Electronic Supplementary Information

Cu-Catalyzed Alkynylation/Cyclization Cascade for the Construction of Pyrazolo[5,1-*a*]isoquinoline Skeleton

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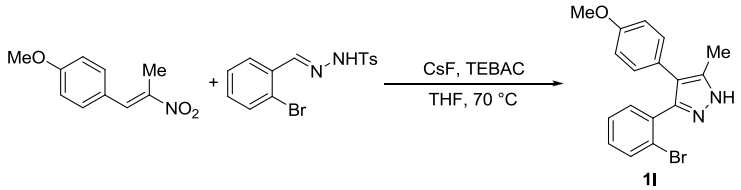
Preparation of substrates 1l, 3-(2-bromophenyl)-4-(4-methoxyphenyl)-5-methyl-1*H*-pyrazole (not optimized)**:**

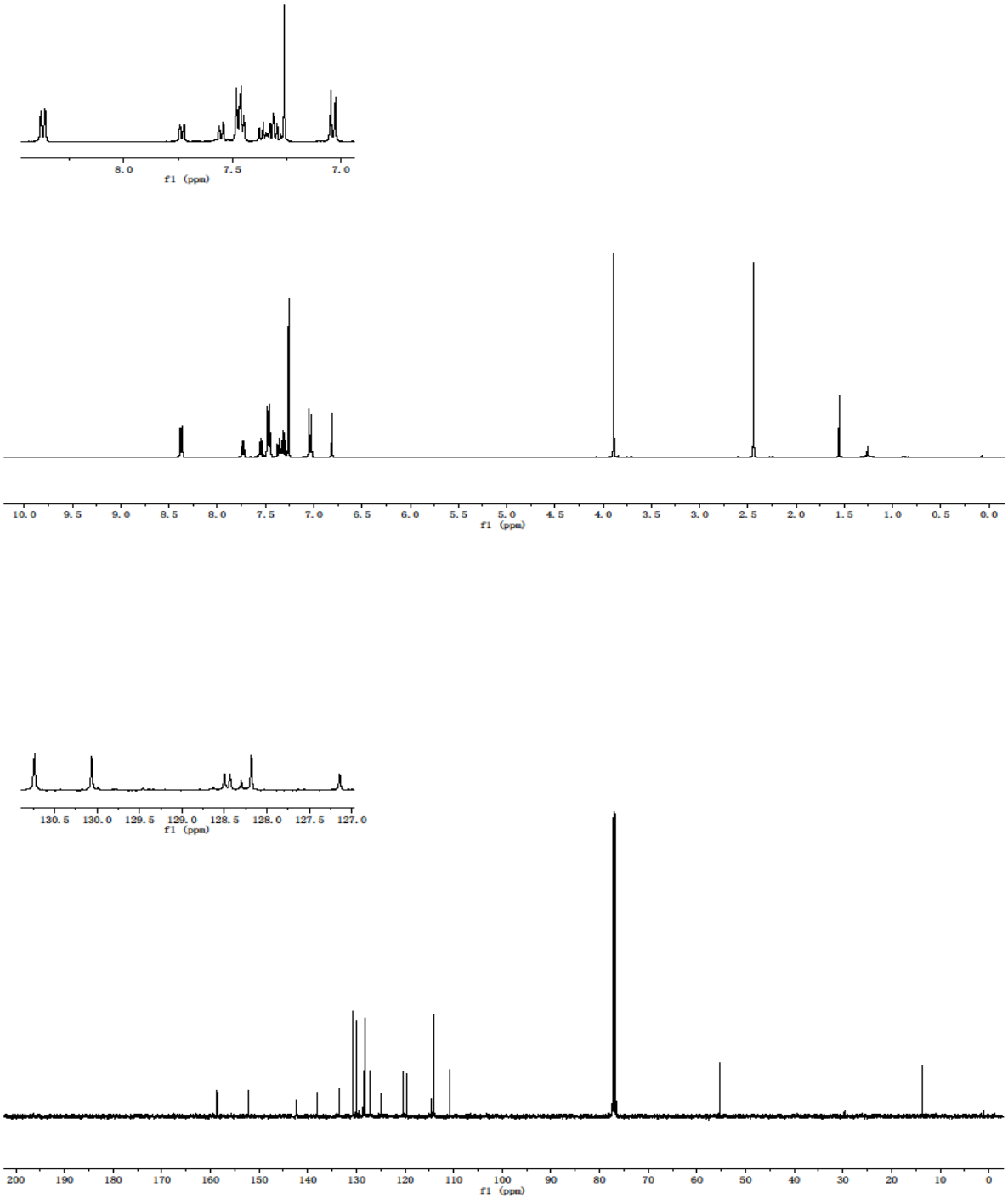


1l

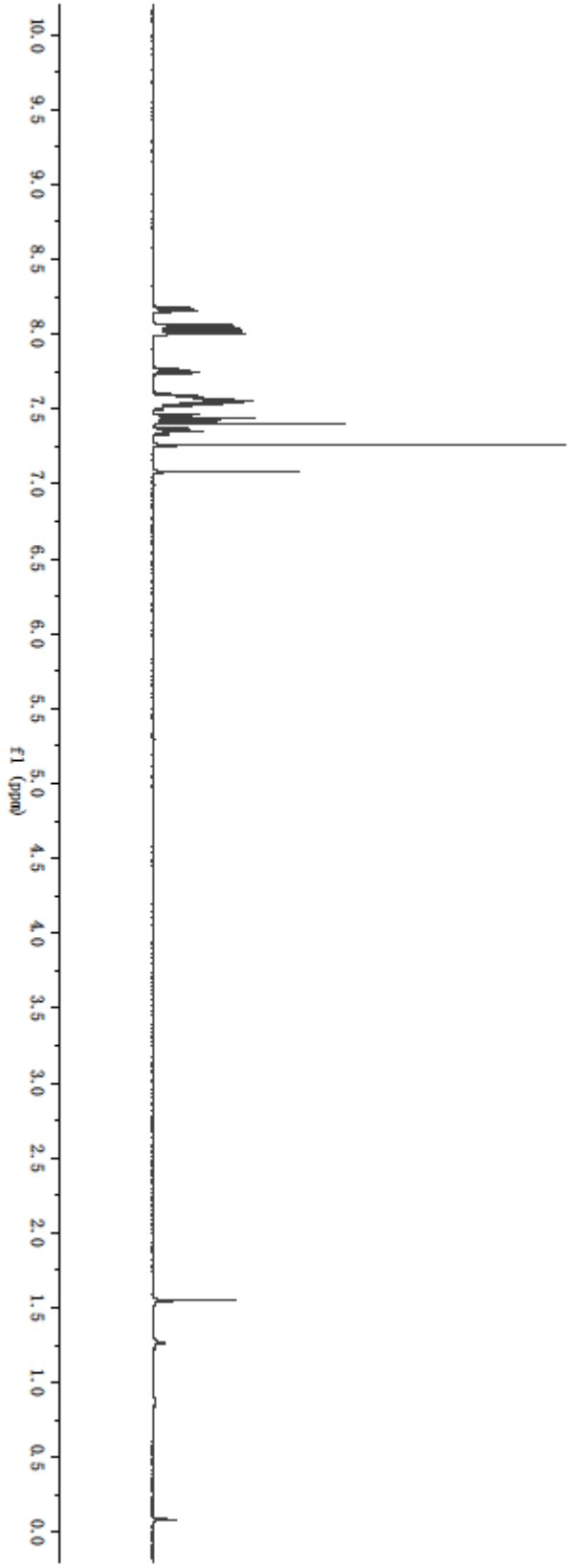
A mixture of 1-methoxy-4-(2-nitropropenyl)benzene (116 mg, 0.6 mmol, 1.2 equiv) and *N'*-(2-bromobenzylidene)tosylhydrazide (176 mg, 0.5 mmol) was dissolved in 10 mL of dry THF. CsF (228 mg, 1.5 mmol, 3 equiv) and TEBAC ([Et_3NBn]Cl, 28 mg, 0.125 mmol, 25 mol %) were added and the mixture was allowed to reflux for 48 h. After being cooled to room temperature, the mixture was poured into brine and extracted with EtOAc. Combined extracts were dried over $MgSO_4$ and concentrated. The residue was purified by column chromatography to afford 29 mg (17%) of **1l** as a slightly yellow solid; mp 67–68 ºC. