Supplementary Material

Solvent-free synthesis and *in vitro* cytotoxicity of fluorinated chalcones against HepG2 cells

Van Thi Bich Pham,[a] Hien Van Nguyen,[a] Ha Quoc An Than,[b] Trung Thanh Pham,[c] and Hao Minh Hoang*[c]

[a]Department of Chemistry, Nong Lam University, Ho Chi Minh City, Vietnam
[b]Institute of Applied Materials Science, Vietnam Academy of Science and Technology, Ho Chi Minh City, Vietnam
[c]Department of Chemical Technology, Ho Chi Minh City University of Technology and Education, Ho Chi Minh City, Vietnam
Email: haohm@hcmute.edu.vn

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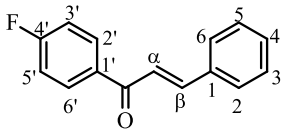
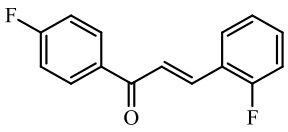
(*E*)-1-(4-Fluorophenyl)-3-phenylprop-2-en-1-one (**1a**)



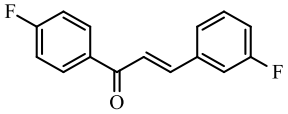
Yield 50%; white solid; mp 80-81 °C; ^{1}H NMR (600 MHz, $CDCl_3$): δ_H 7.18 (dd, *J*(H,H) 8.4 Hz, *J*(H,F) 9.0 Hz, 2H, H-3′,5′), 7.42-7.43 (m, 3H, H-2,4,6), 7.49 (d, *J*(H,H) 15.6 Hz, 1H, H-α), 7.64-7.65 (m, 2H, H-3,5), 7.80 (d, *J*(H,H) 15.6 Hz, 1H, H-β), 8.05 (d, *J*(H,H) 8.4 Hz, 1H, H-2′), 8.06 (d, *J*(H,H) 8.4 Hz, 1H; H-6′); ^{13}C NMR (150 MHz, $CDCl_3$): δ_C 115.67-115.84 (d, *J*(C,F) 25.5 Hz, 2C, C-3′,5′), 121.67 (1C, C-α), 128.47 (2C, C-3,5), 129.00 (2C, C-2,6), 130.65 (1C, C-4), 131.06 (d, *J*(C,F) 10.5 Hz, 2C, C-2′,6′), 134.81 (1C, C-1′), 145.0 (1 C, C-β), 188.87 (1 C, >C=O). ESIMS calcd. for [M + H]: 227.1; found: *m/z* 226.9 $(M + H]^{+}$).

(*E*)-3-(2-Fluorophenyl)-1-(4-fluorophenyl)prop-2-en-1-one (**1b**)



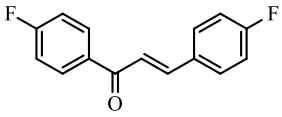
Yield 72%; yellow powder; mp 77-79 °C; ^{1}H NMR (600 MHz, $CDCl_3$): δ_H 7.13-7.16 (m, 1H, H-3), 7.20 (dd, *J*(H,H) 8.4 Hz, *J*(H,F) 8.4 Hz, 2H, H-3′,5′), 7.17-7.22 (m, 1H, H-5), 7.38-7.40 (m, 1H, H-6), 7.61 (d, *J*(H,H) 16.2 Hz, 1H, H-α), 7.62-7.65 (m, 1H, H-4), 7.88 (d, *J*(H,H) 15.6 Hz, 1H; H-β), 8.05 (d, *J*(H,H) 9.0 Hz, 1H, H-2′), 8.06 (d, *J*(H,H) 9.0 Hz, 1H, H-6′). ^{13}C NMR (150 MHz, $CDCl_3$): δ_C 115.9 (d, *J*(C,F) 22.5 Hz, 2C, C-3′,5′), 116.3 (d, *J*(C,F) 22.5 Hz, 1C- C-3), 122.9 (d, *J*(C,F) 12.0 Hz, 1C, C-1), 124.26 (1C, C-α), 124.5 (d, *J*(C,F) 5.5 Hz, 1C, C-5), 129.9 (d, *J*(C,F) 3.0 Hz, 1C, C-4), 131.1 (d, *J*(C,F) 9.0 Hz, 2C, C-2′,6′), 131.9 (d, *J*(C,F) 9.0 Hz, 2C, C-6), 134.4 (1C, C-1′), 137.8 (1C, C-β), 162.6 (d, *J*(C,F) 246.0 Hz, 1C, C-2), 164.9 (d, *J*(C,F) 252.0 Hz, 1C, C-4′), 188.8 (1C, >C=O). ESIMS calcd. for [M + H]: 245.1; found: *m/z* 244.9 $([M + H]^{+})$.

(*E*)-3-(3-Fluorophenyl)-1-(4-fluorophenyl)prop-2-en-1-one (**1c**)



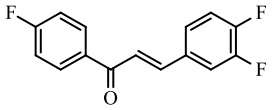
Yield 43%; white solid; mp 80-81 °C; ^{1}H NMR (600 MHz, $CDCl_3$): δ_H 7.11-7.14 (m, 1H, H-2), 7.19 (dd, J(H,H) 8.4 Hz, J(H,F) 8.4 Hz, 2H, H-3′,5′), 7.33-7.34 (m, 1H, H-4), 7.34-7.41 (m, 2H, H-5,6), 7.47 (d, J(H,H) 15.6 Hz, 1H, H-α), 7.75 (d, J(H,H) 15.6 Hz, 1H, H-β), 8.05 (d, J(H,H) 9.0 Hz, 2H, H-2′), 8.06 (d, J(H,H) 9.0 Hz, 2H, H-6′). 13C-NMR (150 MHz, $CDCl_3$): δ_C 114.40 (d, J(C,F) 27.0 Hz, 1C, C-4), 115.77-115.95 (d, J(C,F) 27.0 Hz, 2C, C3′,5′), 117.49 (d, J(C,F) 27.0 Hz, 1C, C-2), 121.54 (1C, C-1), 122.76 (1C, C-α), 124.60 (d, J(C,F) 3.0 Hz, 1C, C-6), 130.53 (d, J(C,F) 10.5 Hz, 1C, C-5), 131.11-131.19 (d, J(C,F) 12.0 Hz, 2C, C-2′,6′), 134.29 (1C, C-1′), 143.52 (1C, C-β), 162.10 (d, *J*(C,F) 294.0 Hz, 1C, C-3), 172.66 (1C, C-4'), 188.49 (1C, >C=O). ESIMS calcd. for [M + 4H_2O]: 316.1; found: *m/z* 316.1 ([M + 4H_2O]$^+$).

(*E*)-1,3-Bis(4-fluorophenyl)prop-2-en-1-one (**1d**)



Yield 67%; white solid; mp 102-104 °C; ^{1}H NMR (600 MHz, $CDCl_3$): δ_H 7.12 (dd, *J*(H,H) 8.4 Hz, *J*(H,F) 9.0 Hz, 2H, H-3′,5′), 7.18 (dd, *J*(H,H) 8.4 Hz, *J*(H,F) 8.4 Hz, 2H, H-3,5), 7.41 (d, *J*(H,H) 15.6 Hz, 1H, H-α), 7.62 (d, *J*(H,H) 9,0 Hz, 1H, H-2), 7.63 (d, *J*(H,H) 9,0 Hz, 1H, H-6), 7.76 (d, *J*(H,H) 15.6 Hz, 1H, H-β), 8.04 (d, *J*(H,H) 9.0 Hz, 1H, H-2'), 8.05 (d, *J*(H,H) 9.0 Hz, 1H, H-6'). ^{13}C NMR (150 MHz, $CDCl_3$): δ_C 115.71-115.88 (d, *J*(C,F) 25.5 Hz, 2C, C-3′,5′), 116.11-116.28 (d, *J*(C,F) 25.5 Hz, 2C, C-3,5), 121.32 (1C, C-α), 130.35-130.42 (d, *J*(C,F) 10.5 Hz, 2C, C-2,6), 131.04-131.11(d, *J*(C,F) 10.5 Hz, 2C, C-2′,6′), 134.46 (1C, C-1′), 143.74 (1C, C-β), 164.65 (1C, C-4), 165.15 (1C, C-4′), 188.63 (1C, >C=O) ppm. ESIMS calcd. for [M + H]: 245.1; found: *m/z* 244.9 ([M + H]$^+$).

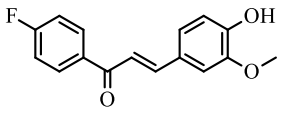
(*E*)-3-(3,4-Difluorophenyl)-1-(4-fluorophenyl)prop-2-en-1-one (**1e**)



Yield 49%; white solid; mp 117-119 °C; ^{1}H NMR (600 MHz, $CDCl_3$): δ_H 7.20 (dd, *J*(H,H) 8.4 Hz, *J*(H,F) 9.0 Hz, 2H, H-3′,5′), 7.20-7.24(m, 1H, H-5), 7.36 (m, 1H, H-2), 7.40 (d, *J*(H,H) 15.6 Hz, 1H, H-α), 7.45-7.50 (m, 1H, H-6), 7.70 (d, *J*(H,H) 15.6 Hz, 1H, H-β), 8.04 (d, *J*(H,H) 9.0 Hz, 1H, H-2′), 8.05 (d, *J*(H,H) 9.0 Hz, 1H, H-6′). ^{13}C NMR (150 MHz, $CDCl_3$): δ_C 115.80-116.59 (d, ^{2}*J*(C,F) 27.0 Hz, 2C, C-3′,5′), 116.45 (d, *J*(C,F) 21.0 Hz, 1C, C-6), 117.90 (d, *J*(C,F) 21.0 Hz, 1C; C-5), 122.42 (C-1), 122.44

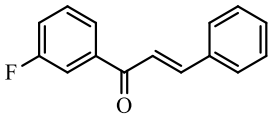
(C-α), 125.36 (dd, *J*(C,F) 7.5 Hz, *J*(C,F) 4.5 Hz, 2C; C-2), 131.09-131.17 (d, *J*(C,F) 12.0 Hz, 2C, C-5′,6′), 134.22 (d, *J*(C,F) 3.0 Hz, 1C, C-1′), 142.54 (1C, C-β), 149.76 (1C, C-3), 150.66 (1C, C-4), 164.76 (d, *J*(C,F) 304.5 Hz, 1C, C-4′), 188.23 (1C, >C=O). ESIMS calcd. for [M + $3H_2O$]: 316.1; found: *m/z* 316.1 (M + $3H_2O]^+$).

(*E*)-1-(4-Fluorophenyl)-3-(4-hydroxy-3-methoxyphenyl)prop-2-en-1-one (**1g**)



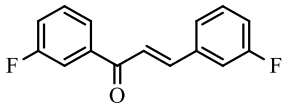
Yield 41%; yellow solid; mp 102-104 °C; ^{1}H NMR (600 MHz, $CDCl_3$): δ_H 3.99 (s, 3H, -OCH_3), 5.97 (s, 1H, -OH), 6.99 (d, *J*(H,H) 8.4 Hz, 1H, H-5), 7.15 (d, *J*(H,H) 1.8 Hz, 1H, H-2), 7.18 (dd, *J*(H,H) 8.4 Hz, *J*(H,F) 8.4 Hz, 2H, H-3′,5′), 7.24 (dd, *J*(H,H) 8.4 Hz, *J*(H,F) 1.8 Hz, 1H, H-6), 7.35 (d, *J*(H,H) 15.6 Hz, 1H, H-α), 7.76 (d, *J*(H,H) 15.6 Hz, 1H, H-β), 8.05 (d, *J*(H,H) 9.0 Hz, 1H, H-2′), 8.06 (d, *J*(H,H) 7.8 Hz, 1H, H-6′); ^{13}C NMR (150 MHz, $CDCl_3$): δ_C 56.05 (1C, -OCH_3), 110.11 (1C, C-2), 114.93 (1C, C-5), 115.59 (d, *J*(C,F) 21.0 Hz, 2C; C-3′,5′), 119.34 (1C, C-α), 123.41 (1C, C-6), 127.40 (1C, C-1), 130.95 (d, *J*(C,F) 9.0 Hz, 2C, C-2′,6′), 134.83 (1C, C-1′), 145.41 (1C, C-β), 146.85 (1C, C-3), 148.42 (1C, C-4), 166.41 (1C, C-4′), 188.94 (1C, >C=O) ppm. ESI MS calcd. for [M- H]: 271.1; found: *m/z* 270.8 (M – H]$^-$).

(*E*)-1-(3-Fluorophenyl)-3-phenylprop-2-en-1-one (**2a**)



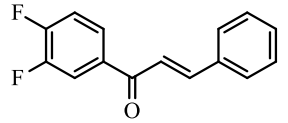
Yield 58%; white solid; mp 62-64 °C; ^{1}H NMR (600 MHz, $CDCl_3$): δ_H 7.29 (m, 1H, H-4′), 7.43-7.44 (m, 3H, H-2,4,6), 7.46 (d, *J*(H,H) 15.6 Hz, 1H, H-α), 7.47-7.51 (m, 1H, H-3′), 7.64-7.66 (m, 2H, H-3,5), 7.69-7.71 (m, 1H, H-6′), 7.80 (d, *J*(H,H) 7.8 Hz, 1 H, H-2′), 7.82 (d, *J*(H,H) 16.2 Hz, 1H, H-β); ^{13}C NMR (150 MHz, $CDCl_3$): δ_C 115.30 (d, *J*(C,F) 22.5 Hz, 1C, C-6′), 119.76 (d, *J*(C,F) 22.5 Hz, 1C, C-4′), 121.61 (1C, C-α), 124.17 (1C, C-2), 128.55 (2C, C-2,6), 129.04 (2C, C-3,5), 130.30 (d, *J*(C,F) 7.5 Hz, 1C, C-3′), 130.81 (1C, C-4), 134.71 (1C, C-1), 140.39 (d, *J*(C,F) 6.0 Hz, 1C, C-1′), 145.60 (1C, C-β), 162.11 (d, *J*(C,F) 246.0 Hz, 1C, C-5′), 189.19 (1C, >C=O). ESIMS calcd. for [M+H]: 227.1; found *m/z* 226.9 ([M + H]$^+$).

(*E*)-1,3-Bis(3-fluorophenyl)prop-2-en-1-one (**2c**)



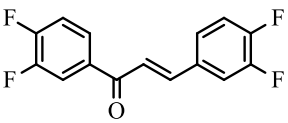
Yield 58%; white solid; mp 83-84 ℃; ^{1}H NMR (600 MHz, $CDCl_3$): δ_H 7.11-7.15 (m, 1H, H-2), 7.29-7.32 (m, 1H, H-4′), 7.33-7.34 (m, 1H, H-4), 7.38 (m, 2H, H-5,6), 7.45 (d, *J*(H,H) 15.6 Hz, 1H, H-α), 7.48 (m, 1H, H-3′), 7.69-7.71 (m, 1H, H-6′), 7.76 (d, *J*(H,H) 15.6 Hz, 1H, H-β), 7.79 (m, 1H, H-2′) ppm. ^{13}C NMR (150 MHz, $CDCl_3$): δ_C 114.50 (d, *J*(C,F) 25.5 Hz, 1C, C-4), 115.25 (d, *J*(C,F) 27.0 Hz, 1C, C-6′), 117.60 (d, *J*(C,F) 25.5 Hz, 1C, C-2), 119.94 (d, *J*(C,F) 25.5 Hz, 1C, C-4′), 122.72 (1C, C-α), 124.19 (d, *J*(C,F) 3.0 Hz, 1C, C-2′), 124.63 (d, *J*(C,F) 3.0 Hz, 1C, C-6), 130.35 (d, *J*(C,F) 9.0 Hz, 1C, C-3′), 130.56 (d, *J*(C,F) 10.5 Hz, 1C, C-5), 136.94 (d, *J*(C,F) 9.0 Hz, 1C, C-1), 140.05 (d, *J*(C,F) 7.5 Hz, 1C, C-1′), 144.03 (1C; C-β), 162.0 (d, *J*(C,F) 295.5 Hz, 1C, C-3), 162.12 (d, *J*(C,F) 294.0 Hz, 1C, C-5′), 188.84 (1C, >C=O). ESIMS calcd. for [M]: 244.1; found: *m/z* 243.9 ([M]$^+$).

(*E*)-1-(3,4-Difluorophenyl)-3-phenylprop-2-en-1-one (**3a**)



Yield 51%; white solid; mp 81-82 °C; ^{1}H NMR (600 MHz, $CDCl_3$): δ_H 7.27-7.31 (m, 1H, H-3′), 7.43-7.45 (m, 3H, H-2,4,6), 7.44 (d, *J*(H,H) 15.6 Hz, 1H, H-β), 7.64-7.66 (m, 2H, H-3,5), 7.80-7.81 (m, 1H, H-2′), 7.82 (d, *J*(H,H) 15.6 Hz, 1H, H-α), 7.85-7.89 (m, 1H, H-6′). ^{13}C NMR (150 MHz, $CDCl_3$): δ_C 117.48 (d, *J*(C,F) 18.0 Hz, 1C, C-3′), 117.81 (d, *J*(C,F) 18.0 Hz, 1C, C-6′), 120.96 (1C, C-α), 125.31 (d, *J*(C,F) 7.5 Hz, 1C, C-2′), 128.57 (2C, C-3,5), 129.06 (2C, C-2,6), 130.91 (1C, C-4), 134.59 (1C, C-1), 135.26 (1C, C-1′), 145.80 (1C, C-β), 187.71 (1C, >C=O). ESIMS calcd. for [M + H]: 245.1; found: *m/z* 244.9 ([M + H]$^+$).

(*E*)-1,3-Bis(3,4-Difluorophenyl)prop-2-en-1-one (**3e**)



Yield 32%; white solid; mp 132-133 °C; ^{1}H NMR (600 MHz, $CDCl_3$): δ_H 7.21-7.25 (m, 1H, H-5), 7.28-7.32 (m, 1H, H-6), 7.35 (d, *J*(H, H) 15.6 Hz, 1H, H-α), 7.36-7.39 (m, 1H, H-2); 7.46-7.49 (m, 1H, H-

3′), 7.72 (d, *J*(H,H) 15.6 Hz, 1H, H-β), 7.79-7.82 (m, 1H, H-2′), 7.85-7.88 (m, 1H; H-6′). ^{13}C NMR (150 MHz, $CDCl_3$): δ_C 116.56 (d, *J*(C,F) 21.0 Hz, 1C, C-3′), 117.59 (d, *J*(C,F) 21.0 Hz, 1C, C-6), 117.82 (d, *J*(C,F) 25.5 Hz, 1C, C-6′), 117.97 (d, *J*(C,F) 22.5 Hz, 1C, C-5), 121.74 (1C, C-α), 125.34-125.53 (m, C-2,2′), 131.78 (1C, C-1), 134.93 (1C, C-1′), 143.26 (1C, C-β), 149.52-152.66 (4C, C-3,4,4′,5′), 187.13 (1 C, >C=O). ESIMS calcd. for [2M - H]: 559.1; found: *m/z* 559.0 ([2M – H]$^-$).

2. ^{1}H, ^{13}C NMR, HSQC and HRESIMS/ESIMS spectra of all fluorinated chalconoids

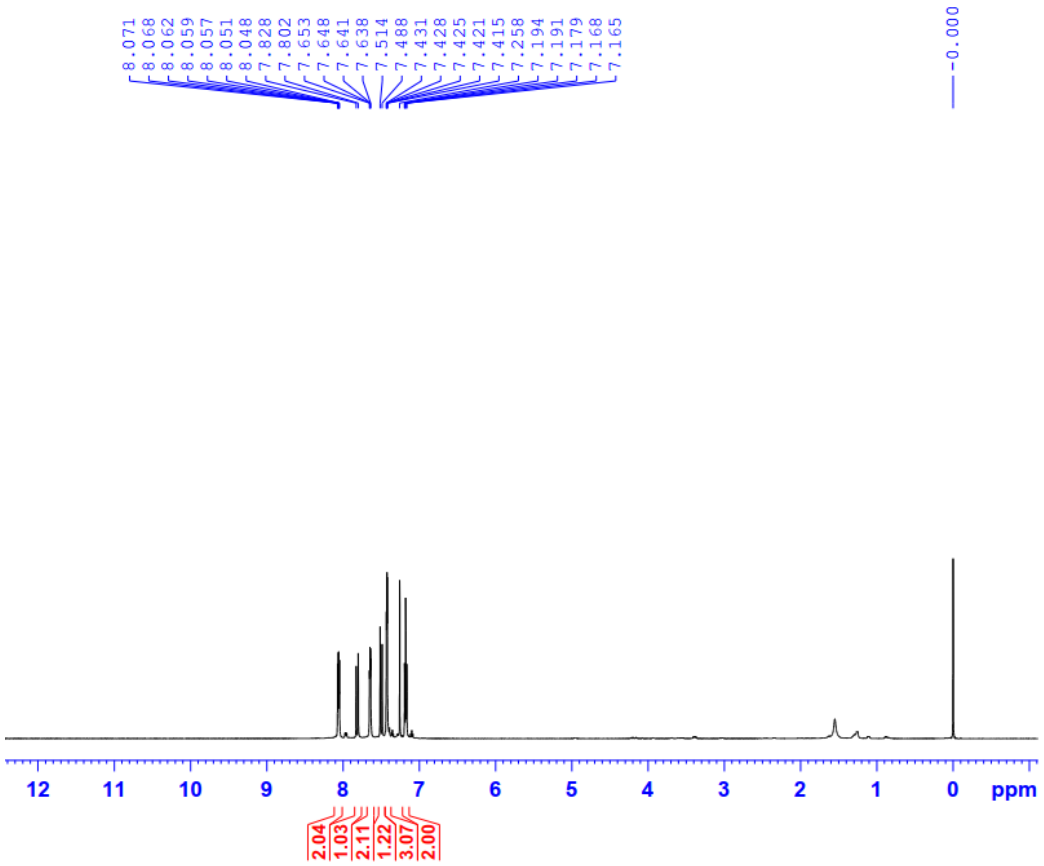


Figure S1a. ^{1}H-NMR spectrum of **1a**.

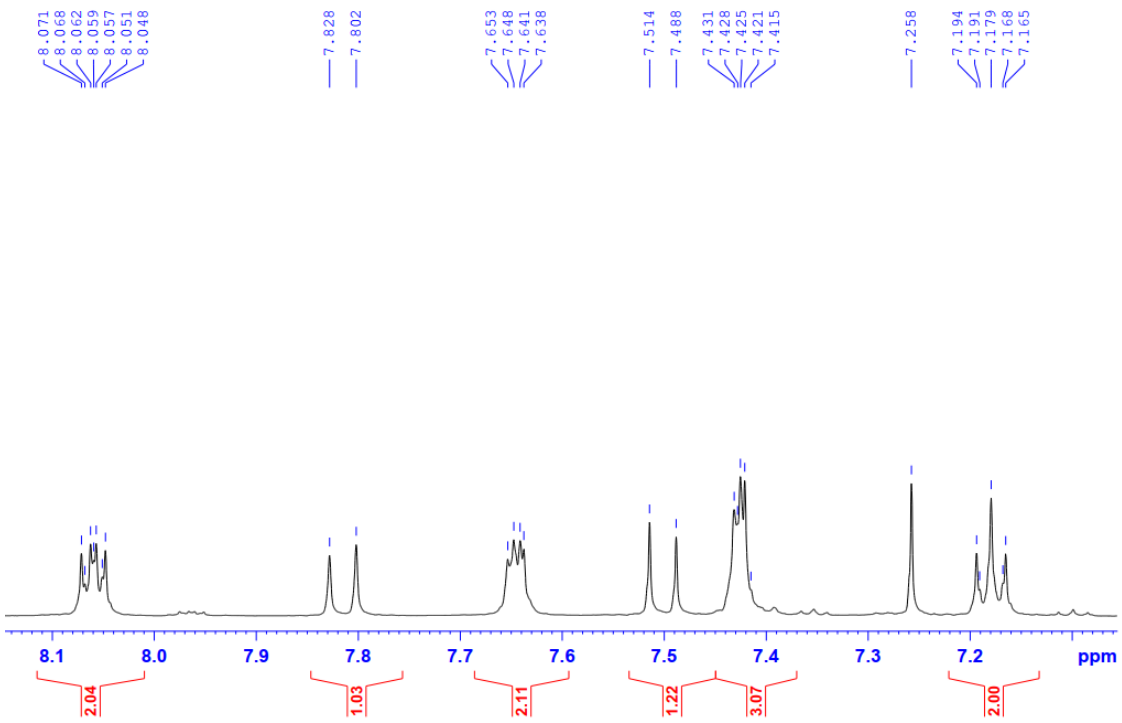


Figure S1b. ^{1}H-NMR spectrum of **1a**.

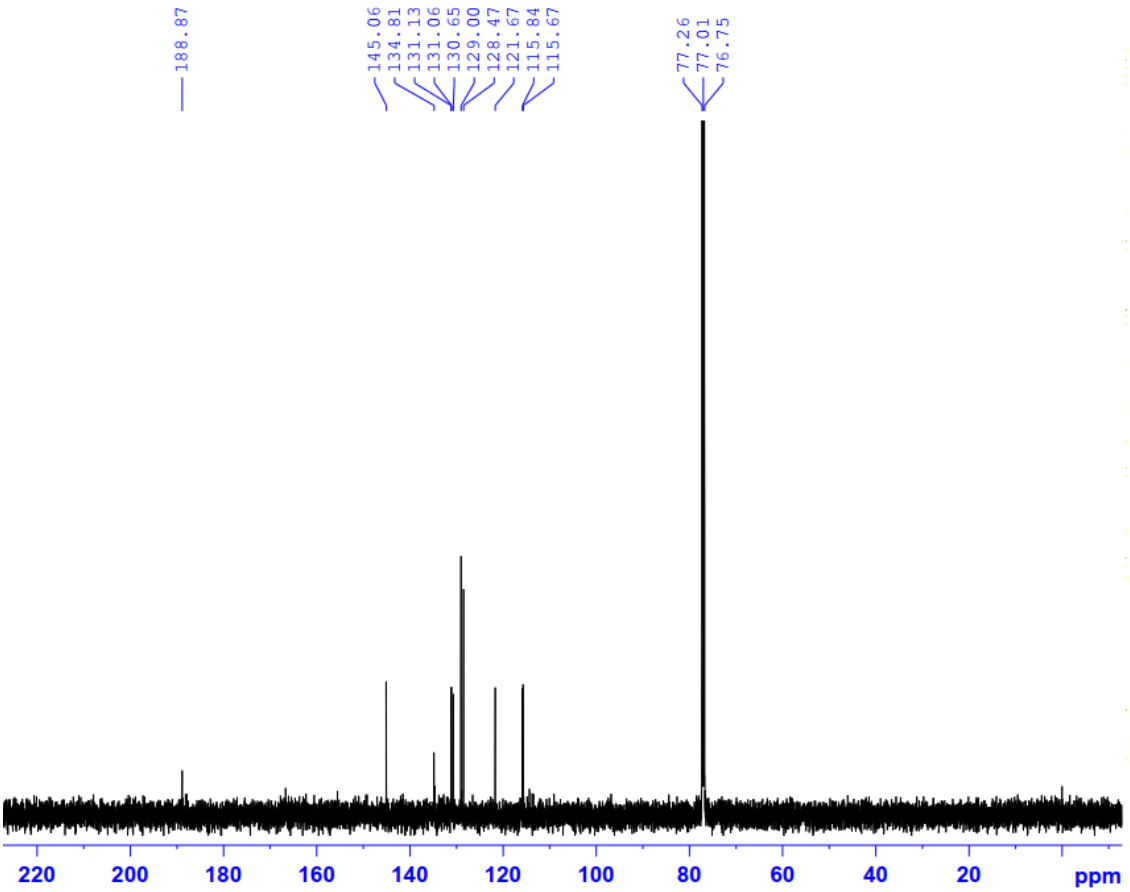


Figure S1c. ^{13}C-NMR spectrum of **1a**.

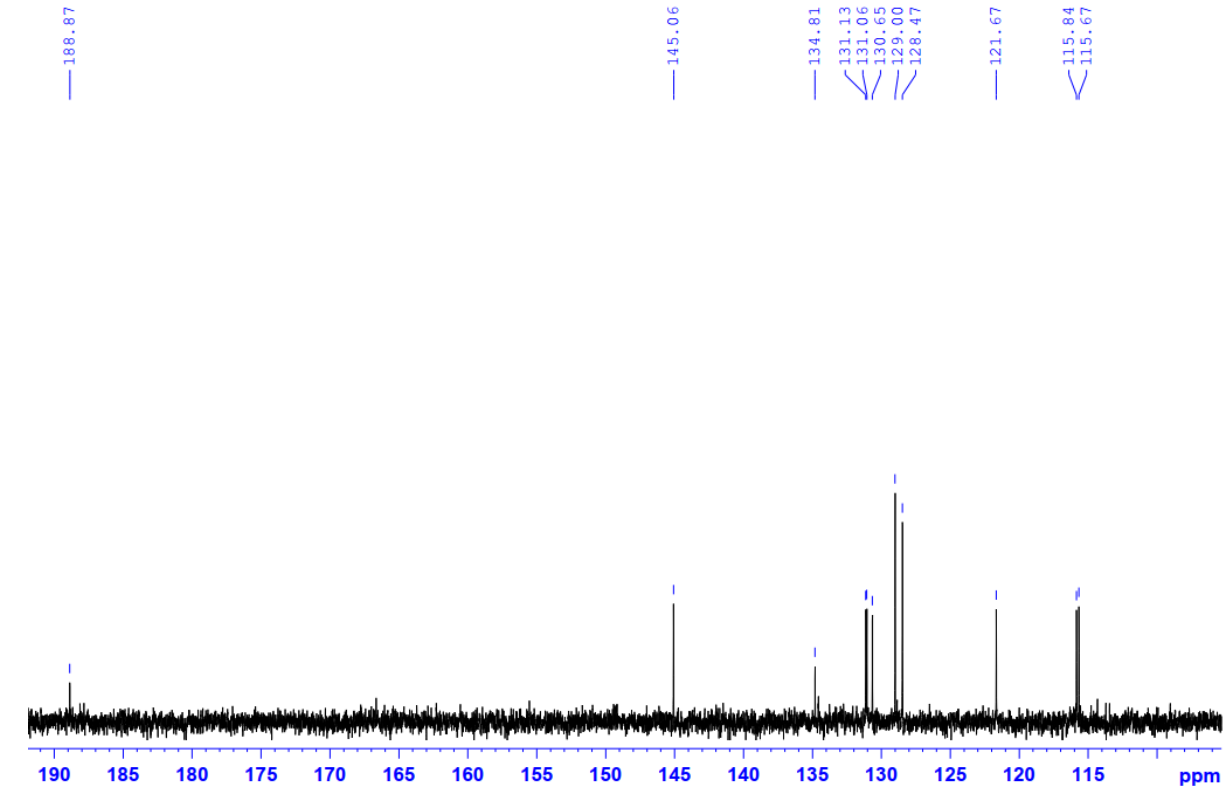


Figure S1d. ^{13}C-NMR spectrum of **1a**.

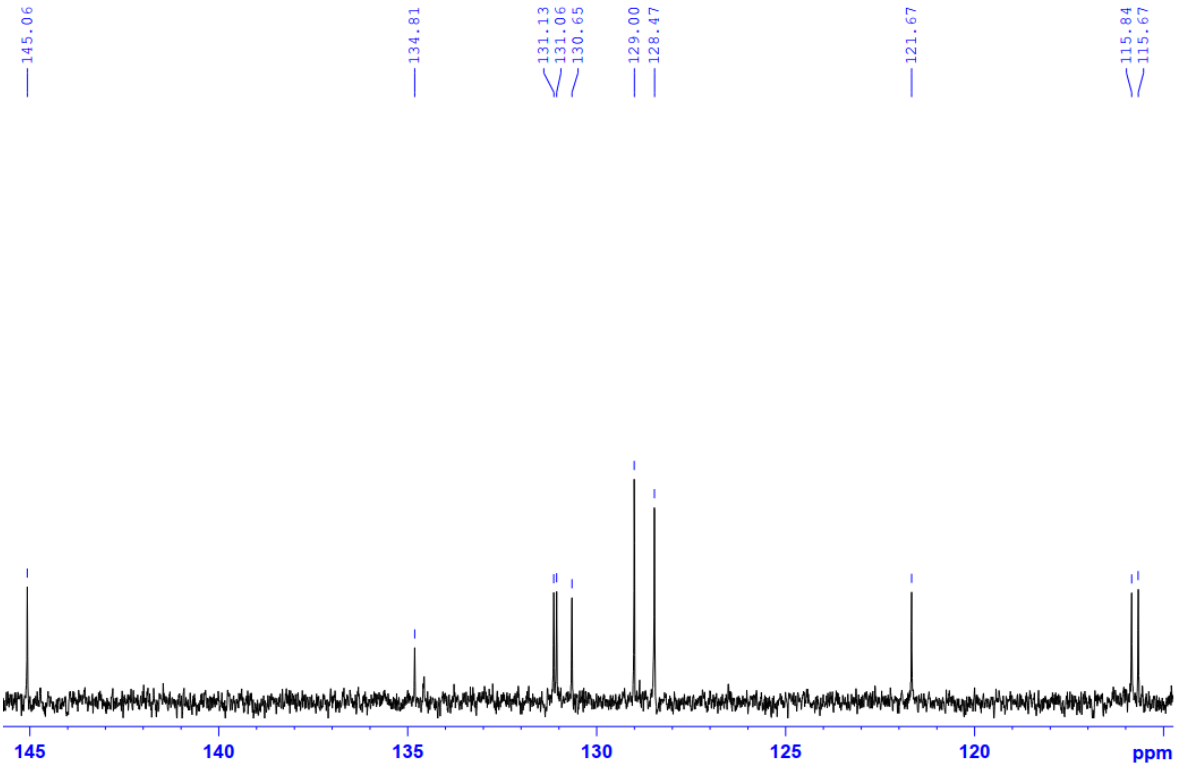


Figure S1e. ^{13}C-NMR spectrum of **1a**.

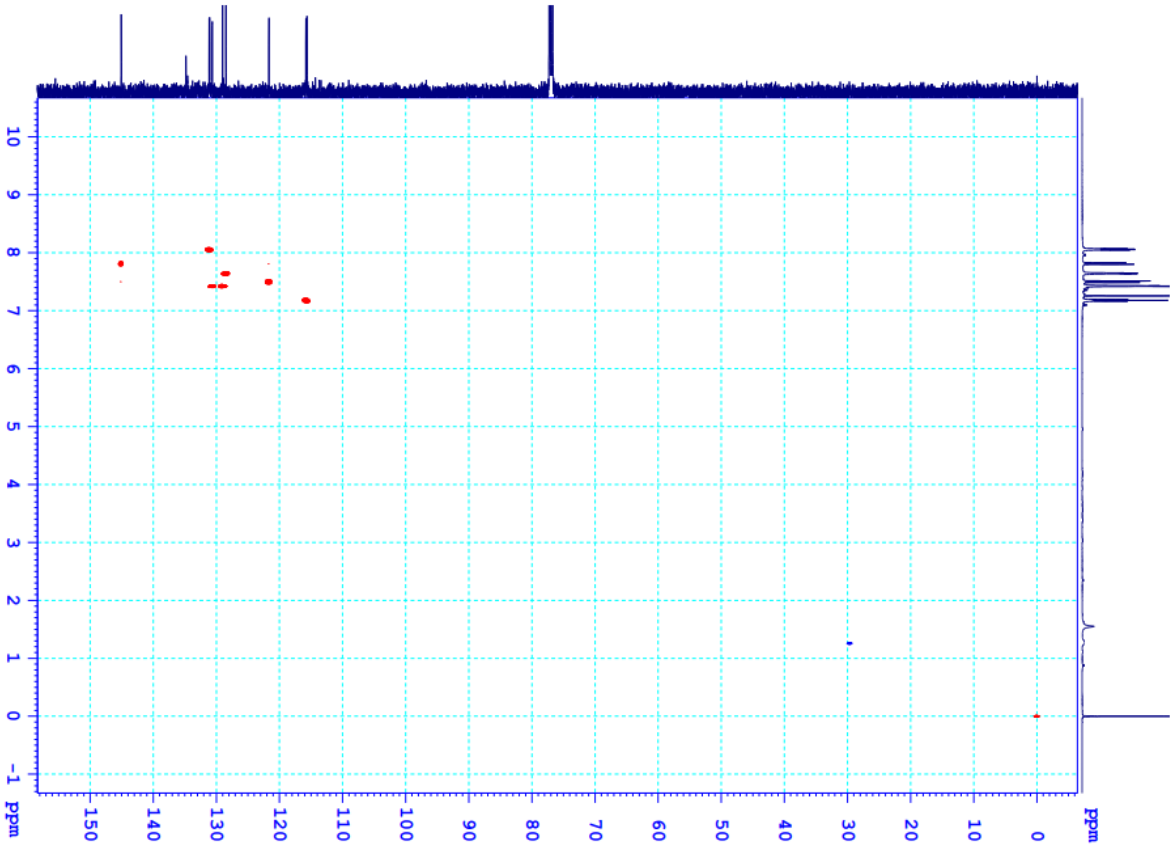


Figure S1f. HSQC spectrum of **1a**.

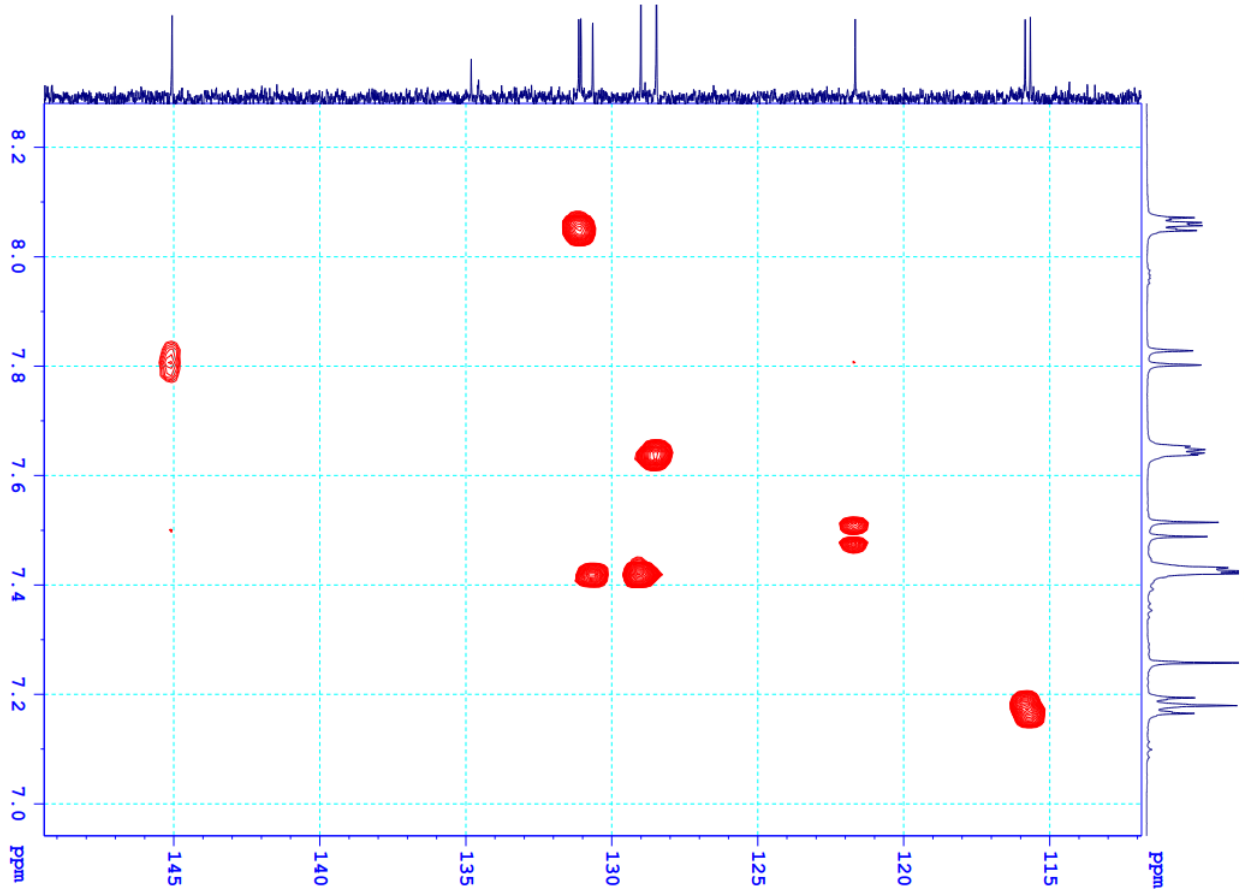


Figure S1g. HSQC spectrum of **1a**.

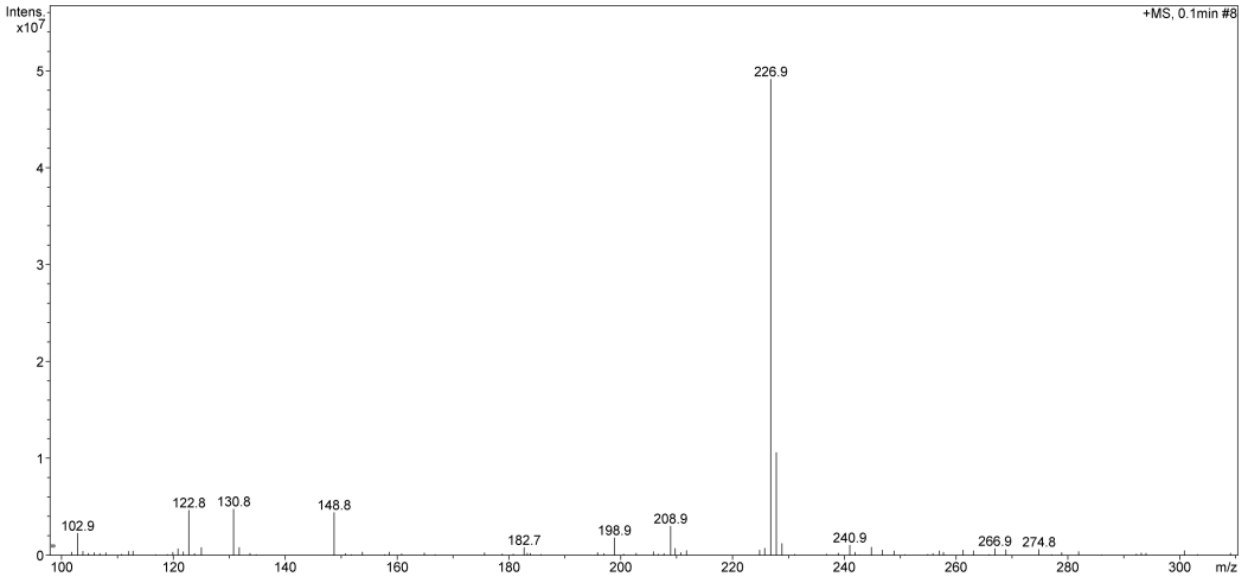


Figure S1h. MS of **1a**.

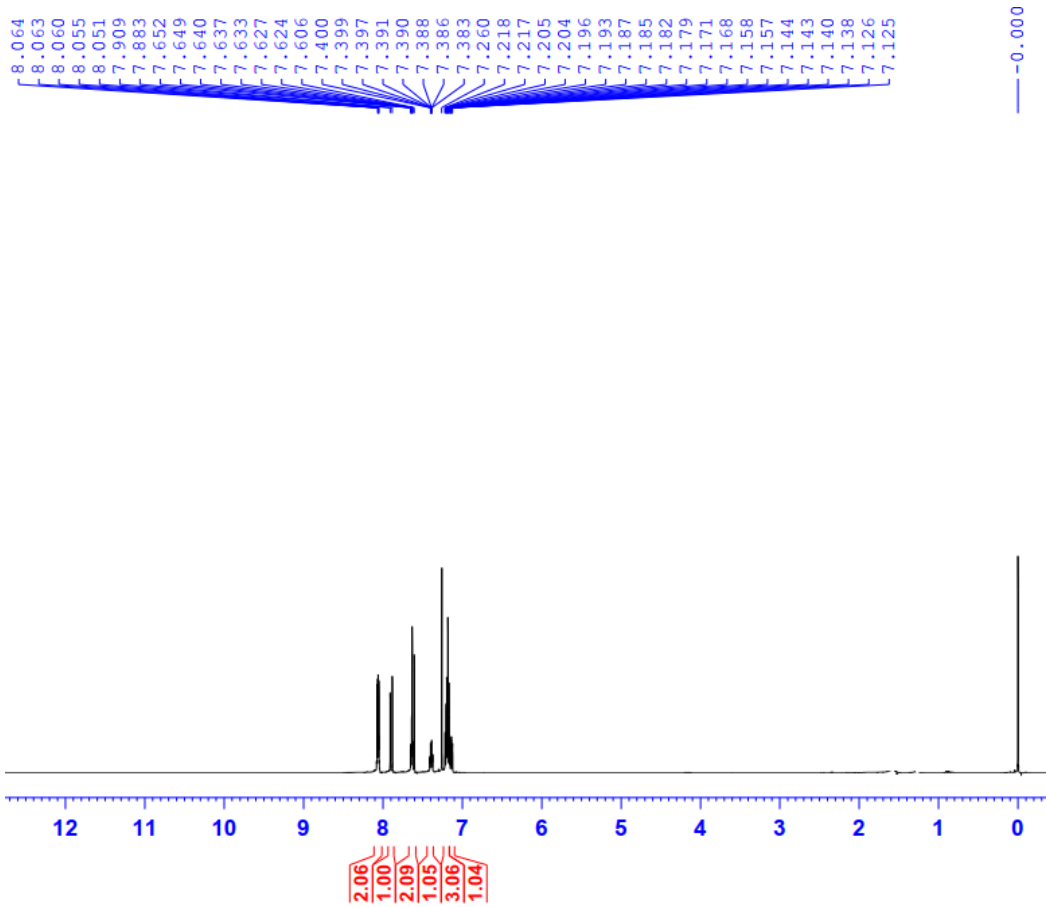


Figure S2a. ^{1}H-NMR spectrum of **1b**.

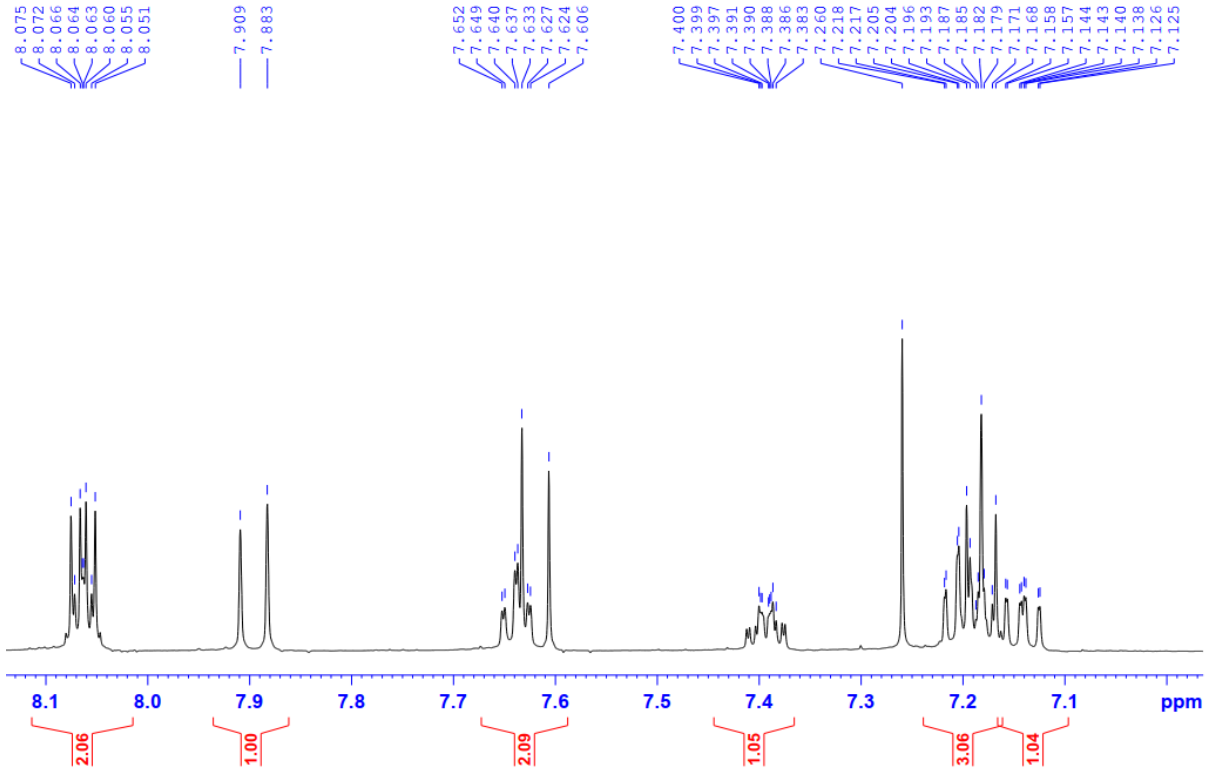


Figure S2b. ^{1}H-NMR spectrum of **1b**.

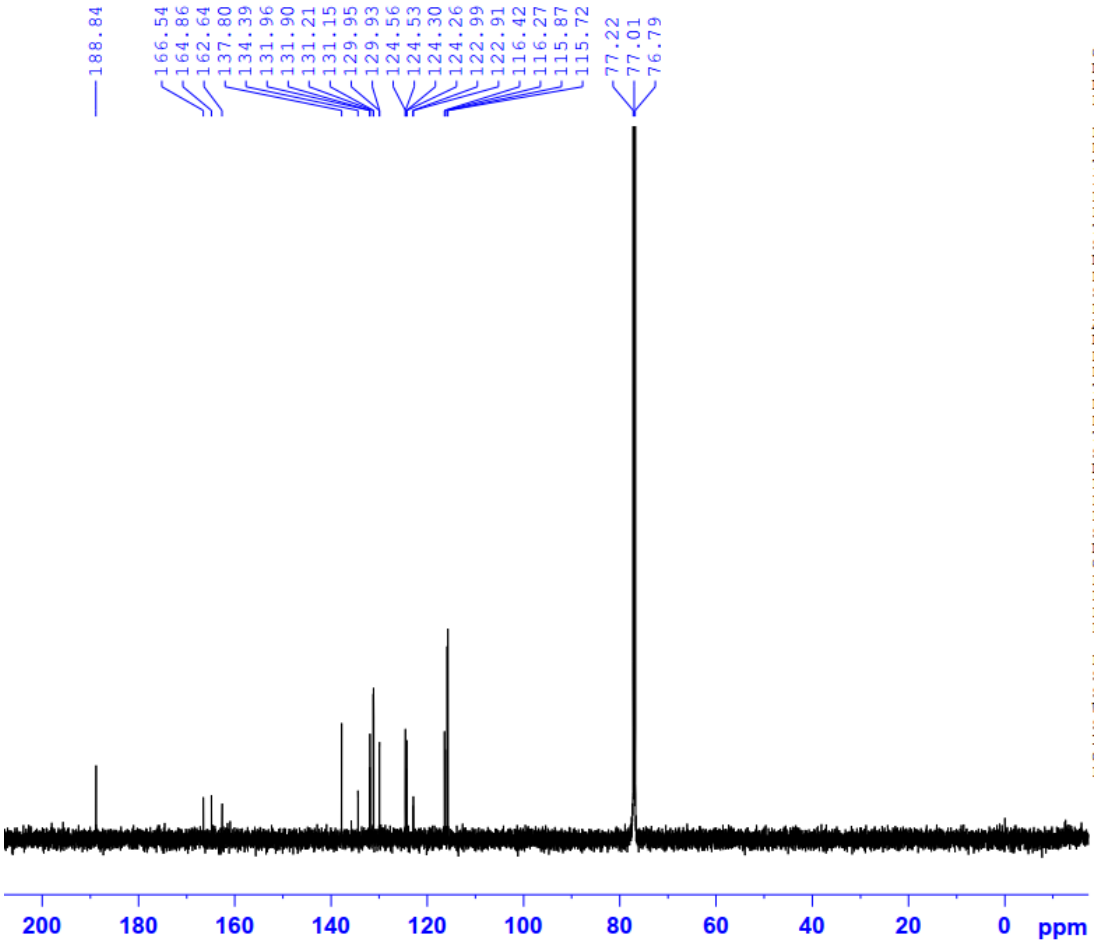


Figure S2c. ^{13}C-NMR spectrum of **1b**.

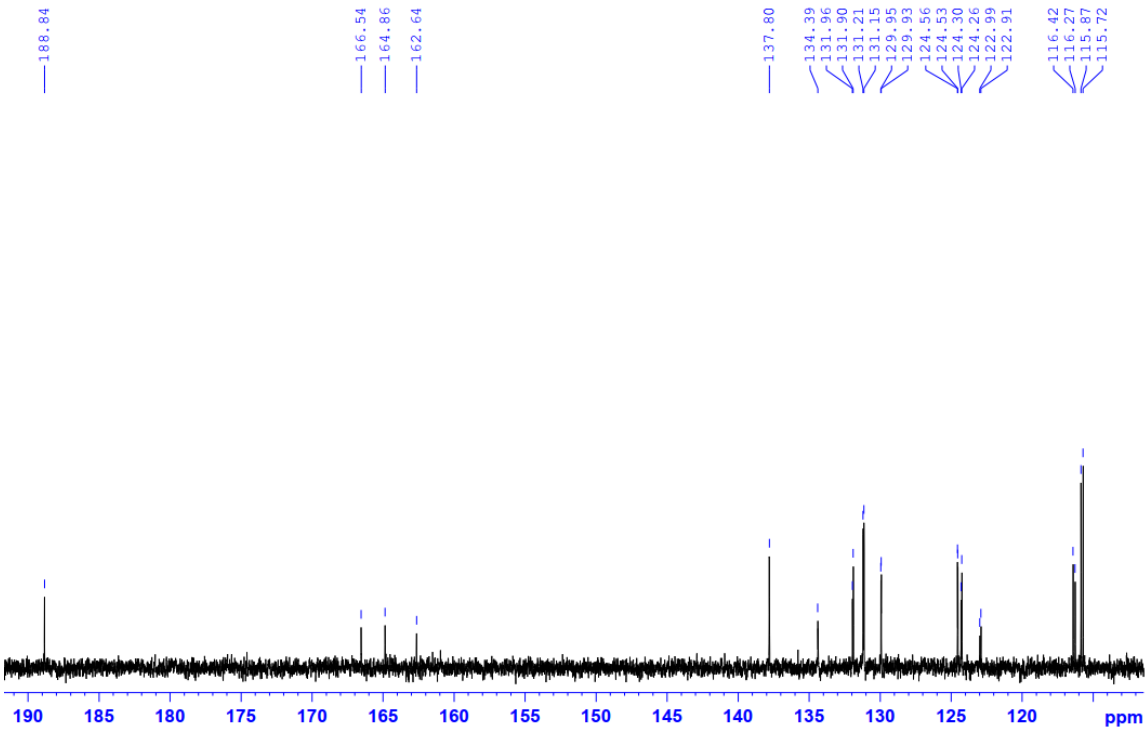


Figure S2d. ^{13}C-NMR spectrum of **1b**.

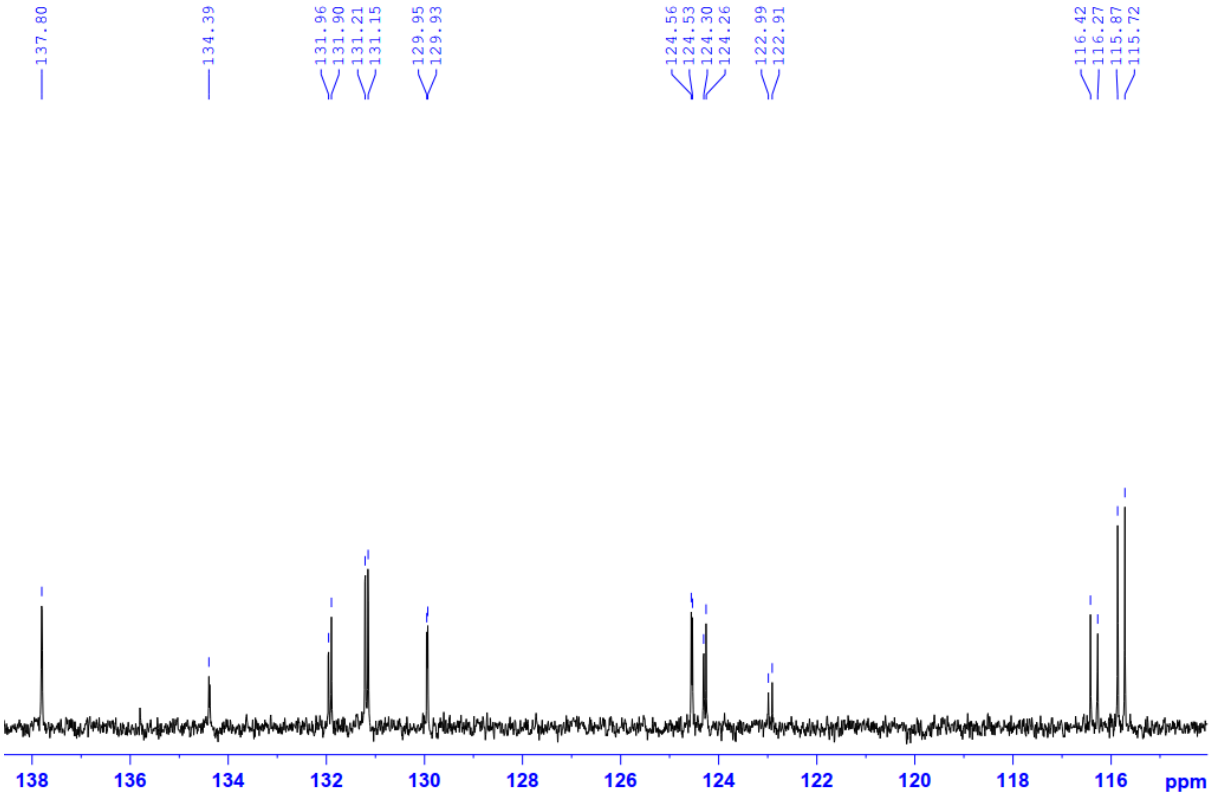


Figure S2e. ^{13}C-NMR spectrum of **1b**.

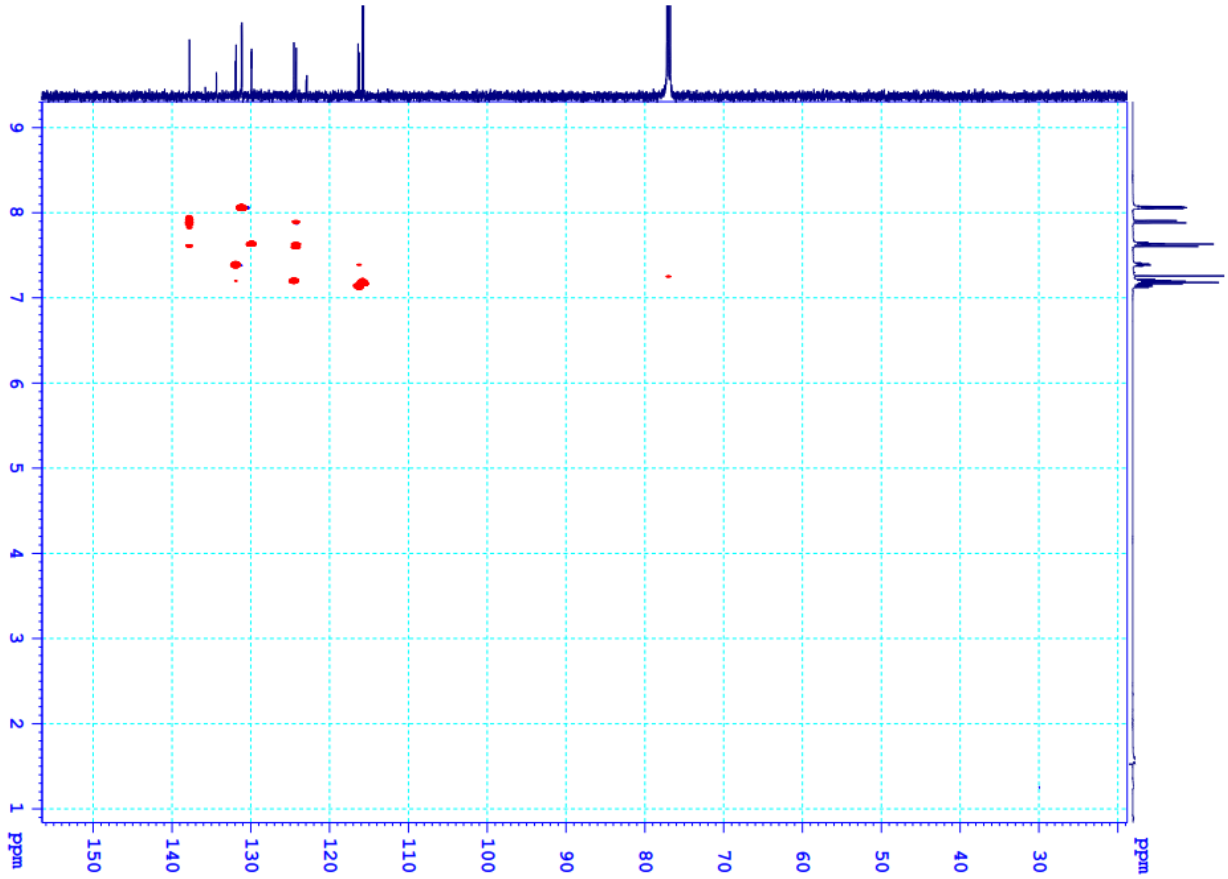


Figure S2f. HSQC spectrum of **1b**.

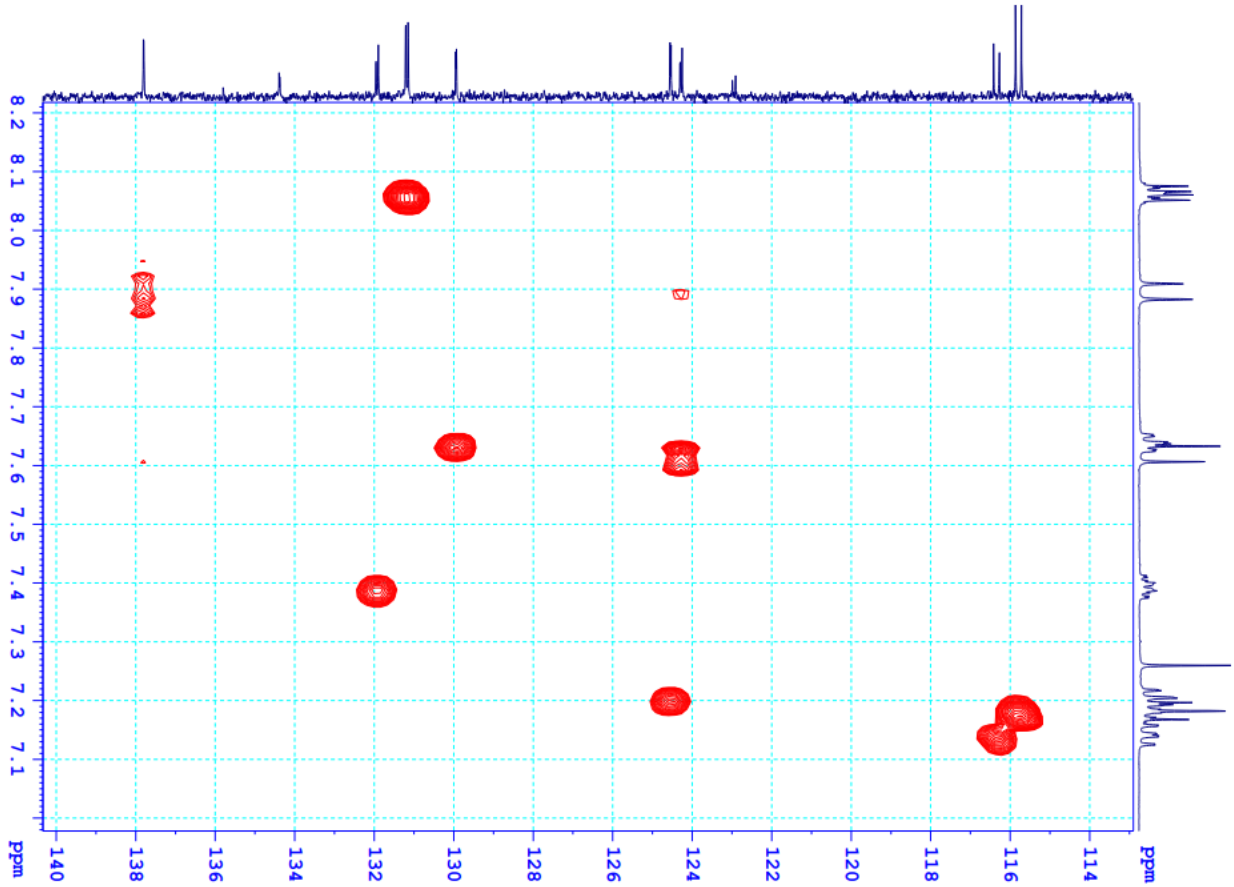


Figure S2g. HSQC spectrum of **1b**.

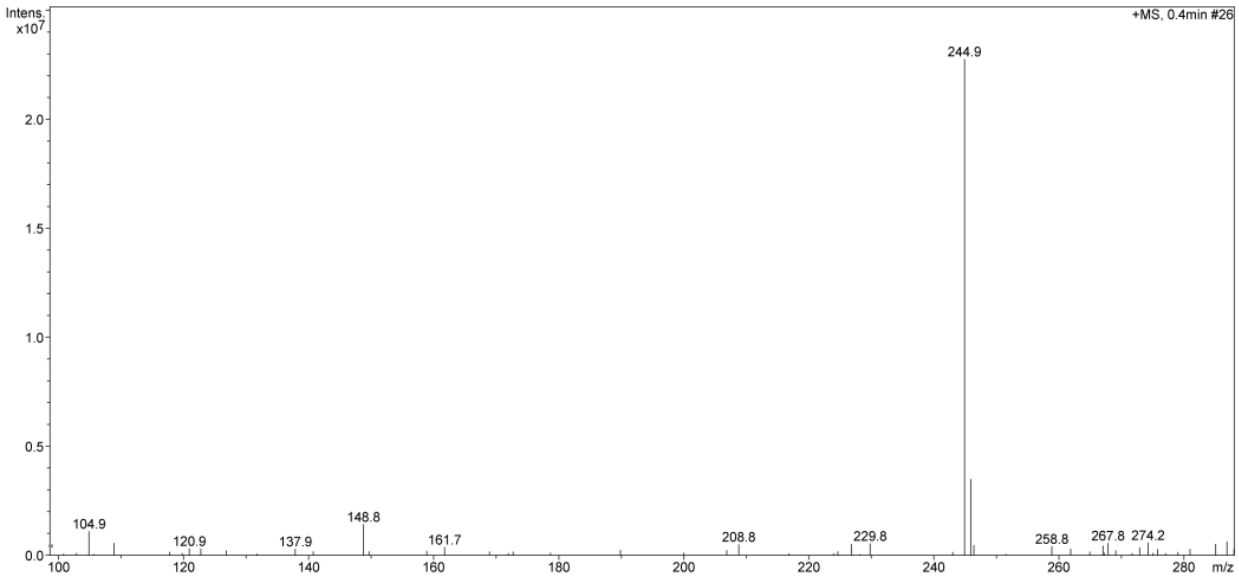


Figure S2h. MS of **1b**.

