Supporting Information

[3+1+1] Cyclization of Vinyl Oxiranes with Azides and CO by Tandem Palladium Catalysis: Efficient Synthesis of Oxazolidinones

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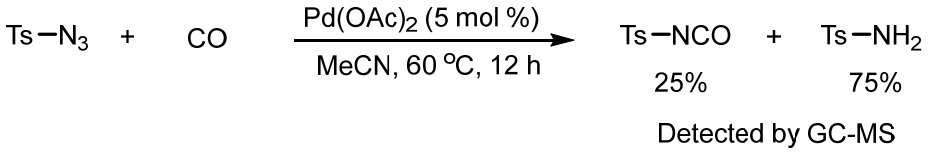
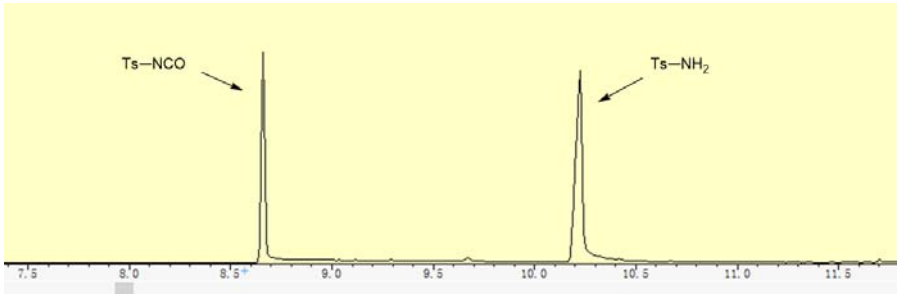
I. General Information

All intermolecular amidation reactions were carried out under atmospheric pressure of carbon monoxide (CO) in oven-dried Schlenk tube. Thin layer chromatography (TLC) employed glass 0.25 mm silica gel plates. Flash chromatography columns were packed with 200-300 mesh silica gel in petroleum (bp. 60-90 ºC). The High Resolution MS analyses were performed on Thermo Fisher Scientific LTQ FT Ultra with DART Positive Mode or Agilent 6530 Accurate–Mass Q-TOF LC/MS with ESI mode. NMR spectra were recorded on a 400 MHz for ^{1}H NMR and 100 MHz for ^{13}C NMR, using tetramethylsilane as an internal reference DMSO-d_6 and $CDCl_3$ as solvent. Chemical shift values for protons are reported in parts per million (ppm, δ scale) downfield from tetramethylsilane and are referenced to residual proton of DMSO-d_6 (δ 2.50) and residual proton (δ 7.26) in $CDCl_3$. Multiplicity is indicated by one or more of the following: s (singlet); d (doublet); t (triplet); q (quartet); p (pentet); m (multiplet); br (broad). Carbon nuclear magnetic resonance spectra (^{13}C NMR) were recorded at 100 MHz. Chemical shifts for carbons are reported in parts per million (ppm, δ scale) downfield from tetramethylsilane and are referenced to the carbon resonance of DMSO-d_6 (δ 40.00) and $CDCl_3$ (77.16). Materials were purchased from Tokyo Chemical Industry Co., Aldrich Inc., Alfa Aesar, Adamas, or other commercial suppliers and used as received unless otherwise noted. Sulfonyl azides were purchased if commercially available or prepared from sulfonyl chlorides and sodium azide according to the well-established methods.

II. Mechanistic Studies

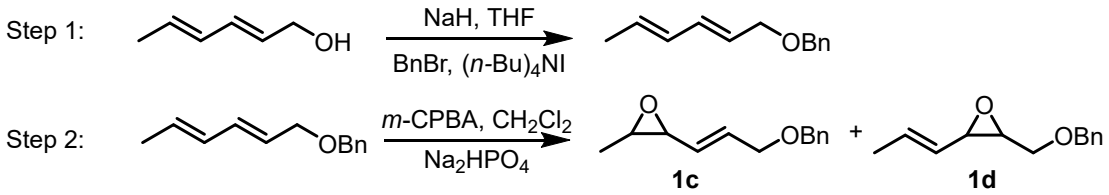




Scheme S1. Control experiments.

III. General Procedure for the Synthesis of Starting Materials

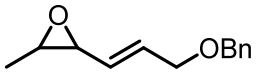
General Procedure for the Synthesis of Vinyl Oxiranes 1c and 1d.[1]



Step 1: A 100 mL flask equipped with a stir bar containing THF (20 mL), tetrabutylammonium iodide (0.46g, 1.25 mmol) and sodium hydride (60% dispersion in mineral oil, 0.6 g, 15 mmol), and then a solution of (2*E*, 4*E*)-2,4-hexadien-1-ol (0.98 g, 10 mmol) in THF was slowly added. After 20 min, benzyl bromide (1.88 g, 11 mmol) were added. After 4 hours, the reaction was quenched with water and diluted with diethyl ether. The layers were separated, and the aqueous layer was extracted (2x) with diethyl ether. The combined organic portions were then washed with brine, dried over $MgSO_4$, and the solvent was removed *in vacuo*. The crude product was purified by chromatography to give the product (*E*,*E*)-1-benzyloxy-2,4-hexadiene as a colorless oil (1.6 g, 85%).

Step 2: To a 100 mL RBF equipped with a stir bar was added methylene chloride (20

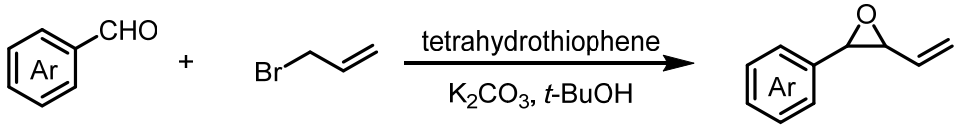
mL), (*E*,*E*)-1-benzyloxy-2,4-hexadiene (0.94 g, 5 mmol), Na_2HPO_4 (1.2 g, equal mass with *m*-CPBA), and *m*-CPBA (85%, 1.2 g, 5.5 mmol). After 1 hour, the reaction was cooled to 0 ℃and filtered through celite. It was then diluted with additional diethyl ether and washed with 1 M NaOH (1x), a saturated $NaHCO_3$ solution (2x), water, and dried over $MgSO_4$. The solvent was removed *in vacuo* to give a clear oil (1.0 g, 98%) that was a 1.5:1 (**1c:1d**) mixture of regioisomers. The regioisomeric vinyl oxiranes could be separated by column chromatography (10-20% Et_2O : 90-80% pentane).



(*E*)-2-(3-(Benzyloxy)prop-1-en-1-yl)-3-methyloxirane 1c (>20:1 dr): ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.33 (d, *J* = 3.9 Hz, 5H), 6.02 (dt, *J* = 15.6, 5.6 Hz, 1H), 5.49 (ddt, *J* = 15.6, 7.9, 1.6 Hz, 1H), 4.51 (s, 2H), 4.03 (dd, *J* = 5.7, 1.6 Hz, 2H), 3.08 (dd, *J* = 7.9, 2.1 Hz, 1H), 2.91 (qd, *J* = 5.2, 2.2 Hz, 1H), 1.33 (d, *J* = 5.2 Hz, 3H). The other analytical data are in accordance with the literature.[1]

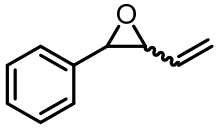
(*E*)-2-((Benzyloxy)methyl)-3-(prop-1-en-1-yl)oxirane 1d (>20:1 dr): ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.40 – 7.24 (m, 5H), 5.95 (dq, *J* = 15.4, 6.6 Hz, 1H), 5.21 (ddd, *J* = 15.4, 8.2, 1.7 Hz, 1H), 4.64 – 4.50 (m, 2H), 3.75 (dd, *J* = 11.5, 3.2 Hz, 1H), 3.51 (dd, *J* = 11.5, 5.5 Hz, 1H), 3.25 (dd, *J* = 8.3, 2.2 Hz, 1H), 3.10 (ddd, *J* = 5.5, 3.2, 2.2 Hz, 1H), 1.74 (dd, *J* = 6.6, 1.7 Hz, 3H). The other analytical data are in accordance with the literature.[1]

General Procedure for the Synthesis of Vinyl Oxiranes 1f –i.[2]

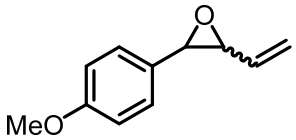


To a Schlenk tube were added tetrahydrothiophene (57 mg, 0.6 mmol), allylbromide (1.68 mL, 19.4 mmol), corresponding aromatic aldehyde (6.5 mmol), dry K_2CO_3 (powdered, 1.07 g, 7.8 mmol) and *t*-BuOH (2 mL, was distilled over sodium) under

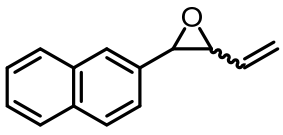
N_2 atmosphere. The resulting mixture was refluxed for 12 hours, and then filtered rapidly through a short silica gel column (ethyl acetate as the eluent). The filtrate was concentrated and the residue was purified by chromatography (hexane/ethyl acetate, 200/1, v/v) on silica gel to afford the desired product.



2-Phenyl-3-vinyloxirane 1f (3:1 dr): For major: ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.32 – 7.12 (m, 5H), 5.63 (ddd, *J* = 17.6, 10.1, 7.8 Hz, 1H), 5.48 – 5.37 (m, 1H), 5.24 (d, *J* = 10.4 Hz, 1H), 3.67 (s, 1H), 3.26 (d, *J* = 7.4 Hz, 1H). **For minor:** ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.32 – 7.12 (m, 5H), 5.50 – 5.39 (m, 1H), 5.36 – 5.27 (m, 1H), 5.17 (d, *J* = 10.2 Hz, 1H), 4.14 (d, *J* = 4.2 Hz, 1H), 3.56 (dd, *J* = 8.2, 4.3 Hz, 1H). The other analytical data are in accordance with the literature.[2]

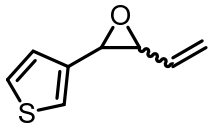


2-(4-Methoxyphenyl)-3-vinyloxirane 1g (1:1 dr): For major: ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.20 (d, *J* = 8.6 Hz, 2H), 6.88 (d, *J* = 8.4 Hz, 2H), 5.72 (ddd, *J* = 17.5, 10.3, 7.3 Hz, 1H), 5.57 – 5.46 (m, 1H), 5.35 – 5.19 (m, 1H), 3.79 (s, 3H), 3.71 (s, 1H), 3.35 (dd, *J* = 7.4, 1.9 Hz, 1H). **For minor:** ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.25 (d, *J* = 8.6 Hz, 2H), 6.88 (d, *J* = 8.4 Hz, 2H), 5.57 – 5.46 (m, 1H), 5.46 – 5.35 (m, 1H), 5.34 – 5.18 (m, 1H), 4.18 (d, *J* = 4.1 Hz, 1H), 3.79 (s, 3H), 3.61 (dd, *J* = 8.0, 4.1 Hz, 1H). The other analytical data are in accordance with the literature.[2]



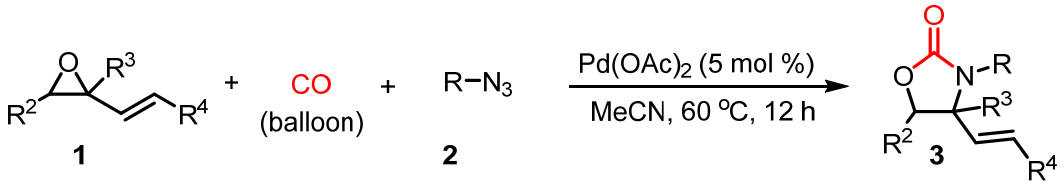
2-(Naphthalen-2-yl)-3-vinyloxirane 1h (1.8:1 dr): For major: ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.85 (m, 4H), 7.51 (m, 2H), 7.38 (dd, *J* = 8.6, 2.6 Hz, 1H), 5.92 – 5.69 (m, 1H), 5.67 – 5.54 (m, 1H), 5.40 (dd, *J* = 10.5, 2.9 Hz, 1H), 3.97 (s, 1H), 3.50 (dd, *J* =

7.7, 2.9 Hz, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 135.2, 133.4, 133.1, 132.2, 128.5, 128.0, 127.9, 126.5, 126.2, 125.1, 122.9, 119.7, 63.1, 60.6. **For minor:** ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.85 (m, 4H), 7.51 (m, 3H), 5.67 – 5.52 (m, 1H), 5.52 – 5.43 (m, 1H), 5.28 (dd, *J* = 10.3, 2.6 Hz, 1H), 4.44 (t, *J* = 3.1 Hz, 1H), 3.80 – 3.66 (m, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 134.6, 133.3, 133.1, 132.8, 128.0, 127.9, 126.4, 126.1, 125.5, 124.4, 122.1, 60.1, 59.1.



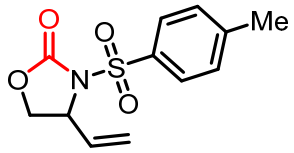
2-(Thiophen-3-yl)-3-vinyloxirane 1i (2.2:1 dr): For major: ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.28 (dd, *J* = 10.6, 3.5 Hz, 2H), 6.98 (d, *J* = 4.9 Hz, 1H), 5.70 (dt, *J* = 17.5, 8.8 Hz, 1H), 5.52 (d, *J* = 16.7 Hz, 1H), 5.32 (t, *J* = 9.7 Hz, 1H), 3.83 (s, 1H), 3.46 (d, *J* = 7.3 Hz, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 139.0, 135.1, 126.5, 125.1, 122.5, 119.7, 62.3, 57.2. **For minor:** ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.28 (dd, *J* = 10.6, 3.5 Hz, 1H), 7.22 (s, 1H), 7.05 (d, *J* = 5.1 Hz, 1H), 5.52 (d, *J* = 16.7 Hz, 2H), 5.32 (t, *J* = 9.7 Hz, 1H), 4.23 (d, *J* = 4.1 Hz, 1H), 3.62 (dd, *J* = 7.5, 4.2 Hz, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 136.8, 132.4, 126.0, 122.3, 121.9, 119.7, 59.7, 56.3.

IV. General Procedure for the Synthesis of Oxazolidinones and Characterization Data of Oxazolidinones



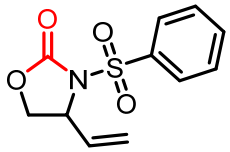
To an oven-dried Schlenk tube (10 mL) was added the organic azide **2** (0.5 mmol), $Pd(OAc)_2$ (5.6 mg, 5 mol%). The tube was purged and backfilled with CO (3 cycles) from a balloon. Anhydrous CH_3CN (3.0 mL) was injected into the tube, and then 2-vinyloxiranes **1** (0.75 mmol) was injected into the tube. After stirring at 60 °C for 12 h under CO atmosphere (balloon). The mixture was concentrated under reduced pressure. The residue was purified by column chromatography (petroleum

ether/EtOAc 4:1~2:1) to give the desired product.



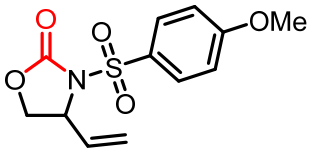
3-Tosyl-4-vinyloxazolidin-2-one 3a

Yield = 92% (123.0 mg). White solid. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.91 (d, *J* = 8.4 Hz, 2H), 7.33 (d, *J* = 8.4 Hz, 2H), 5.81 (ddd, *J* = 16.8, 10.0, 8.4 Hz, 1H), 5.46 (d, *J* = 16.8 Hz, 1H), 5.37 (d, *J* = 10.0 Hz, 1H), 4.90 (td, *J* = 8.0, 3.6 Hz, 1H), 4.48 (t, *J* = 8.4 Hz, 1H), 4.03 (dd, *J* = 8.8, 4.0 Hz, 1H), 2.43 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 151.9, 145.7, 135.1, 133.7, 129.8, 128.7, 120.9, 68.2, 59.7, 21.8. The other analytical data are in accordance with the literature.[3]



3-(Phenylsulfonyl)-4-vinyloxazolidin-2-one 3b

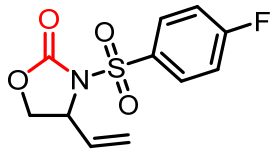
Yield = 87% (110.6 mg). White solid. ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.04 – 8.02 (m, 2H), 7.69 – 7.61 (m, 1H), 7.56 – 7.52 (m, 2H), 5.80 (ddd, *J* = 16.8, 10.0, 8.4 Hz, 1H), 5.46 (d, *J* = 17.2 Hz, 1H), 5.37 (d, *J* = 10.0 Hz, 1H), 4.92 (td, *J* = 8.4, 4.0 Hz, 1H), 4.49 (t, *J* = 8.8 Hz, 1H), 4.04 (dd, *J* = 8.8, 3.6 Hz, 1H). The other analytical data are in accordance with the literature.[3]



3-((4-Methoxyphenyl)sulfonyl)-4-vinyloxazolidin-2-one 3c

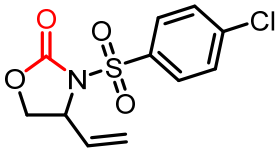
Yield = 89% (126.1 mg). White solid. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.95 (d, *J* = 8.8 Hz, 2H), 6.98 (d, *J* = 8.8 Hz, 2H), 5.81 (ddd, *J* = 16.8, 10.0, 8.4 Hz, 1H), 5.46 (d, *J* = 16.8 Hz, 1H), 5.37 (d, *J* = 10.0 Hz, 1H), 4.89 (td, *J* = 8.0, 3.6 Hz, 1H), 4.47 (t, *J* = 8.8 Hz, 1H), 4.03 (dd, *J* = 8.8, 4.0 Hz, 1H), 3.87 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ

164.4, 152.0, 133.8, 131.1, 129.4, 120.7, 114.3, 68.1, 59.7, 55.8. HRMS (ESI) calculated for $C_{12}H_{14}NO_5S$ $(M+H)^+$ 284.0587, found 284.0583.



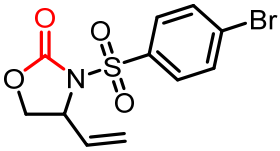
3-((4-Fluorophenyl)sulfonyl)-4-vinyloxazolidin-2-one 3d

Yield = 77% (104.5 mg). White solid. ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.09 – 8.04 (m, 2H), 7.24 – 7.18 (m, 2H), 5.80 (ddd, *J* = 16.8, 10.0, 8.4 Hz, 1H), 5.48 (d, *J* = 16.8 Hz, 1H), 5.39 (d, *J* = 10.0 Hz, 1H), 4.92 (td, *J* = 8.4, 3.6 Hz, 1H), 4.52 (t, *J* = 8.8 Hz, 1H), 4.06 (dd, *J* = 8.8, 3.6 Hz, 1H). The other analytical data are in accordance with the literature.[3]



3-((4-Chlorophenyl)sulfonyl)-4-vinyloxazolidin-2-one 3e

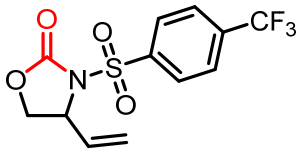
Yield = 64% (92.1 mg). White solid. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.98 (d, *J* = 8.8 Hz, 2H), 7.51 (d, *J* = 8.8 Hz, 2H), 5.80 (ddd, *J* = 16.8, 10.0, 8.4 Hz, 1H), 5.48 (d, *J* = 16.8 Hz, 1H), 5.40 (d, *J* = 10.0 Hz, 1H), 4.92 (td, *J* = 8.4, 3.6 Hz, 1H), 4.52 (t, *J* = 8.4 Hz, 1H), 4.06 (dd, *J* = 8.8, 3.6 Hz, 1H). The other analytical data are in accordance with the literature.[3]



3-((4-Bromophenyl)sulfonyl)-4-vinyloxazolidin-2-one 3f

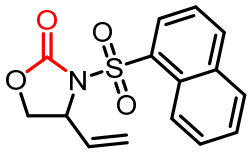
Yield = 62% (103.0 mg). White solid. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.89 (d, *J* = 8.8 Hz, 2H), 7.68 (d, *J* = 8.8 Hz, 2H), 5.79 (ddd, *J* = 16.8, 10.0, 8.4 Hz, 1H), 5.48 (d, *J* = 16.8 Hz, 1H), 5.39 (d, *J* = 10.0 Hz, 1H), 4.92 (td, *J* = 8.4, 3.6 Hz, 1H), 4.52 (t, *J* = 8.4 Hz, 1H), 4.06 (dd, *J* = 8.8, 3.6 Hz, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 151.7, 137.0,

133.4, 132.5, 130.3, 129.9, 121.3, 68.3, 59.7. HRMS (ESI) calculated for $C_{11}H_{11}BrNO_4S$ $(M+H)^+$ 331.9587, found 331.9585.



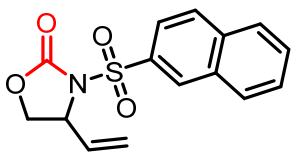
3-((4-(Trifluoromethyl)phenyl)sulfonyl)-4-vinyloxazolidin-2-one 3g

Yield = 51% (81.9 mg). White solid. ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.18 (d, *J* = 8.4 Hz, 2H), 7.81 (d, *J* = 8.4 Hz, 2H), 5.80 (ddd, *J* = 16.8, 10.0, 8.4 Hz, 1H), 5.51 (d, *J* = 16.8 Hz, 1H), 5.42 (d, *J* = 10.0 Hz, 1H), 4.96 (td, *J* = 8.4, 3.6 Hz, 1H), 4.55 (t, *J* = 8.8 Hz, 1H), 4.09 (dd, *J* = 8.8, 3.6 Hz, 1H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 151.6, 141.5, 136.0 (q, *J* = 33.1 Hz), 133.2, 129.4, 126.3 (q, *J* = 3.7 Hz), 123.2 (q, *J* = 271.5 Hz), 121.6, 68.4, 59.8. HRMS (ESI) calculated for $C_{12}H_{10}F_3NO_4SNa$ $(M+Na)^+$ 344.0175, found 344.0167.



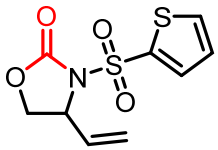
3-(Naphthalen-1-ylsulfonyl)-4-vinyloxazolidin-2-one 3h

Yield = 74% (112.2 mg). White solid. ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.73 (d, *J* = 8.4 Hz, 1H), 8.46 (d, *J* = 7.2 Hz, 1H), 8.14 (d, *J* = 8.4 Hz, 1H), 7.96 (d, *J* = 8.4 Hz, 1H), 7.72 – 7.68 (m, 1H), 7.64 – 7.57 (m, 2H), 5.89 (ddd, *J* = 16.8, 10.0, 8.0 Hz, 1H), 5.52 (d, *J* = 16.8 Hz, 1H), 5.37 (d, *J* = 10.0 Hz, 1H), 5.02 (td, *J* = 8.0, 4.4 Hz, 1H), 4.39 (t, *J* = 8.4 Hz, 1H), 4.02 (dd, *J* = 8.8, 4.4 Hz, 1H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 151.6, 136.2, 134.2, 133.9, 133.3, 132.6, 129.4, 129.0, 128.5, 127.2, 124.2, 124.0, 120.6, 67.8, 59.9. HRMS (ESI) calcd for $C_{15}H_{14}NO_4S$ $(M+H)^+$ 304.0638, found 304.0638.



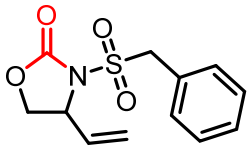
3-(Naphthalen-2-ylsulfonyl)-4-vinyloxazolidin-2-one 3i

Yield = 72% (114.3 mg). White solid. ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.61 (s, 1H), 7.99 – 7.94 (m, 3H), 7.89 (d, *J* = 8.0 Hz, 1H), 7.67 – 7.58 (m, 2H), 5.81 (ddd, *J* = 16.8, 10.0, 8.4 Hz, 1H), 5.49 (d, *J* = 16.8 Hz, 1H), 5.37 (d, *J* = 10.0 Hz, 1H), 4.96 (td, *J* = 8.4, 4.0 Hz, 1H), 4.48 (t, *J* = 8.8 Hz, 1H), 4.02 (dd, *J* = 8.8, 4.0 Hz, 1H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 151.9, 135.6, 134.8, 133.7, 131.9, 130.9, 129.7, 129.4, 128.0, 127.8, 122.8, 120.9, 120.8, 68.2, 59.7. HRMS (ESI) calcd for $C_{15}H_{14}NO_4S$ $(M+H)^+$ 304.0638, found 304.0646.



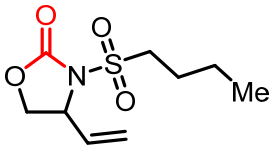
3-(Thiophen-2-ylsulfonyl)-4-vinyloxazolidin-2-one 3j

Yield = 67% (86.9 mg). Colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.86 (dd, *J* = 4.0, 1.6 Hz, 1H), 7.72 (dd, *J* = 4.8, 1.6 Hz, 1H), 7.13 (dd, *J* = 4.8, 4.0 Hz, 1H), 5.87 (ddd, *J* = 16.8, 10.0, 8.4 Hz, 1H), 5.48 (d, *J* = 16.8 Hz, 1H), 5.40 (d, *J* = 10.0 Hz, 1H), 4.90 (td, *J* = 8.4, 4.0 Hz, 1H), 4.50 (t, *J* = 8.4 Hz, 1H), 4.07 (dd, *J* = 8.8, 4.0 Hz, 1H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 151.6, 137.7, 135.8, 134.8, 133.2, 127.7, 121.2, 68.1, 60.0. HRMS (ESI) calcd for $C_9H_9NO_4S_2Na$ $(M+Na)^+$ 281.9865, found 281.9866.



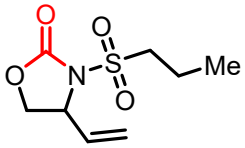
3-(Benzylsulfonyl)-4-vinyloxazolidin-2-one 3k

Yield = 77% (102.6 mg). White solid. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.42 – 7.37 (m, 5H), 5.30 (ddd, *J* = 16.8, 10.0, 8.0 Hz, 1H), 5.17 (d, *J* = 16.8 Hz, 1H), 5.07 (d, *J* = 10.0 Hz, 1H), 4.74 – 4.63 (m, 2H), 4.33 – 4.26 (m, 2H), 4.00 – 3.92 (m, 1H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 152.9, 133.1, 131.1, 129.6, 129.1, 127.4, 120.2, 68.5, 59.3, 58.8. HRMS (ESI) calcd for $C_{12}H_{14}NO_4S$ $(M+H)^+$ 268.0638, found 268.0635.



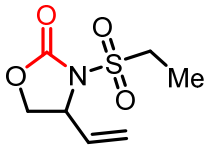
3-(Butylsulfonyl)-4-vinyloxazolidin-2-one 3l

Yield = 71% (82.9 mg). White solid. ^{1}H NMR (400 MHz, $CDCl_3$) δ 5.93 (ddd, *J* = 16.8, 10.0, 8.4 Hz, 1H), 5.46 (d, *J* = 16.8 Hz, 1H), 5.39 (d, *J* = 10.0 Hz, 1H), 4.85 (td, *J* = 8.4, 4.0 Hz, 1H), 4.56 (t, *J* = 8.8 Hz, 1H), 4.13 (dd, *J* = 8.8, 3.6 Hz, 1H), 3.51 – 3.28 m, 2H), 1.85 – 1.75 (m, 2H), 1.50 – 1.40 (m, 2H), 0.93 (t, *J* = 7.6 Hz, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 152.7, 133.6, 121.1, 68.5, 58.8, 53.7, 24.7, 21.4, 13.5. HRMS(ESI) calcd for $C_9H_{16}NO_4S$ $(M+H)^+$ 234.0795, found 234.0803.



3-(Propylsulfonyl)-4-vinyloxazolidin-2-one 3m

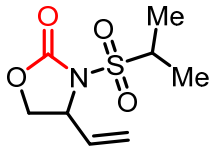
Yield = 77% (84.9 mg). Colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$) δ 5.93 (ddd, *J* = 16.8, 10.0, 8.4 Hz, 1H), 5.46 (d, *J* = 16.8 Hz, 1H), 5.40 (d, *J* = 10.0 Hz, 1H), 4.85 (td, *J* = 8.4, 3.6 Hz, 1H), 4.56 (t, *J* = 8.8 Hz, 1H), 4.14 (dd, *J* = 8.8, 3.6 Hz, 1H), 3.49 – 3.27 (m, 2H), 1.92 – 1.81 (m, 2H), 1.05 (t, *J* = 7.2 Hz, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 152.7, 133.5, 121.2, 68.5, 58.8, 55.6, 16.6, 12.8. HRMS (ESI) calcd for $C_8H_{14}NO_4S$ $(M+H)^+$ 220.0638, found 220.0636.



3-(Ethylsulfonyl)-4-vinyloxazolidin-2-one 3n

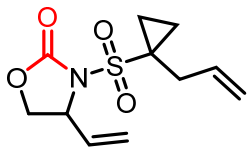
Yield = 68% (69.8 mg). Colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$) δ 5.94 (ddd, *J* = 16.8, 10.0, 8.4 Hz, 1H), 5.48 (d, *J* = 16.8 Hz, 1H), 5.42 (d, *J* = 10.0 Hz, 1H), 4.87 (td, *J* = 8.4, 3.6 Hz, 1H), 4.58 (t, *J* = 8.8 Hz, 1H), 4.16 (dd, *J* = 8.8, 3.6 Hz, 1H), 3.57 – 3.36 (m, 2H), 1.41 (t, *J* = 7.2 Hz, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 152.7, 133.5,

121.4, 68.5, 58.9, 48.5, 7.6. HRMS (ESI) calcd for $C_7H_{11}NO_4SNa$ $(M+Na)^+$ 228.0301, found 228.0291.



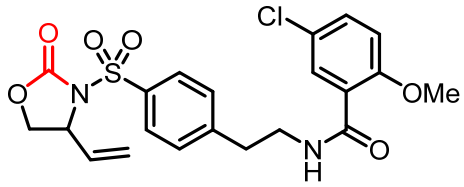
3-(Isopropylsulfonyl)-4-vinyloxazolidin-2-one 3o

Yield = 65% (71.3 mg). Colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$) δ 5.94 (ddd, *J* = 16.8, 10.0, 8.4 Hz, 1H), 5.47 (d, *J* = 16.8 Hz, 1H), 5.40 (d, *J* = 10.0 Hz, 1H), 4.86 (td, *J* = 8.4, 4.0 Hz, 1H), 4.58 (t, *J* = 8.8 Hz, 1H), 4.16 (dd, *J* = 8.8, 4.0 Hz, 1H), 3.87 (hept, *J* = 6.8 Hz, 1H), 1.44 (d, *J* = 6.8 Hz, 3H), 1.41 (d, *J* = 6.8 Hz, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 152.9, 133.9, 121.2, 68.5, 59.0, 54.6, 16.2, 15.9. HRMS (ESI) calcd for $C_8H_{14}NO_4S$ $(M+H)^+$ 220.0638, found 220.0629.



3-((1-Allylcyclopropyl)sulfonyl)-4-vinyloxazolidin-2-one 3p

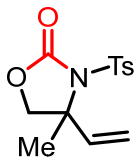
Yield = 62% (79.8 mg). Colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$) δ 5.96 (ddd, *J* = 16.8, 10.0, 8.0 Hz, 1H), 5.79 – 5.67 (m, 1H), 5.45 (d, *J* = 16.8 Hz, 1H), 5.38 (d, *J* = 10.0 Hz, 1H), 5.18 – 5.10 (m, 2H), 4.81 (td, *J* = 8.0, 4.0 Hz, 1H), 4.53 (t, *J* = 8.4 Hz, 1H), 4.11 (dd, *J* = 8.8, 4.0 Hz, 1H), 2.80 (dd, *J* = 15.2, 8.0 Hz, 1H), 2.52 (ddt, *J* = 15.2, 6.4, 1.6 Hz, 1H), 1.74 – 1.63 (m, 2H), 1.06 – 0.94 (m, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 152.4, 134.5, 132.6, 120.4, 119.2, 68.3, 59.4, 40.7, 34.8, 12.0, 11.9. HRMS(ESI) calcd for $C_{11}H_{16}NO_4S$ $(M+H)^+$ 258.0795, found 258.0795.



5-Chloro-2-methoxy-*N*-(4-((2-oxo-4-vinyloxazolidin-3-yl)sulfonyl)phenethyl)benz

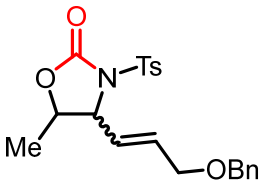
amide 3q

Yield = 77% (179.0 mg). White solid. ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.13 (d, *J* = 2.8 Hz, 1H), 7.97 (d, *J* = 8.0 Hz, 2H), 7.81 (t, *J* = 5.6 Hz, 1H), 7.41 (d, *J* = 8.0 Hz, 2H), 7.36 (dd, *J* = 8.8, 2.8 Hz, 1H), 6.87 (d, *J* = 8.8 Hz, 1H), 5.81 (ddd, *J* = 16.8, 10.0, 8.4 Hz, 1H), 5.47 (d, *J* = 16.8 Hz, 1H), 5.38 (d, *J* = 10.0 Hz, 1H), 4.91 (td, *J* = 8.4, 4.0 Hz, 1H), 4.49 (t, *J* = 8.4 Hz, 1H), 4.04 (dd, *J* = 8.8, 4.0 Hz, 1H), 3.79 (s, 3H), 3.77 – 3.70 (m, 2H), 3.01 (t, *J* = 6.8 Hz, 2H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 164.1, 156.1, 151.8, 146.9, 136.2, 133.6, 132.5, 132.0, 129.7, 129.0, 126.8, 122.8, 121.0, 113.0, 68.2, 59.7, 56.4, 40.6, 35.8. HRMS (ESI) calcd for $C_{21}H_{22}ClN_2O_6S$ $(M+H)^+$ 465.0882, found 465.0872.



