

## Supplementary Material

### Convenient approach to novel tetracyclic-fused pyranoquinolinone compounds from 6-*n*-butyl-3-amino-4-hydroxypyrido[3,2-*c*]quinolinone

Hany M. Hassanin

*Department of Chemistry, Faculty of Education, Ain Shams University Roxy 11711 Cairo, Egypt*

*Email: [hanyhassnin@gmail.com](mailto:hanyhassnin@gmail.com)*

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## Analyses of Compound 2

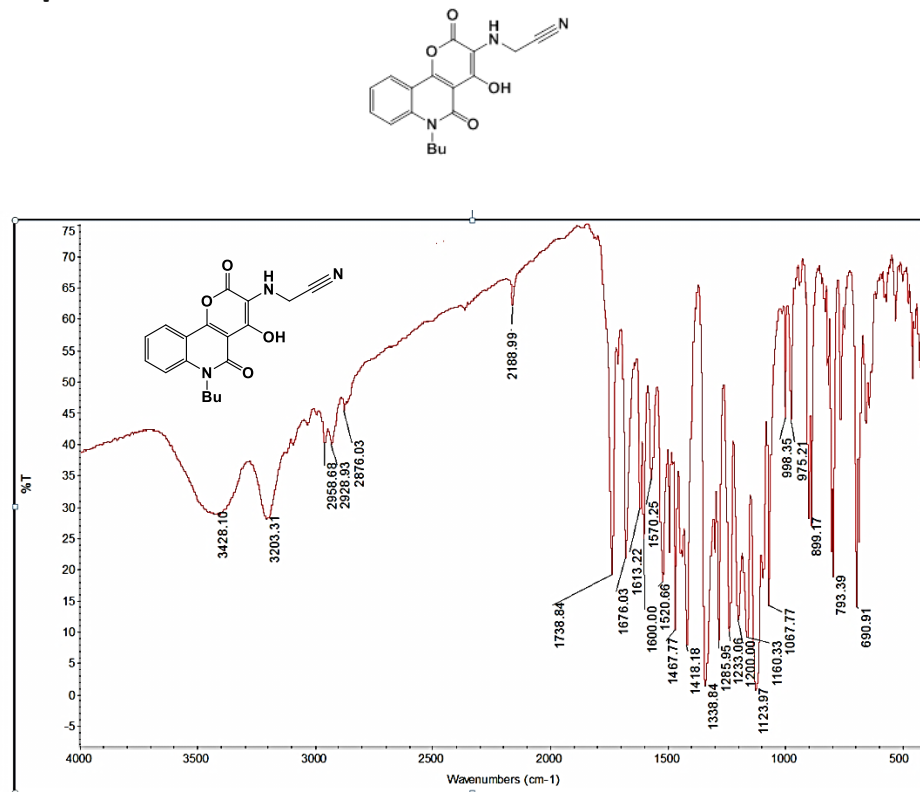


Figure 1-a. IR Spectrum of compound 2.

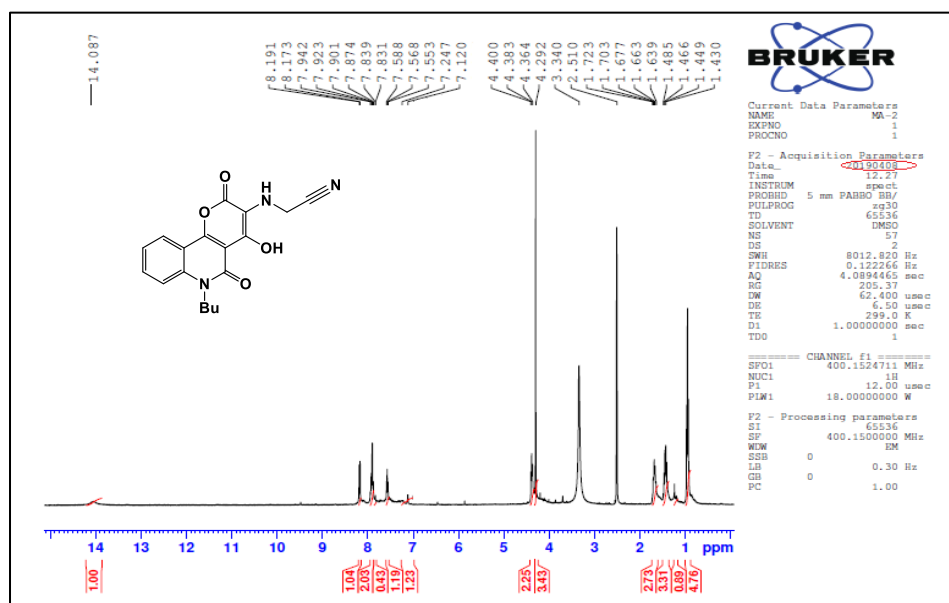


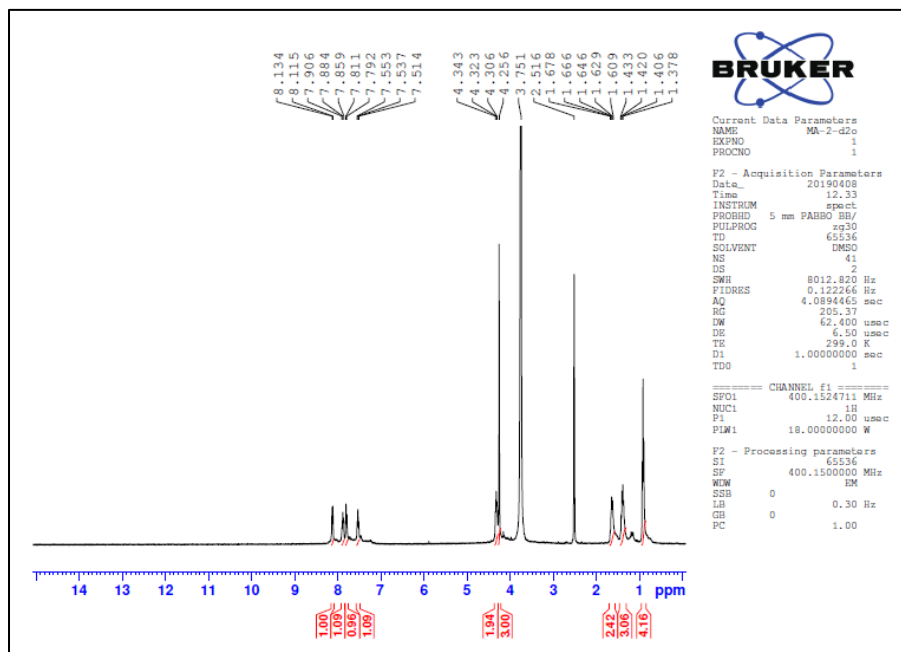
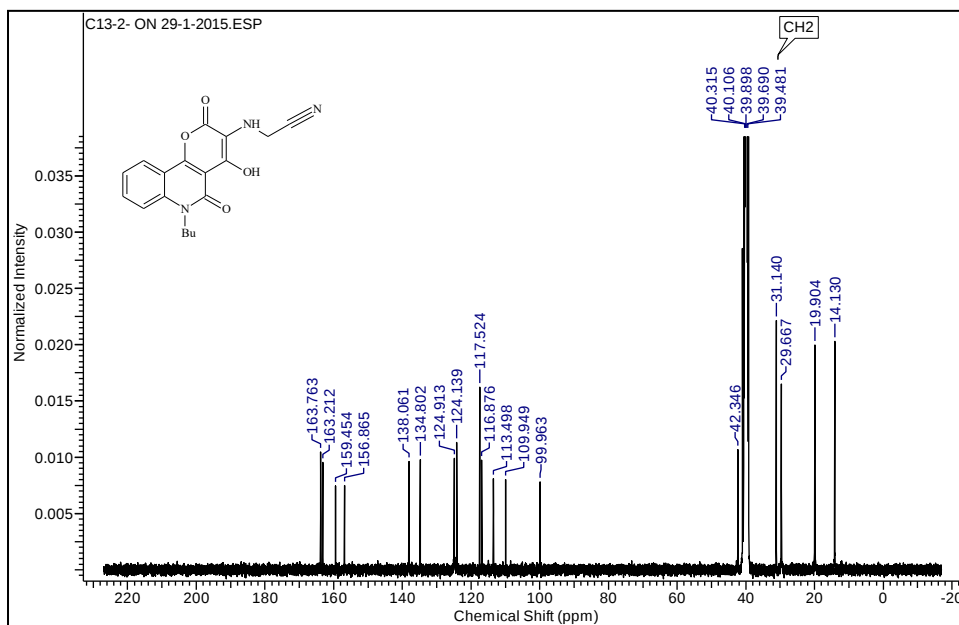
Figure 1-b.  $^1\text{H}$ - NMR Spectrum of compound 2.Figure 1-c.  $\text{D}_2\text{O}$   $^1\text{H}$ -NMR spectrum of compound 2.

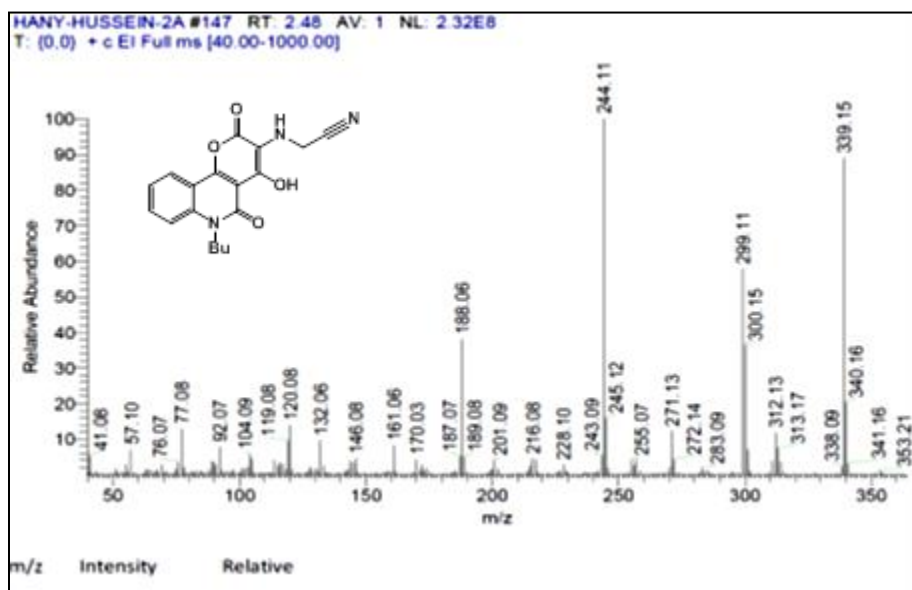
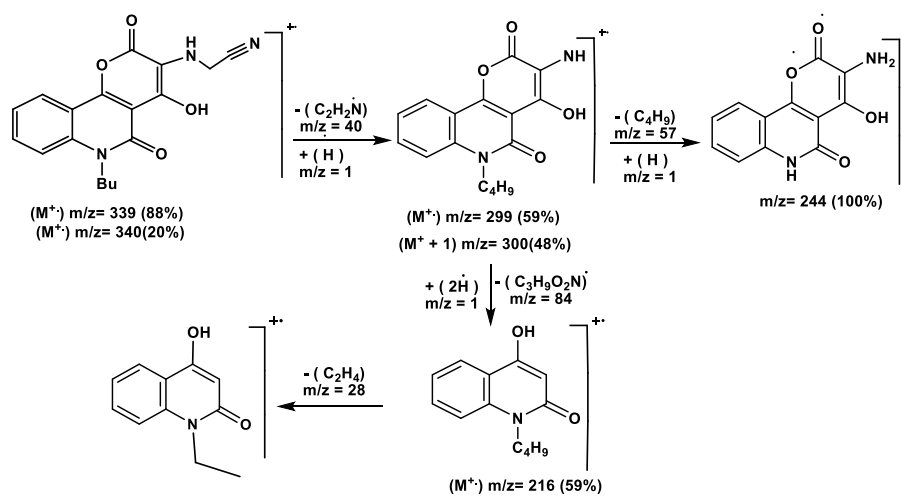
Figure 1-d.  $^{13}\text{C}$ - NMR Spectrum of compound 2.

Figure 1-e. Mass Spectrum and fragmentation of compound 2.

