

## Supplementary Information

# Synthesis of mixed ligand ruthenium (II/III) complexes and their antibacterial evaluation on drug resistant bacterial organisms

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### 1. 4-butoxy-N,N-bis(pyridin-2-ylmethyl)aniline (BUT) 1 Supplementary Material

Yield: 0.15 g, 72.4%. mp 145-147°C. IR(cm<sup>-1</sup>) (C-H) 2959.5, (C=C) 1510.4, (Ar-N) 1433.0, (C-O) 123.5. <sup>1</sup>H NMR (600 MHz, CDCl<sub>3</sub>, δ) 8.55 (m, 2H), 7.59 (m, 2H), 7.31 (m, 2H), 7.13 (m, 2H), 6.67 (dd, J = 91.8, 8.8 Hz, 4H), 4.39 (s, 4H), 3.85 (t, J = 6.6 Hz, 2H), 1.72 – 1.67 (q, 2H), 1.43 (m, 2H), 0.93 (t, J = 7.4 Hz, 3H). HRESI-MS [M+Na]<sup>+</sup> m/z 370.2362 (calcd for C<sub>22</sub>H<sub>25</sub>N<sub>3</sub>ONa 370.4518).

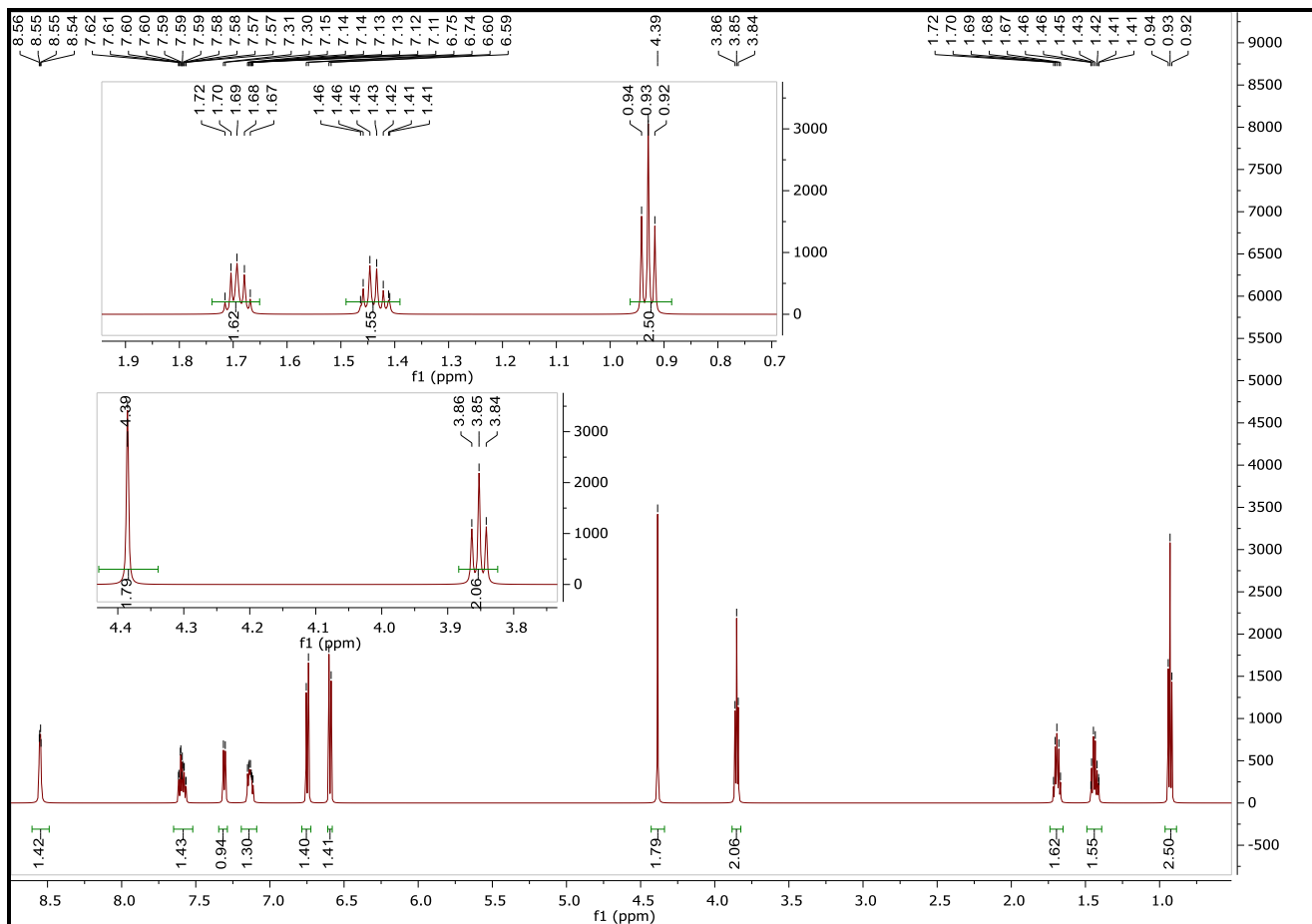


Figure 1: Proton NMR spectrum of BUT 1

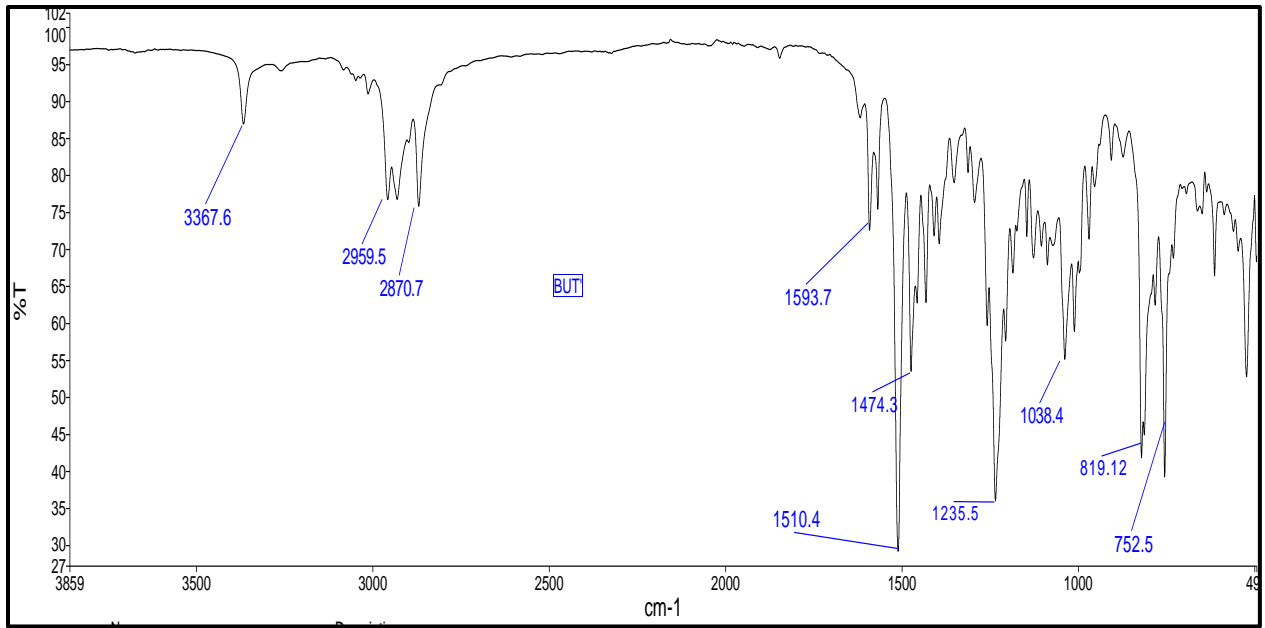


Figure 2: FTIR spectrum of BUT 1

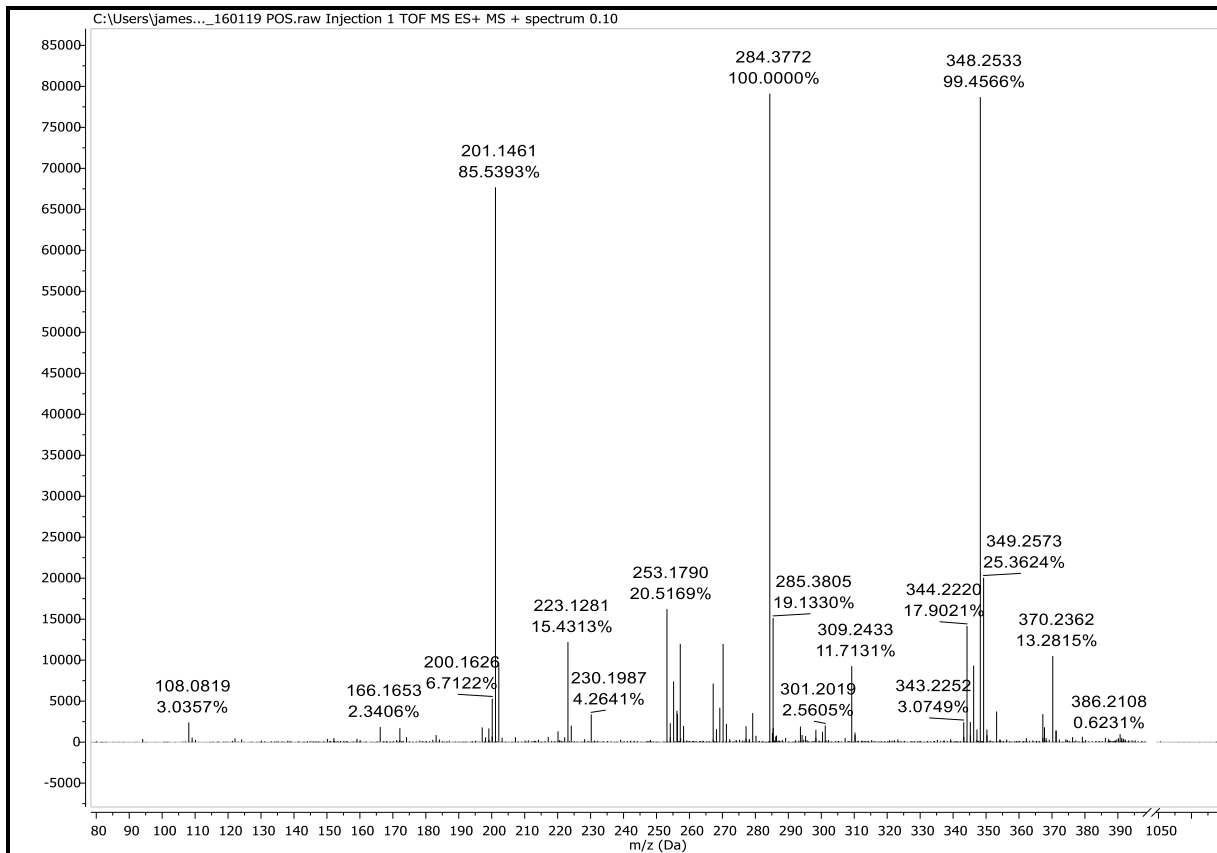


Figure 3: HRESI-MS spectrum of BUT 1

## 2. Li[Ru(Cl)<sub>4</sub>(DPA)] 2 Supplementary Material

Yield: 1.58 g, 78.3%. IR ( $\nu_{\max}$  / $\text{cm}^{-1}$ ) (C-H) 3135.0, (C=C) 1534.0, (C-O) 1244.8, (Ar-N) 1431.2, (N-H) 3287.1-3499.0. UV-Vis (DMF;  $\lambda_{\max}$  [nm]): 309, 373, 578. HRESI-MS [M+OH]  $m/z$  439.3237 (calcd for  $\text{C}_{10}\text{H}_{10}\text{Cl}_4\text{LiN}_3\text{ORu}$  438.0157).

