Electronic Supplementary Material (ESI) for RSC Advances. This journal is © The Royal Society of Chemistry 2017

## **List of Supplementary Data**

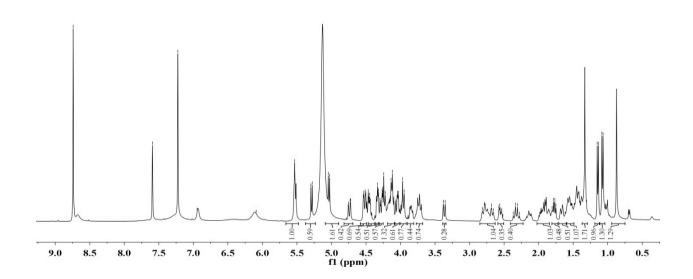
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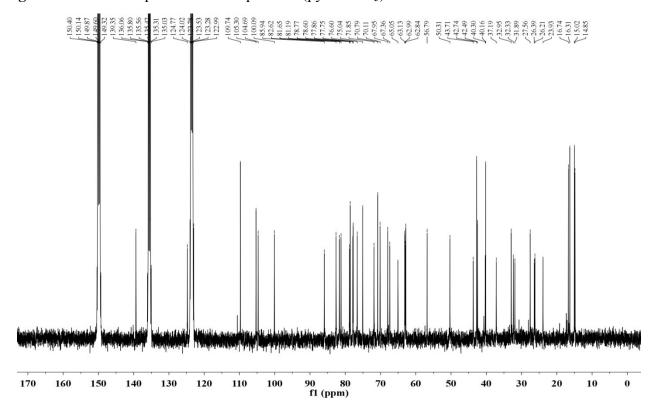
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**Figure S1**. <sup>1</sup>H NMR spectrum of compound **1** (pyridine- $d_5$ )

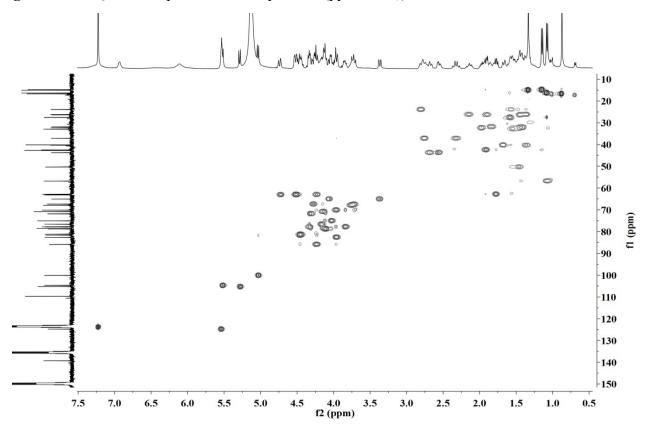




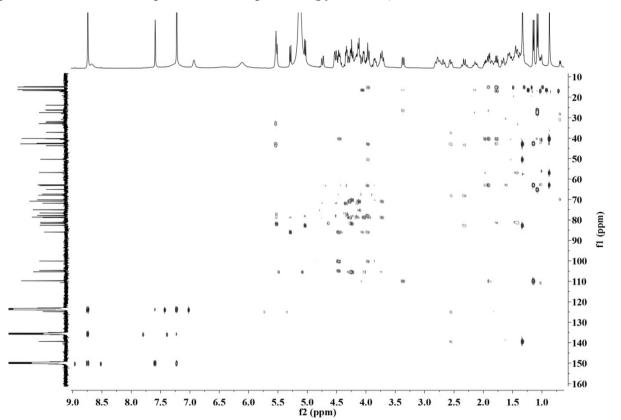
**Figure S2**.  ${}^{1}$ C NMR spectrum of compound **1** (pyridine- $d_{5}$ )



**Figure S3**. HSQC NMR spectrum of compound 1 (pyridine- $d_5$ )



**Figure S4**. HMBC NMR spectrum of compound 1 (pyridine- $d_5$ )



**Figure S5**. TOCSY NMR spectrum of compound 1 (pyridine- $d_5$ )

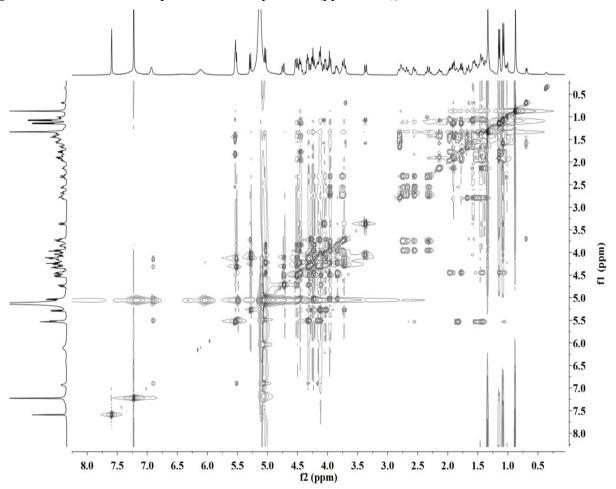


Figure S6. ESI-Q-TOF-MS spectrum of compound 1

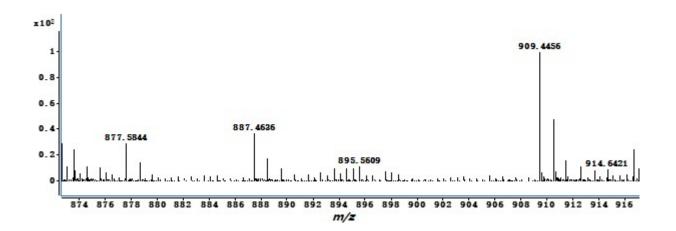
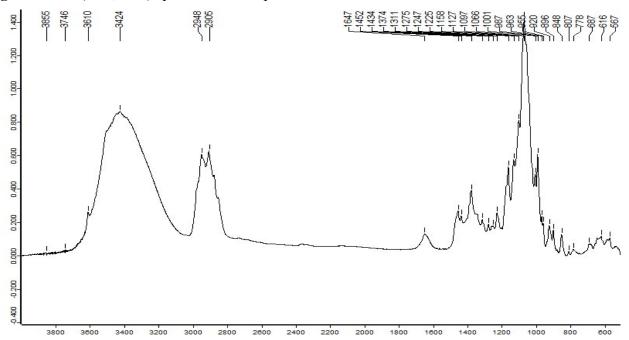


Figure S7. IR (KBr, disc) spectrum of compound 1



**Figure S8**. <sup>1</sup>H NMR spectrum of compound **2** (pyridine- $d_5$ )

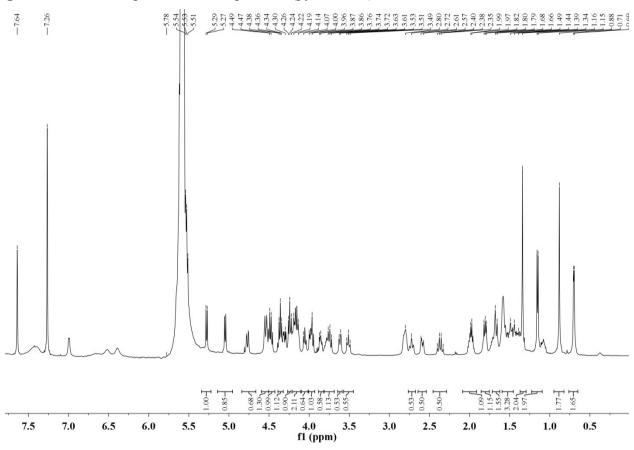
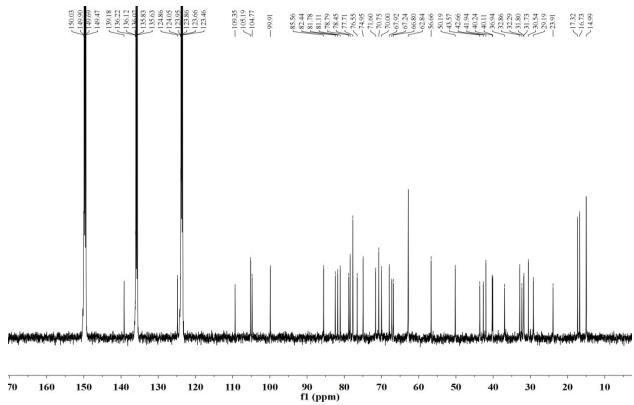


