Electronic Supporting Information for

Polymerization of 1-chloro-2-phenylacetylene derivatives by using Brookhart-type catalyst

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[b.] *State Key Laboratory of Luminescent Materials and Devices, Center for Aggregation-Induced Emission, South China University of Technology, Guangzhou 510640, China.*

[c.] *Department of Chemistry, Hong Kong Branch of Chinese National Engineering Research Center for Tissue Restoration and Reconstruction, The Hong Kong University of Science & Technology, Clear Water Bay, Kowloon, Hong Kong, China.*

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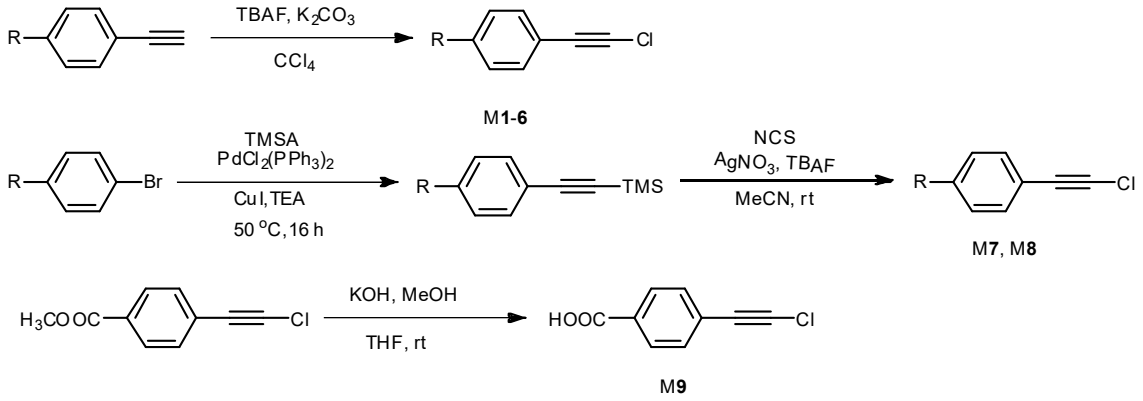
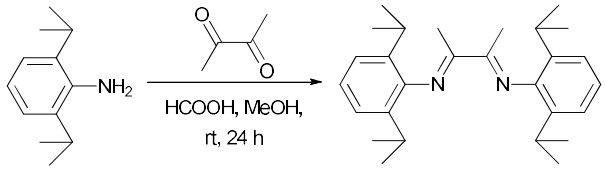
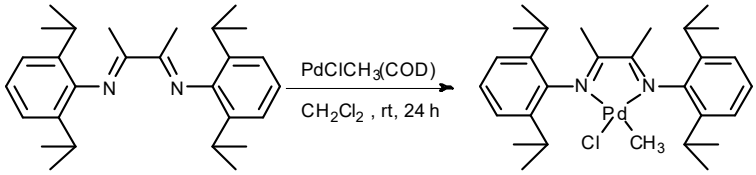


M**1**: R=*t*-Bu
M**2**: R=H
M**3**: R=CH_3
M**4**: R=OMe
M**5**: R=F
M**6**: R=CF_3
M**7**: R=CHO
M**8**: R=$COOCH_3$
M**9**: R=COOH

Scheme S1. Synthetic route to 1-chloro-2-[(para-substituted)-phenyl] acetylene monomers.



Scheme S2. Synthetic route to α-diimine ligand.



Scheme S3. Synthetic route to (α-diimine)PdMeCl complex.

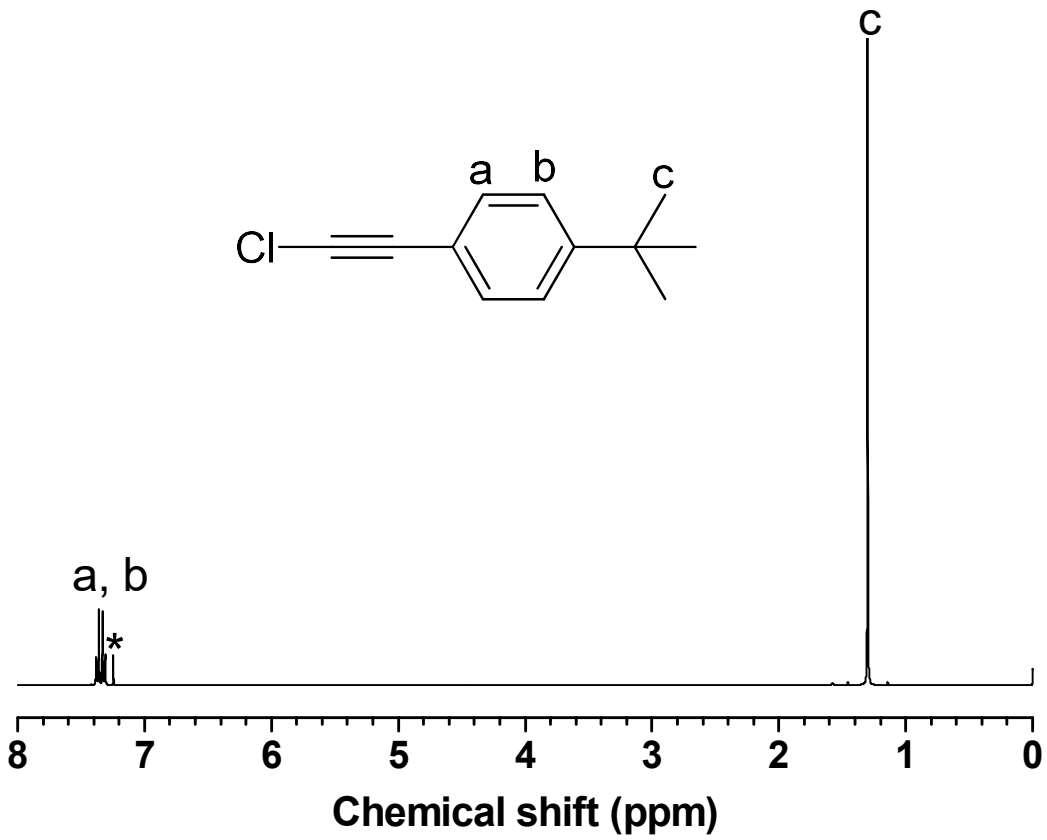


Figure S1. ^{1}H NMR spectrum of M**1** in $CDCl_3$.

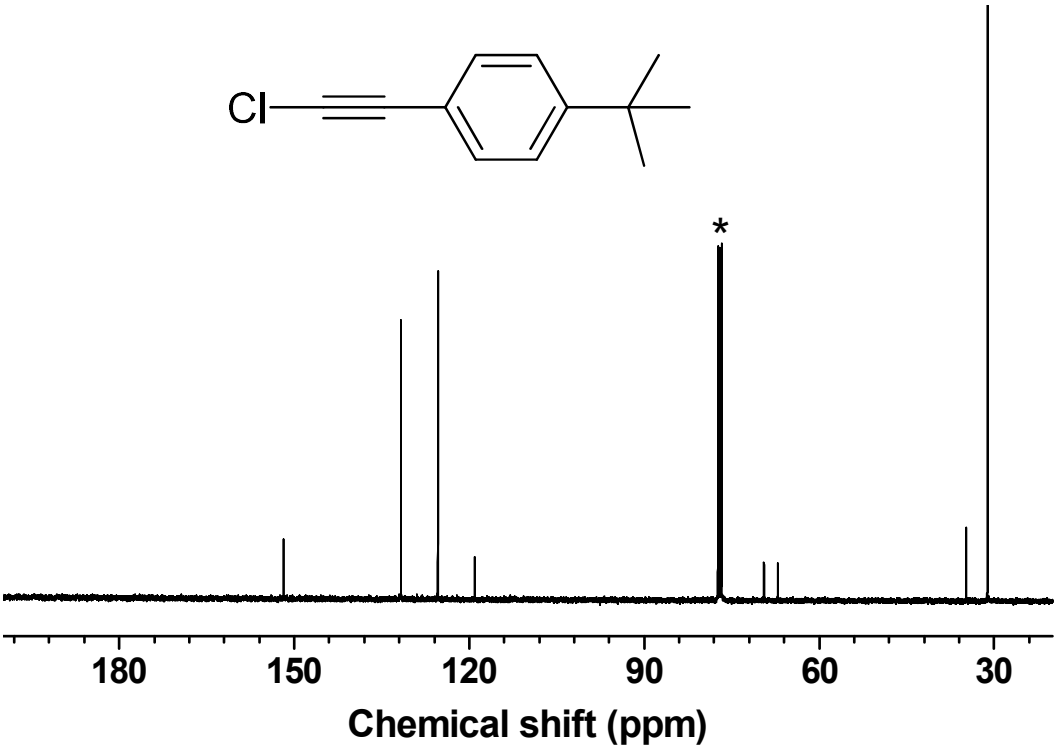


Figure S2. ^{13}C NMR spectrum of M**1** in $CDCl_3$.

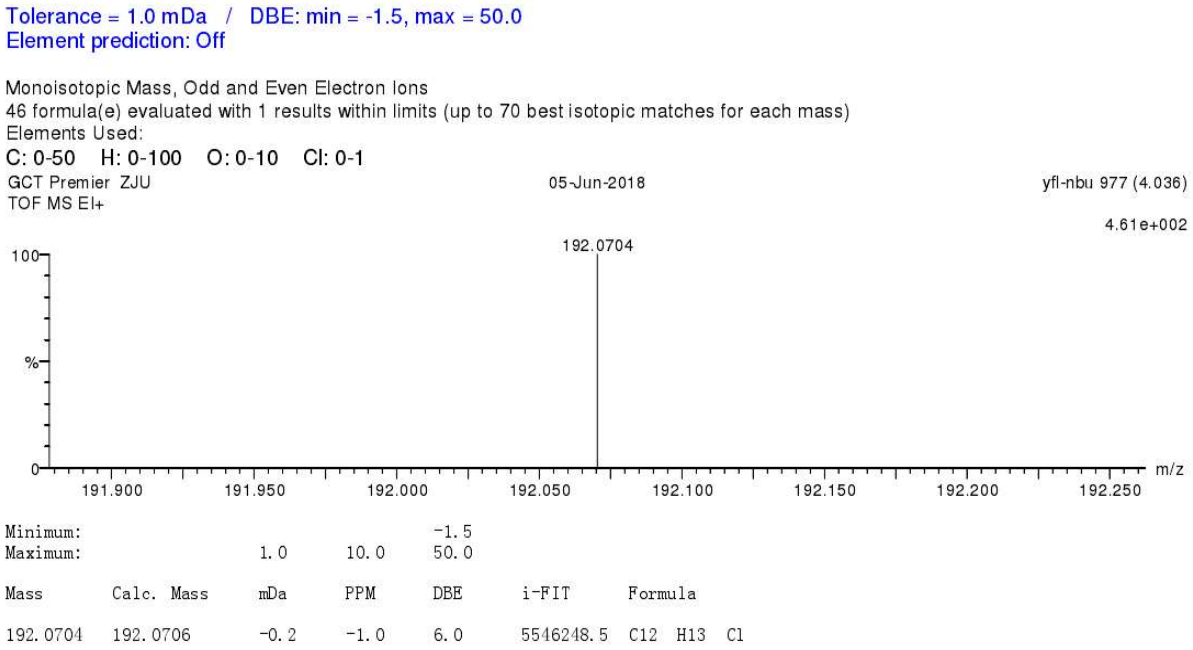


Figure S3. High resolution mass spectrum of M**1**.

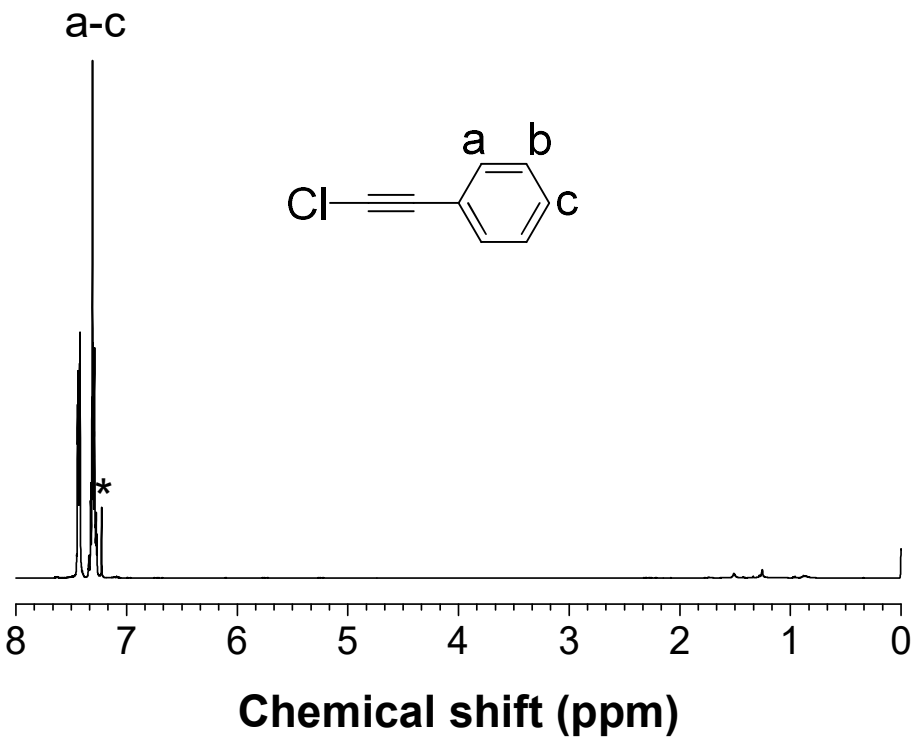


Figure S4. ^{1}H NMR spectrum of M2 in $CDCl_3$.

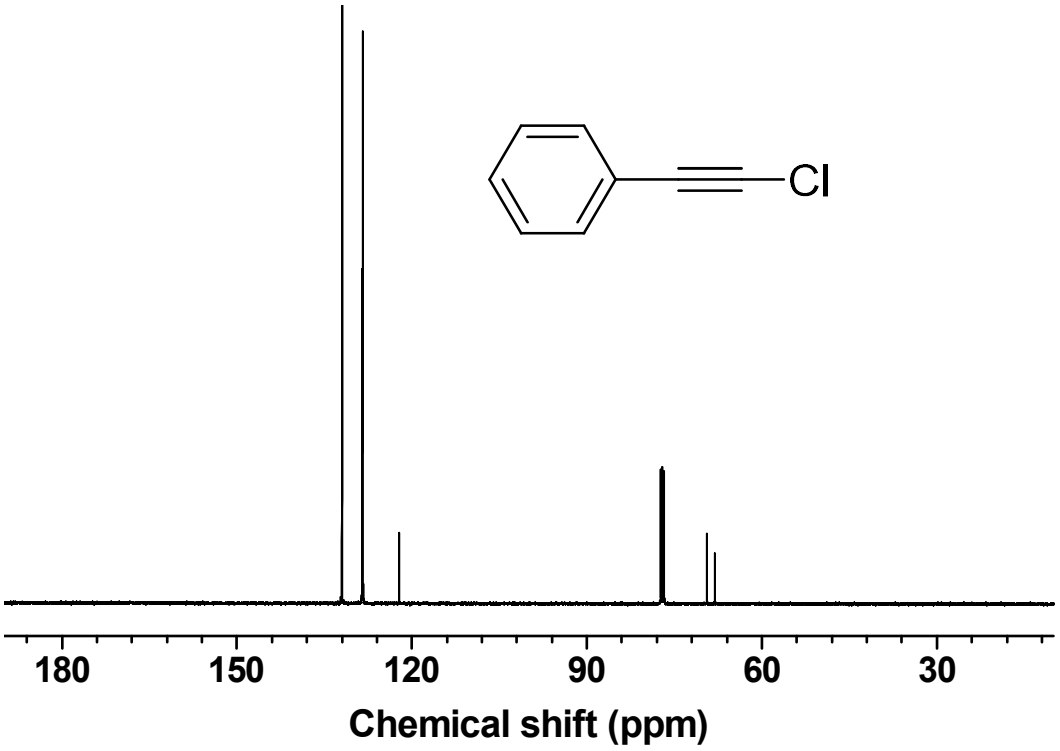


Figure S5. ^{13}C NMR spectrum of M**2** in $CDCl_3$.

