

Supporting Information

Palladium-Catalyzed Desulfitative C-Arylation of Benzo[d]oxazole

Derivatives with Arene Sulfonyl Chlorides

Authors: Manli Zhang, Shouhui Zhang, Miaochang Liu and Jiang Cheng*

College of Chemistry & Materials Engineering, Wenzhou University, Wenzhou, 325027, PR China.

E-mail: jiangcheng@wzu.edu.cn.

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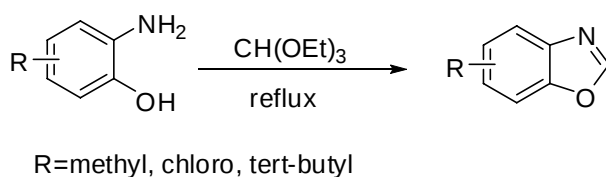
1) General experimental details

Chemicals were either purchased or purified by standard techniques without special instructions. ^1H NMR and ^{13}C NMR spectra were measured on a 500 MHz (^1H 500 MHz, ^{13}C 125 MHz) spectrometer using CDCl_3 as the solvent with tetramethylsilane (TMS) as the internal standard at room temperature. Chemical shifts are given in δ relative to TMS, the coupling constants J are given in Hz. All reactions were conducted under air atmosphere. Column chromatography was performed using EM Silica gel 60 (300-400 mesh).

1.1) General procedure:

Under air atmosphere, a sealed reaction tube was charged with benzoxazole (20 μL , 0.2 mmol), TsCl (76.4 mg, 0.4 mmol), $\text{Pd}(\text{OAc})_2$ (4.5 mg, 10 mol %), CuI (38.0 mg, 0.2 mmol), K_2CO_3 (55.2 mg, 0.4 mmol) and dry 1,4-dioxane (2 mL). The mixture was kept stirring under air at 120 $^\circ\text{C}$ for 48 h in a sealed tube. After the completion of the reaction, as monitored by TLC, the solvent was concentrated in vacuo and the residue was purified by flash column chromatography on silica gel (300-400 mesh) with petroleum ether-EtOAc as eluent to give the desired product.

1.2) Synthesis of the Substituted Benzoazoles¹:

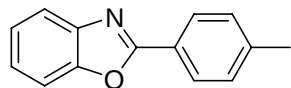


In a 100 mL flask, 2-aminophenol derivative (5 mmol) was added to triethyl orthoformate (15 mL) under an argon atmosphere, the resulting mixture was refluxed for 5-8 h and monitored by TLC. After cooling to room temperature, triethyl orthoformate was removed under reduced pressure at 70-80 $^\circ\text{C}$; the residue was purified by column chromatography to afford the desired products.

1. S. Guo, B. Qian, Y. Xie, C. Xia and H. Huang, *Org. Lett.*, 2011, **13**, 522.

2) Experimental characterization data for compounds

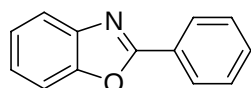
2-*p*-tolylbenzo[d]oxazole 3aa²



Analytical TLC on silica gel, 1:20 ethyl acetate/hexane R_f = 0.55; ^1H NMR (CDCl_3 , 500 MHz): δ 8.18 (d, J = 8.0 Hz, 2H), 7.79 (d, J = 4.0 Hz, 1H), 7.59 (d, J = 4.5 Hz, 1H), 7.38-7.34 (m, 4H), 2.45 (s, 3H).

^{13}C NMR (CDCl_3 , 125 MHz): δ 163.3, 150.5, 142.7, 140.9, 129.8, 127.8, 125.2, 124.8, 123.7, 119.6, 110.6, 21.7.

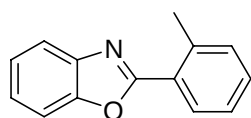
2-phenylbenzo[d]oxazole 3ab³



Analytical TLC on silica gel, 1:20 ethyl acetate/hexane R_f = 0.55; ^1H NMR (CDCl_3 , 500 MHz): δ 8.28 (d, J = 5.5 Hz, 2H), 7.80 (s, 1H), 7.60 (s, 1H), 7.54 (m, 3H), 7.38-7.36 (m, 2H).

^{13}C NMR (CDCl_3 , 125 MHz): δ 163.0, 150.8, 141.9, 131.6, 128.9, 127.6, 127.1, 125.1, 124.6, 120.0, 110.6.

2-*o*-tolylbenzo[d]oxazole 3ac²



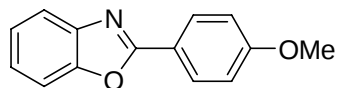
Analytical TLC on silica gel, 1:20 ethyl acetate/hexane R_f = 0.55; ^1H NMR (CDCl_3 , 500 MHz): δ 8.22 (s, 1H), 7.86-7.85 (m, 1H), 7.63 (s, 1H), 7.44-7.42 (m, 1H), 7.37-7.35 (m, 4H), 2.82 (s, 3H).

^{13}C NMR (CDCl_3 , 125 MHz): δ 159.5, 148.4, 142.1, 138.8, 131.8, 130.9, 129.9, 126.3, 126.1, 125.0, 124.3, 120.1, 110.5, 22.1.

2-(4-methoxyphenyl)benzo[d]oxazole 3ad⁴

2. F. Yang, Z. Xu, Z. Wang, Z. Yu and R. Wang, *Chem.—Eur. J.*, 2011, **17**, 6321.

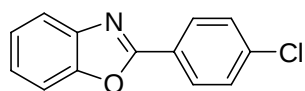
3. J. Peng, C. Zong, M. Ye, D. Chen, D. Gao, Y. Wang and C. Chen, *Org. Biomol. Chem.*, 2011, **9**, 1225.



Analytical TLC on silica gel, 1:20 ethyl acetate/hexane R_f = 0.50; ^1H NMR (CDCl_3 , 500 MHz): δ 8.21 (d, J = 8.0 Hz, 2H), 7.75 (d, J = 7.0 Hz, 1H), 7.55 (d, J = 8.0 Hz, 1H), 7.35-7.30 (m, 2H), 7.03 (d, J = 8.0 Hz, 2H), 3.88 (s, 3H).

^{13}C NMR (CDCl_3 , 125 MHz): δ 163.2, 162.4, 150.7, 141.8, 129.4, 124.7, 124.5, 119.50, 119.45, 114.4, 110.4, 55.4.

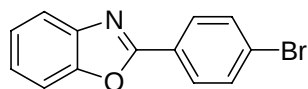
2-(4-chlorophenyl)benzo[d]oxazole 3ae²



Analytical TLC on silica gel, 1:20 ethyl acetate/hexane R_f = 0.45; ^1H NMR (CDCl_3 , 500 MHz): δ 8.19 (d, J = 8.5 Hz, 2H), 7.78-7.76 (m, 1H), 7.58-7.57 (m, 1H), 7.50 (d, J = 8.5 Hz, 2H), 7.37-7.35 (m, 2H).

^{13}C NMR (CDCl_3 , 125 MHz): δ 162.1, 150.8, 142.0, 137.8, 129.3, 128.8, 125.7, 125.3, 124.7, 120.1, 110.6.

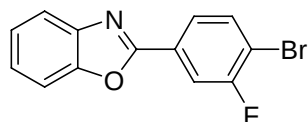
2-(4-bromophenyl)benzo[d]oxazole 3af⁴



Analytical TLC on silica gel, 1:20 ethyl acetate/hexane R_f = 0.50; ^1H NMR (CDCl_3 , 500 MHz): δ 8.11 (d, J = 8.5 Hz, 2H), 7.78-7.76 (m, 1H), 7.66 (d, J = 8.0 Hz, 2H), 7.58-7.57 (m, 1H), 7.38-7.35 (m, 2H).

^{13}C NMR (CDCl_3 , 125 MHz): δ 162.0, 150.7, 141.9, 132.2, 129.0, 126.2, 126.1, 125.4, 124.7, 120.1, 110.6.

2-(4-bromo-3-fluorophenyl)benzo[d]oxazole 3ag



Analytical TLC on silica gel, 1:15 ethyl acetate/hexane R_f = 0.45; ^1H NMR (CDCl_3 ,

4. M. M. Guru, M. A. Ali and T. Punniyamurthy, *Org. Lett.*, 2011, **13**, 1194.

5. P. Saha, T. Ramana, N. Purkait, M. A. Ali, R. Paul and T. Punniyamurthy, *J. Org. Chem.*, 2009, **74**, 8719.

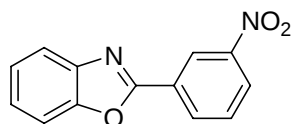
500 MHz): δ 7.99-7.97 (m, 1H), 7.92-7.90 (m, 1H), 7.78-7.76 (m, 1H), 7.72-7.69 (m, 1H), 7.60-7.56 (m, 1H), 7.40-7.36 (m, 2H).

^{13}C NMR (CDCl_3 , 125 MHz): δ 161.0, 159.3 (d, $J = 246.8$ Hz), 150.8, 141.8, 134.3, 128.3 (d, $J = 7.4$ Hz), 125.7, 124.9, 124.1 (d, $J = 3.4$ Hz), 120.3, 115.4 (d, $J = 24.8$ Hz), 112.9 (d, $J = 20.9$ Hz), 110.7.

IR (prism, cm^{-1}): 1618, 1551, 1229, 1059, 736.

MS (ESI) 291 (M^+); HRMS Calcd. for $\text{C}_{13}\text{H}_8\text{BrFNO}$ ($\text{M}+\text{H}$) $^+$: 291.9773, found ($\text{M}+\text{H}$) $^+$: 291.9768.

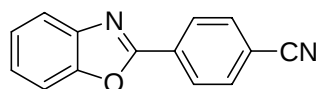
2-(3-nitrophenyl)benzo[d]oxazole 3ah⁵



Analytical TLC on silica gel, 1:15 ethyl acetate/hexane $R_f = 0.40$; ^1H NMR (CDCl_3 , 500 MHz): δ 9.10 (t, $J = 2.0$ Hz, 1H), 8.59 (d, $J = 8.0$ Hz, 1H), 8.40-8.38 (m, 1H), 7.83-7.80 (m, 1H), 7.74 (t, $J = 8.0$ Hz, 1H), 7.65-7.62 (m, 1H), 7.45-7.40 (m, 2H).

^{13}C NMR (CDCl_3 , 125 MHz): δ 160.6, 150.9, 148.8, 141.8, 133.0, 130.1, 129.0, 126.1, 125.8, 125.2, 122.5, 120.5, 110.9.

4-(benzo[d]oxazol-2-yl)benzonitrile 3ai⁶



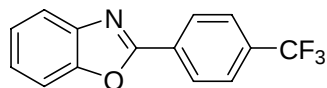
Analytical TLC on silica gel, 1:10 ethyl acetate/hexane $R_f = 0.40$; ^1H NMR (CDCl_3 , 500 MHz): δ 8.36 (d, $J = 8.5$ Hz, 2H), 7.82 (d, $J = 8.0$ Hz, 3H), 7.62 (d, $J = 8.0$ Hz, 1H), 7.44-7.39 (m, 2H).

^{13}C NMR (CDCl_3 , 125 MHz): δ 161.2, 150.9, 141.9, 132.7, 131.1, 128.0, 126.1, 125.1, 120.6, 118.2, 114.7, 110.9.

2-(4-(trifluoromethyl)phenyl)benzo[d]oxazole 3aj⁷

6. J. Huang, J. Chan, Y. Chen, C. J. Borths, K. D. Baucom, R. D. Larsen and M. M. Faul, *J. Am. Chem. Soc.*, 2010, **132**, 3674.

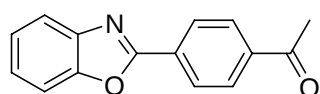
7. R.-G. Xing, Y.-N. Li, Q. Liu, Q.-Y. Meng, J. Li, X.-X. Shen, Z. Liu, B. Zhou, X. Yao and Z.-L. Liu, *Eur. J. Org. Chem.*, 2010, 6627.



