

Appendix

Chapter 3

^1H NMR (700 MHz, METHANOL- d_4) δ ppm 1.41 - 1.44 (m, 4 H) 1.43 - 1.44 (m, 1 H) 1.94 (d, $J=1.44$ Hz, 2 H) 4.43 - 4.48 (m, 1 H) 4.43 - 4.48 (m, 1 H) 4.55 (dd, $J=9.30, 7.18$ Hz, 1 H) 4.53 - 4.57 (m, 1 H) 6.02 - 6.04 (m, 1 H) 6.03 (d, $J=3.66$ Hz, 1 H) 6.18 (d, $J=16.09$ Hz, 1 H) 6.35 - 6.41 (m, 1 H) 6.36 - 6.40 (m, 1 H) 6.36 - 6.40 (m, 1 H) 6.36 - 6.39 (m, 1 H) 6.37 - 6.39 (m, 1 H) 7.13 (d, $J=16.18$ Hz, 1 H)

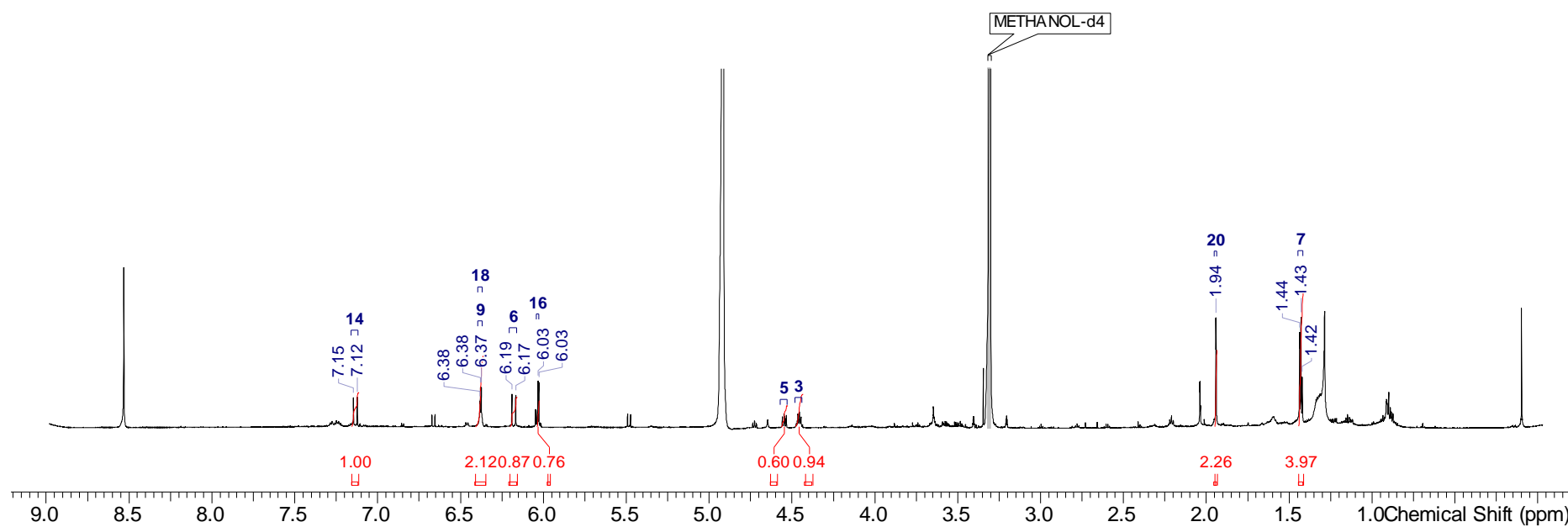


Figure A1 ^1H spectrum of chloroxanthic acid A in methanol- d_4 at 700 MHz.

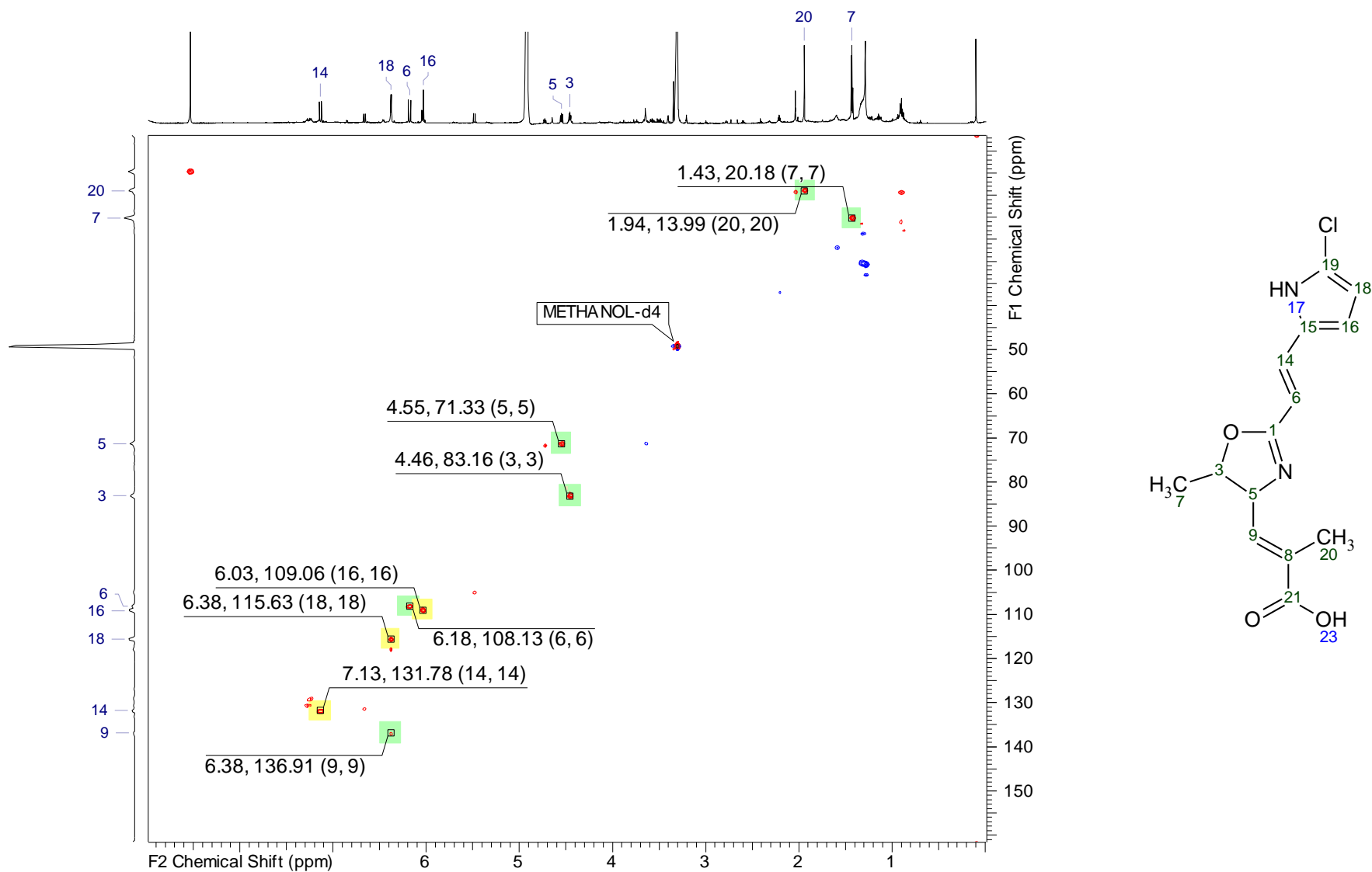


Figure A2 HSQC-dept-spectrum of chloroxanthic acid A in methanol- d_4 at 700/175 MHz.

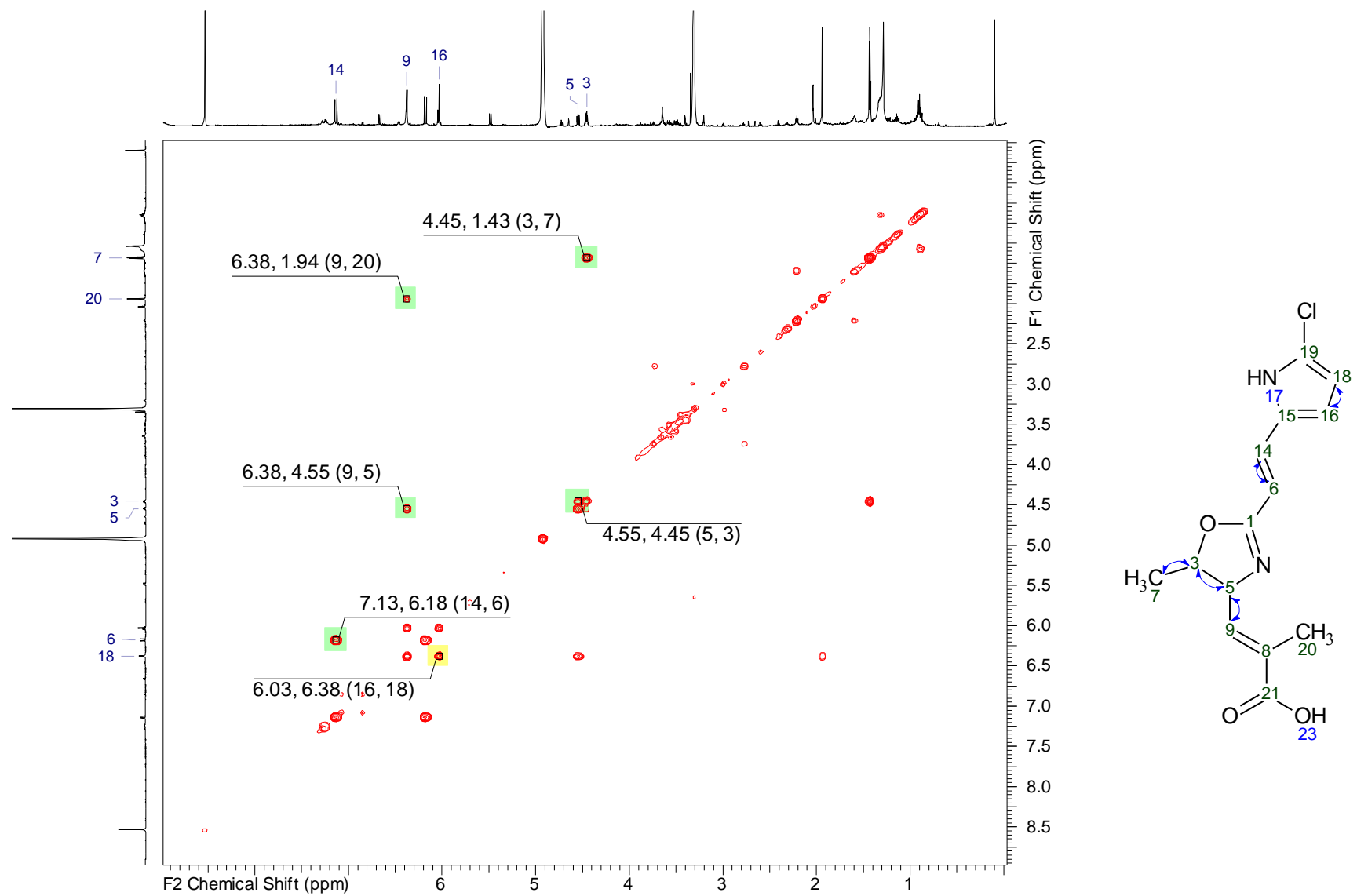


Figure A3 gCOSY-spectrum of chloroxanthic acid A in methanol- d_4 at 700 MHz.

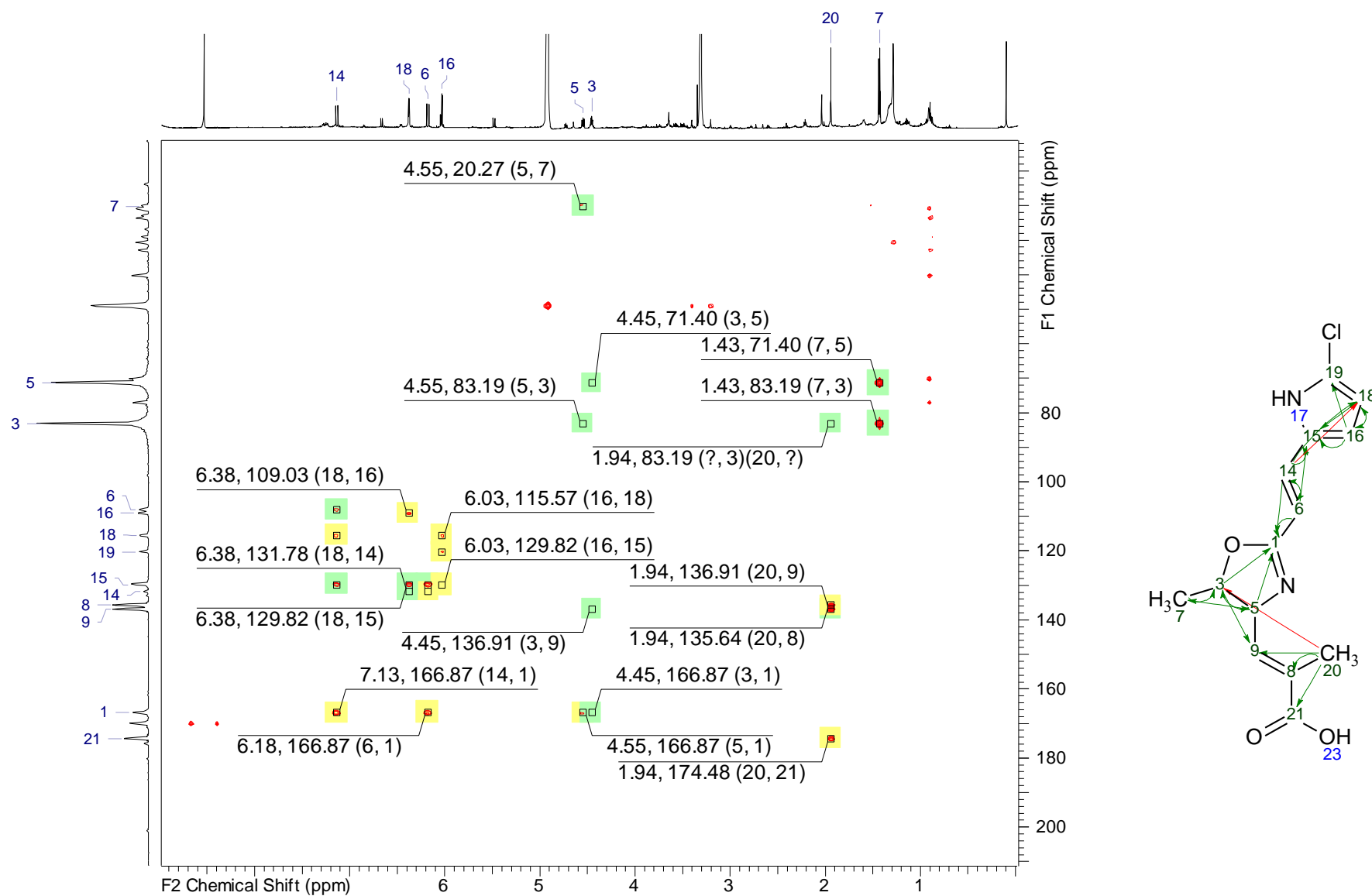
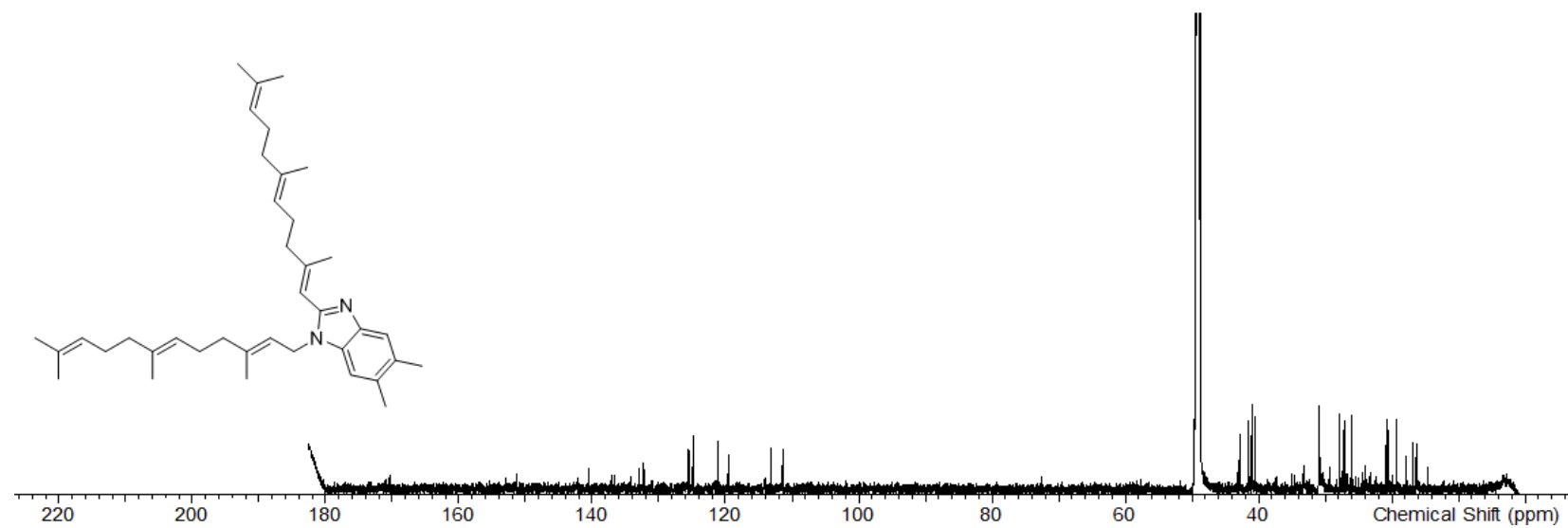
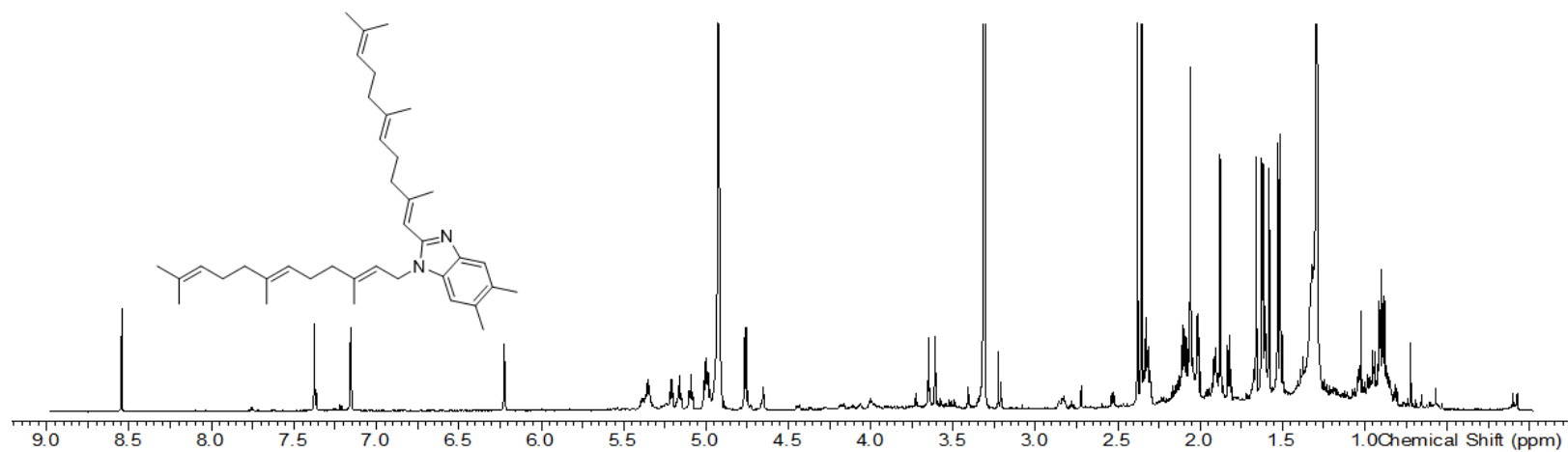


Figure A4 HMBC-spectrum of chloroxanthic acid A in methanol-*d*₄ at 700/175 MHz.

Chapter 4



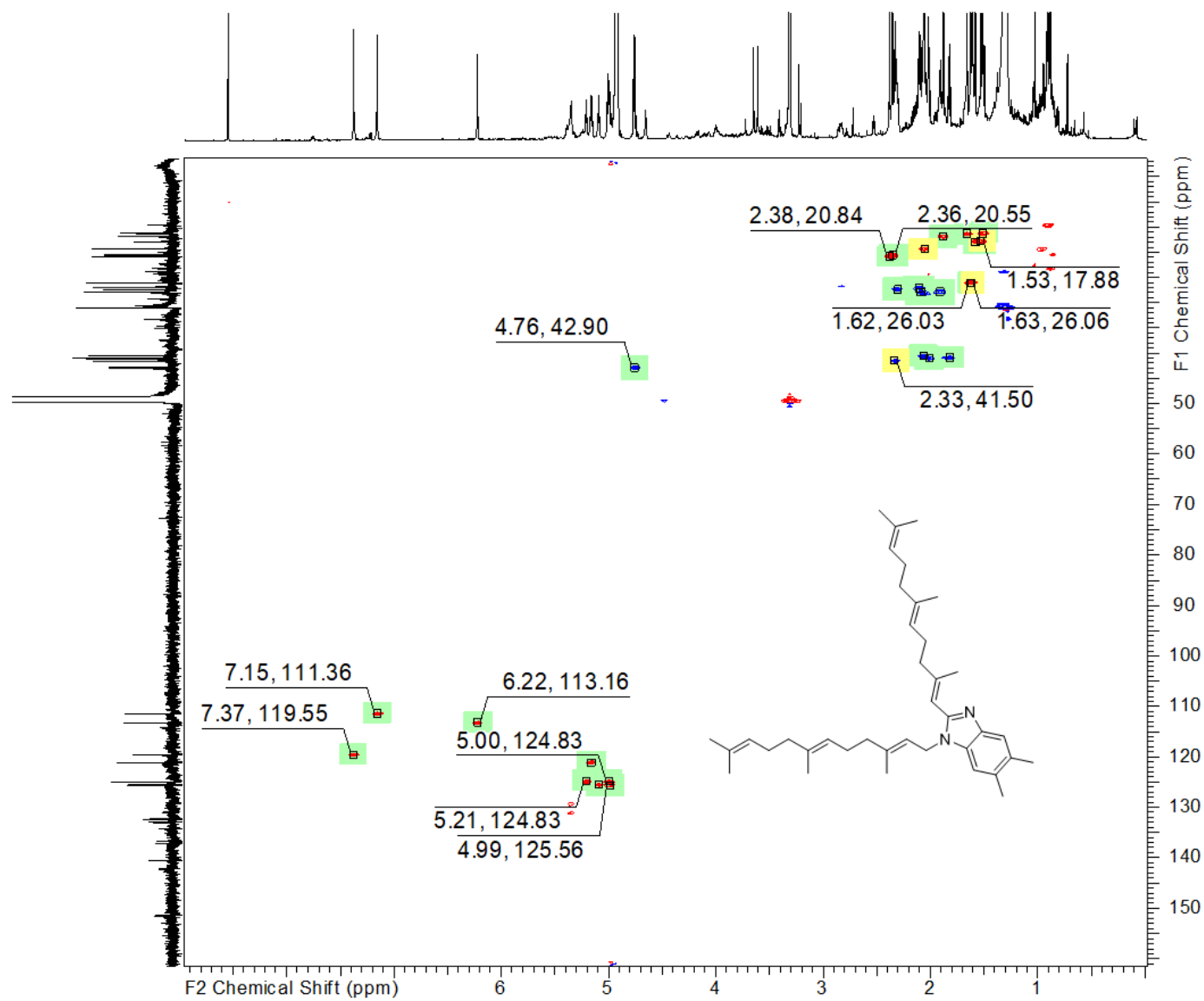


Figure A7 HSQC spectrum of sandacrabrin A in methanol-*d*₄ 500/125 MHz.

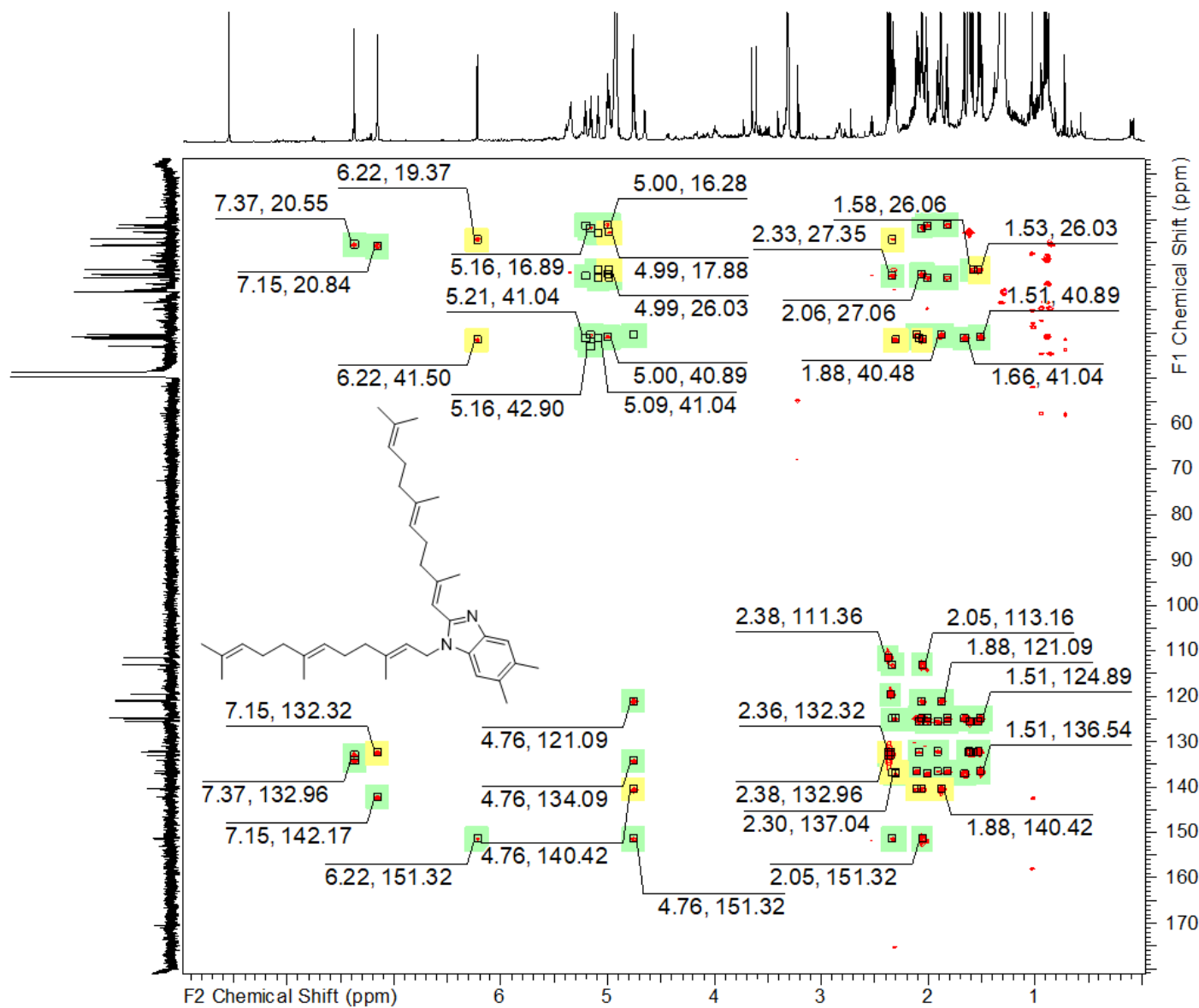


Figure A8 HMBC spectrum of sandacrabrin A in methanol- d_4 500/125 MHz.

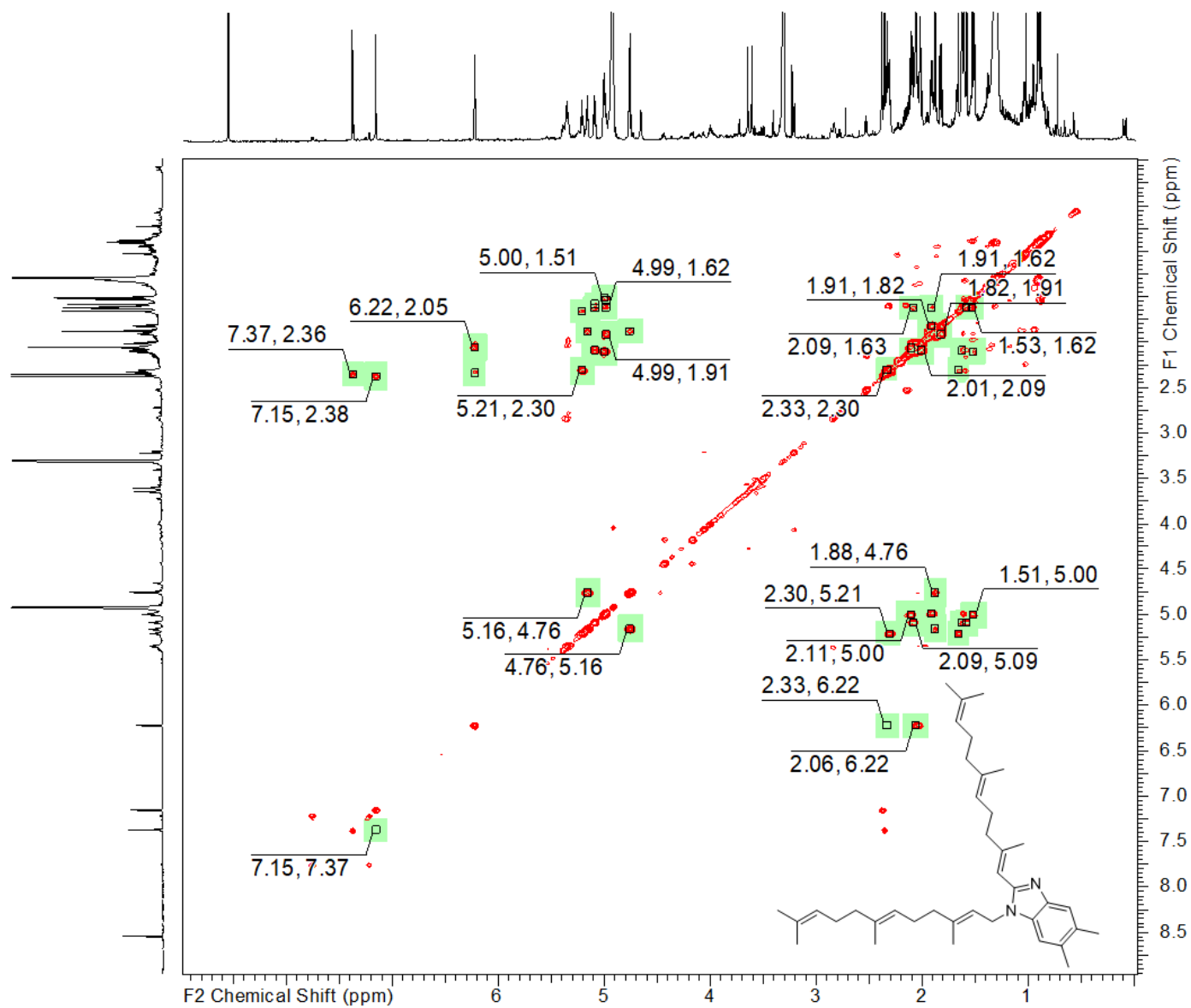
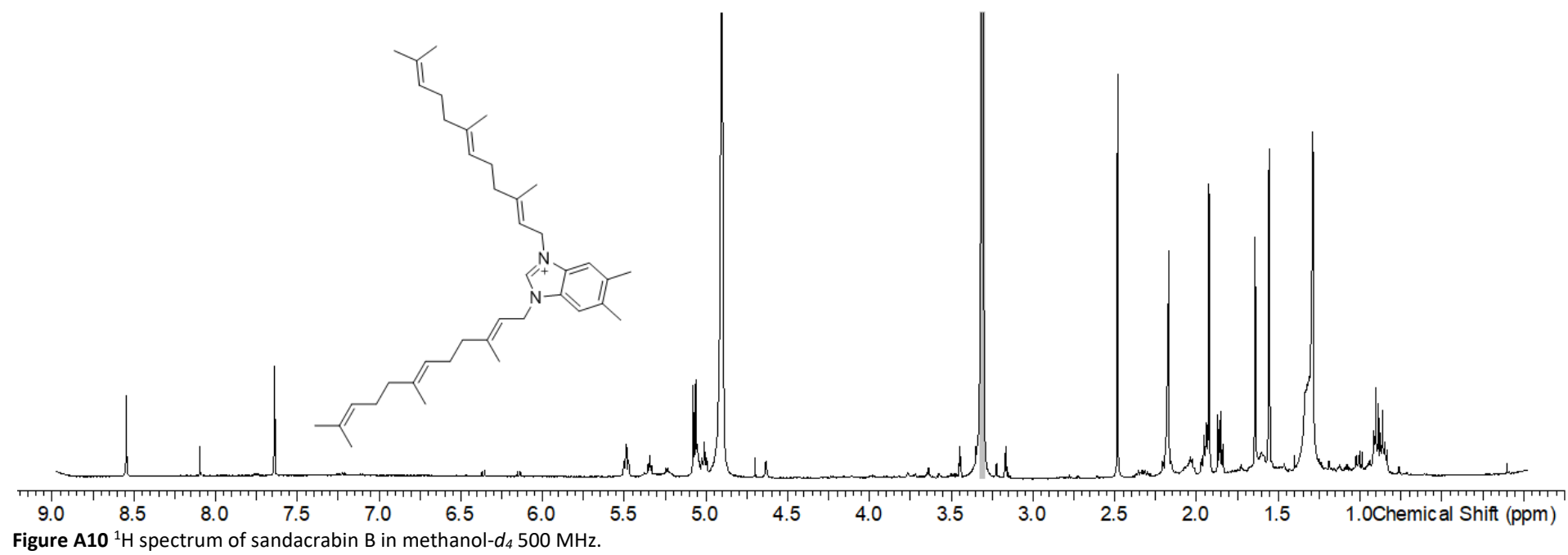


Figure A9 COSY spectrum of sandacrabrin A in methanol- d_4 500 MHz.



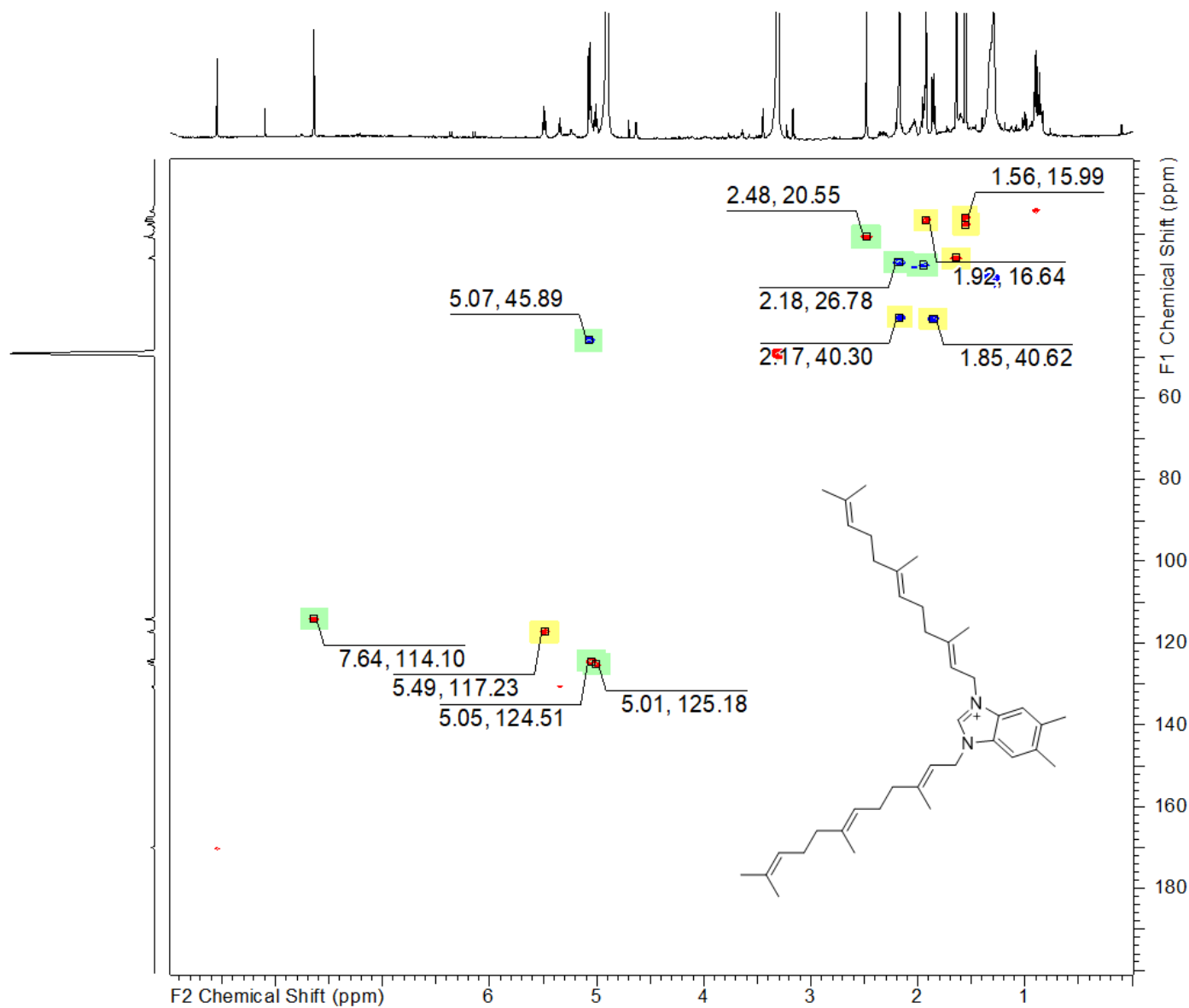


Figure A11 HSQC spectrum of sandacrabrin B in methanol- d_4 500/125 MHz.

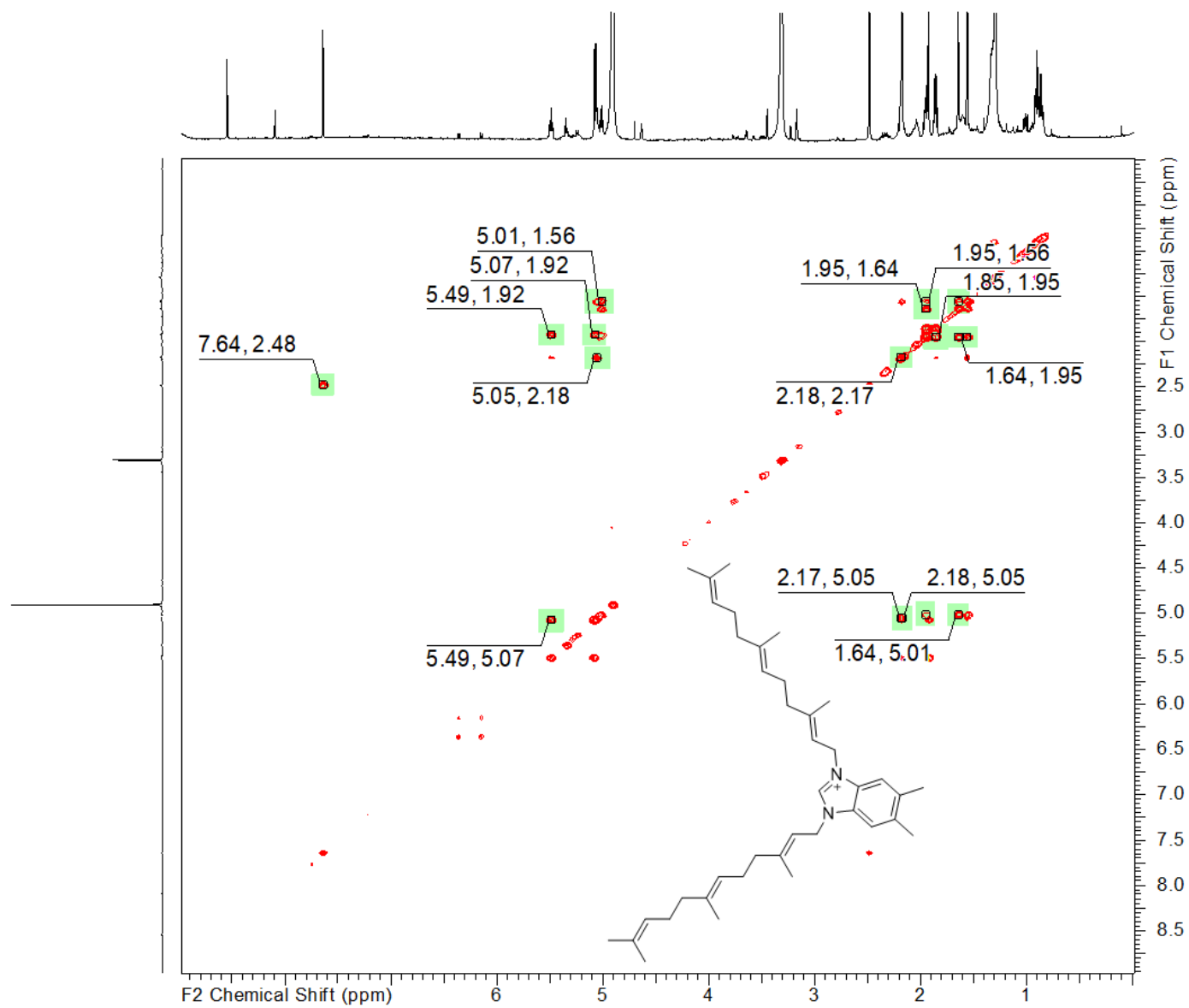


Figure A12 COSY spectrum of sandacrabrin B in methanol- d_4 500 MHz.

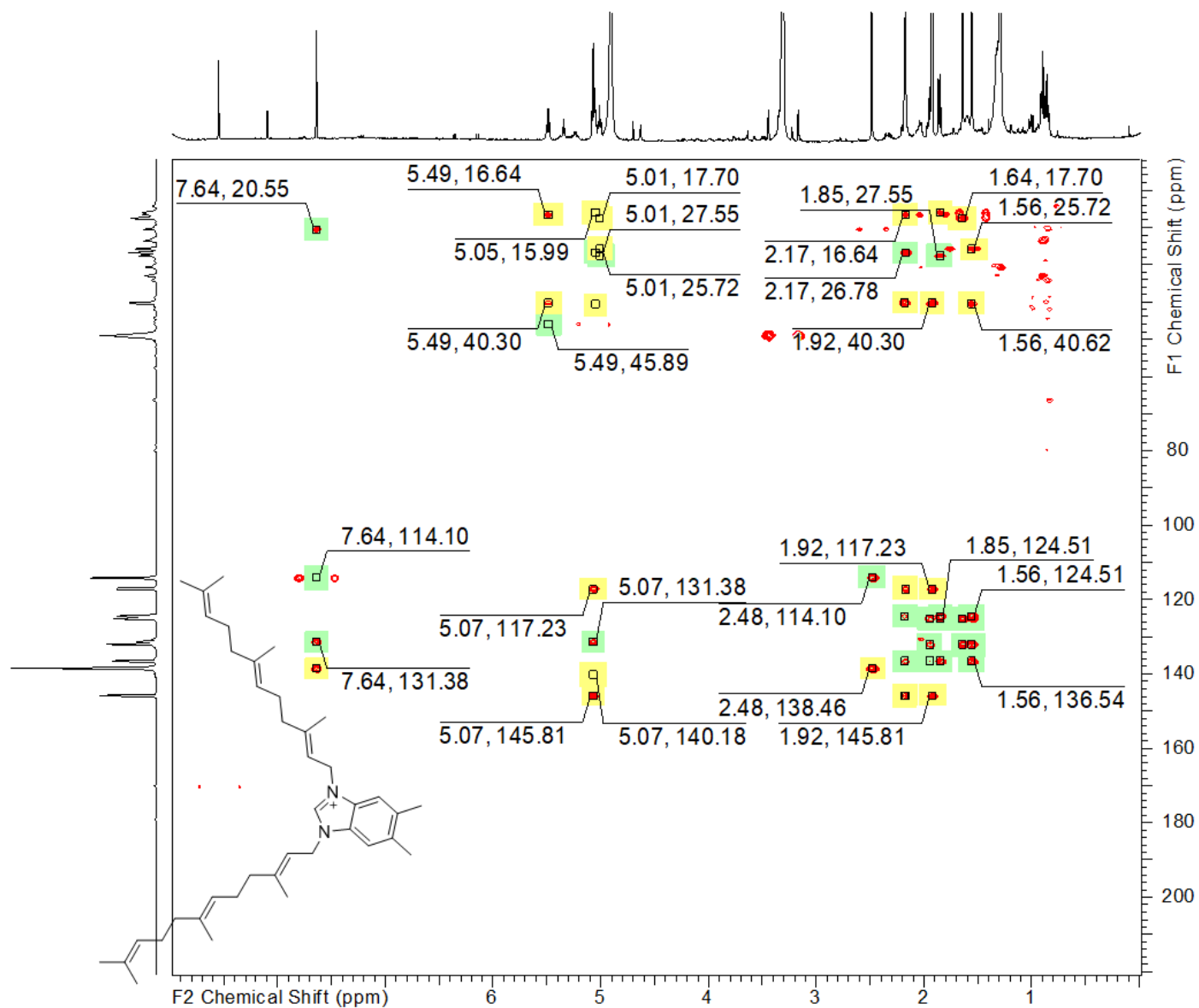


Figure A13 HMBC spectrum of sandacrabrin B in methanol- d_4 500/125 MHz

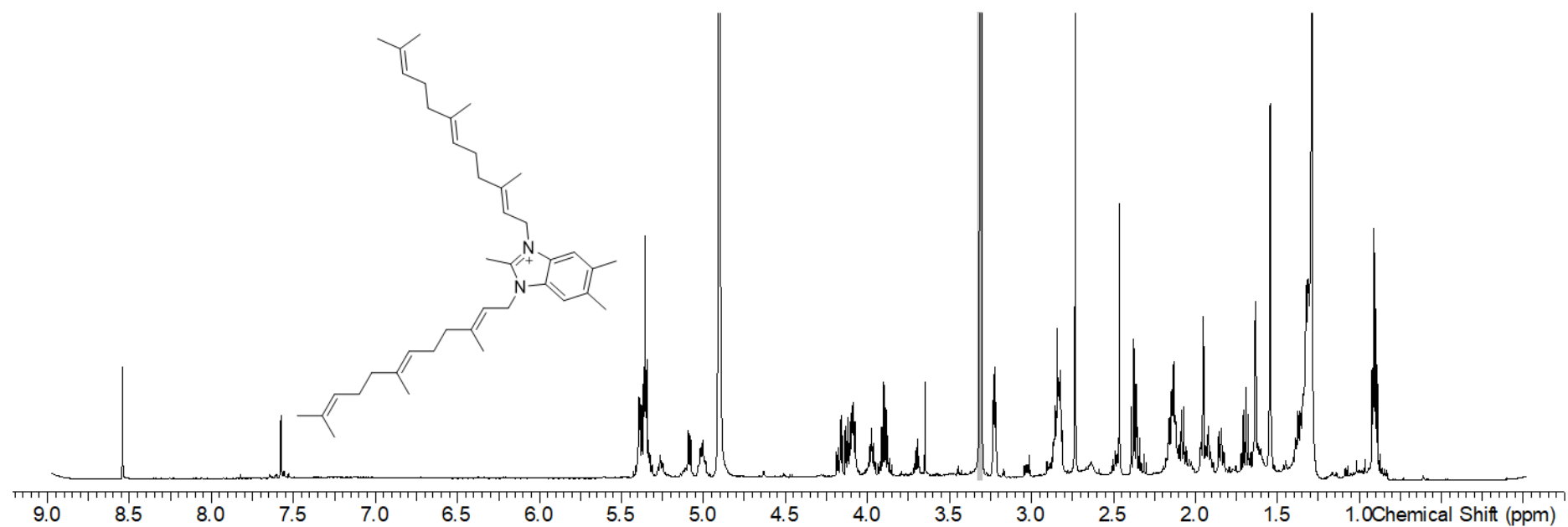


Figure A14 ^1H spectrum of sandacrabrin C in $\text{methanol-}d_4$ 500 MHz.

