

## Supplementary information

# Synthesis, Characterization and *In Vitro* Cytotoxicity of Platinum(II) Complexes Bearing Chiral Tetradentate Salicylaldimine Ligands

Quang Trung Nguyen\*<sup>1,2</sup>, Phuong Nam Pham Thi<sup>1</sup>, Van Tuyen Nguyen<sup>1,2</sup>

<sup>1</sup>Institute of Chemistry, Vietnam Academy of Science and Technology

<sup>2</sup>Graduate School of Science and Technology

18 Hoang Quoc Viet, Cau Giay, Hanoi, Vietnam

\*Corresponding author e-mail address: [trungquang\\_cnhh@yahoo.com](mailto:trungquang_cnhh@yahoo.com)

## Table of Contents

I. Supplementary materials S1: The spectral data of ligands .....	2
I.1. The spectral data of ligands ( <i>R</i> )L1H <sub>2</sub> and ( <i>S</i> )L1H <sub>2</sub> .....	2
I.2. The spectral data of ligands ( <i>R</i> )L2H <sub>2</sub> and ( <i>S</i> )L2H <sub>2</sub> .....	6
I.3. The spectral data of ligands ( <i>R</i> )L3H <sub>2</sub> and ( <i>S</i> )L3H <sub>2</sub> .....	10
I.4. The spectral data of ligands ( <i>R</i> )L4H <sub>2</sub> and ( <i>S</i> )L4H <sub>2</sub> .....	14
I.5. The spectral data of ligands ( <i>R</i> )L5H <sub>2</sub> and ( <i>S</i> )L5H <sub>2</sub> .....	18
I.6. The spectral data of ligands ( <i>R</i> )L6H <sub>2</sub> and ( <i>S</i> )L6H <sub>2</sub> .....	22
II. Supplementary materials S2: The spectral data of Pt(II) complexes.....	26
II.1. The spectral data of complexes [Pt( <i>R</i> )(L1)] and [Pt( <i>S</i> )(L1)].....	26
II.2. The spectral data of complexes [Pt( <i>R</i> )(L2)] and [Pt( <i>S</i> )(L2)].....	31
II.3. The spectral data of complexes [Pt( <i>R</i> )(L3)] and [Pt( <i>S</i> )(L3)].....	36
II.4. The spectral data of complexes [Pt( <i>R</i> )(L4)] and [Pt( <i>S</i> )(L4)].....	41
II.5. The spectral data of complexes [Pt( <i>R</i> )(L5)] and [Pt( <i>S</i> )(L5)].....	46
II.6. The spectral data of complexes [Pt( <i>R</i> )(L6)] and [Pt( <i>S</i> )(L6)].....	51

# I. Supplementary Materials S1: The spectral data of ligands

## I.1. The spectral data of ligand (R)L1H<sub>2</sub> and (S)L1H<sub>2</sub>

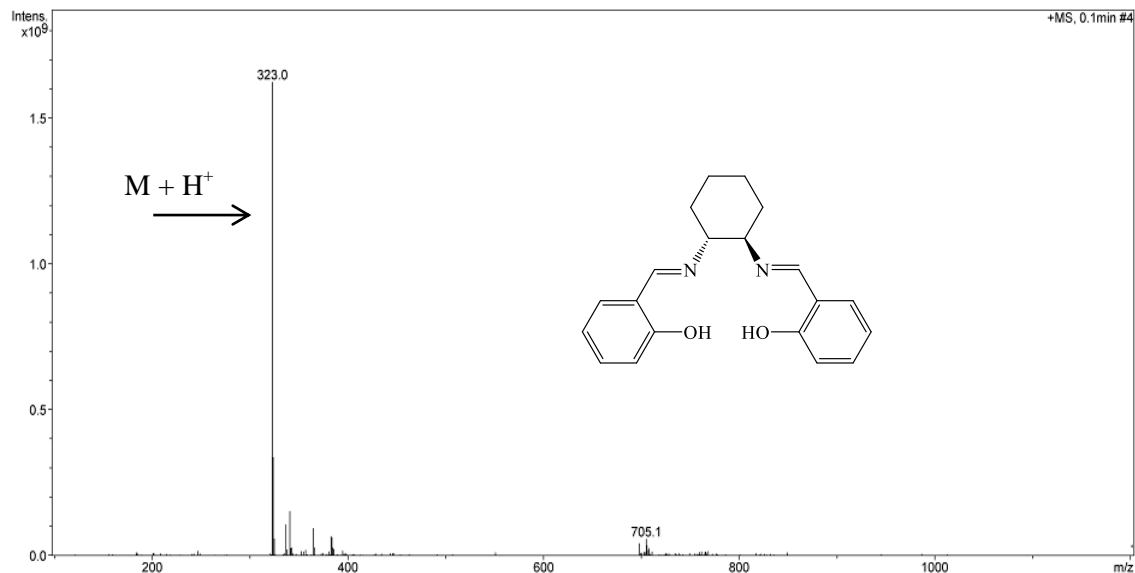


Figure S1.1Ra. The ESI-MS spectrum of ligand (R)L1H<sub>2</sub>

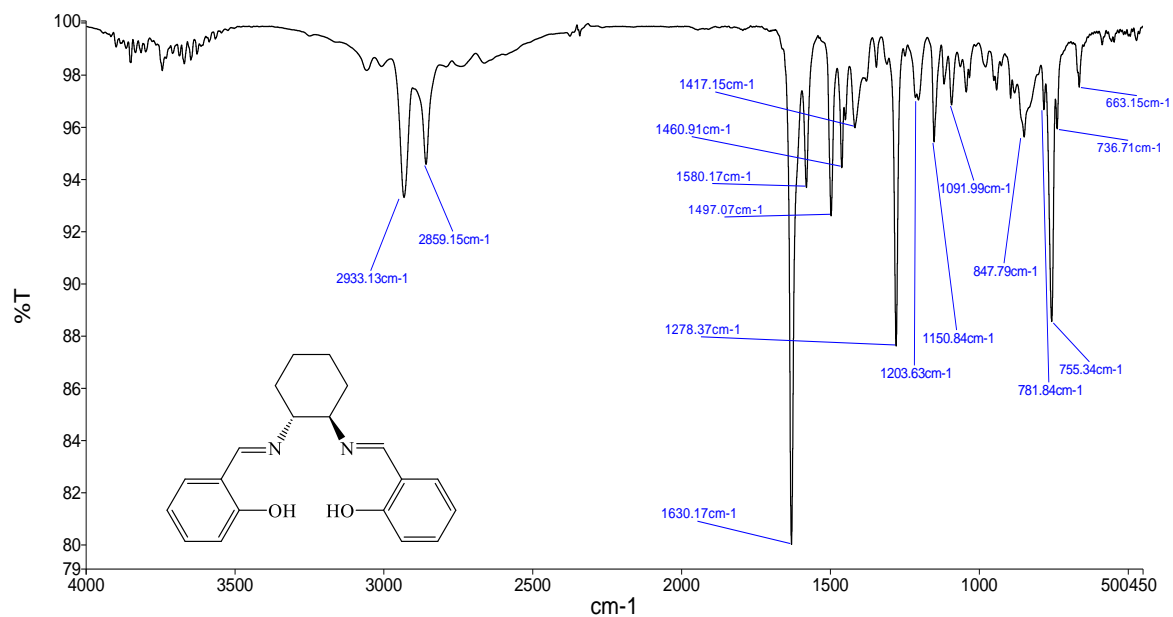


Figure S1.1Rb. The IR spectrum of ligand (R)L1H<sub>2</sub>

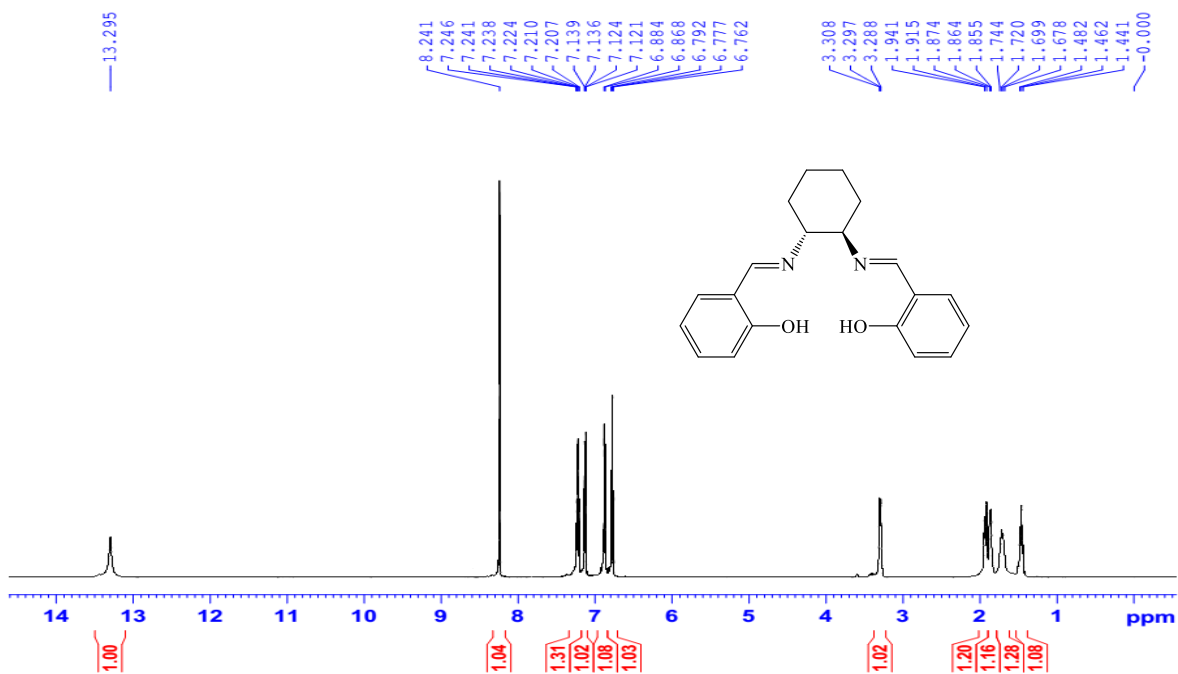


Figure S1.1Rc. The <sup>1</sup>H-NMR spectrum of ligand (R)L1H<sub>2</sub>

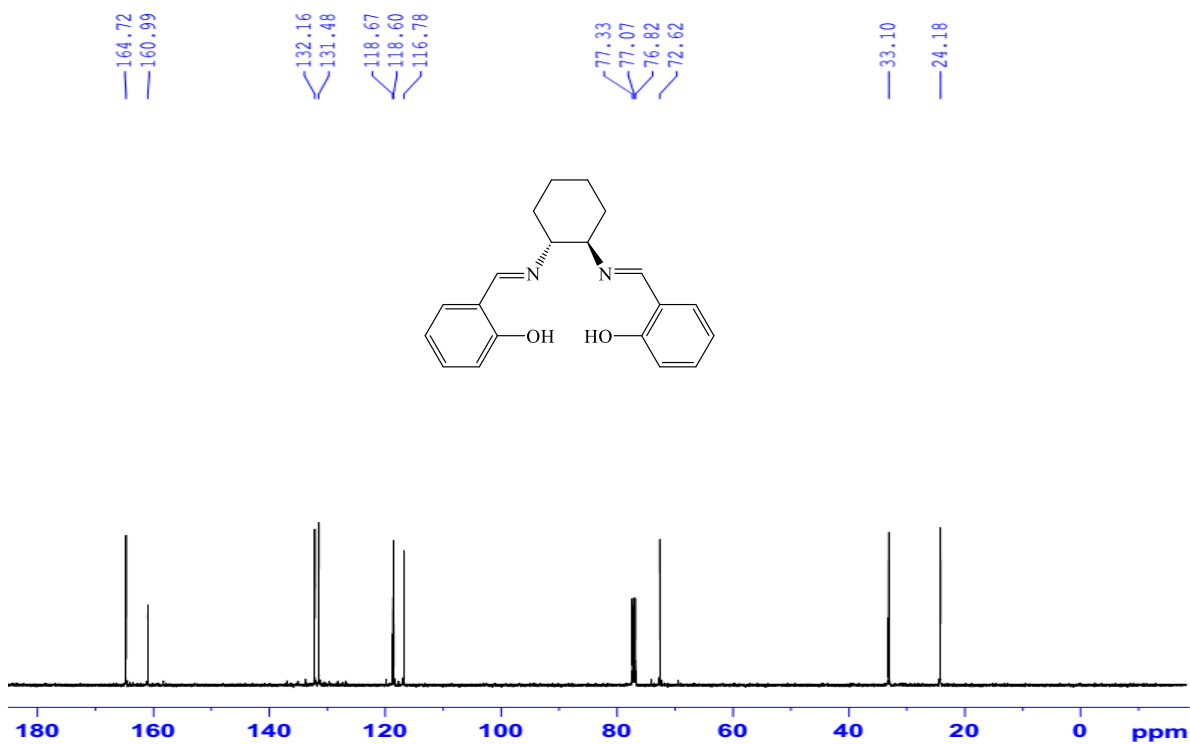
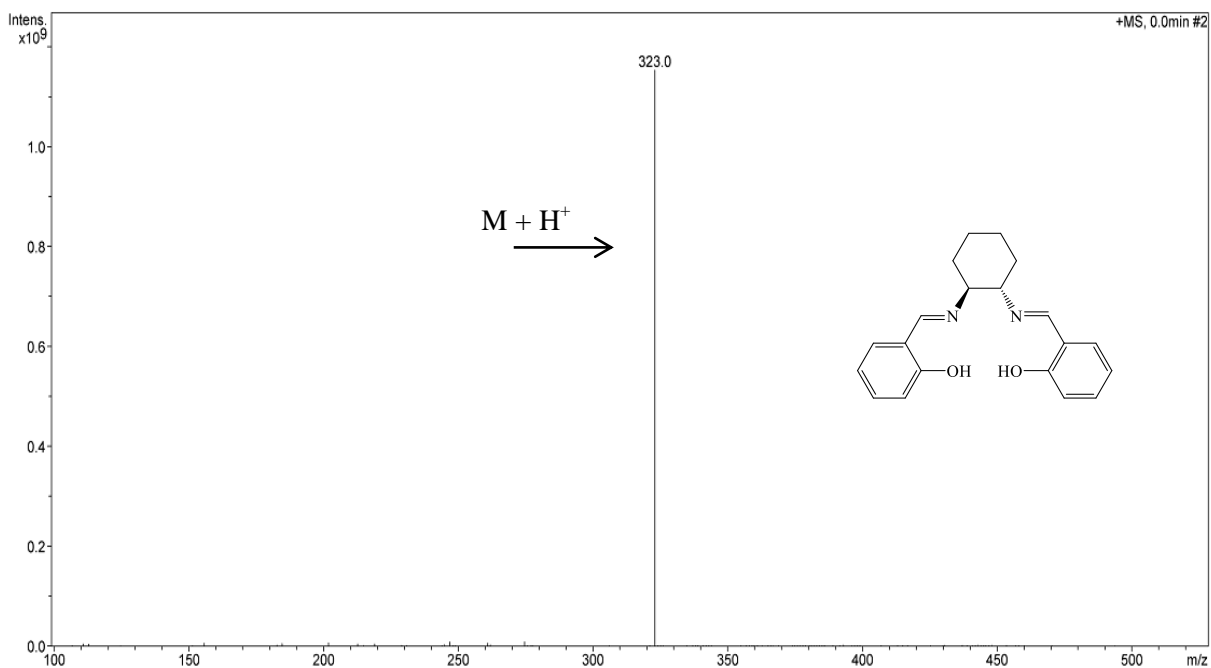
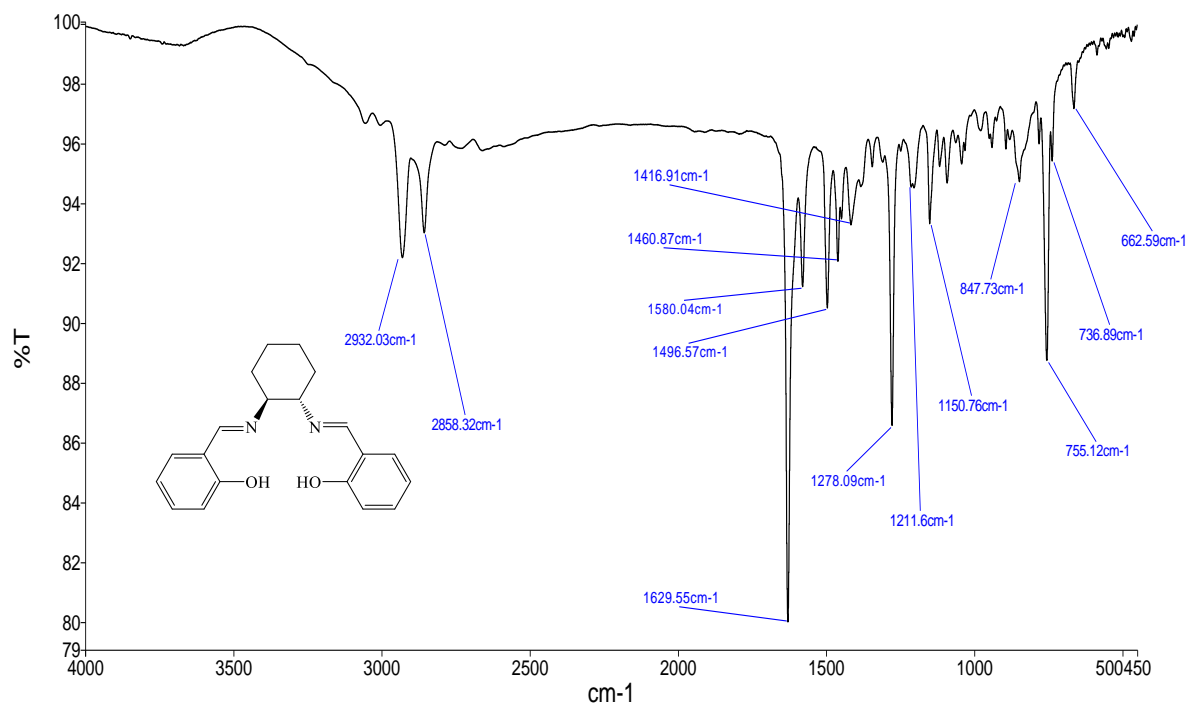


Figure S1.1Rd. The <sup>13</sup>C-NMR spectrum of ligand (R)L1H<sub>2</sub>



**Figure S1.1Sa.** The ESI-MS spectrum of ligand (S)L1H<sub>2</sub>



**Figure S1.1Sb.** The IR spectrum of ligand (S)L1H<sub>2</sub>

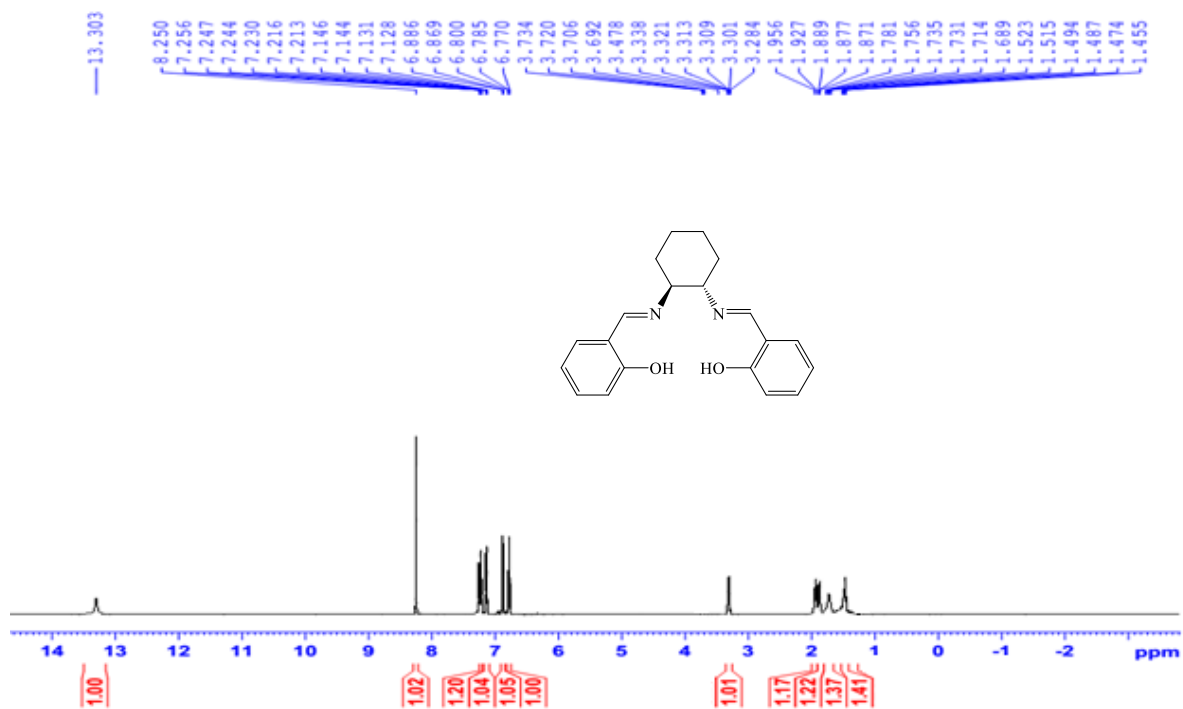


Figure S1.1Sc. The <sup>1</sup>H-NMR spectrum of ligand (S)L1H<sub>2</sub>

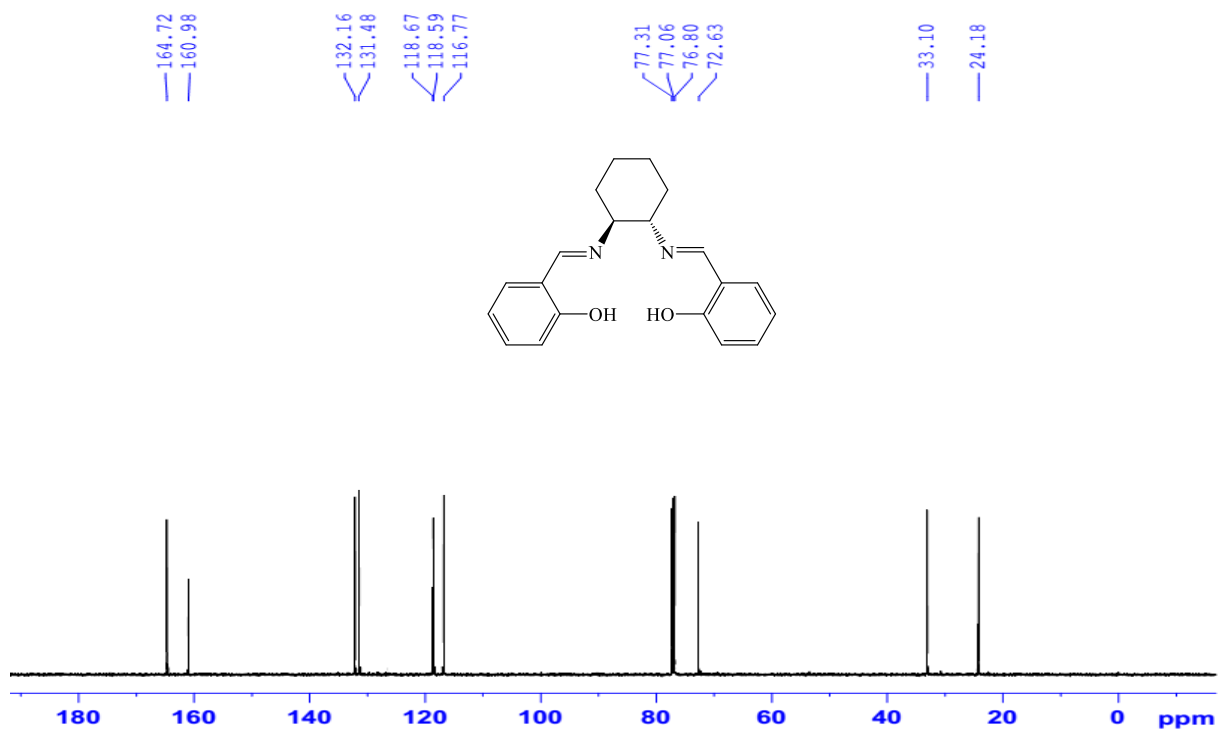


Figure S1.1Sd. The <sup>13</sup>C-NMR spectrum of ligand (S)L1H<sub>2</sub>

## I.2. The spectral data of ligand (*R*)L2H<sub>2</sub> and (*S*)L2H<sub>2</sub>

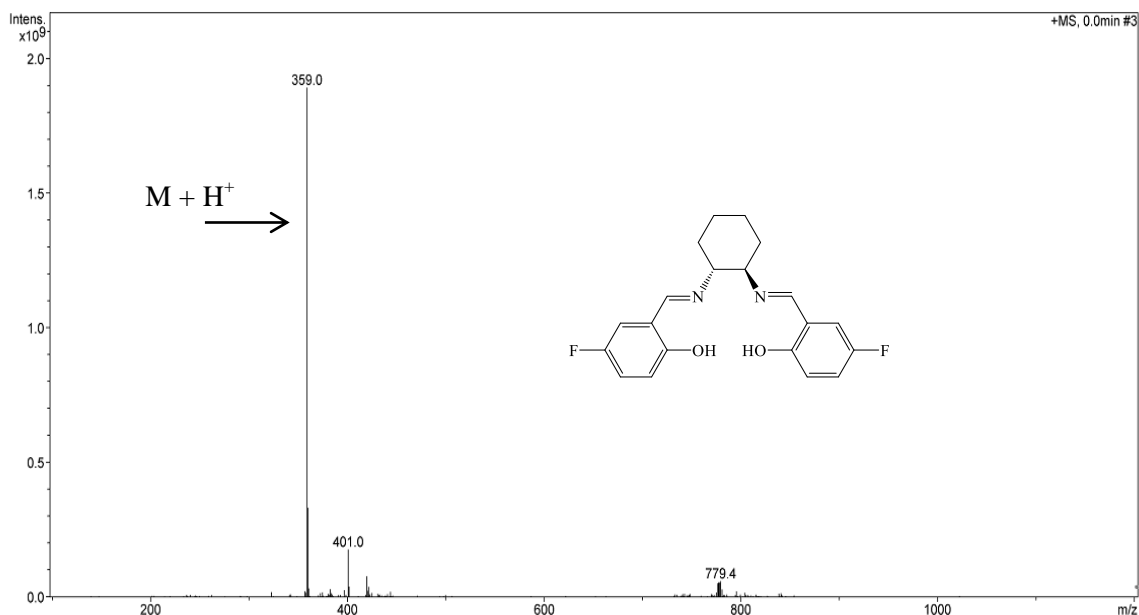


Figure S1.2Ra. The ESI-MS spectrum of ligand (*R*)L2H<sub>2</sub>

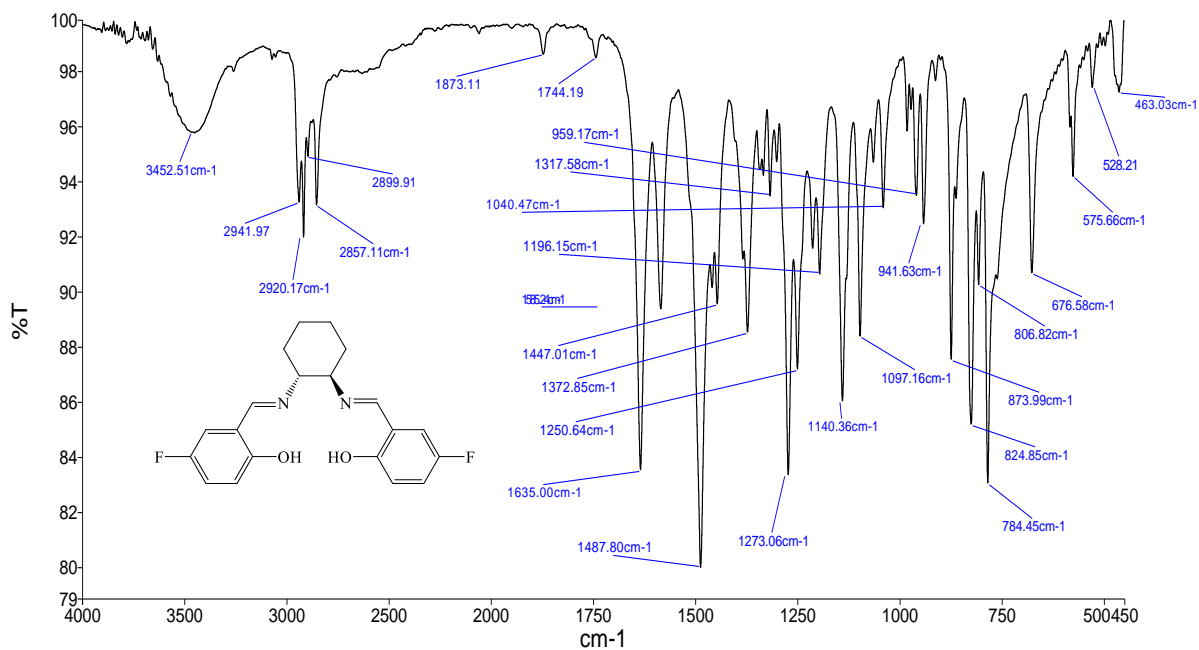


Figure S1.2Rb. The IR spectrum of ligand (*R*)L2H<sub>2</sub>

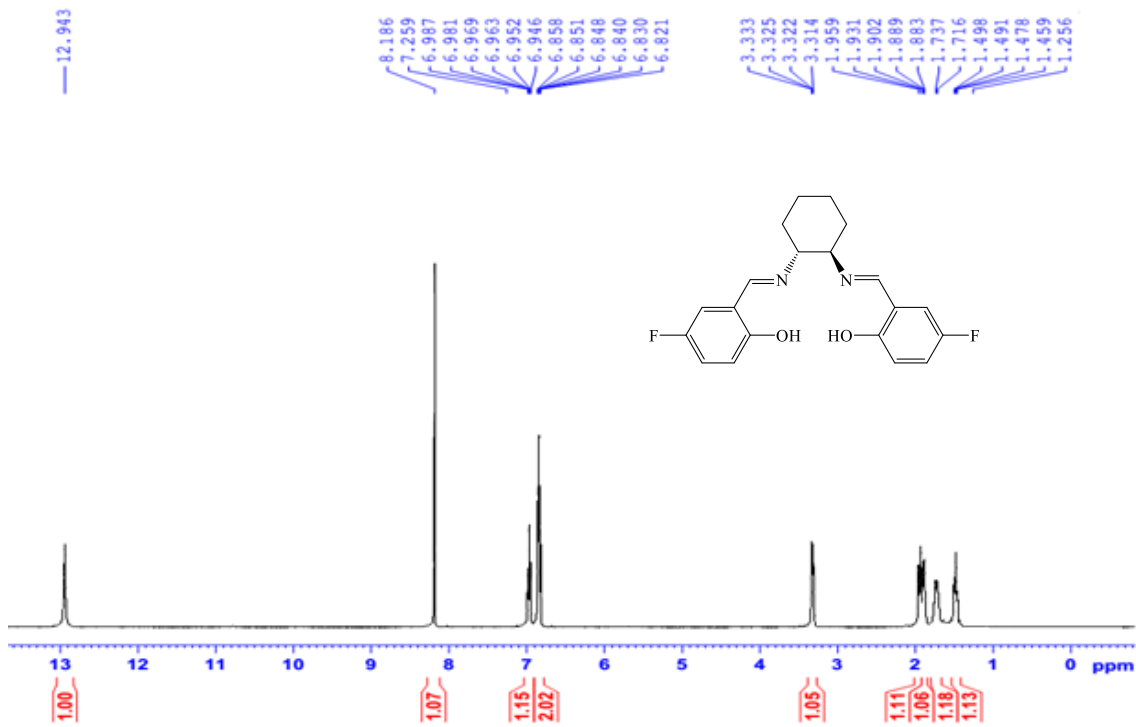


Figure S1.2Rc. The  $^1\text{H}$ -NMR spectrum of ligand (R)L2H<sub>2</sub>

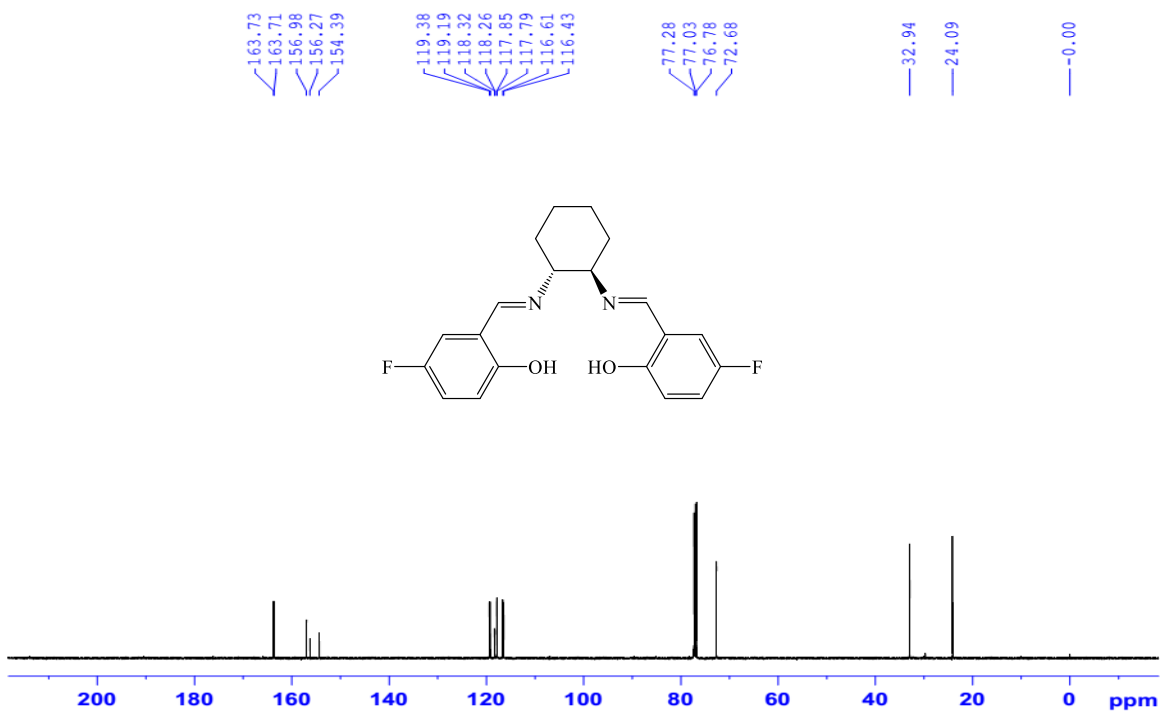
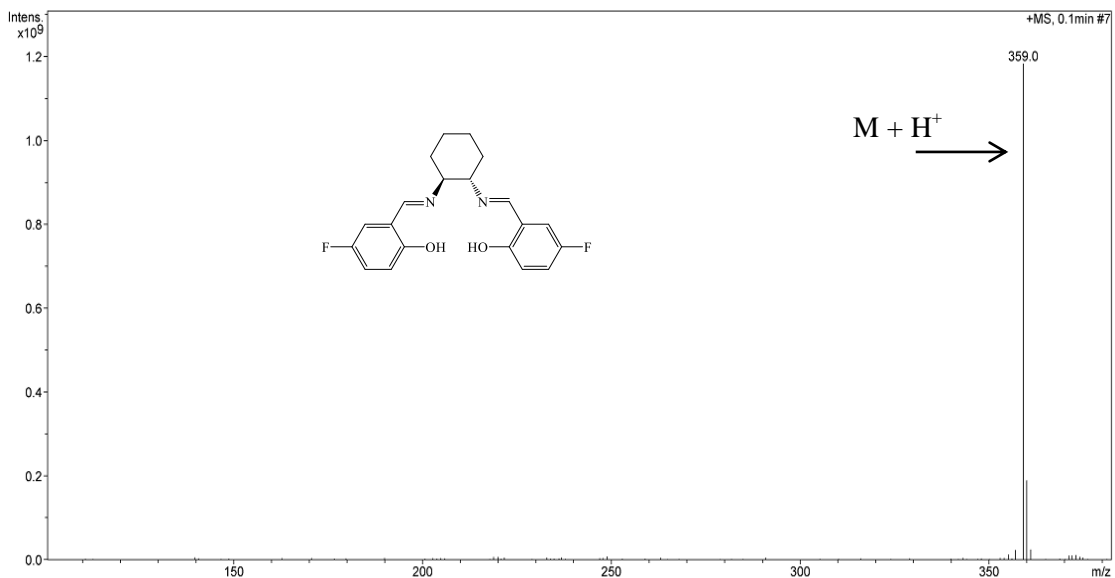
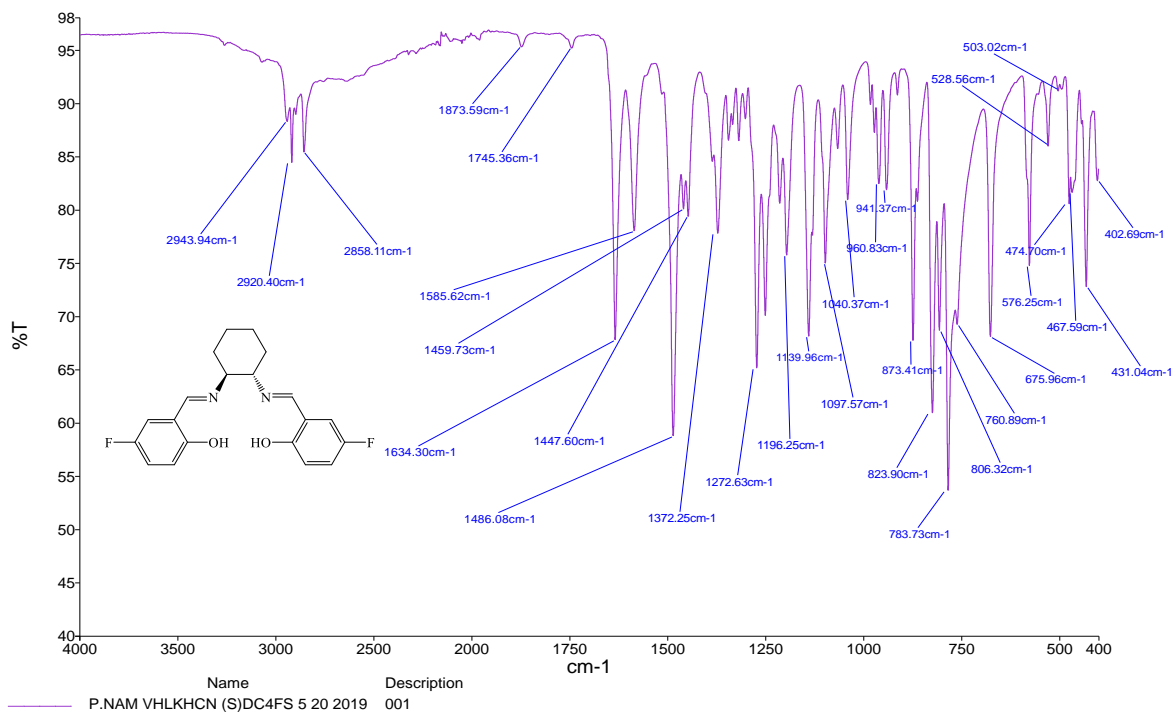


