

Supporting Information

For

Cu-Catalyzed intermolecular oxyalkylation of styrenes under air: access to diverse iminolactones

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I. General Considerations

All reagents were purchased from commercial sources and used without further treatment, unless otherwise indicated. Acetone (AR, $\geq 99.5\%$, $\text{H}_2\text{O} < 0.3\%$) was used as purchased without further purification and degassing. All reactions were run under air with no precautions taken to exclude moisture. ^1H NMR and ^{13}C NMR spectra were recorded at 25 °C on a Varian (400 MHz and 100 MHz). Melting points were obtained with a micro melting point XT4A Beijing Keyi electrooptic apparatus and are uncorrected. High resolution mass spectra were recorded on Bruker microtof. All reactions were monitored by TLC with Taizhou GF254 silica gel coated plates. Flash column chromatography was carried out using 200-300 mesh silica gel at increased pressure.

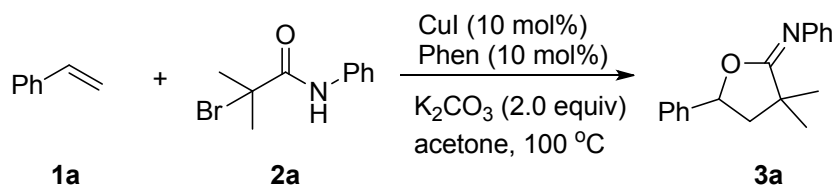
II. General procedure for the preparation of 2, 3 and 4

General procedure for the preparation of 2

Substrates **2** were prepared by the reaction of corresponding anilines (1 equiv) and 2-bromo-2-methylpropanoyl bromide (1.1 equiv) in CH_2Cl_2 at room temperature.

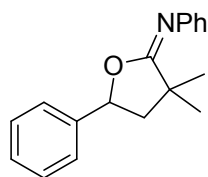
General procedure for the preparation of 3 and 4

3a as an example



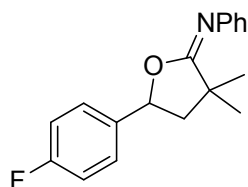
To a solution of the 2-bromo-2-methyl-*N*-phenylpropanamide **2a** (72.6 mg, 0.3 mmol) in acetone (3.0 ml) was added the styrene **1a** (41 μL , 0.36 mmol), Phen (5.4 mg, 0.03 mmol), CuI (5.7 mg, 0.03 mmol), and K₂CO₃ (82.9 mg, 0.6 mmol) under air in screw-cap test tube. The reaction mixture was stirred at 100 °C for 1.5 h. After the reaction finished, the reaction mixture was cooled to room temperature and quenched by water. The mixture was extracted with EtOAc (5.0 mL \times 3), the combined organic phases were dried over anhydrous Na₂SO₄ and the solvent was evaporated under vacuum. The residue was purified by column chromatography to give the corresponding products **3a** (66.1 mg, 83%).

III. Analytical data of Compounds 3, 4, 5, 7 and 8



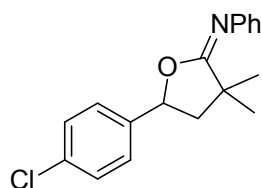
***N*-(3,3-dimethyl-5-phenyldihydrofuran-2(3*H*)-ylidene)aniline 3a**

White solid. mp: 104-106 °C. ¹H NMR (400 MHz, CDCl₃): δ = 1.41 (s, 3H), 1.44 (s, 3H), 2.02 (dd, *J*₁ = 10.0 Hz, *J*₂ = 12.8 Hz, 1H), 2.42 (dd, *J*₁ = 6.0 Hz, *J*₂ = 12.8 Hz, 1H), 5.39 (dd, *J*₁ = 6.0 Hz, *J*₂ = 10.0 Hz, 1H), 7.03 (t, *J* = 7.2 Hz, 1H), 7.12-7.14 (m, 2H), 7.24-7.30 (m, 5H), 7.33-7.37 (m, 2H); ¹³C NMR (100 MHz, CDCl₃): δ = 26.2, 26.4, 41.7, 47.2, 79.8, 122.7, 123.4, 125.4, 128.0, 128.5, 128.6, 140.4, 147.3, 167.9. HRMS (ESI-TOF). Calcd for C₁₈H₂₀NO, [M+H]⁺ *m/z* 266.1545, Found 266.1550.



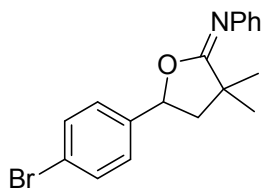
***N*-(5-(4-fluorophenyl)-3,3-dimethyldihydrofuran-2(3*H*)-ylidene)aniline 3b**

White solid. mp: 94-95 °C. ¹H NMR (400 MHz, CDCl₃): δ = 1.41 (s, 3H), 1.44 (s, 3H), 1.95-2.01 (m, 1H), 2.43 (dd, *J*₁ = 6.0 Hz, *J*₂ = 12.8 Hz, 1H), 5.37 (dd, *J*₁ = 6.0 Hz, *J*₂ = 10.0 Hz, 1H), 7.03 (t, *J* = 8.0 Hz, 3H), 7.10 (d, *J* = 7.2 Hz, 2H), 7.24-7.30 (m, 4H); ¹³C NMR (100 MHz, CDCl₃): δ = 26.2, 26.3, 41.7, 47.3, 79.3, 115.5 (d, *J* = 22.0 Hz), 122.6, 123.4, 127.2 (d, *J* = 8.0 Hz), 128.5, 136.0, 147.2, 162.4 (d, *J* = 245.0 Hz), 167.6. HRMS (ESI-TOF). Calcd for C₁₈H₁₉FNO, [M+H]⁺ *m/z* 284.1451, Found 284.1440.



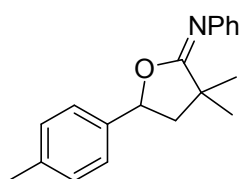
***N*-(5-(4-chlorophenyl)-3,3-dimethyldihydrofuran-2(3*H*)-ylidene)aniline 3c**

White solid. mp: 84-85 °C. ¹H NMR (400 MHz, CDCl₃): δ = 1.40 (s, 3H), 1.44 (s, 3H), 1.94-2.00 (m, 1H), 2.41 (dd, *J*₁ = 6.0 Hz, *J*₂ = 12.8 Hz, 1H), 5.37 (dd, *J*₁ = 6.0 Hz, *J*₂ = 9.6 Hz, 1H), 7.04 (t, *J* = 7.2 Hz, 1H), 7.10 (d, *J* = 7.6 Hz, 2H), 7.21 (d, *J* = 8.0 Hz, 2H), 7.26-7.33 (m, 4H); ¹³C NMR (100 MHz, CDCl₃): δ = 26.2, 26.3, 41.6, 47.1, 79.1, 122.6, 123.5, 126.7, 128.5, 128.8, 133.8, 138.9, 147.1, 167.5. HRMS (ESI-TOF). Calcd for C₁₈H₁₉ClNO, [M+H]⁺ *m/z* 300.1155, Found 300.1151.



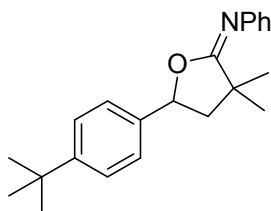
***N*-(5-(4-bromophenyl)-3,3-dimethyl-2(3*H*)-ylidene)aniline 3d**

White solid. mp: 106-108 °C. ¹H NMR (400 MHz, CDCl₃): δ = 1.40 (s, 3H), 1.43 (s, 3H), 1.93-1.99 (m, 1H), 2.41 (dd, *J*₁ = 6.0 Hz, *J*₂ = 12.4 Hz, 1H), 5.33 (dd, *J*₁ = 6.0 Hz, *J*₂ = 9.6 Hz, 1H), 7.02-7.06 (m, 1H), 7.10 (d, *J* = 7.6 Hz, 2H), 7.14 (d, *J* = 8.4 Hz, 2H), 7.25-7.30 (m, 2H), 7.47 (d, *J* = 8.4 Hz, 2H); ¹³C NMR (100 MHz, CDCl₃): δ = 26.2, 26.3, 41.6, 47.1, 79.1, 121.9, 122.6, 123.5, 127.0, 128.5, 131.7, 139.4, 147.1, 167.5. HRMS (ESI-TOF). Calcd for C₁₈H₁₉BrNO, [M+H]⁺ *m/z* 344.0650, Found 344.0652.



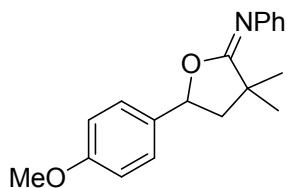
***N*-(5-(3,3-dimethyl-5-(*p*-tolyl)dihydrofuran-2(3*H*)-ylidene)aniline 3e**

White solid. mp: 88-89 °C. ¹H NMR (400 MHz, CDCl₃): δ = 1.40 (s, 3H), 1.43 (s, 3H), 2.01 (t, *J* = 11.2 Hz, 1H), 2.33-2.40 (m, 4H), 5.33-5.37 (m, 1H), 7.01 (t, *J* = 6.8 Hz, 1H), 7.11-7.16 (m, 6H), 7.26 (t, *J* = 7.6 Hz, 2H); ¹³C NMR (100 MHz, CDCl₃): δ = 21.1, 26.2, 26.3, 41.7, 47.2, 79.9, 122.7, 123.3, 125.5, 128.5, 129.2, 137.3, 137.8, 147.3, 168.0. HRMS (ESI-TOF). Calcd for C₁₉H₂₂NO, [M+H]⁺ *m/z* 280.1701, Found 280.1704.



***N*-(5-(4-(tert-butyl)phenyl)-3,3-dimethyl-2(3*H*)-ylidene)aniline 3f**

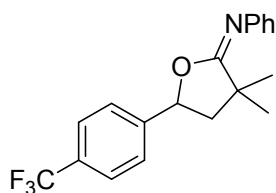
White solid. mp: 85-87 °C. ¹H NMR (400 MHz, CDCl₃): δ = 1.30 (s, 9H), 1.41 (s, 3H), 1.43 (s, 3H), 2.00-2.05 (m, 1H), 2.38 (dd, *J*₁ = 6.0 Hz, *J*₂ = 12.8 Hz, 1H), 5.36 (dd, *J*₁ = 6.0 Hz, *J*₂ = 10.0 Hz, 1H), 7.01 (t, *J* = 7.6 Hz, 1H), 7.12 (d, *J* = 7.2 Hz, 2H), 7.21-7.28 (m, 4H), 7.37 (d, *J* = 8.4 Hz, 2H); ¹³C NMR (100 MHz, CDCl₃): δ = 26.2, 26.3, 31.3, 34.5, 41.7, 47.1, 79.8, 122.7, 123.3, 125.3, 125.4, 128.4, 137.2, 147.3, 151.1, 168.0. HRMS (ESI-TOF). Calcd for C₂₂H₂₈NO, [M+H]⁺ *m/z* 322.2171, Found 322.2175.



***N*-(5-(4-methoxyphenyl)-3,3-dimethyl-2(3*H*)-ylidene)aniline 3g**

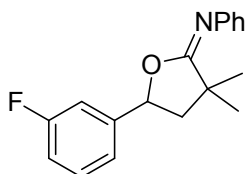
White solid. mp: 117-118 °C. ¹H NMR (400 MHz, CDCl₃): δ = 1.41 (s, 3H), 1.43 (s, 3H), 1.99-2.05 (m, 1H), 2.36 (dd, *J*₁ = 6.0 Hz, *J*₂ = 12.8 Hz, 1H), 3.78 (s, 3H), 5.34 (dd, *J*₁ = 6.0 Hz, *J*₂ =

10.4 Hz, 1H), 6.88 (d, $J = 8.8$ Hz, 2H), 7.01 (t, $J = 7.2$ Hz, 1H), 7.11 (d, $J = 7.6$ Hz, 2H), 7.20-7.28 (m, 4H); ^{13}C NMR (100 MHz, CDCl_3): $\delta = 26.1, 26.3, 41.7, 47.2, 55.3, 79.8, 113.9, 122.7, 123.3, 127.0, 128.5, 132.1, 147.3, 159.4, 168.0$. HRMS (ESI-TOF). Calcd for $\text{C}_{19}\text{H}_{22}\text{NO}_2$, $[\text{M}+\text{H}]^+$ m/z 296.1651, Found 296.1651.



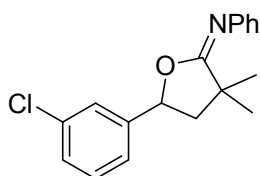
***N*-(3,3-dimethyl-5-(4-(trifluoromethyl)phenyl)dihydrofuran-2(3*H*)-ylidene)aniline 3h**

Colorless oil. ^1H NMR (400 MHz, CDCl_3): $\delta = 1.40$ (s, 3H), 1.45 (s, 3H), 1.97 (dd, $J_1 = 10.0$ Hz, $J_2 = 12.8$ Hz, 1H), 2.46 (dd, $J_1 = 6.0$ Hz, $J_2 = 12.8$ Hz, 1H), 5.43 (dd, $J_1 = 6.0$ Hz, $J_2 = 10.0$ Hz, 1H), 7.05 (t, $J = 7.6$ Hz, 1H), 7.11-7.13 (m, 2H), 7.29 (t, $J = 7.6$ Hz, 2H), 7.38 (d, $J = 8.0$ Hz, 2H), 7.60 (d, $J = 8.4$ Hz, 2H); ^{13}C NMR (100 MHz, CDCl_3): $\delta = 26.2, 26.3, 41.6, 47.0, 78.9, 122.5, 123.9$ (q, $J = 271.0$ Hz), 123.6, 125.5, 125.6 (q, $J = 4.0$ Hz), 128.6, 129.5 (q, $J = 32.0$ Hz), 144.5, 147.0, 167.3. HRMS (ESI-TOF). Calcd for $\text{C}_{19}\text{H}_{19}\text{F}_3\text{NO}$, $[\text{M}+\text{H}]^+$ m/z 334.1419, Found 334.1415.



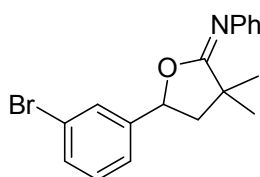
***N*-(5-(3-fluorophenyl)-3,3-dimethyldihydrofuran-2(3*H*)-ylidene)aniline 3i**

Colorless oil. ^1H NMR (400 MHz, CDCl_3): $\delta = 1.40$ (s, 3H), 1.44 (s, 3H), 1.95-2.01 (m, 1H), 2.43 (dd, $J_1 = 6.0$ Hz, $J_2 = 12.4$ Hz, 1H), 5.37 (dd, $J_1 = 6.0$ Hz, $J_2 = 9.6$ Hz, 1H), 6.95-6.99 (m, 2H), 7.03-7.06 (m, 2H), 7.11 (d, $J = 7.6$ Hz, 2H), 7.24-7.31 (m, 3H); ^{13}C NMR (100 MHz, CDCl_3): $\delta = 26.2, 26.3, 41.6, 47.0, 79.0, 112.3$ (d, $J = 22.0$ Hz), 114.8 (d, $J = 21.0$ Hz), 120.8, 122.5, 123.5, 128.6, 130.2 (d, $J = 8.0$ Hz), 143.0, 147.1, 162.9 (d, $J = 245.0$ Hz), 167.4. HRMS (ESI-TOF). Calcd for $\text{C}_{18}\text{H}_{19}\text{FNO}$, $[\text{M}+\text{H}]^+$ m/z 284.1451, Found 284.1455.



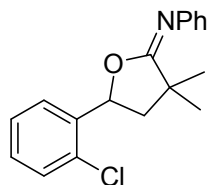
***N*-(5-(3-chlorophenyl)-3,3-dimethyldihydrofuran-2(3*H*)-ylidene)aniline 3j**

Colorless oil. ^1H NMR (400 MHz, CDCl_3): $\delta = 1.41$ (s, 3H), 1.44 (s, 3H), 1.98 (dd, $J_1 = 10.4$ Hz, $J_2 = 12.4$ Hz, 1H), 2.42 (dd, $J_1 = 6.0$ Hz, $J_2 = 12.8$ Hz, 1H), 5.35 (dd, $J_1 = 6.0$ Hz, $J_2 = 9.6$ Hz, 1H), 7.03-7.16 (m, 4H), 7.26-7.31 (m, 5H); ^{13}C NMR (100 MHz, CDCl_3): $\delta = 26.2, 26.3, 41.6, 47.1, 79.0, 122.6, 123.4, 123.5, 125.5, 128.2, 128.6, 129.9, 134.5, 142.5, 147.1, 167.4$. HRMS (ESI-TOF). Calcd for $\text{C}_{18}\text{H}_{19}\text{ClNO}$, $[\text{M}+\text{H}]^+$ m/z 300.1155, Found 300.1157.



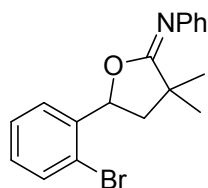
***N*-(5-(3-bromophenyl)-3,3-dimethyldihydrofuran-2(3*H*)-ylidene)aniline 3k**

White solid. mp: 86-87 °C. ¹H NMR (400 MHz, CDCl₃): δ = 1.41 (s, 3H), 1.44 (s, 3H), 1.96-2.01 (m, 1H), 2.42 (dd, *J*₁ = 6.0 Hz, *J*₂ = 12.8 Hz, 1H), 5.35 (dd, *J*₁ = 6.0 Hz, *J*₂ = 9.6 Hz, 1H), 7.03-7.07 (m, 1H), 7.11 (d, *J* = 8.0 Hz, 2H), 7.21-7.31 (m, 4H), 7.42 (s, 2H); ¹³C NMR (100 MHz, CDCl₃): δ = 26.2, 26.3, 41.6, 47.1, 78.9, 122.6, 122.7, 123.5, 123.9, 128.5, 128.6, 130.2, 131.1, 142.7, 147.1, 167.4. HRMS (ESI-TOF). Calcd for C₁₈H₁₉BrNO, [M+H]⁺ *m/z* 344.0650, Found 344.0648.



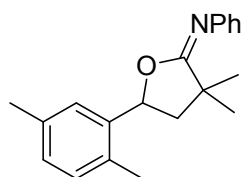
***N*-(5-(2-chlorophenyl)-3,3-dimethyldihydrofuran-2(3*H*)-ylidene)aniline 3l**

Colorless oil. ¹H NMR (400 MHz, CDCl₃): δ = 1.40 (s, 3H), 1.47 (s, 3H), 1.88 (dd, *J*₁ = 10.0 Hz, *J*₂ = 12.4 Hz, 1H), 2.64 (dd, *J*₁ = 6.0 Hz, *J*₂ = 12.8 Hz, 1H), 5.70 (dd, *J*₁ = 6.0 Hz, *J*₂ = 9.6 Hz, 1H), 7.03-7.07 (m, 1H), 7.14 (d, *J* = 8.4 Hz, 2H), 7.18-7.33 (m, 5H), 7.37 (d, *J* = 7.6 Hz, 1H); ¹³C NMR (100 MHz, CDCl₃): δ = 26.4, 26.5, 41.4, 45.5, 77.3, 122.5, 123.5, 126.0, 127.2, 128.6, 128.9, 129.5, 131.1, 138.4, 147.2, 167.7. HRMS (ESI-TOF). Calcd for C₁₈H₁₉ClNO, [M+H]⁺ *m/z* 300.1155, Found 300.1157.



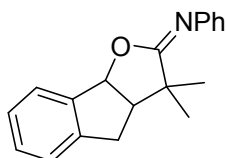
***N*-(5-(2-bromophenyl)-3,3-dimethyldihydrofuran-2(3*H*)-ylidene)aniline 3m**

Colorless oil. ¹H NMR (400 MHz, CDCl₃): δ = 1.40 (s, 3H), 1.47 (s, 3H), 1.82-1.87 (m, 1H), 2.68 (dd, *J*₁ = 6.4 Hz, *J*₂ = 12.8 Hz, 1H), 5.66 (dd, *J*₁ = 6.4 Hz, *J*₂ = 9.6 Hz, 1H), 7.03-7.06 (m, 1H), 7.11-7.15 (m, 3H), 7.24-7.32 (m, 3H), 7.35 (d, *J* = 8.0 Hz, 1H), 7.50 (d, *J* = 8.0 Hz, 1H); ¹³C NMR (100 MHz, CDCl₃): δ = 26.4, 26.5, 41.4, 45.7, 79.2, 120.7, 122.5, 123.5, 126.2, 127.8, 128.6, 129.2, 132.7, 140.0, 147.2, 167.7. HRMS (ESI-TOF). Calcd for C₁₈H₁₉BrNO, [M+H]⁺ *m/z* 344.0650, Found 344.0648.



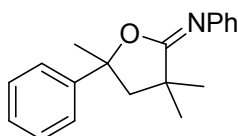
***N*-(5-(2,5-dimethylphenyl)-3,3-dimethyldihydrofuran-2(3*H*)-ylidene)aniline 3n**

White solid. mp: 68-69 °C. ¹H NMR (400 MHz, CDCl₃): δ = 1.43 (s, 3H), 1.46 (s, 3H), 1.92-1.97 (m, 1H), 2.25 (s, 3H), 2.30 (s, 3H), 2.41 (dd, *J*₁ = 6.0 Hz, *J*₂ = 12.4 Hz, 1H), 5.54 (dd, *J*₁ = 6.0 Hz, *J*₂ = 10.0 Hz, 1H), 6.98-7.05 (m, 3H), 7.13 (t, *J* = 7.6 Hz, 3H), 7.24-7.30 (m, 2H); ¹³C NMR (100 MHz, CDCl₃): δ = 18.6, 21.1, 26.4, 26.5, 41.6, 45.8, 77.8, 122.7, 123.3, 125.3, 128.4, 128.5, 130.4, 131.1, 135.8, 138.0, 147.4, 168.1. HRMS (ESI-TOF). Calcd for C₂₀H₂₄NO, [M+H]⁺ *m/z* 294.1858, Found 294.1865.



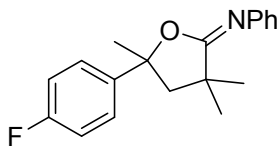
***N*-(3,3-dimethyl-3,3a,4,8b-tetrahydro-2*H*-indeno[1,2-*b*]furan-2-ylidene)aniline 3o**

White solid. mp: 60-61 °C. ¹H NMR (400 MHz, CDCl₃): δ = 1.36 (s, 3H), 1.48 (s, 3H), 2.93-2.98 (m, 1H), 3.05 (d, *J* = 7.6 Hz, 2H), 5.70 (d, *J* = 5.6 Hz, 1H), 6.97-7.00 (m, 3H), 7.20-7.23 (m, 3H), 7.26 (d, *J* = 8.4 Hz, 1H), 7.32 (t, *J* = 7.6 Hz, 1H), 7.43 (d, *J* = 7.2 Hz, 1H); ¹³C NMR (100 MHz, CDCl₃): δ = 22.4, 28.5, 32.9, 43.9, 51.9, 86.7, 122.8, 123.3, 124.8, 126.2, 127.0, 128.4, 129.7, 139.3, 144.5, 147.2, 168.2. HRMS (ESI-TOF). Calcd for C₁₉H₂₀NO, [M+H]⁺ *m/z* 278.1545, Found 278.1547.



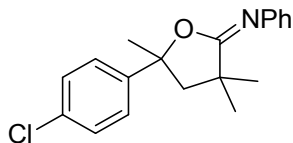
***N*-(3,3,5-trimethyl-5-phenyldihydrofuran-2(3*H*)-ylidene)aniline 3p**

Colorless oil. ¹H NMR (400 MHz, CDCl₃): δ = 1.05 (s, 3H), 1.44 (s, 3H), 1.63 (s, 3H), 2.30 (d, *J* = 12.8 Hz, 1H), 2.53 (d, *J* = 12.8 Hz, 1H), 7.08 (t, *J* = 7.2 Hz, 1H), 7.17 (d, *J* = 7.2 Hz, 2H), 7.22-7.26 (m, 1H), 7.29-7.35 (m, 6H); ¹³C NMR (100 MHz, CDCl₃): δ = 27.8, 28.5, 31.9, 41.8, 51.5, 85.7, 122.7, 123.2, 124.0, 127.0, 128.4, 128.5, 146.6, 147.7, 168.2. HRMS (ESI-TOF). Calcd for C₁₉H₂₂NO, [M+H]⁺ *m/z* 280.1701, Found 280.1707.



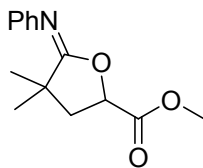
***N*-(5-(4-fluorophenyl)-3,3,5-trimethyldihydrofuran-2(3*H*)-ylidene)aniline 3q**

Colorless oil. ¹H NMR (400 MHz, CDCl₃): δ = 1.06 (s, 3H), 1.44 (s, 3H), 1.61 (s, 3H), 2.30 (d, *J* = 12.8 Hz, 1H), 2.48 (d, *J* = 12.8 Hz, 1H), 7.01 (t, *J* = 8.8 Hz, 2H), 7.08 (t, *J* = 7.6 Hz, 1H), 7.14 (d, *J* = 7.6 Hz, 2H), 7.25-7.28 (m, 2H), 7.33 (t, *J* = 7.6 Hz, 2H); ¹³C NMR (100 MHz, CDCl₃): δ = 27.8, 28.5, 32.0, 41.8, 51.5, 85.3, 115.3 (d, *J* = 21.0 Hz), 122.6, 123.3, 125.8 (d, *J* = 8.0 Hz), 128.5, 142.4 (d, *J* = 3.0 Hz), 147.6, 161.7 (d, *J* = 244.0 Hz), 167.9. HRMS (ESI-TOF). Calcd for C₁₉H₂₁FNO, [M+H]⁺ *m/z* 298.1607, Found 298.1602.



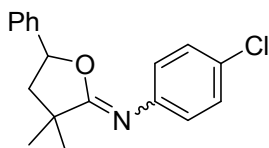
***N*-(5-(4-chlorophenyl)-3,3,5-trimethyldihydrofuran-2(3*H*)-ylidene)aniline 3r**

Colorless oil. ¹H NMR (400 MHz, CDCl₃): δ = 1.05 (s, 3H), 1.43 (s, 3H), 1.61 (s, 3H), 2.29 (d, *J* = 12.8 Hz, 1H), 2.47 (d, *J* = 12.8 Hz, 1H), 7.08 (t, *J* = 7.2 Hz, 1H), 7.13 (d, *J* = 7.2 Hz, 2H), 7.23 (d, *J* = 8.8 Hz, 2H), 7.29-7.35 (m, 4H); ¹³C NMR (100 MHz, CDCl₃): δ = 27.8, 28.4, 31.8, 41.7, 51.4, 85.2, 122.5, 123.3, 125.6, 128.6, 128.6, 132.9, 145.2, 147.5, 167.7. HRMS (ESI-TOF). Calcd for C₁₉H₂₁ClNO, [M+H]⁺ *m/z* 314.1312, Found 314.1310.



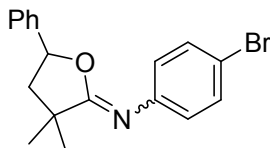
methyl 4,4-dimethyl-5-(phenylimino)tetrahydrofuran-2-carboxylate 3s

Colorless oil. $^1\text{H NMR}$ (400 MHz, CDCl_3): δ = 1.36 (s, 3H), 1.37 (s, 3H), 2.16 (dd, J_1 = 7.2 Hz, J_2 = 12.8 Hz, 1H), 2.36 (dd, J_1 = 8.0 Hz, J_2 = 12.8 Hz, 1H), 3.77 (s, 3H), 4.80 (t, J = 7.6 Hz, 1H), 7.02-7.06 (m, 1H), 7.11 (d, J = 8.0 Hz, 2H), 7.28 (t, J = 7.6 Hz, 2H); $^{13}\text{C NMR}$ (100 MHz, CDCl_3): δ = 26.4, 26.8, 40.1, 41.5, 52.4, 74.9, 122.5, 123.6, 128.4, 146.6, 166.6, 171.1. HRMS (ESI-TOF). Calcd for $\text{C}_{14}\text{H}_{18}\text{NO}_3$, $[\text{M}+\text{H}]^+$ m/z 248.1287, Found 248.1283.



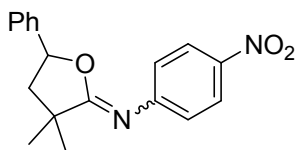
4-chloro-*N*-(3,3-dimethyl-5-phenyldihydrofuran-2(3*H*)-ylidene)aniline 4b

White solid. mp: 104-106 °C. $^1\text{H NMR}$ (400 MHz, CDCl_3): δ = 1.40 (s, 3H), 1.44 (s, 3H), 2.03 (dd, J_1 = 10.0 Hz, J_2 = 12.8 Hz, 1H), 2.43 (dd, J_1 = 6.0 Hz, J_2 = 12.8 Hz, 1H), 5.37 (dd, J_1 = 6.0 Hz, J_2 = 10.4 Hz, 1H), 7.05-7.08 (m, 2H), 7.21-7.38 (m, 7H); $^{13}\text{C NMR}$ (100 MHz, CDCl_3): δ = 26.2, 26.3, 41.9, 47.1, 80.2, 124.2, 125.4, 128.2, 128.5, 128.7, 140.0, 145.8, 168.6. HRMS (ESI-TOF). Calcd for $\text{C}_{18}\text{H}_{19}\text{ClNO}$, $[\text{M}+\text{H}]^+$ m/z 300.1155, Found 300.1166.



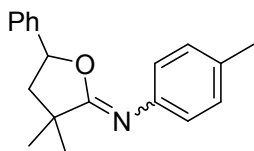
4-bromo-*N*-(3,3-dimethyl-5-phenyldihydrofuran-2(3*H*)-ylidene)aniline 4c

White solid. mp: 128-129 °C. $^1\text{H NMR}$ (400 MHz, CDCl_3): δ = 1.39 (s, 3H), 1.43 (s, 3H), 2.02 (dd, J_1 = 10.0 Hz, J_2 = 12.4 Hz, 1H), 2.41 (dd, J_1 = 6.0 Hz, J_2 = 12.4 Hz, 1H), 5.40 (dd, J_1 = 6.0 Hz, J_2 = 10.0 Hz, 1H), 7.01 (d, J = 8.4 Hz, 2H), 7.24-7.38 (m, 7H); $^{13}\text{C NMR}$ (100 MHz, CDCl_3): δ = 26.1, 26.2, 41.8, 47.0, 80.1, 116.3, 124.6, 125.3, 128.2, 128.6, 131.5, 134.0, 146.3, 168.6. HRMS (ESI-TOF). Calcd for $\text{C}_{18}\text{H}_{19}\text{BrNO}$, $[\text{M}+\text{H}]^+$ m/z 344.0650, Found 344.0648.



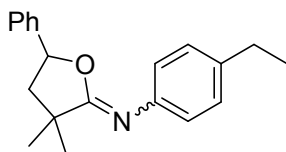
***N*-(3,3-dimethyl-5-phenyldihydrofuran-2(3*H*)-ylidene)-4-nitroaniline 4d**

White solid. mp: 96-98 °C. $^1\text{H NMR}$ (400 MHz, CDCl_3): δ = 1.31 (s, 3H), 1.33 (s, 3H), 1.94 (dd, J_1 = 7.6 Hz, J_2 = 12.8 Hz, 1H), 2.54 (dd, J_1 = 7.6 Hz, J_2 = 12.8 Hz, 1H), 5.26 (t, J = 7.6 Hz, 1H), 7.18 (d, J = 7.2 Hz, 2H), 7.23-7.31 (m, 3H), 7.63 (d, J = 9.2 Hz, 2H), 8.09 (d, J = 9.6 Hz, 2H); $^{13}\text{C NMR}$ (100 MHz, CDCl_3): δ = 25.1, 25.5, 41.7, 44.9, 60.0, 121.5, 124.2, 126.0, 128.0, 129.2, 140.4, 143.6, 144.0, 180.2. HRMS (ESI-TOF). Calcd for $\text{C}_{18}\text{H}_{19}\text{N}_2\text{O}_3$, $[\text{M}+\text{H}]^+$ m/z 311.1396, Found 311.1399.



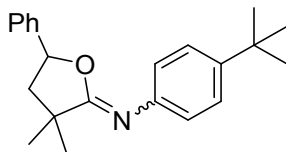
***N*-(3,3-dimethyl-5-phenyldihydrofuran-2(3*H*)-ylidene)-4-methylaniline 4e**

White solid. mp: 106-108 °C. ¹H NMR (400 MHz, CDCl₃): δ = 1.39 (s, 3H), 1.42 (s, 3H), 1.97-2.02 (m, 1H), 2.28 (s, 3H), 2.39 (dd, *J*₁ = 6.0 Hz, *J*₂ = 12.4 Hz, 1H), 5.37 (dd, *J*₁ = 6.0 Hz, *J*₂ = 10.0 Hz, 1H), 7.04-7.09 (m, 4H), 7.27-7.35 (m, 5H); ¹³C NMR (100 MHz, CDCl₃): δ = 20.9, 26.2, 26.3, 41.6, 47.2, 79.7, 122.6, 125.3, 127.9, 128.5, 129.1, 132.7, 140.4, 144.5, 167.6. HRMS (ESI-TOF). Calcd for C₁₉H₂₂NO, [M+H]⁺ *m/z* 280.1701, Found 280.1713.



