Supporting information

Yellow-to-brown and yellow-to-green electrochromic devices based on complexes of transition metal ions with triphenylamine-based ligand

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Table of Contents

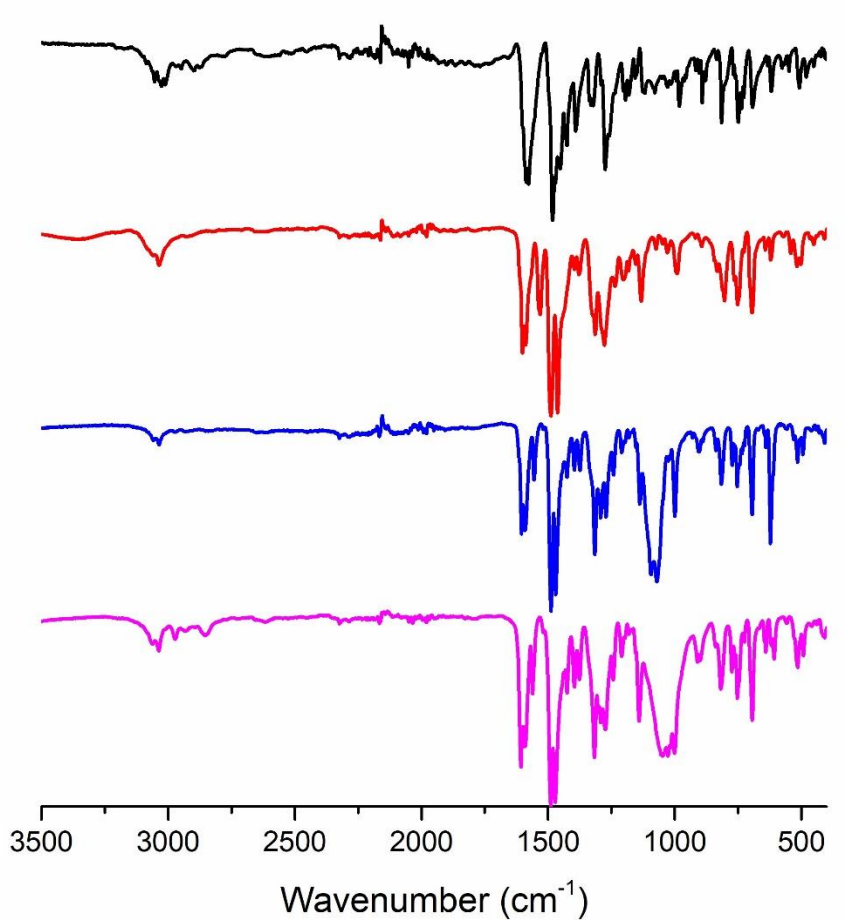

Figure S 1. FTIR spectra of ligand **L** (black), Fe(II) complex (red), Co(II) complex (blue) and Zn(II) complex (magenta).

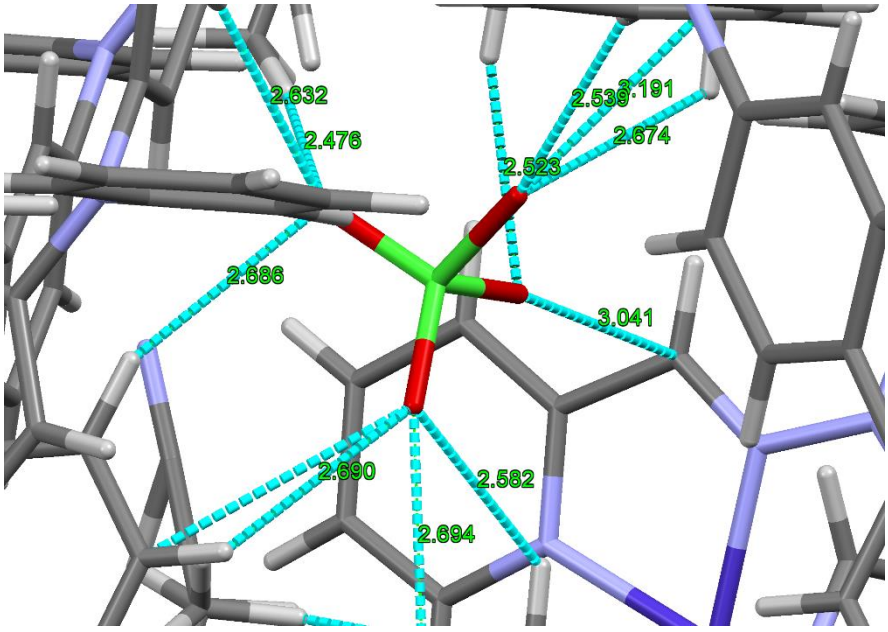

Figure S 2. Presentation of the short contacts between the perchlorate anion and the cation complexes.

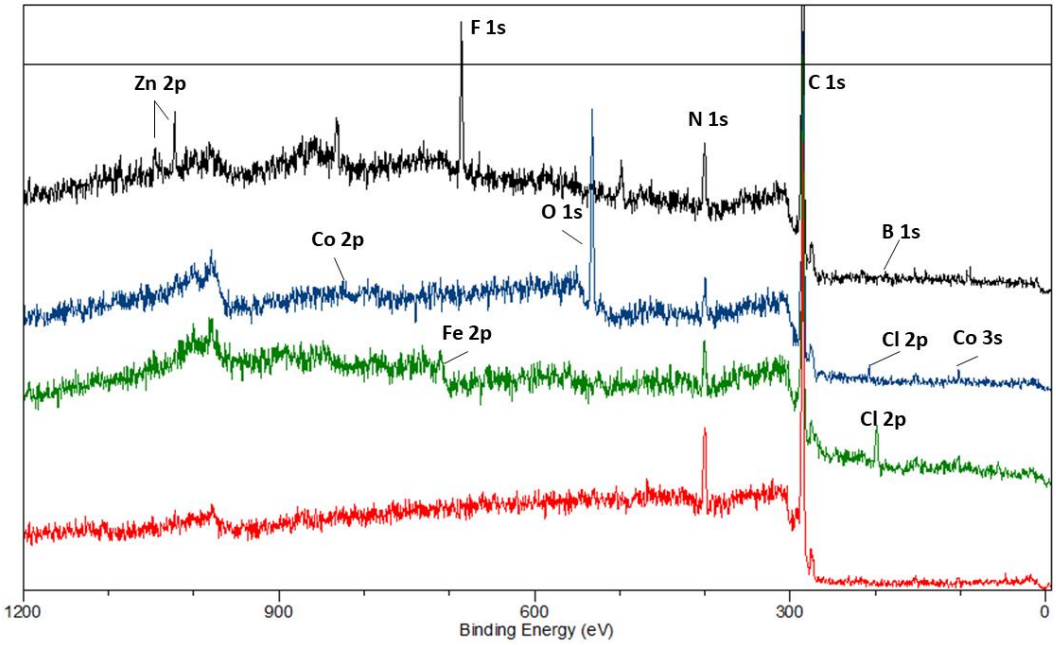

Figure S 3. XPS survey spectrum of ligand **L** (red) and its complexes with Fe(II) (green), Co(II) (blue) and Zn(II) (black) metal ions. The major XPS peaks are marked.