Analytical TLC on silica gel, 1:20 ethyl acetate/hexane R_f = 0.40; ^1H NMR (CDCl_3 , 500 MHz): δ 8.37 (d, J = 8.0 Hz, 2H), 7.82-7.77 (m, 3H), 7.62-7.59 (m, 1H), 7.42-7.37 (m, 2H).

^{13}C NMR (CDCl_3 , 125 MHz): δ 161.5, 150.8, 141.8, 133.0 (q, J = 32.6 Hz), 130.4, 127.9, 125.9 (q, J = 3.8 Hz), 125.8, 124.9, 123.7 (q, J = 275 Hz), 120.4, 110.8.

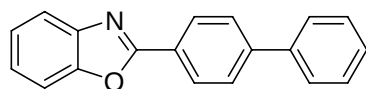
1-(4-(benzo[d]oxazol-2-yl)phenyl)ethanone 3ak³



Analytical TLC on silica gel, 1:20 ethyl acetate/hexane R_f = 0.40; ^1H NMR (CDCl_3 , 500 MHz): δ 8.36 (d, J = 8.5 Hz, 2H), 8.10 (d, J = 8.5 Hz, 2H), 7.82-7.81 (m, 1H), 7.63-7.61 (m, 1H), 7.42-7.37 (m, 2H), 2.67 (s, 3H).

^{13}C NMR (CDCl_3 , 125 MHz): δ 197.7, 161.7, 150.9, 141.9, 139.0, 131.1, 128.8, 127.7, 125.8, 124.9, 120.4, 110.8, 26.8.

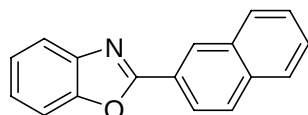
2-([1,1'-biphenyl]-4-yl)benzo[d]oxazole 3al⁸



Analytical TLC on silica gel, 1:20 ethyl acetate/hexane R_f = 0.40; ^1H NMR (CDCl_3 , 500 MHz): δ 8.36 (d, J = 7.5 Hz, 2H), 7.83 (s, 1H), 7.77 (d, J = 7.0 Hz, 2H), 7.68-7.66 (m, 2H), 7.63-7.62 (m, 1H), 7.49 (t, J = 7.0 Hz, 2H), 7.42-7.36 (m, 3H).

^{13}C NMR (CDCl_3 , 125 MHz): δ 163.1, 150.8, 144.4, 141.6, 139.9, 128.9, 128.2, 128.1, 127.6, 127.1, 125.6, 125.2, 124.7, 119.8, 110.6.

2-(naphthalen-2-yl)benzo[d]oxazole 3am²



Analytical TLC on silica gel, 1:20 ethyl acetate/hexane R_f = 0.45; ^1H NMR (CDCl_3 ,

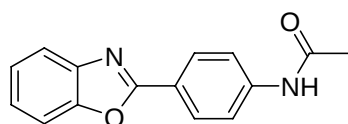
8. L. Ackermann, S. Barfusser and J. Pospech, *Org. Lett.*, 2010, **12**, 724.

9. M.-S. Chua, D.-F. Shi, S. Wrigley, T. D. Bradshaw, I. Hutchinson, P. N. Shaw, D. A. Barrett, L. A. Stanley and M. F. G. Stevens, *J. Med. Chem.*, 1999, **42**, 381.

500 MHz): δ 8.79 (s, 1H), 8.33 (d, J = 8.5 Hz, 1H), 8.00-7.96 (m, 2H), 7.90-7.88 (m, 1H), 7.84-7.82 (m, 1H), 7.63-7.62 (m, 1H), 7.58-7.55 (m, 2H), 7.39-7.36 (m, 2H).

^{13}C NMR (CDCl_3 , 125 MHz): 163.2, 150.8, 142.0, 134.8, 133.0, 128.9, 128.8, 128.2, 127.9, 127.8, 126.9, 125.2, 124.7, 124.3, 123.9, 120.0, 110.6.

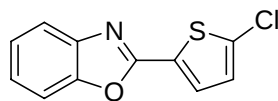
***N*-(4-(benzo[d]oxazol-2-yl)phenyl)acetamide 3an⁹**



Analytical TLC on silica gel, 1:5 ethyl acetate/hexane R_f = 0.55; ^1H NMR (CDCl_3 , 500 MHz): δ 10.28 (s, 1H), 8.11 (d, J = 8.5 Hz, 2H), 7.79 (d, J = 8.0 Hz, 2H), 7.75-7.72 (m, 2H), 7.39-7.34 (m, 2H), 2.08 (s, 3H).

^{13}C NMR (CDCl_3 , 125 MHz): δ 168.9, 162.2, 150.1, 142.6, 141.6, 128.2, 125.1, 124.7, 120.6, 119.5, 119.0, 110.7, 24.1.

2-(5-chlorothiophen-2-yl)benzo[d]oxazole 3ao



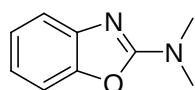
Analytical TLC on silica gel, 1:20 ethyl acetate/hexane R_f = 0.40; ^1H NMR (CDCl_3 , 500 MHz): δ 7.73 (s, 1H), 7.69 (s, 1H), 7.54-7.53 (m, 1H), 7.35-7.34 (m, 2H), 7.00 (s, 1H).

^{13}C NMR (CDCl_3 , 125 MHz): δ 157.7, 150.4, 141.7, 135.3, 129.4, 128.0, 127.6, 125.3, 124.9, 119.9, 110.4.

IR (prism, cm^{-1}): 1620, 1575, 1024, 991, 790.

MS (ESI) 235 (M^+); HRMS Calcd. for $\text{C}_{11}\text{H}_7\text{ClNOS}$ ($\text{M}+\text{H}$)⁺: 235.9937, found ($\text{M}+\text{H}$)⁺: 235.9935.

***N,N*-dimethylbenzo[d]oxazol-2-amine 3ap¹⁰**



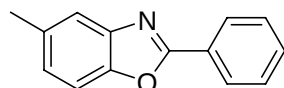
Analytical TLC on silica gel, 1:15 ethyl acetate/hexane R_f = 0.45; ^1H NMR (CDCl_3 ,

10. S. H. Cho, J. Y. Kim, S. Y. Lee and S. Chang, *Angew. Chem., Int. Ed.*, 2009, **48**, 9127.

500 MHz): δ 7.31 (d, J = 5.0 Hz, 1H), 7.19 (d, J = 5.0 Hz, 1H), 7.11-7.08 (m, 1H), 6.96-6.93 (m, 1H), 3.15 (s, 6H).

^{13}C NMR (CDCl_3 , 125 MHz): δ 162.7, 148.8, 142.7, 124.1, 120.5, 115.9, 108.7, 37.8.

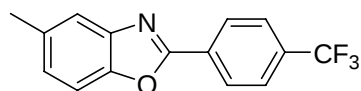
5-methyl-2-phenylbenzo[d]oxazole 4bb¹¹



Analytical TLC on silica gel, 1:20 ethyl acetate/hexane R_f = 0.40; ^1H NMR (CDCl_3 , 500 MHz): δ 8.26 (d, J = 4.5 Hz, 2H), 7.58 (s, 1H), 7.52-7.50 (m, 3H), 7.45 (d, J = 8.0 Hz, 1H), 7.16 (d, J = 8.0 Hz, 1H), 2.48 (s, 3H).

^{13}C NMR (CDCl_3 , 125 MHz): δ 163.1, 149.0, 141.9, 134.5, 131.5, 128.9, 127.6, 127.1, 126.3, 119.8, 109.9, 21.5.

5-methyl-2-(4-(trifluoromethyl)phenyl)benzo[d]oxazole 4bi



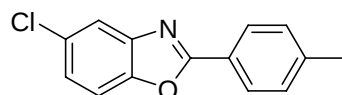
Analytical TLC on silica gel, 1:20 ethyl acetate/hexane R_f = 0.45; ^1H NMR (CDCl_3 , 500 MHz): δ 8.36 (d, J = 8.0 Hz, 2H), 7.78 (d, J = 8.5 Hz, 2H), 7.59 (s, 1H), 7.48 (d, J = 8.5 Hz, 1H), 7.21 (d, J = 8.0 Hz, 1H), 2.50 (s, 3H).

^{13}C NMR (CDCl_3 , 125 MHz): δ 161.6, 149.1, 141.9, 134.9, 132.9 (q, J = 32.6 Hz), 130.5, 127.8, 127.0, 125.9 (q, J = 3.3 Hz), 123.7 (q, J = 272.1 Hz), 120.2, 110.1, 21.5.

IR (prism, cm^{-1}): 1557, 1453, 1320, 806, 698.

MS (ESI) 277 (M^+); HRMS Calcd. for $\text{C}_{15}\text{H}_{11}\text{F}_3\text{NO}$ ($\text{M}+\text{H}$)⁺: 278.0793, found ($\text{M}+\text{H}$)⁺: 278.0782.

5-chloro-2-*p*-tolylbenzo[d]oxazole 4ca⁸



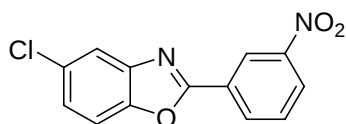
Analytical TLC on silica gel, 1:20 ethyl acetate/hexane R_f = 0.40; ^1H NMR (CDCl_3 , 500 MHz): δ 8.11 (d, J = 8.0 Hz, 2H), 7.72 (d, J = 2.0 Hz, 1H), 7.46 (d, J = 9.0 Hz,

11. W. Han, P. Mayer and A. R. Ofial, *Chem.—Eur. J.*, 2011, **17**, 6904.

1H), 7.33-7.28 (m, 3H), 2.43(s, 3H).

¹³C NMR (CDCl₃, 125 MHz): δ 164.6, 149.2, 143.2, 142.6, 129.9, 129.7, 127.7, 125.1, 123.8, 119.7, 111.1, 21.6.

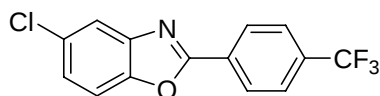
5-chloro-2-(3-nitrophenyl)benzo[d]oxazole 4cg¹²



Analytical TLC on silica gel, 1:15 ethyl acetate/hexane *R_f* = 0.40; ¹H NMR (CDCl₃, 500 MHz): δ 9.07 (s, 1H), 8.56 (d, *J* = 8.0 Hz, 1H), 8.40 (d, *J* = 8.5 Hz, 1H), 7.79 (d, *J* = 2.0 Hz, 1H), 7.74 (t, *J* = 8.0 Hz, 1H), 7.56 (d, *J* = 8.0 Hz, 1H), 7.40-7.38 (m, 1H).

¹³C NMR (CDCl₃, 125 MHz): δ 161.9, 149.4, 148.7, 142.9, 133.1, 130.7, 130.2, 128.5, 126.4, 126.1, 122.6, 120.4, 111.6.

5-chloro-2-(4-(trifluoromethyl)phenyl)benzo[d]oxazole 4ci



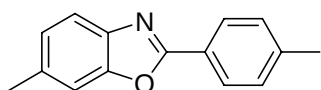
Analytical TLC on silica gel, 1:20 ethyl acetate/hexane *R_f* = 0.40; ¹H NMR (CDCl₃, 500 MHz): δ 8.34 (d, *J* = 8.0 Hz, 2H), 7.79-7.76 (m, 3H), 7.52 (d, *J* = 8.5 Hz, 1H), 7.37-7.35 (m, 1H).

¹³C NMR (CDCl₃, 125 MHz): δ 162.7, 149.4, 143.0, 133.4 (q, *J* = 32.6 Hz), 130.5, 129.9, 128.0, 126.1, 126.0 (q, *J* = 3.8 Hz), 123.6 (q, *J* = 271.0 Hz), 120.3, 111.5.

IR (prism, cm⁻¹): 1557, 1453, 1320, 806, 698.

MS (ESI) 297 (M⁺); HRMS Calcd. for C₁₄H₈ClF₃NO (M+H)⁺: 298.0247, found (M+H)⁺: 298.0241.

6-methyl-2-*p*-tolylbenzo[d]oxazole 4da³



Analytical TLC on silica gel, 1:20 ethyl acetate/hexane *R_f* = 0.40; ¹H NMR (CDCl₃,

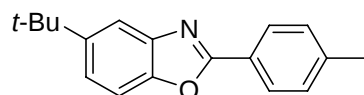
12. C. Praveen, K. H. Kumar, D. Muralidharan and P. T. Perumal, *Tetrahedron*, 2008, **64**, 2369.

