

Magnetically separable graphene oxide anchored sulfonic acid: a novel, high efficient and recyclable catalyst for one-pot synthesis of 3,6-di(pyridin-3-yl)-1*H*-pyrazolo[3,4-*b*]pyridine-5-carbonitriles in deep eutectic solvent under microwave irradiation

Mo Zhang,^a Peng Liu,^a Yu-Heng Liu,^{*a,b} Ze-Ren Shang,^a Hai-Chuan Hu,^a Zhan-Hui Zhang^{*a}

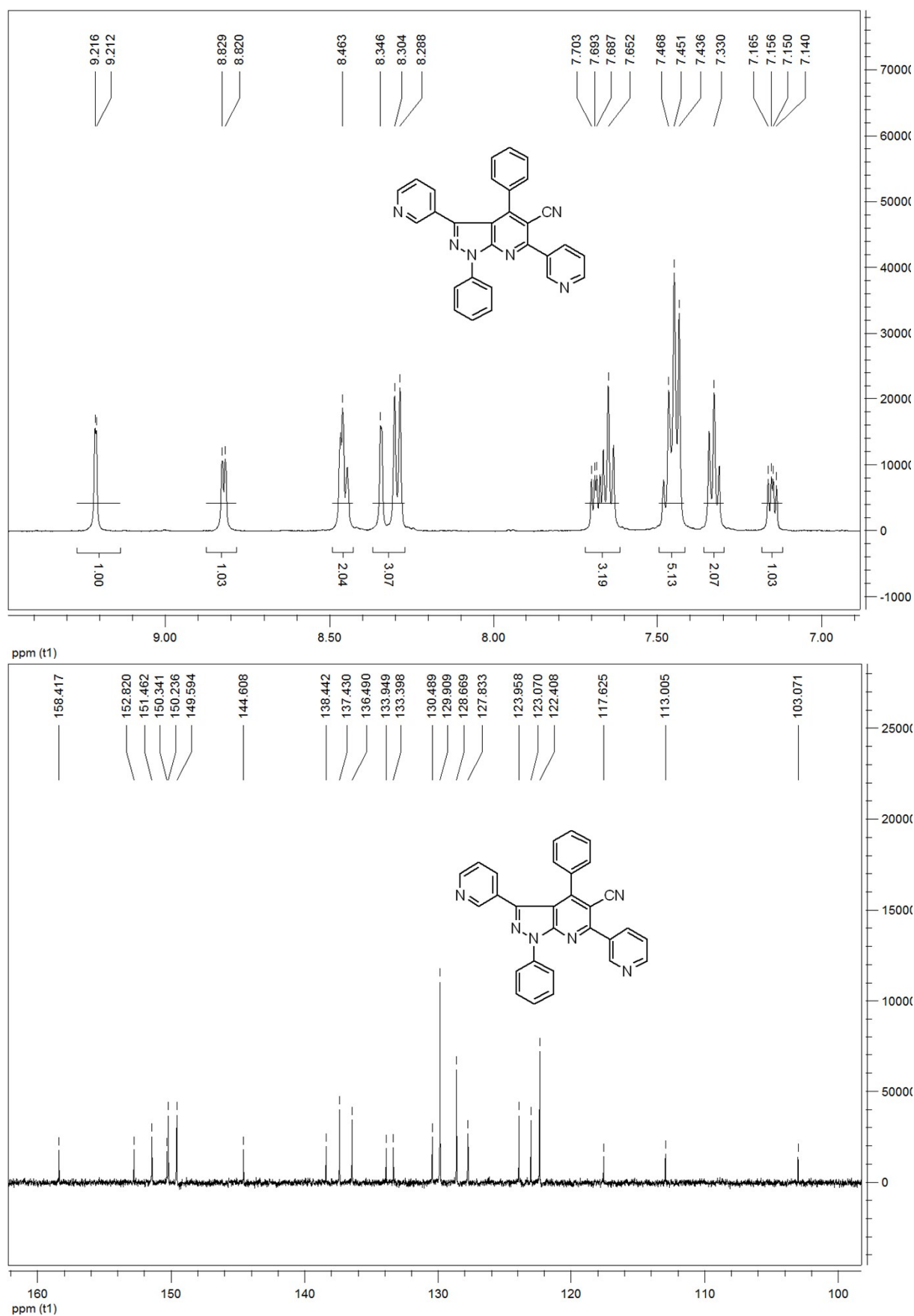
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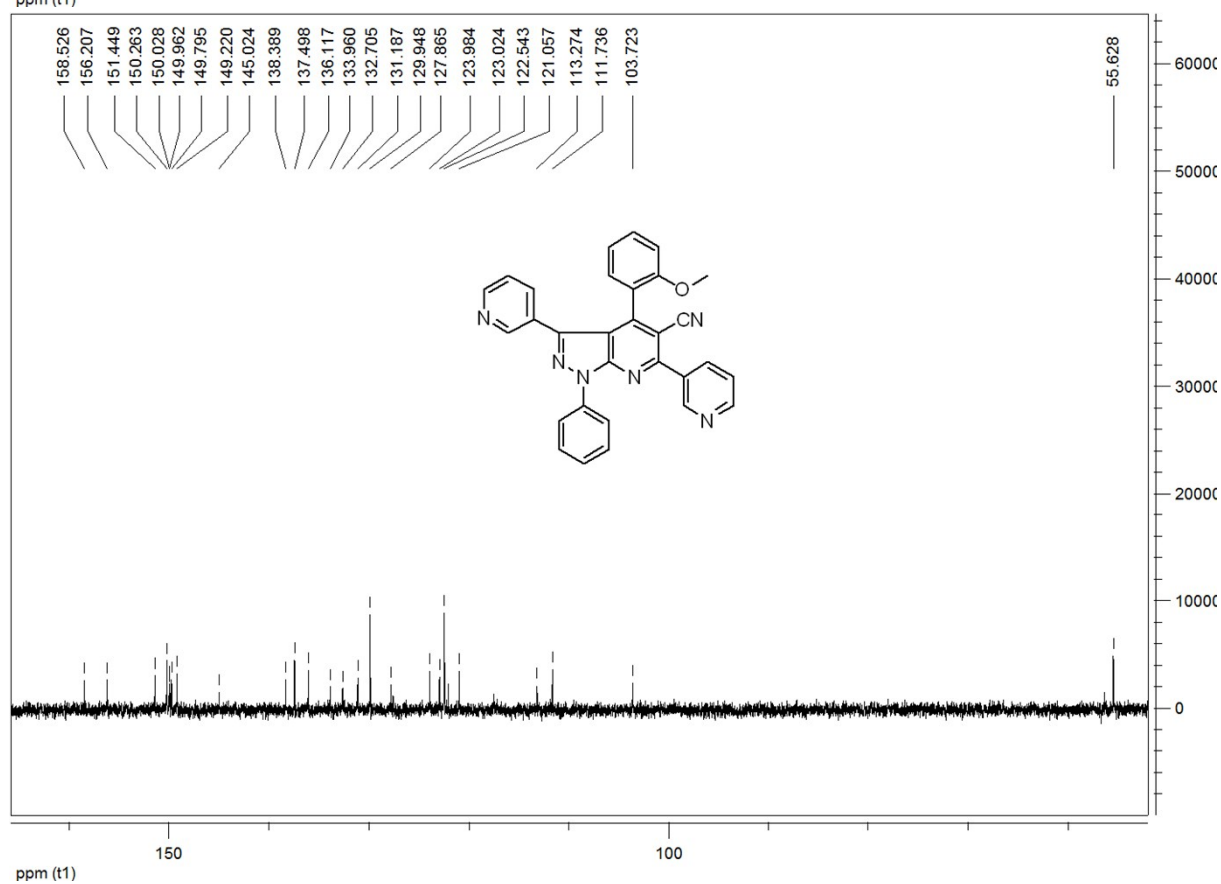
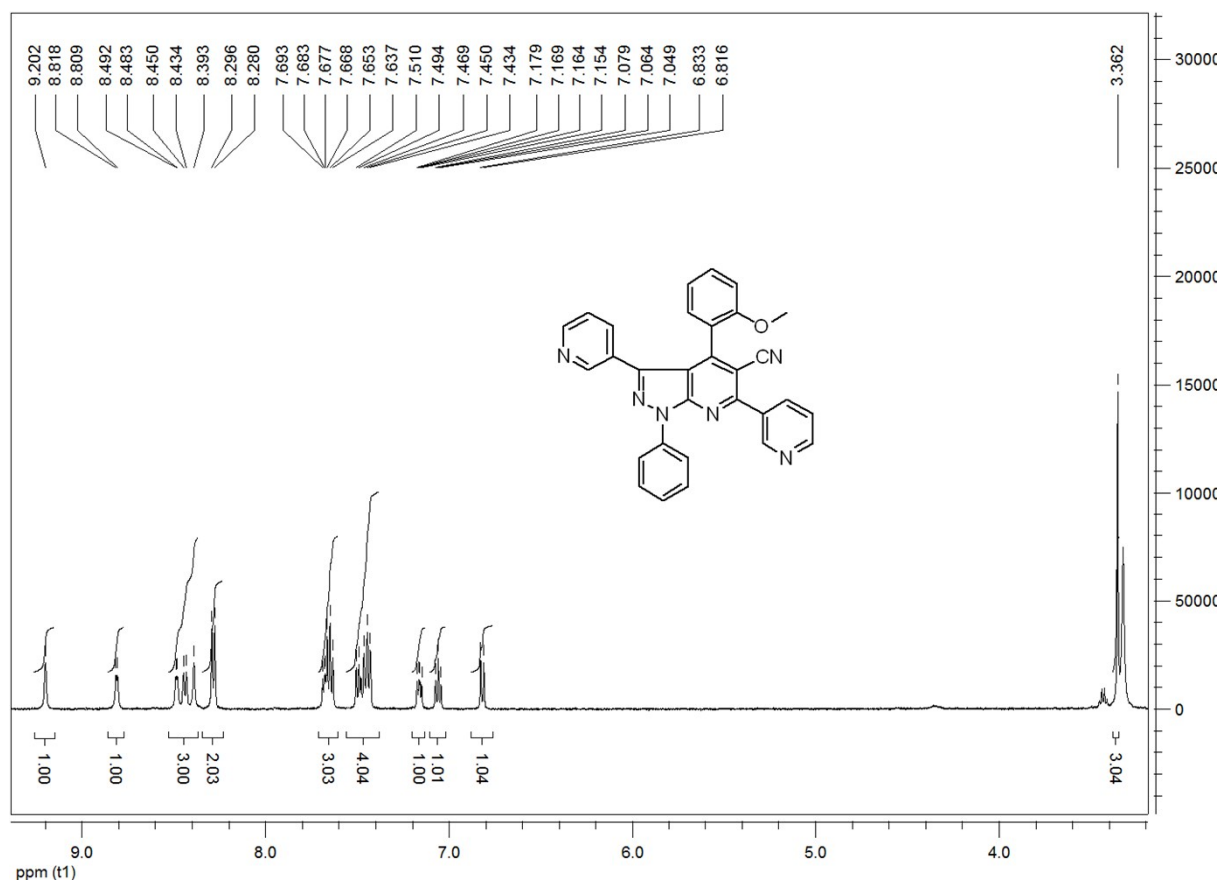
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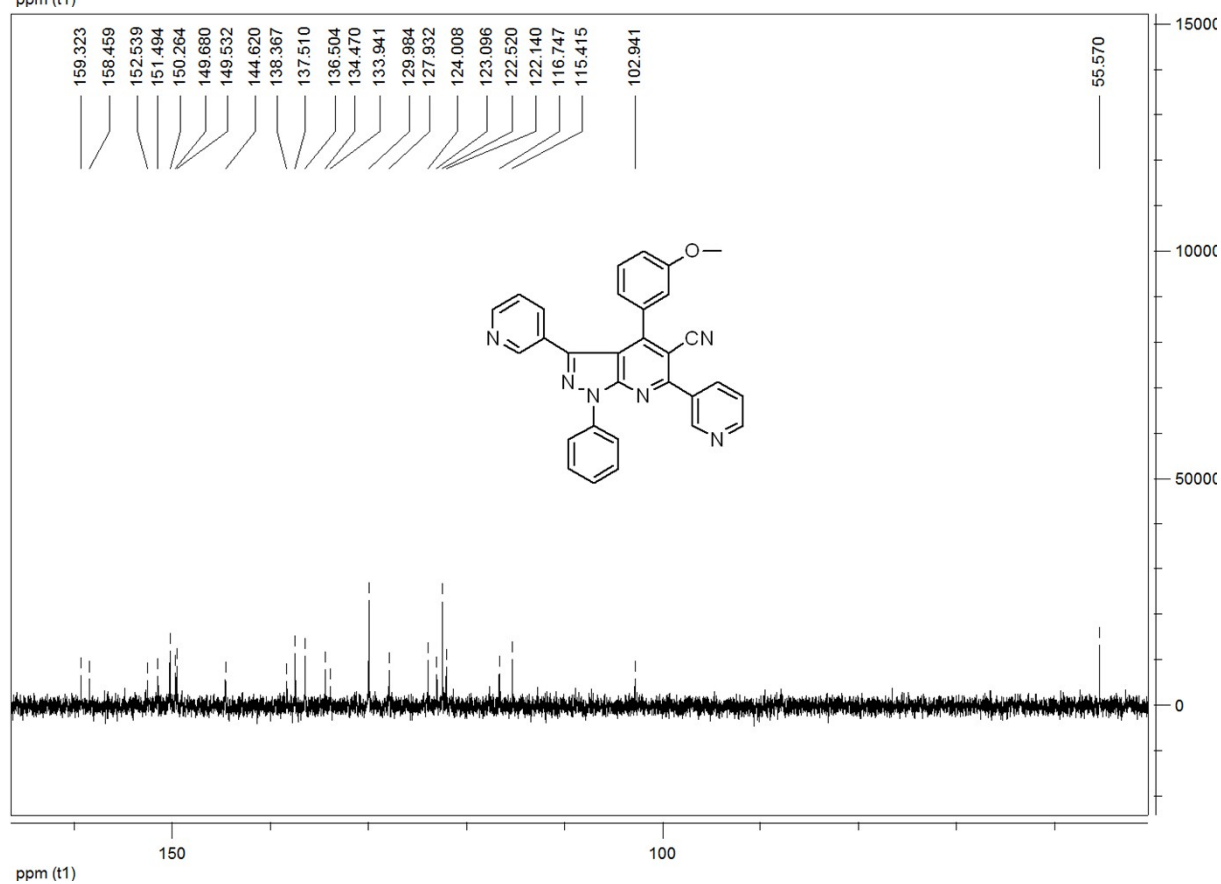
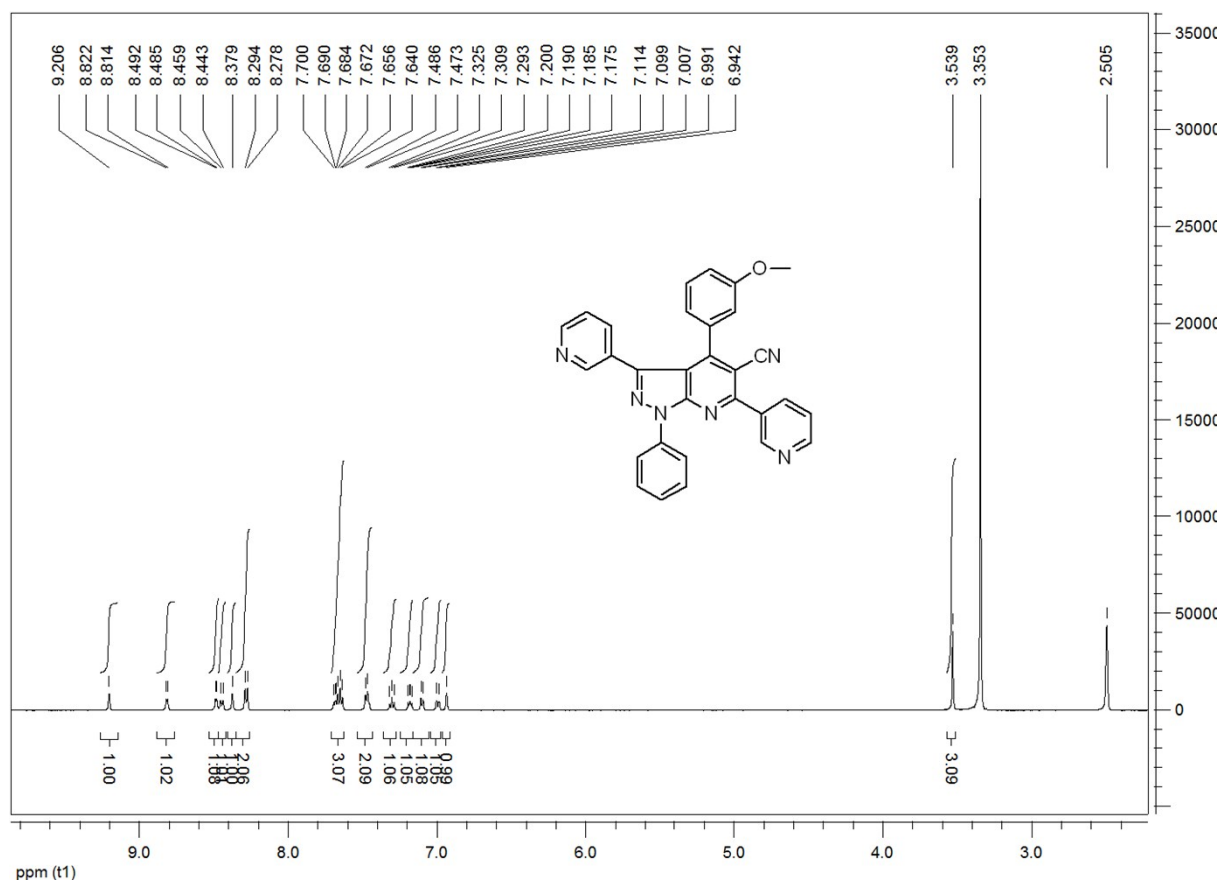
^1H NMR and ^{13}C NMR of compound **4a**



