

Supporting Information

Highly heteroselective ring-opening polymerization of *rac*-lactide initiated by rare-earth alkoxides bearing chiral [NNOO]-type amine-bis(phenolate) ligands

Yu-Lai Duan^{a,*}, Qian Guo^b, Gui-Yang Liu^a, Zhong-Zhou Yi^a, Shao-Ping Feng^a and Yong Huang^{b,*}

^a Local Characteristic Resource Utilization and New Materials Key Laboratory of Universities in Yunnan, School of Chemistry and Resources Engineering, Honghe University, Mengzi, 661199, Yunnan, P. R. China

^b Key Laboratory of Nonferrous Metals Chemistry and Resources Utilization of Gansu Province, College of Chemistry and Chemical Engineering, Lanzhou University, Lanzhou 730000, Gansu, P. R. China

E-mail: duanyl12@lzu.edu.cn; huangyong@lzu.edu.cn.

1. Fig. S1. ¹ H NMR spectrum of ligand (<i>S</i>)-L ¹ -H ₂ in CDCl ₃ at 298 K.....	S2
2. Fig. S2. ¹³ C NMR spectrum of ligand (<i>S</i>)-L ¹ -H ₂ in CDCl ₃ at 298 K.....	S2
3. Fig. S3. ¹ H NMR spectrum of ligand (<i>S</i>)-L ² -H ₂ in CDCl ₃ at 298 K.....	S3
4. Fig. S4. ¹³ C NMR spectrum of ligand (<i>S</i>)-L ² -H ₂ in CDCl ₃ at 298 K.....	S3
5. Fig. S5. ¹ H NMR spectrum of ligand (<i>S</i>)-L ³ -H ₂ in CDCl ₃ at 298 K.....	S4
6. Fig. S6. ¹³ C NMR spectrum of ligand (<i>S</i>)-L ³ -H ₂ in CDCl ₃ at 298 K.....	S4
7. Fig. S7. ¹ H NMR spectrum of ligand (<i>S</i>)-L ⁴ -H ₂ in CDCl ₃ at 298 K.....	S5
8. Fig. S8. ¹³ C NMR spectrum of ligand (<i>S</i>)-L ⁴ -H ₂ in CDCl ₃ at 298 K.....	S5
9. Fig. S9. ¹ H NMR spectrum of complex [L ¹ Y(O ⁱ Pr)(THF)] (1) in C ₆ D ₆ at 298 K.....	S6
10. Fig. S10. ¹³ C NMR spectrum of complex [L ¹ Y(O ⁱ Pr)(THF)] (1) in C ₆ D ₆ at 298 K.....	S6
11. Fig. S11. ¹ H NMR spectrum of complex [L ² Y(O ⁱ Pr)(THF)] (4) in C ₆ D ₆ at 298 K.....	S7
12. Fig. S12. ¹³ C NMR spectrum of complex [L ² Y(O ⁱ Pr)(THF)] (4) in C ₆ D ₆ at 298 K.....	S7
13. Fig. S13. ¹ H NMR spectrum of complex [L ³ Y(O ⁱ Pr)(THF)] (5) in C ₆ D ₆ at 298 K.....	S8
14. Fig. S14. ¹³ C NMR spectrum of complex [L ³ Y(O ⁱ Pr)(THF)] (5) in C ₆ D ₆ at 298 K.....	S8
15. Fig. S15. ¹ H NMR spectrum of complex [L ⁴ Y(O ⁱ Pr)(THF)] (6) in C ₆ D ₆ at 298 K.....	S9
16. Fig. S16. ¹³ C NMR spectrum of complex [L ⁴ Y(O ⁱ Pr)(THF)] (6) in C ₆ D ₆ at 298 K.....	S9
17. Fig. S17. MALDI-TOF spectrum of oligomer of <i>rac</i> -lactide prepared by complex 1.....	S10

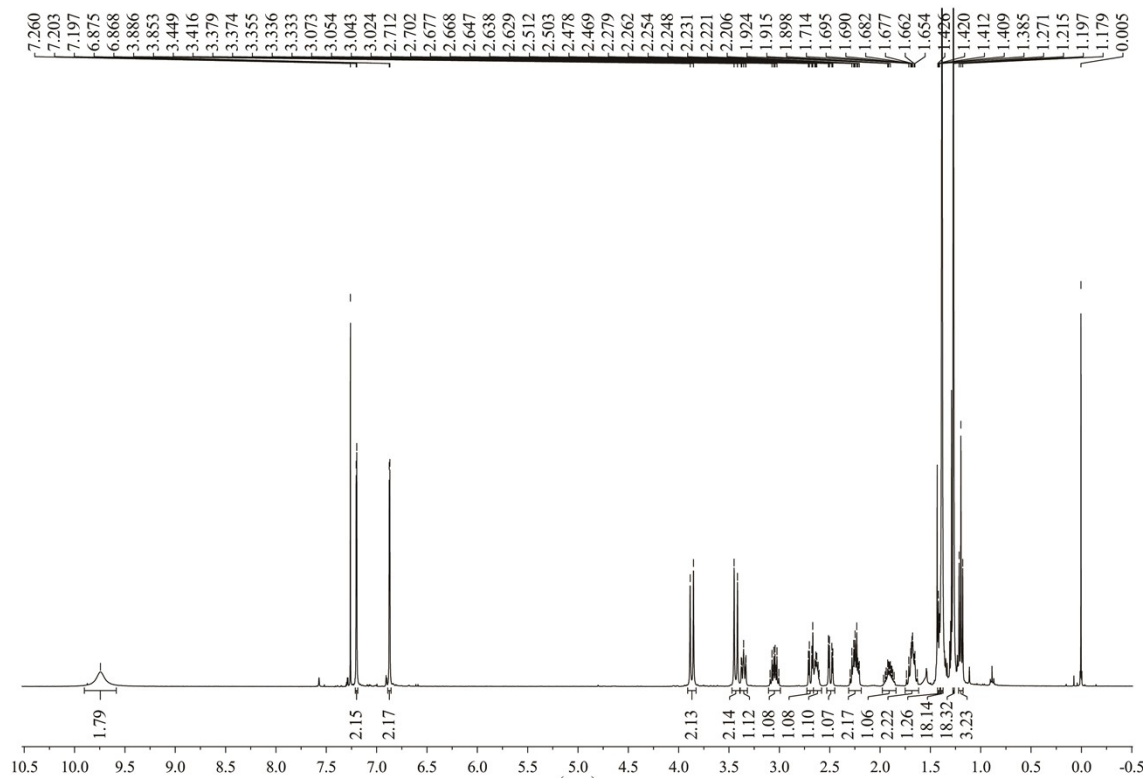


Fig. S1 ^1H NMR spectrum of ligand (*S*)- $\text{L}^1\text{-H}_2$ in CDCl_3 at 298 K.

