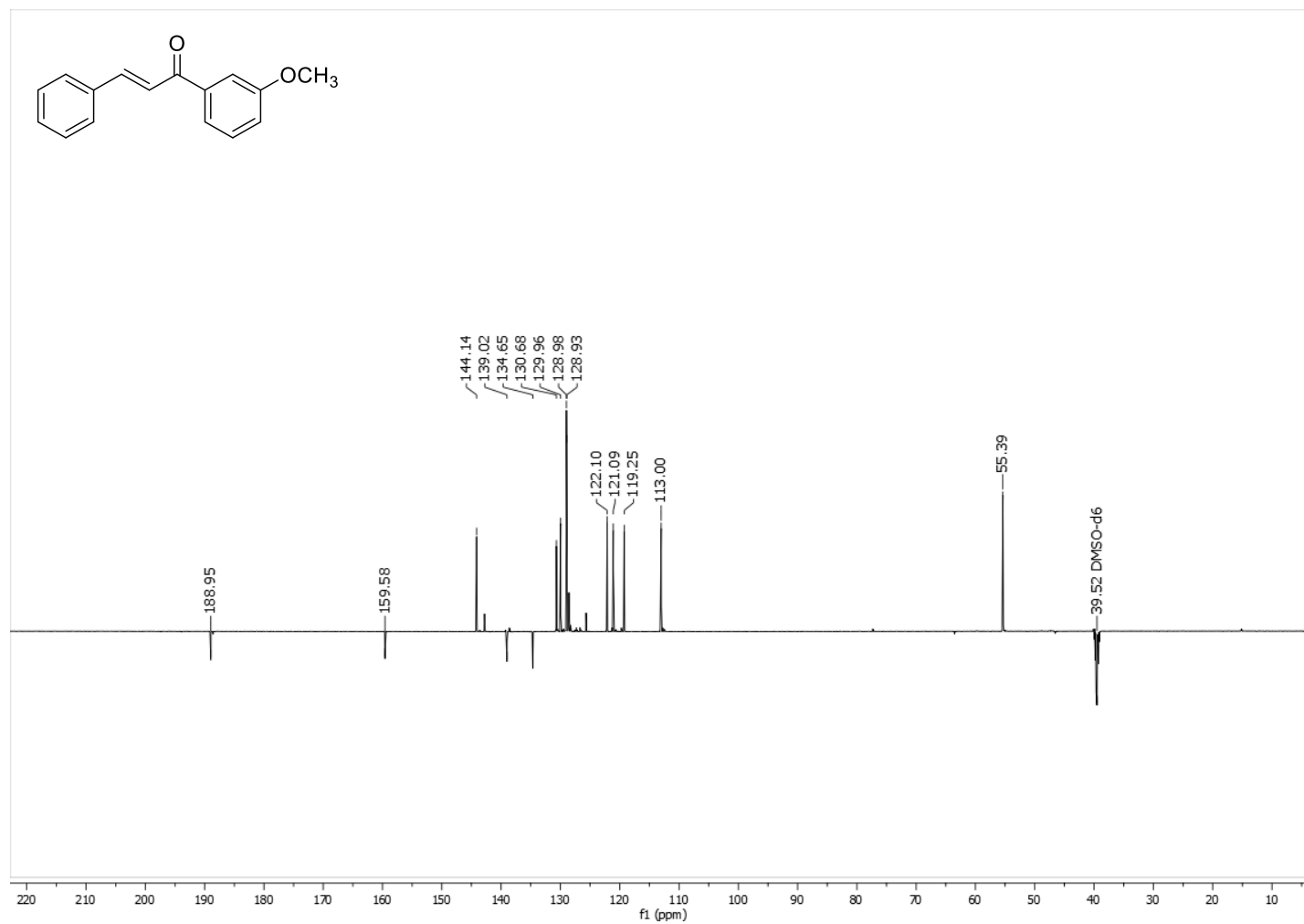
Espectro 102. Mapa de contorno de HMBC (DMSO-d₆, 600 MHz) do composto ácido (*E*)-(4-(3-(3,4-dimetoxifenil)-3-oxoprop-1-en-1-il)fenil)borônico.



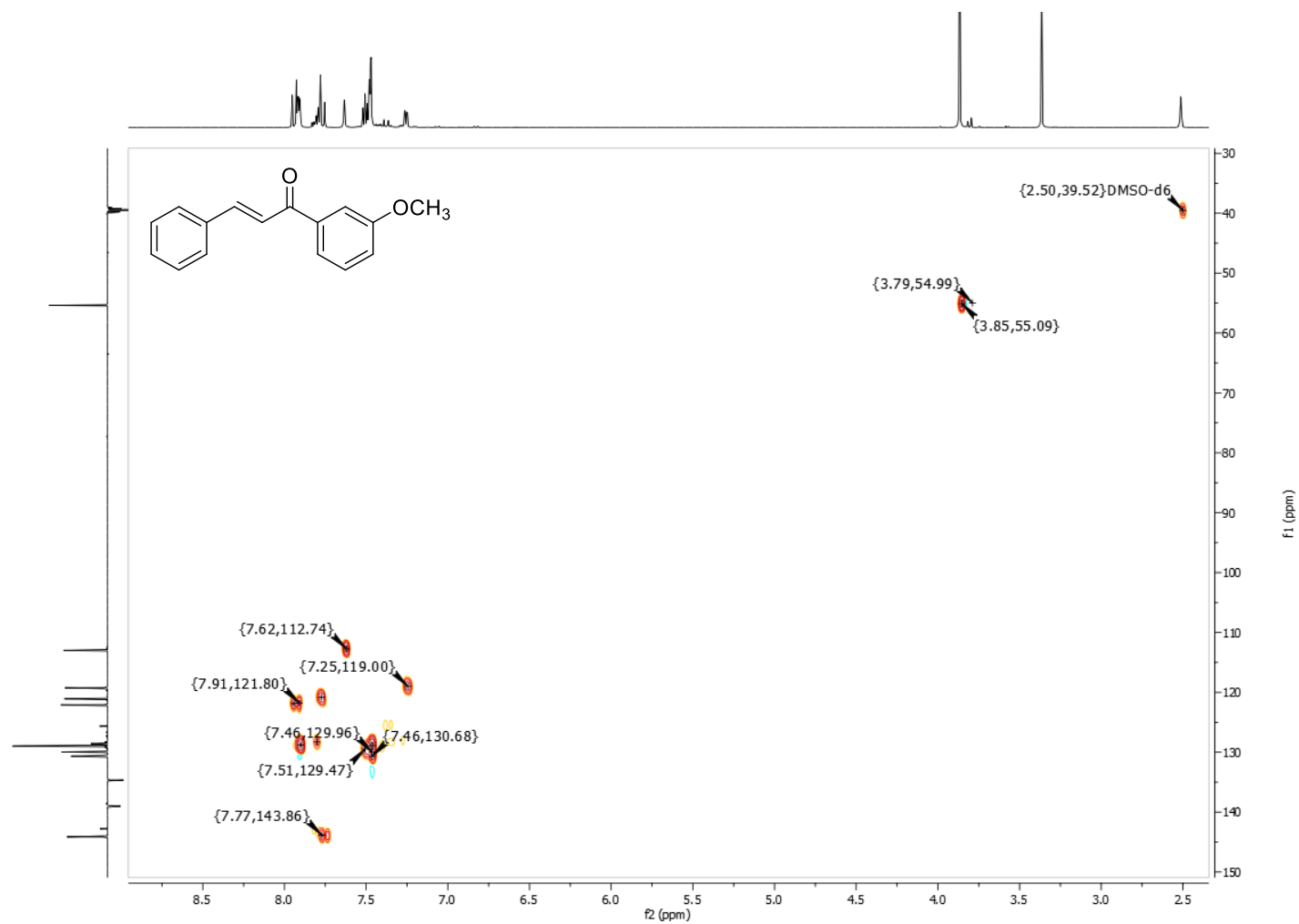
Espectro 103. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto (*E*)-1-(3-metoxifenil)-3-fenilprop-2-en-1-ona



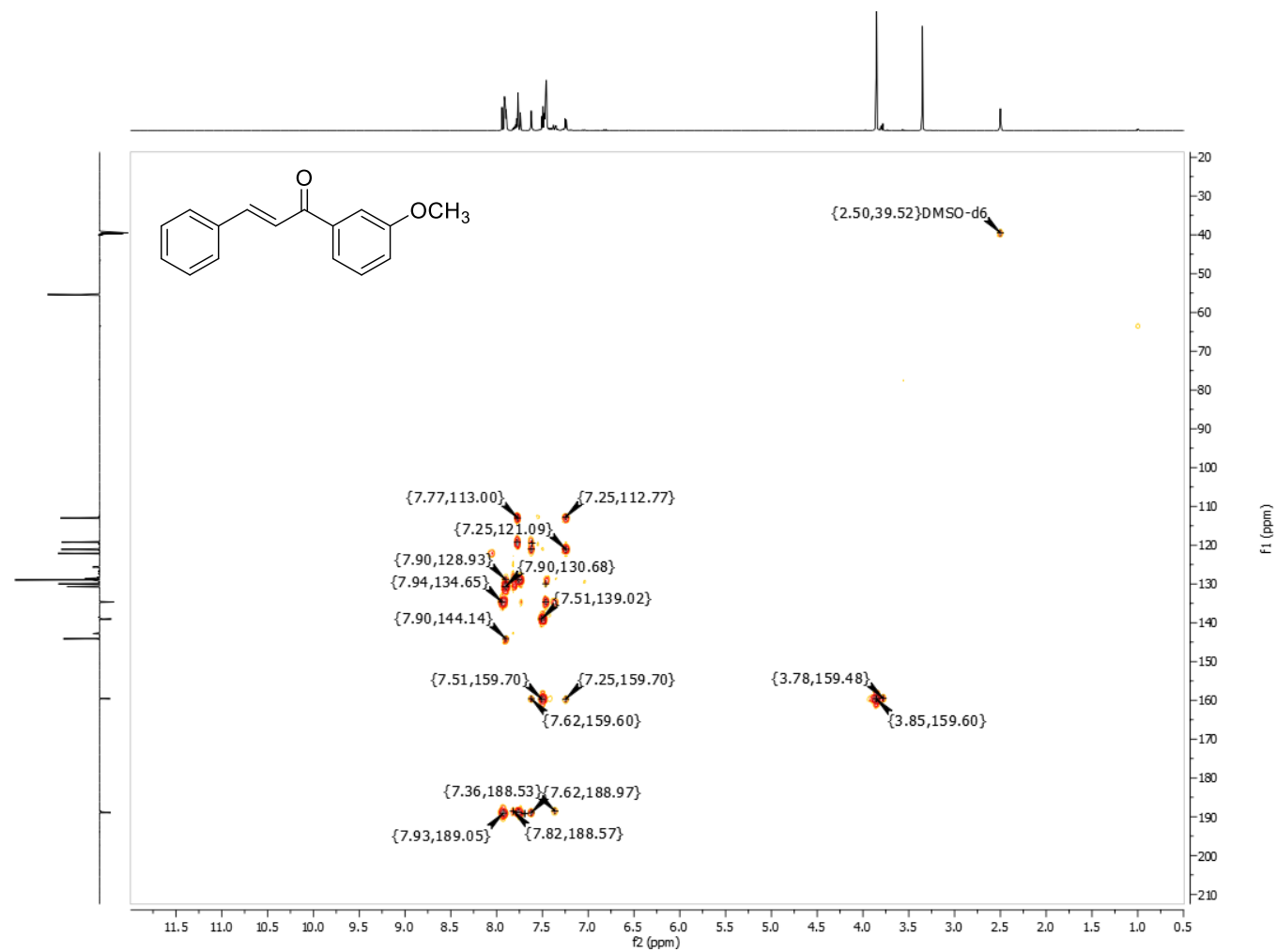
Espectro 104. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do composto (*E*)-1-(3-metoxifenil)-3-fenilprop-2-en-1-ona



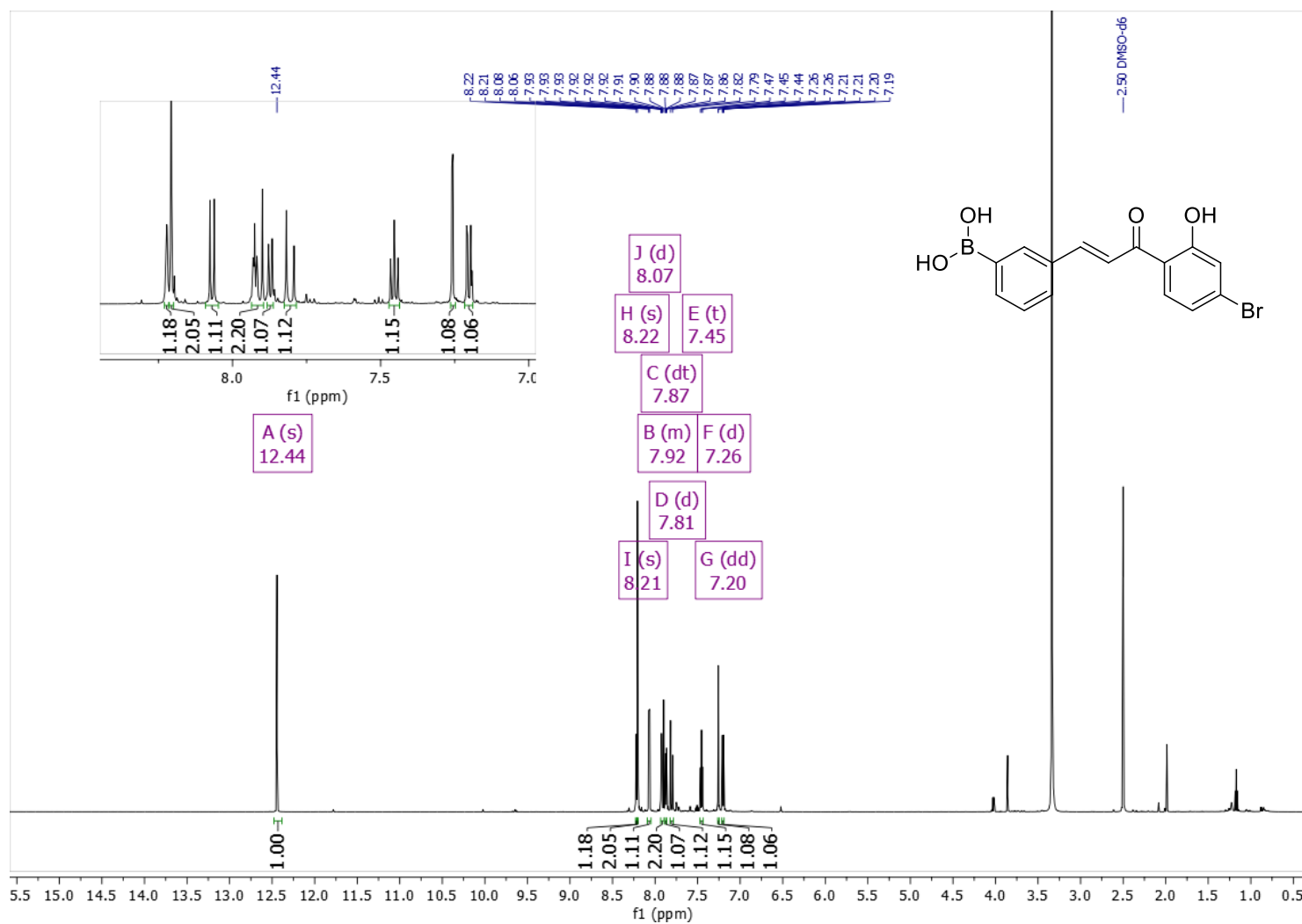
Espectro 105. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto (*E*)-1-(3-metoxifenil)-3-fenilprop-2-en-1-ona



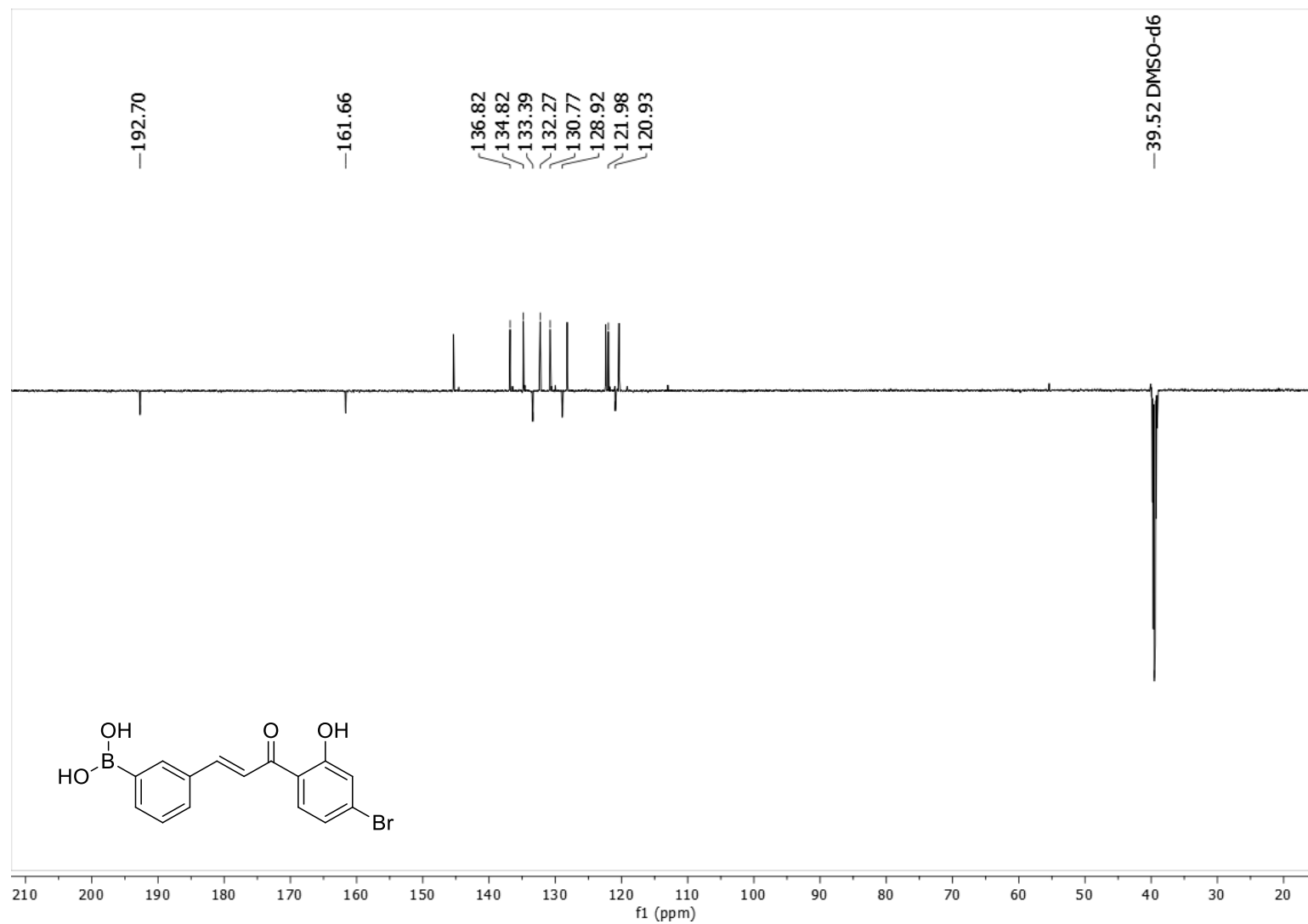
Espectro 106. Mapa de contorno de HMBC (DMSO-d₆, 600 MHz) do composto (*E*)-1-(3-metoxifenil)-3-fenilprop-2-en-1-ona



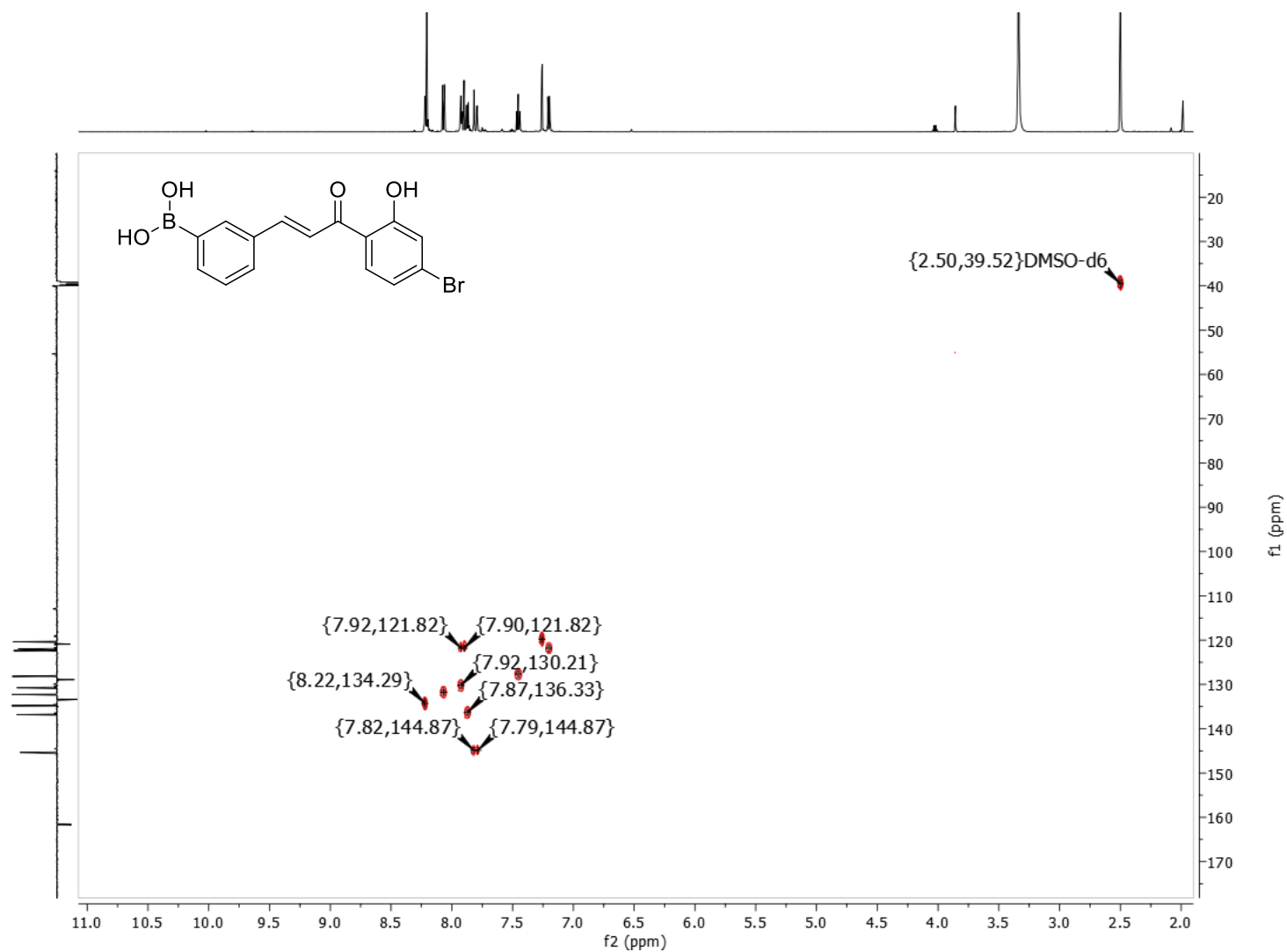
Espectro 107. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (E)-(3-(3-(4-bromo-2-hidroxifenil)-3-oxoprop-1-en-1-il)fenil)borônico



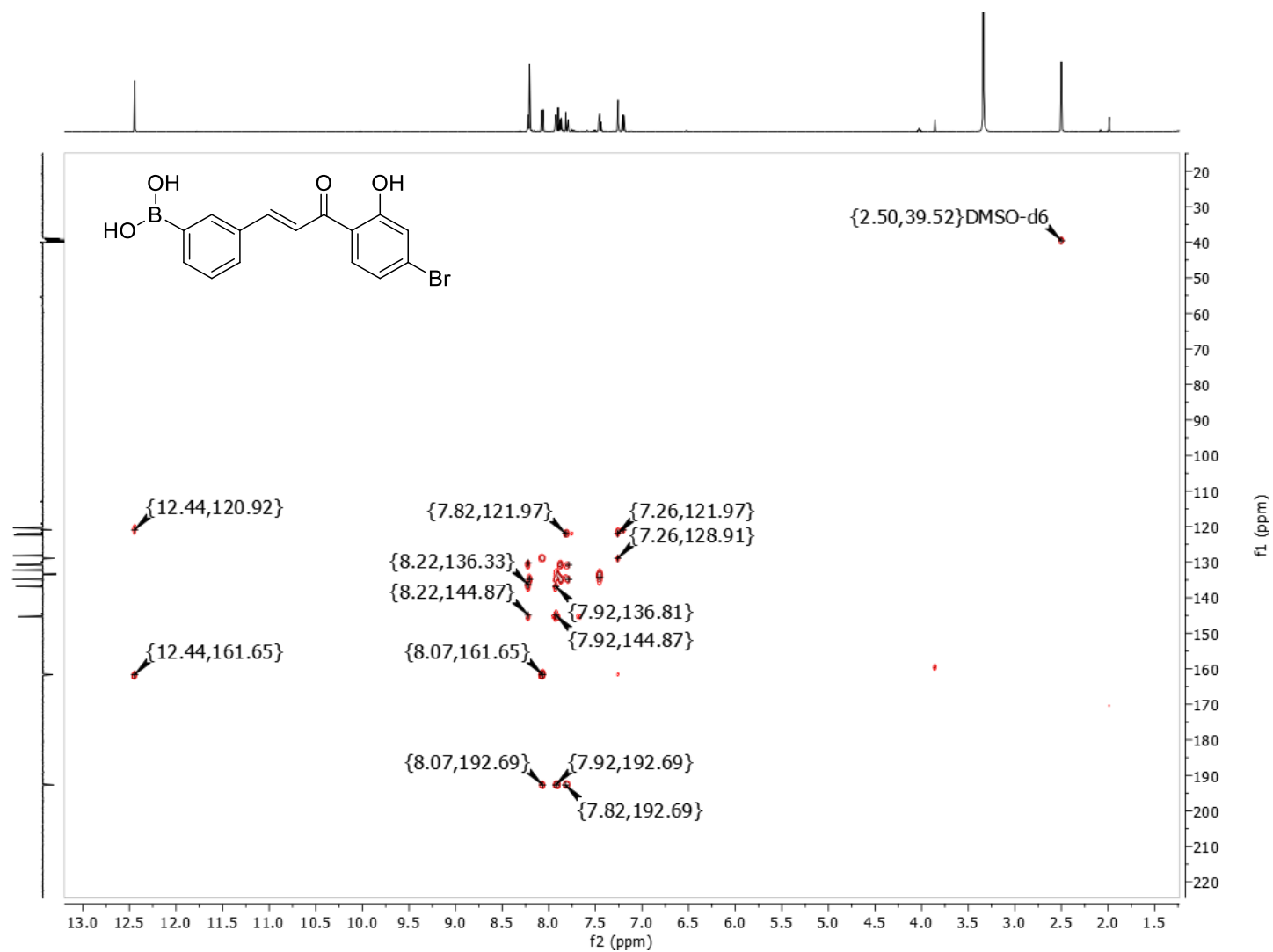
Espectro 108. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do composto ácido (E)-(3-(3-(4-bromo-2-hidroxifenil)-3-oxoprop-1-en-1-il)fenil)borônico



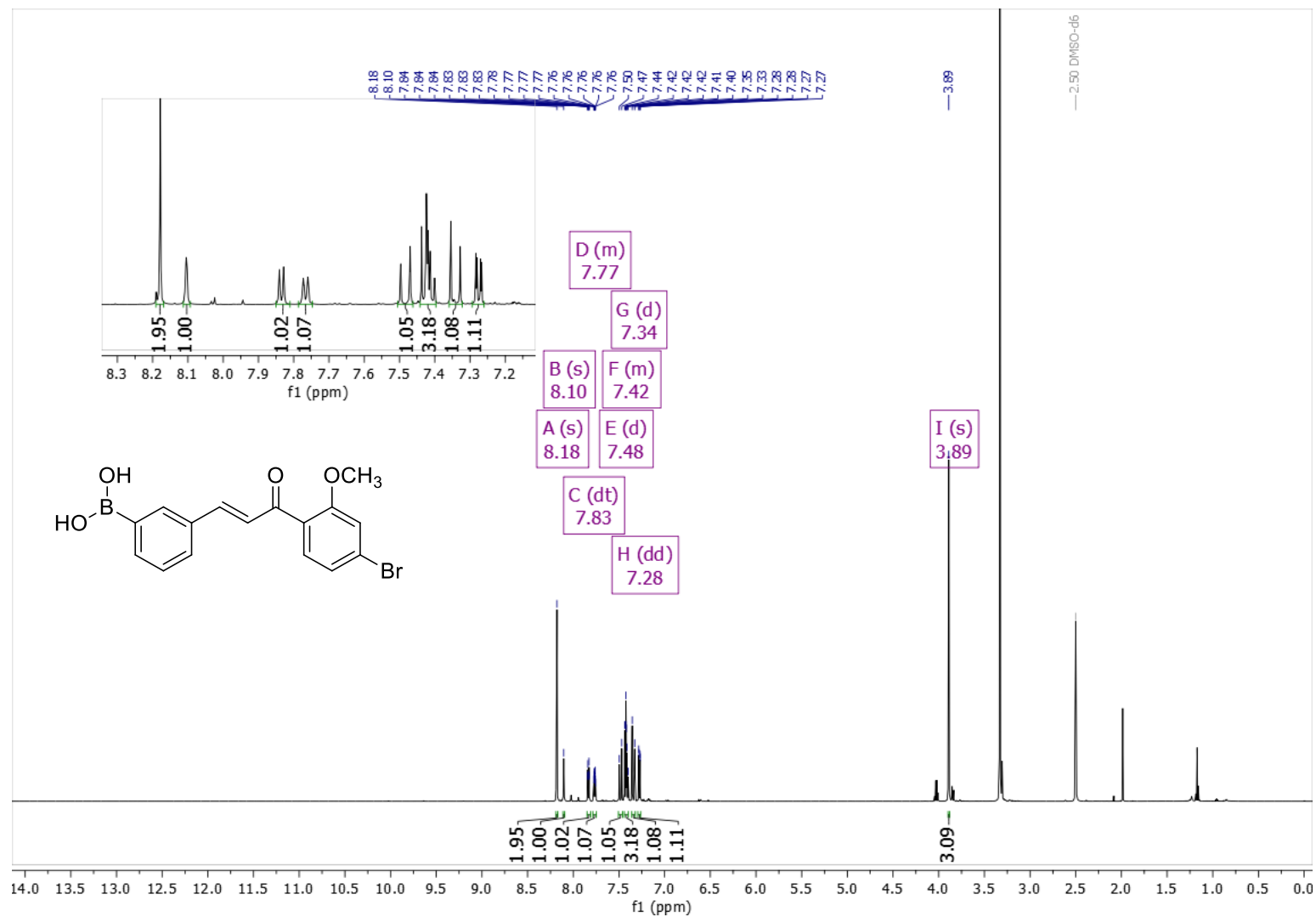
Espectro 109. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (E)-(3-(3-(4-bromo-2-hidroxifenil)-3-oxoprop-1-en-1-il)fenil)borônico



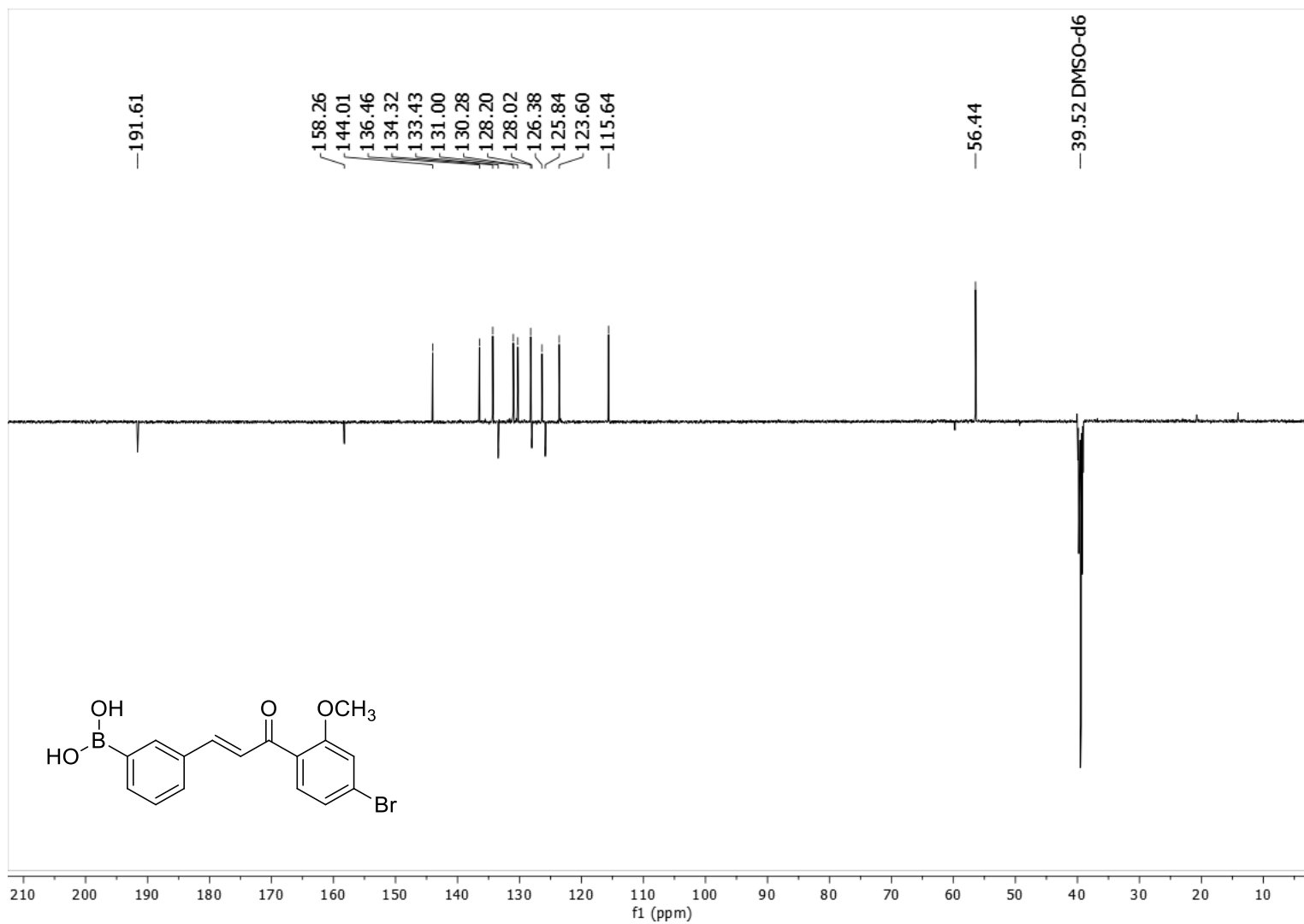
Espectro 110. Mapa de contorno de HMBC (DMSO-d₆, 600 MHz) do composto ácido (E)-(3-(3-(4-bromo-2-hidroxifenil)-3-oxoprop-1-en-1-il)fenil)borônico



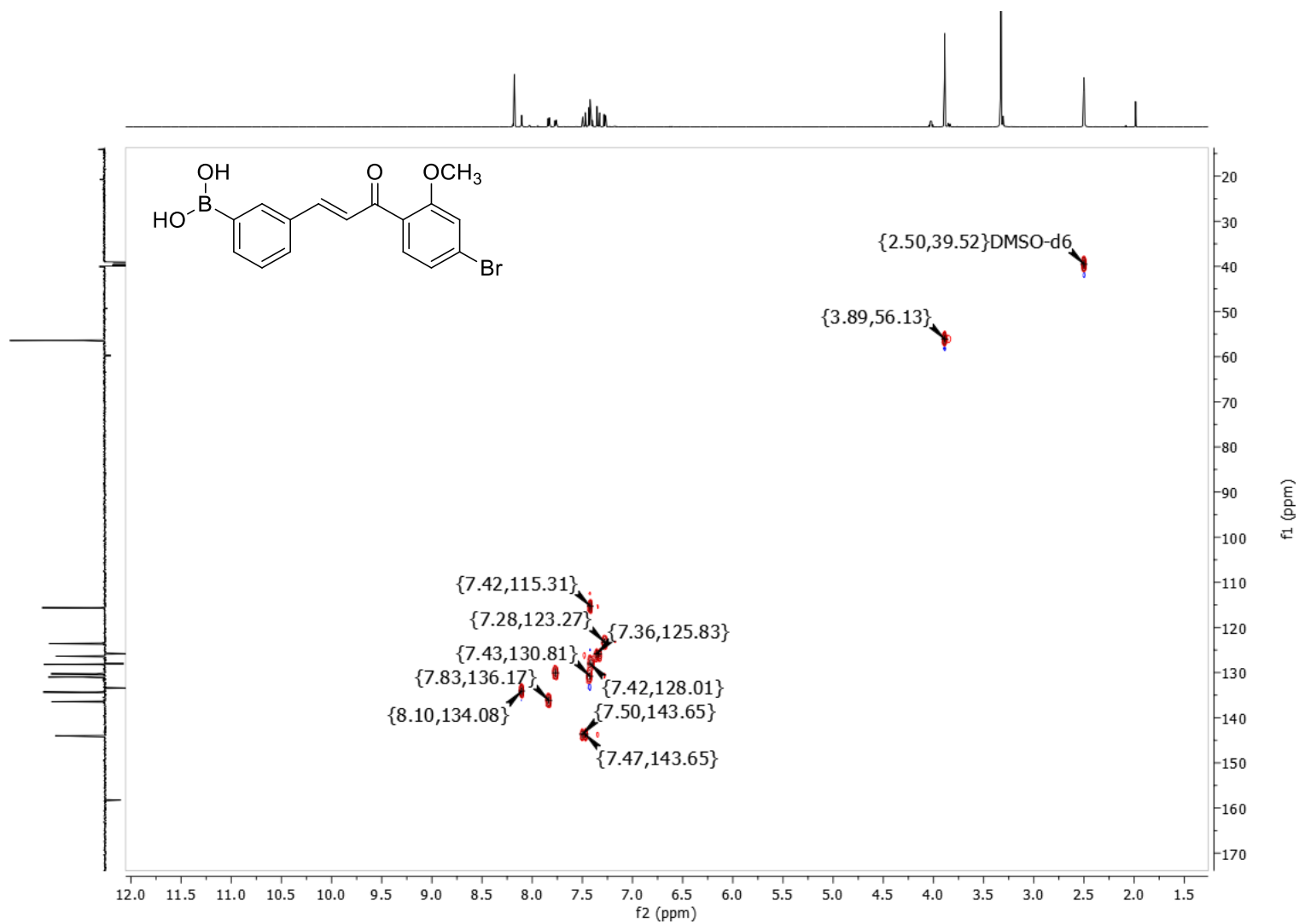
Espectro 111. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (E)-(3-(3-(4-bromo-2-metoxifenil)-3-oxoprop-1-en-1-il)fenil)borônico



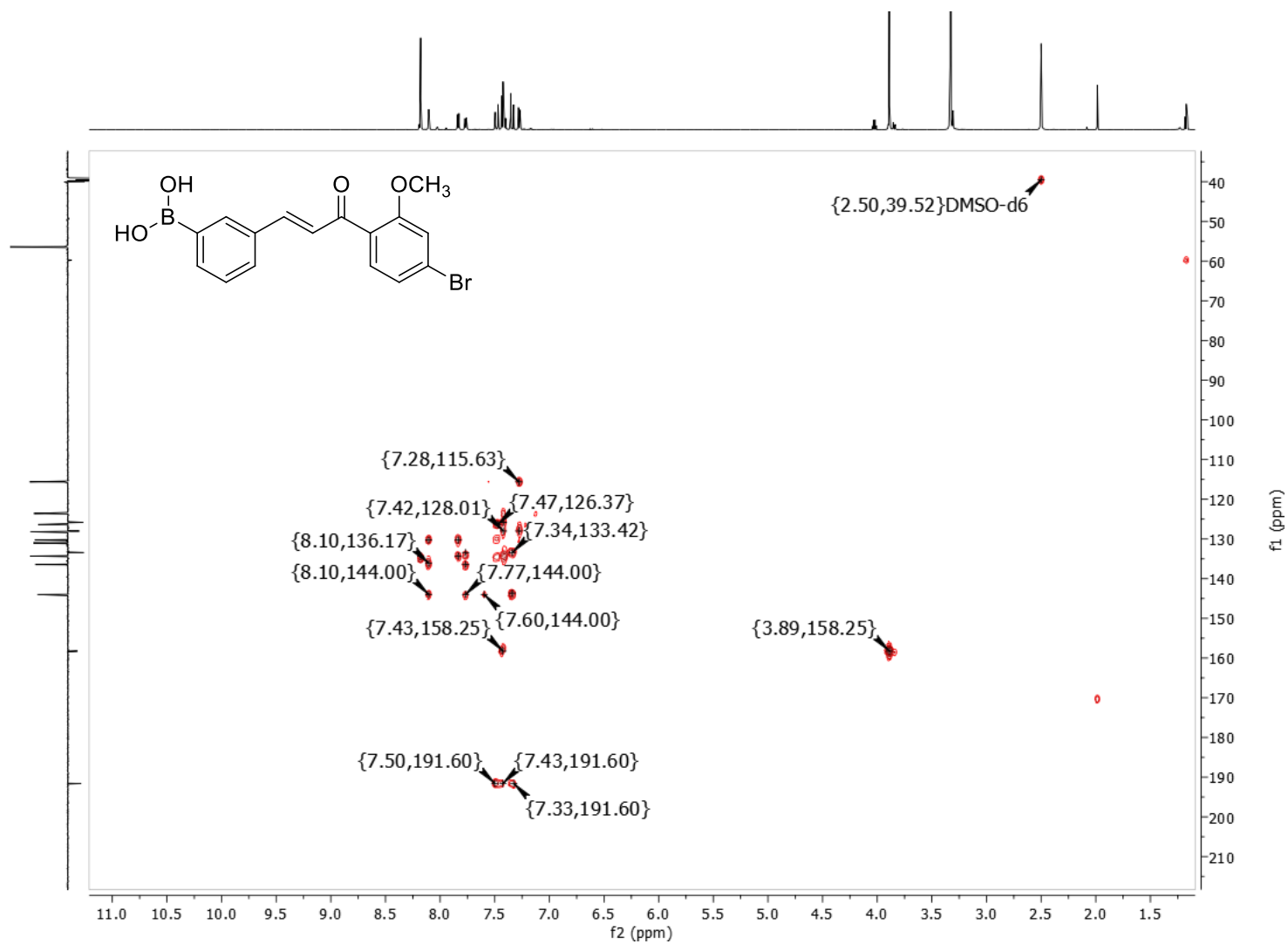
Espectro 112. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do composto ácido (E)-(3-(3-(4-bromo-2-metoxifenil)-3-oxoprop-1-en-1-il)fenil)borônico