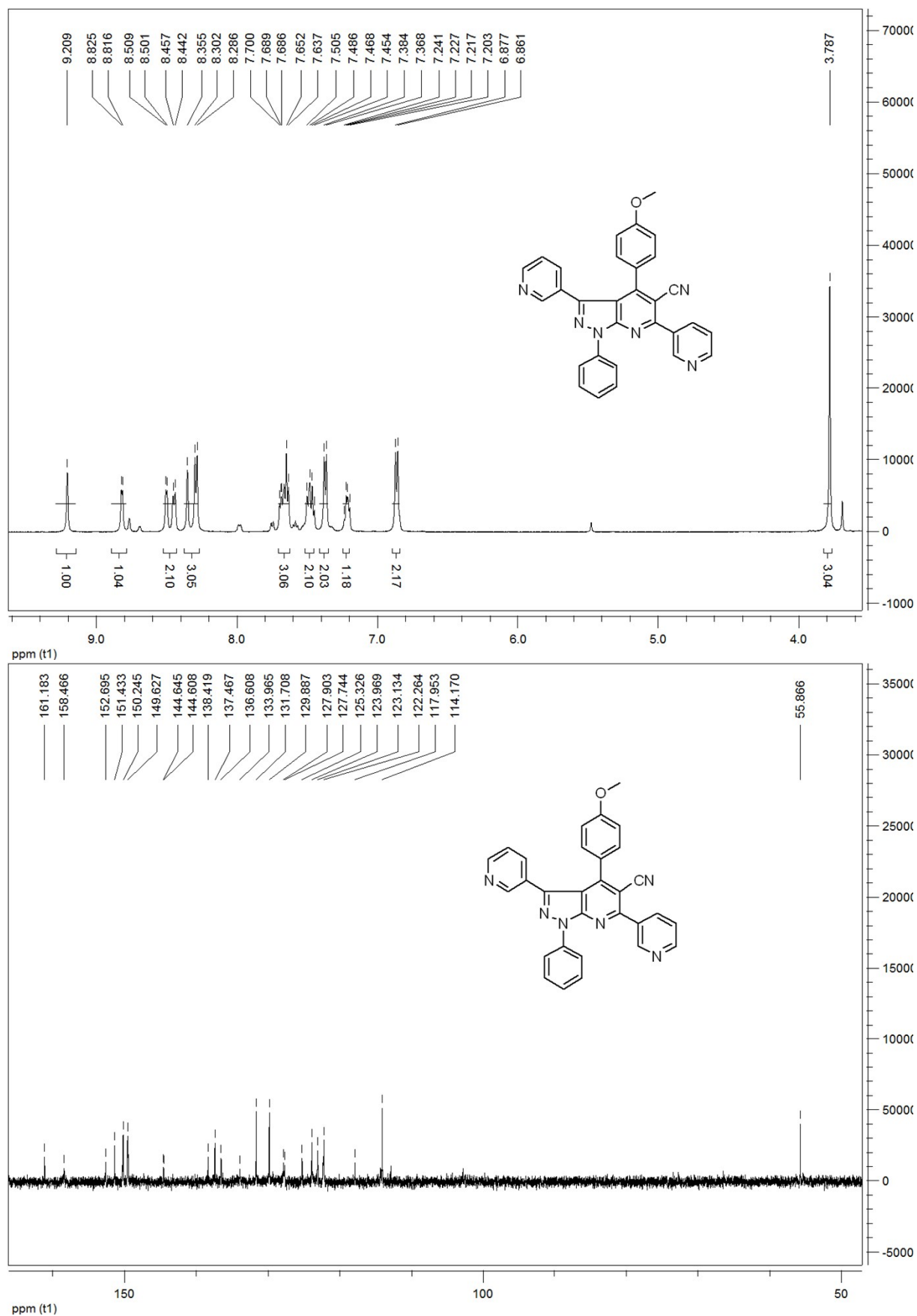
^1H NMR and ^{13}C NMR of compound **4b**