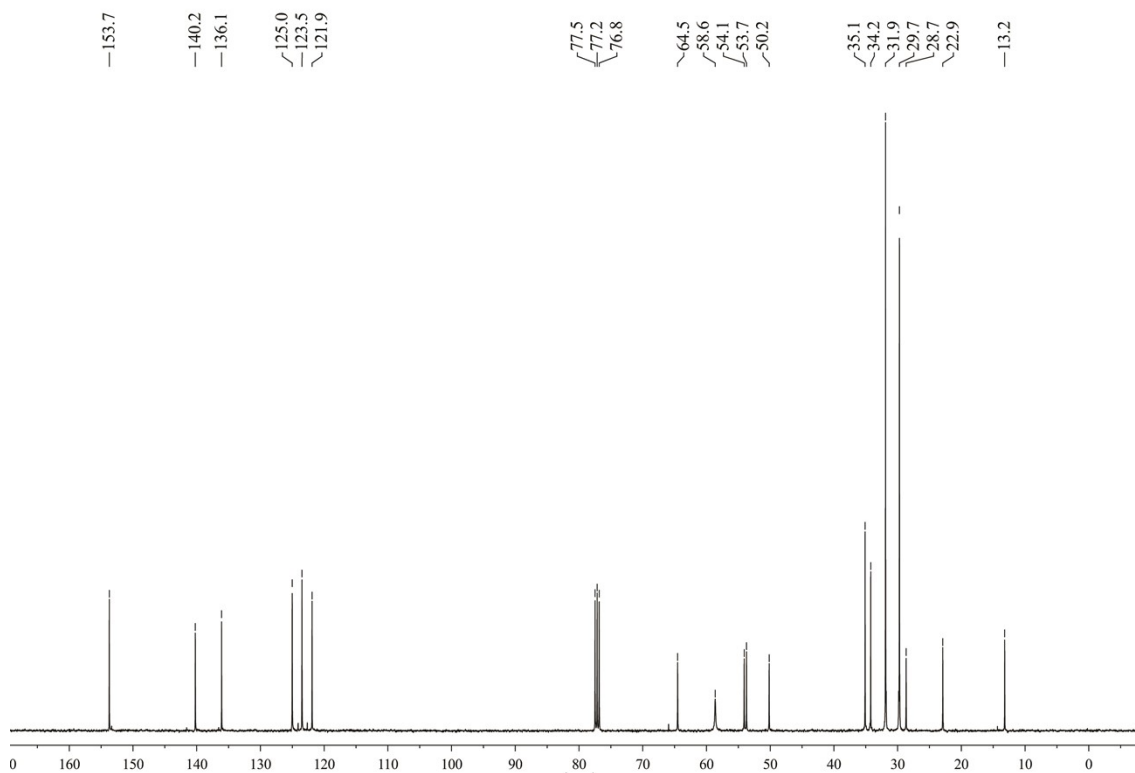


Fig. S2 ^{13}C NMR spectrum of ligand (*S*)- $\text{L}^1\text{-H}_2$ in CDCl_3 at 298 K.

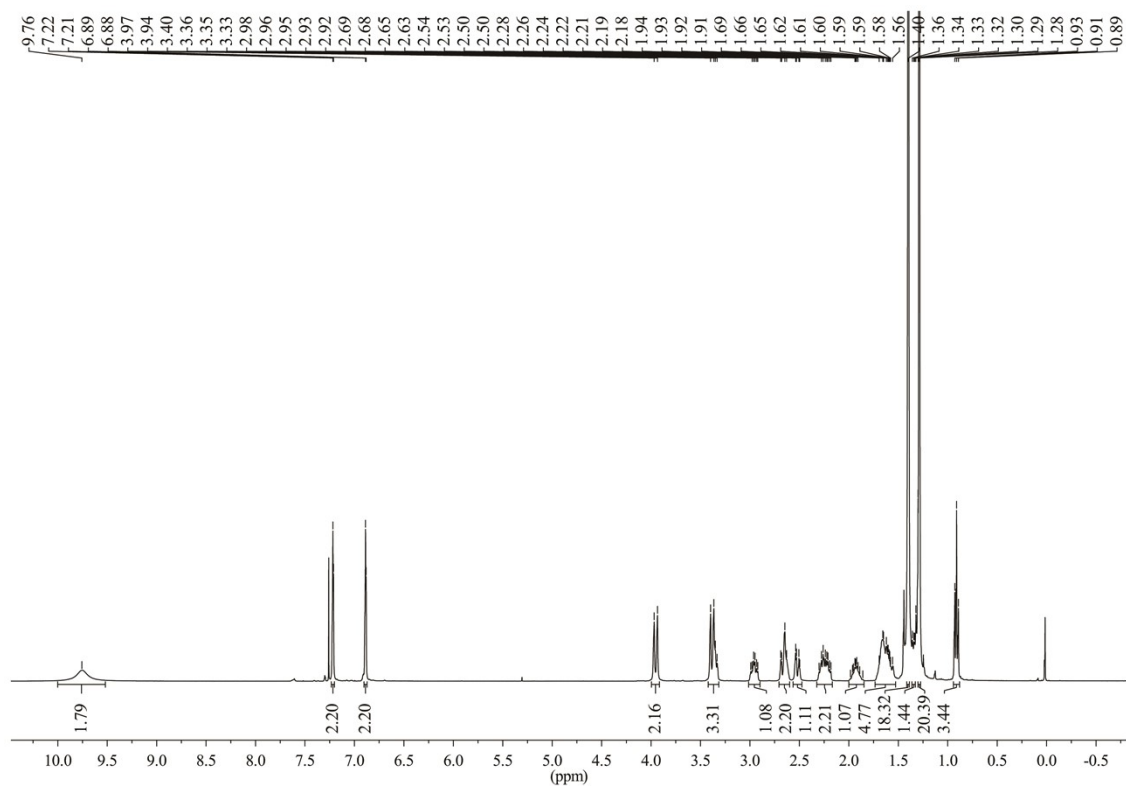


Fig. S3 ^1H NMR spectrum of (*S*)- $\text{L}^2\text{-H}_2$ in CDCl_3 at 298 K.