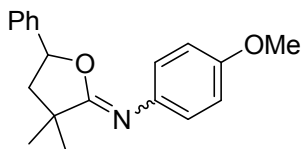
***N*-(3,3-dimethyl-5-phenyldihydrofuran-2(3*H*)-ylidene)-4-ethylaniline 4f**

White solid. mp: 109-110 °C. ¹H NMR (400 MHz, CDCl₃): δ = 1.20 (t, *J* = 7.6 Hz, 3H), 1.40 (s, 3H), 1.43 (s, 3H), 2.01 (t, *J* = 11.6 Hz, 1H), 2.40 (dd, *J*₁ = 6.0 Hz, *J*₂ = 12.4 Hz, 1H), 2.59 (q, *J* = 7.6 Hz, 2H), 5.38 (dd, *J*₁ = 6.0 Hz, *J*₂ = 10.0 Hz, 1H), 6.98-7.17 (m, 4H), 7.24-7.35 (m, 5H); ¹³C NMR (100 MHz, CDCl₃): δ = 15.6, 26.2, 26.4, 28.3, 41.7, 47.3, 79.8, 122.8, 125.4, 127.9, 128.0, 128.5, 139.2, 140.5, 144.6, 167.5. HRMS (ESI-TOF). Calcd for C₂₀H₂₄NO, [M+H]⁺ *m/z* 294.1858, Found 294.1849.



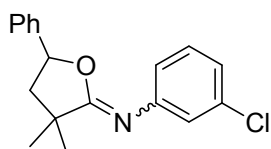
4-(*tert*-butyl)-*N*-(3,3-dimethyl-5-phenyldihydrofuran-2(3*H*)-ylidene)aniline 4g

White solid. mp: 100-102 °C. ¹H NMR (400 MHz, CDCl₃): δ = 1.29 (m, 9H), 1.40 (s, 3H), 1.43 (s, 3H), 2.02 (dd, *J*₁ = 6.0 Hz, *J*₂ = 12.4 Hz, 1H), 2.41 (dd, *J*₁ = 6.0 Hz, *J*₂ = 12.4 Hz, 1H), 5.39 (dd, *J*₁ = 6.0 Hz, *J*₂ = 10.0 Hz, 1H), 7.12 (d, *J* = 8.4 Hz, 2H), 7.25-7.39 (m, 7H); ¹³C NMR (100 MHz, CDCl₃): δ = 26.3, 26.4, 31.5, 34.2, 41.7, 47.4, 79.9, 122.6, 125.3, 125.5, 128.0, 128.6, 140.5, 144.2, 146.2, 167.4. HRMS (ESI-TOF). Calcd for C₂₂H₂₈NO, [M+H]⁺ *m/z* 322.2171, Found 322.2153.



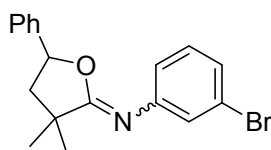
***N*-(3,3-dimethyl-5-phenyldihydrofuran-2(3*H*)-ylidene)-4-methoxyaniline 4h**

White solid. mp: 76-78 °C. ¹H NMR (400 MHz, CDCl₃): δ = 1.40 (s, 3H), 1.43 (s, 3H), 2.01 (dd, *J*₁ = 10.4 Hz, *J*₂ = 12.8 Hz, 1H), 2.41 (dd, *J*₁ = 6.0 Hz, *J*₂ = 12.8 Hz, 1H), 3.77 (s, 3H), 5.40 (dd, *J*₁ = 6.0 Hz, *J*₂ = 10.0 Hz, 1H), 6.83 (d, *J* = 8.8 Hz, 2H), 7.16 (d, *J* = 9.2 Hz, 2H), 7.30-7.34 (m, 5H); ¹³C NMR (100 MHz, CDCl₃): δ = 26.2, 26.4, 41.8, 47.3, 55.4, 79.8, 113.7, 124.3, 125.4, 128.0, 128.6, 140.1, 140.5, 155.9, 167.2. HRMS (ESI-TOF). Calcd for C₁₉H₂₂NO₂, [M+H]⁺ *m/z* 296.1651, Found 296.1647.



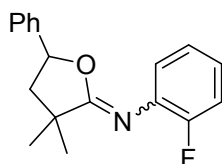
3-chloro-*N*-(3,3-dimethyl-5-phenyldihydrofuran-2(3*H*)-ylidene)aniline 4i

White solid. mp: 98-100 °C. ¹H NMR (400 MHz, CDCl₃): δ = 1.40 (s, 3H), 1.44 (s, 3H), 2.03 (dd, *J*₁ = 10.4 Hz, *J*₂ = 12.8 Hz, 1H), 2.44 (dd, *J*₁ = 6.0 Hz, *J*₂ = 12.8 Hz, 1H), 5.42 (dd, *J*₁ = 6.0 Hz, *J*₂ = 10.0 Hz, 1H), 6.98-7.02 (m, 2H), 7.13 (t, *J* = 2.0 Hz, 1H), 7.19 (t, *J* = 8.0 Hz, 1H), 7.27-7.39 (m, 5H); ¹³C NMR (100 MHz, CDCl₃): δ = 26.2, 26.3, 41.9, 47.1, 80.2, 121.0, 123.0, 123.4, 125.4, 128.2, 128.7, 129.5, 134.0, 140.0, 148.7, 168.9. HRMS (ESI-TOF). Calcd for C₁₈H₁₉ClNO, [M+H]⁺ *m/z* 300.1155, Found 300.1157.



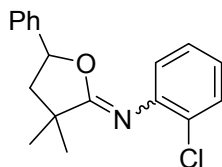
3-bromo-*N*-(3,3-dimethyl-5-phenyldihydrofuran-2(3*H*)-ylidene)aniline 4j

White solid. mp: 106-107 °C. ¹H NMR (400 MHz, CDCl₃): δ = 1.39 (s, 3H), 1.44 (s, 3H), 2.03 (dd, *J*₁ = 10.4 Hz, *J*₂ = 12.8 Hz, 1H), 2.43 (dd, *J*₁ = 6.0 Hz, *J*₂ = 12.8 Hz, 1H), 5.42 (dd, *J*₁ = 6.0 Hz, *J*₂ = 10.0 Hz, 1H), 7.03-7.05 (m, 1H), 7.11-7.17 (m, 2H), 7.25-7.39 (m, 6H); ¹³C NMR (100 MHz, CDCl₃): δ = 26.1, 26.2, 41.9, 47.1, 80.2, 121.4, 122.1, 125.3, 125.9, 126.3, 128.2, 128.7, 129.8, 140.0, 148.8, 168.9. HRMS (ESI-TOF). Calcd for C₁₈H₁₉BrNO, [M+H]⁺ *m/z* 344.0650, Found 344.0656.



***N*-(3,3-dimethyl-5-phenyldihydrofuran-2(3*H*)-ylidene)-2-fluoroaniline 4k**

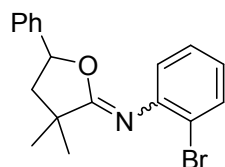
White solid. mp: 114-115 °C. ¹H NMR (400 MHz, CDCl₃): δ = 1.44 (s, 3H), 1.47 (s, 3H), 2.04 (dd, *J*₁ = 10.4 Hz, *J*₂ = 12.8 Hz, 1H), 2.42 (dd, *J*₁ = 6.0 Hz, *J*₂ = 12.8 Hz, 1H), 5.39 (dd, *J*₁ = 6.0 Hz, *J*₂ = 10.0 Hz, 1H), 6.93-7.08 (m, 4H), 7.24-7.35 (m, 5H); ¹³C NMR (100 MHz, CDCl₃): δ = 26.1, 26.2, 41.8, 47.6, 80.3, 115.6 (d, *J* = 21.0 Hz), 123.8 (d, *J* = 4.0 Hz), 124.0 (d, *J* = 3.0 Hz), 124.1, 125.4, 128.1, 128.5, 135.5 (d, *J* = 14.0 Hz), 140.0, 154.1 (d, *J* = 243.0 Hz), 170.2. HRMS (ESI-TOF). Calcd for C₁₈H₁₉FNO, [M+H]⁺ *m/z* 284.1451, Found 284.1453.



2-chloro-*N*-(3,3-dimethyl-5-phenyldihydrofuran-2(3*H*)-ylidene)aniline 4l

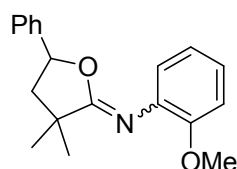
White solid. mp: 66-68 °C. ¹H NMR (400 MHz, CDCl₃): δ = 1.46 (s, 3H), 1.50 (s, 3H), 2.05 (dd, *J*₁ = 10.4 Hz, *J*₂ = 12.8 Hz, 1H), 2.43 (dd, *J*₁ = 6.0 Hz, *J*₂ = 12.8 Hz, 1H), 5.40 (dd, *J*₁ = 6.0 Hz, *J*₂ = 10.0 Hz, 1H), 6.92-7.01 (m, 2H), 7.14-7.18 (m, 1H), 7.25-7.35 (m, 6H); ¹³C NMR (100 MHz, CDCl₃): δ = 26.1, 26.2, 41.7, 47.5, 80.3, 122.7, 123.9, 125.5, 125.8, 126.9, 128.1, 128.5, 129.4,

140.0, 145.4, 169.4. HRMS (ESI-TOF). Calcd for C₁₈H₁₉ClNO, [M+H]⁺ *m/z* 300.1155, Found 300.1154.



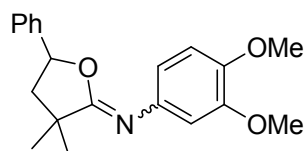
2-bromo-*N*-(3,3-dimethyl-5-phenyldihydrofuran-2(3*H*)-ylidene)aniline 4m

Colorless oil. ¹H NMR (400 MHz, CDCl₃): δ = 1.47 (s, 3H), 1.51 (s, 3H), 2.05 (dd, *J*₁ = 10.4 Hz, *J*₂ = 12.4 Hz, 1H), 2.43 (dd, *J*₁ = 6.0 Hz, *J*₂ = 12.8 Hz, 1H), 5.40 (dd, *J*₁ = 6.0 Hz, *J*₂ = 10.4 Hz, 1H), 6.87 (dt, *J*₁ = 1.6 Hz, *J*₂ = 7.6 Hz, 1H), 6.99 (dd, *J*₁ = 1.6 Hz, *J*₂ = 7.6 Hz, 1H), 7.20 (dt, *J*₁ = 1.2 Hz, *J*₂ = 7.6 Hz, 1H), 7.25-7.35 (m, 5H), 7.52 (dd, *J*₁ = 1.2 Hz, *J*₂ = 8.0 Hz, 1H); ¹³C NMR (100 MHz, CDCl₃): δ = 26.0, 26.2, 41.8, 47.5, 80.4, 116.1, 122.5, 124.2, 125.5, 127.6, 128.1, 128.5, 132.5, 140.0, 146.8, 169.2. HRMS (ESI-TOF). Calcd for C₁₈H₁₉BrNO, [M+H]⁺ *m/z* 344.0650, Found 344.0648.



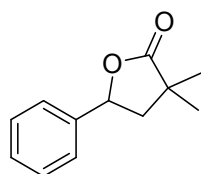
***N*-(3,3-dimethyl-5-phenyldihydrofuran-2(3*H*)-ylidene)-2-methoxyaniline 4n**

Colorless oil. ¹H NMR (400 MHz, CDCl₃): δ = 1.44 (s, 3H), 1.48 (s, 3H), 2.03 (dd, *J*₁ = 10.4 Hz, *J*₂ = 12.8 Hz, 1H), 2.42 (dd, *J*₁ = 6.0 Hz, *J*₂ = 12.8 Hz, 1H), 3.83 (s, 3H), 5.36 (dd, *J*₁ = 6.0 Hz, *J*₂ = 10.0 Hz, 1H), 6.88 (t, *J* = 8.0 Hz, 2H), 6.96-7.01 (m, 2H), 7.27-7.34 (m, 5H); ¹³C NMR (100 MHz, CDCl₃): δ = 26.3, 26.3, 41.5, 47.7, 55.7, 79.7, 111.5, 120.6, 122.5, 123.8, 125.4, 127.9, 128.4, 137.2, 140.7, 150.7, 168.8. HRMS (ESI-TOF). Calcd for C₁₉H₂₂NO₂, [M+H]⁺ *m/z* 296.1651, Found 296.1649.



***N*-(3,3-dimethyl-5-phenyldihydrofuran-2(3*H*)-ylidene)-3,4-dimethoxyaniline 4o**

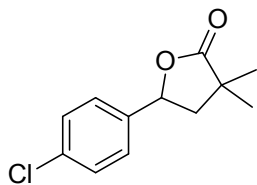
Yellow oil. ¹H NMR (400 MHz, CDCl₃): δ = 1.40 (s, 3H), 1.44 (s, 3H), 2.02 (dd, *J*₁ = 10.4 Hz, *J*₂ = 12.4 Hz, 1H), 2.42 (dd, *J*₁ = 6.0 Hz, *J*₂ = 12.4 Hz, 1H), 3.83 (s, 3H), 3.84 (s, 3H), 5.42 (dd, *J*₁ = 6.0 Hz, *J*₂ = 10.0 Hz, 1H), 6.77-6.82 (m, 3H), 7.28-7.38 (m, 5H); ¹³C NMR (100 MHz, CDCl₃): δ = 26.1, 26.3, 41.8, 47.1, 55.6, 55.9, 79.8, 107.6, 111.0, 114.7, 125.3, 128.0, 128.5, 140.3, 145.3, 148.6, 167.4. HRMS (ESI-TOF). Calcd for C₂₀H₂₄NO₃, [M+H]⁺ *m/z* 326.1756, Found 326.1756.



3,3-dimethyl-5-phenyldihydrofuran-2(3*H*)-one 5a

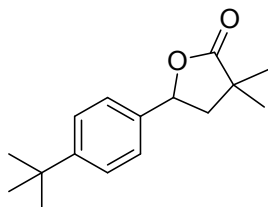
Colorless oil. ¹H NMR (400 MHz, CDCl₃): δ = 1.31 (s, 3H), 1.37 (s, 3H), 2.04-2.11 (m, 1H), 2.48

(dd, $J_1 = 6.4$ Hz, $J_2 = 12.8$ Hz, 1H), 5.45 (dd, $J_1 = 6.4$ Hz, $J_2 = 10.0$ Hz, 1H), 7.32-7.40 (m, 5H); ^{13}C NMR (100 MHz, CDCl_3): $\delta = 24.3, 25.0, 40.7, 46.1, 77.5, 125.3, 128.3, 128.7, 139.6, 181.6$. HRMS (ESI-TOF). Calcd for $\text{C}_{12}\text{H}_{15}\text{O}_2$, $[\text{M}+\text{H}]^+ m/z 191.1072$, Found 191.1068.



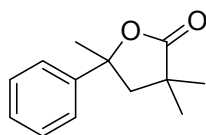
5-(4-chlorophenyl)-3,3-dimethyl-2(3H)-furanone 5b

Colorless oil. ^1H NMR (400 MHz, CDCl_3): $\delta = 1.25$ (s, 3H), 1.30 (s, 3H), 1.97 (dd, $J_1 = 10.0$ Hz, $J_2 = 12.8$ Hz, 1H), 2.43 (dd, $J_1 = 6.0$ Hz, $J_2 = 12.8$ Hz, 1H), 5.36 (dd, $J_1 = 6.4$ Hz, $J_2 = 9.6$ Hz, 1H), 7.22 (d, $J = 8.4$ Hz, 2H), 7.29 (d, $J = 8.8$ Hz, 2H); ^{13}C NMR (100 MHz, CDCl_3): $\delta = 24.1, 24.8, 40.6, 45.9, 76.7, 126.6, 128.8, 134.0, 138.0, 181.2$. HRMS (ESI-TOF). Calcd for $\text{C}_{12}\text{H}_{14}\text{ClO}_2$, $[\text{M}+\text{H}]^+ m/z 225.0682$, Found 225.0685.



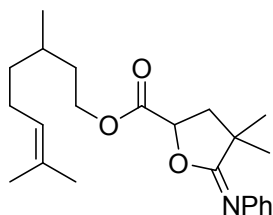
5-(4-(tert-butyl)phenyl)-3,3-dimethyl-2(3H)-furanone 5c

Colorless oil. ^1H NMR (400 MHz, CDCl_3): $\delta = 1.32$ (s, 3H), 1.33 (s, 9H), 1.37 (s, 3H), 2.10 (dd, $J_1 = 10.0$ Hz, $J_2 = 12.8$ Hz, 1H), 2.46 (dd, $J_1 = 6.0$ Hz, $J_2 = 12.8$ Hz, 1H), 5.43 (dd, $J_1 = 6.0$ Hz, $J_2 = 10.0$ Hz, 1H), 7.28 (d, $J = 8.4$ Hz, 2H), 7.41 (d, $J = 8.4$ Hz, 2H); ^{13}C NMR (100 MHz, CDCl_3): $\delta = 24.2, 25.0, 31.3, 34.6, 40.7, 45.9, 77.6, 125.2, 125.6, 136.4, 151.5, 181.6$. HRMS (ESI-TOF). Calcd for $\text{C}_{16}\text{H}_{23}\text{O}_2$, $[\text{M}+\text{H}]^+ m/z 247.1698$, Found 247.1692.



3,3,5-trimethyl-5-phenyl-2(3H)-furanone 5d

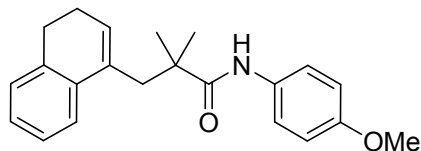
Colorless oil. ^1H NMR (400 MHz, CDCl_3): $\delta = 0.98$ (s, 3H), 1.34 (s, 3H), 1.71 (s, 3H), 2.35 (d, $J = 12.8$ Hz, 1H), 2.56 (d, $J = 13.2$ Hz, 1H), 7.25-7.29 (m, 1H), 7.34-7.40 (m, 4H); ^{13}C NMR (100 MHz, CDCl_3): $\delta = 25.9, 26.7, 32.0, 40.8, 50.8, 83.4, 124.0, 127.3, 128.6, 146.0, 181.7$. HRMS (ESI-TOF). Calcd for $\text{C}_{13}\text{H}_{17}\text{O}_2$, $[\text{M}+\text{H}]^+ m/z 205.1229$, Found 205.1225.



3,7-dimethyloct-6-en-1-yl 4,4-dimethyl-5-(phenylimino)tetrahydrofuran-2-carboxylate 7

Colorless oil. ^1H NMR (400 MHz, CDCl_3): $\delta = 0.92$ (d, $J = 6.8$ Hz, 3H), 1.20-1.35 (m, 2H), 1.38 (s, 6H), 1.47-1.57 (m, 2H), 1.60 (s, 3H), 1.68-1.73 (m, 4H), 1.93-2.02 (m, 2H), 2.16 (dd, $J_1 = 7.2$

Hz, $J_2 = 12.8$ Hz, 1H), 2.38 (dd, $J_1 = 8.0$ Hz, $J_2 = 12.8$ Hz, 1H), 4.18-4.26 (m, 2H), 4.79 (t, $J = 7.6$ Hz, 1H), 5.06-5.09 (m, 1H), 7.04 (t, $J = 7.6$ Hz, 1H), 7.12 (d, $J = 7.6$ Hz, 2H), 7.29 (d, $J = 8.0$ Hz, 2H); ^{13}C NMR (100 MHz, CDCl_3): $\delta = 17.6, 19.3, 25.3, 25.7, 26.4, 26.9, 29.4, 35.3, 36.9, 40.2, 41.6, 64.1, 75.1, 122.6, 123.7, 124.4, 128.5, 131.4, 146.7, 166.8, 170.9$. HRMS (ESI-TOF). Calcd for $\text{C}_{23}\text{H}_{34}\text{NO}_3$, $[\text{M}+\text{H}]^+$ m/z 372.2539, Found 372.2536.

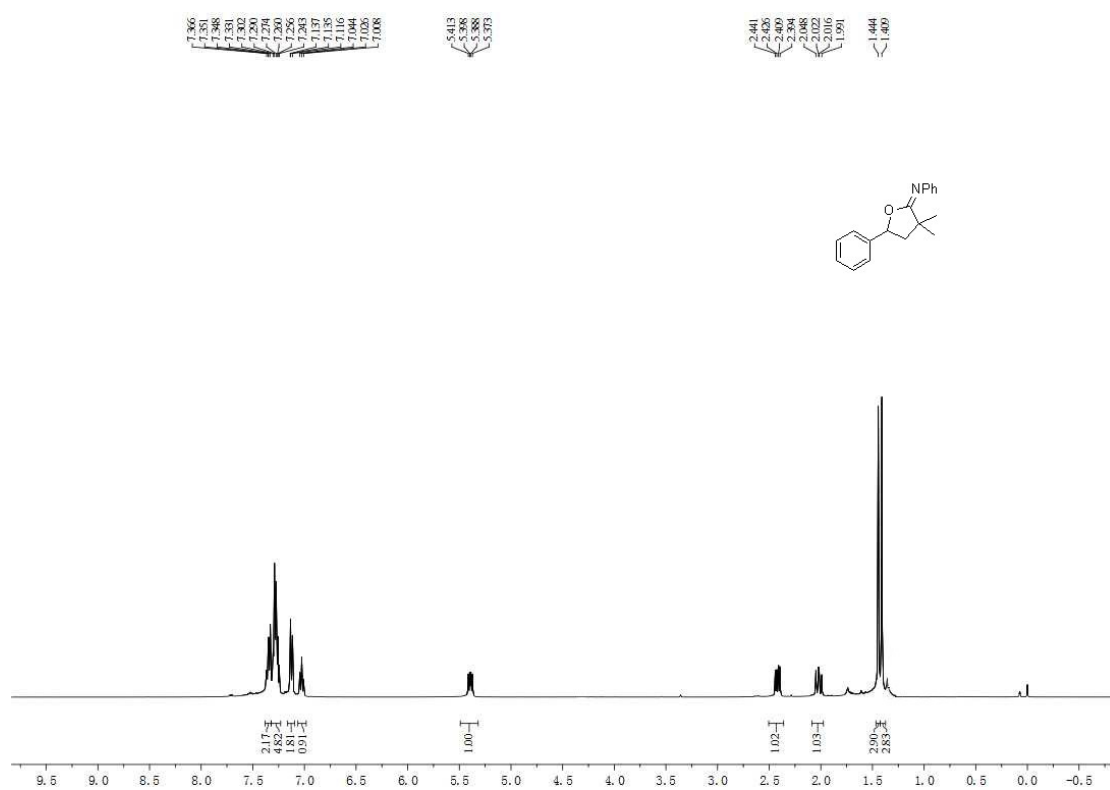


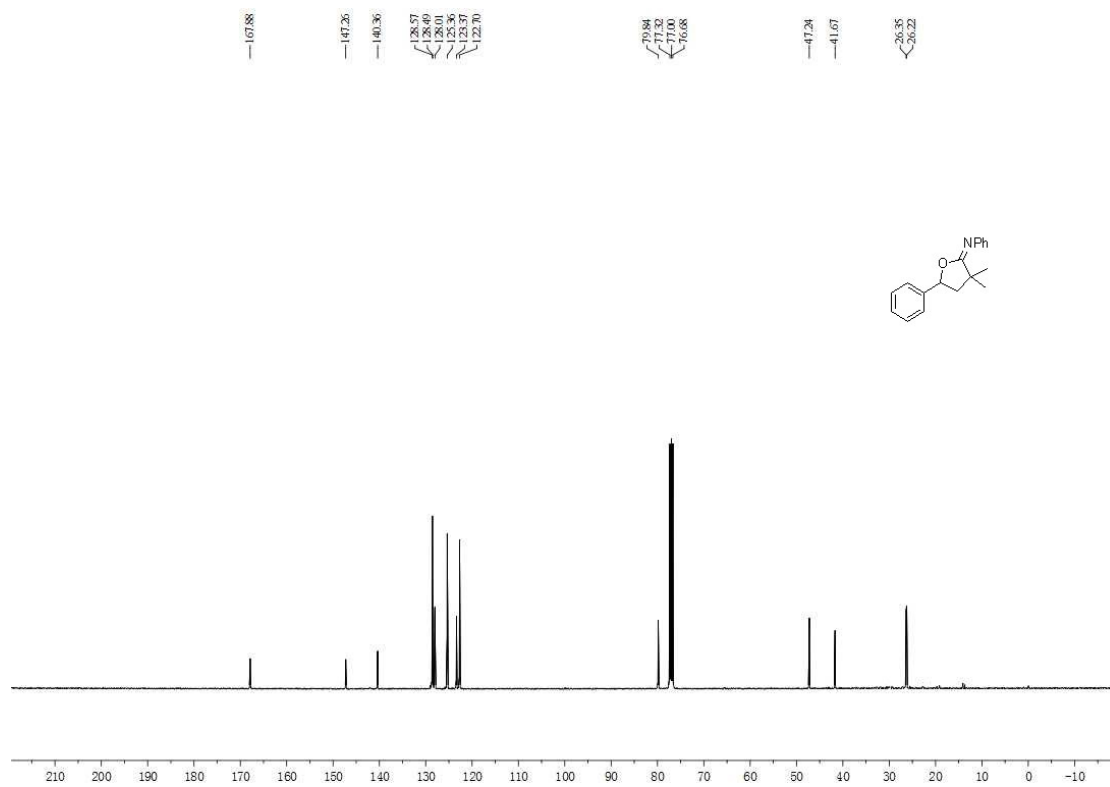
3-(3,4-dihydronaphthalen-1-yl)-N-(4-methoxyphenyl)-2,2-dimethylpropanamide 8

Colorless oil. ^1H NMR (400 MHz, CDCl_3): $\delta = 1.27$ (s, 6H), 2.17-2.22 (m, 2H), 2.67 (t, $J = 8.0$ Hz, 2H), 2.81 (s, 2H), 3.77 (s, 3H), 5.93 (t, $J = 4.4$ Hz, 1H), 6.79 (d, $J = 8.8$ Hz, 2H), 7.07-7.24 (m, 6H), 7.31 (d, $J = 7.6$ Hz, 1H); ^{13}C NMR (100 MHz, CDCl_3): $\delta = 23.3, 26.0, 28.8, 42.3, 43.7, 55.5, 114.0, 122.1, 123.3, 126.3, 126.6, 127.5, 129.5, 130.9, 133.5, 135.3, 136.3, 156.4, 175.4$. HRMS (ESI-TOF). Calcd for $\text{C}_{22}\text{H}_{26}\text{NO}_2$, $[\text{M}+\text{H}]^+$ m/z 336.1964, Found 336.1960.

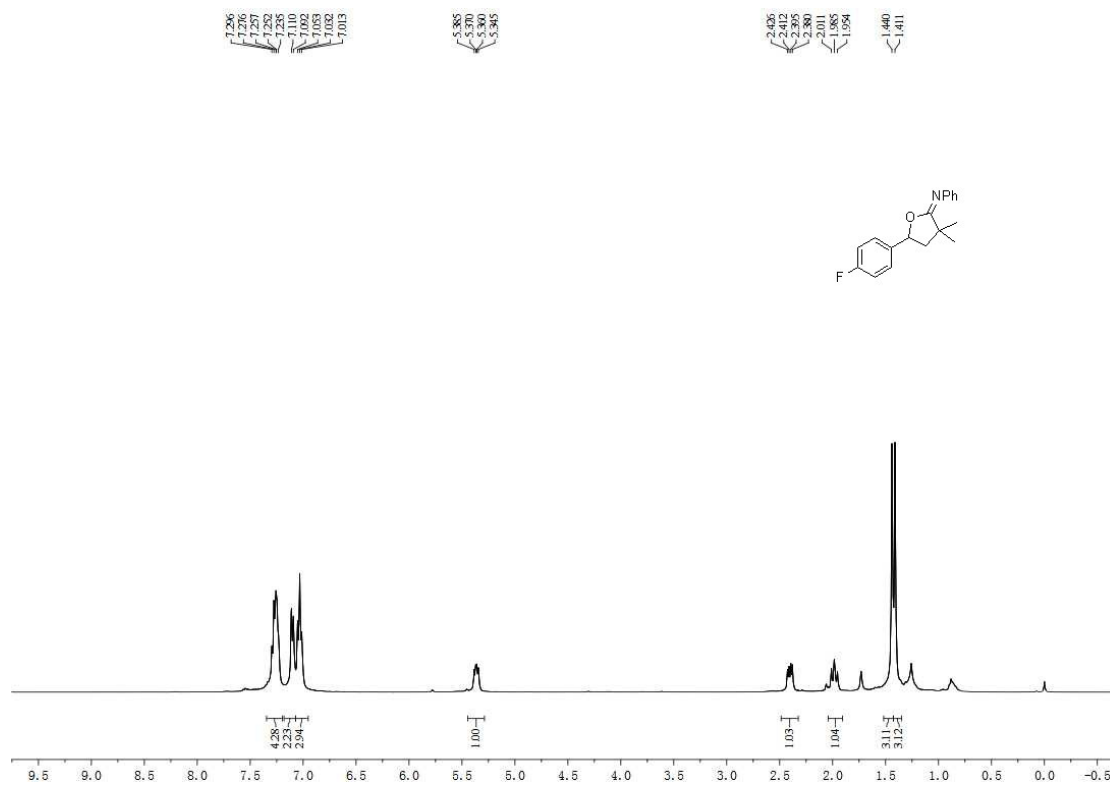
IV. ^1H and ^{13}C NMR Spectra of Compounds 3, 4, 5, 7 and 8

