

Supporting Information

Visible-light-induced cascade sulfenylation/cyclization of N-propargylindoles with aryldiazonium tetrafluoroborates via the insertion of sulfur dioxide

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1. Profile of 3aa with the light on or off

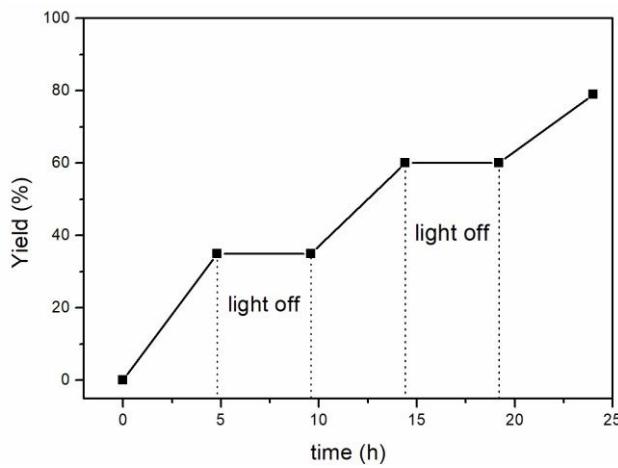
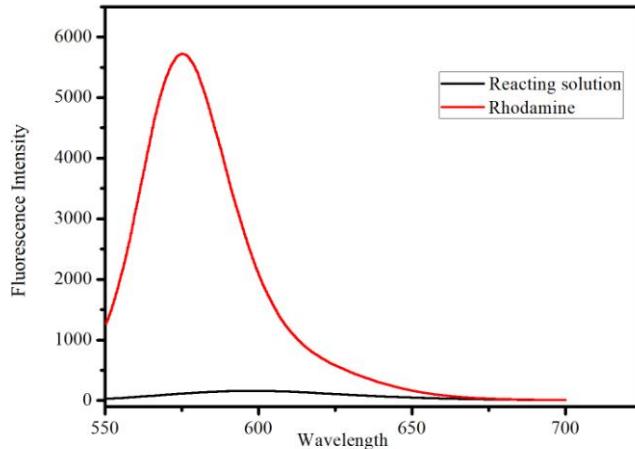


Figure S1. Profile of **3aa** with the light on or off over time. GC yield using biphenyl as an internal standard.

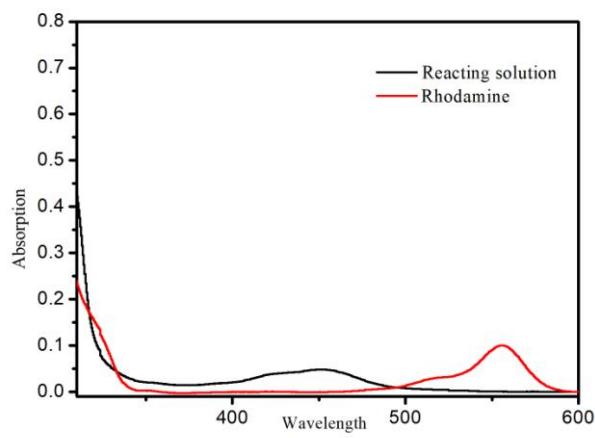
The light on/off experiment verified the necessity of continuous irradiation of visible light and suggested that chain propagation is not the predominant mechanistic pathway (Figure S1).

2. The Quantum Yield of the reaction



F_s Integrated area of fluorescence of Rhodamine B: 180984 (red line)

F_u Integrated area of fluorescence of reaction system: 8319 (black line)



As UV-Vis absorbtion of Rhodamine B at 350nm: 0.0027 (red line)

Au UV-Vis absorbtion of reaction system at 450nm: 0.05 (black line)

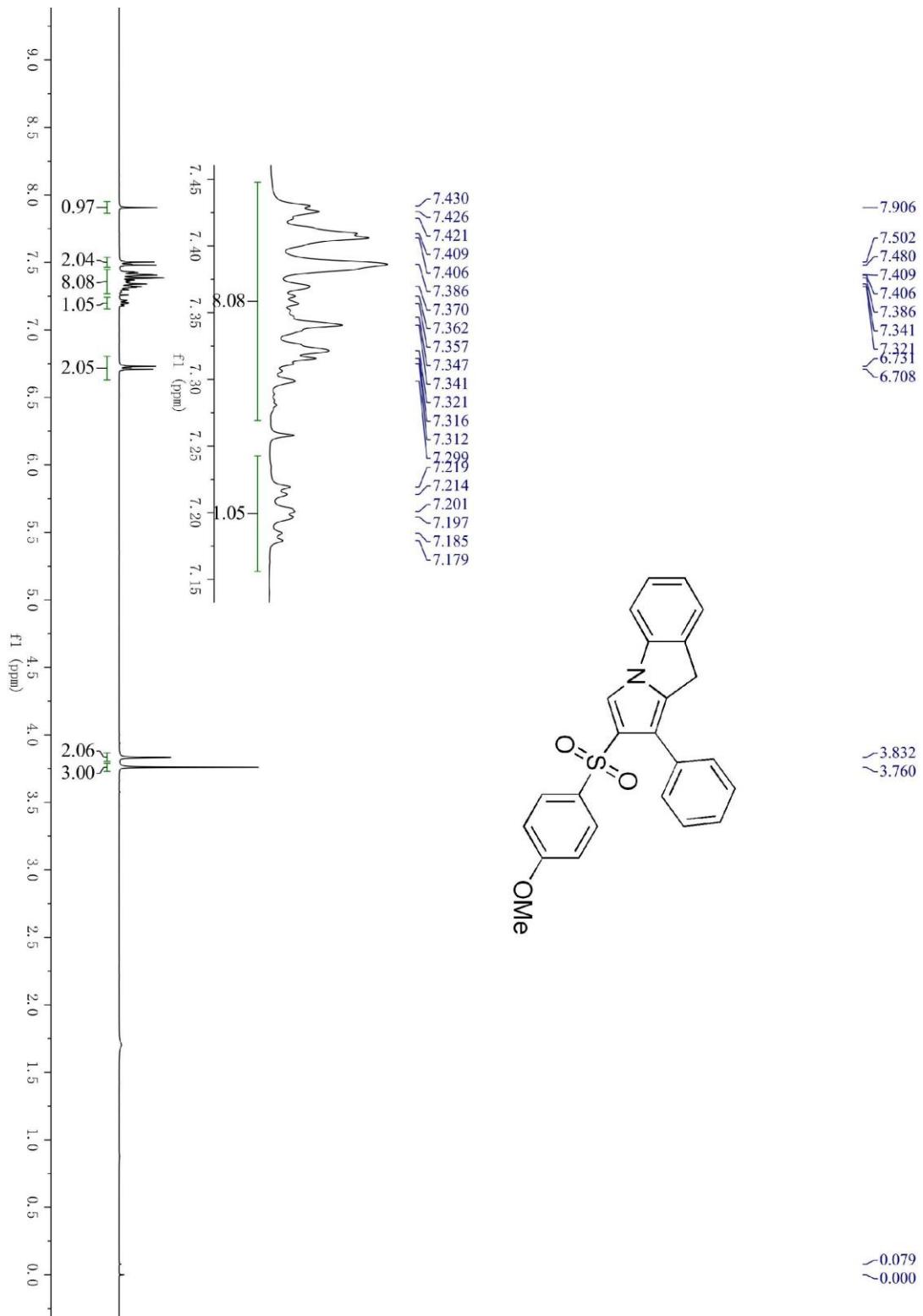
$$Y_u = Y_s * (F_u/F_s) * (A_s/A_u)$$

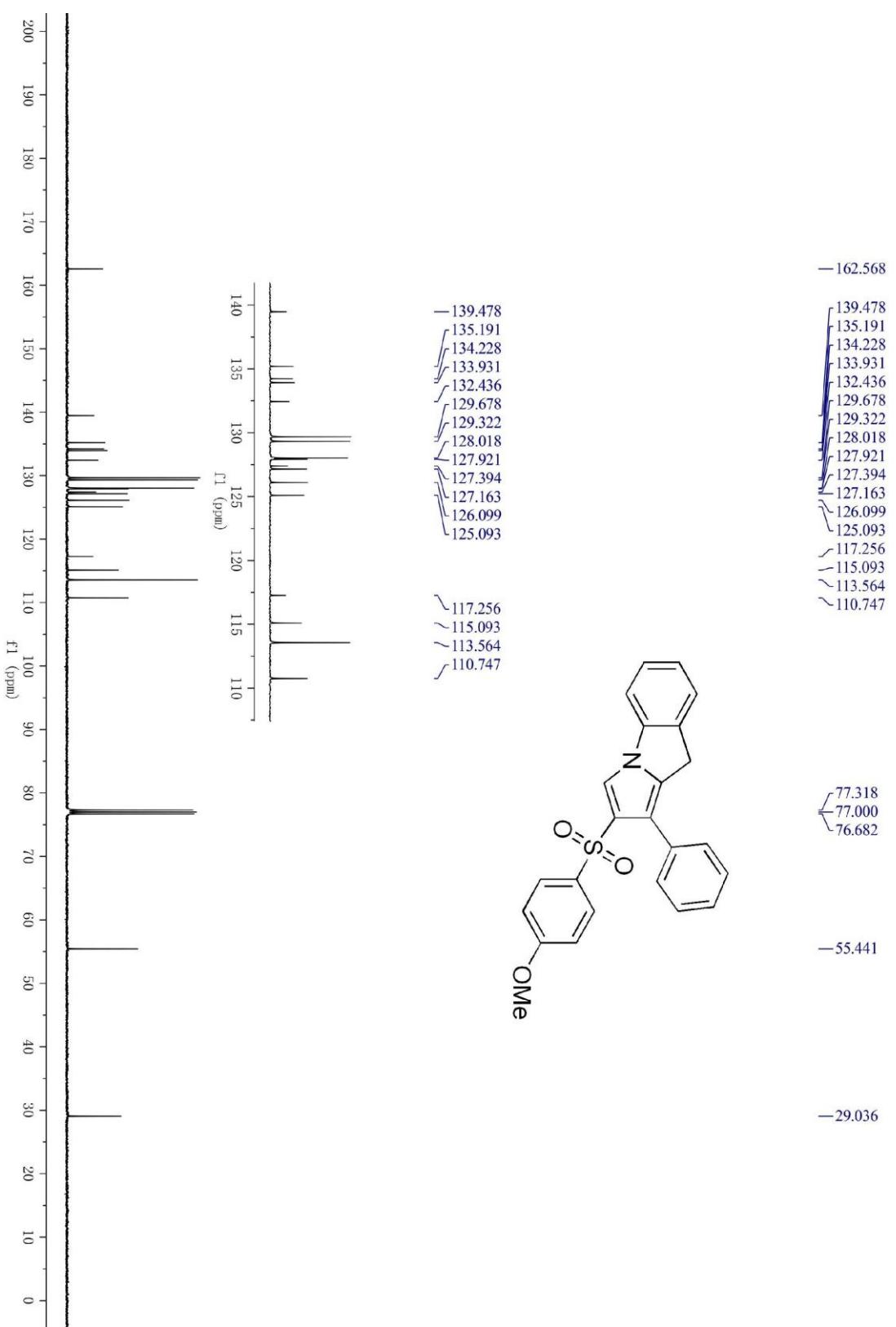
$$F_u = 8319, F_s = 180984, A_s (350 \text{ nm}) = 0.0027, A_u (450 \text{ nm}) = 0.05$$

$$Y_u = Y_s * (F_u/F_s) * (A_s/A_u) = 0.0025 Y_s$$

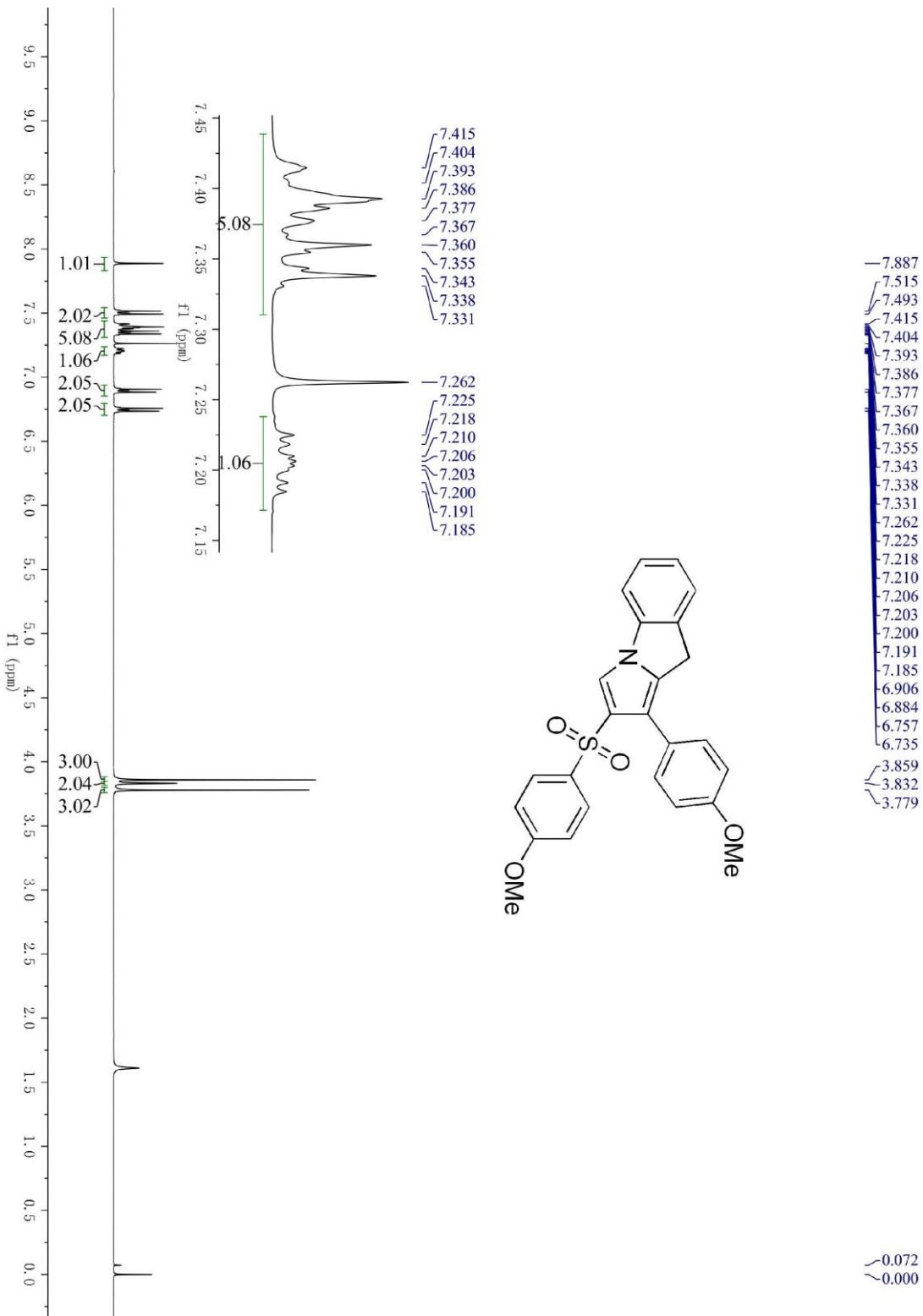
3. ^1H and ^{13}C spectra

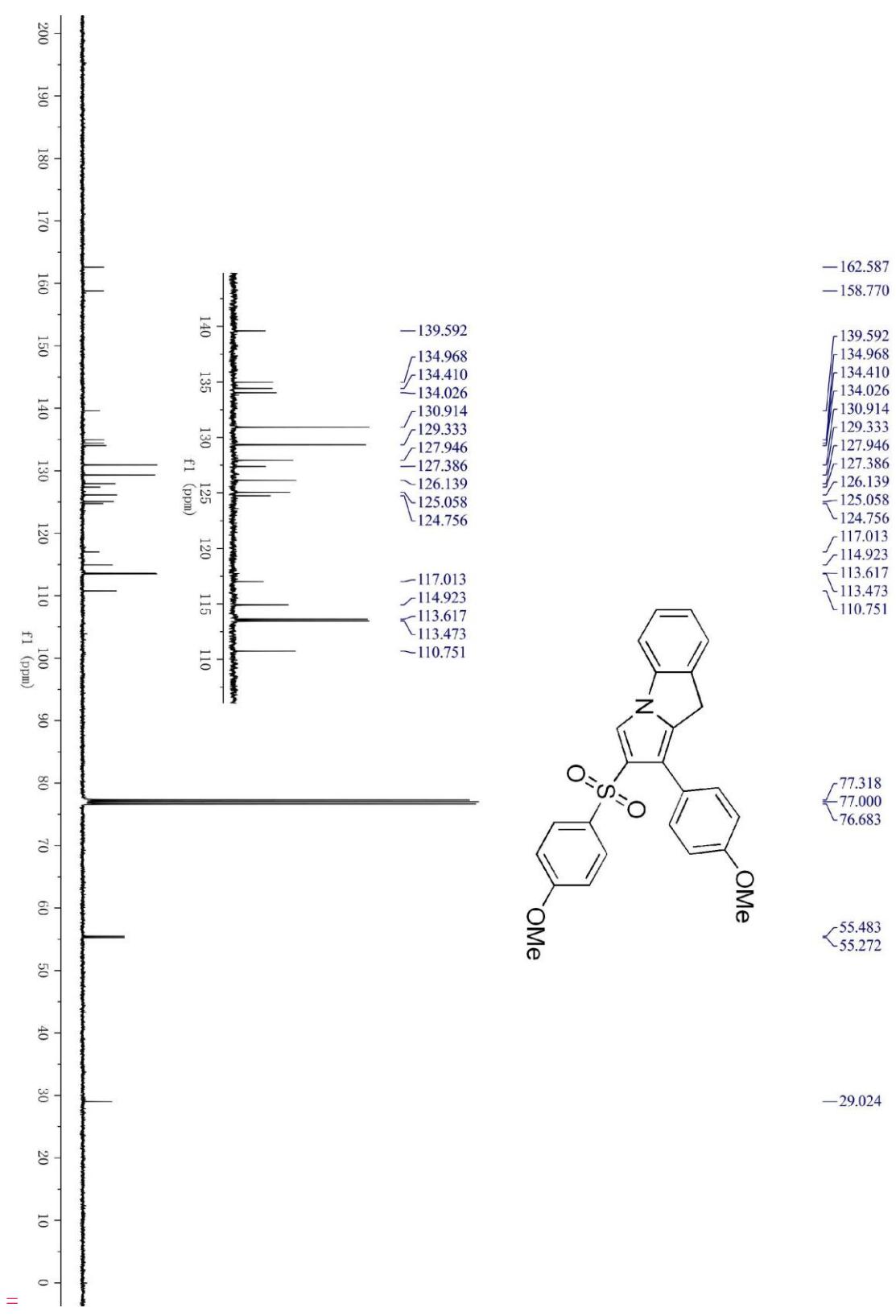
2-((4-Methoxyphenyl)sulfonyl)-1-phenyl-9*H*-pyrrolo[1,2-*a*]indole (3aa)



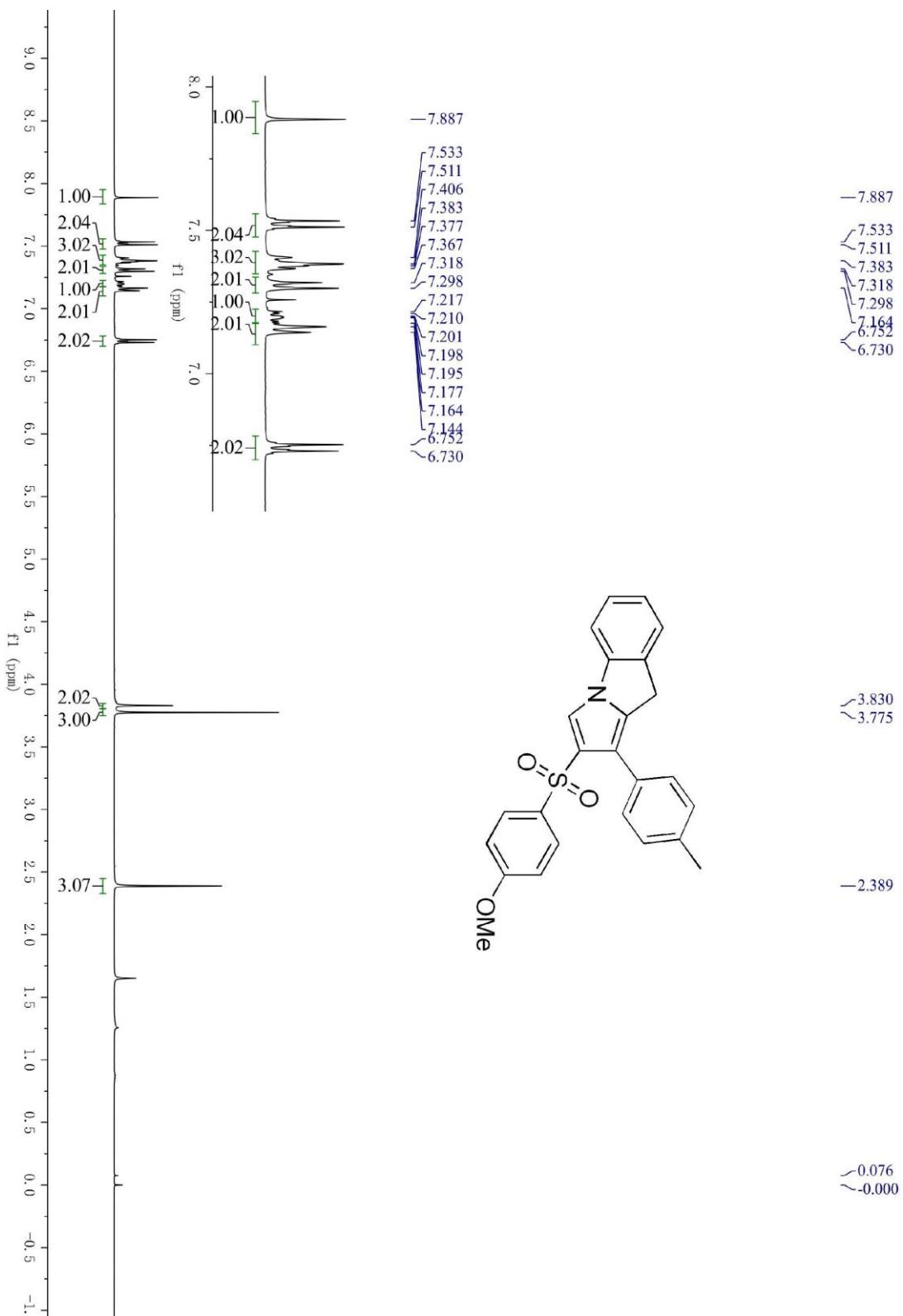


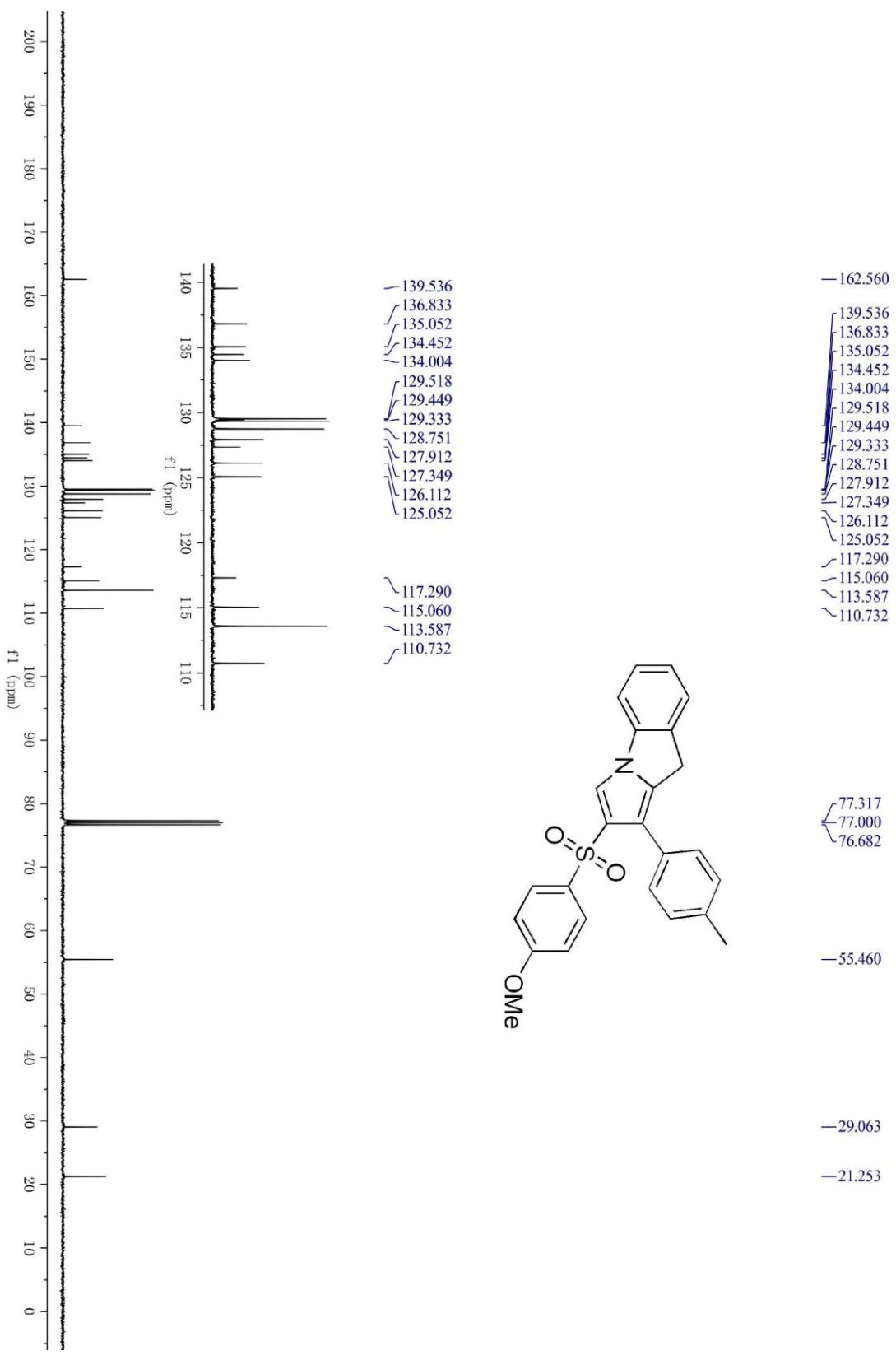
1-(4-Methoxyphenyl)-2-((4-methoxyphenyl)sulfonyl)-9*H*-pyrrolo[1,2-*a*]indole (3ba)



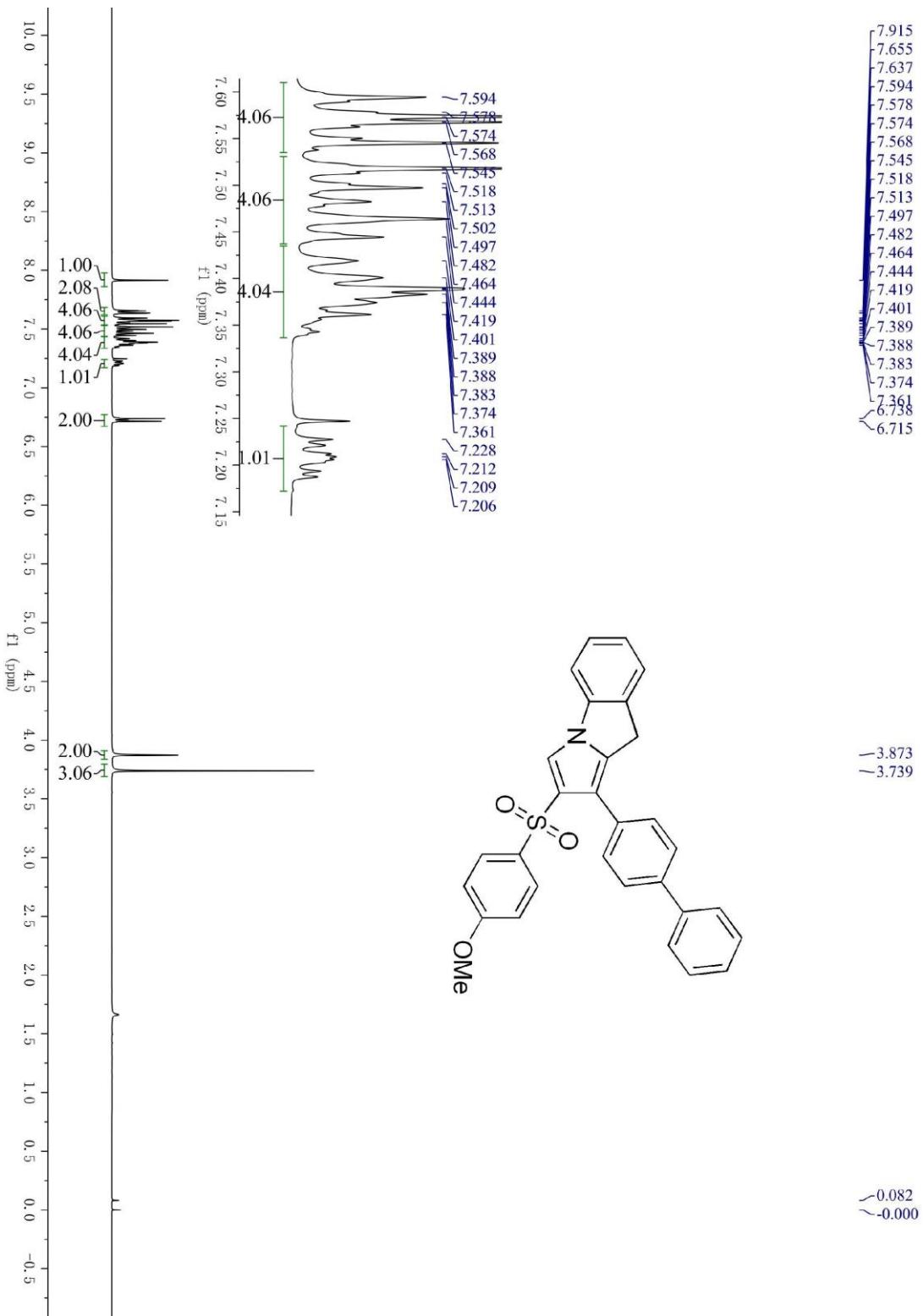


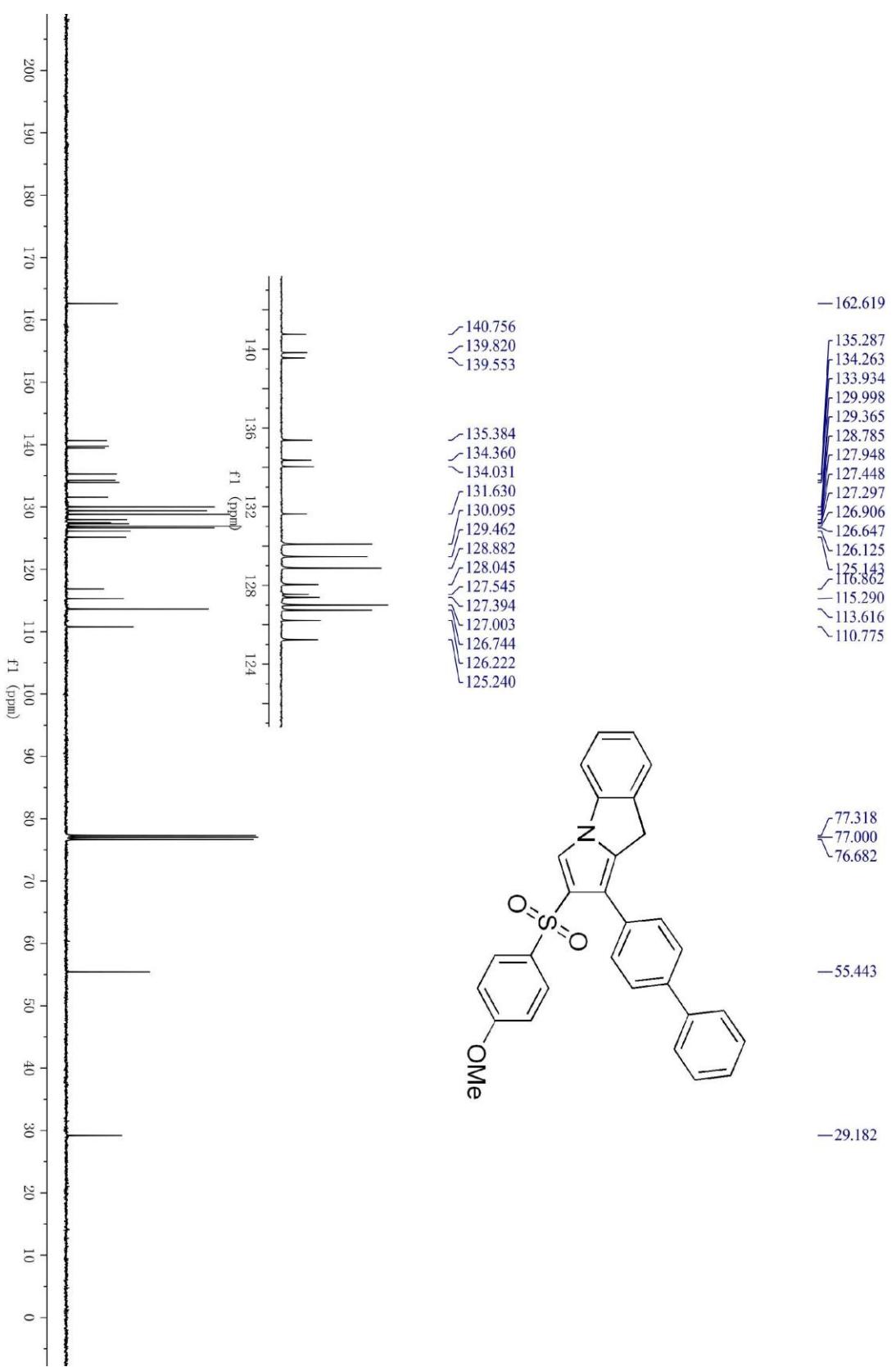
2-((4-Methoxyphenyl)sulfonyl)-1-(p-tolyl)-9*H*-pyrrolo[1,2-*a*]indole (3ca)



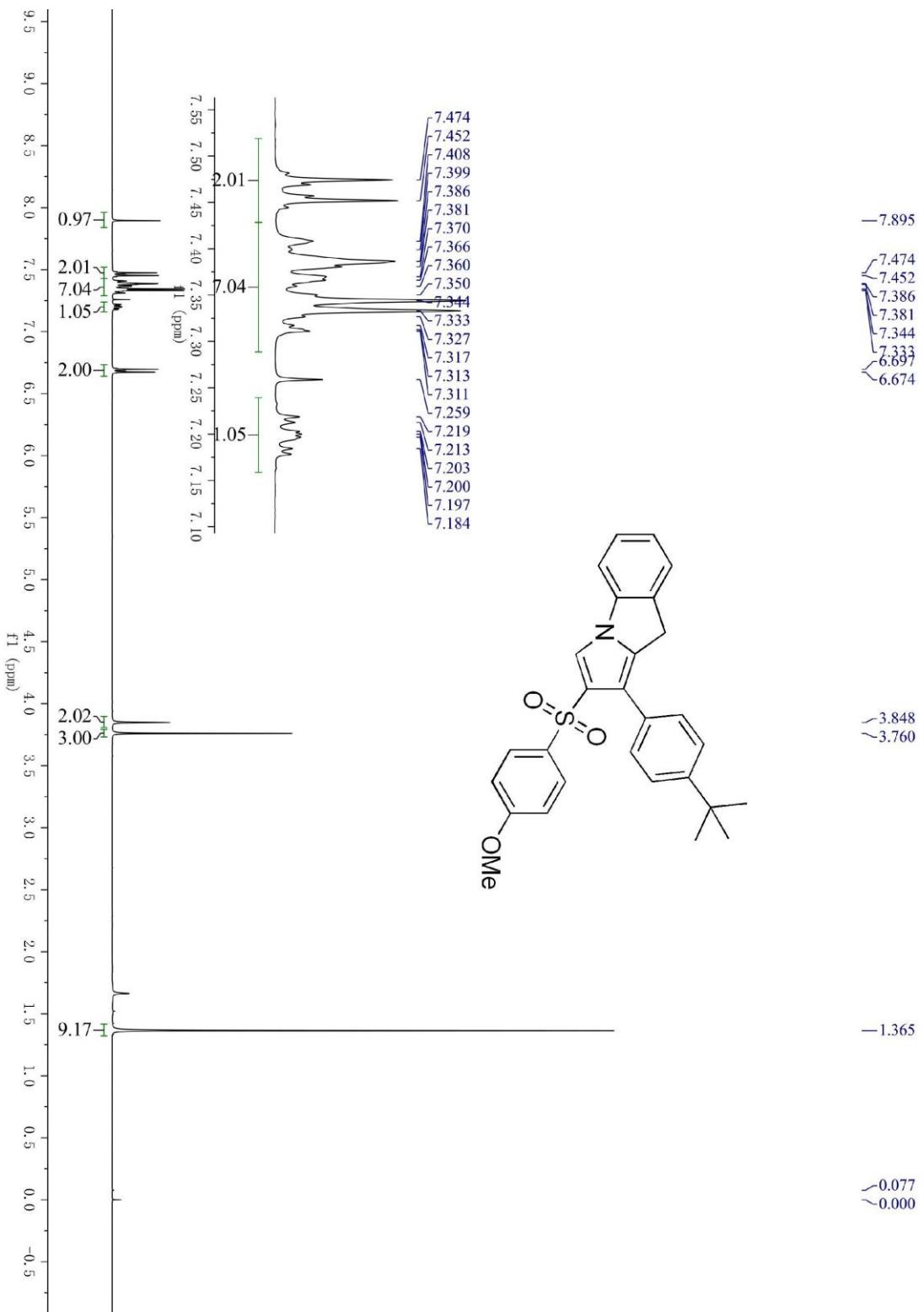


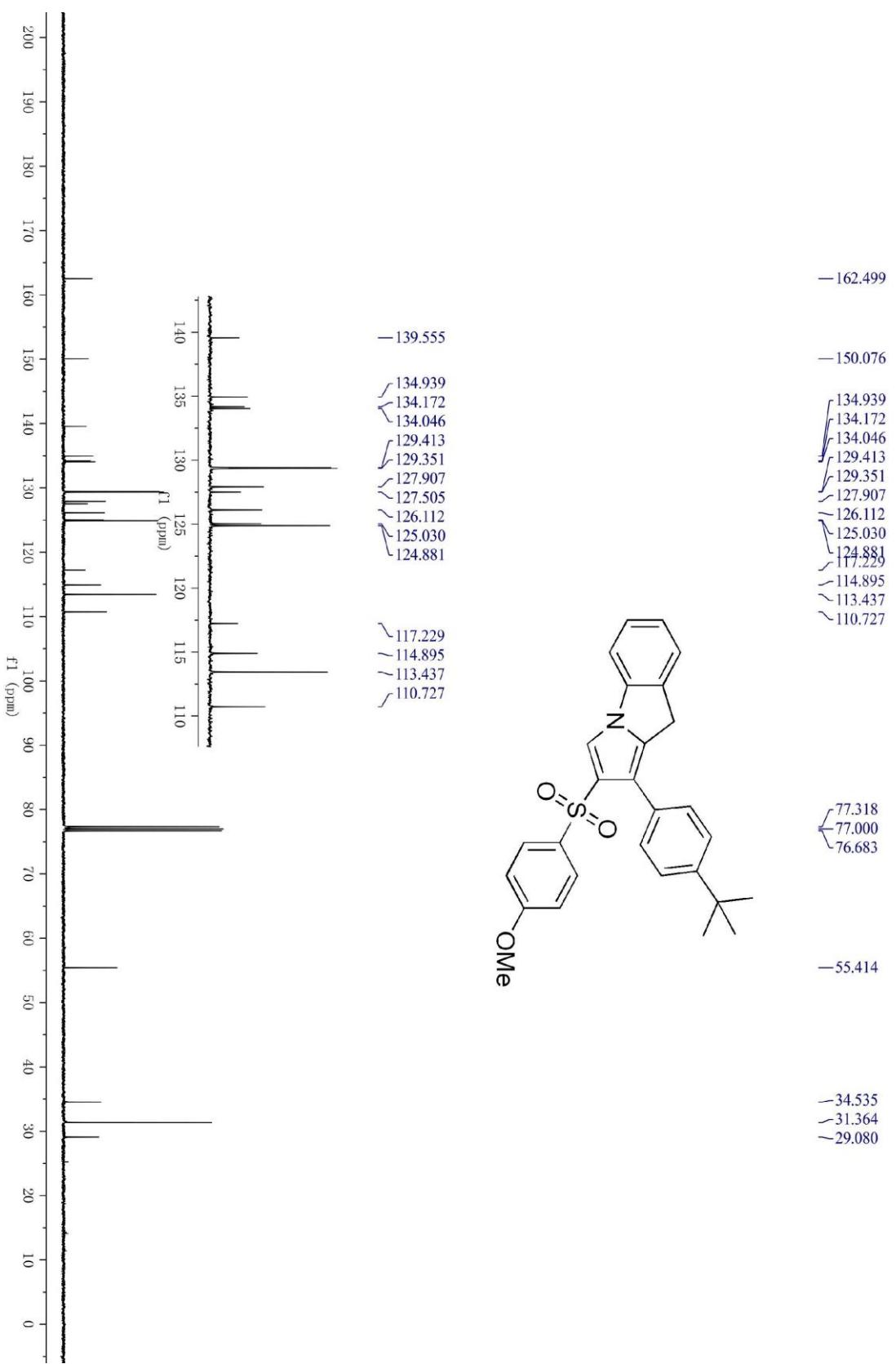
1-([1,1'-Biphenyl]-4-yl)-2-((4-methoxyphenyl)sulfonyl)-9*H*-pyrrolo[1,2-*a*]indole (3da)