Figure S9. <sup>1</sup>C NMR spectrum of compound 2 (pyridine-*d*<sub>5</sub>)



**Figure S10**. HSQC NMR spectrum of compound **2** (pyridine- $d_5$ )

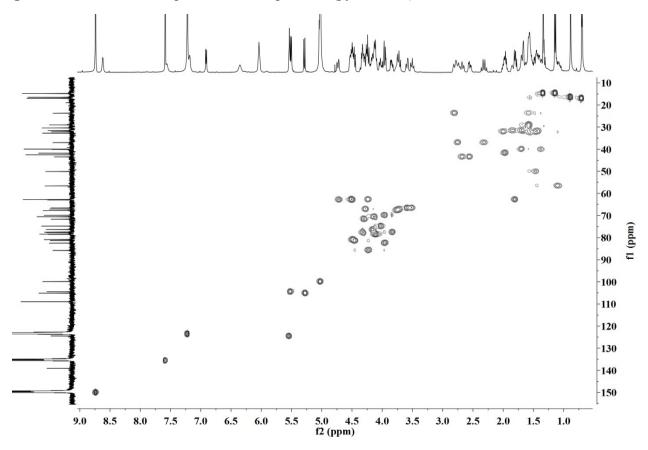


Figure S11. HMBC NMR spectrum of compound 2 (pyridine- $d_5$ )

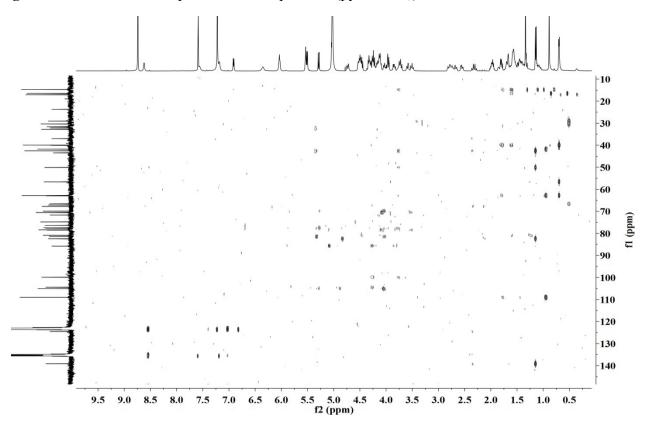


Figure S12. TOCSY NMR spectrum of compound 2 (pyridine-d<sub>5</sub>)

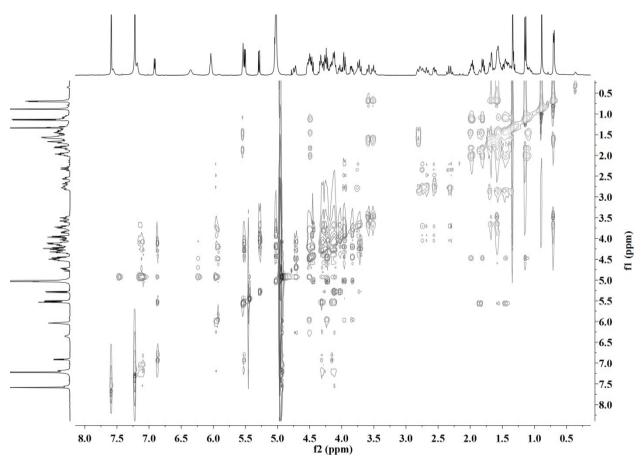


Figure S13. ESI-Q-TOF-MS spectrum of compound 2

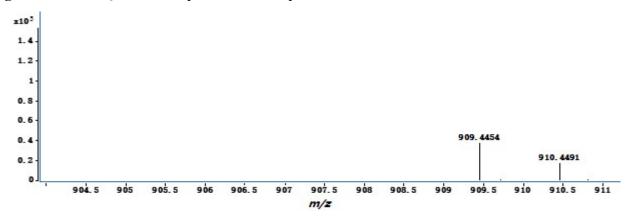


Figure S14. IR (KBr, disc) spectrum of compound 2

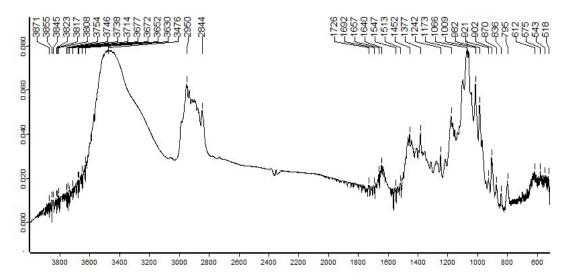


Figure S15. <sup>1</sup>H NMR spectrum of compound 3 (pyridine-*d*<sub>5</sub>)

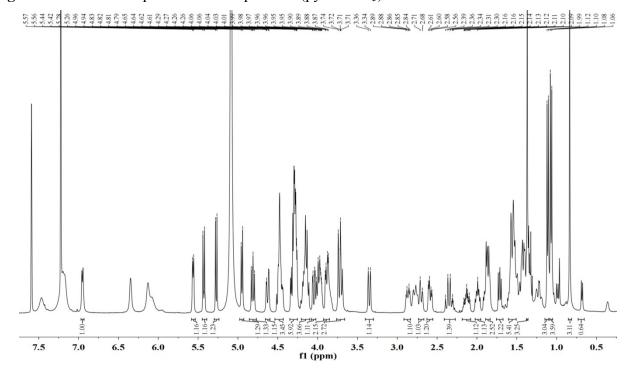
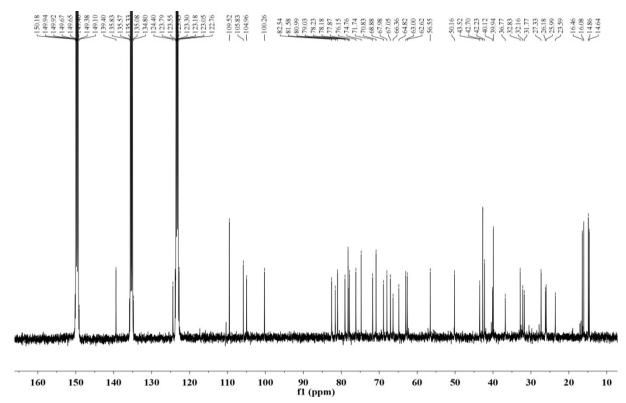
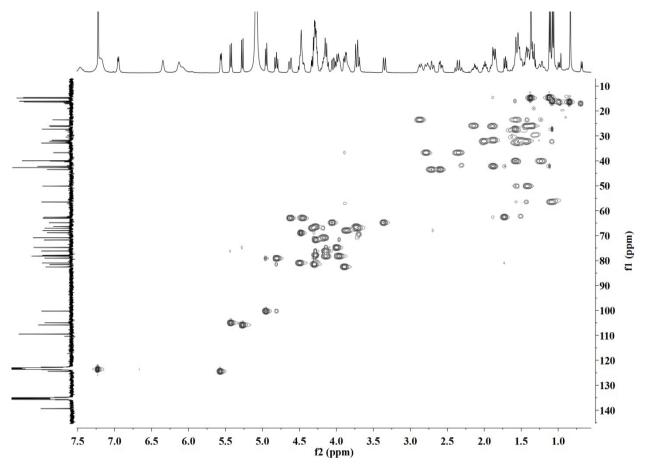


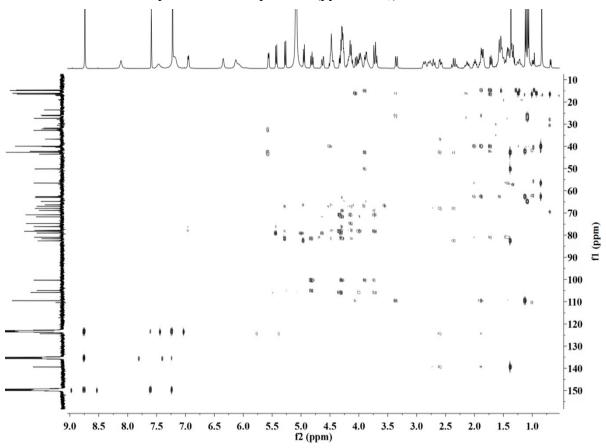
Figure S16. <sup>1</sup>C NMR spectrum of compound 3 (pyridine-*d*<sub>5</sub>)



