

Supporting information

An eco-friendly sequential catalyst- and solvent-free four-component stereoselective synthesis of novel 1,4-pyranonaphthoquinones

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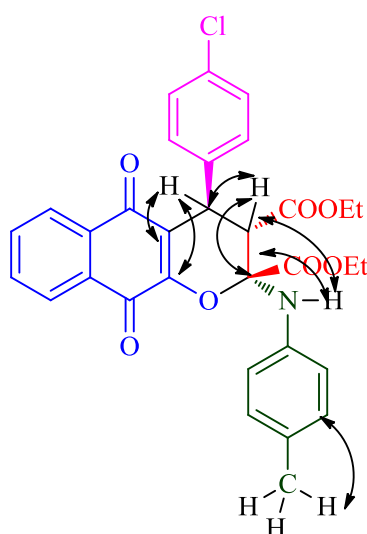


Fig.1. Selected HMB correlations of **5f**

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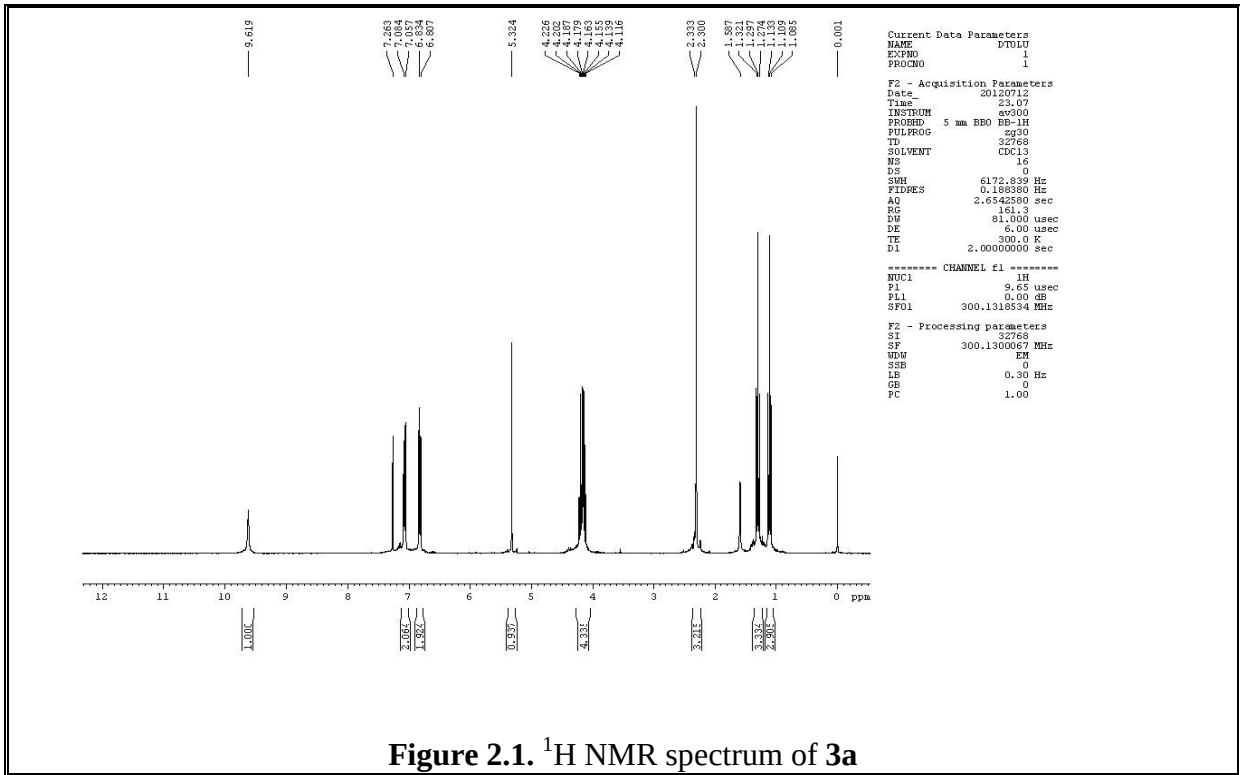