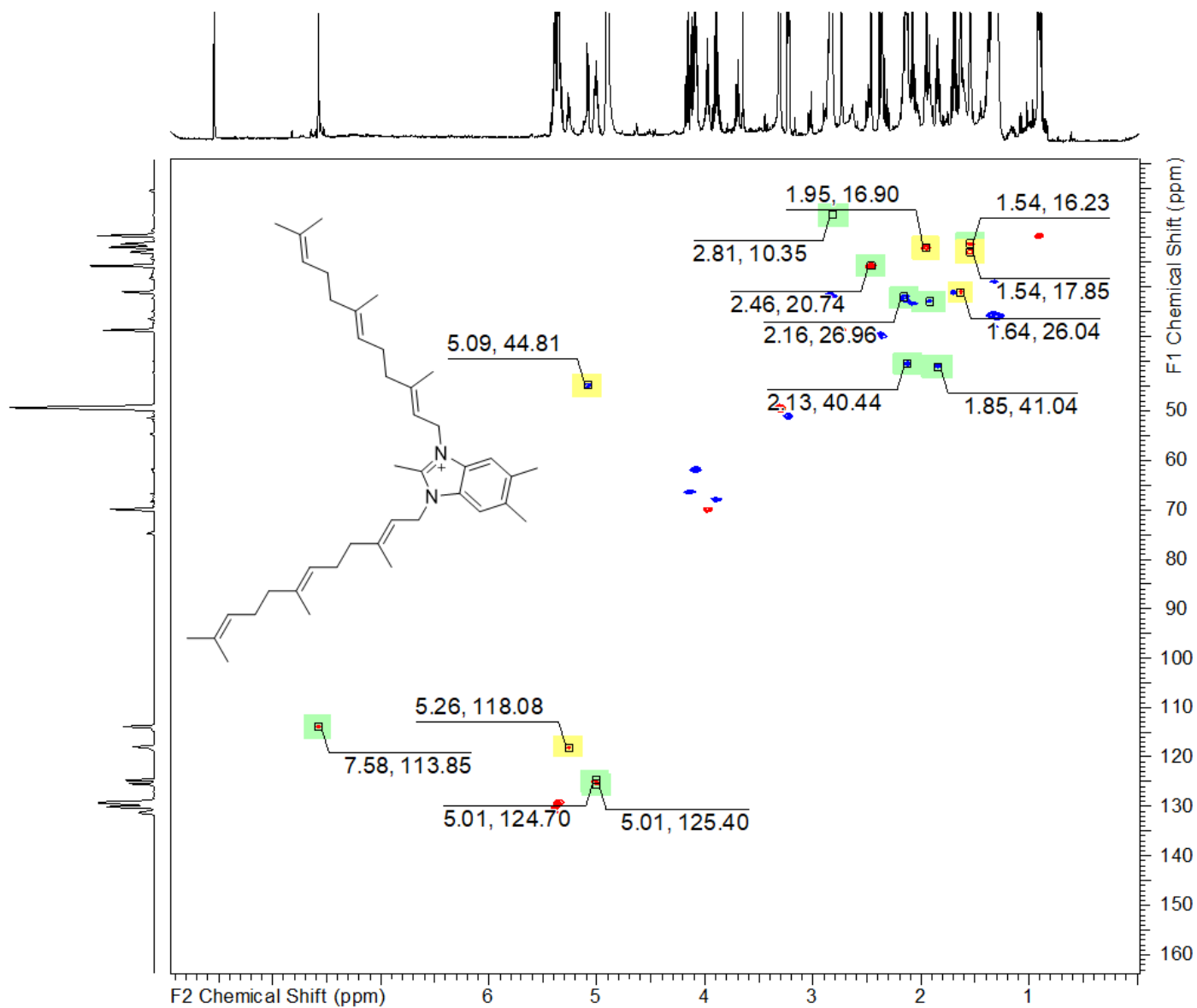


Figure A15 HSQC spectrum of sandacrab C in methanol-*d*₄ 500/125 MHz.

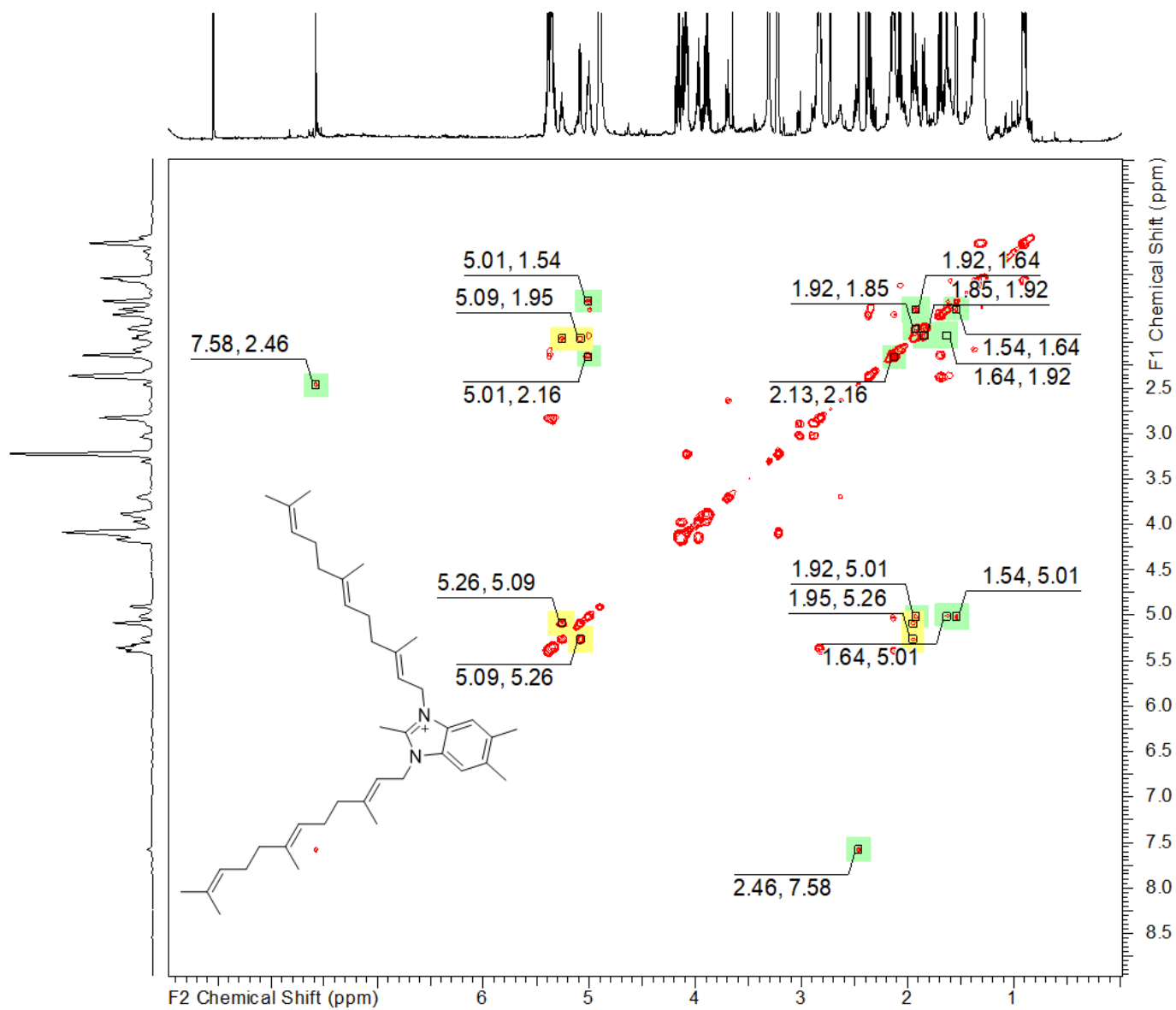


Figure A16 COSY spectrum of sandacrabrin C in methanol- d_4 500 MHz.

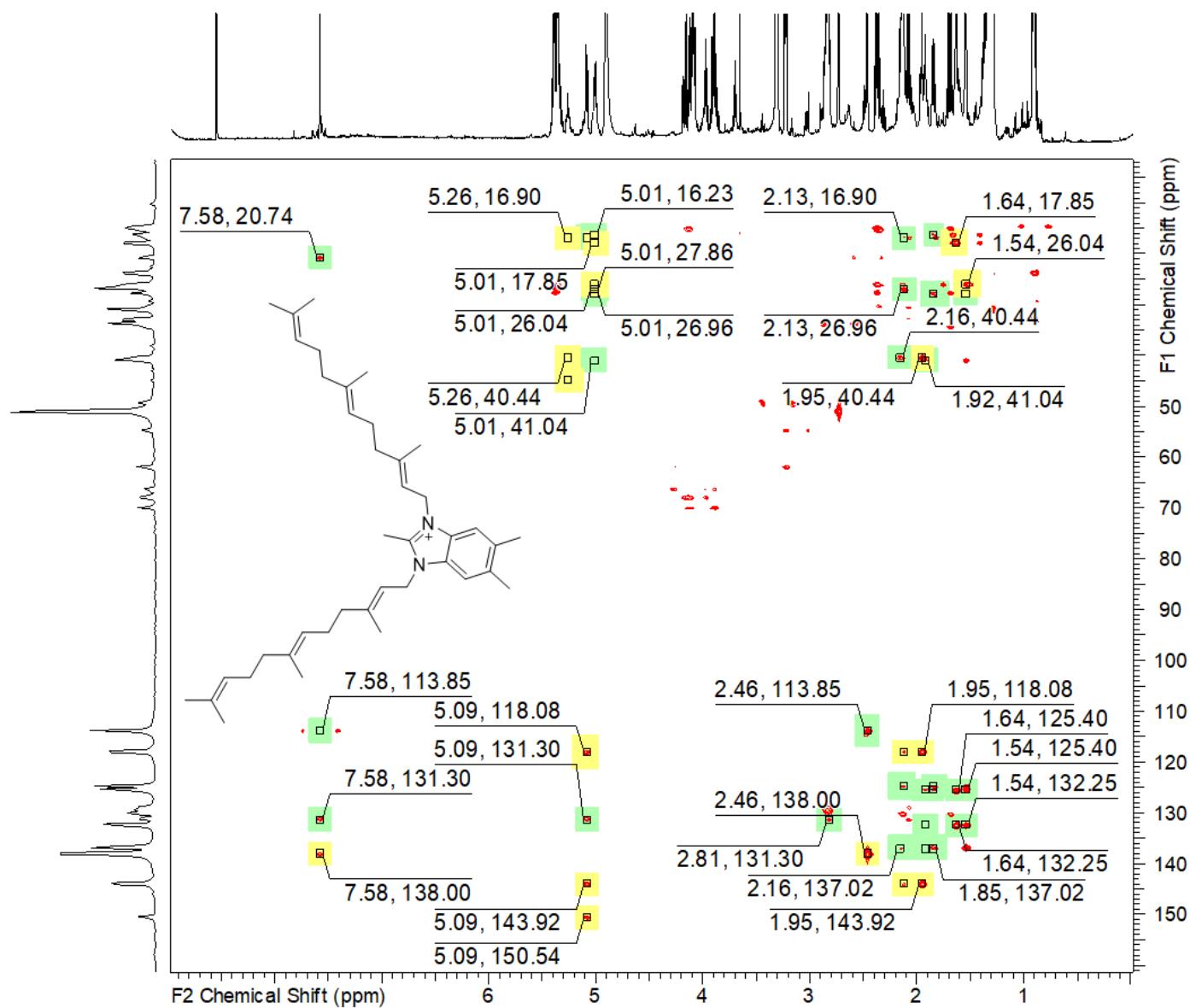
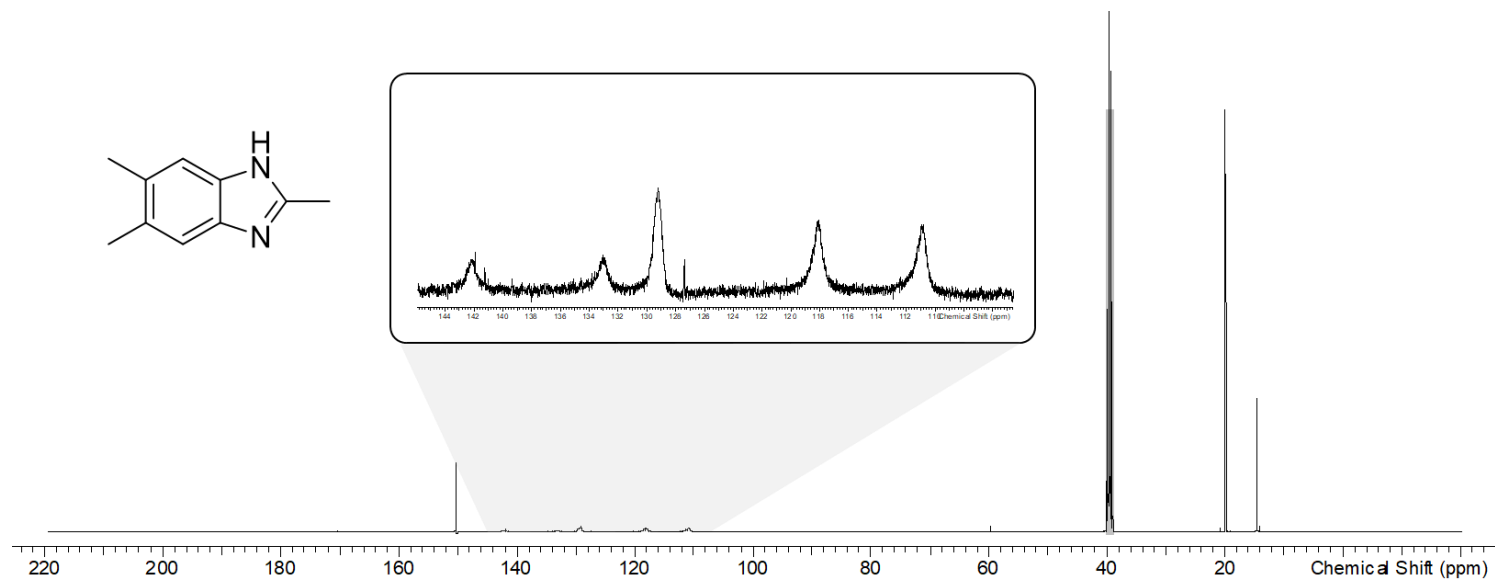
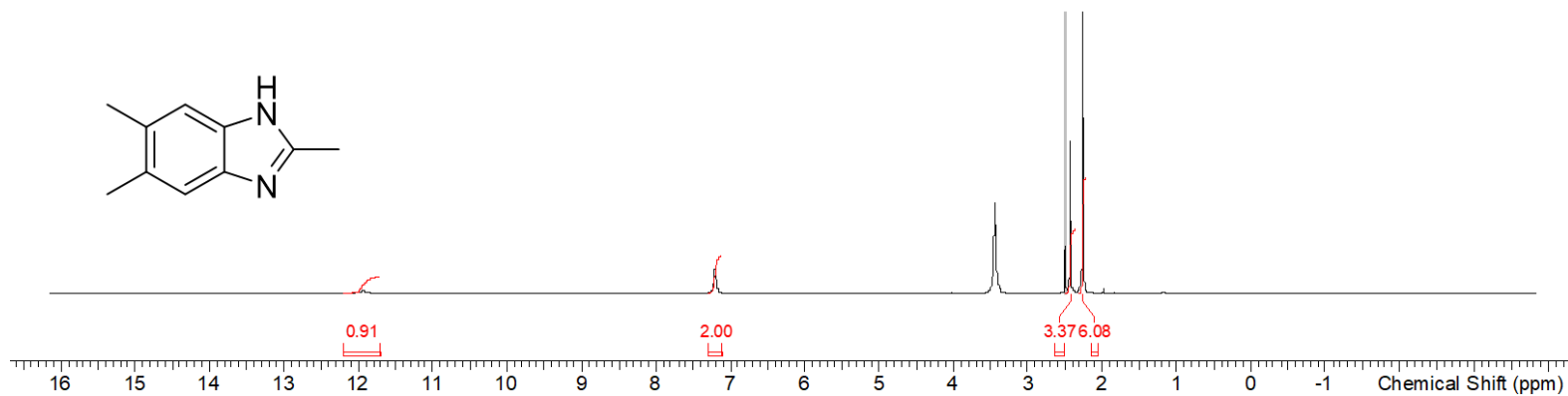


Figure A17 HMBC spectrum of sandacrabrin C in methanol- d_4 500/125 MHz.



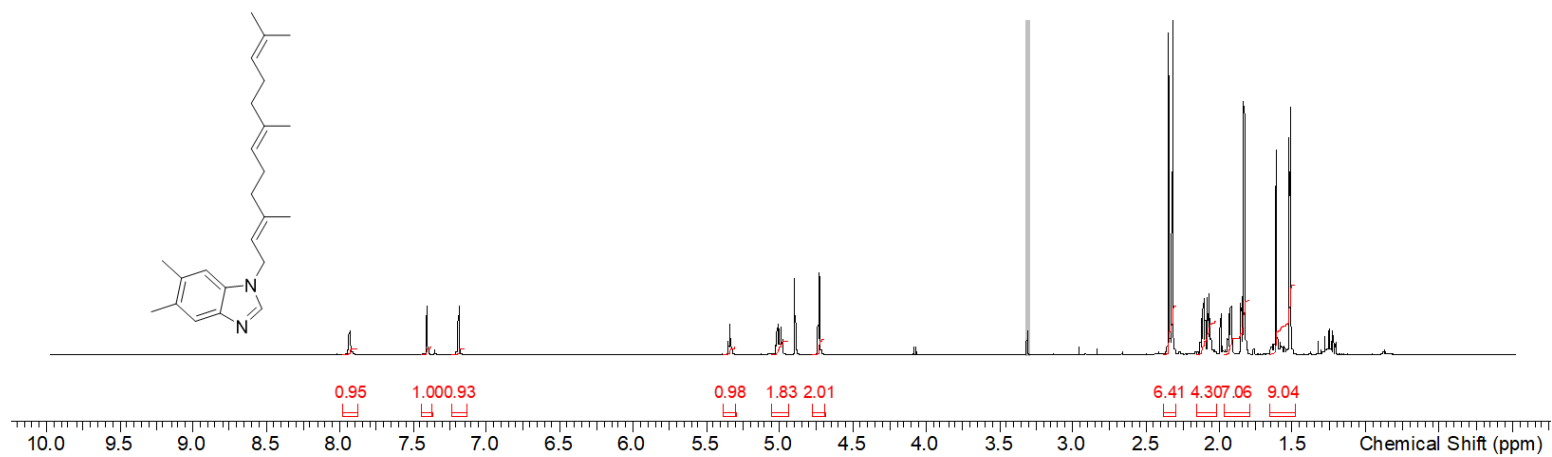


Figure A20 ¹H spectrum of **2** in methanol-*d*₄ at 700 MHz.

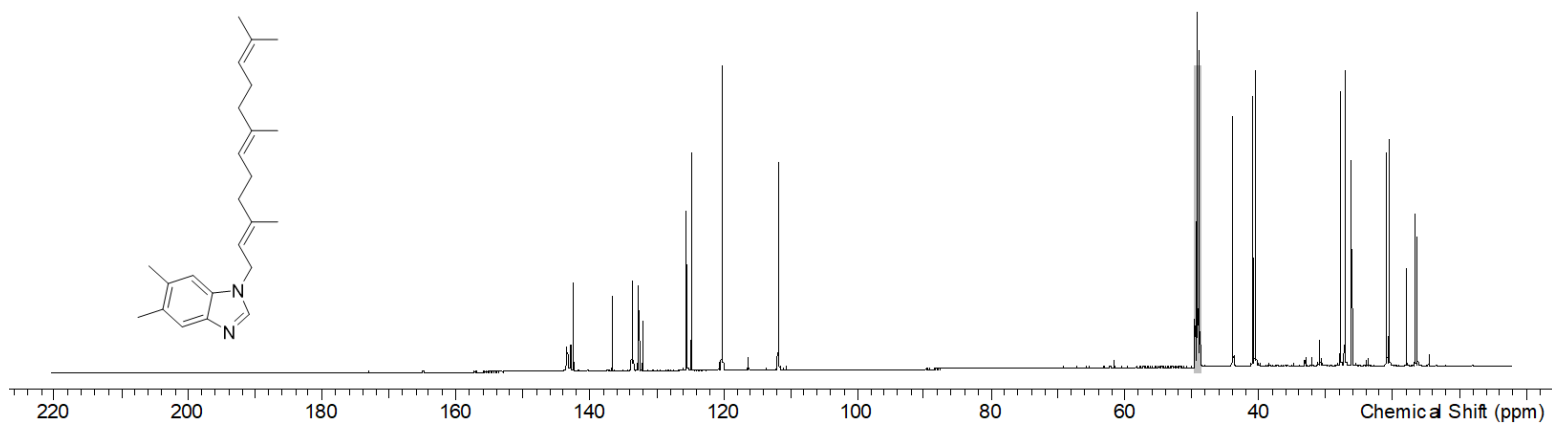


Figure A21 ¹³C spectrum of **2** in methanol-*d*₄ at 175 MHz.

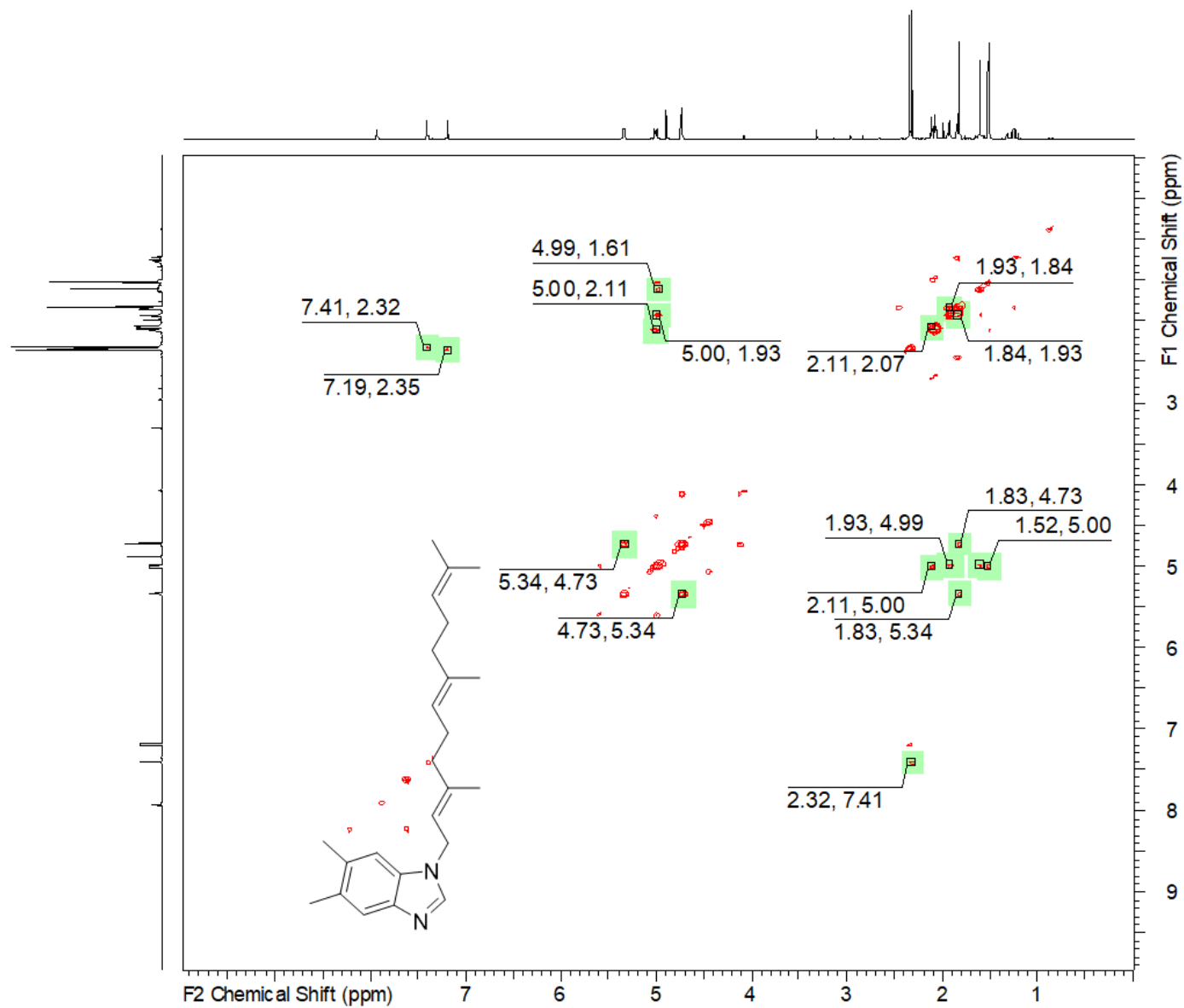


Figure A22 COSY spectrum of **2** in methanol- d_4 at 700 MHz.

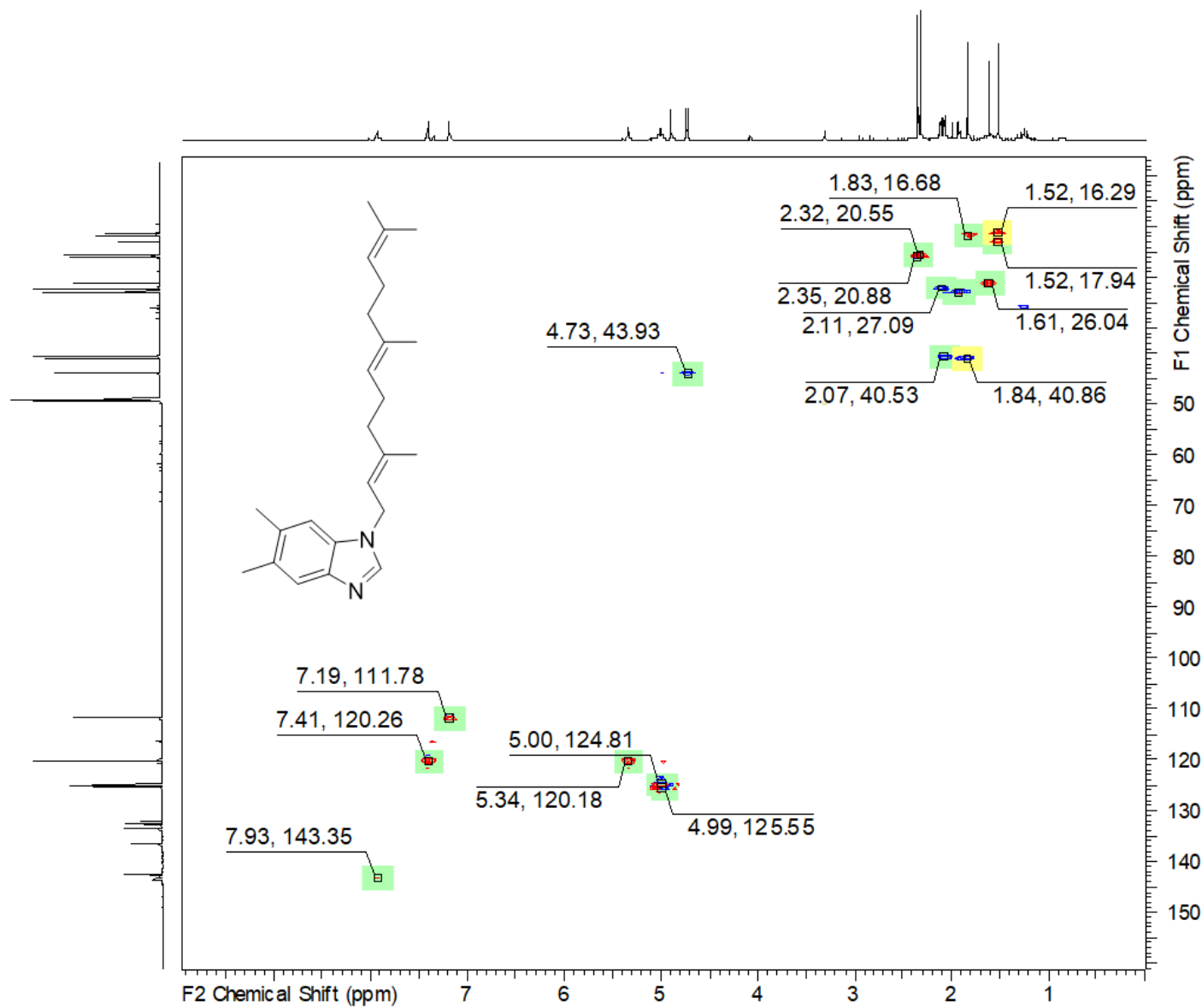


Figure A23 HSQC spectrum of **2** in methanol- d_4 at 700/175 MHz.

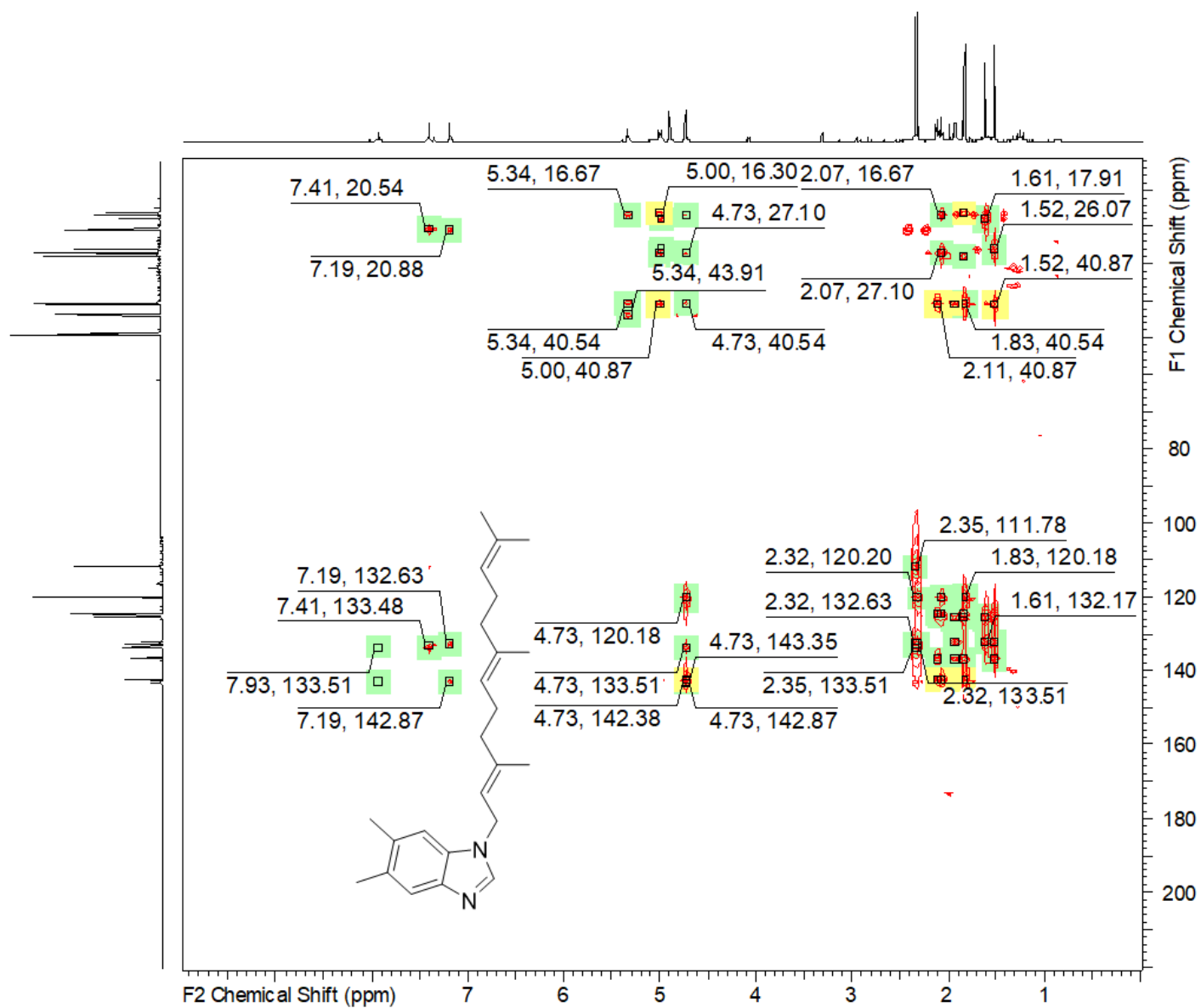


Figure A24 HMBC spectrum of **2** in methanol-*d*₄ at 700/175 MHz.

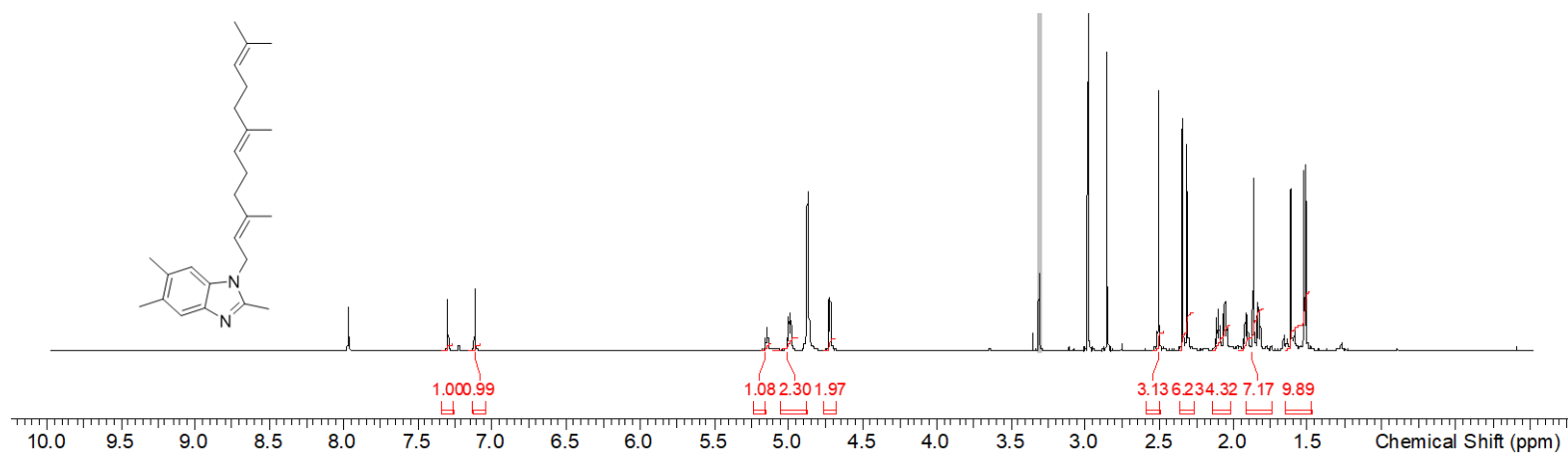


Figure A25 ¹H spectrum of **3** in methanol-*d*₄ at 700 MHz.

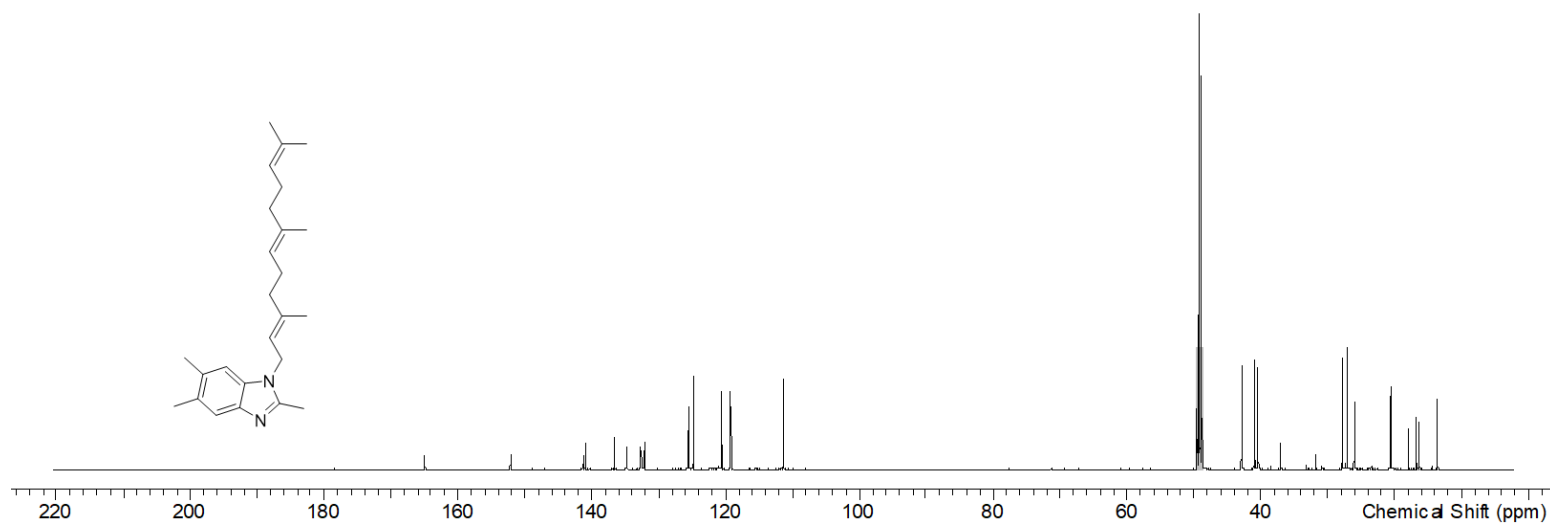


Figure A26 ¹³C spectrum of **3** in methanol-*d*₄ at 175 MHz.

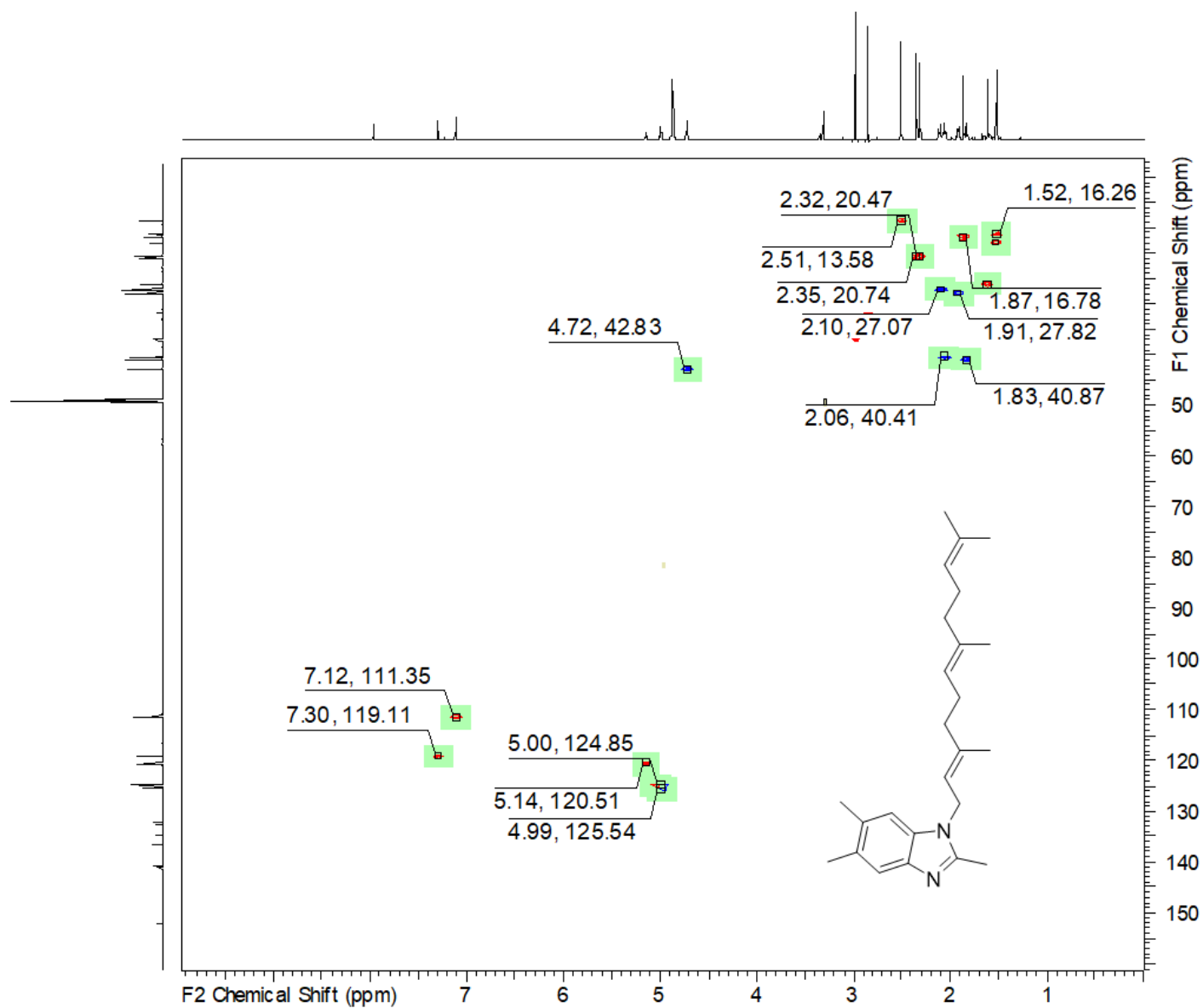


Figure A27 HSQC spectrum of **3** in methanol-*d*₄ at 700/175 MHz.