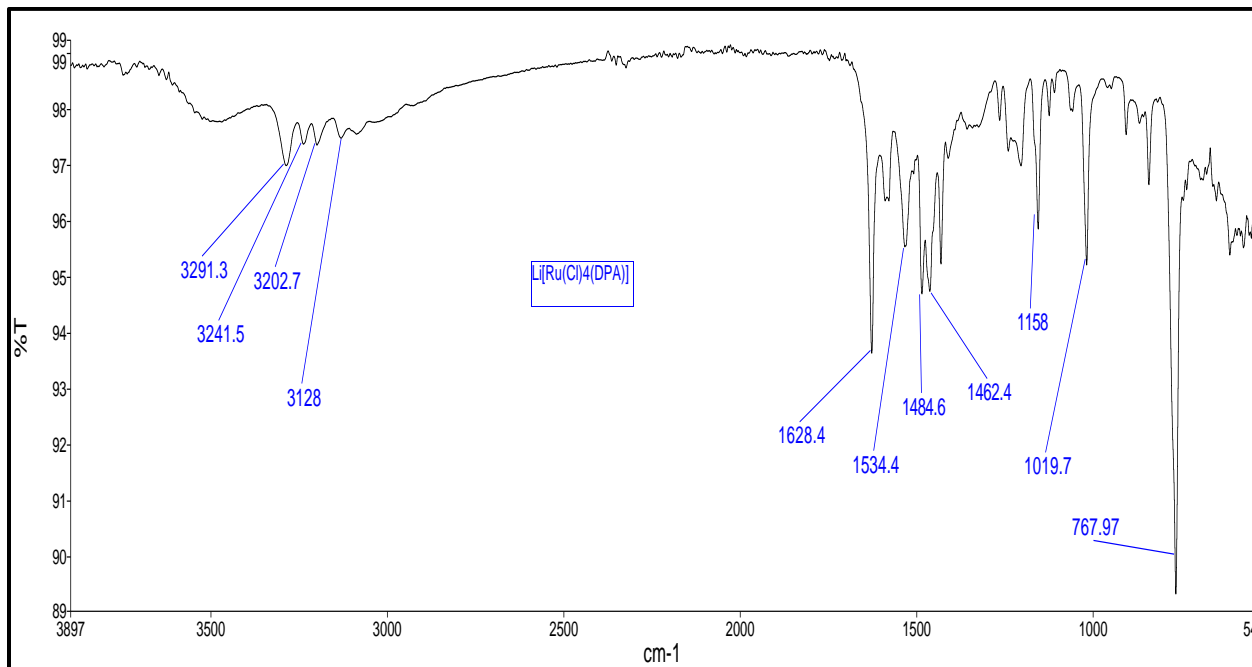


Figure 4: FTIR Spectrum of complex 2

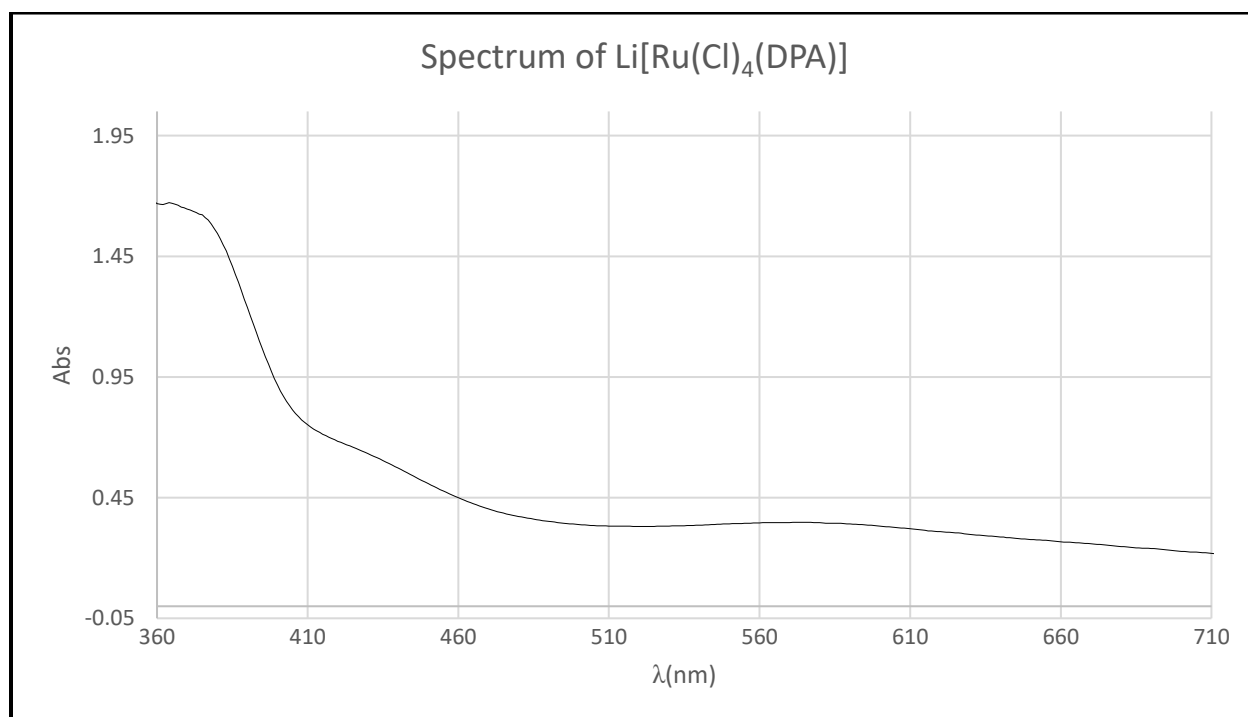


Figure 5: UV/Vis Spectrum of Complex 1

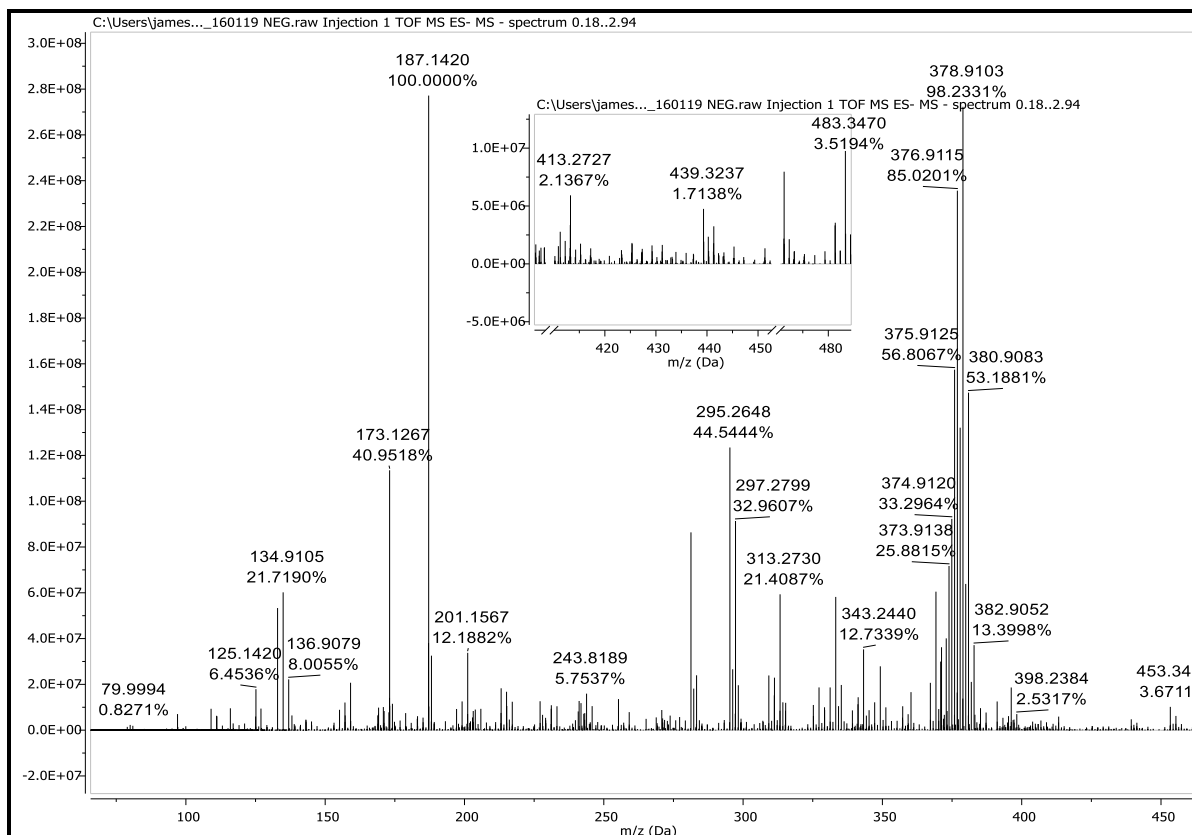


Figure 6: HRESI-MS spectrum of complex 2

### 3. [Ru(BUT)(DMF)(DPA)](BH<sub>4</sub>)<sub>2</sub> 3 Supplementary Material

Yield: 0.140 g, 48.9%. IR ( $\nu_{\max}$  /cm<sup>-1</sup>) (C-H) 2930.0, (C=C) 1504.0, (C-O) 1244.8, (Ar-N) 1434.2, (N-H) 3369.3, (C=O<sub>DMF</sub>) 1950.1. UV-Vis (DMF;  $\lambda_{\max}$  [nm]): 297, 382, 596. HRESI-MS [M+NH<sub>4</sub>] m/z 741.2516 (calcd for C<sub>35</sub>H<sub>53</sub>B<sub>2</sub>N<sub>8</sub>O<sub>2</sub>Ru<sup>2+</sup> 741.3188).

