Electronic Supporting Information

Functionalized hypercrosslinked polymers with knitted *N*-heterocyclic carbene–copper complexes as efficient and recyclable catalysts for organic transformations

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1. General remarks

Indole, 2-methylindole, 5-bromoindole and 1,2-dimethylindole were purchased from Energy Chemical Company. Ethyl-indole-2-carboxylate, 2-phenylindole, 1-iododecane, 4-iodoanisole, and 1-(*tert*-butyl)-4-ethynylbenzene were purchased from Alfa Aesar Chemical Company. 6-Methylindole, 5-methoxyindole, 4-nitroindole, 1,3-cyclohexanedione, and 1,3-cyclopentanedione were purchased from Accela ChemBio Co. Ltd. Benzyl chloride, dimedone, benzimidazole, and formaldehyde dimethyl acetal (FDA, 98%) were purchased from Sinopharm Chemical Reagent Co. Ltd. Pyruvic aldehyde, 5-methoxy-7-methylindole, 5-fluoro-2-methylindole, 7-ethyl-1*H*-indole, 4-chloroindole, and 6-bromoindole were purchased from Adamas Reagent Co. Ltd. 6-Nitroindole, 5-methylindole, 7-azaindole, 5-methoxy-1*H*-pyrrolo[3,2-*b*]pyridine, 3,4-(methylenedioxy) phenylglyoxal hydrate, 5-bromo-2-thiopheneglyaxal hydrate, and 4-bromophenylglyoxal hydrate were purchased from BePharm Co. Ltd. 2-Chlorobenzaldehyde, iodoethane, sodium azide, and 1-ethyl-2-phenylindole were purchased from Aladdin Industrial Corporation. ^{1}H and ^{13}C NMR spectra were recorded on a Bruker AV-400. IR spectra were recorded on a FT-IR Bruker (EQUINOX 55) using KBr technology. High-resolution mass spectra (HRMS) were obtained on Brüker Compass Data Analysis 4.0.

2. Synthesis of *N*,*N*′-dibenzylbenzimidazolium chloride (NHC)

NHC was synthesized according to a reported procedure.[1] 1-Benzyl-1*H*-benzimidazole (2.08 g, 10.0 mmol) was suspended in toluene (100 mL). Then, benzyl chloride (1.40 mL, 12.0 mmol) was added and the mixture refluxed for 20 h. The solids were filtered and washed with Et_2O to give target compound as an white solid (1.90 g, 57%). mp: 210–211 °C. ^{1}H NMR (400 MHz, DMSO, 25 °C): δ = 10.23 (s, 1H), 7.98 (dd, J_a = 3.2 Hz, J_b = 6.4 Hz, 2H), 7.64 (dd, J_a = 3.2 Hz, J_b = 6.4 Hz, 2H), 7.54 (d, J = 4.0 Hz, 4H), 7.45–7.38 (m, 6H), 5.81 ppm (s, 4H); ^{13}C NMR (100 MHz, DMSO, 25 °C): δ = 143.4, 134.5, 131.5, 129.5, 129.2, 128.8, 127.2, 114.6, 50.5 ppm.

3. General procedure for the synthesis of HCP–NHC

HCP-NHC was synthesized according to a reported procedure.[2] NHC (2.01g, 6.0 mmol), benzene (1.40 g, 18 mmol), formaldehyde dimethyl acetal (4.10 g, 54 mmol), $FeCl_3$ (8.75 g, 54 mmol) and 1,2-dichloroethane (40 mL) were used in this polymerization at 80 °C for 24 h.

4. Spectroscopic data of the obtained compounds

5,5-Dimethyl-2-(1-(2-methyl-1*H*-indol-3-yl)-2-oxo-2-phenylethylidene)cyclohexane-1,3-dione (4a): Red solid; mp: 128–130 °C. ^{1}H NMR (400 MHz, DMSO, 25 °C): δ = 12.26 (s, 1H), 7.64 (s, 2H), 7.45 (d, J = 4.0 Hz, 2H), 7.36 (t, J = 7.6 Hz, 1H), 7.27 (t, J = 7.6 Hz, 2H), 7.09–7.05 (m, 1H), 6.99 (t, J = 8.0 Hz, 1H), 2.62–2.49 (m, 4H), 2.34 (s, 3H), 1.05 ppm (s, 6H); ^{13}C NMR (100 MHz,

DMSO, 25 °C): δ = 197.7, 194.6, 160.8, 157.7, 136.2, 135.8, 144.8, 132.5, 129.4, 128.4, 128.1, 127.2, 126.2, 122.4, 121.1, 120.1, 111.7, 53.2, 51.7, 29.8, 28.2, 28.1, 14.7 ppm; IR (KBr) v = 3339, 2957, 2927, 2870, 1735, 1670, 1601, 1448, 1334, 1243, 1178, 1023, 749, 695 cm^{-1}; HRMS (ESI): *m/z*: calcd for $C_{25}H_{23}NNaO_3$: 408.1576 $[M + Na]^+$; found: 408.1569.

5,5-Dimethyl-2-(2-oxo-2-phenyl-1-(2-phenyl-1*H*-indol-3-yl)ethylidene)cyclohexane-1,3-dione (4b): Red solid; mp: 240–242 °C. ^{1}H NMR (400 MHz, DMSO, 25 °C): δ = 12.22 (s, 1H), 7.68 (d, J = 8.0 Hz, 2H), 7.54 (d, J = 2.0 Hz, 2H), 7.49–7.35 (m, 7H), 7.22 (d, J = 8.0 Hz, 1H), 7.16 (t, J = 8.0 Hz, 1H), 7.05 (t, J = 8.0 Hz, 1H), 2.58–2.50 (m, 2H), 2.43–2.40 (m, 1H), 2.09–2.00 (m, 1H), 1.02 (s, 3H), 0.89 ppm (s, 3H); ^{13}C NMR (100 MHz, DMSO, 25 °C): δ = 198.3, 195.4, 154.5, 157.2, 144.7, 137.1, 136.6, 133.1, 132.2, 131.8, 129.5, 129.4, 129.0, 128.9, 128.4, 127.2, 123.1, 121.8, 120.5, 112.8, 109.3, 53.3, 52.5, 29.9, 28.9, 28.4 ppm; IR (KBr) v = 3248, 3061, 2956, 1734, 1663, 1447, 1321, 1241, 1026, 753, 698 cm^{-1}; HRMS (ESI): *m/z*: calcd for $C_{30}H_{25}NNaO_3$: 470.1732 $[M + Na]^+$; found: 470.1727.

2-(1-(1*H*-Indol-3-yl)-2-oxo-2-phenylethylidene)-5,5-dimethylcyclohexane-1,3-dione (4c): Red solid; mp: 206–208 °C. ^{1}H NMR (400 MHz, DMSO, 25 °C): δ = 12.25 (s, 1H), 7.91 (s, 1H), 7.69 (t, J = 4.0 Hz, 2H), 7.50–7.44 (m, 2H), 7.39 (t, J = 8.0 Hz, 2H), 7.19 (t, J = 8.0 Hz, 2H), 7.13 (t, J = 8.0 Hz, 1H), 2.83 (s, 1H), 2.55–2.50 (m, 3H), 1.07 ppm (s, 6H); ^{13}C NMR (100 MHz, DMSO, 25 °C): δ = 198.0, 196.5, 195.8, 156.7, 137.7, 136.6, 136.4, 133.1, 129.1, 128.4, 127.0, 124.7, 123.3, 122.1, 122.0, 113.4, 111.3, 53.8, 52.3, 30.5, 28.8, 28.2 ppm; IR (KBr) v = 3307, 2954, 2926, 1652, 1472, 1424, 1369, 1235, 1138, 1024, 1004, 749, 695 cm^{-1}; HRMS (ESI): *m/z*: calcd for $C_{24}H_{21}NNaO_3$: 394.1419 $[M + Na]^+$; found: 394.1410.

Ethyl 3-(1-(4,4-dimethyl-2,6-dioxocyclohexylidene)-2-oxo-2-phenylethyl)-1*H*-indole-2-carboxylate (4d): Red solid; mp: 178–179 °C. ^{1}H NMR (400 MHz, $CDCl_3$, 25 °C, TMS): δ = 9.65 (s, 1H), 8.07 (t, J = 4.0 Hz, 2H), 7.91 (d, J = 8.0 Hz, 1H), 7.40 (t, J = 8.0 Hz, 1H), 7.30 (t, J = 7.6 Hz, 2H), 7.19 (d, J = 4.0 Hz, 2H), 7.15–7.09 (m, 1H), 4.29–4.18 (m, 2H), 2.71 (d, J = 16.0 Hz, 1H), 2.60–2.54 (m, 3H), 1.29 (t, J = 8.0 Hz, 3H), 1.13 (s, 3H), 1.09 ppm (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$, 25 °C): δ = 198.4, 196.3, 194.4, 161.0, 154.9, 136.0, 135.4, 135.2, 133.1, 129.0, 128.4, 126.7, 126.2, 125.6, 123.0, 122.1, 112.9, 112.1, 61.33, 53.9, 53.4, 30.0, 28.7, 28.6, 14.2 ppm; IR (KBr) v = 3327, 2958, 1709, 1669, 1531, 1431, 1376, 1326, 1244, 1102, 749, 695 cm^{-1}; HRMS (ESI): *m/z*: calcd for $C_{27}H_{25}NNaO_5$: 466.1630 $[M + Na]^+$; found: 466.1623.

2-(1-(6-Methoxy-4-methyl-1*H*-indol-3-yl)-2-oxo-2-phenylethylidene)-5,5-dimethylcyclohexane-1,3-dione (4e): Red solid; mp: 251–252 °C. ^{1}H NMR (400 MHz, DMSO, 25 °C): δ = 12.17 (s, 1H), 7.67 (d, J = 8.0 Hz, 2H), 7.47 (t, J = 8.0 Hz, 1H), 7.40–7.37 (m, 2H), 7.20 (d, J = 8.0 Hz, 1H), 6.72 (dd, J_a = 4.0 Hz, J_b = 8.0 Hz, 1H), 3.63 (s, 3H), 2.55–2.50 (m, 4H), 2.30 (s, 3H), 1.07 ppm (s, 6H); ^{13}C NMR (100 MHz, DMSO, 25 °C): δ = 197.8, 195.0, 157.6,

155.0, 136.4, 132.5, 130.6, 128.5, 128.0, 127.1, 126.3, 112.3, 111.2, 103.5, 55.1, 29.8, 28.1, 14.8 ppm; IR (KBr) v = 3249, 2954, 1663, 1633, 1432, 1334, 1261, 1201, 1026, 1007, 811, 697 cm^{-1}; HRMS (ESI): *m/z*: calcd for $C_{26}H_{25}NNaO_4$: 438.1681 $[M + Na]^+$; found: 438.1675.

2-(1-(2,5-Dimethyl-1*H*-indol-3-yl)-2-oxo-2-phenylethylidene)-5,5-dimethylcyclohexane-1,3-dione (4f): Red solid; mp: 179–181 °C. ^1H NMR (400 MHz, DMSO, 25 °C): δ = 12.15 (s, 1H), 7.65 (d, J = 2.0 Hz, 2H), 7.47–7.44 (m, 1H), 7.37 (t, J = 8.0 Hz, 1H), 7.18 (d, J = 8.0 Hz, 1H), 7.04 (s, 1H), 6.90 (d, J = 8.0 Hz, 1H), 2.55–2.50 (m, 4H), 2.31 (s, 3H), 2.26 (s, 3H), 1.07 ppm (s, 6H); ^{13}C NMR (100 MHz, DMSO, 25 °C): δ = 197.9, 195.2, 158.3, 136.8, 134.5, 132.9, 130.7, 128.9, 128.5, 127.3, 127.0, 124.2, 120.7, 111.8, 53.5, 52.3, 30.3, 28.6, 21.9, 15.2 ppm; IR (KBr) v = 3228, 2955, 2869, 1663, 1638, 1436, 1332, 1247, 1024, 1004, 759, 696 cm^{-1}; HRMS (ESI): *m/z*: calcd for $C_{26}H_{25}NNaO_3$: 422.1732 $[M + Na]^+$; found: 422.1724.

2-(1-(5-Fluoro-2-methyl-1*H*-indol-3-yl)-2-oxo-2-phenylethylidene)-5,5-dimethylcyclohexane-1,3-dione (4g): Red solid; mp: 202–203 °C. ^1H NMR (400 MHz, DMSO, 25 °C): δ = 12.27 (s, 1H), 7.66 (d, J = 4.0 Hz, 2H), 7.47 (t, J = 7.6 Hz, 1H), 7.38 (t, J = 8.0 Hz, 2H), 7.30 (dd, J_a = 4.0 Hz, J_b = 8.0 Hz, 1H), 6.95–6.92 (m, 2H), 2.58 (s, 4H), 2.34 (s, 3H), 1.06 ppm (s, 6H); ^{13}C NMR (100 MHz, DMSO, 25 °C): δ = 197.0, 194.8, 159.6, 157.3, 136.4, 133.1, 132.8, 129.0, 128.5, 128.2, 127.4 (d, J = 10.0 Hz), 113.15 (d, J = 5.0 Hz), 110.6, 110.3, 106.0, 105.7, 53.4, 30.2, 28.5, 15.1 ppm; ^{19}F NMR (377 MHz, DMSO, 25 °C): δ = -121.4 ppm (s, 1F); IR (KBr) v = 2956, 2871, 1660, 1441, 1334, 1251, 1183, 1025, 1006 cm^{-1}; HRMS (ESI) *m/z*: calcd for $C_{25}H_{22}FNNaO_3$: 426.1481 $[M + Na]^+$; found: 426.1484.

5,5-Dimethyl-2-(1-(1-methyl-2-phenyl-1*H*-indol-3-yl)-2-oxo-2-phenylethylidene)cyclohexane-1,3-dione (4h): Red solid; mp: 113–115 °C. ^1H NMR (400 MHz, DMSO, 25 °C): δ = 7.60 (d, J = 4.0 Hz, 2H), 7.54 (d, J = 8.0 Hz, 1H), 7.50–7.43 (m, 4H), 7.35 (t, J = 8.0 Hz, 2H), 7.29–7.23 (m, 4H), 7.12 (d, J = 7.6 Hz, 1H), 3.52 (s, 3H), 2.55–2.46 (m, 2H), 2.31–2.24 (m, 1H), 2.03–1.98 (m, 1H), 0.98 (s, 3H), 0.81 ppm (s, 3H); ^{13}C NMR (100 MHz, DMSO, 25 °C): δ = 197.8, 195.9, 194.5, 156.8, 145.7, 138.0, 136.5, 133.1, 131.4, 130.5, 129.6, 128.9, 128.8, 128.3, 126.1, 123.2, 122.2, 120.6, 111.7, 110.1, 53.4, 52.4, 31.8, 29.8, 28.8, 28.4 ppm; IR (KBr) v = 3058, 2954, 2870, 1734, 1666, 1466, 1394, 1367, 1249, 1056, 1028, 749, 699 cm^{-1}; HRMS (ESI): *m/z*: calcd for $C_{31}H_{27}NNaO_3$: 484.1889 $[M + Na]^+$; found: 484.1891.

2-(1-(1-Ethyl-2-phenyl-1*H*-indol-3-yl)-2-oxo-2-phenylethylidene)-5,5-dimethylcyclohexane-1,3-dione (4i): Red solid; mp: 167–168 °C. ^1H NMR (400 MHz, DMSO, 25 °C): δ = 7.60 (t, J = 8.0 Hz, 3H), 7.49 (t, J = 7.6 Hz, 1H), 7.34–7.33 (m, 3H), 7.37 (t, J = 8.0 Hz, 2H), 7.26–7.22 (m, 4H), 7.11 (t, J = 8.0 Hz, 1H), 4.06–3.98 (m, 2H), 2.59–2.46 (m, 2H), 2.29–2.25 (m, 1H), 2.04 (s, 1H), 1.08 (t, J = 8.0 Hz, 3H), 0.98 (s, 3H), 0.78 (s, 3H) ppm; ^{13}C NMR (100 MHz, DMSO, 25 °C): δ = 197.7, 196.0, 194.7, 156.7, 145.1, 136.7, 136.4, 133.1, 131.2, 130.6, 129.7, 129.0, 128.9, 128.3,

126.3, 123.3, 122.2, 120.8, 111.8, 111.5, 53.4, 52.3, 39.3, 29.7, 28.8, 28.3, 15.3 ppm; IR (KBr) v = 3445, 3059, 2956, 1734, 1665, 1462, 1407, 1356, 1232, 1055, 1027, 761, 699 cm^{-1}; HRMS (ESI): *m/z*: calcd for $C_{32}H_{29}NO_3$: 498.2045 $[M + Na]^+$; found: 498.2040.

2-(1-(4-Ethyl-1*H*-indol-3-yl)-2-oxo-2-phenylethylidene)-5,5-dimethylcyclohexane-1,3-dione (4j): Red solid; mp: 123–125 °C. ^1H NMR (400 MHz, DMSO, 25 °C): δ = 12.27 (s, 1H), 7.86 (s, 1H), 7.70 (d, J = 8.0 Hz, 2H), 7.48 (t, J = 8.0 Hz, 1H), 7.38 (t, J = 7.6 Hz, 2H), 7.07–7.04 (m, 2H), 7.10–7.03 (m, 1H), 2.84 (quint, J = 8.0 Hz, 2H), 2.58–2.50 (m, 4H), 1.23 (t, J = 8.0 Hz, 3H), 1.07 ppm (s, 6H); ^{13}C NMR (100 MHz, DMSO, 25 °C): δ = 194.8, 156.6, 136.4, 135.9, 133.1, 129.1, 129.0, 128.4, 127.2, 124.7, 122.2, 119.8, 111.6, 53.8, 52.3, 30.5, 28.6, 23.9, 15.0 ppm; IR (KBr) v = 3162, 3102, 2959, 2873, 1657, 1488, 1427, 1368, 1229, 1144, 1052, 1026, 1005, 752, 698 cm^{-1}; HRMS (ESI): *m/z*: calcd for $C_{26}H_{25}NNaO_3$: 422.1732 $[M + Na]^+$; found: 422.1728.

5,5-Dimethyl-2-(1-(5-methyl-1*H*-indol-3-yl)-2-oxo-2-phenylethylidene)cyclohexane-1,3-dione (4k): Red solid; mp: 212–213 °C. ^1H NMR (400 MHz, $CDCl_3$, 25 °C, TMS): δ = 9.98 (s, 1H), 7.73 (d, J = 8.0 Hz, 2H), 7.38 (t, J = 6.8 Hz, 1H), 7.30–7.25 (m, 3H), 6.94 (d, J = 8.0 Hz, 1H), 6.90–6.86 (m, 2H), 2.68 (d, J = 16.0 Hz, 2H), 2.49 (s, 2H), 2.37 (s, 3H), 1.15 ppm (d, J = 8.0 Hz, 6H); ^{13}C NMR (100 MHz, $CDCl_3$, 25 °C): δ = 197.6, 196.6, 195.7, 159.0, 136.9, 136.5, 135.7, 132.7, 131.8, 128.6, 128.4, 125.4, 125.2, 124.2, 122.3, 112.7, 112.4, 54.1, 52.5, 30.4, 28.7, 21.9 ppm; IR (KBr) v = 3296, 2956, 1734, 1648, 1421, 1366, 1238, 1139, 802, 694 cm^{-1}; HRMS (ESI): *m/z*: calcd for $C_{25}H_{23}NNaO_3$: 408.1576 $[M + Na]^+$; found: 408.1577.

2-(1-(5-Methoxy-1*H*-indol-3-yl)-2-oxo-2-phenylethylidene)-5,5-dimethylcyclohexane-1,3-dione (4l): Red solid; mp: 145–147 °C. ^1H NMR (400 MHz, $CDCl_3$, 25 °C, TMS): δ = 10.08 (s, 1H), 7.75 (d, J = 8.0 Hz, 2H), 7.42–7.38 (m, 2H), 7.31–7.28 (m, 2H), 6.95 (d, J = 8.0 Hz, 1H), 6.70 (d, J = 12.0 Hz, 1H), 6.52 (s, 1H), 3.73 (s, 3H), 2.67 (s, 2H), 2.49 (s, 2H), 1.14 ppm (s, 6H); ^{13}C NMR (100 MHz, $CDCl_3$, 25 °C): δ = 197.7, 196.4, 195.9, 159.0, 155.9, 137.5, 136.5, 132.8, 132.1, 128.6, 128.3, 125.1, 113.7, 112.9, 112.7, 105.4, 55.6, 54.1, 52.4, 30.3, 28.7 ppm; IR (KBr) v = 3305, 2955, 1735, 1663, 1633, 1466, 1367, 1247, 1204, 1140, 1039, 803, 695 cm^{-1}; HRMS (ESI): *m/z*: calcd for $C_{25}H_{23}NNaO_4$: 424.1525 $[M + Na]^+$; found: 424.1517.

2-(1-(5-Fluoro-1*H*-indol-3-yl)-2-oxo-2-phenylethylidene)-5,5-dimethylcyclohexane-1,3-dione (4m): Red solid; mp: 120–122 °C. ^1H NMR (400 MHz, $CDCl_3$, 25 °C, TMS): δ = 10.99 (d, J = 12.0 Hz, 1H), 7.74 (d, J = 8.0 Hz, 2H), 7.56 (s, 1H), 7.41 (t, J = 7.6 Hz, 1H), 7.30 (t, J = 8.0 Hz, 2H), 7.09–7.06 (m, 1H), 6.910–6.86 (m, 1H), 2.70 (s, 2H), 2.51 (s, 2H), 1.15 ppm (s, 6H); ^{13}C NMR (100 MHz, $CDCl_3$, 25 °C): δ = 197.9, 196.9, 195.7, 161.3, 158.9, 158.1, 137.4, 136.2, 133.0, 128.7, 128.3, 122.7 (d, J = 11.0 Hz), 120.5, 112.0, 110.7 (d, J = 24.0 Hz), 99.4, 99.1, 54.2, 52.6, 30.4, 28.6 ppm. ^{19}F NMR (377 MHz, $CDCl_3$, 25 °C): δ = -118.4 ppm (sext, J = 6.4 Hz, 1F); IR (KBr) v = 3301, 3067, 2960, 1732, 1671, 1622, 1524, 1450, 1375, 1242, 1141, 1043, 955, 844,

694 cm^{-1}; HRMS (ESI): *m/z*: calcd for $C_{24}H_{20}FNNaO_3$: 412.1325 $[M + Na]^+$; found: 412.1320.

2-(1-(6-Methoxy-4-methyl-1*H*-indol-3-yl)-2-oxo-2-phenylethylidene)-5,5-dimethylcyclohexane-1,3-dione (4n): Red solid; mp: 125–126 °C. ^1H NMR (400 MHz, $CDCl_3$, 25 °C, TMS): δ = 10.04 (s, 1H), 7.70 (d, J = 8.0 Hz, 2H), 7.37 (t, J = 8.0 Hz, 1H), 7.27 (t, J = 8.0 Hz, 3H), 6.58 (s, 1H), 6.36 (s, 1H), 3.75 (s, 3H), 2.71–2.60 (m, 2H), 2.50 (s, 2H), 2.12 (s, 3H), 1.15 ppm (d, J = 8.0 Hz, 6H); ^{13}C NMR (100 MHz, $CDCl_3$, 25 °C): δ = 197.3, 196.8, 195.4, 159.4, 156.0, 136.9, 136.4, 132.7, 132.0, 128.6, 128.3, 125.1, 124.4, 123.8, 113.7, 113.1, 102.8, 55.6, 54.1, 52.4, 30.4, 28.5, 16.2 ppm; IR (KBr) v = 3297, 2953, 1732, 1664, 1640, 1465, 1427, 1366, 1211, 1136, 1047, 844, 800, 697 cm^{-1}; HRMS (ESI): *m/z*: calcd for $C_{26}H_{25}NNaO_4$: 438.1681 $[M + Na]^+$; found: 438.1676.

5,5-Dimethyl-2-(1-(6-nitro-1*H*-indol-3-yl)-2-oxo-2-phenylethylidene)cyclohexane-1,3-dione (4o): Red solid; mp: 125–126 °C. ^1H NMR (400 MHz, $CDCl_3$, 25 °C, TMS): δ = 10.39 (s, 1H), 8.00–7.94 (m, 2H), 7.90 (d, J = 3.2 Hz, 1H), 7.76 (d, J = 8.0 Hz, 2H), 7.43 (t, J = 8.0 Hz, 1H), 7.32 (t, J = 8.0 Hz, 2H), 7.27 (d, J = 2.0 Hz, 1H), 2.76 (s, 2H), 2.60 (s, 2H), 1.18 ppm (s, 6H); ^{13}C NMR (100 MHz, $CDCl_3$, 25 °C): δ = 198.2, 197.2, 195.6, 156.4, 143.6, 138.4, 135.6, 133.4, 128.8, 128.4, 121.4, 117.0, 111.4, 109.2, 54.3, 53.8, 31.0, 30.4, 28.6 cm^{-1}; IR (KBr) v = 3329, 2958, 2929, 1734, 1664, 1512, 1448, 1339, 1241, 1115, 1044, 699 cm^{-1}; HRMS (ESI): *m/z*: calcd for $C_{24}H_{20}N_2NaO_5$: 439.1270 $[M + Na]^+$; found: 439.1259.

2-(1-(4-Hydroxy-1*H*-indol-3-yl)-2-oxo-2-phenylethylidene)-5,5-dimethylcyclohexane-1,3-dione (4p): Red solid; mp: 147–149 °C. ^1H NMR (400 MHz, DMSO, 25 °C): δ = 11.74 (s, 1H), 9.80 (s, 1H), 7.80 (d, J = 8.0 Hz, 2H), 7.48 (t, J = 7.6 Hz, 1H), 7.40 (t, J = 8.0 Hz, 2H), 7.29 (d, J = 4.0 Hz, 1H), 7.00 (t, J = 8.0 Hz, 1H), 6.88 (d, J = 8.0 Hz, 1H), 6.52 (d, J = 8.0 Hz, 1H), 2.72 (s, 1H), 2.43 (s, 3H), 1.11 ppm (s, 6H); ^{13}C NMR (100 MHz, DMSO, 25 °C): δ = 197.0, 195.5, 156.1, 151.8, 139.7, 136.1, 133.0, 131.3, 129.0, 128.5, 124.5, 113.6, 107.3, 104.4, 53.1, 52.5, 30.2, 28.9 ppm; IR (KBr) v = 3301, 2954, 2871, 1658, 1594, 1526, 1494, 1451, 1426, 1307, 1241, 1130, 1024, 782, 744, 700 cm^{-1}; HRMS (ESI): *m/z*: calcd for $C_{24}H_{21}NNaO_4$: 410.1368 $[M + Na]^+$; found: 410.1362.

2-(1-(5-Methoxy-1*H*-pyrrolo[3,2-*b*]pyridin-3-yl)-2-oxo-2-phenylethylidene)-5,5-dimethylcyclohexane-1,3-dione (4q): Red solid; mp: 122–124 °C. ^1H NMR (400 MHz, $CDCl_3$, 25 °C, TMS): δ = 9.96 (s, 1H), 7.82 (d, J = 8.0 Hz, 2H), 7.45–7.41 (m, 2H), 7.32 (t, J = 7.6 Hz, 2H), 7.24 (d, J = 8.0 Hz, 1H), 6.43 (d, J = 8.0 Hz, 1H), 3.72 (s, 3H), 2.84–2.68 (m, 2H), 2.48 (s, 2H), 1.16–1.10 ppm (m, 6H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 198.0, 197.5, 196.1, 160.5, 154.6, 139.2, 136.2, 134.3, 132.8, 129.9, 128.6, 125.9, 123.1, 111.3, 106.9, 54.3, 53.4, 53.0, 31.6, 30.4, 29.1 ppm; IR (KBr) v = 3269, 2955, 2927, 2870, 1652, 1583, 1452, 1407, 1296, 1241, 1145, 1024, 938, 813, 694, 667, 582 cm^{-1}; HRMS (ESI): *m/z*: calcd for $C_{24}H_{22}N_2NaO_4$: 425.1477 $[M + Na]^+$;

found: 425.1474.

2-(2-Cyclopropyl-1-(2-methyl-1*H*-indol-3-yl)-2-oxoethylidene)-5,5-dimethylcyclohexane-1,3-dione (4r): Orange solid; mp: 123–125 °C. ^{1}H NMR (400 MHz, DMSO, 25 °C): δ = 12.22 (s, 1H), 7.35 (d, J = 8.0 Hz, 1H), 7.19 (d, J = 8.0 Hz, 1H), 7.13 (t, J = 8.0 Hz, 1H), 7.06 (t, J = 7.6 Hz, 1H), 2.55–2.50 (m, 4H), 2.27 (s, 3H), 2.01–1.93 (m, 1H), 1.05–0.98 (m, 8H), 0.86–0.81 ppm (m, 2H); ^{13}C NMR (100 MHz, DMSO, 25 °C): δ = 205.8, 195.3, 147.8, 136.2, 127.2, 122.8, 121.6, 120.3, 111.2, 109.4, 53.7, 52.4, 32.2, 30.1, 28.9, 14.8 ppm; IR (KBr) v = 3323, 2959, 2930, 1729, 1675, 1627, 1456, 1373, 1334, 1242, 1051, 1025, 746 cm^{-1}; HRMS (ESI): *m/z*: calcd for $C_{22}H_{23}NNaO_3$: 372.1576 [M + Na]$^+$; found: 372.1572.

5,5-Dimethyl-2-(1-(2-methyl-1*H*-indol-3-yl)-2-oxopropylidene)cyclohexane-1,3-dione (4s): Red solid; mp: 147–149 °C. ^{1}H NMR (400 MHz, DMSO, 25 °C): δ = 12.29 (s, 1H), 7.38 (d, J = 8.0 Hz, 1H), 7.23 (d, J = 8.0 Hz, 2H), 7.16 (t, J = 8.0 Hz, 1H), 7.07 (t, J = 7.6 Hz, 1H), 2.54–2.50 (m, 4H), 2.25 (s, 3H), 2.15 (s, 3H), 1.05 ppm (s, 3H); ^{13}C NMR (100 MHz, DMSO, 25 °C): δ = 203.2, 160.0, 148.2, 136.3, 128.7, 128.2, 126.7, 123.0, 122.0, 120.1, 112.2, 109.0, 56.3, 31.2, 30.2, 30.0, 28.6, 14.9 ppm; IR (KBr) v = 3298, 2961, 2922, 1720, 1673, 1603, 1460, 1261, 1197, 1023, 804, 749, 537 cm^{-1}; HRMS (ESI): *m/z*: calcd for $C_{20}H_{21}NNaO_3$: 346.1419 [M + Na]$^+$; found: 346.1412.

2-(2-(4-Bromophenyl)-1-(2-methyl-1*H*-indol-3-yl)-2-oxoethylidene)-5,5-dimethylcyclohexane-1,3-dione (4t): Red solid; mp: 185–186 °C. ^{1}H NMR (400 MHz, DMSO, 25 °C): δ = 12.34 (s, 1H), 7.57 (s, 4H), 7.31 (d, J = 8.0 Hz, 2H), 7.09 (t, J = 8.0 Hz, 1H), 7.01 (t, J = 7.6 Hz, 1H), 2.60–2.50 (m, 4H), 2.34 (s, 3H), 1.06 ppm (s, 6H); ^{13}C NMR (100 MHz, DMSO, 25 °C): δ = 197.9, 194.4, 193.7, 156.9, 156.8, 135.8, 135.3, 131.6, 129.9, 127.0, 126.5, 126.1, 122.5, 121.5, 120.0, 111.7, 53.1, 51.5, 29.8, 28.0, 14.1 ppm; IR (KBr) v = 3180, 2955, 1667, 1639, 1585, 1439, 1332, 1243, 1174, 1005, 802, 751 cm^{-1}; HRMS (ESI): *m/z*: calcd for $C_{25}H_{22}BrNNaO_3$: 486.0681 [M + Na]$^+$; found: 486.0672.

2-(2-(Benzo[*d*][1,3]dioxol-5-yl)-1-(2-methyl-1*H*-indol-3-yl)-2-oxoethylidene)-5,5-dimethylcyclohexane-1,3-dione (4u): Red solid; mp: 126–128°C. ^{1}H NMR (400 MHz, DMSO, 25 °C): δ = 12.25 (s, 1H), 7.30 (d, J = 8.0 Hz, 1H), 7.16–7.06 (m, 4H), 6.99 (t, J = 7.6 Hz, 1H), 6.86 (t, J = 7.6 Hz, 1H), 6.04 (s, 2H), 2.50 (s, 4H), 2.32 (s, 3H), 1.05 ppm (s, 6H); ^{13}C NMR (100 MHz, DMSO, 25 °C): δ = 195.0, 159.7, 151.6, 148.1, 136.1, 131.8, 128.3, 127.9, 126.4, 125.0, 123.3, 122.4, 121.0, 112.0, 108.1, 108.0, 101.8, 53.7, 52.6, 30.1, 29.0, 28.4, 14.8 ppm; IR (KBr) v = 3274, 2955, 2924, 1736, 1702, 1615, 1544, 1458, 1423, 1331, 1226, 1103, 1044, 981, 746 cm^{-1}; HRMS (ESI): *m/z*: calcd for $C_{26}H_{23}NNaO_5$: 452.1474 [M + Na]$^+$; found: 452.1470.

2-(2-(Benzofuran-2-yl)-1-(2-methyl-1*H*-indol-3-yl)-2-oxoethylidene)-5,5-dimethylcyclohexane-1,3-dione (4v): Red solid; mp: 128–130°C. ^{1}H NMR (400 MHz, DMSO,

25 °C): δ = 12.38 (s, 1H), 7.71 (d, J = 8.0 Hz, 1H), 7.63 (d, J = 8.0 Hz, 1H), 7.49–7.46 (m, 1H), 7.34–7.28 (m, 3H), 7.22–7.15 (m, 1H), 7.09 (t, J = 8.0 Hz, 1H), 6.99 (t, J = 8.0 Hz, 1H), 2.62 (s, 2H), 2.52–2.50 (m, 2H), 2.35 (s, 3H), 1.07 ppm (s, 6H); ^{13}C NMR (100 MHz, DMSO, 25 °C): δ = 198.7, 194.8, 185.5, 155.1, 152.8, 136.3, 128.6, 127.2, 127.0, 124.5, 124.0, 123.1, 122.1, 120.4, 113.0, 112.6, 112.3, 53.6, 52.3, 52.2, 30.2, 29.5, 28.5, 15.2 ppm; IR (KBr) v = 2955, 2923, 2853, 1661, 1556, 1444, 1332, 1240, 1022, 1006, 816, 750 cm^{-1}; HRMS (ESI): *m/z*: calcd for $C_{27}H_{23}NNaO_4$: 448.1525 $[M + Na]^+$: found: 448.1522.

2-(2-(5-Bromothiophen-2-yl)-1-(2-methyl-1*H*-indol-3-yl)-2-oxoethylidene)-5,5-dimethylcyclohexane-1,3-dione (4w): Red solid; mp: 123–125 °C. ^{1}H NMR (400 MHz, DMSO, 25 °C): δ = 12.39 (s, 1H), 7.34 (d, J = 8.0 Hz, 1H), 7.19 (d, J = 4.0 Hz, 2H), 7.13–7.10 (m, 2H), 7.02 (t, J = 8.0 Hz, 1H), 2.61–2.58 (m, 2H), 2.52–2.50 (m, 2H), 2.31 (s, 3H), 1.05 ppm (s, 6H); ^{13}C NMR (100 MHz, $CDCl_3$, 25 °C): δ = 198.7, 183.6, 156.5, 149.2, 145.2, 143.9, 136.0, 132.4, 131.2, 128.0, 126.5, 123.6, 122.6, 120.9, 111.9, 53.7, 52.7, 30.1, 29.1, 28.2, 14.7 ppm; IR (KBr) v = 3284, 2964, 2927, 1663, 1432, 1330, 1248, 1104, 1025, 748, 694 cm^{-1}; HRMS (ESI): *m/z*: calcd for $C_{23}H_{20}BrNNaO_3S$: 492.0245 $[M + Na]^+$; found: 492.0239.

2-(1-(2-Methyl-1*H*-indol-3-yl)-2-oxo-2-phenylethylidene)cycloheptane-1,3-dione (4x): Red solid; mp: 70–72°C. ^{1}H NMR (400 MHz, $CDCl_3$, 25 °C, TMS): δ = 8.73 (d, J = 12.0 Hz 1H), 7.83 (d, J = 4.0 Hz, 2H), 7.41 (t, J = 8.0 Hz, 1H), 7.32–7.29 (m, 3H), 7.12–7.06 (m, 3H), 2.76–2.73 (m, 2H), 2.63–2.60 (m, 2H), 2.06–2.05 (m, 5H), 2.02–1.98 ppm (m, 2H); ^{13}C NMR (100 MHz, $CDCl_3$, 25 °C): δ = 204.4, 200.0, 195.6, 151.1, 137.5, 136.2, 135.6, 135.3, 132.9, 128.7, 128.5, 126.2, 122.2, 120.9, 119.0, 111.2, 107.2, 43.0, 41.7, 24.8, 24.2, 13.5 ppm; IR (KBr) v = 3336, 2930, 2864, 1665, 1596, 1453, 1251, 1130, 1044, 1009, 842, 747 cm^{-1}; HRMS (ESI): *m/z*: calcd for $C_{24}H_{21}NNaO_3$: 394.1419 $[M + Na]^+$; found: 394.1414.

4,4-Dimethyl-2-(1-(2-methyl-1*H*-indol-3-yl)-2-oxo-2-phenylethylidene)cyclohexane-1,3-dione (4y): Red solid (*Z*/*E* isomer mixture); mp: 127–129 °C. ^{1}H NMR (400 MHz, DMSO, 25 °C): δ = 12.21 (s, 1H), 7.66 (d, J = 4.0 Hz, 2H), 7.45 (t, J = 8.0 Hz, 1H), 7.37 (t, J = 8.0 Hz, 2H), 7.30 (t, J = 8.0 Hz, 1H), 7.22 (s, 1H), 7.07 (t, J = 8.0 Hz, 1H), 6.99 (t, J = 8.0 Hz, 1H), 2.68 (t, J = 7.6 Hz, 1H), 2.58 (s, 1H), 2.35 (s, 3H), 1.89 (t, J = 7.6 Hz, 2H), 1.25–1.22 (m, 3H), 1.07 ppm (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$, 25 °C): δ = 202.7, 198.4, 195.5, 158.8, 146.8, 136.7, 136.3, 133.0, 128.9, 128.6, 126.7, 122.8, 121.8, 120.5, 112.1, 43.2, 42.1, 36.5, 35.1, 31.7, 31.3, 25.3, 25.0, 15.2 ppm; IR (KBr) v = 3247,2955, 2924, 1649, 1486, 1440, 1332, 1251, 1101, 1132, 1005, 932, 798, 751 cm^{-1}; HRMS (ESI): *m/z*: calcd for $C_{25}H_{23}NNaO_3$: 408.1576 $[M + Na]^+$; found: 408.1578.

2-(1-(1*H*-Indol-3-yl)-2-oxo-2-phenylethylidene)-5,5-dimethylcyclohexane-1,3-dione (5a): Yellow solid; mp: 92–93 °C. ^{1}H NMR (400 MHz, DMSO, 25 °C): δ = 10.90 (s, 1H), 10.64 (s, 1H), 7.77 (d, J = 8.0 Hz, 2H), 7.49 (t, J = 7.6 Hz, 1H), 7.42 (q, J = 8.0 Hz, 3H), 7.18 (d, J = 8.0 Hz, 1H),

6.91 (t, J = 8.0 Hz, 1H), 6.81 (t, J = 7.6 Hz, 1H), 5.81 (s, 1H), 2.30 (s, 3H), 2.24–1.99 (m, 4H), 0.83 ppm (s, 6H); ^{13}C NMR (100 MHz, DMSO, 25 °C): δ = 198.7, 196.1, 171.0, 138.3, 135.5, 133.3, 132.1, 129.0, 128.5, 127.8, 120.1, 119.8, 118.1, 114.8, 110.4, 109.0, 50.3, 43.3, 41.0, 32.3, 28.2, 12.5 ppm; IR (KBr) v = 3348, 3060, 2959, 2872, 2652, 1735, 1691, 1638, 1455, 1421, 1372, 1251, 1147, 1100, 1046, 1007, 930, 847, 786, 744, 693 cm^{-1}; HRMS (ESI) *m/z*: calcd for $C_{25}H_{25}NNaO_3$: 410.1732 [M + Na]$^+$; found: 410.1728.

3-Acetyl-2-(1*H*-indol-3-yl)-1-phenylpentane-1,4-dione (5b): Brown viscous liquid; ^{1}H NMR (400 MHz, $CDCl_3$, TMS, 25 °C): δ = 8.80 (s, 1H), 7.94 (d, J = 7.2 Hz, 2H), 7.73–7.01 (m, 1H), 7.36 (t, J = 7.2 Hz, 1H), 7.27–7.23 (m, 3H), 7.14–7.12 (m, 2H), 7.01 (d, J = 2.8 Hz, 1H), 5.67 (d, J = 11.2 Hz, 1H), 5.06 (d, J = 11.2 Hz, 1H), 2.28 (s, 3H), 1.86 ppm (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$, 25 °C): δ = 204.0, 202.3, 197.8, 136.5, 135.8, 133.0 128.7, 128.4, 125.7, 124.2, 122.5, 120.3, 118.9, 111.7, 109.0, 70.2, 45.5, 31.5, 30.3 ppm; IR (KBr) v = 3398, 2934, 1725, 2696, 1597, 1355, 1264, 744, 691, 560, 504, 427 cm^{-1}; HRMS (ESI): *m/z*: calcd for $C_{21}H_{19}NNaO_3$: 356.1263 [M + Na]$^+$; found: 356.1257.

2-((2-Chlorophenyl)(2-methyl-1*H*-indol-3-yl)methylene)-5,5-dimethylcyclohexane-1,3-dione (7a): Orange solid; mp: 179–180 °C. ^{1}H NMR (400 MHz, DMSO, 25 °C): δ = 12.06 (s, 1H), 7.38–7.29 (m, 5H), 7.01 (t, J = 8.0 Hz, 1H), 6.80 (t, J = 8.0 Hz, 1H), 6.41 (d, J = 8.0 Hz, 1H), 2.70–2.59 (m, 2H), 2.43 (d, J = 8.0 Hz, 2H), 2.19 (s, 3H), 1.09–1.01 ppm (m, 6H); ^{13}C NMR (100 MHz, DMSO, 25 °C): δ = 180.6, 136.1, 130.1, 128.2, 127.2, 122.2, 121.3, 119.9, 115.8, 111.9, 54.1, 29.9, 29.4, 27.9, 14.5 ppm; IR (KBr) v = 3390, 2959, 2924, 2872, 2648, 1762, 1608, 1463, 1373, 1252, 1041, 909, 735 cm^{-1}; HRMS (ESI): *m/z*: calcd for $C_{24}H_{22}ClNNaO_2$: 414.1237 [M + Na]$^+$; found: 414.1231.

1-Denzyl-4-phenyl-1*H*-1,2,3-triazole (8a):[3] White solid; mp: 128–130 °C. ^{1}H NMR (400 MHz, $CDCl_3$, 25 °C, TMS): δ = 7.80 (d, J = 4.0 Hz, 2H), 7.66 (s, 1H), 7.42–7.36 (m, 5H), 7.33–7.30 (m, 3H), 5.58 ppm (s, 2H); ^{13}C NMR (100 MHz, $CDCl_3$, 25 °C): δ = 148.3, 134.7, 130.6, 129.2, 128.8, 128.2, 128.1, 125.7, 119.5, 54.3 ppm.

1-Benzyl-4-(4-fluorophenyl)-1*H*-1,2,3-triazole (8b):[4] White solid; mp: 109–110 °C; ^{1}H NMR (400 MHz, $CDCl_3$, 25 °C, TMS): δ = 7.75 (q, J = 4.0 Hz, 2H), 7.64 (s, 1H), 7.35 (s, 3H), 7.29 (d, J = 4.0 Hz, 2H), 7.05 (d, J = 8.4 Hz, 2H), 5.53 ppm (s, 2H); ^{13}C NMR (100 MHz, $CDCl_3$, 25 °C): δ = 162.7 (d, J = 246.0 Hz), 147.3, 134.7, 129.2, 128.8, 128.1, 127.45 (d, J = 9.0 Hz), 119.4, 115.8 (d, J = 21.0 Hz), 54.2 ppm; ^{19}F NMR (377 MHz, $CDCl_3$, 25 °C): δ = -113.5 ppm (heptet, J = 5.6 Hz, 1F).