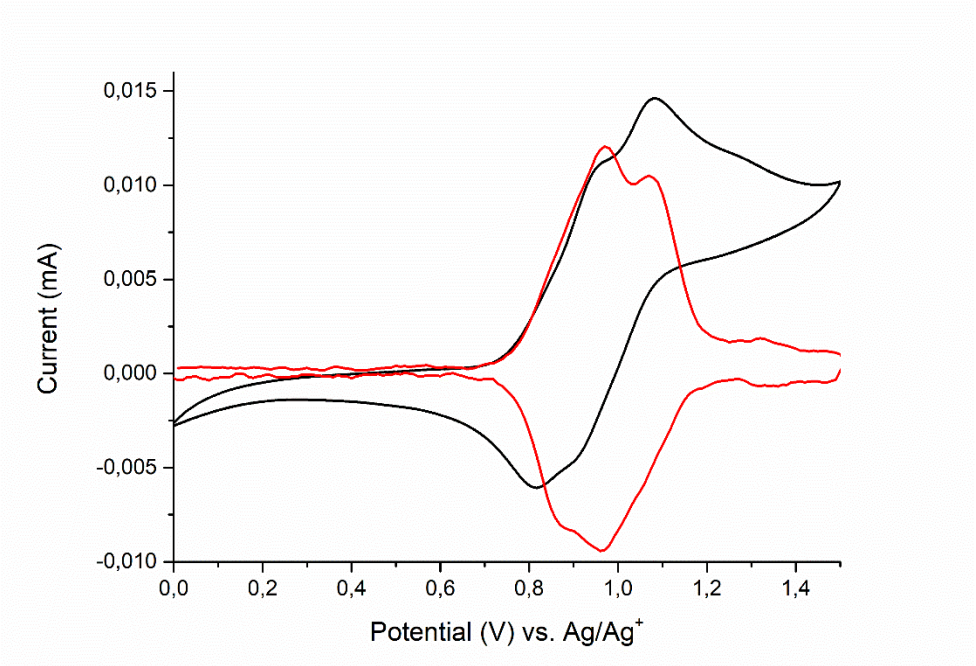

Figure S 4. CV and SWV of ligand **L** measured in anhydrous and deaerated 0.1 M solution of TBAClO4 in PC as an electroilyte at 50 mV/s scan rate.

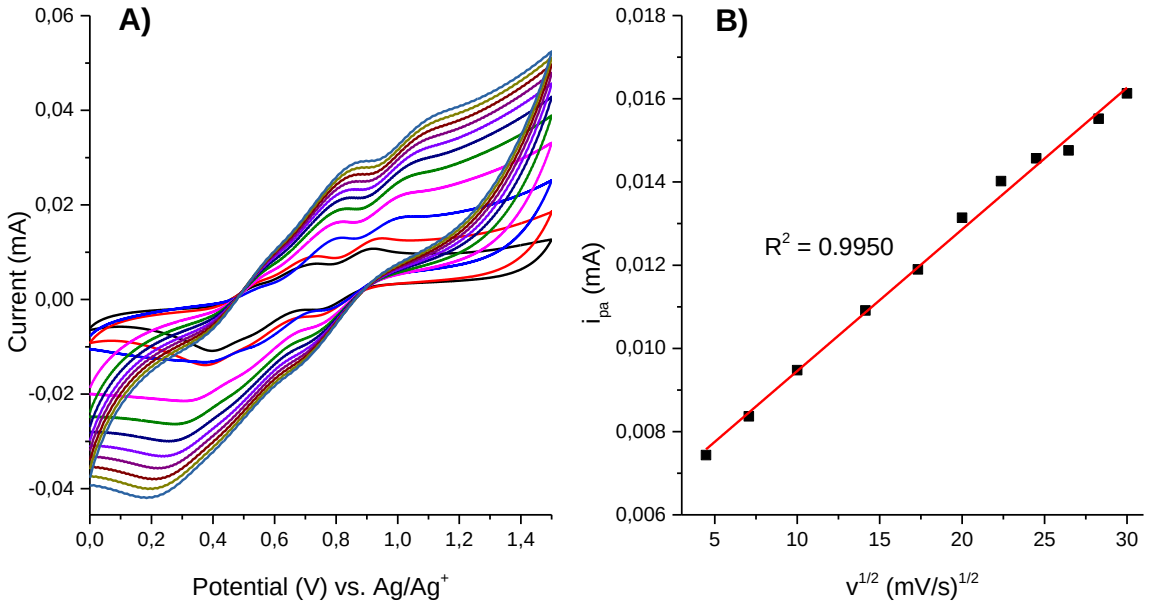

Figure S 5. A) CV profiles of Fe(II) complex at different scan rates; B) Peak current vs. the square root of the scan rate for the Fe(II) complex.

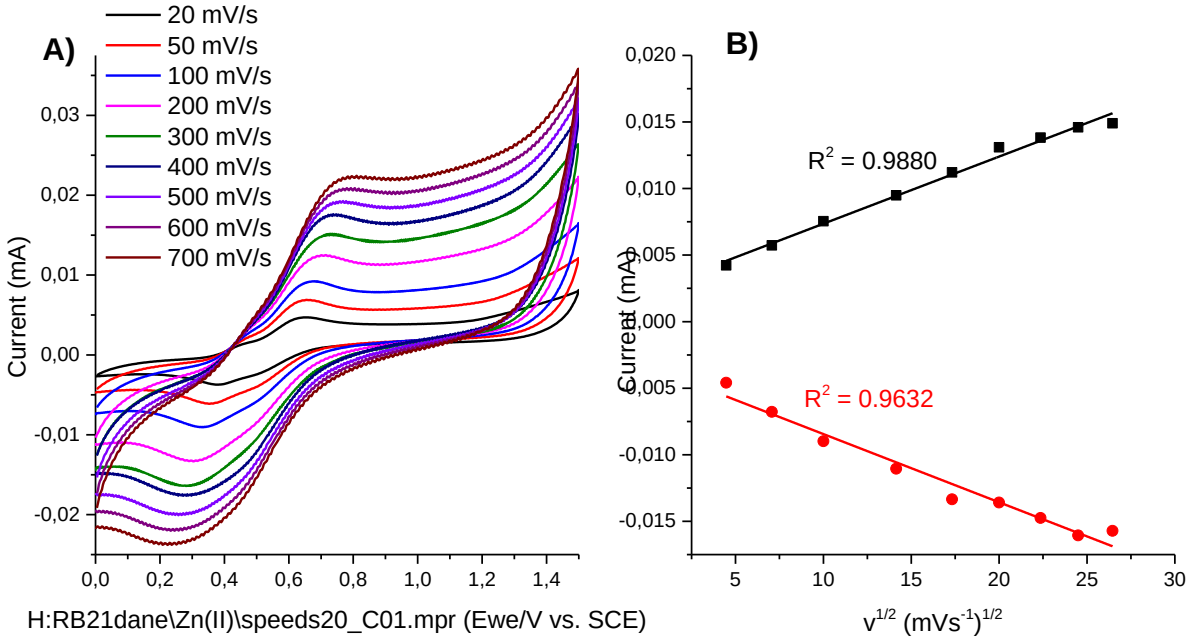

Figure S 6. A) CV profiles of Zn(II) complex at different scan rates; B) Peak current vs. the square root of the scan rate for the Zn(II) complex.