4-Methyl-3-tosyl-4-vinyloxazolidin-2-one 3r

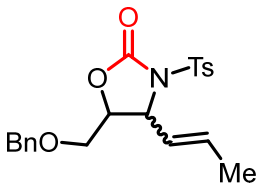
Yield = 88% (123.7 mg). White solid. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.92 (d, *J* = 8.0 Hz, 2H), 7.31 (d, *J* = 8.0 Hz, 2H), 6.08 (dd, *J* = 17.6, 10.8 Hz, 1H), 5.43 – 5.35 (m, 2H), 4.10 (d, *J* = 8.8 Hz, 1H), 3.99 (d, *J* = 8.8 Hz, 1H), 2.42 (s, 3H), 1.81 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 152.3, 145.4, 138.2, 135.7, 129.5, 129.0, 117.2, 74.5, 66.1, 23.4, 21.7. The other analytical data are in accordance with the literature.[4]



(*E*)-4-(3-(Benzyloxy)prop-1-en-1-yl)-5-methyl-3-tosyloxazolidin-2-one 3s (3:1 dr)

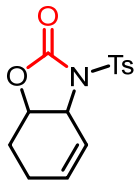
Yield = 54% (108.4 mg). White solid. **For major**: ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.89 (d, *J* = 8.0 Hz, 2H), 7.39 – 7.30 (m, 5H), 7.26 (d, *J* = 8.0 Hz, 2H), 5.99 (dt, *J* = 15.6, 4.8 Hz, 1H), 5.71 (dd, *J* = 15.6, 8.8 Hz, 1H), 4.55 (s, 2H), 4.43 (dd, *J* = 8.8, 4.4 Hz, 1H), 4.30 – 4.24 (m, 1H), 4.06 (d, *J* = 5.2 Hz, 2H), 2.40 (s, 3H), 1.39 (d, *J* = 6.4 Hz, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 151.4, 145.5, 138.0, 135.1, 133.4, 129.7, 128.6,

128.6, 127.9, 127.8, 127.0, 76.9, 72.8, 69.1, 65.5, 21.8, 19.4. **For minor**: ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.87 (d, *J* = 8.0 Hz, 2H), 7.39 – 7.30 (m, 5H), 7.22 (d, *J* = 8.0 Hz, 2H), 6.81 (dd, *J* = 15.6, 8.4 Hz, 1H), 6.16 (d, *J* = 15.6 Hz, 1H), 5.53 (dd, *J* = 15.6, 9.6 Hz, 1H), 5.25 – 5.17 (m, 2H), 4.81 (dt, *J* = 40.8, 6.8 Hz, 2H), 2.37 (s, 3H), 1.25 (d, *J* = 6.4 Hz, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 146.0, 141.5, 135.2, 129.9, 129.6, 128.9, 128.8, 128.6, 127.7, 125.5, 123.2, 75.9, 75.4, 66.9, 64.1, 63.4, 15.3. The other analytical data are in accordance with the literature.[5]



(*E*)-5-((Benzyloxy)methyl)-4-(prop-1-en-1-yl)-3-tosyloxazolidin-2-one 3t (1.8:1 dr)

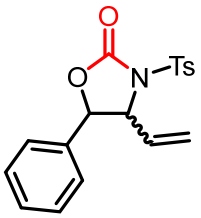
Yield = 57% (114.4 mg). White solid. **For major**: ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.85 (d, *J* = 8.0 Hz, 2H), 7.36 – 7.23 (m, 7H), 5.88 (dq, *J* = 13.6, 6.4 Hz, 1H), 5.43 (dd, *J* = 15.2, 8.4 Hz, 1H), 4.77 – 4.70 (m, 1H), 4.52 – 4.43 (m, 2H), 4.22 – 4.20 (m, 1H), 3.59 – 3.47 (m, 2H), 2.39 (s, 3H), 1.73 (d, *J* = 6.4 Hz, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 151.6, 145.3, 137.2, 135.4, 134.5, 132.5, 129.5, 128.6, 128.5, 127.8, 122.5, 78.9, 73.6, 68.7, 61.1, 21.7, 17.7. **For minor**: ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.85 (d, *J* = 8.0 Hz, 2H), 7.36 – 7.23 (m, 7H), 5.88 (dq, *J* = 13.6, 6.4 Hz, 1H), 5.17 (dd, *J* = 14.0, 9.6 Hz, 1H), 4.92 – 4.87 (m, 1H), 4.77 – 4.70 (m, 1H), 4.52 – 4.43 (m, 2H), 3.59 – 3.47 (m, 2H), 2.42 (s, 3H), 1.69 (d, *J* = 6.4 Hz, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 151.3, 145.4, 137.3, 135.5, 129.5, 128.8, 128.5, 128.0, 128.0, 127.7, 127.3, 79.0, 73.6, 67.5, 62.1, 55.6, 17.7, 13.2. HRMS(ESI) calcd for $C_{21}H_{24}NO_5S$ $(M+H)^+$ 402.1370, found 402.1362.



3-Tosyl-3a,6,7,7a-tetrahydrobenzo[*d*]oxazol-2(3*H*)-one 3u

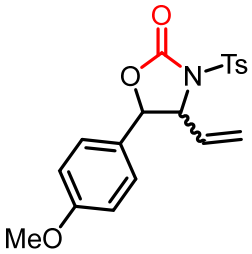
Yield = 62% (90.9 mg). White solid. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.94 (d, *J* = 8.4

Hz, 2H), 7.33 (d, J = 8.4 Hz, 2H), 6.11 – 6.05 (m, 1H), 5.98 – 5.93 (m, 1H), 4.88 – 4.80 (m, 2H), 2.43 (s, 3H), 2.20 – 2.13 (m, 2H), 2.03 – 1.96 (m, 1H), 1.81 – 1.72 (m, 1H). The other analytical data are in accordance with the literature.[4]



5-Phenyl-3-tosyl-4-vinyloxazolidin-2-one 3v (2.6:1 dr)

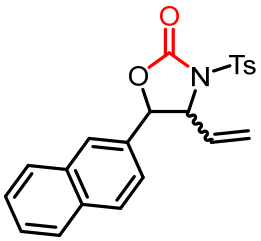
Yield = 71% (121.9 mg). White solid. **For major**: ^{1}H NMR (400 MHz, $CDCl_3$) 7.90 (d, J = 8.0 Hz, 2H), 7.39 – 7.32 (m, 5H), 7.22 – 7.17 (m, 2H), 5.96 (ddd, J = 17.6, 10.0, 8.4 Hz, 1H), 5.46 – 5.41 (m, 1H), 5.23 – 5.09 (m, 2H), 4.69 (dd, J = 8.4, 4.8 Hz, 1H), 2.46 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 151.6, 145.7, 136.5, 134.9, 133.7, 129.8, 129.2, 128.6, 126.0, 125.4, 121.1, 80.7, 67.3, 21.8. **For minor**: ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.95 (d, J = 8.0 Hz, 2H), 7.39 – 7.32 (m, 5H), 7.22 – 7.17 (m, 2H), 5.75 (d, J = 7.2 Hz, 1H), 5.46 – 5.41 (m, 2H), 5.23 – 5.09 (m, 2H), 2.44 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 151.5, 145.7, 135.1, 132.6, 130.5, 129.7, 129.6, 129.0, 128.7, 122.0, 19.8, 64.6, 21.8. The other analytical data are in accordance with the literature.[6]



5-(4-Methoxyphenyl)-3-tosyl-4-vinyloxazolidin-2-one 3w (2.6:1 dr)

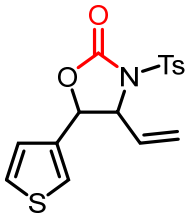
Yield = 75% (140.0 mg). White solid. **For major**: ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.91 (d, J = 8.0 Hz, 2H), 7.34 (d, J = 8.0 Hz, 2H), 7.13 (d, J = 8.4 Hz, 2H), 6.87 (d, J = 8.4 Hz, 2H), 5.93 (ddd, J = 17.6, 10.0, 8.0 Hz, 1H), 5.43 – 5.37 (m, 1H), 5.26 – 5.22 (m, 1H), 5.04 (d, J = 4.8 Hz, 1H), 4.67 (dd, J = 8.4, 4.8 Hz, 1H), 3.81 (s, 3H), 2.46 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 160.6, 151.6, 145.7, 135.0, 133.8, 129.8, 128.6, 127.2, 121.0, 114.6, 114.1, 80.9, 67.3, 55.5, 21.8. **For minor**: ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.94 (d, J = 8.0 Hz, 2H), 7.32 (d, J = 8.0 Hz, 2H), 7.09 (d, J = 8.8 Hz, 2H), 6.85 (d, J

= 8.8 Hz, 2H), 5.69 (d, *J* = 7.2 Hz, 1H), 5.43 – 5.37 (m, 2H), 5.14 – 5.11 (m, 1H), 4.95 – 4.90 (m, 1H), 3.78 (s, 3H), 2.44 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 160.0, 151.6, 145.6, 135.2, 130.7, 129.7, 129.0, 128.2, 127.6, 124.5, 121.8, 79.8, 64.8, 55.4, 21.8. HRMS(ESI) calcd for $C_{19}H_{20}NO_5S$ $(M+H)^+$ 374.1057, found 374.1056.



5-(Naphthalen-2-yl)-3-tosyl-4-vinyloxazolidin-2-one 3x (2.5:1 dr)

Yield = 74% (145.6 mg). White solid. **For major**: ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.87 – 7.78 (m, 4H), 7.75 – 7.71 (m, 1H), 7.61 (s, 1H), 7.53 – 7.51 (m, 2H), 7.26 – 7.18 (m, 3H), 6.07 – 5.98 (m, 1H), 5.48 – 5.44 (m, 1H), 5.29 – 5.20 (m, 2H), 4.76 (dd, *J* = 7.2, 4.4 Hz, 1H), 2.40 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 151.7, 145.7, 134.8, 133.8, 133.7, 133.5, 132.9, 129.8, 129.5, 128.5, 128.2, 127.6, 127.1, 127.0, 125.0, 122.2, 121.0, 80.9, 67.3, 21.8. **For minor**: ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.98 – 7.95 (m, 1H), 7.87 – 7.78 (m, 4H), 7.53 – 7.51 (m, 2H), 7.33 – 7.30 (m, 1H), 7.26 – 7.18 (m, 3H), 5.90 – 5.88 (m, 1H), 5.49 – 5.44 (m, 2H), 5.29 – 5.20 (m, 1H), 5.05 – 5.26 (m, 1H), 2.42 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 151.5, 145.7, 135.1, 133.3, 132.9, 130.4, 130.0, 129.7, 129.0, 128.6, 128.1, 127.8, 126.8, 126.8, 125.4, 123.3. 79.8, 64.6. HRMS(ESI) calcd for $C_{22}H_{20}NO_4S$ $(M+H)^+$ 394.1108, found 394.1096.



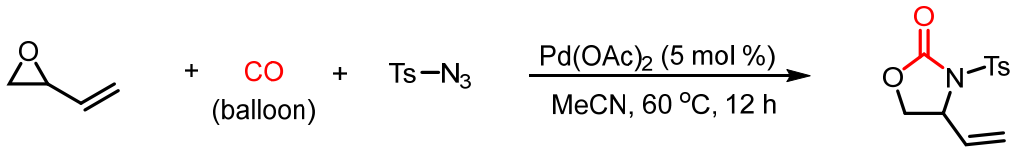
5-(Thiophen-3-yl)-3-tosyl-4-vinyloxazolidin-2-one 3y (2.0:1 dr)

Yield = 54% (94.3 mg). Yellow oil. **For major**: ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.89 (d, *J* = 8.4, 2H), 7.38 – 7.32 (m, 3H), 7.22 – 7.09 (m, 1H), 6.99 – 83 (m, 1H), 5.98 – 5.88 (m, 1H), 5.49 – 5.28 (m, 2H), 5.23 – 5.16 (m, 1H), 4.81 – 4.67 (m, 1H), 2.45 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 151.4, 145.8, 137.3, 134.9, 133.5, 129.8, 128.1, 125.4, 124.4, 123.6, 121.2, 77.5, 66.6, 21.8. **For minor**: ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.94 (d, *J* = 8.0, 2H), 7.49 – 7.47 (m, 1H), 7.38 – 7.32 (m, 2H), 7.22 – 7.10 (m, 1H), 6.99 –

6.83 (m, 1H), 5.80 – 5.78 (m, 1H), 5.49 – 5.29 (m, 2H), 5.23 – 5.16 (m, 1H), 5.10 – 5.07 (m, 1H), 2.44 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 151.4, 145.7, 135.1, 133.6, 130.5, 129.7, 129.0, 127.0, 125.4, 123.4, 122.1, 77.3, 64.3, 21.8. HRMS(ESI) calcd for $C_{16}H_{15}NO_4S_2Na$ $(M+Na)^+$ 372.0335, found 372.0331.

V. Synthetic Applications

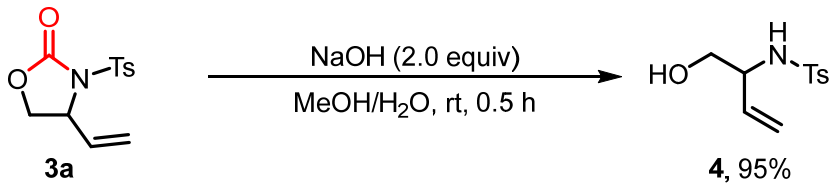
Scale-up reaction



1a **2a** (5 mmol) 80% **3a**, 1.06g

To an oven-dried Schlenk tube (50 mL) was added the organic azide **2a** (5 mmol, 0.99 g), $Pd(OAc)_2$ (56 mg, 5 mol %). The tube was purged and backfilled with CO (3 cycles) from a balloon. Anhydrous CH_3CN (5.0 mL) was injected into the tube, and then 2-vinyloxiranes **1a** (7.5 mmol, 0.53 g) was injected into the tube. After stirring at 60 °C for 12 h under CO atmosphere (balloon).The mixture was concentrated under reduced pressure. The residue was purified by column chromatography (petroleum ether/EtOAc 4:1~2:1) to give the desired product **3a** in 80% yield (1.06 g).

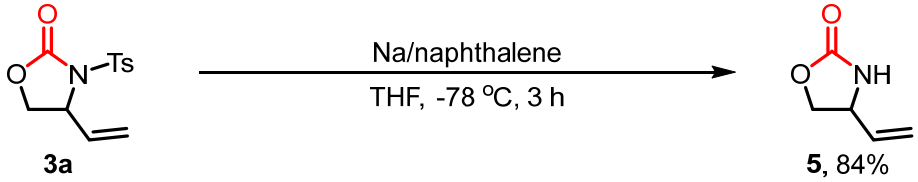
Derivatization of Oxazolidinones 3a



3a **4**, 95%

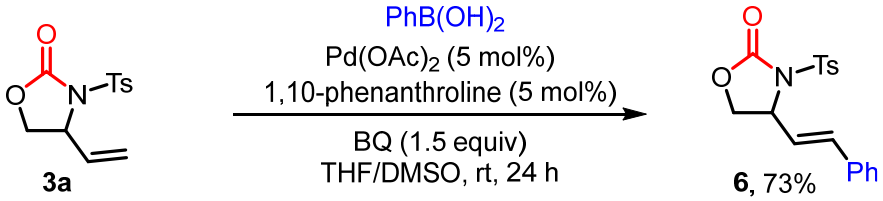
To an oven-dried Schlenk tube (10 mL) was added the **3a** (133.7 mg, 0.5 mmol), NaOH (40.0 mg, 1.0 mmol), and $MeOH/H_2O$ (4/1, 3.0 mL). After stirring at 25 °C for 0.5 h. The mixture was extracted with EtOAc (3x10 mL), and the organic extracts were combined, dried over Na_2SO_4 and concentrated under reduced pressure. The residue was purified by column chromatography (petroleum ether/EtOAc 3:1) to give the desired product **4** in 95% yield (120.7 mg) as a colorless oil. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.76 (d, J = 8.0 Hz, 2H), 7.28 (d, J = 8.0 Hz, 2H), 5.76 (d, J = 7.6 Hz, 1H), 5.59 (ddd, J = 16.8, 10.4, 6.4 Hz, 1H), 5.09 – 5.02 (m, 2H), 3.87 (brs, 1H), 3.63 – 3.52 (m, 2H), 3.00 (brs, 1H), 2.41 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 143.5, 137.5, 134.4, 129.7, 127.3, 117.9, 64.8, 57.9, 21.6. The other analytical data are in

accordance with the literature.[7]



3a **5**, 84%

To a sttired solution of naphthalene (0.65 g, 5 mmol) in THF (10 mL) was added sodium (0.175g, 7.5 mmol) at room temperature, and the mixture was stirred for 1h to give a deep green solution of sodium naphthalenide. To a stired solution of **3a** (133.7 mg, 0.5 mmol) in THF (3 mL) was added the sodium naphthalenide solution (4 mL) at –78 °C, and the mixture was stirred for 3 h at –78 °C. Saturated aqueous $NaHCO_3$ was added to quench the reaction, and the mixture was extracted with EtOAc. And the organic extracts were combined, dried over Na_2SO_4 and concentrated under reduced pressure. The residue was purified by column chromatography (petroleum ether/EtOAc 1:1) to give the desired product **5** in 84% yield (47.5 mg) as a yellow oil. ^{1}H NMR (400 MHz, $CDCl_3$) δ 6.43 (brs, 1H), 5.80 (ddd, *J* = 16.8, 10.0, 7.2 Hz, 1H), 5.32 – 5.21 (m, 2H), 4.52 (t, *J* = 8.4 Hz, 1H), 4.40 – 4.34 (m, 1H), 4.04 (t, *J* = 7.6 Hz, 1H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 160.1, 135.8, 118.7, 70.1, 55.3. The other analytical data are in accordance with the literature.[8]



3a **6**, 73%

To an oven-dried Schlenk tube (10 mL) was added the **3a** (133.7 mg, 0.5 mmol), $PhB(OH)_2$ (91.4 mg, 0.75 mmol), $Pd(OAc)_2$ (5.6 mg, 5 mol%), 1,10-phenanthroline (4.5 mg, 5 mol%), benzoquinone (54.1 mg, 0.75 mmol) and THF/DMSO (1:1, 3.0 mL). After stirring at room temperature for 24 h. The mixture was washed with a solution of 1 M NaOH, and extracted with EtOAc. The organic extracts were combined, dried over Na_2SO_4 and concentrated under reduced pressure. The residue was purified by column chromatography (petroleum ether/EtOAc 10:1) to give the desired product **6** in 73% yield (125.3 mg) as a white solid. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.86 (d, *J* = 8.0 Hz, 2H), 7.36 – 7.30 (m, 5H), 7.21 (d, *J* = 8.0 Hz, 2H), 6.76 (d, *J* = 15.6 Hz, 1H), 6.02 – 5.95 (m, 1H), 5.12 – 5.07 (m, 1H), 4.56 (t, *J* = 8.4 Hz, 1H), 4.14 – 4.10 (m, 1H), 2.40 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 151.8, 145.6,

136.2, 135.3, 135.1, 129.7, 129.1, 128.9, 128.9, 127.0, 123.7, 68.4, 59.8, 21.8. The other analytical data are in accordance with the literature.[7]

Reference:

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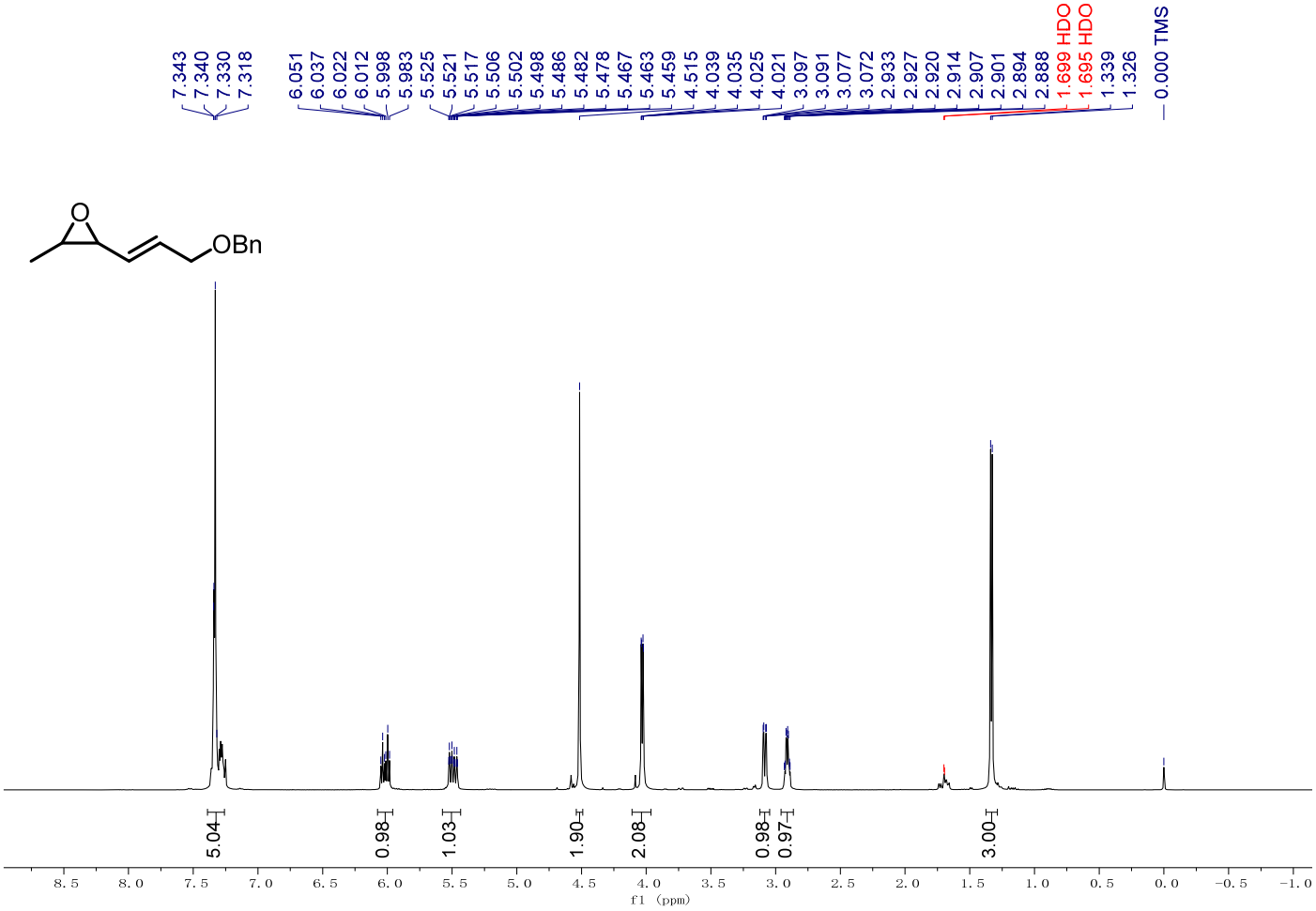
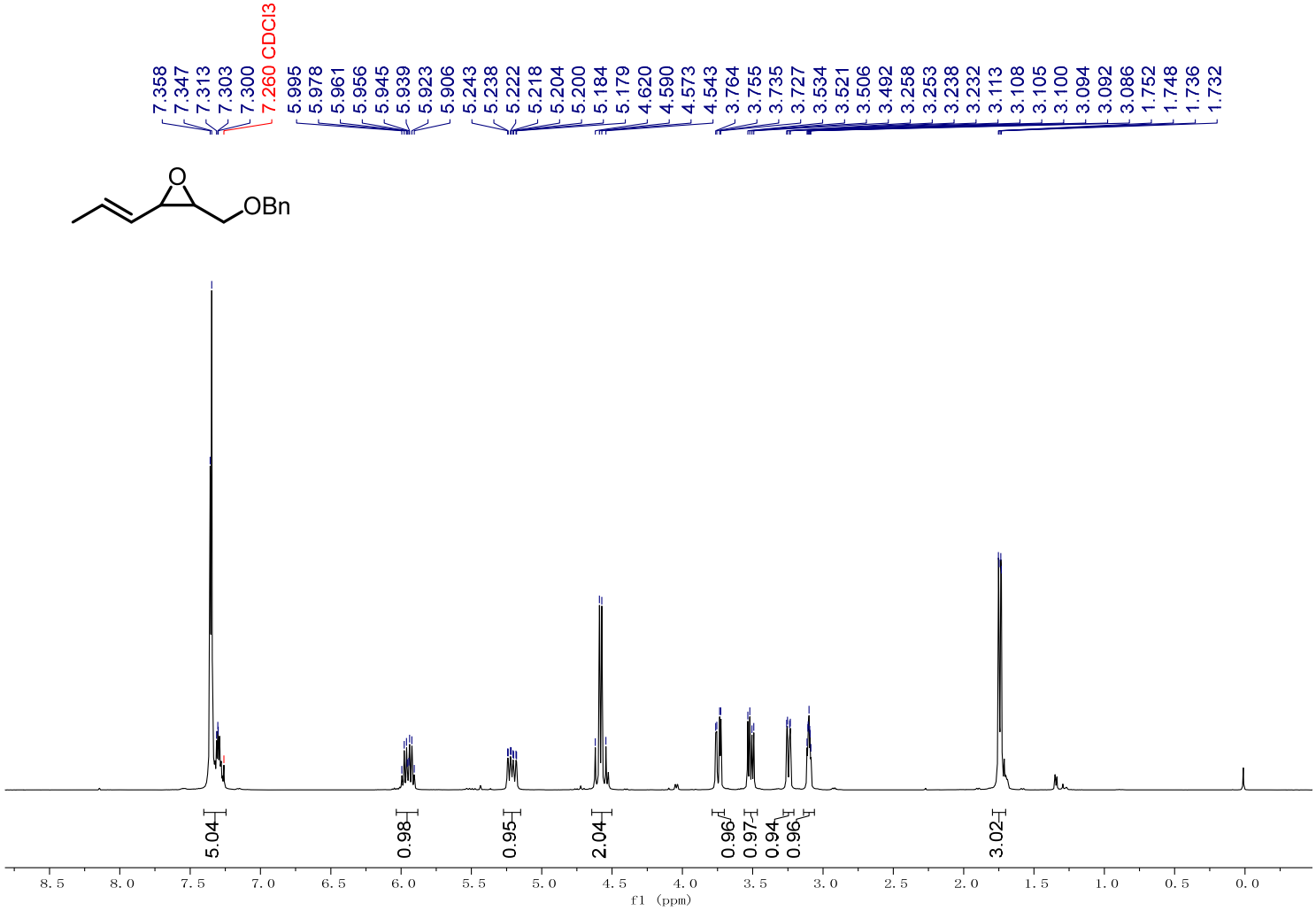
VI. Copy of NMR Spectra

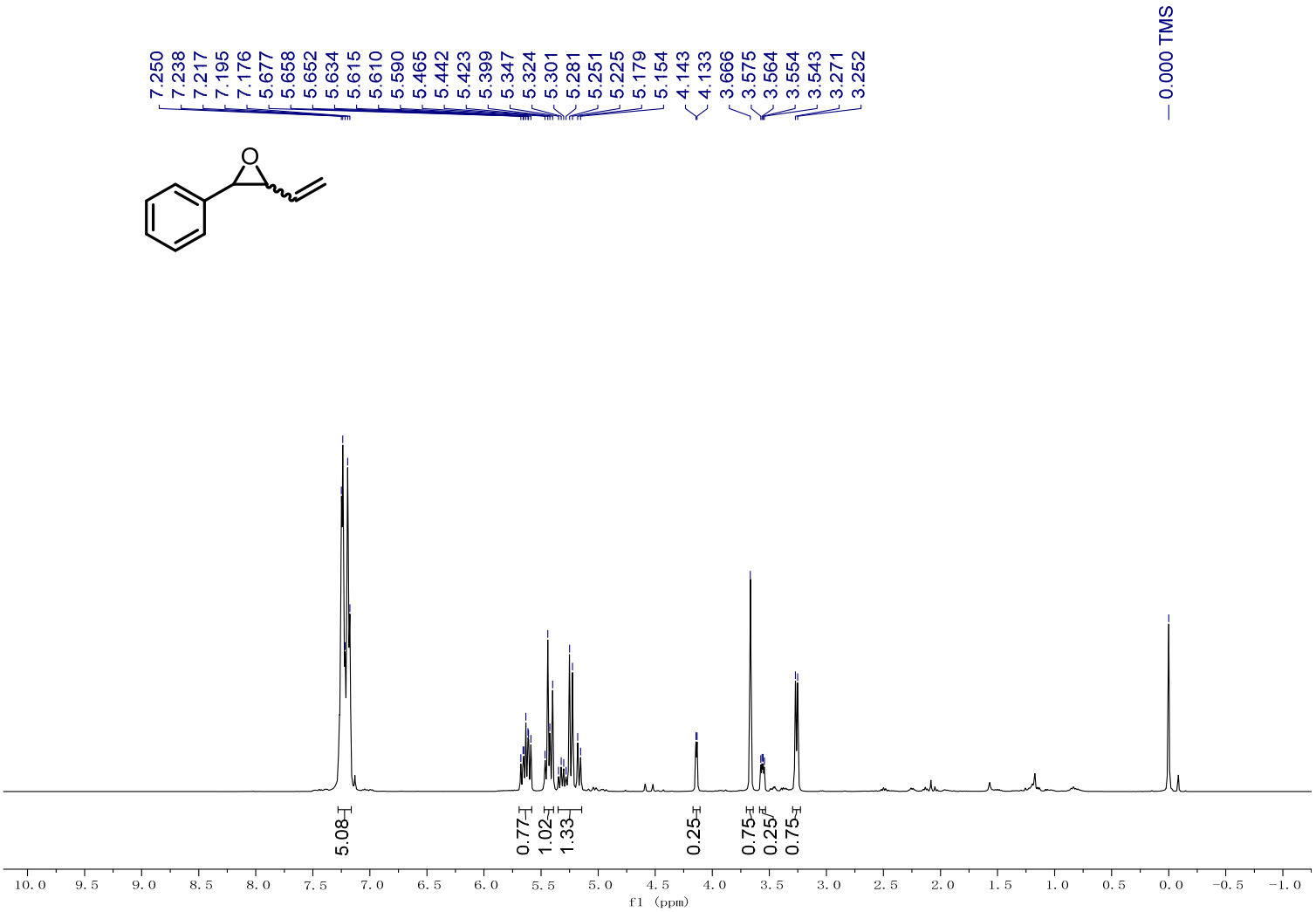
^{1}H NMR (400 MHz, $CDCl_3$) Spectrum of (*E*)-2-(3-(benzyloxy)prop-1-en-1-yl)-3-methyloxirane 1c



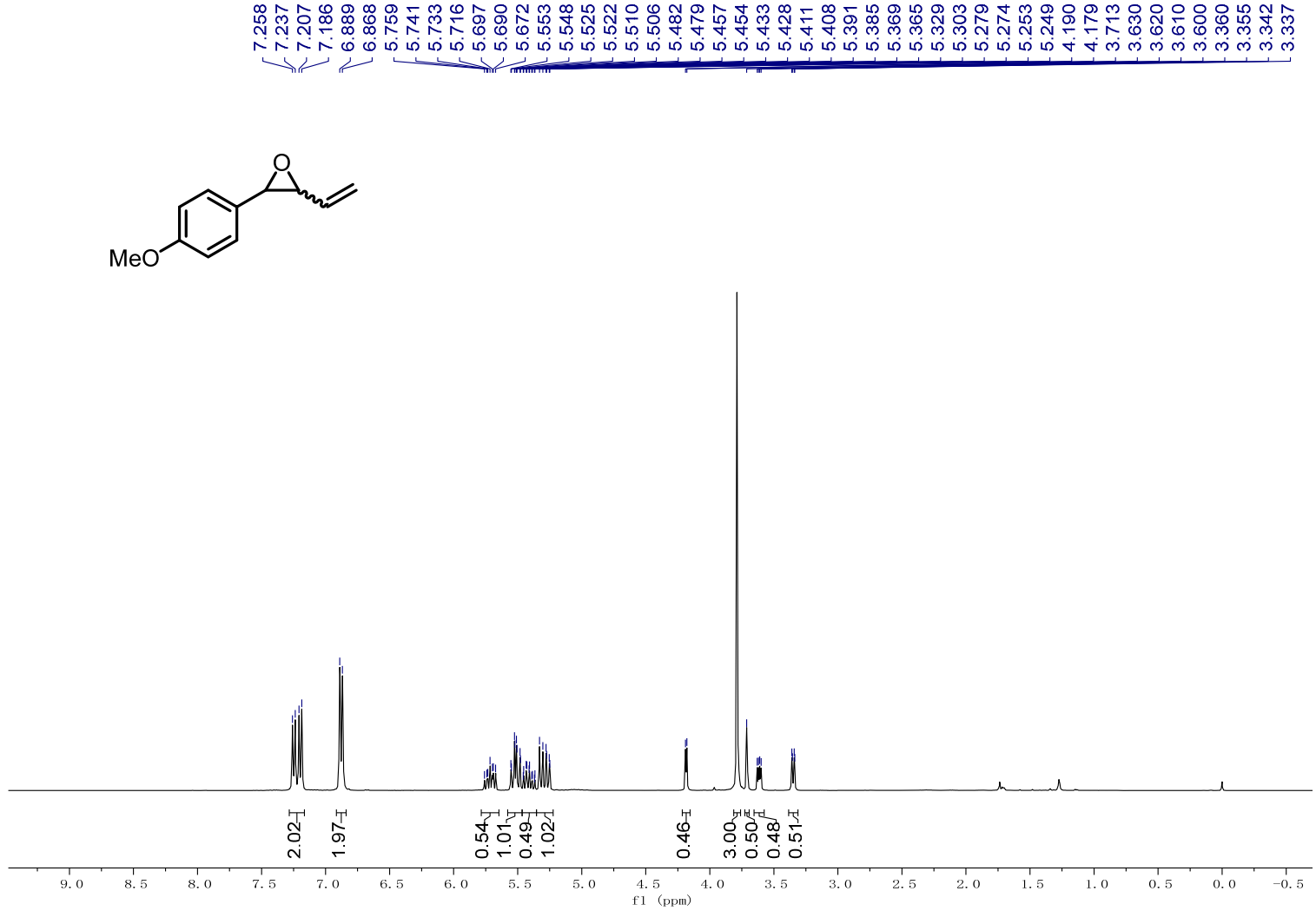
^{1}H NMR (400 MHz, $CDCl_3$) Spectrum of (*E*)-2-((benzyloxy)methyl)-3-(prop-1-en-1-yl)oxirane 1d



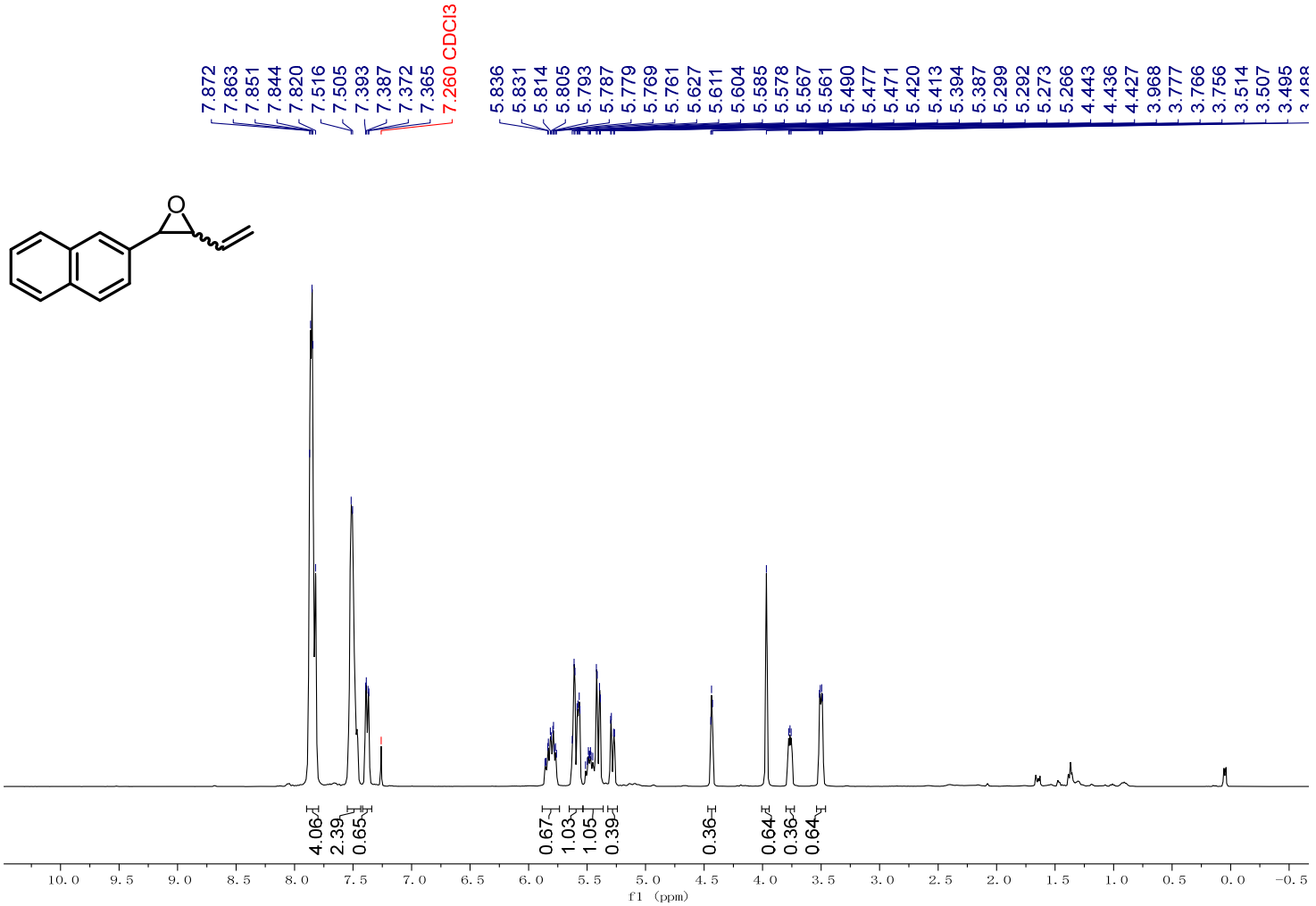
^{1}H NMR (400 MHz, $CDCl_3$) Spectrum of 2-phenyl-3-vinyloxirane 1f



