Supporting Information

Selective functionalization of 6-amino-6-methyl-1,4-perhydrodiazepine for the synthesis of a library of polydentate chelators

Jonathan Martinelli,* Davide Remotti and Lorenzo Tei

Department of Science and Technological Innovation, Università del Piemonte Orientale, Viale Michel 11, 15121 Alessandria, Italy

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1. HPLC methods and chromatograms

L1

Semi-preparative HPLC gradient conditions:

Solvent A: H_2O TFA 0.1%; Solvent B: MeOH TFA 0.1%; Flow: 20 ml/min; t_R = 3.6 min

Time (min)	Solvent A (%)	Solvent B (%)
0	60	40
2,00	60	40
7,00	39	61
8,00	0	100
11,00	0	100

Analytical HPLC gradient conditions:

Solvent A: H_2O TFA 0.1%; Solvent B: MeOH TFA 0.1%; Flow: 1 ml/min; t_R = 14.2 min

Time (min)	Solvent A (%)	Solvent B (%)
0	70	30
2,00	70	30
16,00	0	100
19,00	0	100

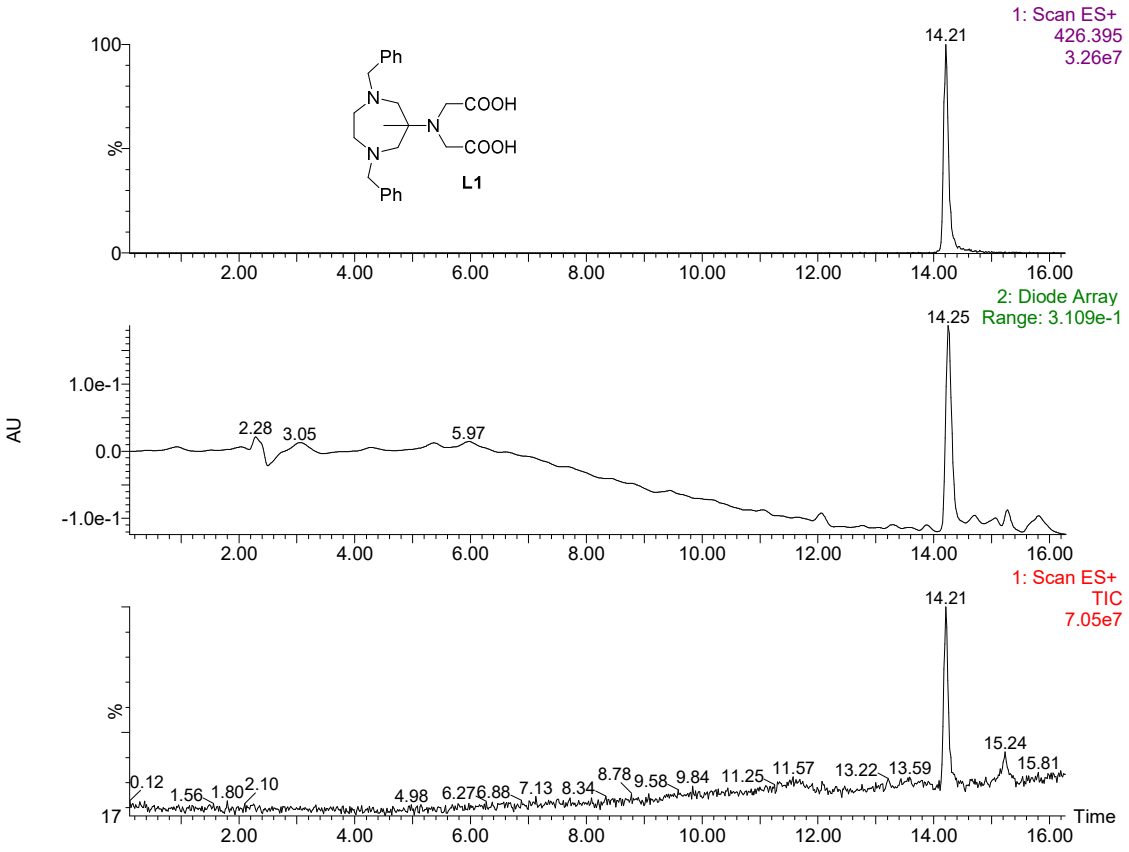

Figure S1. ESI^+ MS (*bottom*) and UV (254 nm, *middle*) HPLC chromatograms of ligand **L1**.