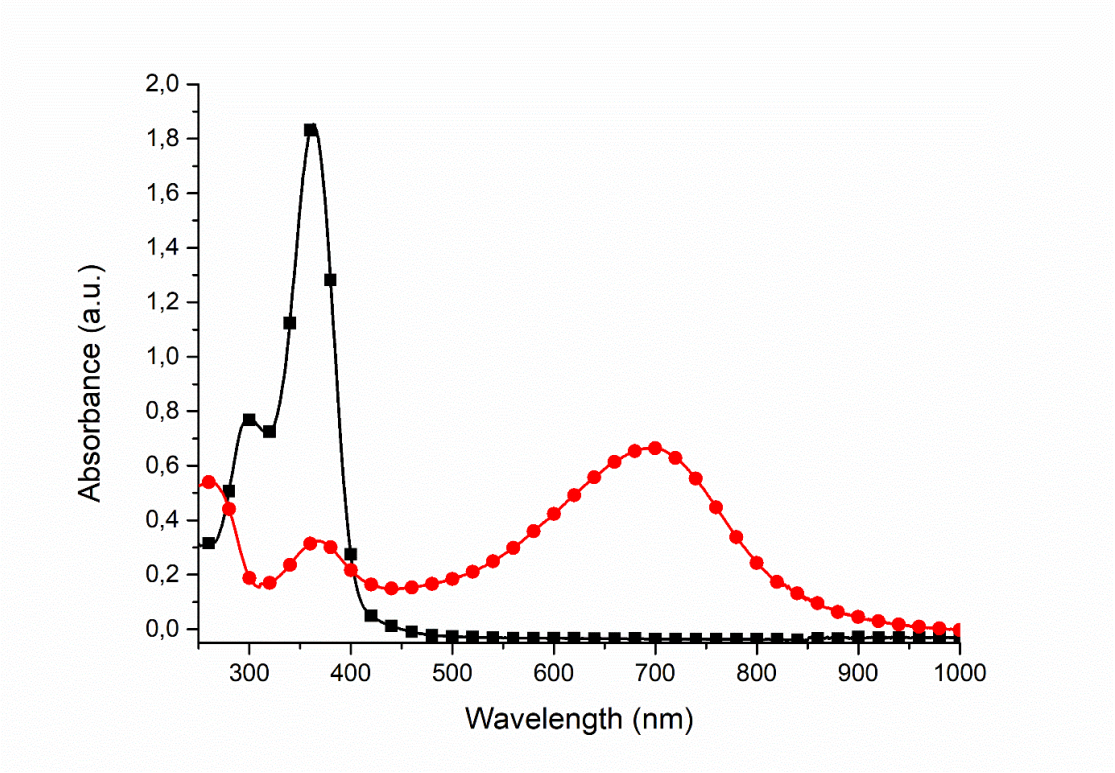

Figure S 7. The UV-Vis spectra of ligand **L** in its neutral (black) and oxidized (red) states.

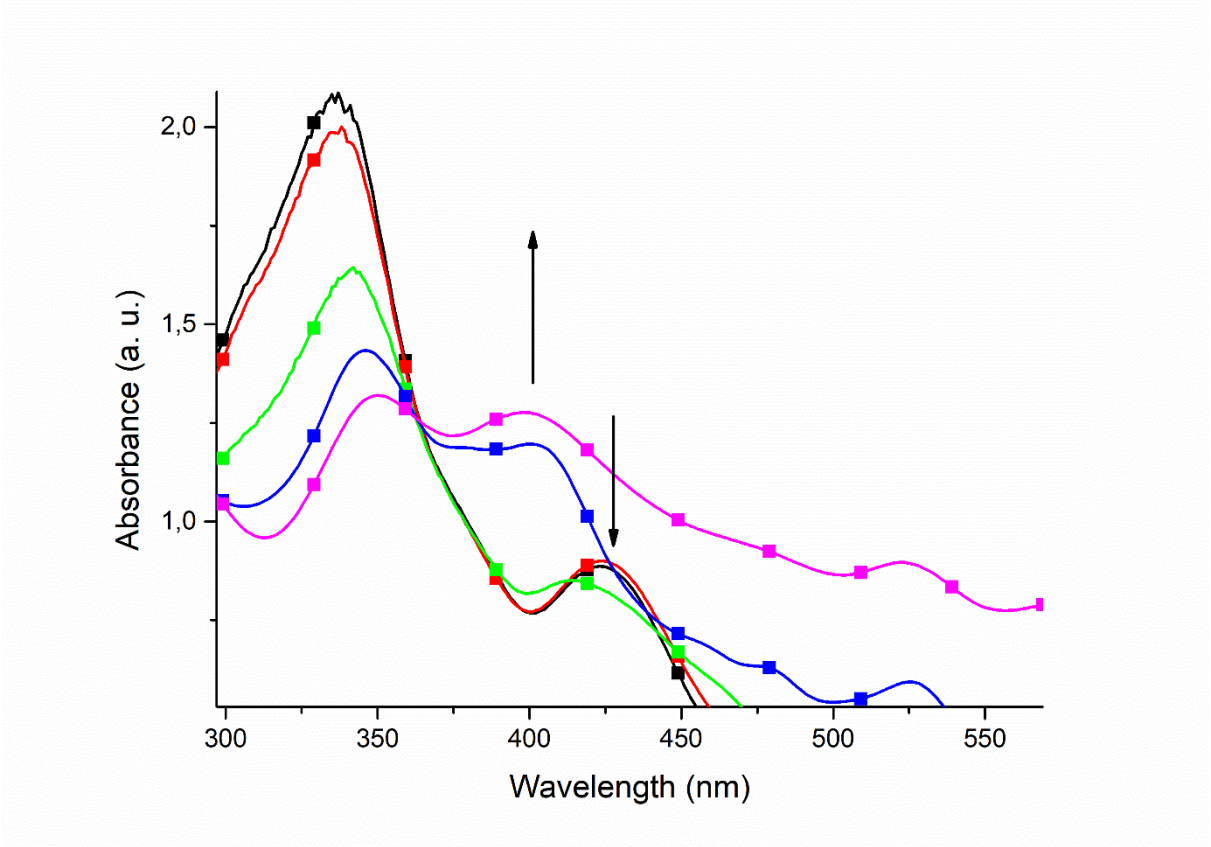

Figure S 8. The zoom of MLCT and LMCT bands in spectroelectrochemistry of Fe(II) complex in anhydrous and deaerated PC with 0.1 M $TBAClO_4$ as a supporting electrolyte by applying potentials of 0V (■), +0.7V (■), +0.8V (■), +0.9V (■) and +1.0V (■) versus Ag/AgCl gel

reference electrode held for 30 s per potential. Inset: photographs of complex Fe(II) in two different redox states.

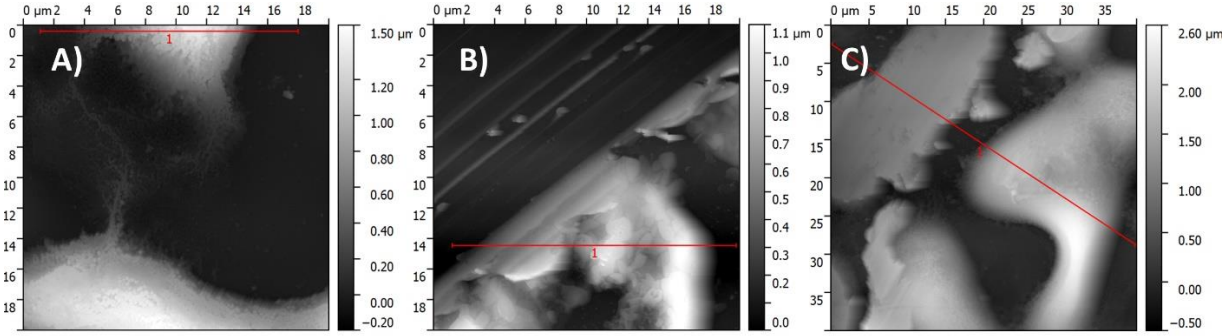

Figure S 9. AFM micrographs of complex Fe(II) (A), Co(II) (B) and Zn(II) (C) spray-coated on ITO electrodes. AFM cross-section profiles were measured at a marked places.