1-Benzyl-4-(4-methoxyphenyl)-1*H*-1,2,3-triazole (8c):[4] White solid; mp: 138–139 °C. ^{1}H NMR (400 MHz, $CDCl_3$, 25 °C, TMS): δ = 7.71 (d, J = 8.0 Hz, 2H), 7.58 (s, 1H), 7.37–7.35 (m, 3H), 7.29–7.27 (m, 2H), 6.92 (d, J = 12.0 Hz, 2H), 5.52 (s, 2H), 3.80 ppm (s, 3H); ^{13}C NMR (100 MHz,

$CDCl_3$, 25 °C): δ = 159.6, 148.1, 134.8, 129.1, 128.7, 128.0, 127.0, 123.3, 118.8, 114.2, 55.3, 54.2 ppm.

1-Benzyl-4-(4-(*tert*-butyl)phenyl)-1*H*-1,2,3-triazole (8d):[4] White solid; mp: 112–113 °C. ^{1}H NMR (400 MHz, $CDCl_3$, 25 °C, TMS): δ = 7.72 (d, J = 8.0 Hz, 2H), 7.64 (s, 1H), 7.41 (d, J = 8.0 Hz, 2H), 7.35–7.34 (m, 3H), 7.28–7.26 (m, 2H), 5.52 (s, 2H), 1.23 ppm (s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$, 25 °C): δ = 151.3, 148.2, 134.9, 129.1, 128.7, 128.0, 127.8, 125.8, 125.5, 119.4, 54.2, 34.7, 31.3 ppm.

1-Benzyl-4-(4-ethylphenyl)-1*H*-1,2,3-triazole (8e):[3] White solid; mp: 147–148 °C. ^{1}H NMR (400 MHz, $CDCl_3$, 25 °C, TMS): δ = 7.70 (d, J = 8.0 Hz, 2H), 7.63 (s, 1H), 7.35–7.33 (m, 3H), 7.28–7.26 (m, 2H), 7.21 (d, J = 8.0 Hz, 2H), 5.51 (s, 2H), 2.64 (q, J = 8.0 Hz, 2H), 1.23 ppm (t, J = 8.0 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$, 25 °C): δ = 148.3, 144.4, 134.8, 129.1, 128.7, 128.3, 128.0, 125.7, 119.3, 54.2, 28.7, 15.5 ppm.

1-Benzyl-4-(4-pentylphenyl)-1*H*-1,2,3-triazole (8f):[5] White solid; mp: 103–104 °C. ^{1}H NMR (400 MHz, $CDCl_3$, 25 °C, TMS): δ = 7.70 (d, J = 8.0 Hz, 2H), 7.62 (s, 1H), 7.37–7.35 (m, 3H), 7.29–7.27 (m, 2H), 7.20 (d, J = 8.0 Hz, 2H), 5.53 (s, 2H), 2.60 (t, J = 8.0 Hz, 2H), 1.61 (quint, J = 8.0 Hz, 2H), 1.35–1.26 (m, 4H), 0.88 ppm (t, J = 8.0 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$, 25 °C): δ = 148.3, 143.1, 134.8, 129.1, 128.9, 128.7, 128.0, 125.6, 119.3, 54.2, 35.7, 31.5, 31.1, 22.6, 14.1 ppm.

1-Benzyl-4-(4-propylphenyl)-1*H*-1,2,3-triazole (8g):[6] White solid; mp: 113–115 °C. ^{1}H NMR (400 MHz, $CDCl_3$, 25 °C, TMS): δ = 7.70 (d, J = 8.0 Hz, 2H), 7.62 (s, 1H), 7.38–7.34 (m, 3H), 7.29–7.27 (m, 2H), 7.20 (d, J = 8.0 Hz, 2H), 5.54 (s, 2H), 2.59 (d, J = 7.6 Hz, 2H), 1.68–1.59 (m, 2H), 0.93 ppm (t, J = 8.0 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$, 25 °C): δ = 148.3, 142.9, 134.8, 129.1, 128.9, 128.7, 128.0, 125.6, 119.2, 54.2, 37.8, 24.5, 13.8 ppm.

1-Phenethyl-4-phenyl-1*H*-1,2,3-triazole (8h):[6] White solid; mp: 124–125 °C. ^{1}H NMR (400 MHz, $CDCl_3$, 25 °C, TMS): δ = 7.77–7.75 (m, 2H), 7.47 (s, 1H), 7.38 (t, J = 8.0 Hz, 2H), 7.31–7.21 (m, 4H), 7.10 (d, J = 4.0 Hz, 2H), 4.59 (t, J = 7.6 Hz, 2H), 3.21 ppm (t, J = 8.0 Hz, 2H); ^{13}C NMR (100 MHz, $CDCl_3$, 25 °C): δ = 147.5, 137.1, 130.7, 128.9, 128.8, 128.1, 127.1, 125.7, 120.0, 51.7, 36.8 ppm.

1-Ethyl-4-phenyl-1*H*-1,2,3-triazole (8i):[6] White solid; mp: 55–57 °C. ^{1}H NMR (400 MHz, $CDCl_3$, 25 °C, TMS): δ = 7.83–7.81 (m, 2H), 7.76 (s, 1H), 7.41 (t, J = 8.0 Hz, 2H), 7.32 (m, 1H), 4.43 (q, J = 8.0 Hz, 2H), 1.58 ppm (t, J = 7.6 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$, 25 °C): δ = 147.8, 130.8, 128.8, 128.1, 125.7, 119.0, 45.4, 15.5 ppm.

1-Ethyl-4-(4-fluorophenyl)-1*H*-1,2,3-triazole (8j):[4] White solid; mp: 114–115 °C. ^{1}H NMR (400 MHz, $CDCl_3$, 25 °C, TMS): δ = 7.81–7.77 (m, 2H), 7.74 (s, 1H), 7.10 (t, J = 8.0 Hz, 2H), 4.44 (q, J = 8.0 Hz, 2H), 1.58 ppm (t, J = 7.6 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$, 25 °C): δ = 163.8,

161.4, 146.9, 127.38 (d, J = 12.0 Hz), 118.8, 115.7 (d, J = 22.0 Hz), 45.4, 15.5 ppm. ^{19}F NMR (377 MHz, $CDCl_3$, 25 °C): δ = -113.8 ppm (heptet, J = 5.7 Hz, 1F).

4-Phenyl-1-propyl-1*H*-1,2,3-triazole (8k):[7] White solid; mp: 102–103 °C. ^{1}H NMR (400 MHz, $CDCl_3$, 25 °C, TMS): δ = 7.83 (d, J = 8.0 Hz, 2H), 7.75 (s, 1H), 7.41 (t, J = 8.0 Hz, 2H), 7.31 (t, J = 8.0 Hz, 1H), 4.36 (t, J = 8.0 Hz, 2H), 1.94–1.90 (m, 2H), 1.33–1.25 (m, 14H), 0.87 ppm (t, J = 8.0 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$, 25 °C): δ = 147.7, 130.8, 128.8, 128.0, 125.7, 119.5, 50.4, 31.9, 30.4, 29.5, 29.4, 29.3, 29.0, 26.5, 22.7, 14.1 ppm.

4-((4-Phenyl-1*H*-1,2,3-triazol-1-yl)methyl)benzoic acid (8l):[8] White solid; mp: 114–116 °C. ^{1}H NMR (400 MHz, DMSO, 25 °C): δ = 8.66 (s, 1H), 7.96 (d, J = 8.0 Hz, 2H), 7.86 (d, J = 8.0 Hz, 2H), 7.46–7.42 (m, 4H), 7.34–7.31 (m, 1H), 5.75 ppm (s, 2H); ^{13}C NMR (100 MHz, DMSO, 25 °C): δ = 167.5, 147.2, 141.1, 131.2, 131.0, 130.3, 129.4, 128.4, 125.7, 122.3, 53.1 ppm.

1-(4-Nitrobenzyl)-4-phenyl-1*H*-1,2,3-triazole (8m):[6] White solid; mp: 140–141 °C. ^{1}H NMR (400 MHz, $CDCl_3$, 25 °C, TMS): δ = 8.20 (d, J = 8.0 Hz, 2H), 7.80 (d, J = 8.0 Hz, 3H), 7.43–7.39 (m, 4H), 7.35–7.31 (m, 1H), 5.68 ppm (s, 2H); ^{13}C NMR (100 MHz, $CDCl_3$, 25 °C): δ = 148.7, 148.1, 141.8, 130.1, 128.9, 128.6, 128.5, 125.8, 124.3, 119.9, 53.2 ppm.

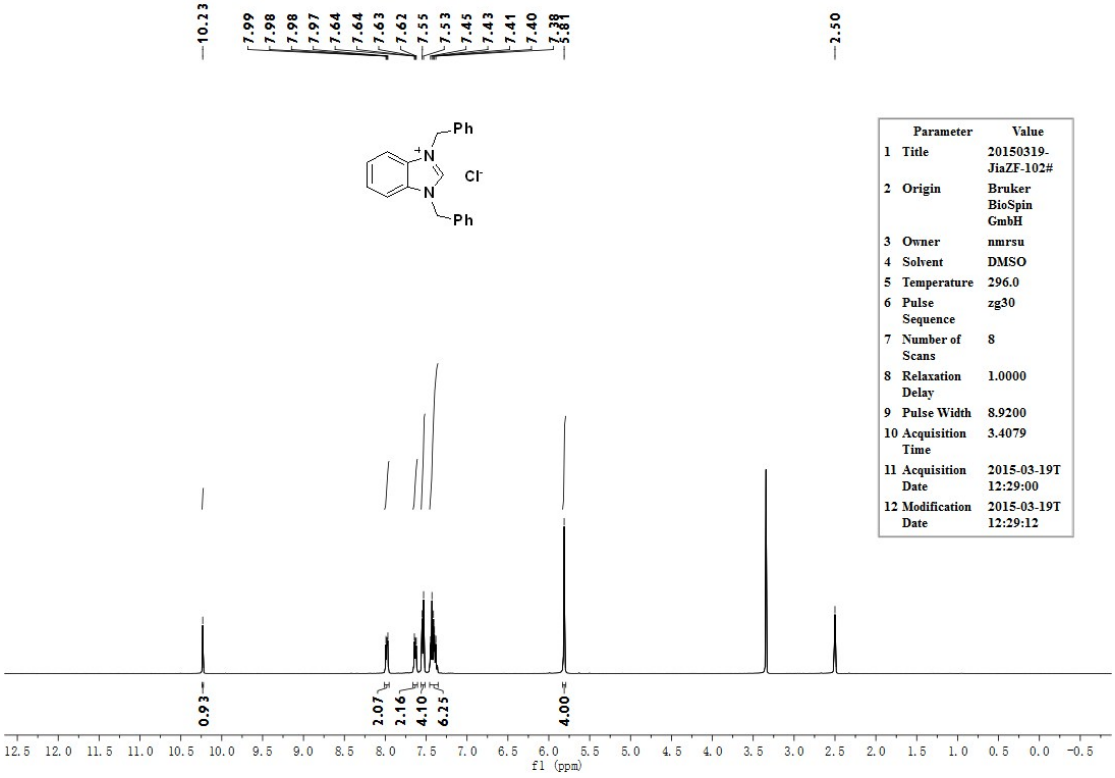
1-Benzyl-4-(phenoxymethyl)-1*H*-1,2,3-triazole (8n):[3] White solid; mp: 102–104 °C. ^{1}H NMR (400 MHz, $CDCl_3$, 25 °C, TMS): δ = 7.52 (s, 2H), 7.37–7.33 (m, 3H), 7.28–7.24 (m, 4H), 6.96–6.93 (m, 3H), 5.50 (s, 2H), 5.16 ppm (s, 2H); ^{13}C NMR (100 MHz, $CDCl_3$, 25 °C): δ = 158.2, 144.7, 134.5, 129.6, 129.2, 128.8, 128.1, 122.7, 121.3, 114.8, 62.1, 54.2 ppm.

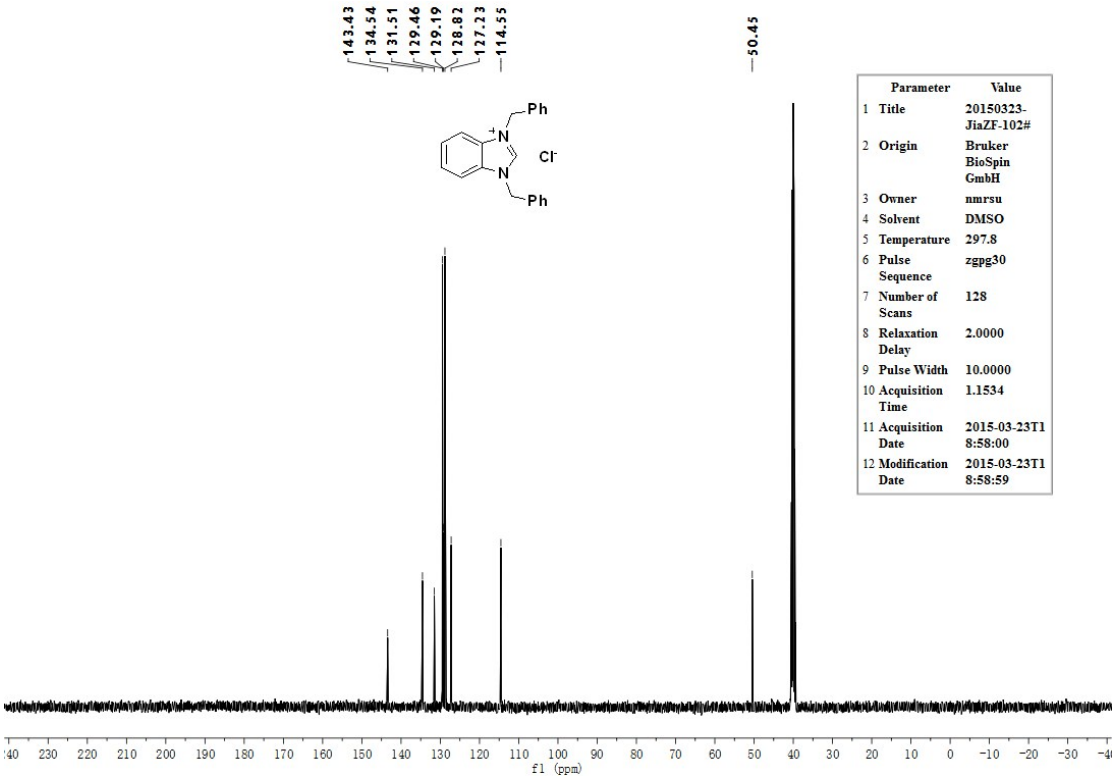
1-Hexyl-4-phenyl-1*H*-1,2,3-triazole (8o):[4] White solid; mp: 63–64 °C. ^{1}H NMR (400 MHz, $CDCl_3$, 25 °C, TMS): δ = 7.84–7.82 (m, 2H), 7.75 (s, 1H), 7.41 (t, J = 8.0 Hz, 2H), 7.32 (t, J = 8.0 Hz, 1H), 4.37 (t, J = 8.0 Hz, 2H), 1.96–1.89 (m, 2H), 1.36–1.29 (m, 6H), 0.88 ppm (t, J = 8.0 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$, 25 °C): δ = 147.7, 130.8, 128.8, 128.1, 125.7, 119.5, 50.4, 31.2, 30.3, 26.2, 22.4, 13.9 ppm.

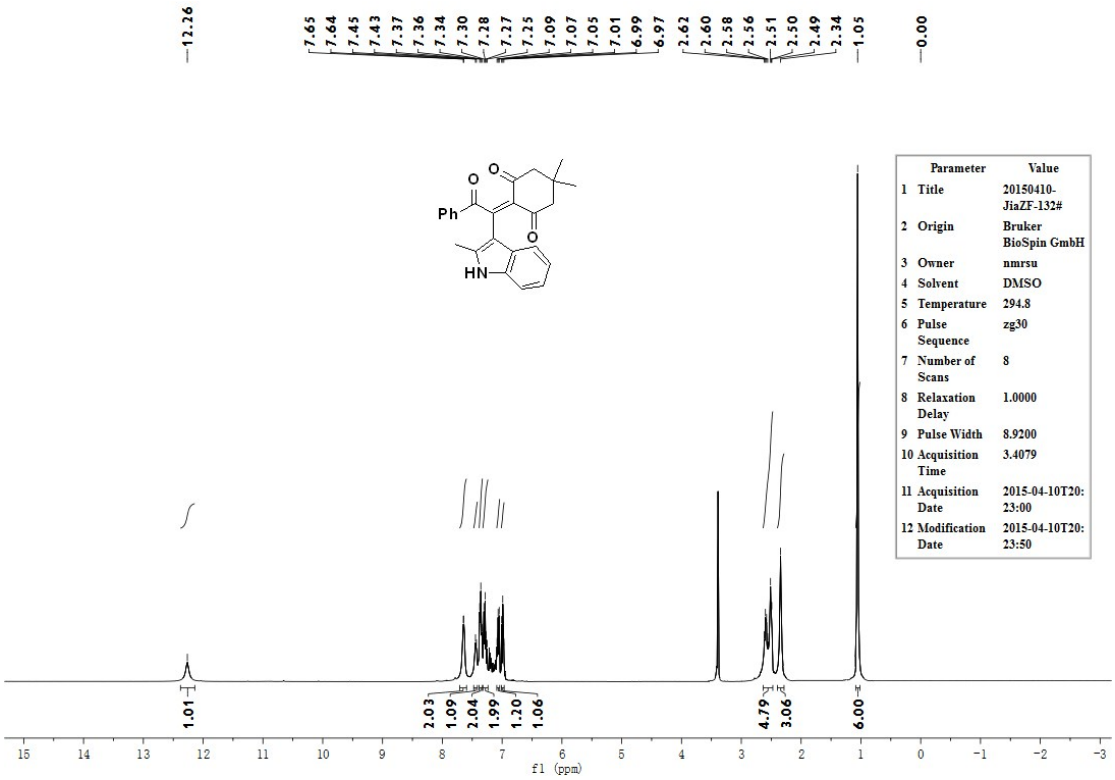
1,4-Diphenylbuta-1,3-diyne (9a):[5] White solid; mp: 83–85 °C. ^{1}H NMR (400 MHz, $CDCl_3$, 25 °C, TMS): δ = 7.51–7.52 (m, 5H), 7.33–7.31 ppm (m, 5H); ^{13}C NMR (100 MHz, $CDCl_3$, 25 °C): δ = 132.6, 129.3, 128.5, 121.9, 81.7, 74.1 ppm.

1-(4-Methoxyphenyl)-1*H*-indole (10a):[9] White solid; mp: 70–72 °C. ^{1}H NMR (400 MHz, $CDCl_3$, 25 °C, TMS): δ = 7.68 (d, J = 8.0 Hz, 1H), 7.46 (d, J = 8.0 Hz, 1H), 7.40 (d, J = 8.0 Hz, 2H), 7.28 (d, J = 4.0 Hz, 1H), 7.22–7.13 (m, 2H), 7.03 (d, J = 8.0 Hz, 2H), 6.65 (d, J = 4.0 Hz, 1H), 3.87 ppm (d, 3H); ^{13}C NMR (100 MHz, $CDCl_3$, 25 °C): δ = 158.3, 138.2, 136.3, 132.9, 129.0, 128.3, 126.0, 122.2, 121.0, 120.1, 114.7, 110.4, 102.9, 55.6 ppm.

5. ^{1}H NMR and ^{13}C NMR spectra



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6.97
2.62
2.60
2.58
2.56
2.51
2.50
2.49
2.34
1.05
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Ph
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HN
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3 Owner nmrsu
4 Solvent DMSO
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10 Acquisition Time 3.4079
11 Acquisition Date 2015-04-10T20:23:00
12 Modification Date 2015-04-10T20:23:50
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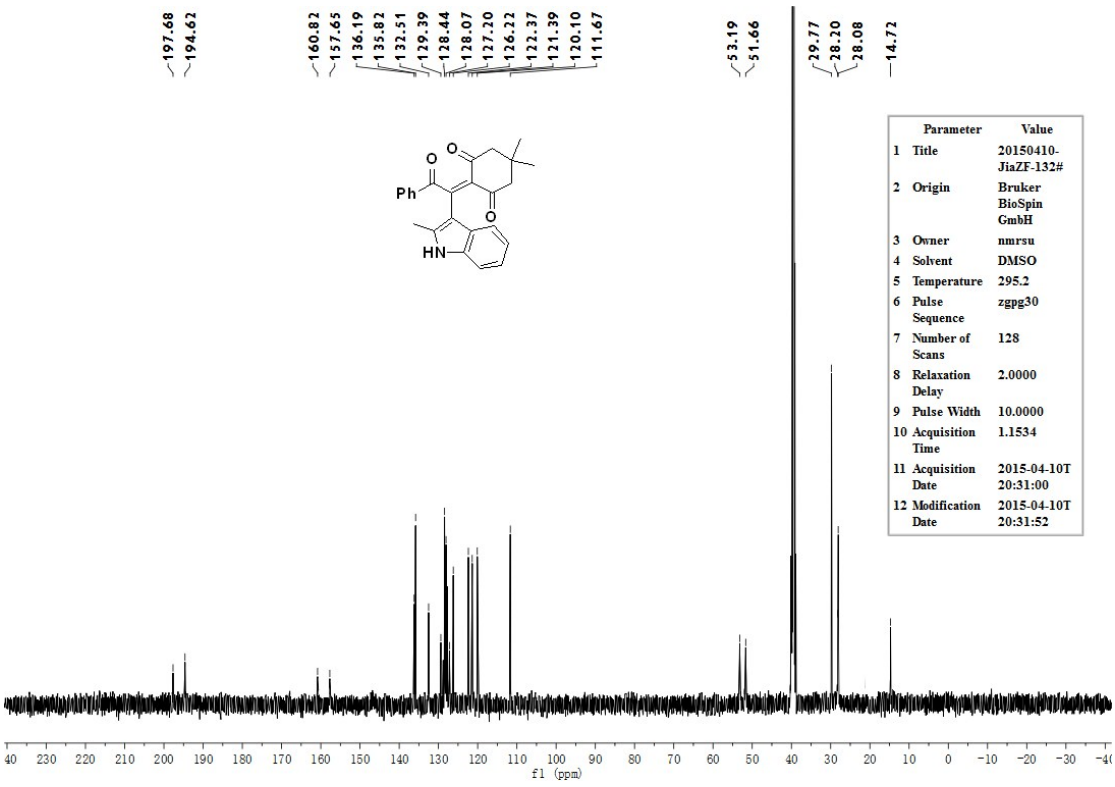
f1 (ppm)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29.77
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4 Solvent DMSO
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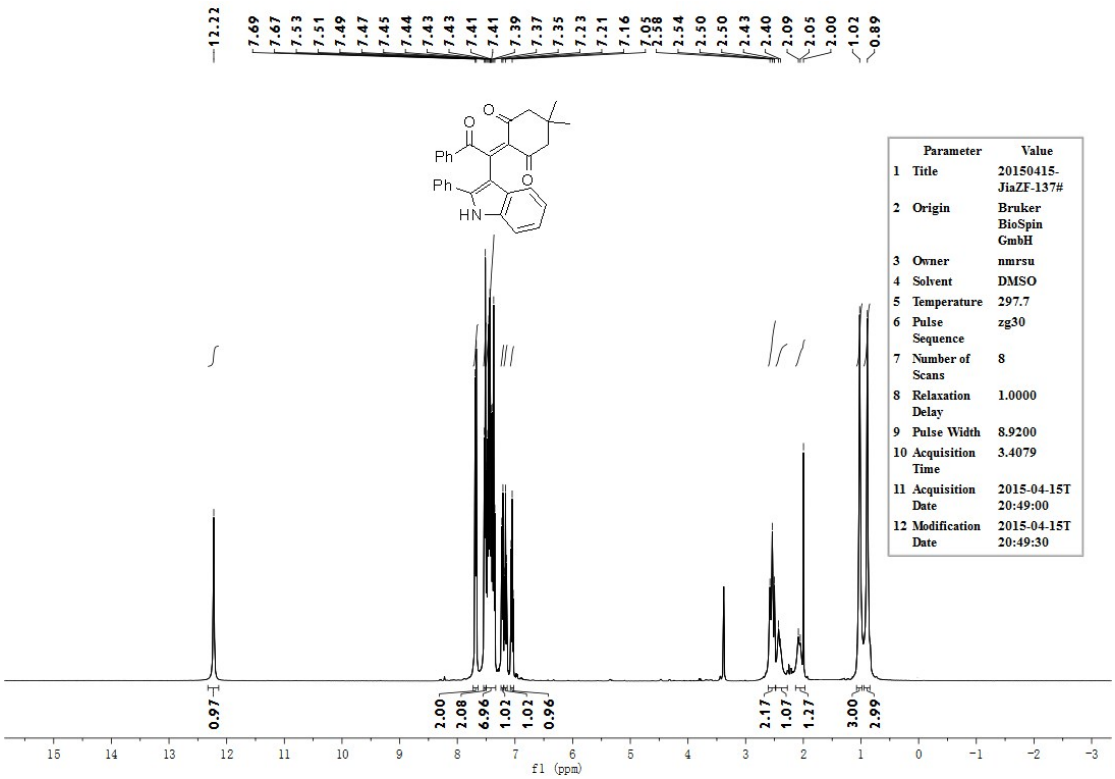
f1 (ppm)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7.39
7.37
7.35
7.23
7.21
7.16
7.05
2.58
2.54
2.50
2.50
2.43
2.40
2.09
2.05
2.00
1.02
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Ph
HN
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1.27
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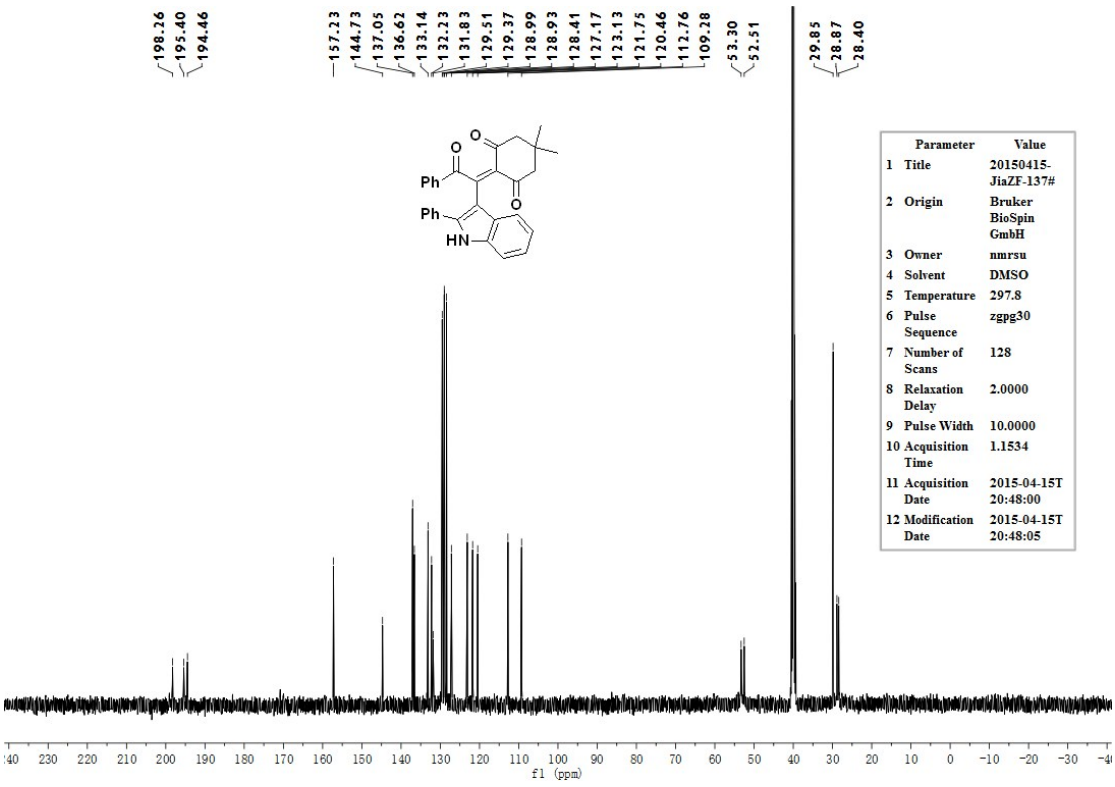
2.99
f1 (ppm)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128.41
127.17
123.13
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109.28
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52.51
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28.87
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Ph
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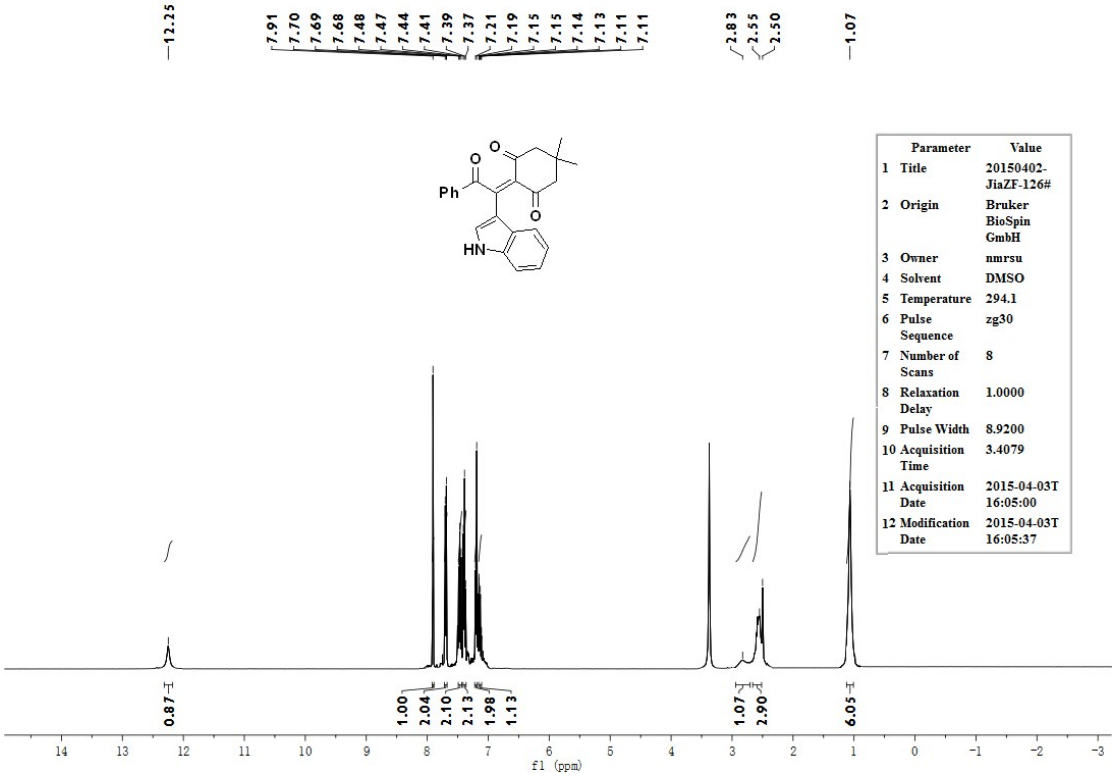
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7.15
7.15
7.14
7.13
7.11
7.11
2.83
2.55
2.50
1.07
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6 Pulse Sequence zg30
7 Number of Scans 8
8 Relaxation Delay 1.0000
9 Pulse Width 8.9200
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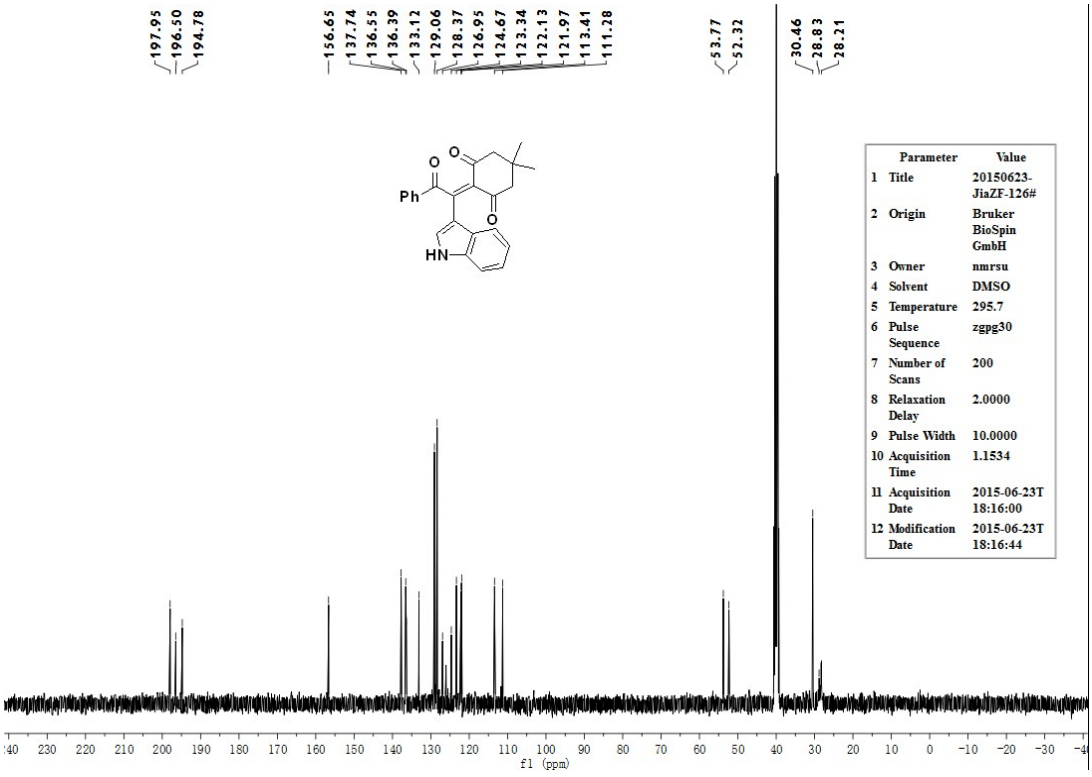
f1 (ppm)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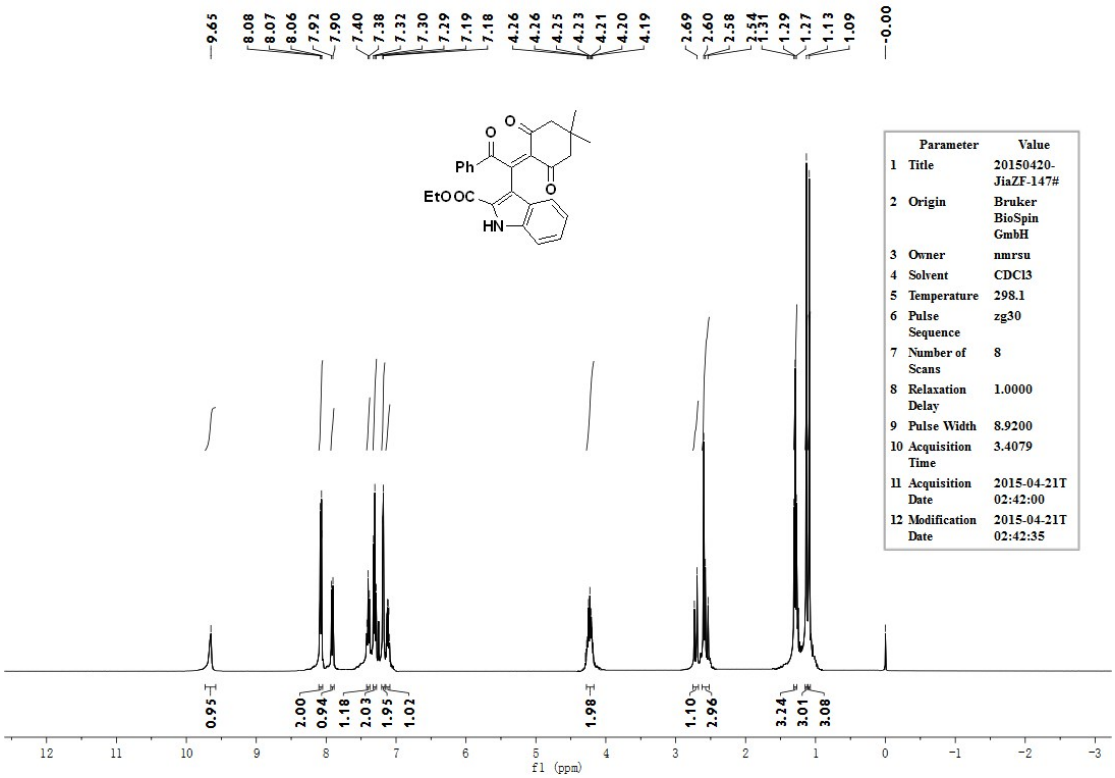
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7.19
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4.26
4.26
4.25
4.23
4.21
4.20
4.19
2.69
2.60
2.58
1.31
1.29
1.27
1.13
1.09
0.00
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EtOOC
HN
O
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2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent CDCl3
5 Temperature 298.1
6 Pulse Sequence zg30
7 Number of Scans 8
8 Relaxation Delay 1.0000
9 Pulse Width 8.9200
10 Acquisition Time 3.4079
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3.24
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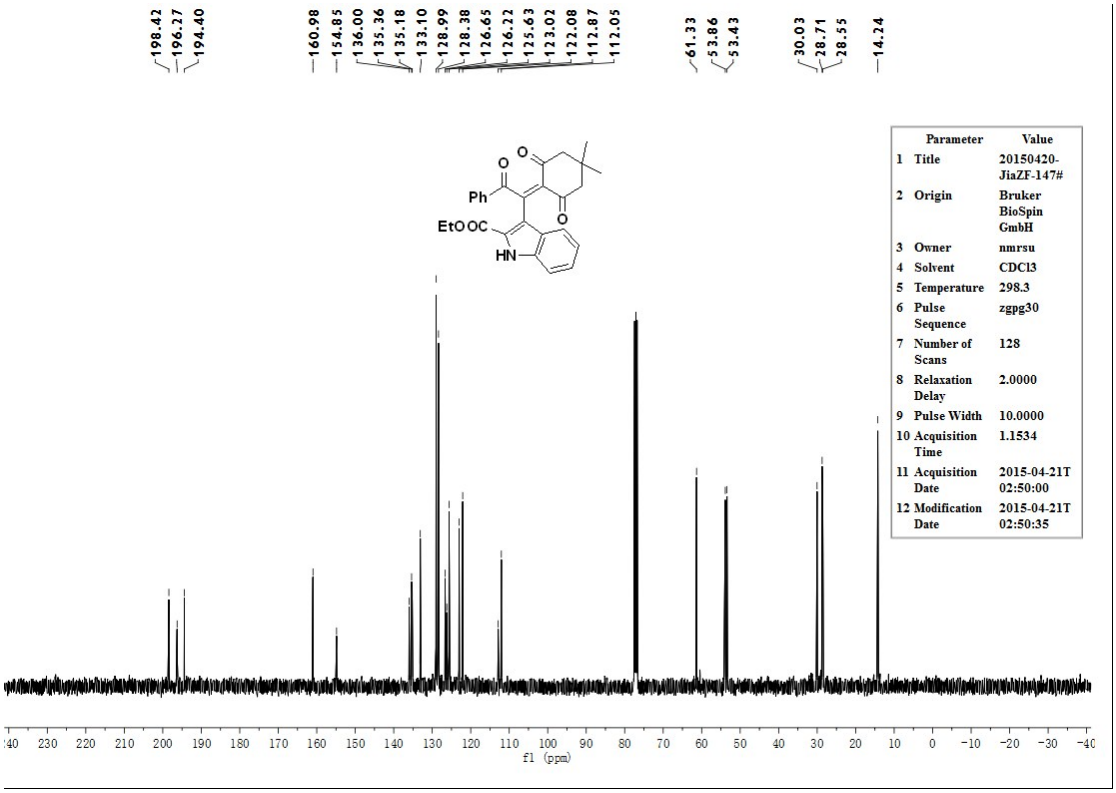
3.08
f1 (ppm)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3 Owner nmrsu
4 Solvent CDCl3
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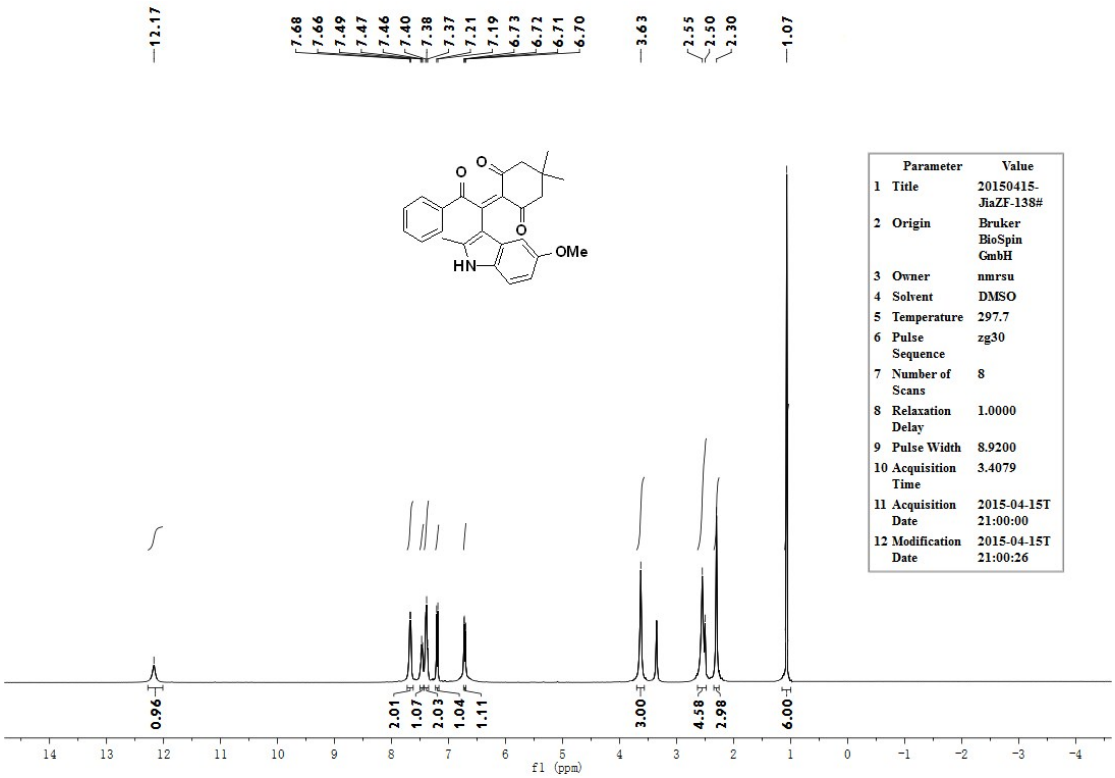
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2.30
1.07
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O
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OMe
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4 Solvent DMSO
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1.04
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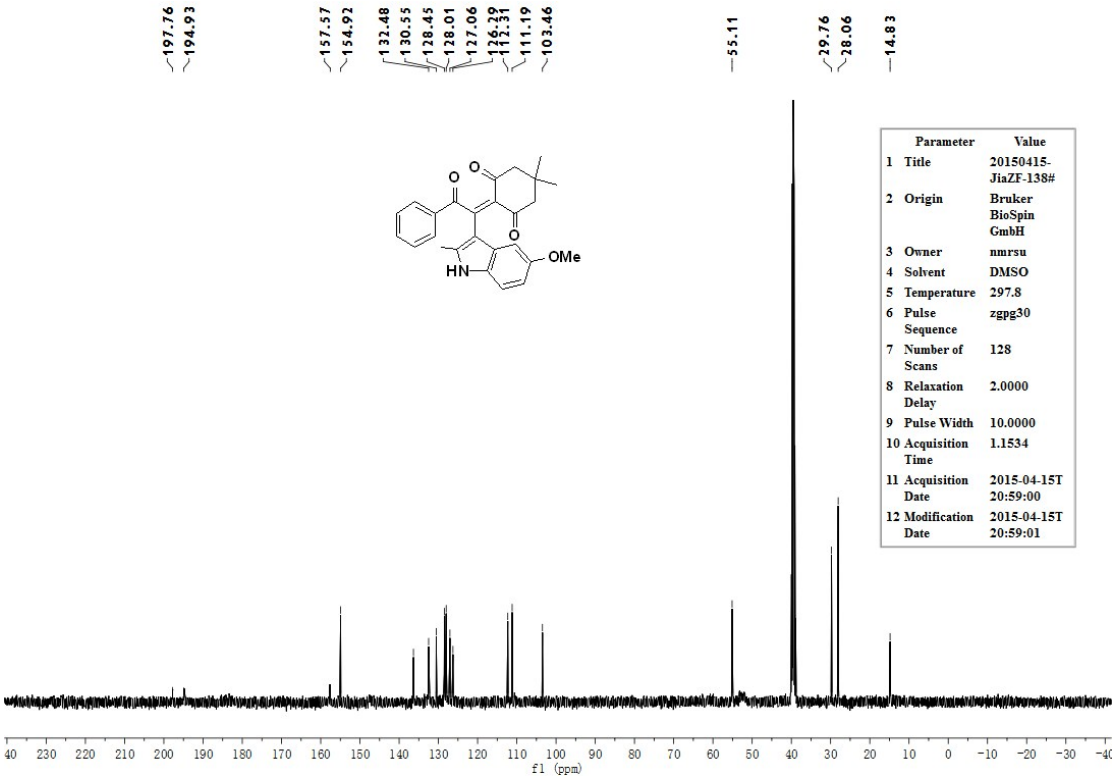
4.58
2.98
6.00
f1 (ppm)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29.76
28.06
14.83
O
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O
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OMe
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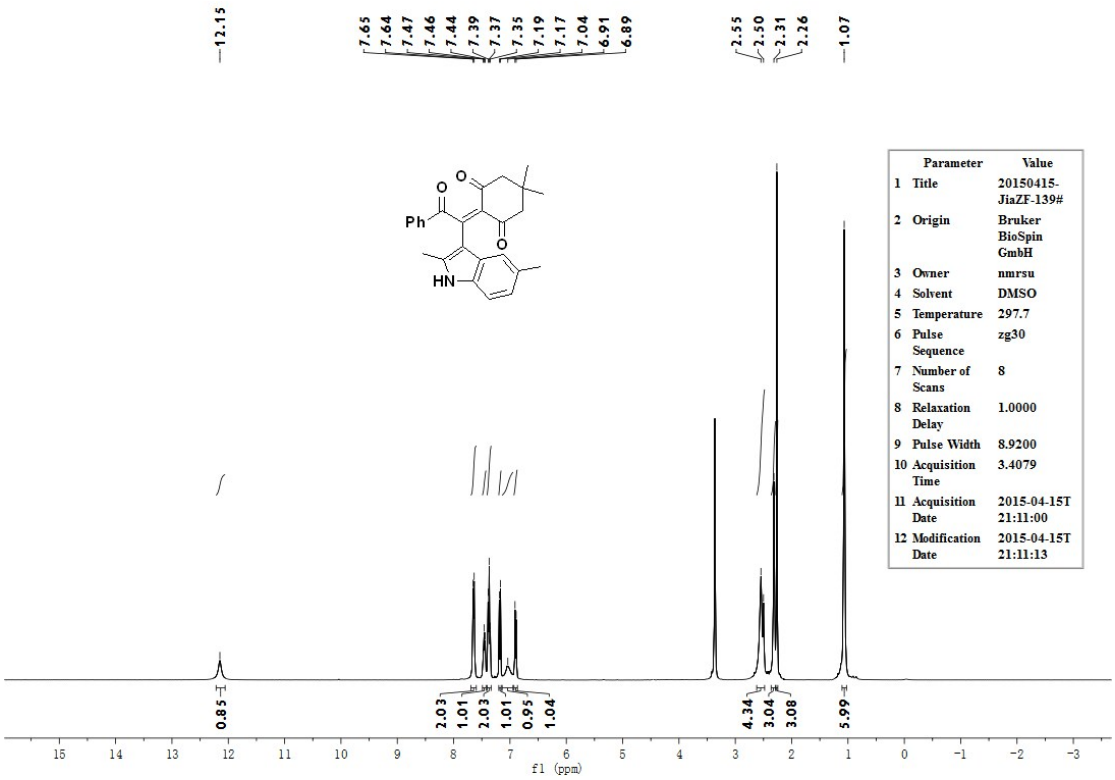
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6.89
2.55
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2.31
2.26
1.07
Ph
O
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4 Solvent DMSO
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2.03
1.01
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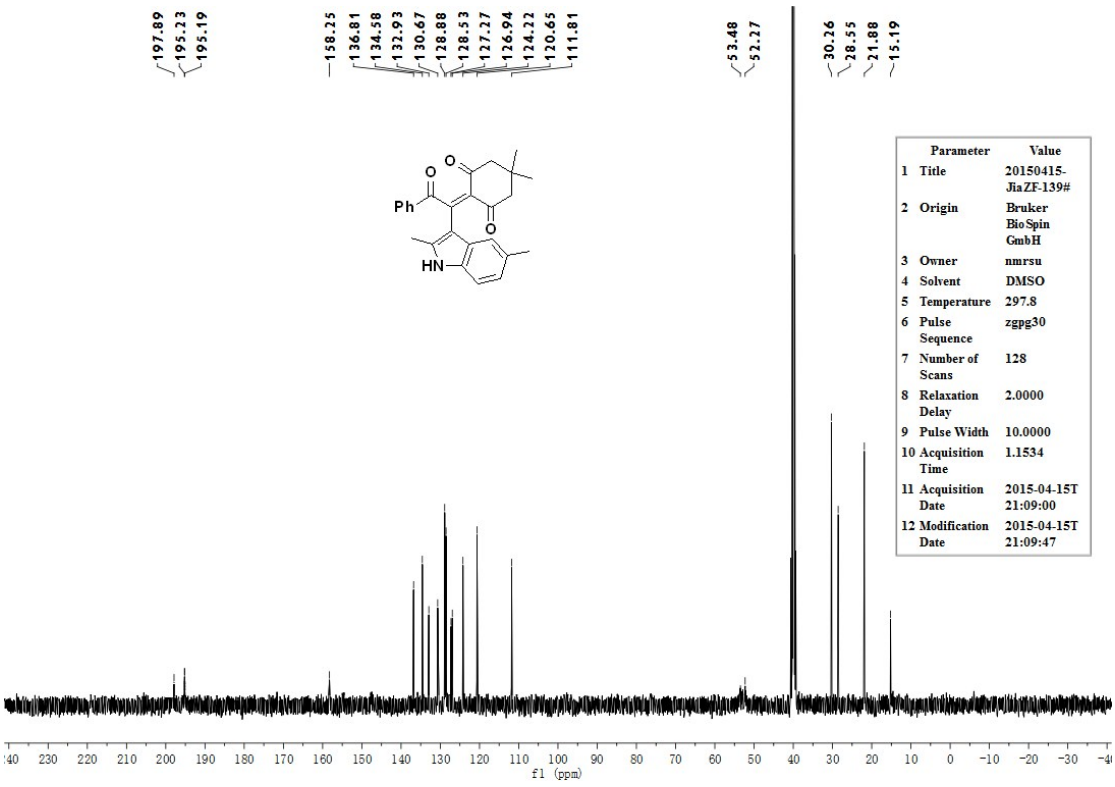
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28.55
21.88
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Ph
O
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3 Owner nmrsu
4 Solvent DMSO
5 Temperature 297.8
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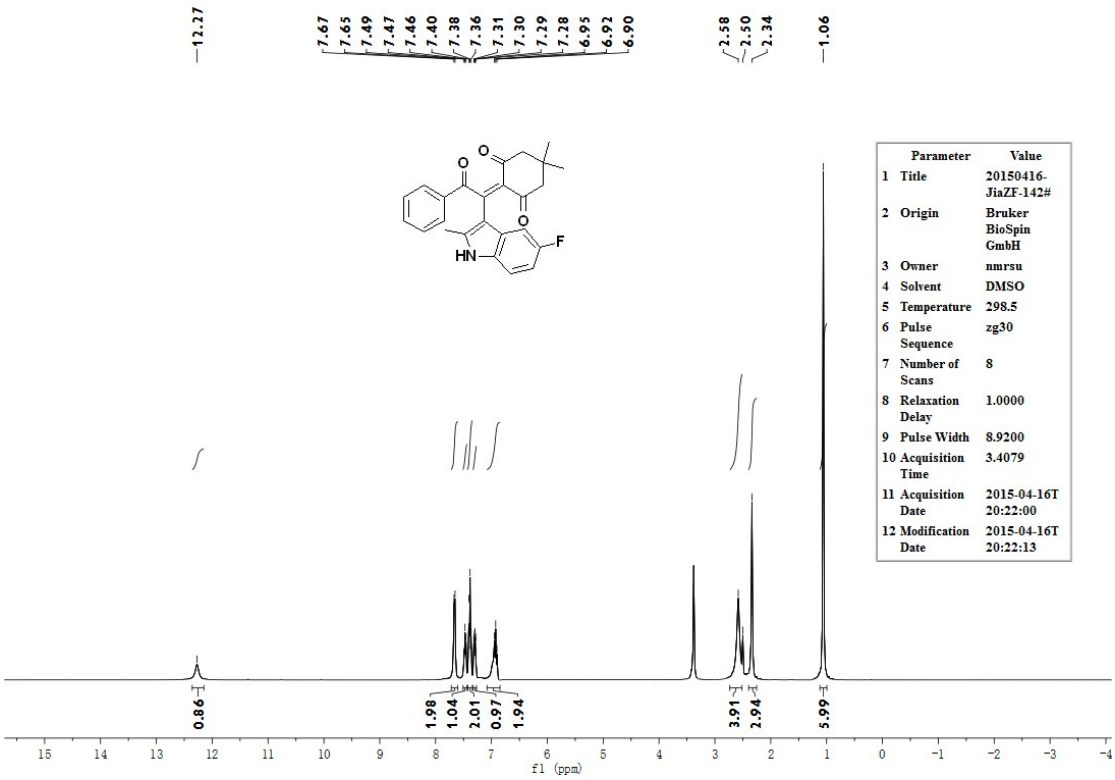
f1 (ppm)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7.28
6.95
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6.90
2.58
2.50
2.34
1.06
O
O
O
HN
F
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3 Owner nmrsu
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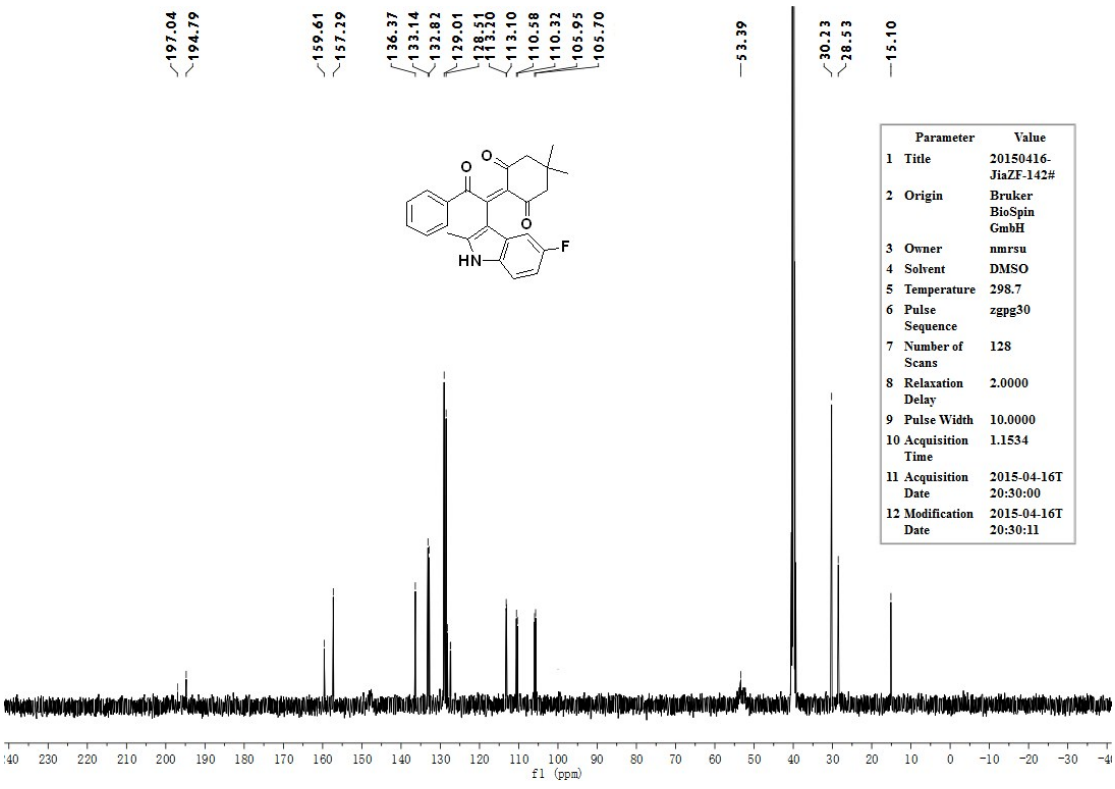
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105.95
105.70
53.39
30.23
28.53
15.10
O
O
O
HN
F
Parameter Value
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3 Owner nmrsu
4 Solvent DMSO
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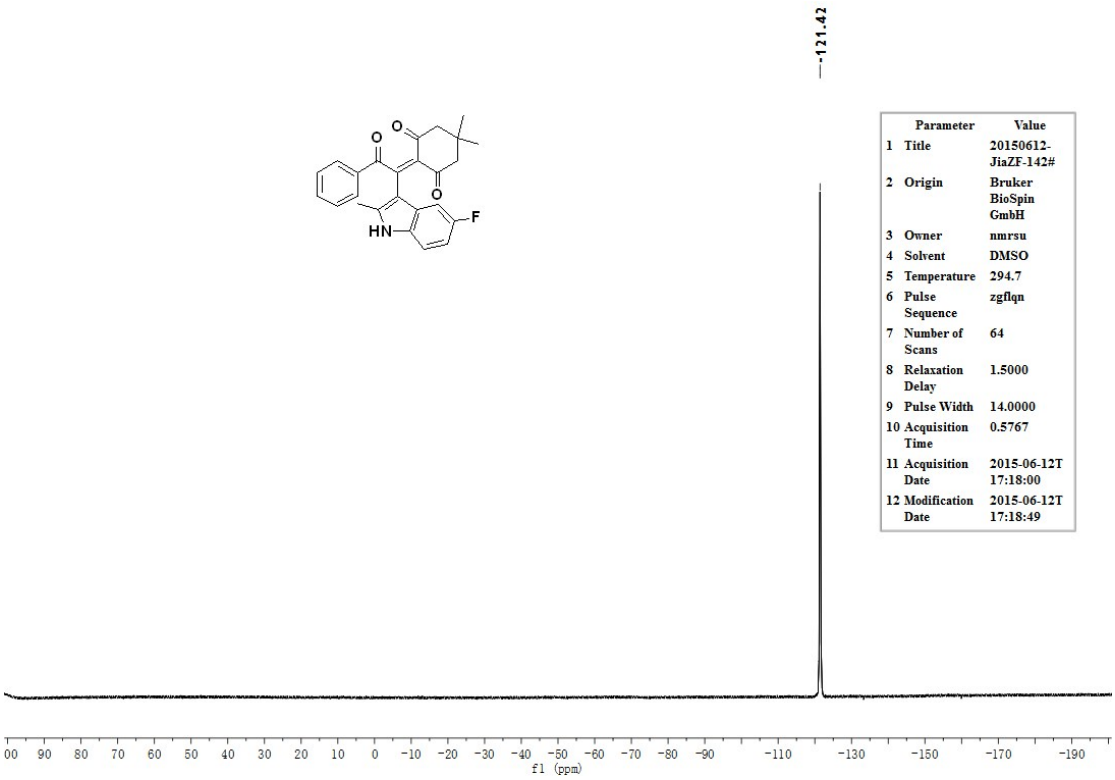
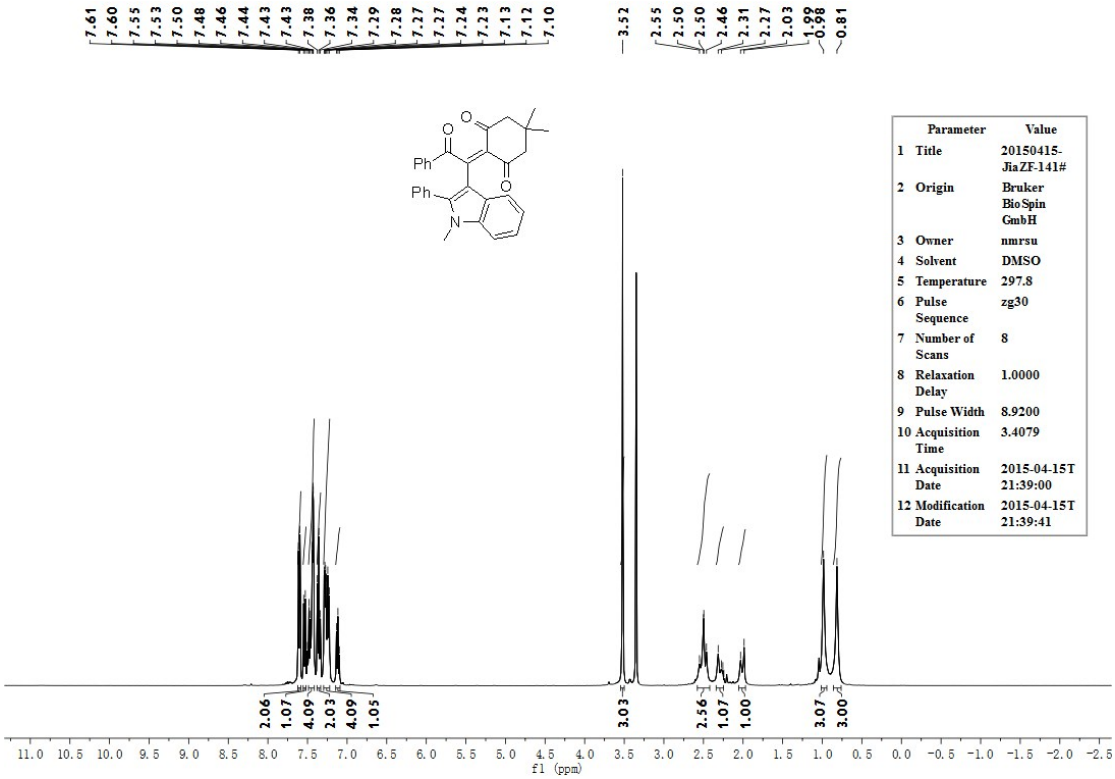
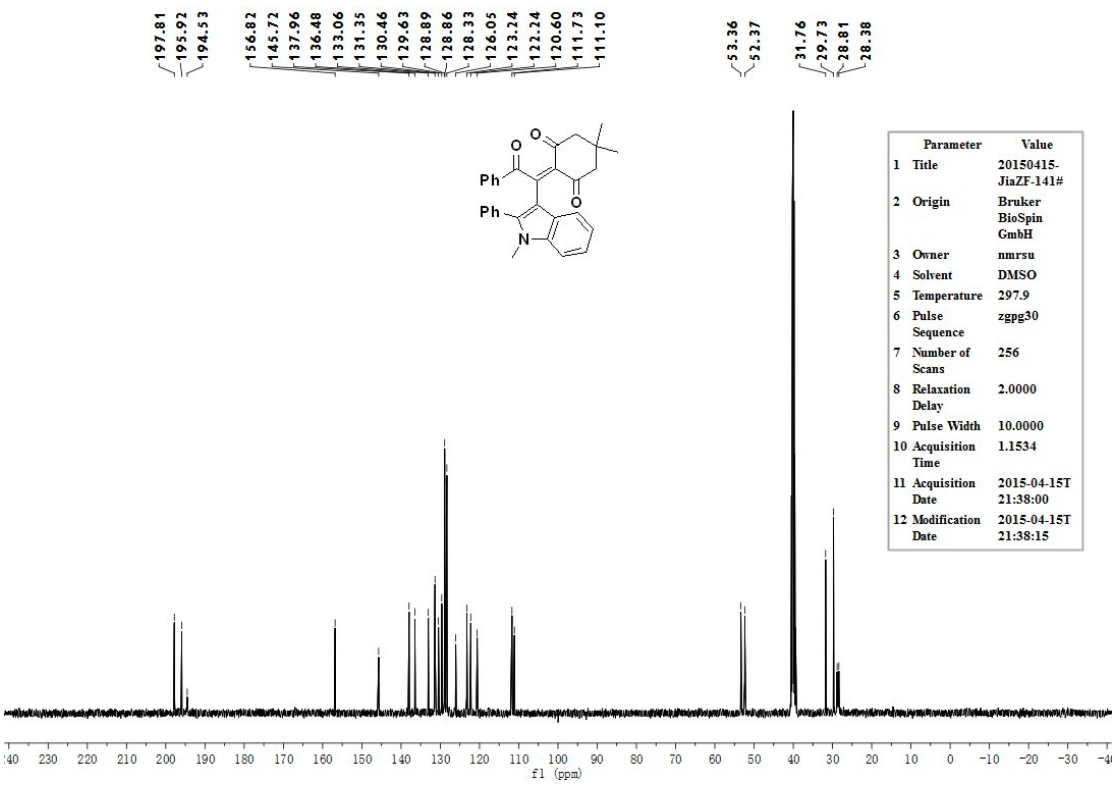
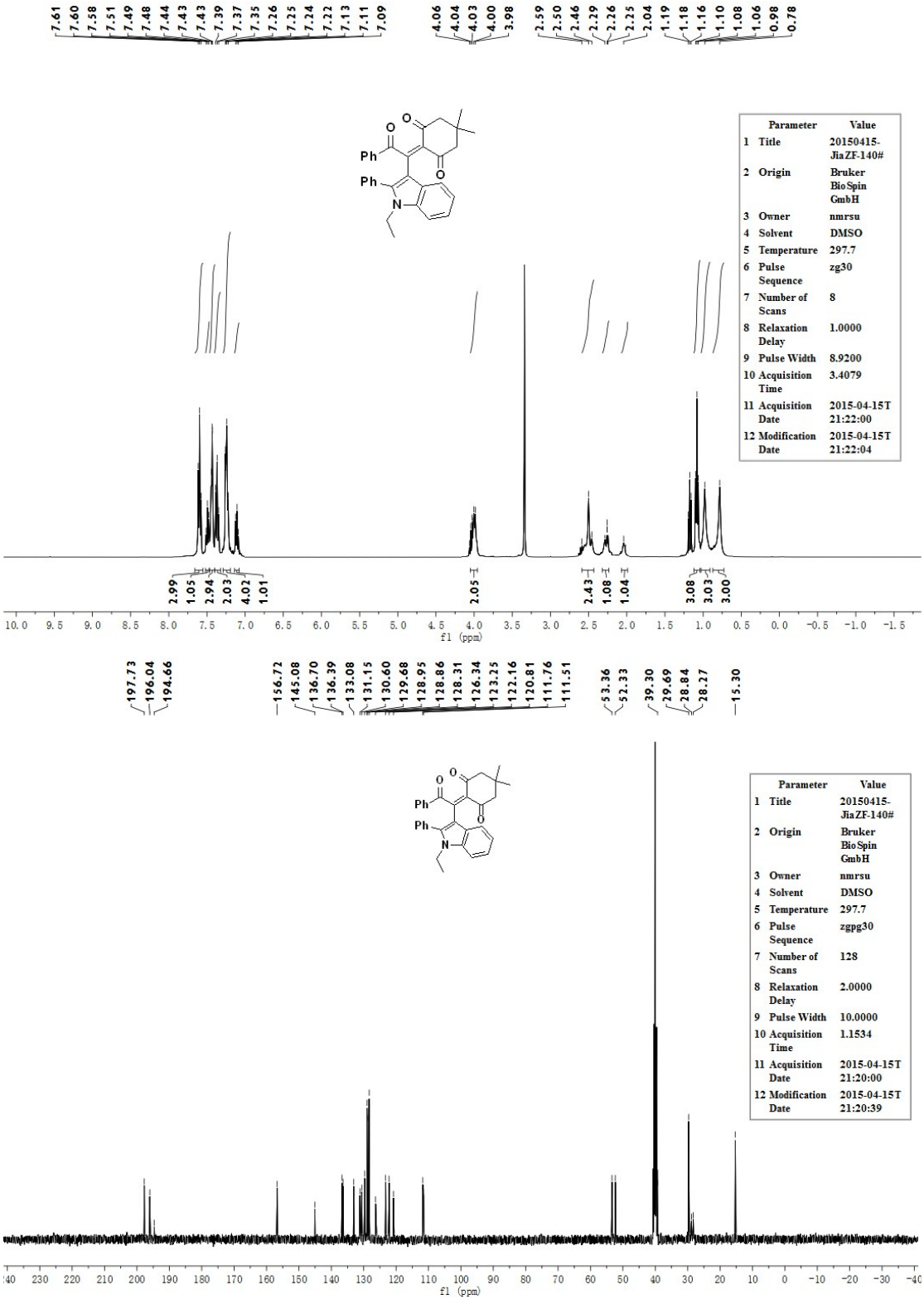
12 Modification Date 2015-04-16T 20:30:11
f1 (ppm)