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.58 (d, *J* = 7.7 Hz, 1 H), 7.26–7.22 (m, 2 H), 7.21–7.16 (m, 1 H), 7.04–6.99 (m, 2 H), 6.82–6.77 (m, 2 H), 3.77 (s, 3 H), 2.30 (s, 3 H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 157.9, 133.9, 132.9, 132.5, 130.2, 129.7, 127.1, 125.5, 124.0, 118.8, 113.7, 55.1, 10.9 (two quaternary C's are missing even after long scan); HRMS (ESI) calcd for $C_{17}H_{16}BrN_2O$ (M+H) 343.0446, found 343.0438.

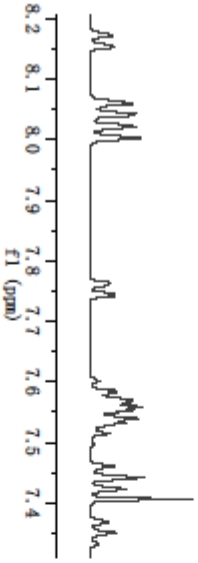
Side-product of 3la (presumably 8-benzylidene-3-(4-methoxyphenyl)-2-methyl-8*H*-pyrazolo[5,1-*a*]isoindole)**:**

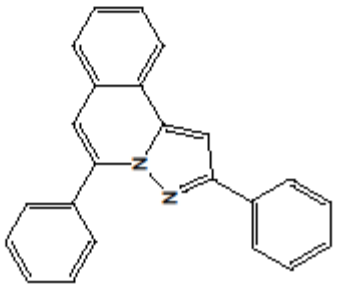
Isolated from the reaction of **1l** and **2a** (18.4 mg on a 0.34 mmol scale without AgOTf, corresponding to 15%; or 23.4 mg on a 0.2 mmol scale with 1 equiv of AgOTf, corresponding to 32%) as a yellow solid; mp 134–135 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.40–8.34 (m, 2 H), 7.75–7.71 (m, 1 H), 7.57–7.53 (m, 1 H), 7.50–7.43 (m, 4 H), 7.39–7.27 (m, 3 H), 7.06–7.01 (m, 2 H), 6.81 (s, 1 H), 3.89 (s, 1 H), 2.44 (s, 1 H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 158.6, 152.2, 142.4, 138.0, 133.5, 130.7 (overlapped signal**)**, 130.1, 128.5, 128.4, 128.3, 128.2, 127.1, 124.9, 120.4, 119.6, 114.6, 114.1, 110.8, 55.3, 13.6. HRMS (ESI) calcd for $C_{25}H_{21}N_2O$ (M+H) 365.1654, found 365.1645.