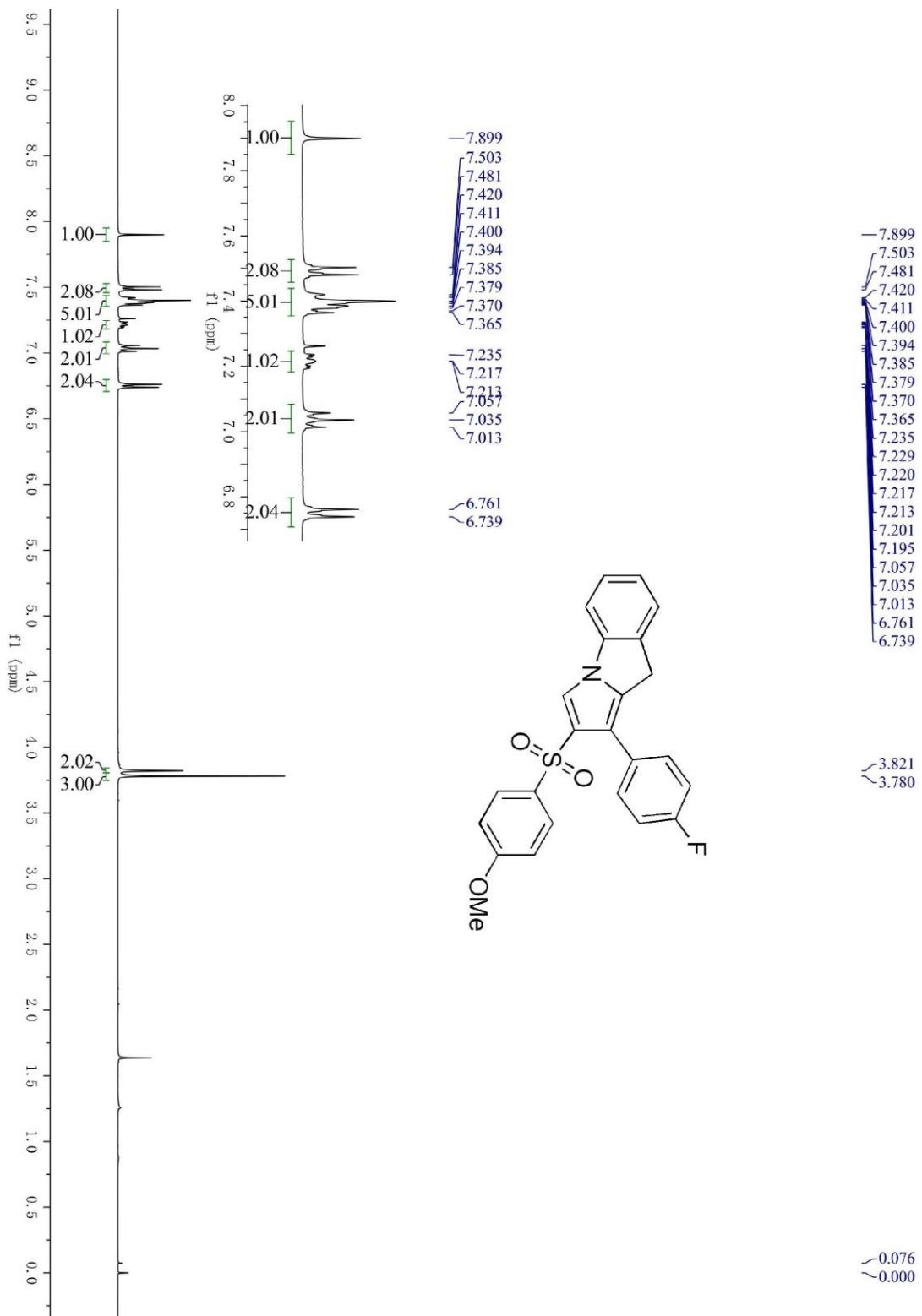


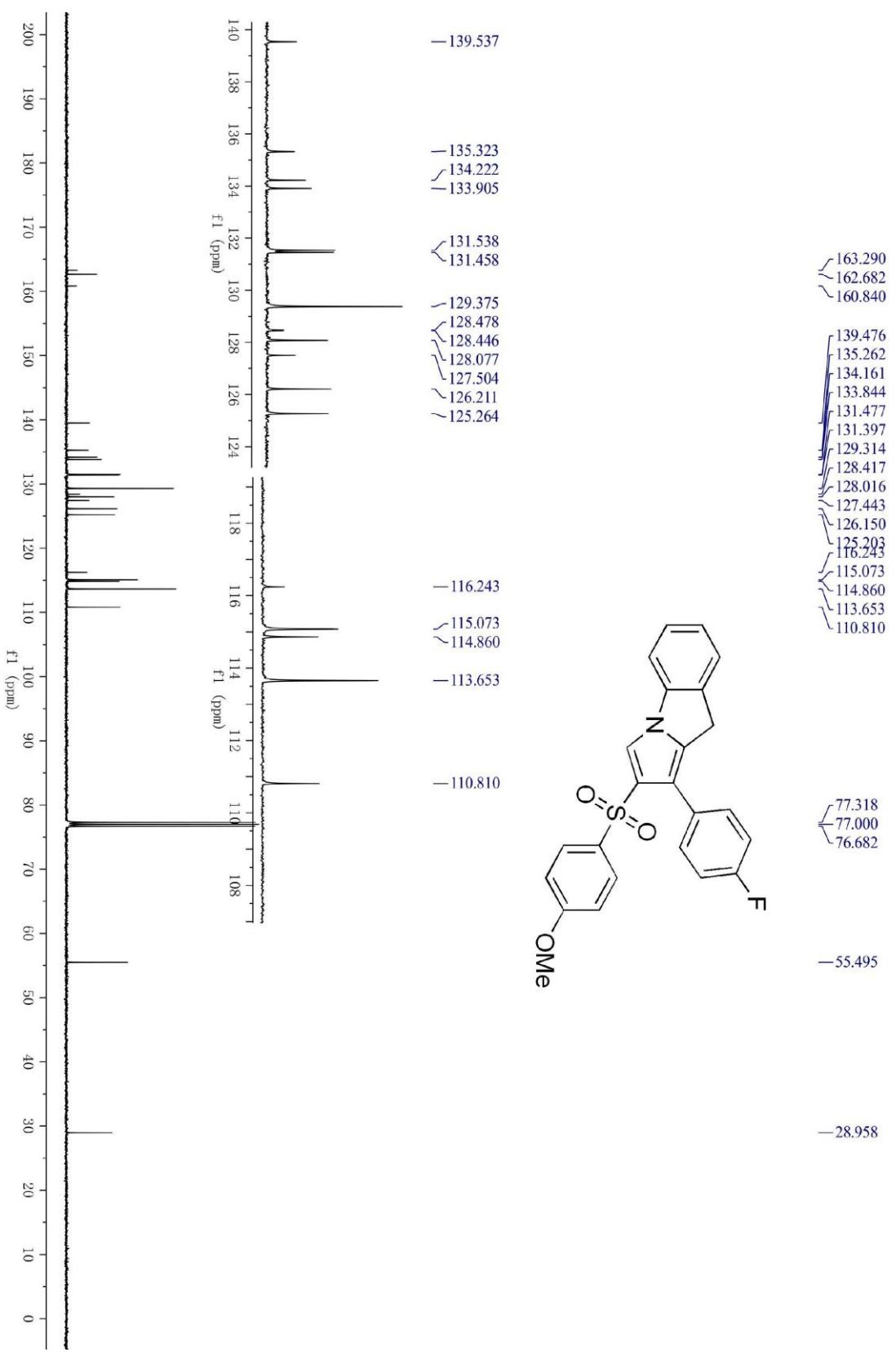
1-(4-(*tert*-Butyl)phenyl)-2-((4-methoxyphenyl)sulfonyl)-9*H*-pyrrolo[1,2-*a*]indole (3ea)

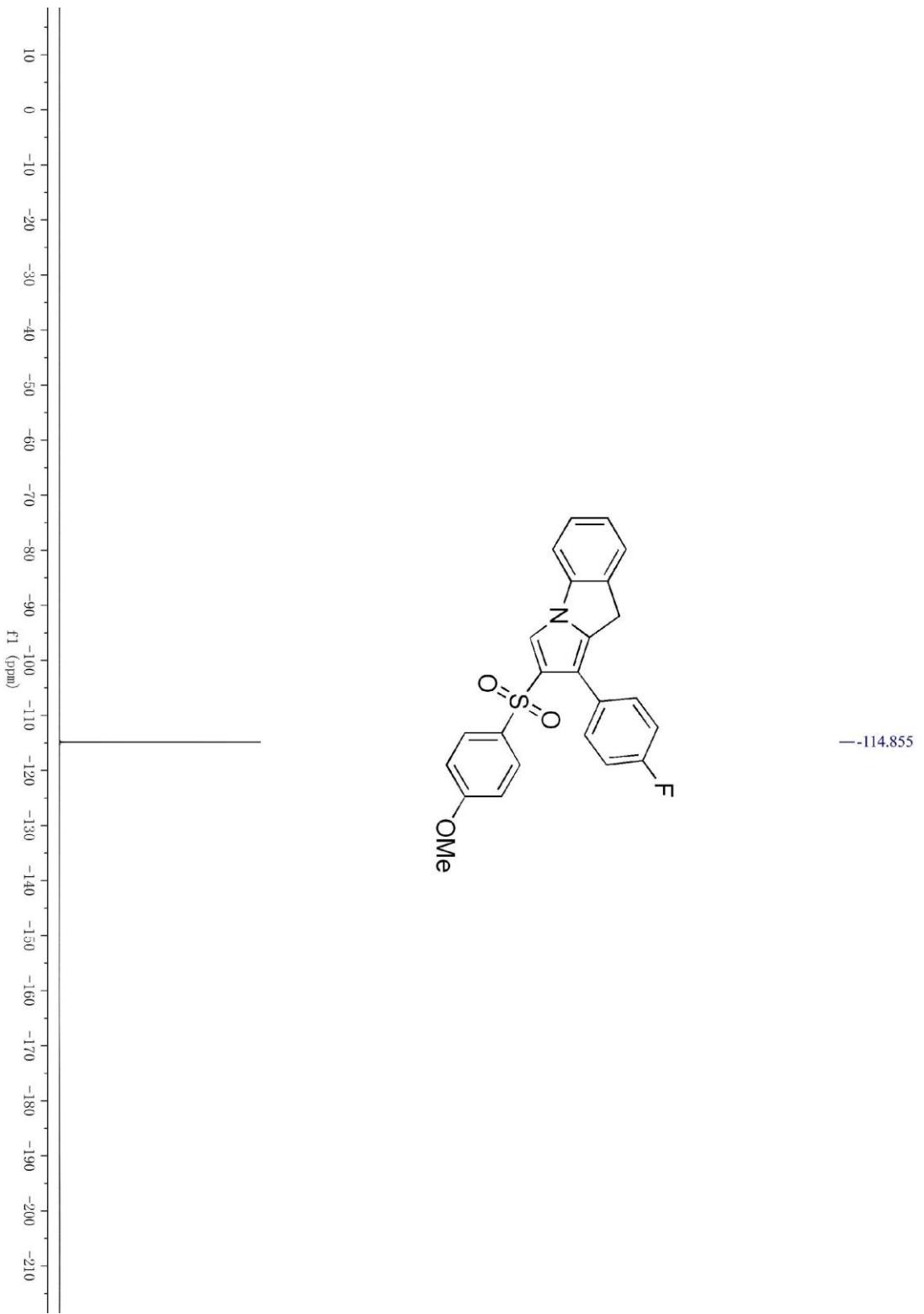




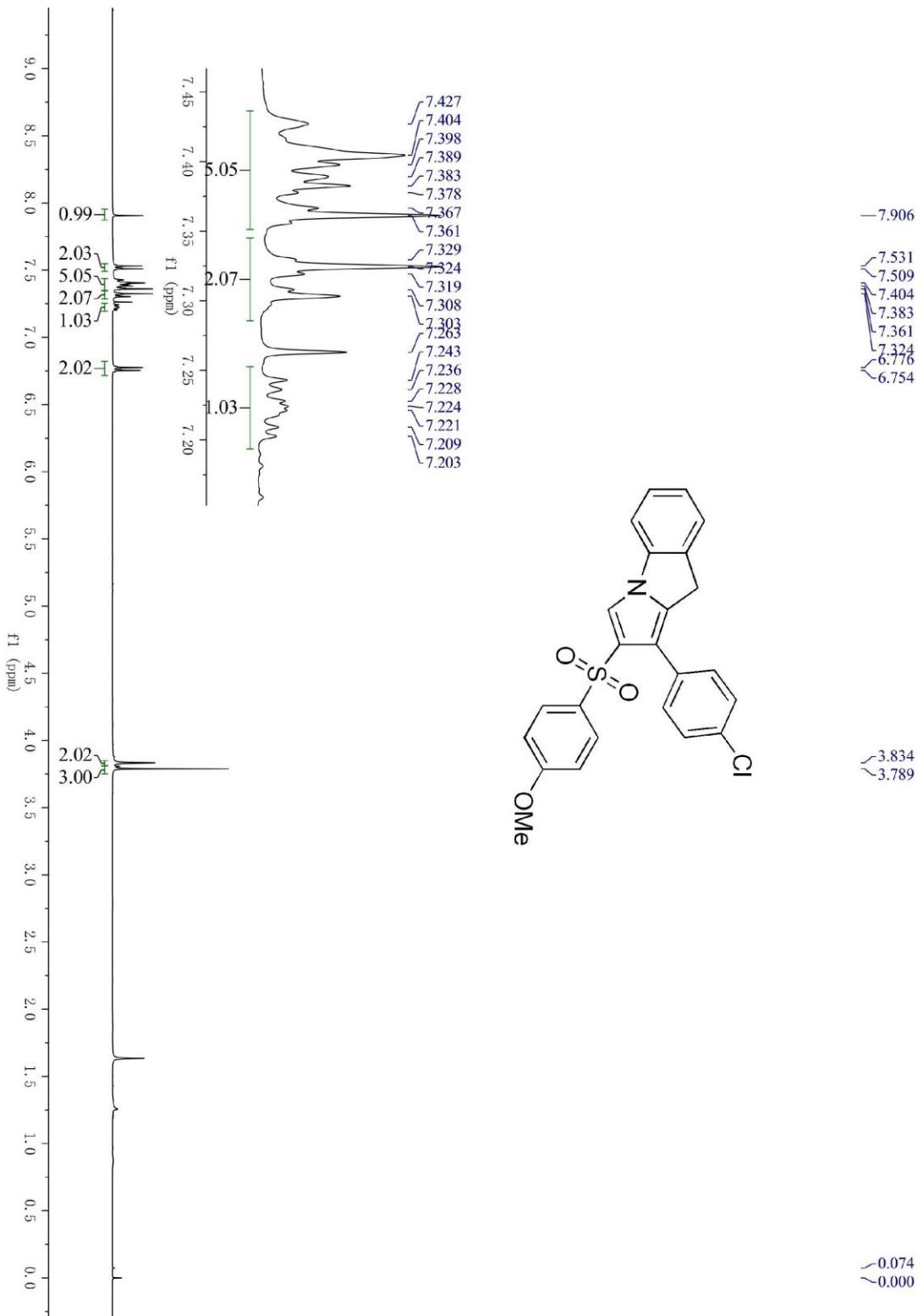
1-(4-Fluorophenyl)-2-((4-methoxyphenyl)sulfonyl)-9*H*-pyrrolo[1,2-*a*]indole (3fa)

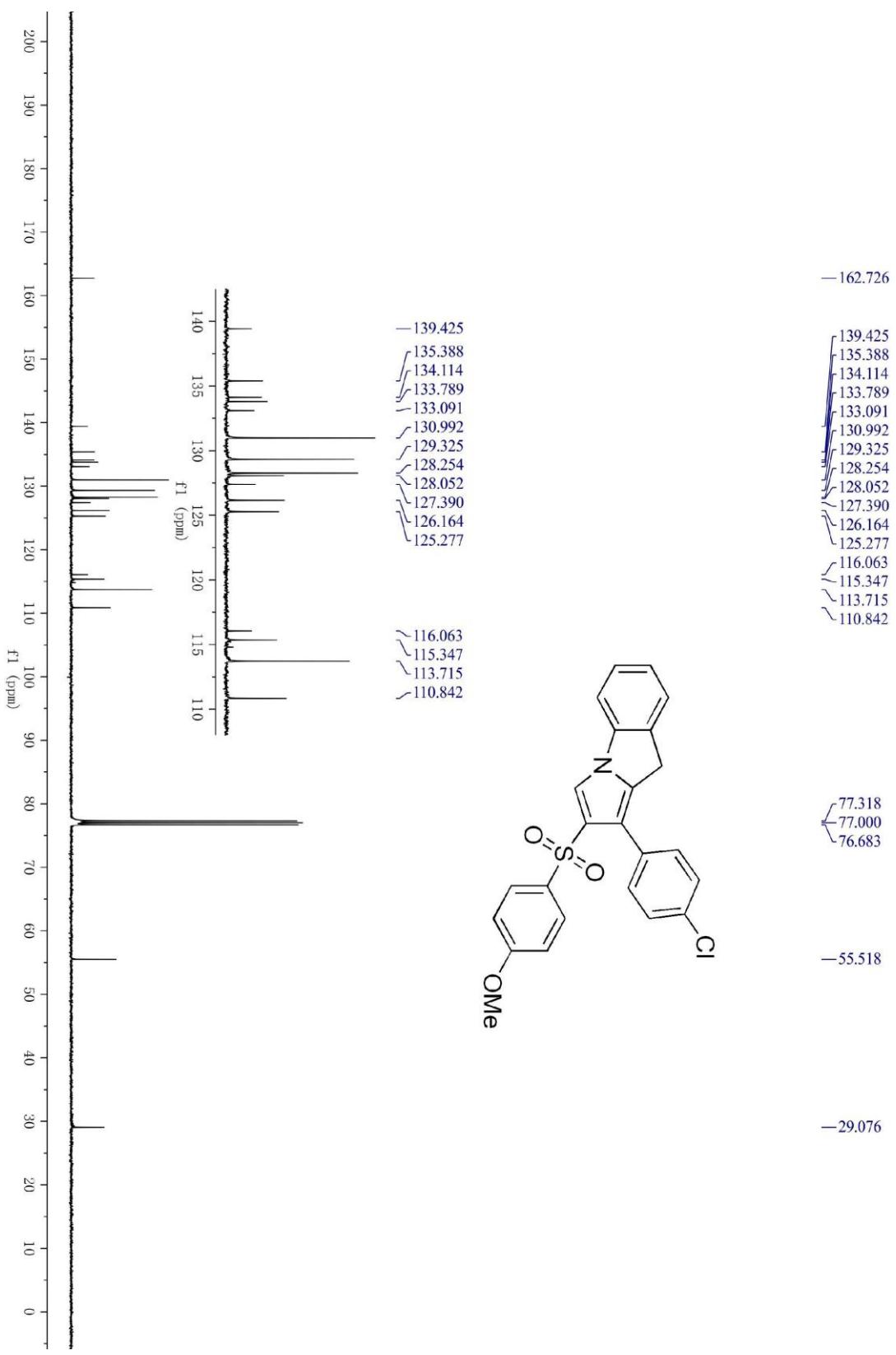




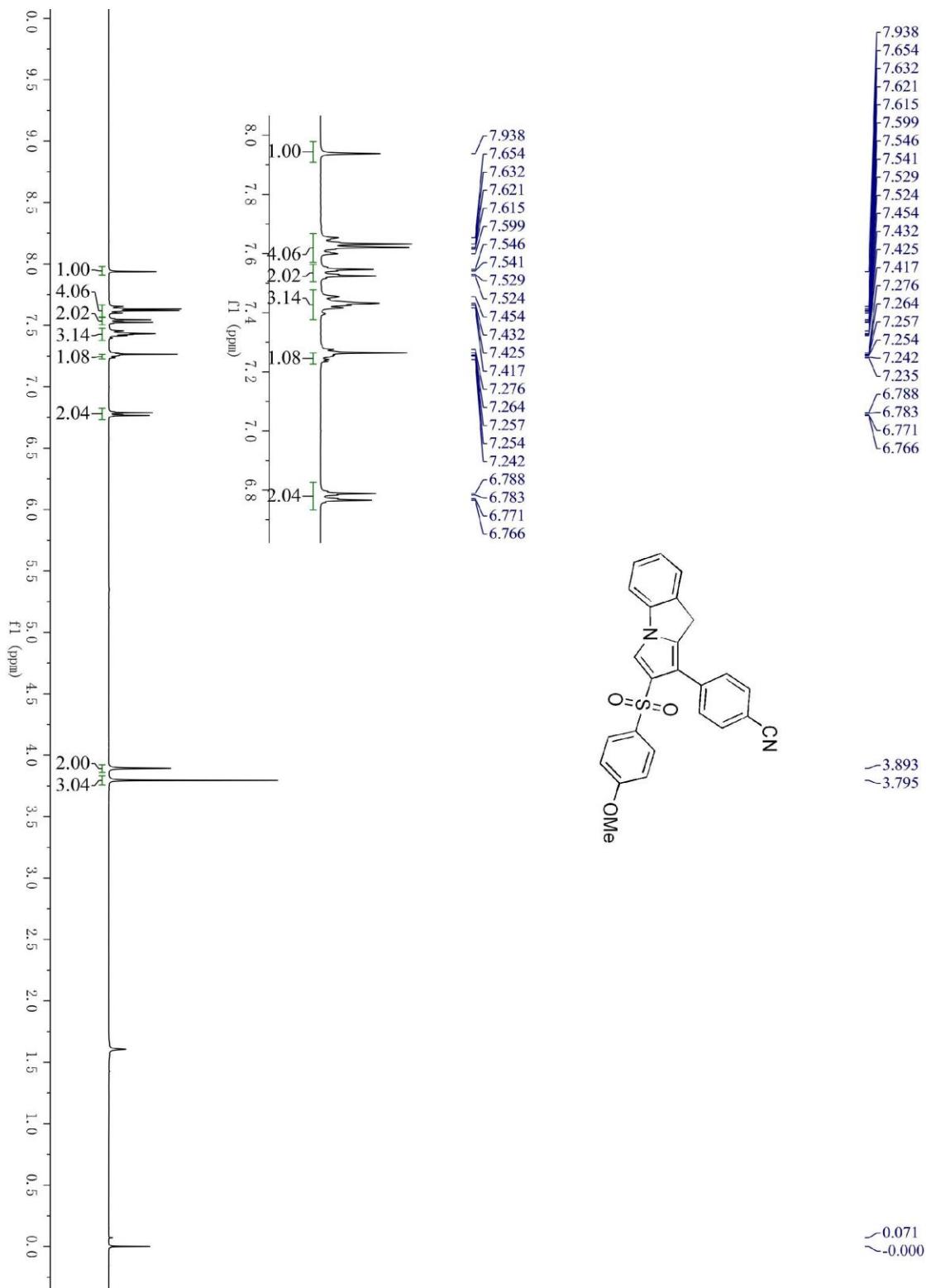


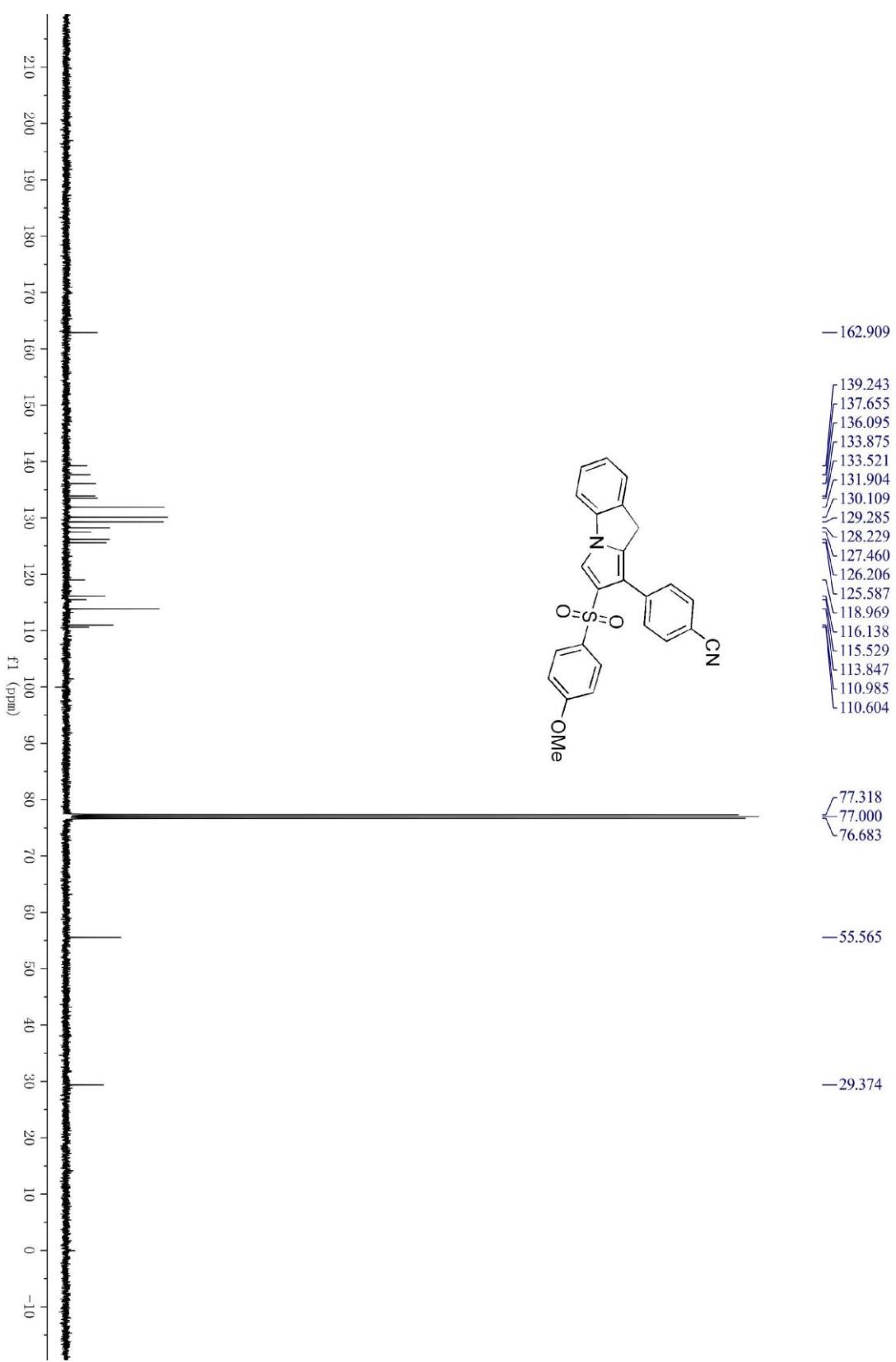
1-(4-Chlorophenyl)-2-((4-methoxyphenyl)sulfonyl)-9*H*-pyrrolo[1,2-*a*]indole (3ga)



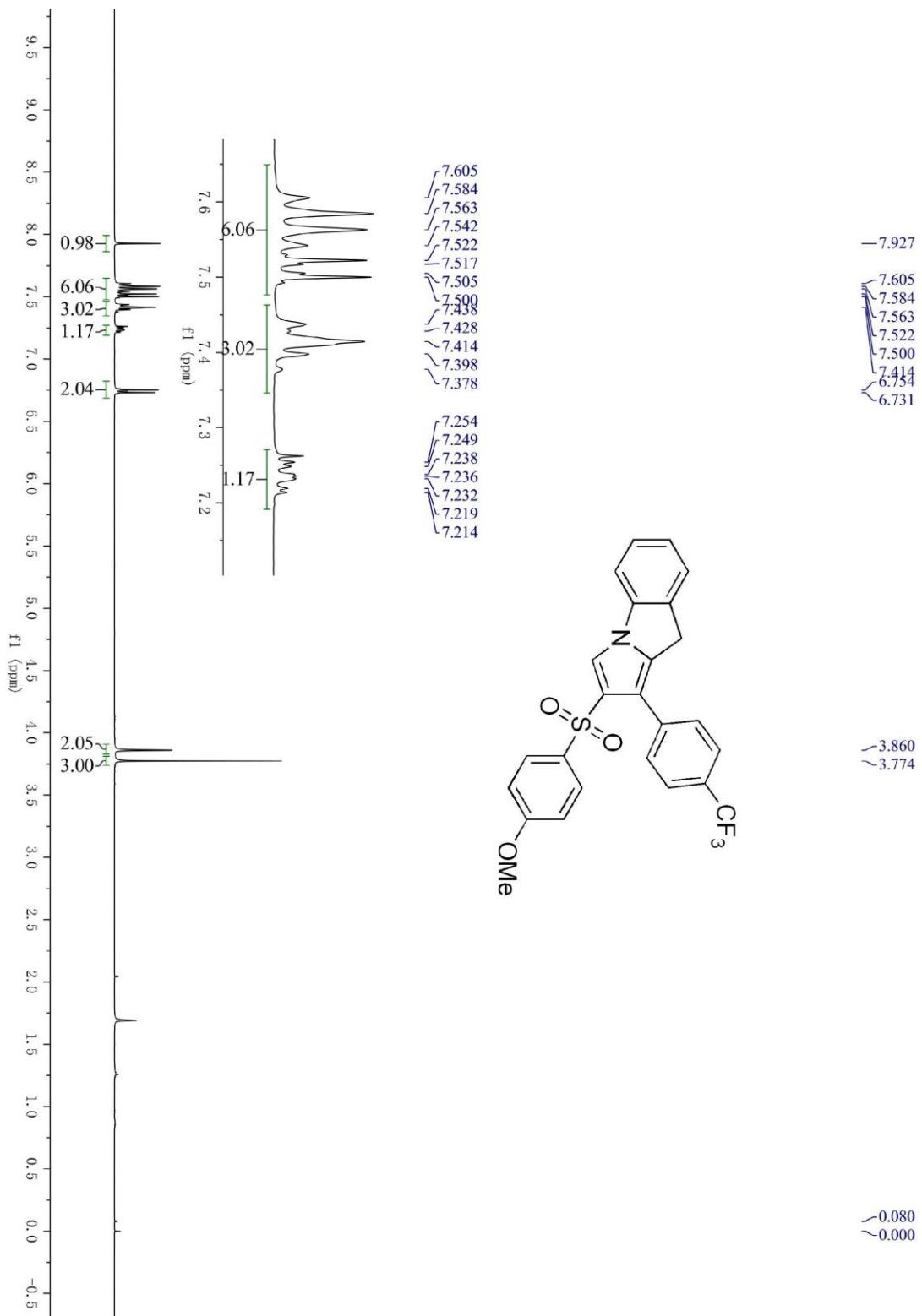


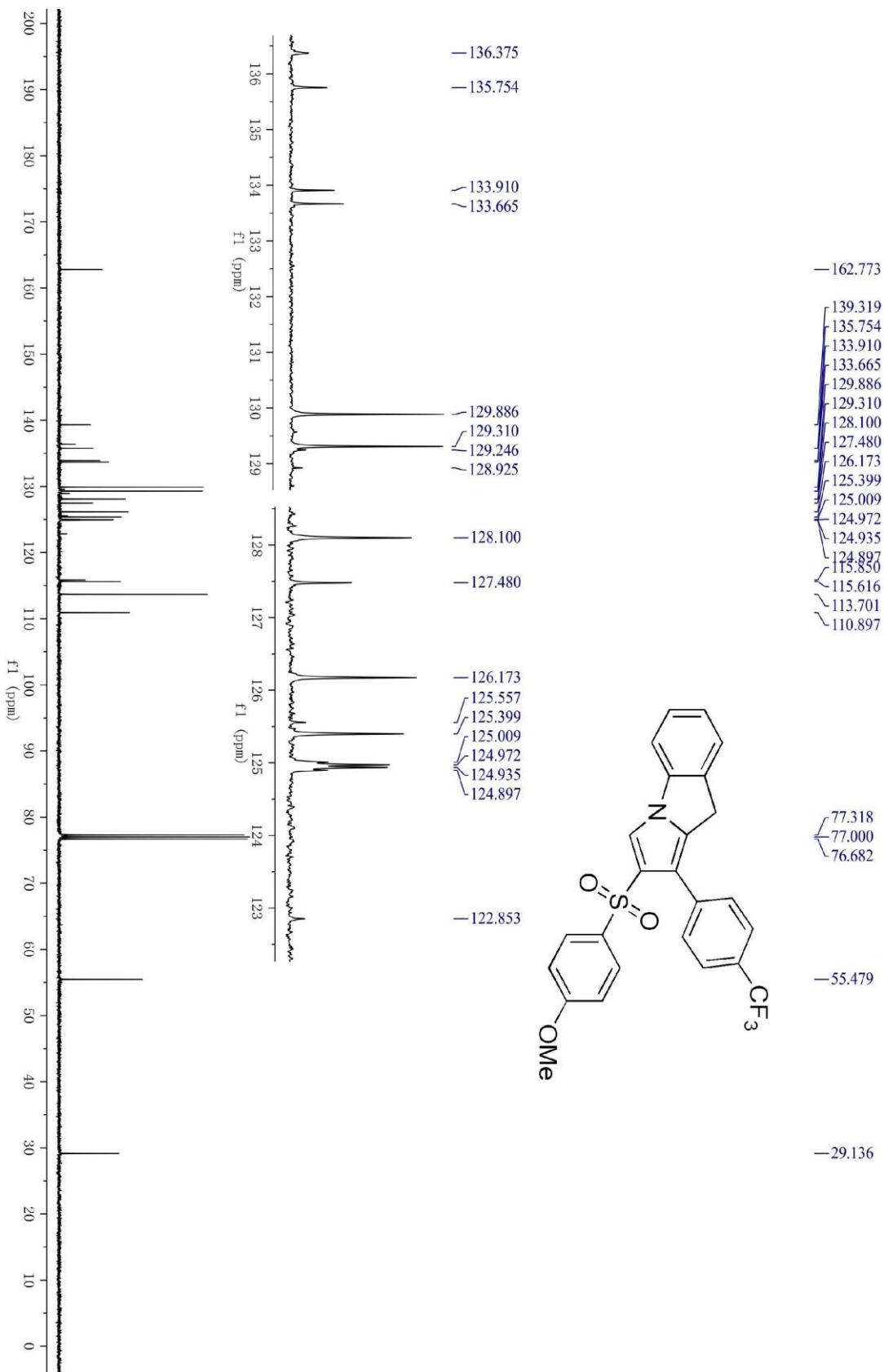
4-((2-((4-methoxyphenyl)sulfonyl)-9H-pyrrolo[1,2-a]indol-1-yl)benzonitrile (3ha)