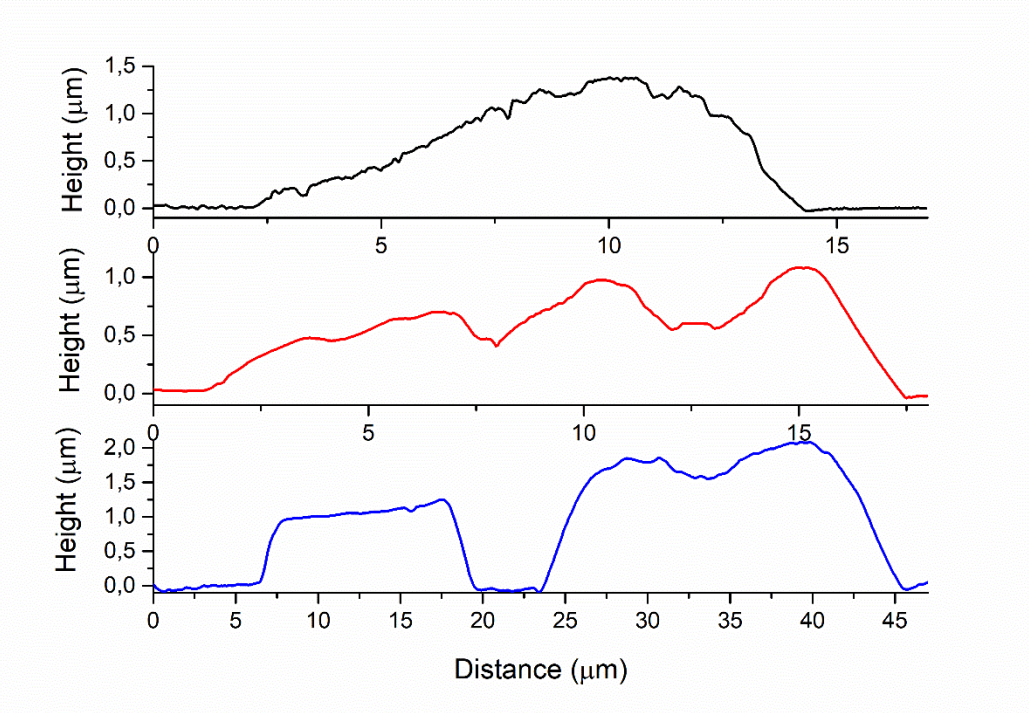

Figure S 10. AFM cross-section profiles of complexes: Fe(II) (black), Co(II) (red) and Zn(II) (blue) measured at marked places.

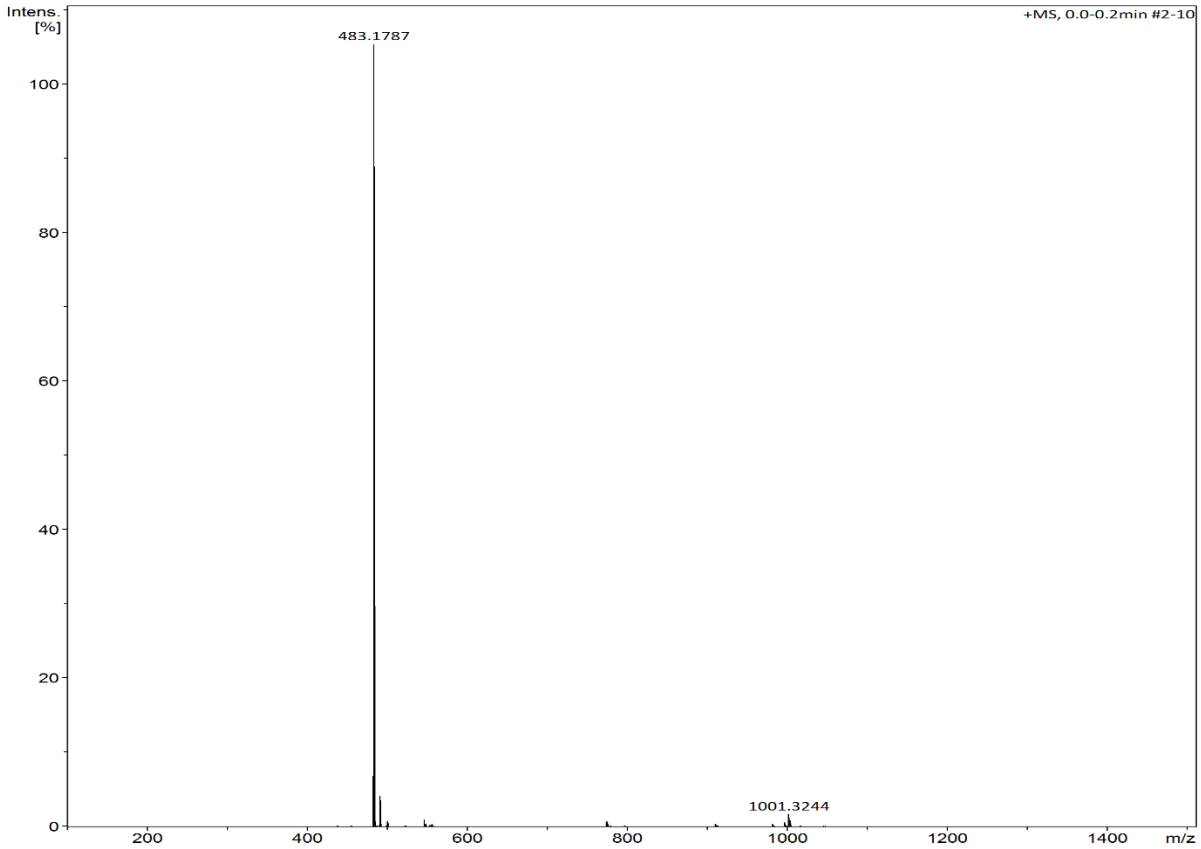

Figure S11. HR-ESI-MS spectrum of Fe(II) complex.

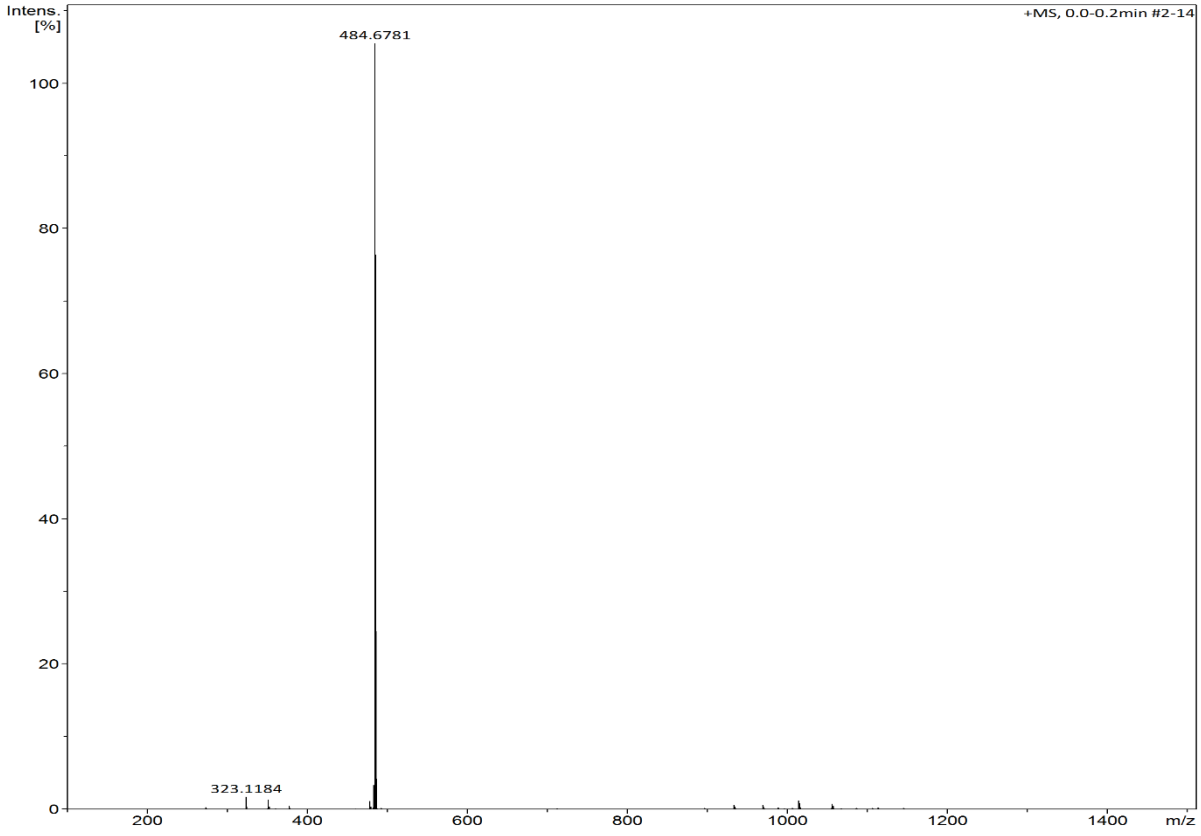

Figure S12. HR-ESI-MS spectra of Co(II) complex.