## Analyses of Compound 7

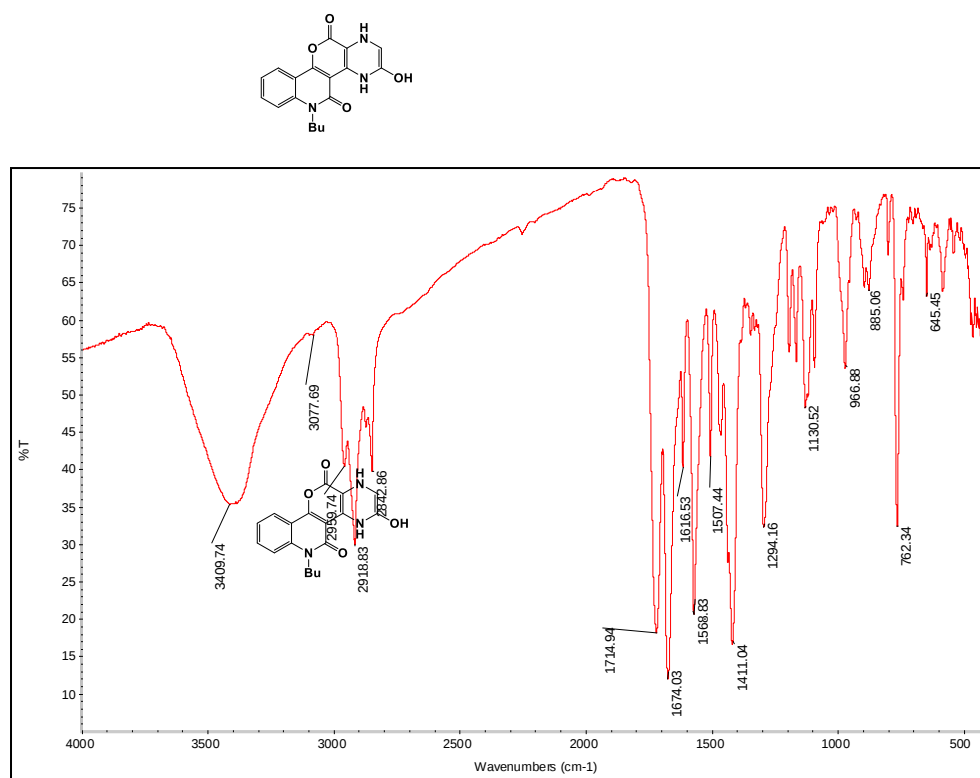
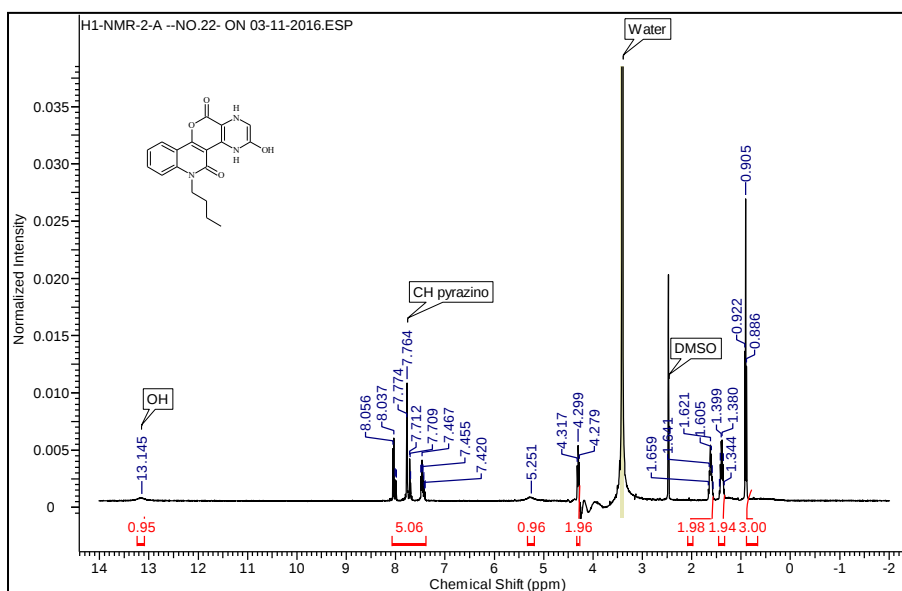
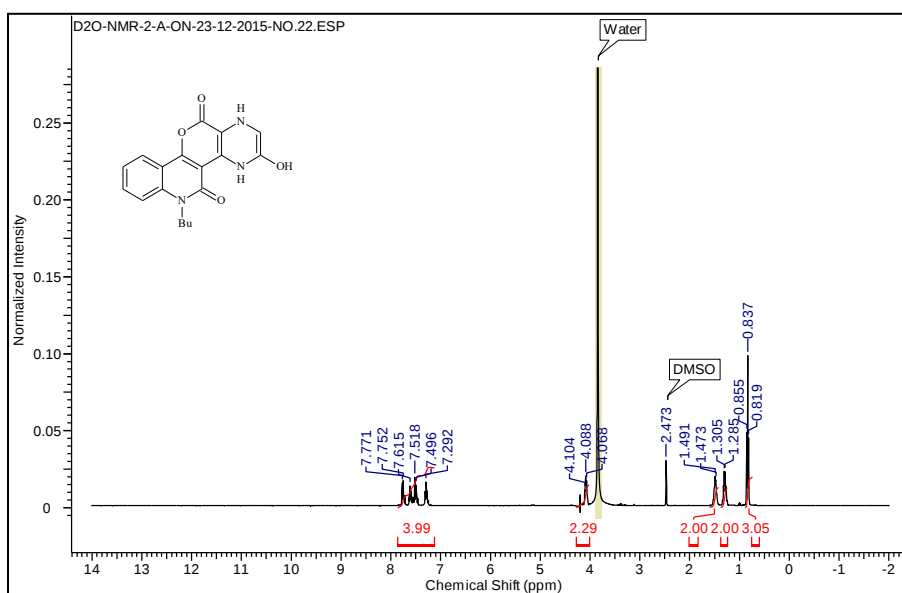


Figure 2-a. IR Spectrum of compound 7.

Figure 2b.  $^1\text{H}$ - NMR Spectrum of compound 7.Figure 2c.  $\text{D}_2\text{O}$ - $^1\text{H}$ - NMR Spectrum of compound 7.

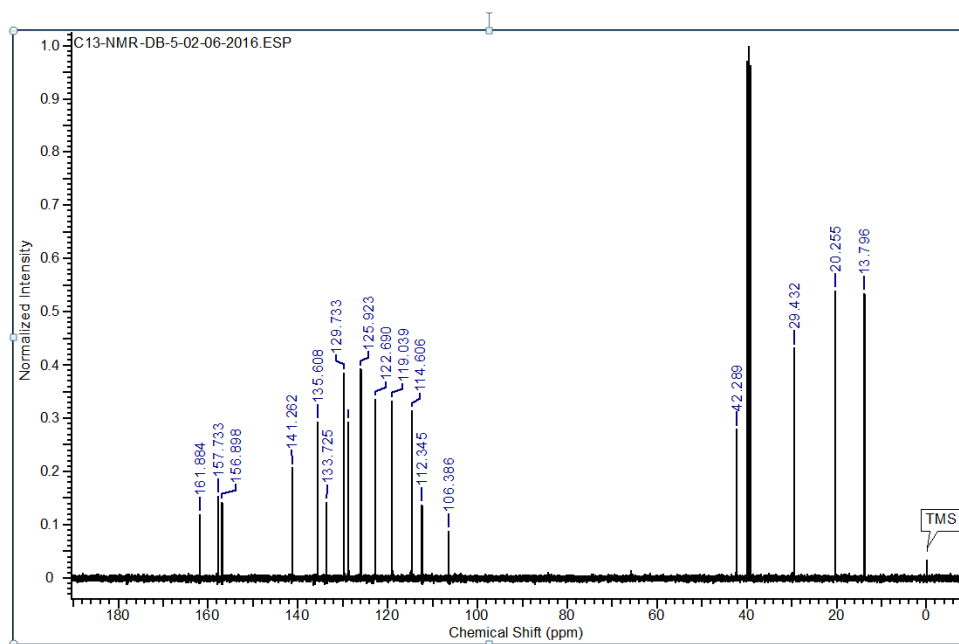


Figure 2d. <sup>13</sup>C- NMR Spectrum of compound 7.

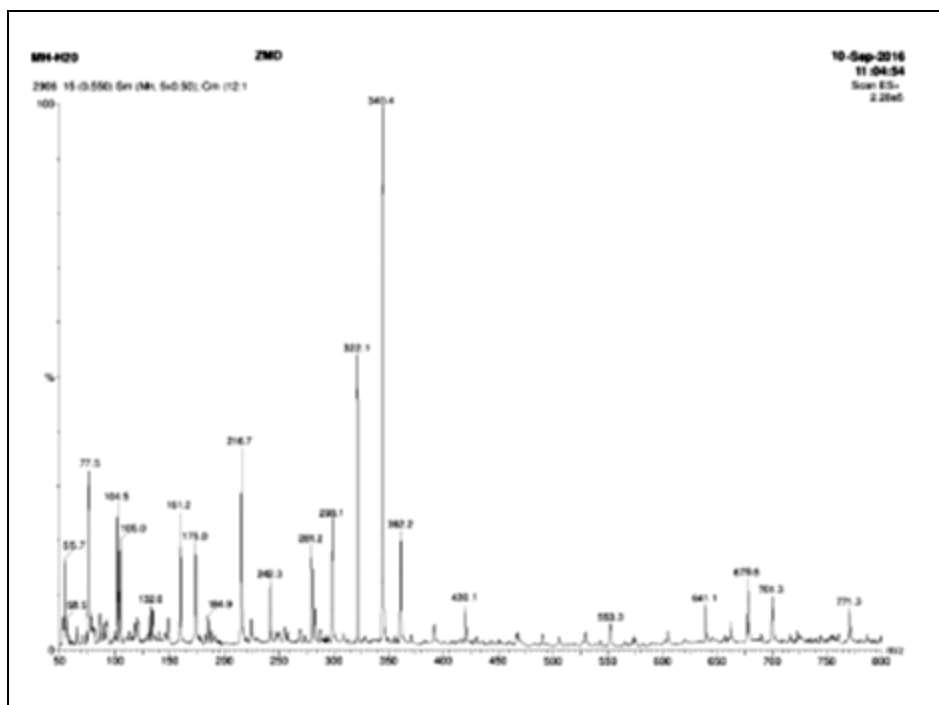


Figure 2e. ESI Spectrum of compound 7.

## Analyses of Compound 8

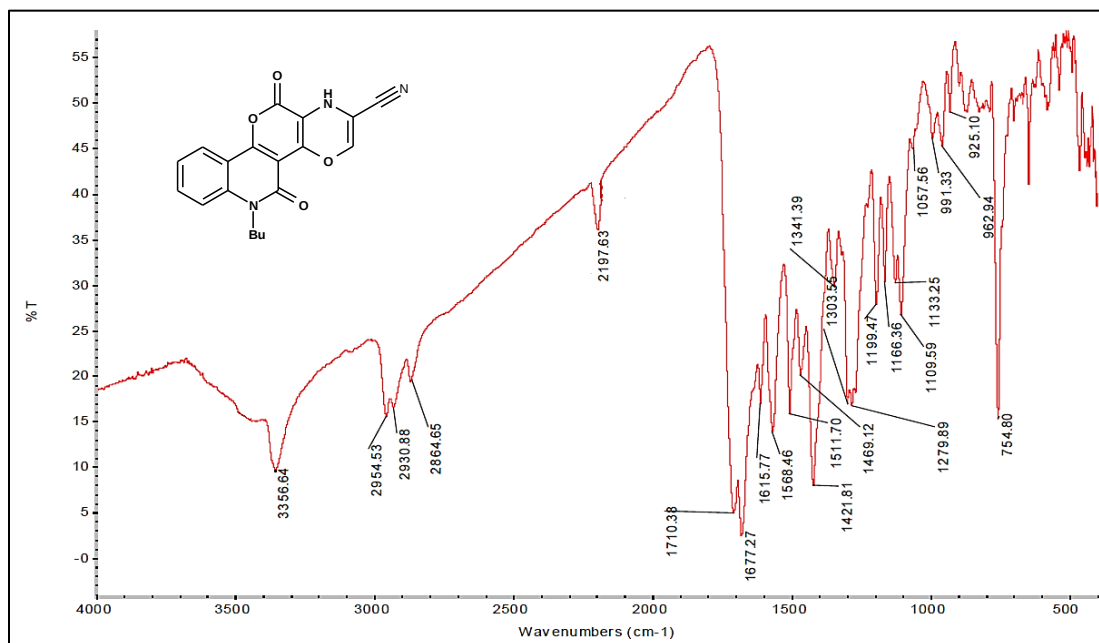
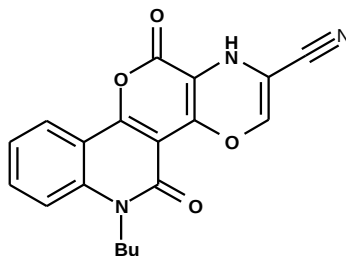
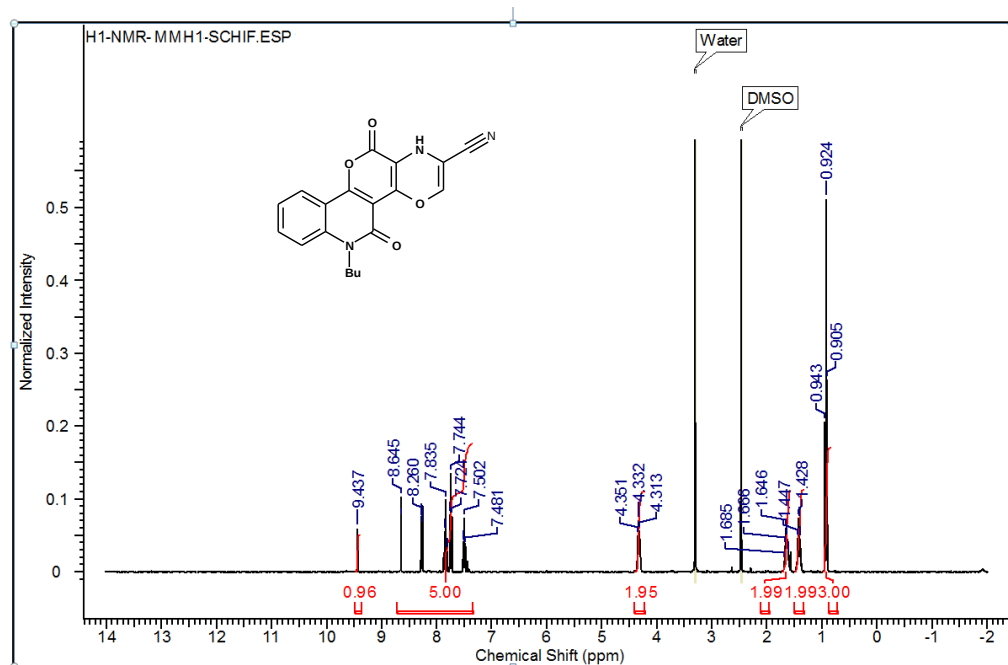


Figure 3-a. IR Spectrum of compound 8.