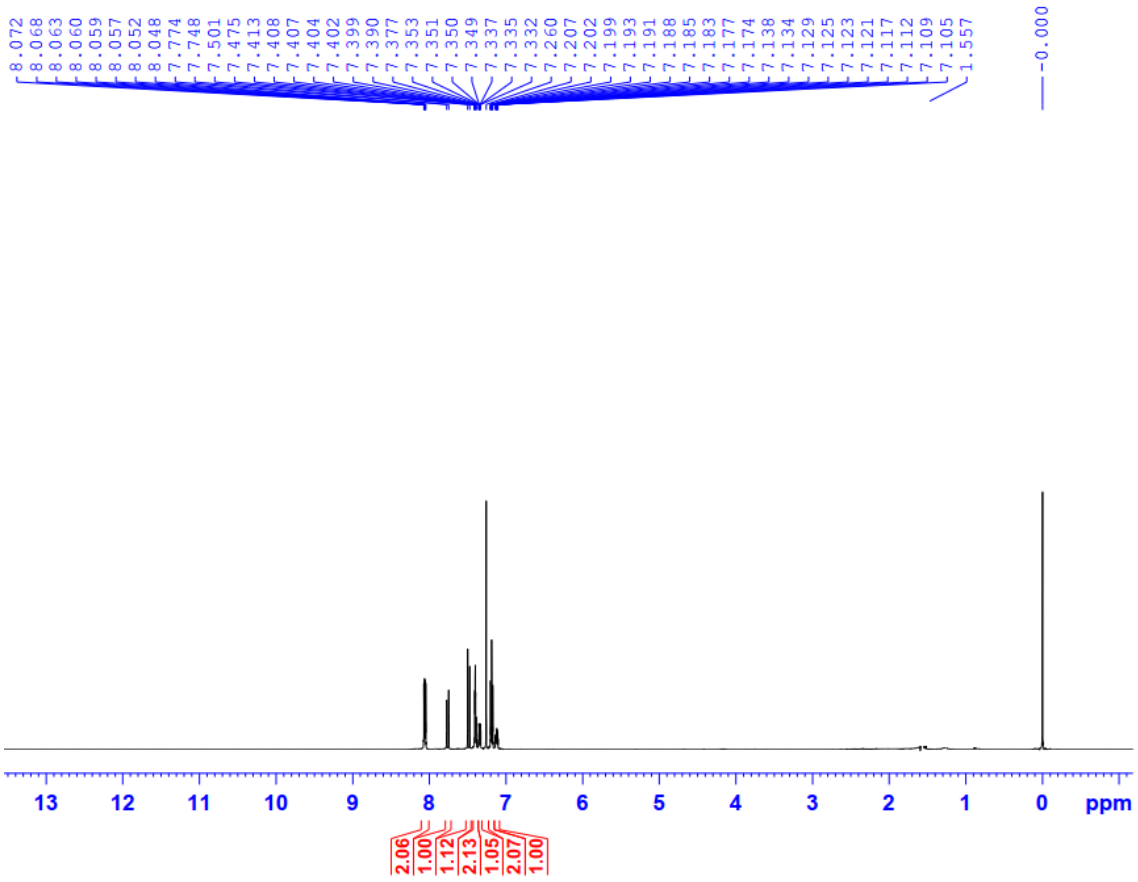


Figure S3a. ^{1}H-NMR spectrum of **1c**.

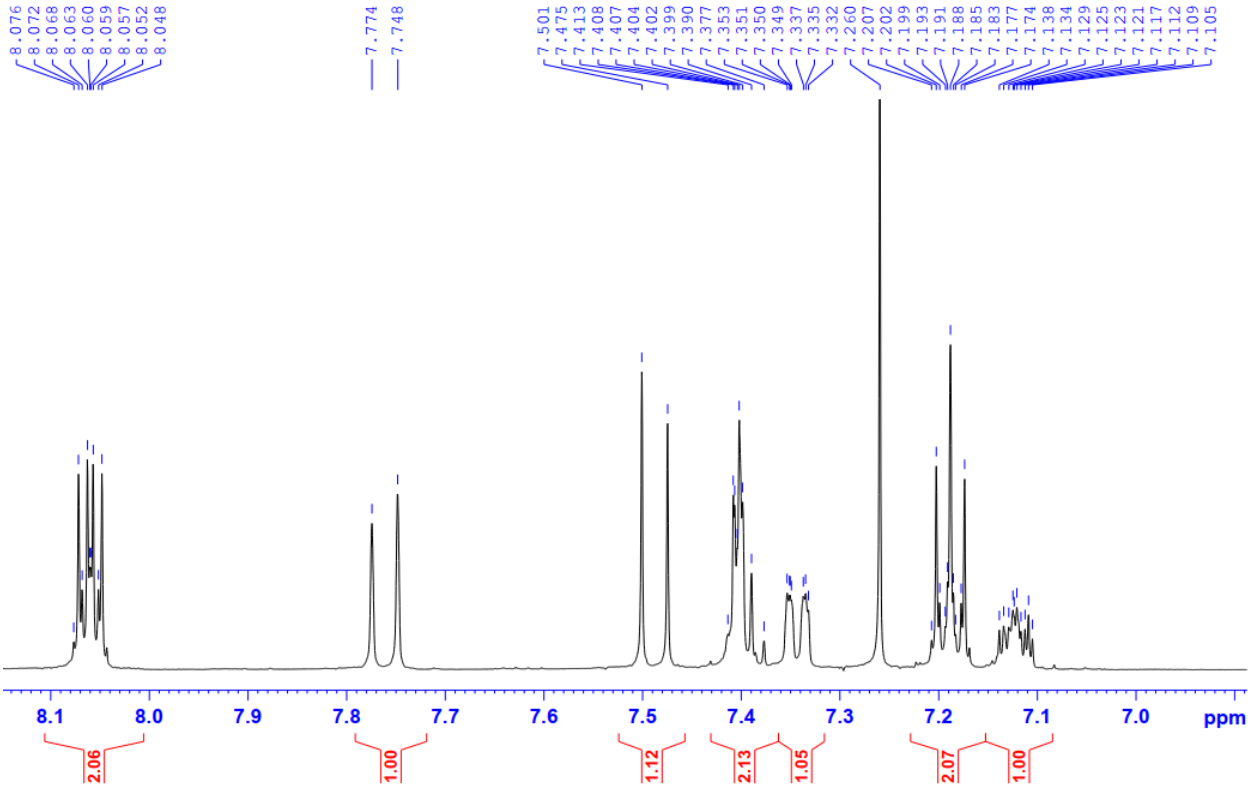


Figure S3b. ^{1}H-NMR spectrum of **1c**.

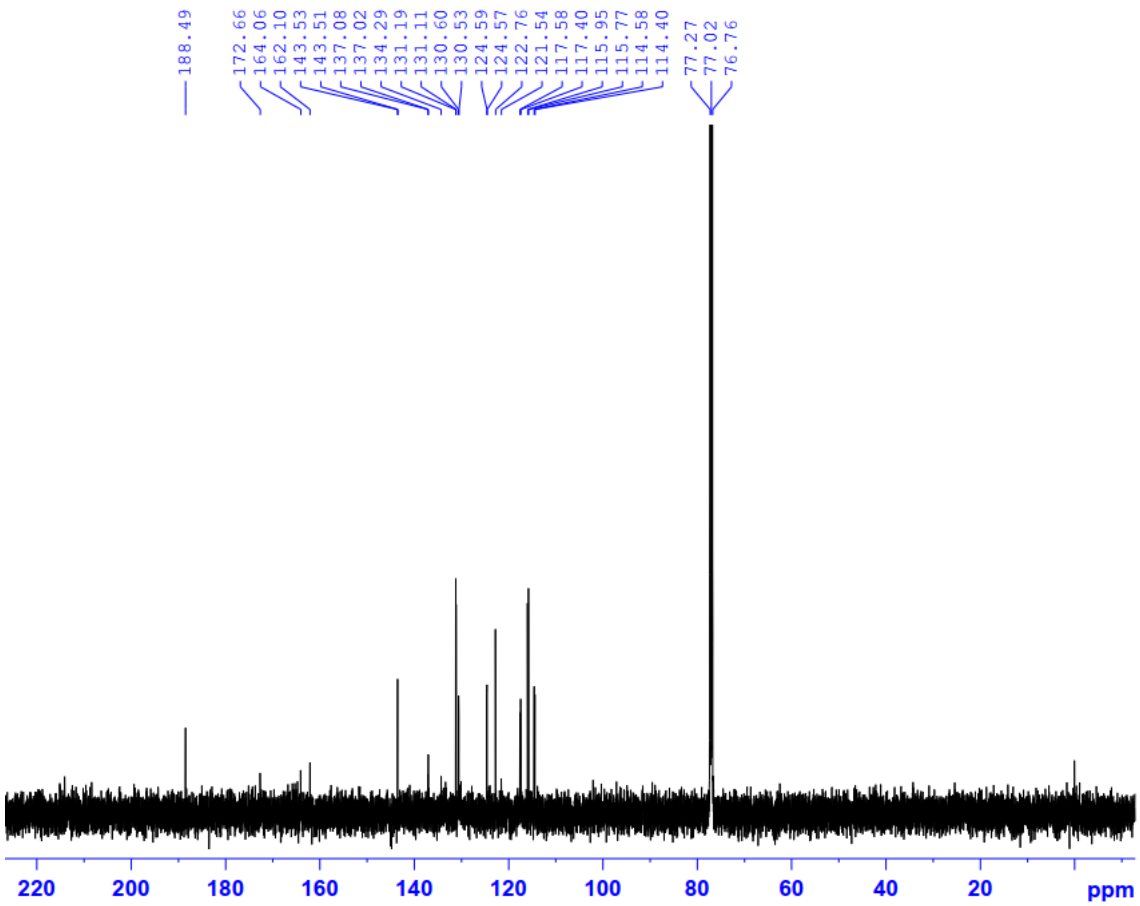


Figure S3c. ^{13}C-NMR spectrum of **1c**.

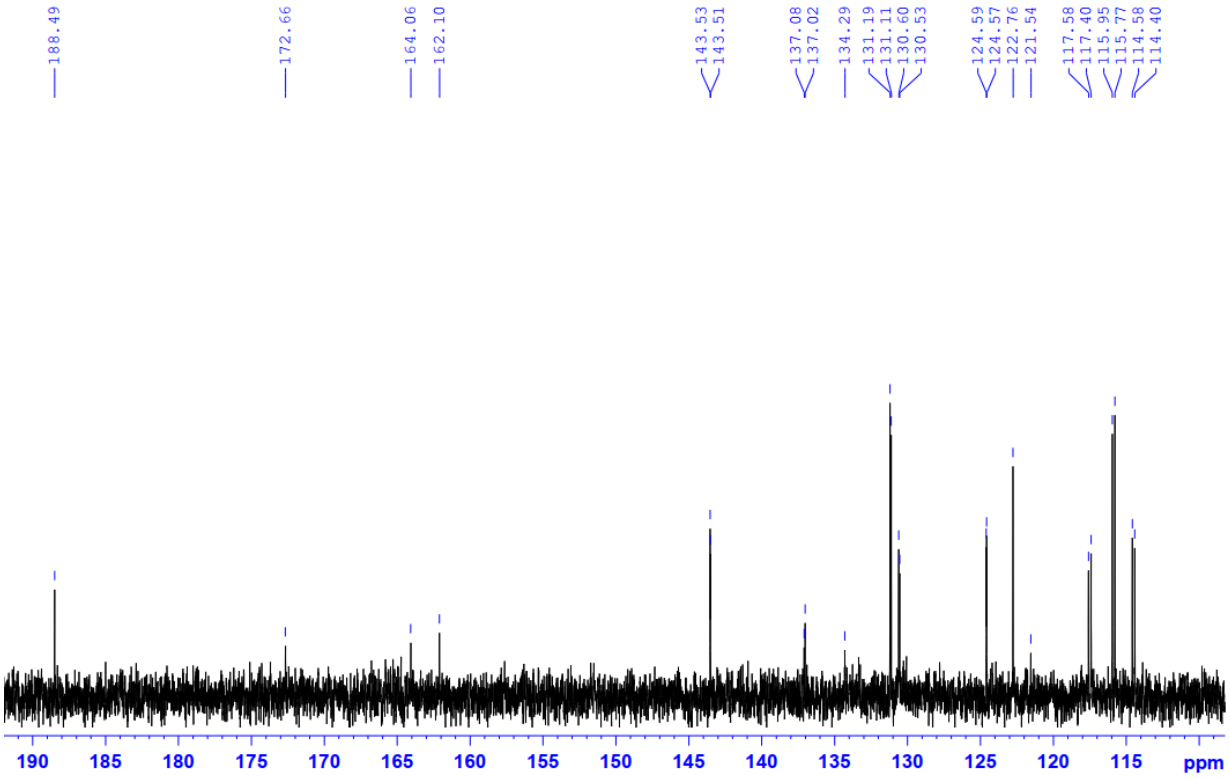


Figure S3d. ^{13}C-NMR spectrum of **1c**.

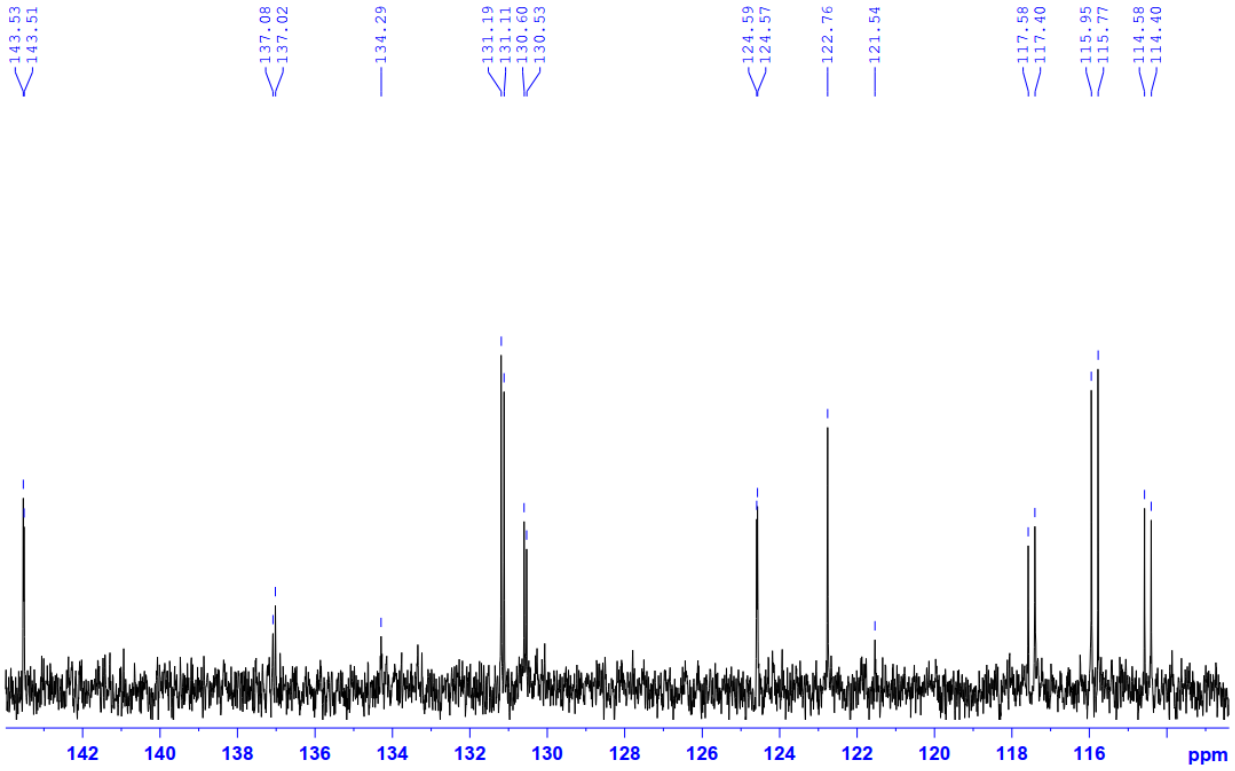


Figure S3e. ^{13}C-NMR spectrum of **1c**.

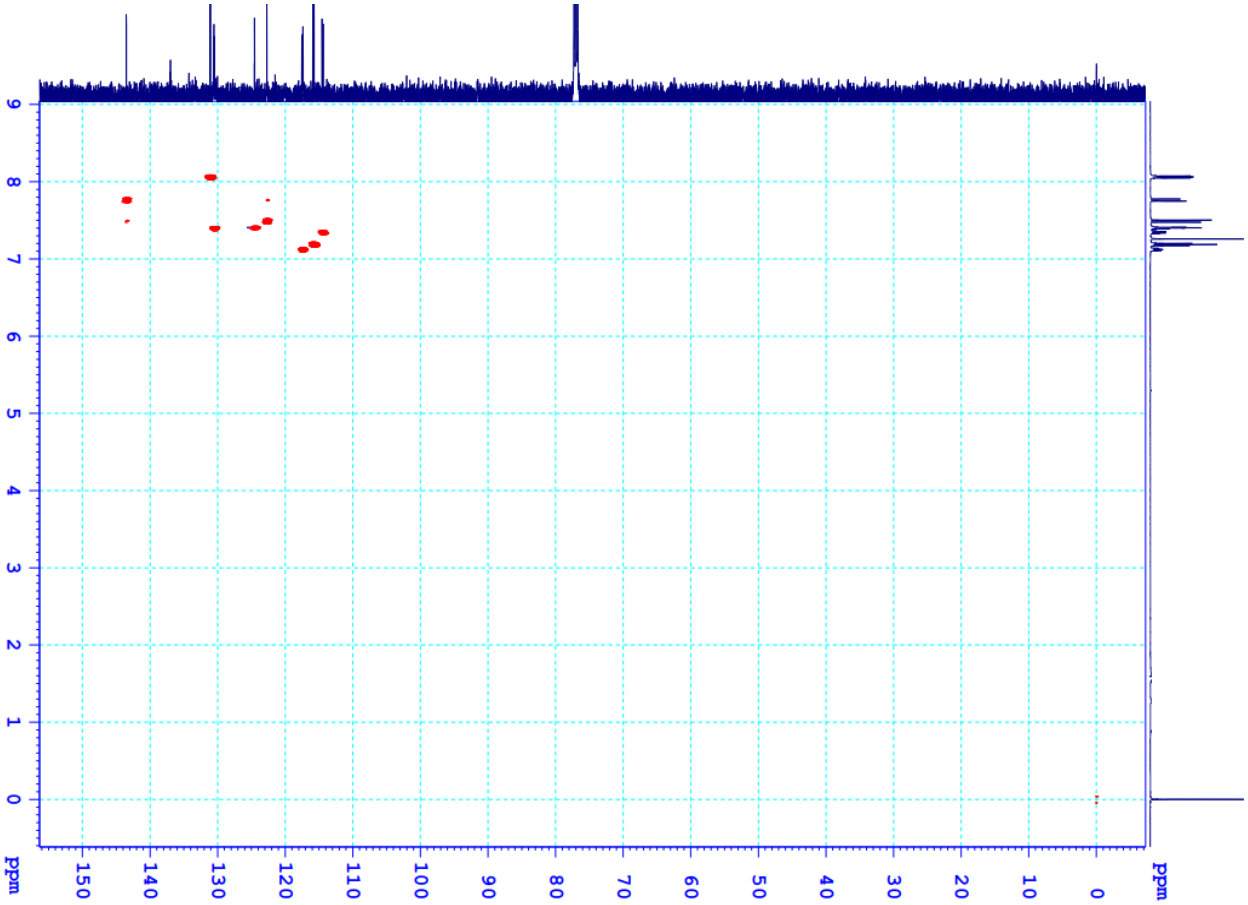


Figure S3f. HSQC spectrum of **1c**.

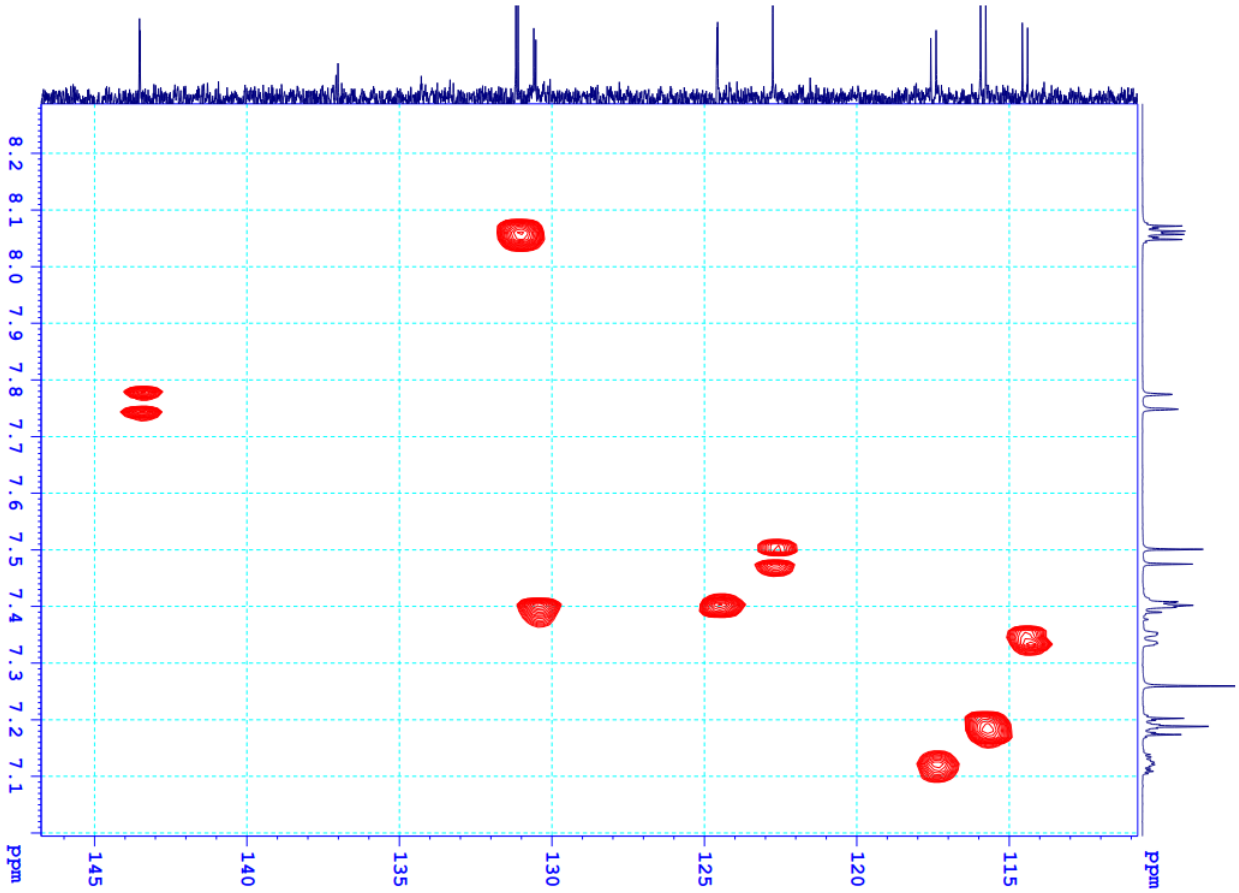


Figure S3g. HSQC spectrum of **1c**.

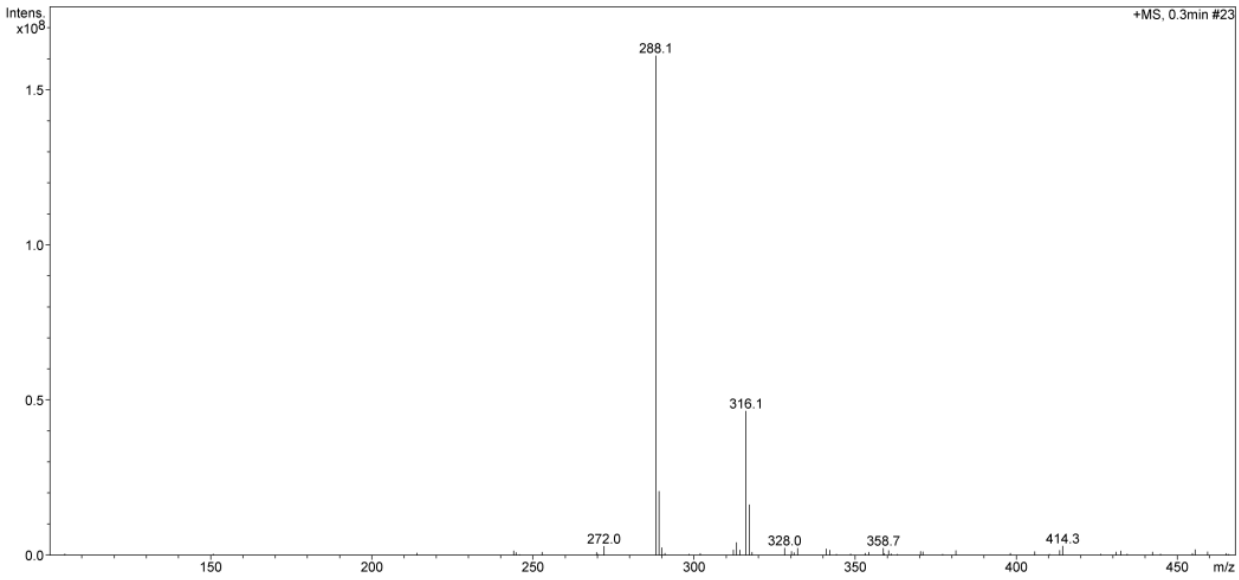


Figure S3h. MS of **1c**.

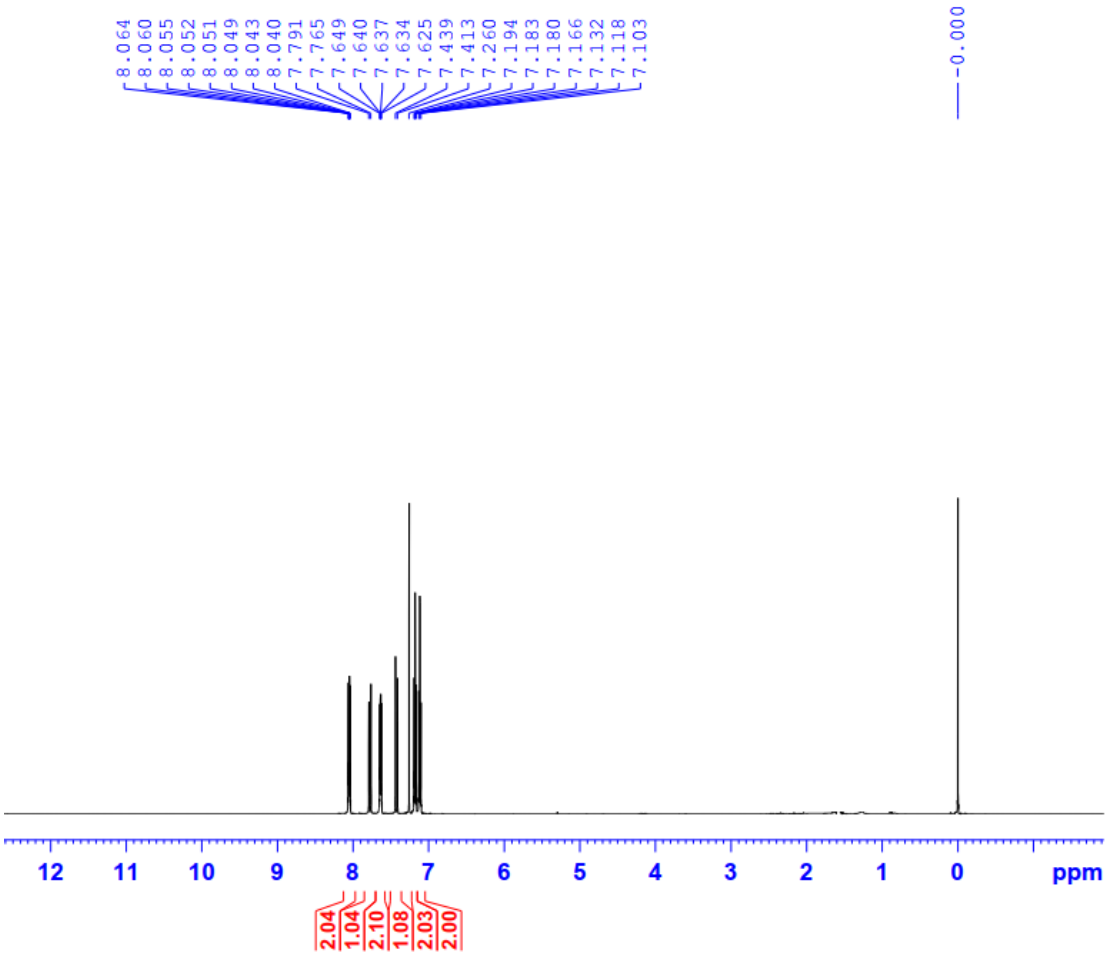


Figure S4a. ^{1}H-NMR spectrum of **1d**.

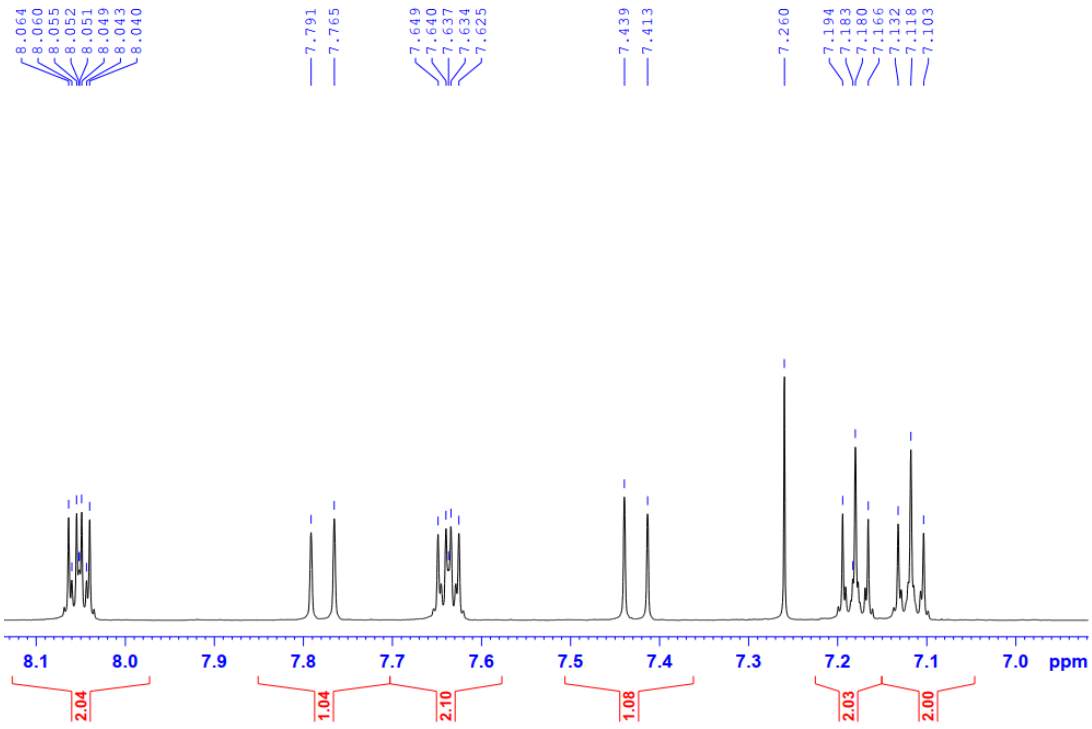


Figure S4b. ^{1}H-NMR spectrum of **1d**.

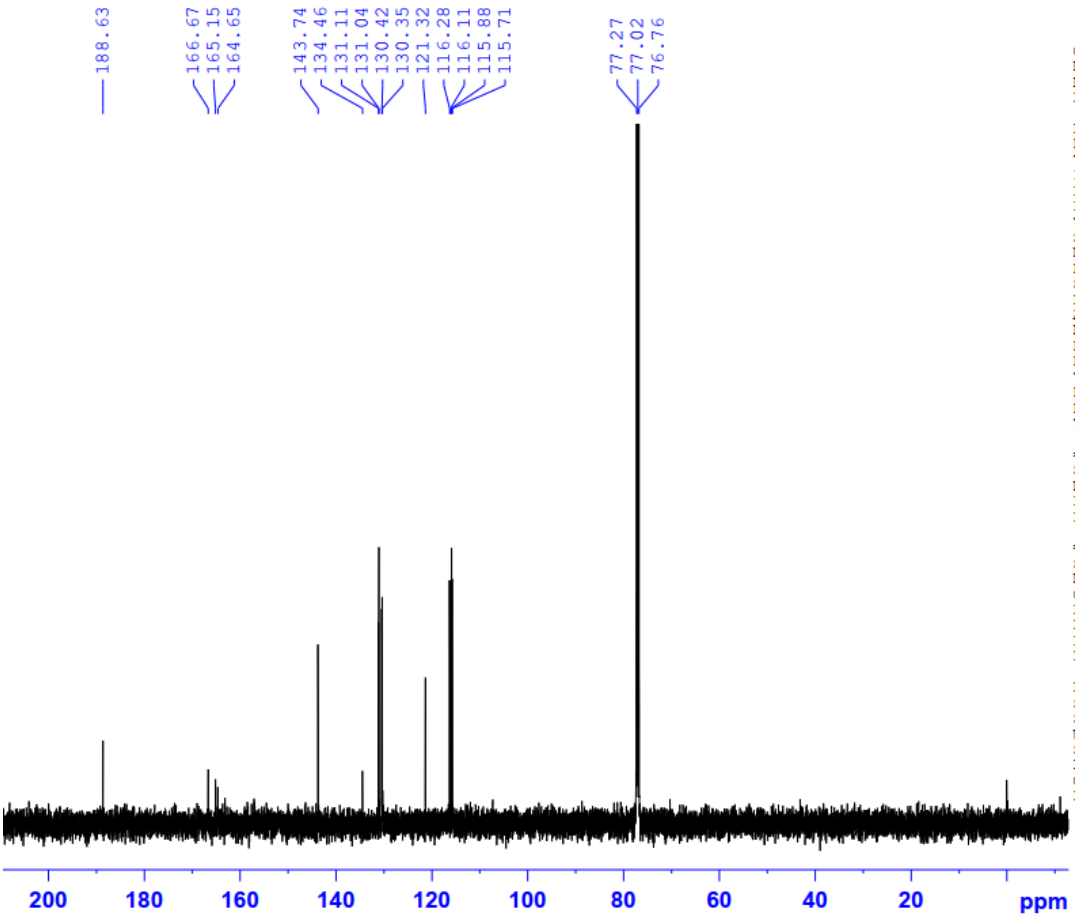


Figure S4c. ^{13}C-NMR spectrum of **1d**.

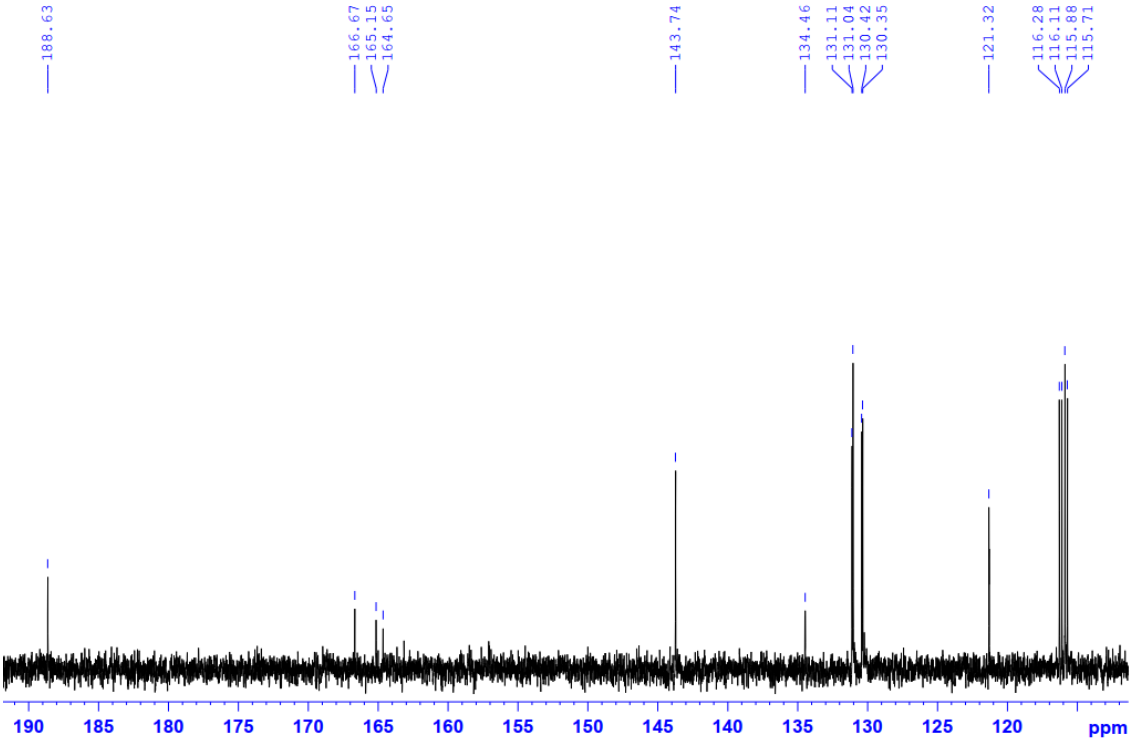


Figure S4d. ^{13}C-NMR spectrum of **1d**.

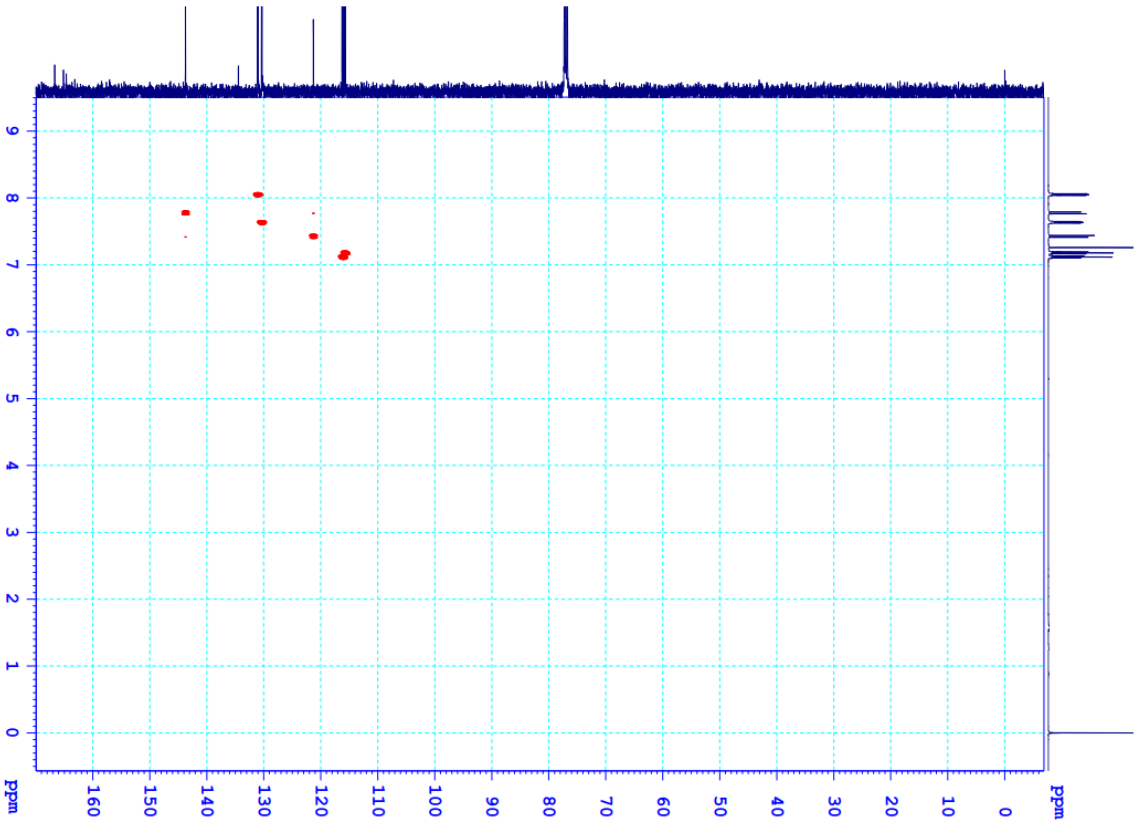


Figure S4e. HSQC spectrum of **1d**.

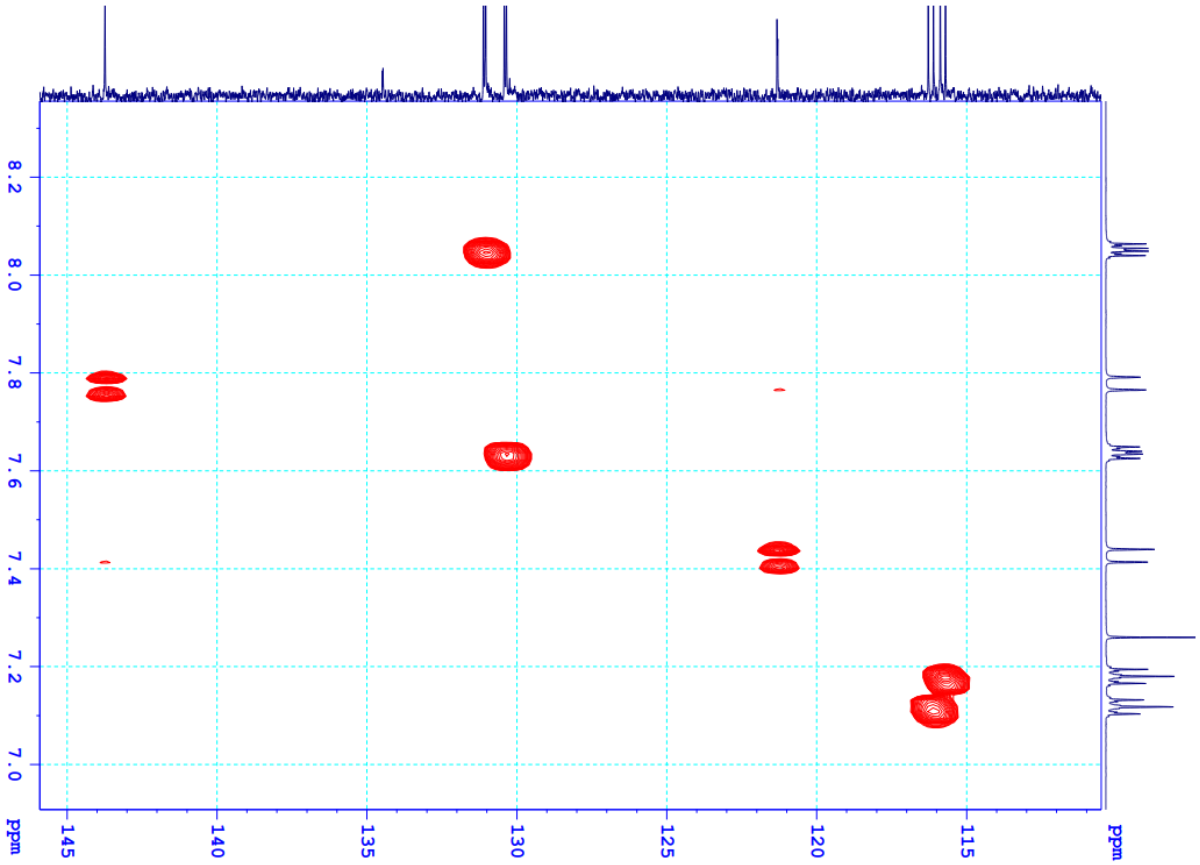


Figure S4f. HSQC spectrum of **1d**.

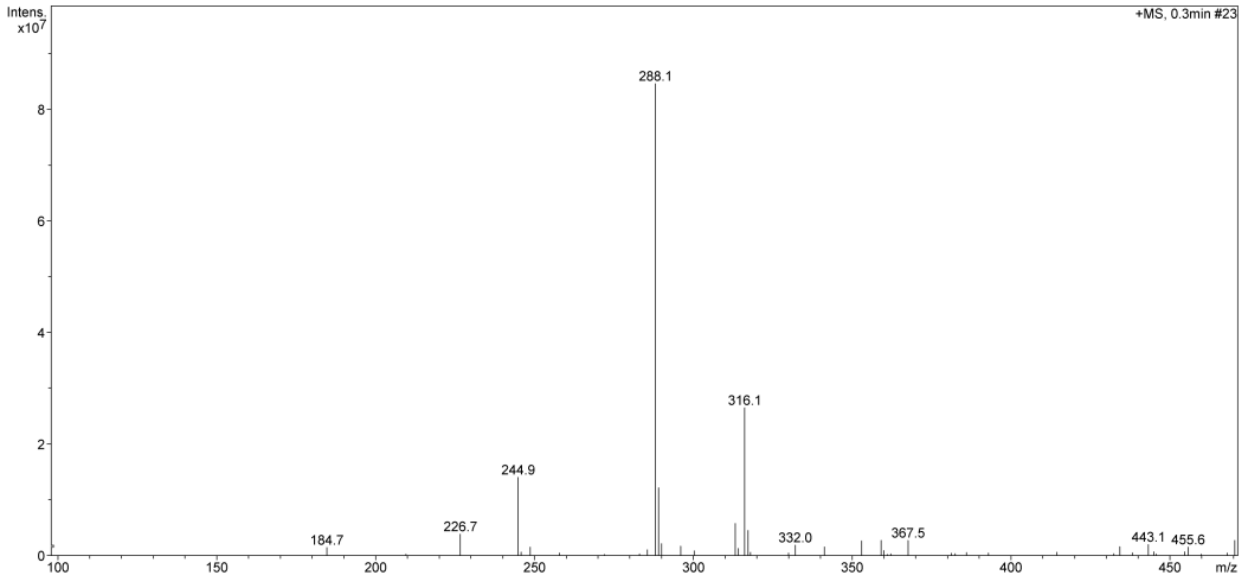


Figure S4g. MS of **1d**.

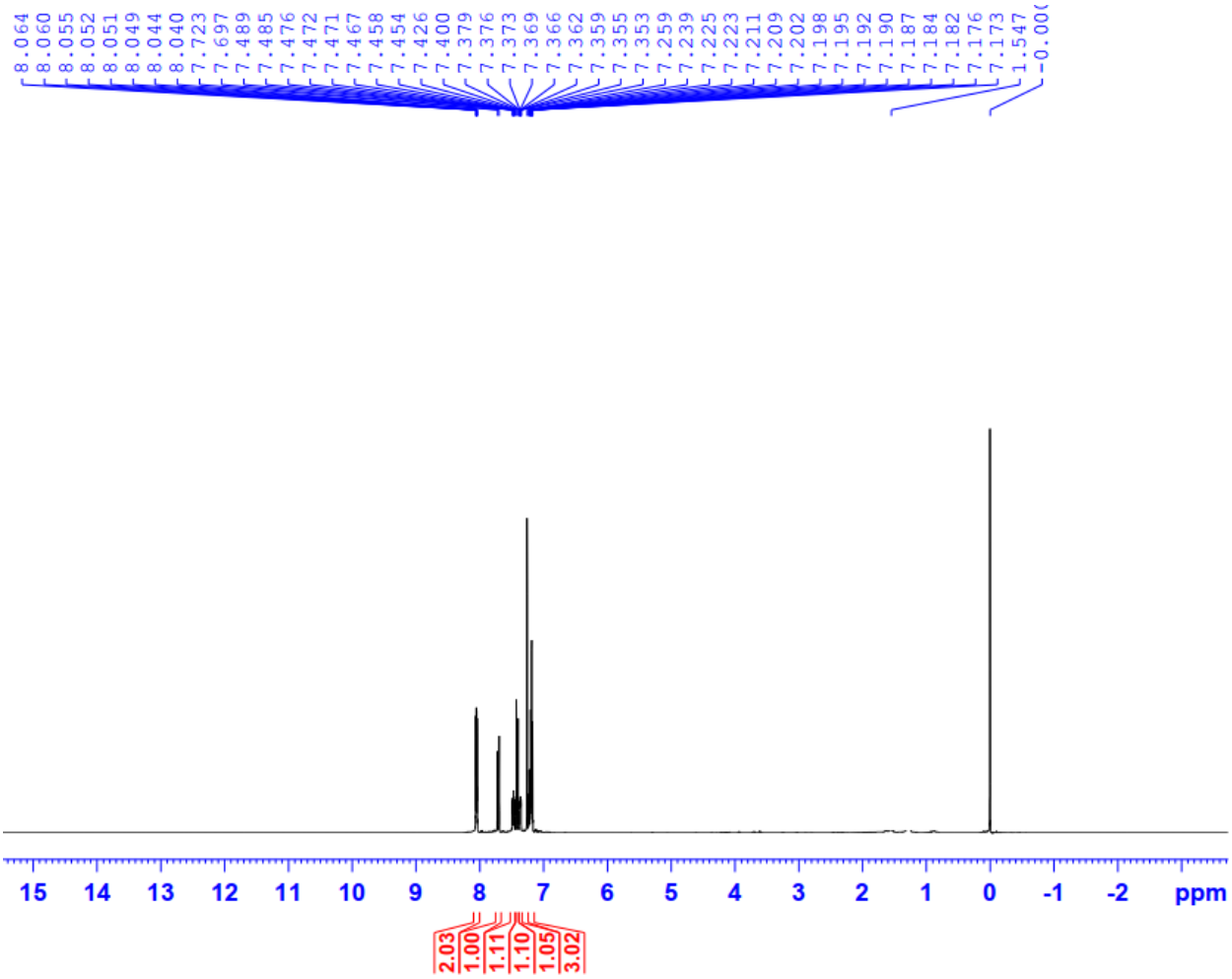


Figure S5a. ^{1}H-NMR spectrum of **1e**.

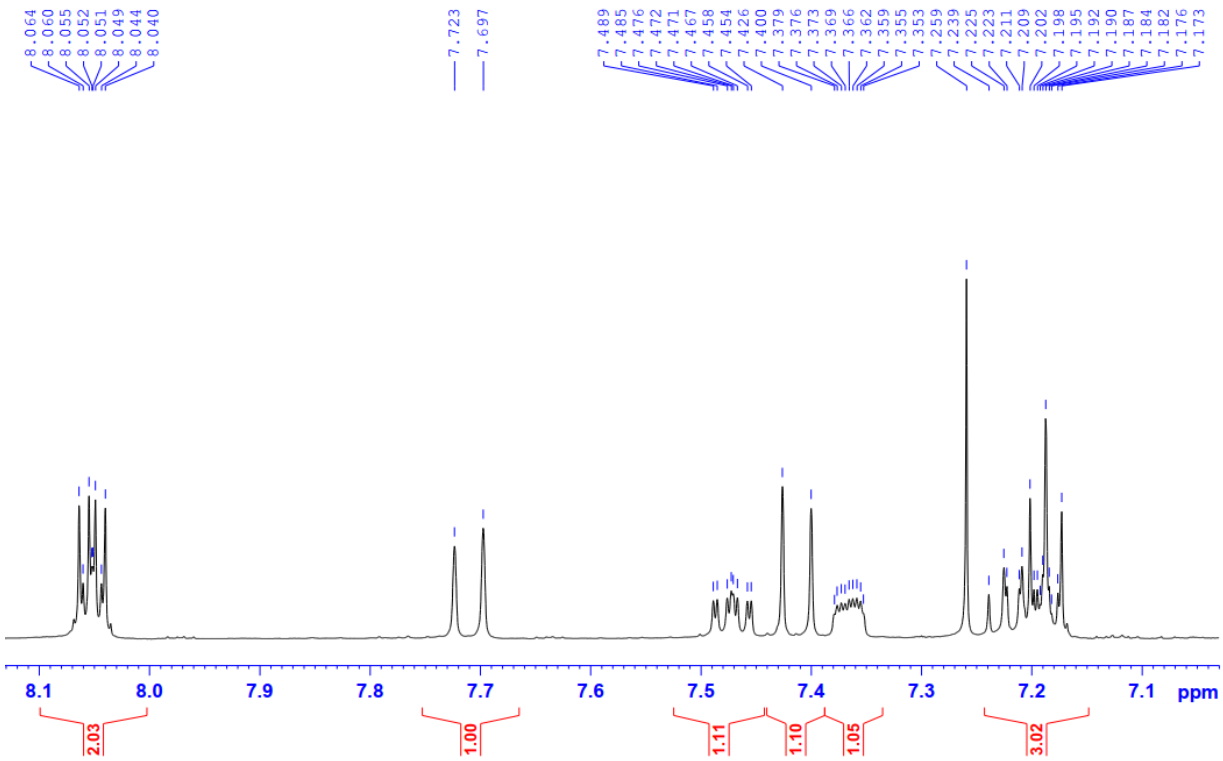


Figure S5b. ^{1}H-NMR spectrum of **1e**.

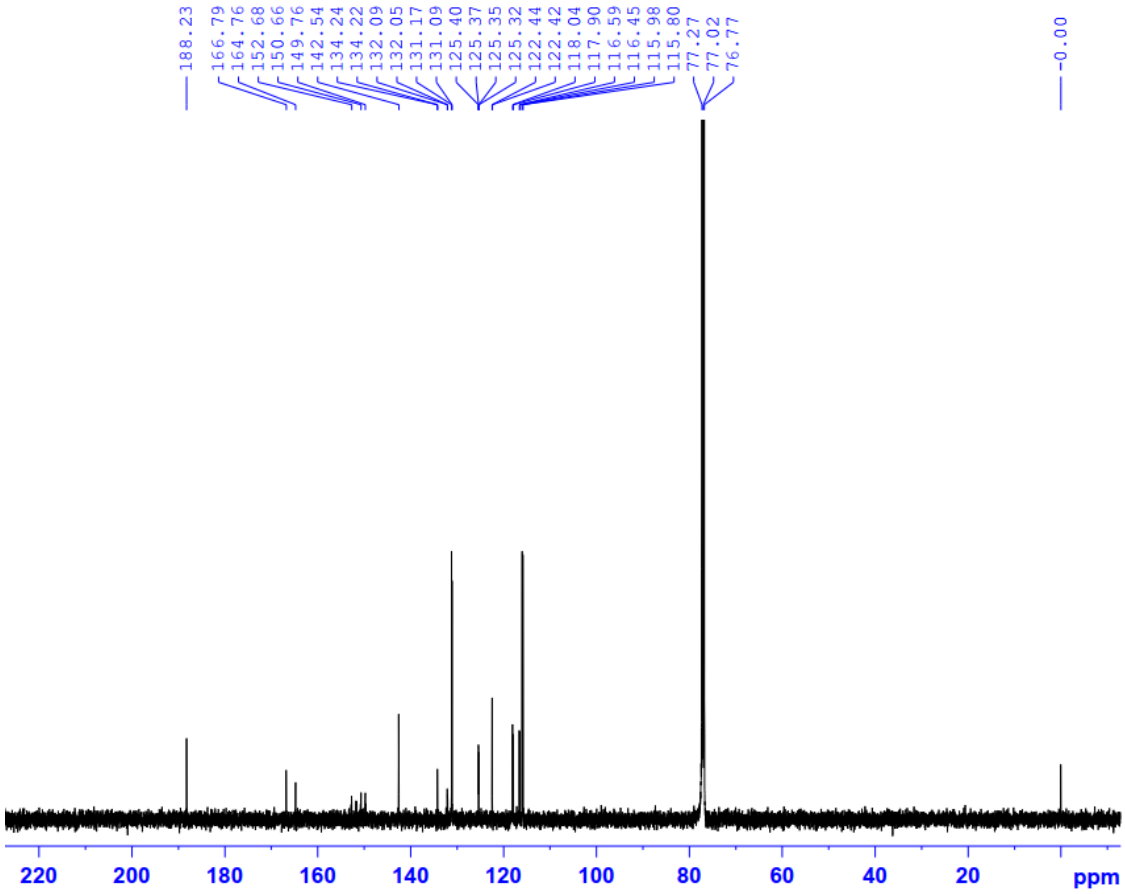


Figure S5c. ^{13}C-NMR spectrum of **1e**.

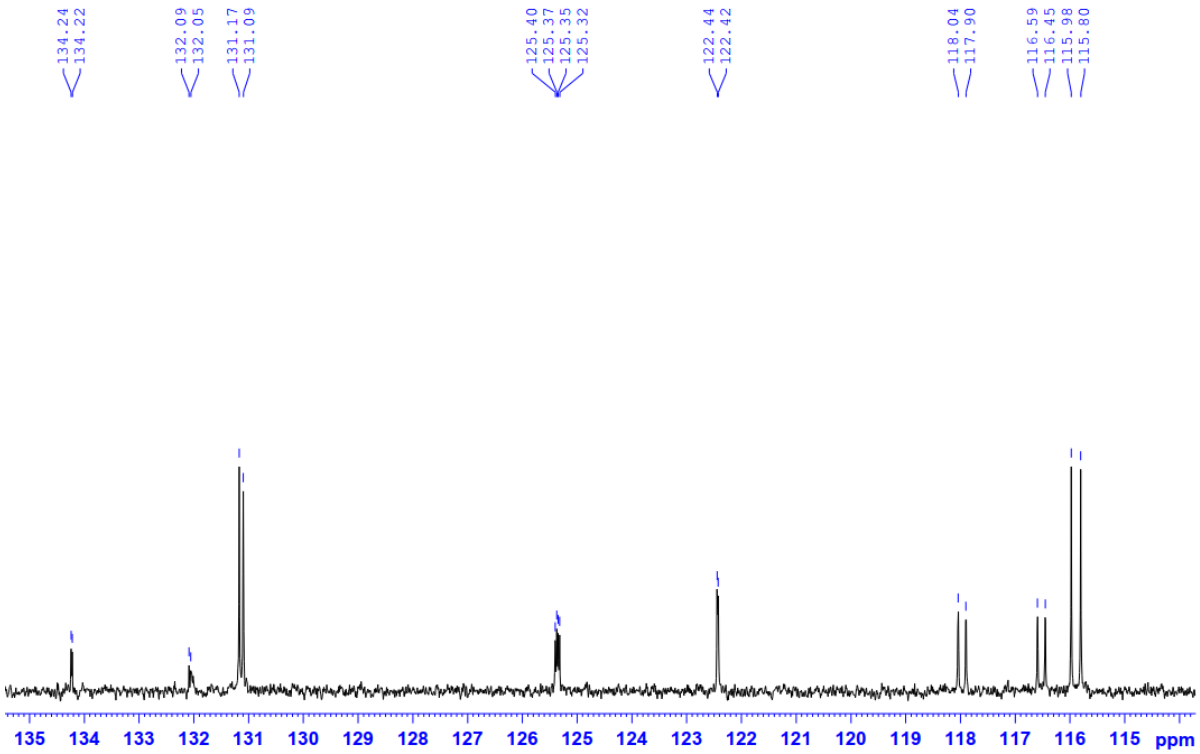


Figure S5d. ^{13}C-NMR spectrum of **1e**.

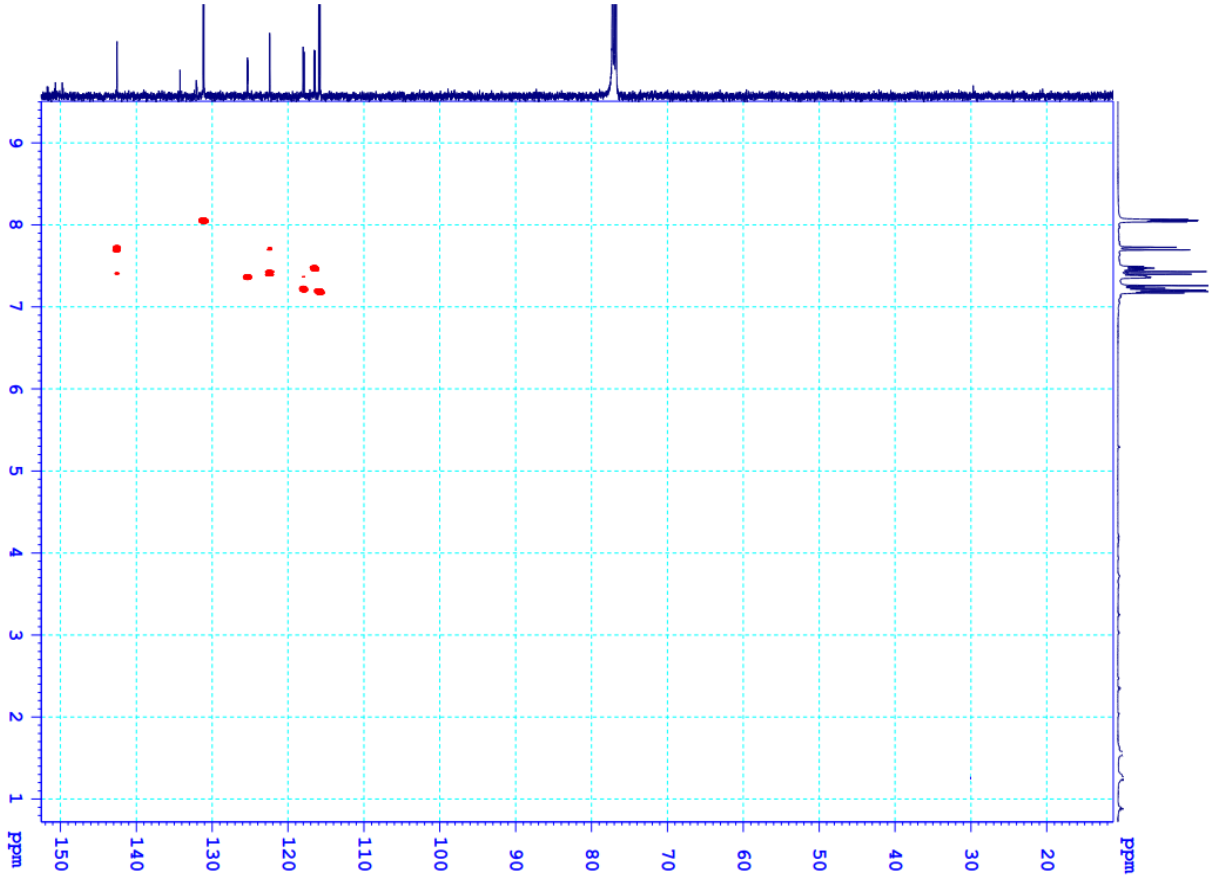


Figure S5e. HSQC spectrum of **1e**.

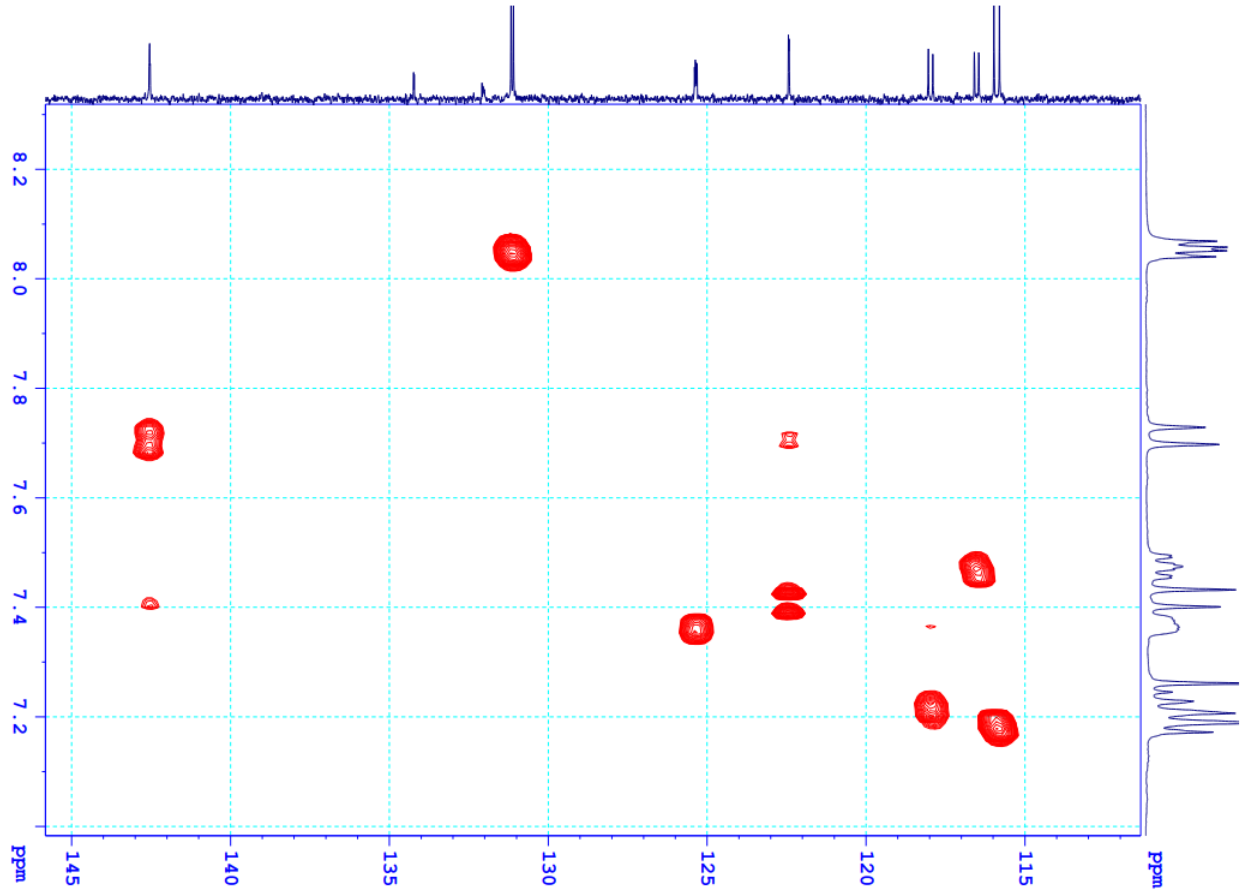


Figure S5f. HSQC spectrum of **1e**.