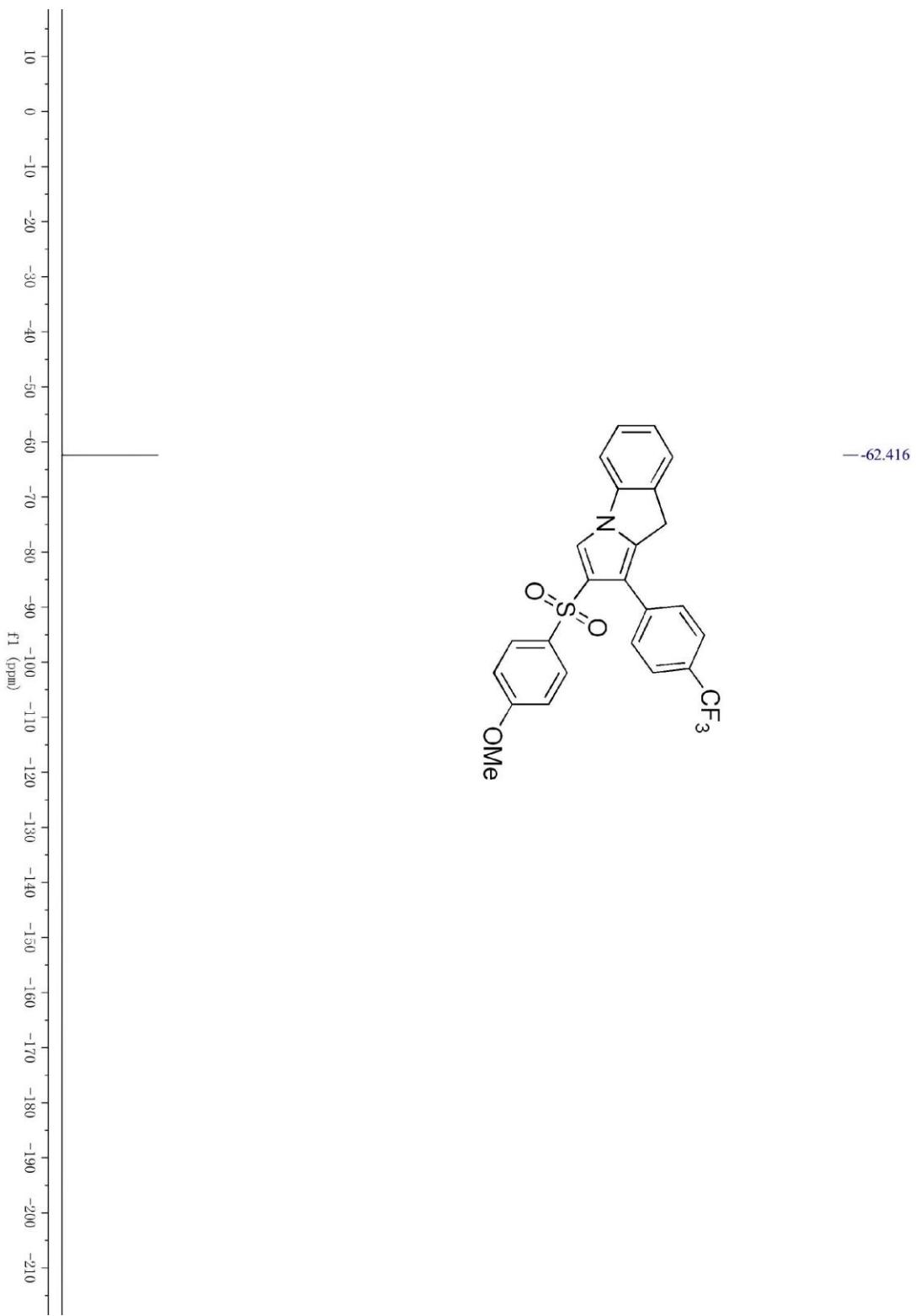




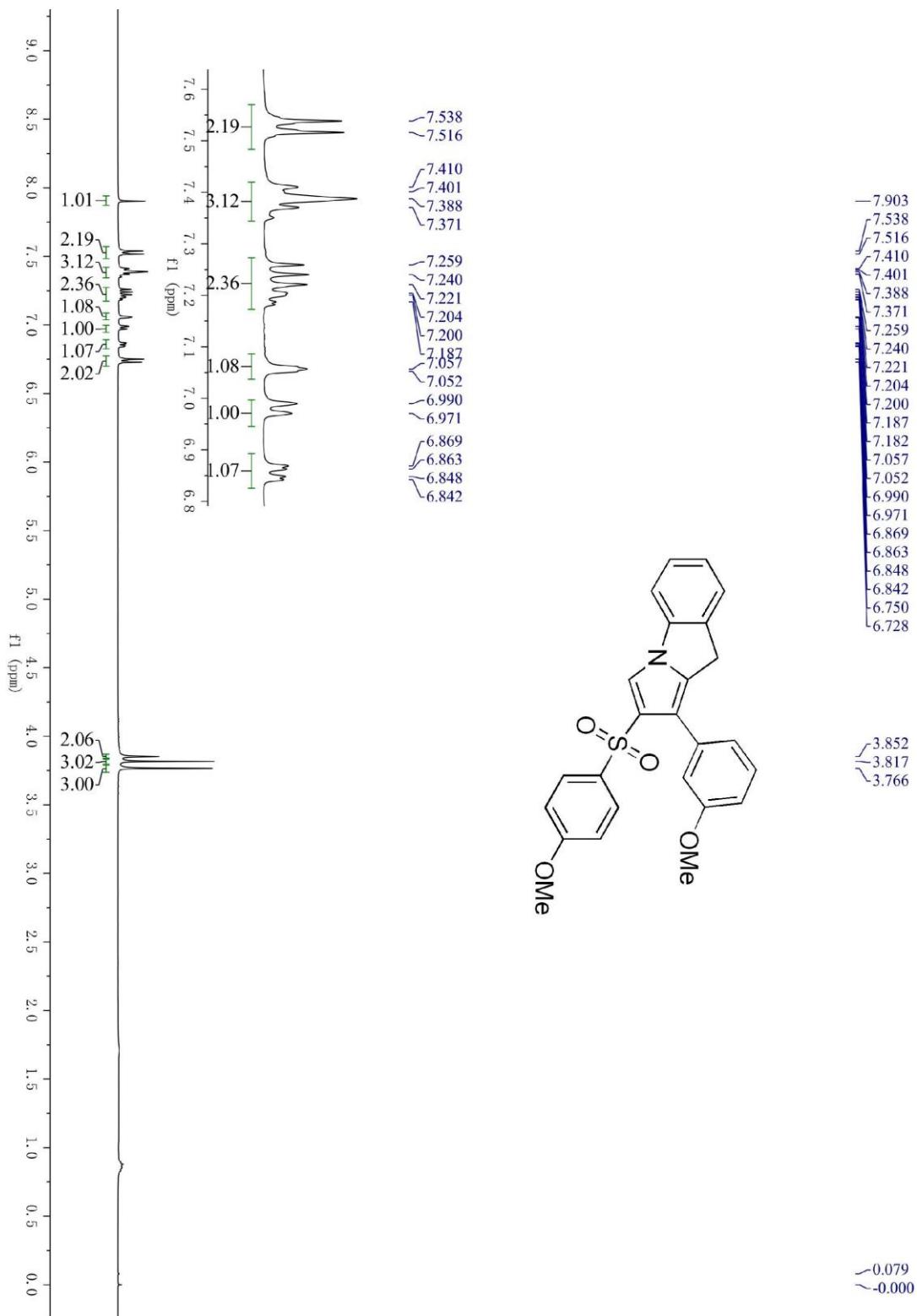
2-((4-Methoxyphenyl)sulfonyl)-1-(4-(trifluoromethyl)phenyl)-9*H*-pyrrolo[1,2-*a*]indole (3ia)

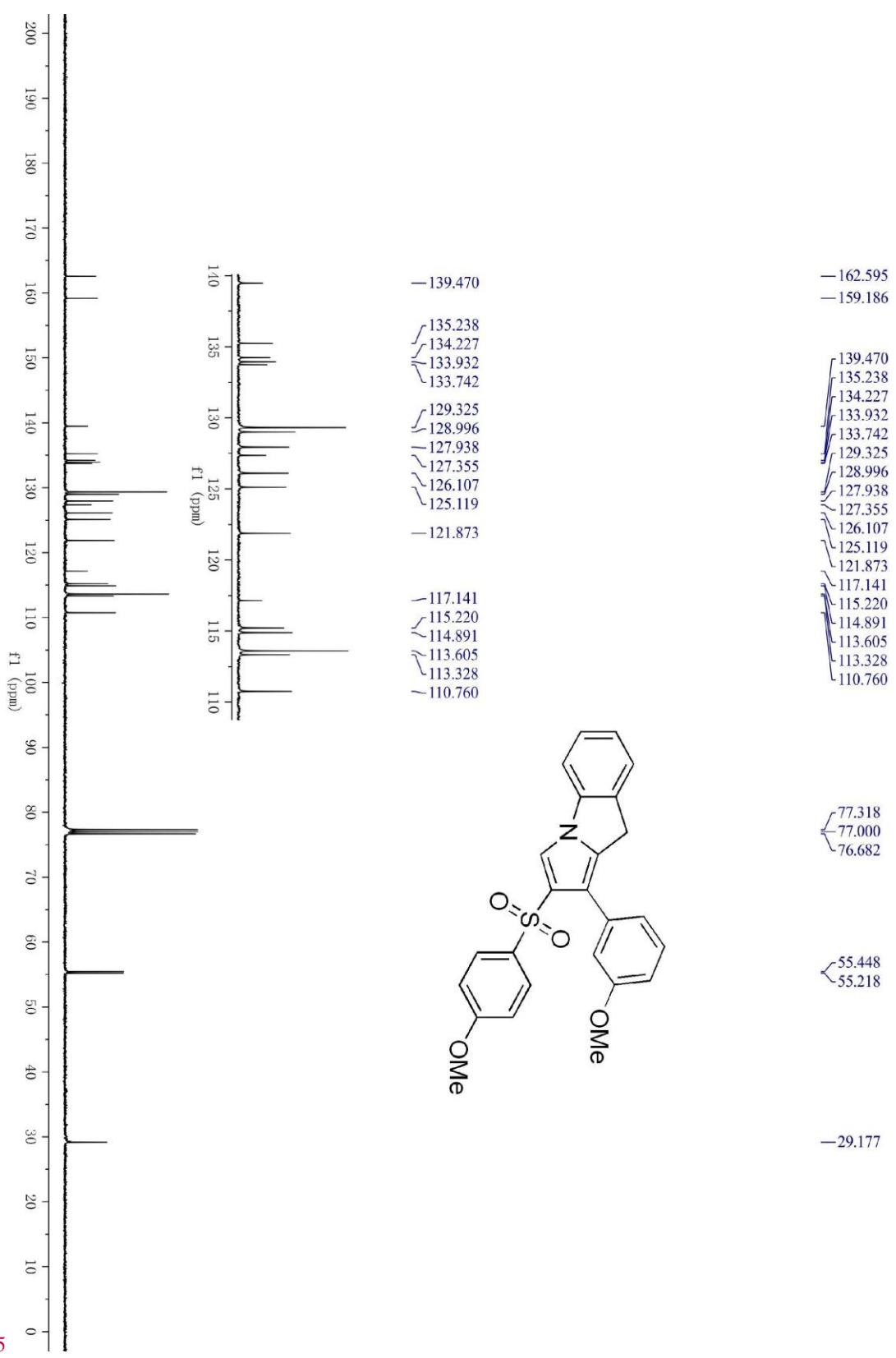






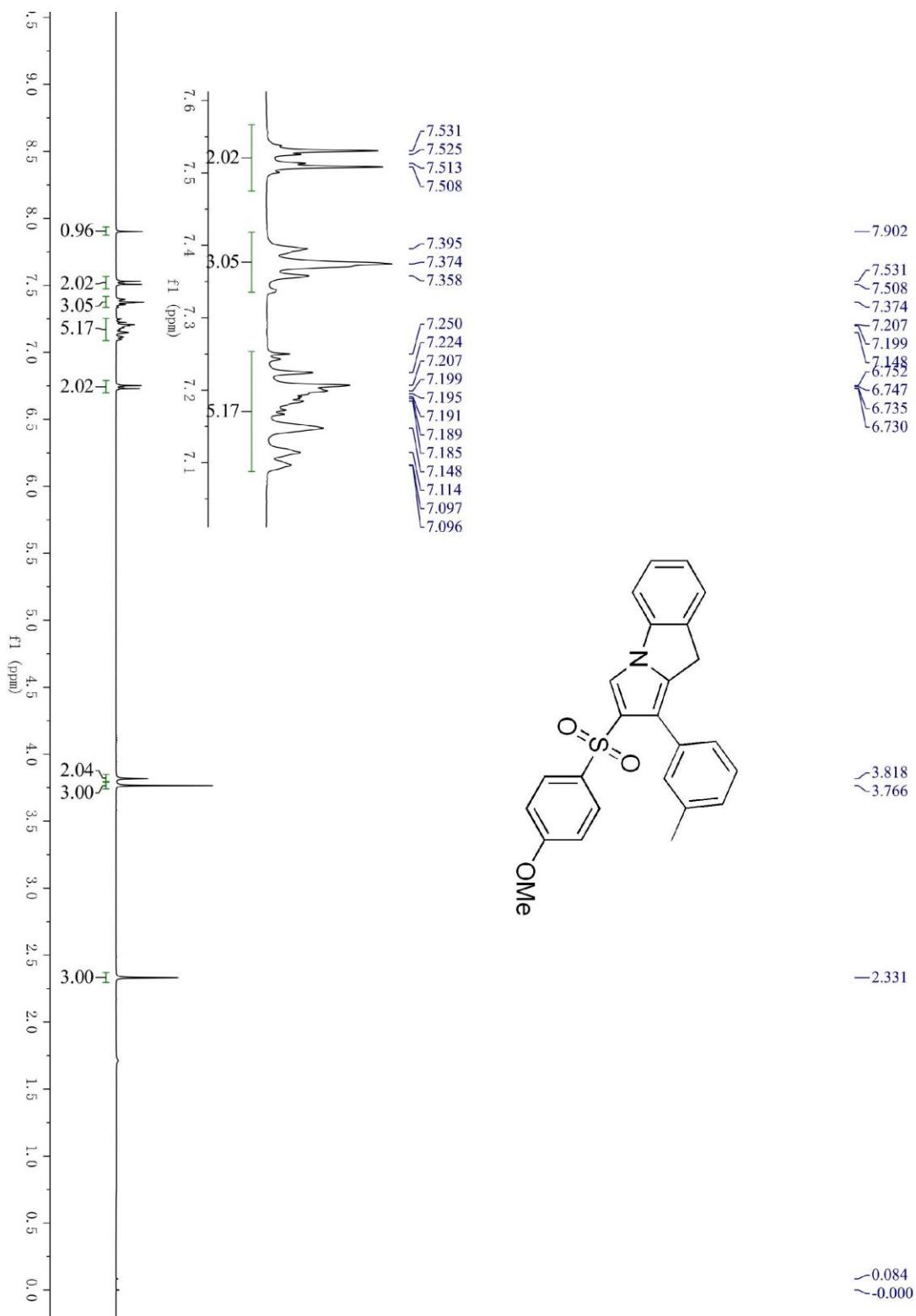
1-(3-Methoxyphenyl)-2-((4-methoxyphenyl)sulfonyl)-9*H*-pyrrolo[1,2-*a*]indole (3ka)

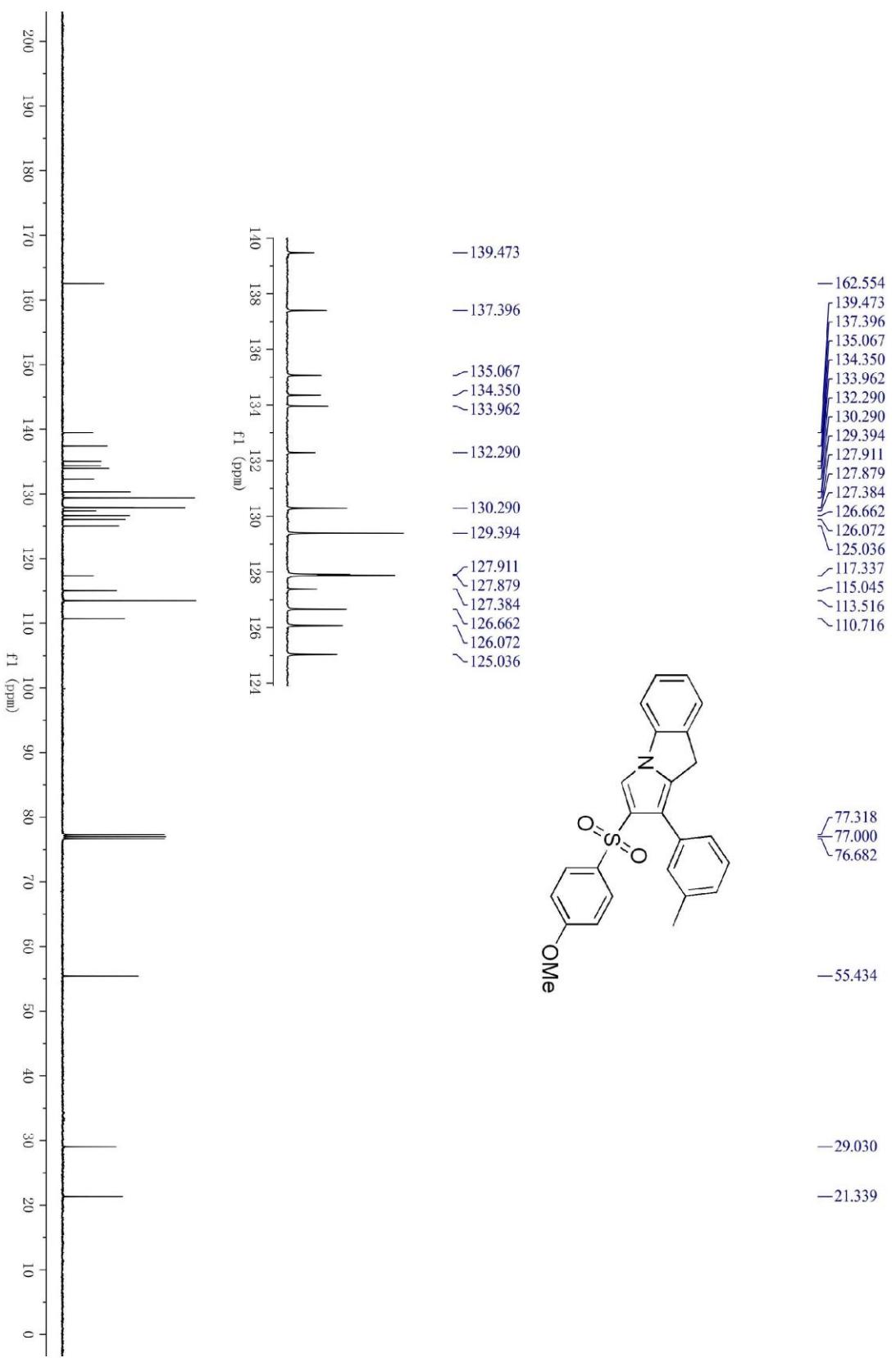




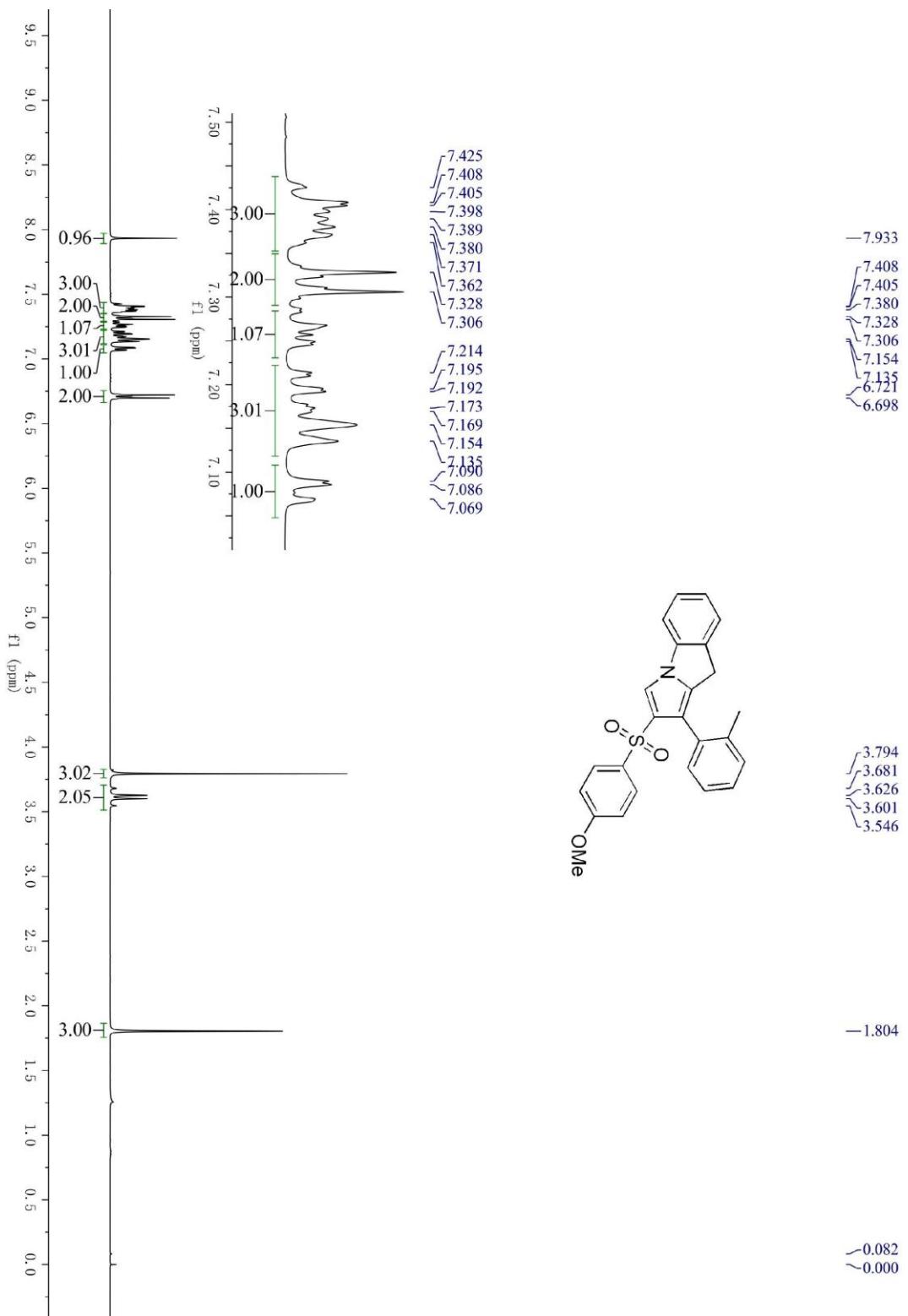
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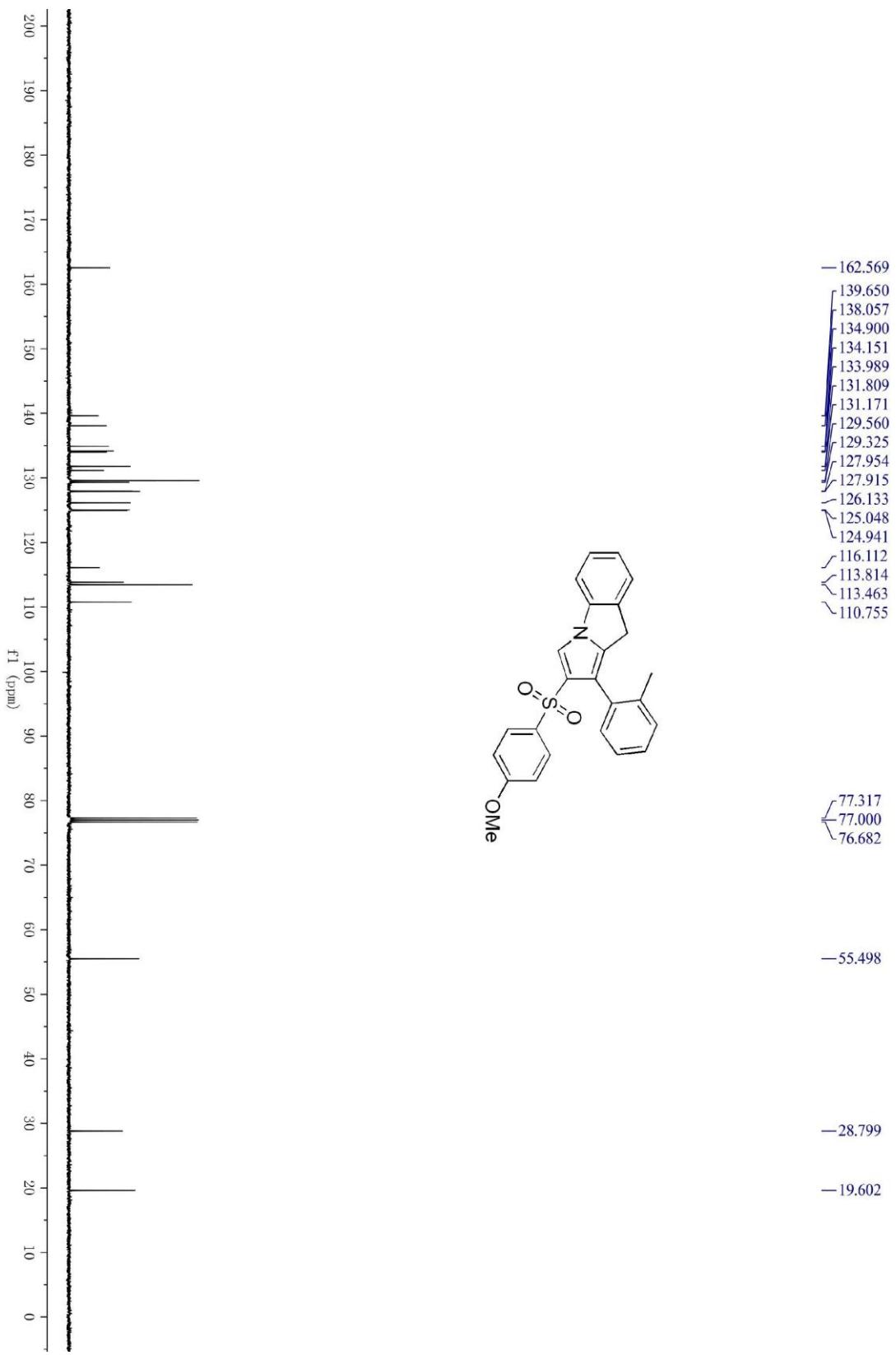
2-((4-Methoxyphenyl)sulfonyl)-1-(*m*-tolyl)-9*H*-pyrrolo[1,2-*a*]indole (3la)



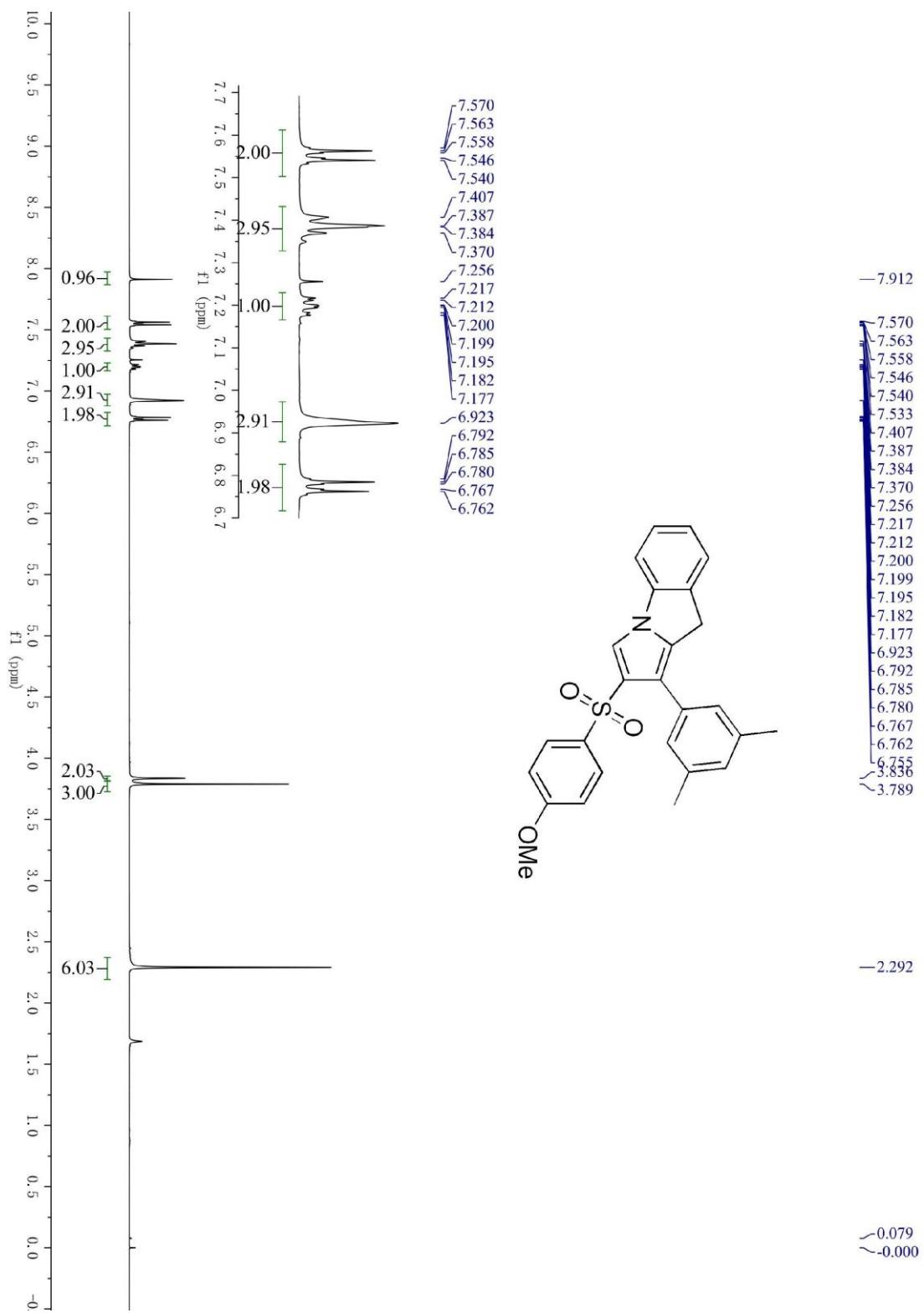


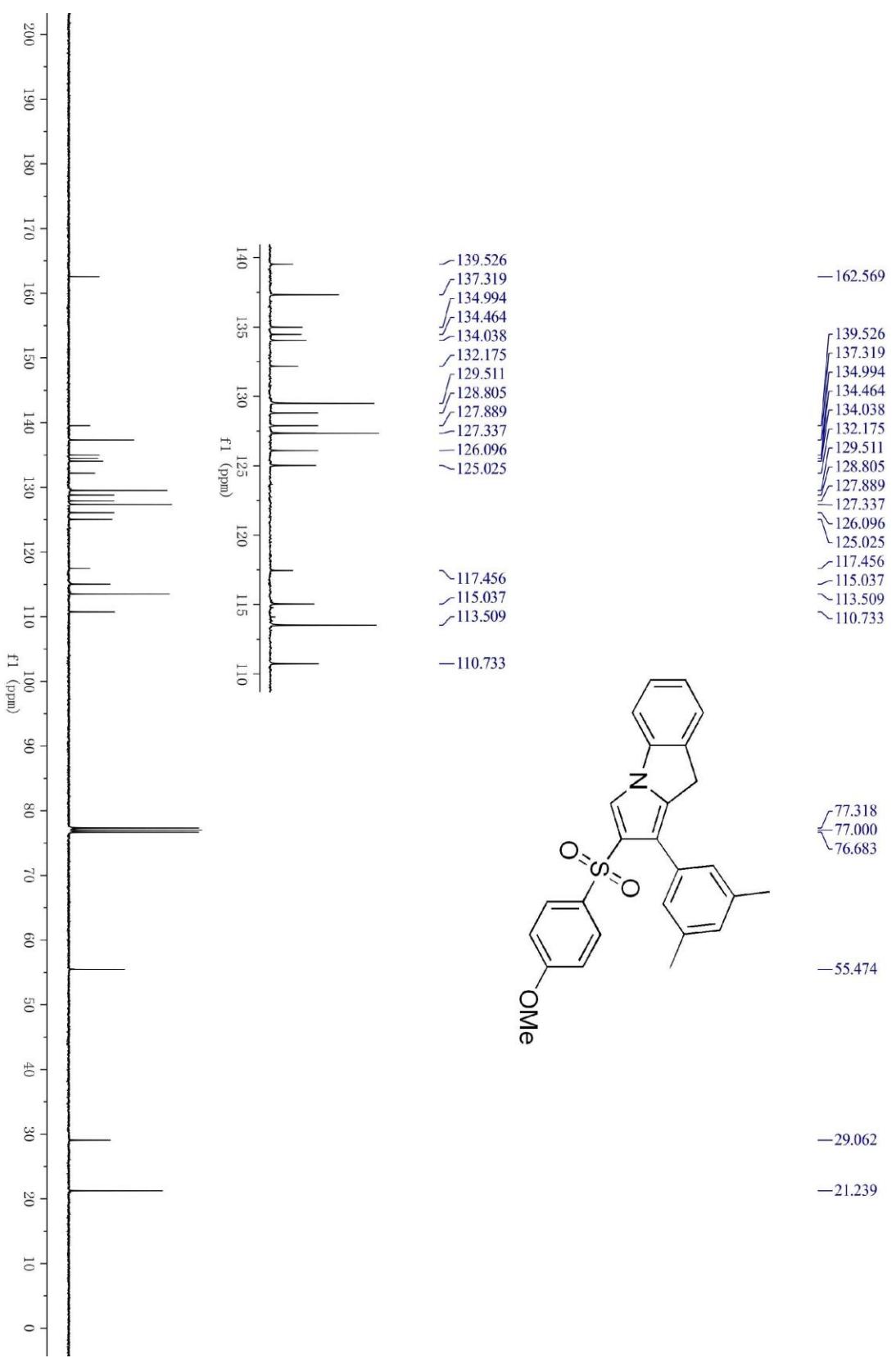
2-((4-Methoxyphenyl)sulfonyl)-1-(*o*-tolyl)-9*H*-pyrrolo[1,2-*a*]indole (3ma)



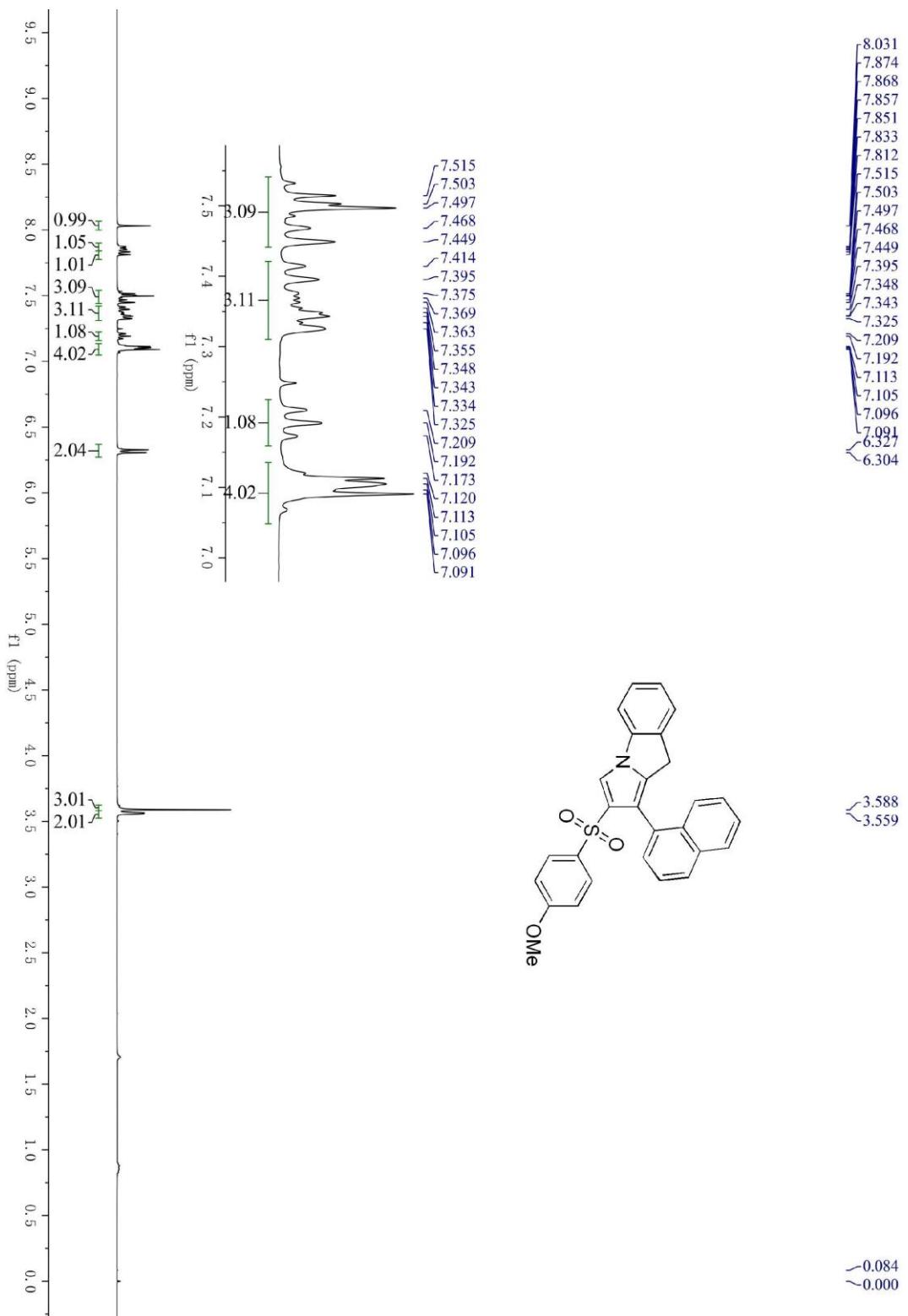


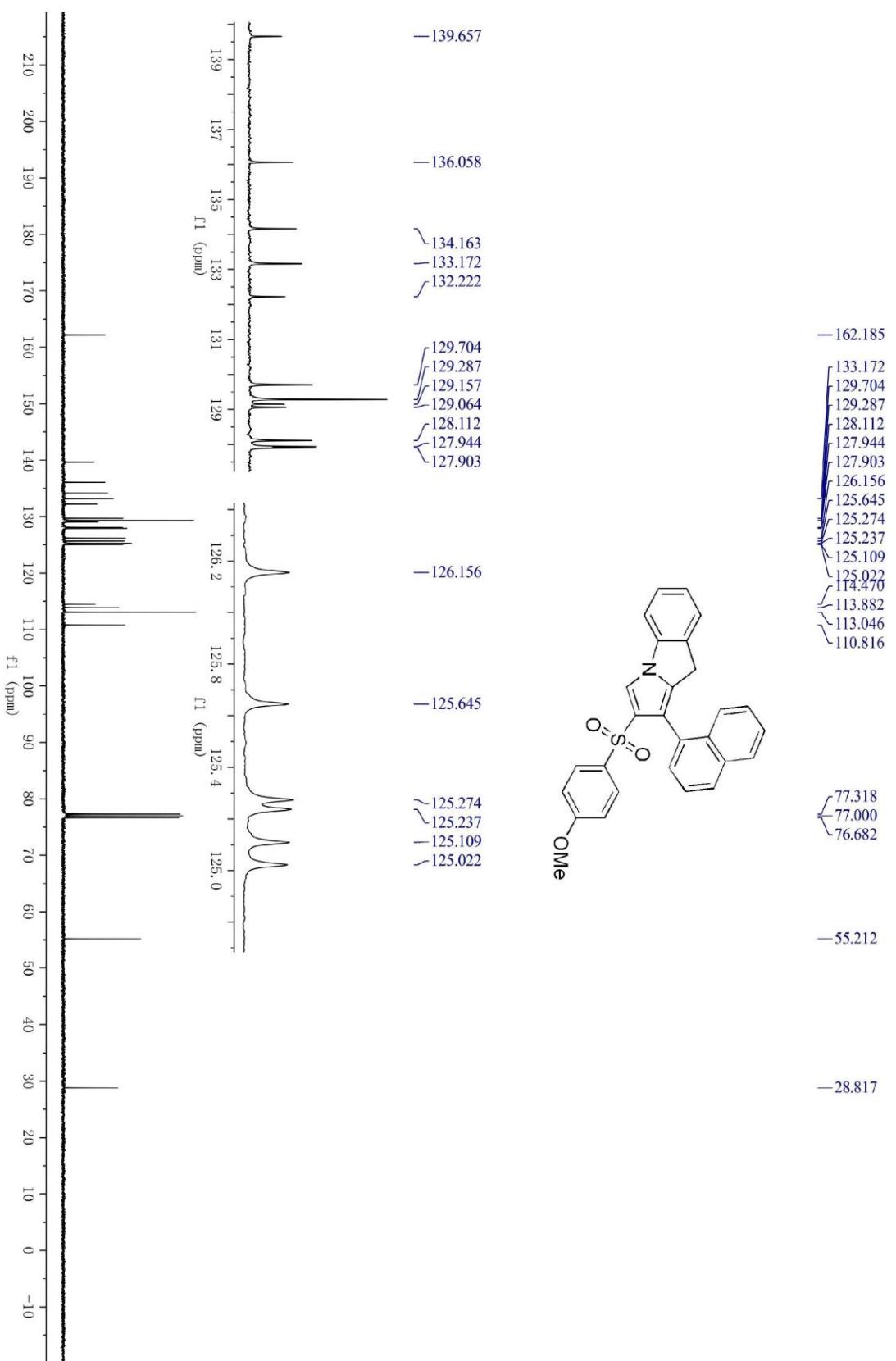
1-(3,5-Dimethylphenyl)-2-((4-methoxyphenyl)sulfonyl)-9*H*-pyrrolo[1,2-*a*]indole (3na)