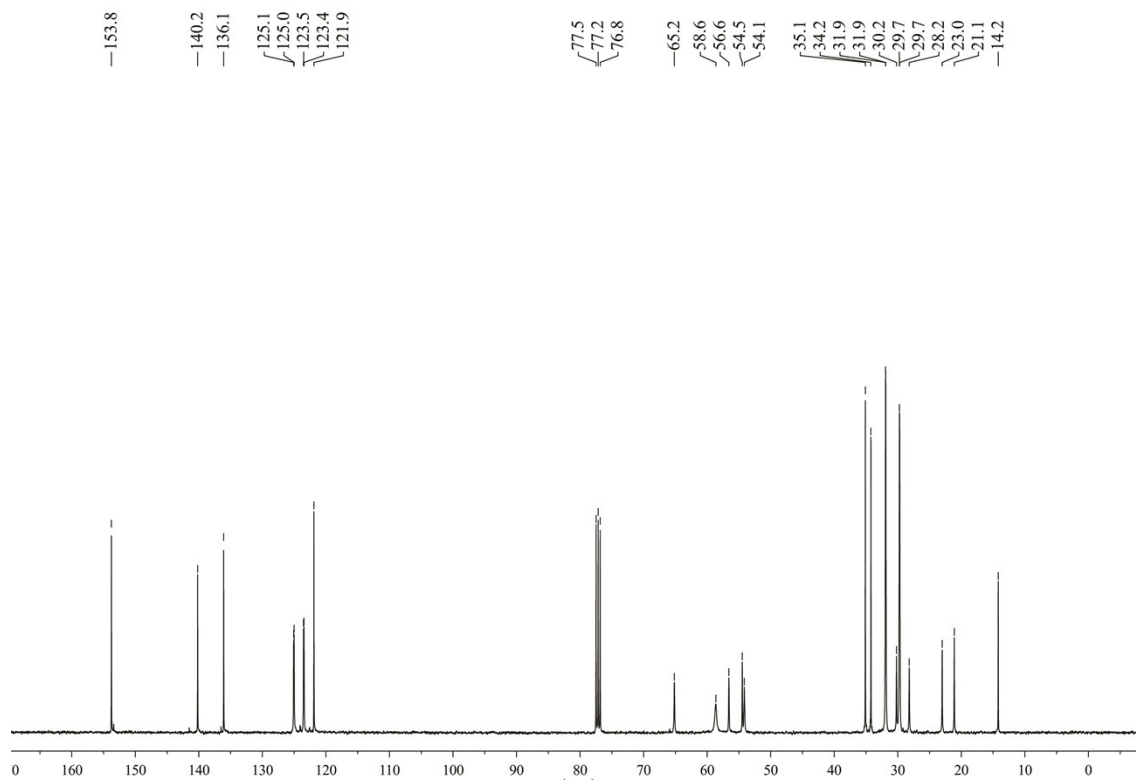


Fig. S4 ^{13}C NMR spectrum of (*S*)- $\text{L}^2\text{-H}_2$ in CDCl_3 at 298 K.

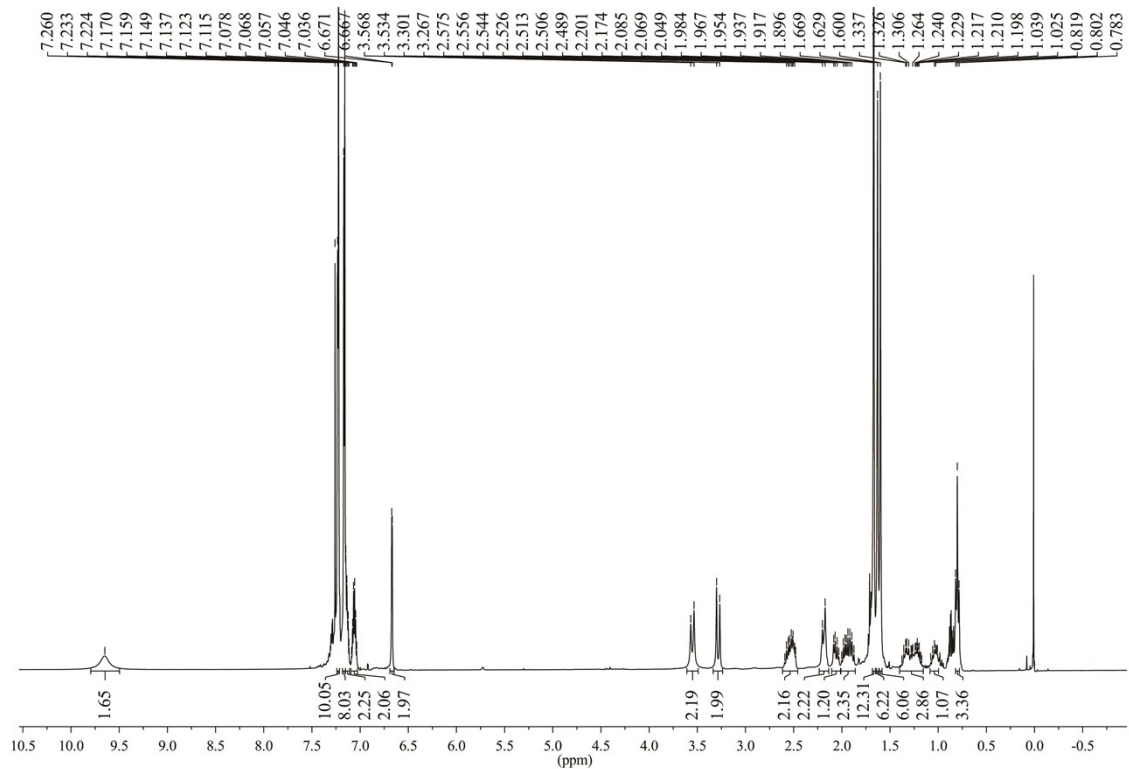


Fig. S5 ^1H NMR spectrum of $(S)\text{-L}^3\text{-H}_2$ in CDCl_3 at 298 K.

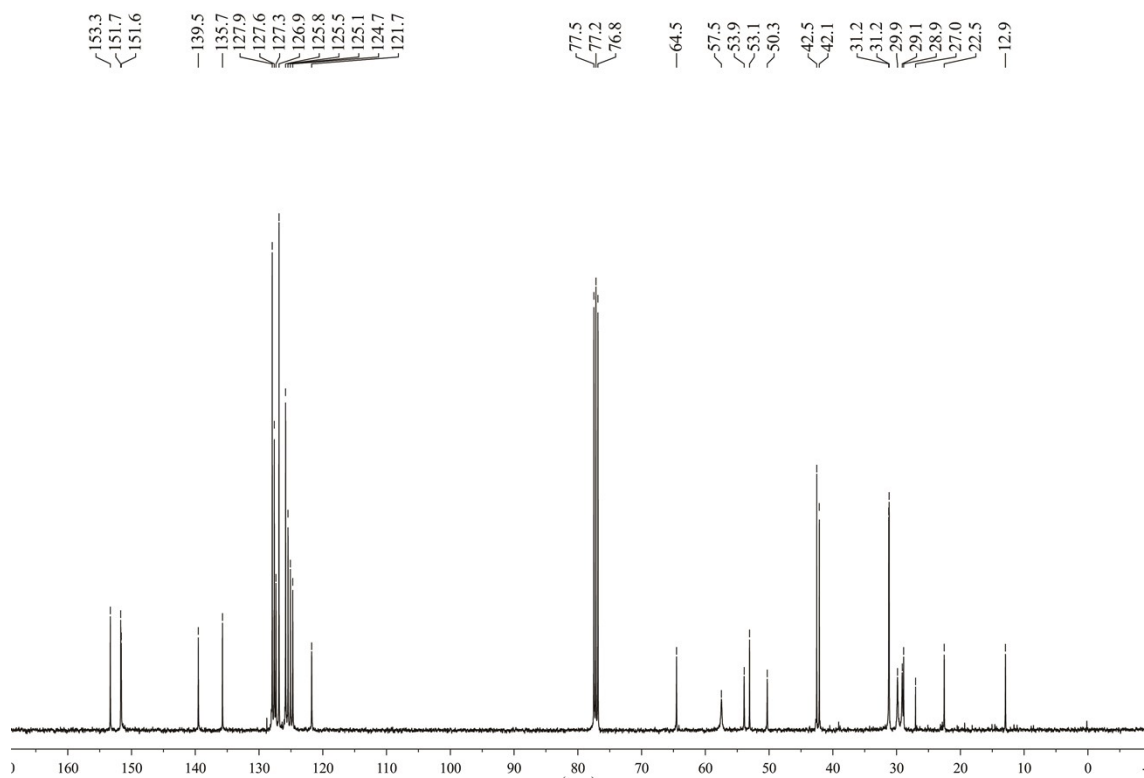


Fig. S6 ^{13}C NMR spectrum of $(S)\text{-L}^3\text{-H}_2$ in CDCl_3 at 298 K.