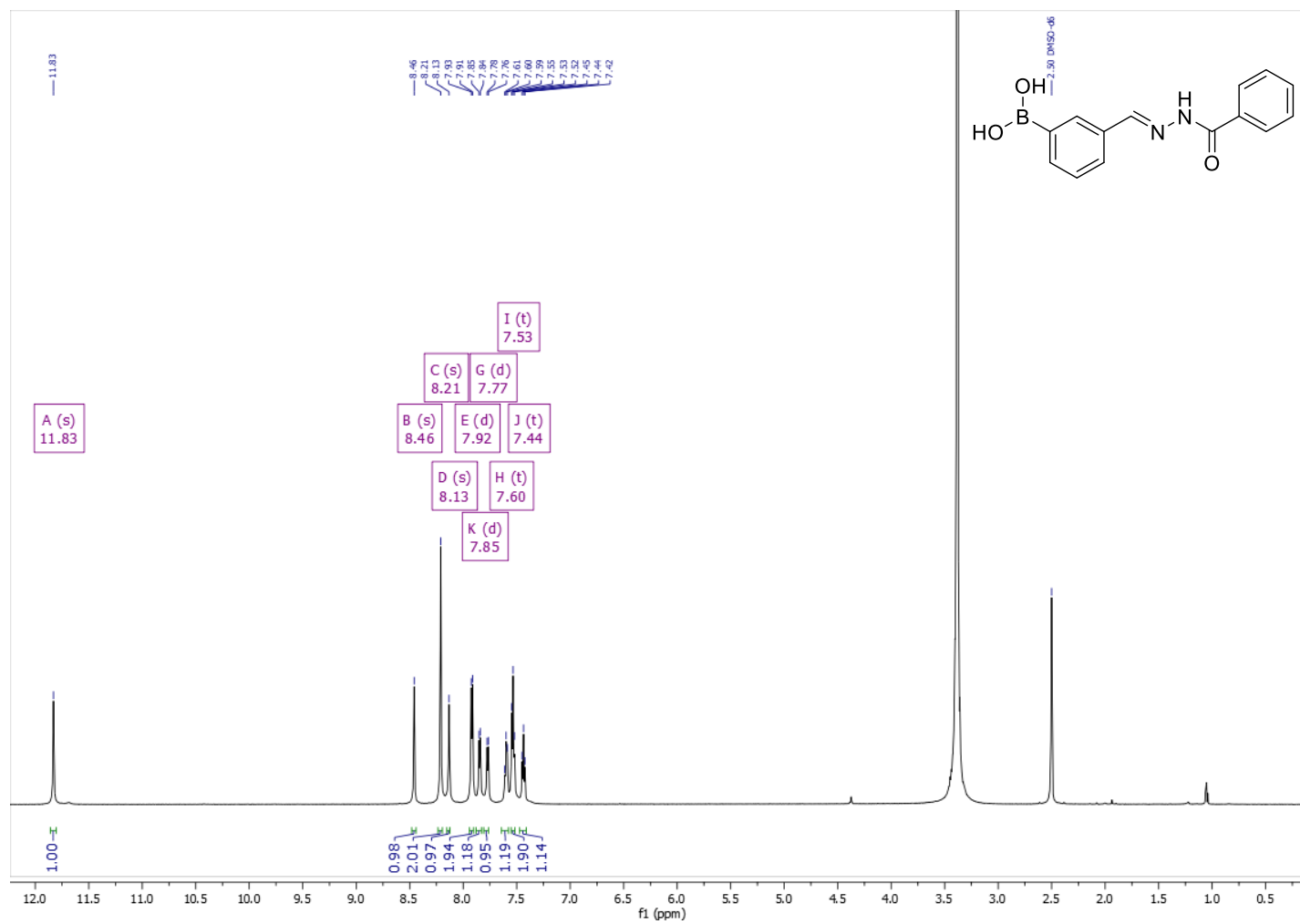
Espectro 113. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido E)-(3-(3-(4-bromo-2-metoxifenil)-3-oxoprop-1-en-1-il)fenil)borônico



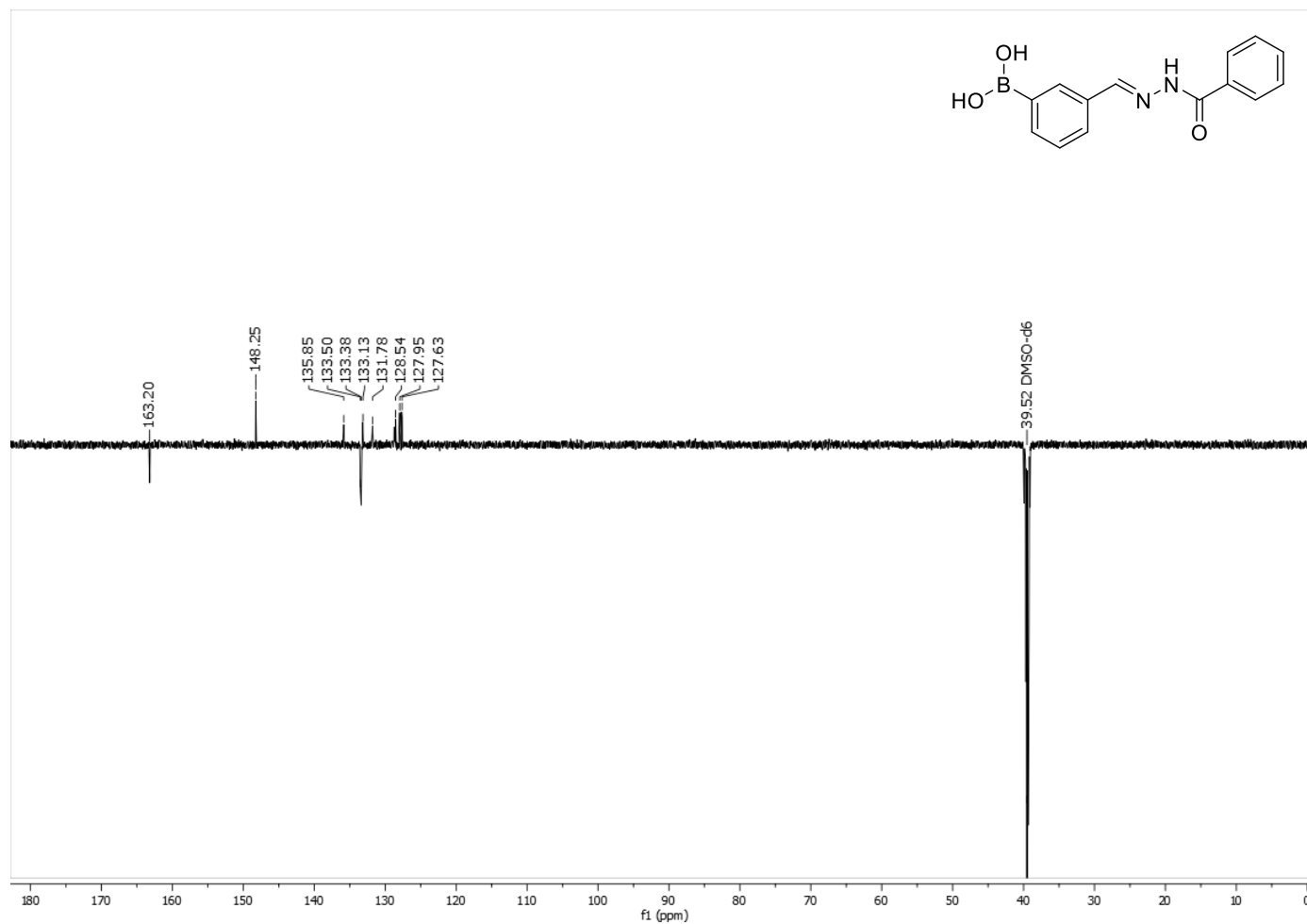
Espectro 114. Mapa de contorno de HMBC (DMSO-d₆, 600 MHz) do composto ácido E-(3-(3-(4-bromo-2-metoxifenil)-3-oxoprop-1-en-1-il)fenil)borônico



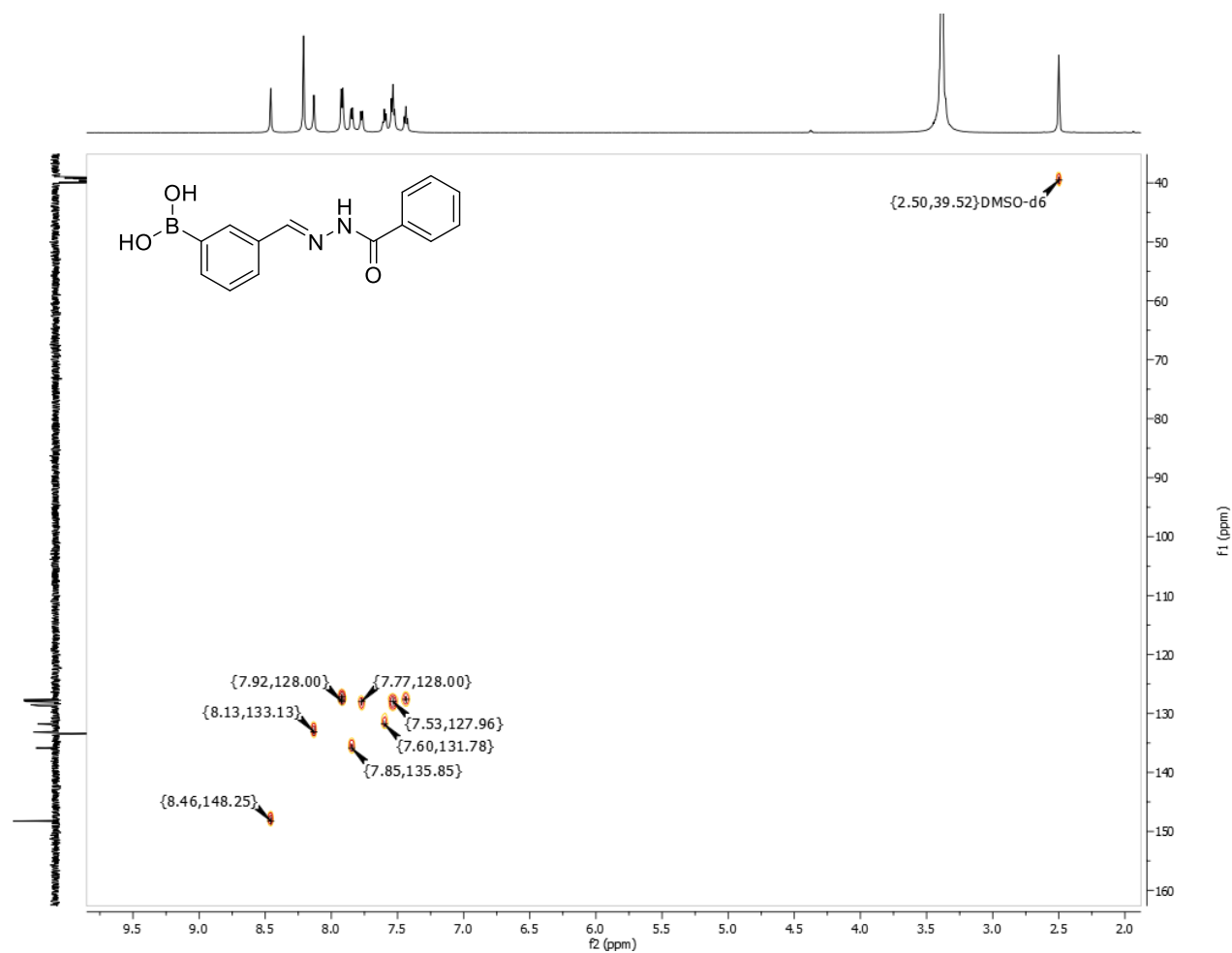
Espectro 115. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (*E*)-(3-((2-benzoilhidrazono)metil)fenil)borônico



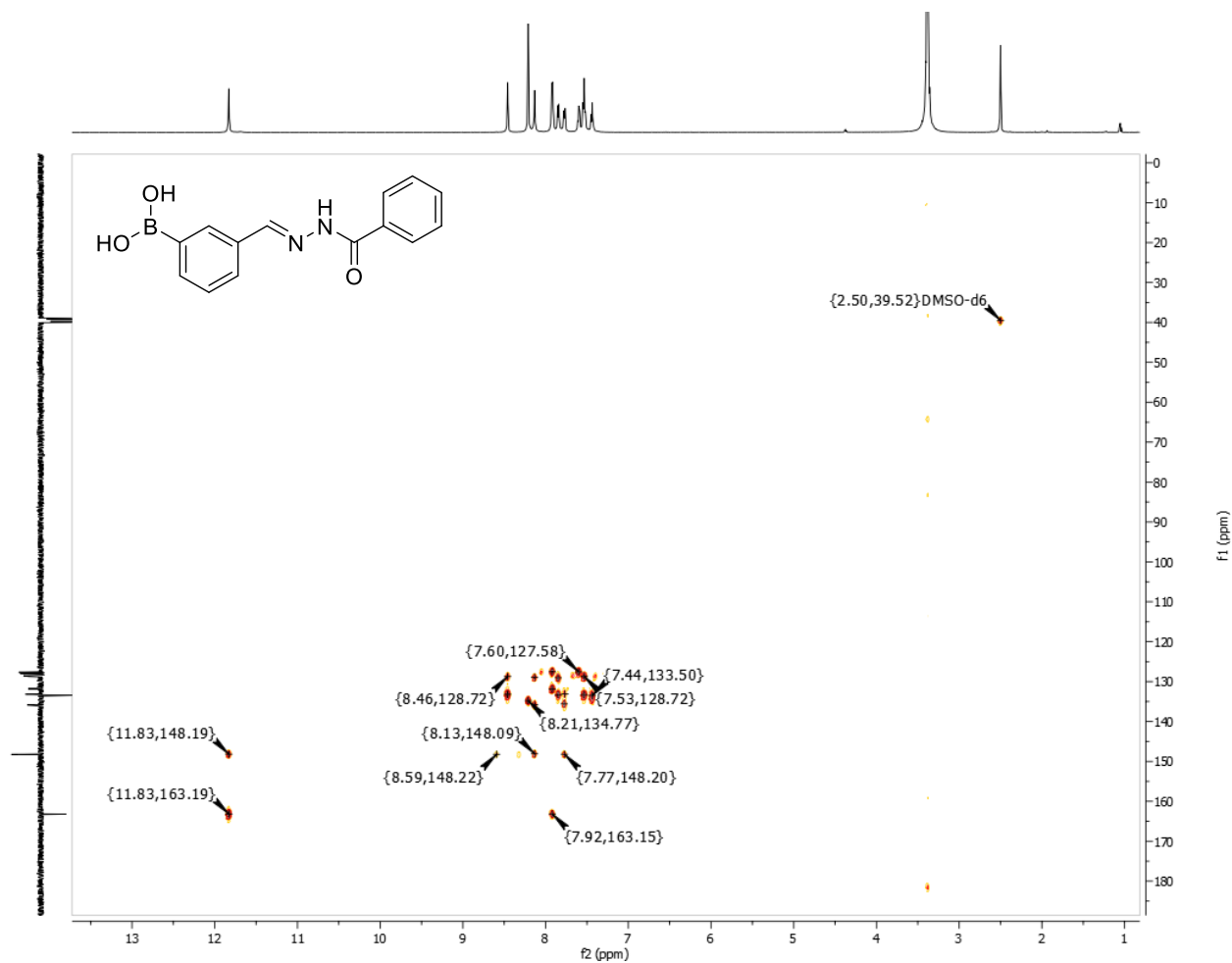
Espectro 116. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do composto ácido (E)-3-((2-benzoilhidrazono)metil)fenil)borônico



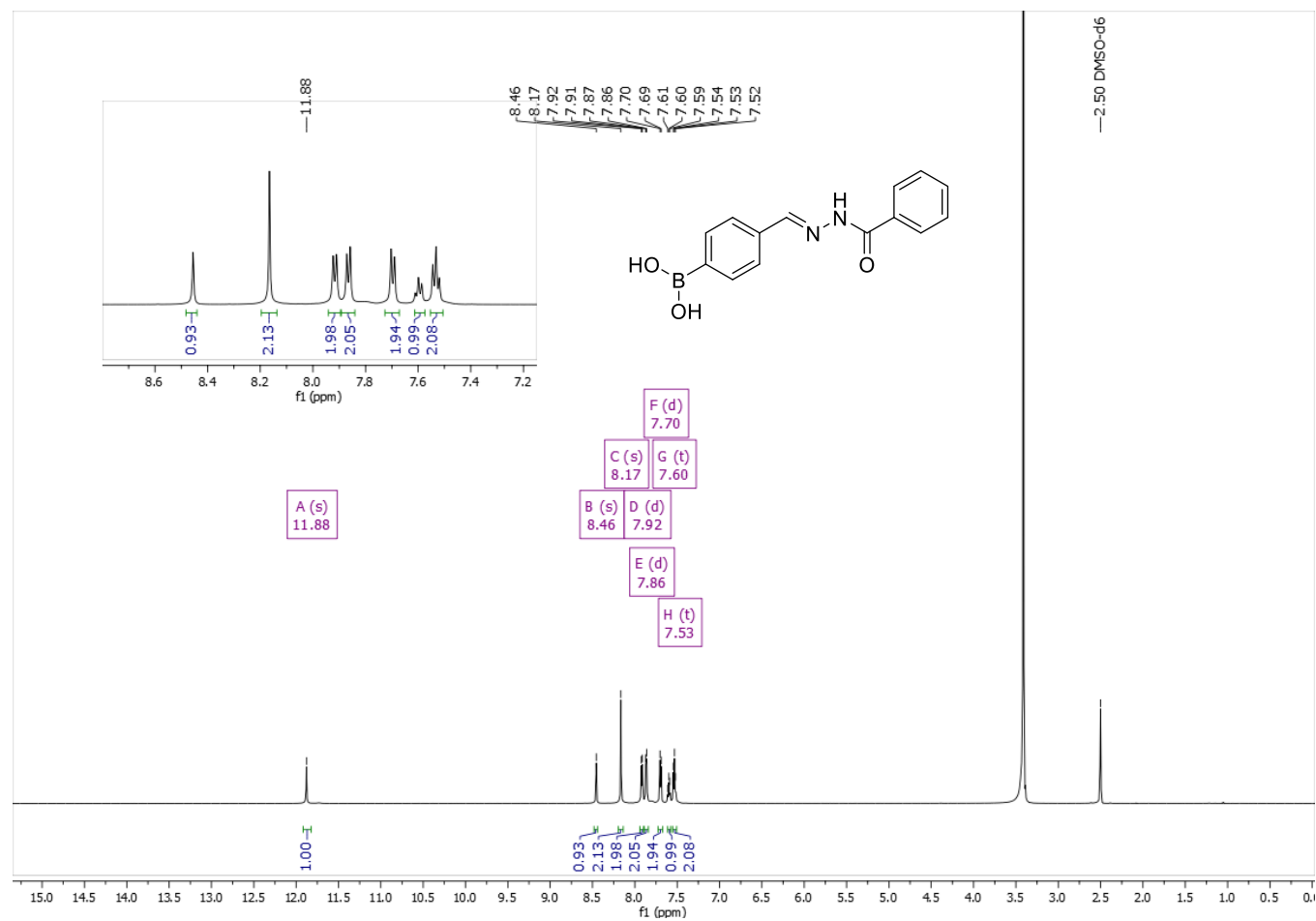
Espectro 117. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (E)-3-((2-benzoilhidrazono)metil)fenil)borônico



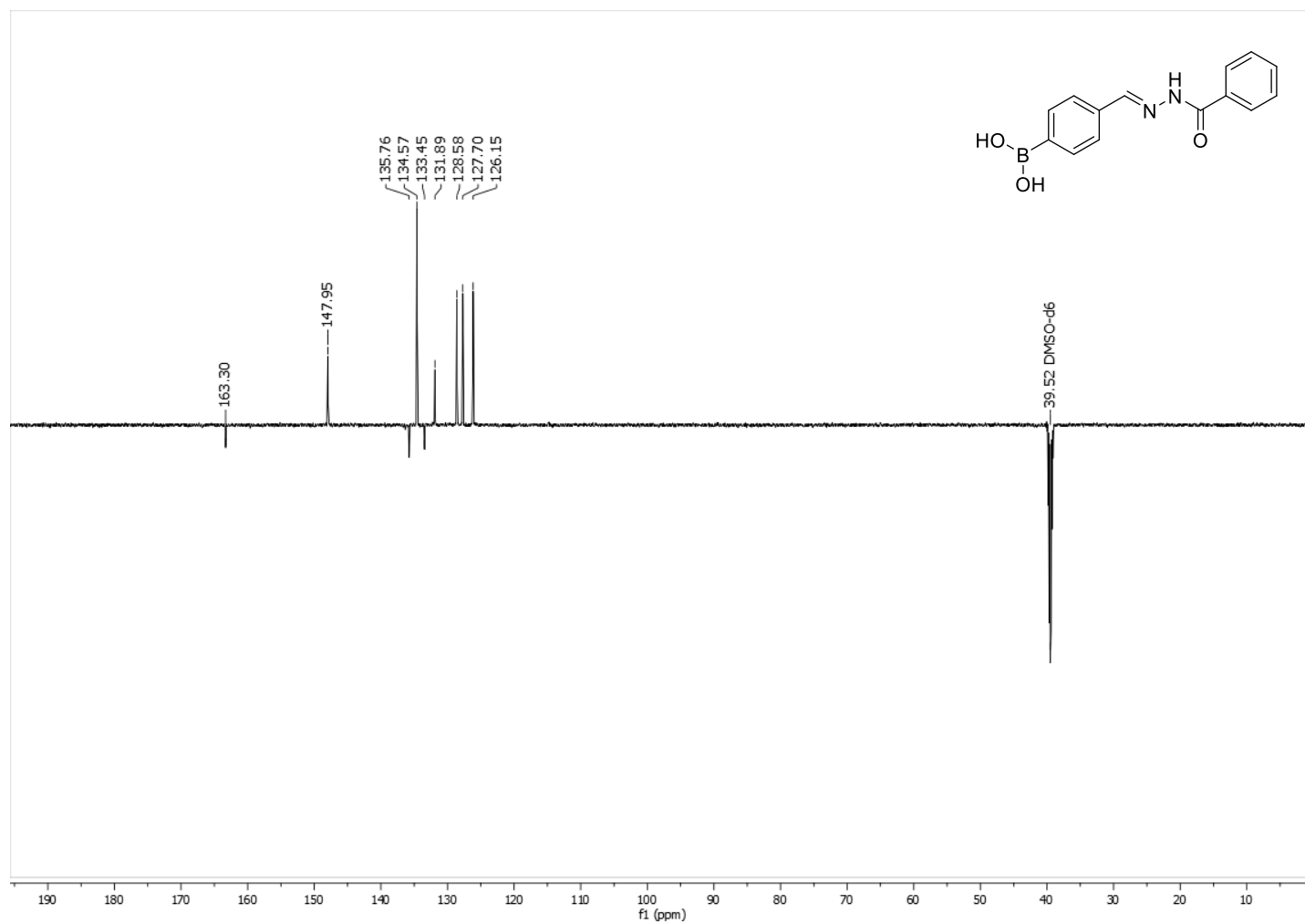
Espectro 118. Mapa de contorno de HMBC (DMSO-d₆, 600 MHz) do composto ácido (E)-3-((2-benzoilhidrazono)metil)fenil)borônico



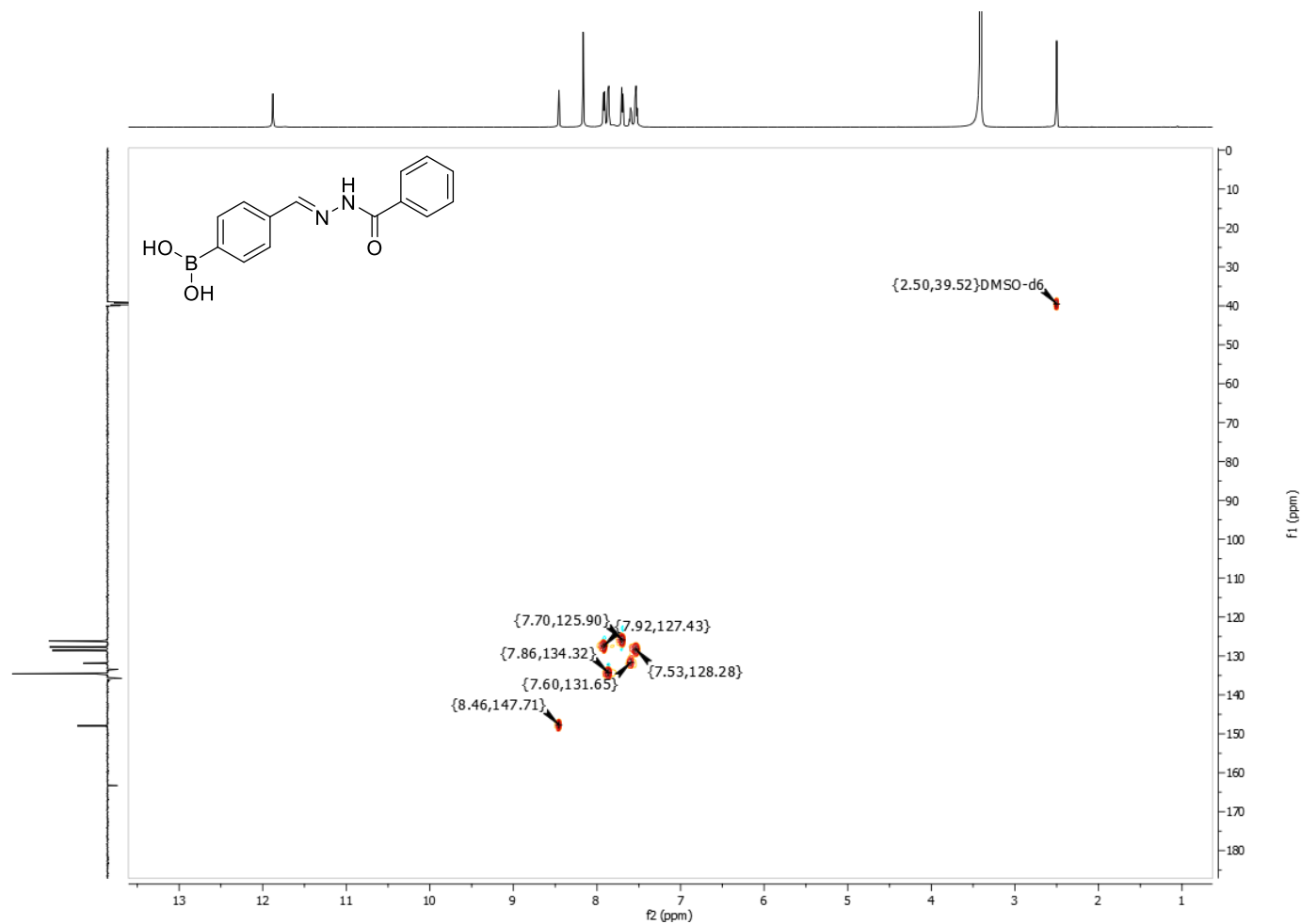
Espectro 119. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (*E*)-4-((2-benzoilhidrazono)metil)fenil)borônico



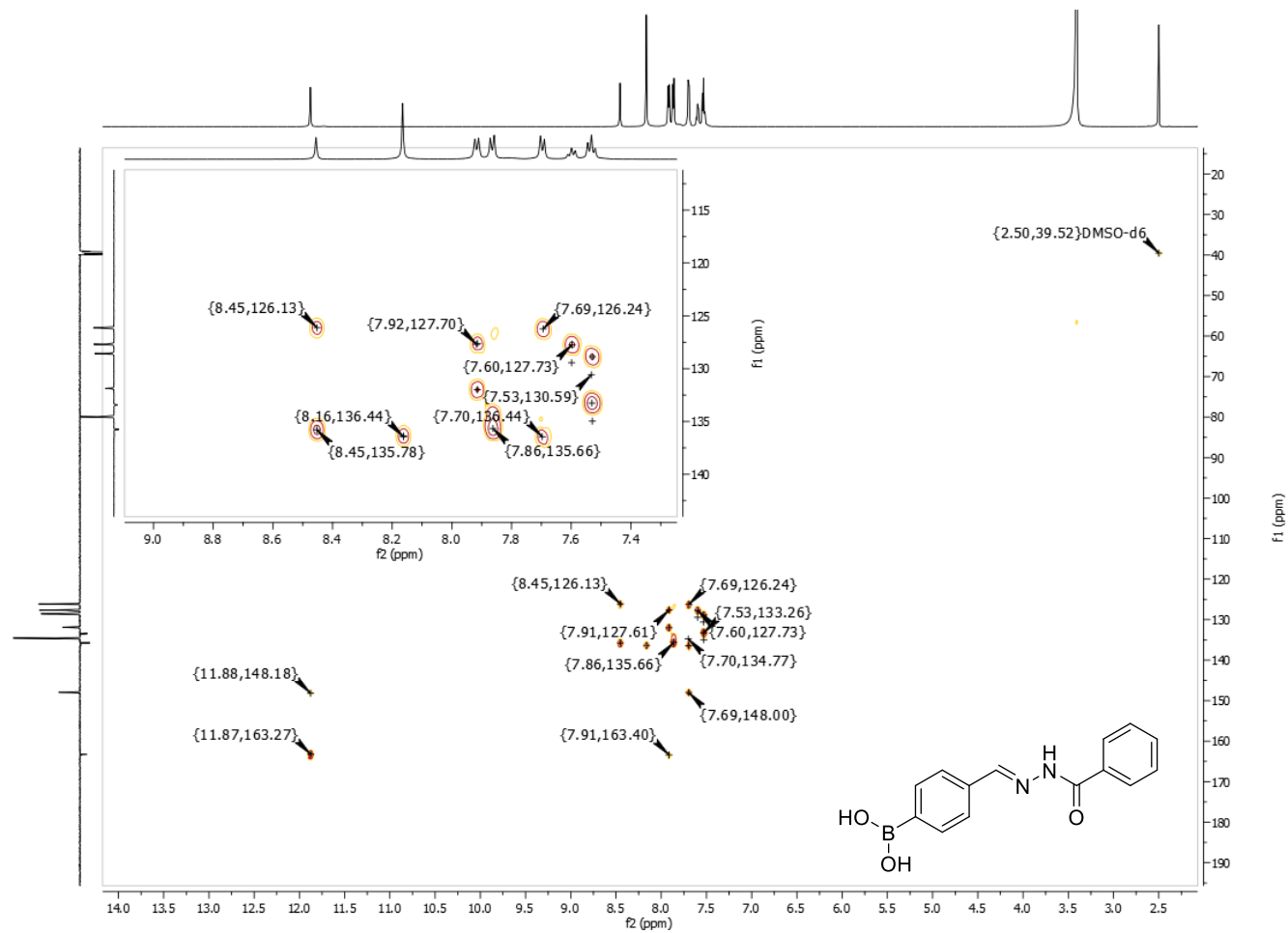
Espectro 120. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do composto ácido (*E*)-(4-((2-benzoilhidrazono)metil)fenil)borônico



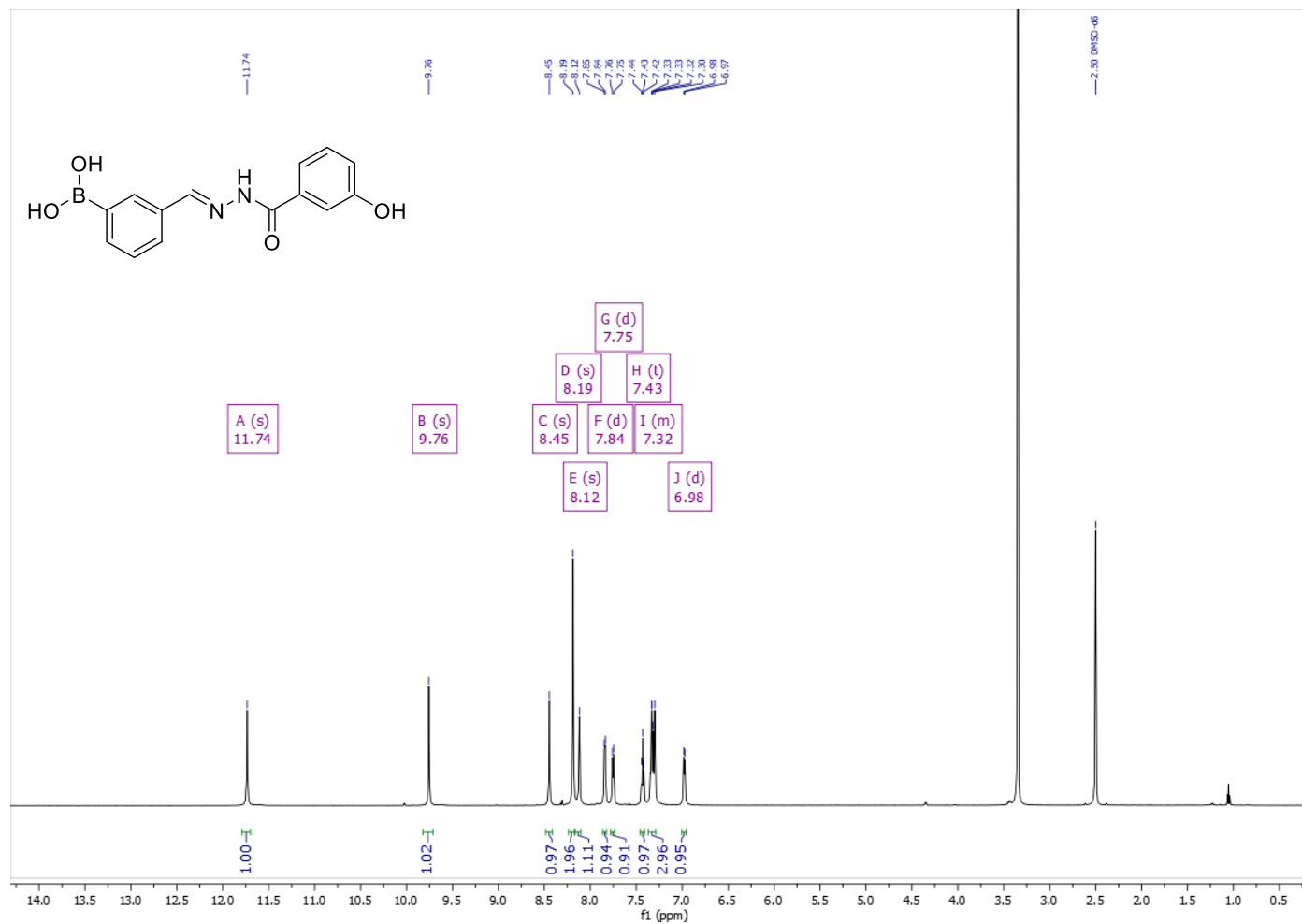
Espectro 121. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (E)-4-((2-benzoilhidrazono)metil)fenil)borônico



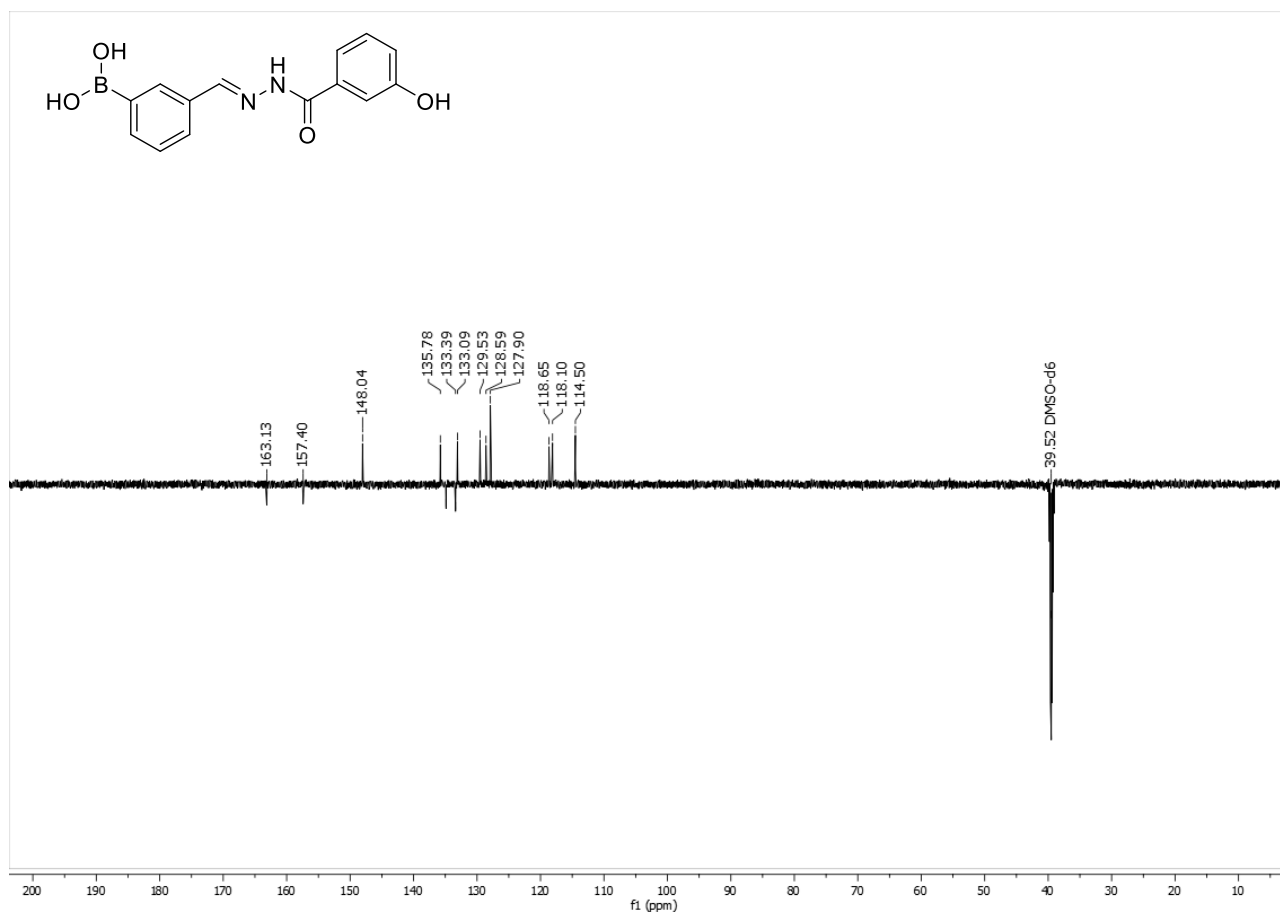
Espectro 122. Mapa de contorno de HMBC (DMSO-d₆, 600 MHz) do composto ácido (*E*)-(4-((2-benzoilhidrazono)metil)fenil)borônico



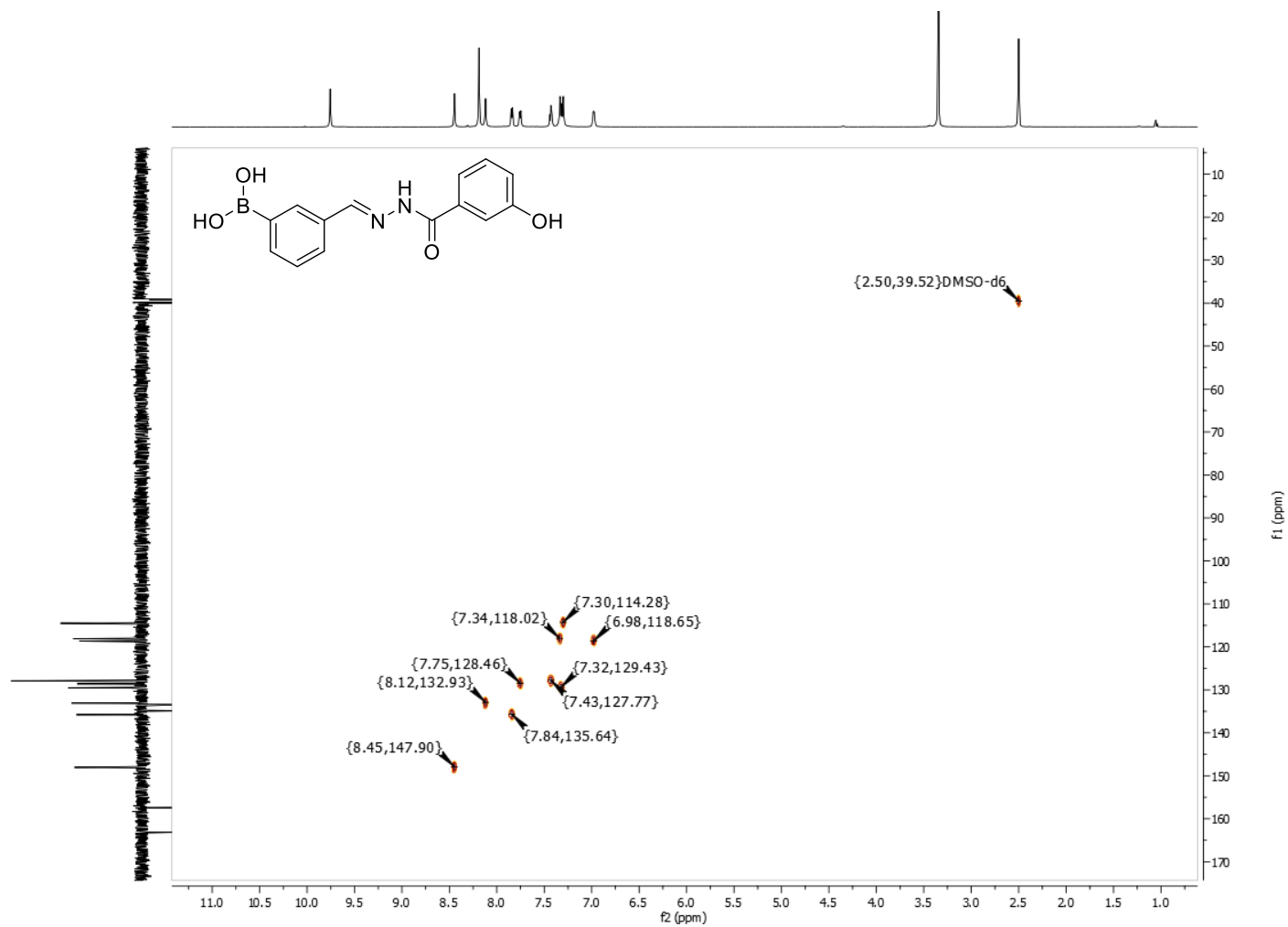
Espectro 123. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (E)-3-((2-(3-hidroxibenzoil)hidrazono)metil)fenil)borônico