Figure 3-b. <sup>1</sup>H- NMR Spectrum of compound 8.

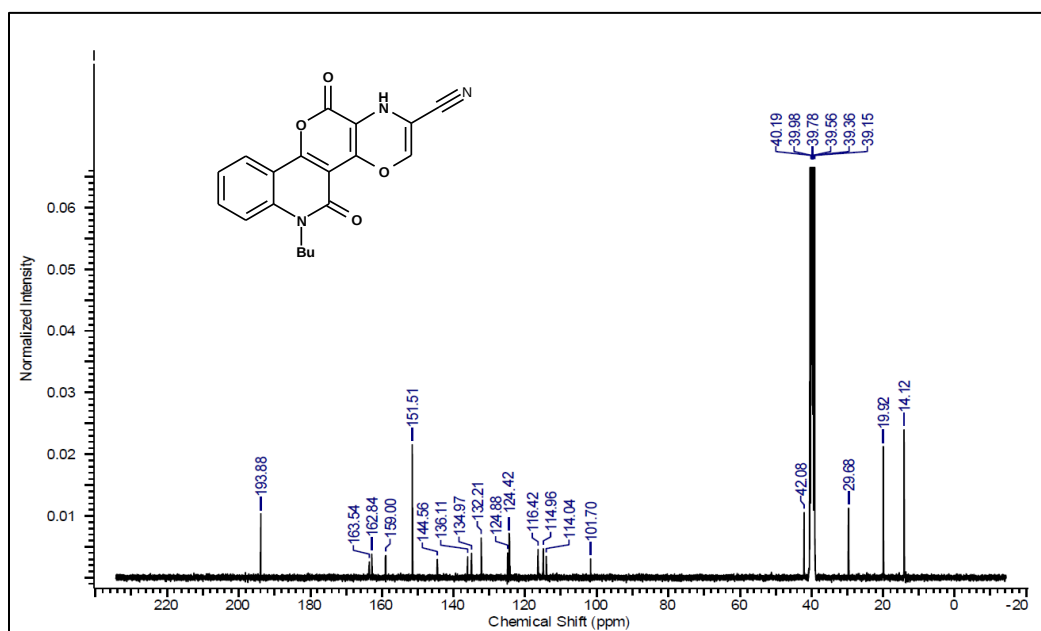


Figure 3-c.  $^{13}\text{C}$ -NMR Spectrum of compound 8.

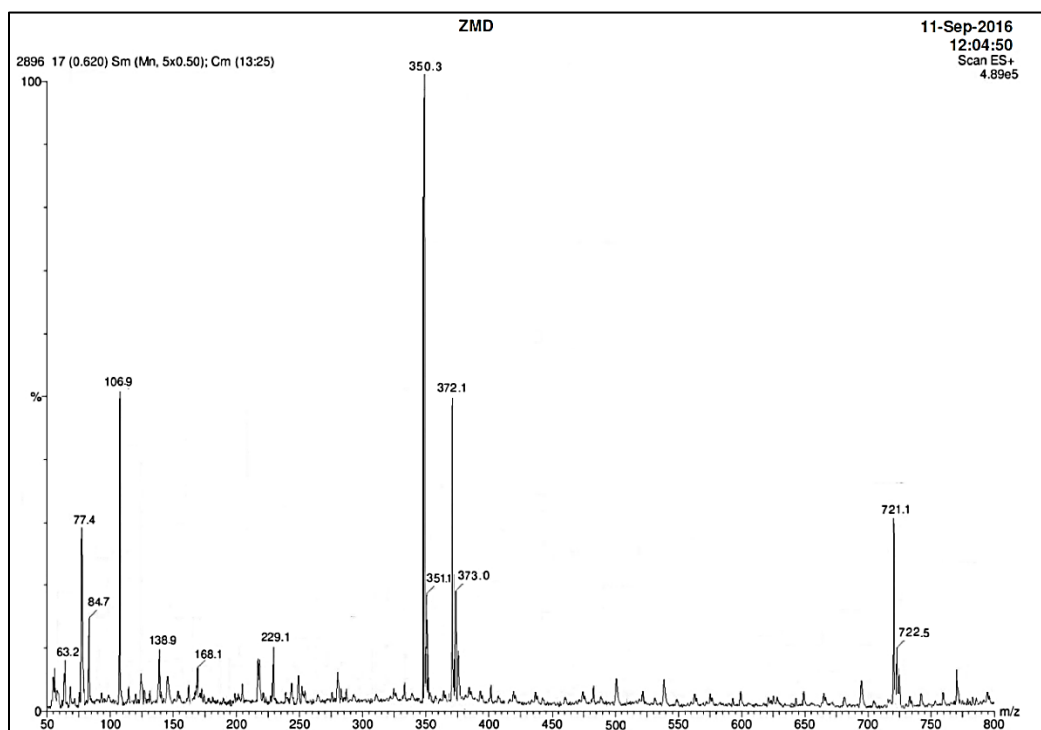


Figure 3d. ESI Spectrum of compound 8.

## Analyses of Compound 10

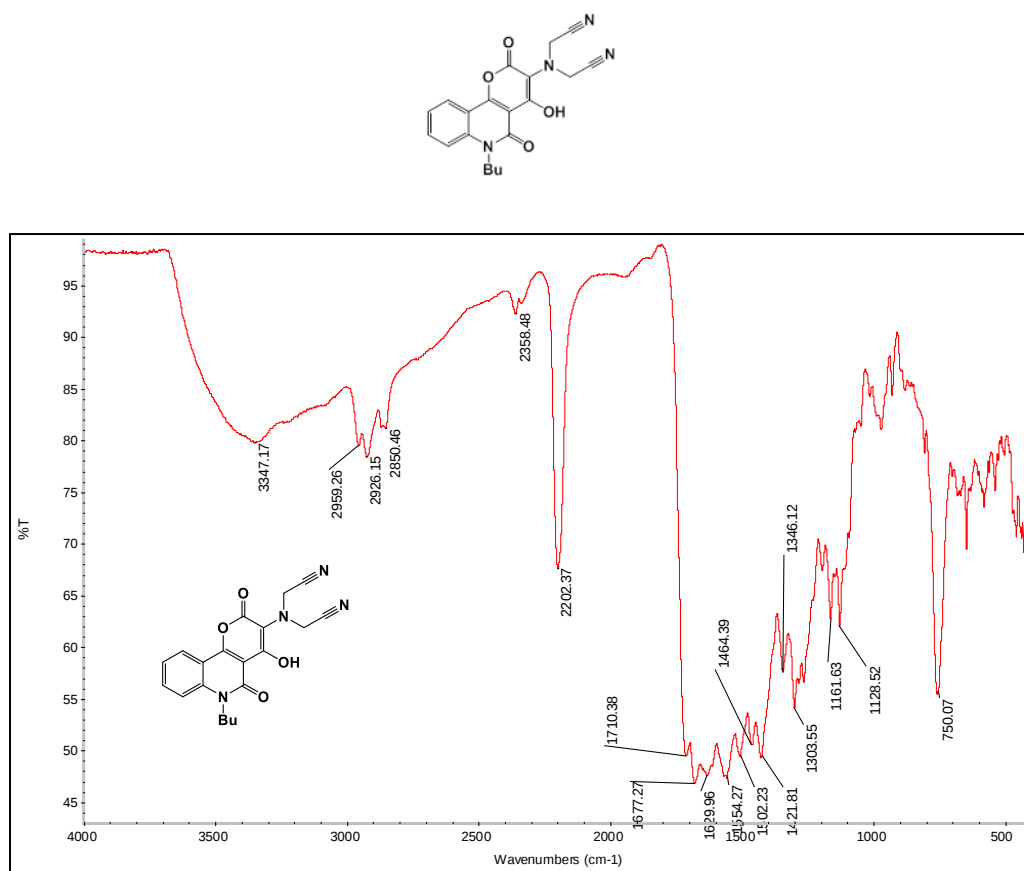
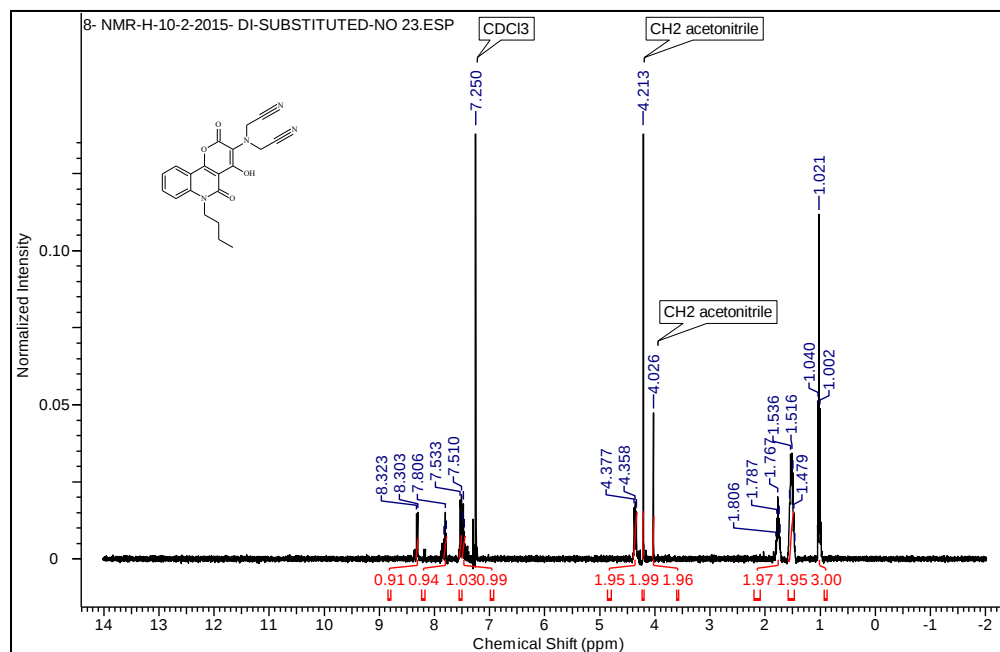
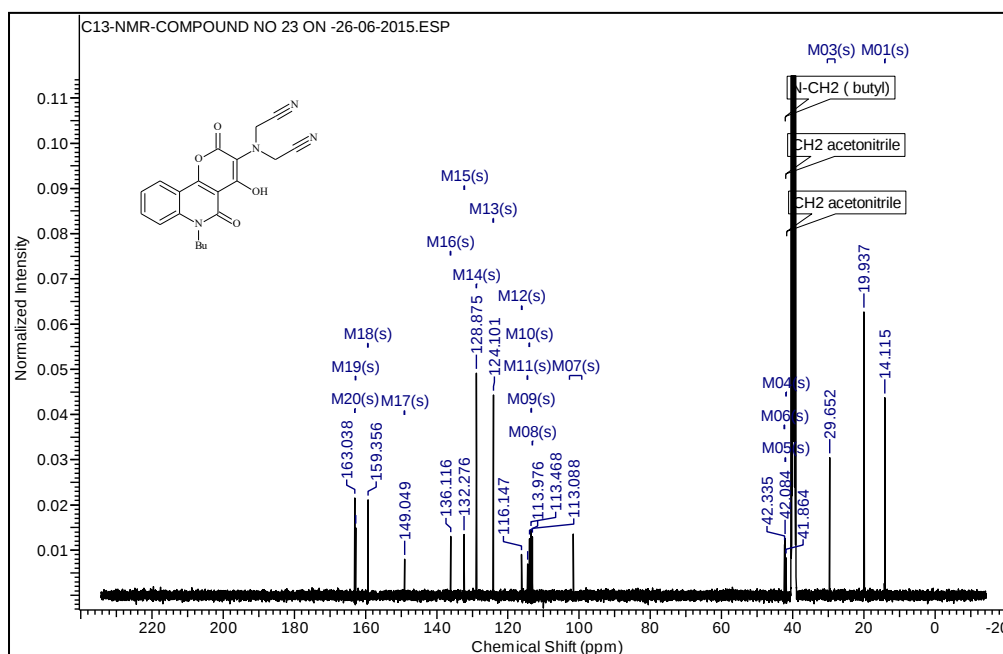
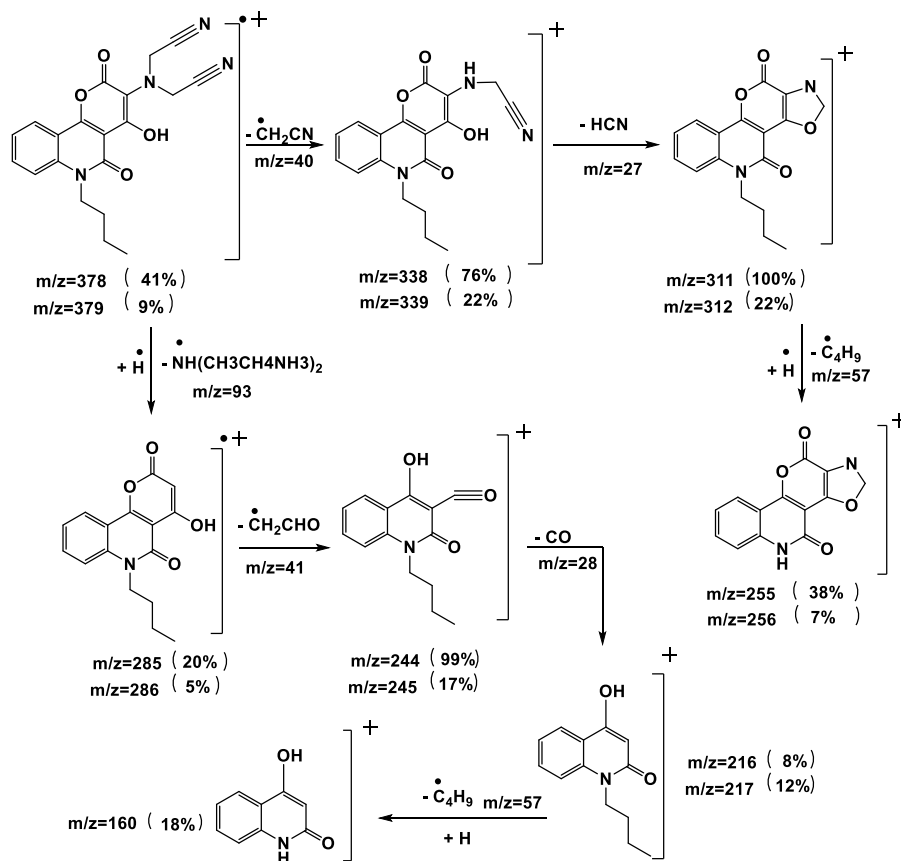


Figure 4-a. IR Spectrum of compound 10.