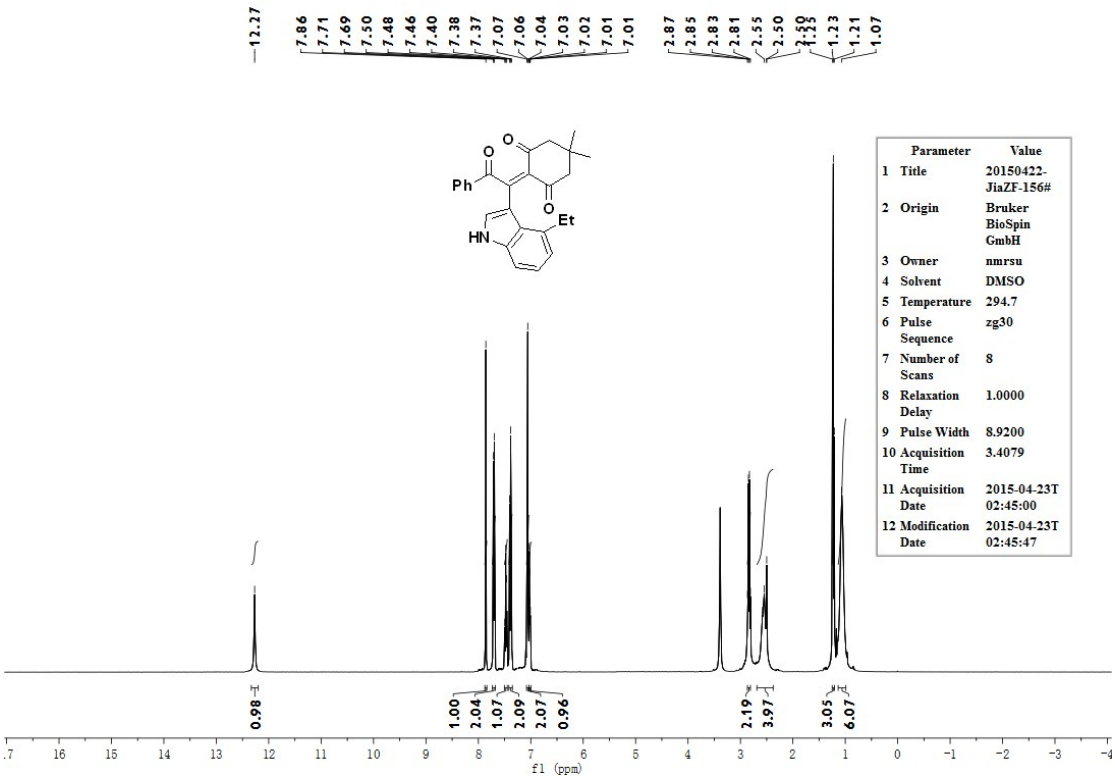


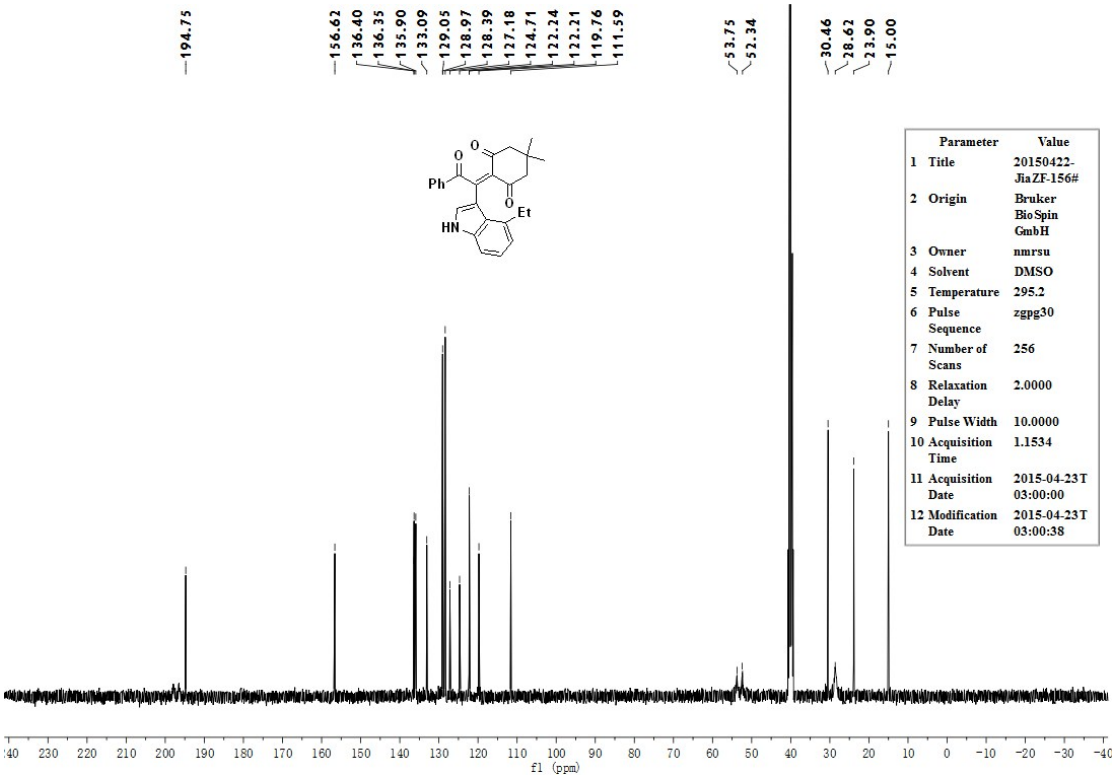
	Parameter	Value
1	Title	20150612-JiaZF-142#
2	Origin	Bruker BioSpin GmbH
3	Owner	nmrsu
4	Solvent	DMSO
5	Temperature	294.7
6	Pulse Sequence	zgflqn
7	Number of Scans	64
8	Relaxation Delay	1.5000
9	Pulse Width	14.0000
10	Acquisition Time	0.5767
11	Acquisition Date	2015-06-12T 17:18:00
12	Modification Date	2015-06-12T 17:18:49

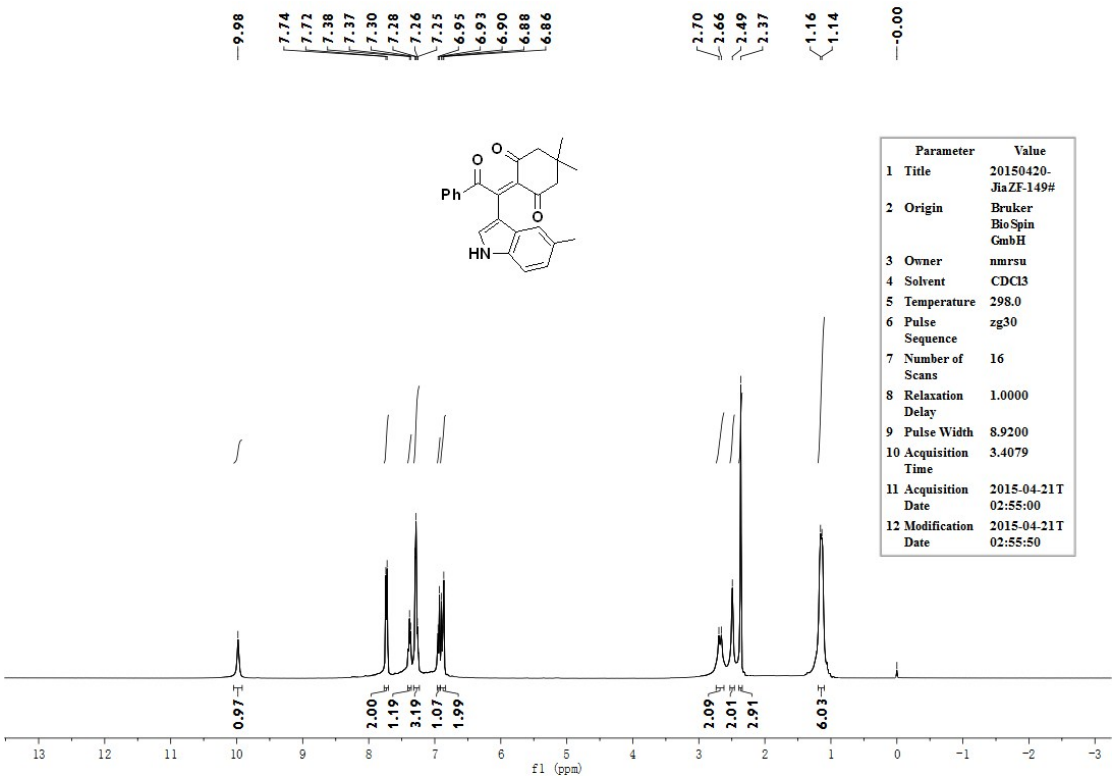

7.61 7.60 7.55 7.53 7.50 7.48 7.46 7.44 7.43 7.43 7.38 7.36 7.34 7.29 7.28 7.27 7.27 7.24 7.23 7.13 7.12 7.10
3.52
2.55 2.50 2.50 2.46 2.31 2.27 2.03 1.99 0.98 0.81
Ph
Ph
N
O
O
O
Parameter Value
1 Title 20150415-JiaZF-141#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent DMSO
5 Temperature 297.8
6 Pulse Sequence zg30
7 Number of Scans 8
8 Relaxation Delay 1.0000
9 Pulse Width 8.9200
10 Acquisition Time 3.4079
11 Acquisition Date 2015-04-15T 21:39:00
12 Modification Date 2015-04-15T 21:39:41
2.06 1.07 4.09 2.03 4.09 1.05
3.03
2.56 1.07 1.00
3.07 3.00
f1 (ppm)

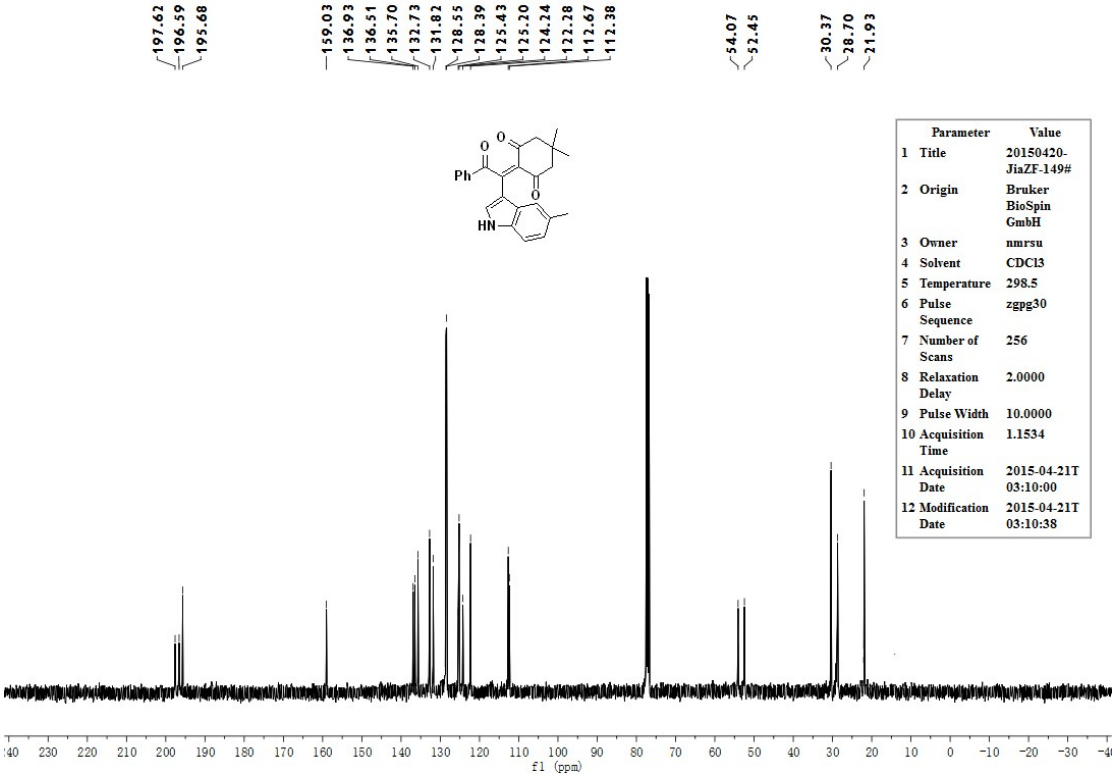

197.81 195.92 194.53 156.82 145.72 137.96 136.48 133.06 131.35 130.46 129.63 128.89 128.86 128.33 126.05 123.24 122.24 120.60 111.73 111.10
53.36 52.37
31.76 29.73 28.81 28.38
Ph
Ph
N
O
O
O
Parameter Value
1 Title 20150415-JiaZF-141#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent DMSO
5 Temperature 297.9
6 Pulse Sequence zgpg30
7 Number of Scans 256
8 Relaxation Delay 2.0000
9 Pulse Width 10.0000
10 Acquisition Time 1.1534
11 Acquisition Date 2015-04-15T 21:38:00
12 Modification Date 2015-04-15T 21:38:15
f1 (ppm)

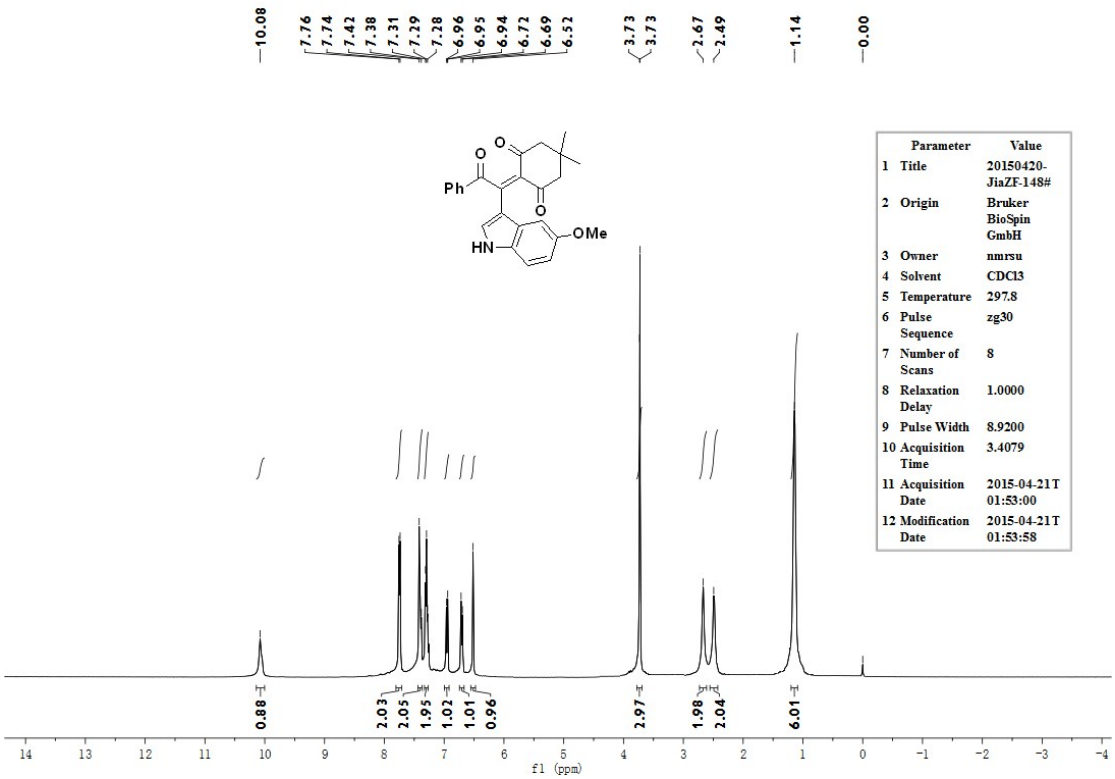

7.61 7.60 7.58 7.51 7.49 7.48 7.44 7.43 7.43 7.39 7.37 7.35 7.26 7.25 7.24 7.22 7.13 7.11 7.09
4.06 4.04 4.03 4.00 3.98
2.59 2.50 2.46 2.29 2.26 2.25 2.04
1.19 1.18 1.16 1.10 1.08 1.06 0.98 0.78
Ph
Ph
N
Parameter Value
1 Title 20150415-JiaZF-140#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent DMSO
5 Temperature 297.7
6 Pulse Sequence zg30
7 Number of Scans 8
8 Relaxation Delay 1.0000
9 Pulse Width 8.9200
10 Acquisition Time 3.4079
11 Acquisition Date 2015-04-15T 21:22:00
12 Modification Date 2015-04-15T 21:22:04
2.99 1.05 2.94 2.03 4.02 1.01
2.05
2.43 1.08 1.04
3.08 3.03 3.00
f1 (ppm)
197.73 196.04 194.66
156.72 145.08 136.70 136.39 133.08 131.15 130.60 129.68 128.95 128.86 128.31 126.34 123.25 122.16 120.81 111.76 111.51
53.36 52.33
39.30 29.69 28.84 28.27
15.30
Parameter Value
1 Title 20150415-JiaZF-140#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent DMSO
5 Temperature 297.7
6 Pulse Sequence zgpg30
7 Number of Scans 128
8 Relaxation Delay 2.0000
9 Pulse Width 10.0000
10 Acquisition Time 1.1534
11 Acquisition Date 2015-04-15T 21:20:00
12 Modification Date 2015-04-15T 21:20:39
f1 (ppm)

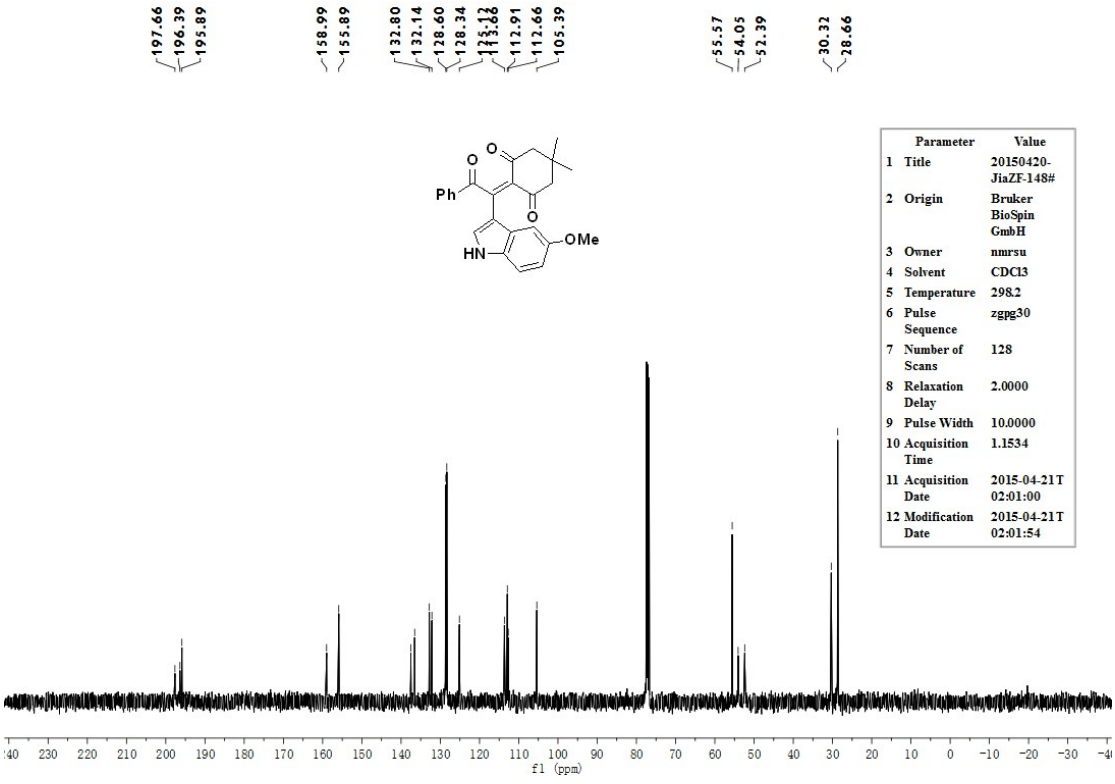

12.27
7.86
7.71
7.69
7.50
7.48
7.46
7.40
7.38
7.37
7.07
7.06
7.04
7.03
7.02
7.01
7.01
2.87
2.85
2.83
2.81
2.55
2.50
1.23
1.21
1.07
Ph
O
O
Et
HN
Parameter Value
1 Title 20150422-JiaZF-156#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent DMSO
5 Temperature 294.7
6 Pulse Sequence zg30
7 Number of Scans 8
8 Relaxation Delay 1.0000
9 Pulse Width 8.9200
10 Acquisition Time 3.4079
11 Acquisition Date 2015-04-23T 02:45:00
12 Modification Date 2015-04-23T 02:45:47
0.98
1.00
2.04
1.07
2.09
2.07
0.96
2.19
3.97
3.05
6.07
f1 (ppm)