Figure 2.1. ¹H NMR spectrum of 3a

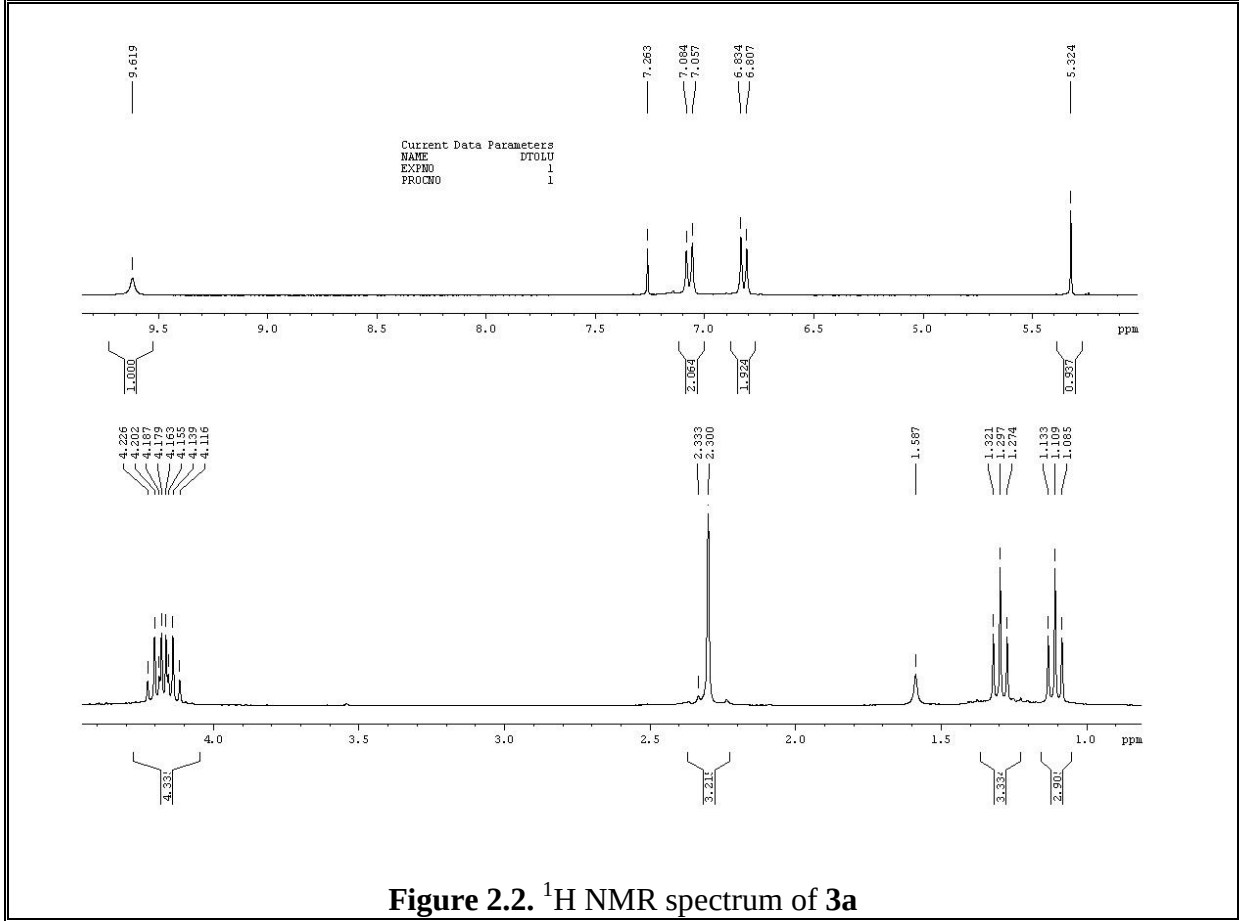


Figure 2.2. ¹H NMR spectrum of 3a

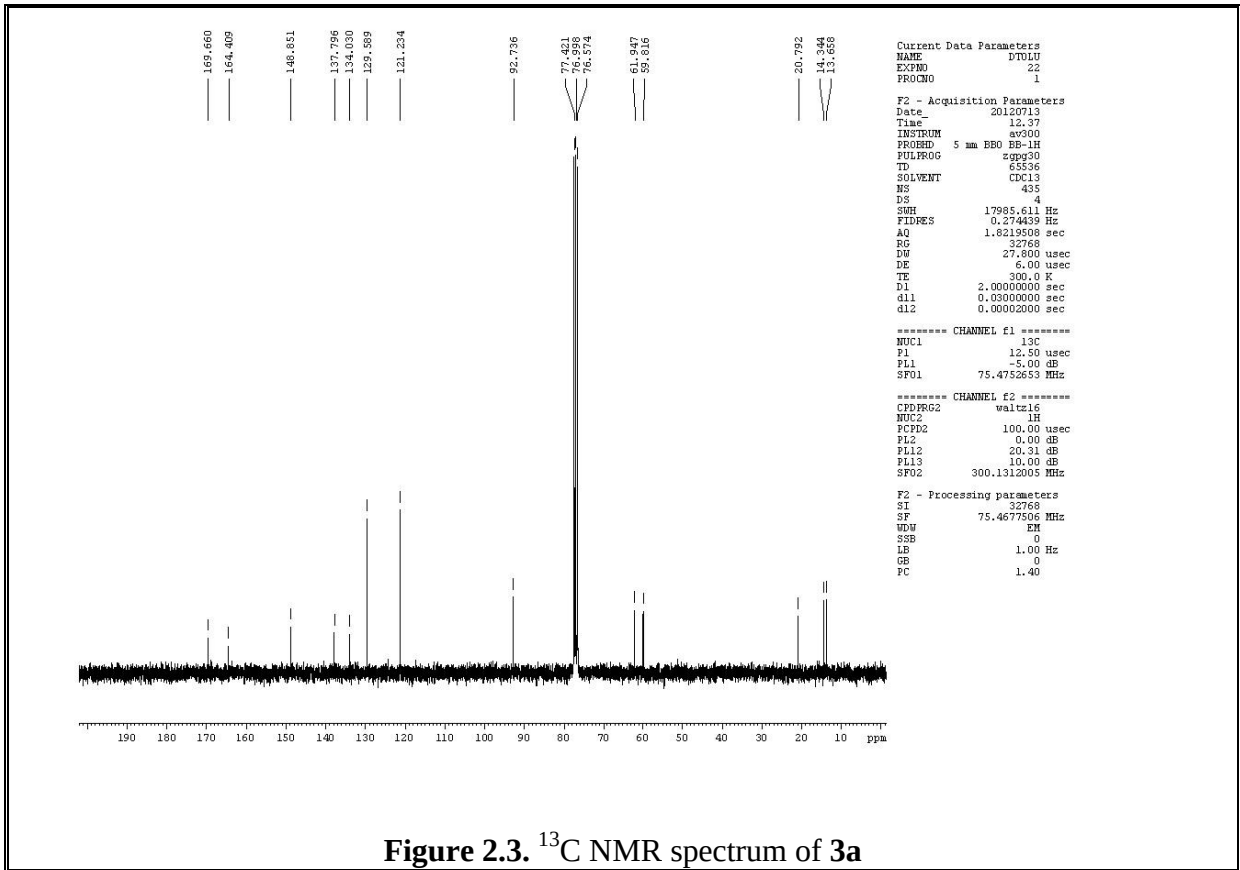


Figure 2.3. ^{13}C NMR spectrum of 3a

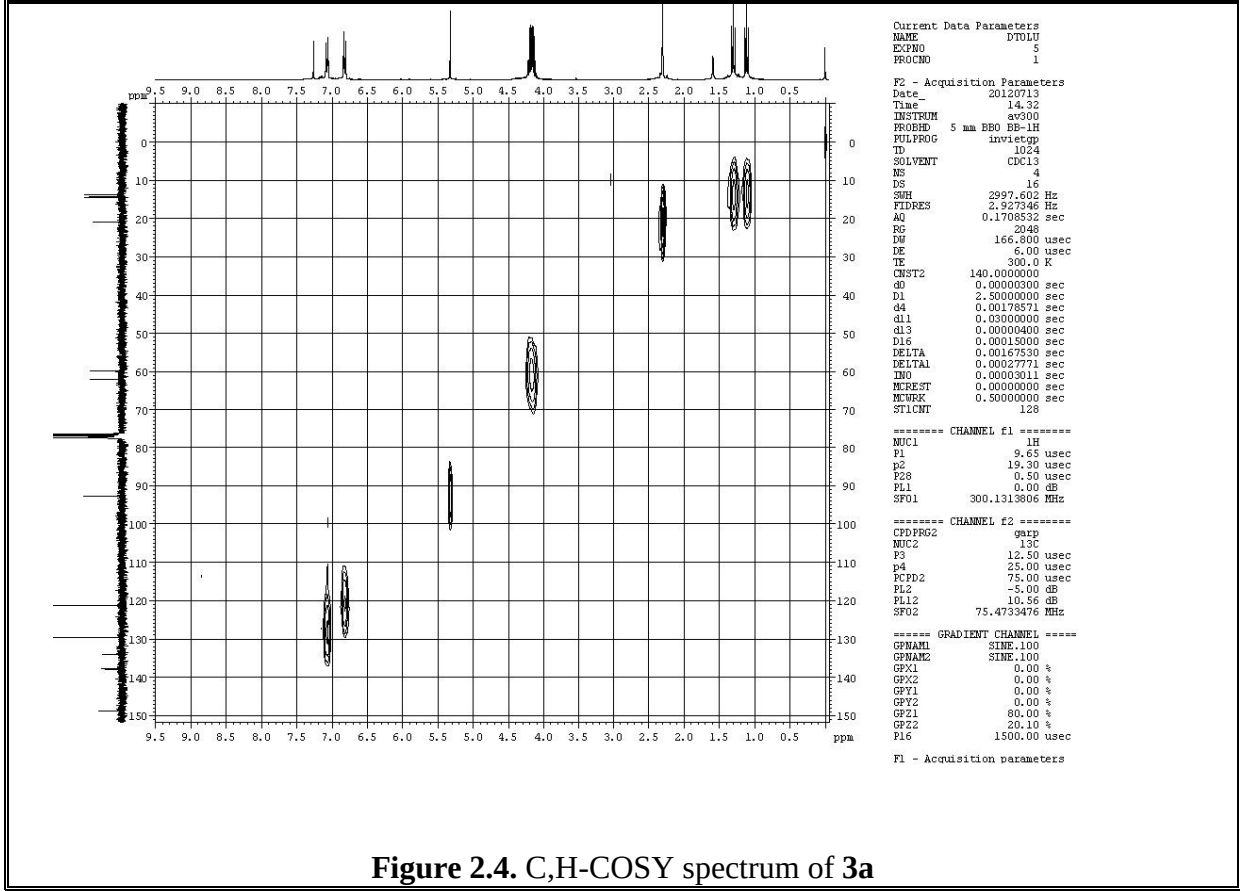


Figure 2.4. C,H-COSY spectrum of 3a

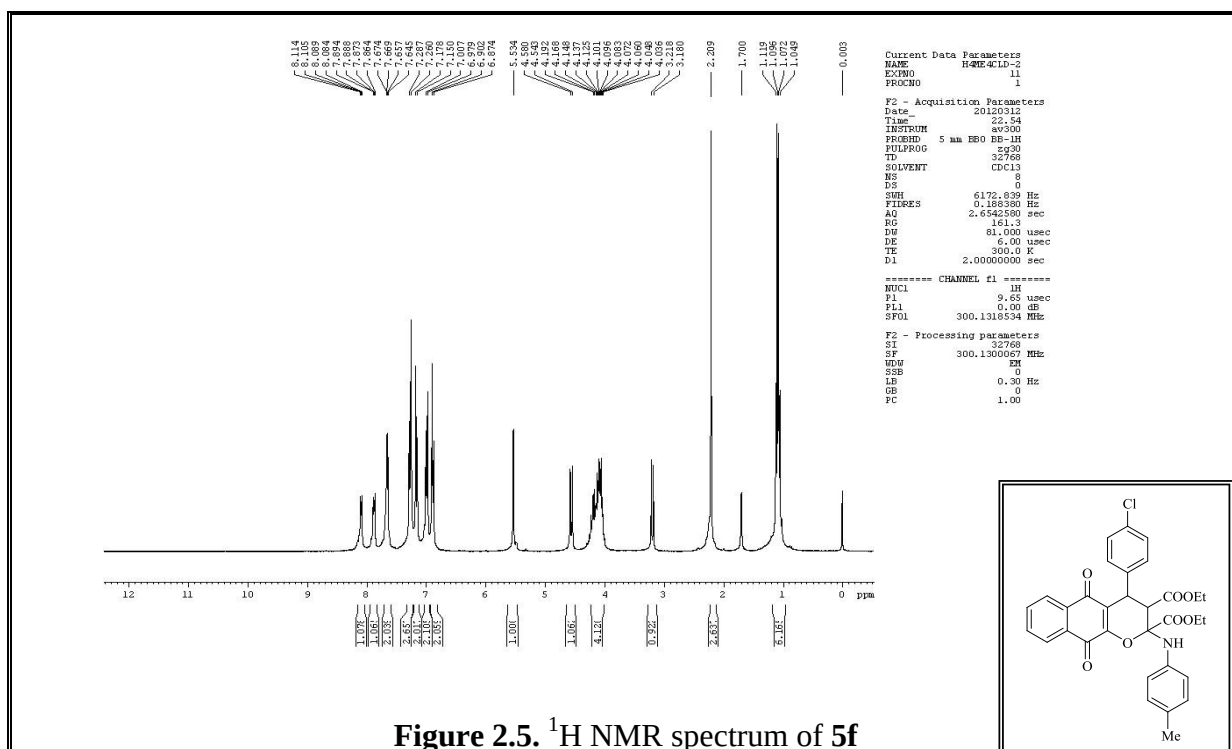


Figure 2.5. ^1H NMR spectrum of 5f

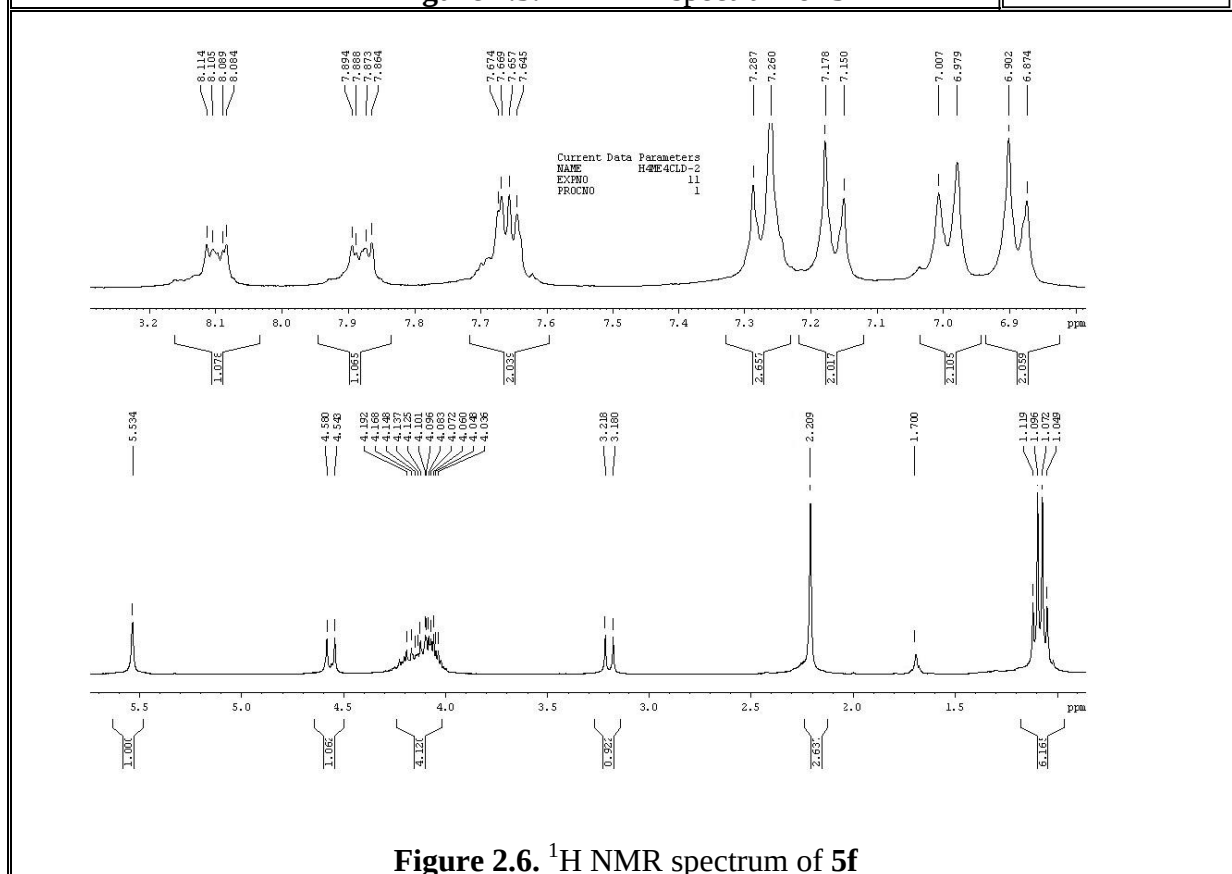
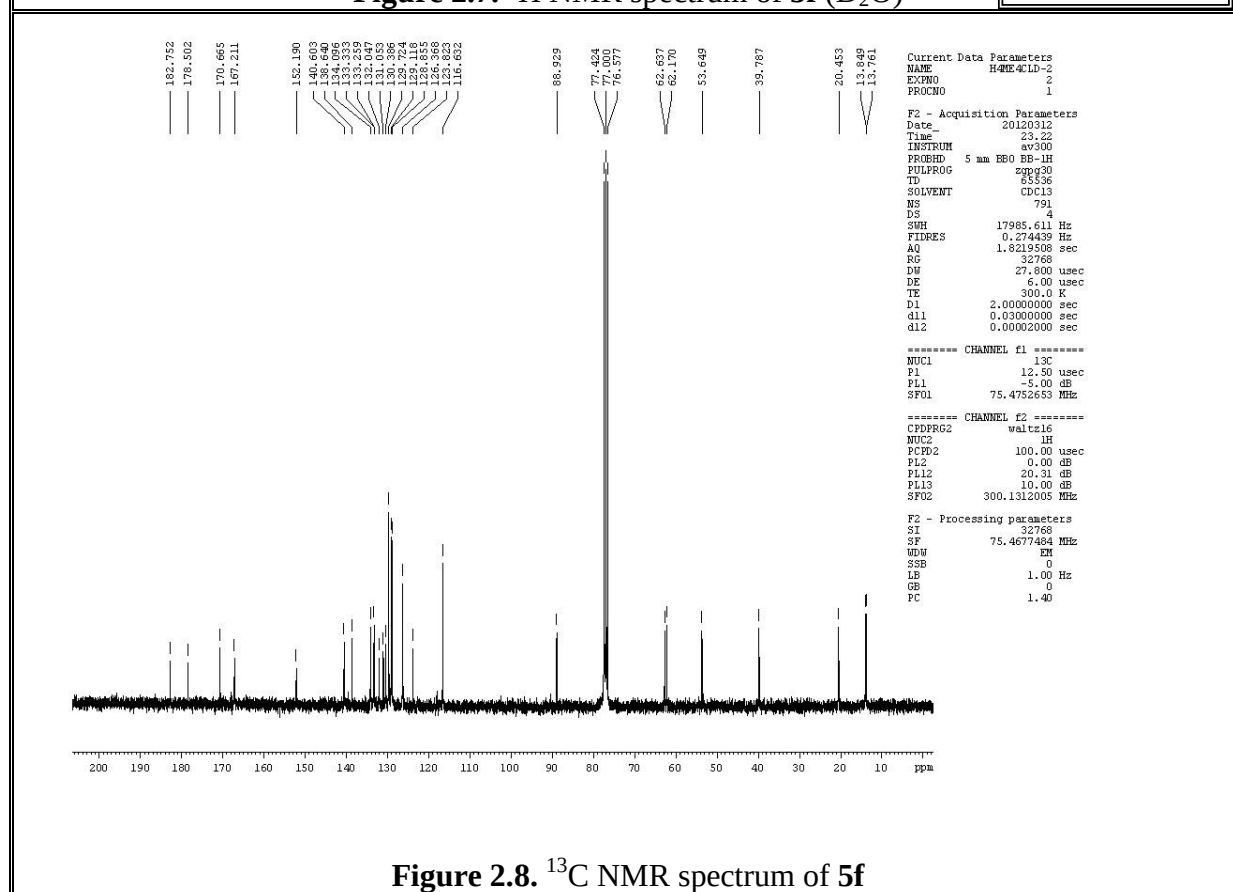
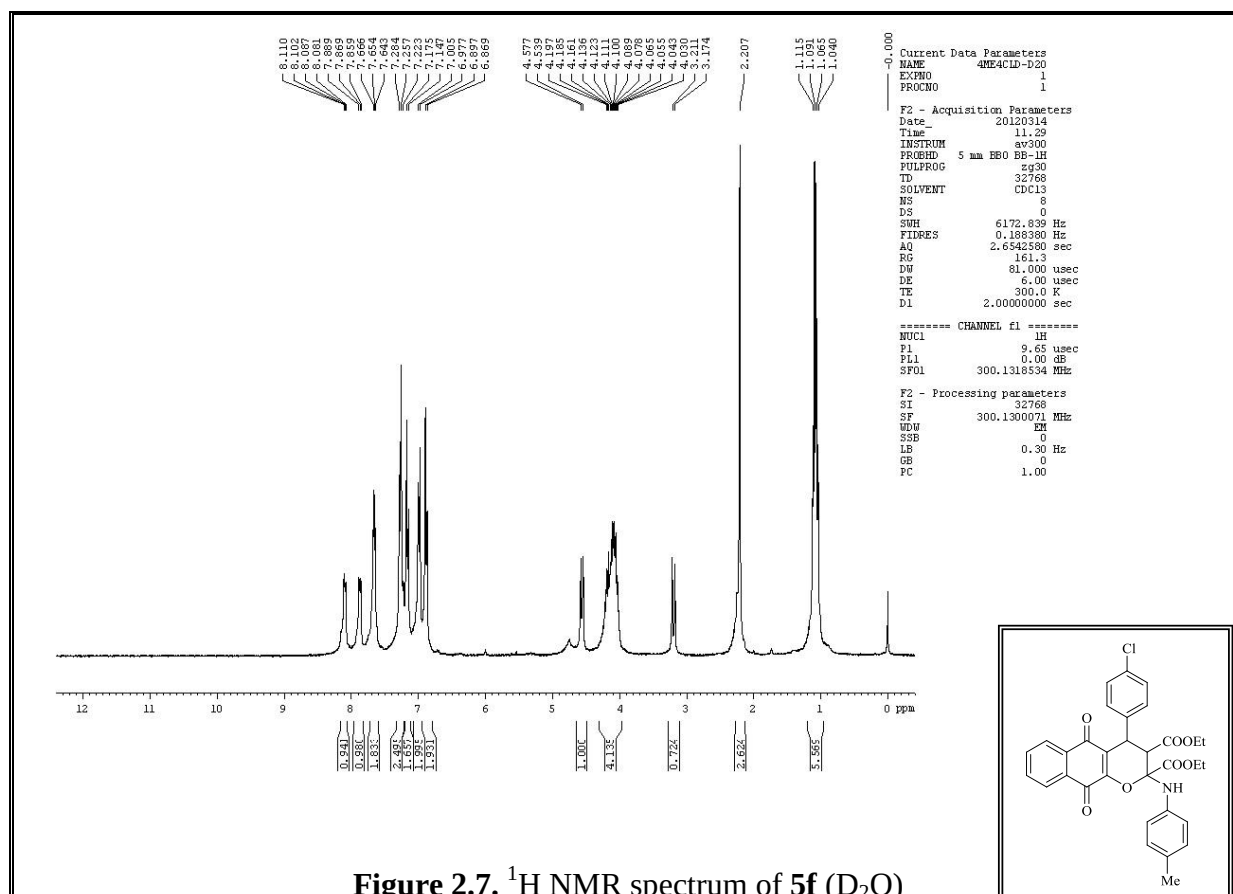


Figure 2.6. ^1H NMR spectrum of 5f



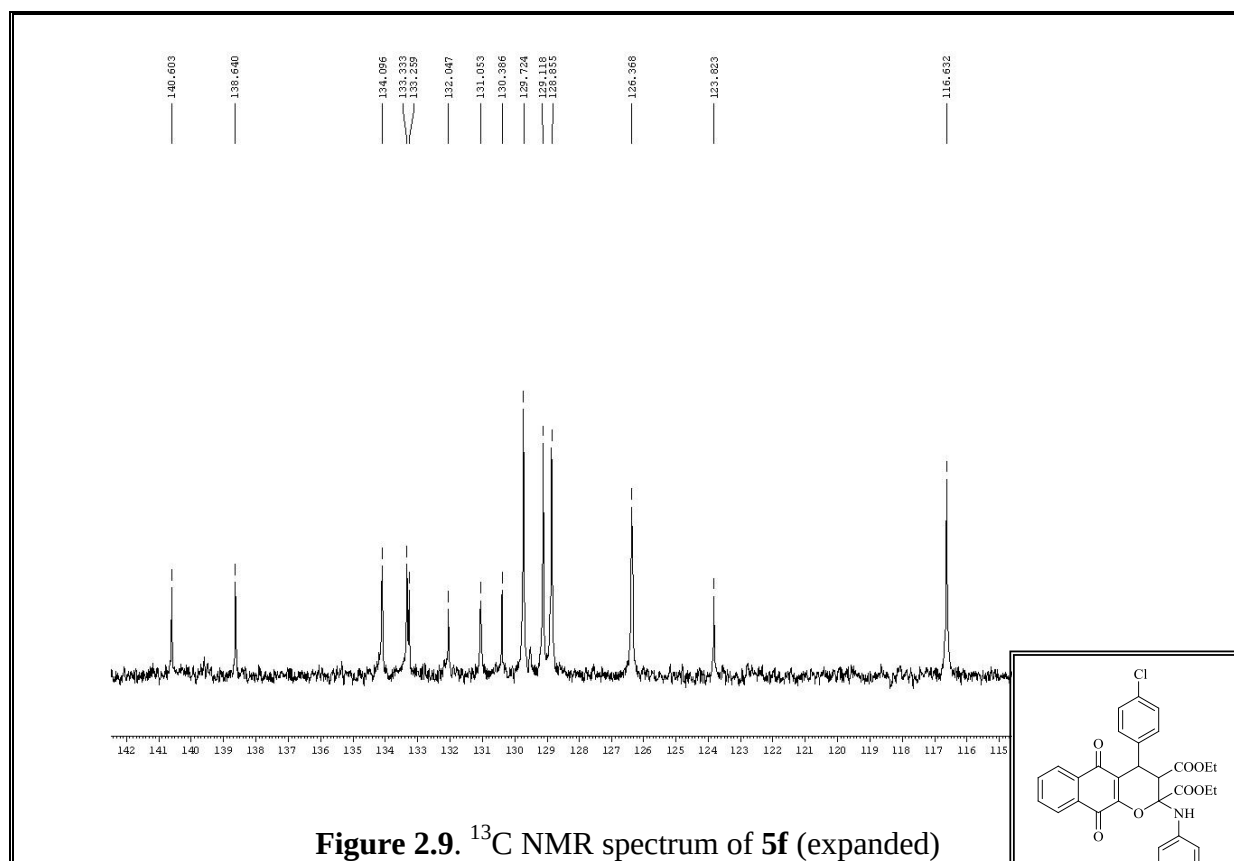


Figure 2.9. ^{13}C NMR spectrum of **5f** (expanded)