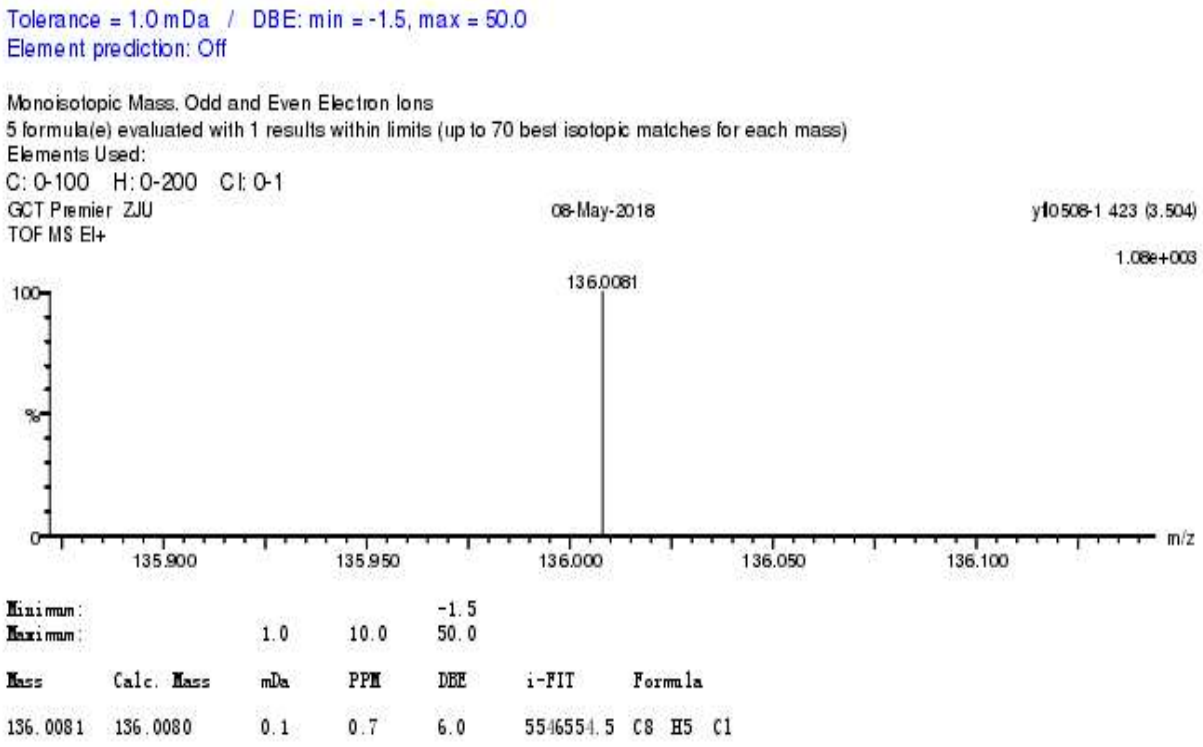


Figure S6. High resolution mass spectrum of M**2**.

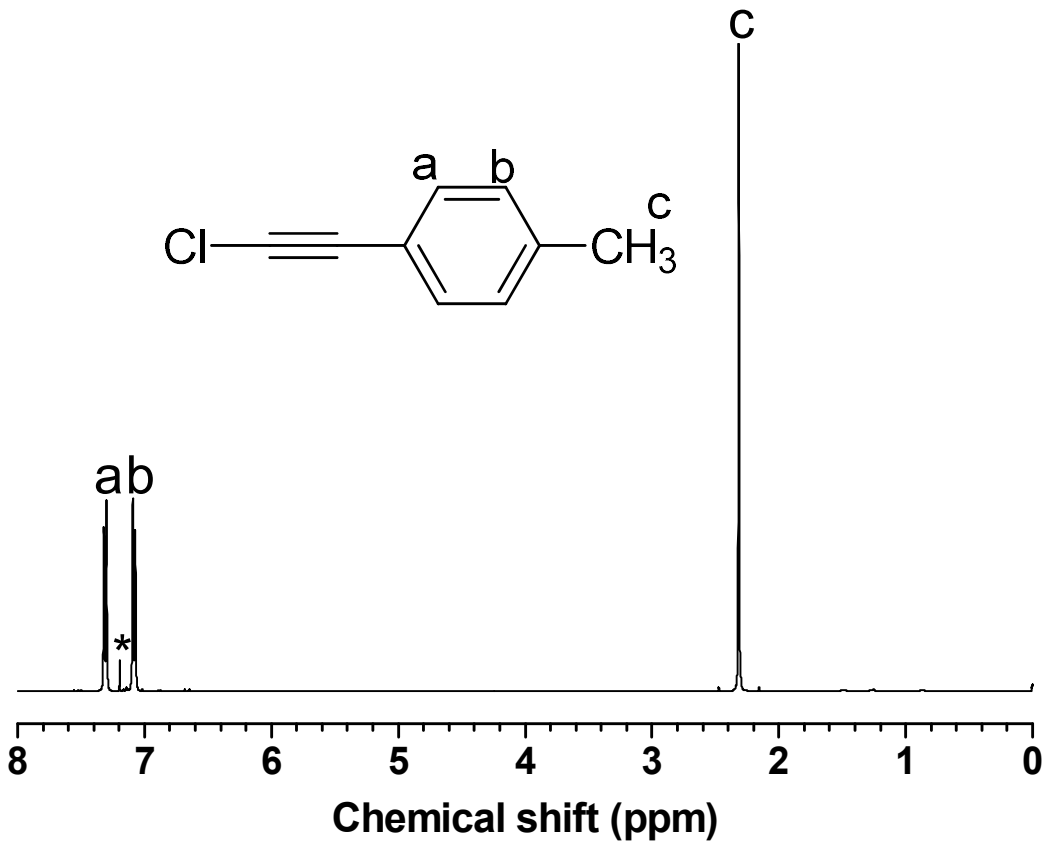


Figure S7. ^{1}H NMR spectrum of M**3** in $CDCl_3$.

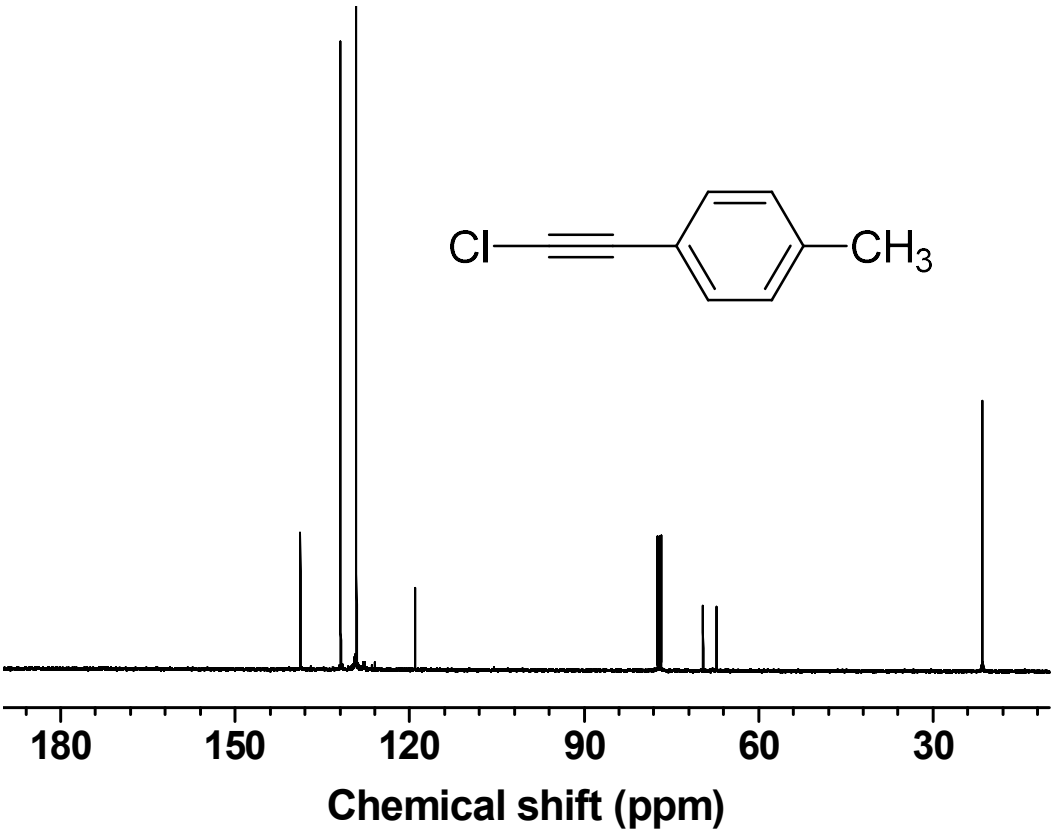


Figure S8. ^{13}C NMR spectrum of M**3** in $CDCl_3$.

Tolerance = 1.0 mDa / DBE: min = -1.5, max = 50.0
Element prediction: Off

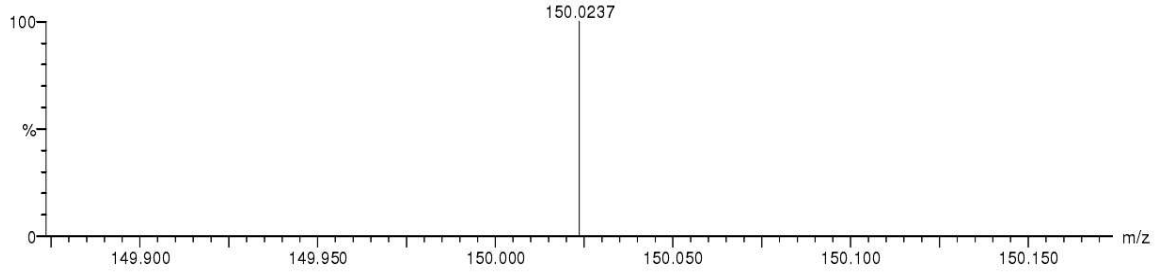
Monoisotopic Mass, Odd and Even Electron Ions
5 formula(e) evaluated with 1 results within limits (up to 70 best isotopic matches for each mass)
Elements Used:
C: 0-100 H: 0-200 Cl: 0-1

GCT Premier ZJU
TOF MS EI+

08-May-2018

yfl0508-2 456 (3.625)

2.19e+003



Minimum:				-1.5		
Maximum:		1.0	10.0	50.0		
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Formula
150.0237	150.0236	0.1	0.7	6.0	5547112.0	C9 H7 Cl

Figure S9. High resolution mass spectrum of M**3**.

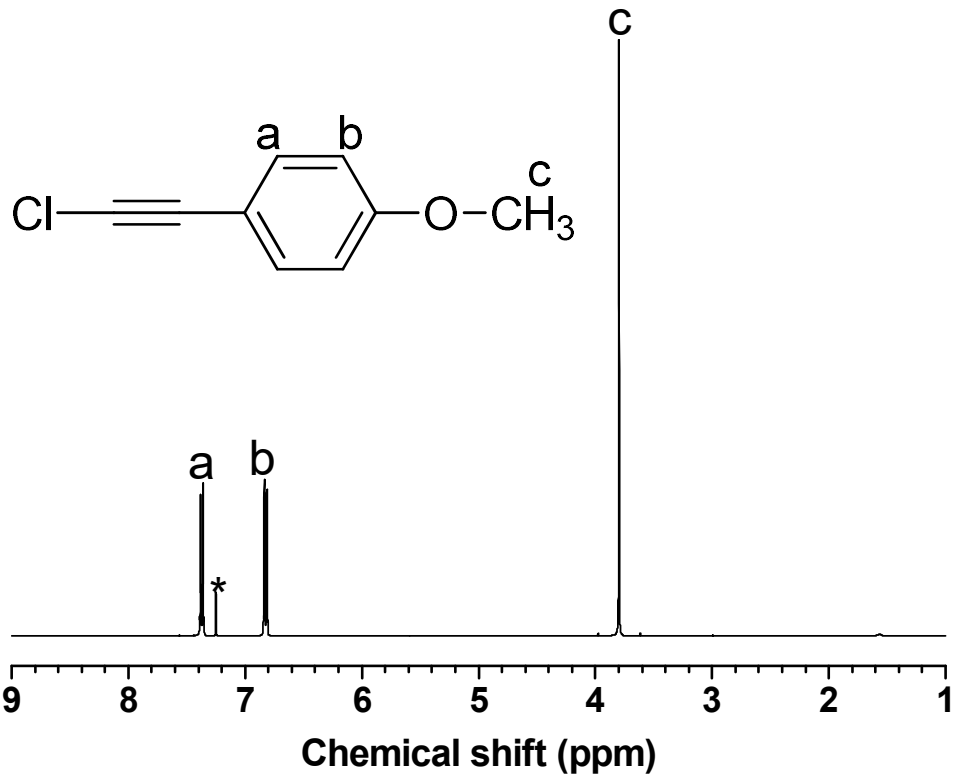


Figure S10. ^{1}H NMR spectrum of M**4** in $CDCl_3$.

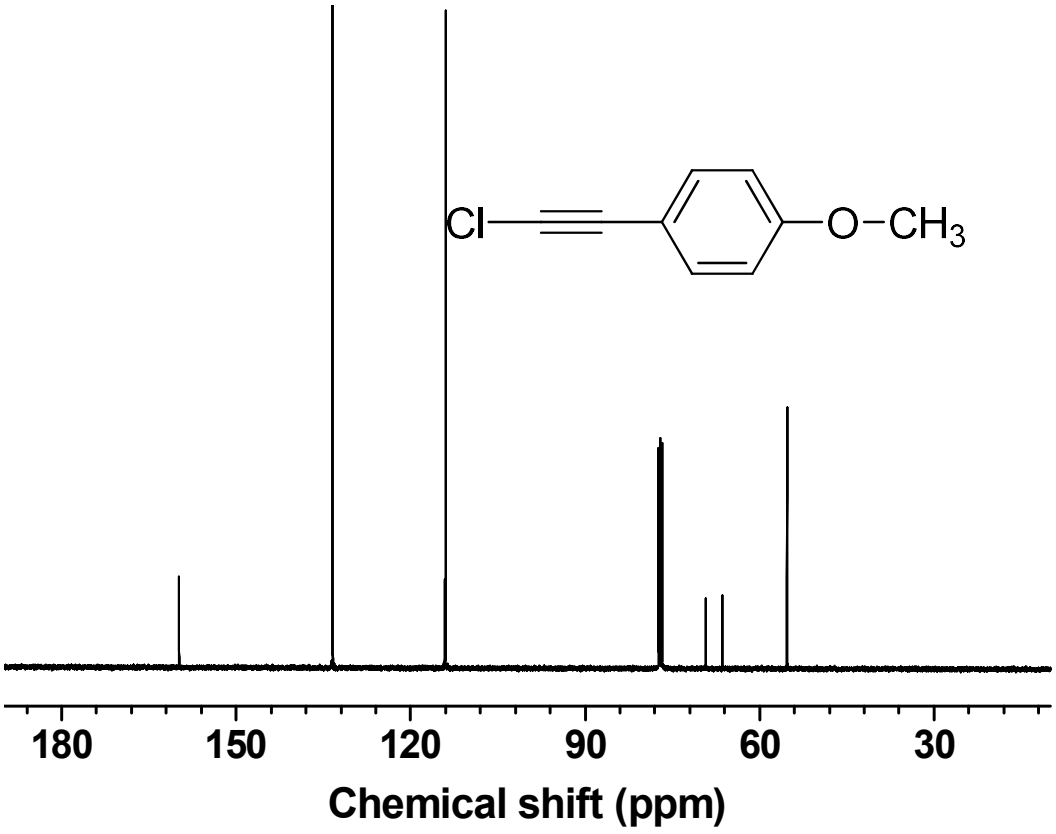


Figure S11. ^{13}C NMR spectrum of M**4** in $CDCl_3$.

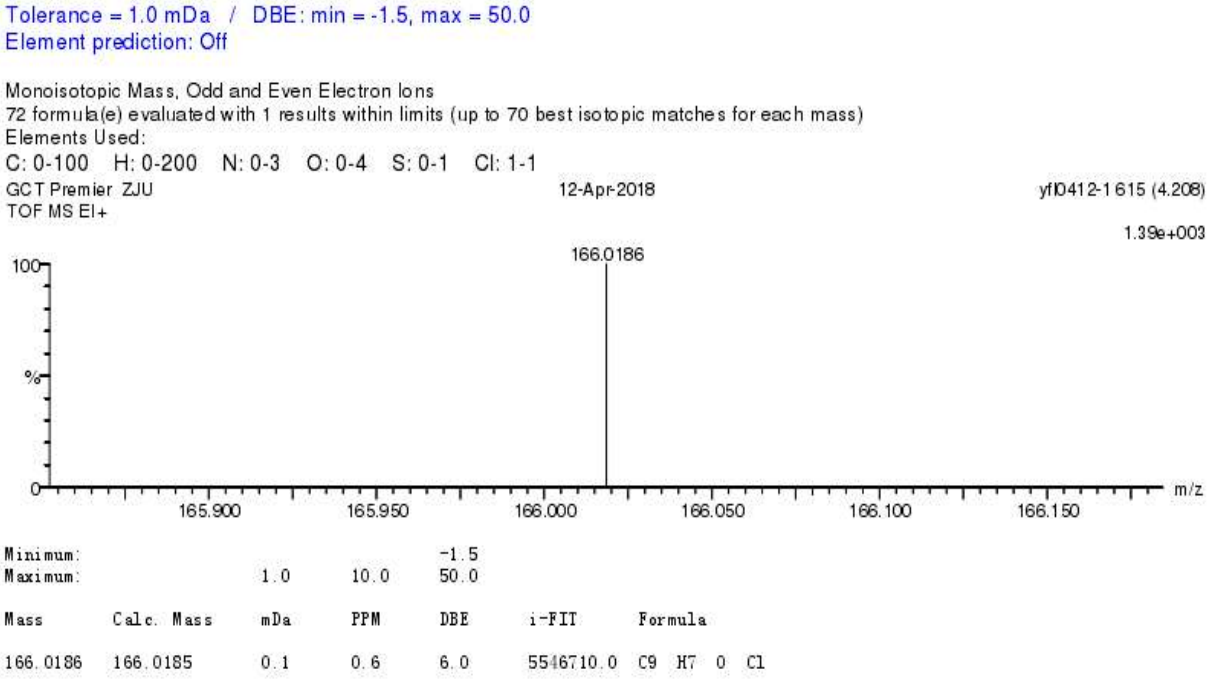


Figure S12. High resolution mass spectrum of M**4**.