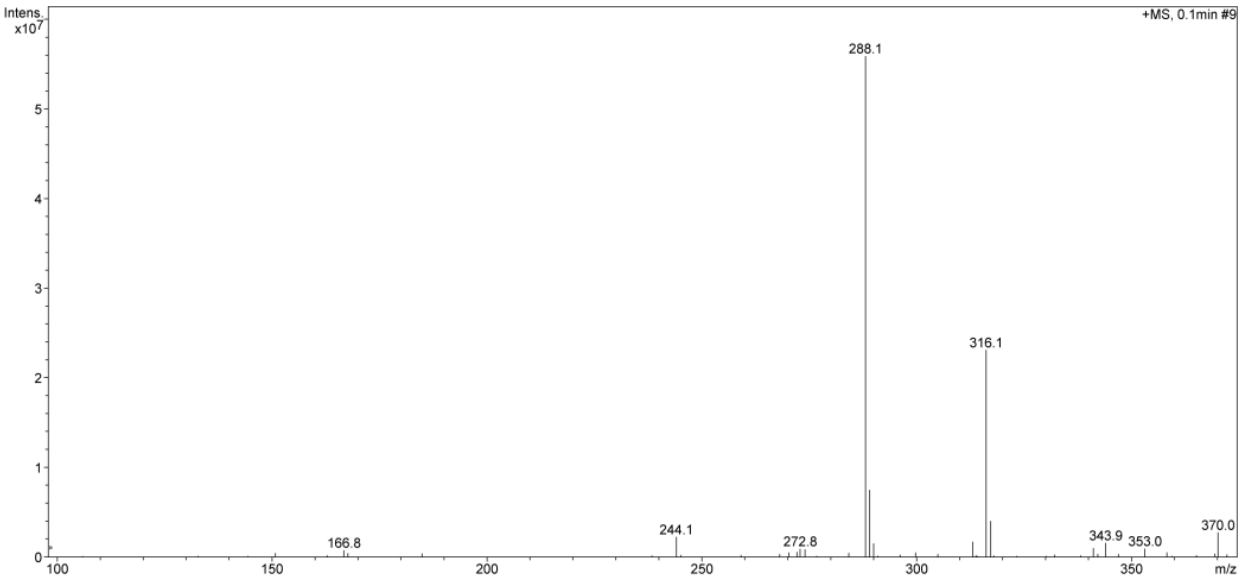


Figure S5g. MS of **1e**.

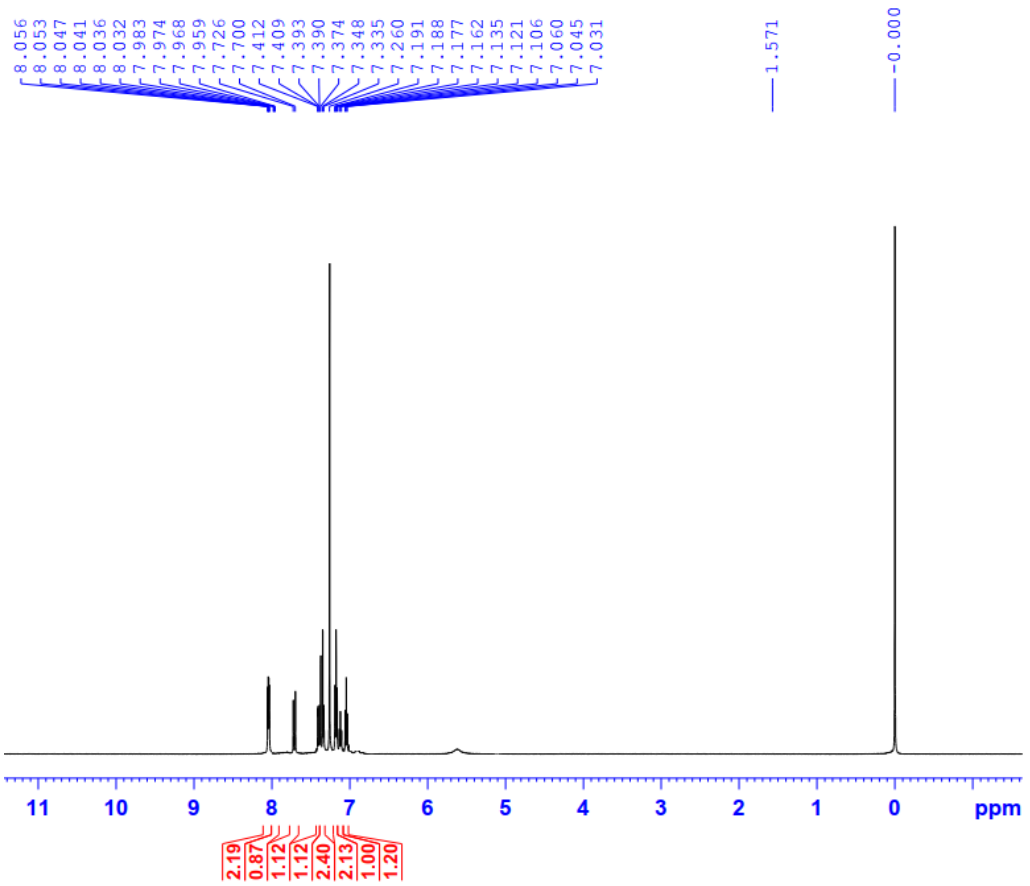


Figure S6a. ^{1}H-NMR spectrum of **1f**.

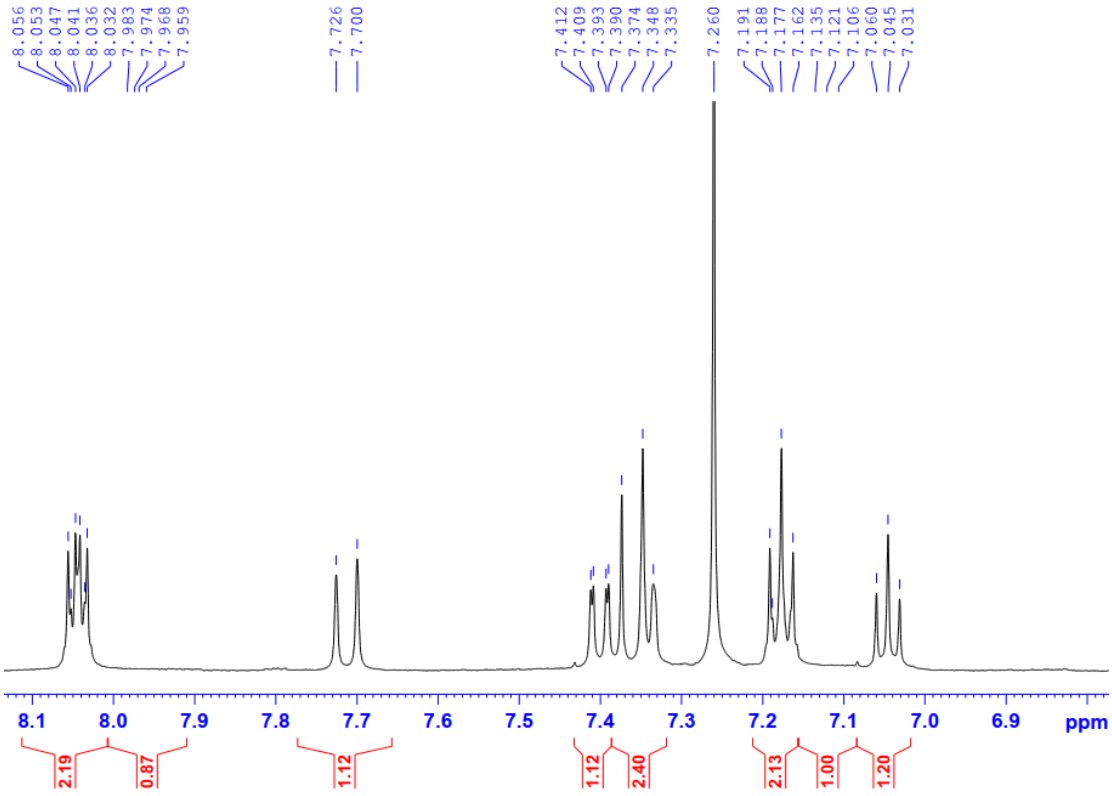


Figure S6b. ^{1}H-NMR spectrum of **1f**.

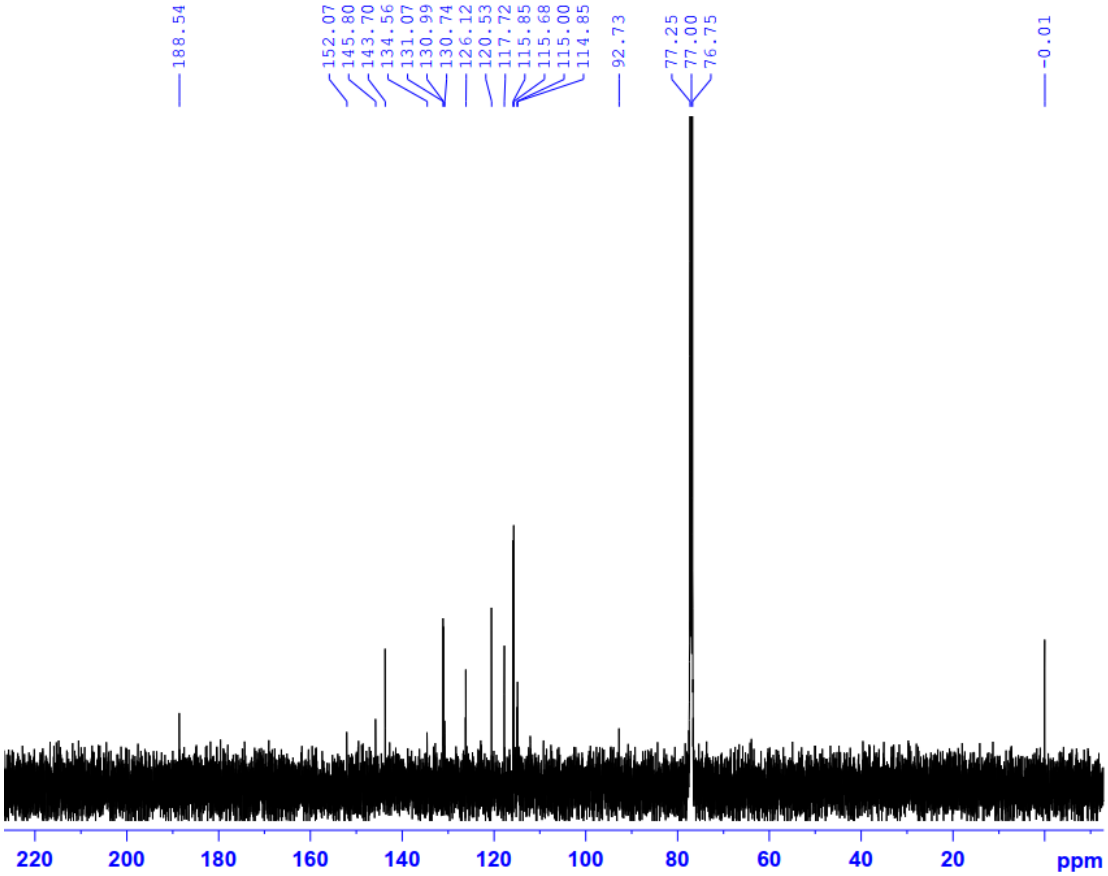


Figure S6c. ^{13}C-NMR spectrum of **1f**.

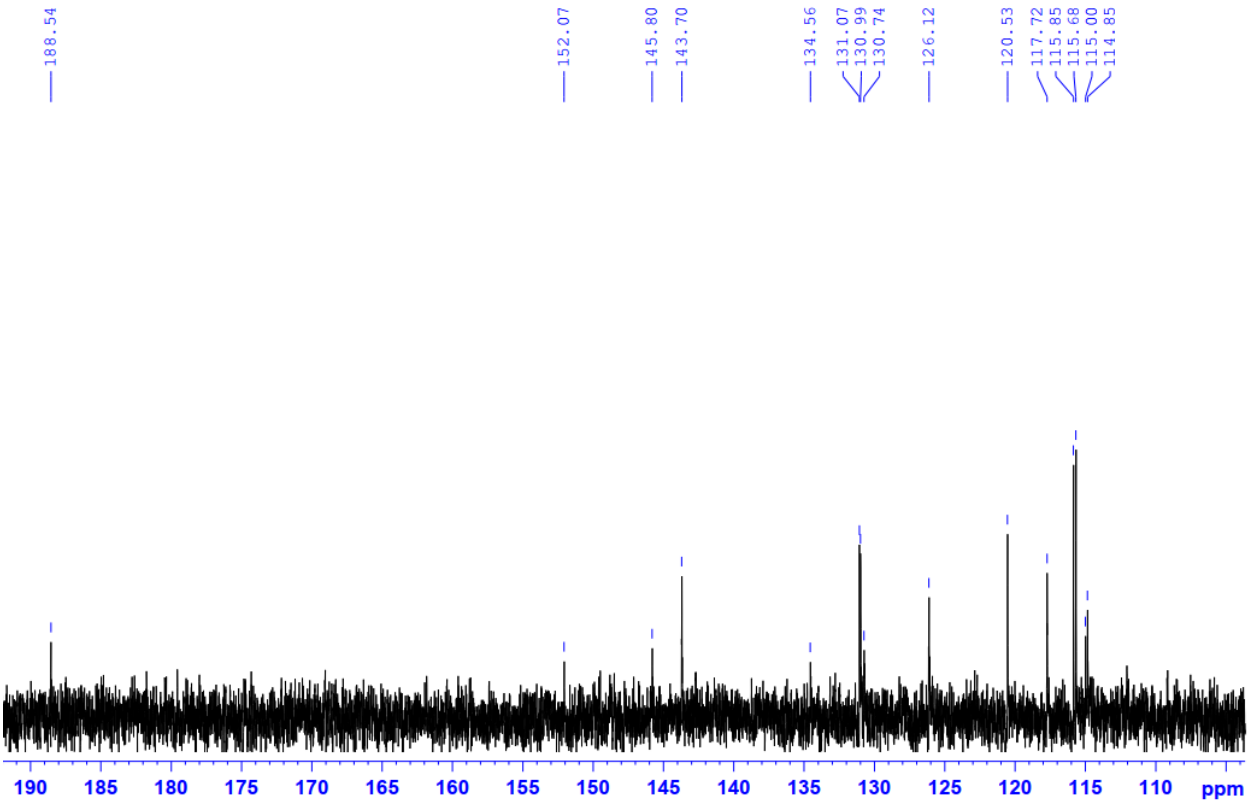


Figure S6d. ^{13}C-NMR spectrum of **1f**.

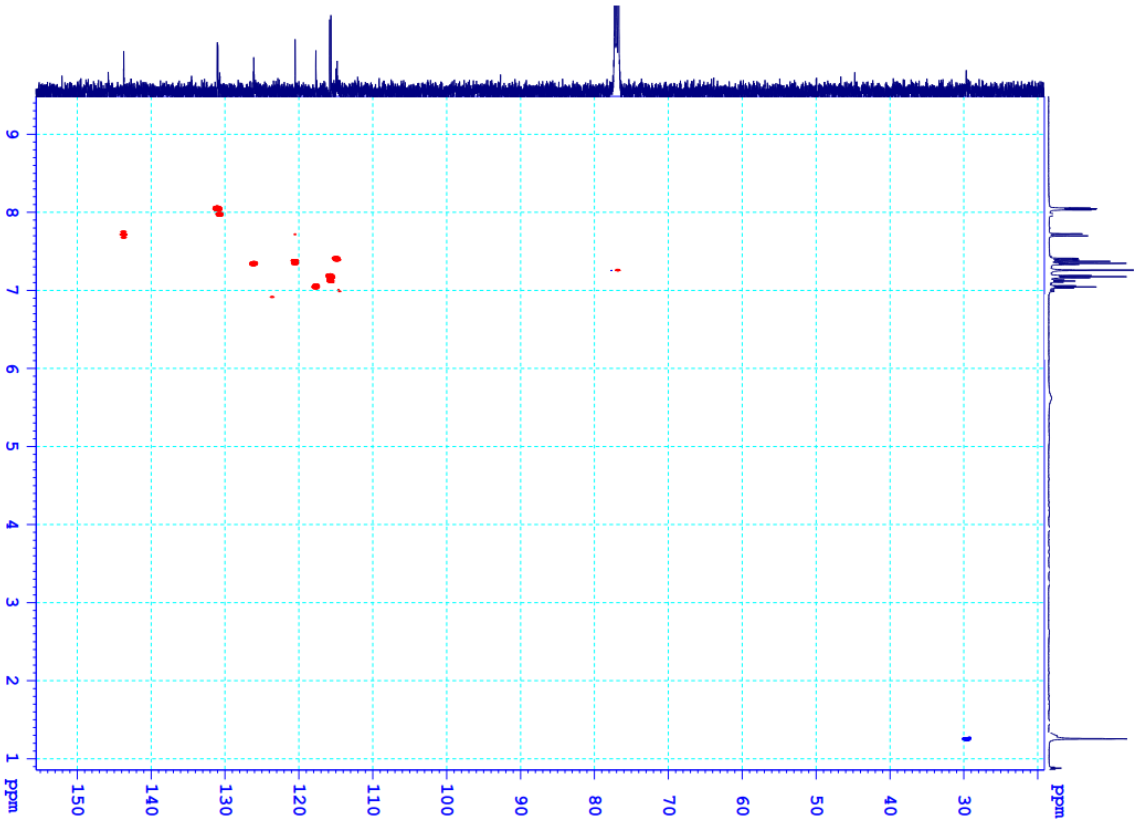


Figure S6e. HSQC spectrum of **1f**.

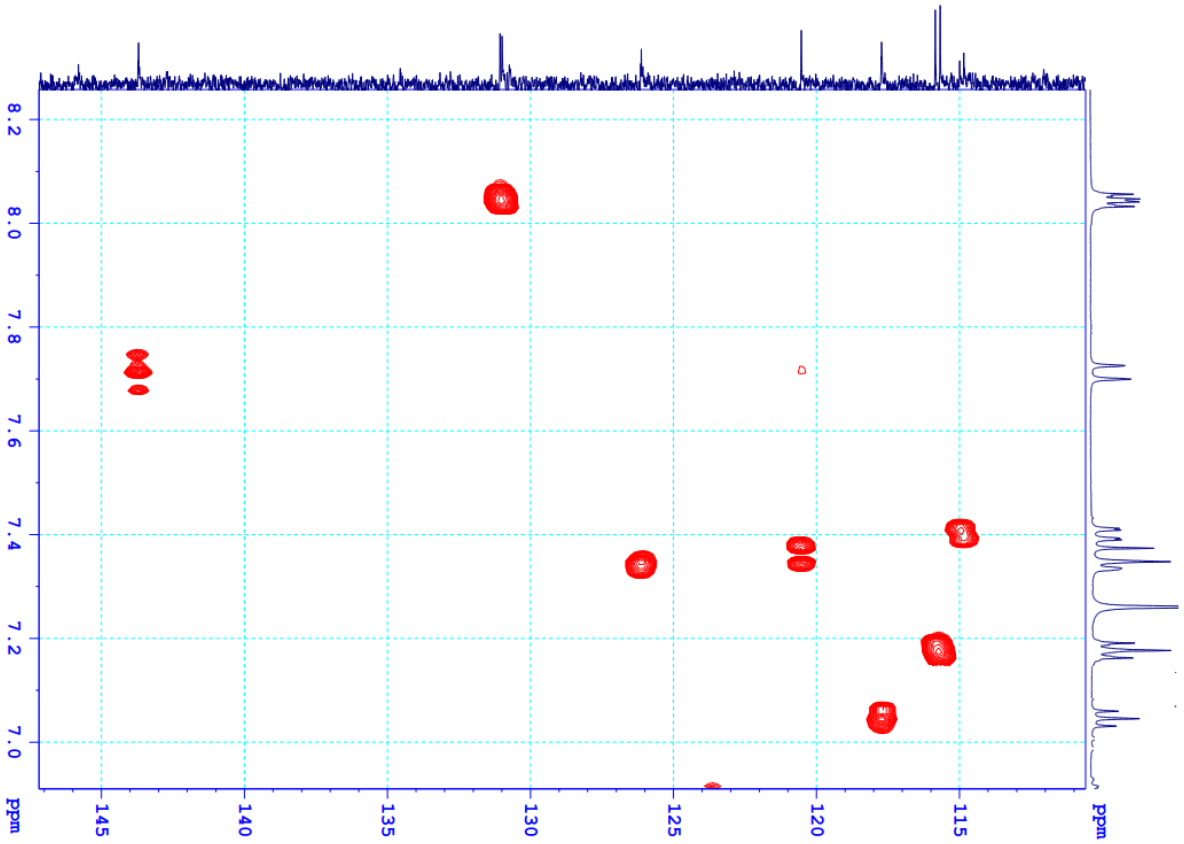


Figure S6f. HSQC spectrum of **1f**.

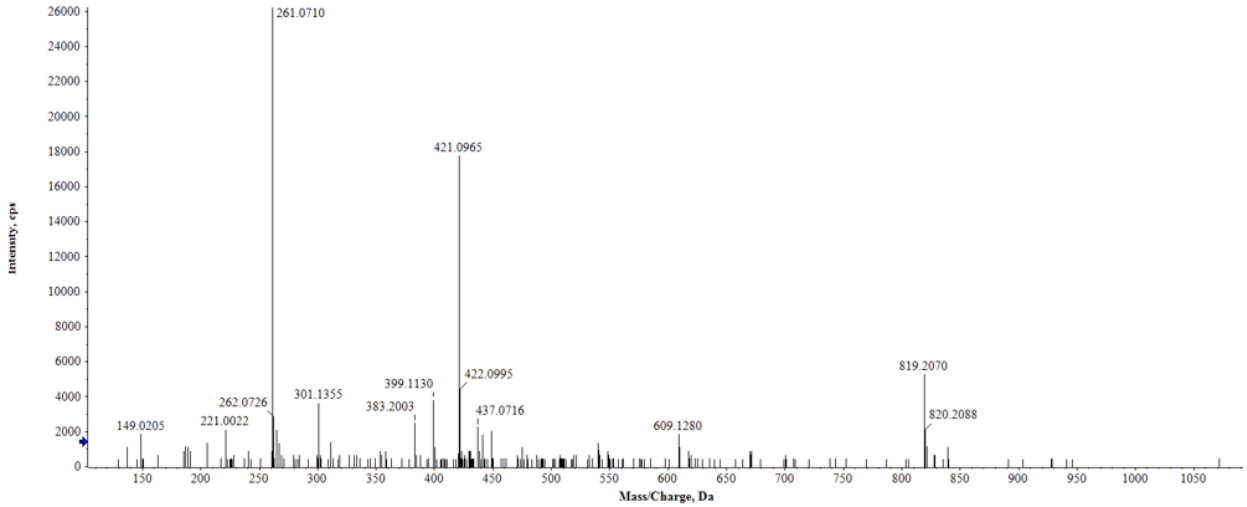


Figure S6g. HRMS of **1f**.

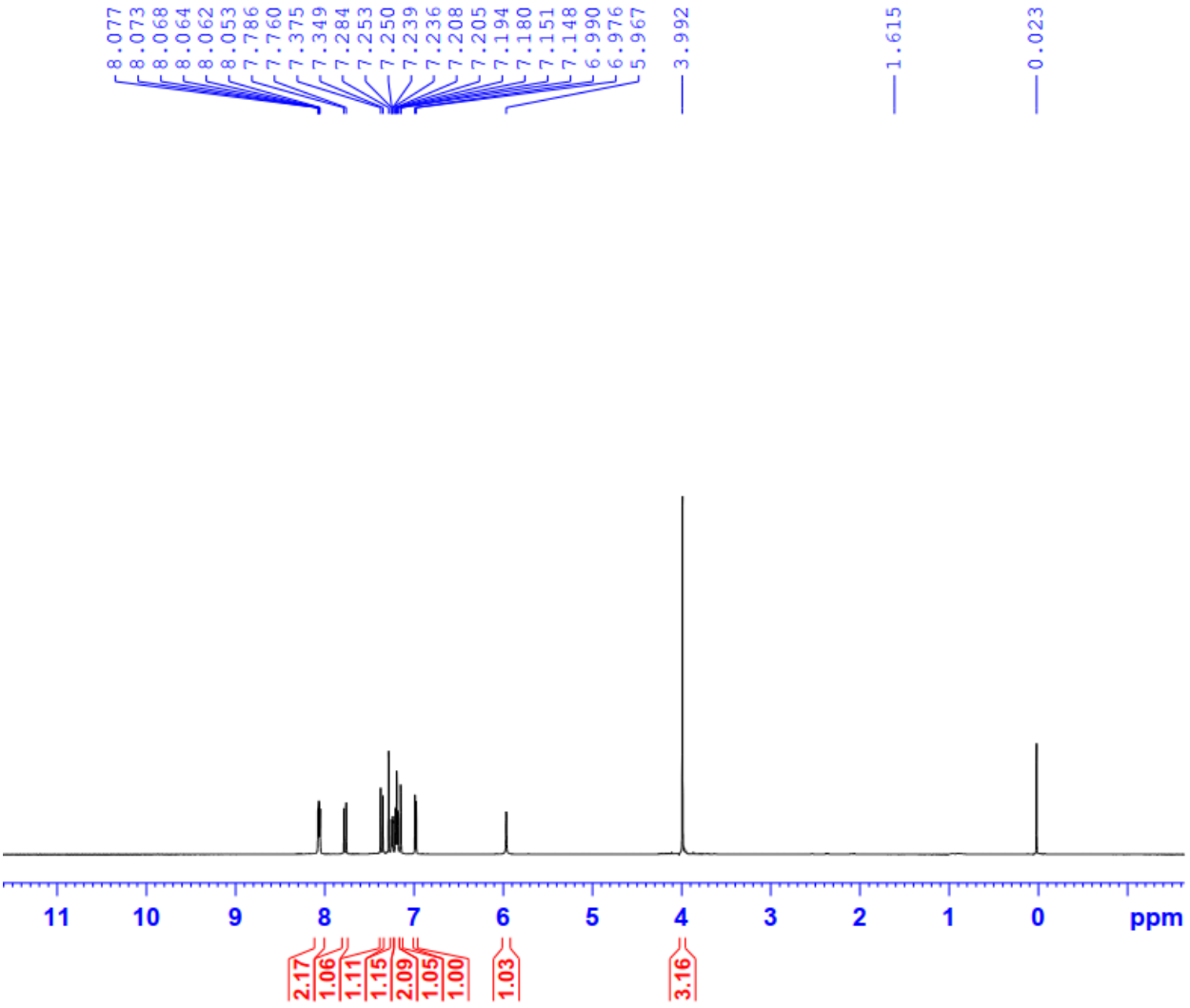


Figure S7a. ^{1}H-NMR spectrum of **1g**.

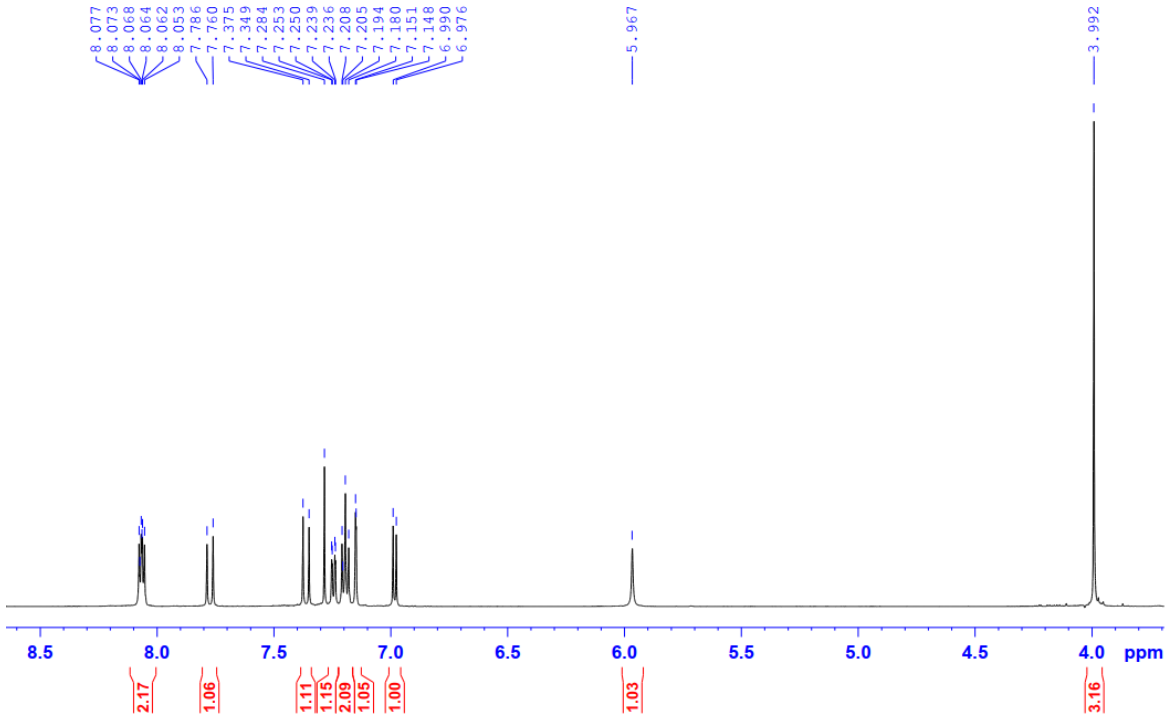


Figure S7b. ^{1}H-NMR spectrum of **1g**.

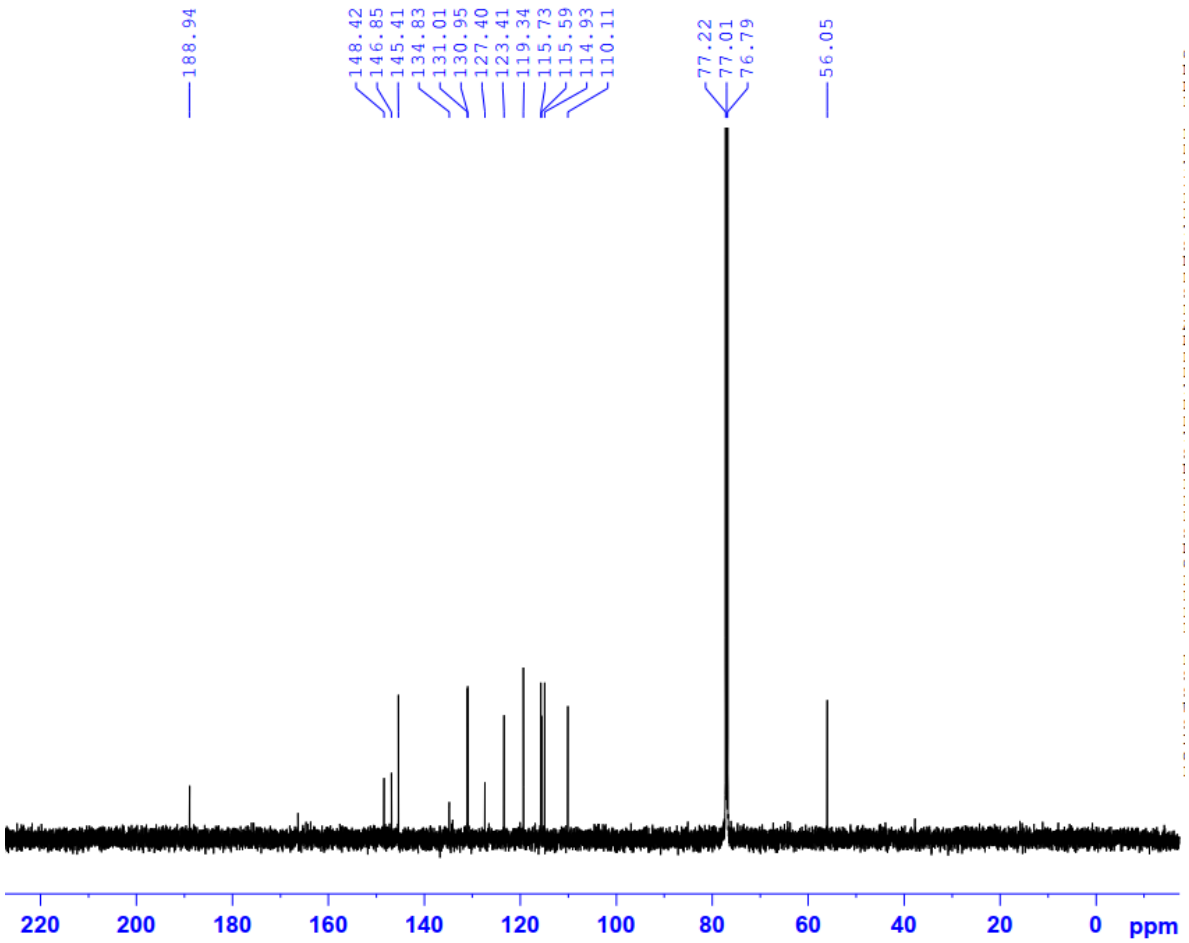


Figure S7c. ^{13}C-NMR spectrum of **1g**.

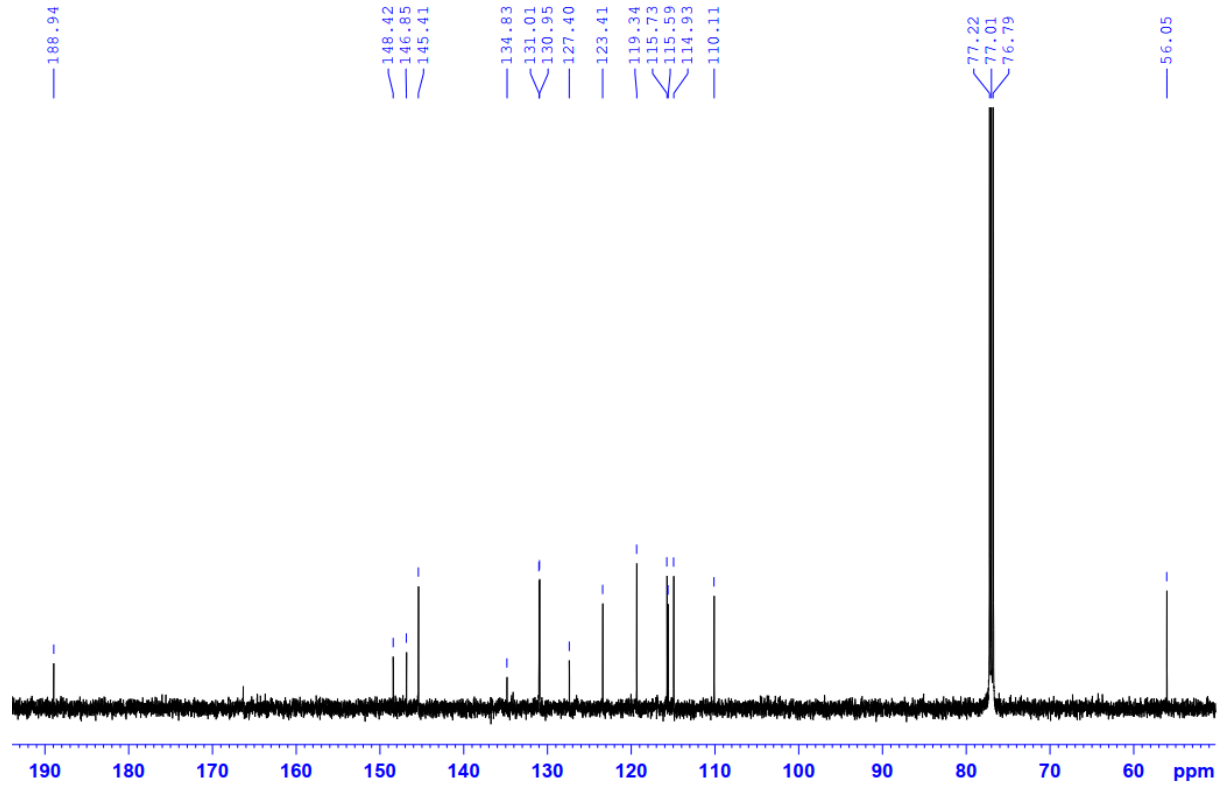


Figure S7d. ^{13}C-NMR spectrum of **1g**.

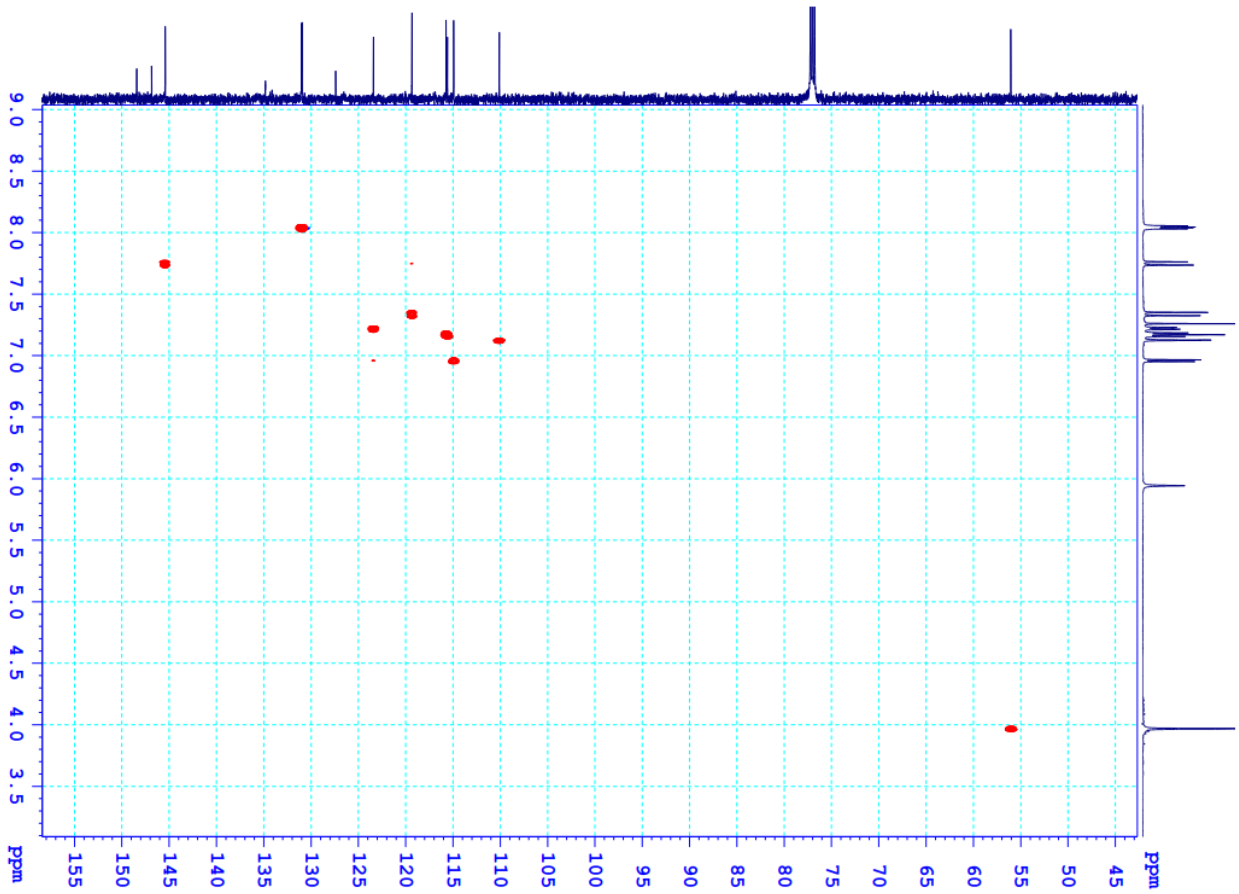


Figure S7e. HSQC spectrum of **1g**.

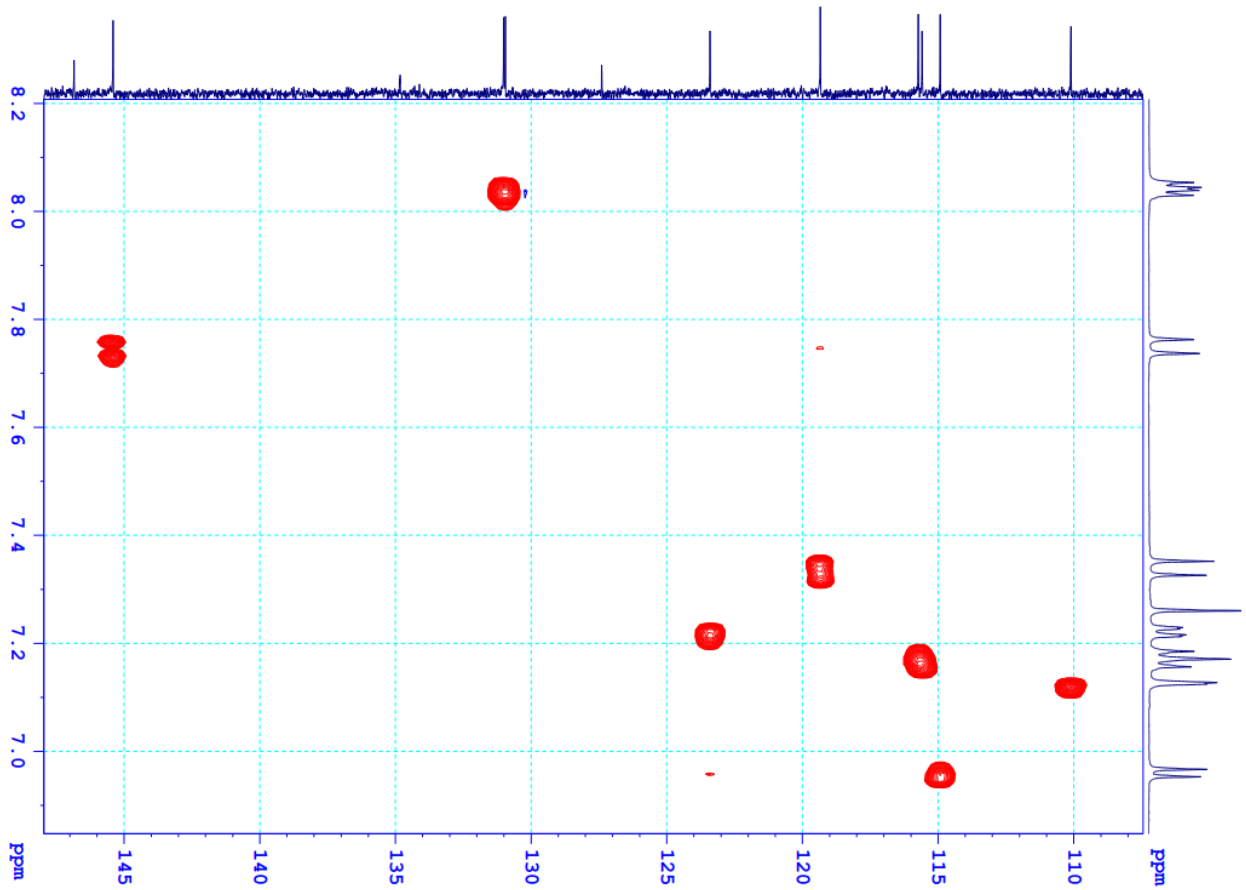


Figure S7f. HSQC spectrum of **1g**.

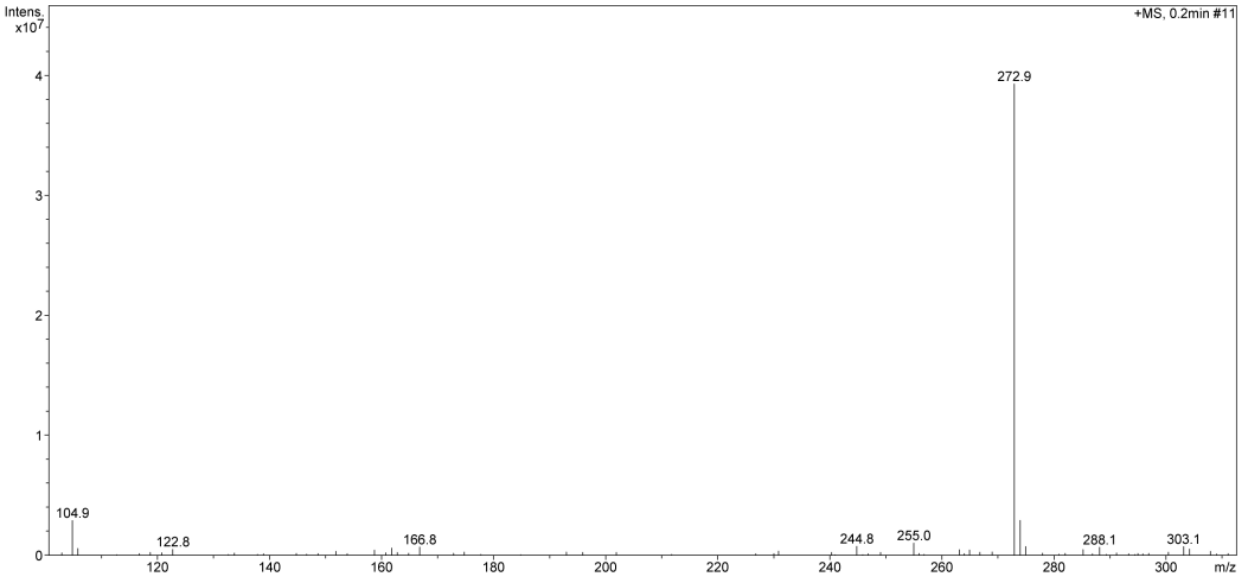


Figure S7g. MS of **1g**.

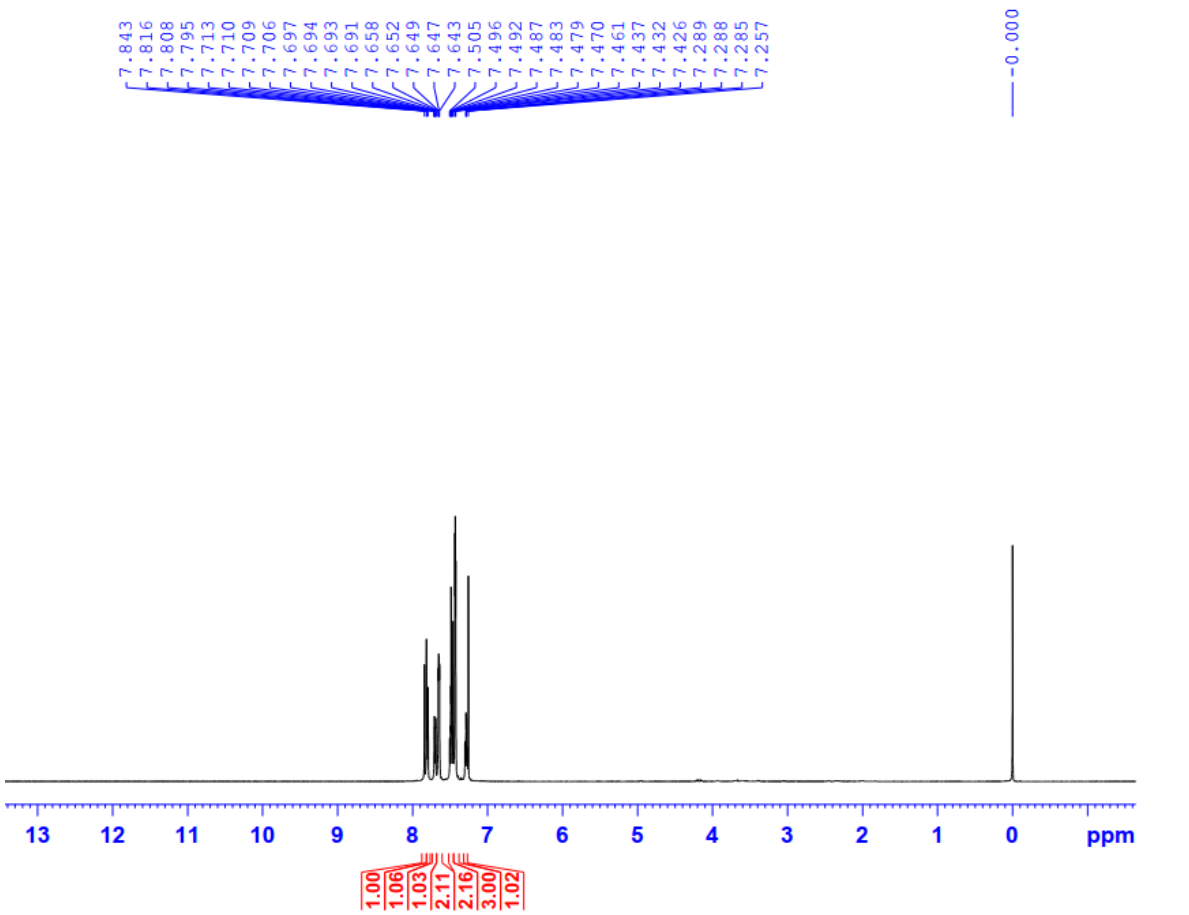


Figure S8a. ^{1}H-NMR spectrum of **2a**.

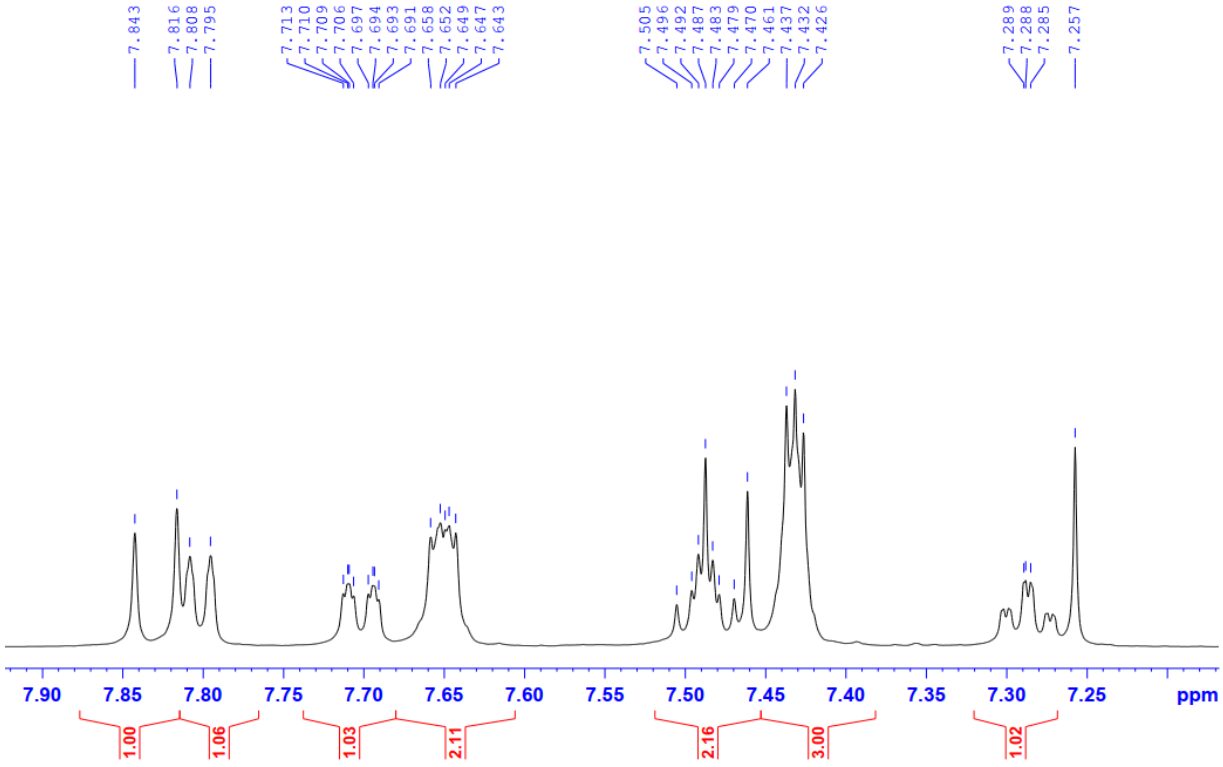


Figure S8b. ^{1}H-NMR spectrum of **2a**.

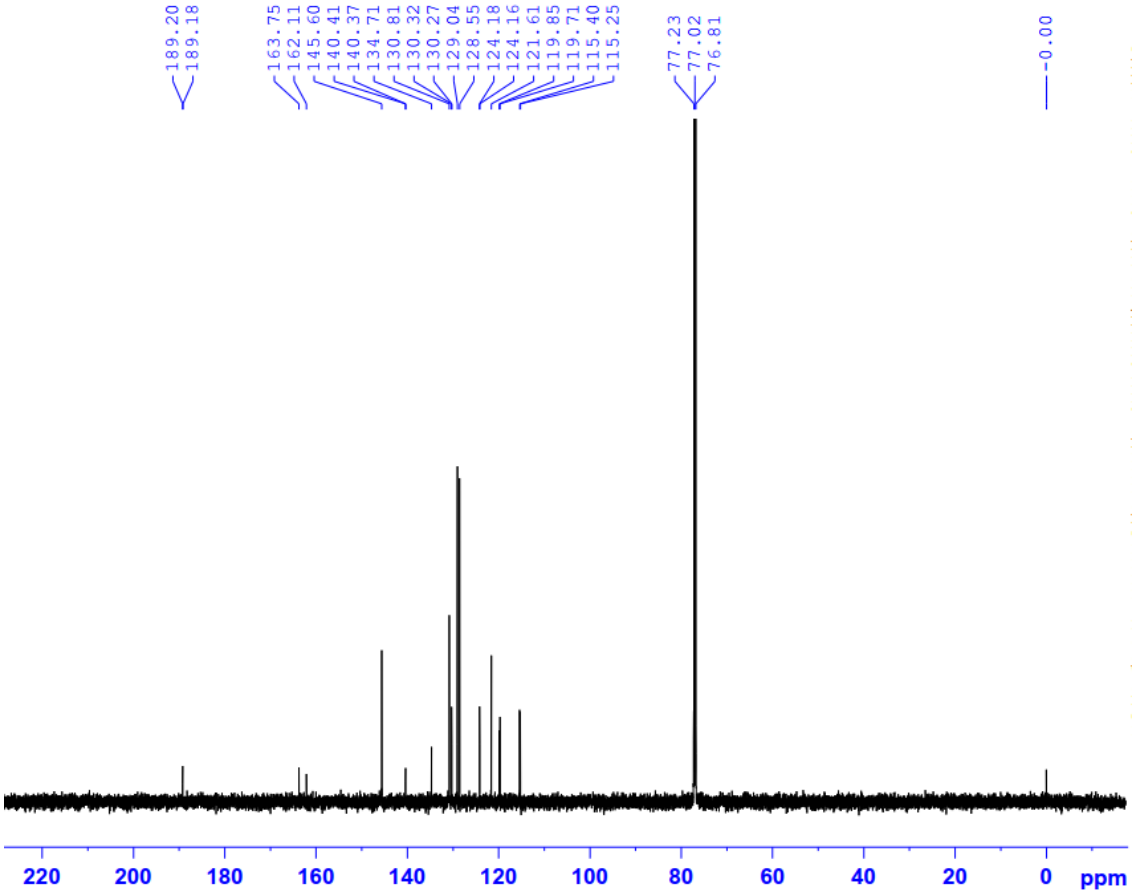


Figure S8c. ^{13}C-NMR spectrum of **2a**.

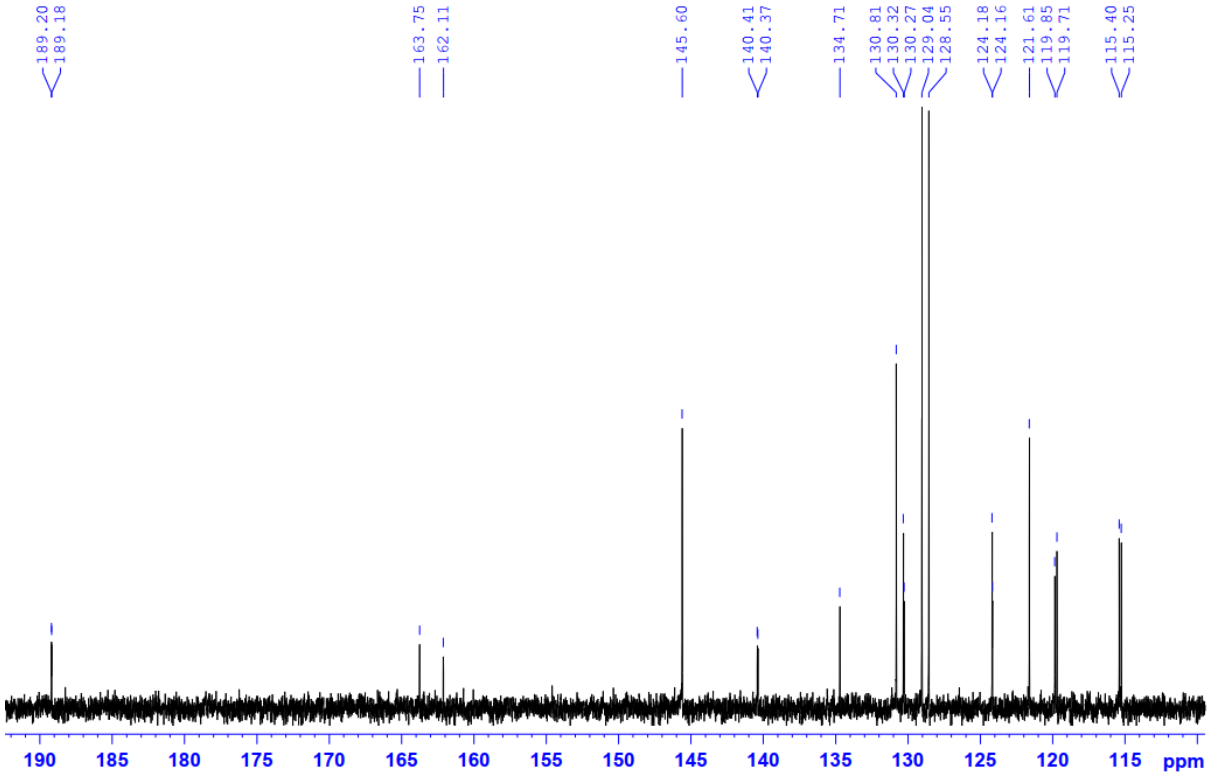


Figure S8d. ^{13}C-NMR spectrum of **2a**.

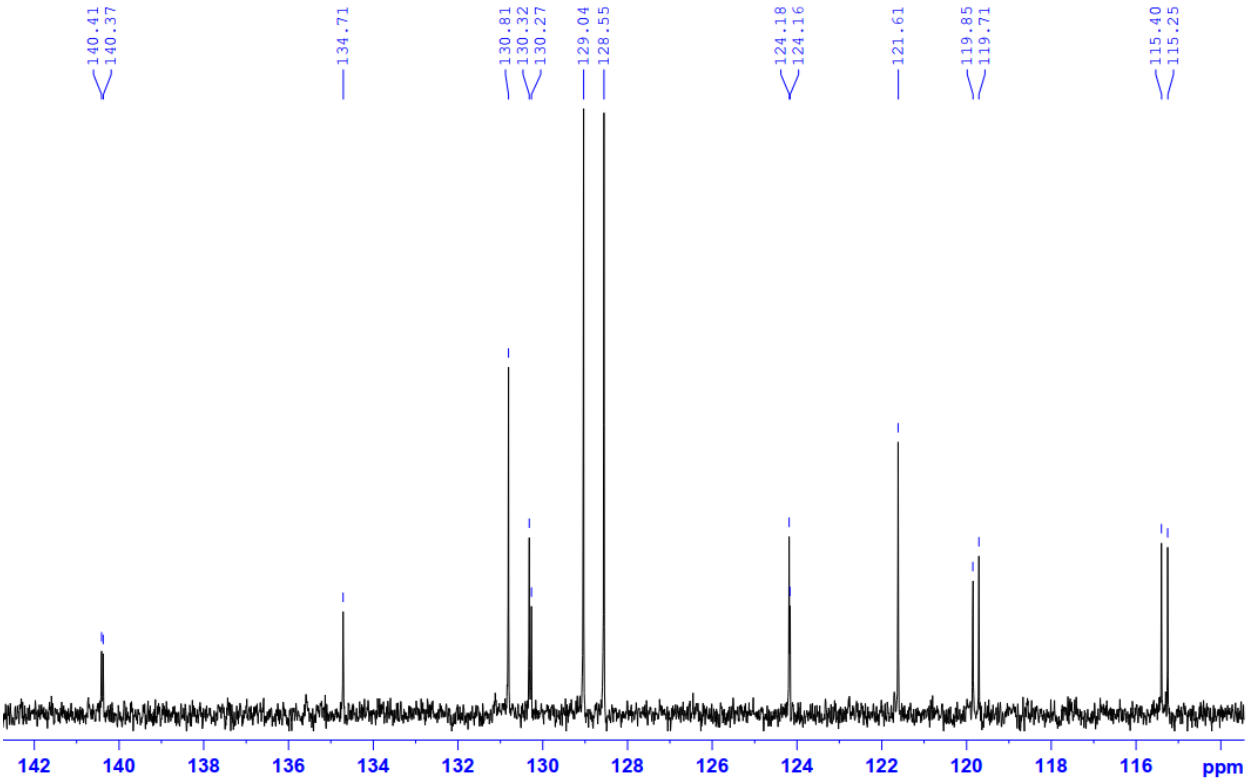


Figure S8e. ^{13}C-NMR spectrum of **2a**.

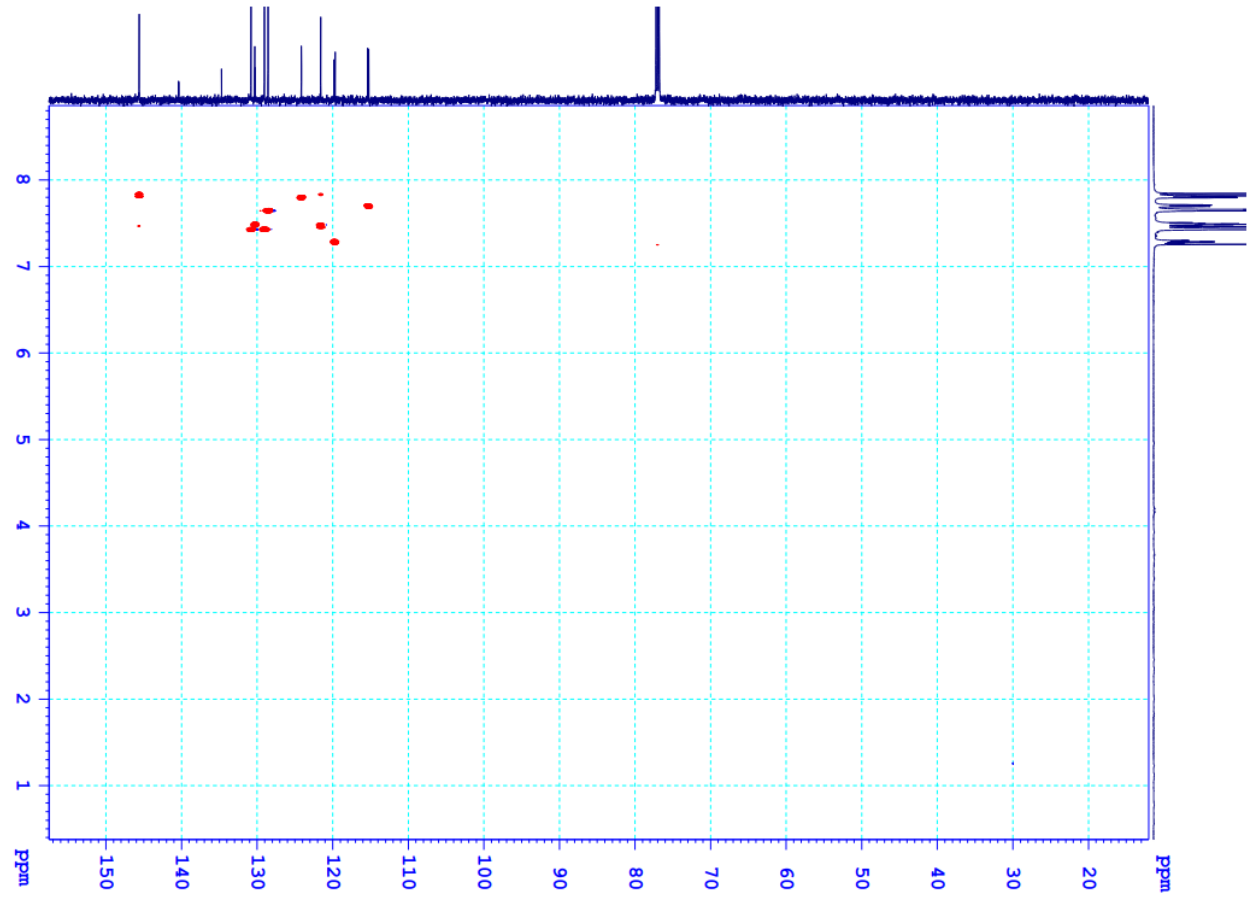


Figure S8f. HSQC spectrum of **2a**.