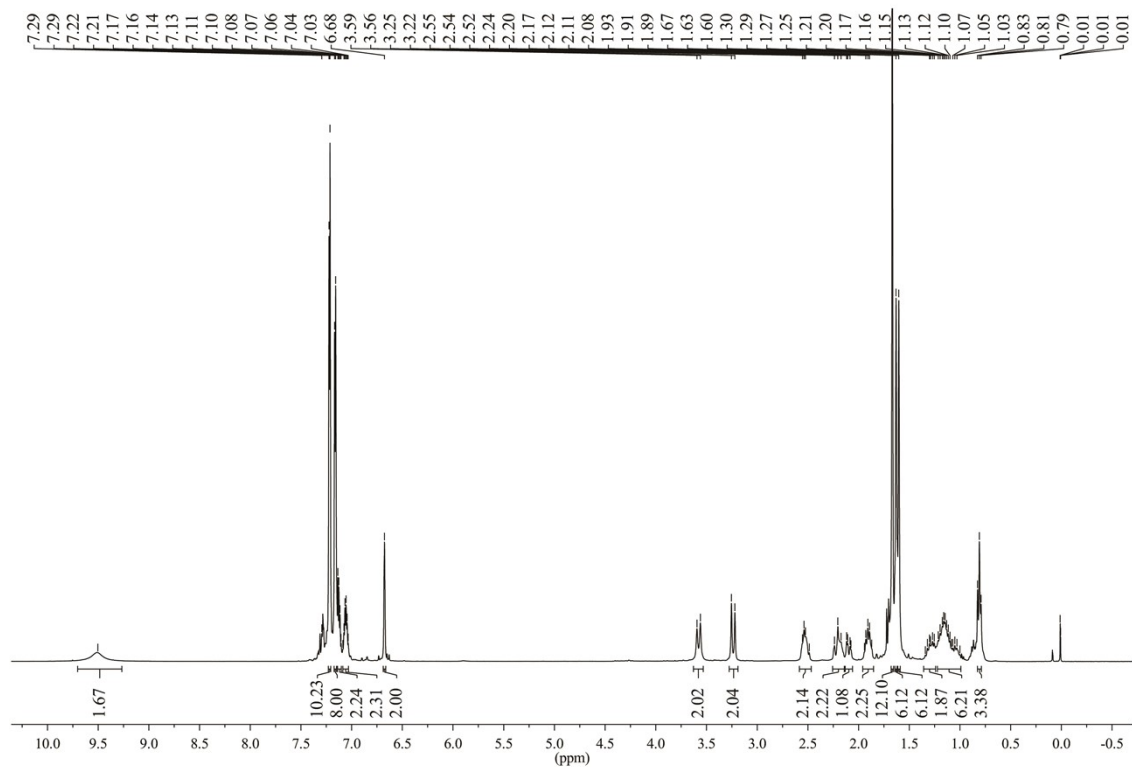


Fig. S7 ^1H NMR spectrum of $(S)\text{-L}^4\text{-H}_2$ in CDCl_3 at 298 K.

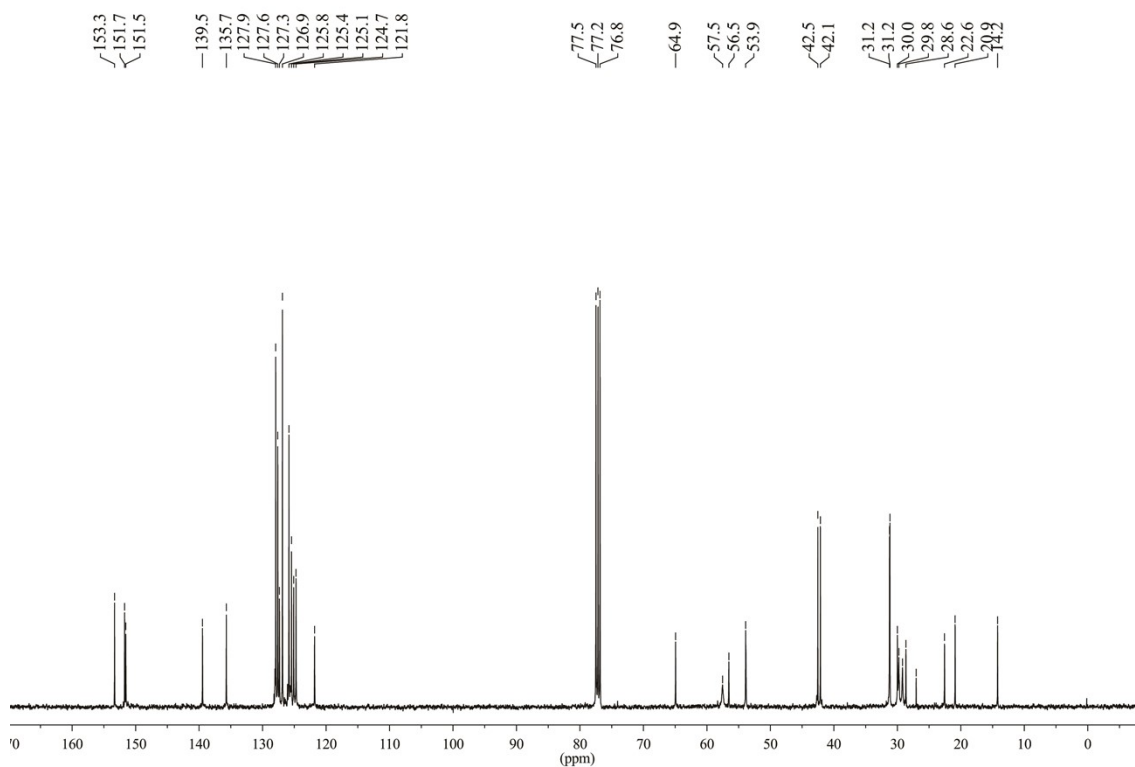


Fig. S8 ^{13}C NMR spectrum of $(S)\text{-L}^4\text{-H}_2$ in CDCl_3 at 298 K.