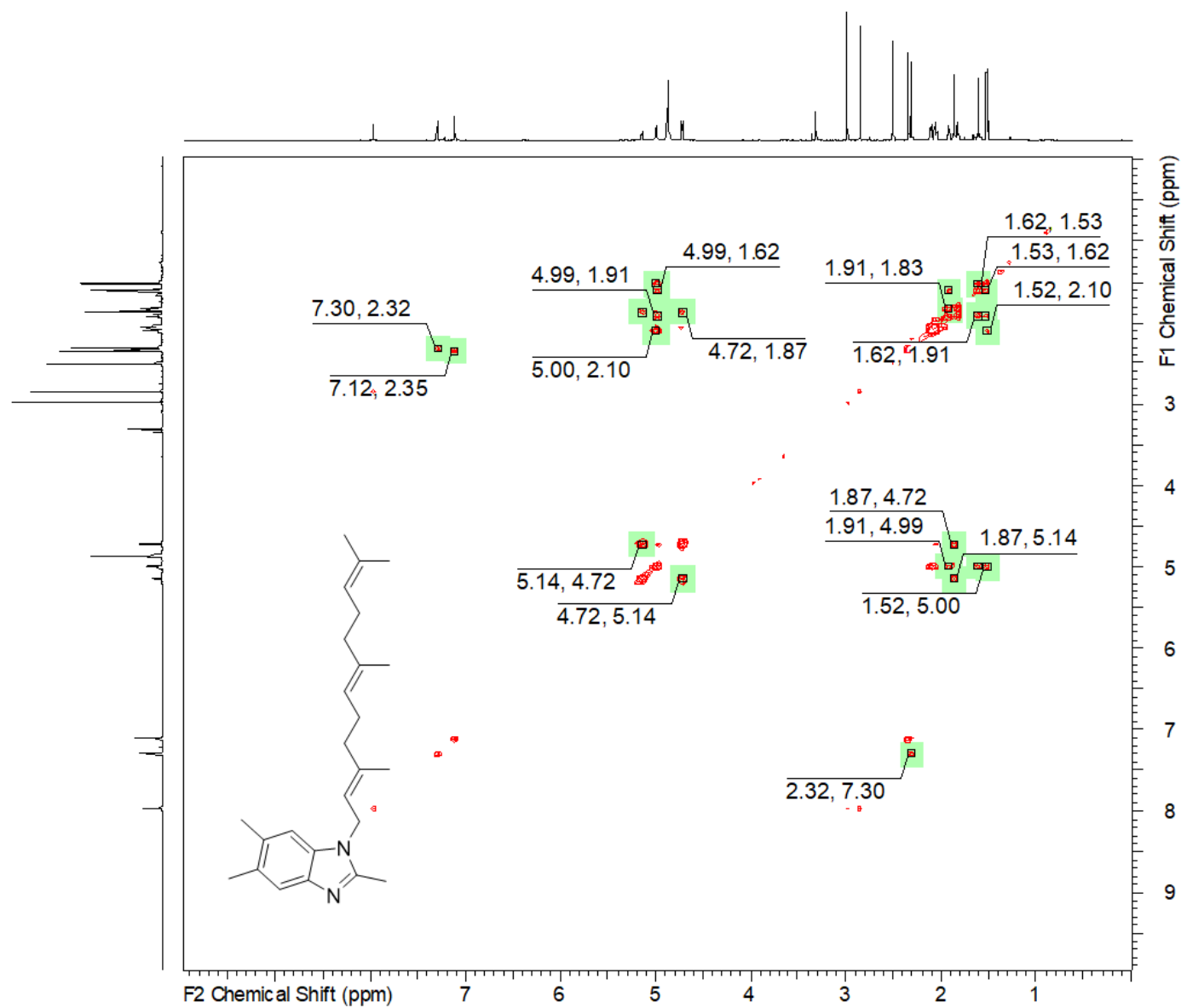


Figure A28 COSY spectrum of **3** in methanol-*d*₄ at 700 MHz.

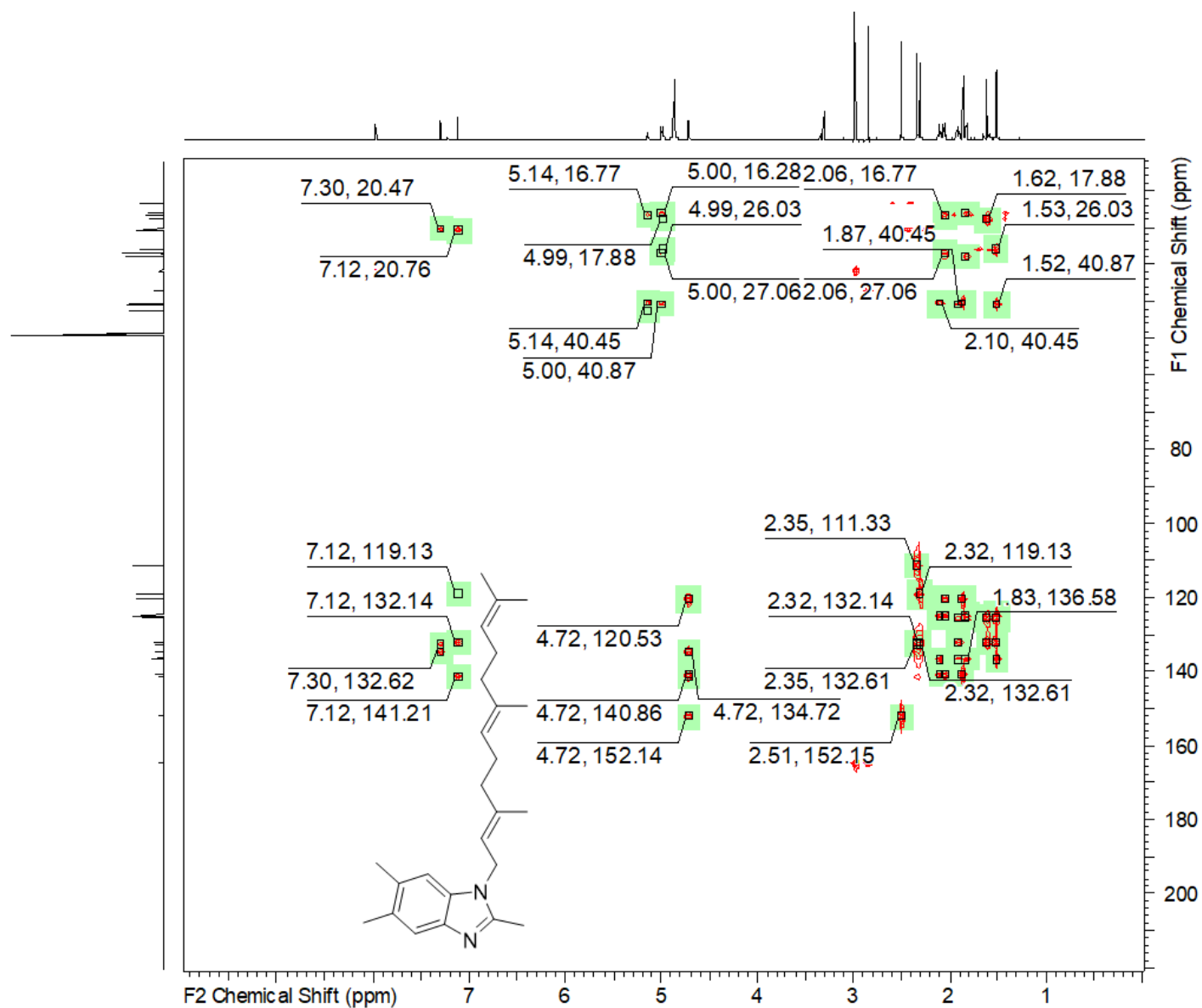


Figure A29 HMBC spectrum of **3** in methanol- d_4 at 700/175 MHz.

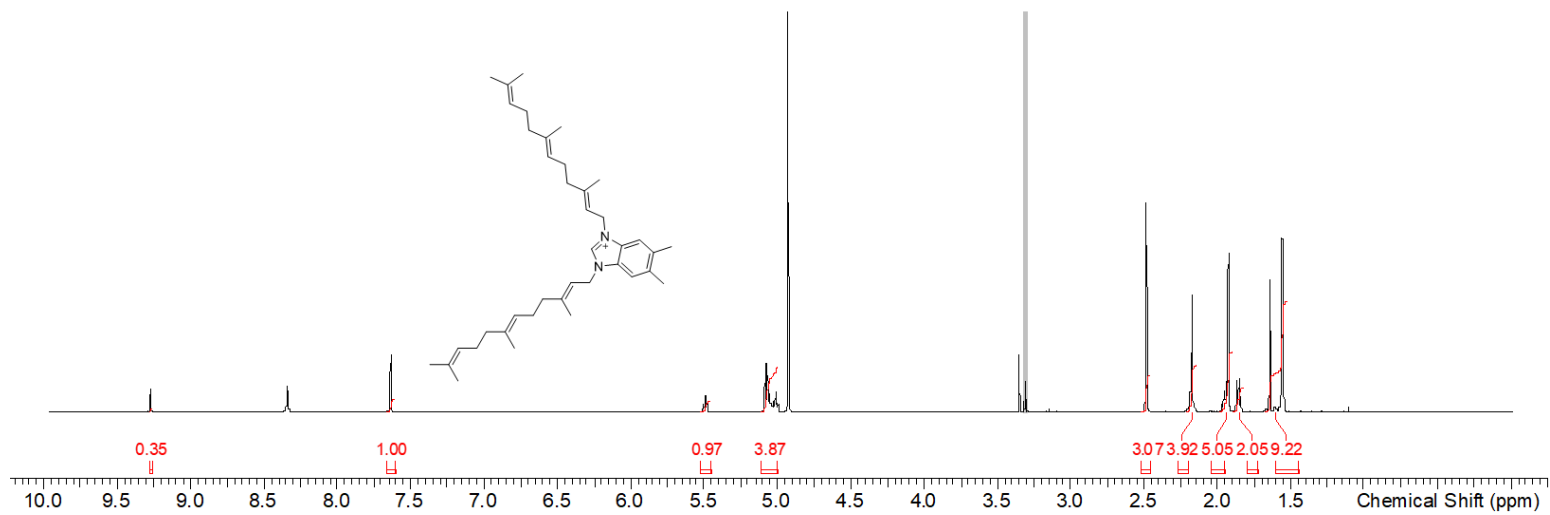


Figure A30 ^1H spectrum of **4** in methanol- d_4 at 500 MHz.

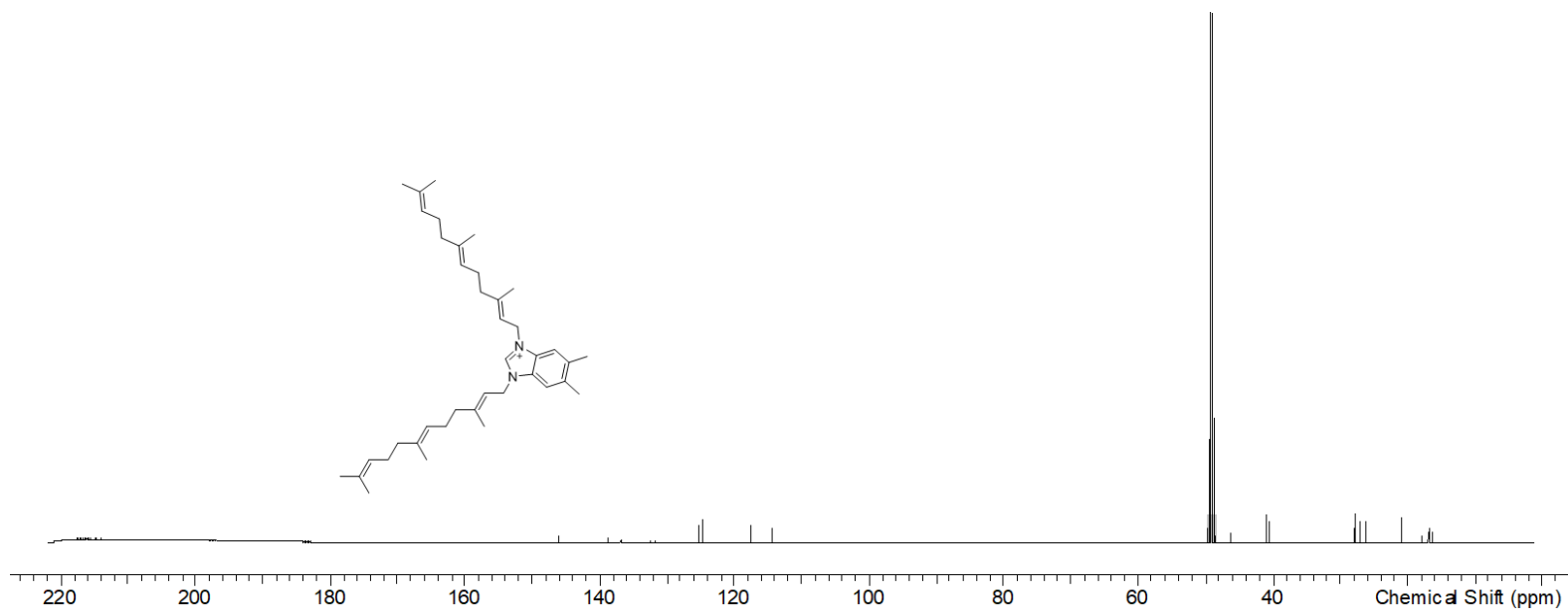


Figure A31 ^{13}C spectrum of **4** in methanol- d_4 at 125 MHz.

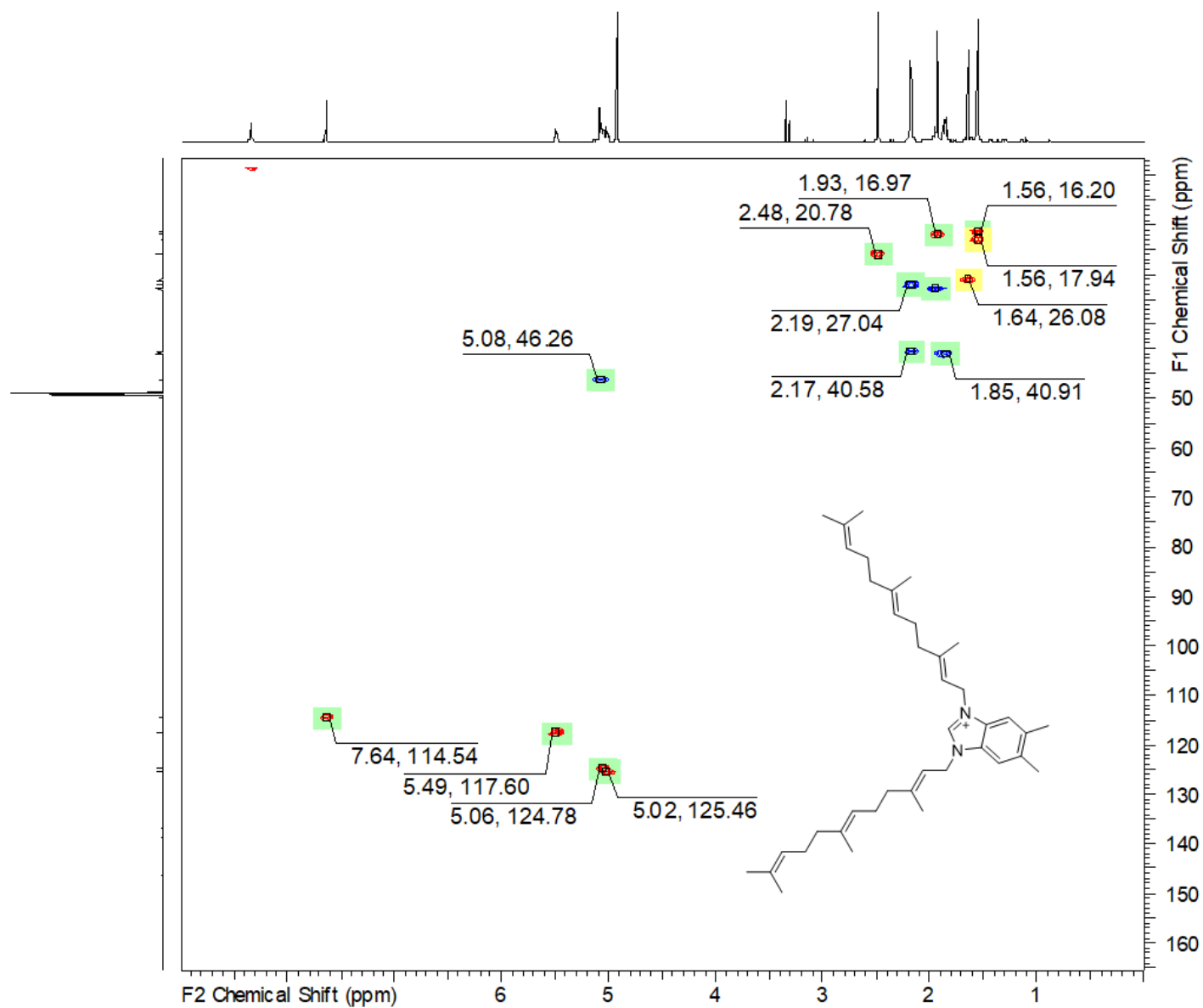


Figure A32 HSQC spectrum of **4** in methanol-*d*₄ at 500/125 MHz.

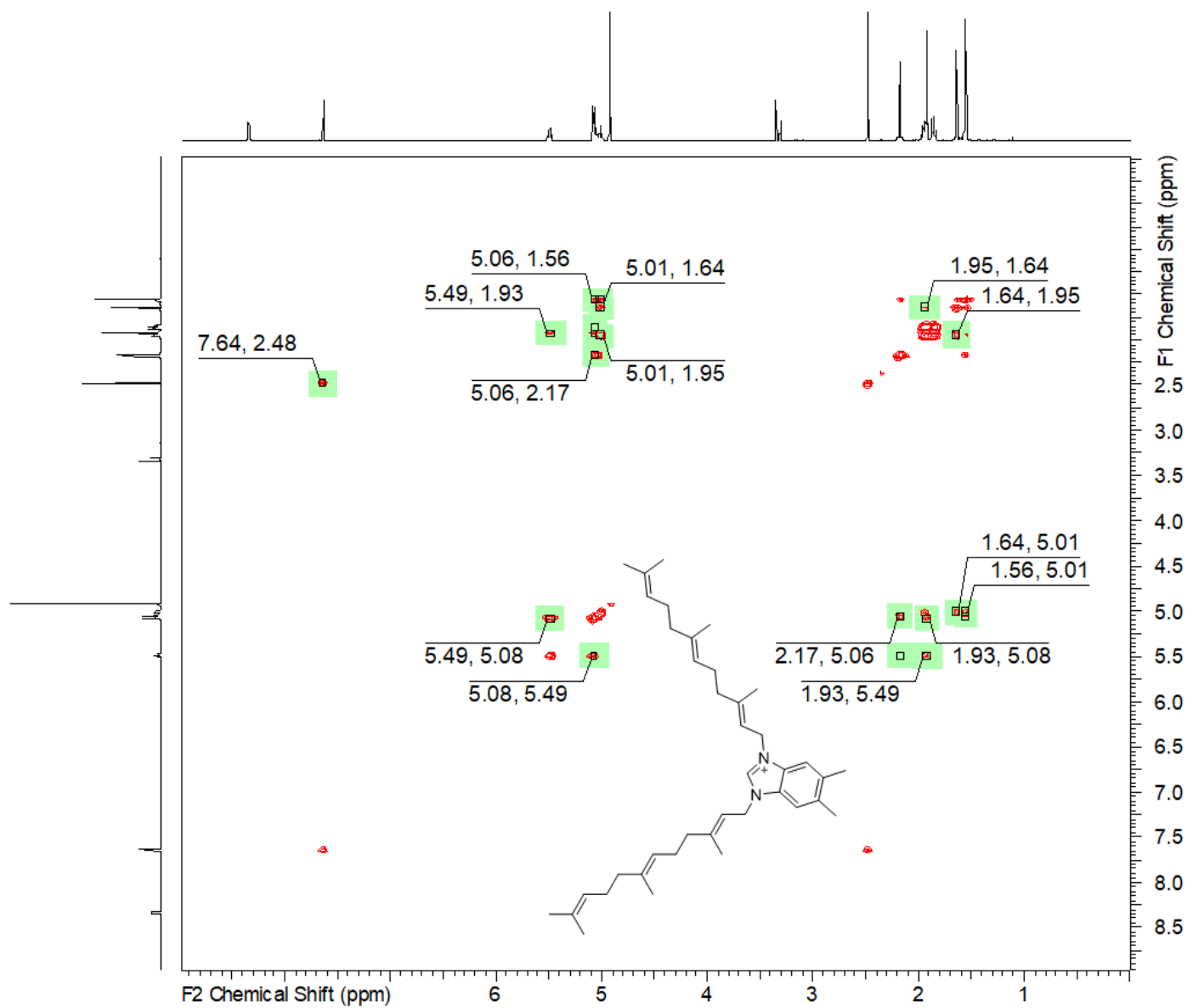


Figure A33 COSY spectrum of **4** in methanol- d_4 at 500 MHz.

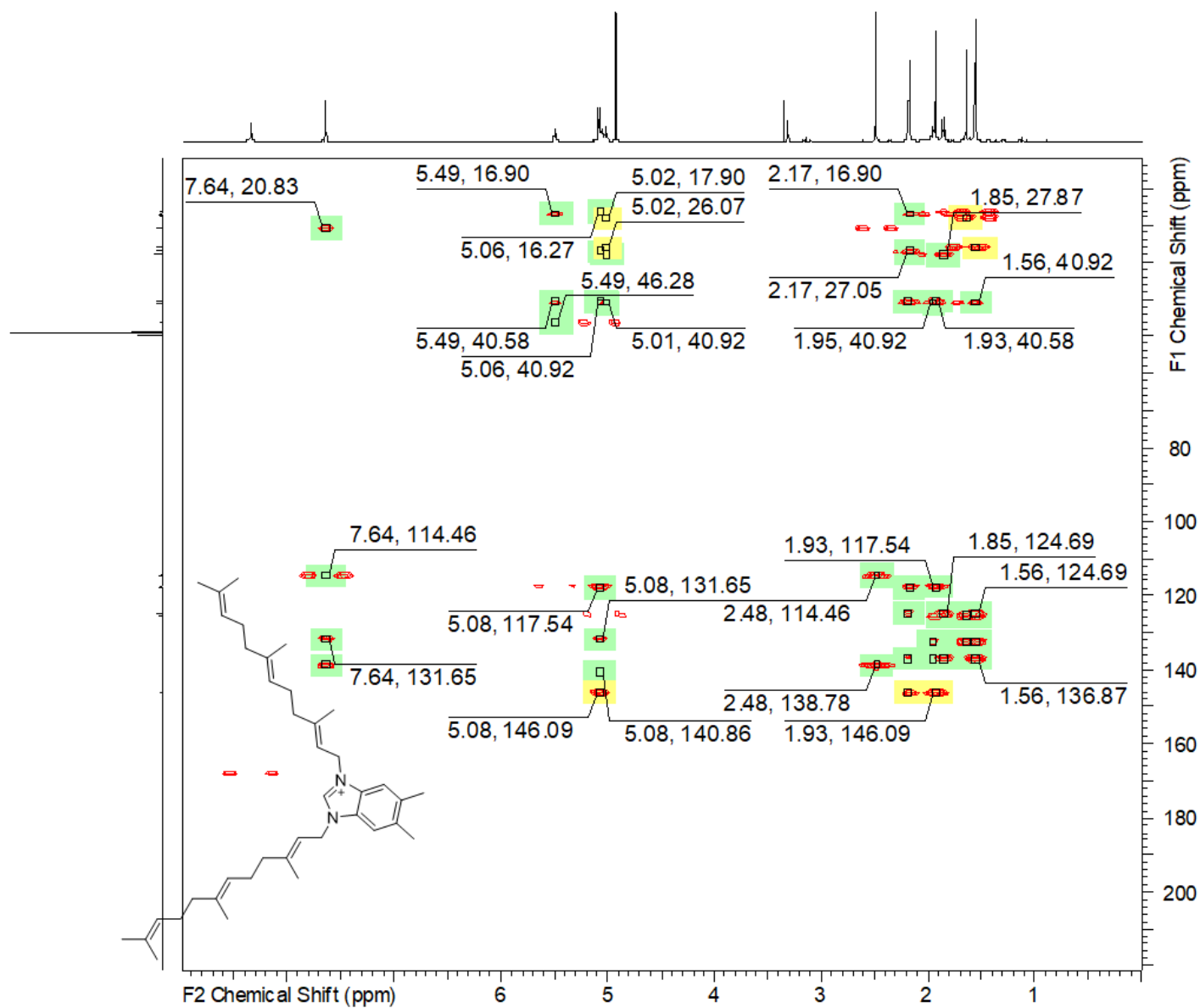


Figure A34 HMBC spectrum of **4** in methanol- d_4 at 500/125 MHz.

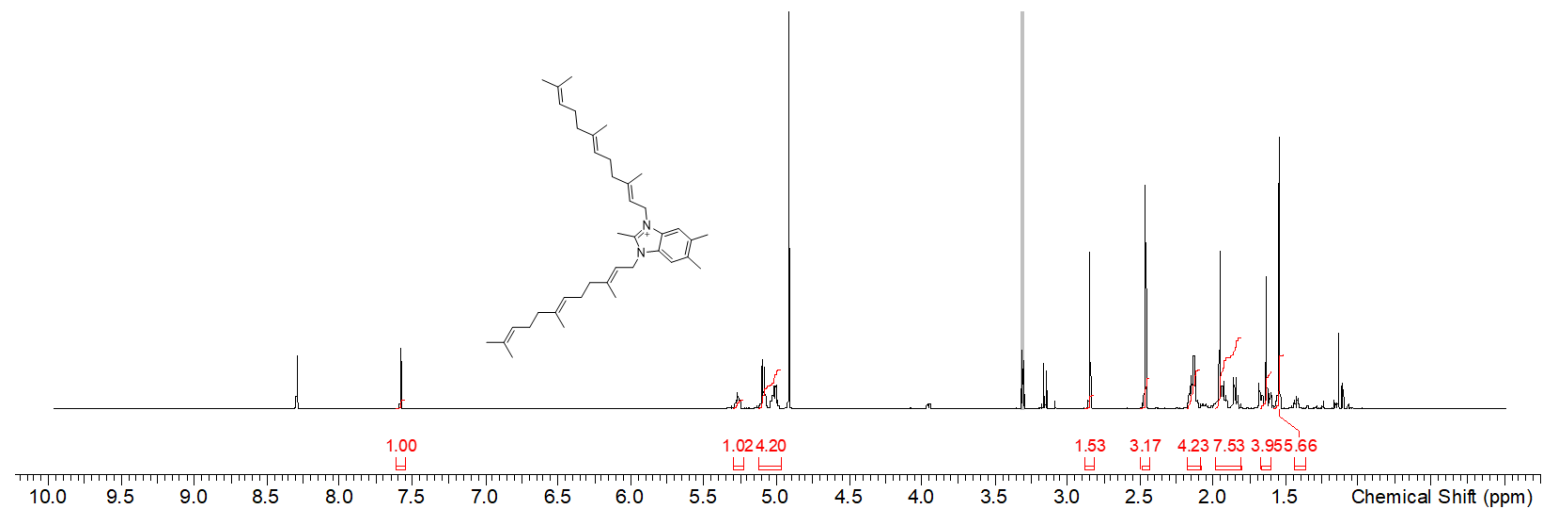


Figure A35 ^1H spectrum of **5** in $\text{methanol-}d_4$ at 500 MHz.

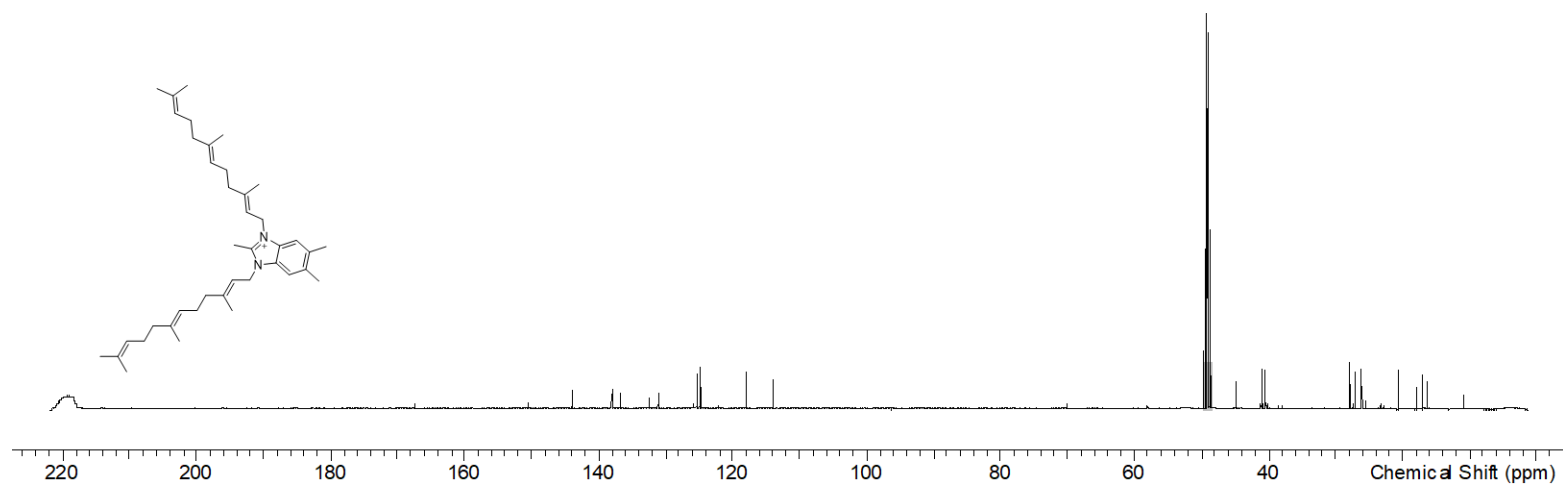


Figure A36 ^{13}C spectrum of **5** in $\text{methanol-}d_4$ at 125 MHz.

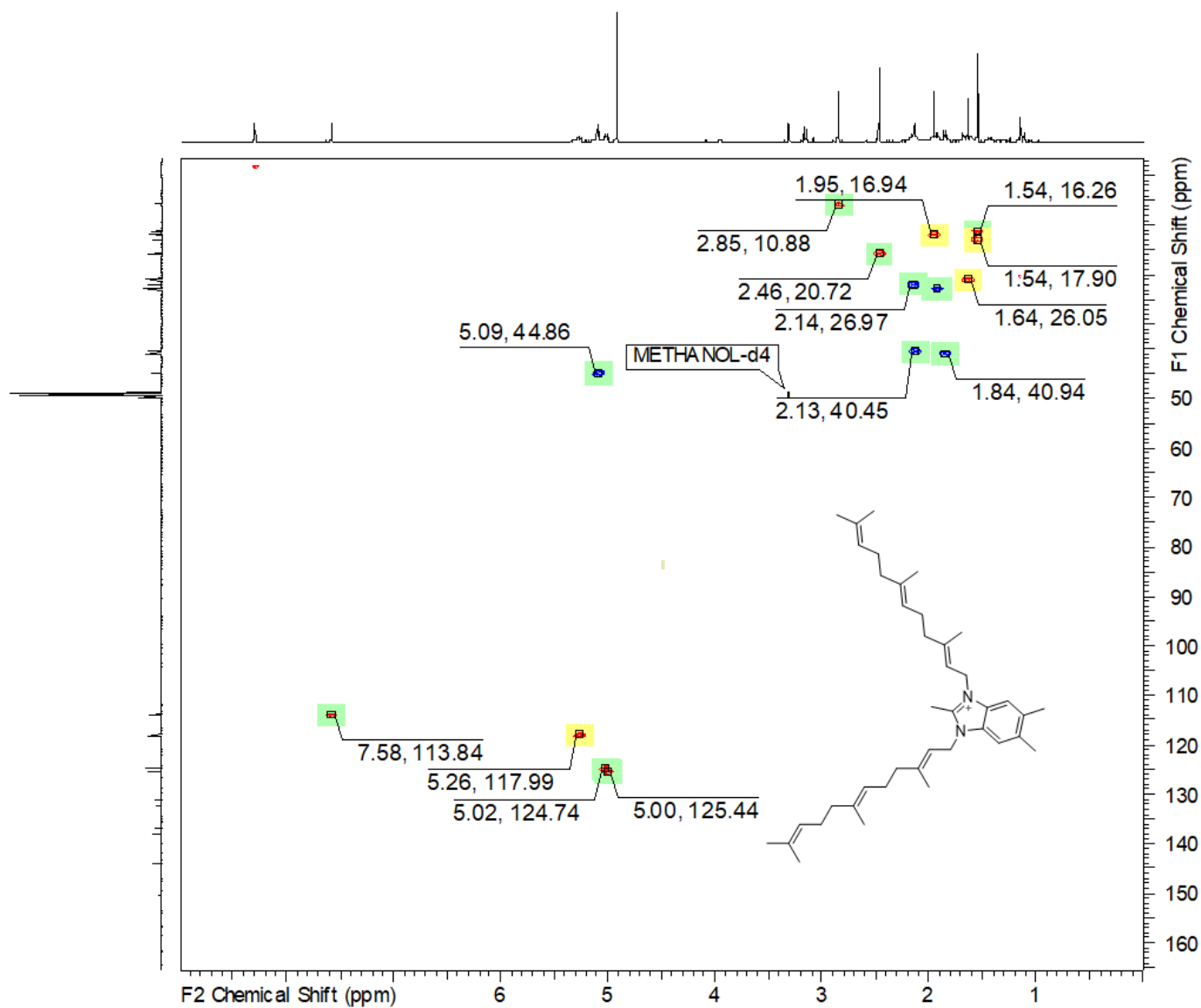


Figure A37 HSQC spectrum of 5 in methanol- d_4 at 500/125 MHz.

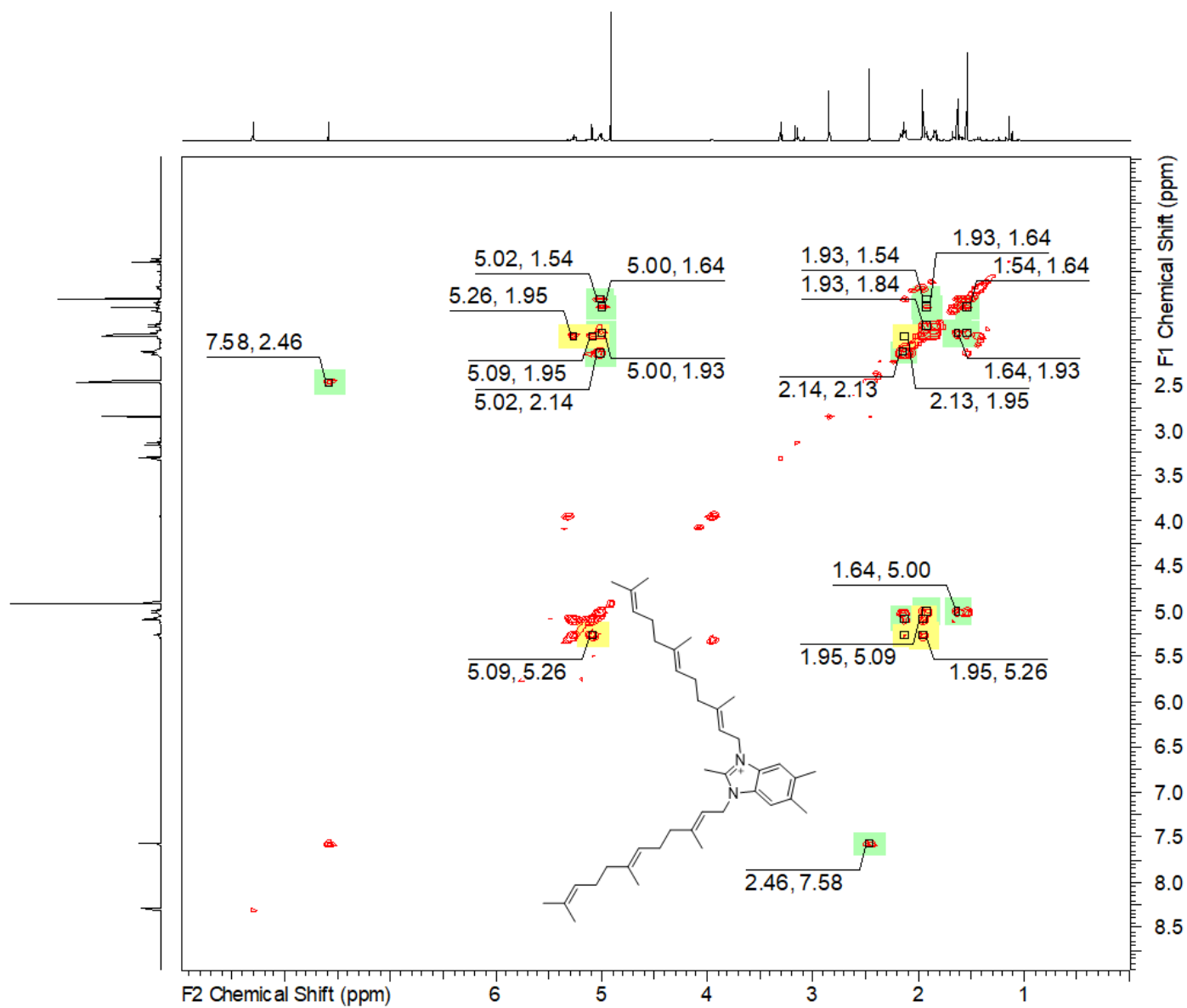


Figure A38 COSY spectrum of 5 in methanol- d_4 at 500 MHz.

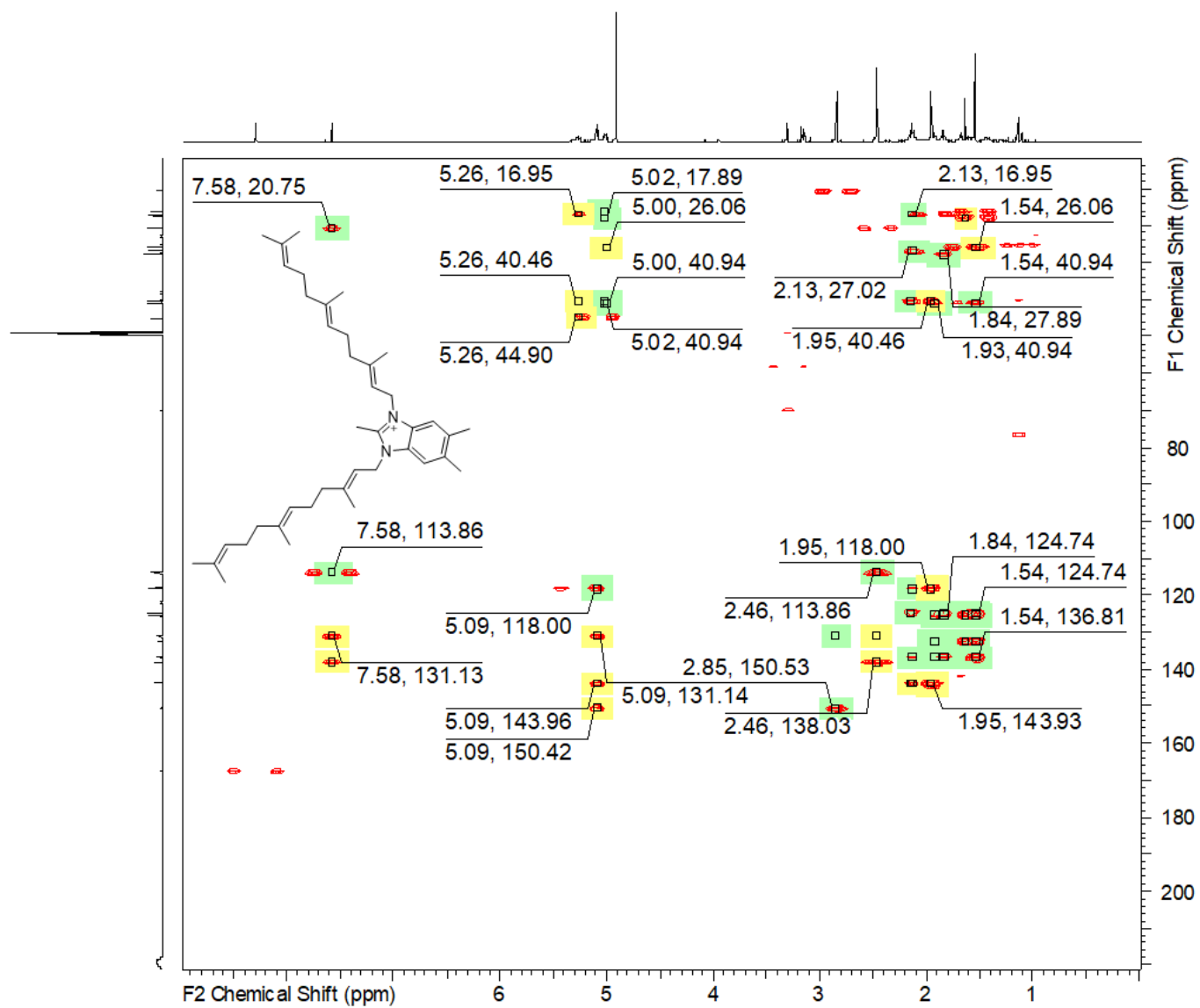


Figure A39 HMBC spectrum of **5** in methanol- d_4 at 500/125 MHz.

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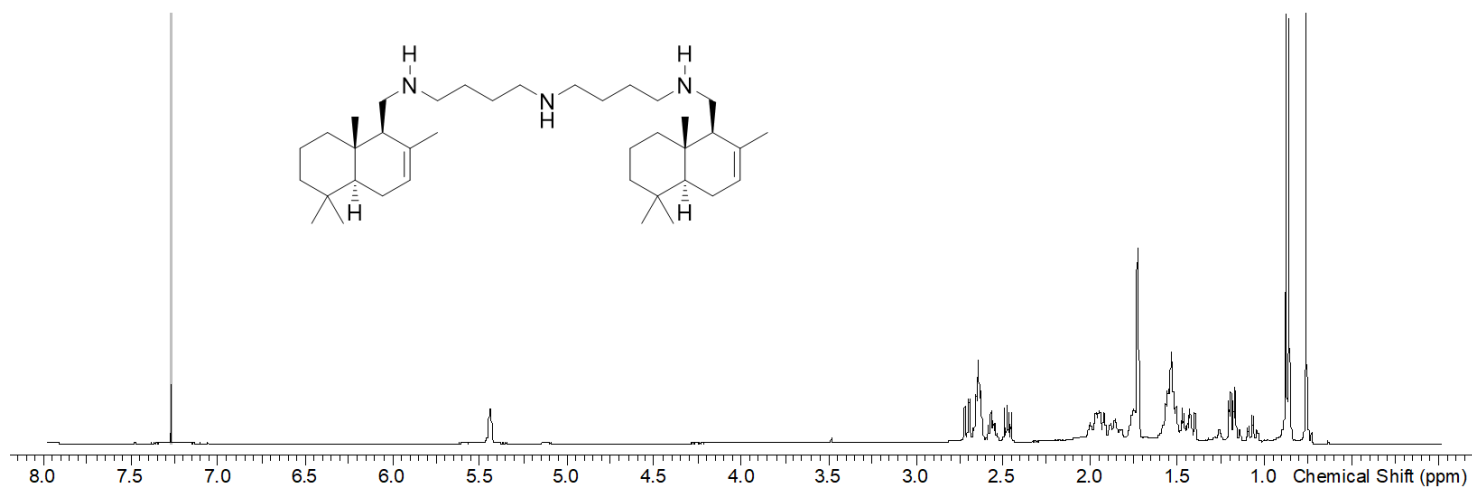


Figure A40 ¹H spectrum of sandaramin A (1) in CDCl₃ at 500 MHz isolated from MSr10575 extracts.

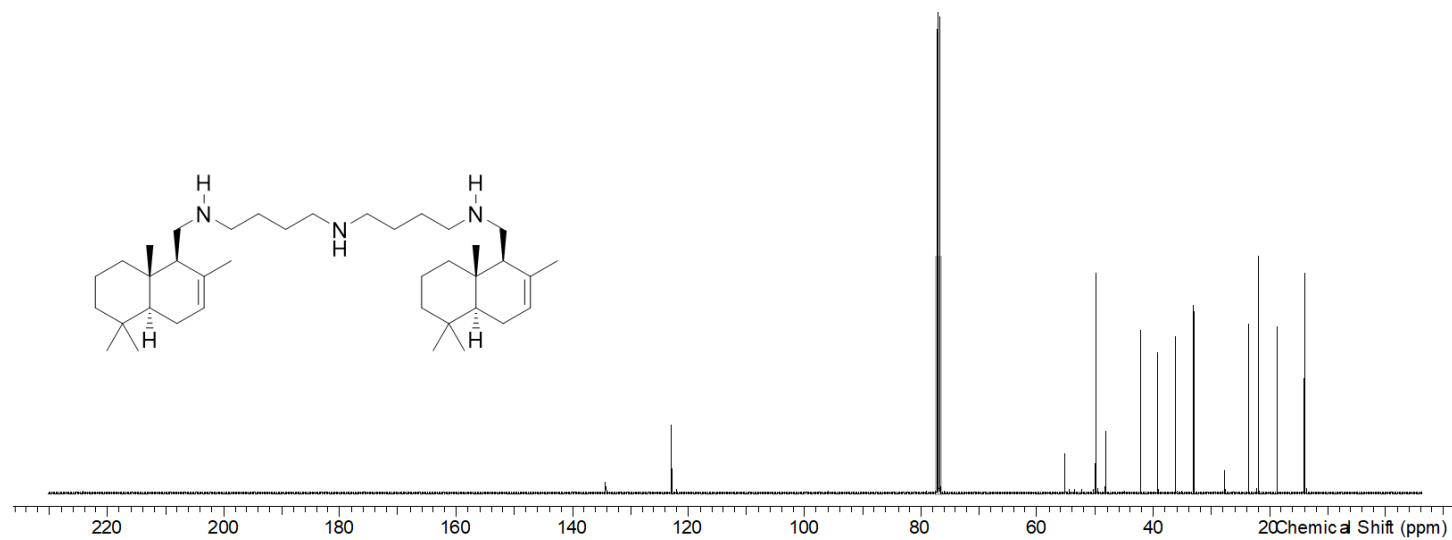


Figure A41 ¹³C spectrum of sandaramin A (1) in CDCl₃ at 125 MHz isolated from MSr10575 extracts.