**Figure S17**. HSQC NMR spectrum of compound **3** (pyridine- $d_5$ )



**Figure S18**. HMBC NMR spectrum of compound **3** (pyridine- $d_5$ )



**Figure S19**. TOCSY NMR spectrum of compound **3** (pyridine- $d_5$ )

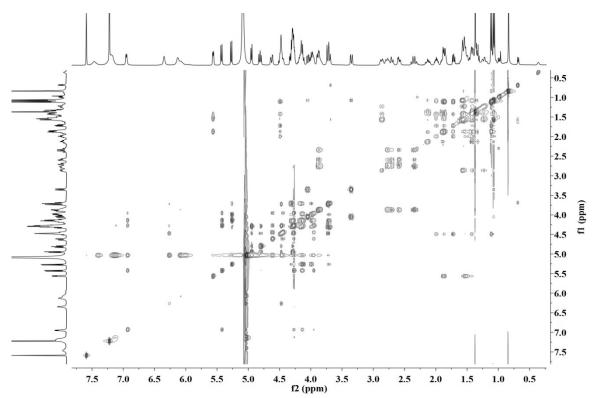


Figure S20. ESI-Q-TOF-MS spectrum of compound 3

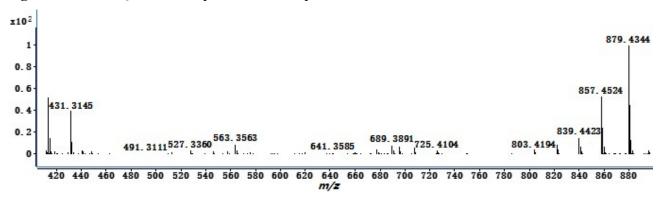
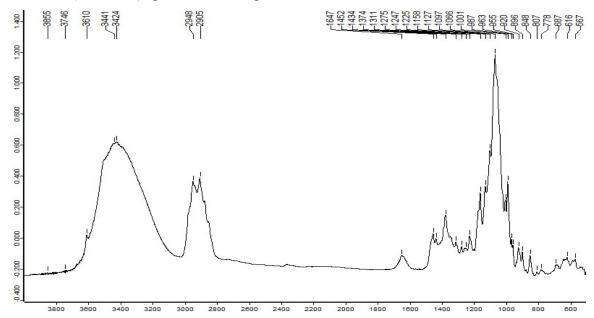


Figure S21. IR (KBr, disc) spectrum of compound 3



**Figure S22**. <sup>1</sup>H NMR spectrum of compound 4 (pyridine- $d_5$ )

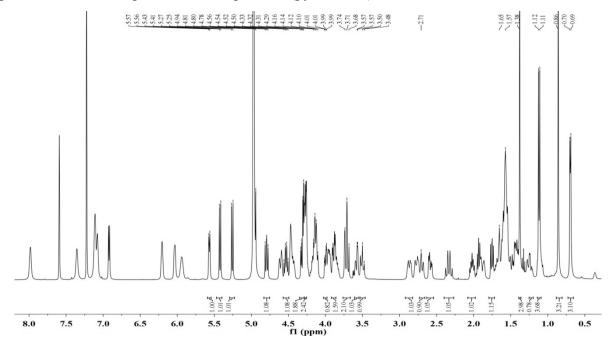


Figure S23. <sup>1</sup>C NMR spectrum of compound 4 (pyridine-*d*<sub>5</sub>)

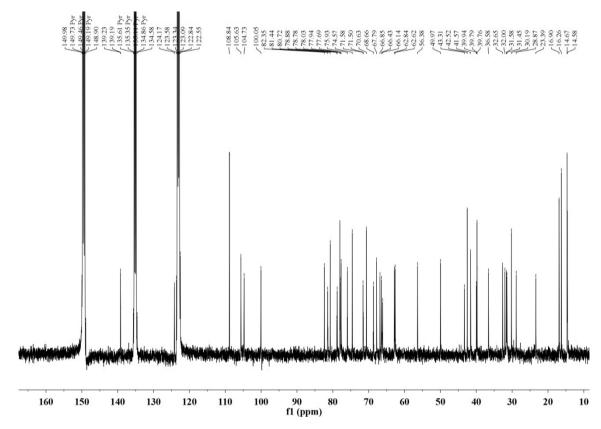
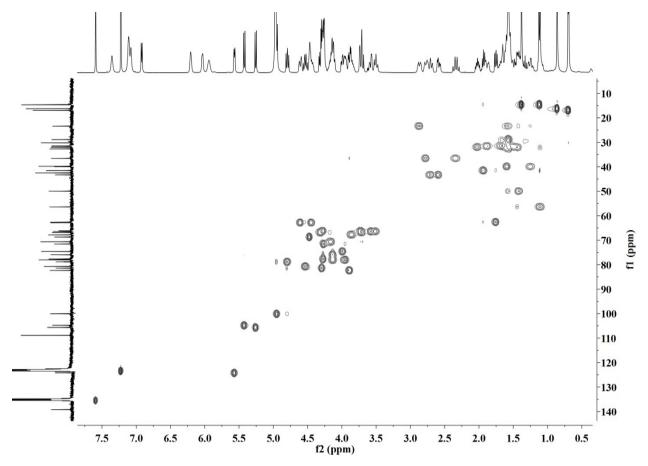


Figure S24. HSQC NMR spectrum of compound 4 (pyridine-d<sub>5</sub>)



**Figure S25**. HMBC NMR spectrum of compound 4 (pyridine- $d_5$ )

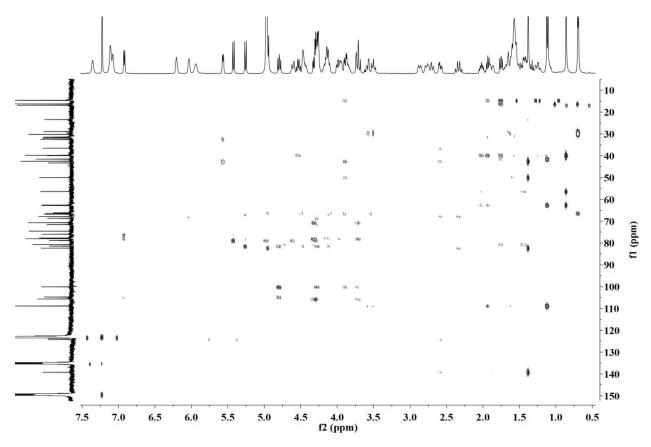


Figure S26. TOCSY NMR spectrum of compound 4 (pyridine-d<sub>5</sub>)

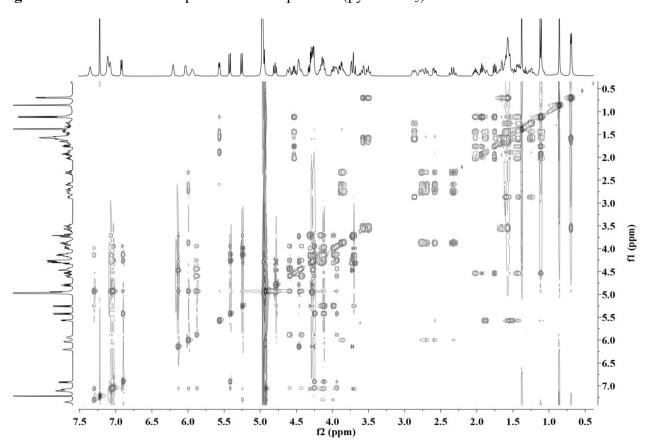


Figure S27. ESI-Q-TOF-MS spectrum of compound 4

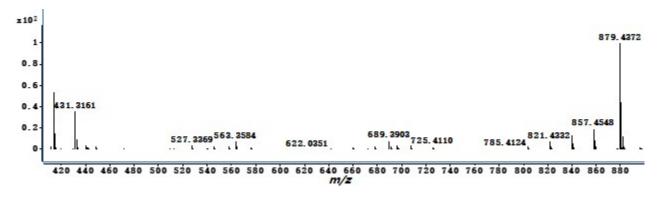
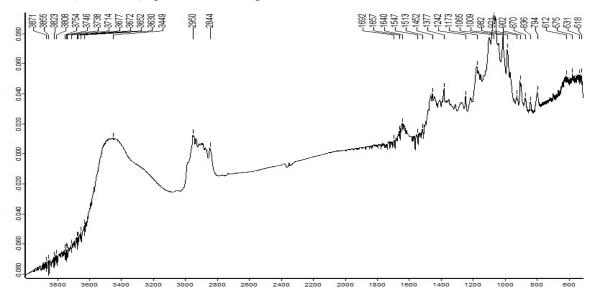