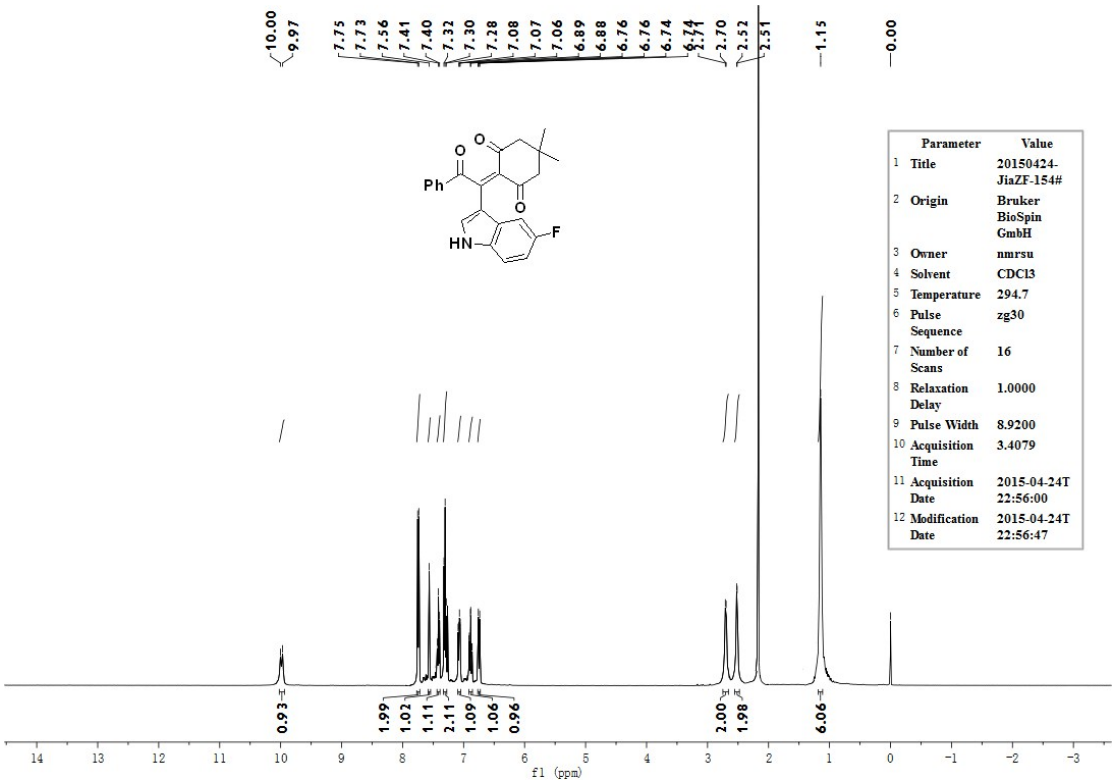

194.75
156.62
136.40
136.35
135.90
133.09
129.05
128.97
128.39
127.18
124.71
122.24
122.21
119.76
111.59
53.75
52.34
30.46
28.62
23.90
15.00
Ph
O
O
Et
HN
Parameter Value
1 Title 20150422-JiaZF-156#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent DMSO
5 Temperature 295.2
6 Pulse Sequence zgpg30
7 Number of Scans 256
8 Relaxation Delay 2.0000
9 Pulse Width 10.0000
10 Acquisition Time 1.1534
11 Acquisition Date 2015-04-23T 03:00:00
12 Modification Date 2015-04-23T 03:00:38
f1 (ppm)


9.98
7.74
7.72
7.38
7.37
7.30
7.28
7.26
7.25
6.95
6.93
6.90
6.88
6.86
2.70
2.66
2.49
2.37
1.16
1.14
0.00
Ph
O
HN
Parameter Value
1 Title 20150420-JiaZF-149#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent CDCl3
5 Temperature 298.0
6 Pulse Sequence zg30
7 Number of Scans 16
8 Relaxation Delay 1.0000
9 Pulse Width 8.9200
10 Acquisition Time 3.4079
11 Acquisition Date 2015-04-21T 02:55:00
12 Modification Date 2015-04-21T 02:55:50
0.97
2.00
1.19
3.19
1.07
1.99
2.09
2.01
2.91
6.03
f1 (ppm)

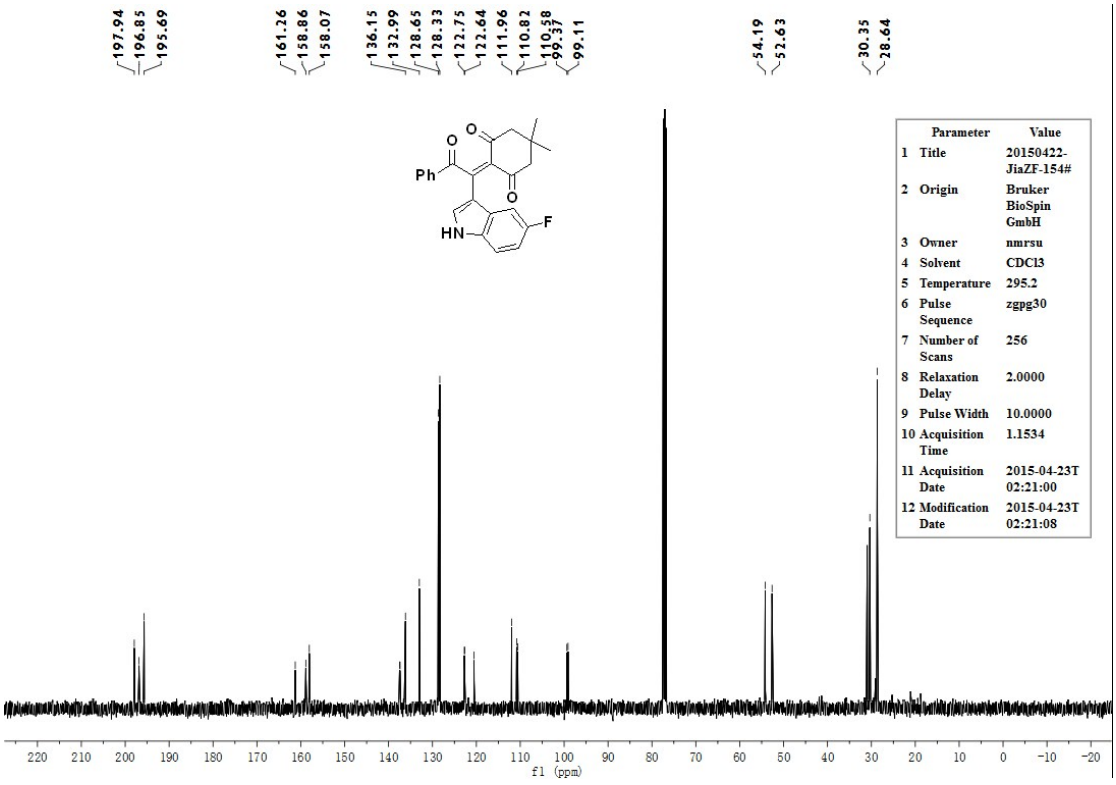

197.62
196.59
195.68
159.03
136.93
136.51
135.70
132.73
131.82
128.55
128.39
125.43
125.20
124.24
122.28
112.67
112.38
54.07
52.45
30.37
28.70
21.93
Ph
O
HN
Parameter Value
1 Title 20150420-JiaZF-149#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent CDCl3
5 Temperature 298.5
6 Pulse Sequence zgpg30
7 Number of Scans 256
8 Relaxation Delay 2.0000
9 Pulse Width 10.0000
10 Acquisition Time 1.1534
11 Acquisition Date 2015-04-21T 03:10:00
12 Modification Date 2015-04-21T 03:10:38
f1 (ppm)


10.08
7.76
7.74
7.42
7.38
7.31
7.29
7.28
6.96
6.95
6.94
6.72
6.69
6.52
3.73
3.73
2.67
2.49
1.14
0.00
Ph
O
O
HN
OMe
Parameter Value
1 Title 20150420-JiaZF-148#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent CDCl3
5 Temperature 297.8
6 Pulse Sequence zg30
7 Number of Scans 8
8 Relaxation Delay 1.0000
9 Pulse Width 8.9200
10 Acquisition Time 3.4079
11 Acquisition Date 2015-04-21T 01:53:00
12 Modification Date 2015-04-21T 01:53:58
0.88
2.03
2.05
1.95
1.02
1.01
0.96
2.97
1.98
2.04
6.01
f1 (ppm)

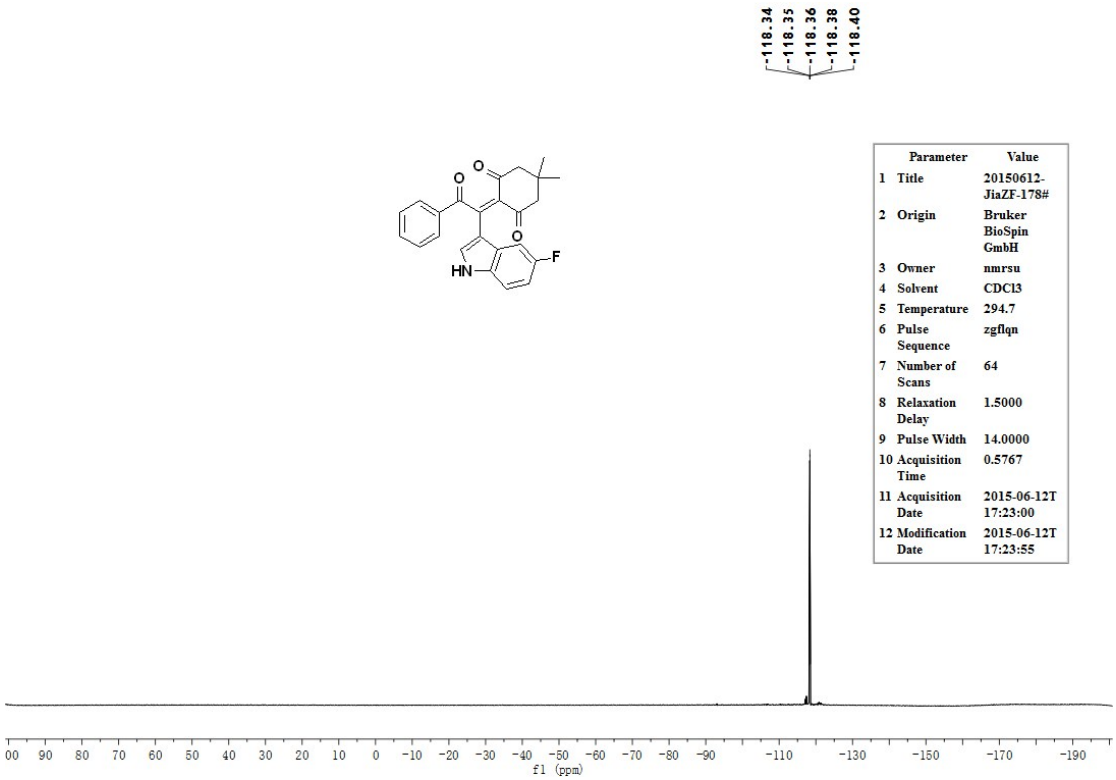

197.66
196.39
195.89
158.99
155.89
132.80
131.14
128.60
128.34
112.91
112.66
105.39
55.57
54.05
52.39
30.32
28.66
Ph
O
O
HN
OMe
Parameter Value
1 Title 20150420-JiaZF-148#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent CDCl3
5 Temperature 298.2
6 Pulse Sequence zgpg30
7 Number of Scans 128
8 Relaxation Delay 2.0000
9 Pulse Width 10.0000
10 Acquisition Time 1.1534
11 Acquisition Date 2015-04-21T 02:01:00
12 Modification Date 2015-04-21T 02:01:54
f1 (ppm)

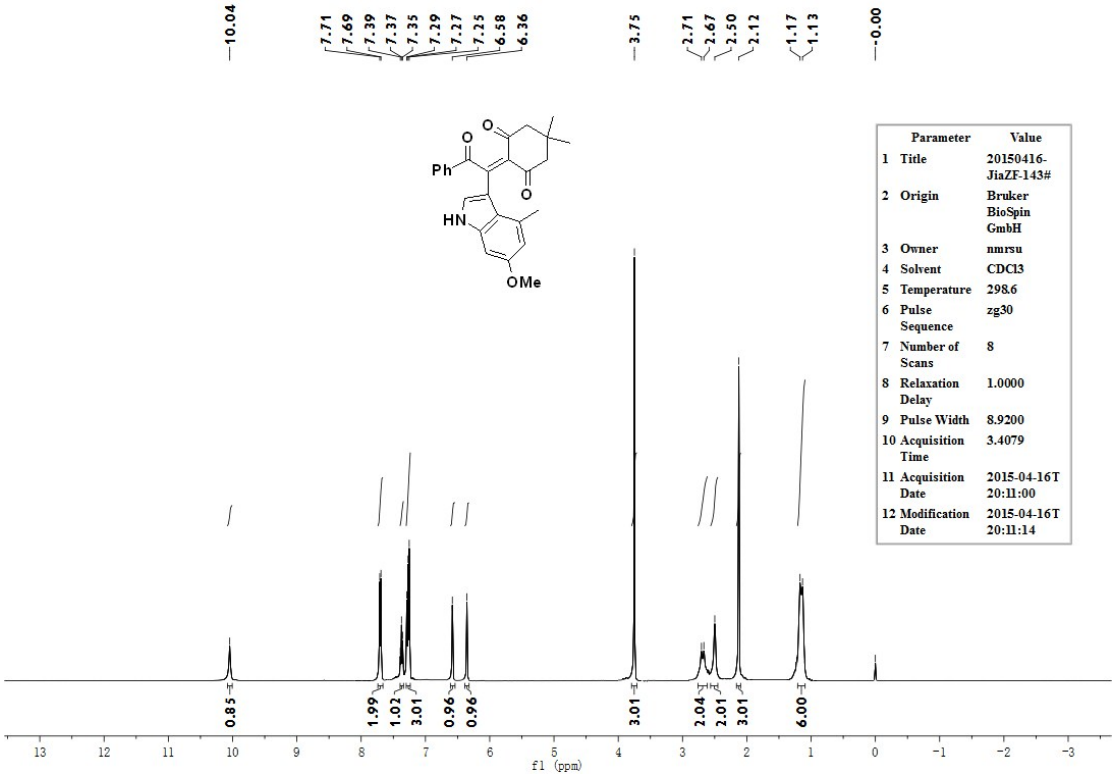


	Parameter	Value
1	Title	20150424-JiaZF-154#
2	Origin	Bruker BioSpin GmbH
3	Owner	nmrsu
4	Solvent	CDCl3
5	Temperature	294.7
6	Pulse Sequence	zg30
7	Number of Scans	16
8	Relaxation Delay	1.0000
9	Pulse Width	8.9200
10	Acquisition Time	3.4079
11	Acquisition Date	2015-04-24T 22:56:00
12	Modification Date	2015-04-24T 22:56:47

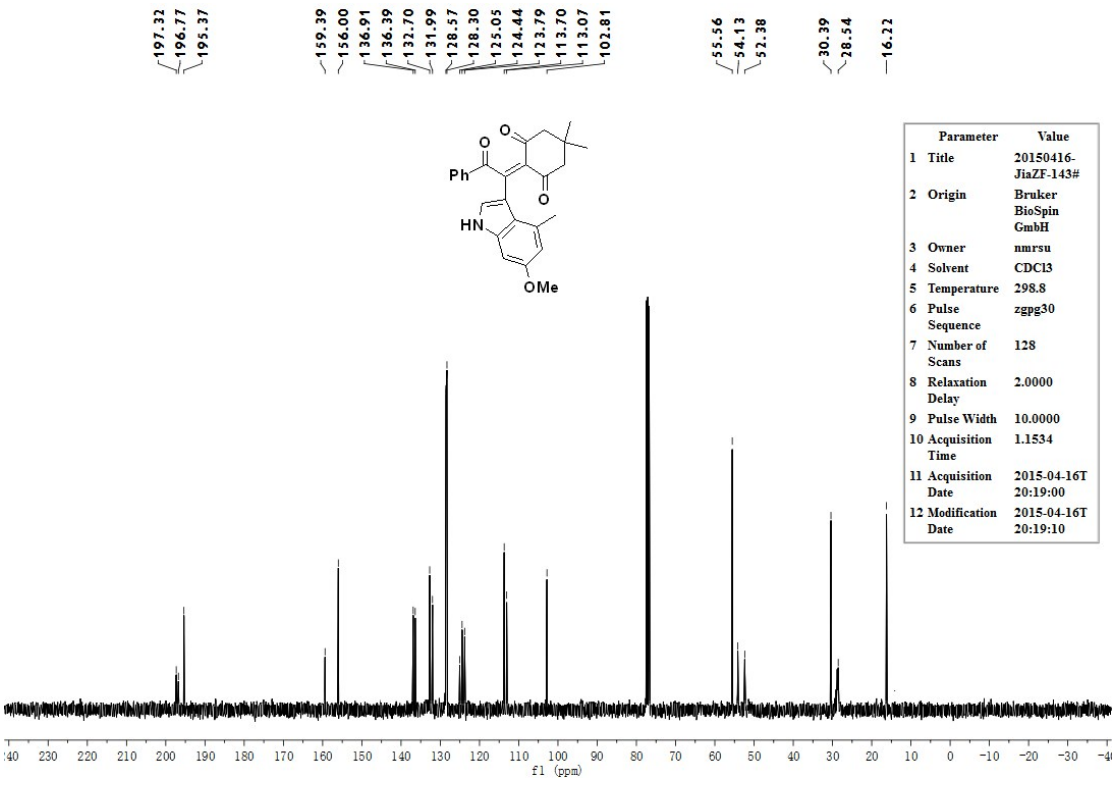


	Parameter	Value
1	Title	20150422-JiaZF-154#
2	Origin	Bruker BioSpin GmbH
3	Owner	nmrsu
4	Solvent	CDCl3
5	Temperature	295.2
6	Pulse Sequence	zgpg30
7	Number of Scans	256
8	Relaxation Delay	2.0000
9	Pulse Width	10.0000
10	Acquisition Time	1.1534
11	Acquisition Date	2015-04-23T 02:21:00
12	Modification Date	2015-04-23T 02:21:08

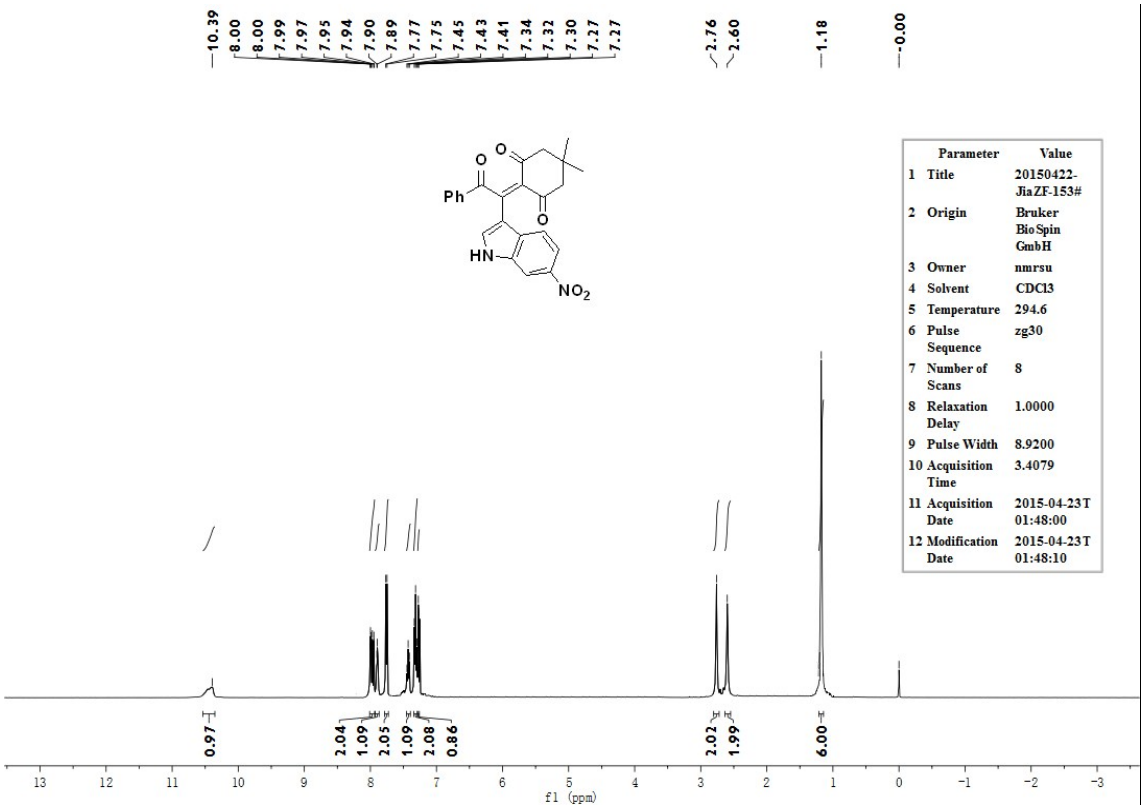

-118.34
-118.35
-118.36
-118.38
-118.40
O
O
O
HN
F
Parameter Value
1 Title 20150612-JiaZF-178#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent CDCl3
5 Temperature 294.7
6 Pulse Sequence zgflqn
7 Number of Scans 64
8 Relaxation Delay 1.5000
9 Pulse Width 14.0000
10 Acquisition Time 0.5767
11 Acquisition Date 2015-06-12T 17:23:00
12 Modification Date 2015-06-12T 17:23:55
00 90 80 70 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -110 -130 -150 -170 -190
f1 (ppm)

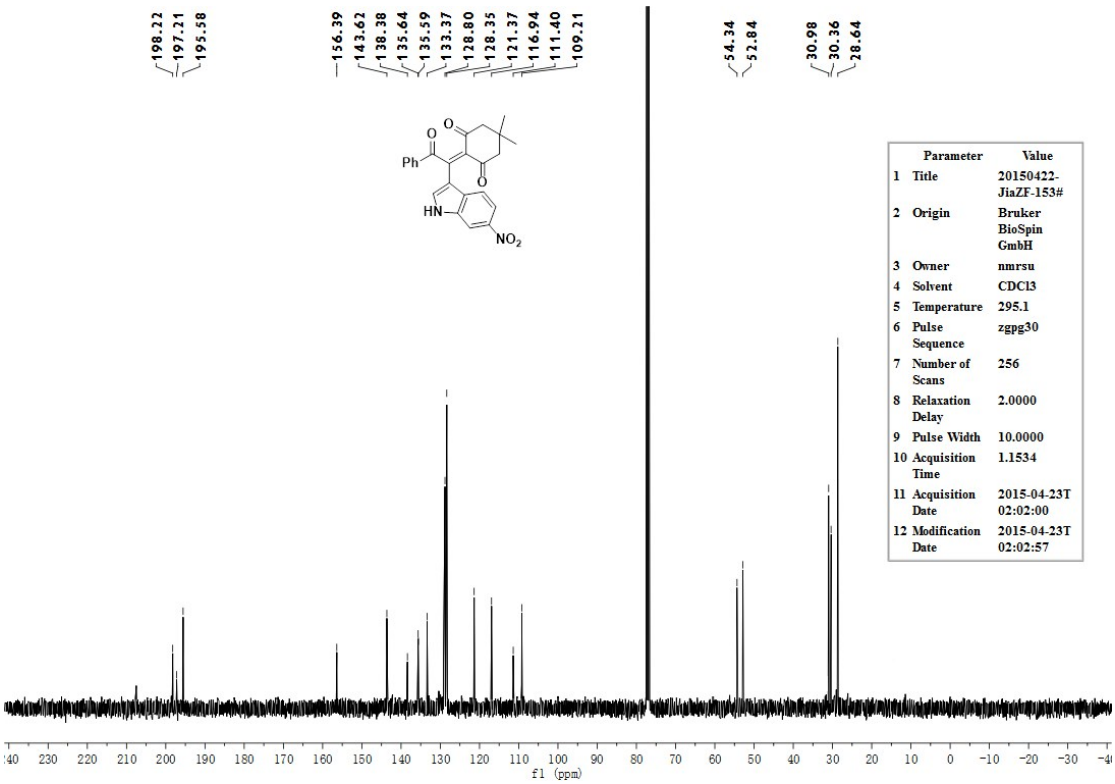


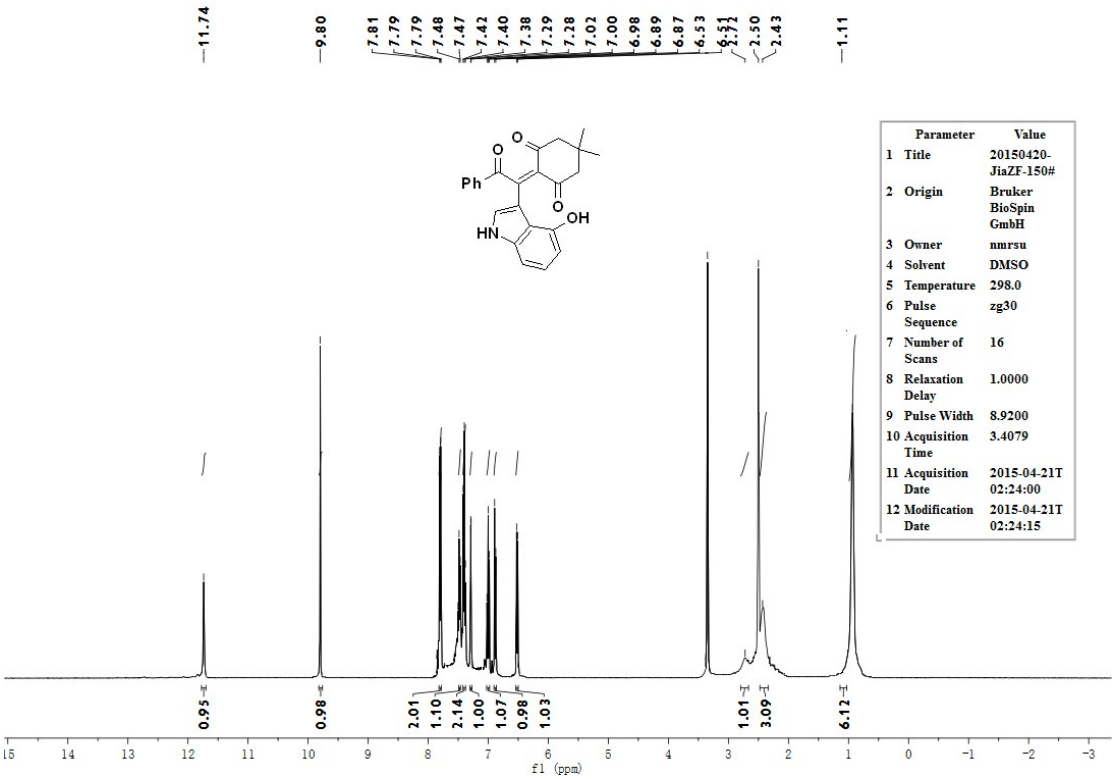
	Parameter	Value
1	Title	20150416-JiaZF-143#
2	Origin	Bruker BioSpin GmbH
3	Owner	nmrsu
4	Solvent	CDCl3
5	Temperature	298.6
6	Pulse Sequence	zg30
7	Number of Scans	8
8	Relaxation Delay	1.0000
9	Pulse Width	8.9200
10	Acquisition Time	3.4079
11	Acquisition Date	2015-04-16T 20:11:00
12	Modification Date	2015-04-16T 20:11:14



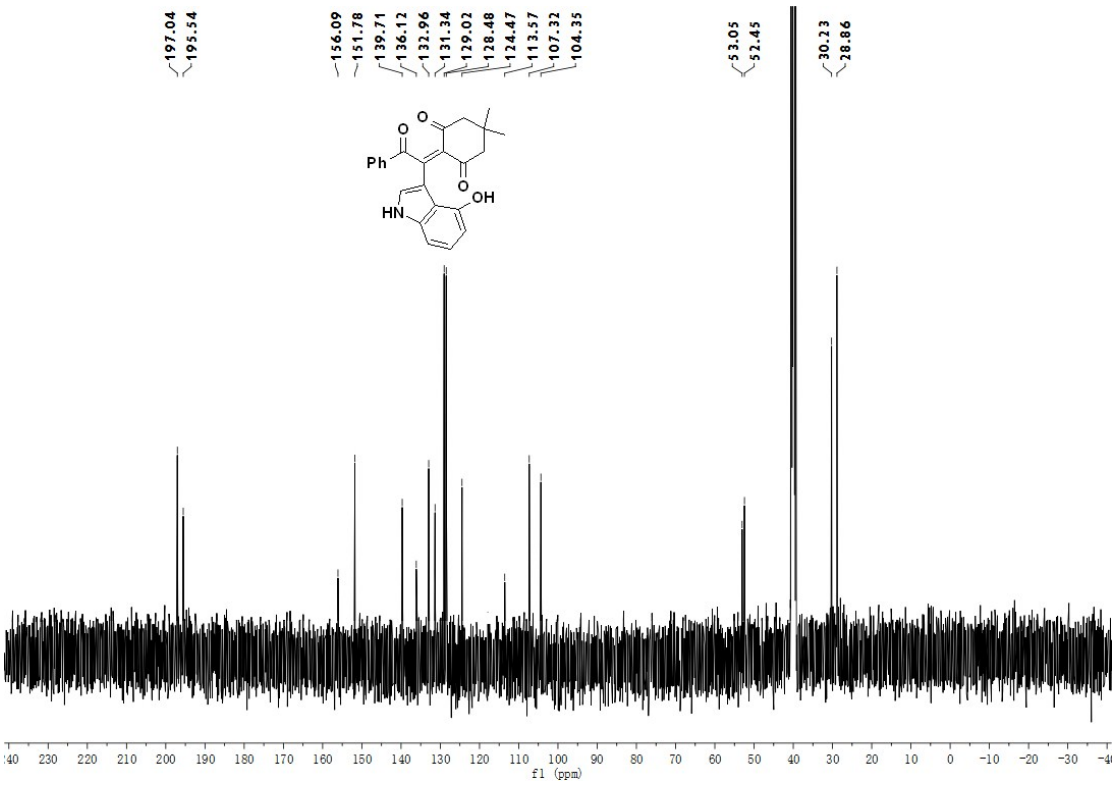
	Parameter	Value
1	Title	20150416-JiaZF-143#
2	Origin	Bruker BioSpin GmbH
3	Owner	nmrsu
4	Solvent	CDCl3
5	Temperature	298.8
6	Pulse Sequence	zgpg30
7	Number of Scans	128
8	Relaxation Delay	2.0000
9	Pulse Width	10.0000
10	Acquisition Time	1.1534
11	Acquisition Date	2015-04-16T 20:19:00
12	Modification Date	2015-04-16T 20:19:10

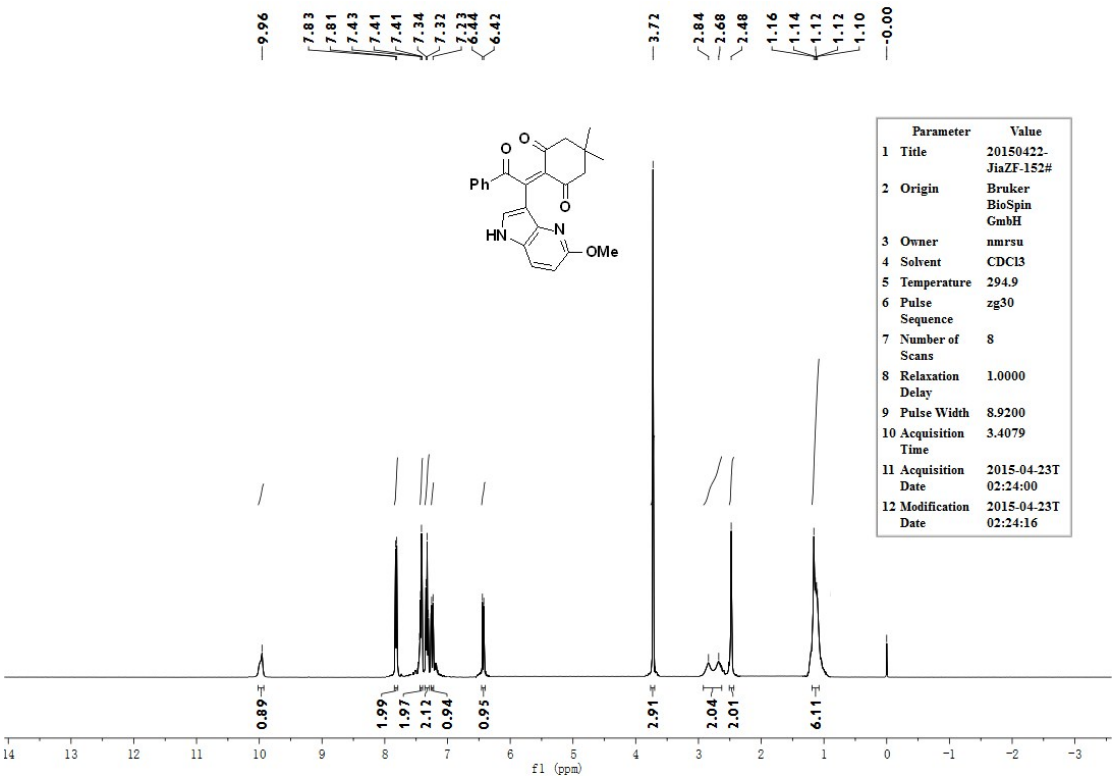

10.39
8.00
8.00
7.99
7.97
7.95
7.94
7.90
7.89
7.77
7.75
7.45
7.43
7.41
7.34
7.32
7.30
7.27
7.27
2.76
2.60
1.18
0.00
Ph
O
HN
NO2
Parameter Value
1 Title 20150422-JiaZF-153#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent CDCl3
5 Temperature 294.6
6 Pulse Sequence zg30
7 Number of Scans 8
8 Relaxation Delay 1.0000
9 Pulse Width 8.9200
10 Acquisition Time 3.4079
11 Acquisition Date 2015-04-23T 01:48:00
12 Modification Date 2015-04-23T 01:48:10
0.97
2.04
1.09
2.05
1.09
2.08
0.86
2.02
1.99
6.00
f1 (ppm)

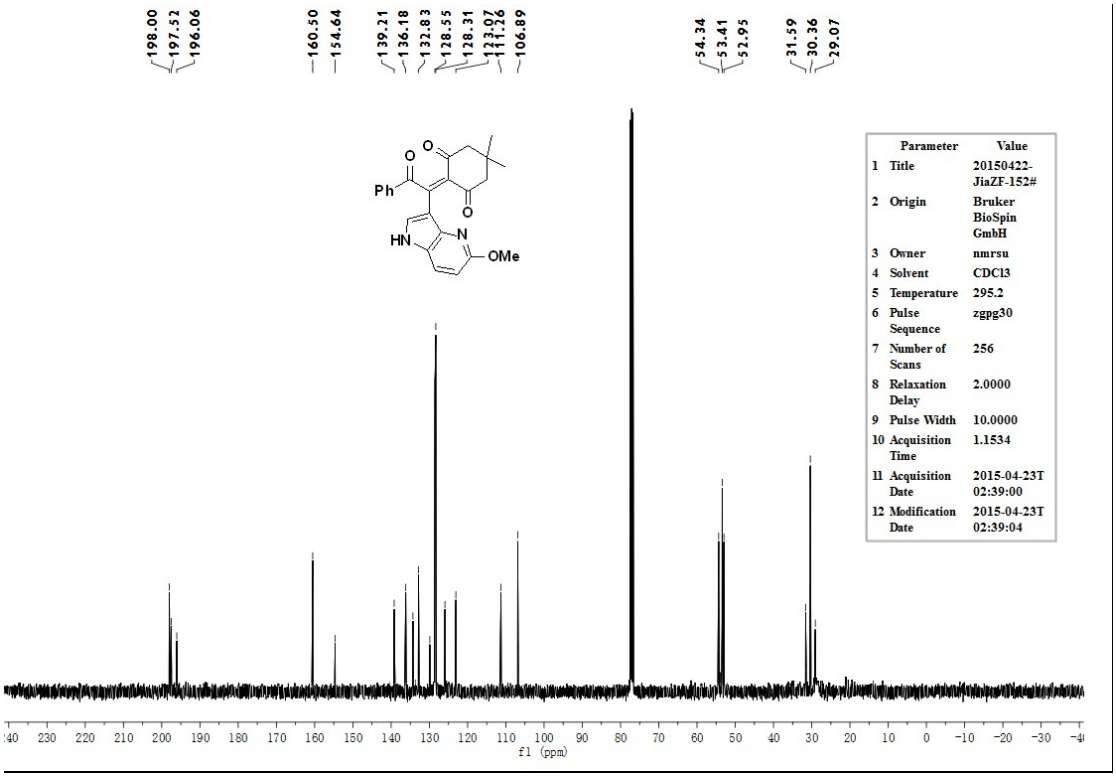

198.22
197.21
195.58
156.39
143.62
138.38
135.64
135.59
133.37
128.80
128.35
121.37
116.94
111.40
109.21
54.34
52.84
30.98
30.36
28.64
Ph
O
HN
NO2
Parameter Value
1 Title 20150422-JiaZF-153#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent CDCl3
5 Temperature 295.1
6 Pulse Sequence zgpg30
7 Number of Scans 256
8 Relaxation Delay 2.0000
9 Pulse Width 10.0000
10 Acquisition Time 1.1534
11 Acquisition Date 2015-04-23T 02:02:00
12 Modification Date 2015-04-23T 02:02:57
f1 (ppm)

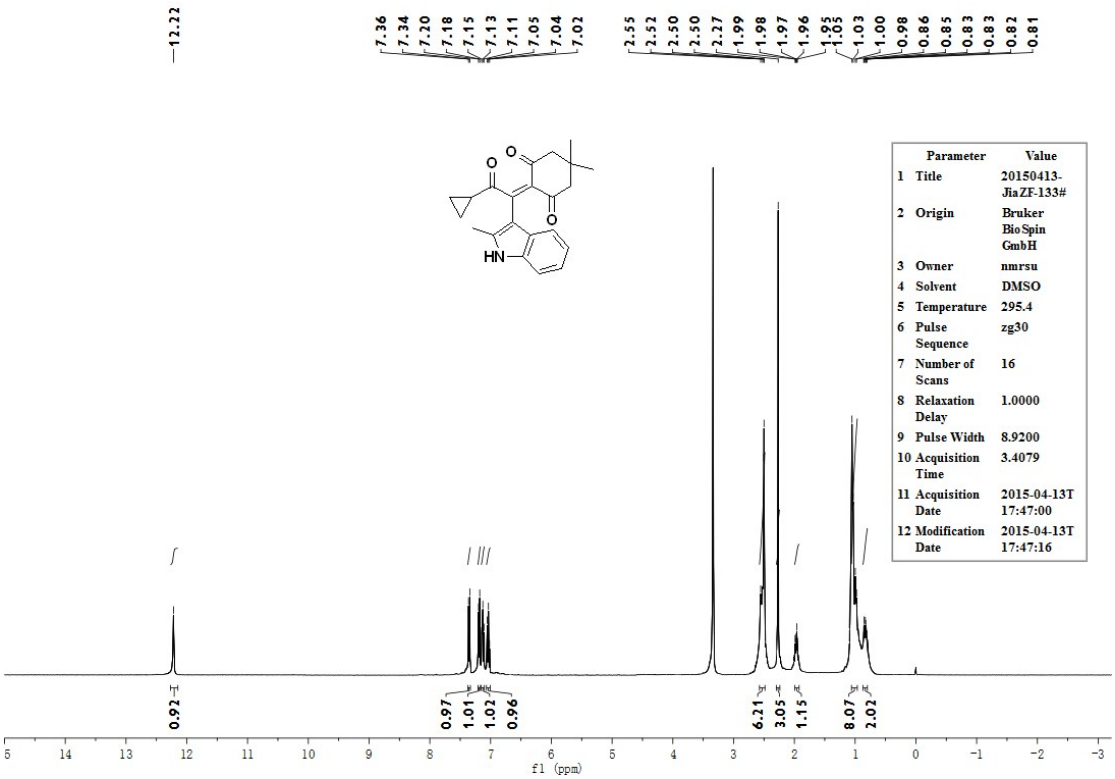


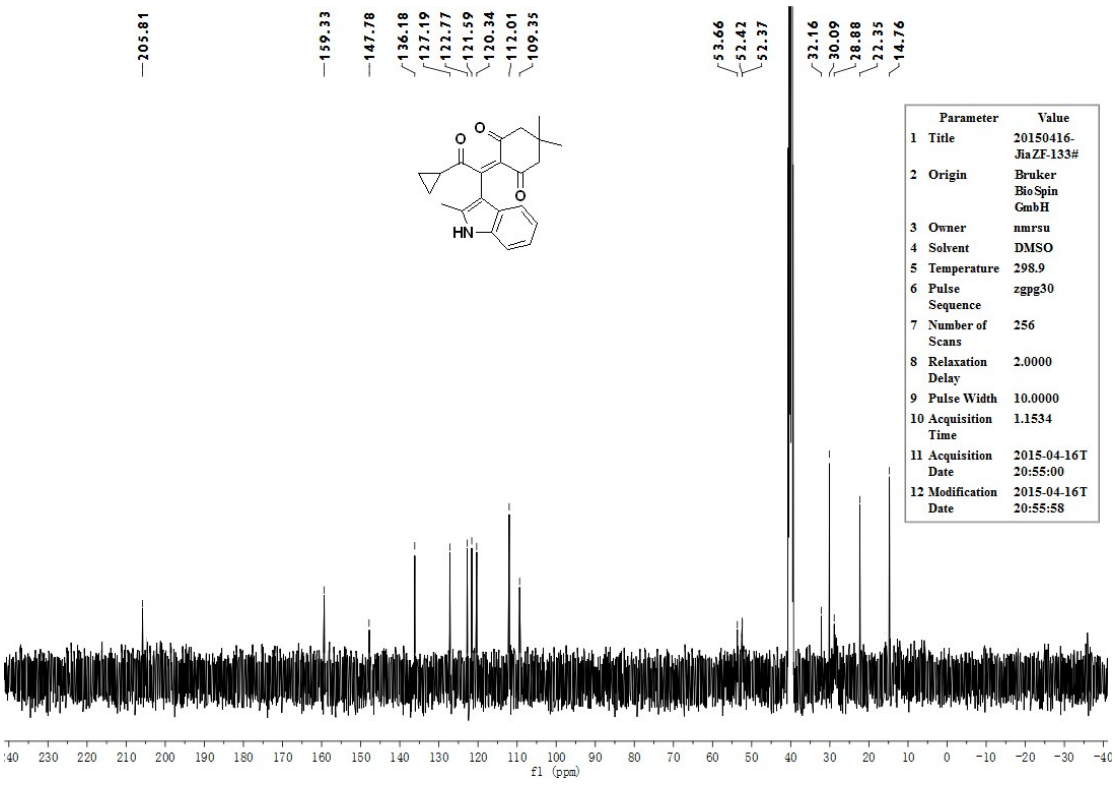
	Parameter	Value
1	Title	20150420-JiaZF-150#
2	Origin	Bruker BioSpin GmbH
3	Owner	nmrsu
4	Solvent	DMSO
5	Temperature	298.0
6	Pulse Sequence	zg30
7	Number of Scans	16
8	Relaxation Delay	1.0000
9	Pulse Width	8.9200
10	Acquisition Time	3.4079
11	Acquisition Date	2015-04-21T 02:24:00
12	Modification Date	2015-04-21T 02:24:15