Figure S1.2Rd. The  $^{13}\text{C}$ -NMR spectrum of ligand (R)L2H<sub>2</sub>



**Figure S1.2Sa.** The ESI-MS spectrum of ligand (S)L2H<sub>2</sub>



**Figure S1.2Sb.** The IR spectrum of ligand (S)L2H<sub>2</sub>



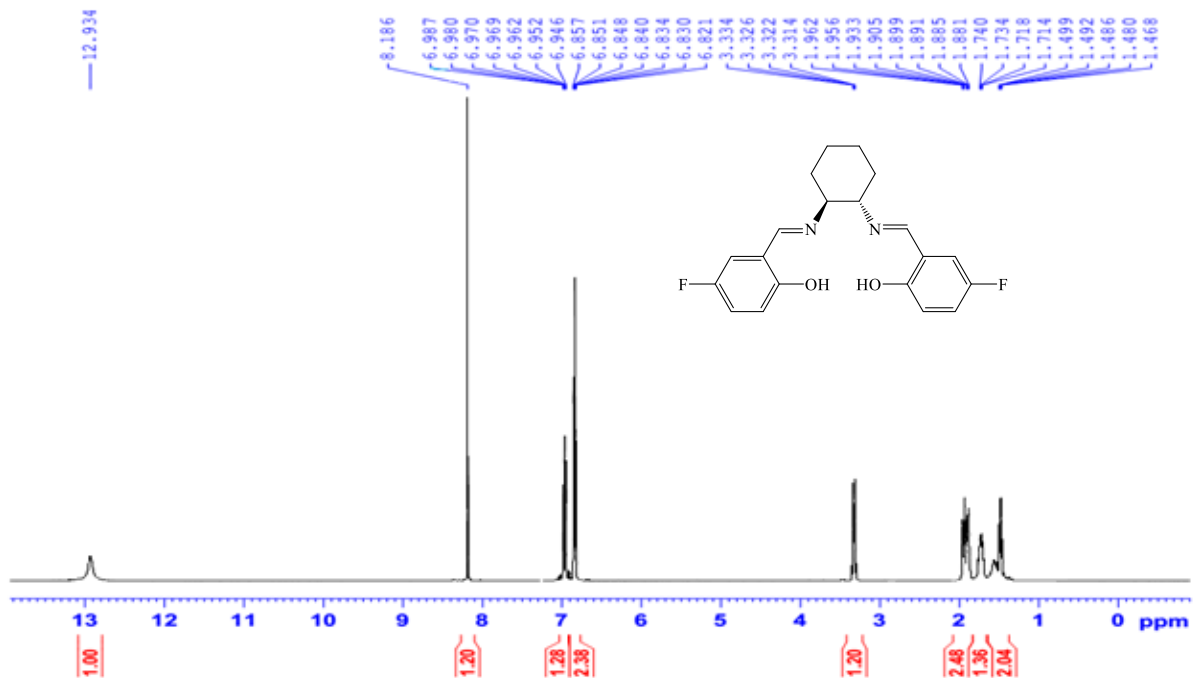


Figure S1.2Sc. The <sup>1</sup>H-NMR spectrum of ligand (S)L<sub>2</sub>H<sub>2</sub>

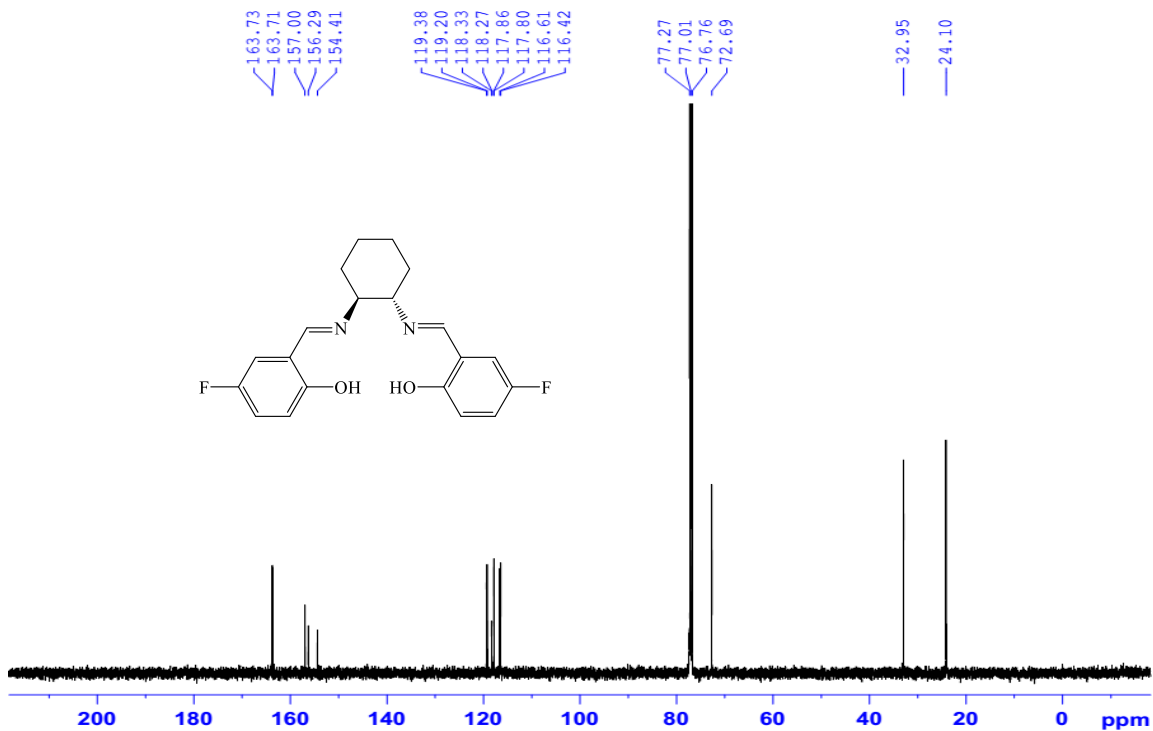


Figure S1.2Sd. The <sup>13</sup>C-NMR spectrum of ligand (S)L<sub>2</sub>H<sub>2</sub>

### II.3. The spectral data of ligand (*R*)L3H<sub>2</sub> and (*S*)L3H<sub>2</sub>

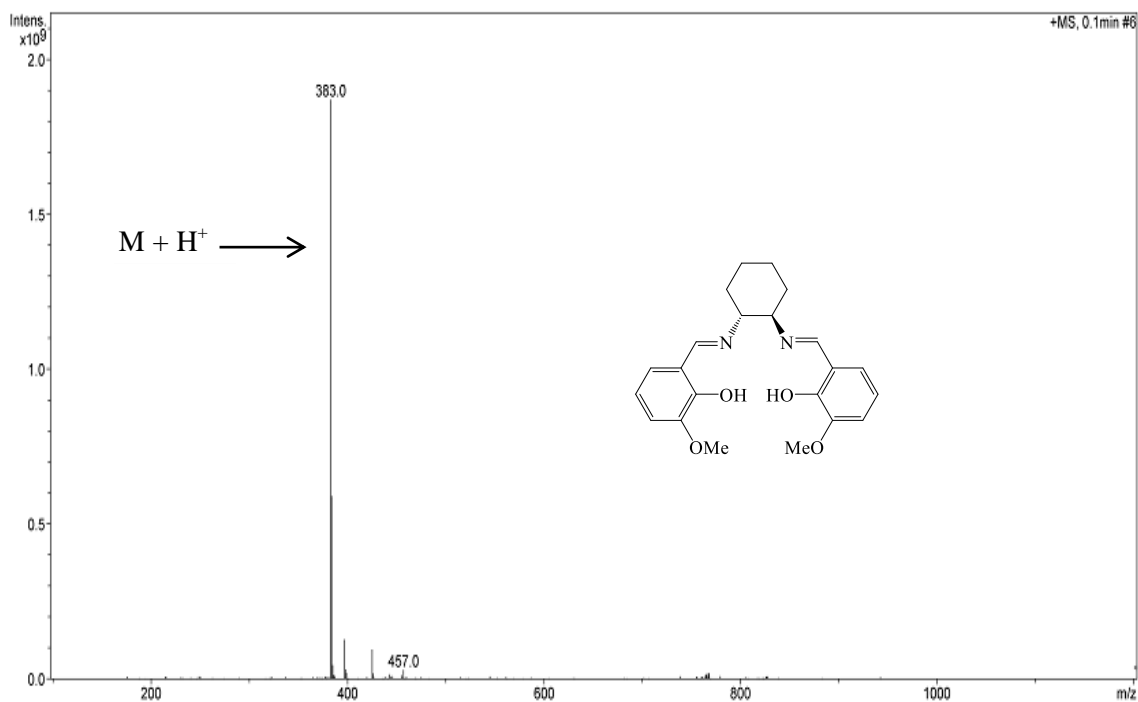


Figure S1.3Ra. The ESI-MS spectrum of ligand (*R*)L3H<sub>2</sub>

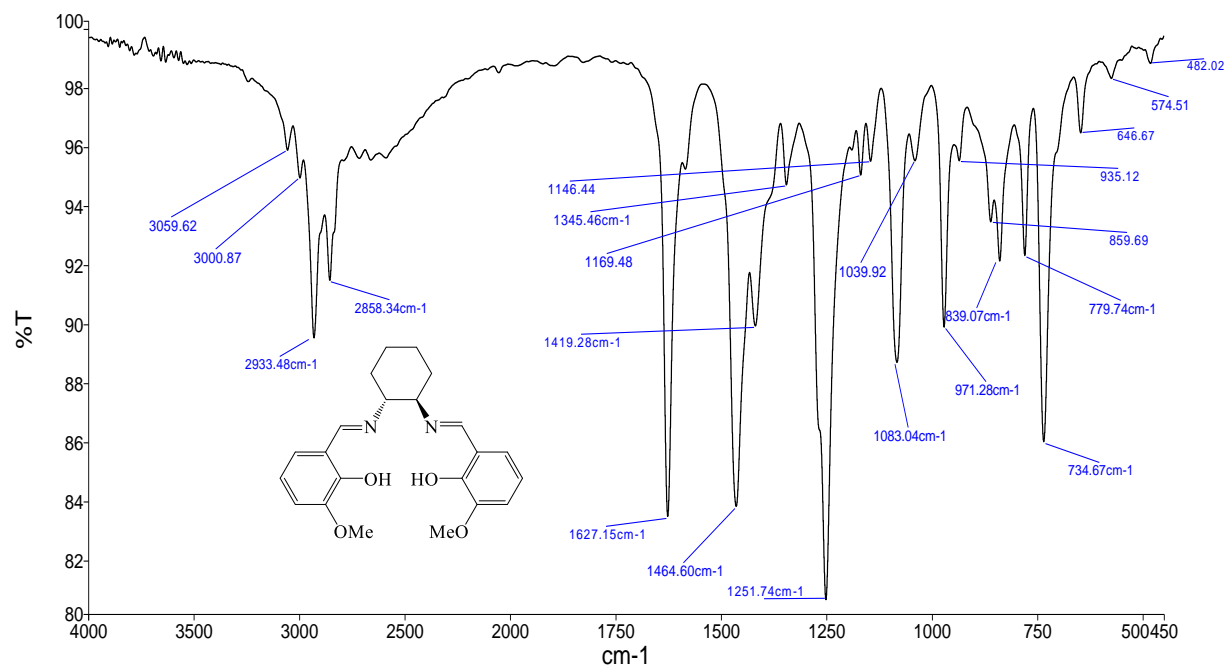


Figure S1.3Rb. The IR spectrum of ligand (*R*)L3H<sub>2</sub>

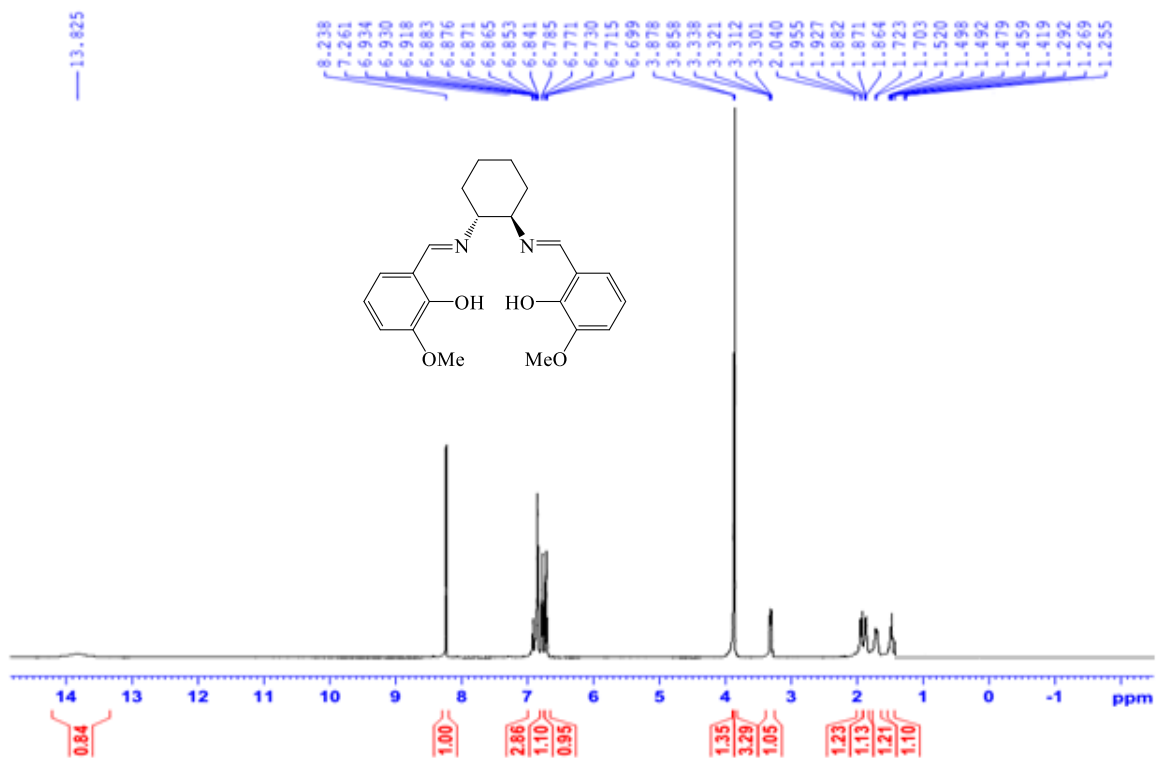


Figure S1.3Rc. The <sup>1</sup>H-NMR spectrum of ligand (R)L3H<sub>2</sub>

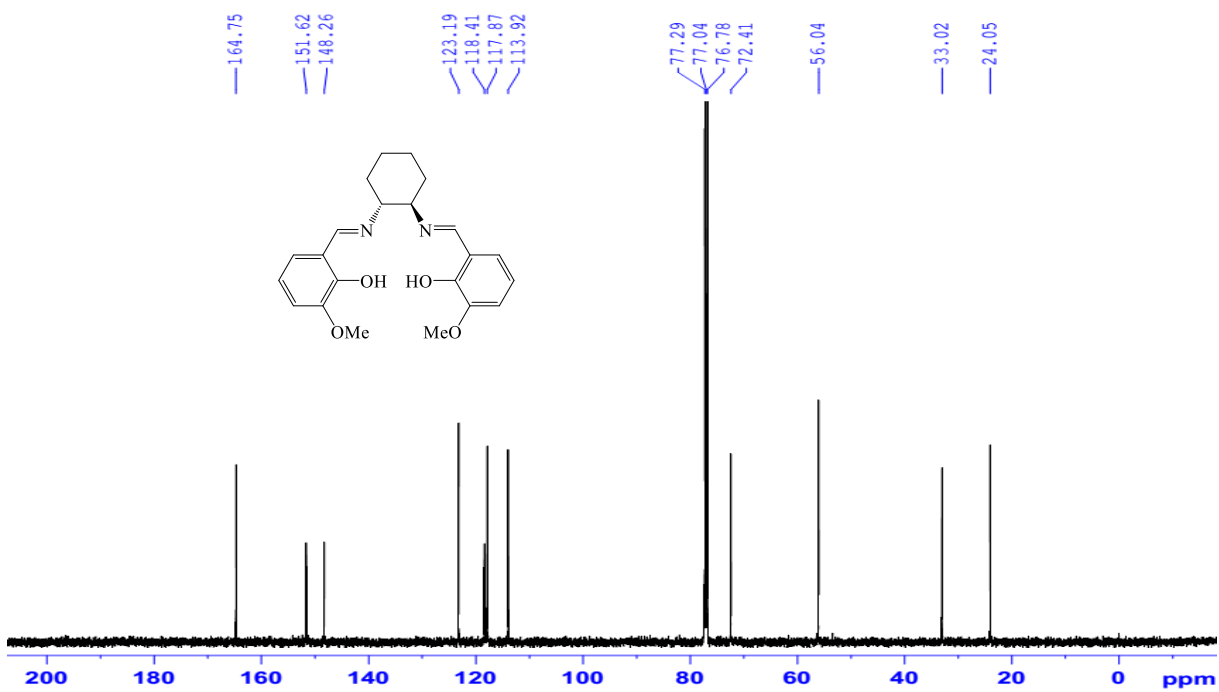
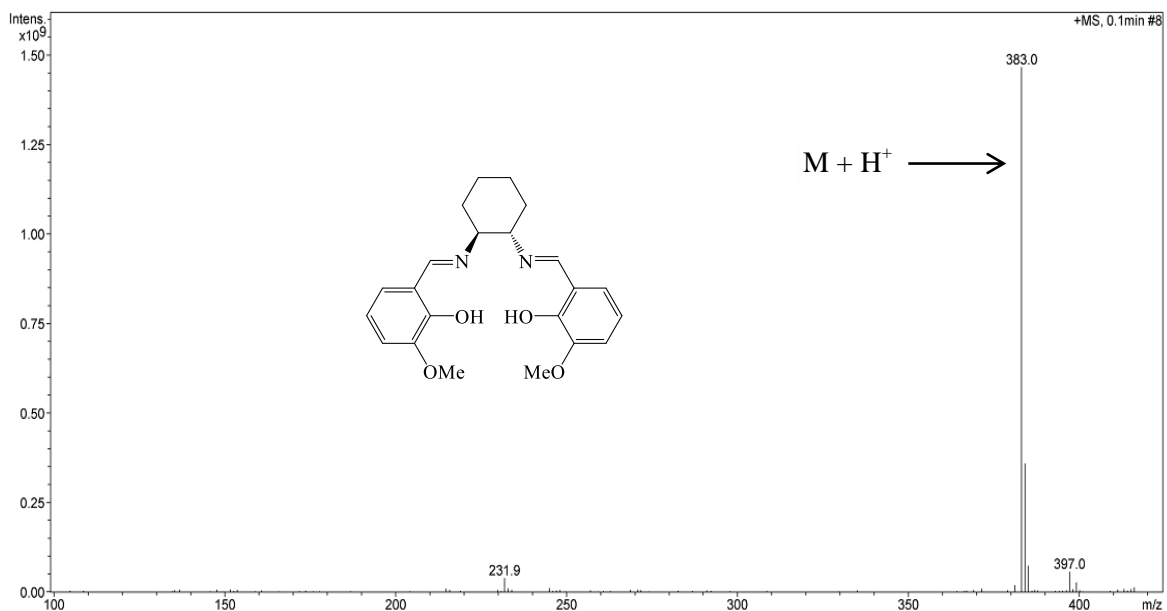
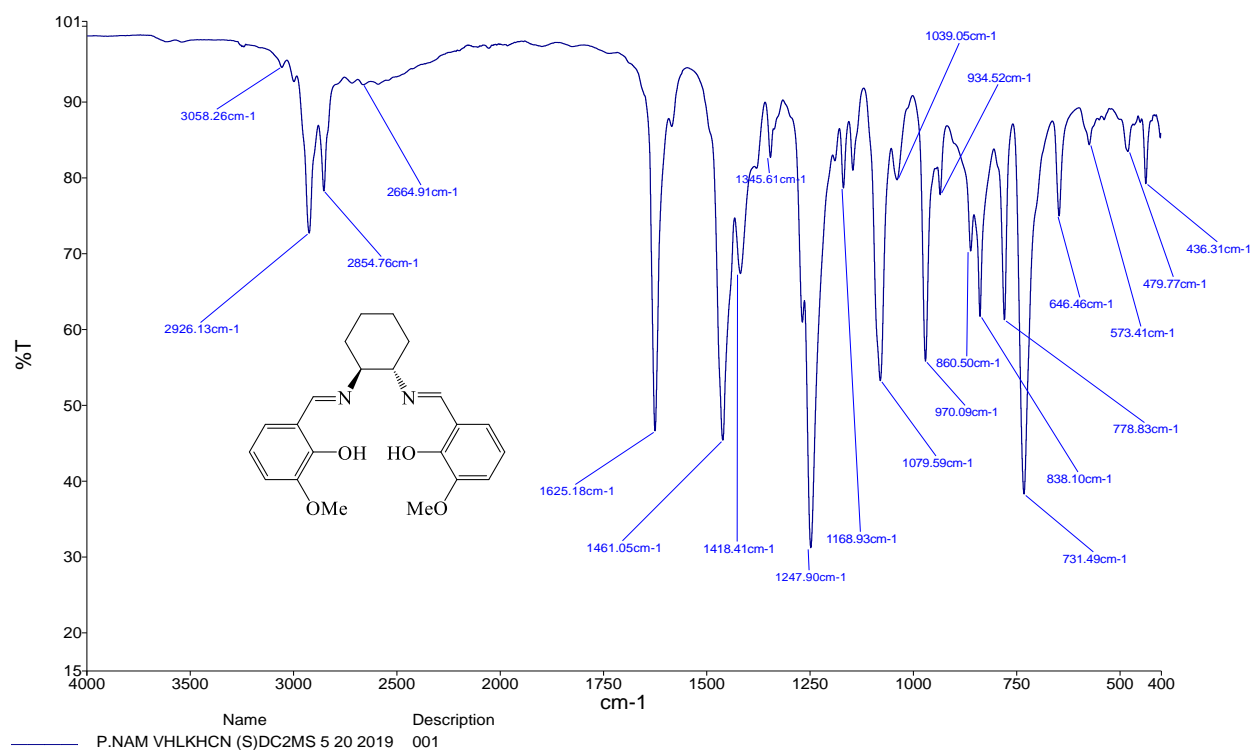