L2

Analytical HPLC gradient conditions:

Solvent A: H_2O TFA 0.1%; Solvent B: MeOH TFA 0.1%; Flow: 1 ml/min; t_R = 10.1 min

Time (min)	Solvent A (%)	Solvent B (%)
0	90	10
2,00	90	10
16,00	0	100
19,00	0	100

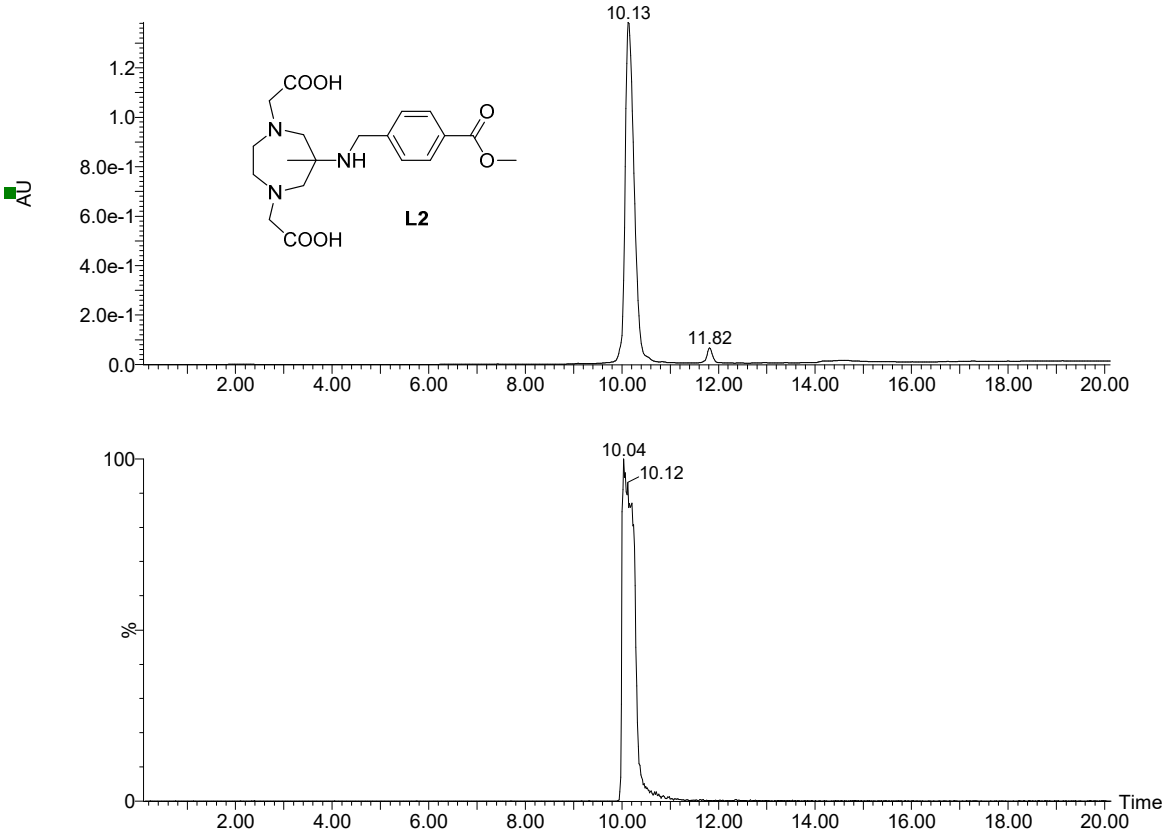

Figure S2. ESI^+ MS (*bottom*) and UV (254 nm, *top*) HPLC chromatograms of ligand **L2**.