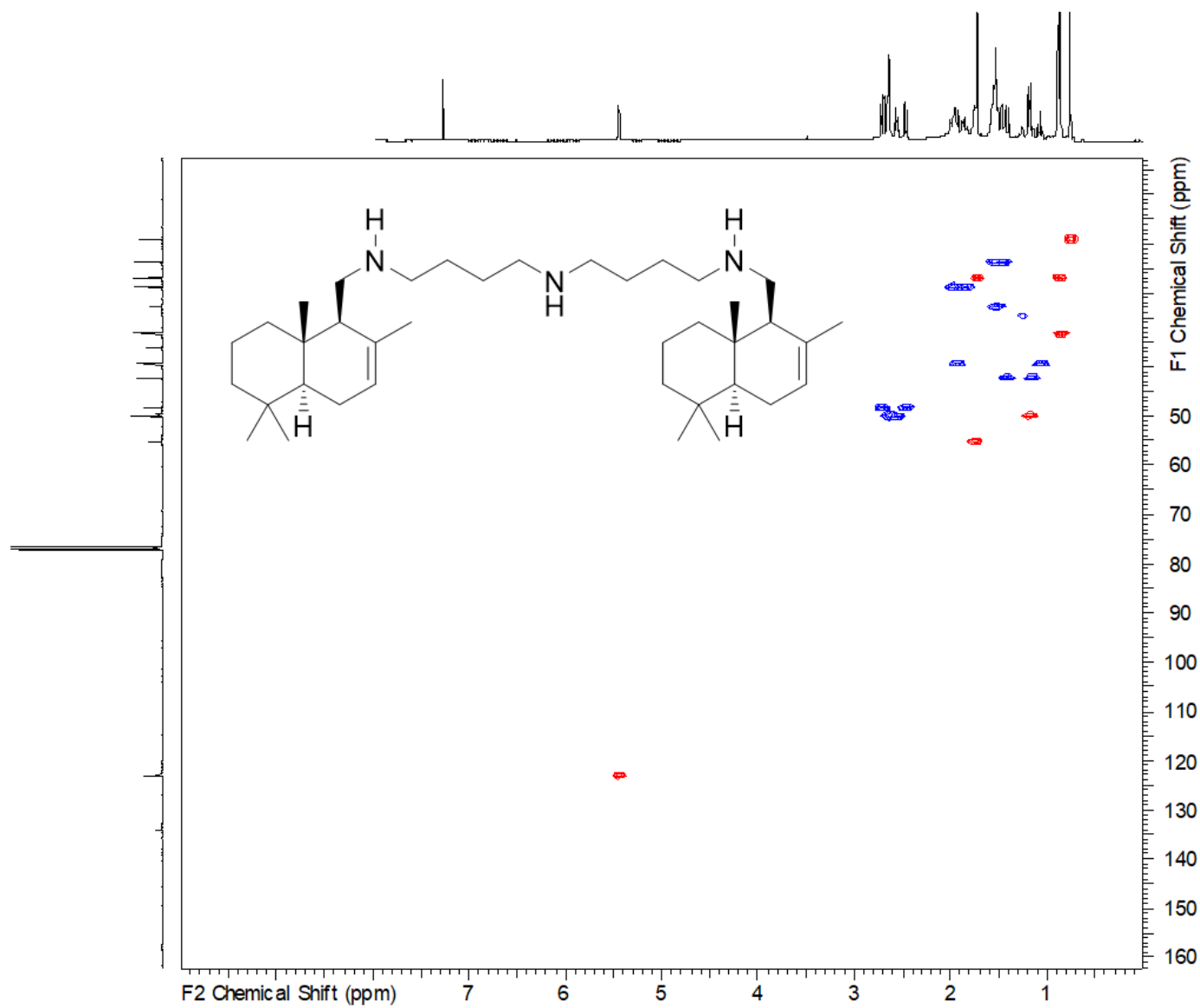


Figure A42 HSQC-dept spectrum of sandaramin A (**1**) in CDCl₃ at 500/125 MHz isolated from MSr10575 extracts.

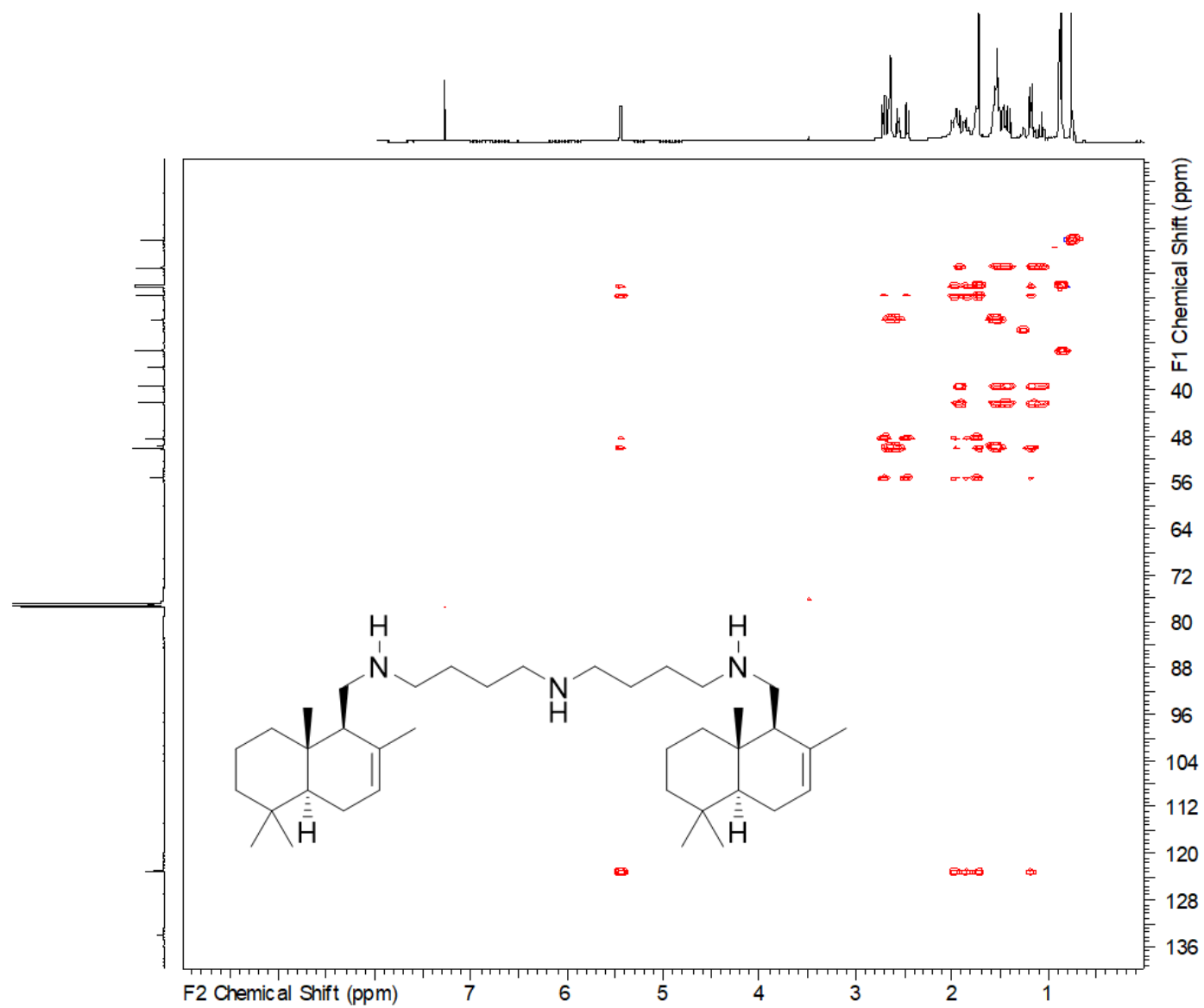


Figure A43 HSQC-TOCSY spectrum of sandaramin A (**1**) in CDCl₃ at 500/125 MHz isolated from MSr10575 extracts.

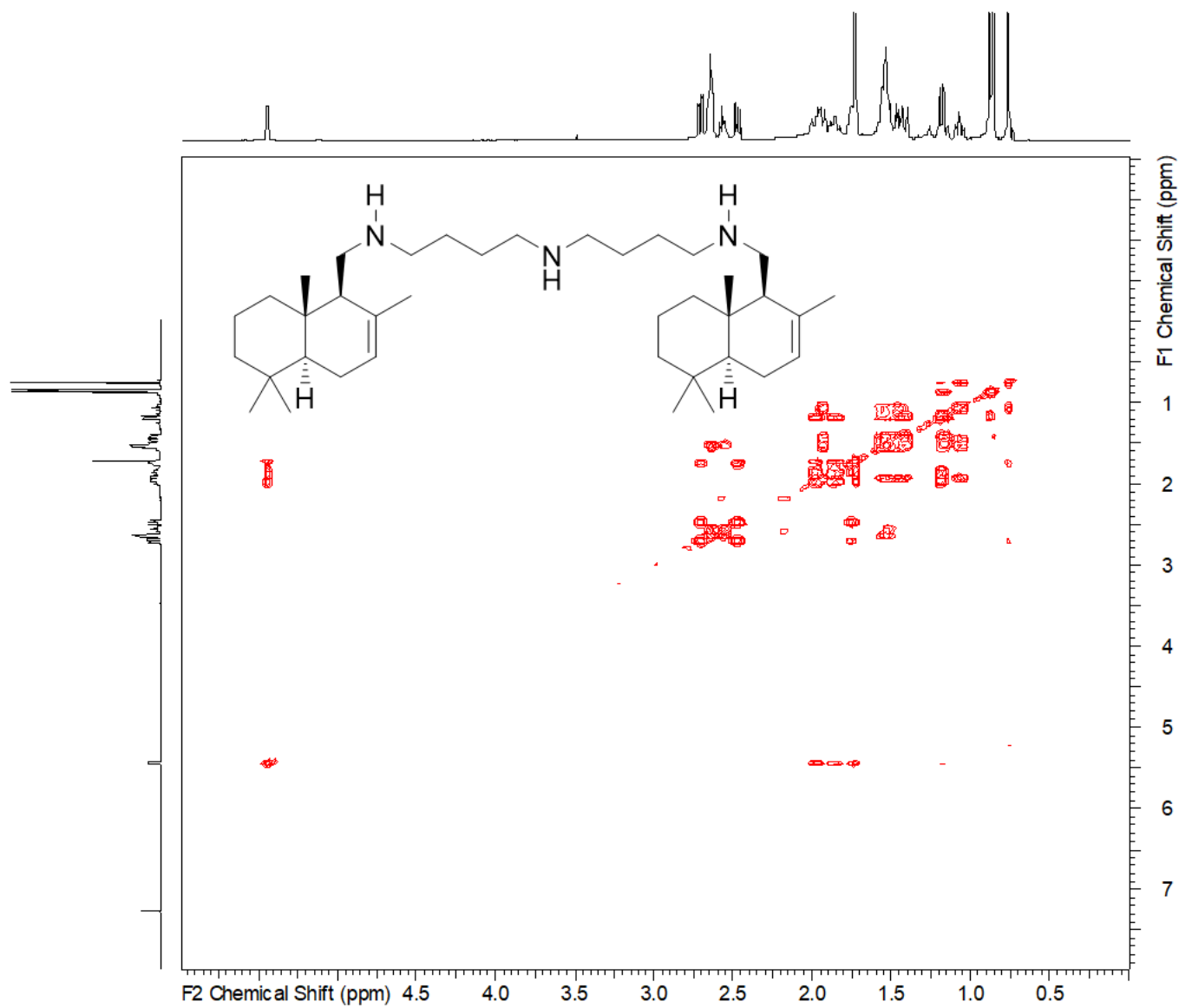


Figure A44 COSY spectrum of sandaramin A (1) in CDCl₃ at 500 MHz isolated from MSr10575 extracts

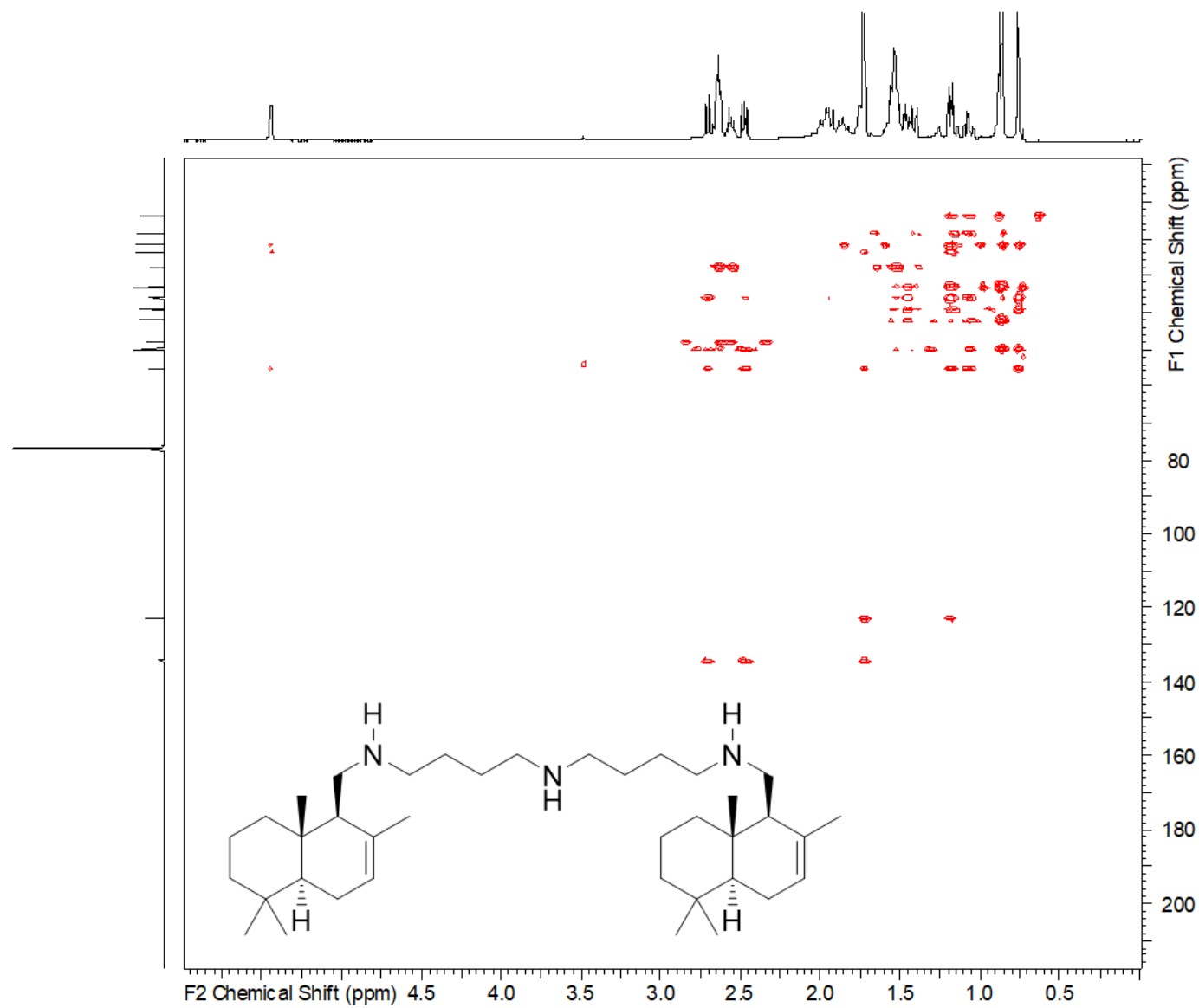


Figure A45 HMBC spectrum of sandaramin A (**1**) in CDCl₃ at 500/125 MHz isolated from MSr10575 extracts.

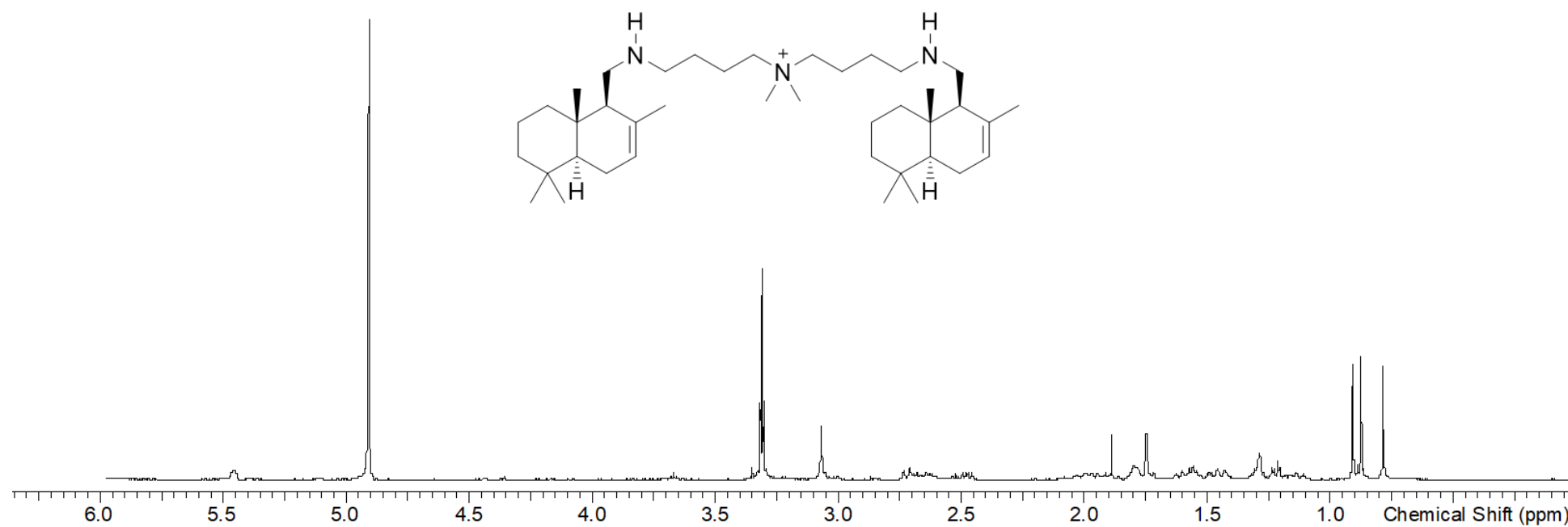


Figure A46 ^1H spectrum of sandaramin B (**2**) in $\text{MeOD-}d_4$ at 500 MHz isolated from MSr10575 extracts.

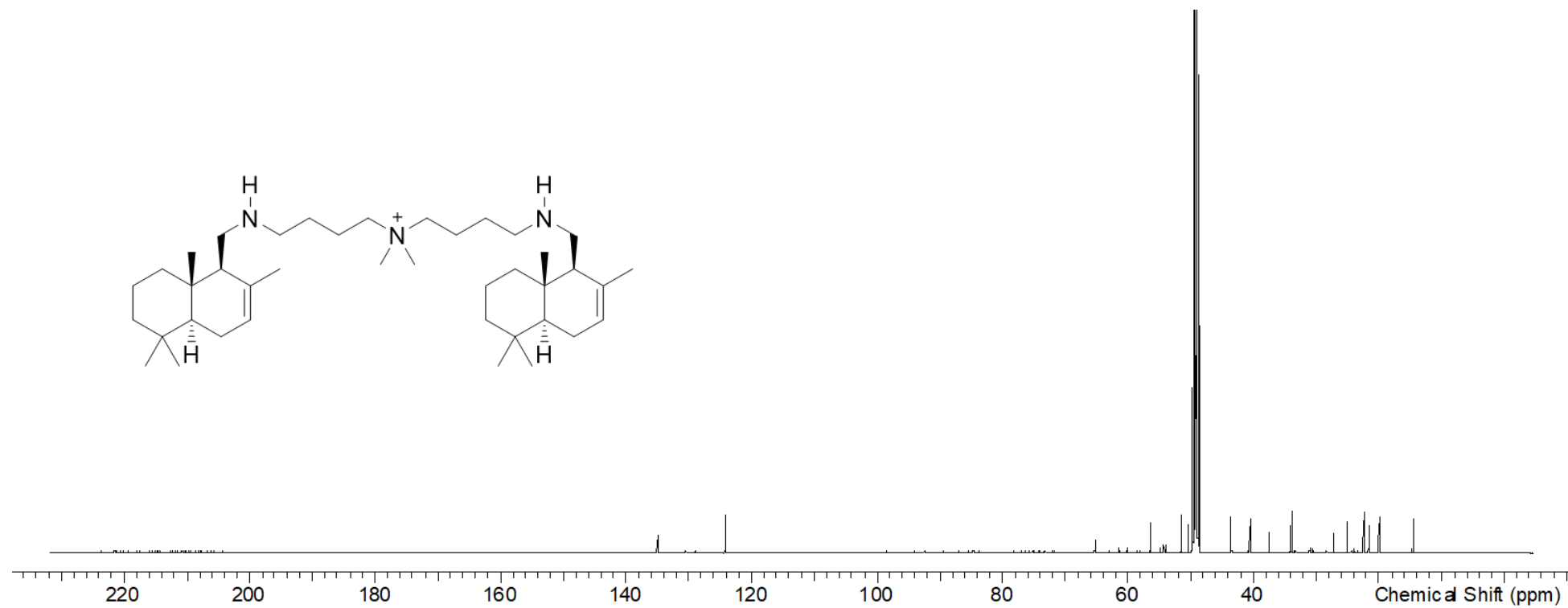


Figure A47 ^{13}C spectrum of sandaramin B (**2**) in $\text{MeOD-}d_4$ at 125 MHz isolated from MSr10575 extracts.

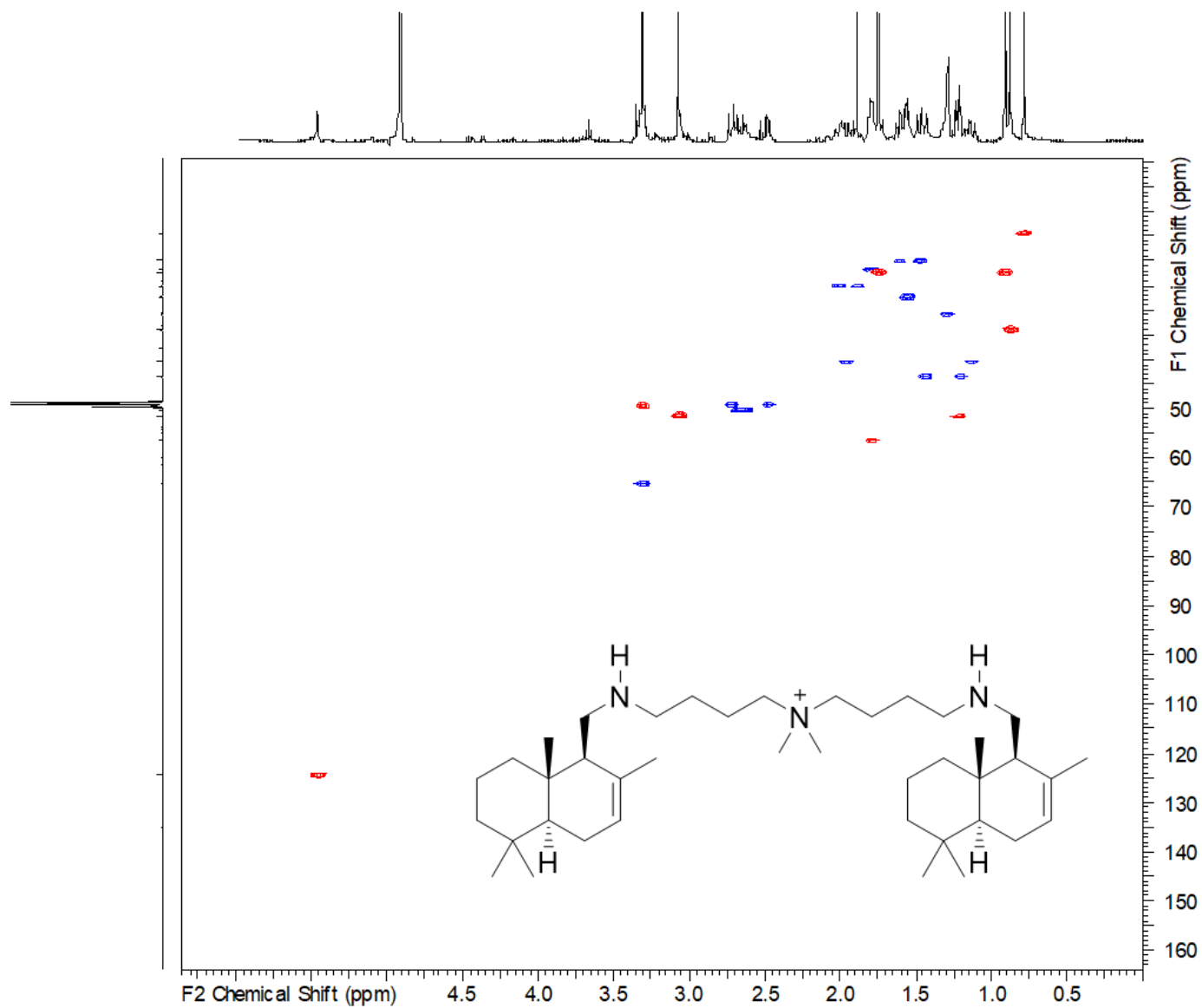


Figure A48 HSQC-dept spectrum of sandaramin B (**2**) in MeOD-*d*₄ at 500/125 MHz isolated from MSr10575 extracts.

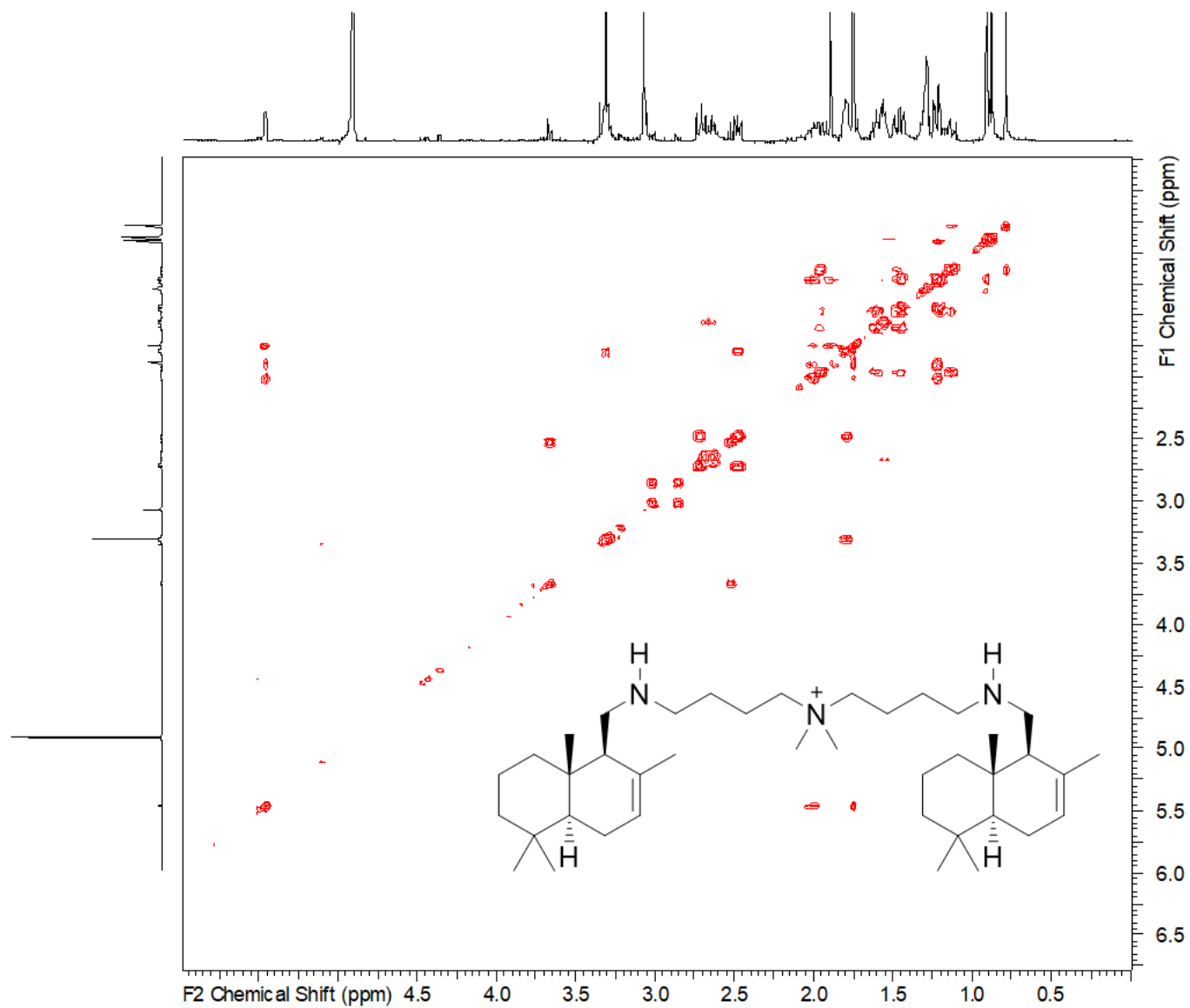


Figure A49 COSY spectrum of sandaramin B (**2**) in MeOD-*d*₄ at 500 MHz isolated from MSr10575 extracts.

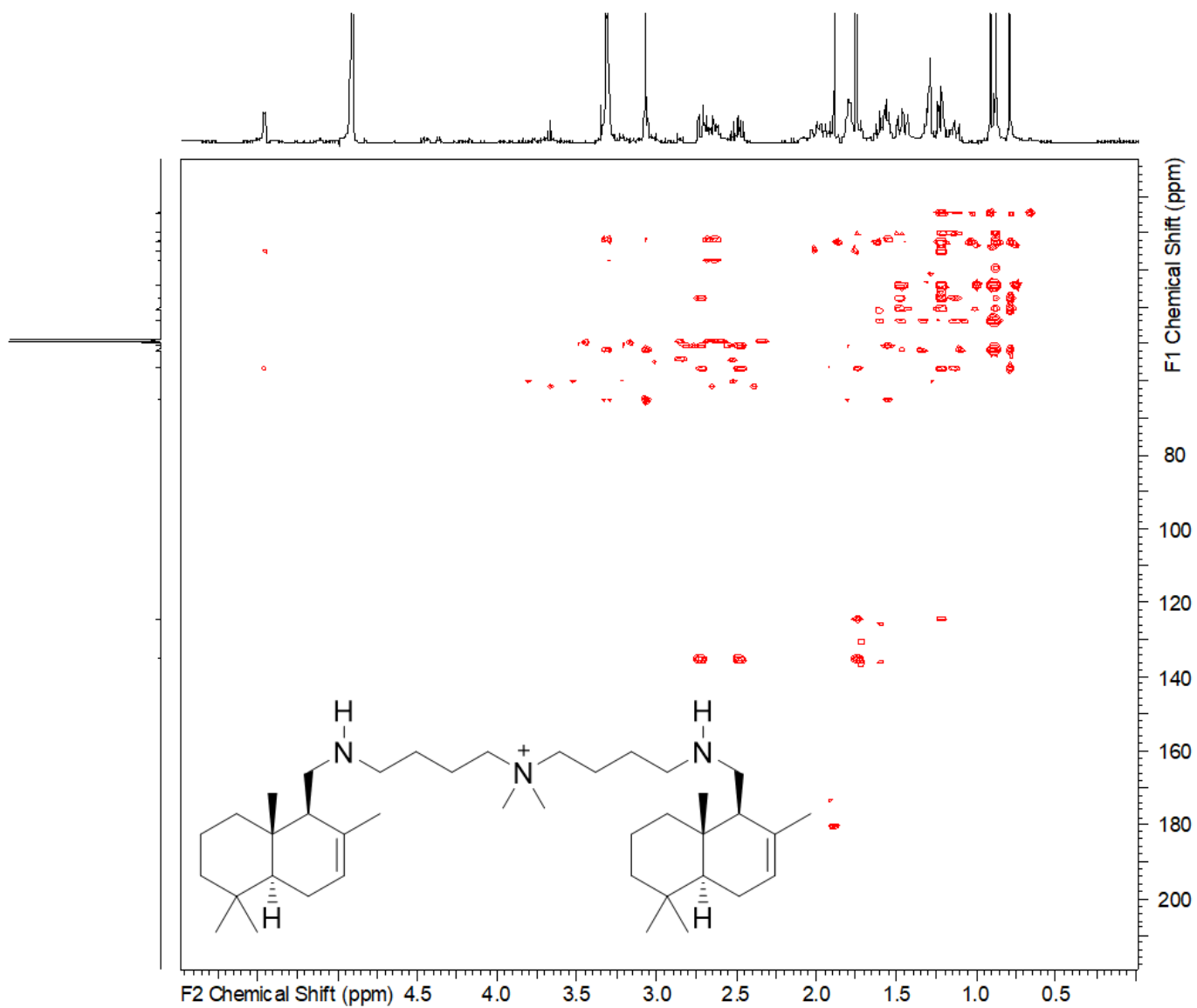


Figure A50 HMBC spectrum of sandaramin B (2) in MeOD-*d*₄ at 500/125 MHz isolated from MSr10575 extracts.

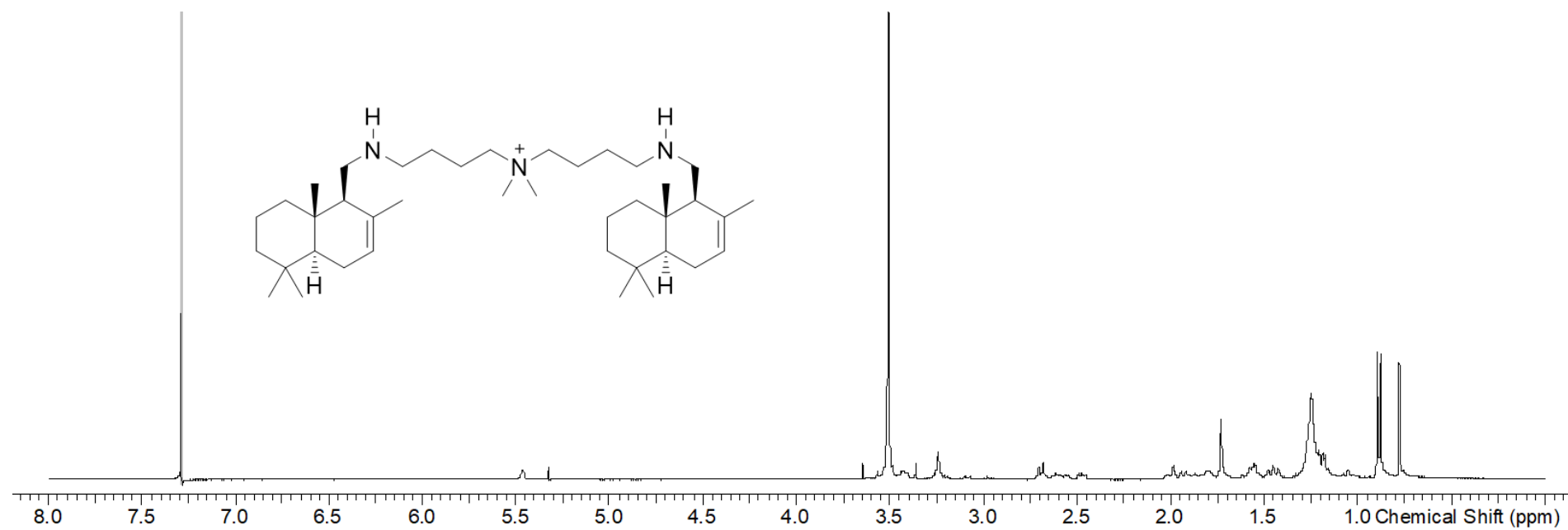


Figure A51 ¹H spectrum of sandaramin B (**2**) in CDCl₃ at 500 MHz isolated from MSr10575 extracts.

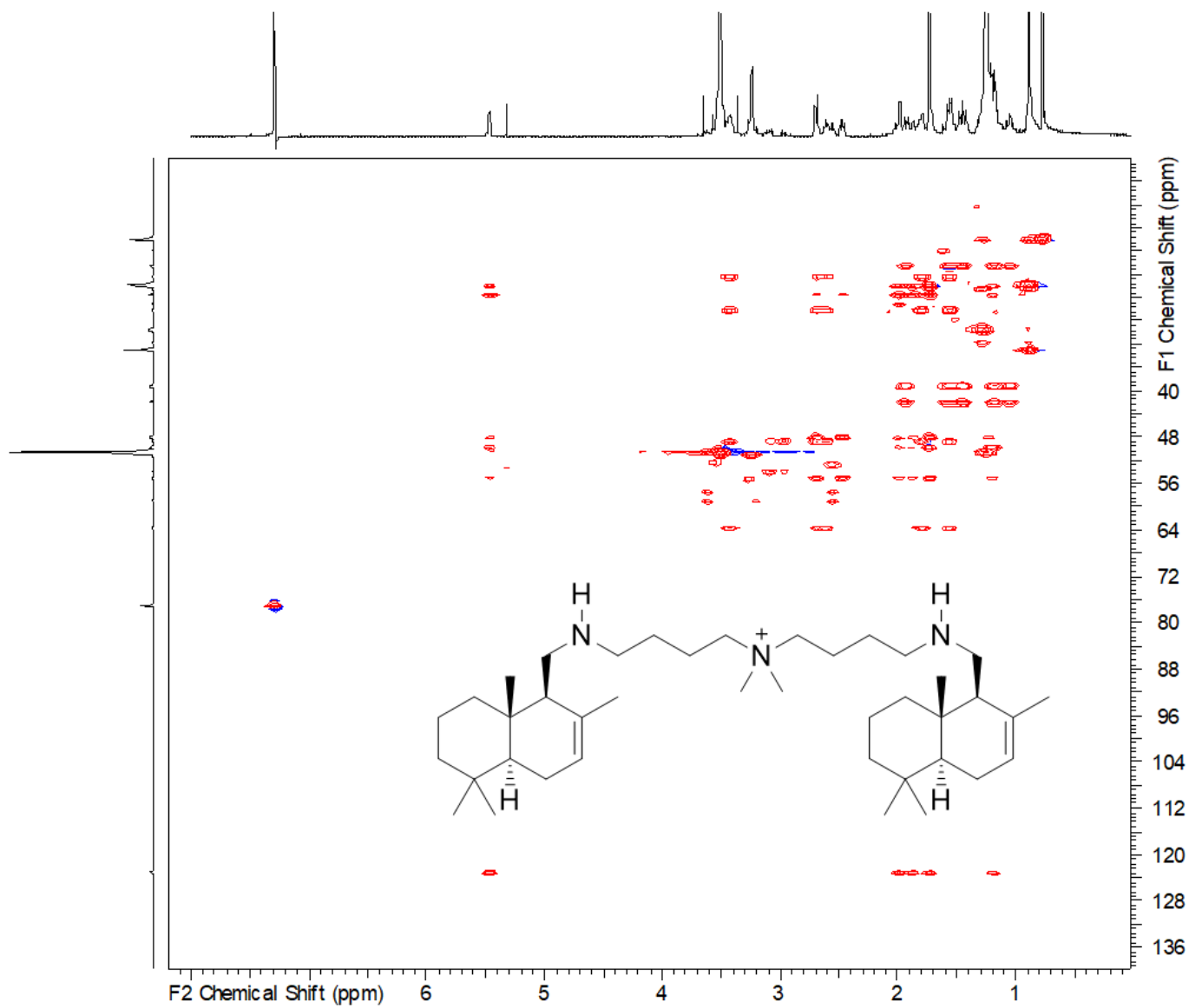


Figure A52 HSQC-TOCSY spectrum of sandaramin B (**2**) in CDCl₃ at 125 MHz isolated from MSr10575 extracts.

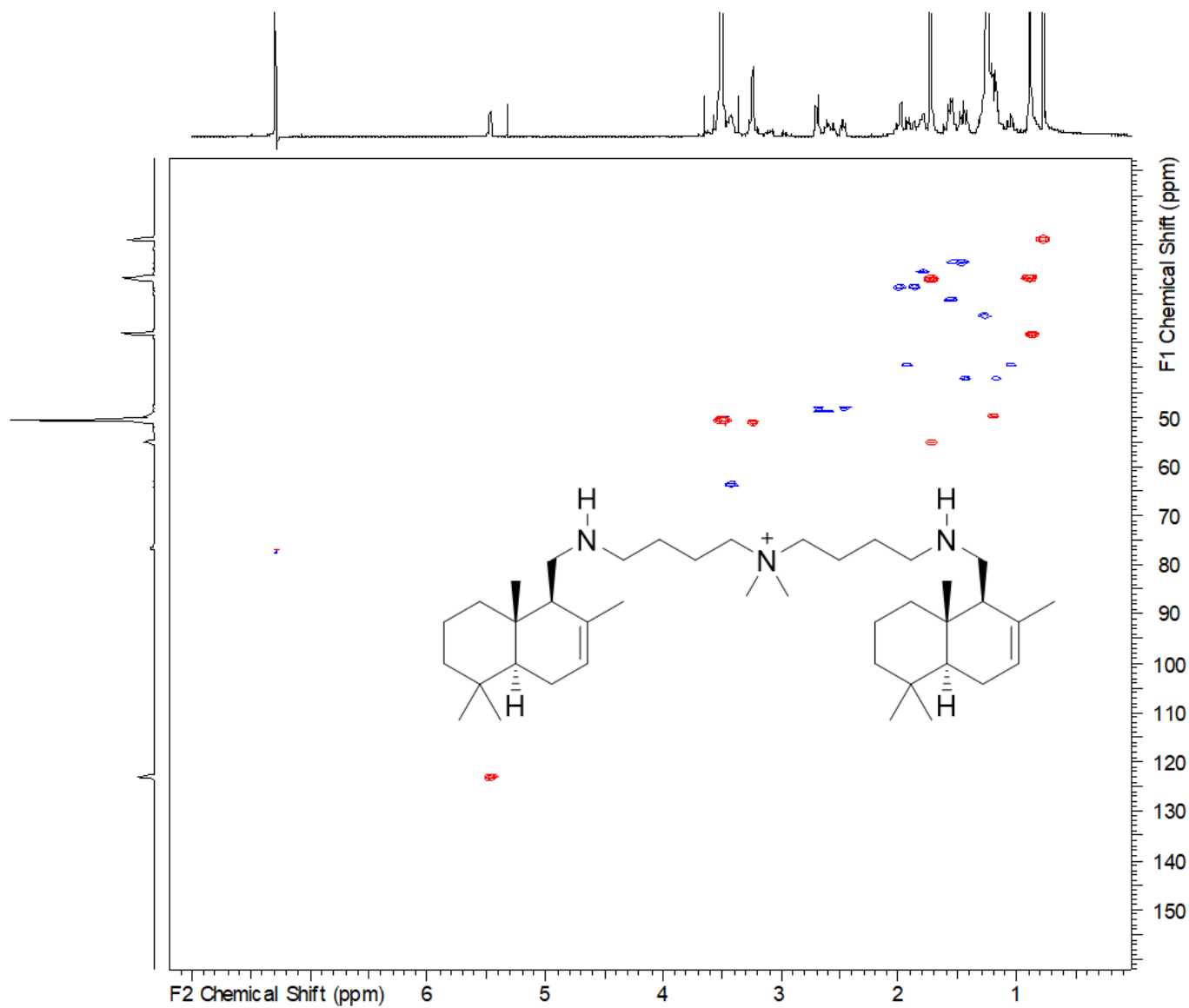


Figure A53 HSQC spectrum of sandaramin B (**2**) in CDCl₃ at 500/125 MHz isolated from MSr10575 extracts.

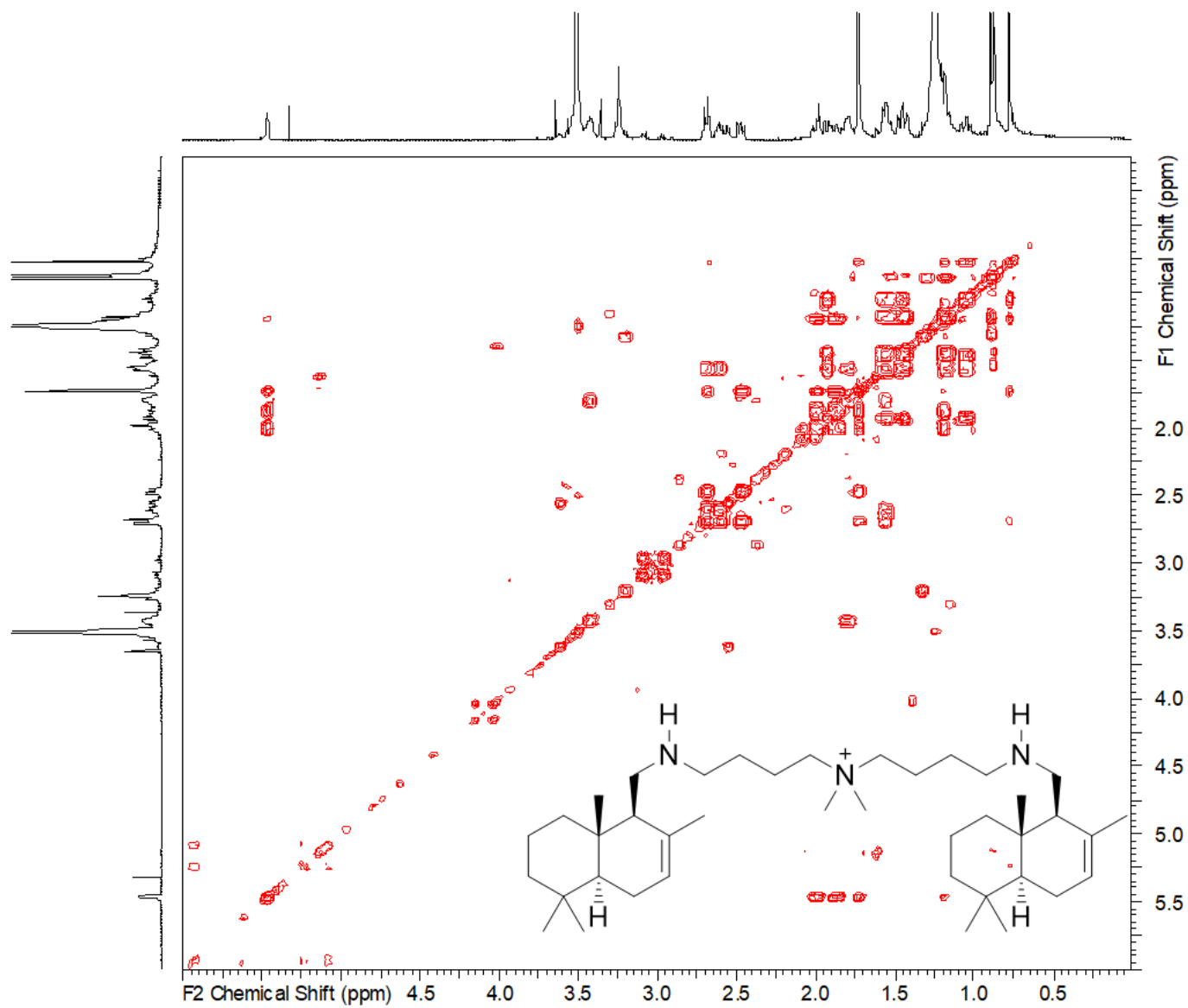


Figure A54 COSY spectrum of sandaramin B (**2**) in CDCl₃ at 500 MHz isolated from MSr10575 extracts.