Figure S1.3Rd. The <sup>13</sup>C-NMR spectrum of ligand (R)L3H<sub>2</sub>



**Figure S1.3Sa.** The ESI-MS spectrum of ligand (S)L3H<sub>2</sub>



**Figure S1.3Sb.** The IR spectrum of ligand (S)L3H<sub>2</sub>

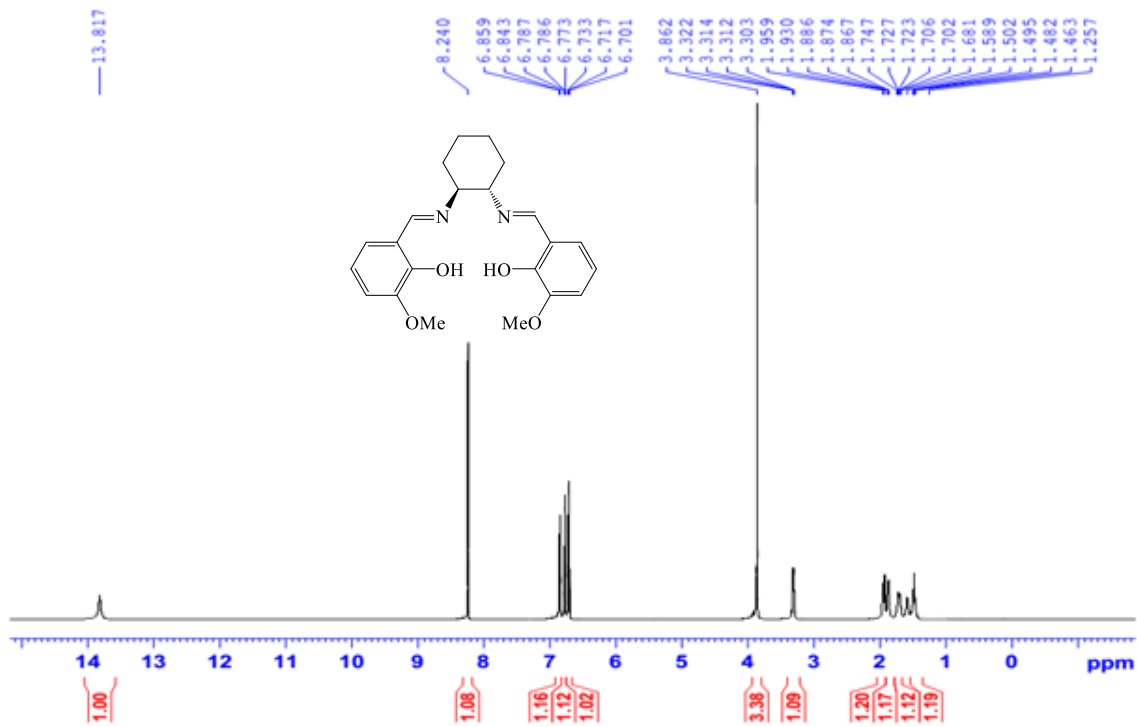


Figure S1.3Sc. The <sup>1</sup>H-NMR spectrum of ligand (S)L3H<sub>2</sub>

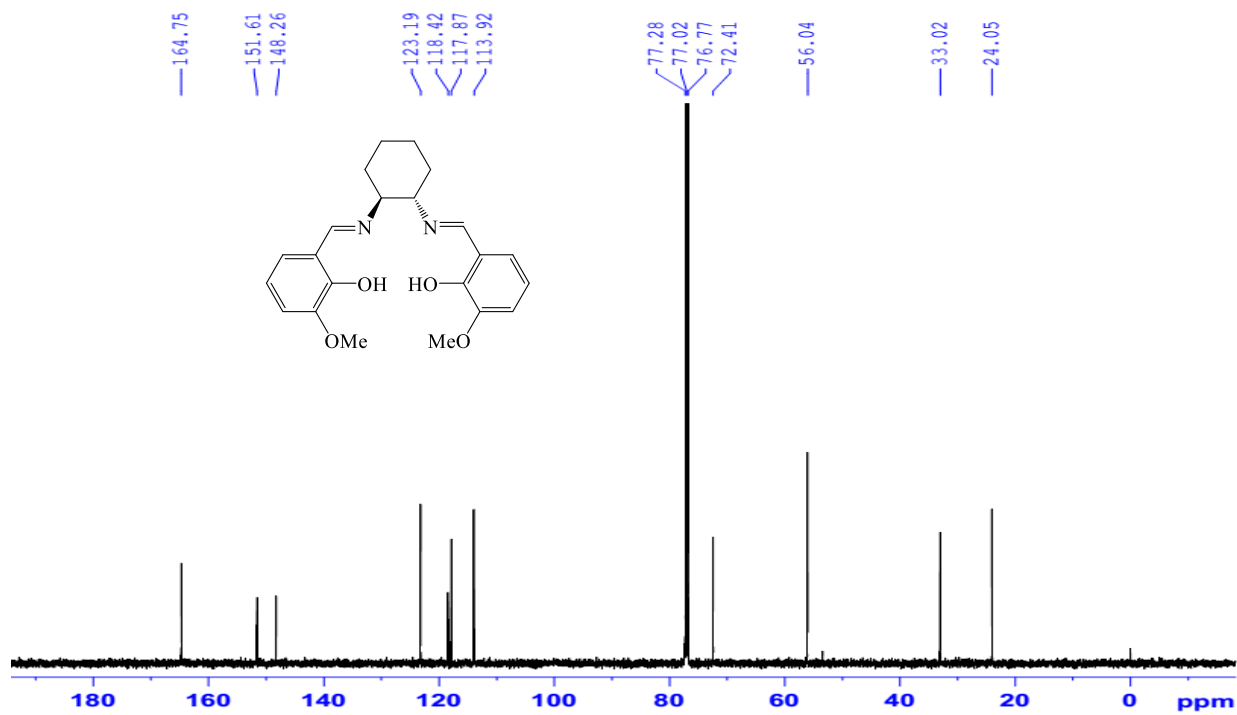


Figure S1.3Sd. The <sup>13</sup>C-NMR spectrum of ligand (S)L3H<sub>2</sub>

#### I.4. The spectral data of ligand (*R*)L4H<sub>2</sub> and (*S*)L4H<sub>2</sub>

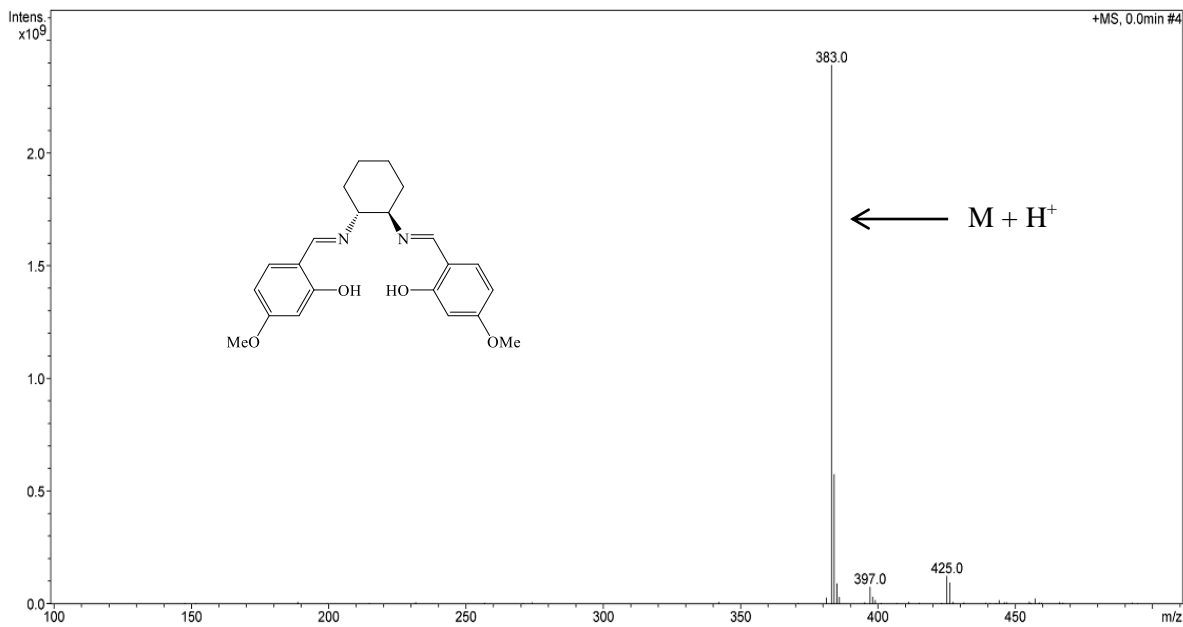


Figure S1.4Ra. The ESI-MS spectrum of ligand (*R*)L4H<sub>2</sub>

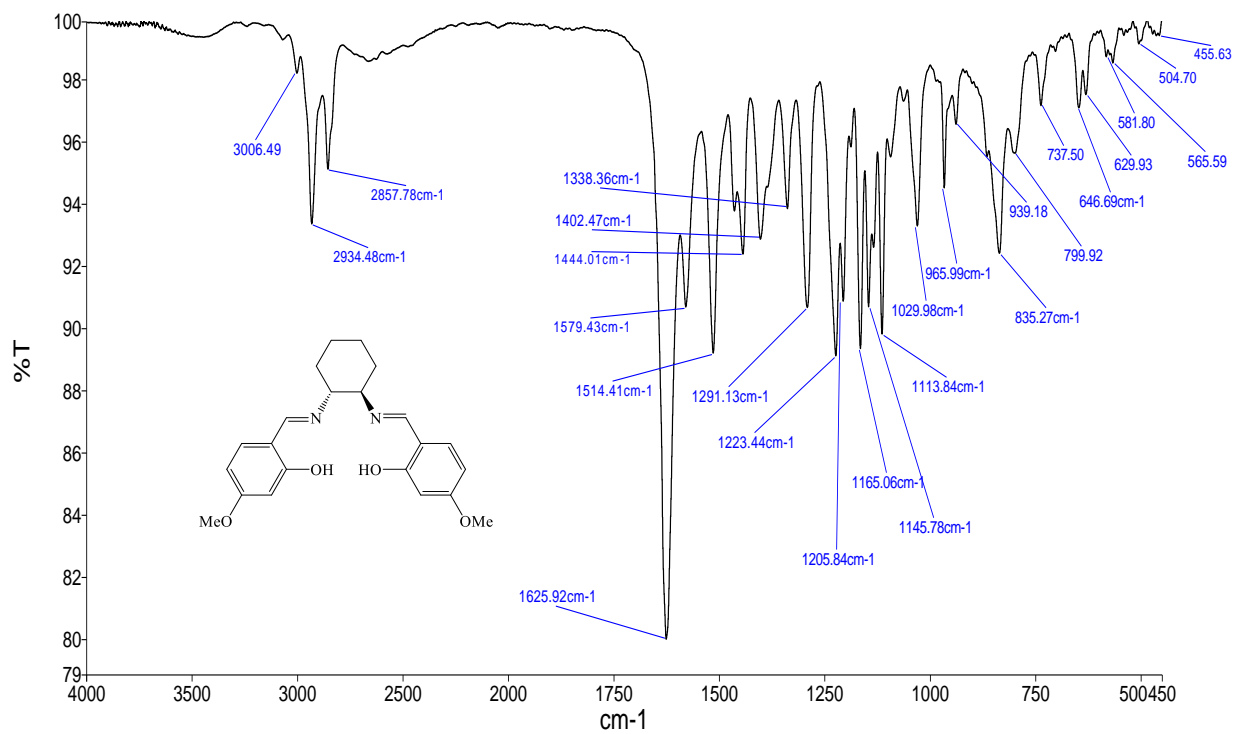


Figure S1.4Rb. The IR spectrum of ligand (*R*)L4H<sub>2</sub>

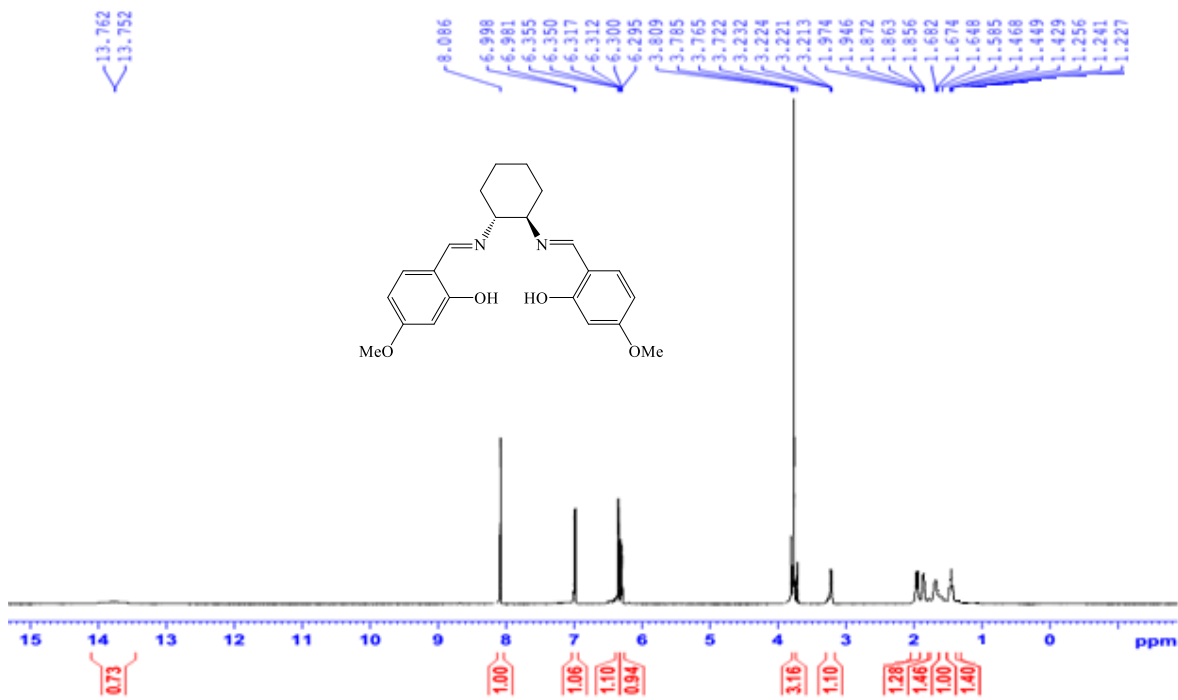


Figure S1.4Rc. The <sup>1</sup>H-NMR spectrum of ligand (R)L4H<sub>2</sub>

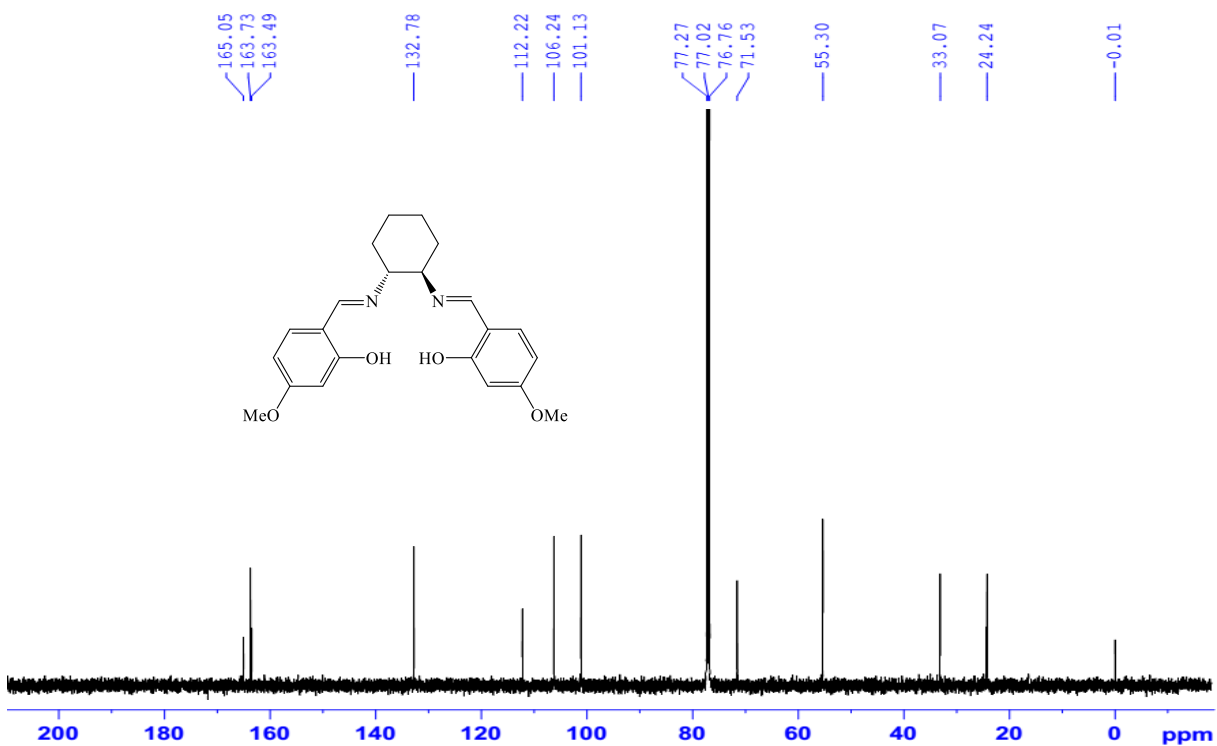
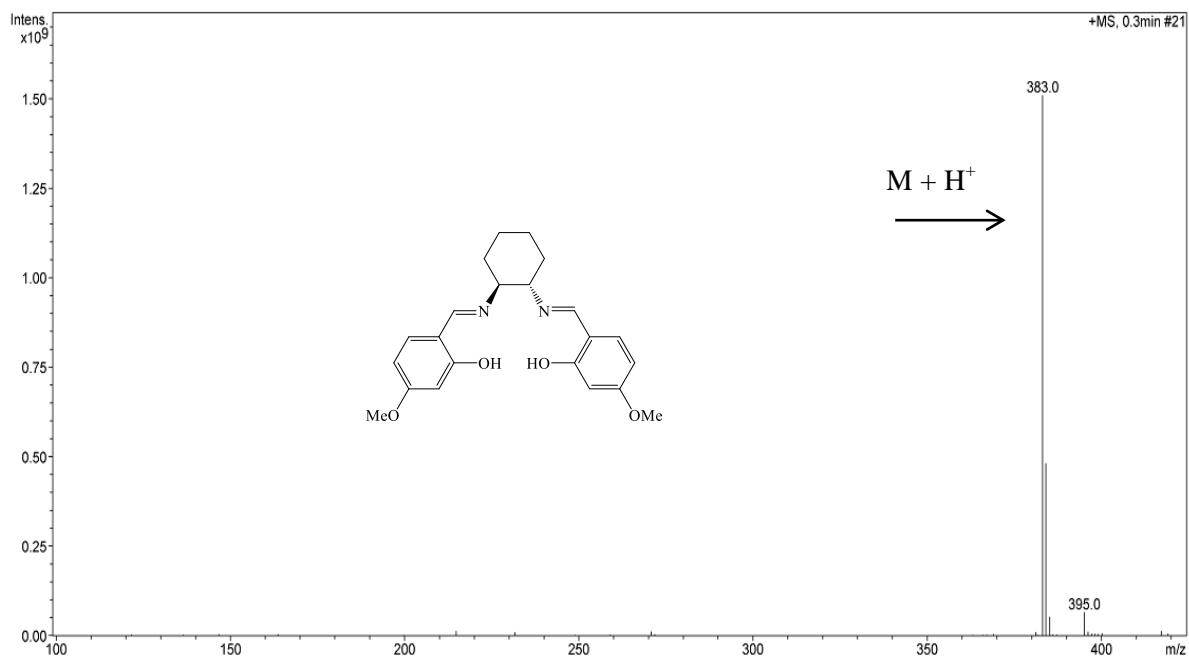
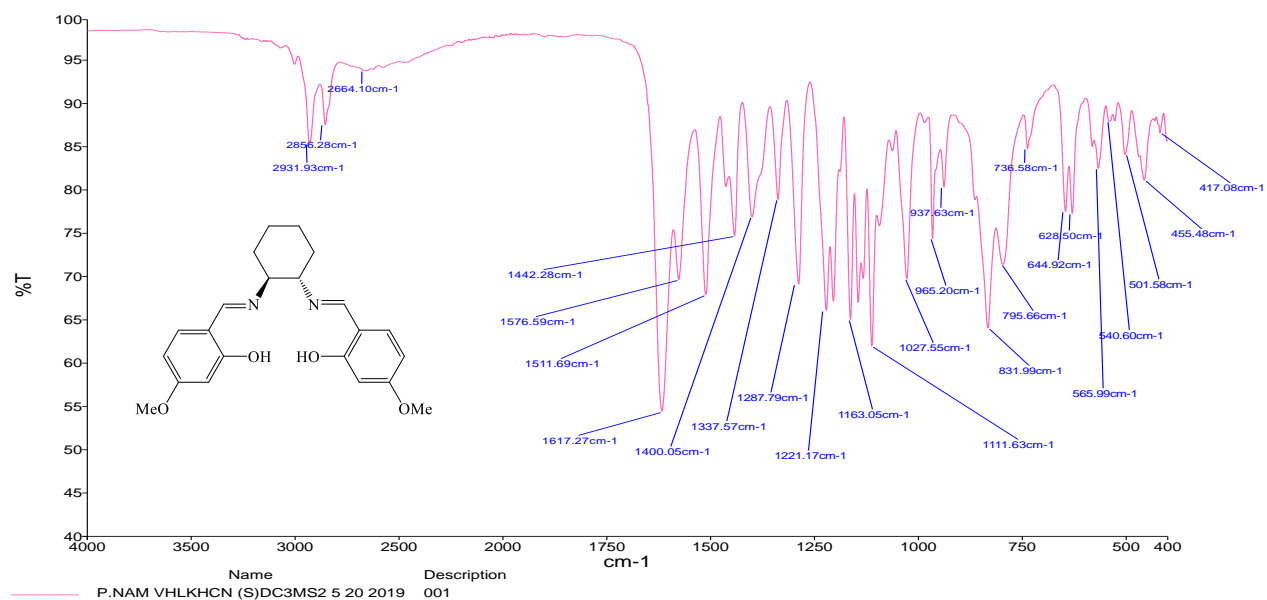


Figure S1.4Rd. The <sup>13</sup>C-NMR spectrum of ligand (R)L4H<sub>2</sub>



**Figure S1.4Sa.** The ESI-MS spectrum of ligand (S)L4H<sub>2</sub>



**Figure S1.4Sb.** The IR spectrum of ligand (S)L4H<sub>2</sub>



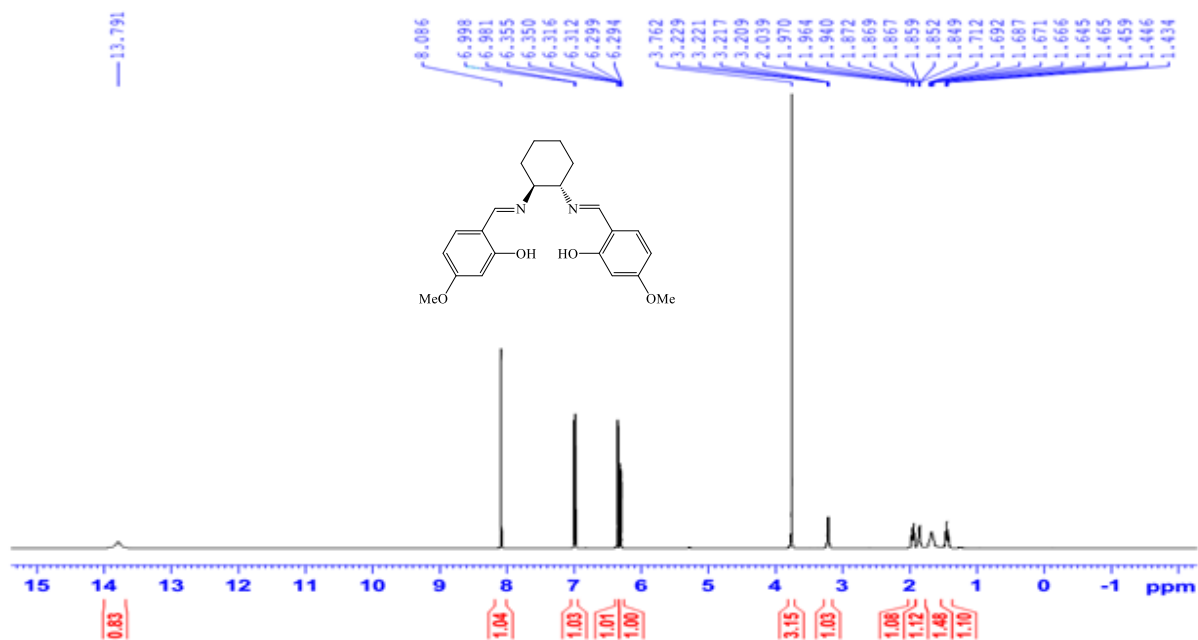


Figure S1.4Sc. The  $^1\text{H}$ -NMR spectrum of ligand (S)L4H<sub>2</sub>

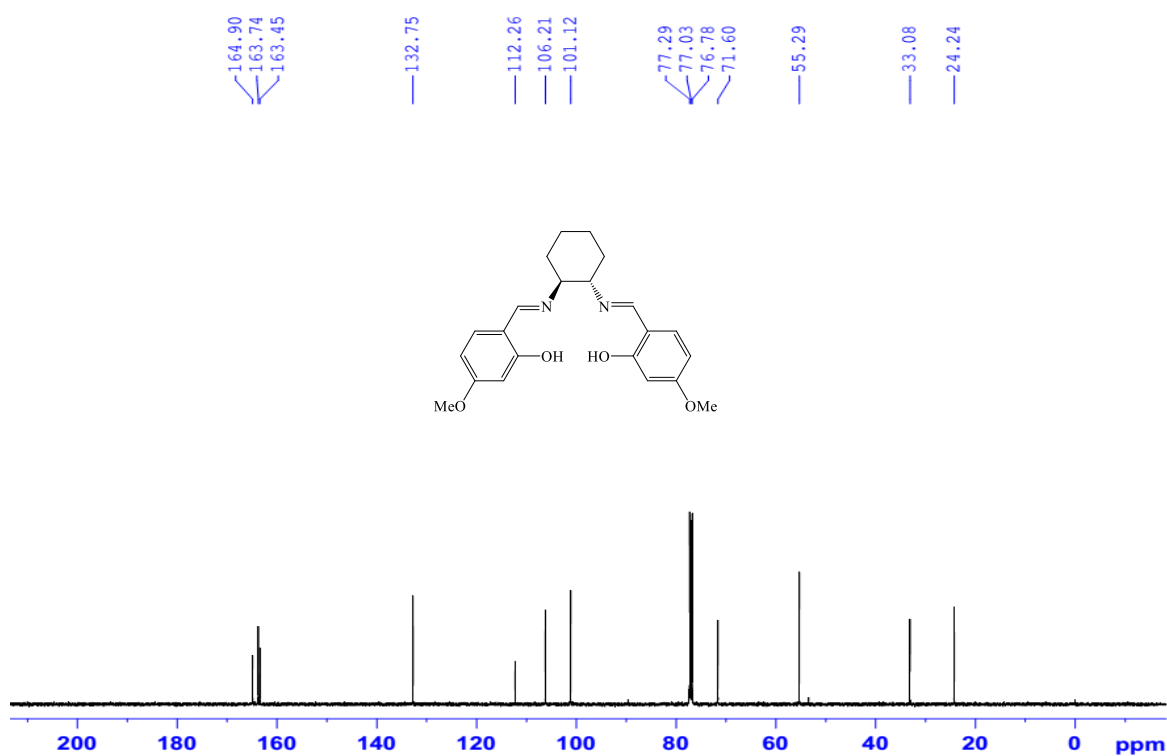
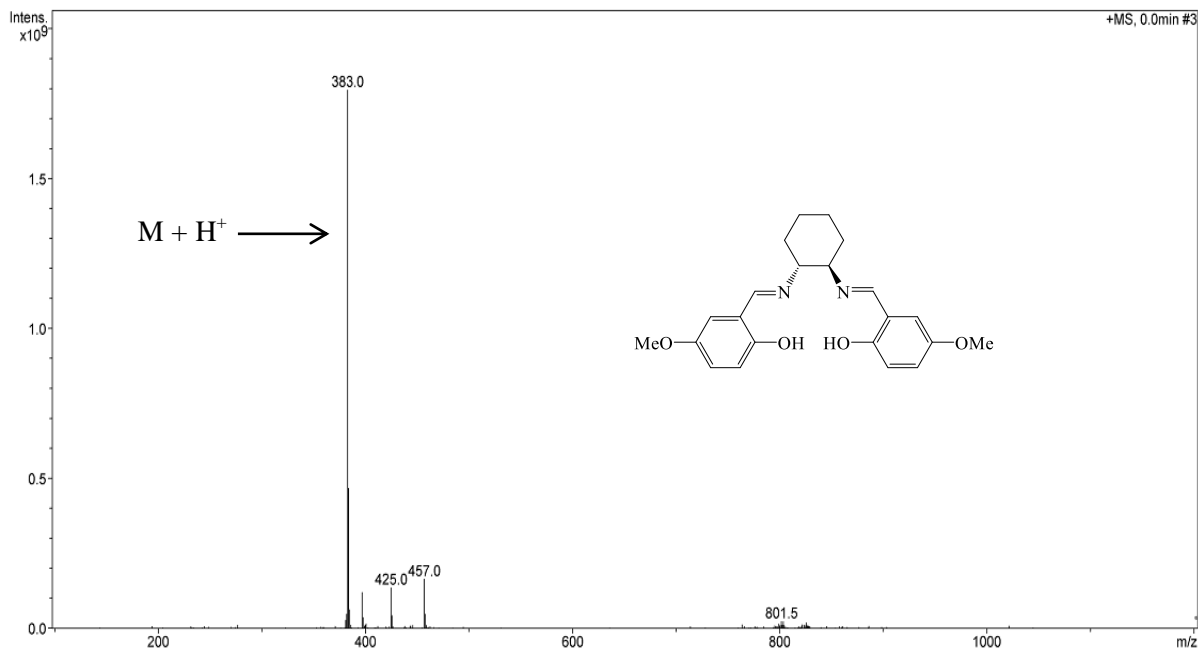
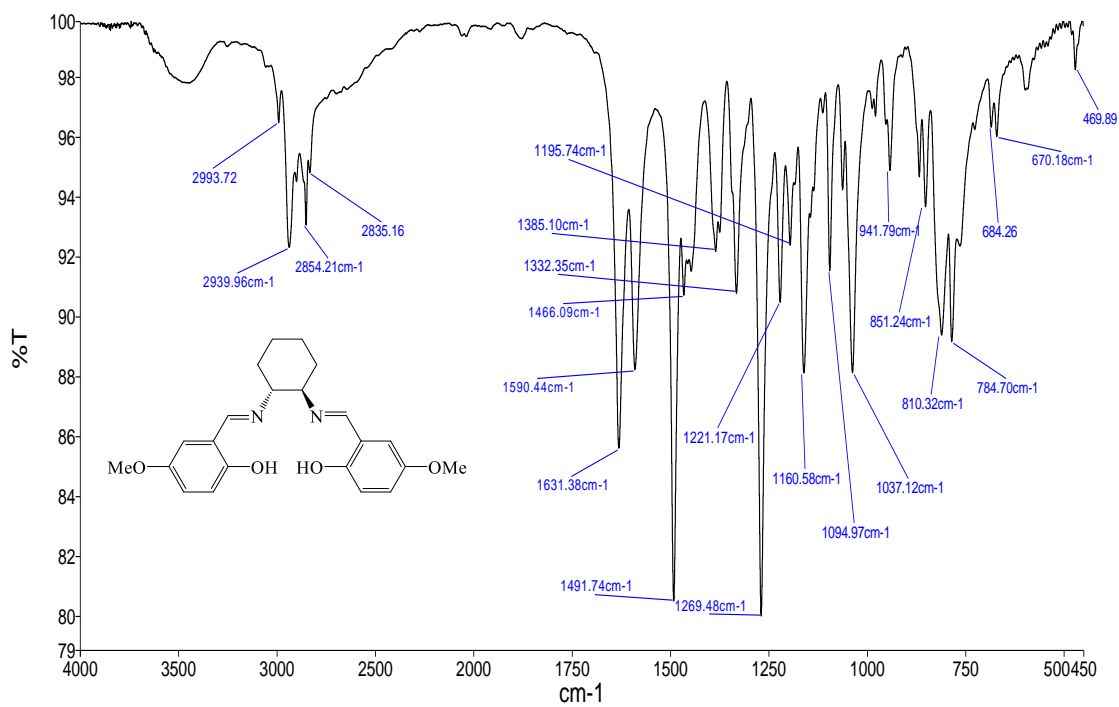


Figure S1.4Sd. The  $^{13}\text{C}$ -NMR spectrum of ligand (S)L4H<sub>2</sub>

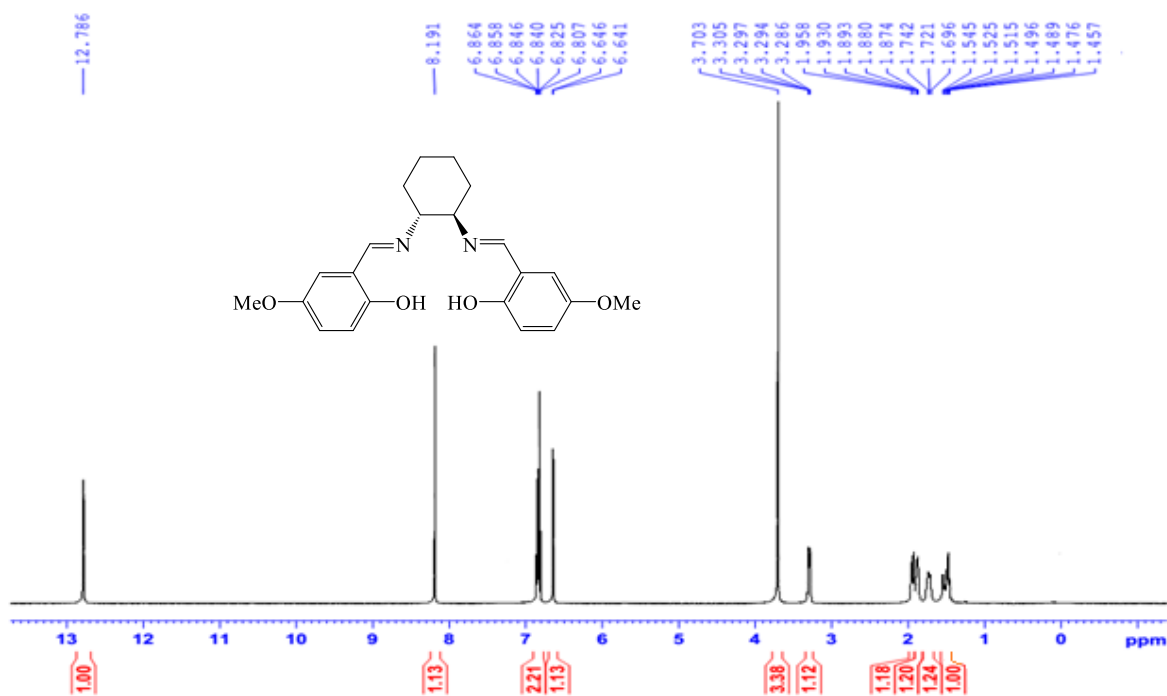
## I.5. The spectral data of ligand (*R*)L5H<sub>2</sub> and (*S*)L5H<sub>2</sub>



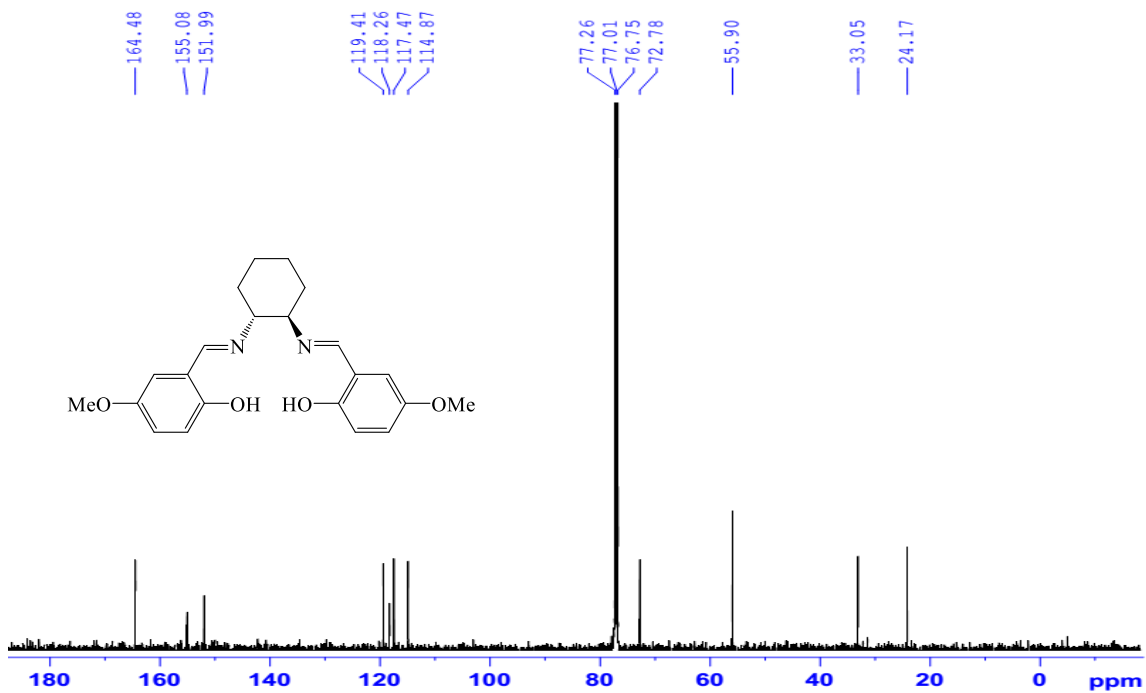
**Figure S1.5Ra.** The ESI-MS spectrum of ligand (*R*)L5H<sub>2</sub>



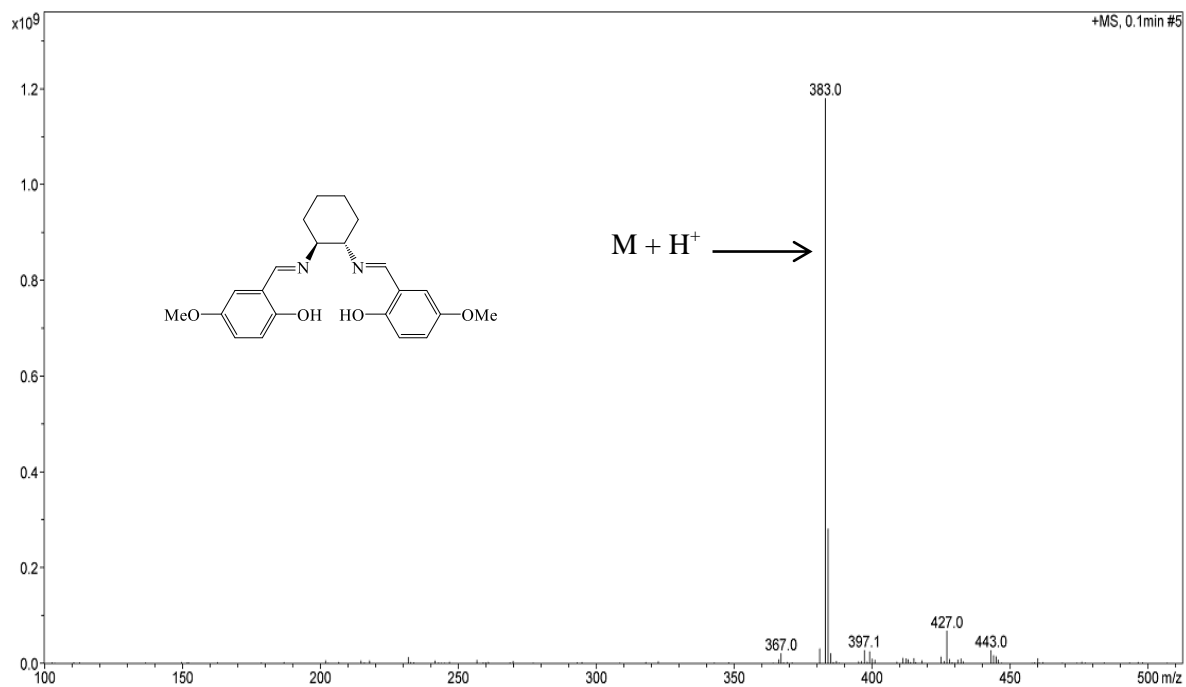
**Figure S1.5Rb.** The IR spectrum of ligand (*R*)L5H<sub>2</sub>



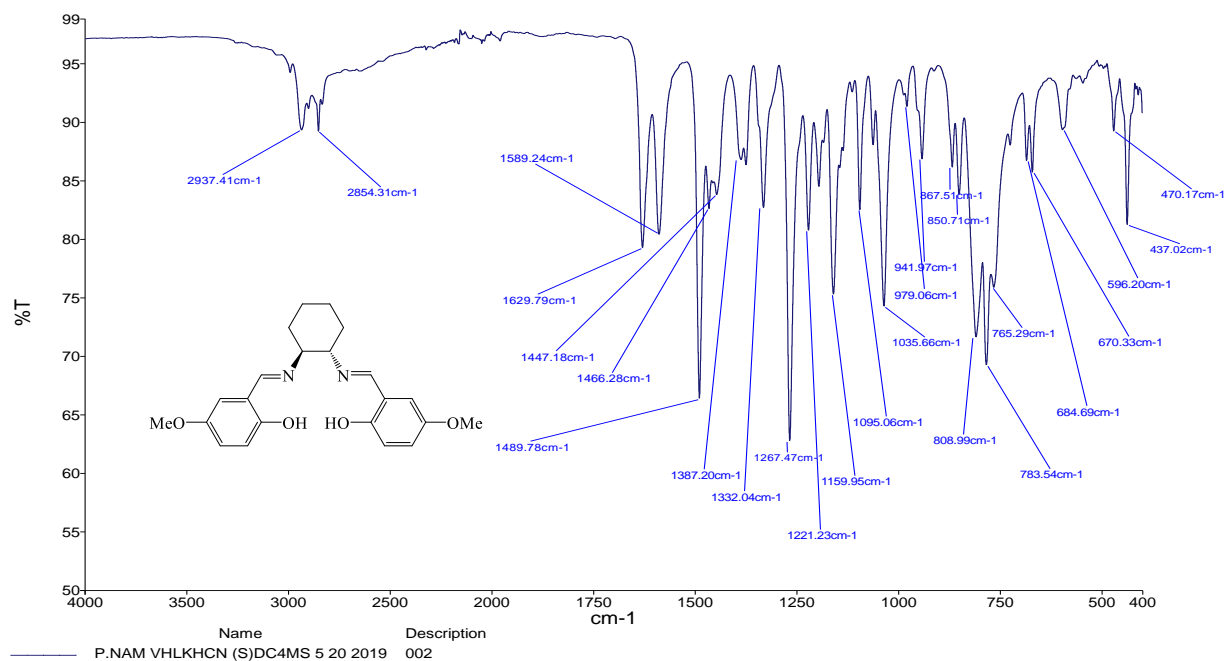
**Figure S1.5Rc.** The <sup>1</sup>H-NMR spectrum of ligand (R)L5H<sub>2</sub>