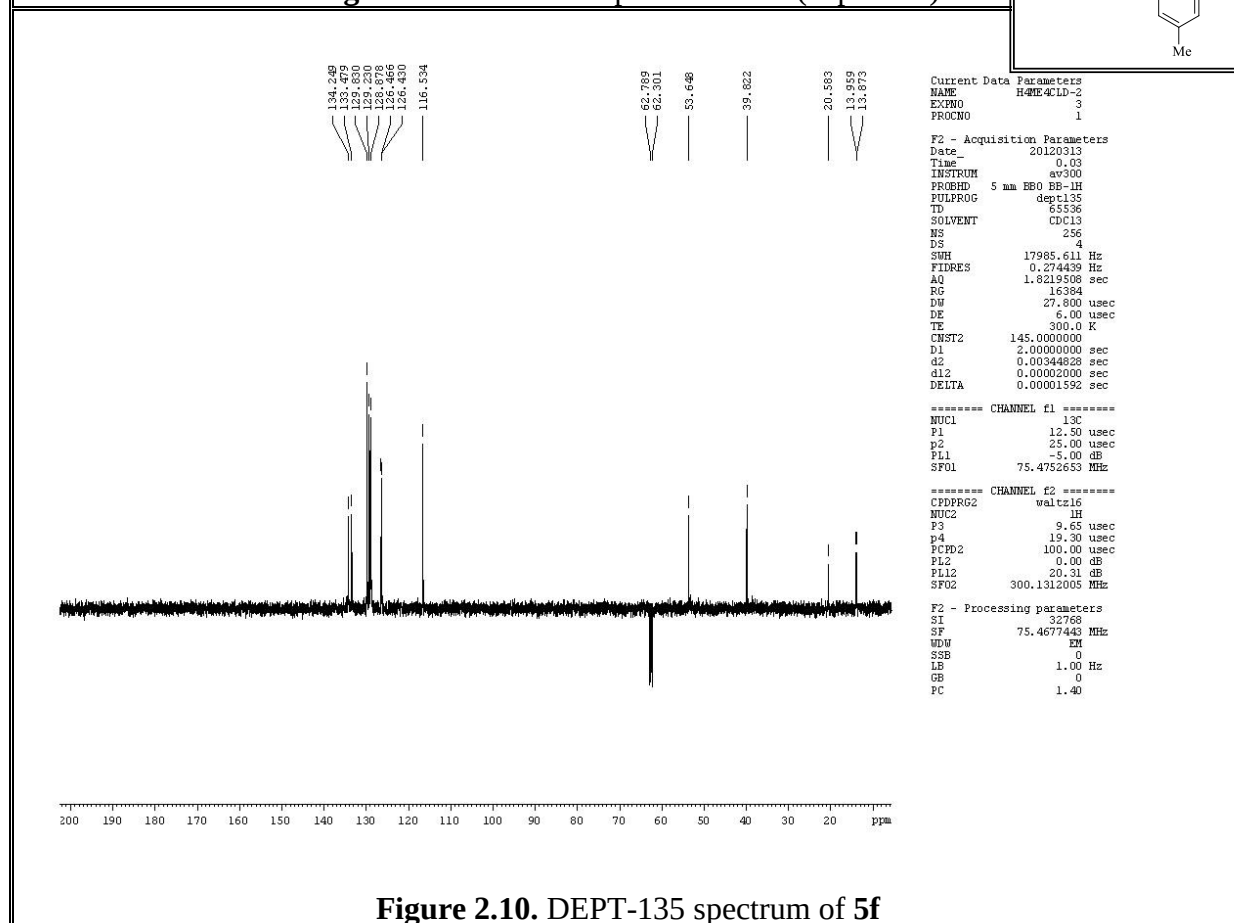


Figure 2.10. DEPT-135 spectrum of **5f**

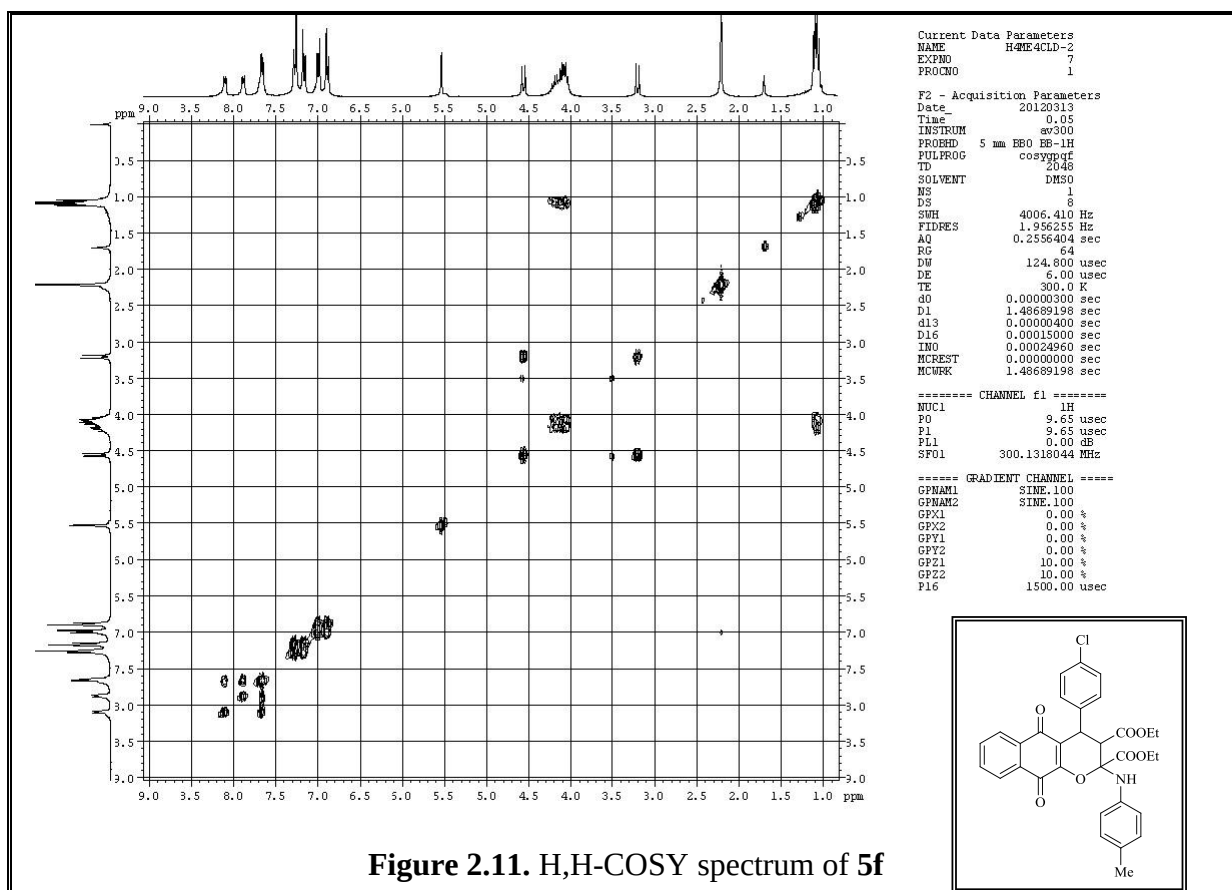


Figure 2.11. H,H-COSY spectrum of **5f**

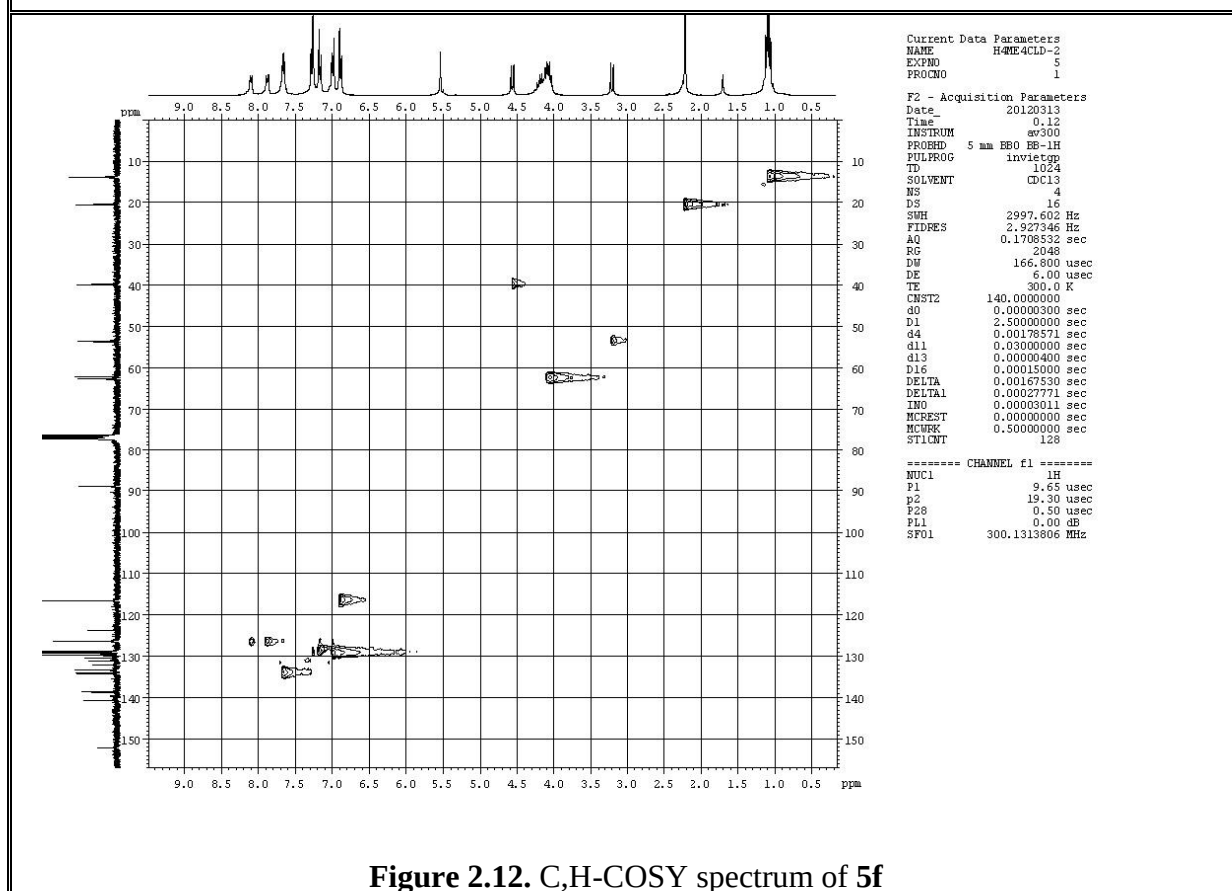


Figure 2.12. C,H-COSY spectrum of **5f**



Figure 2.14. HMBC spectrum of **5f**

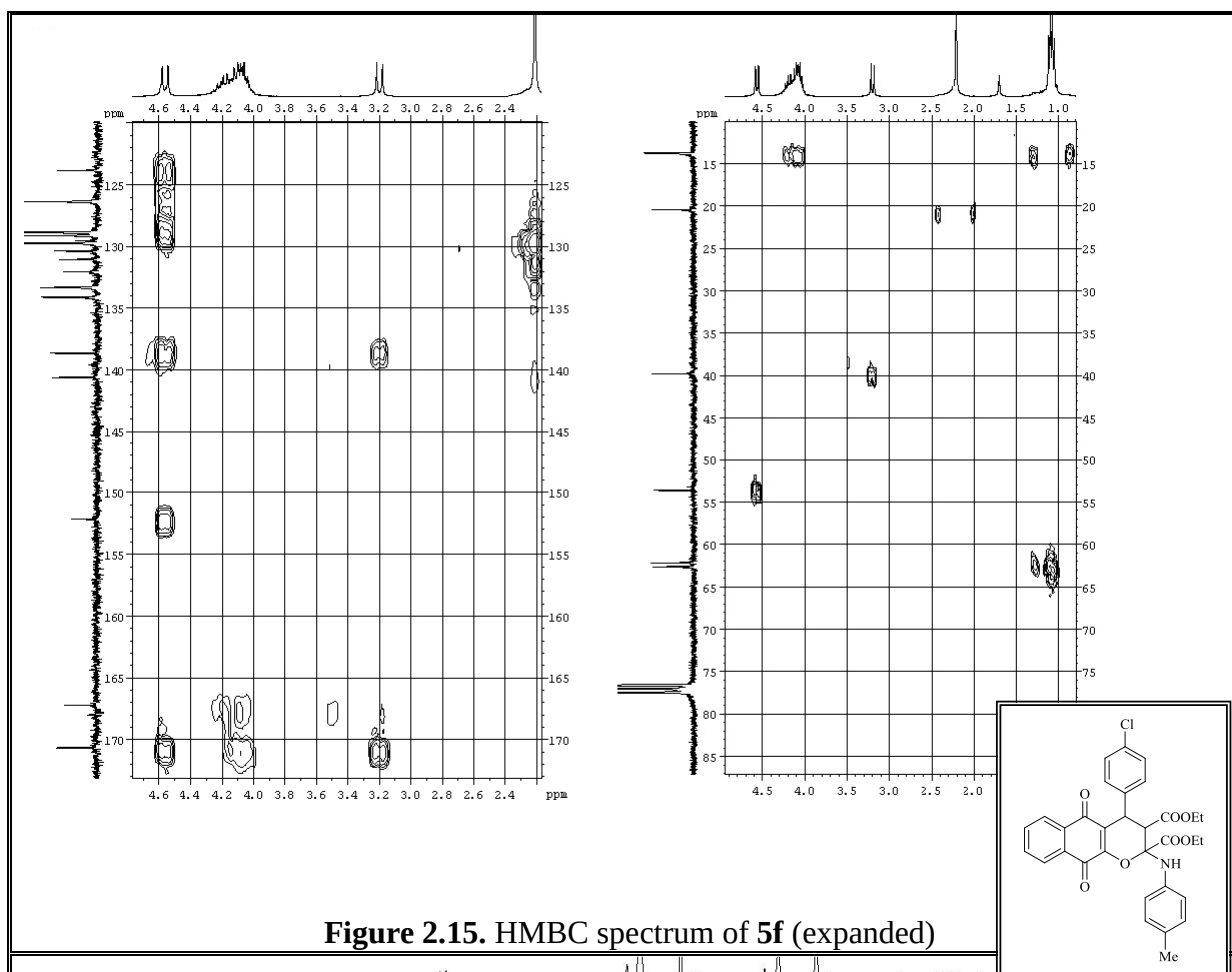


Figure 2.15. HMBC spectrum of 5f (expanded)

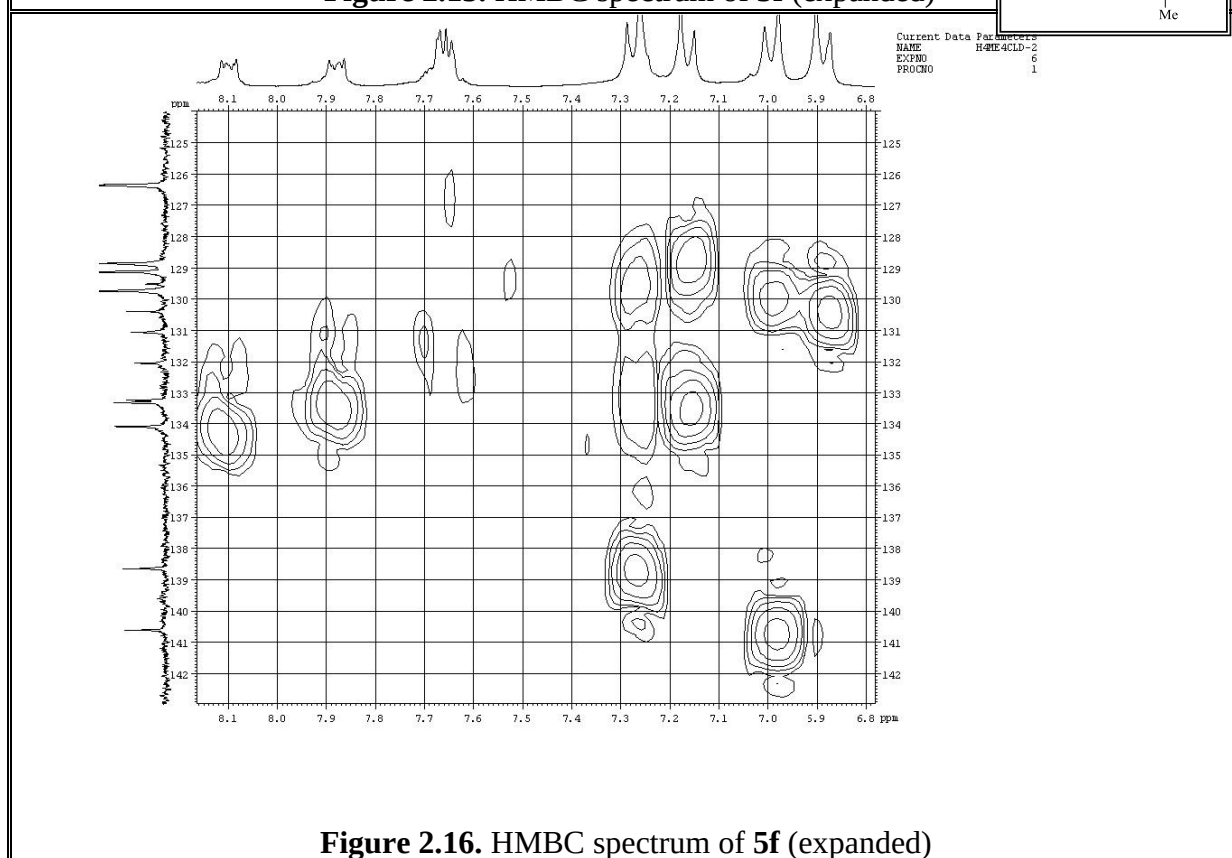


Figure 2.16. HMBC spectrum of 5f (expanded)

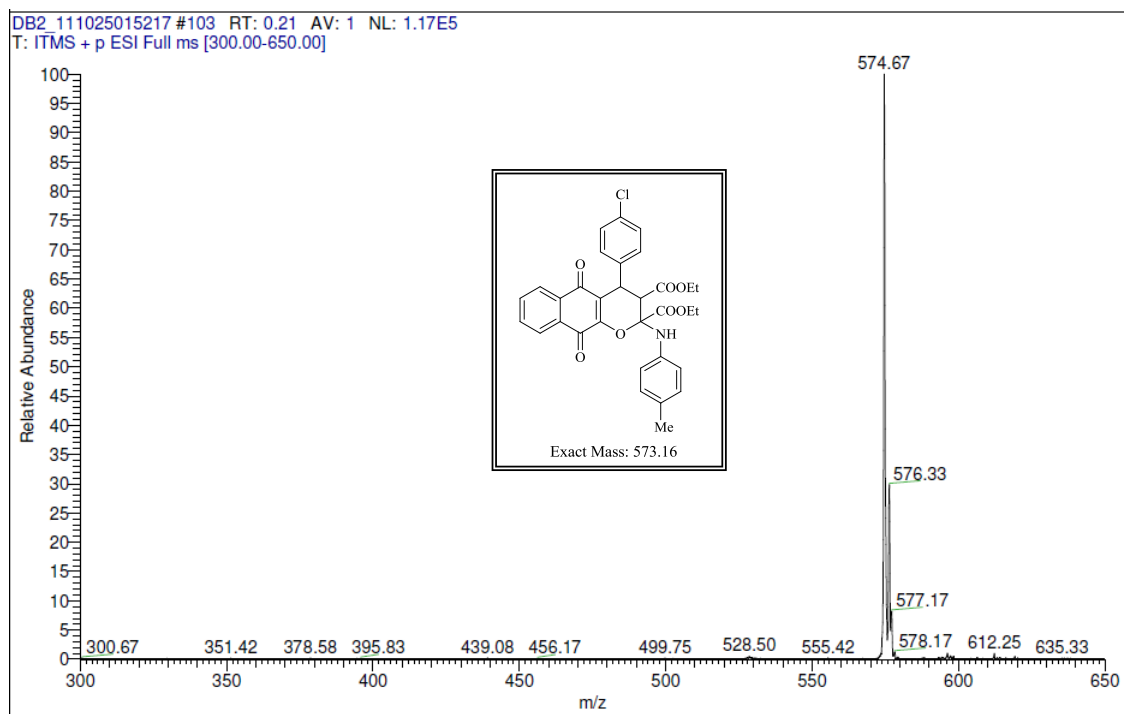
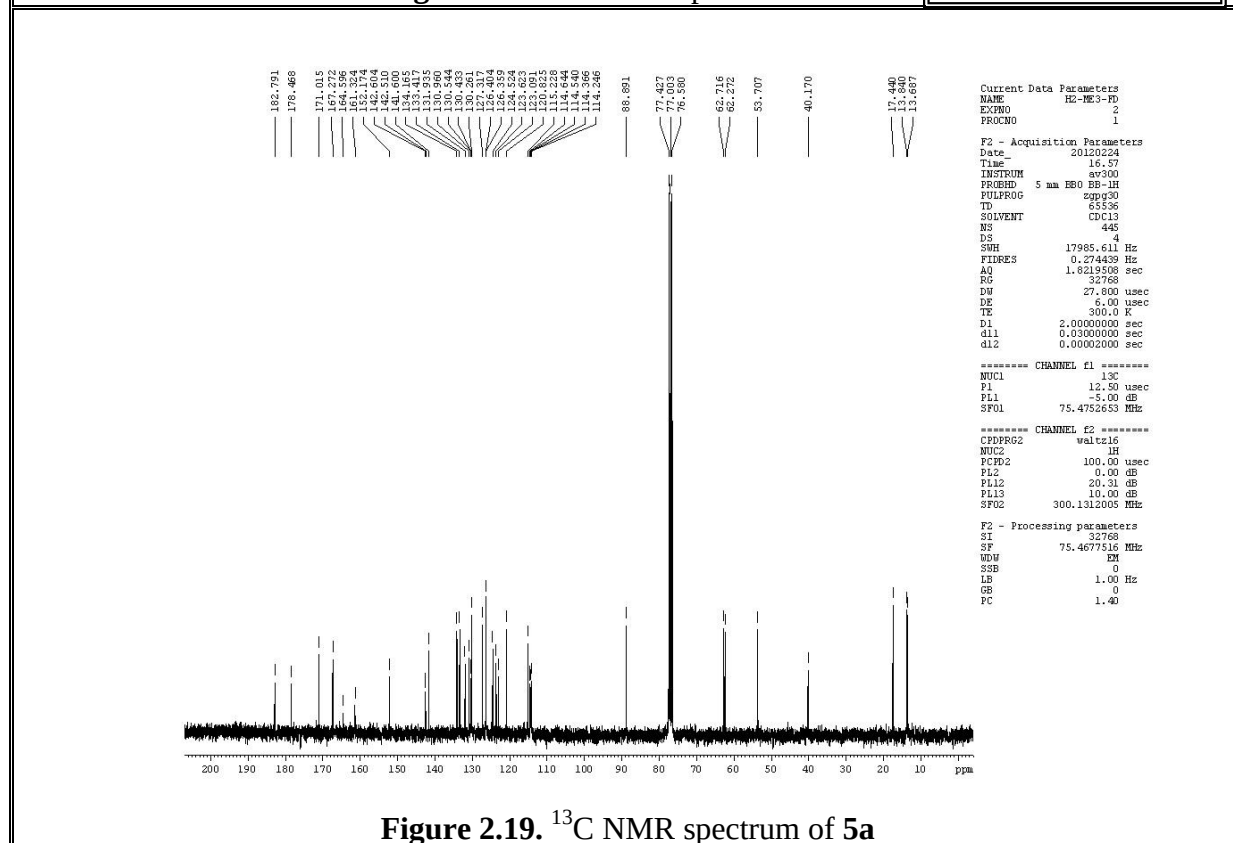
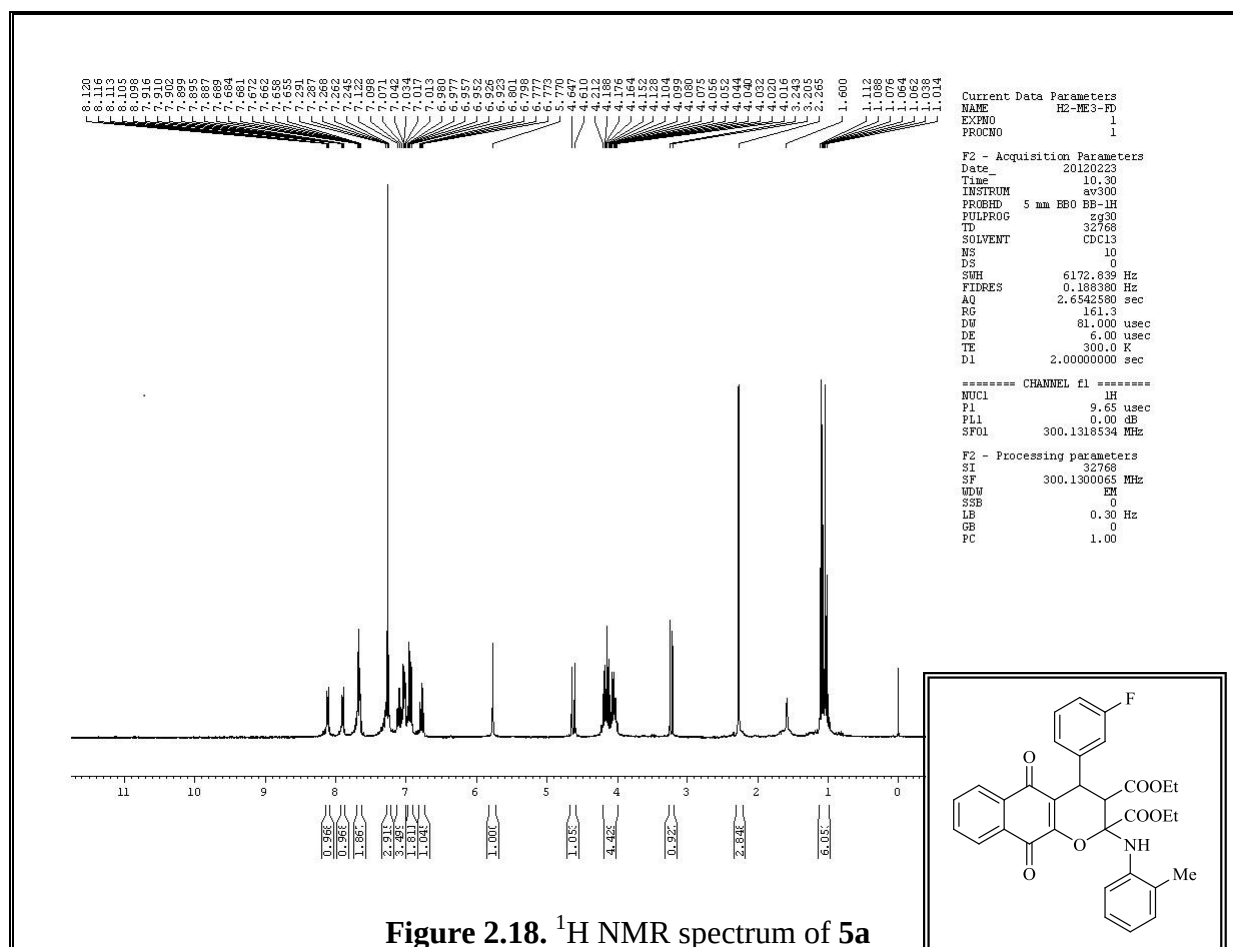