13. B. Wang, Y. Zhang, P. Li and L. Wang, *Chin. J. Chem.*, 2010, **28**, 1697.

500 MHz): δ 8.16 (s, 2H), 7.67 (s, 1H), 7.40 (s, 1H), 7.33 (d, J = 6.5 Hz, 2H), 7.17 (d, J = 7.0 Hz, 1H), 2.50 (s, 3H), 2.43 (s, 3H)

^{13}C NMR (CDCl_3 , 125 MHz): δ 163.0, 151.1, 142.0, 139.2, 135.5, 129.6, 127.5, 125.8, 124.3, 119.0, 110.7, 21.7, 21.6.

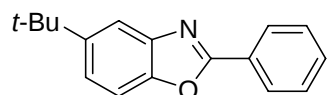
5-*tert*-butyl-2-*p*-tolylbenzo[d]oxazole 4ea¹³



Analytical TLC on silica gel, 1:20 ethyl acetate/hexane R_f = 0.45; ^1H NMR (CDCl_3 , 500 MHz): δ 8.17 (d, J = 7.5 Hz, 2H), 7.82 (s, 1H), 7.49 (d, J = 8.5 Hz, 1H), 7.41 (d, J = 8.5 Hz, 1H), 7.33 (d, J = 7.5 Hz, 2H), 2.44 (s, 3H), 1.40 (s, 9H).

^{13}C NMR (CDCl_3 , 125 MHz): δ 158.1, 148.3, 147.4, 142.2, 141.4, 129.7, 127.6, 124.2, 122.8, 116.2, 109.7, 34.9, 31.7, 21.6.

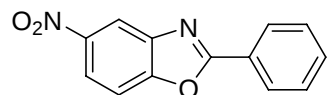
5-*tert*-butyl-2-phenylbenzo[d]oxazole 4eb¹³



Analytical TLC on silica gel, 1:20 ethyl acetate/hexane R_f = 0.45; ^1H NMR (CDCl_3 , 500 MHz): δ 8.28 (d, J = 4.0 Hz, 2H), 7.84 (s, 1H), 7.54-7.51 (m, 4H), 7.43 (d, J = 8.5 Hz, 1H), 1.40 (s, 9H).

^{13}C NMR (CDCl_3 , 125 MHz): δ 163.1, 148.8, 148.3, 141.4, 131.5, 128.9, 127.6, 127.0, 123.0, 116.4, 109.7, 35.0, 31.7.

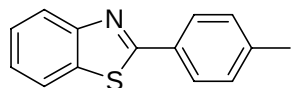
5-nitro-2-phenylbenzo[d]oxazole 4fb³



Analytical TLC on silica gel, 1:20 ethyl acetate/hexane R_f = 0.40; ^1H NMR (CDCl_3 , 500 MHz): δ 8.65 (d, J = 2.0 Hz, 1H), 8.32 (dd, J = 7.0 Hz, 2.0 Hz, 1H), 8.27 (d, J = 7.5 Hz, 2H), 7.68 (d, J = 7.5 Hz, 1H), 7.63-7.55 (m, 3H).

^{13}C NMR (CDCl_3 , 125 MHz): δ 166.0, 154.3, 145.5, 142.6, 132.6, 129.1, 128.1, 126.0, 121.1, 116.3, 110.7.

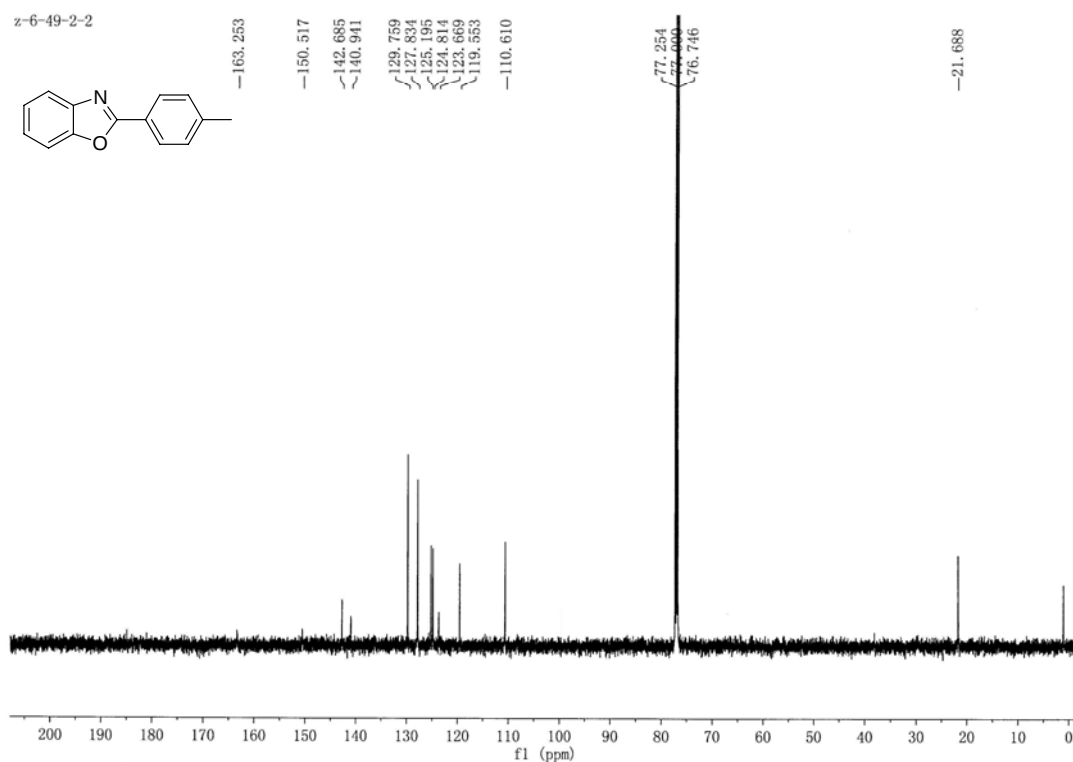
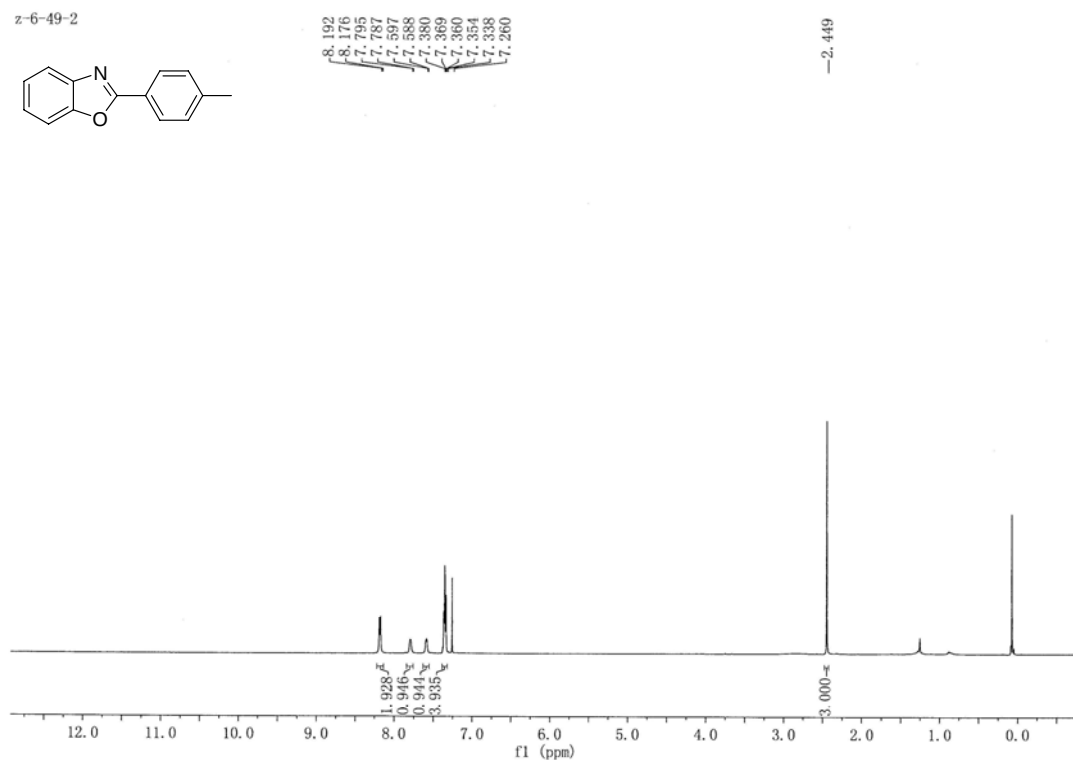
2-*p*-tolylbenzo[d]thiazole 4ga¹¹

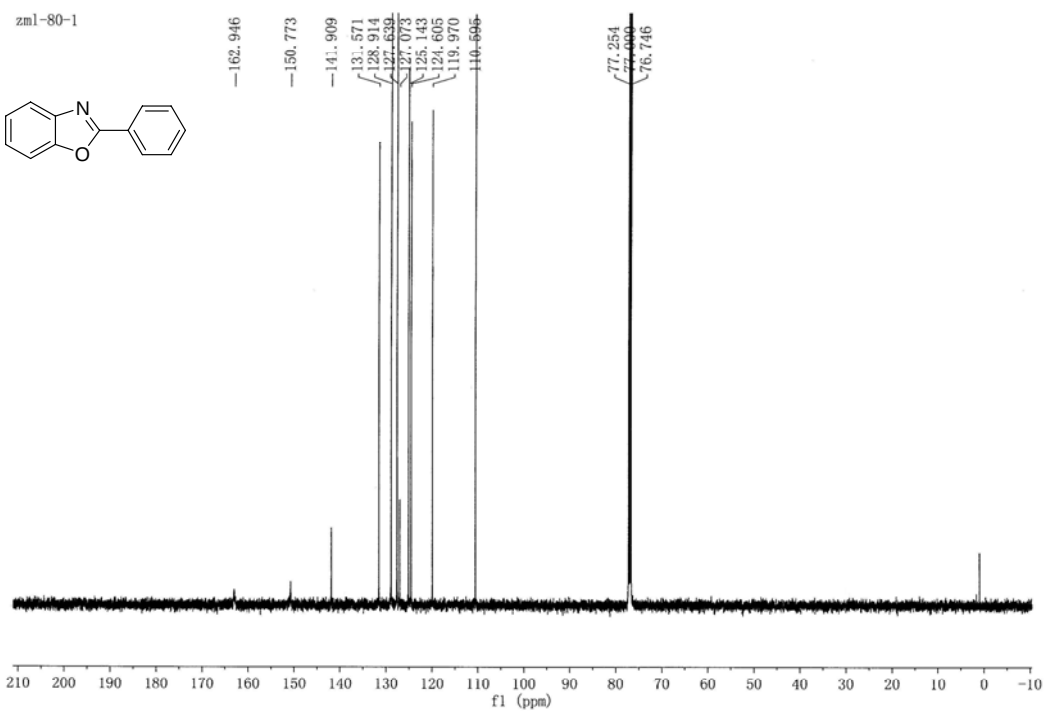
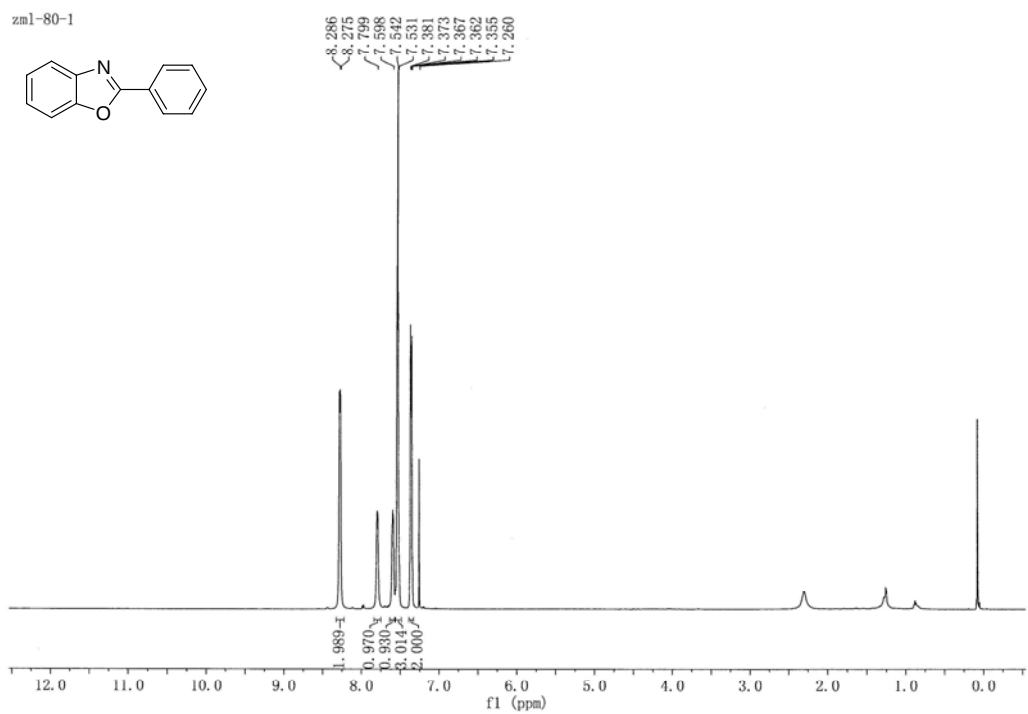