**Figure S1.5Rd.** The <sup>13</sup>C-NMR spectrum of ligand (R)L5H<sub>2</sub>



**Figure S1.5Sa.** The ESI-MS spectrum of ligand (S)L5H<sub>2</sub>



**Figure S1.5Sb.** The IR spectrum of ligand (S)L5H<sub>2</sub>

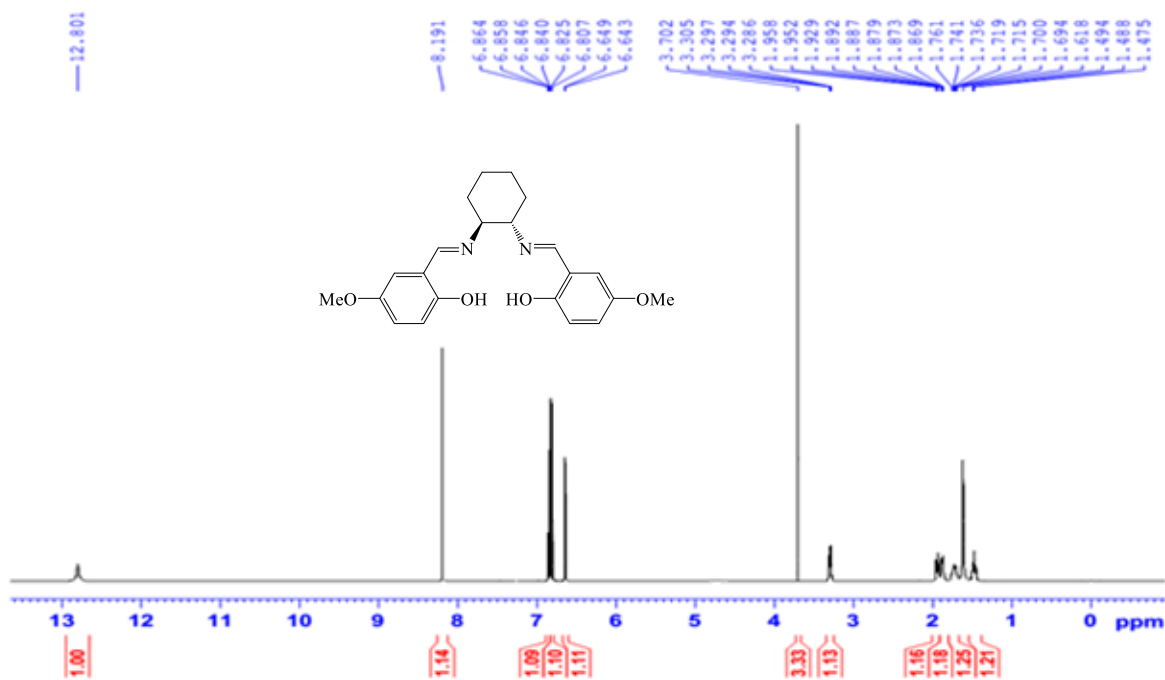


Figure S1.5Sc. The <sup>1</sup>H-NMR spectrum of ligand (S)L5H<sub>2</sub>

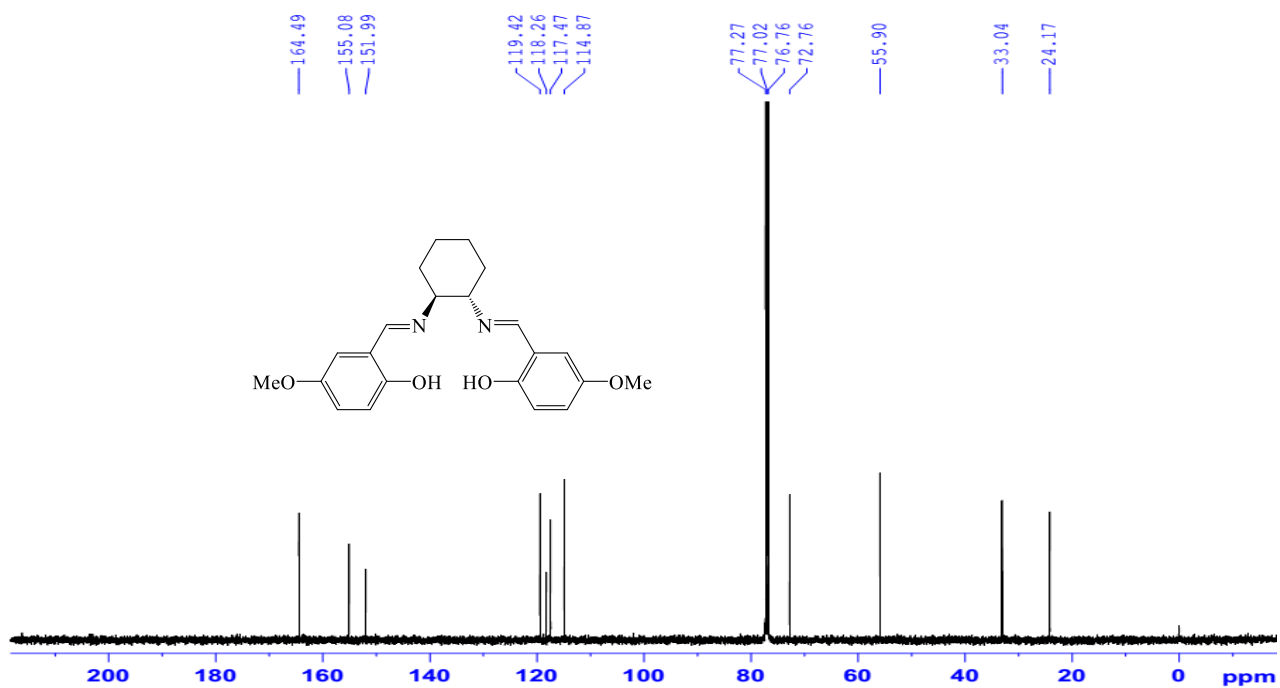
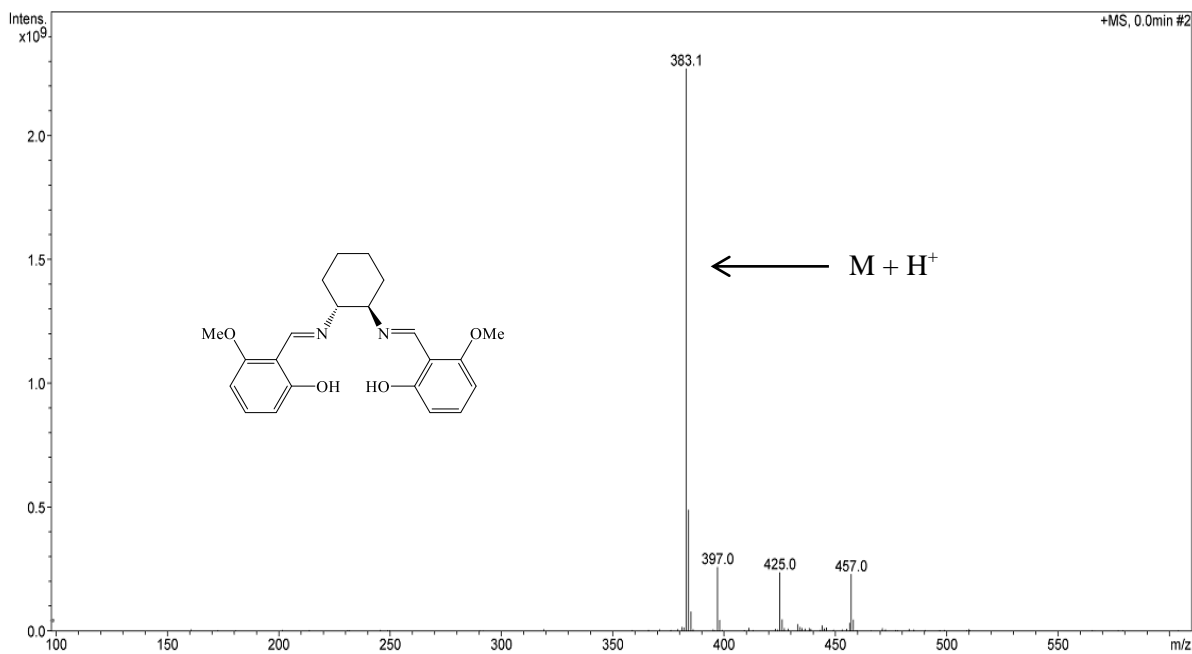
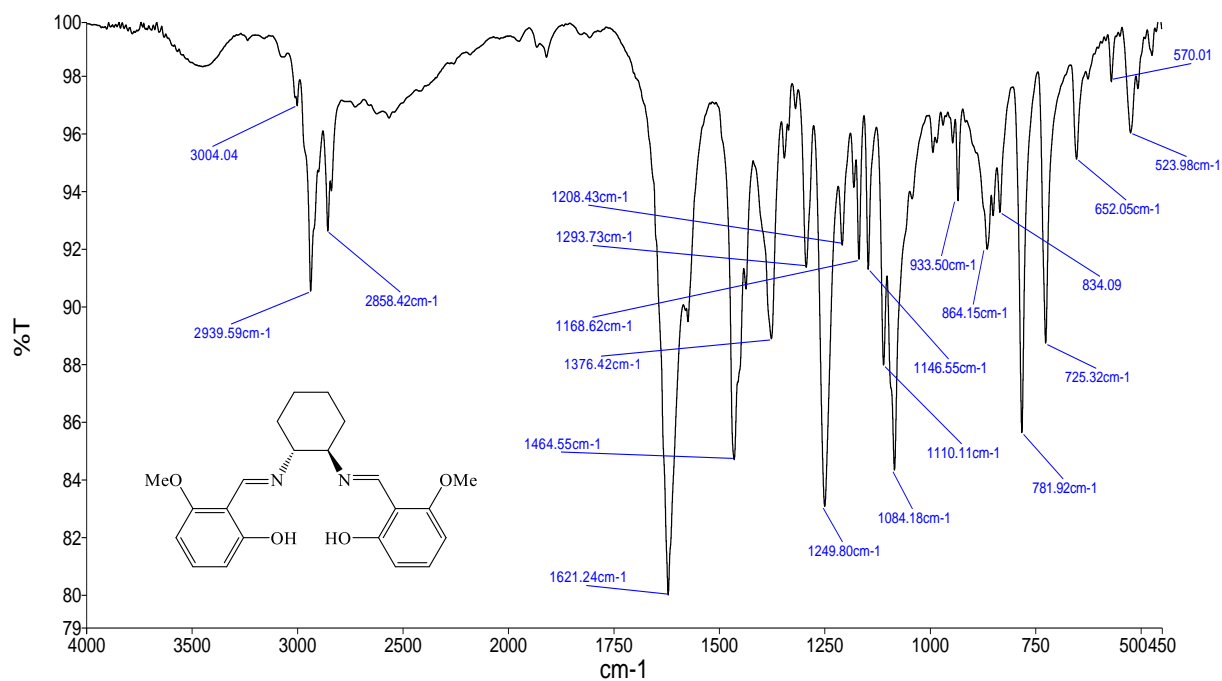


Figure S1.5Sd. The <sup>13</sup>C-NMR spectrum of ligand (S)L5H<sub>2</sub>

## I.6. The spectral data of ligands (*R*)L6H<sub>2</sub> and (*S*)L6H<sub>2</sub>



**Figure S1.6Ra.** The ESI-MS spectrum of ligand (*R*)L6H<sub>2</sub>



**Figure S1.6Rb.** The IR spectrum of ligand (*R*)L6H<sub>2</sub>

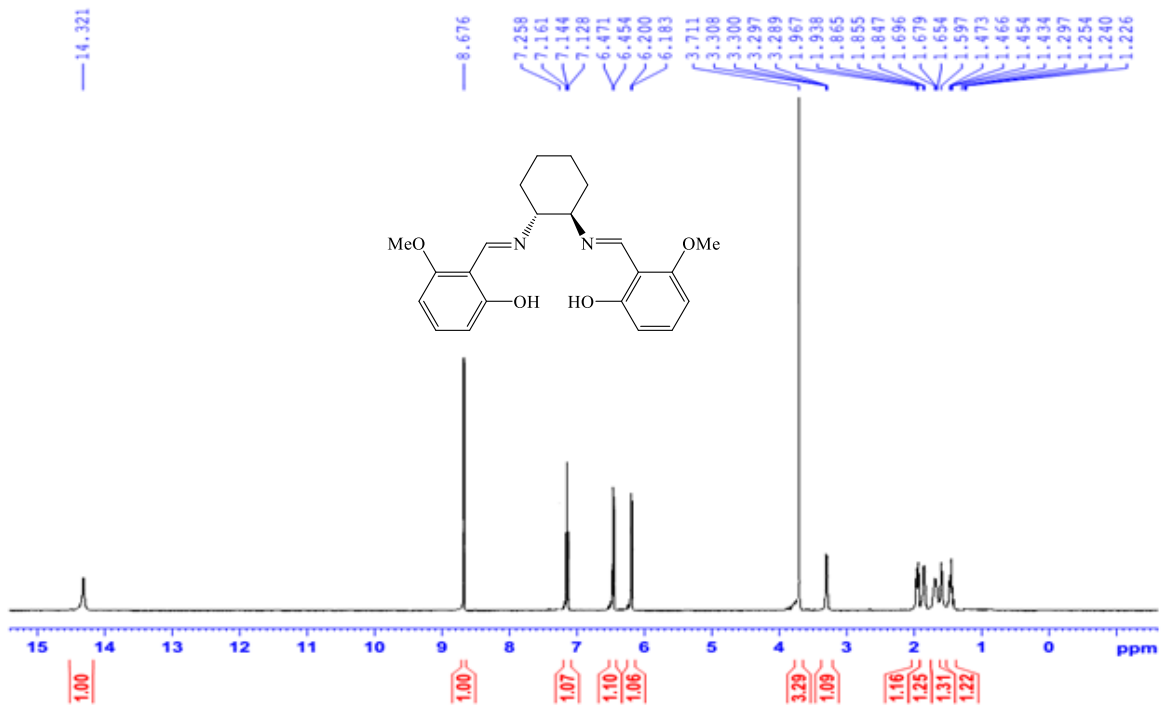


Figure S1.6Rc. The  $^1\text{H}$ -NMR spectrum of ligand (R)L6H<sub>2</sub>

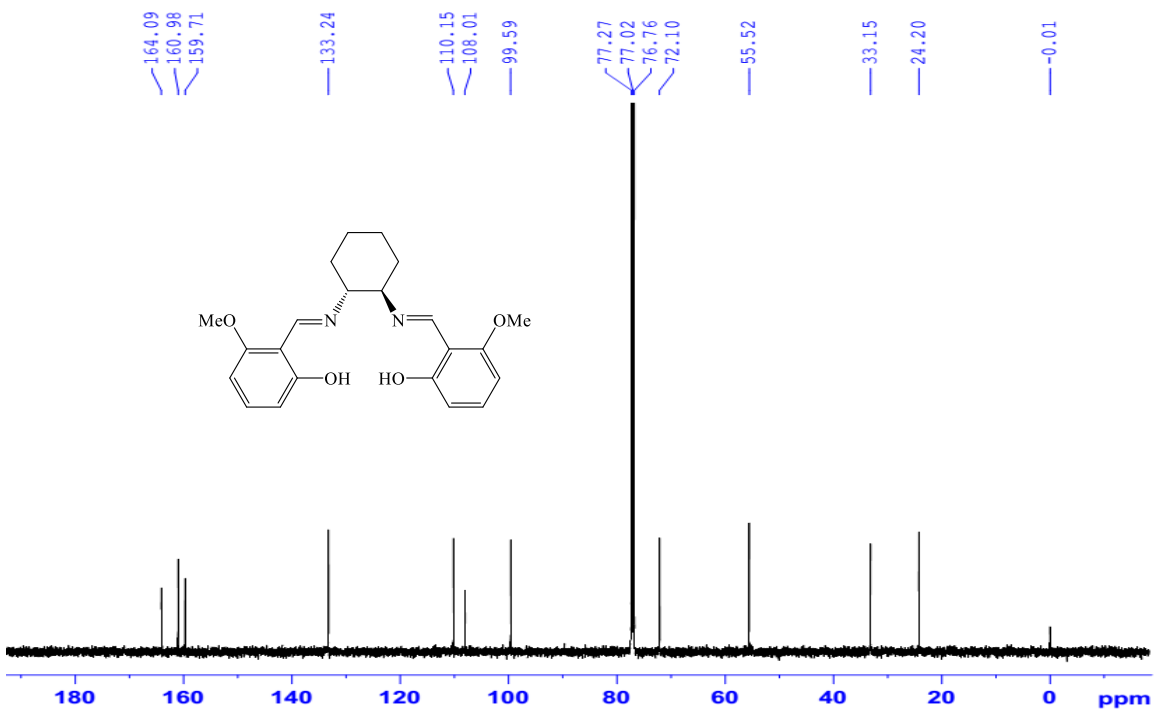
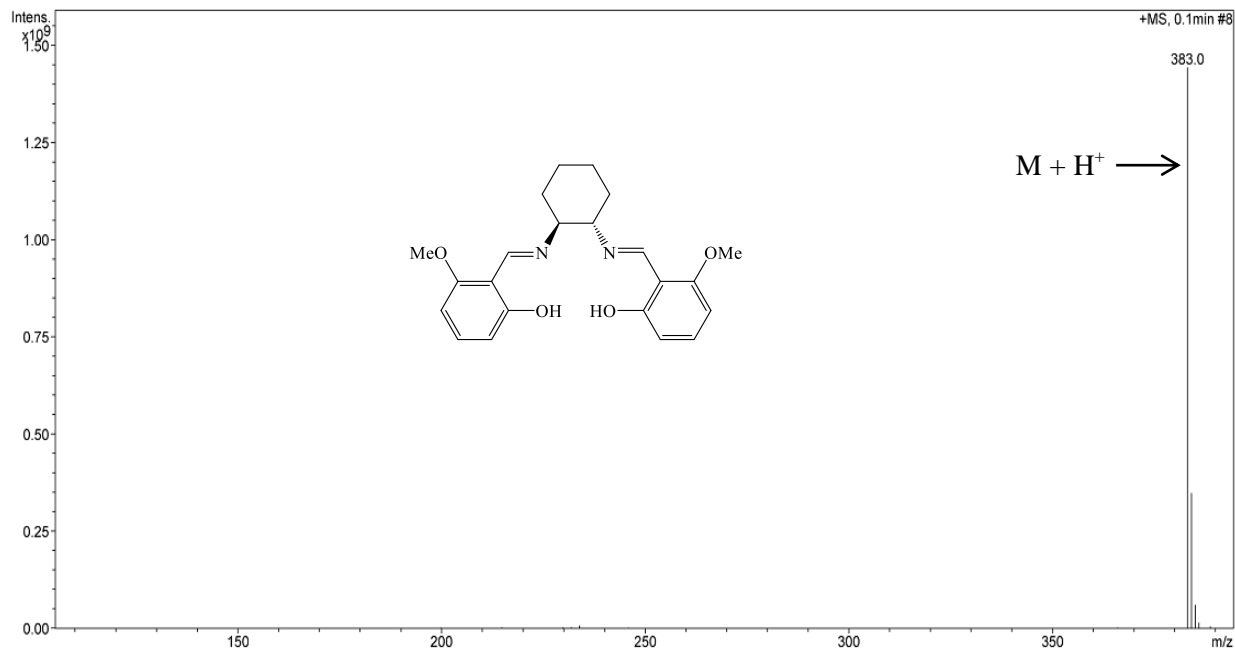
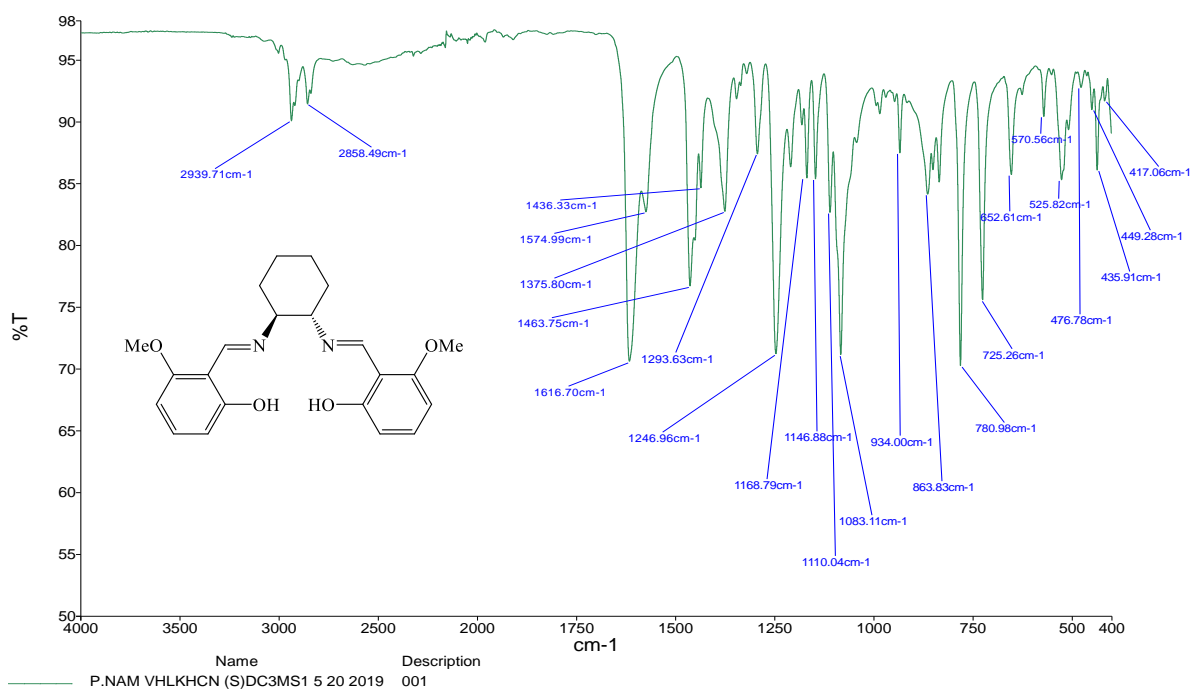


Figure S1.6Rd. The  $^{13}\text{C}$ -NMR spectrum of ligand (R)L6H<sub>2</sub>



**Figure S1.6Sa.** The ESI-MS spectrum of ligand (S)L6H<sub>2</sub>



**Figure S1.6Sb.** The IR spectrum of ligand (S)L6H<sub>2</sub>



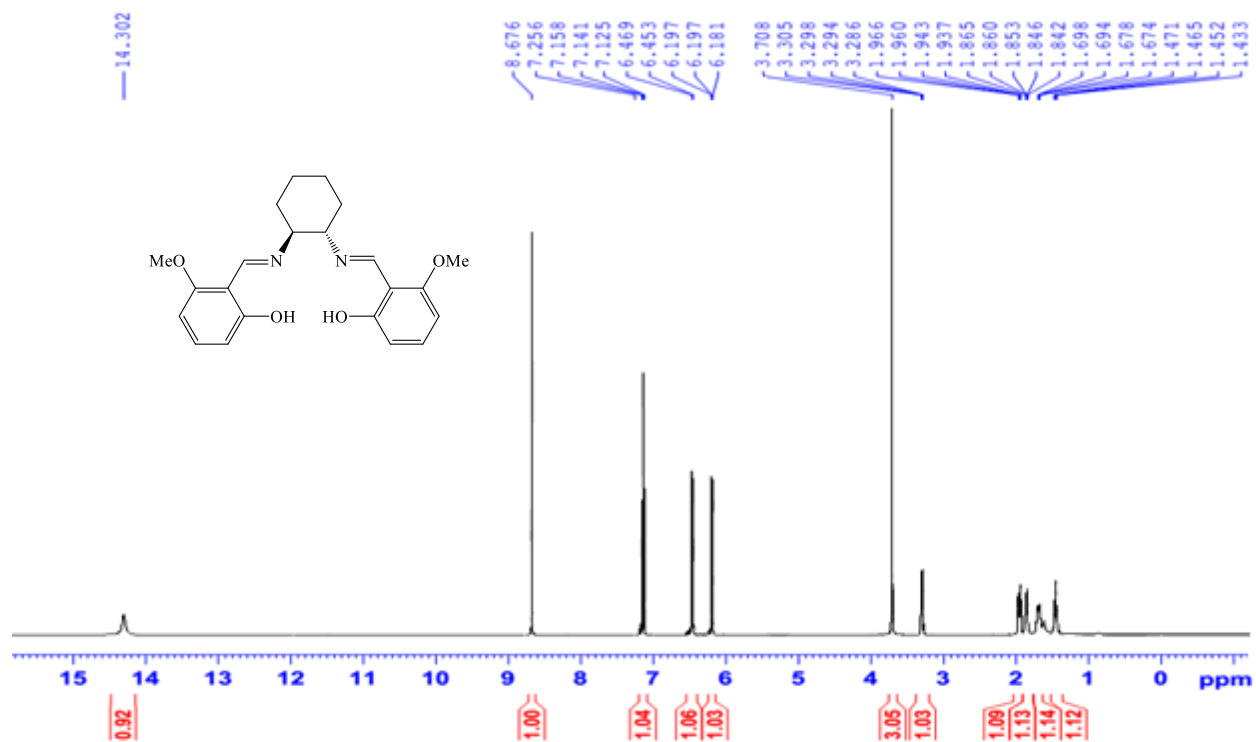


Figure S1.6Sc. The  $^1\text{H}$ -NMR spectrum of ligand (S)L6H<sub>2</sub>

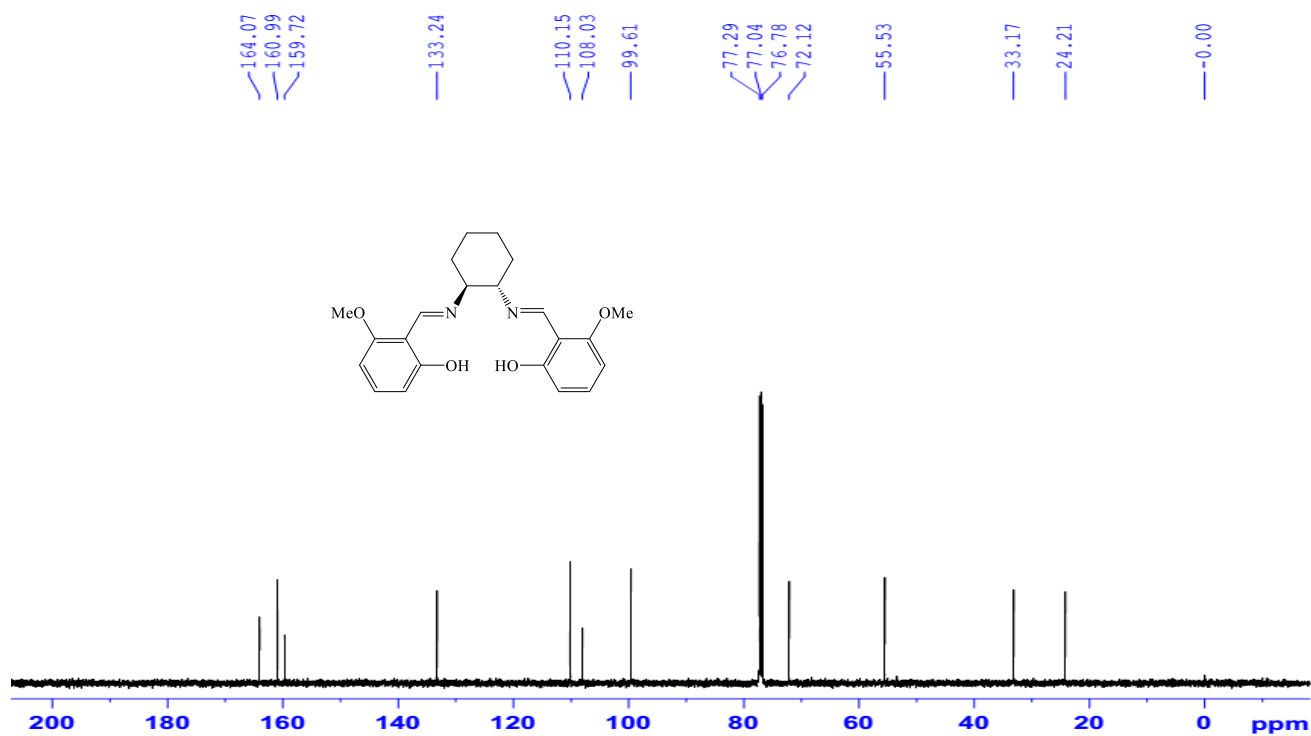


Figure S1.6Sd. The  $^{13}\text{C}$ -NMR spectrum of ligand (S)L6H<sub>2</sub>

## II. Supplementary Materials 2: The Spectral data of Pt(II) complexes

### II.1. The spectral data of complexes [Pt(R)(L1)] and [Pt(S)(L1)]

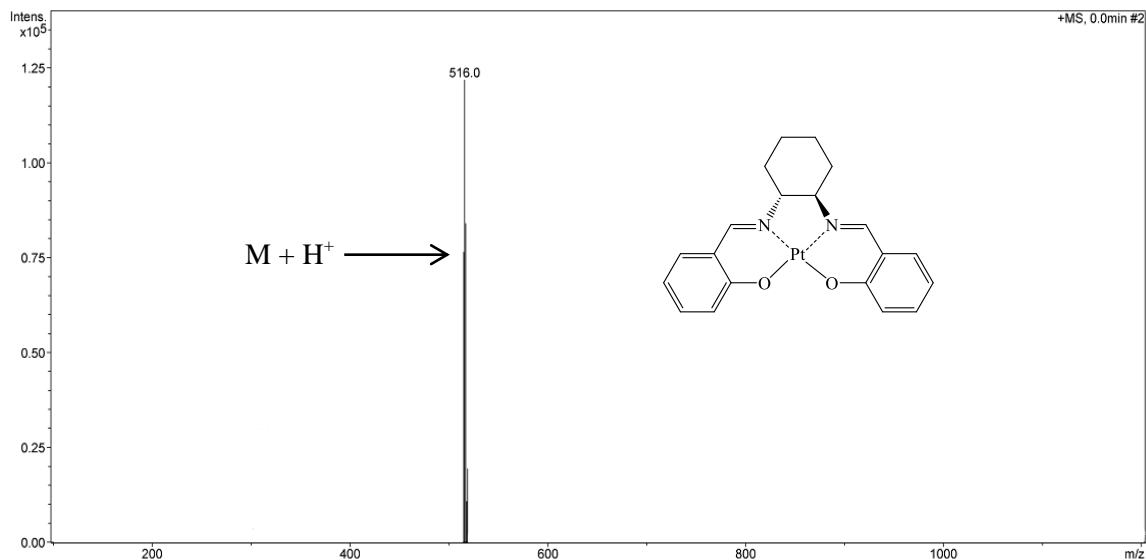


Figure S2.1Ra. The ESI-MS spectrum of complex [Pt(R)L1]

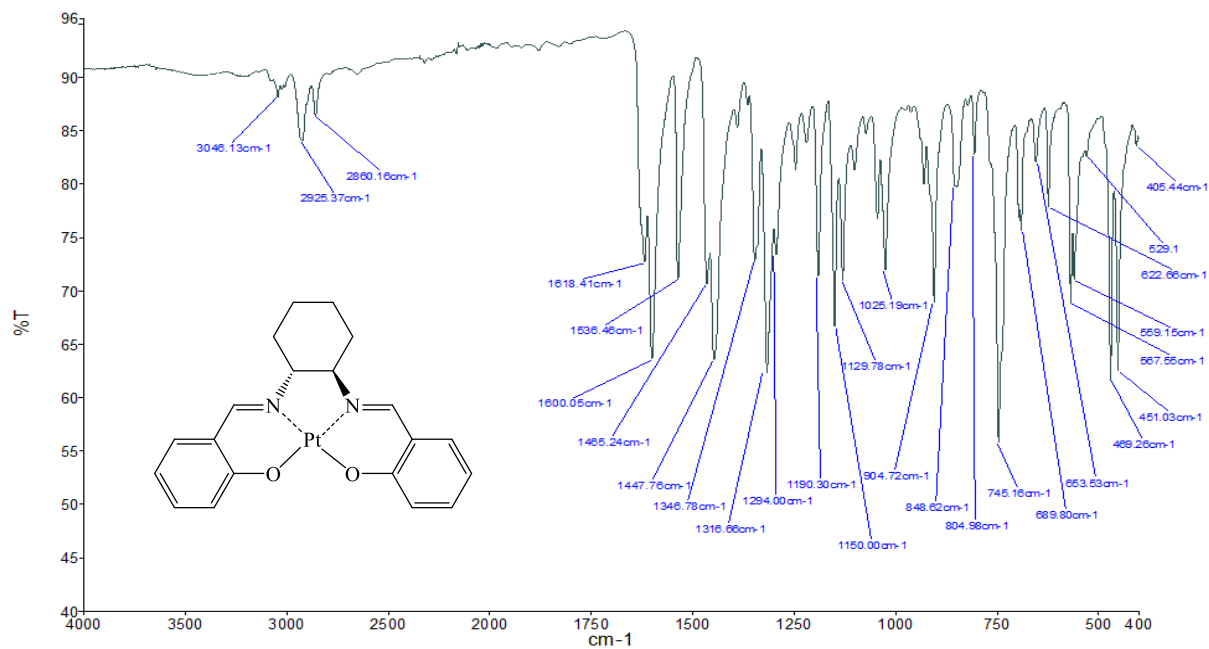


Figure S2.1Rb. The IR spectrum of complex [Pt(R)L1]

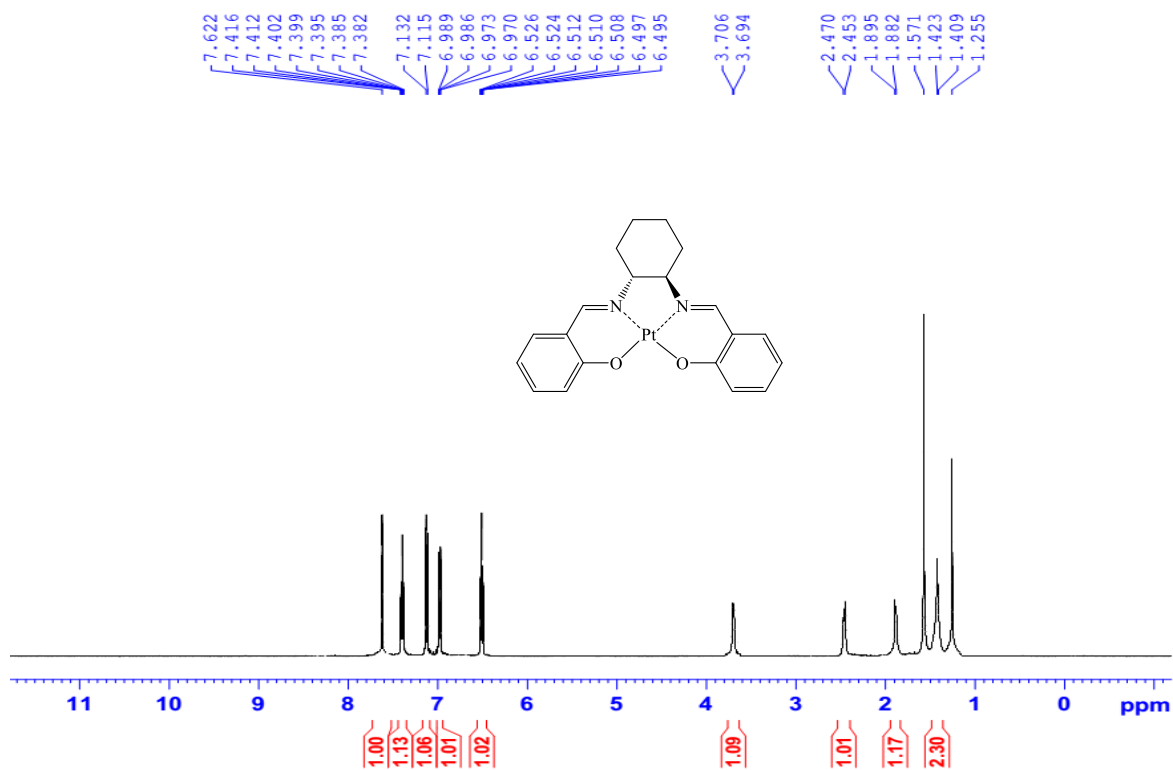


Figure S2.1Rc. The <sup>1</sup>H-NMR spectrum of complex [Pt(R)L1]