Figure 2.17. ESI Mass spectrum of **5f**



5-A_120403111331 #236 RT: 0.49 AV: 1 NL: 4.88E3
T: ITMS + c ESI Full ms [400.00-750.00]

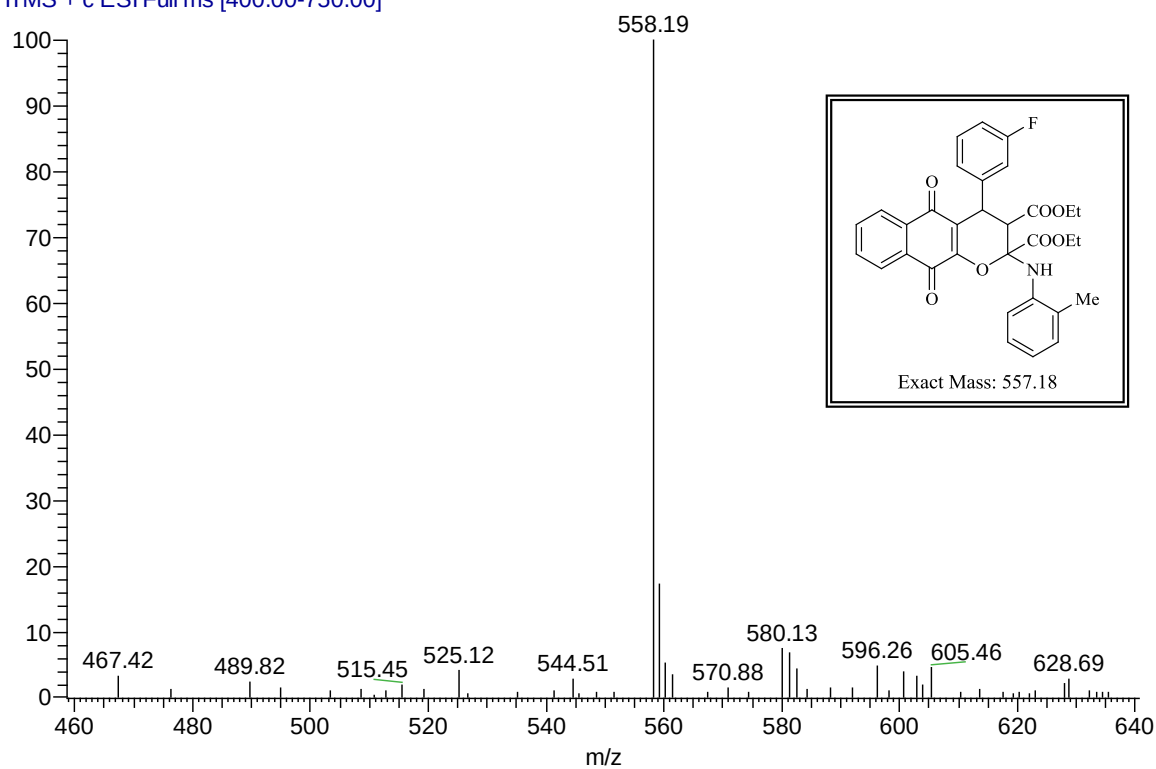
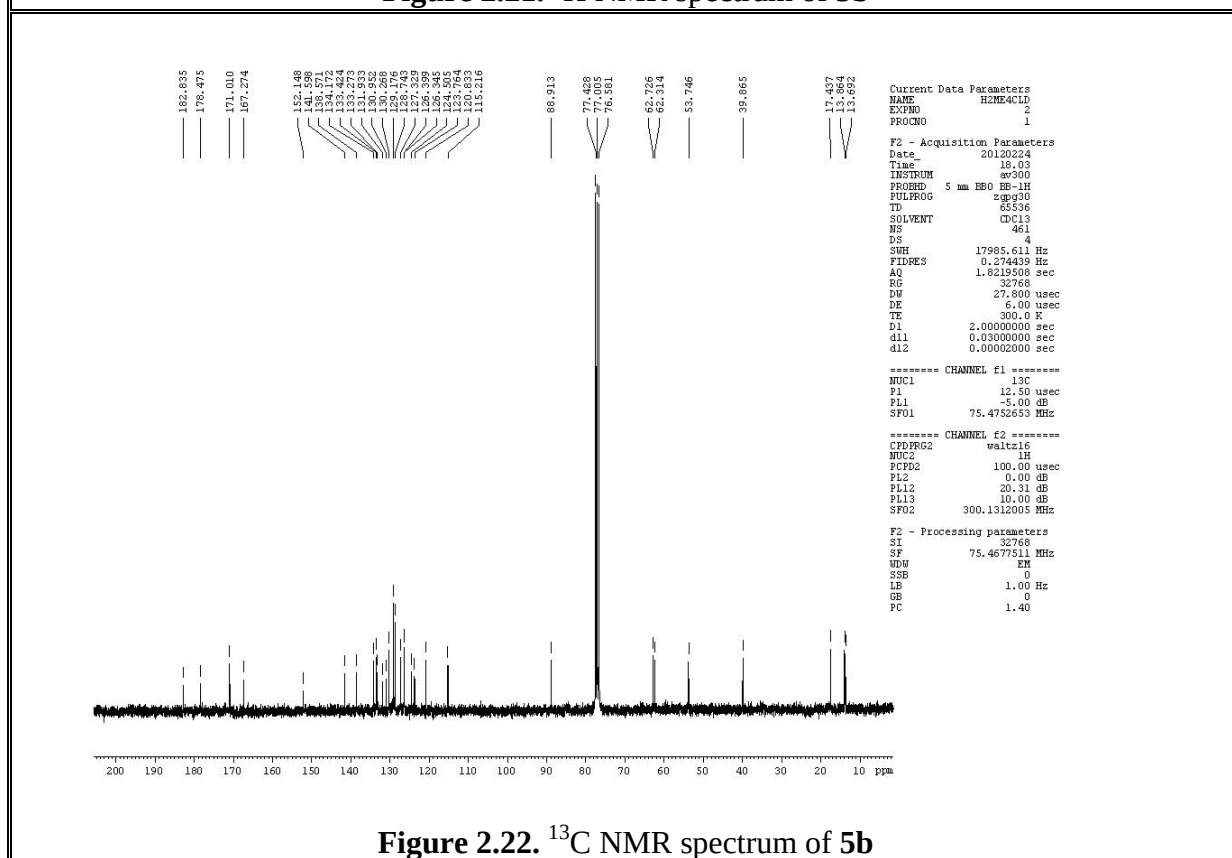
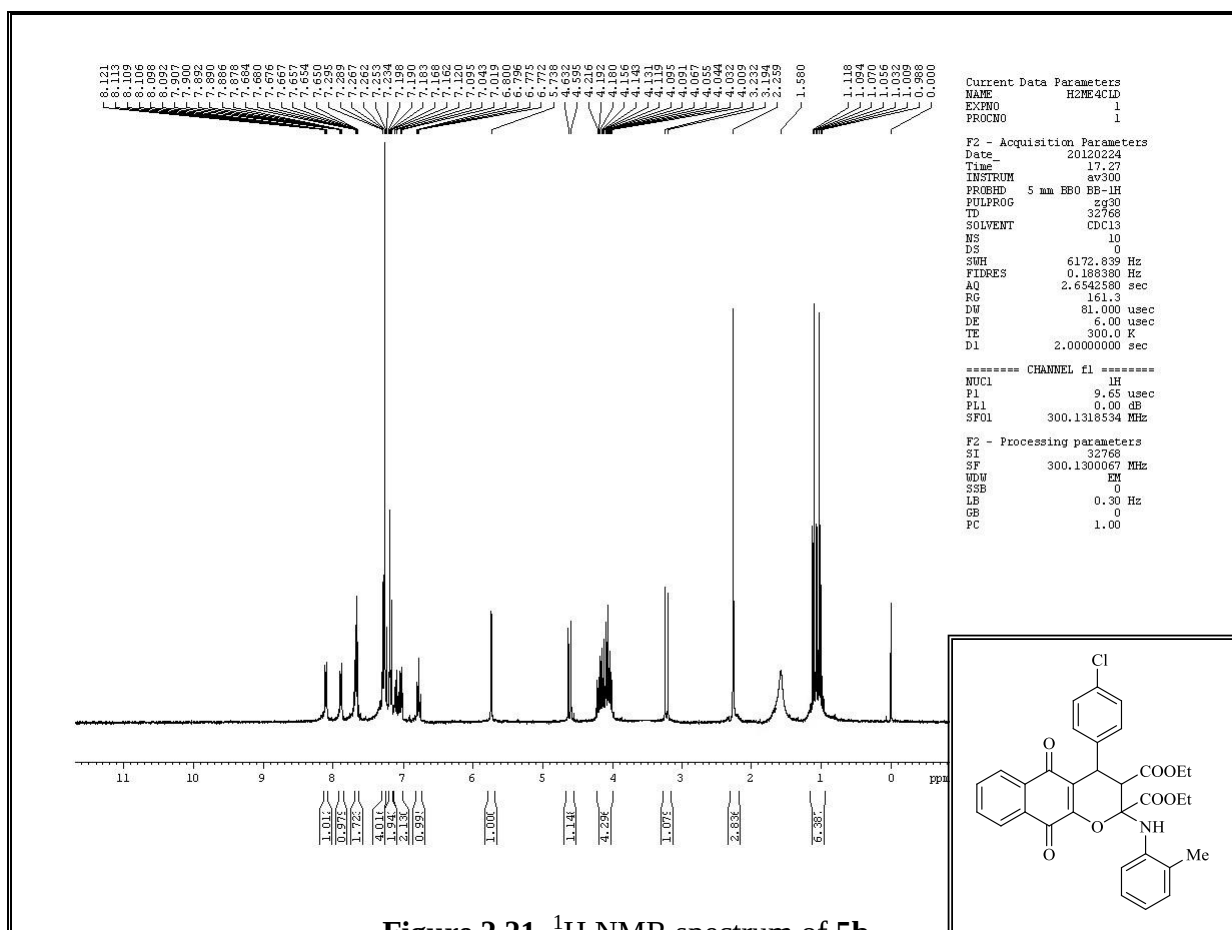
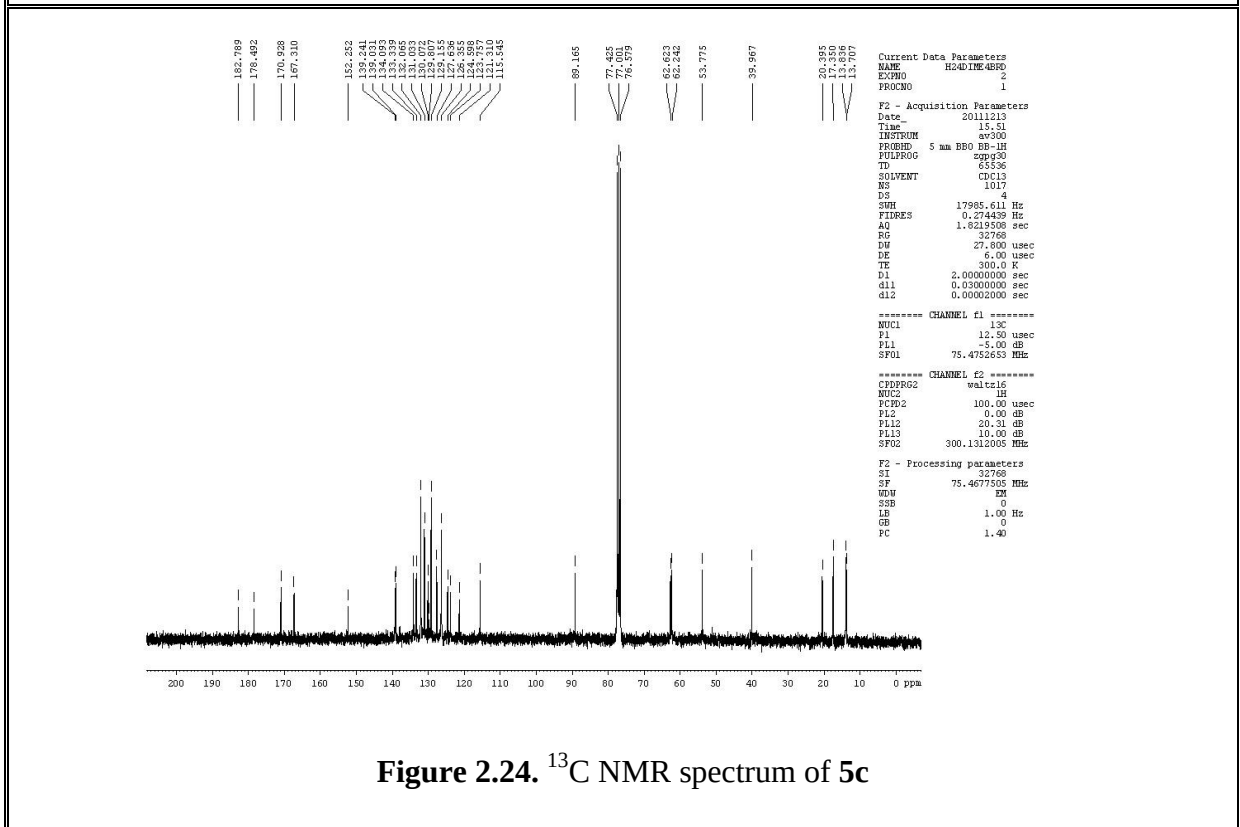
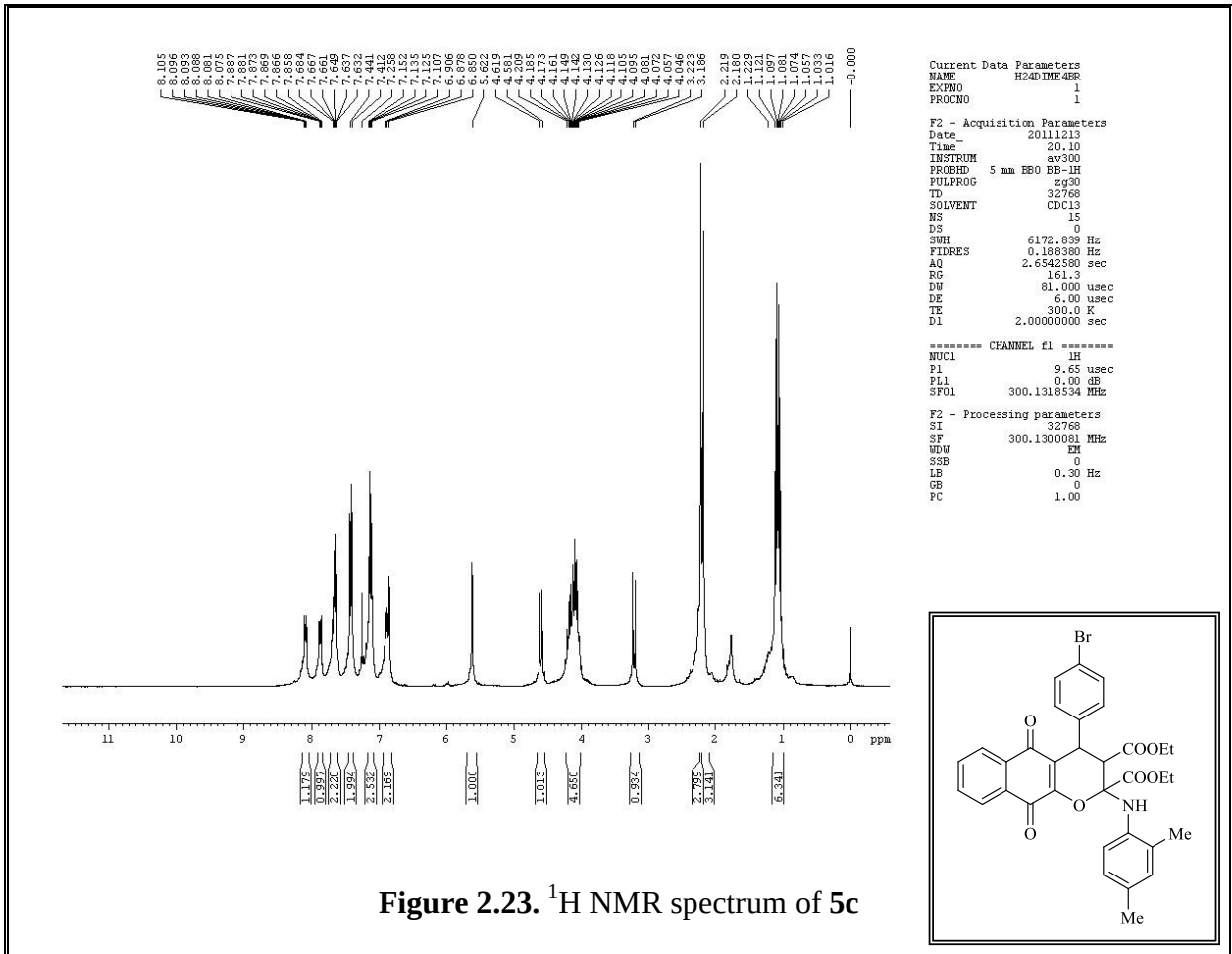
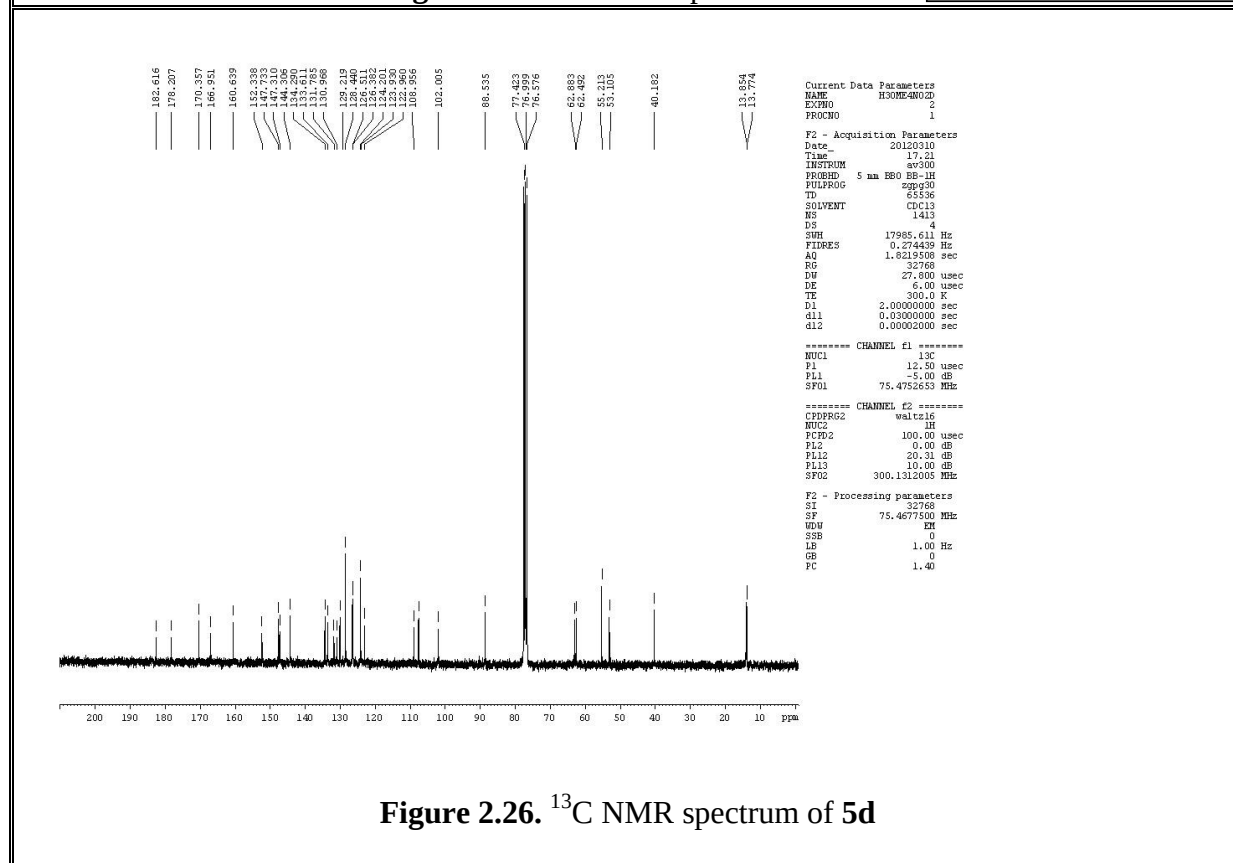
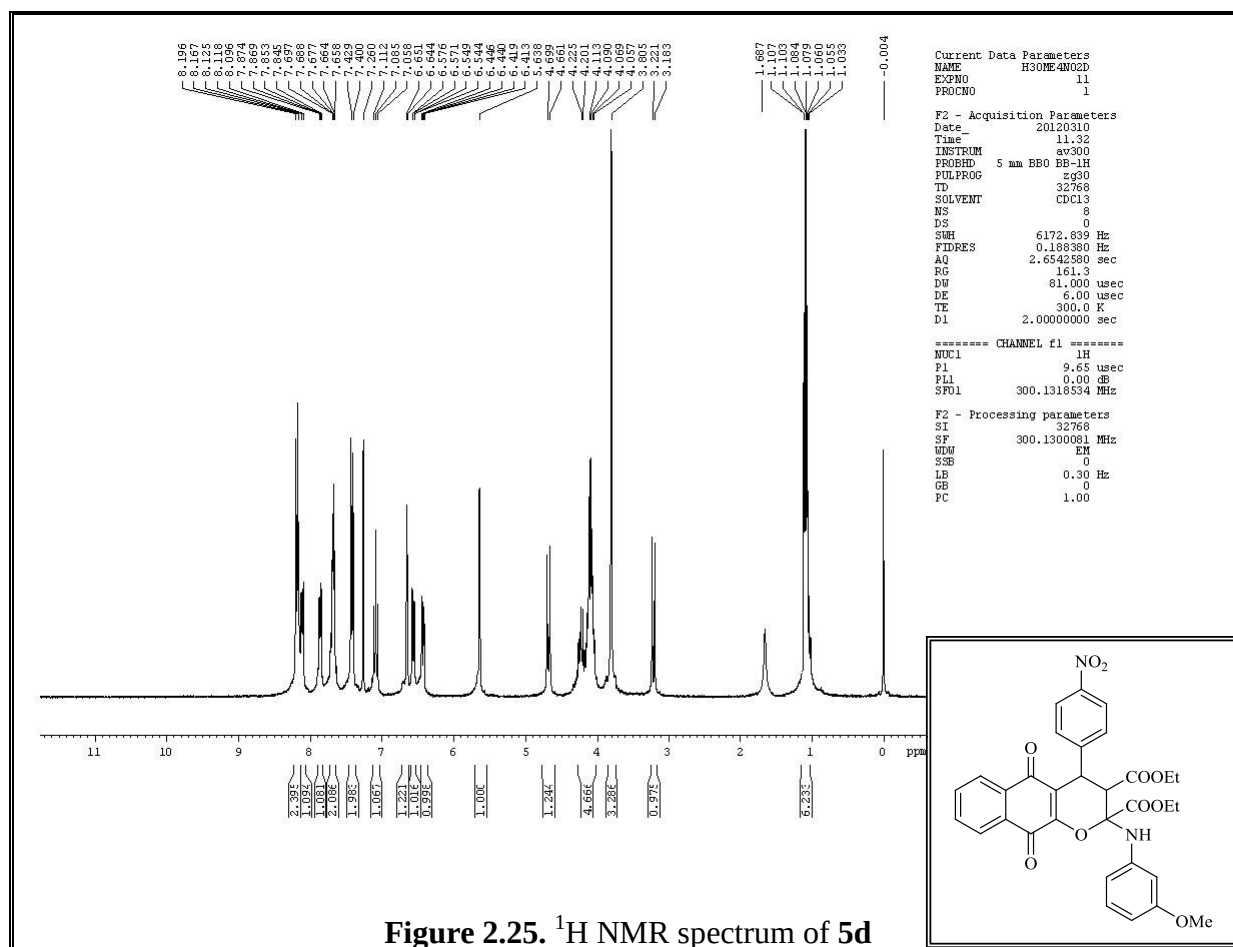