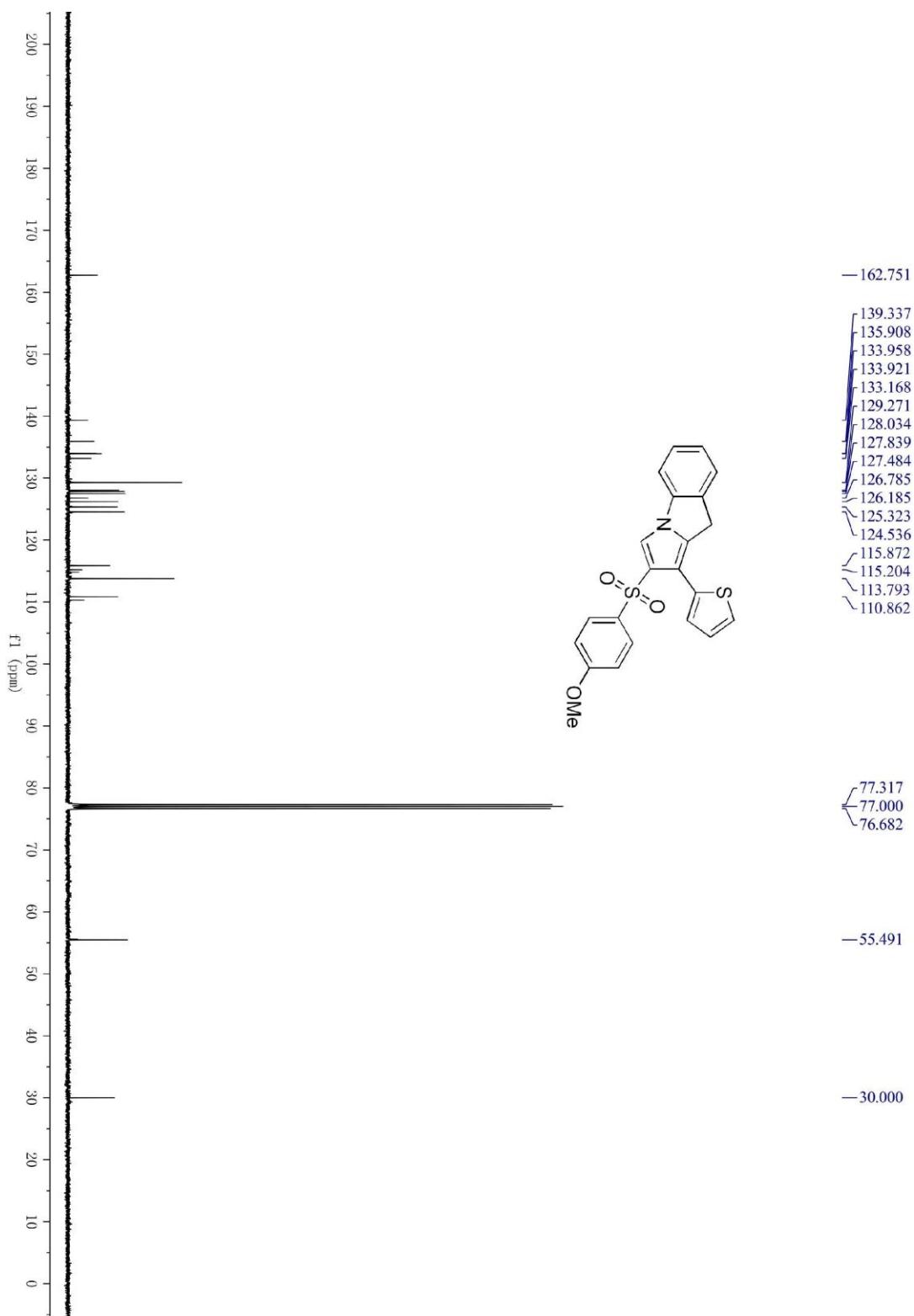


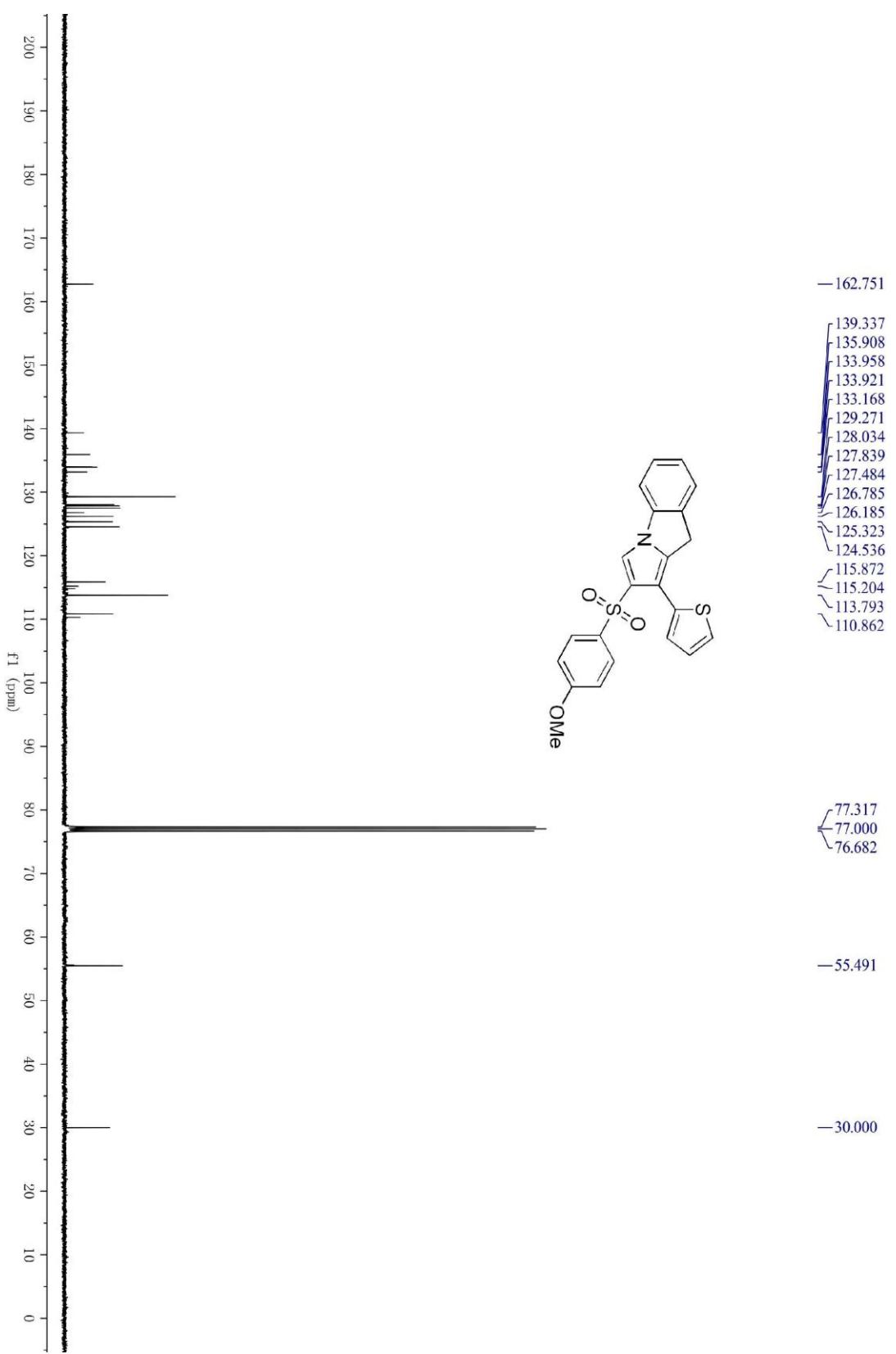
2-((4-methoxyphenyl)sulfonyl)-1-(naphthalen-1-yl)-9*H*-pyrrolo[1,2-*a*]indole (3oa)



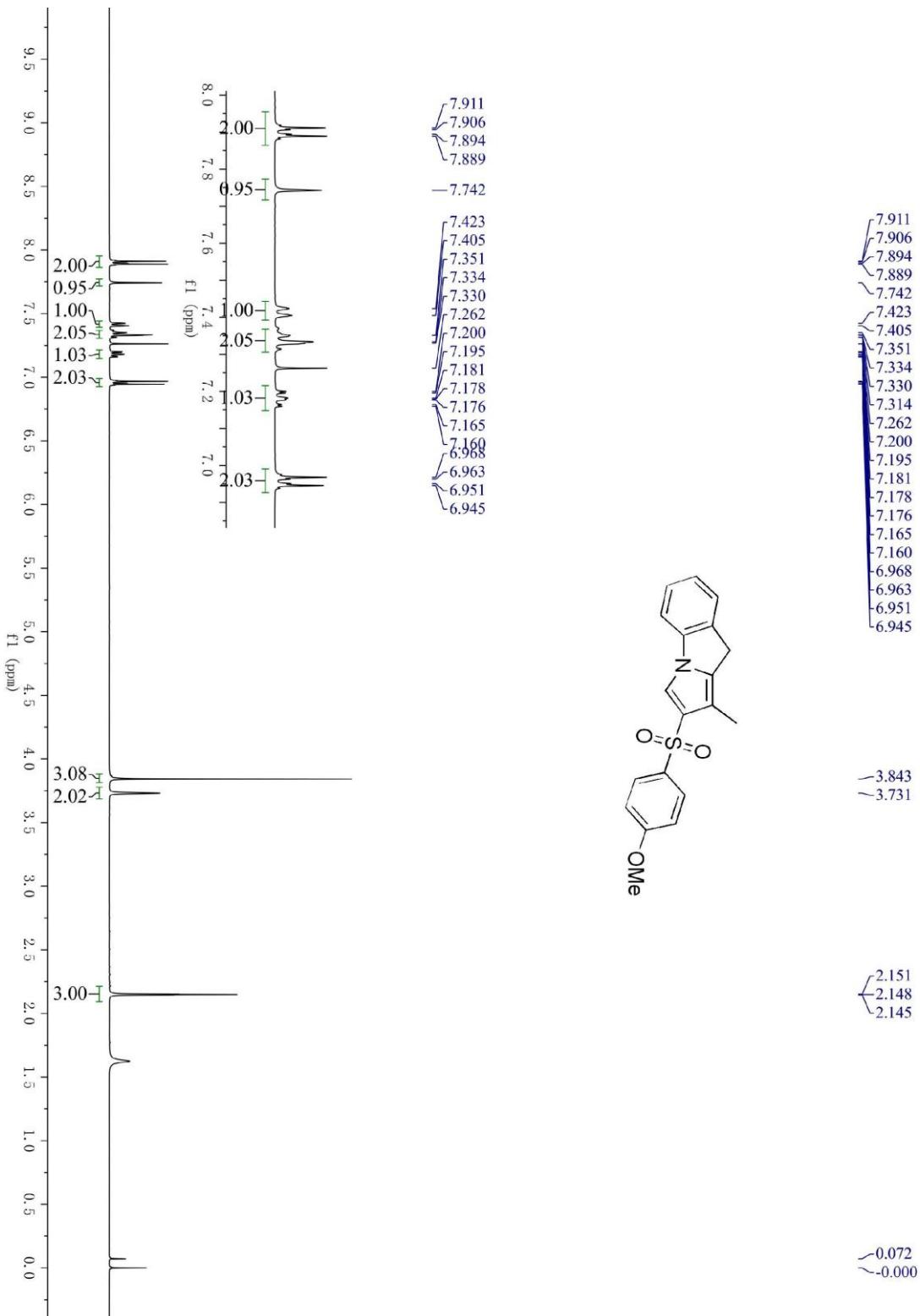


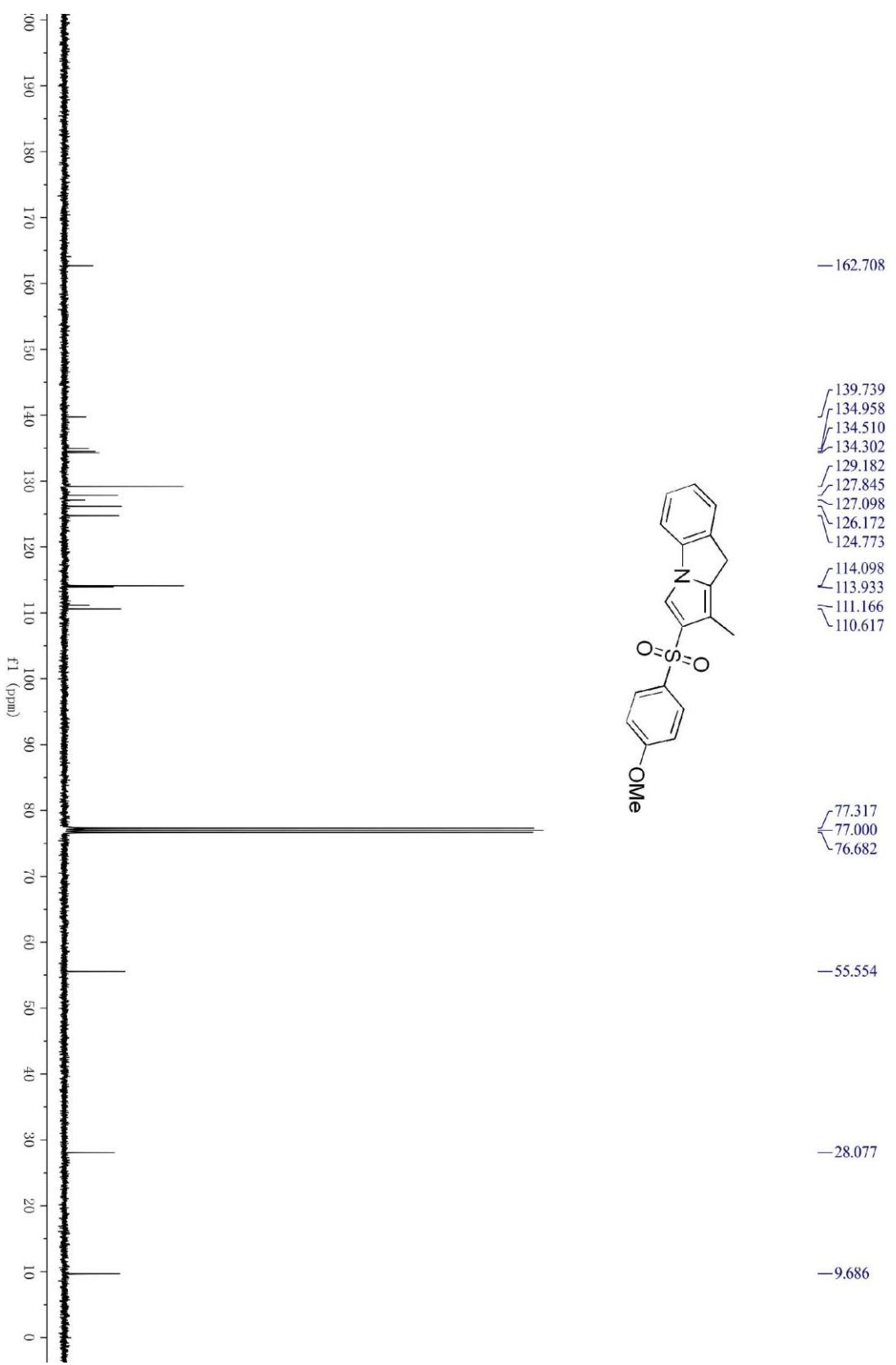
2-((4-Methoxyphenyl)sulfonyl)-1-(thiophen-2-yl)-9*H*-pyrrolo[1,2-*a*]indole (3pa):



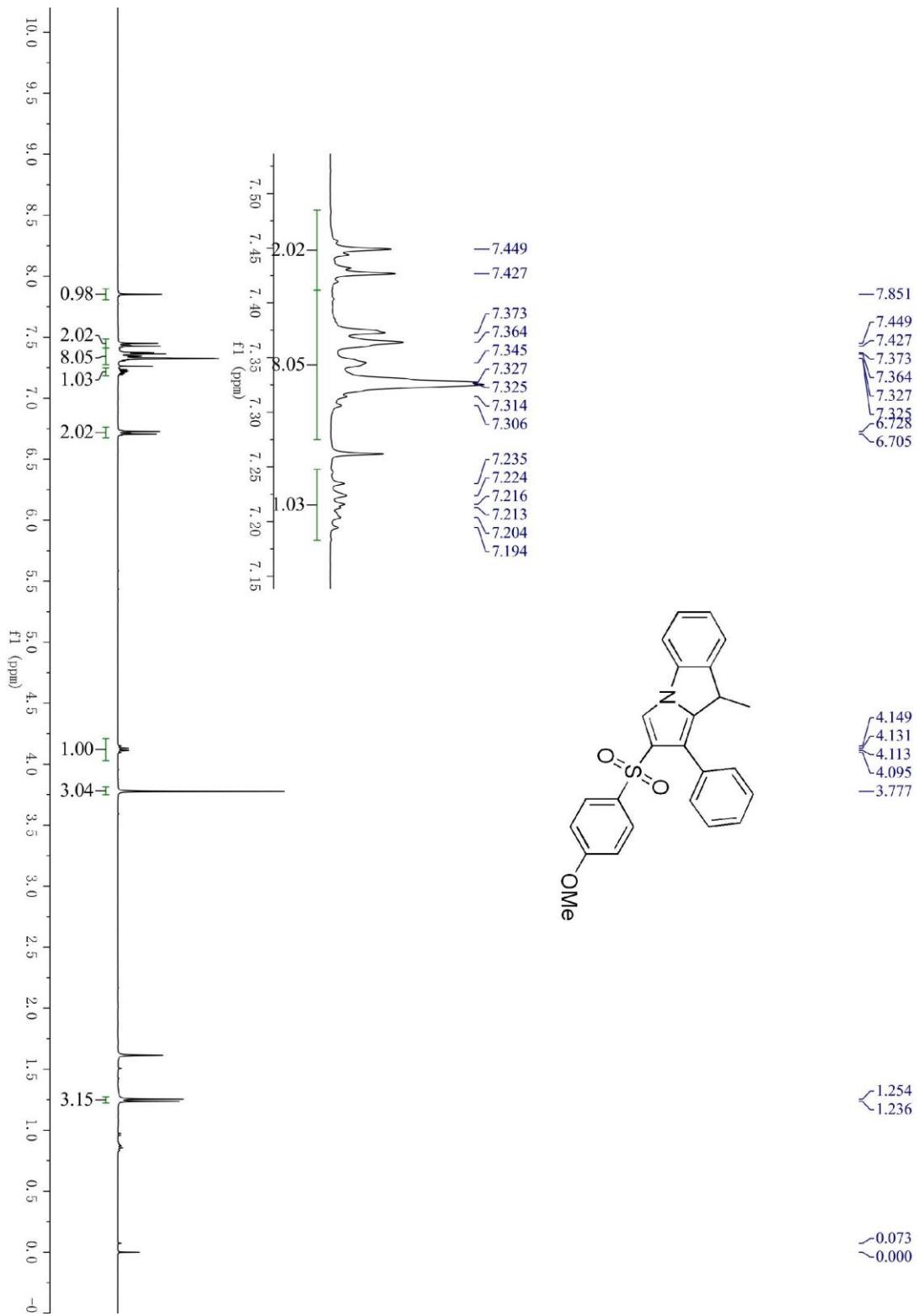


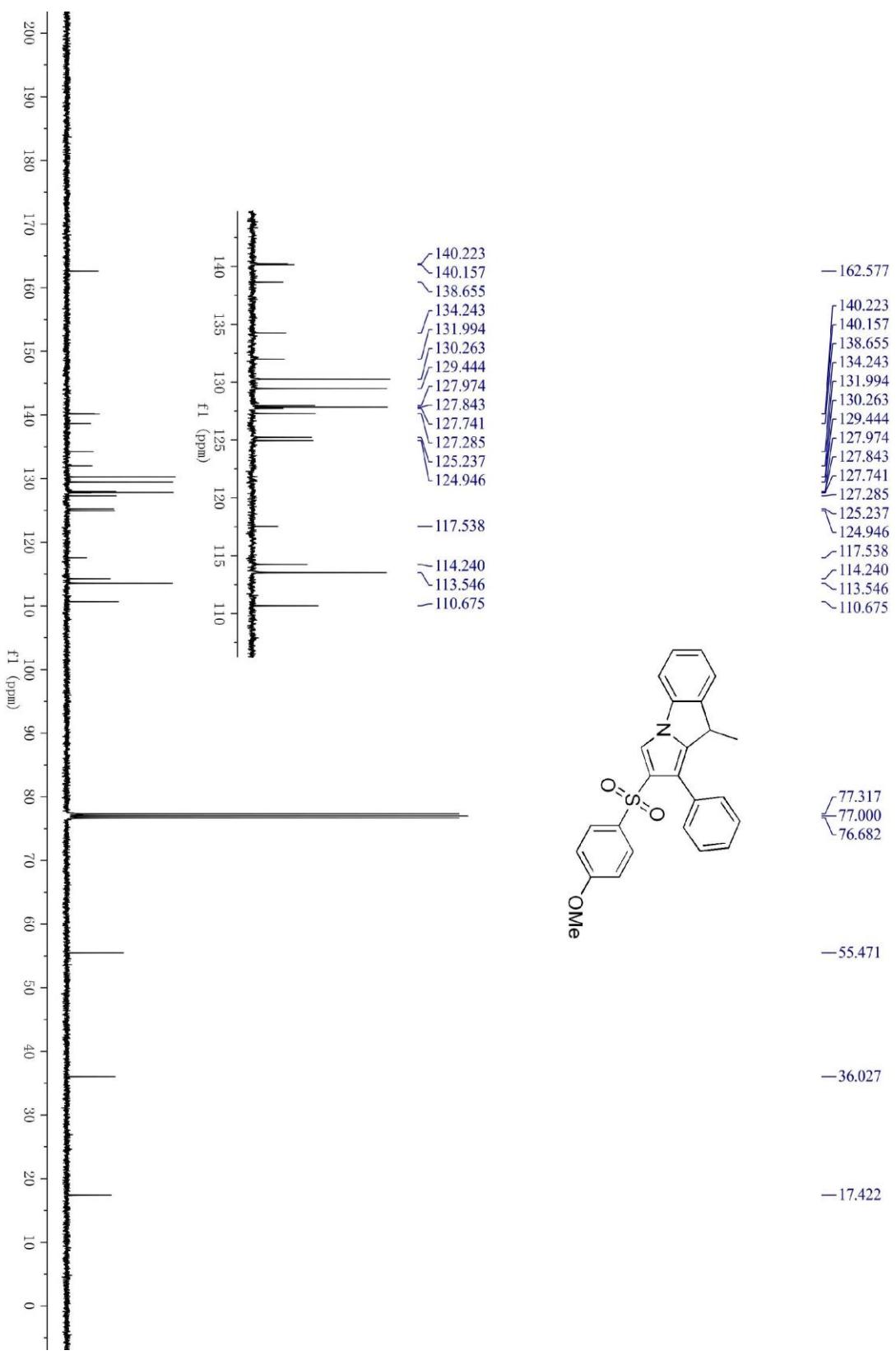
2-((4-methoxyphenyl)sulfonyl)-1-methyl-9H-pyrrolo[1,2-a]indole (3qa)



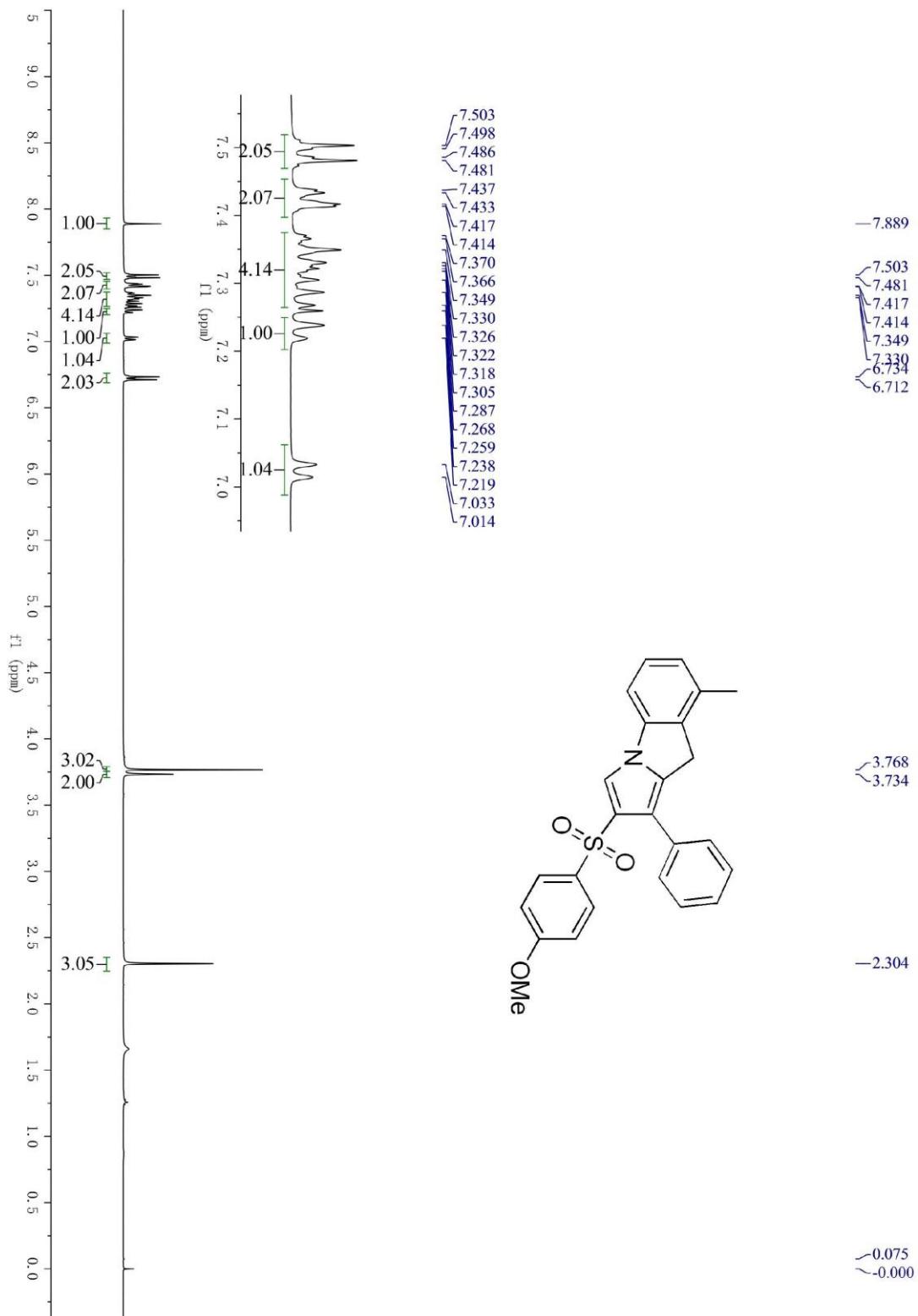


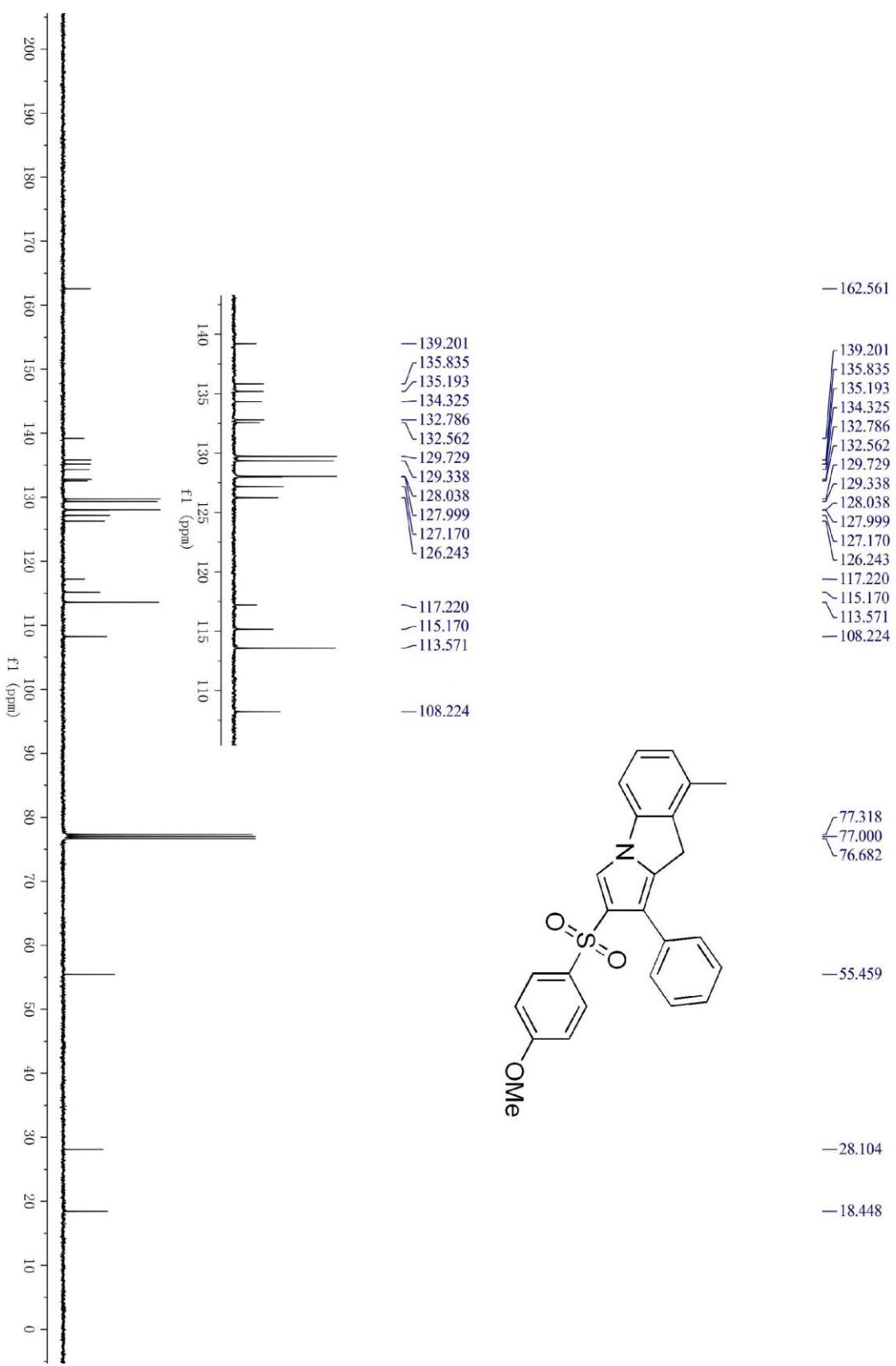
2-((4-Methoxyphenyl)sulfonyl)-9-methyl-1-phenyl-9*H*-pyrrolo[1,2-*a*]indole (3sa)



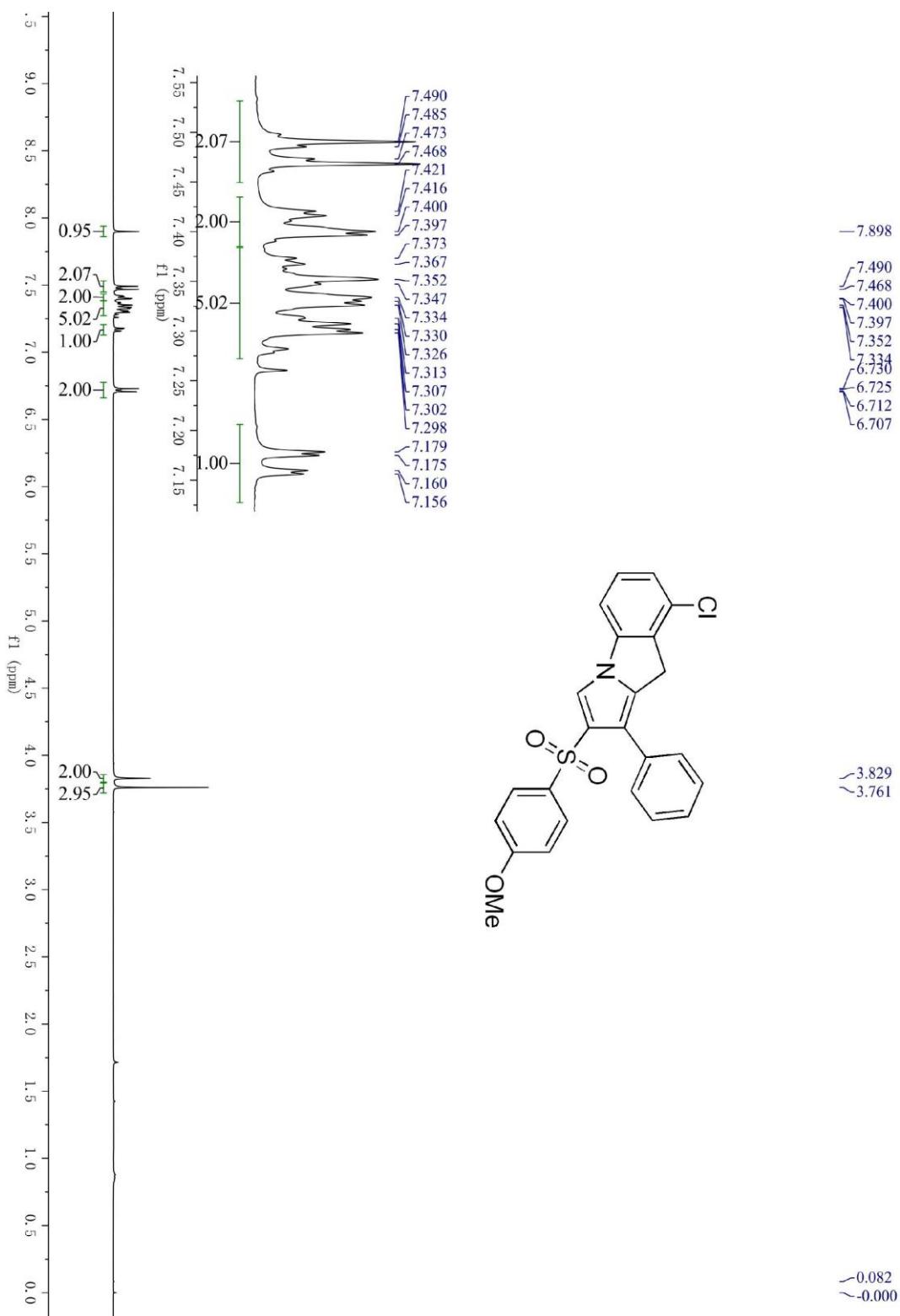


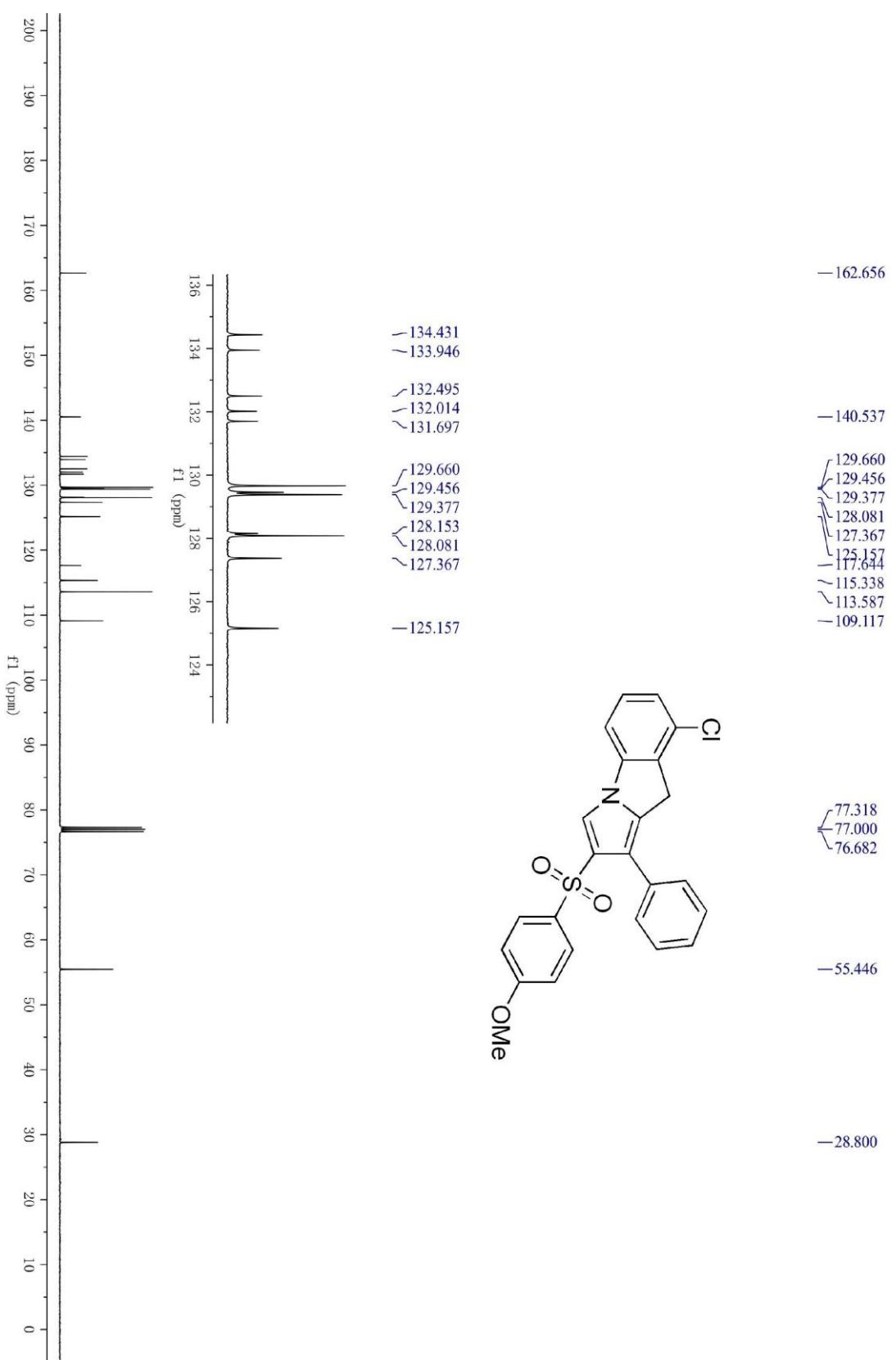
2-((4-Methoxyphenyl)sulfonyl)-8-methyl-1-phenyl-9*H*-pyrrolo[1,2-*a*]indole (3ta)