Figure 4-b. <sup>1</sup>H-NMR Spectrum of compound 10.

Figure 4-c.  $^{13}\text{C}$ - NMR Spectrum of compound 10.

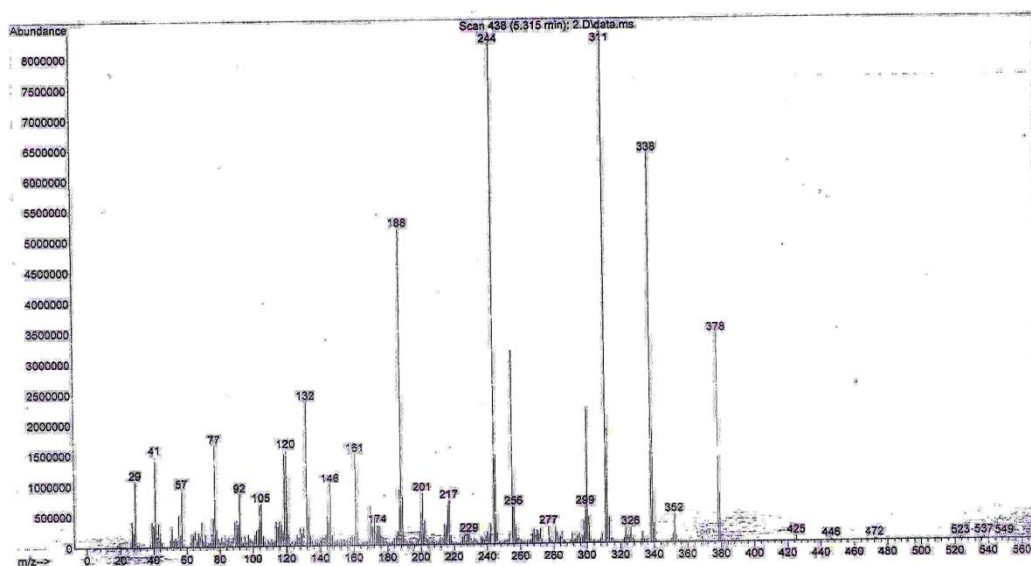


Figure 4d. Mass fragmentation pattern of compound 10.

## Analyses of Compound 11

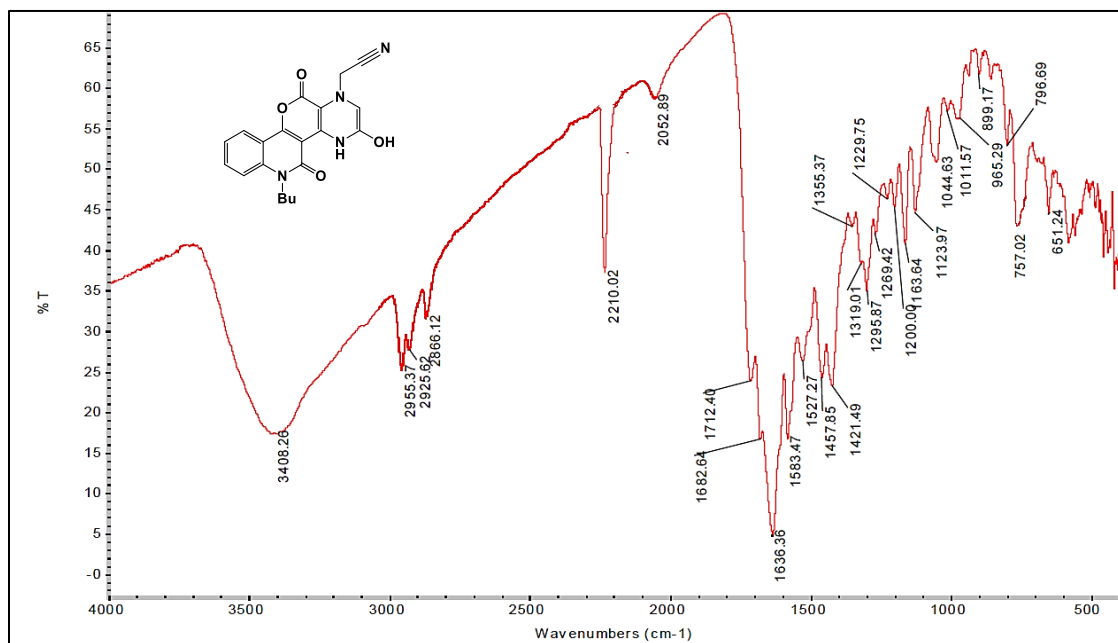
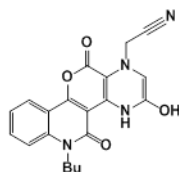
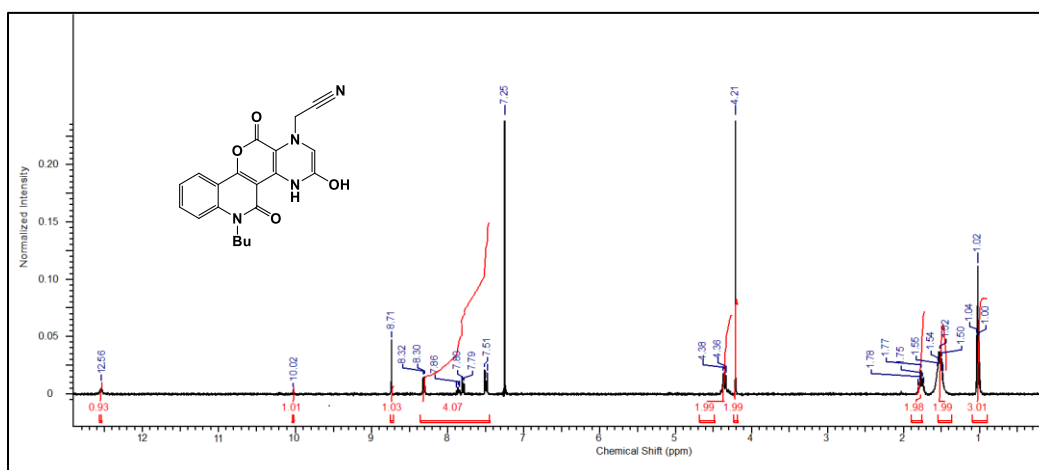
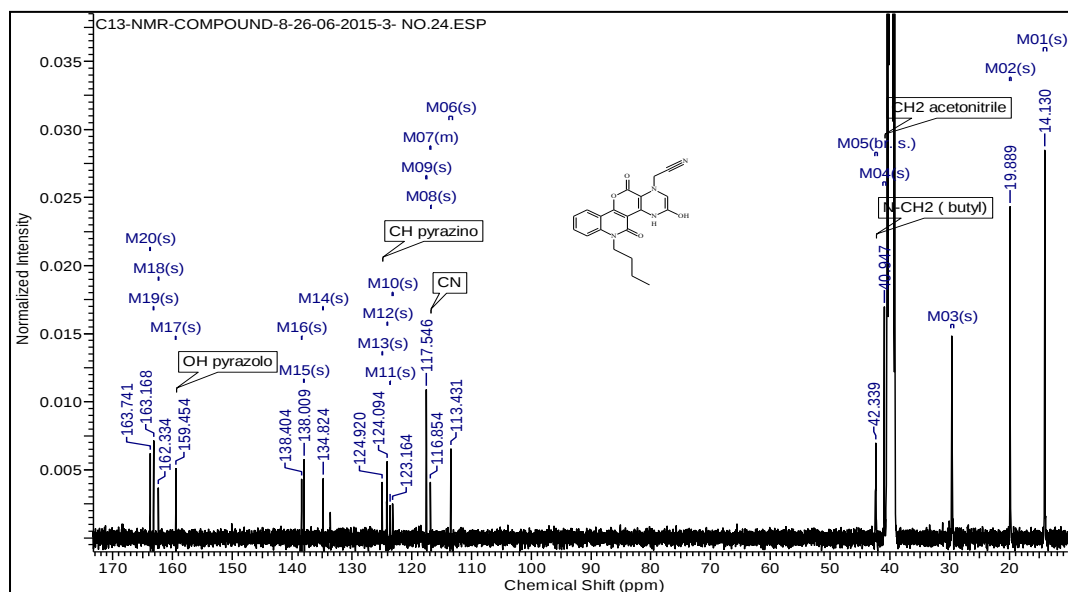


Figure 5-a. IR Spectrum of compound 11.

Figure 5-b. <sup>1</sup>H- NMR Spectrum of compound 11.Figure 5-c. <sup>13</sup>C- NMR Spectrum of compound 11.

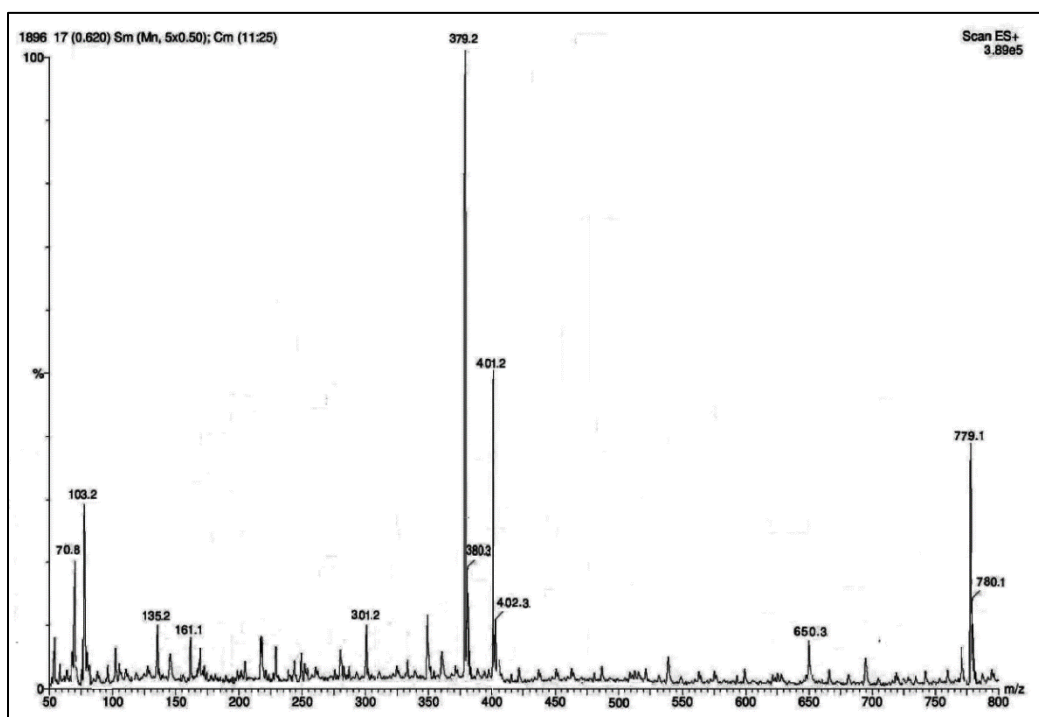


Figure 5d. ESI Spectrum of compound 11.