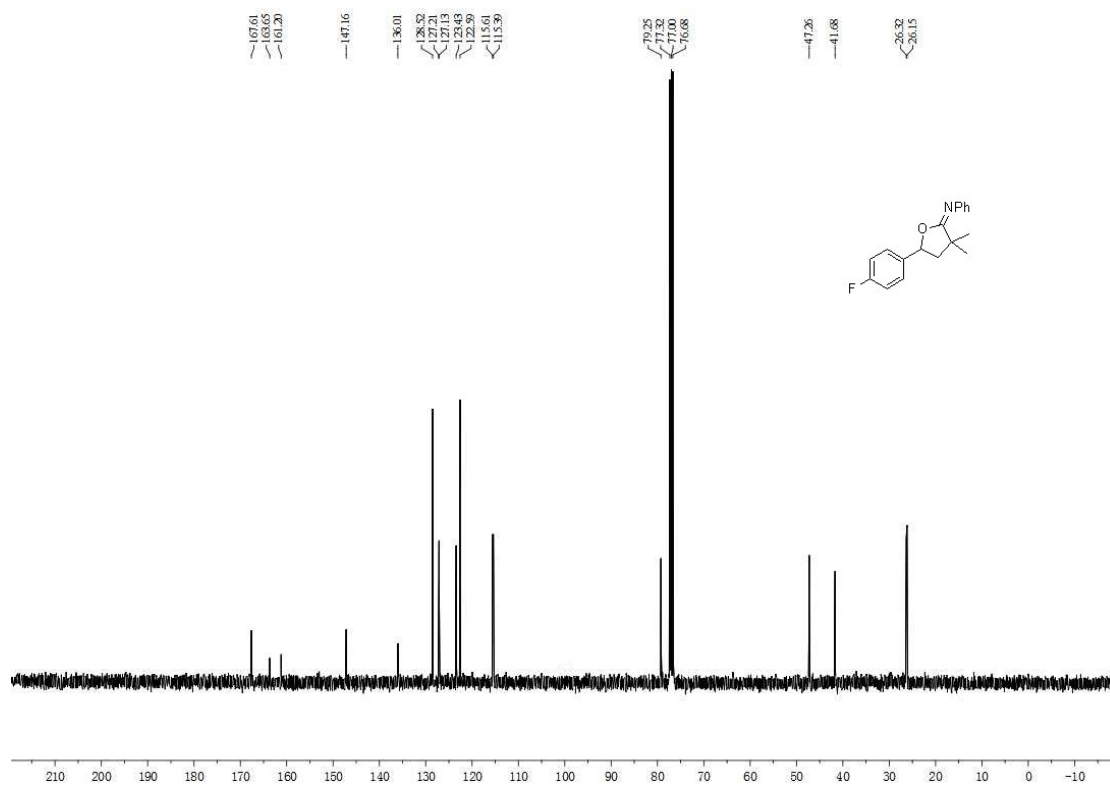
Product 3a



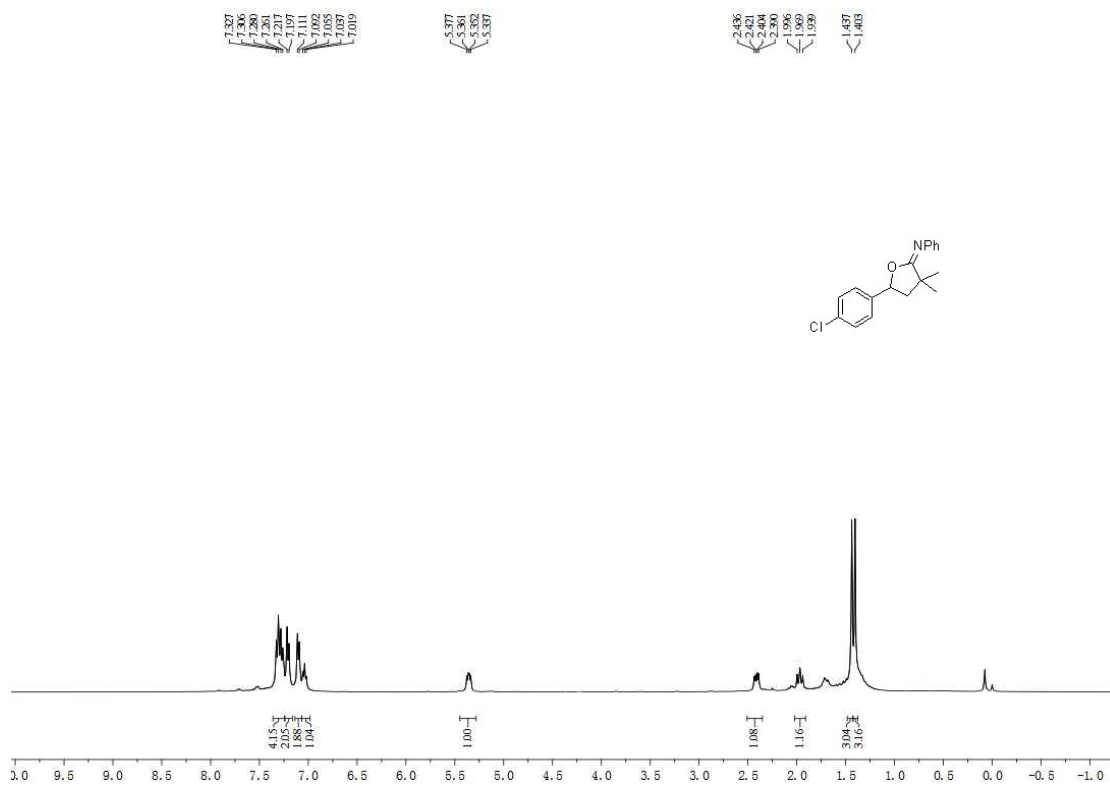


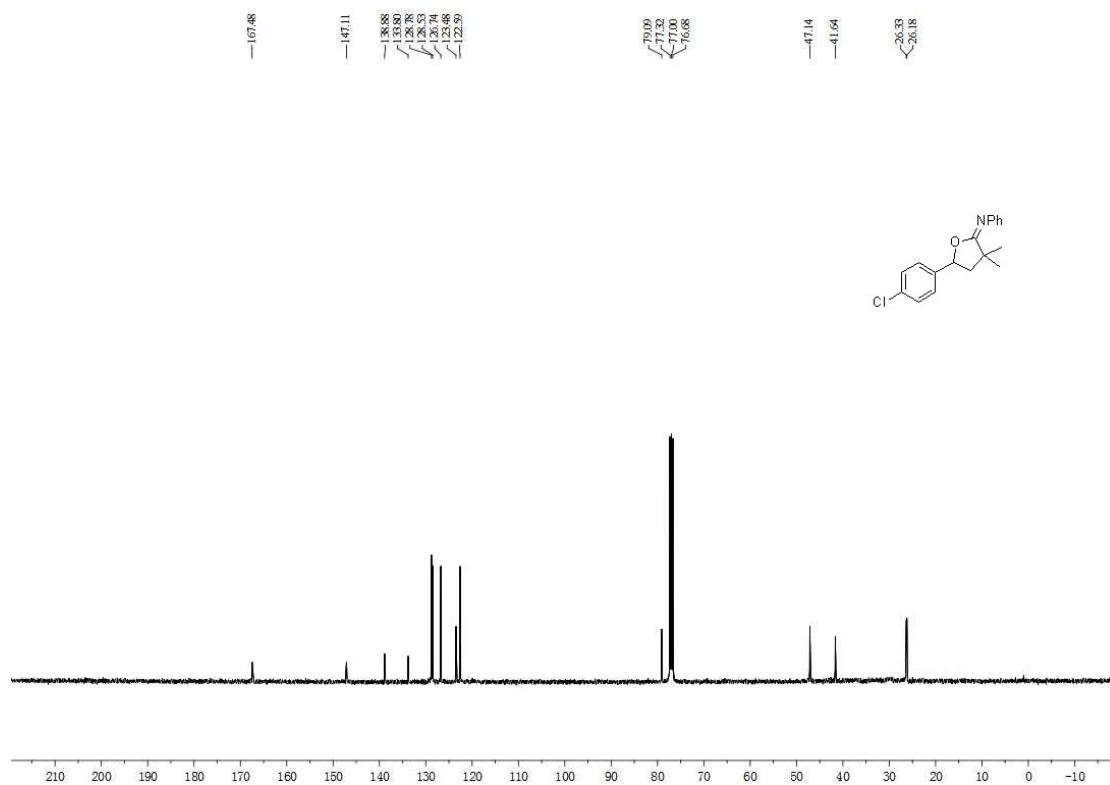
Product 3b



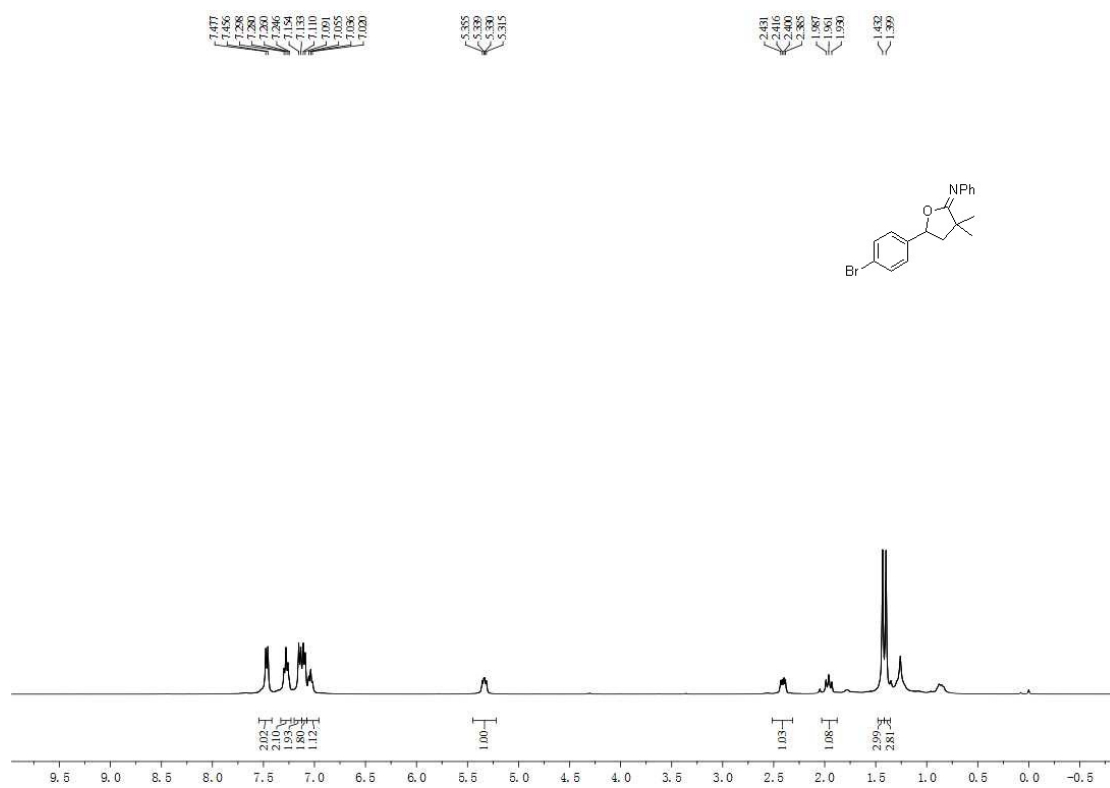


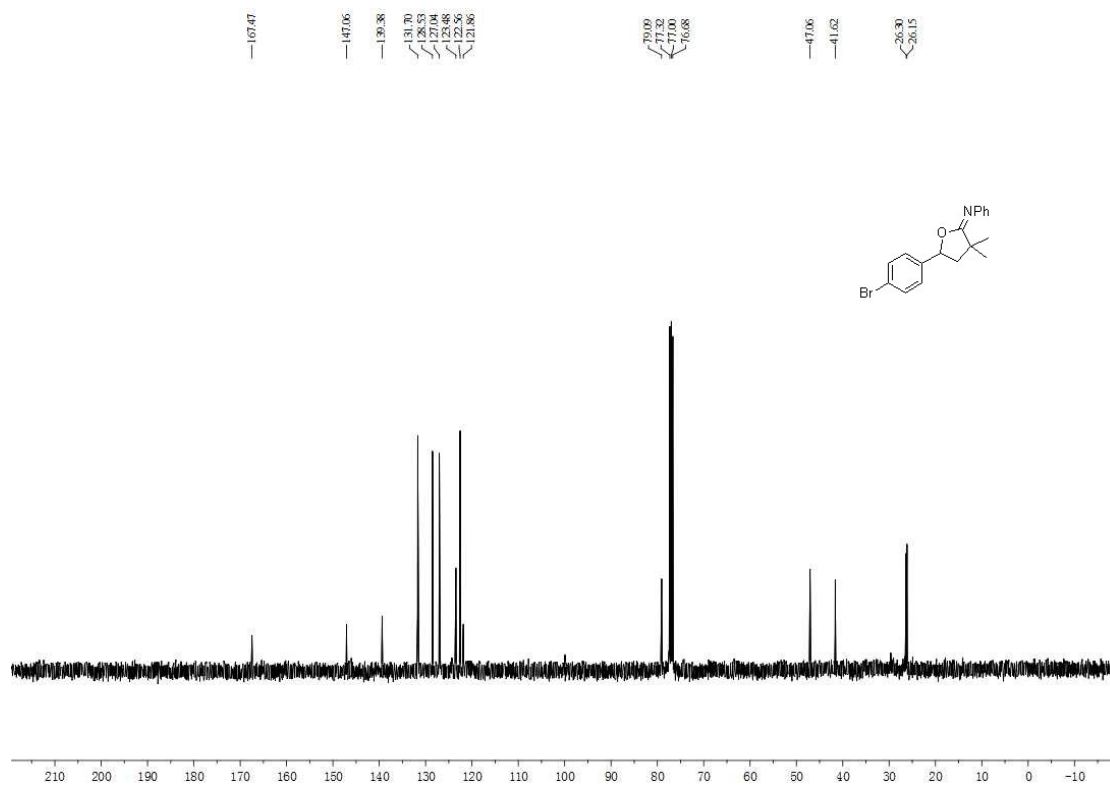
Product 3c



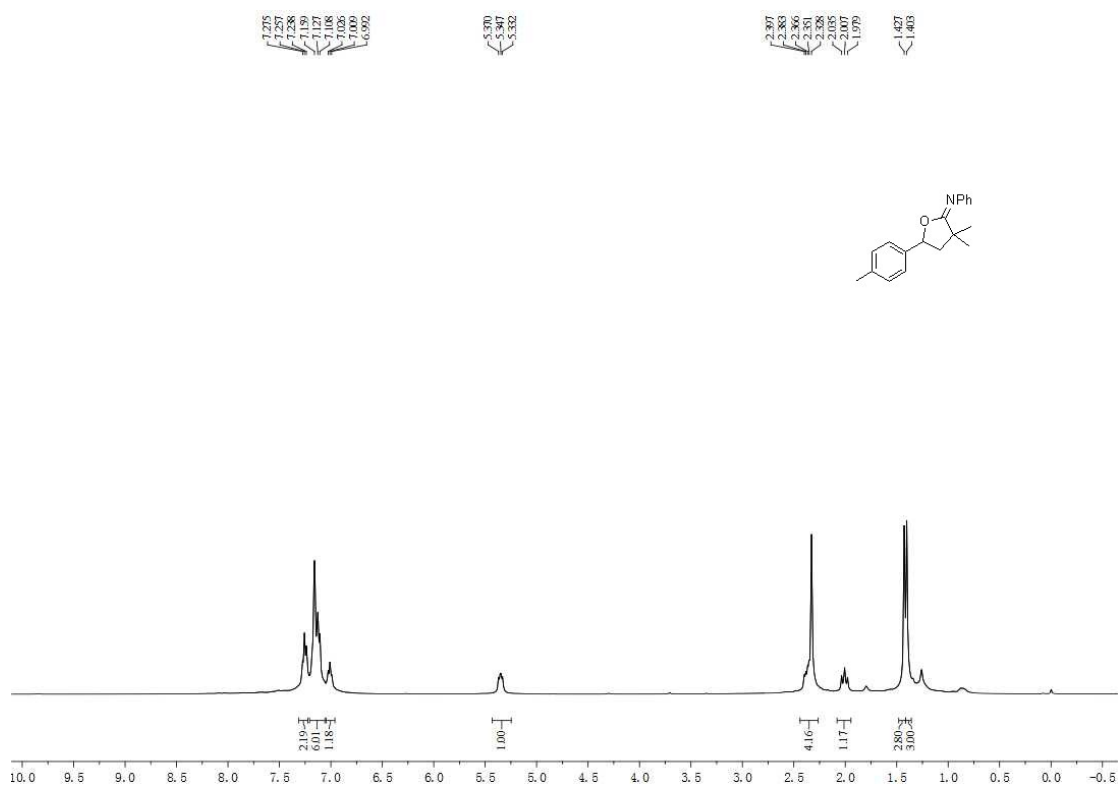


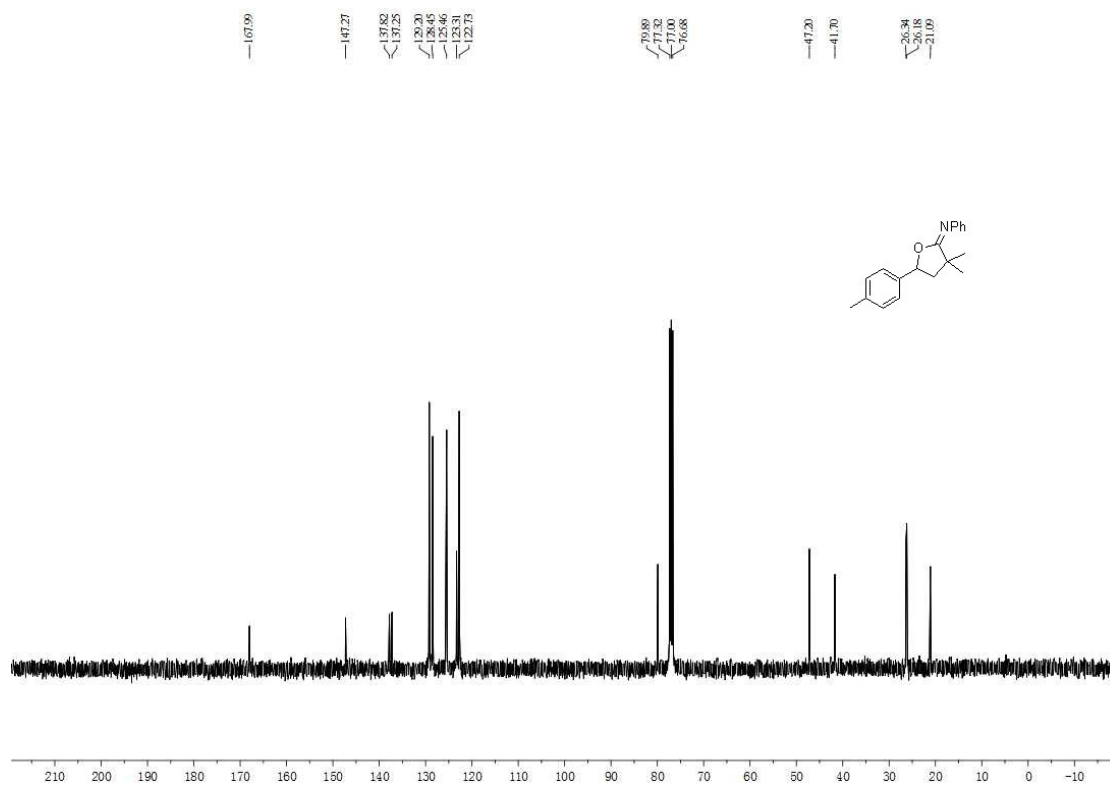
Product 3d



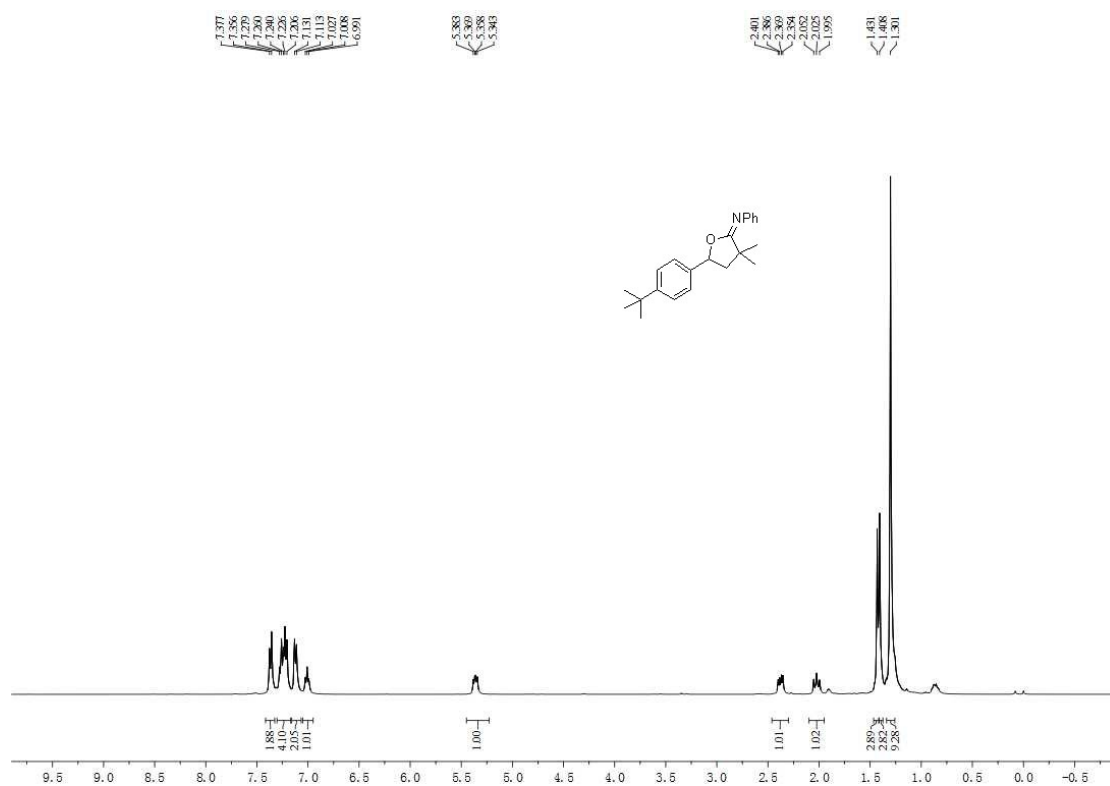


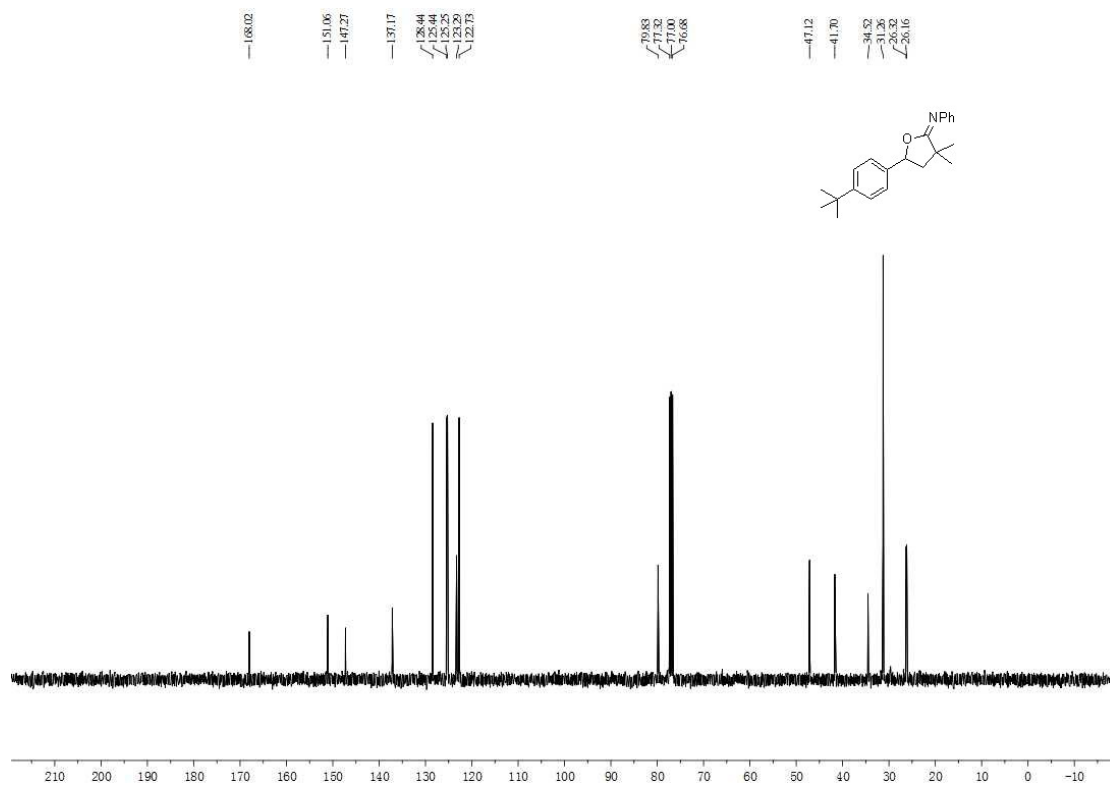
Product 3e



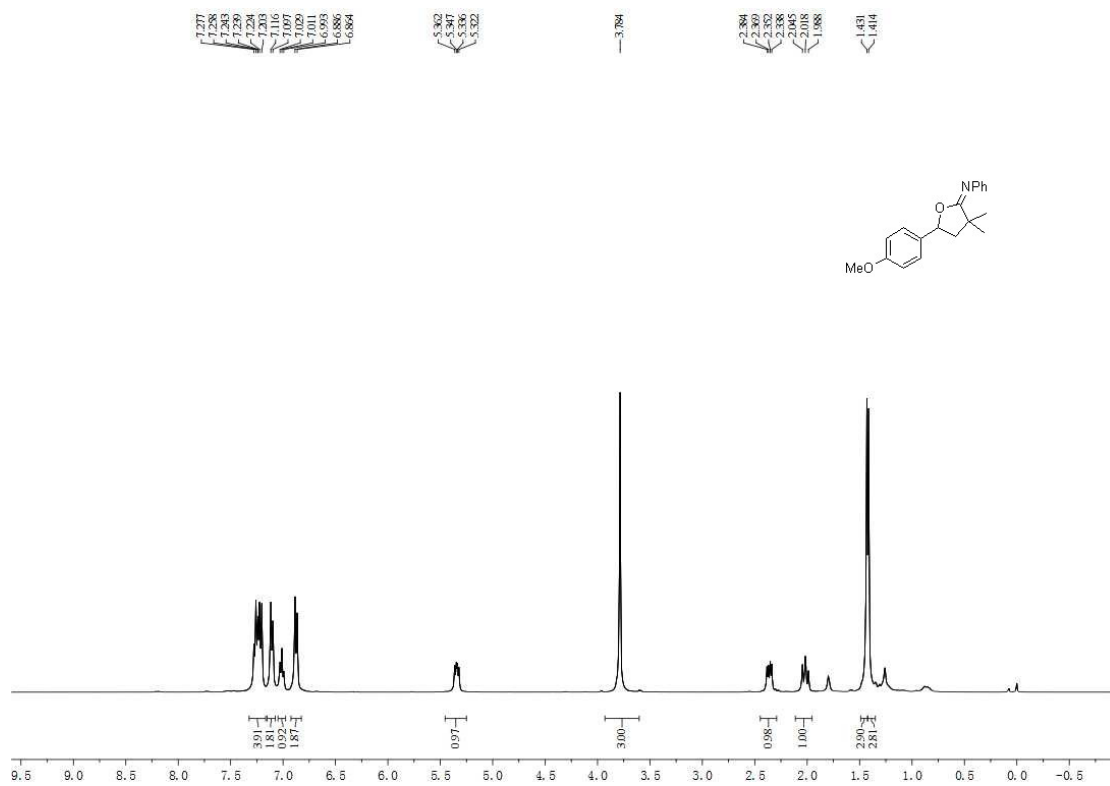


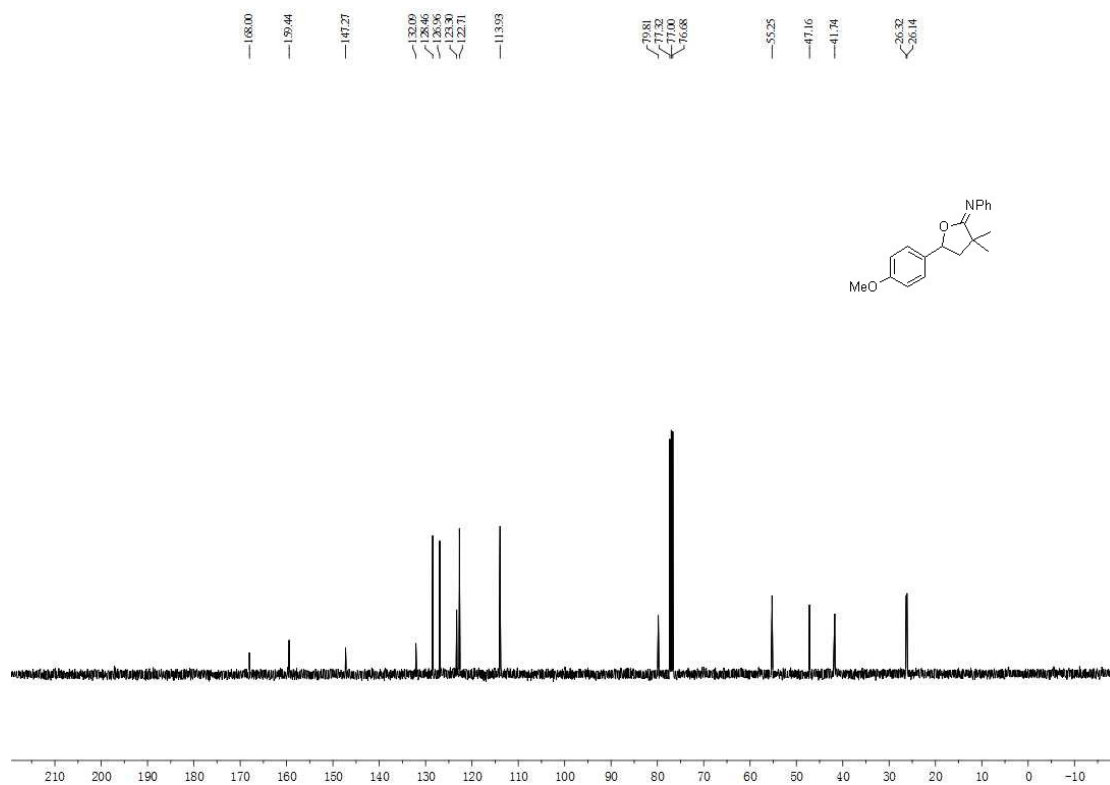
Product 3f



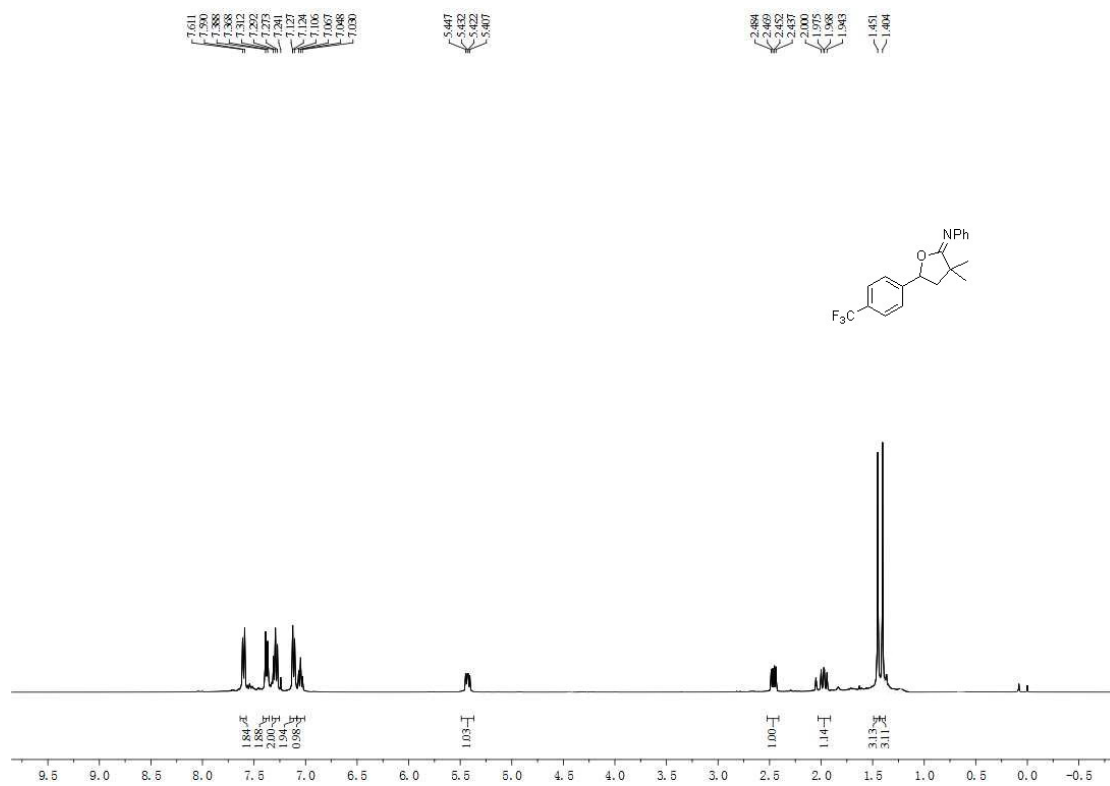