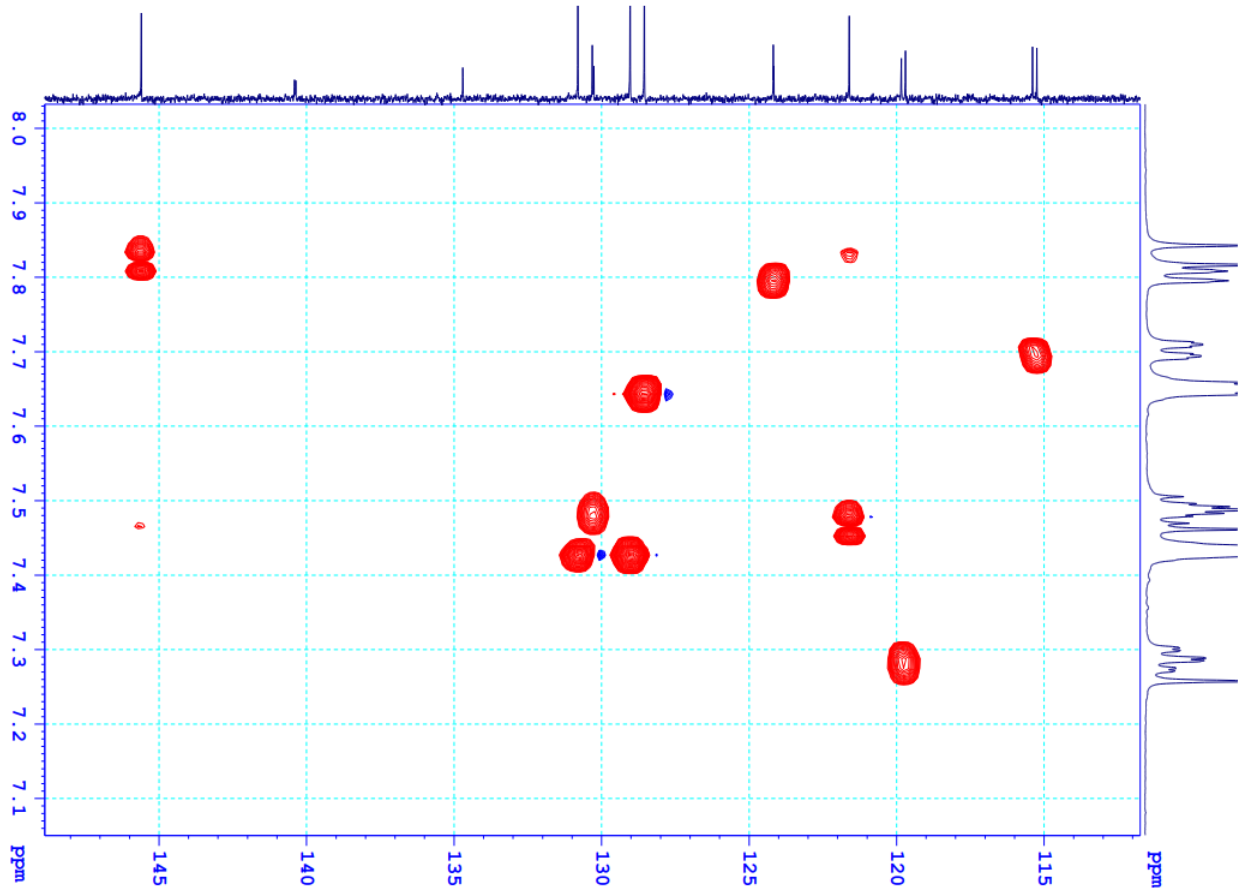


Figure S8g. HSQC spectrum of **2a**.

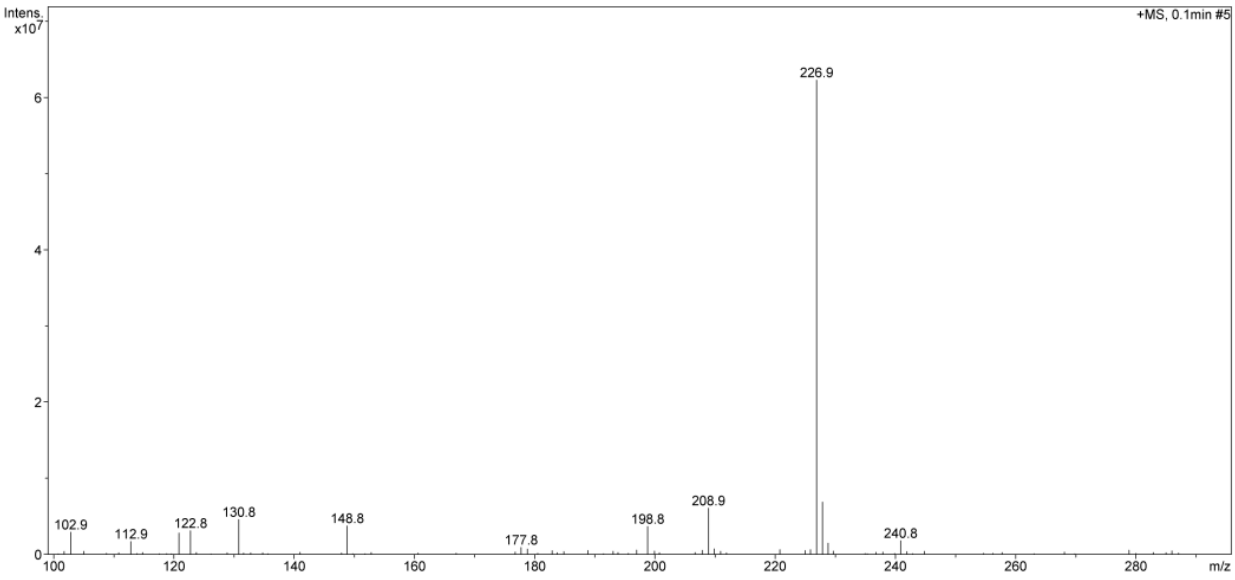


Figure S8h. MS of **2a**.

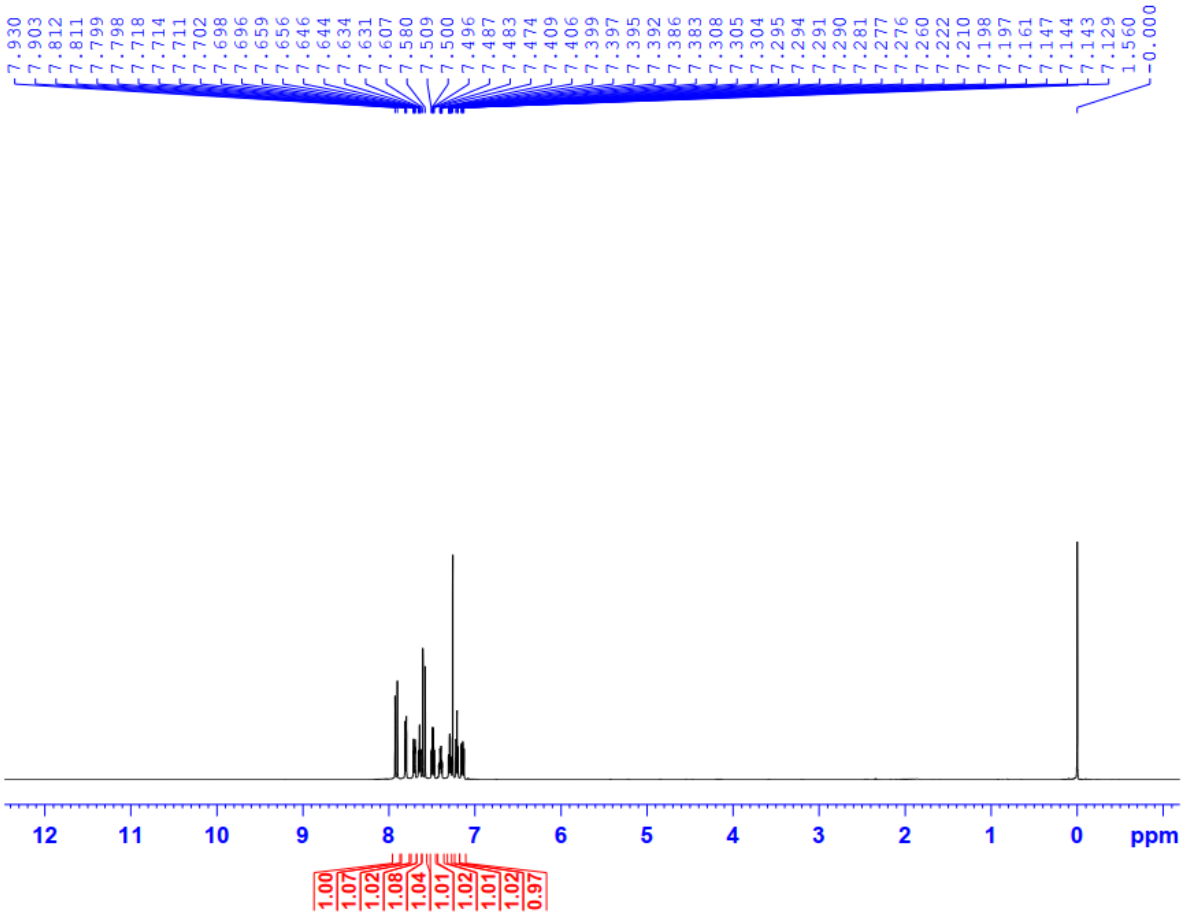


Figure S9a. ^{1}H-NMR spectrum of **2b**.

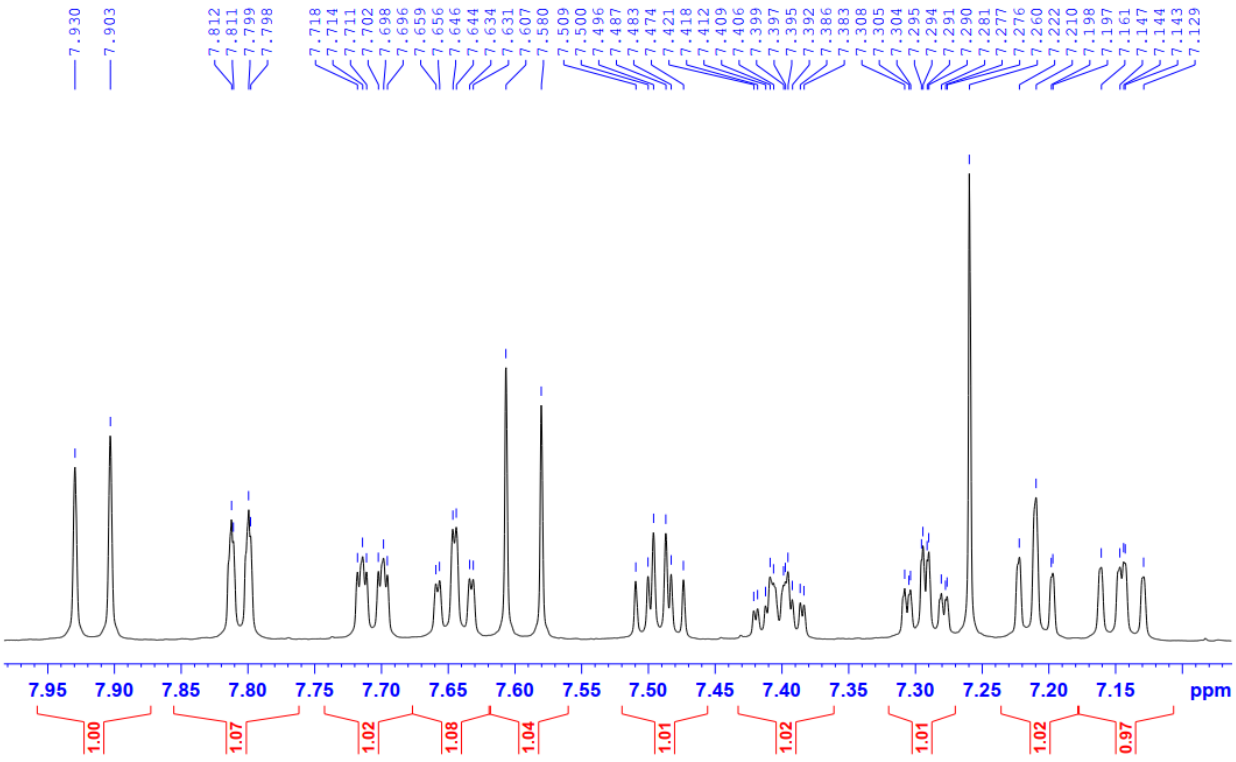


Figure S9b. ^{1}H-NMR spectrum of **2b**.

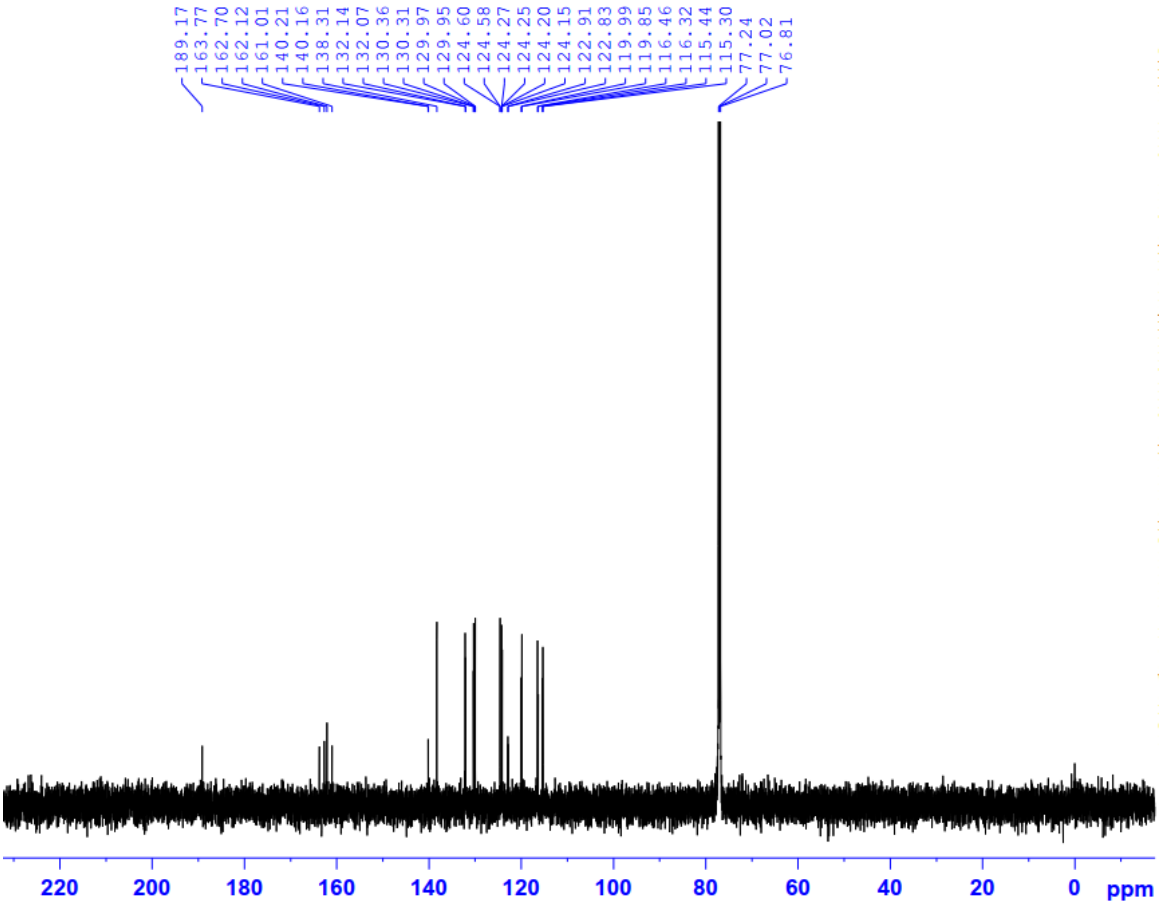


Figure S9c. ^{13}C-NMR spectrum of **2b**.

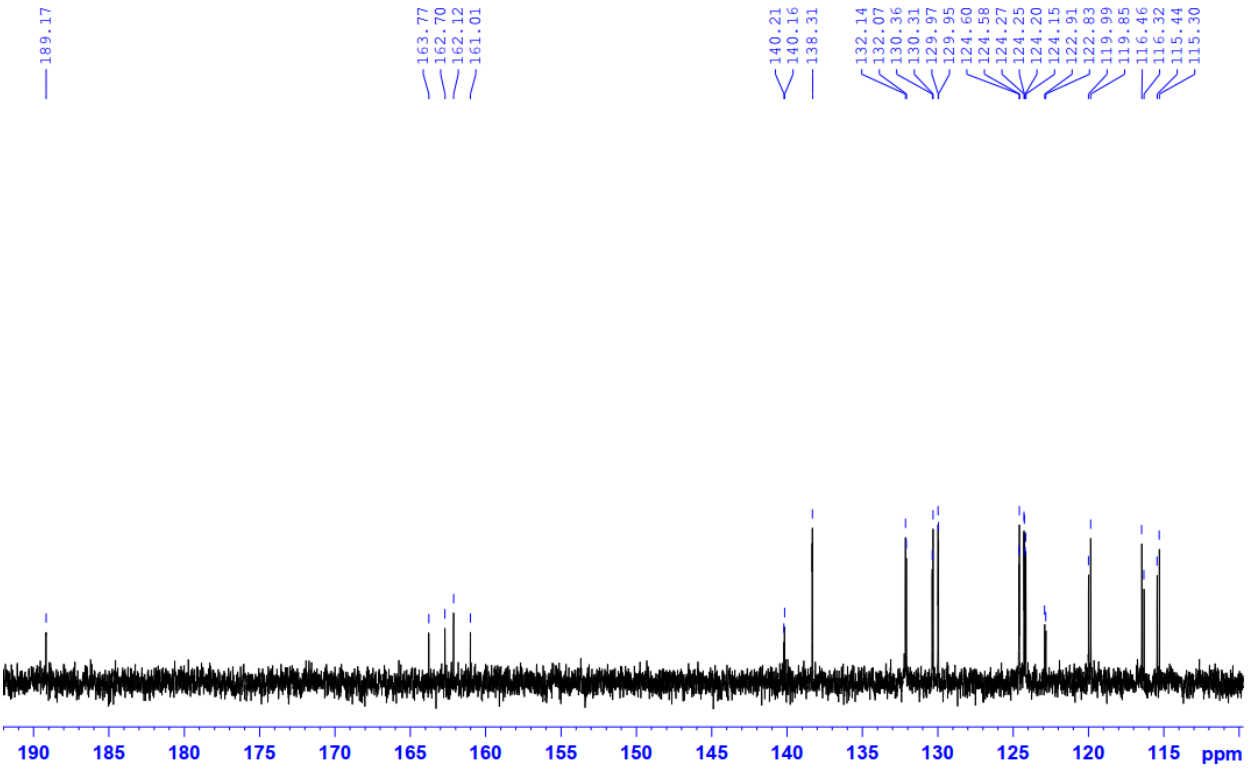


Figure S9d. ^{13}C-NMR spectrum of **2b**.

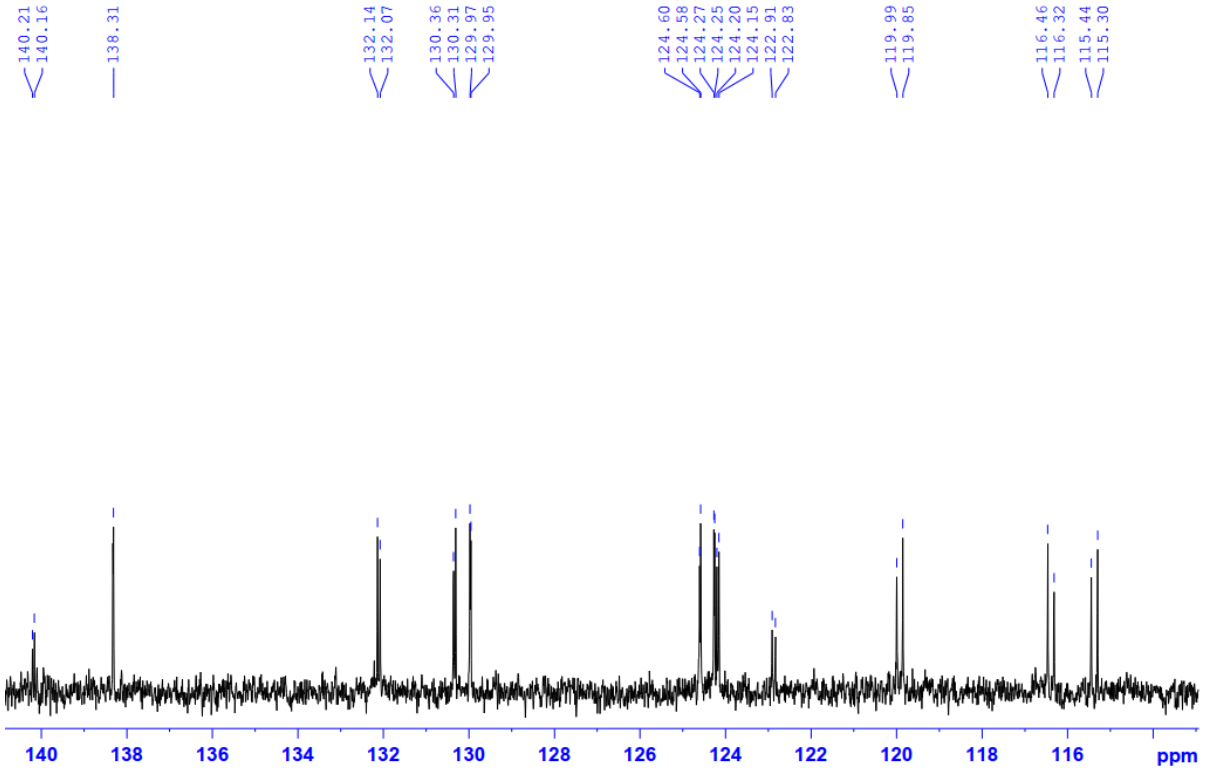


Figure S9e. ^{13}C-NMR spectrum of **2b**.

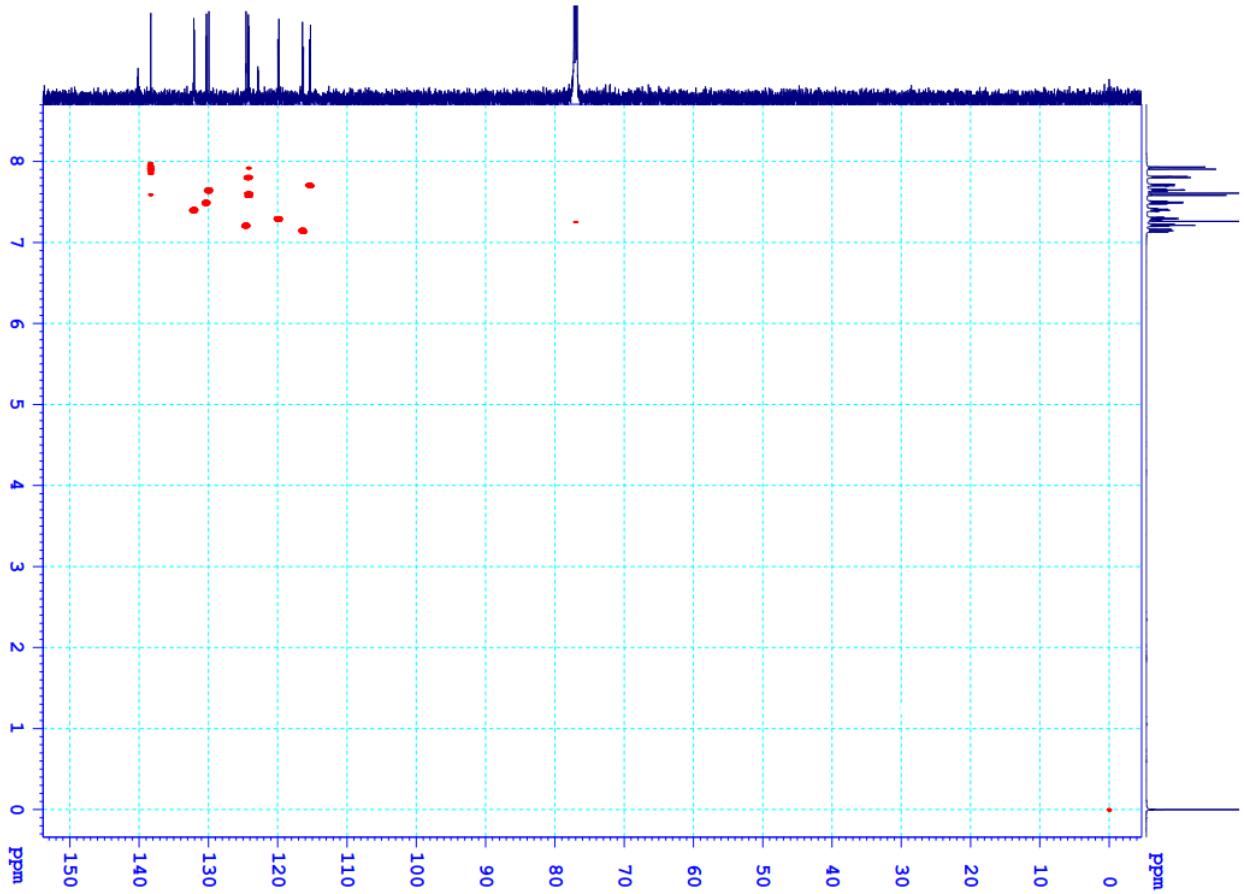


Figure S9f. HSQC spectrum of **2b**.

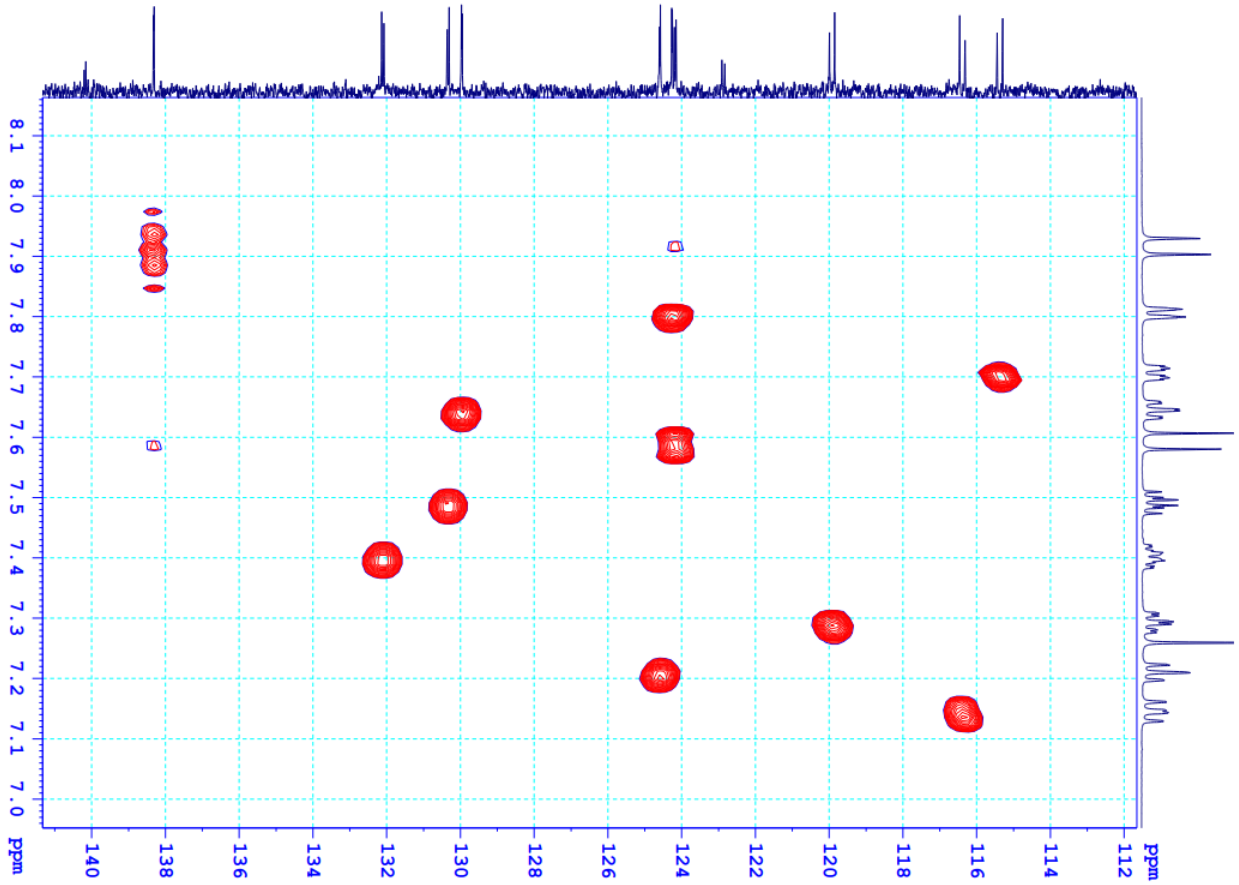


Figure S9g. HSQC spectrum of **2b**.

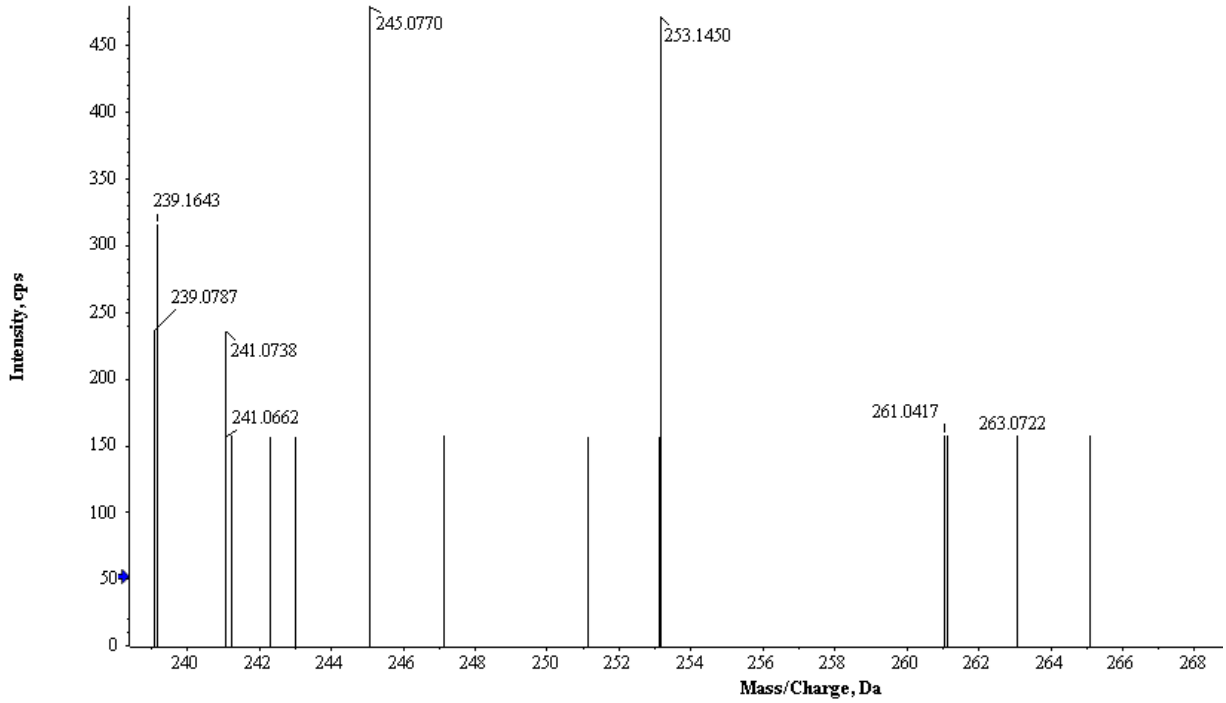


Figure S9h. HRMS of **2b**.

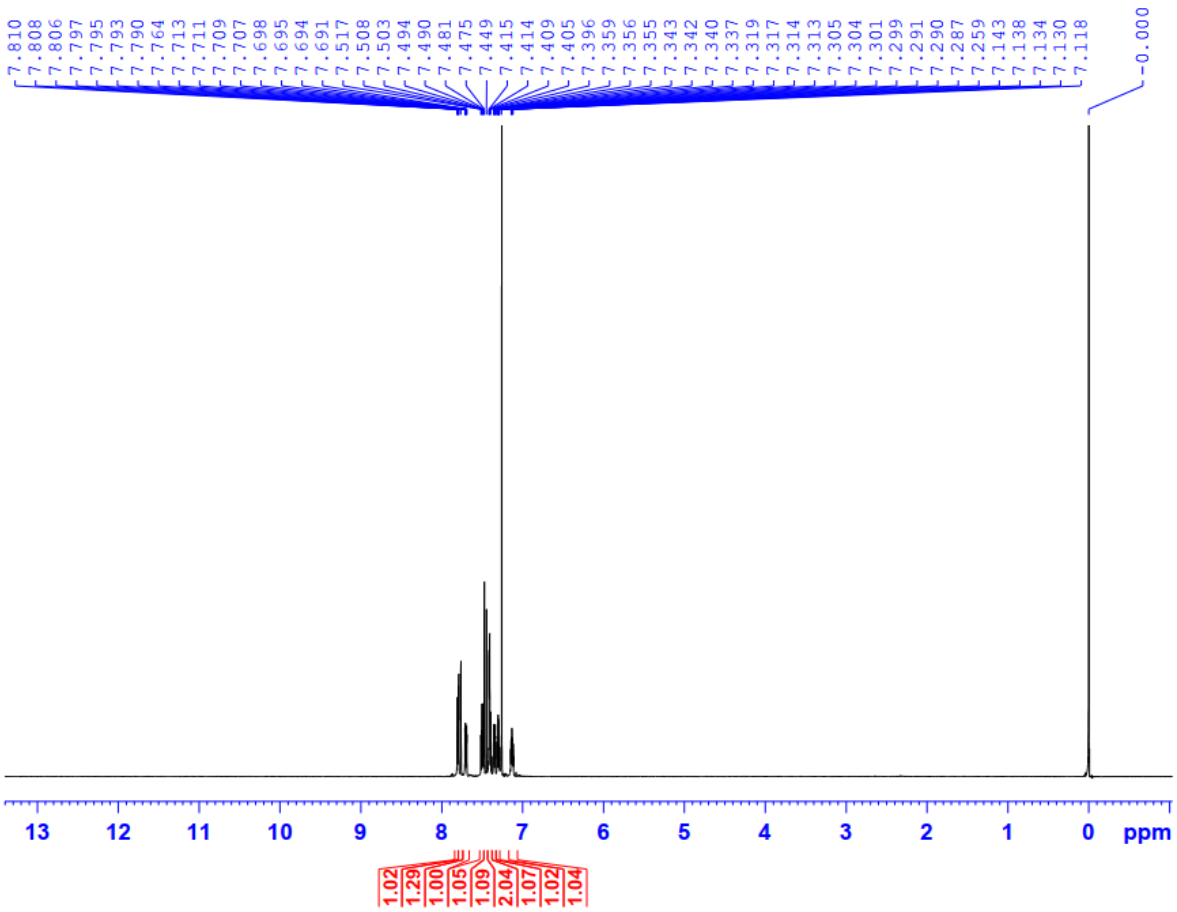


Figure S10a. ^{1}H-NMR spectrum of **2c**.

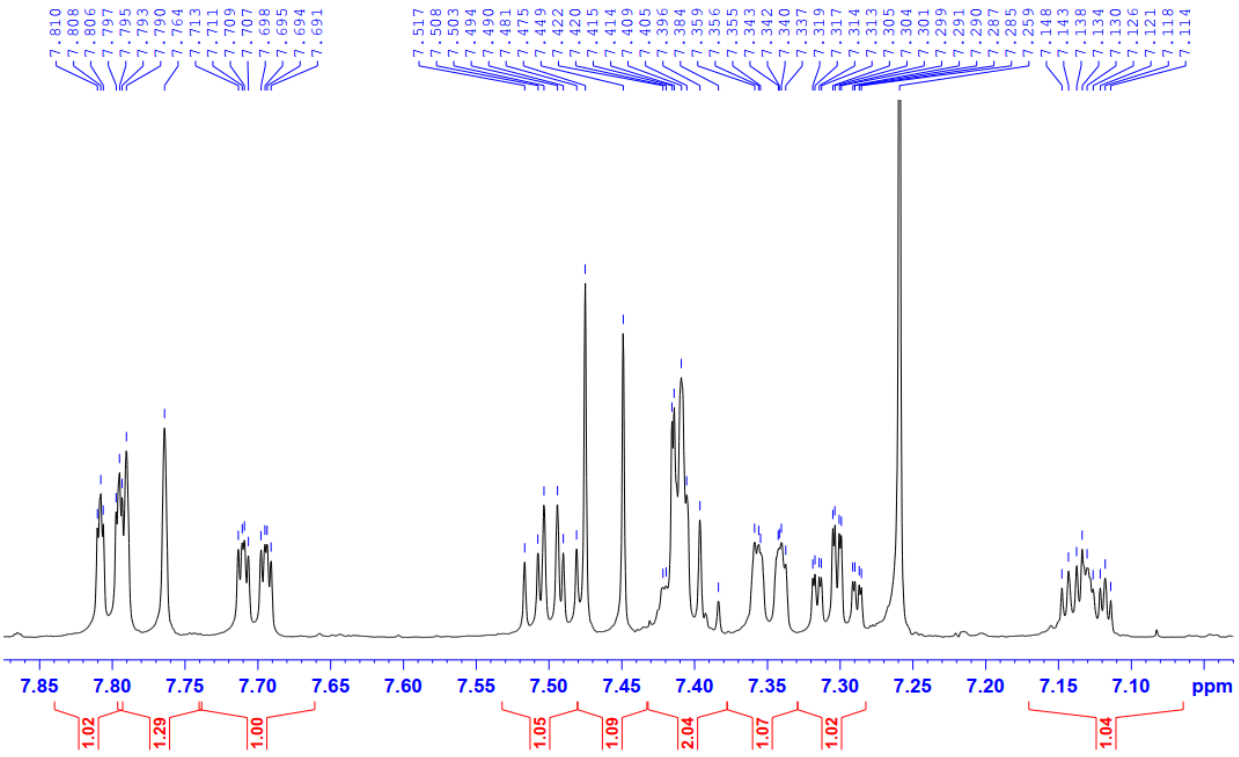


Figure S10b. ^{1}H-NMR spectrum of **2c**.

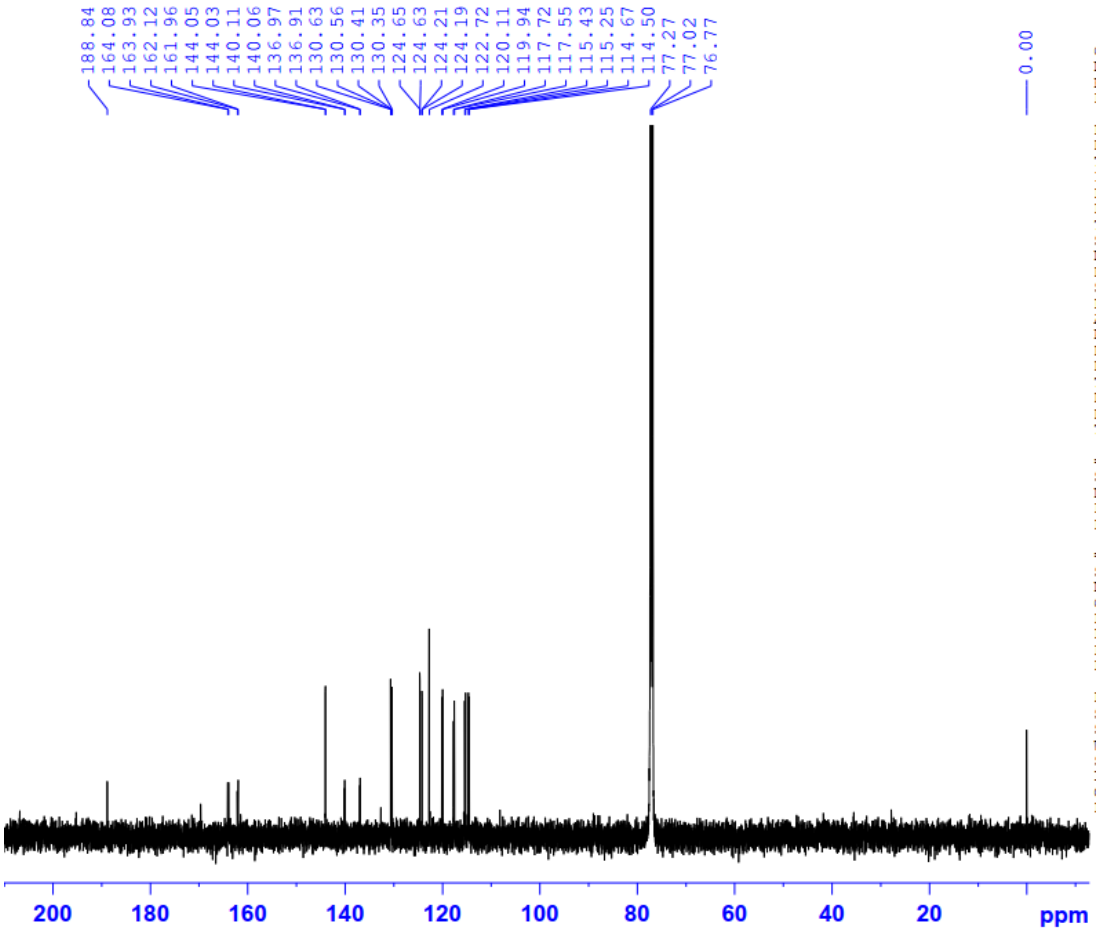


Figure S10c. ^{13}C-NMR spectrum of **2c**.

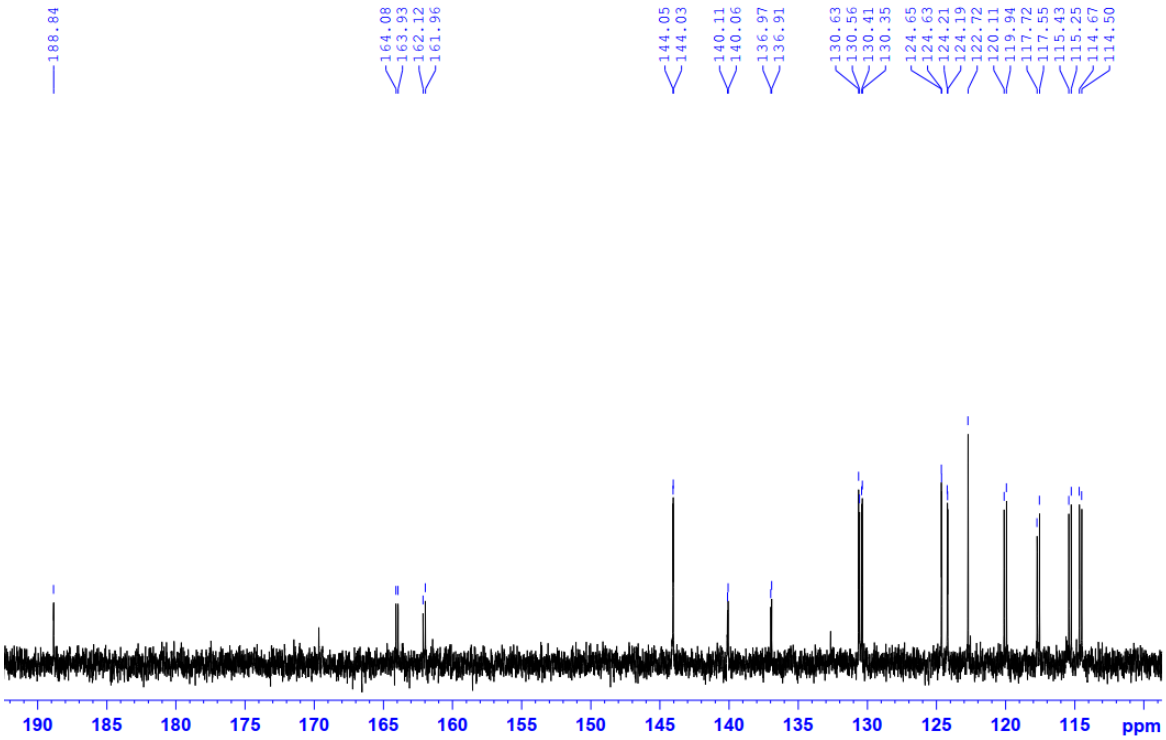


Figure S10d. ^{13}C-NMR spectrum of **2c**.

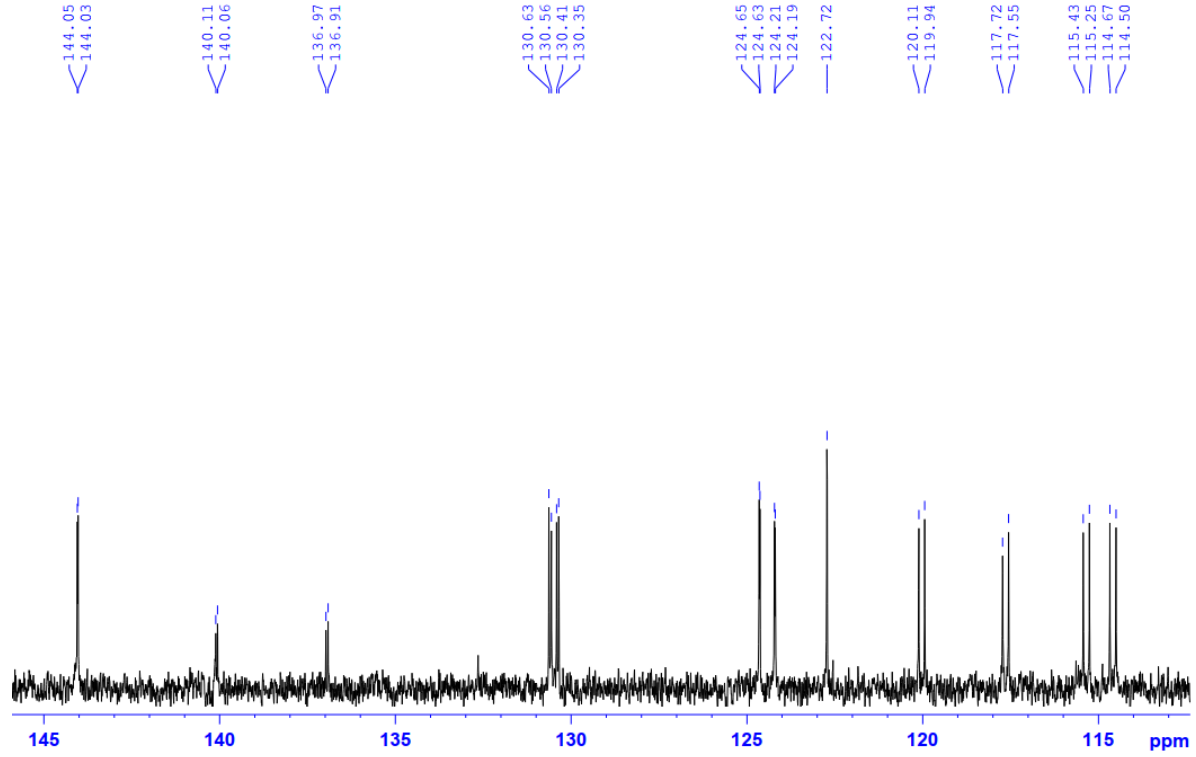


Figure S10e. ^{13}C-NMR spectrum of **2c**.

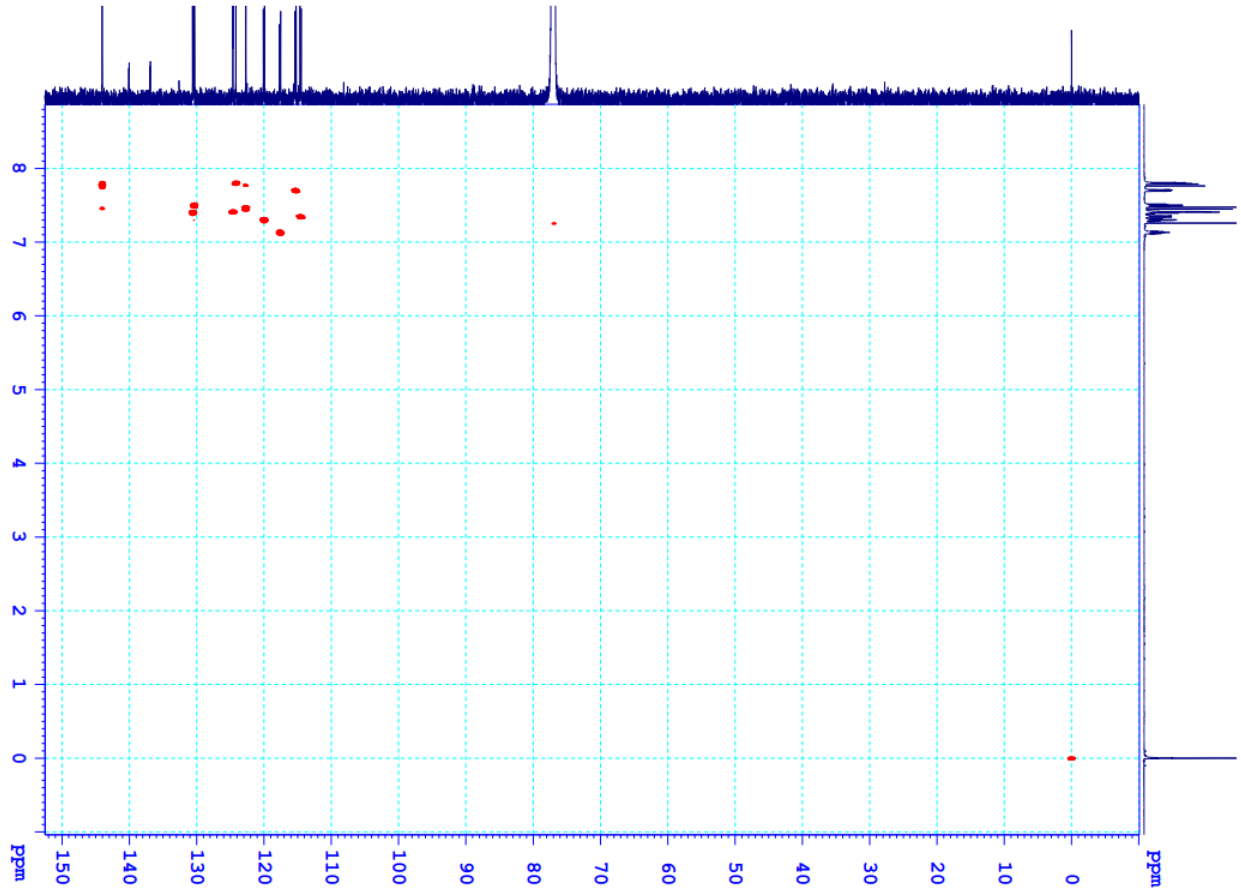


Figure S10f. HSQC spectrum of **2c**.

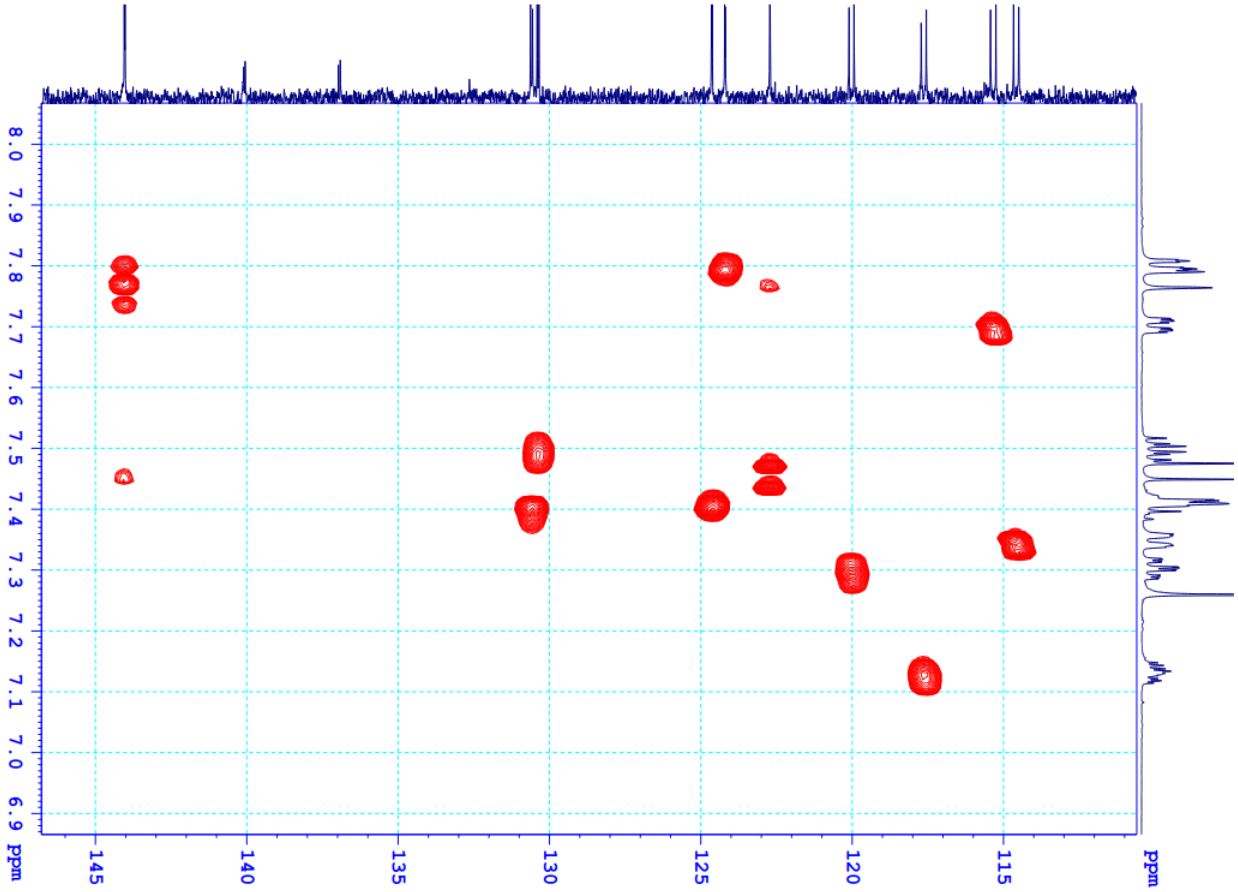


Figure S10g. HSQC spectrum of **2c**.

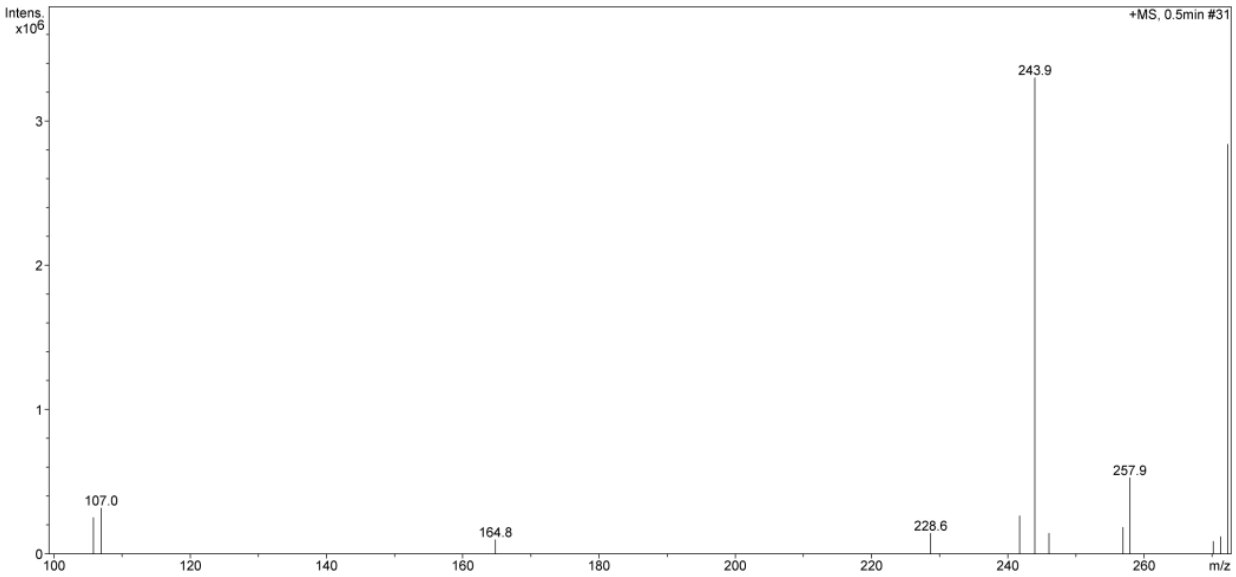


Figure S10h. MS of **2c**.

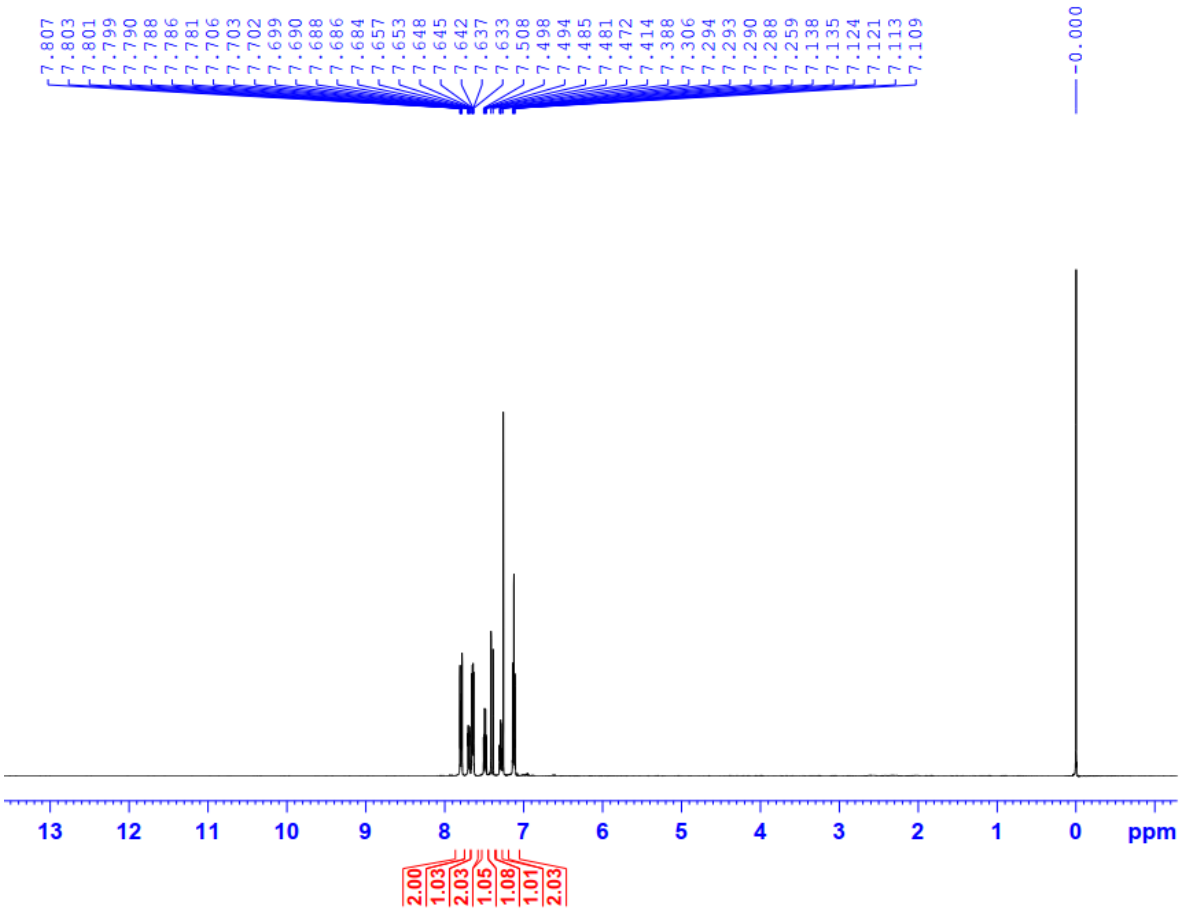


Figure S11a. ^{1}H-NMR spectrum of **2d**.

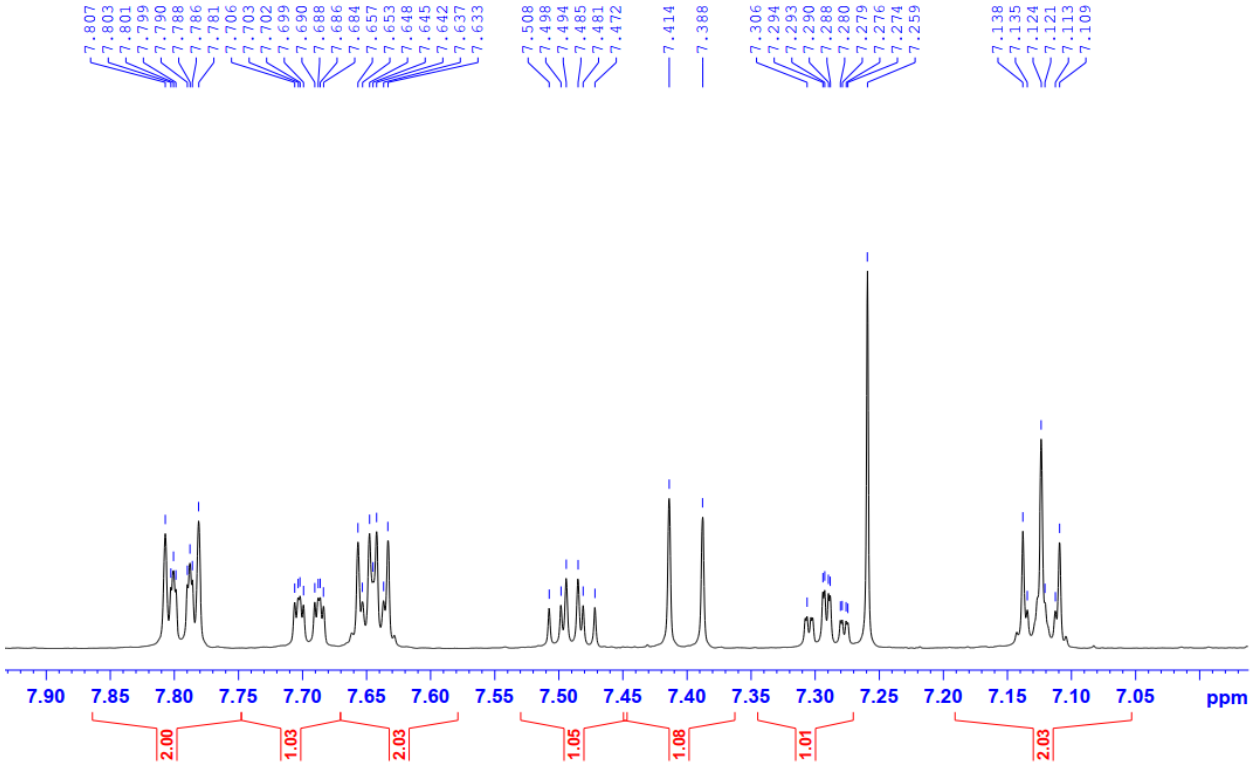


Figure S11b. ^{1}H-NMR spectrum of **2d**.

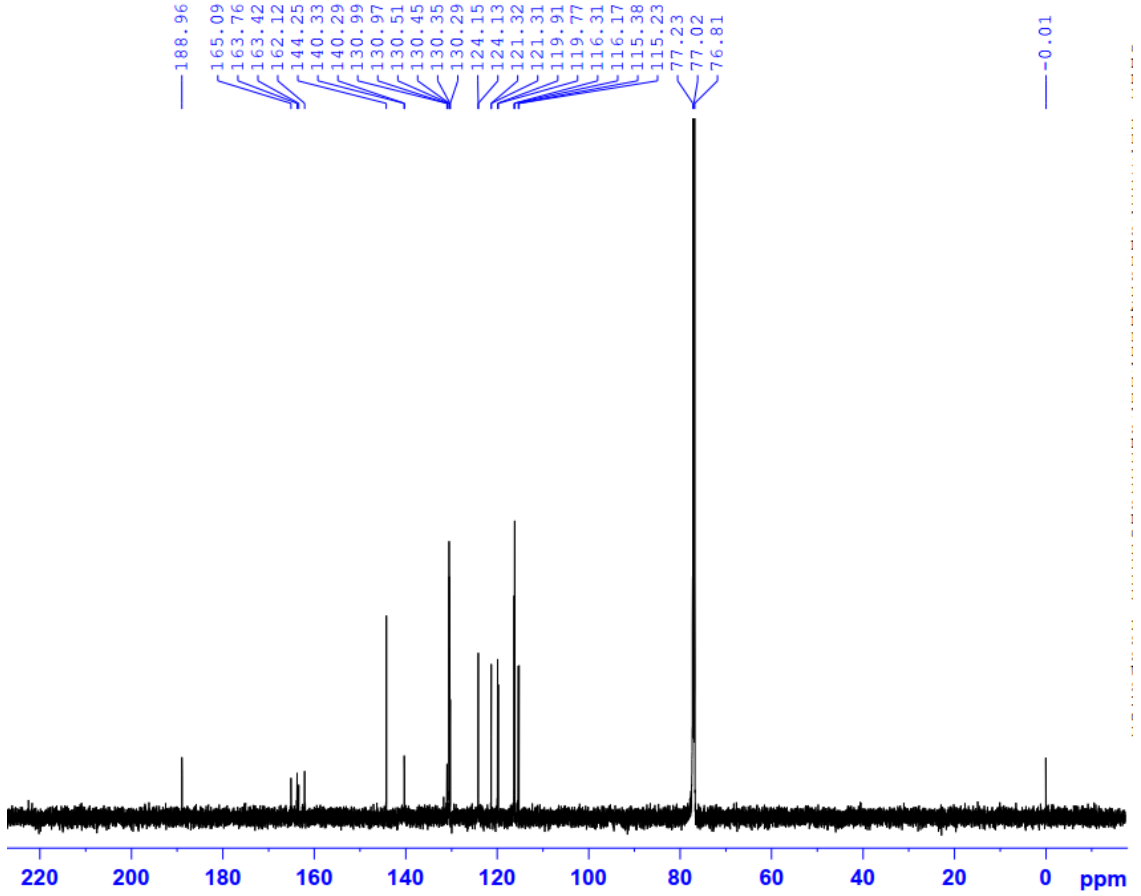


Figure S11c. ^{13}C-NMR spectrum of **2d**.