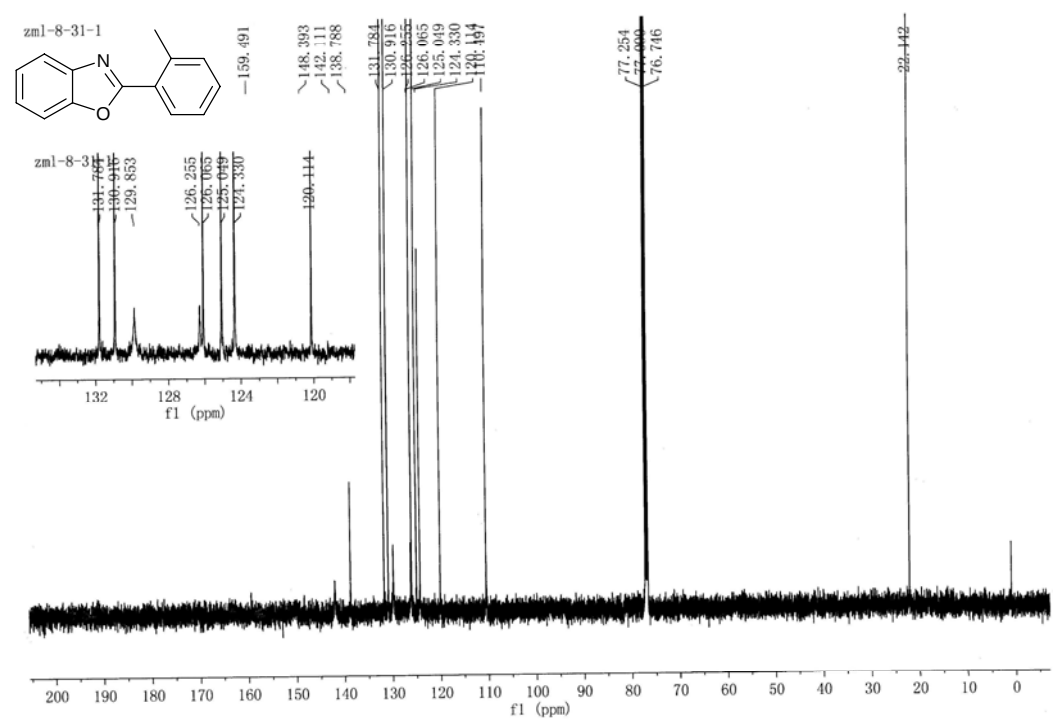
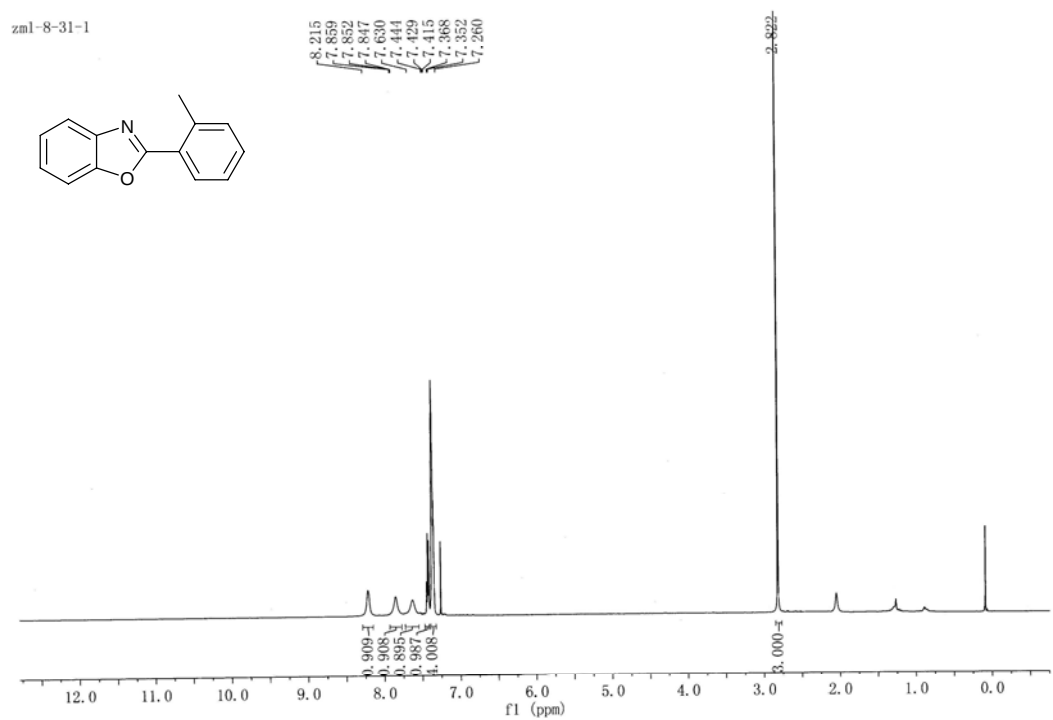
Analytical TLC on silica gel, 1:20 ethyl acetate/hexane R_f = 0.40; ^1H NMR (CDCl_3 , 500 MHz): δ 8.12 (s, 1H), 8.03 (d, J = 6.5 Hz, 2H), 7.90 (s, 1 H), 7.50 (t, J = 6.5 Hz, 1H), 7.38 (t, J = 8.0 Hz, 1H), 7.31 (d, J = 7.0 Hz, 2H), 2.43 (s, 3H).

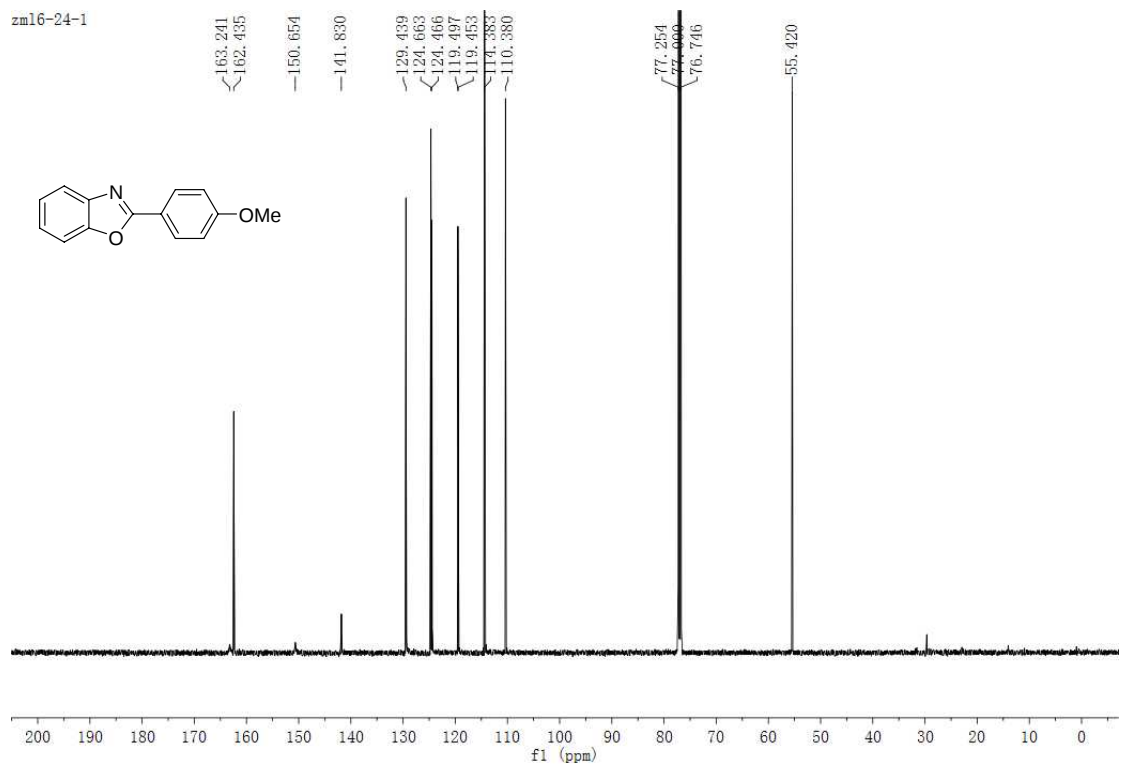
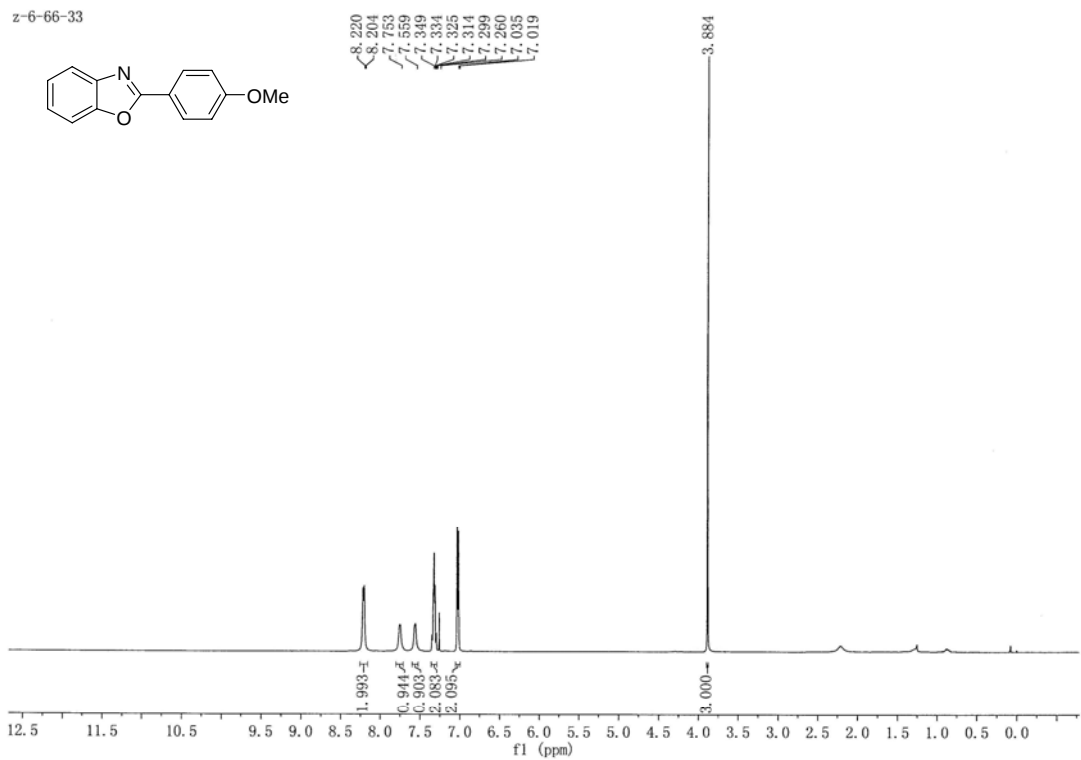
^{13}C NMR (CDCl_3 , 125 MHz): δ 168.1, 153.7, 141.7, 135.0, 130.6, 129.8, 127.5, 126.4, 125.2, 122.9, 121.6, 21.5.