L3

Analytical HPLC gradient conditions:

Solvent A: H_2O TFA 0.1%; Solvent B: MeOH TFA 0.1%; Flow: 1 ml/min; t_R = 12.3 min

Time (min)	Solvent A (%)	Solvent B (%)
0	90	10
2,00	90	10
16,00	0	100
19,00	0	100

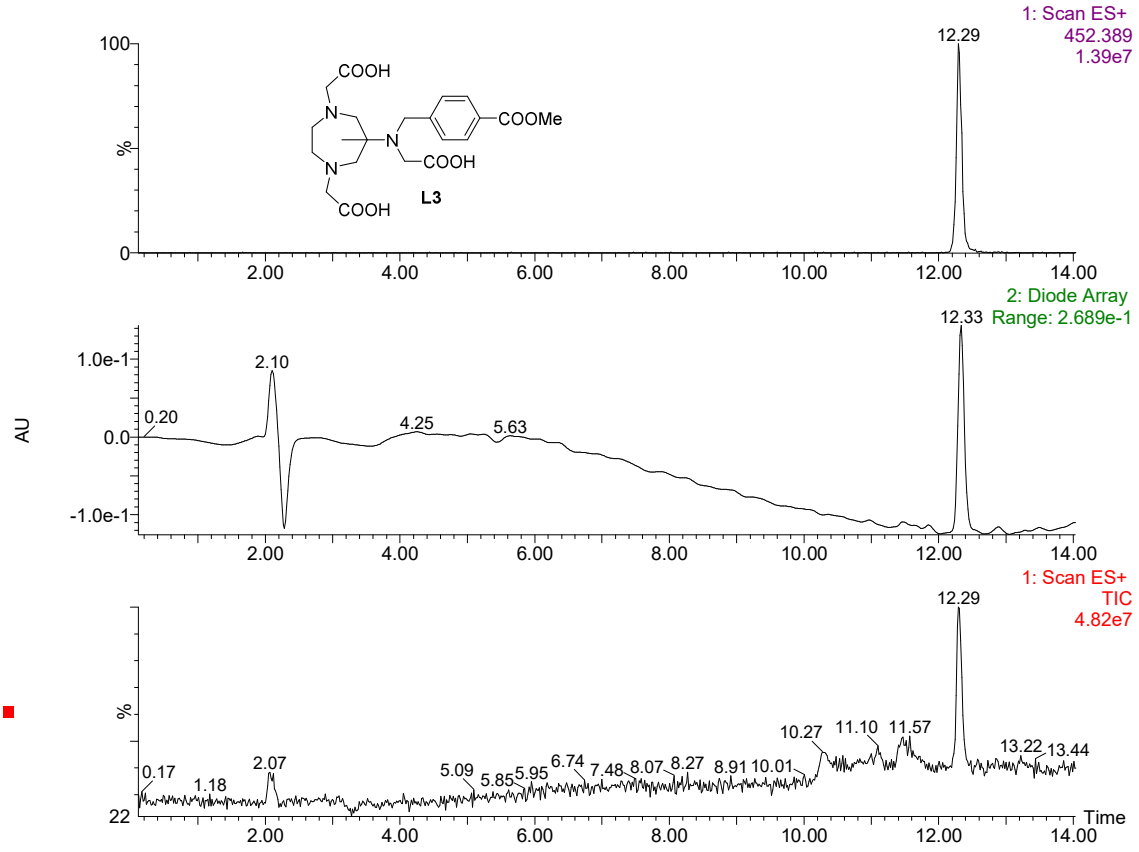

Figure S3. ESI^+ MS (*bottom*) and UV (254 nm, *middle*) HPLC chromatograms of ligand **L3**.

L4

Analytical HPLC gradient conditions:

Solvent A: H_2O TFA 0.1%; Solvent B: MeOH TFA 0.1%; Flow: 1 ml/min; t_R = 2.0 min