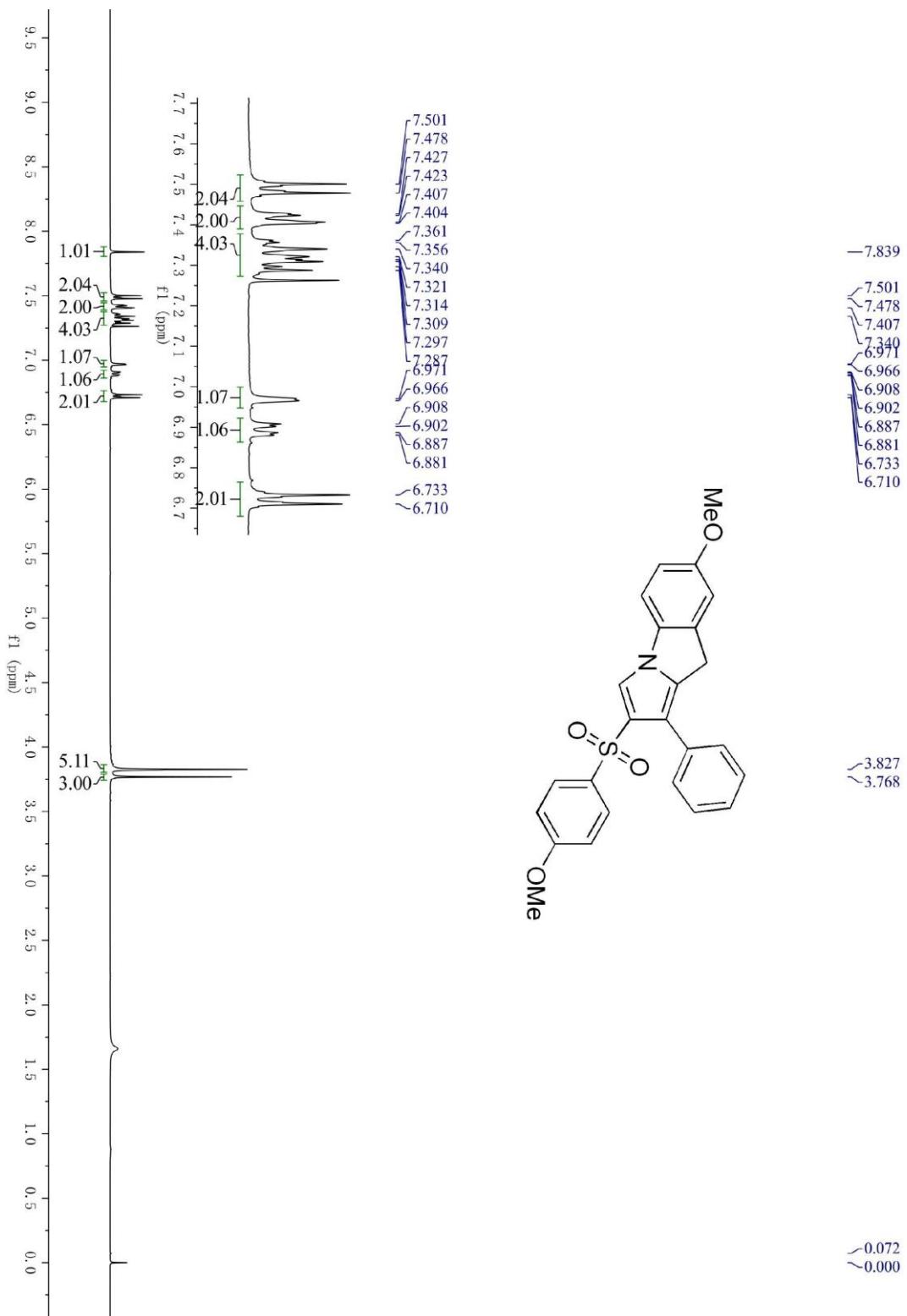


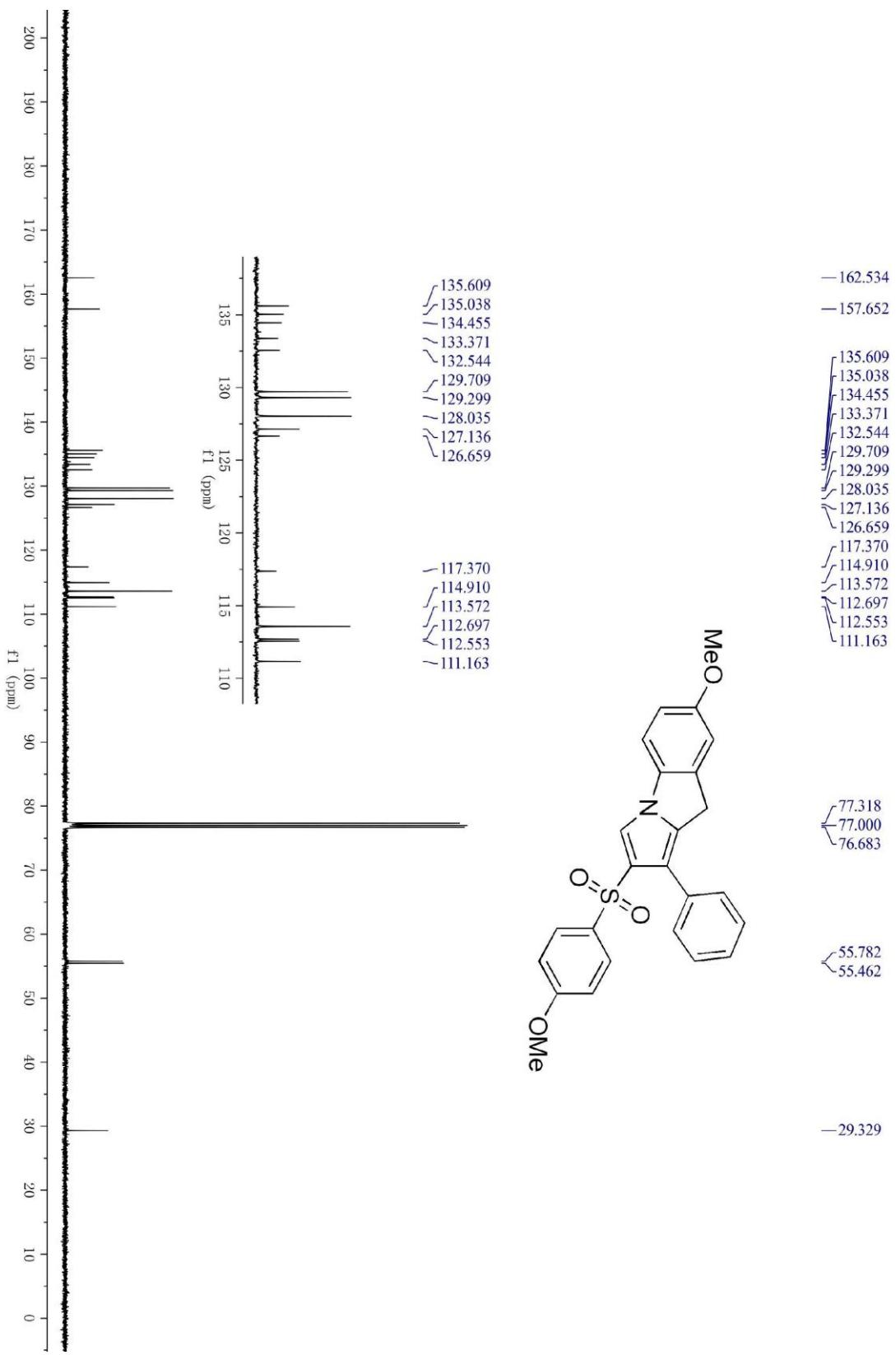
8-Chloro-2-((4-methoxyphenyl)sulfonyl)-1-phenyl-9*H*-pyrrolo[1,2-*a*]indole (3ua)



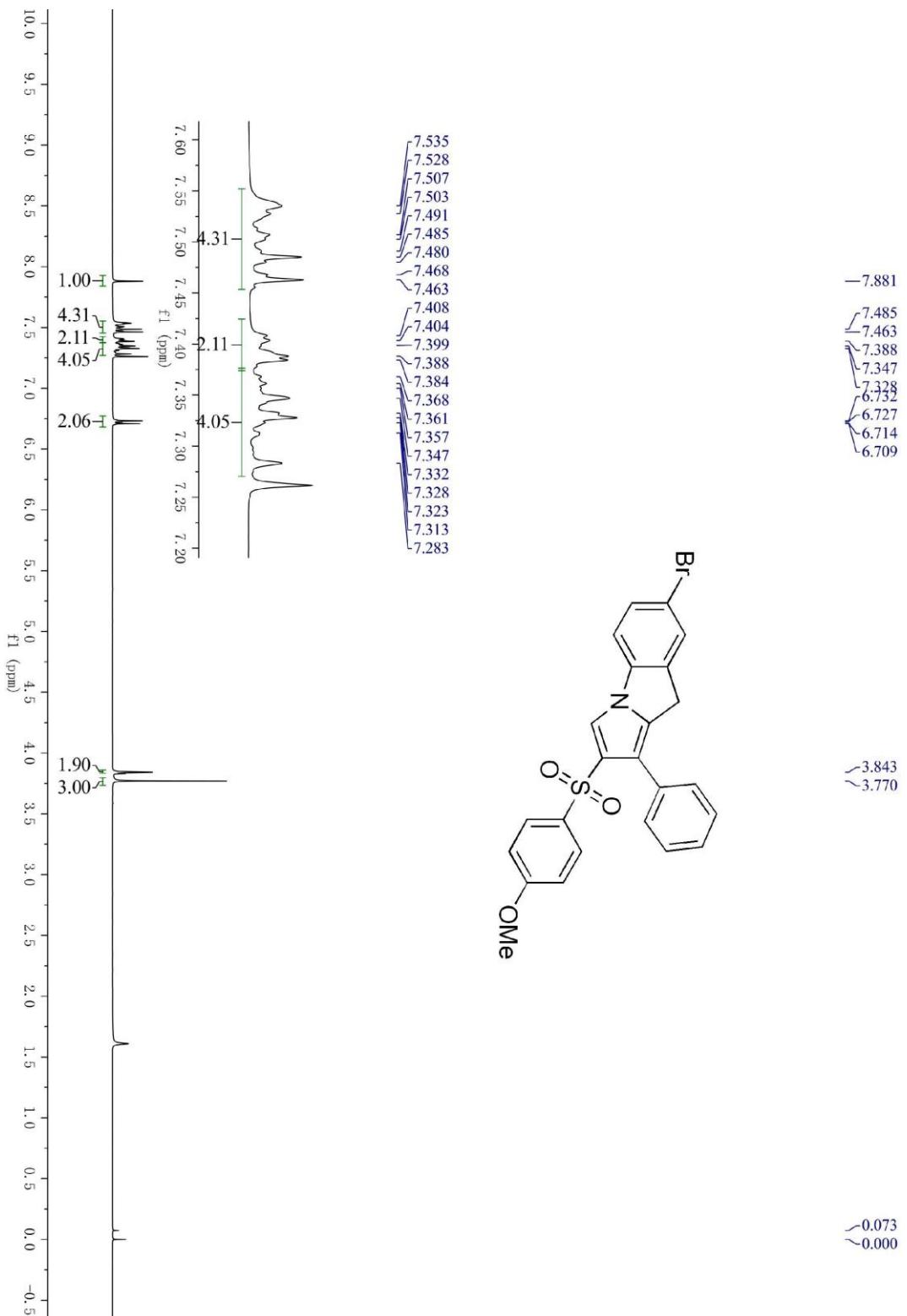


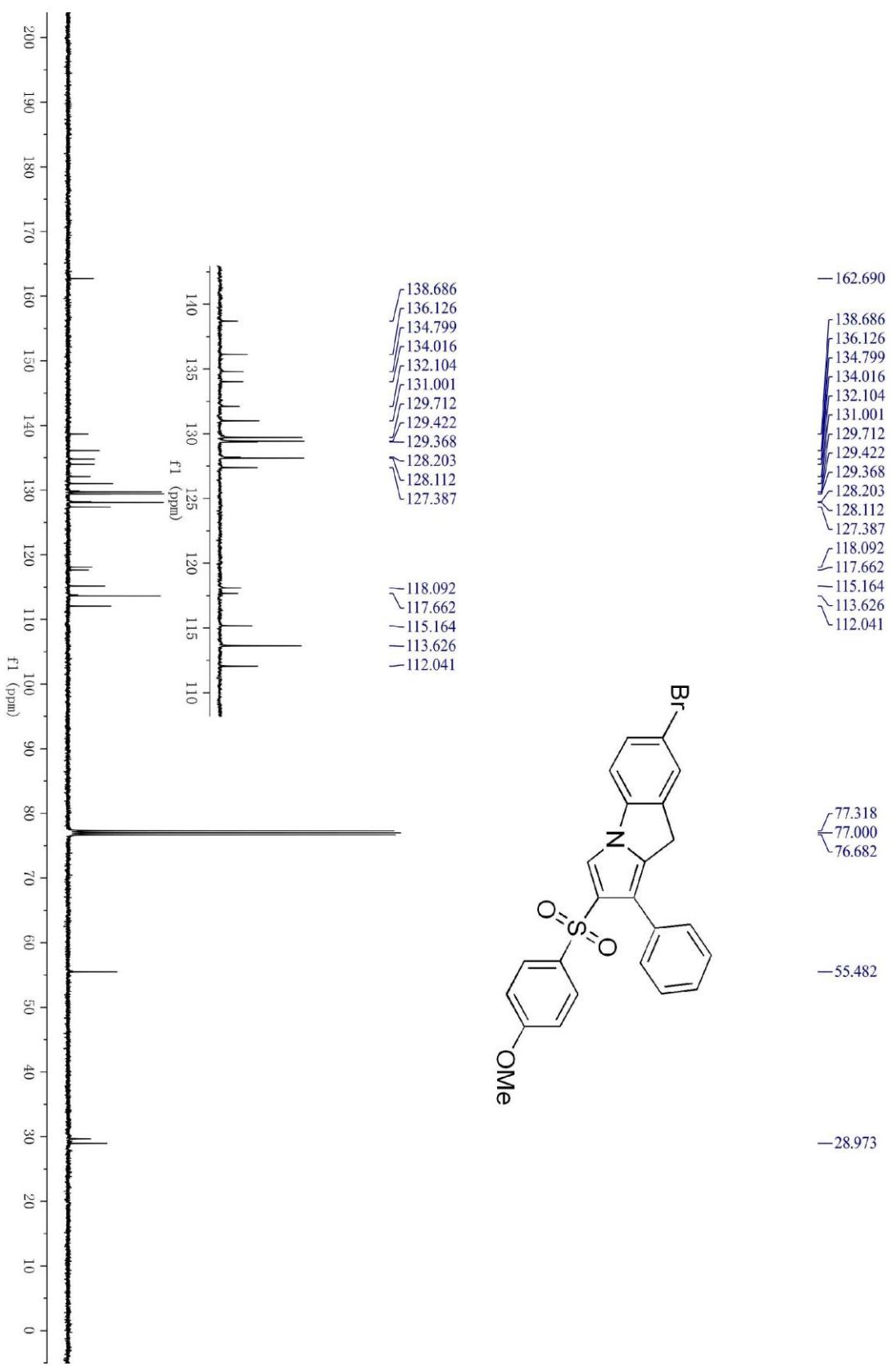
7-Methoxy-2-((4-methoxyphenyl)sulfonyl)-1-phenyl-9*H*-pyrrolo[1,2-*a*]indole (3va)



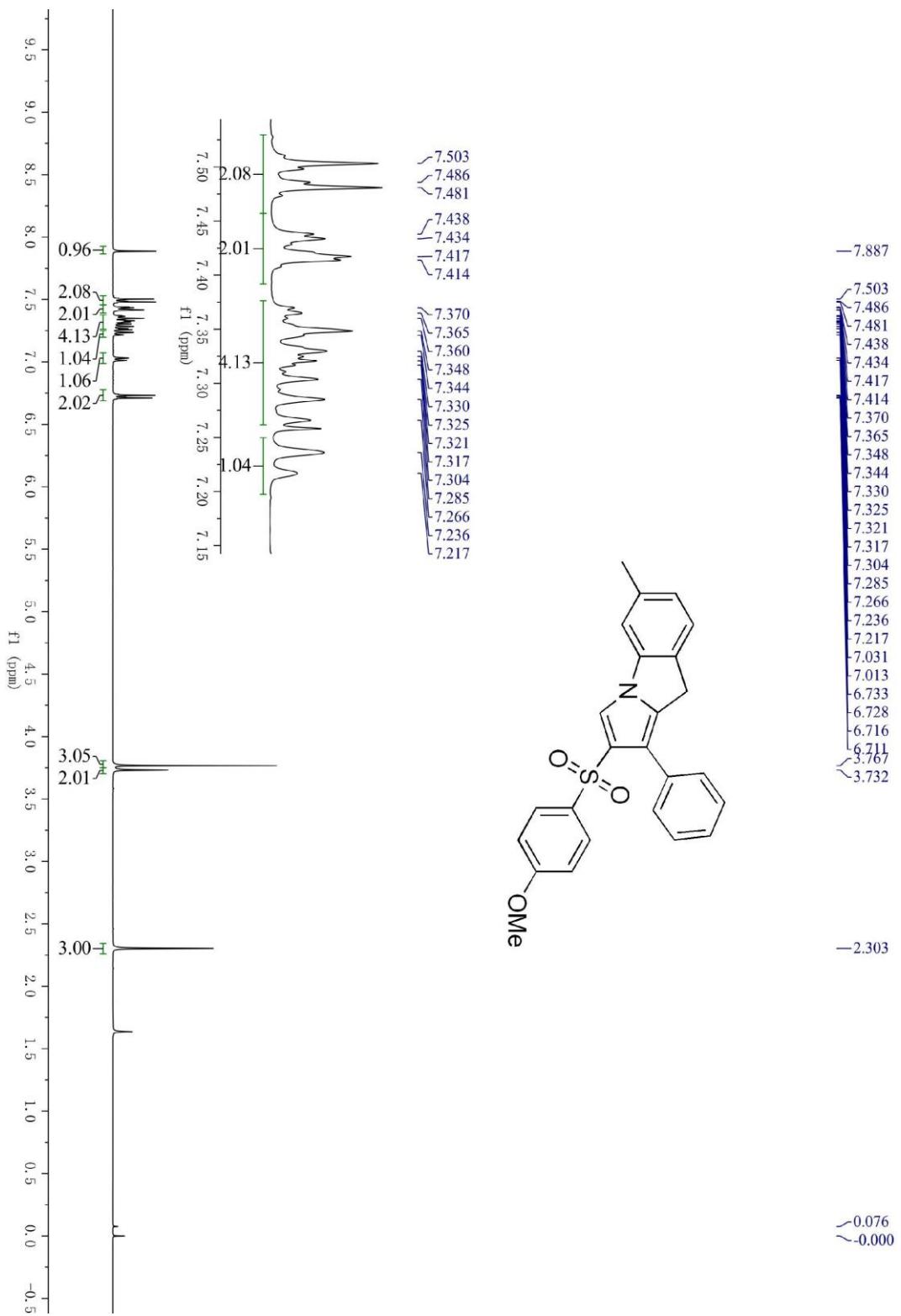


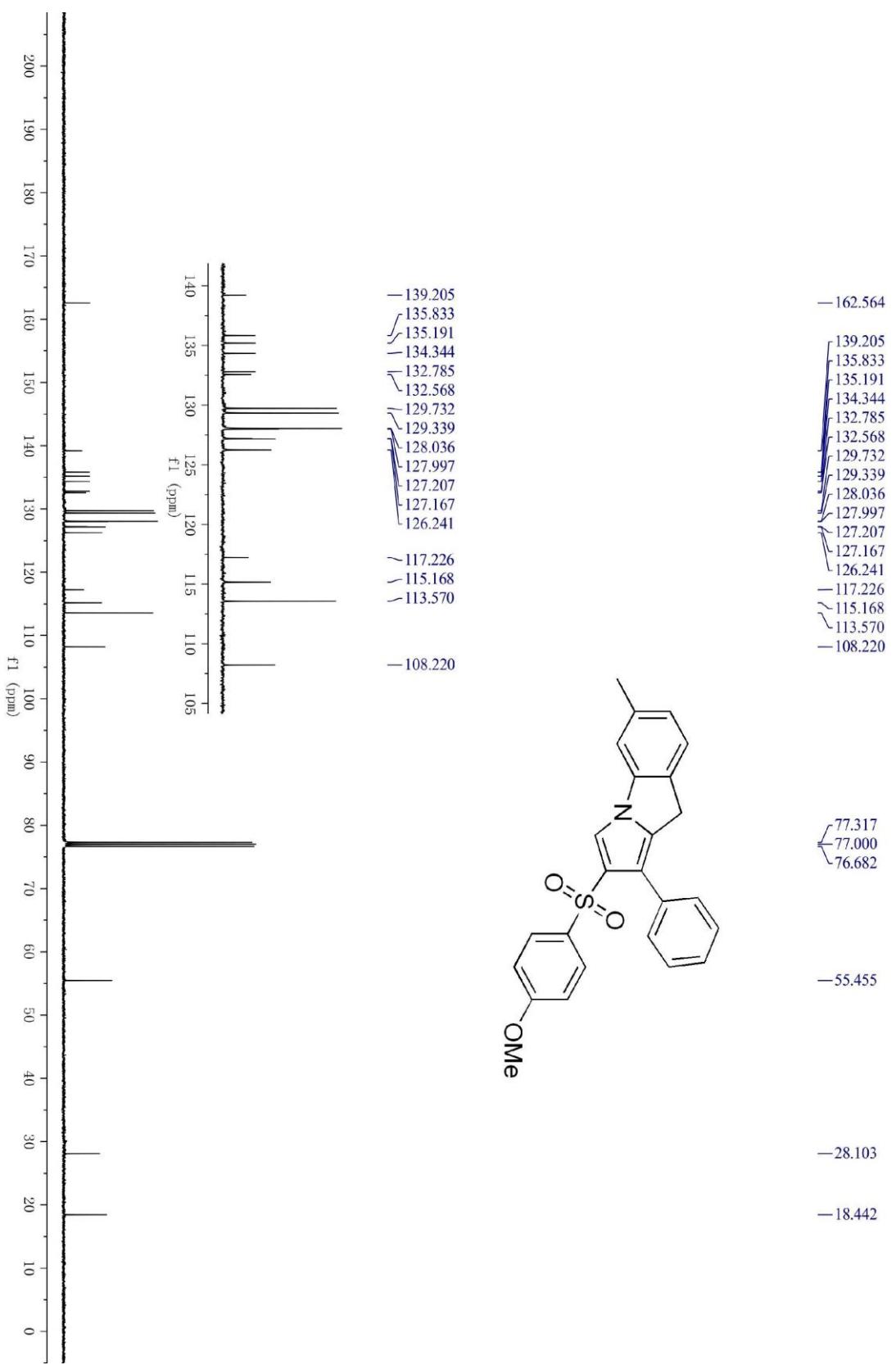
7-Bromo-2-((4-methoxyphenyl)sulfonyl)-1-phenyl-9*H*-pyrrolo[1,2-*a*]indole (3wa)



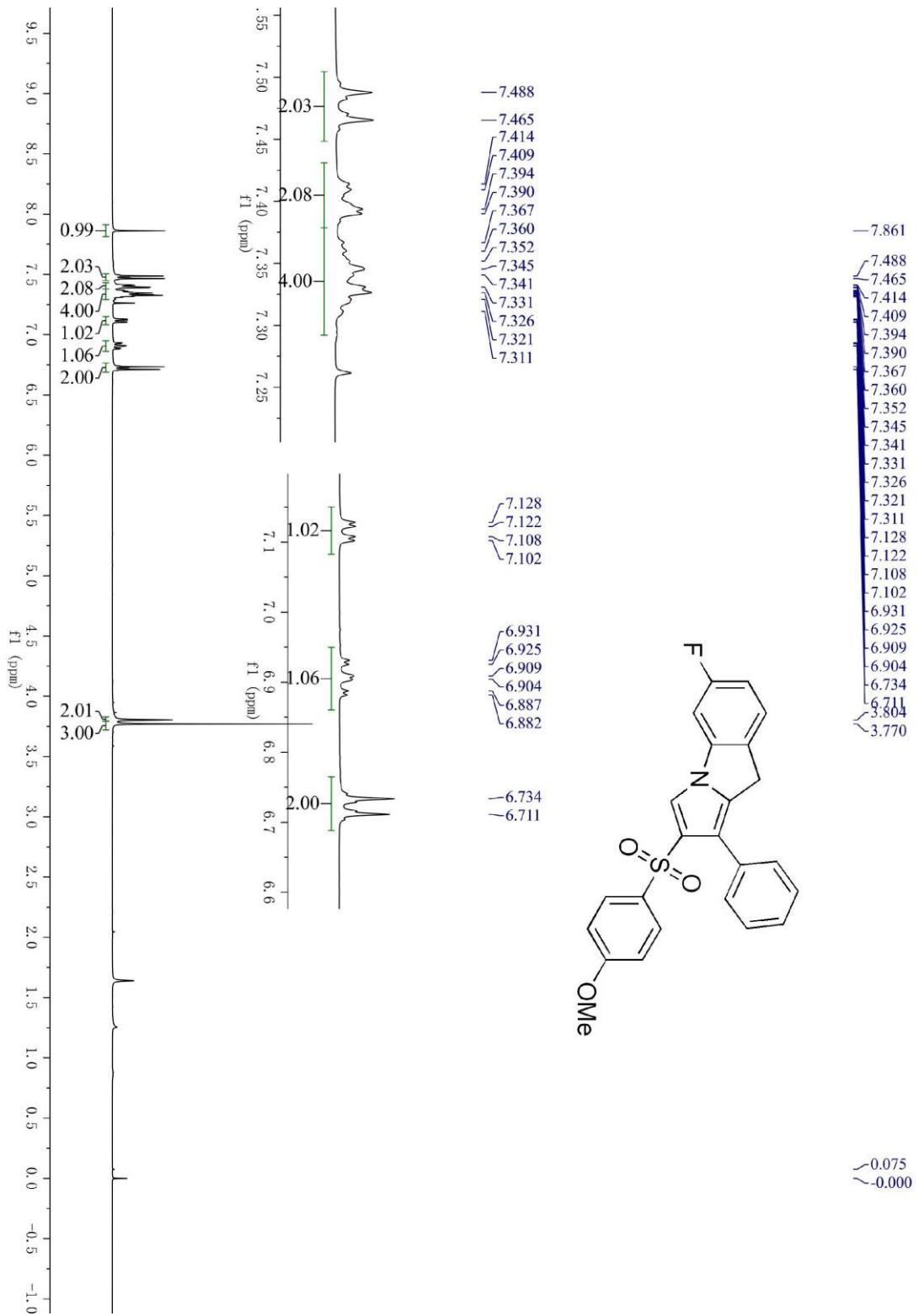


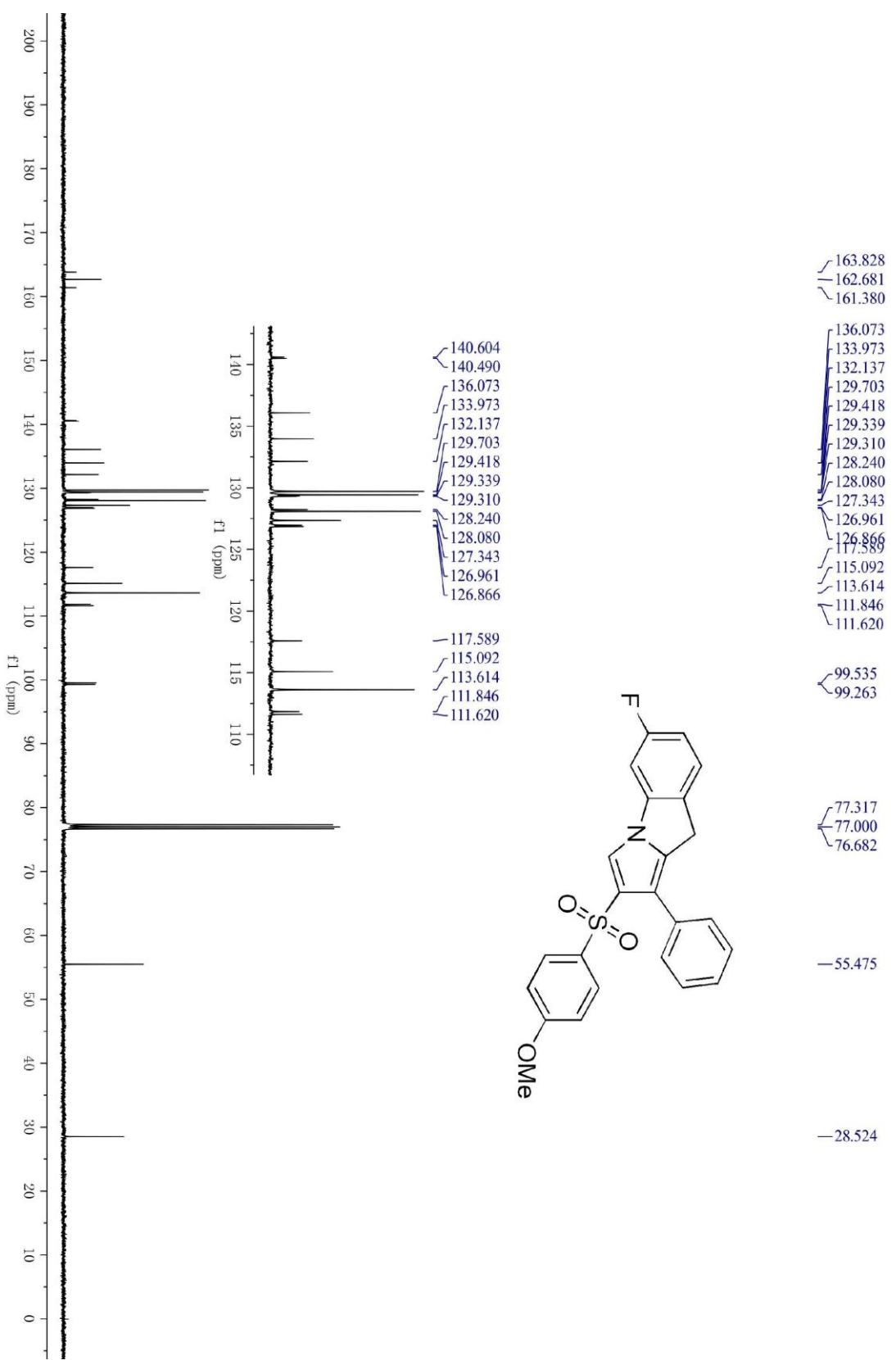
2-((4-Methoxyphenyl)sulfonyl)-6-methyl-1-phenyl-9*H*-pyrrolo[1,2-*a*]indole (3xa)

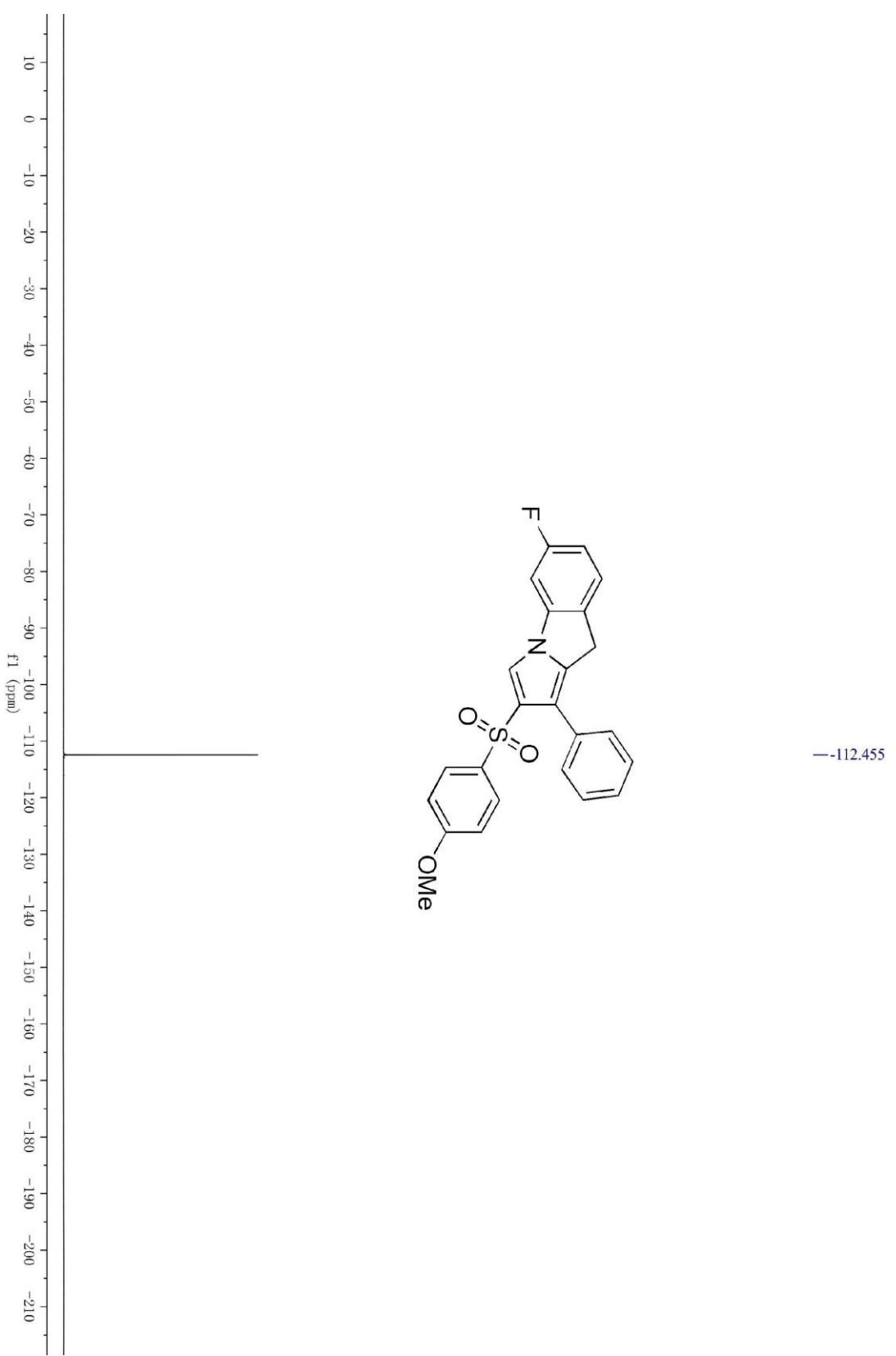




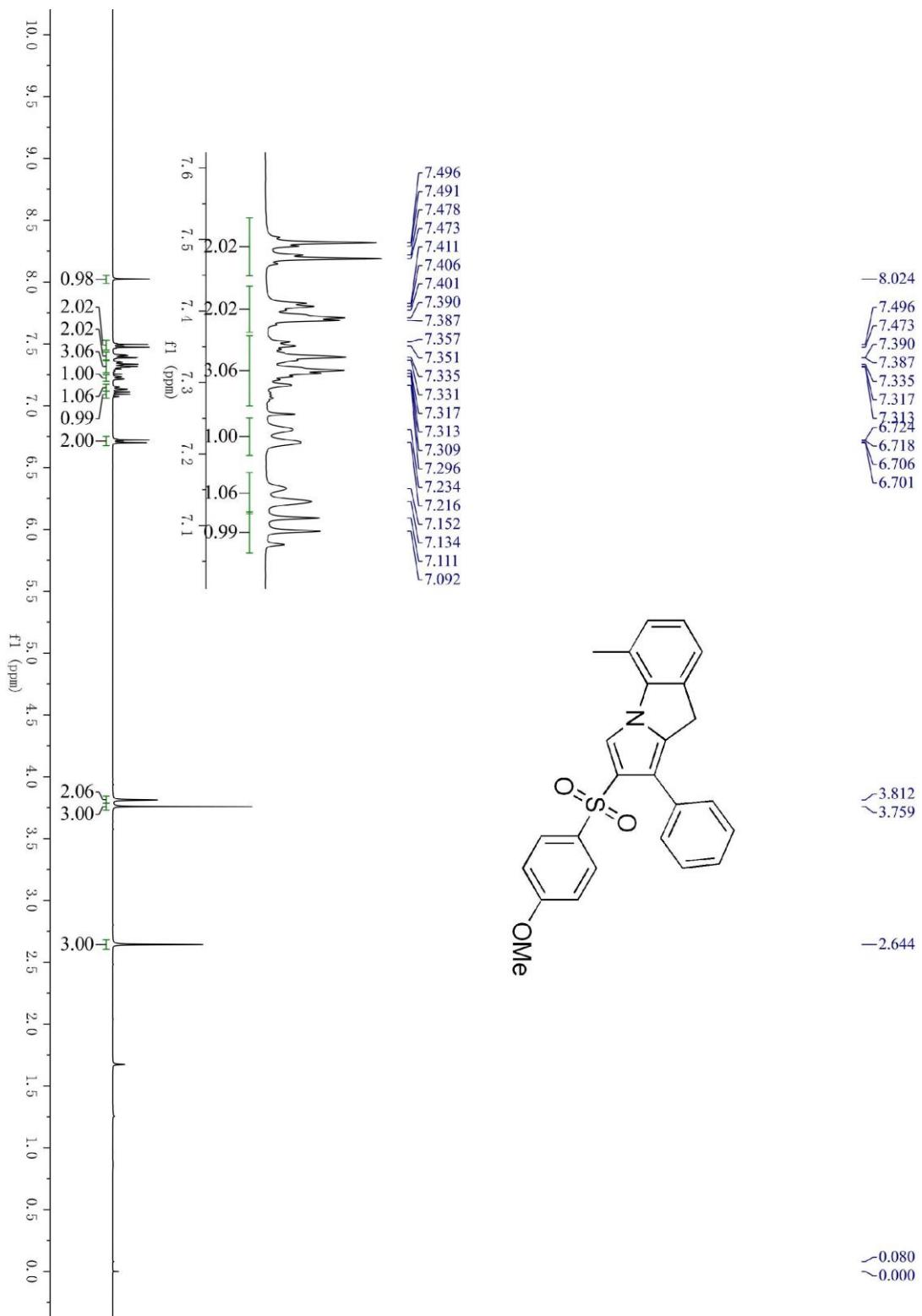
6-Fluoro-2-((4-methoxyphenyl)sulfonyl)-1-phenyl-9*H*-pyrrolo[1,2-*a*]indole (3ya)