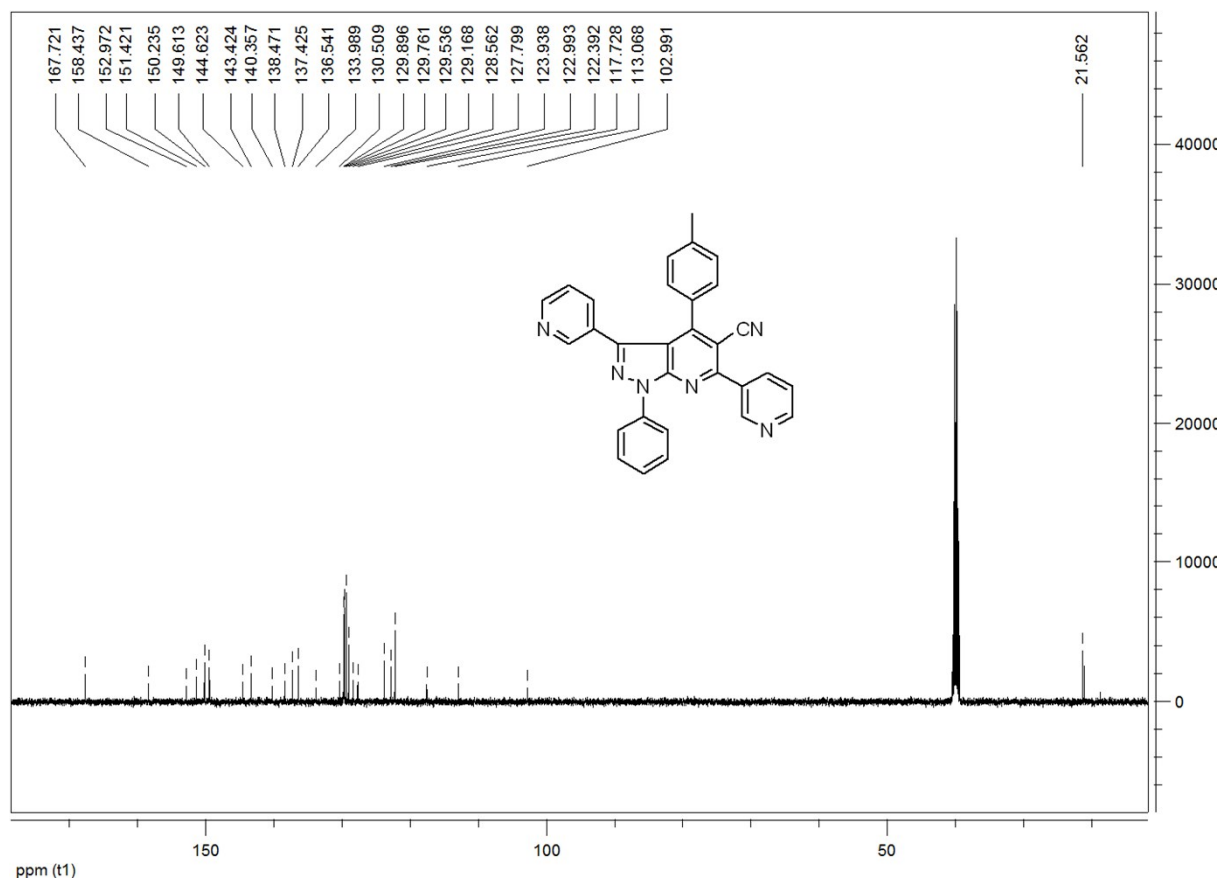
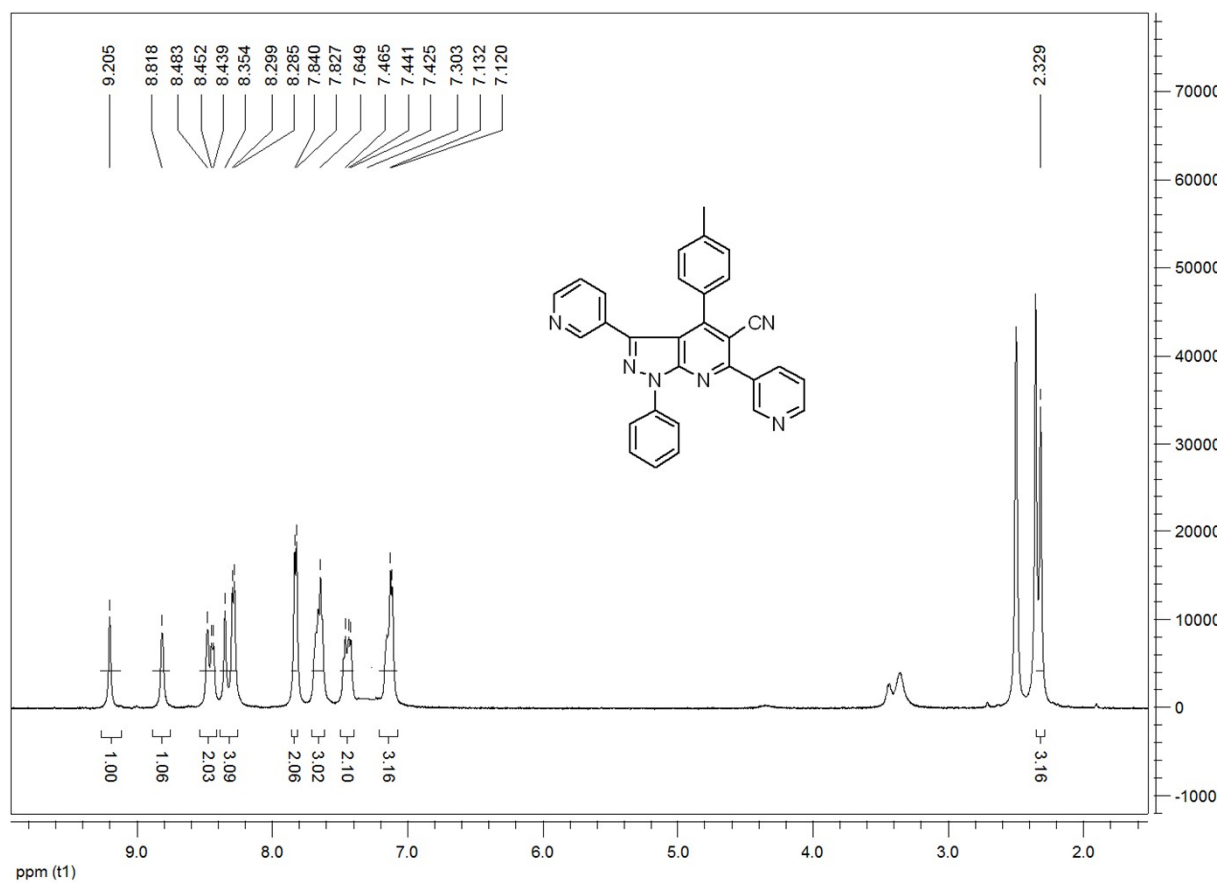
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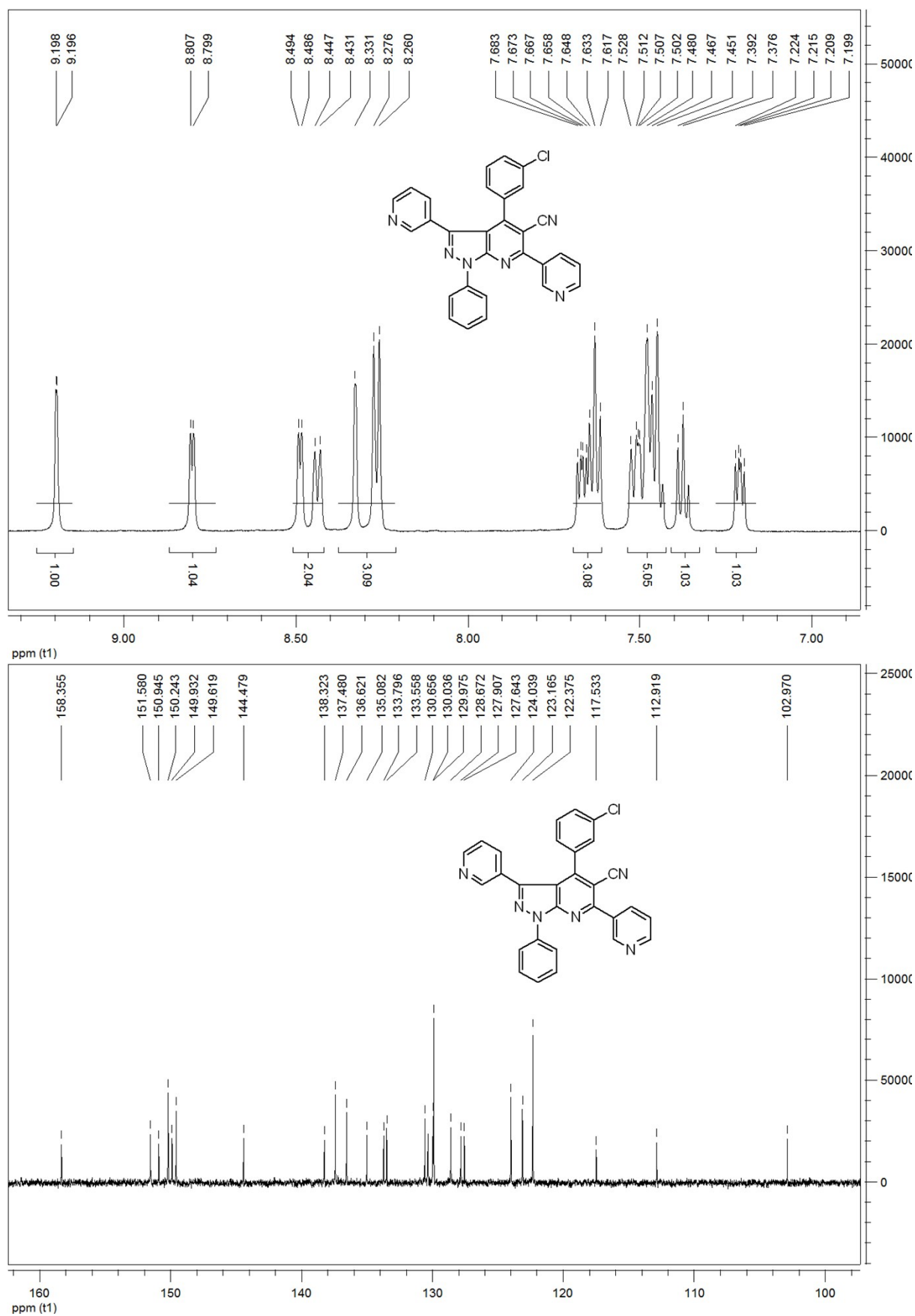
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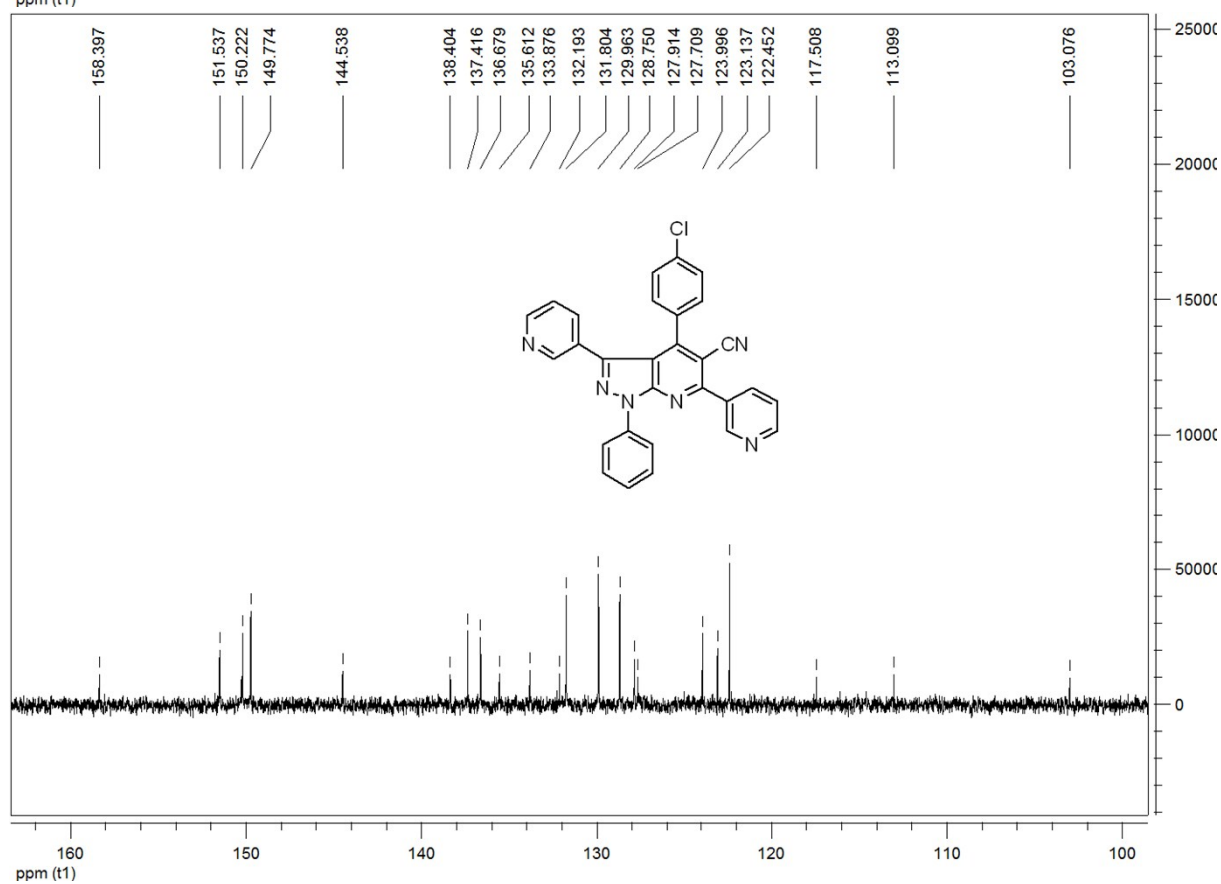
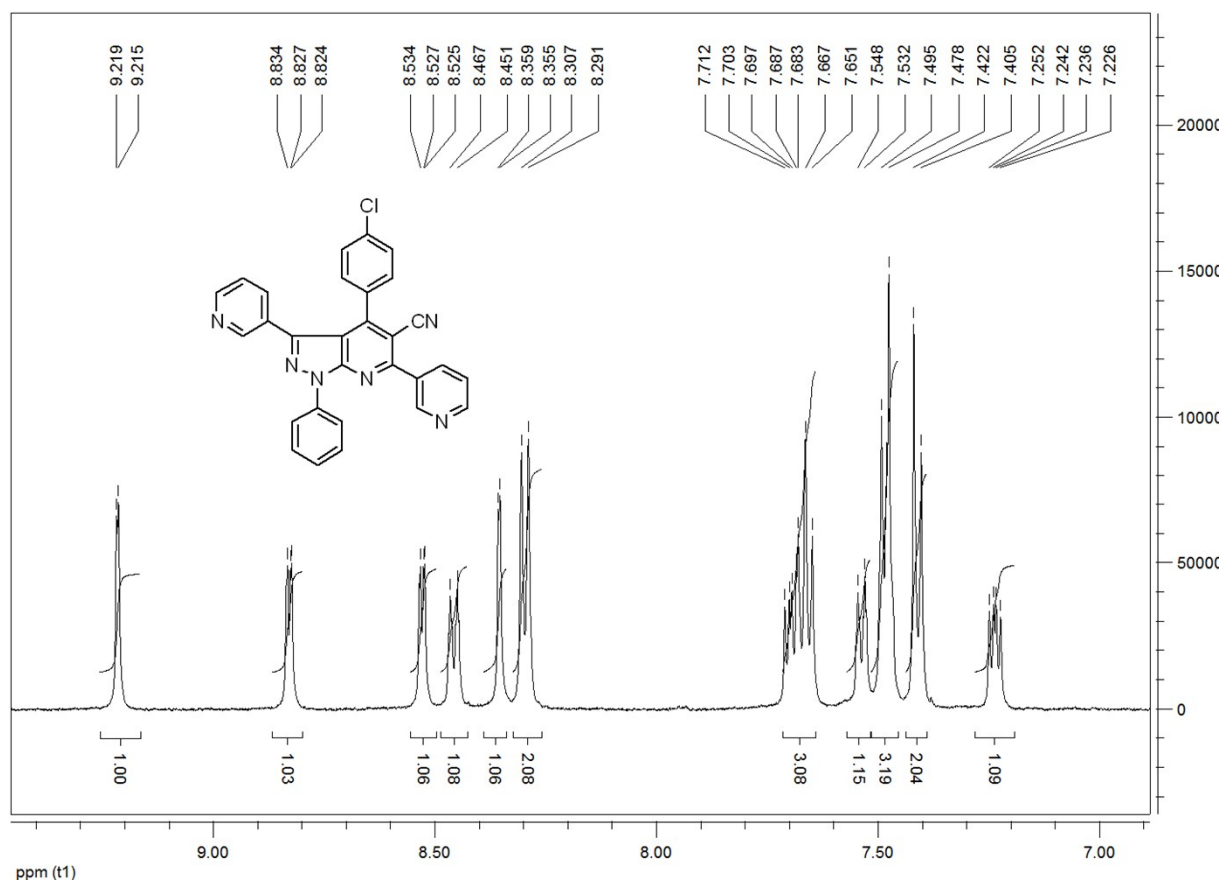
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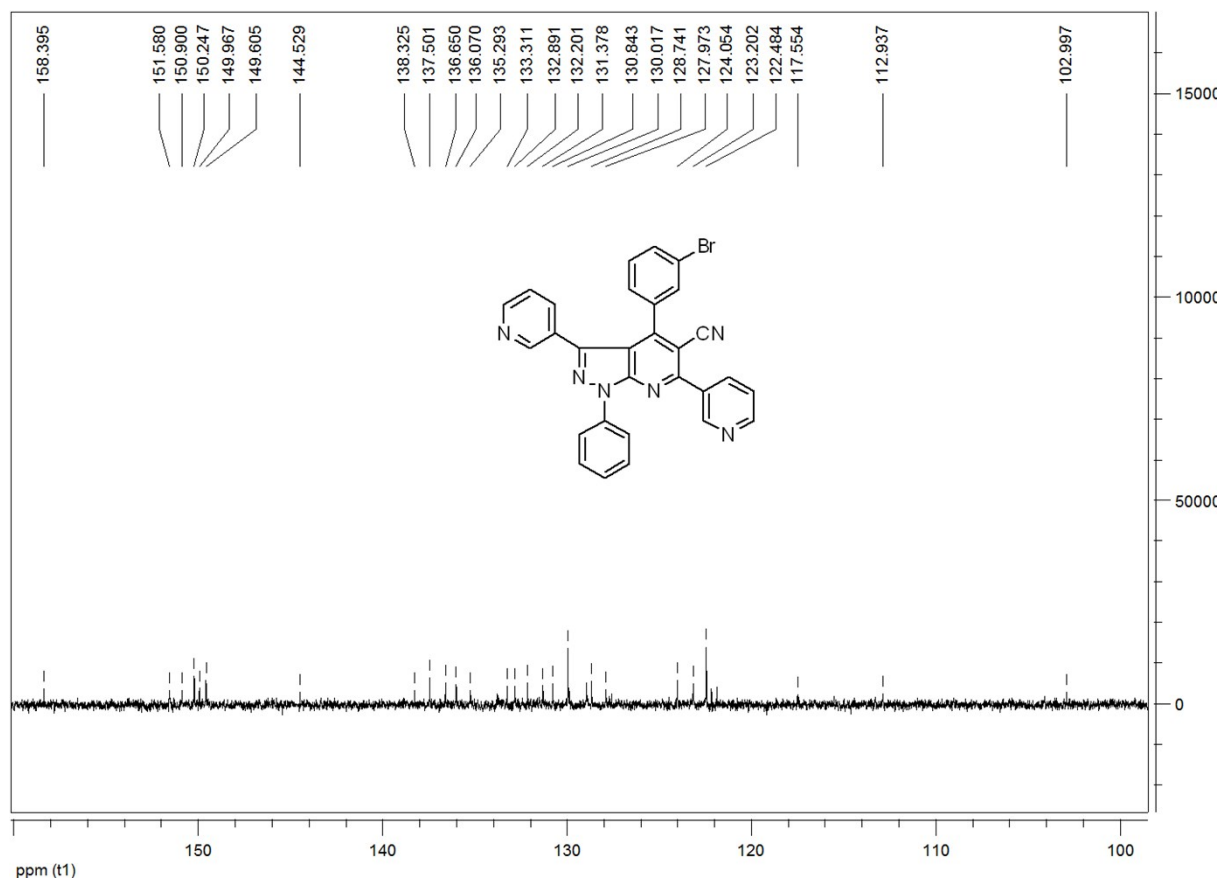
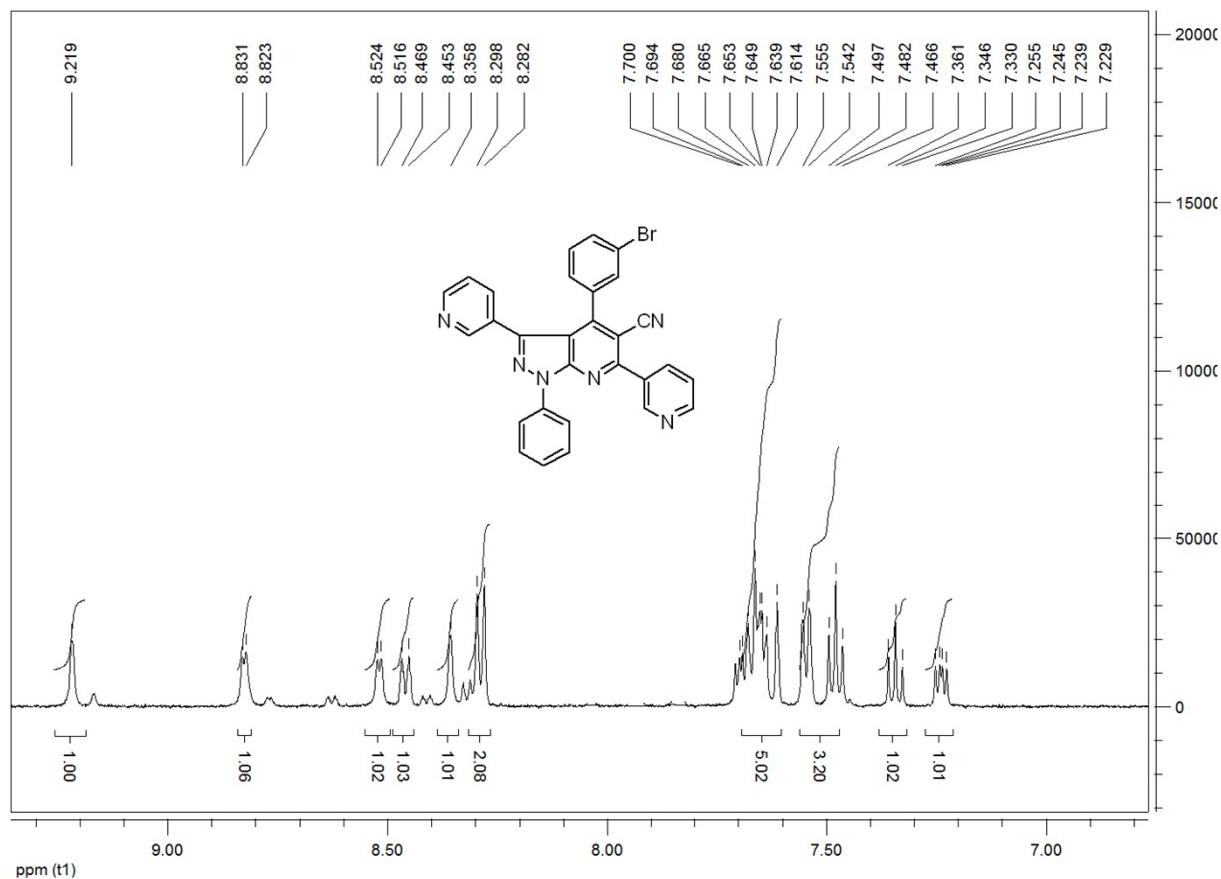
^1H NMR and ^{13}C NMR of compound **4f**