Time (min)	Solvent A (%)	Solvent B (%)
0	99	1
2,00	99	1
10,00	0	100
13,00	0	100

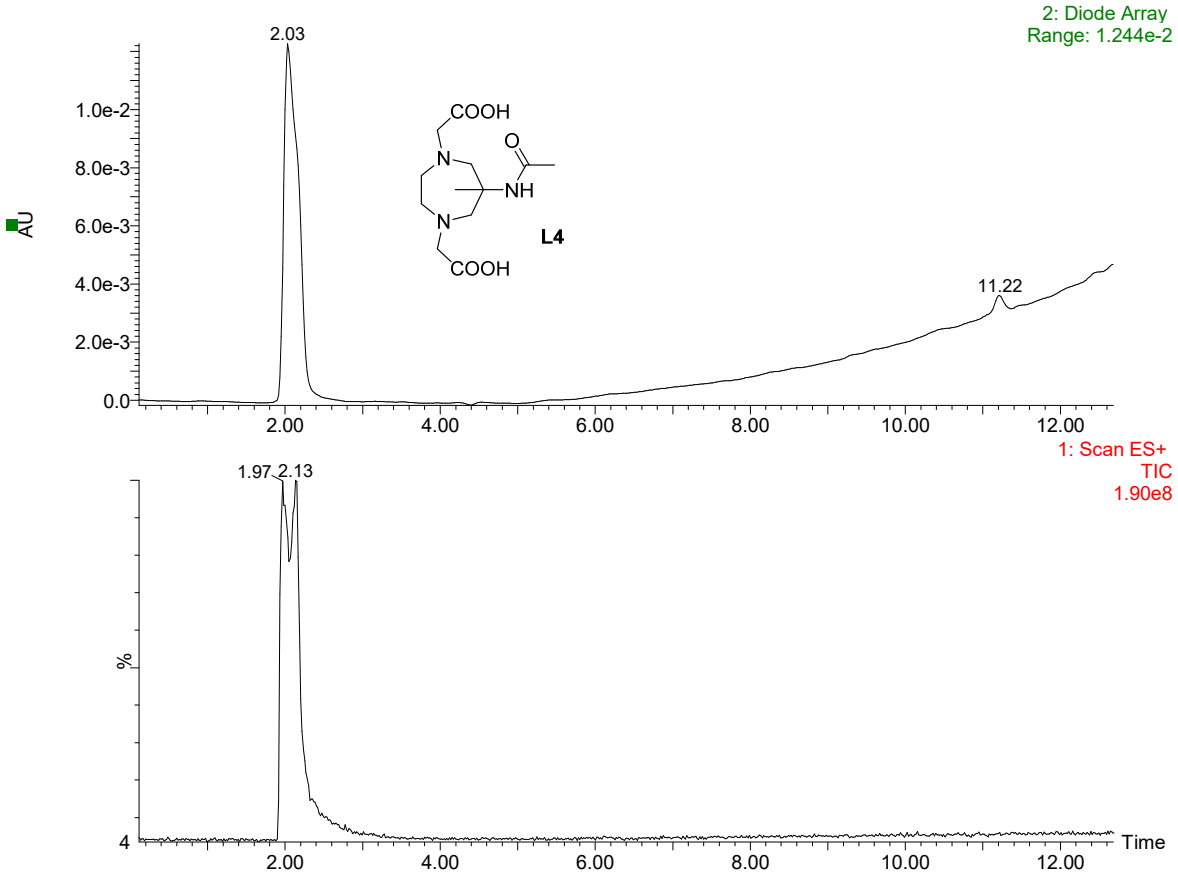

Figure S4. ESI^+ MS (*bottom*) and UV (254 nm, *top*) HPLC chromatograms of ligand **L4**.

L5

Semi-preparative HPLC gradient conditions:

Solvent A: H_2O TFA 0.1%; Solvent B: MeOH TFA 0.1%; Flow: 20 ml/min; t_R = 6.0 min

Time (min)	Solvent A (%)	Solvent B (%)
0	95	5
2,00	95	5
10,00	47	53
11,00	0	100
15,00	0	100

Analytical HPLC gradient conditions:

Solvent A: H_2O TFA 0.1%; Solvent B: MeOH TFA 0.1%; Flow: 1 ml/min; t_R = 10.6 min