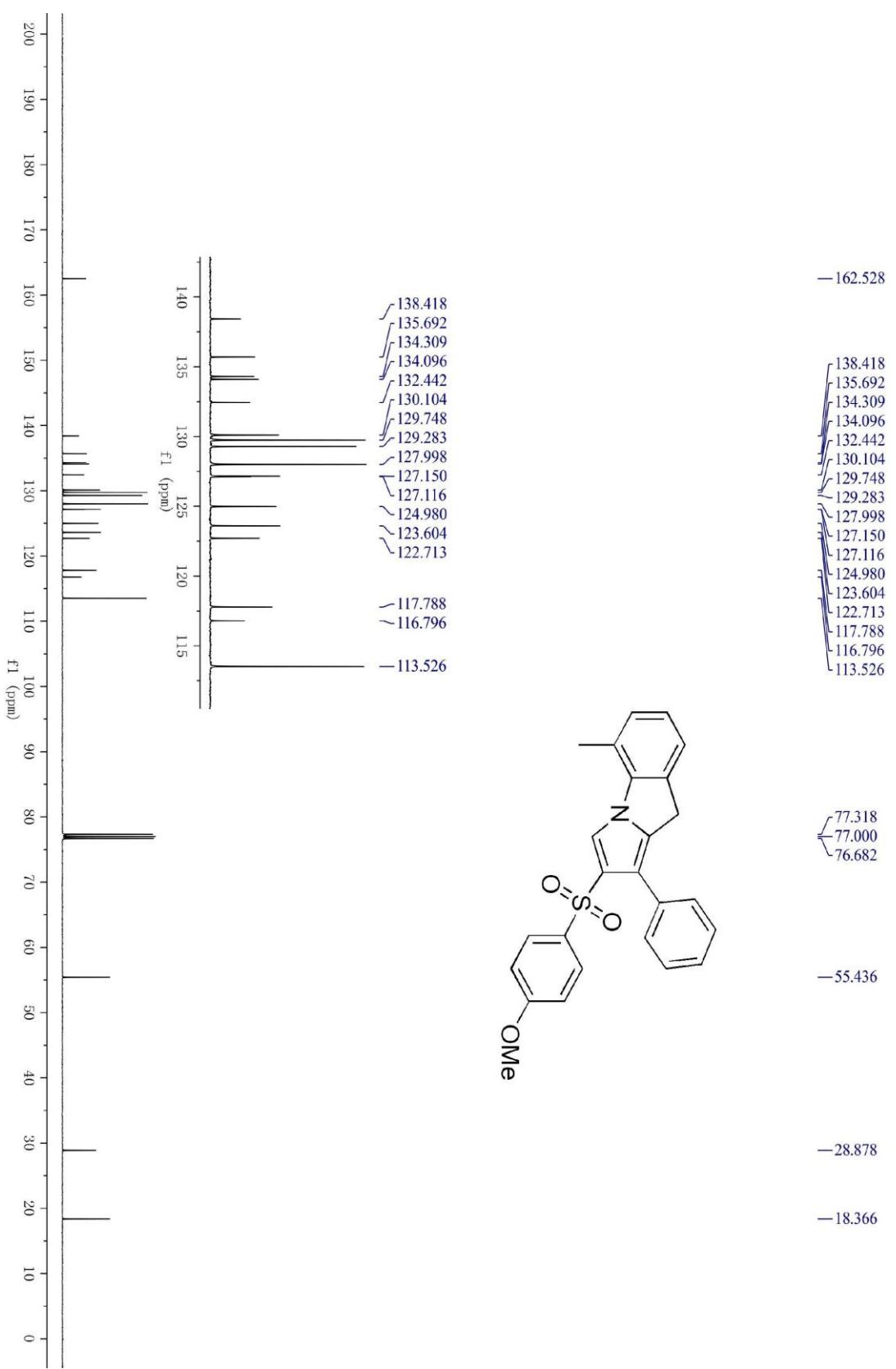




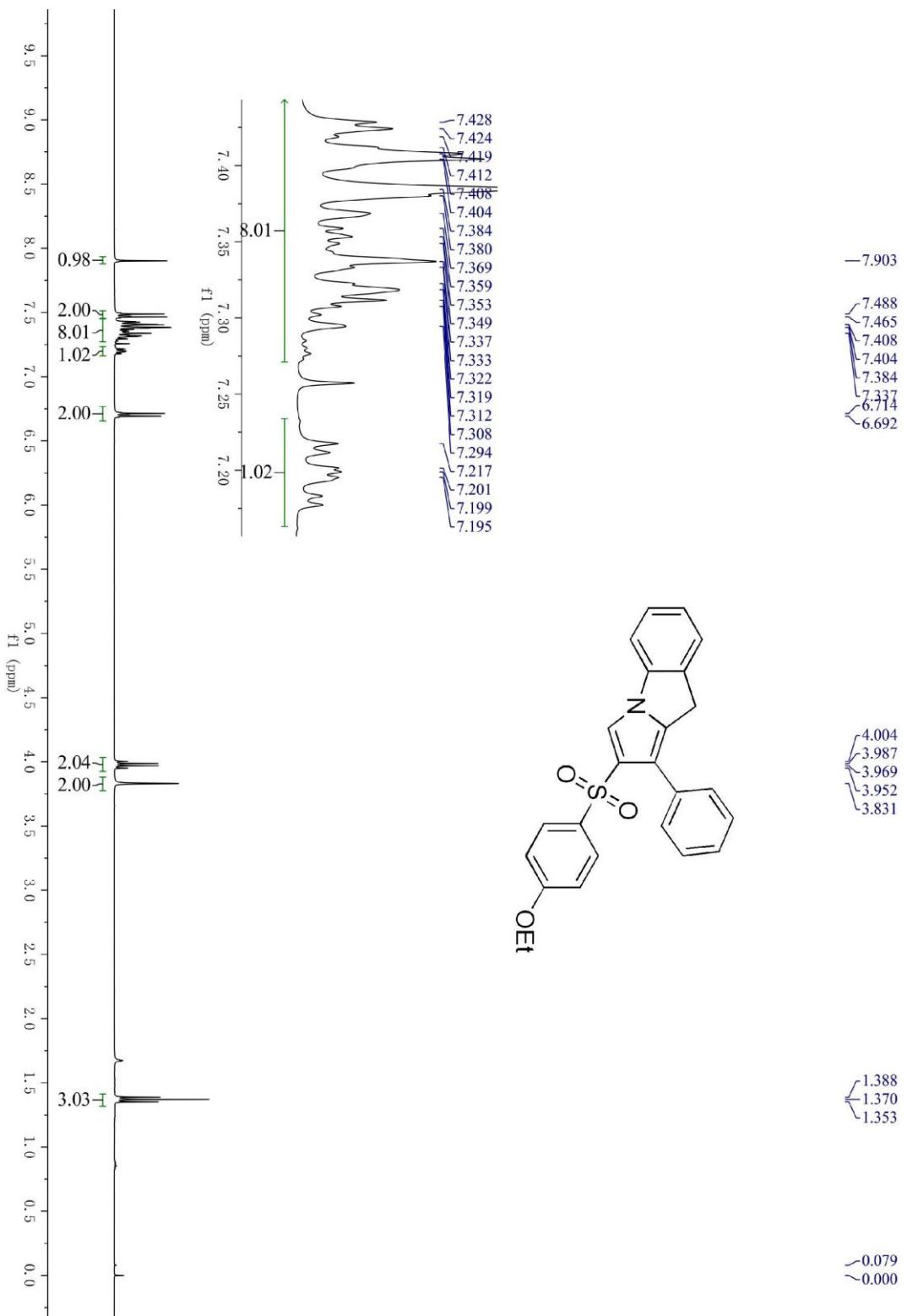


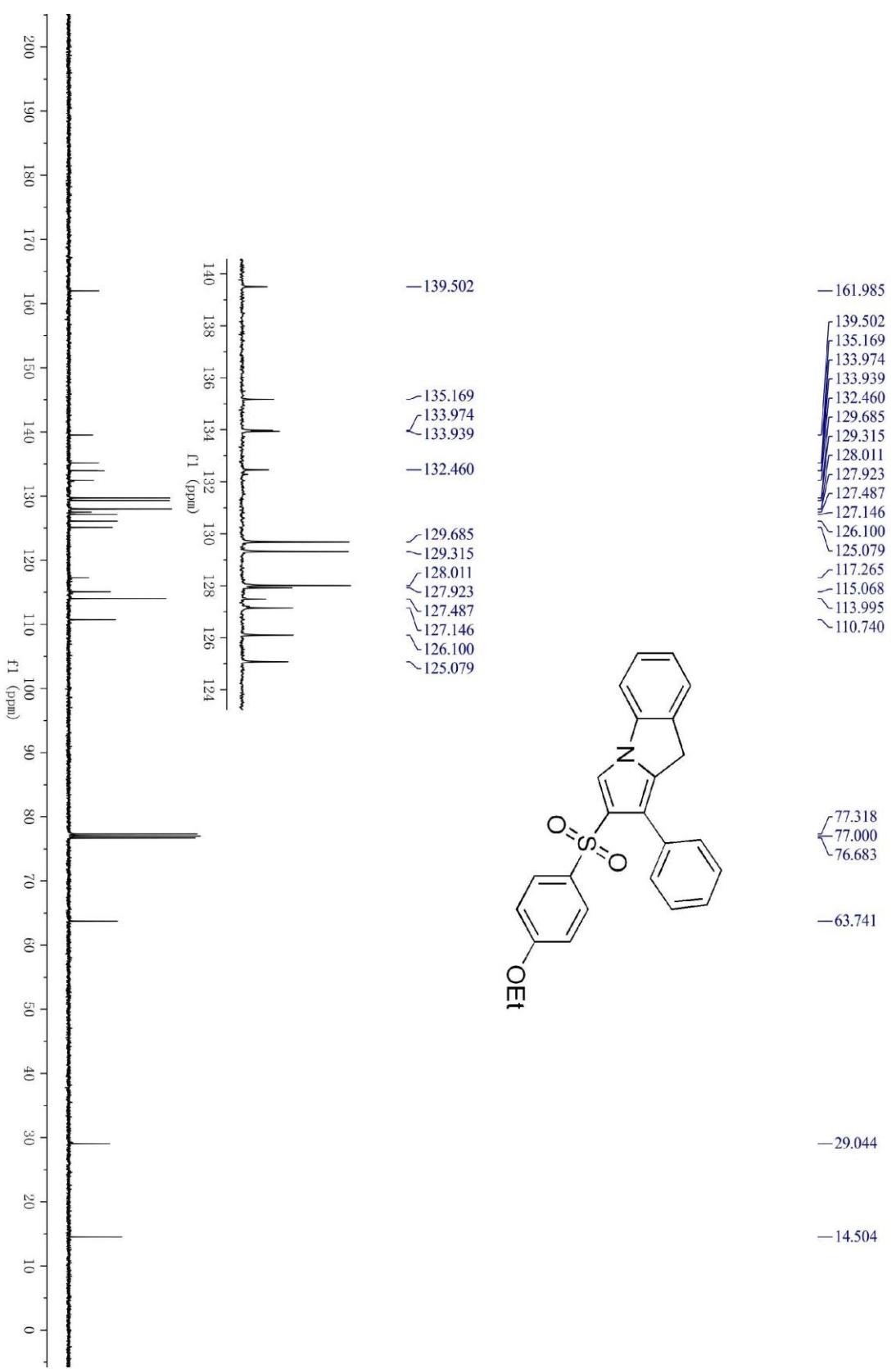
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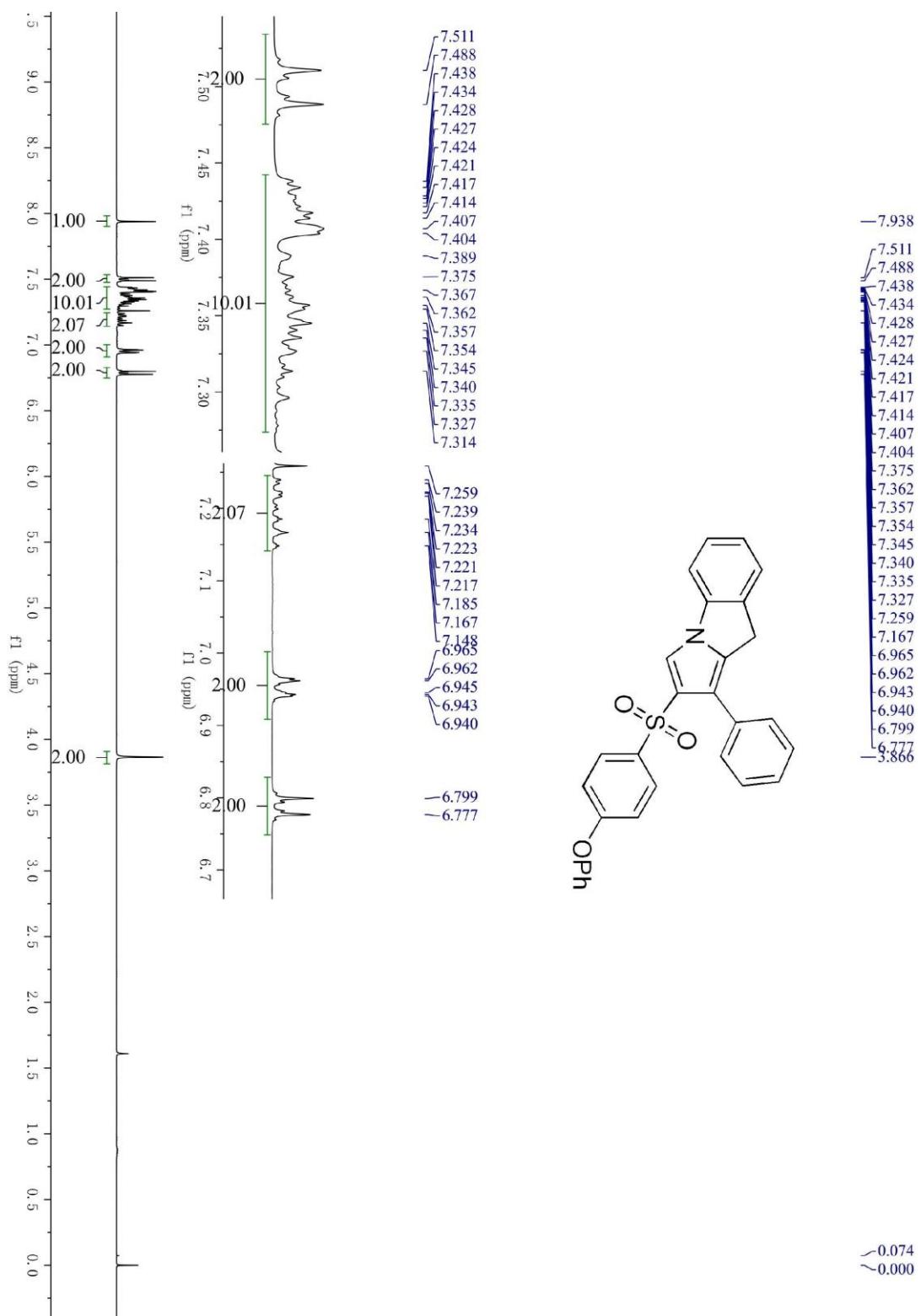


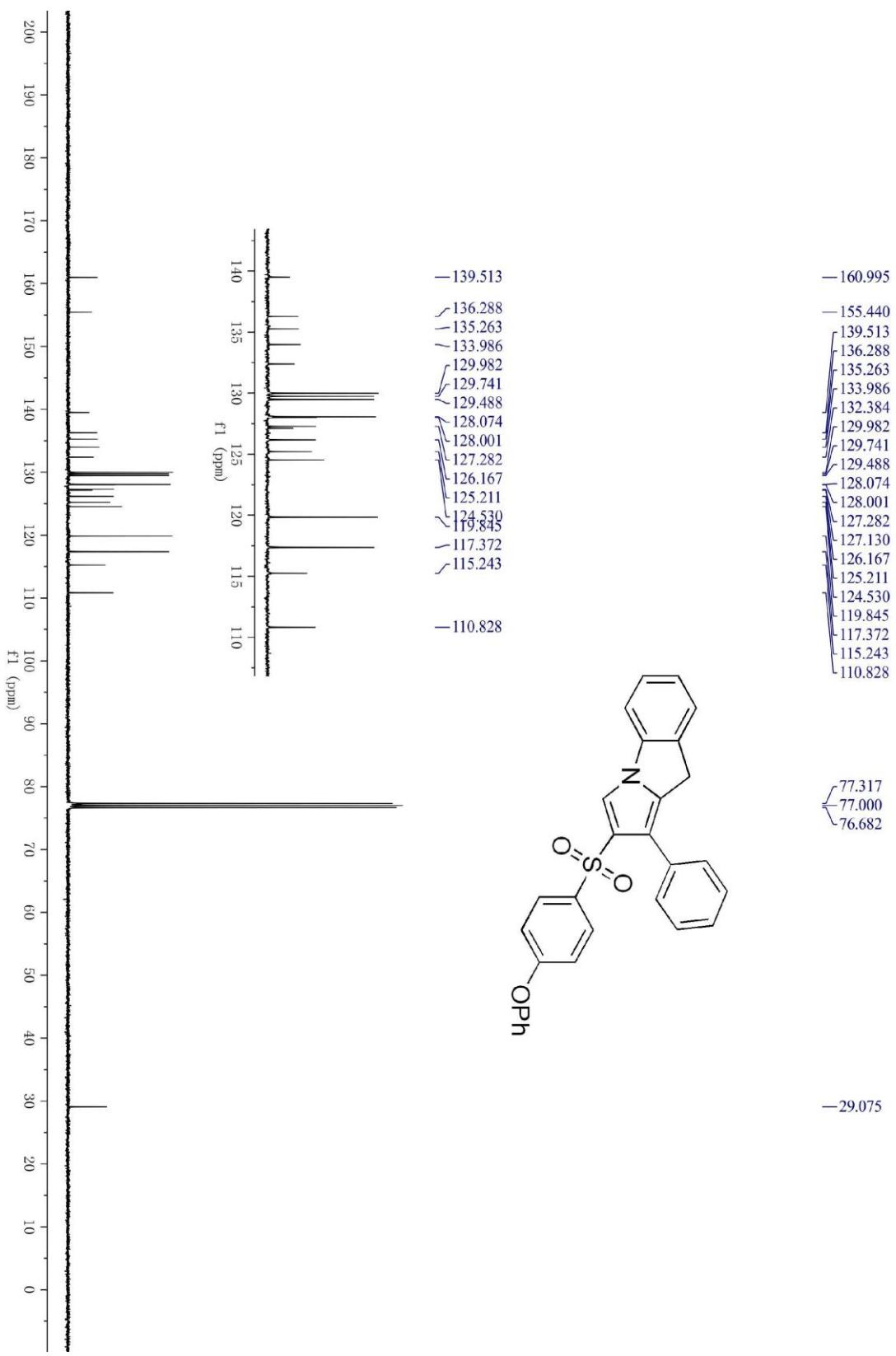
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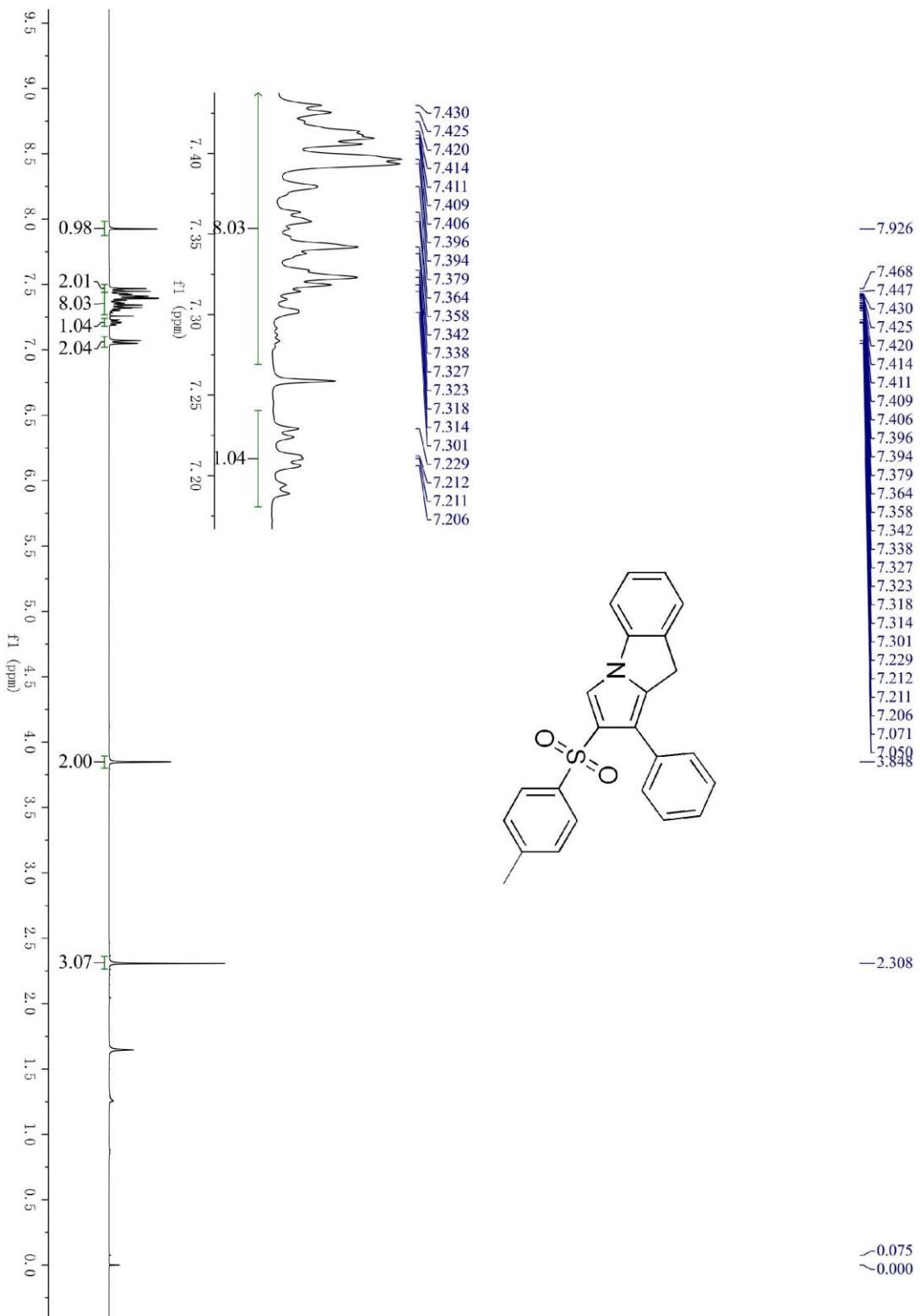


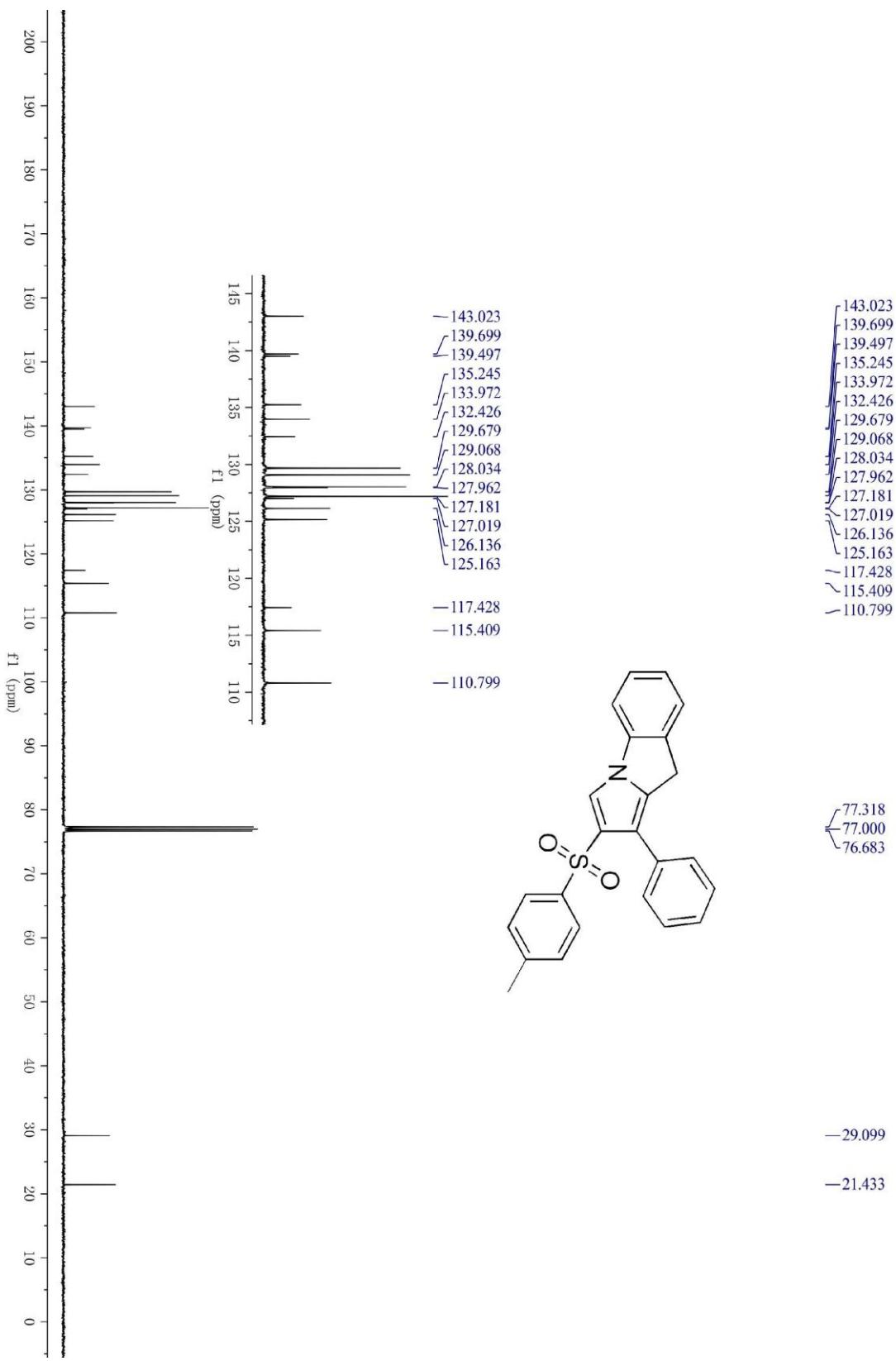
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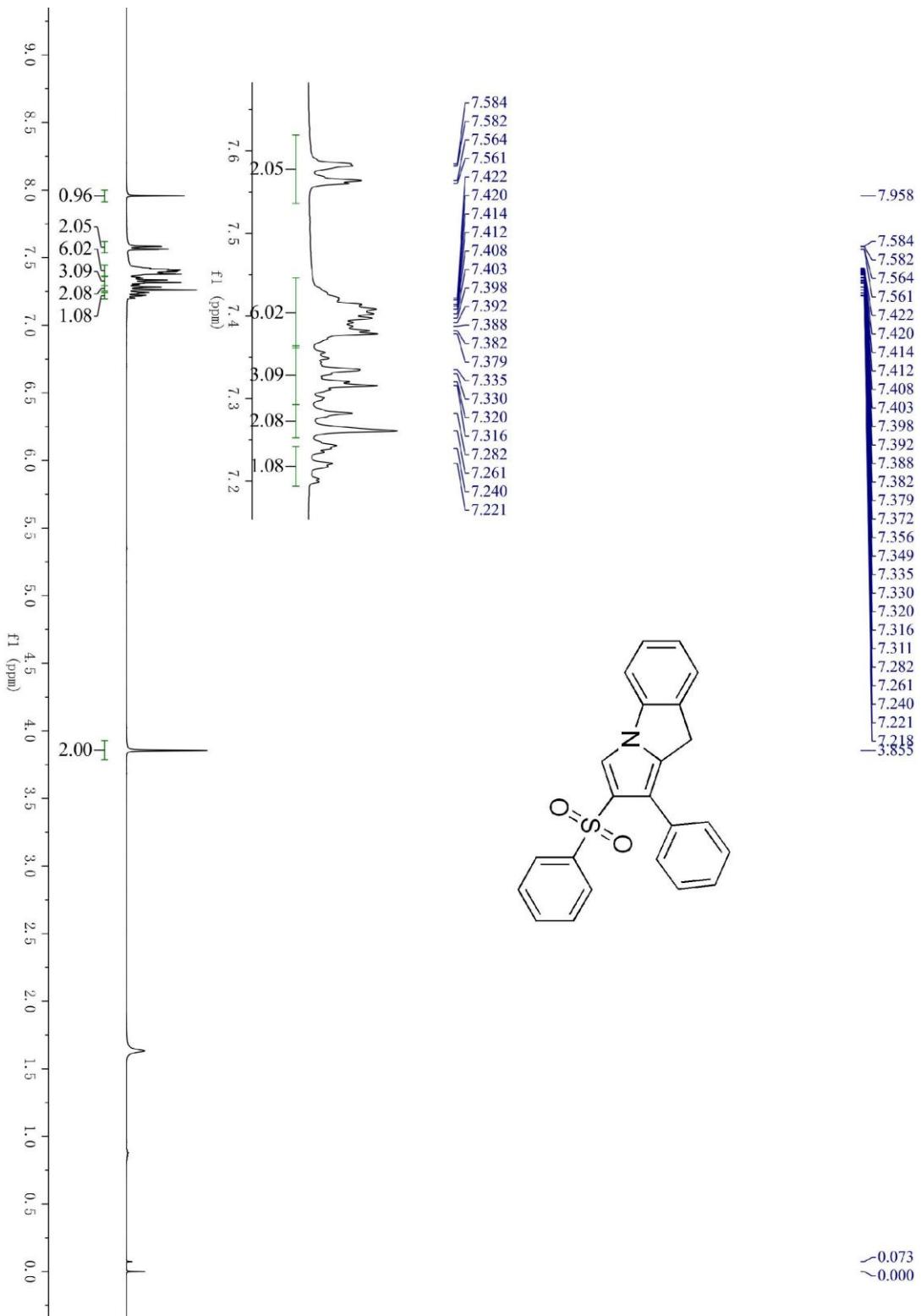


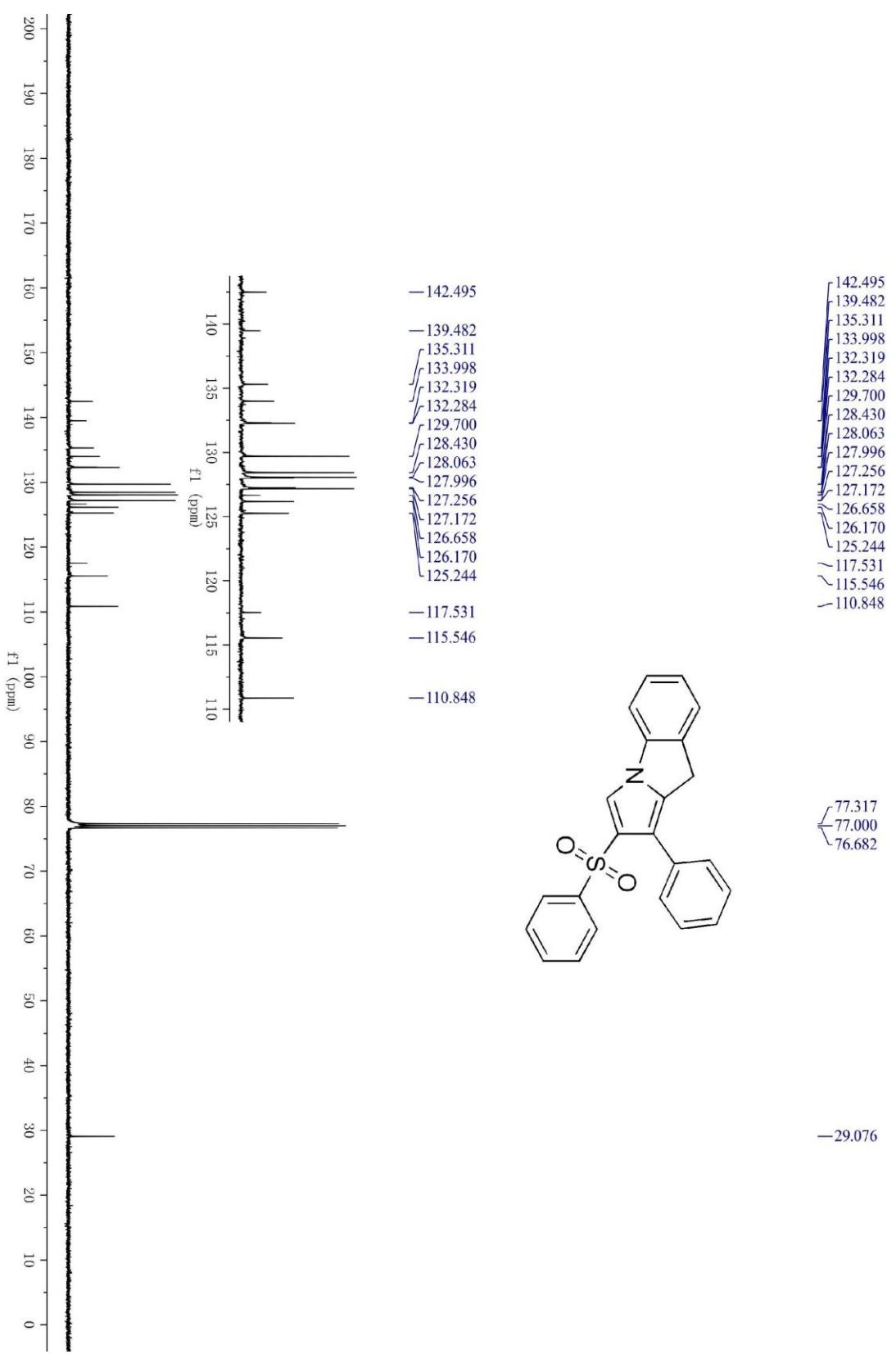
1-Phenyl-2-tosyl-9*H*-pyrrolo[1,2-*a*]indole (3ad)



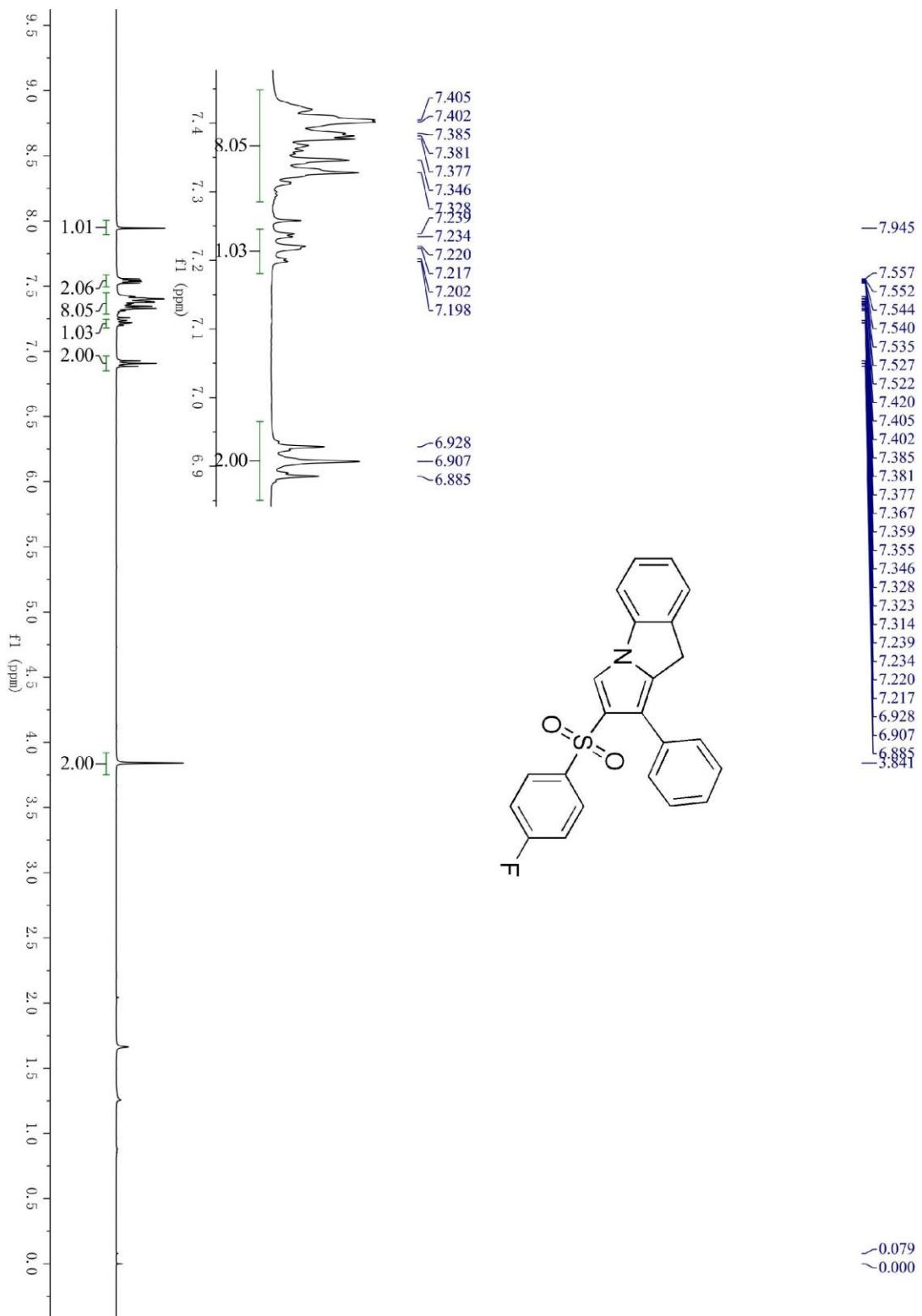


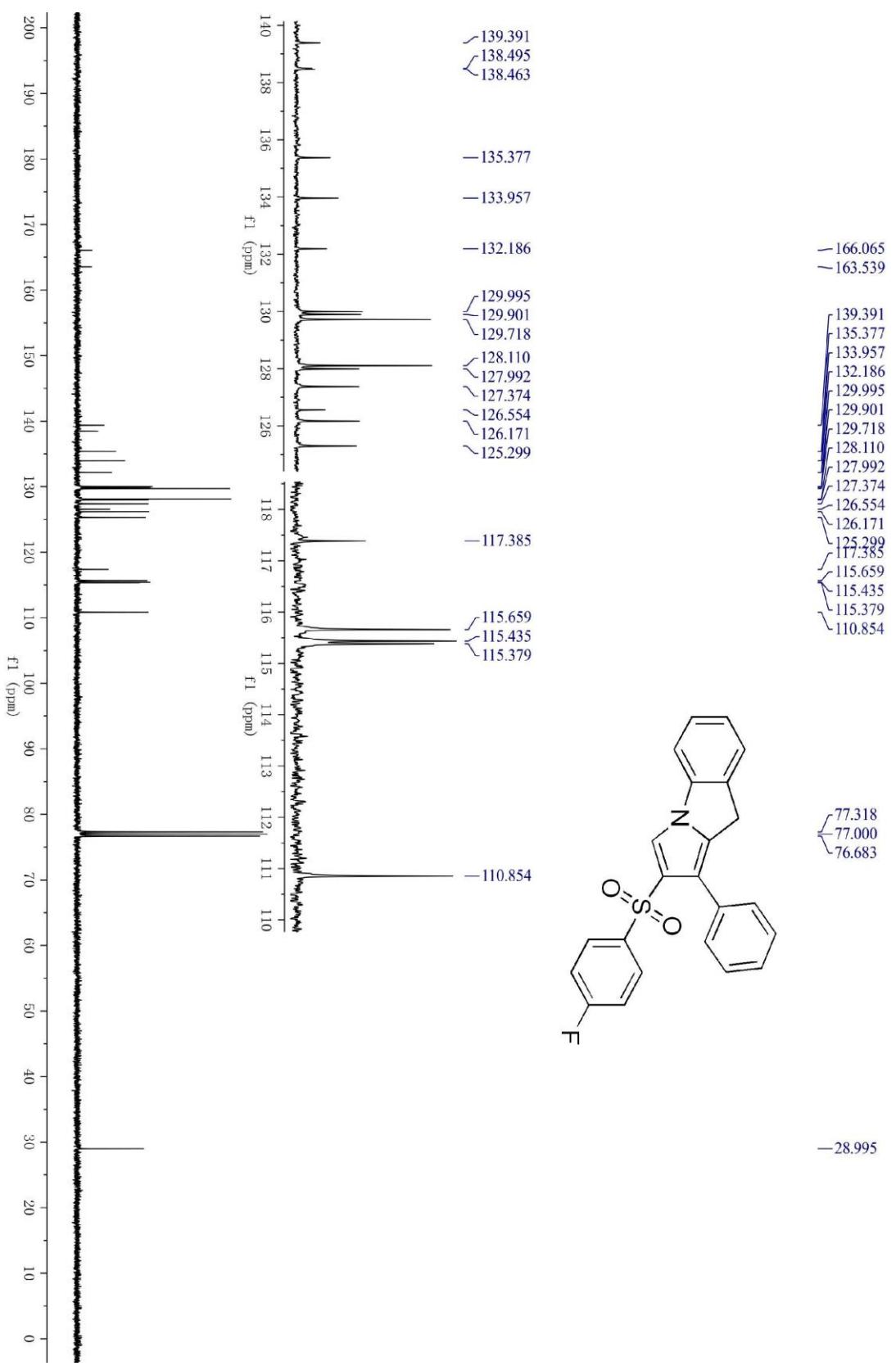
1-Phenyl-2-(phenylsulfonyl)-9*H*-pyrrolo[1,2-*a*]indole (3ae)