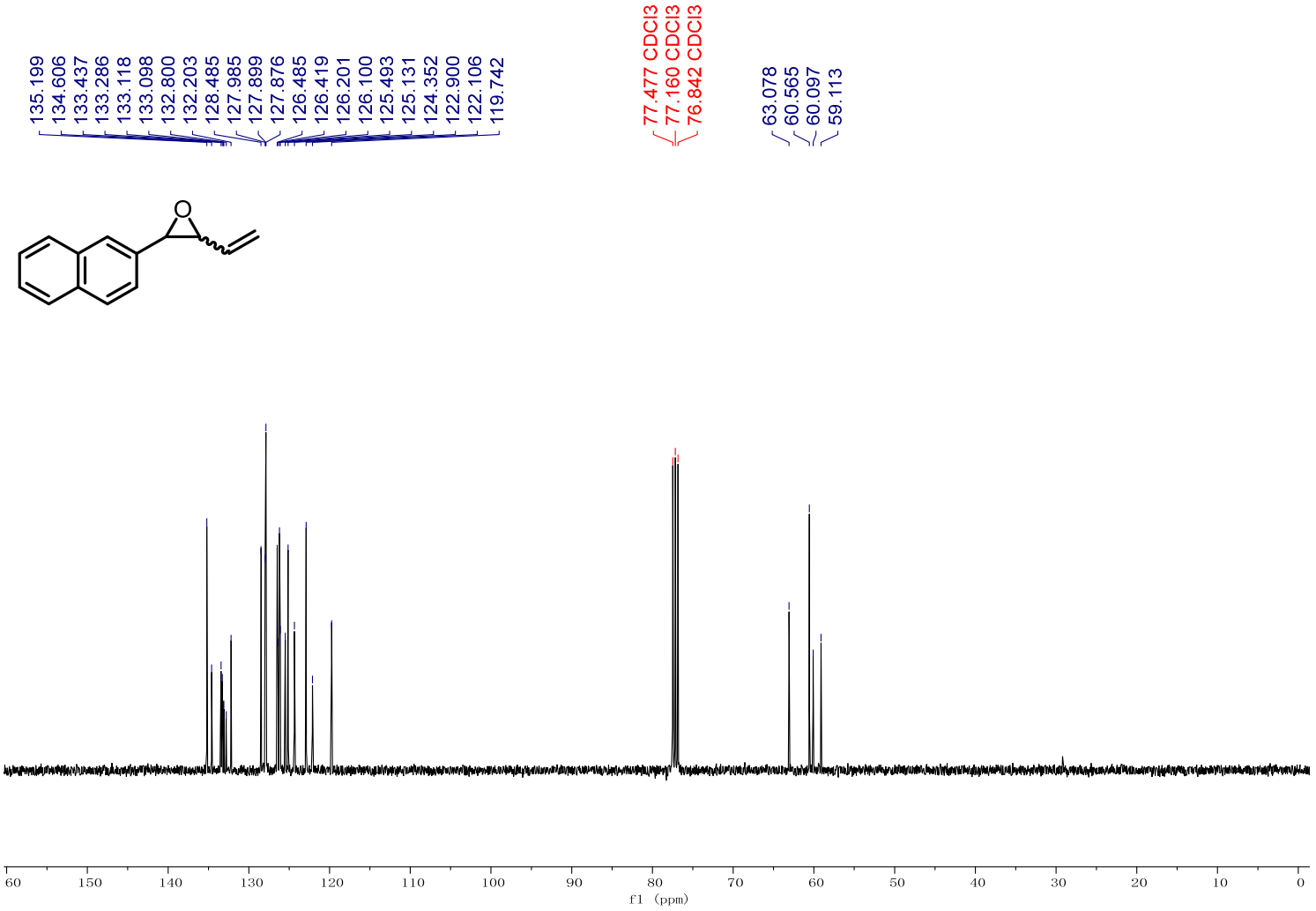
^{1}H NMR (400 MHz, $CDCl_3$) Spectrum of 2-(4-methoxyphenyl)-3-vinyloxirane 1g



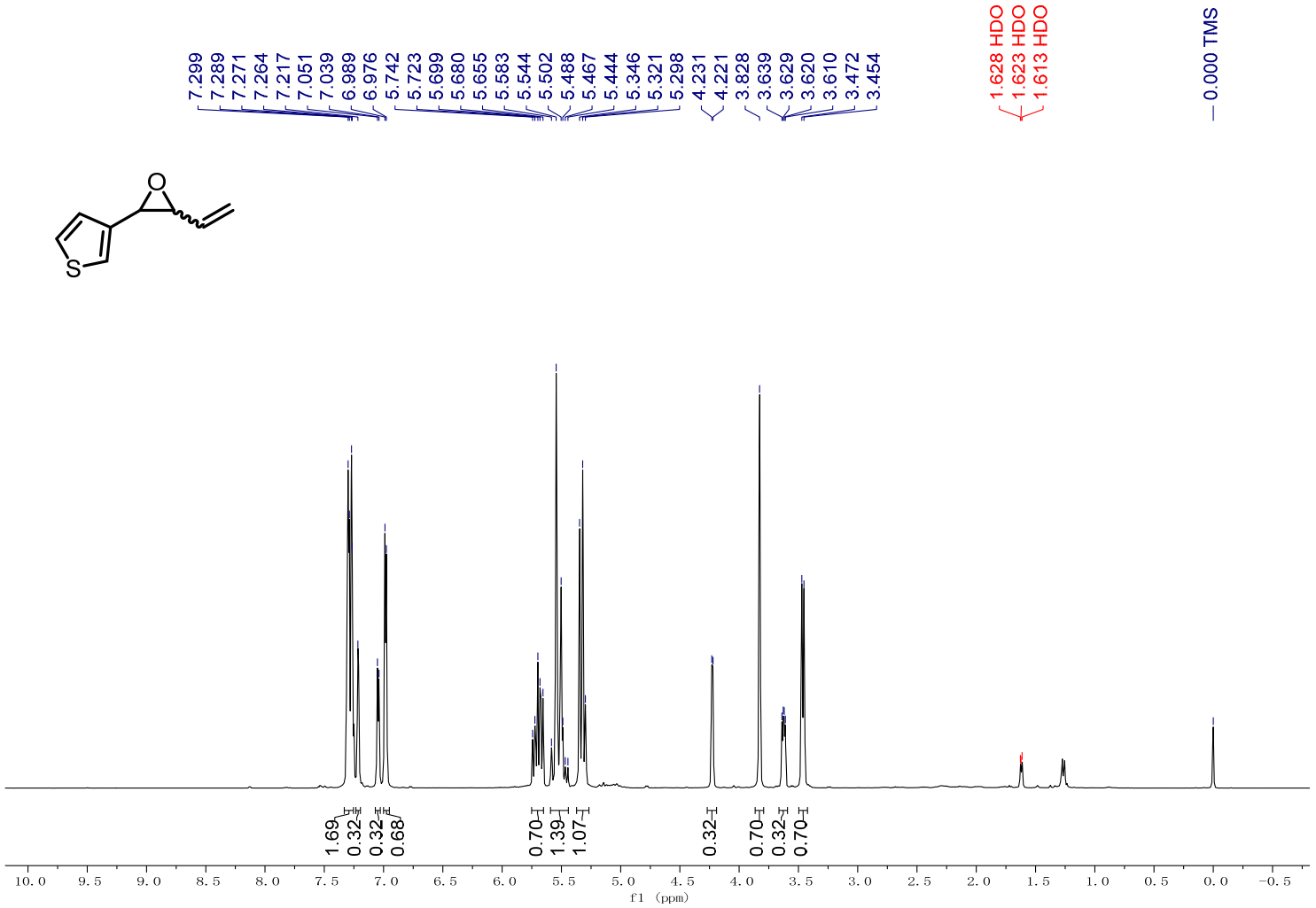
^{1}H NMR (400 MHz, $CDCl_3$) Spectrum of 2-(naphthalen-2-yl)-3-vinyloxirane 1h



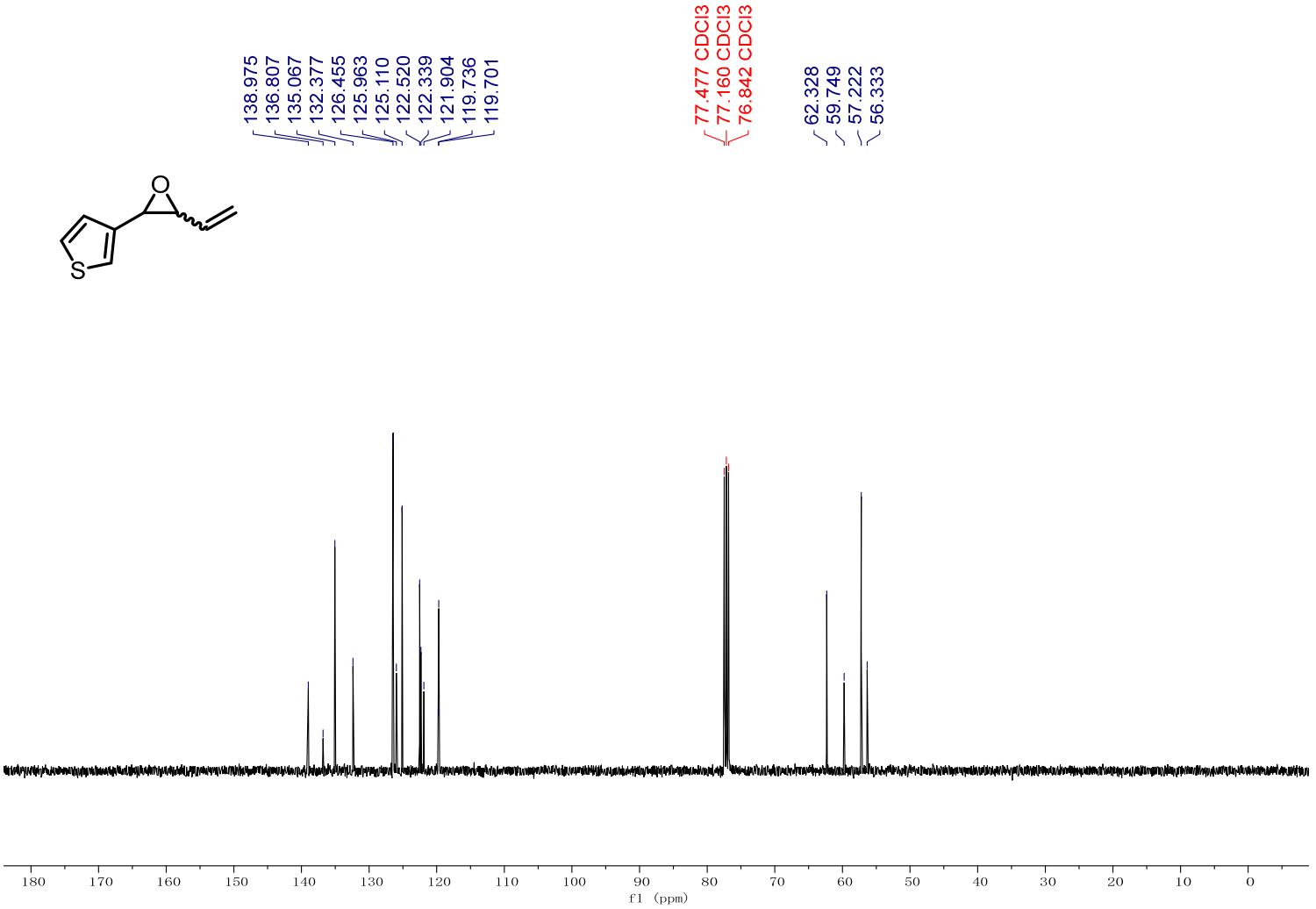
^{13}C NMR (100 MHz, $CDCl_3$) Spectrum of 2-(naphthalen-2-yl)-3-vinyloxirane 1h



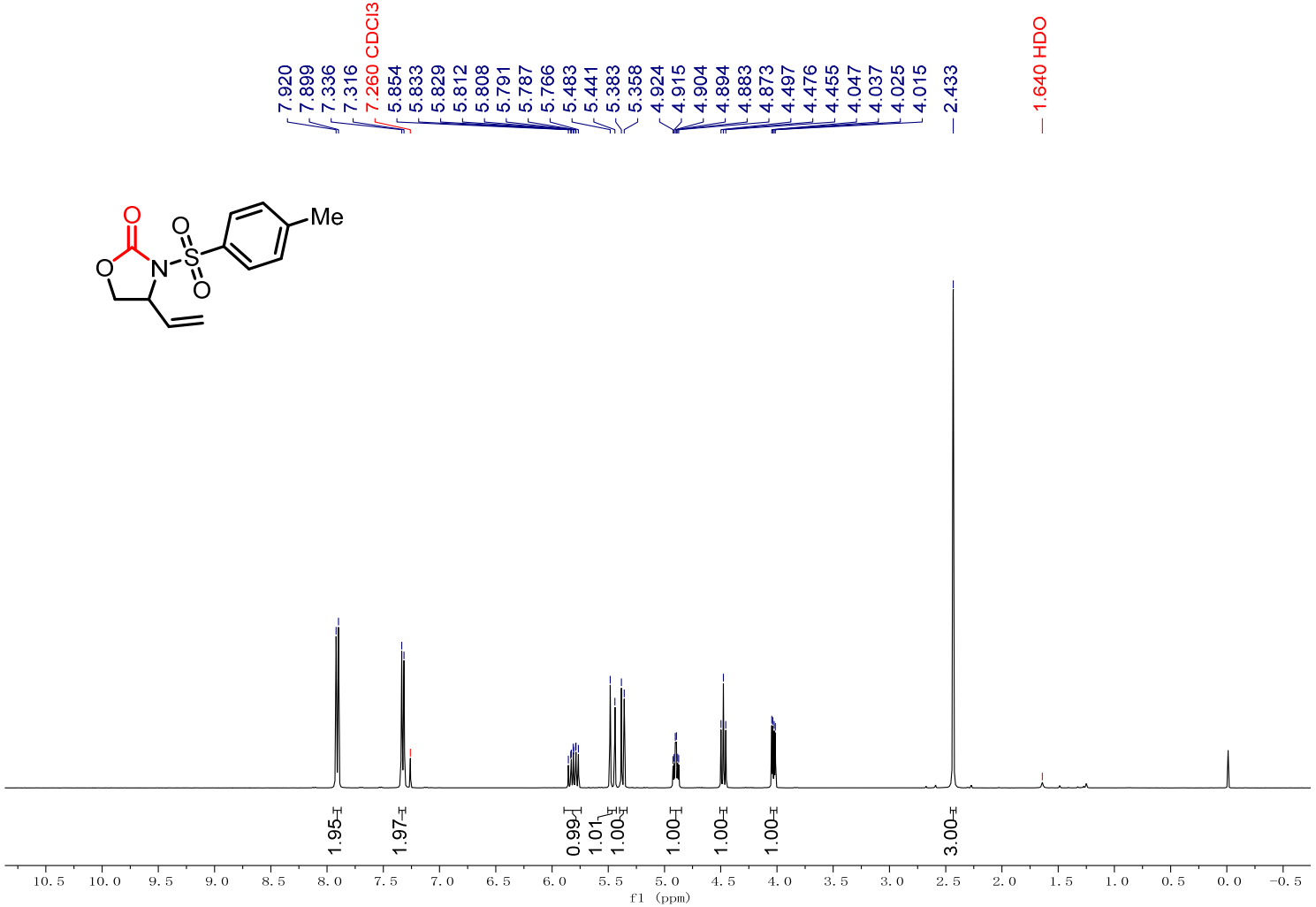
^{1}H NMR (400 MHz, $CDCl_3$) Spectrum of 2-(thiophen-3-yl)-3-vinyloxirane 1i



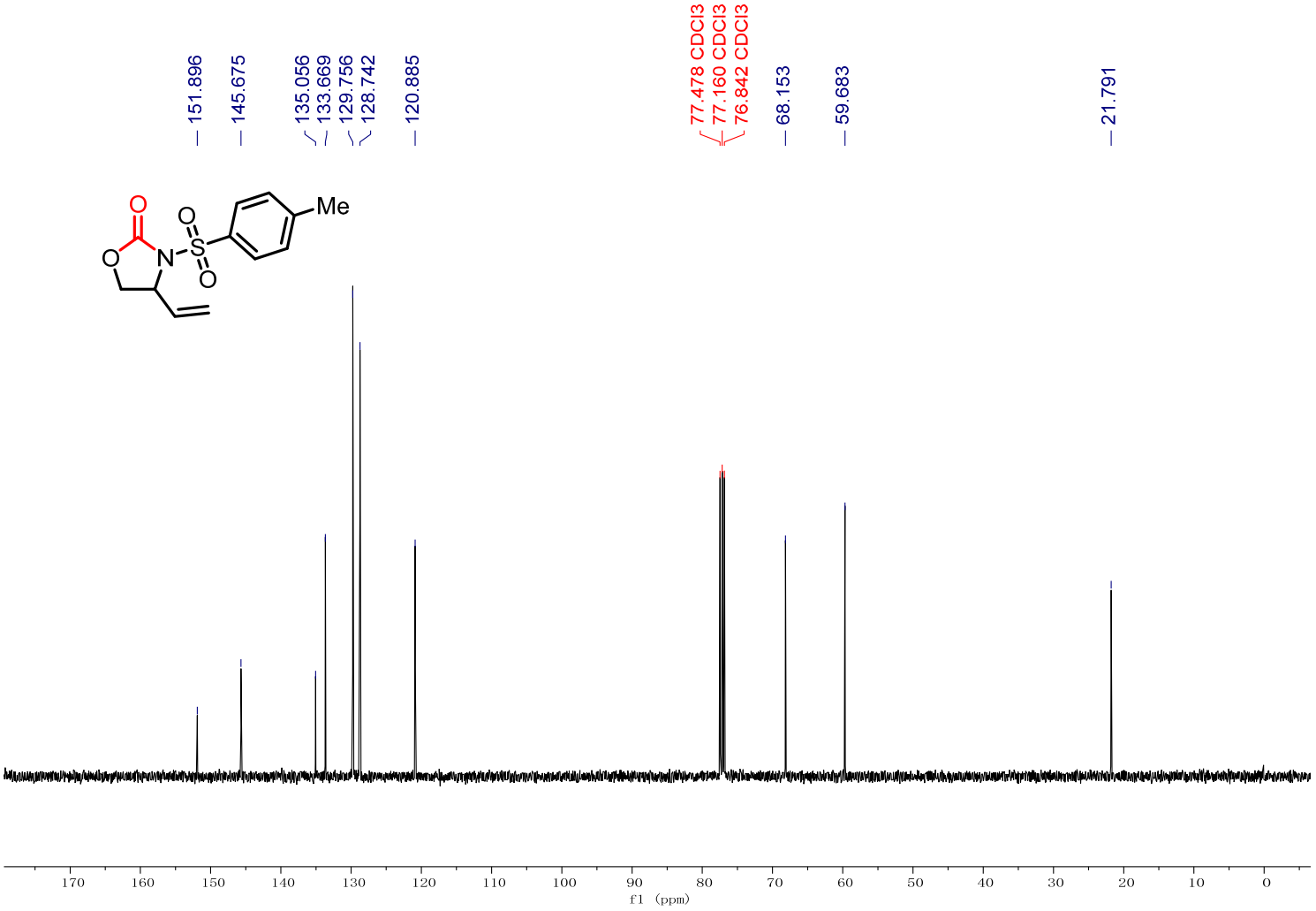
^{13}C NMR (100 MHz, $CDCl_3$) Spectrum of 2-(thiophen-3-yl)-3-vinyloxirane 1i



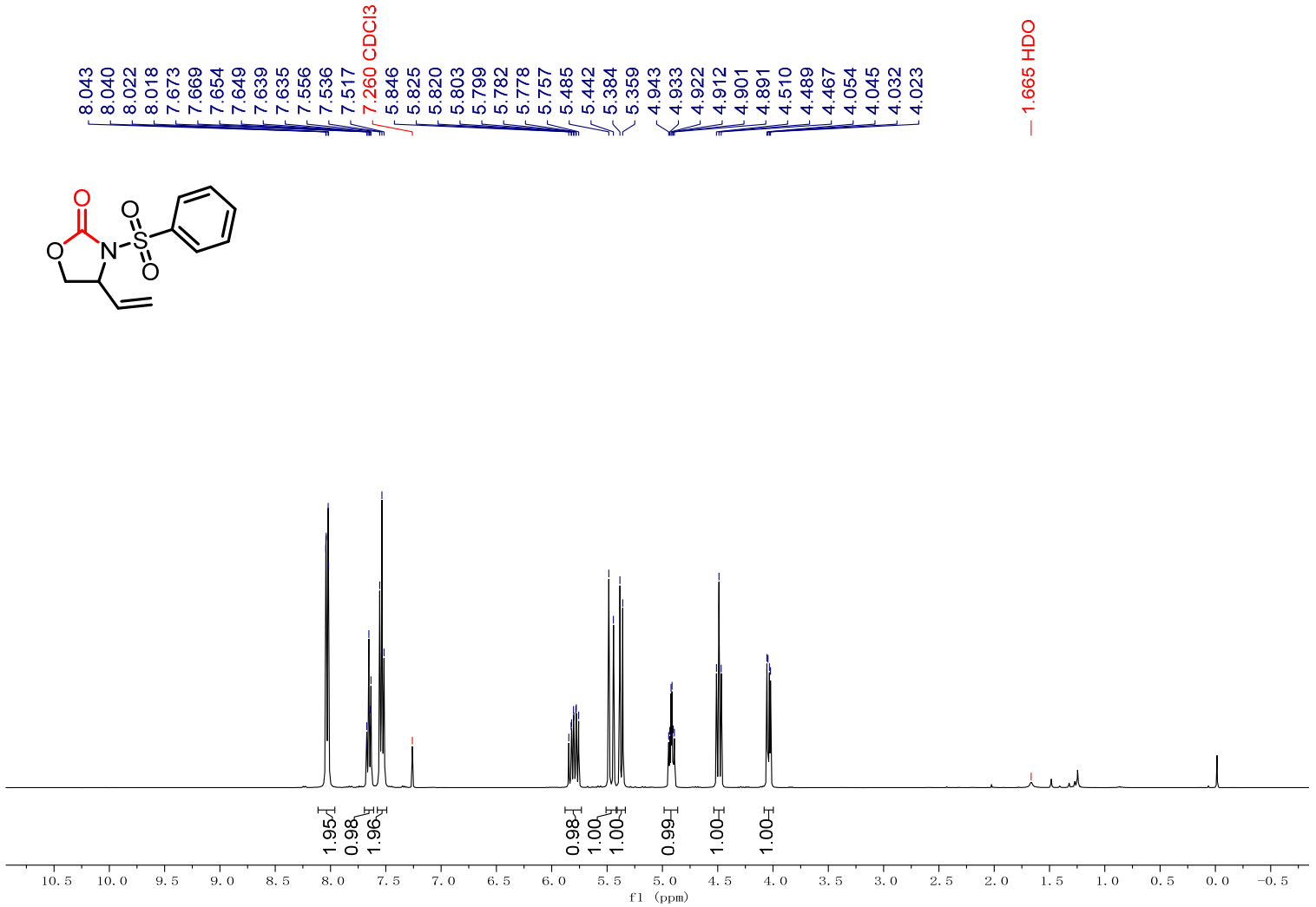
^{1}H NMR (400 MHz, $CDCl_3$) Spectrum of 3-tosyl-4-vinyloxazolidin-2-one 3a



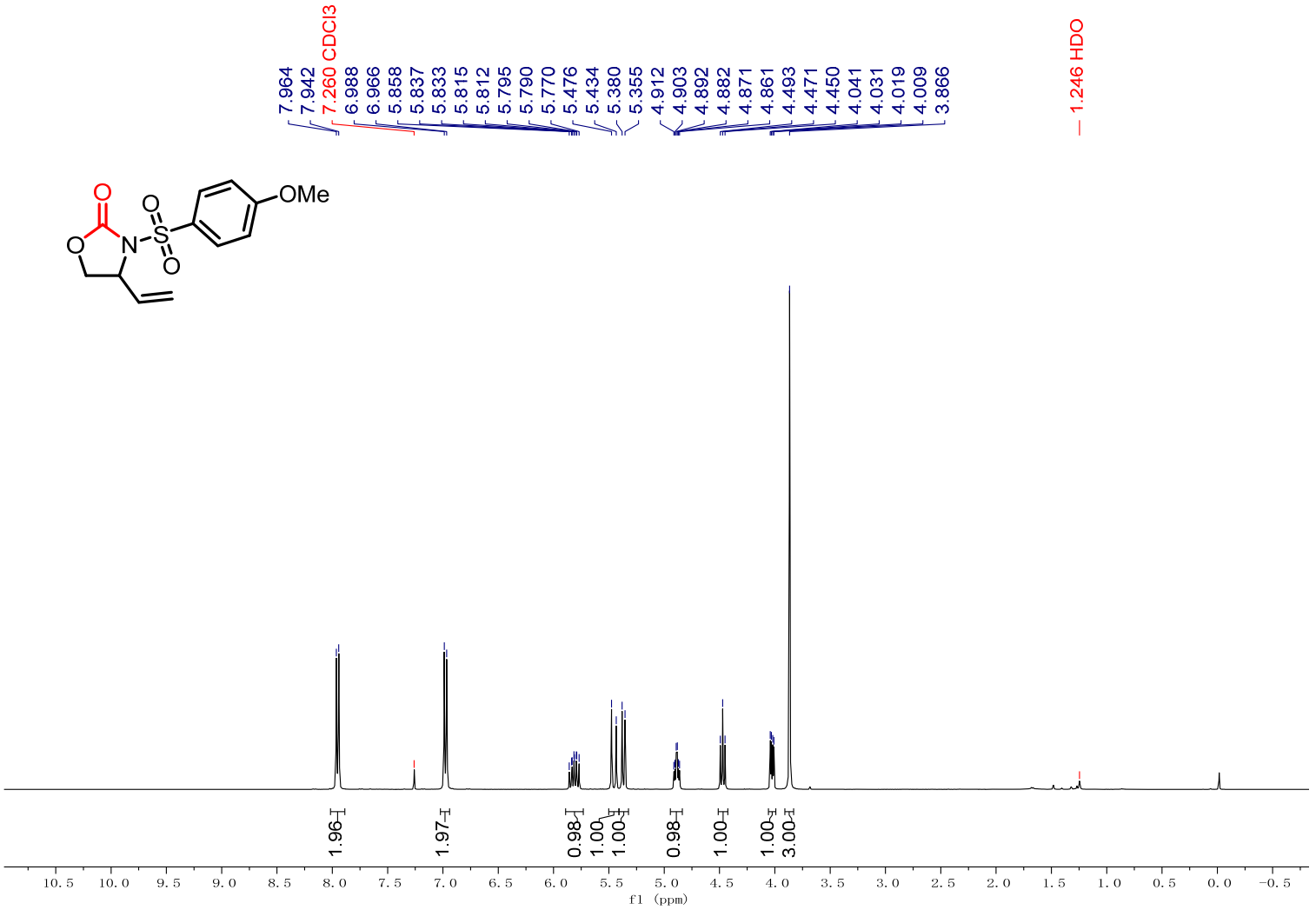
^{13}C NMR (100 MHz, $CDCl_3$) Spectrum of 3-tosyl-4-vinyloxazolidin-2-one 3a



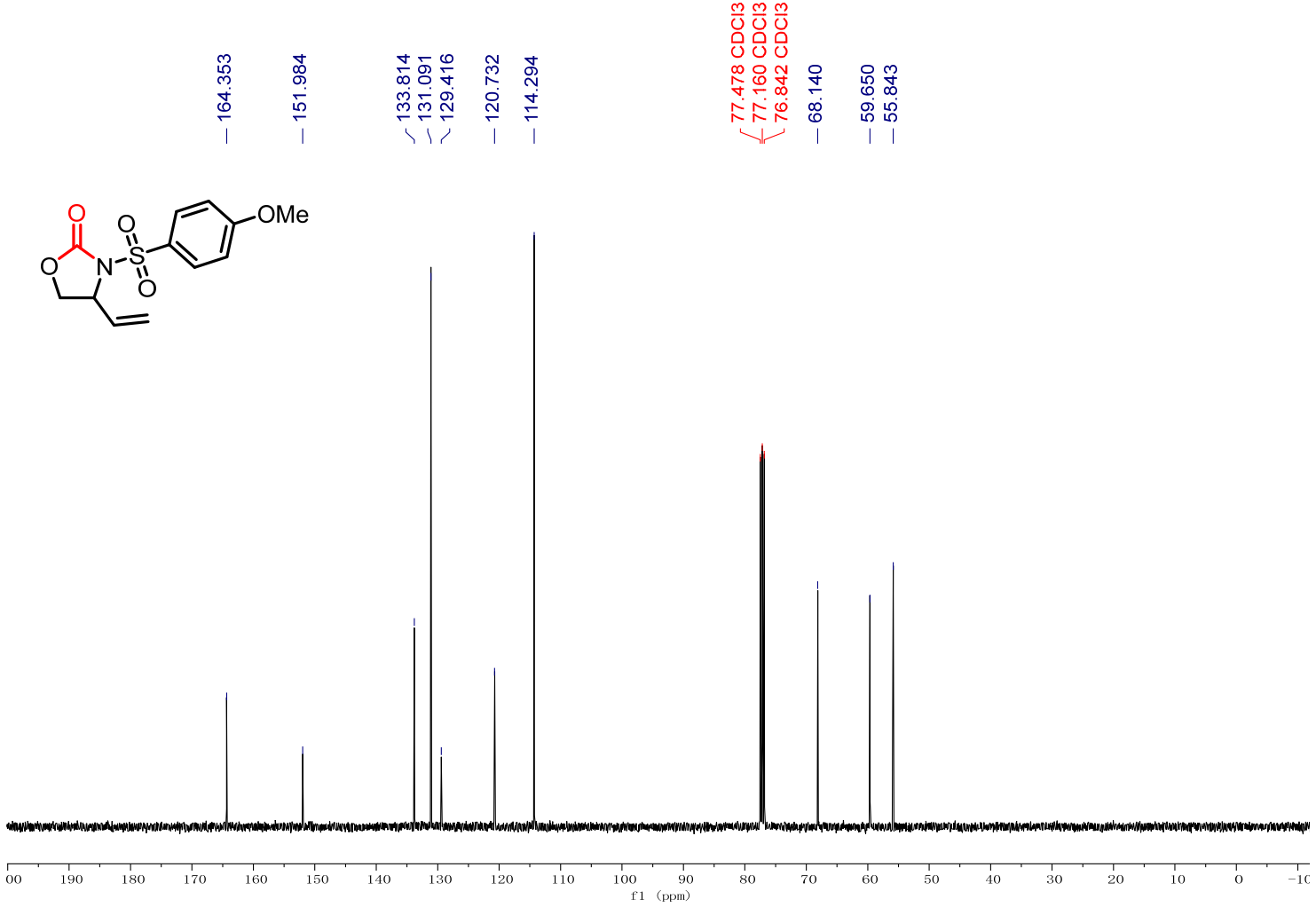
^{1}H NMR (400 MHz, $CDCl_3$) Spectrum of 3-(phenylsulfonyl)-4-vinyloxazolidin-2-one 3b



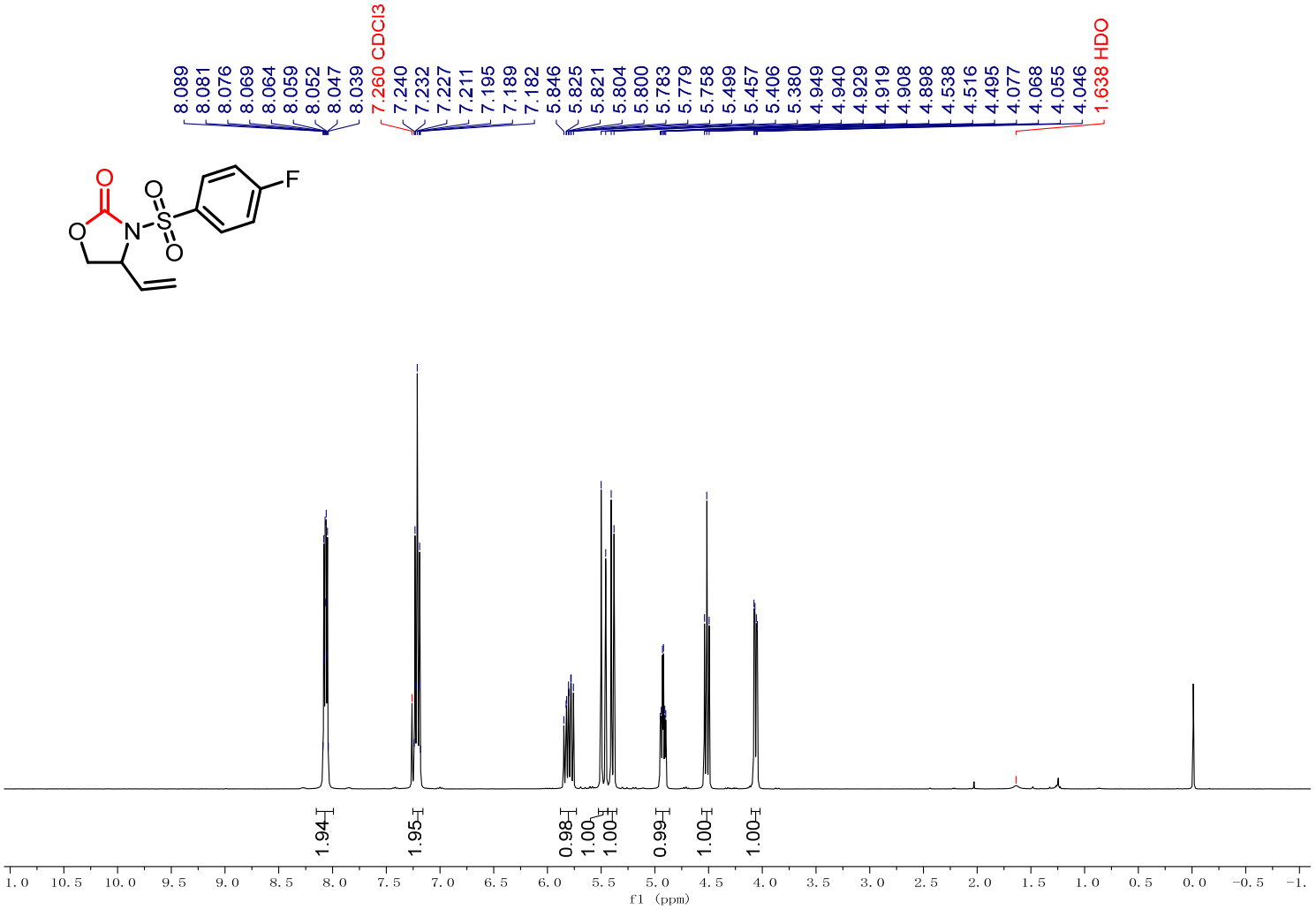
^{1}H NMR (400 MHz, $CDCl_3$) Spectrum of 3-((4-methoxyphenyl)sulfonyl)-4-vinyloxazolidin-2-one 3c