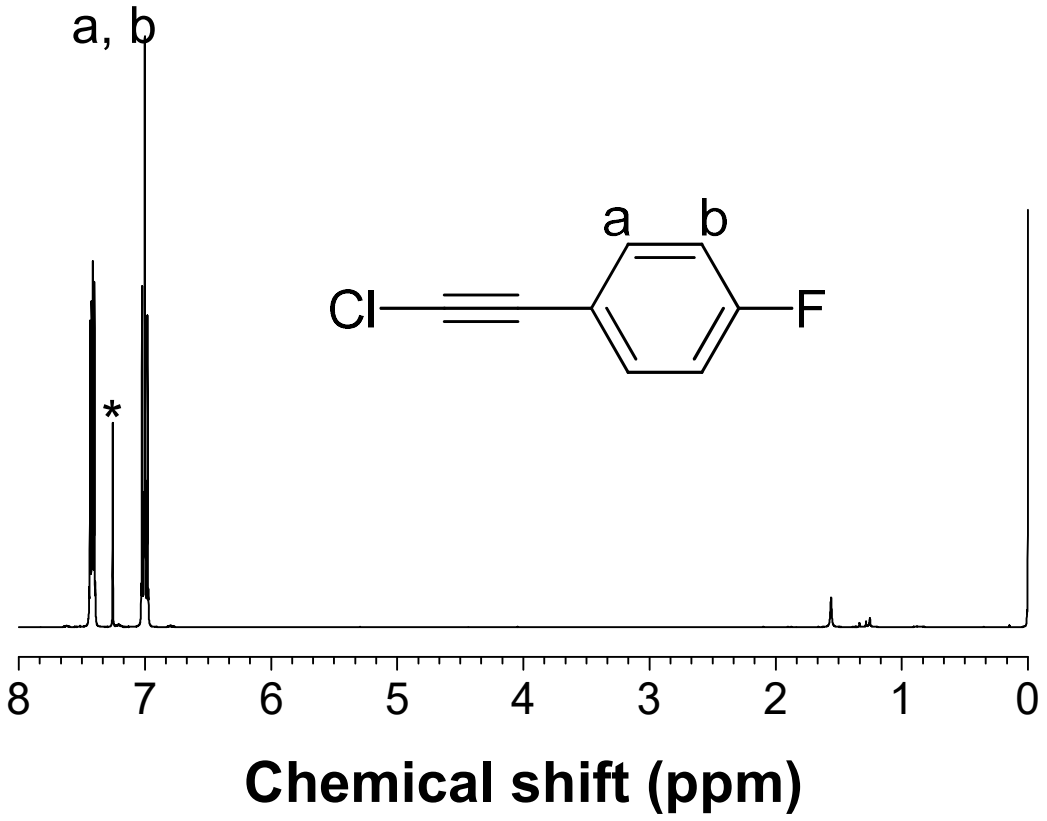


Figure S13. ^{1}H NMR spectrum of M**5** in $CDCl_3$.

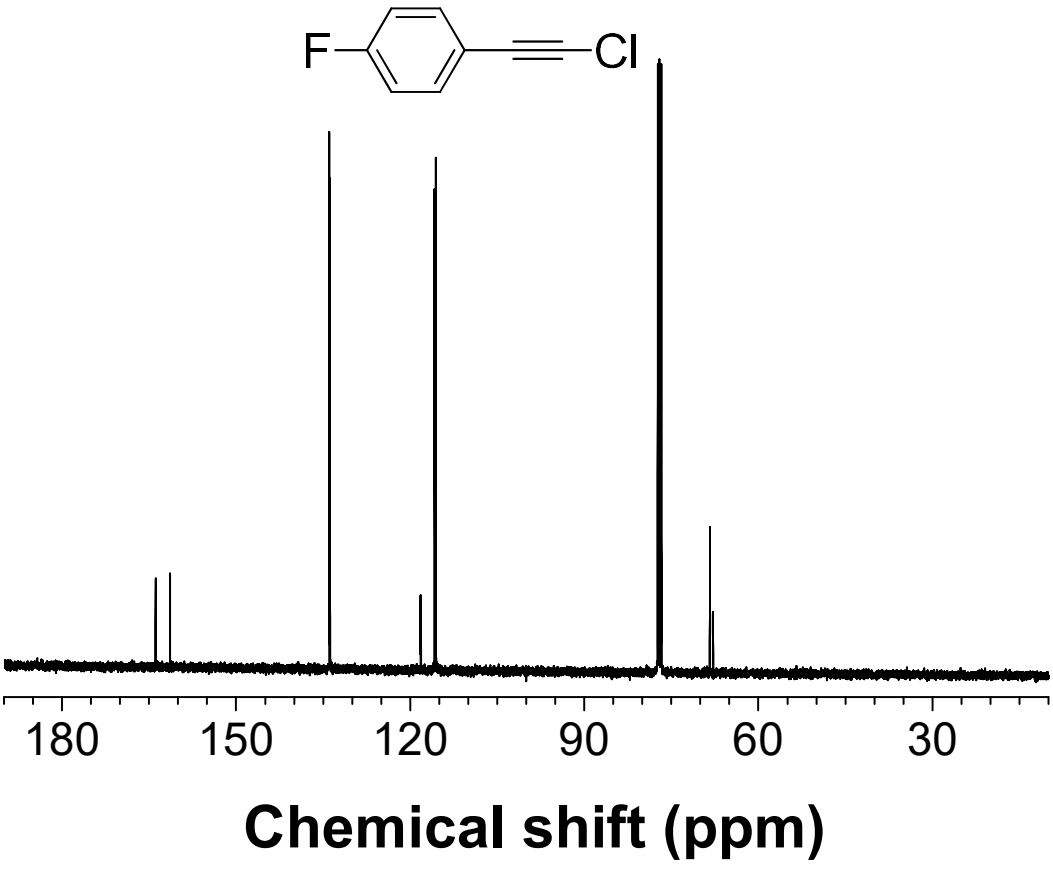
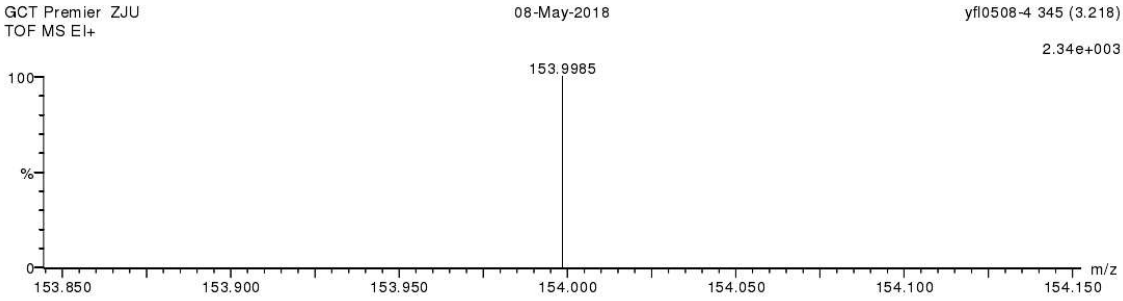


Figure S14. ^{13}C NMR spectrum of M**5** in $CDCl_3$.

Tolerance = 1.0 mDa / DBE: min = -1.5, max = 50.0
Element prediction: Off

Monoisotopic Mass, Odd and Even Electron Ions
10 formula(e) evaluated with 1 results within limits (up to 70 best isotopic matches for each mass)
Elements Used:
C: 0-100 H: 0-200 Cl: 0-1 F: 0-1



Minimum:				-1.5		
Maximum:		1.0	10.0	50.0		
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Formula
153.9985	153.9986	-0.1	-0.6	6.0	5547185.0	C8 H4 Cl F

Figure S15. High resolution mass spectrum of M**5**.

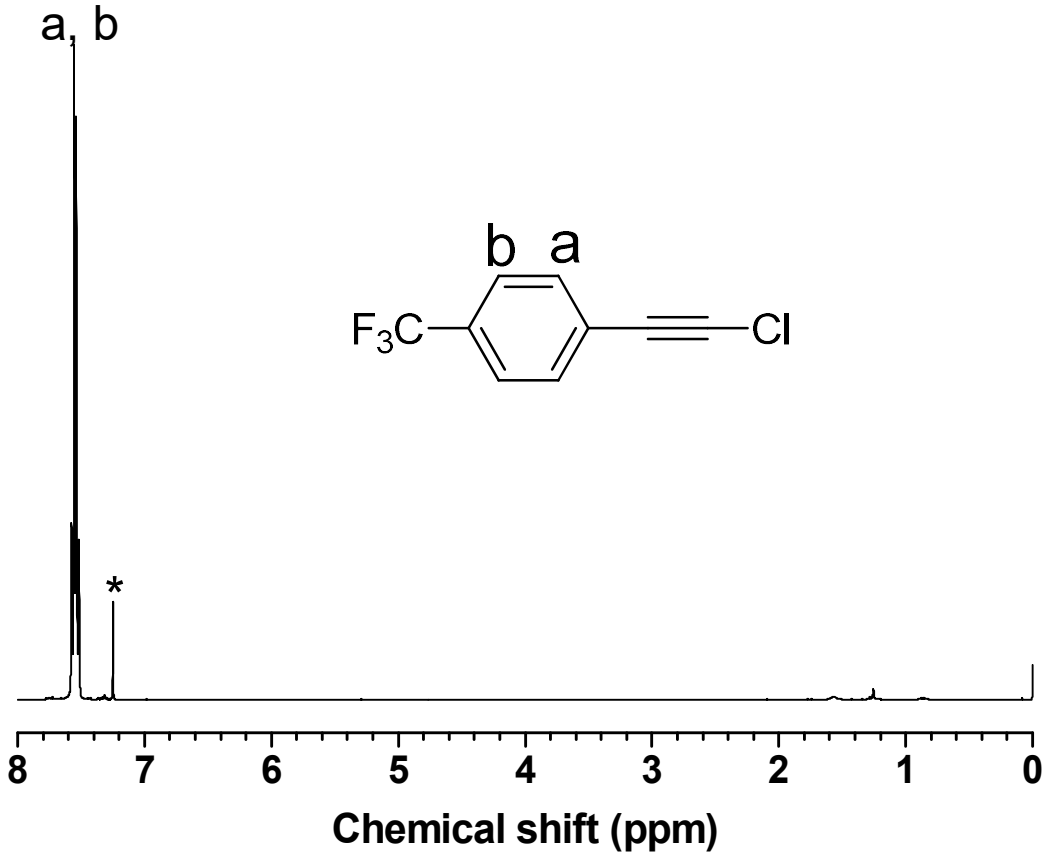


Figure S16. ^{1}H NMR spectrum of M**6** in $CDCl_3$.

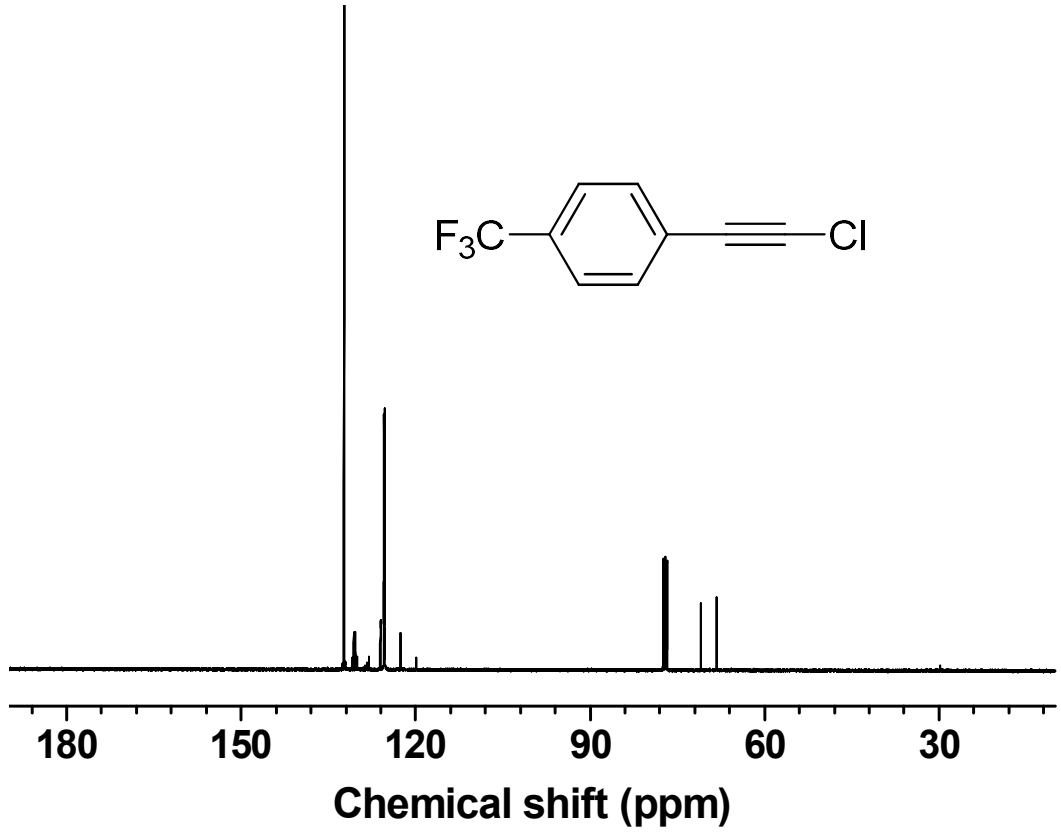
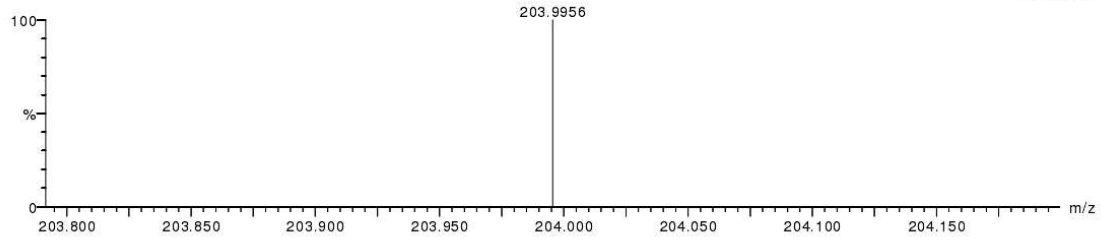


Figure S17. ^{13}C NMR spectrum of M**6** in $CDCl_3$.

Tolerance = 1.0 mDa / DBE: min = -1.5, max = 50.0
Element prediction: Off

Monoisotopic Mass, Odd and Even Electron Ions
23 formula(e) evaluated with 1 results within limits (up to 70 best isotopic matches for each mass)
Elements Used:
C: 0-100 H: 0-200 F: 0-3 Cl: 0-1

GCT Premier ZJU 08-May-2018 yfl0508-5 370 (3.309)
TOF MS EI+ 2.26e+003



Minimum:				-1.5		
Maximum:		1.0	10.0	50.0		
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Formula
203.9956	203.9954	0.2	1.0	6.0	5547147.0	C9 H4 F3 Cl

Figure S18. High resolution mass spectrum of M**6**.