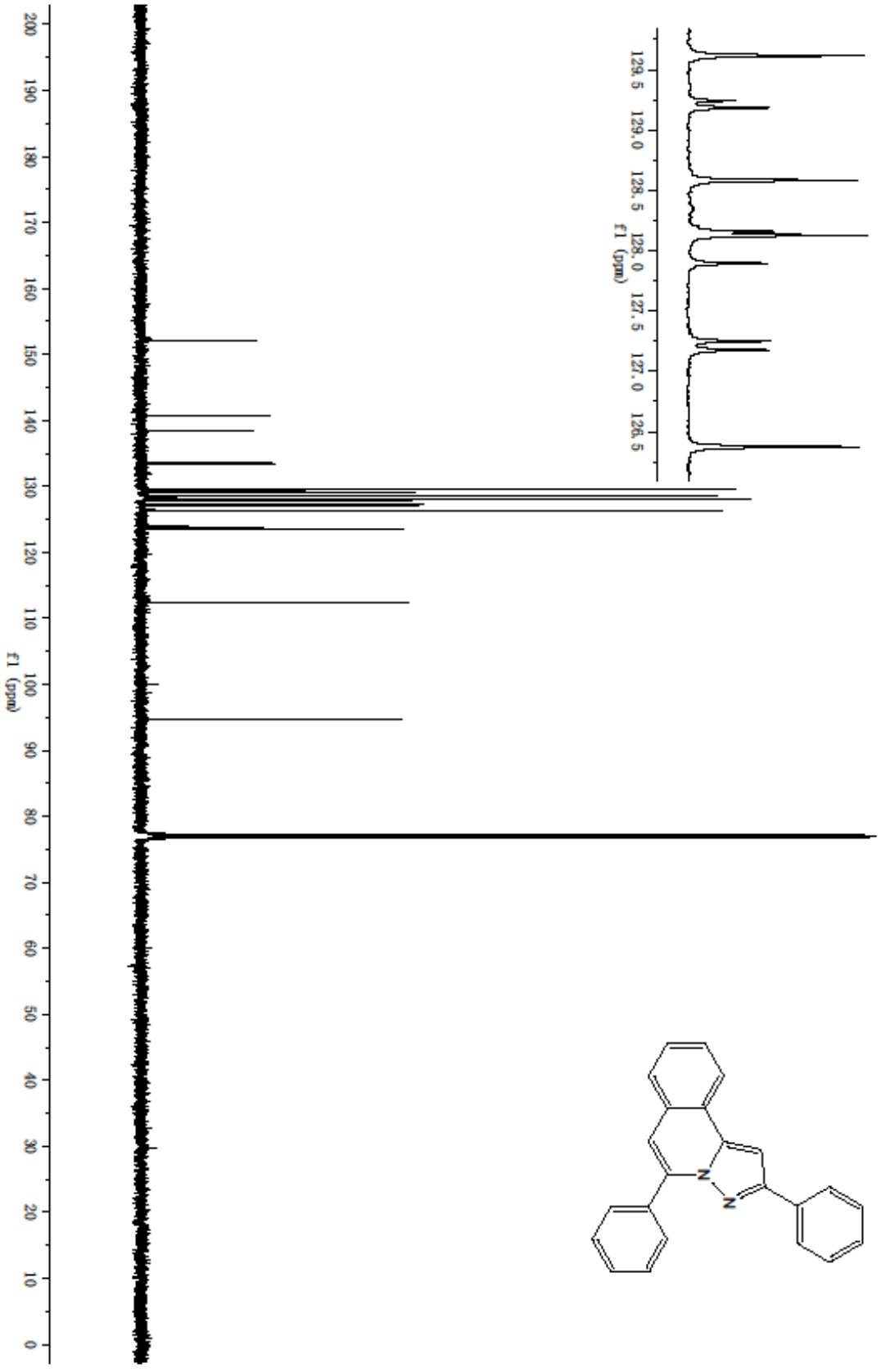


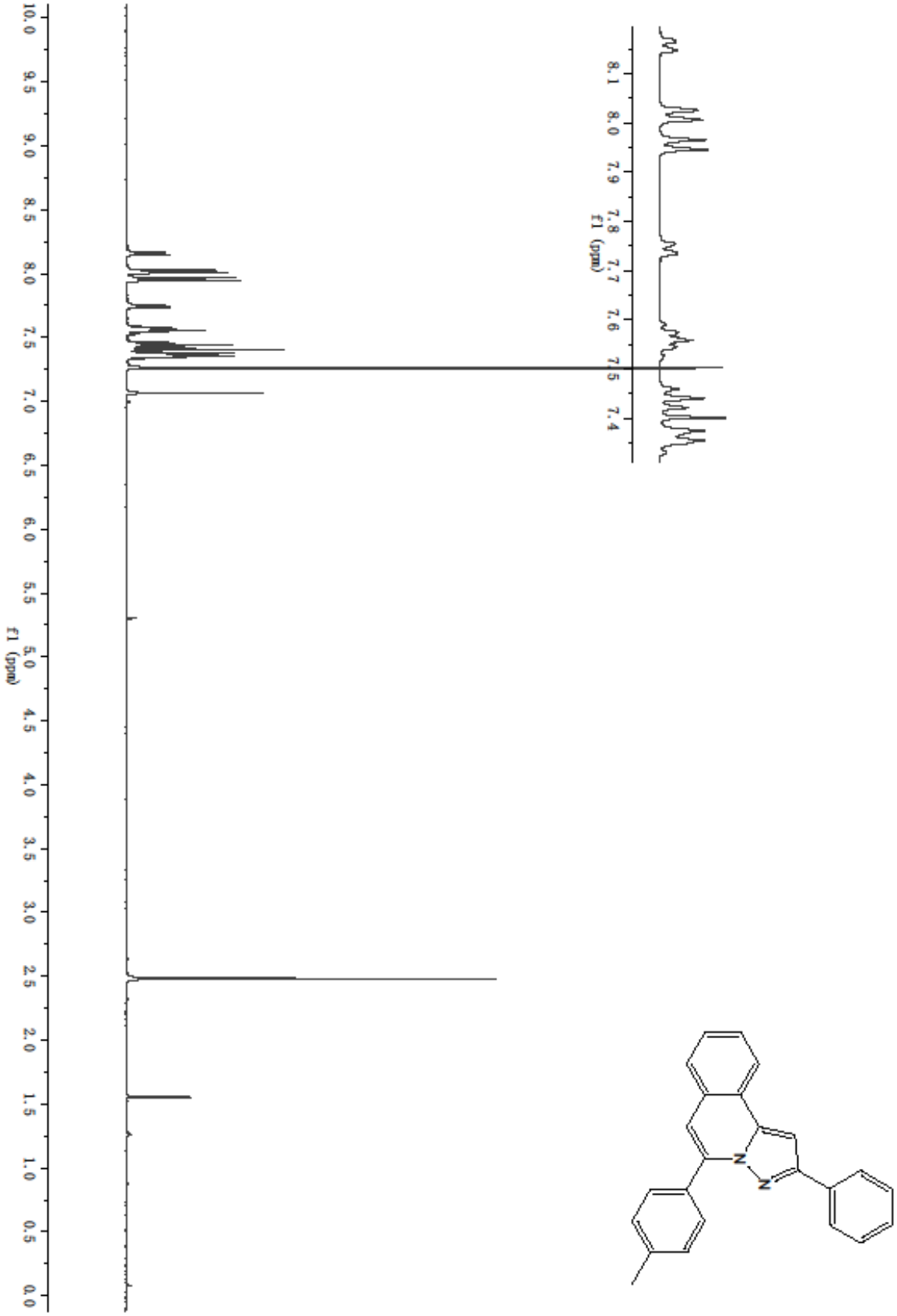
Copies of ^{1}H and ^{13}C NMR spectra