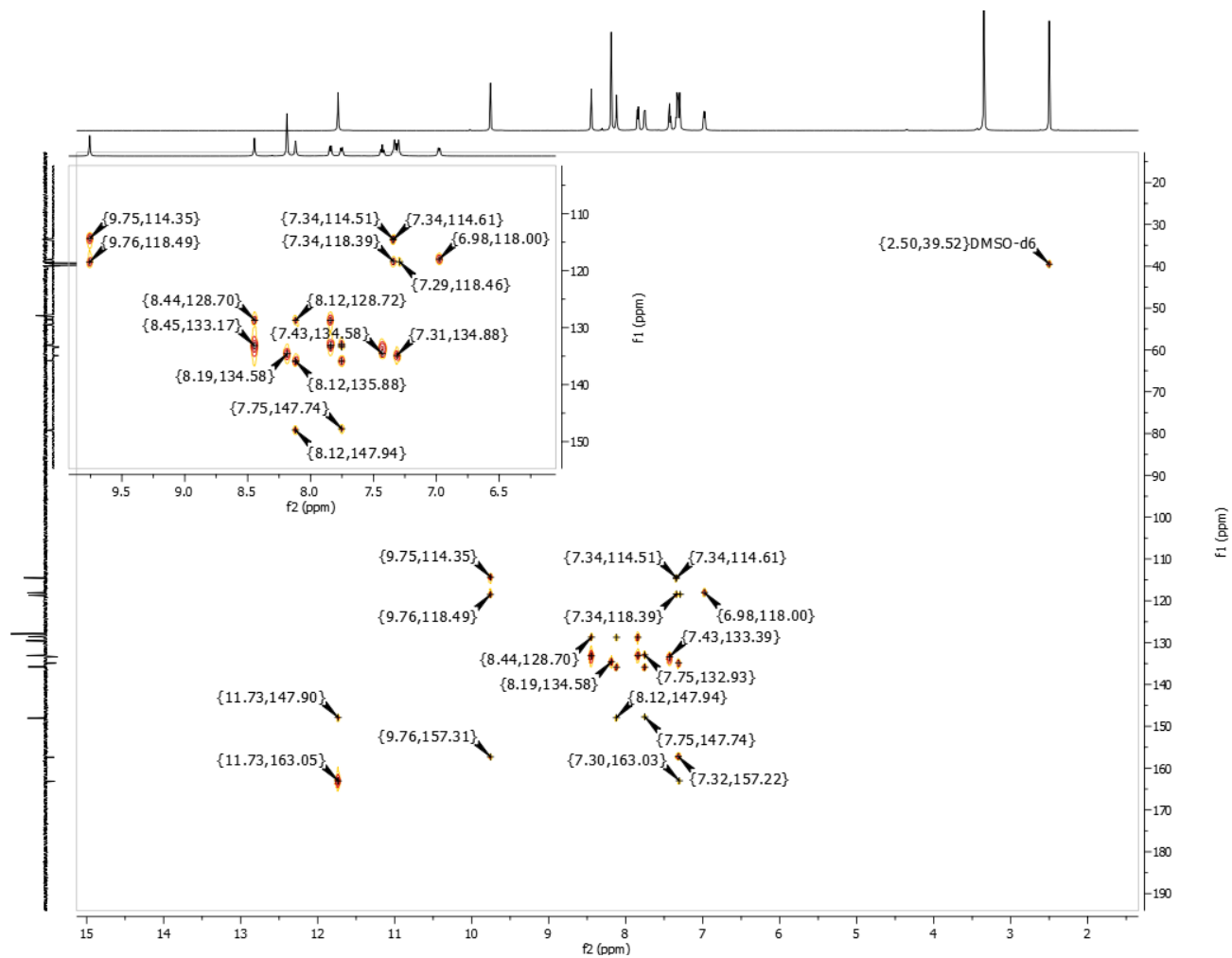
Espectro 124. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do composto ácido (*E*)-3-((2-(3-hidroxibenzoil)hidrazono)metil)fenil)borônico



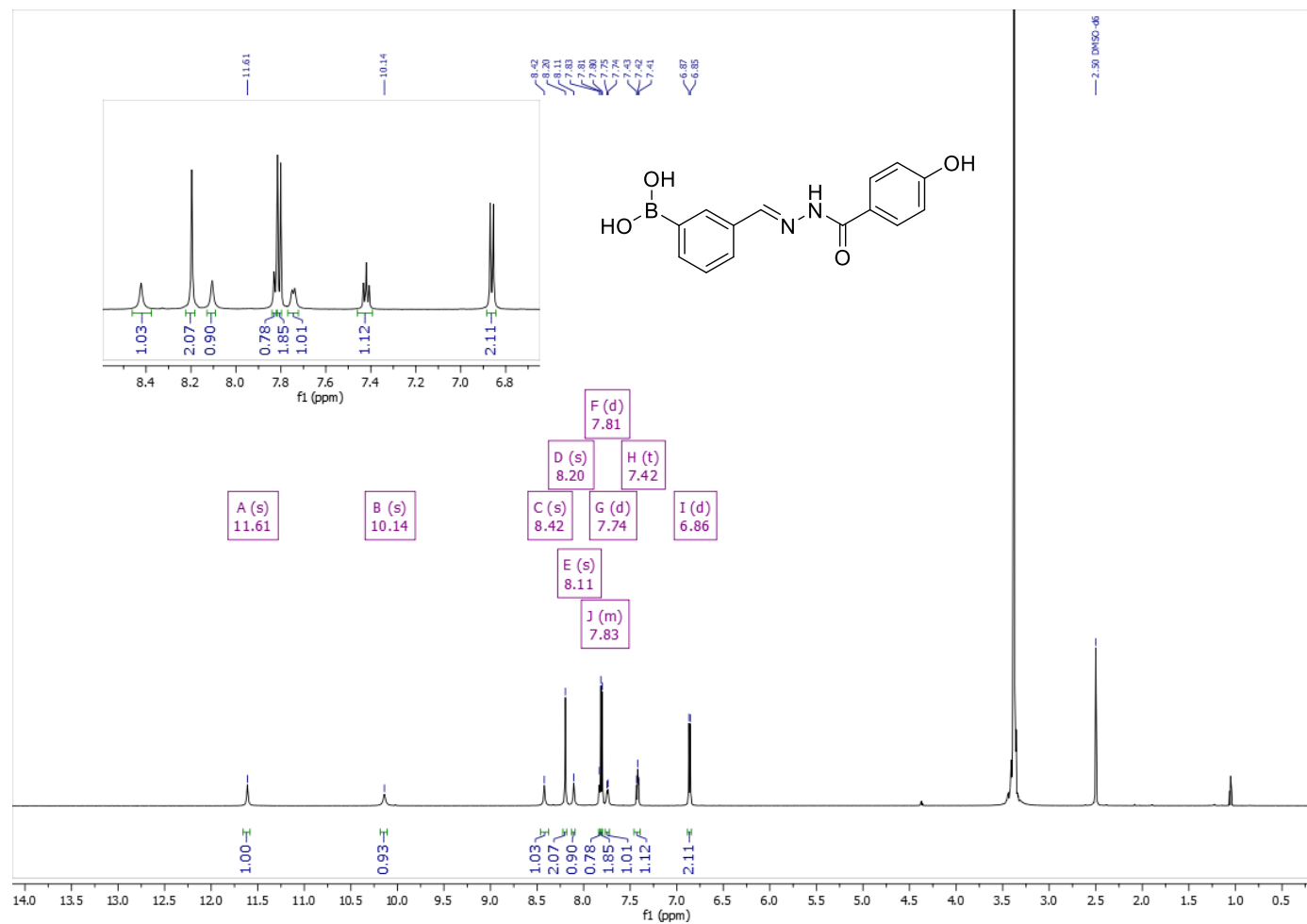
Espectro 125. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (E)-3-((2-(3-hidroxibenzoil)hidrazono)metil)fenil)borônico



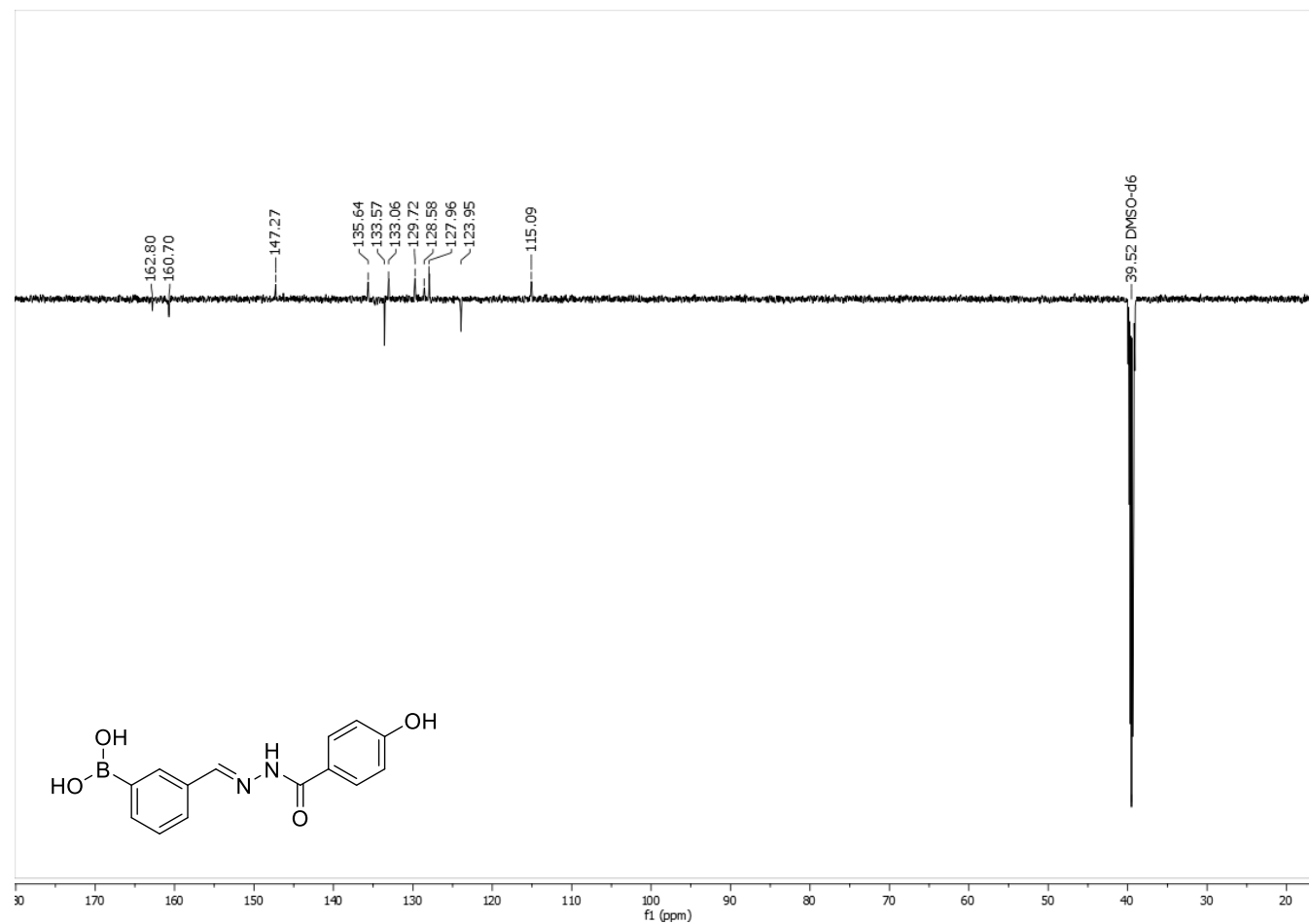
Espectro 126. Mapa de contorno de HMBC (DMSO-d₆, 600 MHz) do composto ácido (*E*)-(3-((2-(3-hidroxibenzoil)hidrazono)metil)fenil)borônico



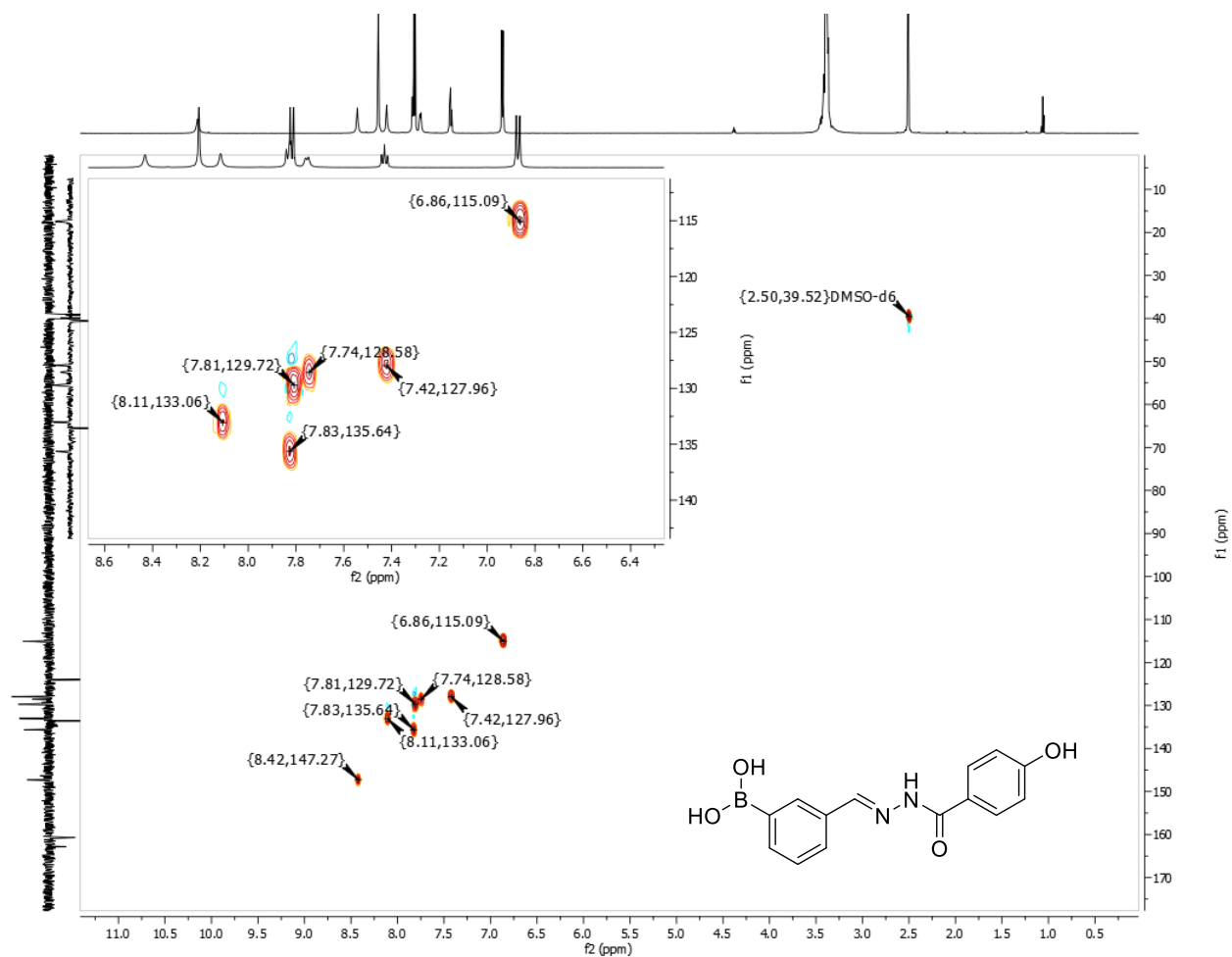
Espectro 127. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (E)-3-((2-(4-hidroxibenzoil)hidrazono)metil)fenil)borônico



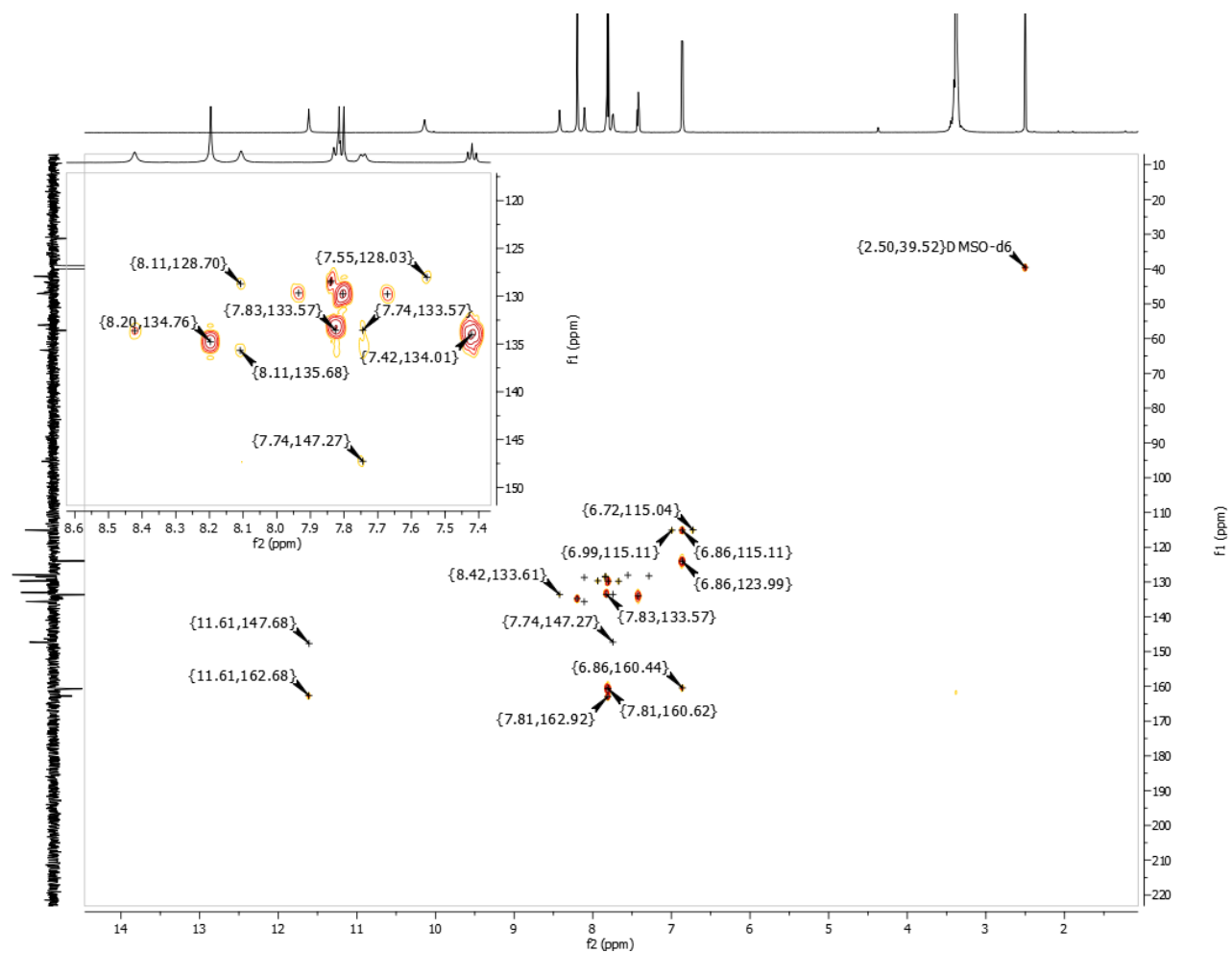
Espectro 128. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do composto ácido (E)-3-((2-(4-hidroxibenzoil)hidrazono)metil)fenil)borônico



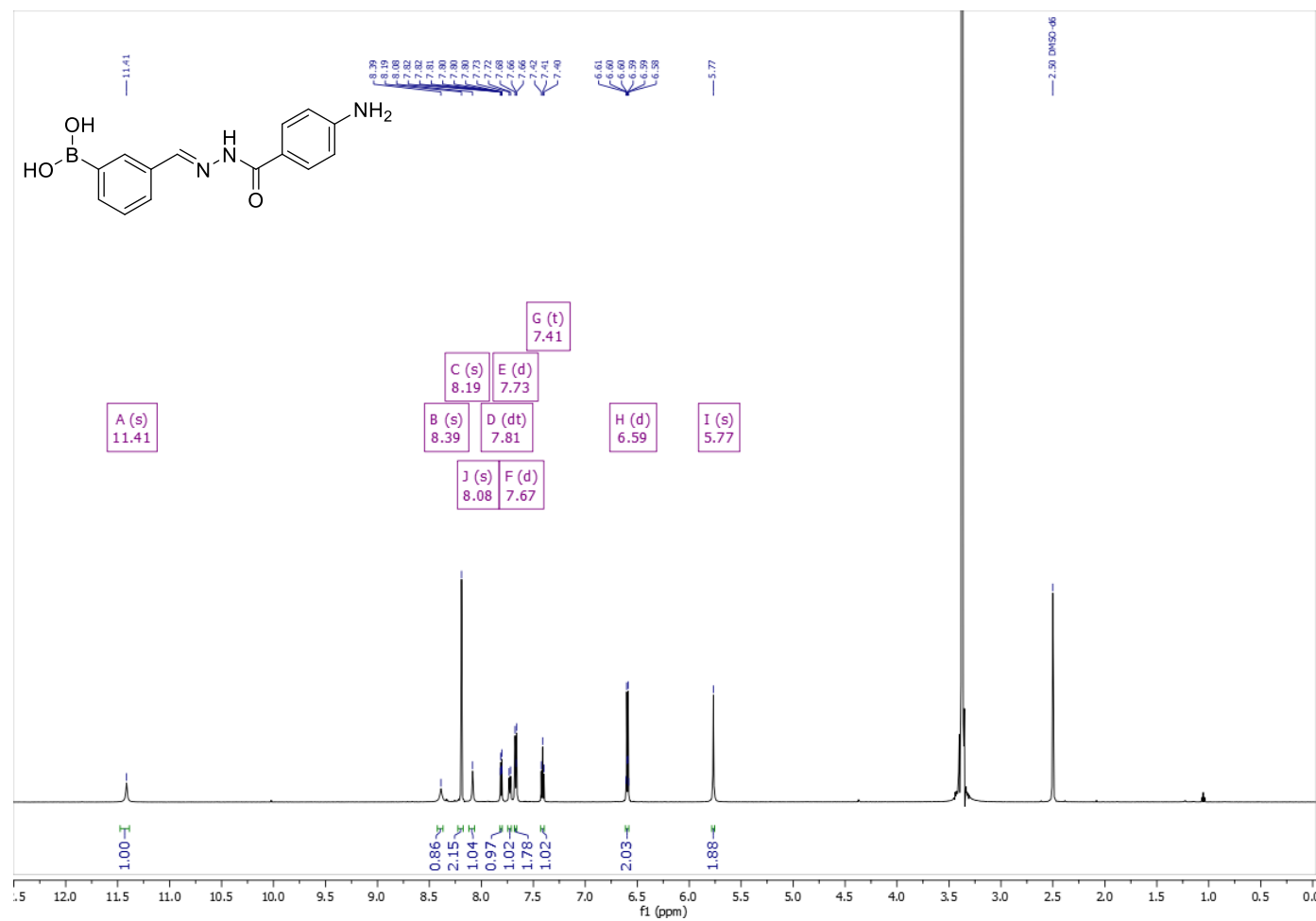
Espectro 129. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (E)-3-((2-(4-hidroxibenzoil)hidrazono)metil)fenil)borônico



Espectro 130. Mapa de contorno de HMBC (DMSO-d₆, 600 MHz) do composto ácido (E)-3-((2-(4-hidroxibenzoil)hidrazono)metil)fenil)borônico



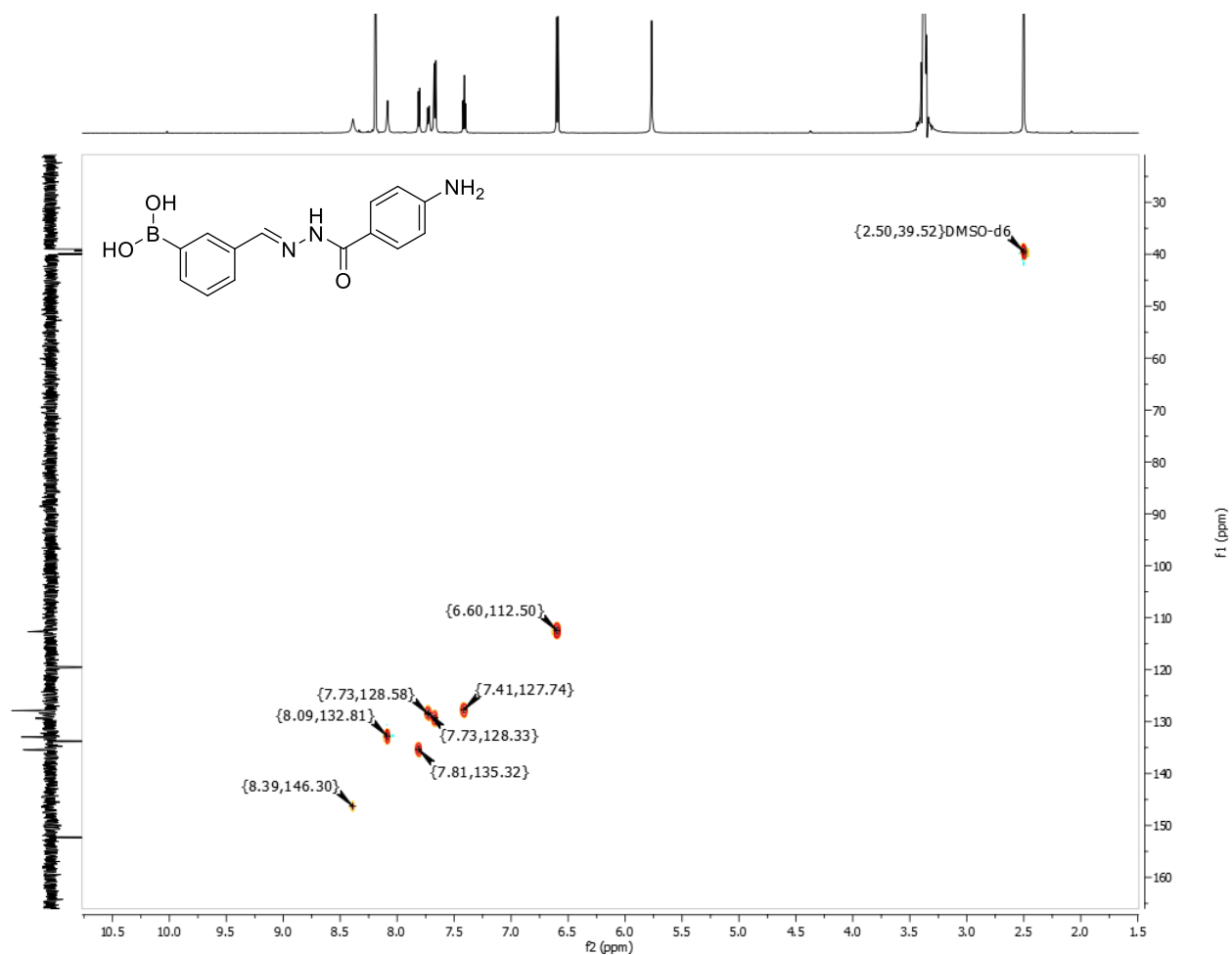
Espectro 131. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (E)-3-((2-(4-aminobenzoyl)hidrazono)metil)fenil)borônico



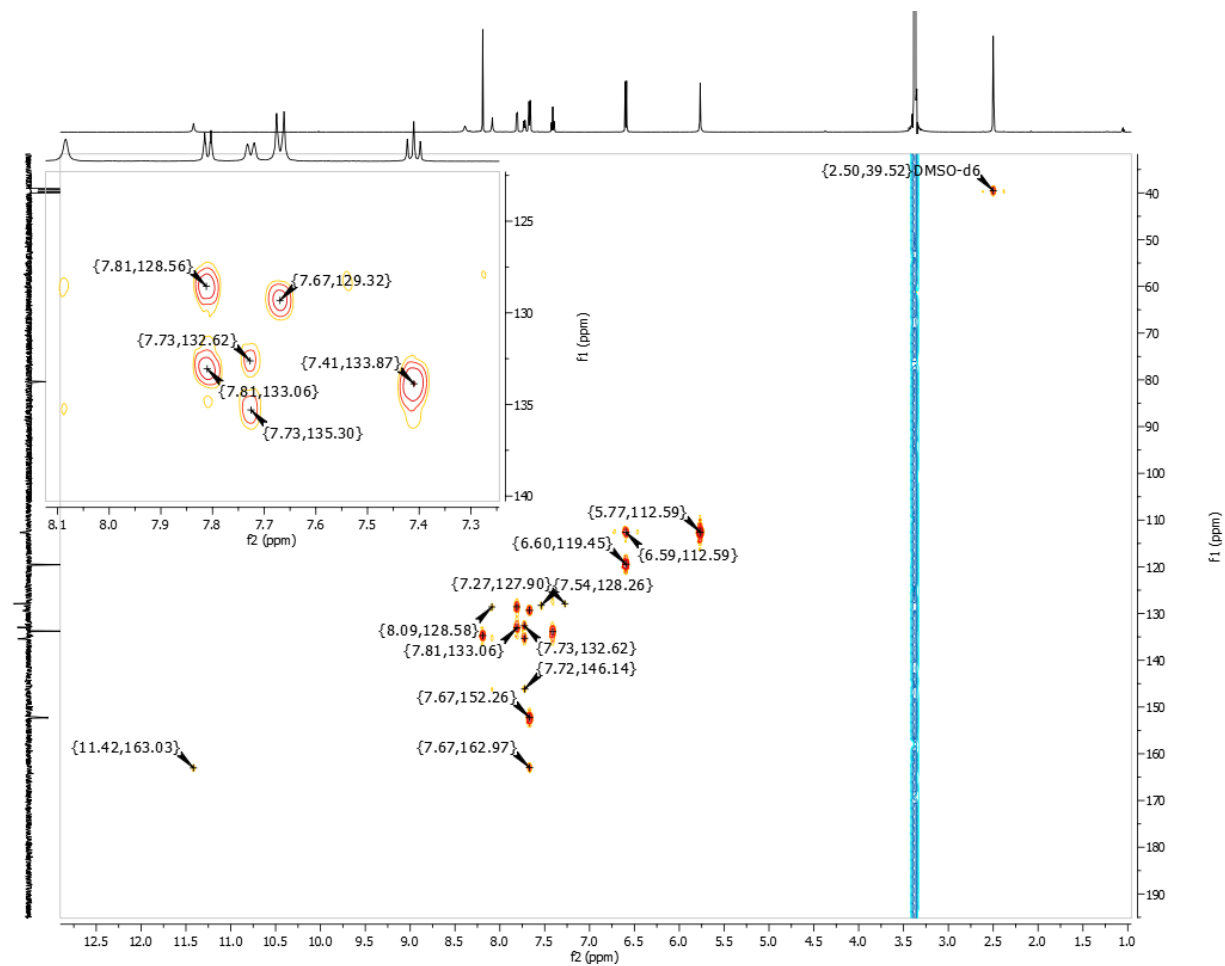
Espectro 132. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do composto ácido (*E*)-3-((2-(4-aminobenzoi)hidrazono)metil)fenil)borônico



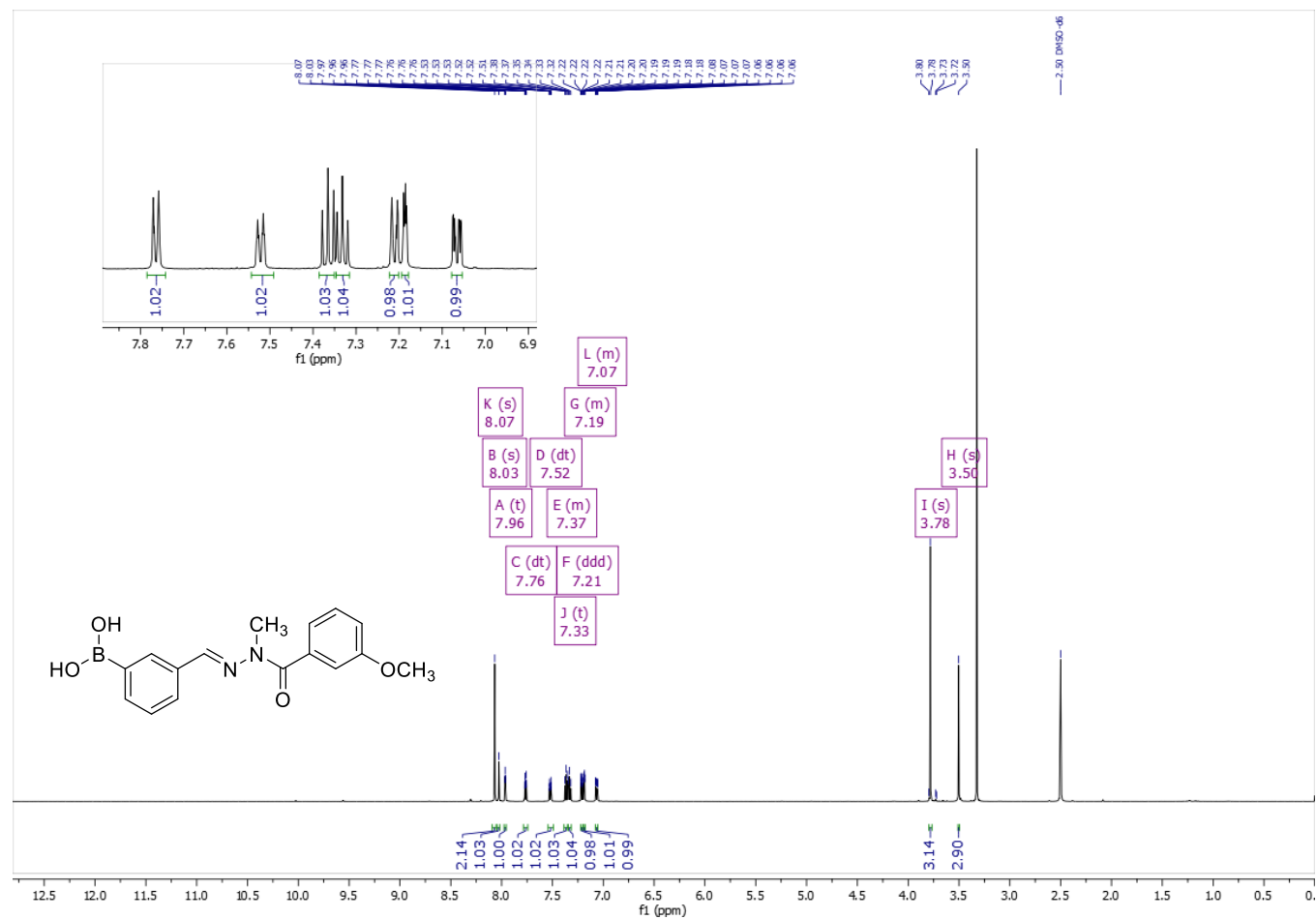
Espectro 133. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (E)-3-((2-(4-aminobenzoi)hidrazono)metil)fenil)borônico



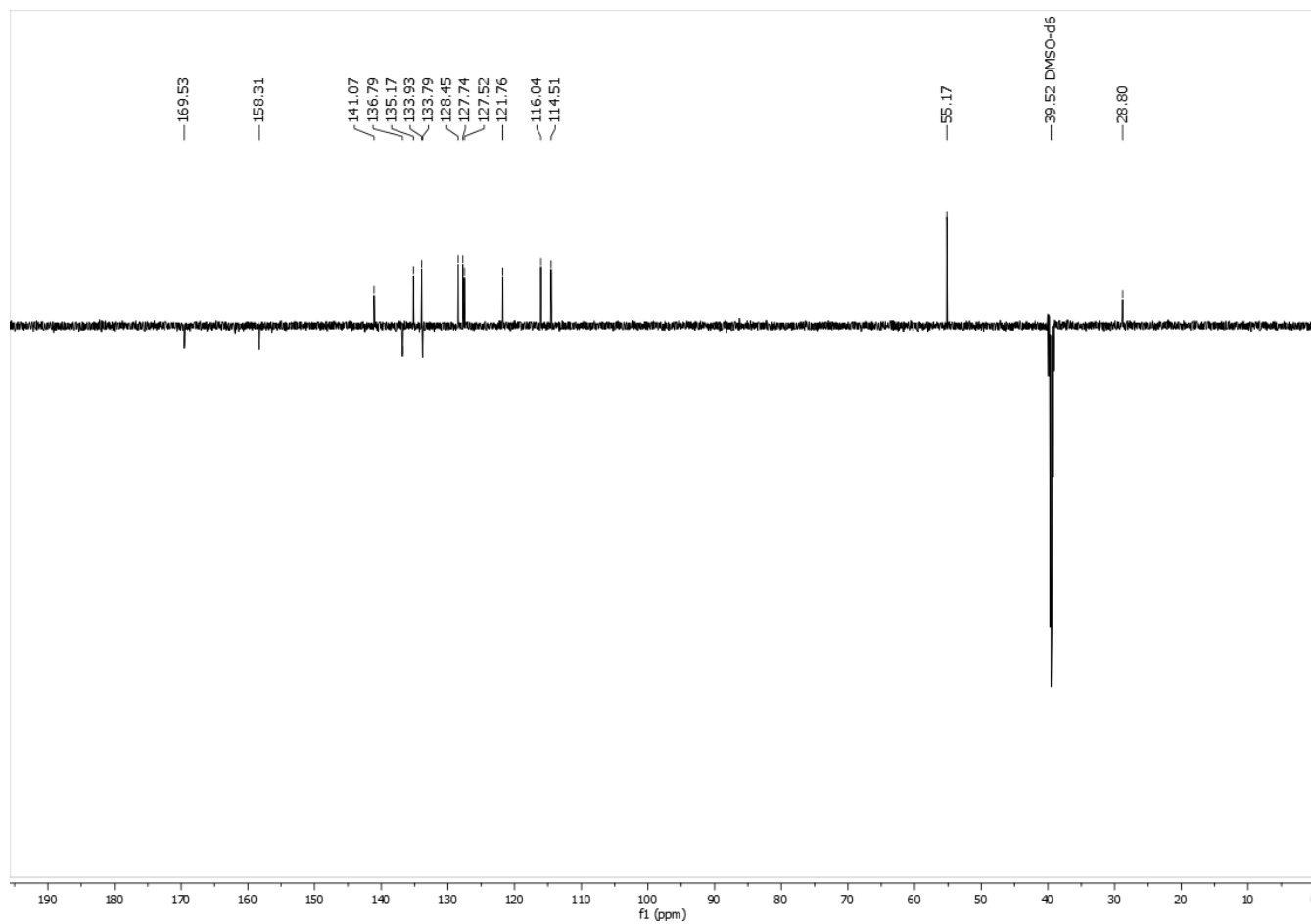
Espectro 134. Mapa de contorno de HMBC (DMSO-d₆, 600 MHz) do composto ácido (E)-3-((2-(4-aminobenzoi)hidrazono)metil)fenil)borônico



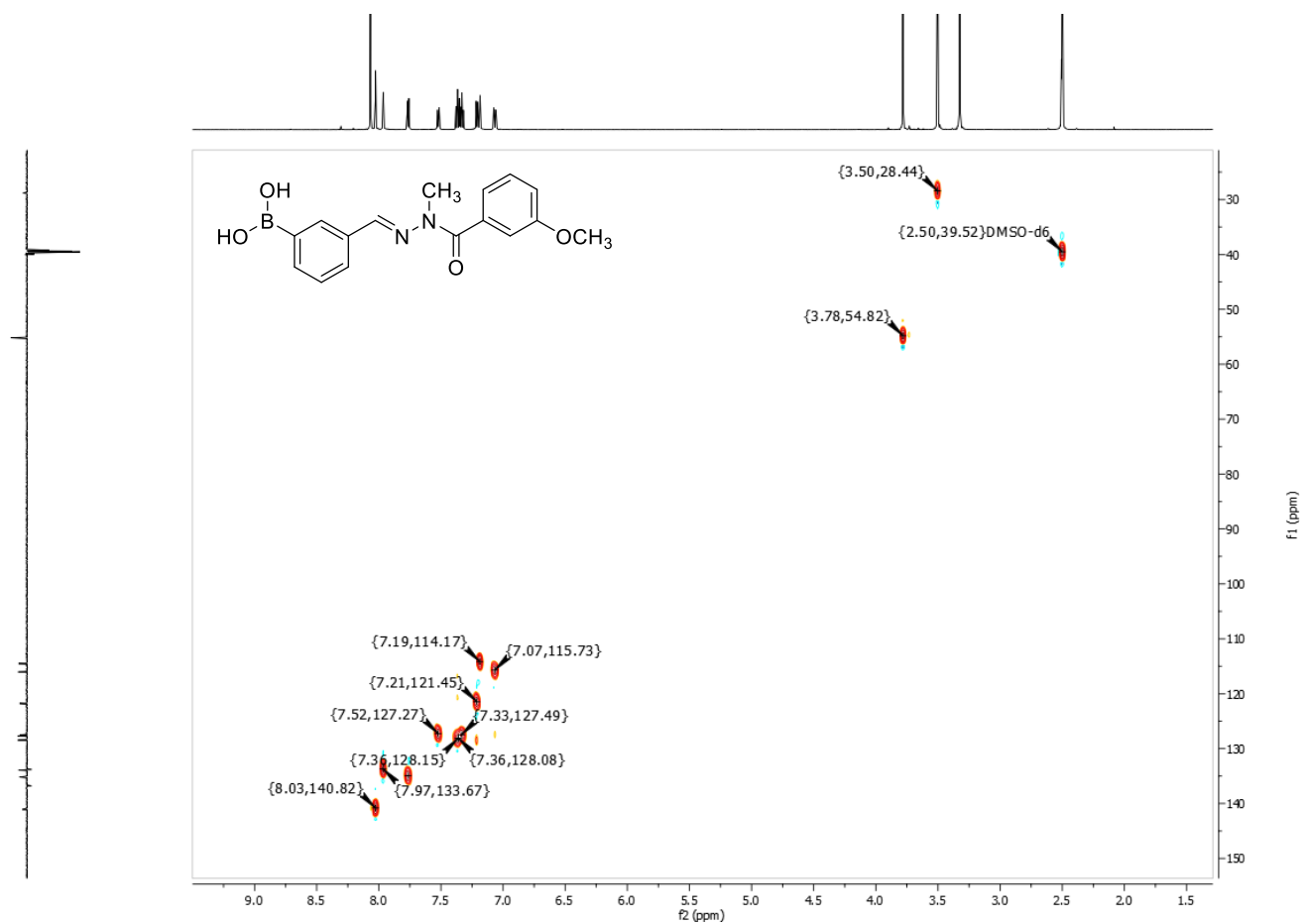
Espectro 135. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (E)-3-((2-(3-metoxibenzoil)-2-metilhidrazono)metil)fenil)borônico