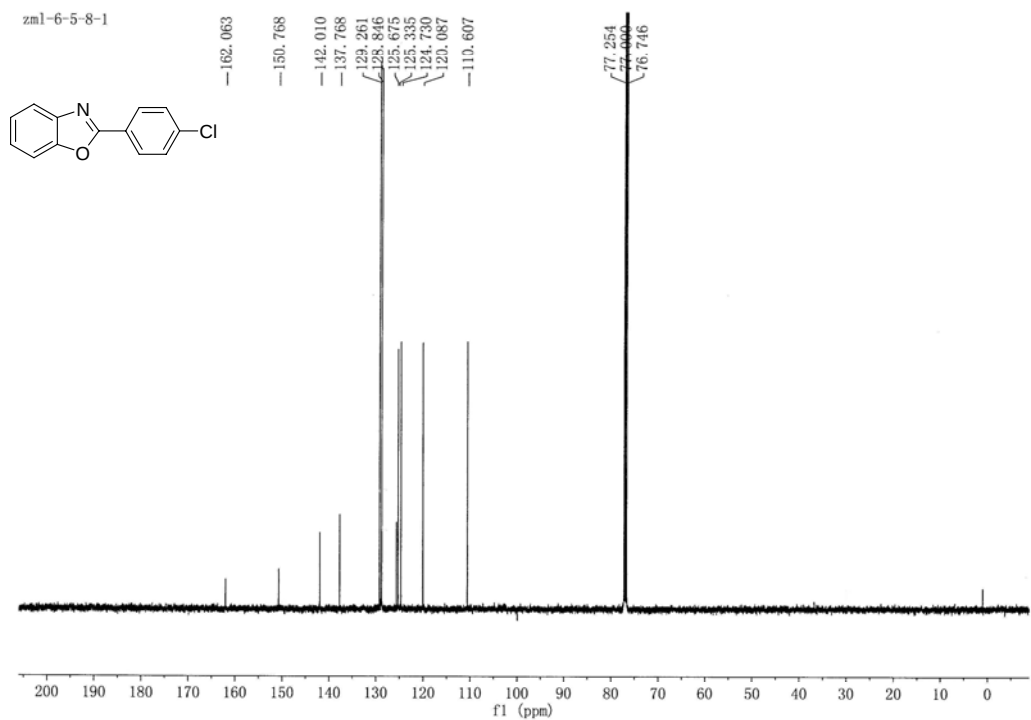
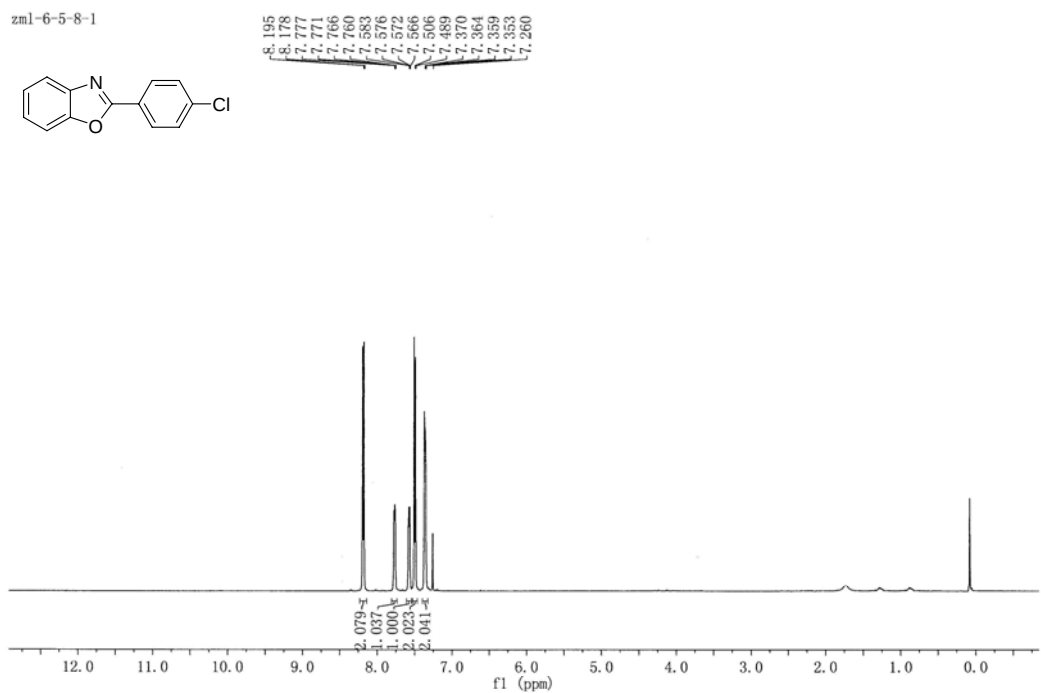
3) Copies of ^1H NMR and ^{13}C NMR spectra

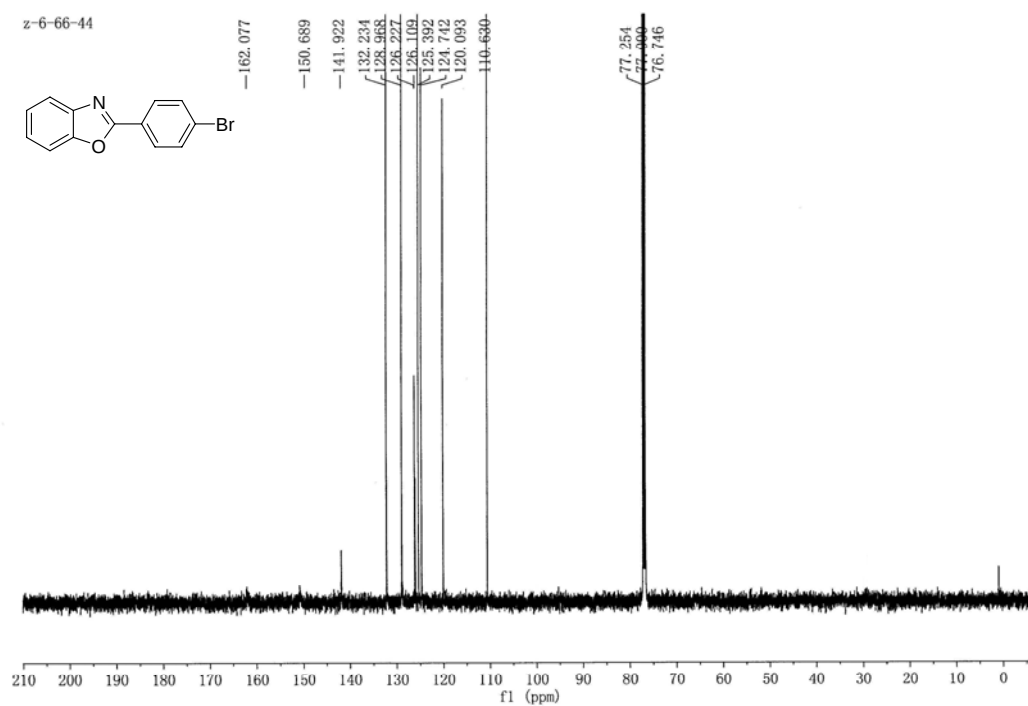
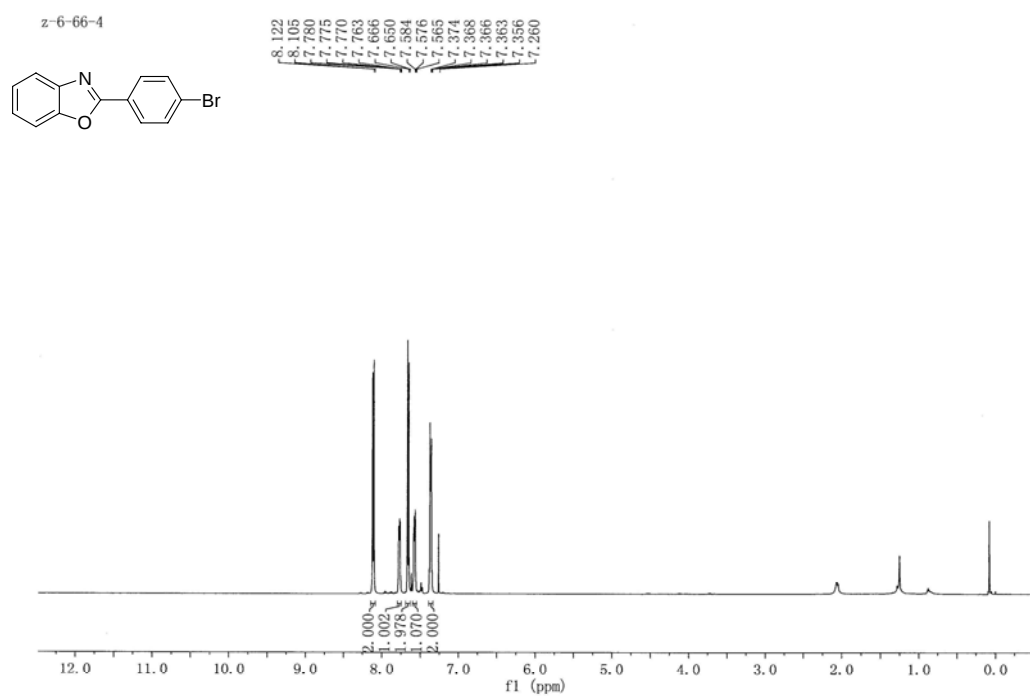