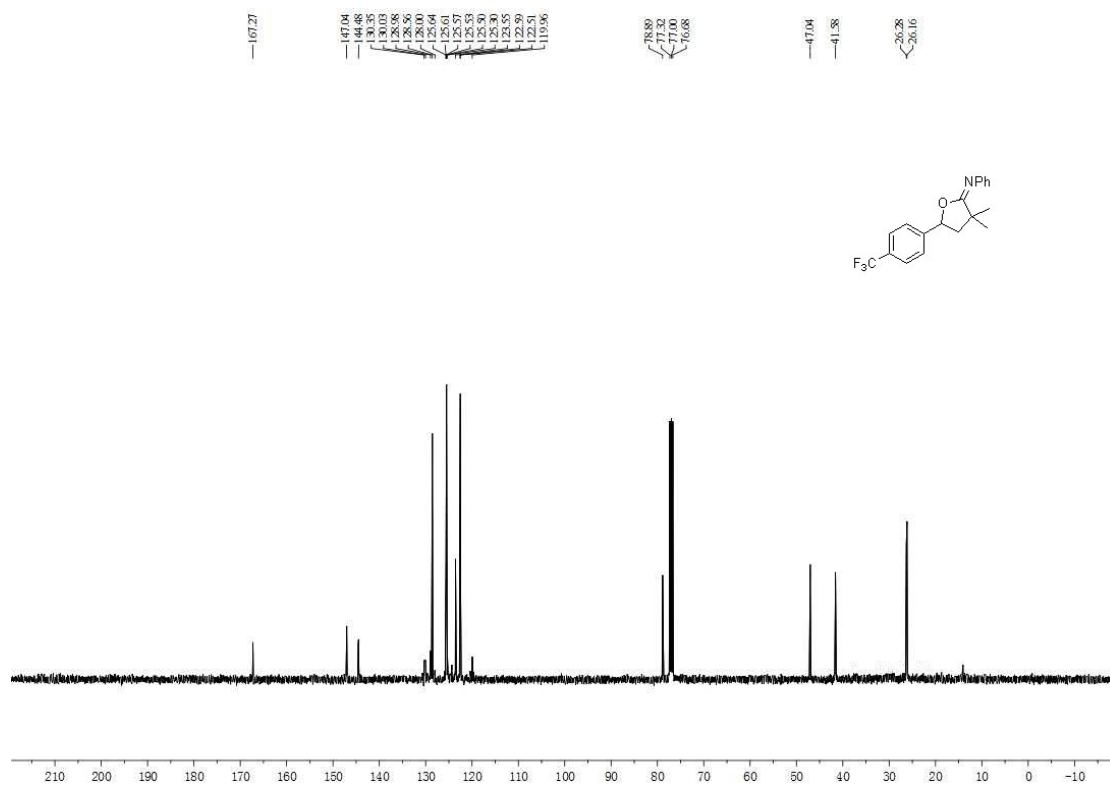
Product 3g



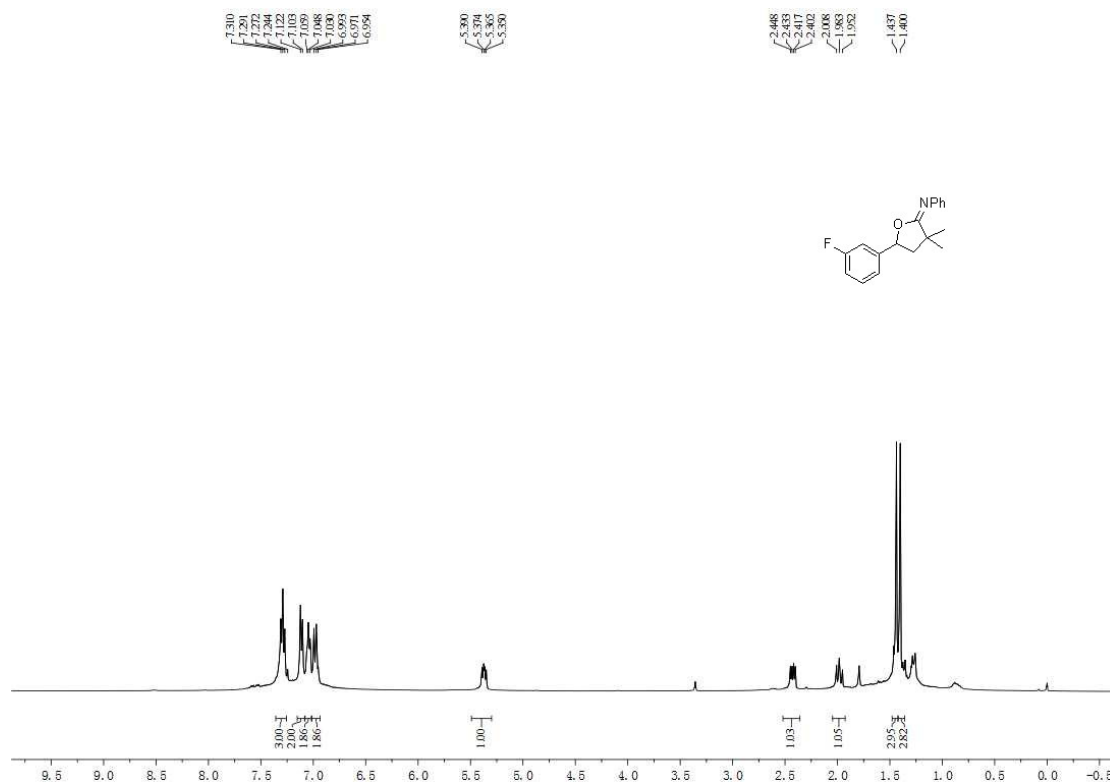


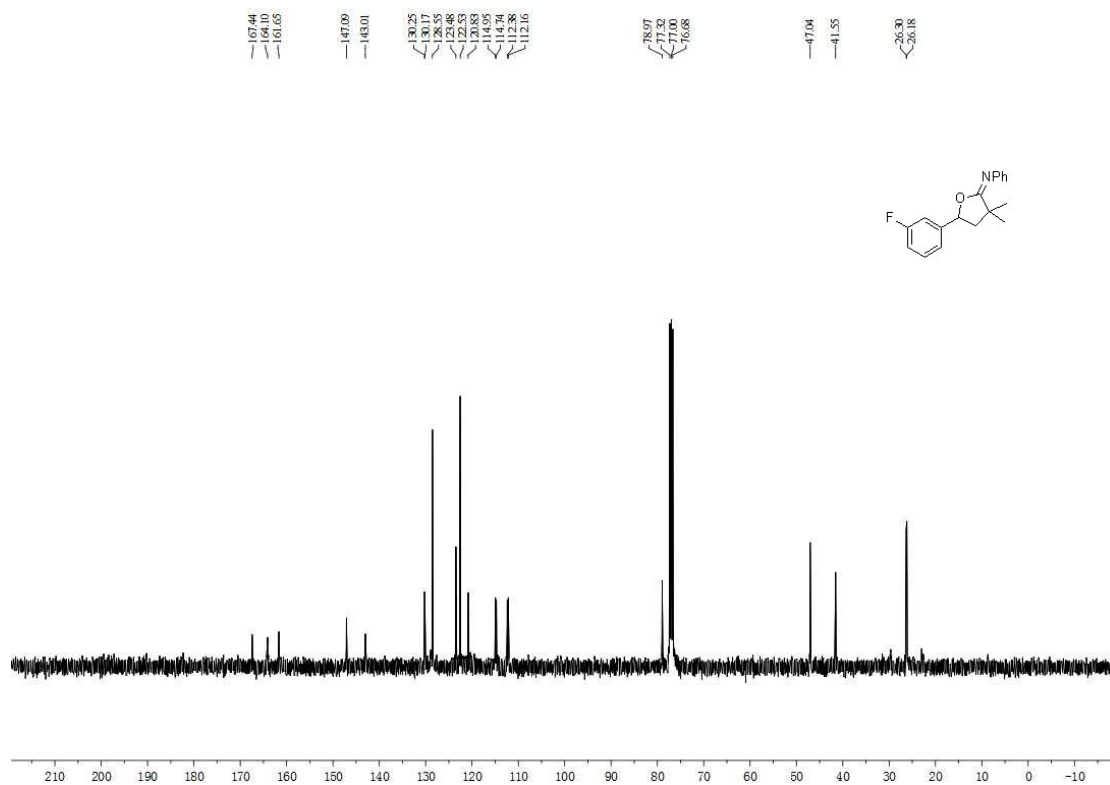
Product 3h



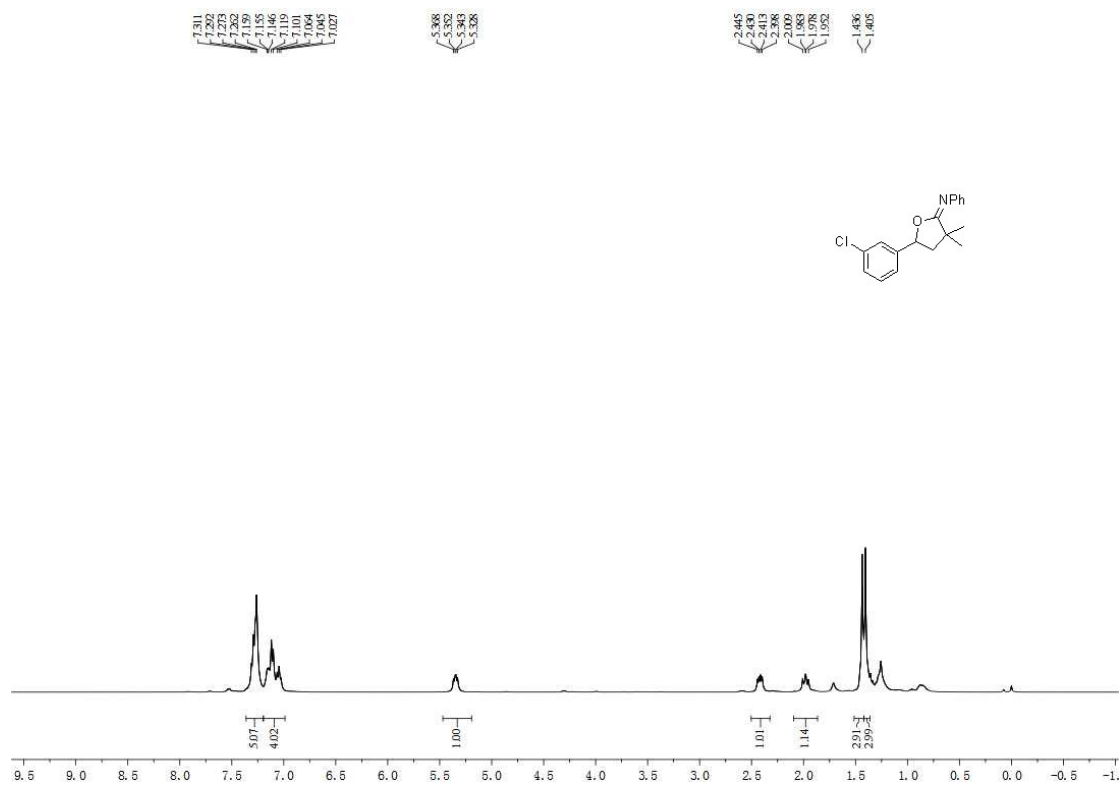


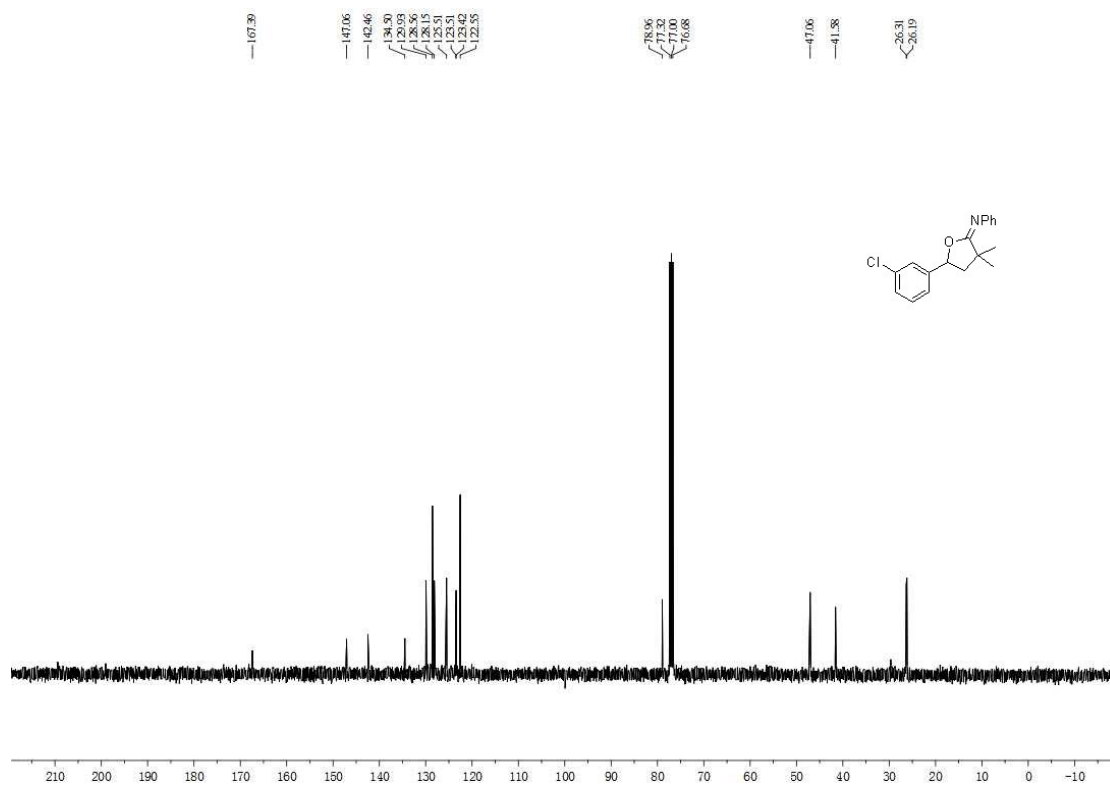
Product 3i



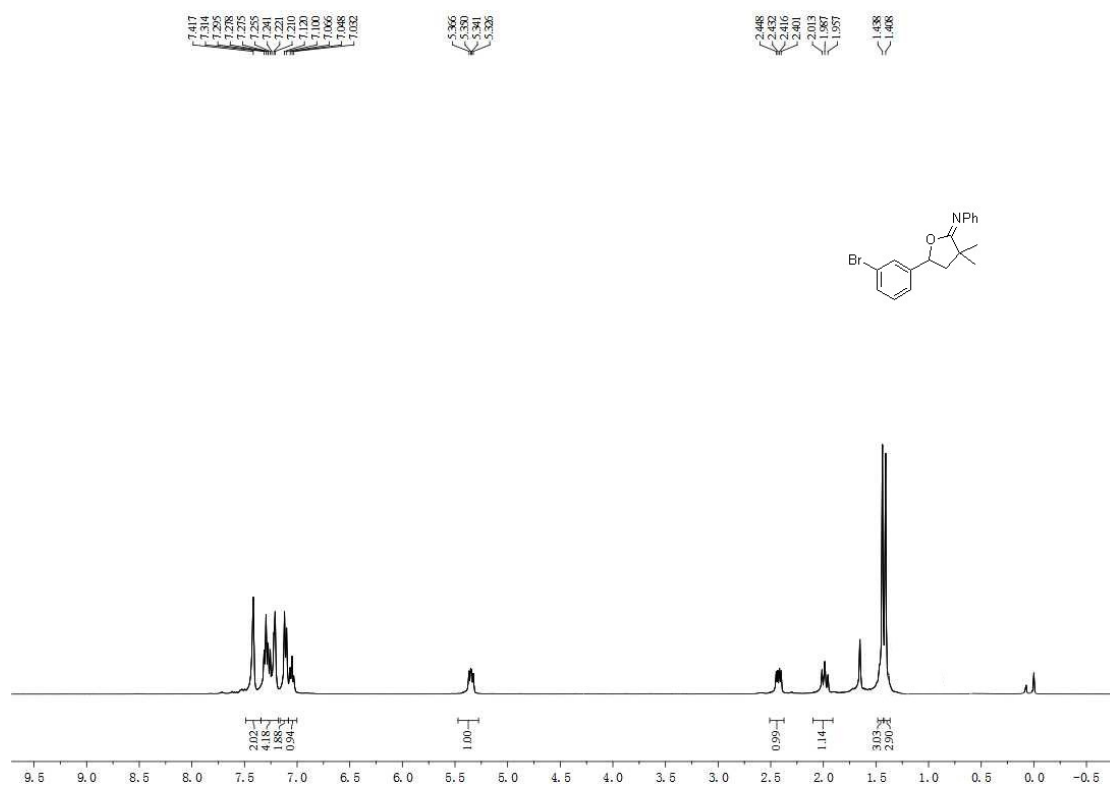


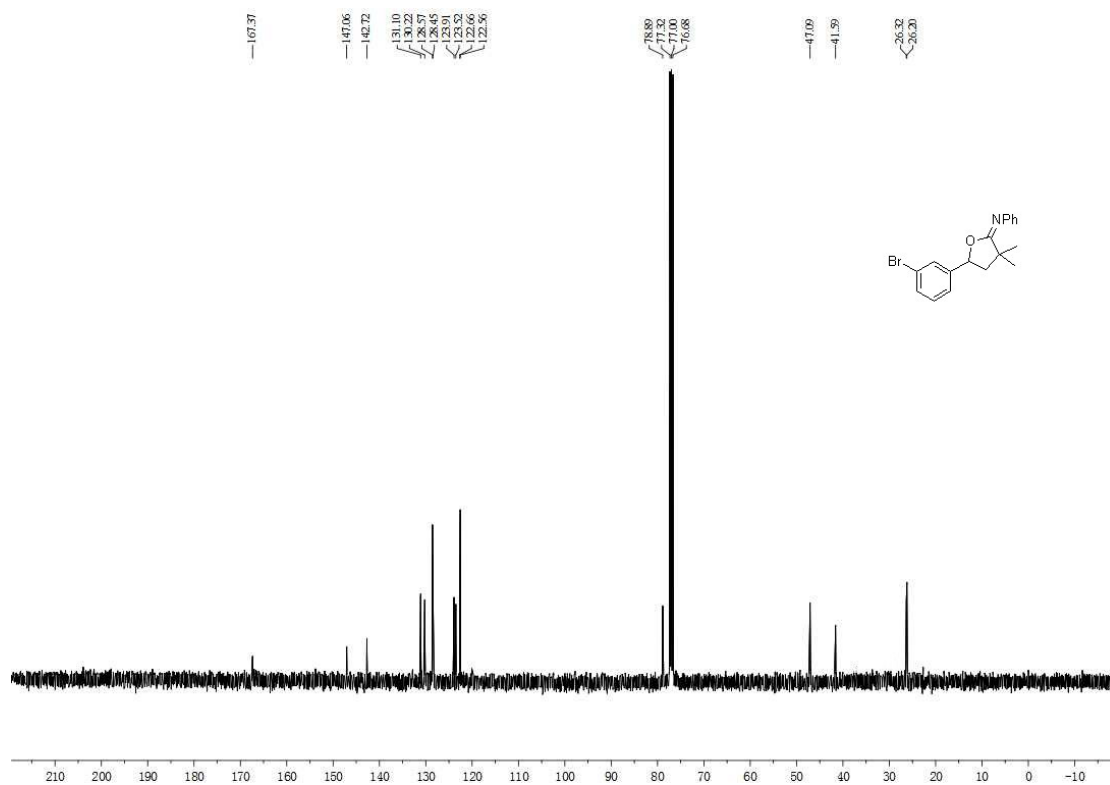
Product 3j



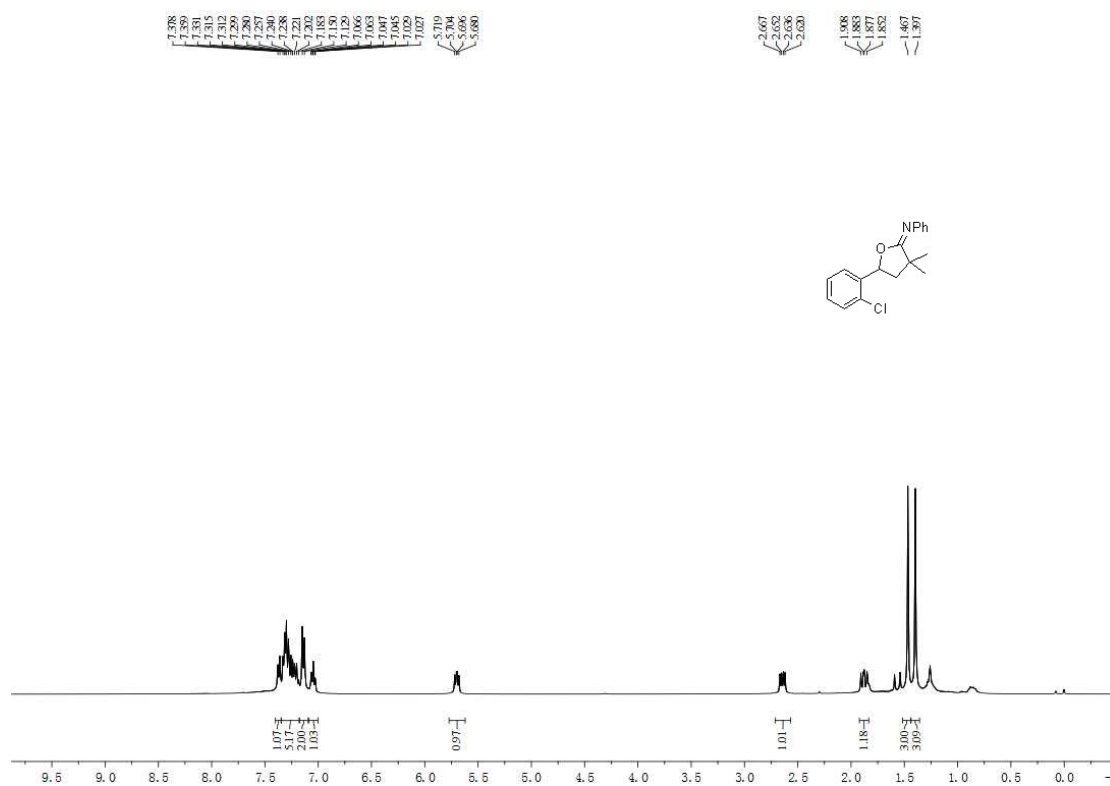


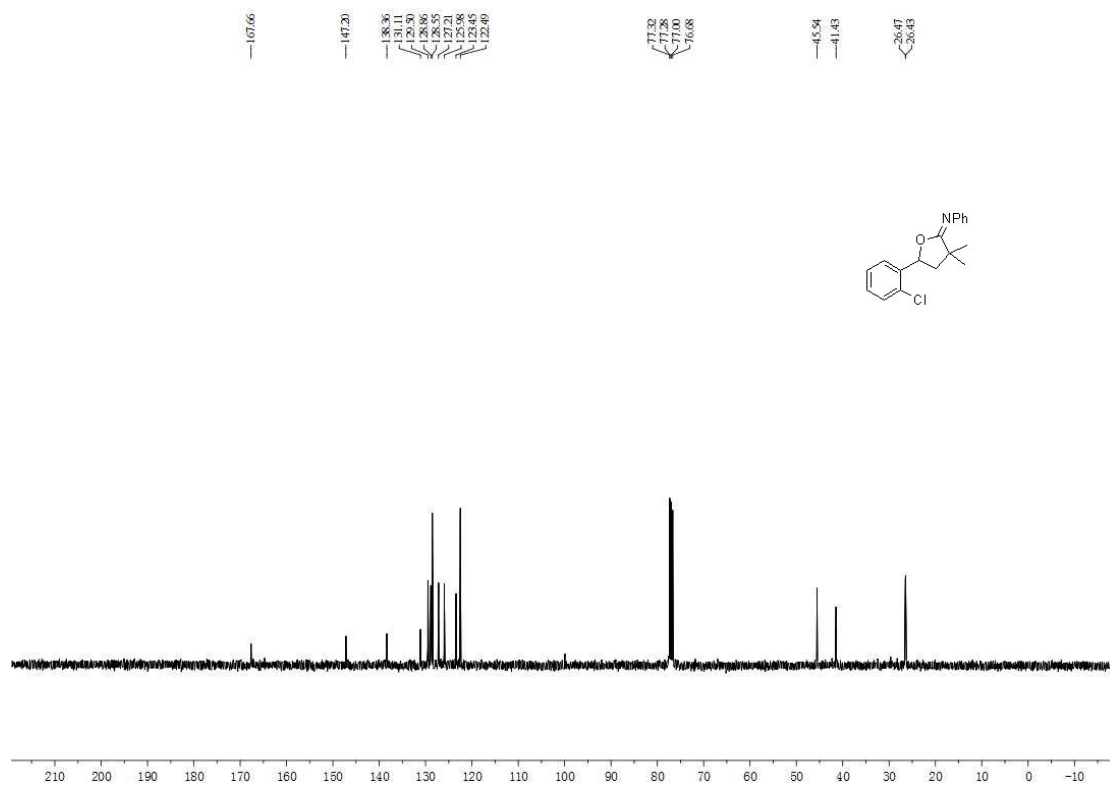
Product 3k



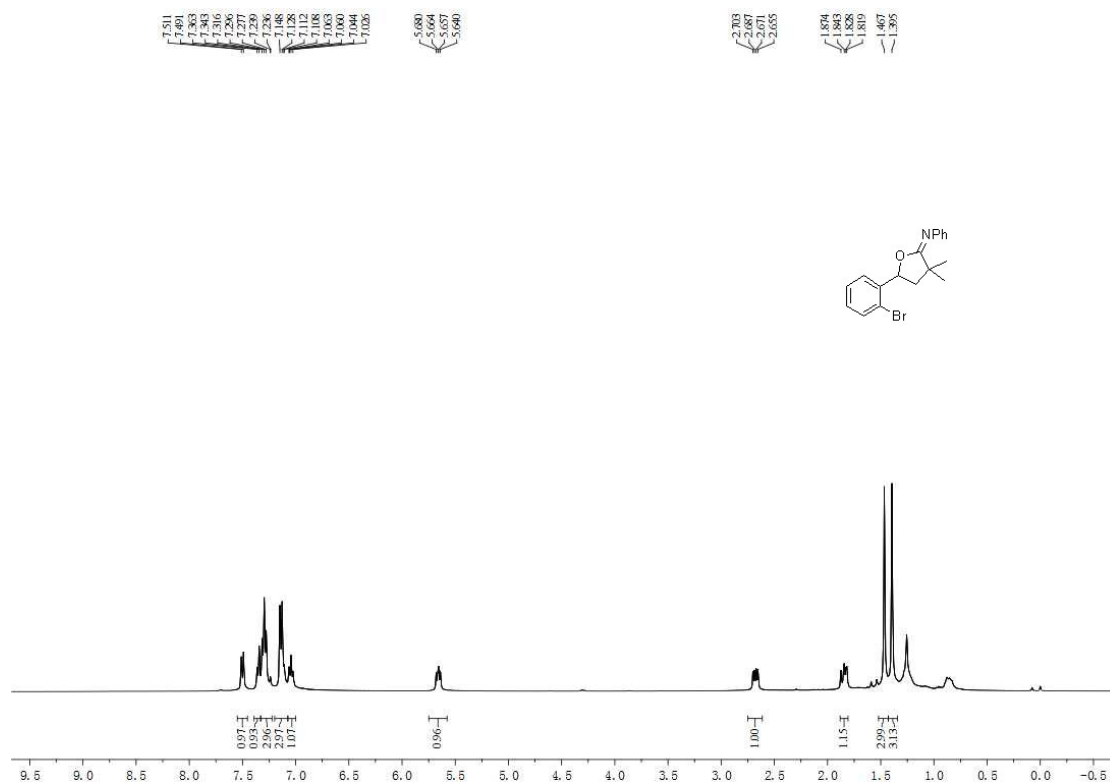


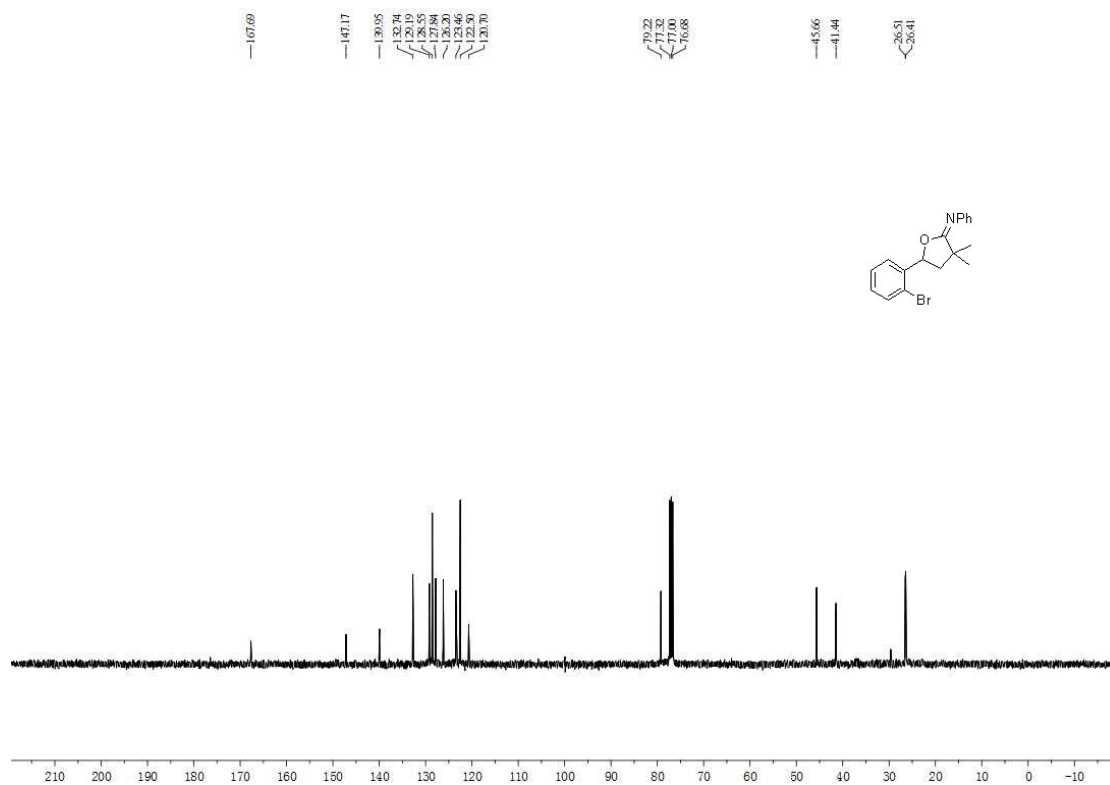
Product 31



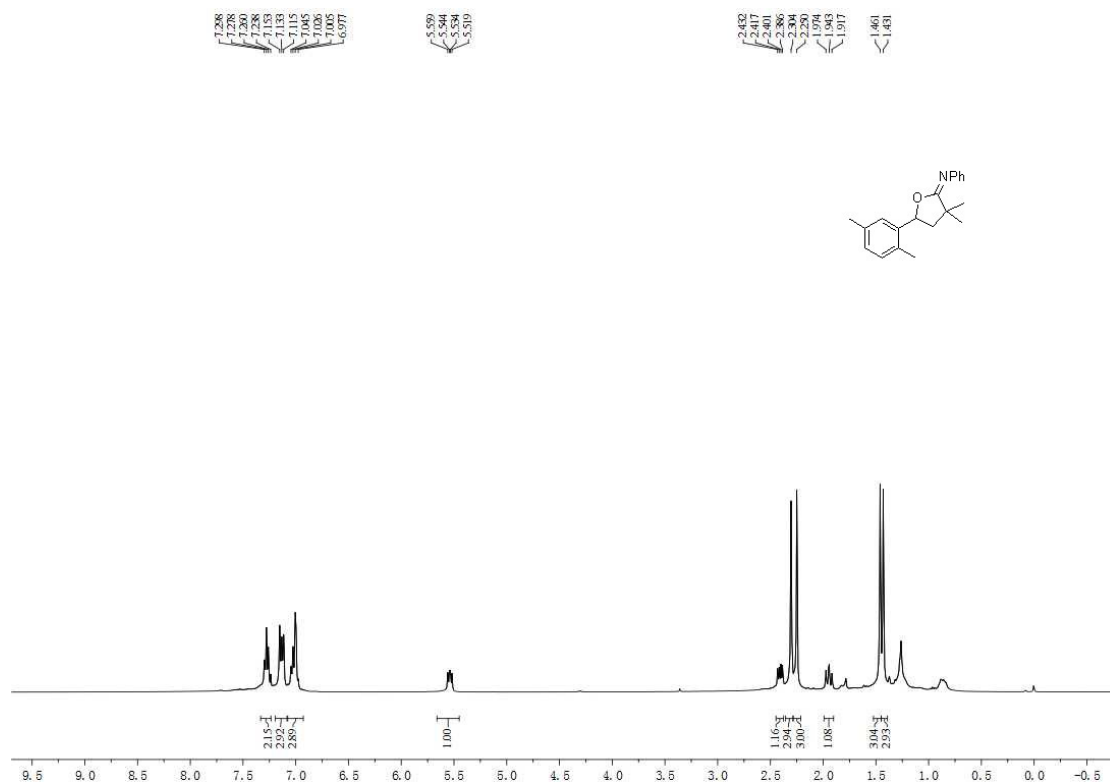


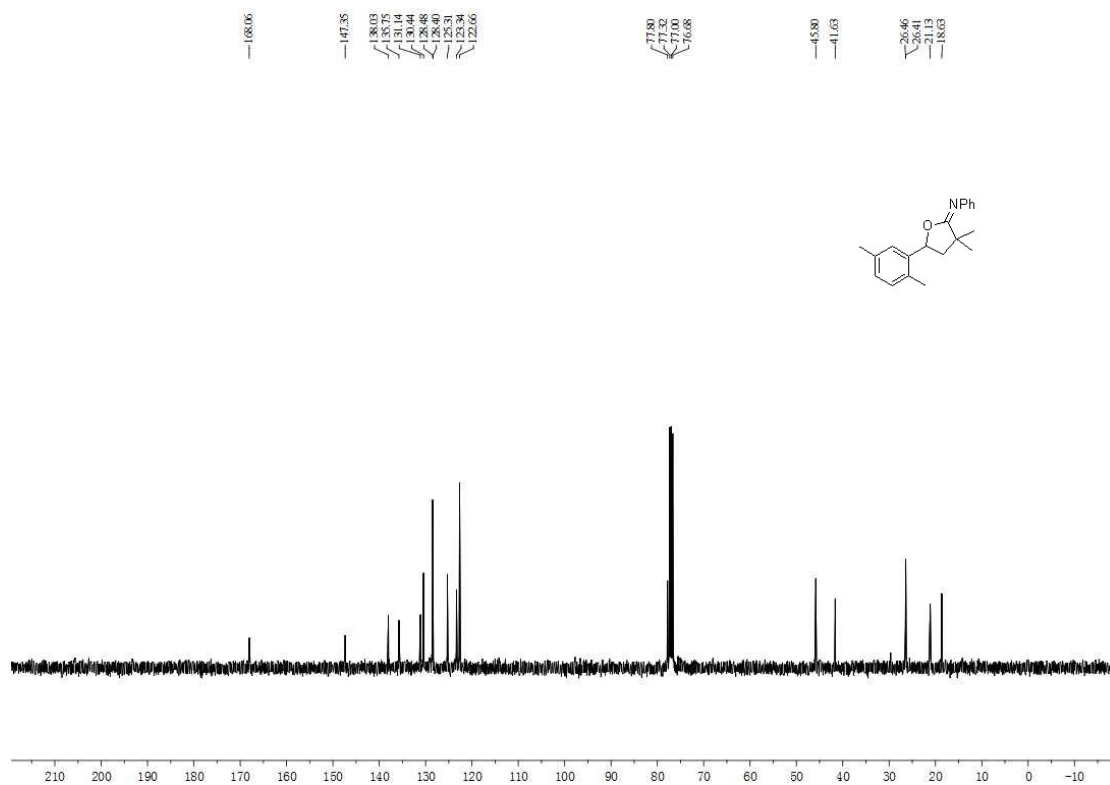