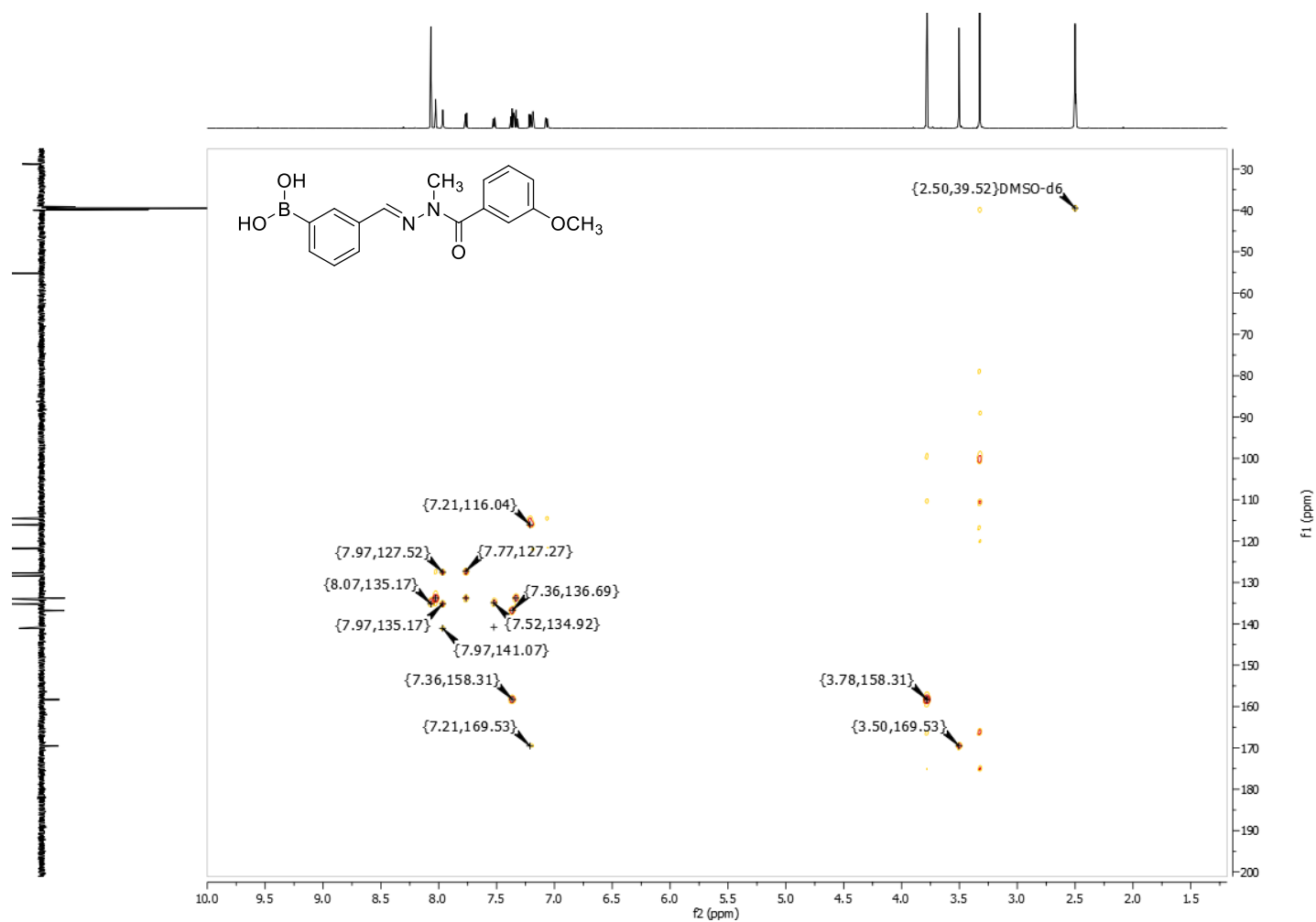


Espectro 136. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (E)-3-((2-(3-metoxibenzoil)-2-metilhidrazono)metil)fenil)borônico

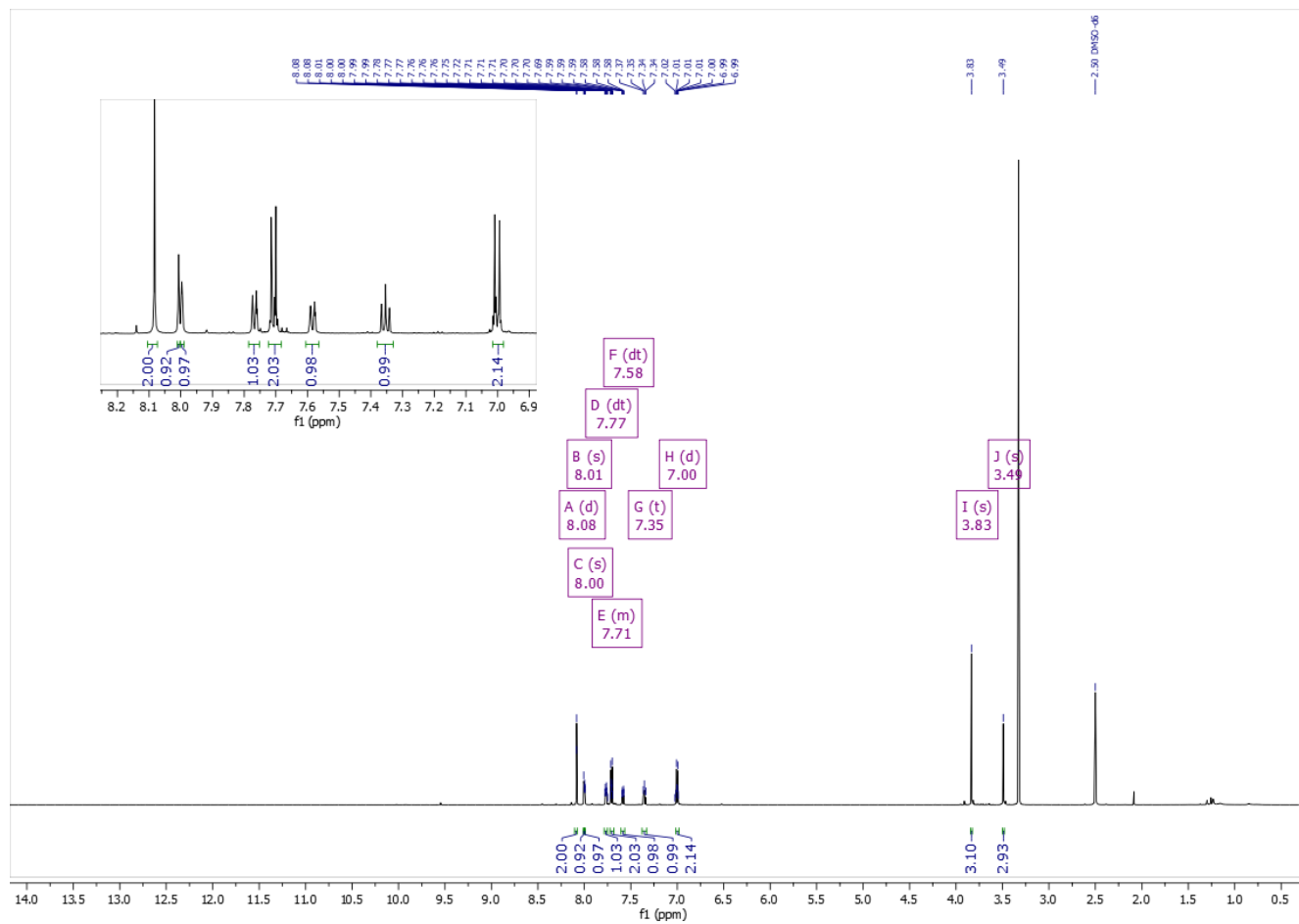


Espectro 137. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (E)-3-((2-(3-metoxibenzoil)-2-metilhidrazono)metil)fenil)borônico

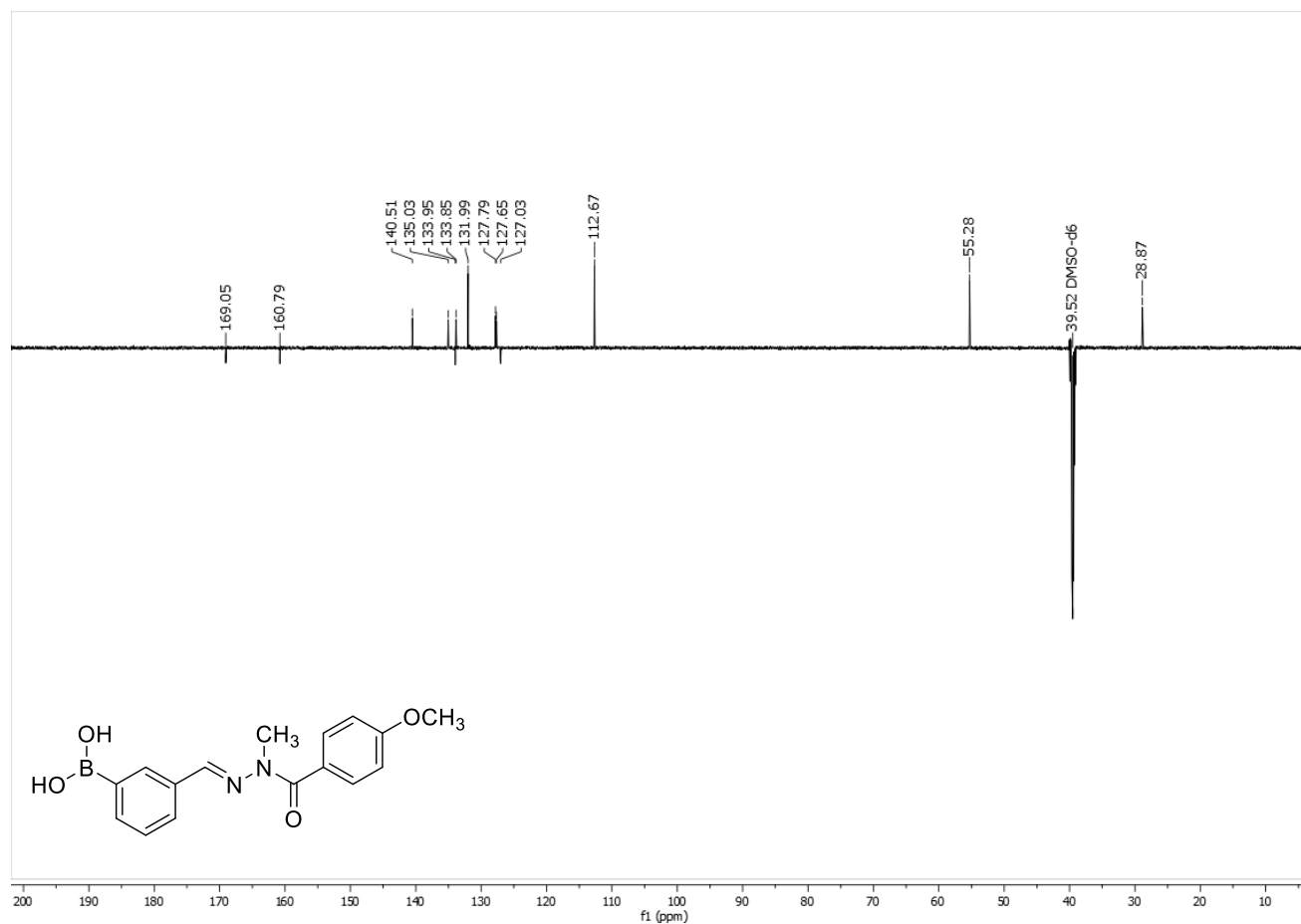


Espectro 138. Mapa de contorno de HMBC (DMSO-d₆, 600 MHz) do composto ácido (E)-3-((2-(3-metoxibenzoil)-2-metilhidrazono)metil)fenil)borônico

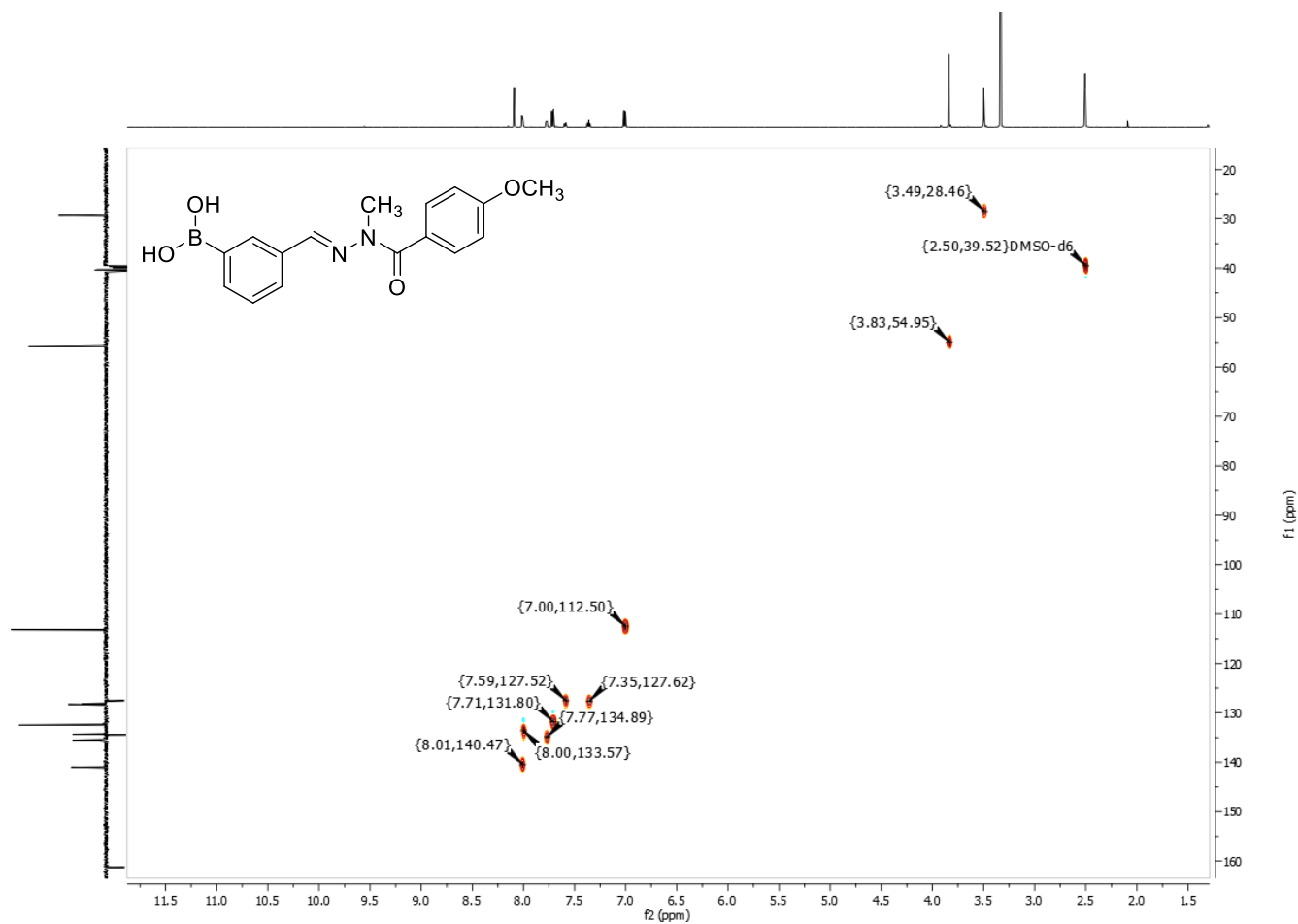
Espectro 139. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (E)-3-((2-(4-metoxibenzoil)-2-metilhidrazono)metil)fenil)borônico



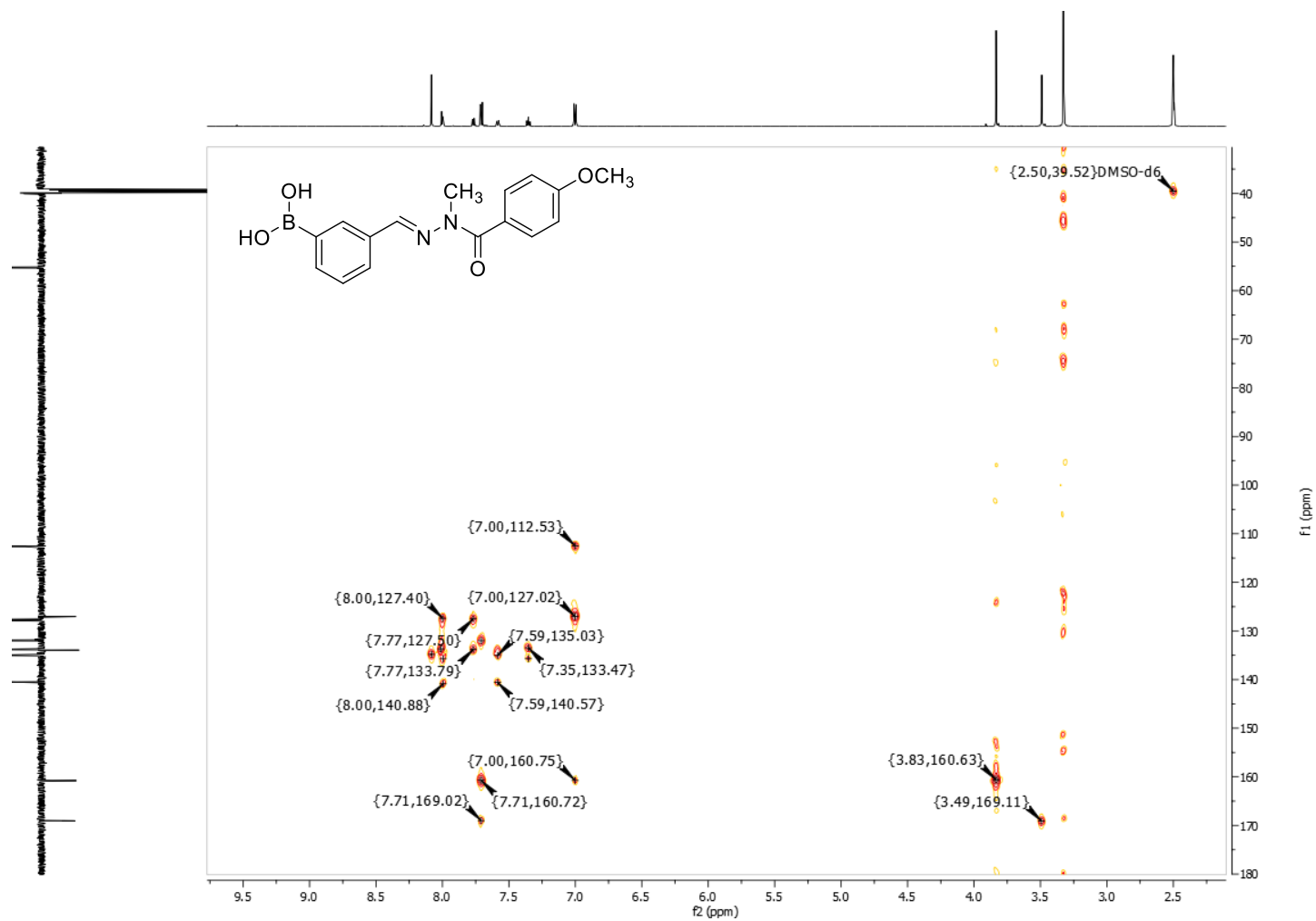
Espectro 140. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do composto ácido (*E*)-(3-((2-(4-metoxibenzoil)-2-metilhidrazono)metil)fenil)borônico



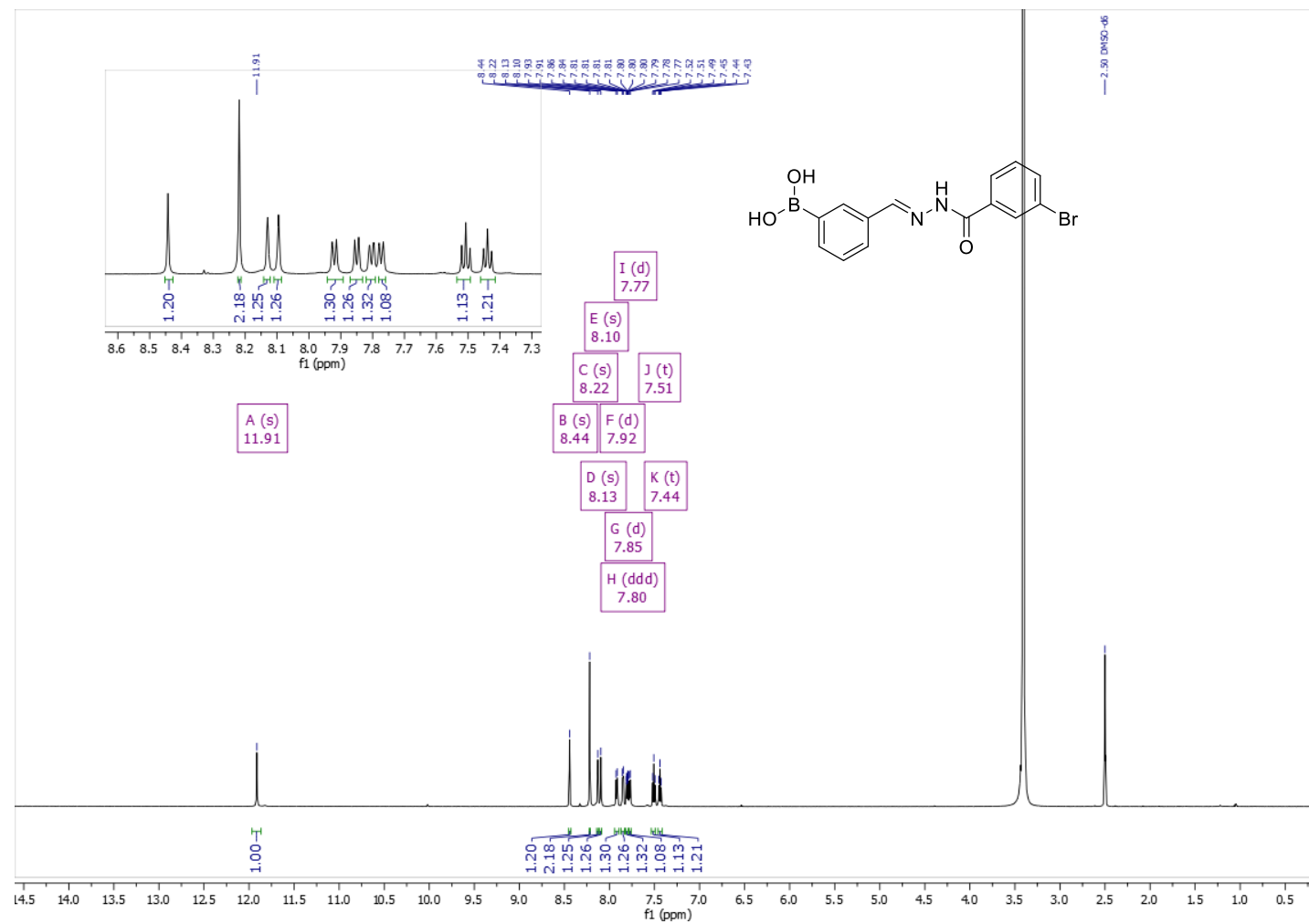
Espectro 141. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (E)-3-((2-(4-metoxibenzoil)-2-metilhidrazono)metil)fenil)borônico



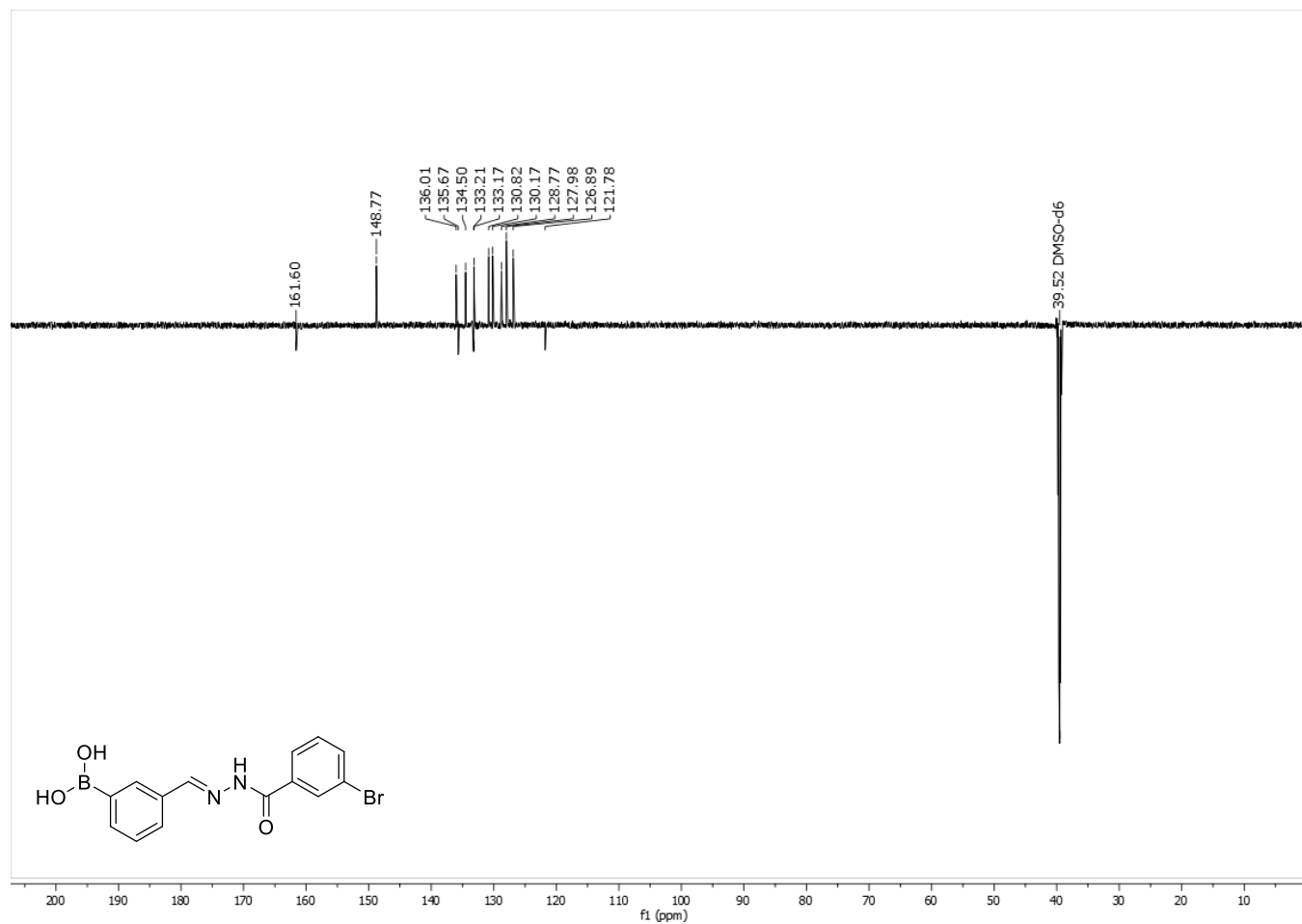
Espectro 142. Mapa de contorno de HMBC (DMSO-d₆, 600 MHz) do composto ácido (*E*)-3-((2-(4-metoxibenzoil)-2-metilhidrazono)metil)fenil)borônico



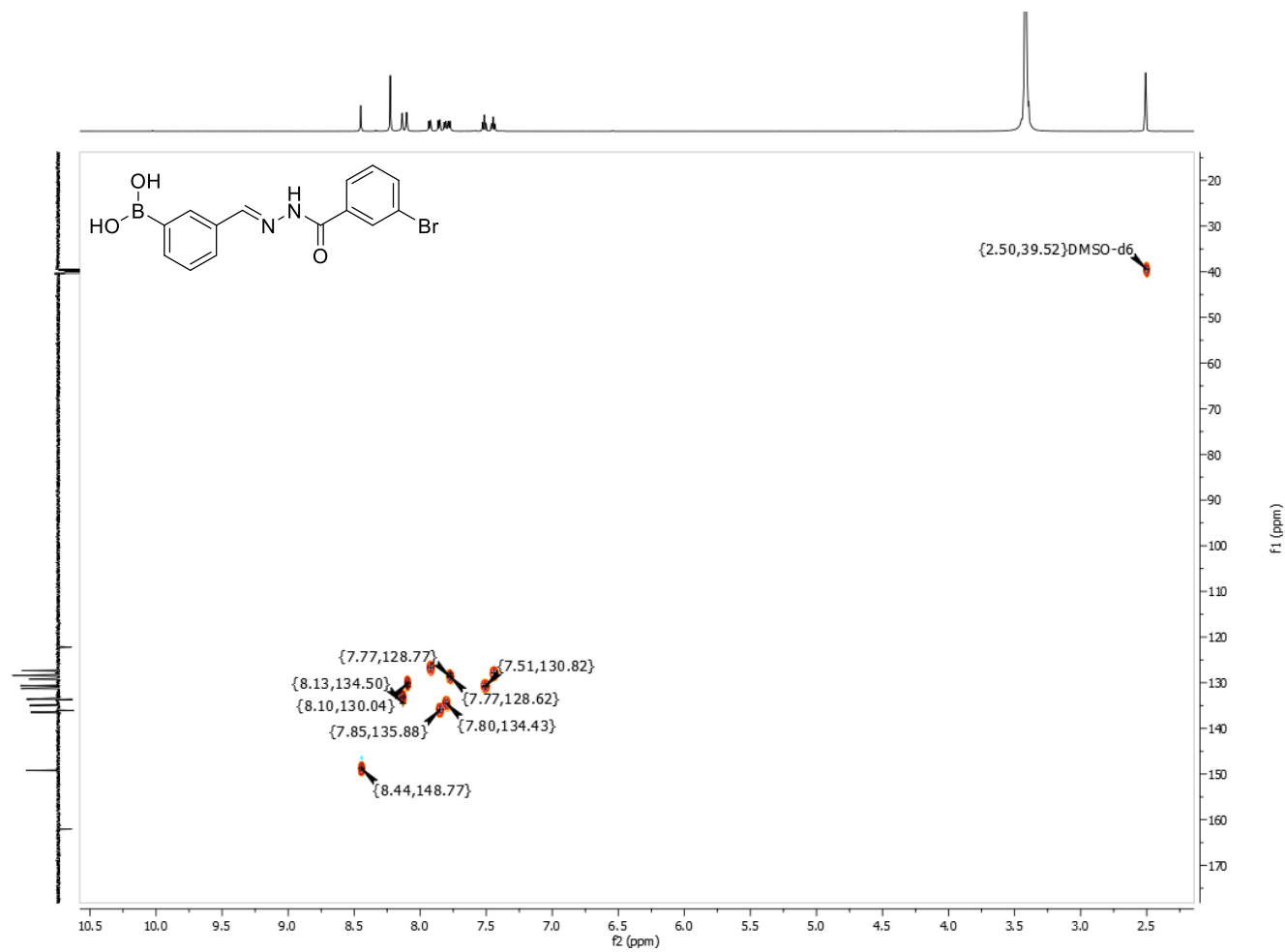
Espectro 143. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (E)-3-((2-(3-bromobenzoyl)hidrazono)metil)fenil)borônico



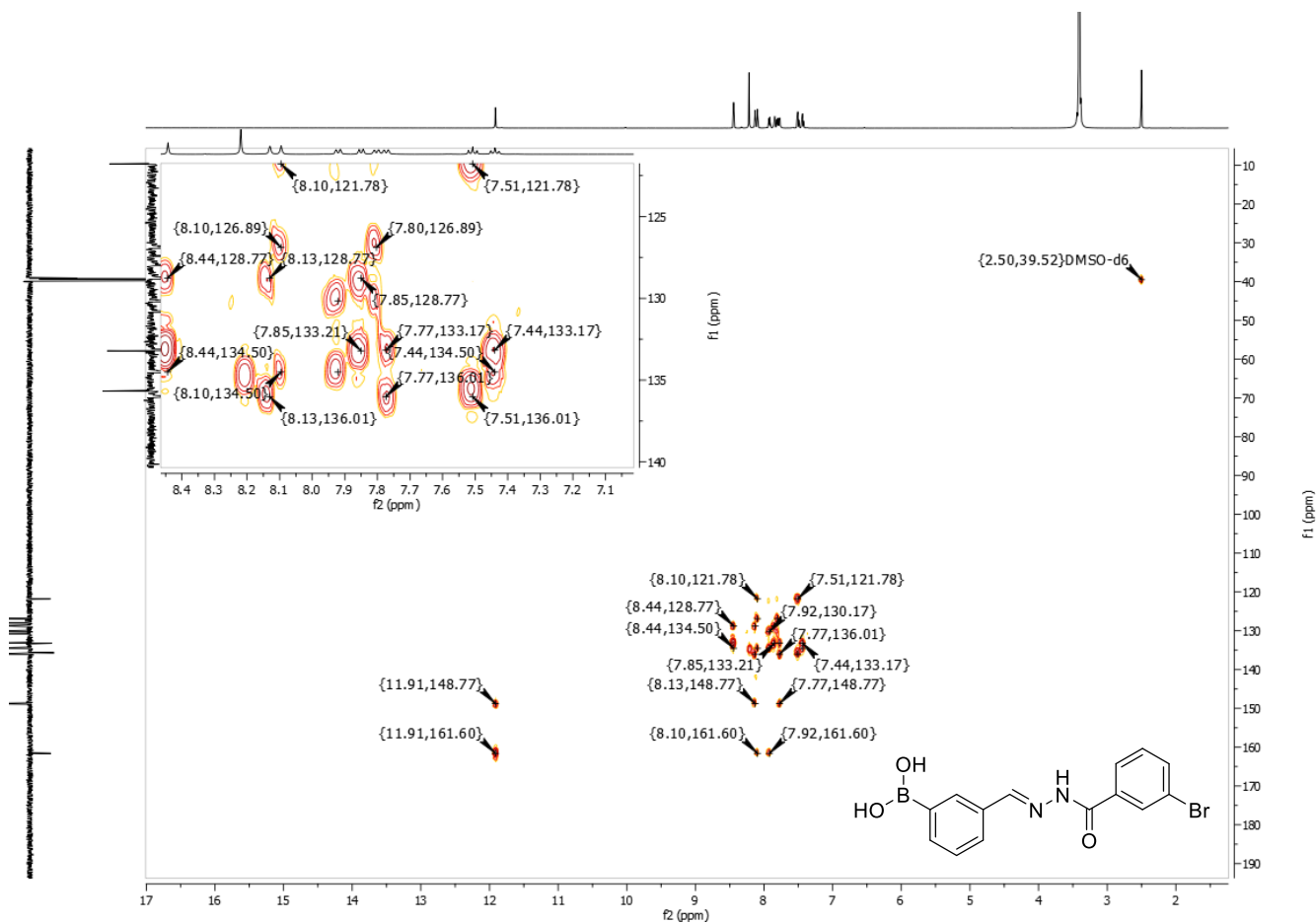
Espectro 144. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do composto ácido (E)-3-((2-(3-bromobenzoyl)hidrazono)metil)fenil)borônico



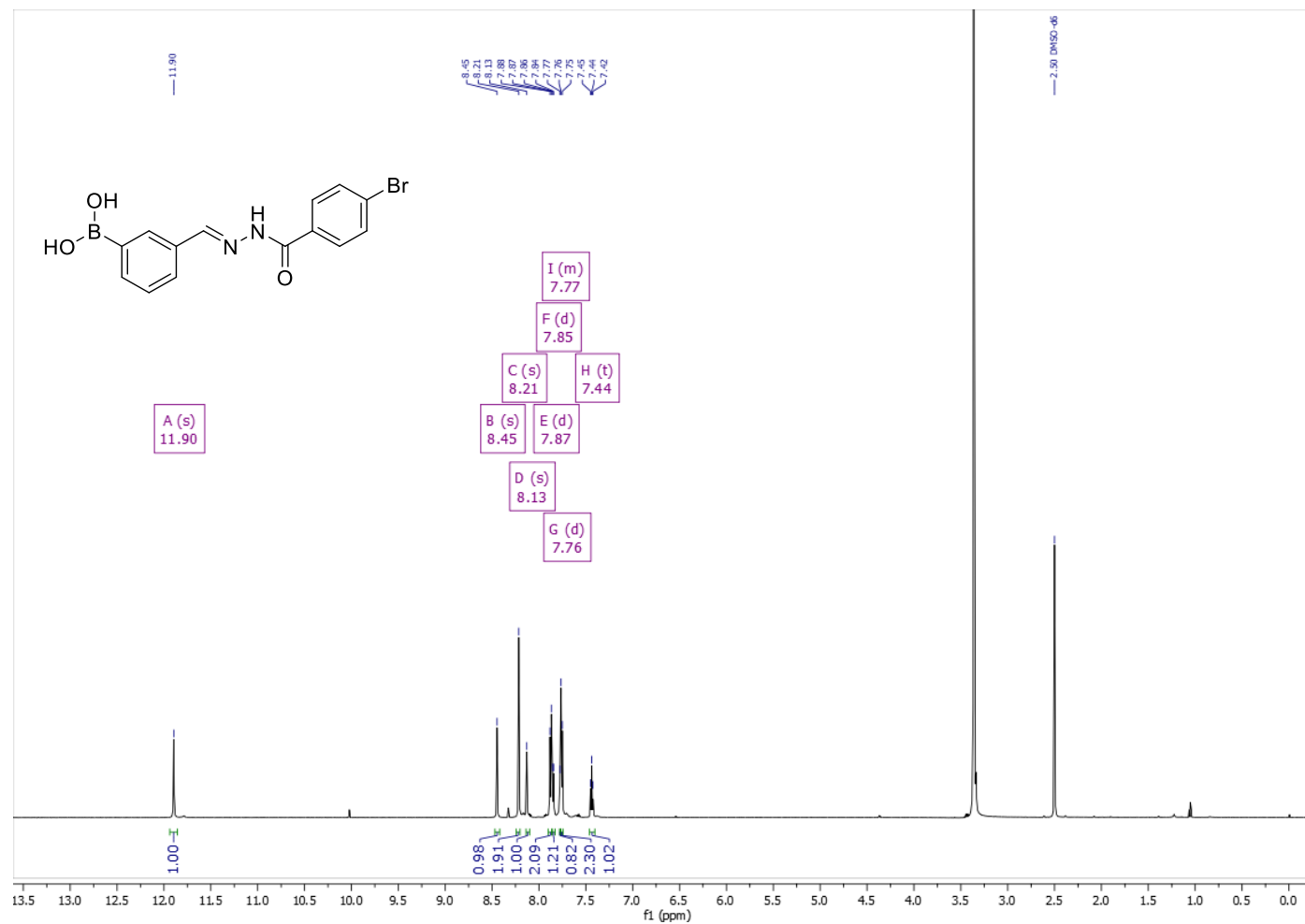
Espectro 145. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (E)-3-((2-(3-bromobenzoyl)hidrazono)metil)fenil)borônico



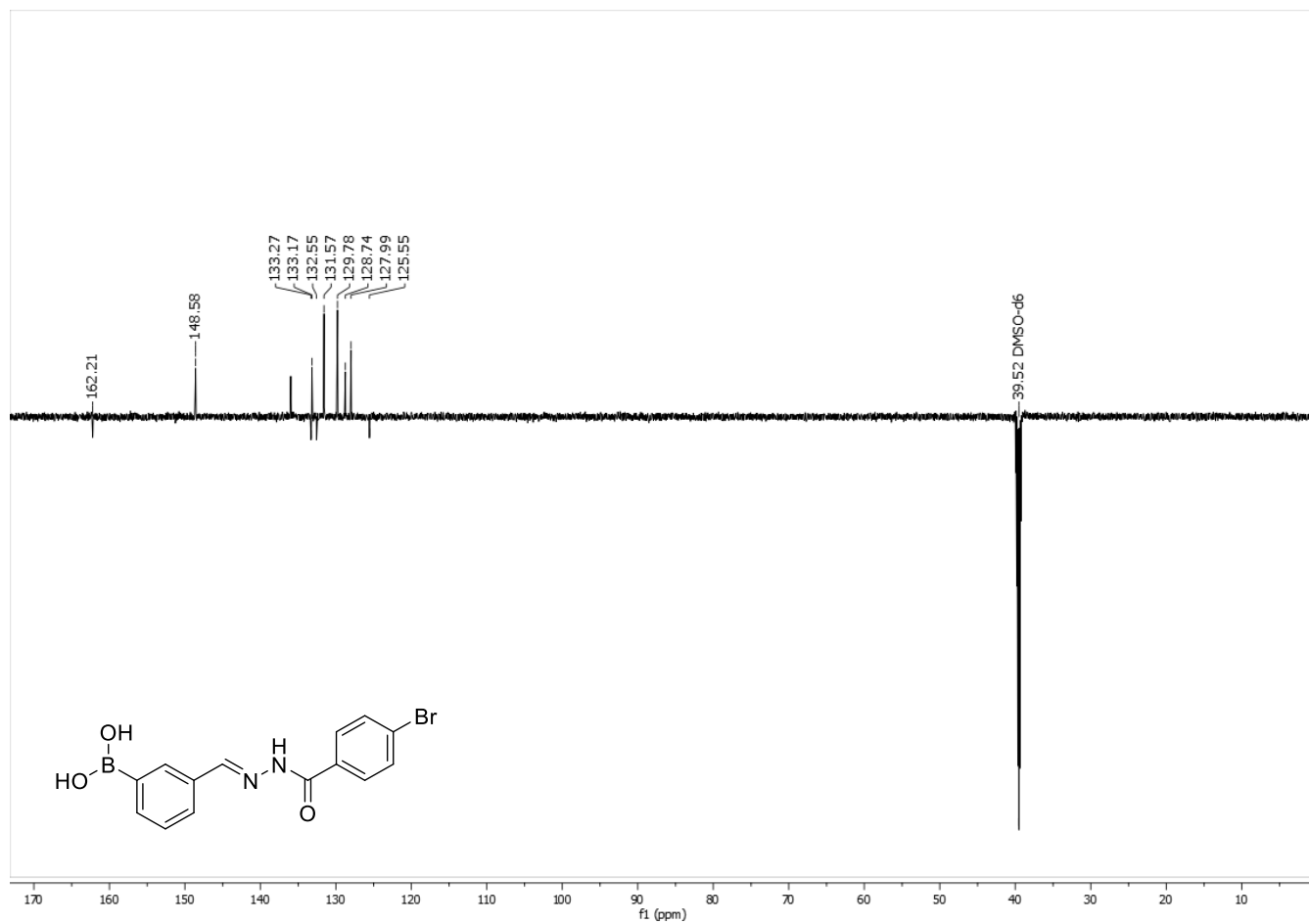
Espectro 146. Mapa de contorno de HMBC (DMSO-d₆, 600 MHz) do composto ácido (*E*)-(3-((2-(3-bromobenzoyl)hidrazono)metil)fenil)borônico



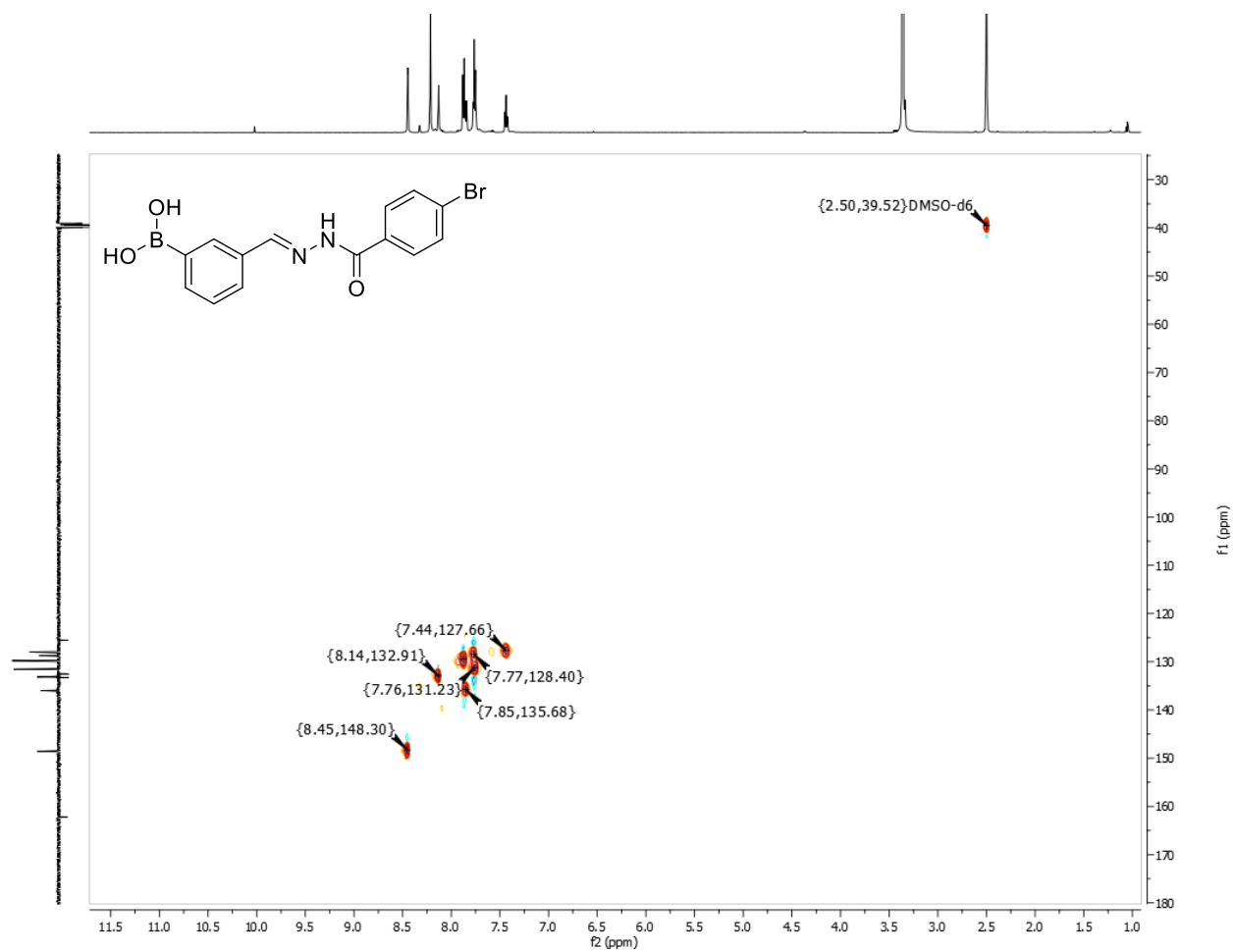
Espectro 147. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (E)-3-((2-(4-bromobenzoyl)hidrazono)metil)fenil)borônico