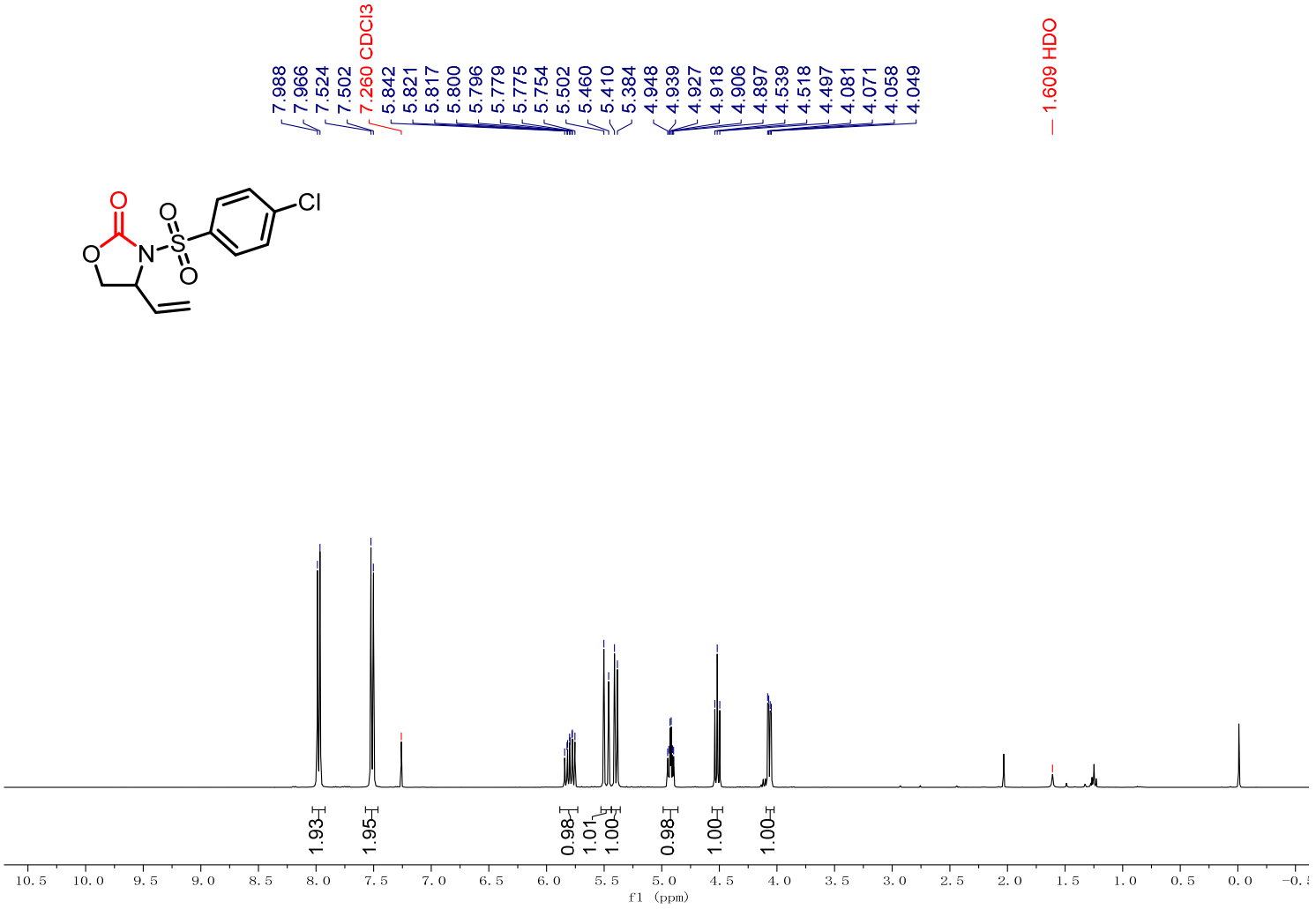
^{13}C NMR (100 MHz, $CDCl_3$) Spectrum of 3-((4-methoxyphenyl)sulfonyl)-4-vinyloxazolidin-2-one 3c



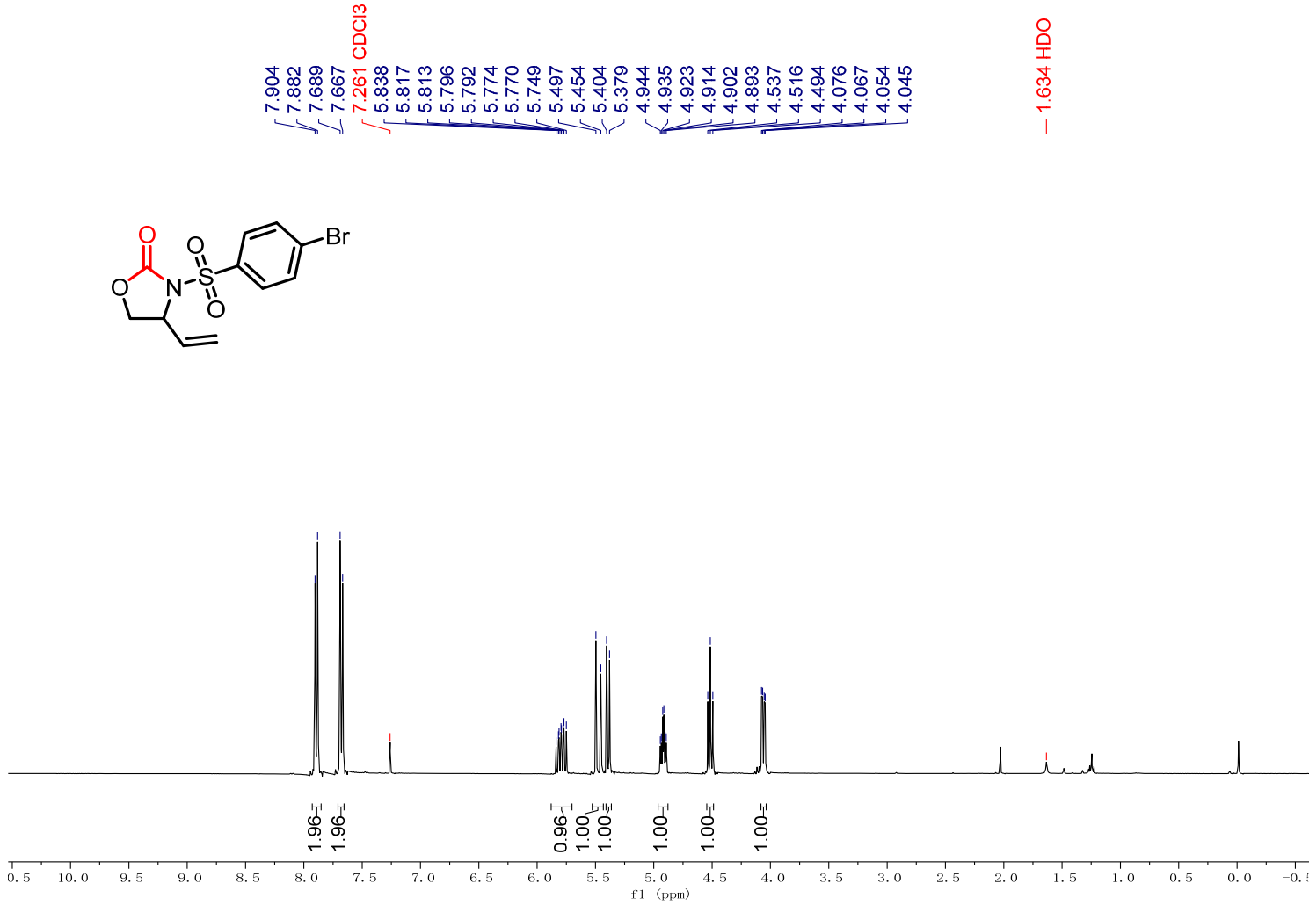
^{1}H NMR (400 MHz, $CDCl_3$) Spectrum of 3-((4-fluorophenyl)sulfonyl)-4-vinyloxazolidin-2-one 3d



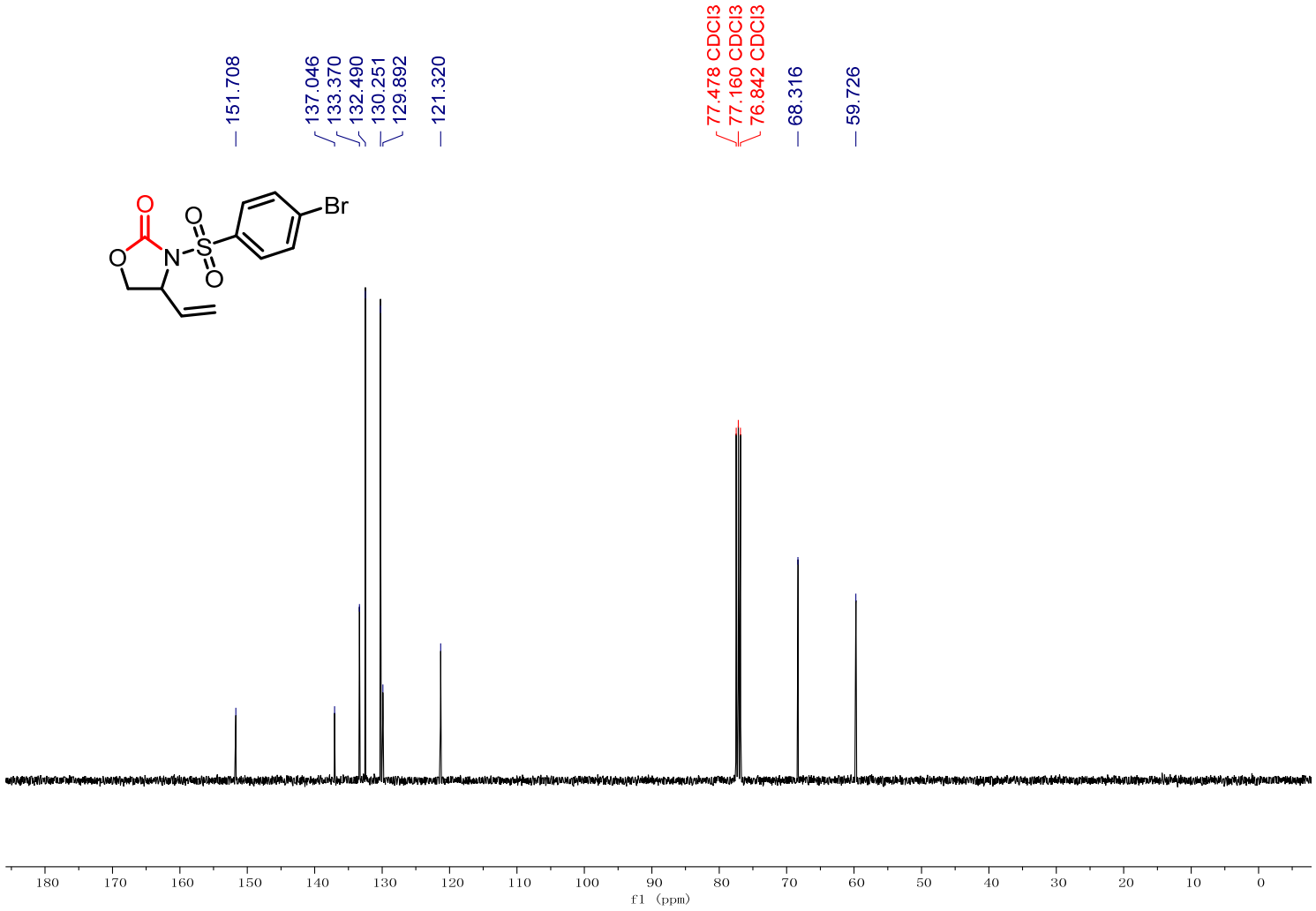
^{1}H NMR (400 MHz, $CDCl_3$) Spectrum of 3-((4-chlorophenyl)sulfonyl)-4-vinyloxazolidin-2-one 3e



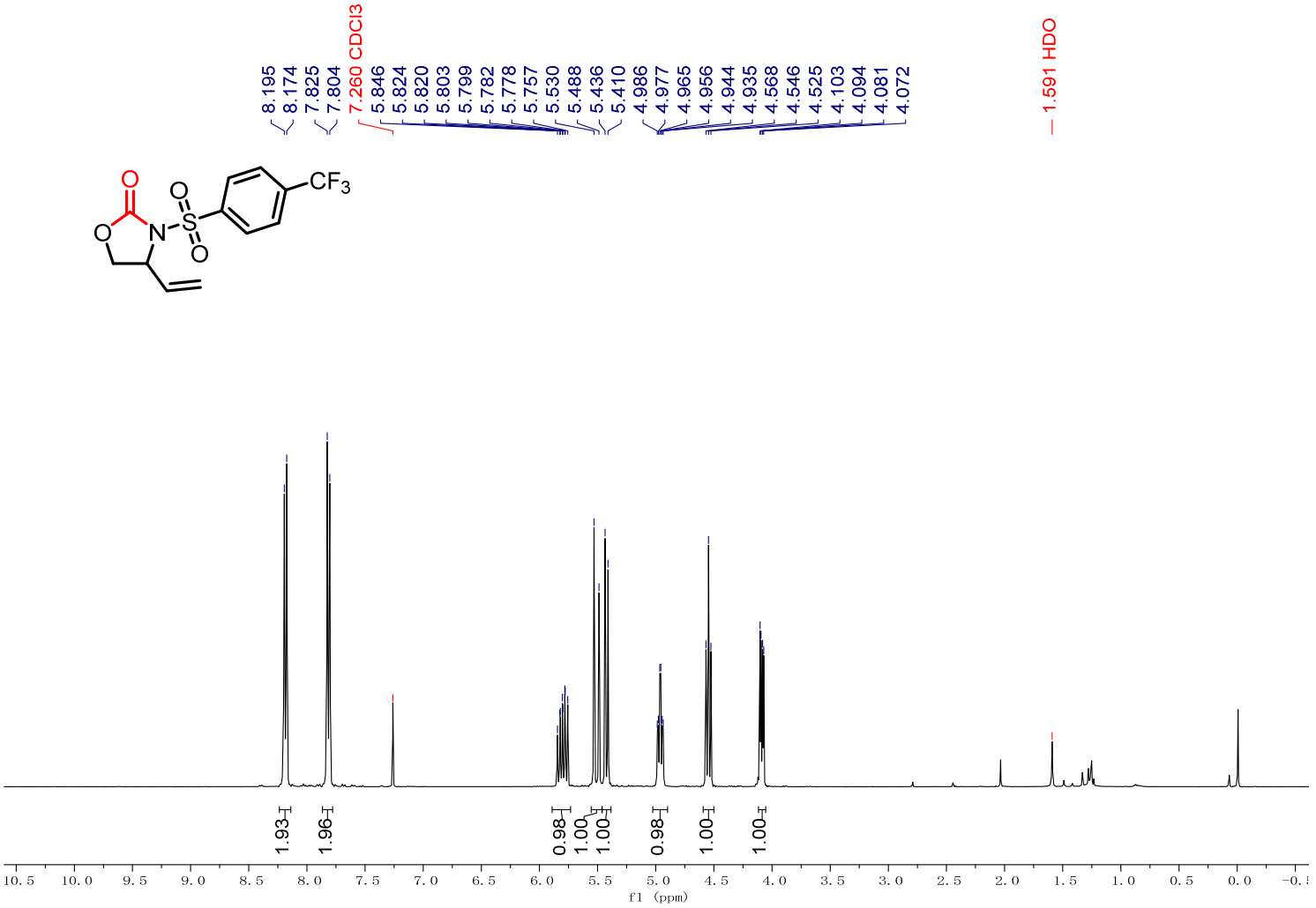
^{1}H NMR (400 MHz, $CDCl_3$) Spectrum of 3-((4-bromophenyl)sulfonyl)-4-vinyloxazolidin-2-one 3f



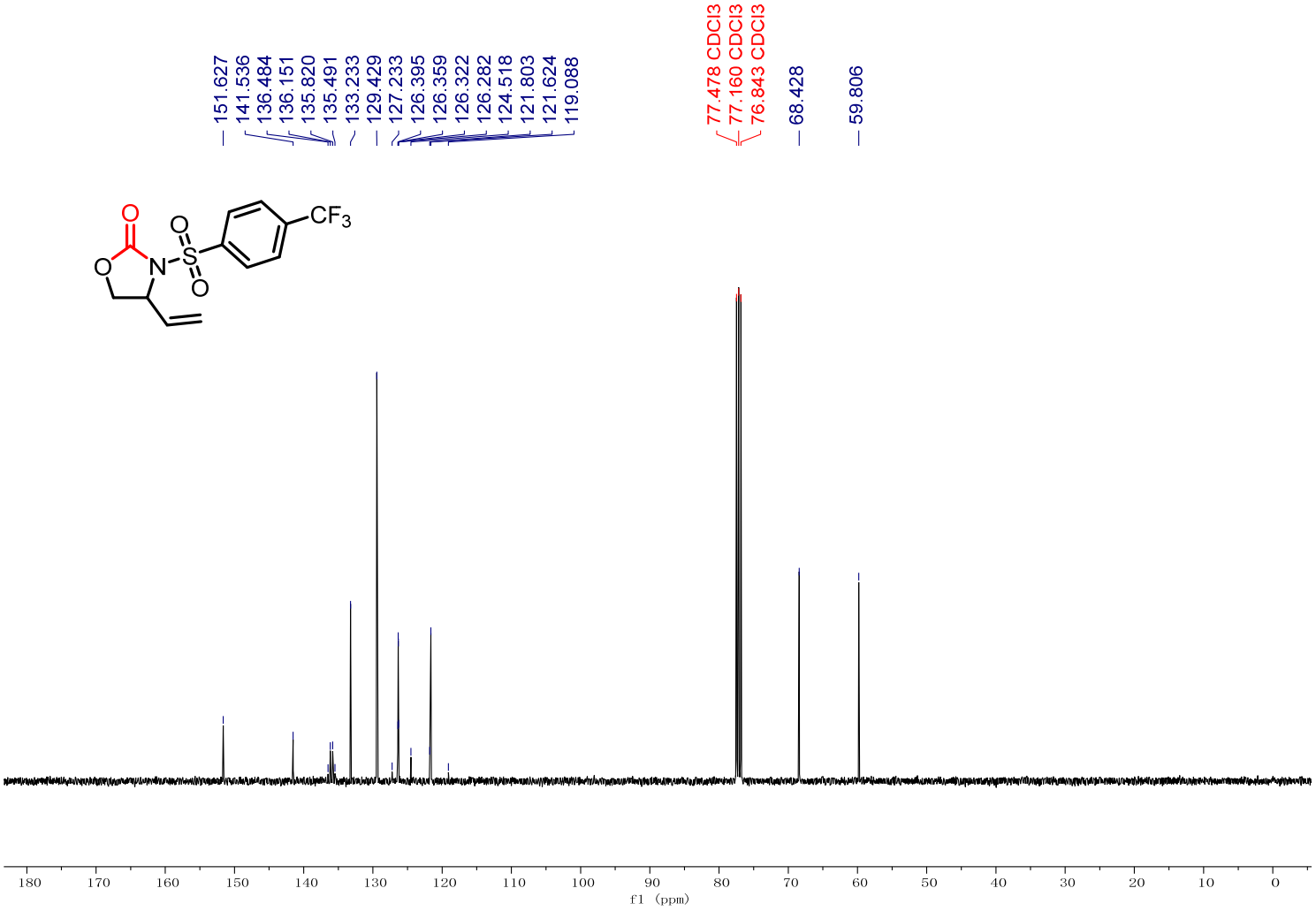
^{13}C NMR (100 MHz, $CDCl_3$) Spectrum of 3-((4-bromophenyl)sulfonyl)-4-vinyloxazolidin-2-one 3f



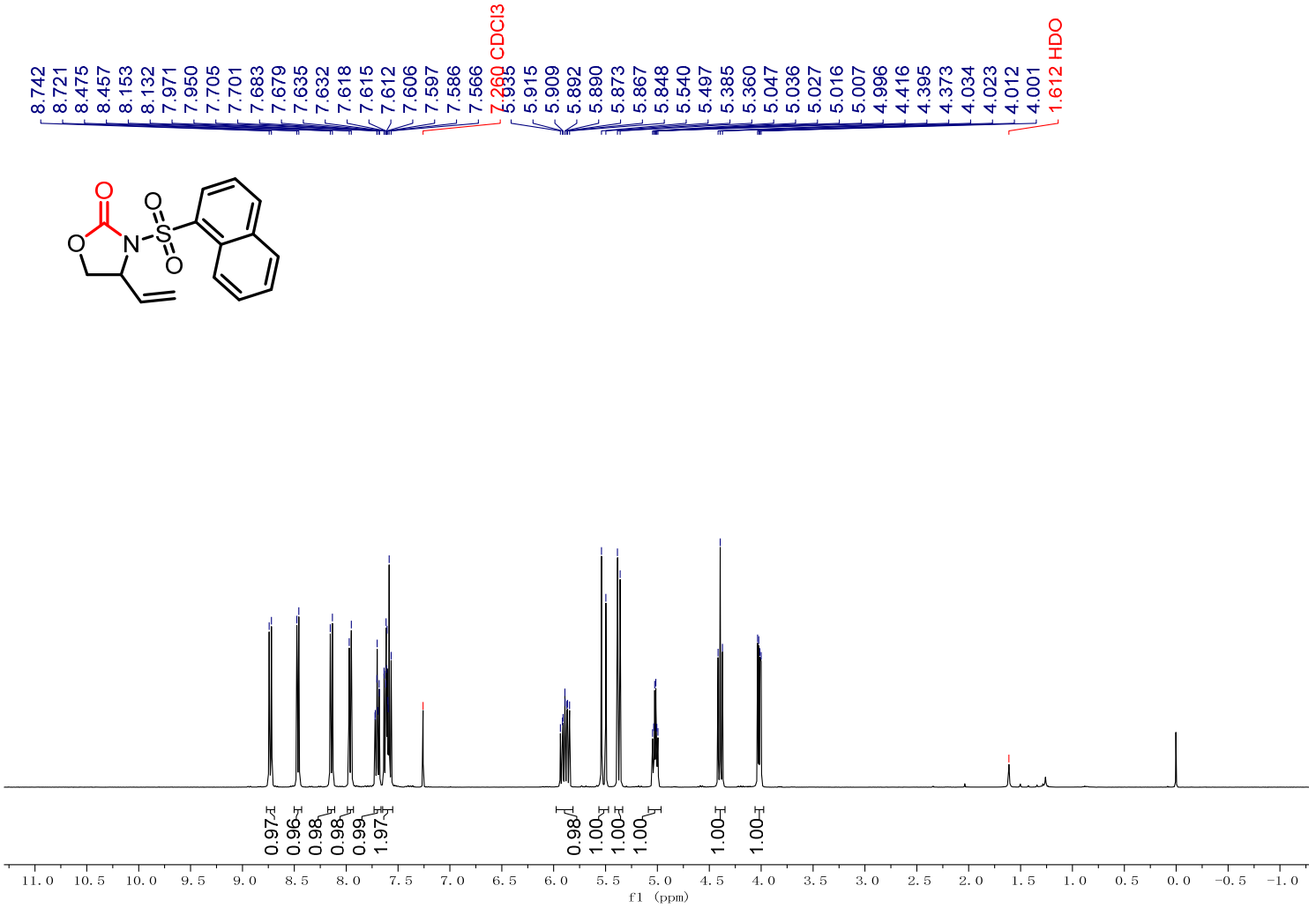
^{1}H NMR (400 MHz, $CDCl_3$) Spectrum of 3-((4-(trifluoromethyl)phenyl)sulfonyl)-4-vinyloxazolidin-2-one 3g



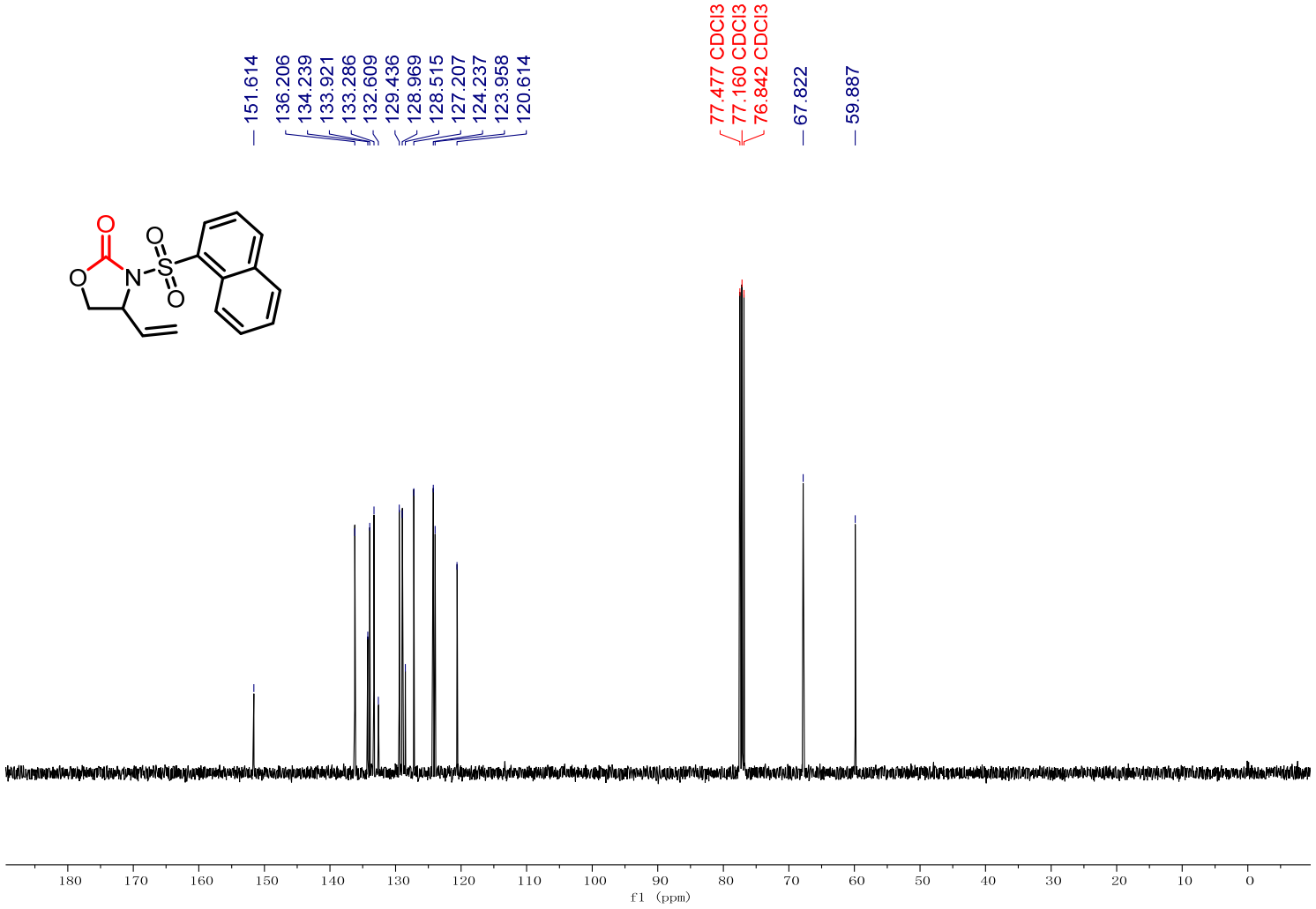
^{13}C NMR (100 MHz, $CDCl_3$) Spectrum of 3-((4-(trifluoromethyl)phenyl)sulfonyl)-4-vinyloxazolidin-2-one 3g



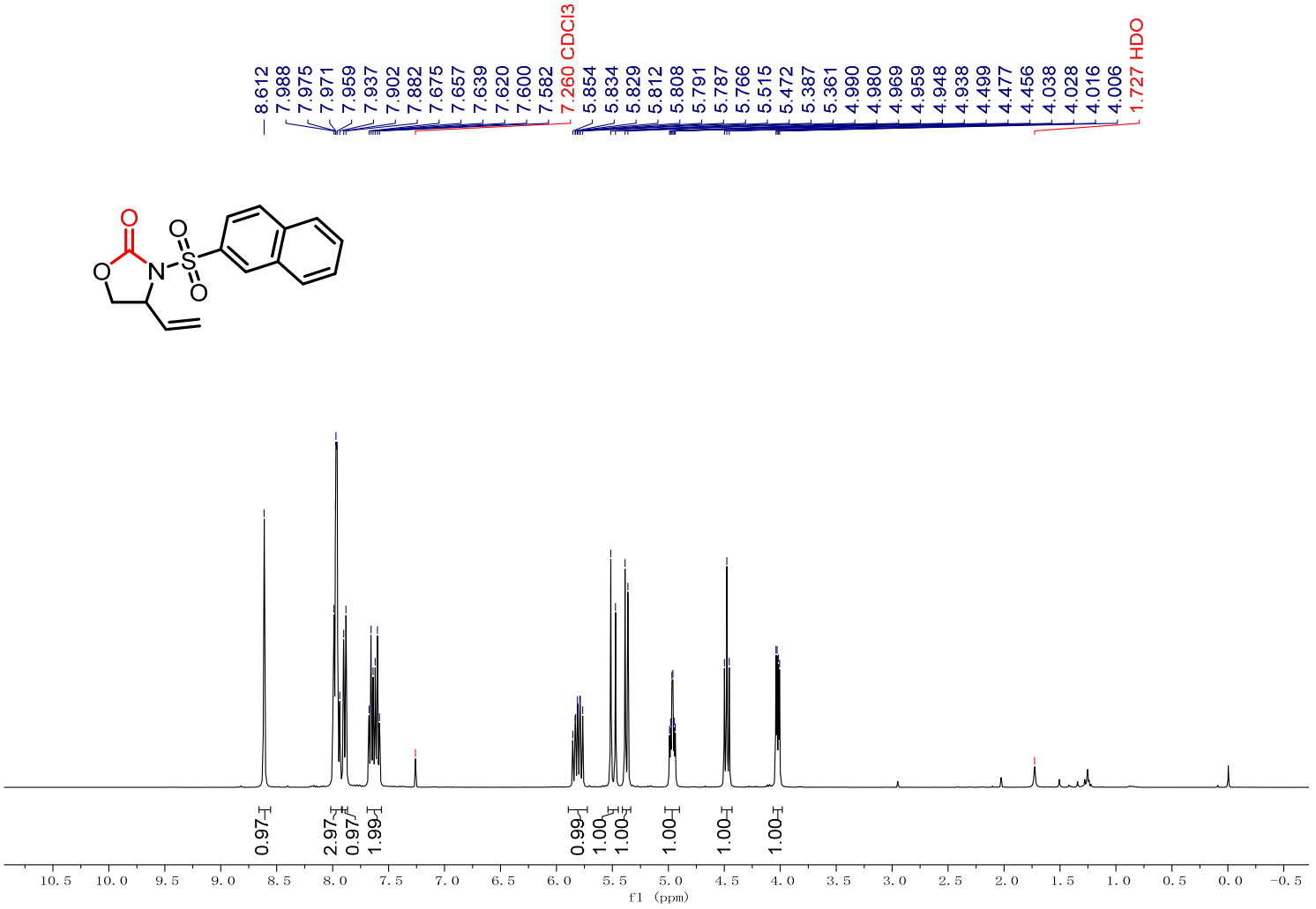
^{1}H NMR (400 MHz, $CDCl_3$) Spectrum of 3-(naphthalen-1-ylsulfonyl)-4-vinyloxazolidin-2-one 3h



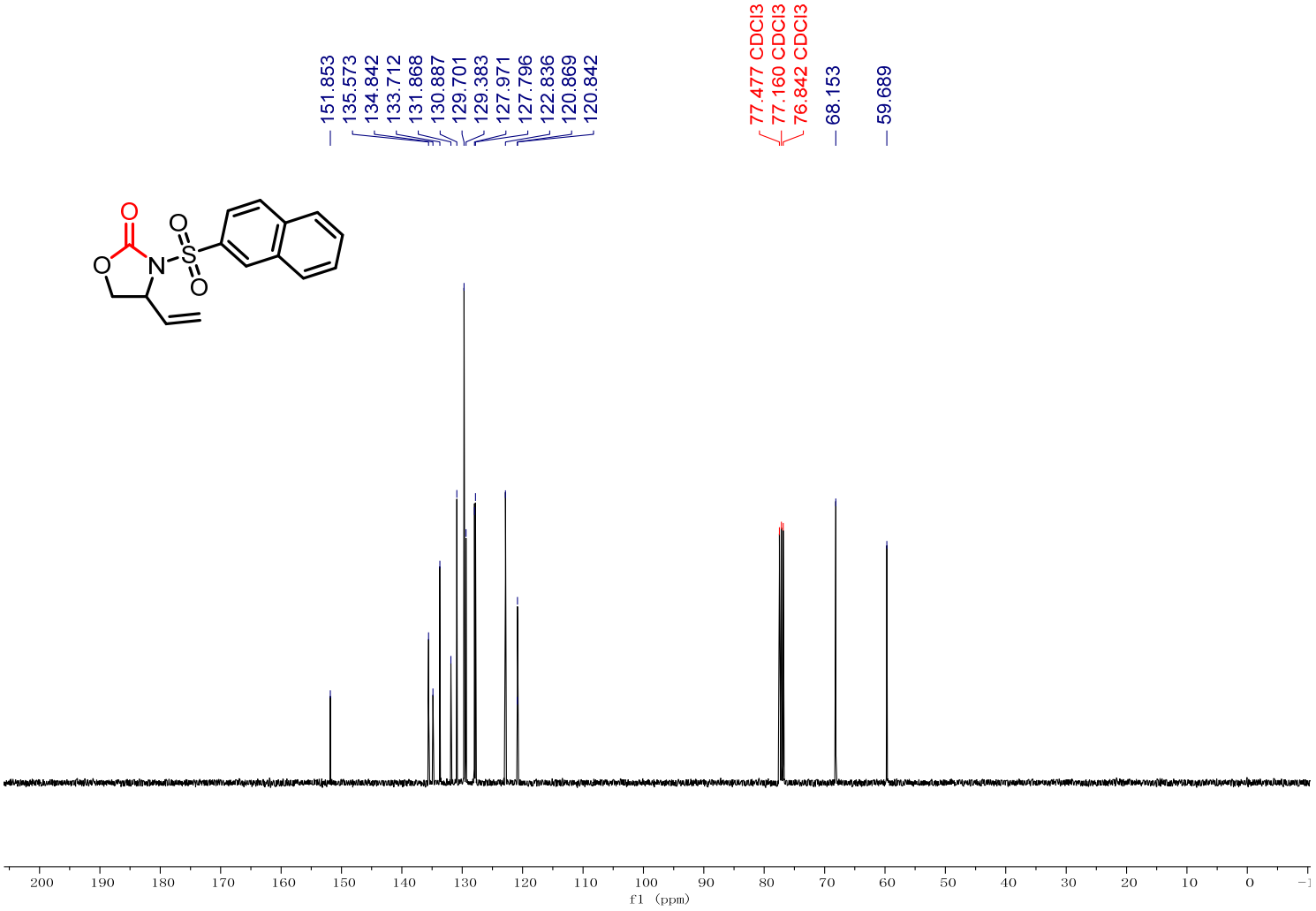
^{13}C NMR (100 MHz, $CDCl_3$) Spectrum of 3-(naphthalen-1-ylsulfonyl)-4-vinyloxazolidin-2-one 3h