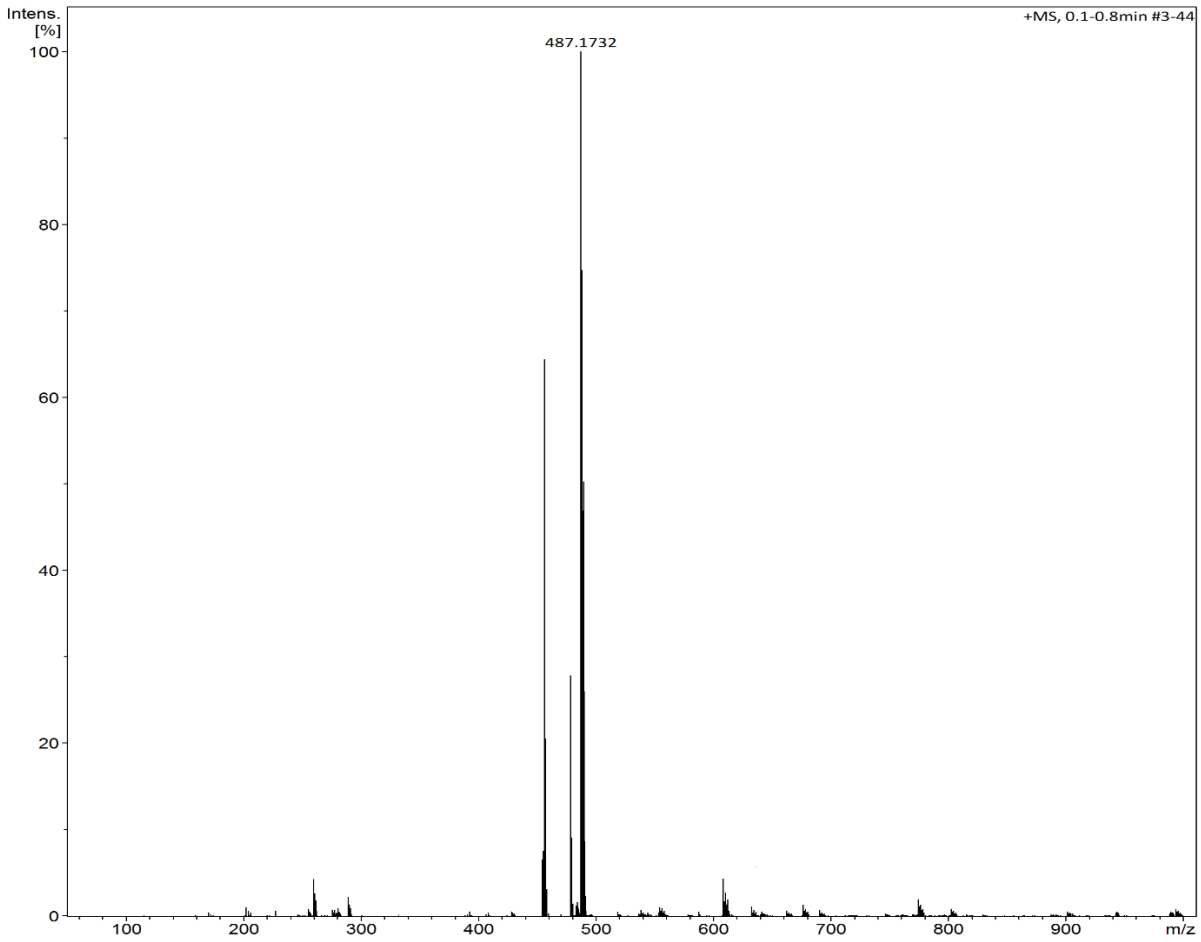

Figure S13. HR-ESI-MS spectra of Zn(II) complex.

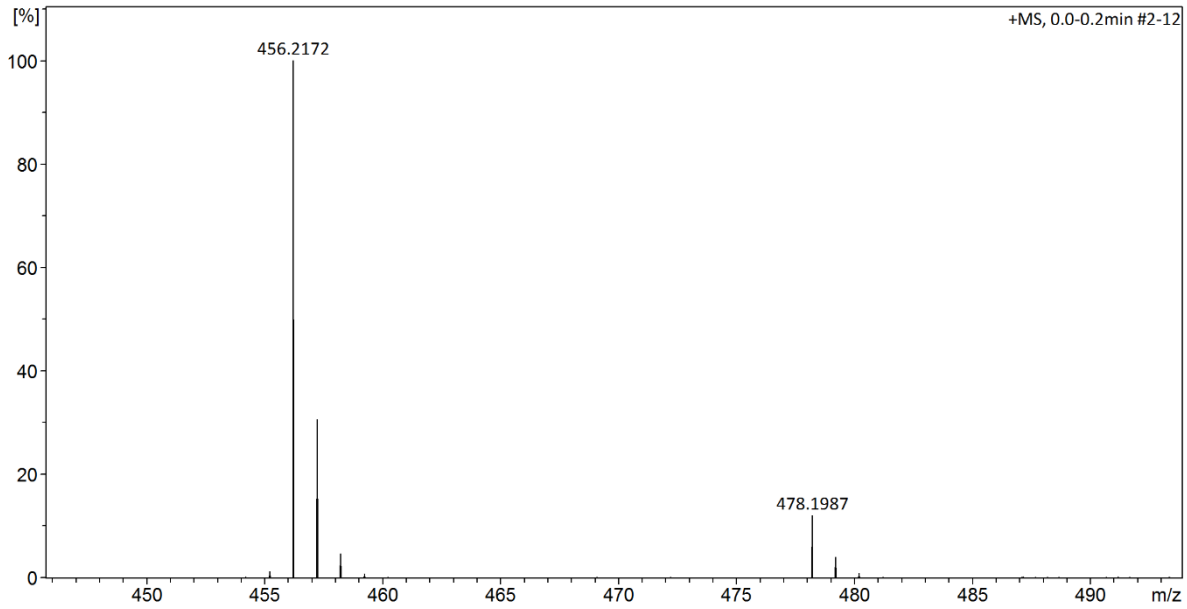

Figure S14. HR-ESI-MS spectra of ligand **L**.

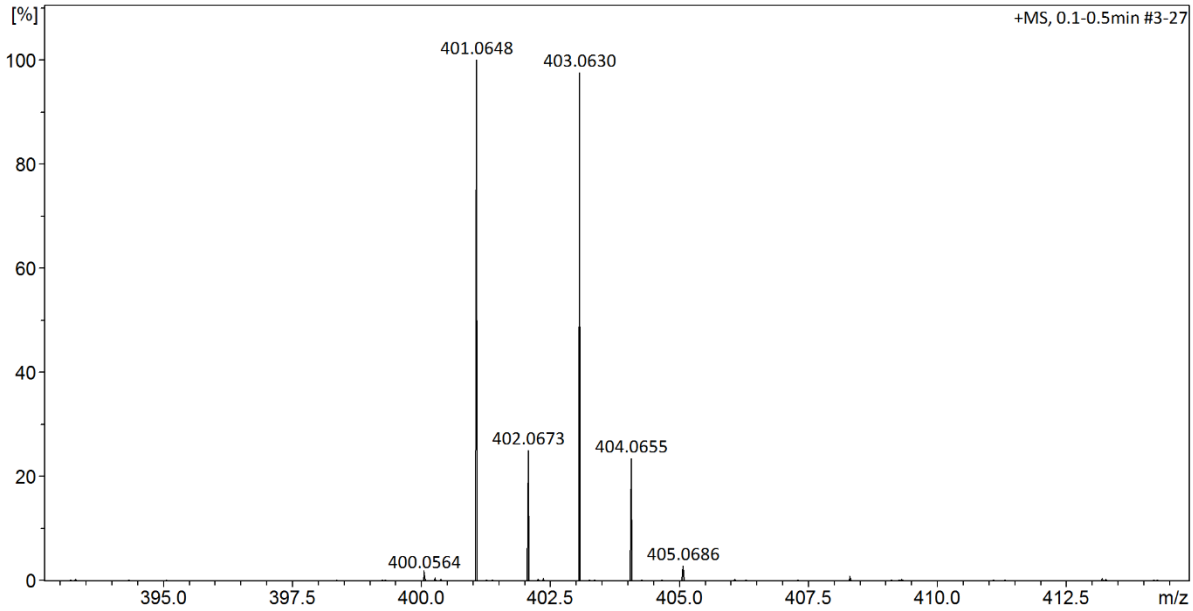

Figure S15. HR-ESI-MS spectra of compound **A**.