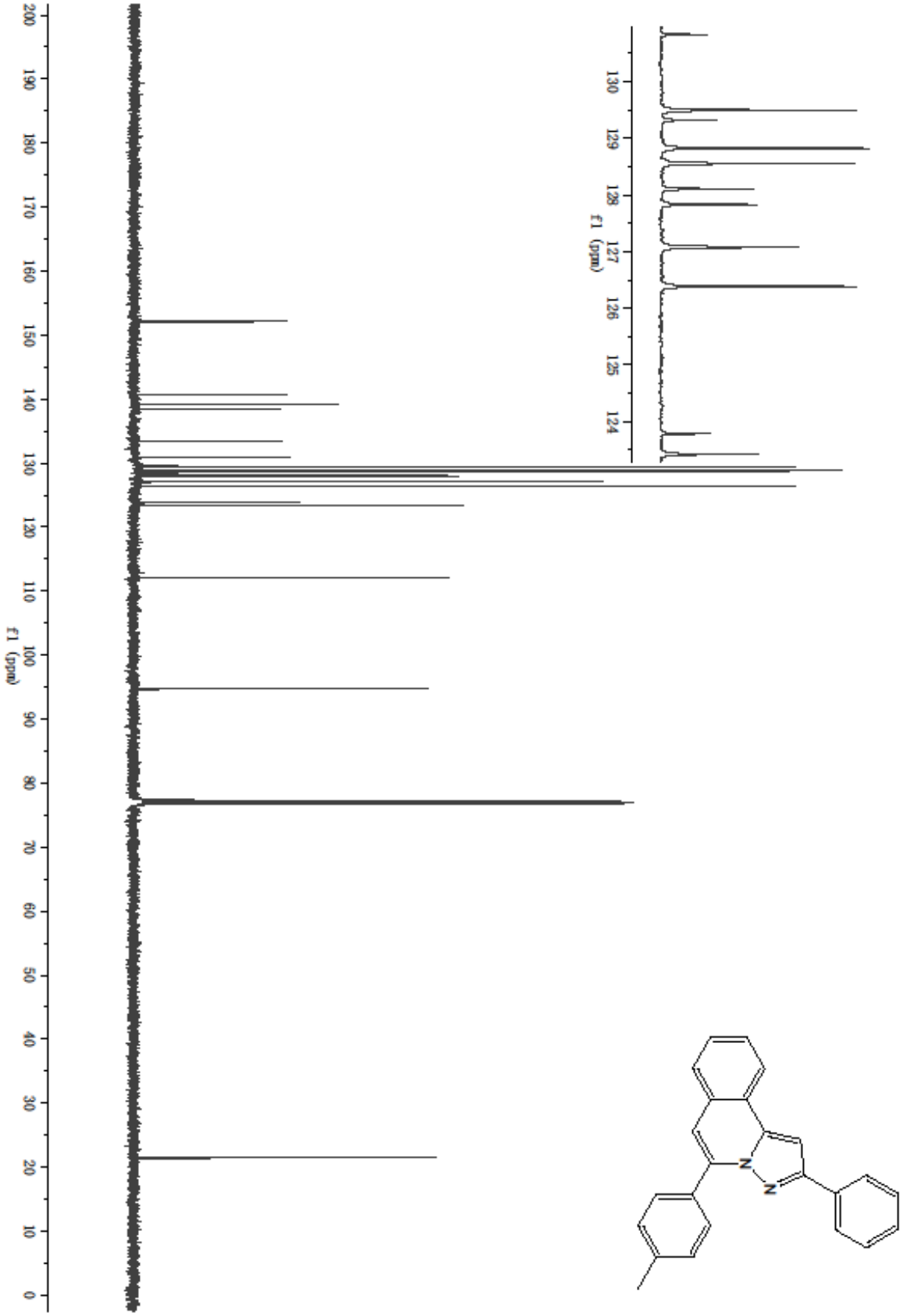


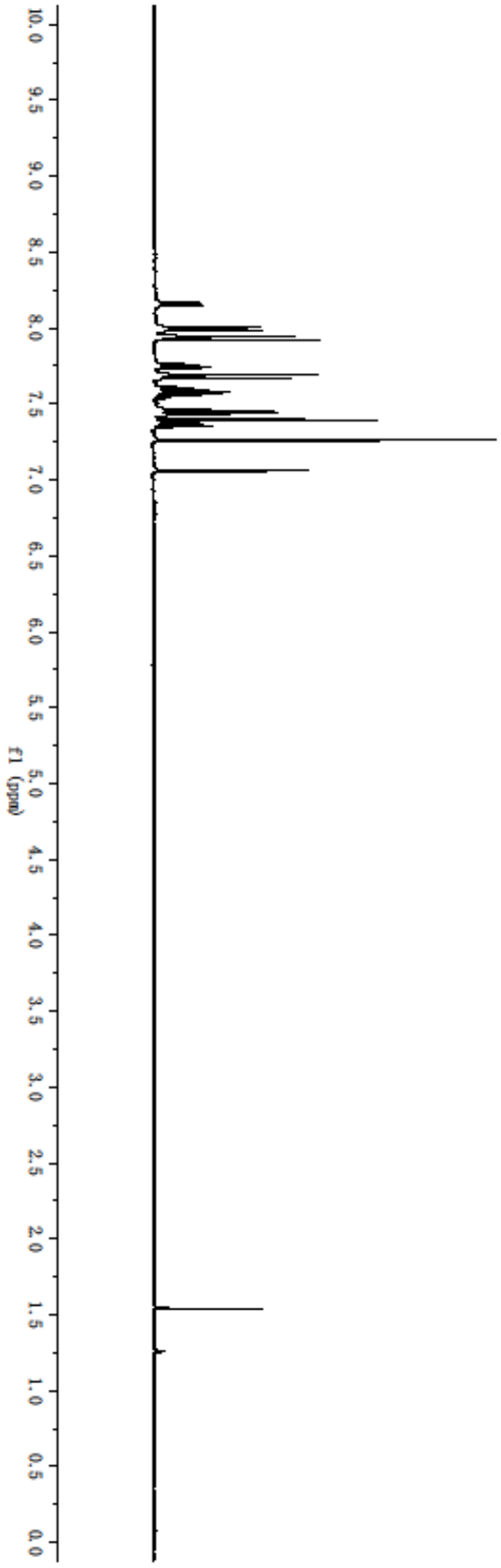


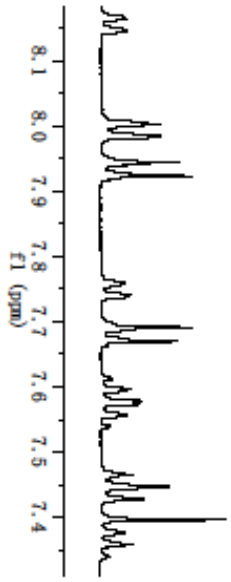