Figure S28. IR (KBr, disc) spectrum of compound 4



**Figure S29**. <sup>1</sup>H NMR spectrum of compound **5** (pyridine- $d_5$ )

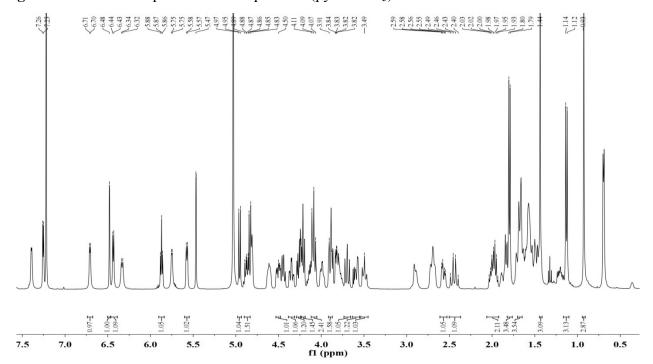
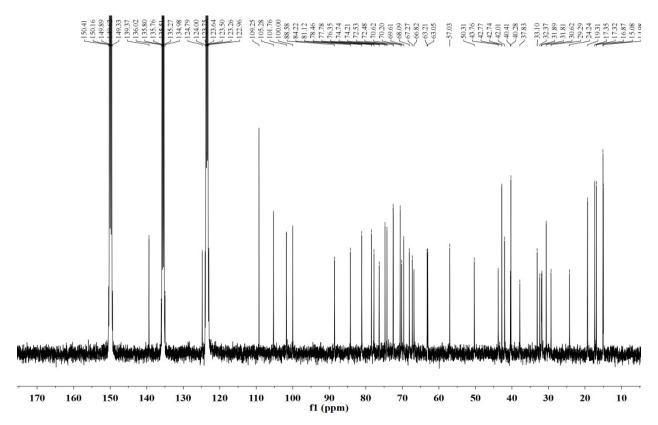
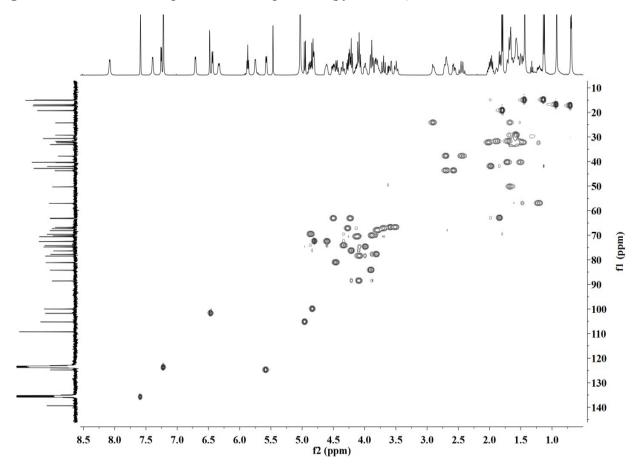


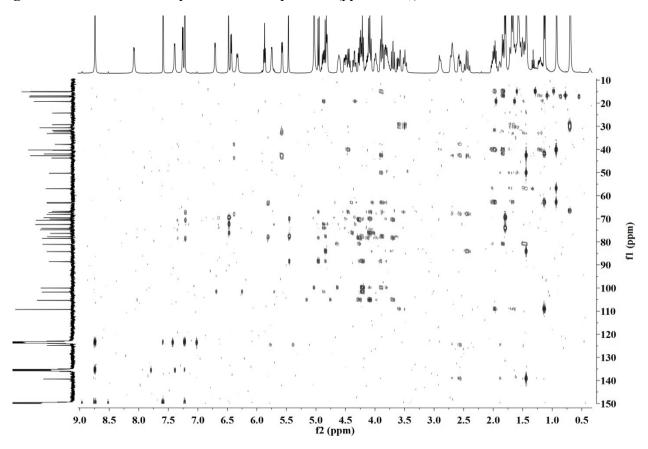
Figure S30. <sup>1</sup>C NMR spectrum of compound 5 (pyridine-*d*<sub>5</sub>)



**Figure S31**. HSQC NMR spectrum of compound **5** (pyridine- $d_5$ )



**Figure S32**. HMBC NMR spectrum of compound **5** (pyridine- $d_5$ )



**Figure S33**. TOCSY NMR spectrum of compound **5** (pyridine- $d_5$ )

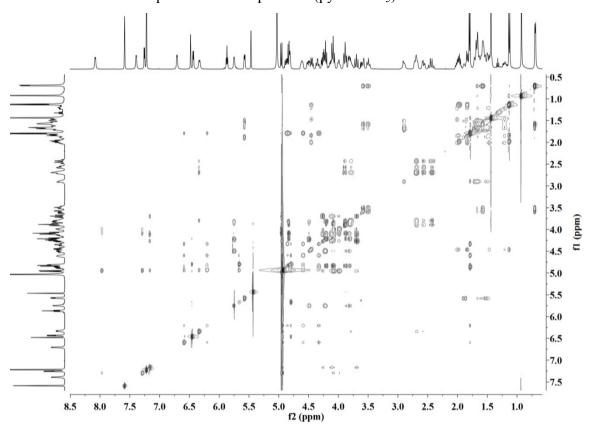


Figure S34. ESI-Q-TOF-MS spectrum of compound 5

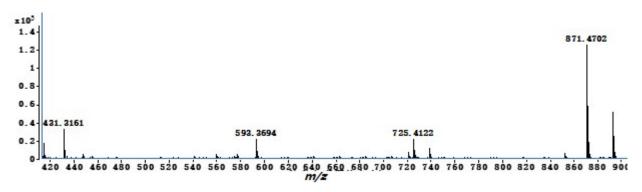


Figure S35. IR (KBr, disc) spectrum of compound 5

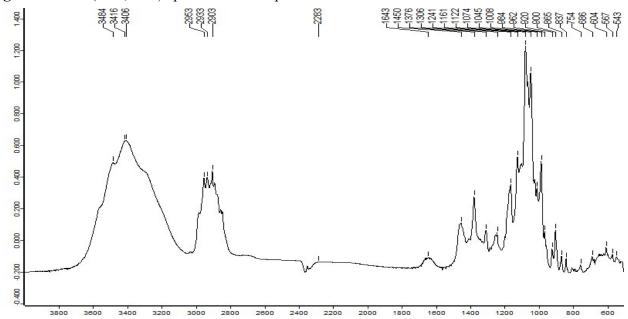


Figure S36. <sup>1</sup>H NMR spectrum of compound 6 (pyridine-*d*<sub>5</sub>)

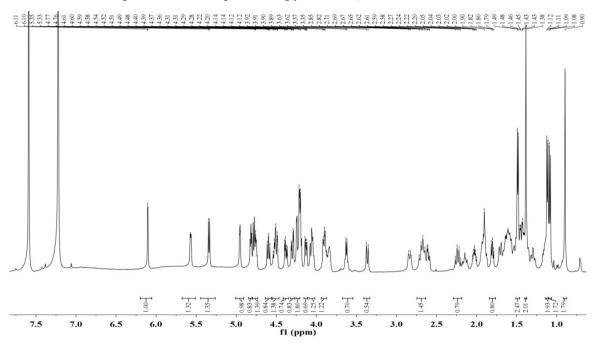
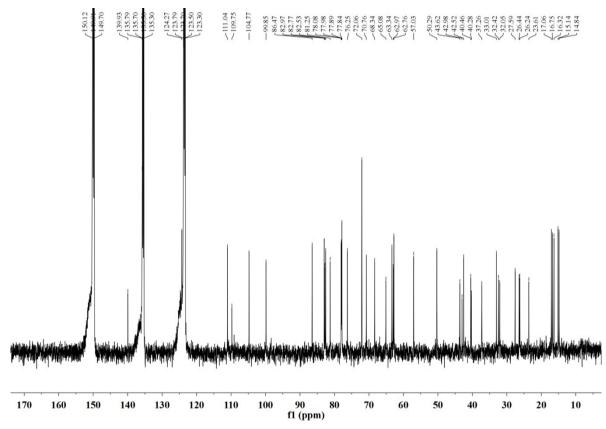
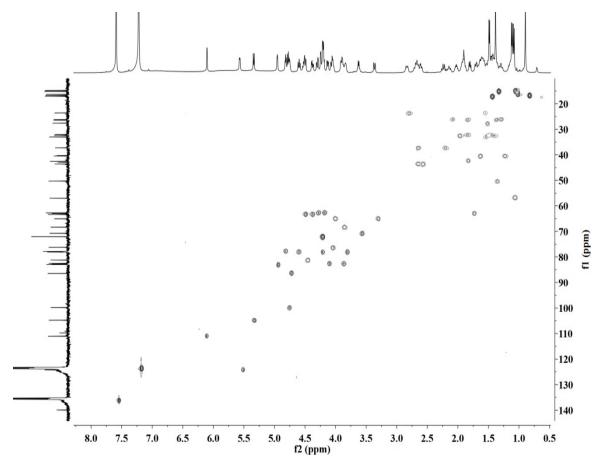