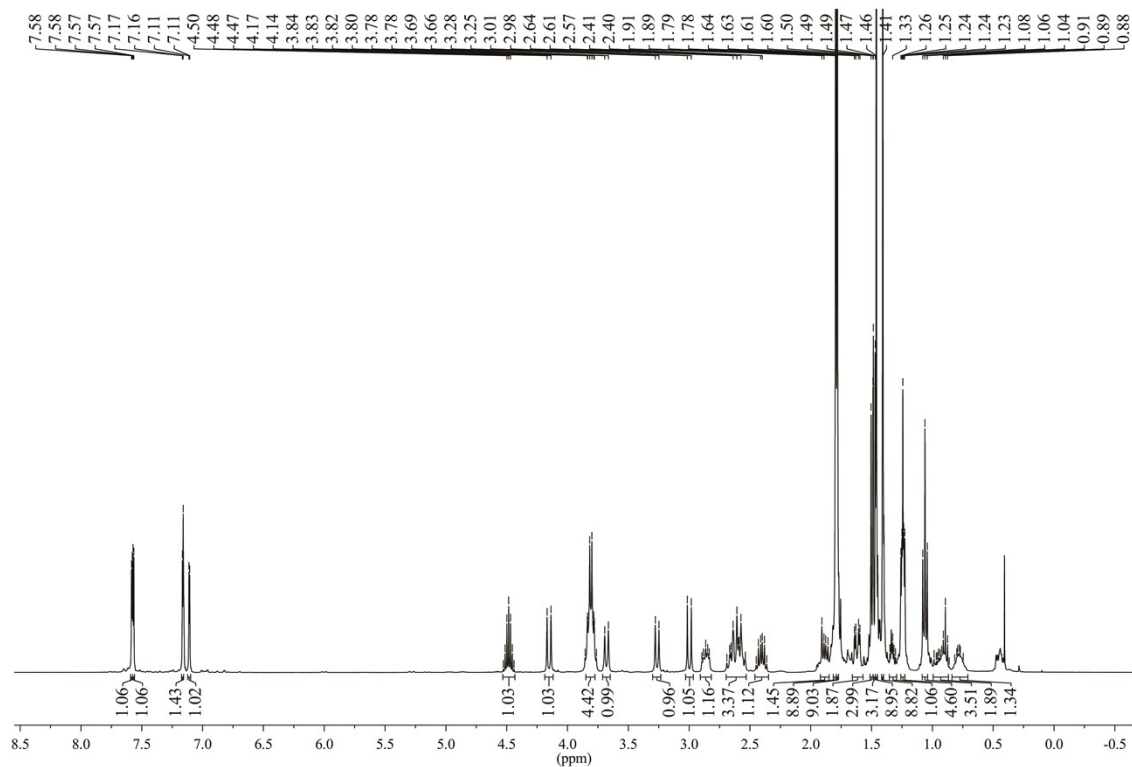


Fig. S9 ^1H NMR spectrum of complex $[\text{L}^1\text{Y}(\text{O}^i\text{Pr})(\text{THF})]$ (**1**) in C_6D_6 at 298 K.

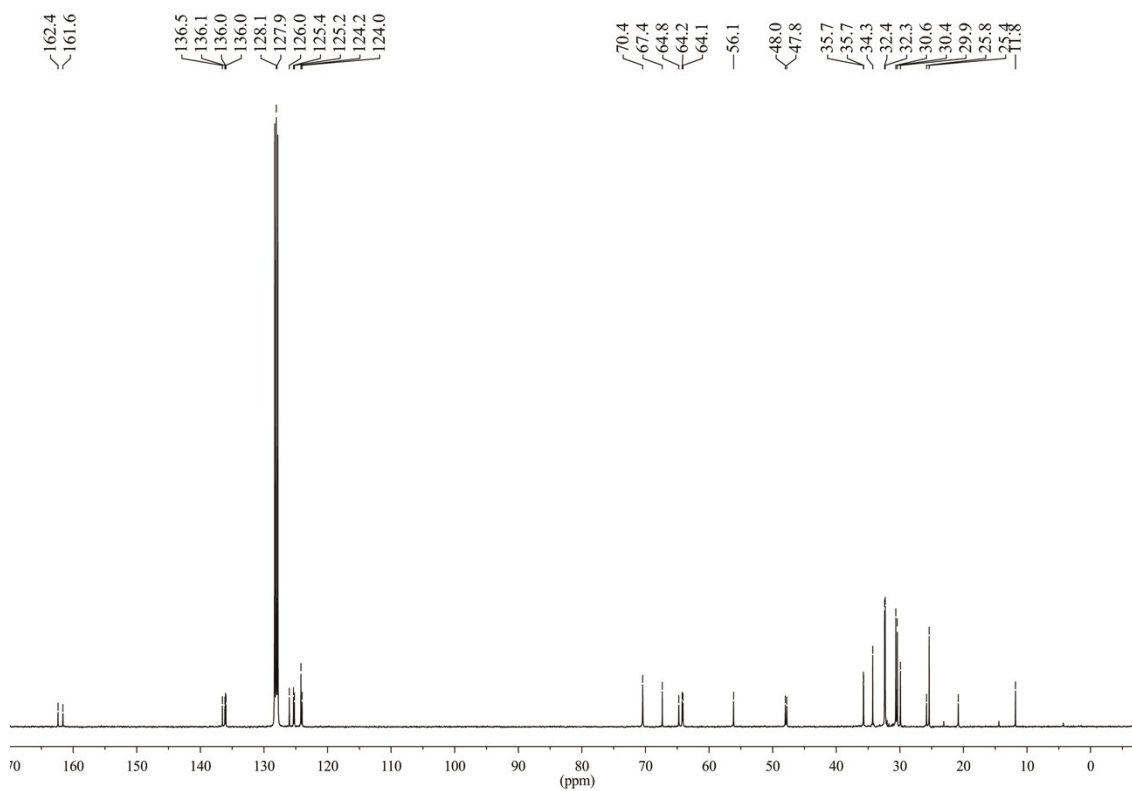


Fig. S10 ^{13}C NMR spectrum of complex $[\text{L}^1\text{Y}(\text{O}^i\text{Pr})(\text{THF})]$ (**1**) in C_6D_6 at 298 K.