Time (min)	Solvent A (%)	Solvent B (%)
0	95	5
2,00	95	5
16,00	0	100
19,00	0	100

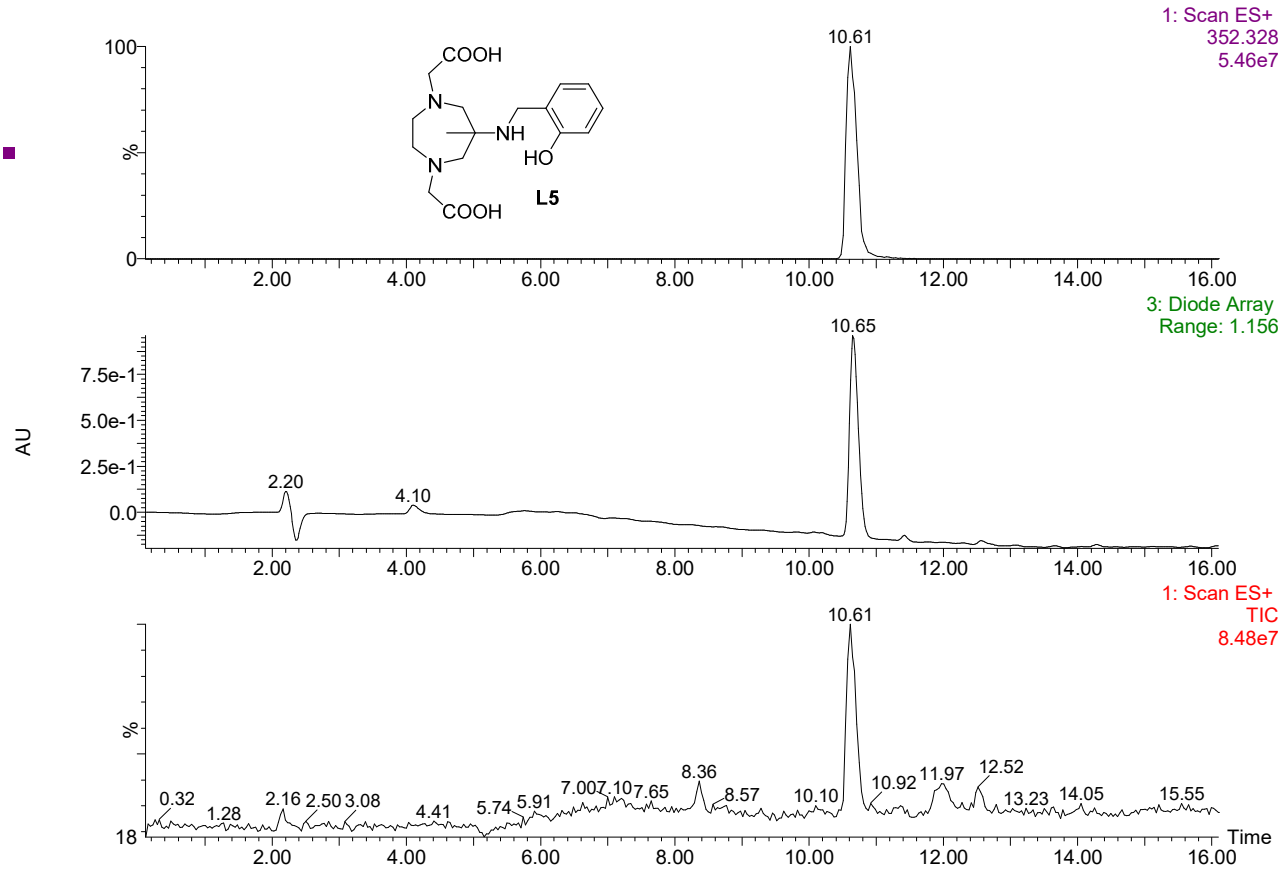

Figure S5. ESI^+ MS (*bottom*) and UV (254 nm, *middle*) HPLC chromatograms of ligand **L5**.