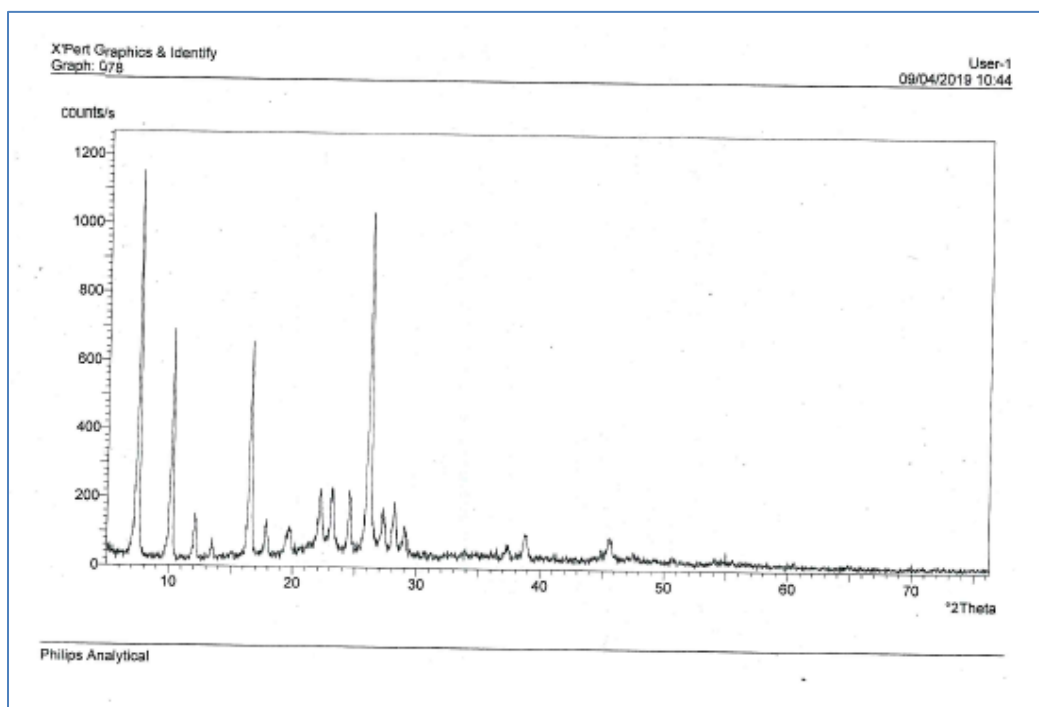


Figure 5e. XRD patterns of compound 11.

## Analyses of Compound 13

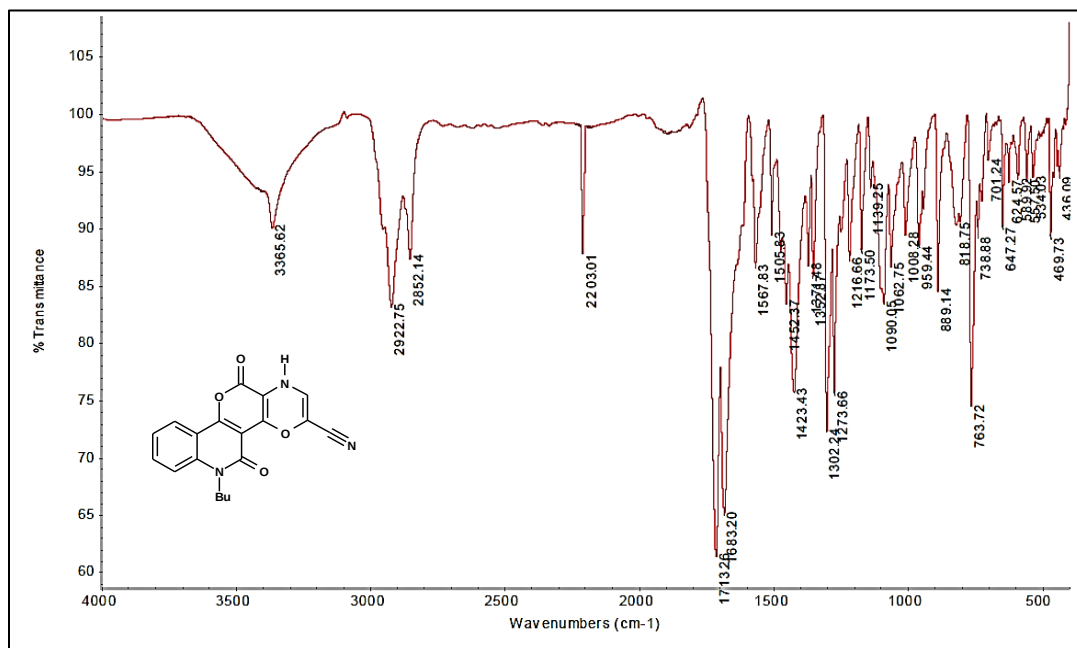
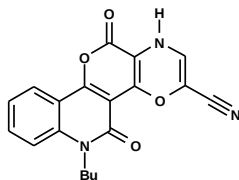
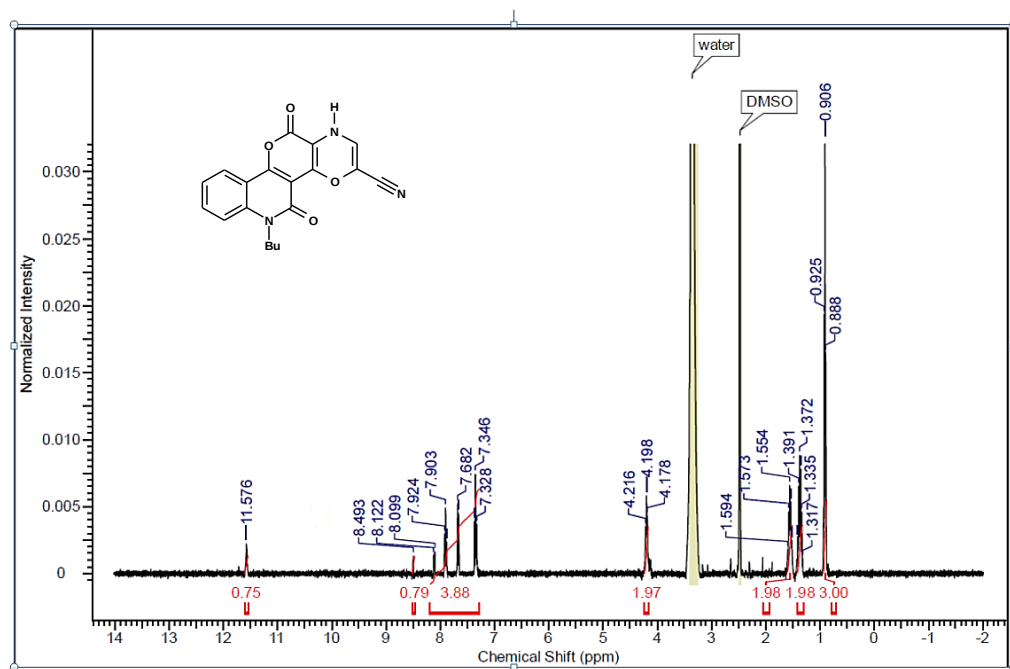


Figure 6-a. IR Spectrum of compound 13.

Figure 6-b. <sup>1</sup>H-NMR Spectrum of compound 13.

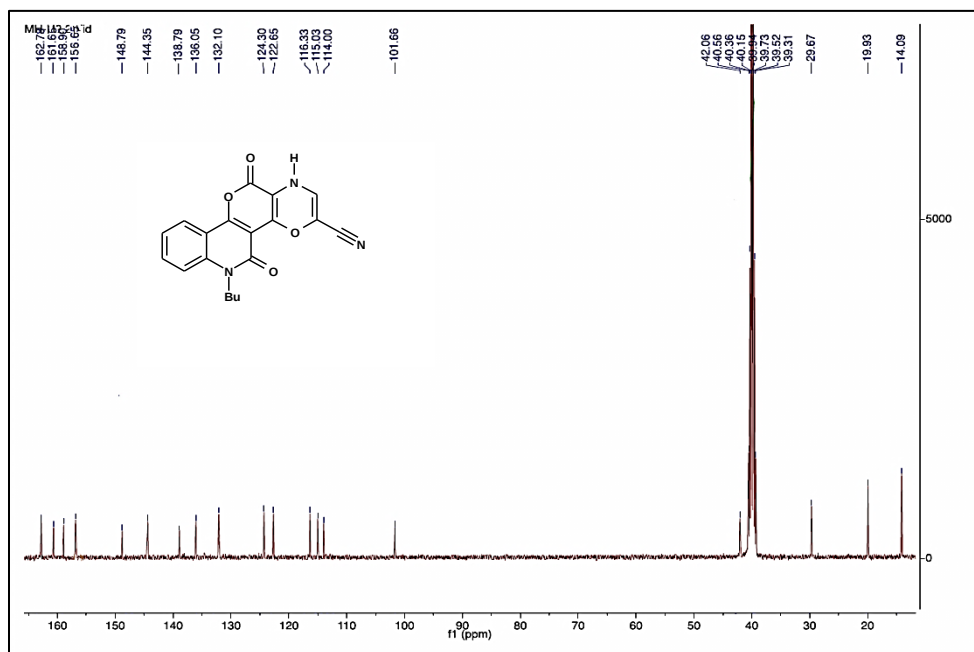
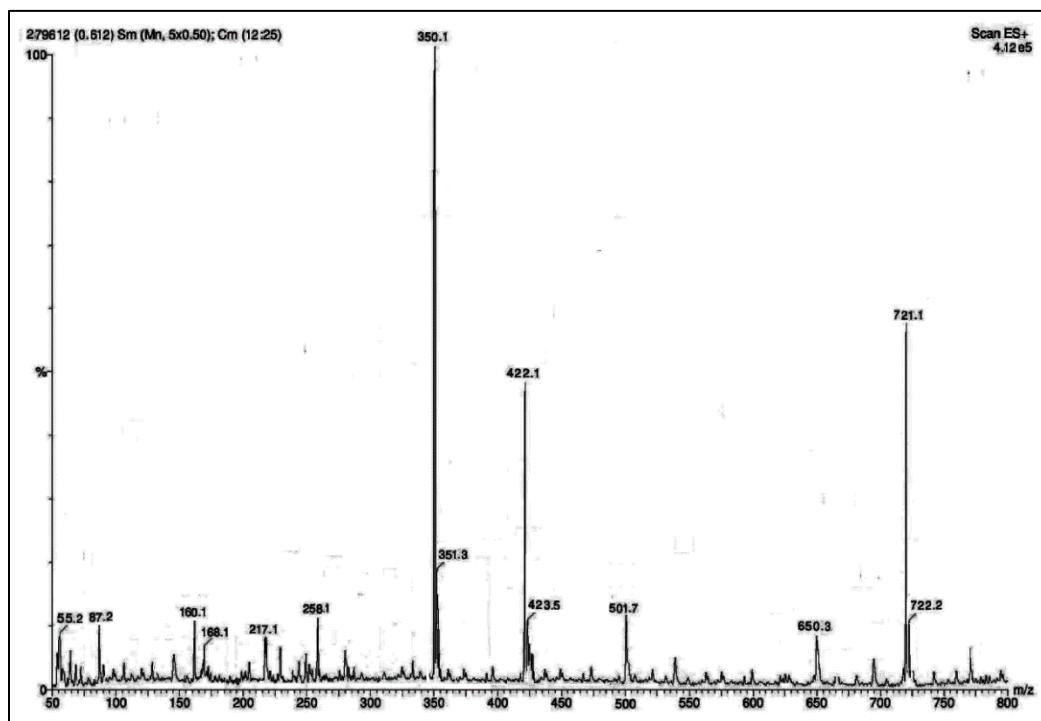
Figure 6-c. <sup>13</sup>C- NMR Spectrum of compound 13.

Figure 6-d. ESI Spectrum of compound 13.