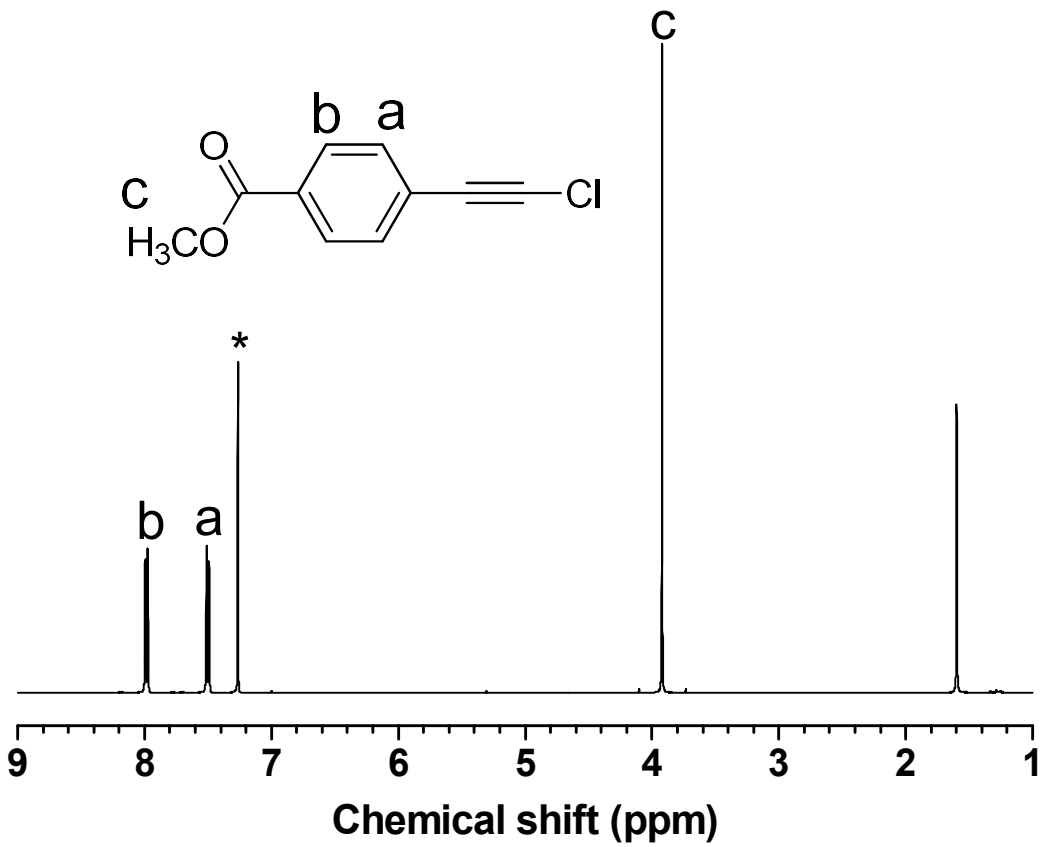


Figure S19. ^{1}H NMR spectrum of M**7** in $CDCl_3$.

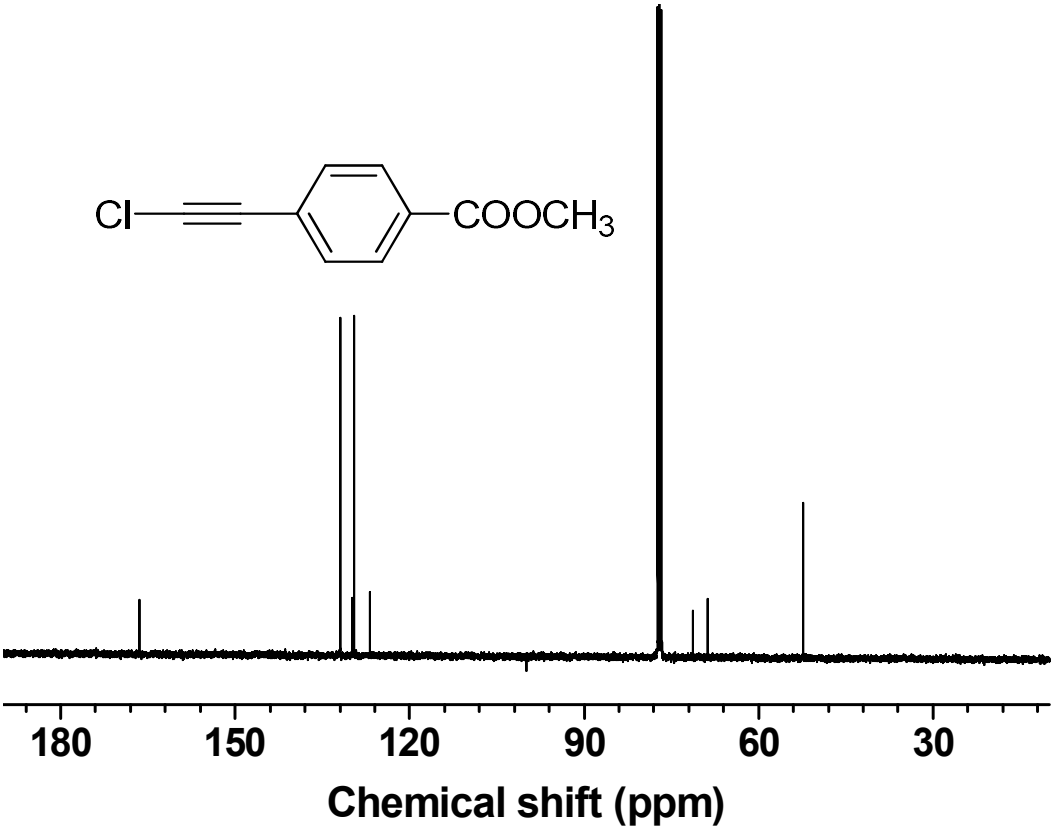


Figure S20. ^{13}C NMR spectrum of M**7** in $CDCl_3$.

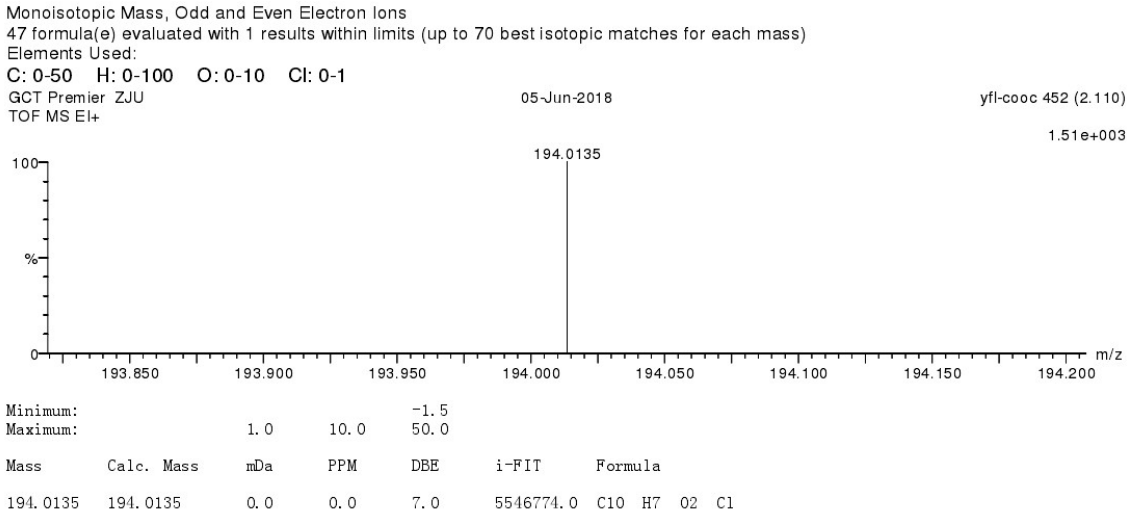


Figure S21. High resolution mass spectrum of M**7**.

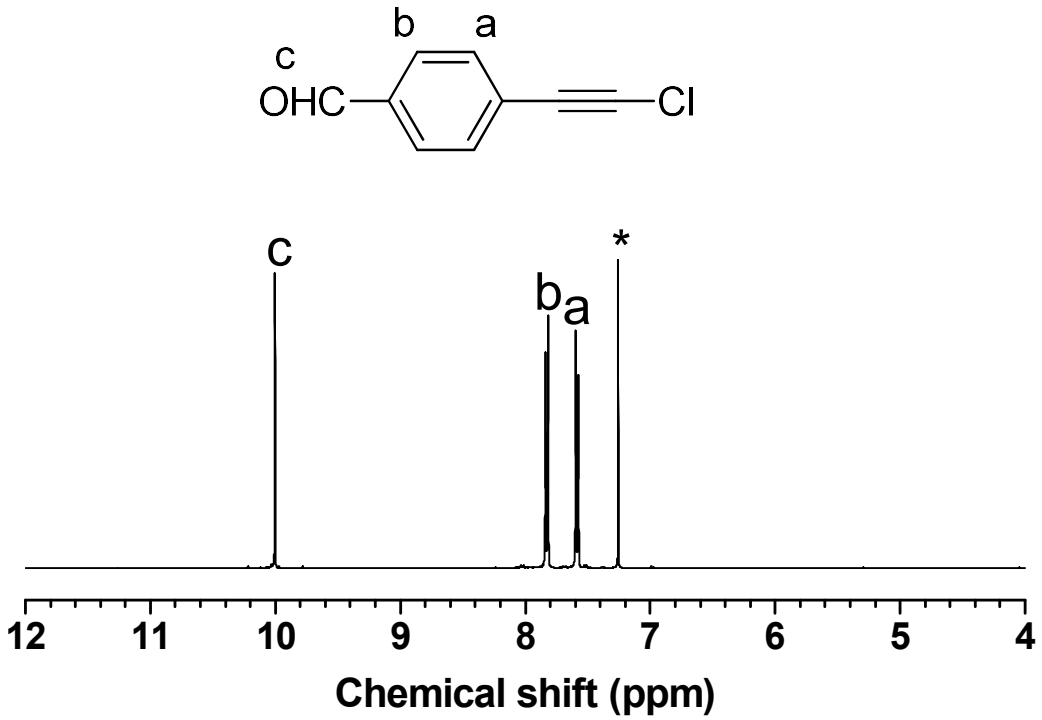


Figure S22. ^{1}H NMR spectrum of M**8** in $CDCl_3$.

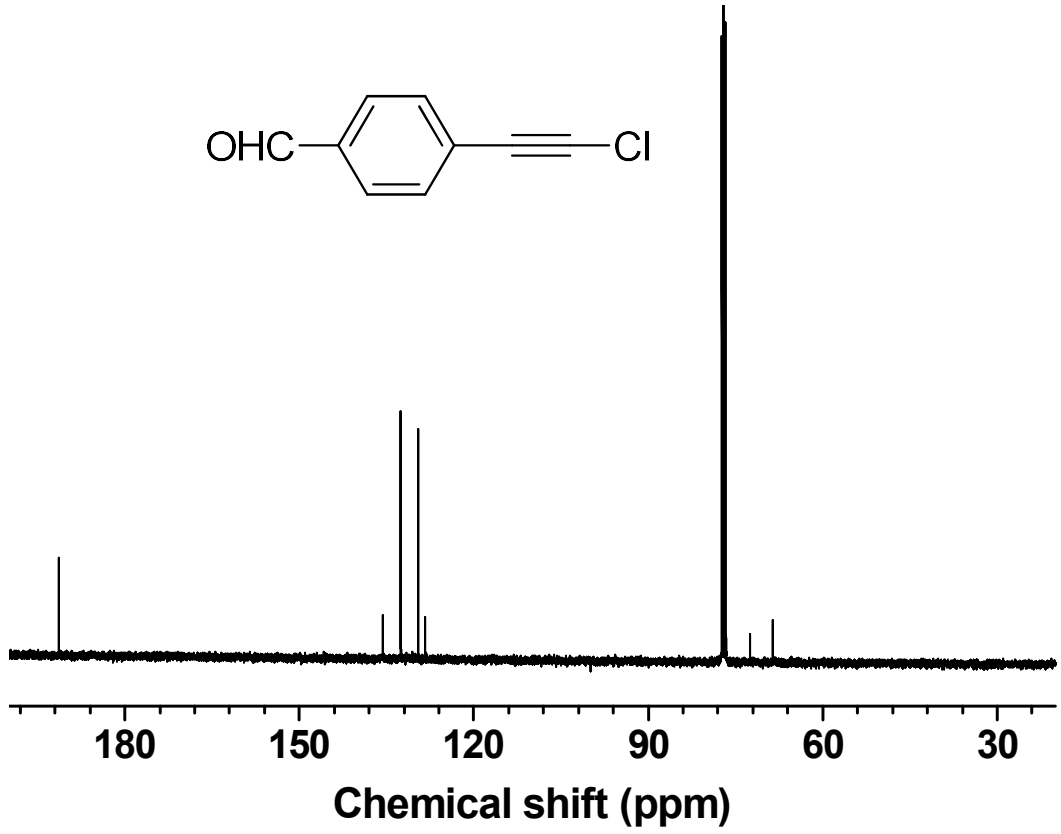


Figure S23. ^{13}C NMR spectrum of M**8** in $CDCl_3$.

Tolerance = 1.0 mDa / DBE: min = -1.5, max = 50.0
Element prediction: Off

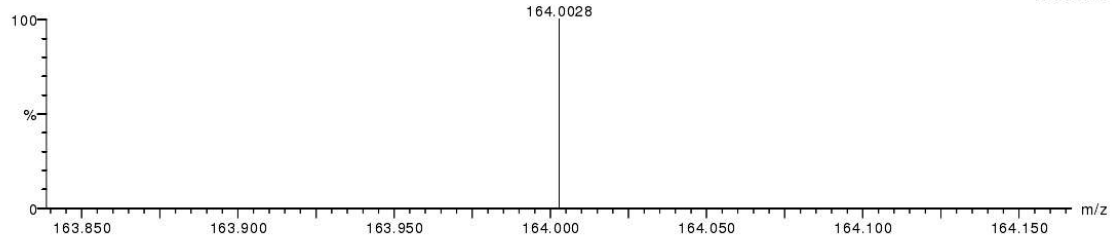
Monoisotopic Mass, Odd and Even Electron Ions
73 formula(e) evaluated with 1 results within limits (up to 70 best isotopic matches for each mass)
Elements Used:
C: 0-100 H: 0-200 N: 0-3 O: 0-4 S: 0-1 Cl: 1-1

GCT Premier ZJU
TOF MS EI+

12-Apr-2018

yfl0412-3 609 (4.179)

7.43e+002



Minimum:				-1.5		
Maximum:		1.0	10.0	50.0		
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Formula
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Figure S24. High resolution mass spectrum of M**8**.

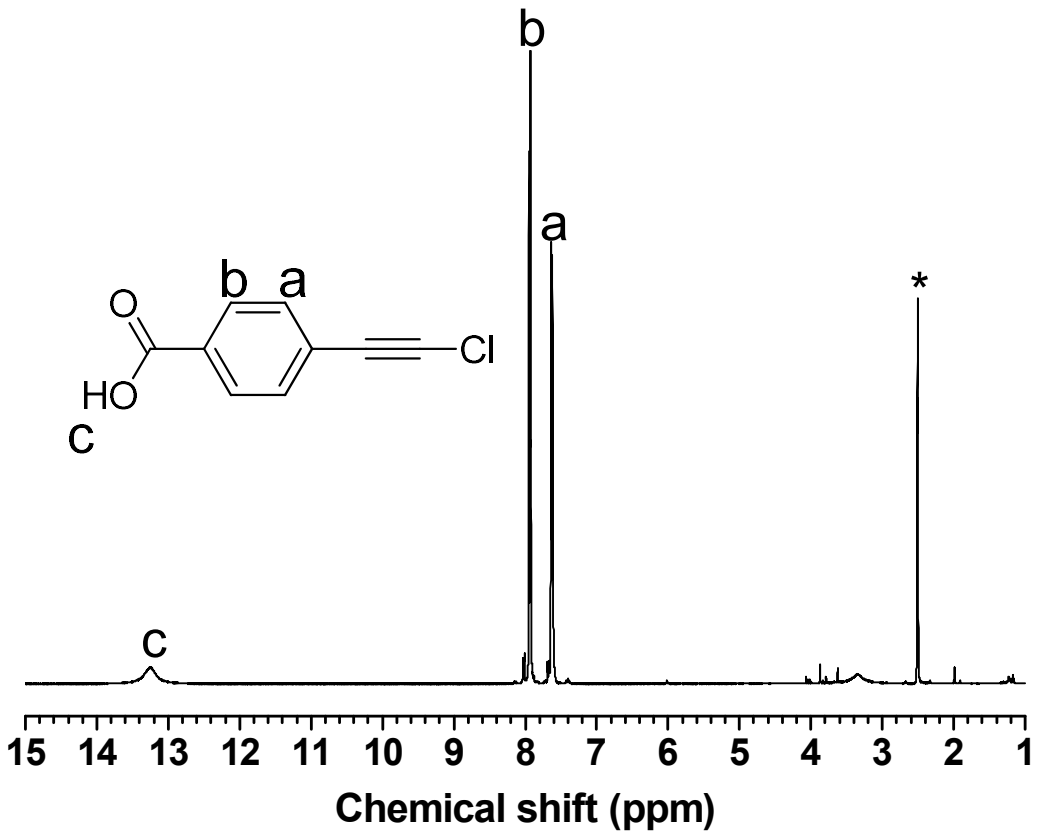

Figure S25. ^{1}H NMR spectrum of M**9** in DMSO-d_6.