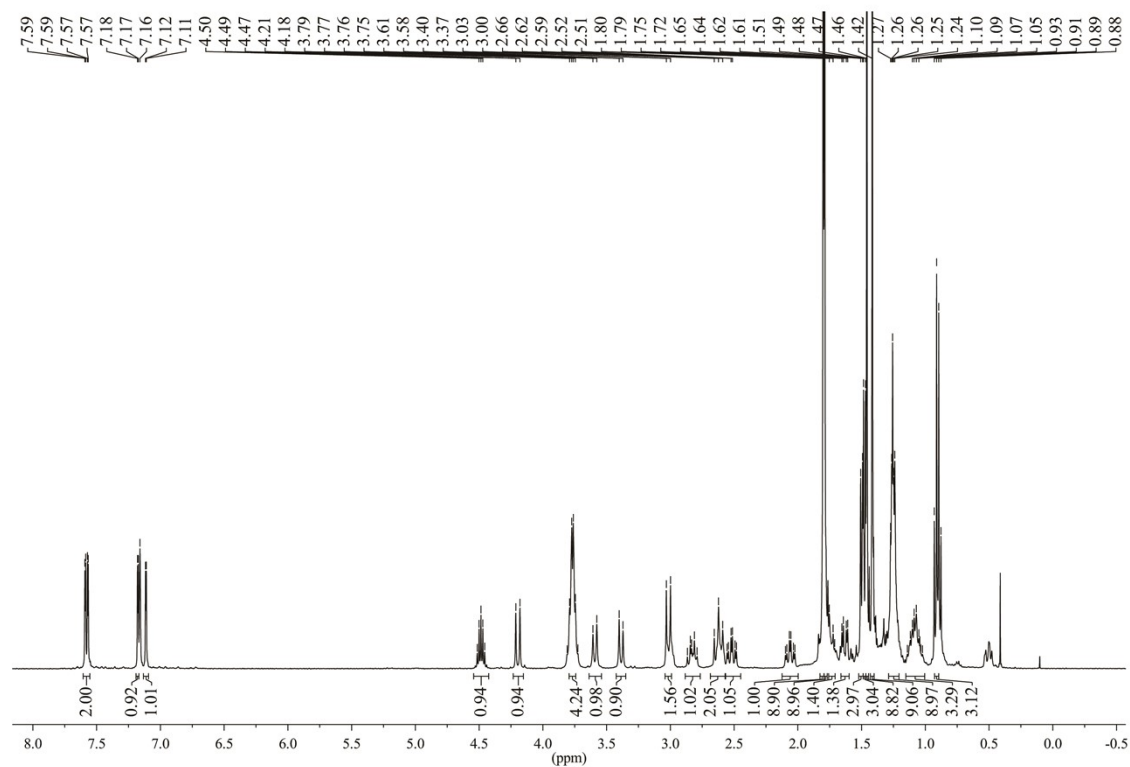


Fig. S11 ^1H NMR spectrum of complex $[\text{L}^2\text{Y}(\text{O}^i\text{Pr})(\text{THF})]$ (**4**) in C_6D_6 at 298 K.

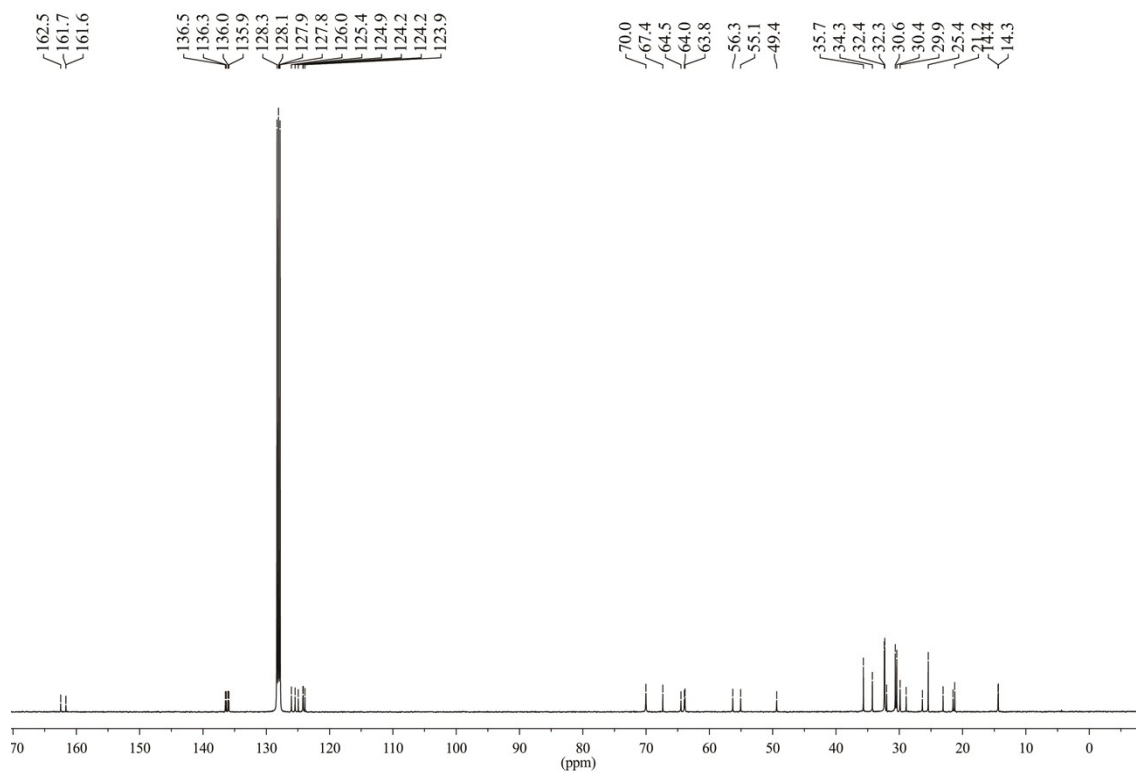


Fig. S12 ^{13}C NMR spectrum of complex $[\text{L}^2\text{Y}(\text{O}^i\text{Pr})(\text{THF})]$ (**4**) in C_6D_6 at 298 K.