Figure S37. <sup>1</sup>C NMR spectrum of compound 6 (pyridine-*d*<sub>5</sub>)



**Figure S38**. HSQC NMR spectrum of compound **6** (pyridine- $d_5$ )



**Figure S39**. HMBC NMR spectrum of compound **6** (pyridine- $d_5$ )

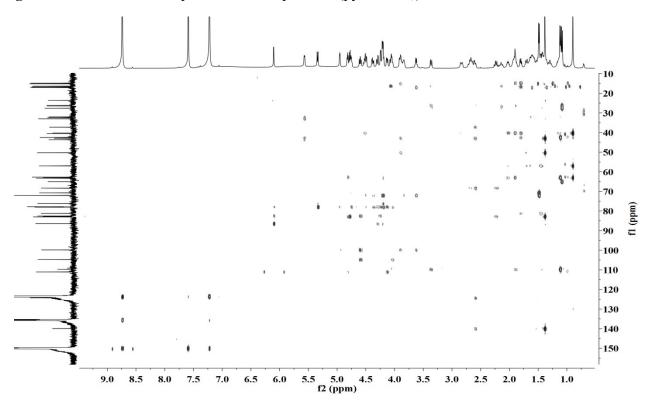


Figure S40. ESI-Q-TOF-MS spectrum of compound 6

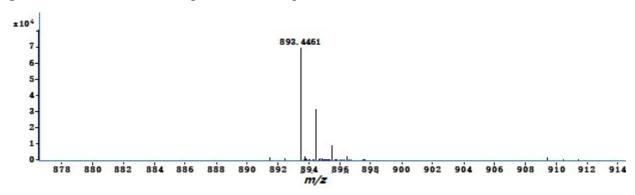
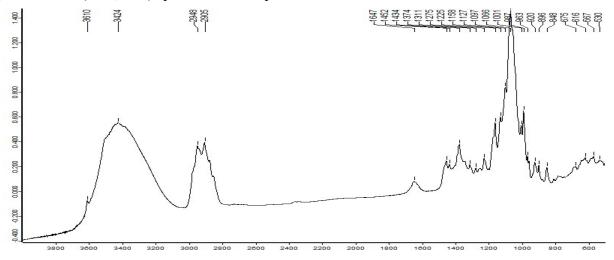


Figure S41. IR (KBr, disc) spectrum of compound 6



**Figure S42**. <sup>1</sup>H NMR spectrum of compound 7 (pyridine-*d*<sub>5</sub>)

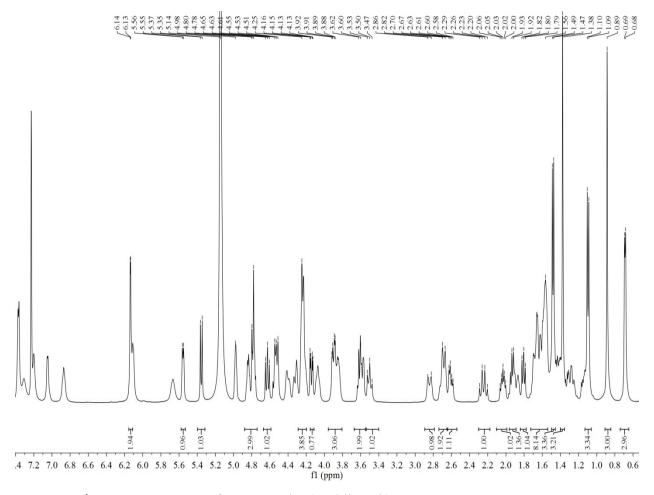


Figure S43. <sup>1</sup>C NMR spectrum of compound 7 (pyridine-*d*<sub>5</sub>)

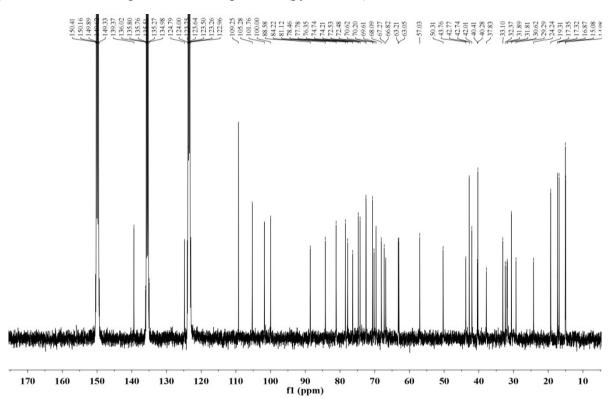
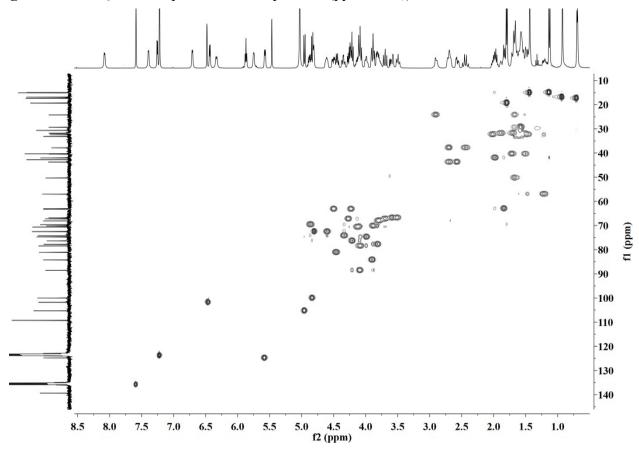
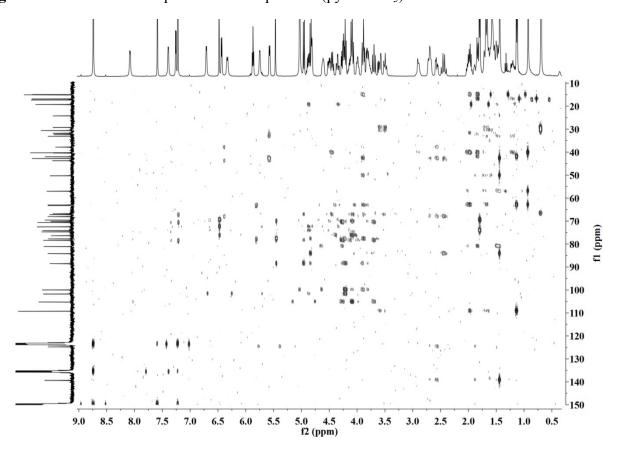


Figure S44. HSQC NMR spectrum of compound 7 (pyridine- $d_5$ )