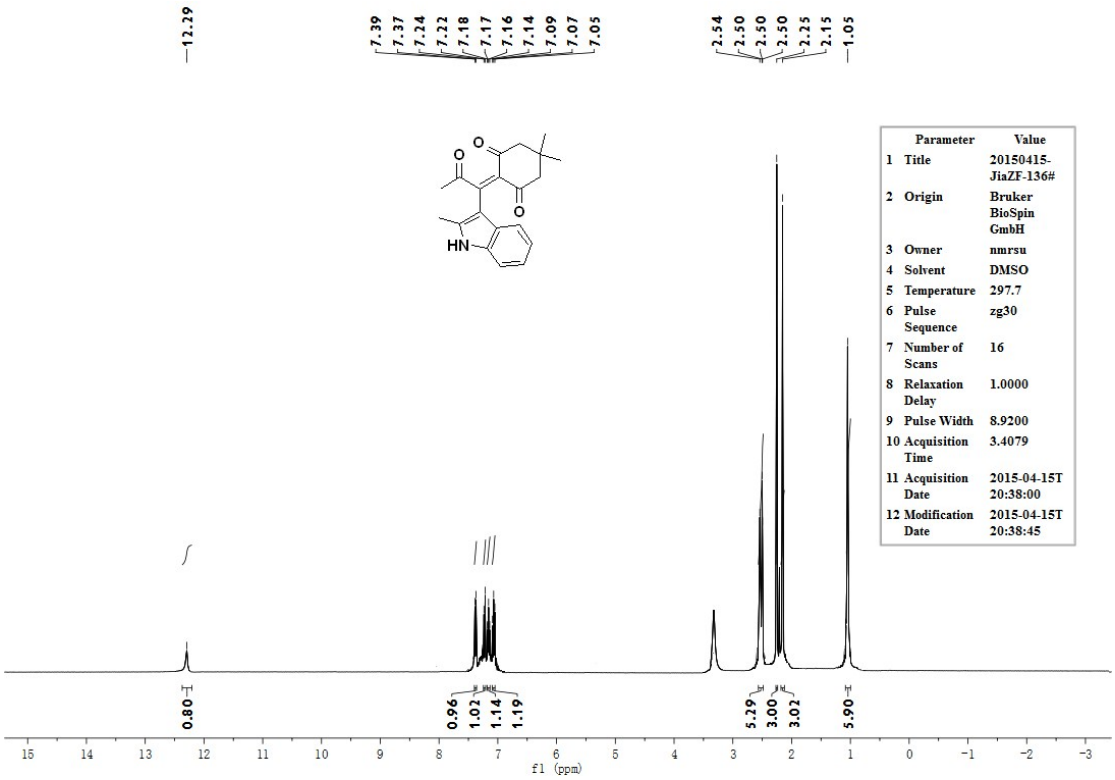


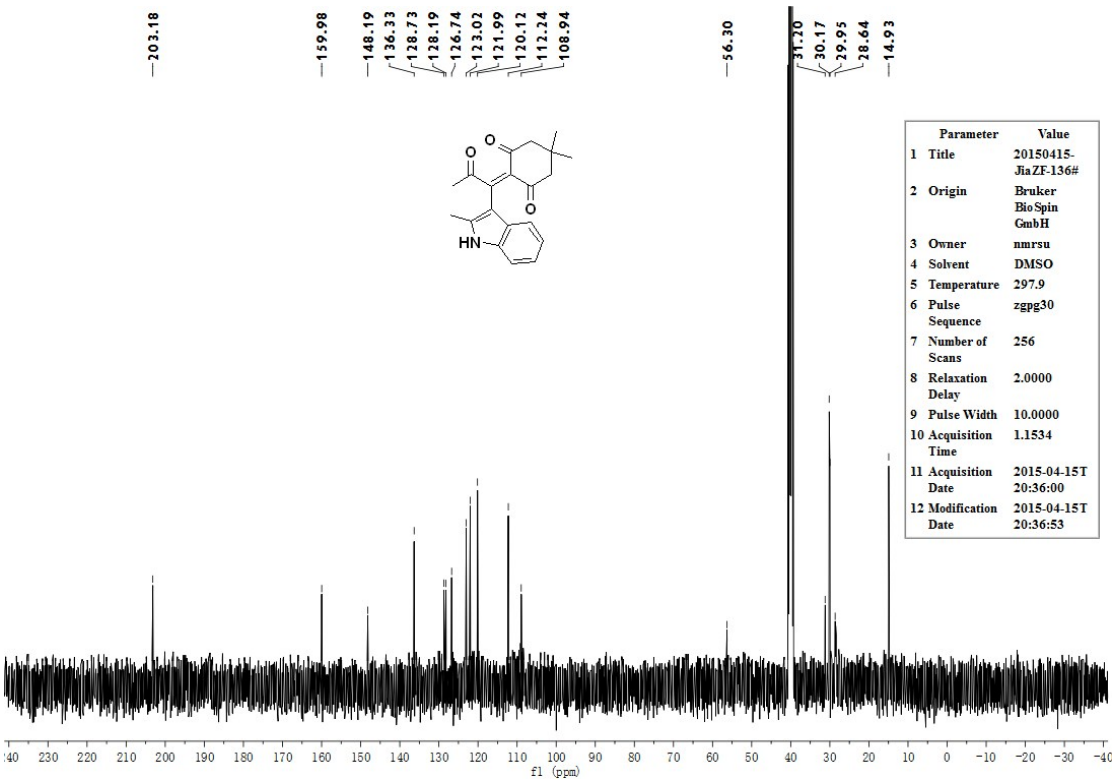

9.96
7.83
7.81
7.43
7.41
7.41
7.34
7.32
7.23
6.44
6.42
3.72
2.84
2.68
2.48
1.16
1.14
1.12
1.12
1.10
0.00
Ph
O
O
HN
N
OMe
0.89
1.99
1.97
2.12
0.94
0.95
2.91
2.04
2.01
6.11
f1 (ppm)
Parameter Value
1 Title 20150422-JiaZF-152#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent CDCl3
5 Temperature 294.9
6 Pulse Sequence zg30
7 Number of Scans 8
8 Relaxation Delay 1.0000
9 Pulse Width 8.9200
10 Acquisition Time 3.4079
11 Acquisition Date 2015-04-23T 02:24:00
12 Modification Date 2015-04-23T 02:24:16

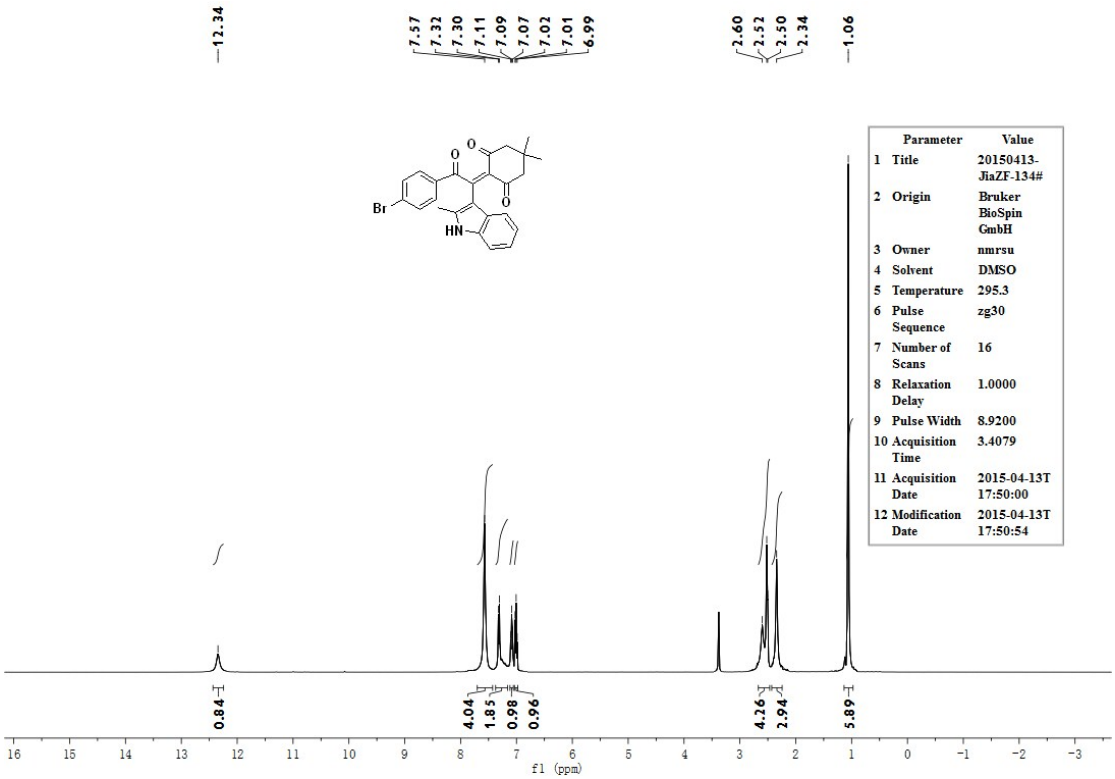

198.00
197.52
196.06
160.50
154.64
139.21
136.18
132.83
128.55
128.31
123.07
111.26
106.89
54.34
53.41
52.95
31.59
30.36
29.07
Ph
O
O
HN
N
OMe
f1 (ppm)
Parameter Value
1 Title 20150422-JiaZF-152#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent CDCl3
5 Temperature 295.2
6 Pulse Sequence zgpg30
7 Number of Scans 256
8 Relaxation Delay 2.0000
9 Pulse Width 10.0000
10 Acquisition Time 1.1534
11 Acquisition Date 2015-04-23T 02:39:00
12 Modification Date 2015-04-23T 02:39:04

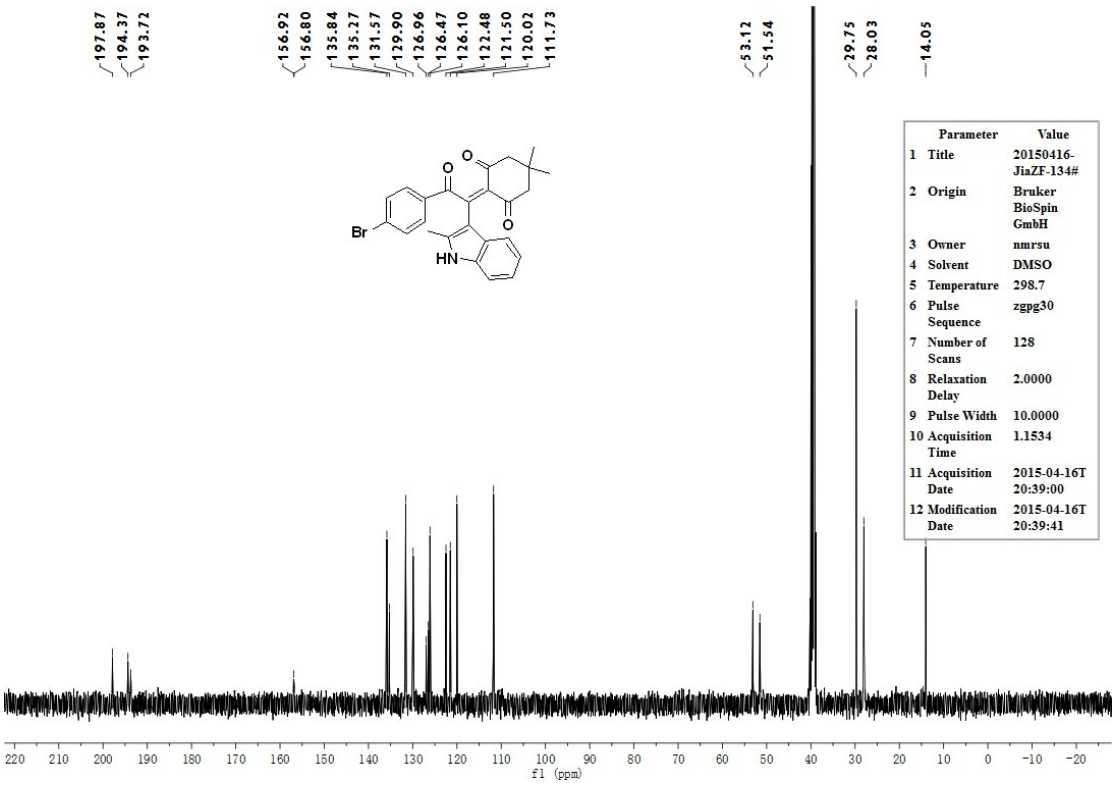

12.22
7.36
7.34
7.20
7.18
7.15
7.13
7.11
7.05
7.04
7.02
2.55
2.52
2.50
2.50
2.27
1.99
1.98
1.97
1.96
1.95
1.05
1.03
1.00
0.98
0.86
0.85
0.83
0.83
0.82
0.81
O
O
O
HN
Parameter Value
1 Title 20150413-JiaZF-133#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent DMSO
5 Temperature 295.4
6 Pulse Sequence zg30
7 Number of Scans 16
8 Relaxation Delay 1.0000
9 Pulse Width 8.9200
10 Acquisition Time 3.4079
11 Acquisition Date 2015-04-13T17:47:00
12 Modification Date 2015-04-13T17:47:16
0.92
0.97
1.01
1.02
0.96
6.21
3.05
1.15
8.07
2.02
f1 (ppm)

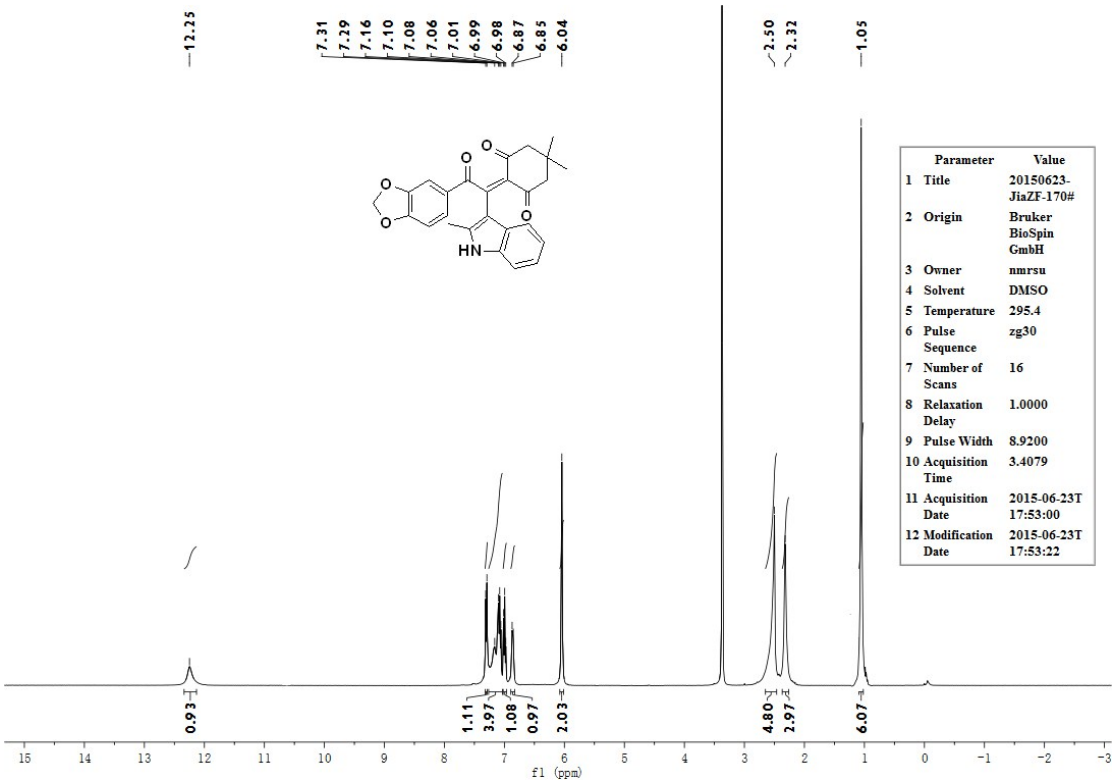

205.81
159.33
147.78
136.18
127.19
122.77
121.59
120.34
112.01
109.35
53.66
52.42
52.37
32.16
30.09
28.88
22.35
14.76
O
O
O
HN
Parameter Value
1 Title 20150416-JiaZF-133#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent DMSO
5 Temperature 298.9
6 Pulse Sequence zgpg30
7 Number of Scans 256
8 Relaxation Delay 2.0000
9 Pulse Width 10.0000
10 Acquisition Time 1.1534
11 Acquisition Date 2015-04-16T20:55:00
12 Modification Date 2015-04-16T20:55:58
f1 (ppm)

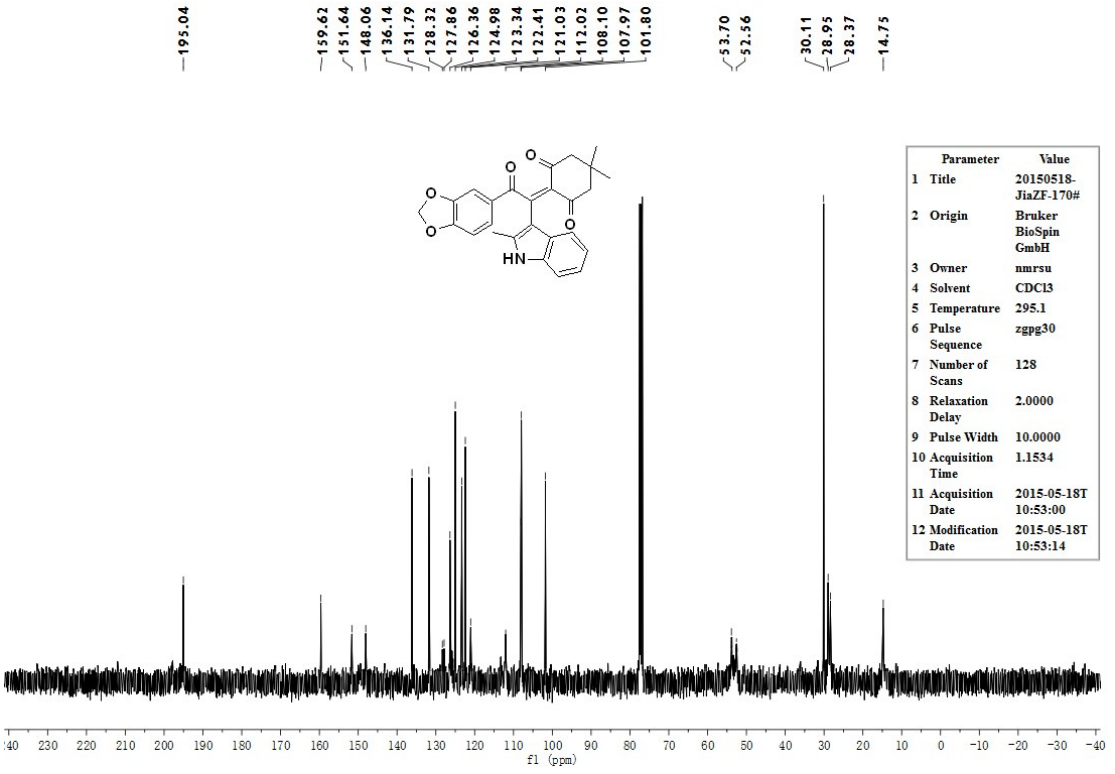

12.29
7.39
7.37
7.24
7.22
7.18
7.17
7.16
7.14
7.09
7.07
7.05
2.54
2.50
2.50
2.50
2.25
2.15
1.05
O
O
O
HN
Parameter Value
1 Title 20150415-JiaZF-136#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent DMSO
5 Temperature 297.7
6 Pulse Sequence zg30
7 Number of Scans 16
8 Relaxation Delay 1.0000
9 Pulse Width 8.9200
10 Acquisition Time 3.4079
11 Acquisition Date 2015-04-15T 20:38:00
12 Modification Date 2015-04-15T 20:38:45
0.80
0.96
1.02
1.14
1.19
5.29
3.00
3.02
5.90
f1 (ppm)

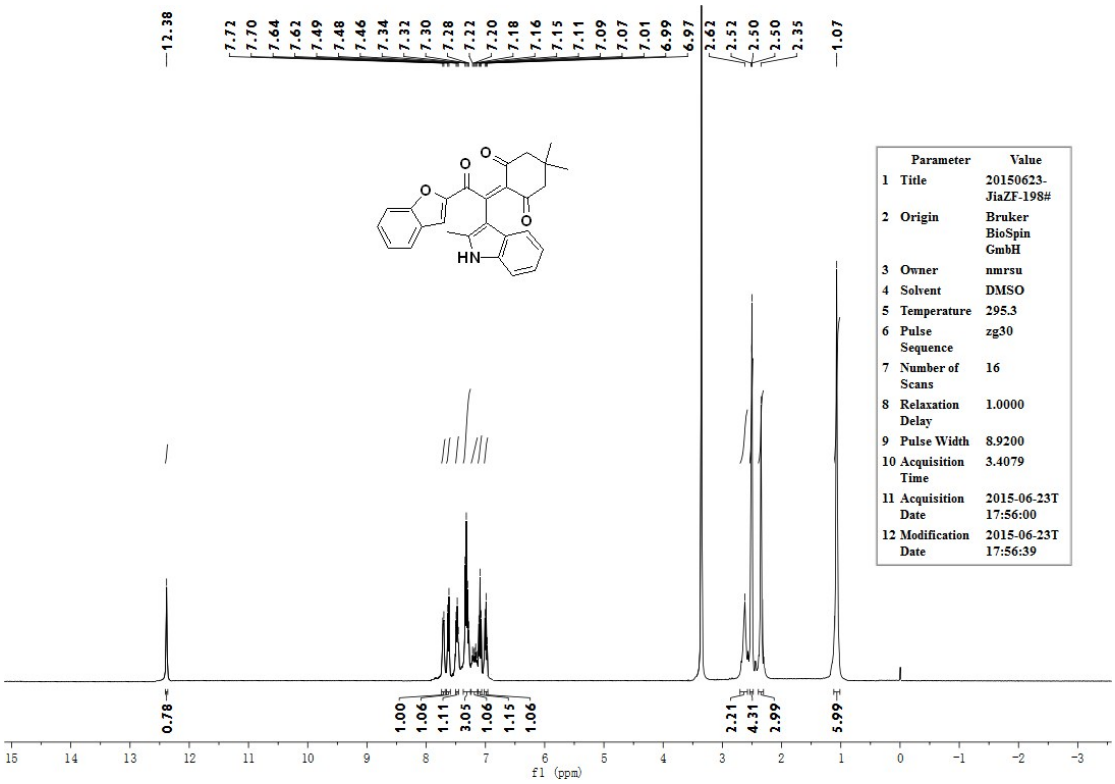

203.18
159.98
148.19
136.33
128.73
128.19
126.74
123.02
121.99
120.12
112.24
108.94
56.30
31.20
30.17
29.95
28.64
14.93
O
O
O
HN
Parameter Value
1 Title 20150415-JiaZF-136#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent DMSO
5 Temperature 297.9
6 Pulse Sequence zgpg30
7 Number of Scans 256
8 Relaxation Delay 2.0000
9 Pulse Width 10.0000
10 Acquisition Time 1.1534
11 Acquisition Date 2015-04-15T 20:36:00
12 Modification Date 2015-04-15T 20:36:53
f1 (ppm)

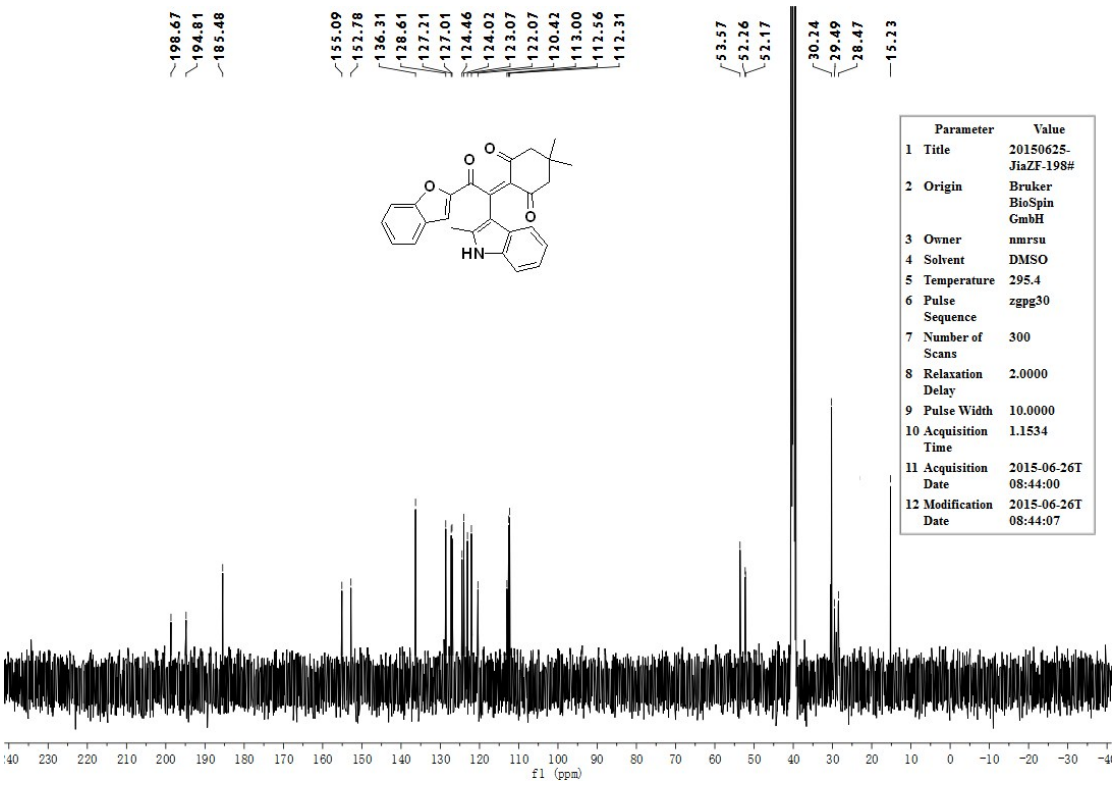

12.34
7.57
7.32
7.30
7.11
7.09
7.07
7.02
7.01
6.99
2.60
2.52
2.50
2.34
1.06
Br
HN
O
Parameter Value
1 Title 20150413-JiaZF-134#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent DMSO
5 Temperature 295.3
6 Pulse Sequence zg30
7 Number of Scans 16
8 Relaxation Delay 1.0000
9 Pulse Width 8.9200
10 Acquisition Time 3.4079
11 Acquisition Date 2015-04-13T 17:50:00
12 Modification Date 2015-04-13T 17:50:54
0.84
4.04
1.85
0.98
0.96
4.26
2.94
5.89
f1 (ppm)

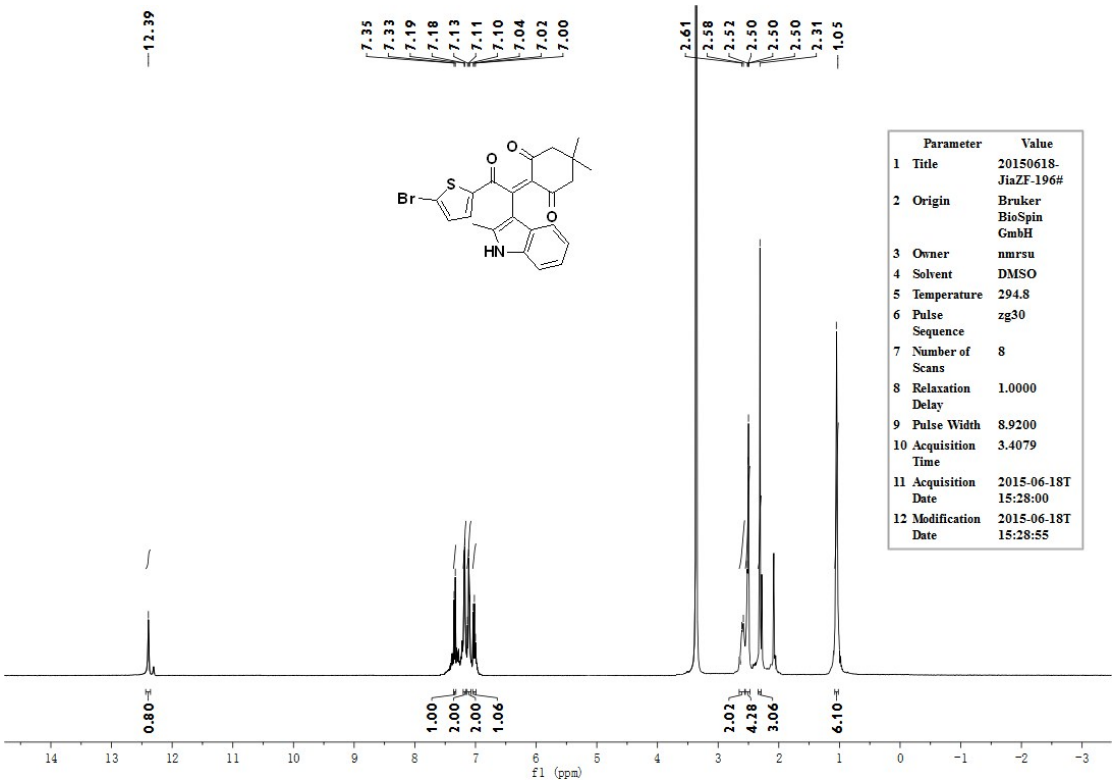

197.87
194.37
193.72
156.92
156.80
135.84
135.27
131.57
129.90
126.96
126.47
126.10
122.48
121.50
120.02
111.73
53.12
51.54
29.75
28.03
14.05
Br
HN
O
Parameter Value
1 Title 20150416-JiaZF-134#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent DMSO
5 Temperature 298.7
6 Pulse Sequence zgpg30
7 Number of Scans 128
8 Relaxation Delay 2.0000
9 Pulse Width 10.0000
10 Acquisition Time 1.1534
11 Acquisition Date 2015-04-16T 20:39:00
12 Modification Date 2015-04-16T 20:39:41
f1 (ppm)


12.25
7.31
7.29
7.16
7.10
7.08
7.06
7.01
6.99
6.98
6.87
6.85
6.04
2.50
2.32
1.05
0.93
1.11
3.97
1.08
0.97
2.03
4.80
2.97
6.07
f1 (ppm)
Parameter Value
1 Title 20150623-JiaZF-170#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent DMSO
5 Temperature 295.4
6 Pulse Sequence zg30
7 Number of Scans 16
8 Relaxation Delay 1.0000
9 Pulse Width 8.9200
10 Acquisition Time 3.4079
11 Acquisition Date 2015-06-23T 17:53:00
12 Modification Date 2015-06-23T 17:53:22

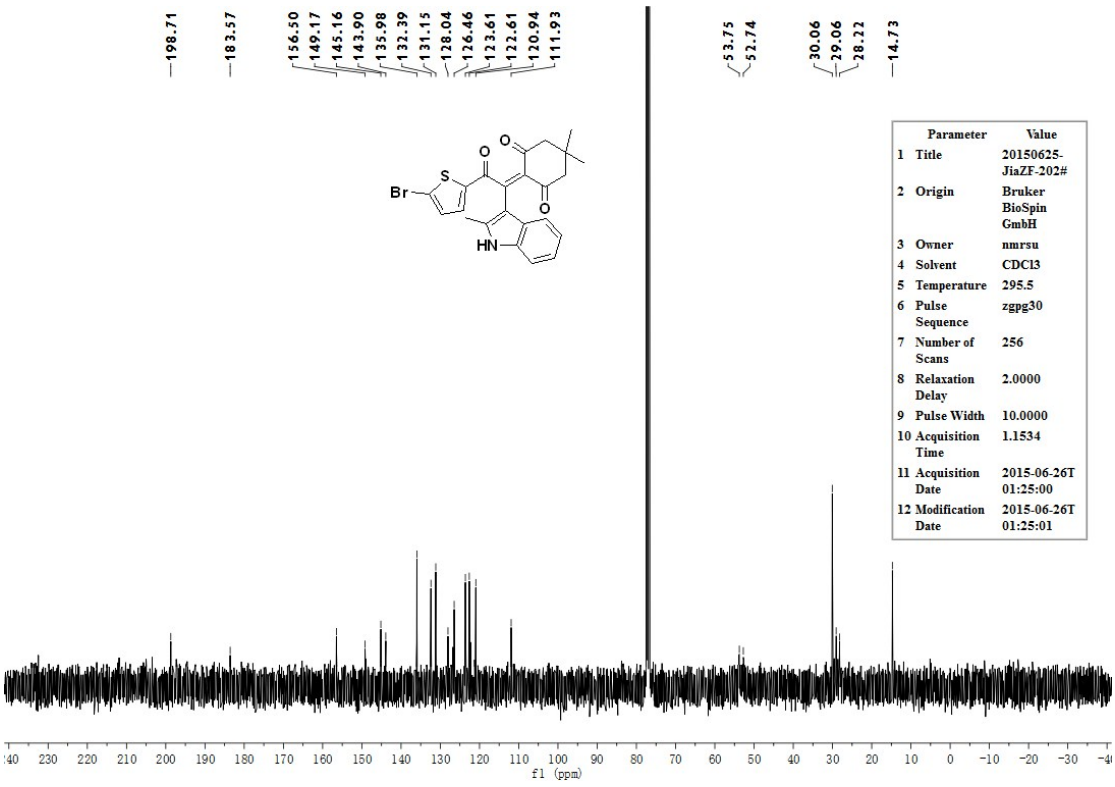

195.04
159.62
151.64
148.06
136.14
131.79
128.32
127.86
126.36
124.98
123.34
122.41
121.03
112.02
108.10
107.97
101.80
53.70
52.56
30.11
28.95
28.37
14.75
f1 (ppm)
Parameter Value
1 Title 20150518-JiaZF-170#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent CDCl3
5 Temperature 295.1
6 Pulse Sequence zgpg30
7 Number of Scans 128
8 Relaxation Delay 2.0000
9 Pulse Width 10.0000
10 Acquisition Time 1.1534
11 Acquisition Date 2015-05-18T 10:53:00
12 Modification Date 2015-05-18T 10:53:14


12.38
7.72
7.70
7.64
7.62
7.49
7.48
7.46
7.34
7.32
7.30
7.28
7.22
7.20
7.18
7.16
7.15
7.11
7.09
7.07
7.01
6.99
6.97
2.62
2.52
2.50
2.50
2.35
1.07
HN
Parameter Value
1 Title 20150623-JiaZF-198#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent DMSO
5 Temperature 295.3
6 Pulse Sequence zg30
7 Number of Scans 16
8 Relaxation Delay 1.0000
9 Pulse Width 8.9200
10 Acquisition Time 3.4079
11 Acquisition Date 2015-06-23T 17:56:00
12 Modification Date 2015-06-23T 17:56:39
0.78
1.00
1.06
1.11
3.05
1.06
1.15
1.06
2.21
4.31
2.99
5.99
f1 (ppm)

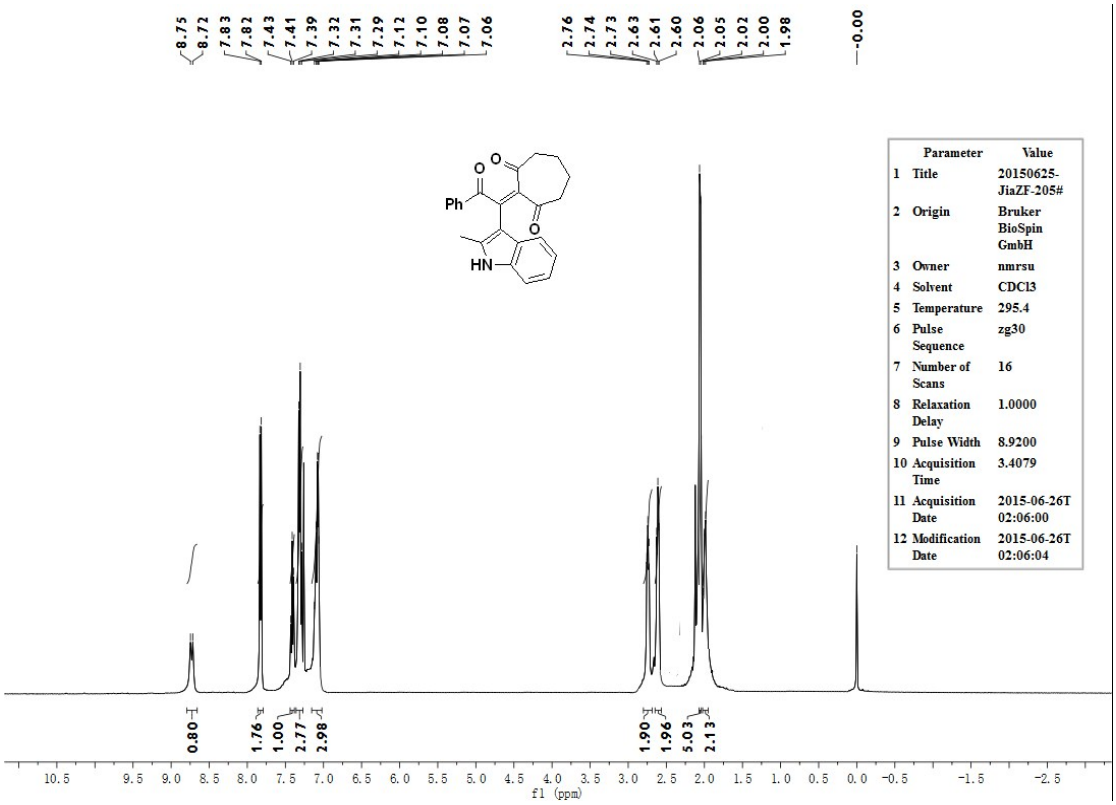

198.67
194.81
185.48
155.09
151.78
136.31
128.61
127.21
127.01
124.46
124.02
123.07
122.07
120.42
113.00
112.56
112.31
53.57
52.26
52.17
30.24
29.49
28.47
15.23
HN
Parameter Value
1 Title 20150625-JiaZF-198#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent DMSO
5 Temperature 295.4
6 Pulse Sequence zgpg30
7 Number of Scans 300
8 Relaxation Delay 2.0000
9 Pulse Width 10.0000
10 Acquisition Time 1.1534
11 Acquisition Date 2015-06-26T 08:44:00
12 Modification Date 2015-06-26T 08:44:07
f1 (ppm)

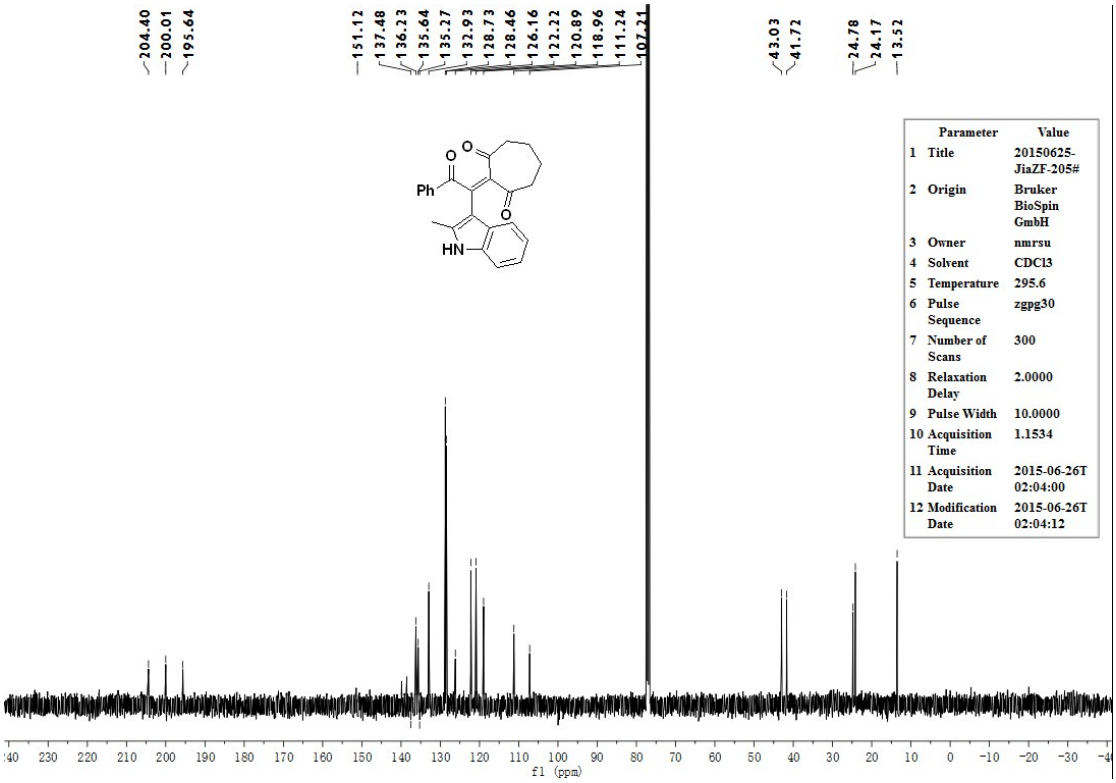


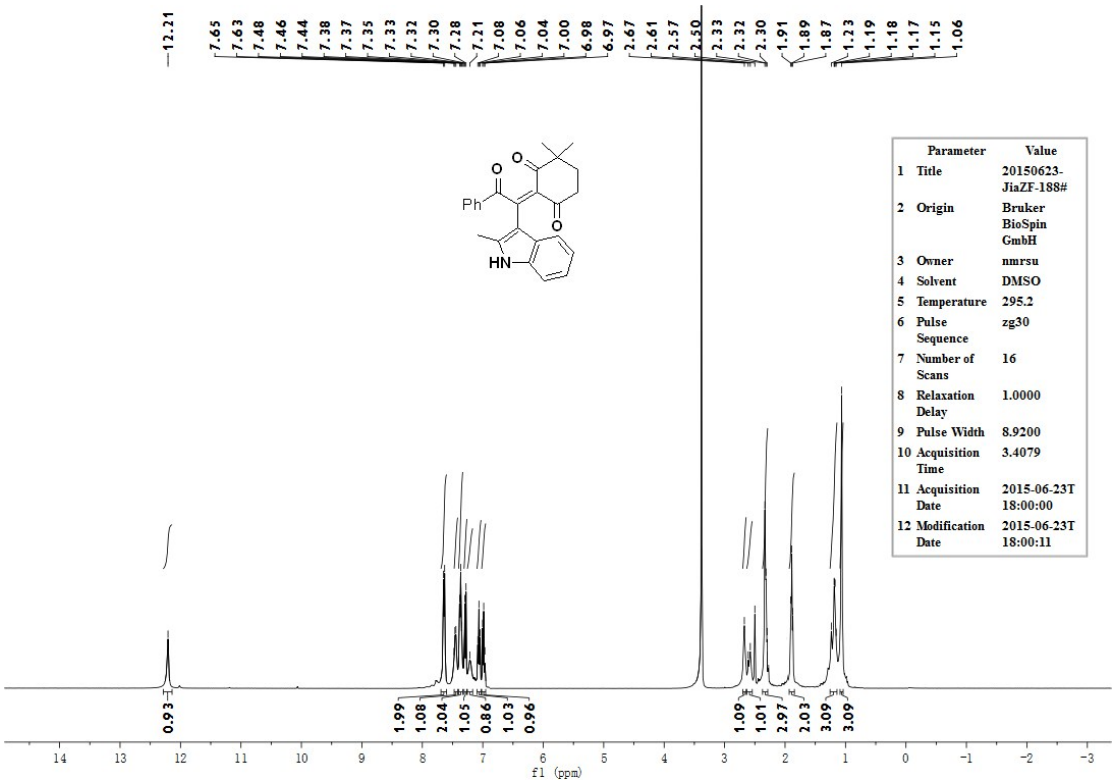
	Parameter	Value
1	Title	20150618-JiaZF-196#
2	Origin	Bruker BioSpin GmbH
3	Owner	nmrsu
4	Solvent	DMSO
5	Temperature	294.8
6	Pulse Sequence	zg30
7	Number of Scans	8
8	Relaxation Delay	1.0000
9	Pulse Width	8.9200
10	Acquisition Time	3.4079
11	Acquisition Date	2015-06-18T 15:28:00
12	Modification Date	2015-06-18T 15:28:55