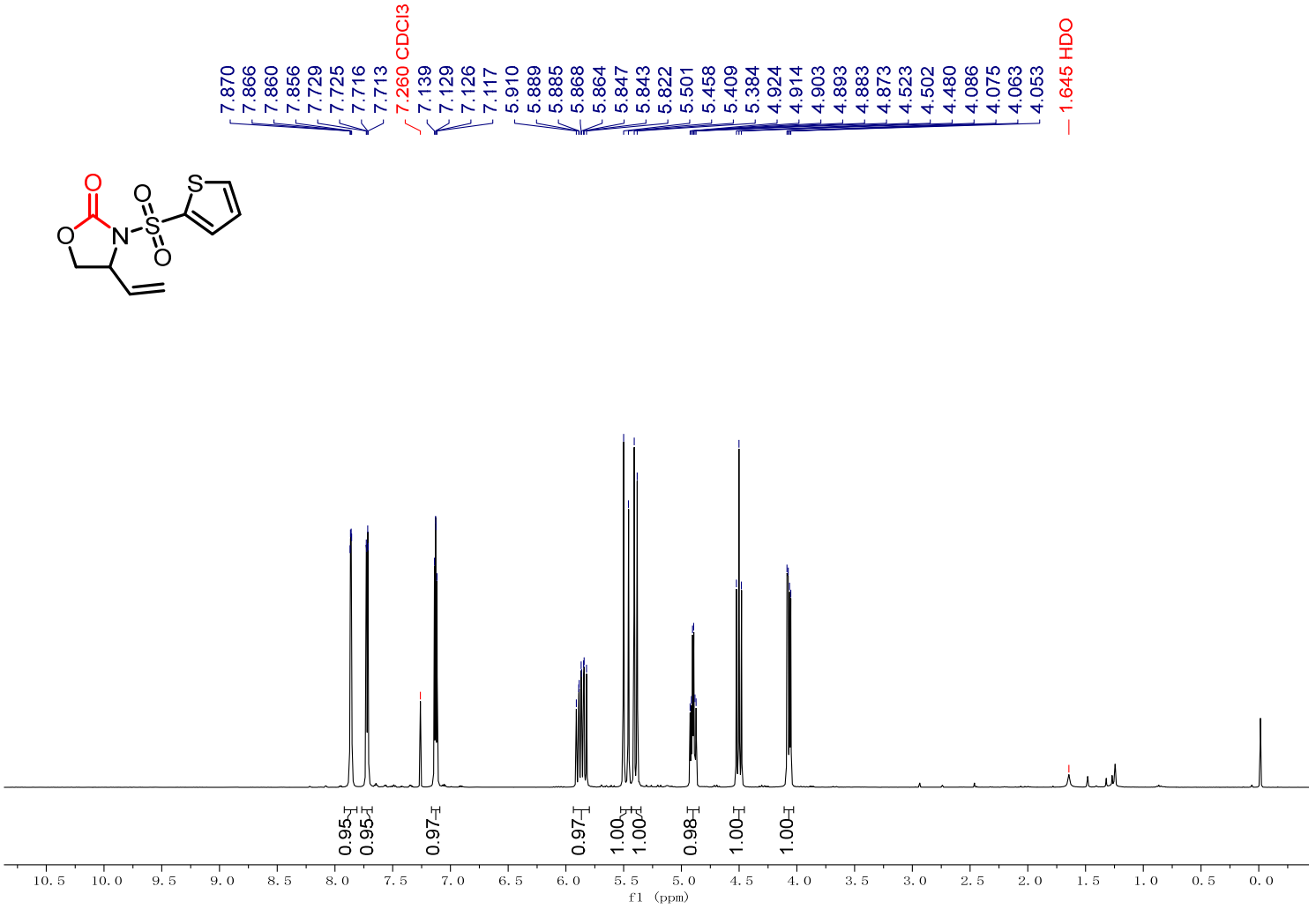
^{1}H NMR (400 MHz, $CDCl_3$) Spectrum of 3-(naphthalen-2-ylsulfonyl)-4-vinyloxazolidin-2-one 3i



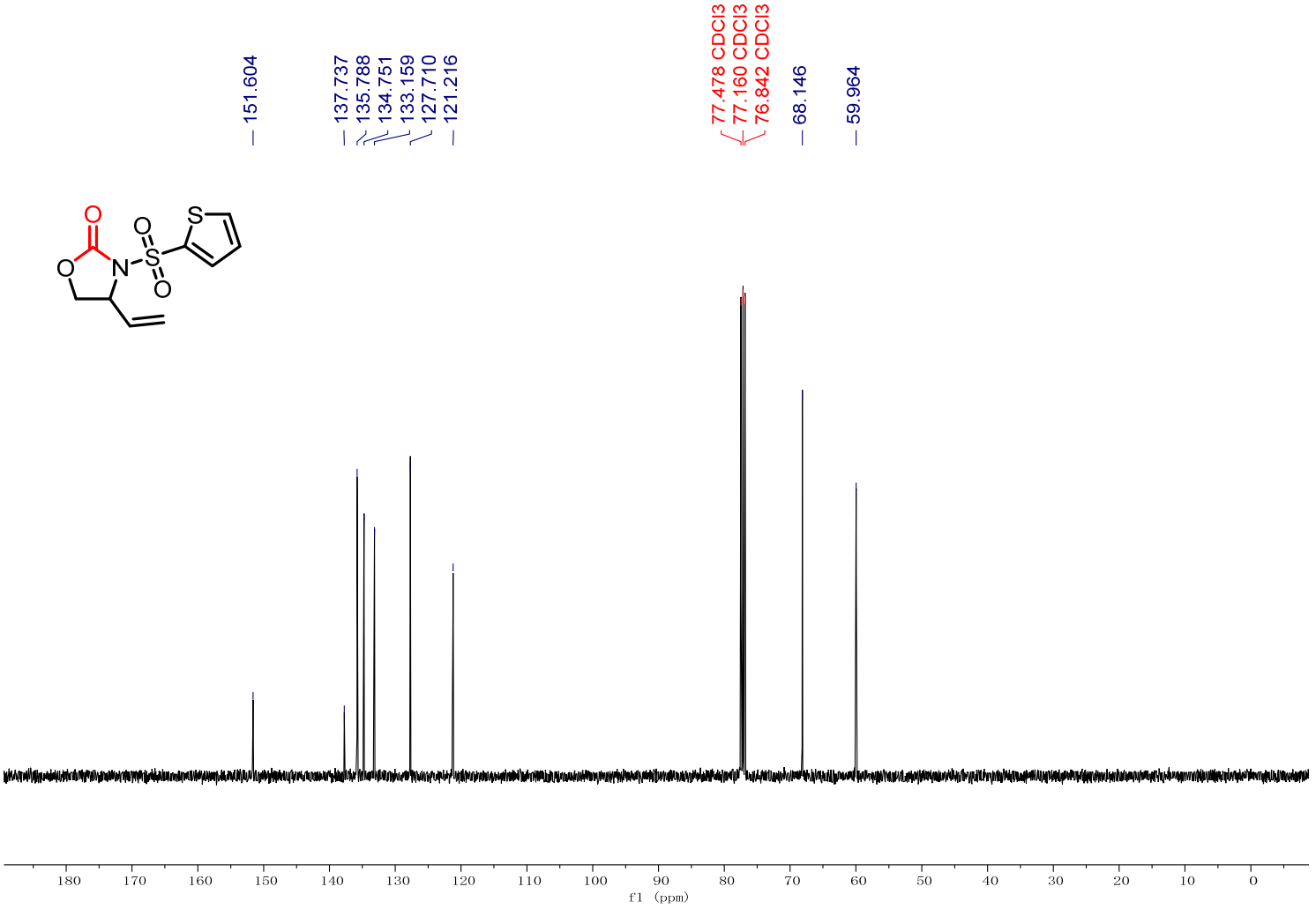
^{13}C NMR (100 MHz, $CDCl_3$) Spectrum of 3-(naphthalen-2-ylsulfonyl)-4-vinyloxazolidin-2-one 3i



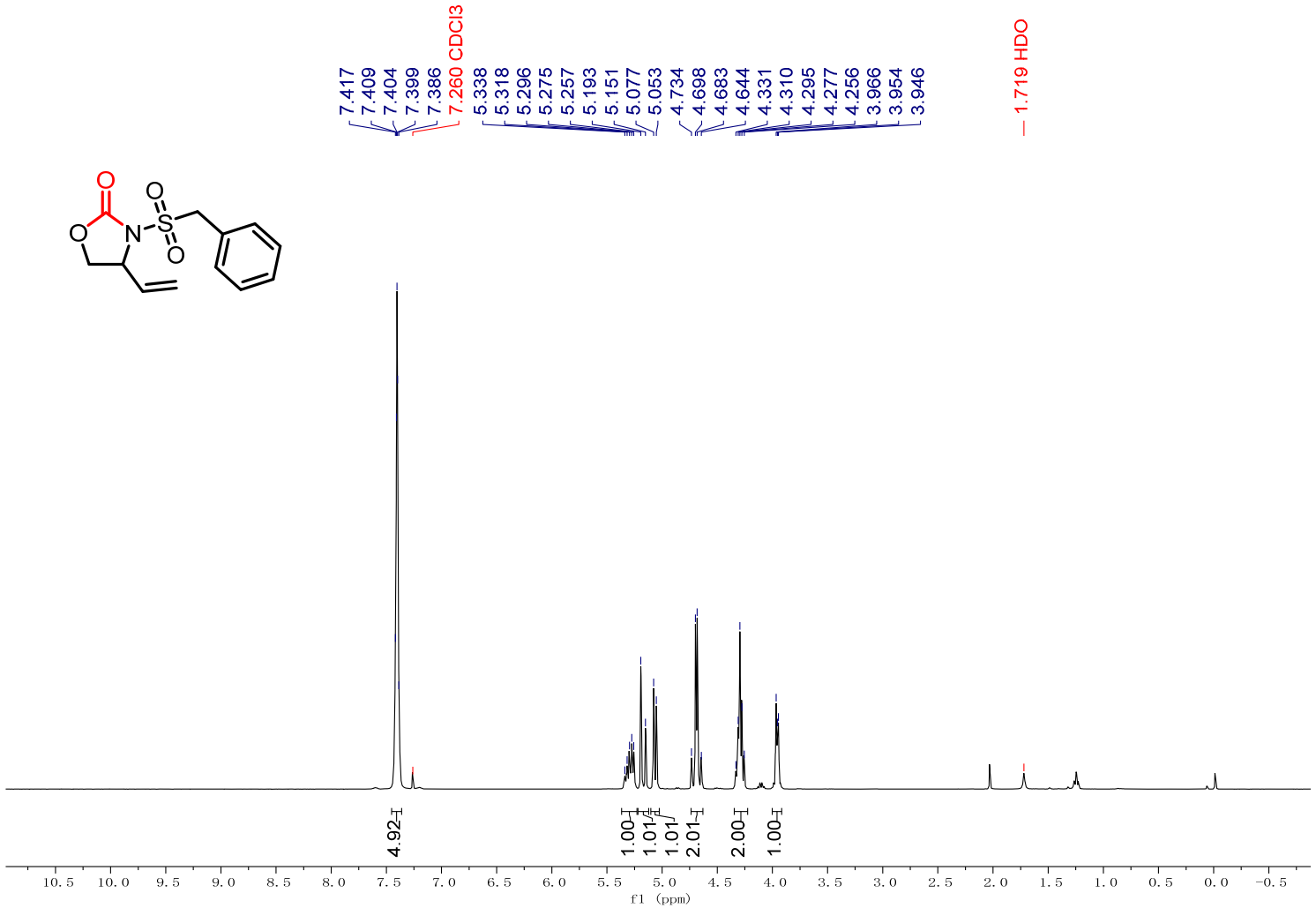
^{1}H NMR (400 MHz, $CDCl_3$) Spectrum of 3-(thiophen-2-ylsulfonyl)-4-vinyloxazolidin-2-one 3j



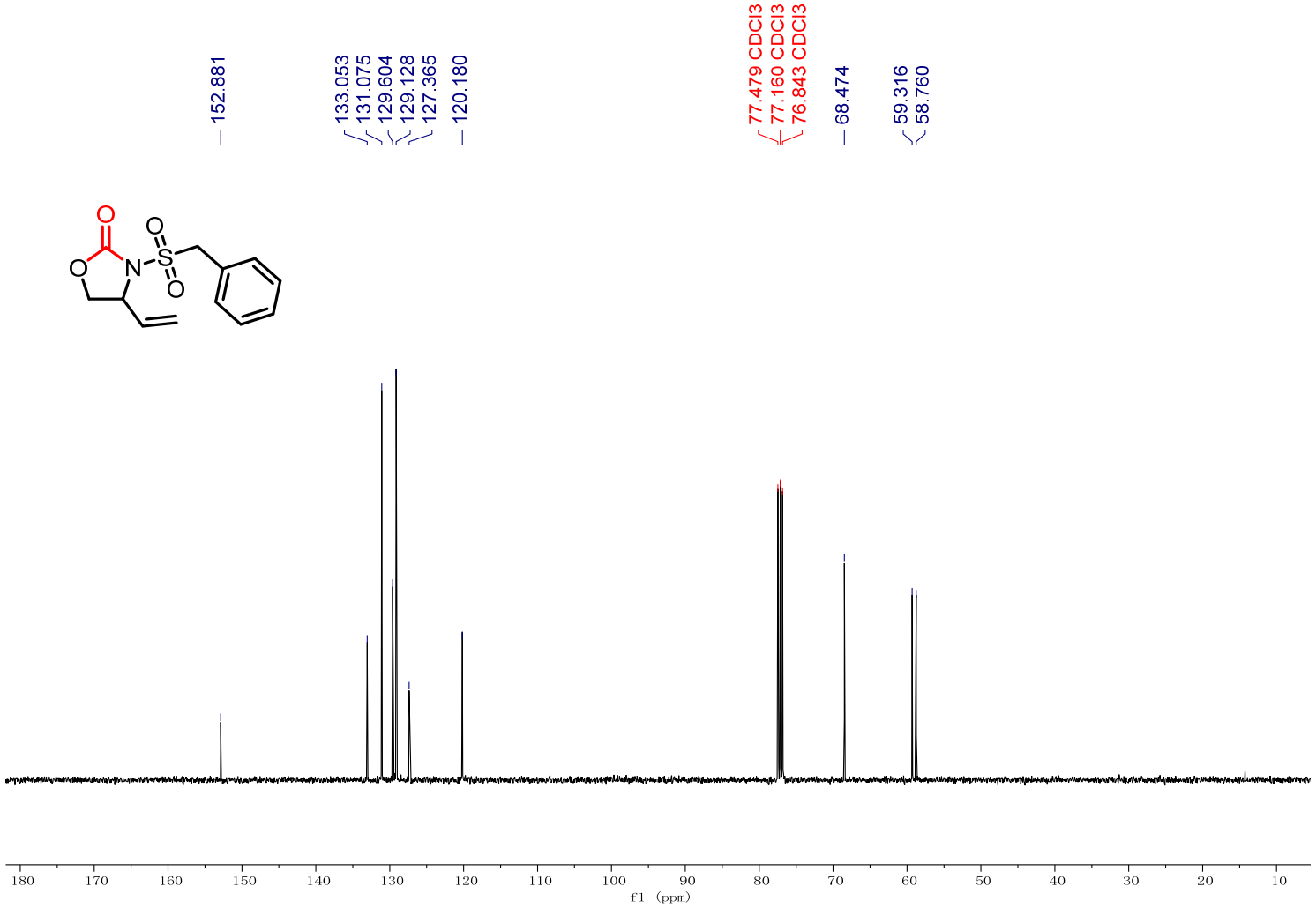
^{13}C NMR (100 MHz, $CDCl_3$) Spectrum of 3-(thiophen-2-ylsulfonyl)-4-vinyloxazolidin-2-one 3j



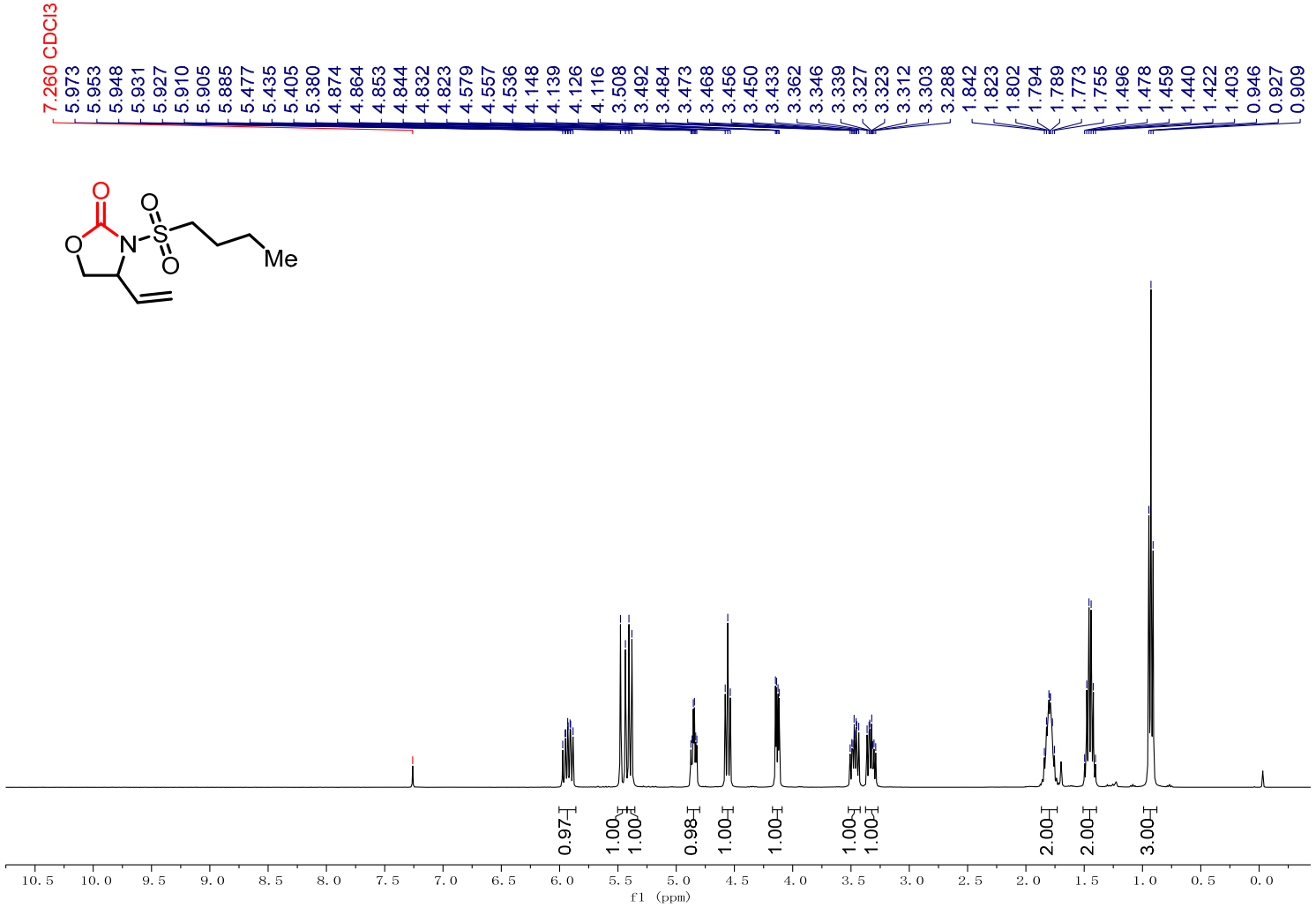
^{1}H NMR (400 MHz, $CDCl_3$) Spectrum of 3-(benzylsulfonyl)-4-vinyloxazolidin-2-one 3k



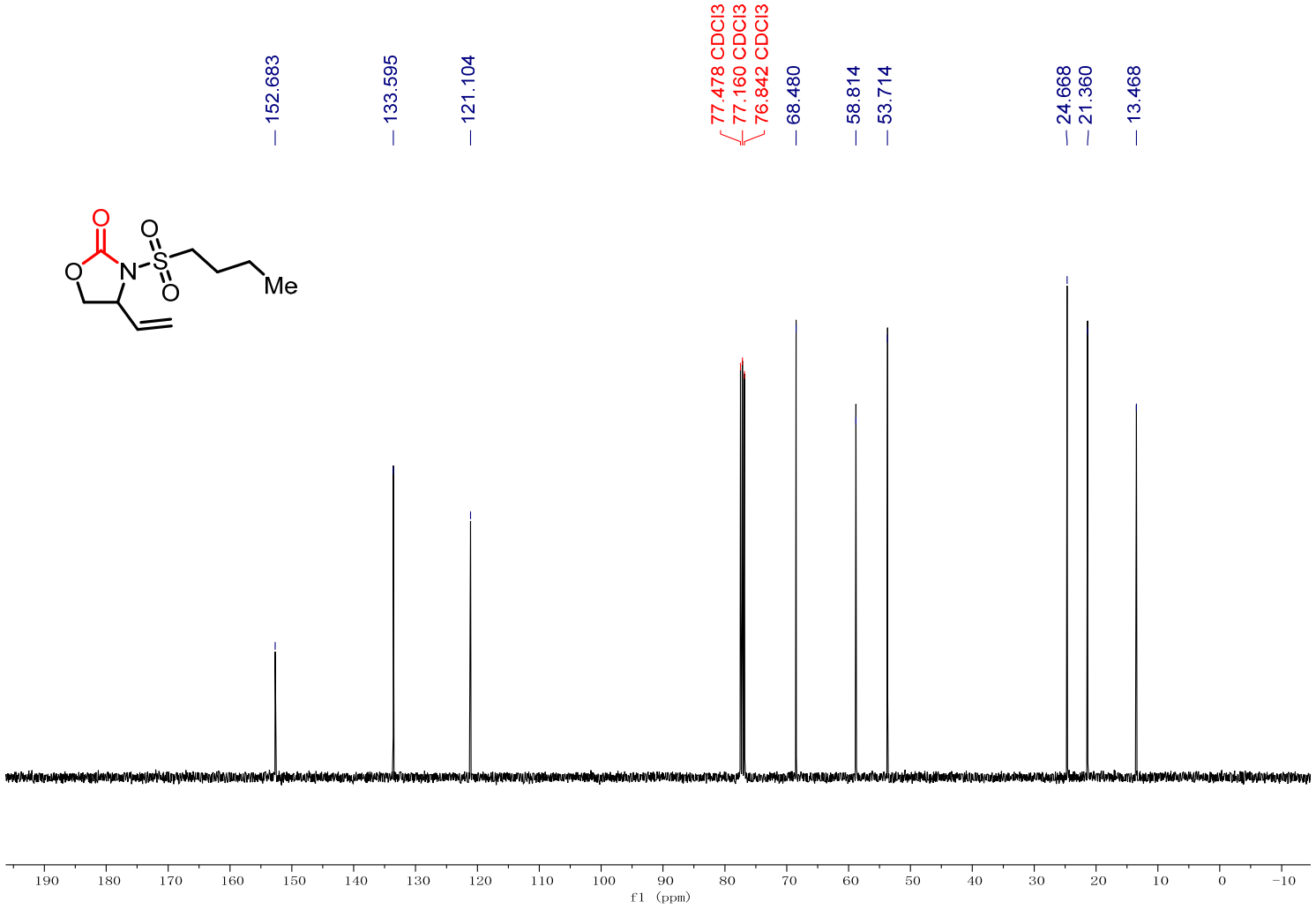
^{13}C NMR (100 MHz, $CDCl_3$) Spectrum of 3-(benzylsulfonyl)-4-vinyloxazolidin-2-one 3k



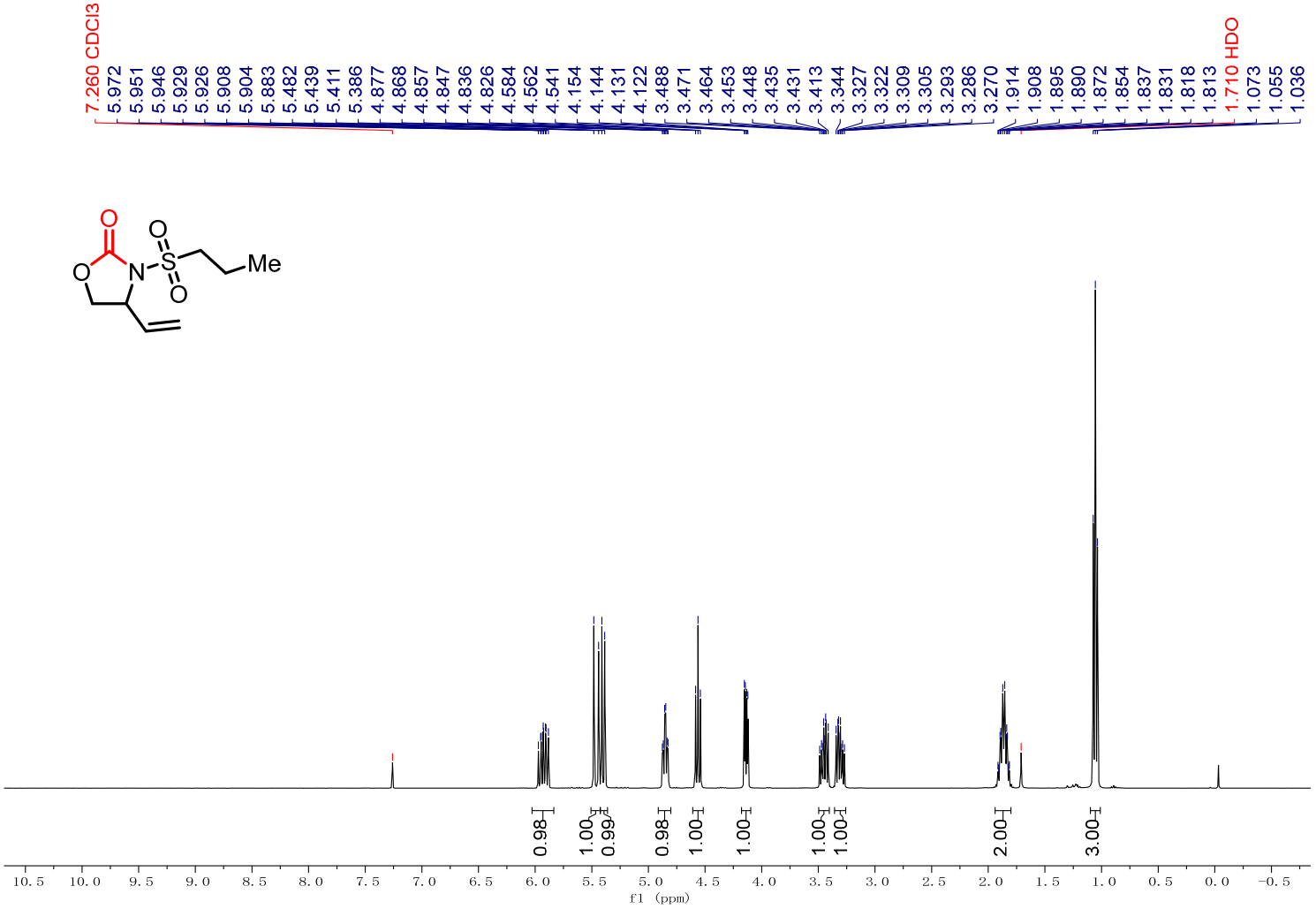
^{1}H NMR (400 MHz, $CDCl_3$) Spectrum of 3-(butylsulfonyl)-4-vinyloxazolidin-2-one 3l



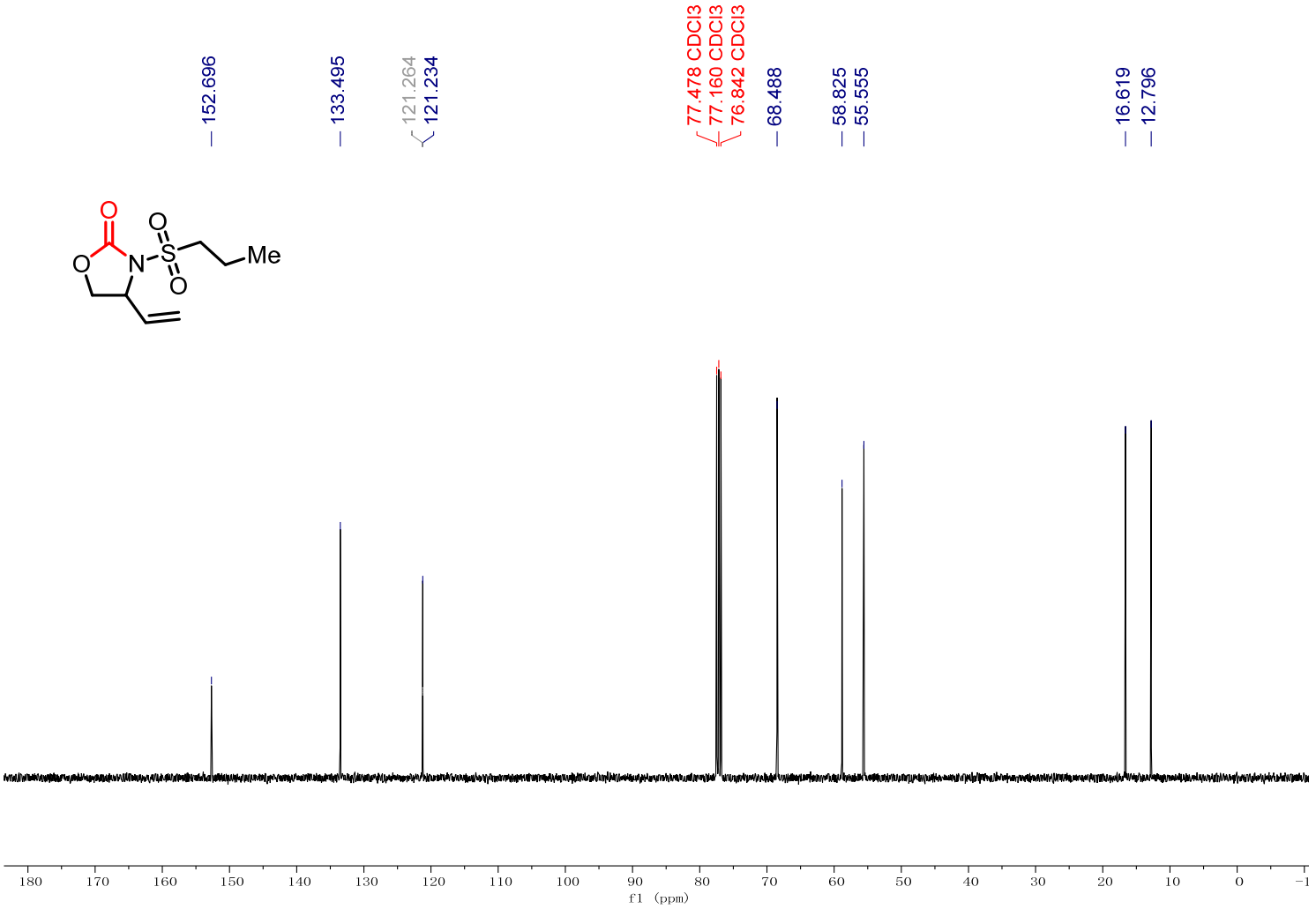
^{13}C NMR (100 MHz, $CDCl_3$) Spectrum of 3-(butylsulfonyl)-4-vinyloxazolidin-2-one 3l



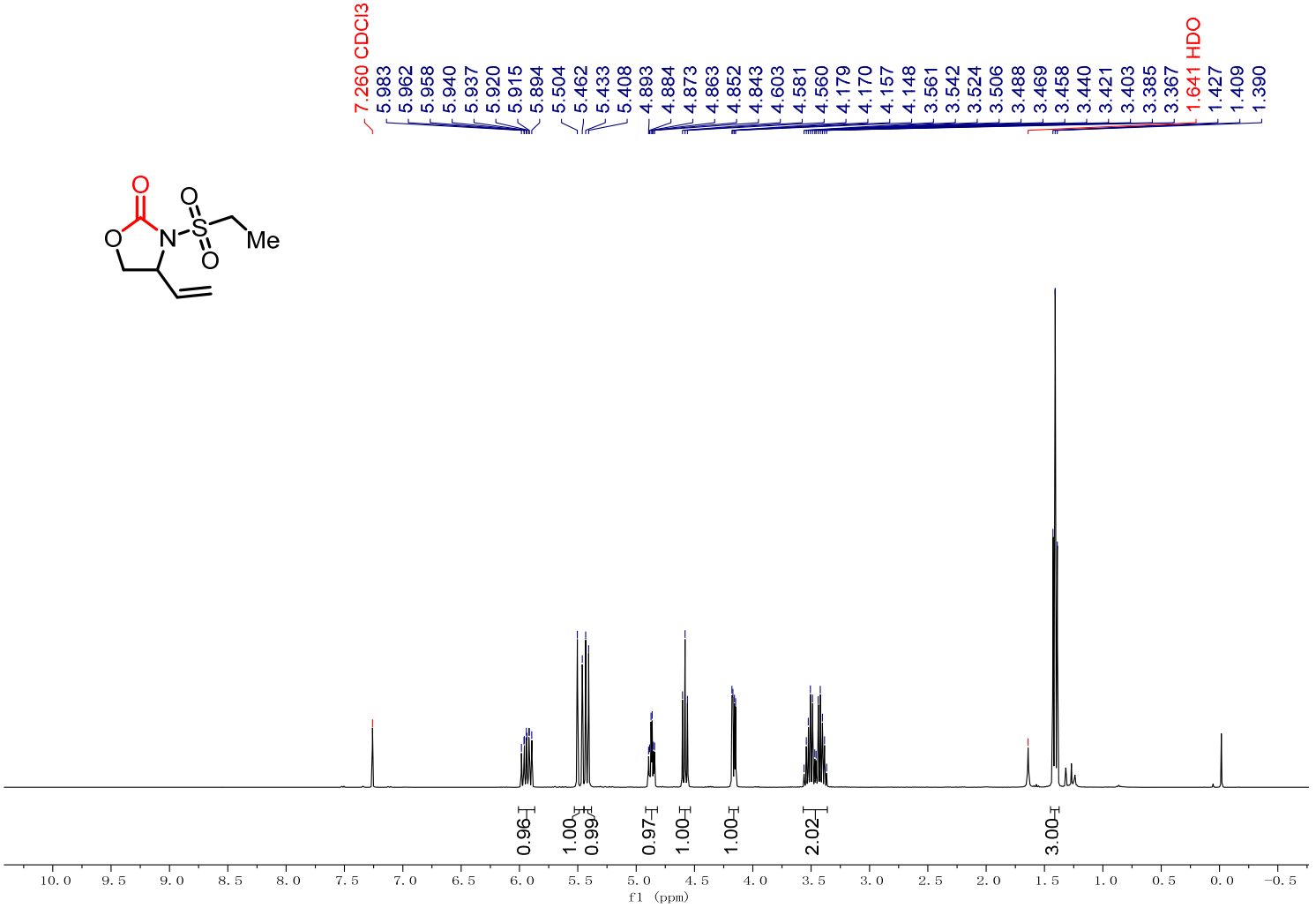
^{1}H NMR (400 MHz, $CDCl_3$) Spectrum of 3-(propylsulfonyl)-4-vinyloxazolidin-2-one 3m