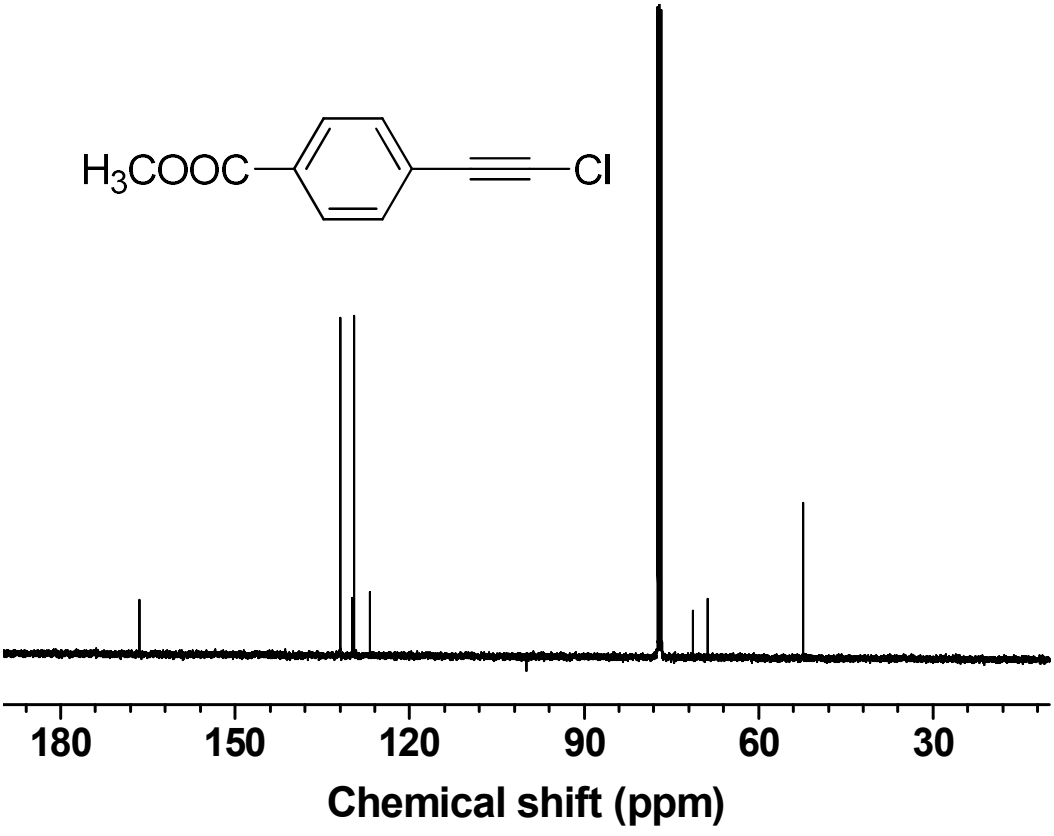

Figure S26. ^{13}C NMR spectrum of M**9** in DMSO-d_6.

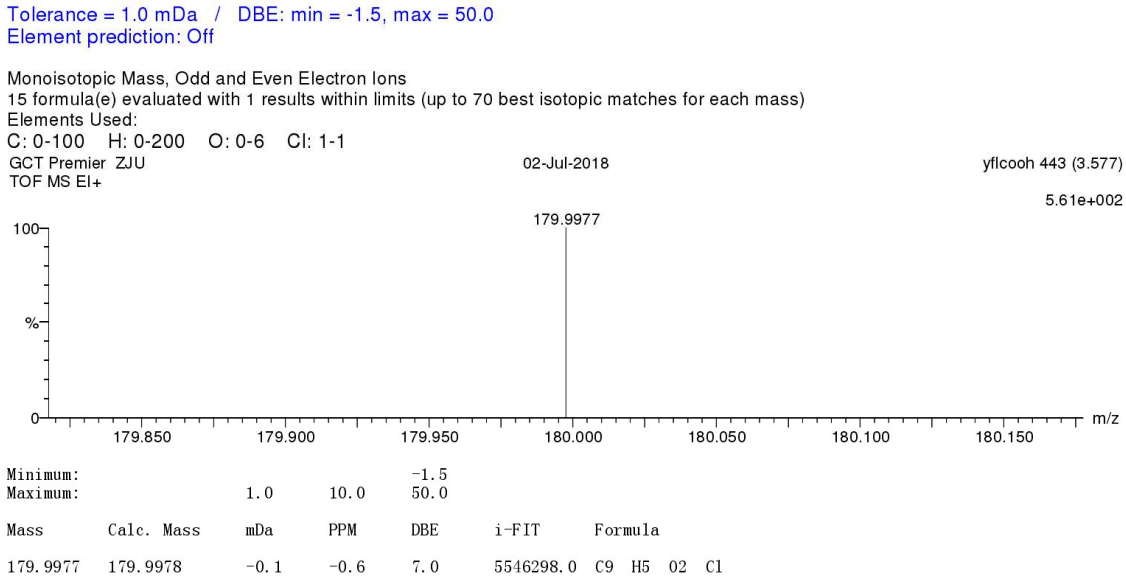

Figure S27. High resolution mass spectrum of M**9**.

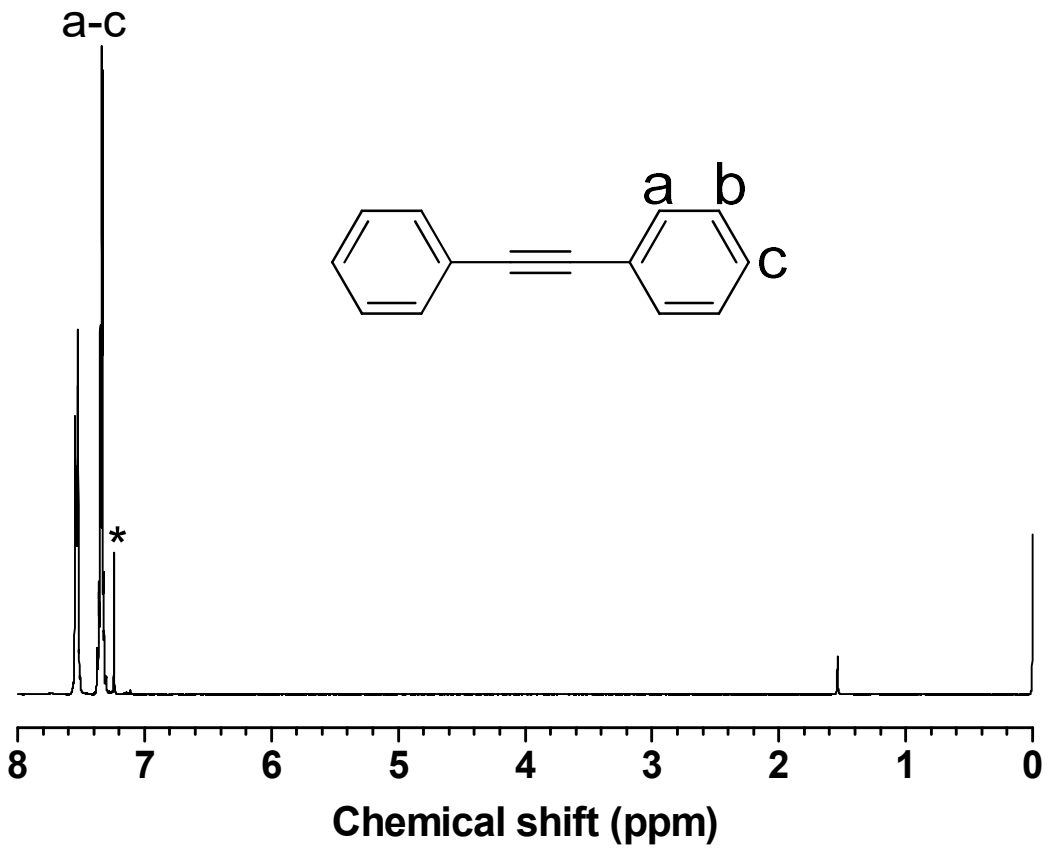

Figure S28. ^{1}H NMR spectrum of M**10** in $CDCl_3$.

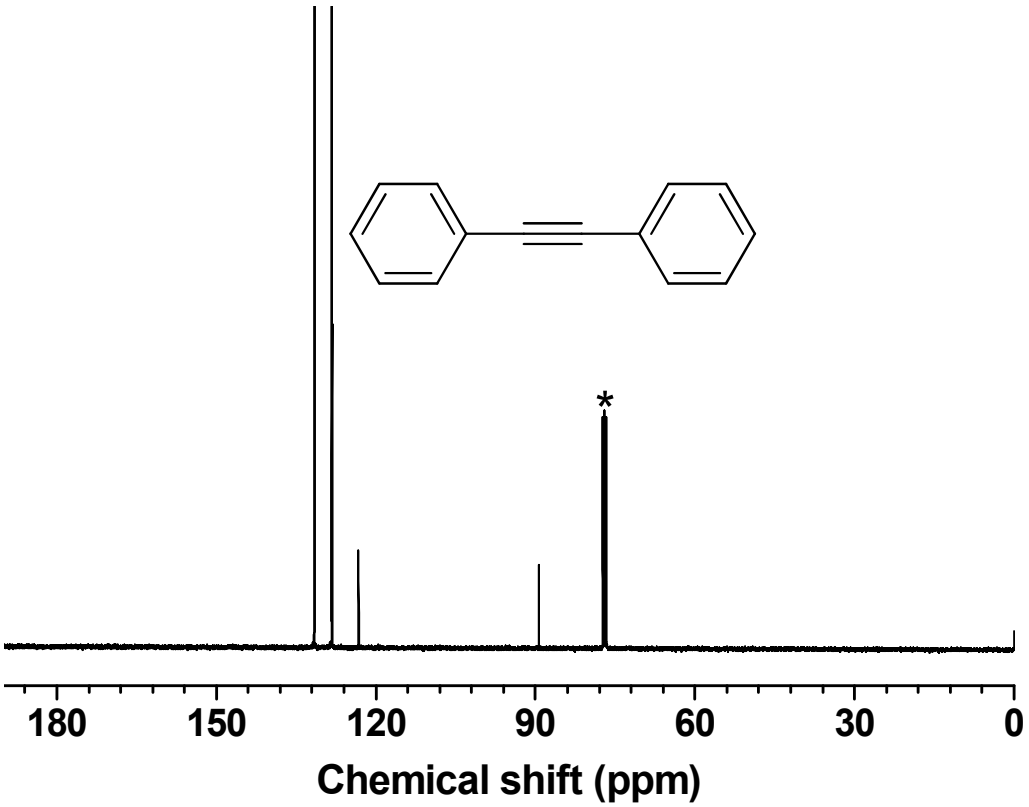

Figure S29. ^{13}C NMR spectrum of M**10** in $CDCl_3$.

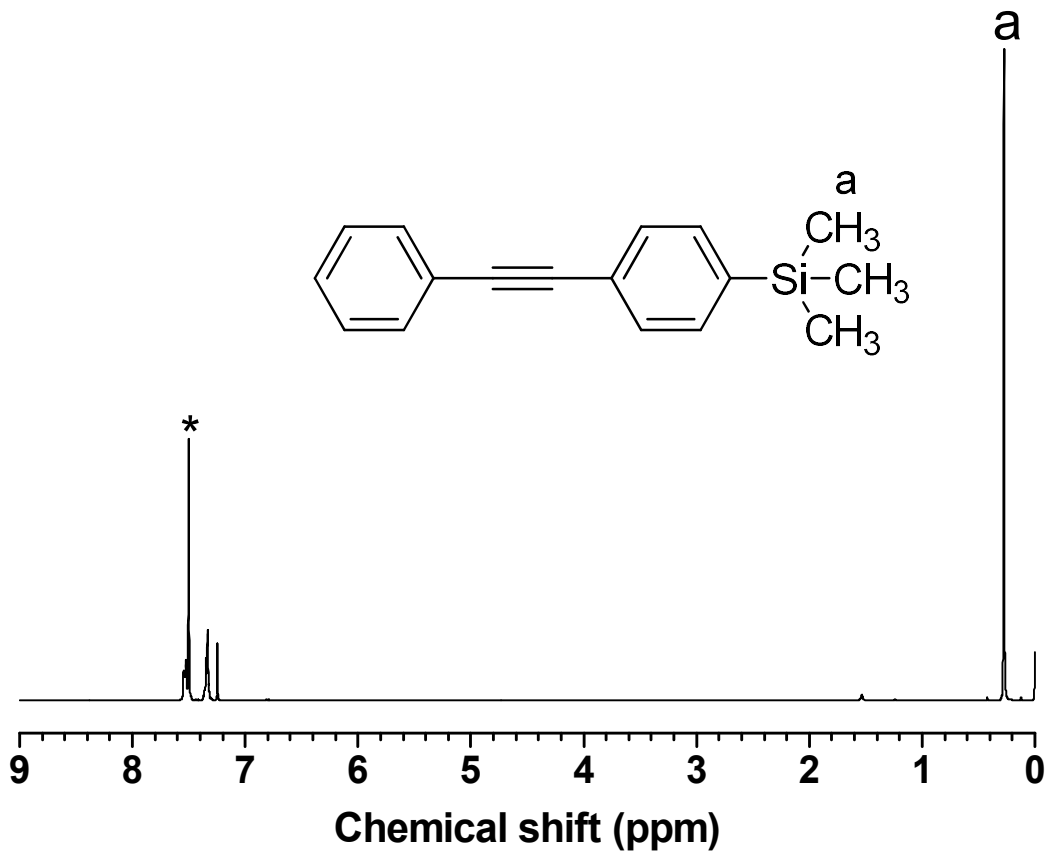

Figure S30. ^{1}H NMR spectrum of M**11** in $CDCl_3$.

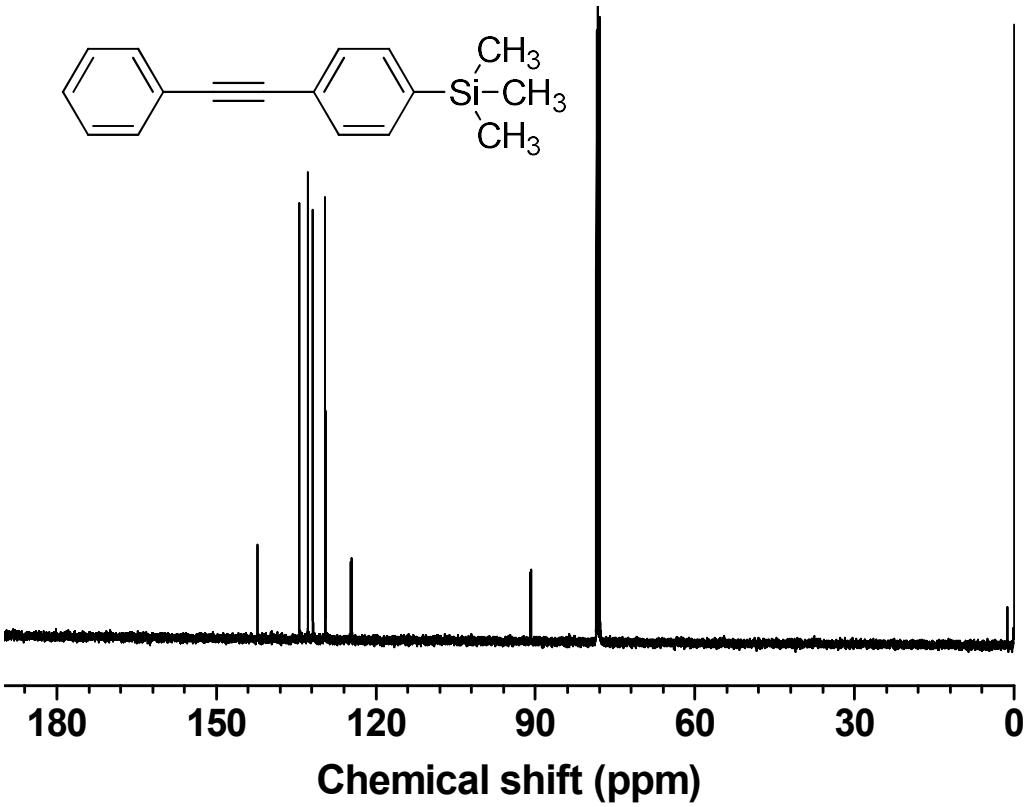

Figure S31. ^{13}C NMR spectrum of M**11** in $CDCl_3$.