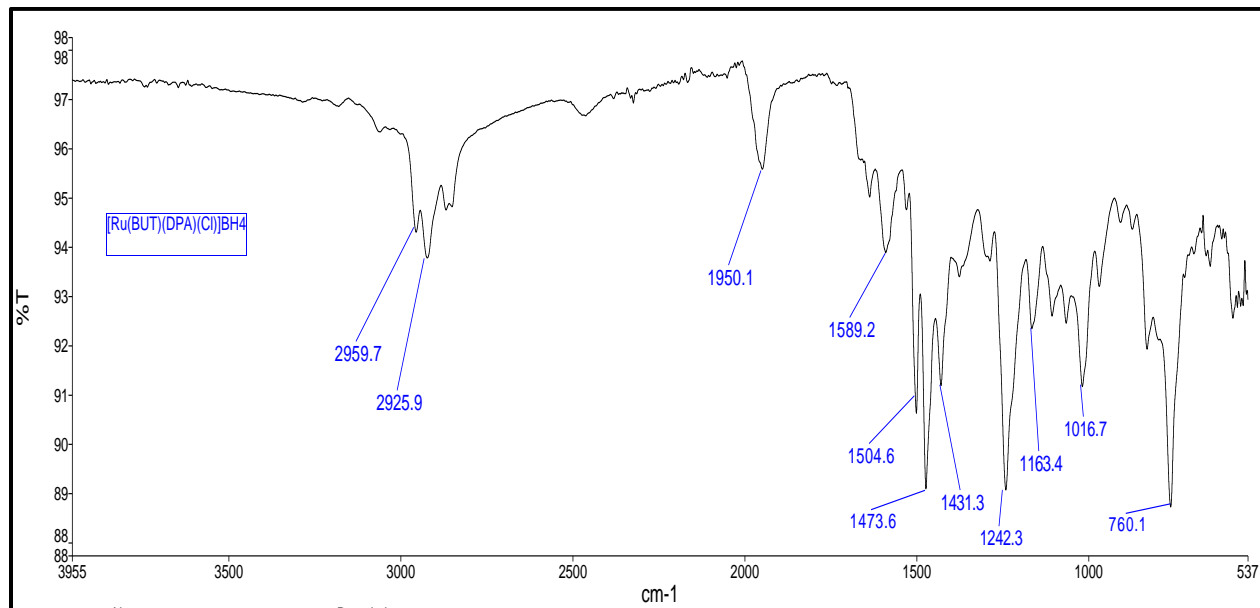


Figure 7: FTIR Spectrum of complex 3

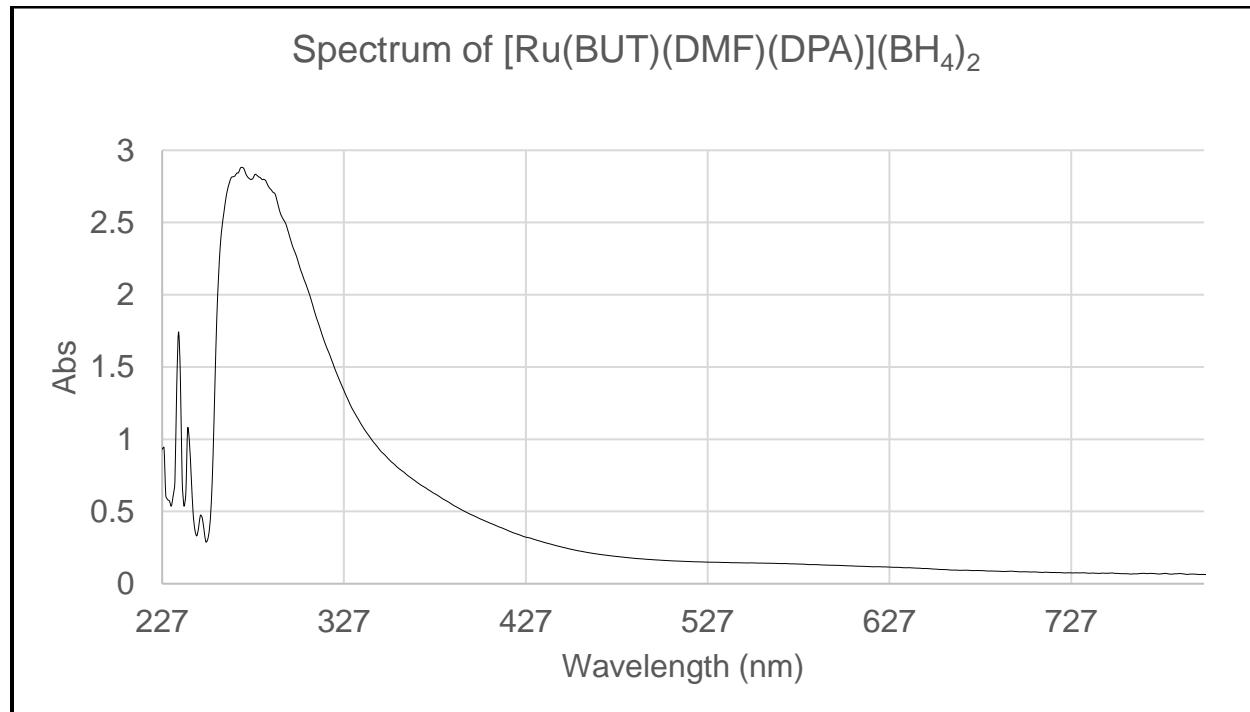


Figure 8: UV/Vis Spectrum of complex 3

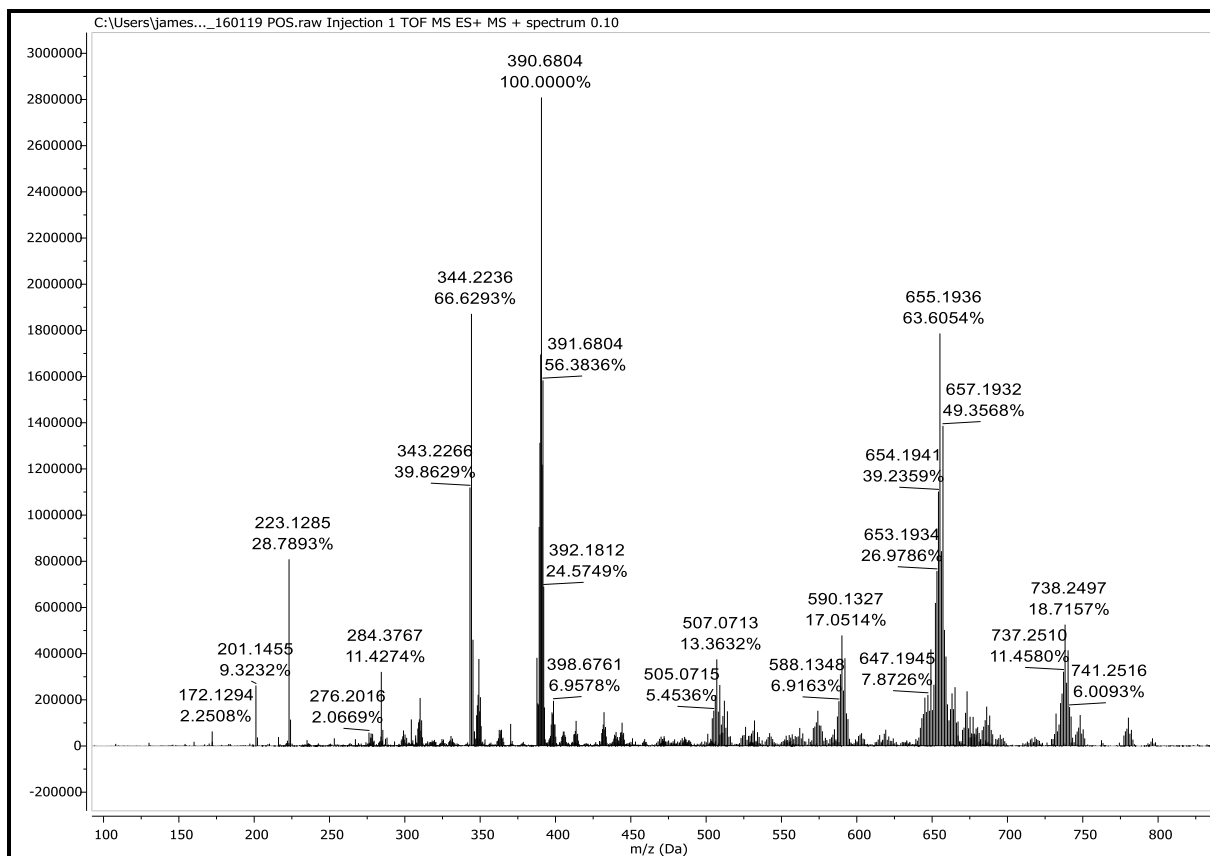


Figure 9: HRESI-MS spectrum of complex 3

#### 4. [Ru(BUT)(Cl)<sub>3</sub>] 4 Supplementary Material

Yield: 1.9 g, 72.0 %. IR ( $\nu_{\max}$  / $\text{cm}^{-1}$ ) (C-H) 2958.7, (C=C) 1503.8, (C-O) 1249.3, (Ar-N) 1438.3. UV-Vis (DMF;  $\lambda_{\max}$  [nm]): 271, 380, 596. HRESI-MS [M+K]  $m/z$  593.1459 (calcd for  $\text{C}_{22}\text{H}_{25}\text{Cl}_3\text{N}_3\text{OKRu}$  593.0107)