## Analyses of Compound 14a

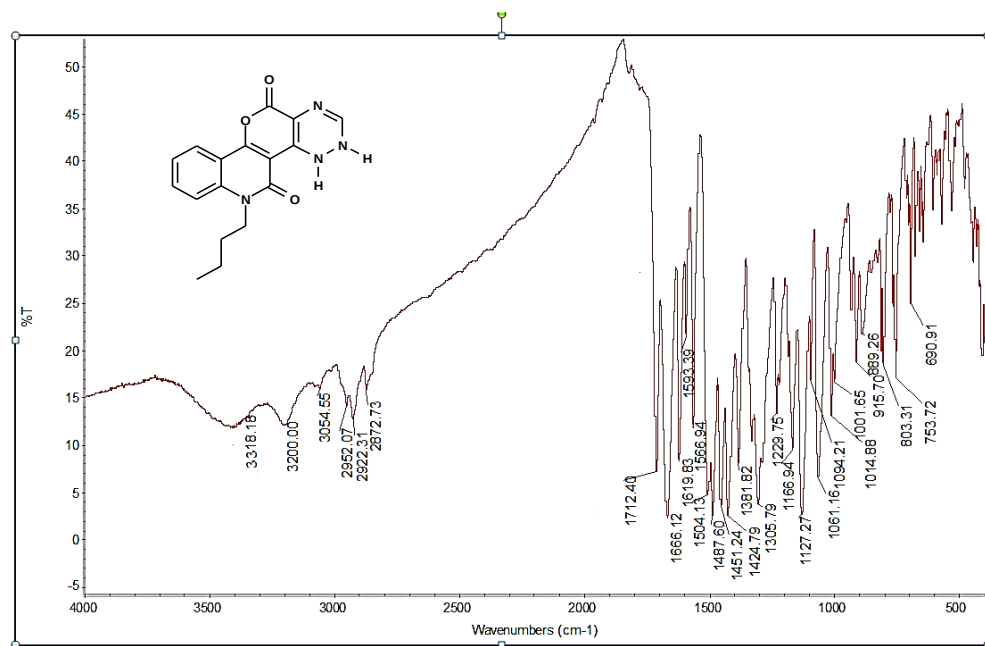
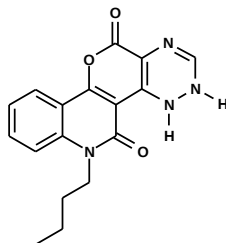
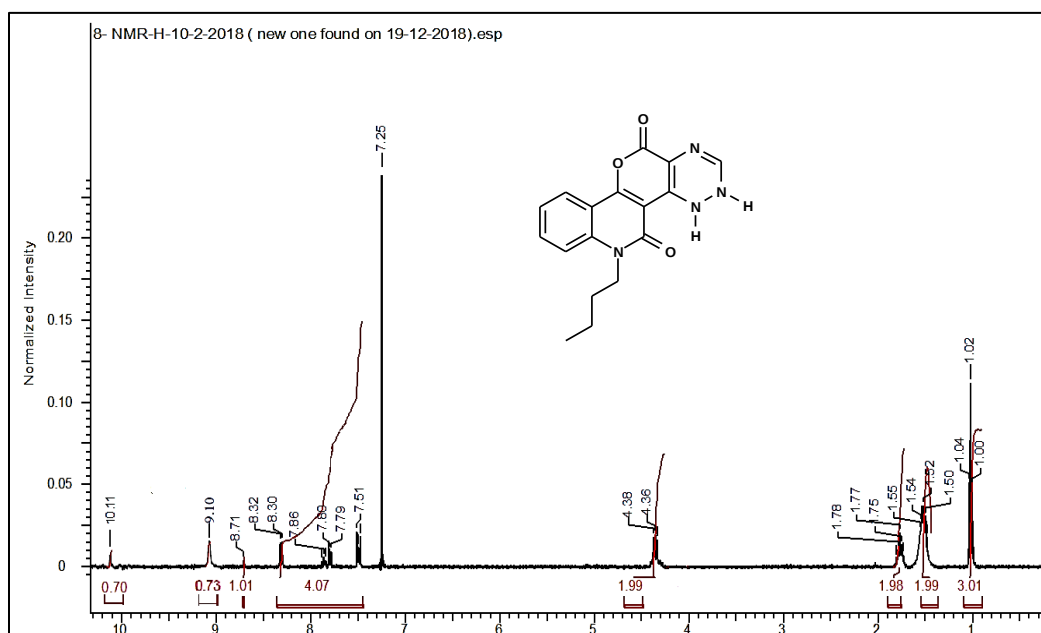
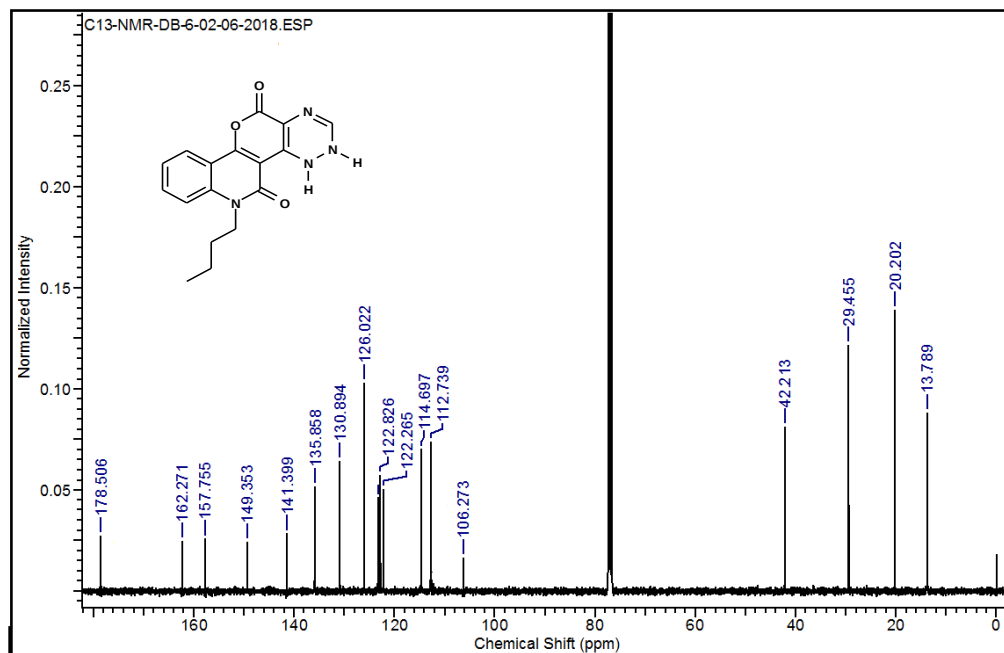


Figure 7-a. IR Spectrum of compound 14a.

Figure 7-b. <sup>1</sup>H- NMR Spectrum of compound 14a.Figure 7-c. <sup>13</sup>C- NMR Spectrum of compound 14a.

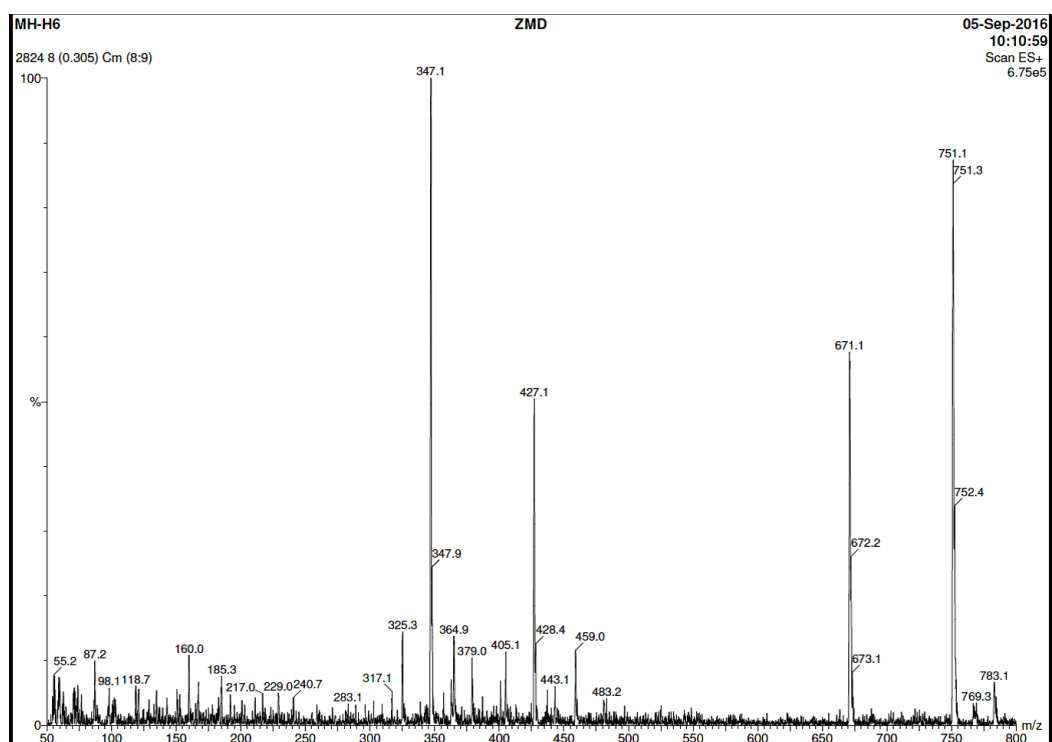


Figure 7-d. ESI Spectrum of compound 14a.

## Analyses of Compound 14b

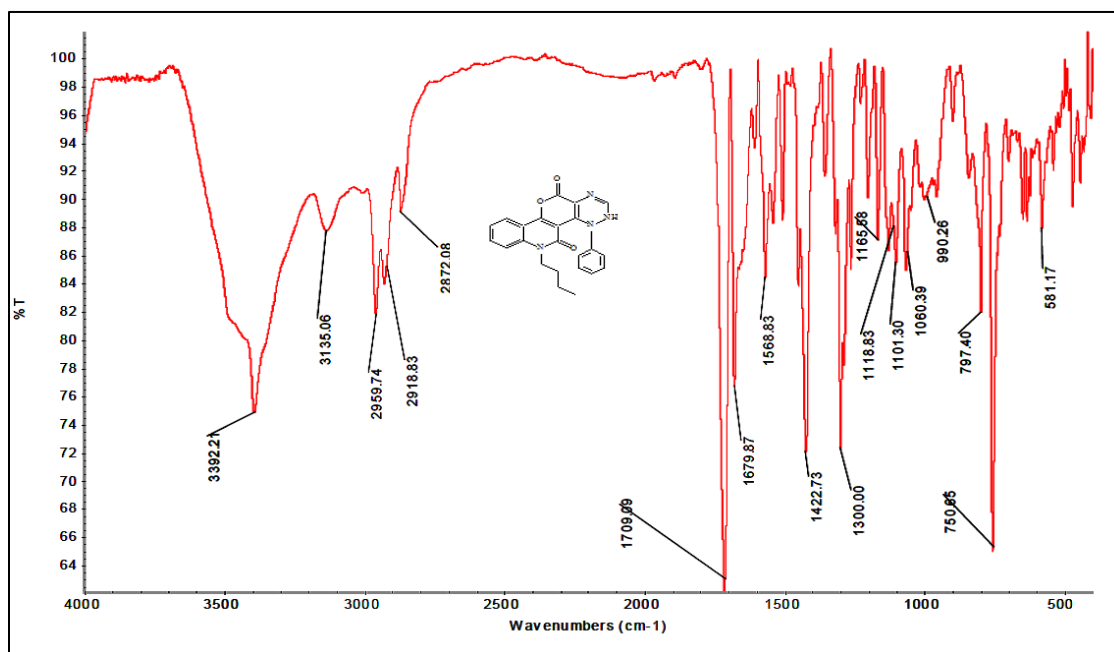
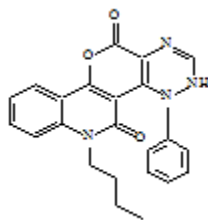
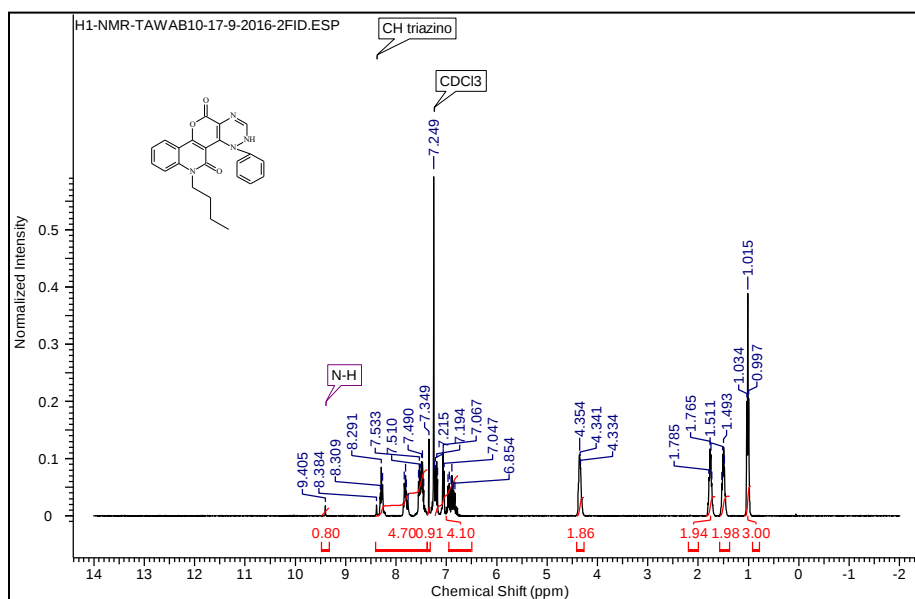


Figure 8-a. IR Spectrum of compound 14b.

Figure 8-b. <sup>1</sup>H- NMR Spectrum of compound 14b.



## Analyses of Compound 15

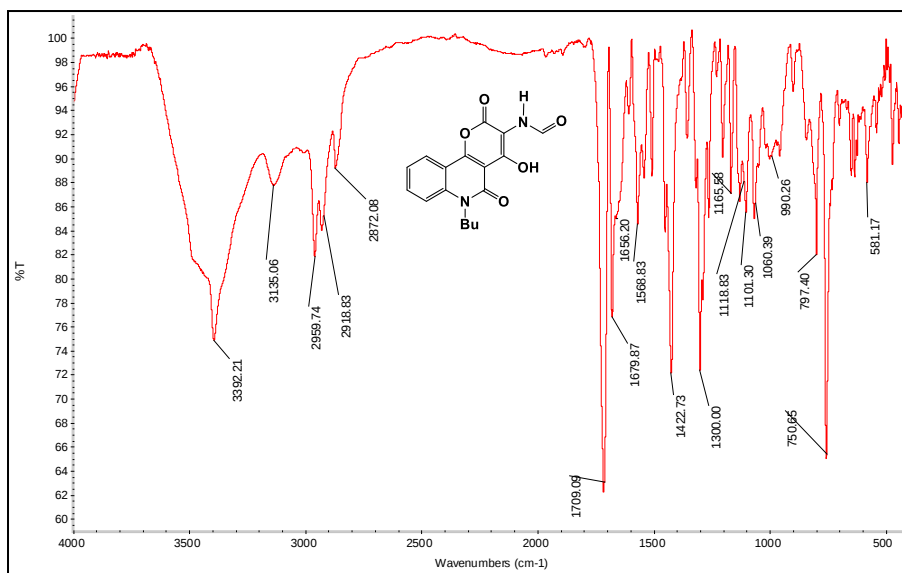
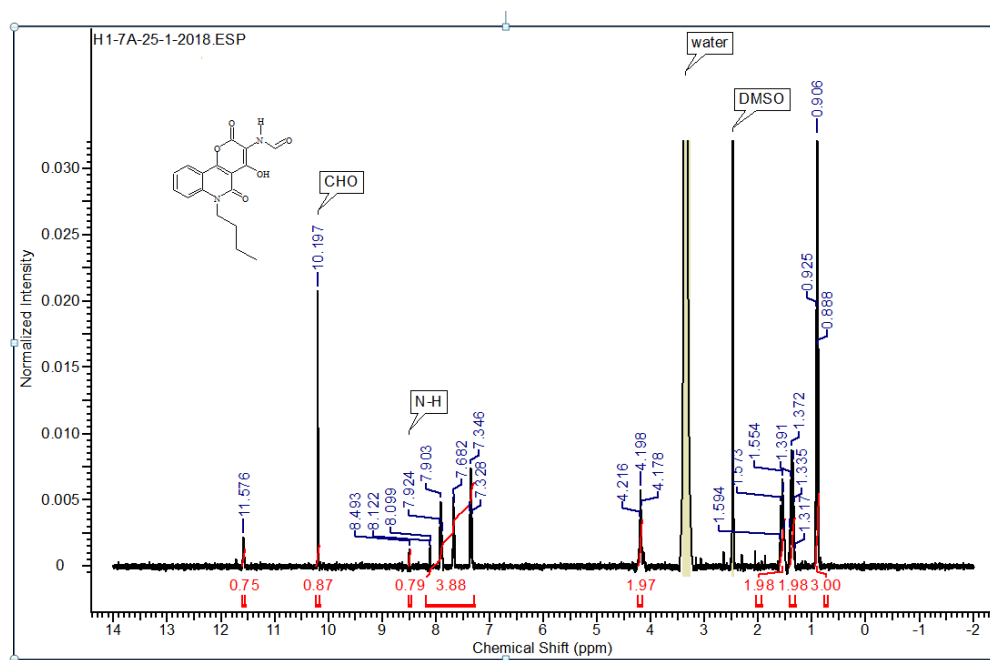


Figure 9-a. IR Spectrum of compound 15.