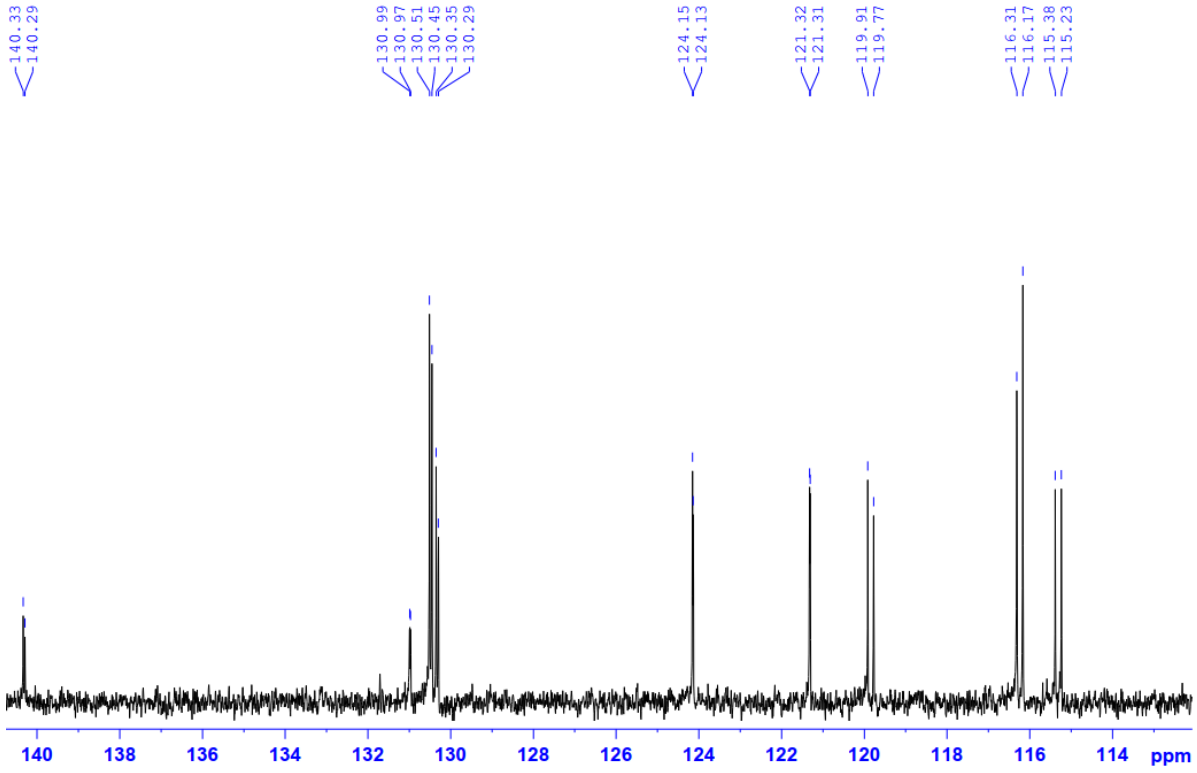


Figure S11d. ^{13}C-NMR spectrum of **2d**.

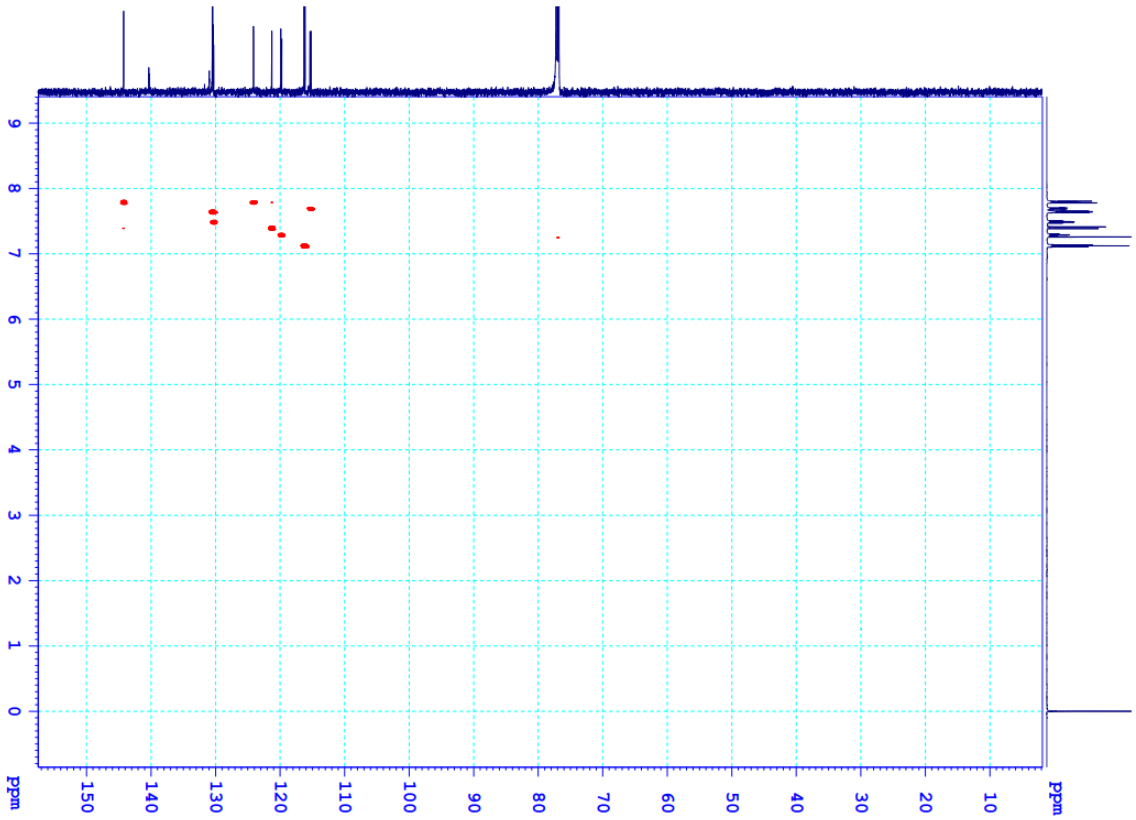


Figure S11e. HSQC spectrum of **2d**.

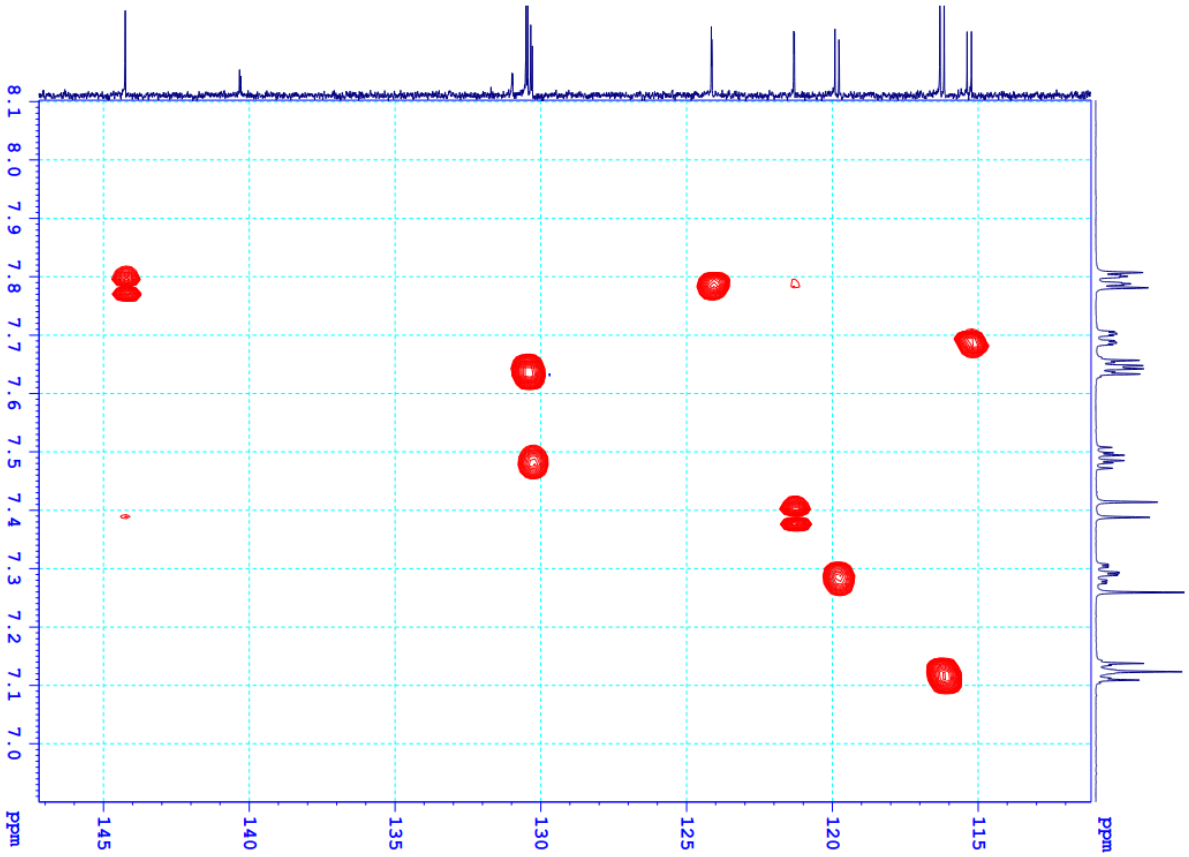


Figure S11f. HSQC spectrum of **2d**.

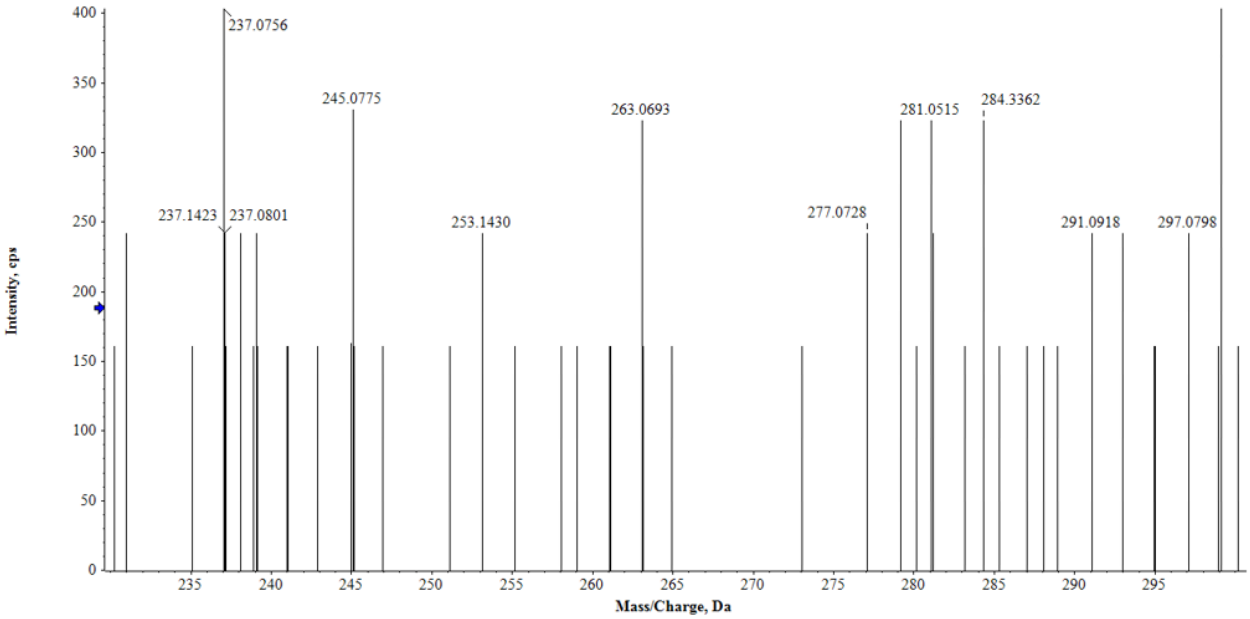


Figure S11g. HRMS of **2d**.

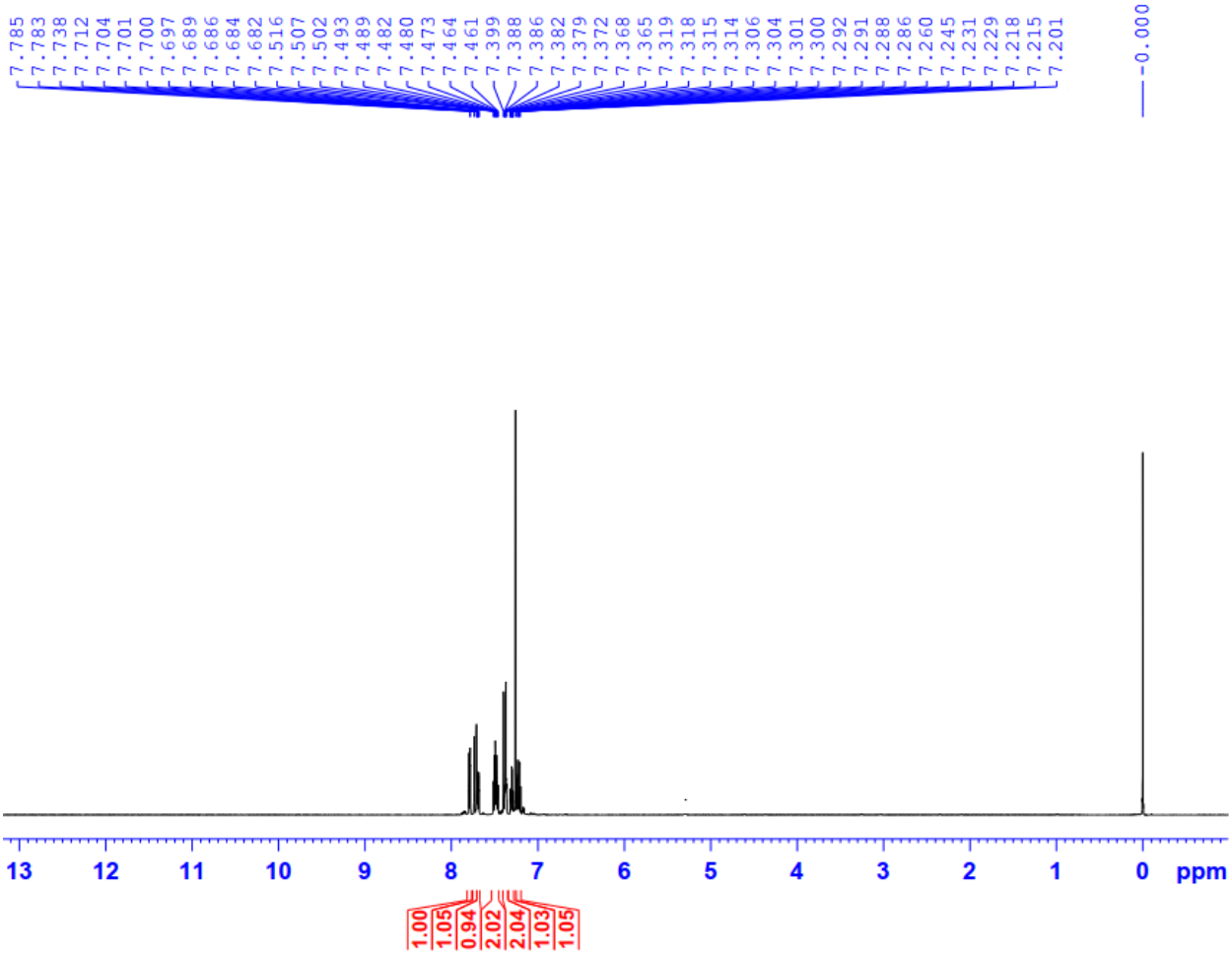


Figure S12a. ^{1}H-NMR spectrum of **2e**.

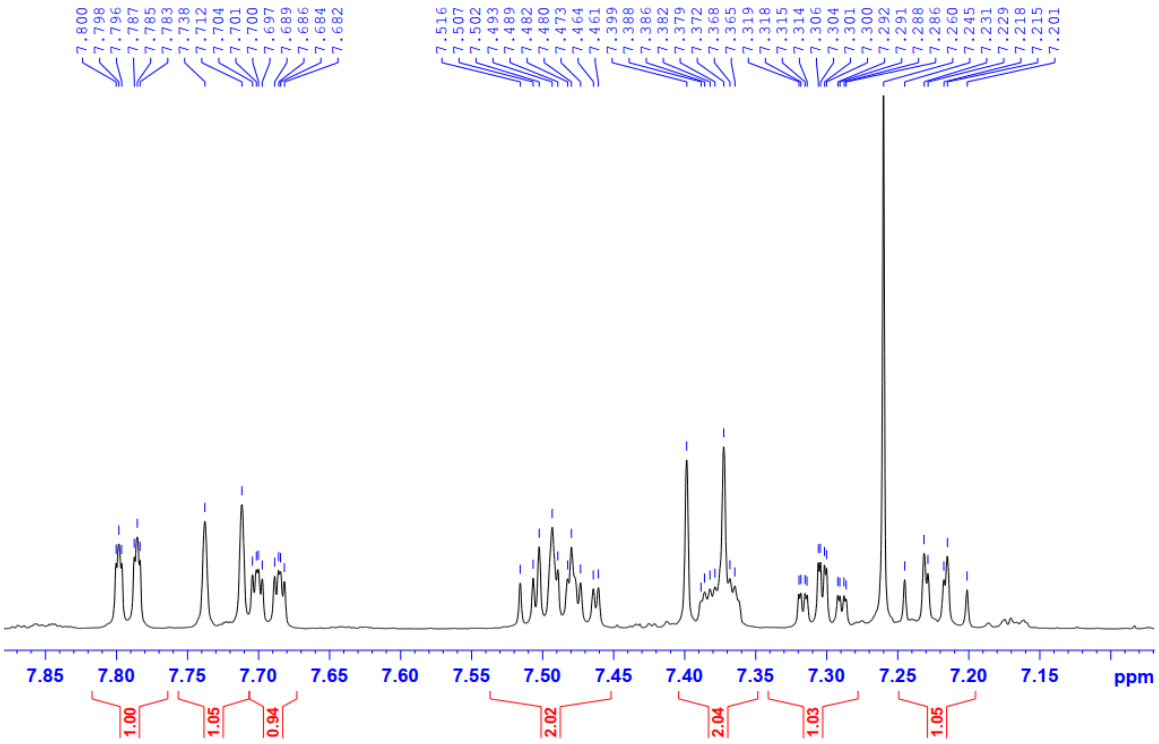


Figure S12b. ^{1}H-NMR spectrum of **2e**.

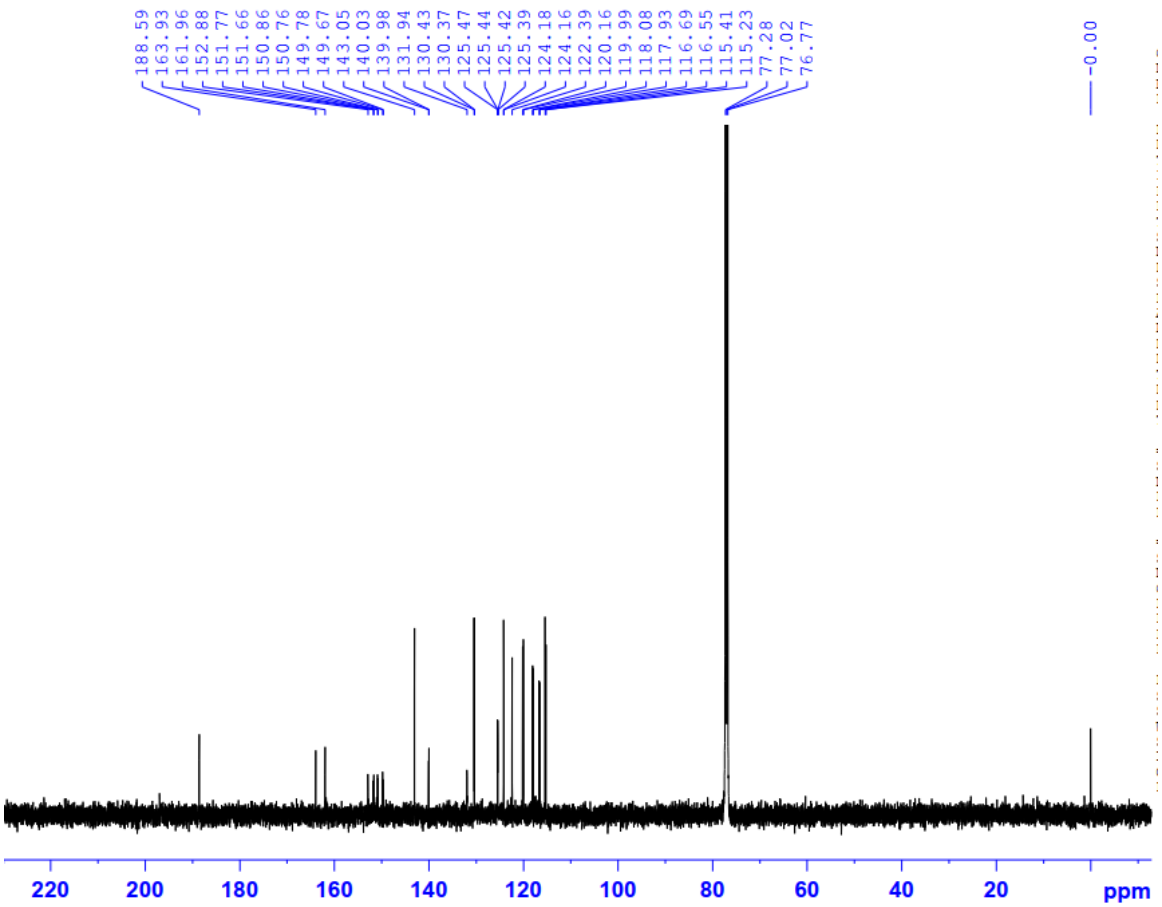


Figure S12c. ^{13}C-NMR spectrum of **2e**.

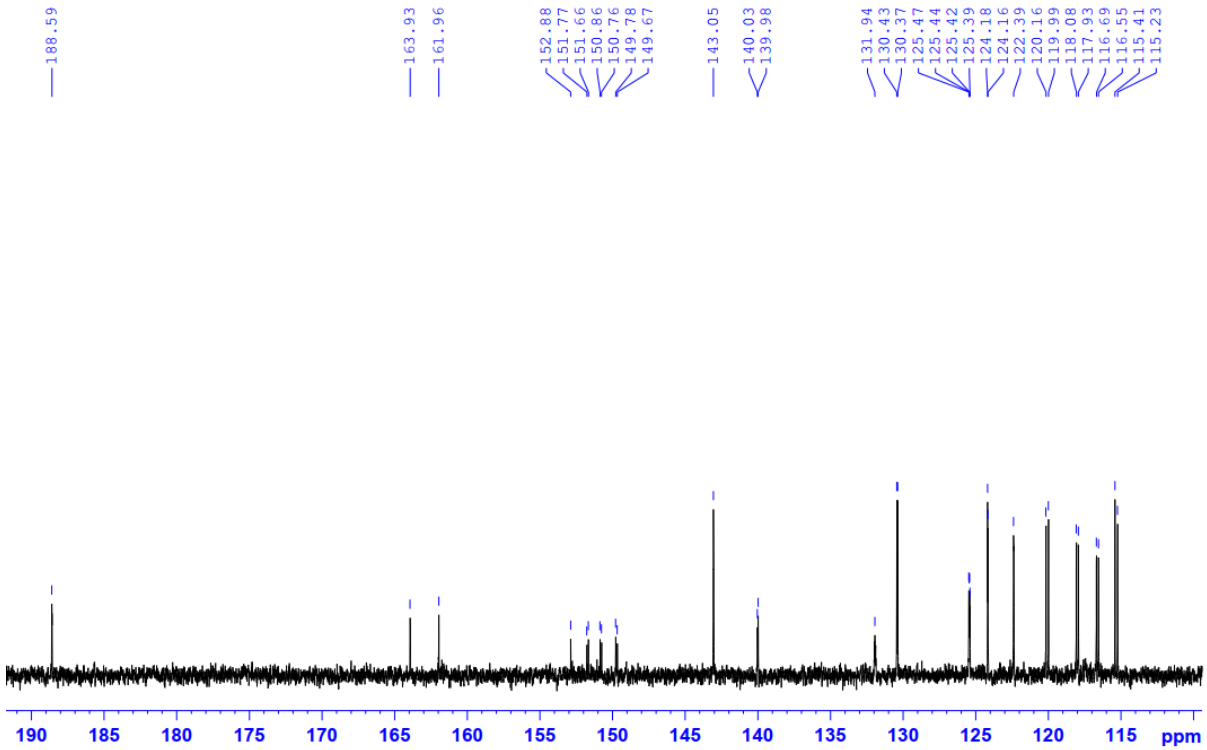


Figure S12d. ^{13}C-NMR spectrum of **2e**.

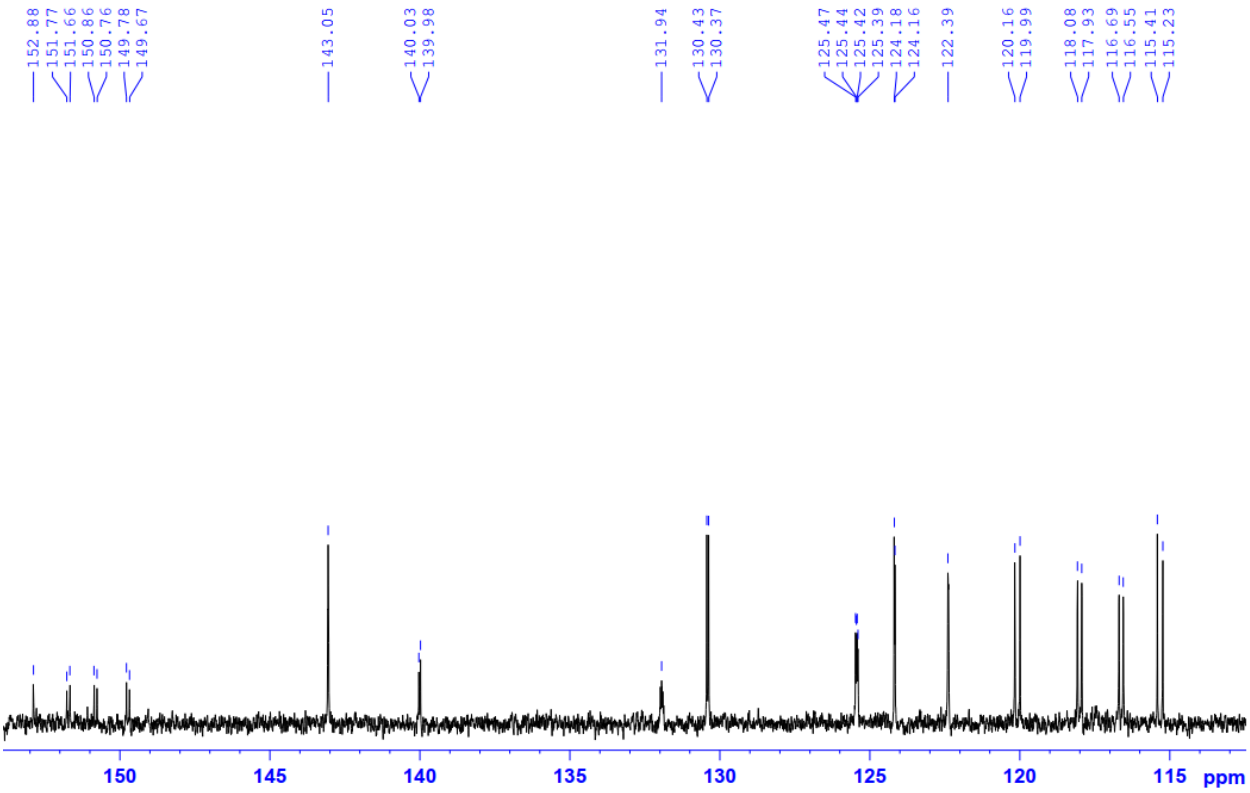


Figure S12e. ^{13}C-NMR spectrum of **2e**.

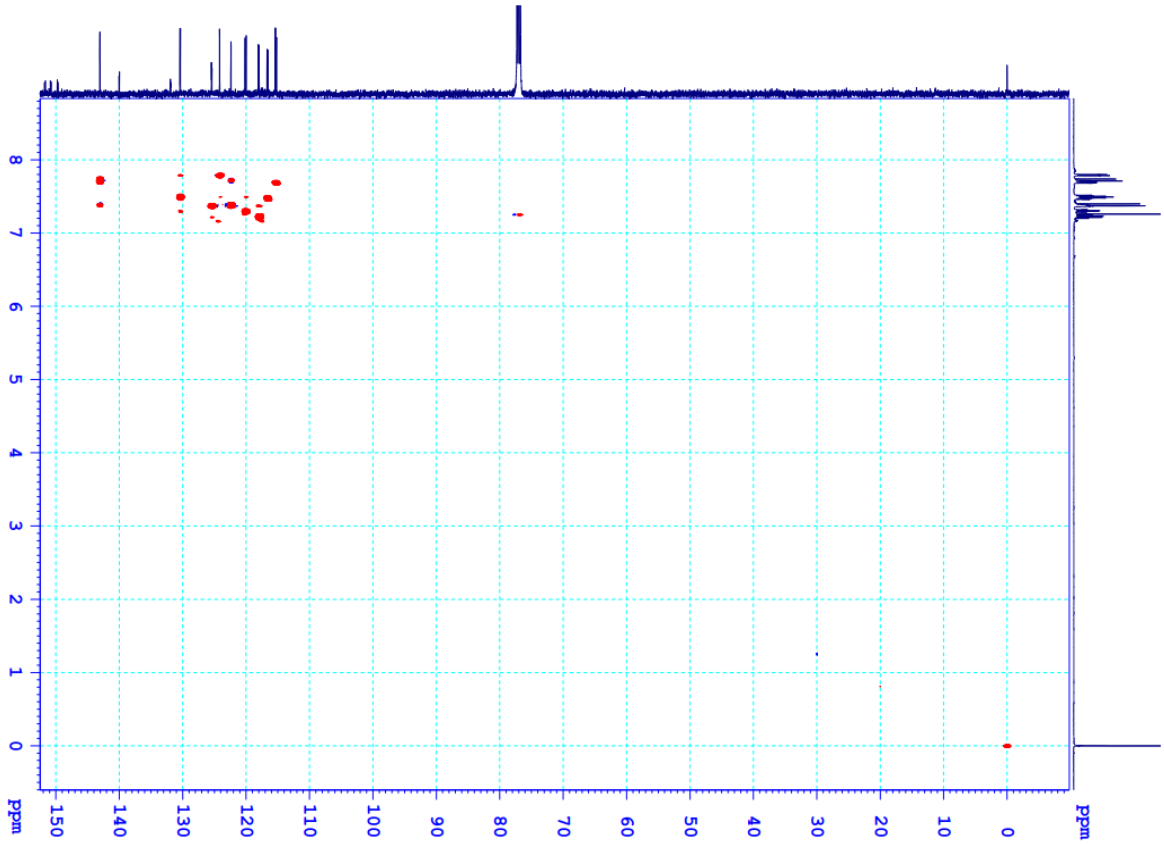


Figure S12f. HSQC spectrum of **2e**.

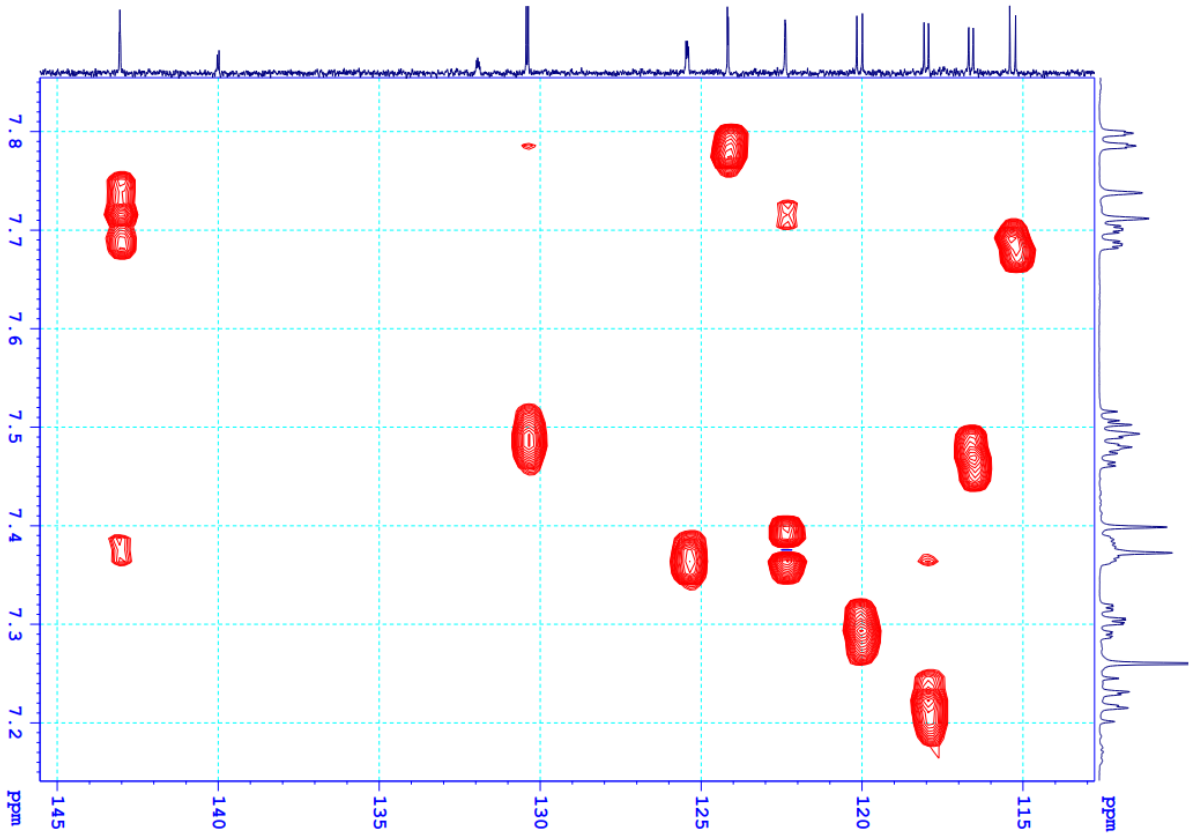


Figure S12g. HSQC spectrum of **2e**.

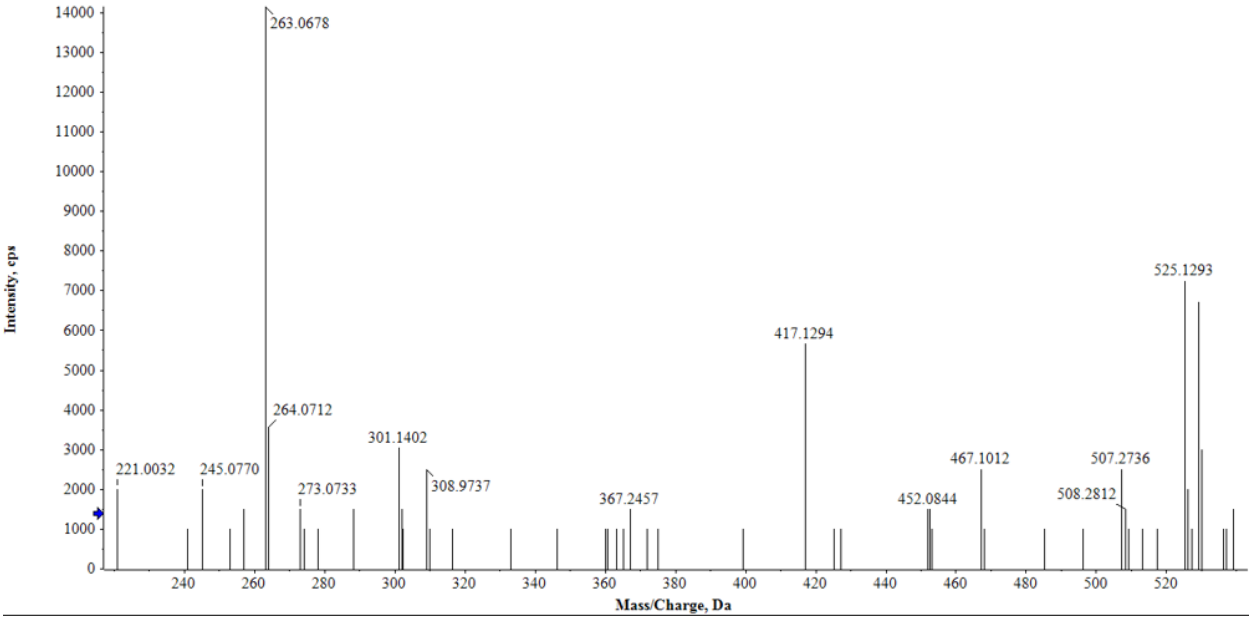


Figure S12h. HRMS of **2e**.

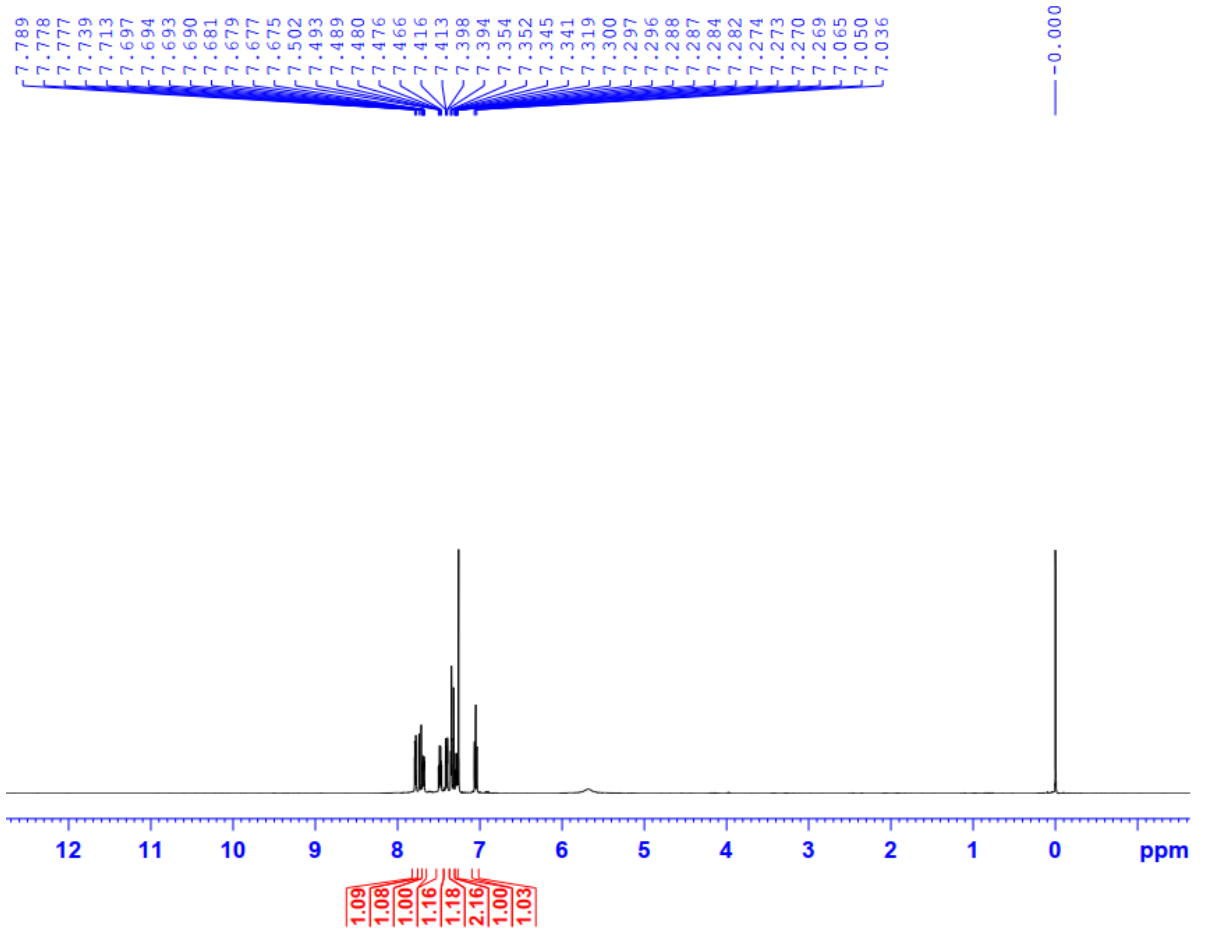


Figure S13a. ^{1}H-NMR spectrum of **2f**.

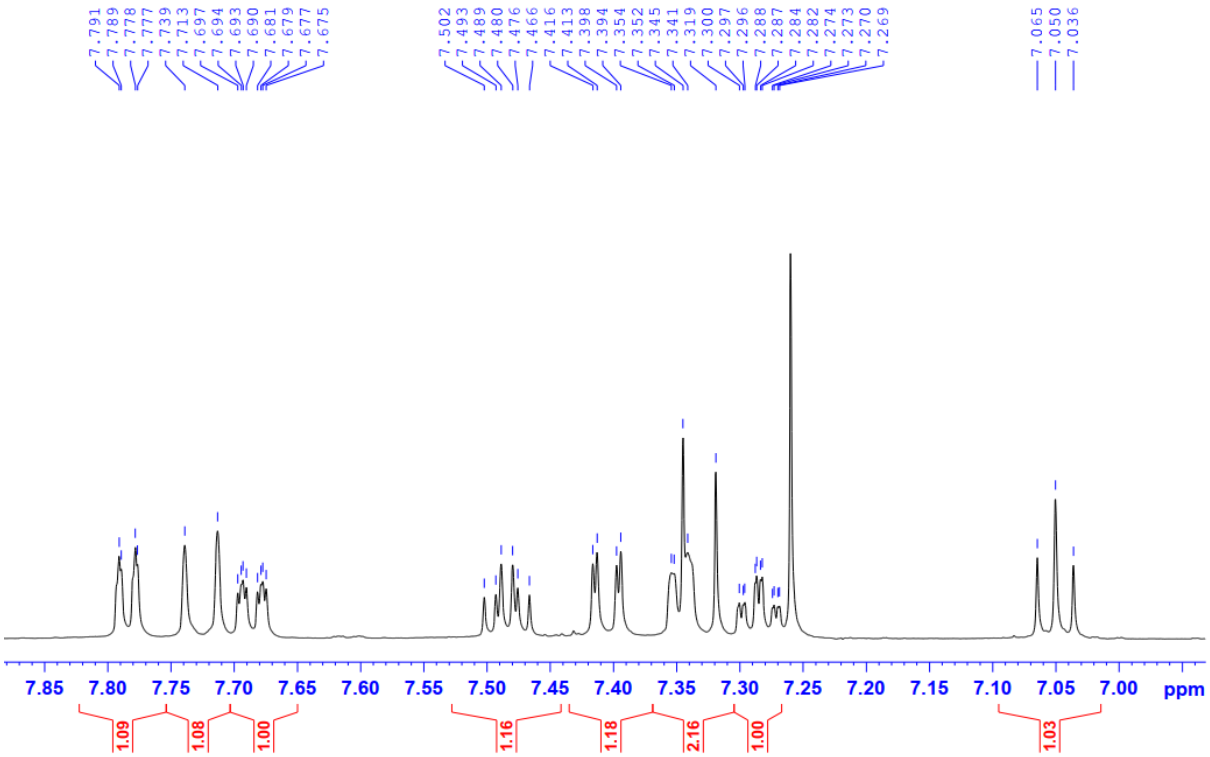


Figure S13b. ^{1}H-NMR spectrum of **2f**.

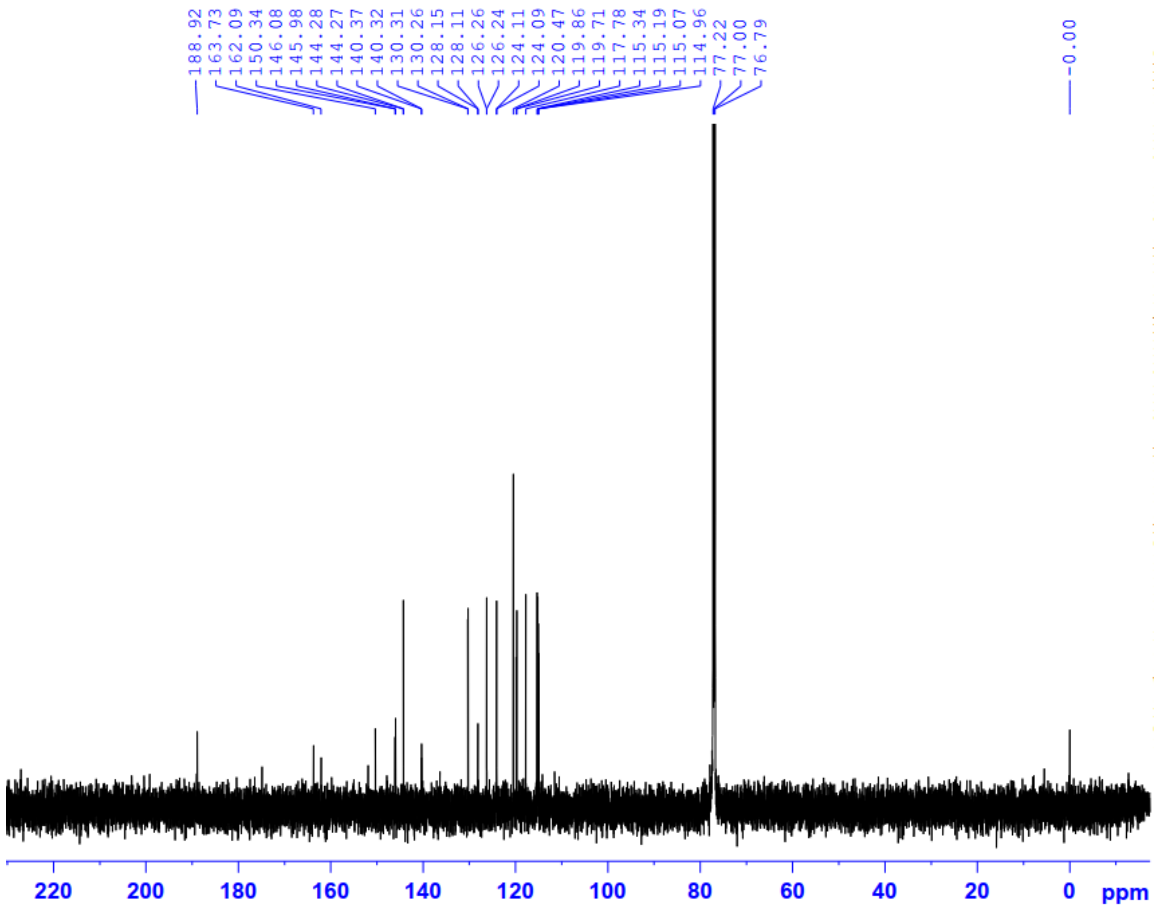


Figure S13c. ^{13}C-NMR spectrum of **2f**.

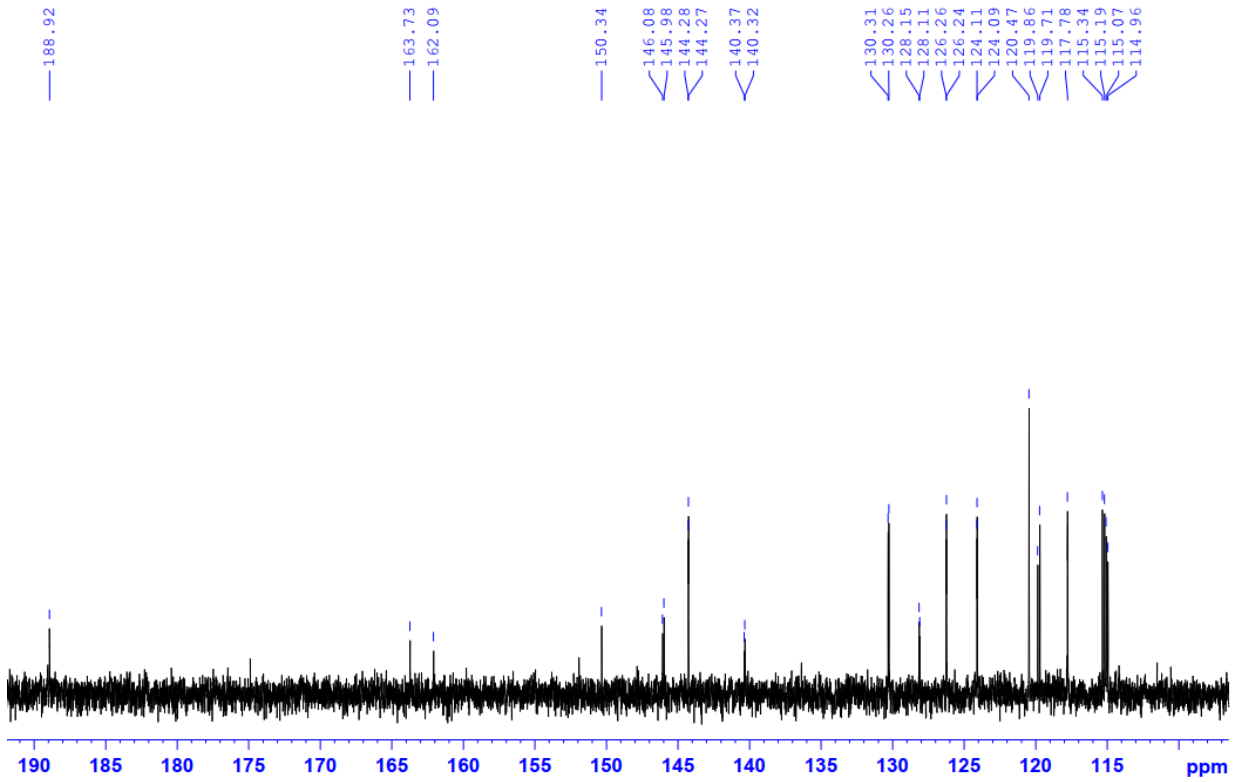


Figure S13d. ^{13}C-NMR spectrum of **2f**.

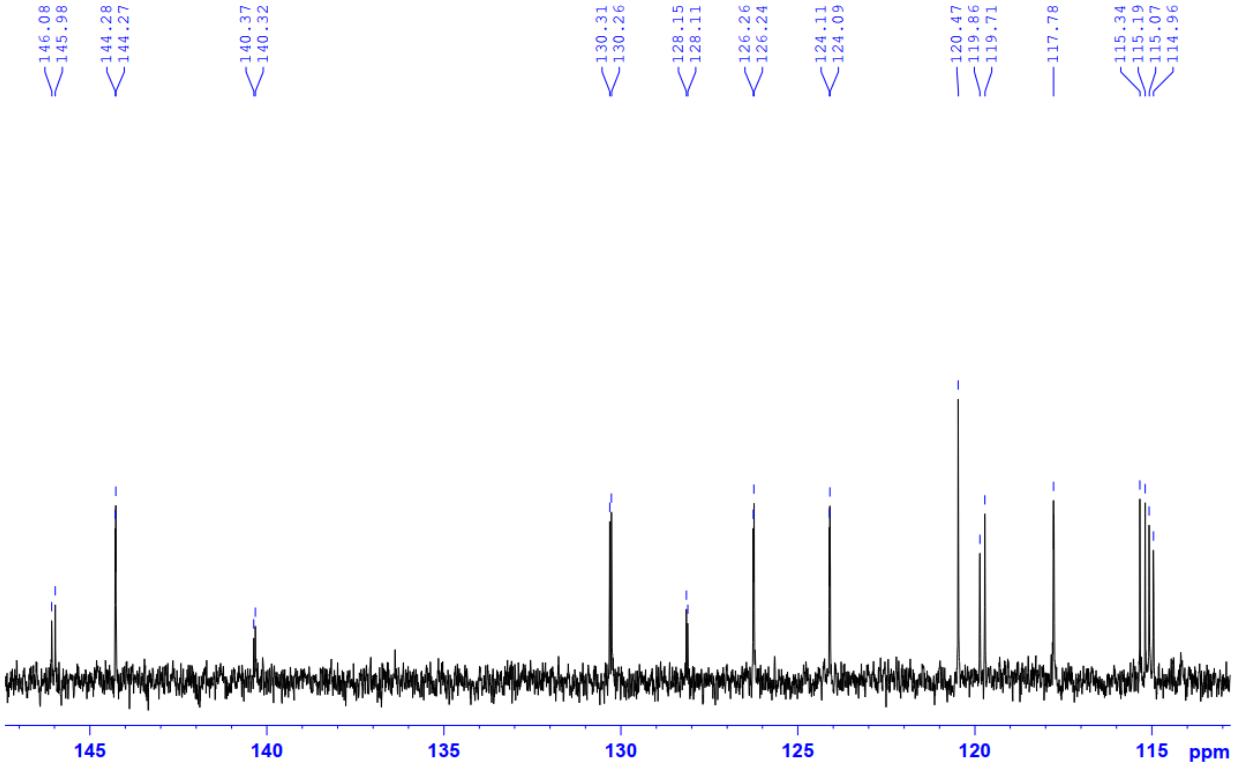


Figure S13e. ^{13}C-NMR spectrum of **2f**.

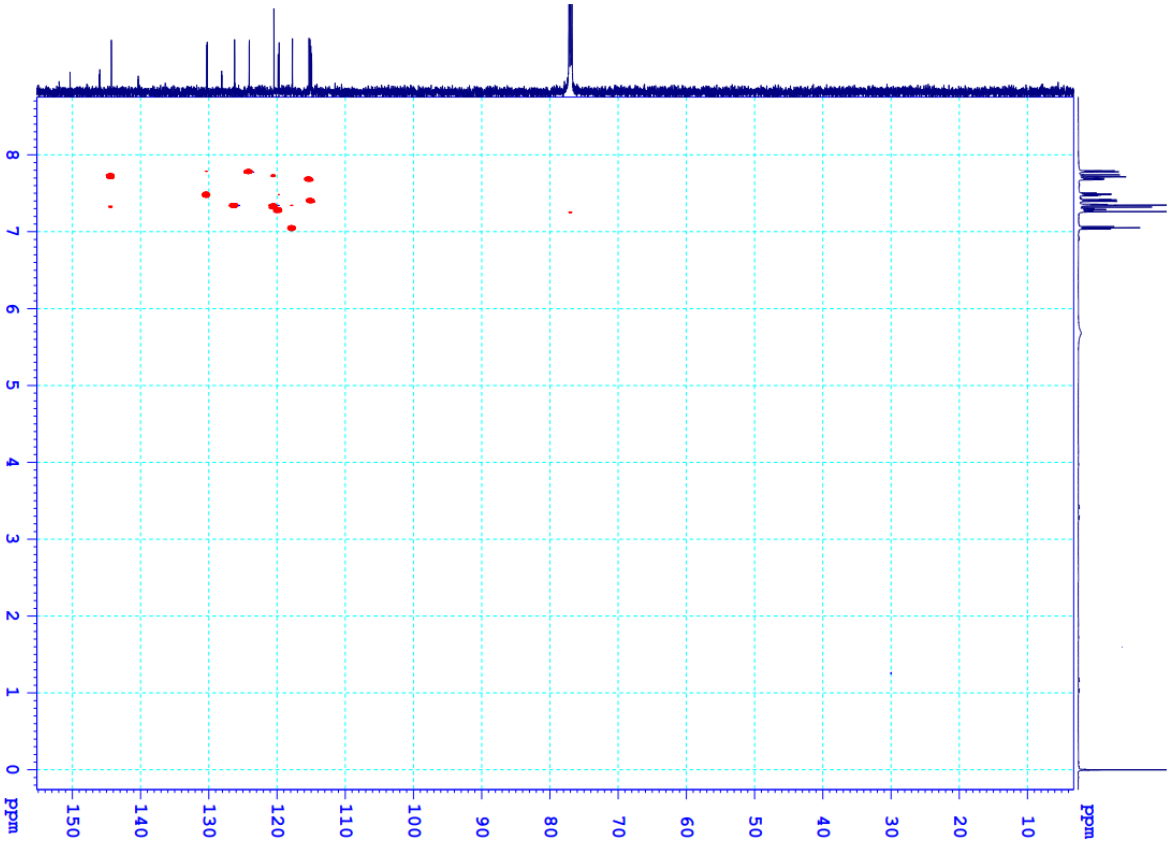


Figure S13f. HSQC spectrum of **2f**.

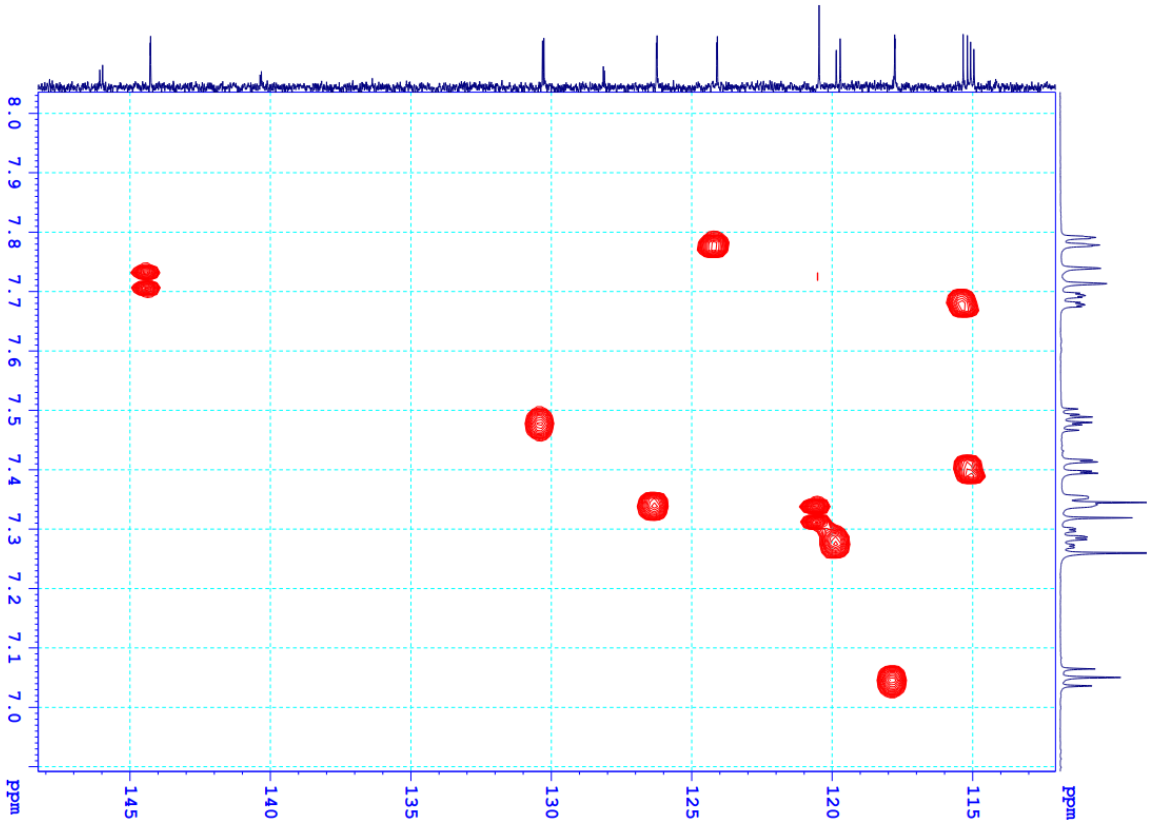


Figure S13g. HSQC spectrum of **2f**.

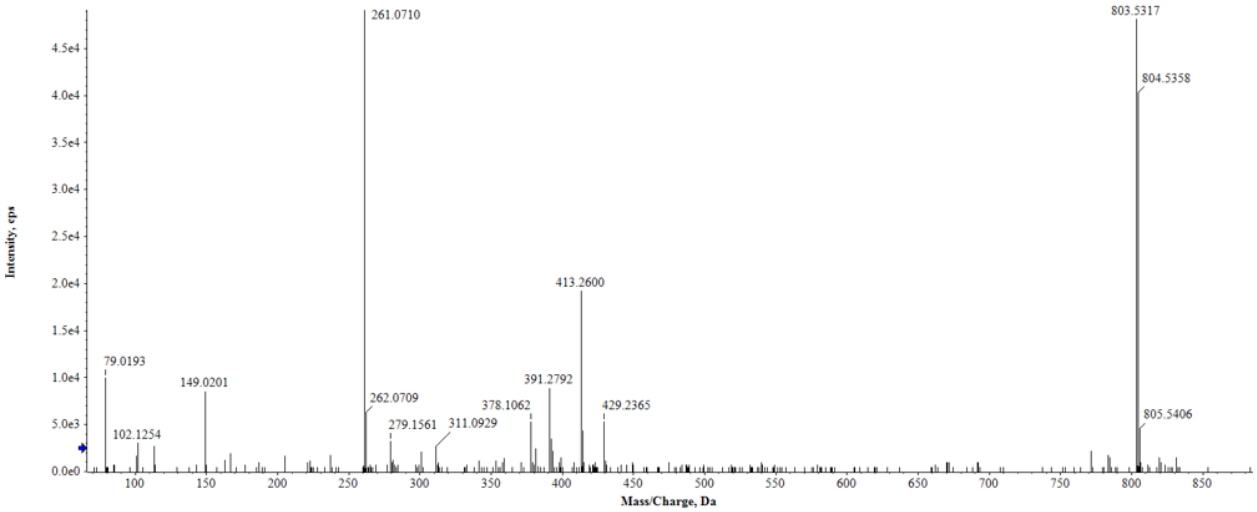


Figure S13h. HRMS of **2f**.

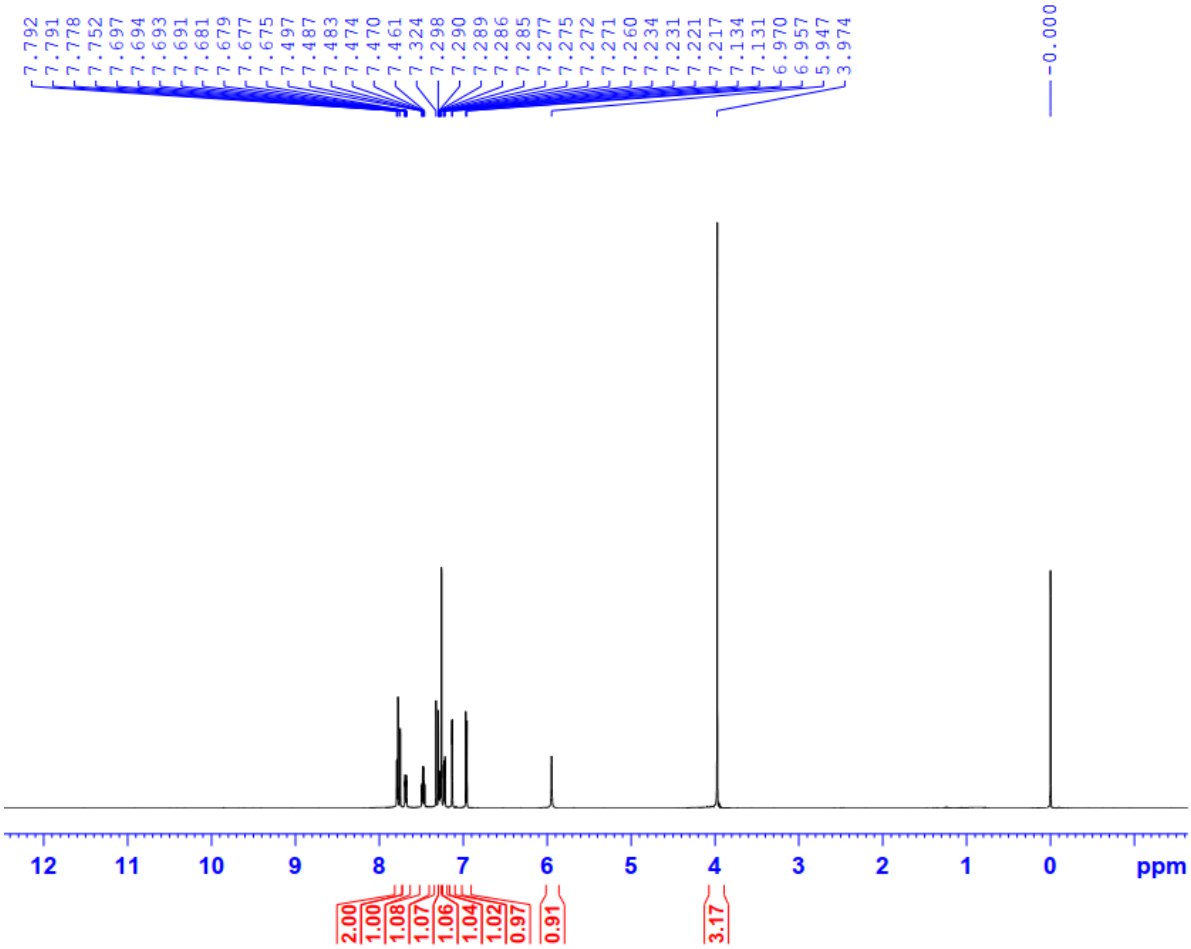


Figure S14a. ^{1}H-NMR spectrum of **2g**.

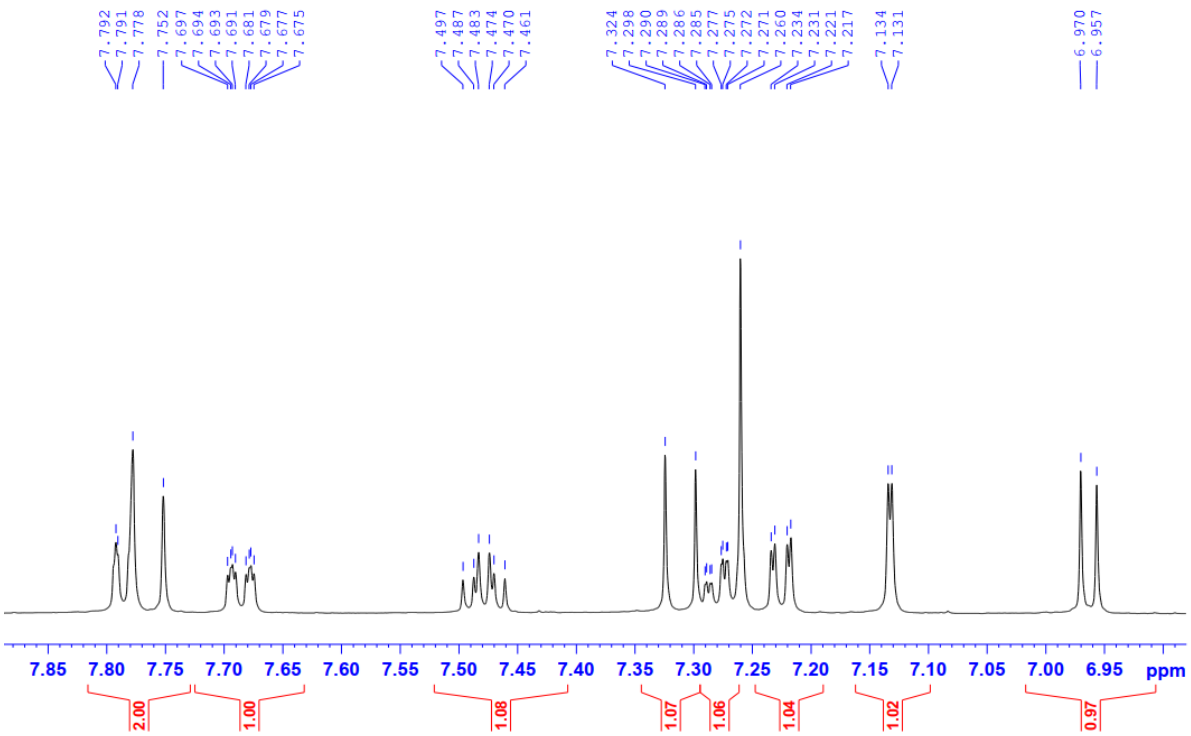


Figure S14b. ^{1}H-NMR spectrum of **2g**.