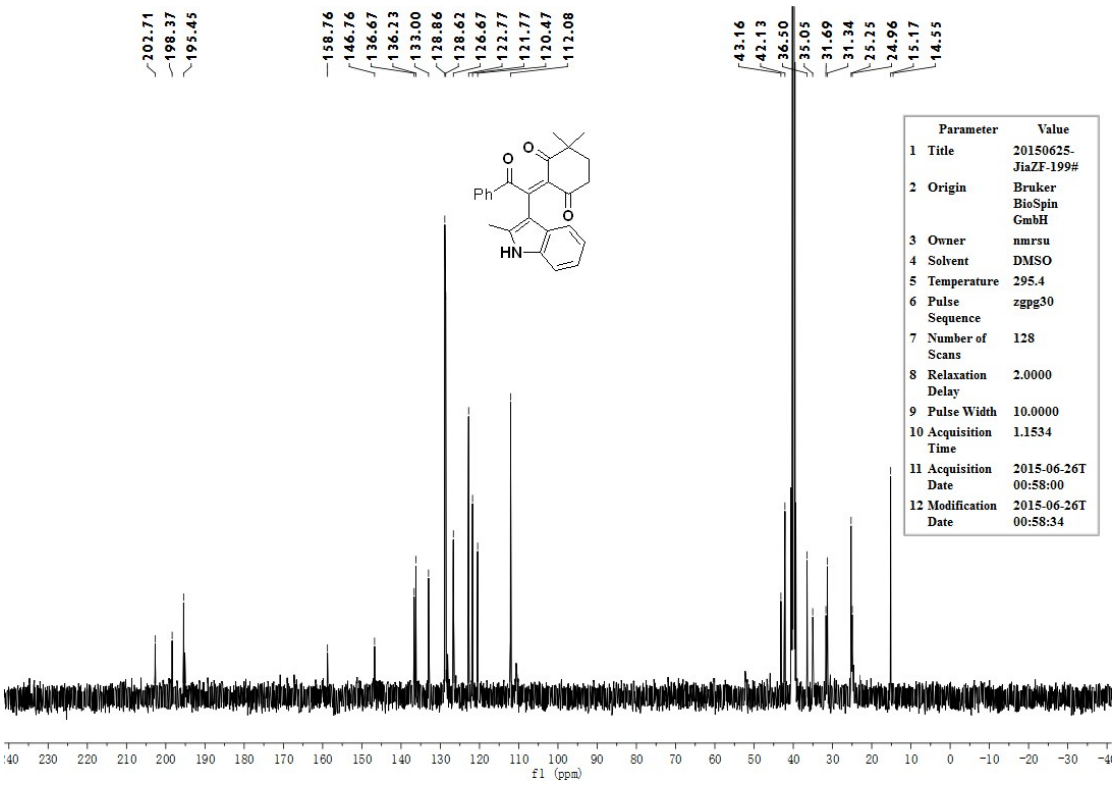


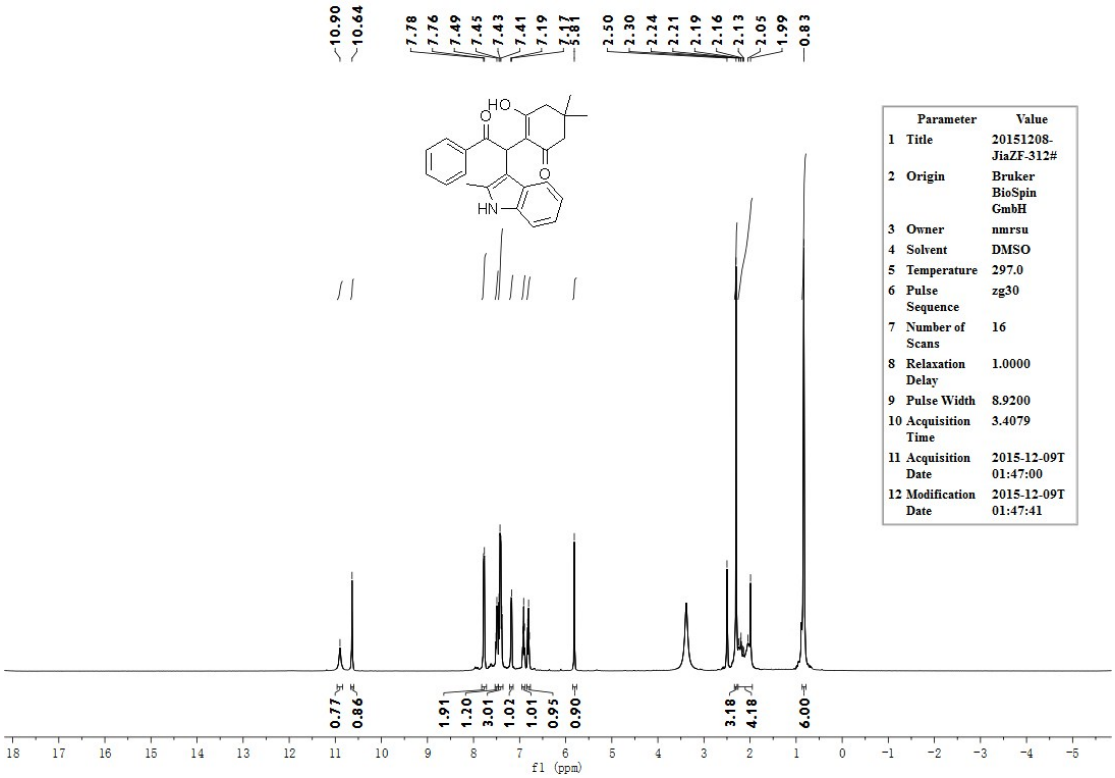
	Parameter	Value
1	Title	20150625-JiaZF-202#
2	Origin	Bruker BioSpin GmbH
3	Owner	nmrsu
4	Solvent	CDCl3
5	Temperature	295.5
6	Pulse Sequence	zgpg30
7	Number of Scans	256
8	Relaxation Delay	2.0000
9	Pulse Width	10.0000
10	Acquisition Time	1.1534
11	Acquisition Date	2015-06-26T 01:25:00
12	Modification Date	2015-06-26T 01:25:01


8.75
8.72
7.83
7.82
7.43
7.41
7.39
7.32
7.31
7.29
7.12
7.10
7.08
7.07
7.06
2.76
2.74
2.73
2.63
2.61
2.60
2.06
2.05
2.02
2.00
1.98
0.00
Ph
O
HN
0.80
1.76
1.00
2.77
2.98
1.90
1.96
5.03
2.13
f1 (ppm)
Parameter Value
1 Title 20150625-JiaZF-205#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent CDCl3
5 Temperature 295.4
6 Pulse Sequence zg30
7 Number of Scans 16
8 Relaxation Delay 1.0000
9 Pulse Width 8.9200
10 Acquisition Time 3.4079
11 Acquisition Date 2015-06-26T 02:06:00
12 Modification Date 2015-06-26T 02:06:04

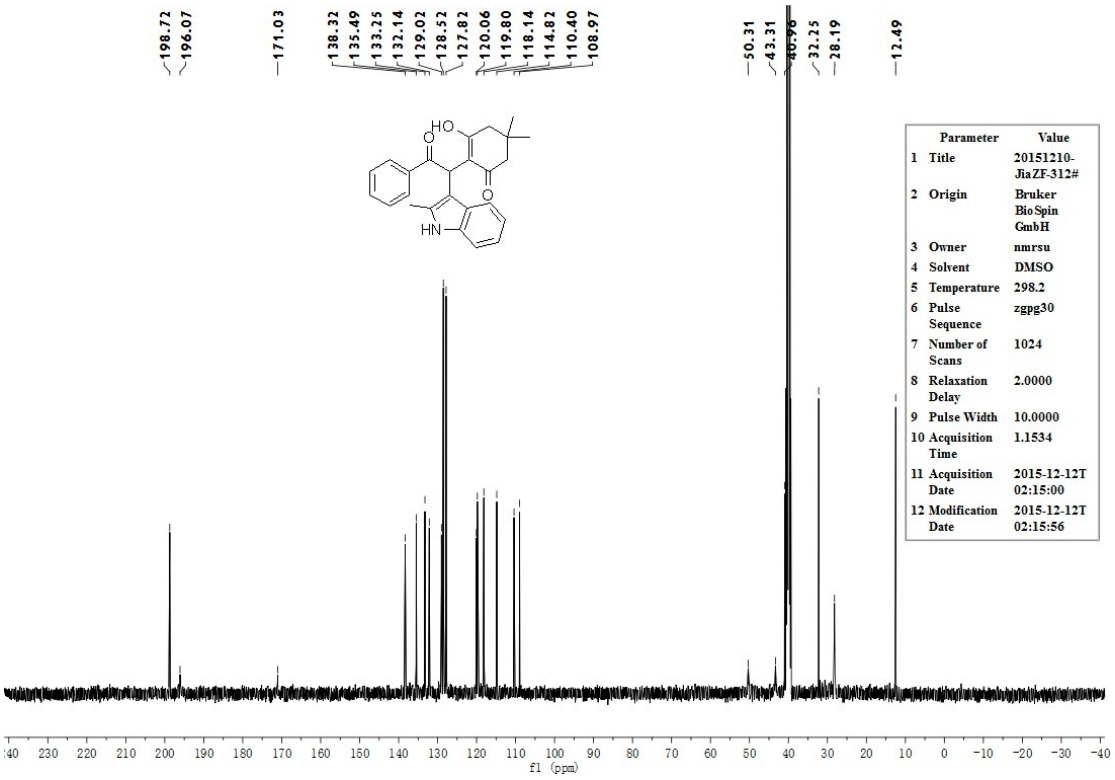

204.40
200.01
195.64
151.12
137.48
136.23
135.64
135.27
132.93
128.73
128.46
126.16
122.22
120.89
118.96
111.24
107.21
43.03
41.72
24.78
24.17
13.52
Ph
O
HN
f1 (ppm)
Parameter Value
1 Title 20150625-JiaZF-205#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent CDCl3
5 Temperature 295.6
6 Pulse Sequence zgpg30
7 Number of Scans 300
8 Relaxation Delay 2.0000
9 Pulse Width 10.0000
10 Acquisition Time 1.1534
11 Acquisition Date 2015-06-26T 02:04:00
12 Modification Date 2015-06-26T 02:04:12


12.21
7.65
7.63
7.48
7.46
7.44
7.38
7.37
7.35
7.33
7.32
7.30
7.28
7.21
7.08
7.06
7.04
7.00
6.98
6.97
2.67
2.61
2.57
2.50
2.33
2.32
2.30
1.91
1.89
1.87
1.23
1.19
1.18
1.17
1.15
1.06
Ph
O
O
O
HN
0.93
1.99
1.08
2.04
1.05
0.86
1.03
0.96
1.09
1.01
2.97
2.03
3.09
3.09
f1 (ppm)
Parameter Value
1 Title 20150623-JiaZF-188#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent DMSO
5 Temperature 295.2
6 Pulse Sequence zg30
7 Number of Scans 16
8 Relaxation Delay 1.0000
9 Pulse Width 8.9200
10 Acquisition Time 3.4079
11 Acquisition Date 2015-06-23T 18:00:00
12 Modification Date 2015-06-23T 18:00:11

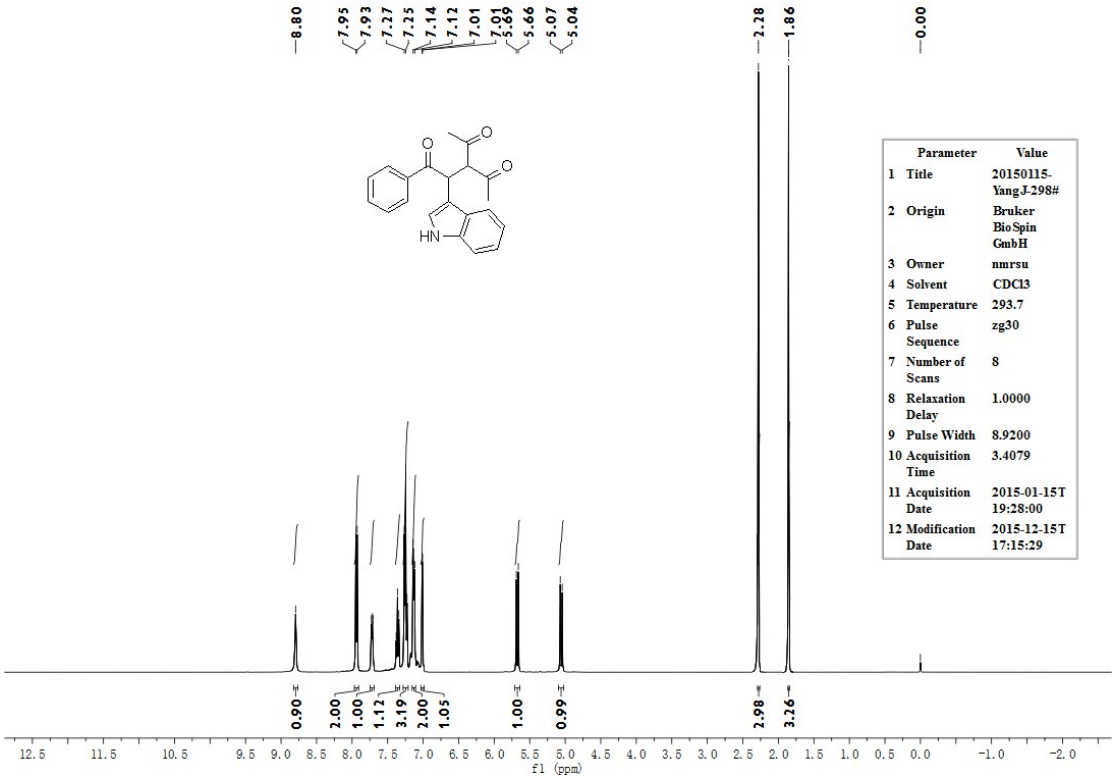

201.71
198.37
195.45
158.76
146.76
136.67
136.23
133.00
128.86
128.62
126.67
122.77
121.77
120.47
112.08
43.16
42.13
36.50
35.05
31.69
31.34
25.25
24.96
15.17
14.55
Ph
O
O
O
HN
f1 (ppm)
Parameter Value
1 Title 20150625-JiaZF-199#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent DMSO
5 Temperature 295.4
6 Pulse Sequence zgpg30
7 Number of Scans 128
8 Relaxation Delay 2.0000
9 Pulse Width 10.0000
10 Acquisition Time 1.1534
11 Acquisition Date 2015-06-26T 00:58:00
12 Modification Date 2015-06-26T 00:58:34



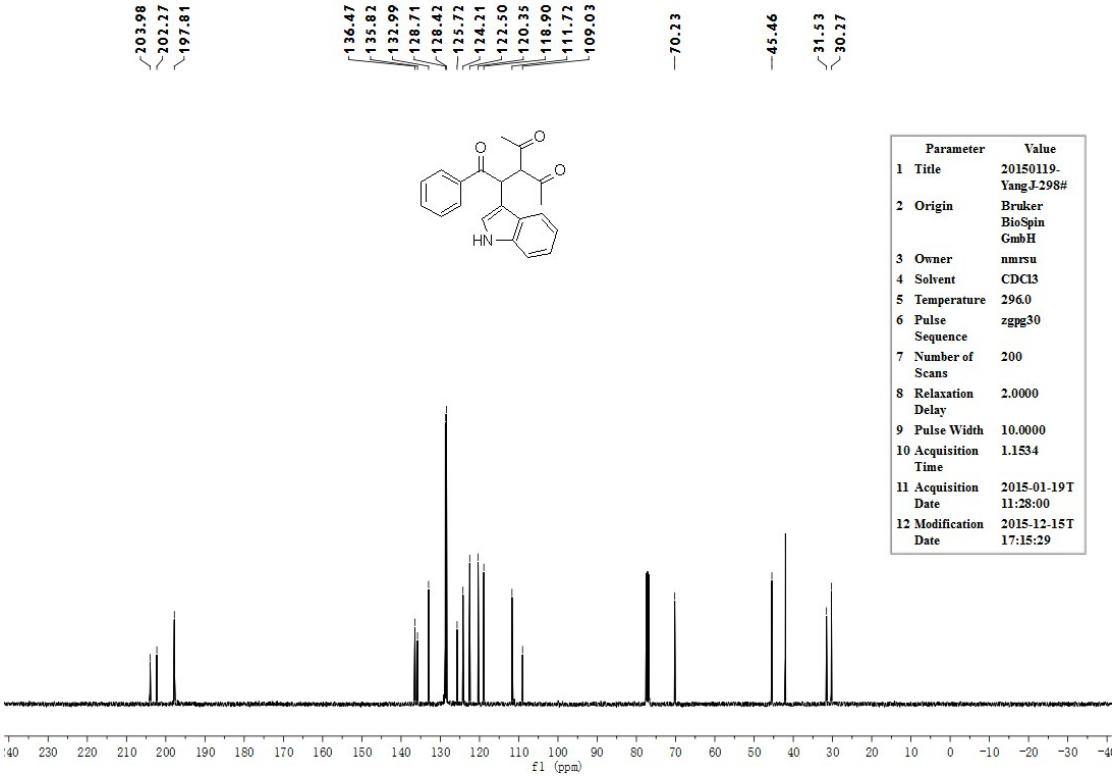
	Parameter	Value
1	Title	20151208-JiaZF-312#
2	Origin	Bruker BioSpin GmbH
3	Owner	nmrsu
4	Solvent	DMSO
5	Temperature	297.0
6	Pulse Sequence	zg30
7	Number of Scans	16
8	Relaxation Delay	1.0000
9	Pulse Width	8.9200
10	Acquisition Time	3.4079
11	Acquisition Date	2015-12-09T 01:47:00
12	Modification Date	2015-12-09T 01:47:41



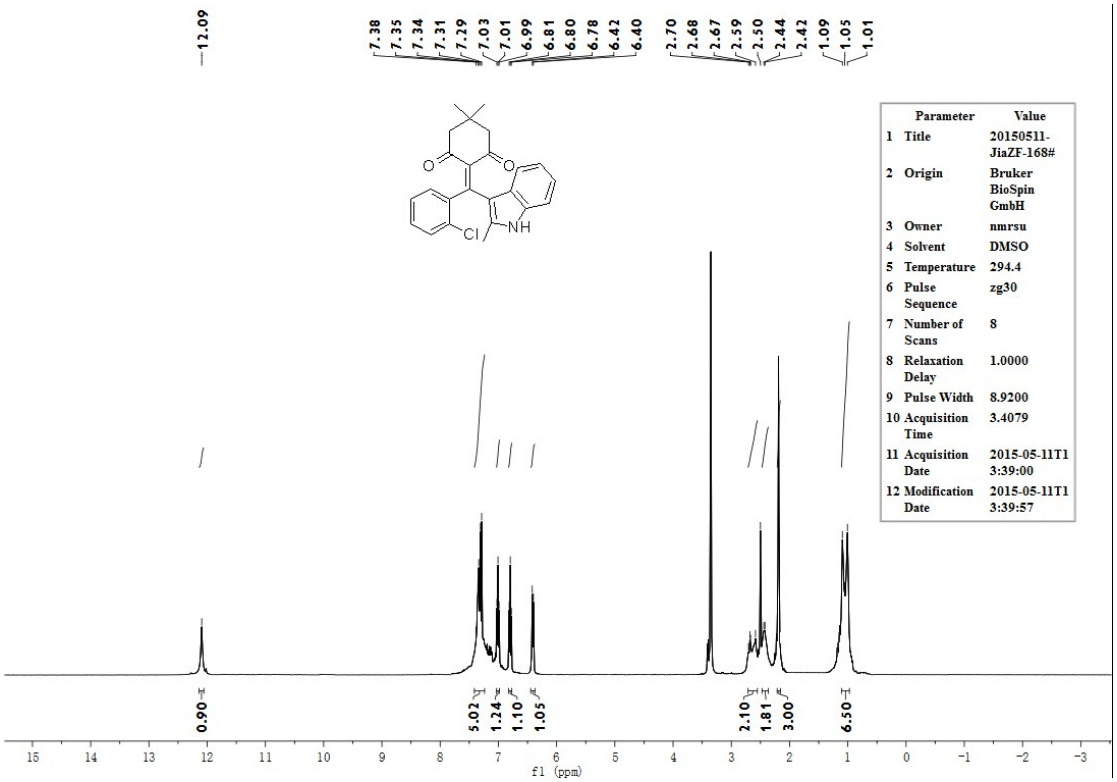
	Parameter	Value
1	Title	20151210-JiaZF-312#
2	Origin	Bruker BioSpin GmbH
3	Owner	nmrsu
4	Solvent	DMSO
5	Temperature	298.2
6	Pulse Sequence	zgpg30
7	Number of Scans	1024
8	Relaxation Delay	2.0000
9	Pulse Width	10.0000
10	Acquisition Time	1.1534
11	Acquisition Date	2015-12-12T 02:15:00
12	Modification Date	2015-12-12T 02:15:56

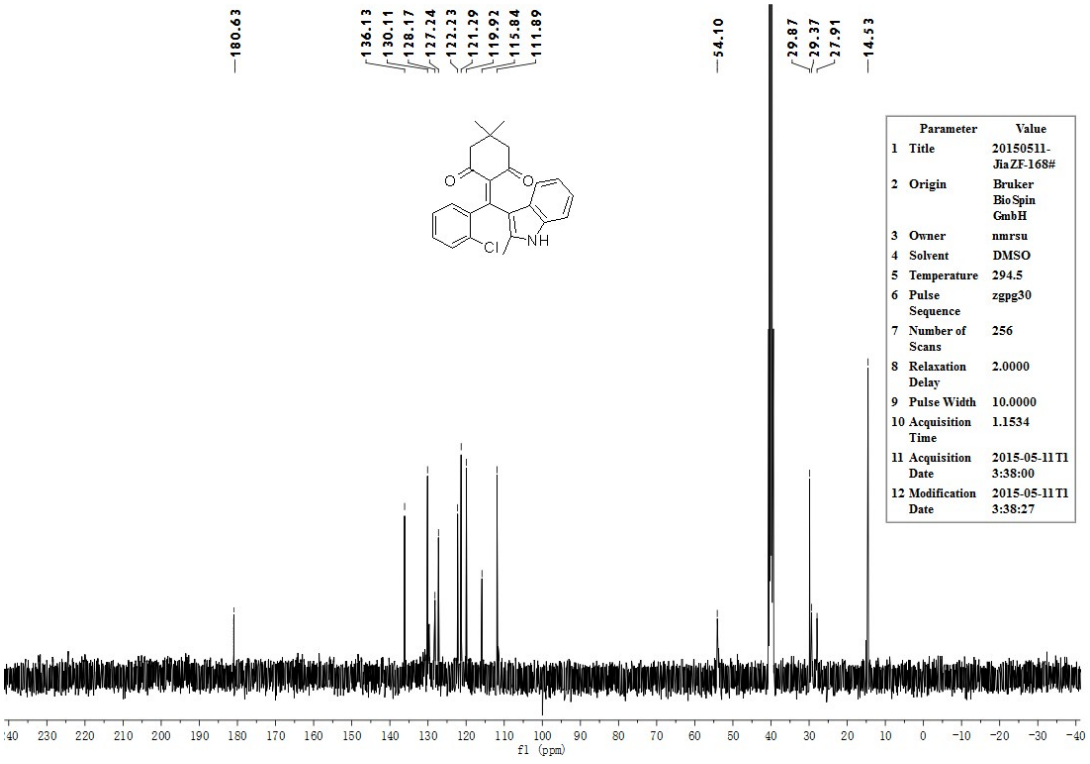


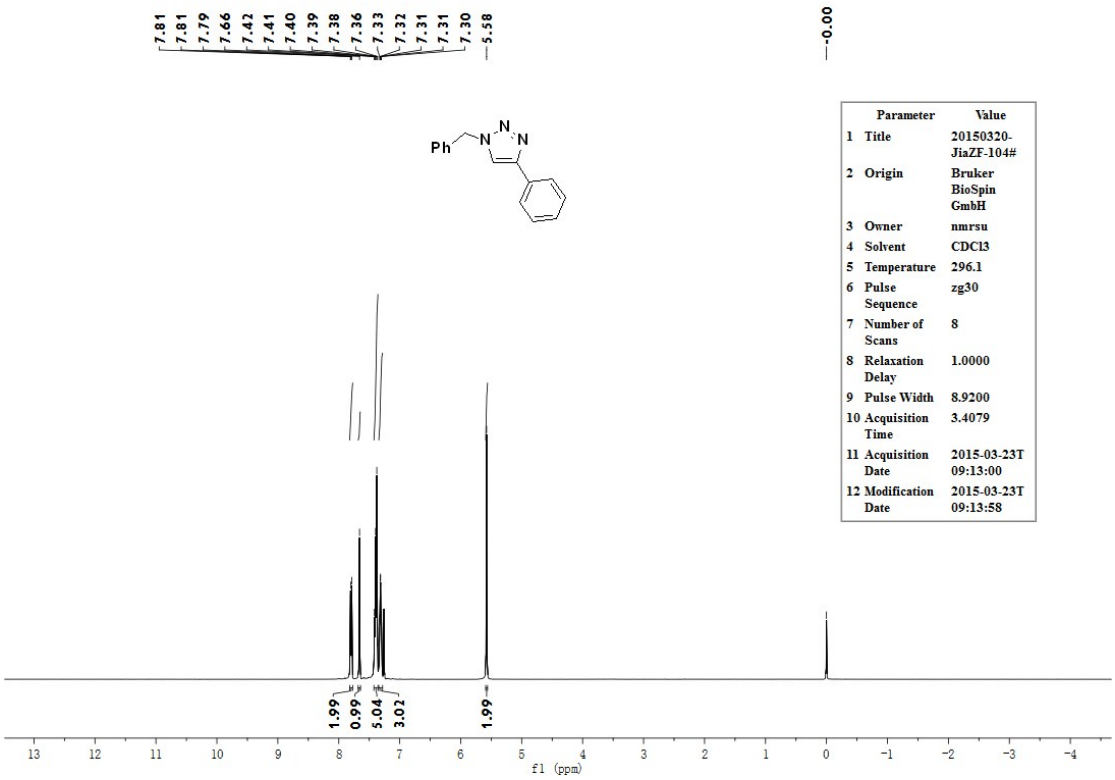
	Parameter	Value
1	Title	20150115-YangJ-298#
2	Origin	Bruker BioSpin GmbH
3	Owner	nmrsu
4	Solvent	CDCl3
5	Temperature	293.7
6	Pulse Sequence	zg30
7	Number of Scans	8
8	Relaxation Delay	1.0000
9	Pulse Width	8.9200
10	Acquisition Time	3.4079
11	Acquisition Date	2015-01-15T 19:28:00
12	Modification Date	2015-12-15T 17:15:29



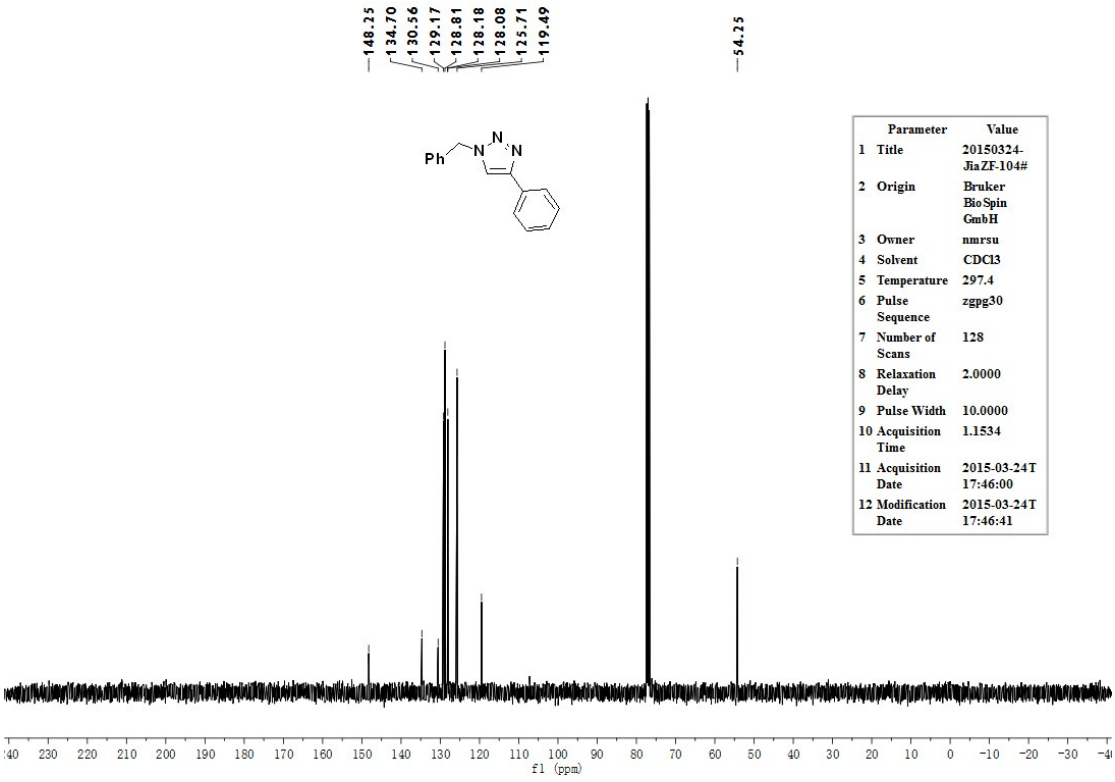
	Parameter	Value
1	Title	20150119-YangJ-298#
2	Origin	Bruker BioSpin GmbH
3	Owner	nmrsu
4	Solvent	CDCl3
5	Temperature	296.0
6	Pulse Sequence	zgpg30
7	Number of Scans	200
8	Relaxation Delay	2.0000
9	Pulse Width	10.0000
10	Acquisition Time	1.1534
11	Acquisition Date	2015-01-19T 11:28:00
12	Modification Date	2015-12-15T 17:15:29


12.09
7.38
7.35
7.34
7.31
7.29
7.03
7.01
6.99
6.81
6.80
6.78
6.42
6.40
2.70
2.68
2.67
2.59
2.50
2.44
2.42
1.09
1.05
1.01
O
O
Cl
NH
Parameter Value
1 Title 20150511-JiaZF-168#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent DMSO
5 Temperature 294.4
6 Pulse Sequence zg30
7 Number of Scans 8
8 Relaxation Delay 1.0000
9 Pulse Width 8.9200
10 Acquisition Time 3.4079
11 Acquisition Date 2015-05-11T13:39:00
12 Modification Date 2015-05-11T13:39:57
0.90
5.02
1.24
1.10
1.05
2.10
1.81
3.00
6.50
f1 (ppm)

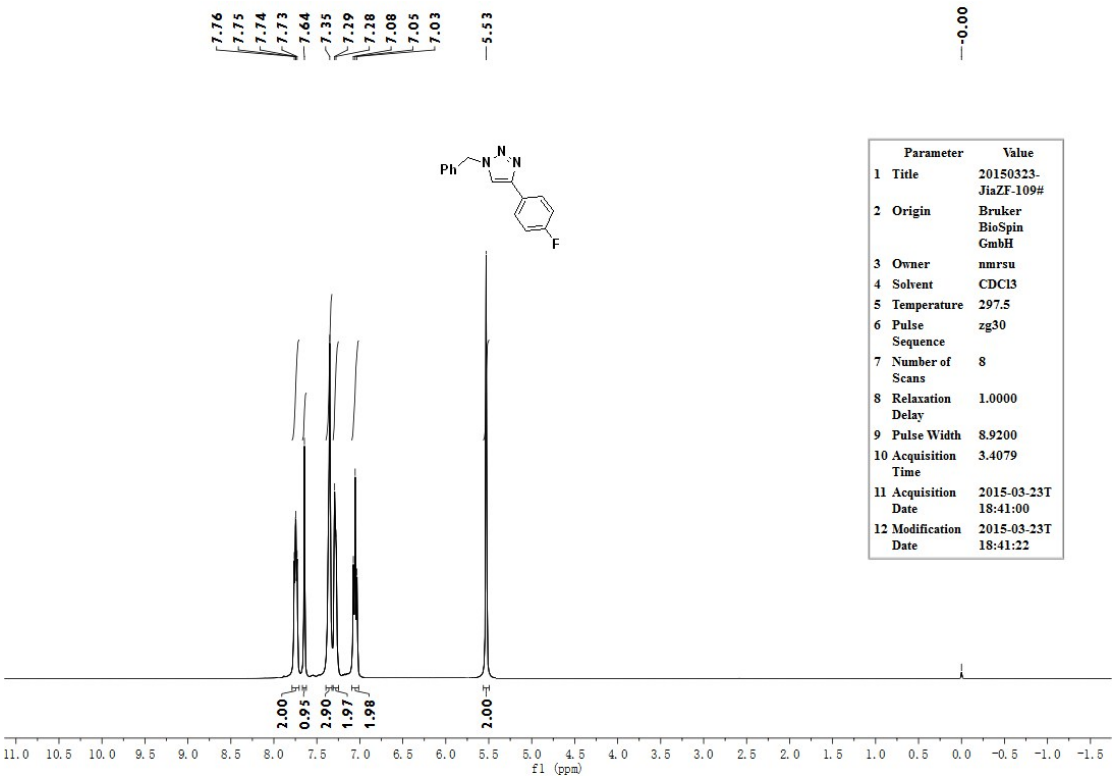

180.63
136.13
130.11
128.17
127.24
122.23
121.29
119.92
115.84
111.89
54.10
29.87
29.37
27.91
14.53
O
O
Cl
NH
Parameter Value
1 Title 20150511-JiaZF-168#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent DMSO
5 Temperature 294.5
6 Pulse Sequence zgpg30
7 Number of Scans 256
8 Relaxation Delay 2.0000
9 Pulse Width 10.0000
10 Acquisition Time 1.1534
11 Acquisition Date 2015-05-11T13:38:00
12 Modification Date 2015-05-11T13:38:27
f1 (ppm)



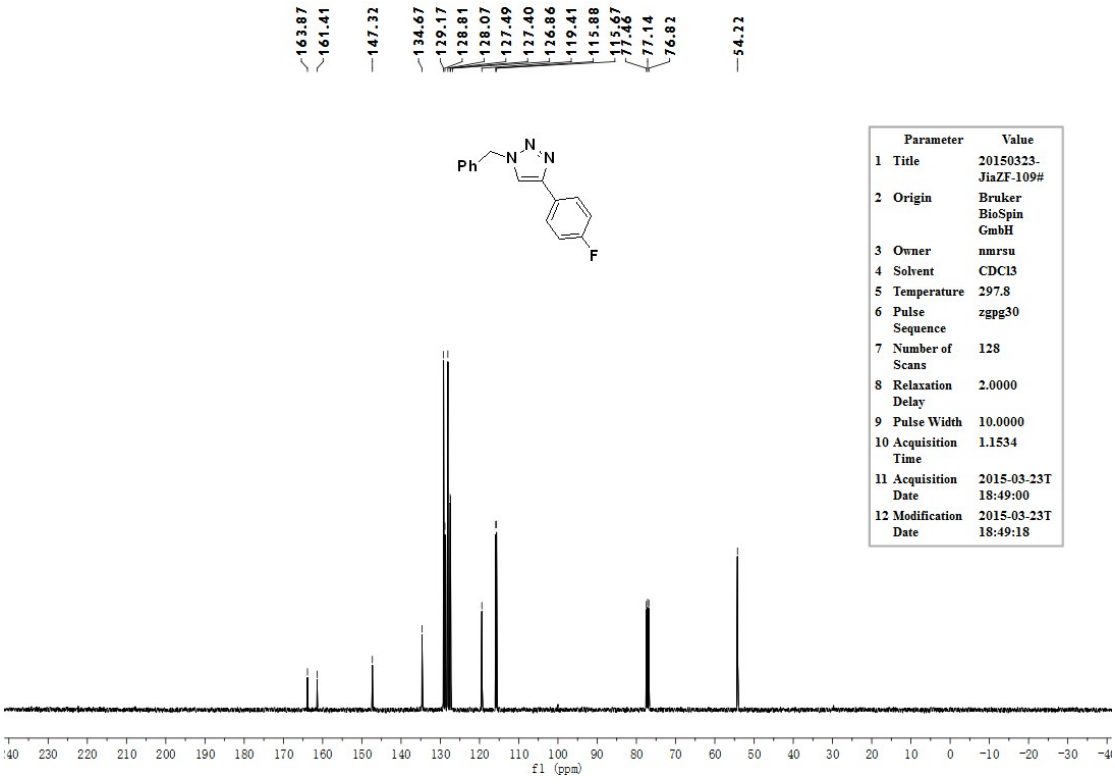
	Parameter	Value
1	Title	20150320-JiaZF-104#
2	Origin	Bruker BioSpin GmbH
3	Owner	nmrsu
4	Solvent	CDCl3
5	Temperature	296.1
6	Pulse Sequence	zg30
7	Number of Scans	8
8	Relaxation Delay	1.0000
9	Pulse Width	8.9200
10	Acquisition Time	3.4079
11	Acquisition Date	2015-03-23T 09:13:00
12	Modification Date	2015-03-23T 09:13:58



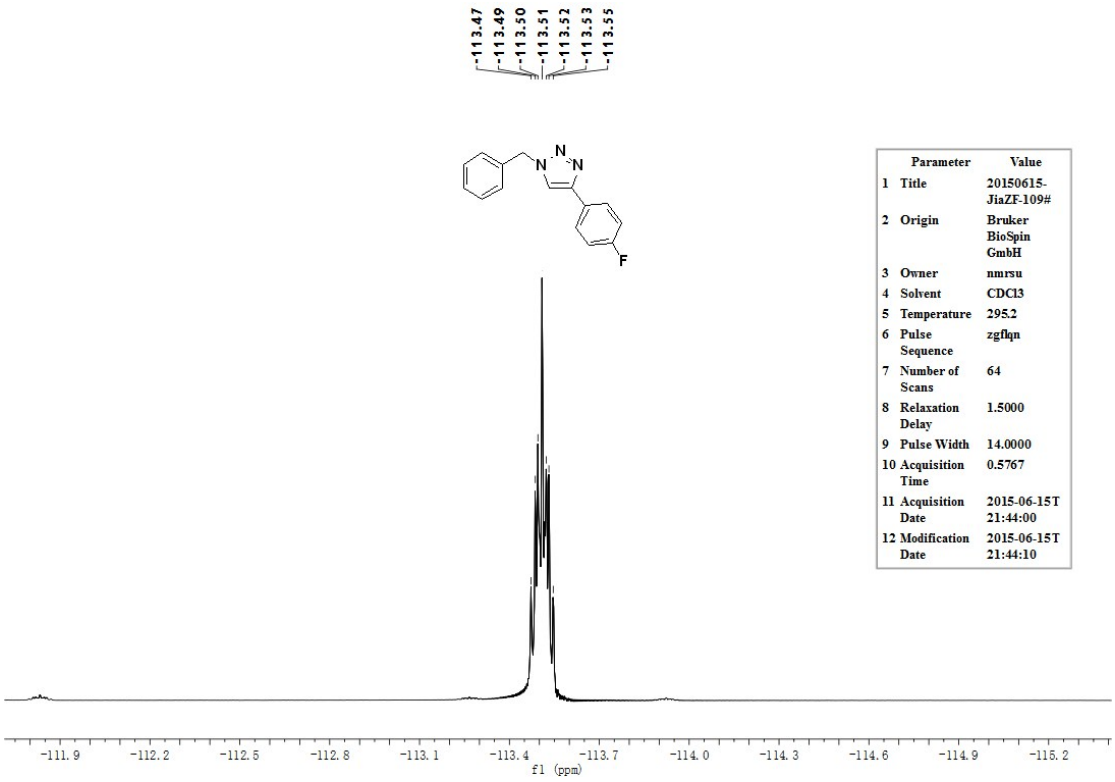
	Parameter	Value
1	Title	20150324-JiaZF-104#
2	Origin	Bruker BioSpin GmbH
3	Owner	nmrsu
4	Solvent	CDCl3
5	Temperature	297.4
6	Pulse Sequence	zgpg30
7	Number of Scans	128
8	Relaxation Delay	2.0000
9	Pulse Width	10.0000
10	Acquisition Time	1.1534
11	Acquisition Date	2015-03-24T 17:46:00
12	Modification Date	2015-03-24T 17:46:41

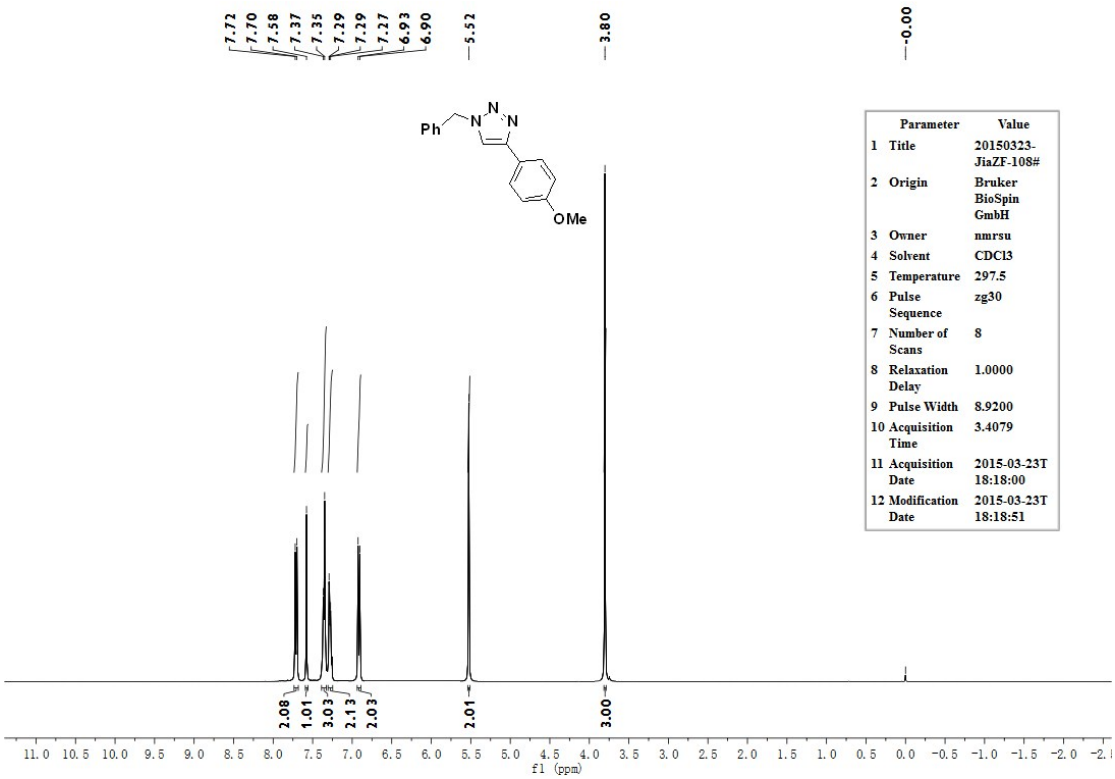


	Parameter	Value
1	Title	20150323-JiaZF-109#
2	Origin	Bruker BioSpin GmbH
3	Owner	nmrsu
4	Solvent	CDCl3
5	Temperature	297.5
6	Pulse Sequence	zg30
7	Number of Scans	8
8	Relaxation Delay	1.0000
9	Pulse Width	8.9200
10	Acquisition Time	3.4079
11	Acquisition Date	2015-03-23T 18:41:00
12	Modification Date	2015-03-23T 18:41:22

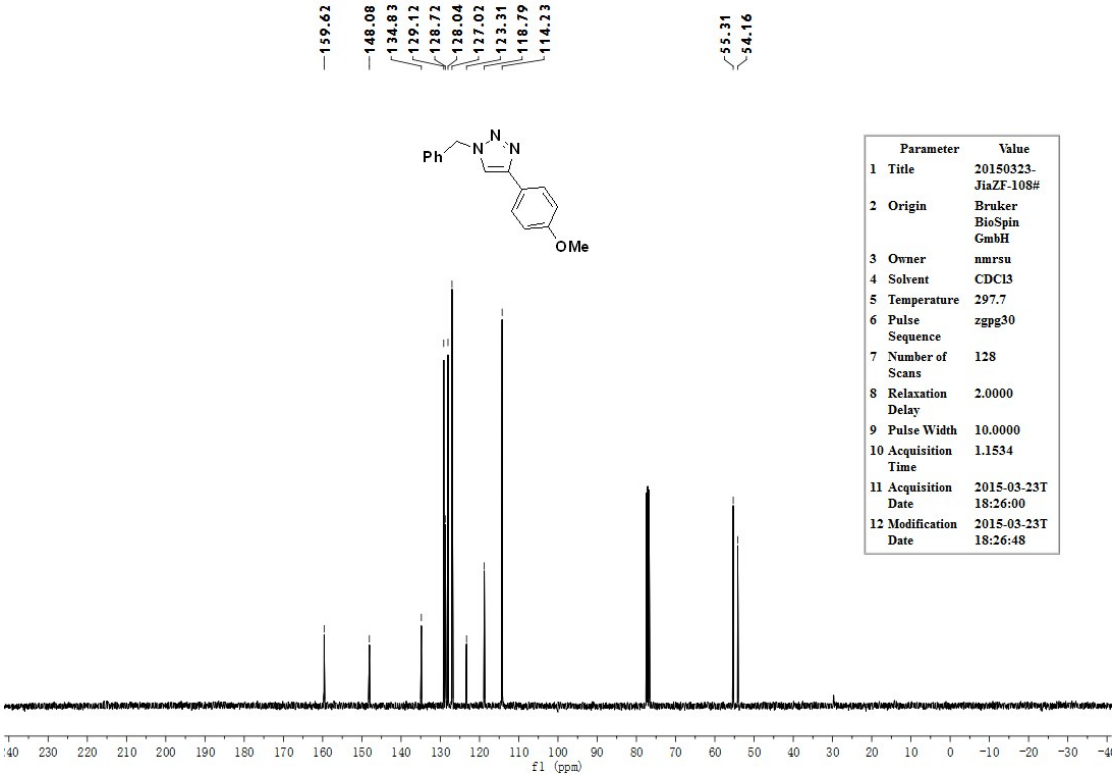


	Parameter	Value
1	Title	20150323-JiaZF-109#
2	Origin	Bruker BioSpin GmbH
3	Owner	nmrsu
4	Solvent	CDCl3
5	Temperature	297.8
6	Pulse Sequence	zgpg30
7	Number of Scans	128
8	Relaxation Delay	2.0000
9	Pulse Width	10.0000
10	Acquisition Time	1.1534
11	Acquisition Date	2015-03-23T 18:49:00
12	Modification Date	2015-03-23T 18:49:18