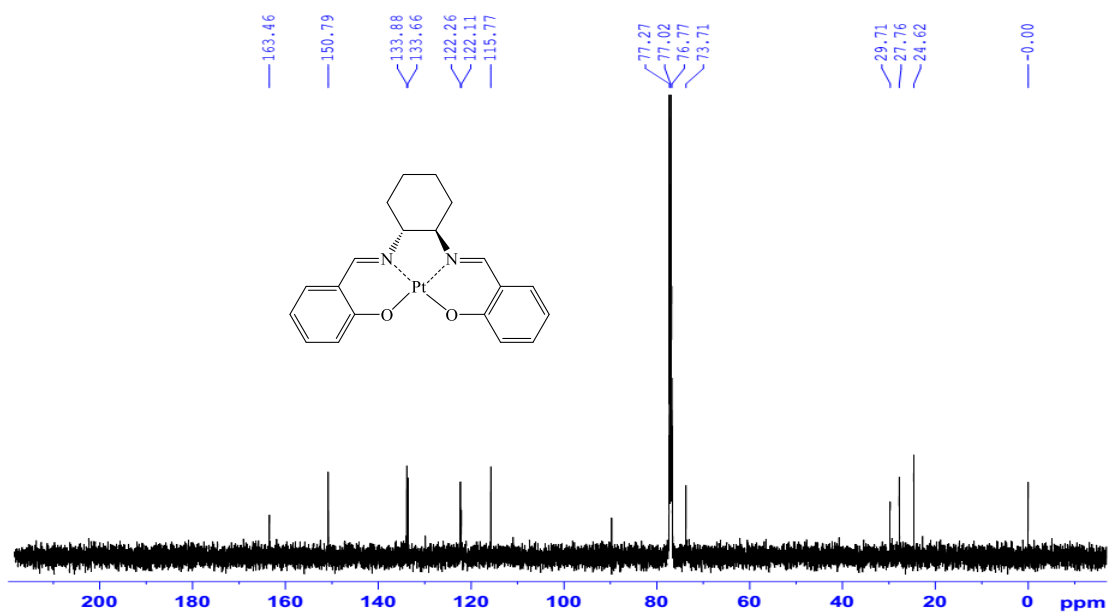
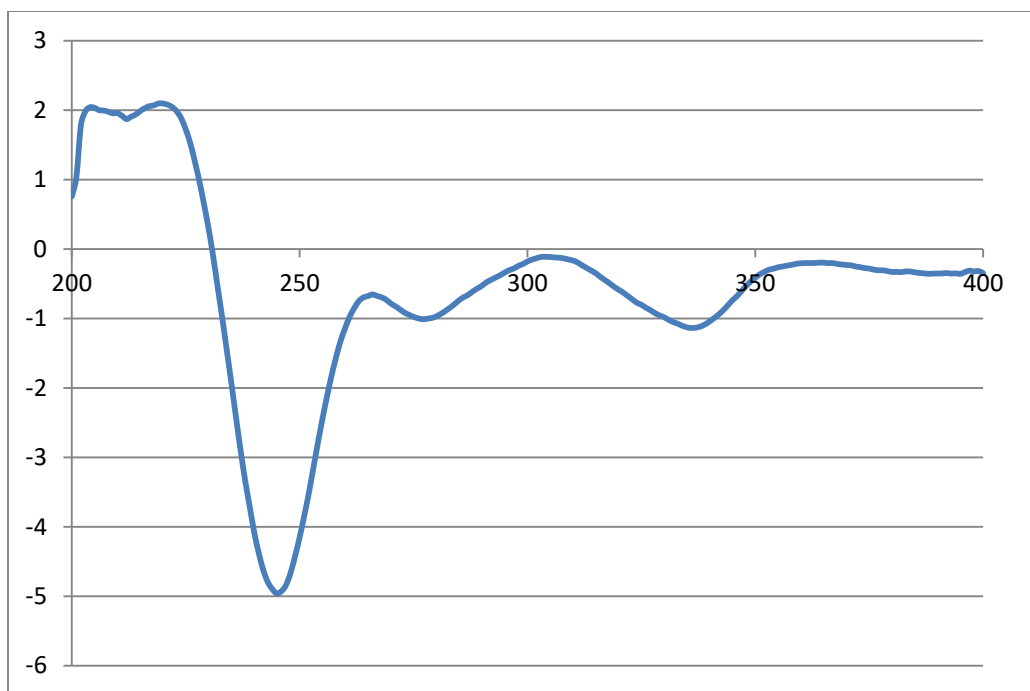
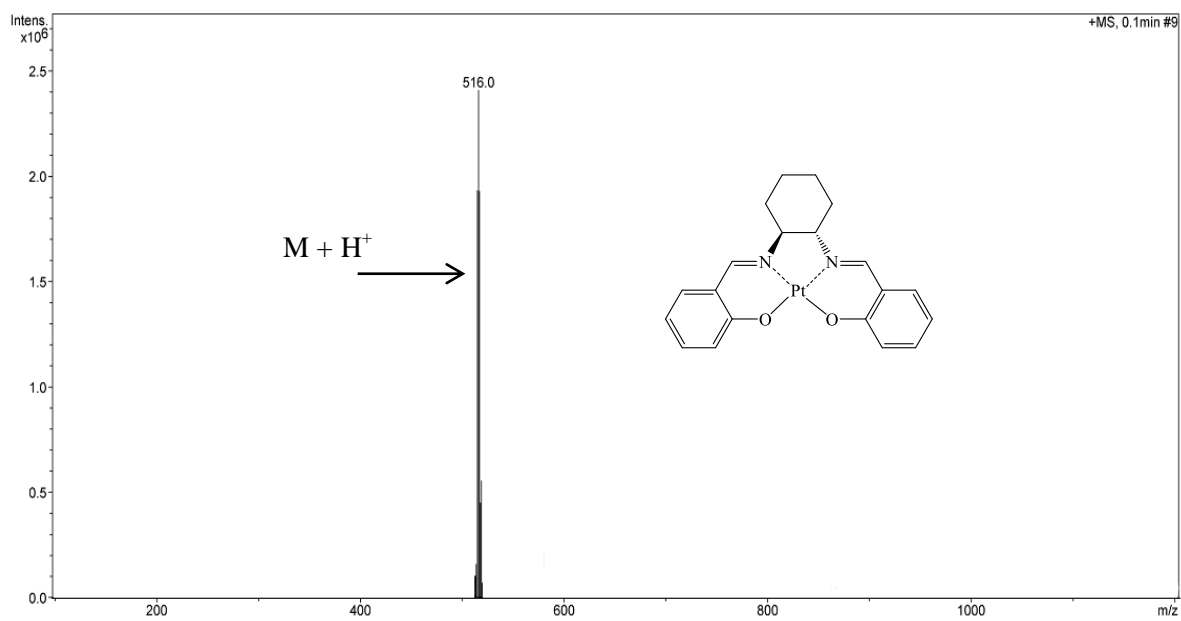


Figure S2.1Rd. The <sup>13</sup>C-NMR spectrum of complex [Pt(R)L1]

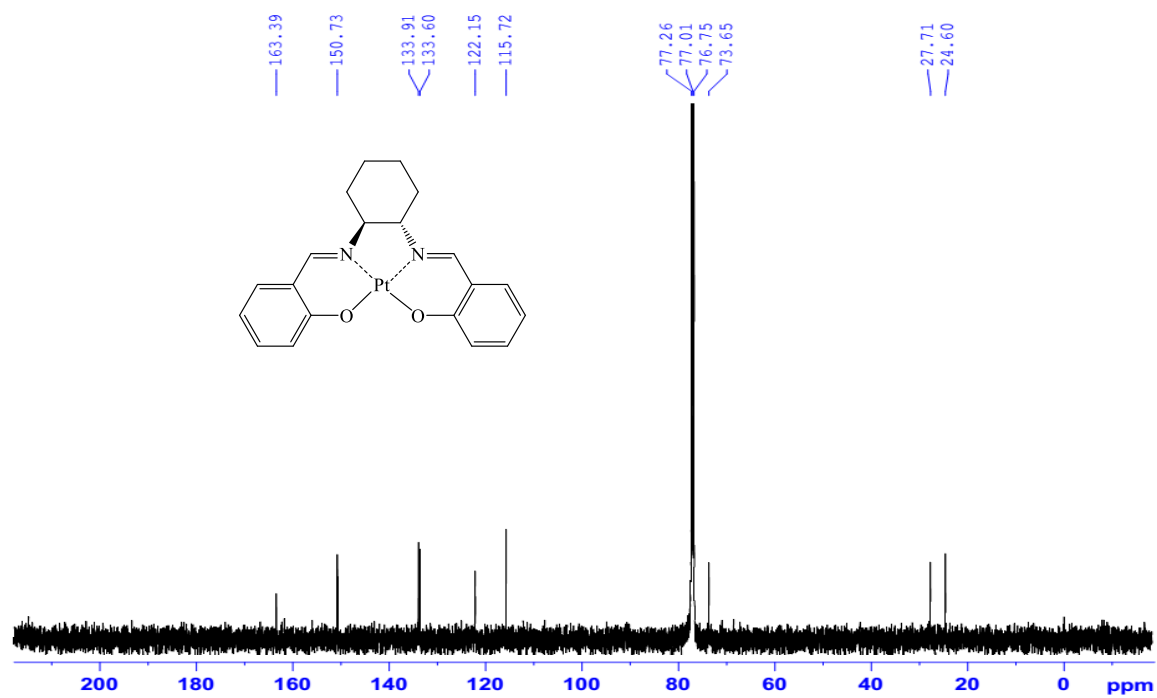


**Figure S2.1Re.** The CD spectrum of complex [Pt(*R*)L1]

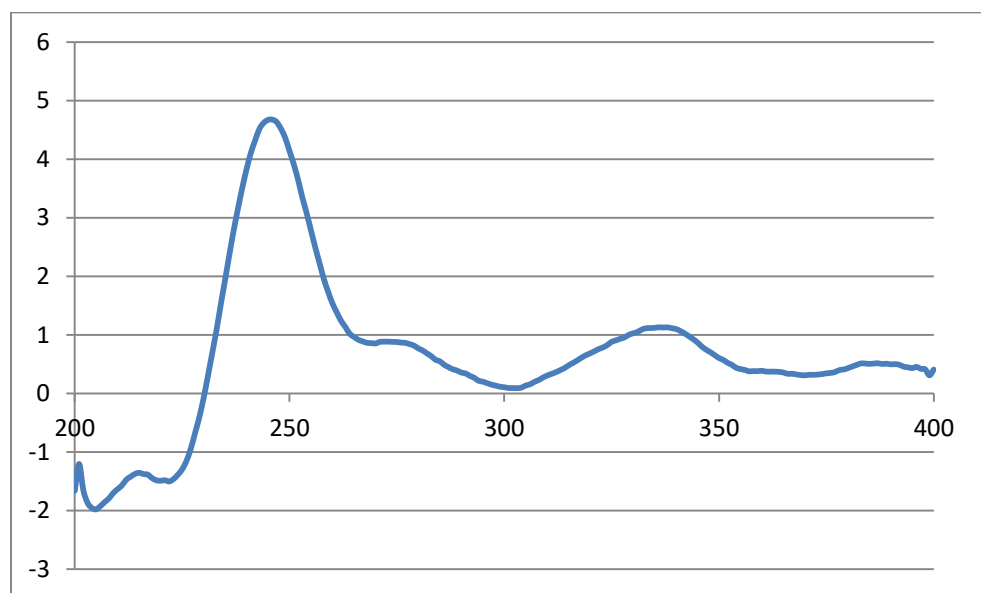


**Figure S2.1Sa.** The ESI-MS spectrum of complex [Pt(*S*)L1]



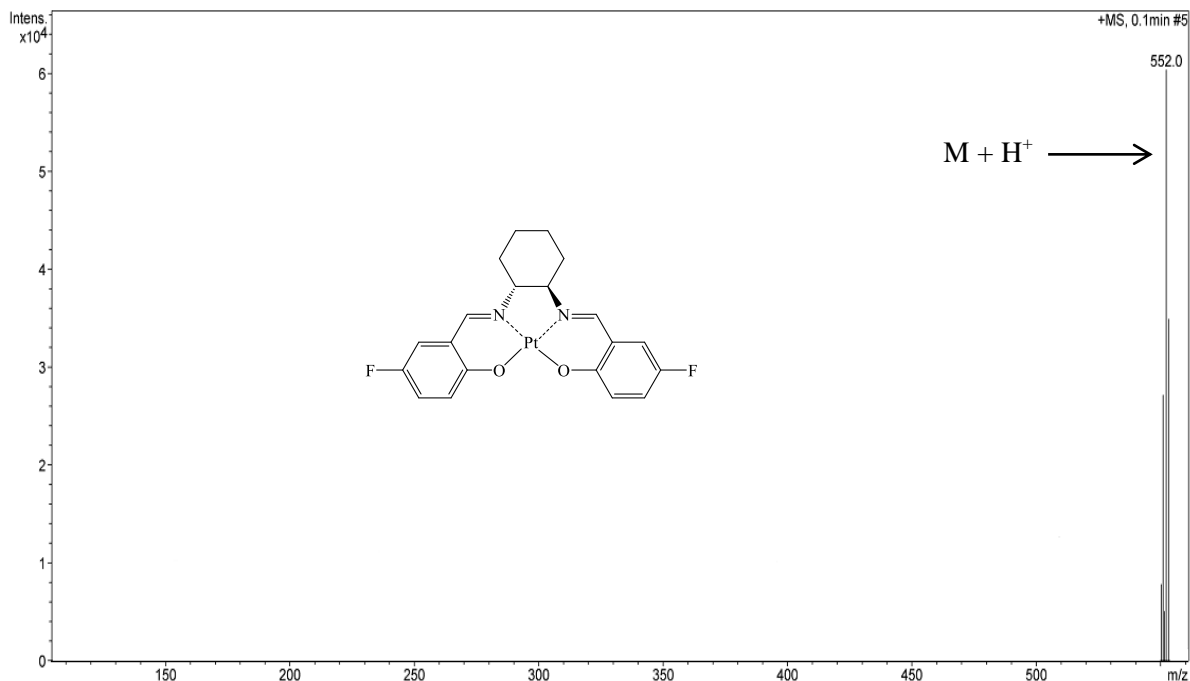


**Figure S2.1Sd.** The  $^{13}\text{C}$ -NMR spectrum of complex [Pt(S)L1]

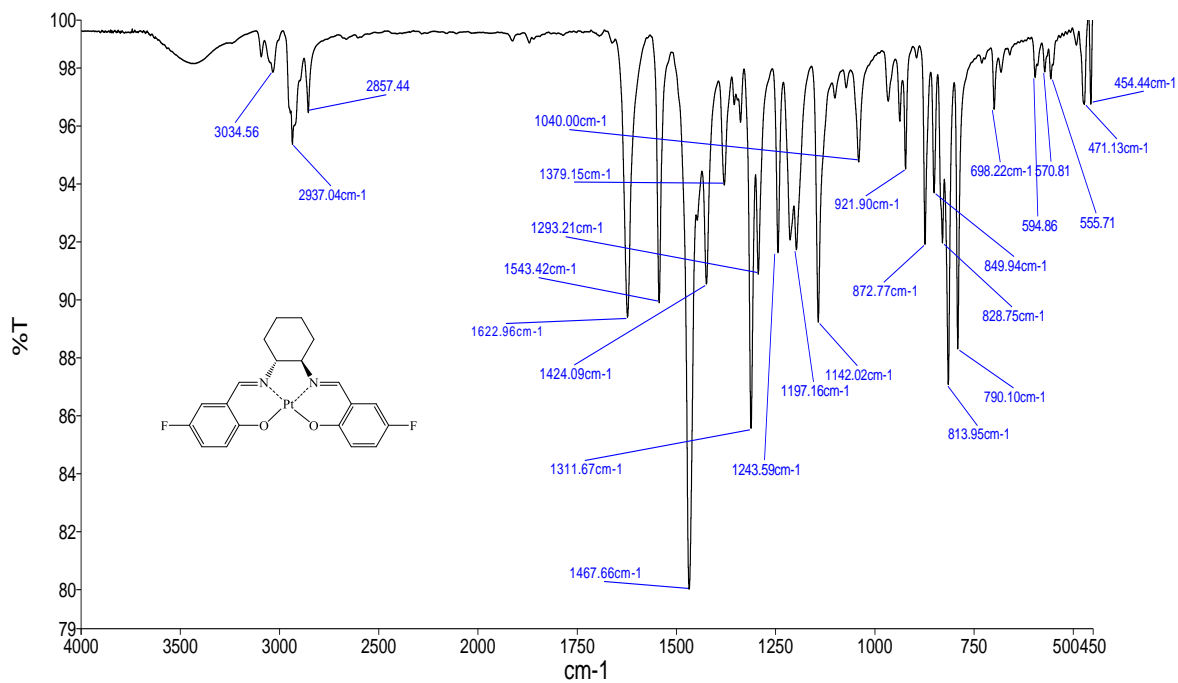


**Figure S2.1Se.** The CD spectrum of complex [Pt(S)L1]

## II.2. The spectral data of complexes [Pt(*R*)L2] and [Pt(*S*)L2]



**Figure S2.2Ra.** The ESI-MS spectrum of complex [Pt(*R*)L2]



**Figure S2.2Rb.** The IR spectrum of complex [Pt(*R*)L2]

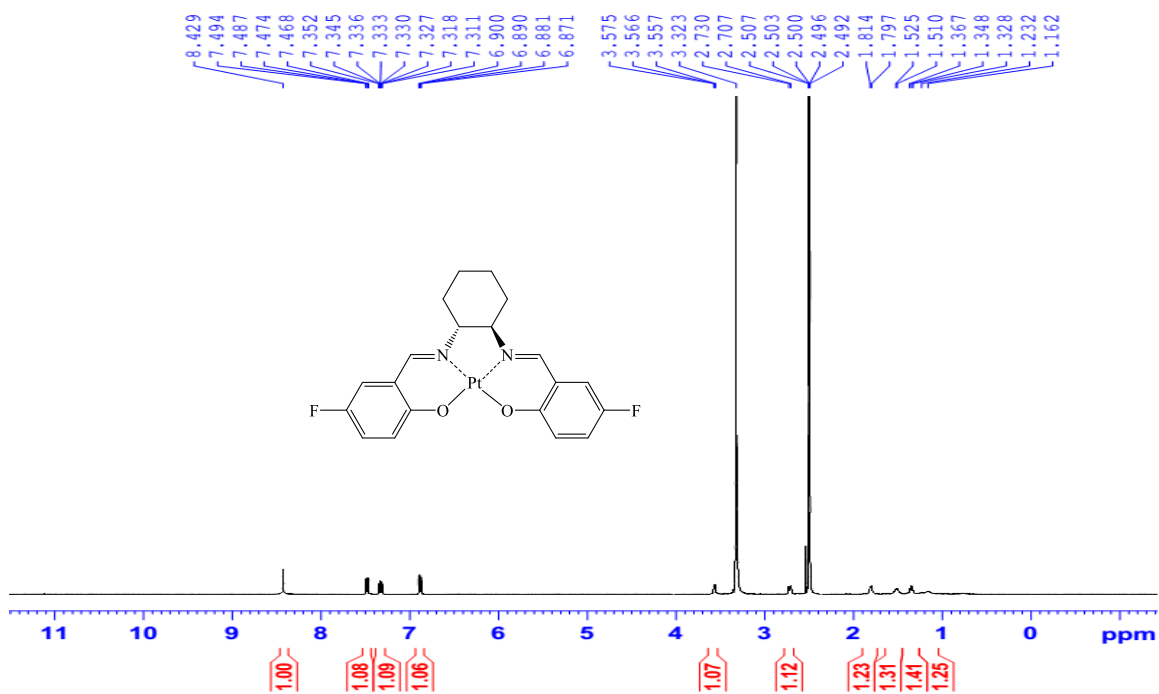


Figure S2.2Rc. The <sup>1</sup>H-NMR spectrum of complex [Pt(R)L2]

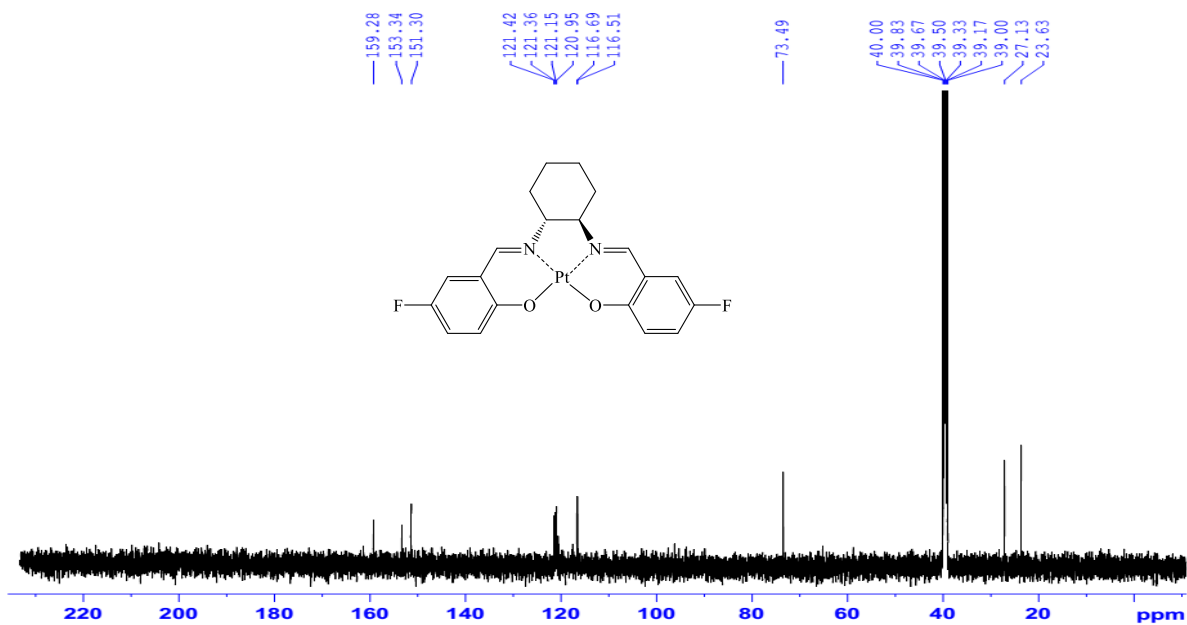
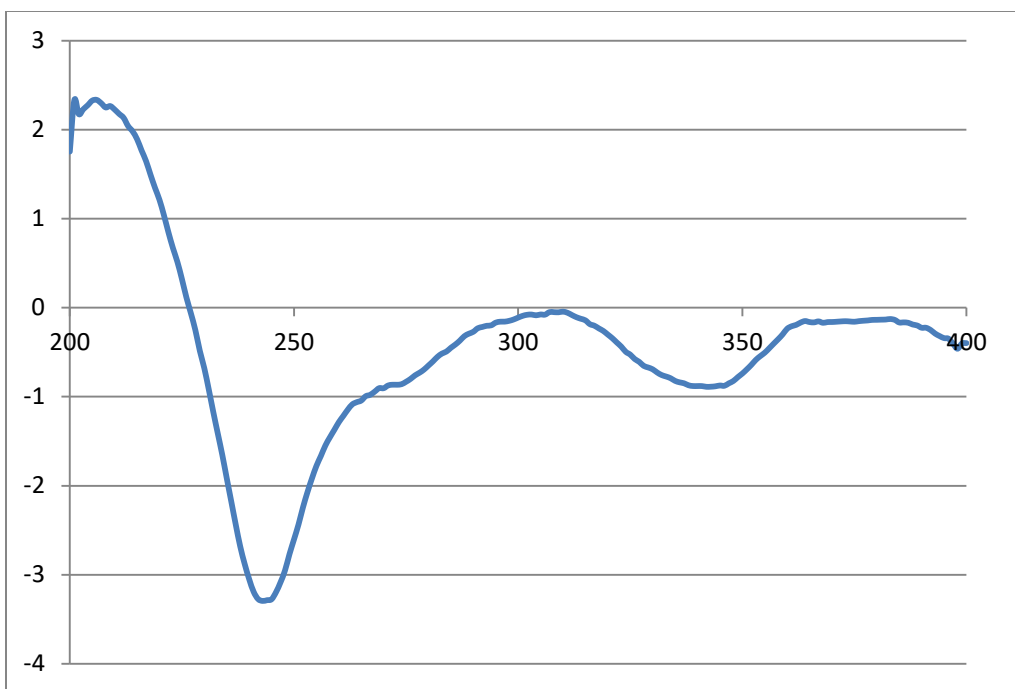
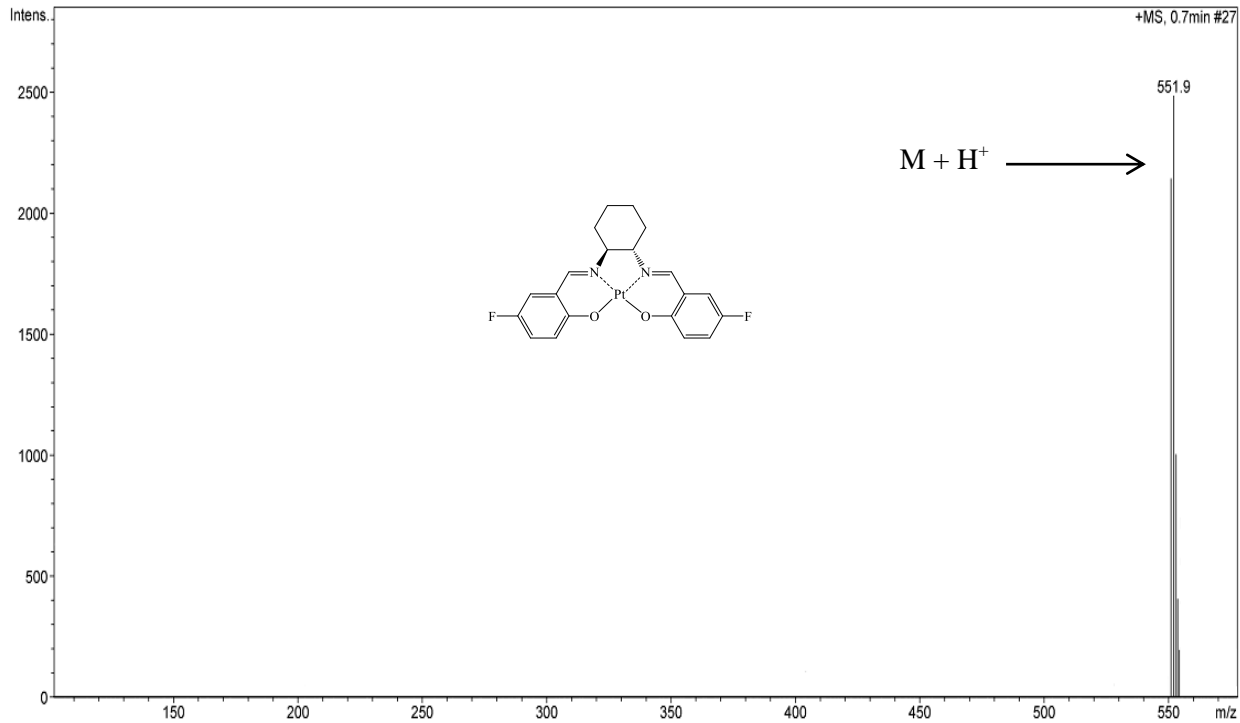


Figure S2.2Rd. The <sup>13</sup>C-NMR spectrum of complex [Pt(R)L2]

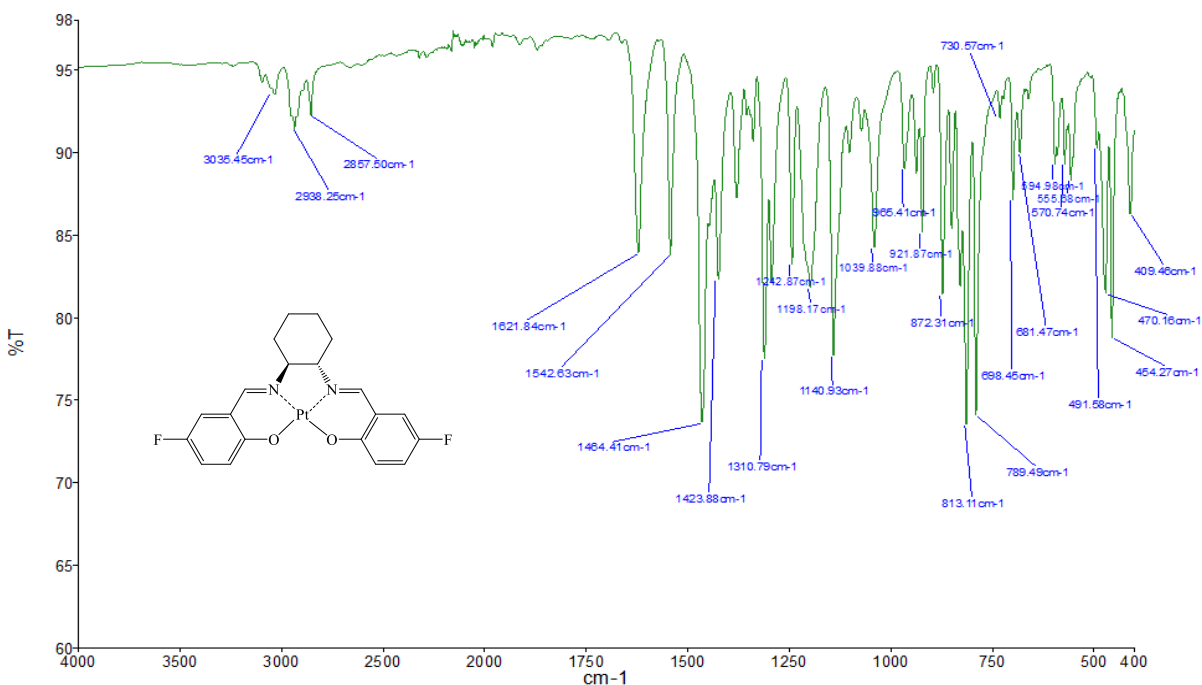




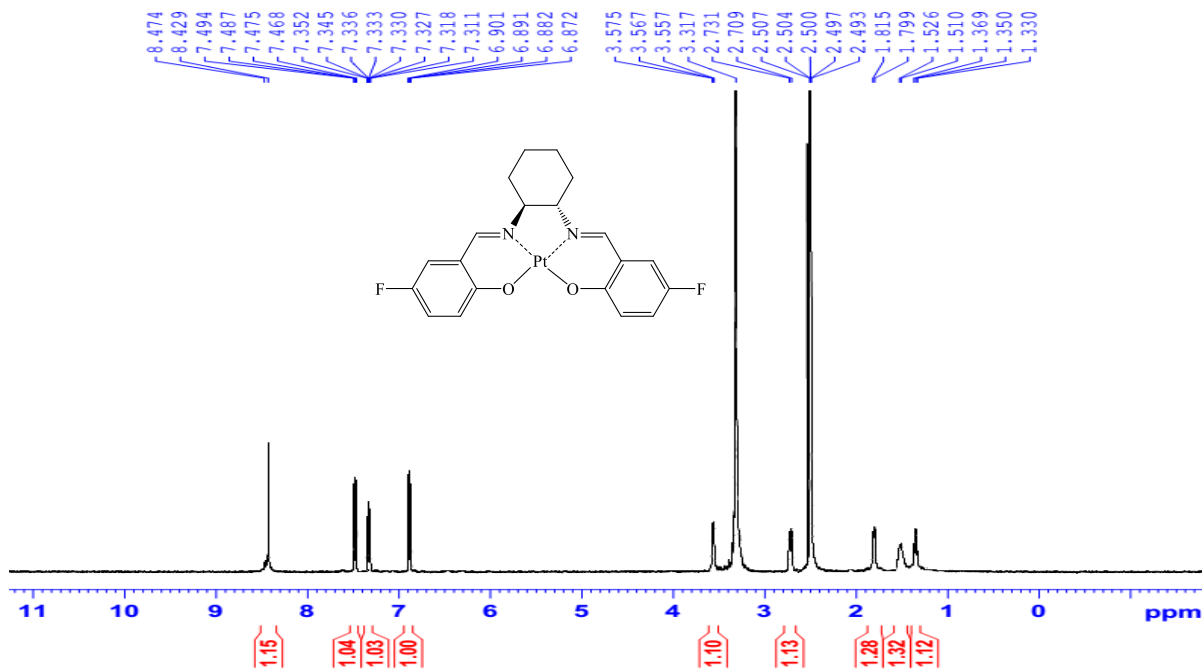
**Figure S2.2Re.** The CD spectrum of complex [Pt(R)L2]



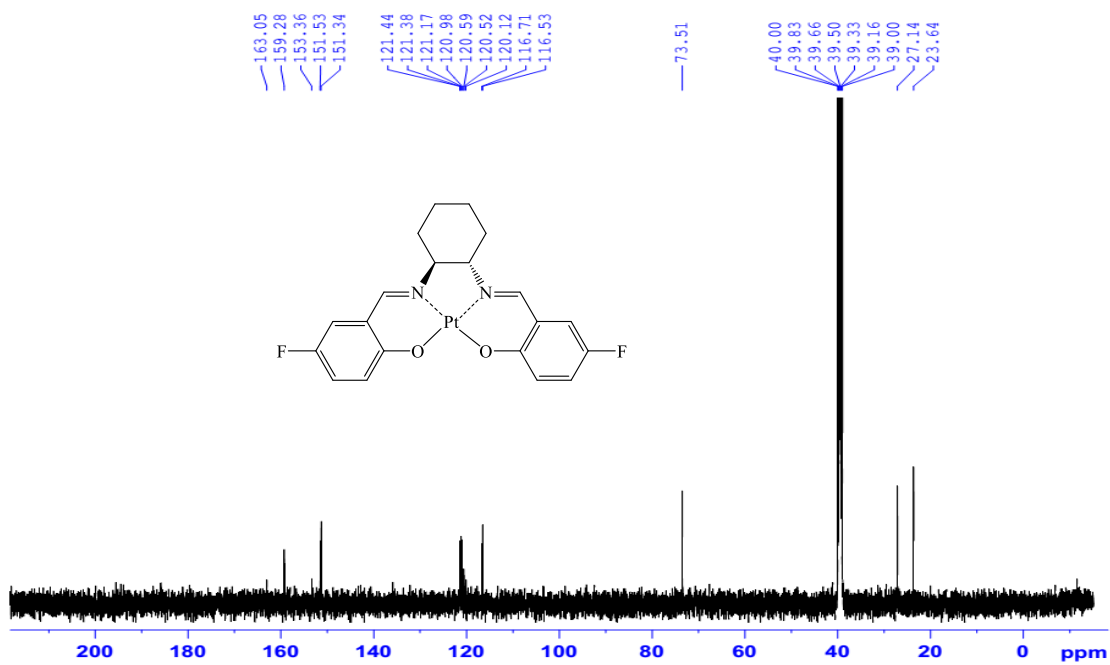
**Figure S2.2Sa.** The ESI-MS spectrum of complex [Pt(S)L2]