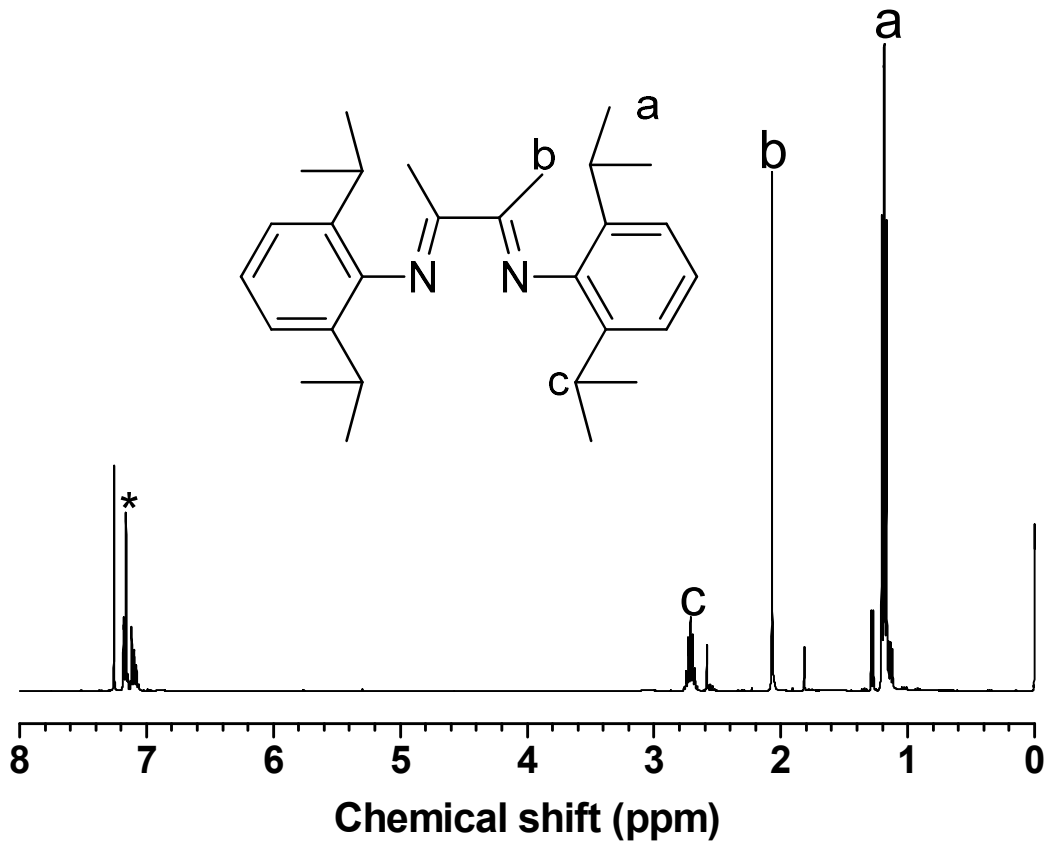

Figure S32. ^{1}H NMR spectrum of α-diimine ligand in $CDCl_3$.

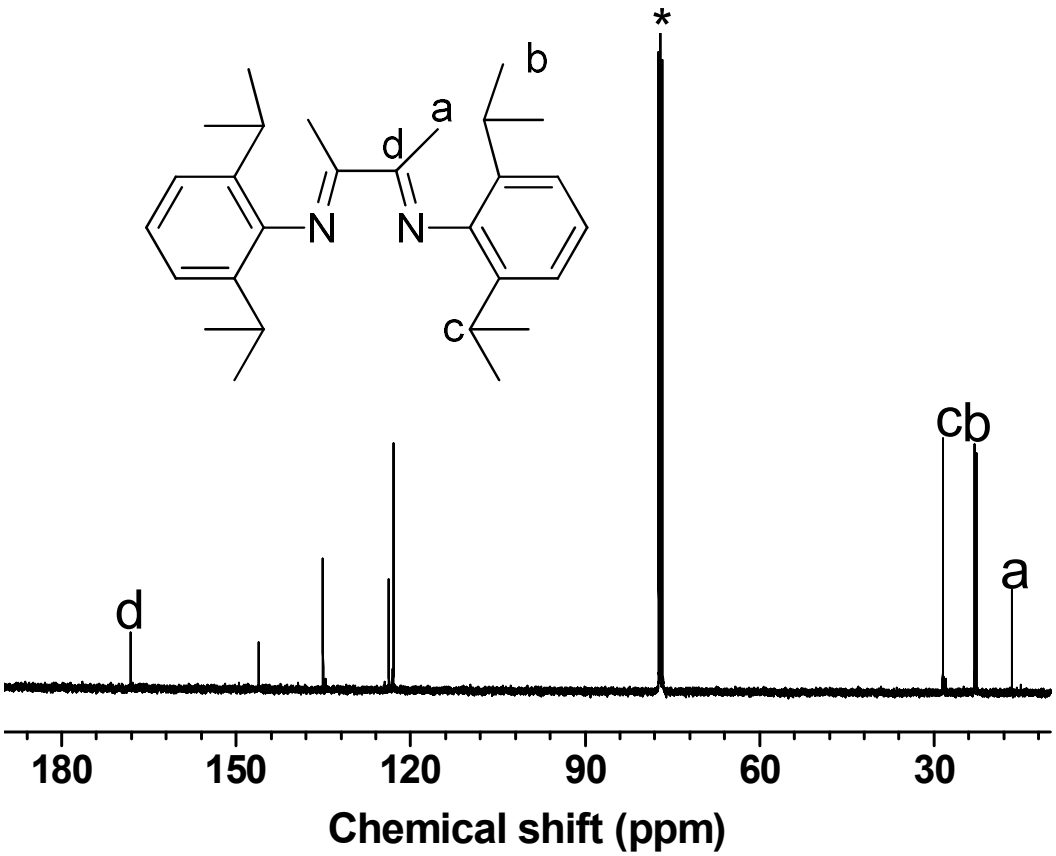

Figure S33. ^{13}C NMR spectrum of α-diimine ligand in $CDCl_3$.

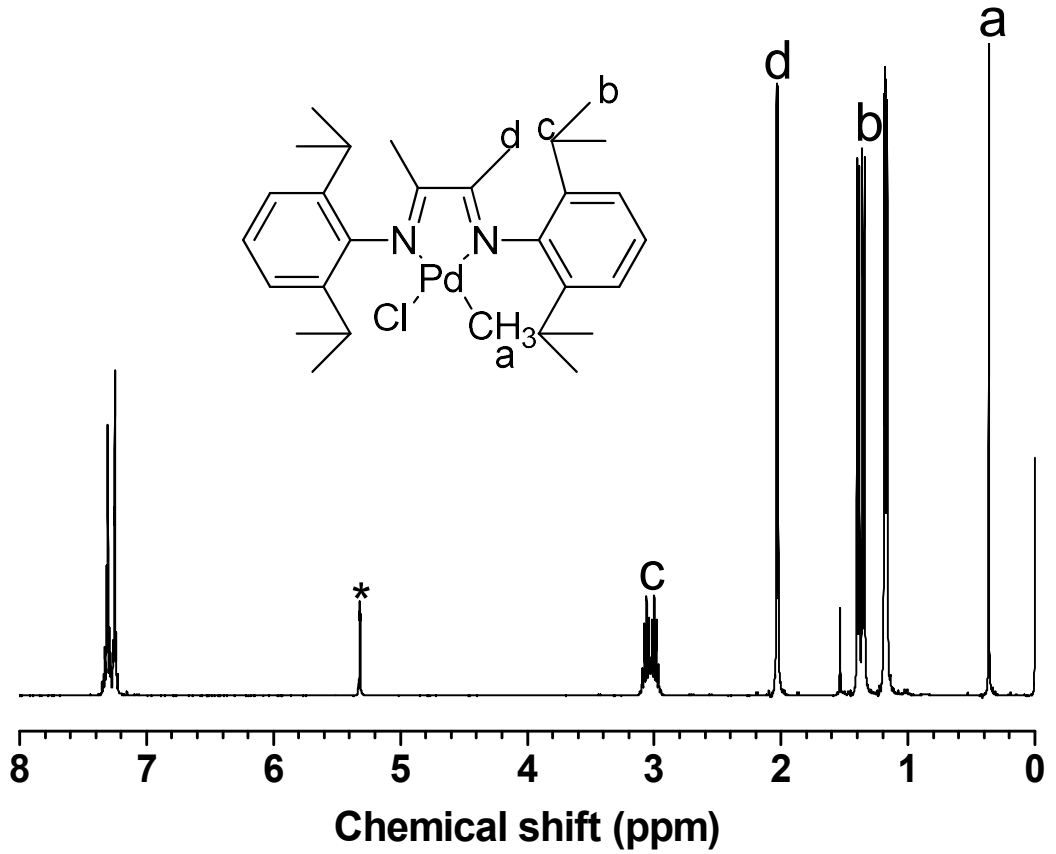

Figure S34. ^{1}H NMR spectrum of (α-diimine)PdMeCl complex in CD_2Cl_2.

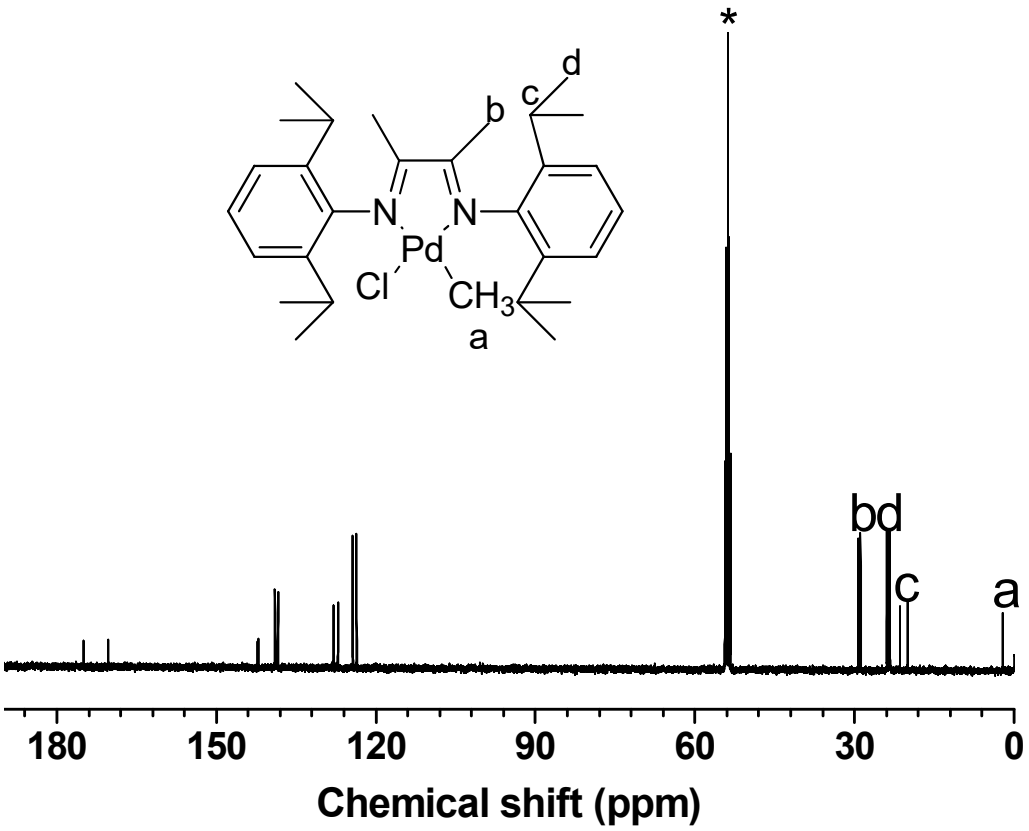

Figure S35. ^{13}C NMR spectrum of (α-diimine)PdMeCl complex in CD_2Cl_2.

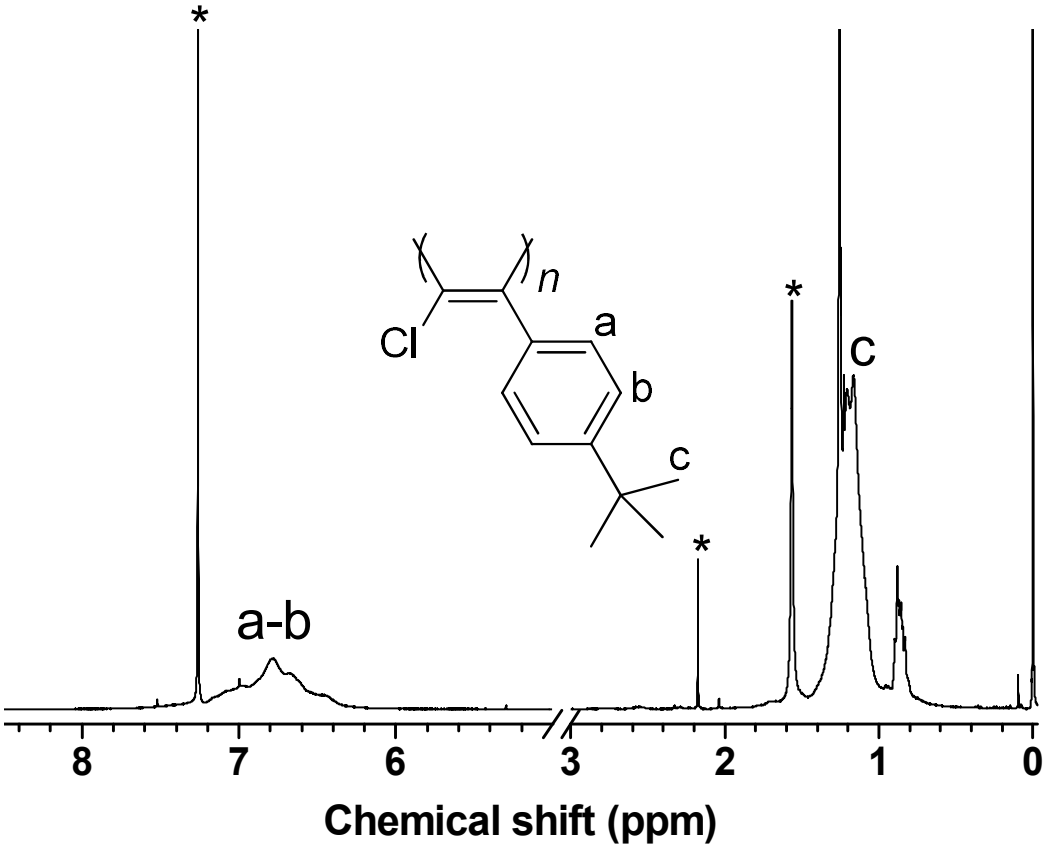

Figure S36. ^{1}H NMR spectrum of P**1**(Ag) in $CDCl_3$.

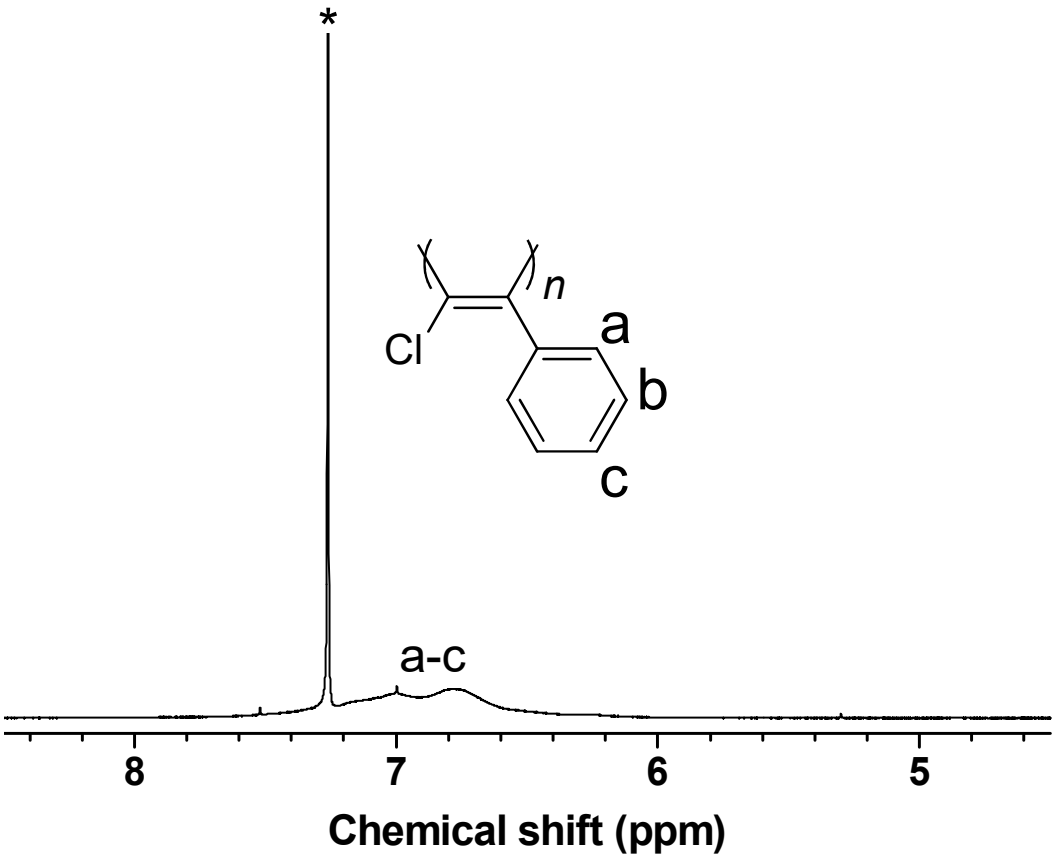

Figure S37. ^{1}H NMR spectrum of P**2**(Ag) in $CDCl_3$.