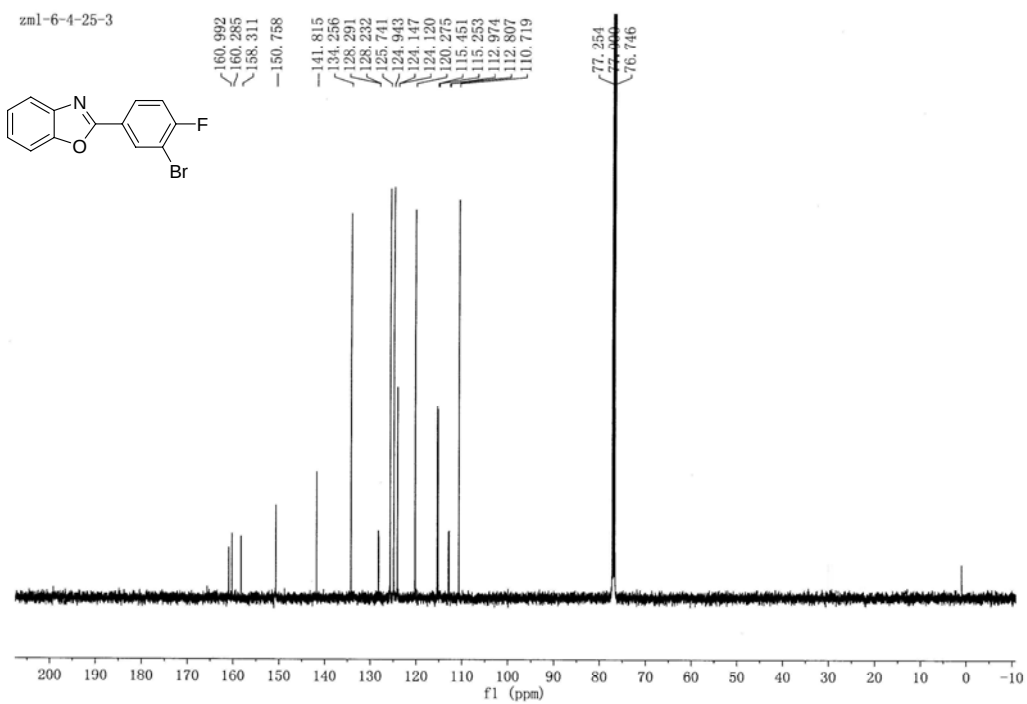
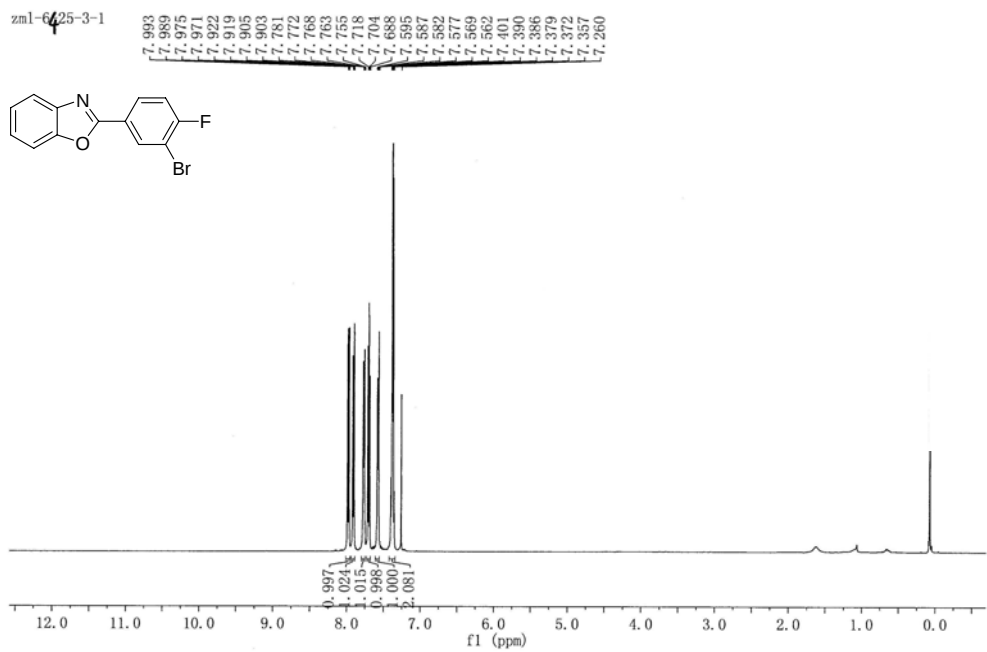


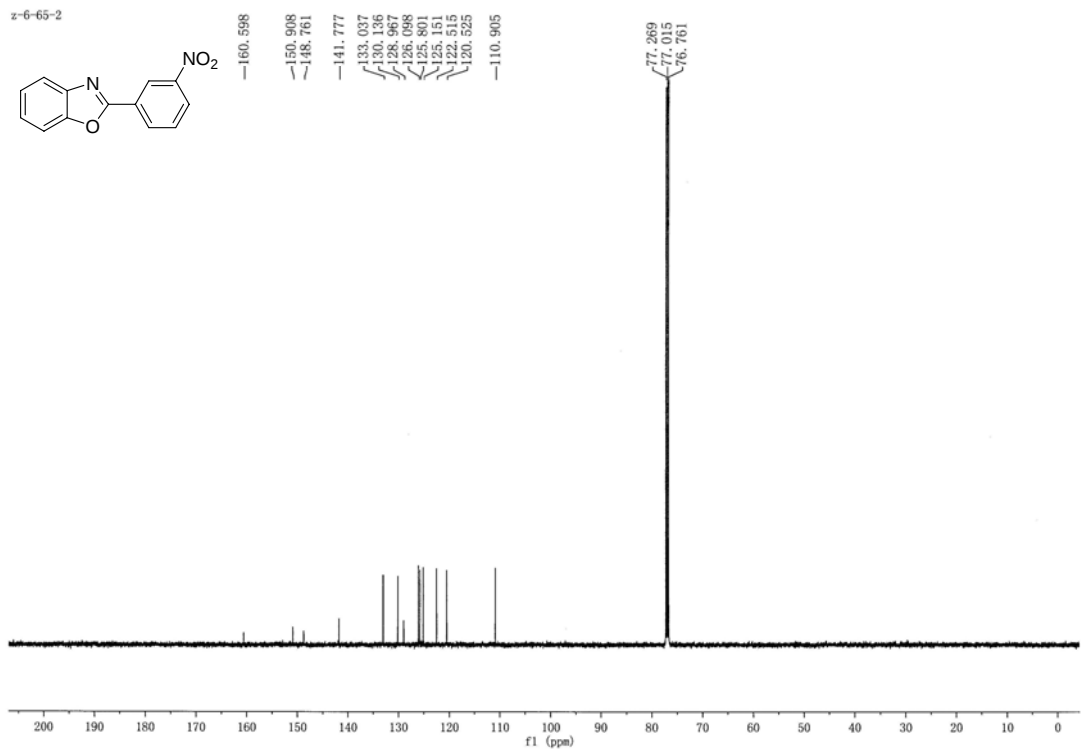
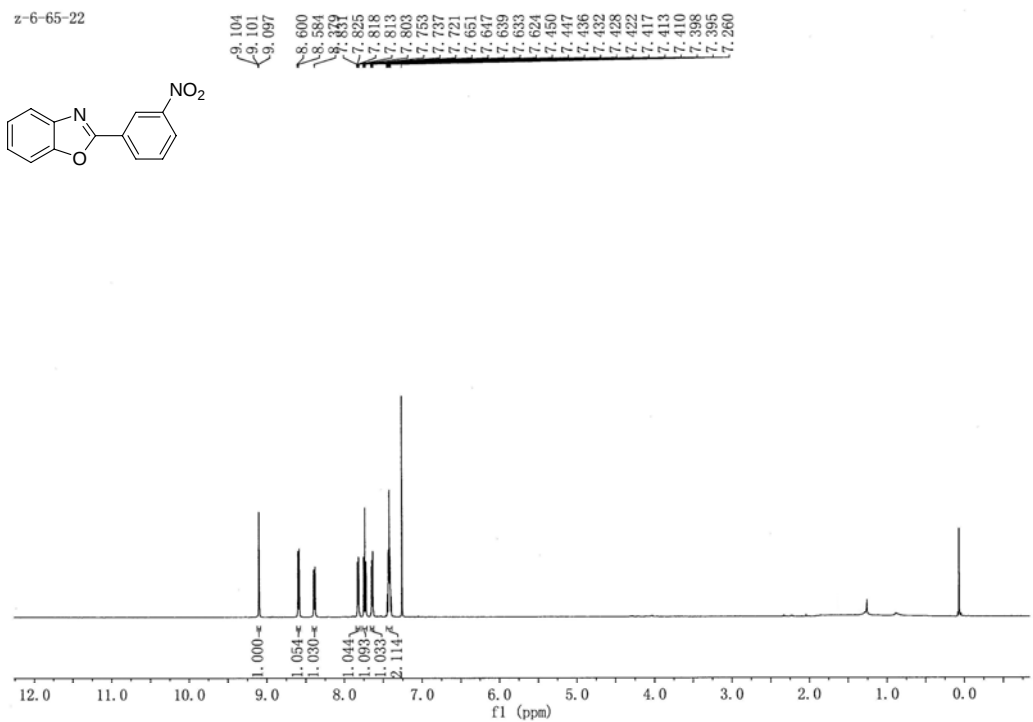


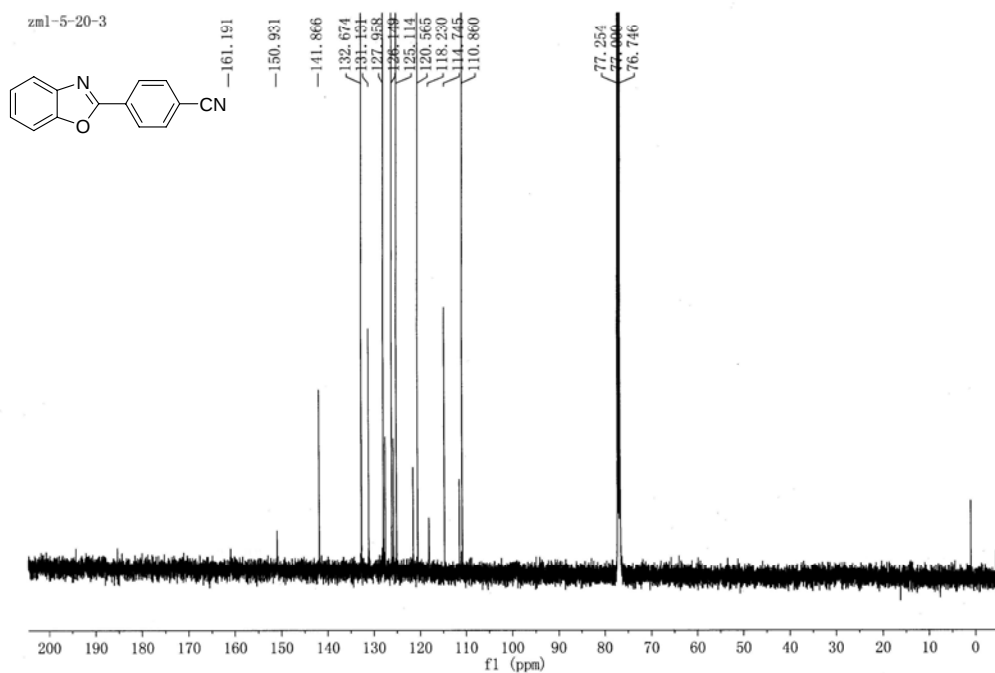
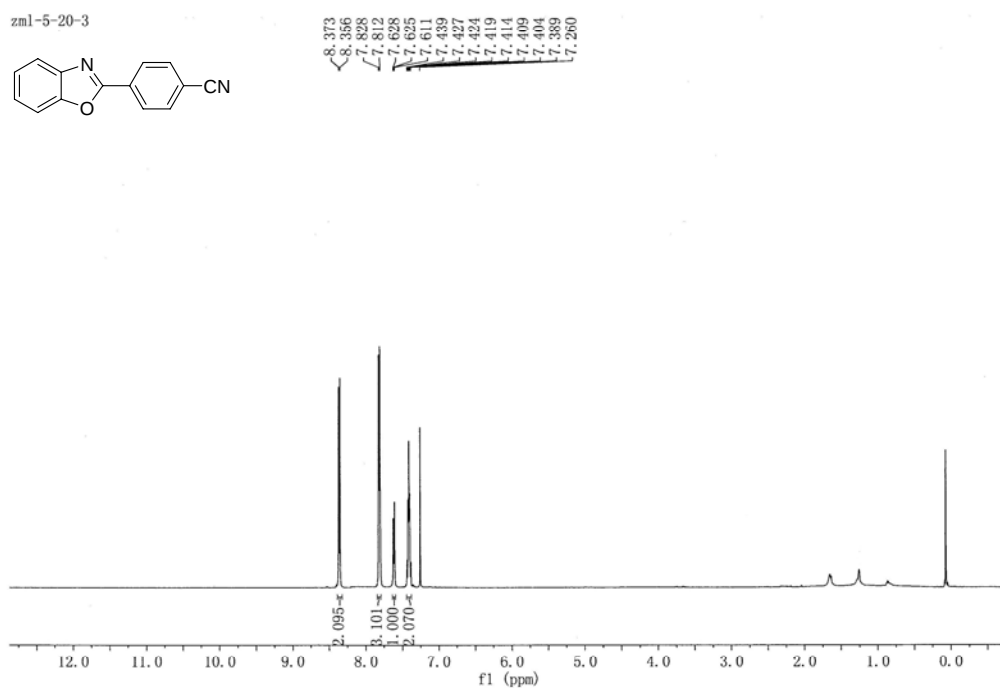