Product 3m



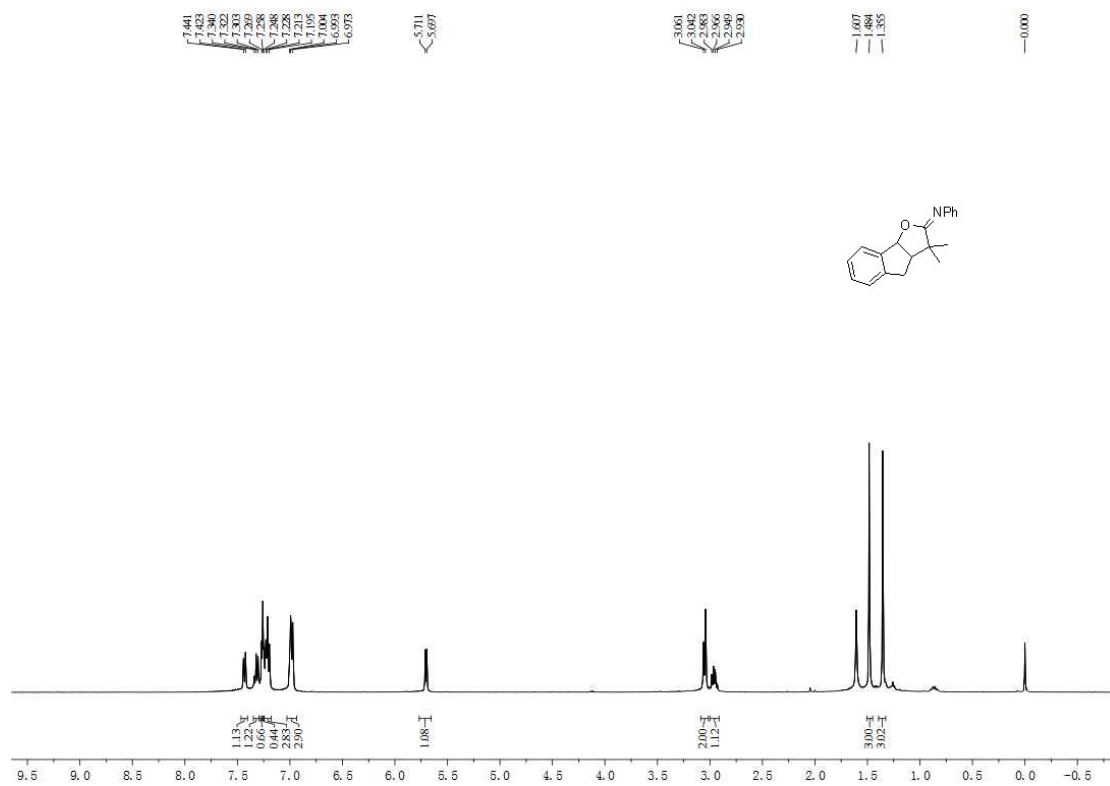


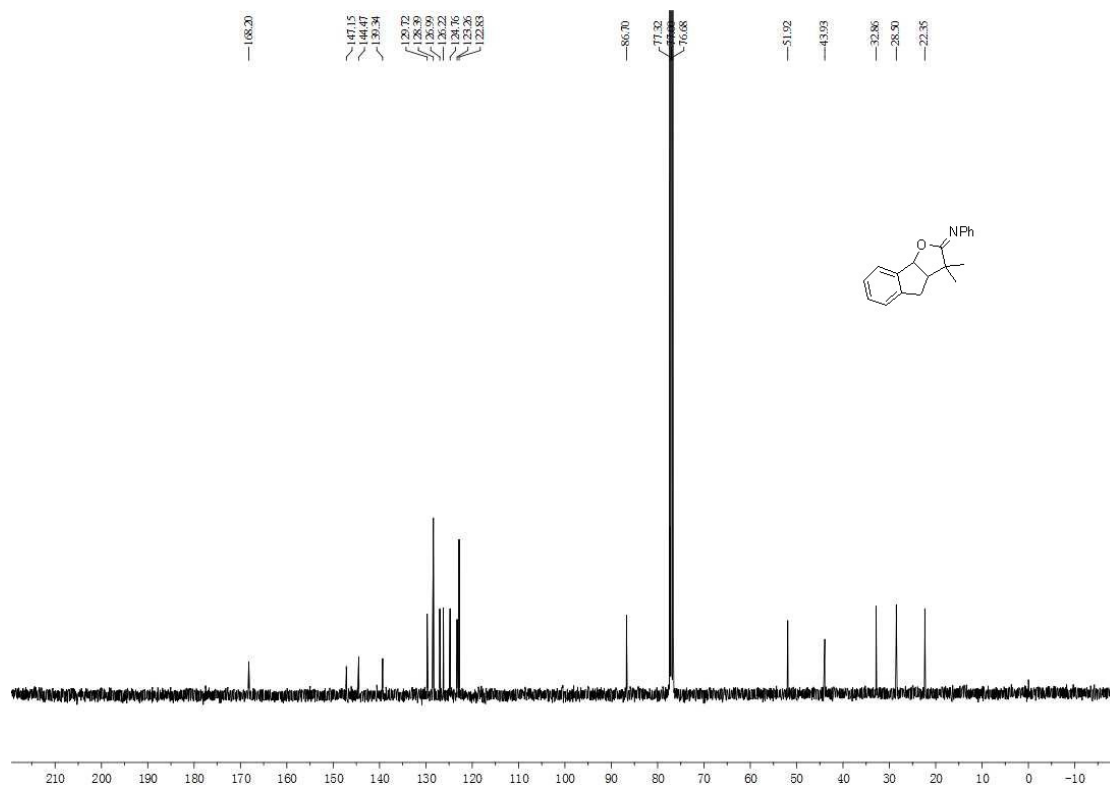
Product 3n



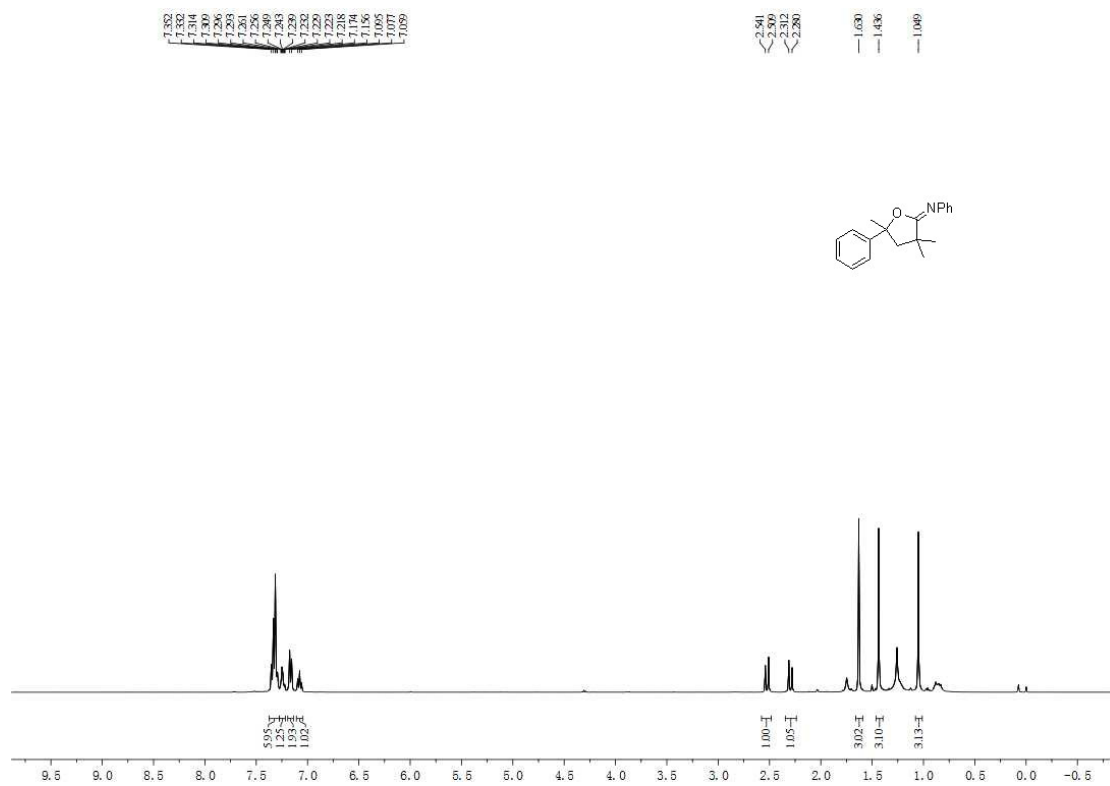


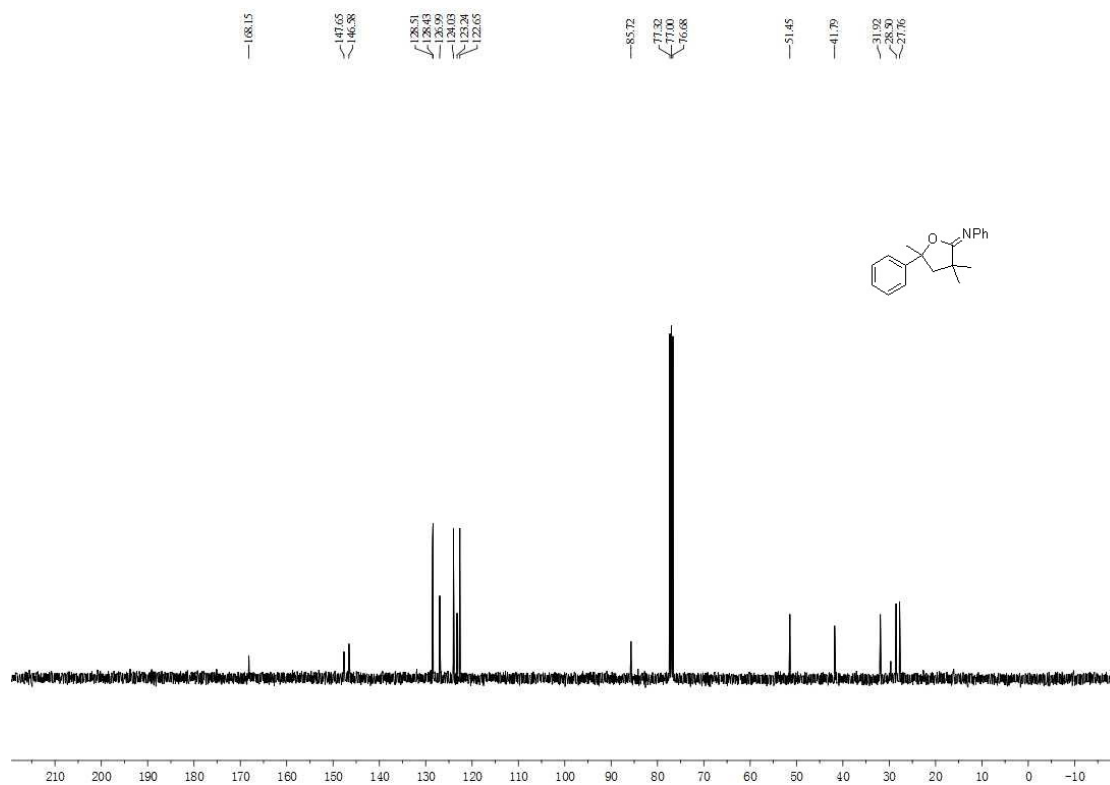
Product 3o



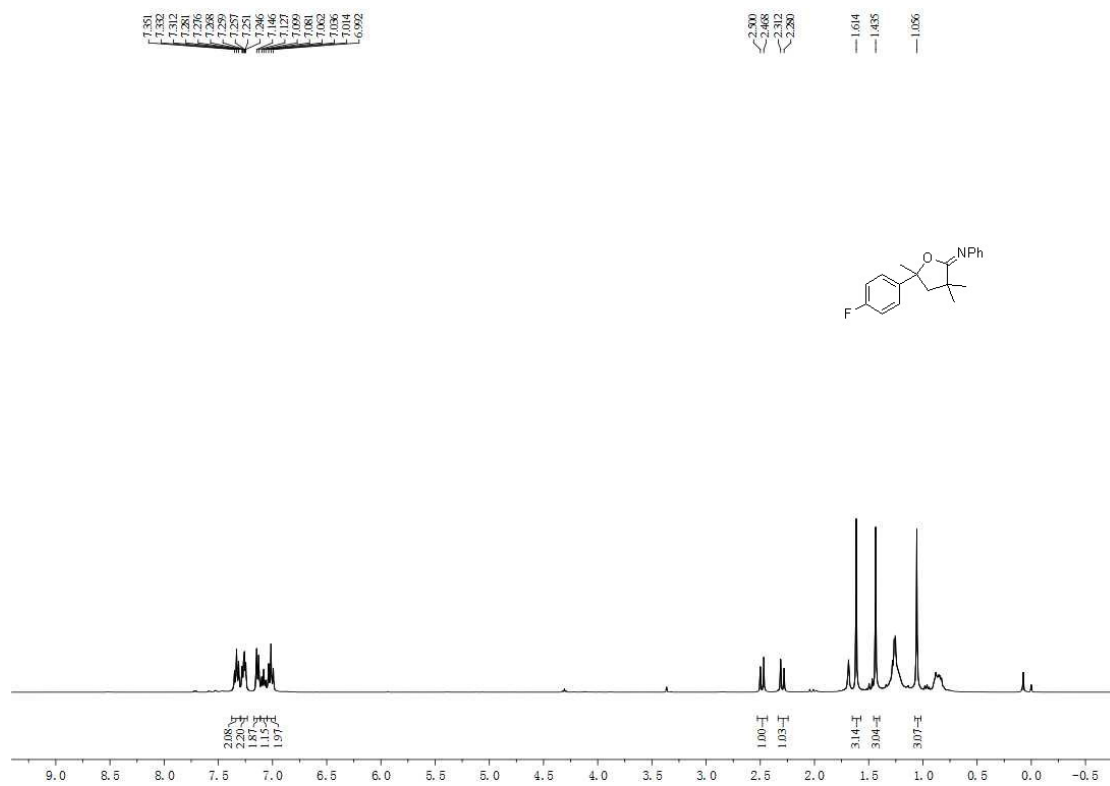


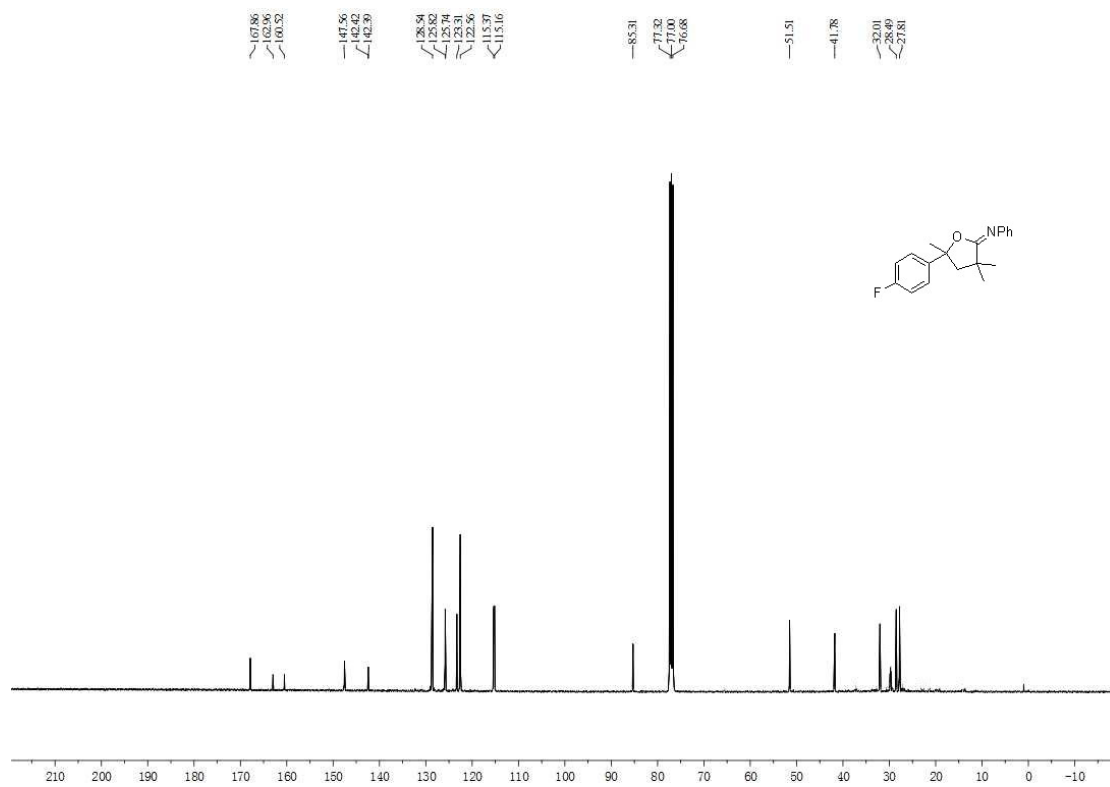
Product 3p



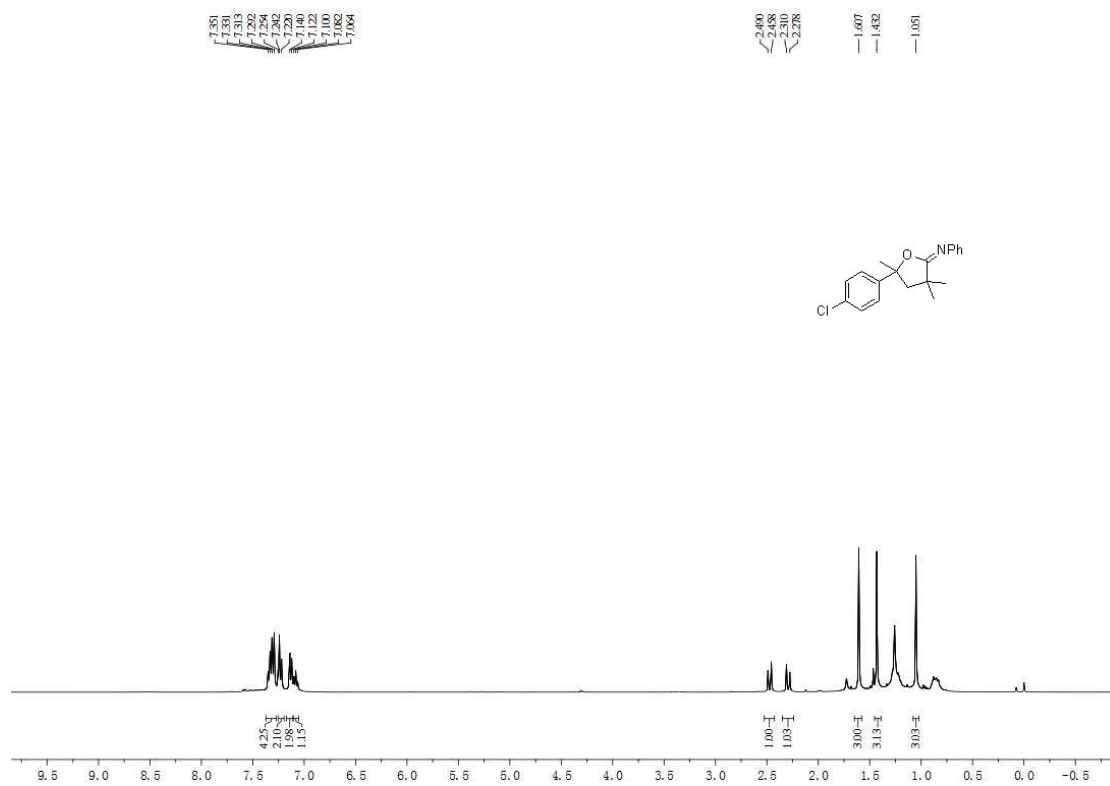


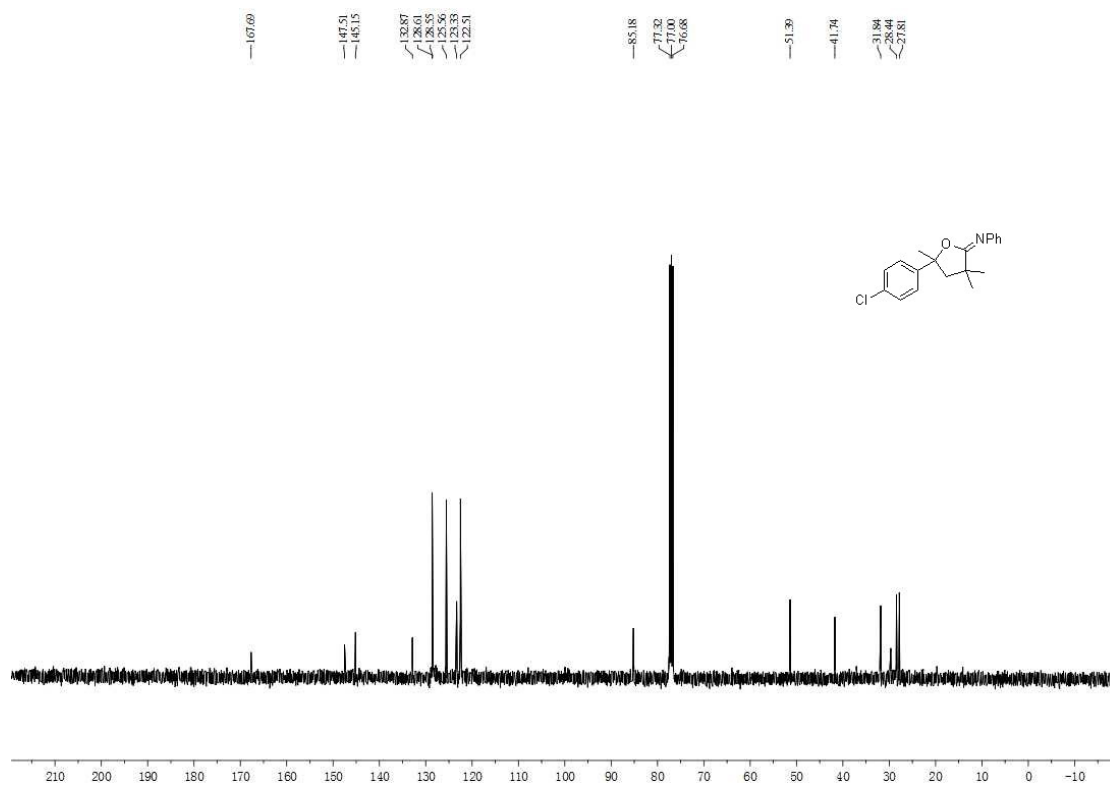
Product 3q



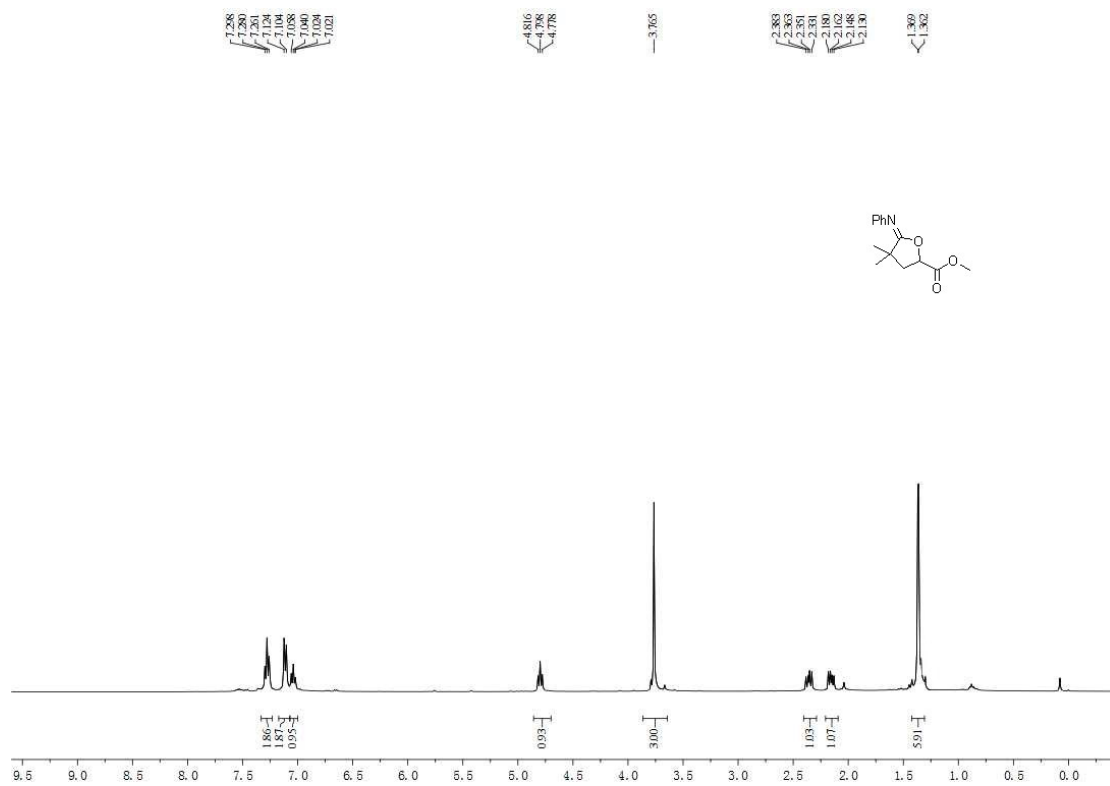


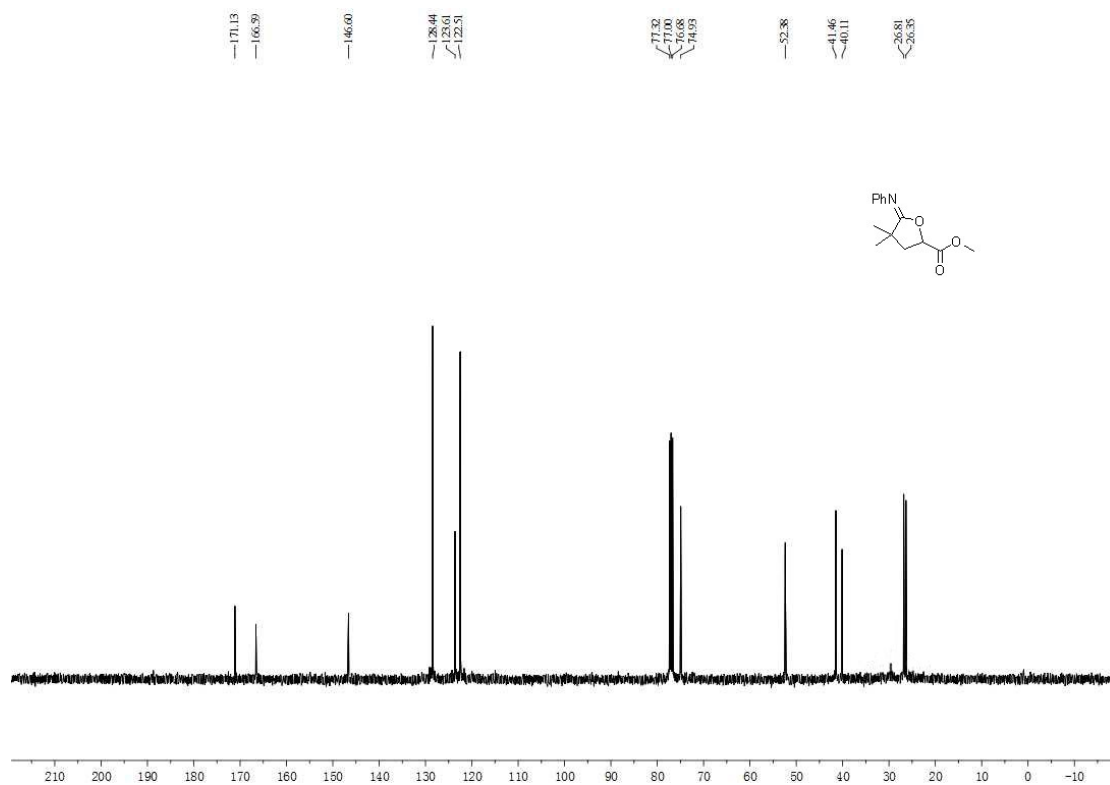
Product 3r



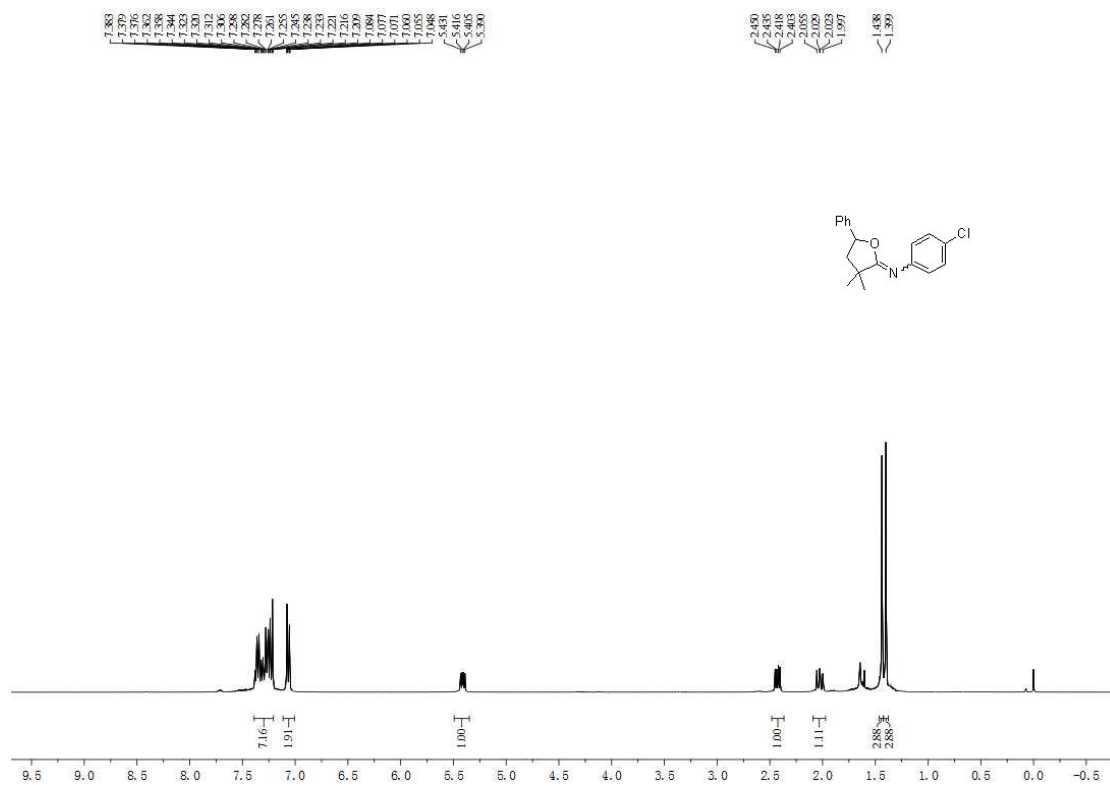


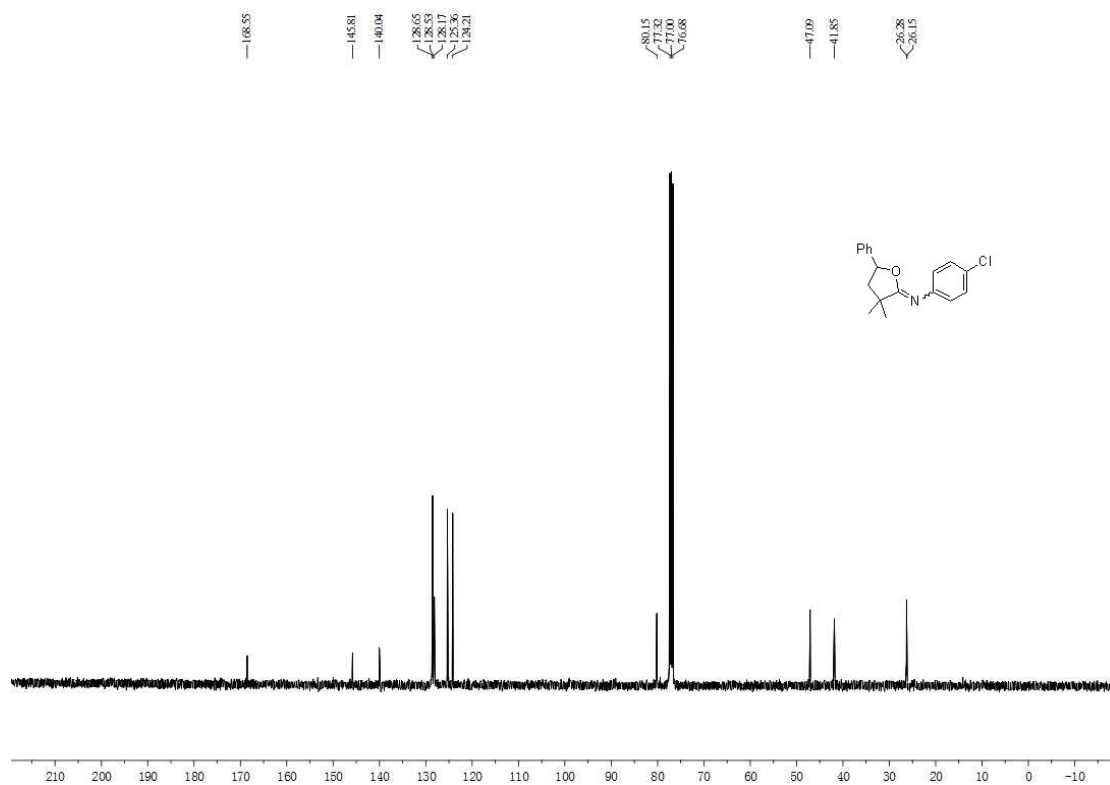