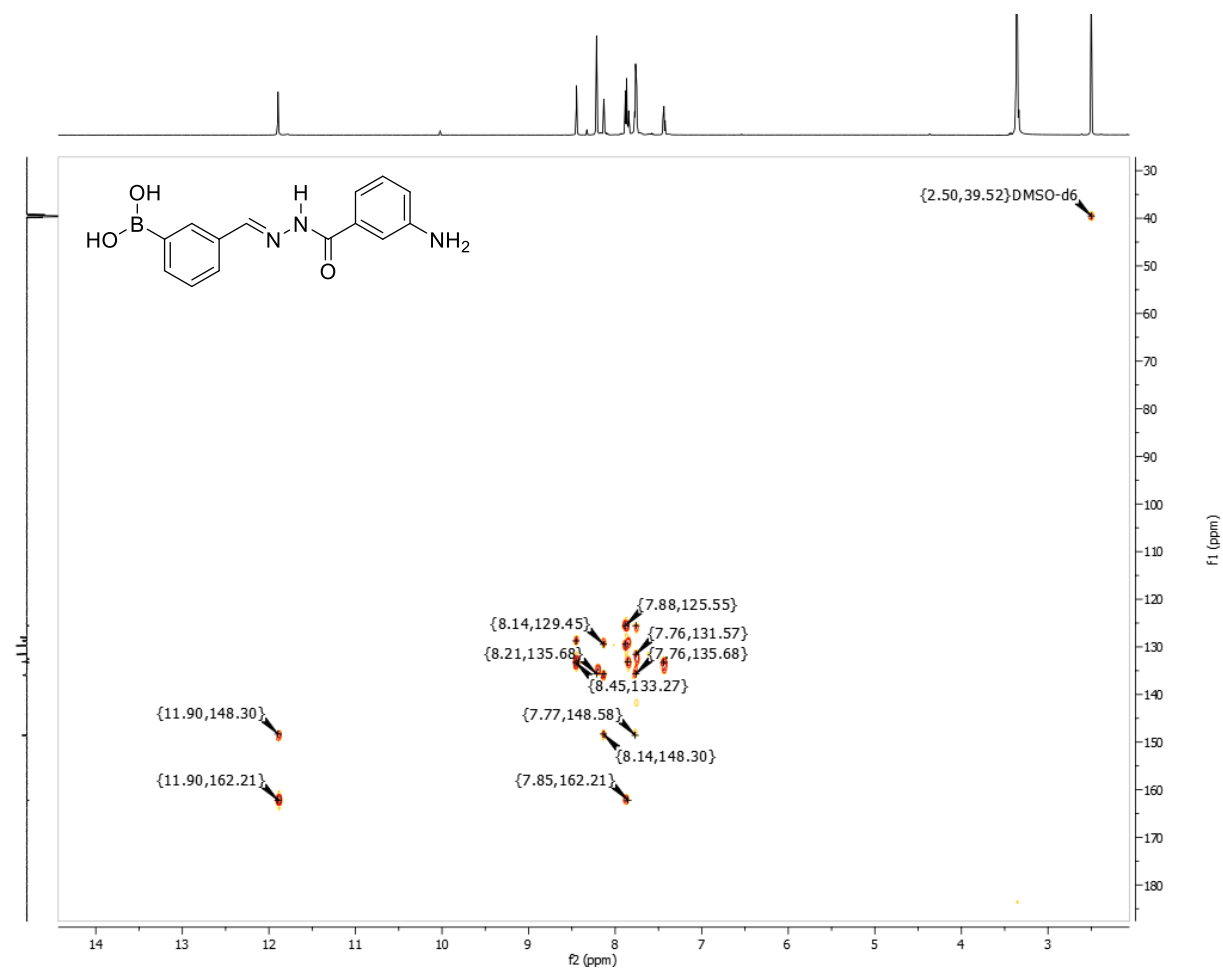
Espectro 148. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do composto ácido (E)-3-((2-(4-bromobenzil)hidrazono)metil)fenil)borônico



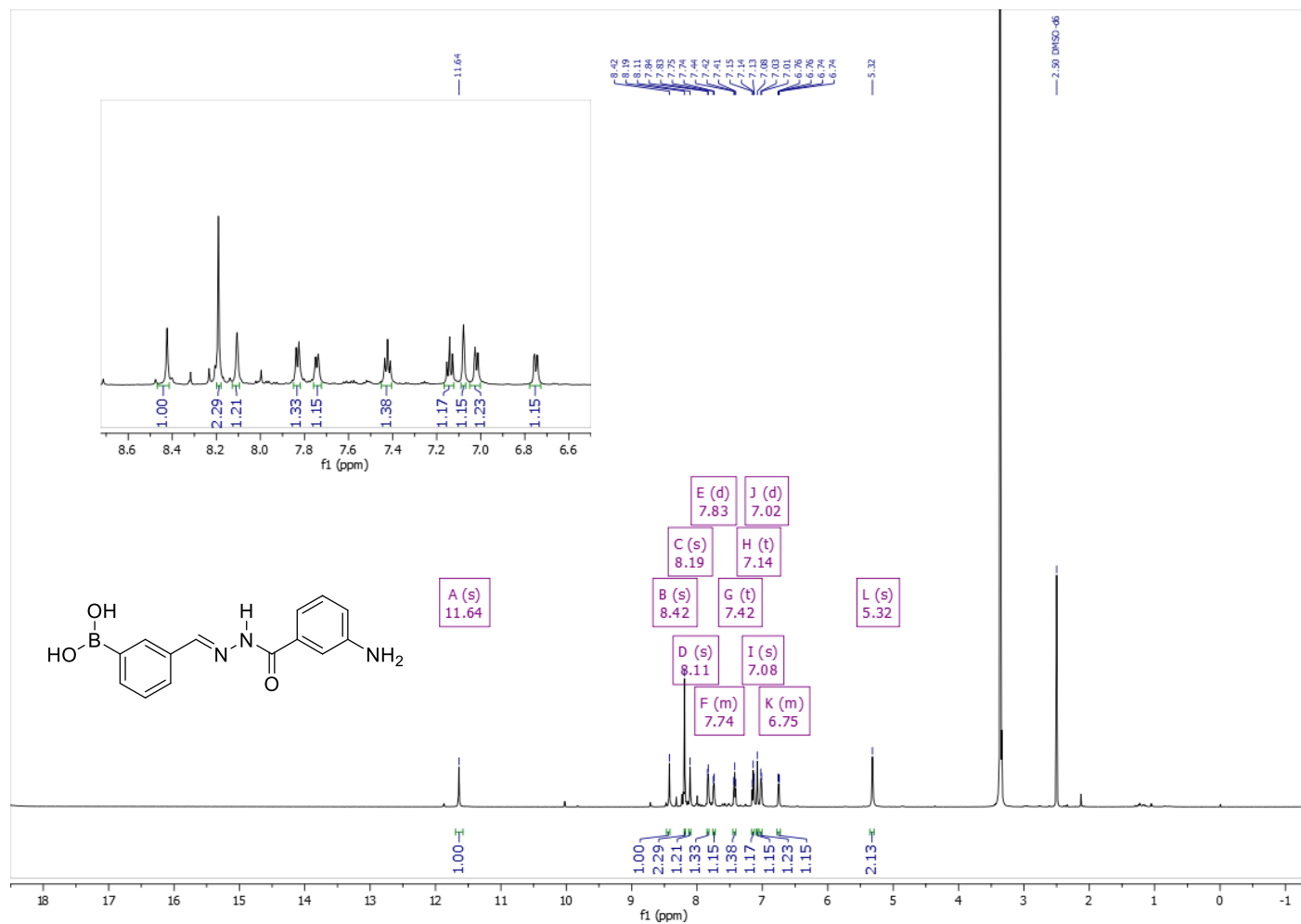
Espectro 149. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (E)-3-((2-(4-bromobenzil)hidrazono)metil)fenil)borônico



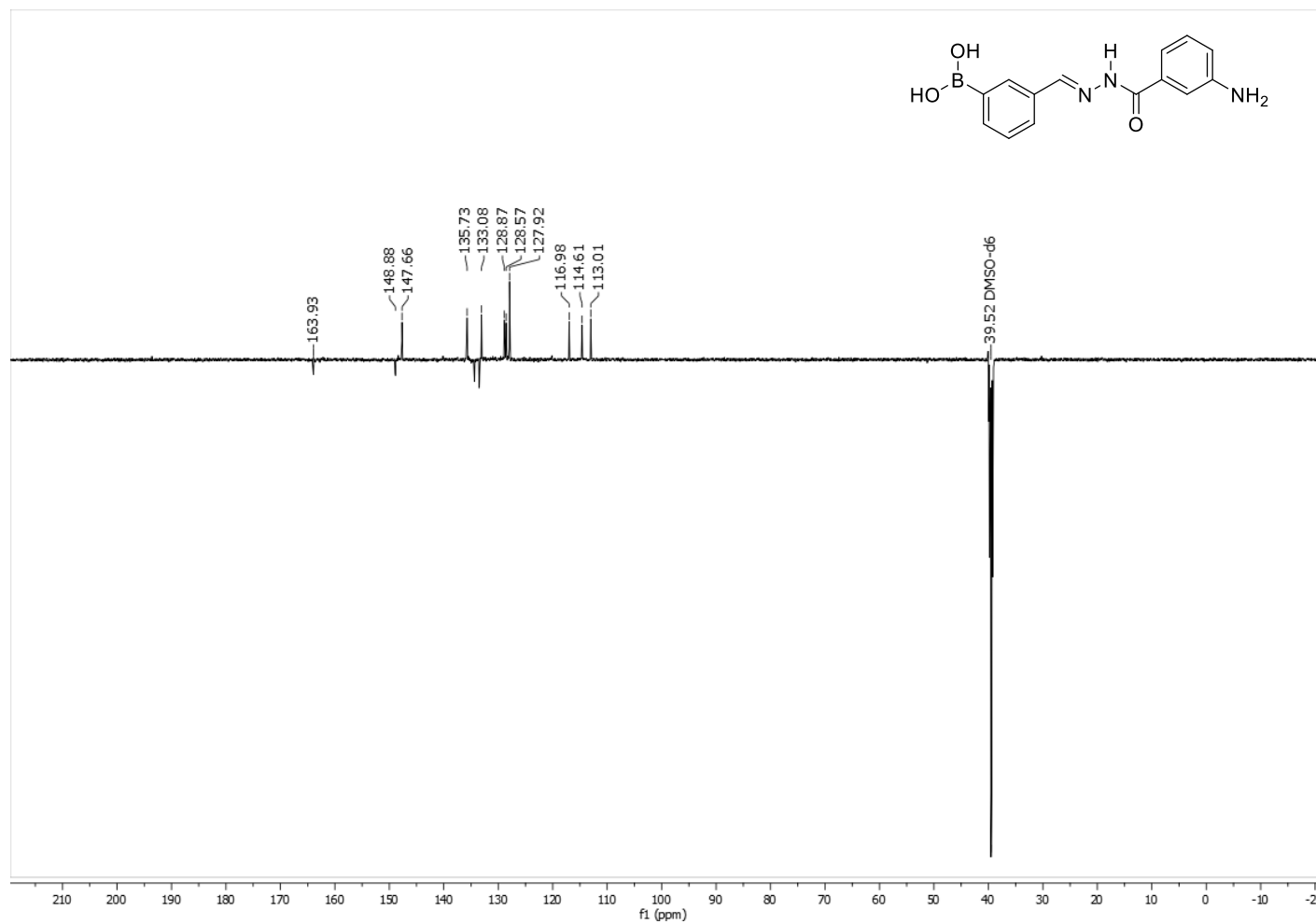
Espectro 150. Mapa de contorno de HMBC (DMSO-d₆, 600 MHz) do composto ácido (*E*)-(3-((2-(4-bromobenzoil)hidrazono)metil)fenil)borônico



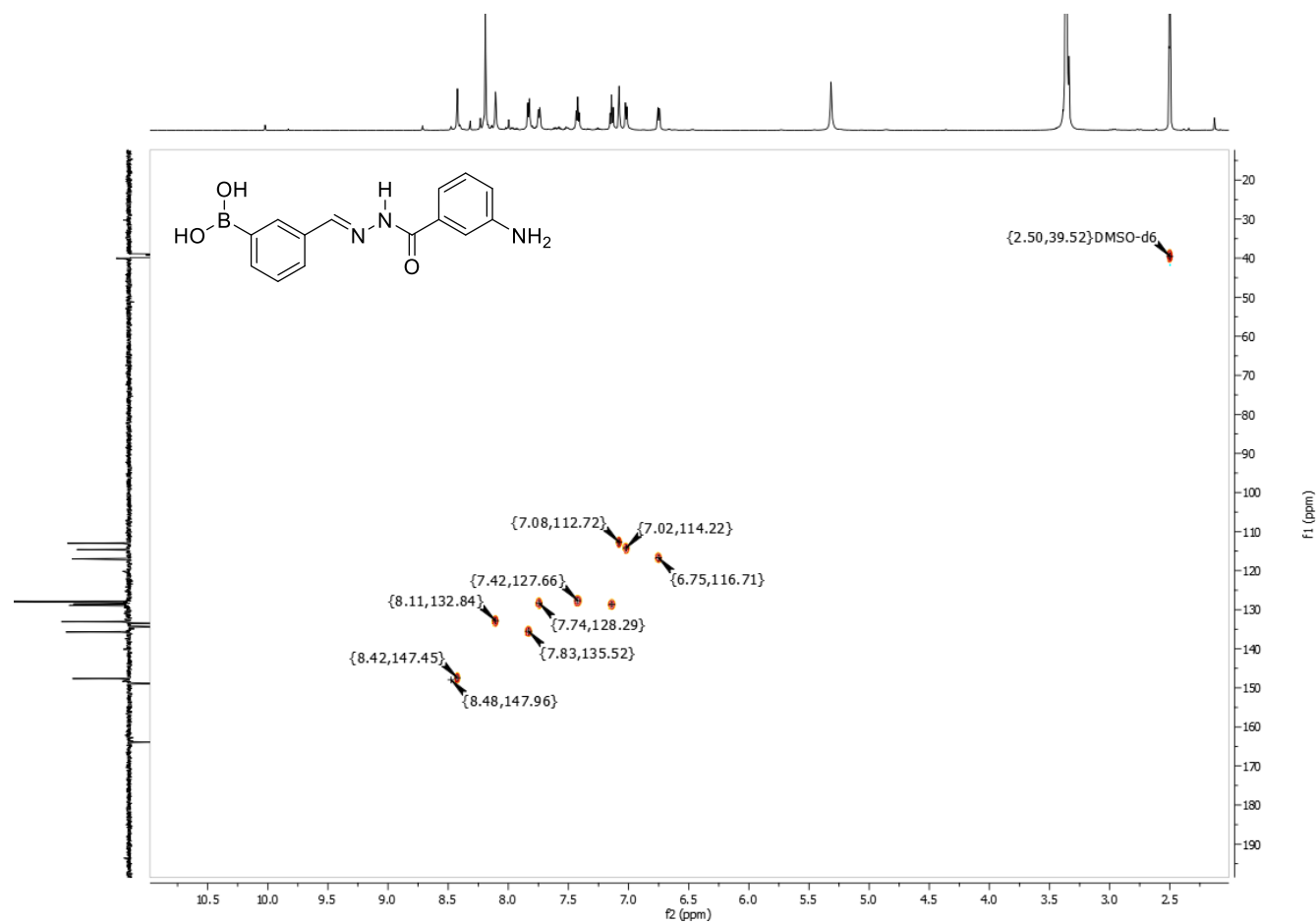
Espectro 151. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (*E*)-3-((2-(3-aminobenzoyl)hidrazono)metil)fenil)borônico



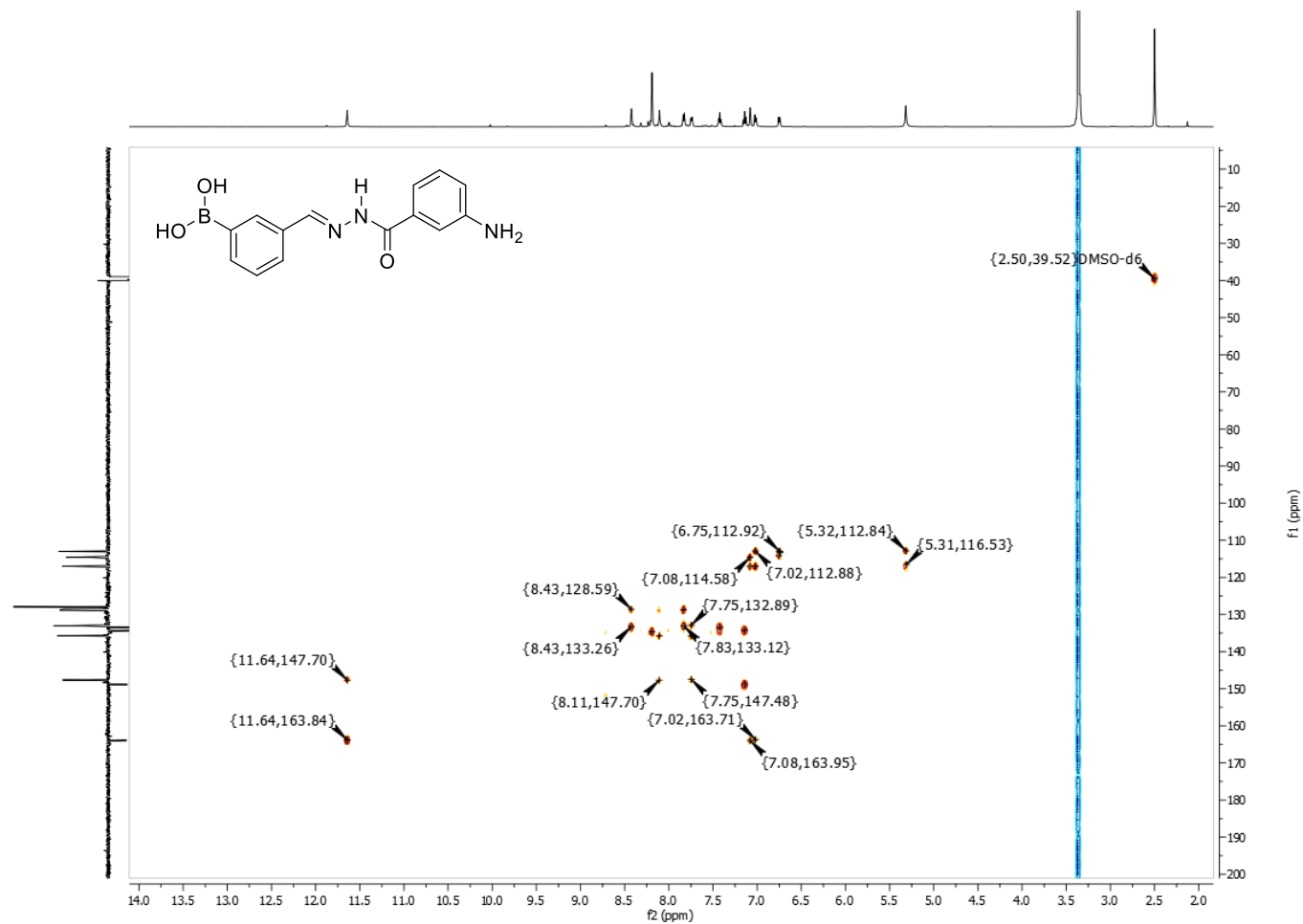
Espectro 152. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do composto ácido (*E*)-(3-((2-(3-aminobenzil)hidrazono)metil)fenil)borônico



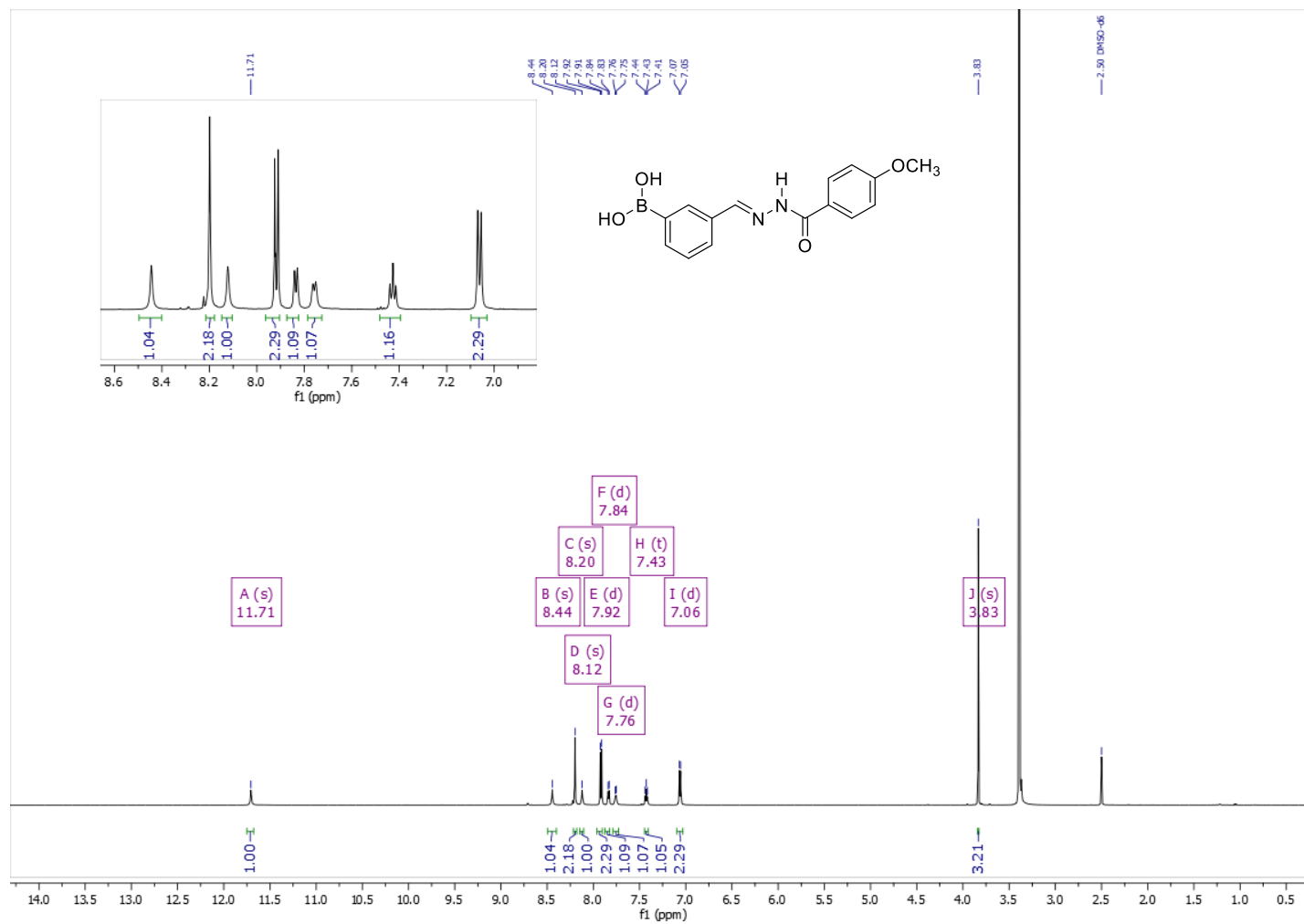
Espectro 153. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (*E*)-(3-((2-(3-aminobenzoyl)hidrazono)metil)fenil)borônico



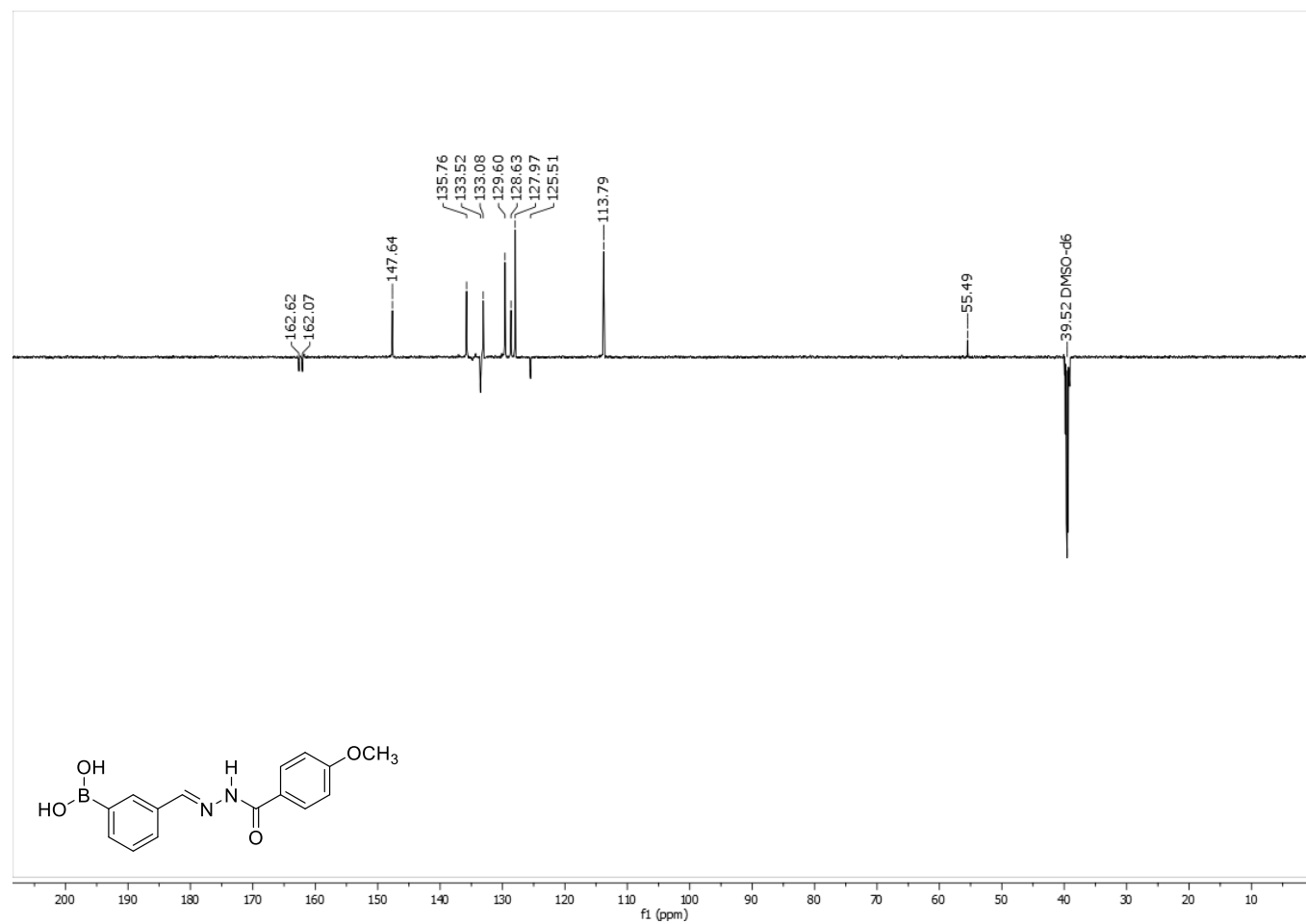
Espectro 154. Mapa de contorno de HMBC (DMSO-d₆, 600 MHz) do composto ácido (*E*)-3-((2-(3-aminobenzil)hidrazono)metil)fenil)borônico



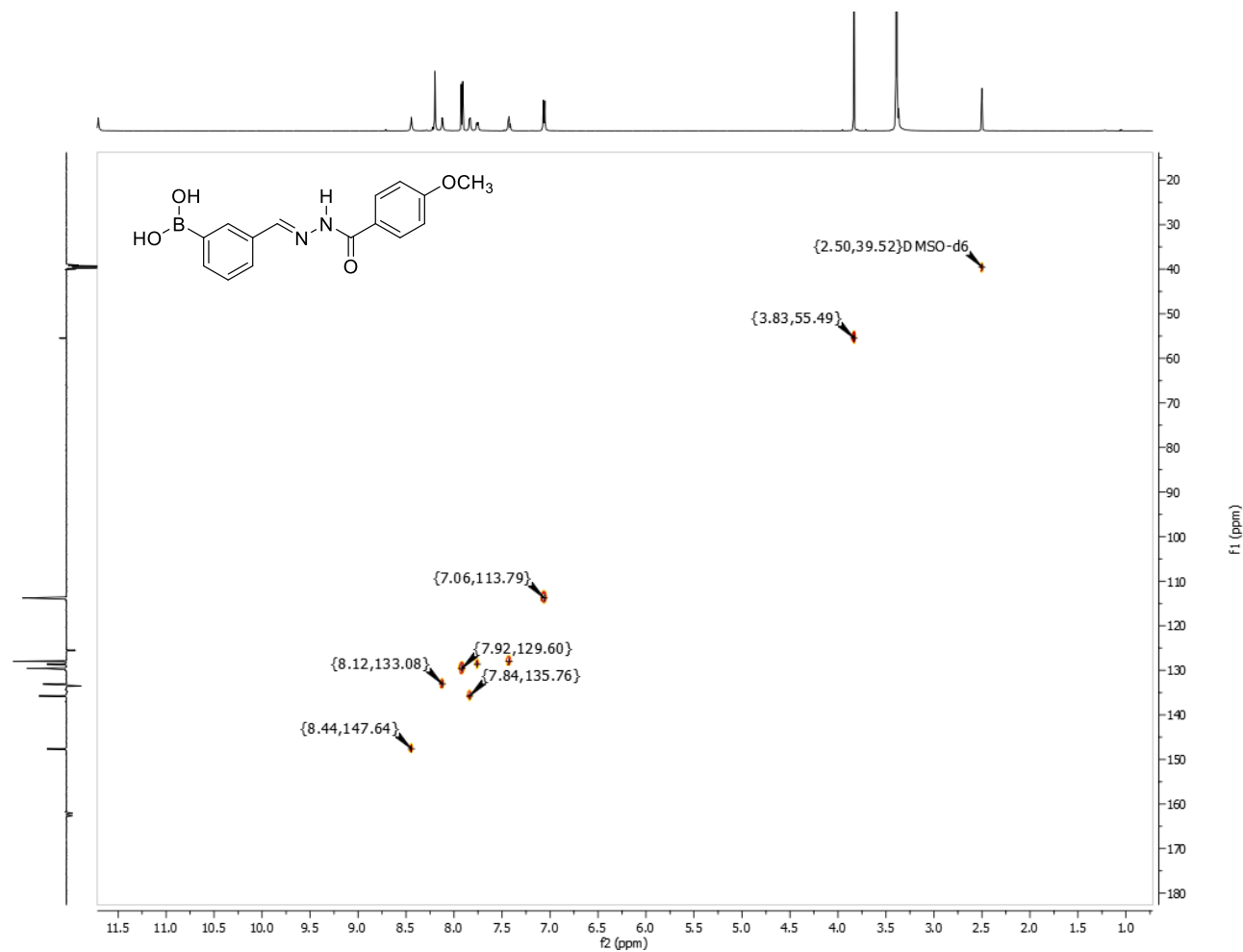
Espectro 155. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (*E*)-3-((2-(4-metoxibenzoil)hidrazono)metil)fenil)borônico



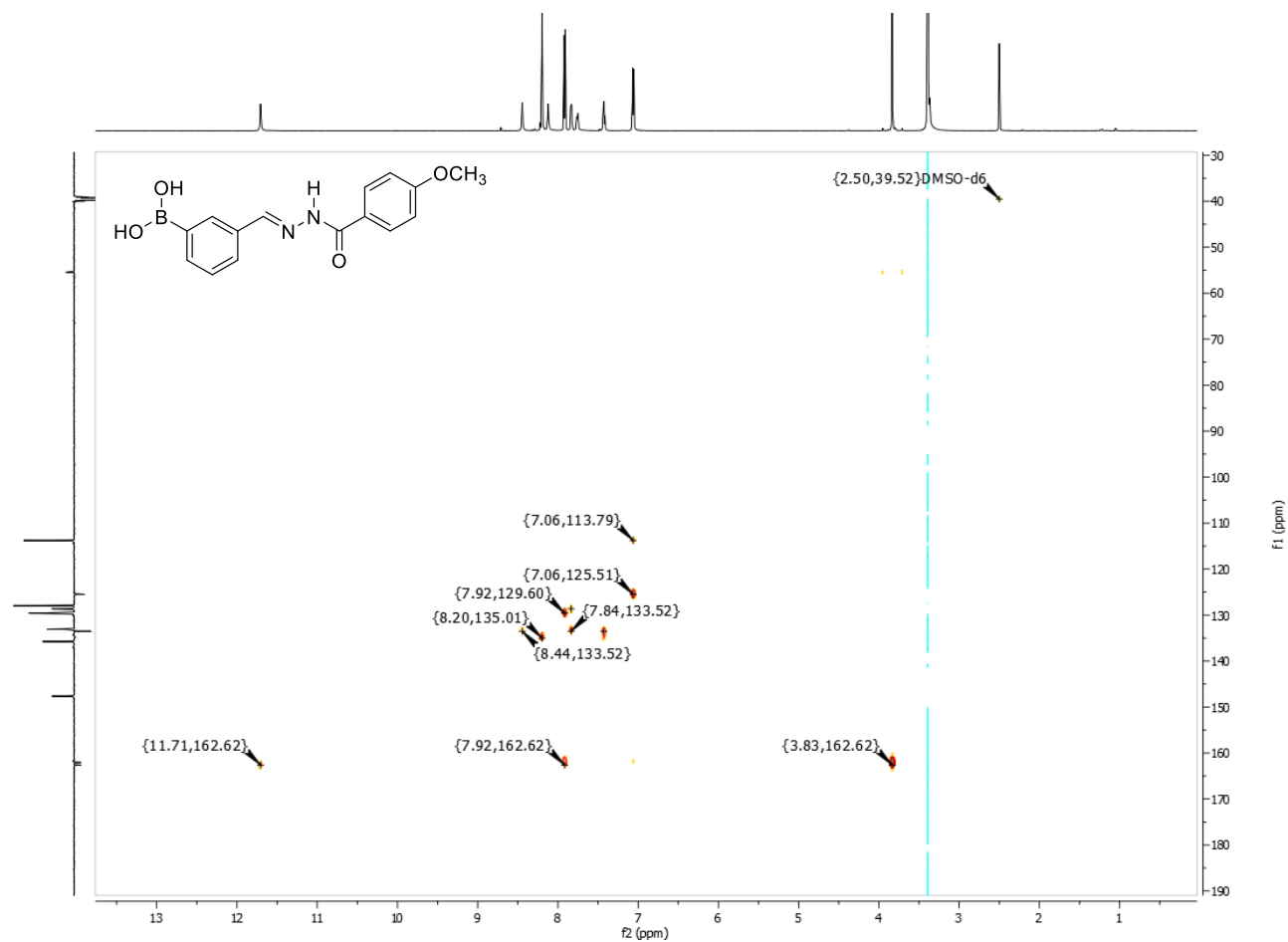
Espectro 156. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do composto ácido (*E*)-(3-((2-(4-metoxibenzoil)hidrazono)metil)fenil)borônico



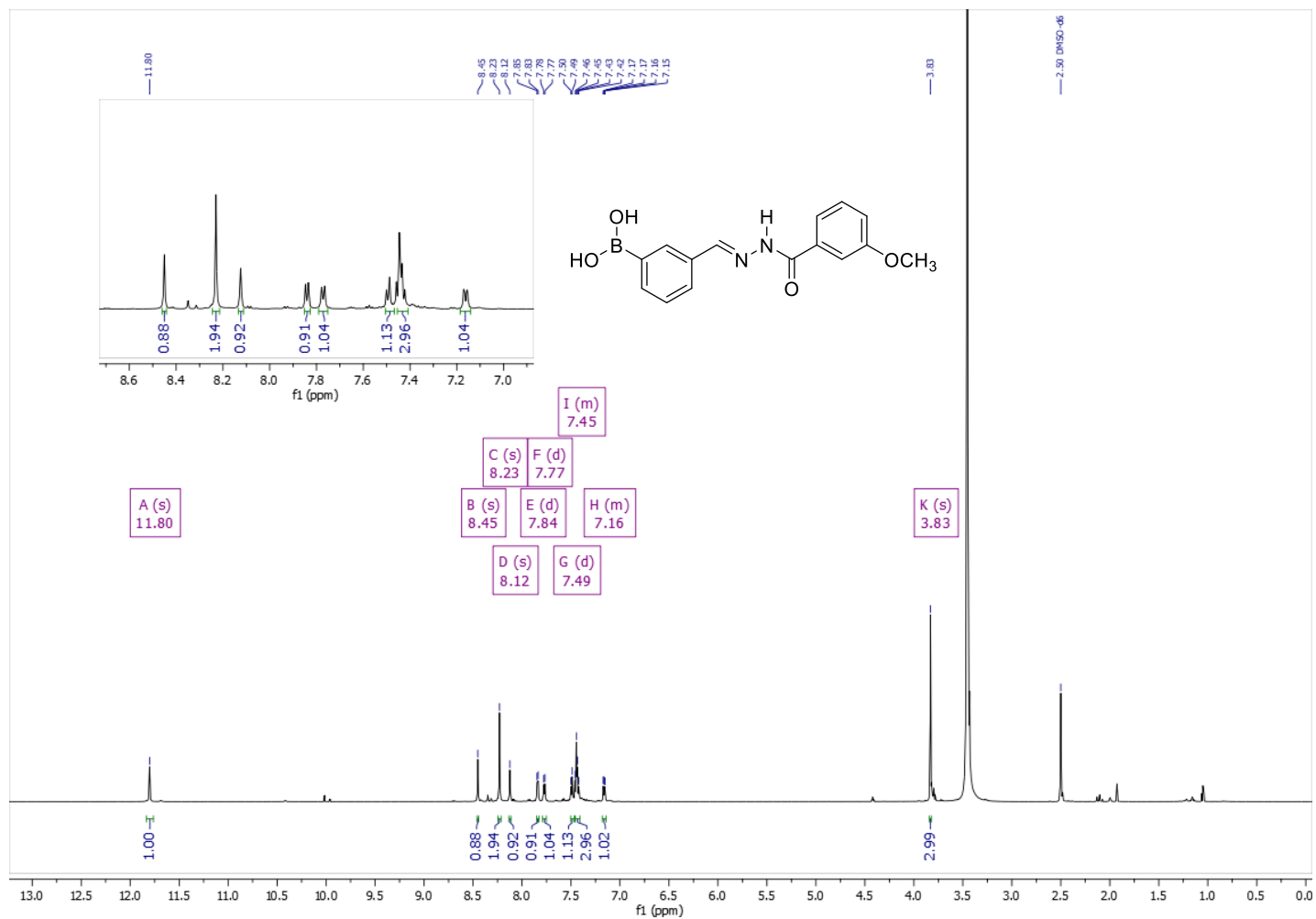
Espectro 157. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (*E*)-(3-((2-(4-metoxibenzoil)hidrazono)metil)fenil)borônico



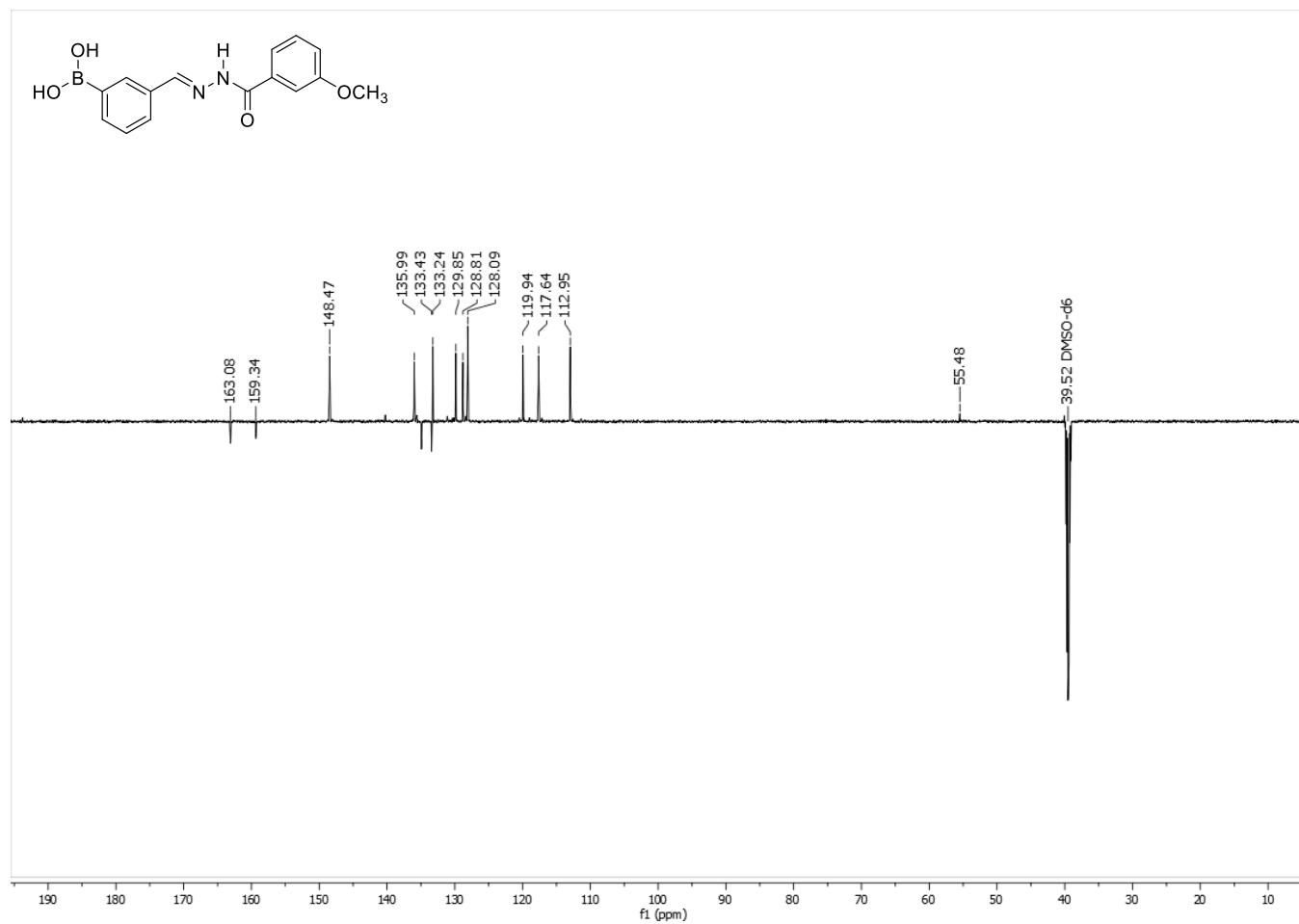
Espectro 158. Mapa de contorno de HMBC (DMSO-d₆, 600 MHz) do composto ácido (*E*)-(3-((2-(4-metoxibenzoil)hidrazono)metil)fenil)borônico