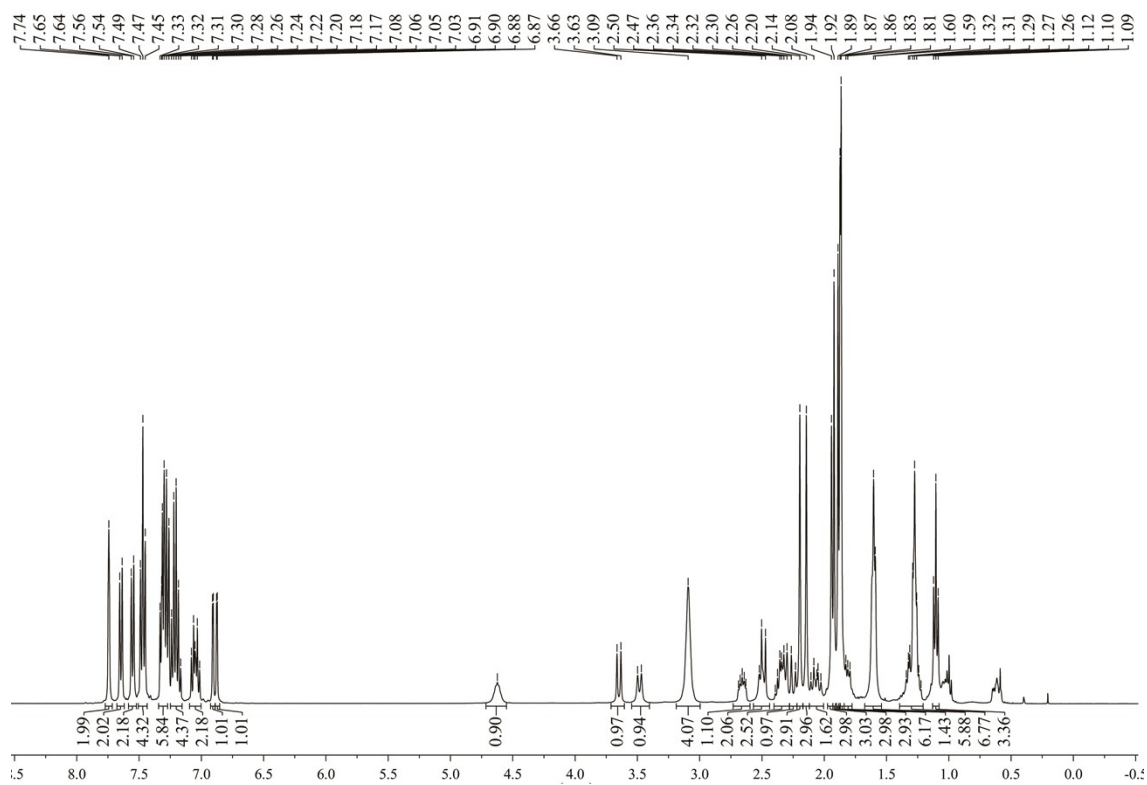


Fig. S13 ^1H NMR spectrum of complex $[\text{L}^3\text{Y}(\text{O}^i\text{Pr})(\text{THF})]$ (**5**) in C_6D_6 at 298 K.

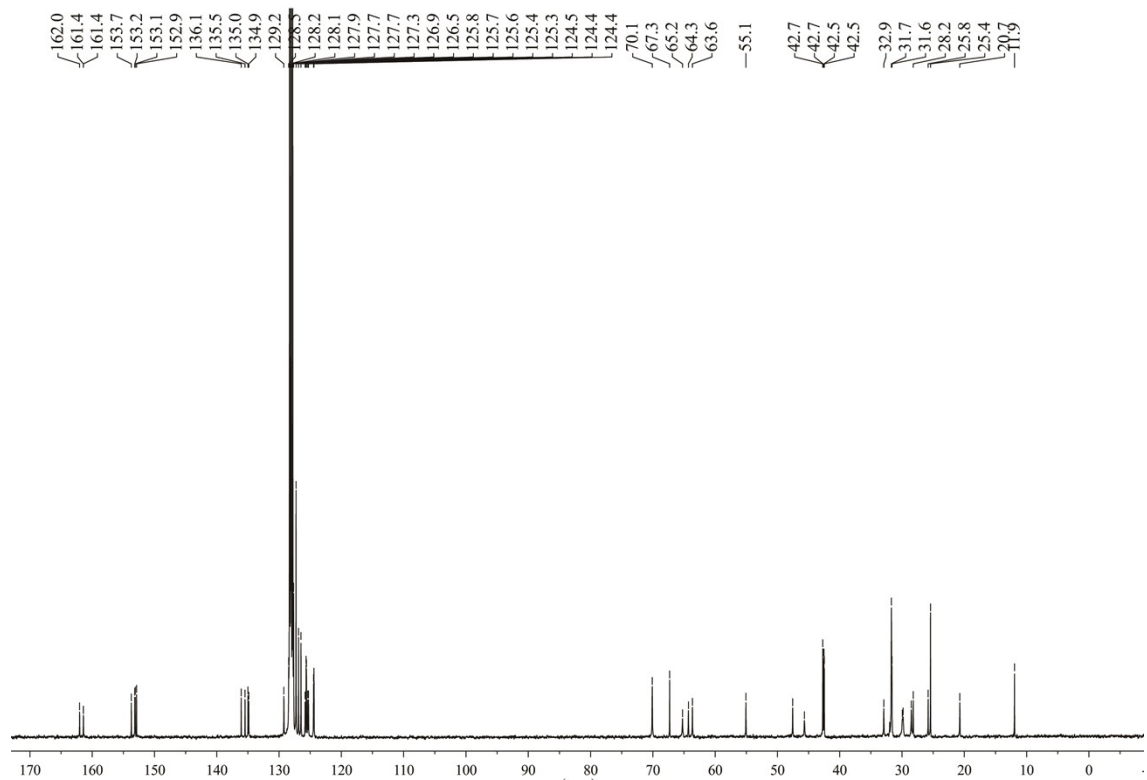


Fig. S14 ^{13}C NMR spectrum of complex $[\text{L}^3\text{Y}(\text{O}^i\text{Pr})(\text{THF})]$ (**5**) in C_6D_6 at 298 K.

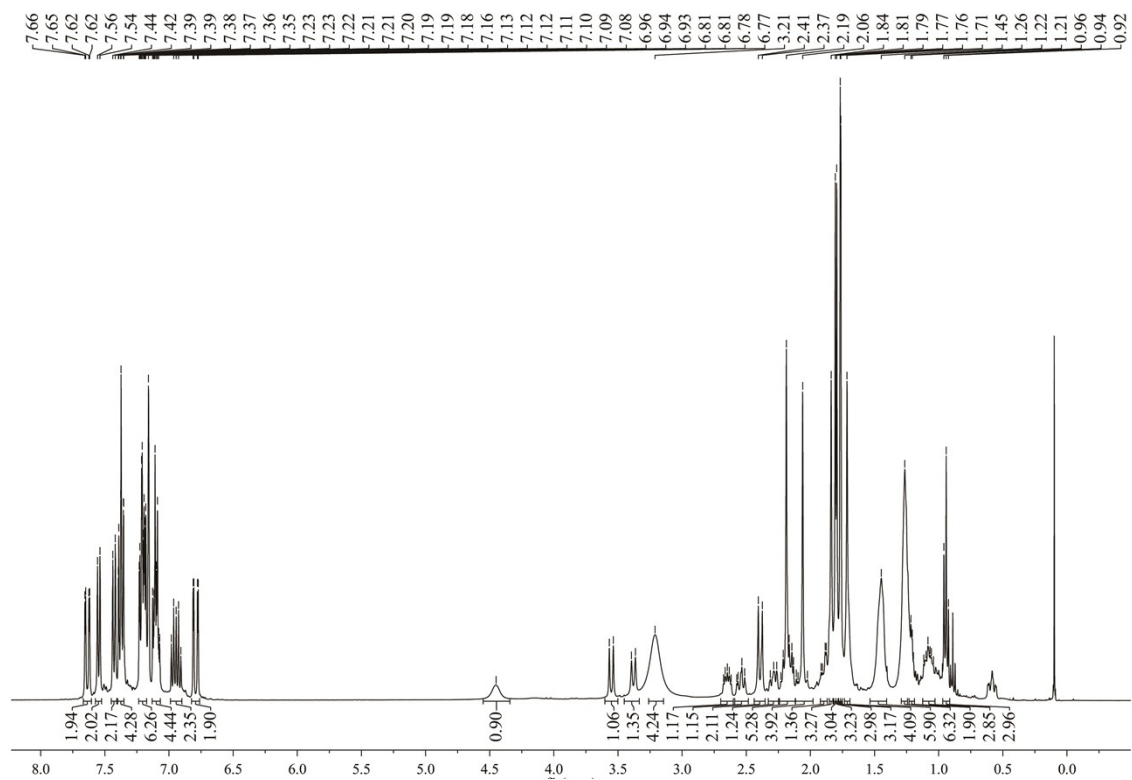


Fig. S15 ^1H NMR spectrum of complex $[\text{L}^4\text{Y}(\text{O}^i\text{Pr})(\text{THF})]$ (6) in C_6D_6 at 298 K.