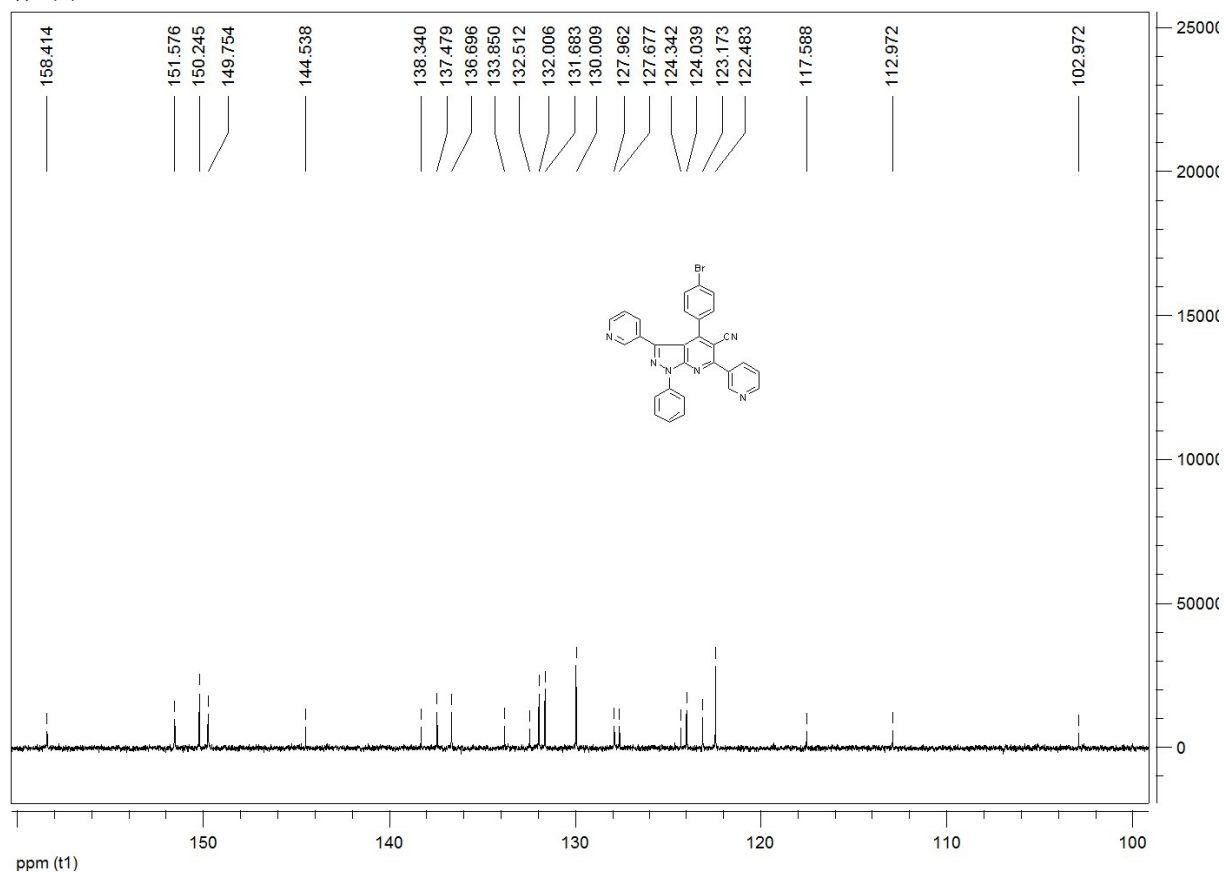
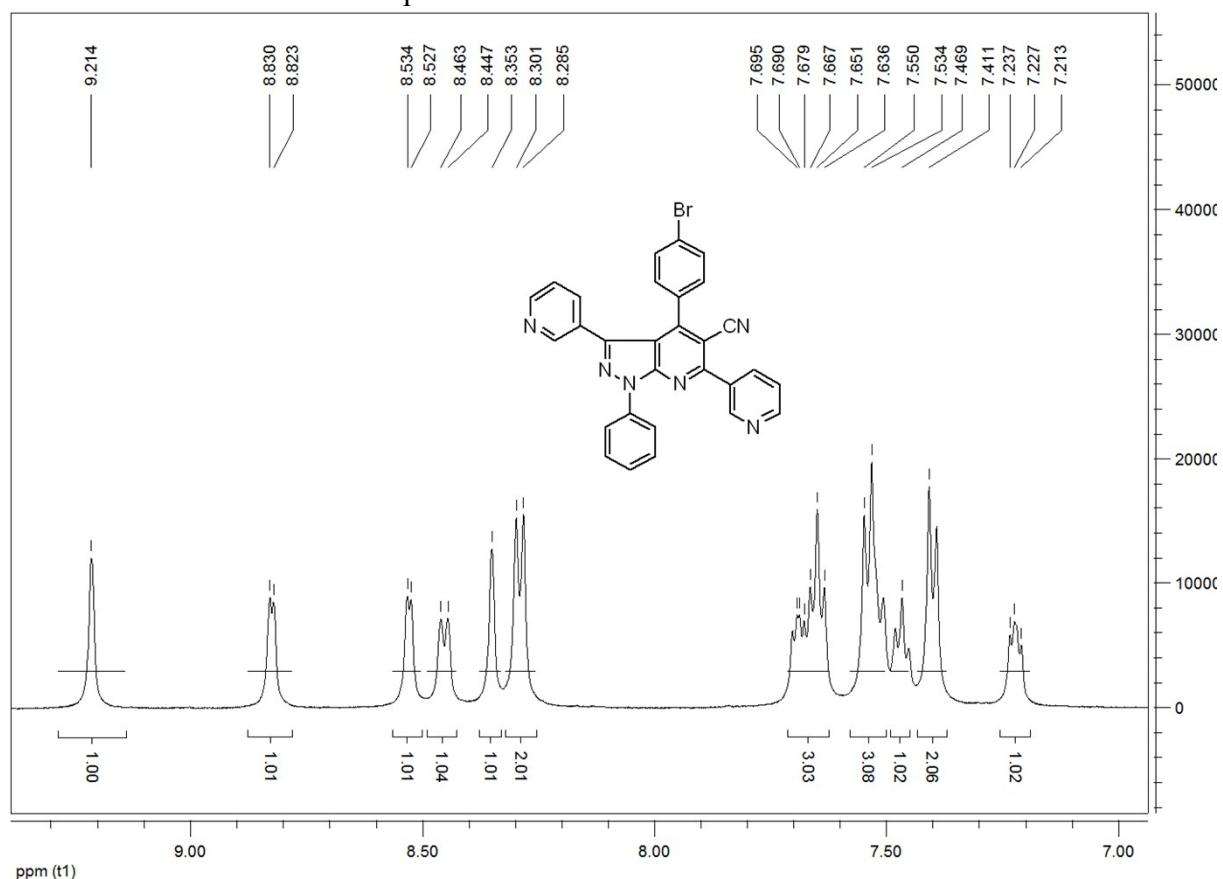
^1H NMR and ^{13}C NMR of compound **4g**



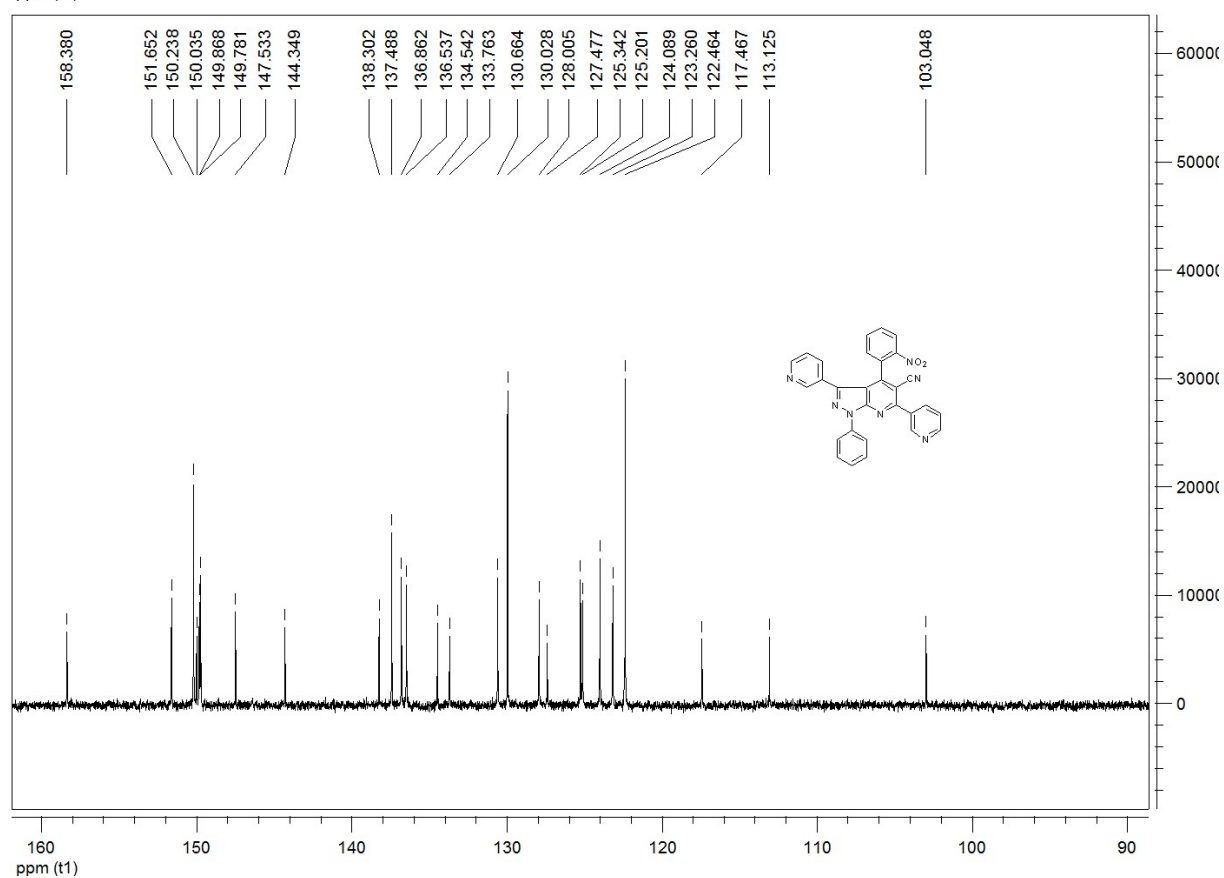
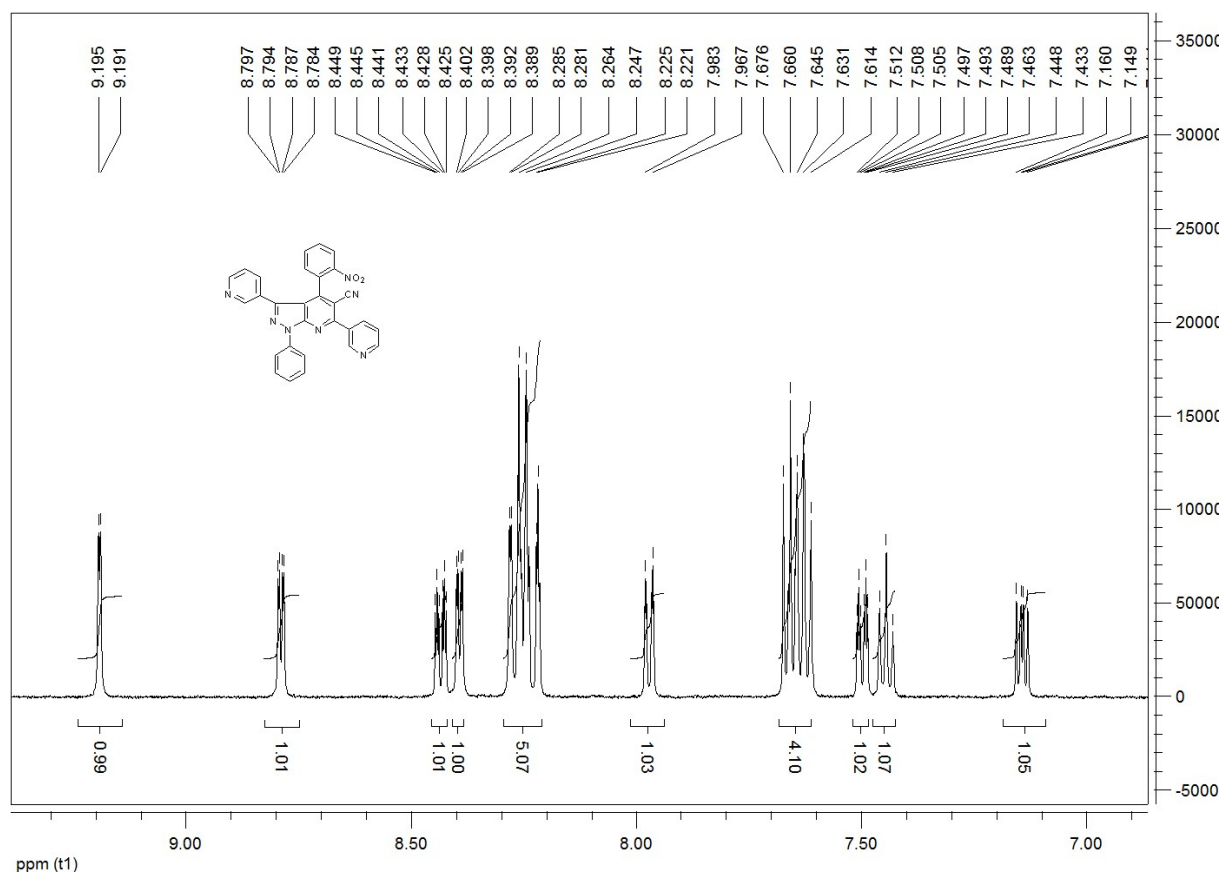
^1H NMR and ^{13}C NMR of compound **4h**