Product 3s



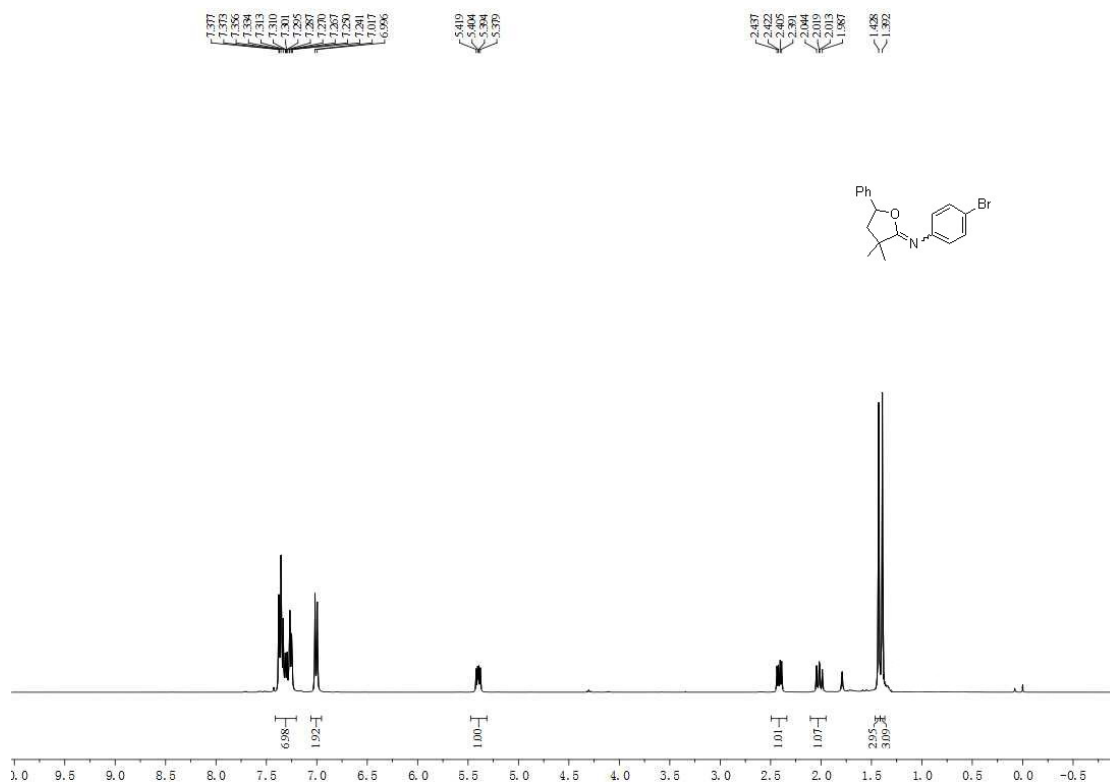


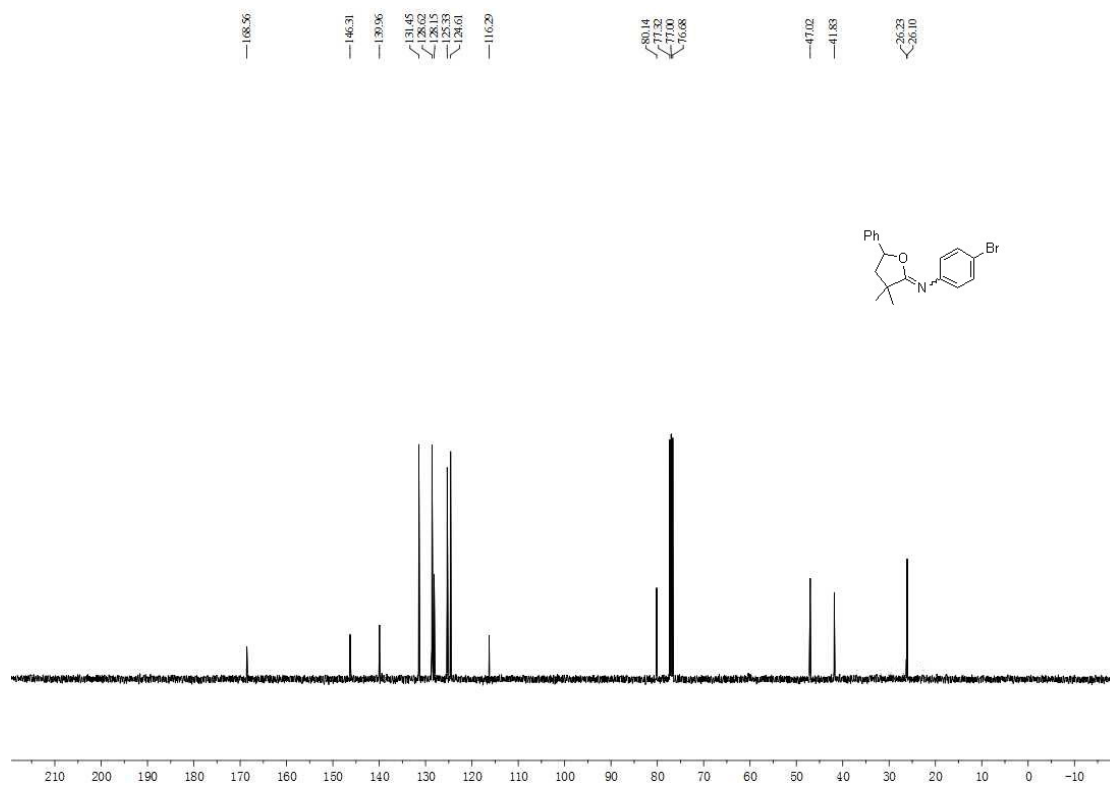
Product 4b



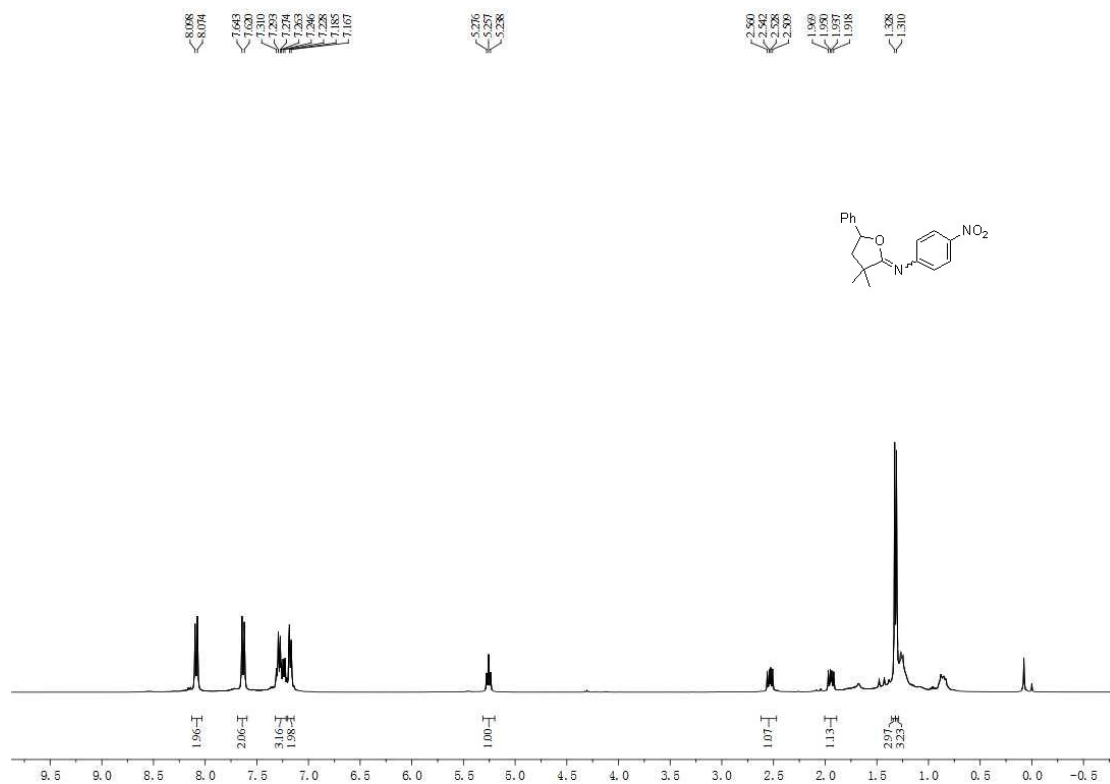


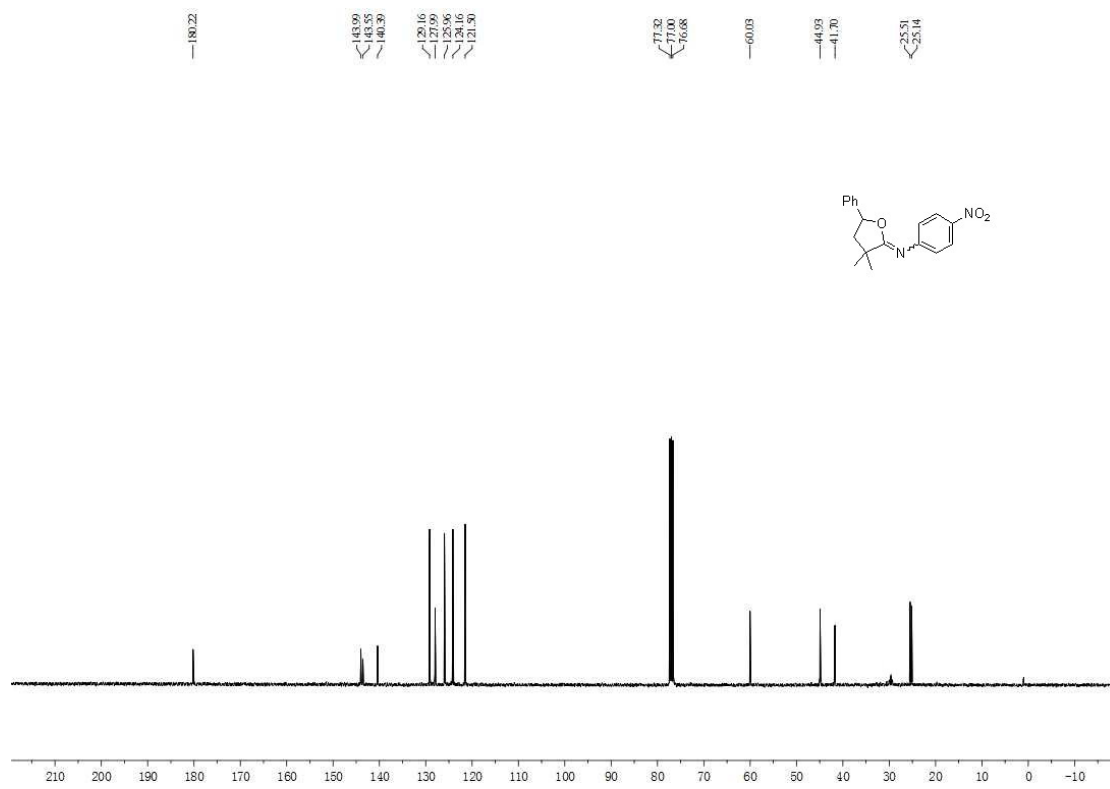
Product 4c



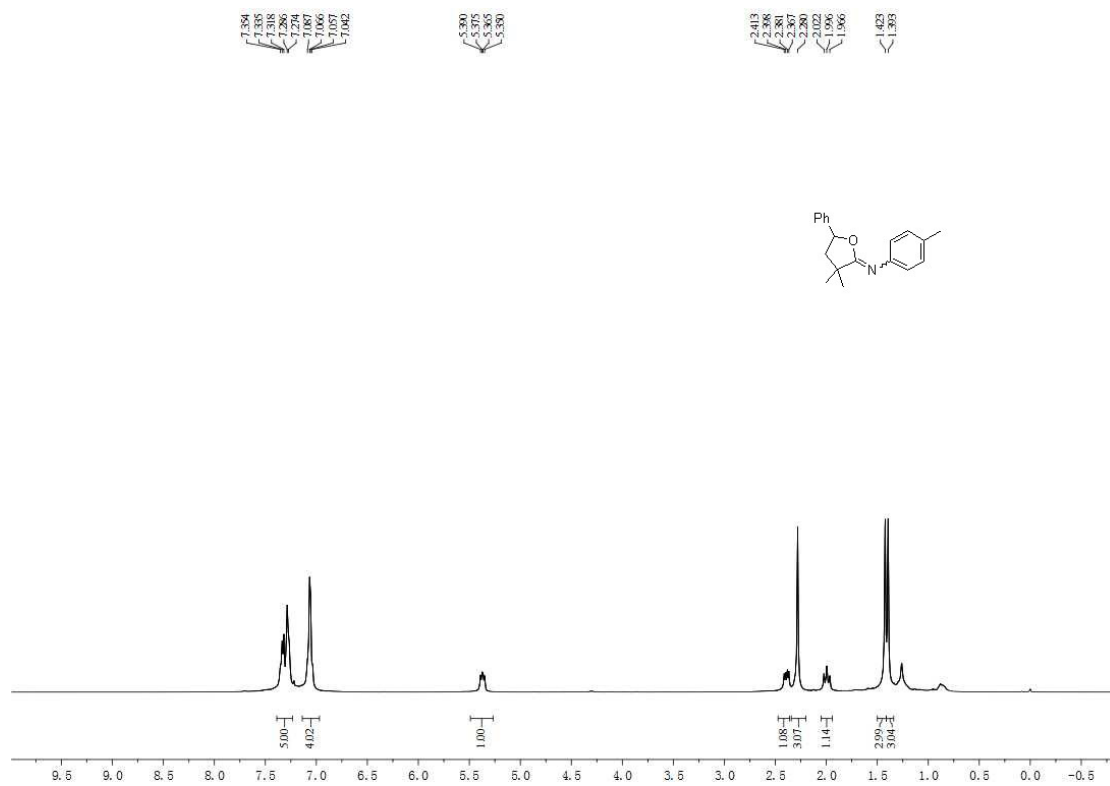


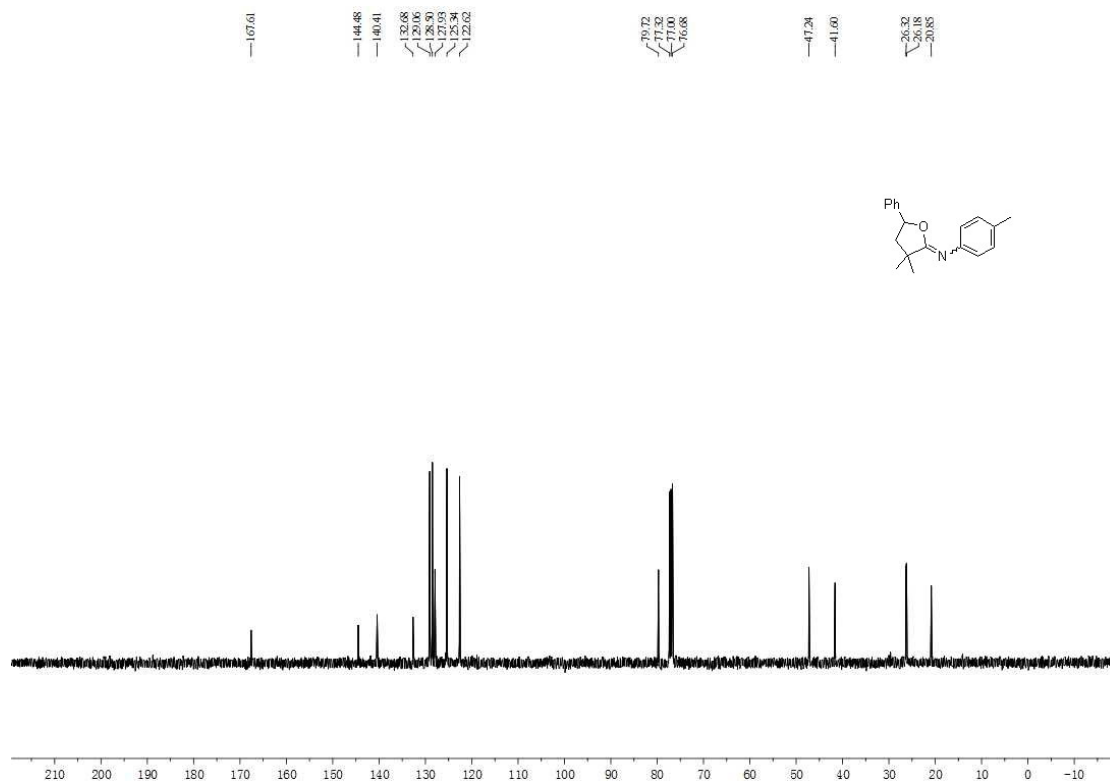
Product 4d



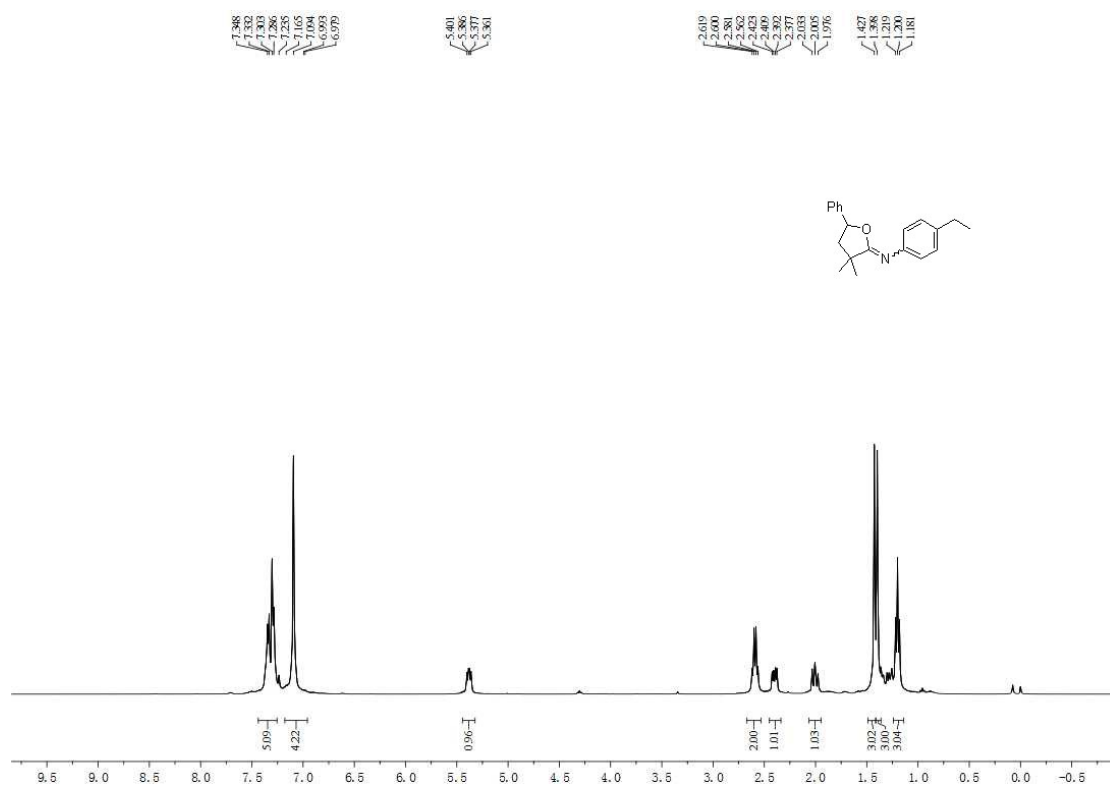


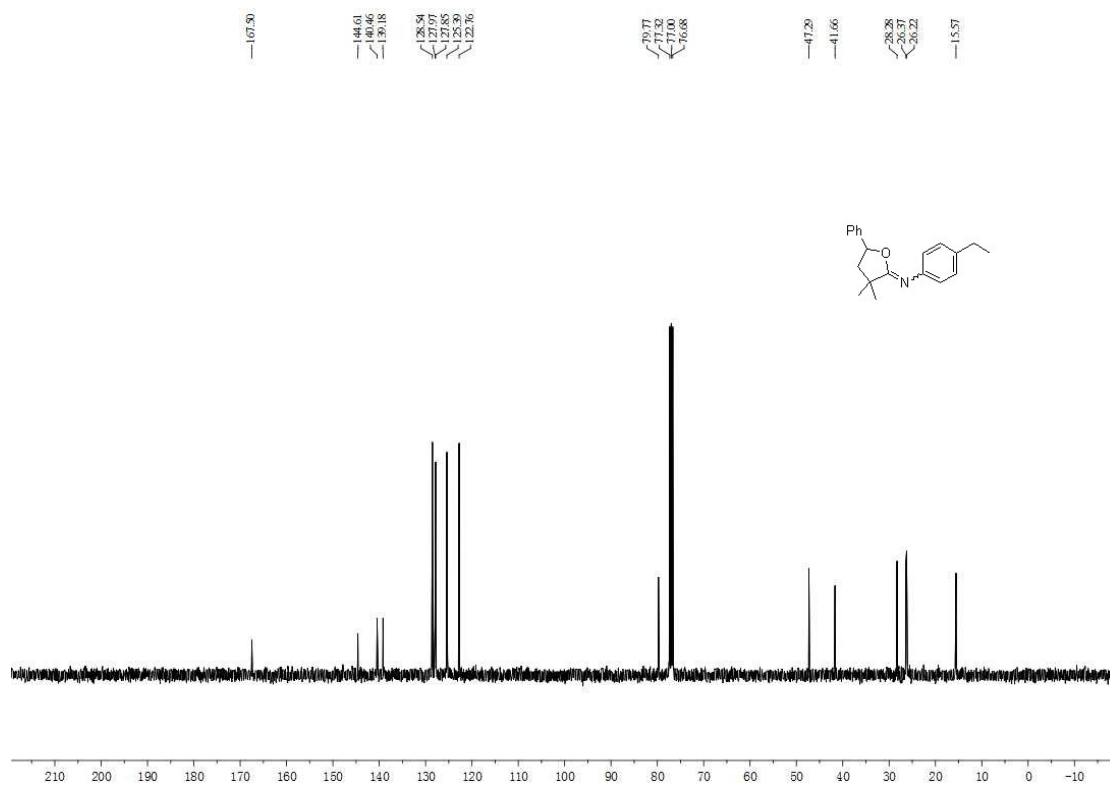
Product 4e



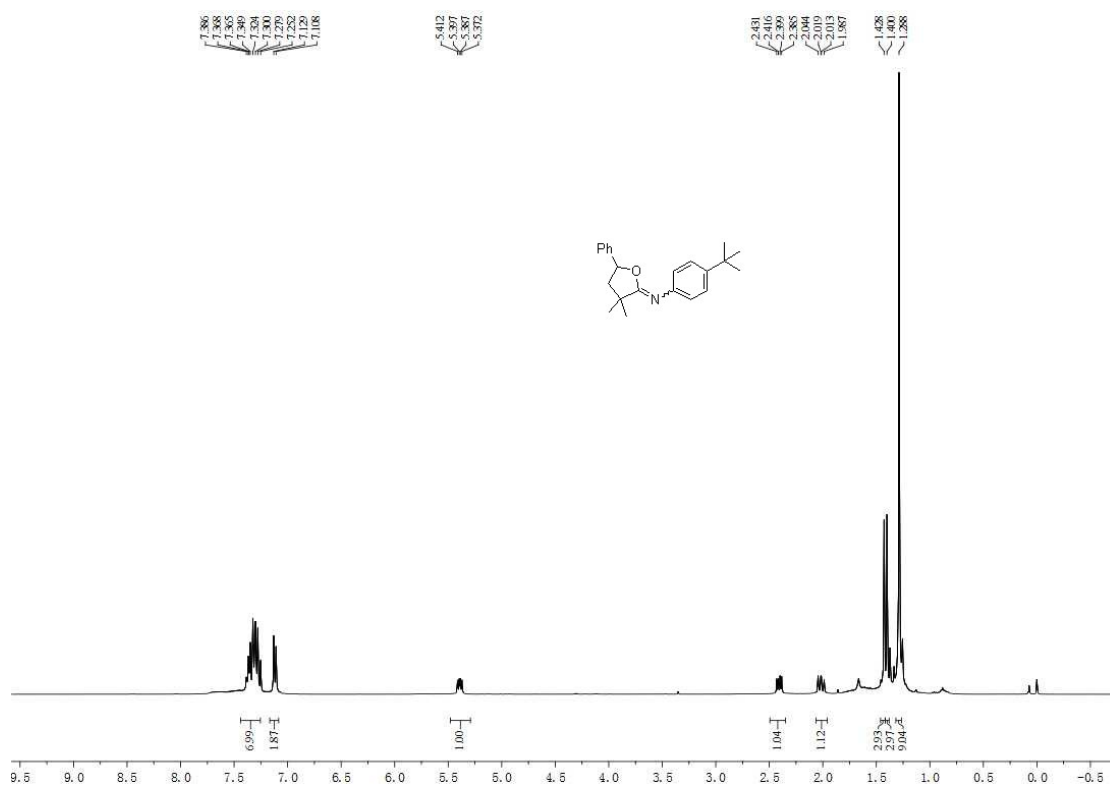


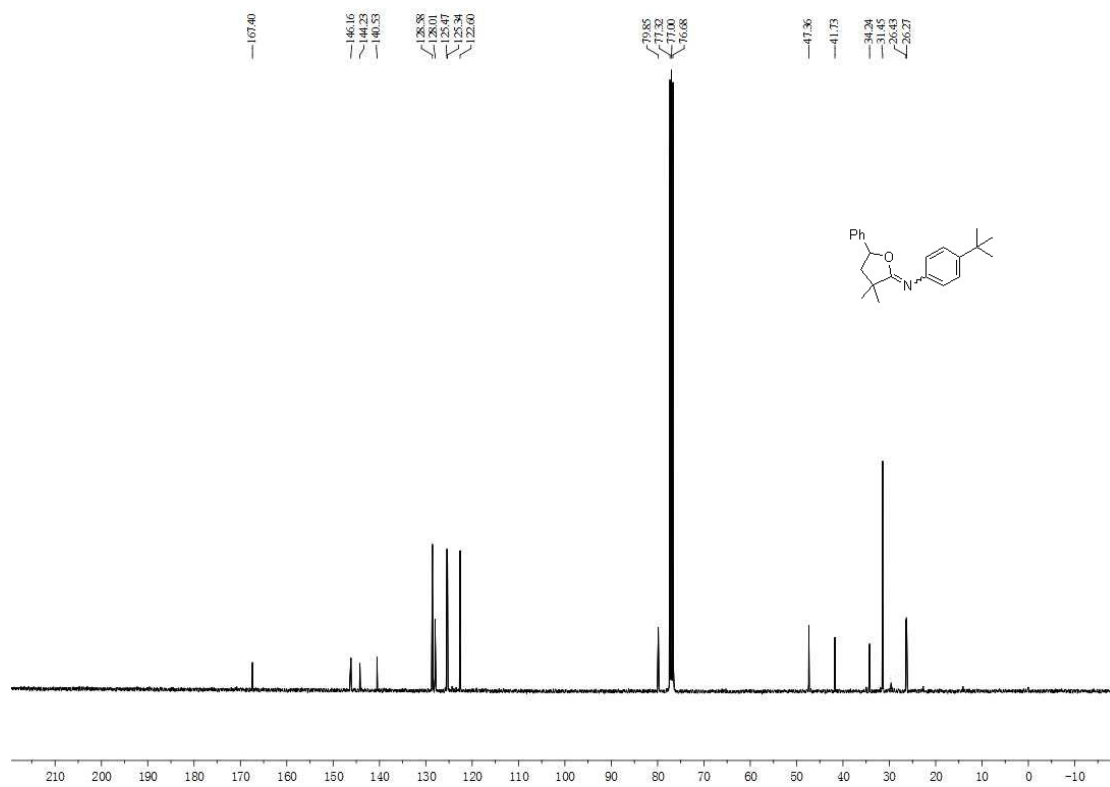
Product 4f



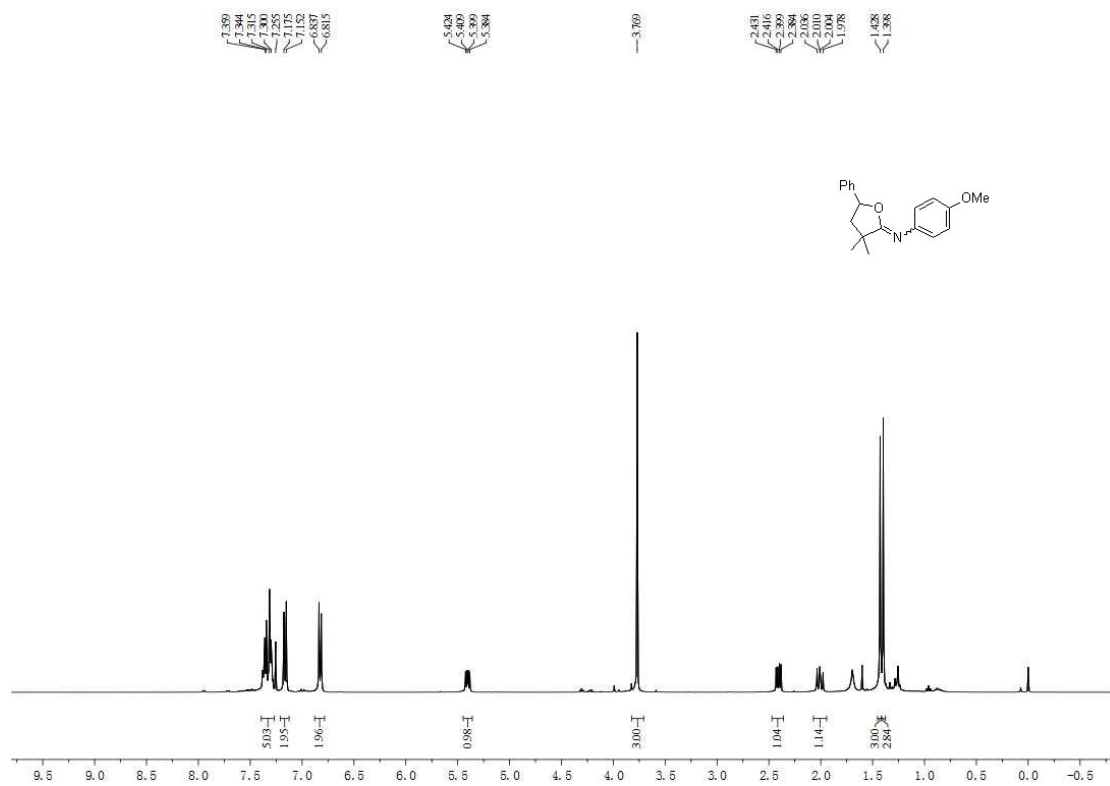


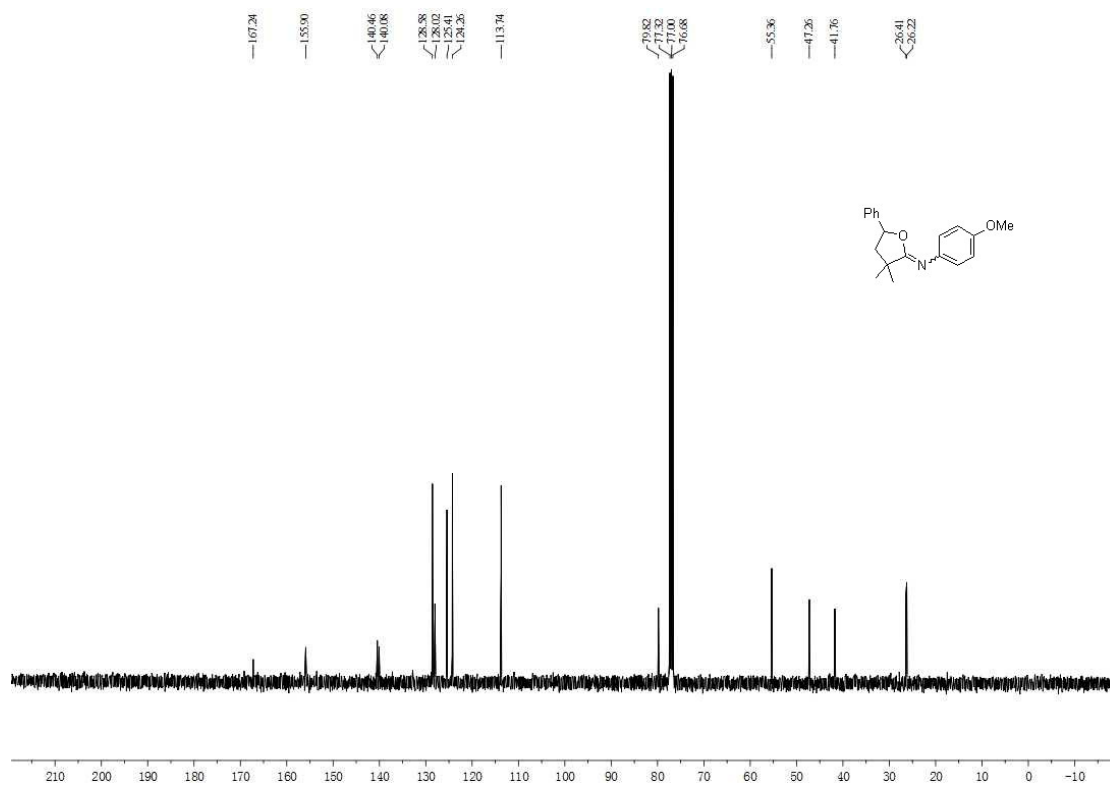
Product 4g