Figure 2.20. ESI Mass spectrum of **5a**







5-Q_120403111331 #127 RT: 0.26 AV: 1 NL: 2.84E4
T: ITMS + c ESI Full ms [400.00-750.00]

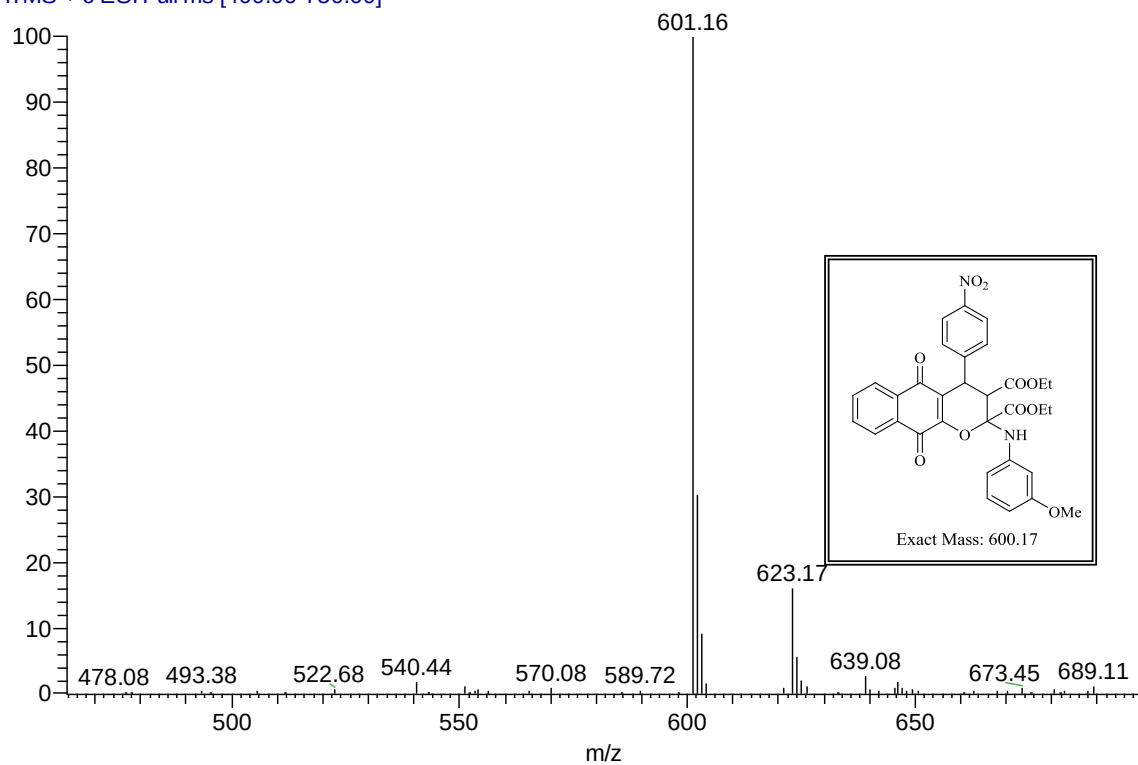
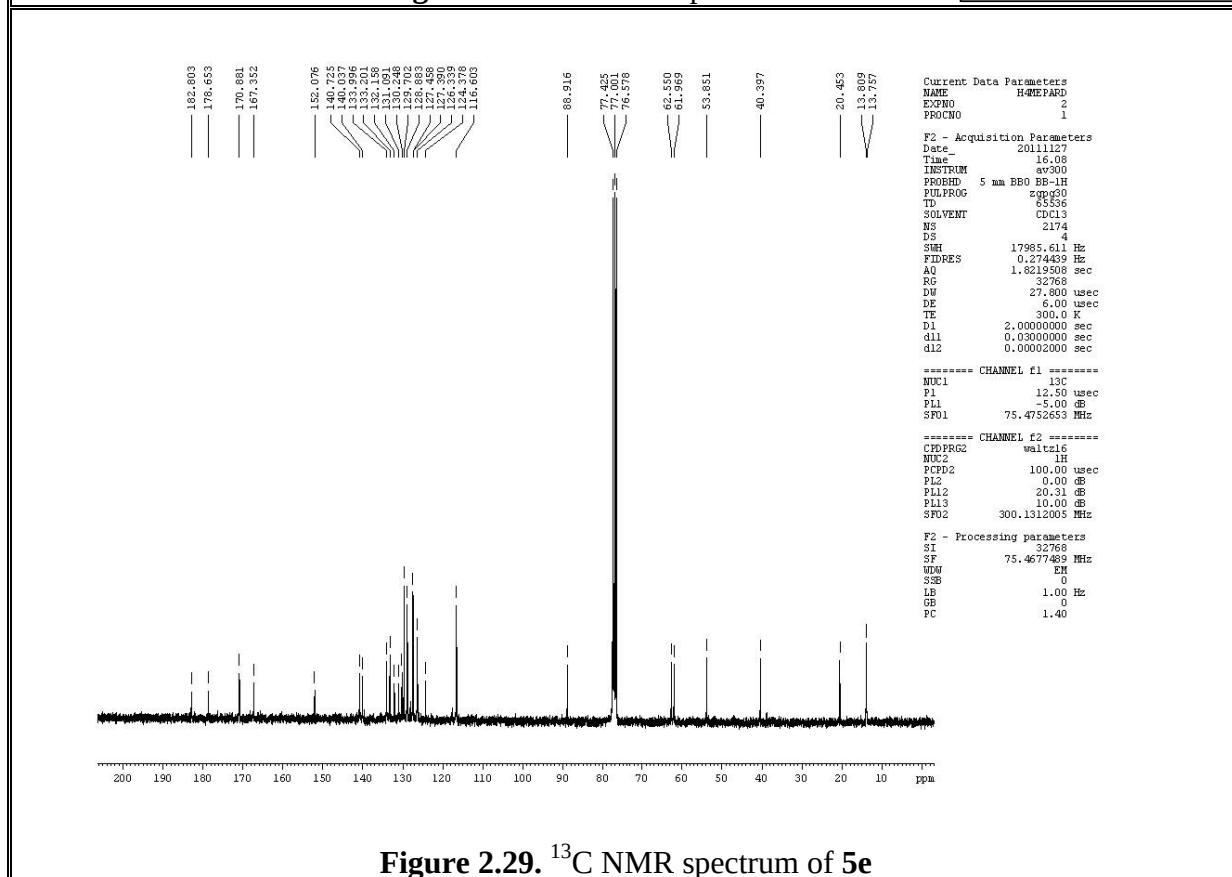
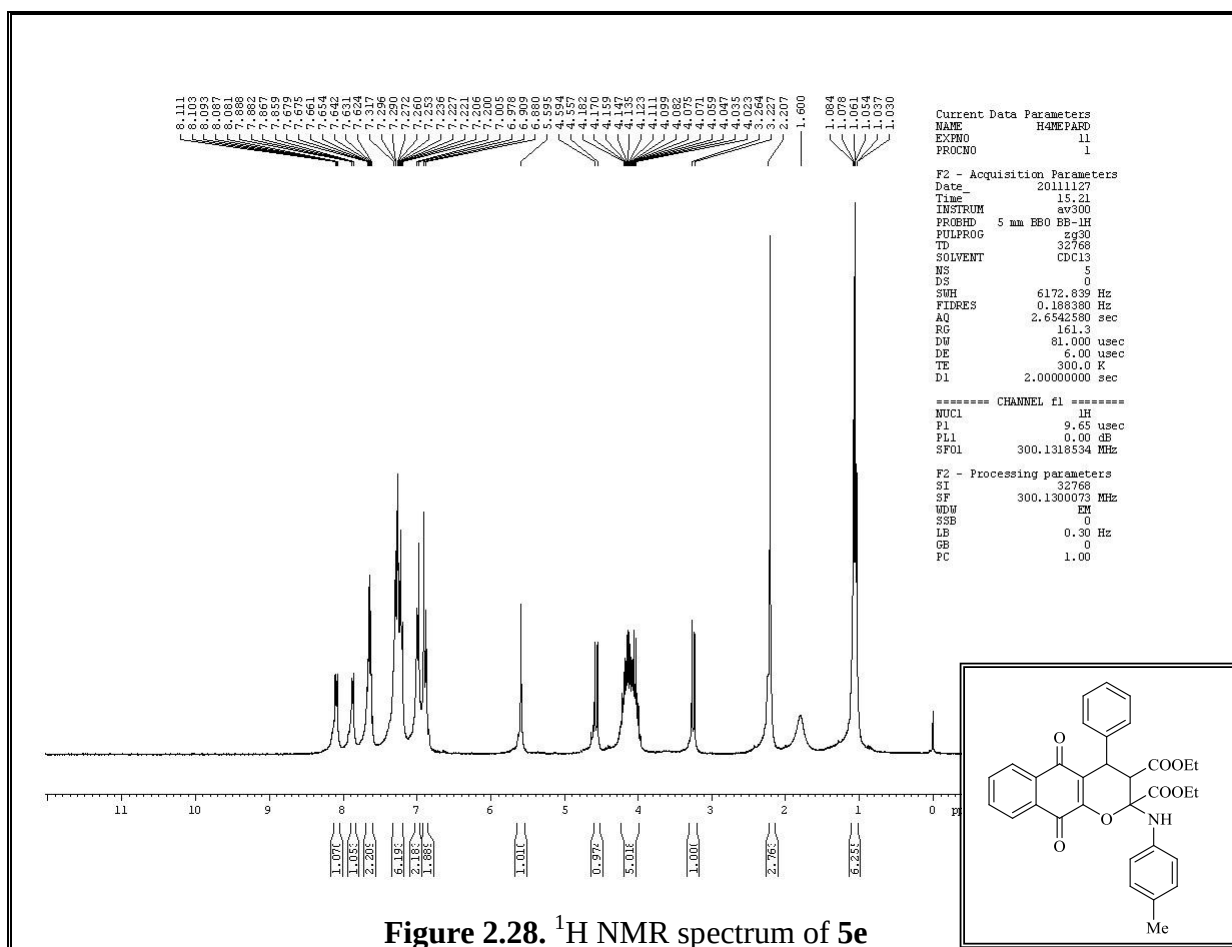


Figure 2.27. ESI Mass spectrum of 5d



5-E_120403111331 #95 RT: 0.20 AV: 1 NL: 2.78E4
T: ITMS + c ESI Full ms [400.00-750.00]