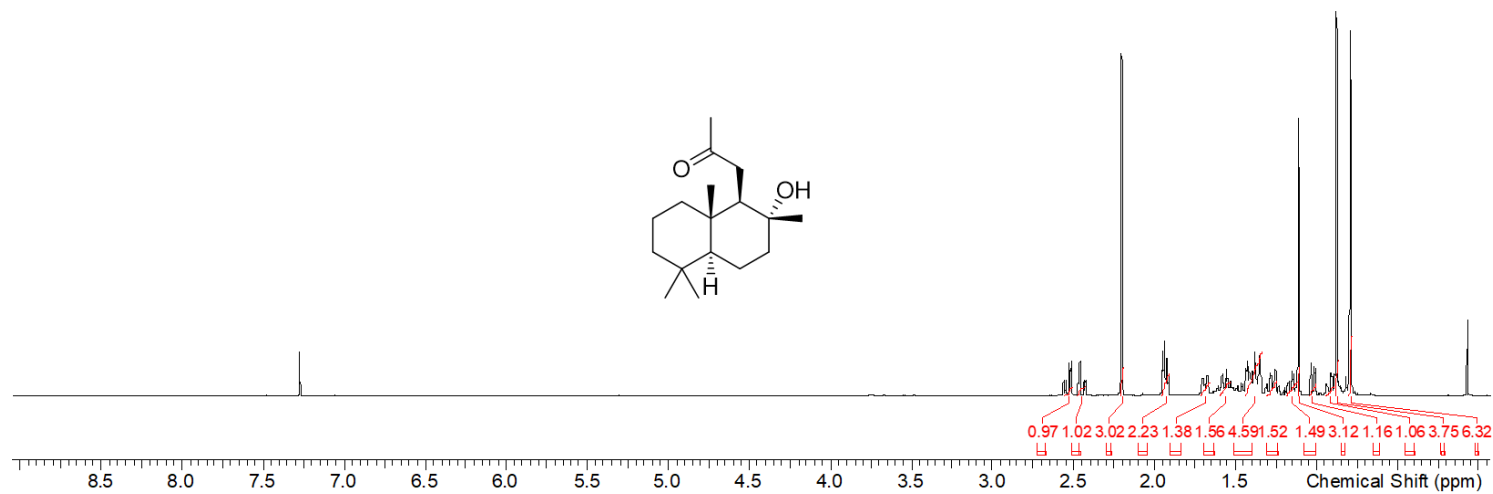


Figure A55 ^1H spectrum of 6 in CDCl_3 at 500 MHz.

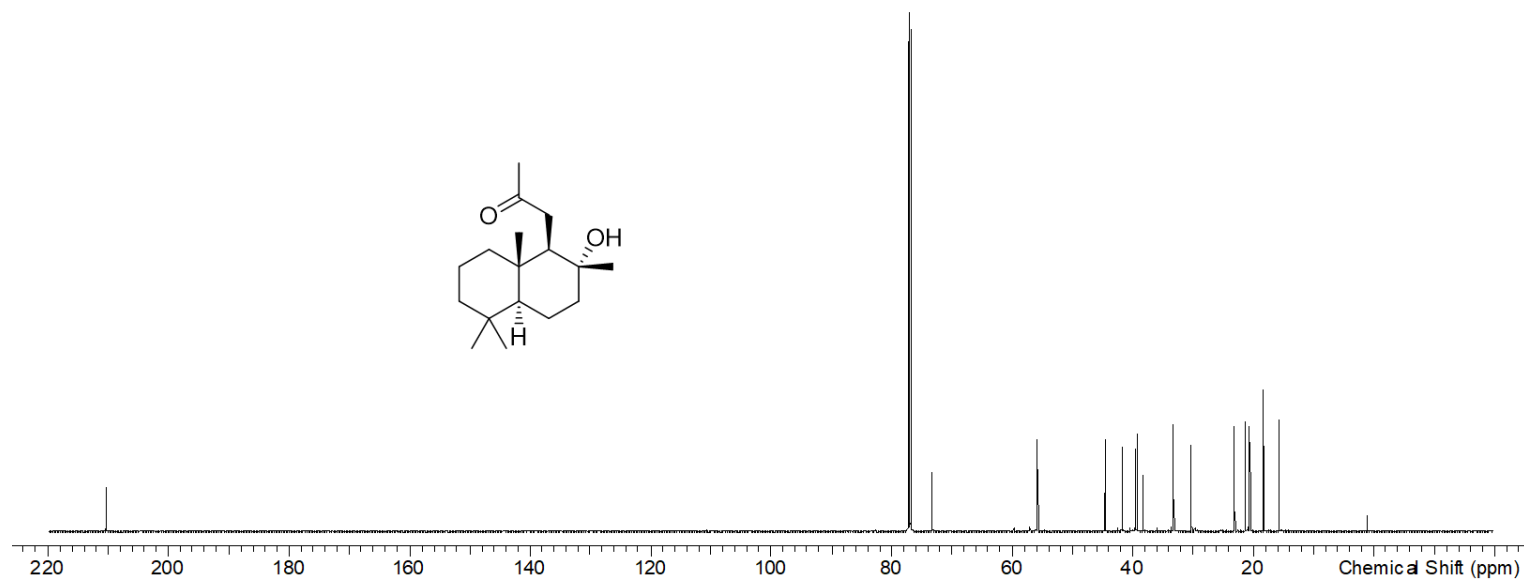


Figure A56 ^{13}C spectrum of 6 in CDCl_3 at 125 MHz.

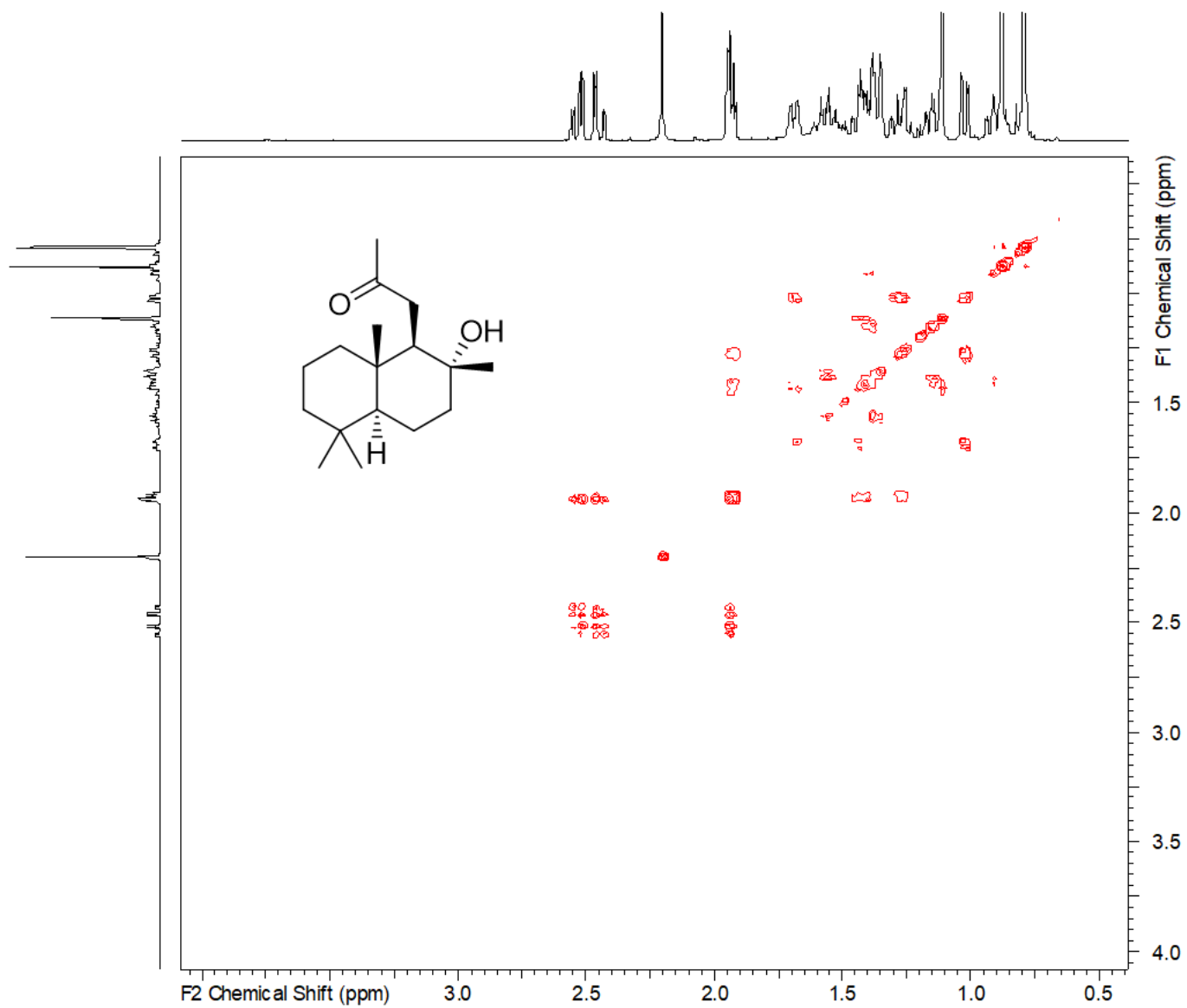


Figure A57 COSY spectrum of **6** in CDCl₃ at 500 MHz.

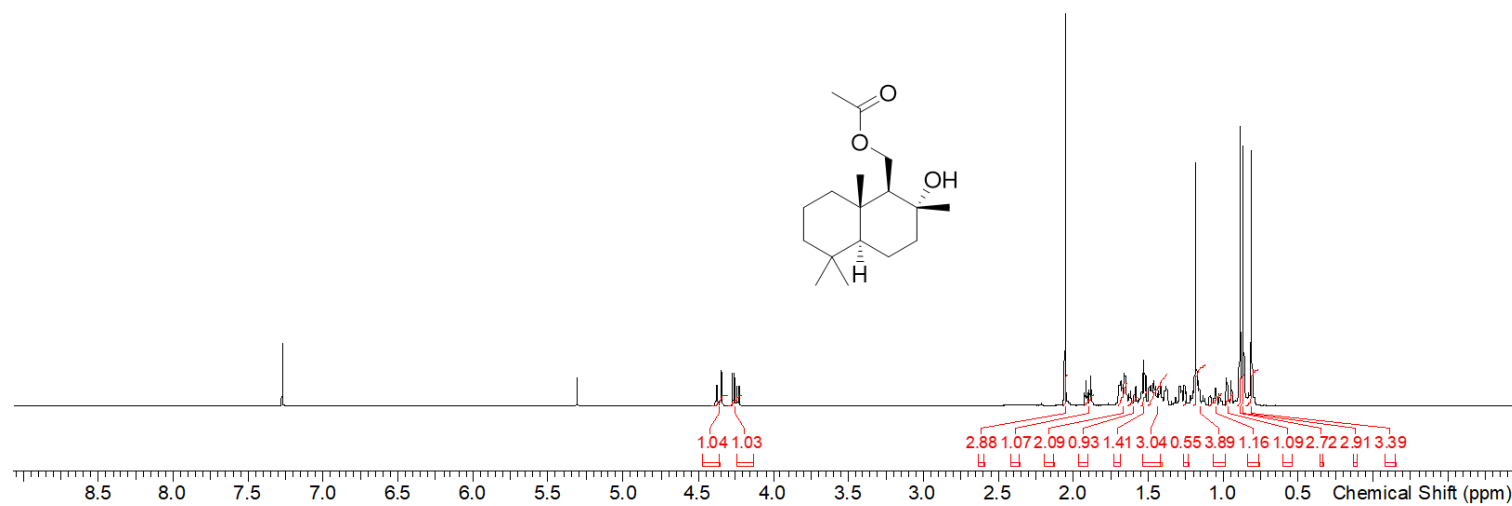


Figure A58 ¹H spectrum of 7 in CDCl₃ at 400 MHz.

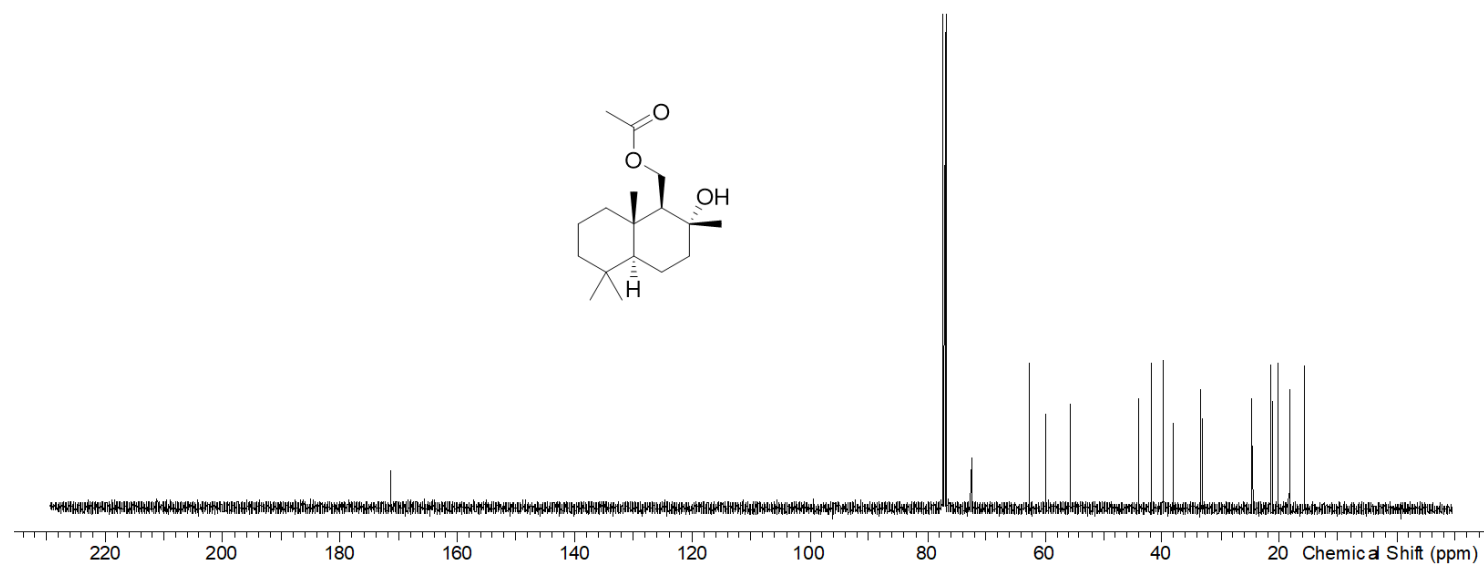


Figure A59 ¹³C spectrum of 7 in CDCl₃ at 100 MHz.

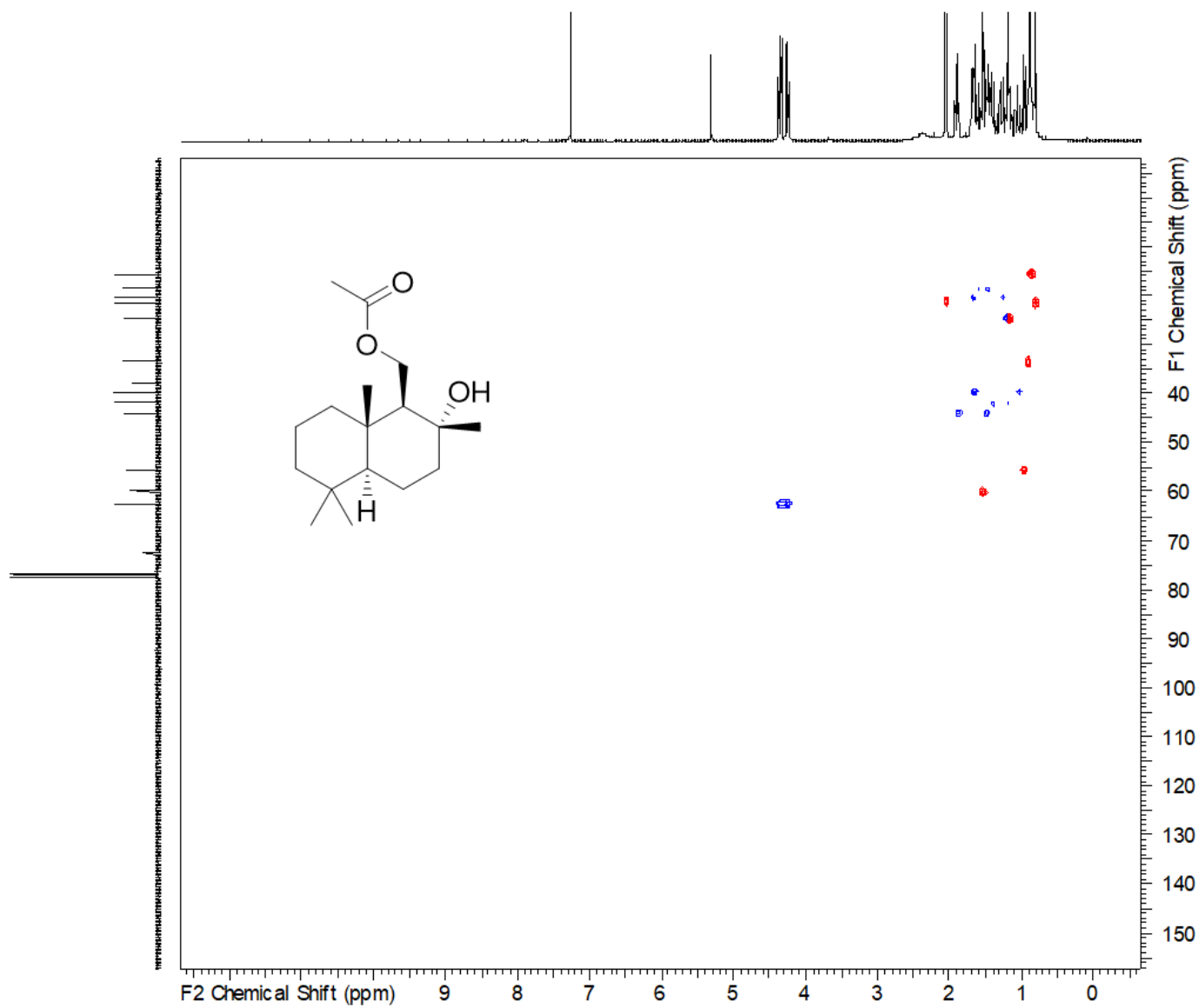


Figure A60 HSQC-dept spectrum of **7** in CDCl₃ at 400/100 MHz.

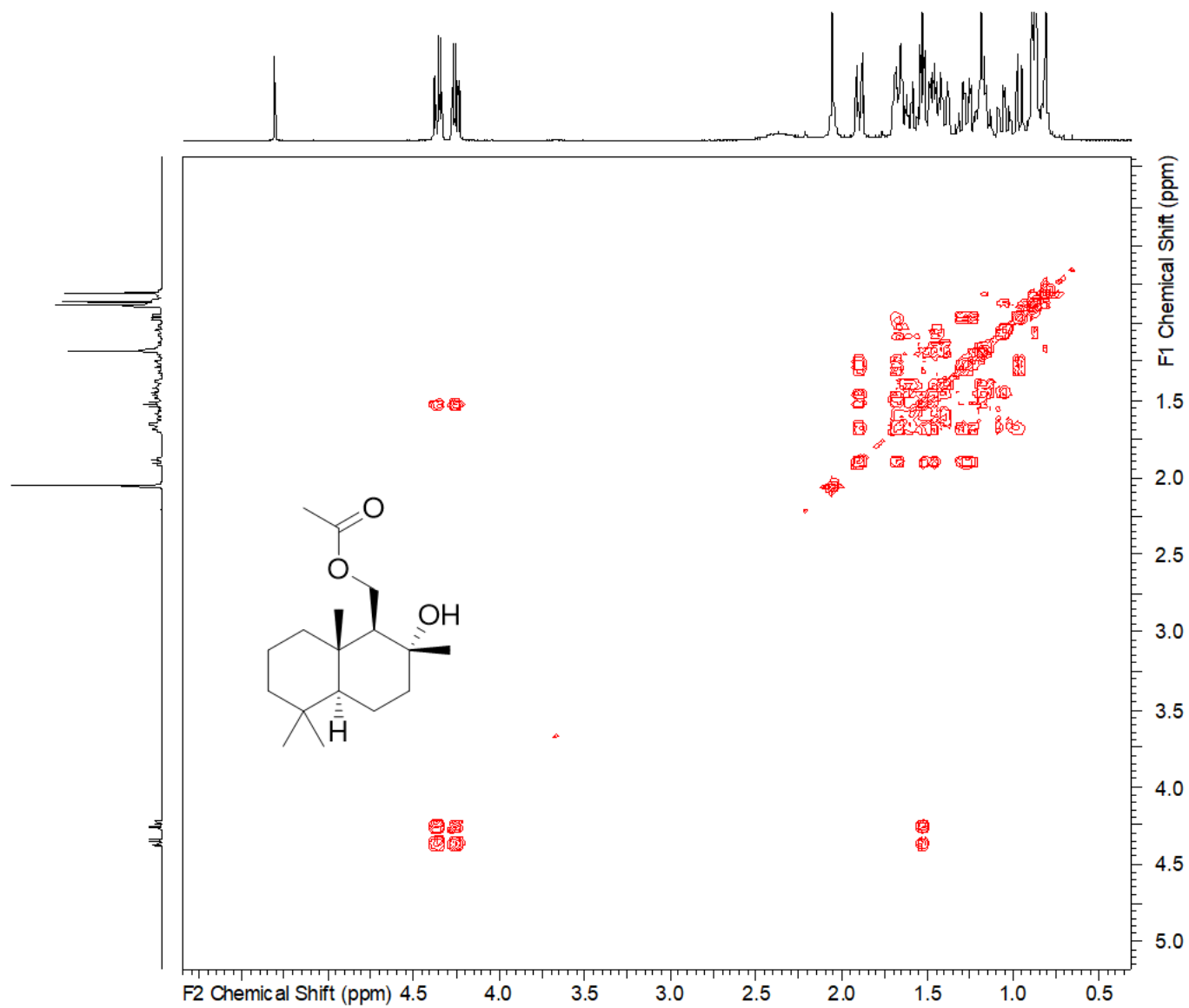


Figure A61 COSY spectrum of **7** in CDCl₃ at 400 MHz.

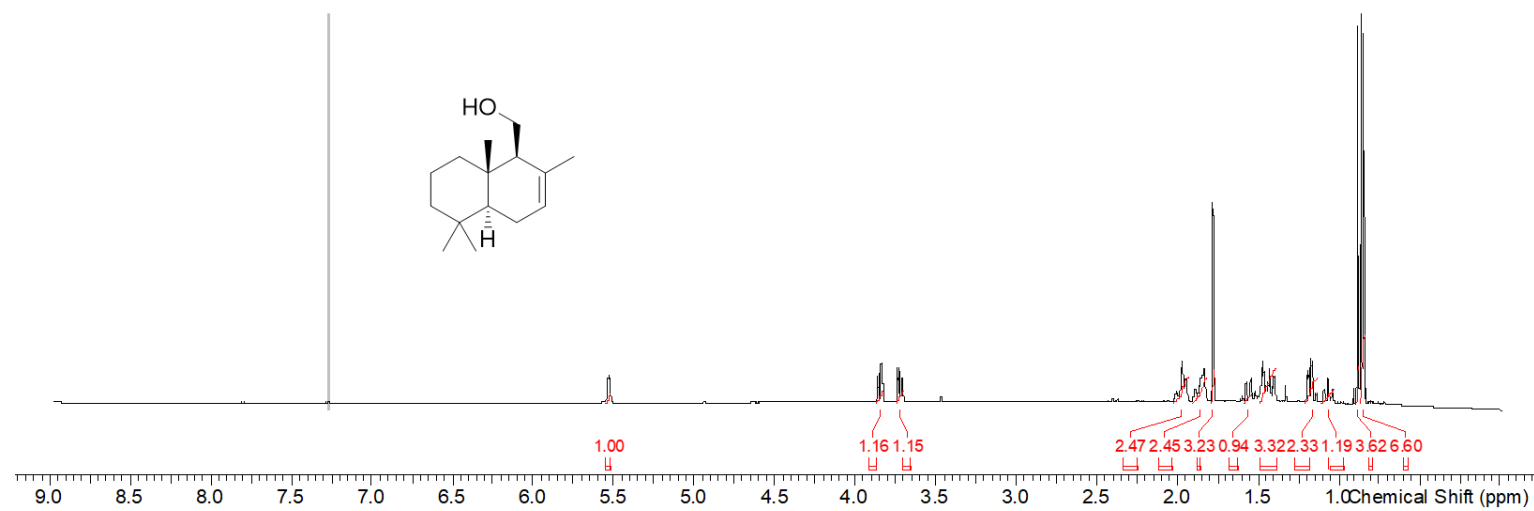


Figure A62 ¹H spectrum of 8 in CDCl₃ at 500 MHz.

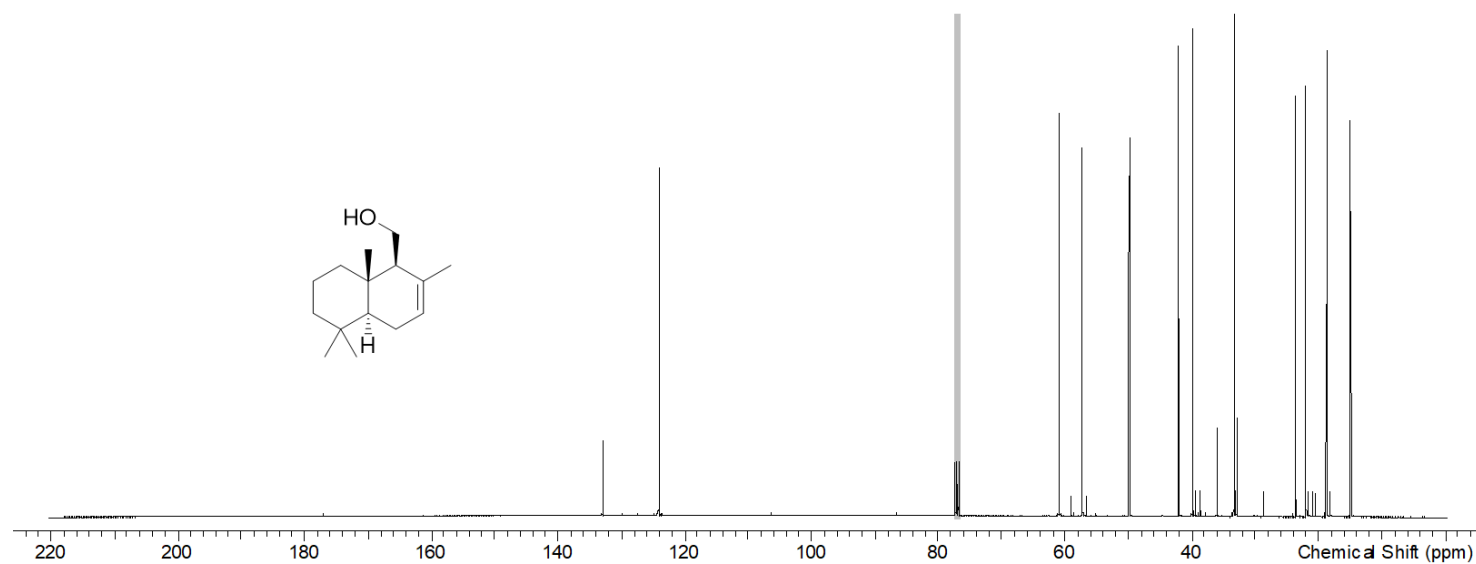


Figure A63 ¹³C spectrum of 8 in CDCl₃ at 125 MHz.

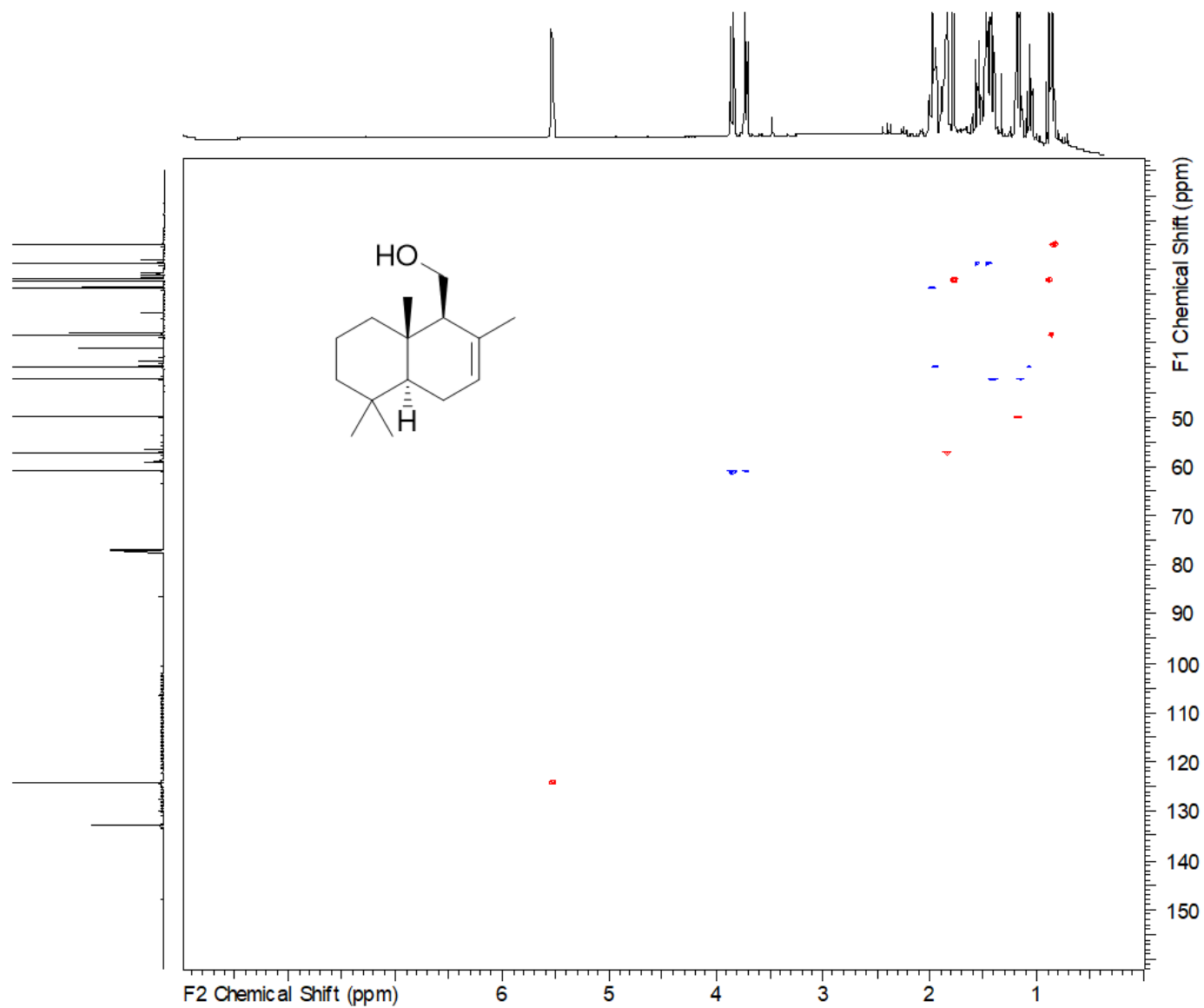


Figure A64 HSQC-dept spectrum of **8** in CDCl_3 at 500/125 MHz.

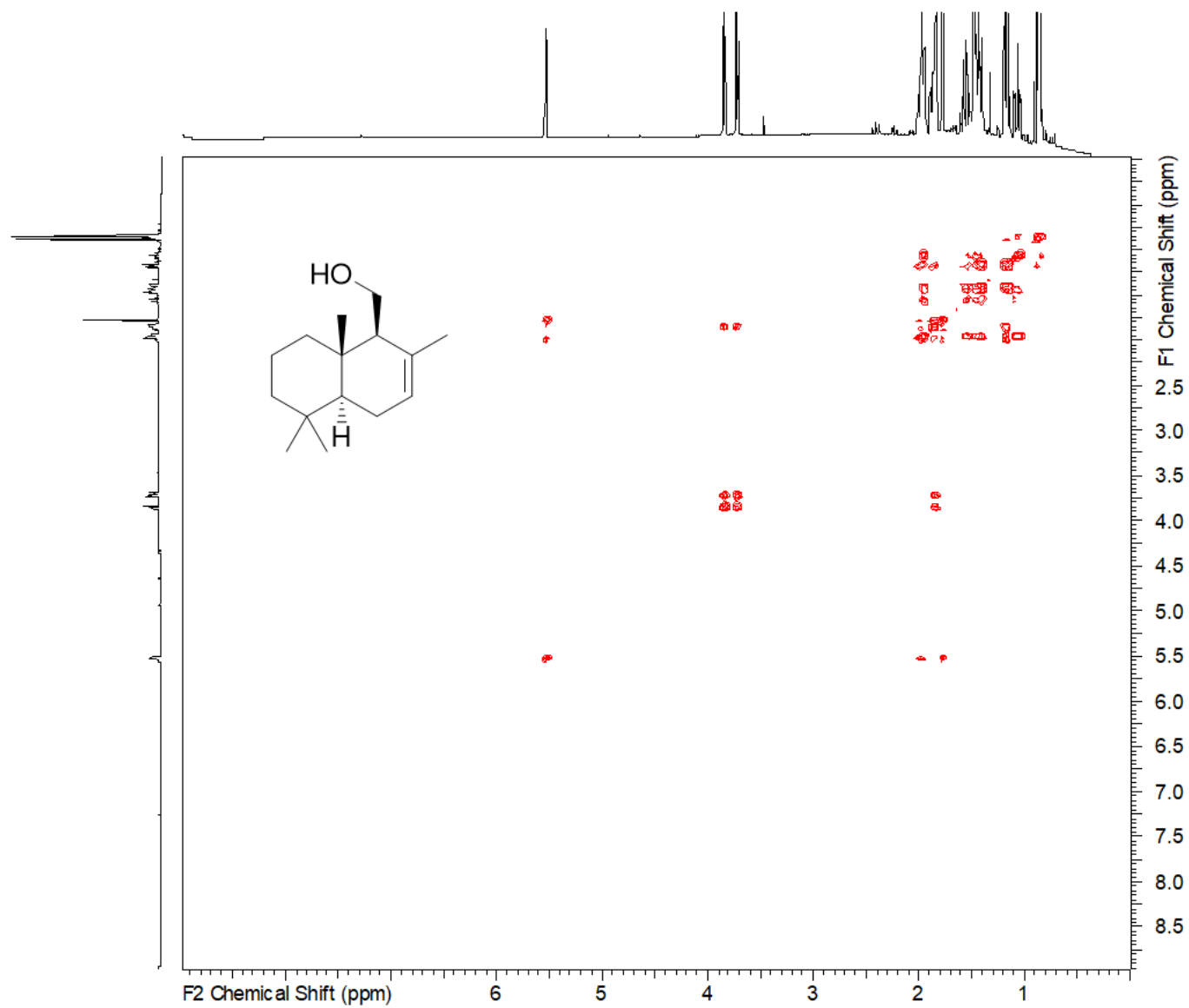


Figure A65 COSY spectrum of **8** in CDCl_3 at 500 MHz.

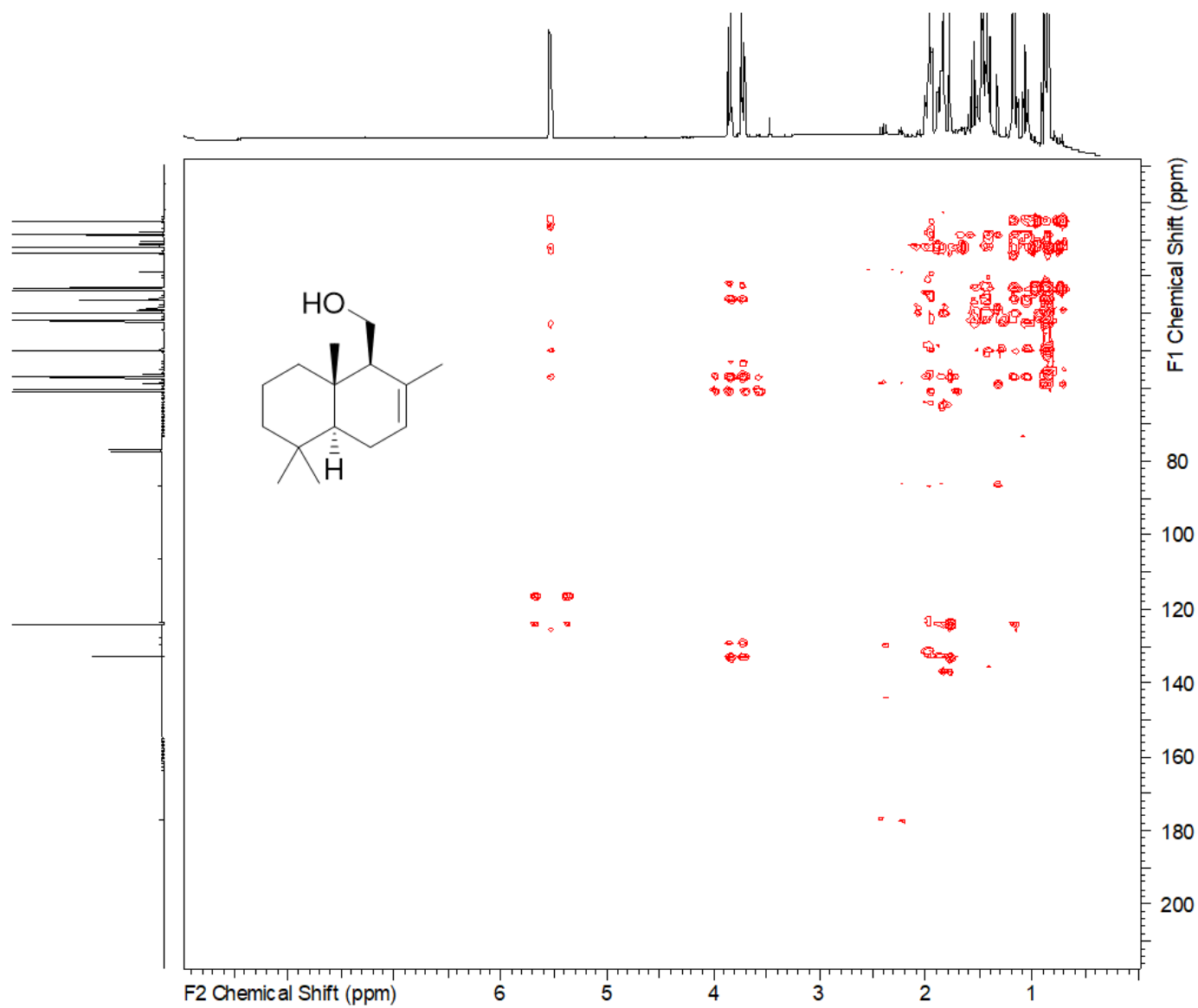


Figure A66 HMBC spectrum of **8** in CDCl₃ at 500/125 MHz.

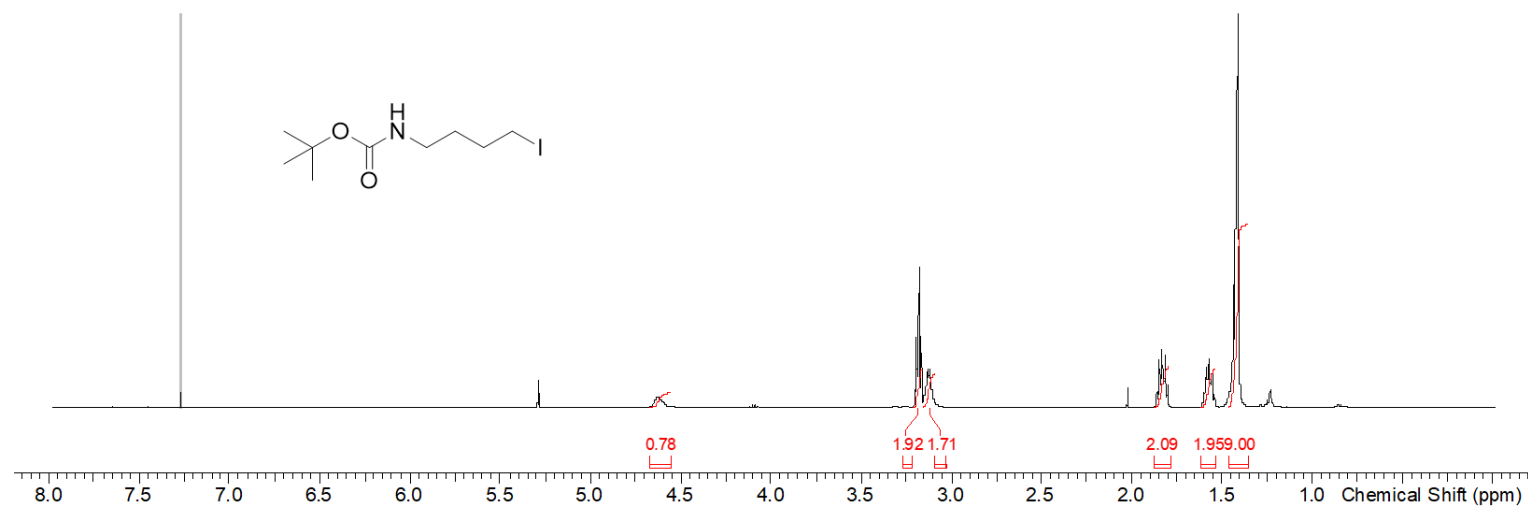


Figure A67 ¹H spectrum of 11 in CDCl₃ at 500 MHz.

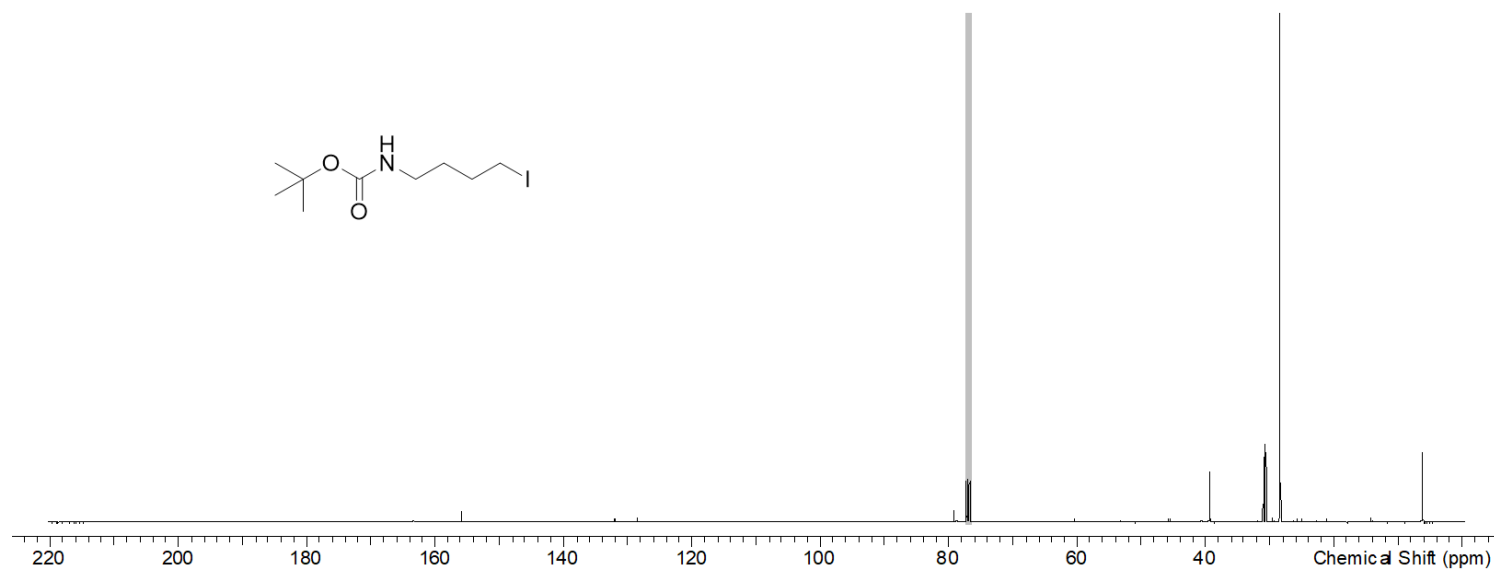


Figure A68 ¹³C spectrum of 11 in CDCl₃ at 125 MHz.