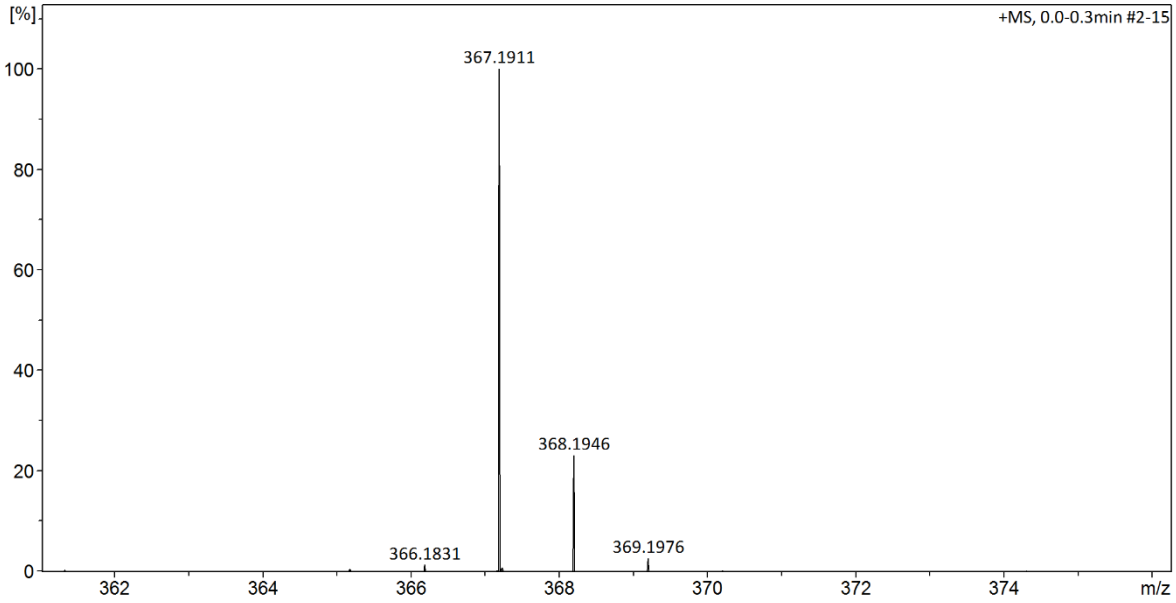

Figure S16. HR-ESI-MS spectra of compound **B**.

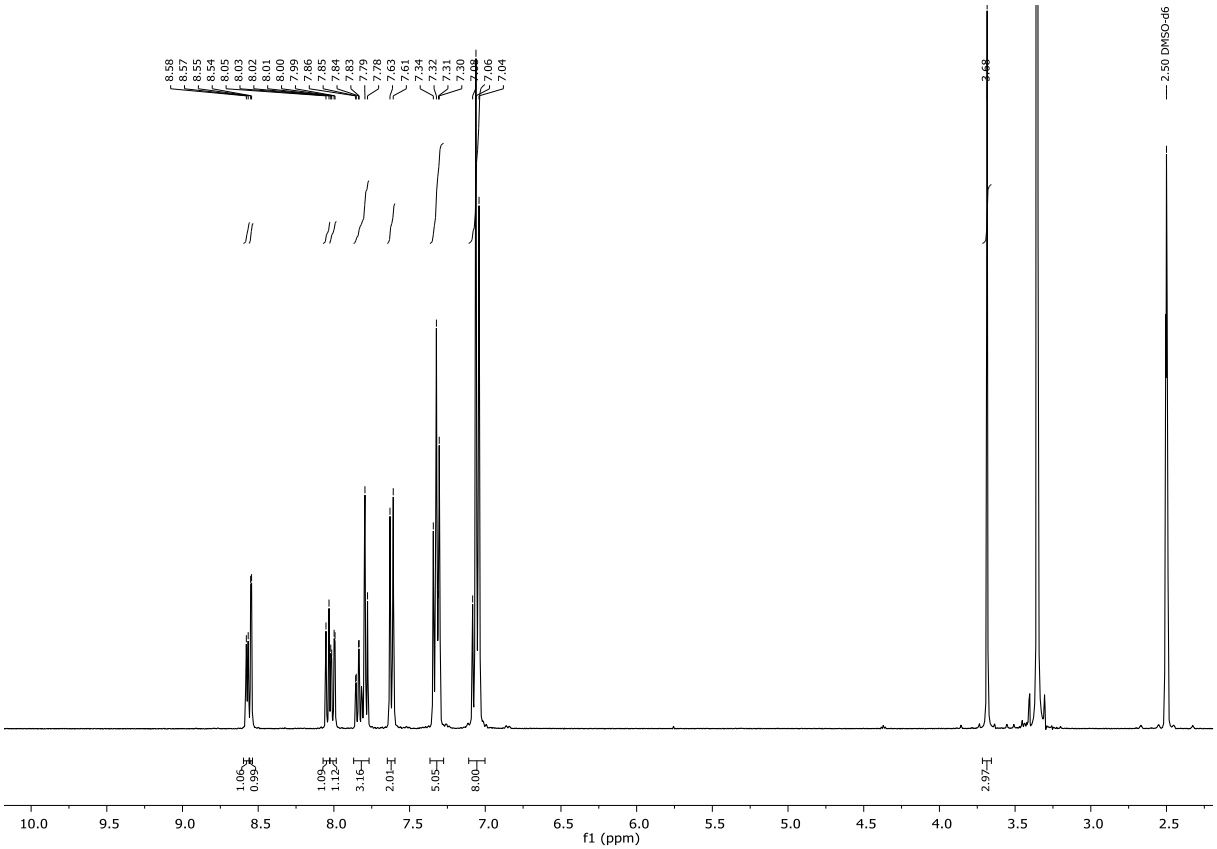

Figure S17. ^{1}H NMR spectra of ligand **L** in d_6-DMSO.