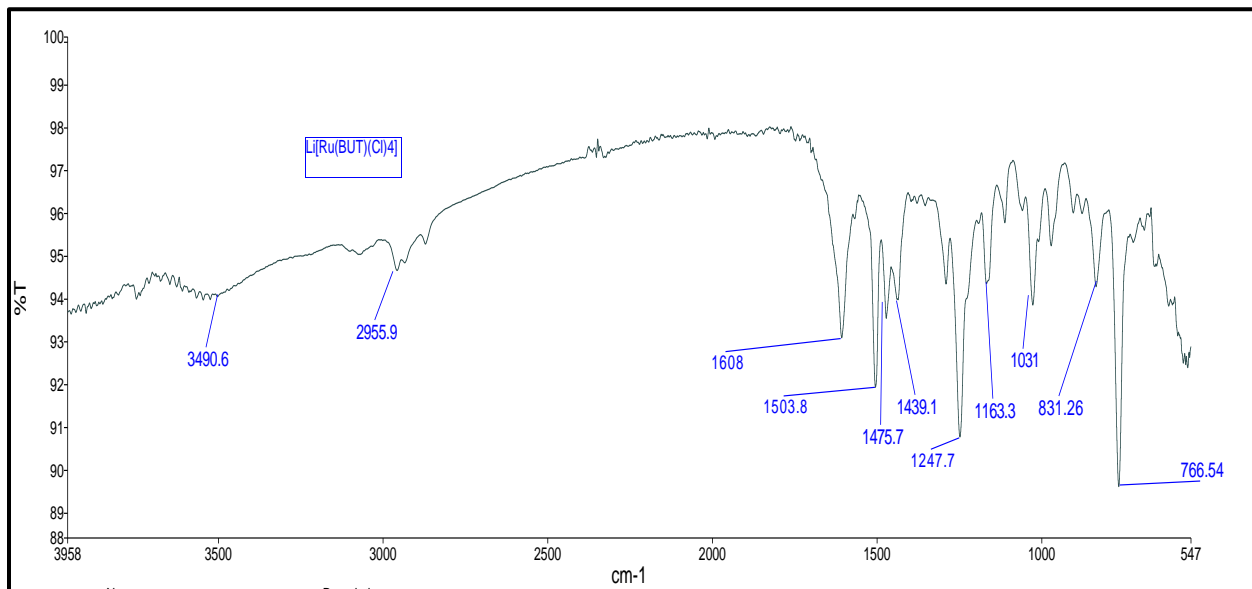


Figure 10: FTIR Spectrum of complex 4

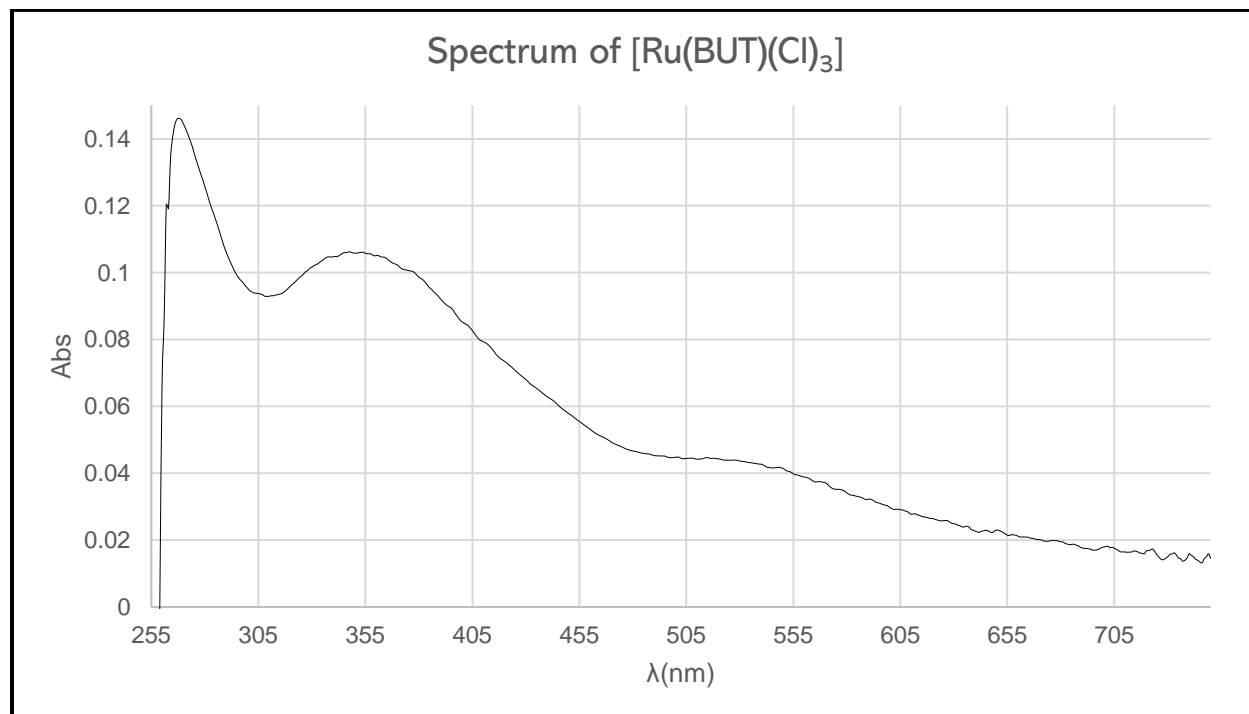