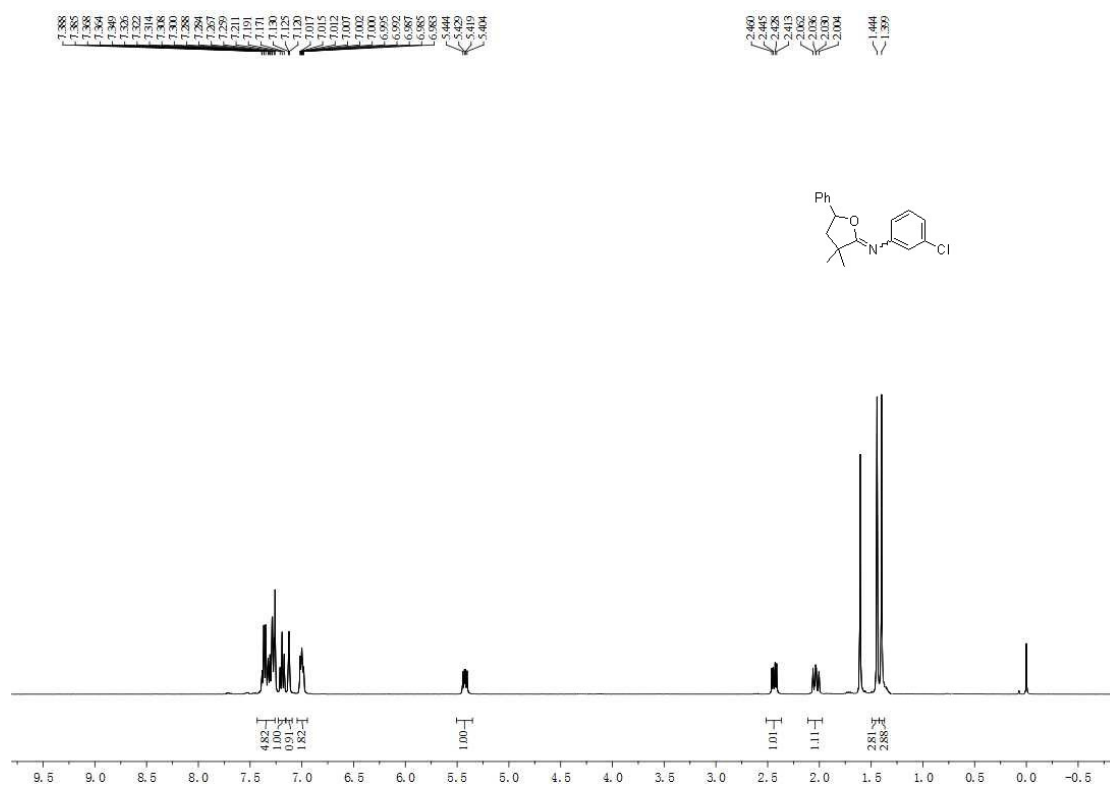


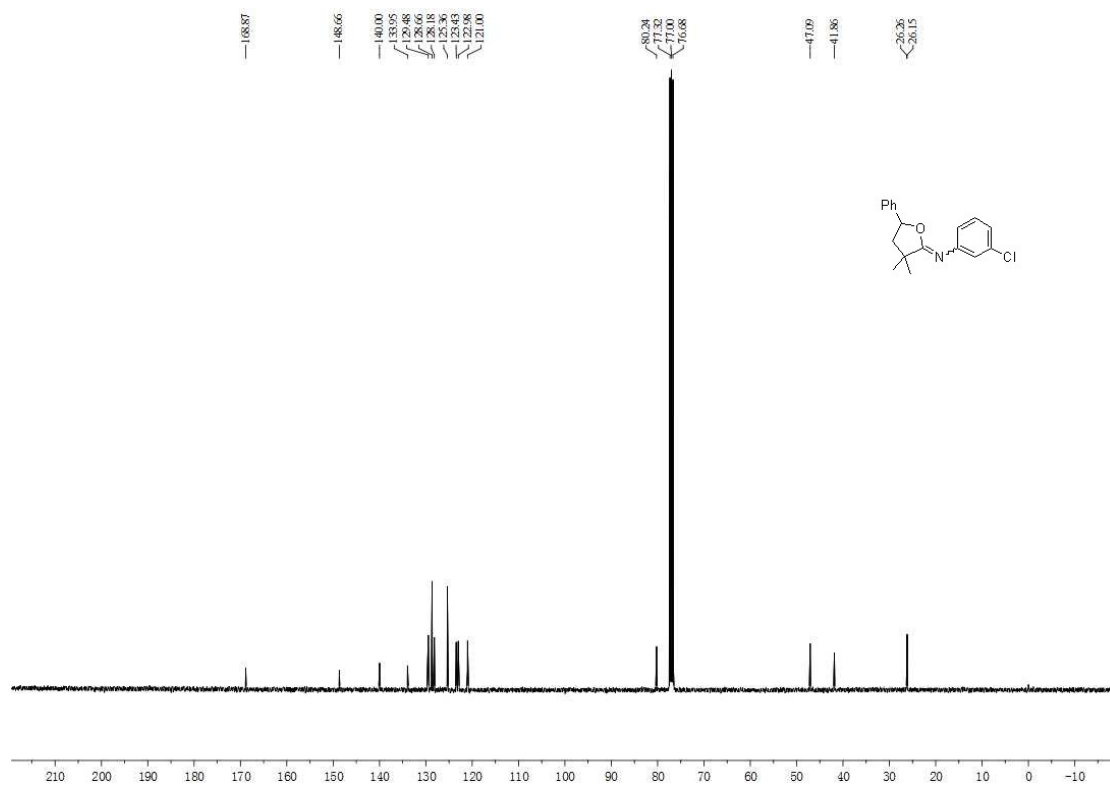
Product 4h



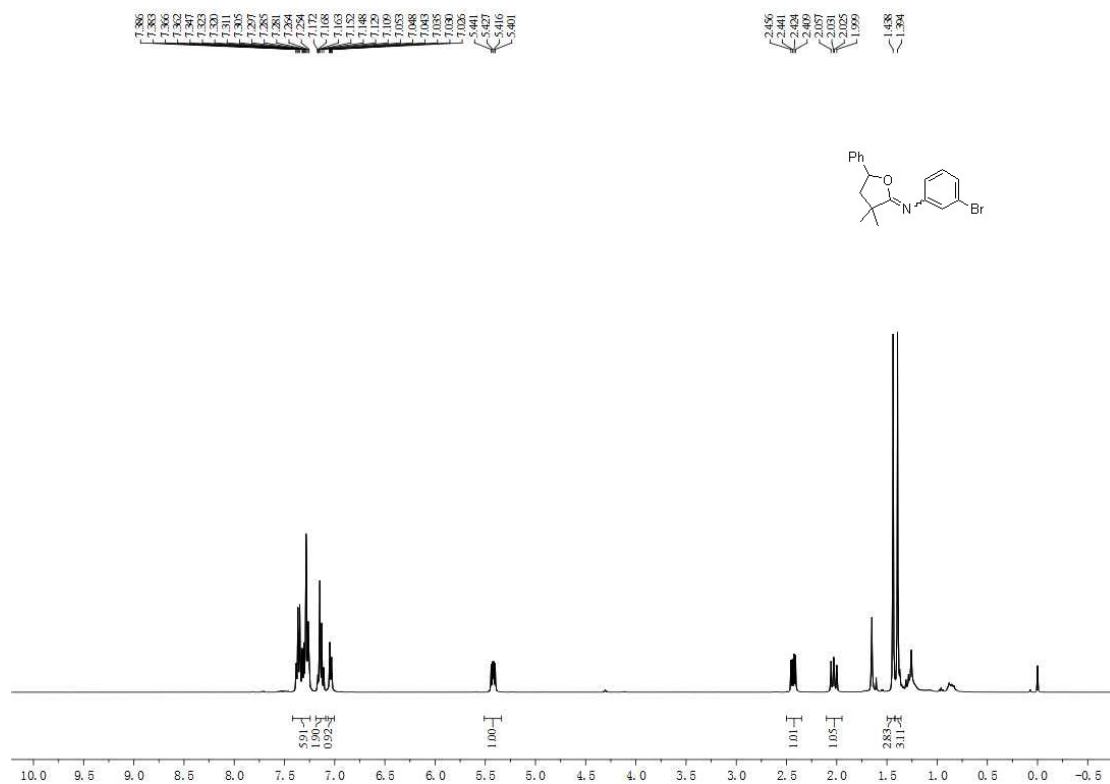


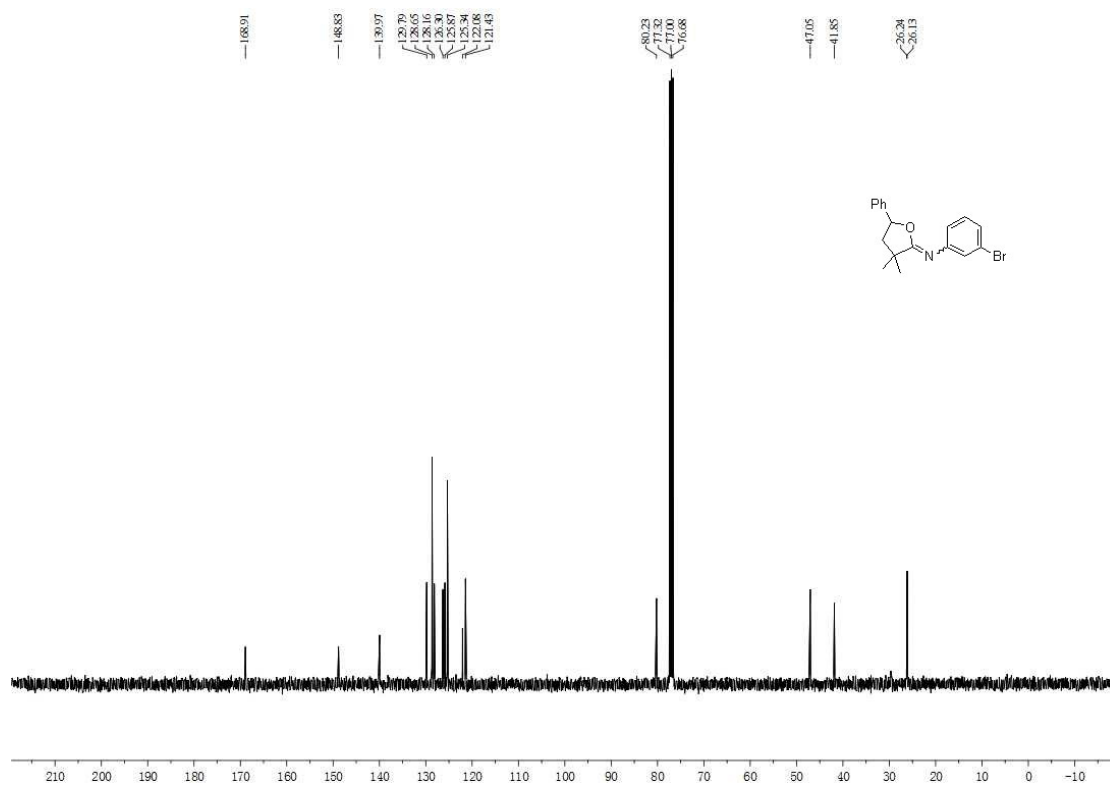
Product 4i



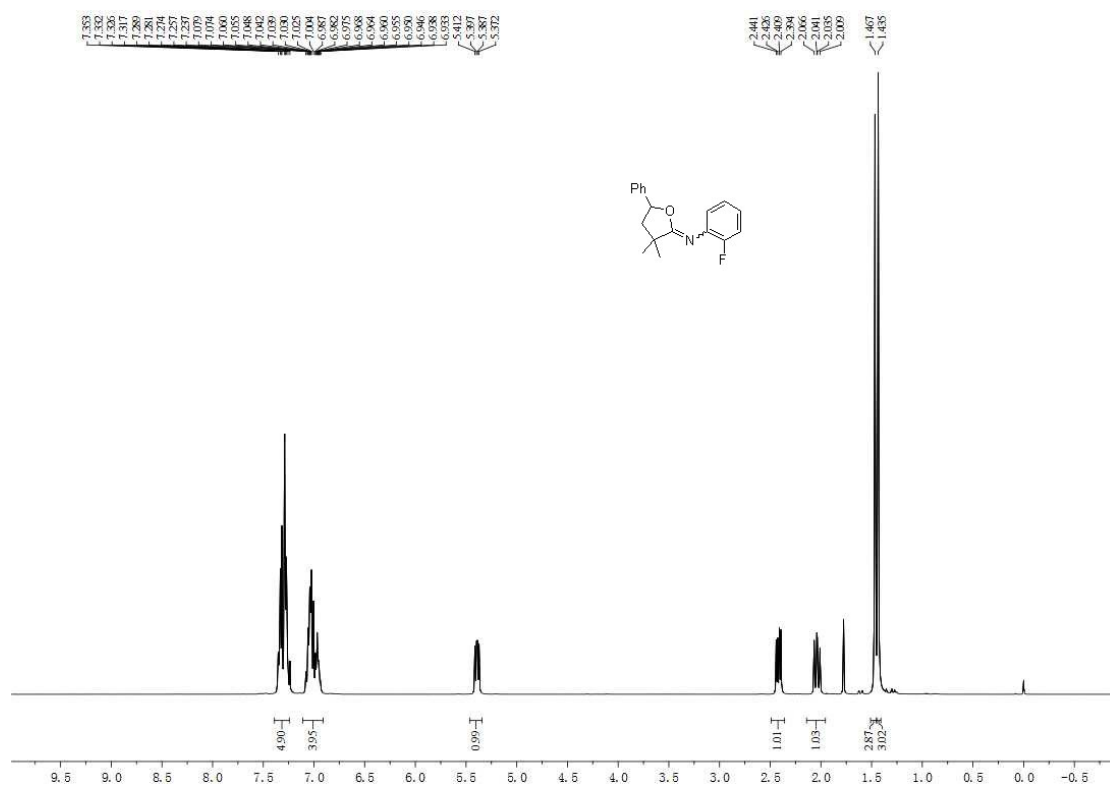


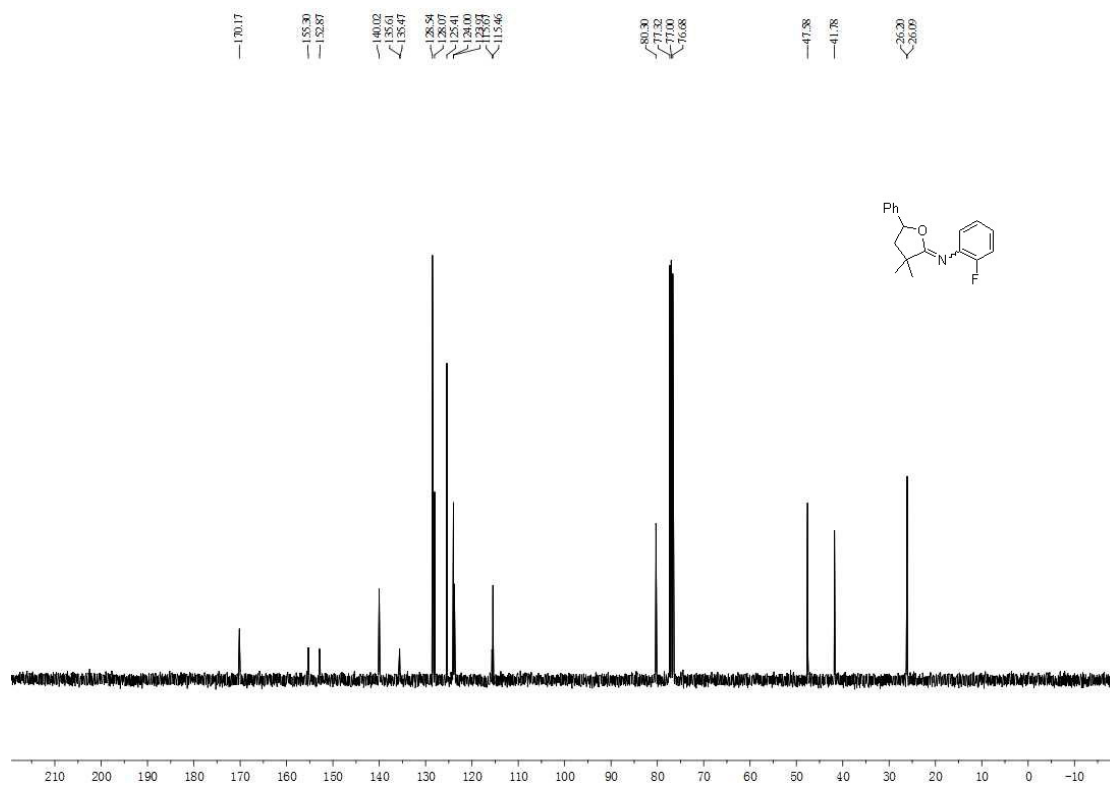
Product 4j



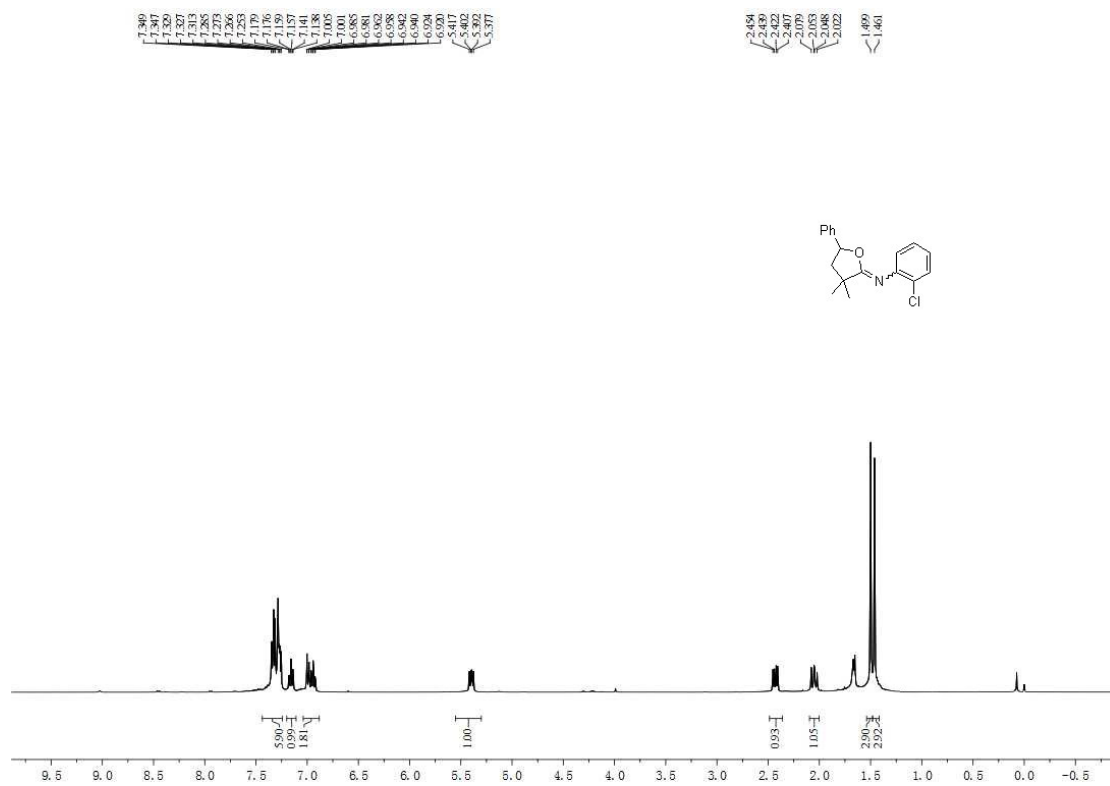


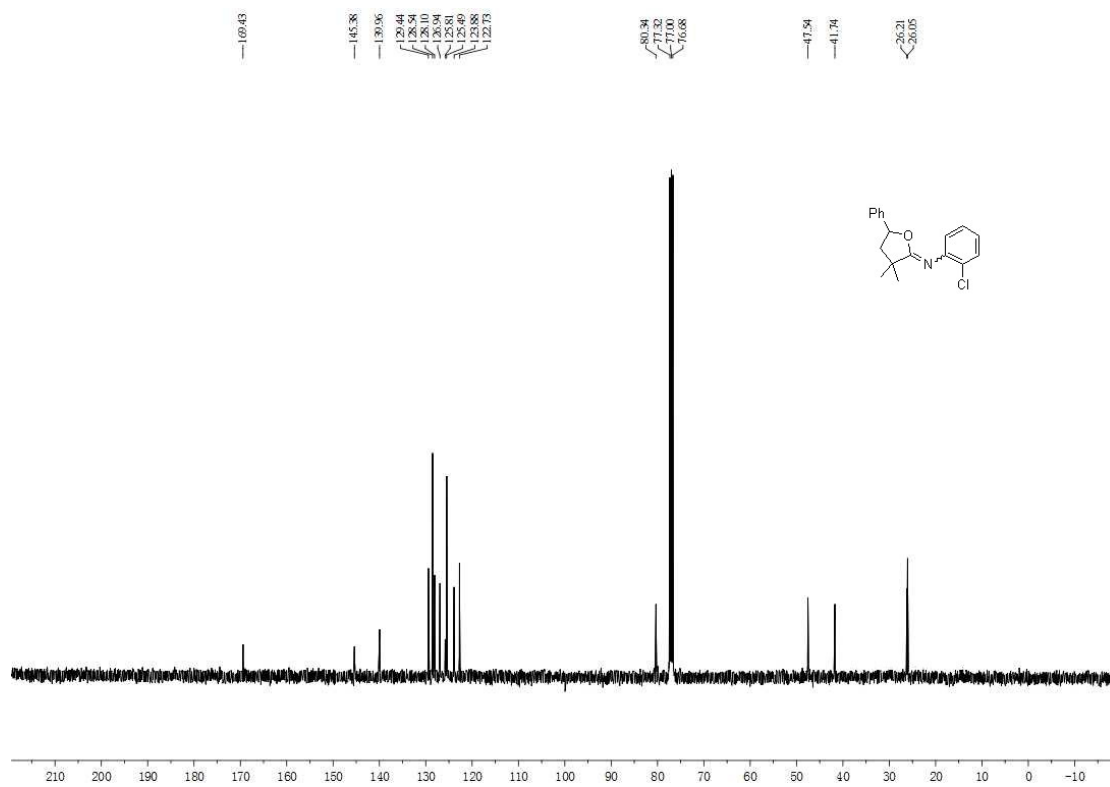
Product 4k



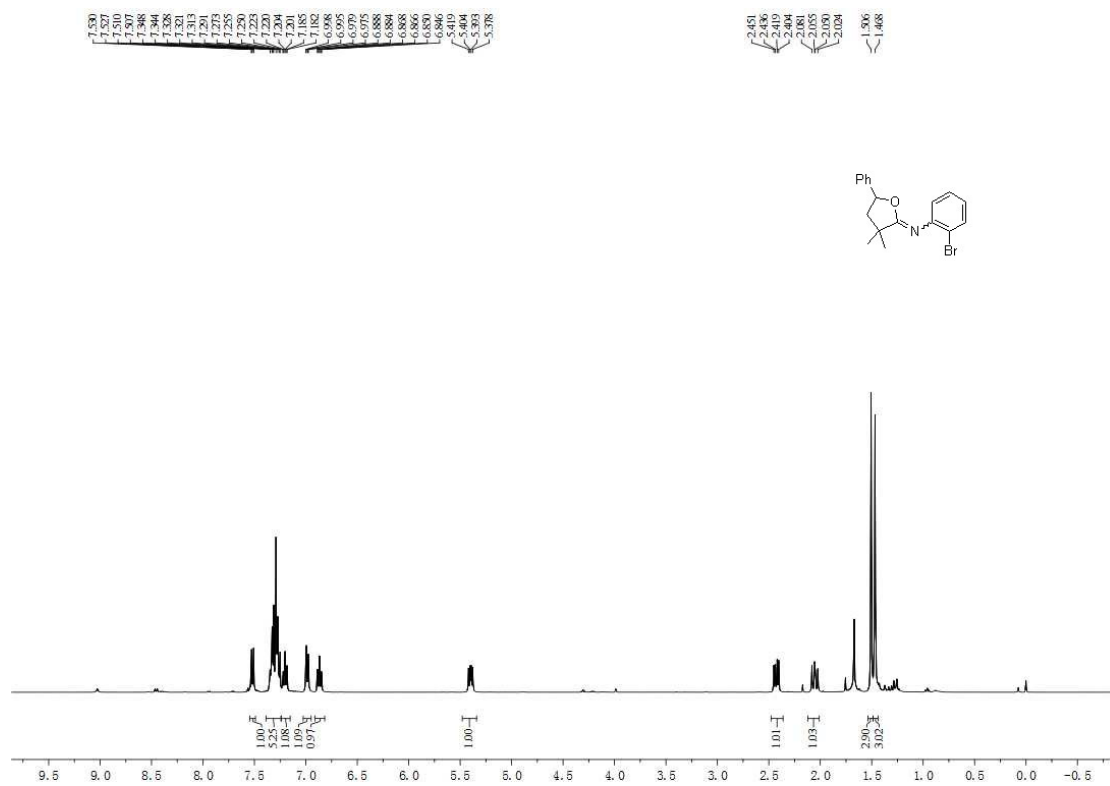


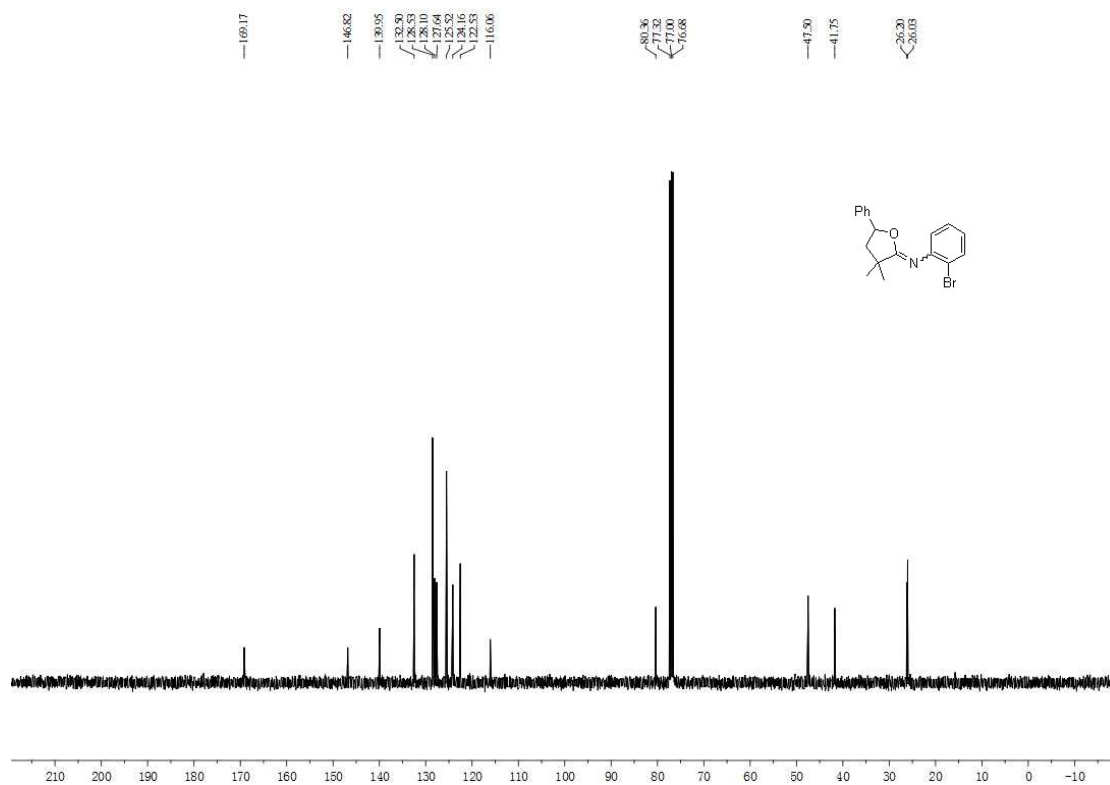
Product 4l



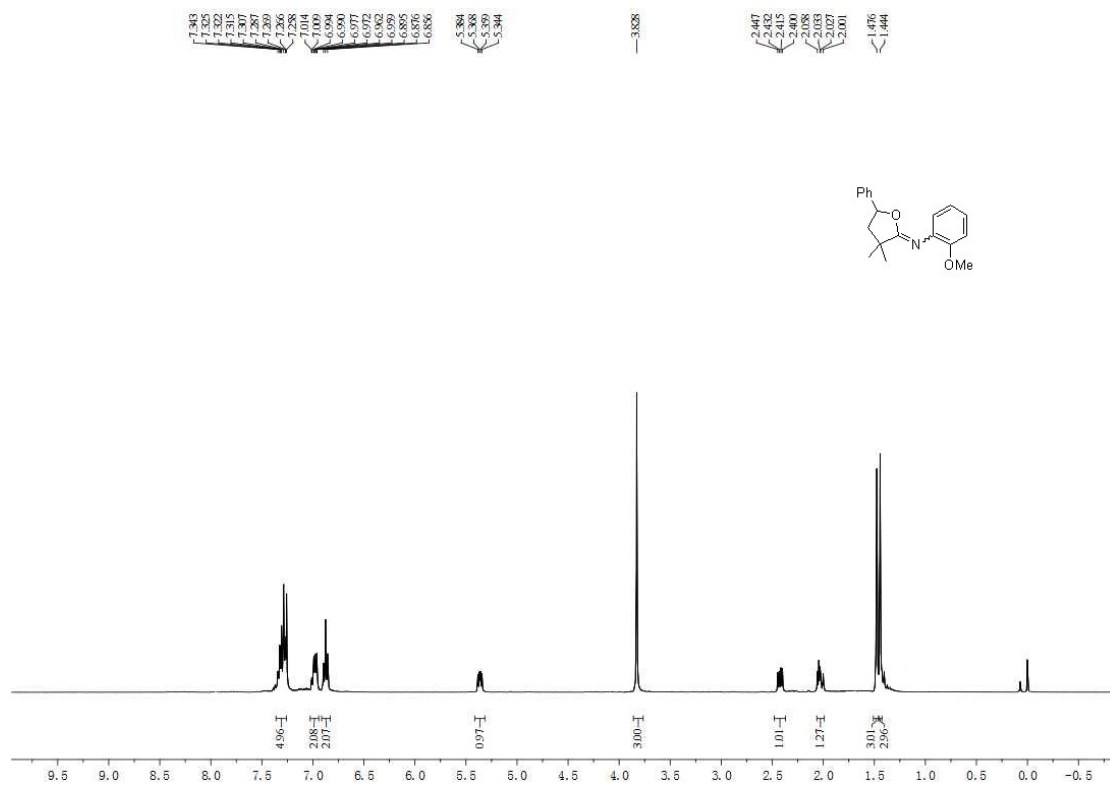


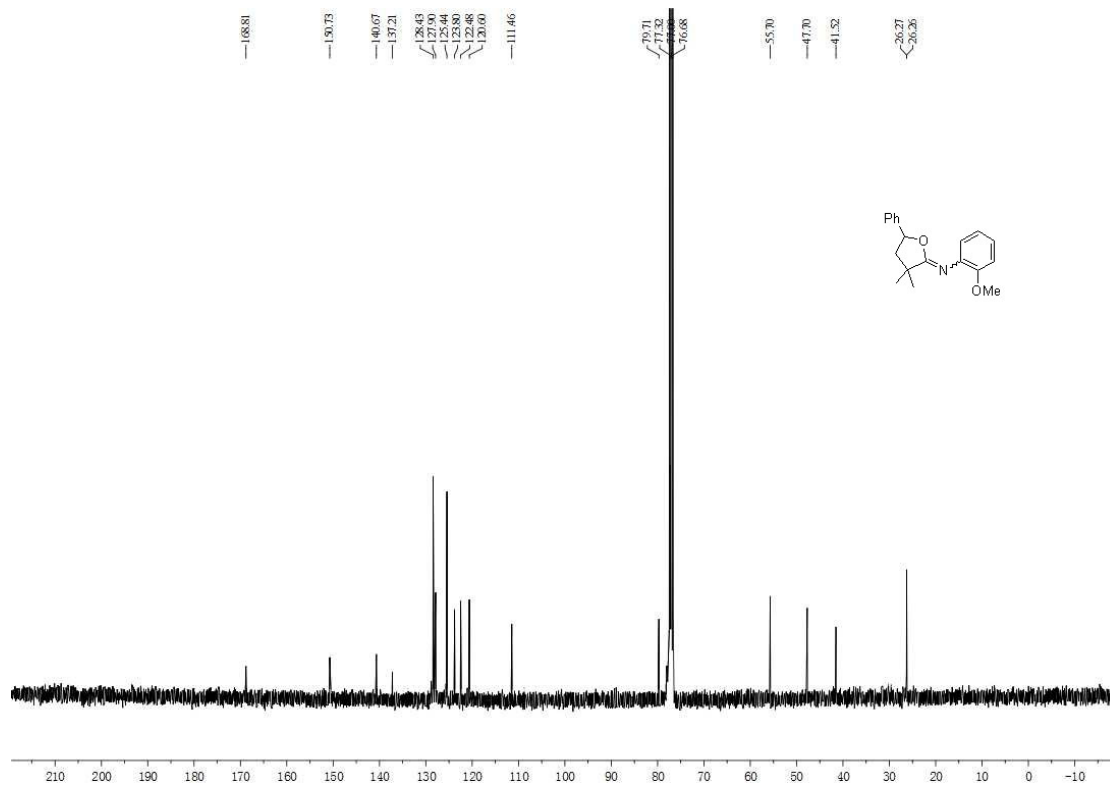
Product 4m