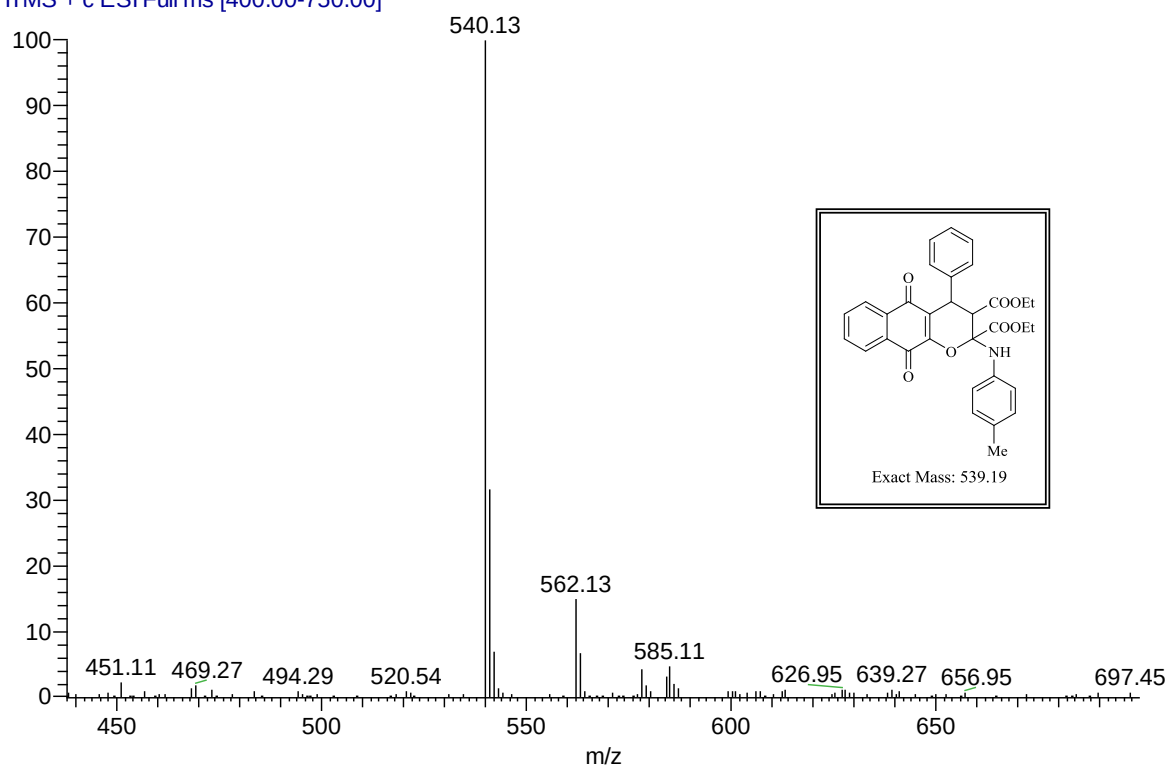
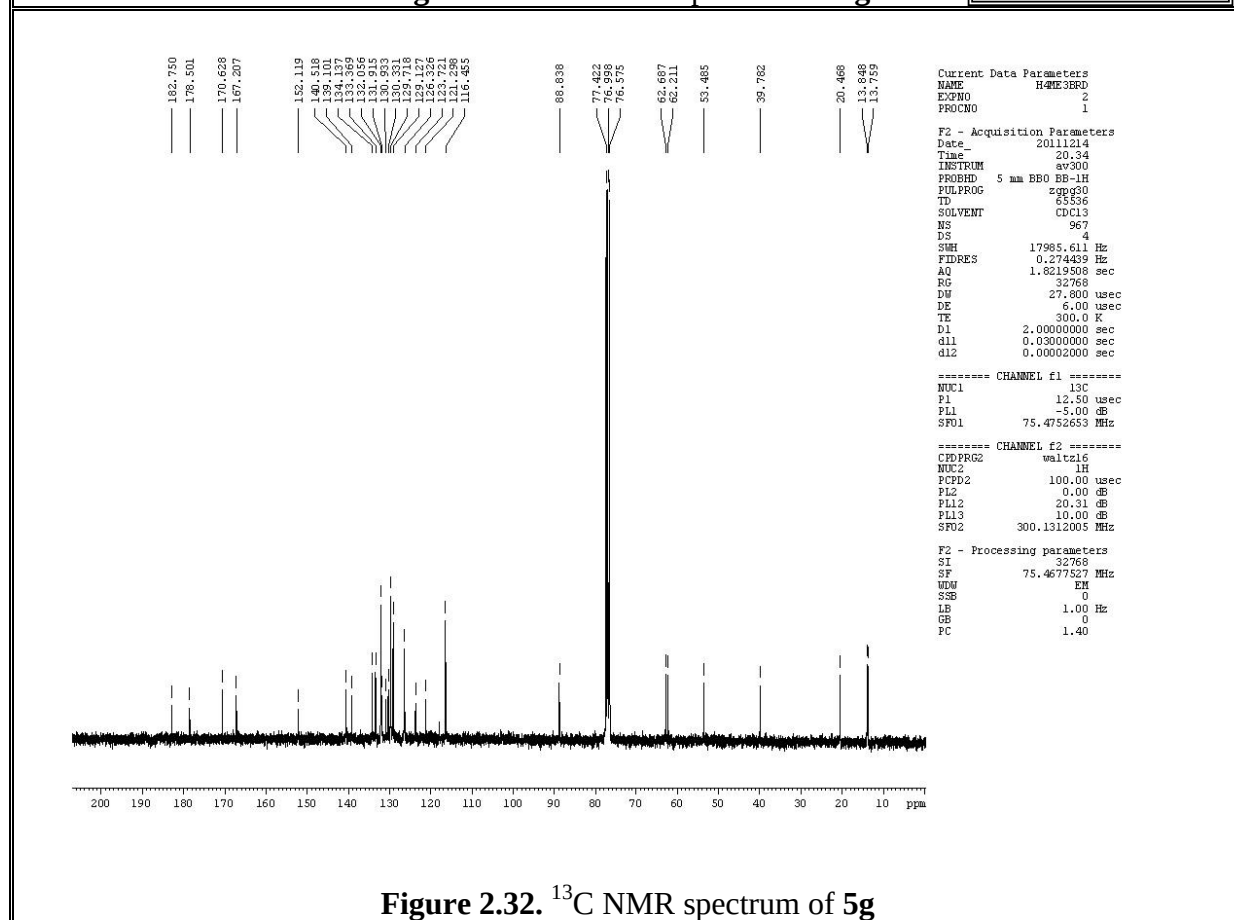
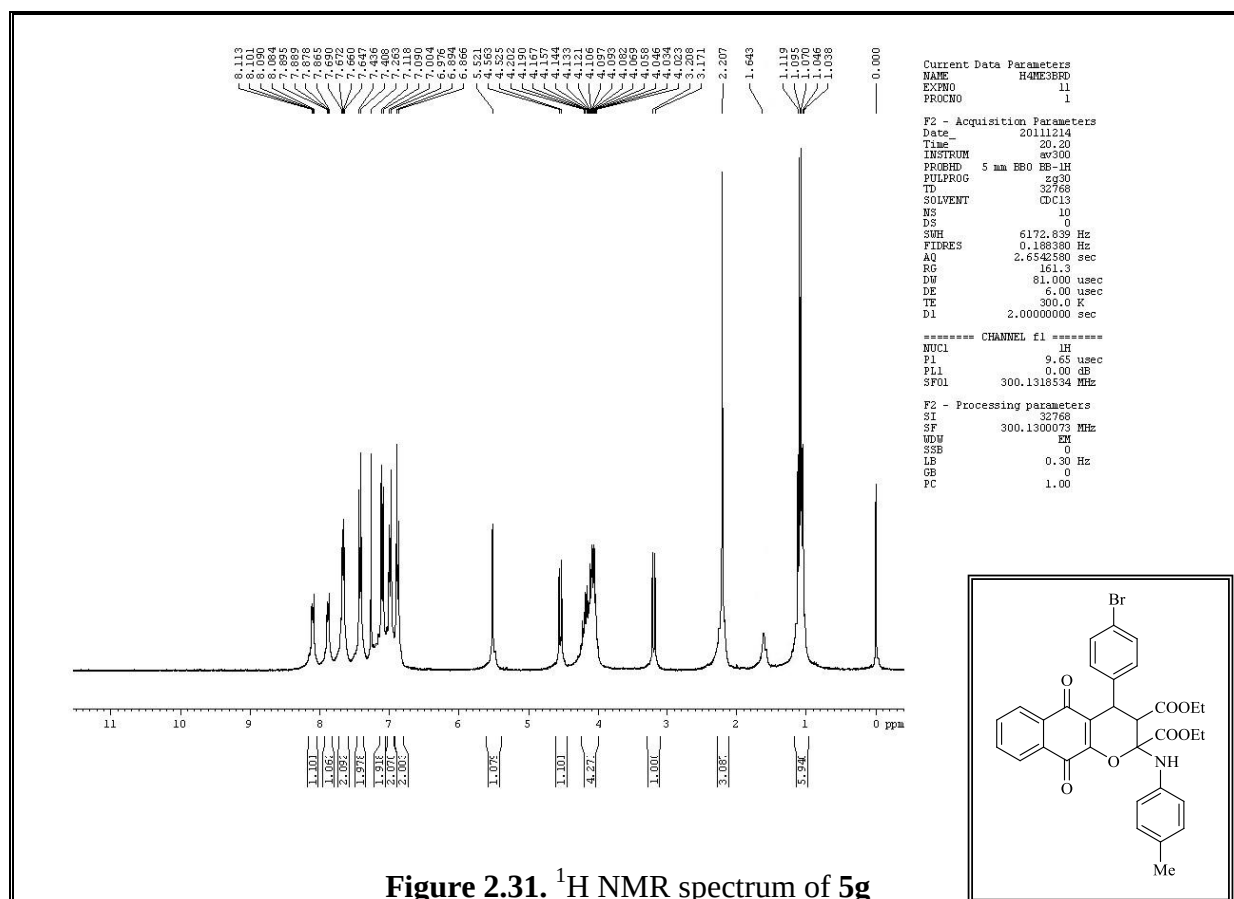
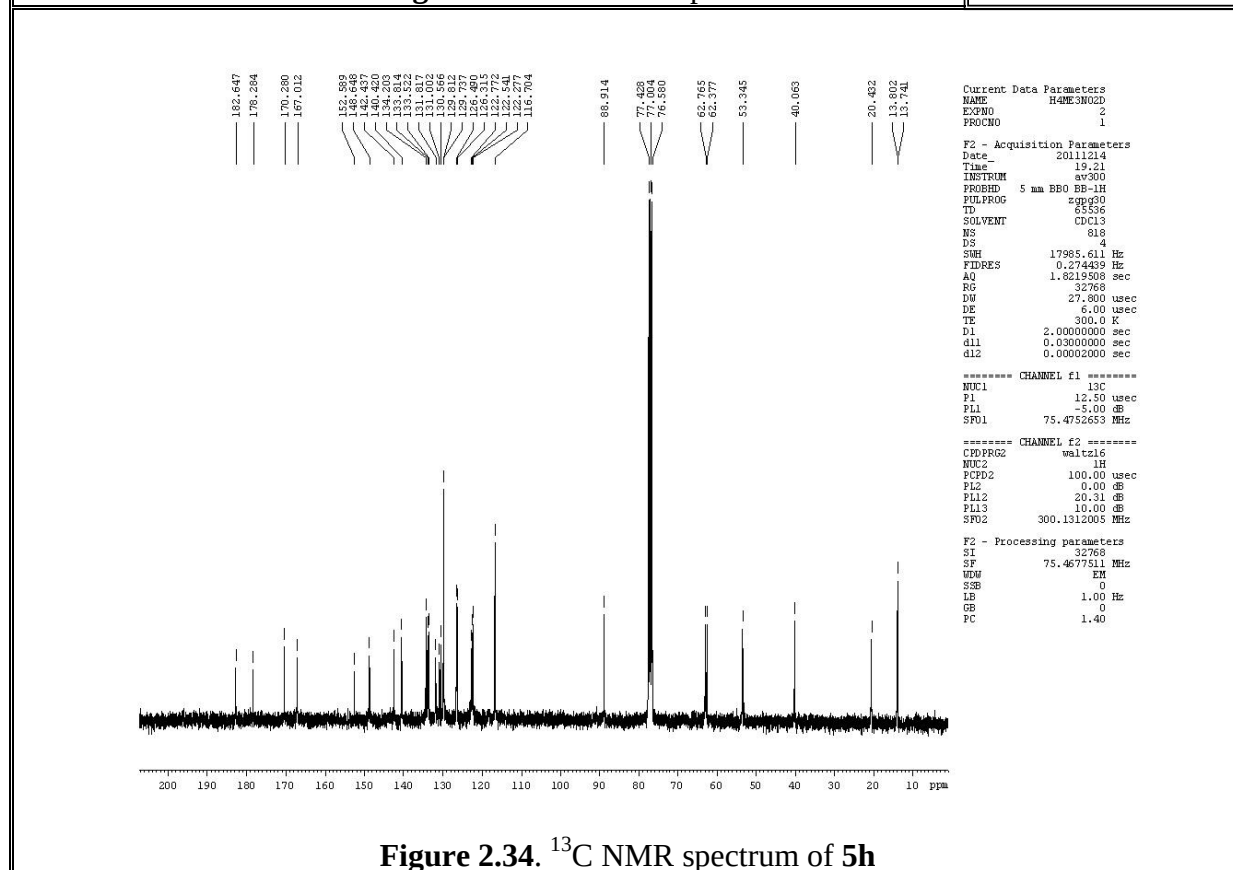
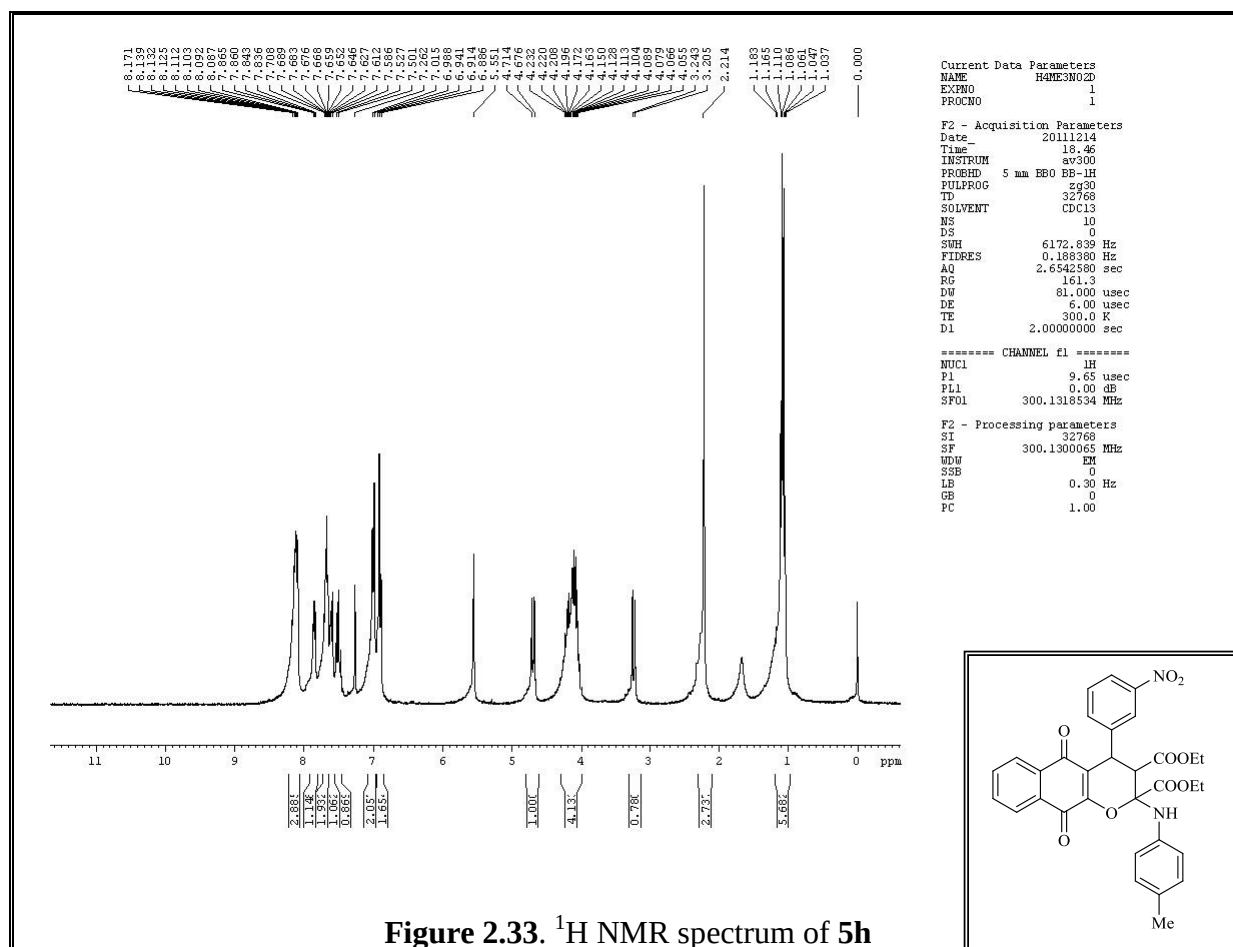


Figure 2.30. ESI Mass spectrum of **5e**





5-H 120403111331 #36 RT: 0.07 AV: 1 NL: 1.00E5
T: ITMS + c ESI Full ms [400.00-750.00]