Figure 11: UV/Vis Spectrum of complex 4



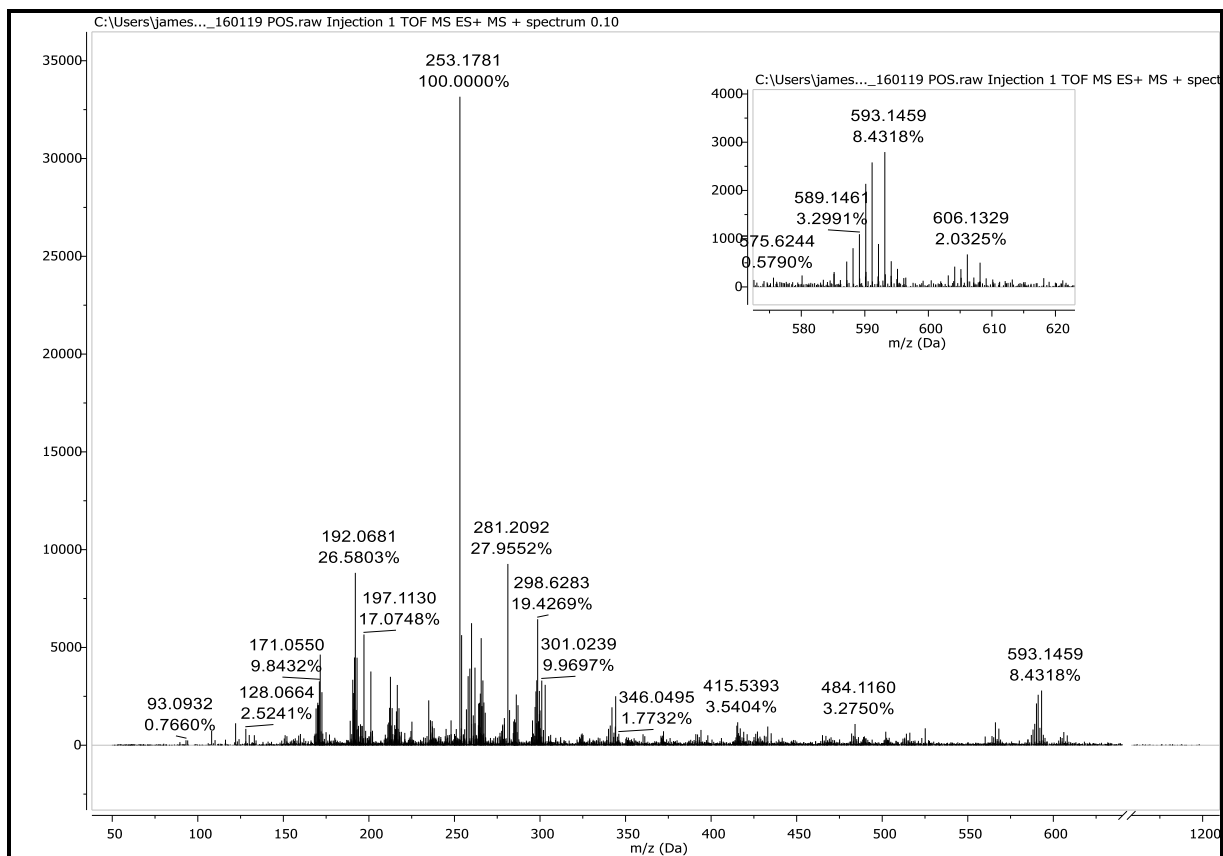


Figure 12: HRESI-MS spectrum of complex 4