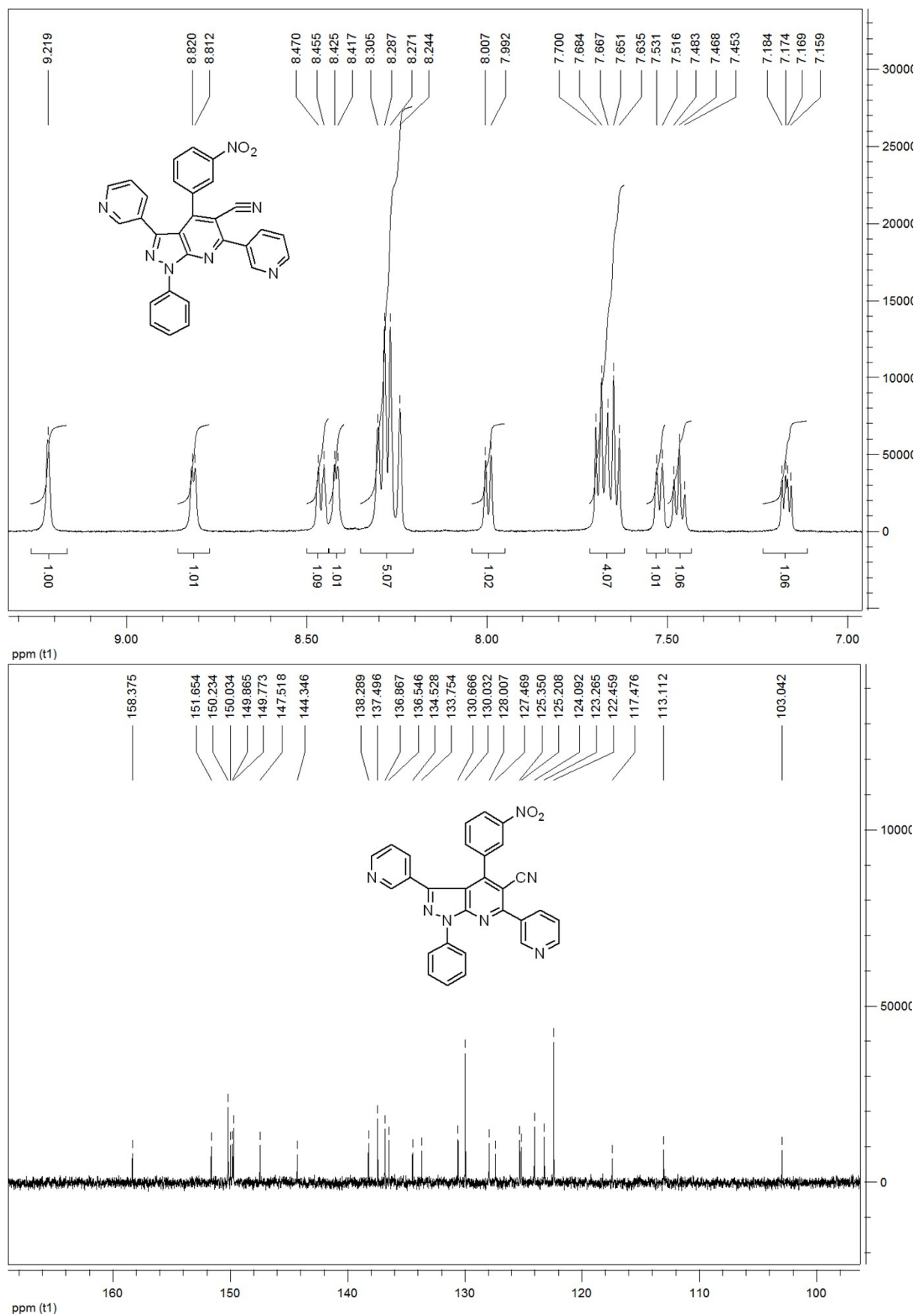
^1H NMR and ^{13}C NMR of compound **4i**