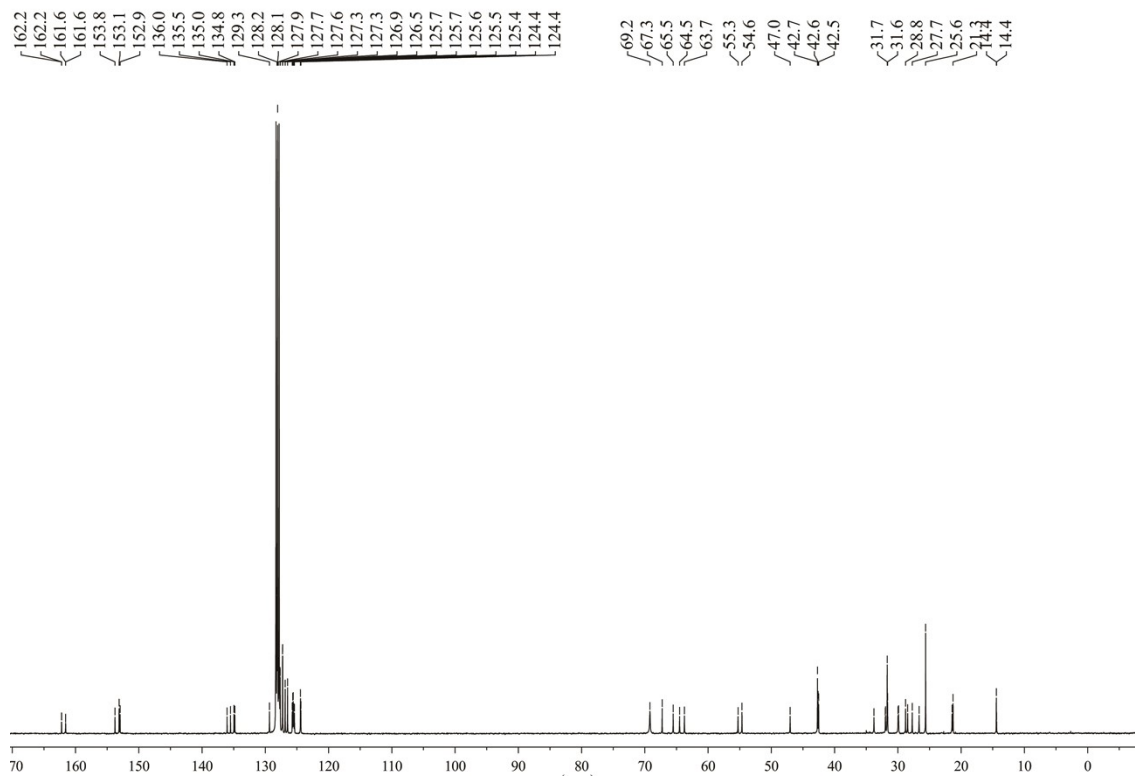


Fig. S16 ^{13}C NMR spectrum of complex $[\text{L}^4\text{Y}(\text{O}^i\text{Pr})(\text{THF})]$ (6) in C_6D_6 at 298 K.

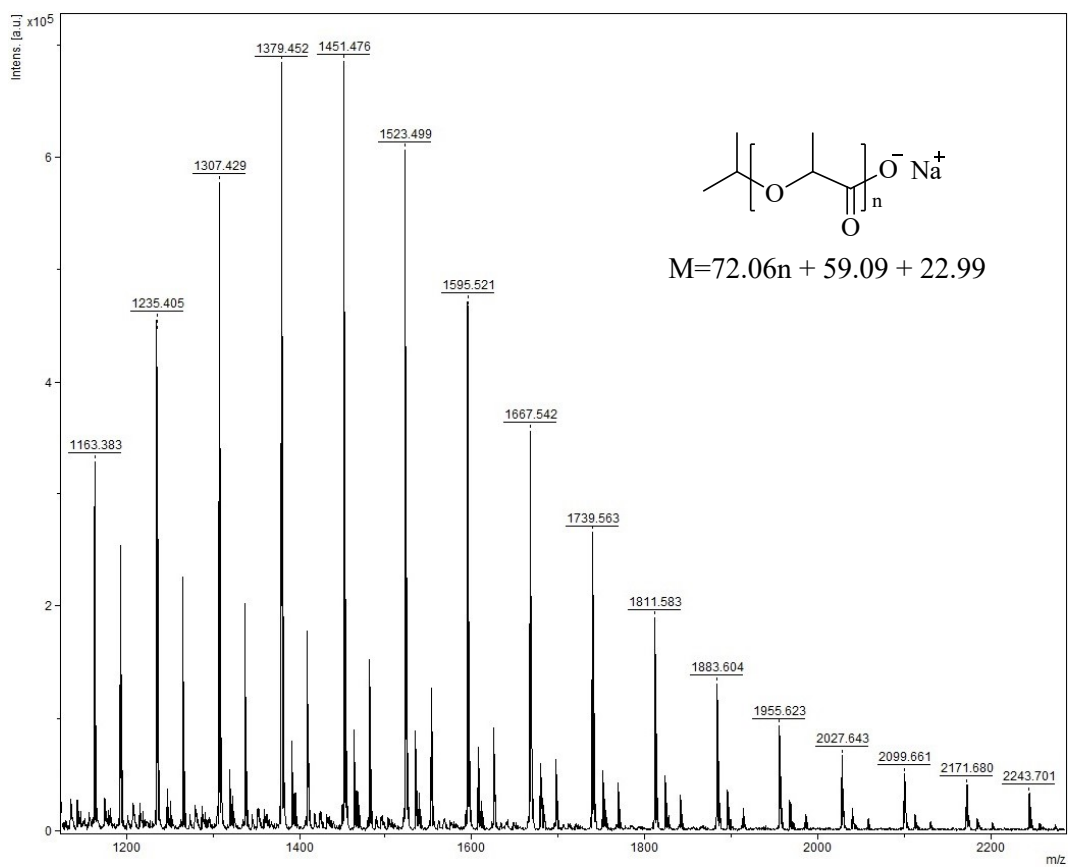


Fig. S17 MALDI-TOF spectrum of oligomer of *rac*-lactide prepared by complex **1**.