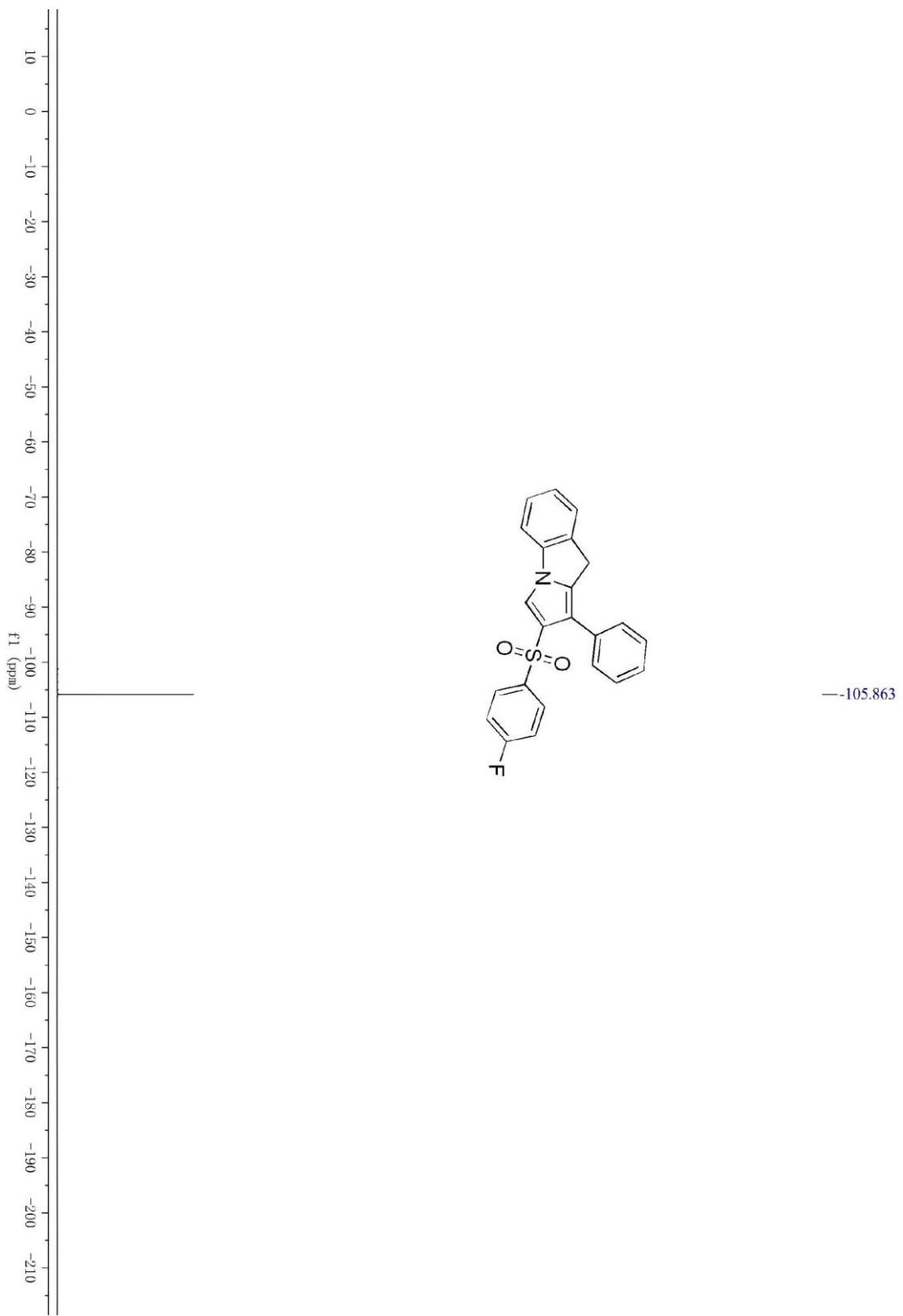




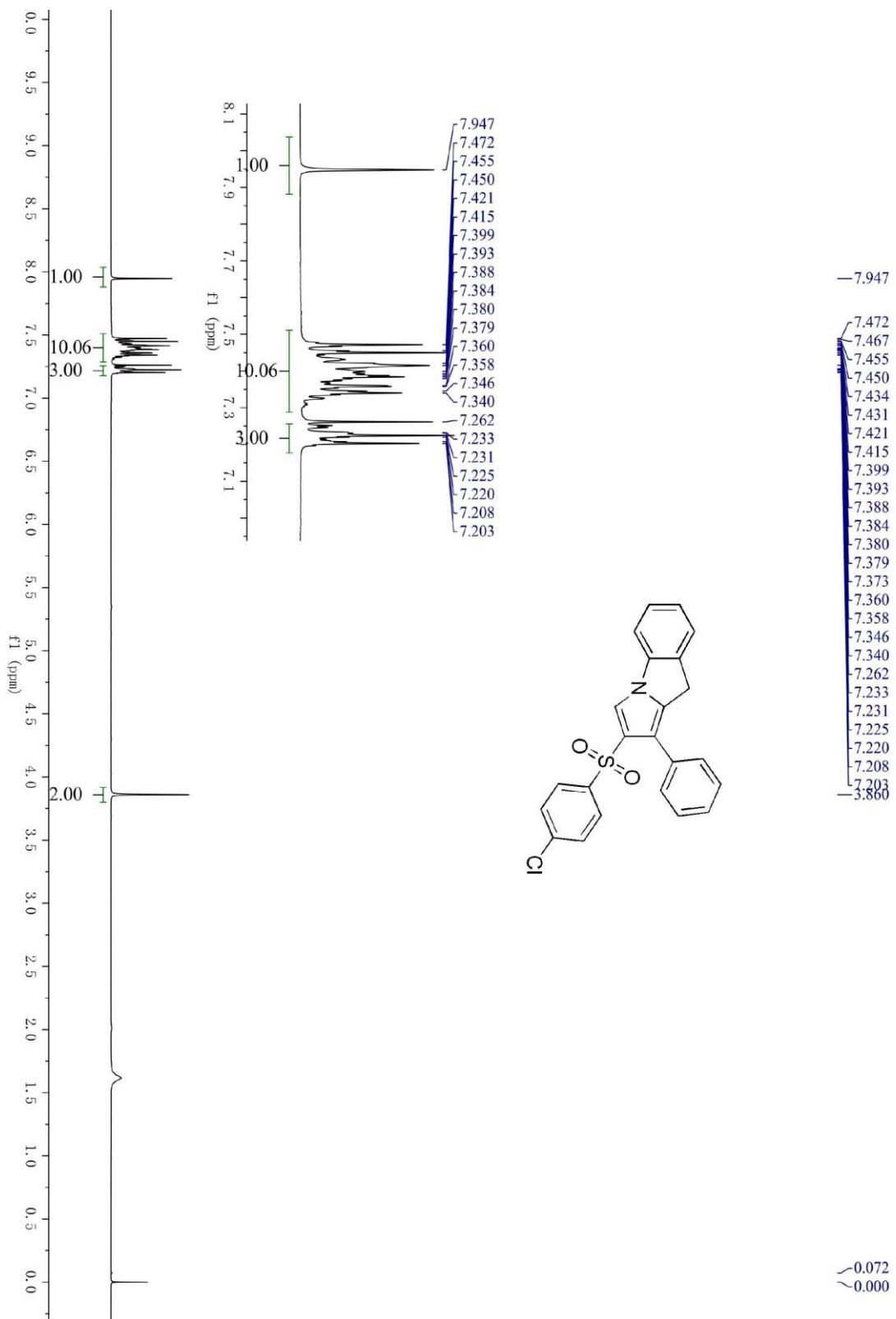
2-((4-Fluorophenyl)sulfonyl)-1-phenyl-9*H*-pyrrolo[1,2-*a*]indole (3af)

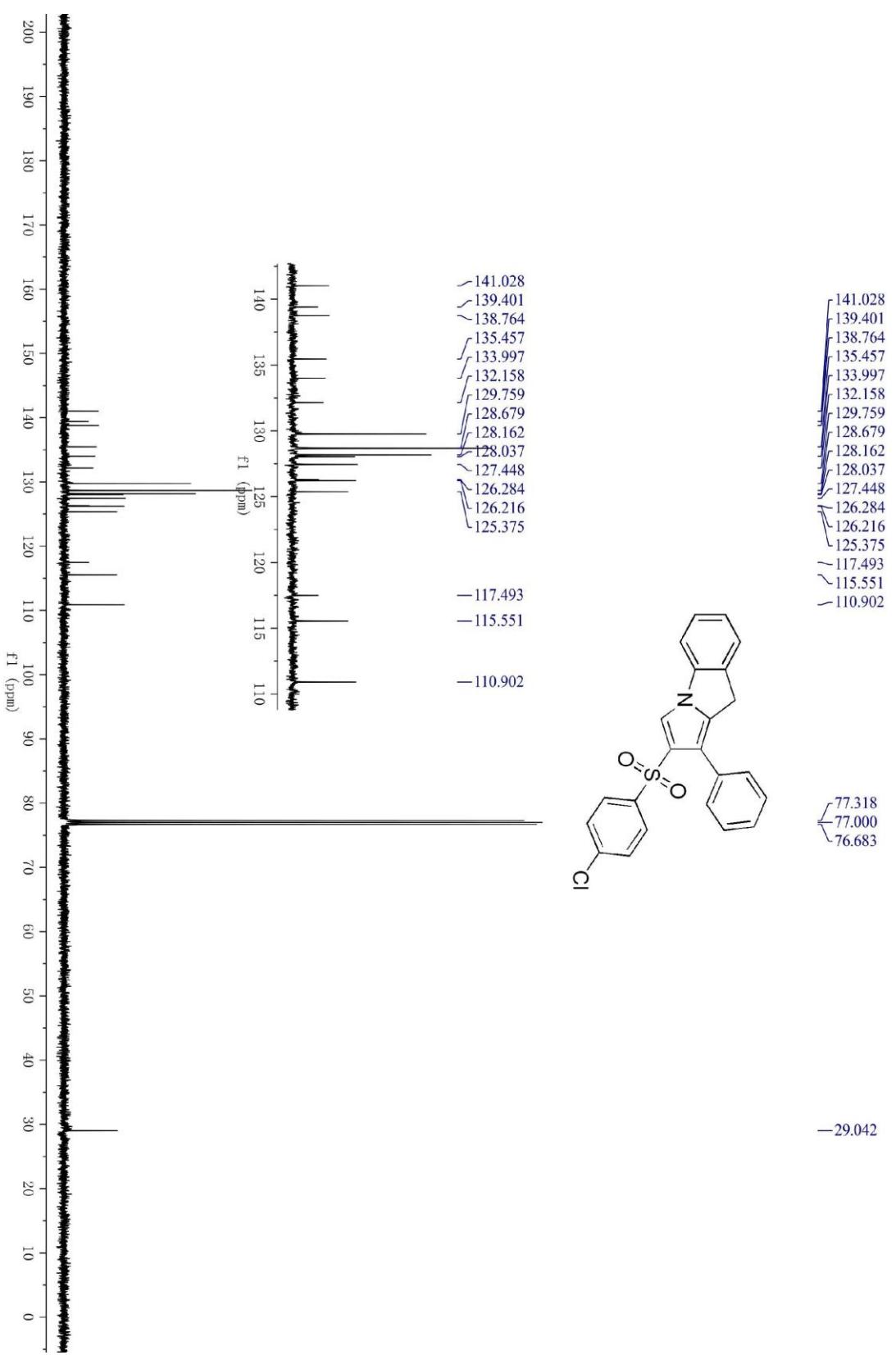




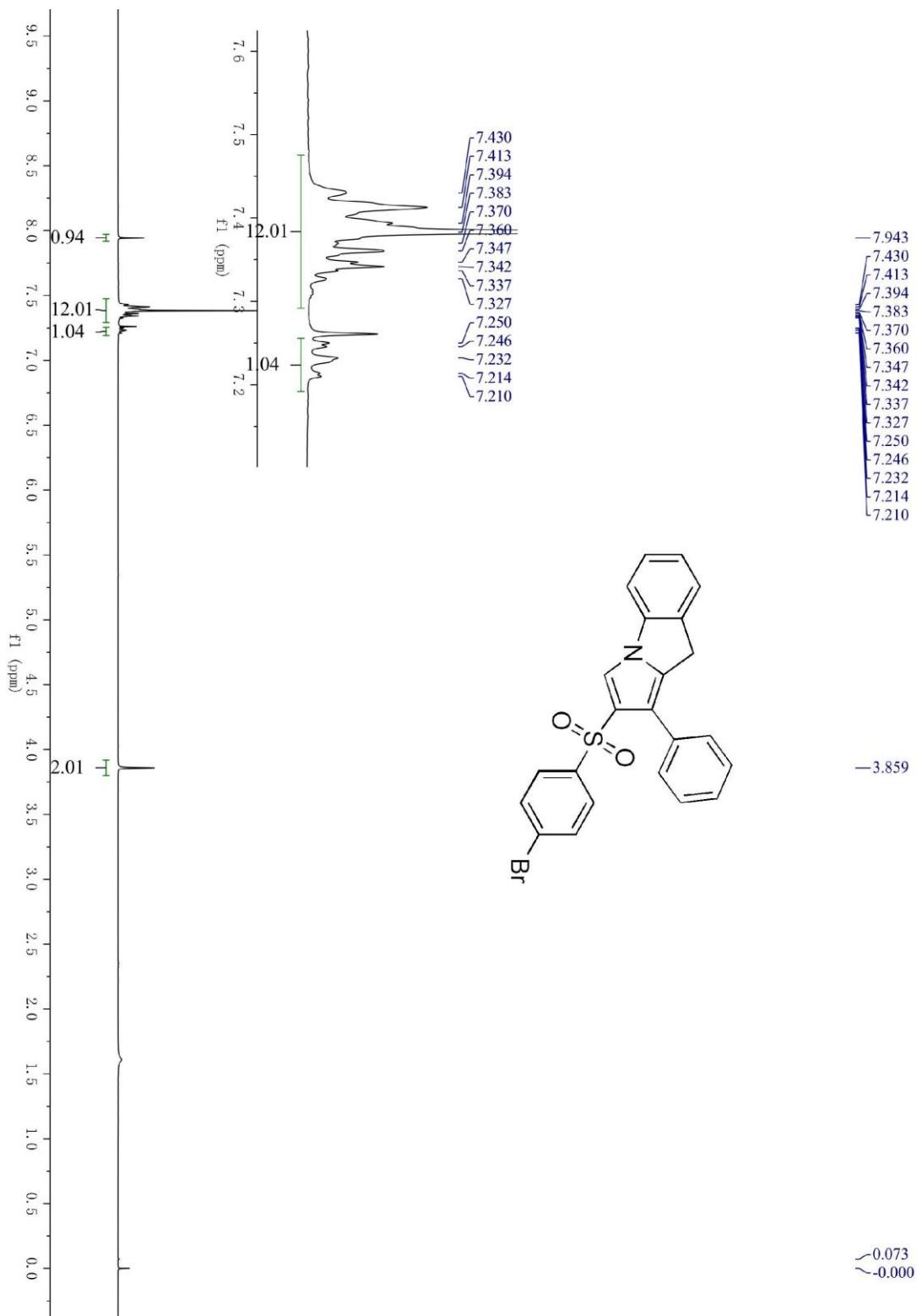


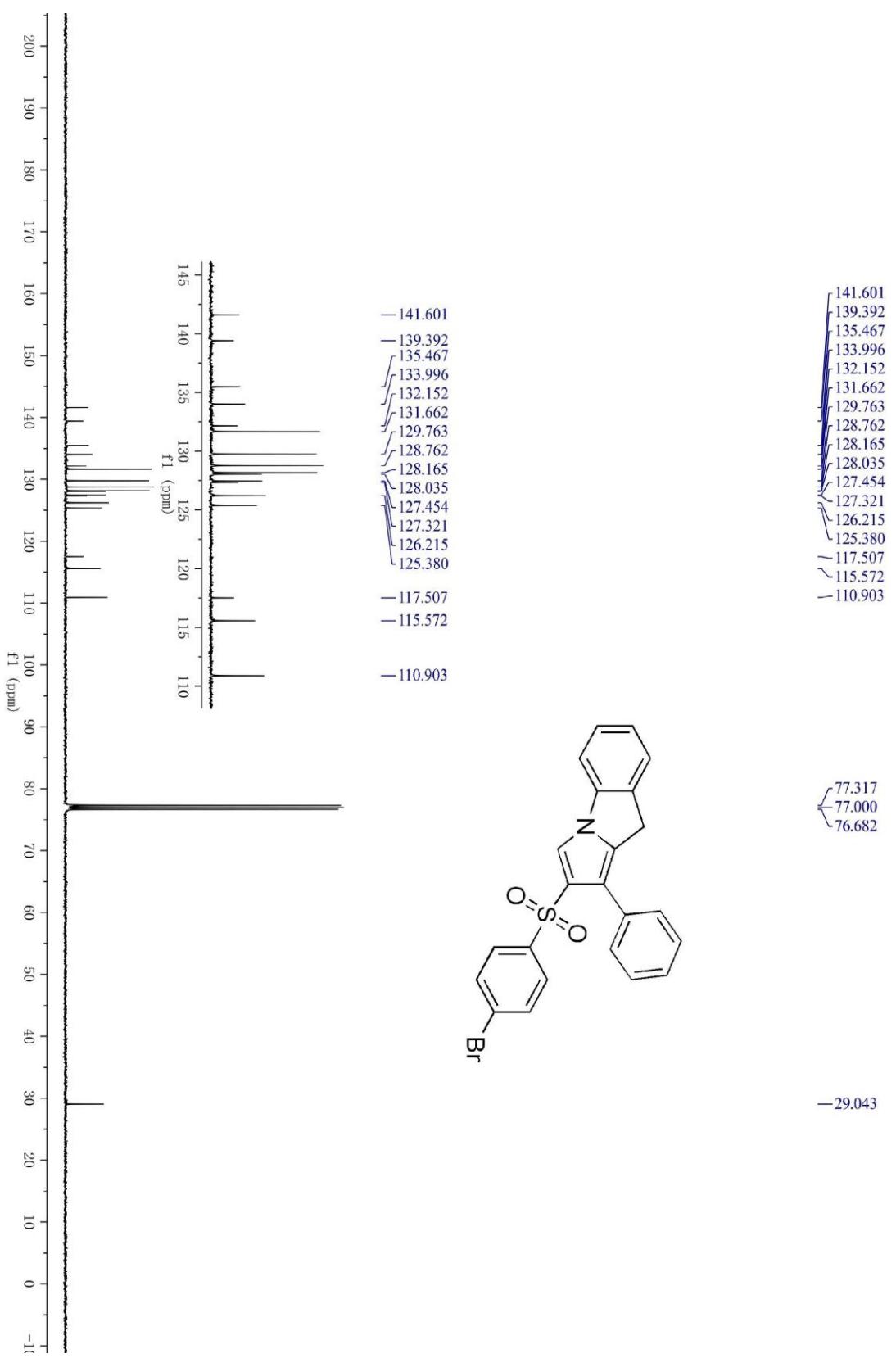
2-((4-Chlorophenyl)sulfonyl)-1-phenyl-9*H*-pyrrolo[1,2-*a*]indole (3ag)



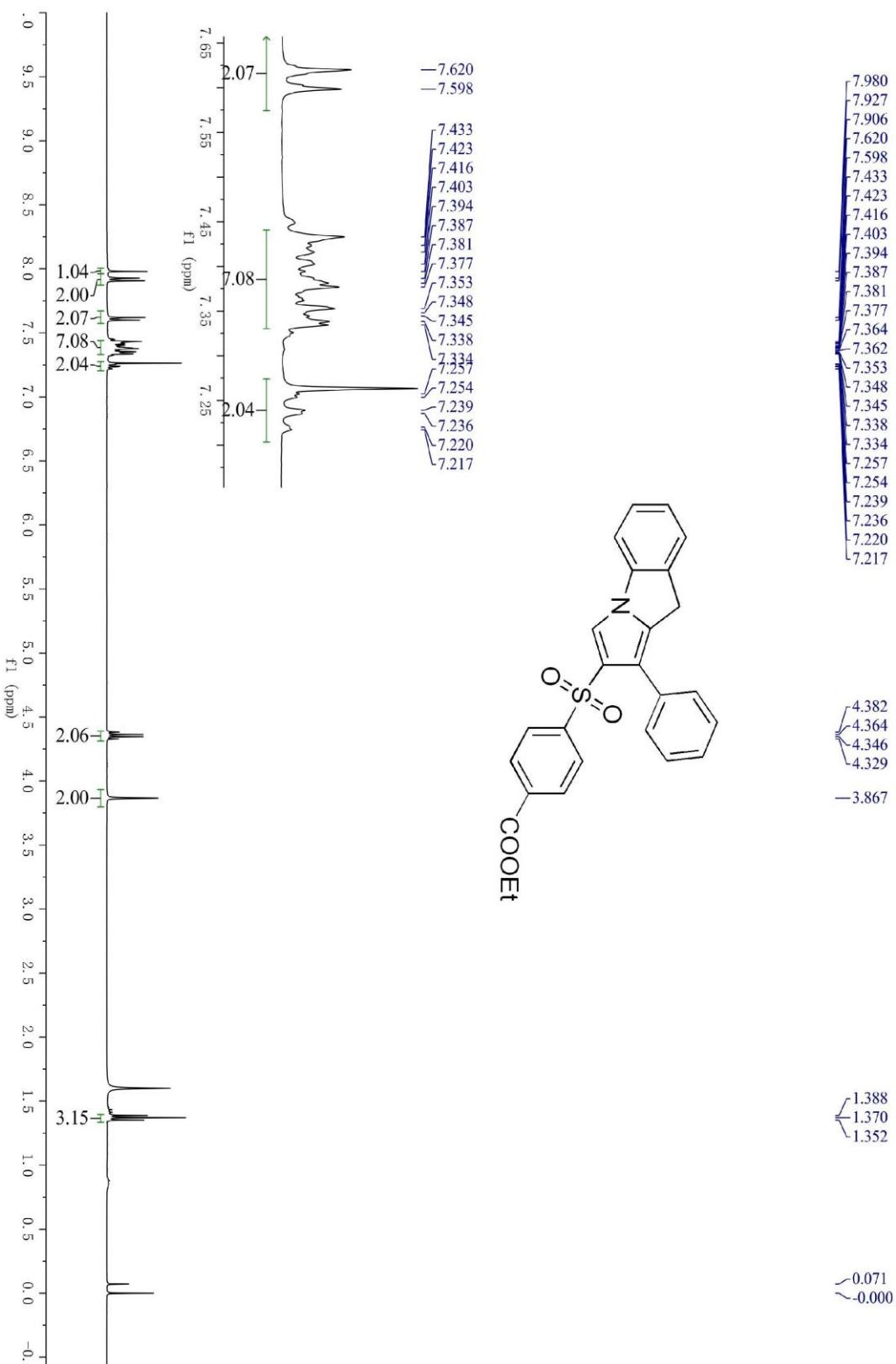


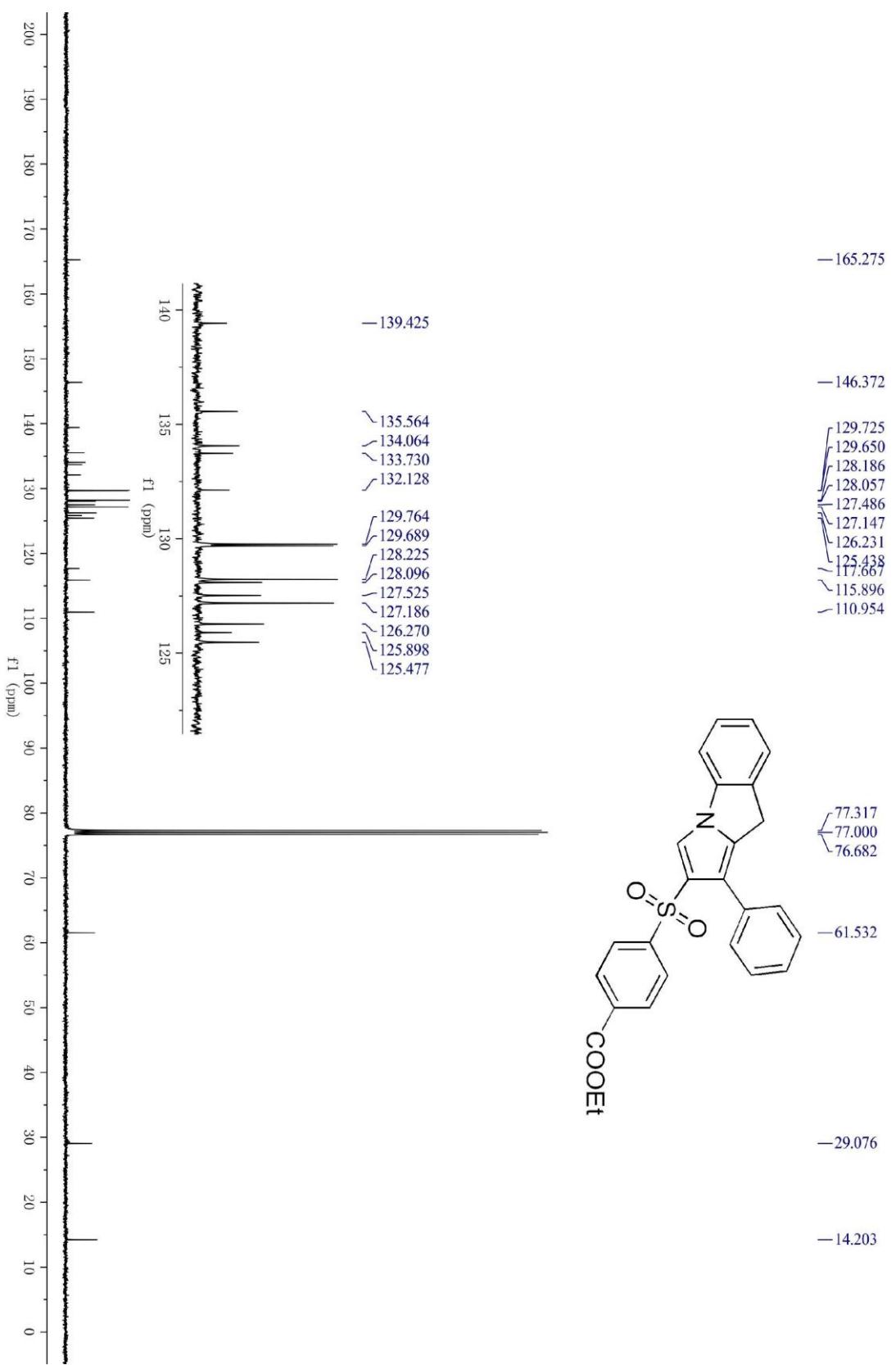
2-((4-Bromophenyl)sulfonyl)-1-phenyl-9*H*-pyrrolo[1,2-*a*]indole (3ah)



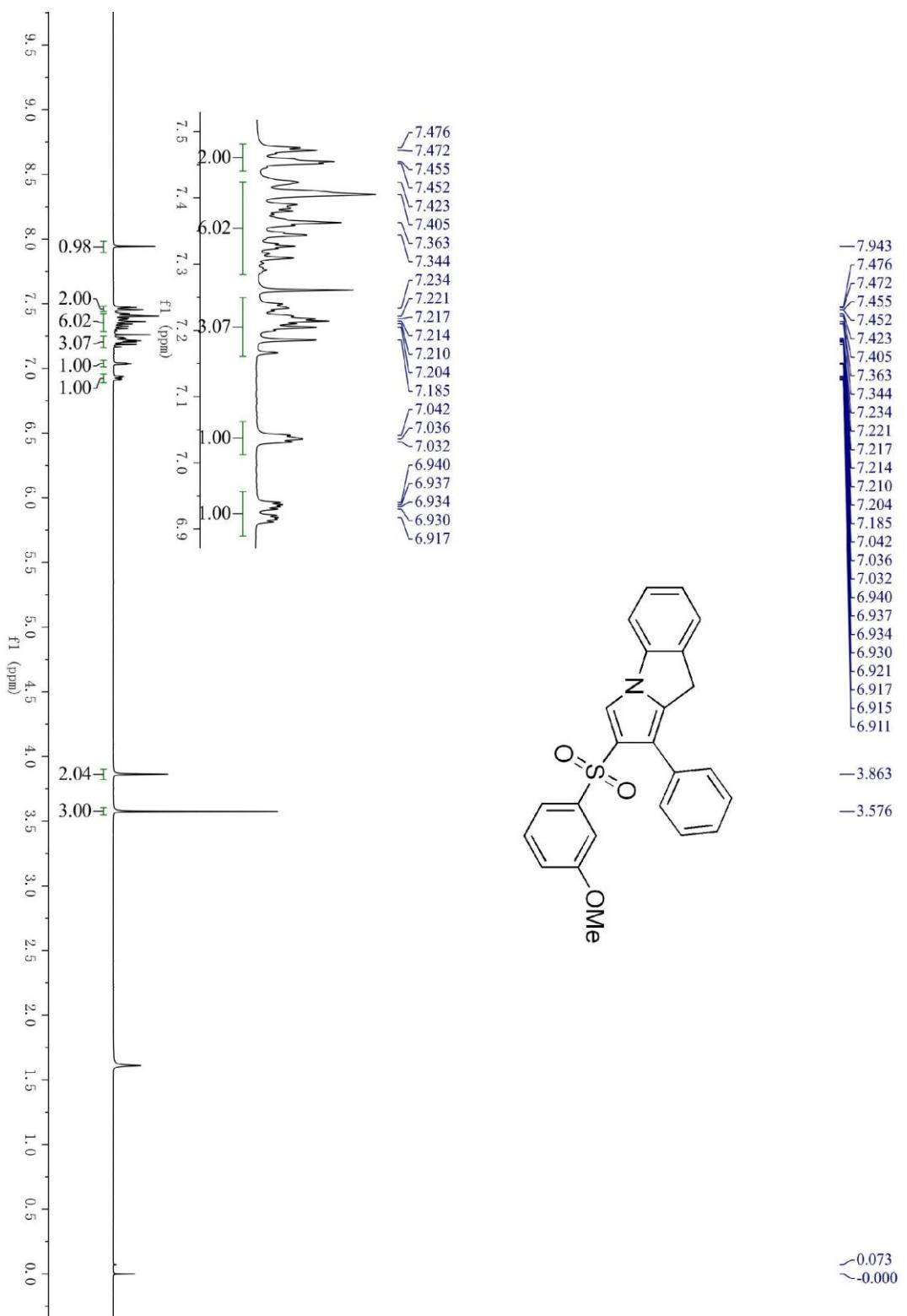


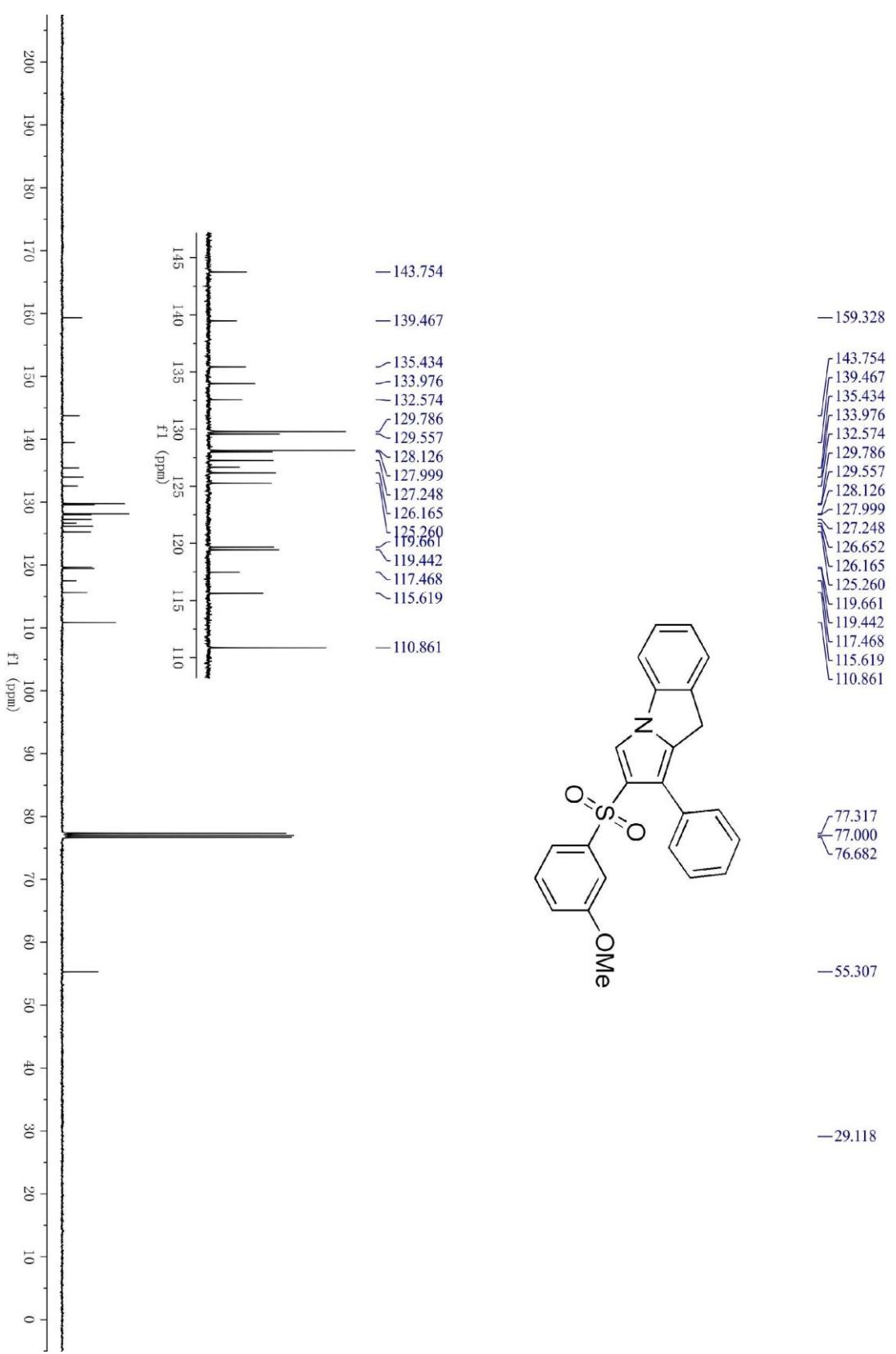
Ethyl 4-((1-phenyl-9*H*-pyrrolo[1,2-*a*]indol-2-yl)sulfonyl)benzoate (3ai)



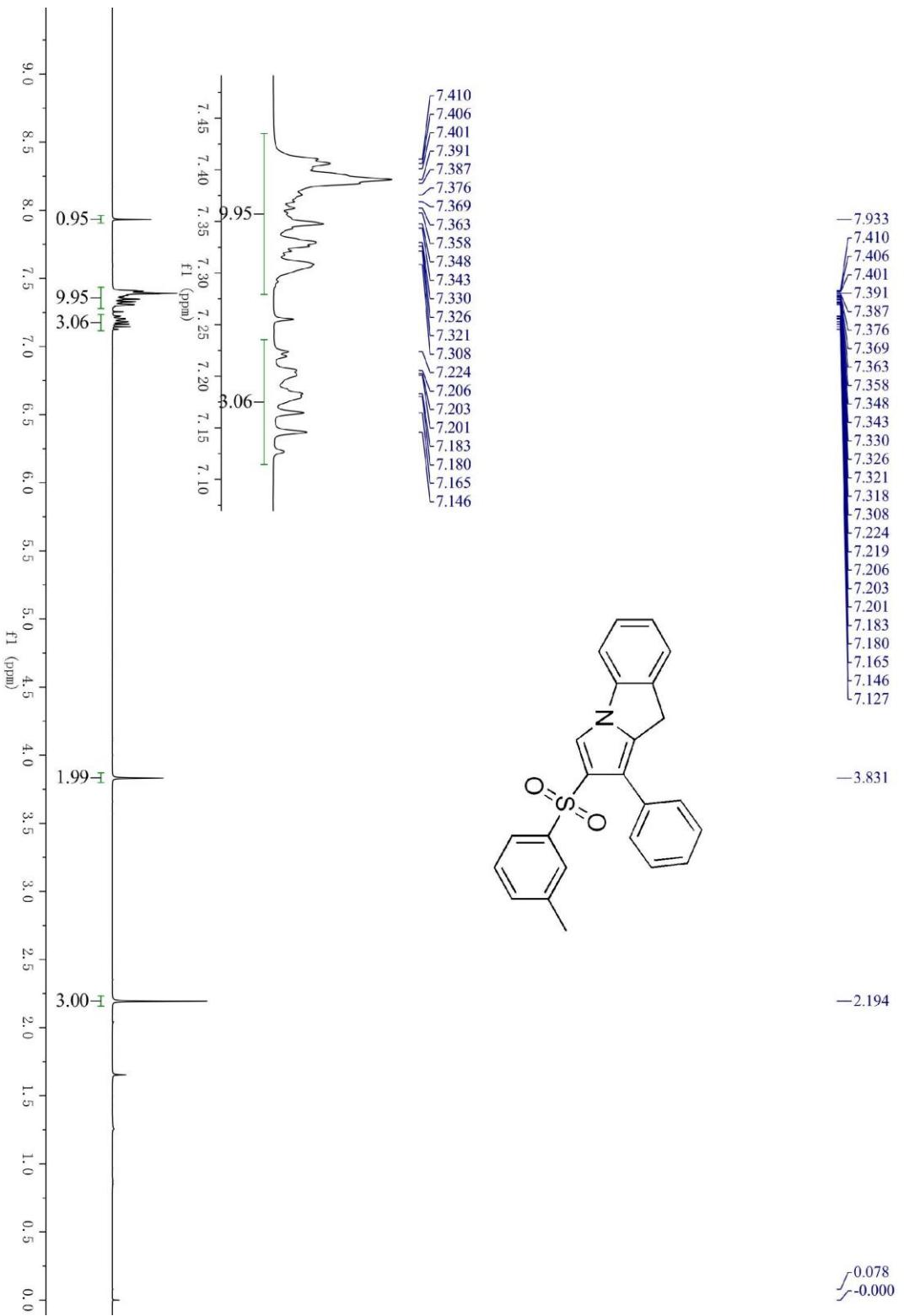


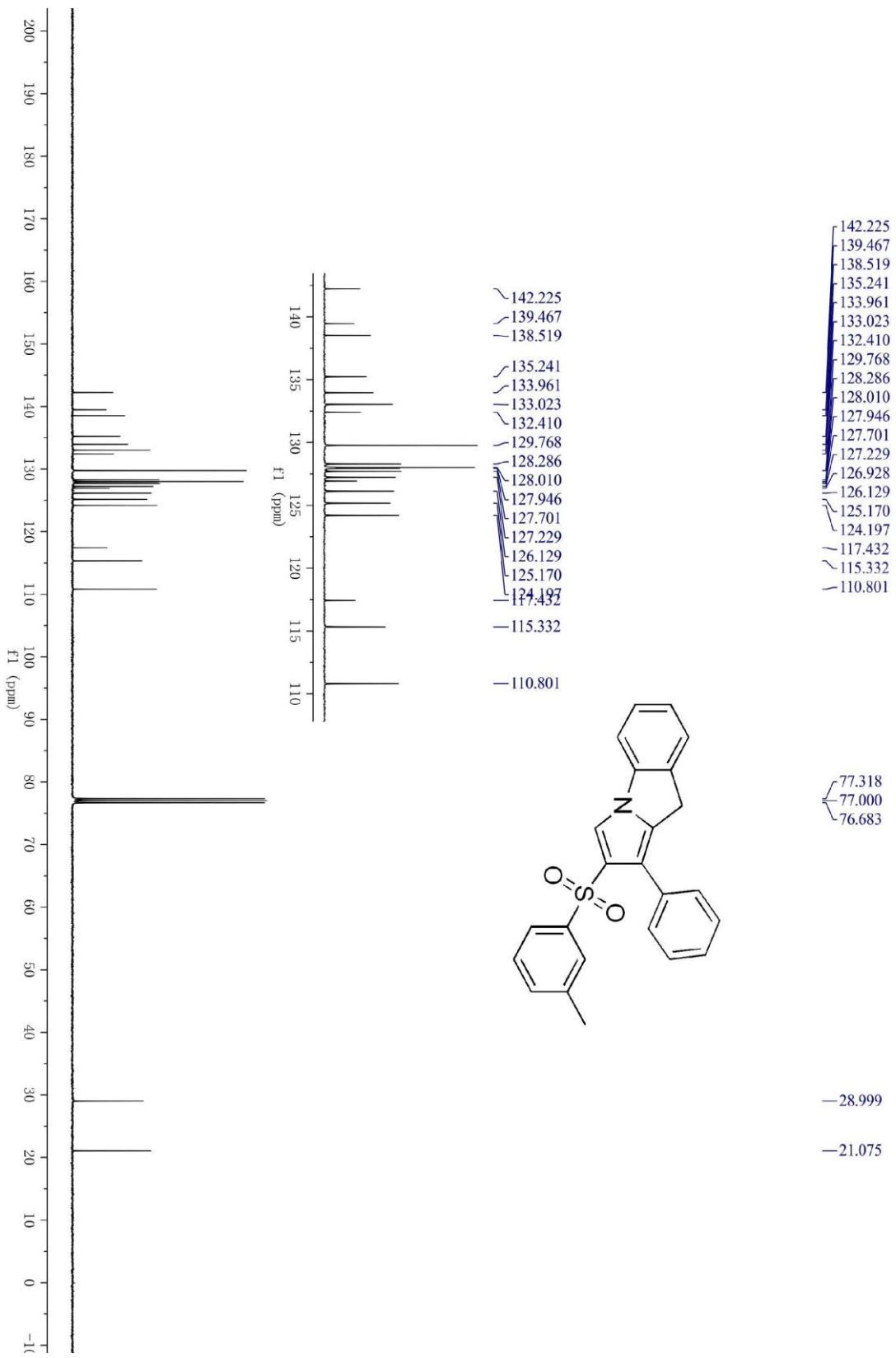
2-((3-Methoxyphenyl)sulfonyl)-1-phenyl-9H-pyrrolo[1,2-a]indole (3aj)