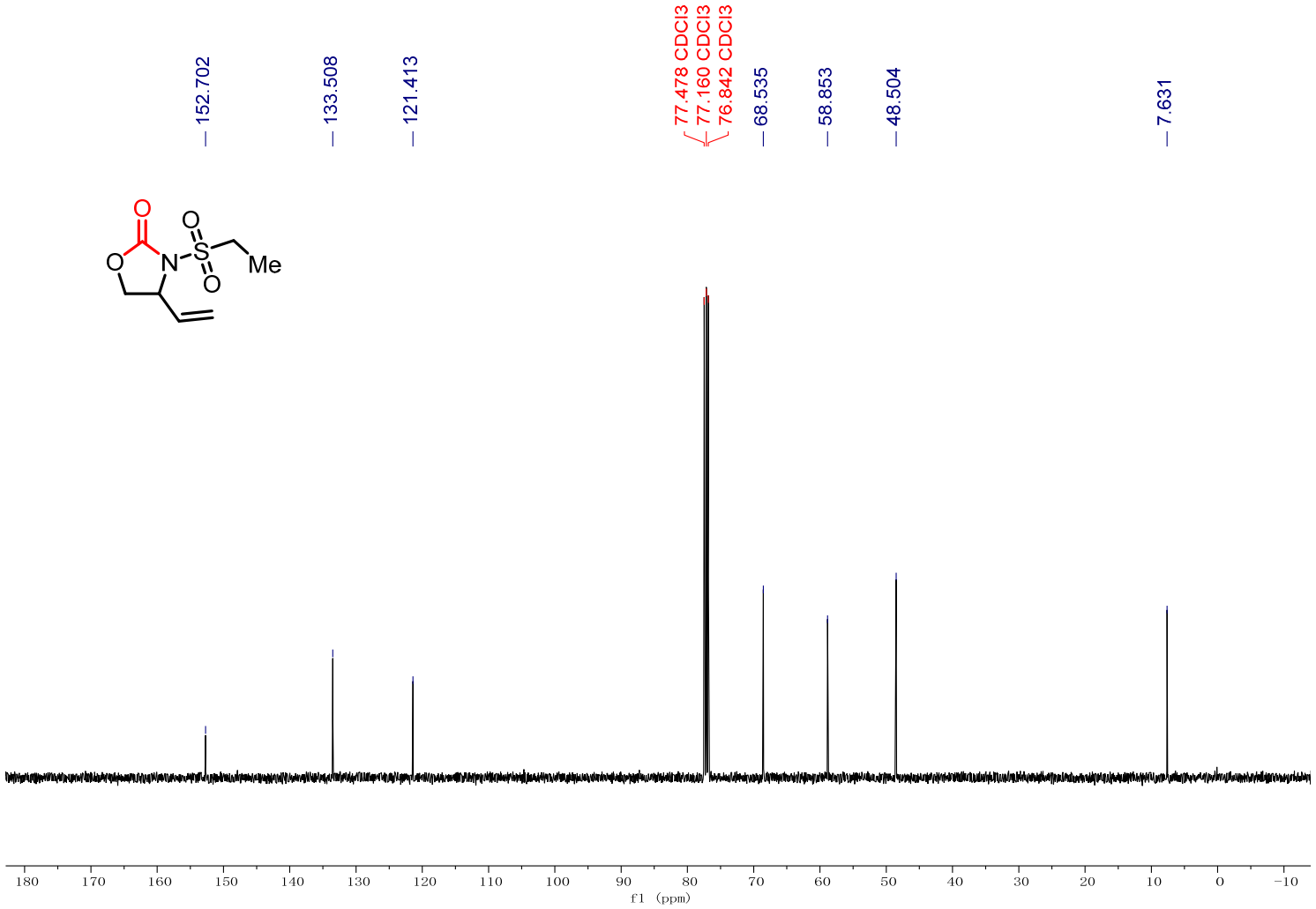
^{13}C NMR (100 MHz, $CDCl_3$) Spectrum of 3-(propylsulfonyl)-4-vinyloxazolidin-2-one 3m



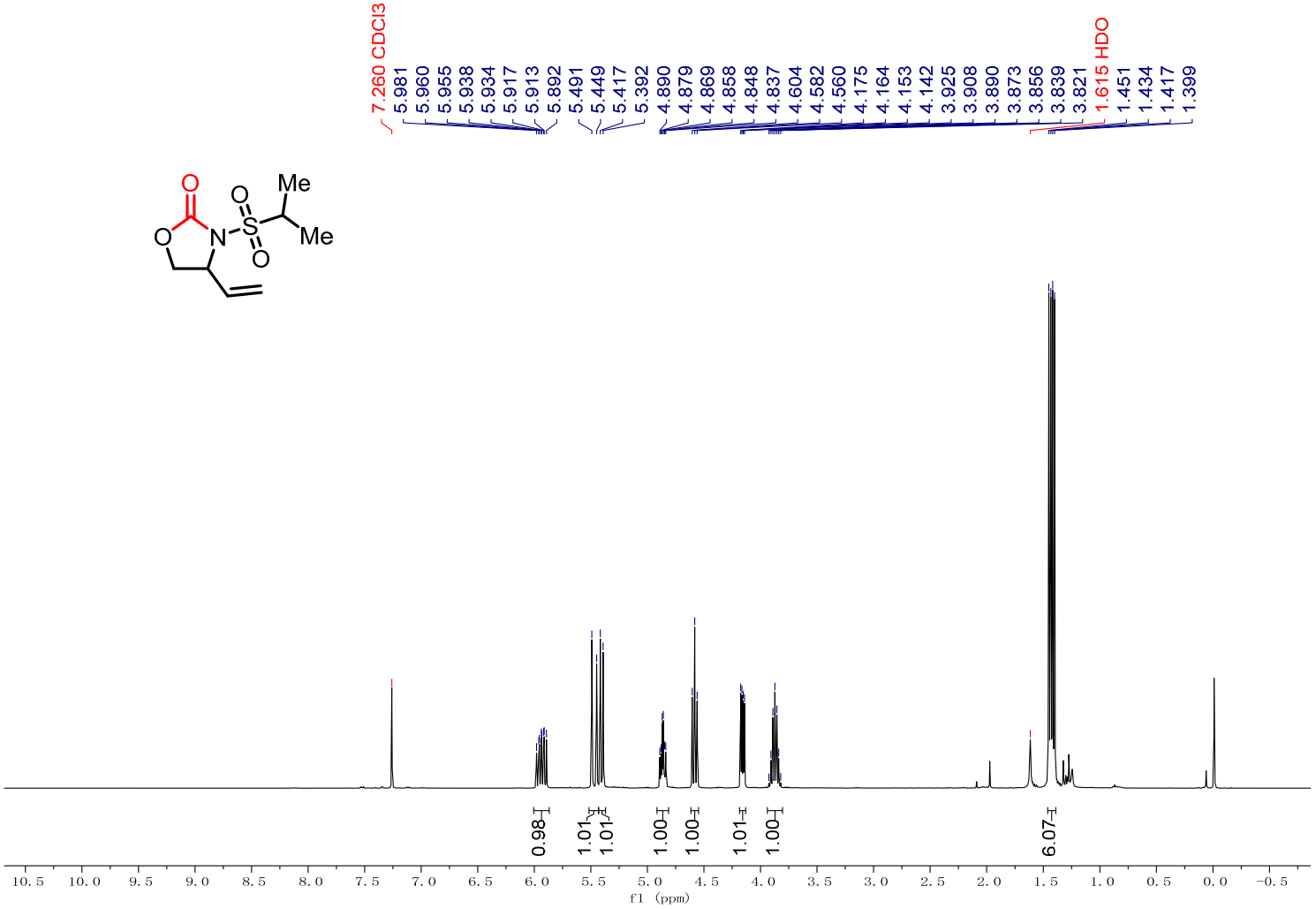
^{1}H NMR (400 MHz, $CDCl_3$) Spectrum of 3-(ethylsulfonyl)-4-vinyloxazolidin-2-one 3n



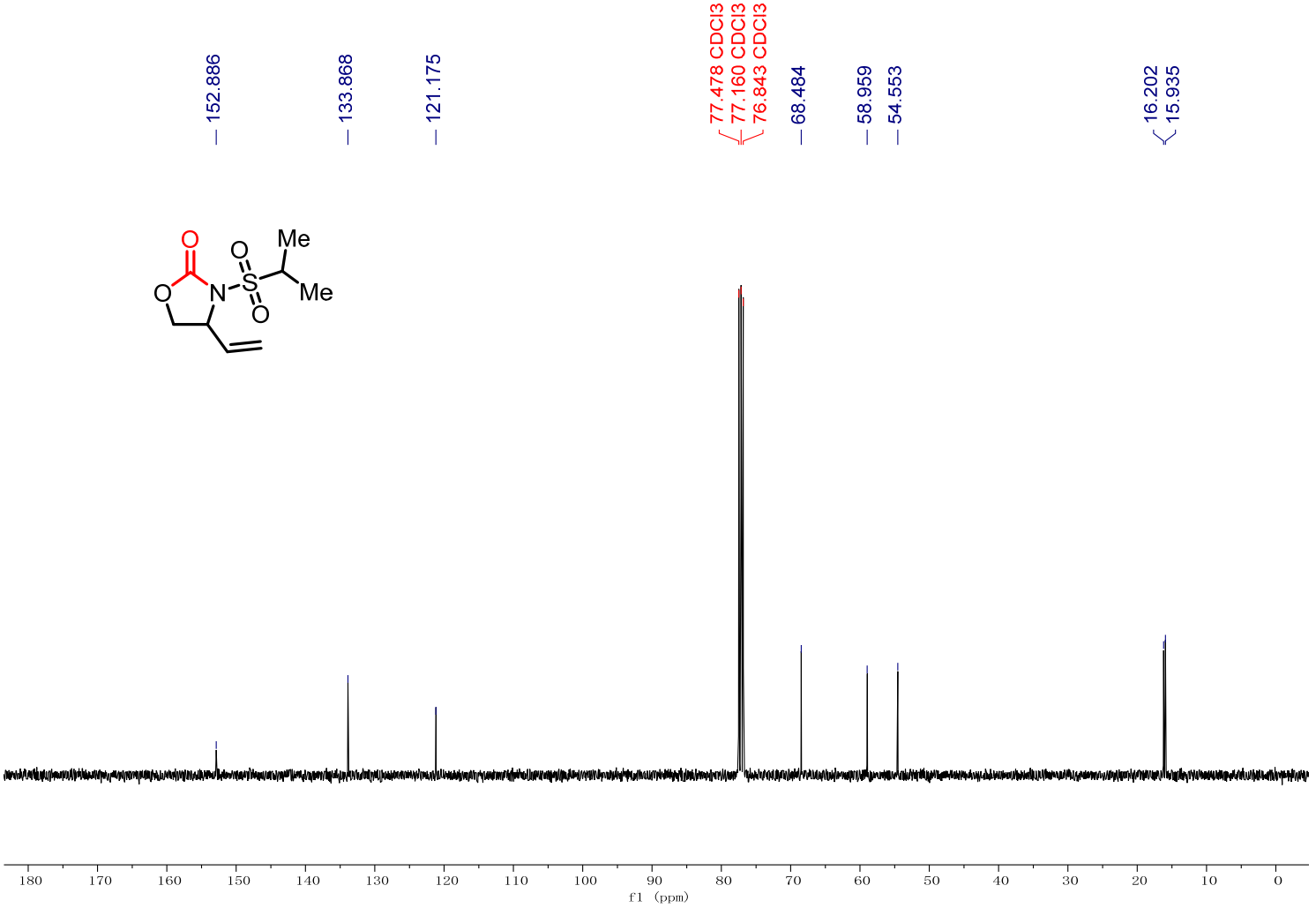
^{13}C NMR (100 MHz, $CDCl_3$) Spectrum of 3-(ethylsulfonyl)-4-vinyloxazolidin-2-one 3n



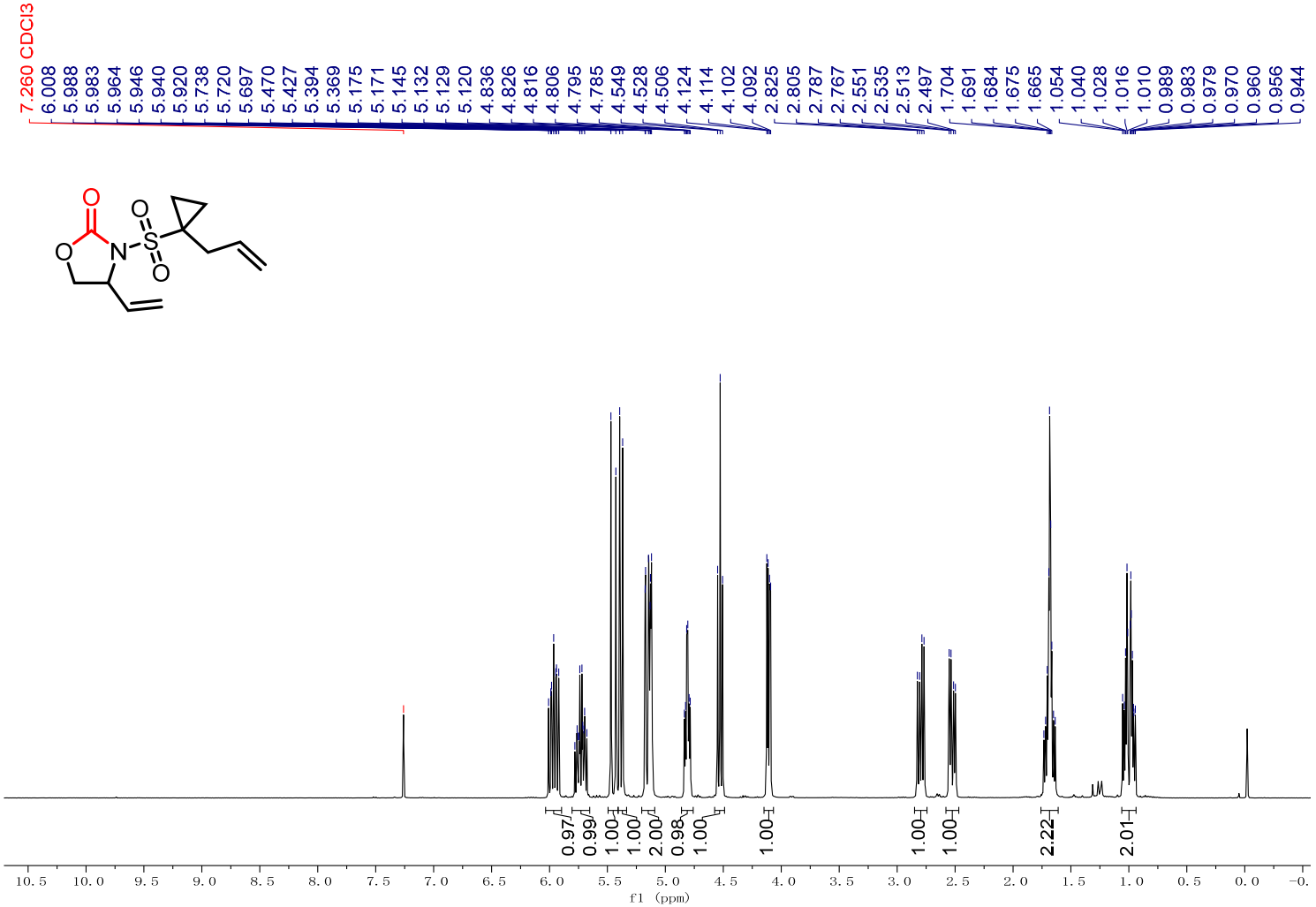
^{1}H NMR (400 MHz, $CDCl_3$) Spectrum of 3-(isopropylsulfonyl)-4-vinyloxazolidin-2-one 3o



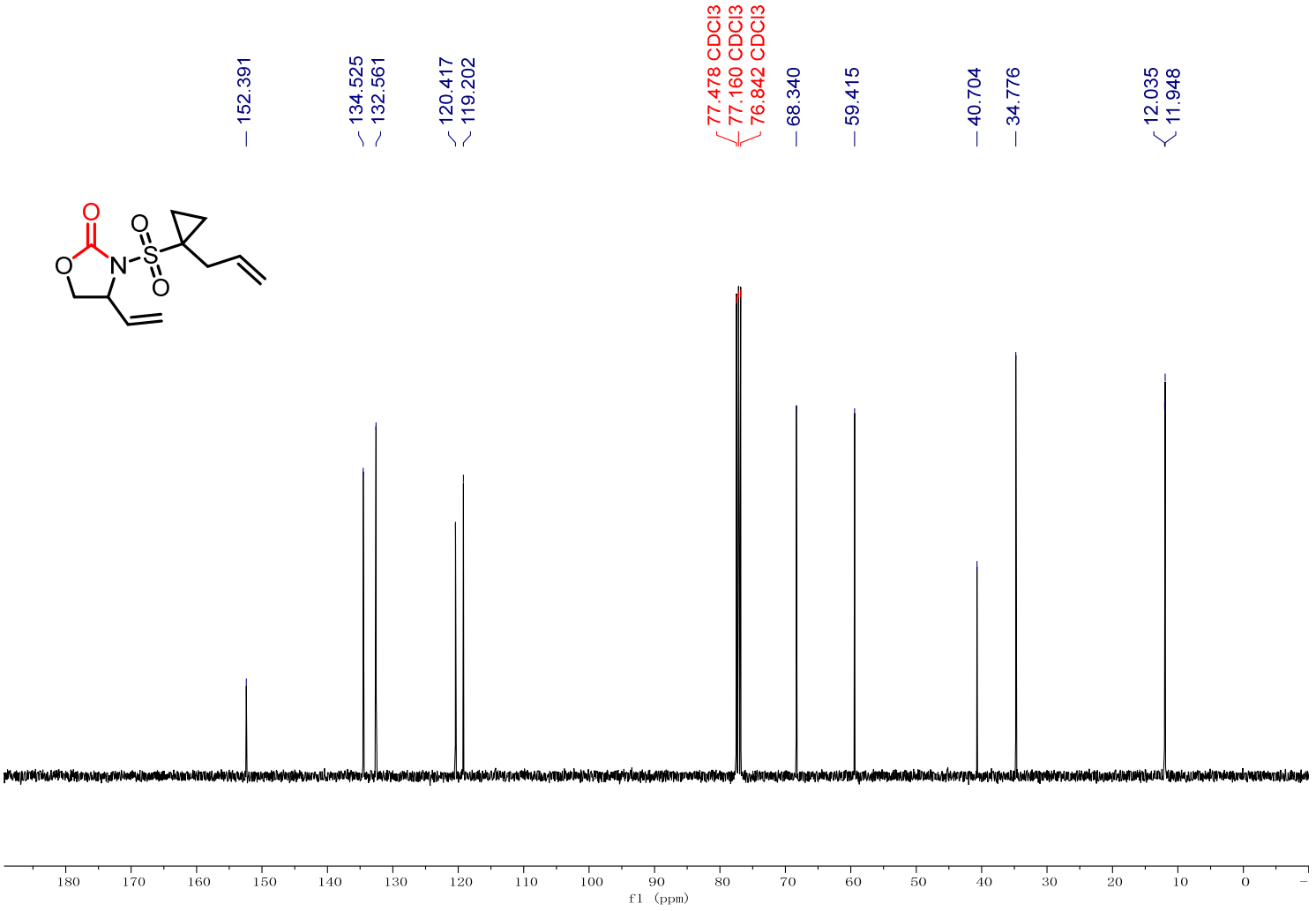
^{13}C NMR (100 MHz, $CDCl_3$) Spectrum of 3-(isopropylsulfonyl)-4-vinyloxazolidin-2-one 3o



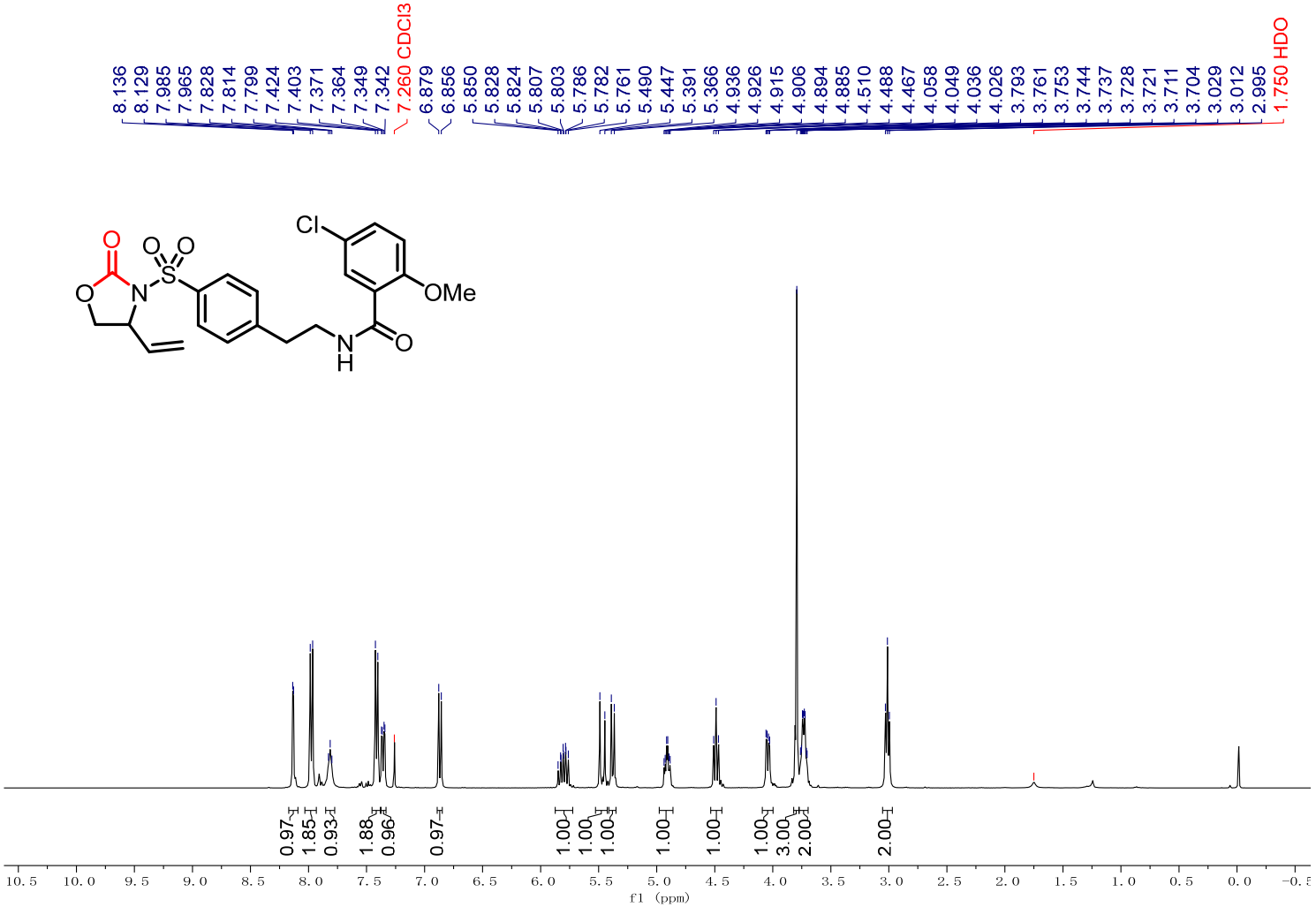
^{1}H NMR (400 MHz, $CDCl_3$) Spectrum of 3-((1-allylcyclopropyl)sulfonyl)-4-vinyloxazolidin-2-one 3p



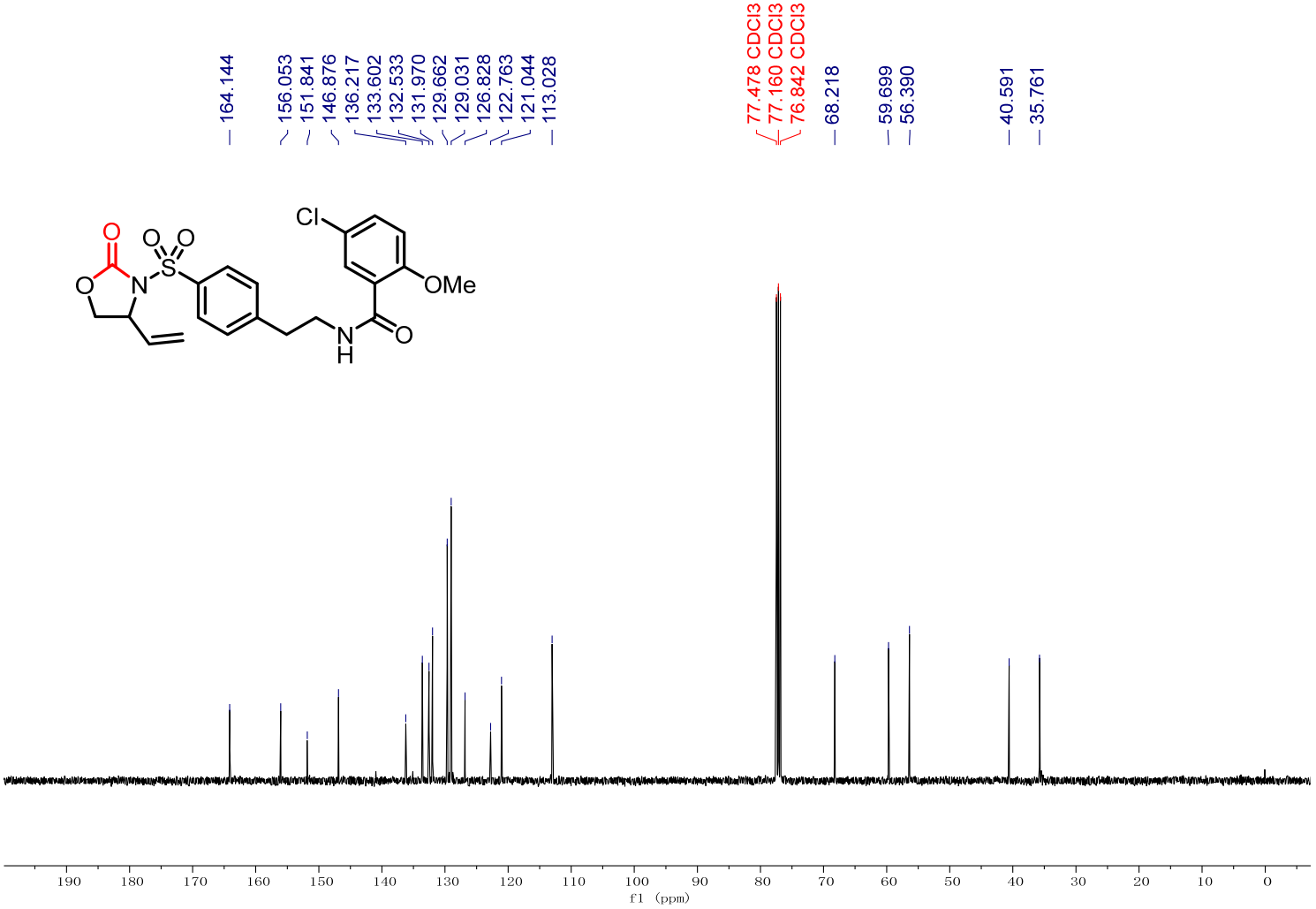
^{13}C NMR (100 MHz, $CDCl_3$) Spectrum of 3-((1-allylcyclopropyl)sulfonyl)-4-vinyloxazolidin-2-one 3p



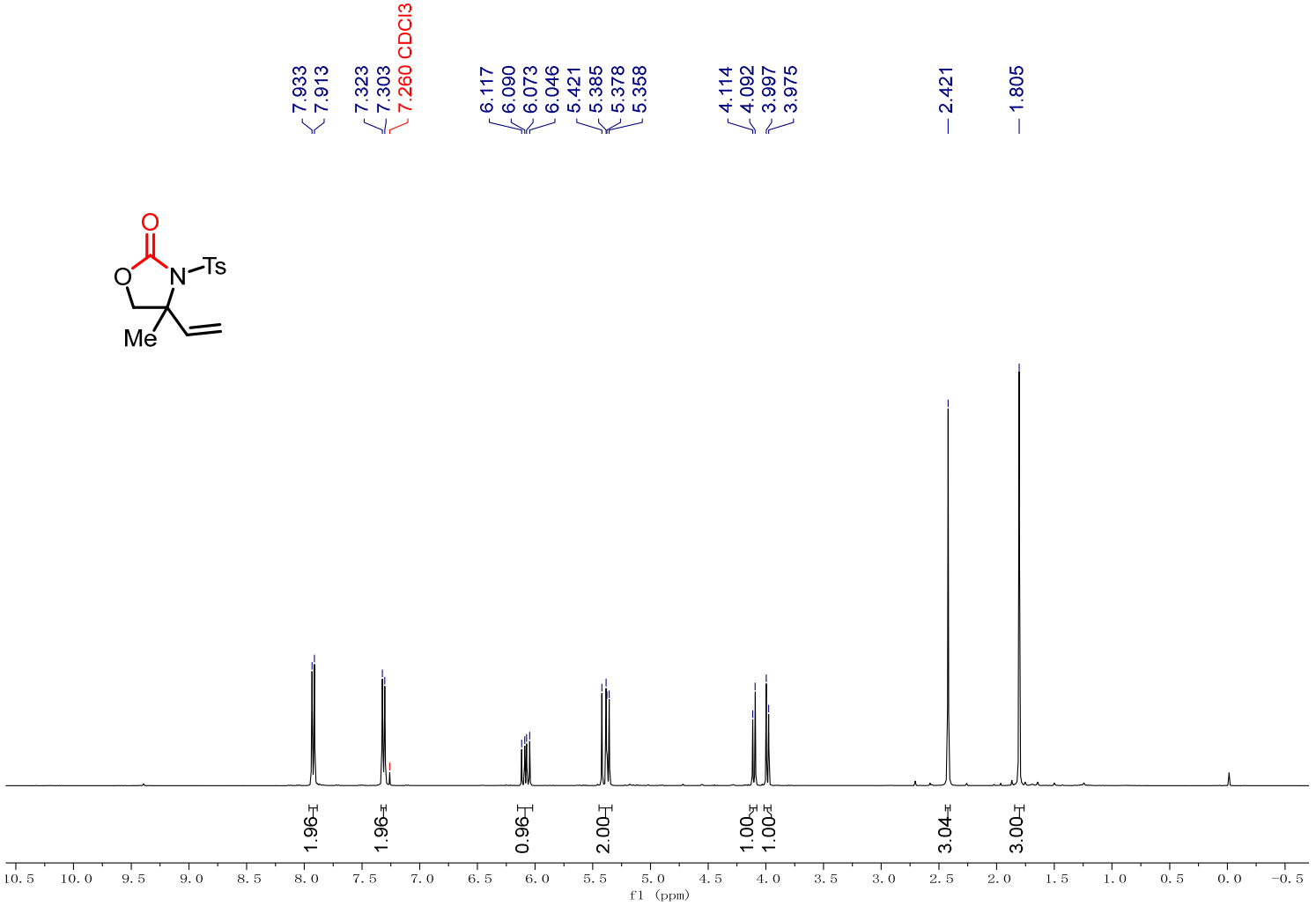
^{1}H NMR (400 MHz, $CDCl_3$) Spectrum of 5-chloro-2-methoxy-*N*-(4-((2-oxo-4-vinyloxazolidin-3-yl)sulfonyl)phenethyl)benzamide 3q



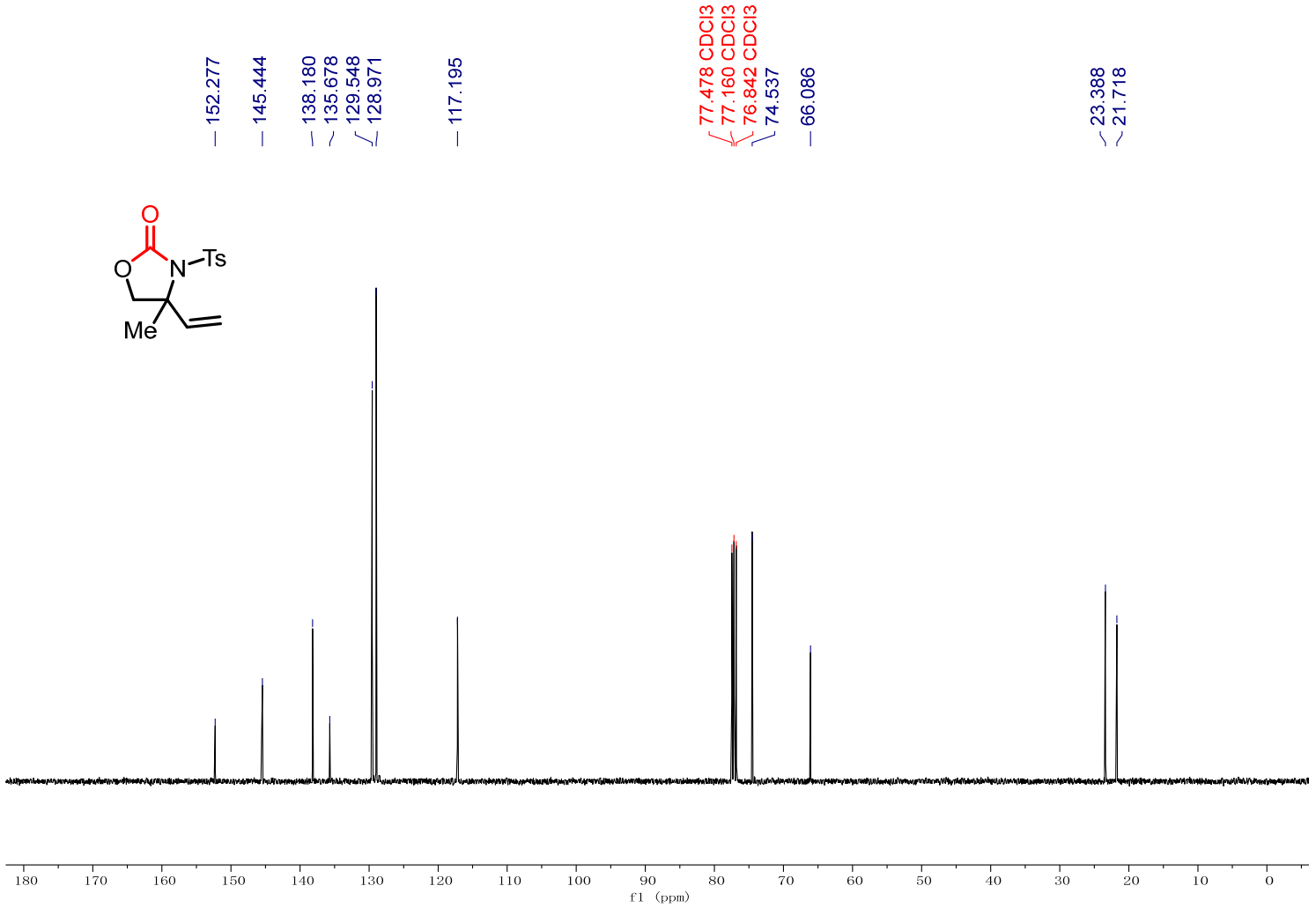
^{13}C NMR (100 MHz, $CDCl_3$) Spectrum of 5-chloro-2-methoxy-*N*-(4-((2-oxo-4-vinyloxazolidin-3-yl)sulfonyl)phenethyl)benzamide 3q