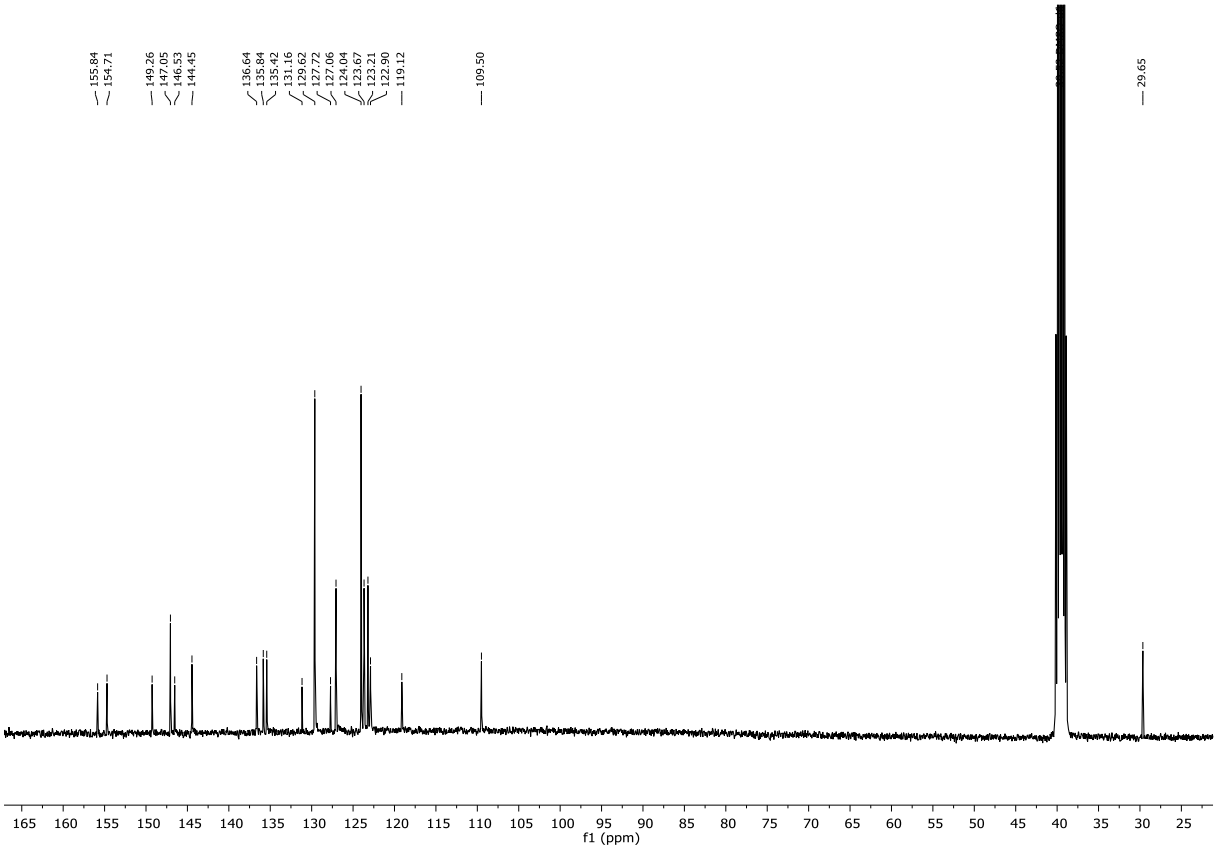

Figure S18. ^{13}C NMR spectra of ligand **L** in d_6-DMSO.

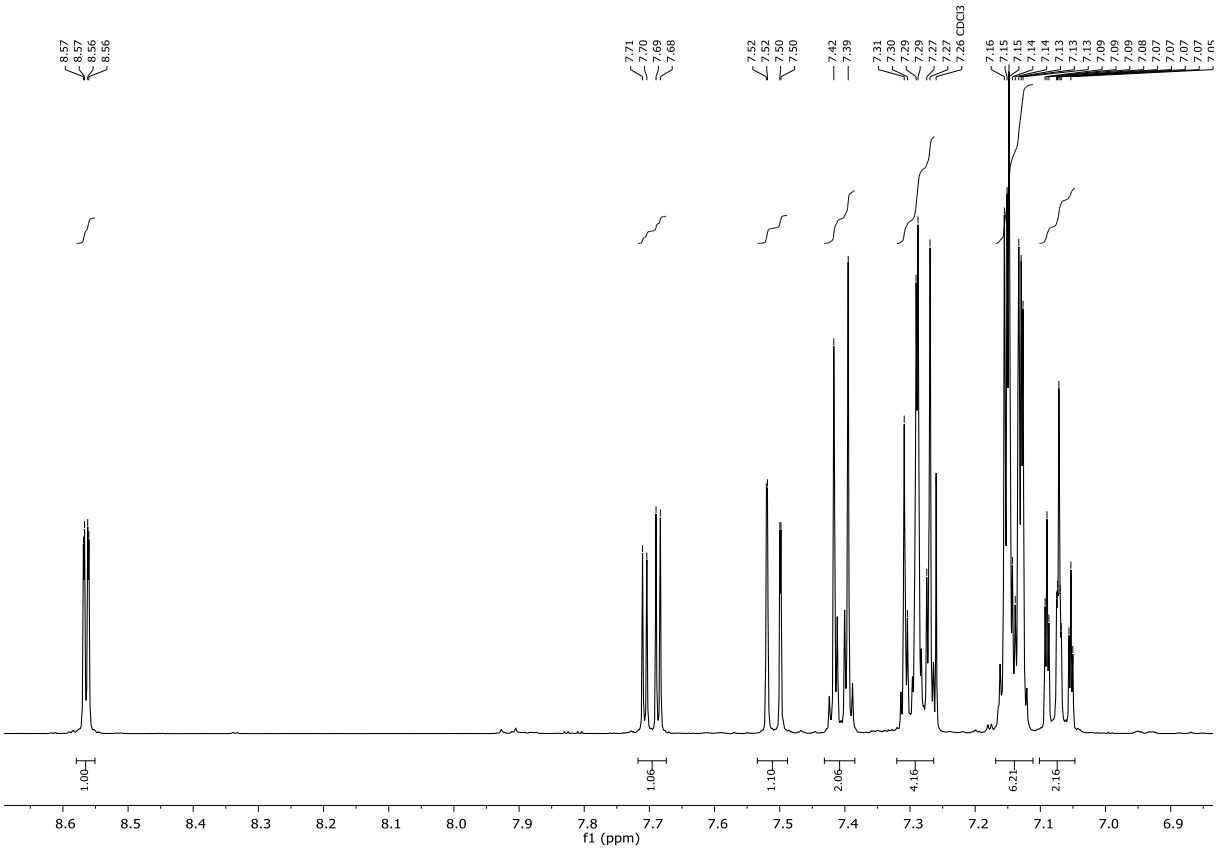

Figure S19. ^{1}H NMR spectra of compound **A** in $CDCl_3$.

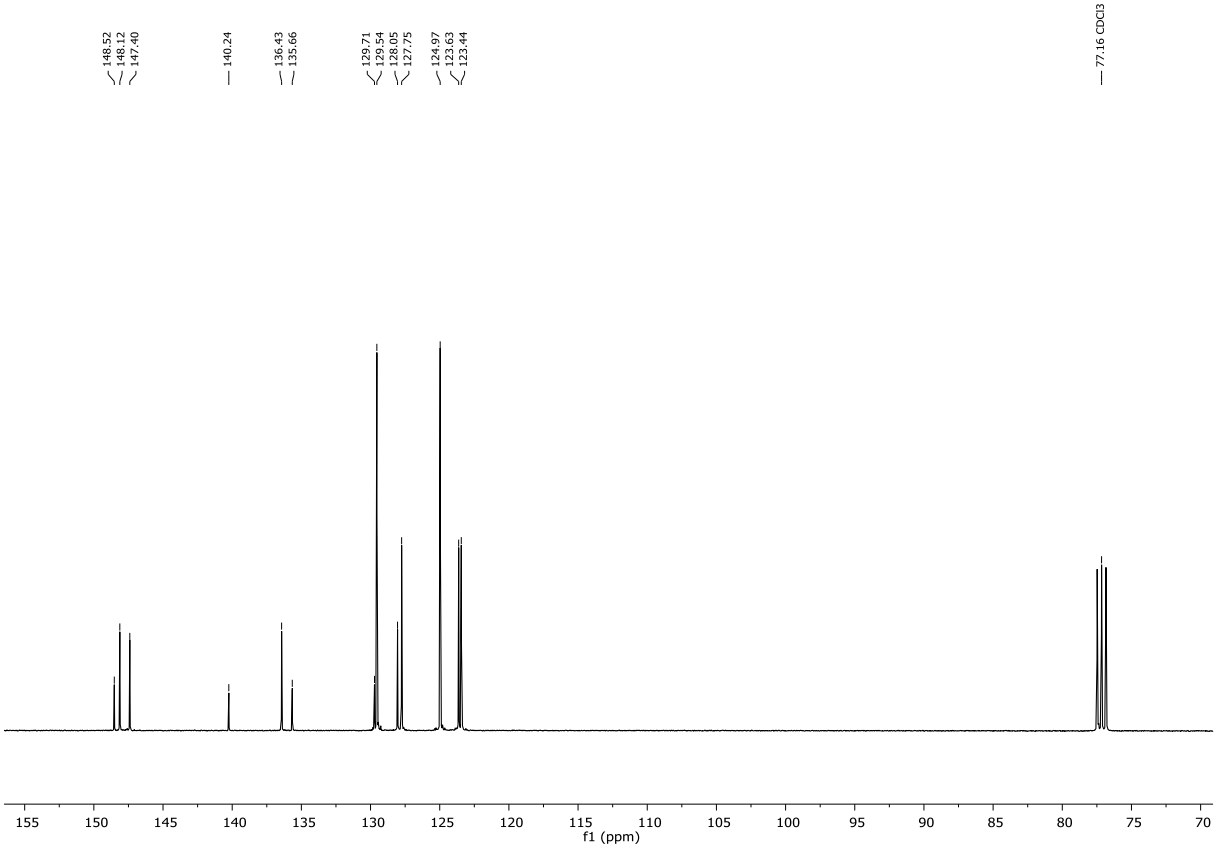

Figure S20. ^{13}C NMR of compound **A** in $CDCl_3$.