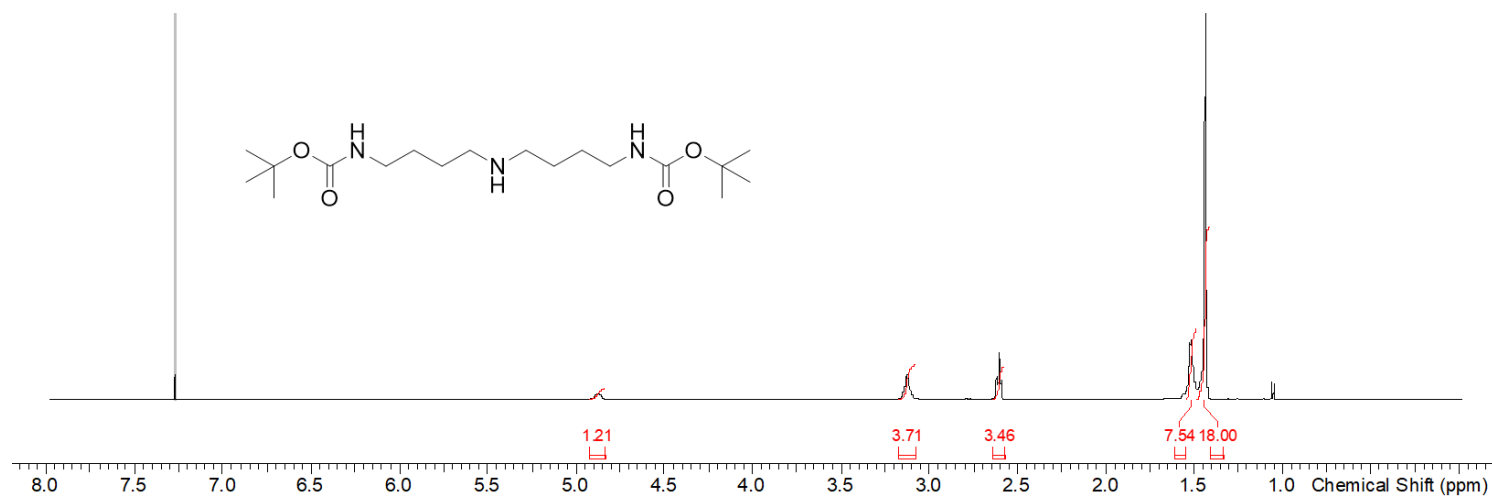


Figure A69 ¹H spectrum of 13a in CDCl₃ at 500 MHz.

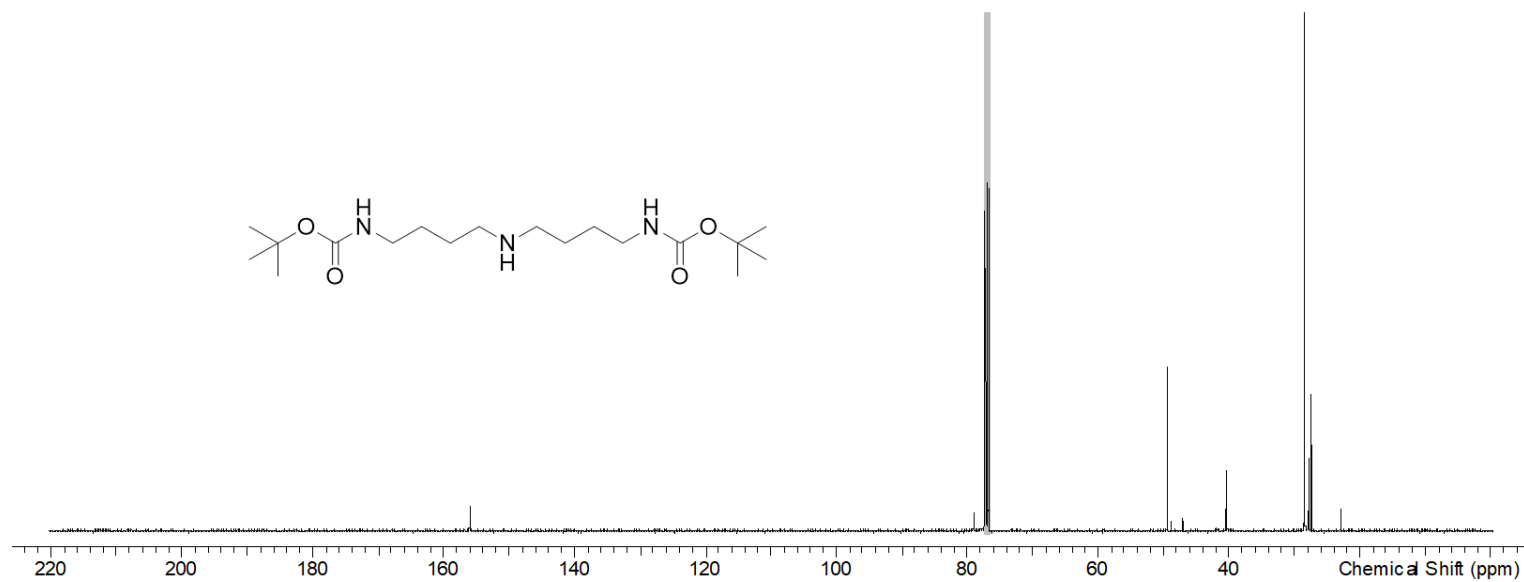


Figure A70 ¹³C spectrum of 13a in CDCl₃ at 125 MHz.

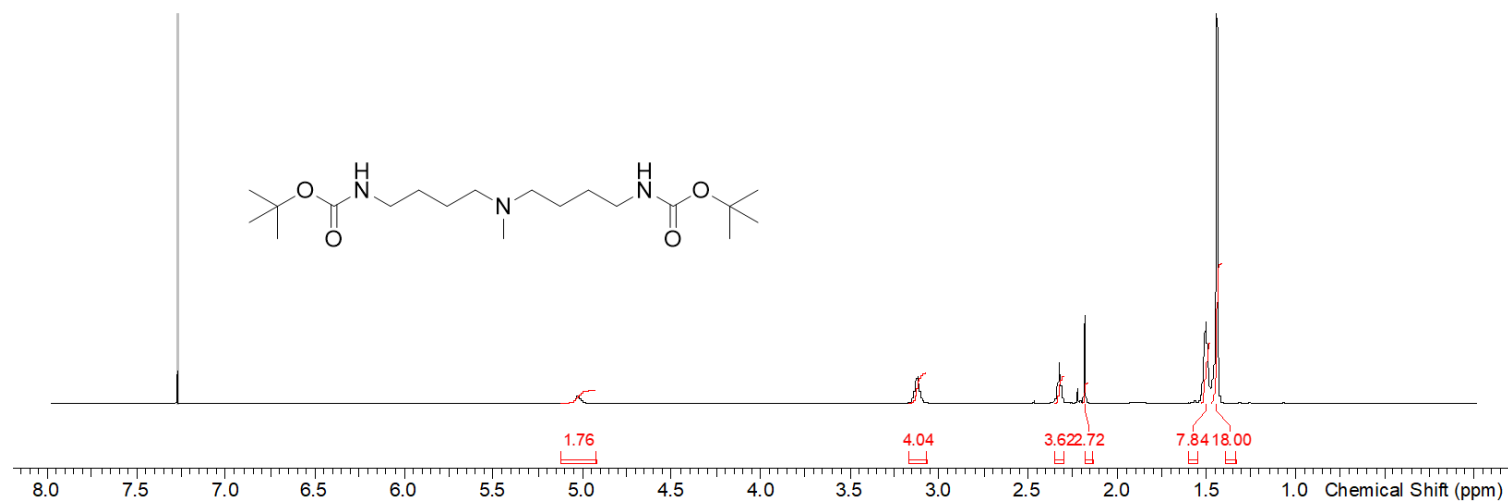


Figure A71 ¹H spectrum of 13b in CDCl₃ at 500 MHz.

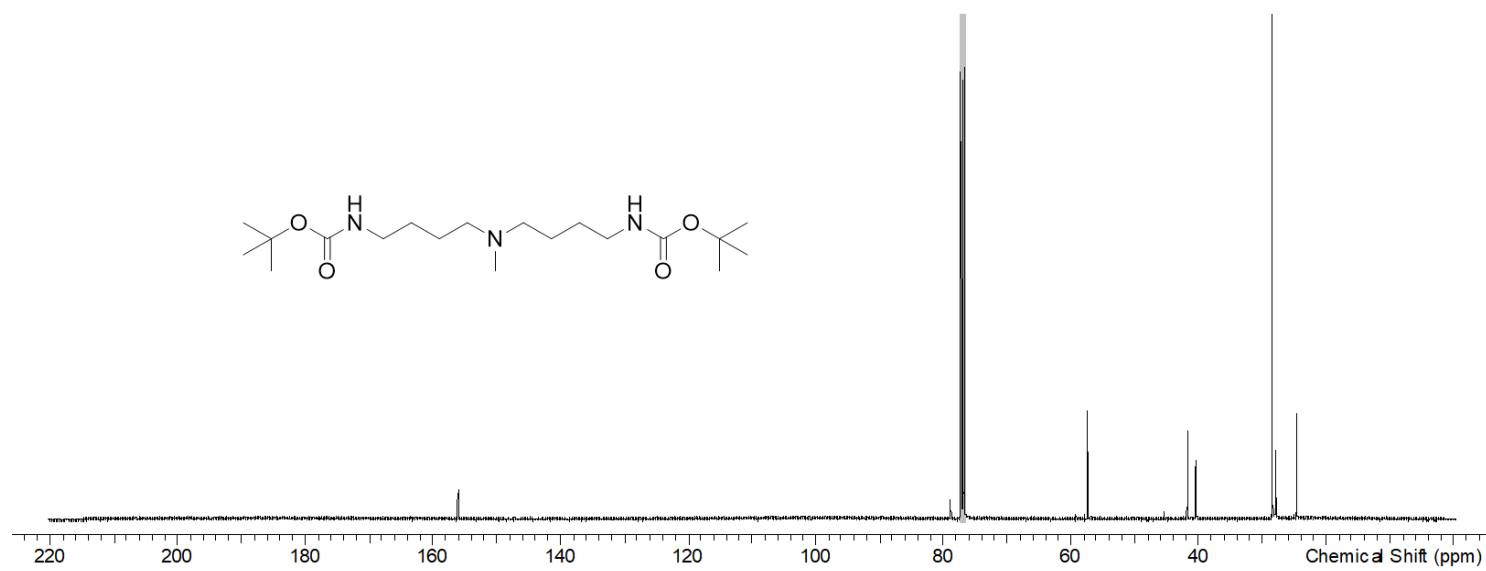


Figure A72 ¹³C spectrum of 13b in CDCl₃ at 125 MHz.

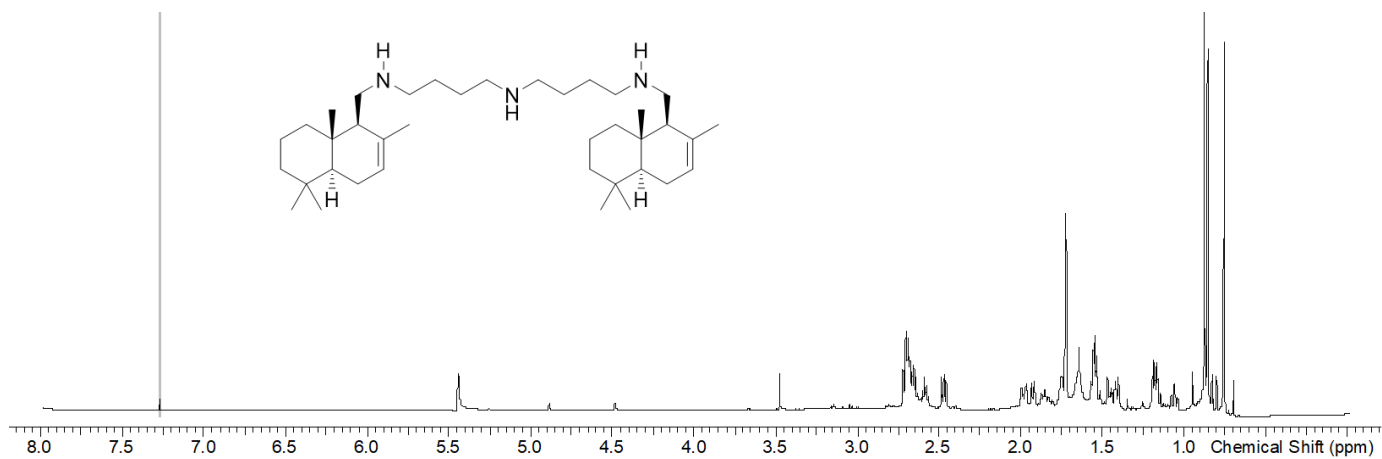


Figure A73 ¹H spectrum of synthetic sandaramin A (**1**) in CDCl₃ at 700 MHz.

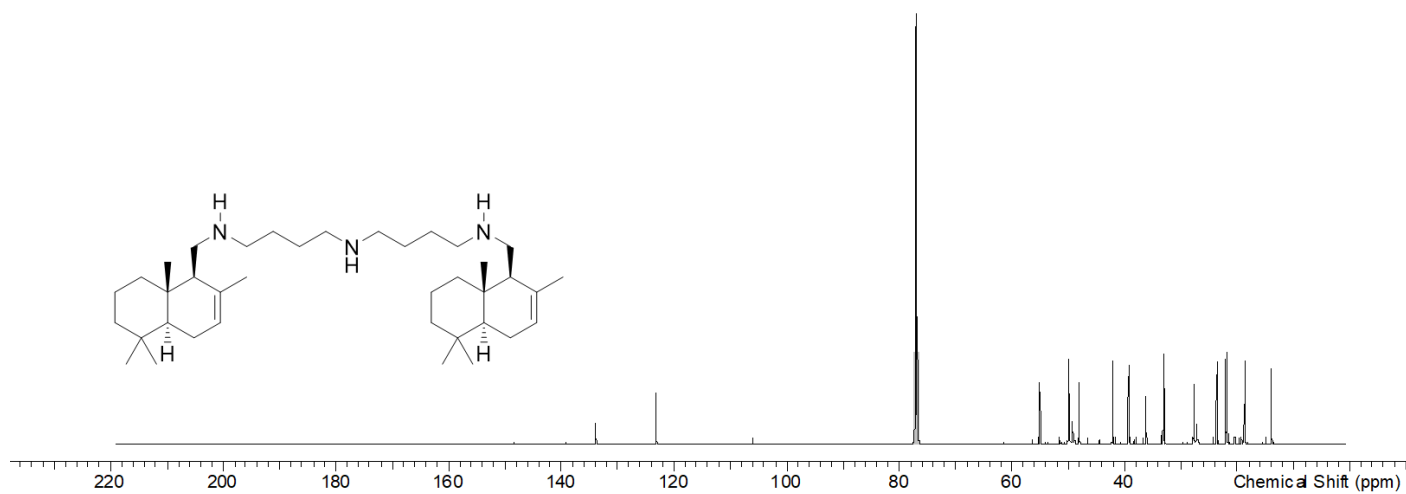


Figure A74 ¹³C spectrum of synthetic sandaramin A (**1**) in CDCl₃ at 175 MHz.

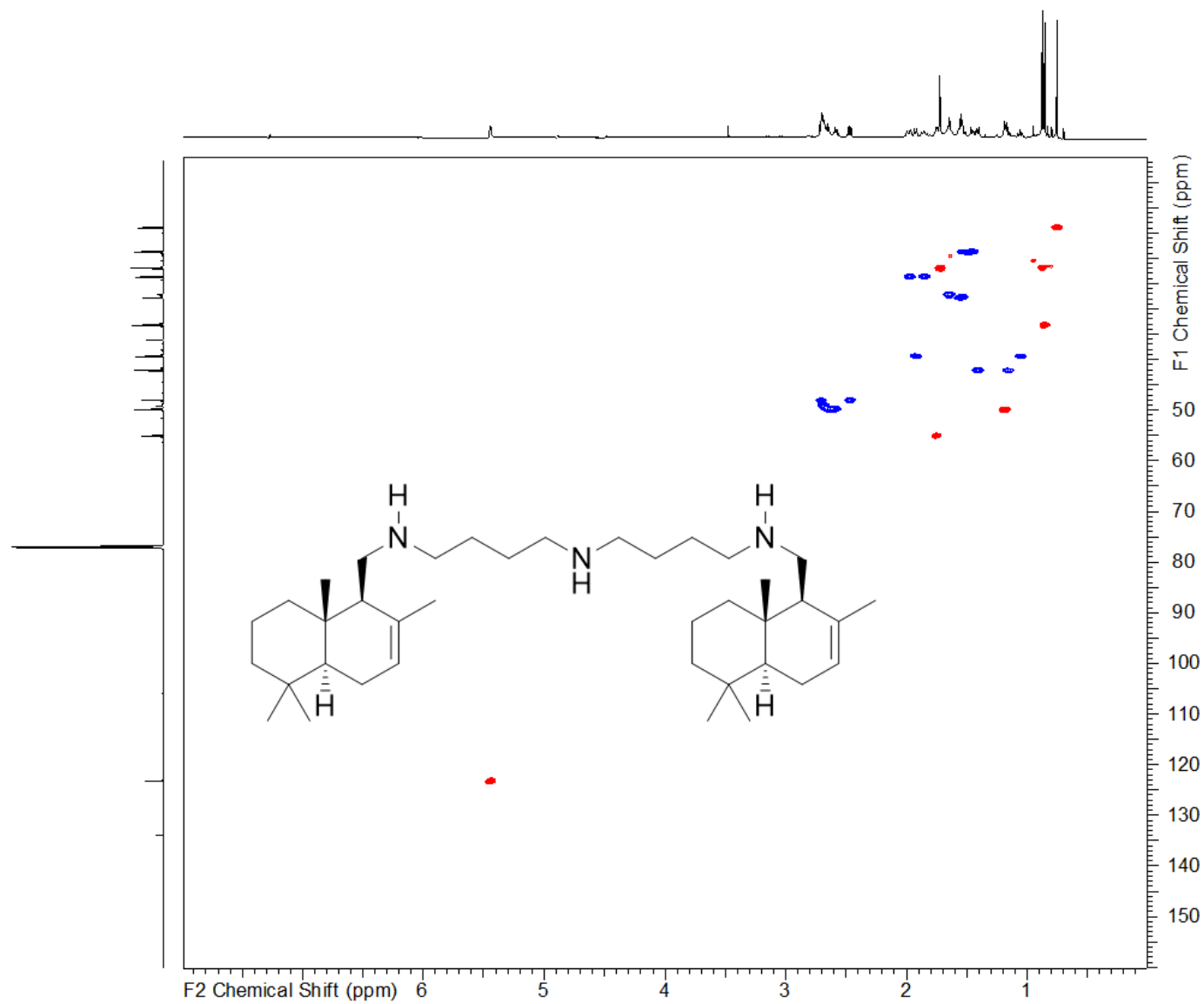


Figure A75 HSQC spectrum of synthetic sandaramin A (1) in CDCl₃ at 700/175 MHz.

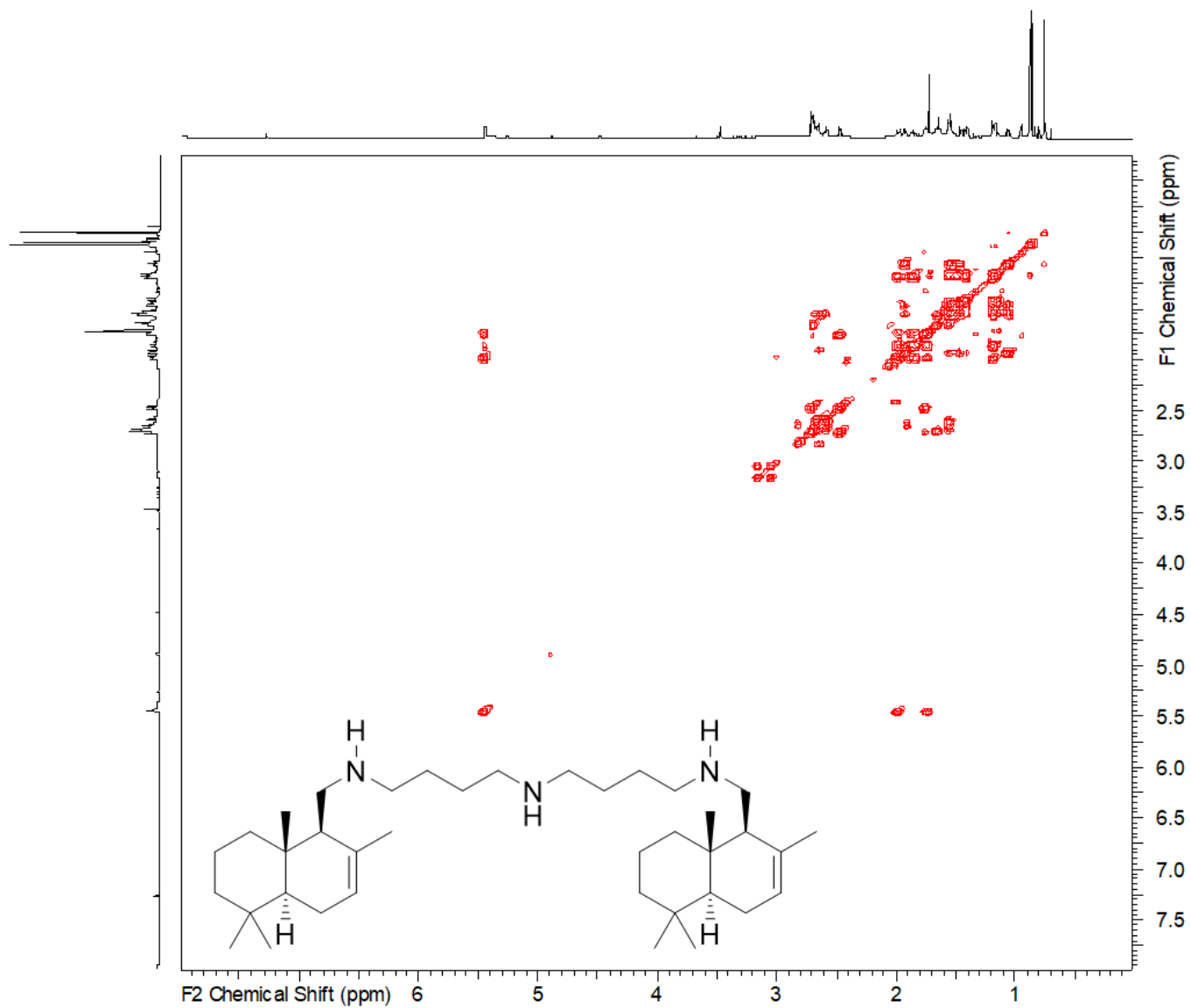


Figure A76 COSY spectrum of synthetic sandaramin A (1) in CDCl₃ at 700 MHz.

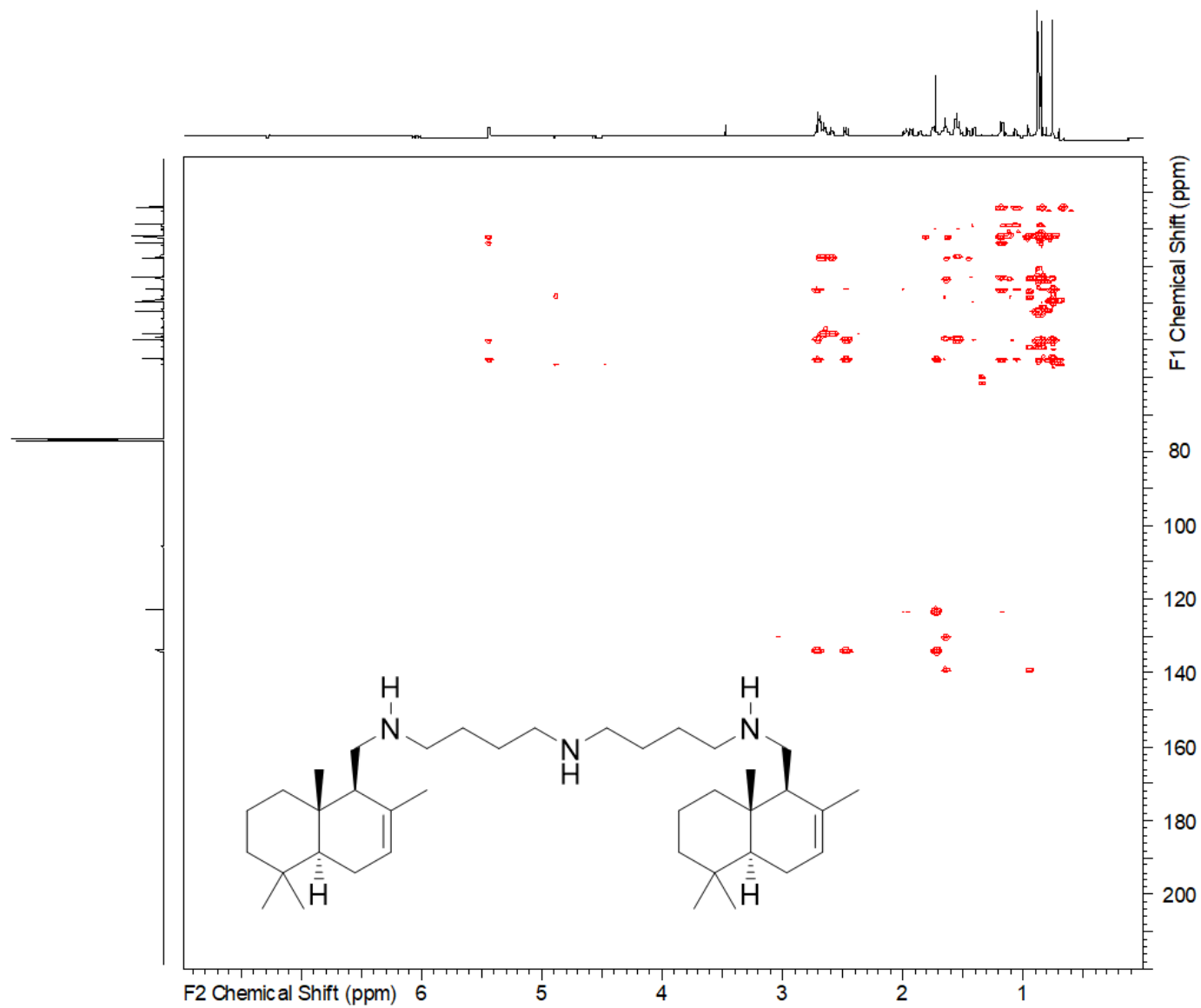


Figure A77 HMBC spectrum of synthetic sandaramin A (**1**) in CDCl_3 at 700/175 MHz.

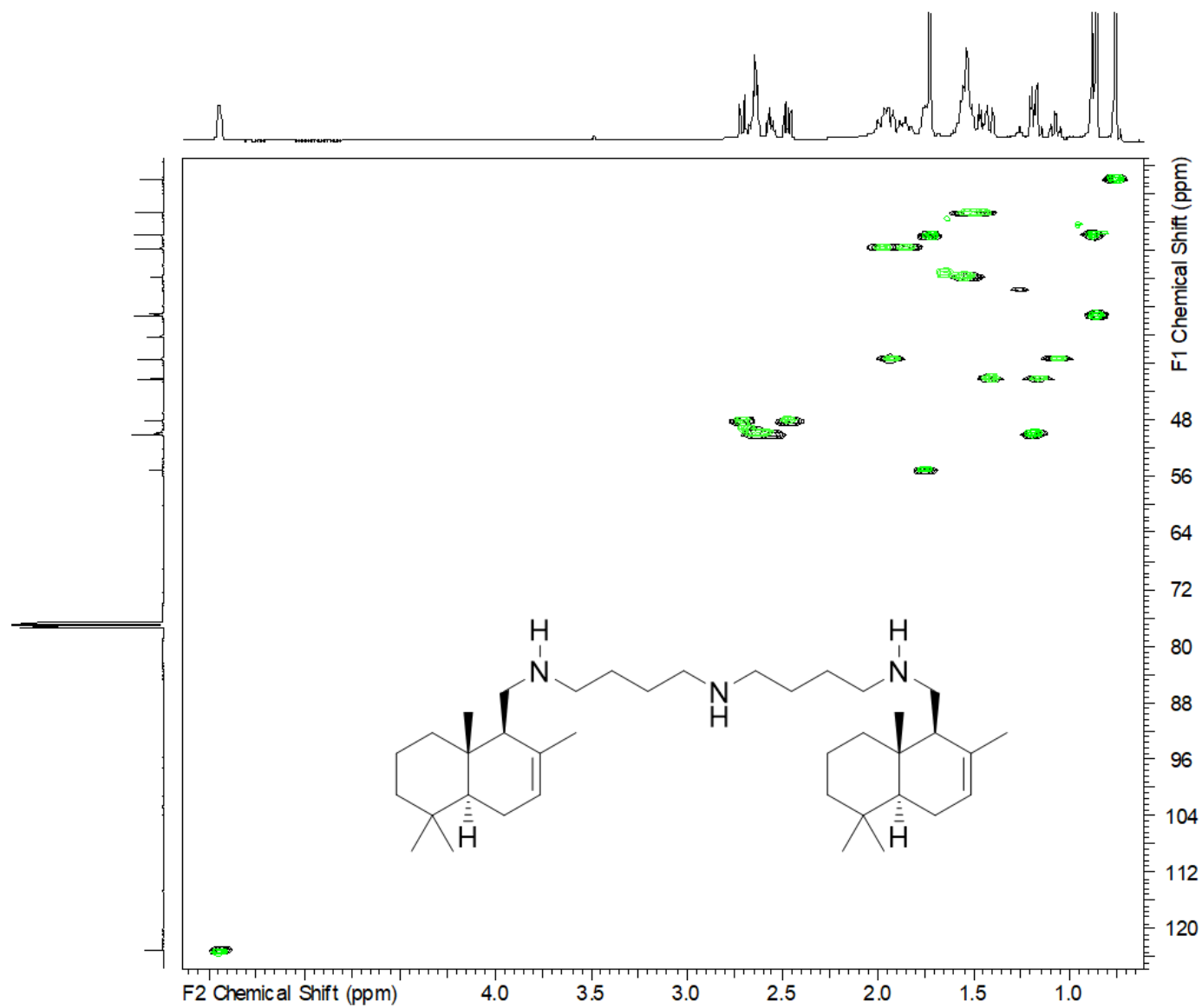


Figure A78 HSQC spectral overlay of synthetic sandaramin A (**1**) (green) and natural product isolated from MSr10575 (black). ^1H , ^{13}C spectra from isolated natural product.

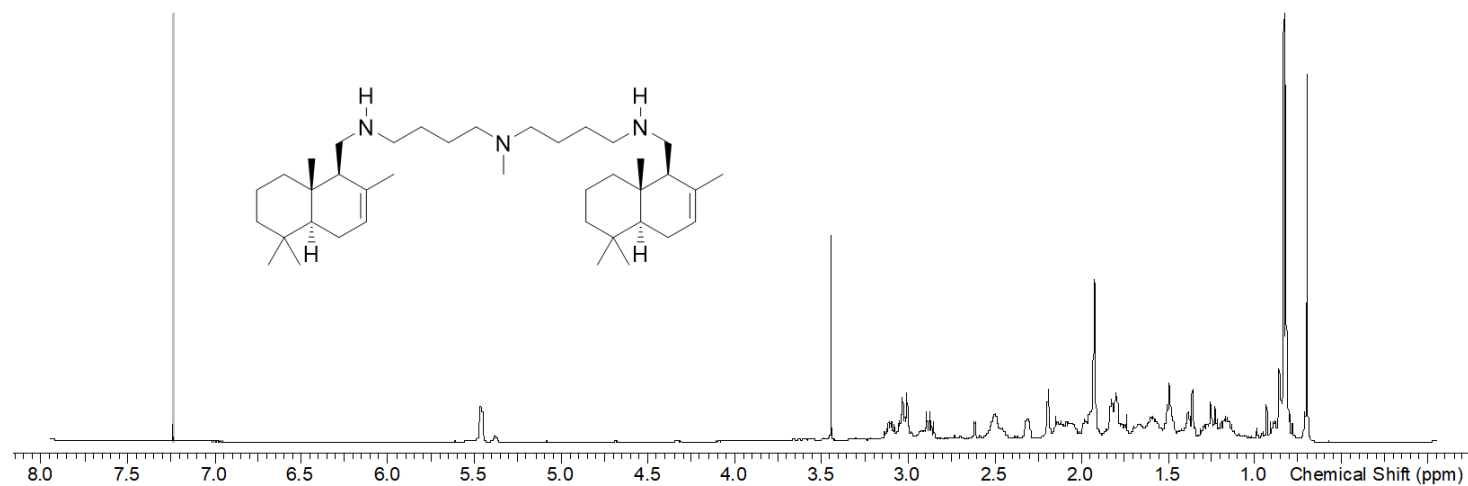


Figure A79 ¹H spectrum of synthetic sandaramin C (3) in CDCl₃ at 500 MHz.

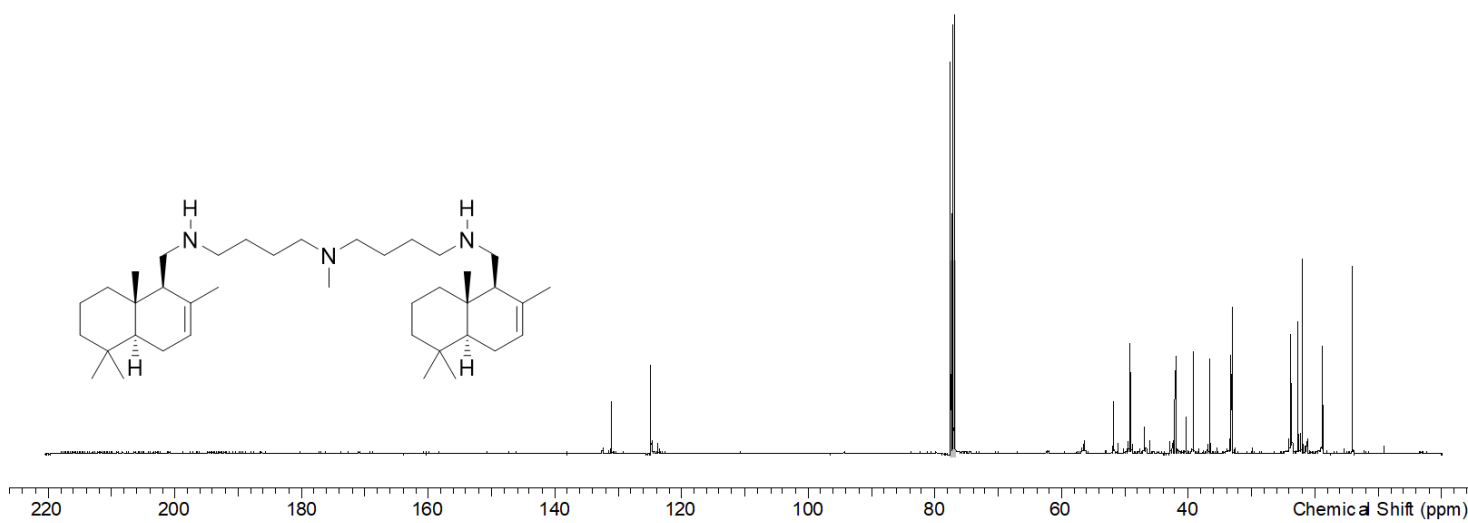


Figure A80 ¹³C spectrum of synthetic sandaramin C (3) in CDCl₃ at 125 MHz.

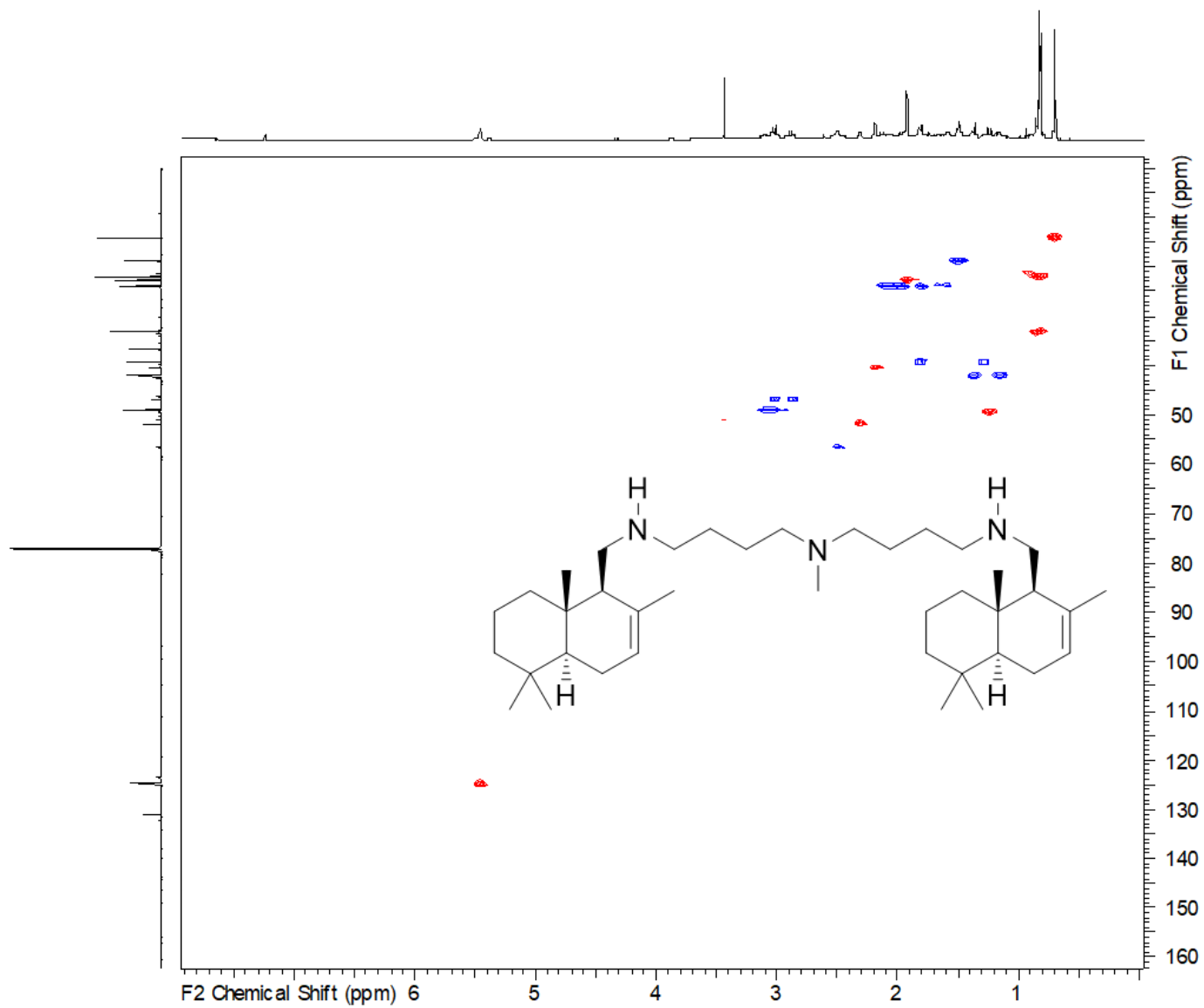


Figure A81 HSQC spectrum of synthetic sandaramin C (**3**) in CDCl₃ at 500/125 MHz.

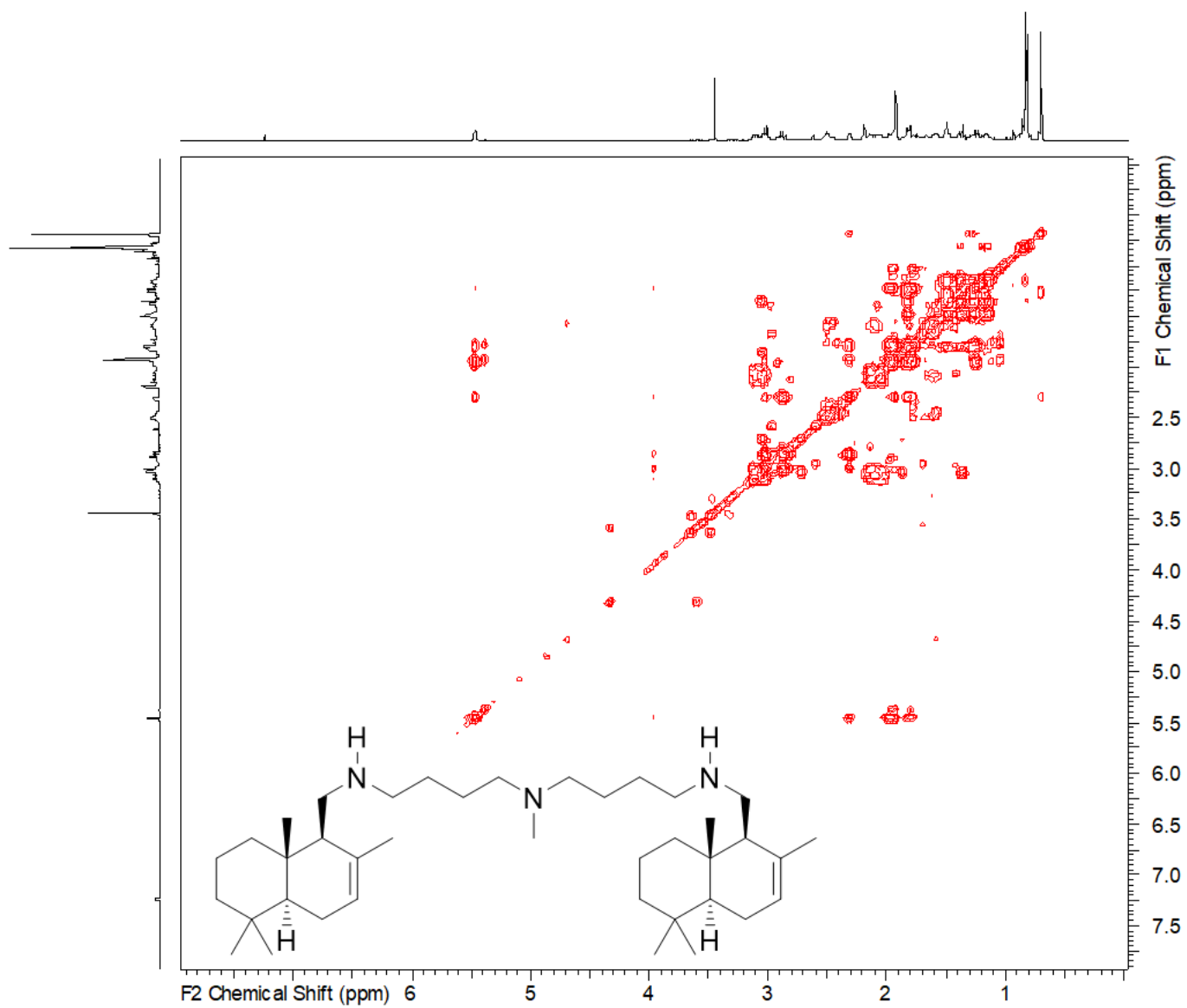


Figure A82 COSY spectrum of synthetic sandaramin C (3) in CDCl₃ at 500 MHz.

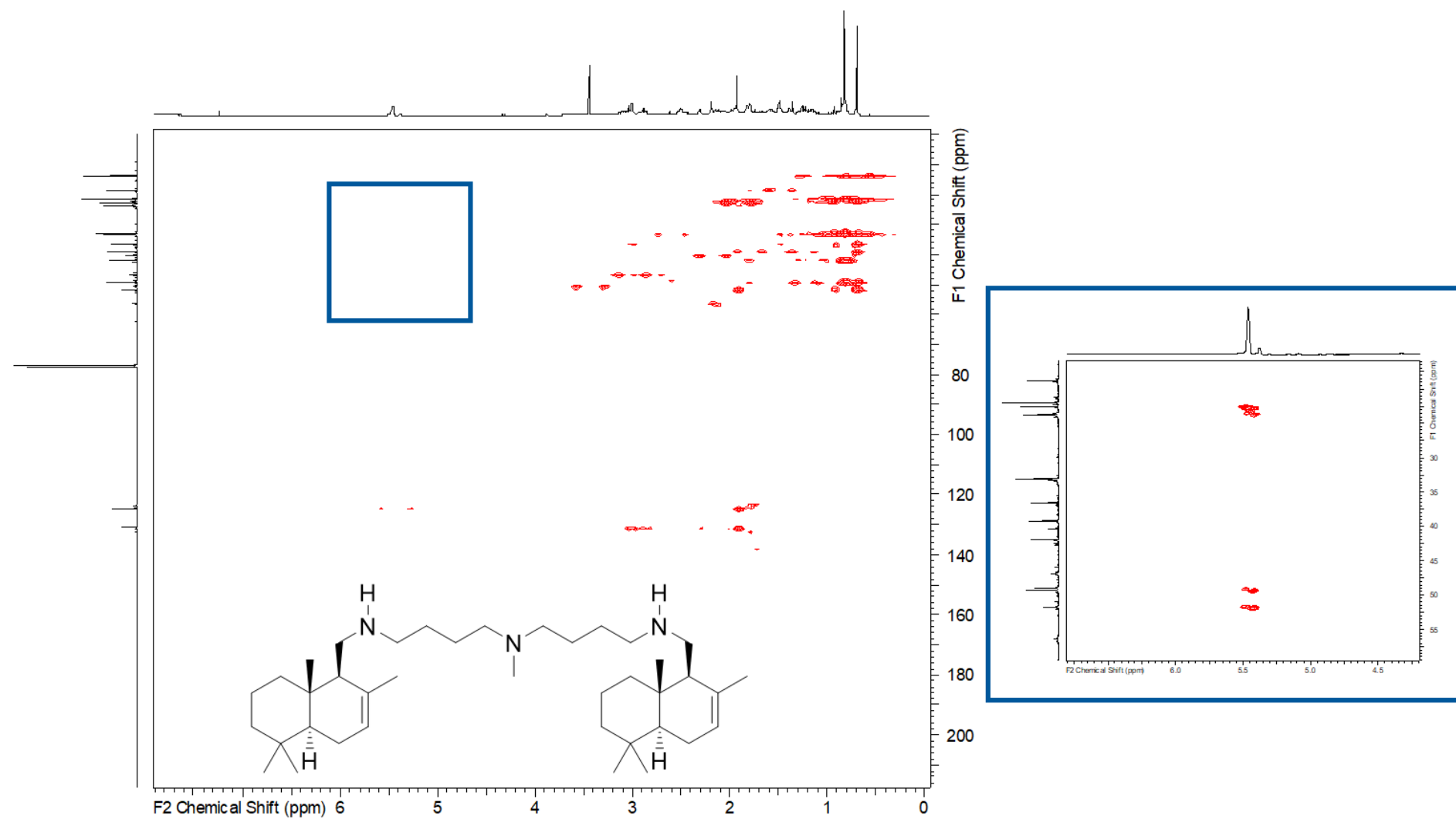


Figure A83 HMBC spectrum of synthetic sandaramin C (**3**) in CDCl₃ at 500/125 MHz. Blue Box: Zoom into HMBC correlations of double bond proton.