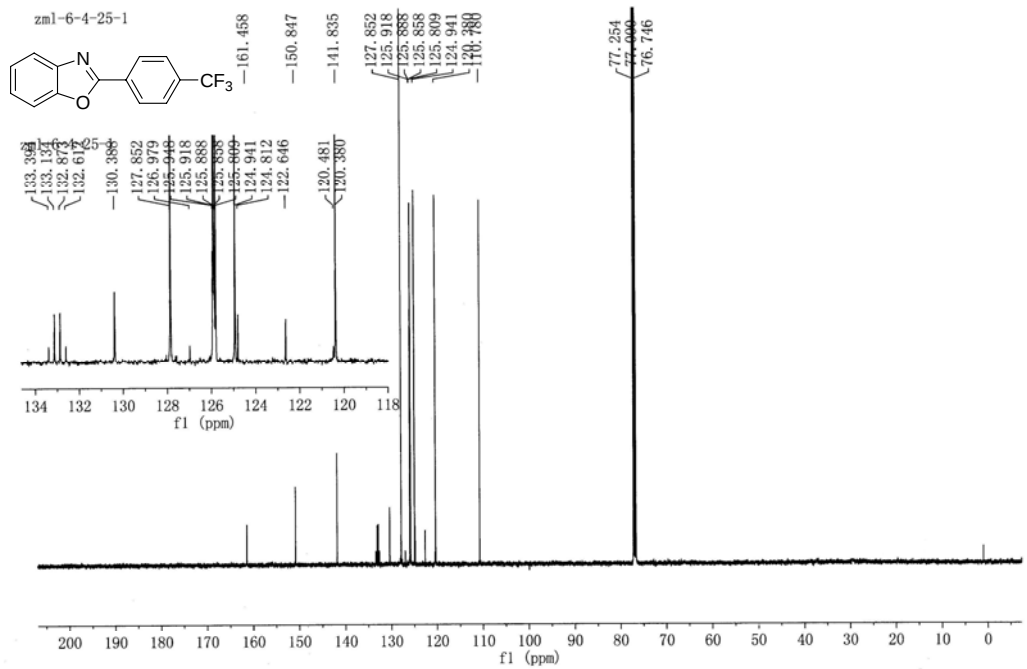
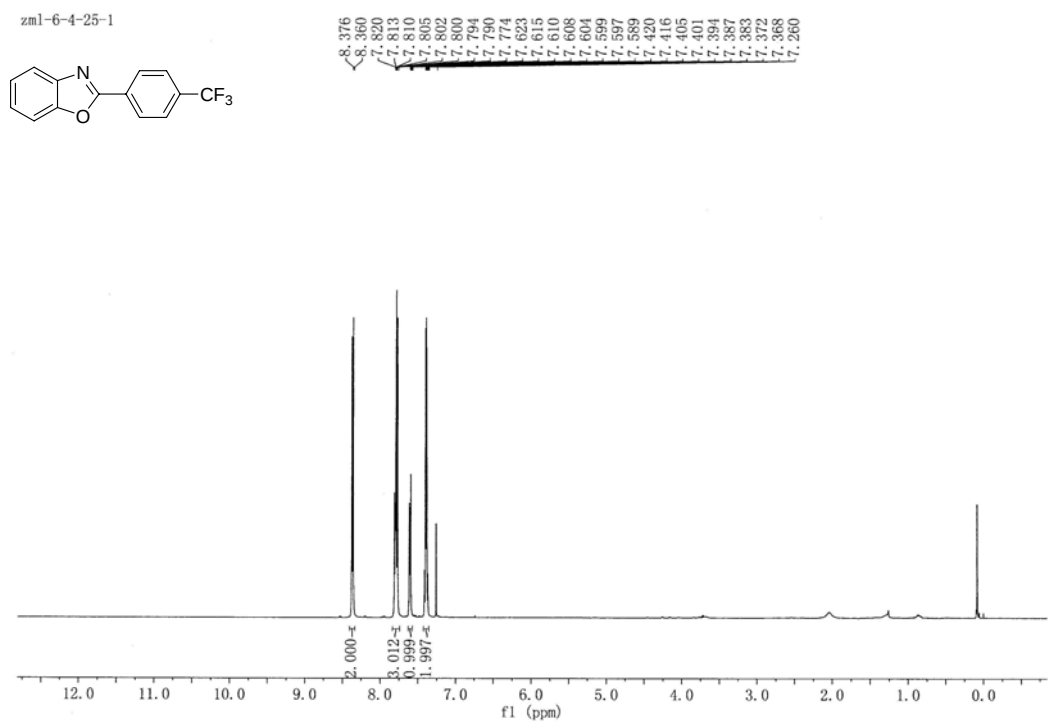


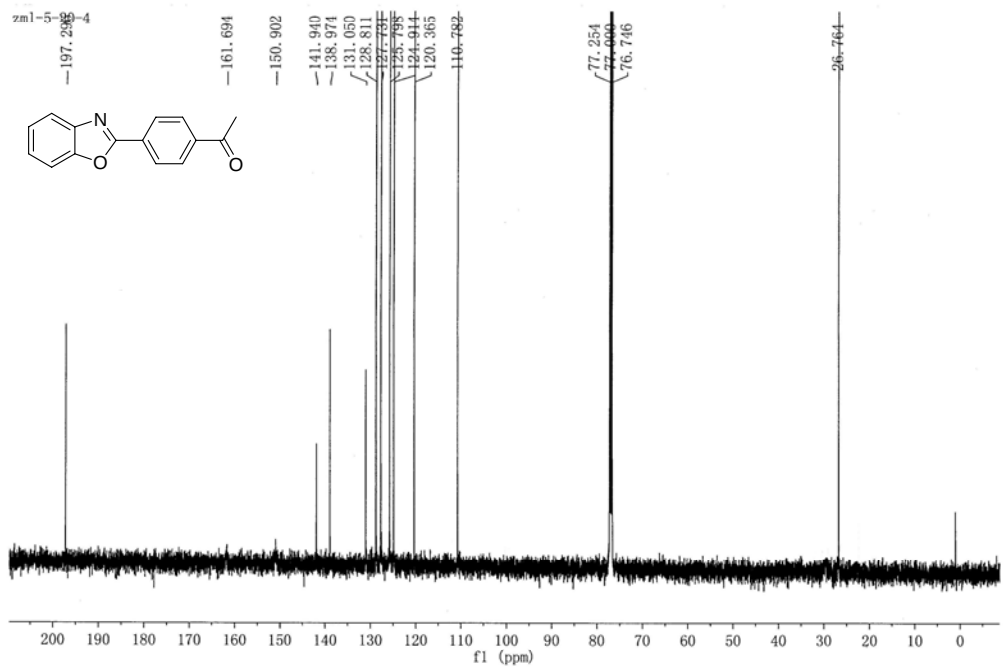
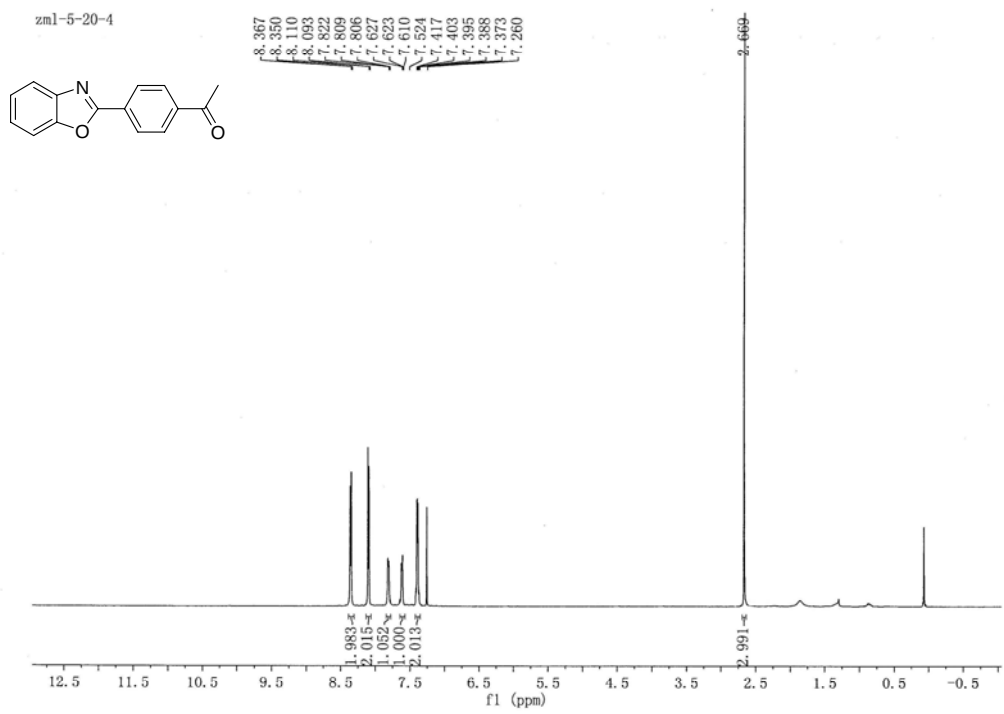


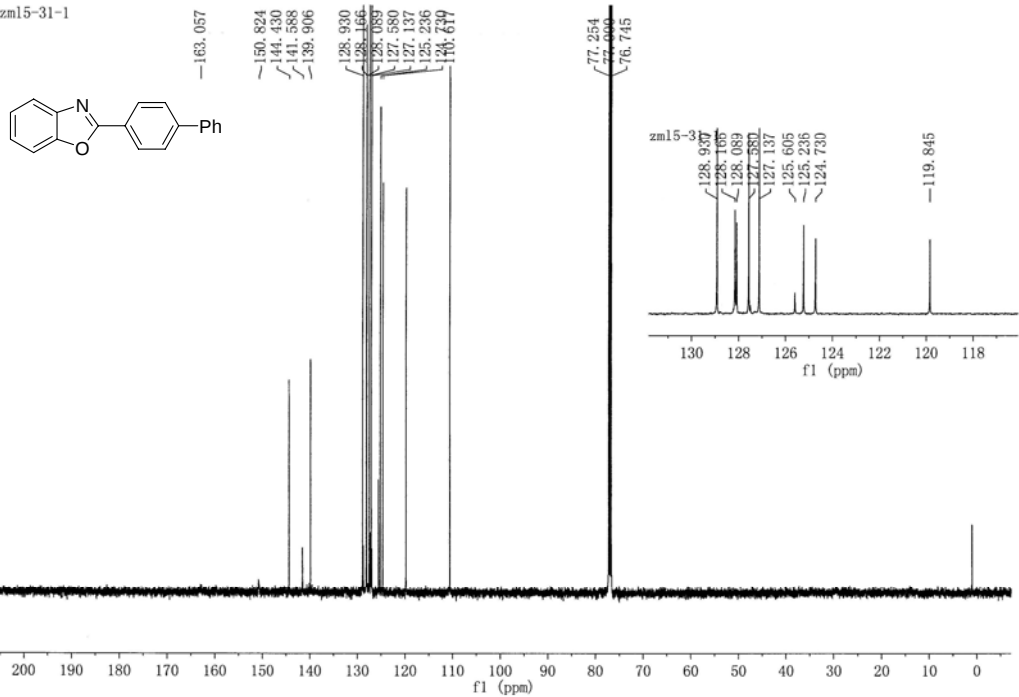
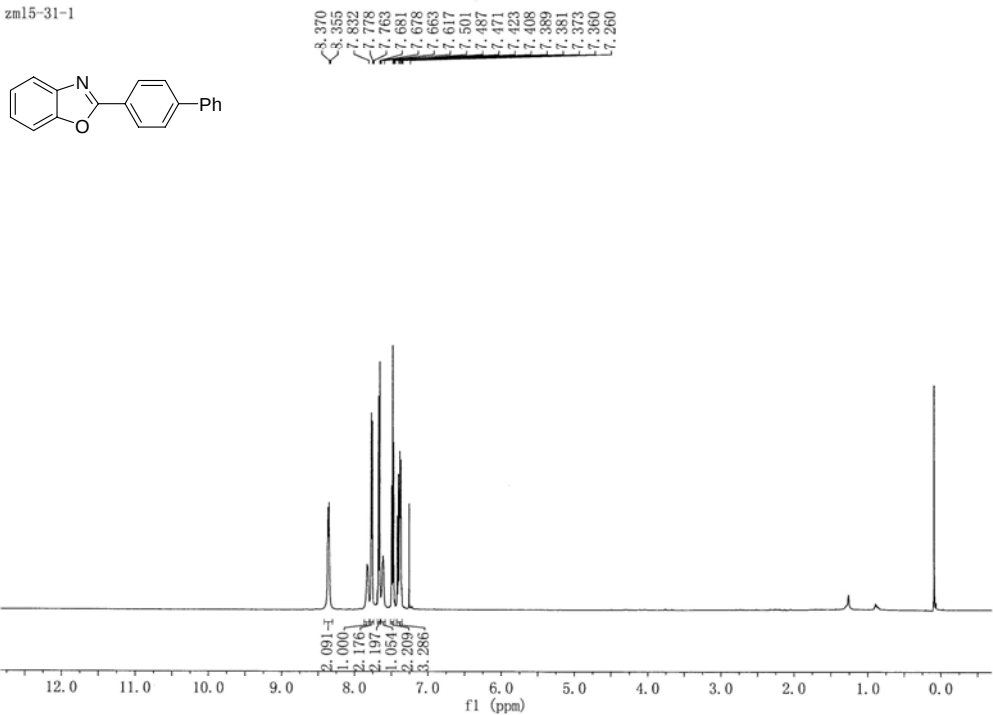