**Figure S45**. HMBC NMR spectrum of compound 7 (pyridine-*d*<sub>5</sub>)



**Figure S46**. TOCSY NMR spectrum of compound **6** (pyridine- $d_5$ )

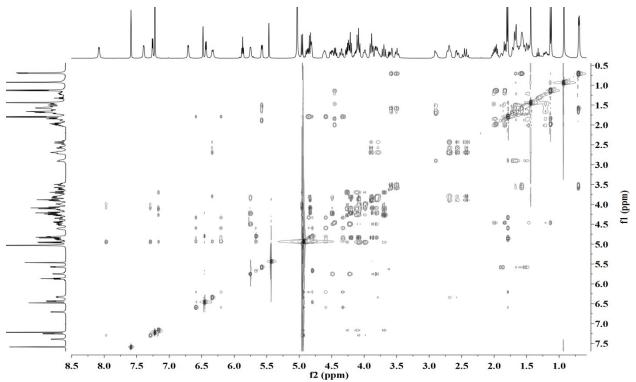


Figure S47. ESI-Q-TOF-MS spectrum of compound 7

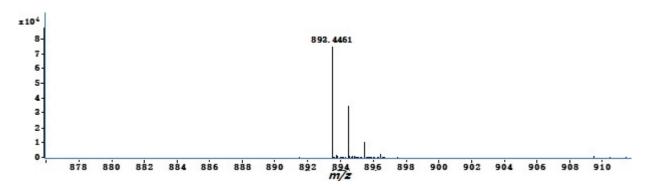
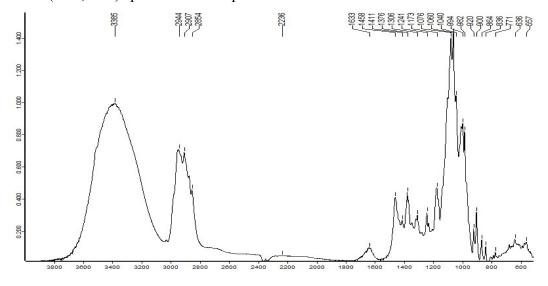


Figure S48. IR (KBr, disc) spectrum of compound 7



**Figure S49**. <sup>1</sup>H NMR spectrum of compound **8** (pyridine-*d*<sub>5</sub>)

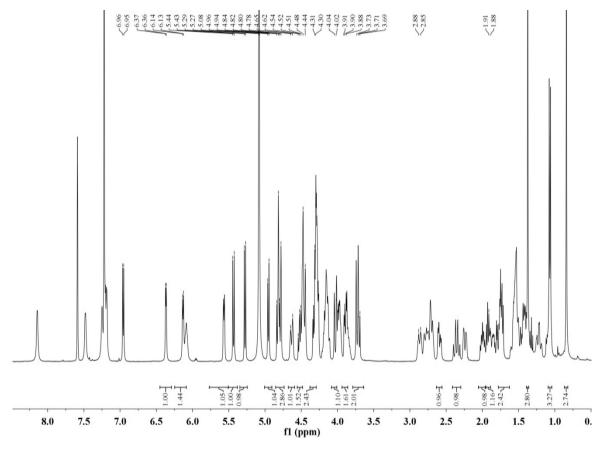


Figure S50. <sup>1</sup>C NMR spectrum of compound 8 (pyridine-*d*<sub>5</sub>)

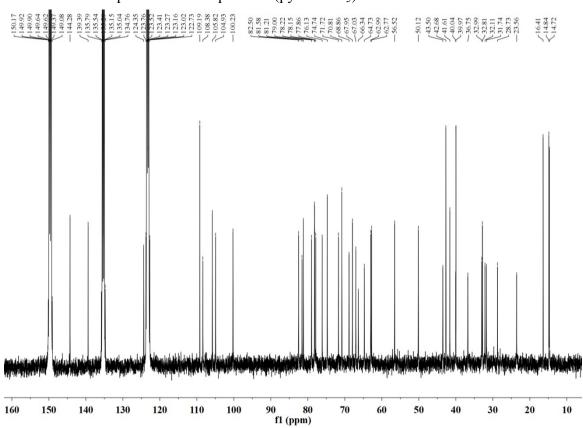
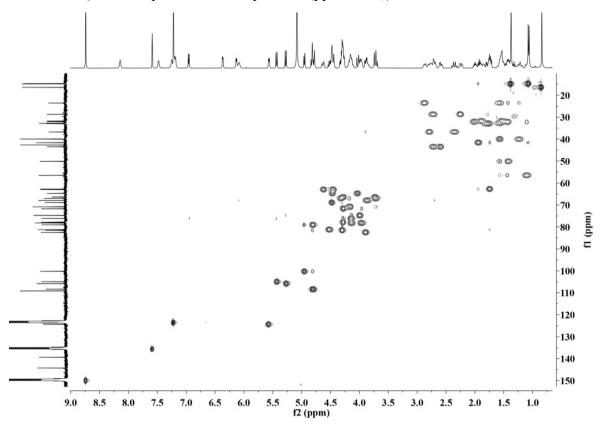
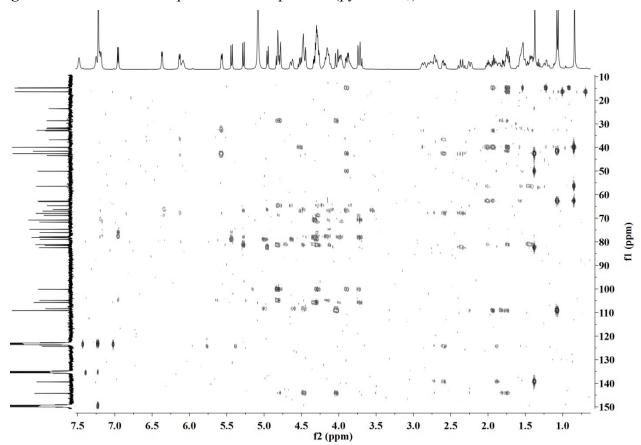


Figure S51. HSQC NMR spectrum of compound 8 (pyridine- $d_5$ )



**Figure S52**. HMBC NMR spectrum of compound **8** (pyridine-*d*<sub>5</sub>)



**Figure S53**. TOCSY NMR spectrum of compound **8** (pyridine- $d_5$ )

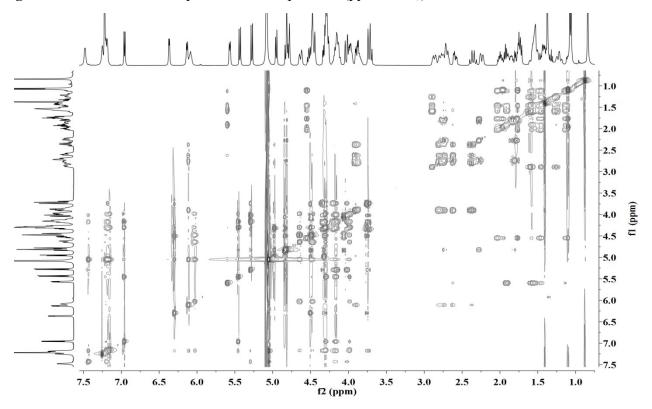


Figure S54. ESI-Q-TOF-MS spectrum of compound 8

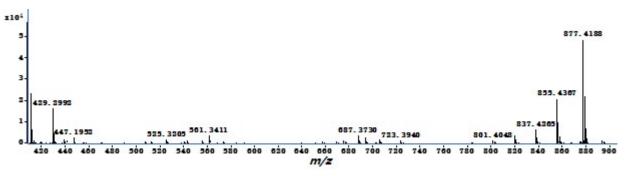


Figure S55. IR (KBr, disc) spectrum of compound 8

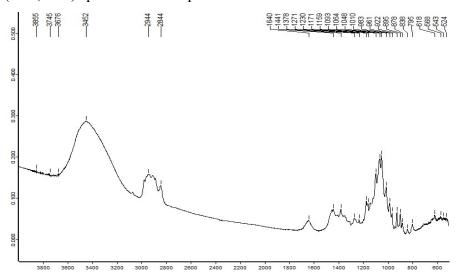


Figure S56. <sup>1</sup>H NMR spectrum of compound 9 (pyridine-*d*<sub>5</sub>)