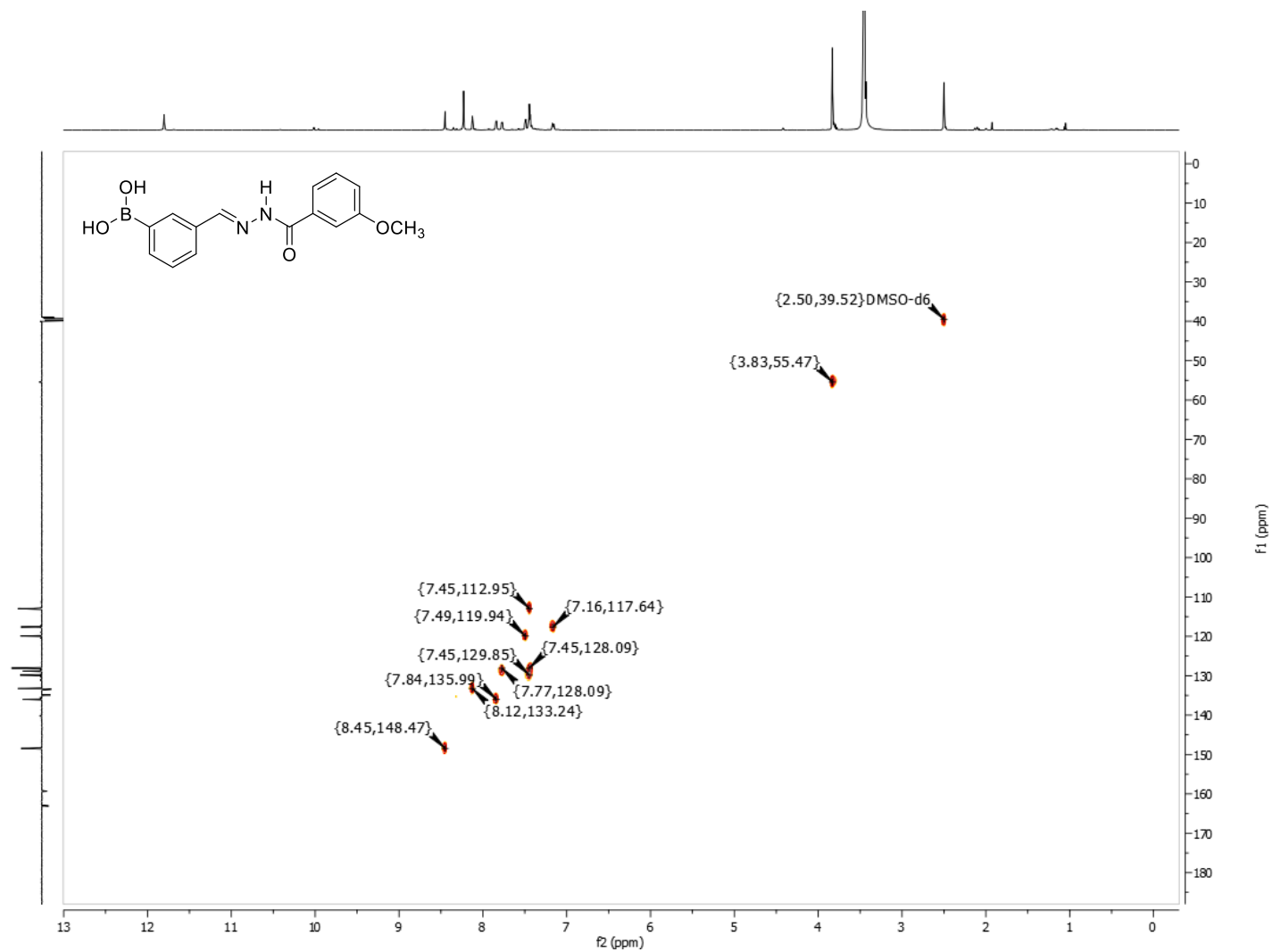
Espectro 159. RMN de ^1H (DMSO- d_6 , 600 MHz) do composto ácido (*E*)-3-((2-(3-metoxibenzoil)hidrazono)metil)fenil)borônico



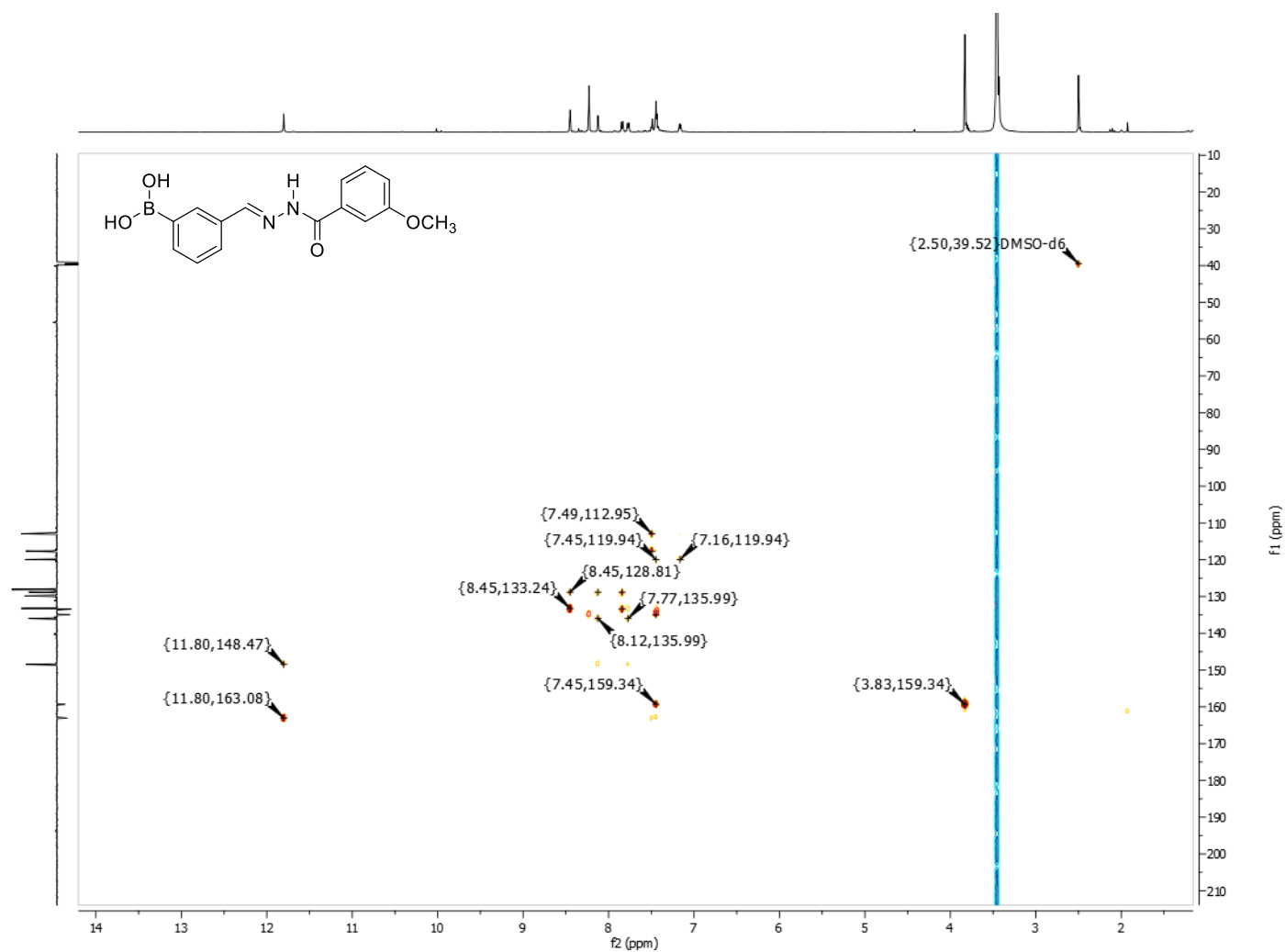
Espectro 160. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do composto ácido (*E*)-(3-((2-(3-metoxibenzoil)hidrazono)metil)fenil)borônicov

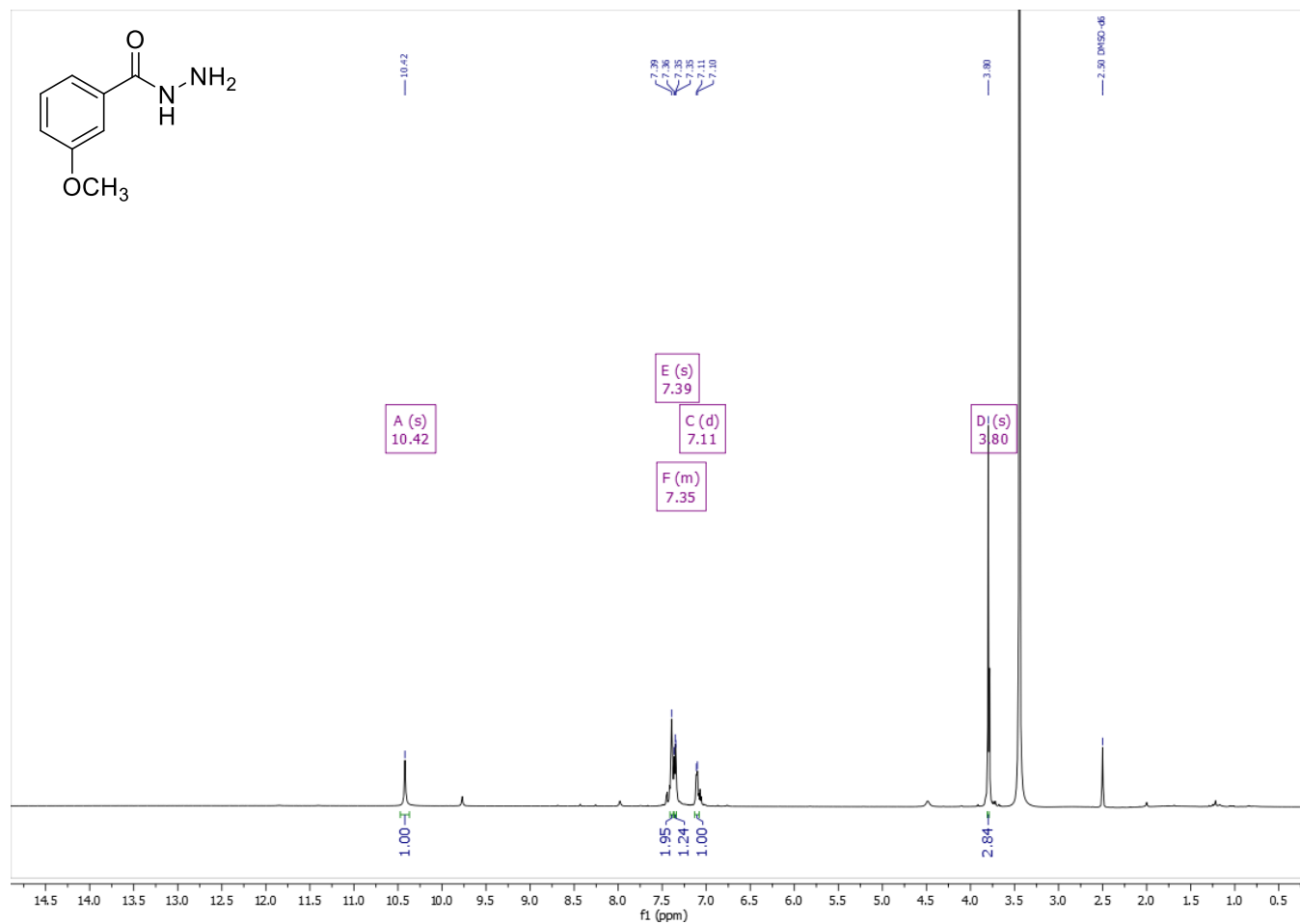


Espectro 161. Mapa de contorno de HSQC (DMSO-d₆, 600 MHz) do composto ácido (*E*)-(3-((2-(3-metoxibenzoil)hidrazono)metil)fenil)borônico

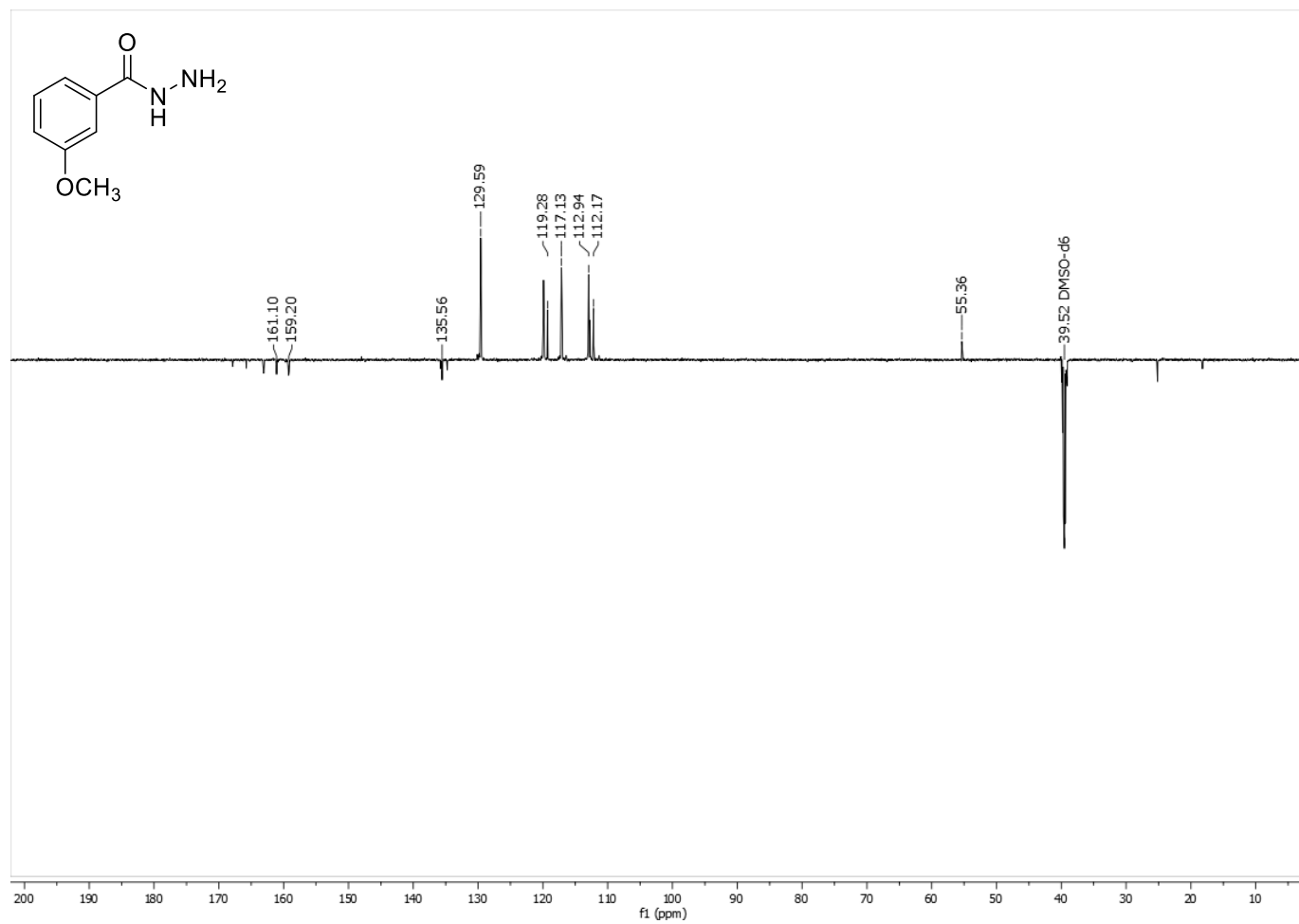


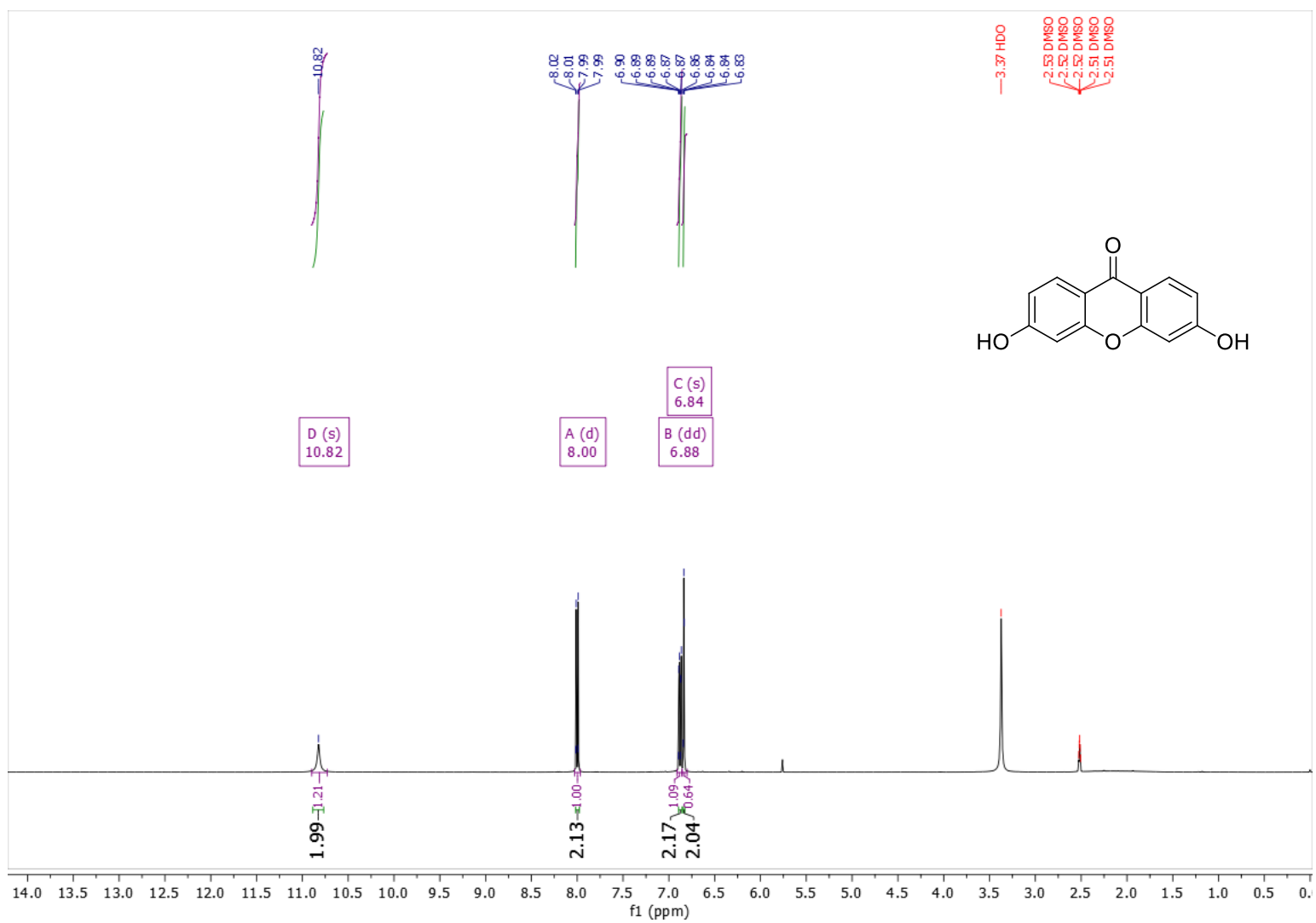
Espectro 162. Mapa de contorno de HMBC (DMSO-d₆, 600 MHz) do composto ácido (*E*)-(3-((2-(3-metoxibenzoil)hidrazono)metil)fenil)borônico

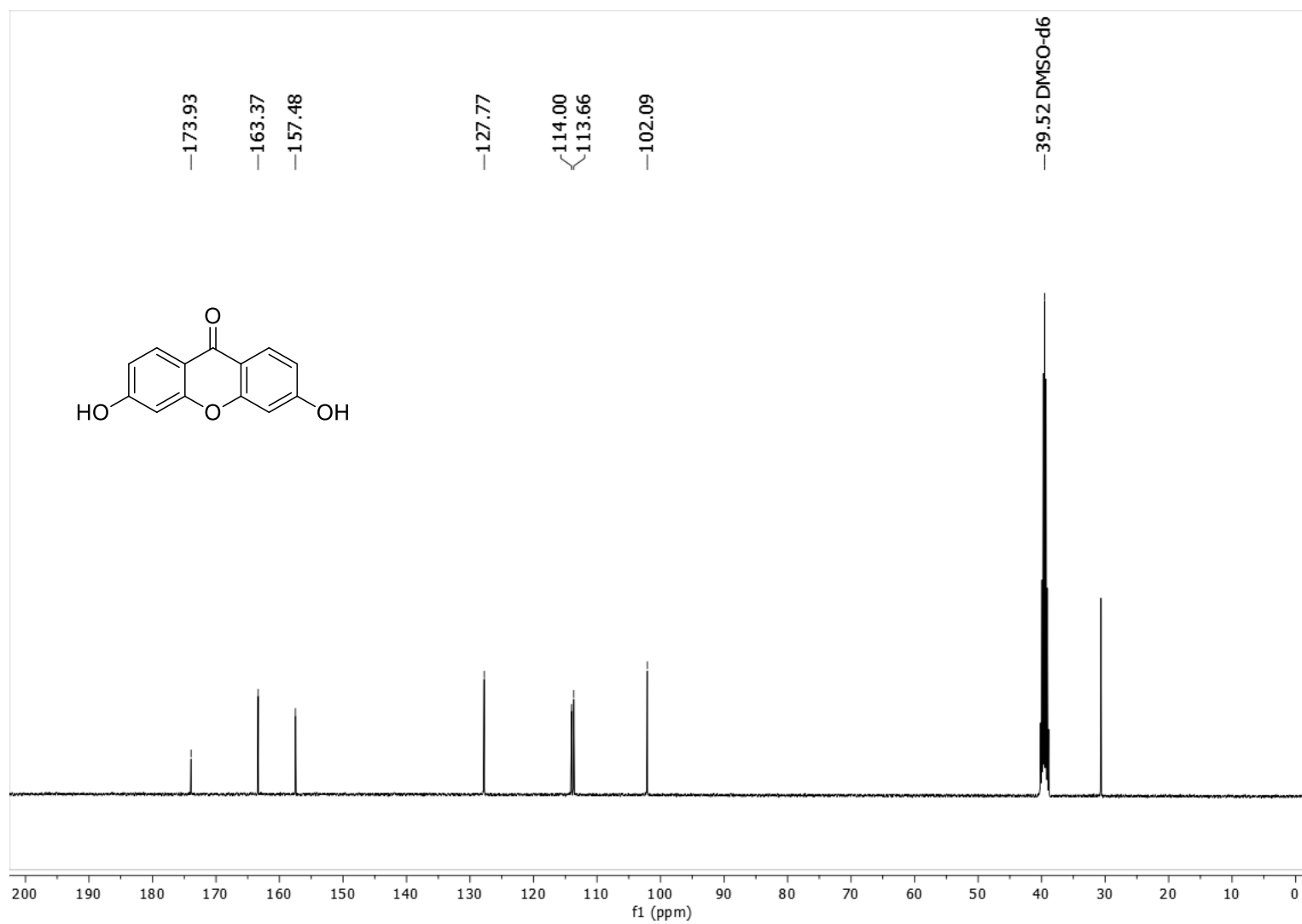


Espectro 163. RMN de ^1H (DMSO- d_6 , 600 MHz) do intermediário 3-metoxibenzohidrazida

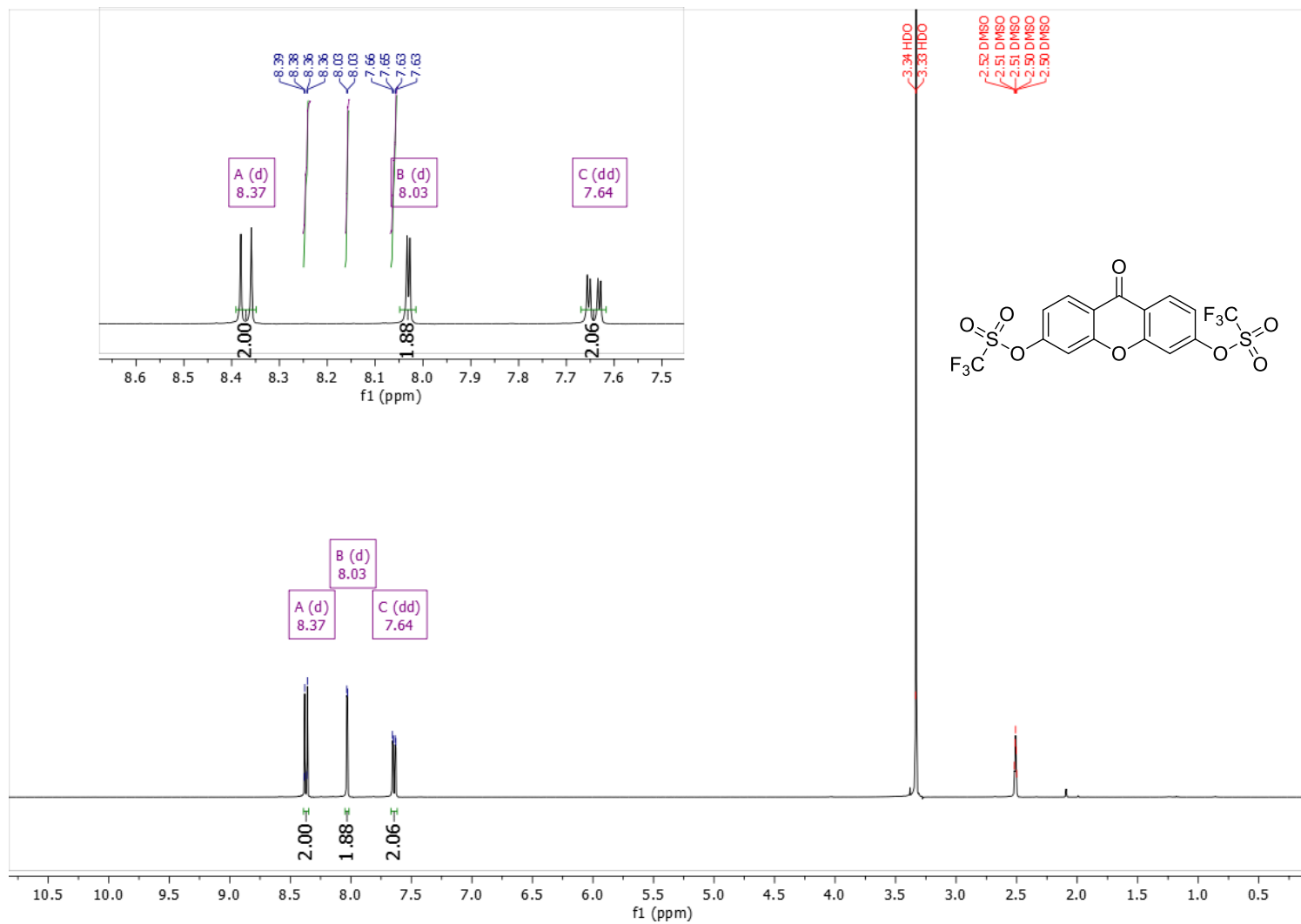
Espectro 164. RMN de DEPT-Q (DMSO-d₆, 150 MHz) do intermediário 3-metoxibenzohidrazida



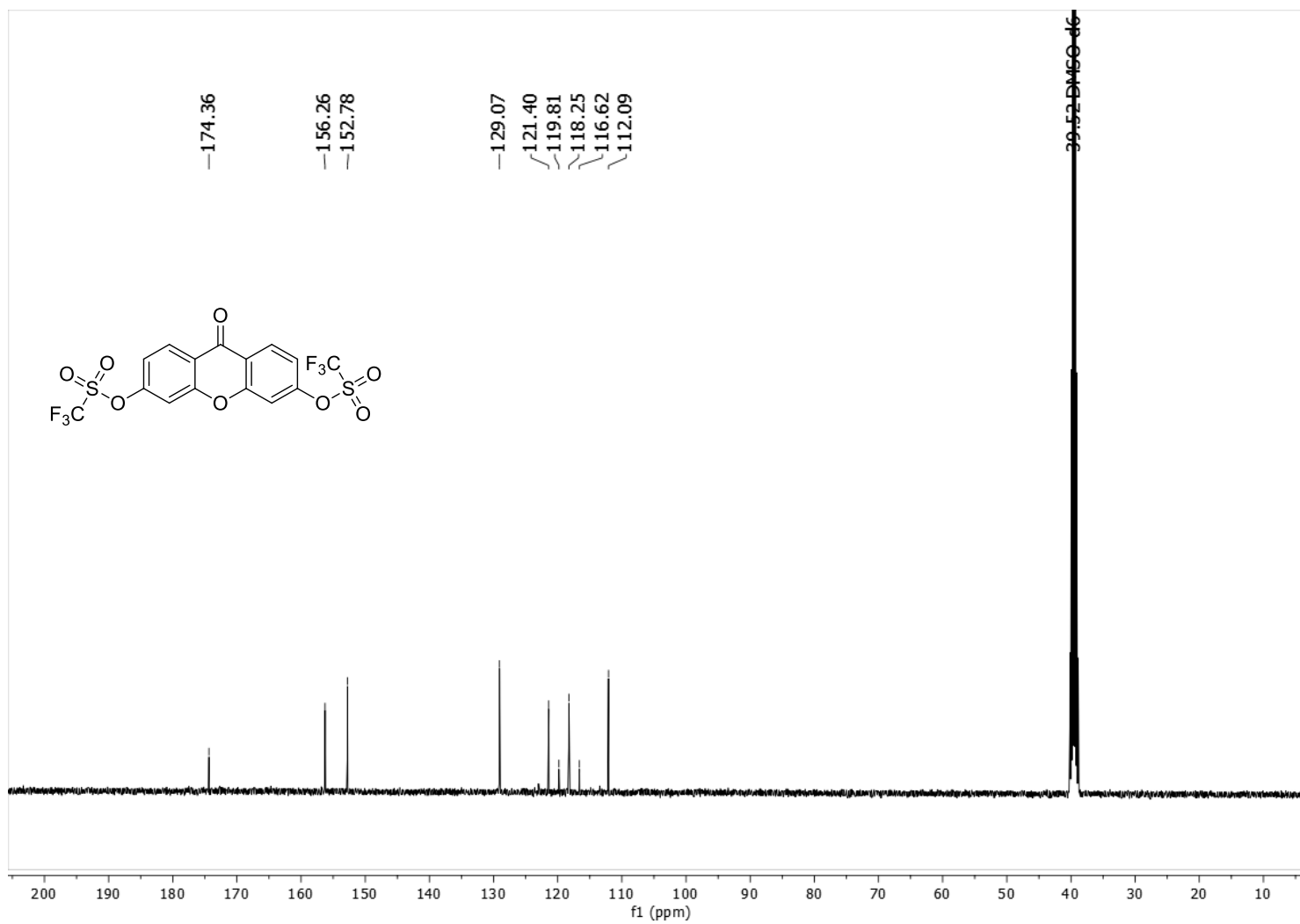
Espectro 165. RMN de ^1H (DMSO- d_6 , 600 MHz) do intermediário 3,6-dihidroxi-9H-xanten-9-ona

Espectro 166. RMN de ^{13}C (DMSO- d_6 , 600 MHz) do intermediário 3,6-dihidroxi-9H-xanten-9-ona

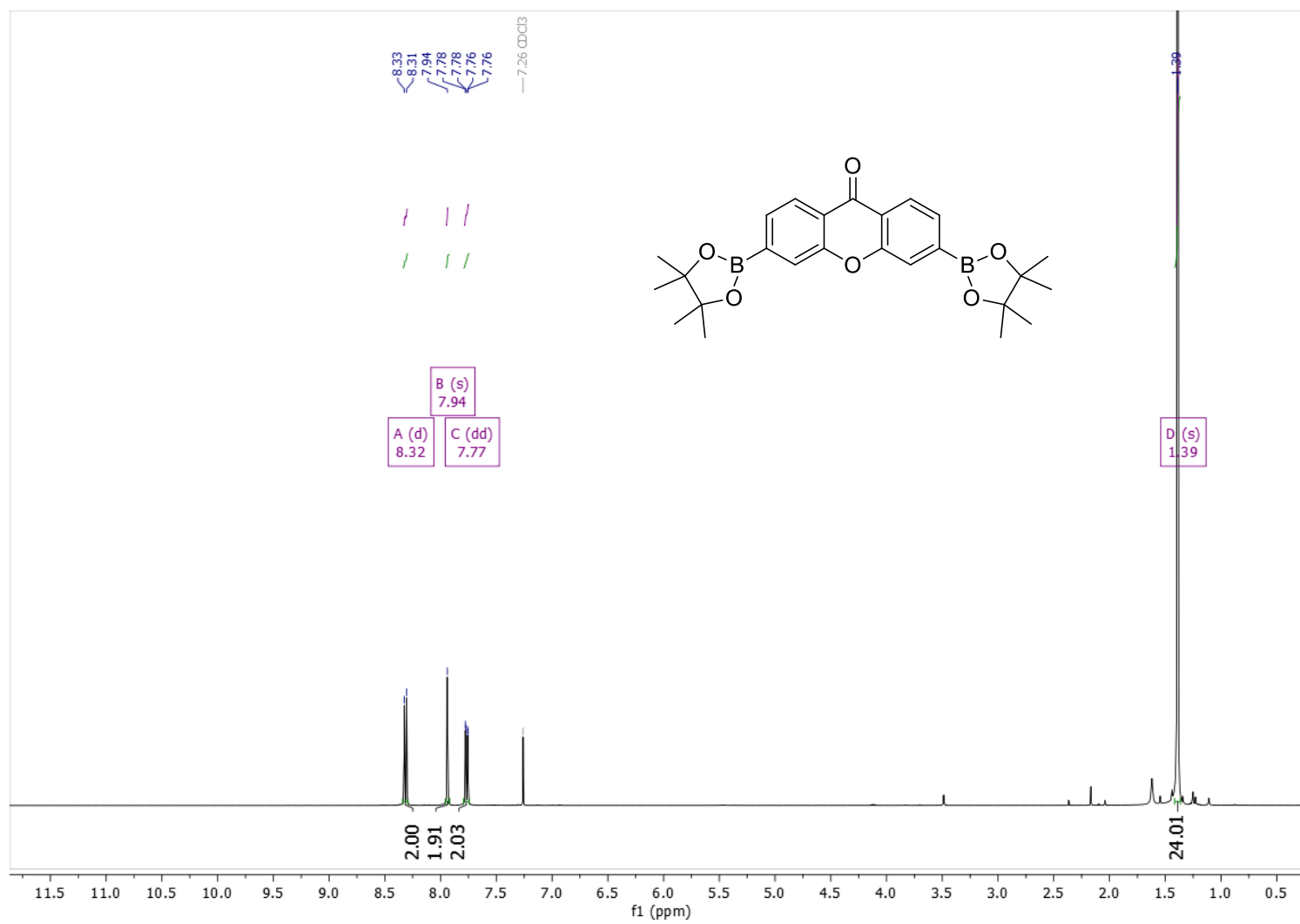
Espectro 167. RMN de ^1H (DMSO- d_6 , 600 MHz) do intermediário 9-oxo-9H-xanteno-3,6-diil bis(trifluorometanossulfonato)



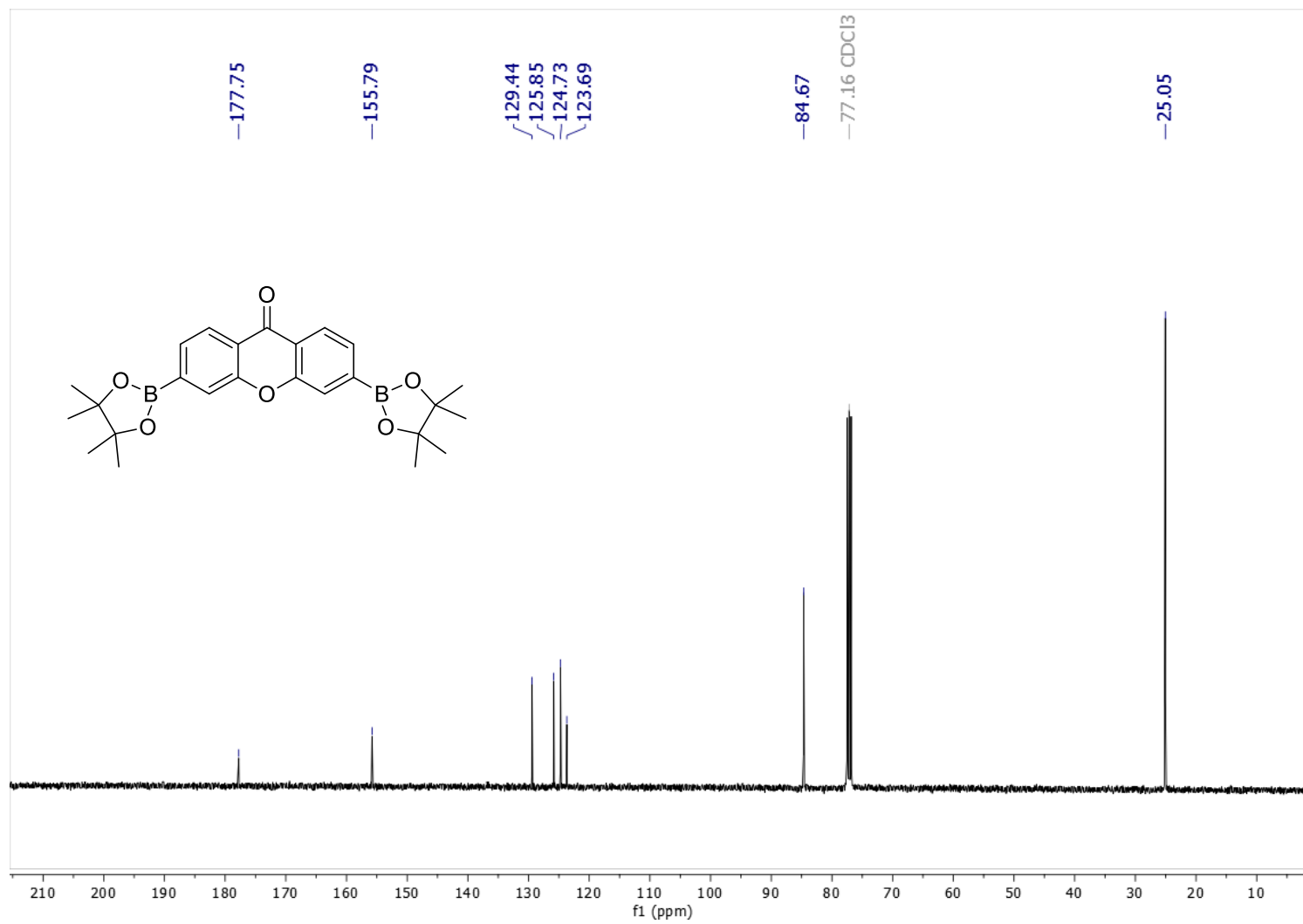
Espectro 168. RMN de ^{13}C (DMSO- d_6 , 600 MHz) do intermediário 9-oxo-9H-xanteno-3,6-diil bis(trifluorometanossulfonato)



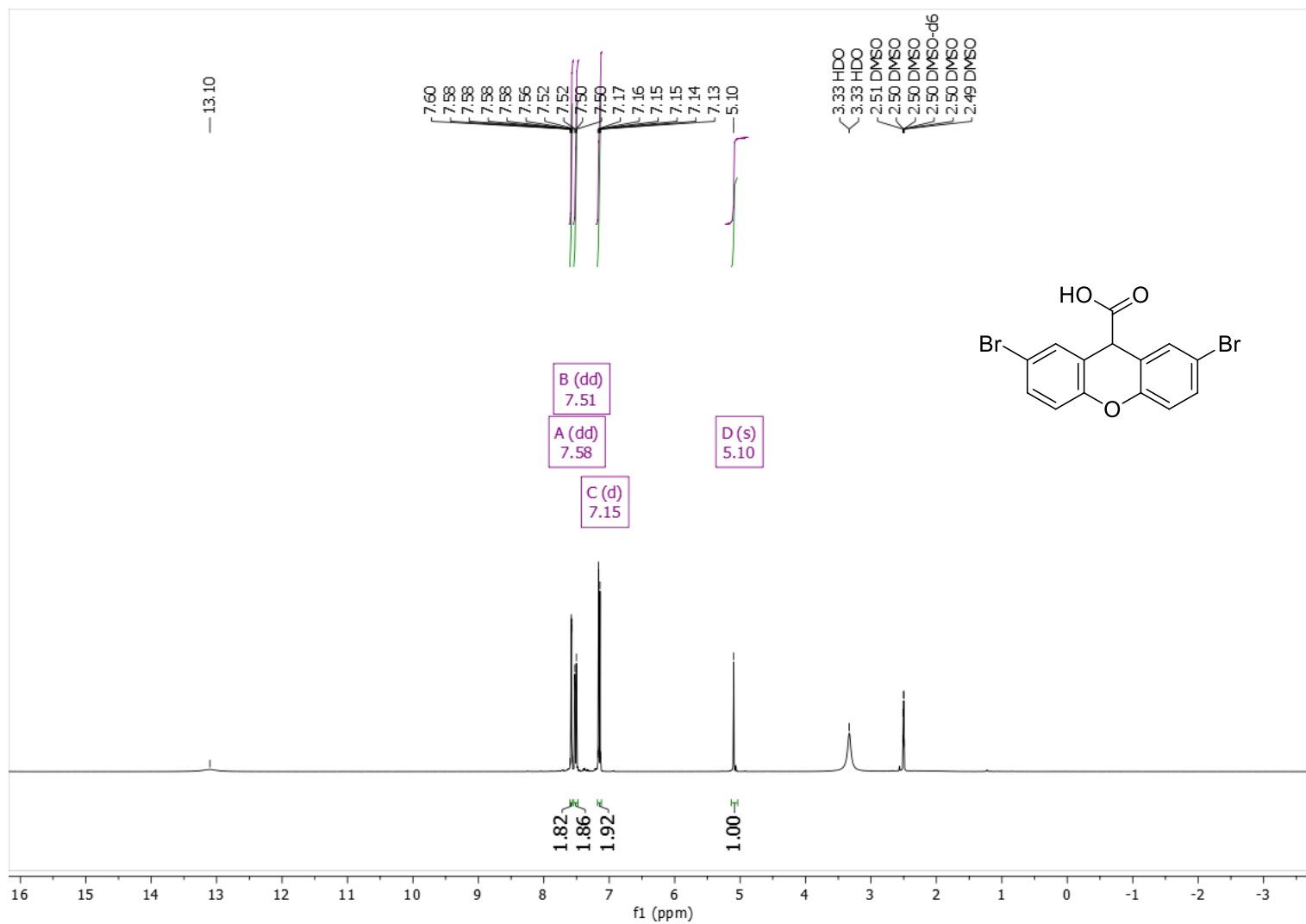
Espectro 169. RMN de ^1H (CDCl_3 , 600 MHz) do intermediário 3,6-bis(4,4,5,5-tetrametil-1,3,2-dioxaborolan-2-il)-9H-xanten-9-ona