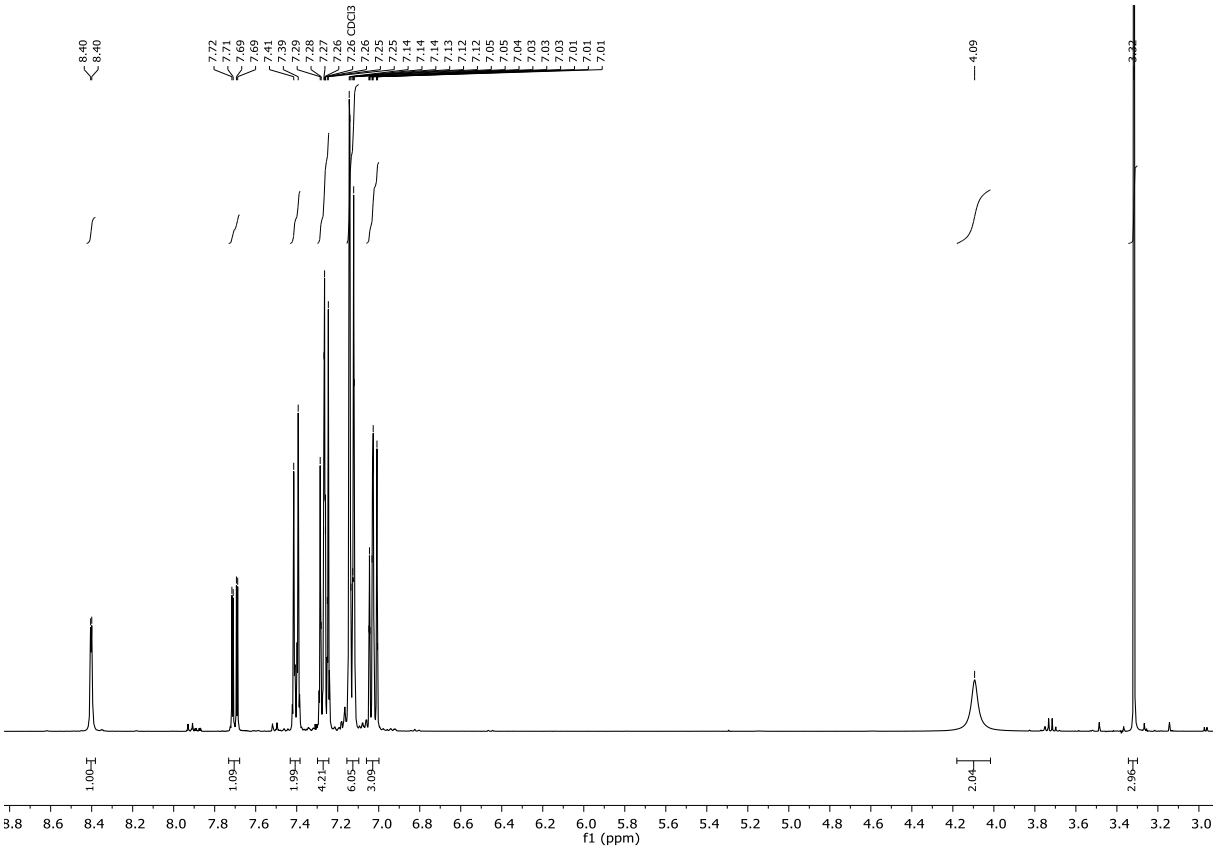

Figure S21. ^{1}H NMR spectra of compound **B** in $CDCl_3$.

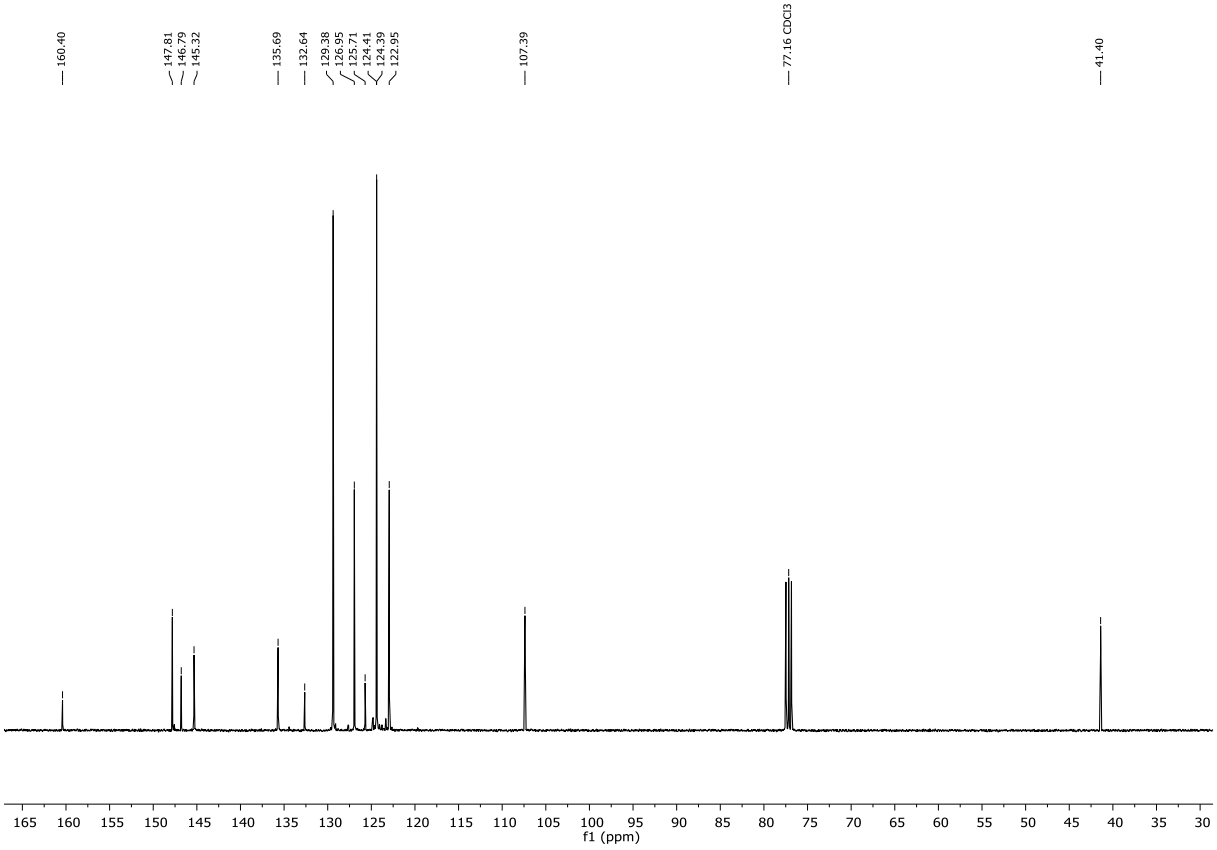

Figure S22. ^{13}C NMR spectra of compound **B** in $CDCl_3$.