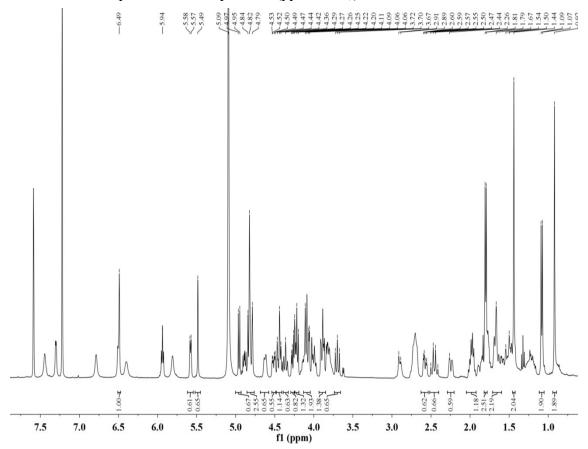
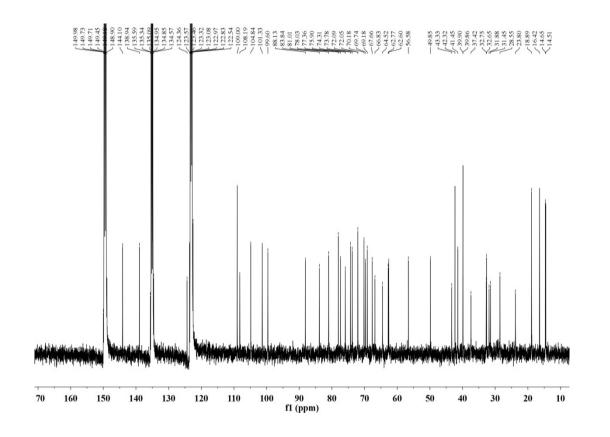
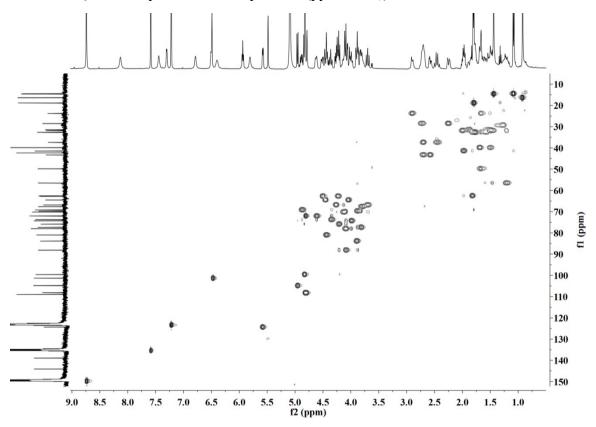


Figure S57. <sup>1</sup>C NMR spectrum of compound 9 (pyridine-*d*<sub>5</sub>)



**Figure S58**. HSQC NMR spectrum of compound **9** (pyridine- $d_5$ )



**Figure S59**. HMBC NMR spectrum of compound **9** (pyridine-*d*<sub>5</sub>)

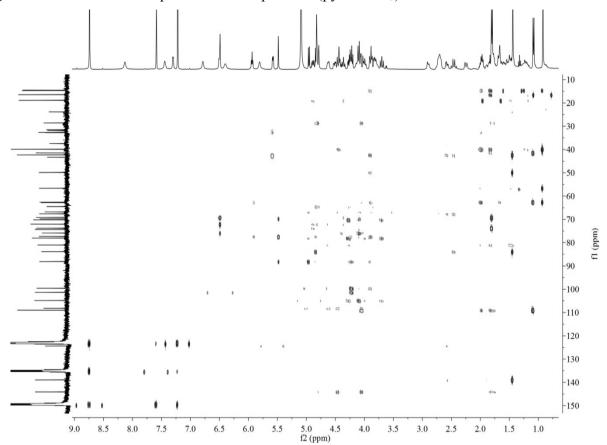


Figure S60. TOCSY NMR spectrum of compound 9 (pyridine-d<sub>5</sub>)

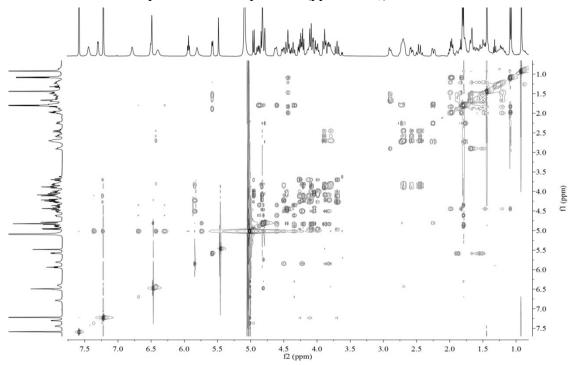


Figure S61. ESI-Q-TOF-MS spectrum of compound 9

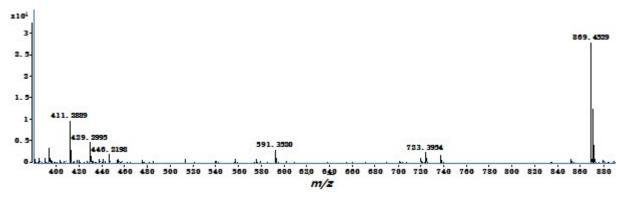
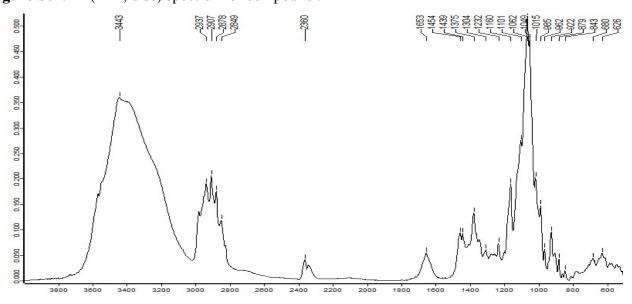
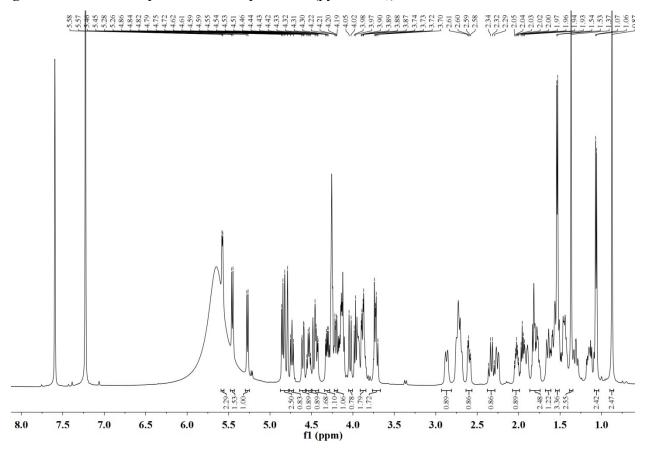


Figure S62. IR (KBr, disc) spectrum of compound 9



**Figure S63**. <sup>1</sup>H NMR spectrum of compound **10** (pyridine-*d*<sub>5</sub>)



**Figure S64**. <sup>1</sup>C NMR spectrum of compound **10** (pyridine-*d*<sub>5</sub>)

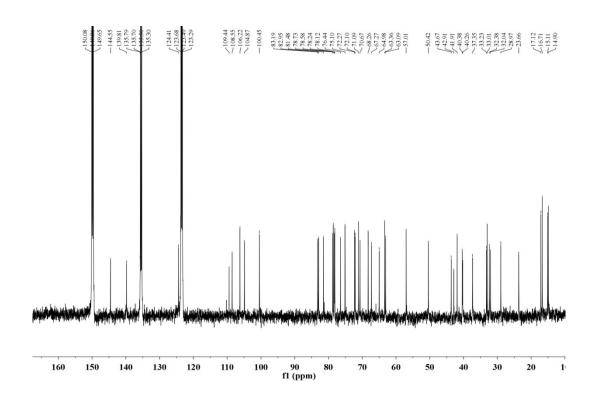
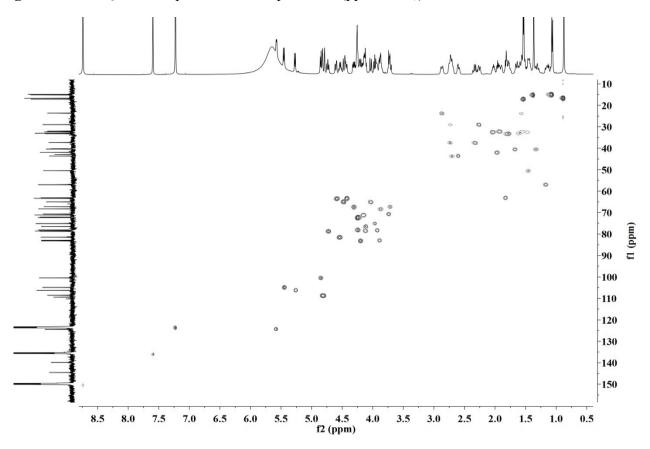