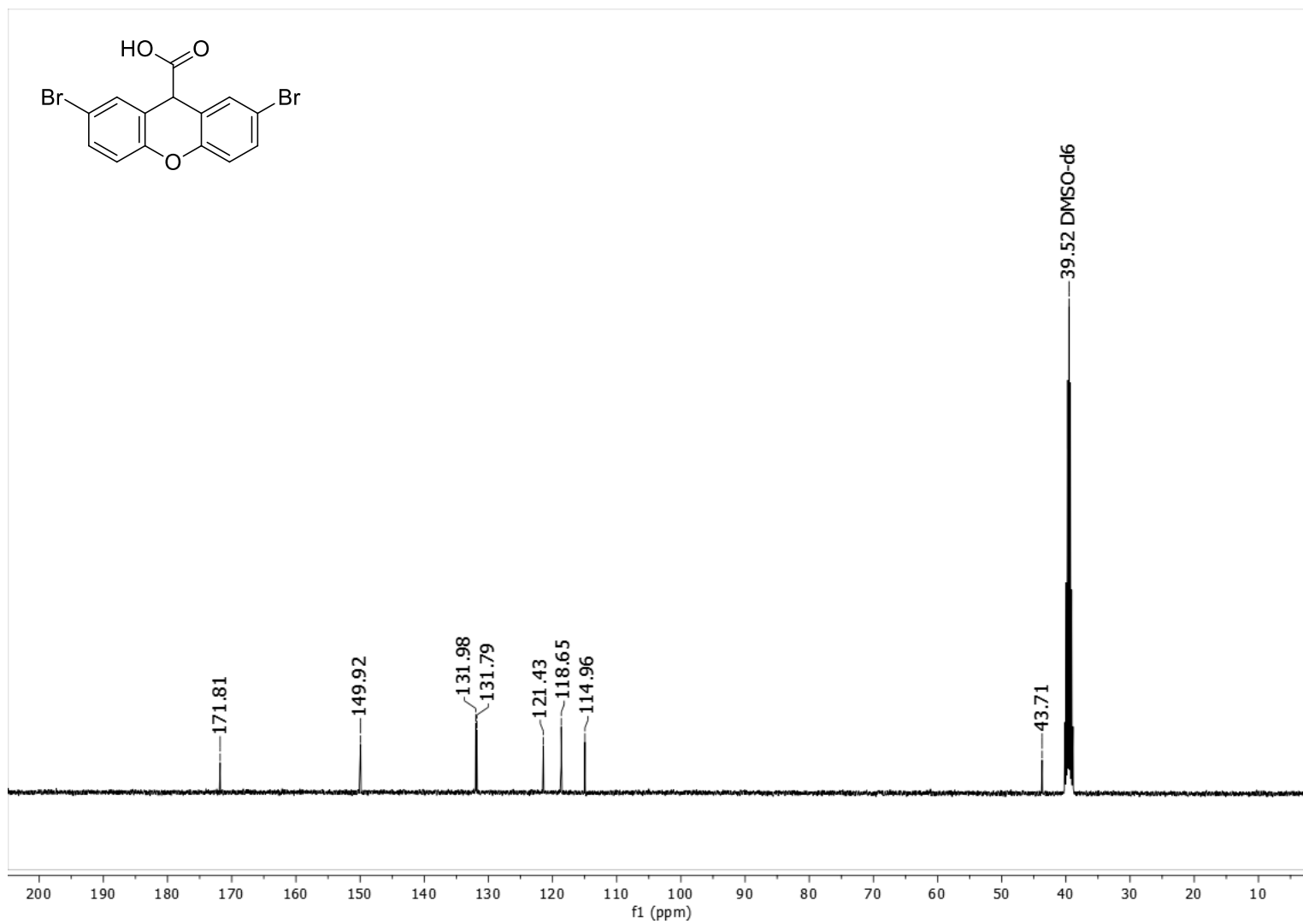
Espectro 170. RMN de ^{13}C (CDCl_3 , 400 MHz) do intermediário 3,6-bis(4,4,5,5-tetrametil-1,3,2-dioxaborolan-2-il)-9H-xanten-9-ona



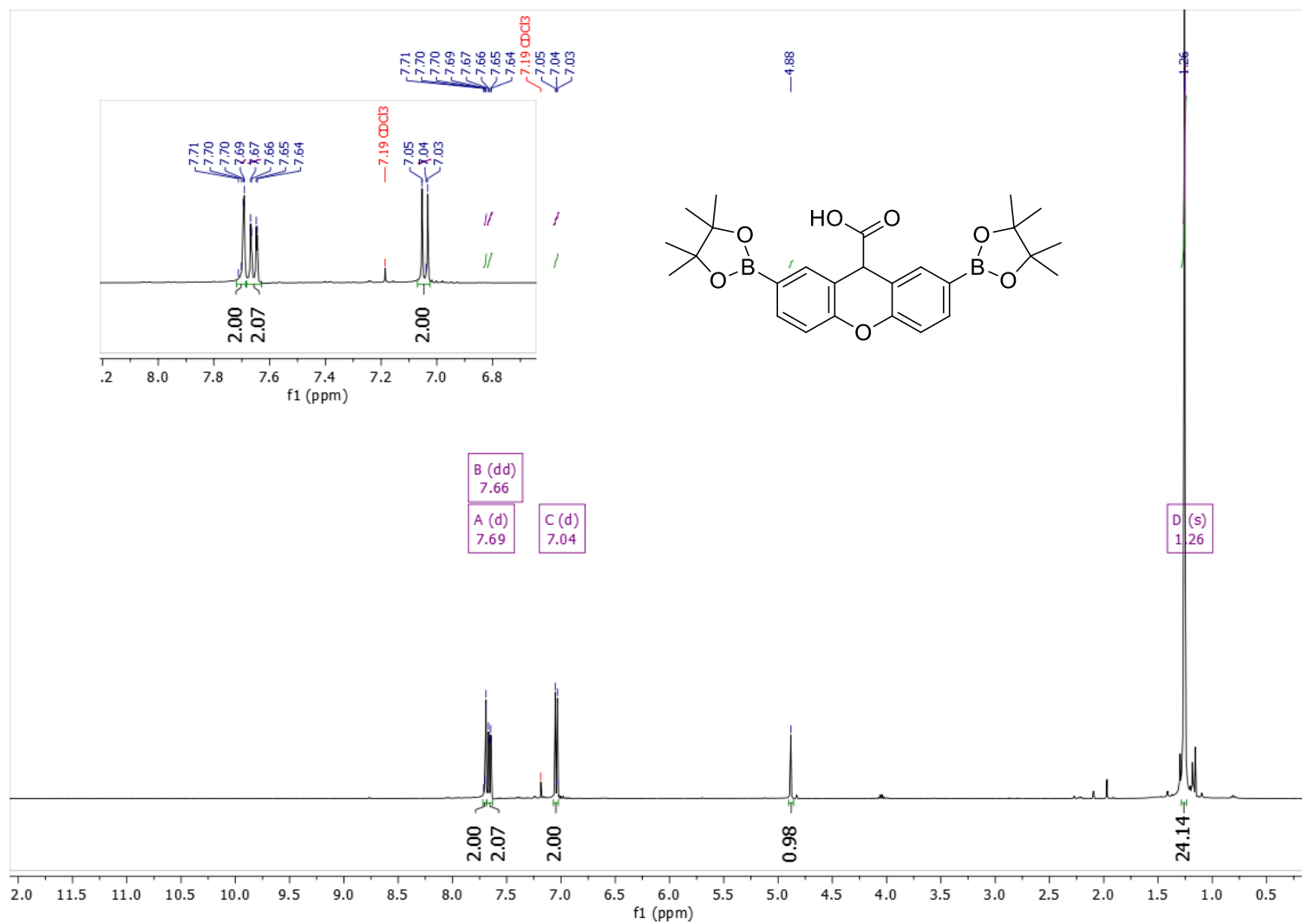
Espectro 171. RMN de ^1H (CDCl_3 , 400 MHz) do intermediário ácido 2,7-dibromo-9H-xanteno-9-carboxílico



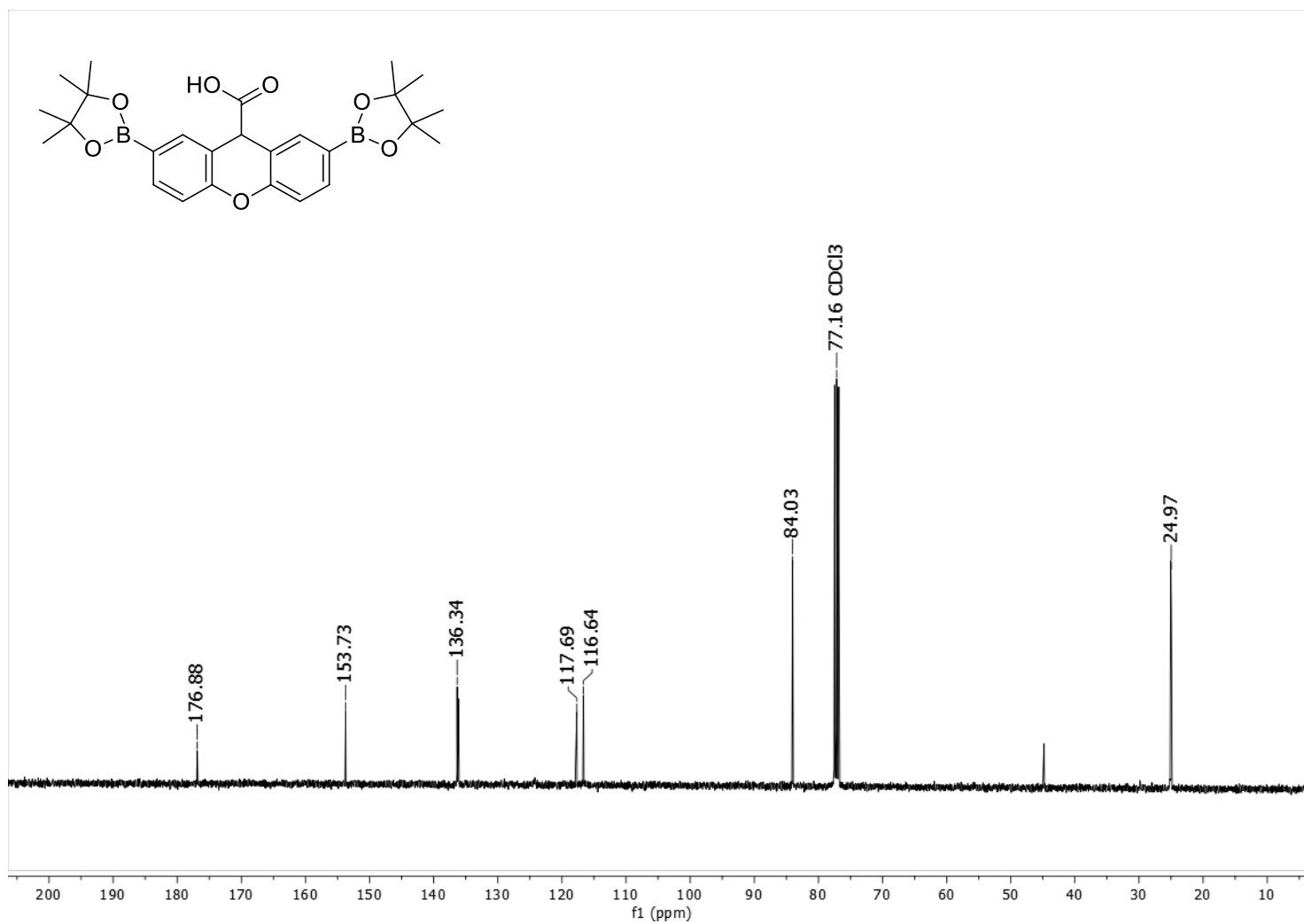
Espectro 172. RMN de ^{13}C (CDCl_3 , 400 MHz) do intermediário ácido 2,7-dibromo-9H-xanteno-9-carboxílico



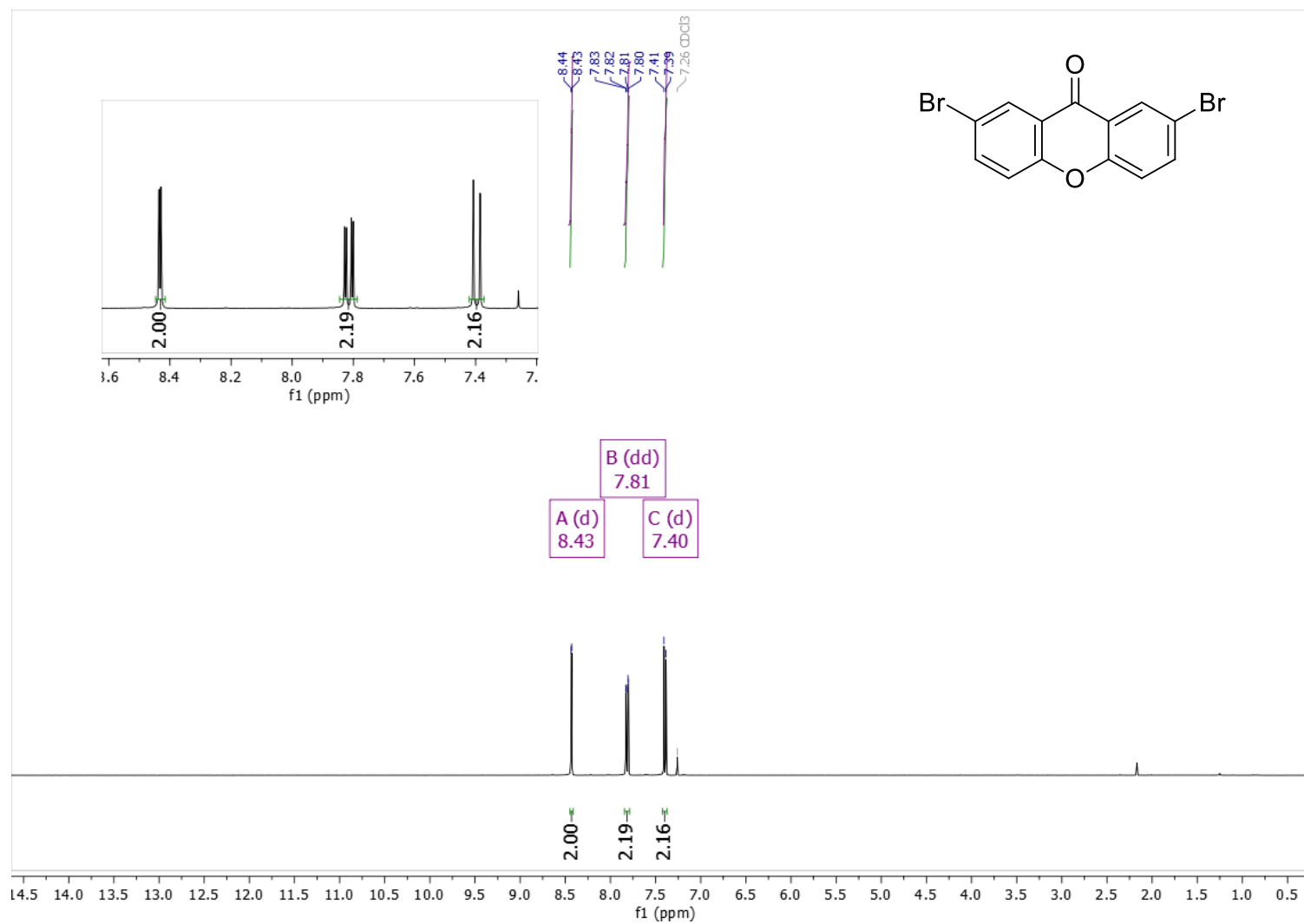
Espectro 173. RMN de ^1H (CDCl_3 , 400 MHz) do intermediário ácido 2,7-bis(4,4,5,5-tetrametil-1,3,2-dioxaborolan-2-il)-9H-xanteno-9-carboxílico



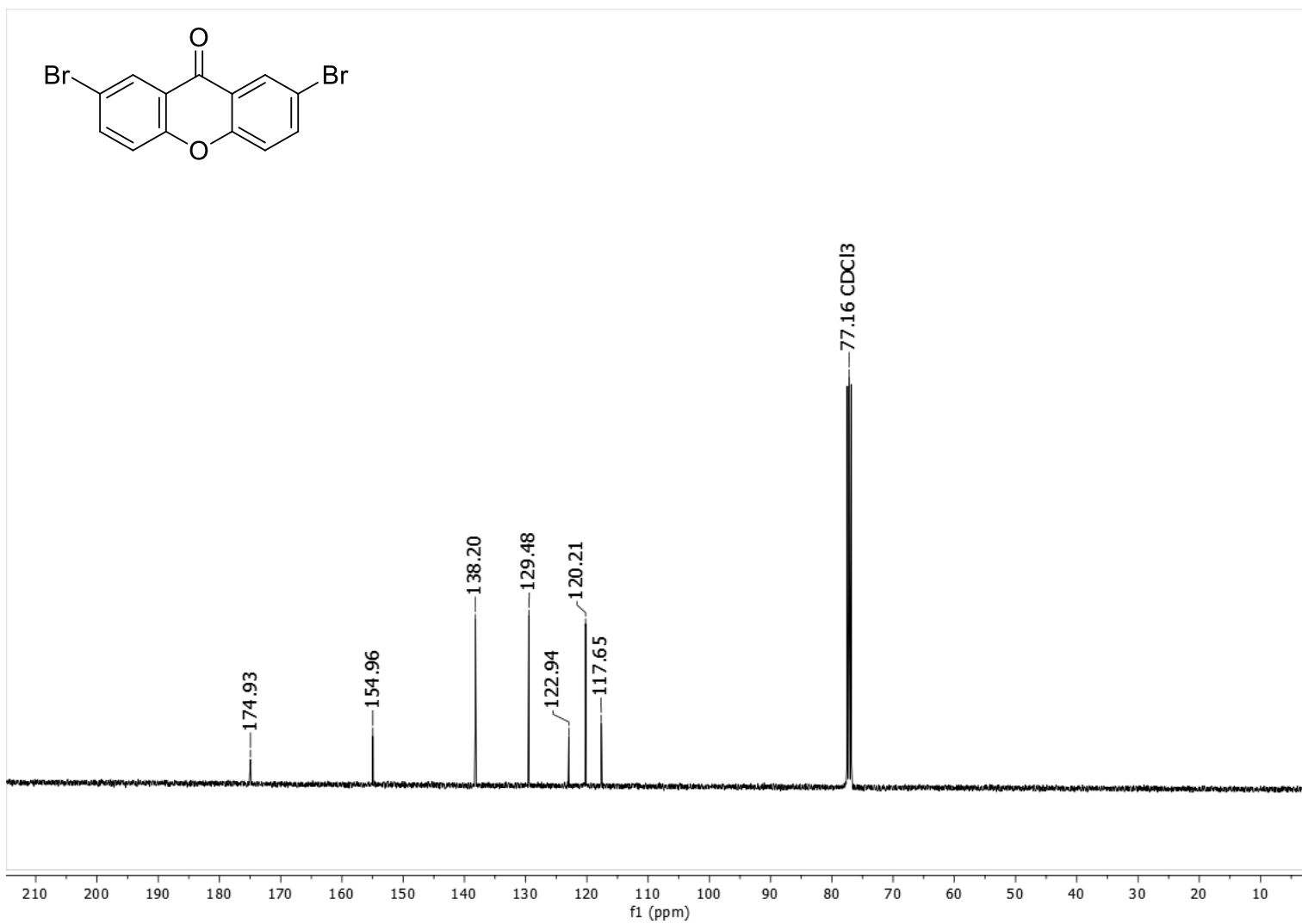
Espectro 174. RMN de ^{13}C (CDCl_3 , 400 MHz) do intermediário ácido 2,7-bis(4,4,5,5-tetrametil-1,3,2-dioxaborolan-2-il)-9H-xanteno-9-carboxílico



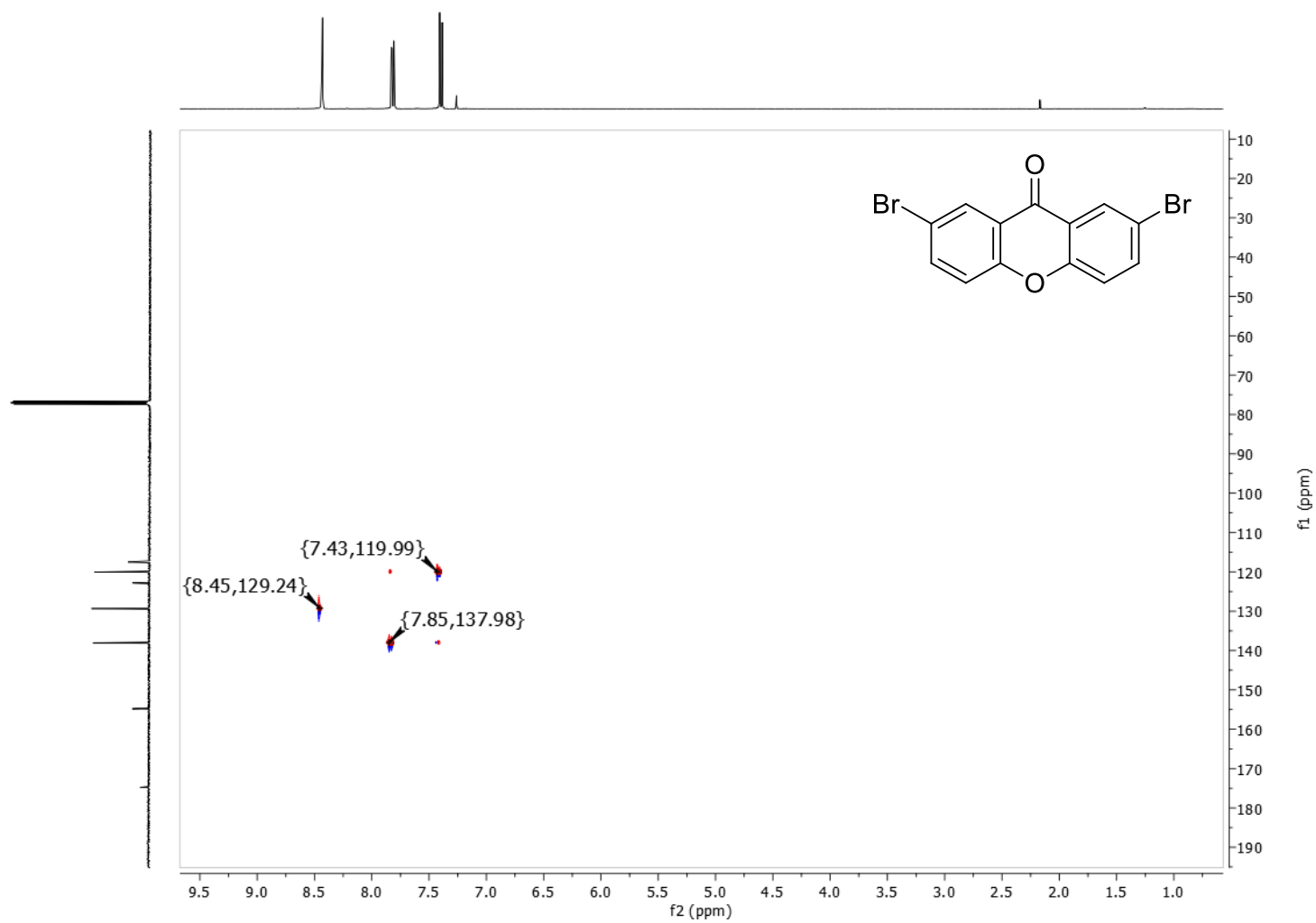
Espectro 175. RMN de ^1H (CDCl_3 , 400 MHz) do intermediário 2,7-dibromo-9H-xanteno-9-ona



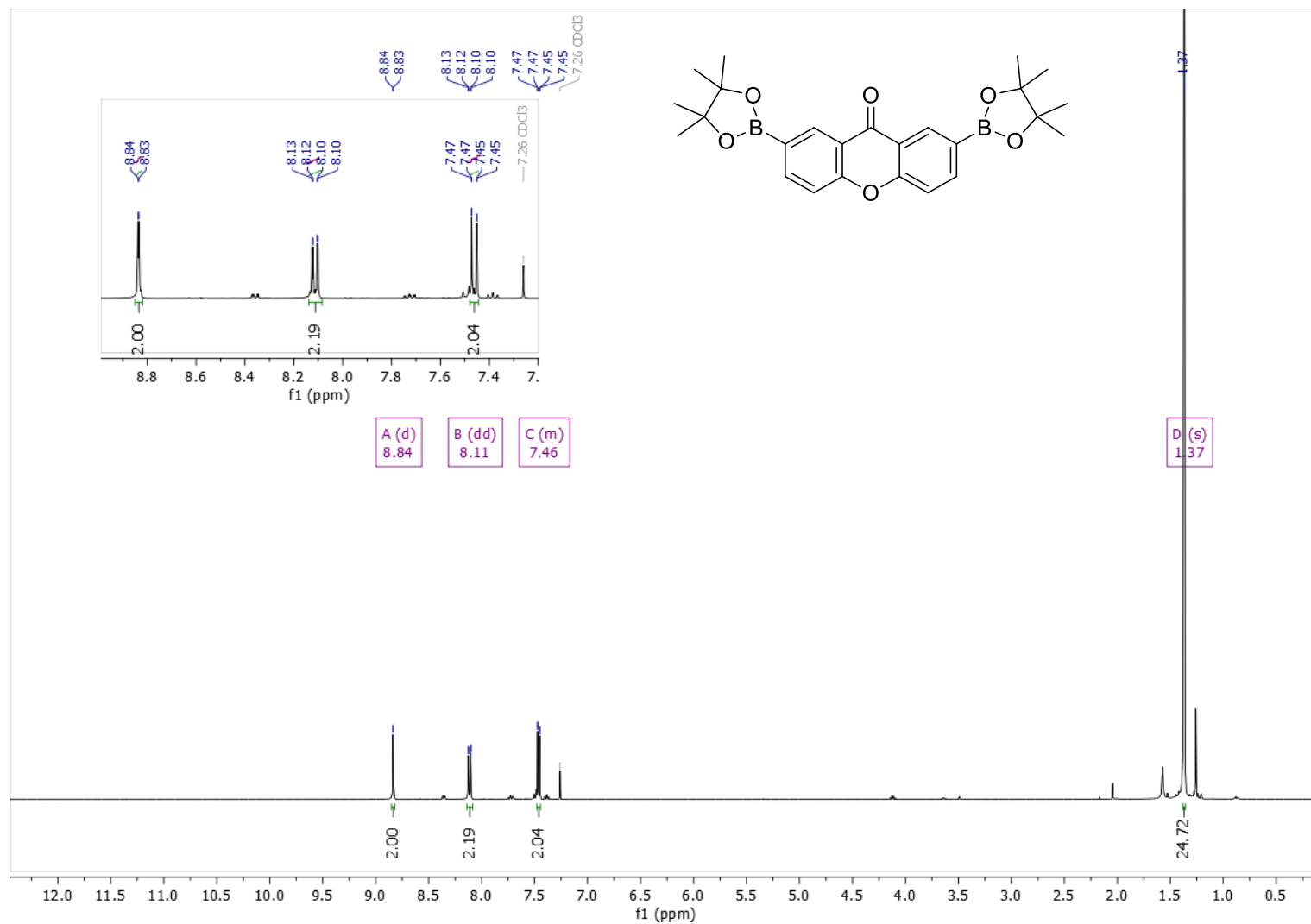
Espectro 176. RMN de ^{13}C (CDCl_3 , 400 MHz) do intermediário 2,7-dibromo-9H-xanteno-9-ona



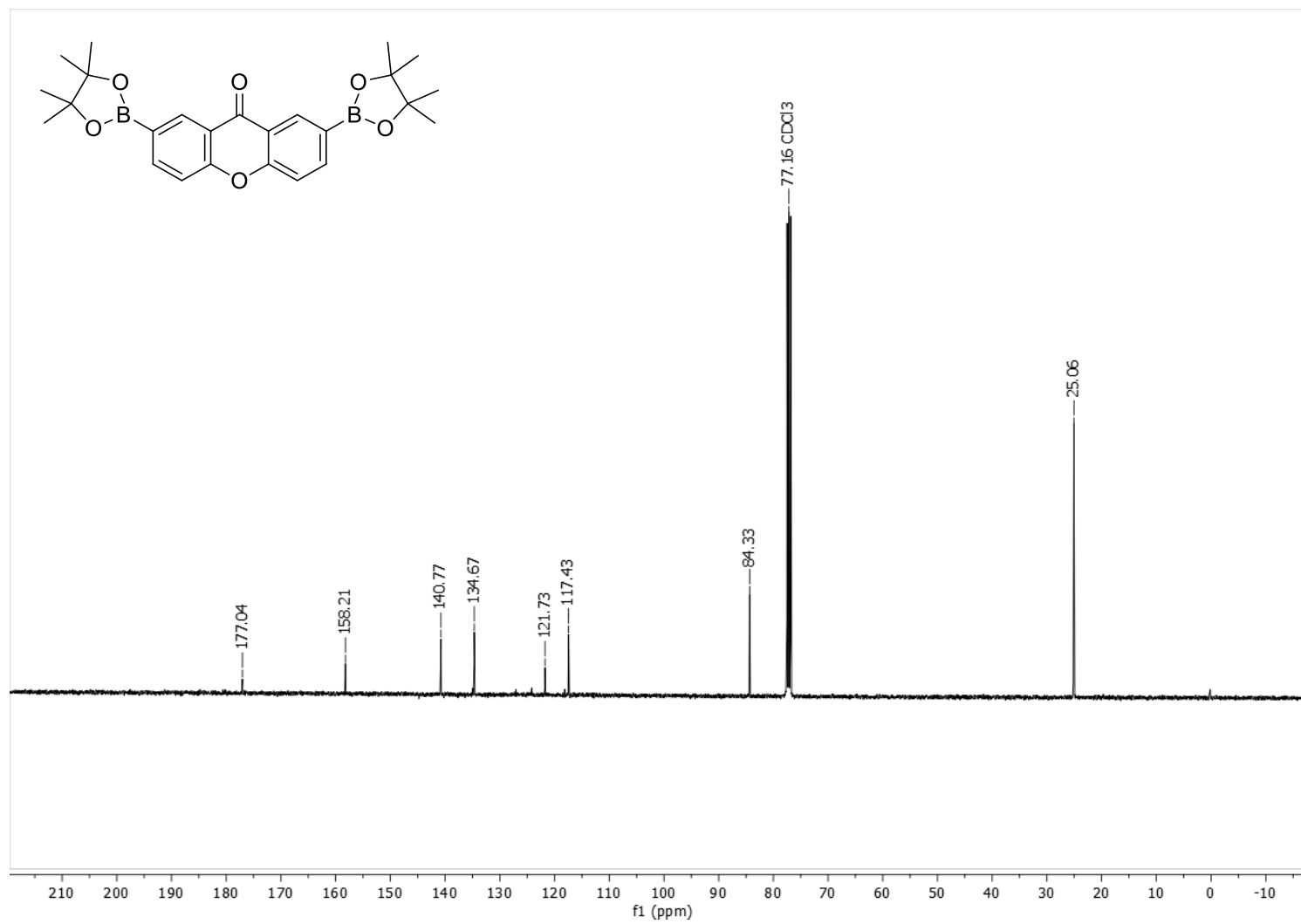
Espectro 177. Mapa de contorno de HSQC (CDCl_3 , 400 MHz) do intermediário 2,7-dibromo-9H-xanteno-9-ona

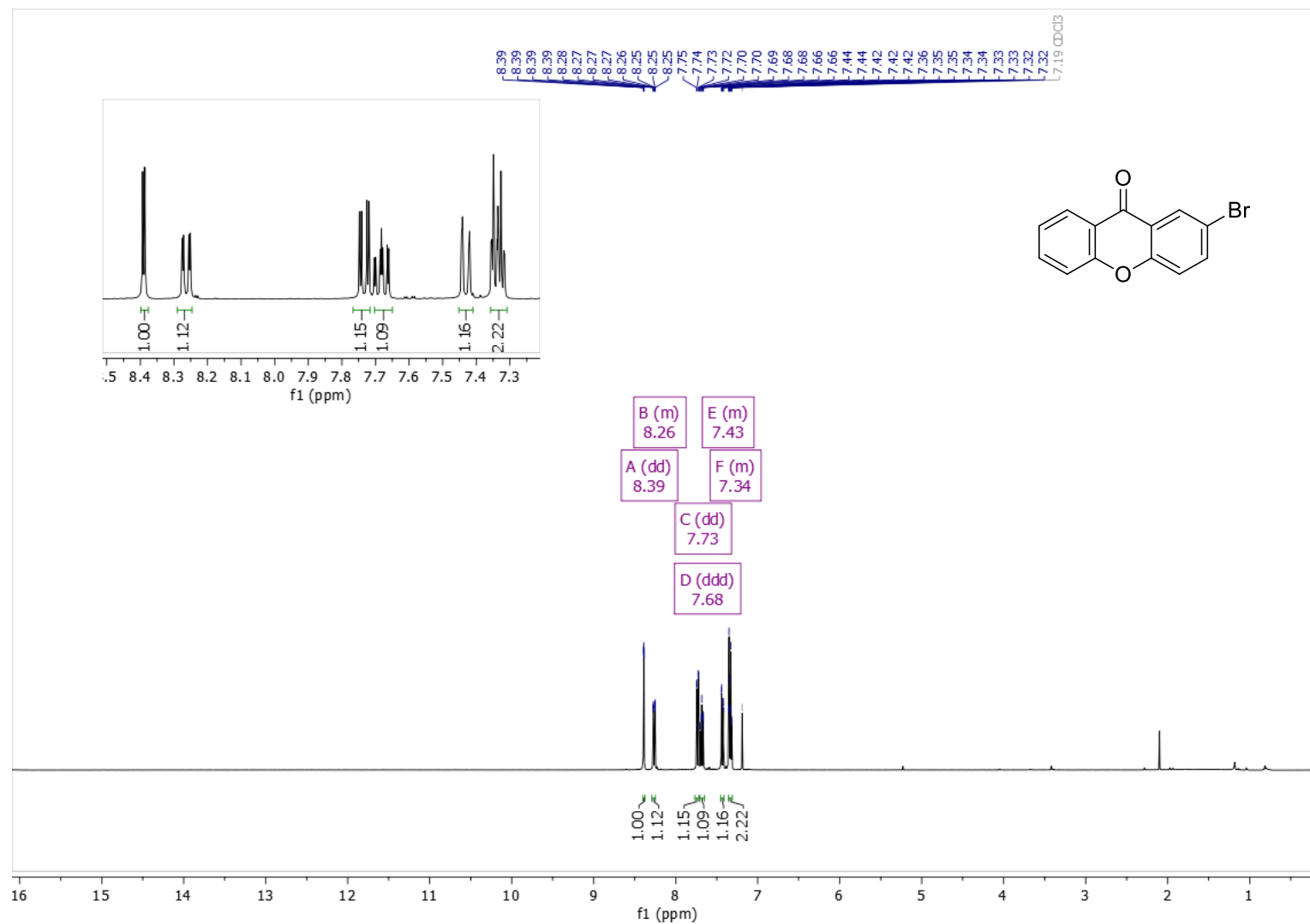


Espectro 178. RMN de ^1H (CDCl_3 , 400 MHz) do intermediário 2,7-bis(4,4,5,5-tetrametil-1,3,2-dioxaborolan-2-il)-9H-xanten-9-ona

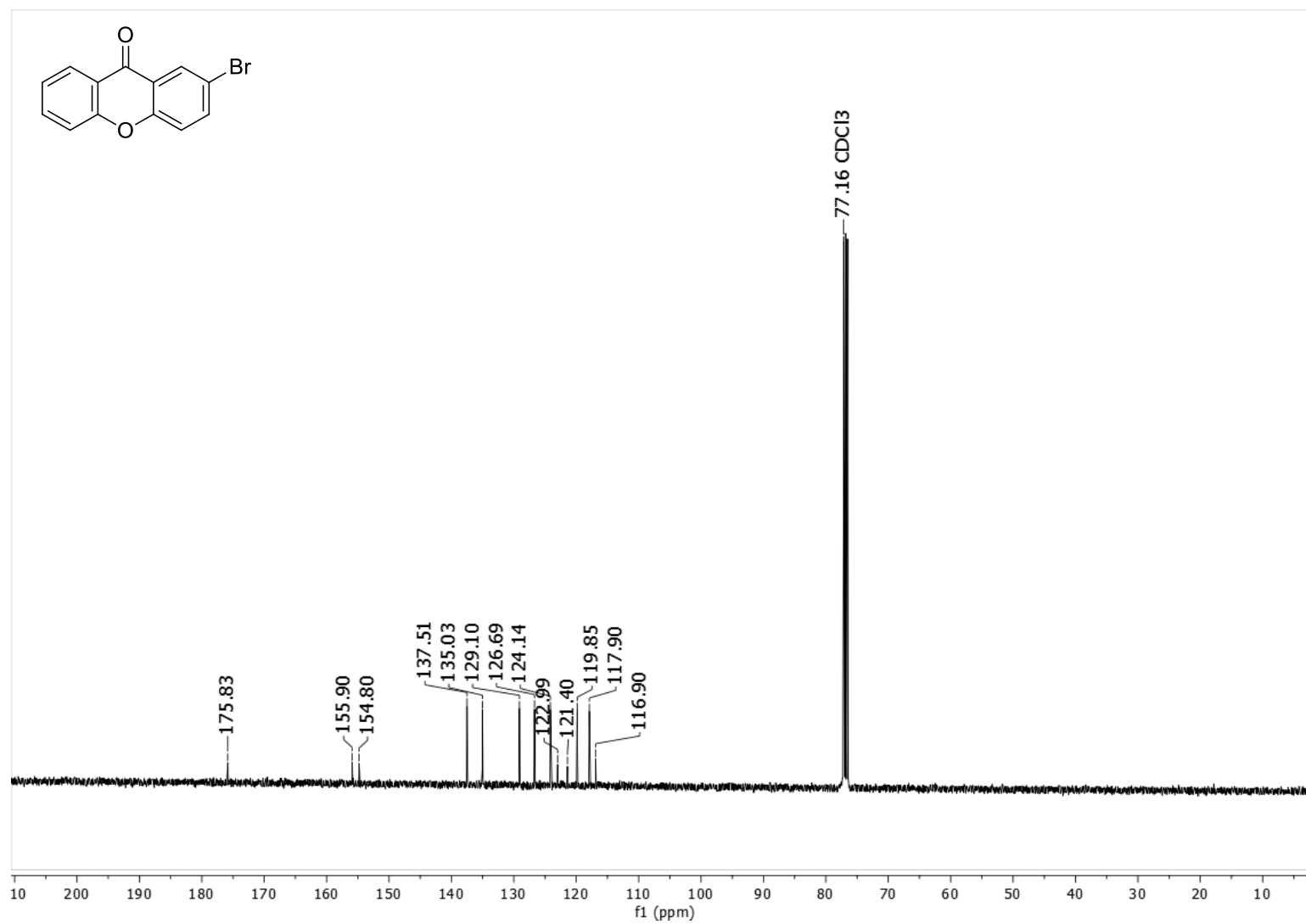


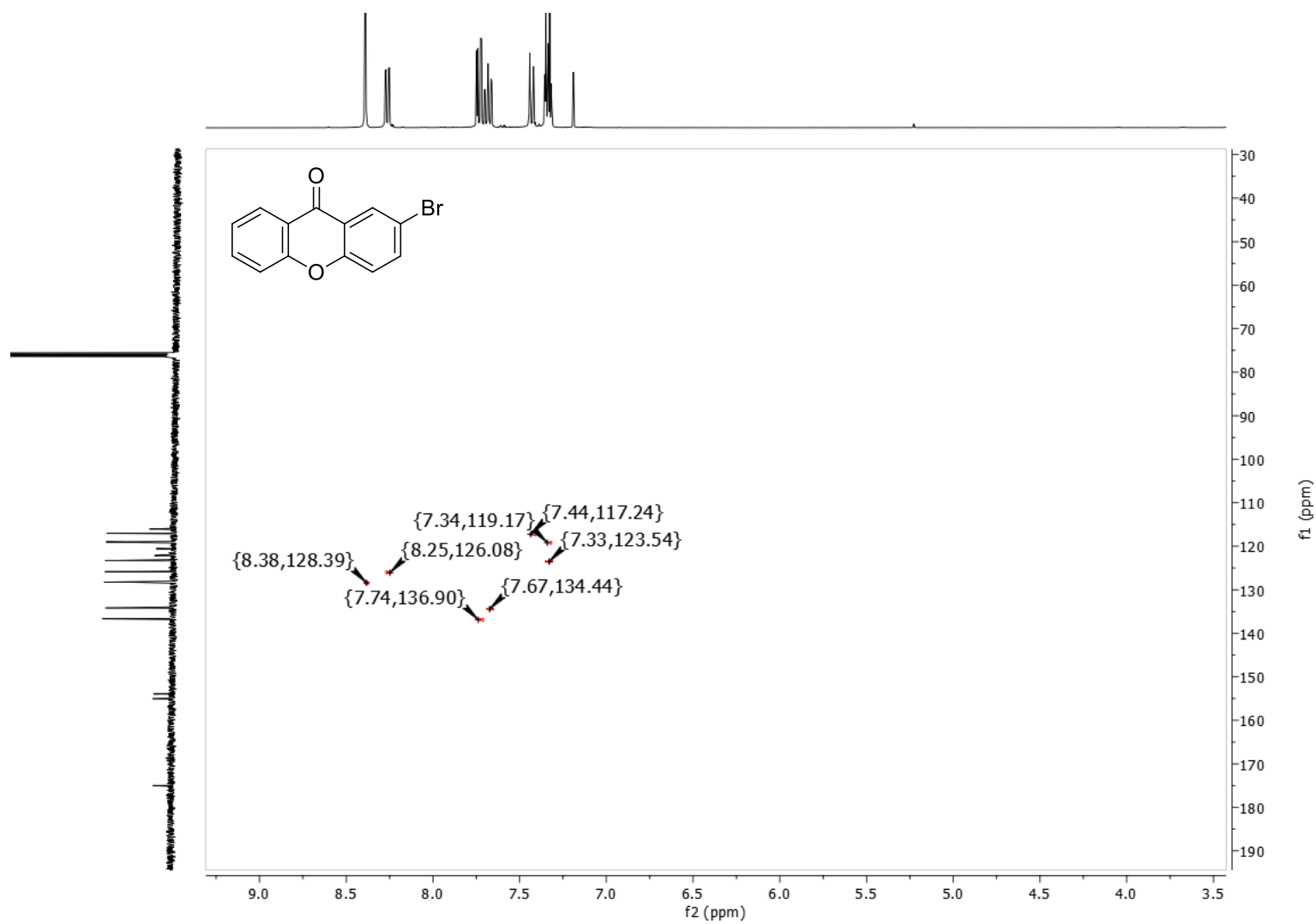
Espectro 179. RMN de ^{13}C (CDCl_3 , 400 MHz) do intermediário 2,7-bis(4,4,5,5-tetrametil-1,3,2-dioxaborolan-2-il)-9H-xanten-9-ona