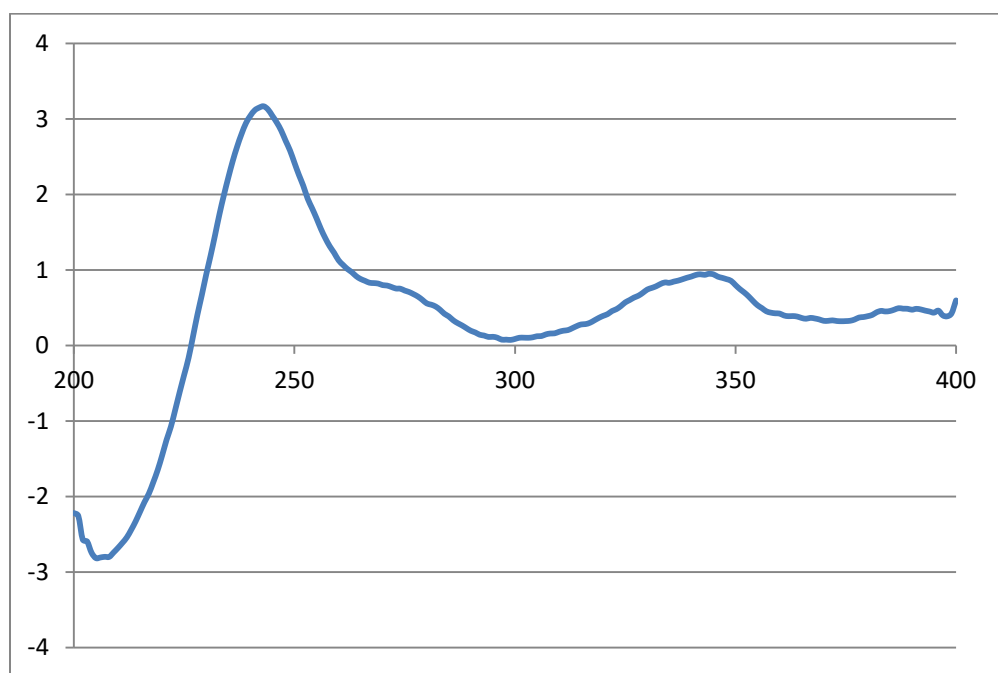
**Figure S2.2Sb.** The IR spectrum of complex [Pt(S)L2]



**Figure S2.2Sc.** The <sup>1</sup>H-NMR spectrum of complex [Pt(S)L2]



**Figure S2.2Sd.** The  $^{13}\text{C}$ -NMR spectrum of complex  $[\text{Pt}(\text{S})\text{L}_2]$



**Figure S2.2Se.** The CD spectrum of complex  $[\text{Pt}(\text{S})\text{L}_2]$

### II.3. The spectral data of complexes [Pt(R)L3] and [Pt(S)L3]

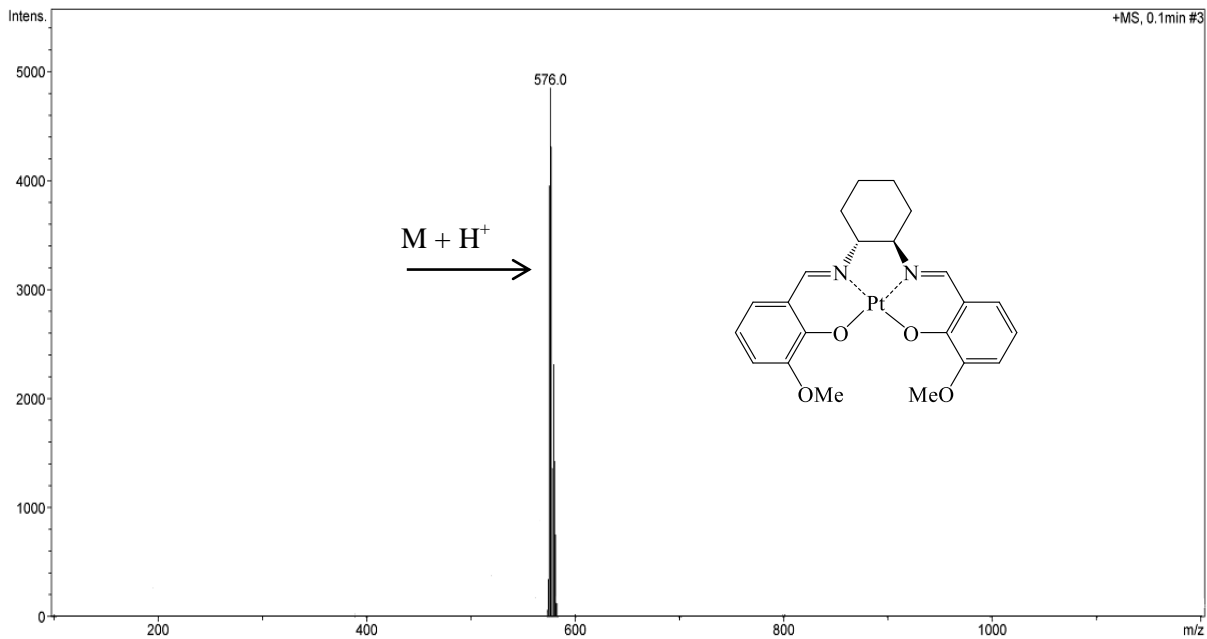


Figure S2.3Ra. The ESI-MS spectrum of complex [Pt(R)L3]

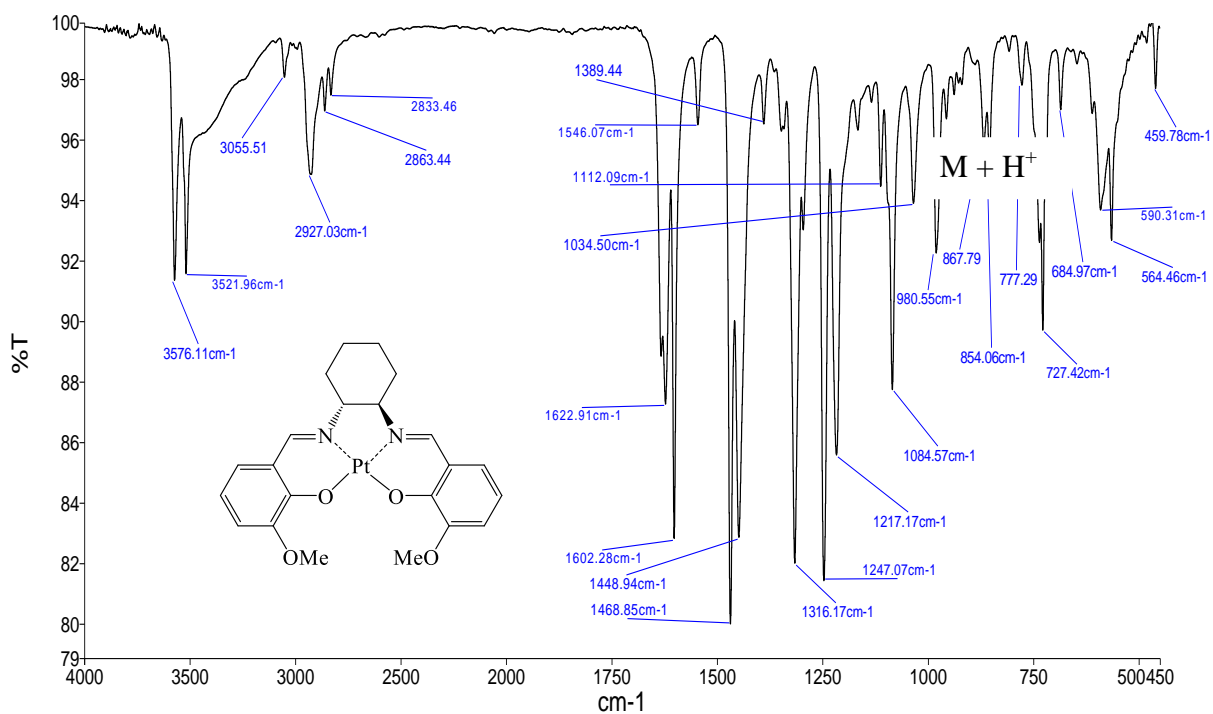


Figure S2.3Rb. The IR spectrum of complex [Pt(R)L3]

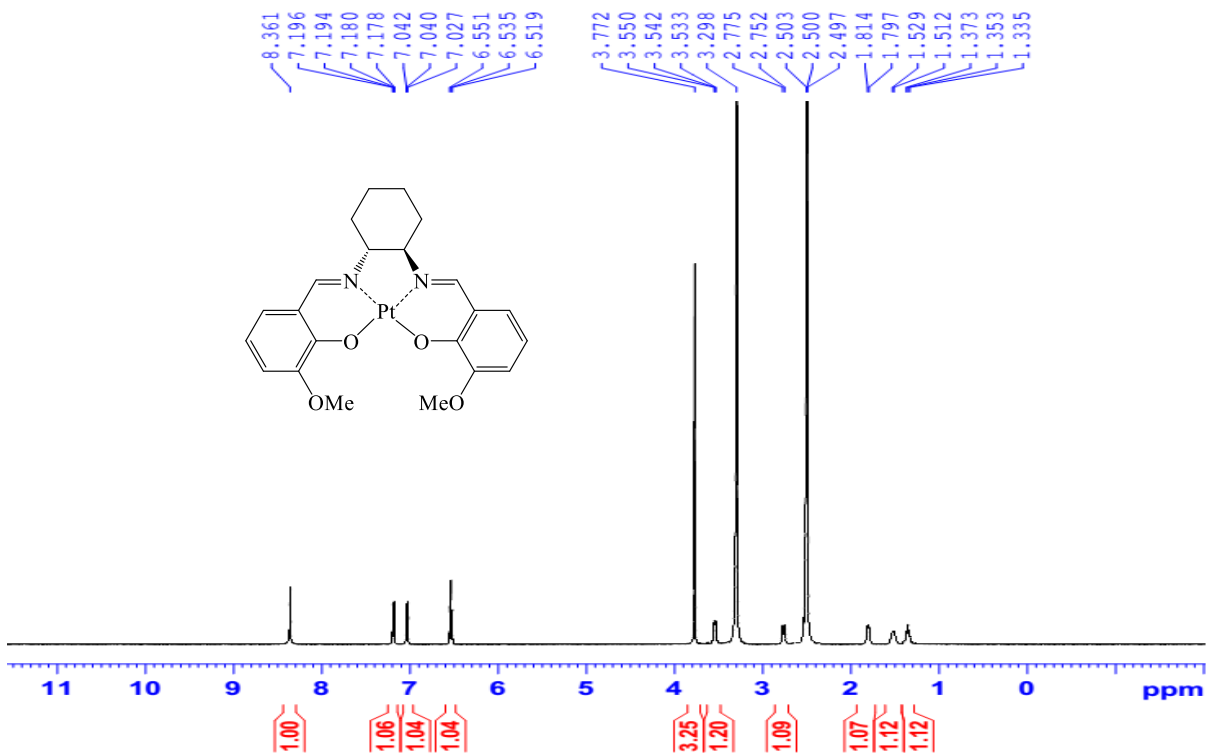


Figure S2.3Rc. The <sup>1</sup>H-NMR spectrum of complex [Pt(R)L3]

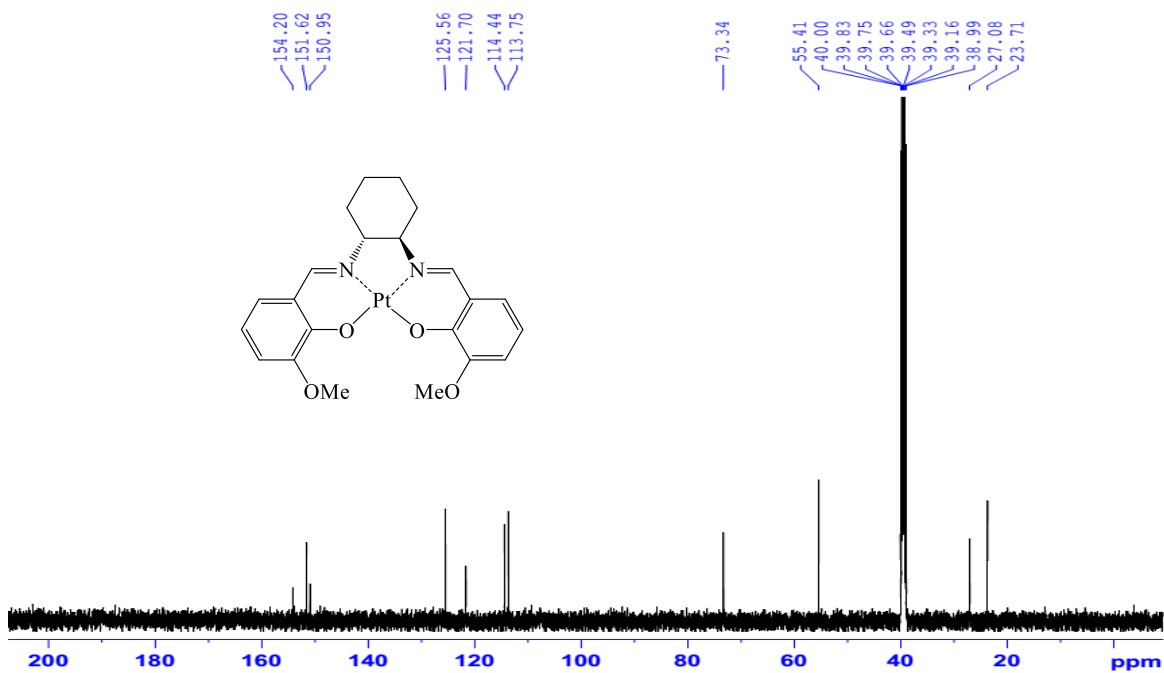
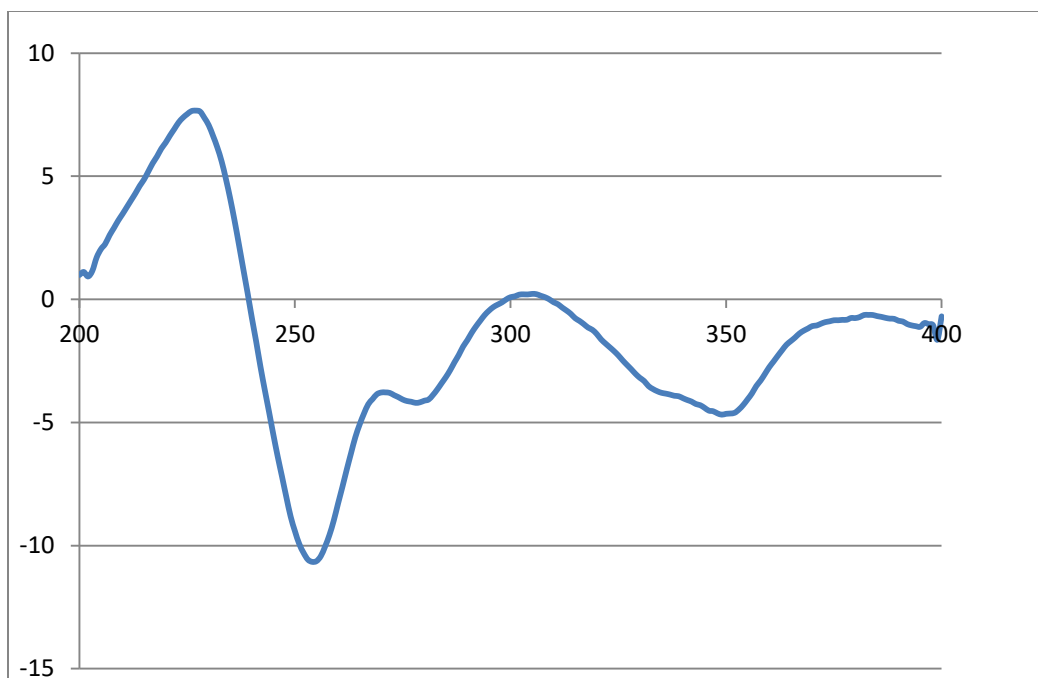
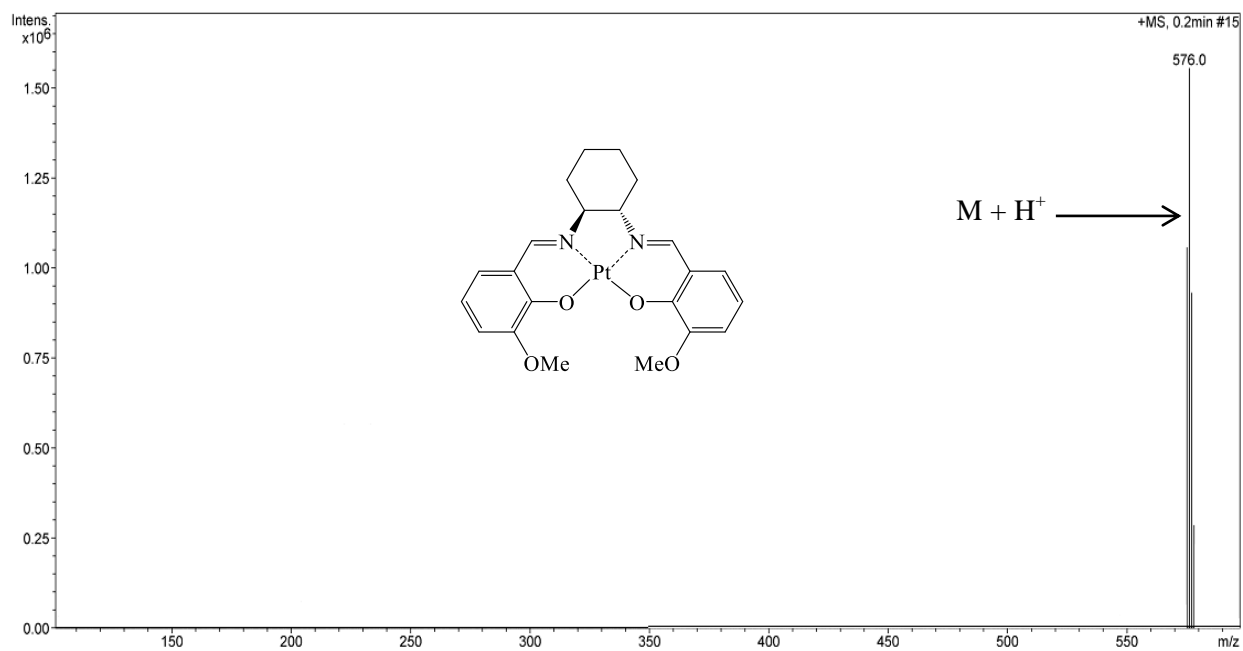


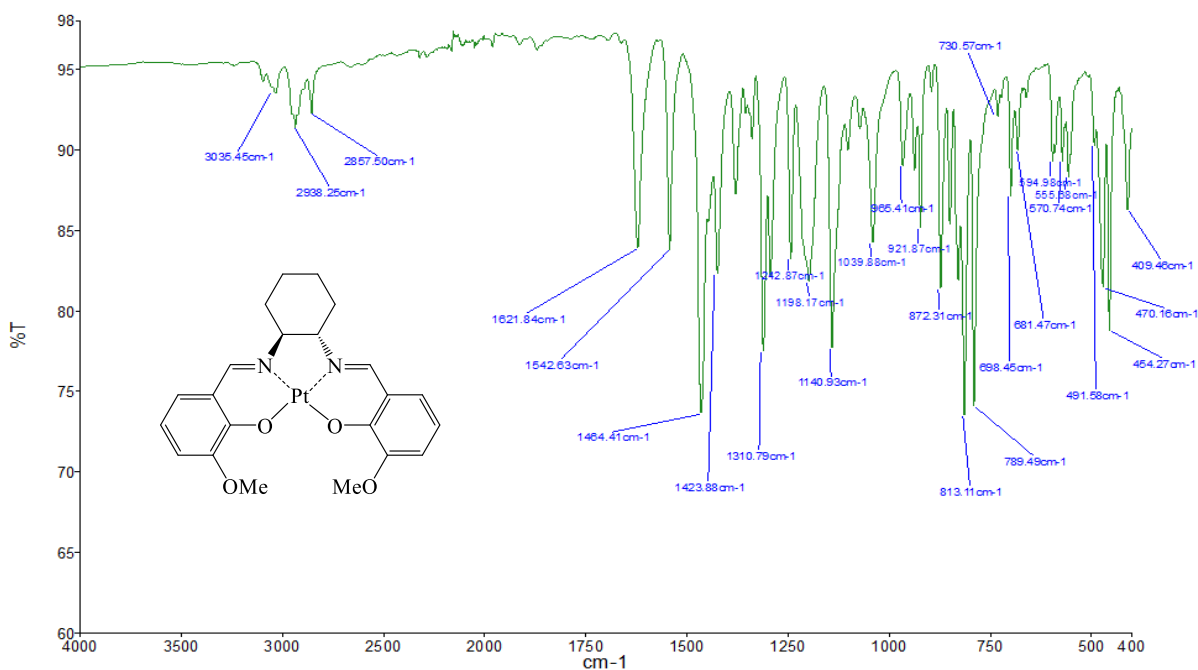
Figure S2.3Rd. The <sup>13</sup>C-NMR spectrum of complex [Pt(R)L3]



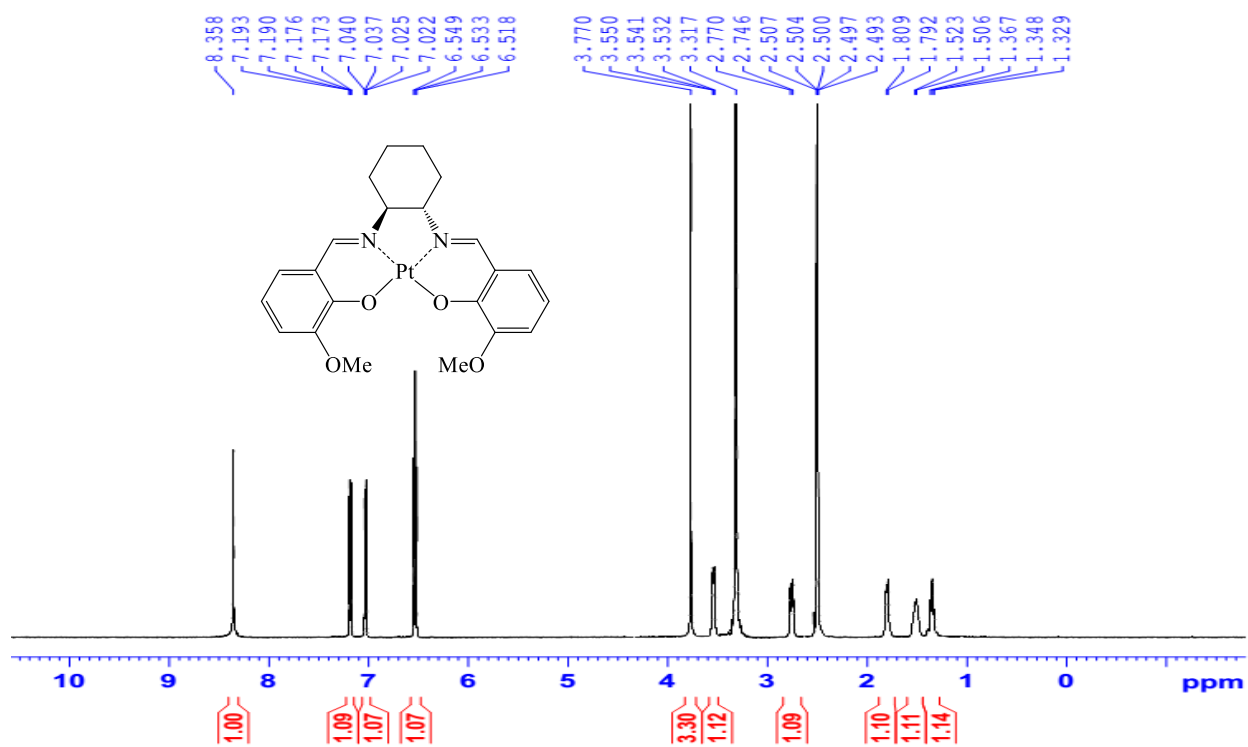
**Figure S2.3Re.** The CD spectrum of complex [Pt(*R*)L3]



**Figure S2.3Sa.** The ESI-MS spectrum of complex [Pt(*S*)L3]



**Figure S2.3Sb.** The IR spectrum of complex [Pt(S)L3]



**Figure S2.3Sc.** The <sup>1</sup>H-NMR spectrum of complex [Pt(S)L3]

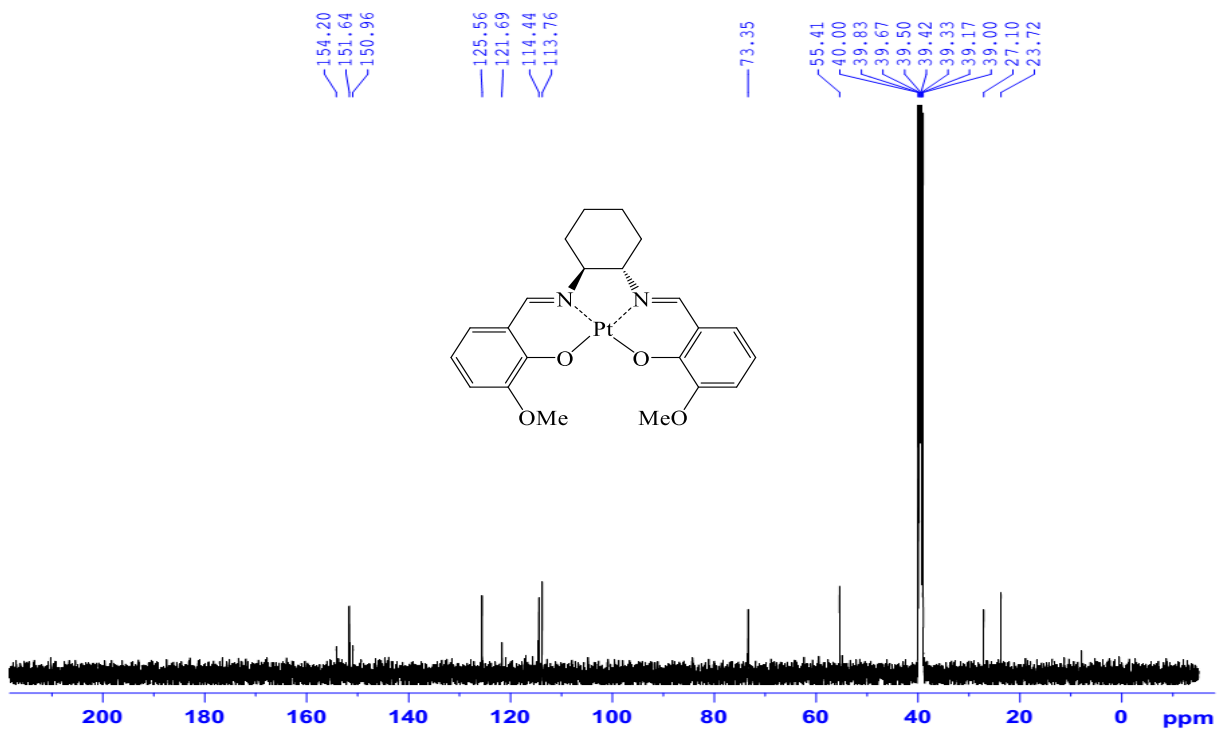


Figure S2.3Sd. The  $^{13}\text{C}$ -NMR spectrum of complex [Pt(S)L3]

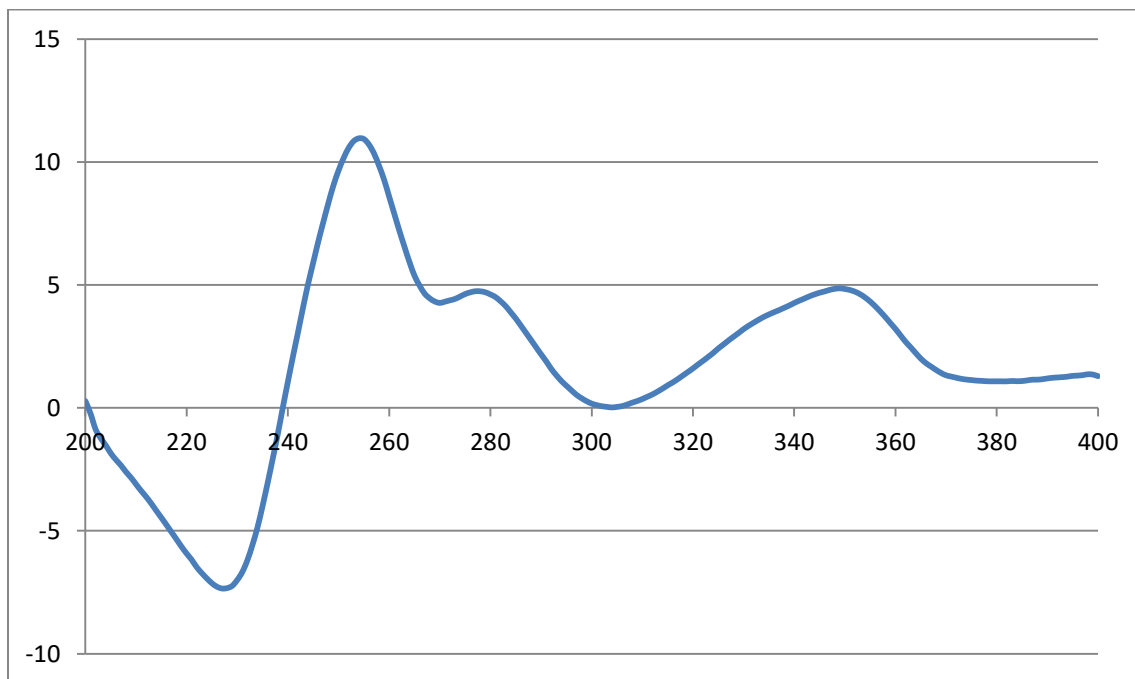


Figure S2.3Se. The CD spectrum of complex [Pt(S)L3]



## II.4. The spectral data of complexes [Pt(R)L4] and [Pt(S)L4]

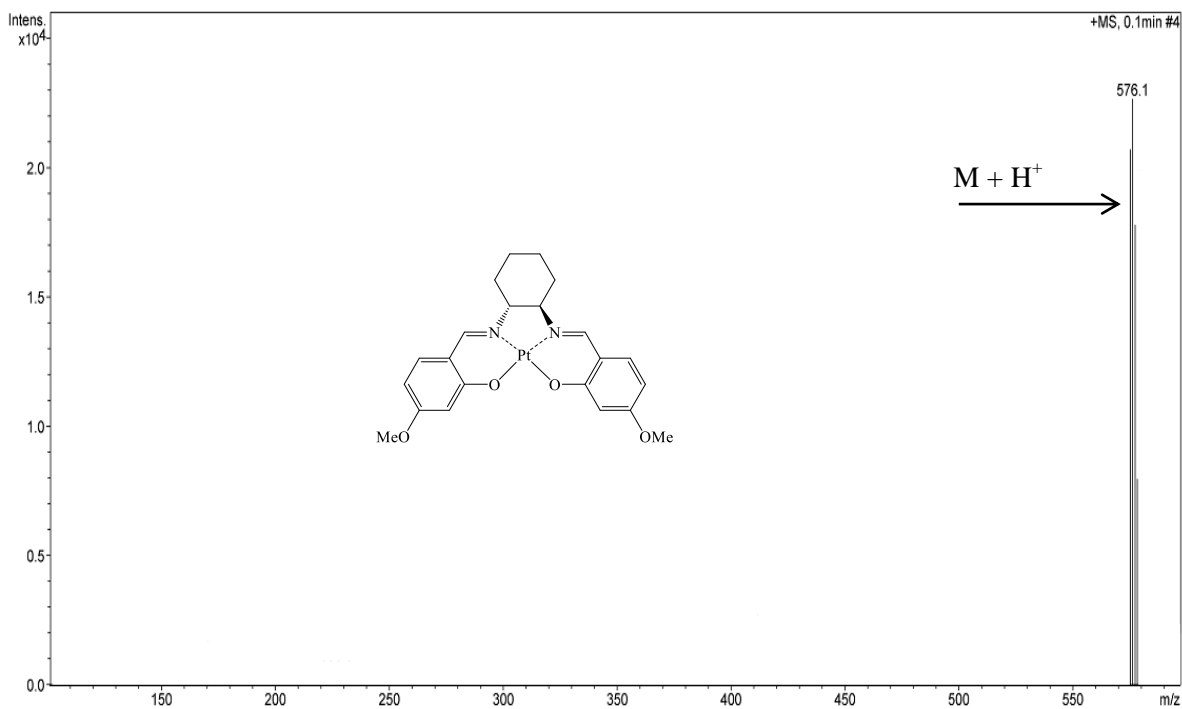


Figure S2.4Ra. The ESI-MS spectrum of complex [Pt(R)L4]