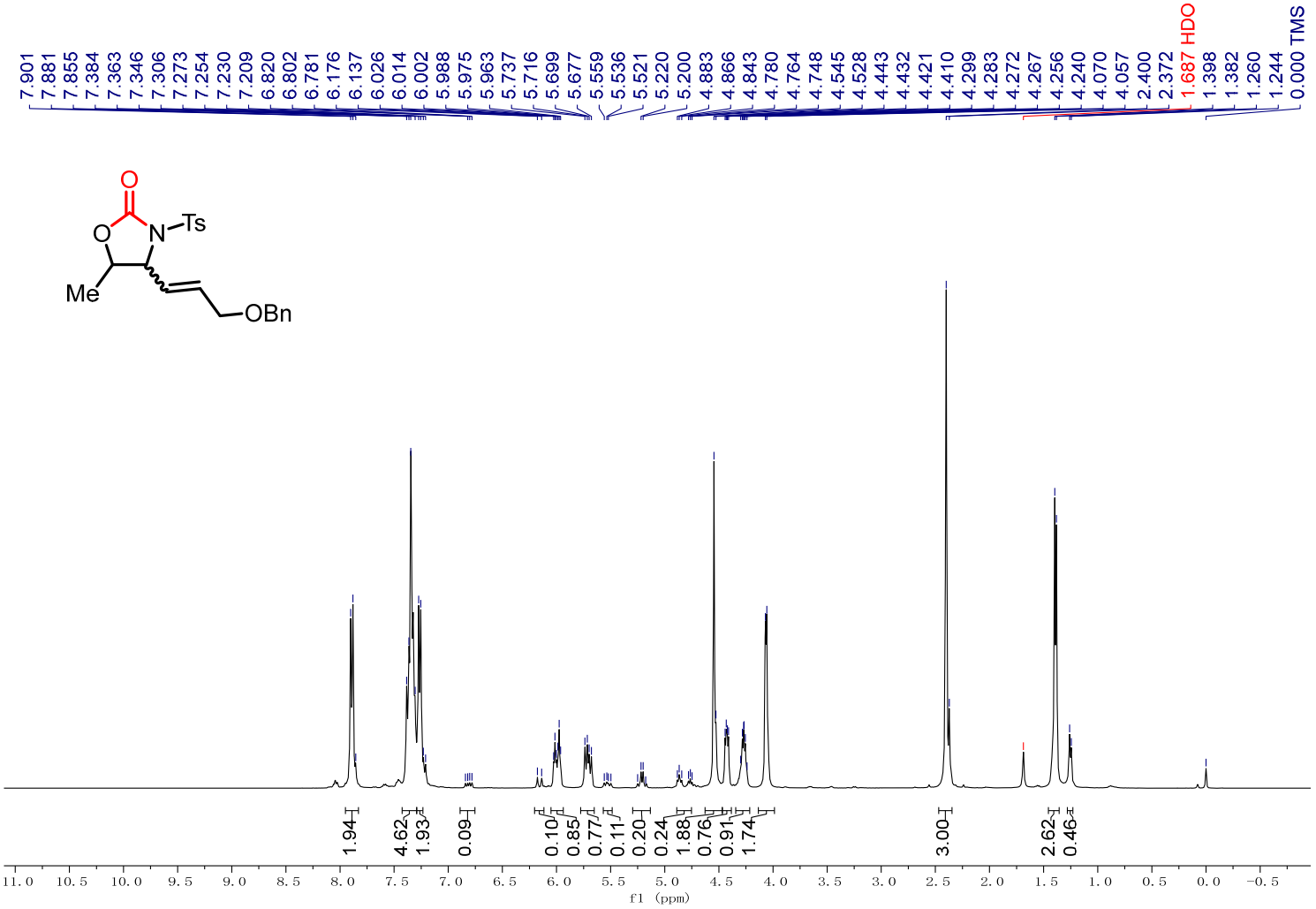
^{1}H NMR (400 MHz, $CDCl_3$) Spectrum of 4-methyl-3-tosyl-4-vinyloxazolidin-2-one 3r



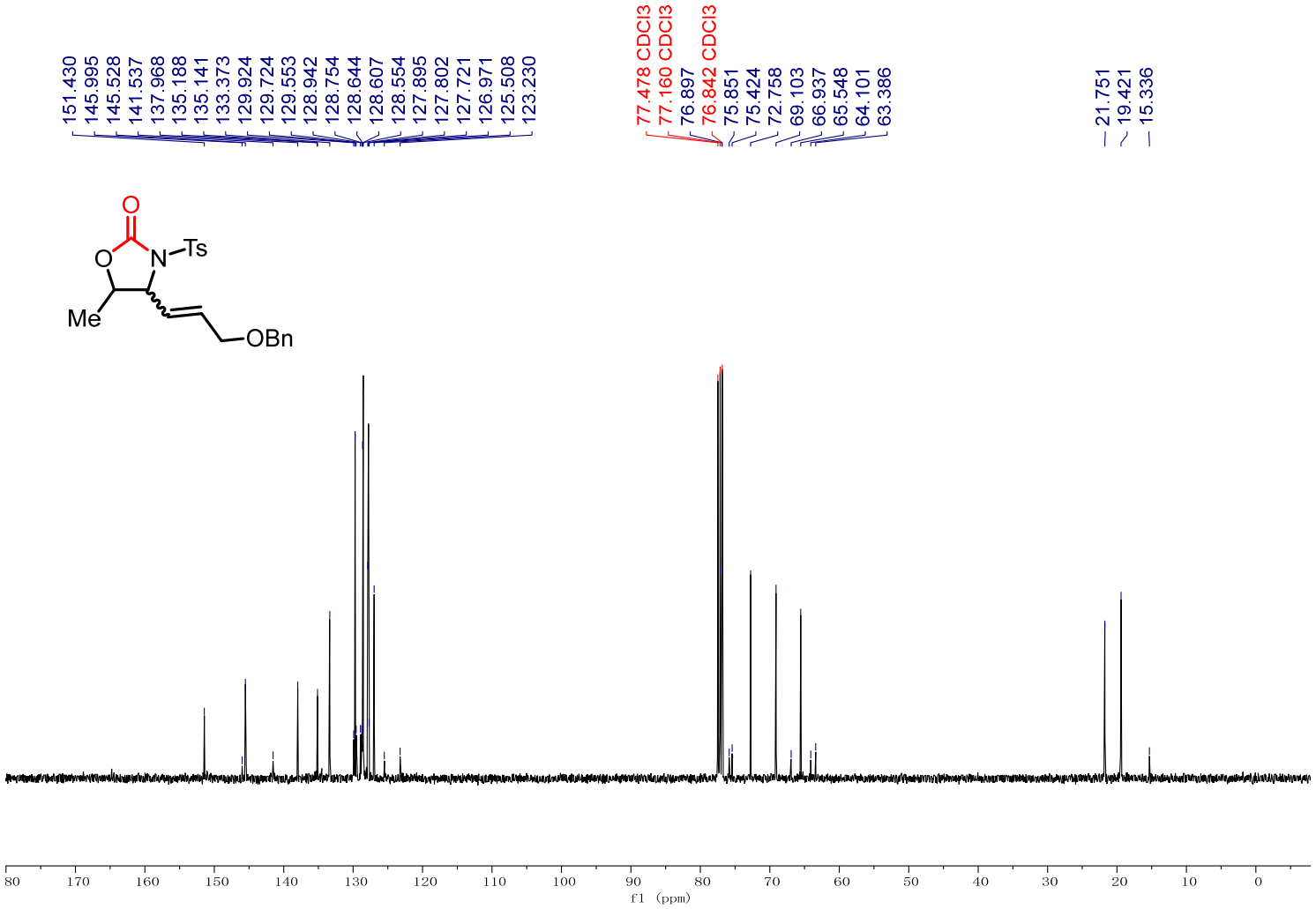
^{13}C NMR (100 MHz, $CDCl_3$) Spectrum of 4-methyl-3-tosyl-4-vinyloxazolidin-2-one 3r



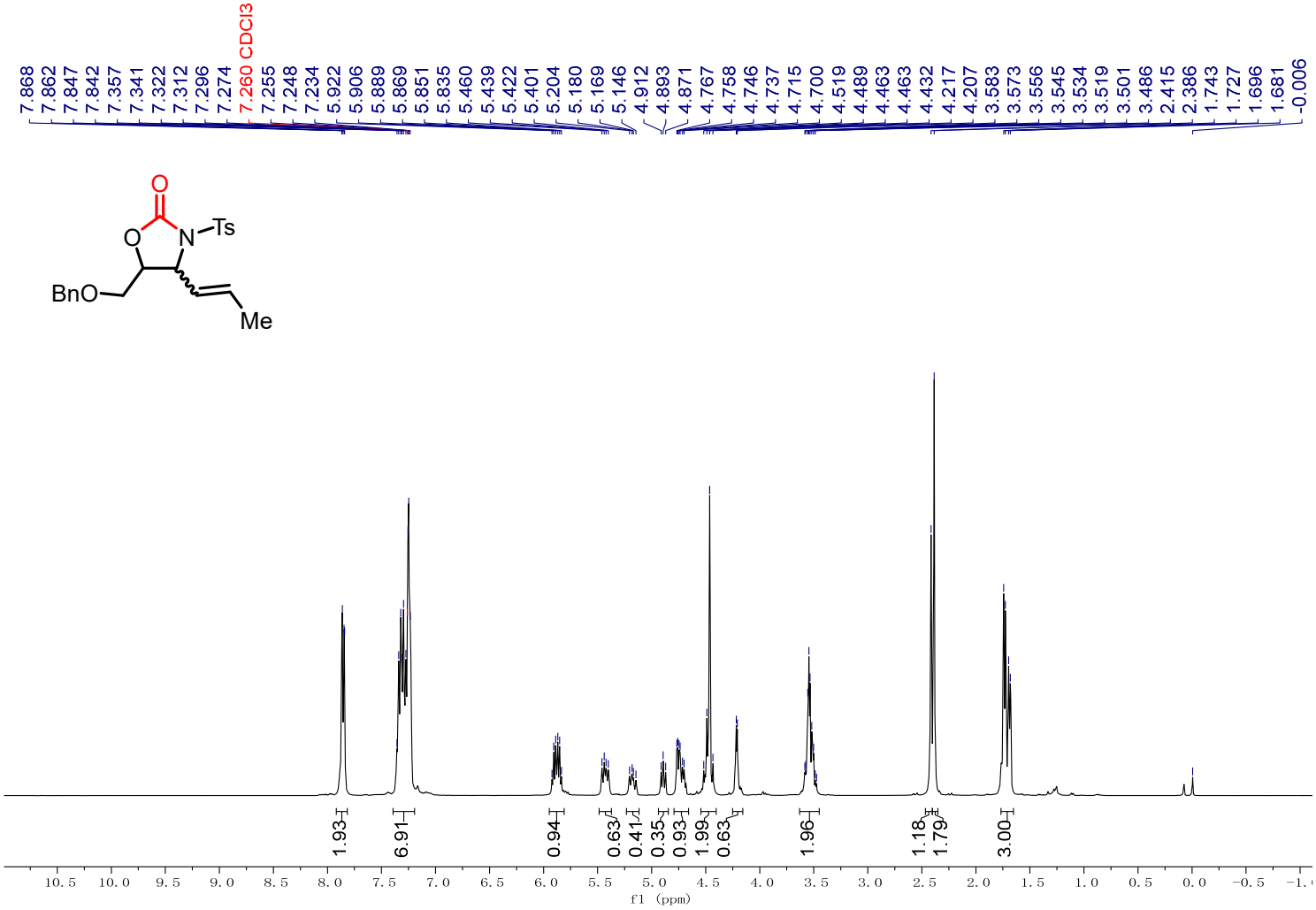
^{1}H NMR (400 MHz, $CDCl_3$) Spectrum of (*E*)-4-(3-(benzyloxy)prop-1-en-1-yl)-5-methyl-3-tosyloxazolidin-2-one 3s



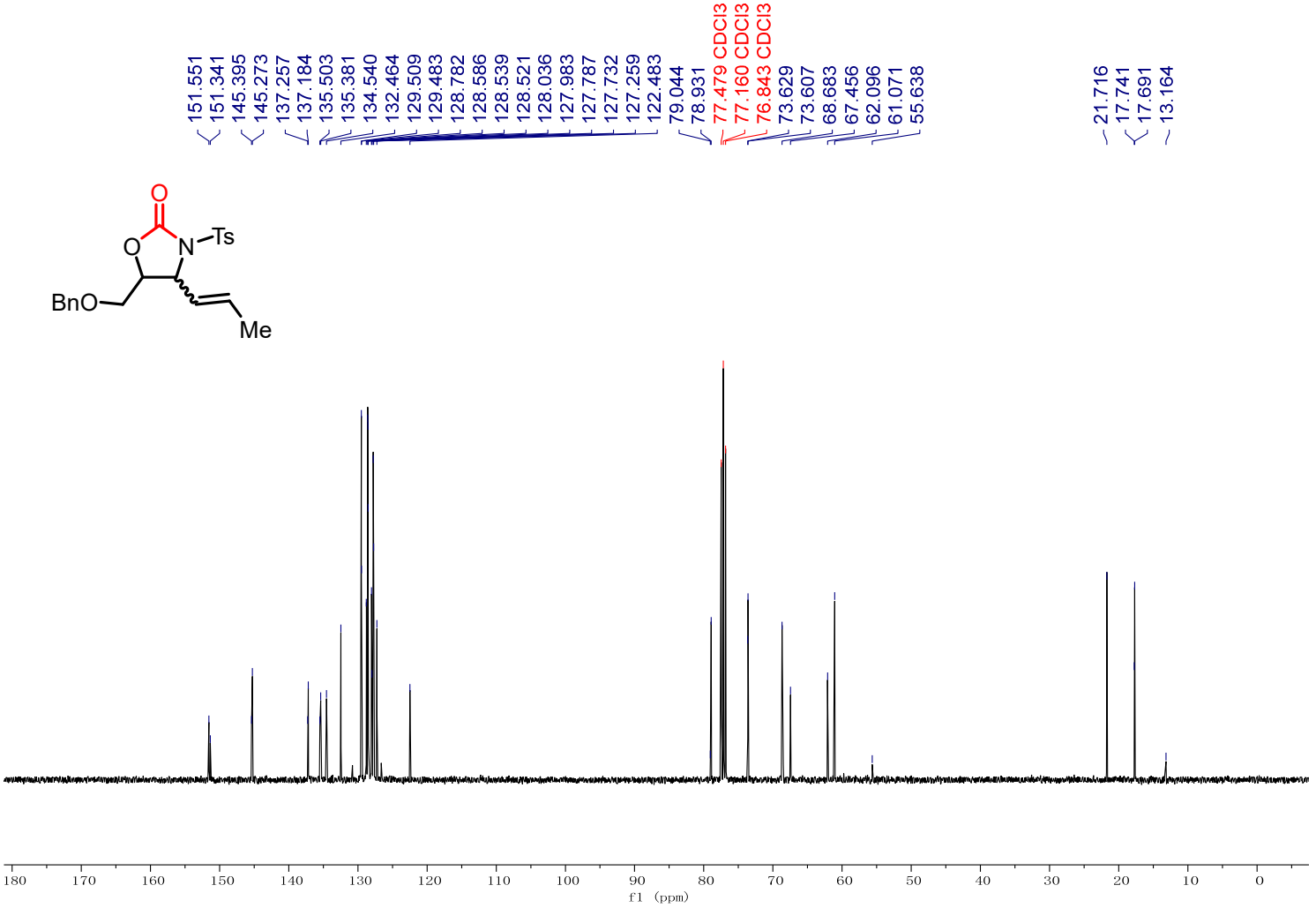
^{13}C NMR (100 MHz, $CDCl_3$) Spectrum of (*E*)-4-(3-(benzyloxy)prop-1-en-1-yl)-5-methyl-3-tosyloxazolidin-2-one 3s



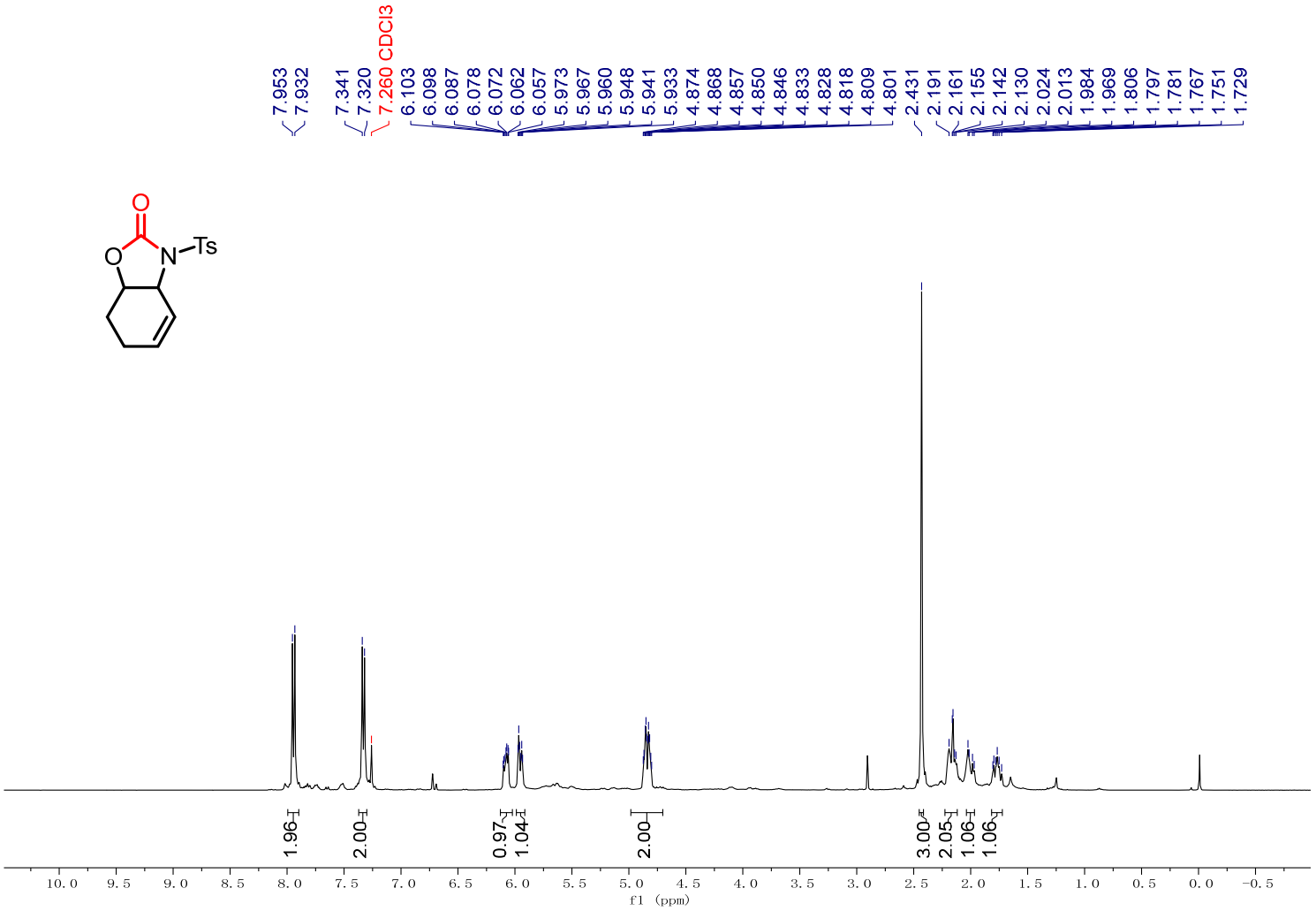
^{1}H NMR (400 MHz, $CDCl_3$) Spectrum of (*E*)-5-((benzyloxy)methyl)-4-(prop-1-en-1-yl)-3-tosyloxazolidin-2-one 3t



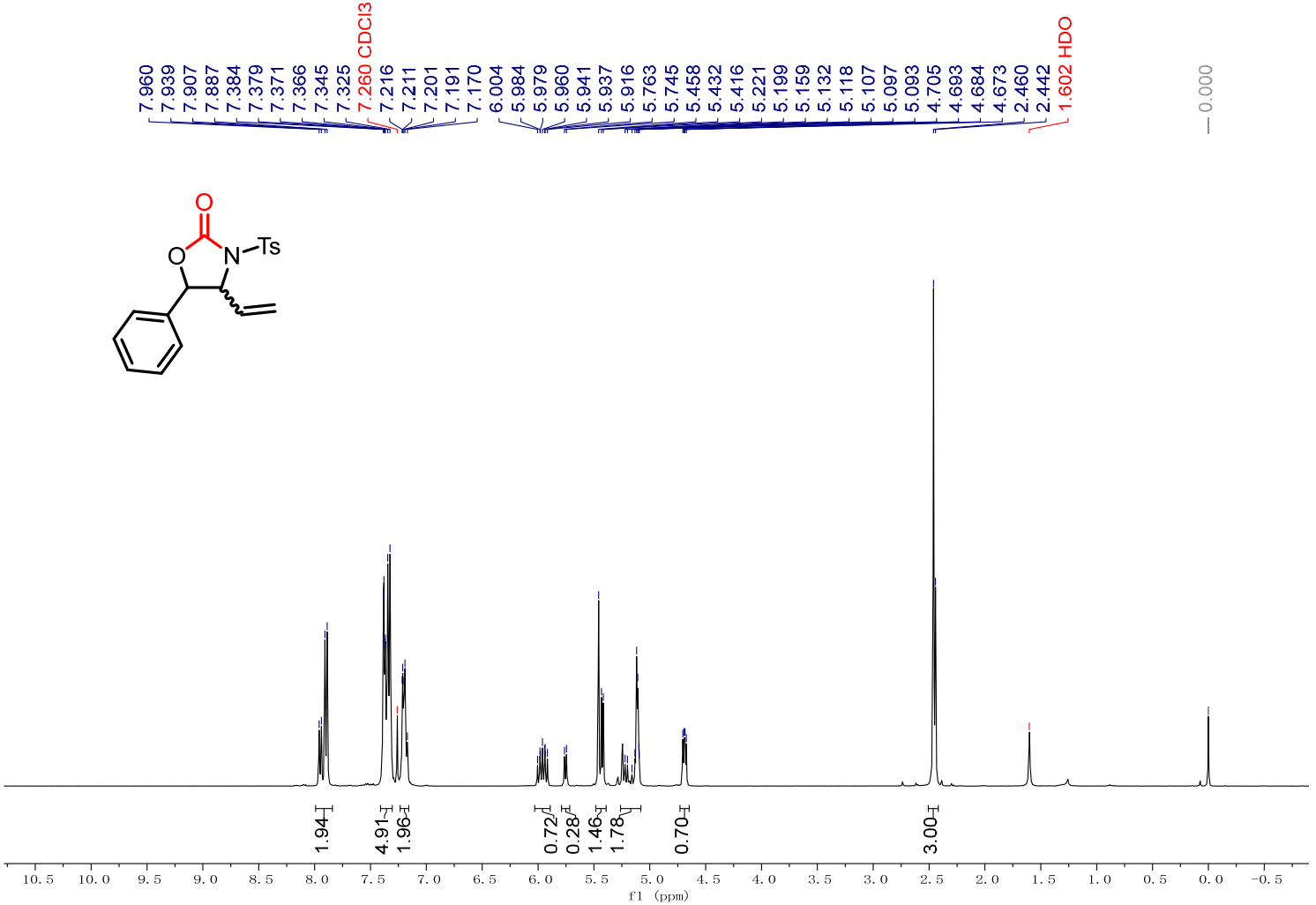
^{13}C NMR (100 MHz, $CDCl_3$) Spectrum of (*E*)-5-((benzyloxy)methyl)-4-(prop-1-en-1-yl)-3-tosyloxazolidin-2-one 3t



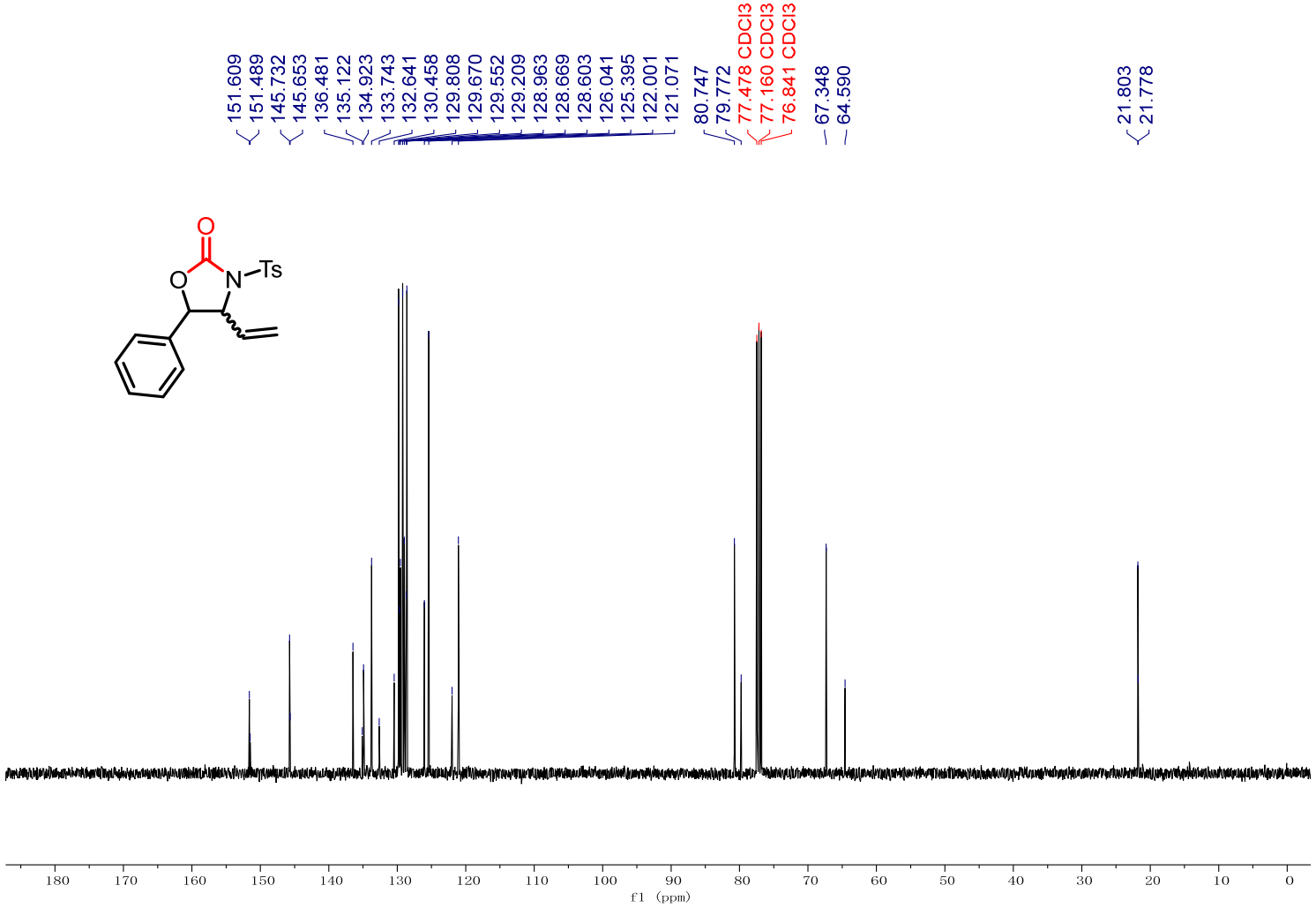
^{1}H NMR (400 MHz, $CDCl_3$) Spectrum of 3-tosyl-3a,6,7,7a-tetrahydrobenzo[*d*]oxazol-2(3*H*)-one 3u



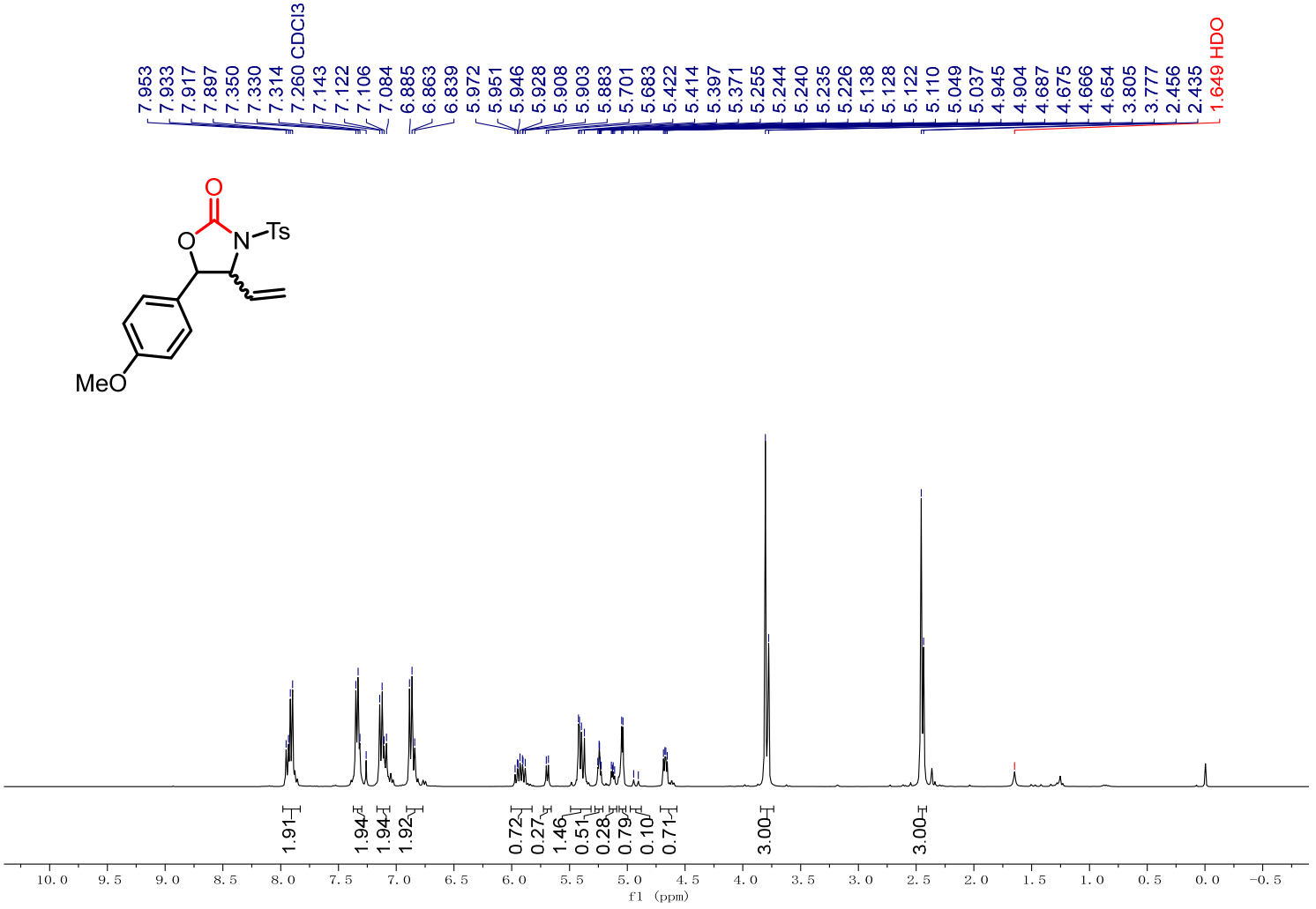
^{1}H NMR (400 MHz, $CDCl_3$) Spectrum of 5-phenyl-3-tosyl-4-vinyloxazolidin-2-one 3v



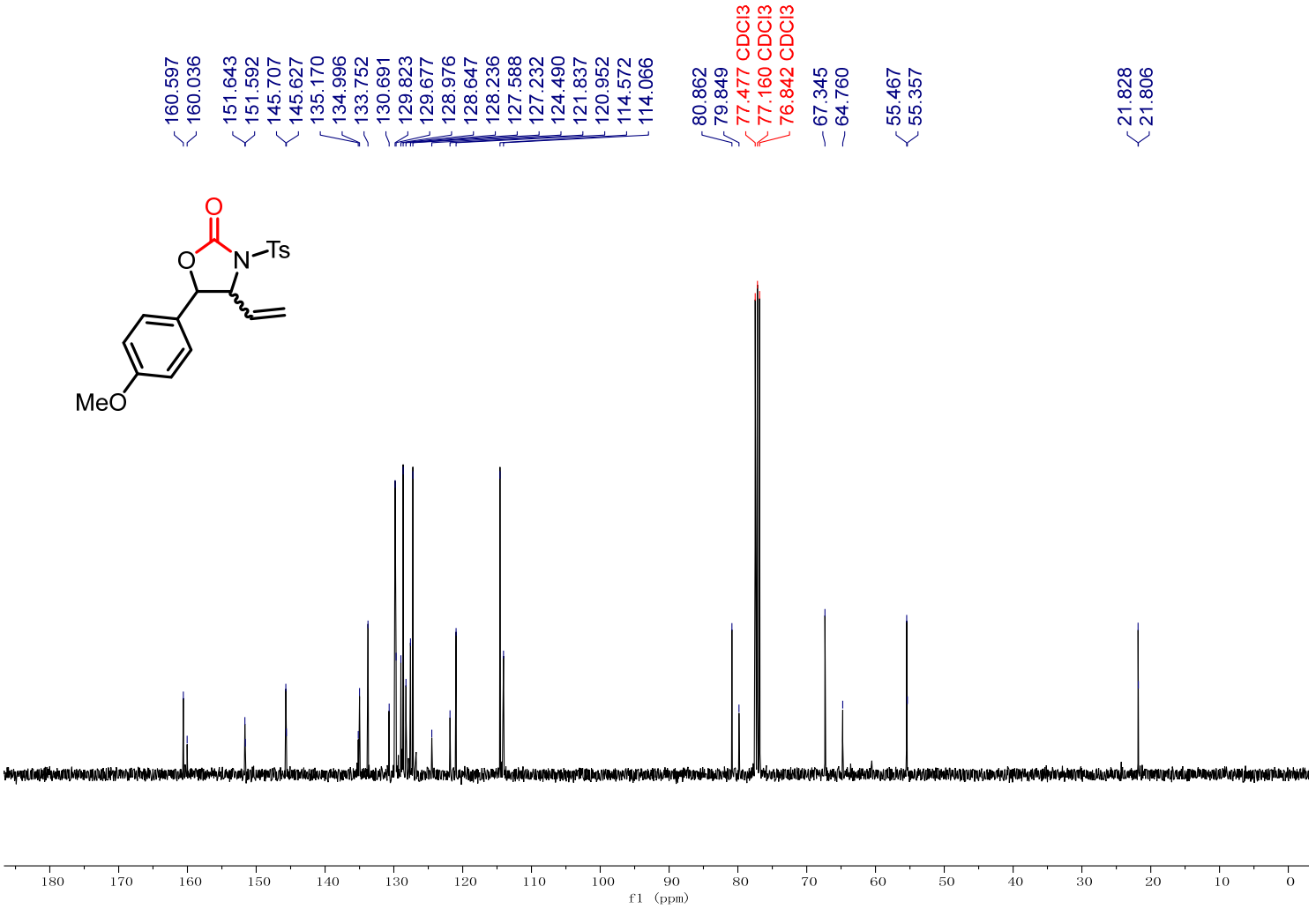
^{13}C NMR (100 MHz, $CDCl_3$) Spectrum of 5-phenyl-3-tosyl-4-vinyloxazolidin-2-one 3v