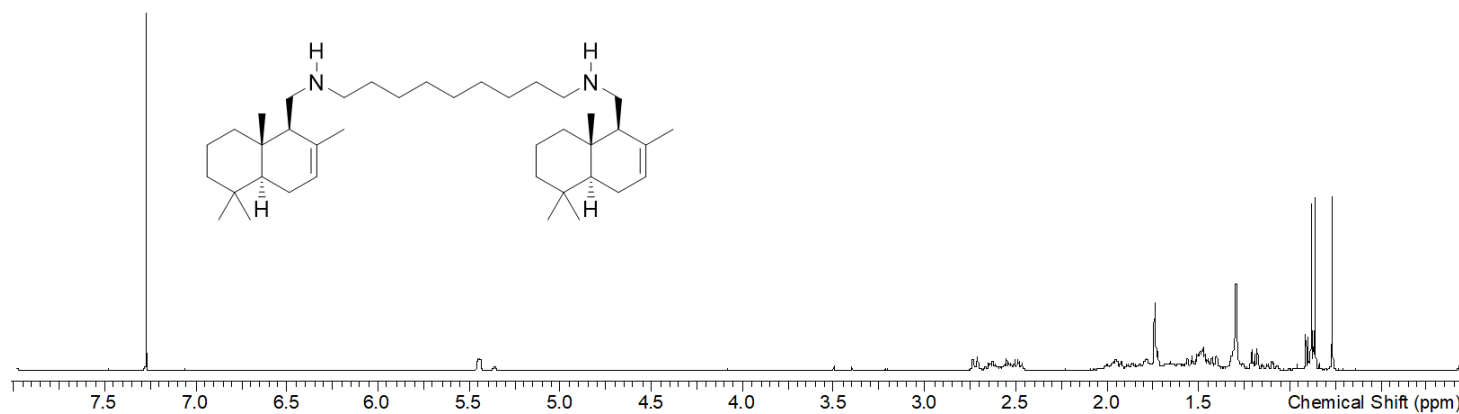


Figure A84 ¹H spectrum of synthetic sandaramin D (4) in CDCl₃ at 500 MHz.

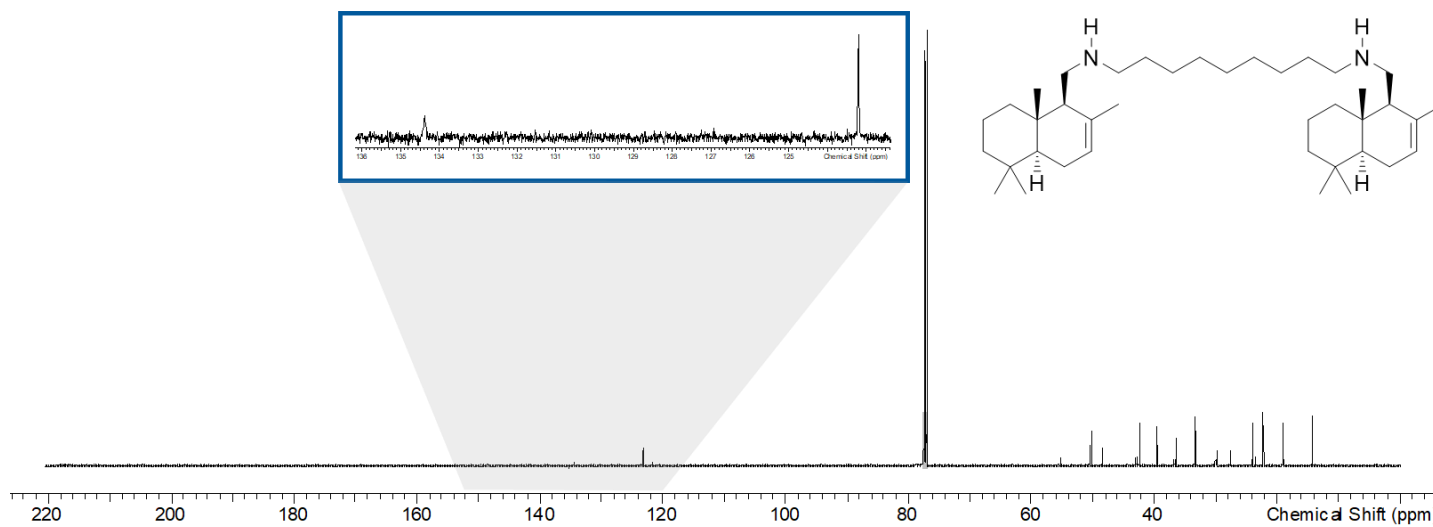


Figure A85 ¹³C spectrum of synthetic sandaramin D (4) in CDCl₃ at 125 MHz. Blue box: Zoom into double bond region to visualize signal of the quaternary carbon at 134.4 ppm.

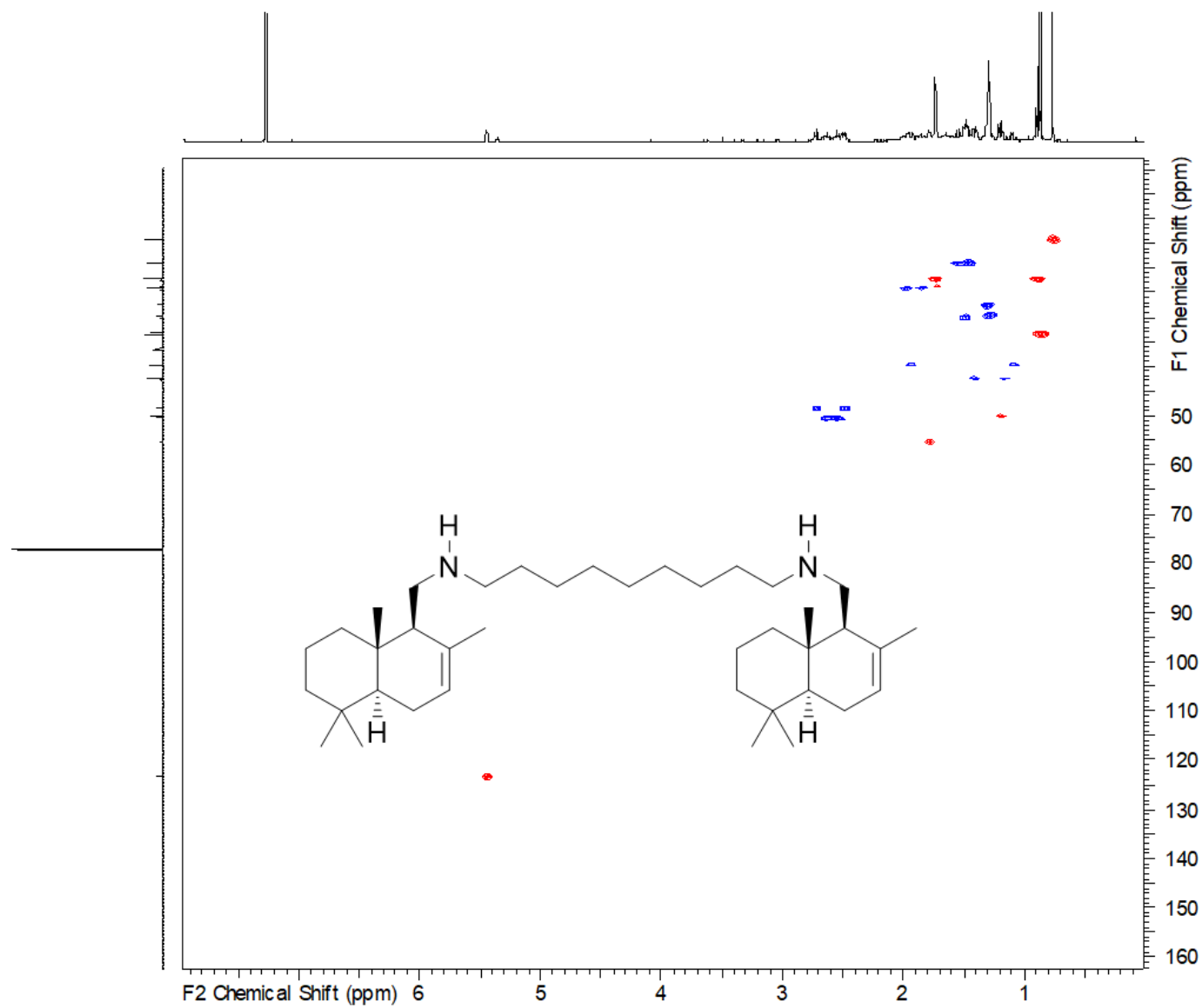


Figure A86 HSQC spectrum of synthetic sandaramin D (4) in CDCl₃ at 500/125 MHz.

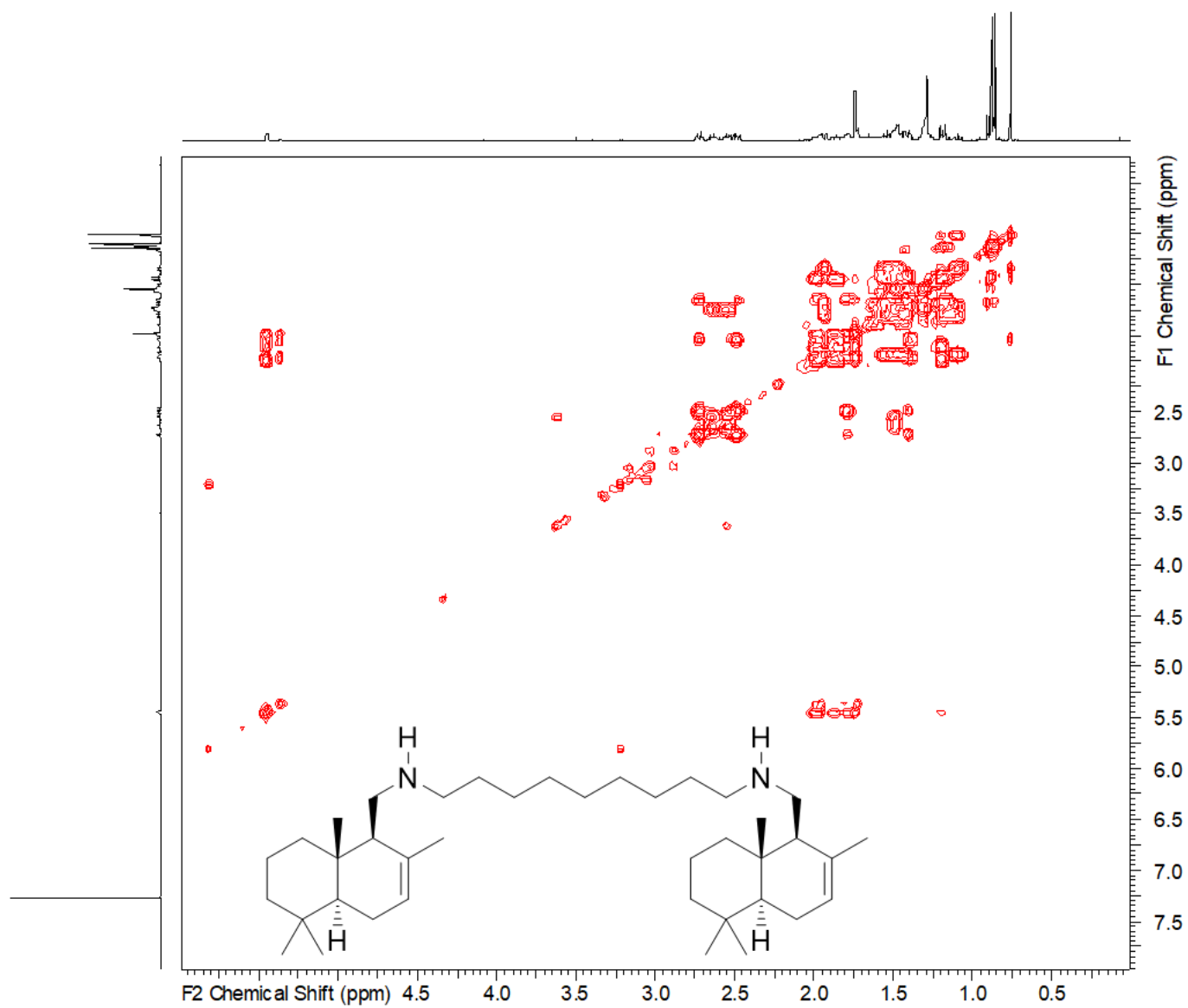


Figure A87 COSY spectrum of synthetic sandaramin D (**4**) in CDCl₃ at 500 MHz.

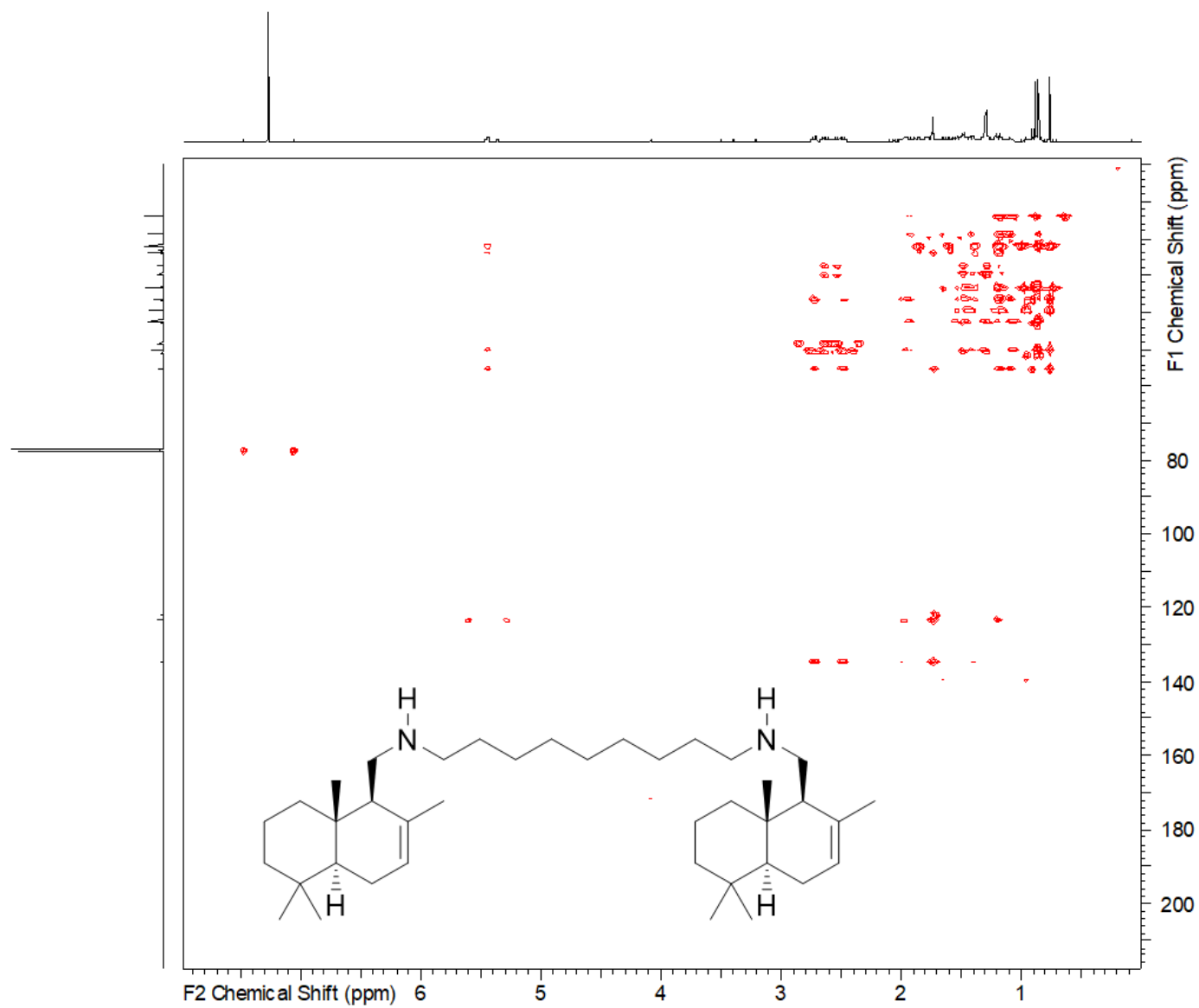


Figure A88 HMBC spectrum of synthetic sandaramin D (**4**) in CDCl₃ at 500/125 MHz.

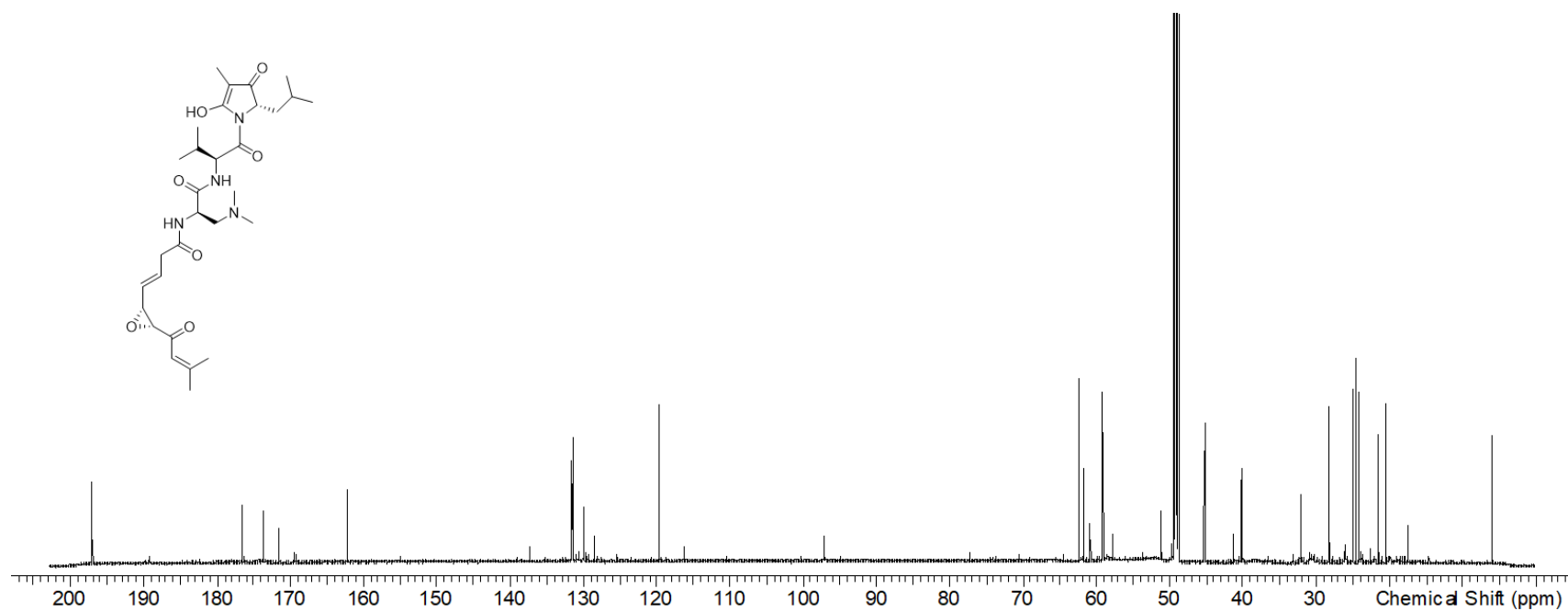


Figure A90 ^{13}C spectrum of sandarazol A in methanol- d_4 at 175 MHz

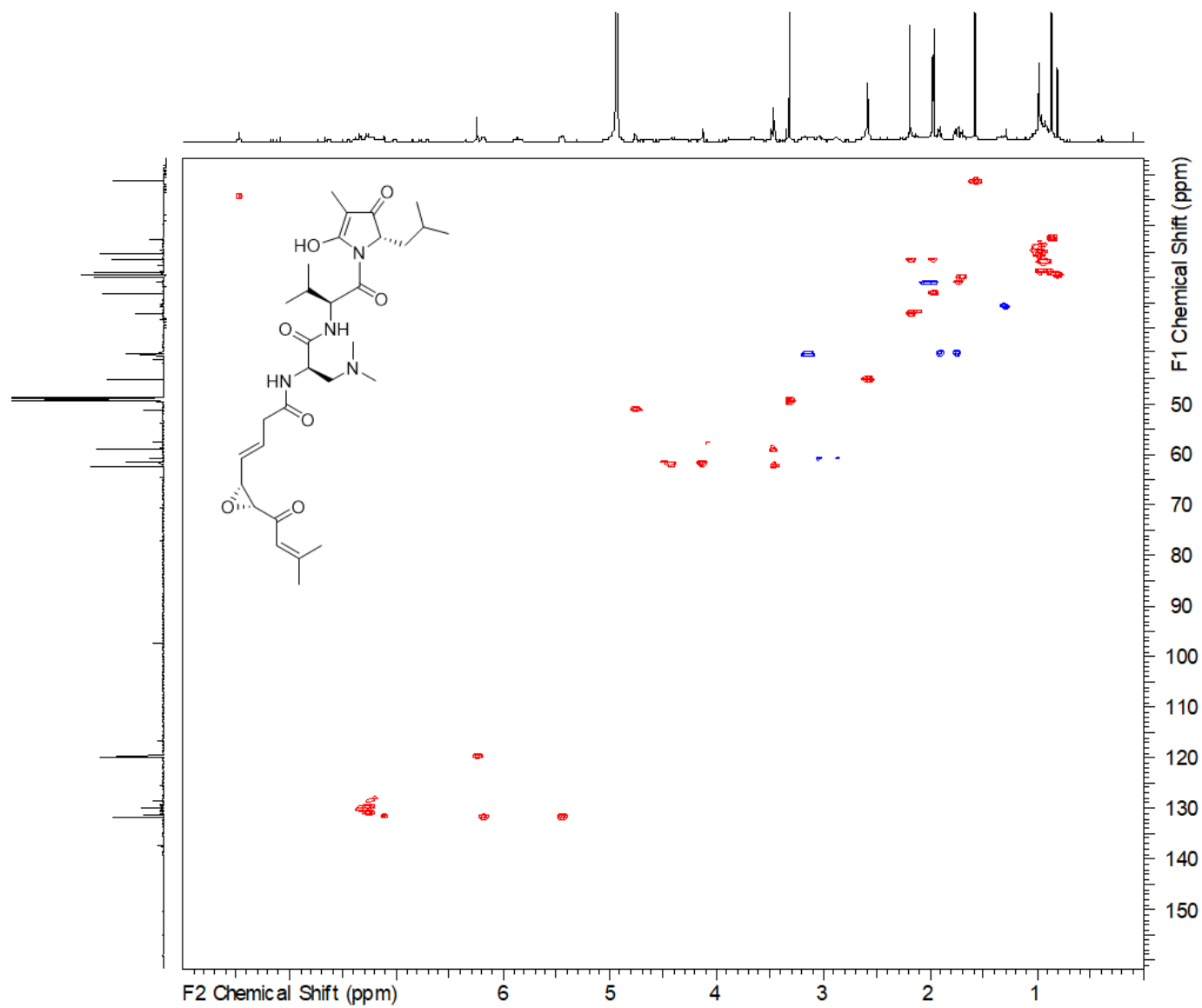


Figure A91 HSQC spectrum of sandarazol A in methanol- d_4 at 700/175 MHz

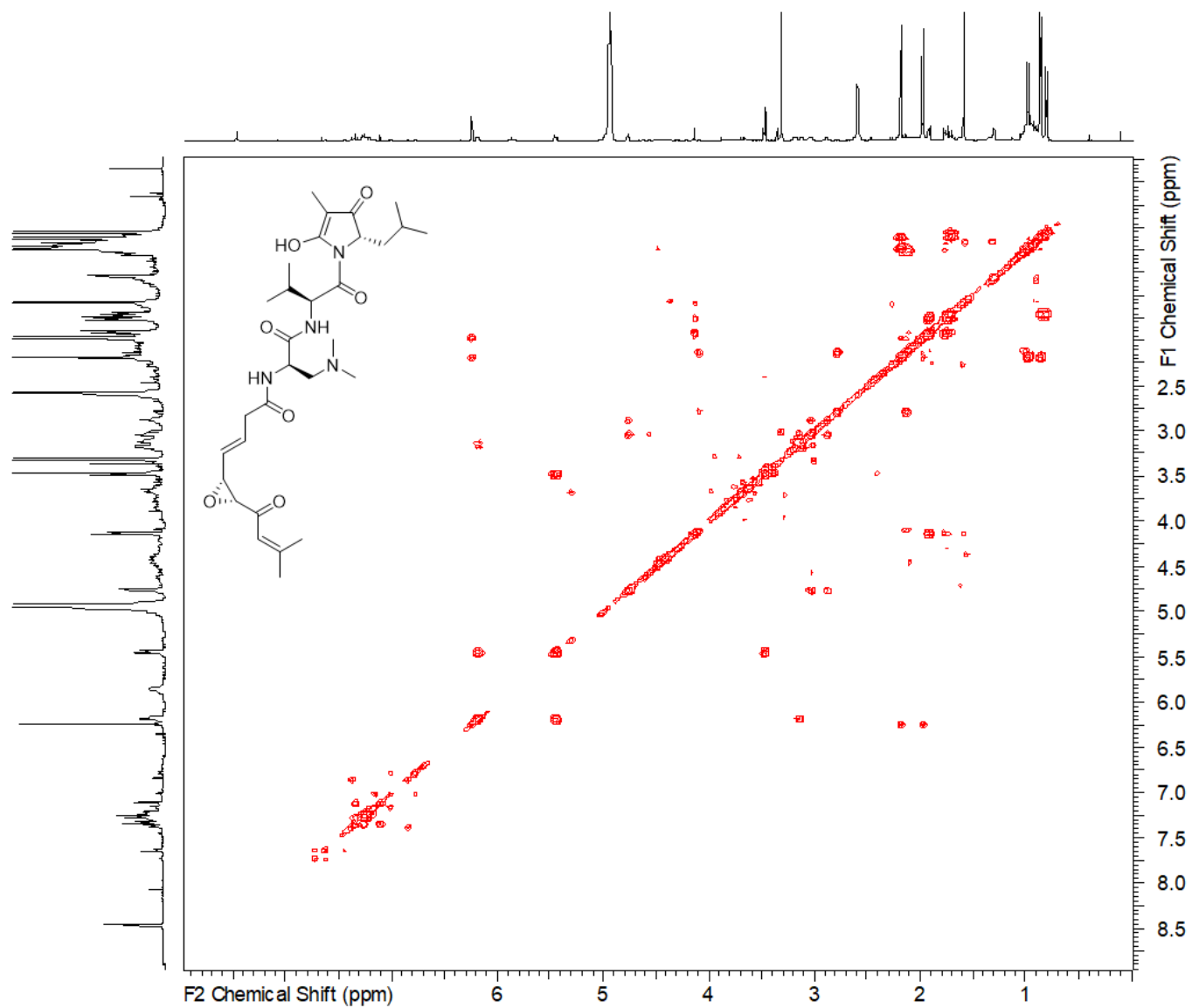


Figure A92 COSY spectrum of sandarazol A in methanol-*d*₄ at 700 MHz.

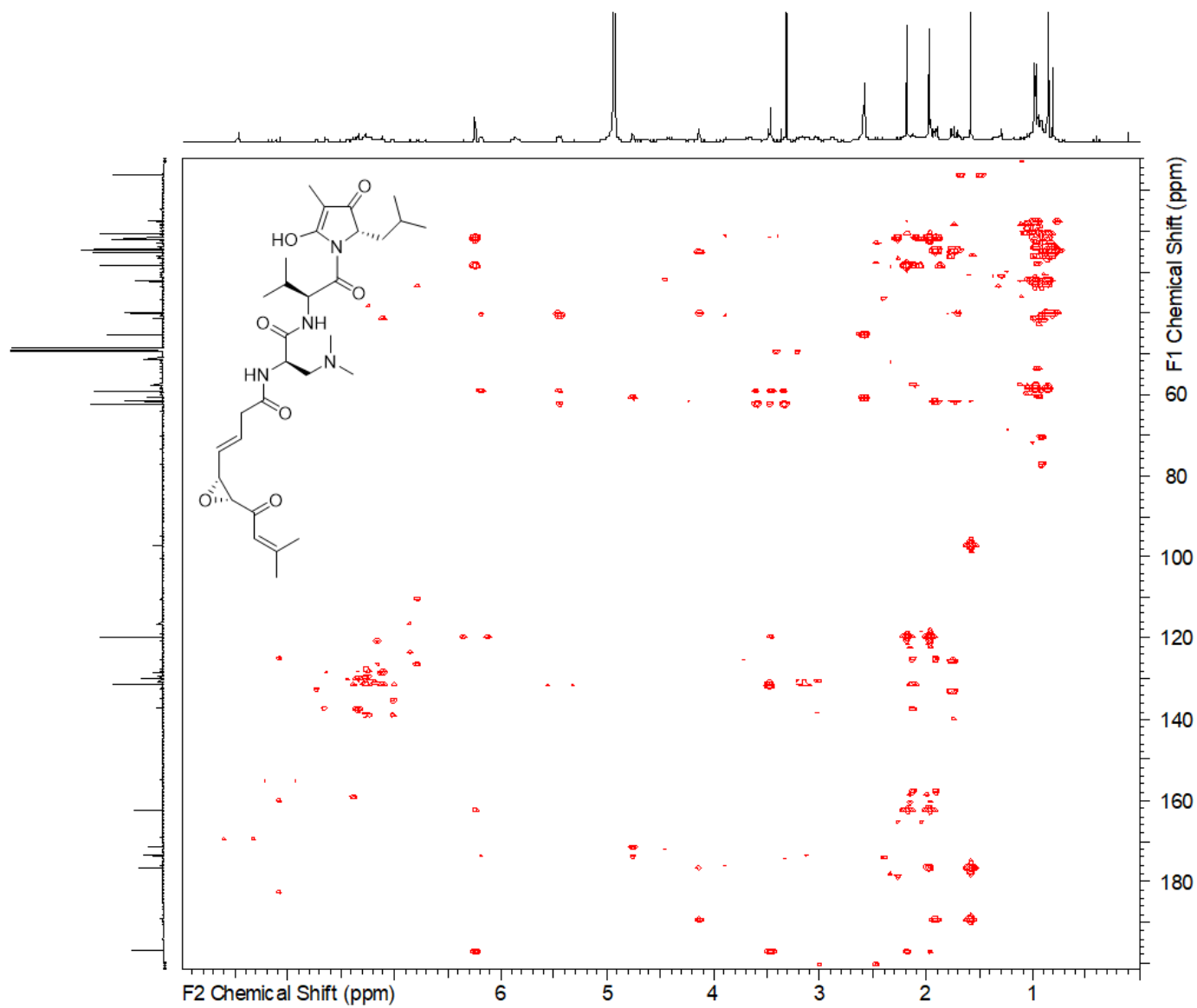


Figure A94 HMBC spectrum of sandarazol A in methanol- d_4 at 700/175 MHz.

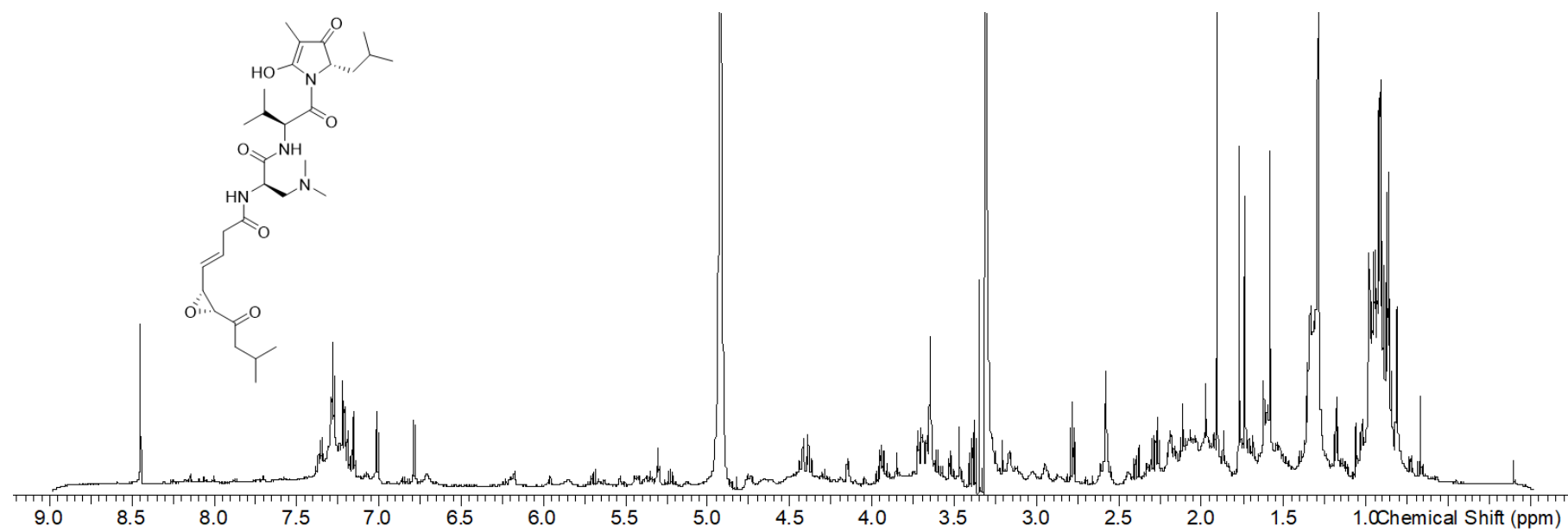


Figure A95 ^1H spectrum of sandarazol B in $\text{methanol-}d_4$ at 700 MHz.

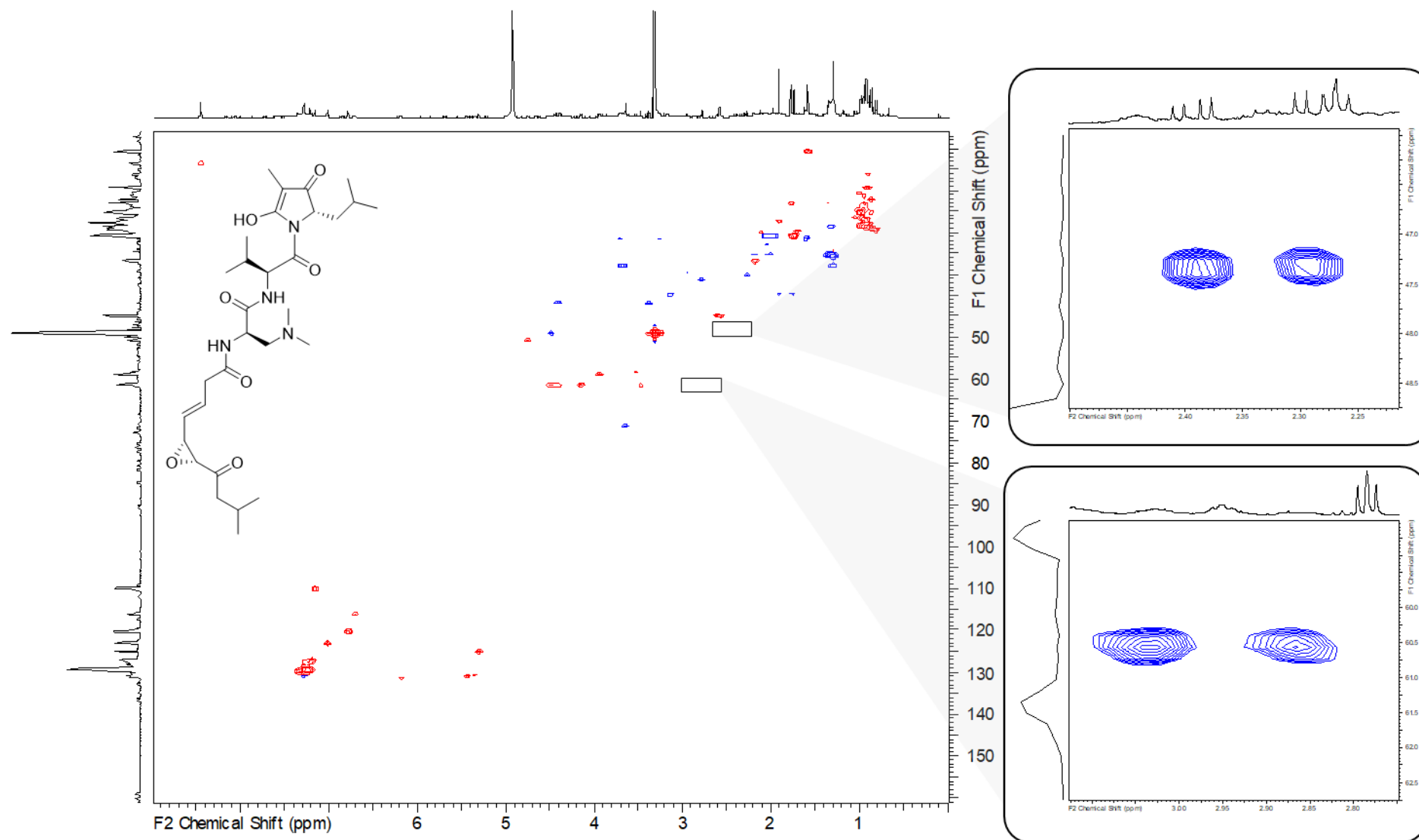


Figure A96 HSQC spectrum of sandarazol B in methanol- d_4 at 700/175 MHz. Right side: Zoom into two methyl groups not visible at the zoom factor of the complete spectrum.

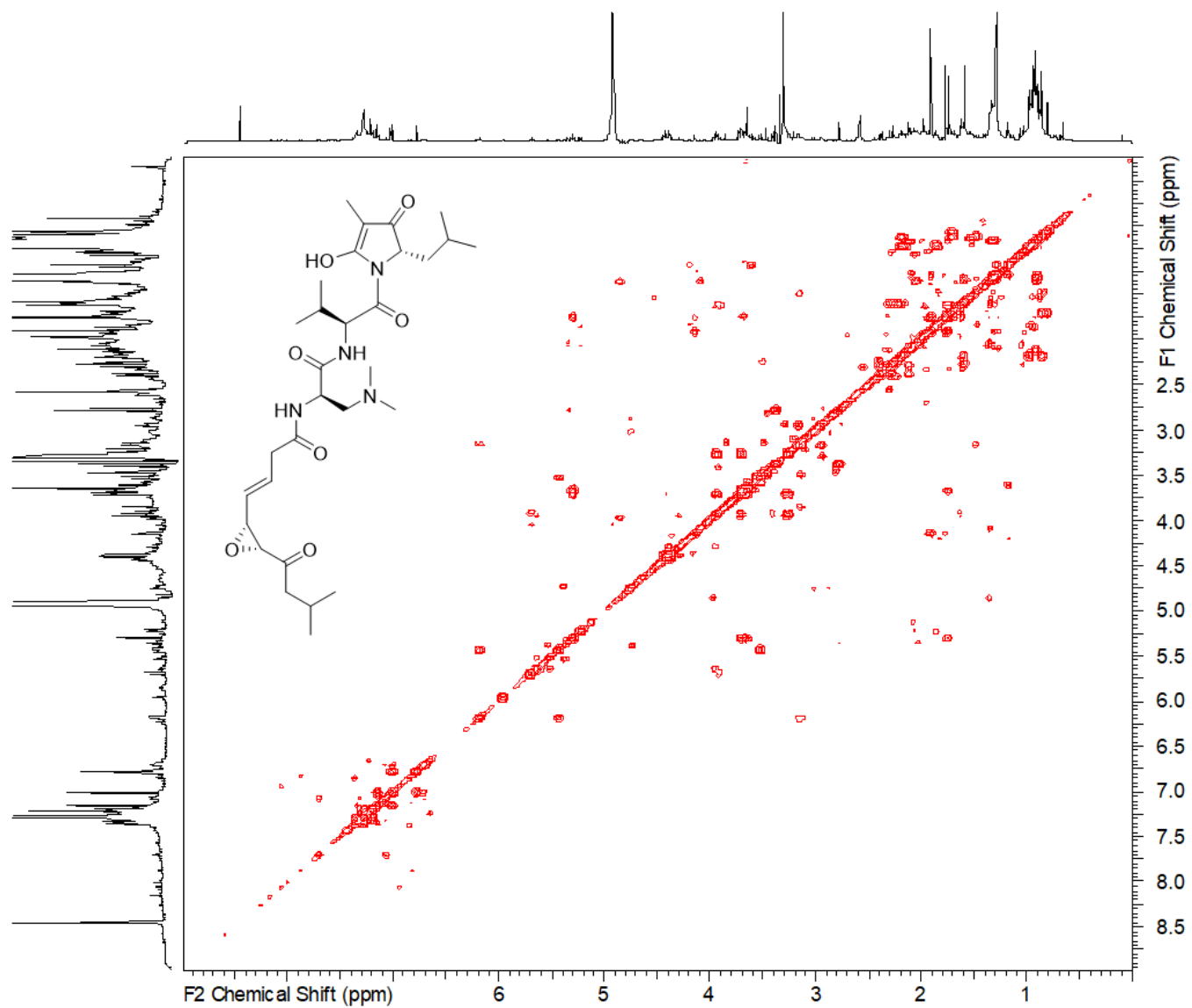


Figure A97 COSY spectrum of sandarazol B in methanol-*d*₄ at 700 MHz.

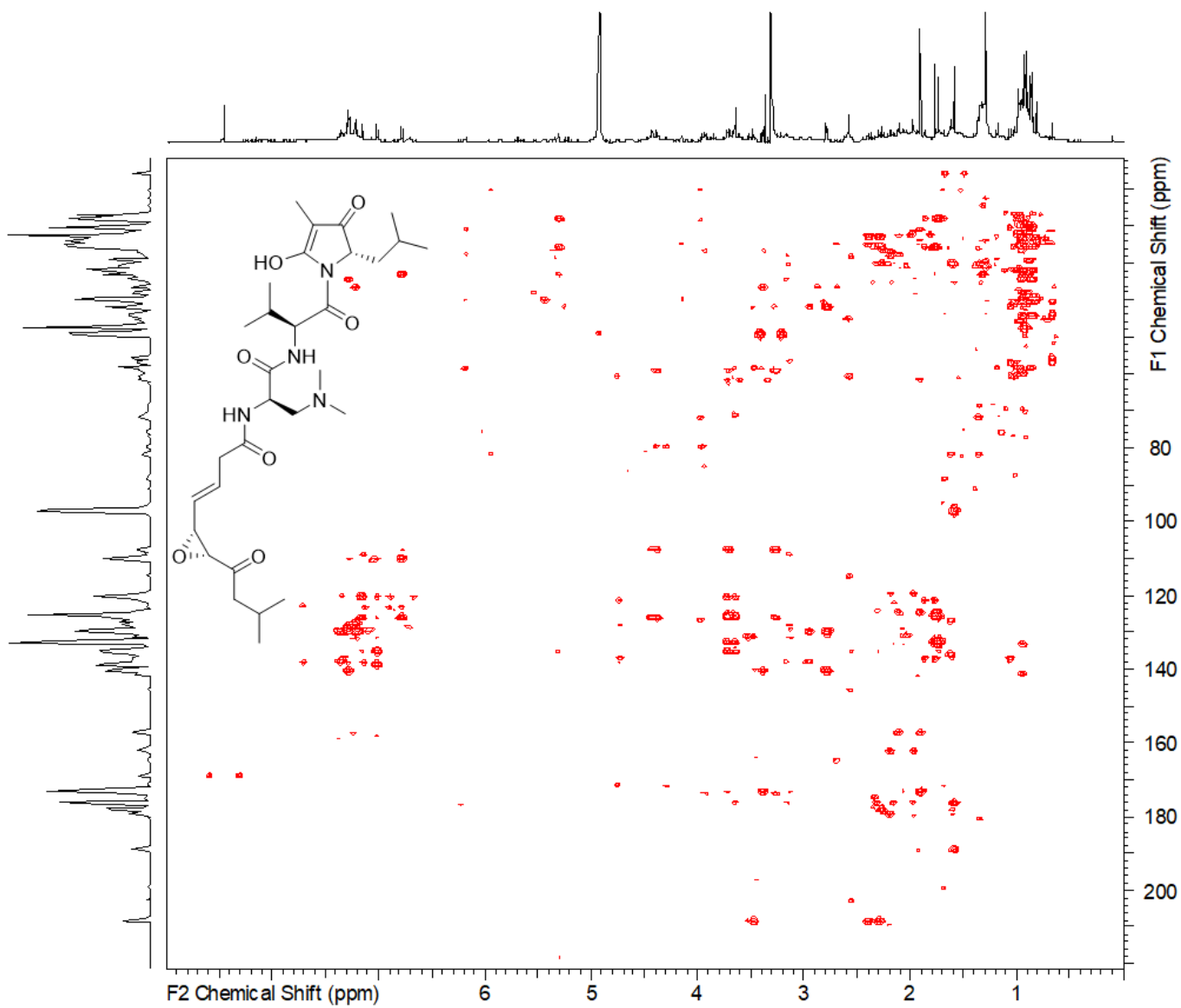


Figure A98 HMBC spectrum of sandarazol B in methanol- d_4 at 700/175 MHz.