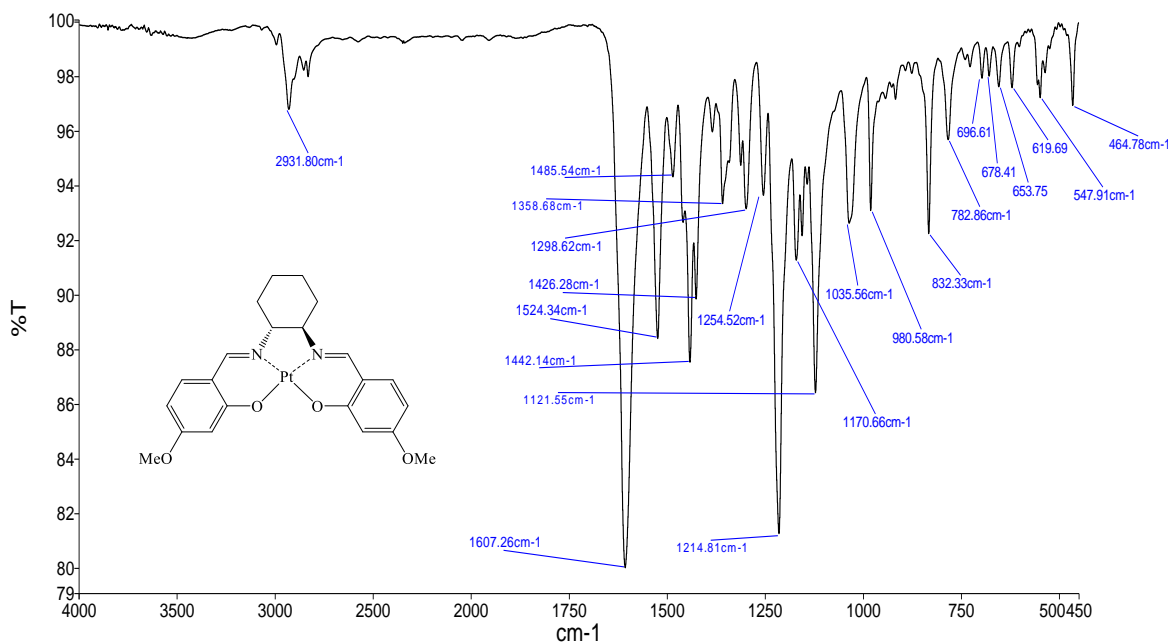
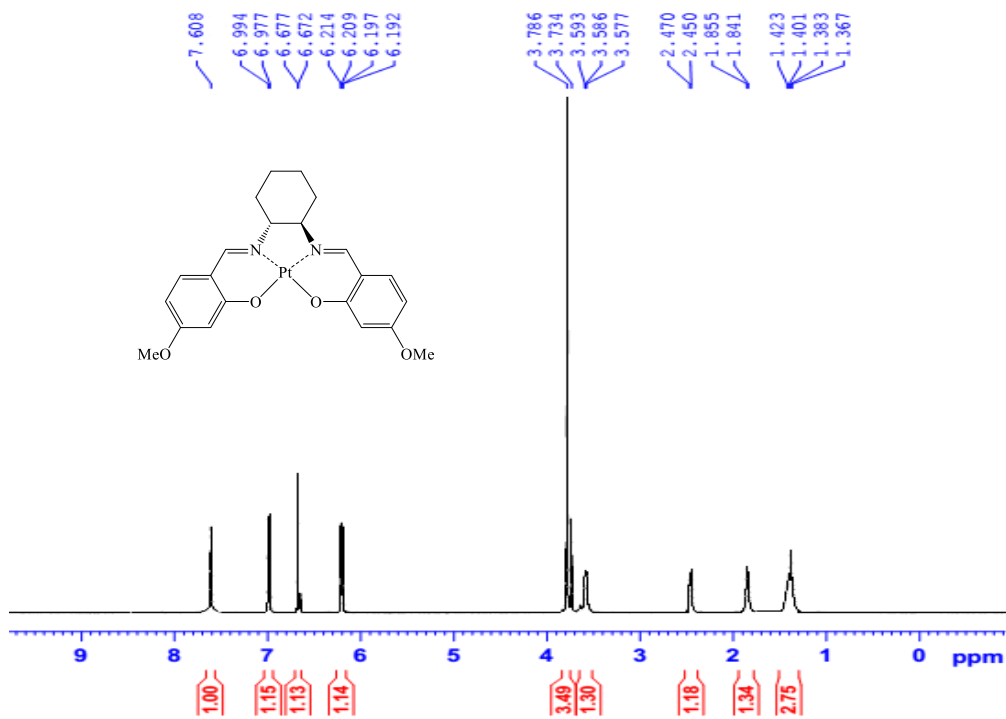
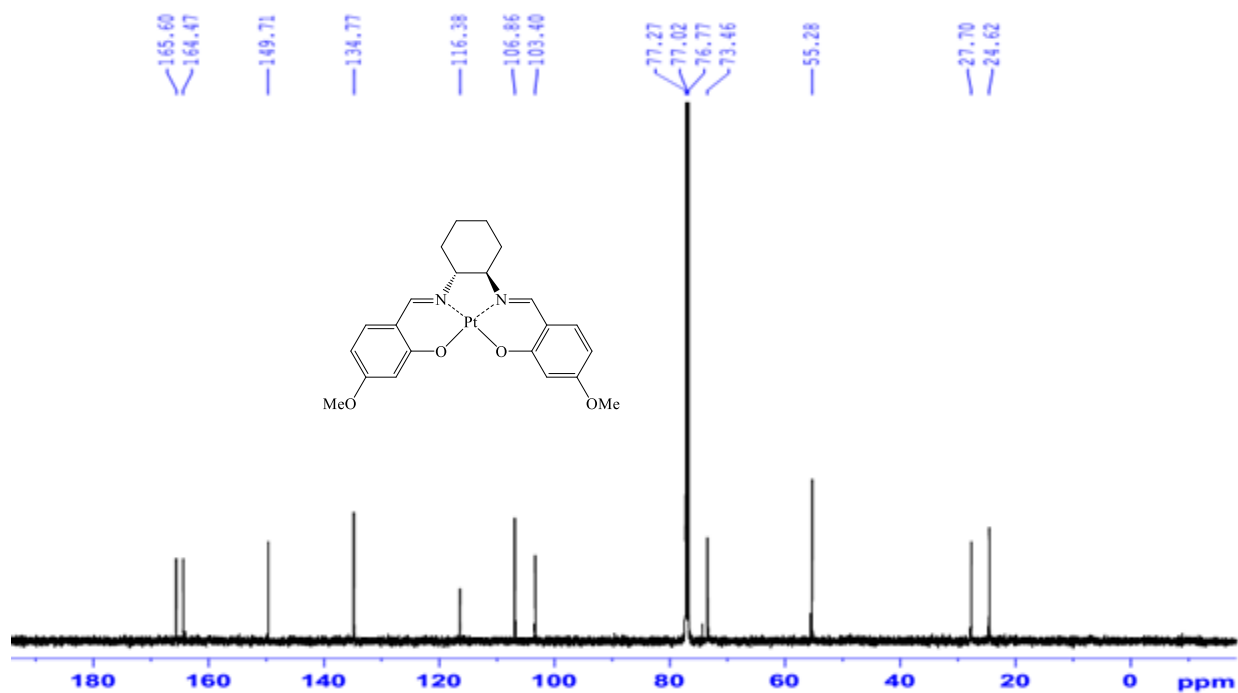


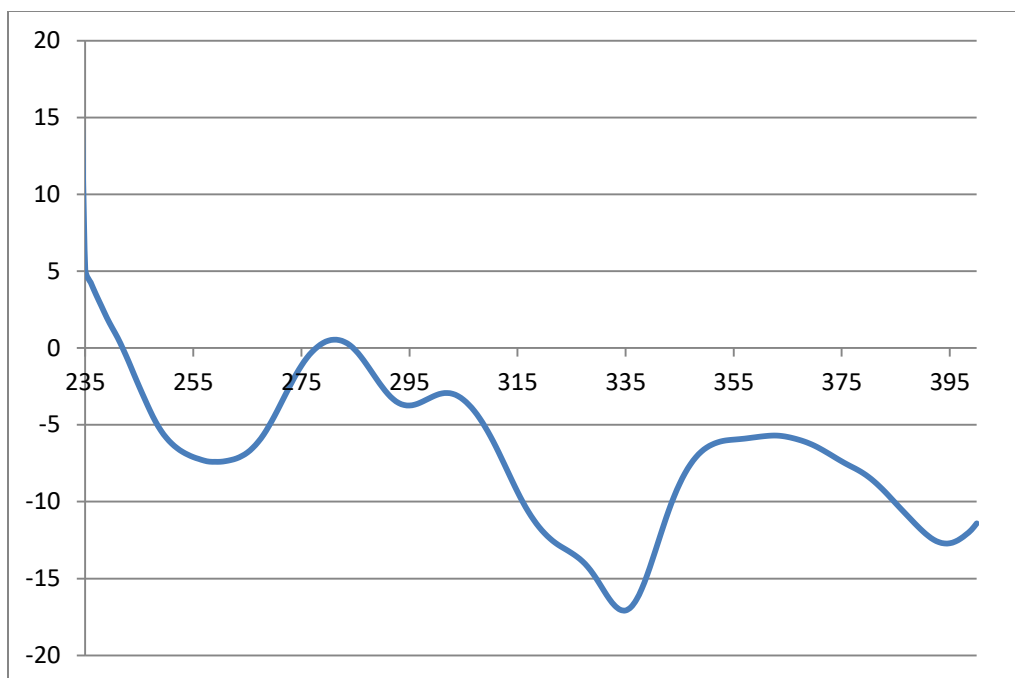
Figure S2.4Rb. The IR spectrum of complex [Pt(R)L4]



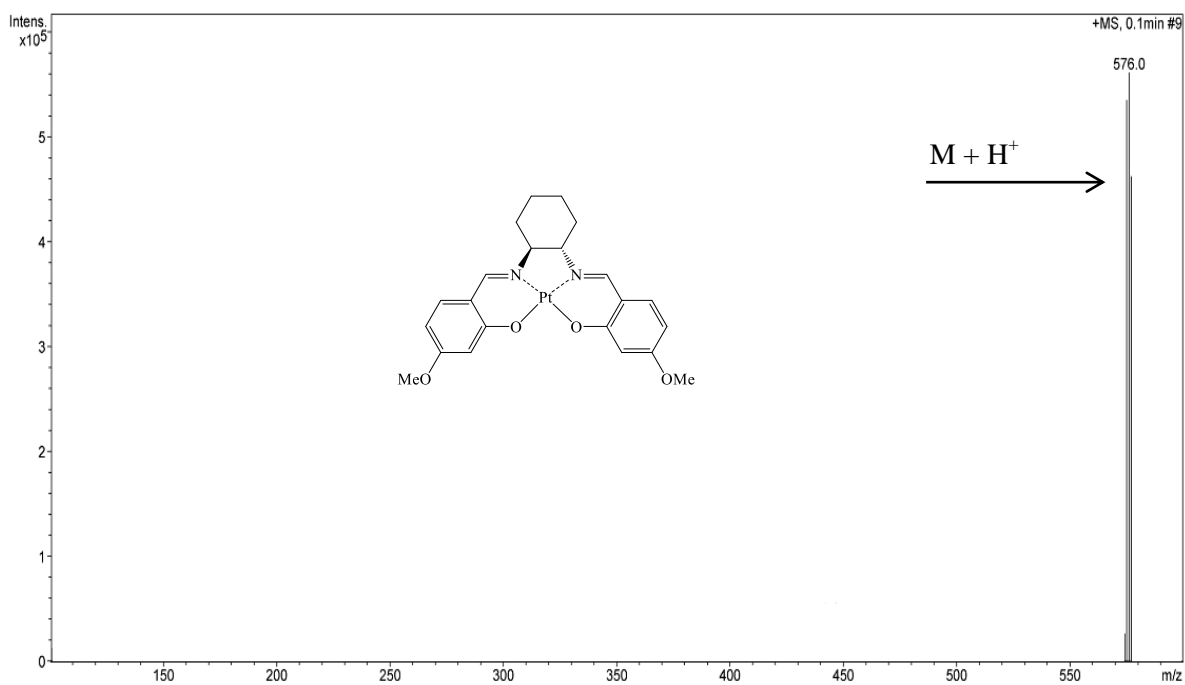
**Figure S2.4Rc.** The <sup>1</sup>H-NMR spectrum of complex [Pt(R)L4]



**Figure S2.4Rd.** The <sup>13</sup>C-NMR spectrum of complex [Pt(R)L4]



**Figure S2.4Re.** The CD spectrum of complex [Pt(R)L4]



**Figure S2.4Sa.** The ESI-MS spectrum of complex [Pt(S)L4]

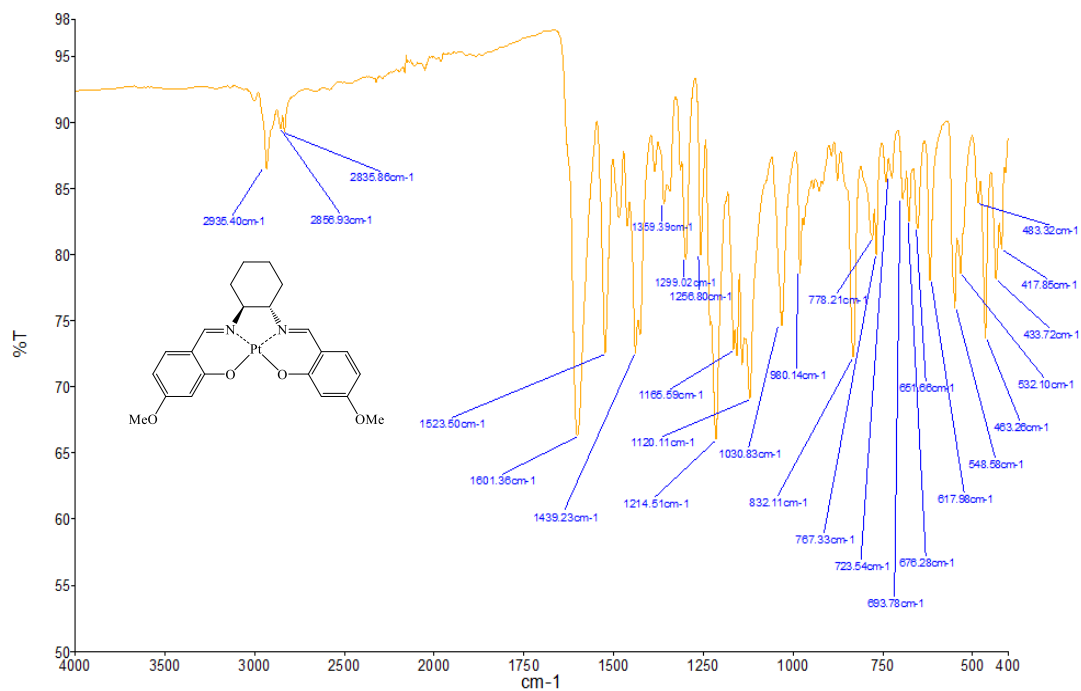


Figure S2.4Sb. The IR spectrum of complex [Pt(S)L4]

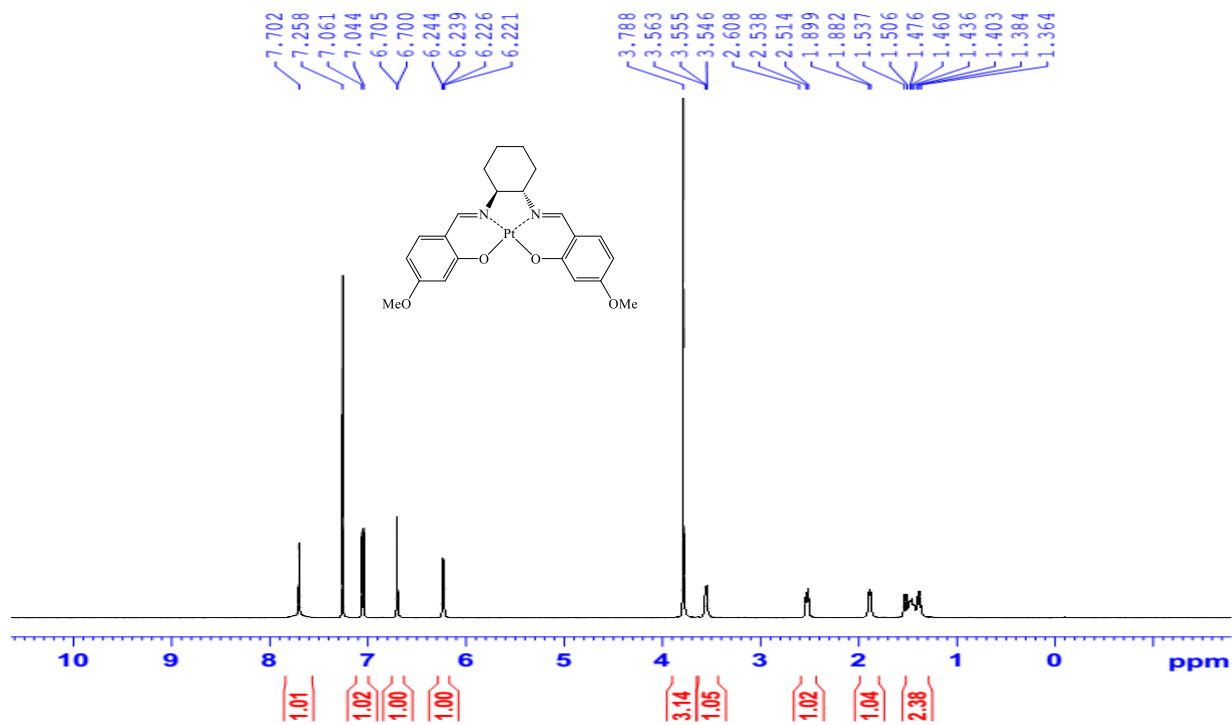
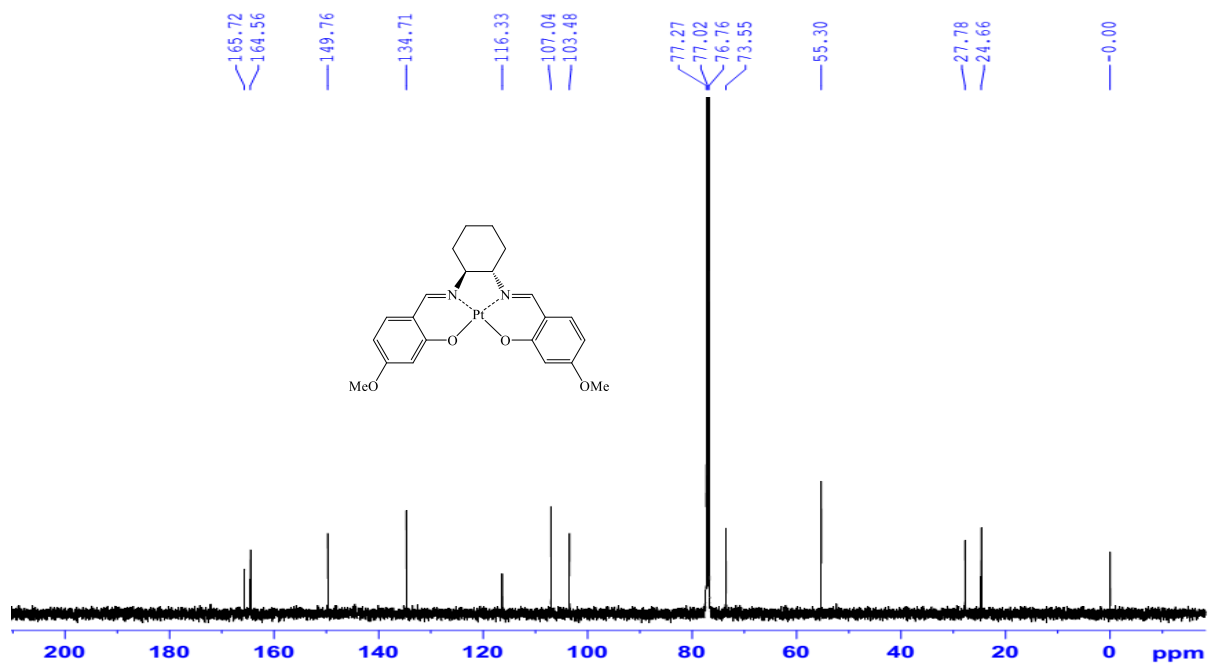
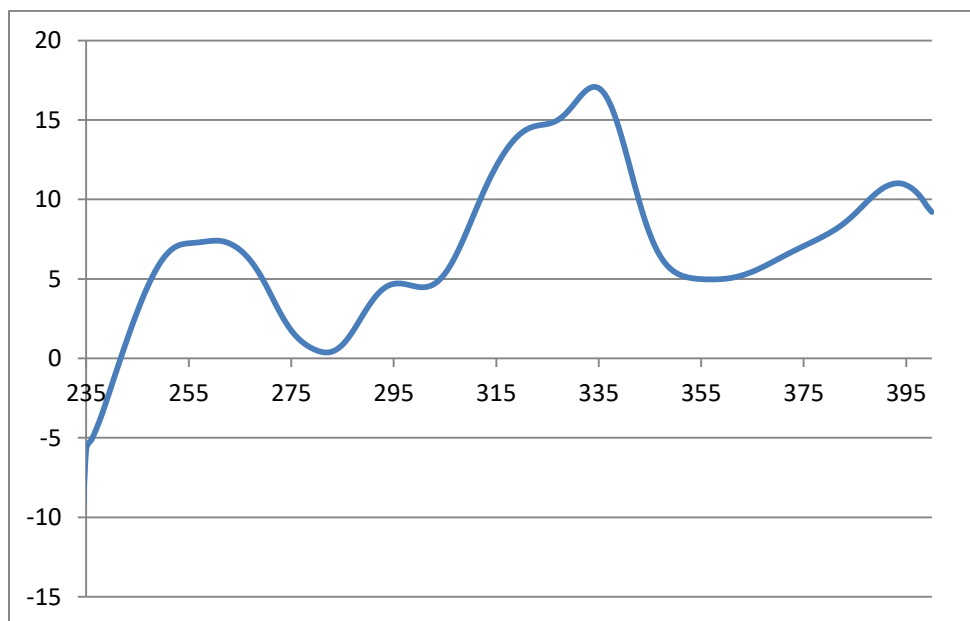


Figure S2.4Sc. The <sup>1</sup>H-NMR spectrum of complex [Pt(S)L4]



**Figure S2.4Sd.** The  $^{13}\text{C}$ -NMR spectrum of complex [Pt(S)L4]



**Figure S2.4Se.** The CD spectrum of complex [Pt(S)L4]

## II.5. The spectral data of complexes [Pt(R)L5] and [Pt(S)L5]

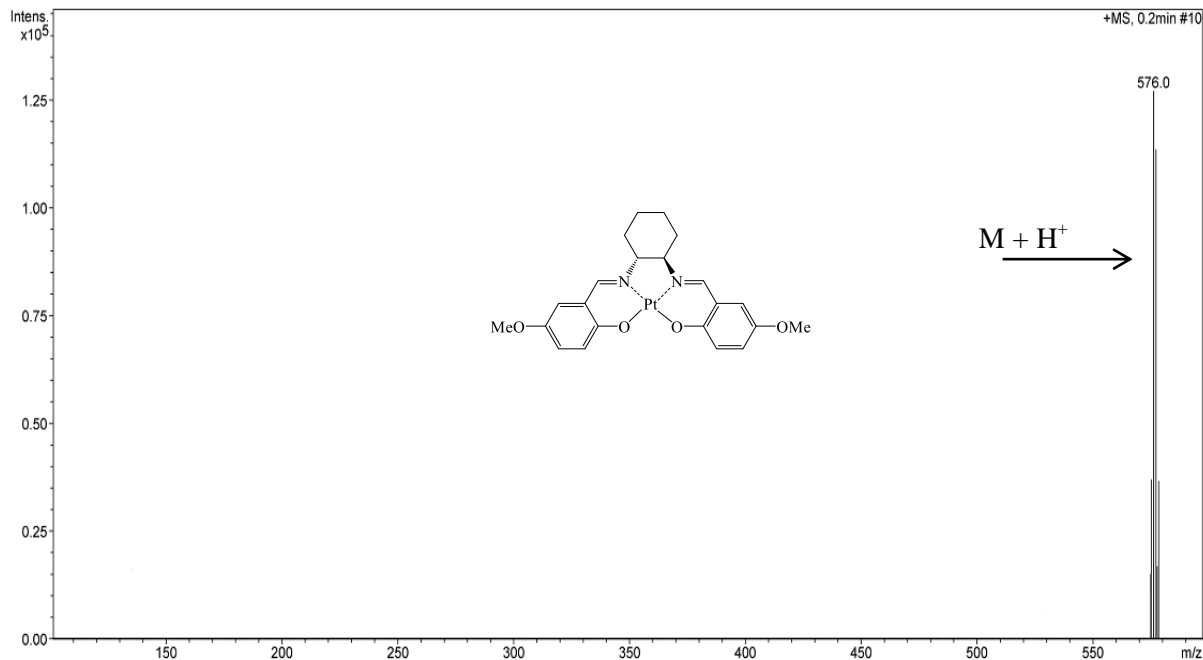


Figure S2.5Ra. The ESI-MS spectrum of complex [Pt(R)L5]

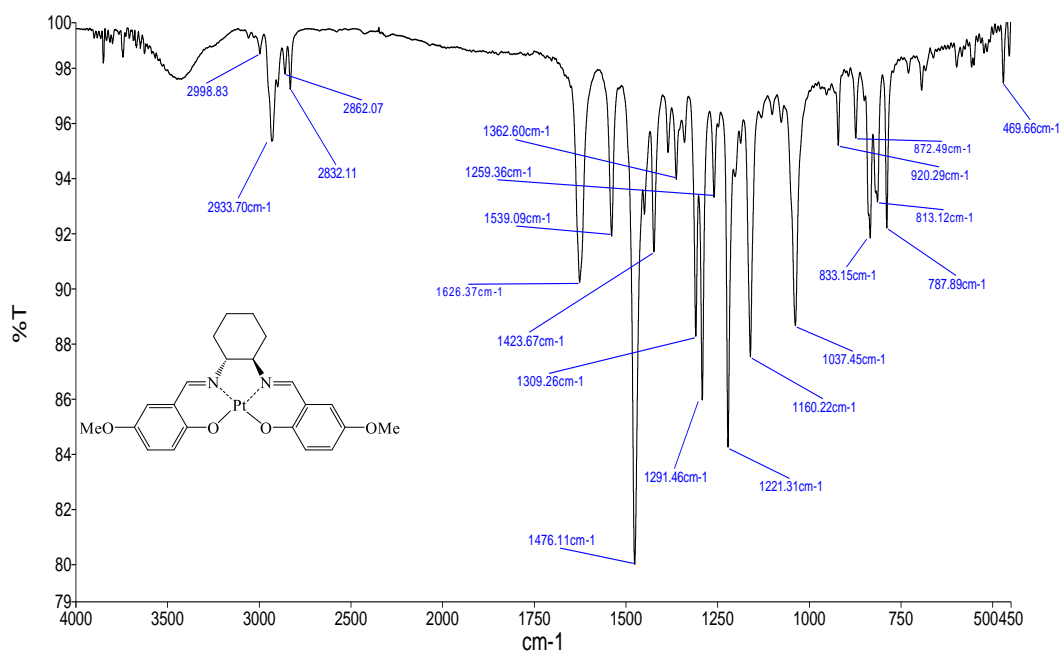


Figure S2.5Rb. The IR spectrum of complex [Pt(R)L5]

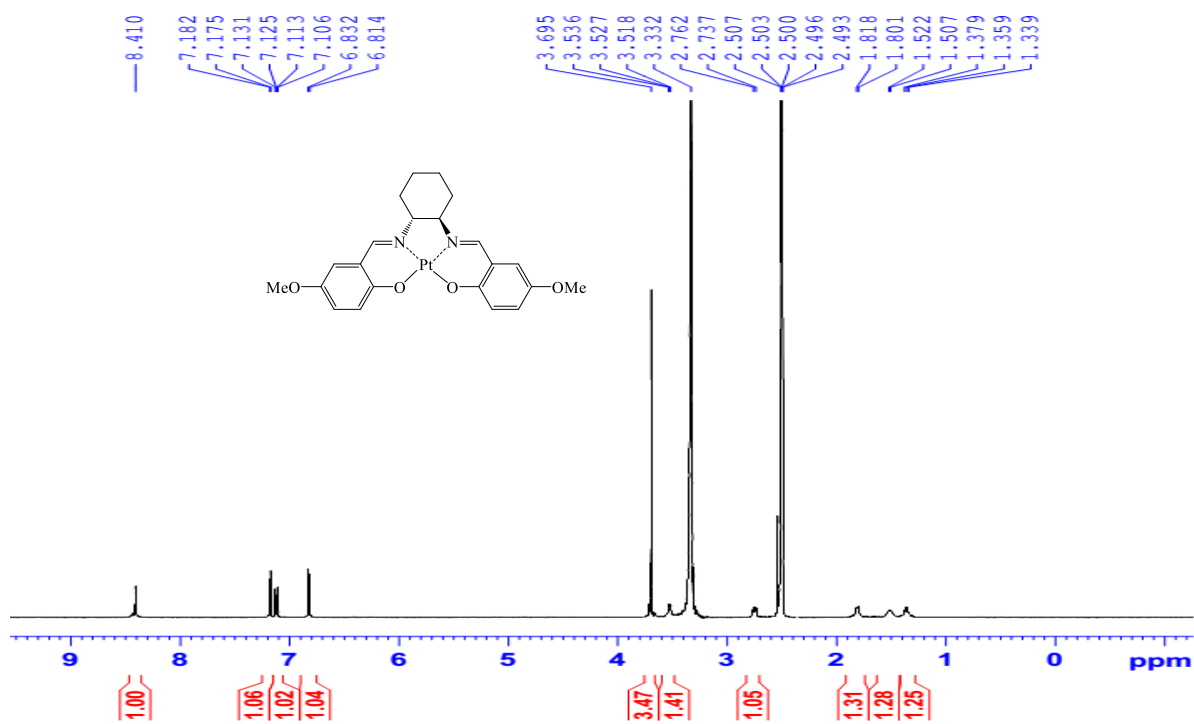


Figure S2.5Rc. The <sup>1</sup>H-NMR spectrum of complex [Pt(R)L5]

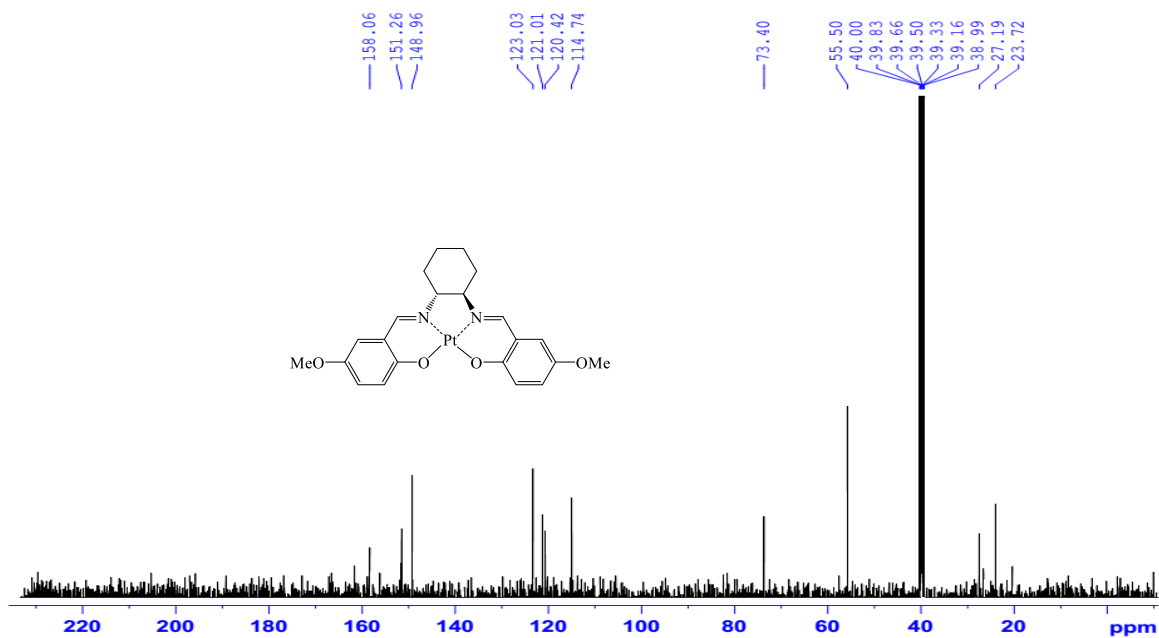
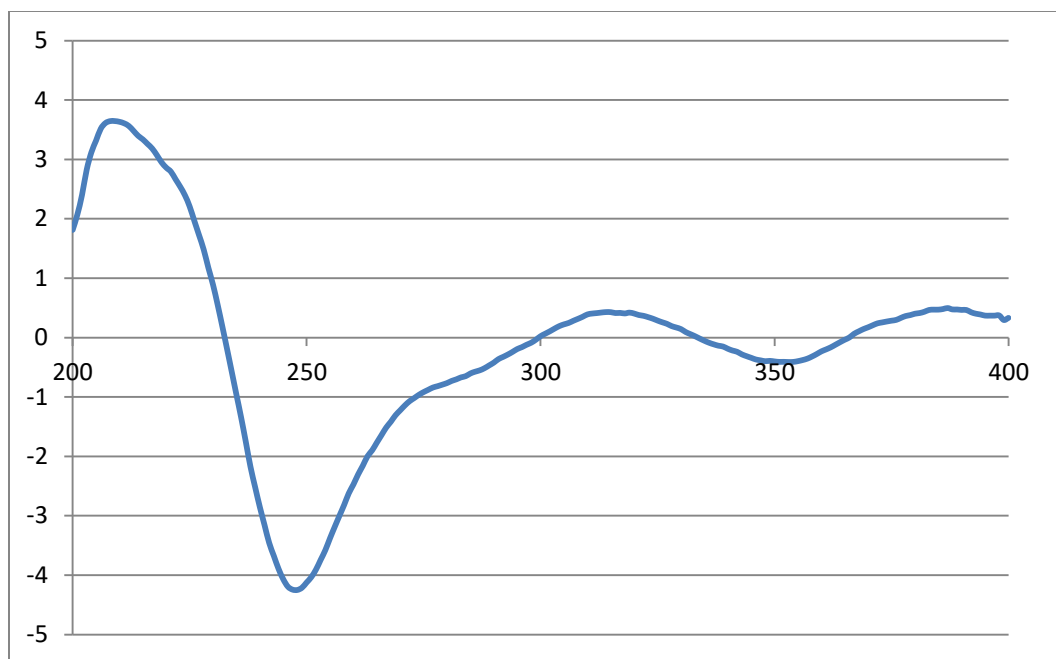
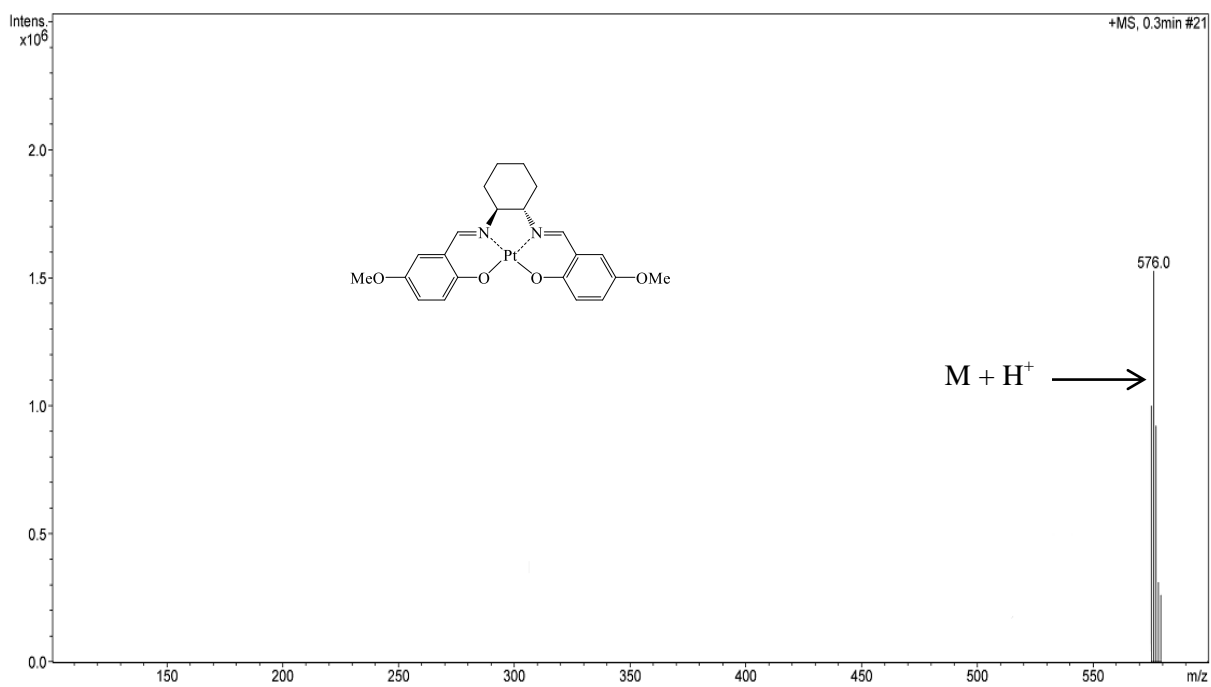


Figure S2.5Rd. The <sup>13</sup>C-NMR spectrum of complex [Pt(R)L5]