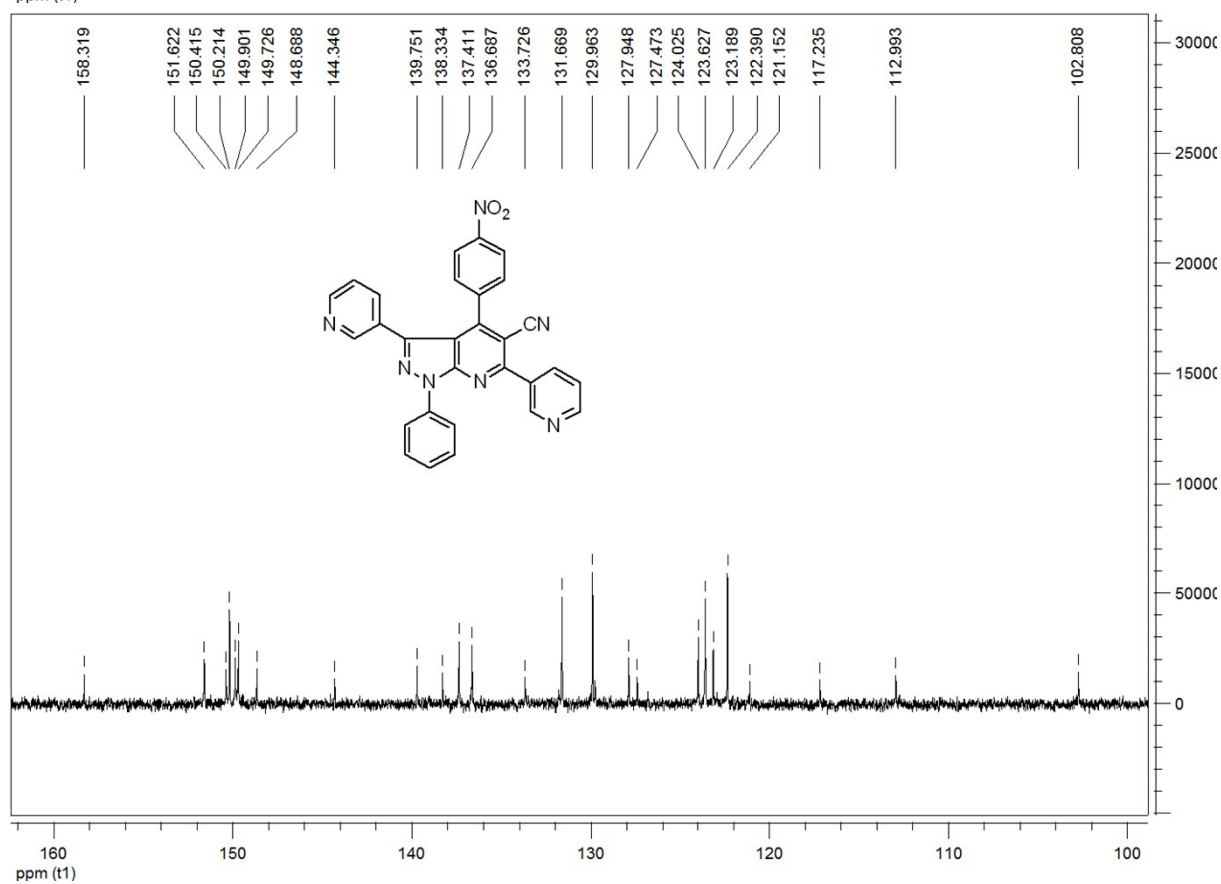
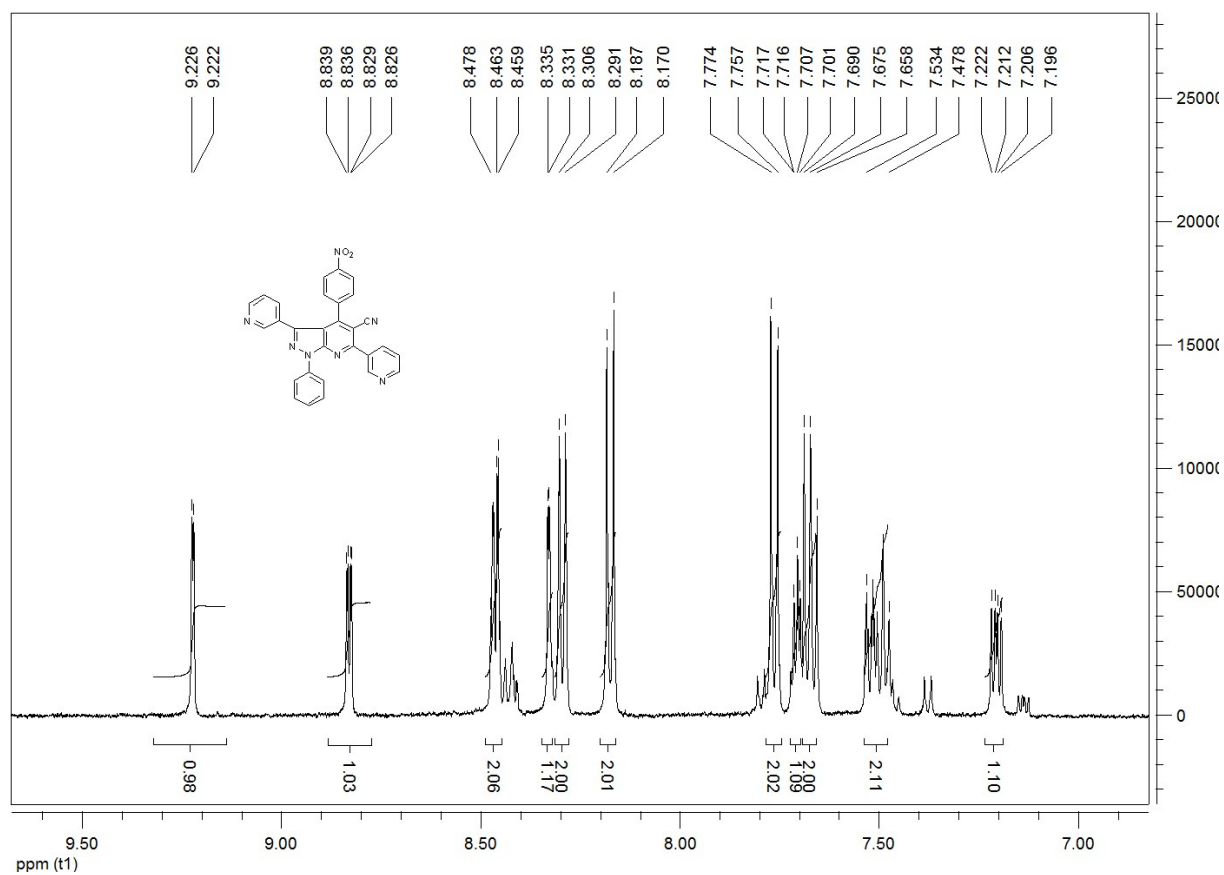
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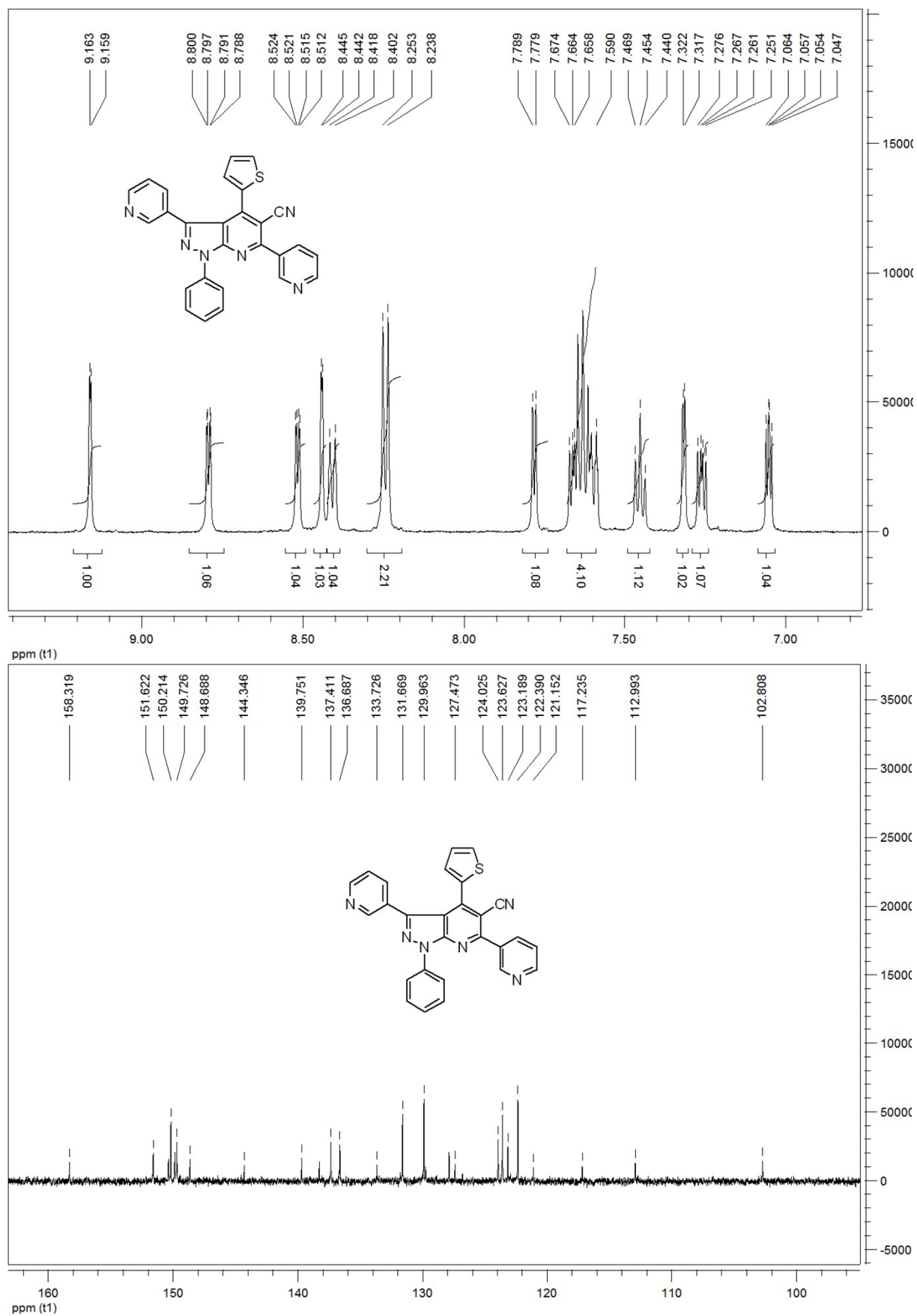
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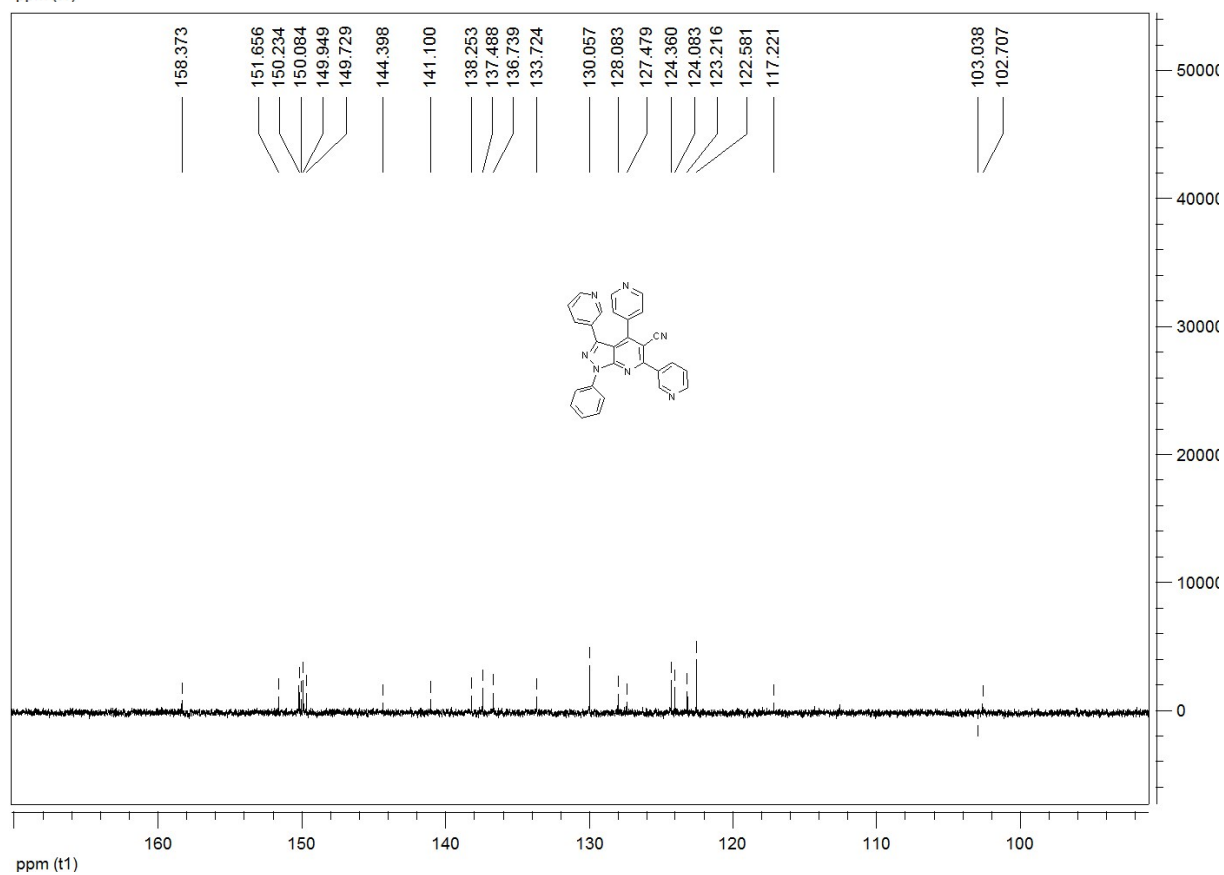
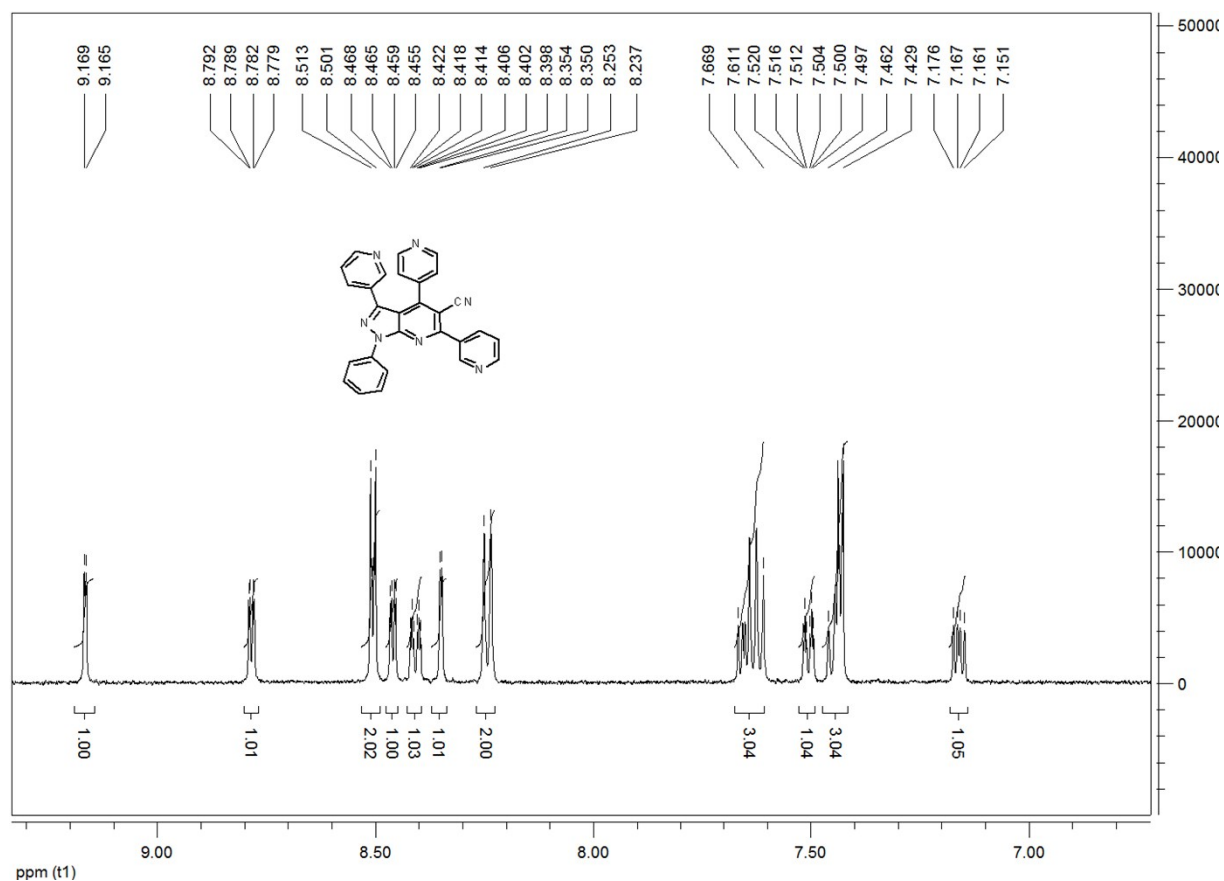
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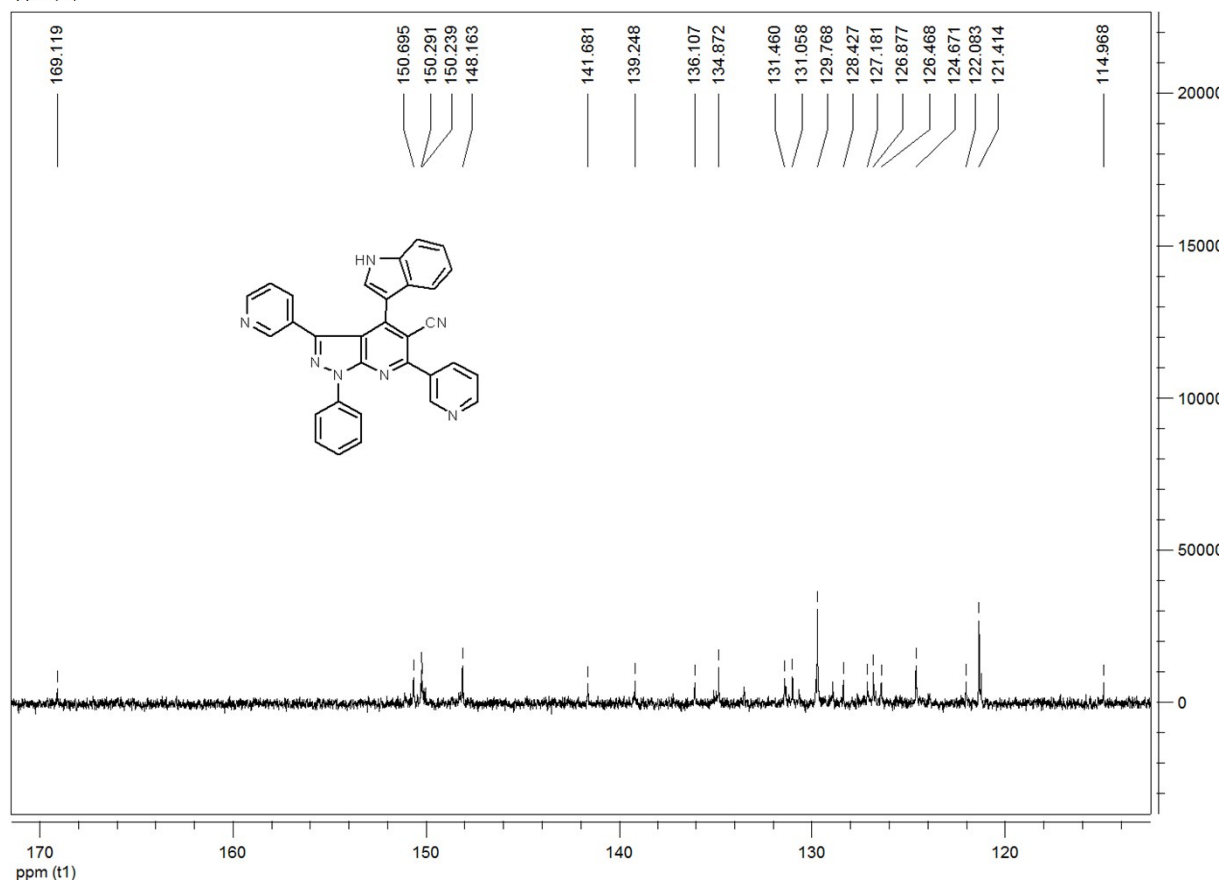
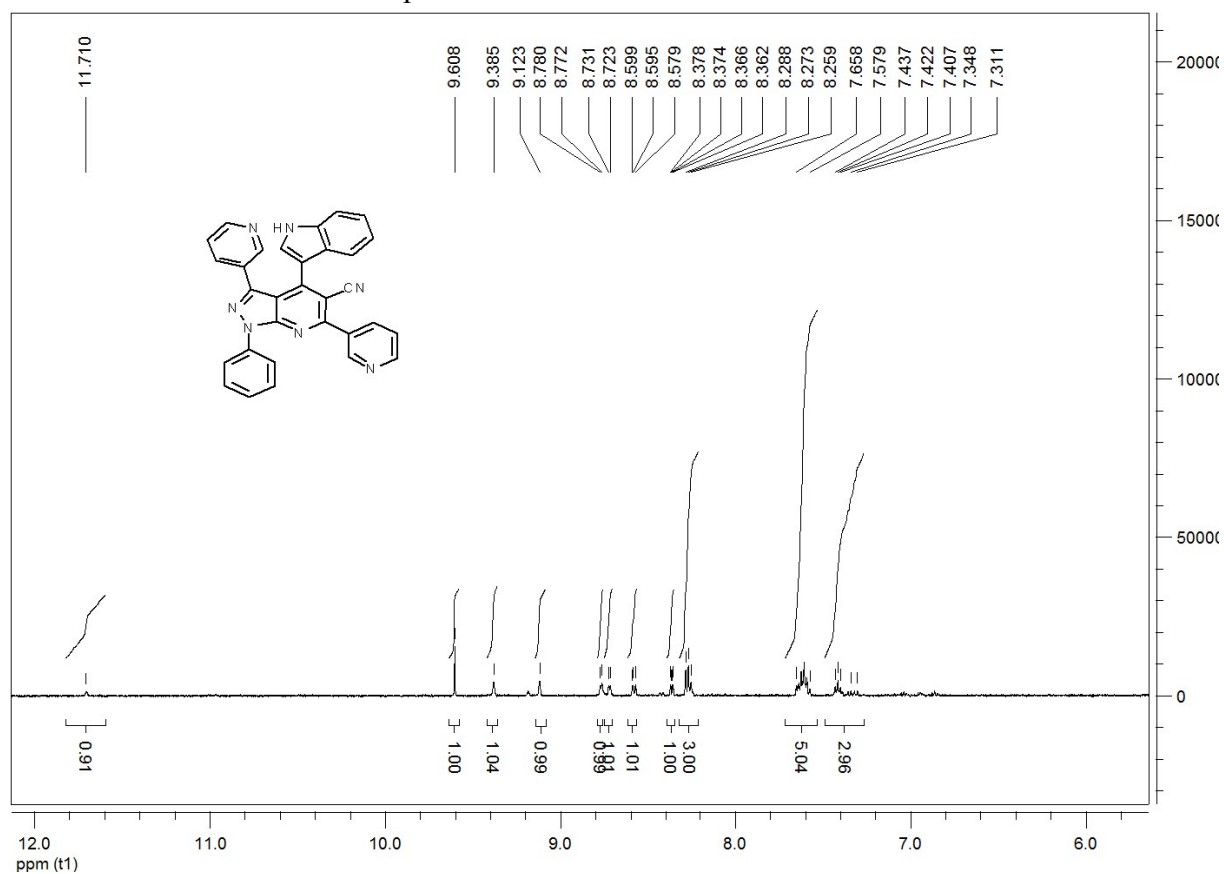
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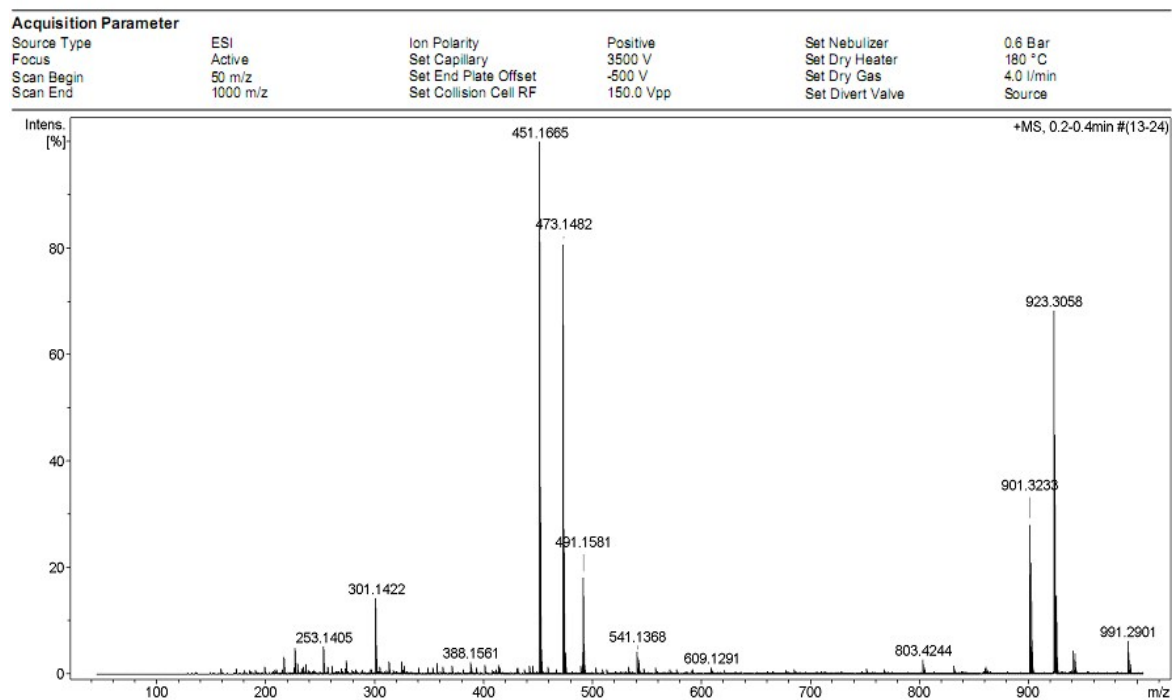
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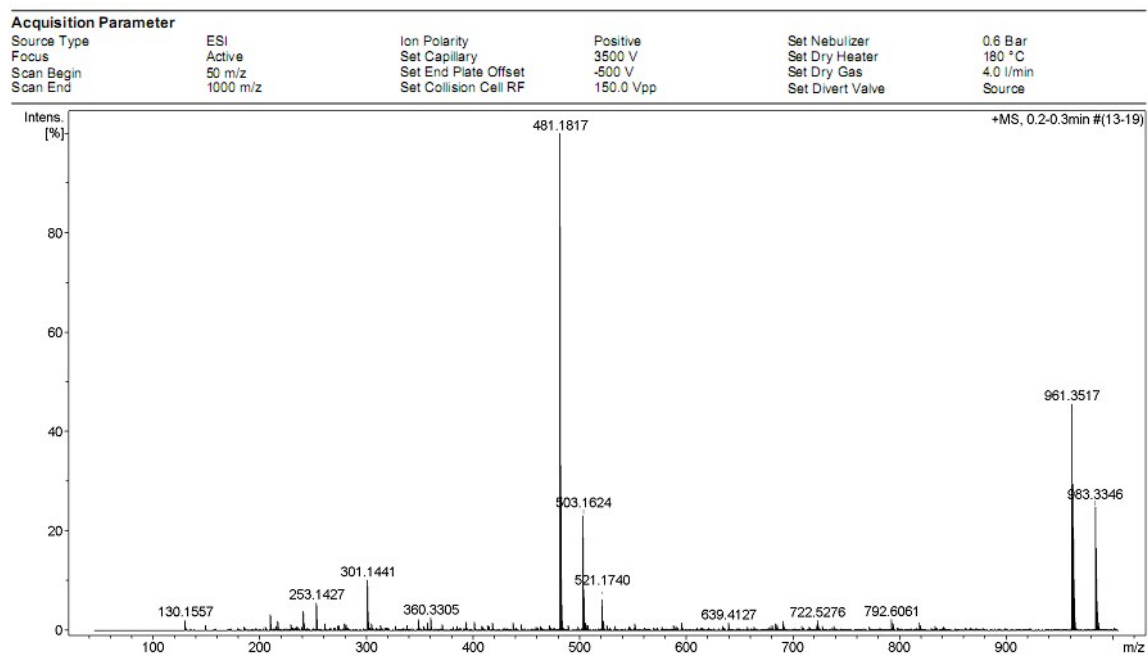
^1H NMR and ^{13}C NMR of compound **4o**