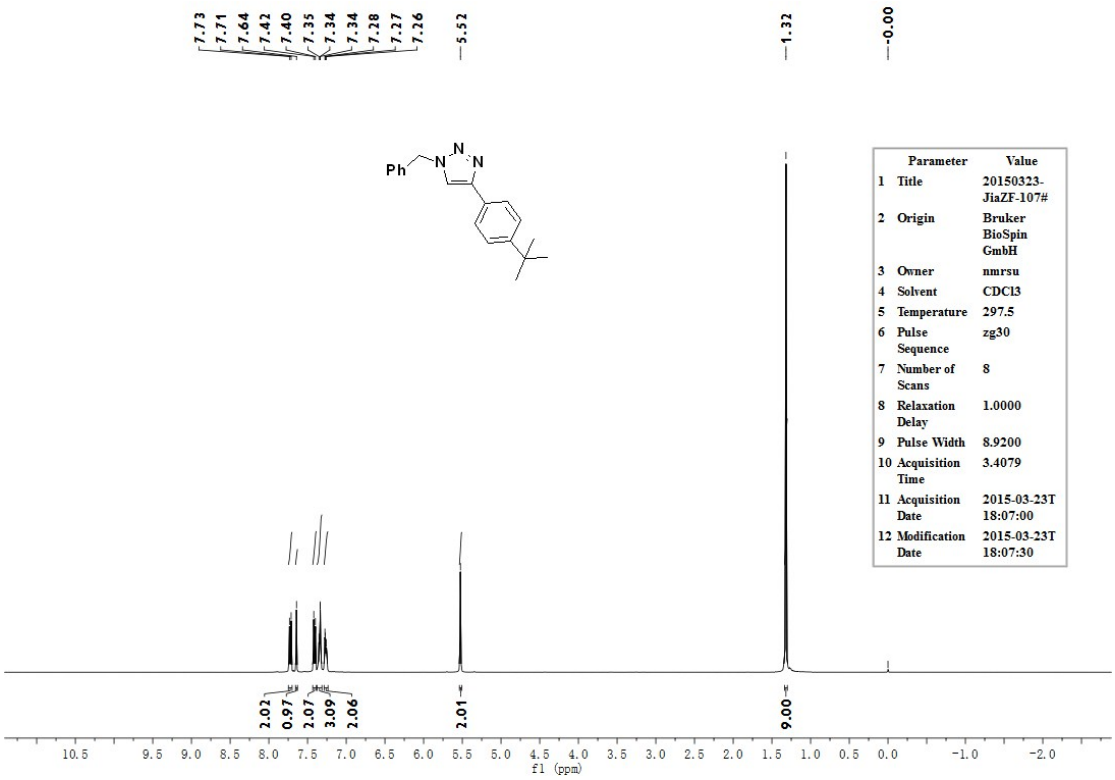

-113.47
-113.49
-113.50
-113.51
-113.52
-113.53
-113.55
N
N
N
F
Parameter Value
1 Title 20150615-JiaZF-109#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent CDCl3
5 Temperature 295.2
6 Pulse Sequence zgflqn
7 Number of Scans 64
8 Relaxation Delay 1.5000
9 Pulse Width 14.0000
10 Acquisition Time 0.5767
11 Acquisition Date 2015-06-15T 21:44:00
12 Modification Date 2015-06-15T 21:44:10
-111.9
-112.2
-112.5
-112.8
-113.1
-113.4
-113.7
-114.0
-114.3
-114.6
-114.9
-115.2
f1 (ppm)

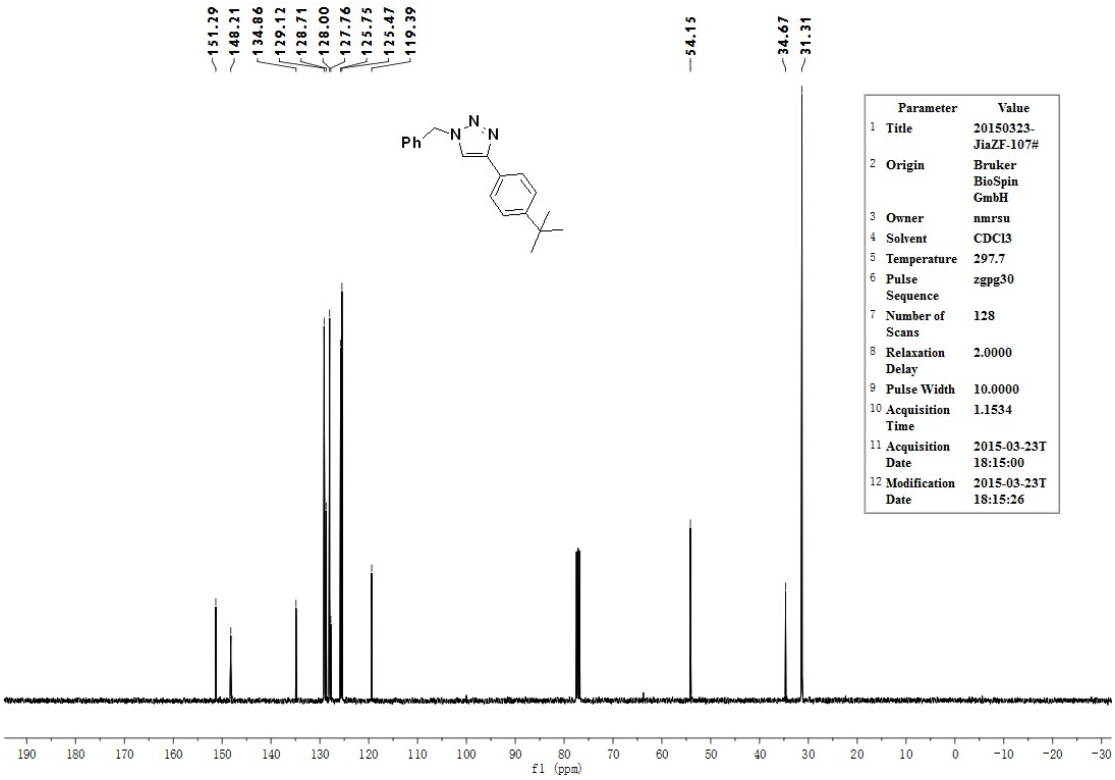


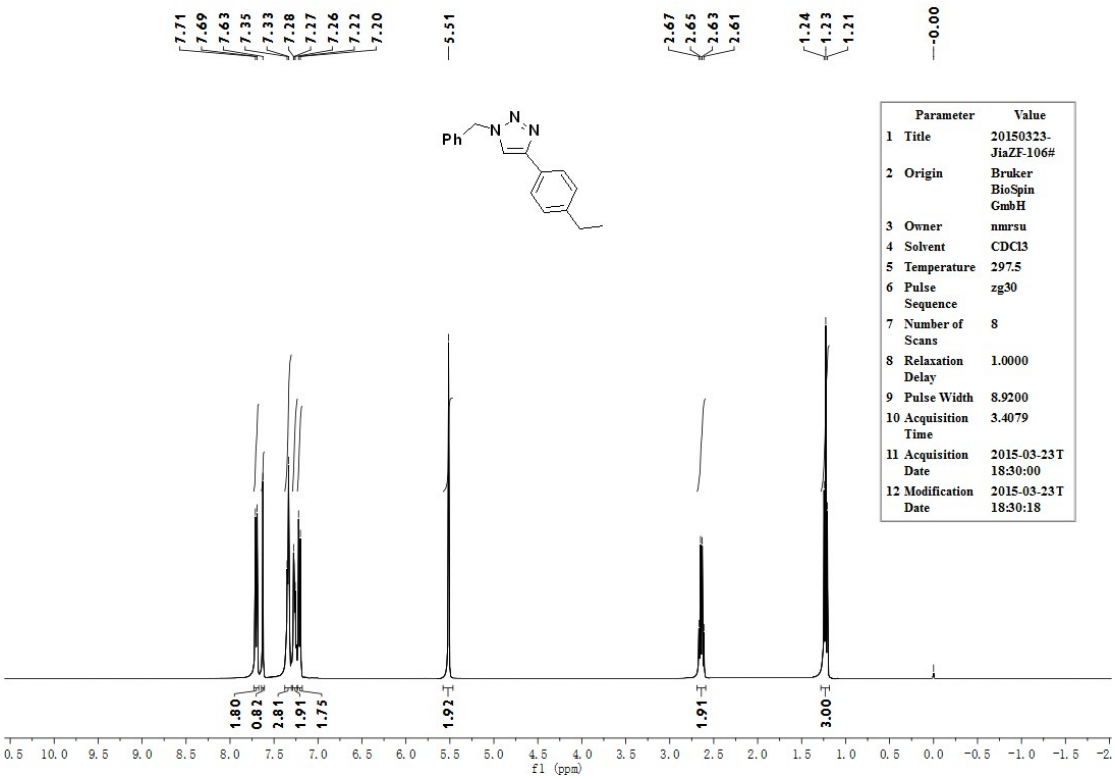
	Parameter	Value
1	Title	20150323-JiaZF-108#
2	Origin	Bruker BioSpin GmbH
3	Owner	nmrsu
4	Solvent	CDCl3
5	Temperature	297.5
6	Pulse Sequence	zg30
7	Number of Scans	8
8	Relaxation Delay	1.0000
9	Pulse Width	8.9200
10	Acquisition Time	3.4079
11	Acquisition Date	2015-03-23T 18:18:00
12	Modification Date	2015-03-23T 18:18:51

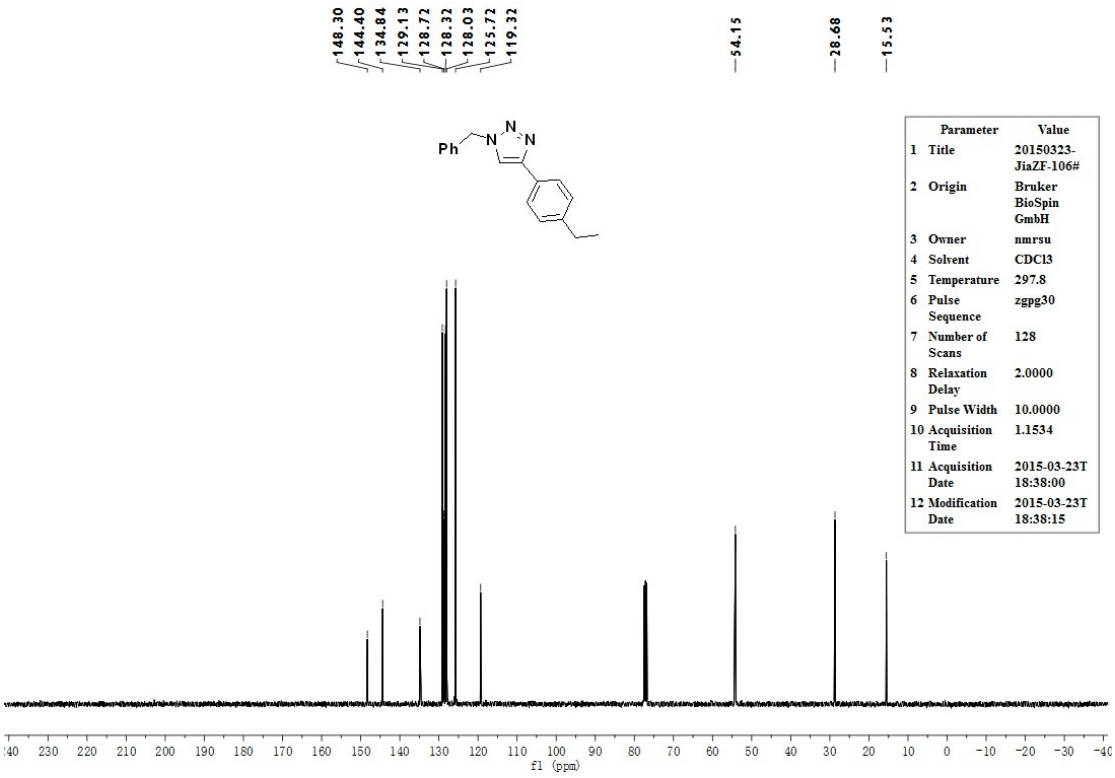


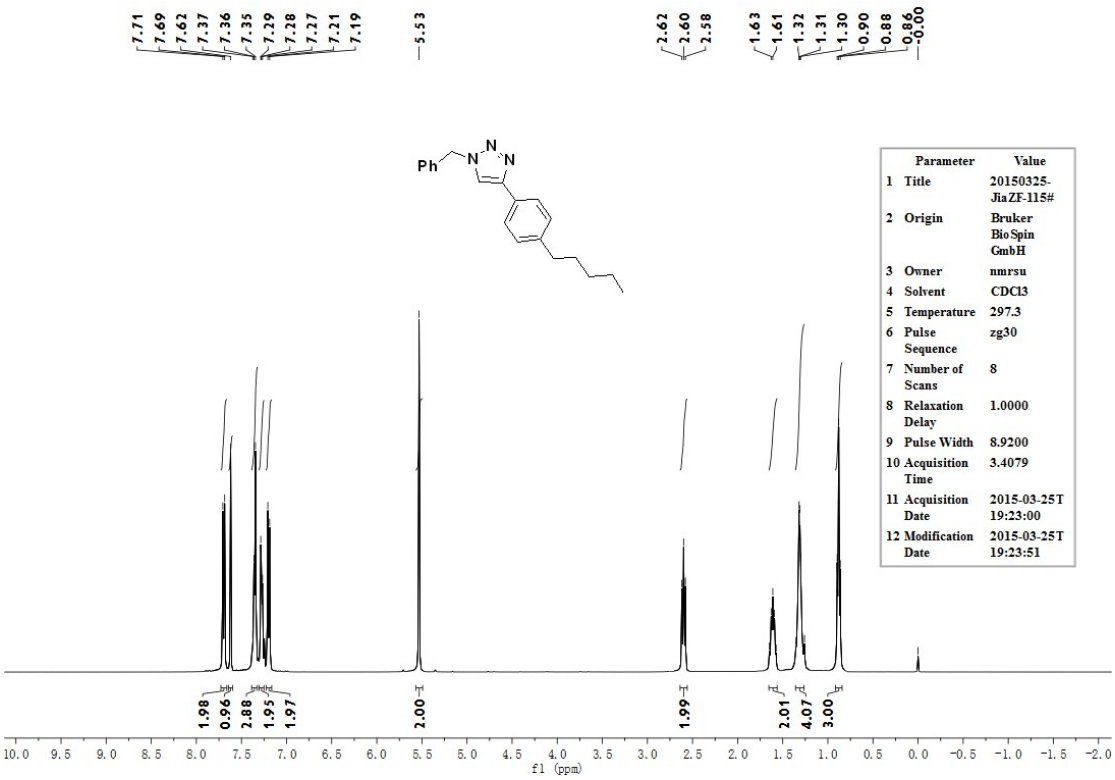
	Parameter	Value
1	Title	20150323-JiaZF-108#
2	Origin	Bruker BioSpin GmbH
3	Owner	nmrsu
4	Solvent	CDCl3
5	Temperature	297.7
6	Pulse Sequence	zgpg30
7	Number of Scans	128
8	Relaxation Delay	2.0000
9	Pulse Width	10.0000
10	Acquisition Time	1.1534
11	Acquisition Date	2015-03-23T 18:26:00
12	Modification Date	2015-03-23T 18:26:48

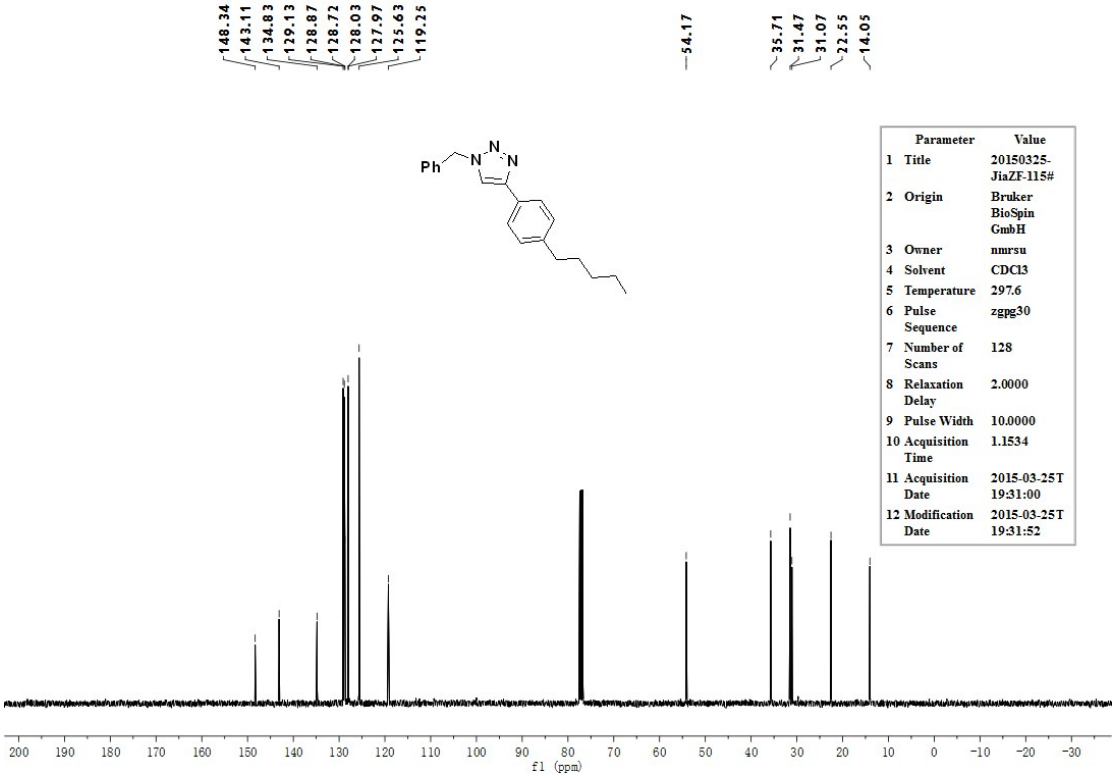

7.73
7.71
7.64
7.42
7.40
7.35
7.34
7.34
7.28
7.27
7.26
5.52
1.32
0.00
Ph
N
N
N
Parameter Value
1 Title 20150323-JiaZF-107#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent CDCl3
5 Temperature 297.5
6 Pulse Sequence zg30
7 Number of Scans 8
8 Relaxation Delay 1.0000
9 Pulse Width 8.9200
10 Acquisition Time 3.4079
11 Acquisition Date 2015-03-23T 18:07:00
12 Modification Date 2015-03-23T 18:07:30
2.02
0.97
2.07
3.09
2.06
2.01
9.00
f1 (ppm)

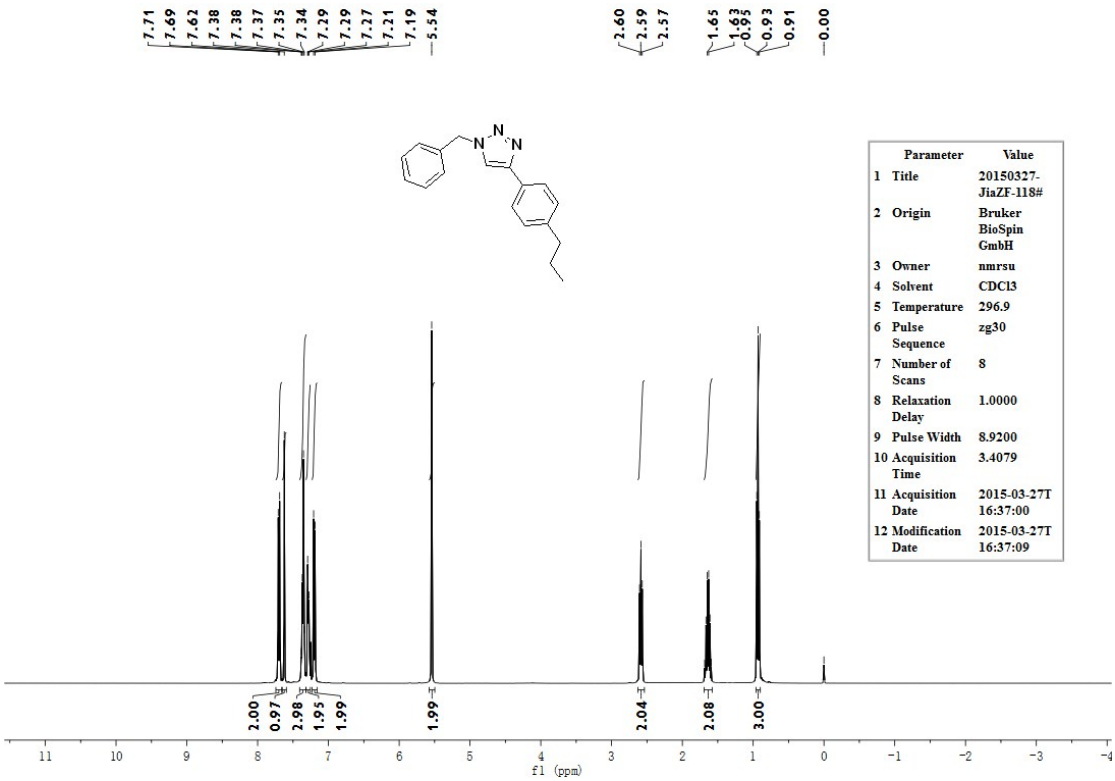

151.29
148.21
134.86
129.12
128.71
128.00
127.76
125.75
125.47
119.39
54.15
34.67
31.31
Ph
N
N
N
Parameter Value
1 Title 20150323-JiaZF-107#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent CDCl3
5 Temperature 297.7
6 Pulse Sequence zgpg30
7 Number of Scans 128
8 Relaxation Delay 2.0000
9 Pulse Width 10.0000
10 Acquisition Time 1.1534
11 Acquisition Date 2015-03-23T 18:15:00
12 Modification Date 2015-03-23T 18:15:26
f1 (ppm)

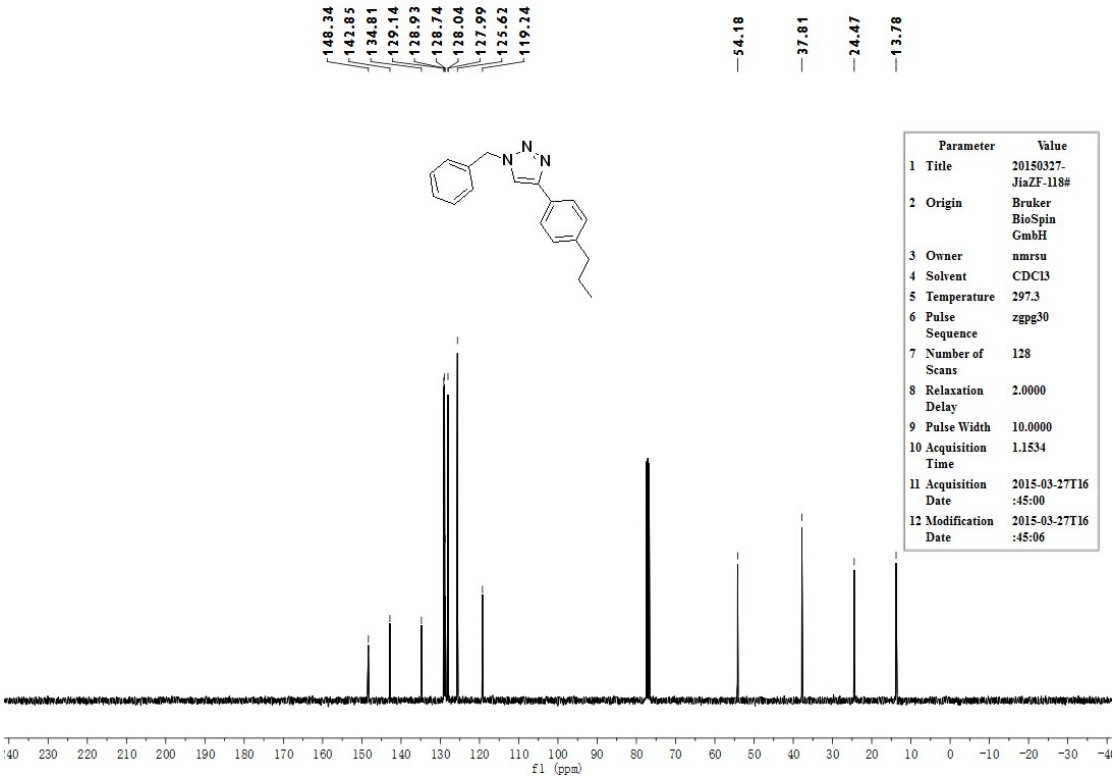

7.71
7.69
7.63
7.35
7.33
7.28
7.27
7.26
7.22
7.20
5.51
2.67
2.65
2.63
2.61
1.24
1.23
1.21
0.00
Ph
Parameter Value
1 Title 20150323-JiaZF-106#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent CDCl3
5 Temperature 297.5
6 Pulse Sequence zg30
7 Number of Scans 8
8 Relaxation Delay 1.0000
9 Pulse Width 8.9200
10 Acquisition Time 3.4079
11 Acquisition Date 2015-03-23T 18:30:00
12 Modification Date 2015-03-23T 18:30:18
1.80
0.82
2.81
1.91
1.75
1.92
1.91
3.00
f1 (ppm)

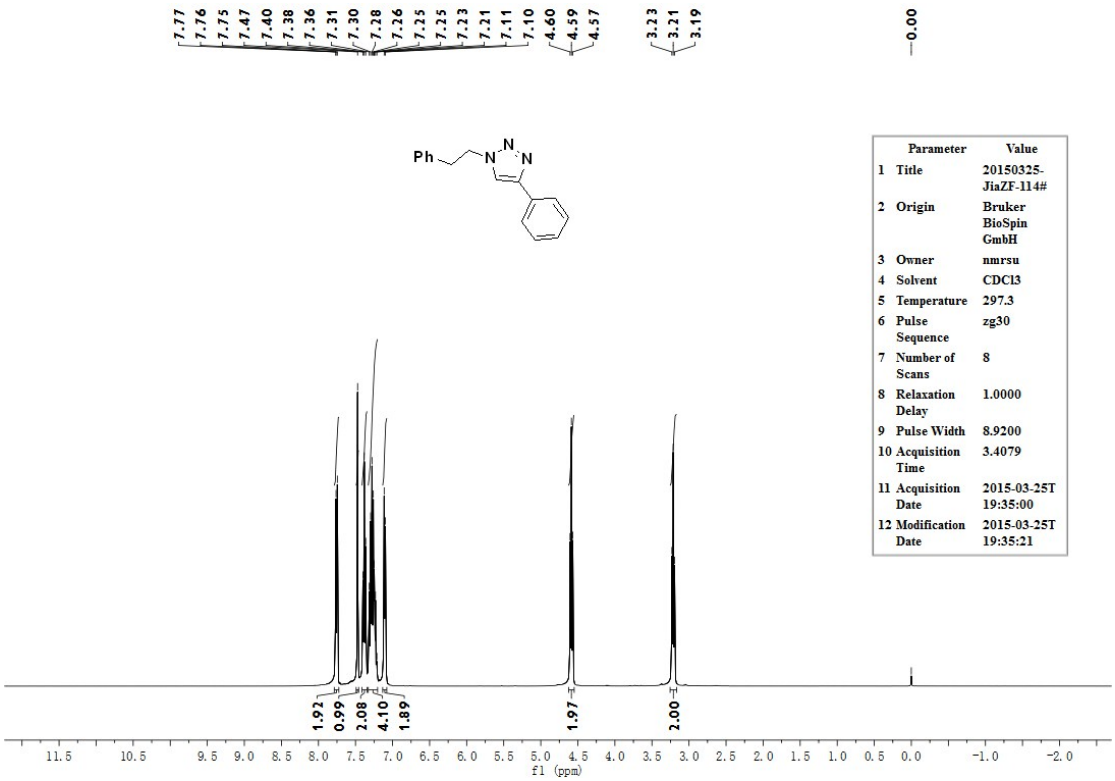

148.30
144.40
134.84
129.13
128.72
128.32
128.03
125.72
119.32
54.15
28.68
15.53
Ph
Parameter Value
1 Title 20150323-JiaZF-106#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent CDCl3
5 Temperature 297.8
6 Pulse Sequence zgpg30
7 Number of Scans 128
8 Relaxation Delay 2.0000
9 Pulse Width 10.0000
10 Acquisition Time 1.1534
11 Acquisition Date 2015-03-23T 18:38:00
12 Modification Date 2015-03-23T 18:38:15
f1 (ppm)

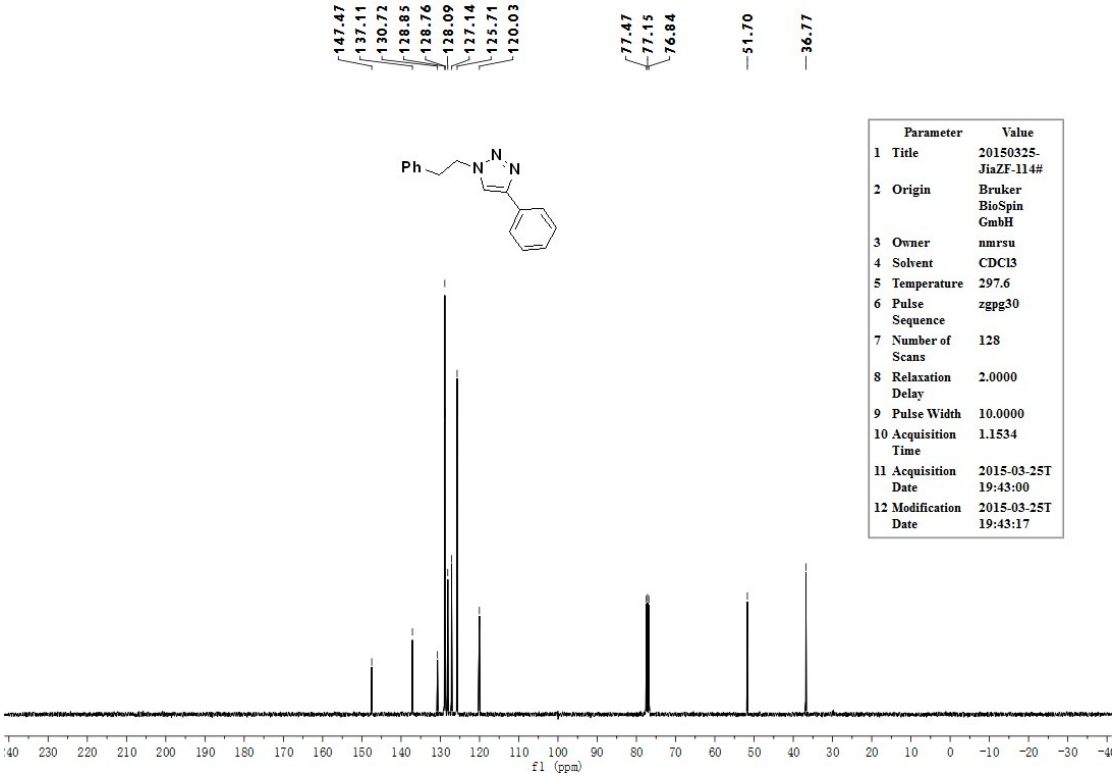

7.71
7.69
7.62
7.37
7.36
7.35
7.29
7.28
7.27
7.21
7.19
5.53
2.62
2.60
2.58
1.63
1.61
1.32
1.31
1.30
0.90
0.88
0.86
-0.00
Ph
Parameter Value
1 Title 20150325-JiaZF-115#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent CDCl3
5 Temperature 297.3
6 Pulse Sequence zg30
7 Number of Scans 8
8 Relaxation Delay 1.0000
9 Pulse Width 8.9200
10 Acquisition Time 3.4079
11 Acquisition Date 2015-03-25T 19:23:00
12 Modification Date 2015-03-25T 19:23:51
1.98
0.96
2.88
1.95
1.97
2.00
1.99
2.01
4.07
3.00
f1 (ppm)

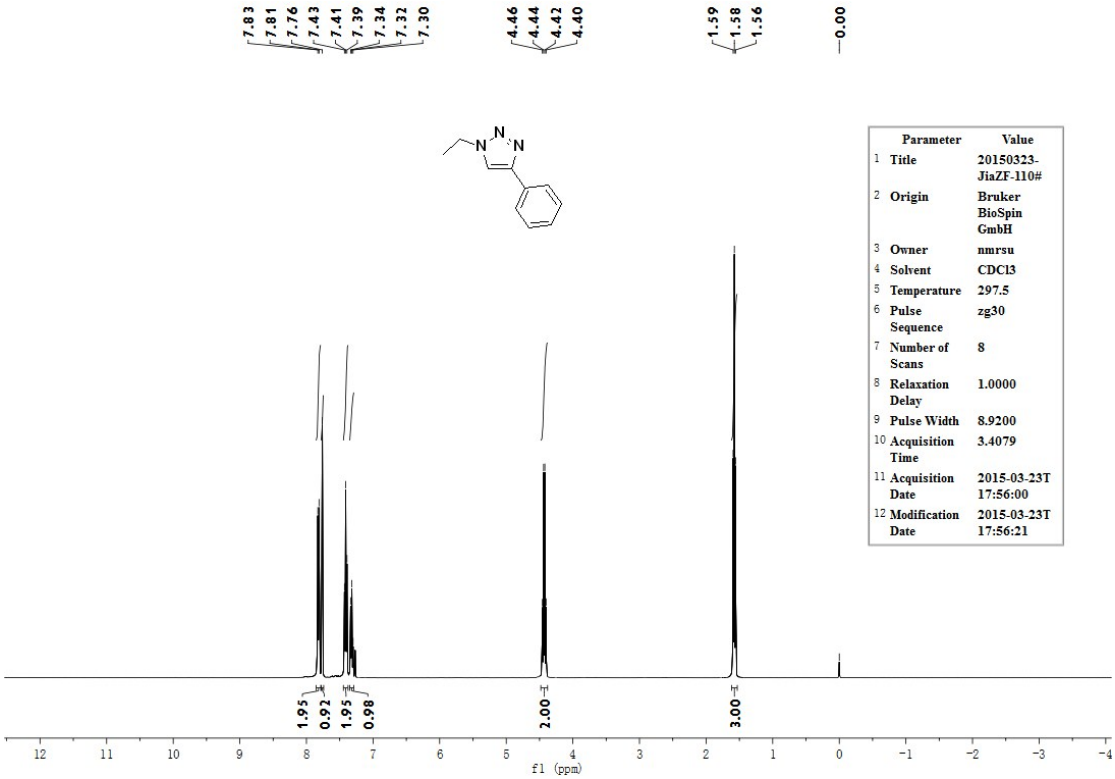

148.34
143.11
134.83
129.13
128.87
128.72
128.03
127.97
125.63
119.25
54.17
35.71
31.47
31.07
22.55
14.05
Ph
Parameter Value
1 Title 20150325-JiaZF-115#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent CDCl3
5 Temperature 297.6
6 Pulse Sequence zgpg30
7 Number of Scans 128
8 Relaxation Delay 2.0000
9 Pulse Width 10.0000
10 Acquisition Time 1.1534
11 Acquisition Date 2015-03-25T 19:31:00
12 Modification Date 2015-03-25T 19:31:52
f1 (ppm)


7.71
7.69
7.62
7.38
7.38
7.37
7.35
7.34
7.29
7.29
7.27
7.21
7.19
5.54
2.60
2.59
2.57
1.65
1.63
0.95
0.93
0.91
0.00
Parameter Value
1 Title 20150327-JiaZF-118#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent CDCl3
5 Temperature 296.9
6 Pulse Sequence zg30
7 Number of Scans 8
8 Relaxation Delay 1.0000
9 Pulse Width 8.9200
10 Acquisition Time 3.4079
11 Acquisition Date 2015-03-27T16:37:00
12 Modification Date 2015-03-27T16:37:09
2.00
0.97
2.98
1.95
1.99
1.99
2.04
2.08
3.00
f1 (ppm)

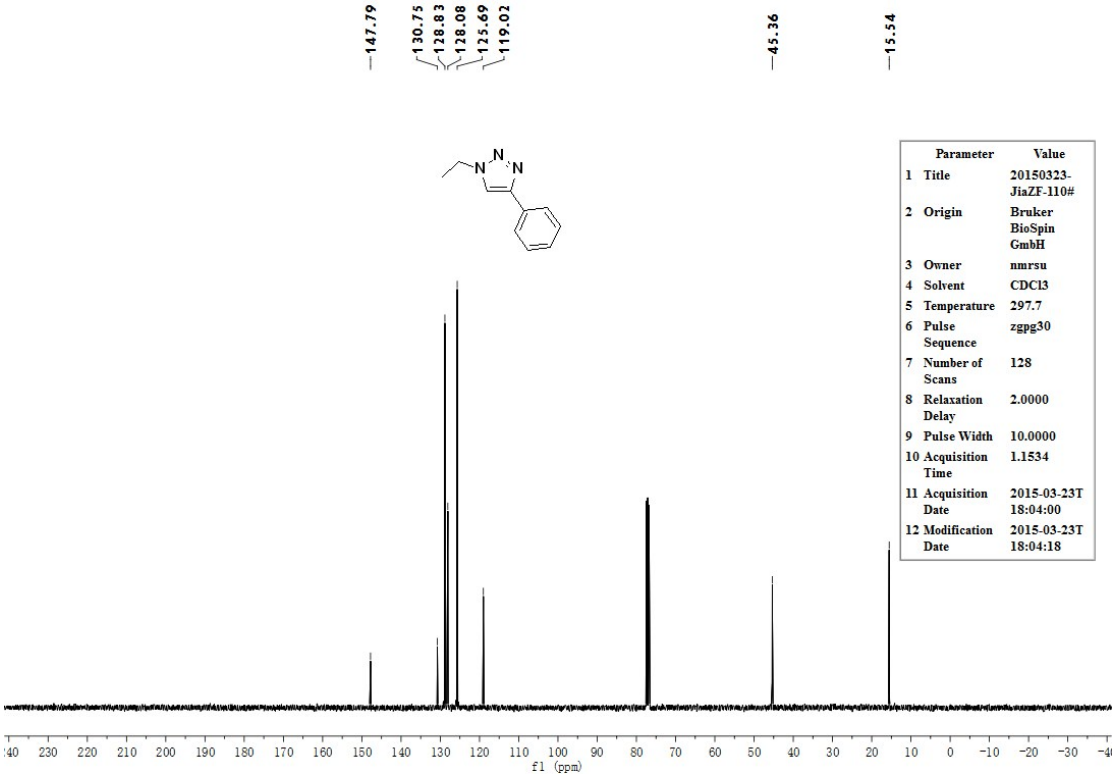

148.34
142.85
134.81
129.14
128.93
128.74
128.04
127.99
125.62
119.24
54.18
37.81
24.47
13.78
Parameter Value
1 Title 20150327-JiaZF-118#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent CDCl3
5 Temperature 297.3
6 Pulse Sequence zgpg30
7 Number of Scans 128
8 Relaxation Delay 2.0000
9 Pulse Width 10.0000
10 Acquisition Time 1.1534
11 Acquisition Date 2015-03-27T16:45:00
12 Modification Date 2015-03-27T16:45:06
f1 (ppm)


7.77
7.76
7.75
7.47
7.40
7.38
7.36
7.31
7.30
7.28
7.26
7.25
7.25
7.23
7.21
7.11
7.10
4.60
4.59
4.57
3.23
3.21
3.19
0.00
Ph
N
N
N
Parameter Value
1 Title 20150325-JiaZF-114#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent CDCl3
5 Temperature 297.3
6 Pulse Sequence zg30
7 Number of Scans 8
8 Relaxation Delay 1.0000
9 Pulse Width 8.9200
10 Acquisition Time 3.4079
11 Acquisition Date 2015-03-25T 19:35:00
12 Modification Date 2015-03-25T 19:35:21
1.92
0.99
2.08
4.10
1.89
1.97
2.00
f1 (ppm)

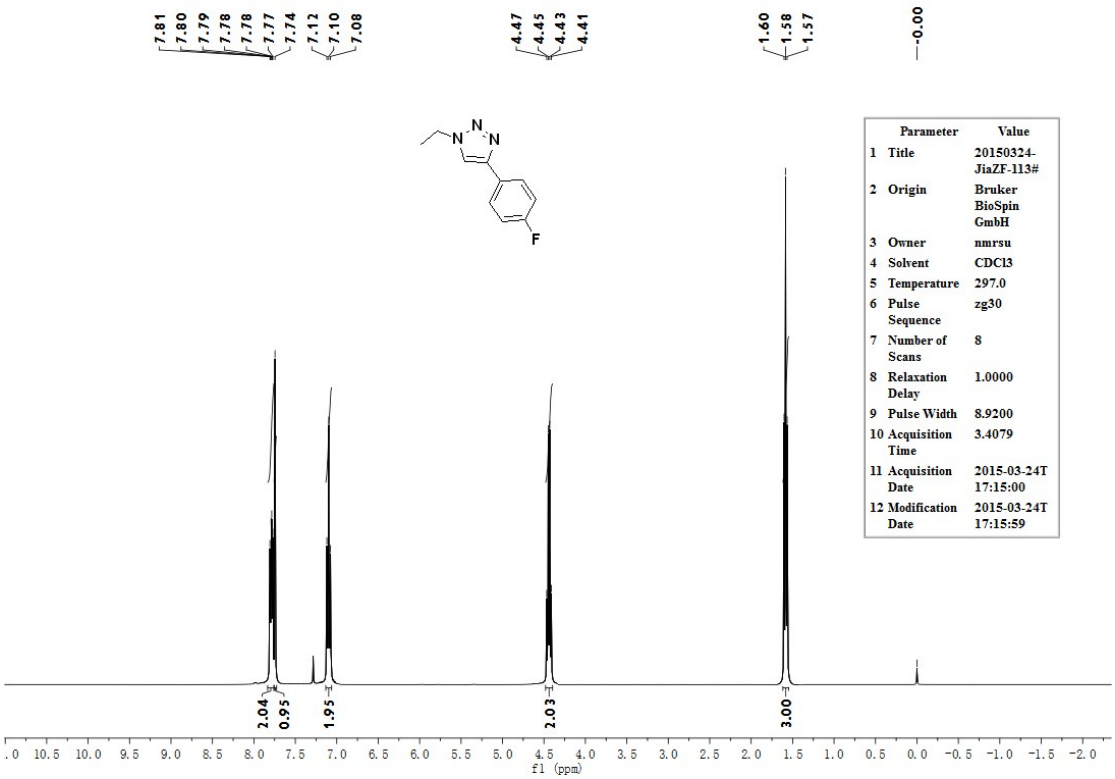

147.47
137.11
130.72
128.85
128.76
128.09
127.14
125.71
120.03
77.47
77.15
76.84
51.70
36.77
Ph
N
N
N
Parameter Value
1 Title 20150325-JiaZF-114#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent CDCl3
5 Temperature 297.6
6 Pulse Sequence zgpg30
7 Number of Scans 128
8 Relaxation Delay 2.0000
9 Pulse Width 10.0000
10 Acquisition Time 1.1534
11 Acquisition Date 2015-03-25T 19:43:00
12 Modification Date 2015-03-25T 19:43:17
f1 (ppm)