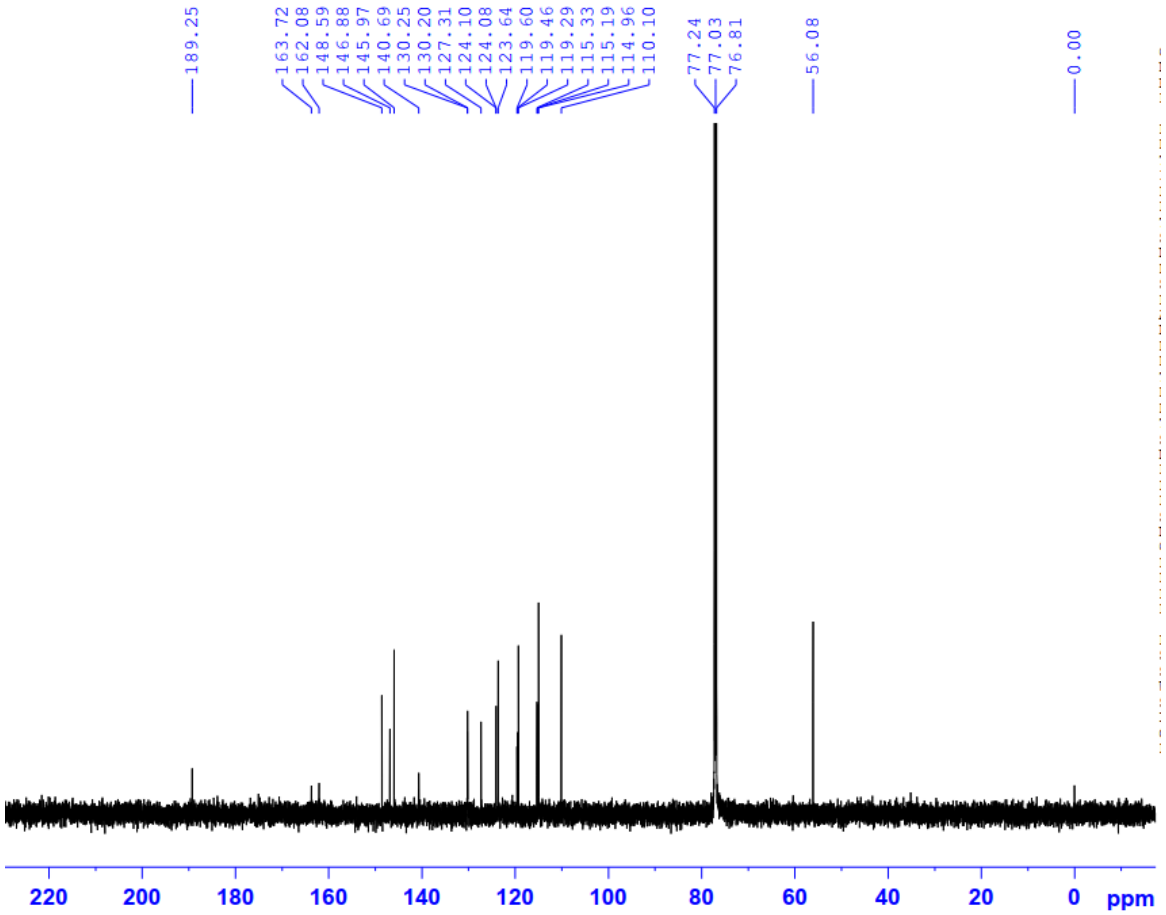


Figure S14c. ^{13}C-NMR spectrum of **2g**.

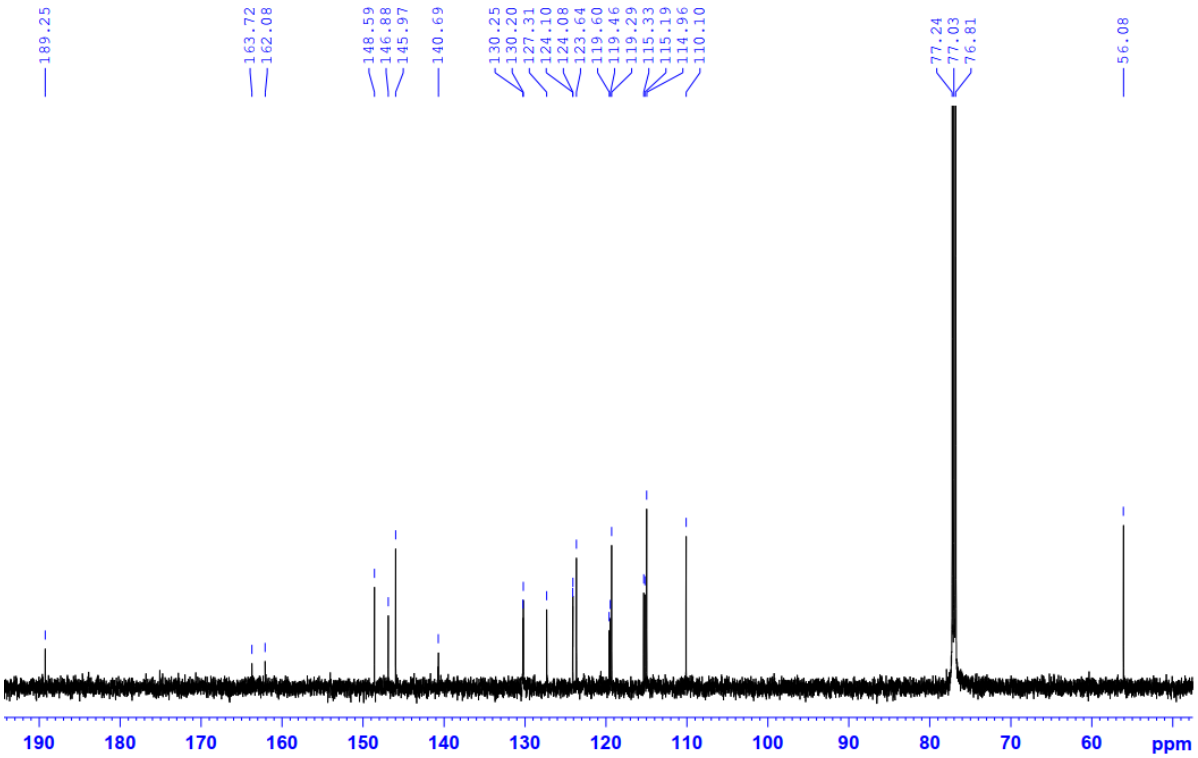


Figure S14d. ^{13}C-NMR spectrum of **2g**.

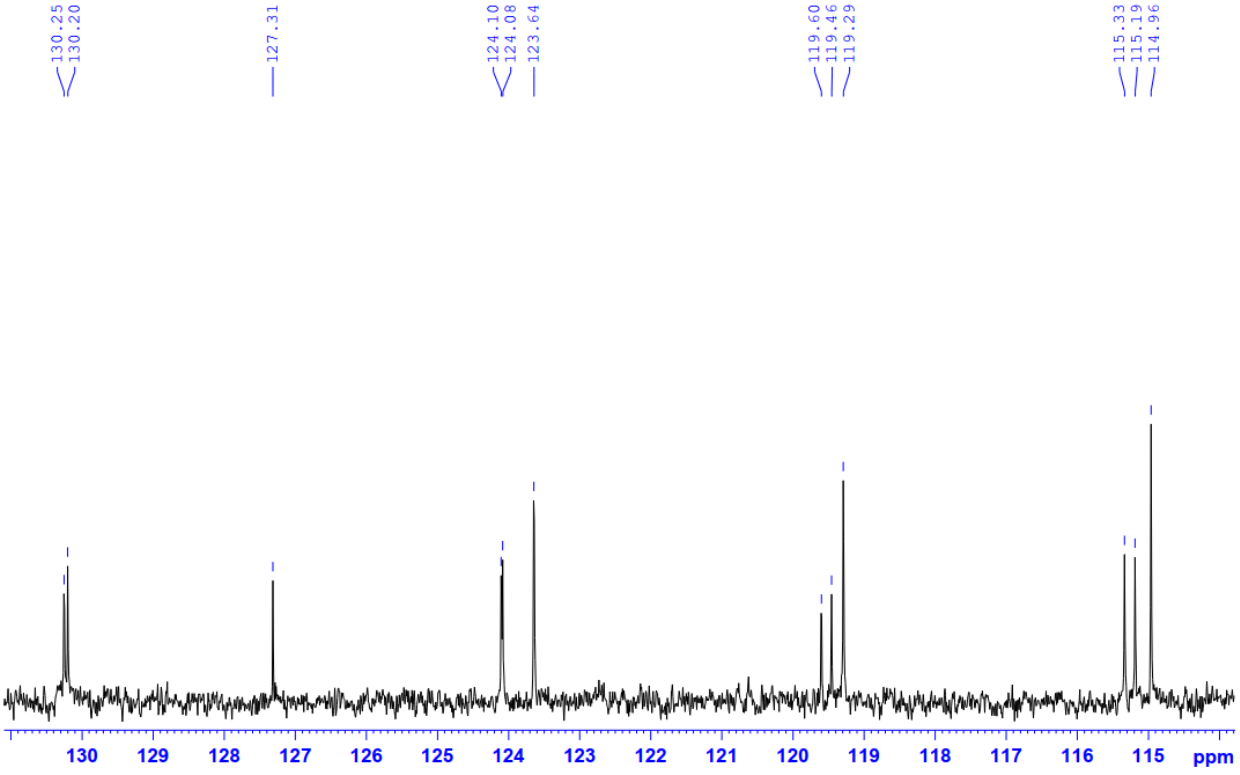


Figure S14e. ^{13}C-NMR spectrum of **2g**.

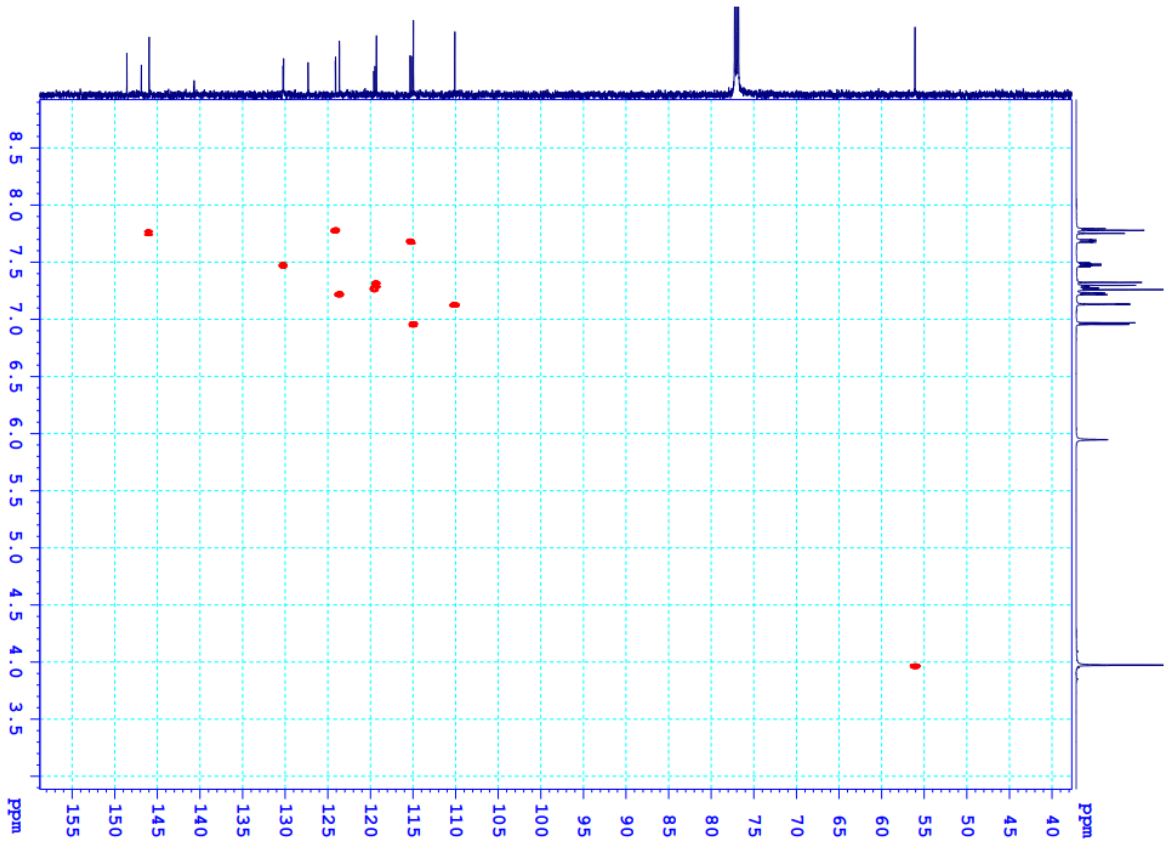


Figure S14f. HSQC spectrum of **2g**.

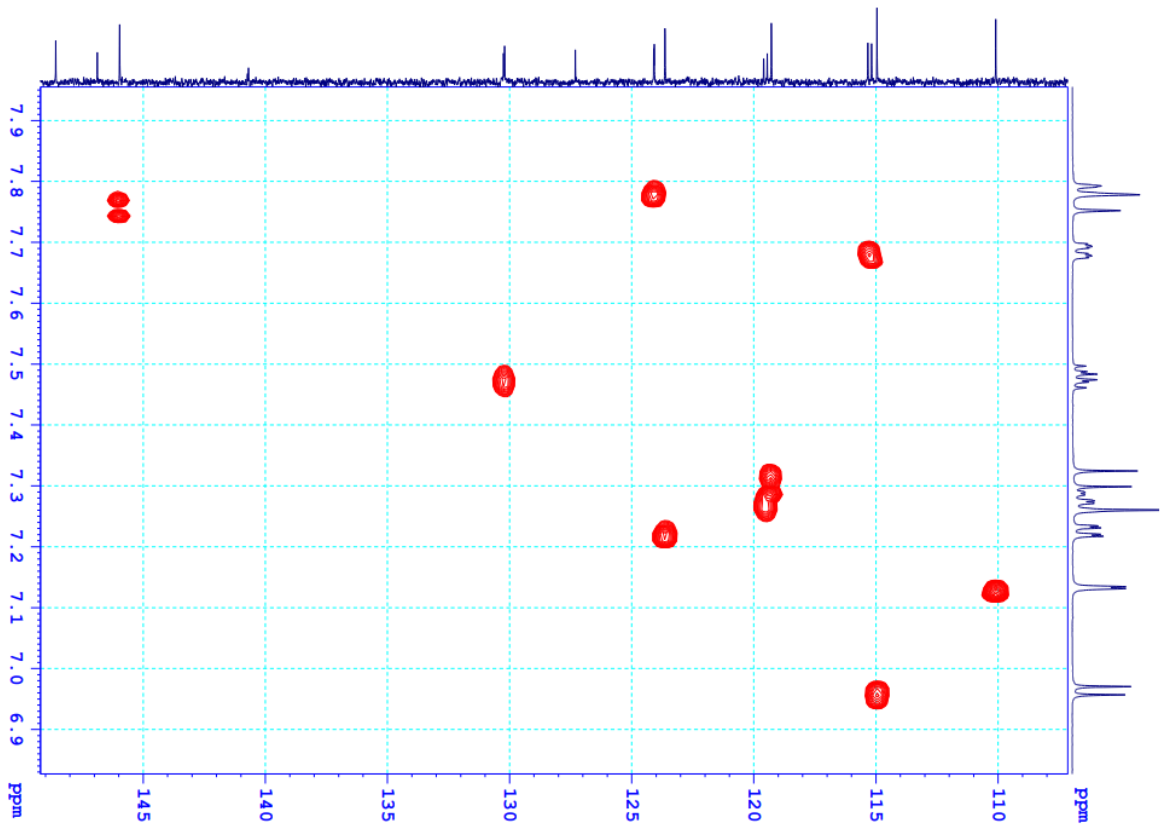


Figure S14g. HSQC spectrum of **2g**.

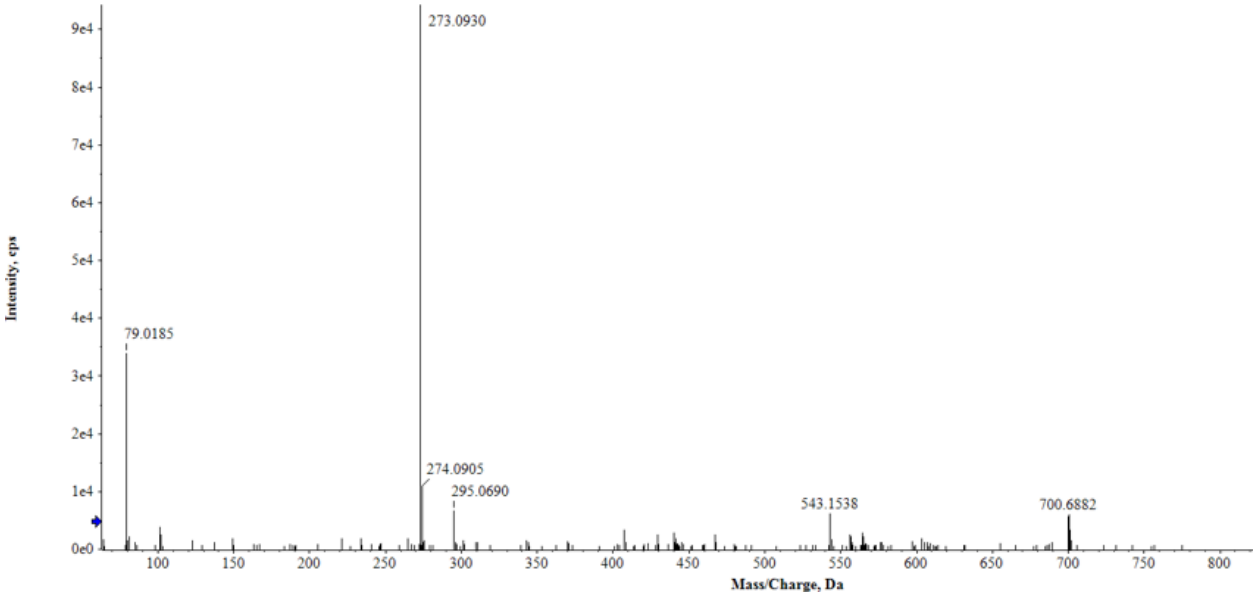


Figure S14h. HRMS of **2g**.

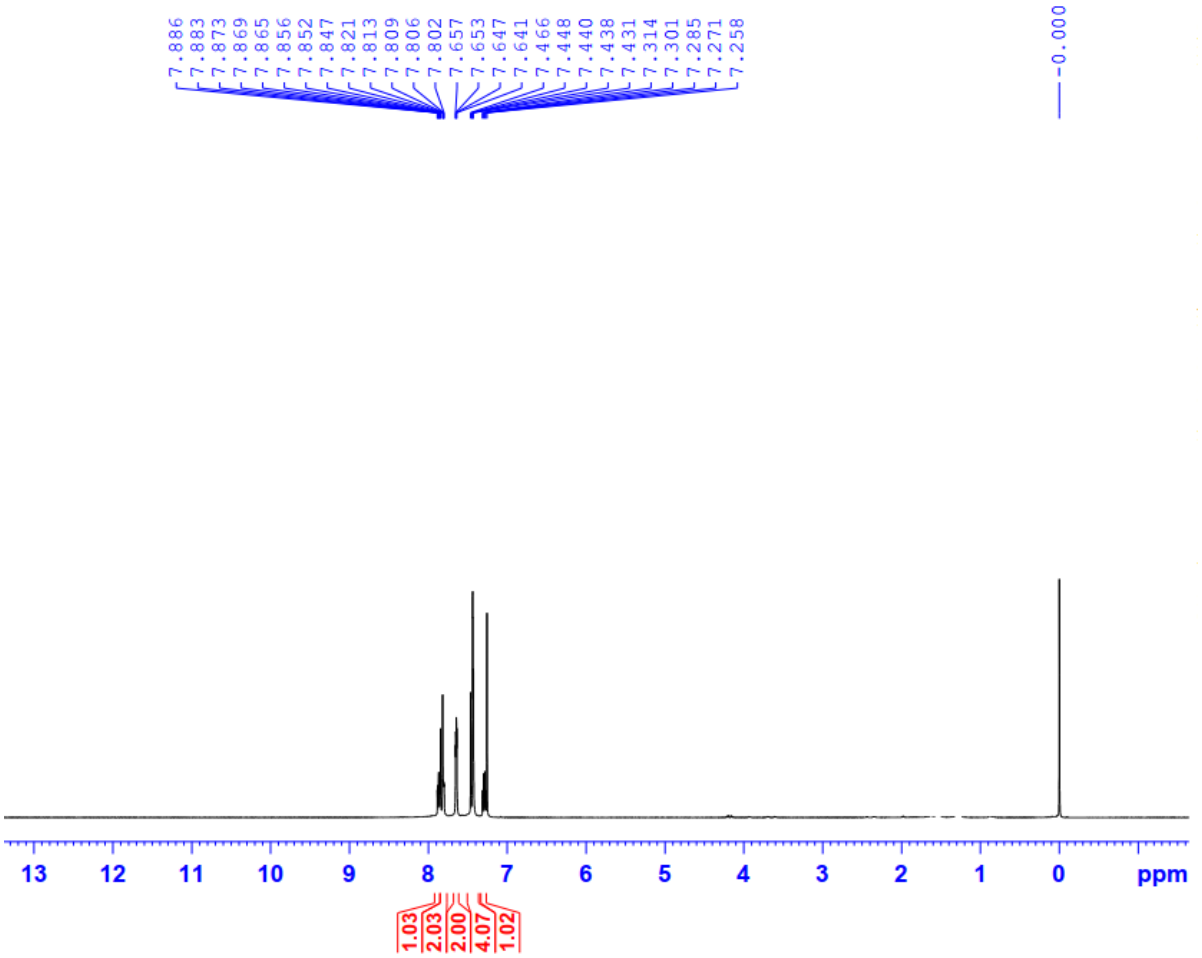


Figure S15a. ^{1}H-NMR spectrum of **3a**.

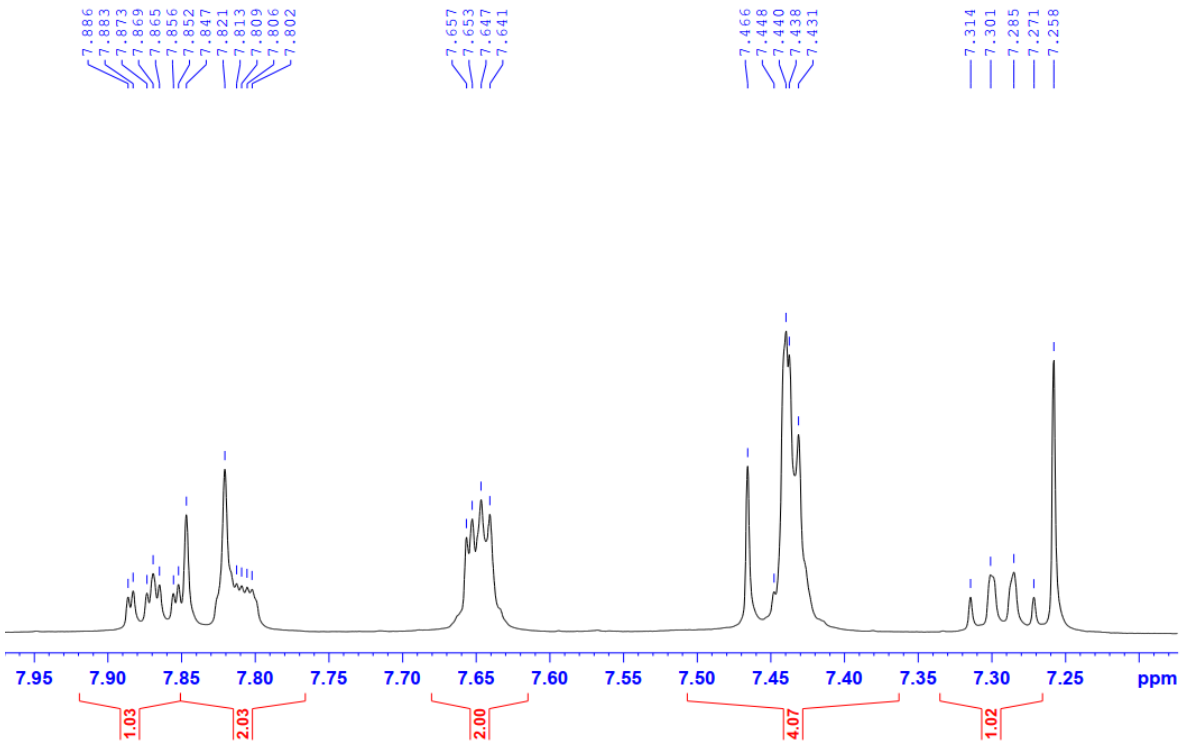


Figure S15b. ^{1}H-NMR spectrum of **3a**.

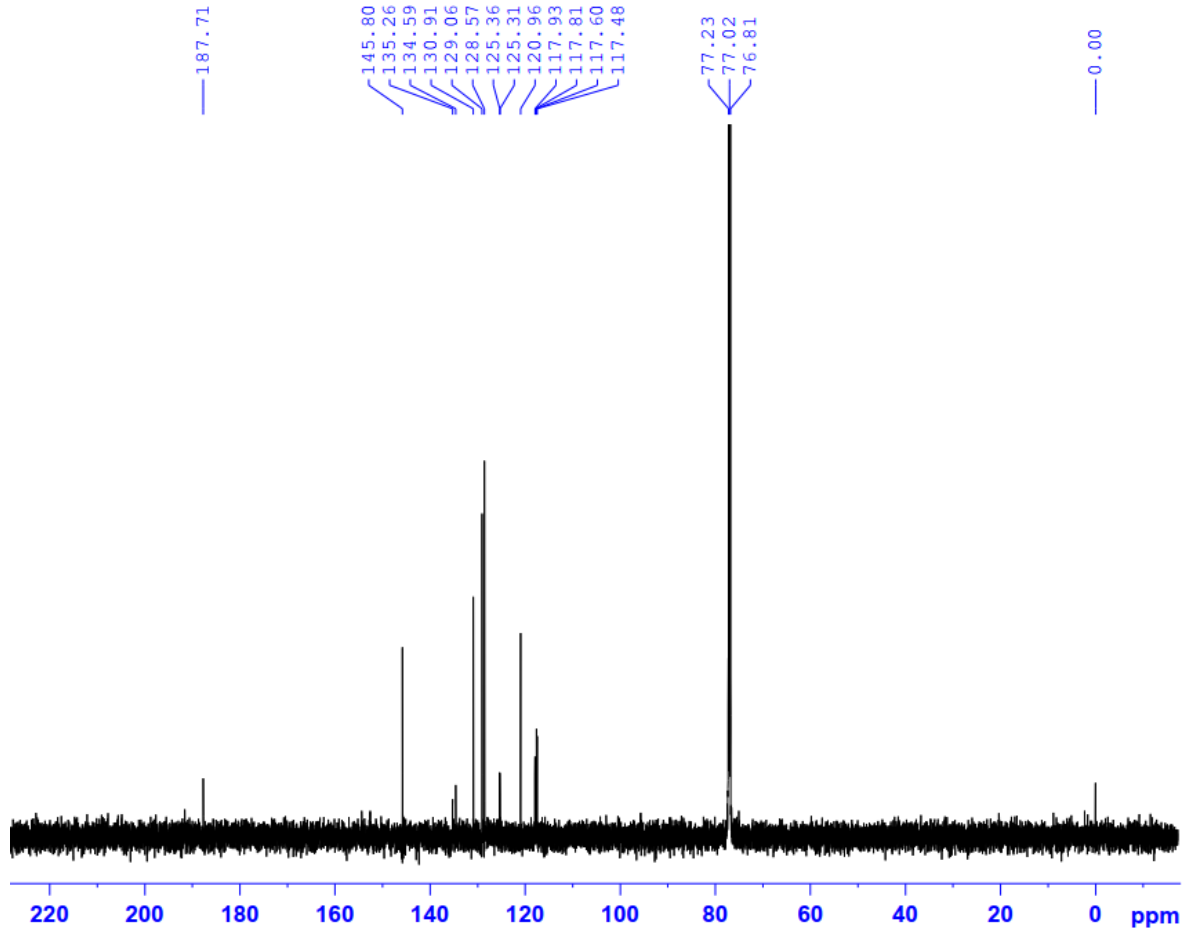


Figure S15c. ^{13}C-NMR spectrum of **3a**.

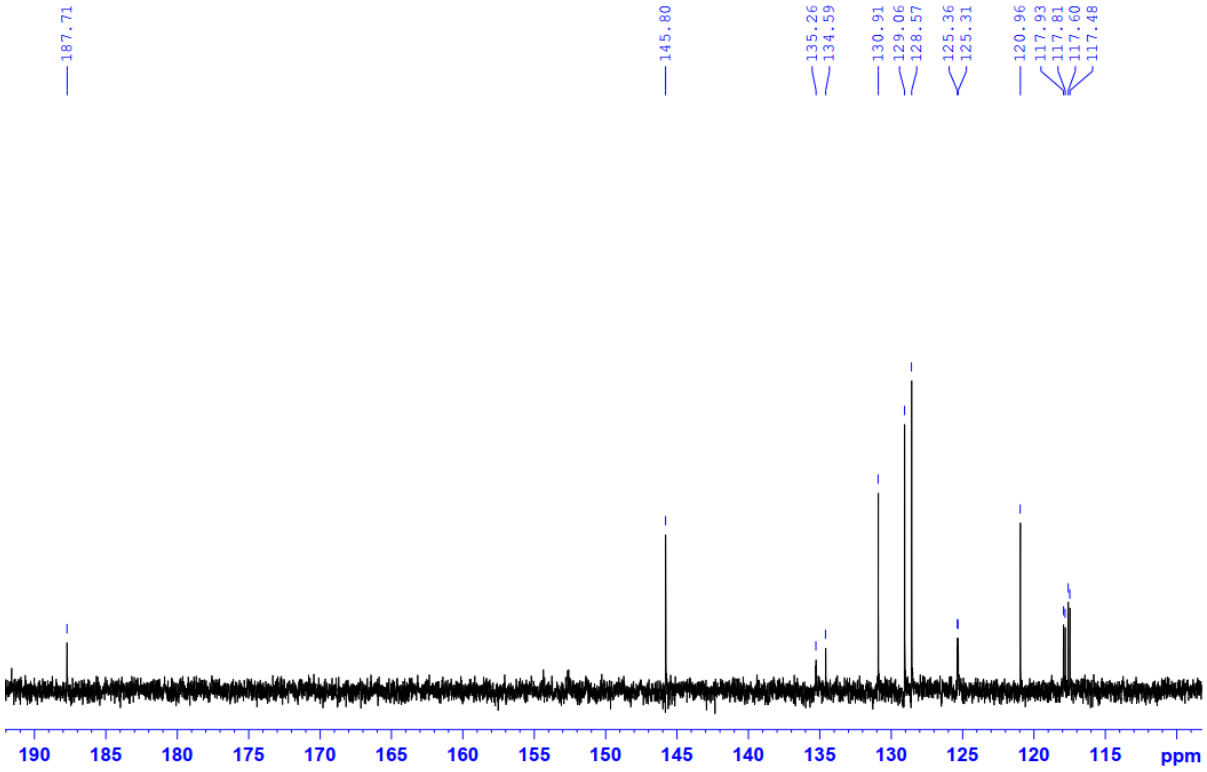


Figure S15d. ^{13}C-NMR spectrum of **3a**.

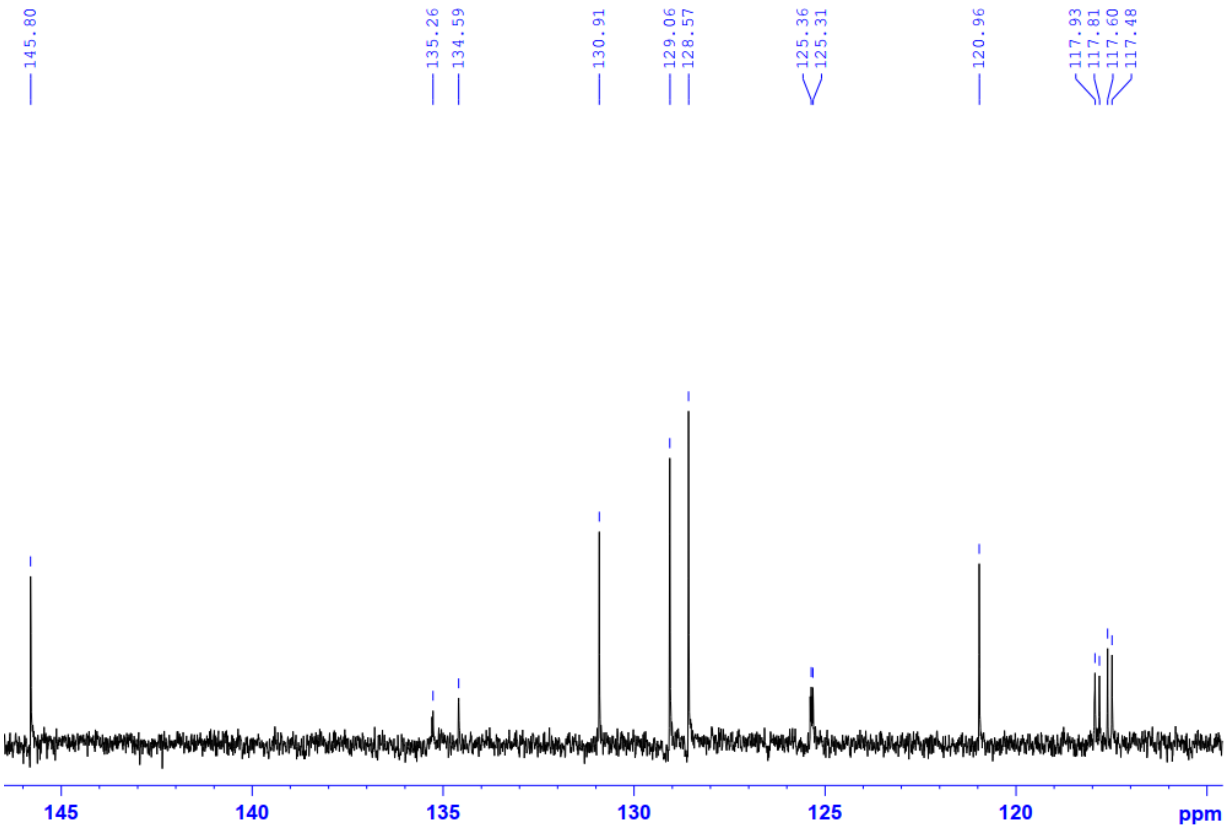


Figure S15e. ^{13}C-NMR spectrum of **3a**.

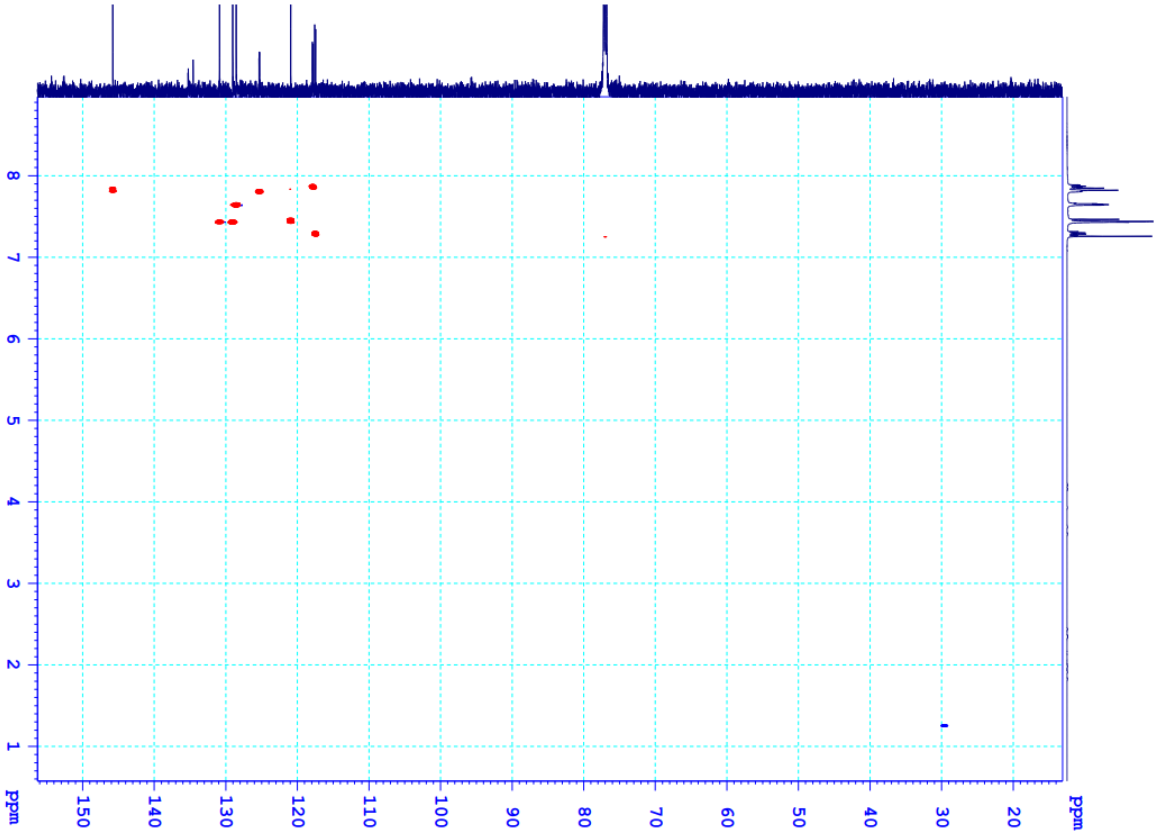


Figure S15f. HSQC spectrum of **3a**.

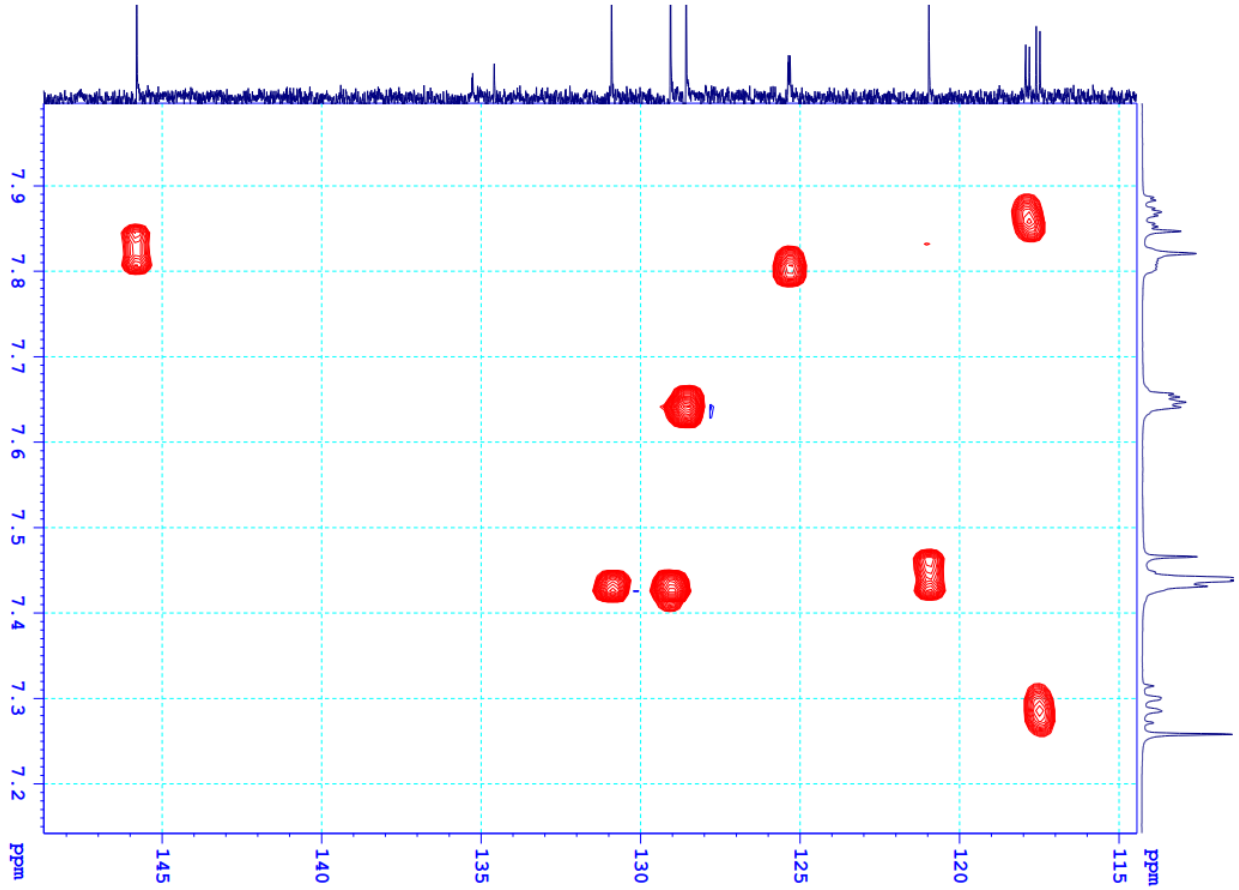


Figure S15g. HSQC spectrum of **3a**.

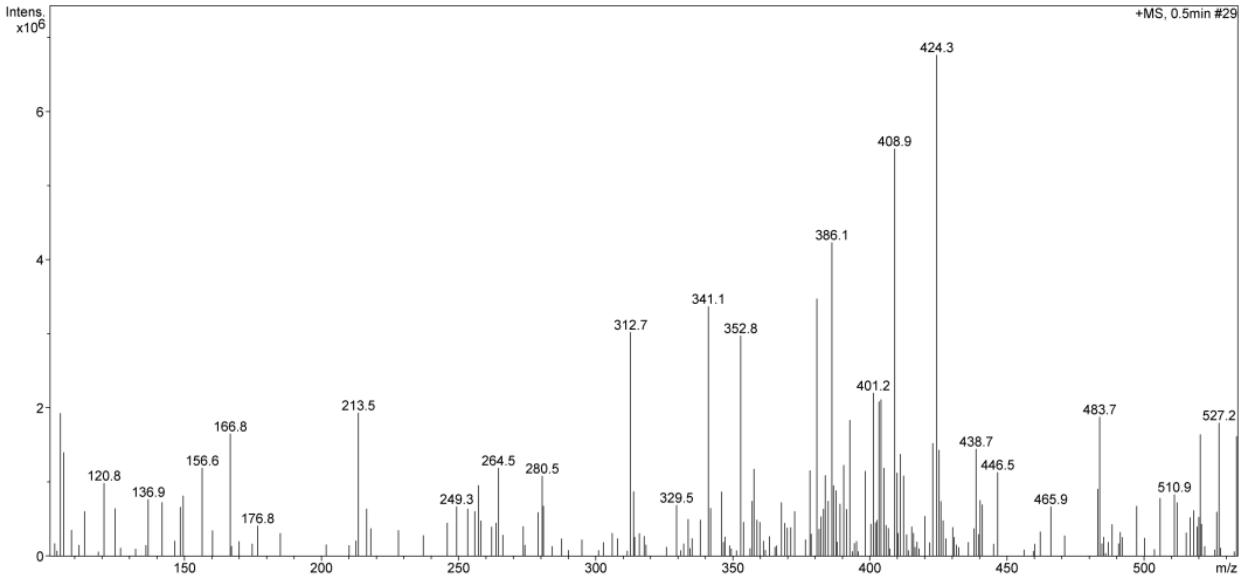


Figure S15h. MS of **3a**.

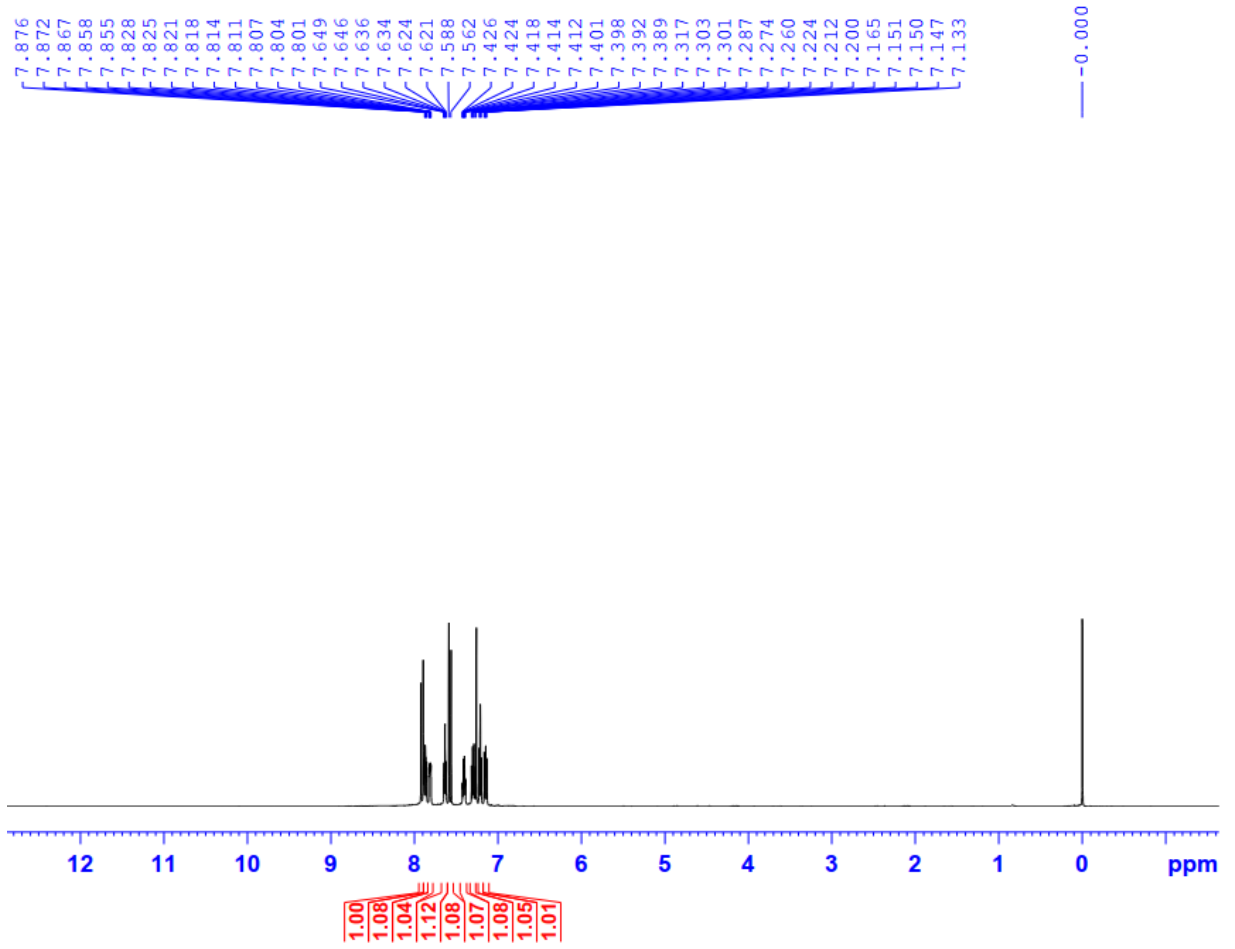


Figure S16a. ^{1}H-NMR spectrum of **3b**.

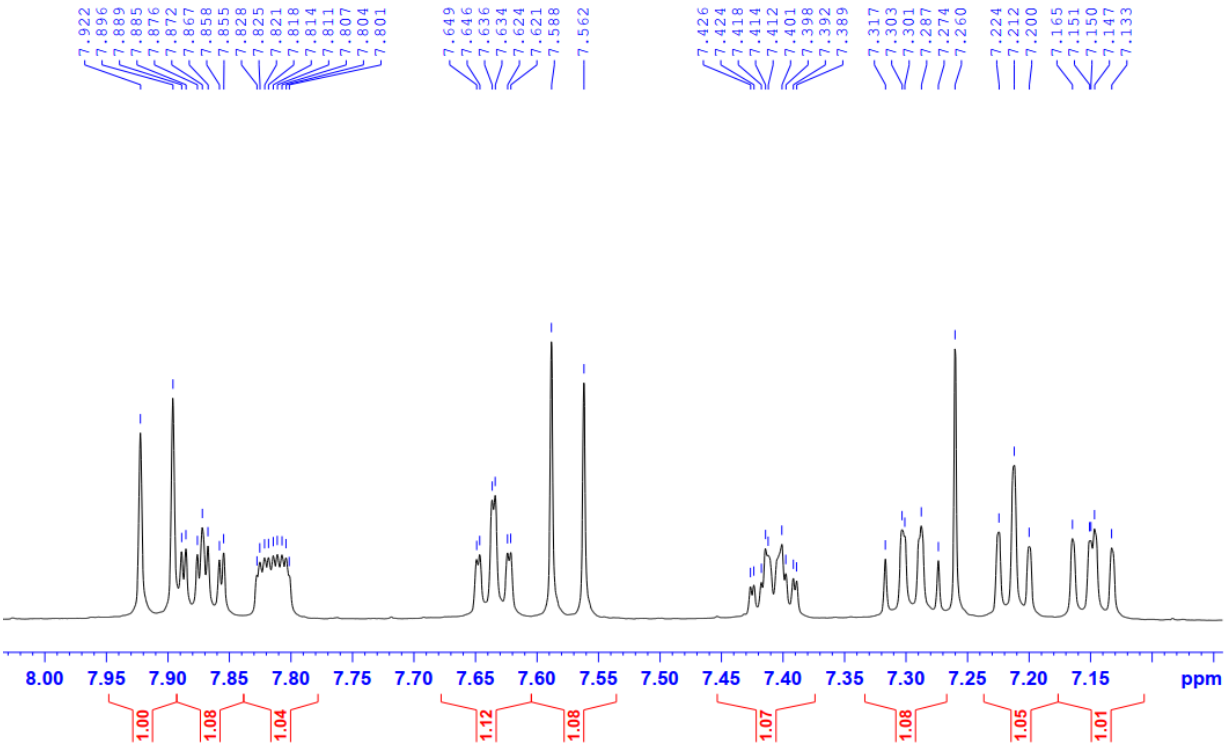


Figure S16b. ^{1}H-NMR spectrum of **3b**.

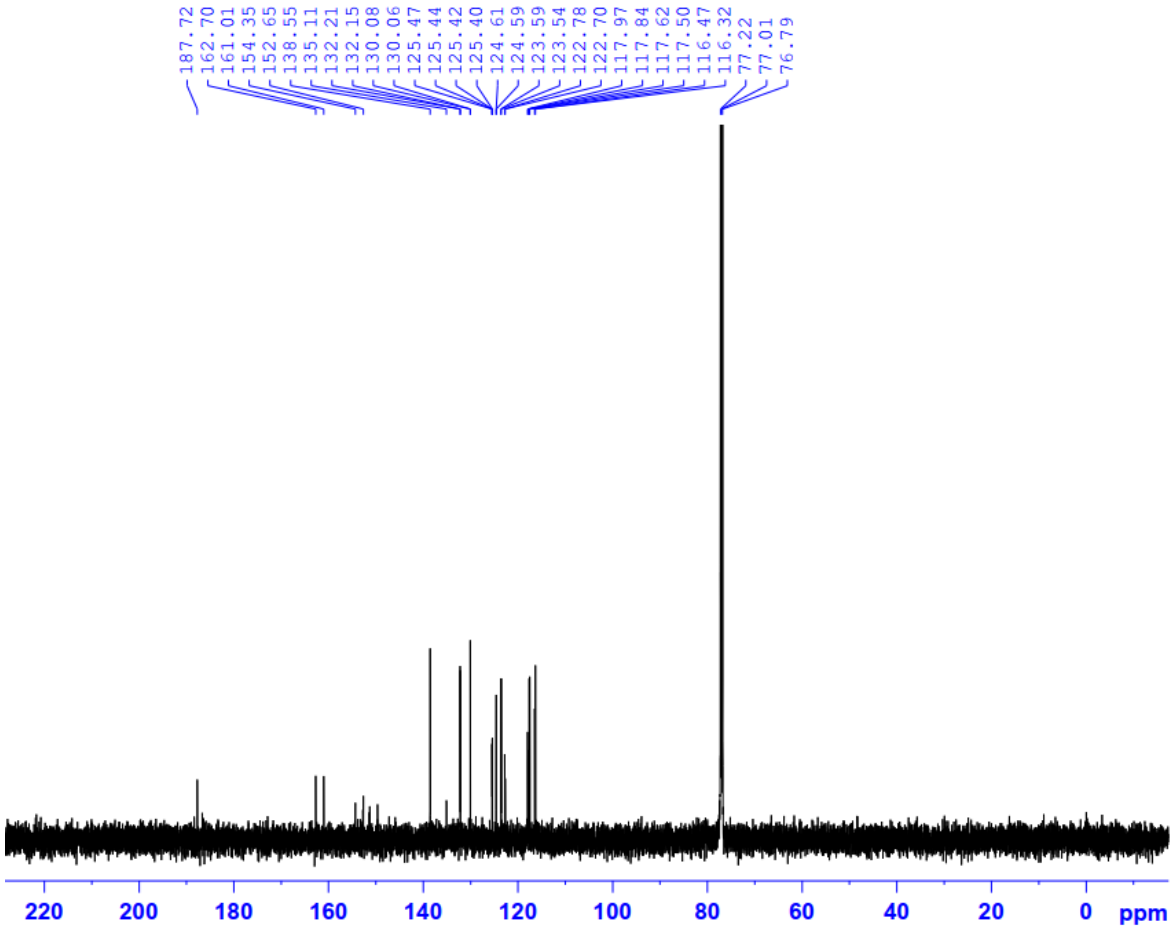


Figure S16c. ^{13}C-NMR spectrum of **3b**.

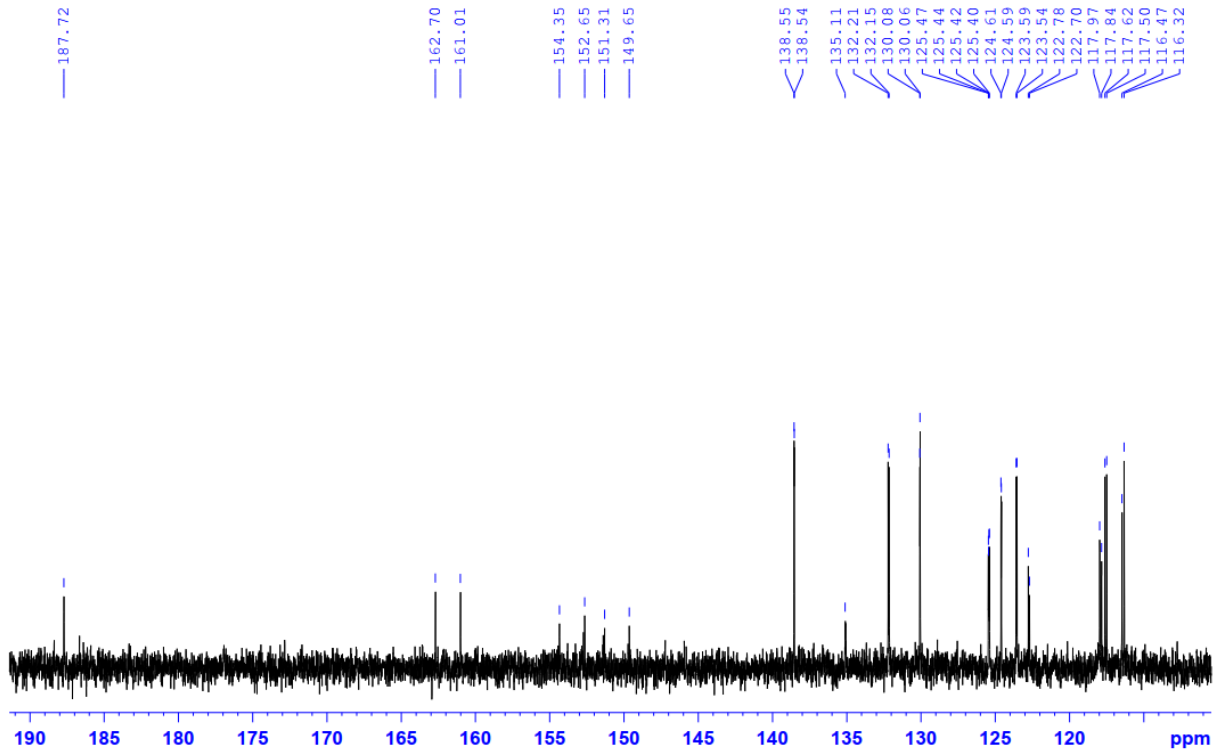


Figure S16d. ^{13}C-NMR spectrum of **3b**.

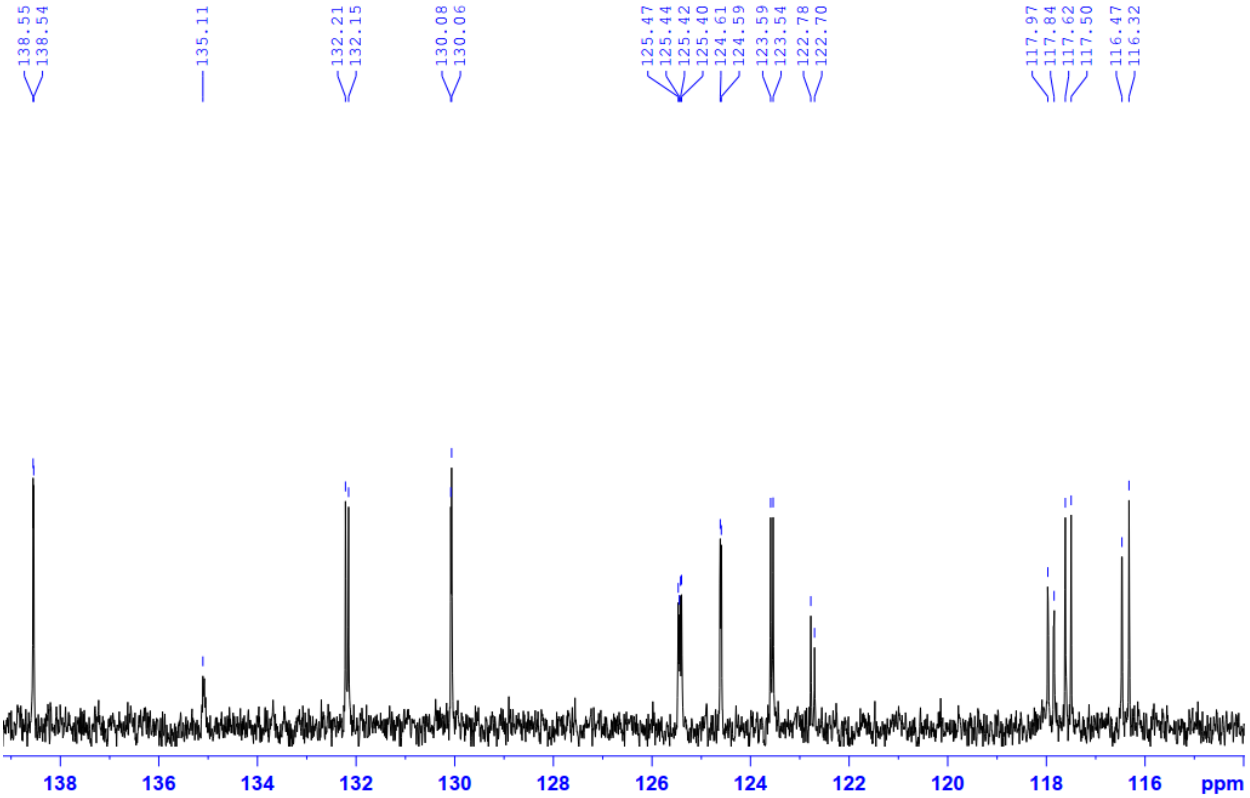


Figure S16e. ^{13}C-NMR spectrum of **3b**.

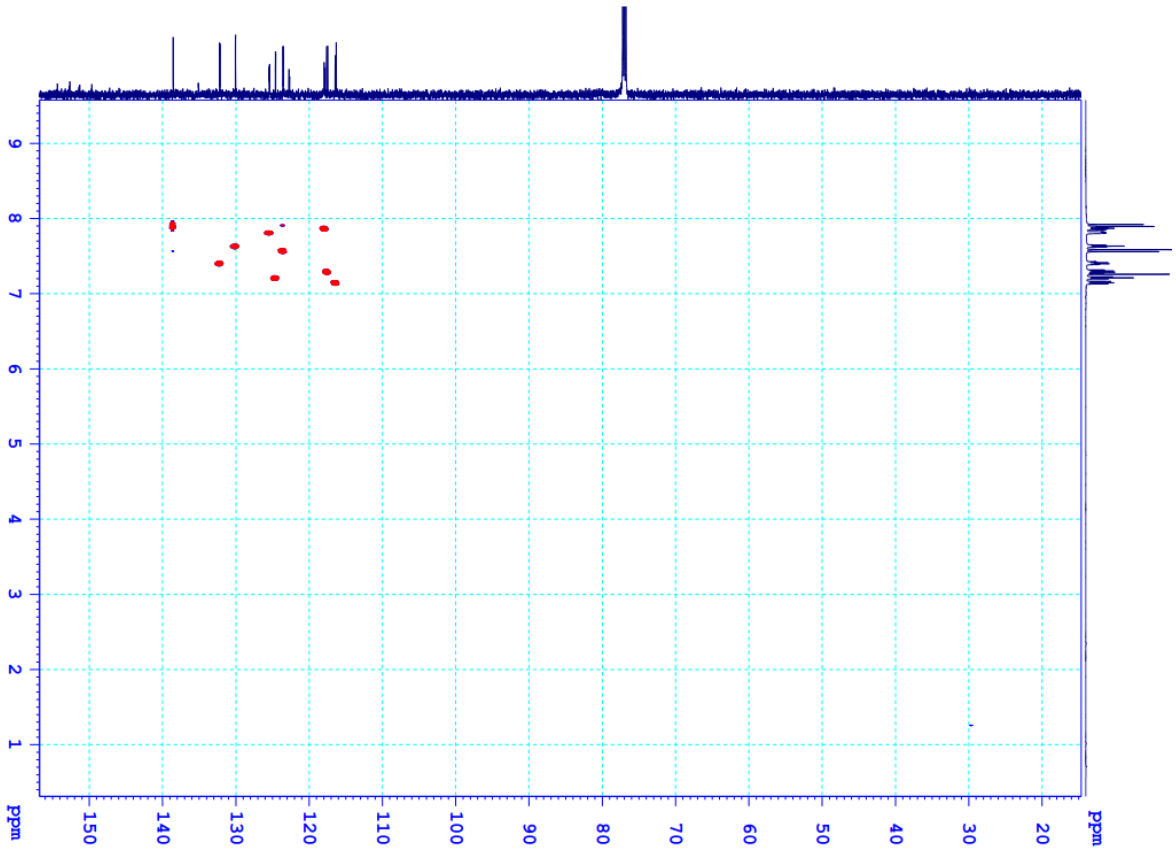


Figure S16f. HSQC spectrum of **3b**.

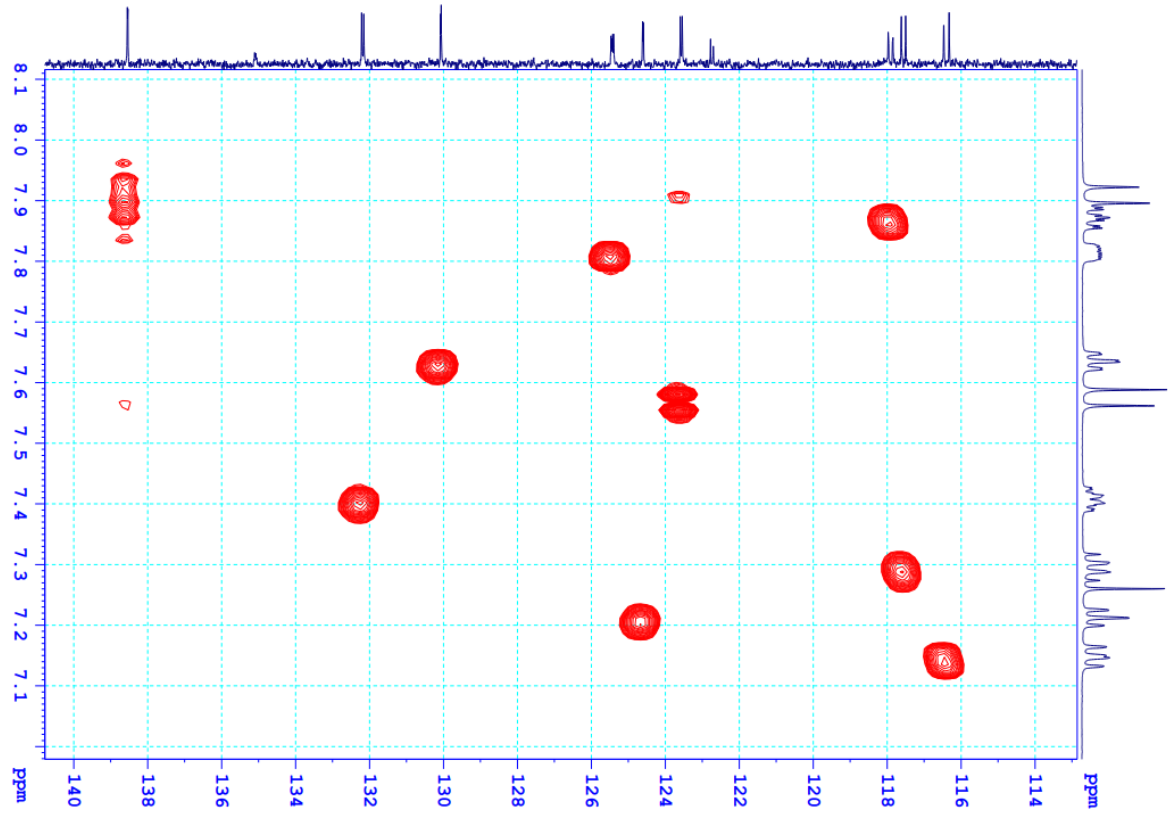


Figure S16g. HSQC spectrum of **3b**.