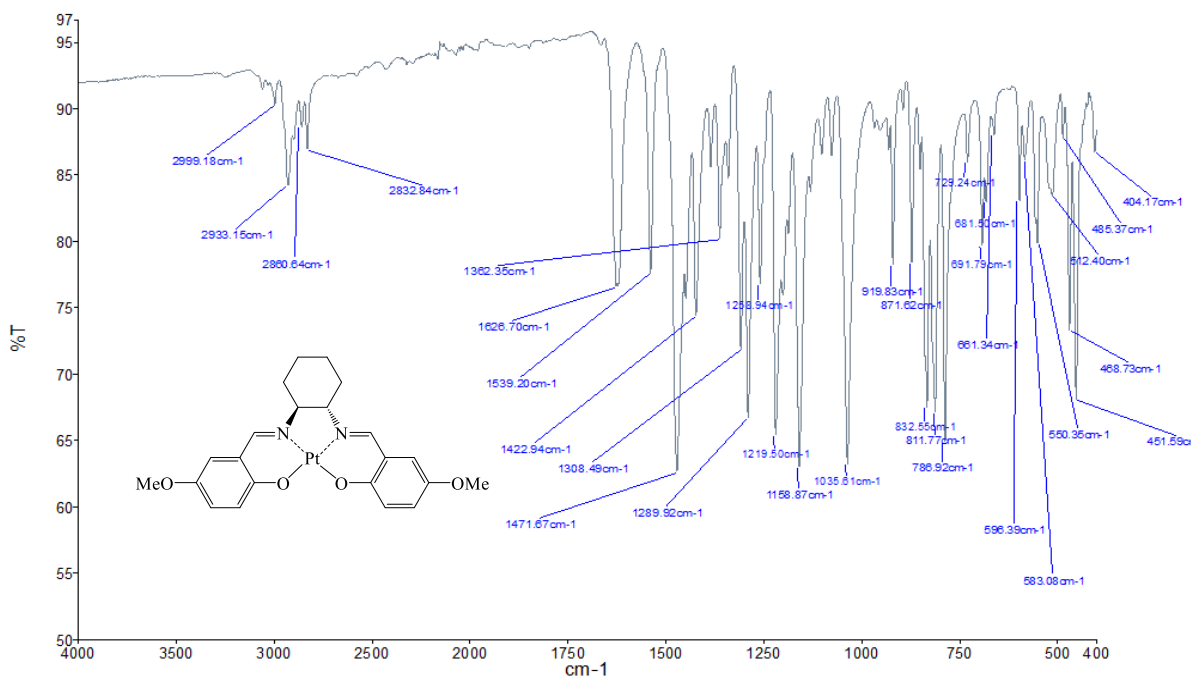


**Figure S2.5Re.** The CD spectrum of complex [Pt(R)L5]

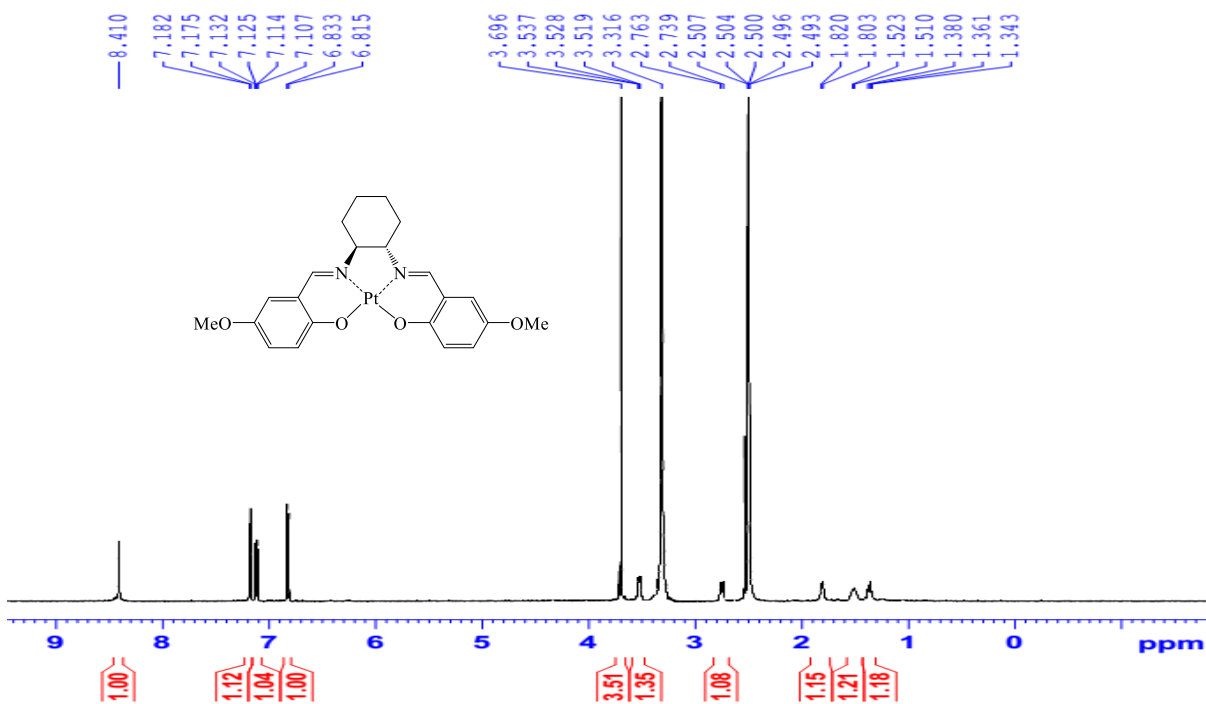


**Figure S2.5Sa.** The ESI-MS spectrum of complex [Pt(S)L5]

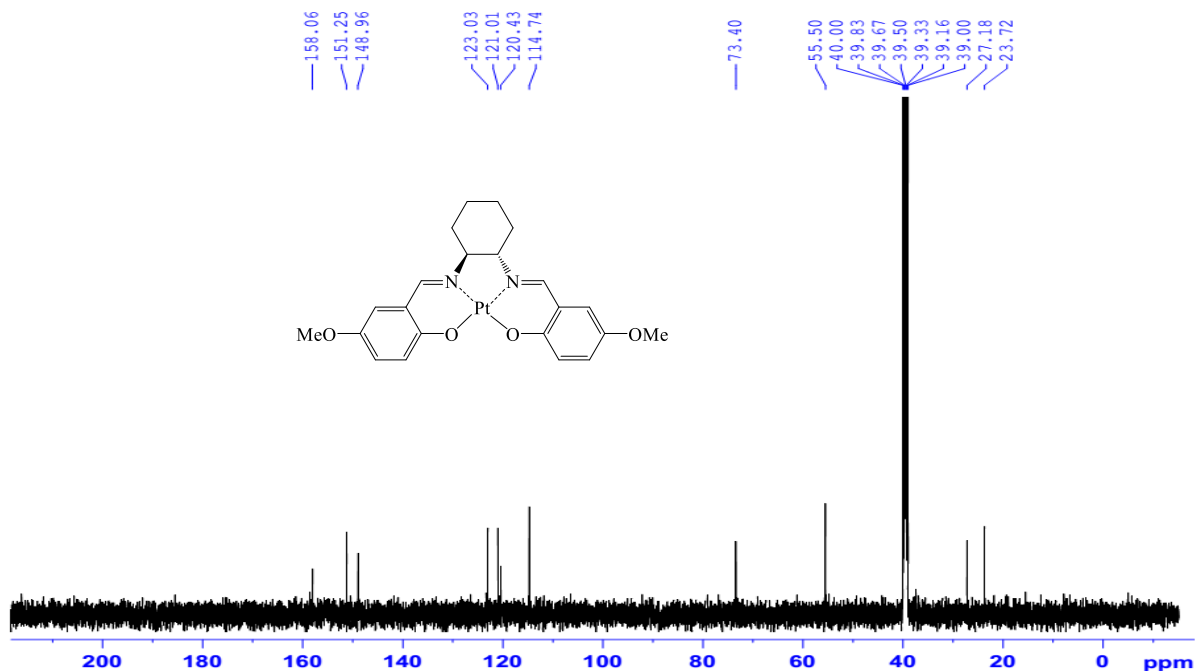




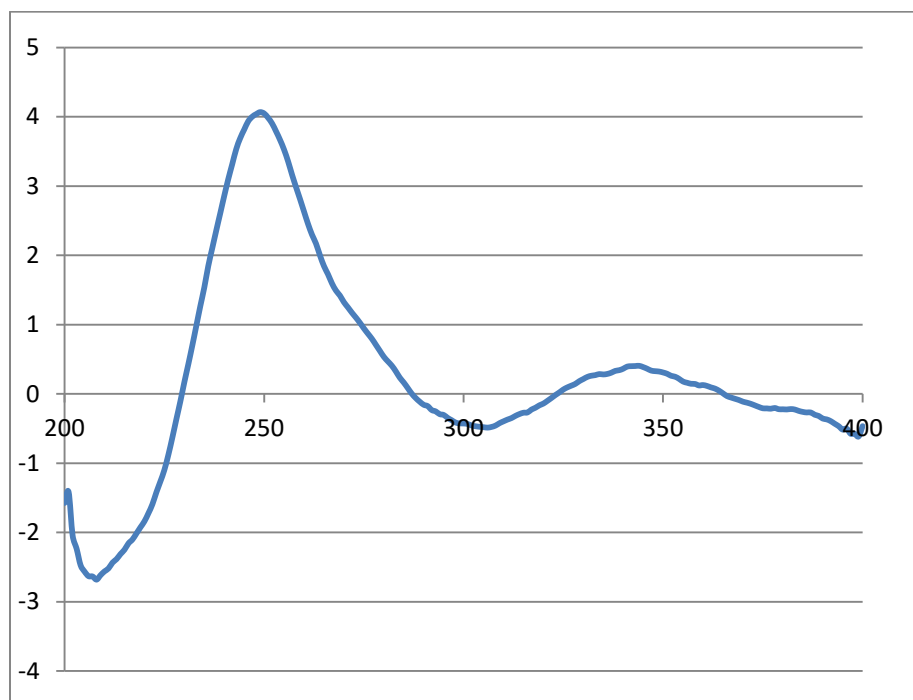
**Figure S2.5Sb.** The IR spectrum of complex [Pt(S)L5]



**Figure S2.5Sc.** The <sup>1</sup>H-NMR spectrum of complex [Pt(S)L5]



**Figure S2.5Sd.** The  $^{13}\text{C}$ -NMR spectrum of complex [Pt(S)L5]



**Figure S2.5Se.** The CD spectrum of complex [Pt(S)L5]

## II.6. The spectral data of complexes [Pt(R)L6] and [Pt(S)L6]

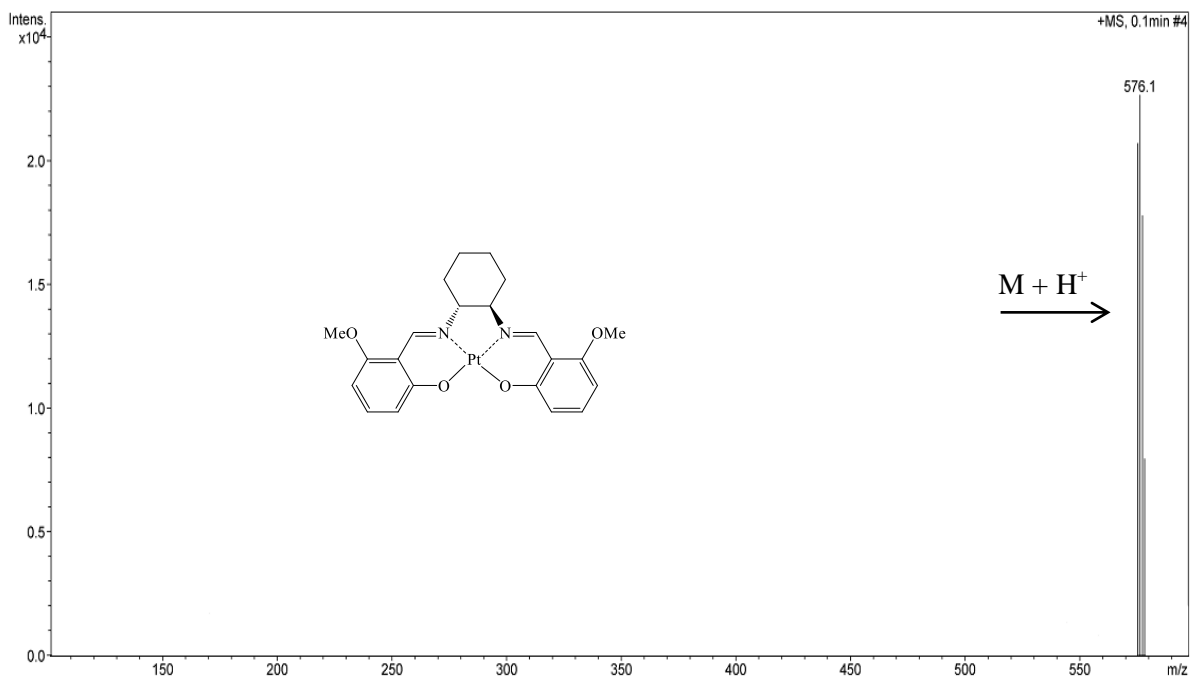


Figure S2.6Ra. The ESI-MS spectrum of complex [Pt(R)L6]

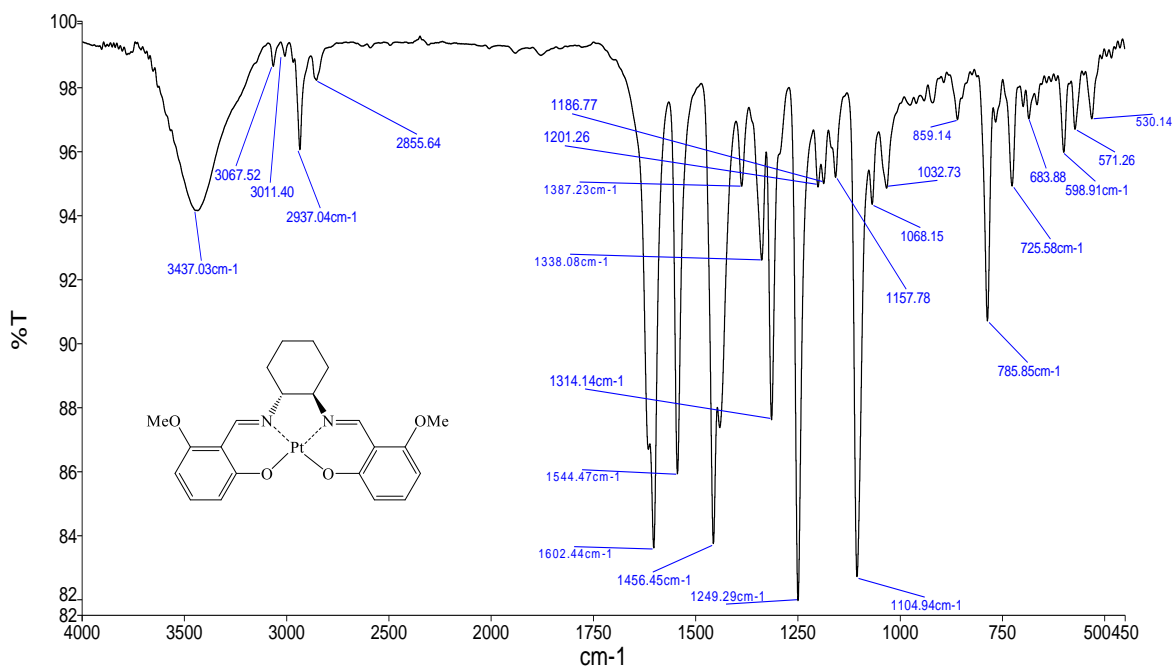


Figure S2.6Rb. The IR spectrum of complex [Pt(R)L6]

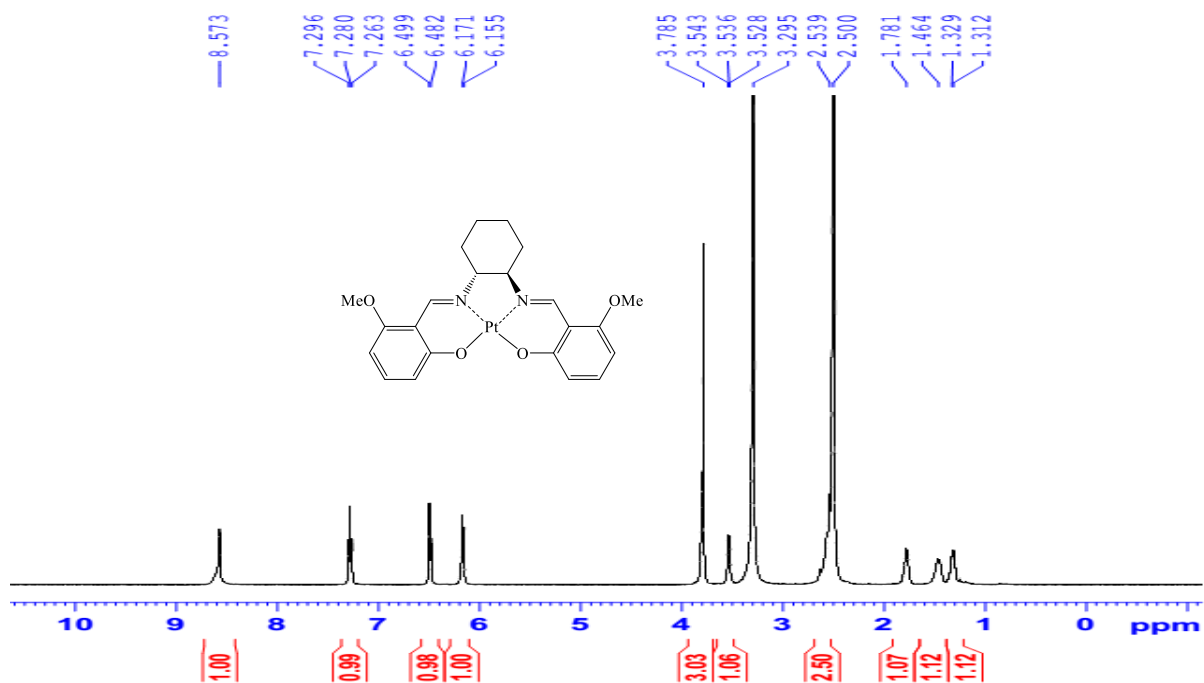


Figure S2.6Rc. The <sup>1</sup>H-NMR spectrum of complex [Pt(R)L6]

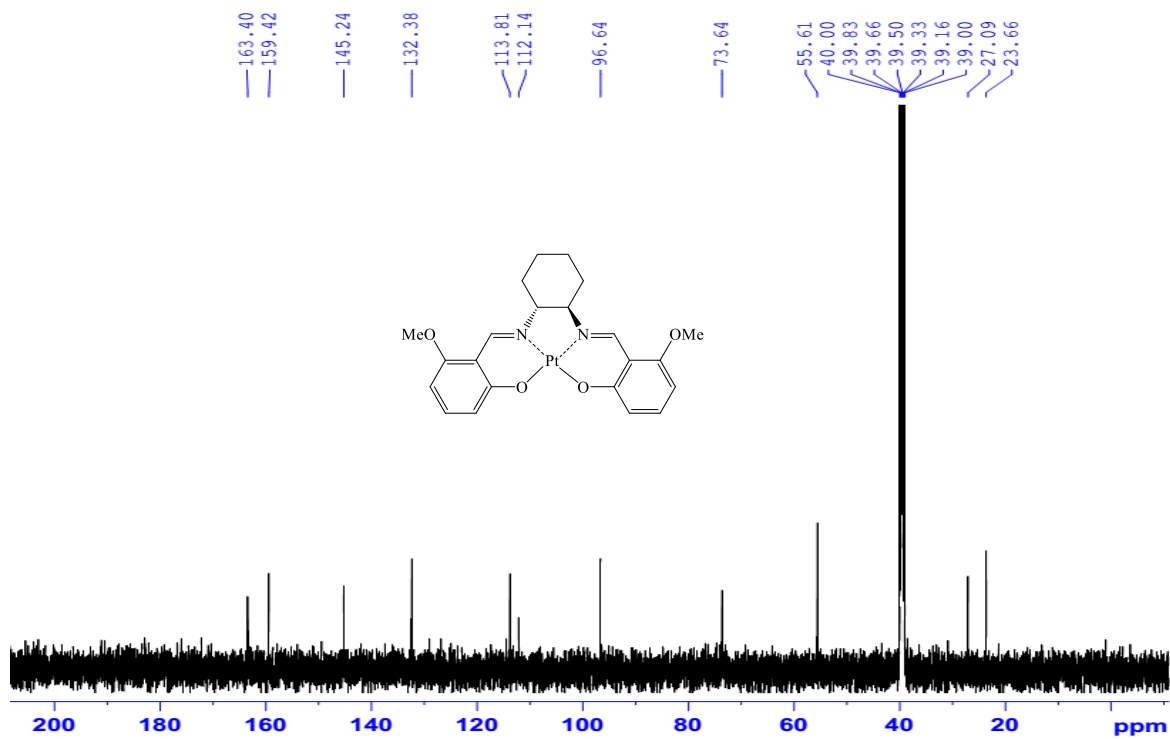
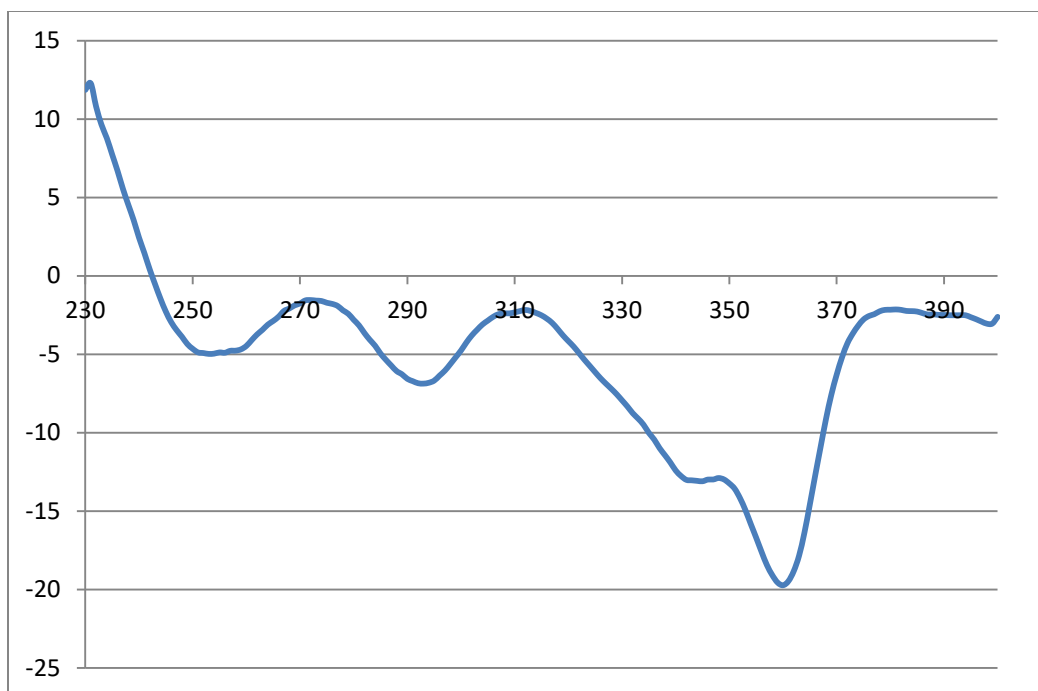
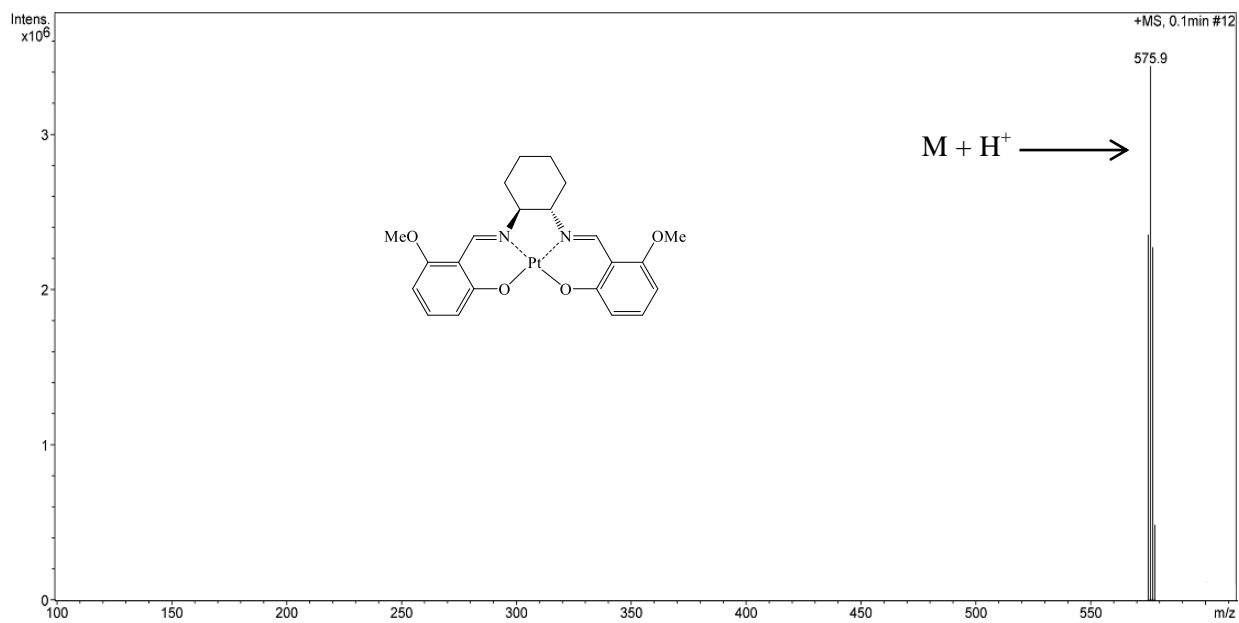


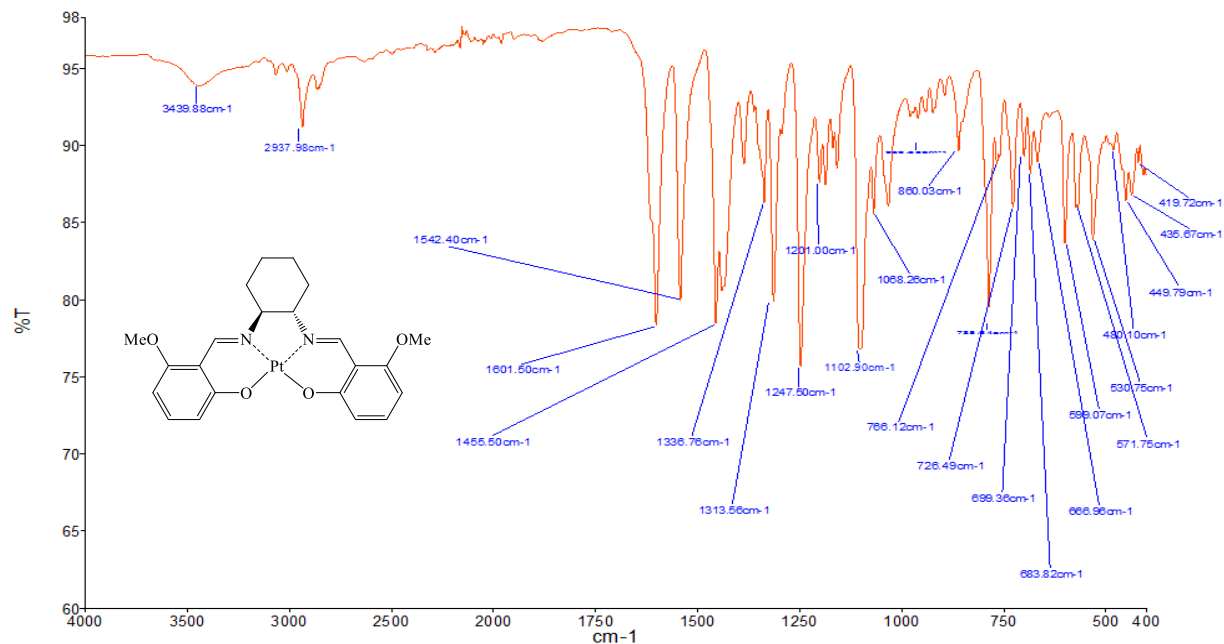
Figure S2.6Rd. The <sup>13</sup>C-NMR spectrum of complex [Pt(R)L6]



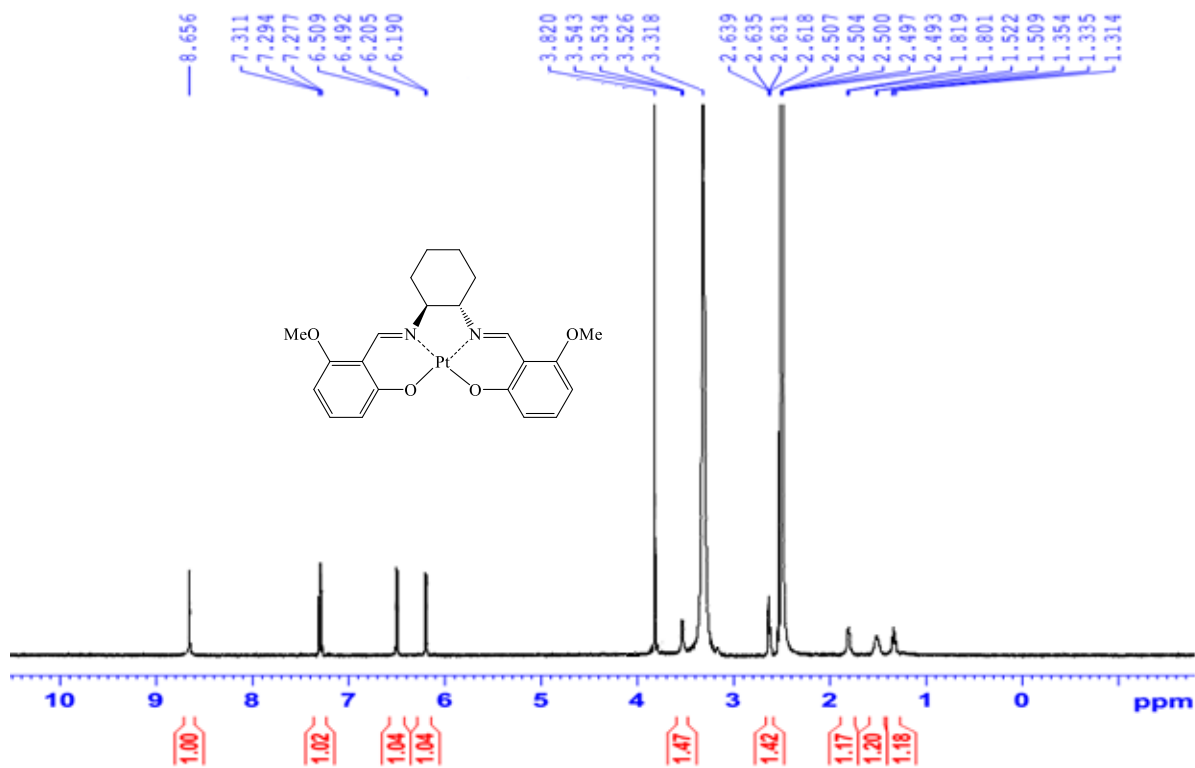
**Figure S2.6Re.** The CD spectrum of complex [Pt(*R*)L6]



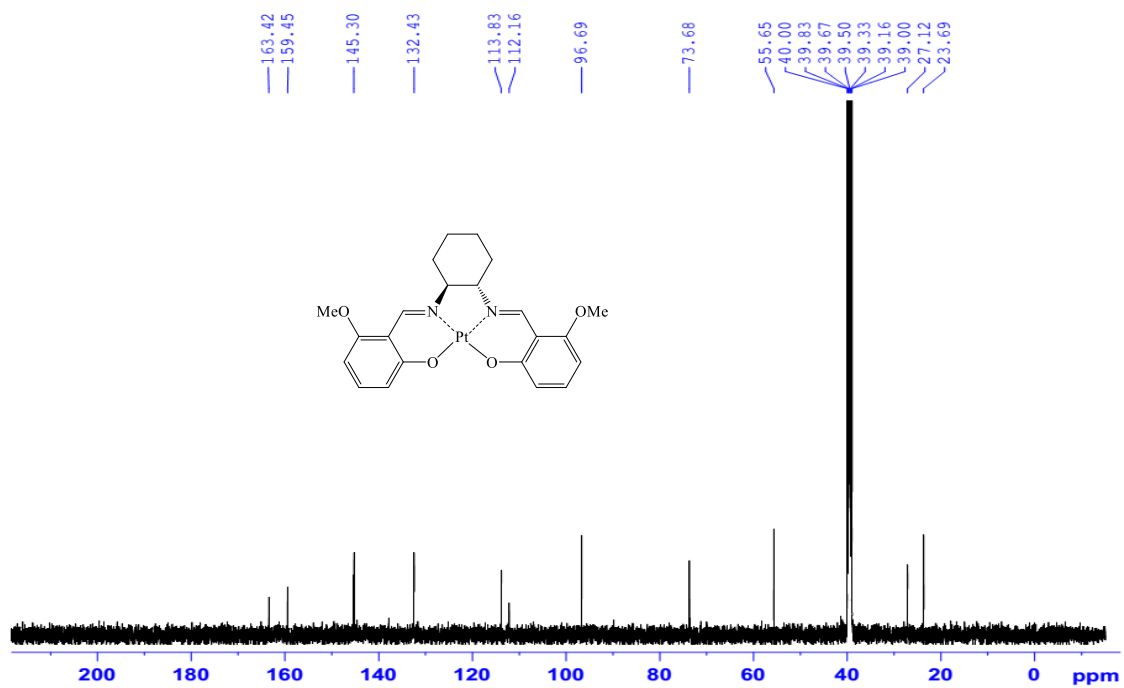
**Figure S2.6Sa.** The ESI-MS spectrum of complex [Pt(*S*)L6]



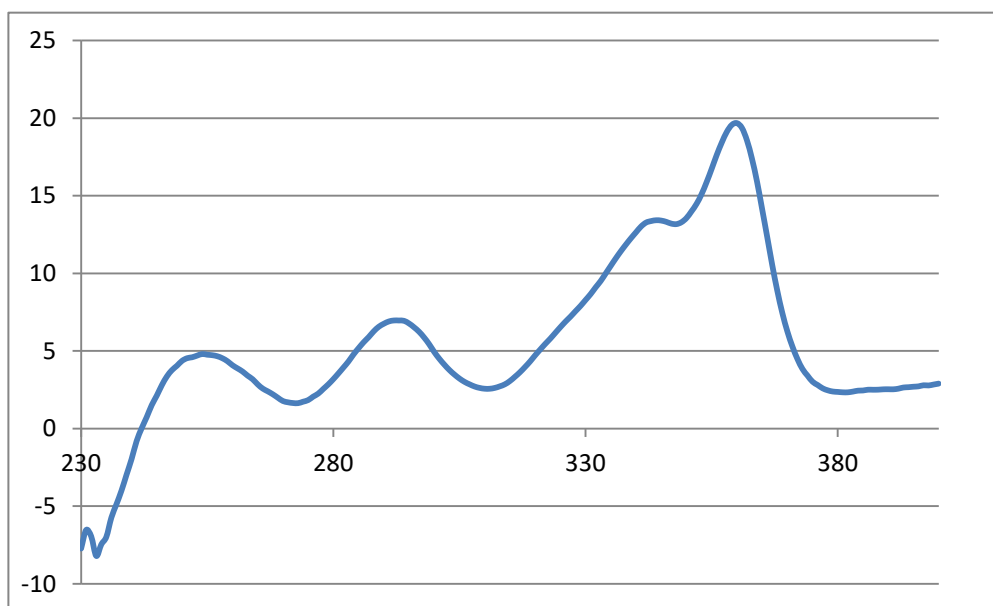
**Figure S2.6Sb.** The IR spectrum of complex [Pt(S)L6]



**Figure S2.6Sc.** The <sup>1</sup>H-NMR spectrum of complex [Pt(S)L6]



**Figure S2.6Sd.** The  $^{13}\text{C}$ -NMR spectrum of complex [Pt(S)L6]



**Figure S2.6Se.** The CD spectrum of complex [Pt(S)L6]