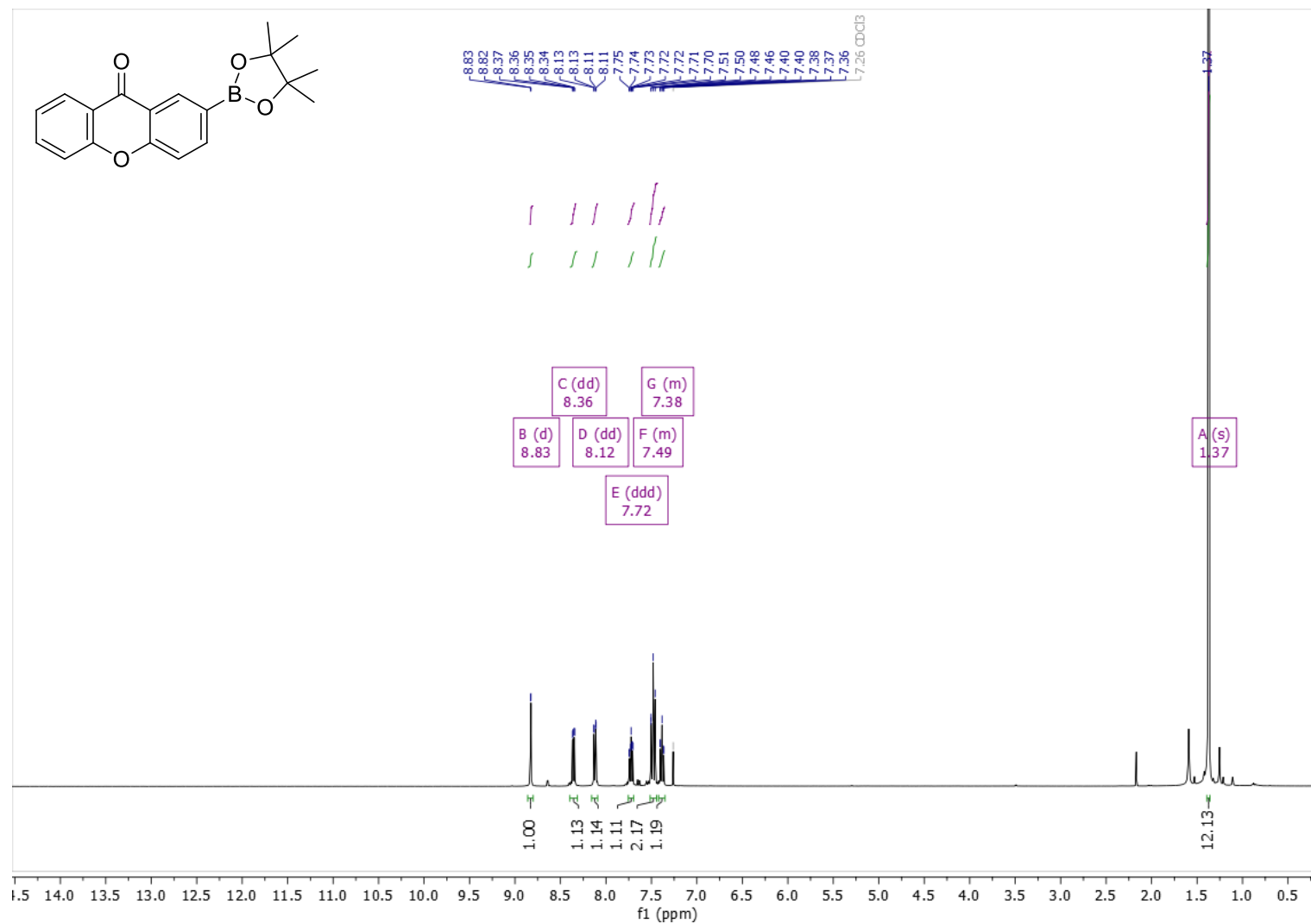


Espectro 180. RMN de ^1H (CDCl_3 , 400 MHz) do intermediário 2-bromo-9H-xanteno-9-ona

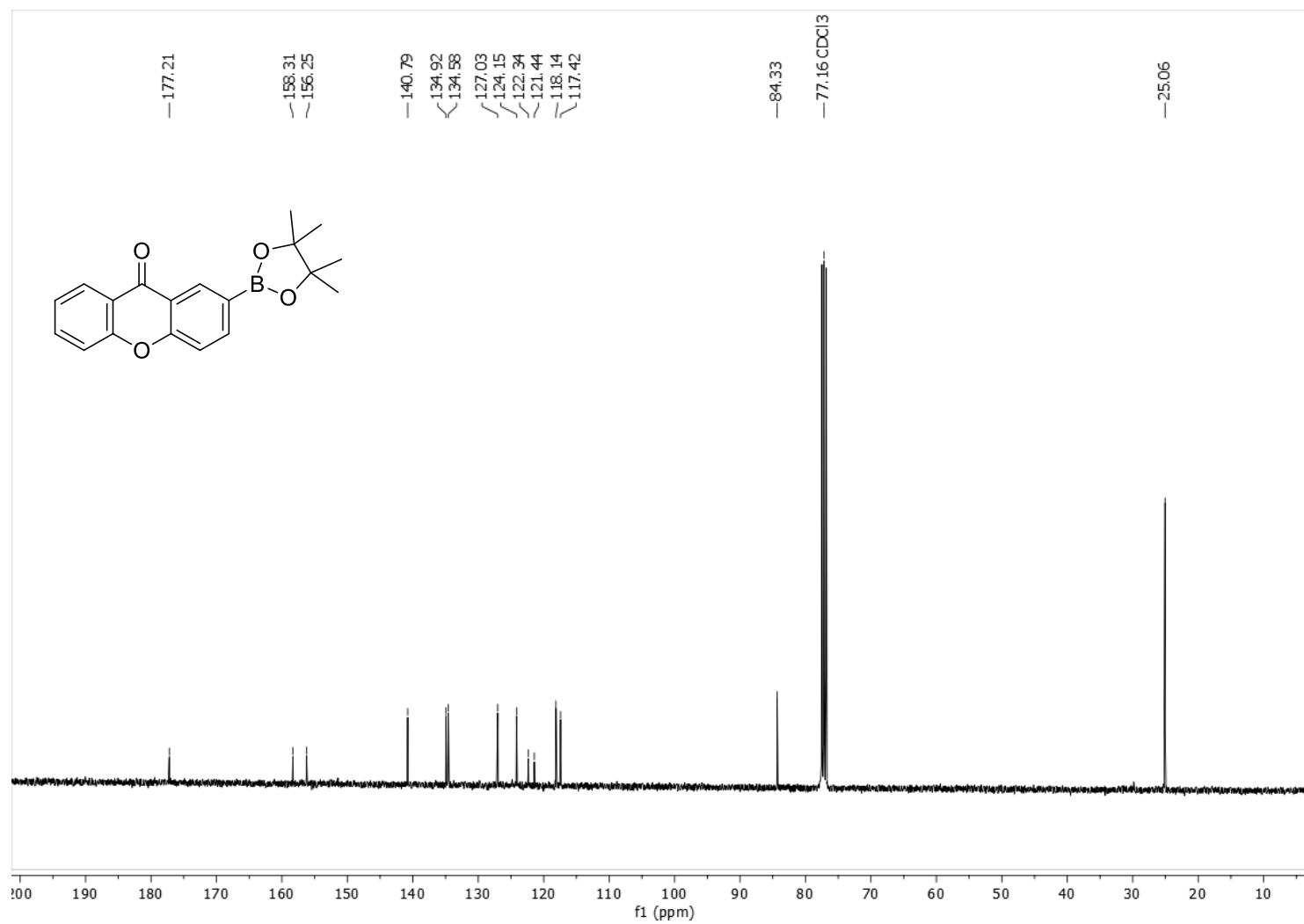
Espectro 181. RMN de ^{13}C (CDCl_3 , 400 MHz) do intermediário 2-bromo-9H-xanteno-9-ona



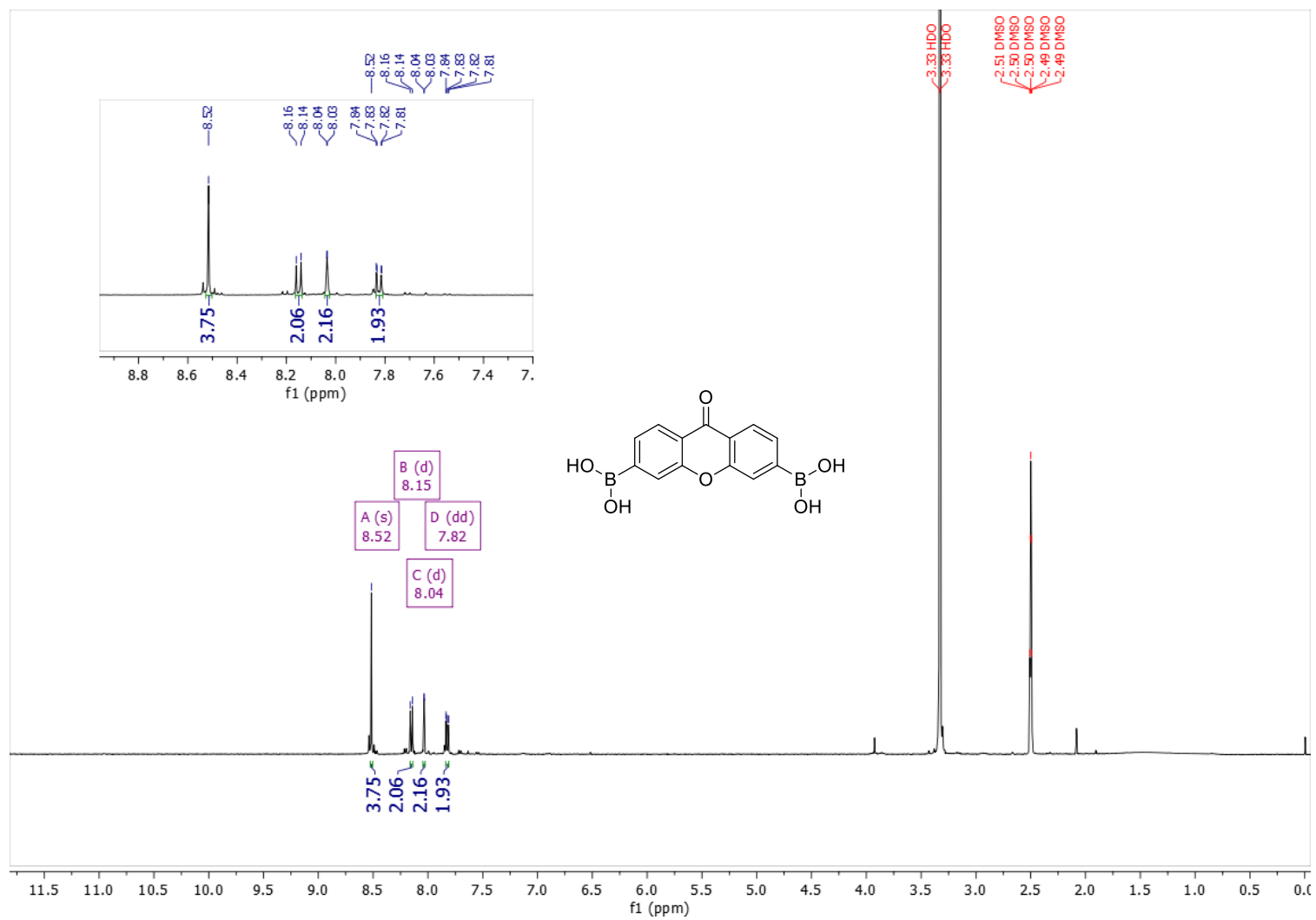
Espectro 182. Mapa de contorno de HSQC (CDCl_3 , 400 MHz) do intermediário 2-bromo-9H-xanteno-9-ona

Espectro 183. RMN de ^1H (CDCl_3 , 400 MHz) do intermediário 2-(4,4,5,5-tetrametil-1,3,2-dioxaborolan-2-il)-9H-xanten-9-ona

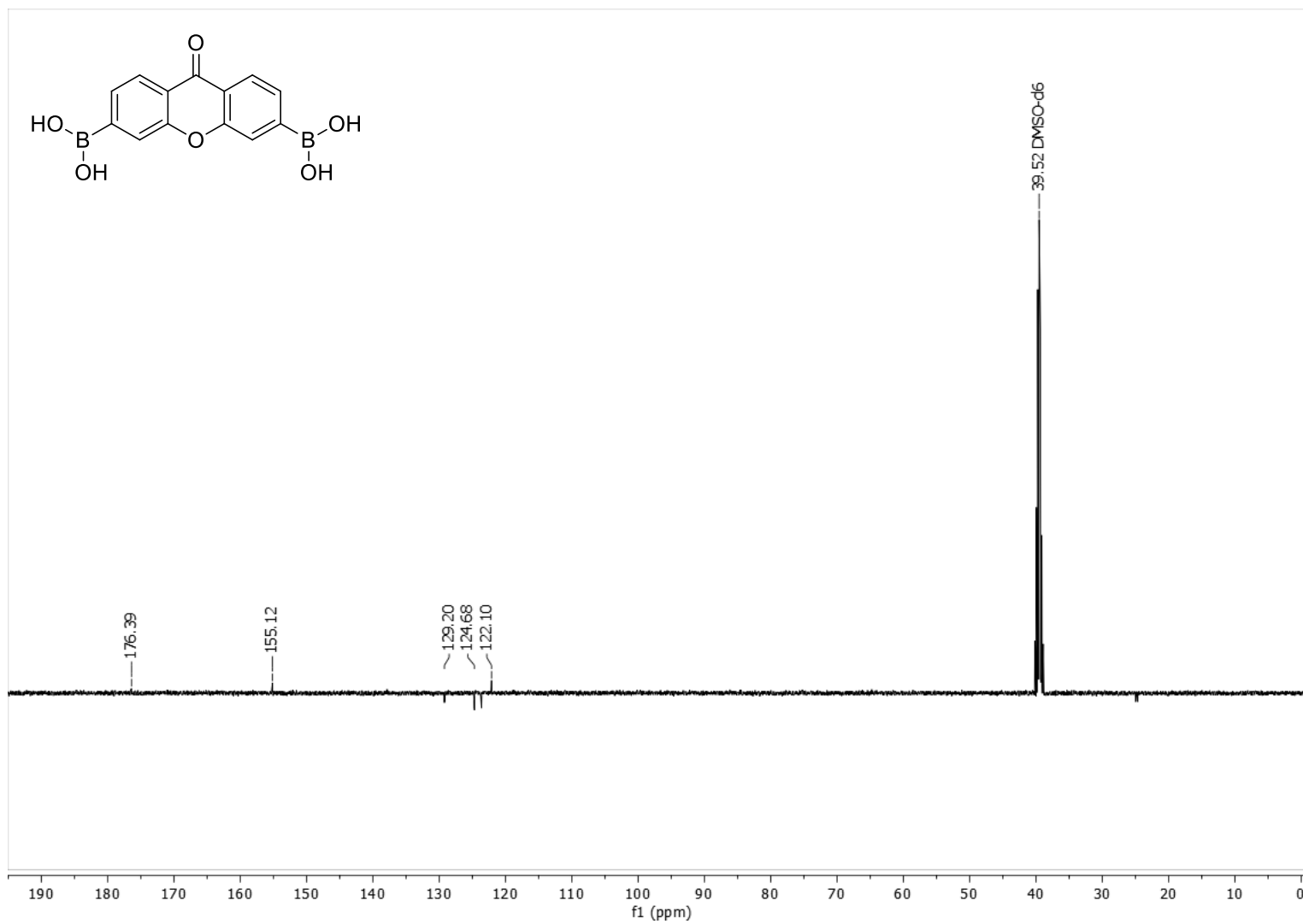
Espectro 184. RMN de ^{13}C (CDCl_3 , 400 MHz) do intermediário 2-(4,4,5,5-tetrametil-1,3,2-dioxaborolan-2-il)-9H-xanten-9-ona



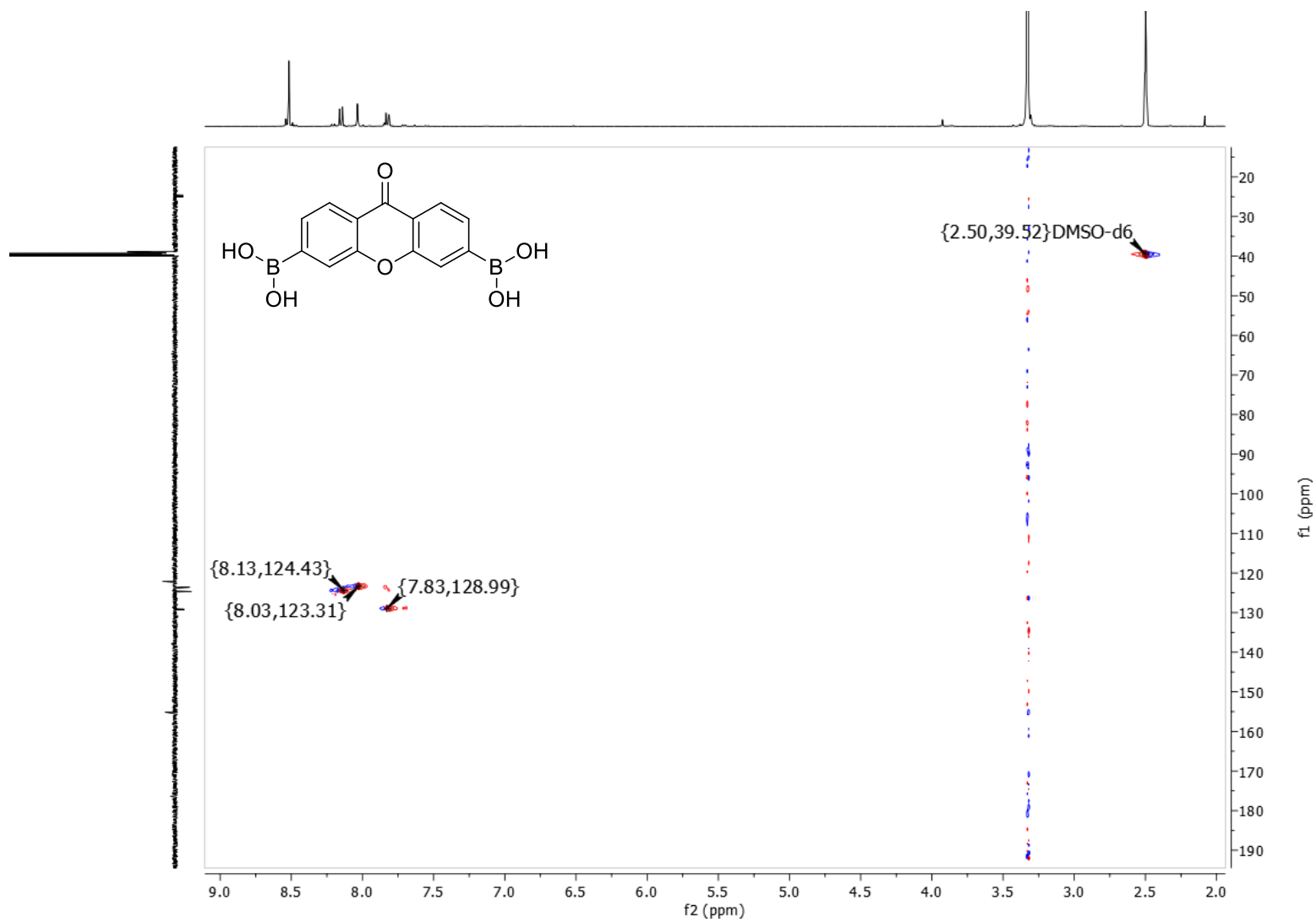
Espectro 185. RMN de ^1H (DMSO- d_6 , 400 MHz) do composto ácido (9-oxo-9H-xanteno-3,6-diil)diborônico



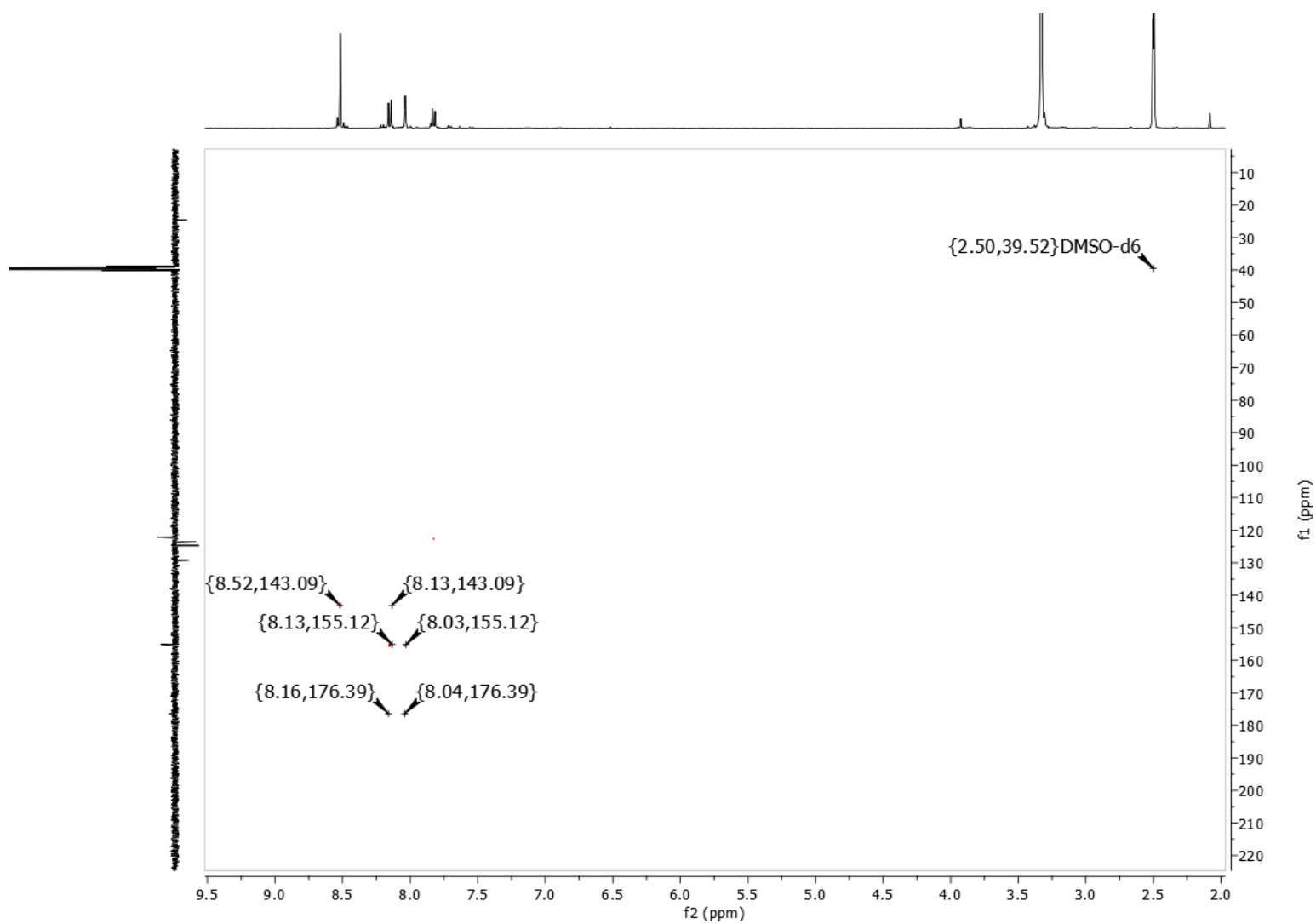
Espectro 186. RMN de ^{13}C (DMSO- d_6 , 400 MHz) do composto ácido (9-oxo-9H-xanteno-3,6-diil)diborônico



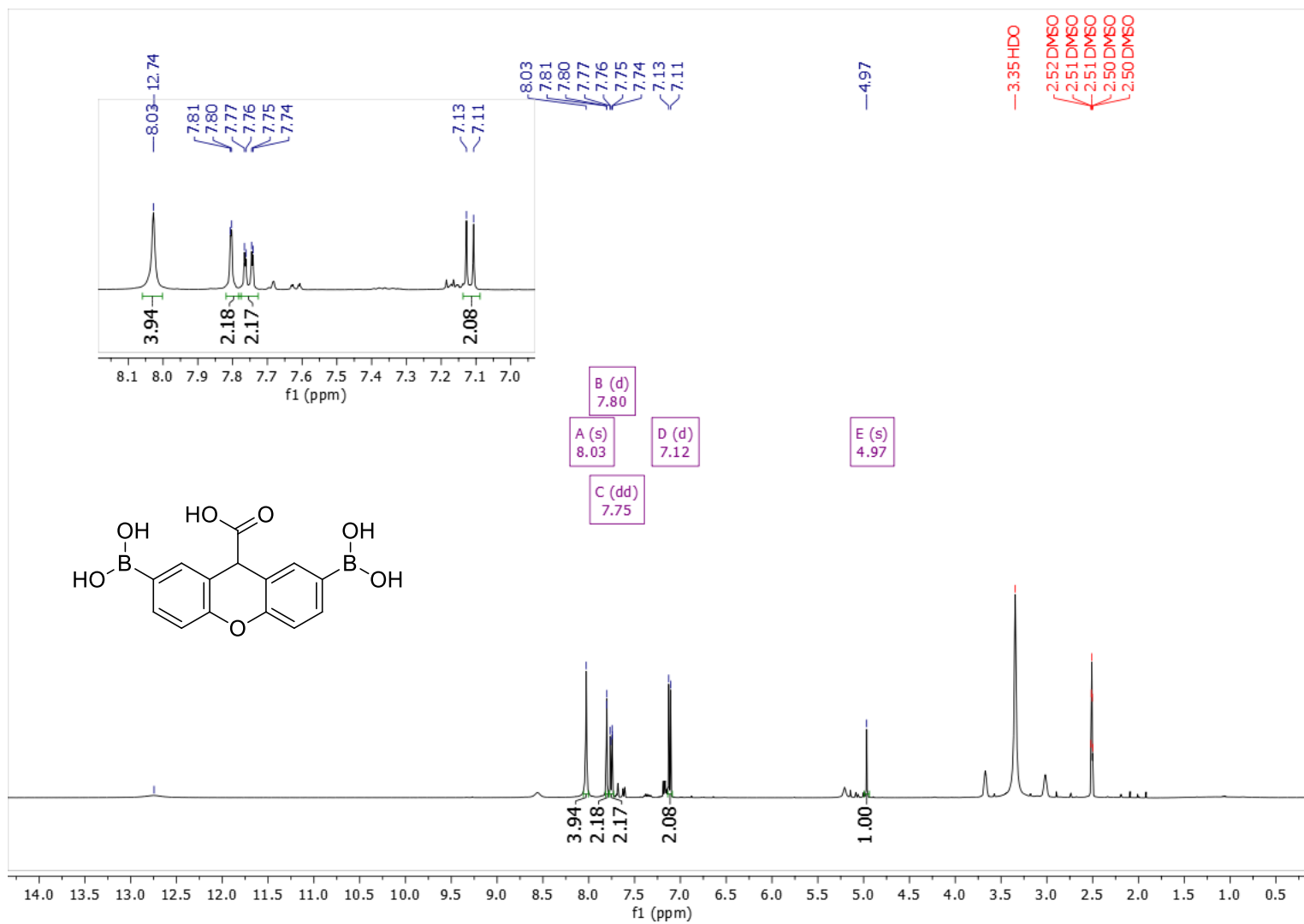
Espectro 187. Mapa de contorno de HSQC (DMSO-d₆, 400 MHz) do composto ácido (9-oxo-9H-xanteno-3,6-diil)diborônico



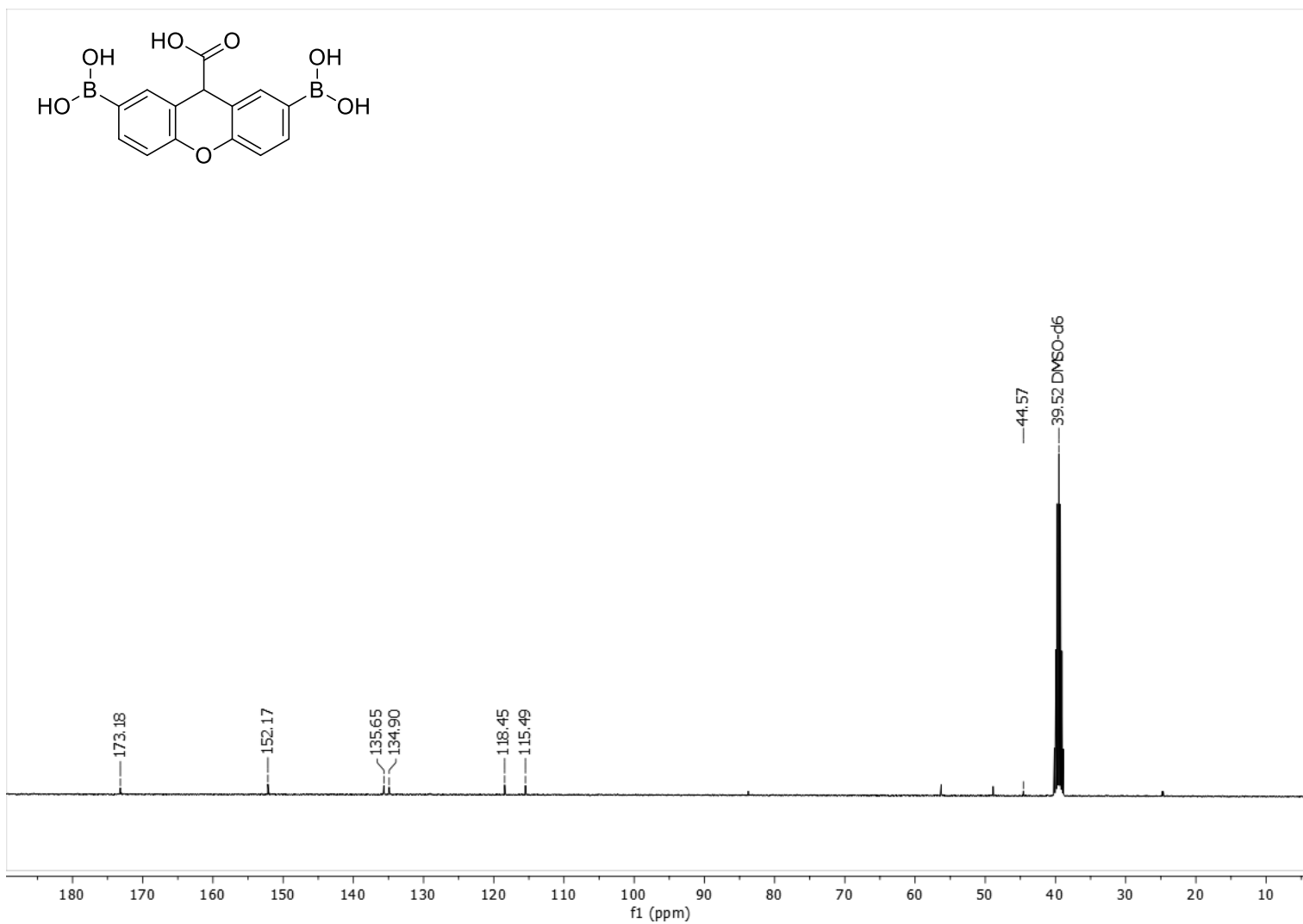
Espectro 188. Mapa de contorno de HMBC (DMSO-d₆, 400 MHz) do composto ácido (9-oxo-9H-xanteno-3,6-diil)diborônico



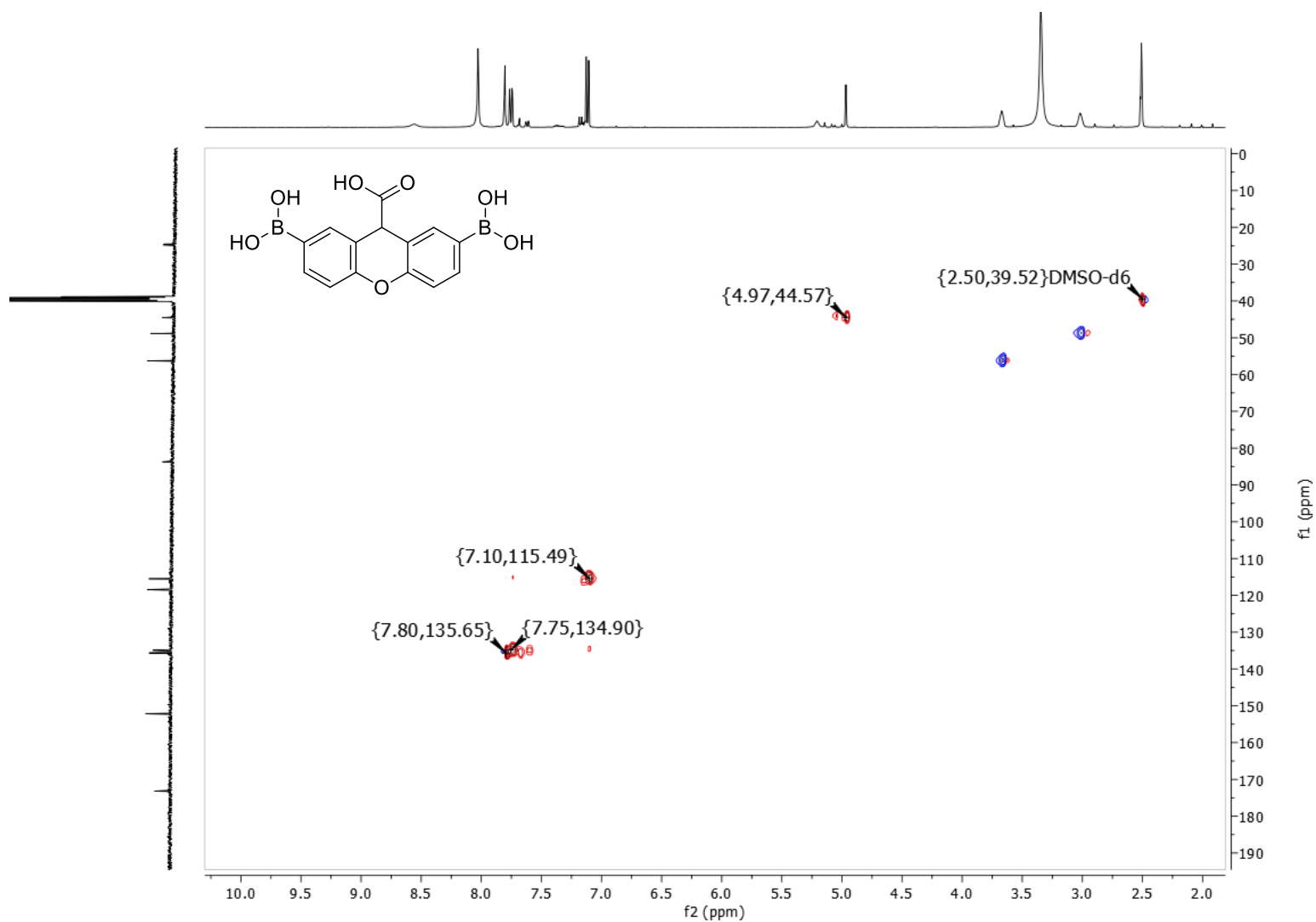
Espectro 189. RMN de ^1H (DMSO- d_6 , 400 MHz) do composto ácido 2,7-diborono-9H-xanteno-9-carboxílico



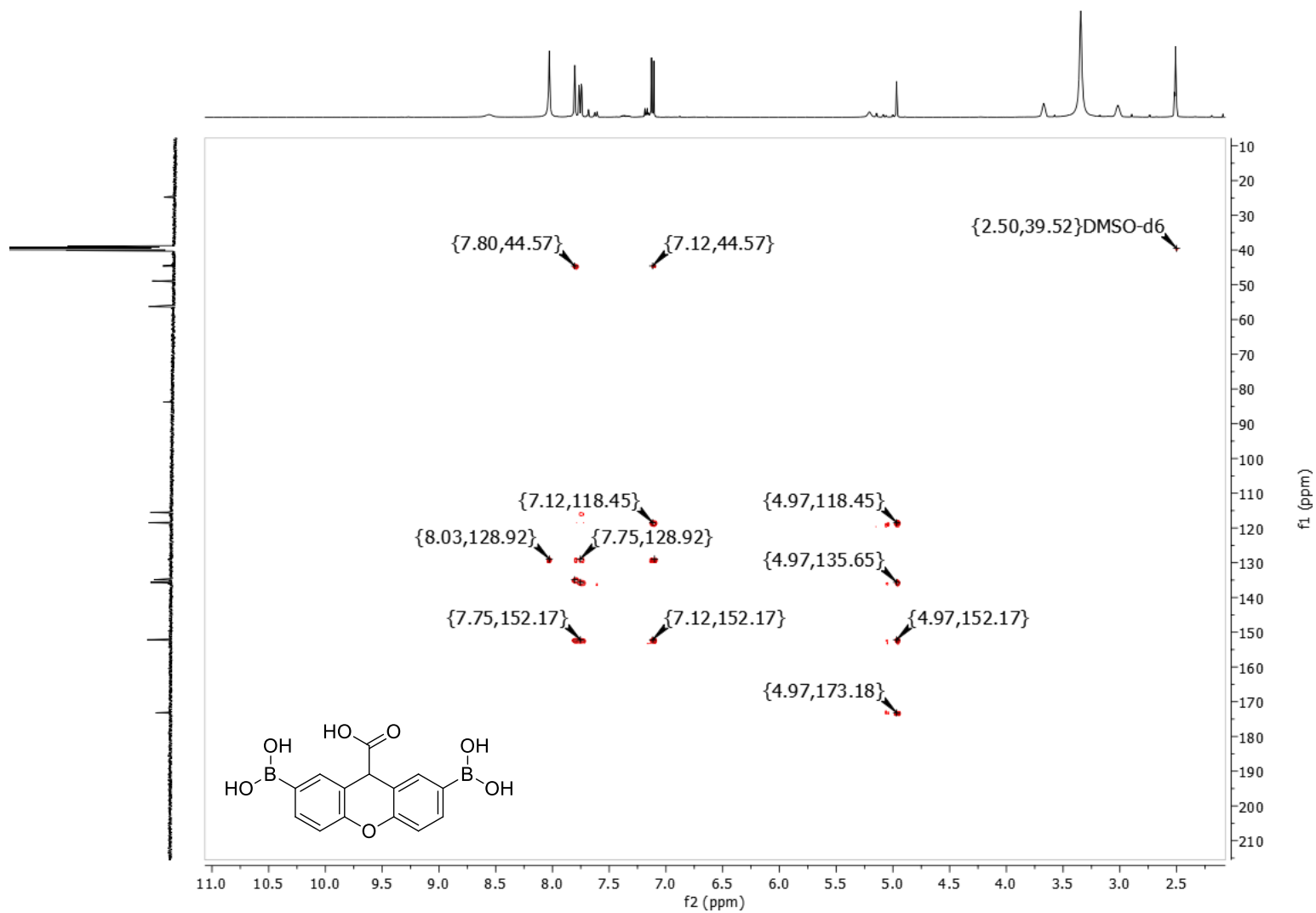
Espectro 190. RMN de ^{13}C (DMSO- d_6 , 400 MHz) do composto ácido 2,7-diborono-9H-xanteno-9-carboxílico

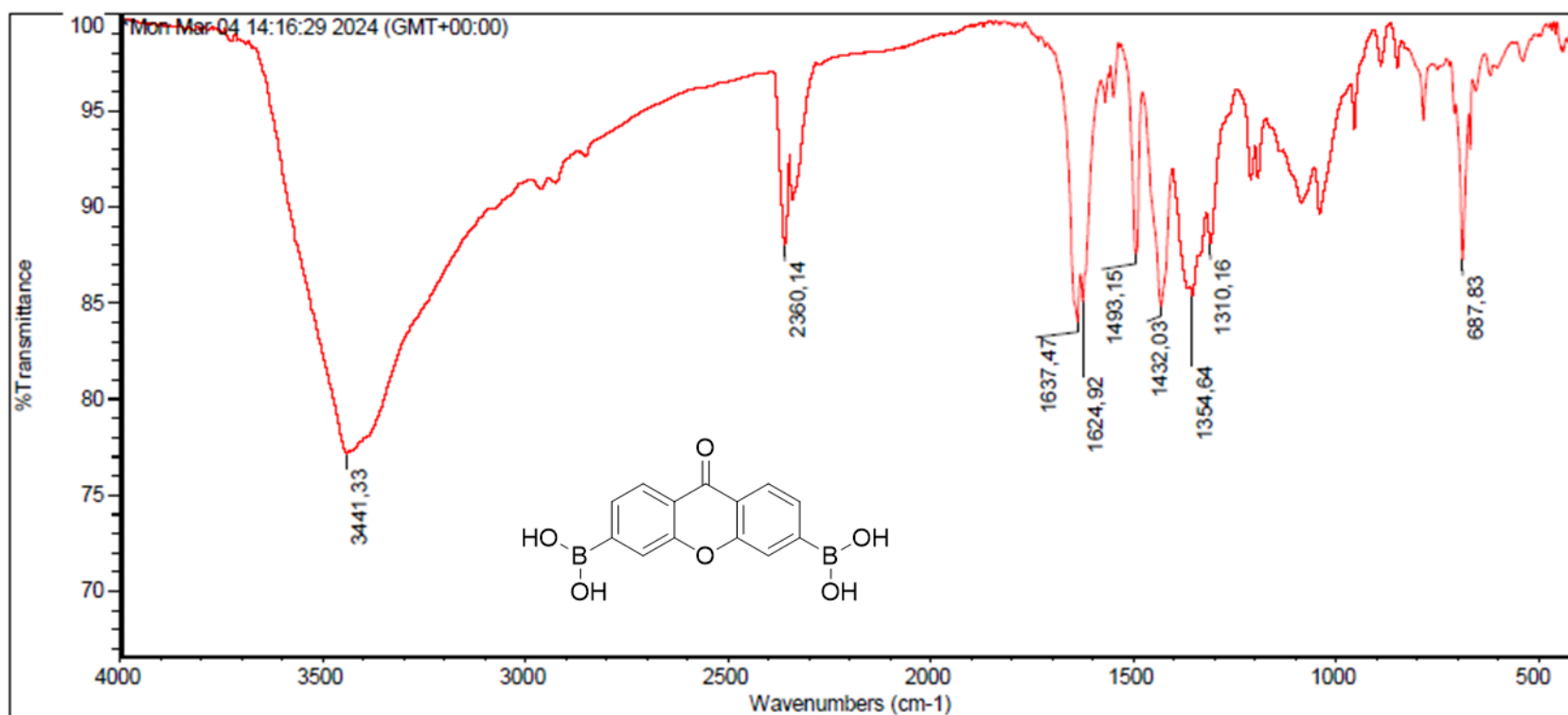


Espectro 191. Mapa de contorno de HSQC (DMSO-d₆, 400 MHz) do composto ácido 2,7-diborono-9H-xanteno-9-carboxílico



Espectro 192. Mapa de contorno de HMBC (DMSO-d₆, 400 MHz) do composto ácido 2,7-diborono-9H-xanteno-9-carboxílico



Espectro 193. Espectro de IV do composto ácido (9-oxo-9H-xanteno-3,6-diil)diborônico

Espectro 194. Espectro de IV do composto ácido ácido 2,7-diborono-9H-xanteno-9-carboxílico