Figure 9-b. <sup>1</sup>H- NMR Spectrum of compound 15.

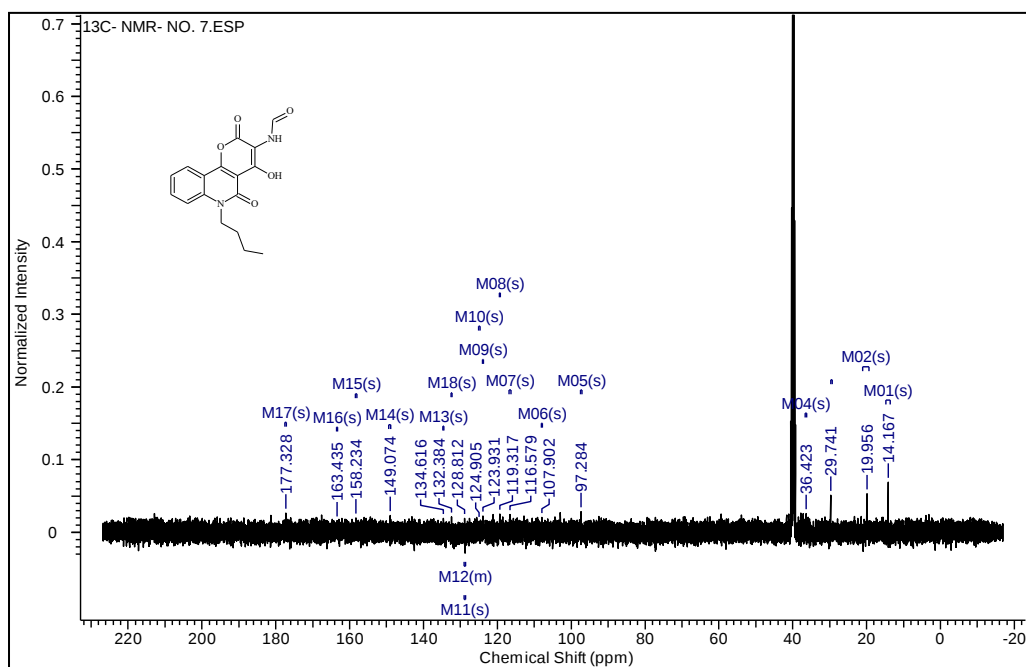
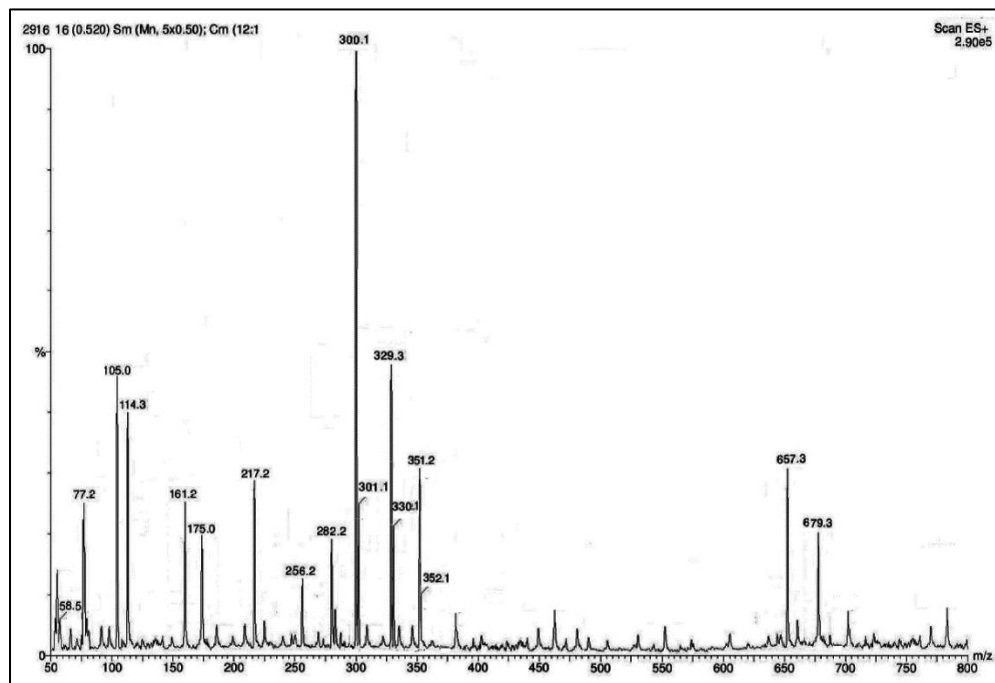
Figure 9-c. <sup>13</sup>C-NMR Spectrum of compound 15.

Figure 9-d. ESI Spectrum of compound 15.

## Analyses of Compound 16

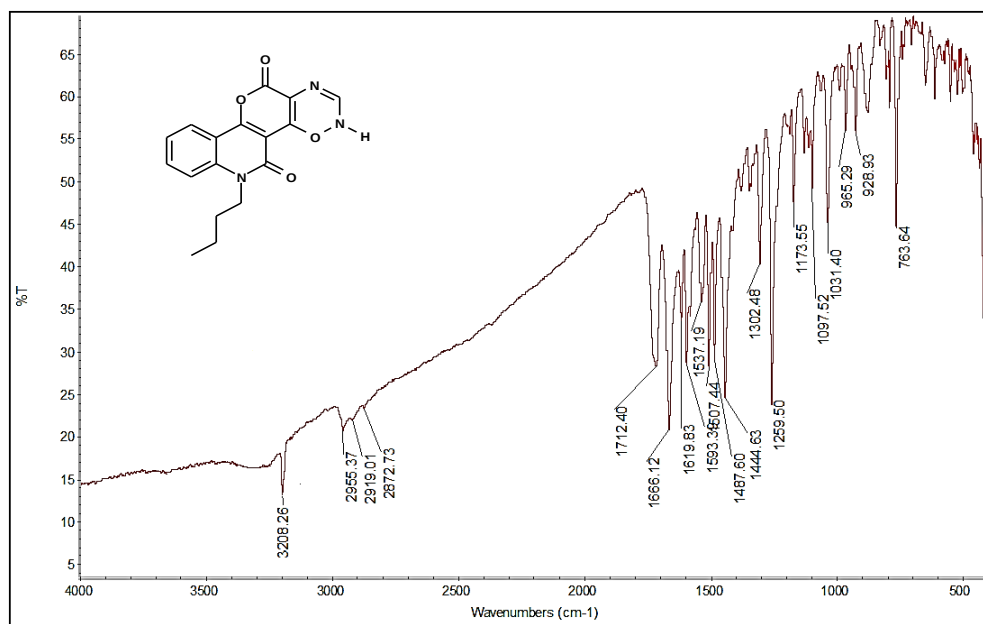
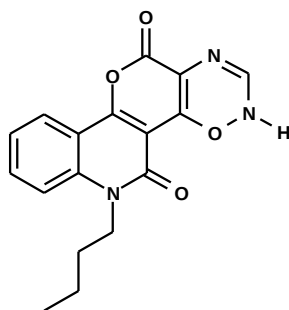
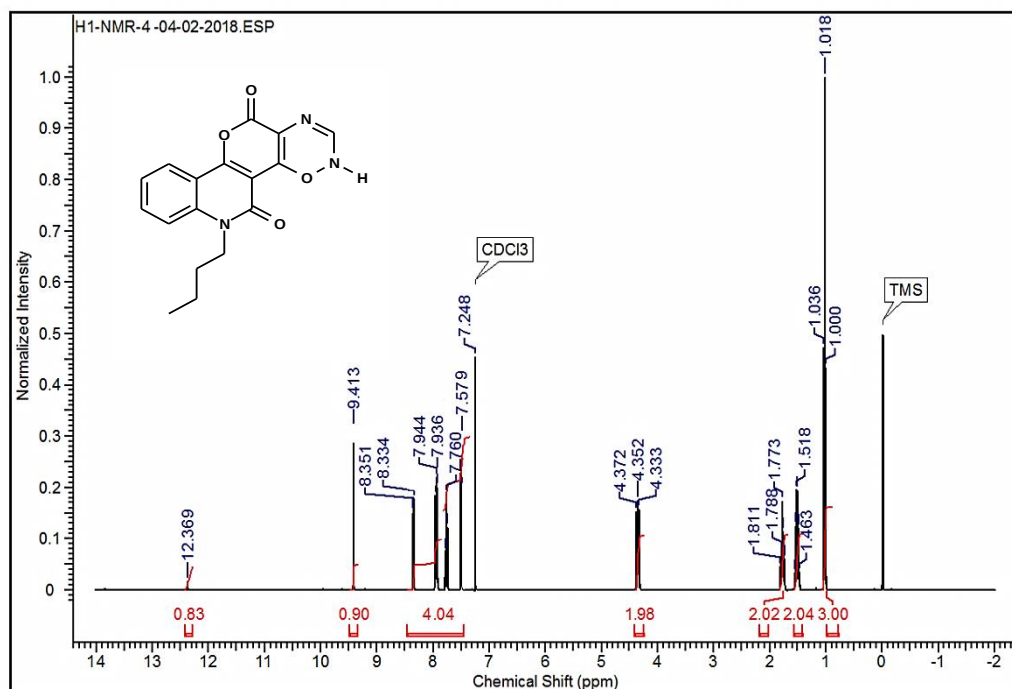
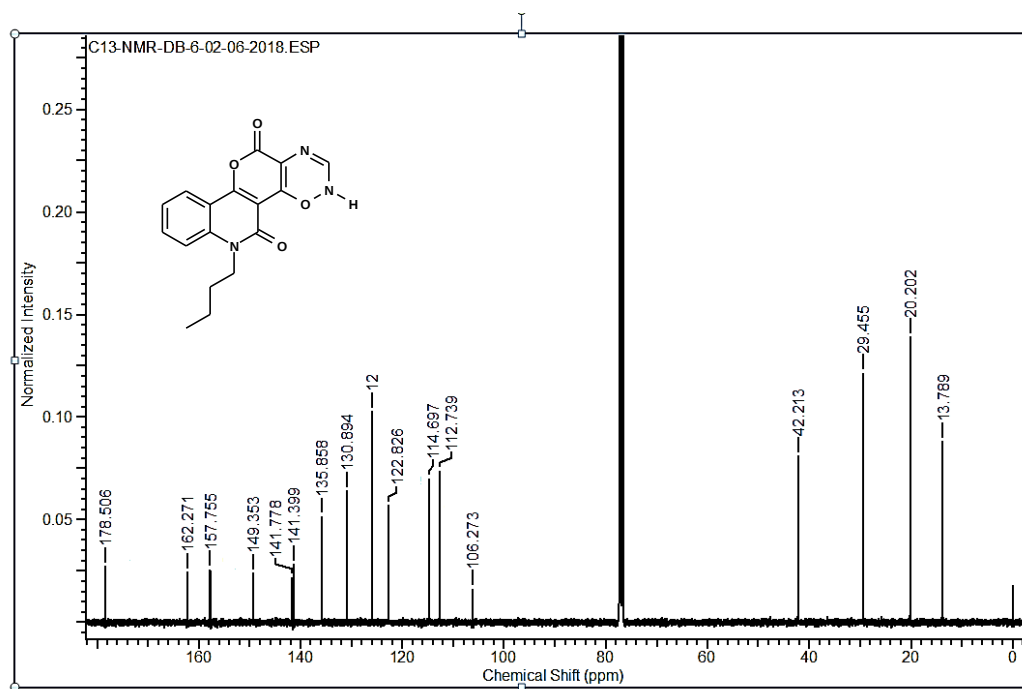


Figure 10-a. IR Spectrum of compound 16.

Figure 10-b. <sup>1</sup>H- NMR Spectrum of compound 16.Figure 10-c. <sup>13</sup>C- NMR Spectrum of compound 16.