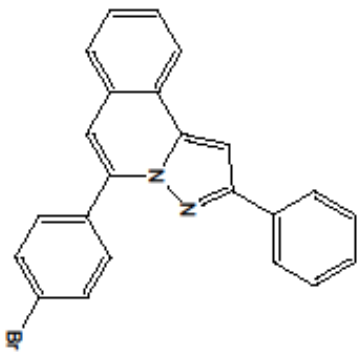


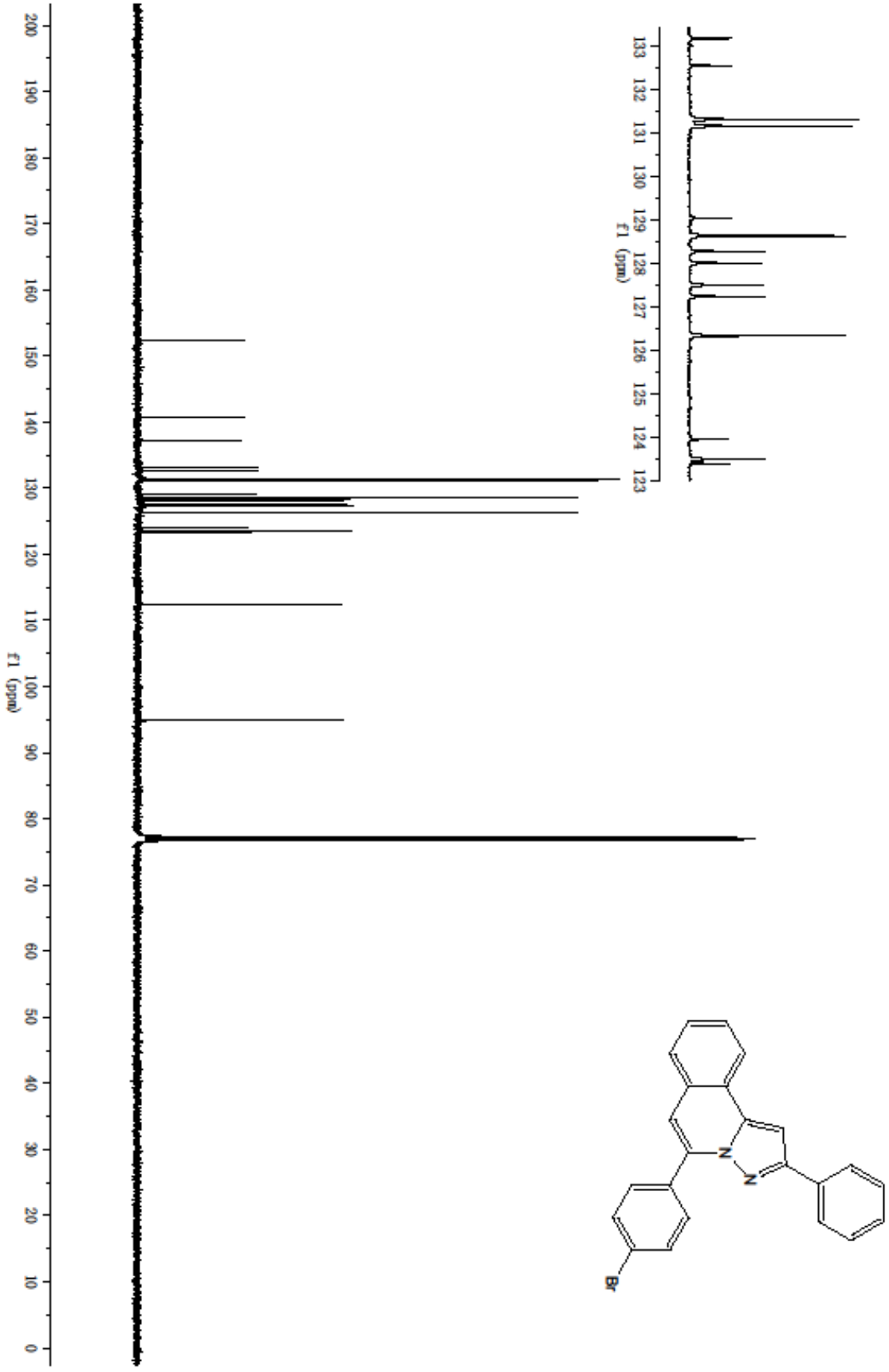


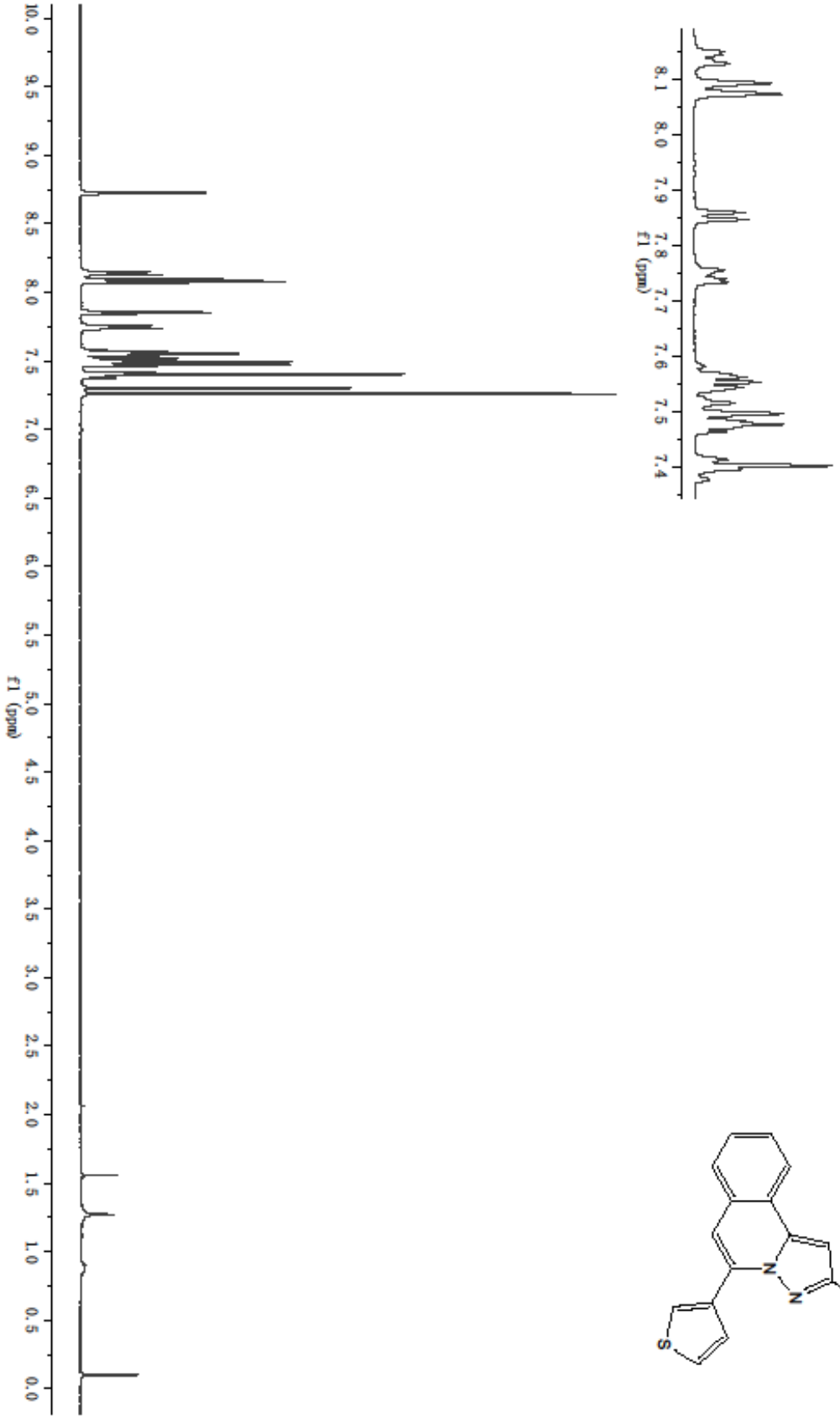