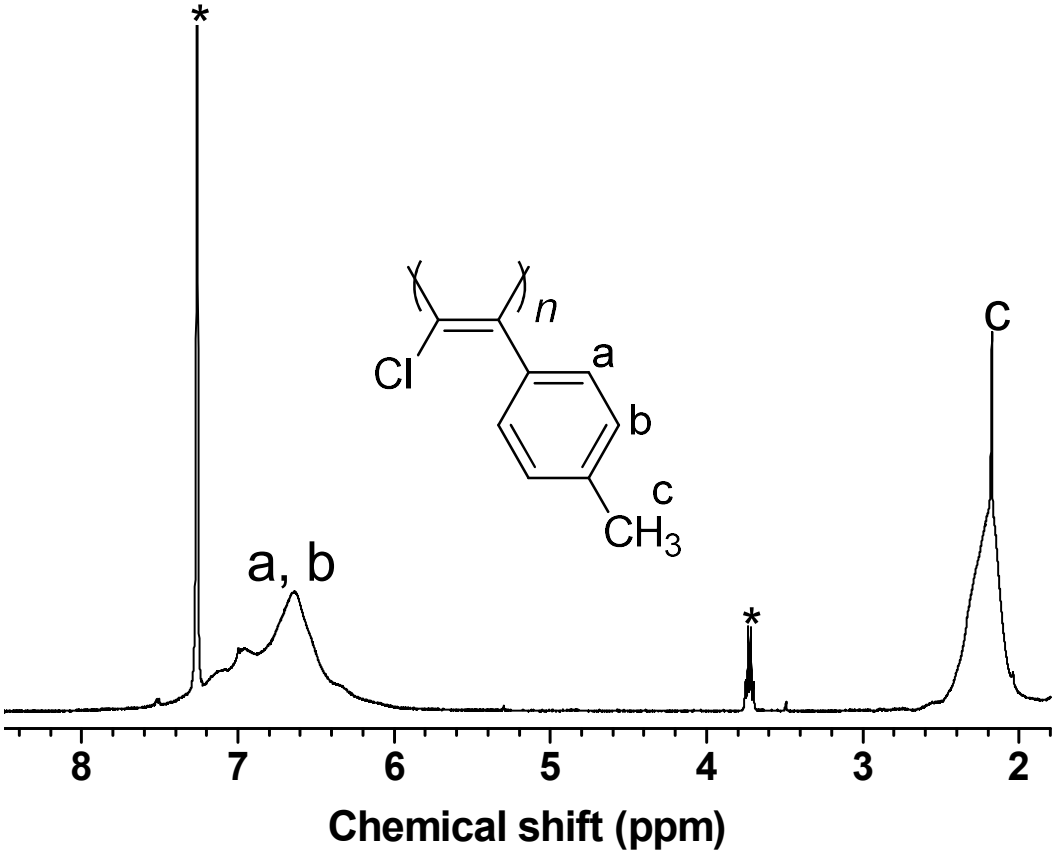

Figure S38. ^{1}H NMR spectrum of P**3**(Ag) in $CDCl_3$.

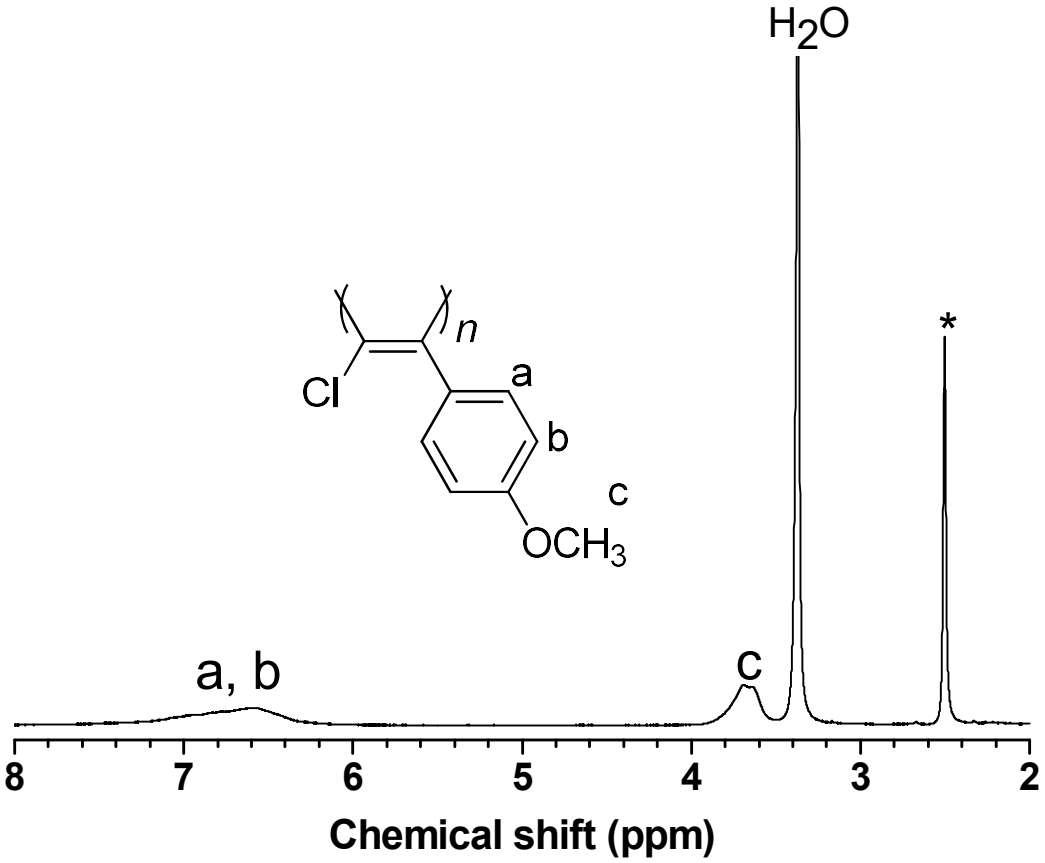

Figure S39. ^{1}H NMR spectrum of P**4**(Ag) in DMSO-d_6.

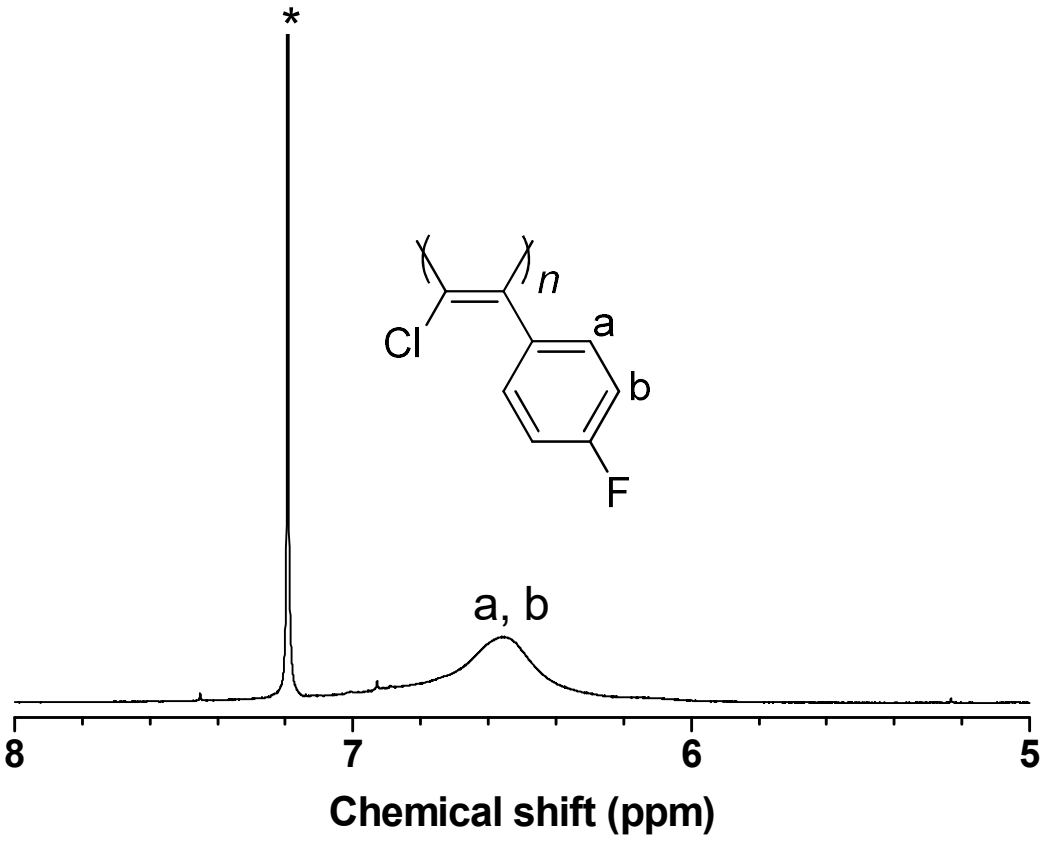

Figure S40. ^{1}H NMR spectrum of P**5**(Ag) in $CDCl_3$.

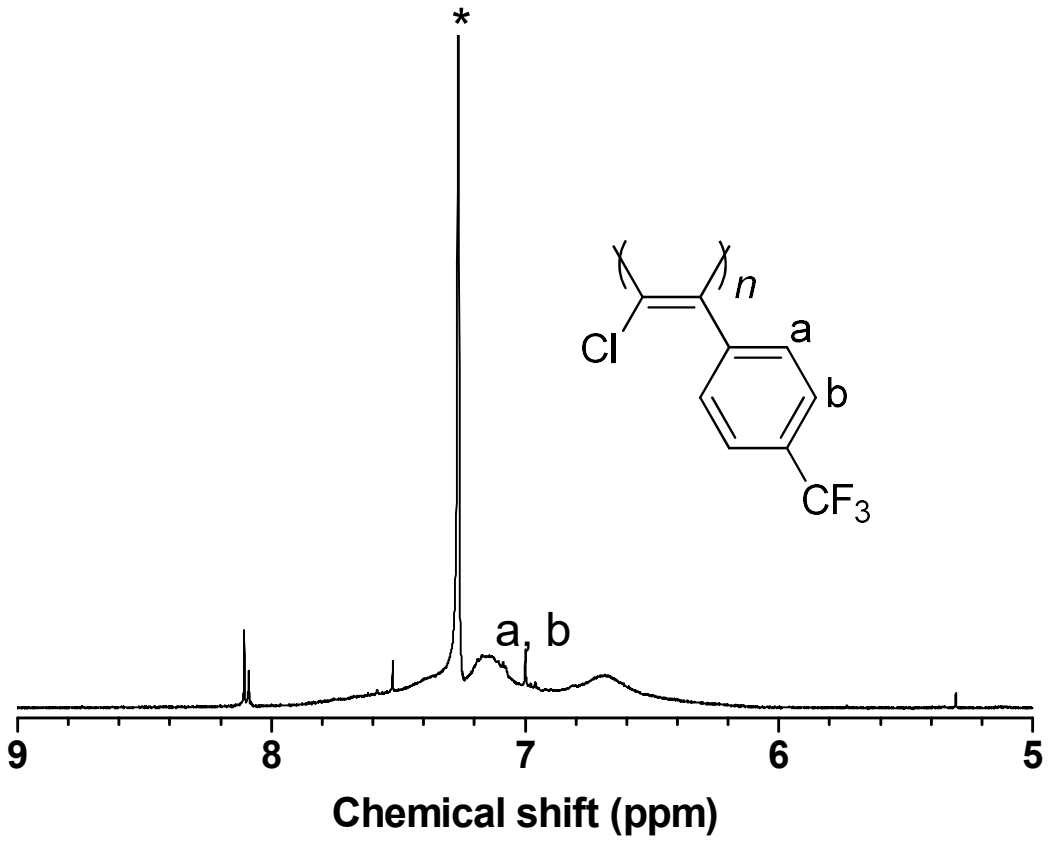

Figure S41. ^{1}H NMR spectrum of P**6**(Ag) in $CDCl_3$.

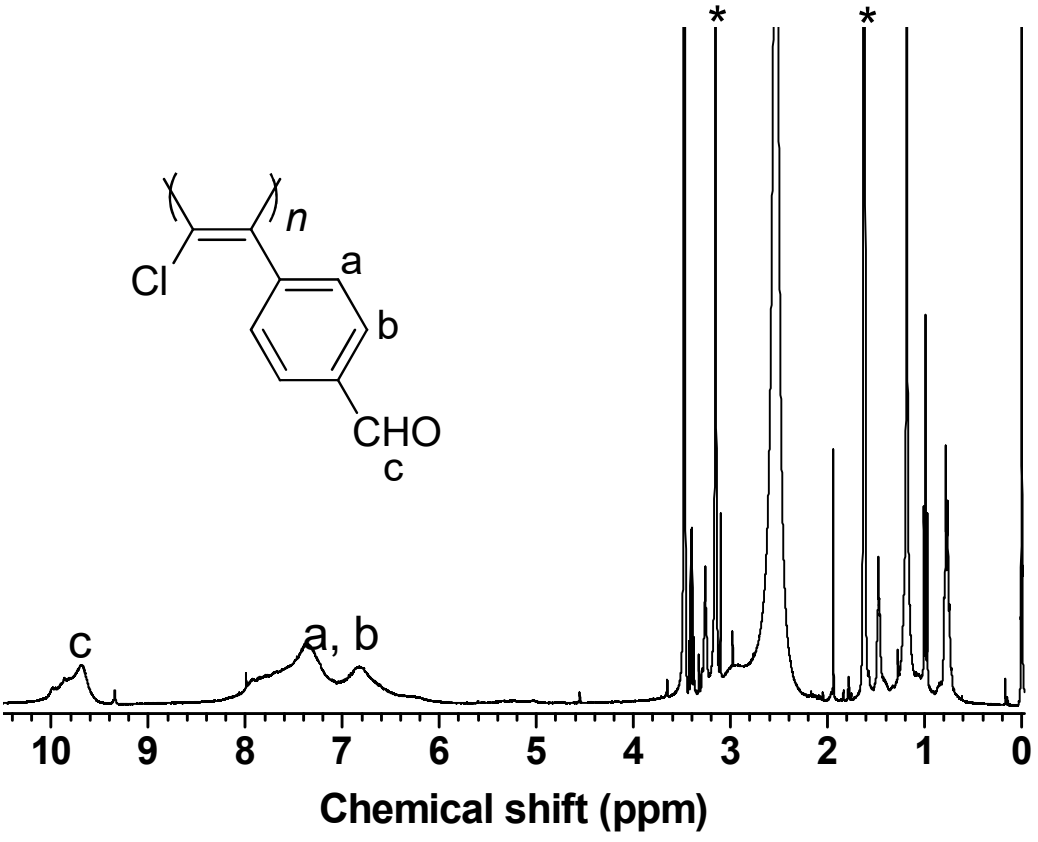

Figure S42. ^{1}H NMR spectrum of P**8**(Ag) in (THF-d_8).

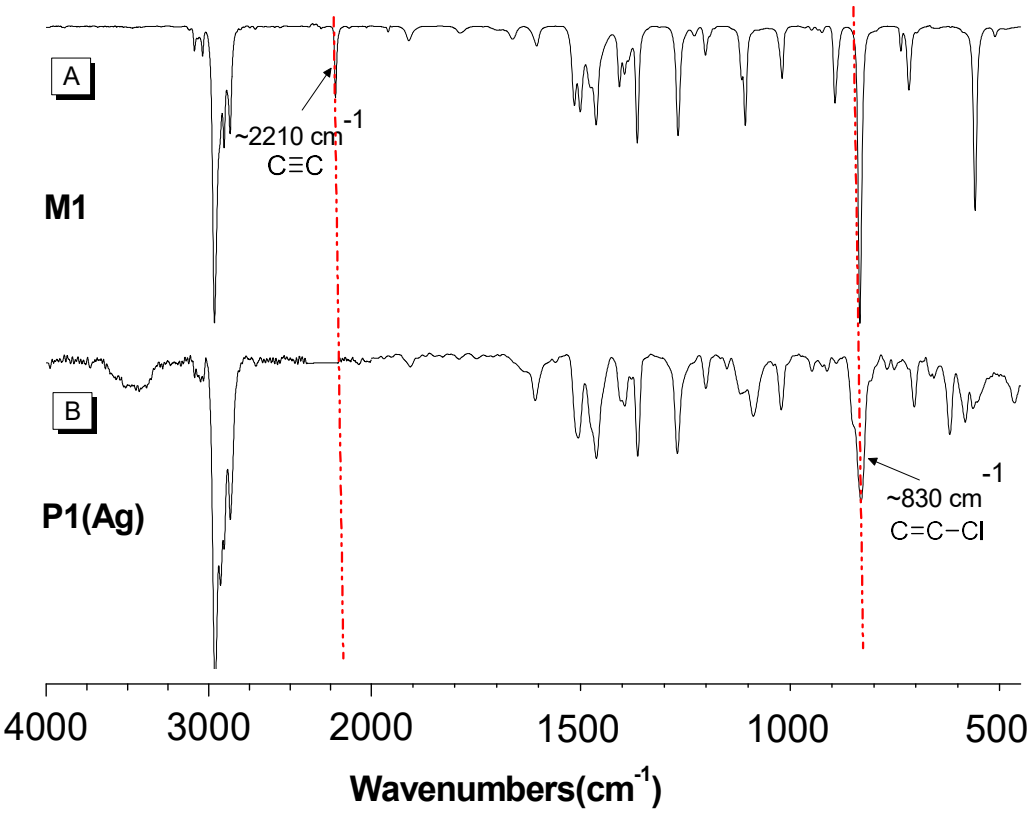

Figure S43. FTIR spectra of (A) M**1** and (B) P**1**(Ag).