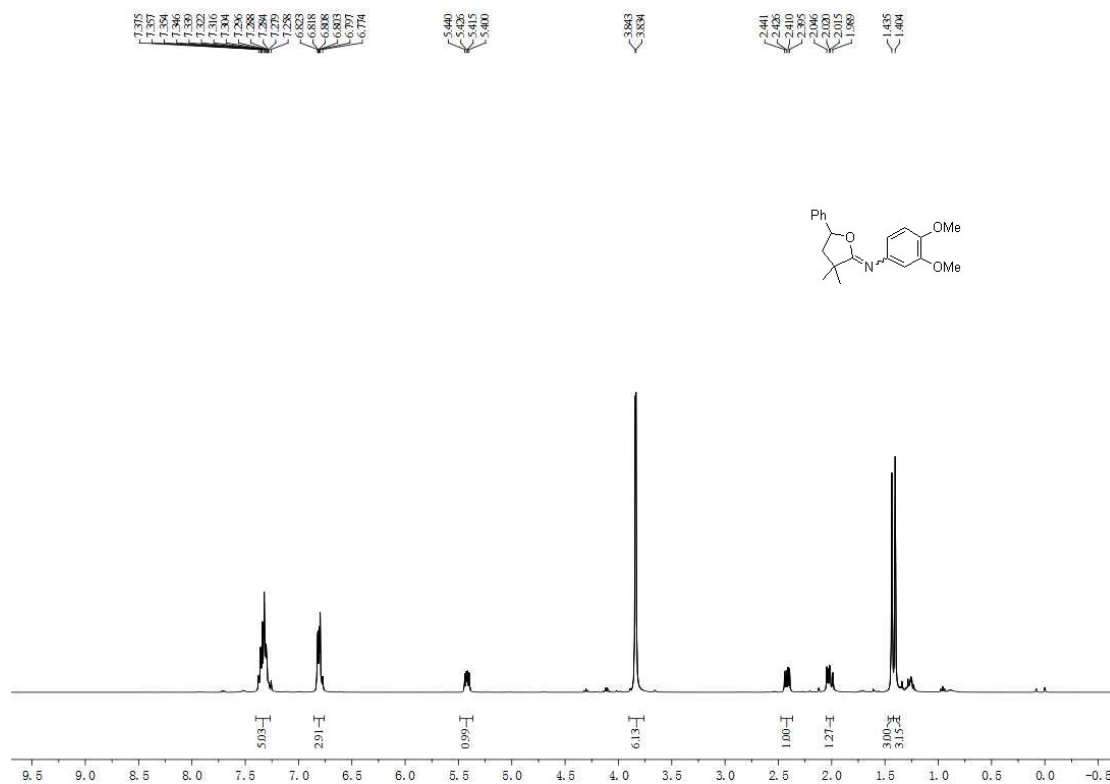


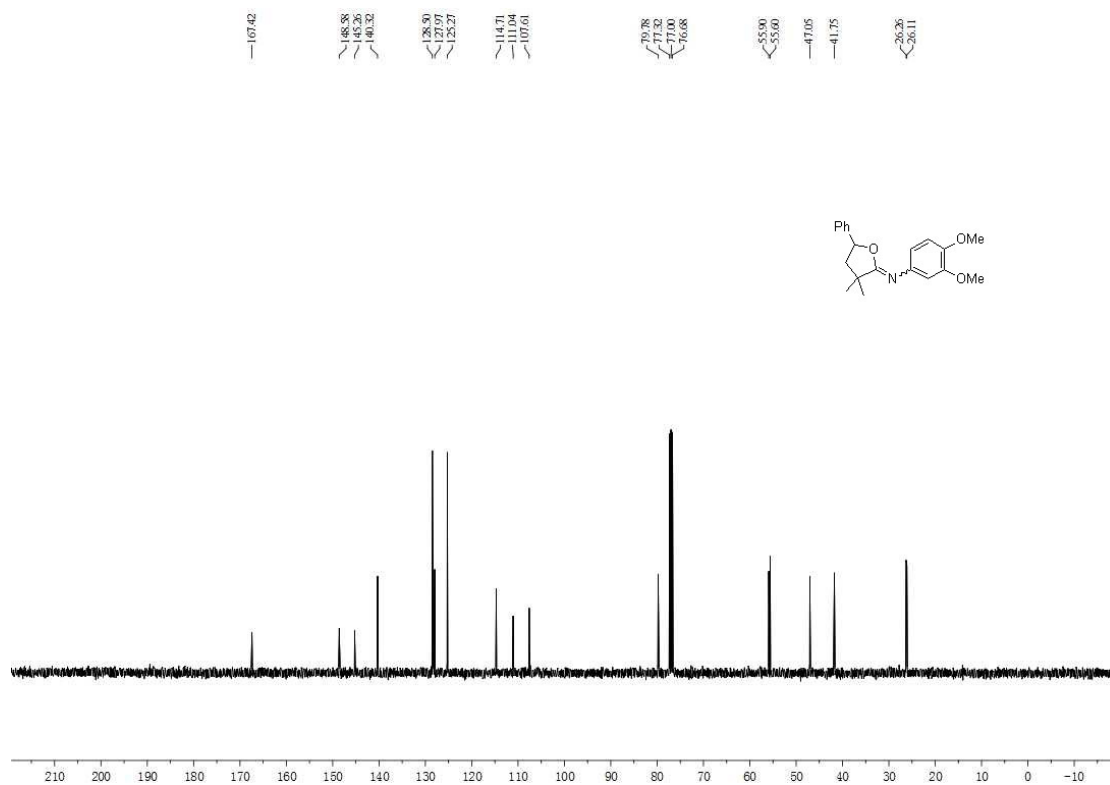
Product 4n



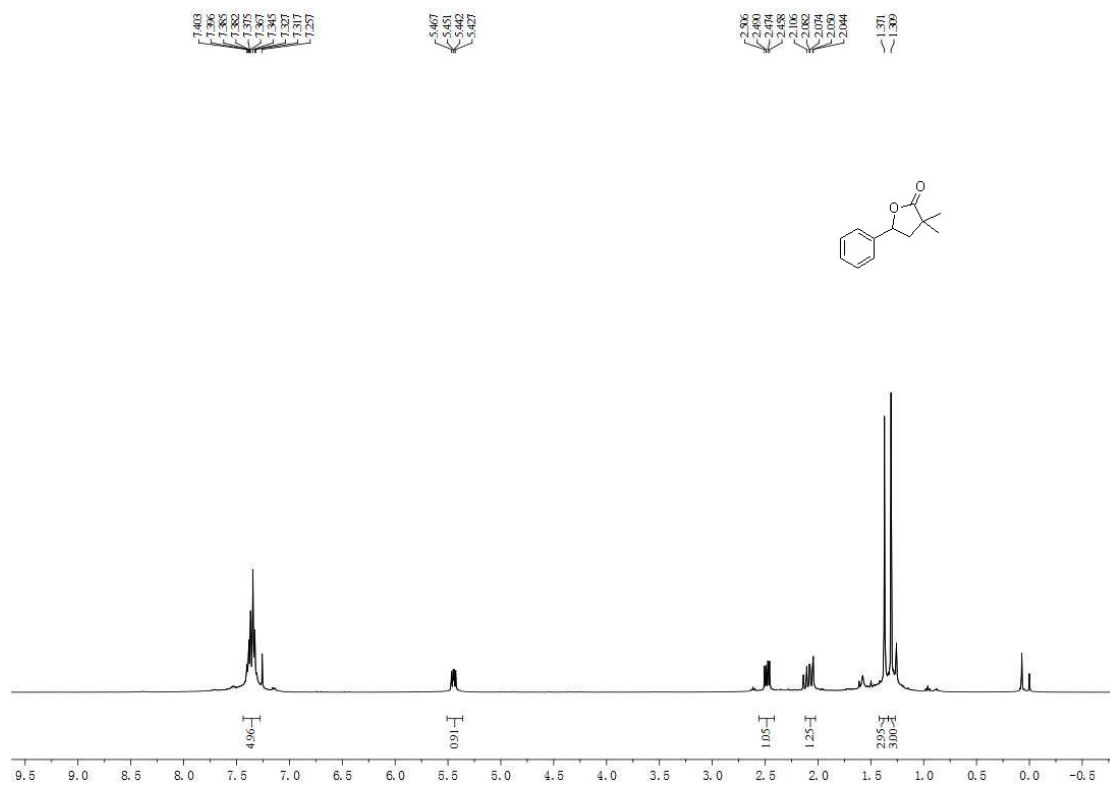


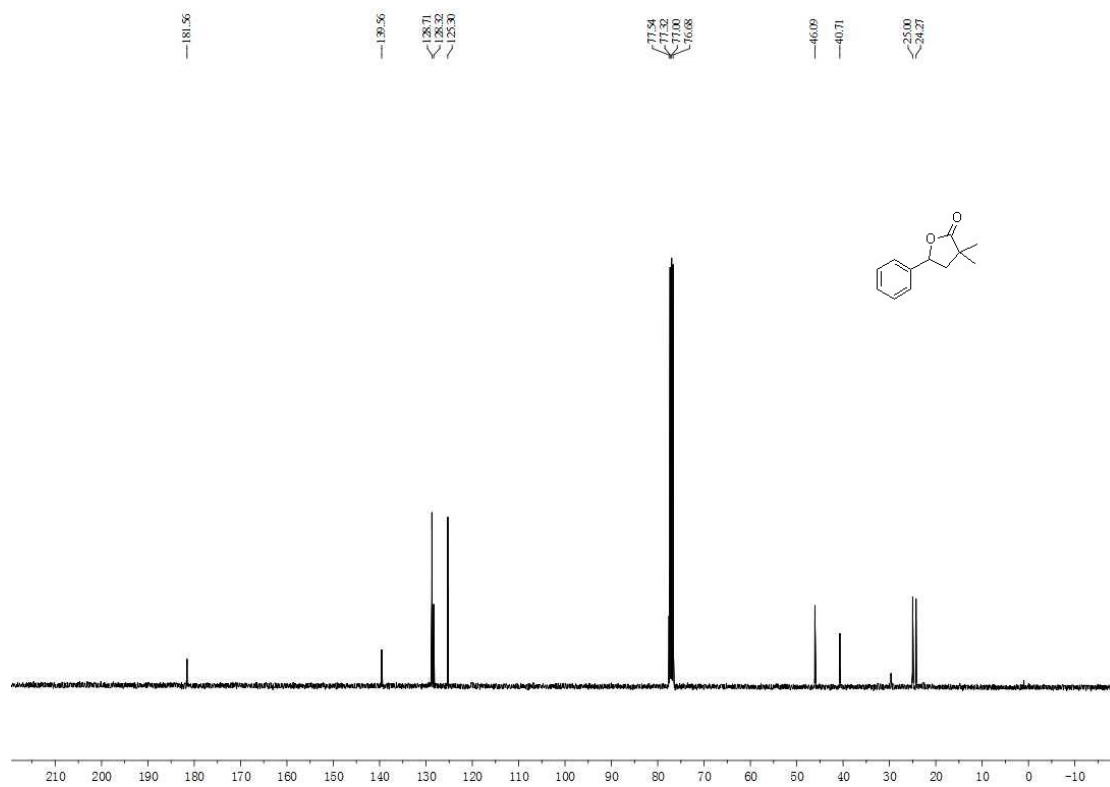
Product 4o



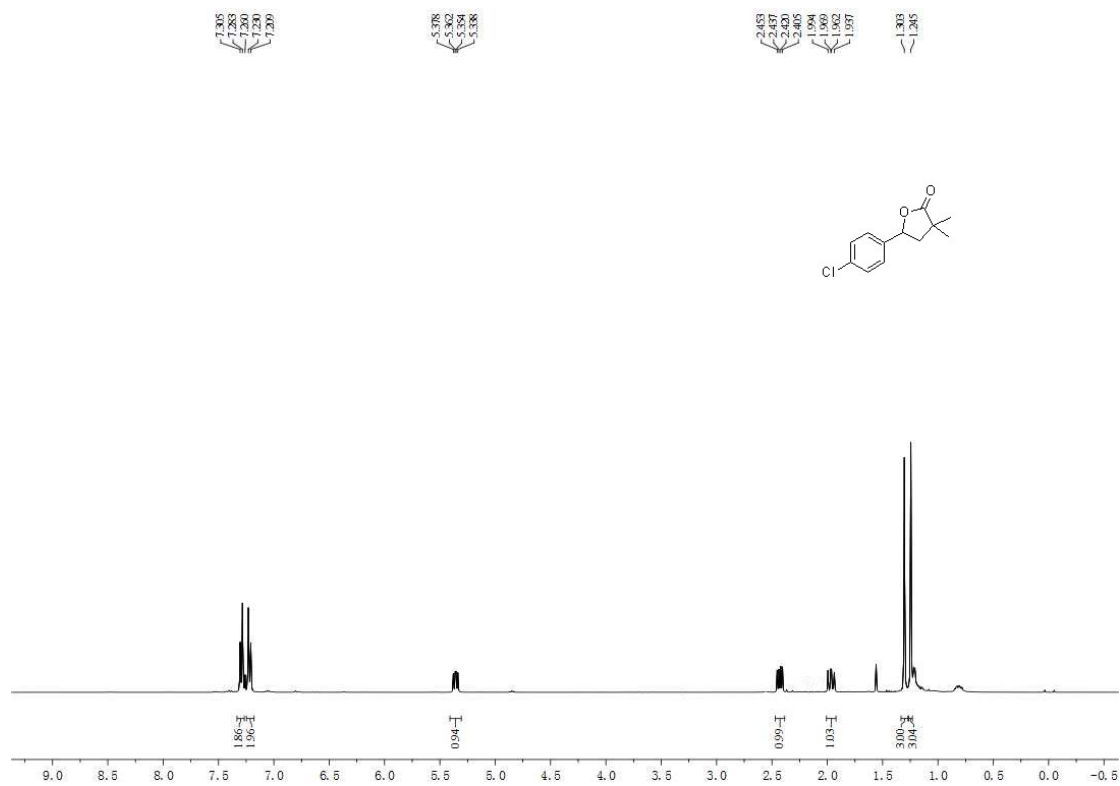


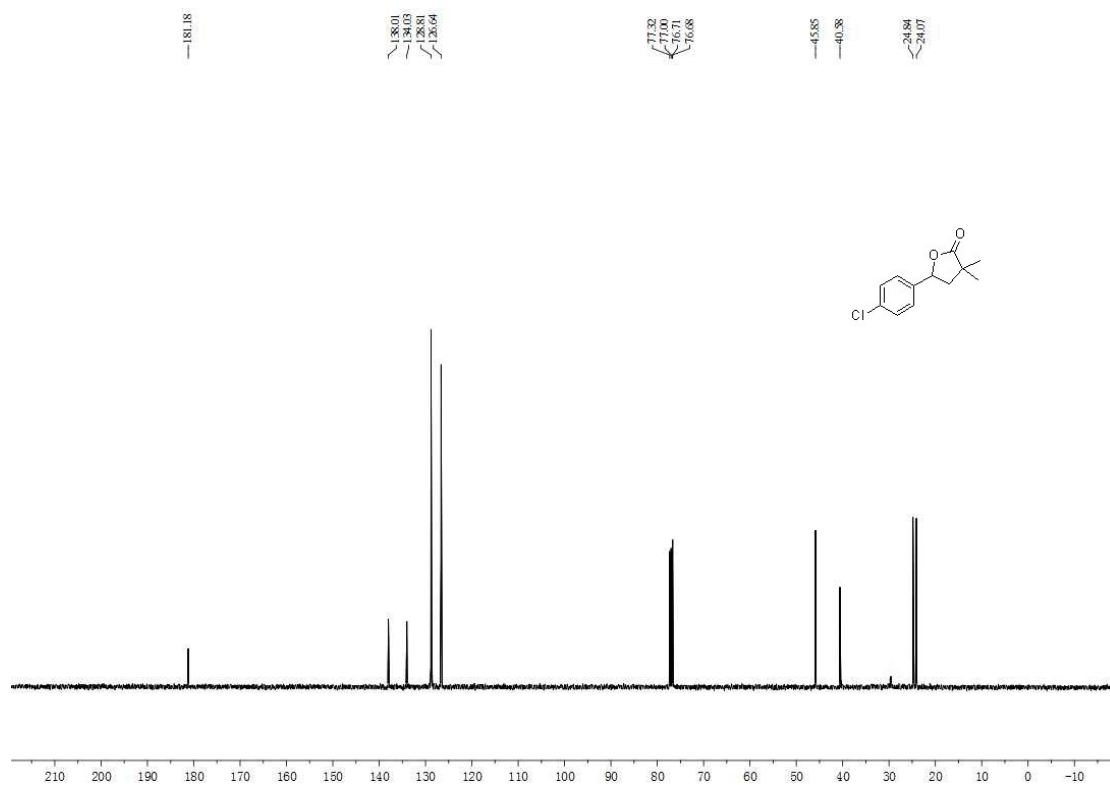
Product 5a



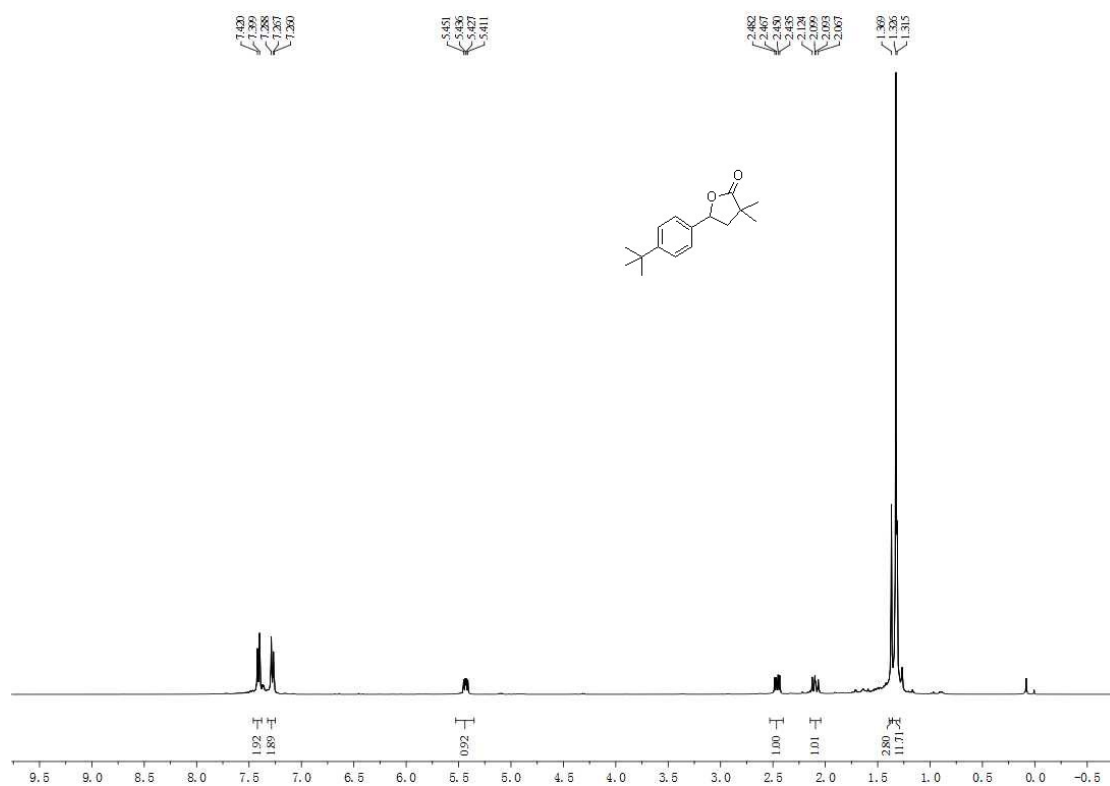


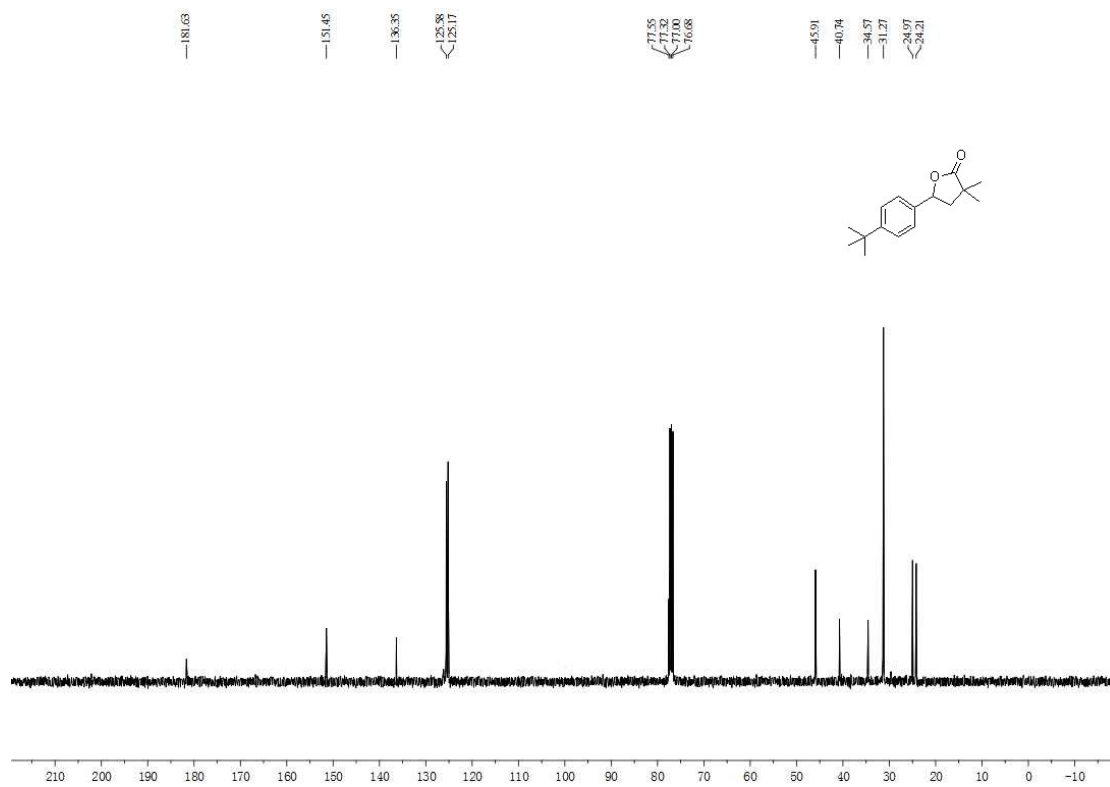
Product 5b



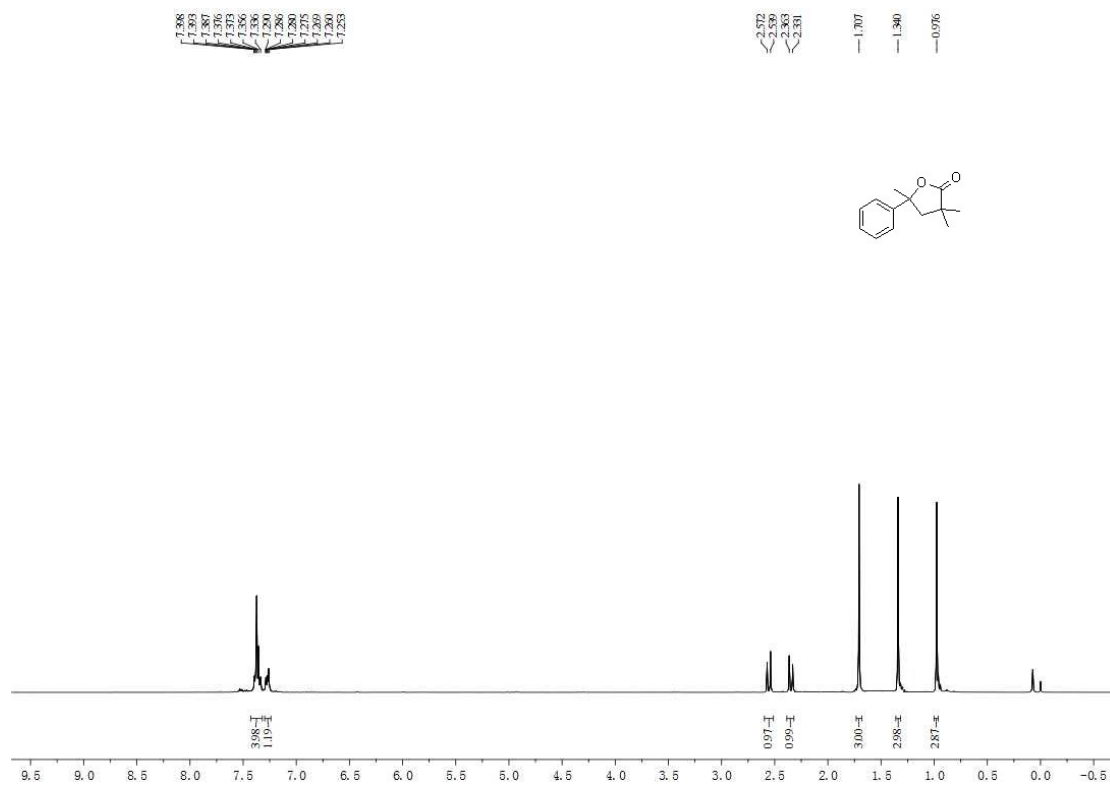


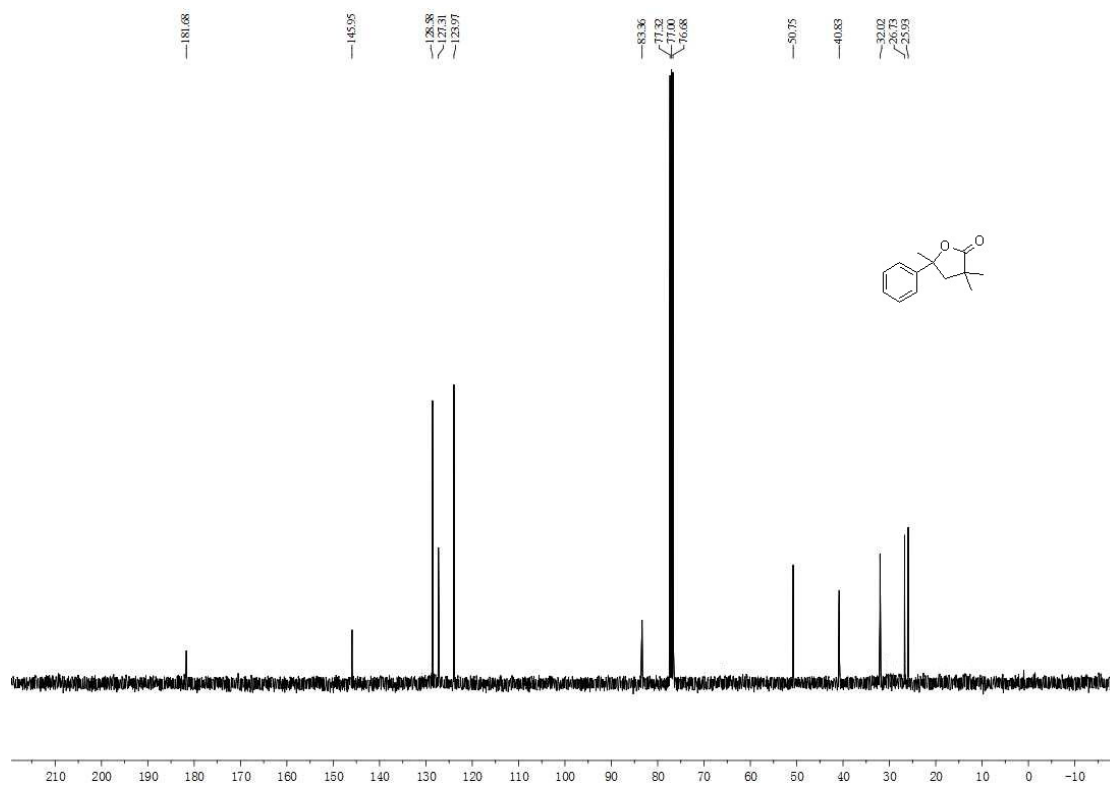
Product 5c



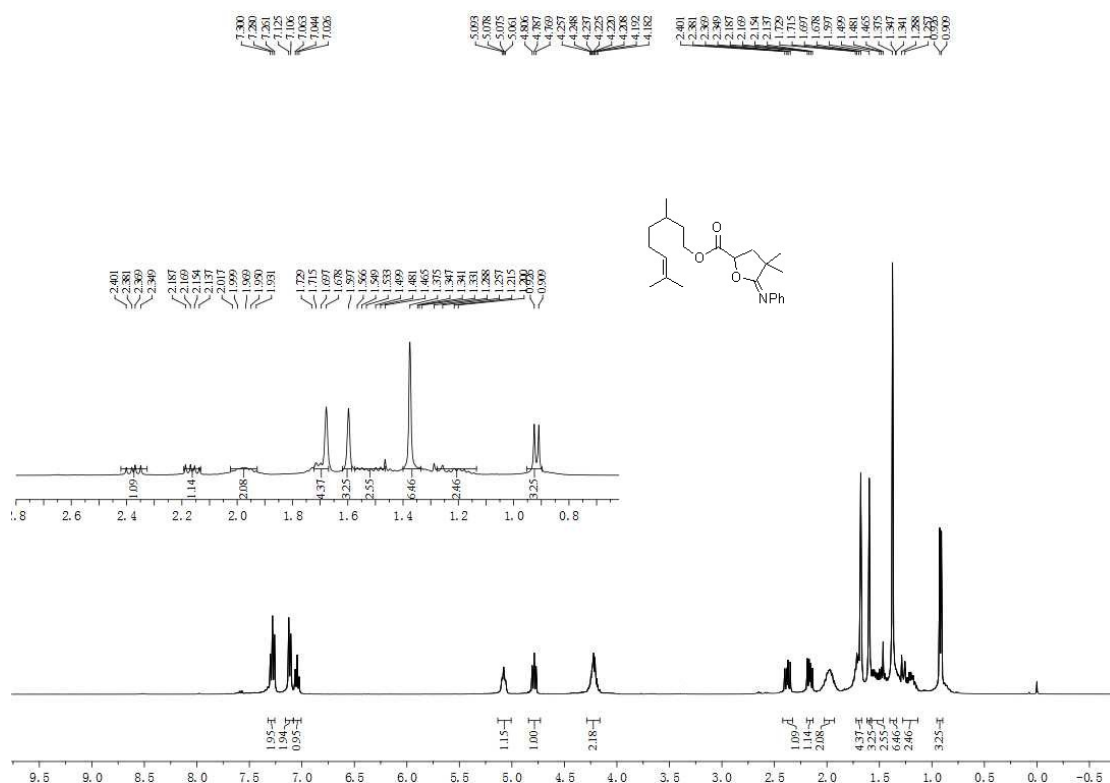


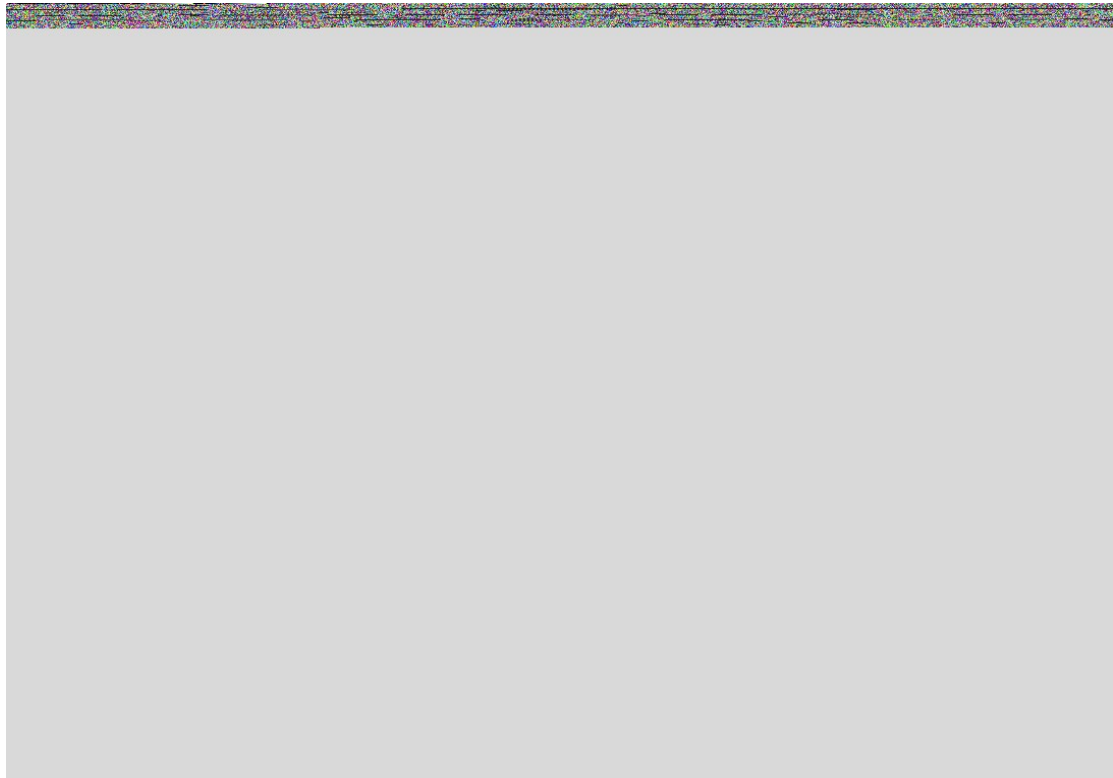
Product 5d





Product 7





Product 8