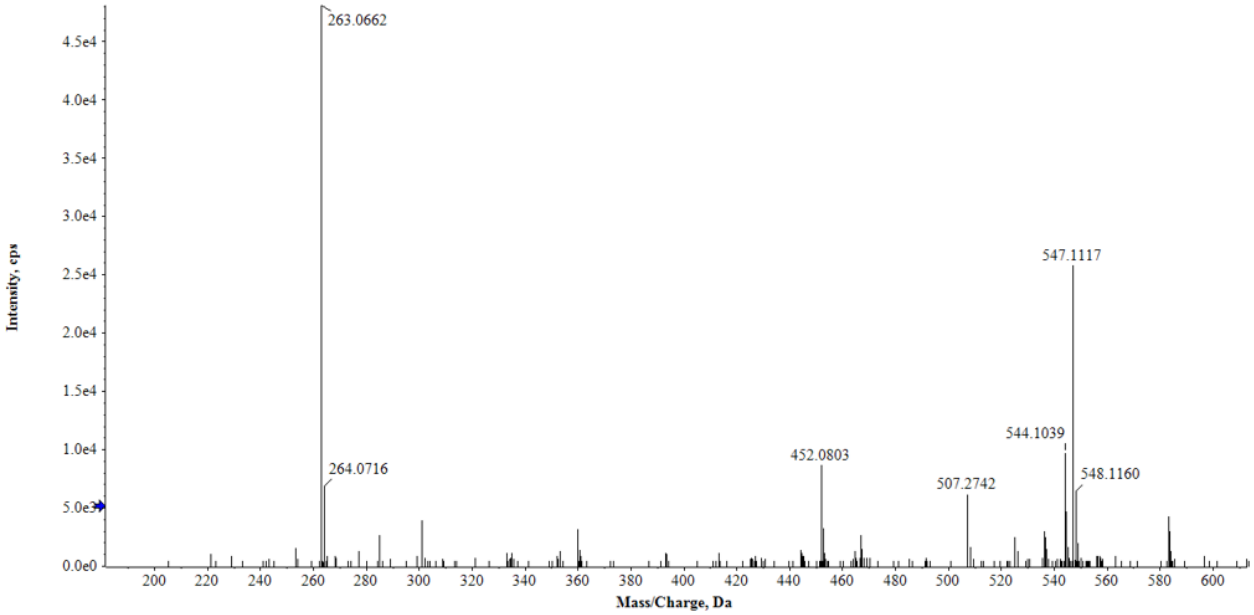


Figure S16h. HRMS of **3b**.

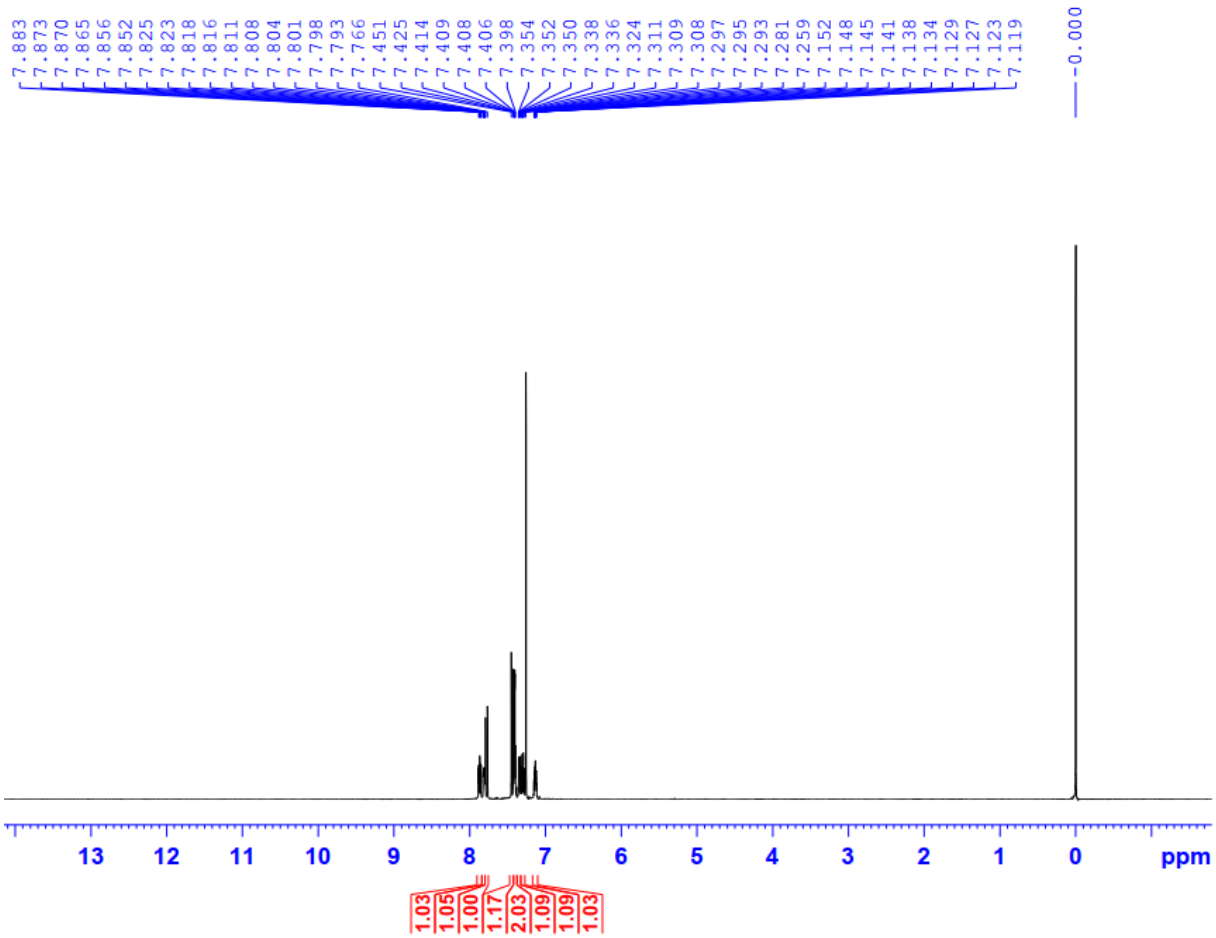


Figure S17a. ^{1}H-NMR spectrum of **3c**.

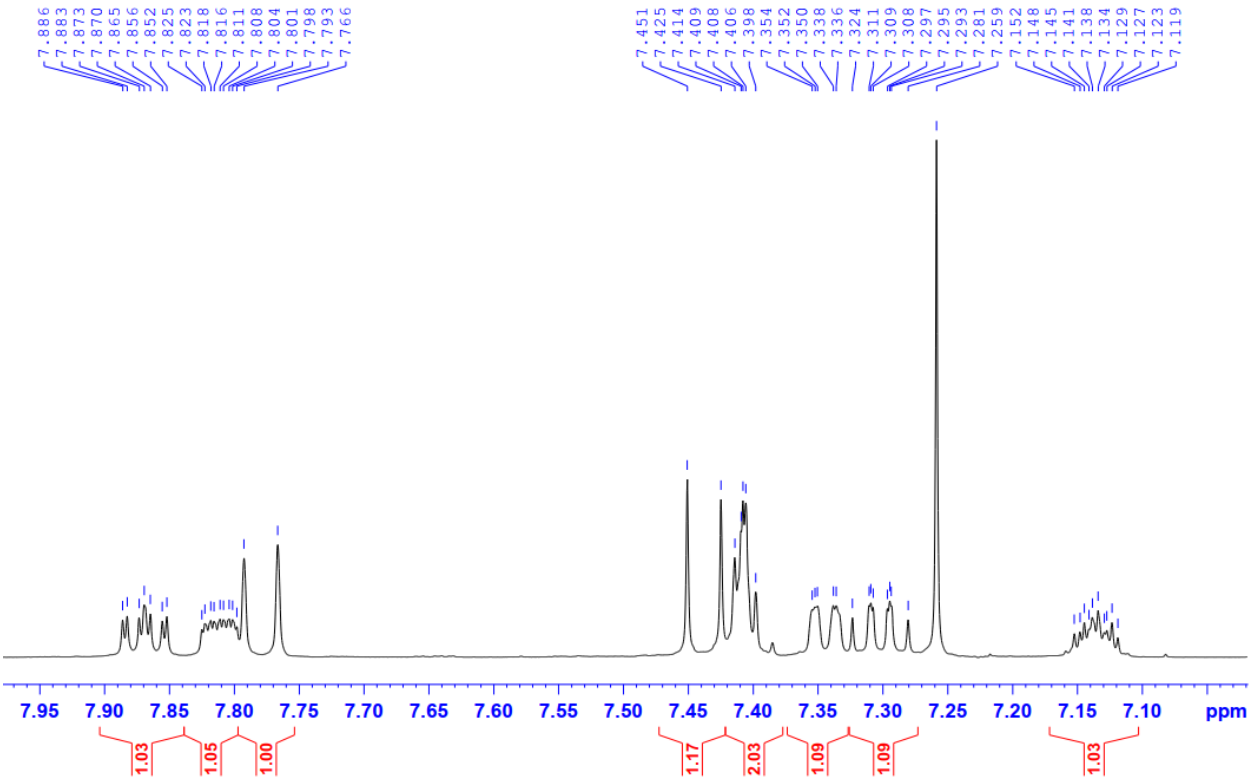


Figure S17b. ^{1}H-NMR spectrum of **3c**.

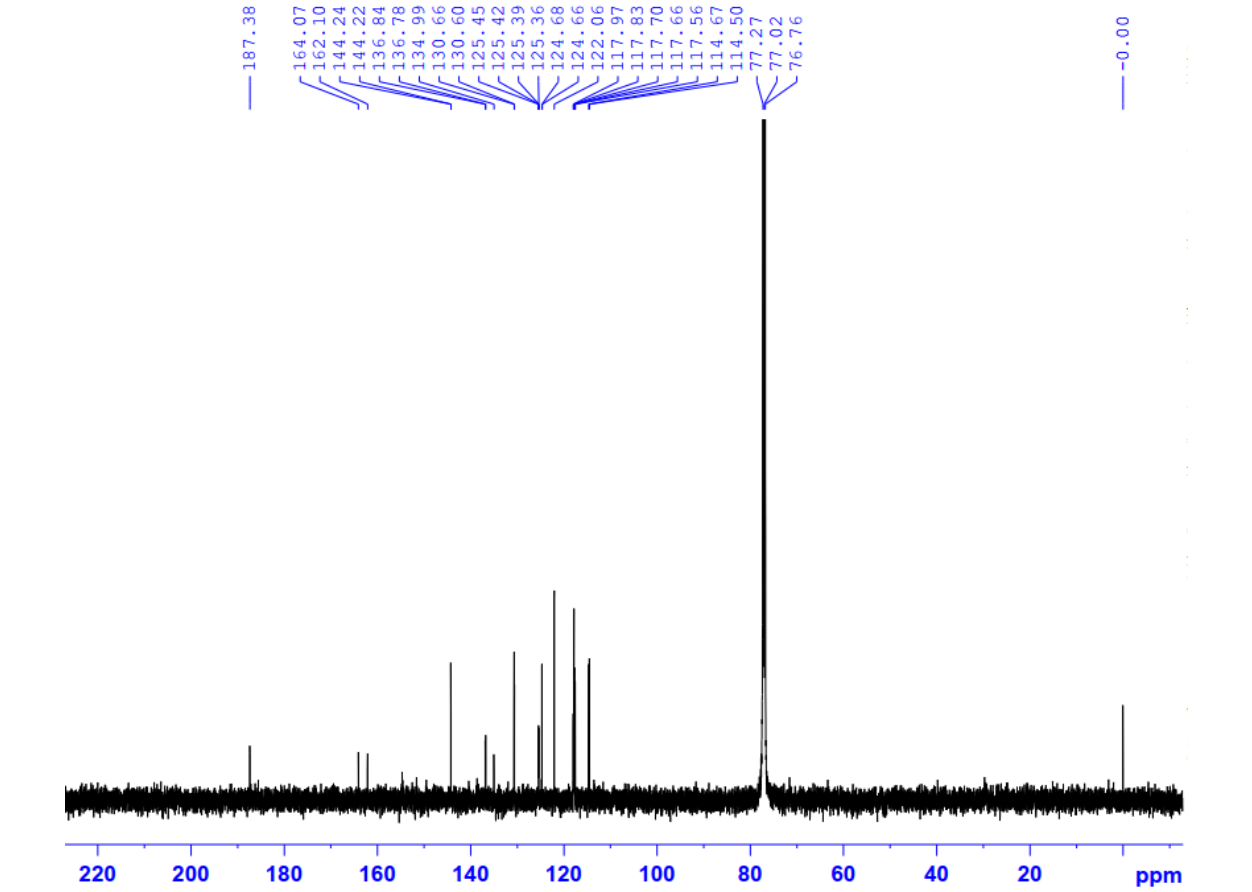


Figure S17c. ^{13}C-NMR spectrum of **3c**.

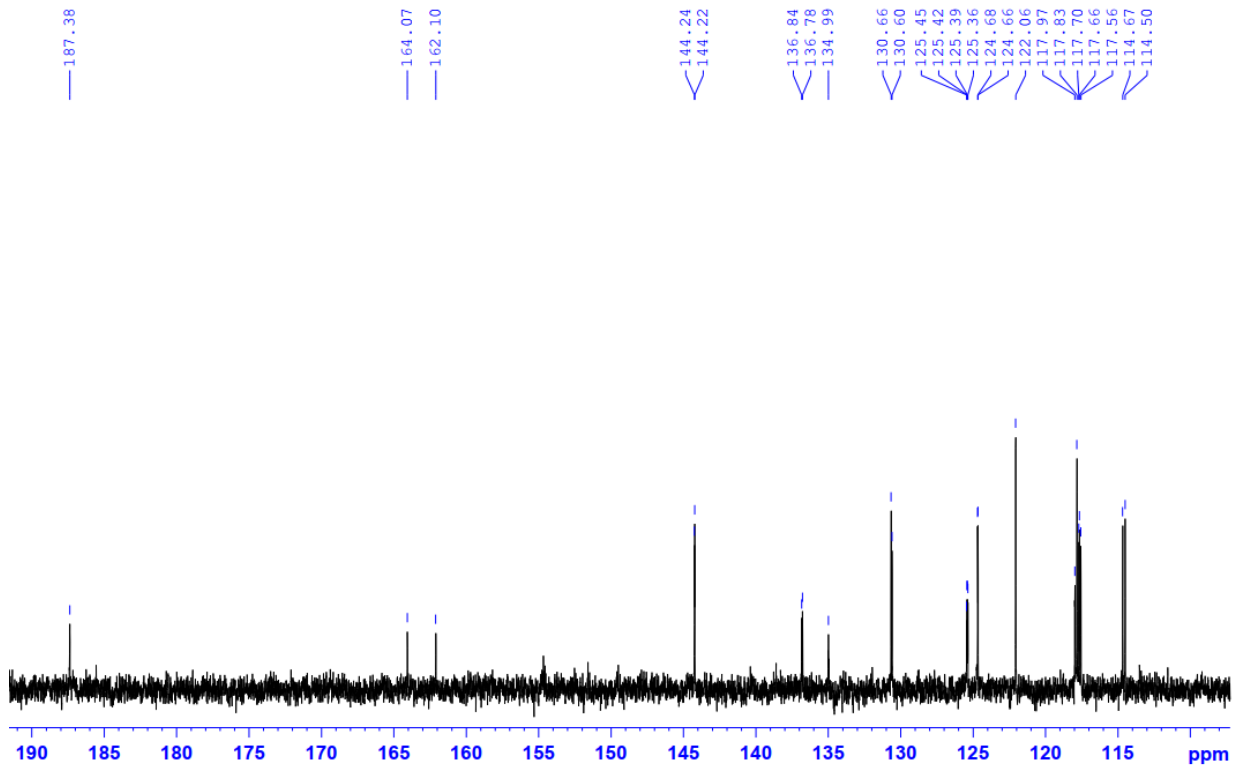


Figure S17d. ^{13}C-NMR spectrum of **3c**.

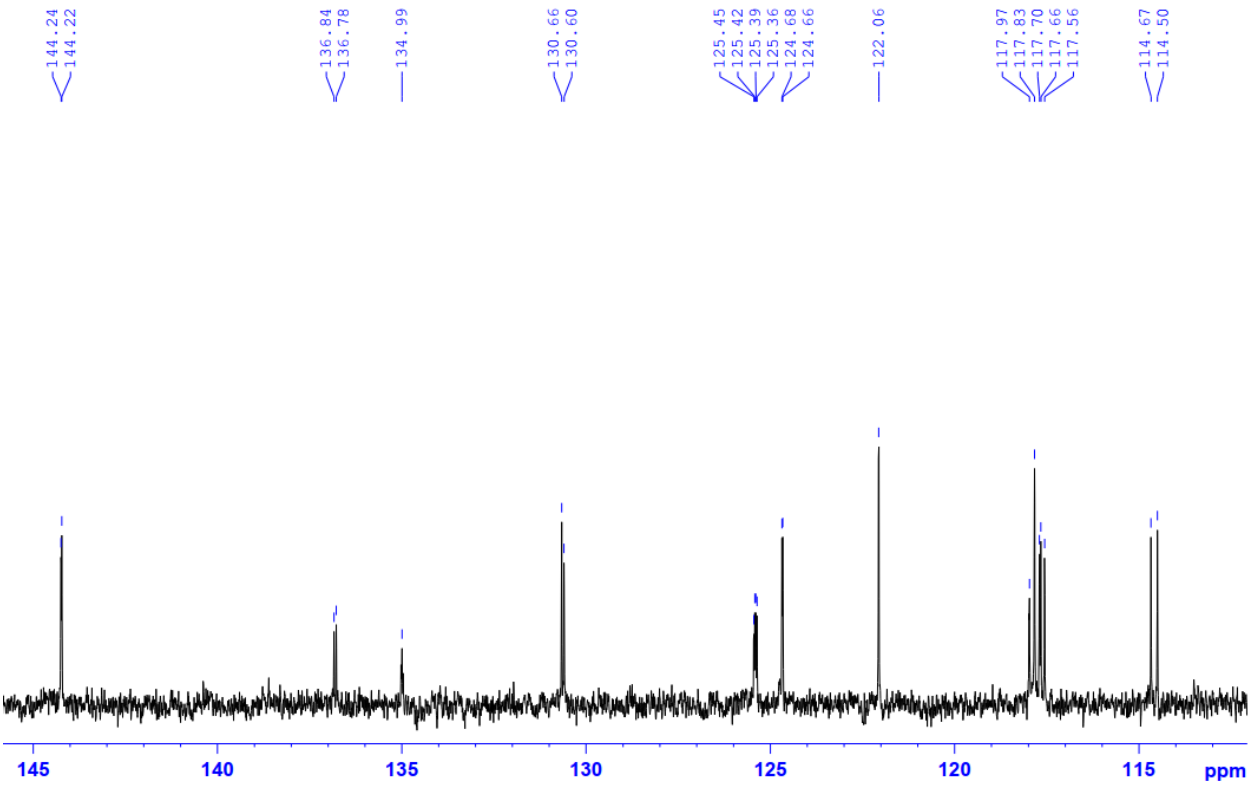


Figure S17e. ^{13}C-NMR spectrum of **3c**.

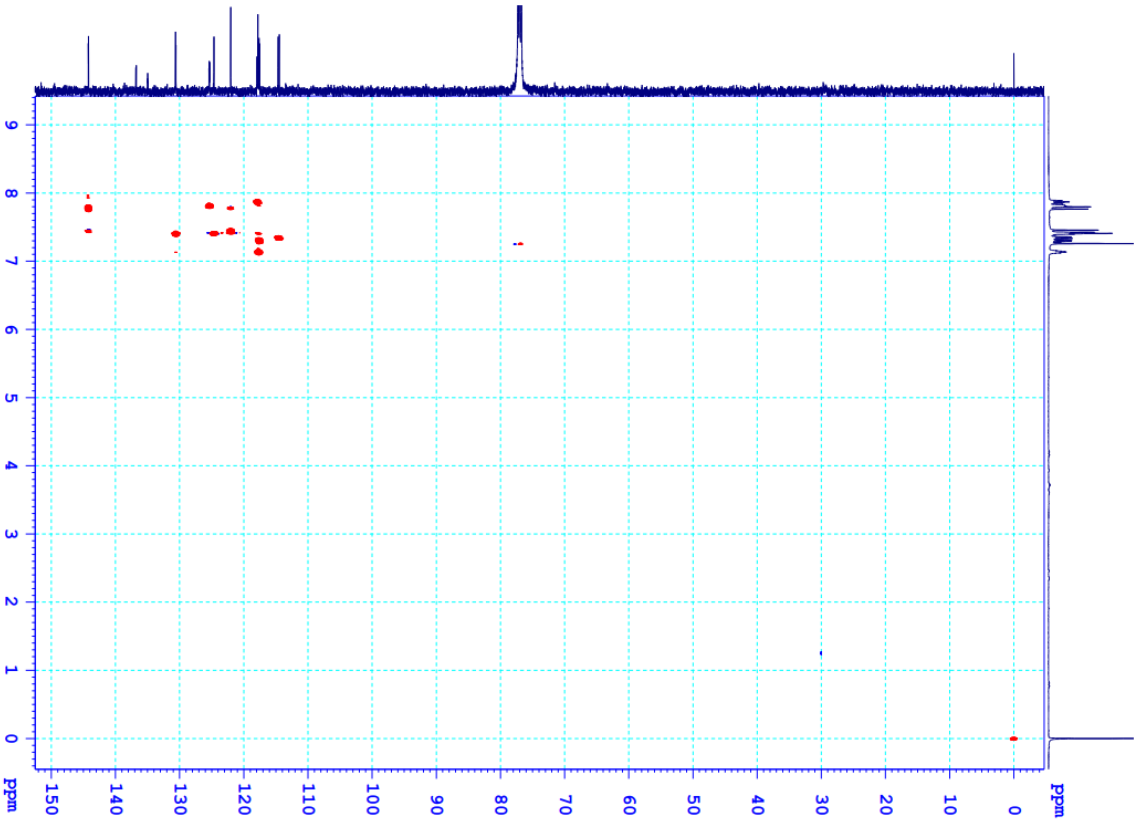


Figure S17f. HSQC spectrum of **3c**.

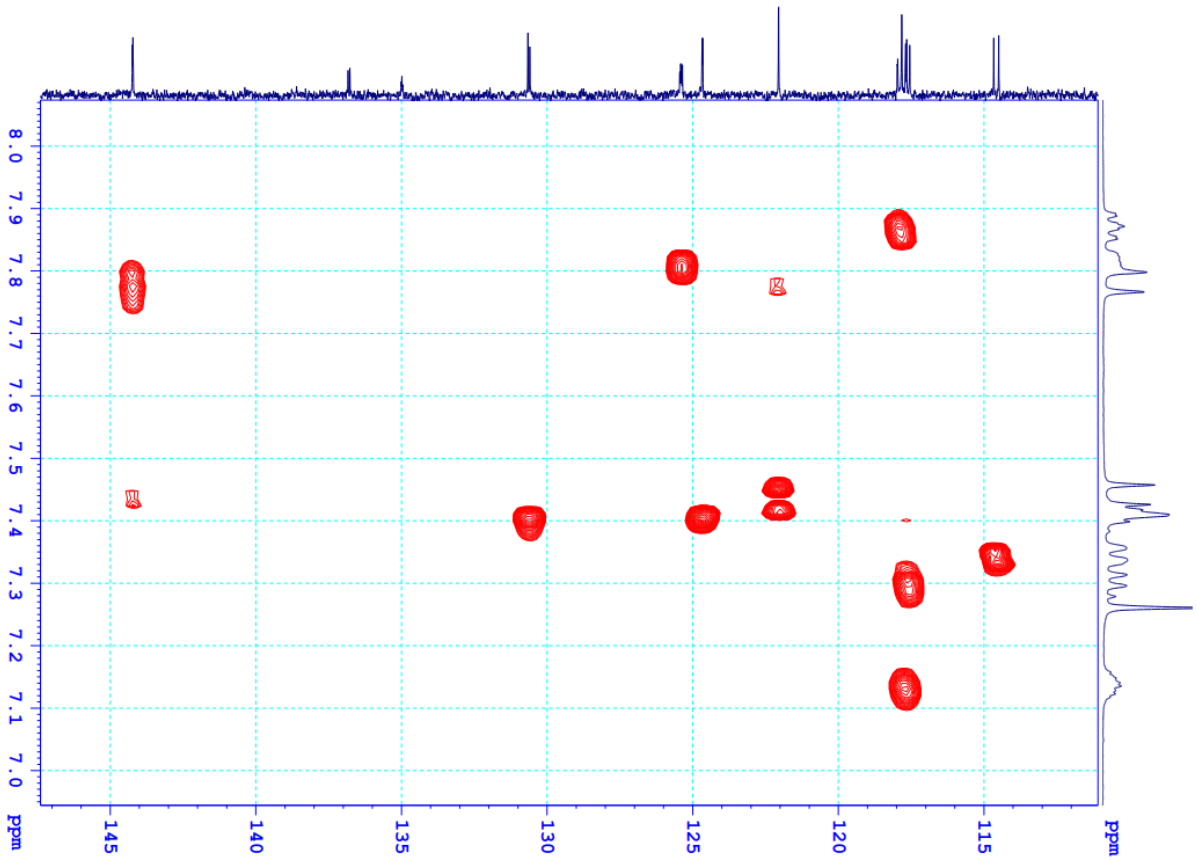


Figure S17g. HSQC spectrum of **3c**.

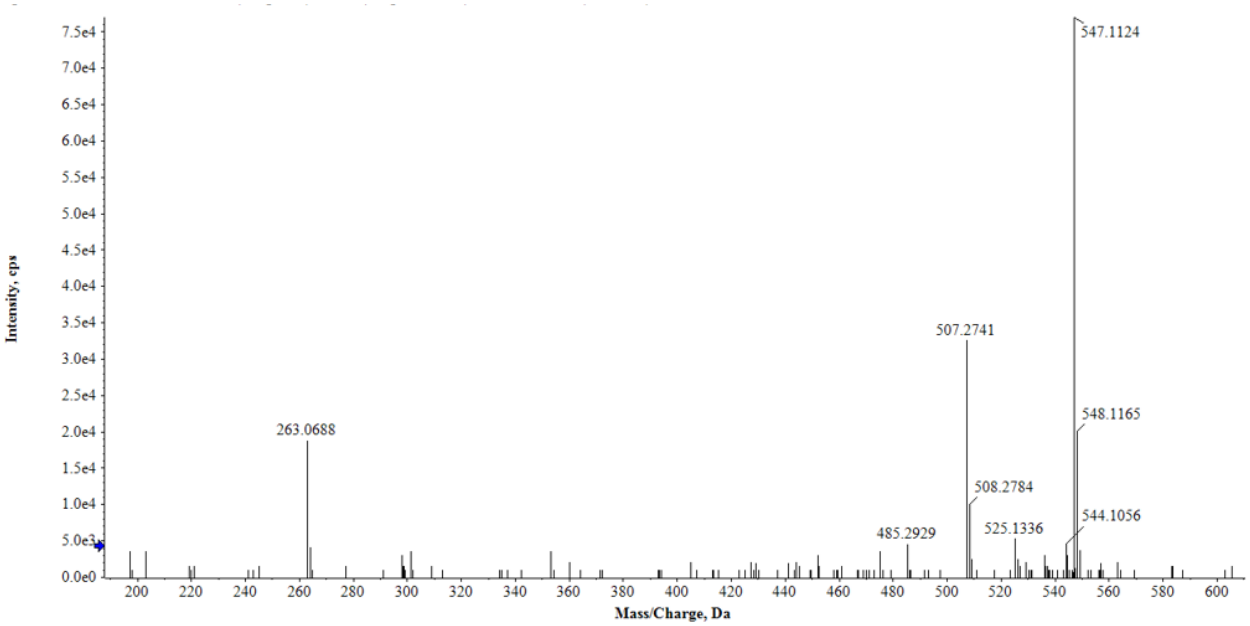


Figure S17h. HRMS of **3c**.

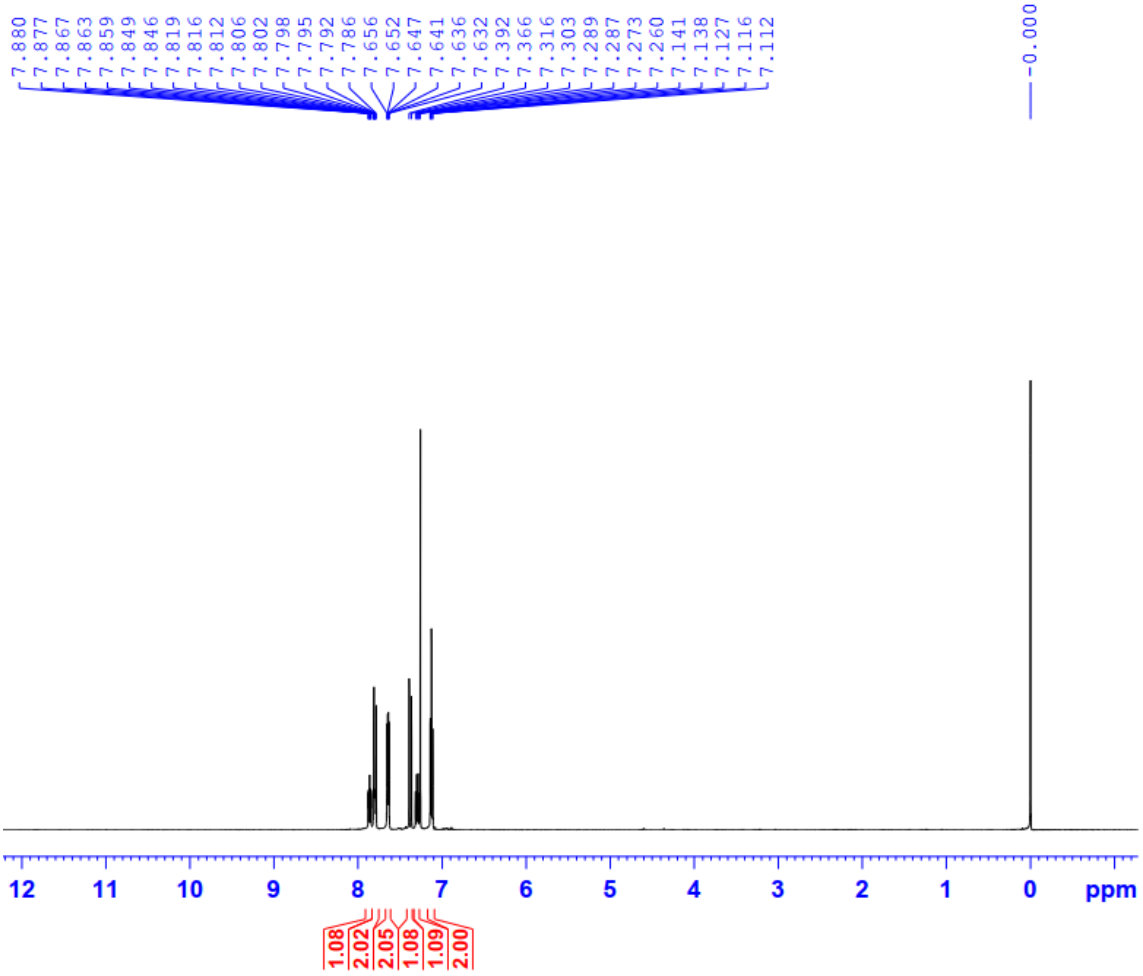


Figure S18a. ^{1}H-NMR spectrum of **3d**.

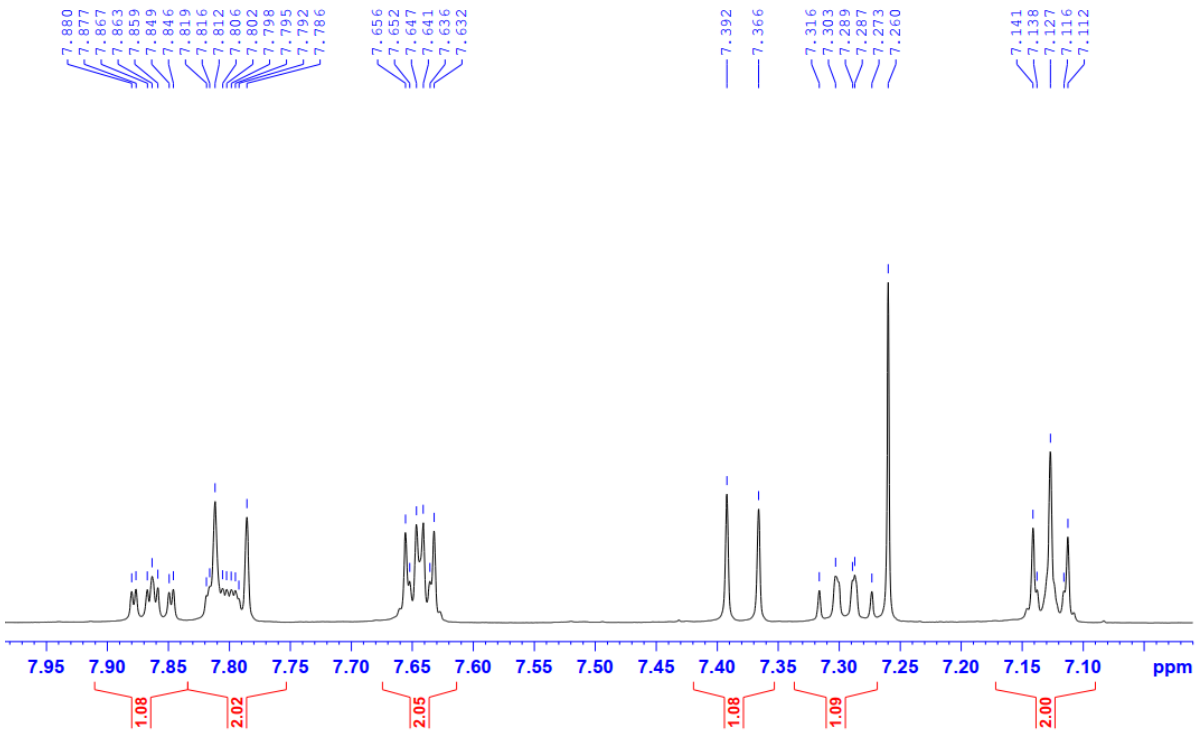


Figure S18b. ^{1}H-NMR spectrum of **3d**.

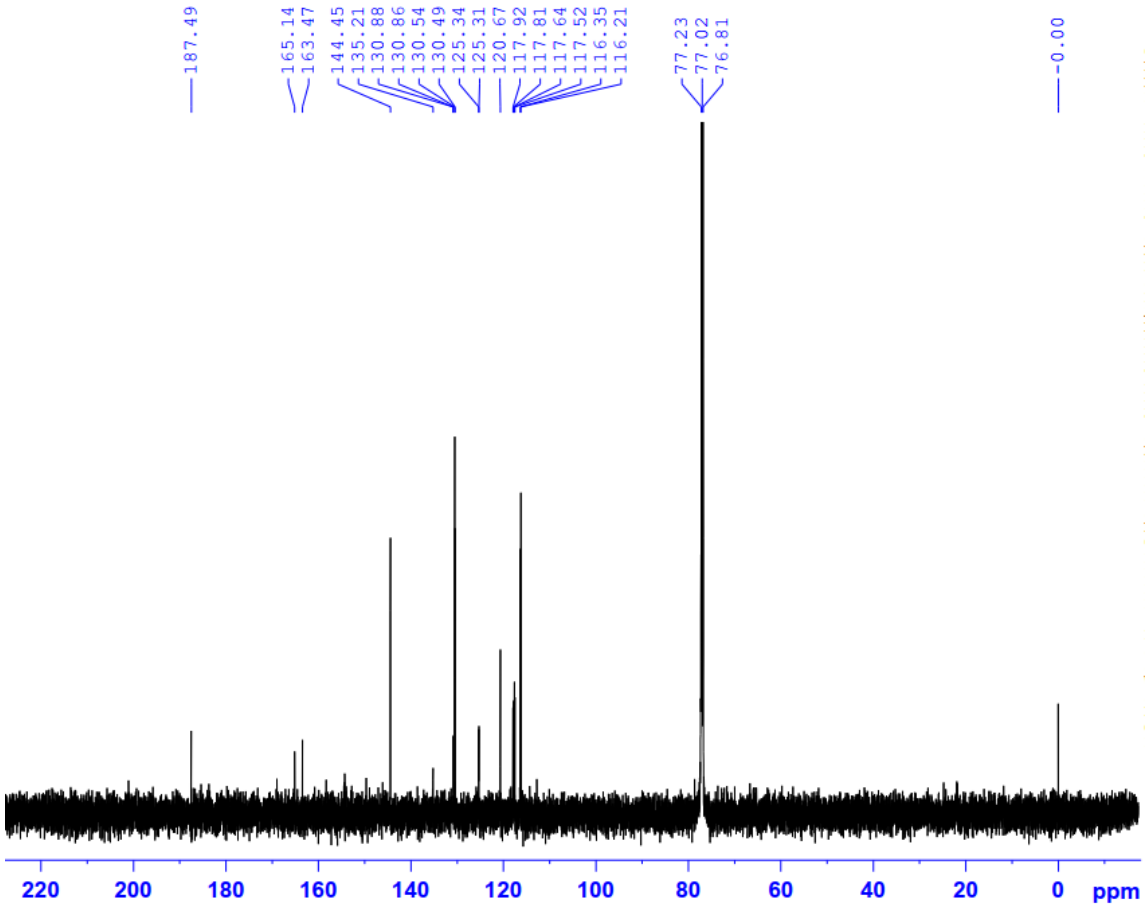


Figure S18c. ^{13}C-NMR spectrum of **3d**.

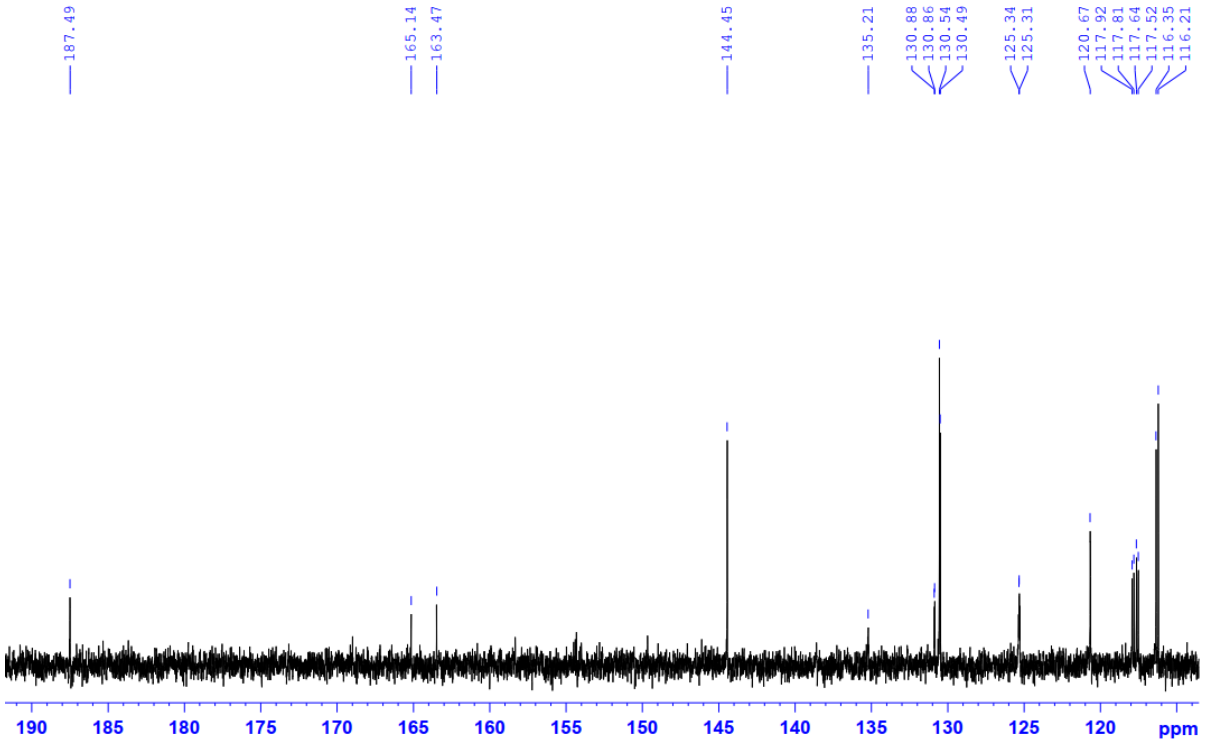


Figure S18d. ^{13}C-NMR spectrum of **3d**.

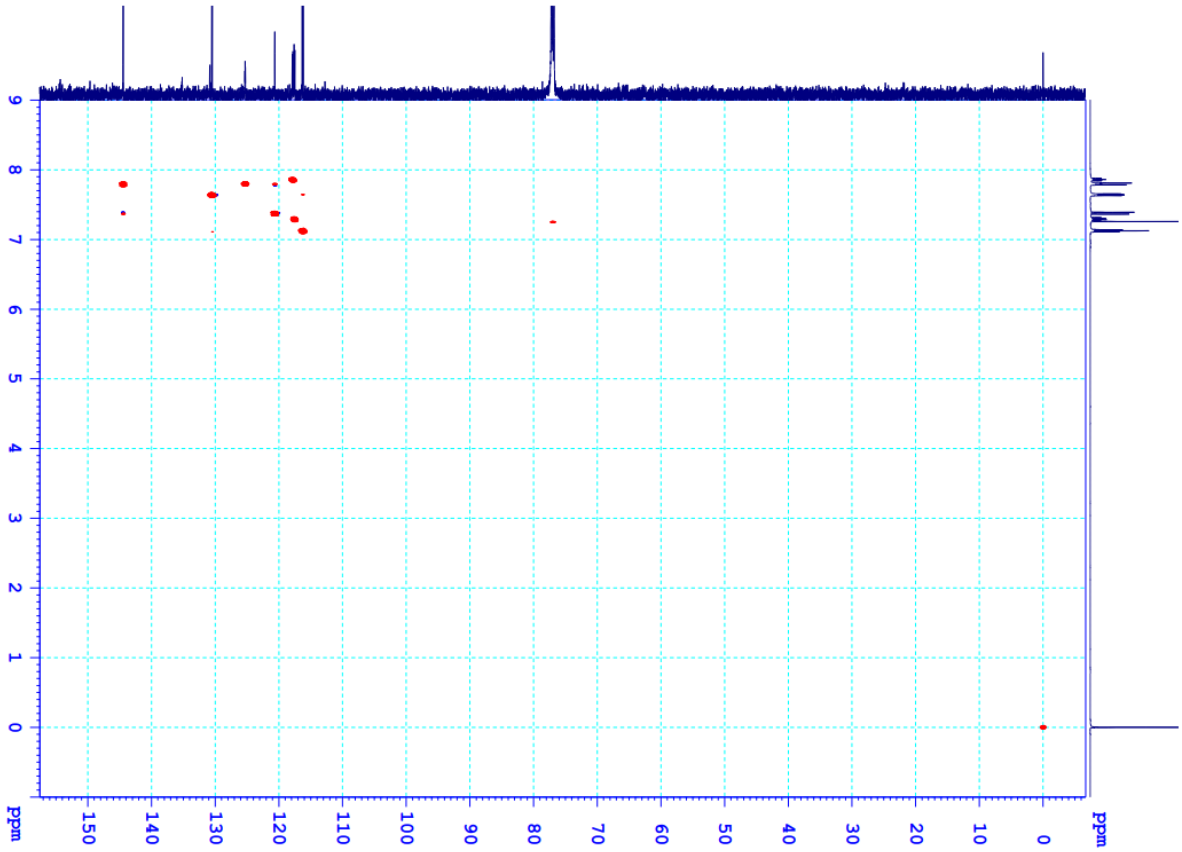


Figure S18e. HSQC spectrum of **3d**.

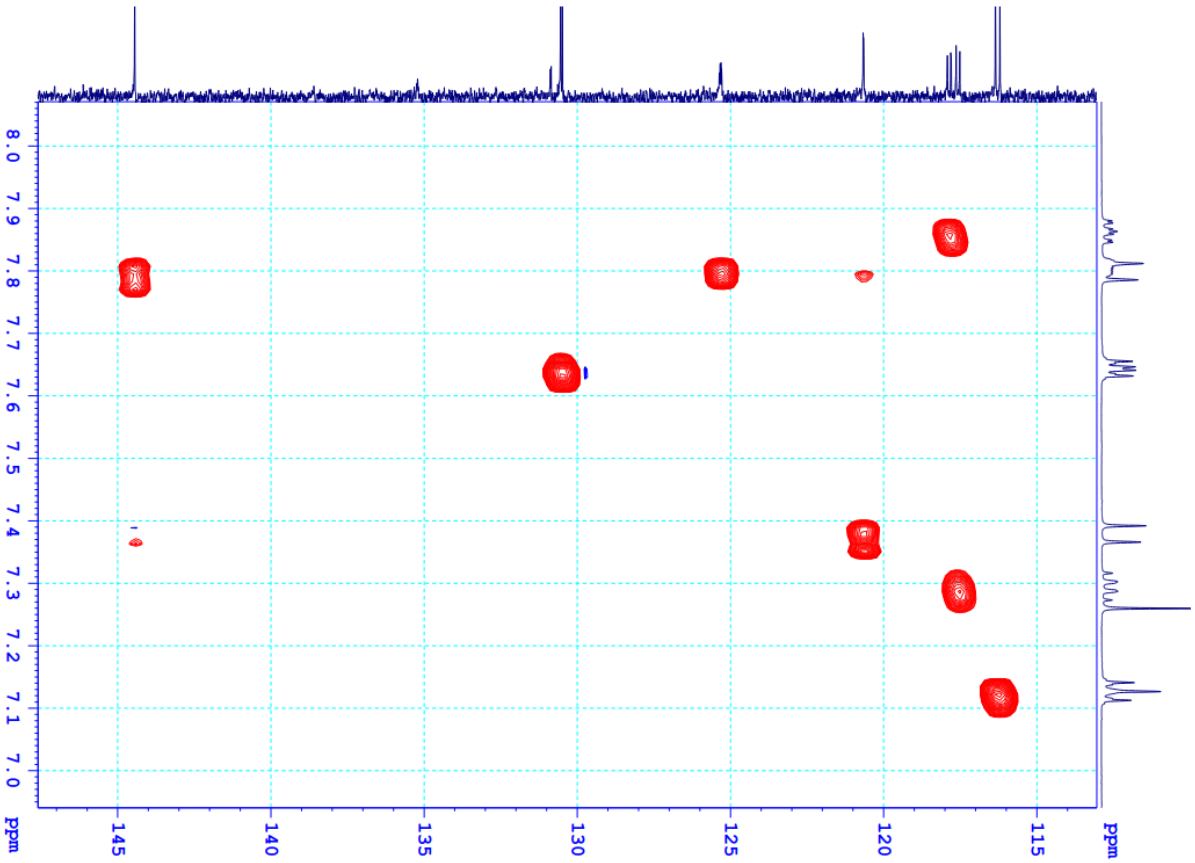


Figure S18f. HSQC spectrum of **3d**.

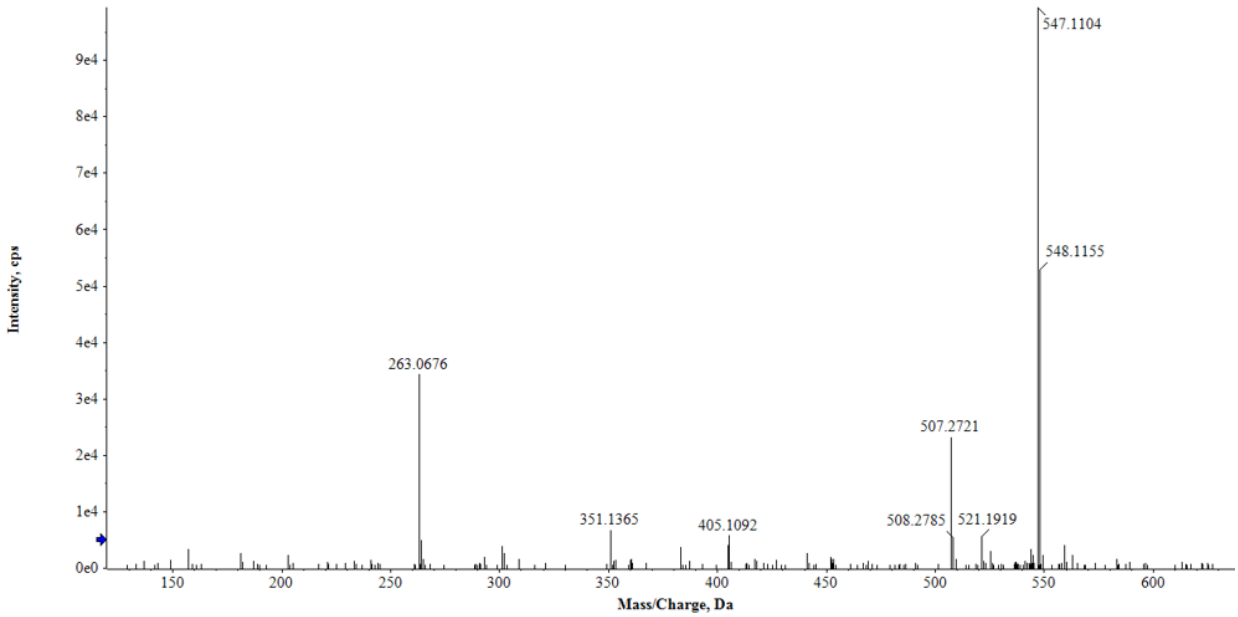


Figure S18g. HRMS of **3d**.

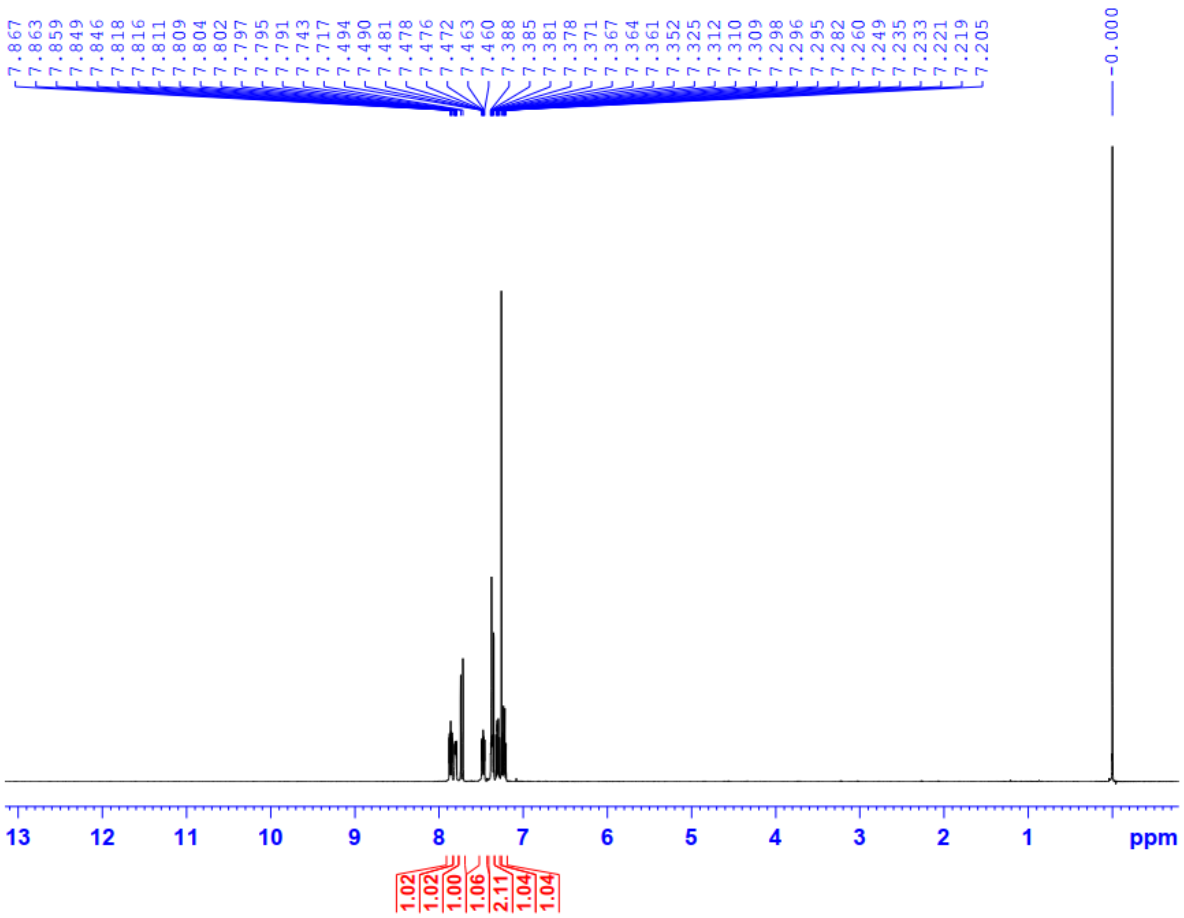


Figure S19a. ^{1}H-NMR spectrum of **3e**.

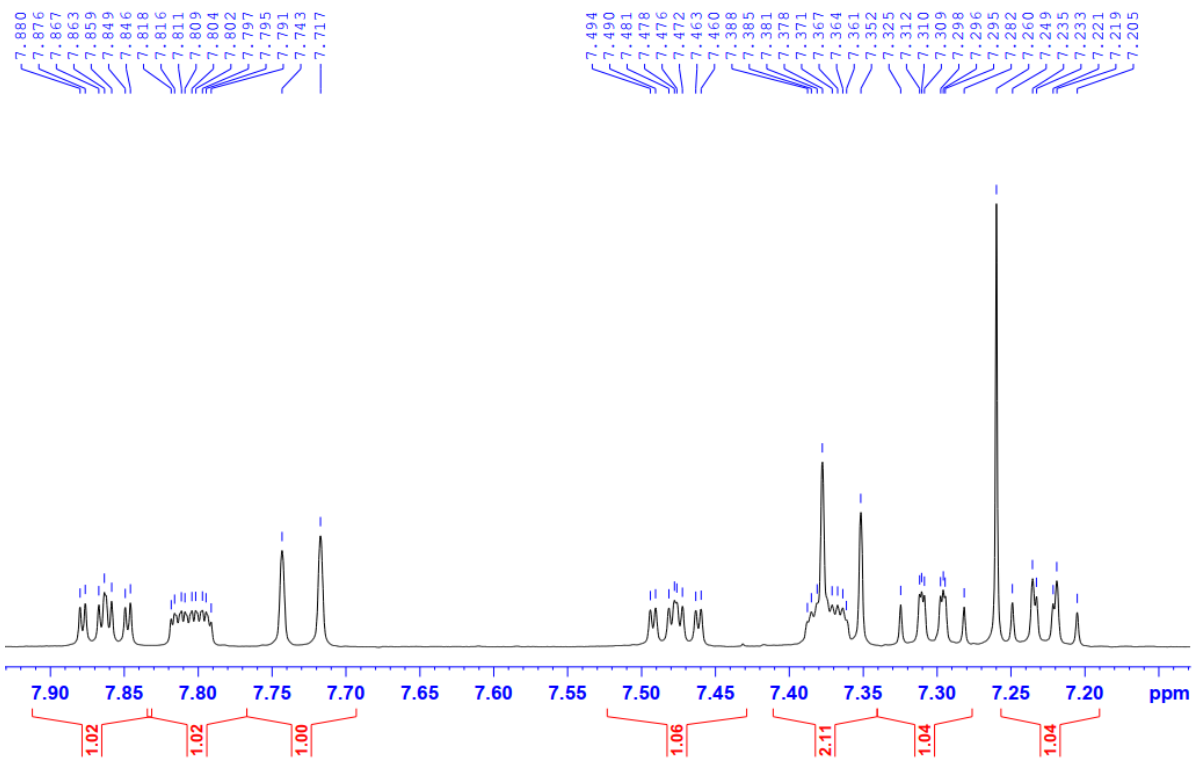


Figure S19b. ^{1}H-NMR spectrum of **3e**.

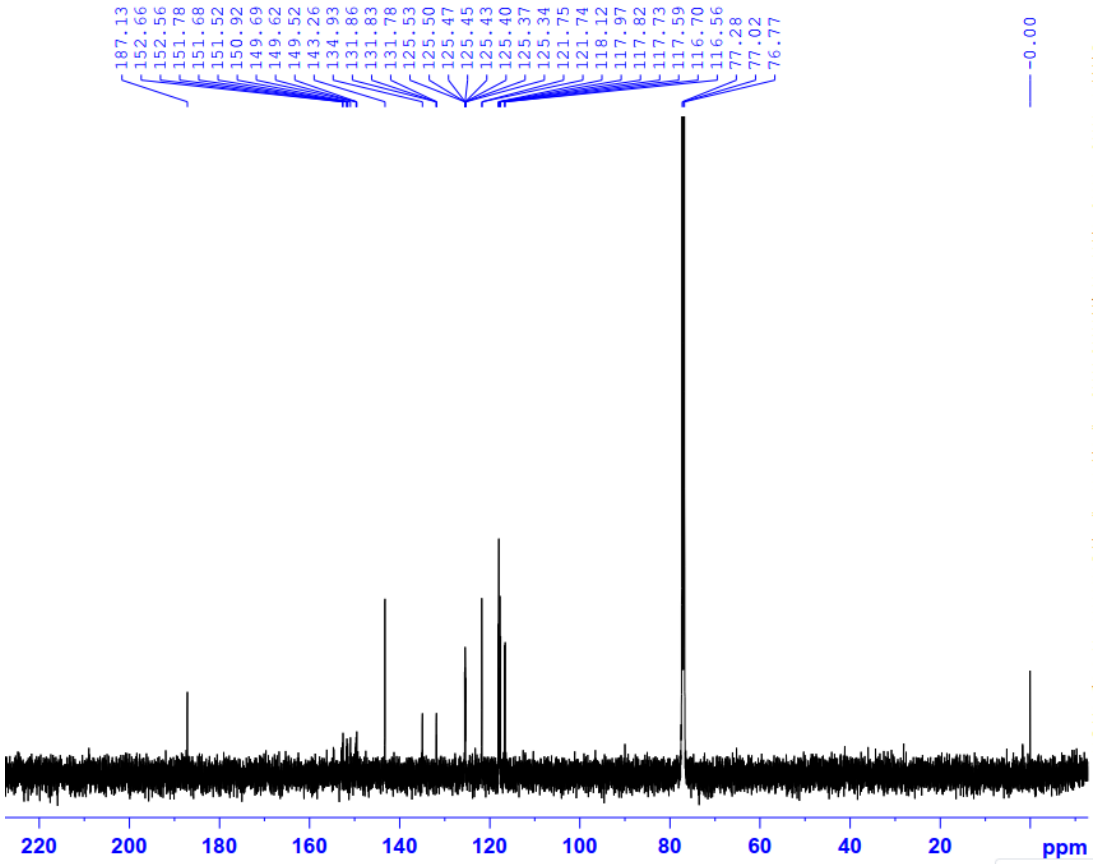


Figure S19c. ^{13}C-NMR spectrum of **3e**.

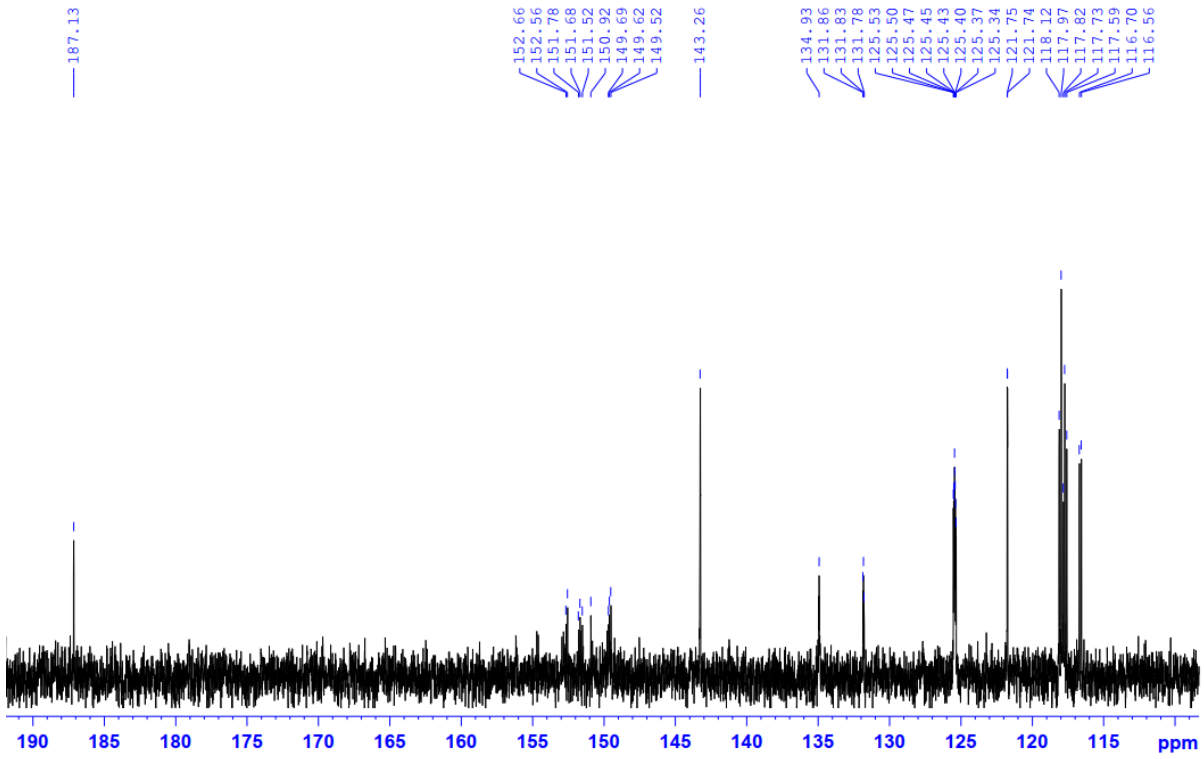


Figure S19d. ^{13}C-NMR spectrum of **3e**.

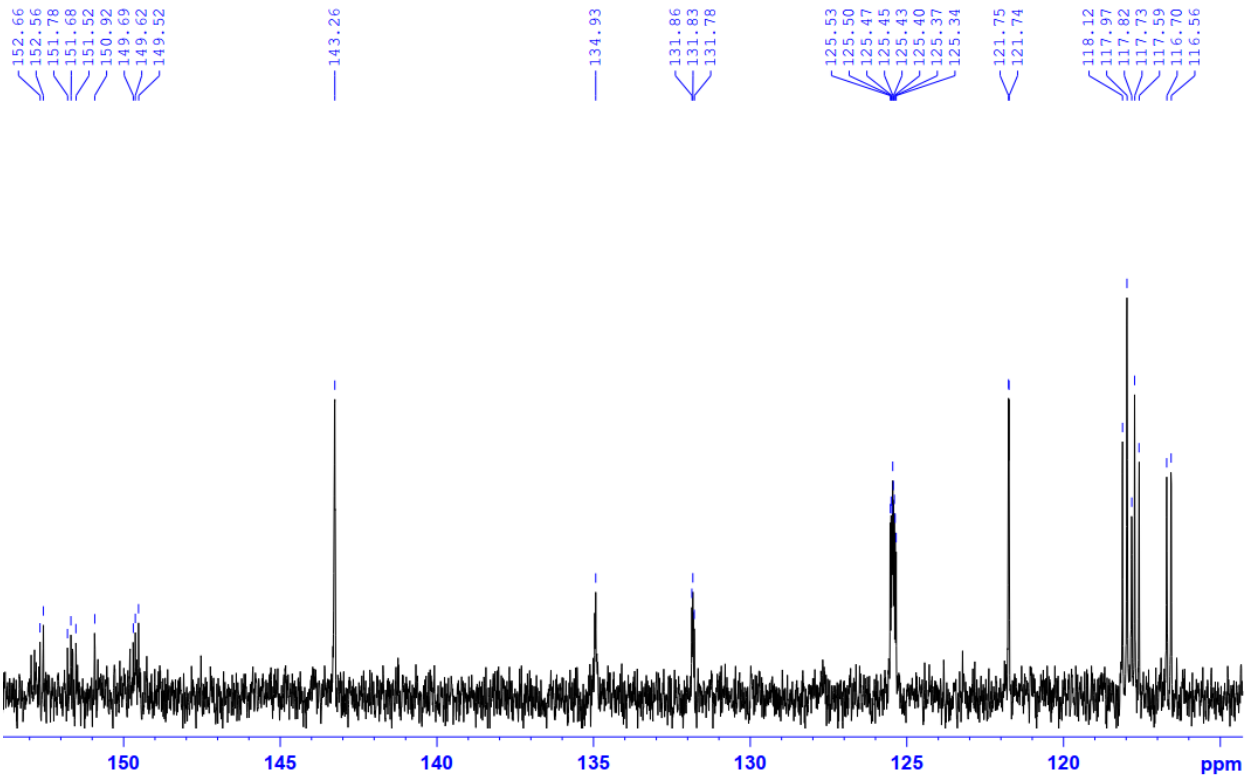


Figure S19e. ^{13}C-NMR spectrum of **3e**.