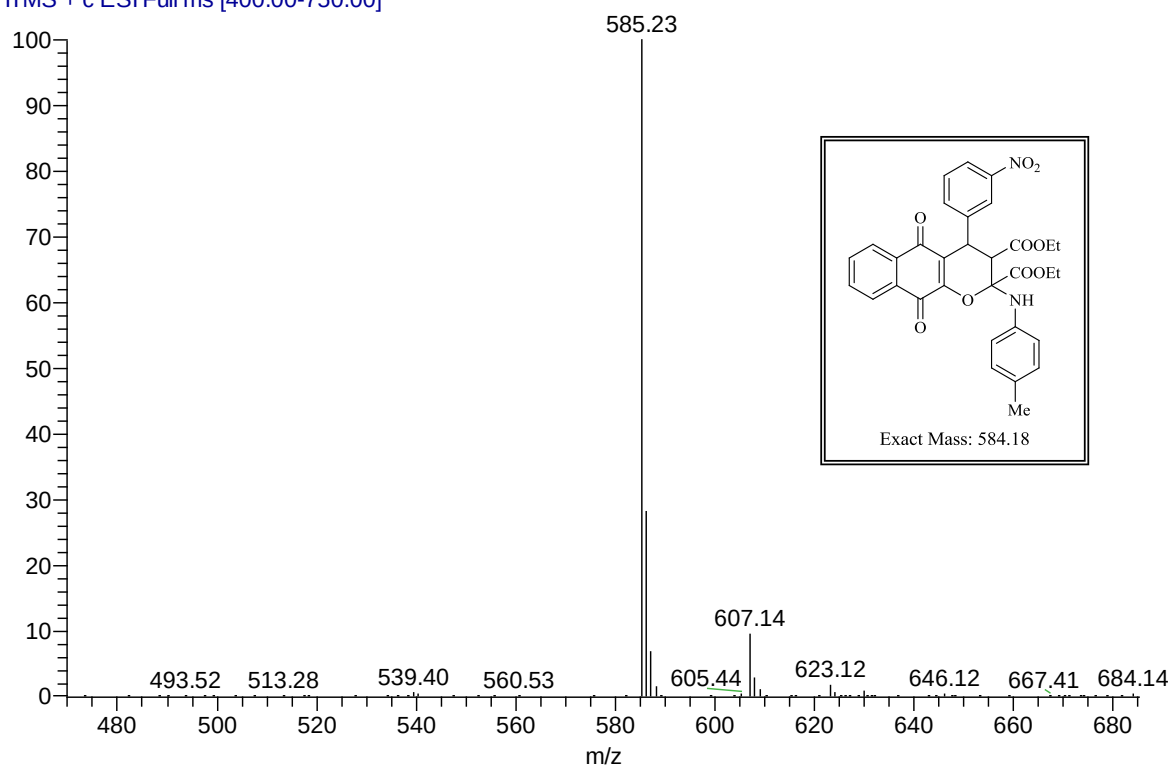
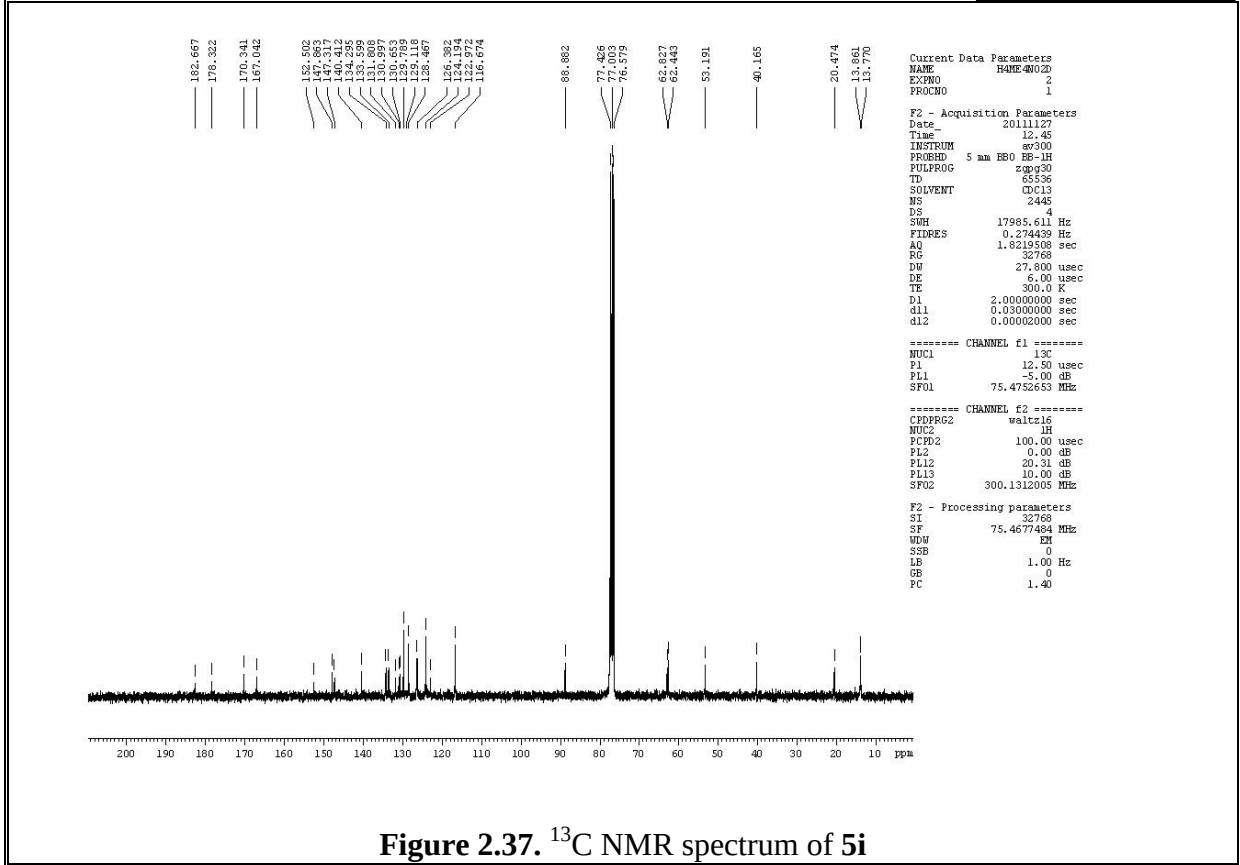
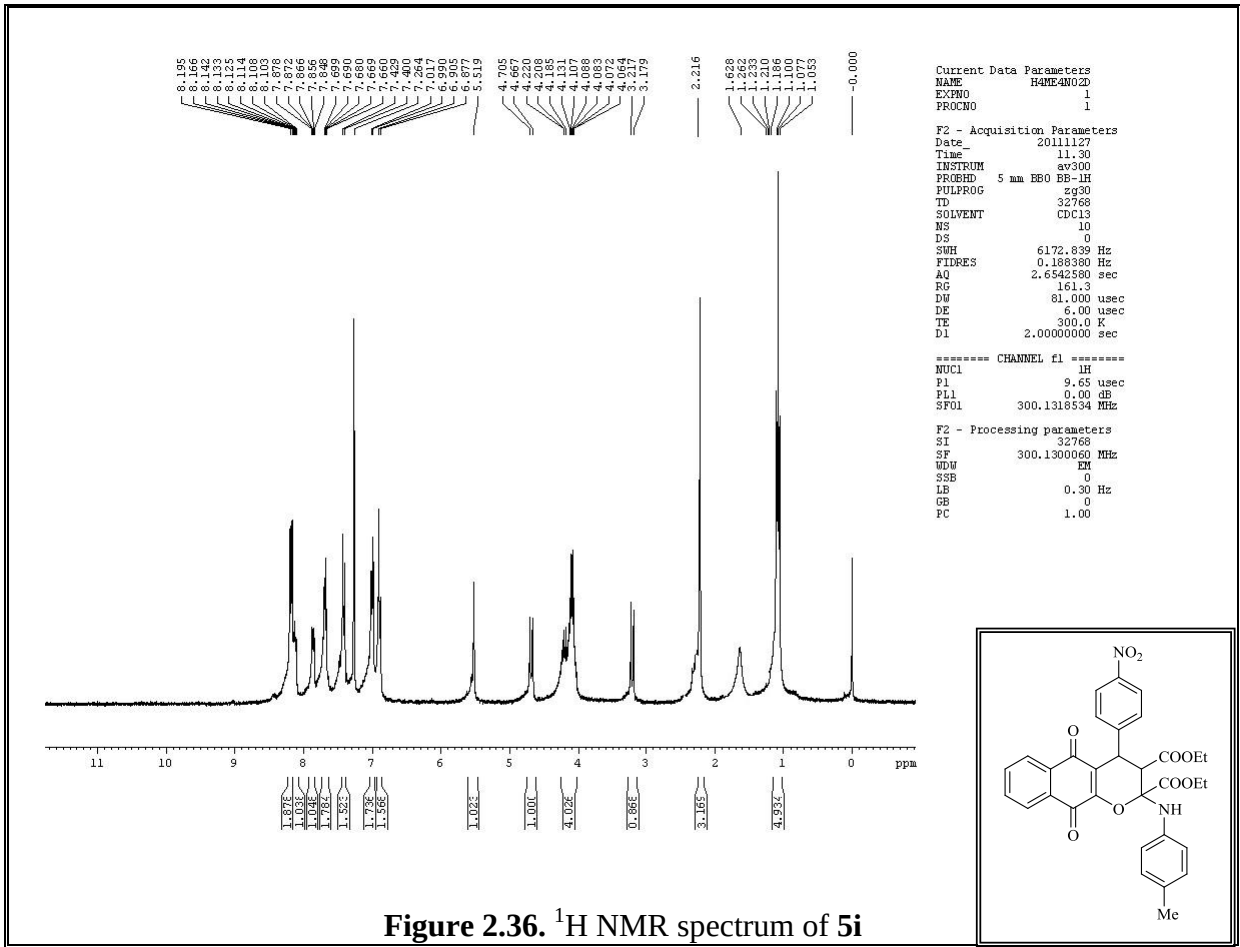
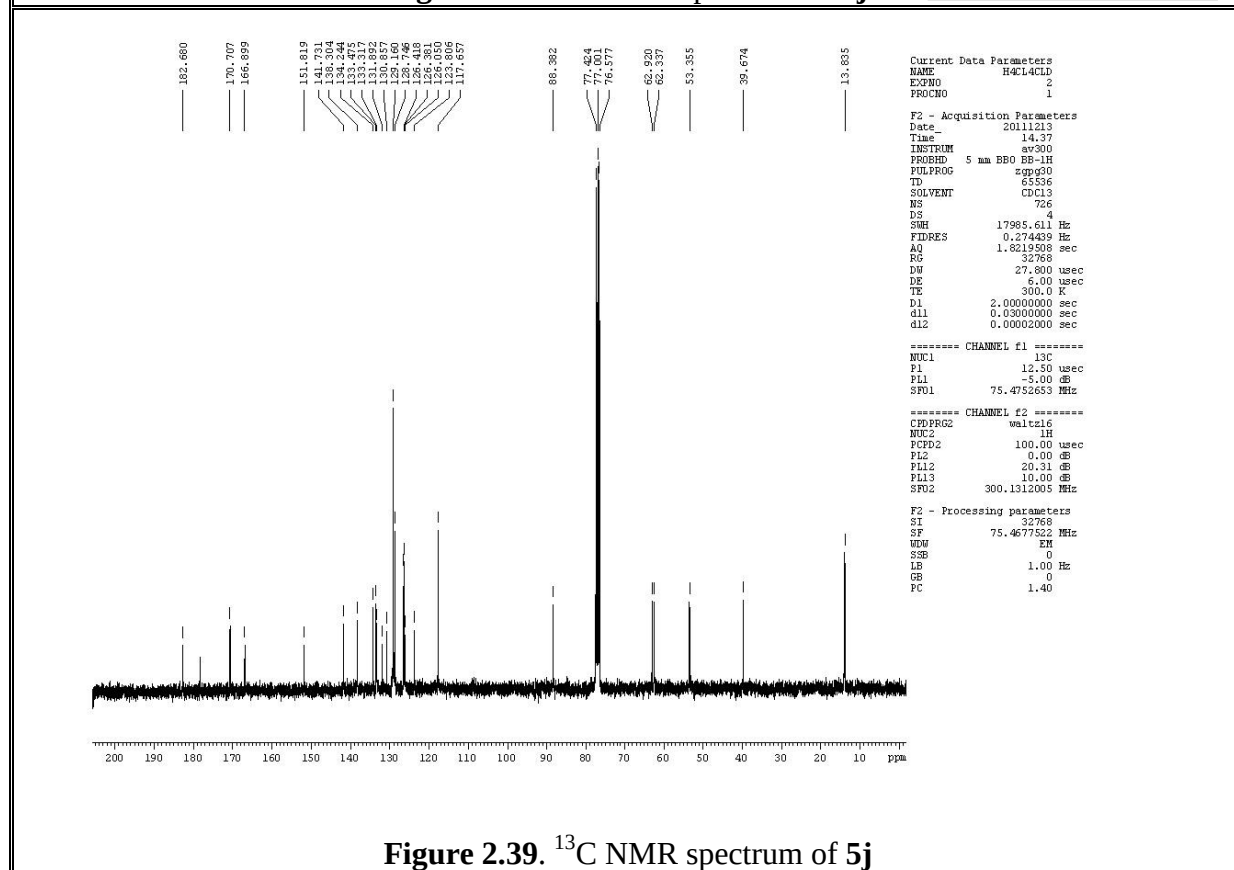
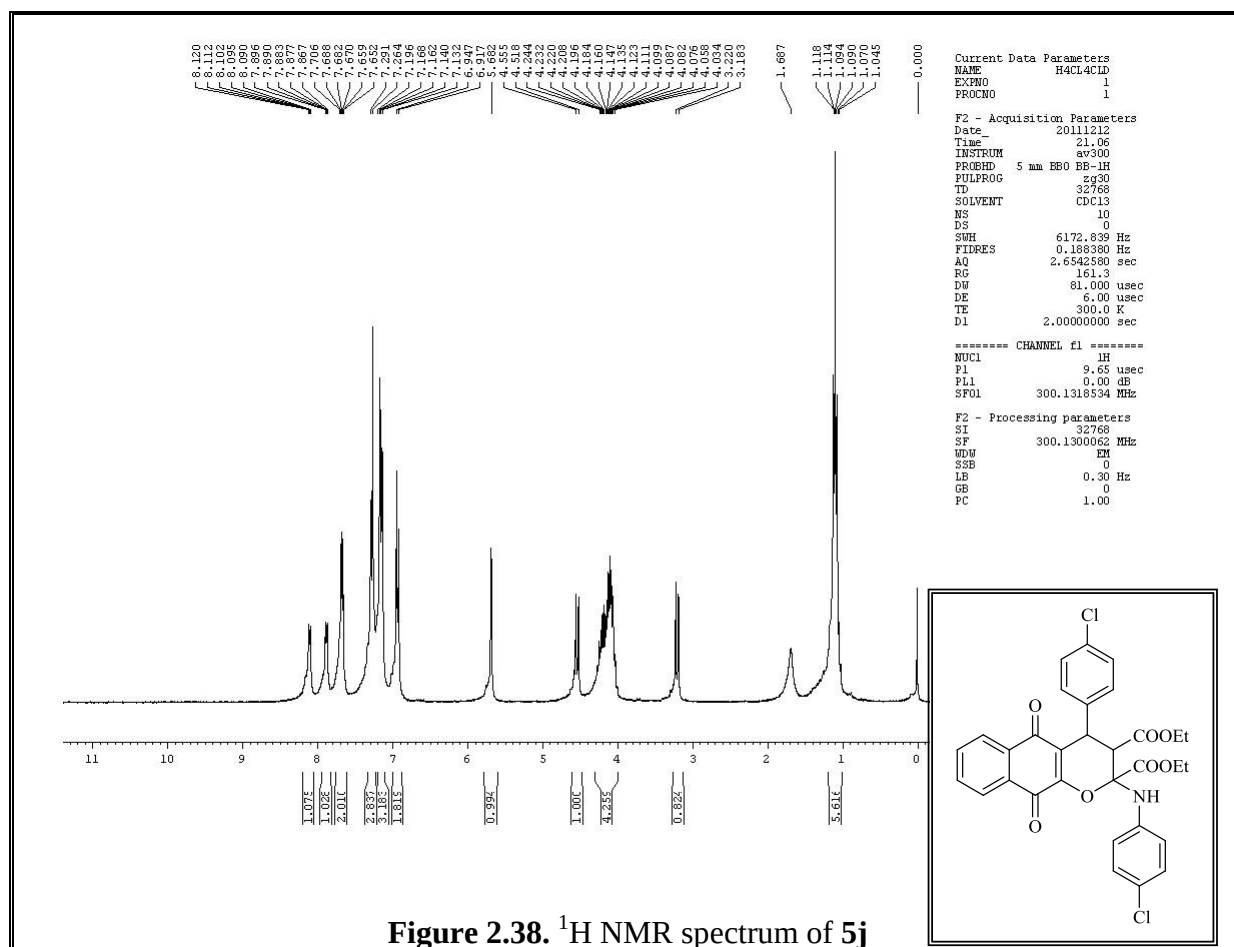
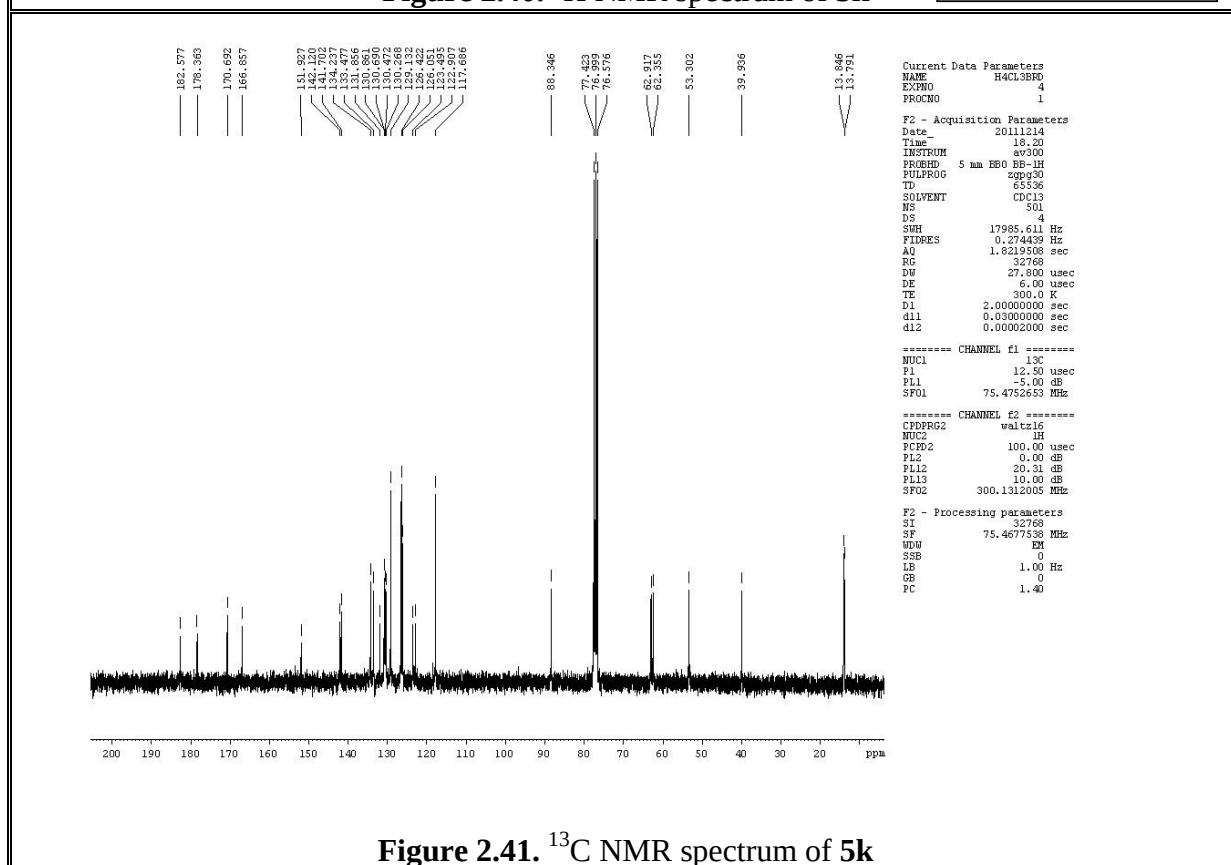
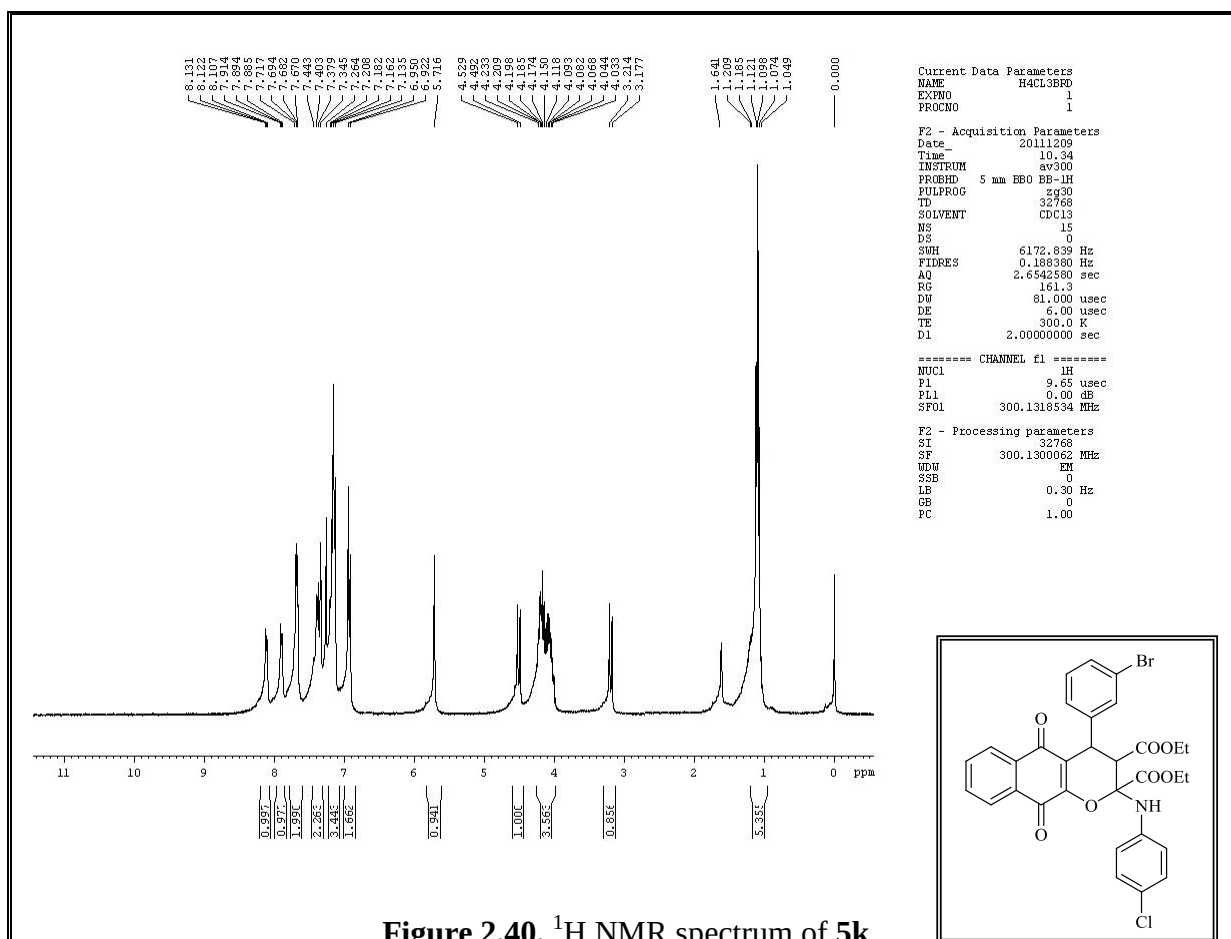
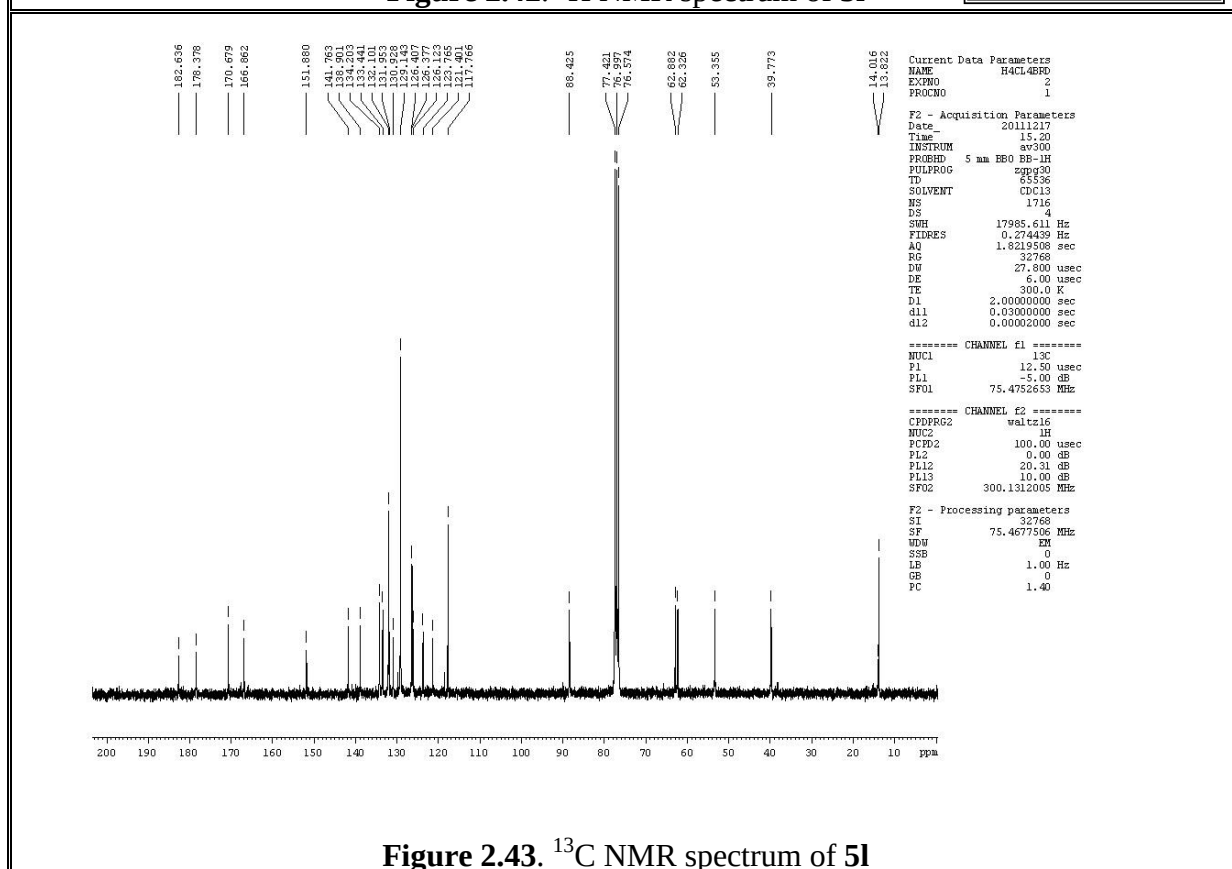
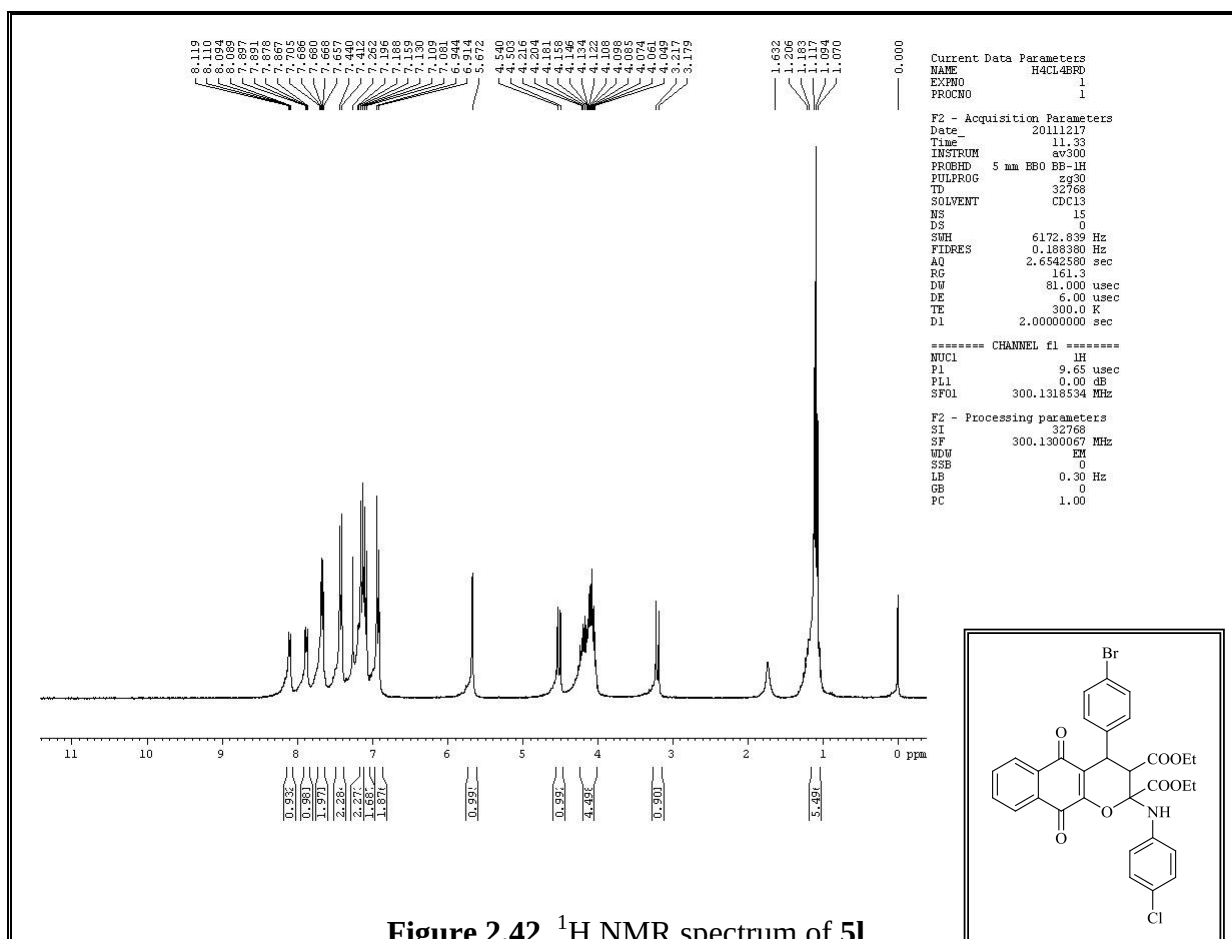