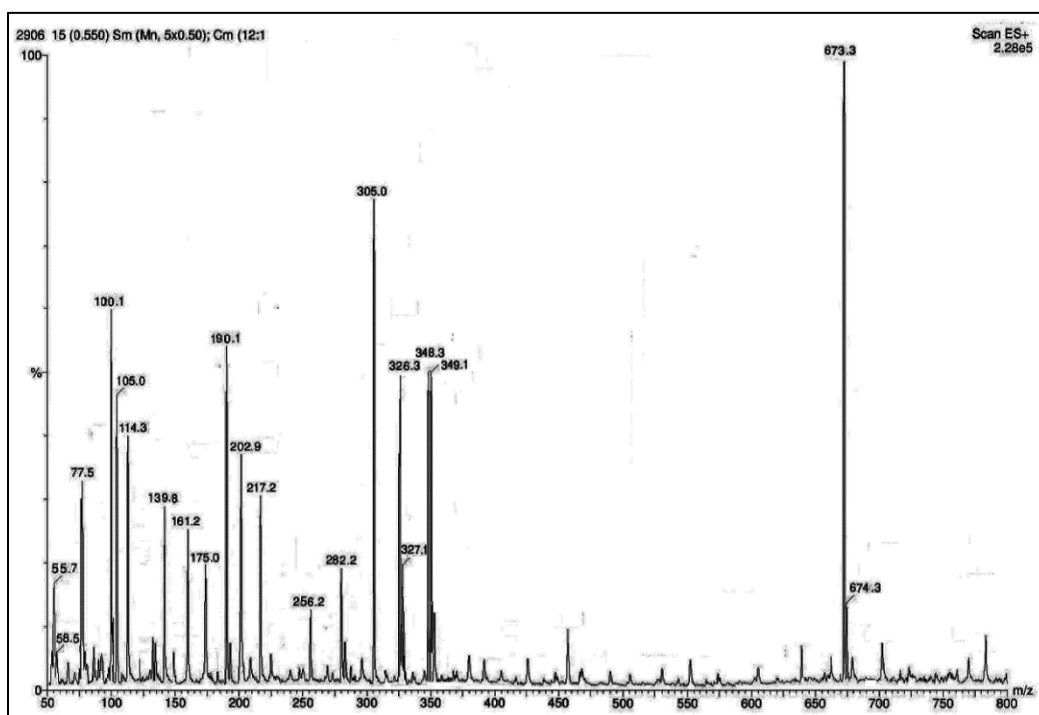


Figure 10-d. ESI Spectrum of compound 16.

## Analyses of compound 19

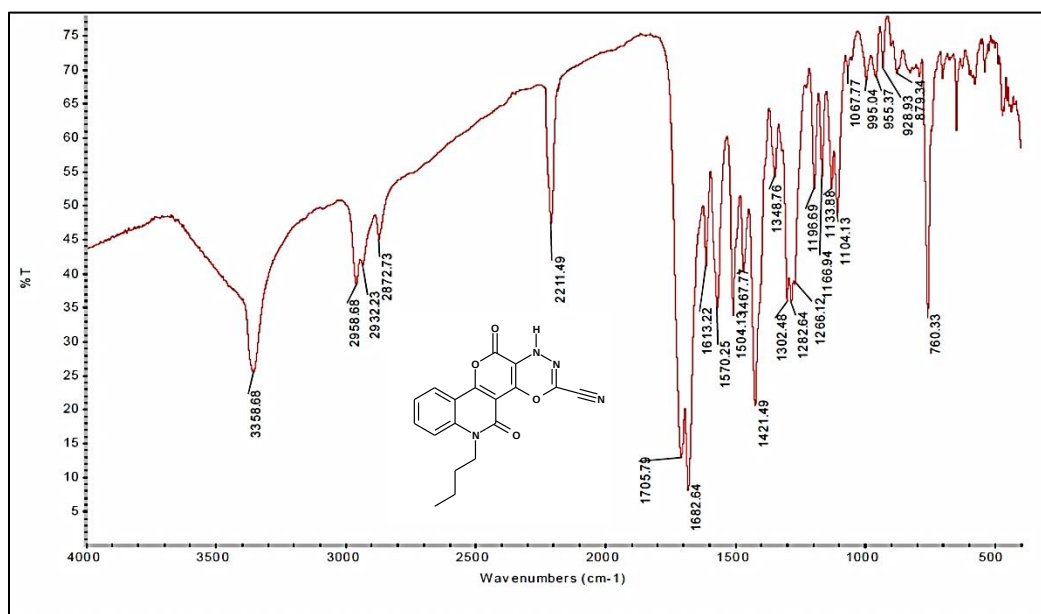
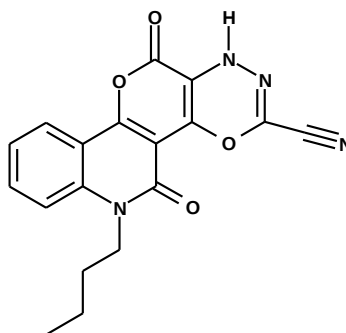
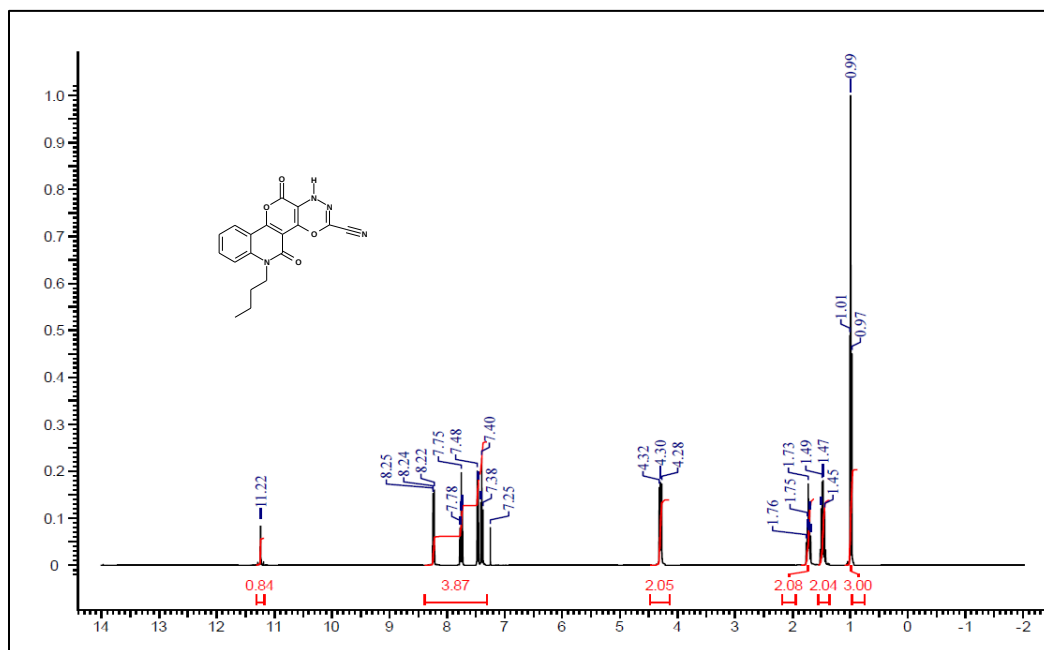
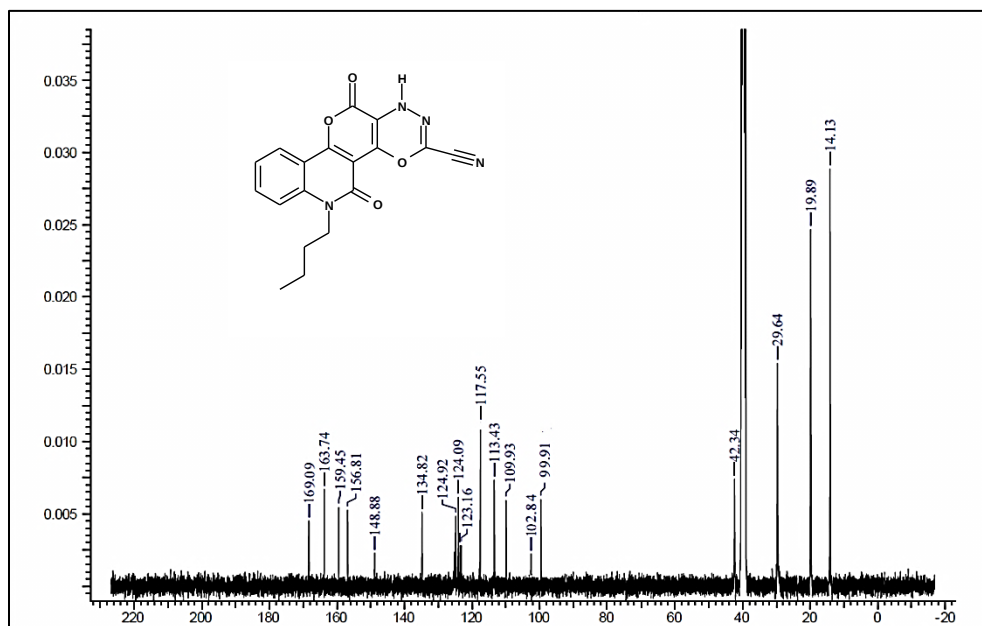


Figure 11-a. IR Spectrum of compound 19.

Figure 11-b. <sup>1</sup>H- NMR Spectrum of compound 19.Figure 11-c. <sup>13</sup>C- NMR Spectrum of compound 19.

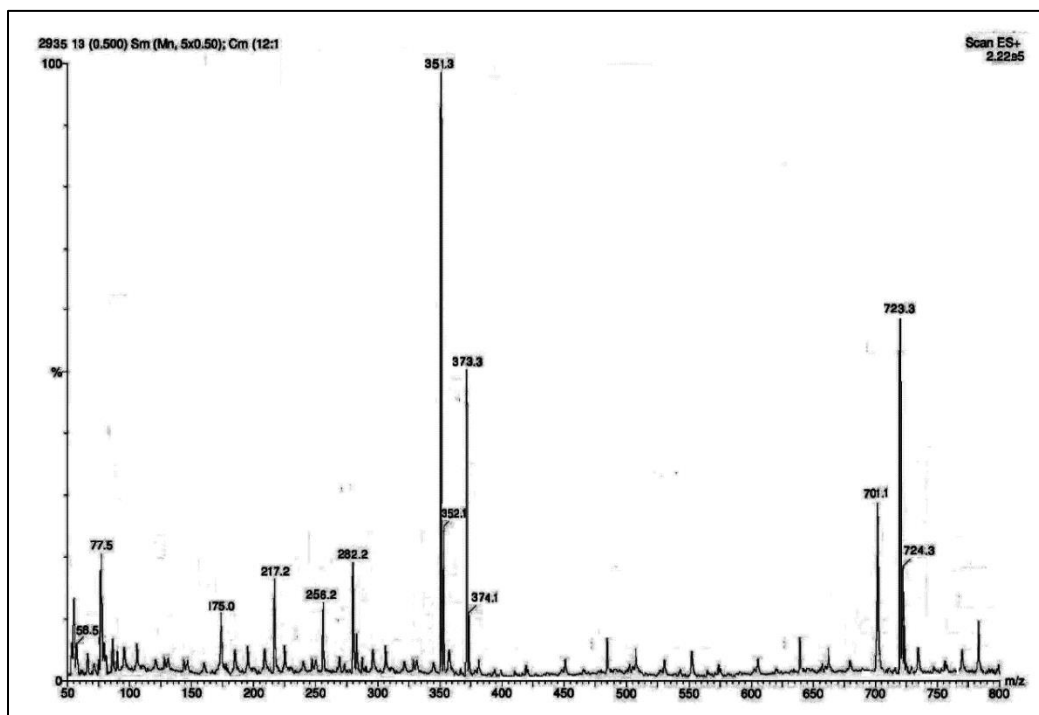


Figure 11-d. ESI Spectrum of compound 19.

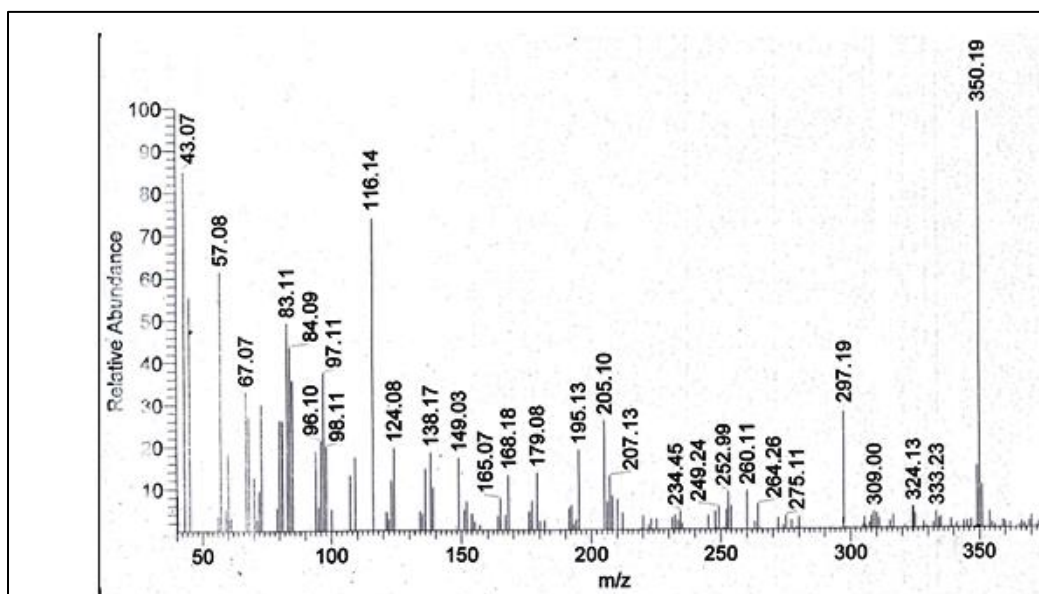


Figure 11-e. Mass Spectrum of compound 19.