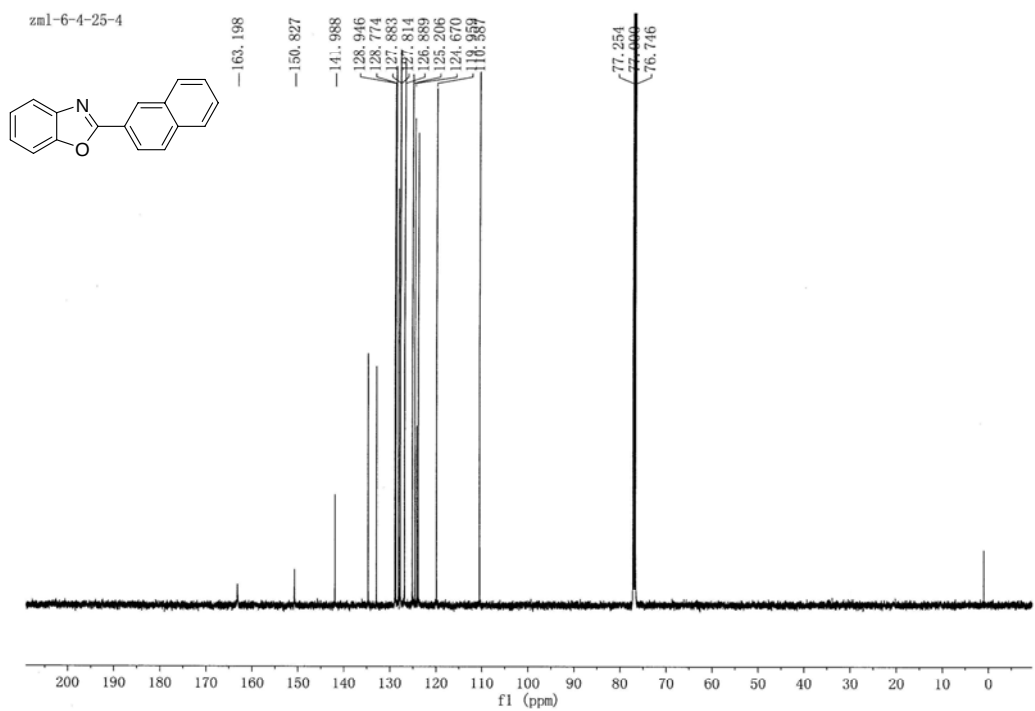
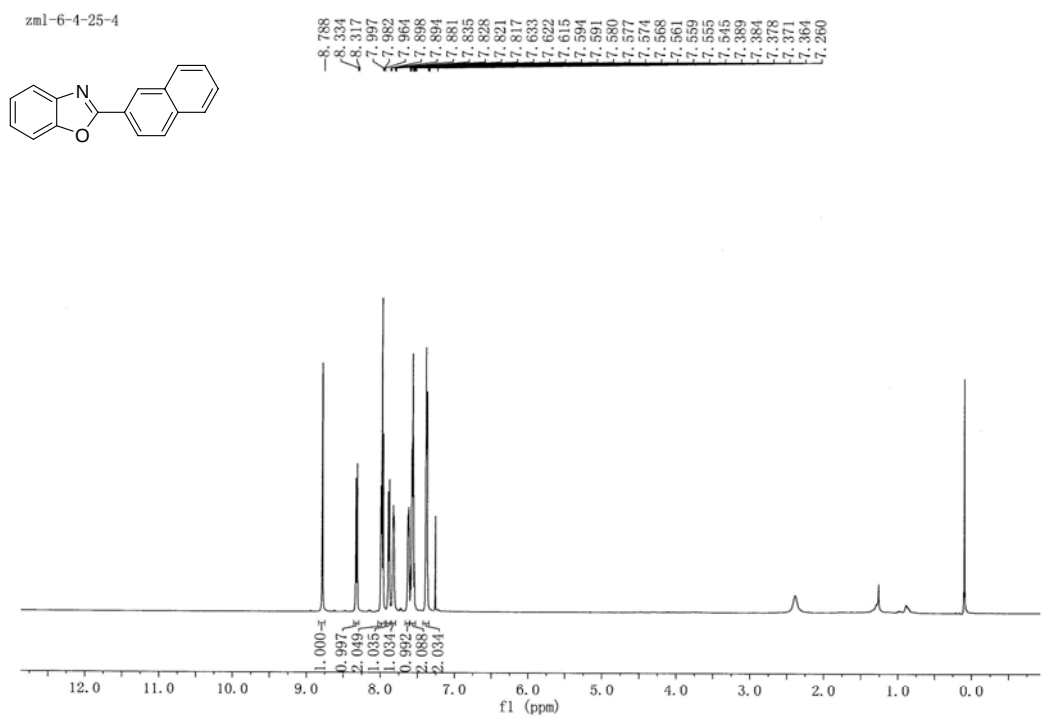


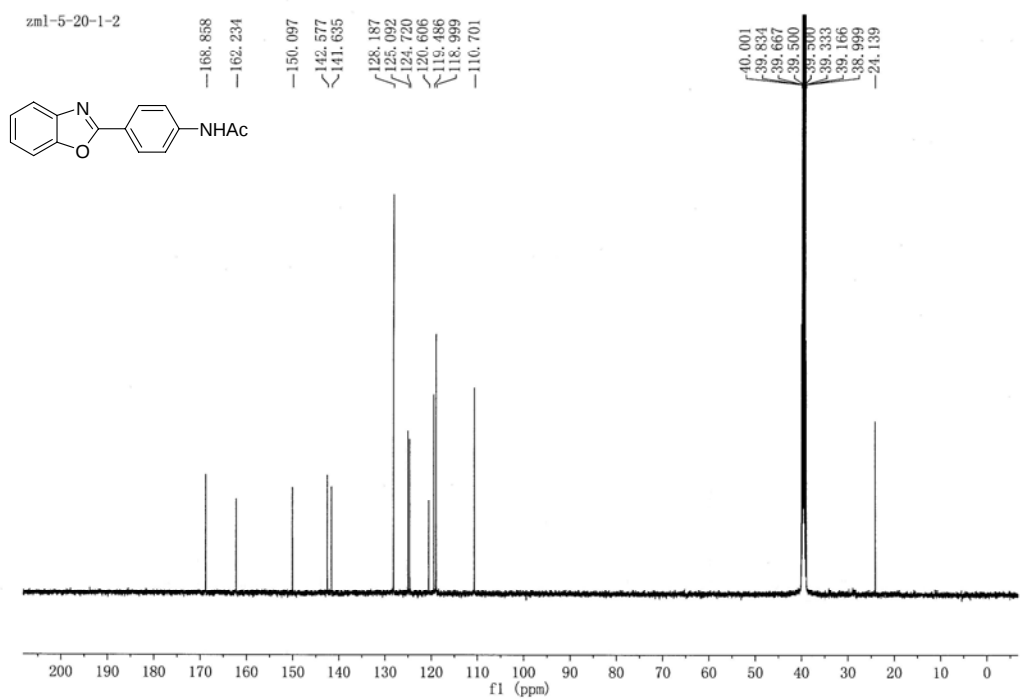
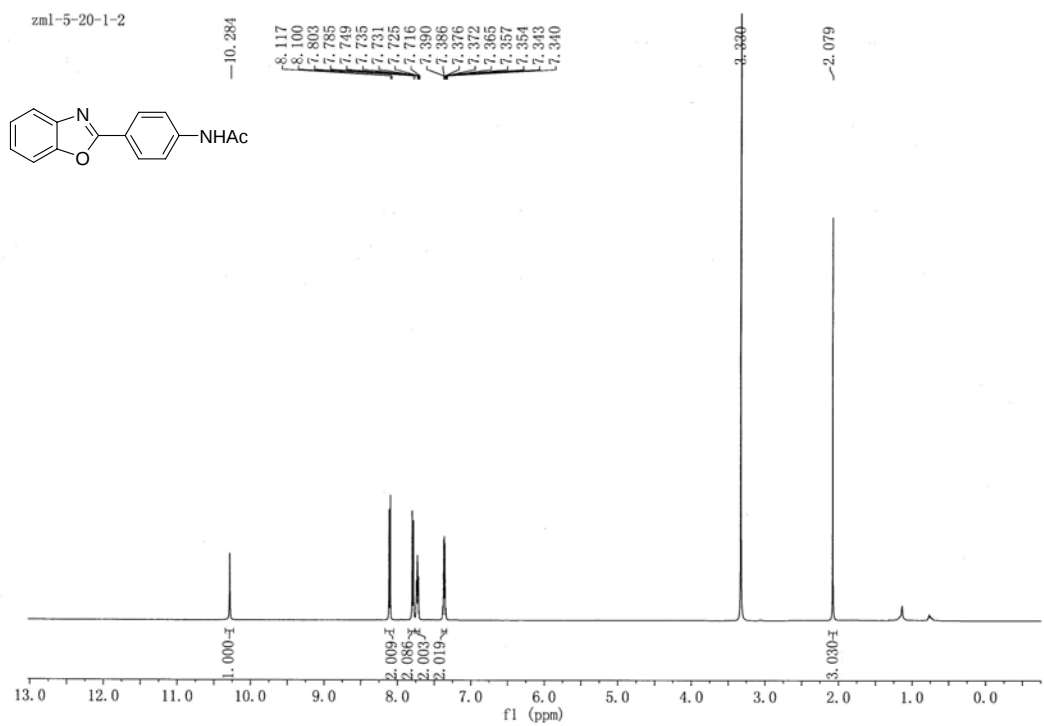




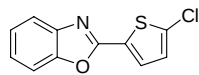




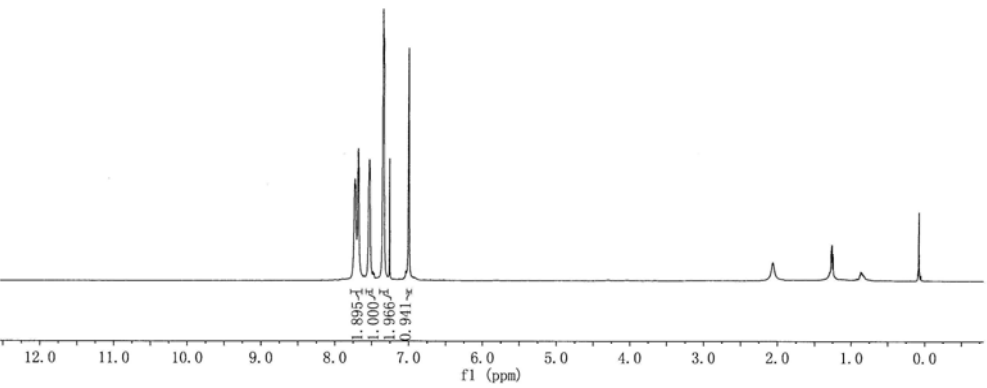




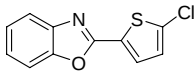
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