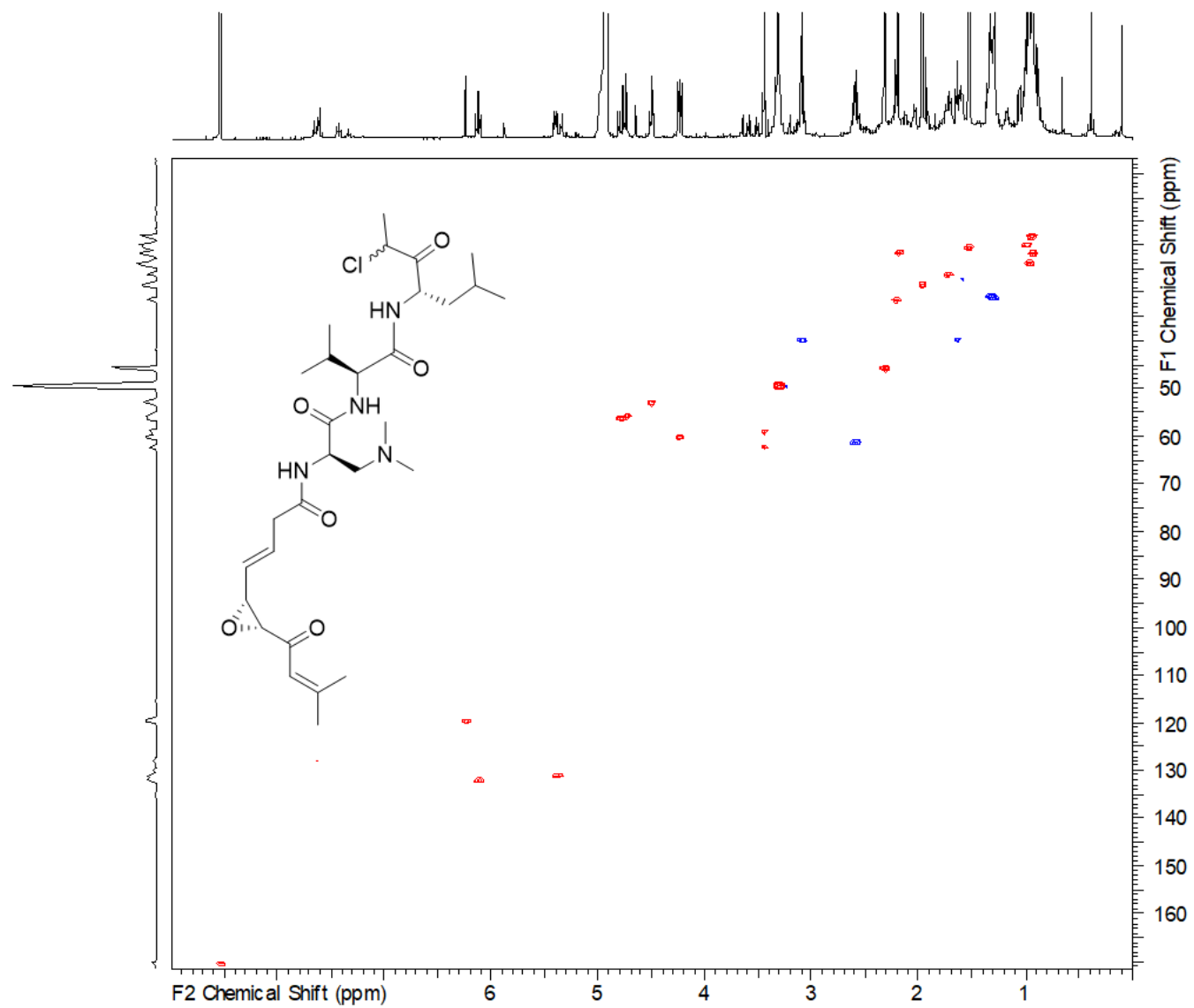


Figure A100 HSQC spectrum of sandarazol C in methanol- d_4 at 700/175 MHz.

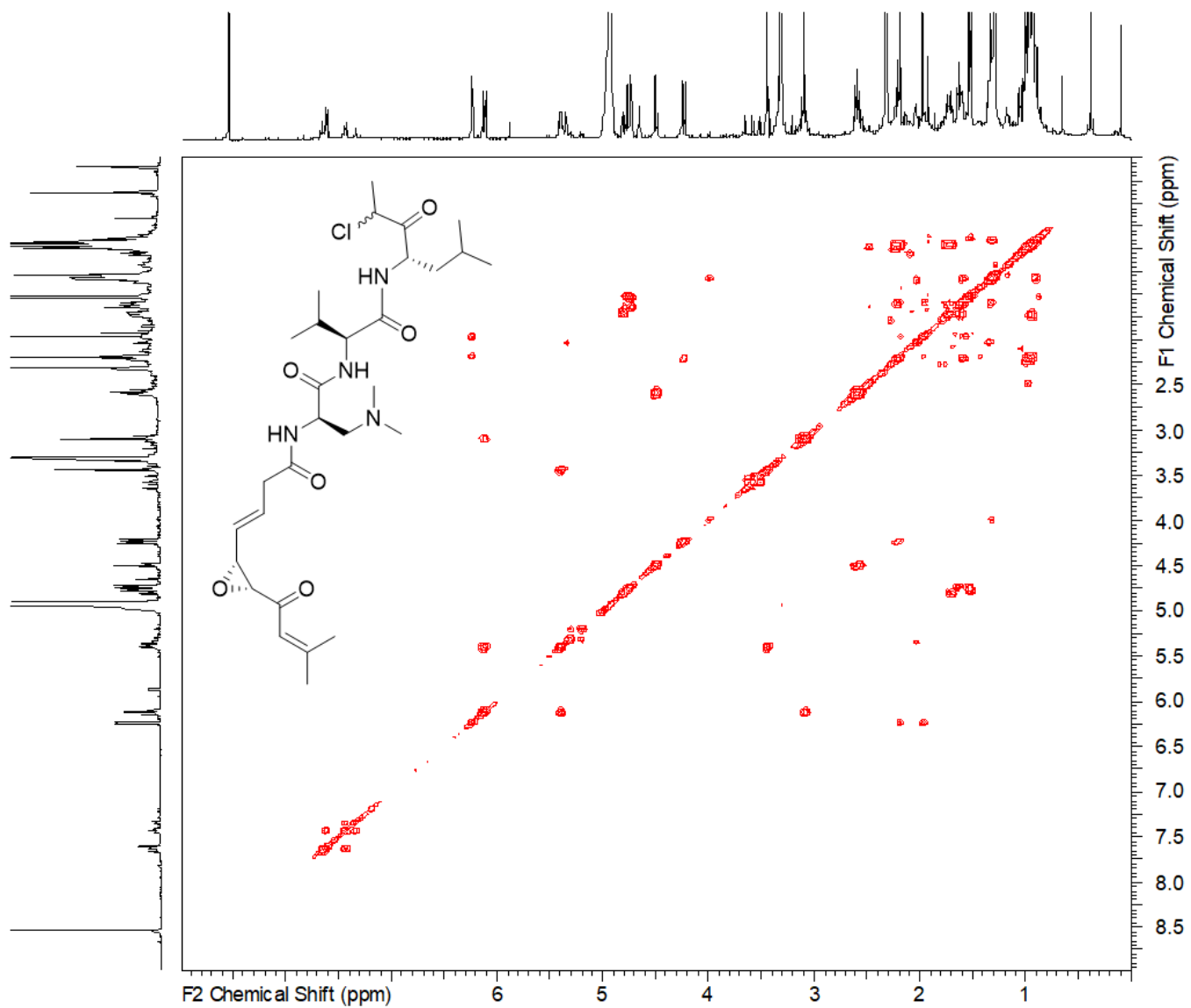


Figure A101 COSY spectrum of sandarazol C in methanol-*d*₄ at 700 MHz.

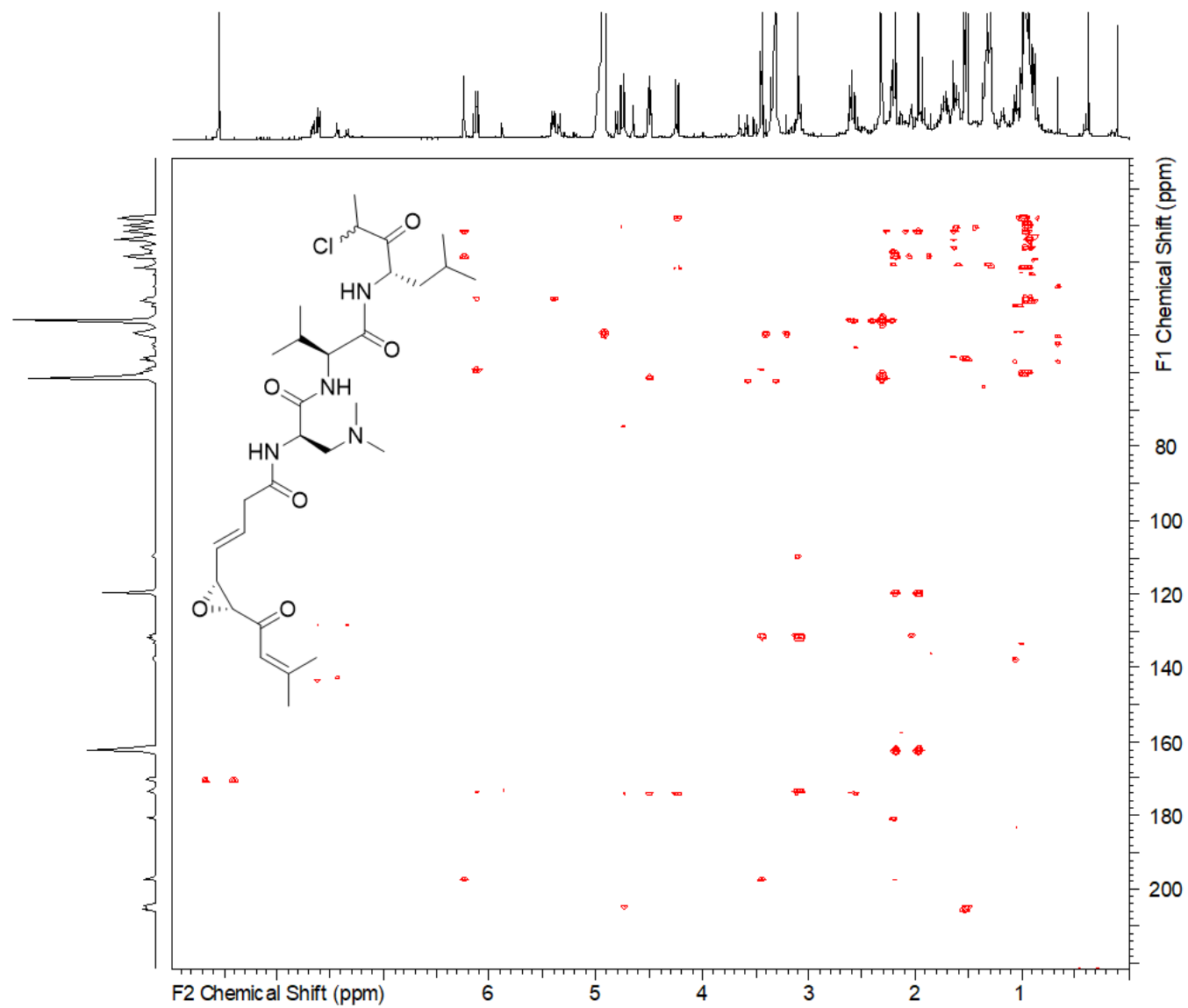


Figure A102 HMBC spectrum of sandarazol C in methanol- d_4 at 700/175 MHz.

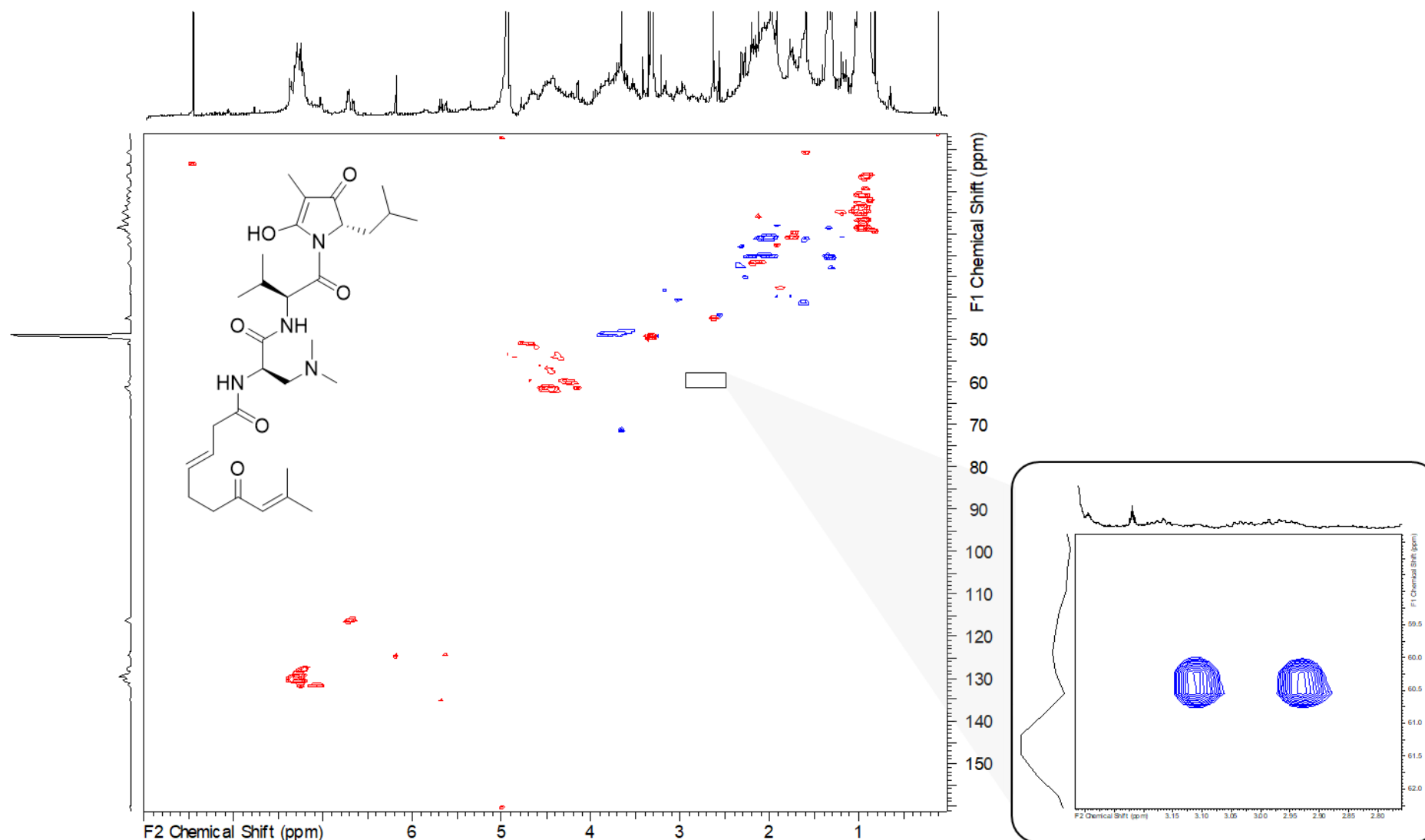


Figure A104 HSQC spectrum of sandarazol F in methanol- d_4 at 700/175 MHz. Right side: Zoom into methyl group not visible at the zoom factor of the complete spectrum.

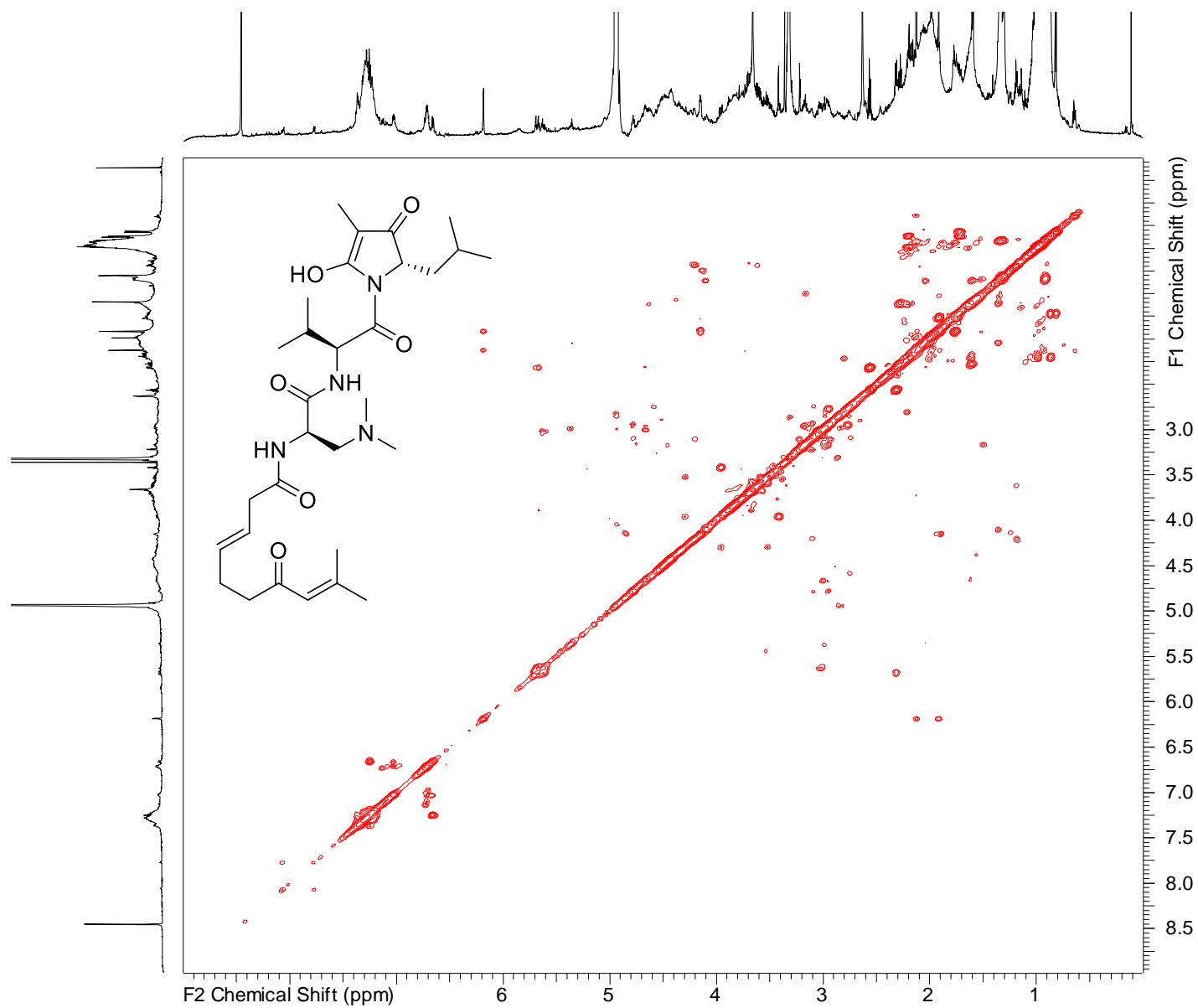


Figure A105 COSY spectrum of sandarazol F in in methanol-*d*₄ at 700 MHz.

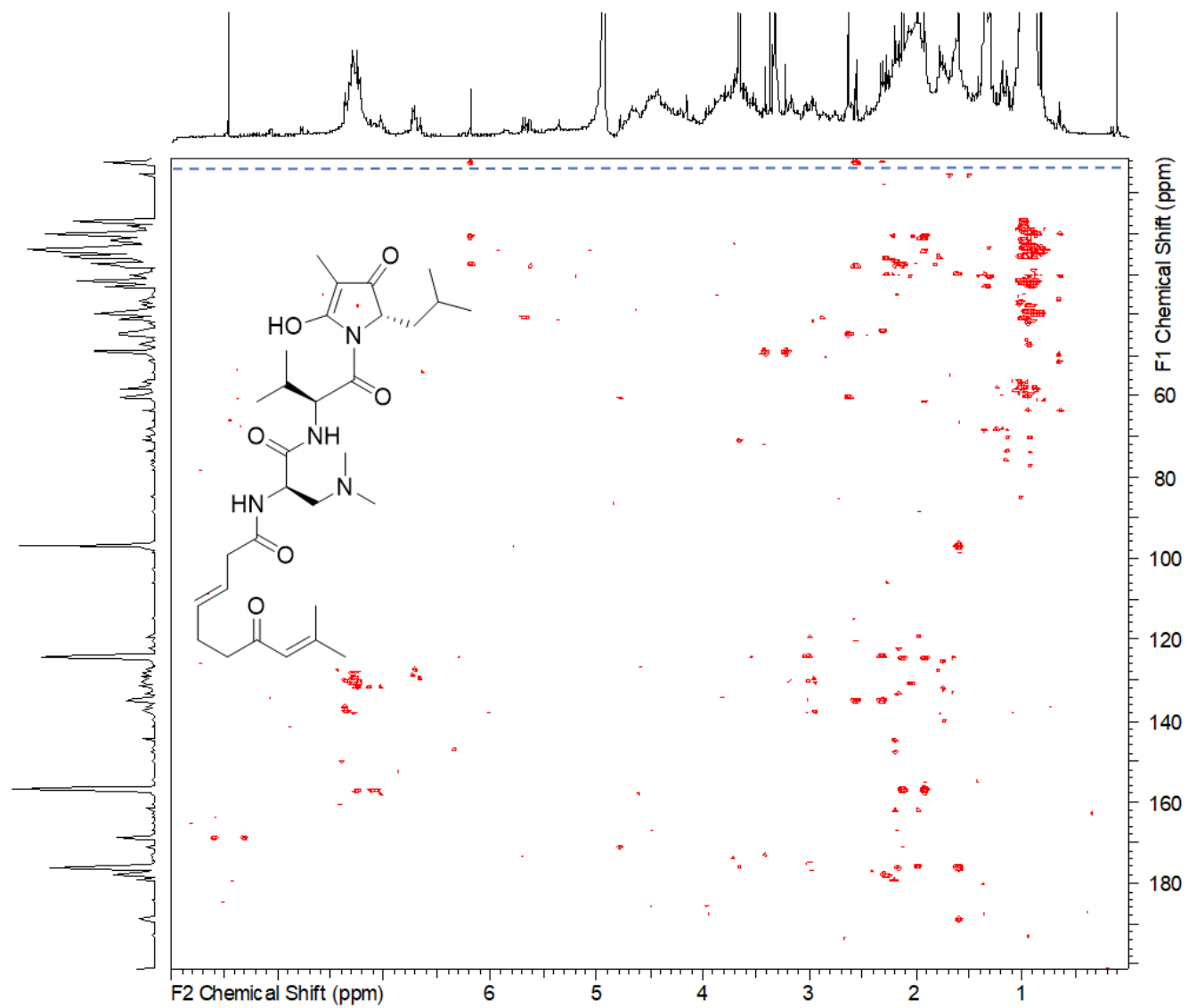


Figure A106 HMBC spectrum of sandarazol F in in methanol- d_4 at 700/175 MHz. Blue dashed line: Signals exceeding ^{13}C 200 ppm, displayed highfield due to limited width of 200 ppm.

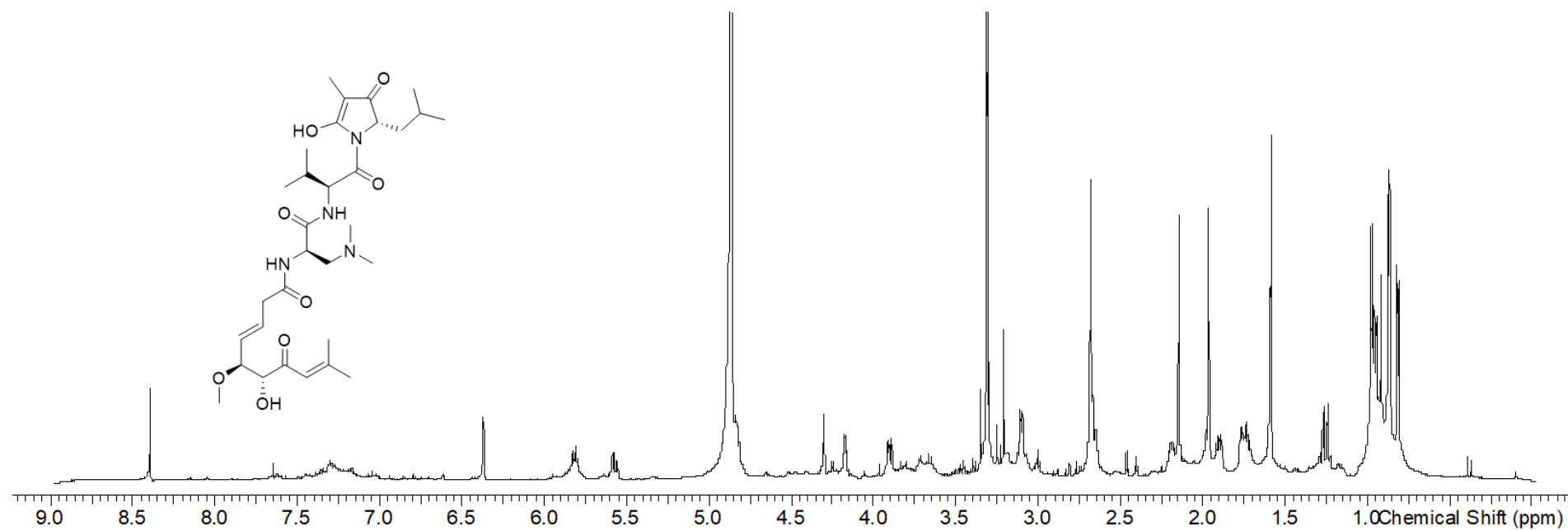


Figure A107 ^1H spectrum of methoxy sandarazol A in methanol- d_4 at 700 MHz.

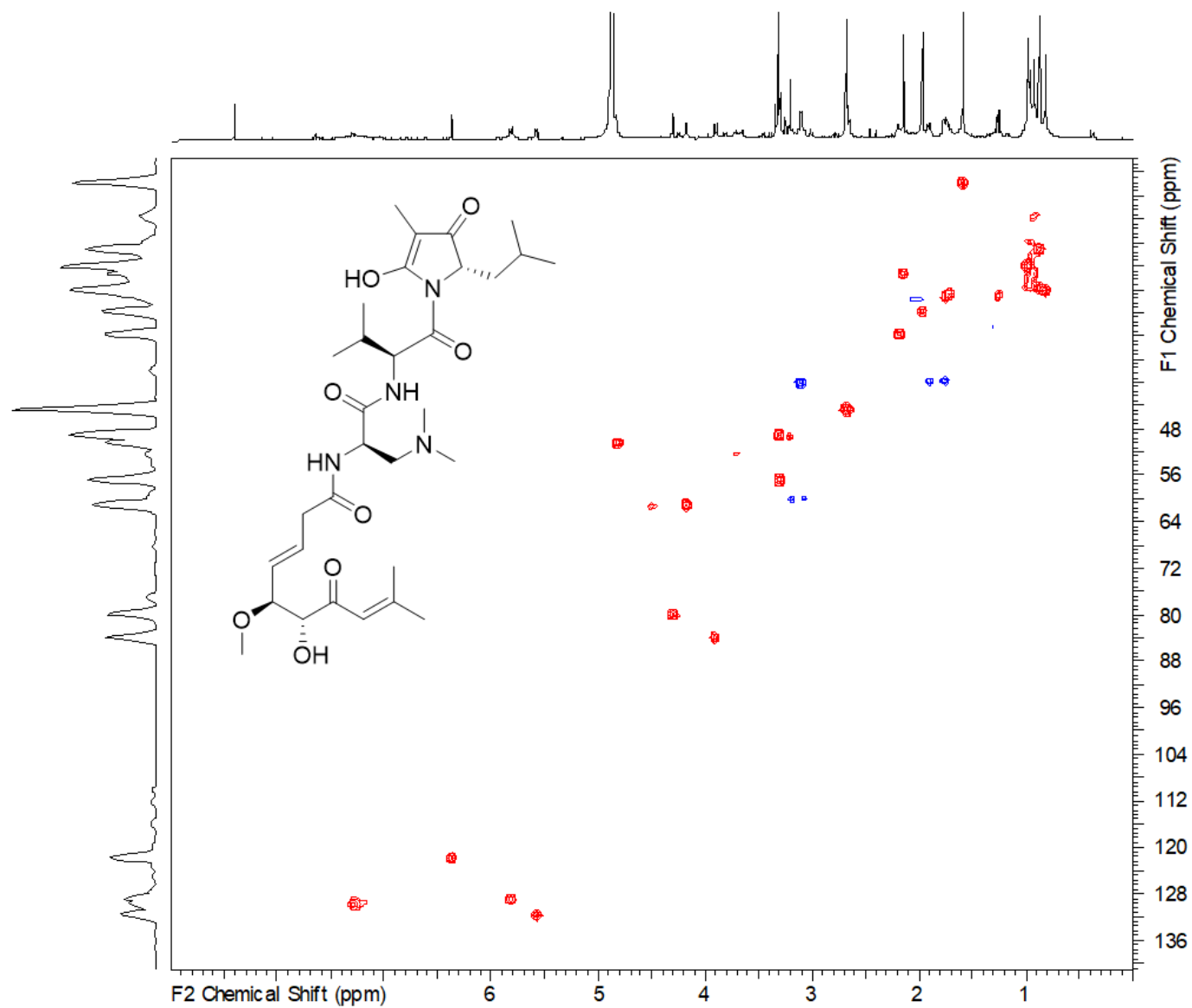


Figure A108 HSQC spectrum of methoxy sandarazol A in methanol- d_4 at 700/175 MHz.

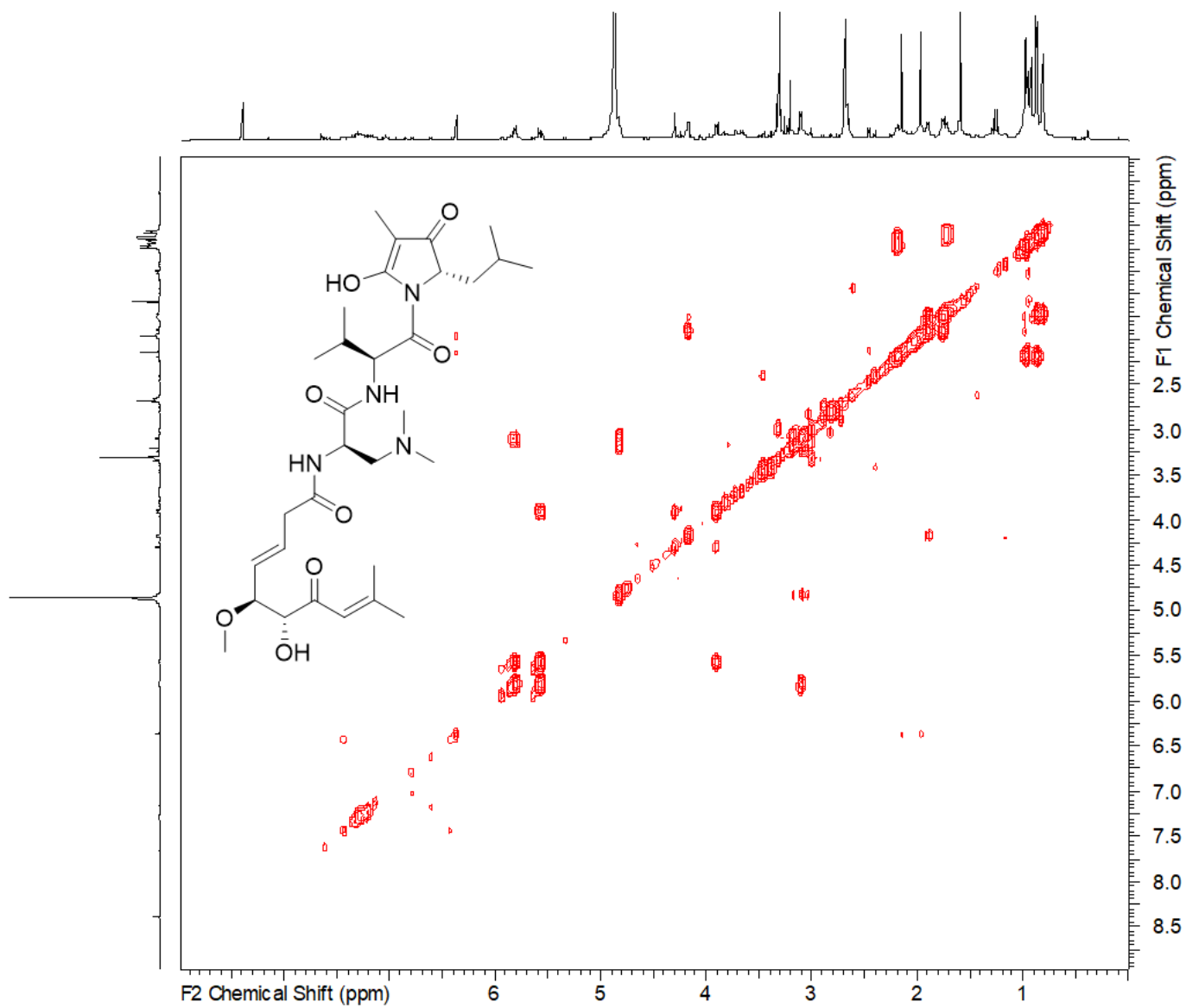


Figure A109 COSY spectrum of methoxy sandarazol A in methanol-*d*₄ at 700 MHz.

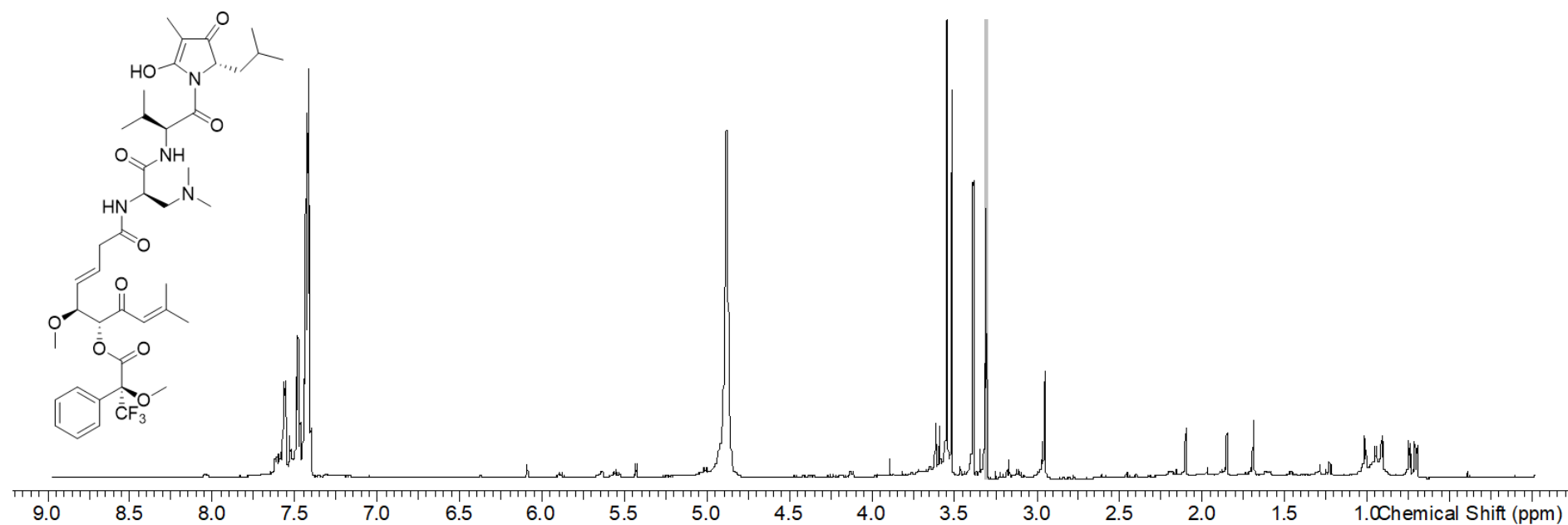


Figure A110 ¹H spectrum of methoxy sandarazol A(S)-Mosher ester in methanol-*d*₄ at 700 MHz.

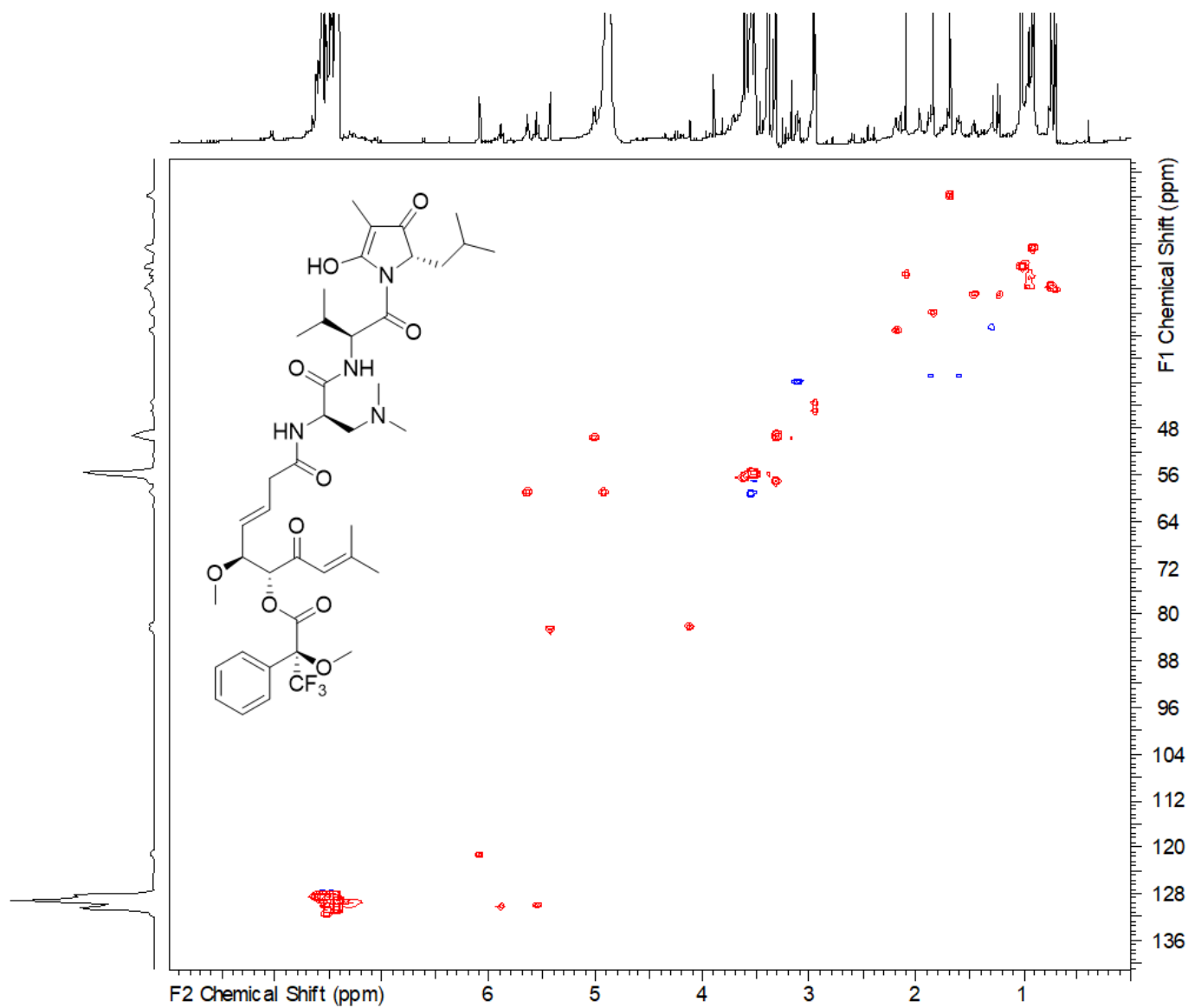


Figure A111 HSQC spectrum of methoxy sandarazol A(S)-Mosher ester in methanol- d_4 at 700/175 MHz.

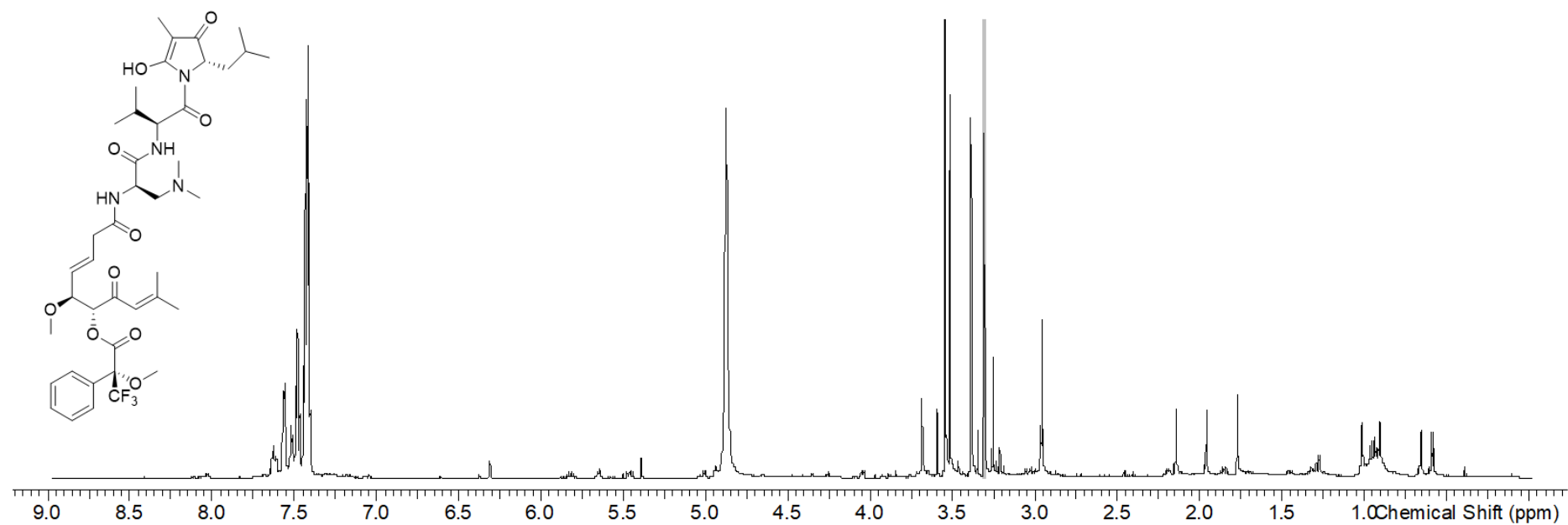


Figure A112 ¹H spectrum of methoxy sandarazol A(R)-Mosher ester in methanol-*d*₄ at 700 MHz.

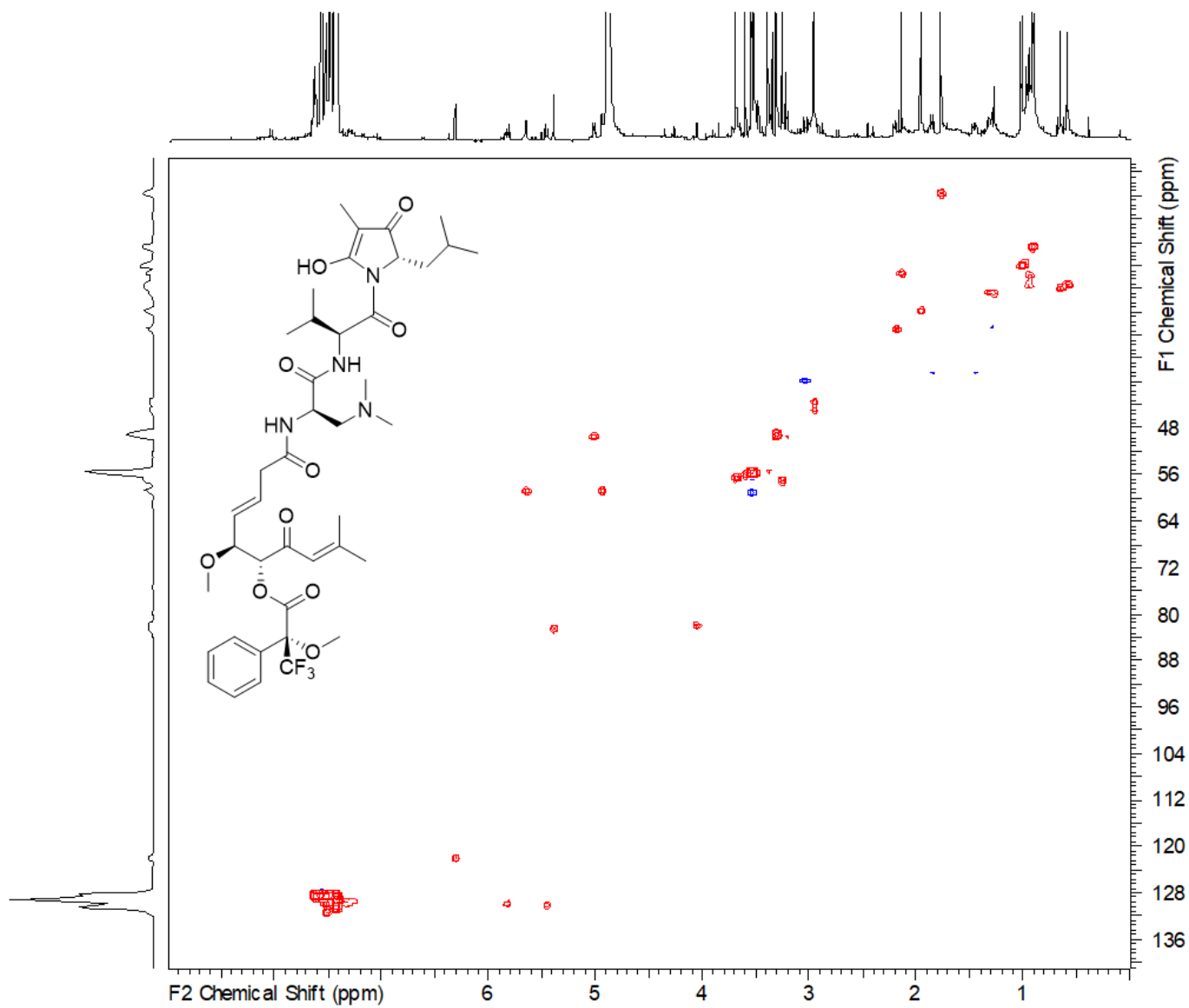


Figure A113 HSQC spectrum of methoxy sandarazol A(R)-Mosher ester in methanol-*d*₄ at 700/175 MHz.