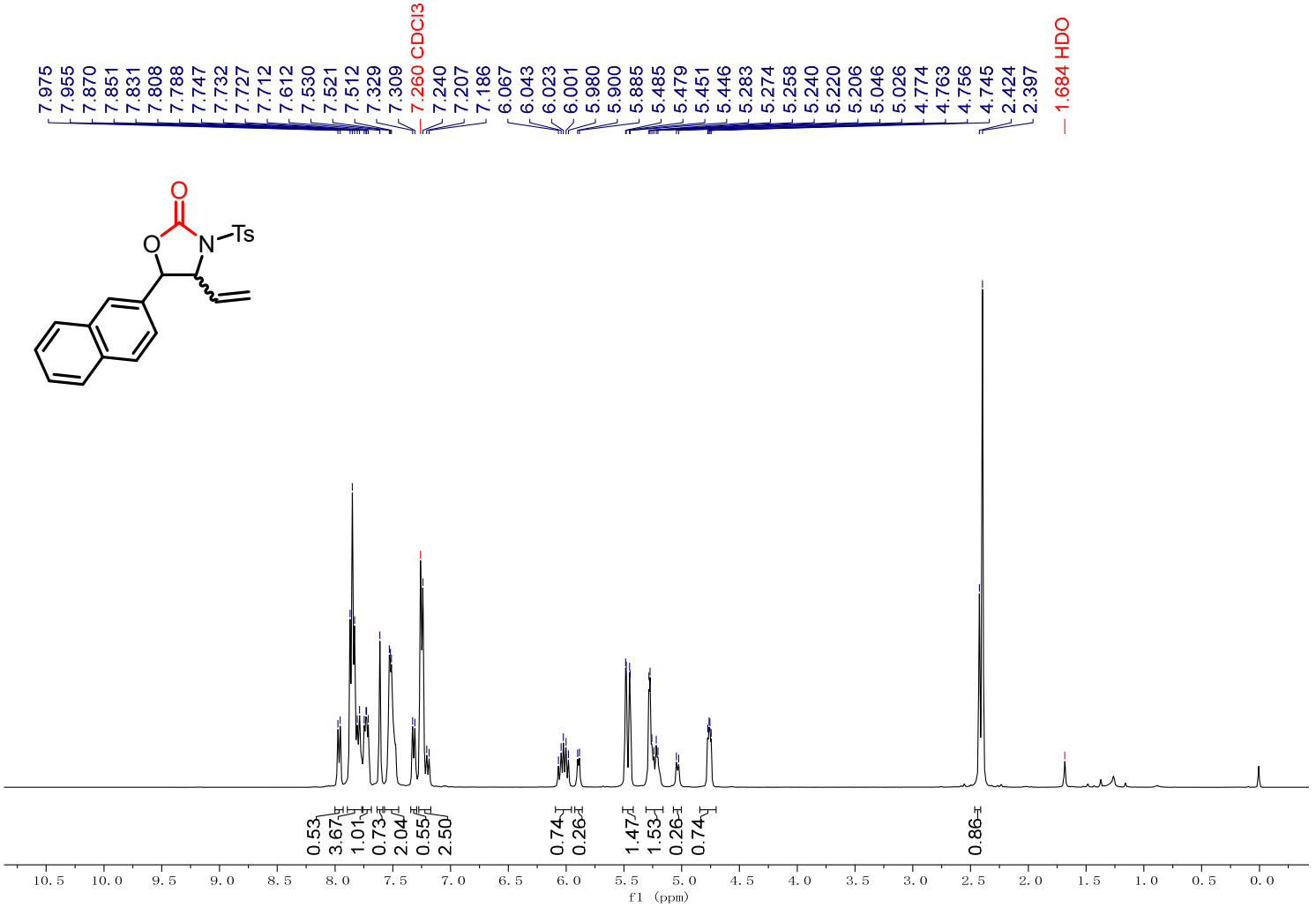
^{1}H NMR (400 MHz, $CDCl_3$) Spectrum of 5-(4-methoxyphenyl)-3-tosyl-4-vinyloxazolidin-2-one 3w



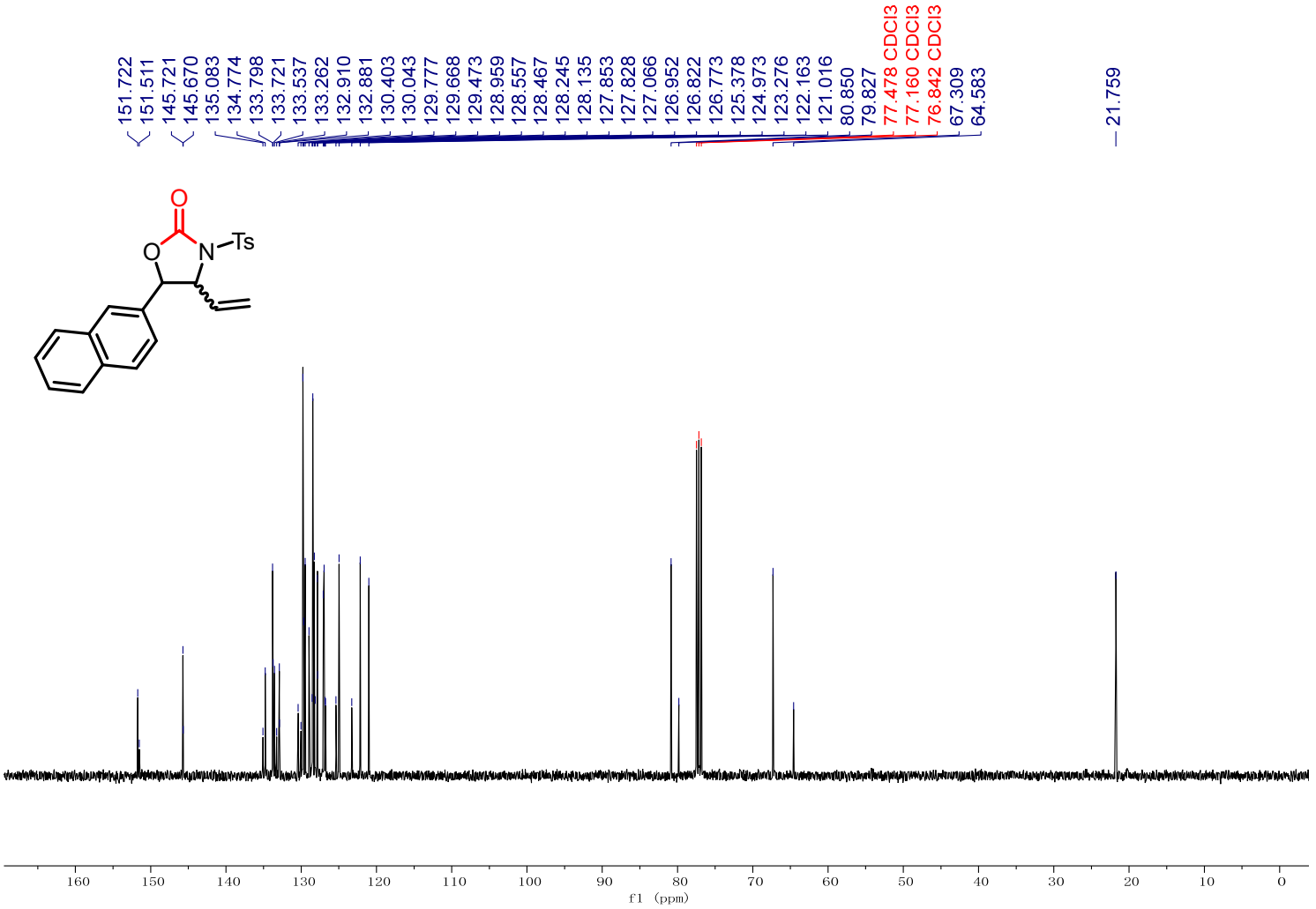
^{13}C NMR (100 MHz, $CDCl_3$) Spectrum of 5-(4-methoxyphenyl)-3-tosyl-4-vinyloxazolidin-2-one 3w



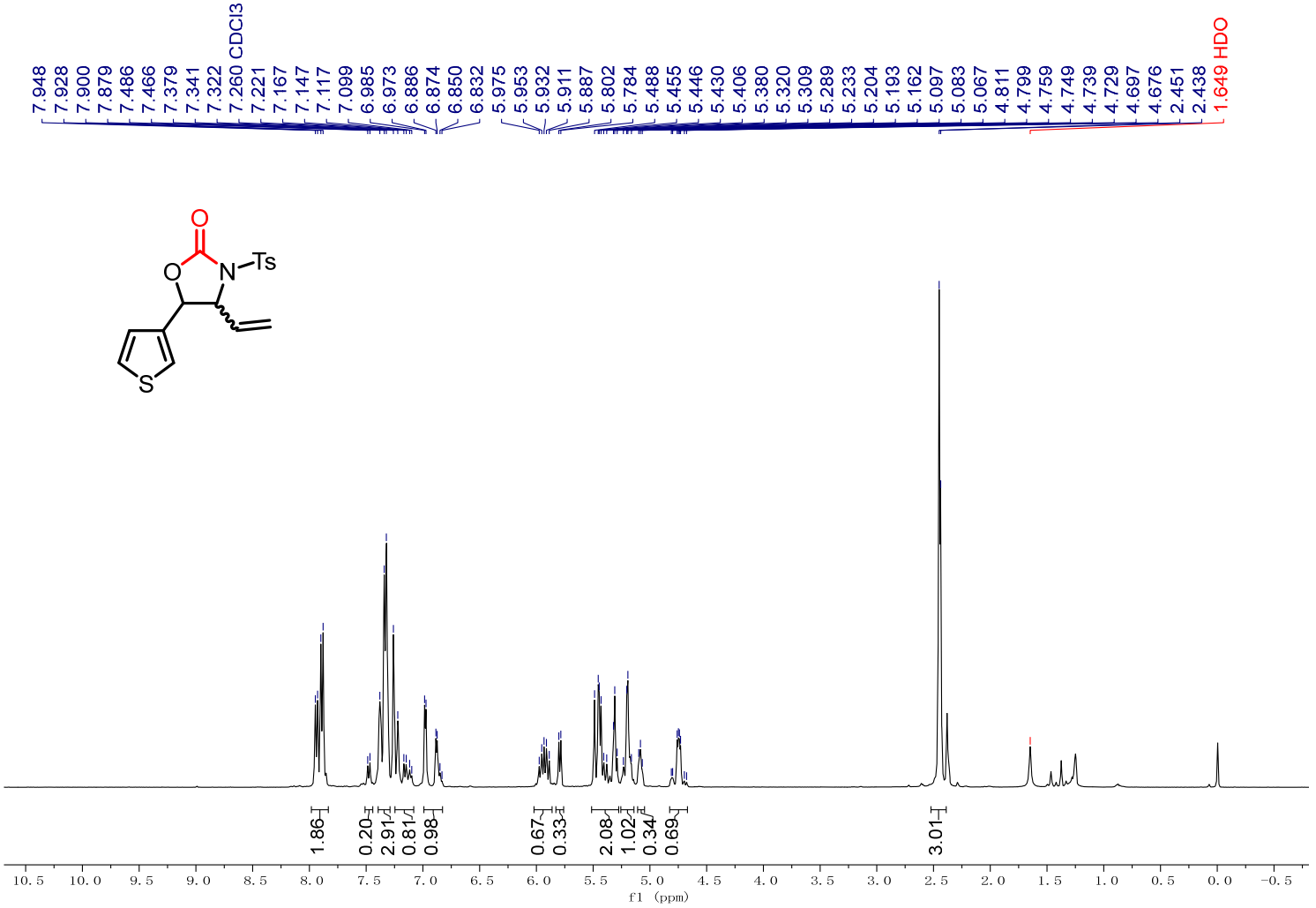
^{1}H NMR (400 MHz, $CDCl_3$) Spectrum of 5-(naphthalen-2-yl)-3-tosyl-4-vinyloxazolidin-2-one 3x



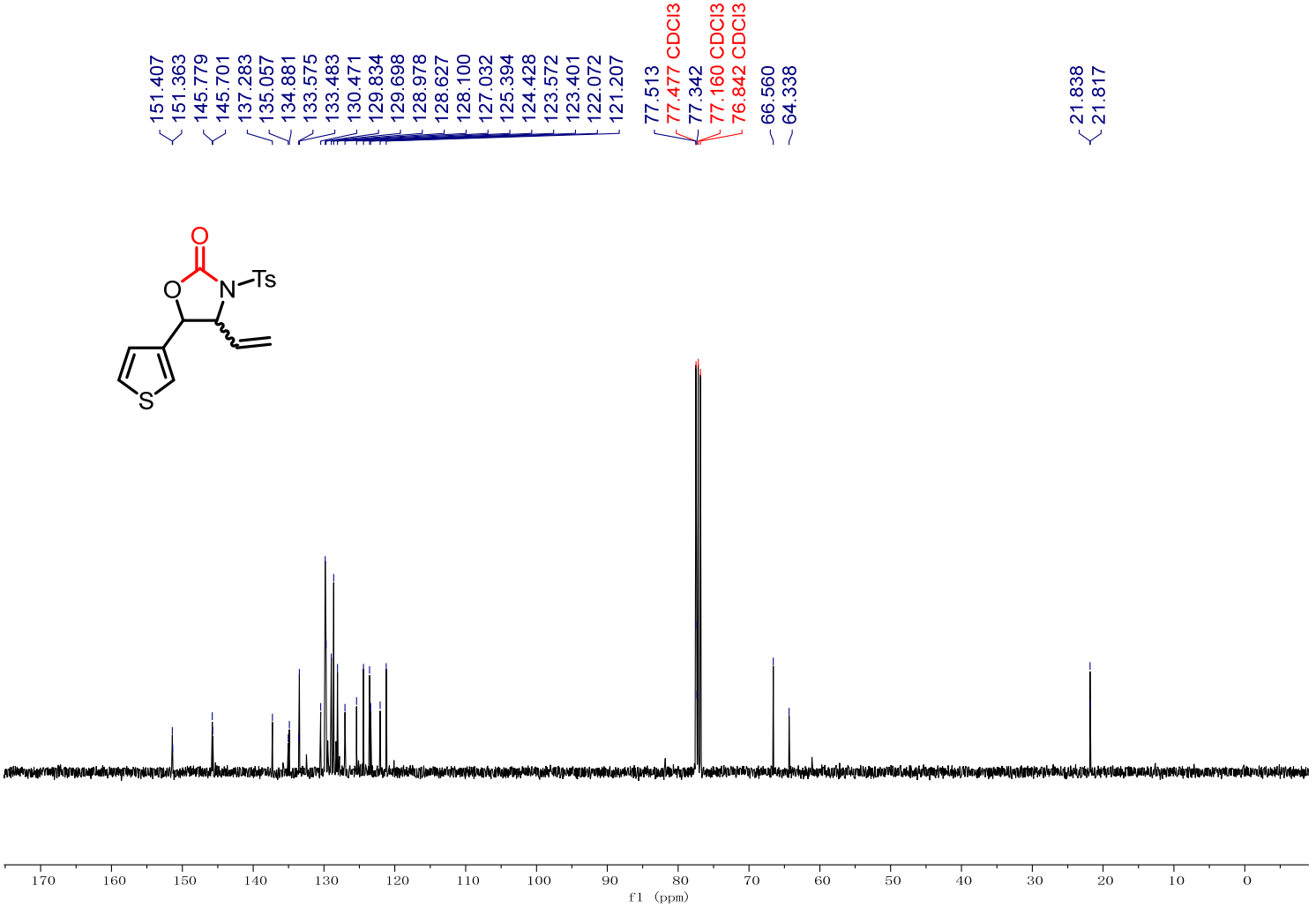
^{13}C NMR (100 MHz, $CDCl_3$) Spectrum of 5-(naphthalen-2-yl)-3-tosyl-4-vinyloxazolidin-2-one 3x



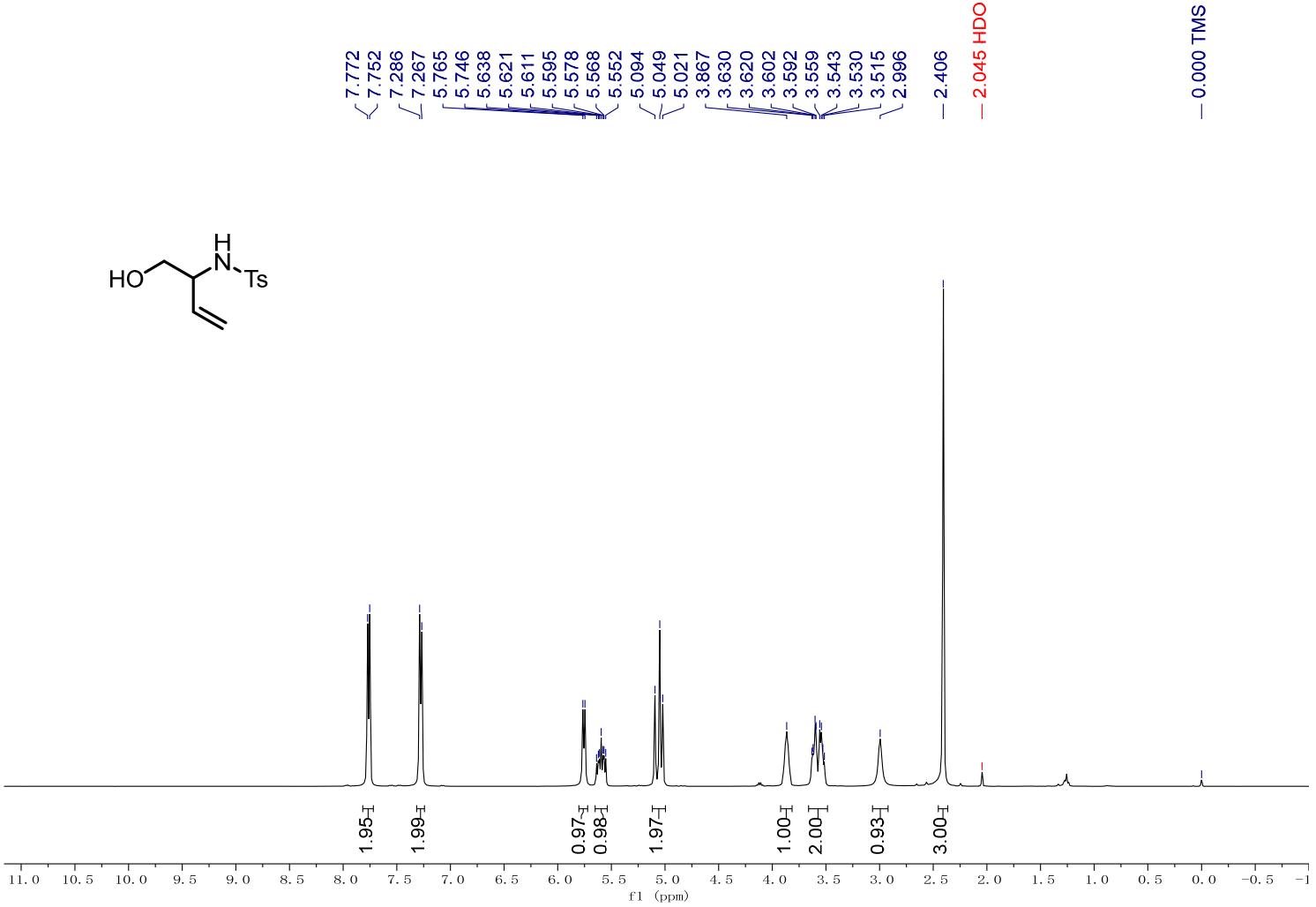
^{1}H NMR (400 MHz, $CDCl_3$) Spectrum of 5-(thiophen-3-yl)-3-tosyl-4-vinyloxazolidin-2-one 3y



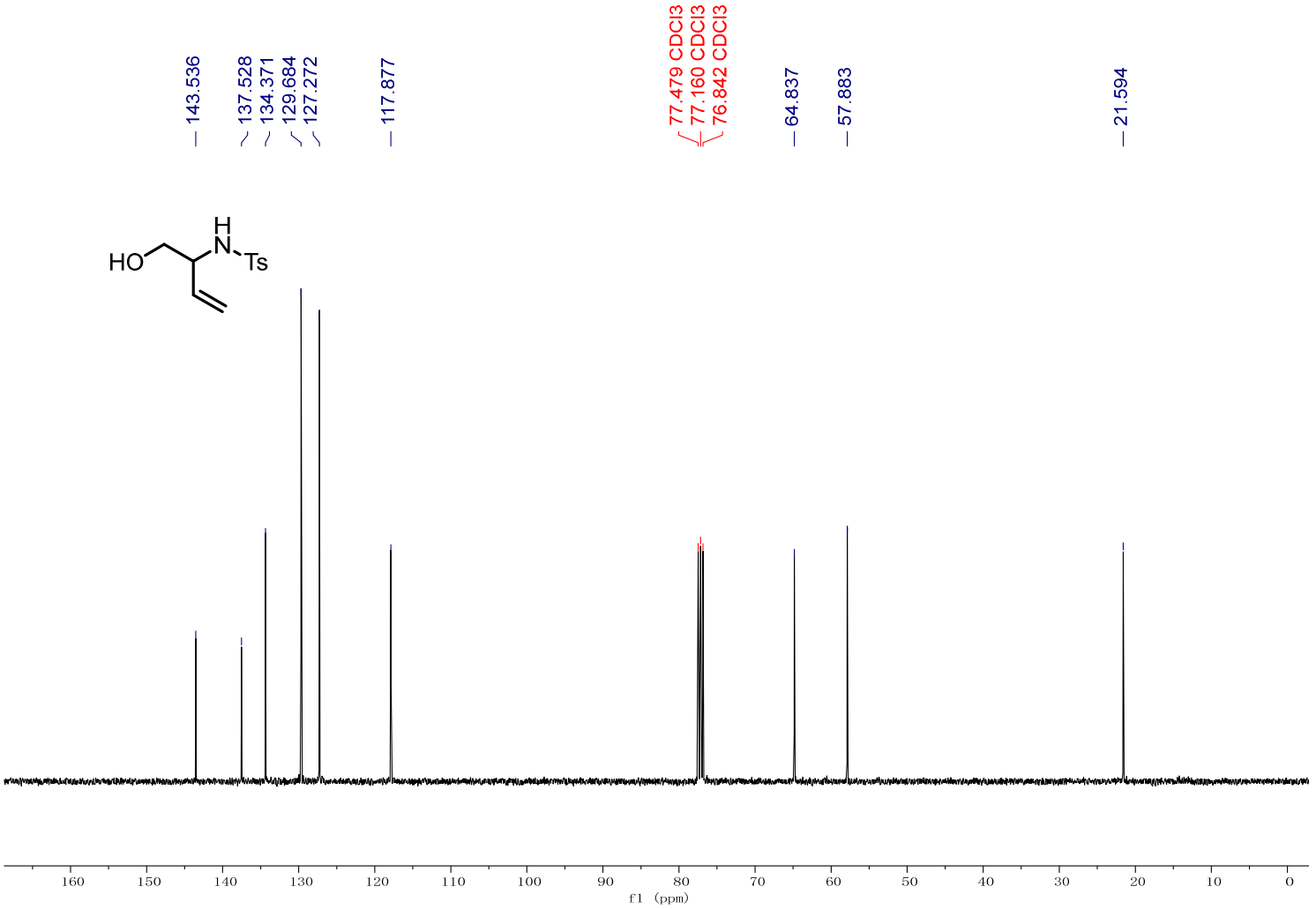
^{13}C NMR (100 MHz, $CDCl_3$) Spectrum of 5-(thiophen-3-yl)-3-tosyl-4-vinyloxazolidin-2-one 3y



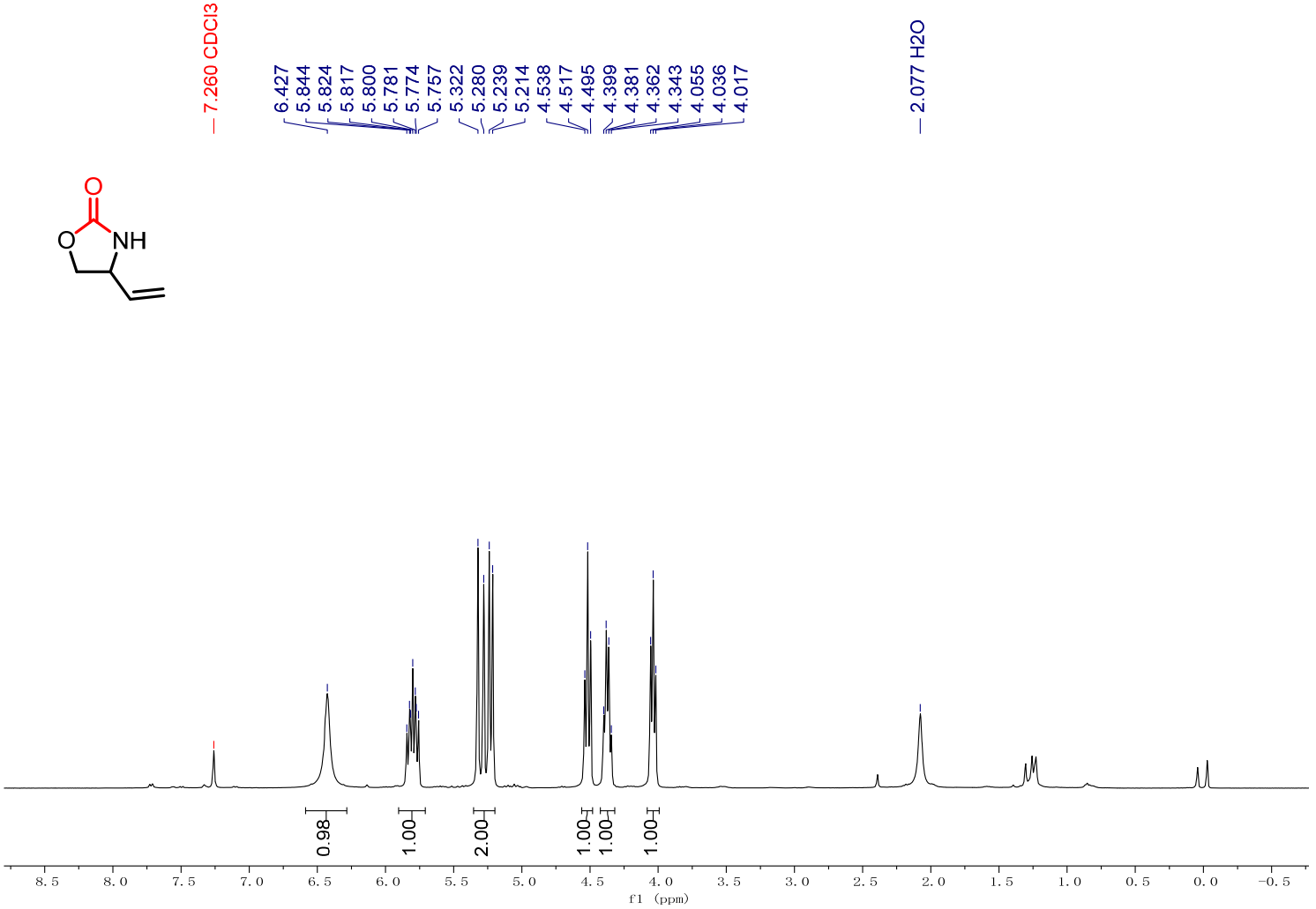
^{1}H NMR (400 MHz, $CDCl_3$) Spectrum of *N*-(1-hydroxybut-3-en-2-yl)-4-methylbenzenesulfonamide 4



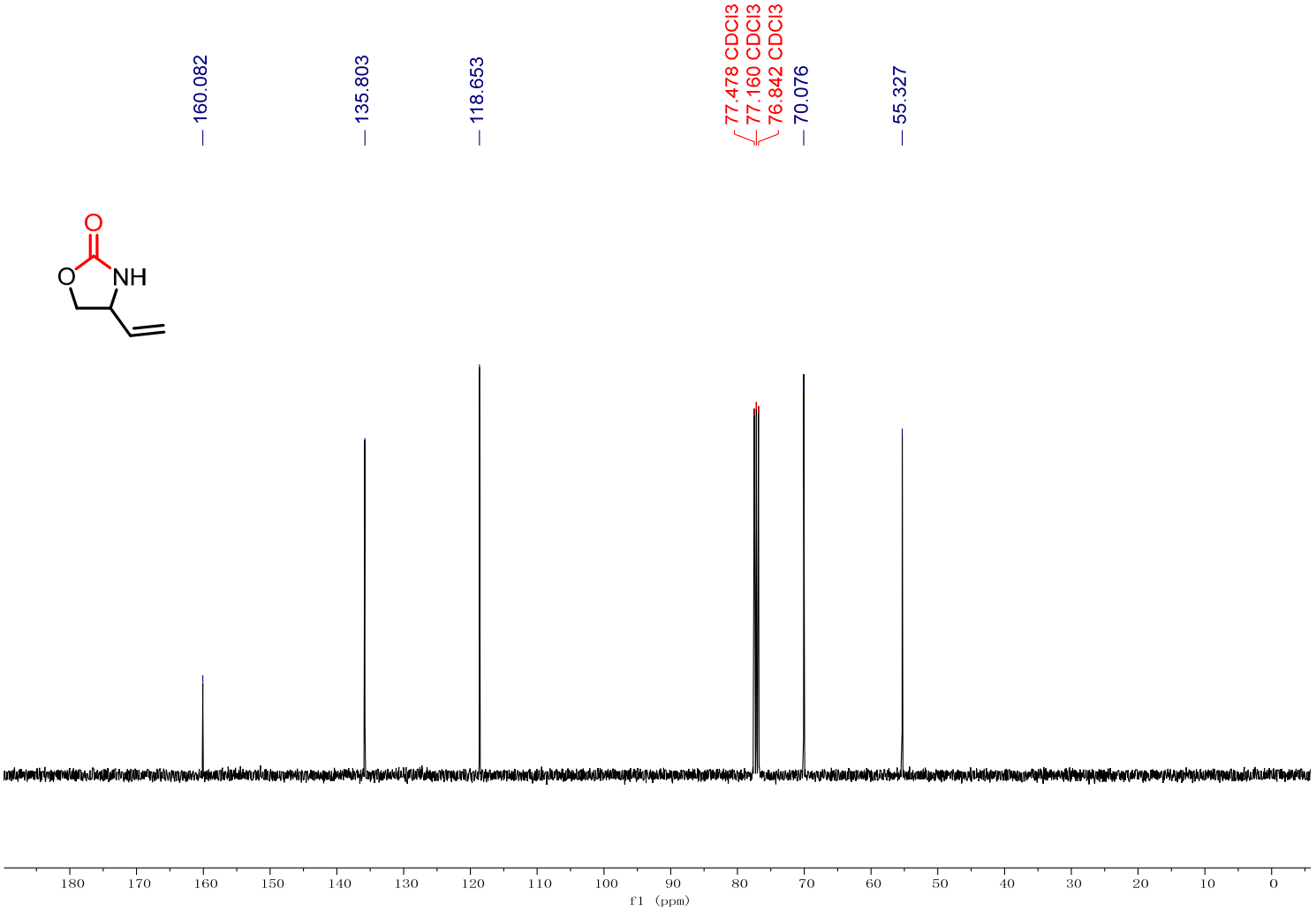
^{13}C NMR (100 MHz, $CDCl_3$) Spectrum of *N*-(1-hydroxybut-3-en-2-yl)-4-methylbenzenesulfonamide 4



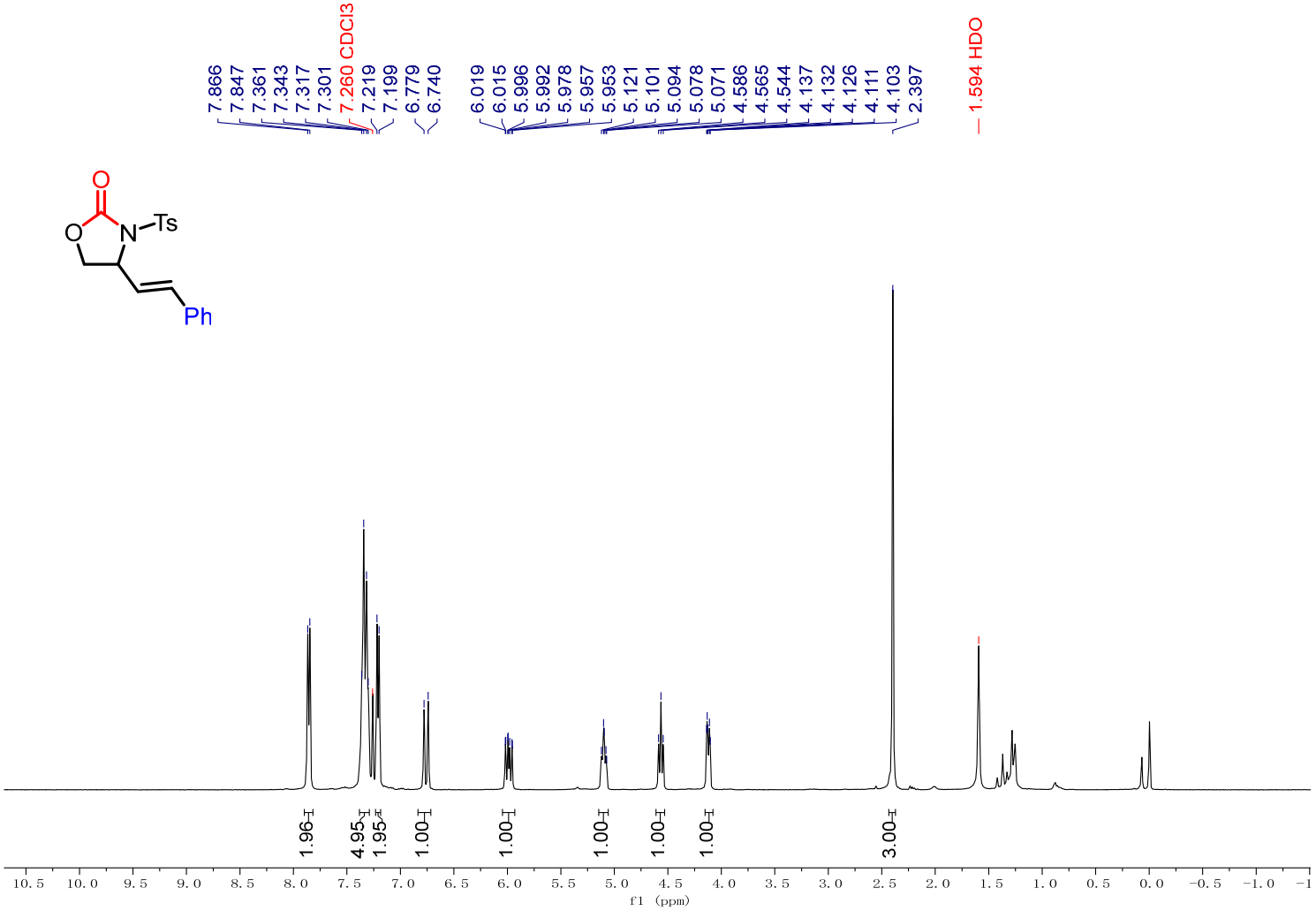
^{1}H NMR (400 MHz, $CDCl_3$) Spectrum of 4-vinyloxazolidin-2-one 5



^{13}C NMR (100 MHz, $CDCl_3$) Spectrum of 4-vinyloxazolidin-2-one 5



^{1}H NMR (400 MHz, $CDCl_3$) Spectrum of (*E*)-4-styryl-3-tosyloxazolidin-2-one 6



^{13}C NMR (100 MHz, $CDCl_3$) Spectrum of (*E*)-4-styryl-3-tosyloxazolidin-2-one 6