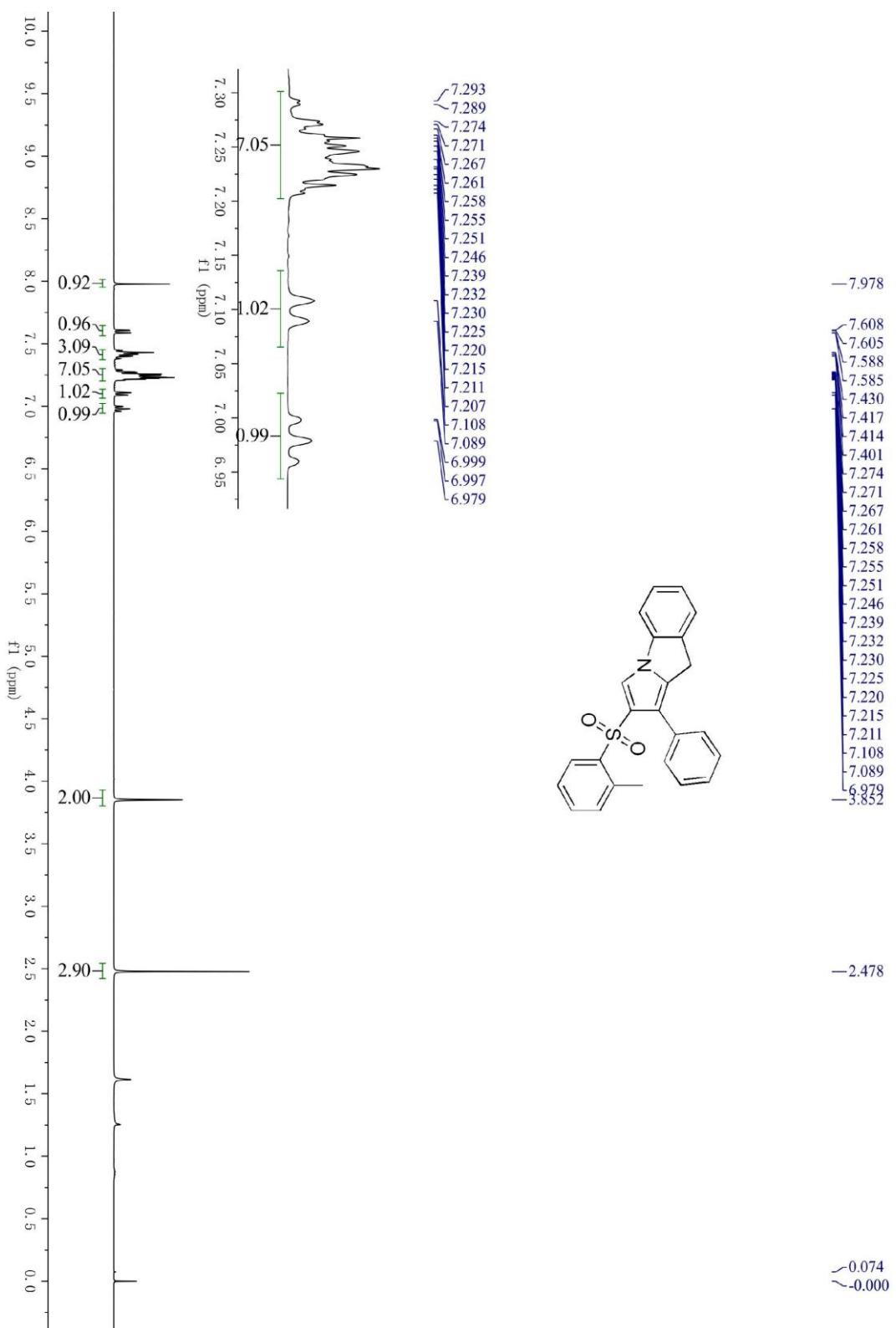


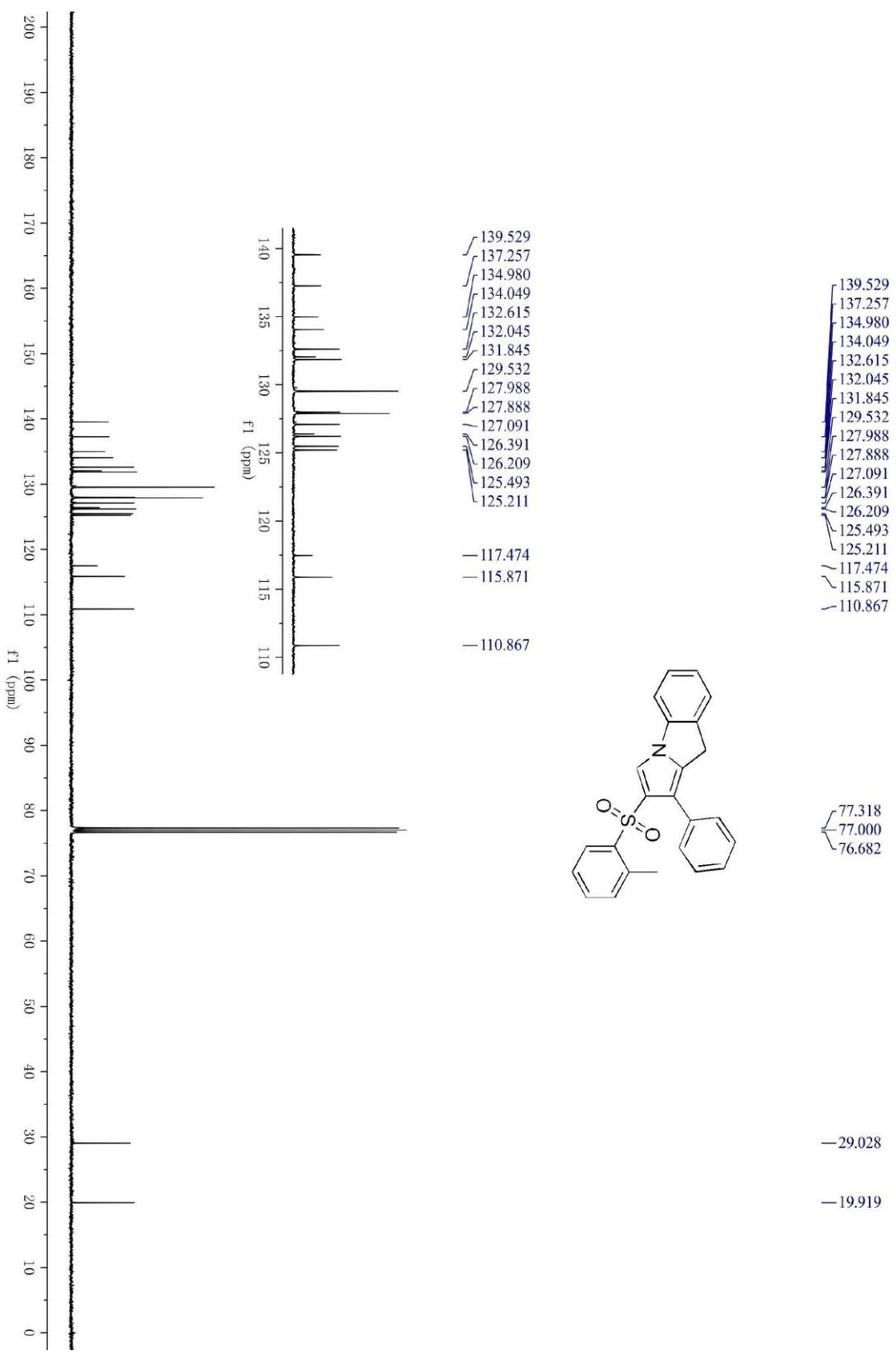
1-Phenyl-2-(*m*-tolylsulfonyl)-9*H*-pyrrolo[1,2-*a*]indole (3ak)



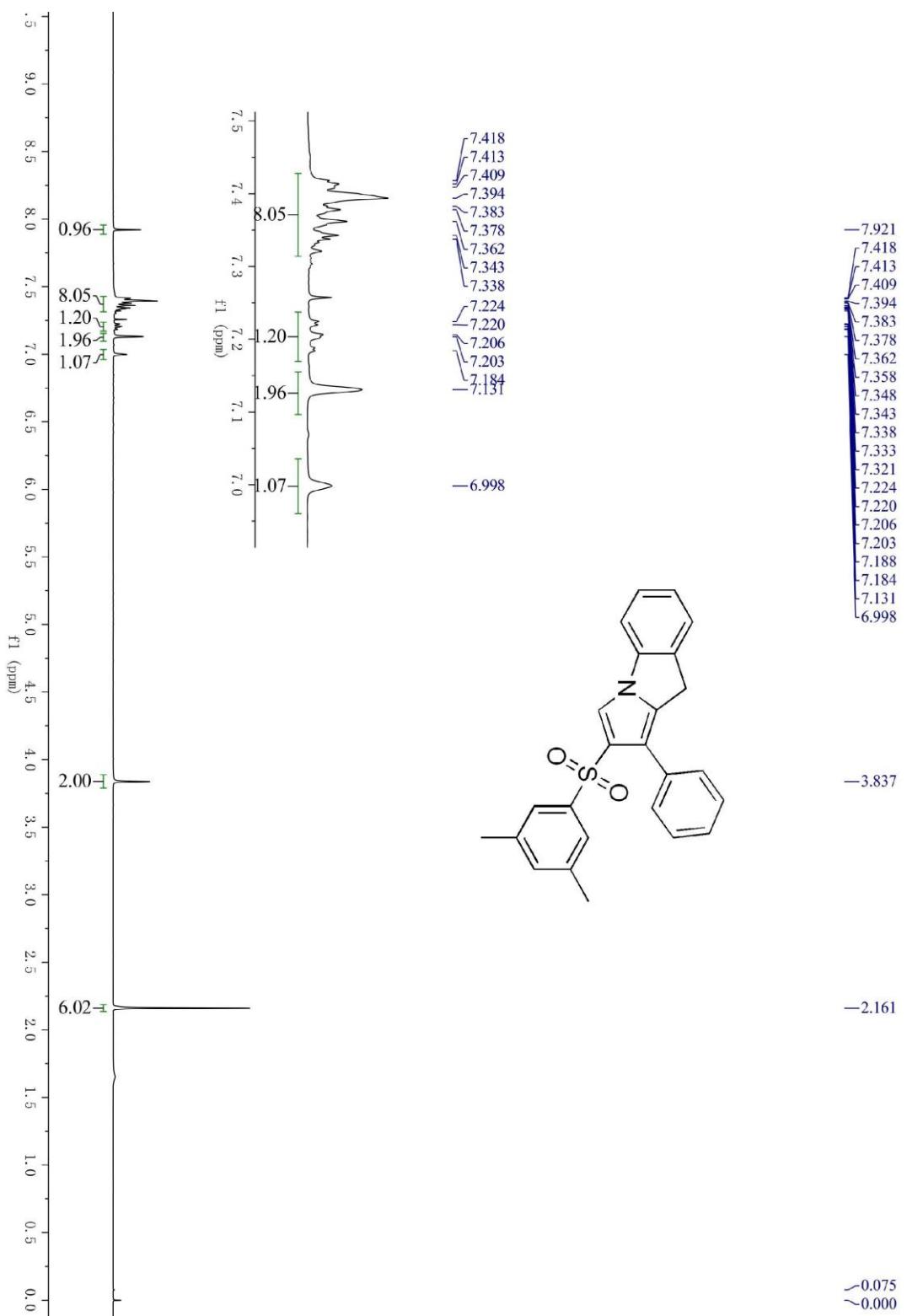


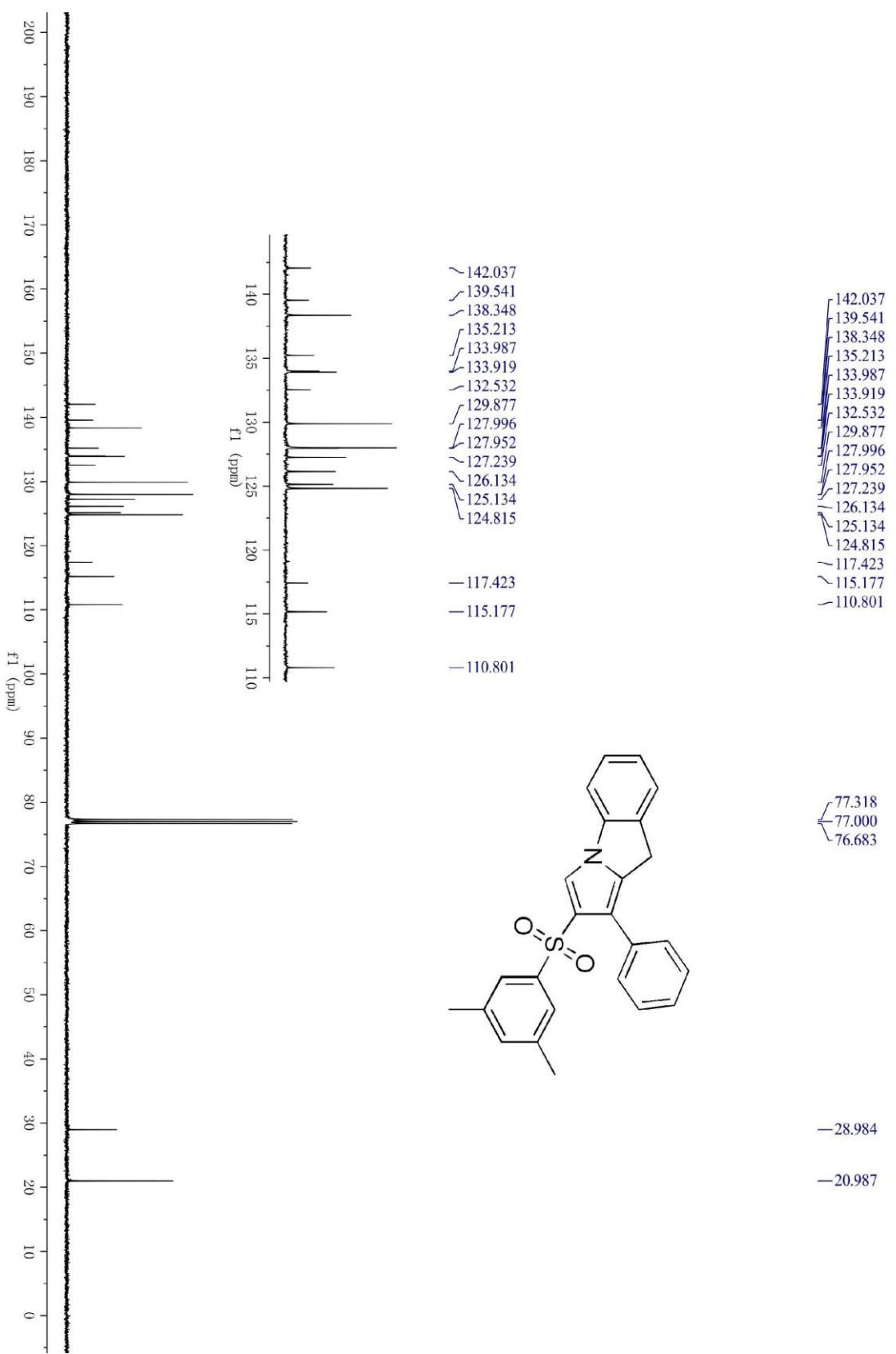
1-Phenyl-2-(*o*-tolylsulfonyl)-9*H*-pyrrolo[1,2-*a*]indole (3al)



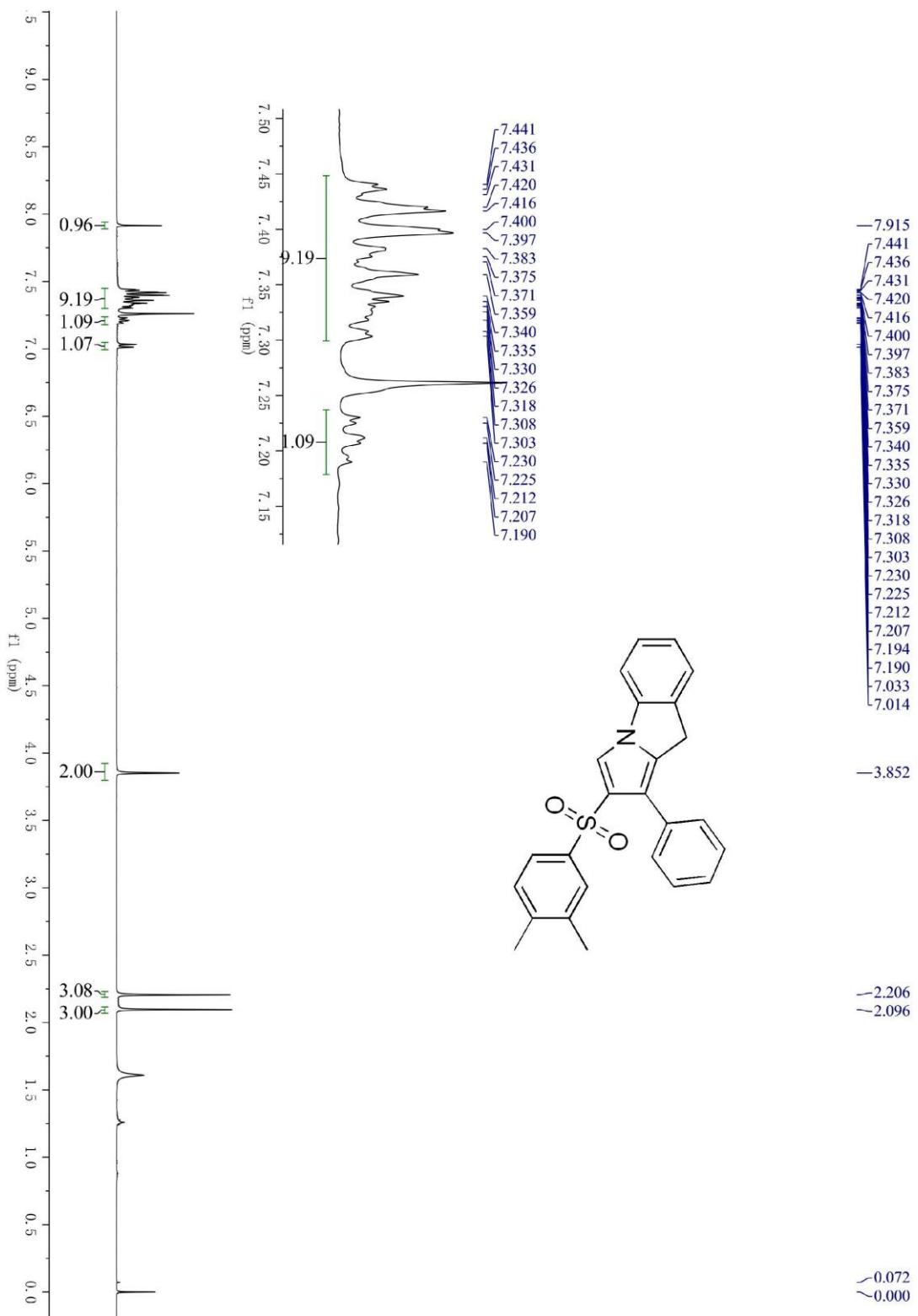


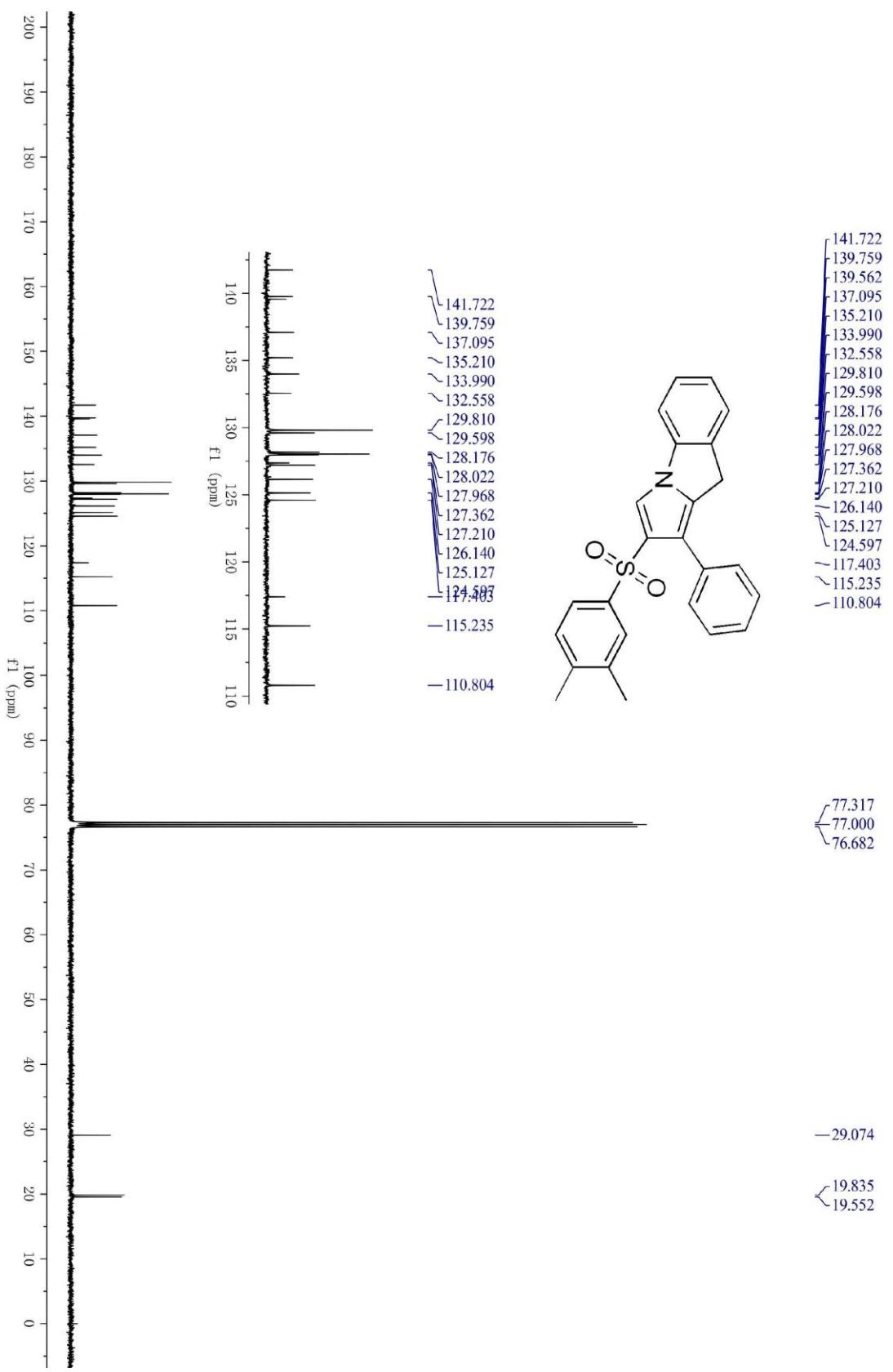
2-((3,5-Dimethylphenyl)sulfonyl)-1-phenyl-9*H*-pyrrolo[1,2-*a*]indole (3am)



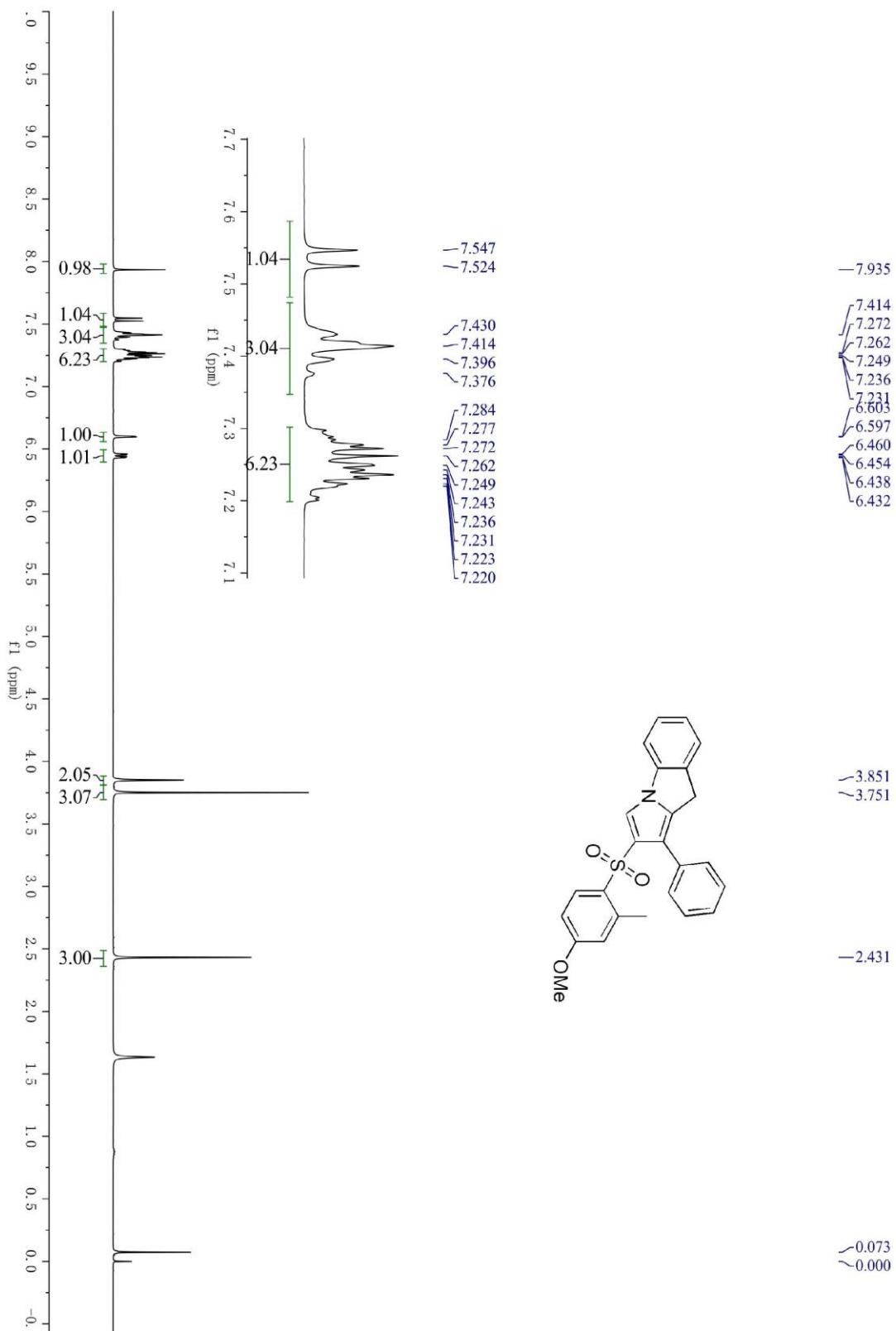


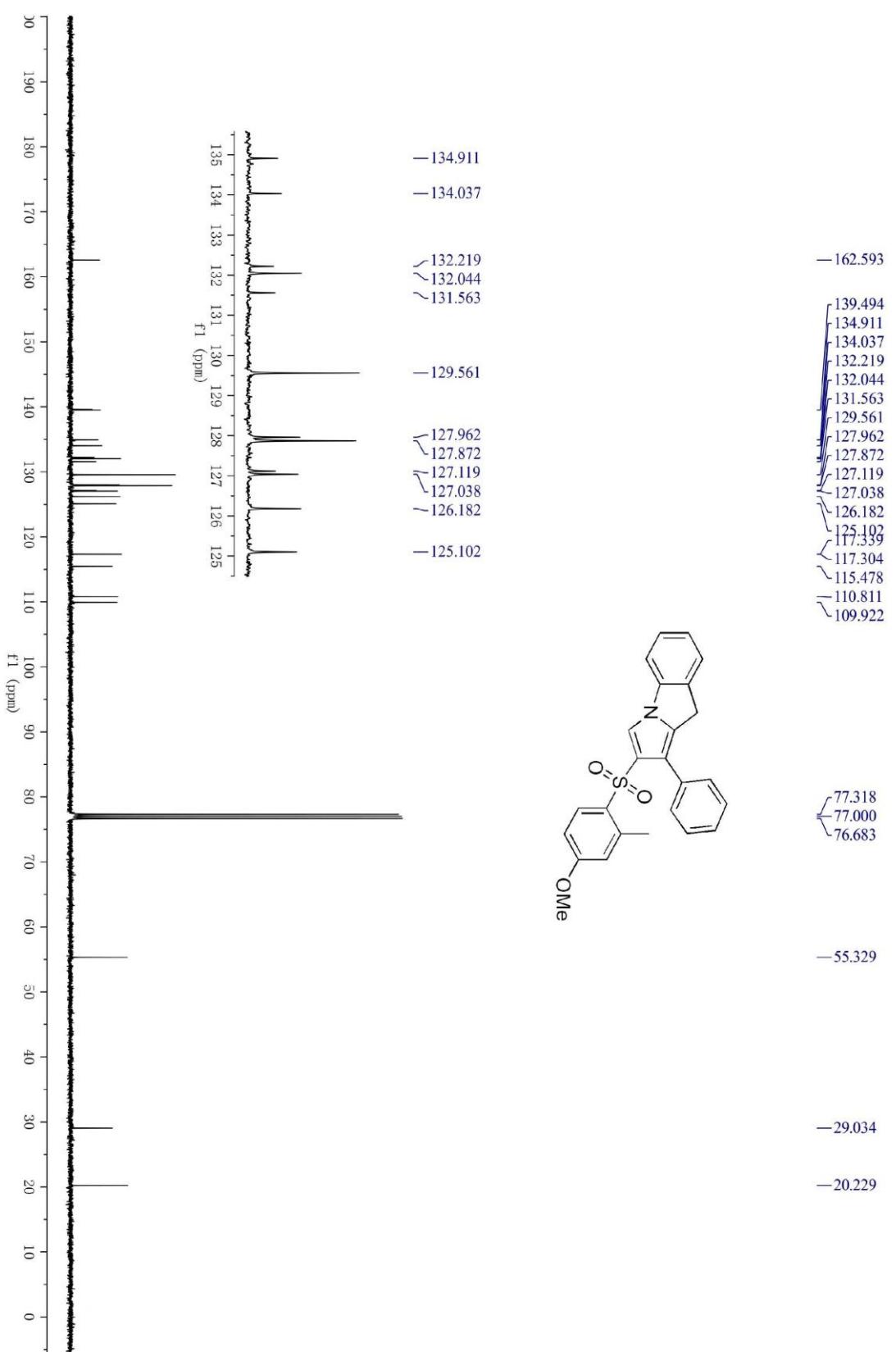
2-((3,4-Dimethylphenyl)sulfonyl)-1-phenyl-9*H*-pyrrolo[1,2-*a*]indole (3an)



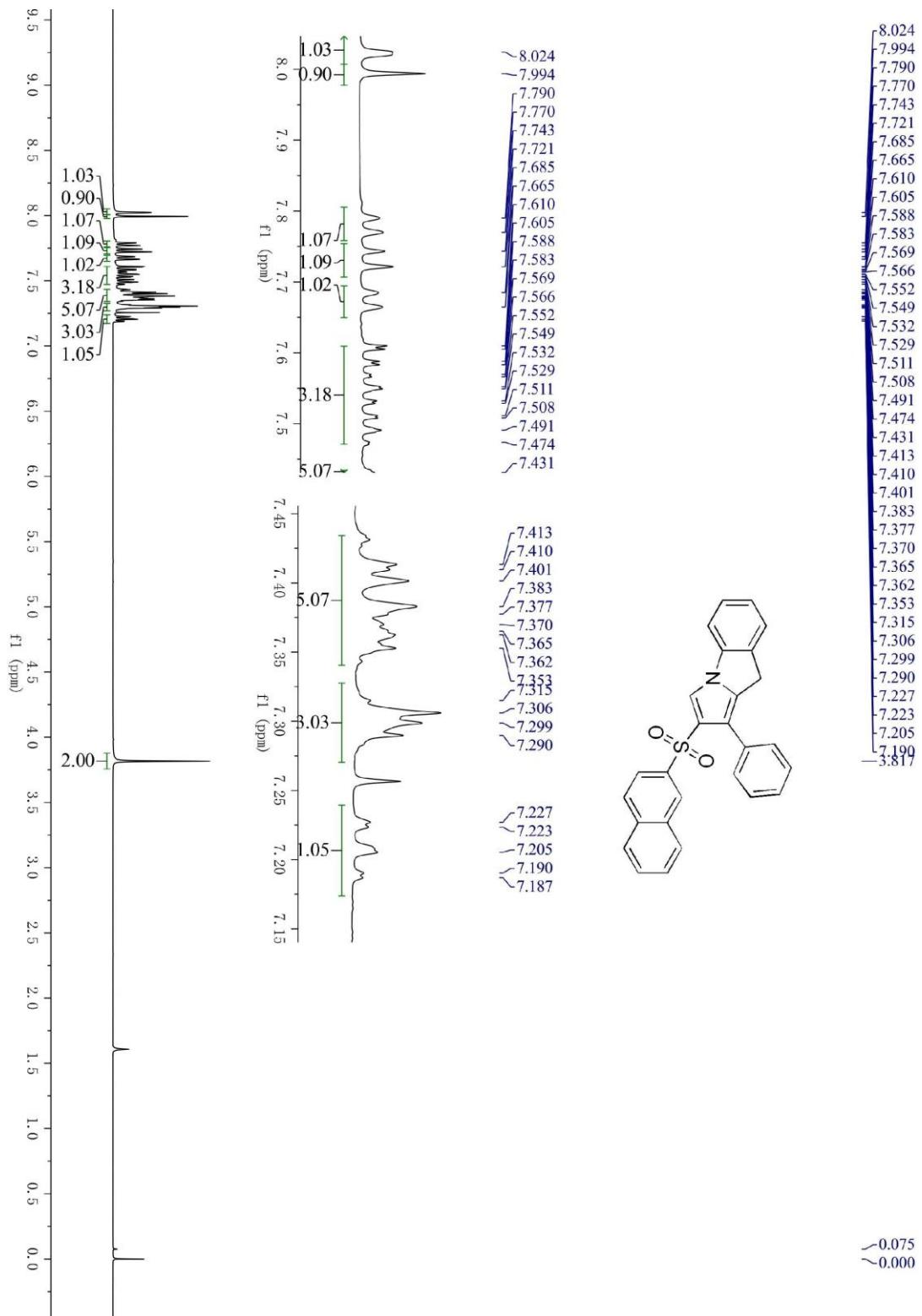


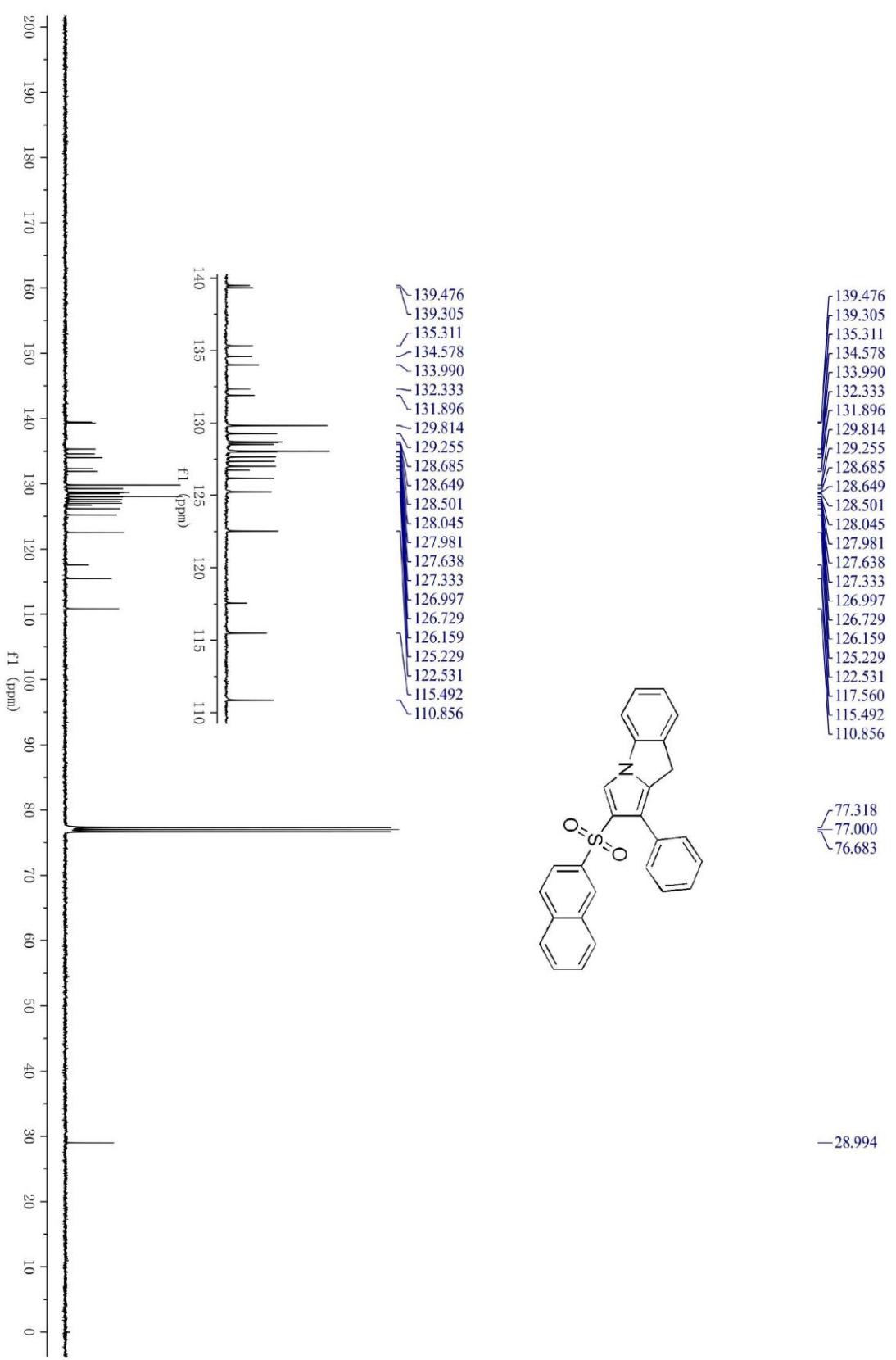
2-((4-Methoxy-2-methylphenyl)sulfonyl)-1-phenyl-9*H*-pyrrolo[1,2-*a*]indole (3ao)





2-(Naphthalen-2-ylsulfonyl)-1-phenyl-9*H*-pyrrolo[1,2-*a*]indole (3ap)





(2-((4-Methoxyphenyl)sulfonyl)ethene-1,1-diyldibenzene (4)