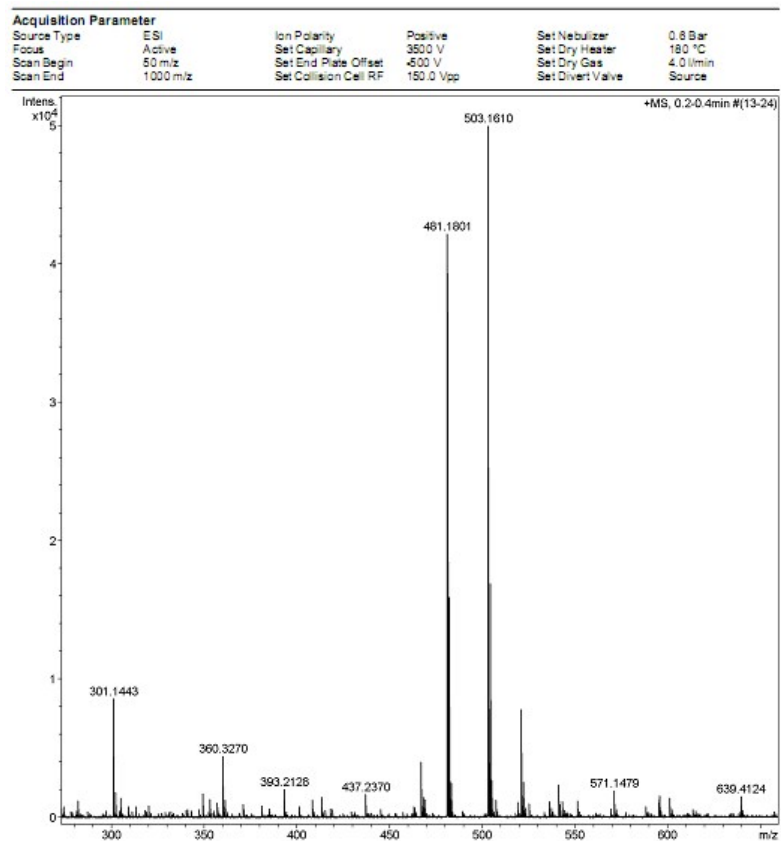
HRMS of 4a



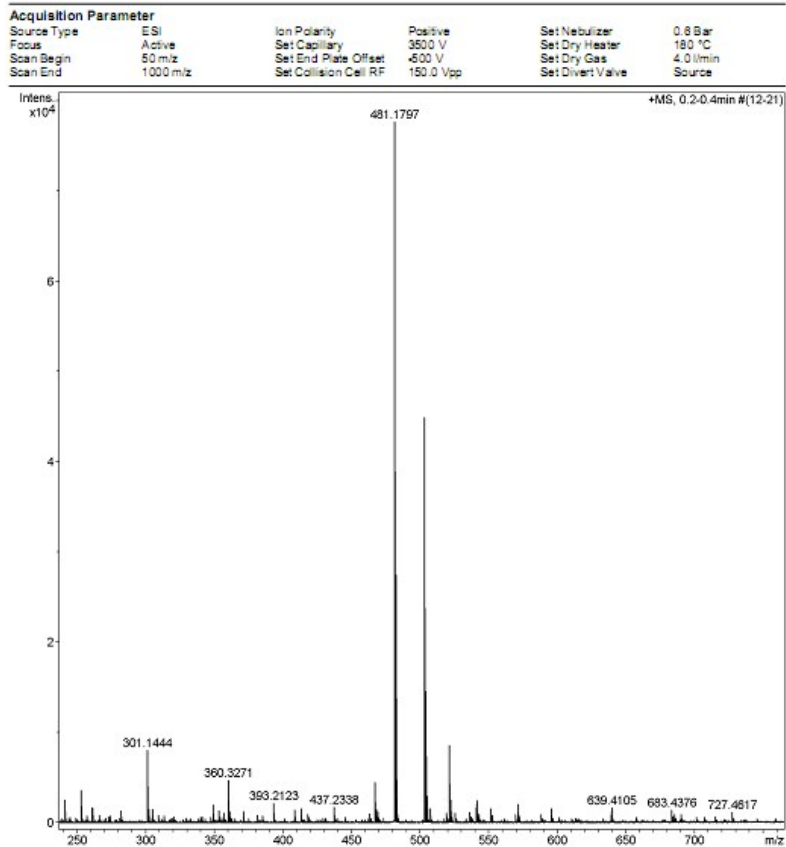
HRMS of 4b



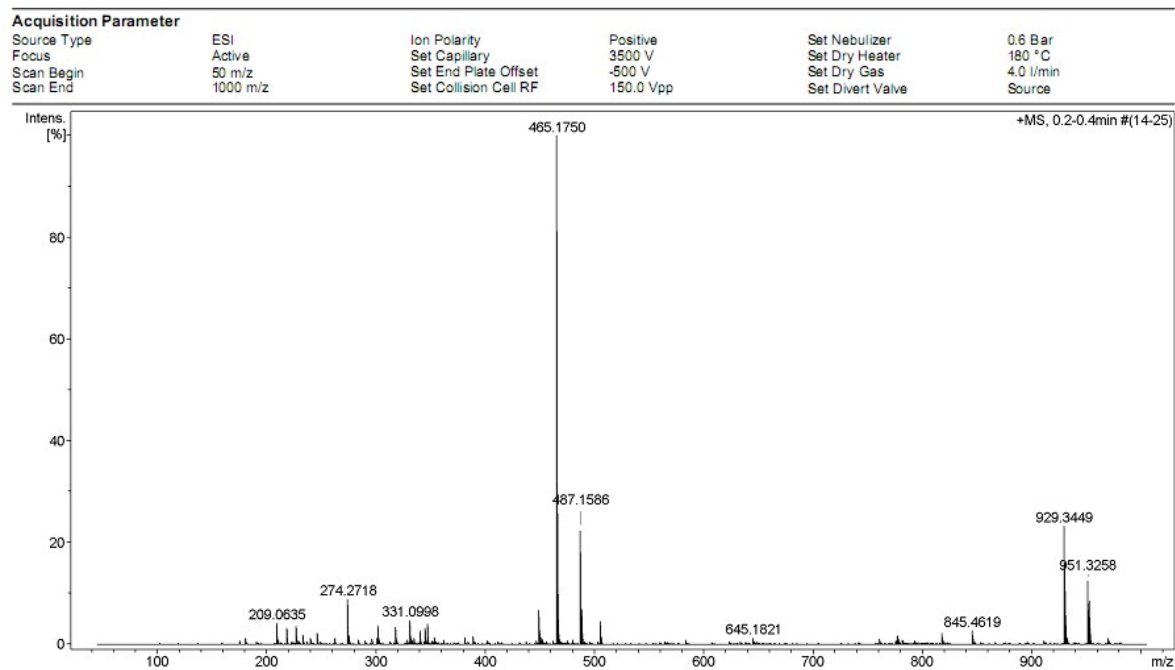
HRMS of 4c



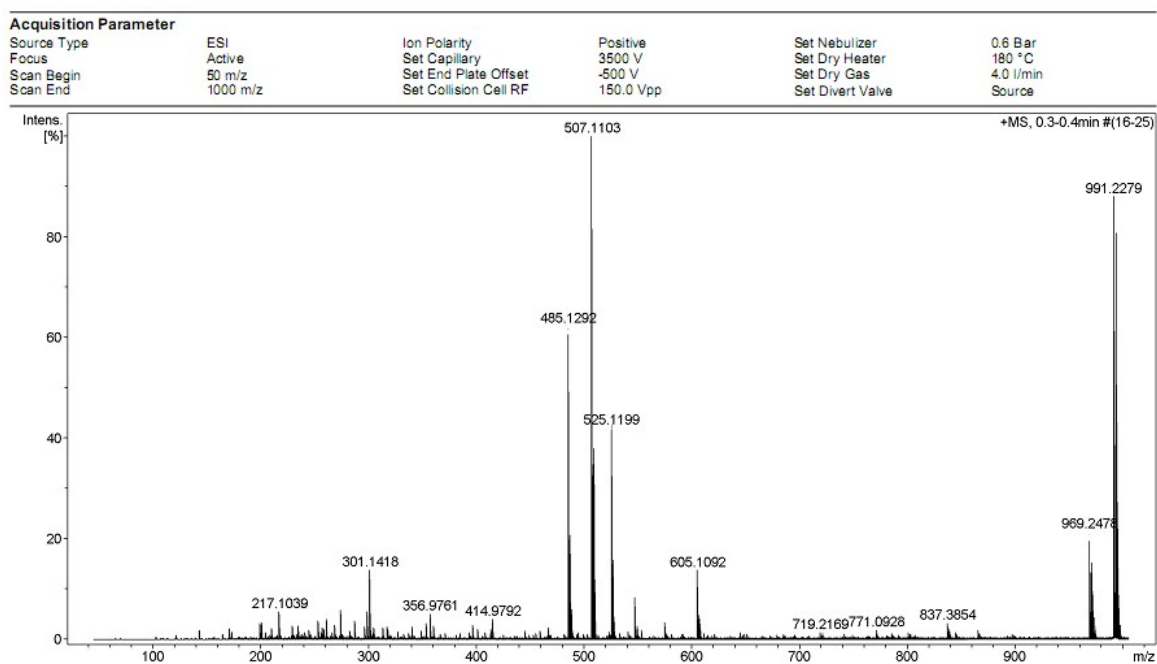
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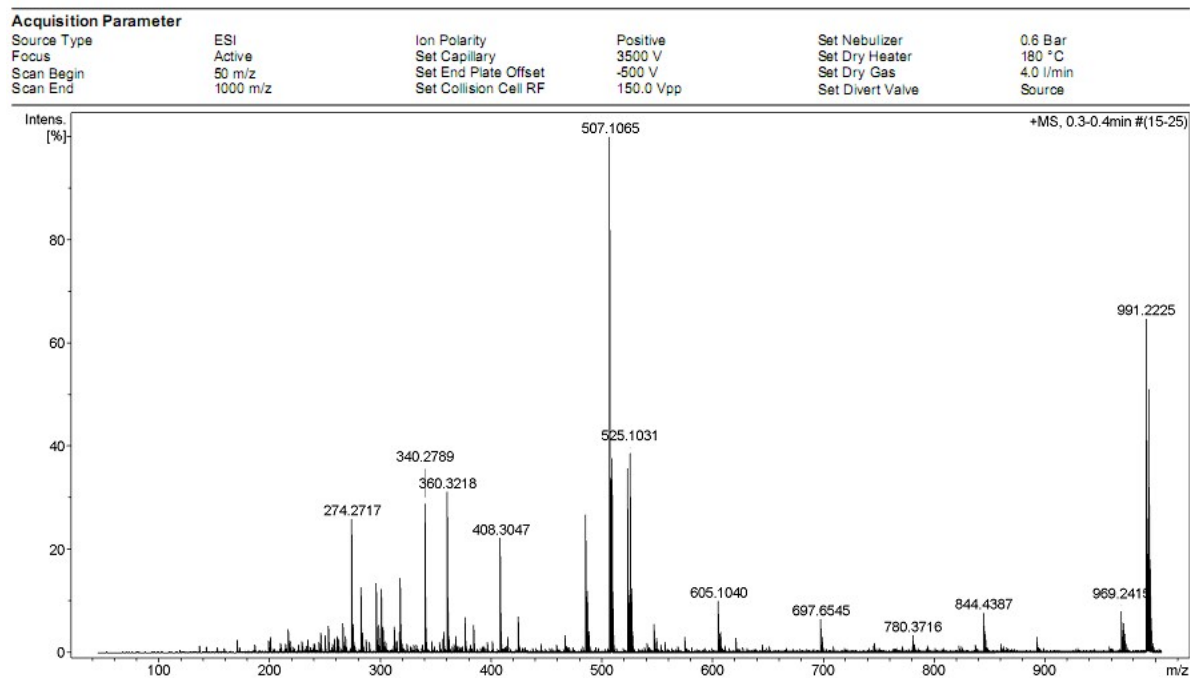
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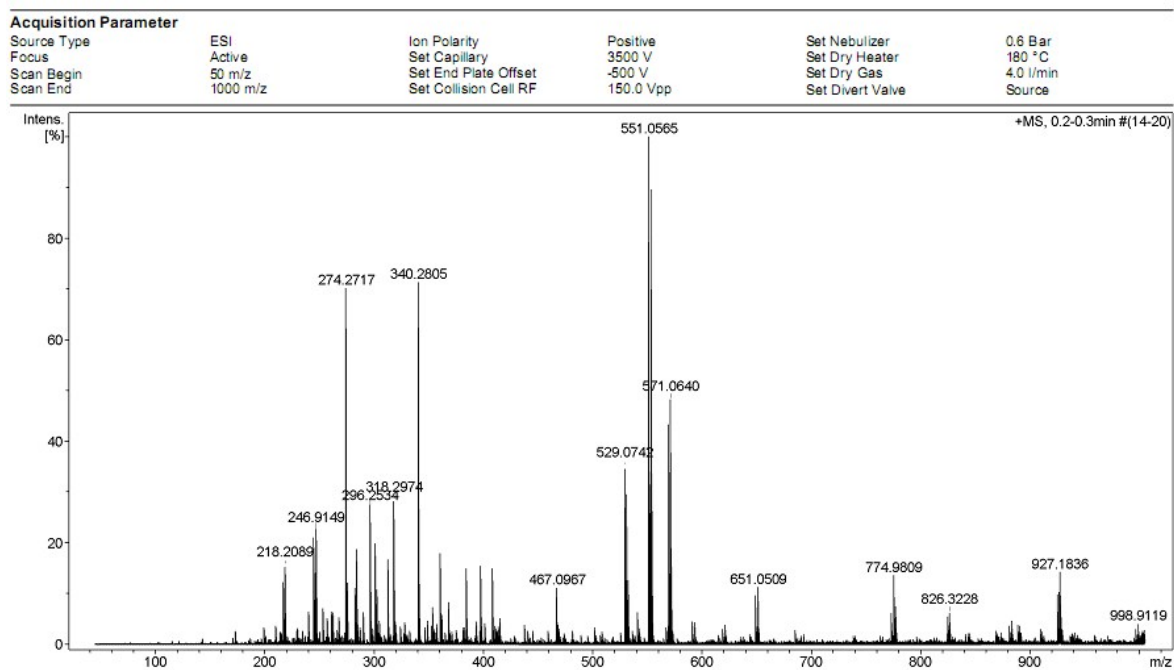
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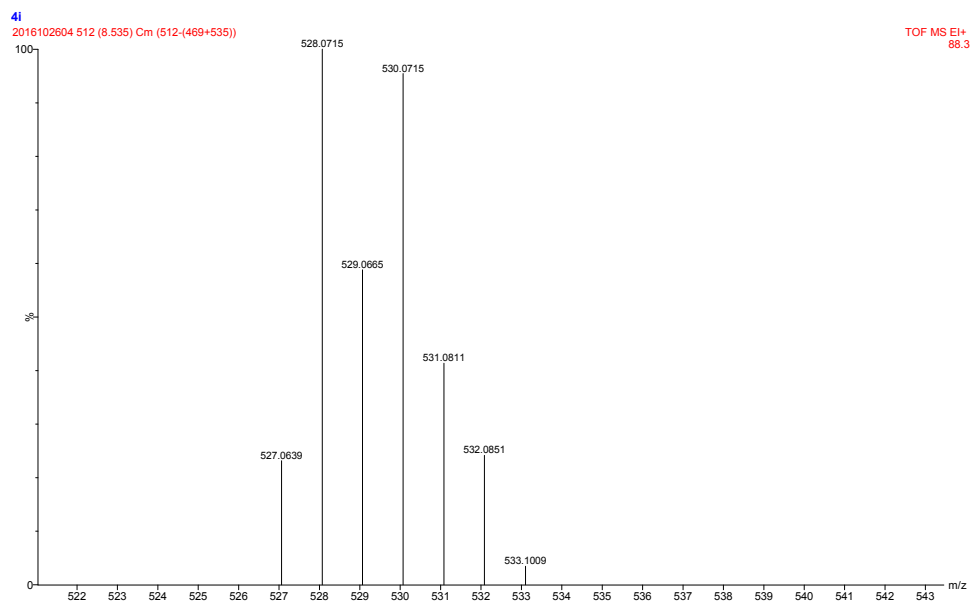
HRMS of 4g