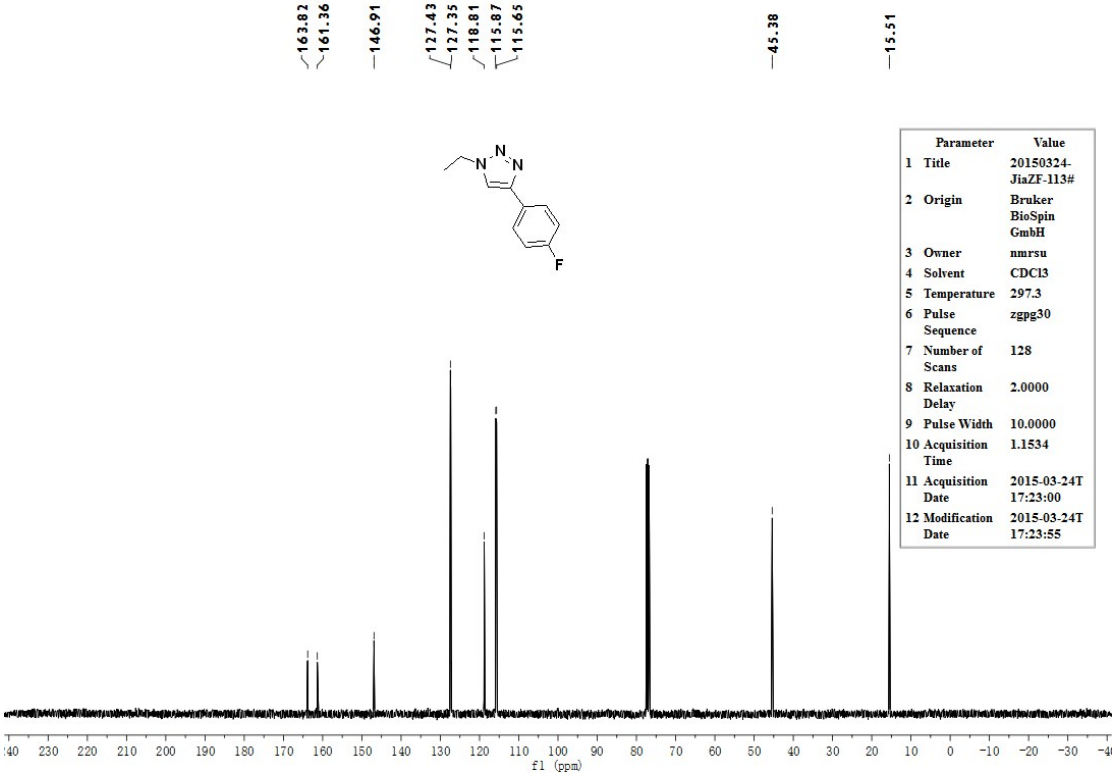
	Parameter	Value
1	Title	20150323-JiaZF-110#
2	Origin	Bruker BioSpin GmbH
3	Owner	nmrsu
4	Solvent	CDCl3
5	Temperature	297.5
6	Pulse Sequence	zg30
7	Number of Scans	8
8	Relaxation Delay	1.0000
9	Pulse Width	8.9200
10	Acquisition Time	3.4079
11	Acquisition Date	2015-03-23T 17:56:00
12	Modification Date	2015-03-23T 17:56:21



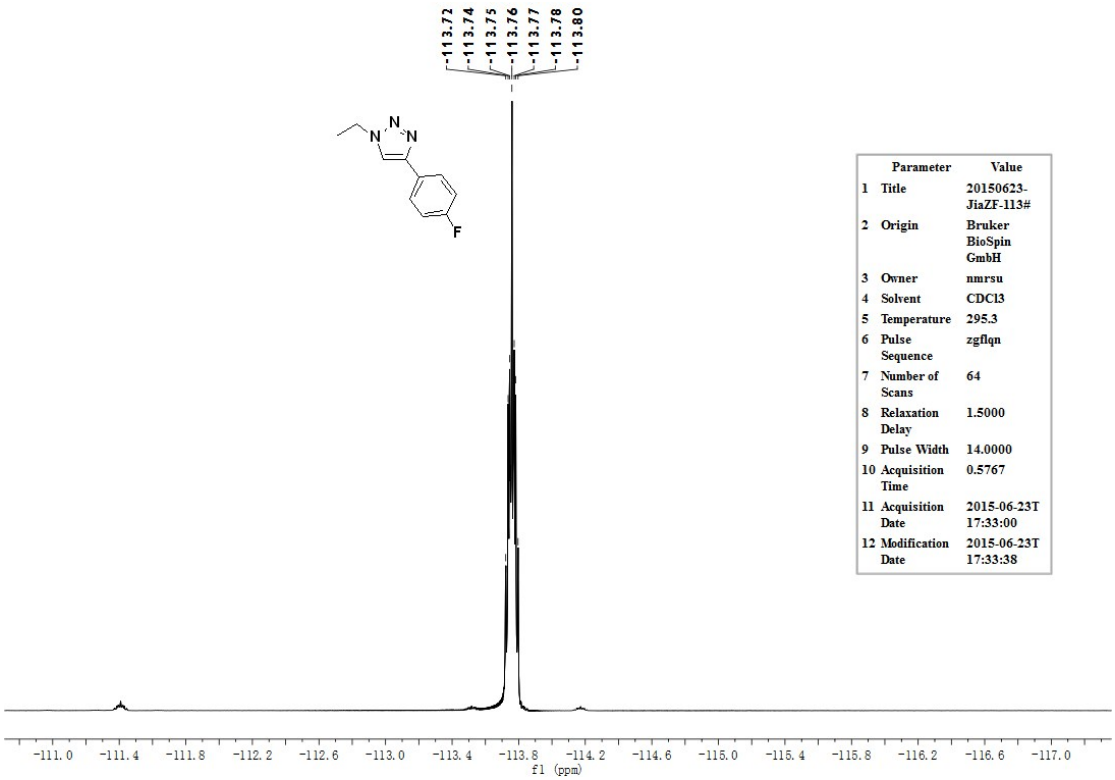
	Parameter	Value
1	Title	20150323-JiaZF-110#
2	Origin	Bruker BioSpin GmbH
3	Owner	nmrsu
4	Solvent	CDCl3
5	Temperature	297.7
6	Pulse Sequence	zgpg30
7	Number of Scans	128
8	Relaxation Delay	2.0000
9	Pulse Width	10.0000
10	Acquisition Time	1.1534
11	Acquisition Date	2015-03-23T 18:04:00
12	Modification Date	2015-03-23T 18:04:18

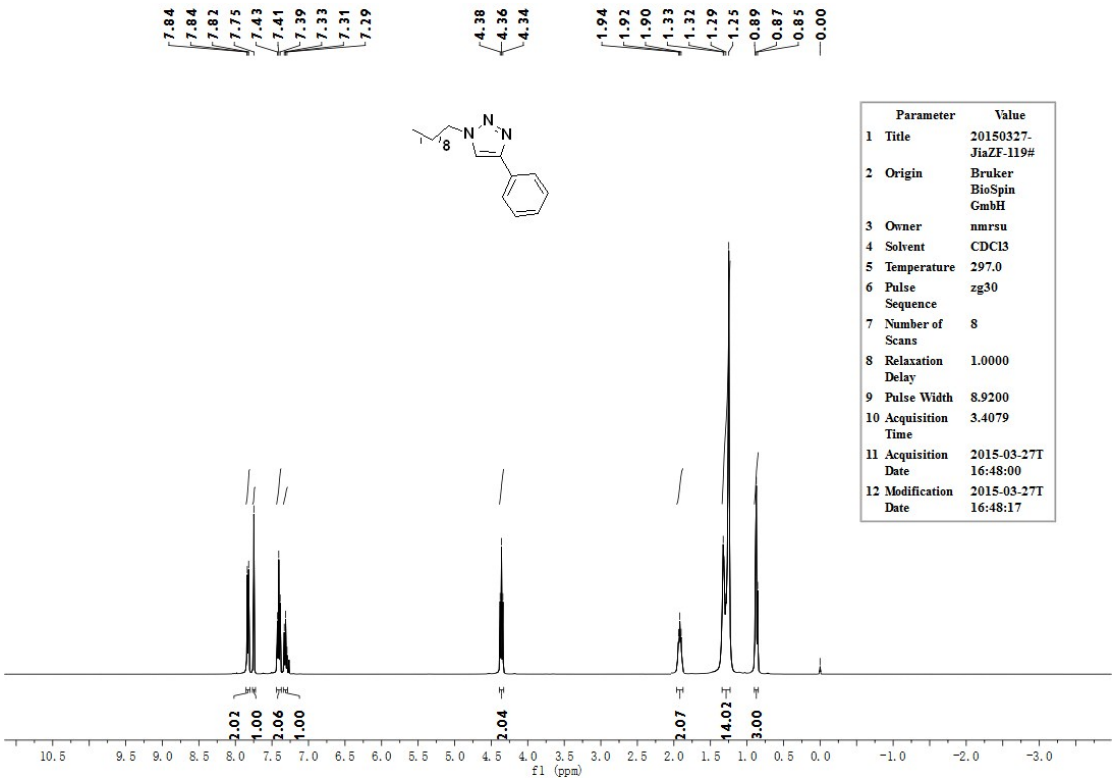


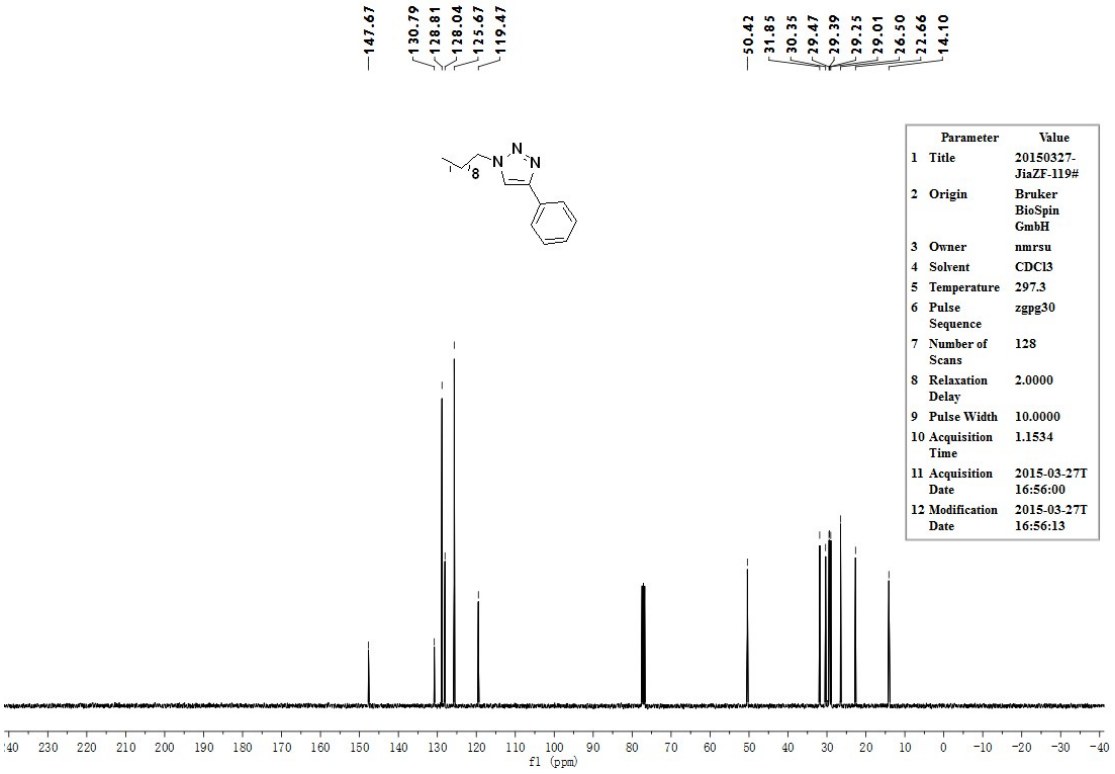
	Parameter	Value
1	Title	20150324-JiaZF-113#
2	Origin	Bruker BioSpin GmbH
3	Owner	nmrsu
4	Solvent	CDCl3
5	Temperature	297.0
6	Pulse Sequence	zg30
7	Number of Scans	8
8	Relaxation Delay	1.0000
9	Pulse Width	8.9200
10	Acquisition Time	3.4079
11	Acquisition Date	2015-03-24T 17:15:00
12	Modification Date	2015-03-24T 17:15:59

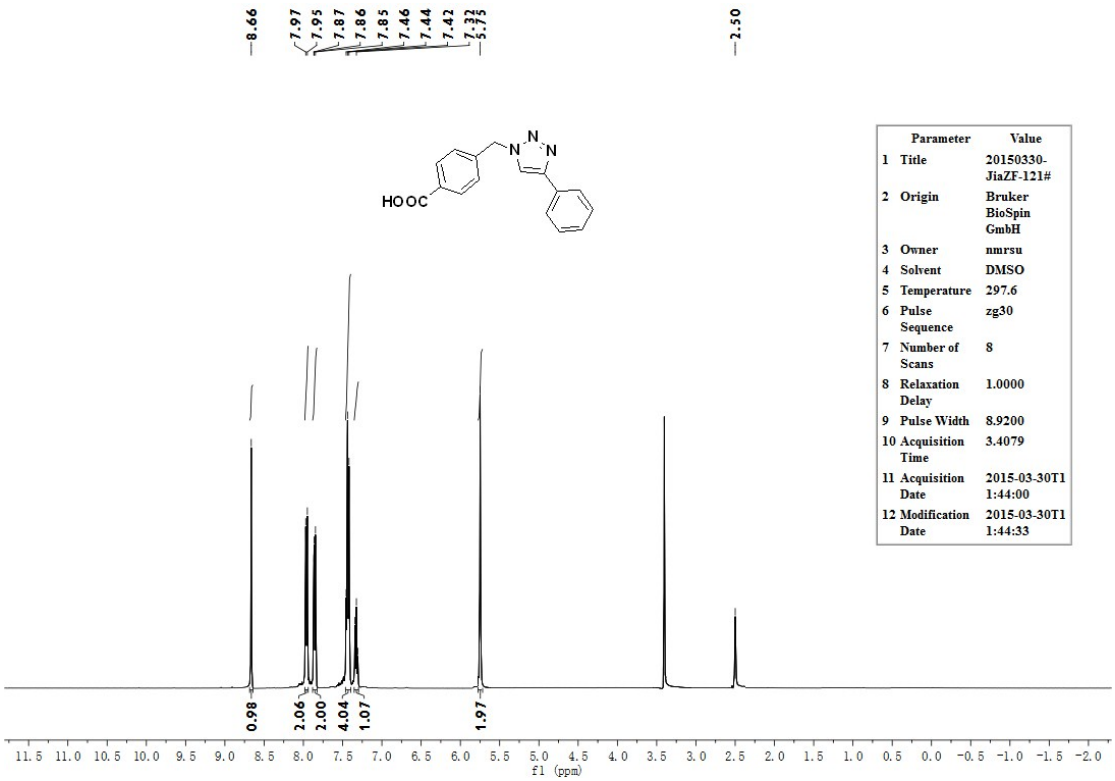


	Parameter	Value
1	Title	20150324-JiaZF-113#
2	Origin	Bruker BioSpin GmbH
3	Owner	nmrsu
4	Solvent	CDCl3
5	Temperature	297.3
6	Pulse Sequence	zgpg30
7	Number of Scans	128
8	Relaxation Delay	2.0000
9	Pulse Width	10.0000
10	Acquisition Time	1.1534
11	Acquisition Date	2015-03-24T 17:23:00
12	Modification Date	2015-03-24T 17:23:55

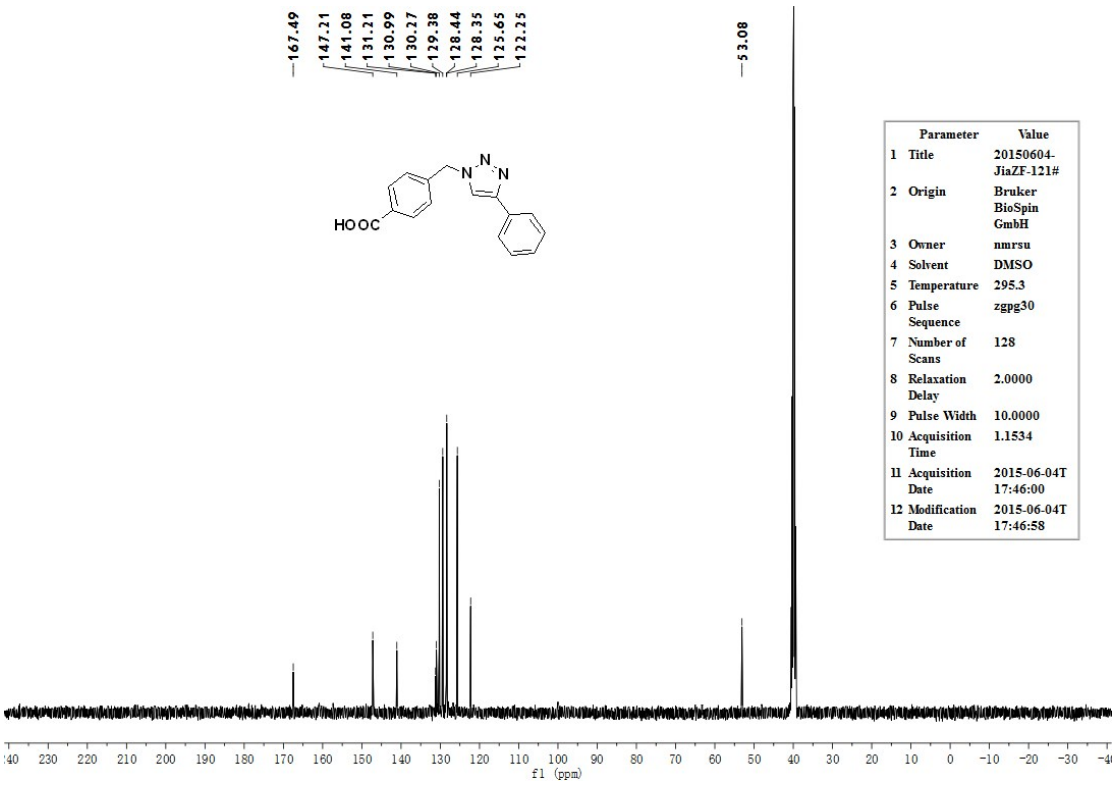

-113.72
-113.74
-113.75
-113.76
-113.77
-113.78
-113.80
N
N
N
F
Parameter Value
1 Title 20150623-JiaZF-113#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent CDCl3
5 Temperature 295.3
6 Pulse Sequence zgflqn
7 Number of Scans 64
8 Relaxation Delay 1.5000
9 Pulse Width 14.0000
10 Acquisition Time 0.5767
11 Acquisition Date 2015-06-23T 17:33:00
12 Modification Date 2015-06-23T 17:33:38
-111.0 -111.4 -111.8 -112.2 -112.6 -113.0 -113.4 -113.8 -114.2 -114.6 -115.0 -115.4 -115.8 -116.2 -116.6 -117.0
f1 (ppm)


7.84
7.84
7.82
7.75
7.43
7.41
7.39
7.33
7.31
7.29
4.38
4.36
4.34
1.94
1.92
1.90
1.33
1.32
1.29
1.25
0.89
0.87
0.85
0.00
Parameter Value
1 Title 20150327-JiaZF-119#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent CDCl3
5 Temperature 297.0
6 Pulse Sequence zg30
7 Number of Scans 8
8 Relaxation Delay 1.0000
9 Pulse Width 8.9200
10 Acquisition Time 3.4079
11 Acquisition Date 2015-03-27T 16:48:00
12 Modification Date 2015-03-27T 16:48:17
2.02
1.00
2.06
1.00
2.04
2.07
14.02
3.00
f1 (ppm)


147.67
130.79
128.81
128.04
125.67
119.47
50.42
31.85
30.35
29.47
29.39
29.25
29.01
26.50
22.66
14.10
Parameter Value
1 Title 20150327-JiaZF-119#
2 Origin Bruker BioSpin GmbH
3 Owner nmrsu
4 Solvent CDCl3
5 Temperature 297.3
6 Pulse Sequence zgpg30
7 Number of Scans 128
8 Relaxation Delay 2.0000
9 Pulse Width 10.0000
10 Acquisition Time 1.1534
11 Acquisition Date 2015-03-27T 16:56:00
12 Modification Date 2015-03-27T 16:56:13
f1 (ppm)



	Parameter	Value
1	Title	20150330-JiaZF-121#
2	Origin	Bruker BioSpin GmbH
3	Owner	nmrsu
4	Solvent	DMSO
5	Temperature	297.6
6	Pulse Sequence	zg30
7	Number of Scans	8
8	Relaxation Delay	1.0000
9	Pulse Width	8.9200
10	Acquisition Time	3.4079
11	Acquisition Date	2015-03-30T11:44:00
12	Modification Date	2015-03-30T11:44:33



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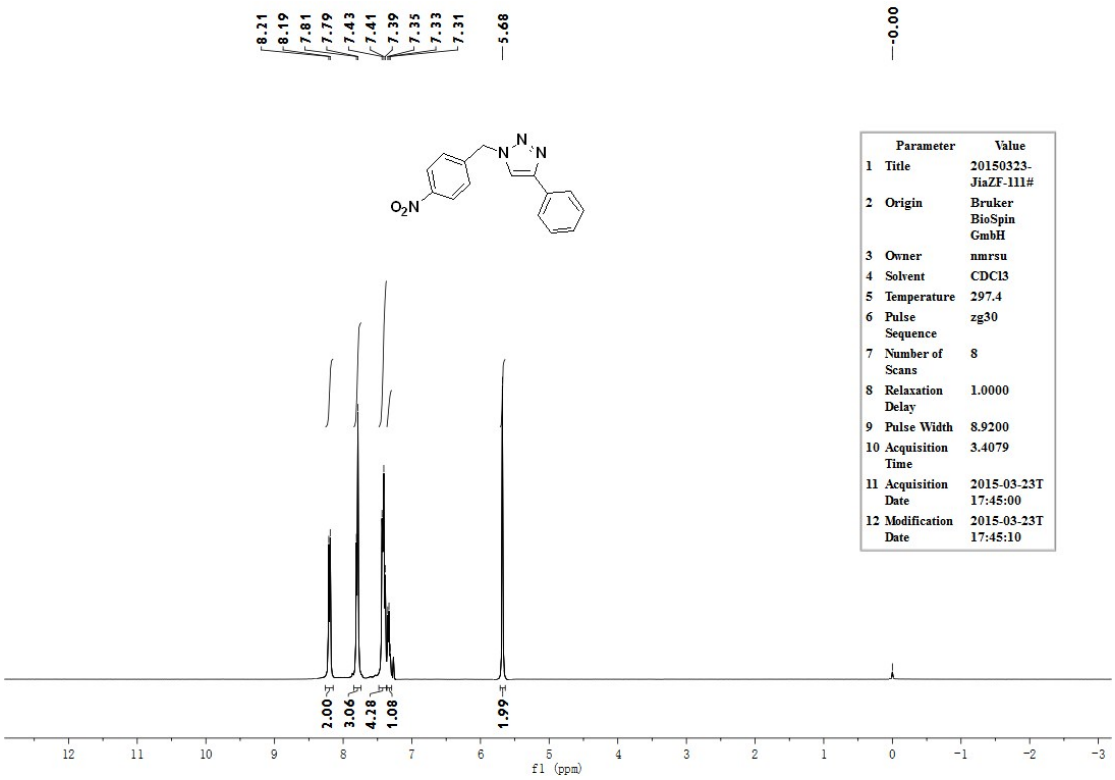
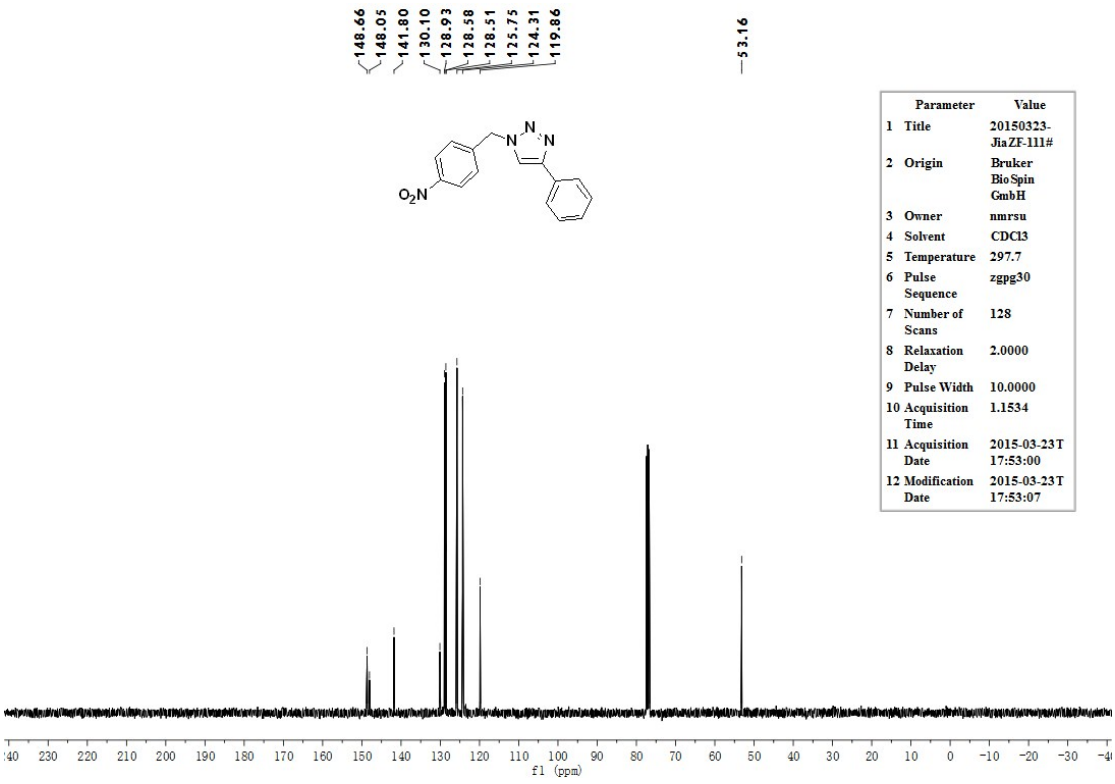
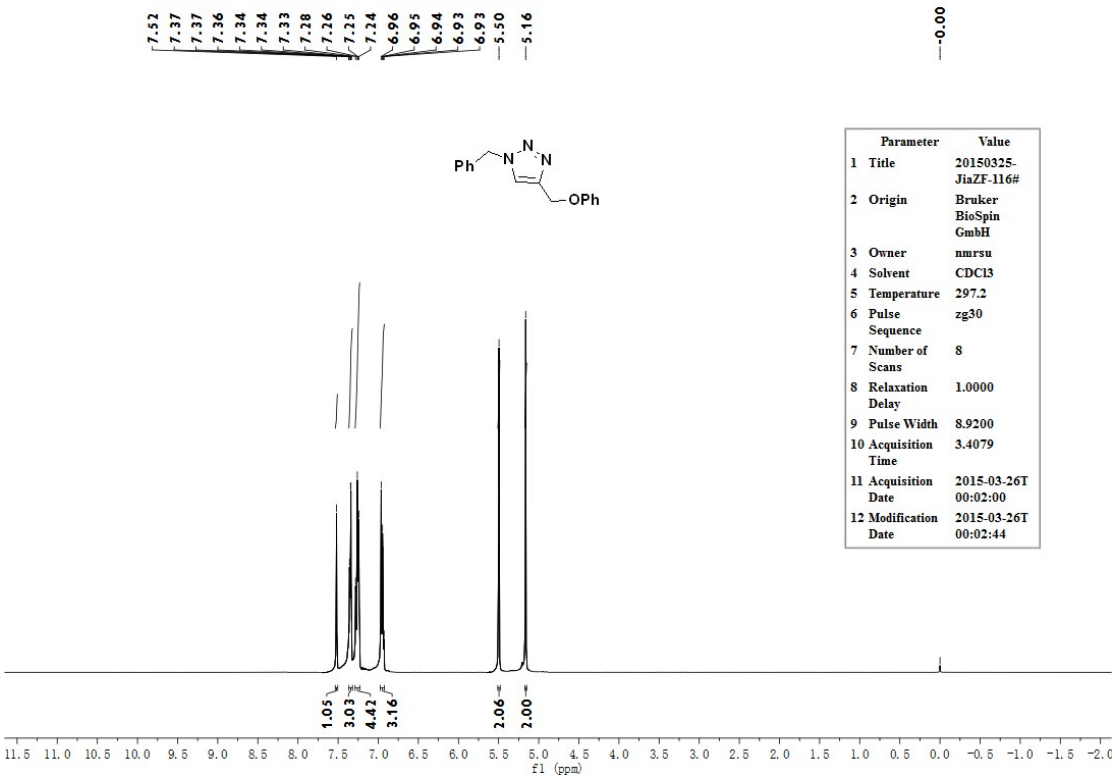
1	Title	20150604-JiaZF-121#
2	Origin	Bruker BioSpin GmbH
3	Owner	nmrsu
4	Solvent	DMSO
5	Temperature	295.3
6	Pulse Sequence	zgpg30
7	Number of Scans	128
8	Relaxation Delay	2.0000
9	Pulse Width	10.0000
10	Acquisition Time	1.1534
11	Acquisition Date	2015-06-04T17:46:00
12	Modification Date	2015-06-04T17:46:58



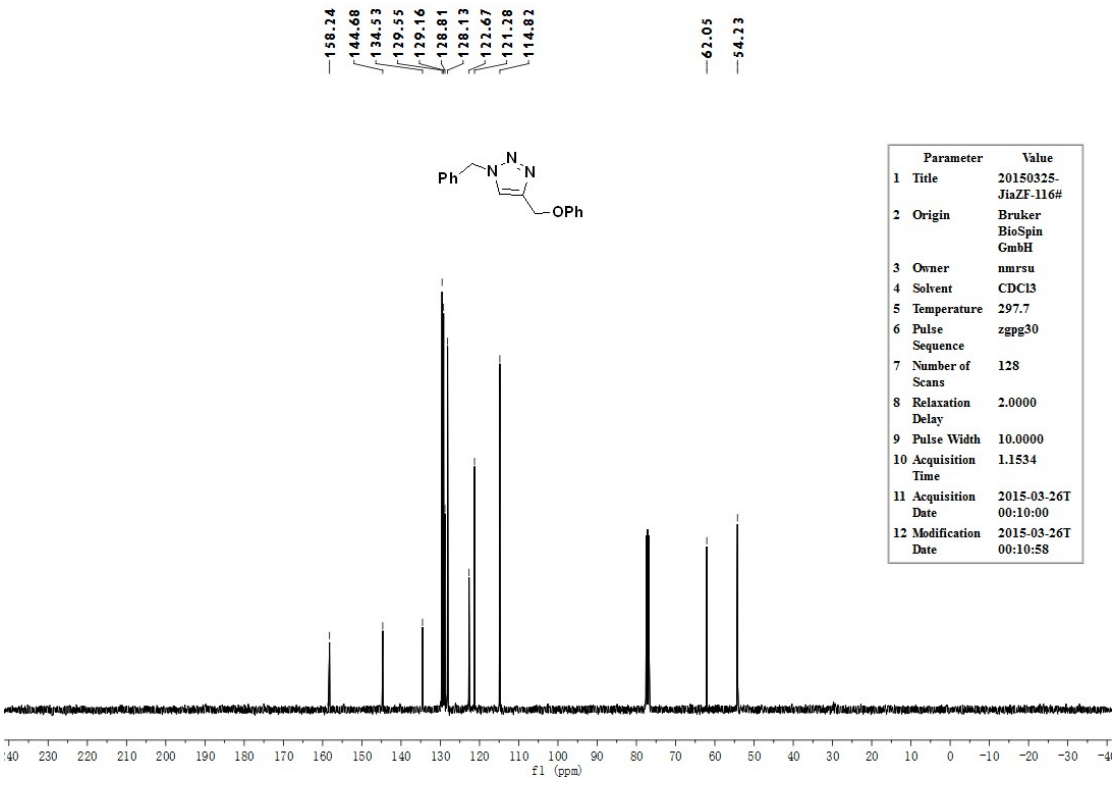
	Parameter	Value
1	Title	20150323-JiaZF-111#
2	Origin	Bruker BioSpin GmbH
3	Owner	nmrsu
4	Solvent	CDCl3
5	Temperature	297.4
6	Pulse Sequence	zg30
7	Number of Scans	8
8	Relaxation Delay	1.0000
9	Pulse Width	8.9200
10	Acquisition Time	3.4079
11	Acquisition Date	2015-03-23T 17:45:00
12	Modification Date	2015-03-23T 17:45:10



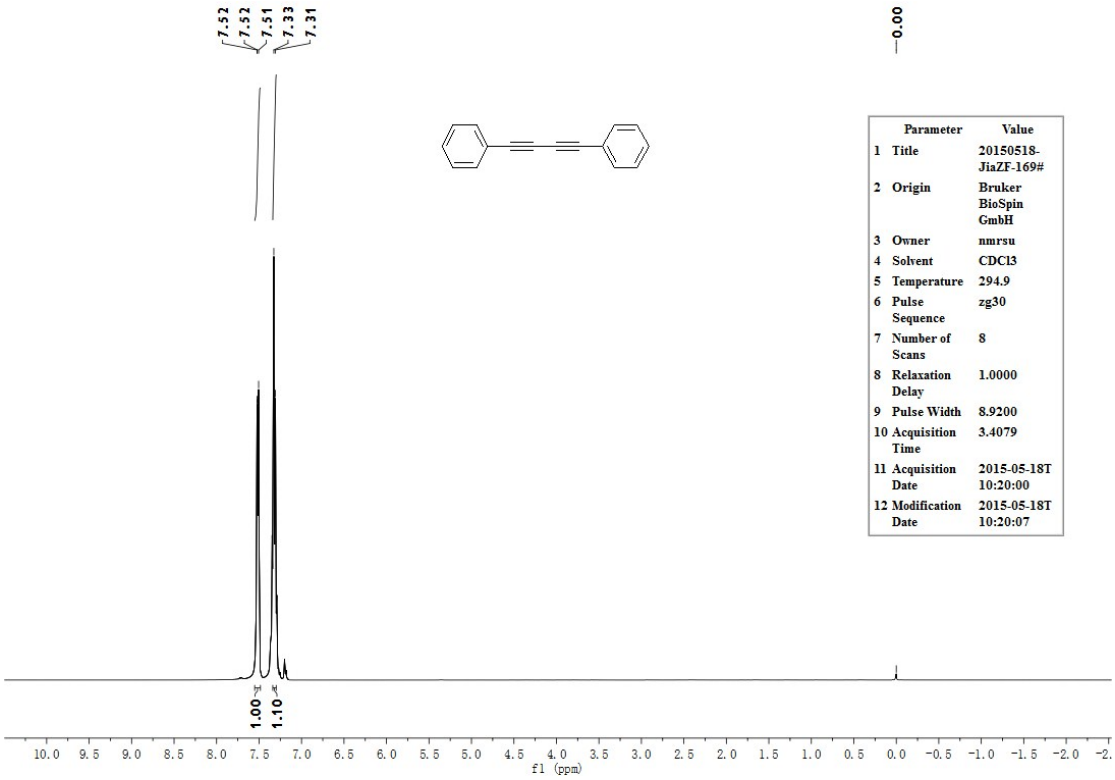
	Parameter	Value
1	Title	20150323-JiaZF-111#
2	Origin	Bruker BioSpin GmbH
3	Owner	nmrsu
4	Solvent	CDCl3
5	Temperature	297.7
6	Pulse Sequence	zgpg30
7	Number of Scans	128
8	Relaxation Delay	2.0000
9	Pulse Width	10.0000
10	Acquisition Time	1.1534
11	Acquisition Date	2015-03-23T 17:53:00
12	Modification Date	2015-03-23T 17:53:07



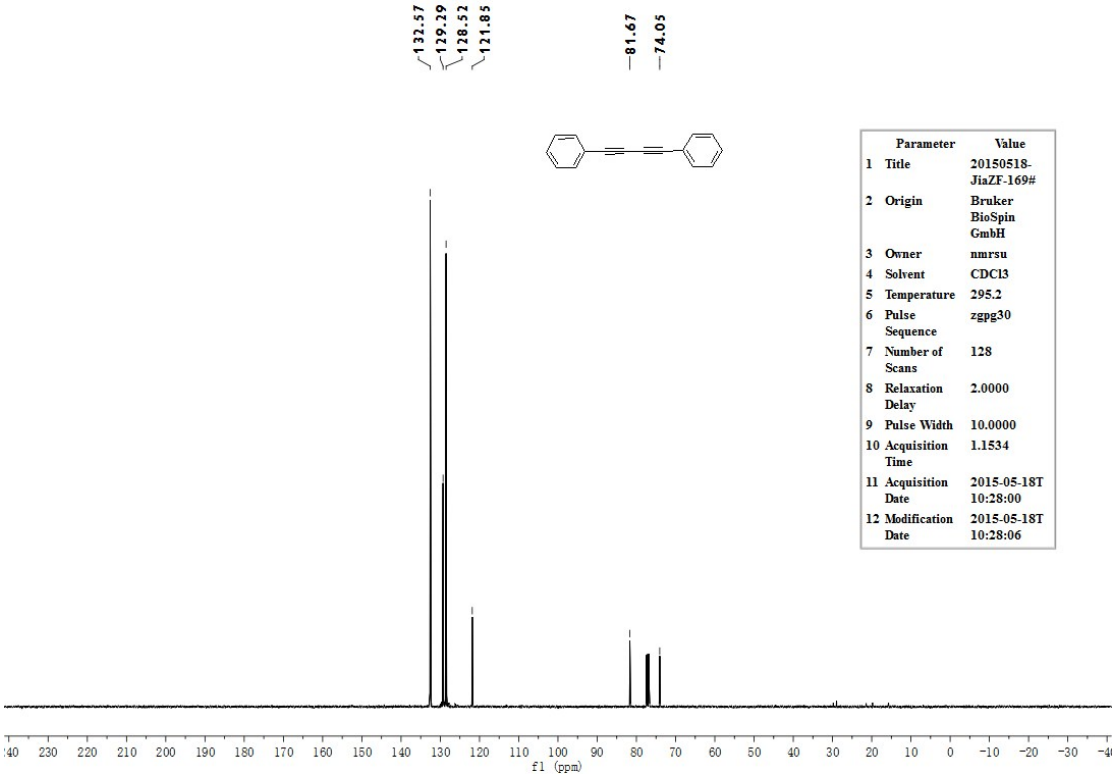
	Parameter	Value
1	Title	20150325-JiaZF-116#
2	Origin	Bruker BioSpin GmbH
3	Owner	nmrsu
4	Solvent	CDCl3
5	Temperature	297.2
6	Pulse Sequence	zg30
7	Number of Scans	8
8	Relaxation Delay	1.0000
9	Pulse Width	8.9200
10	Acquisition Time	3.4079
11	Acquisition Date	2015-03-26T 00:02:00
12	Modification Date	2015-03-26T 00:02:44



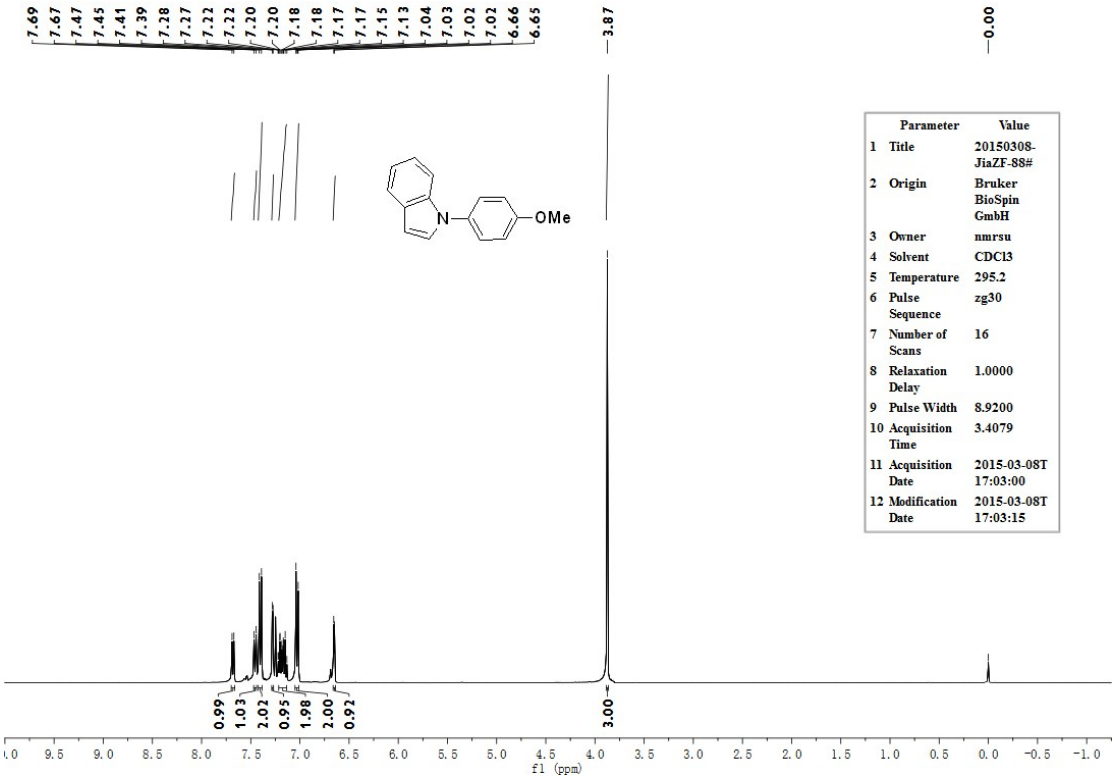
	Parameter	Value
1	Title	20150325-JiaZF-116#
2	Origin	Bruker BioSpin GmbH
3	Owner	nmrsu
4	Solvent	CDCl3
5	Temperature	297.7
6	Pulse Sequence	zgpg30
7	Number of Scans	128
8	Relaxation Delay	2.0000
9	Pulse Width	10.0000
10	Acquisition Time	1.1534
11	Acquisition Date	2015-03-26T 00:10:00
12	Modification Date	2015-03-26T 00:10:58

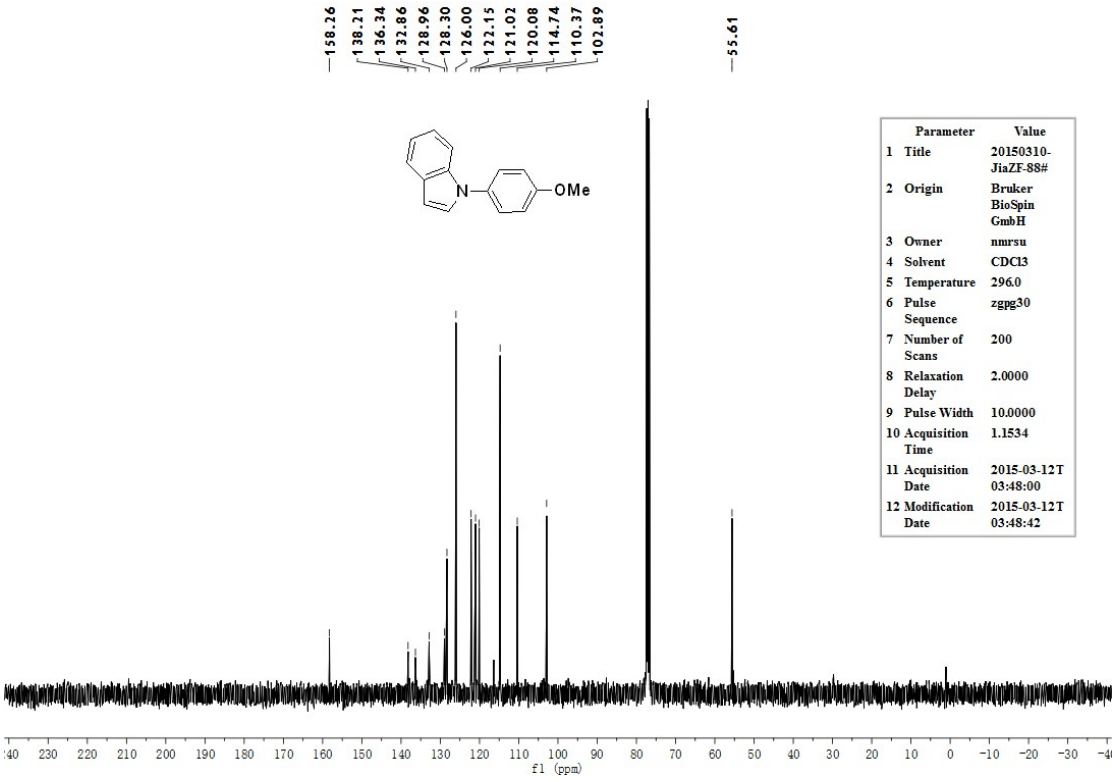


	Parameter	Value
1	Title	20150518-JiaZF-169#
2	Origin	Bruker BioSpin GmbH
3	Owner	nmrsu
4	Solvent	CDCl3
5	Temperature	294.9
6	Pulse Sequence	zg30
7	Number of Scans	8
8	Relaxation Delay	1.0000
9	Pulse Width	8.9200
10	Acquisition Time	3.4079
11	Acquisition Date	2015-05-18T 10:20:00
12	Modification Date	2015-05-18T 10:20:07



	Parameter	Value
1	Title	20150518-JiaZF-169#
2	Origin	Bruker BioSpin GmbH
3	Owner	nmrsu
4	Solvent	CDCl3
5	Temperature	295.2
6	Pulse Sequence	zgpg30
7	Number of Scans	128
8	Relaxation Delay	2.0000
9	Pulse Width	10.0000
10	Acquisition Time	1.1534
11	Acquisition Date	2015-05-18T 10:28:00
12	Modification Date	2015-05-18T 10:28:06





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