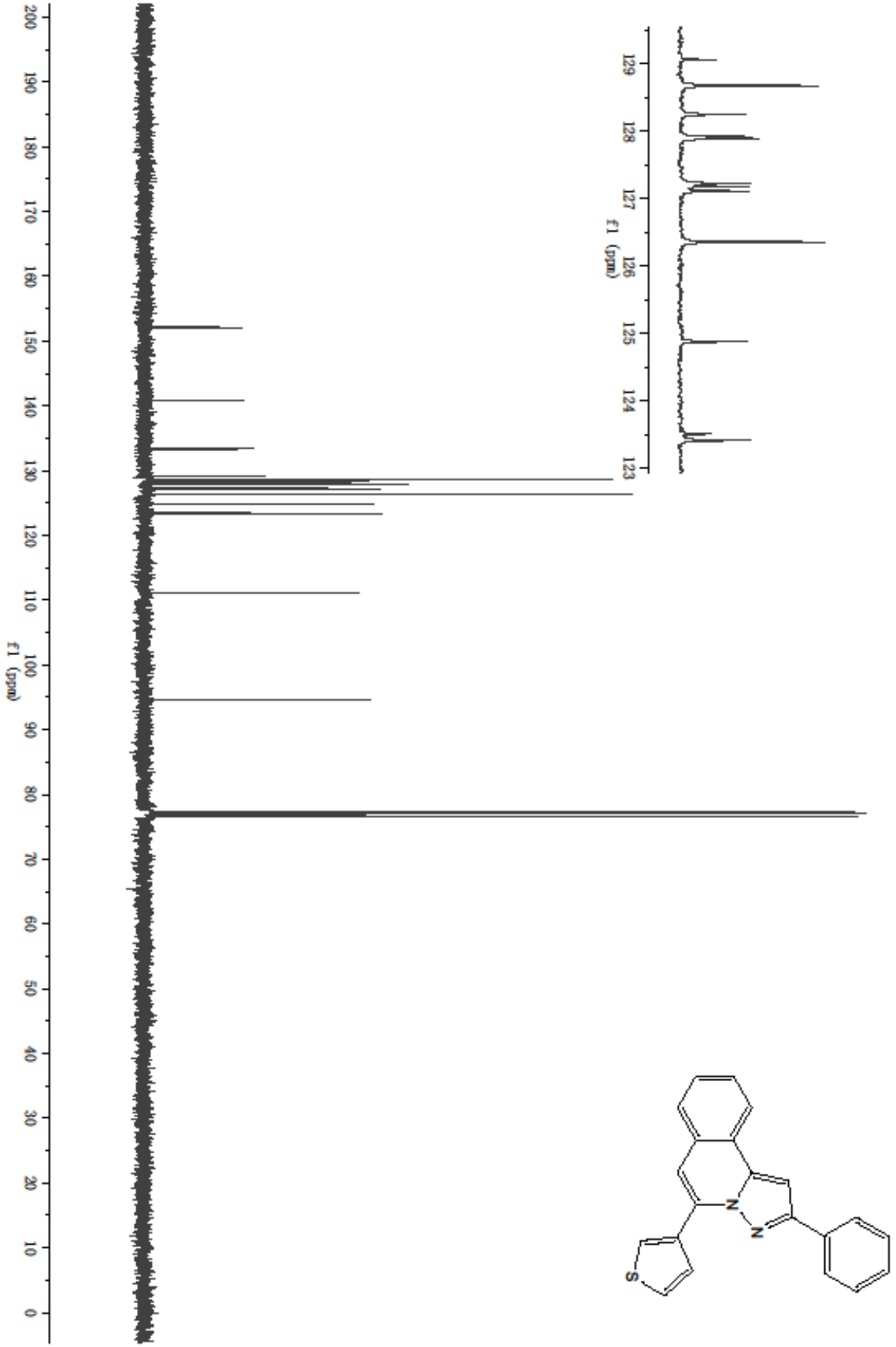


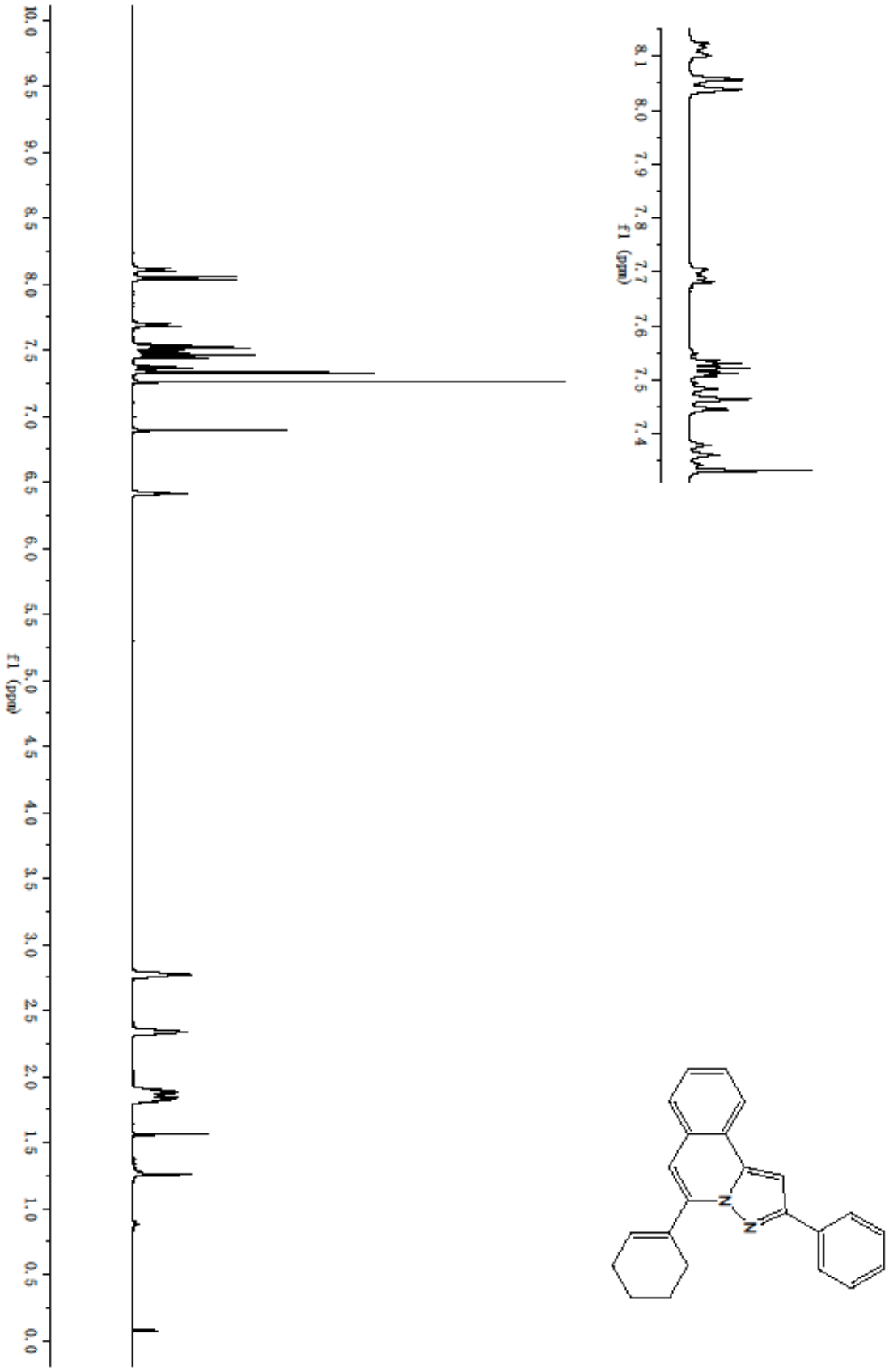




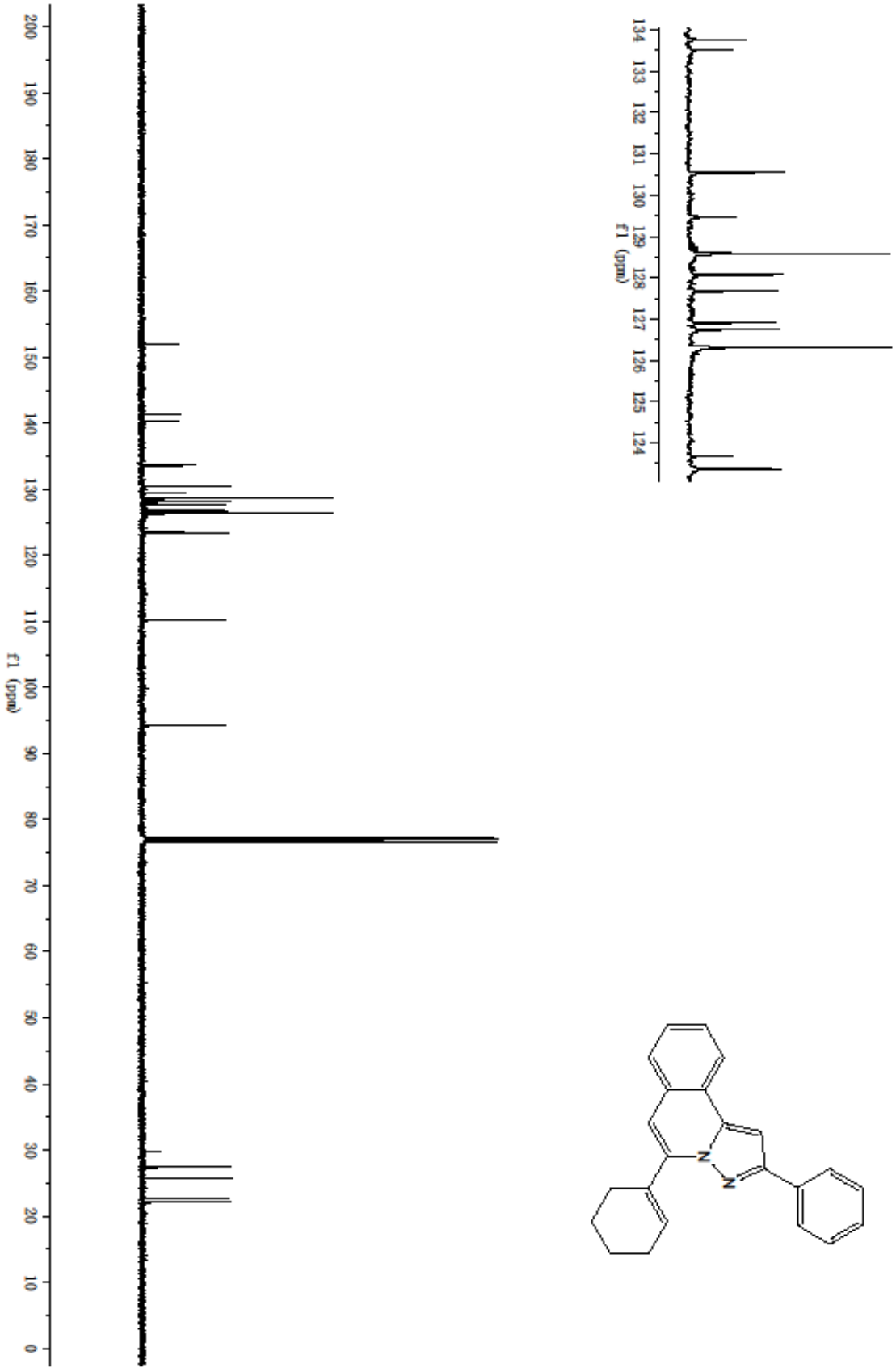








The signals at 1.25 and 0.87 ppm are the petroleum ether residues. See: H. E. Gottlieb, V. Kotlyar, and A. Nudelman, *J. Org. Chem.*, 1997, *62*, 7512, where this residue is noted as “grease”.



The small signal at 29.8 ppm is the petroleum ether residue.