Figure S65. HSQC NMR spectrum of compound 10 (pyridine-d<sub>5</sub>)



**Figure S66**. HMBC NMR spectrum of compound **10** (pyridine-*d*<sub>5</sub>)

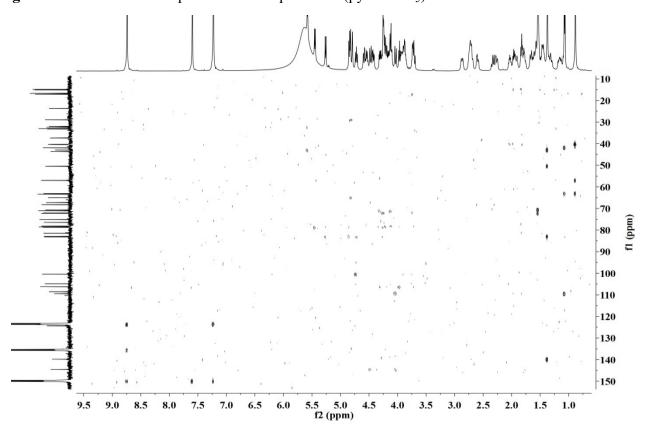


Figure S67. TOCSY NMR spectrum of compound 10 (pyridine- $d_5$ )

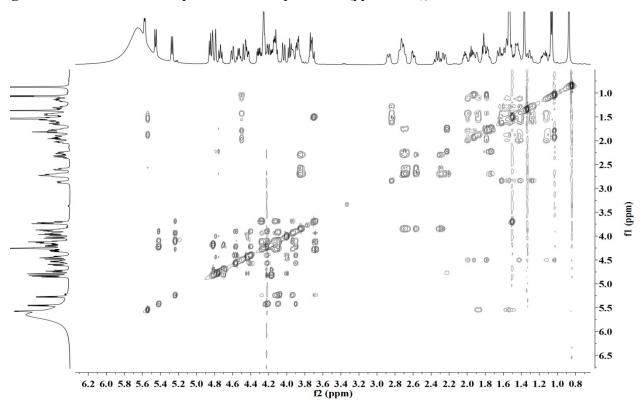


Figure S68. ESI-Q-TOF-MS spectrum of compound 10

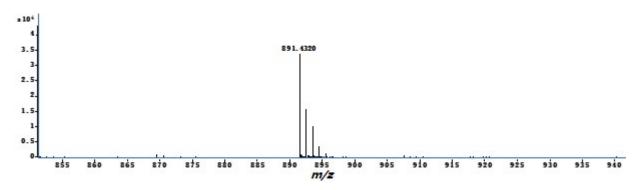
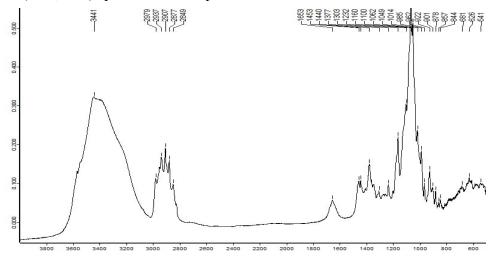


Figure S69. IR (KBr, disc) spectrum of compound 10



**Figure S70**. <sup>1</sup>H NMR spectrum of compound **11** (pyridine-*d*<sub>5</sub>)

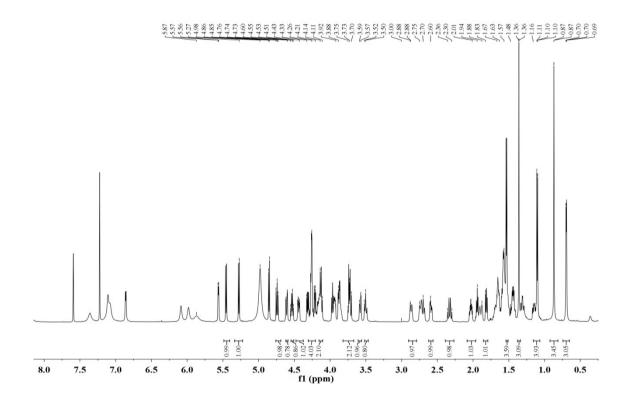
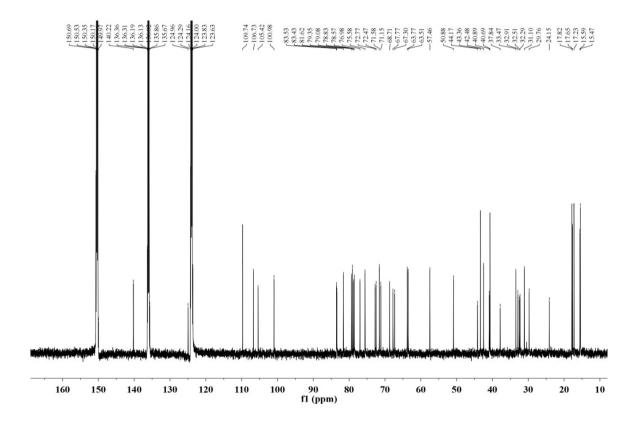


Figure S71. <sup>1</sup>C NMR spectrum of compound 11 (pyridine-*d*<sub>5</sub>)



**Figure S72**.  ${}^{1}$ H NMR spectrum of compound **12** (pyridine- $d_{5}$ )

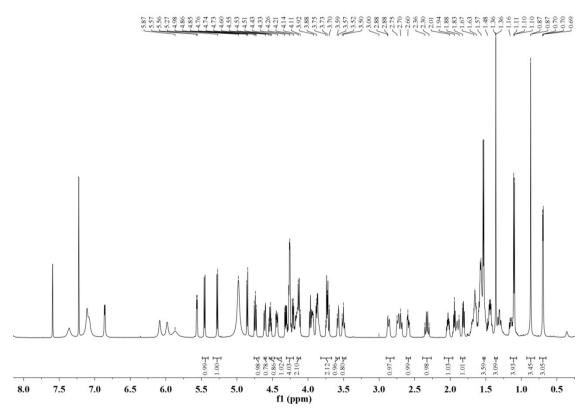
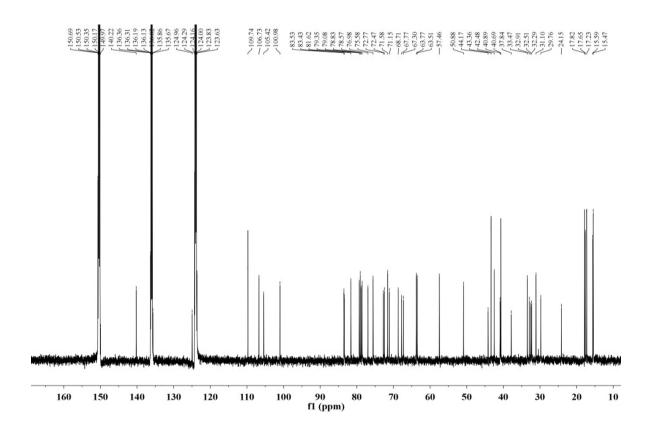


Figure 73.  ${}^{1}$ C NMR spectrum of compound 12 (pyridine- $d_{5}$ )



**Figure S74**. <sup>1</sup>H NMR spectrum of compound **13** (pyridine-*d*<sub>5</sub>)

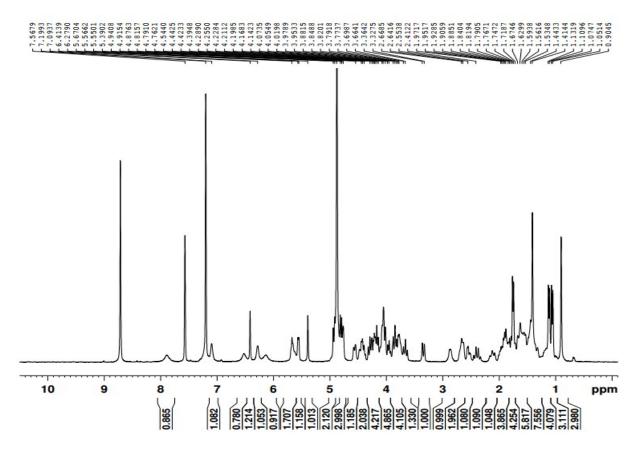


Figure S75. <sup>1</sup>C NMR spectrum of compound 13 (pyridine-*d*<sub>5</sub>)