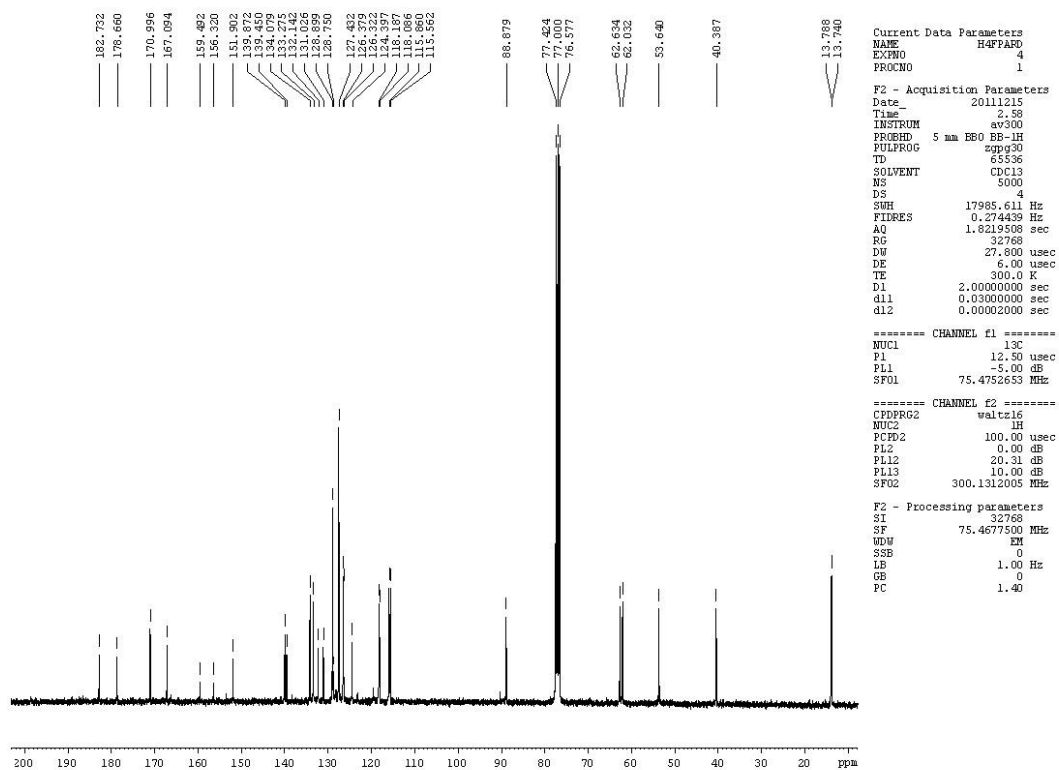
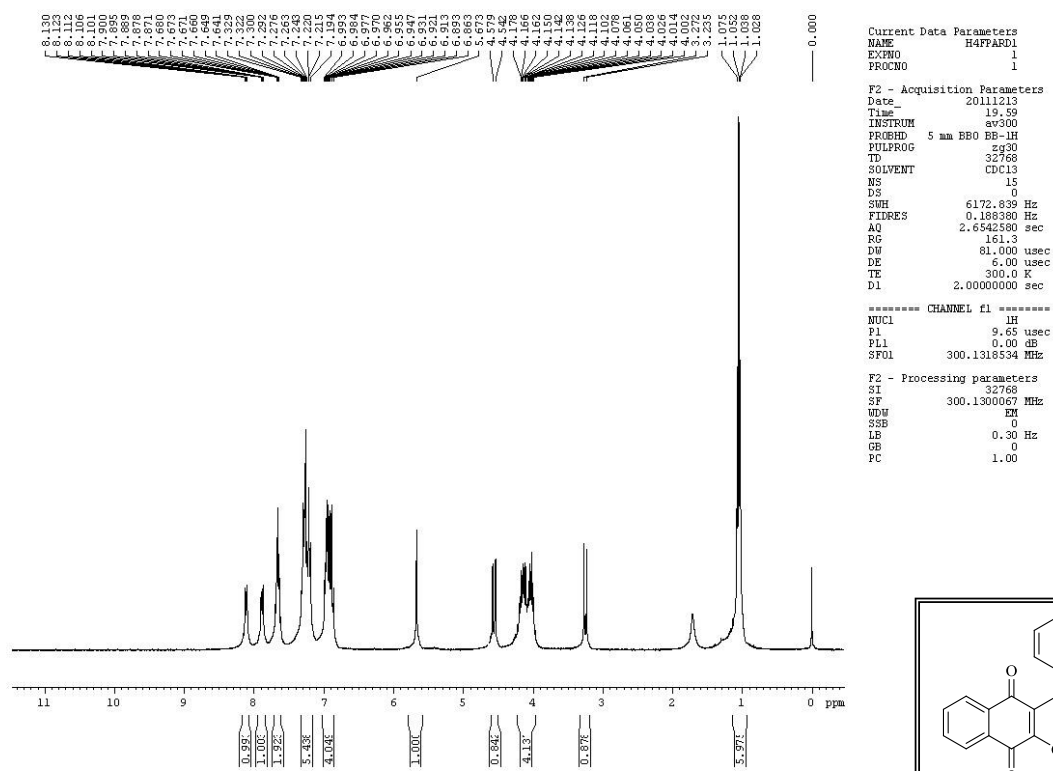
Figure 2.35. ESI Mass spectrum of **5h**











5-M_120403111331 #136 RT: 0.28 AV: 1 NL: 9.22E3
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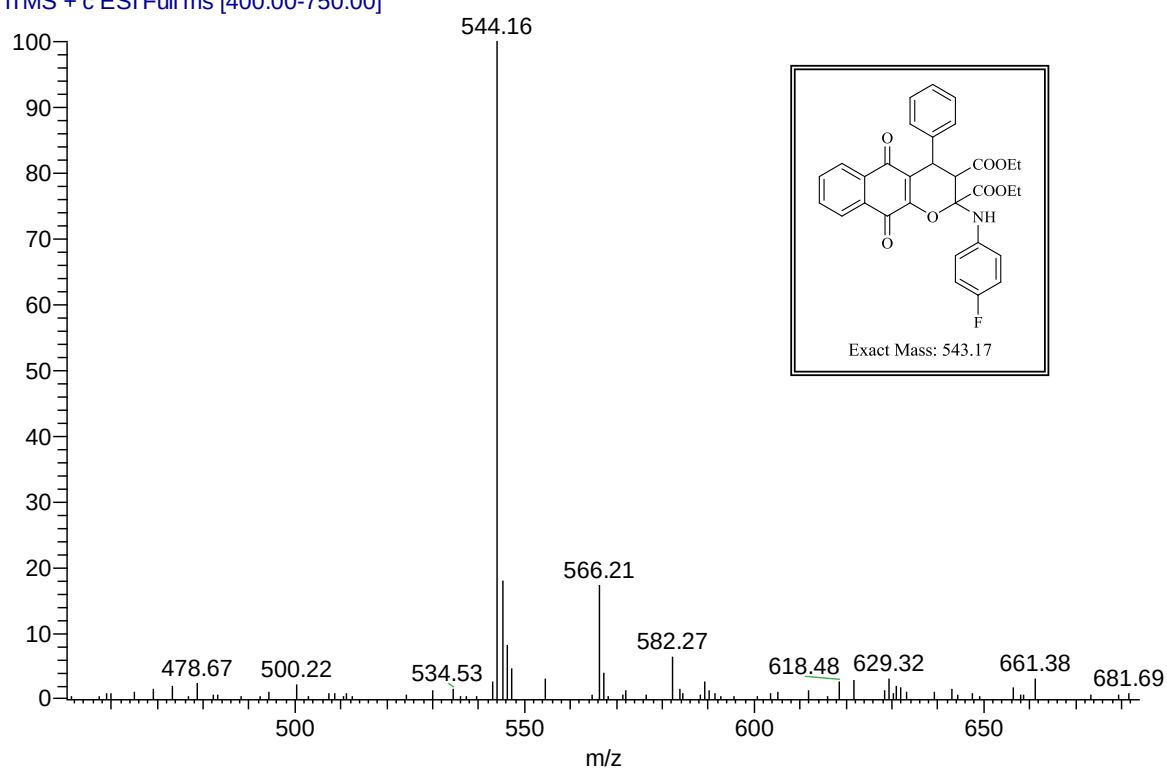


Figure 2.46. ESI Mass spectrum of **5m**