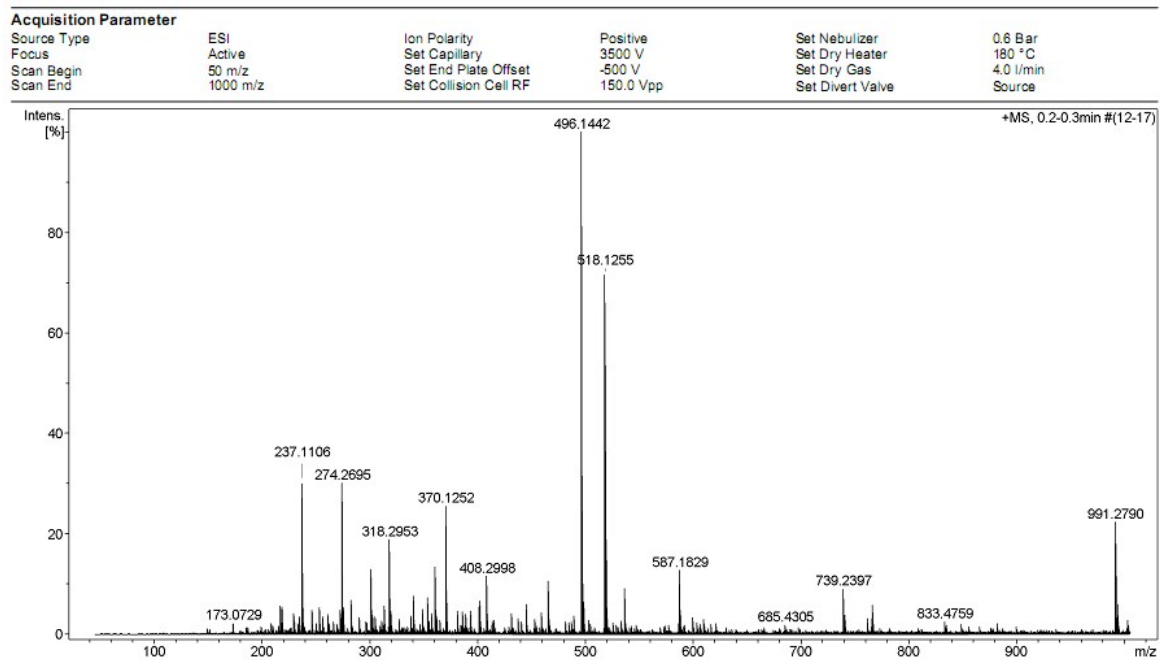
HRMS of 4h



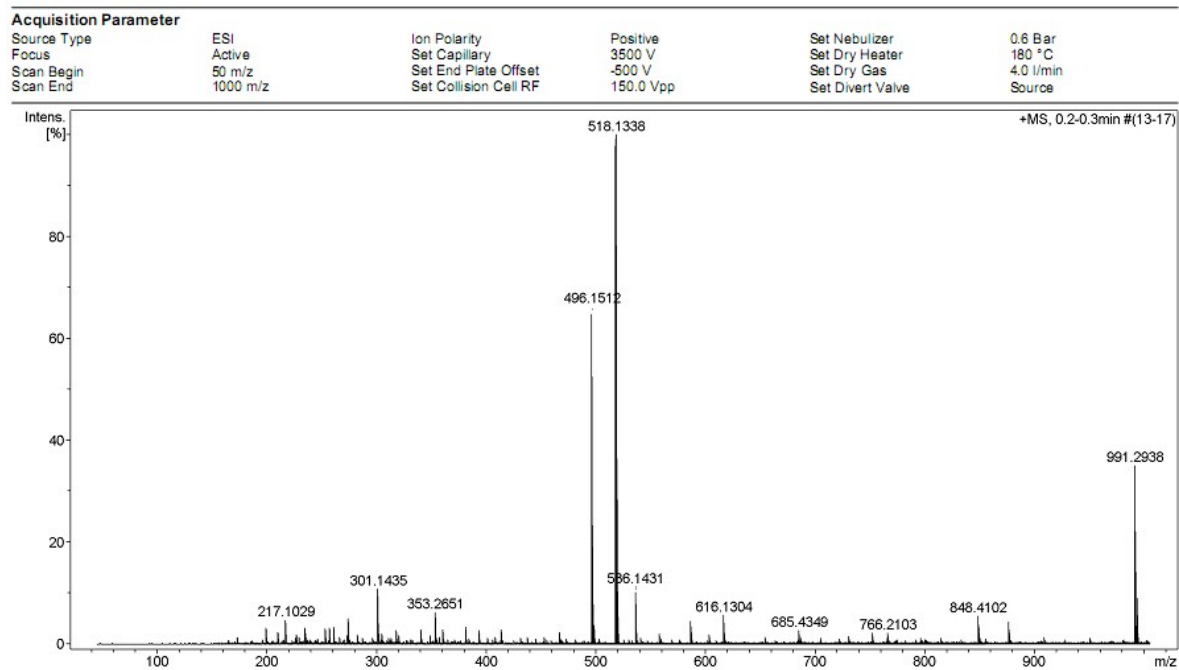
HRMS of 4i



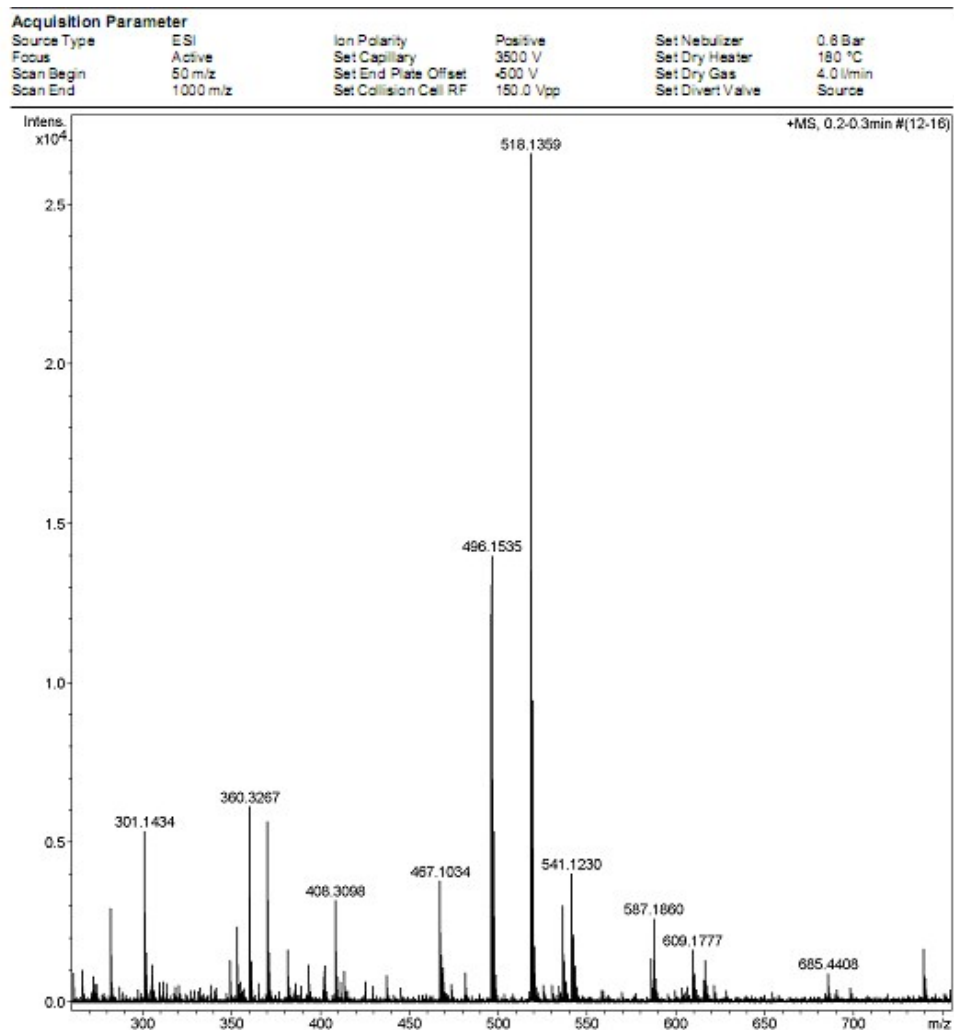
HRMS of 4j



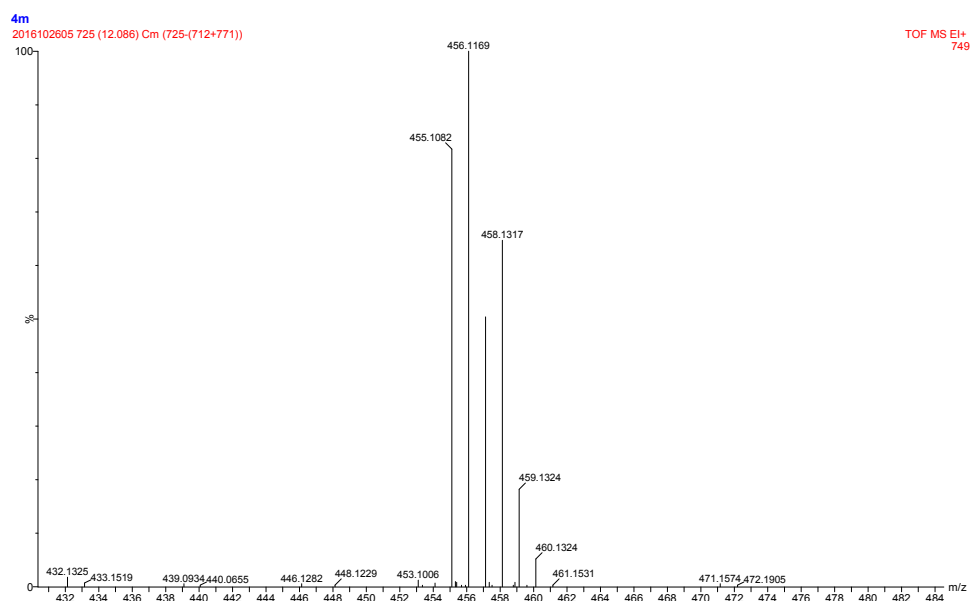
HRMS of 4k



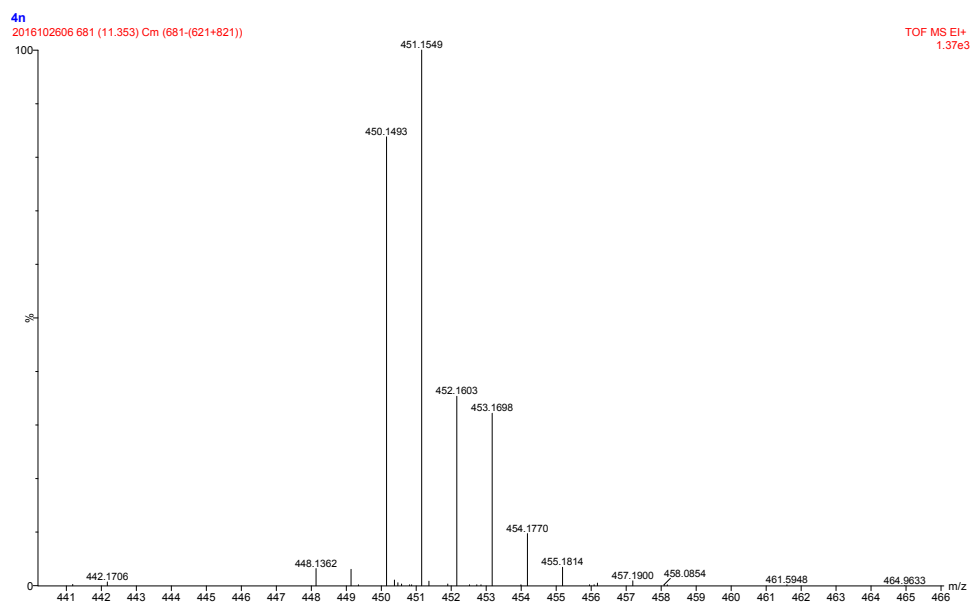
HRMS of 4l



HRMS of **4m**



HRMS of **4n**



HRMS of **4o**