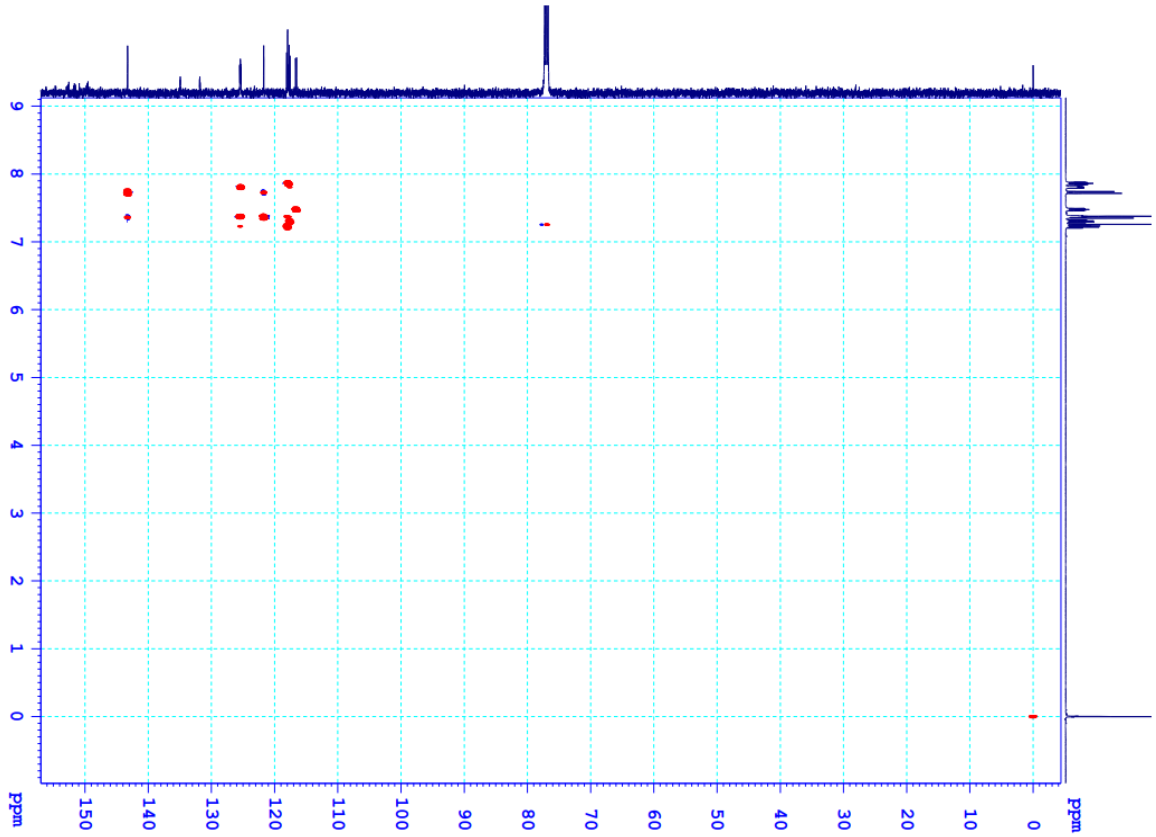


Figure S19f. HSQC spectrum of **3e**.

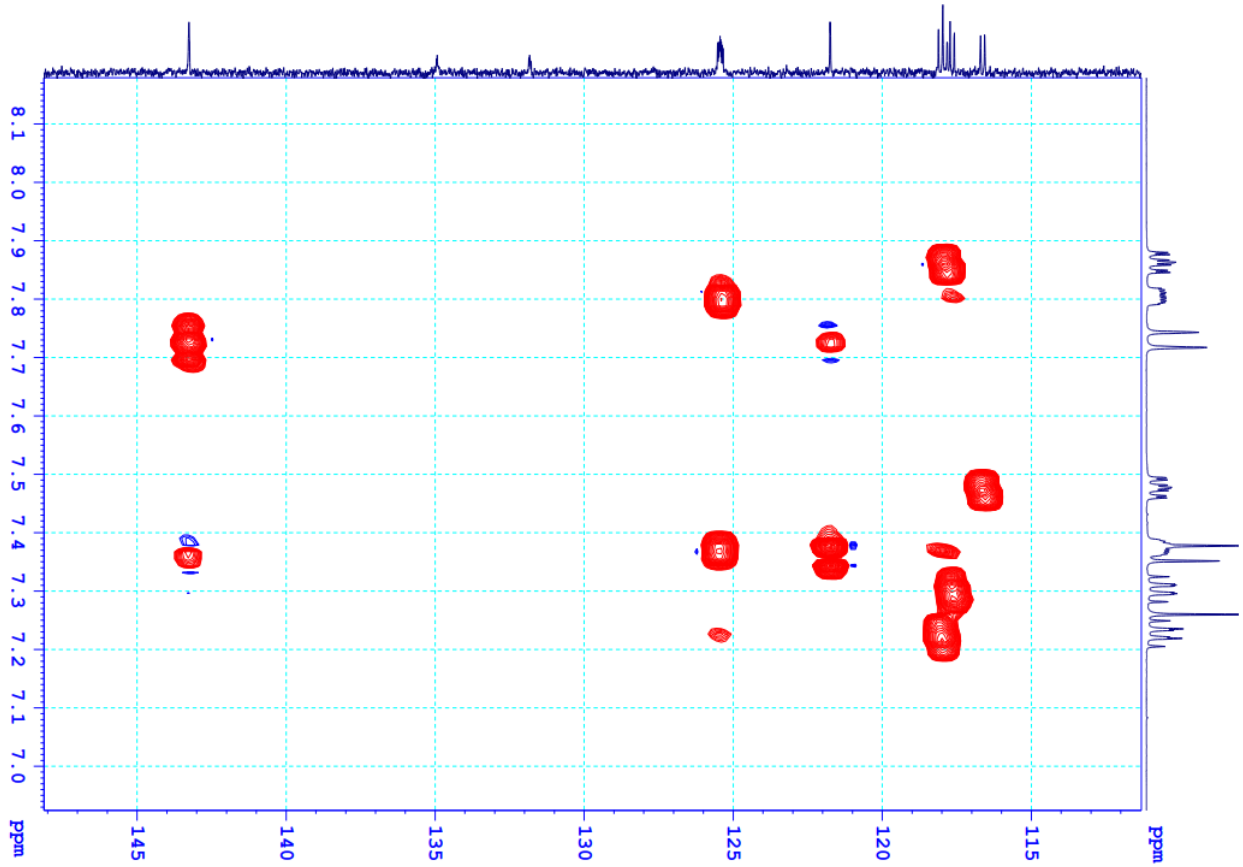


Figure S19g. HSQC spectrum of **3e**.

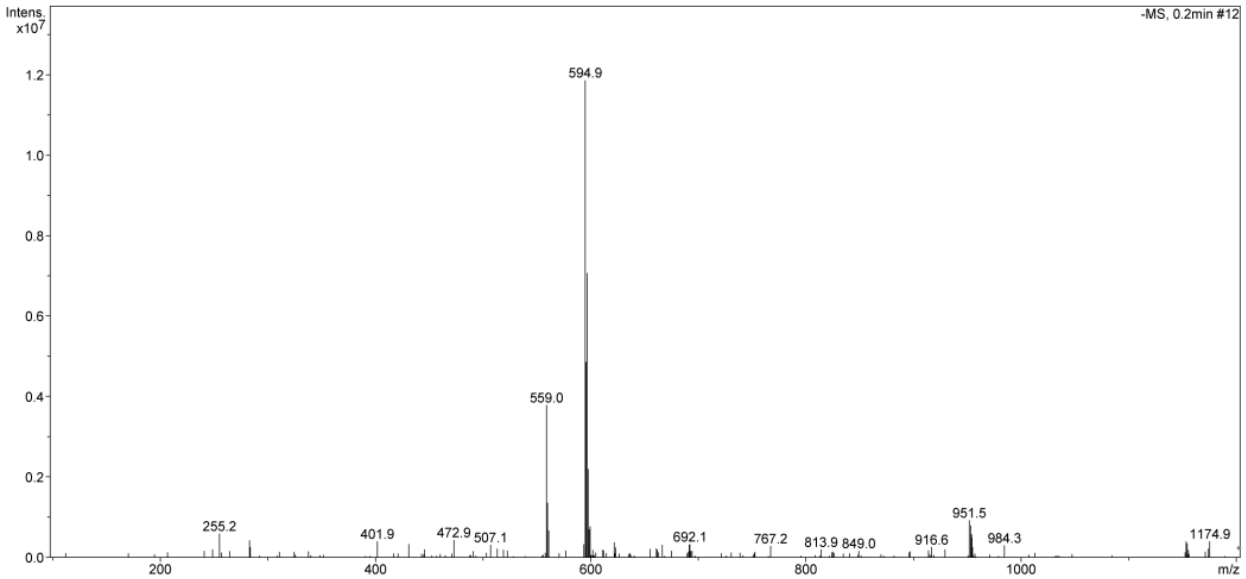


Figure S19h. MS of **3e**.

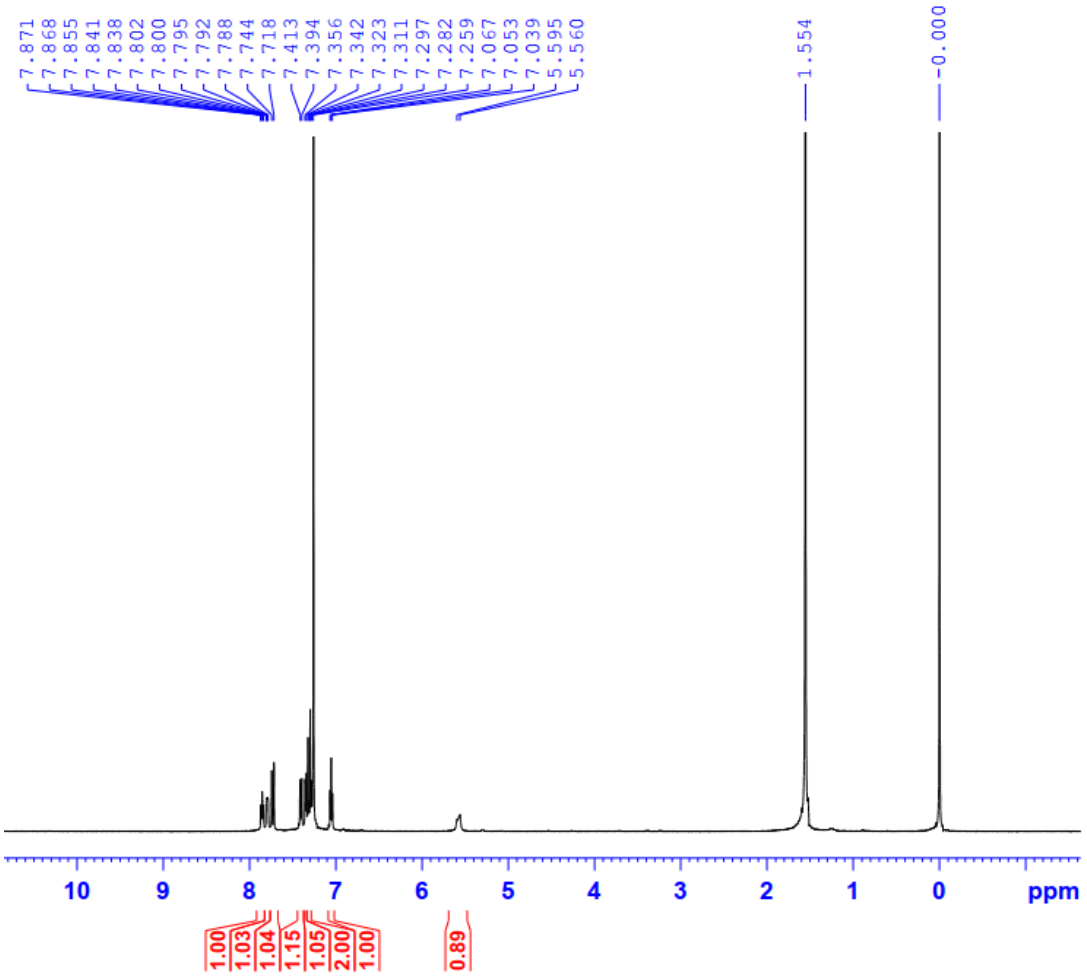


Figure S20a. ^{1}H-NMR spectrum of **3f**.

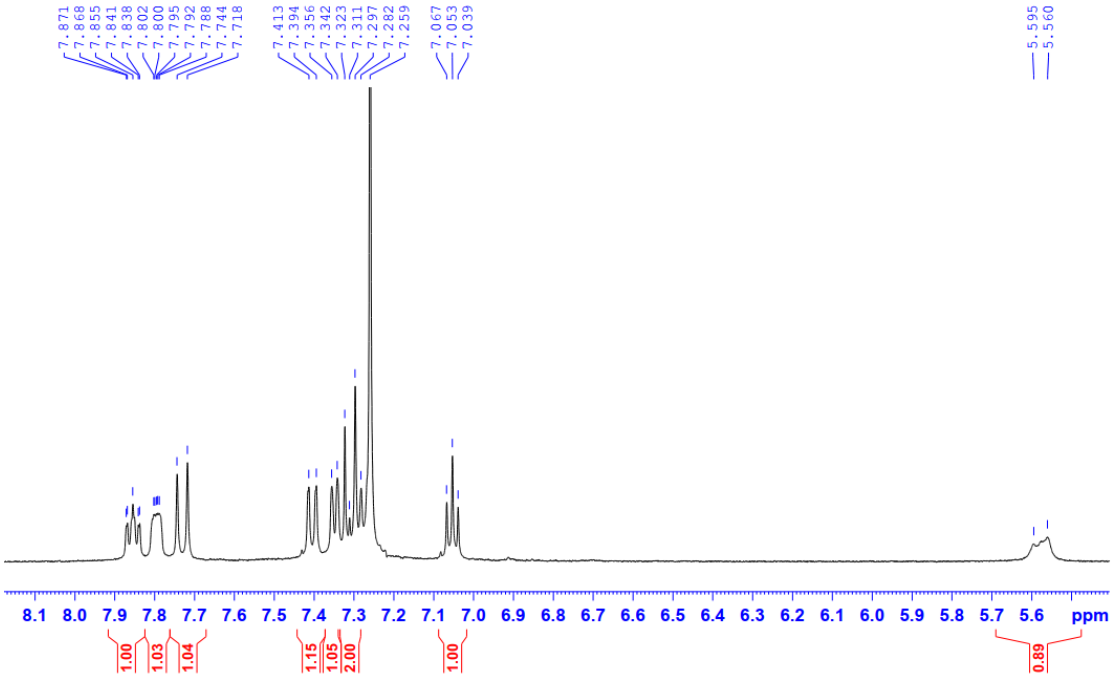


Figure S20b. ^{1}H-NMR spectrum of **3f**.

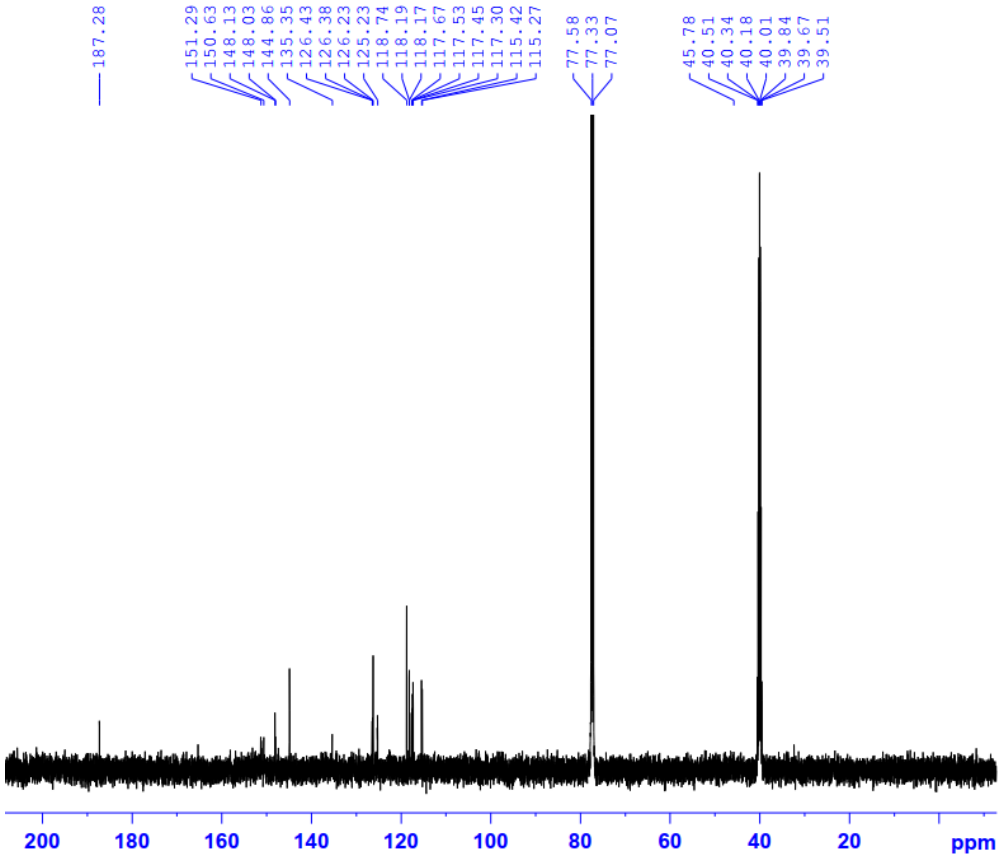


Figure S20c. ^{13}C-NMR spectrum of **3f**.

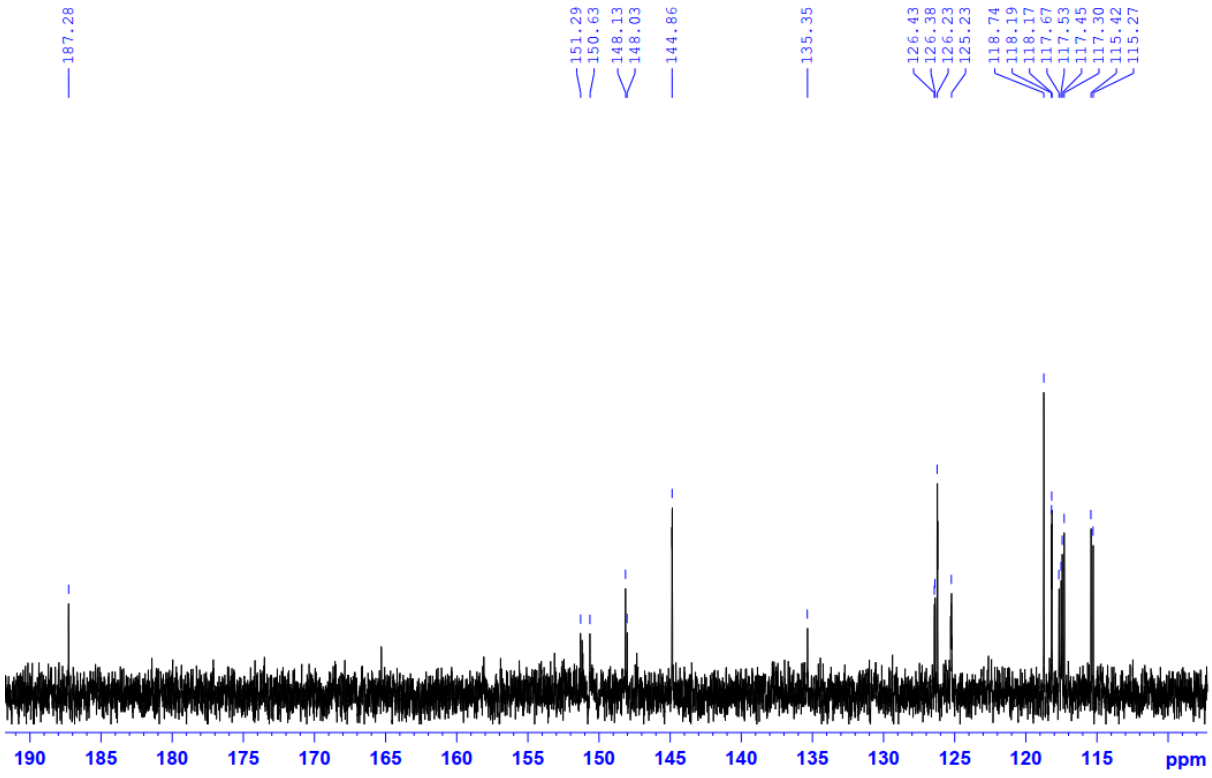


Figure S20d. ^{13}C-NMR spectrum of **3f**.

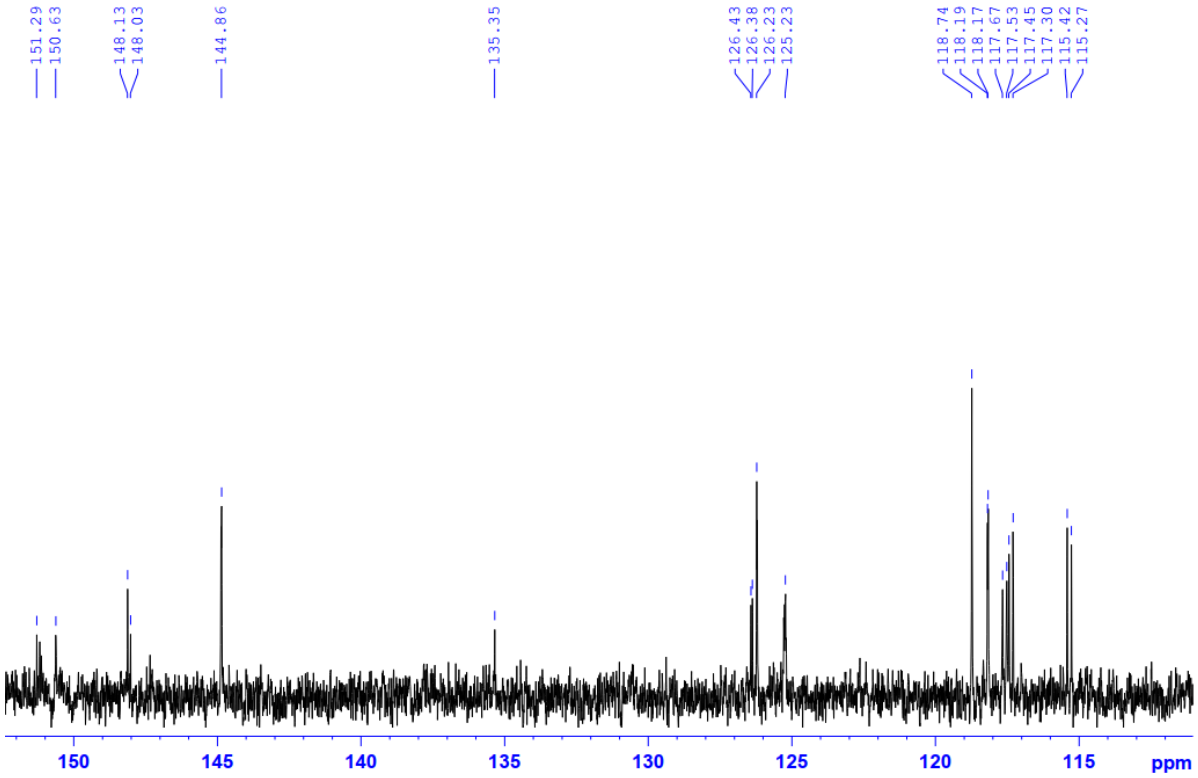


Figure S20e. ^{13}C-NMR spectrum of **3f**.

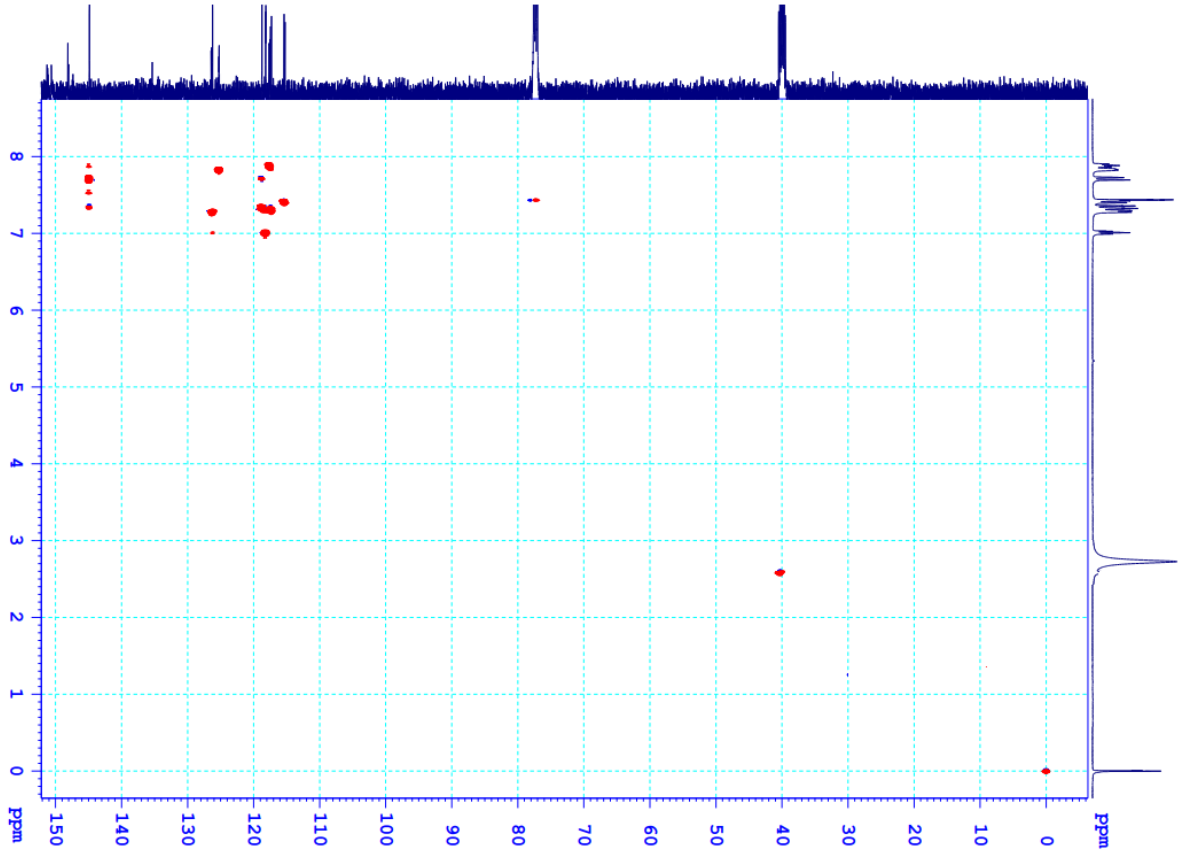


Figure S20f. HSQC spectrum of **3f**.

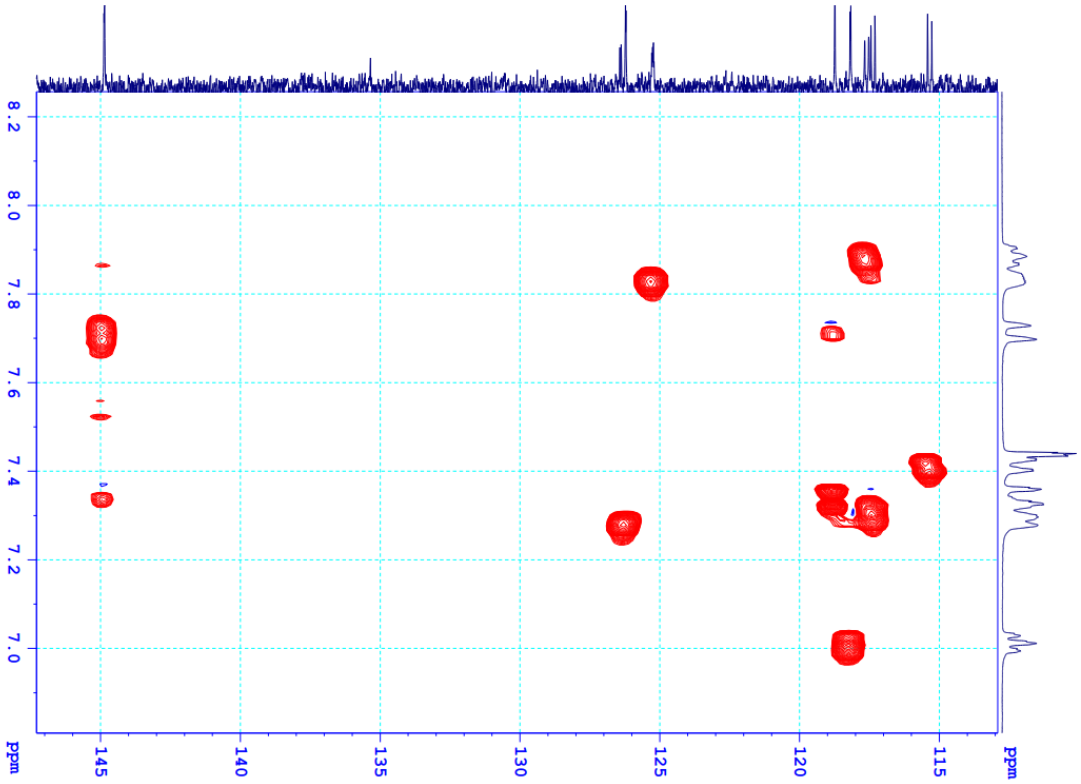


Figure S20g. HSQC spectrum of **3f**.

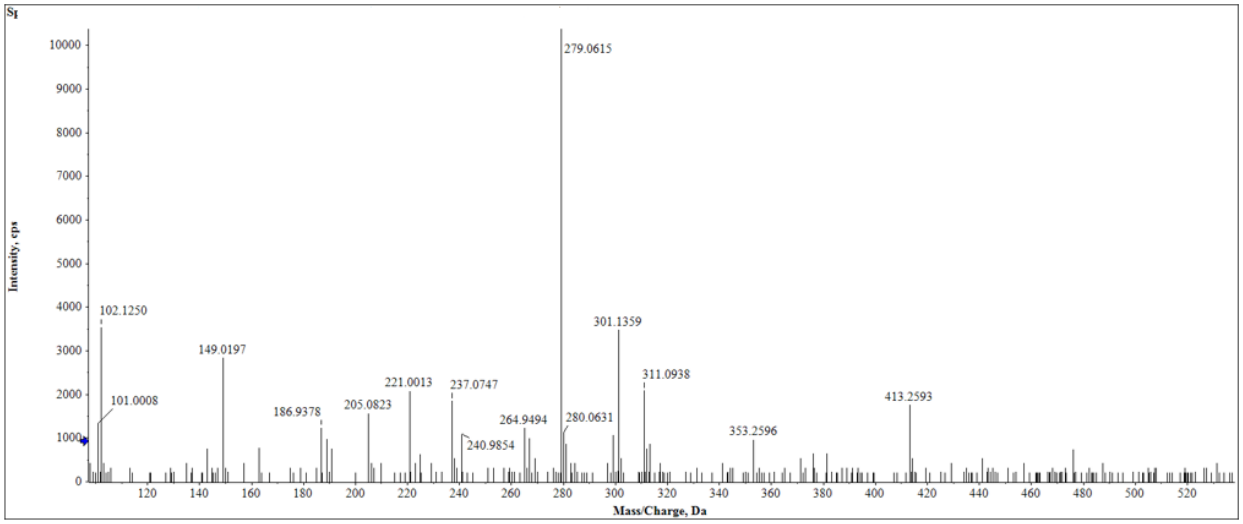


Figure S20h. HRMS of **3f**.

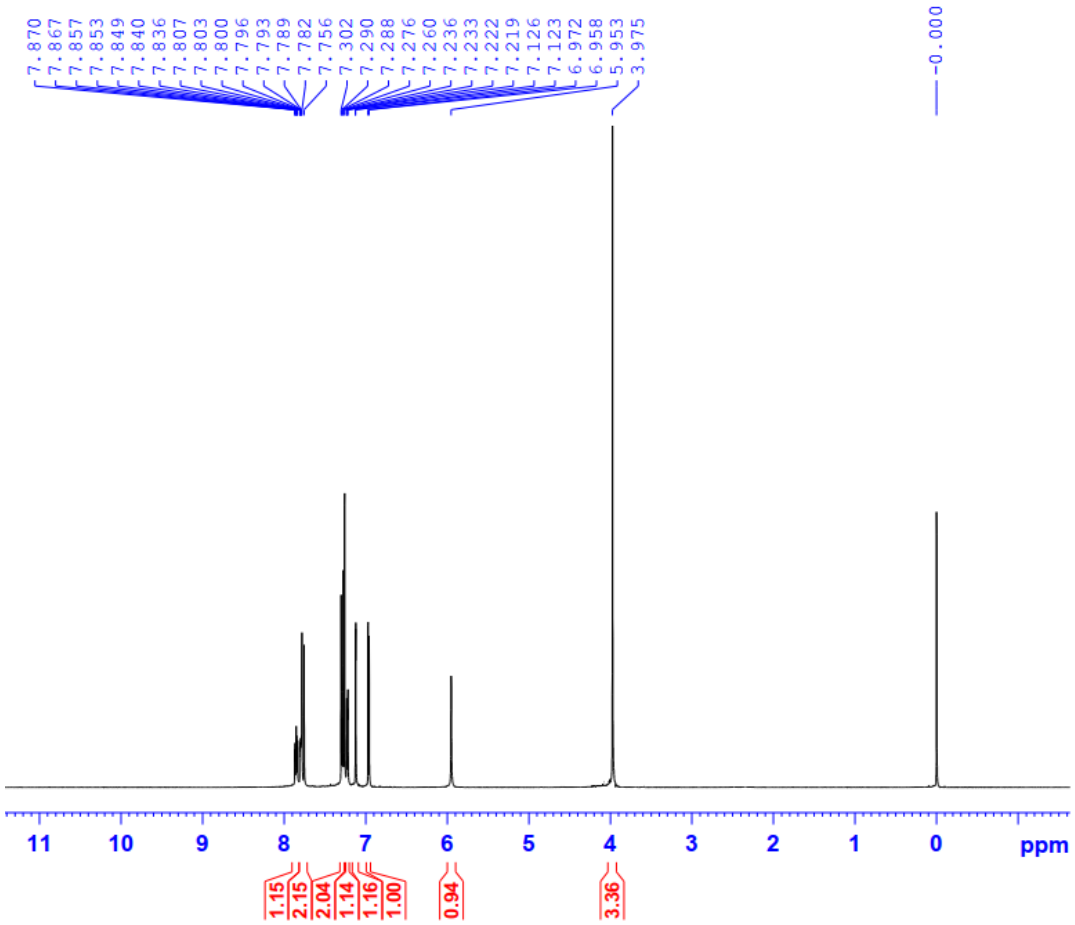


Figure S21a. ^{1}H-NMR spectrum of **3g**.

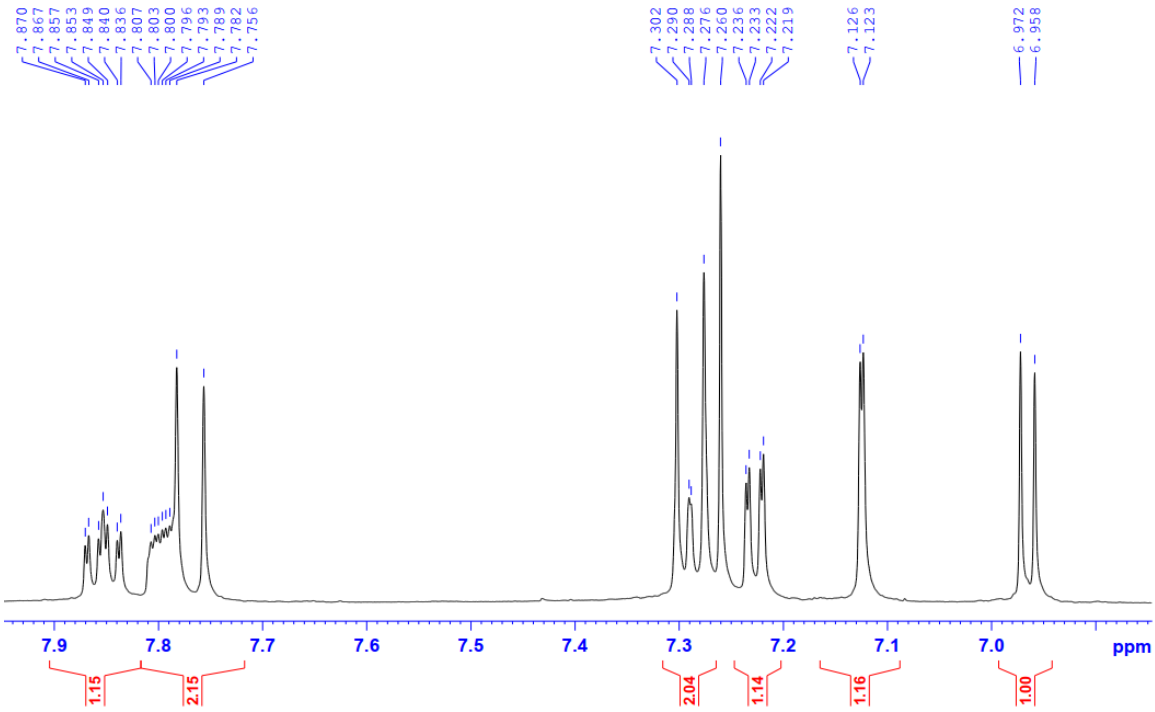


Figure S21b. ^{1}H-NMR spectrum of **3g**.

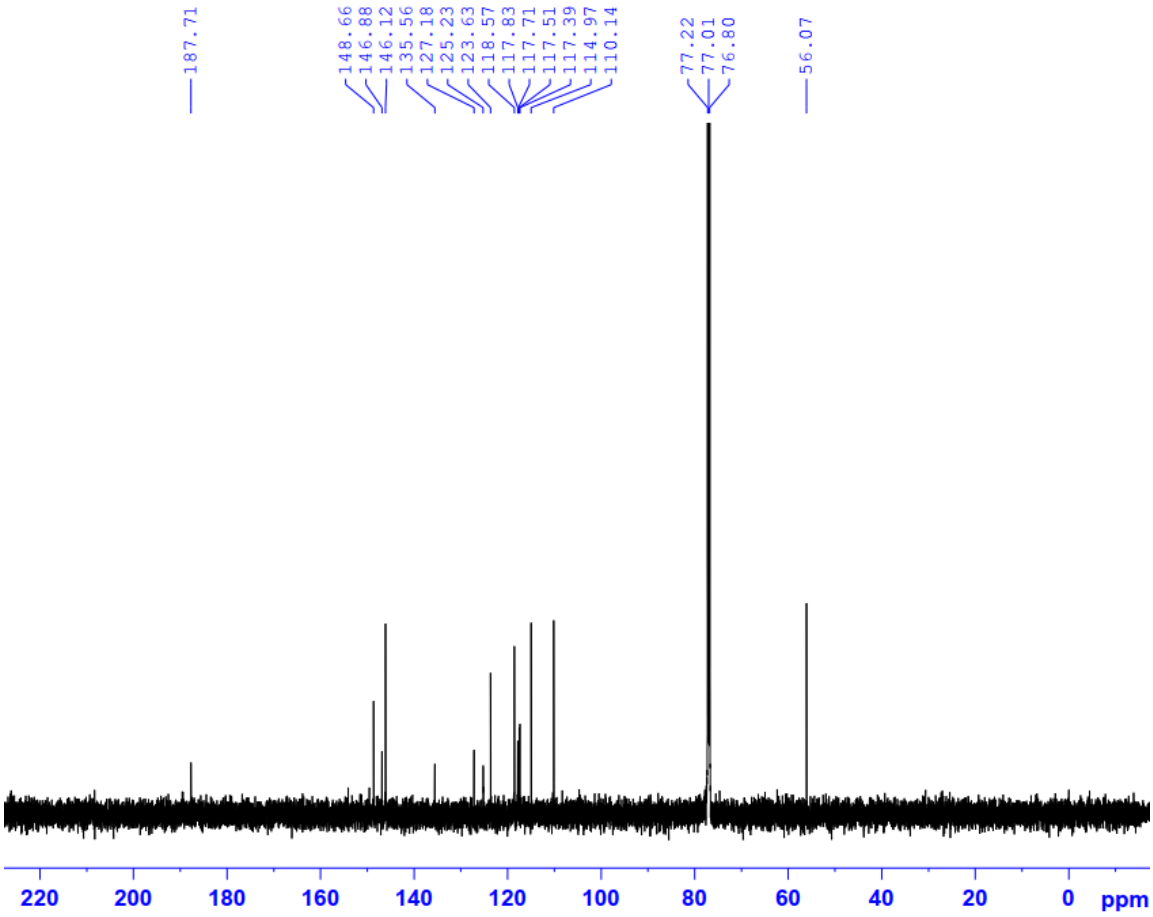


Figure S21c. ^{13}C-NMR spectrum of **3g**.

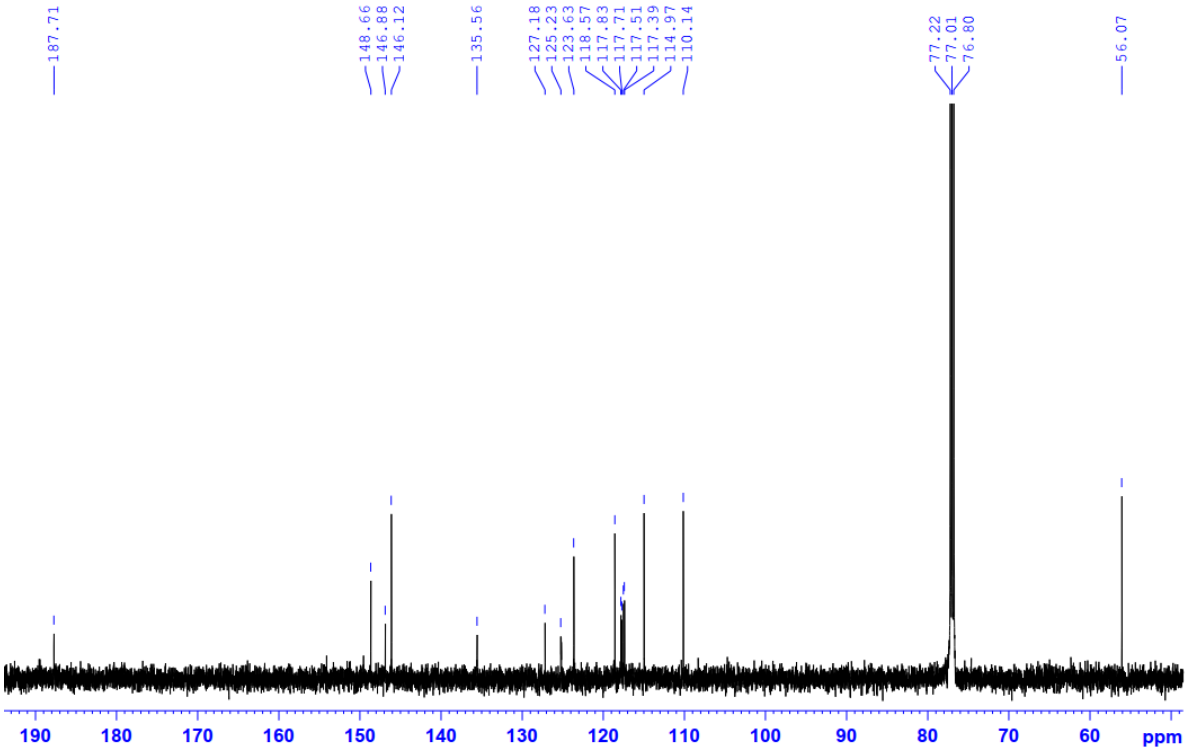


Figure S21d. ^{13}C-NMR spectrum of **3g**.

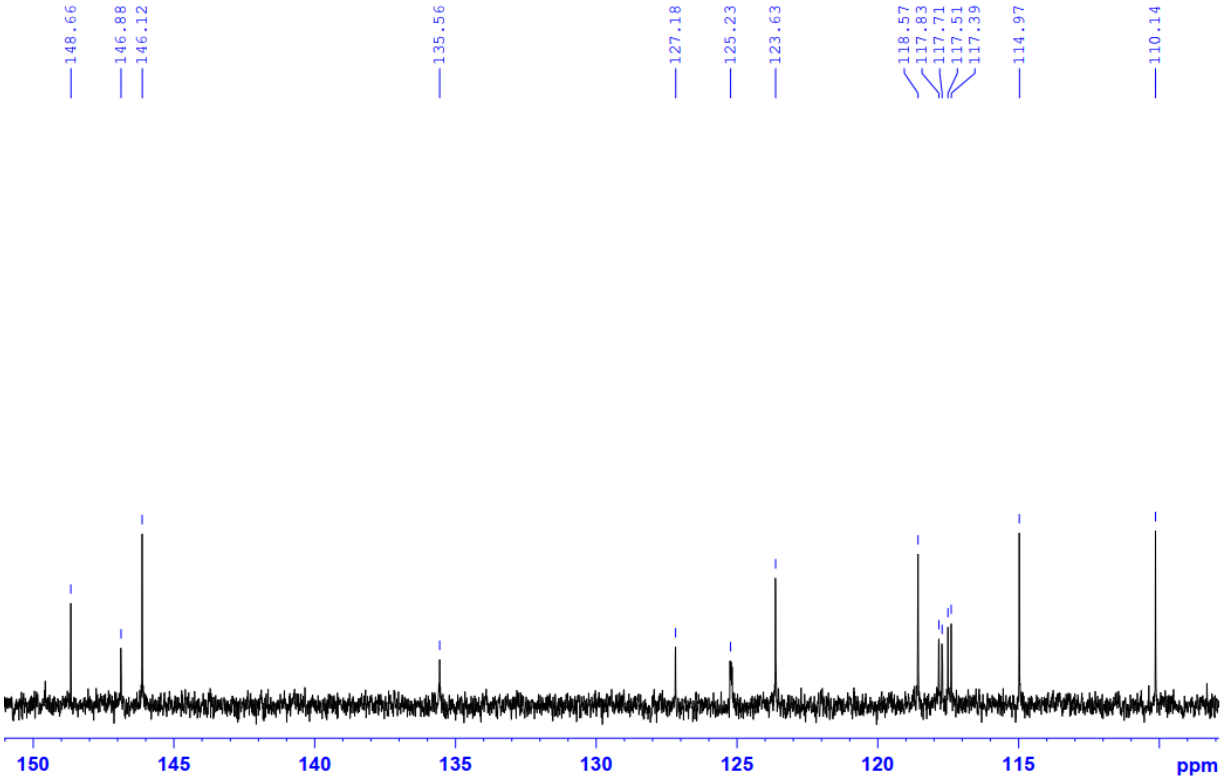


Figure S21e. ^{13}C-NMR spectrum of **3g**.

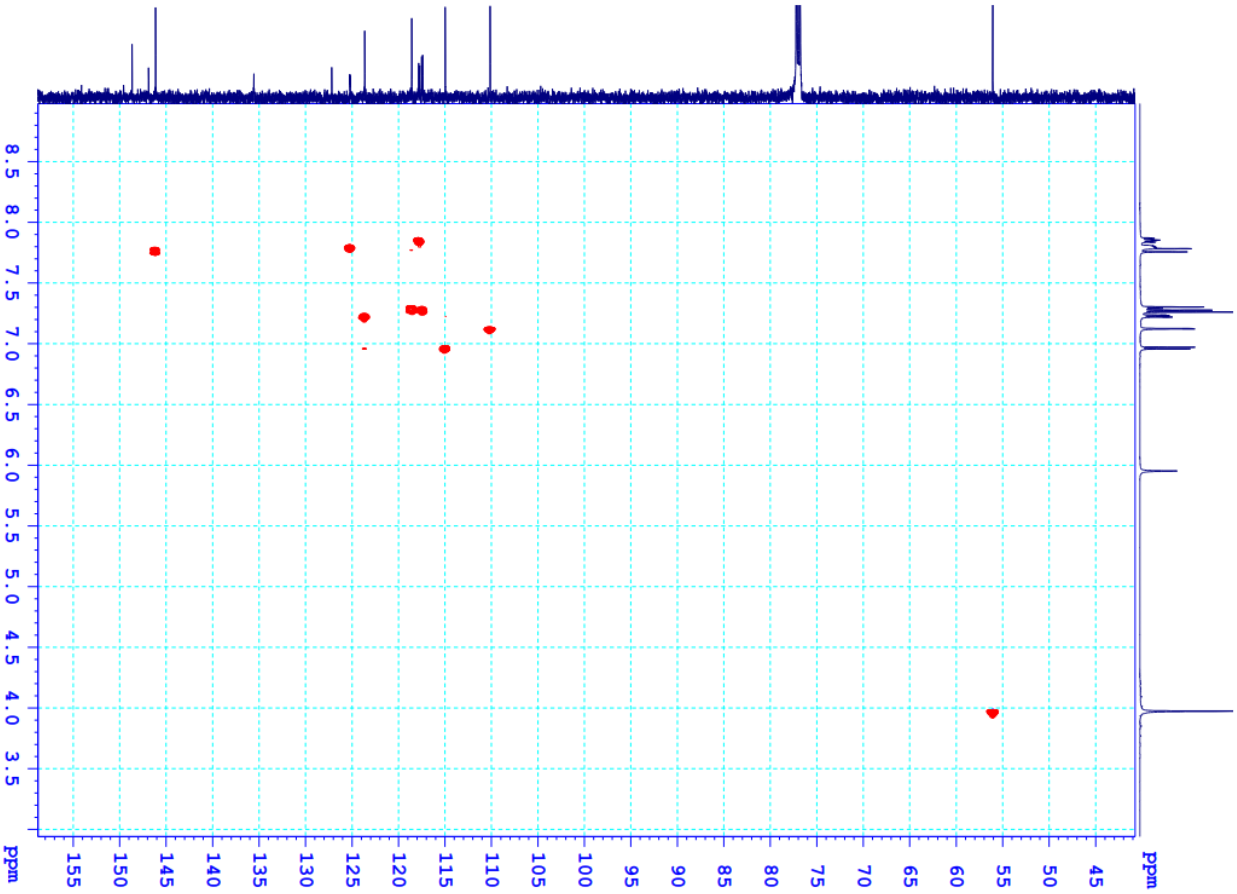


Figure S21f. HSQC spectrum of **3g**.

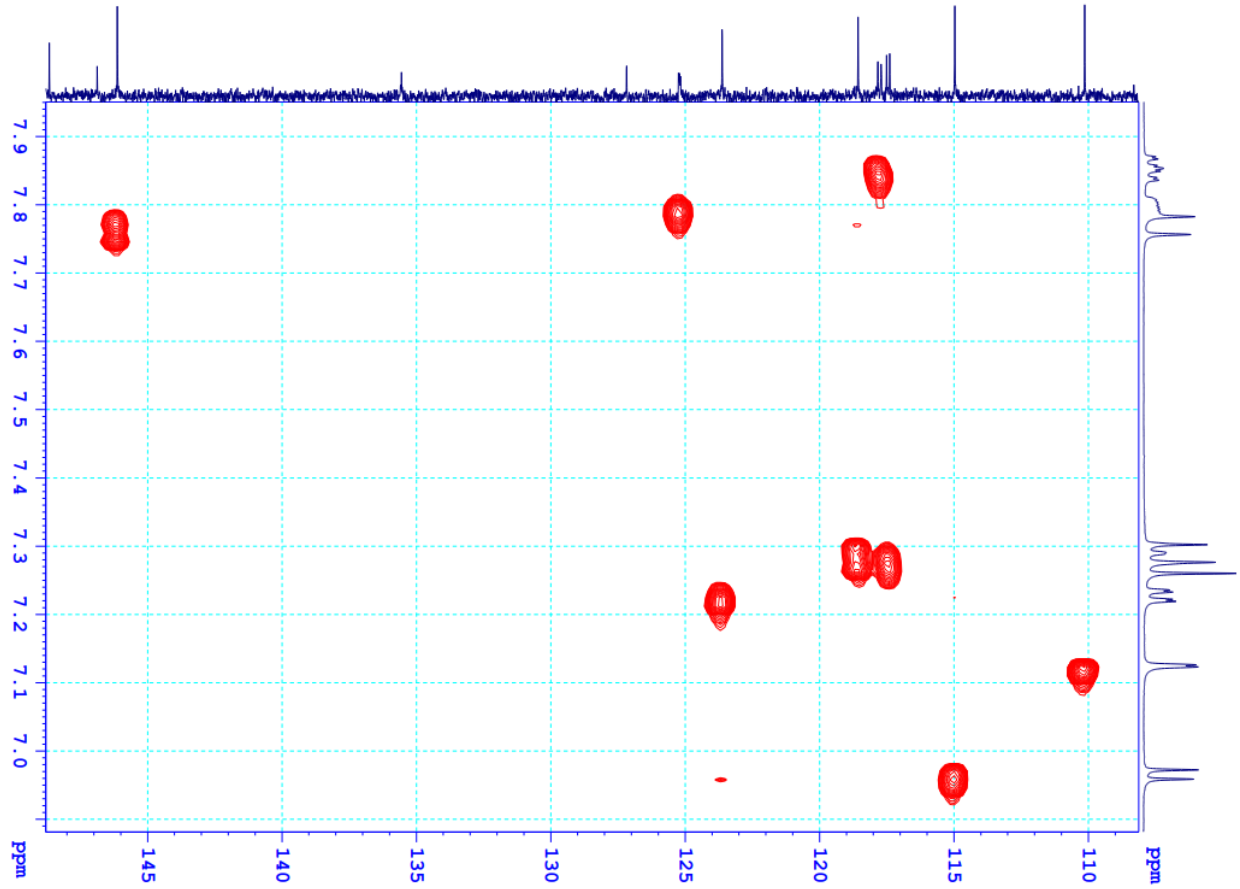


Figure S21g. HSQC spectrum of **3g**.

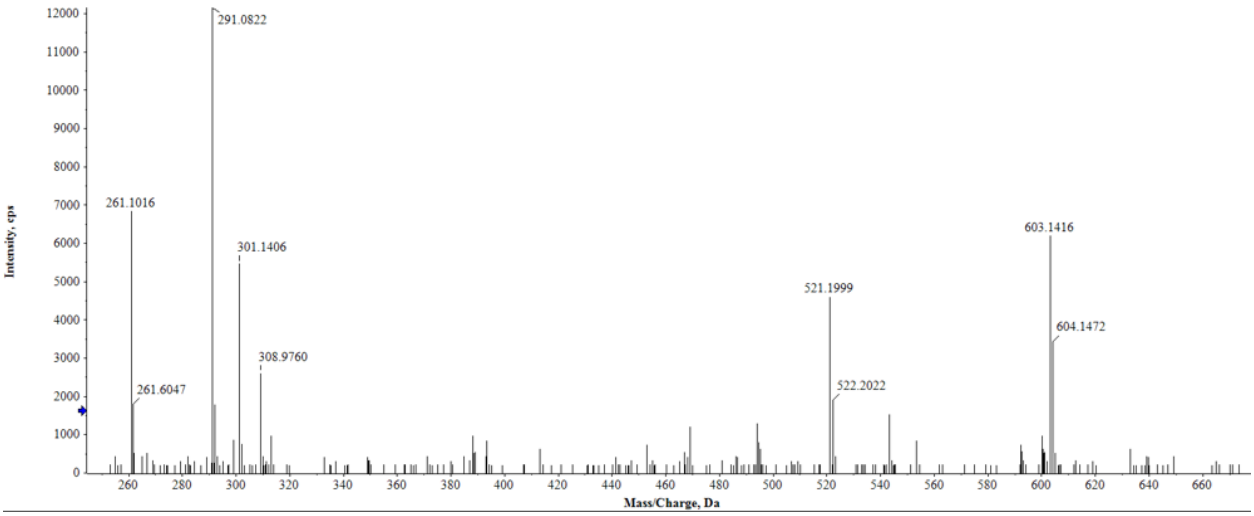


Figure S21h. HRMS of **3g**.

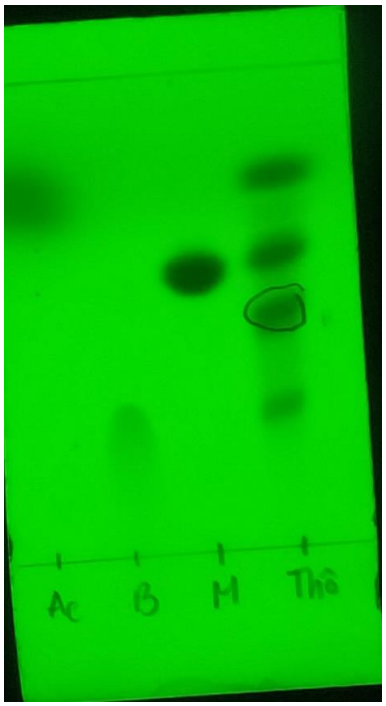


Figure S22. TLC result of the base-catalyzed reaction between acetophenone and benzaldehyde after stirring in ethanol for 24 h at reflux condition. Eluent: *n*-hexane/EA (9/1). Ac: acetophenone. B: benzaldehyde. M: Michael addition product. Thô: crude mixture. Spots were visualized at 254 nm.

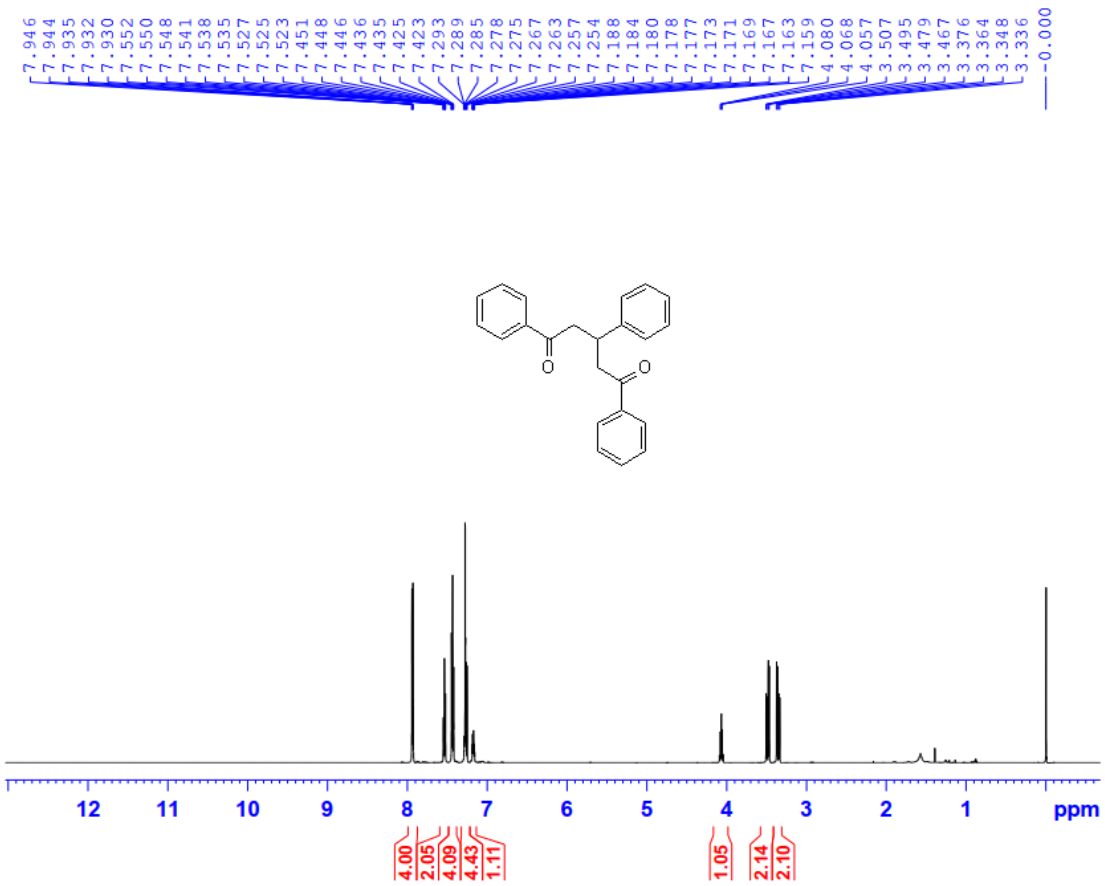


Figure S23a. ^{1}H-NMR spectrum of Michael addition product.

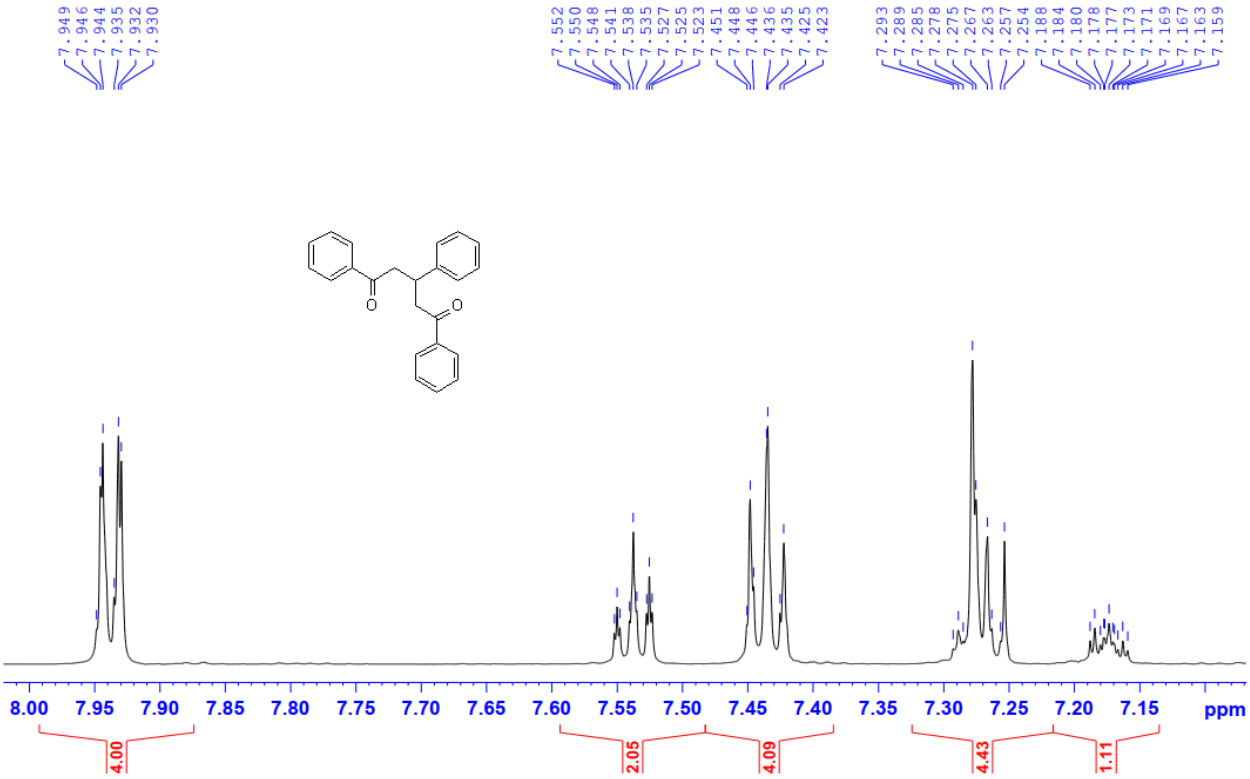


Figure S23b. ^{1}H-NMR spectrum of Michael addition product (expanded).

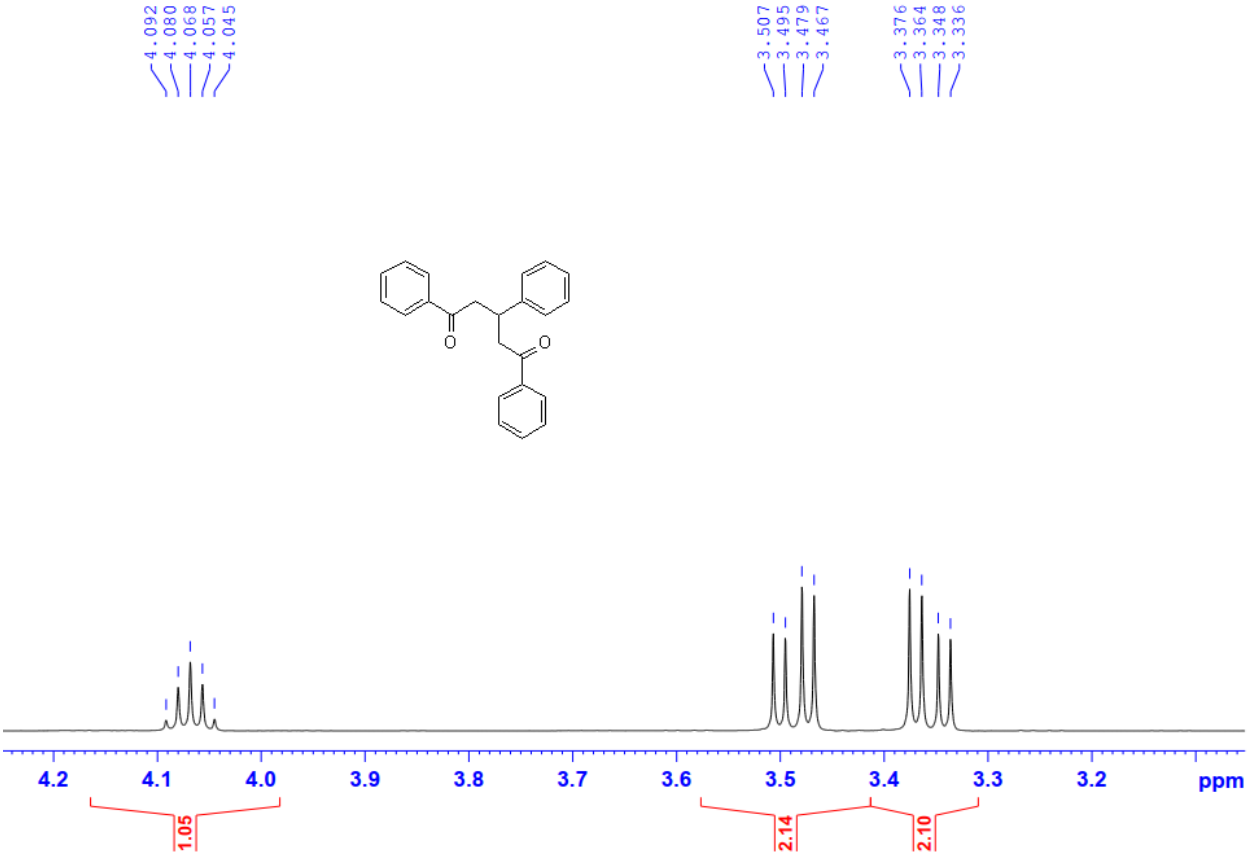


Figure S23c. ^{1}H-NMR spectrum of Michael addition product (expanded).