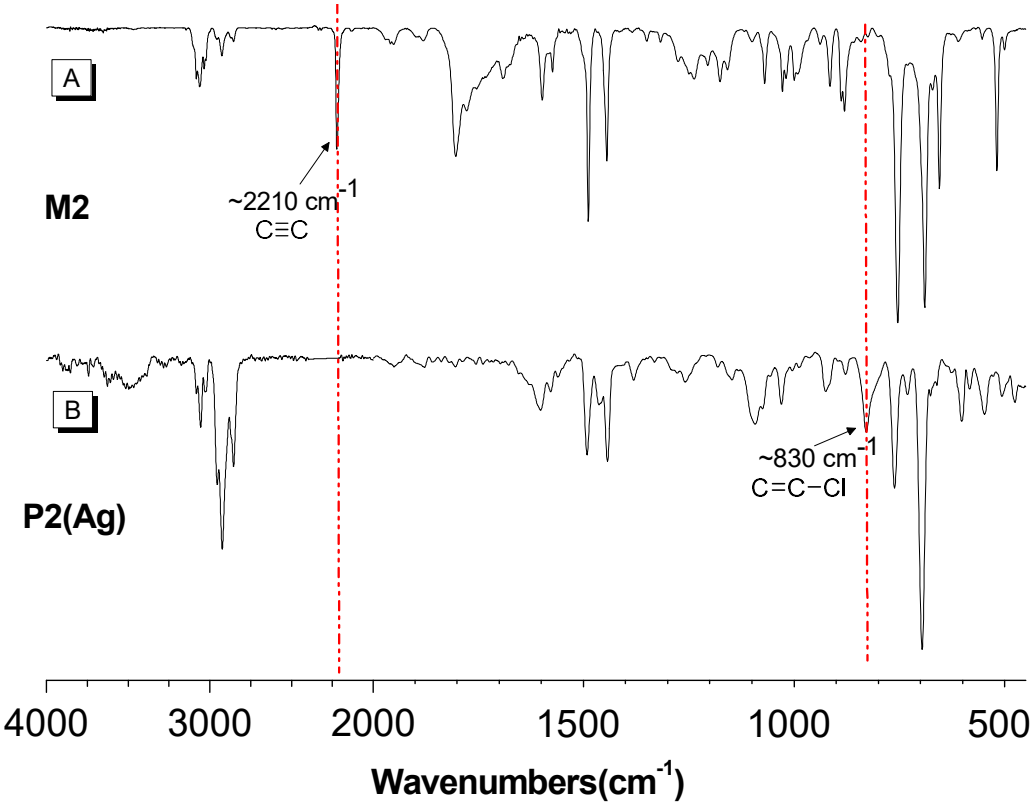

Figure S44. FTIR spectra of (A) M**2** and (B) P**2**(Ag).

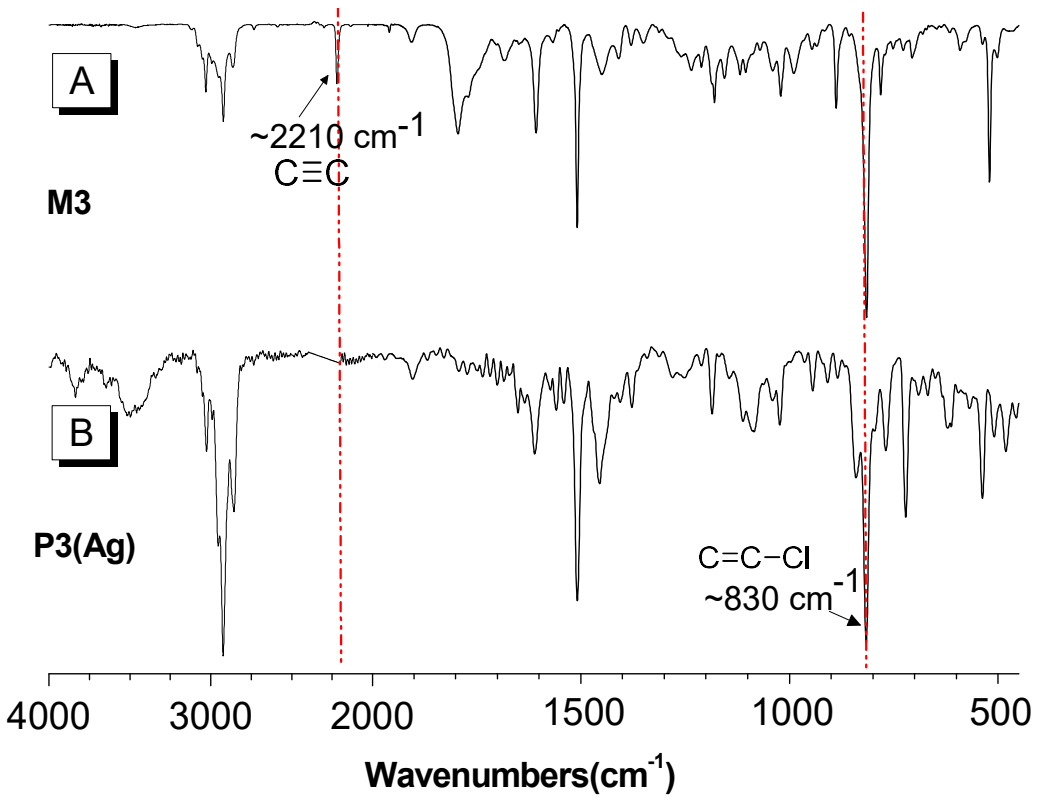

Figure S45. FTIR spectra of (A) M**3** and (B) P**3**(Ag).

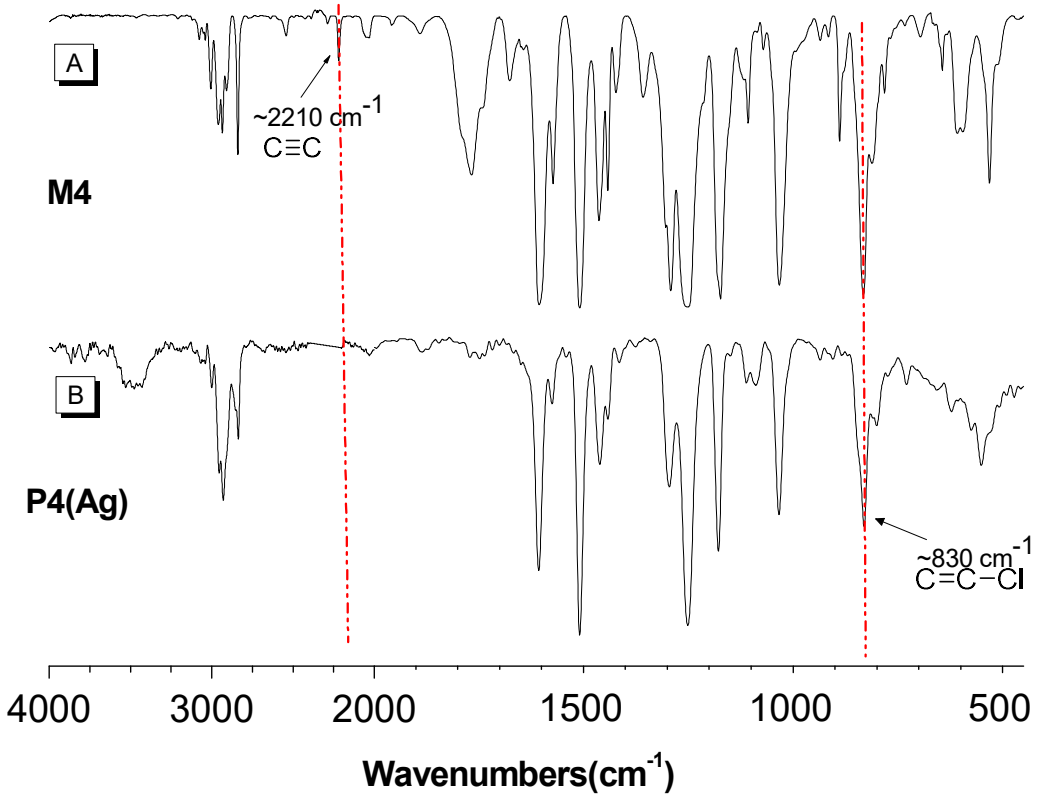

Figure S46. FTIR spectra of (A) M**4** and (B) P**4**(Ag).

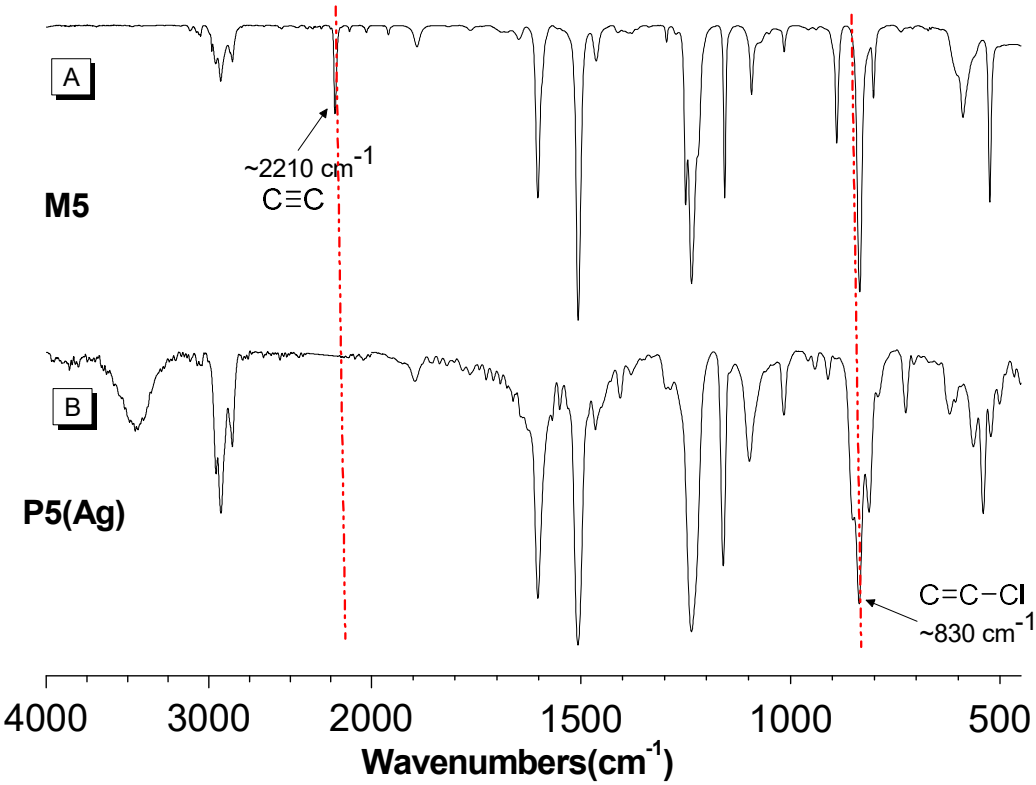

Figure S47. FTIR spectra of (A) M**5** and (B) P**5**(Ag).

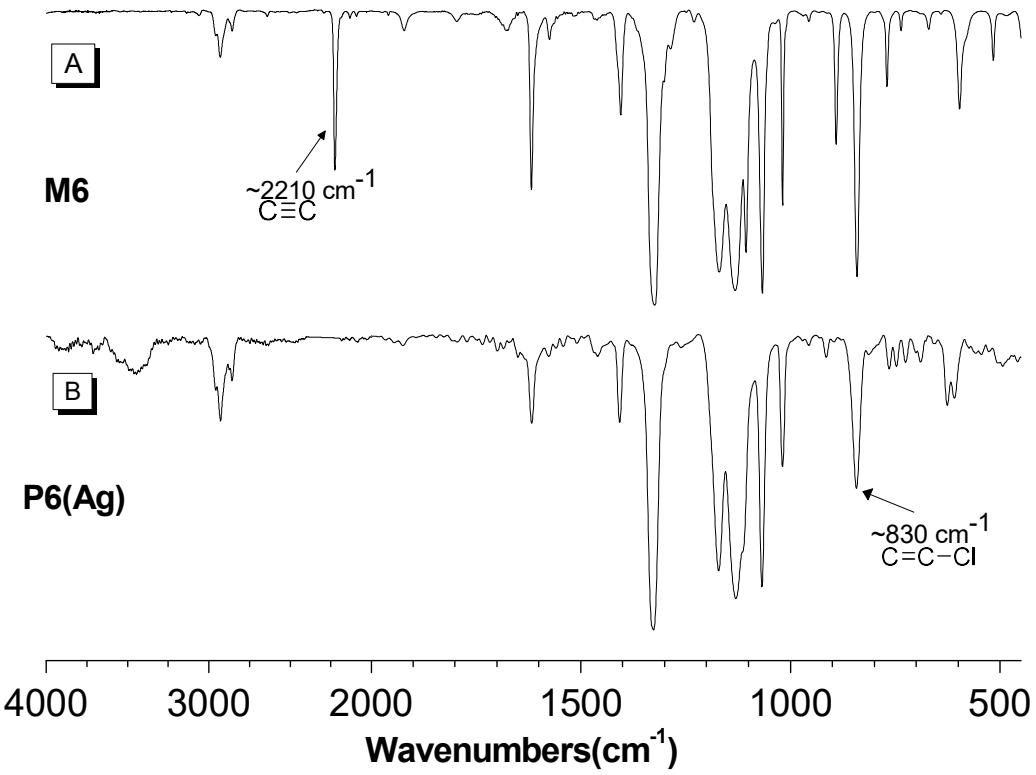

Figure S48. FTIR spectra of (A) M**6** and (B) P**6**(Ag).

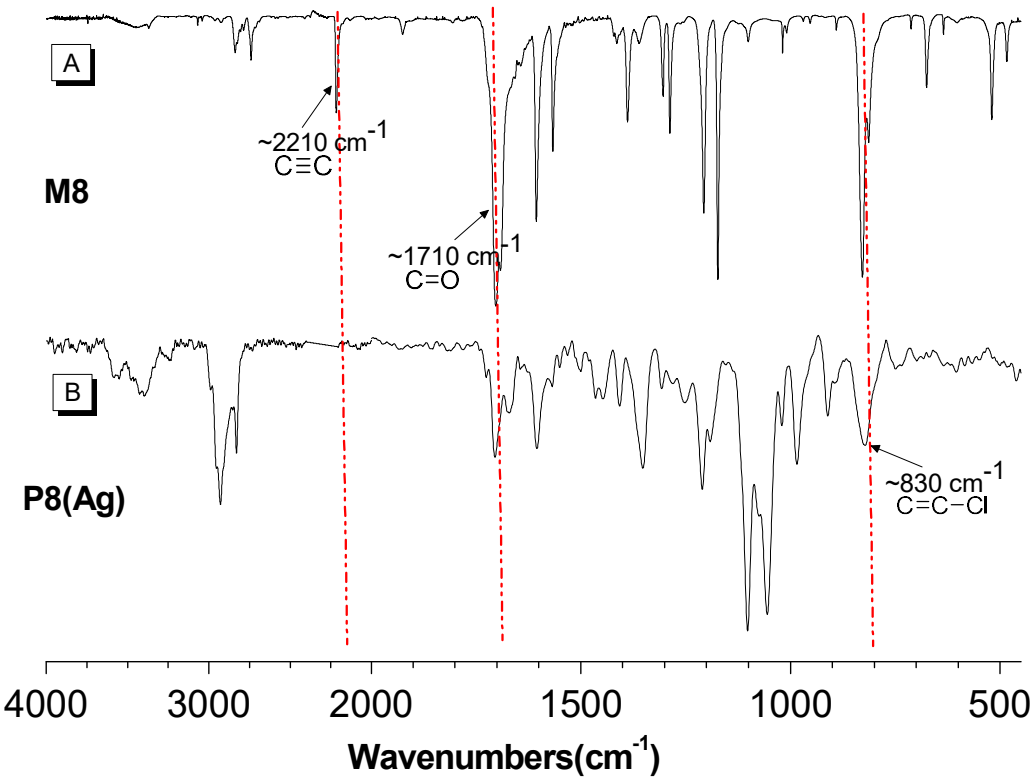

Figure S49. FTIR spectra of (A) M**8** and (B) P**8**(Ag).