L6

Semi-preparative HPLC gradient conditions:

Solvent A: H_2O TFA 0.1%; Solvent B: MeOH TFA 0.1%; Flow: 20 ml/min; t_R = 6.1 min

Time (min)	Solvent A (%)	Solvent B (%)
0	95	5
2,00	95	5
9,00	53	47
10,00	0	100
13,00	0	100

Analytical HPLC gradient conditions:

Solvent A: H_2O TFA 0.1%; Solvent B: MeOH TFA 0.1%; Flow: 1 ml/min; t_R = 12.2 min

Time (min)	Solvent A (%)	Solvent B (%)
0	99	0
2,00	99	0
16,00	0	100
19,00	0	100

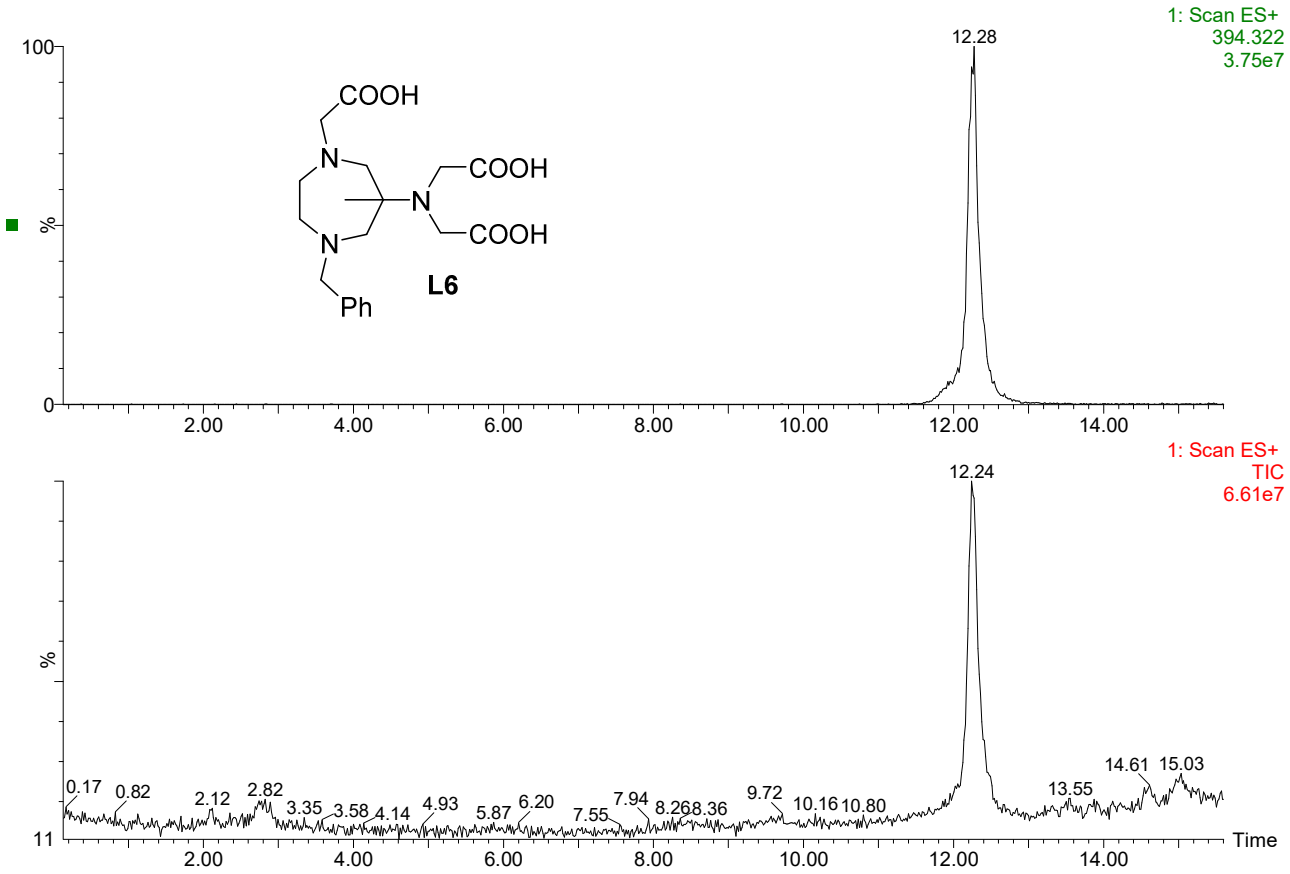

Figure S6. ESI^+ MS (*bottom*) HPLC chromatogram of ligand **L6**.

2. NMR spectra

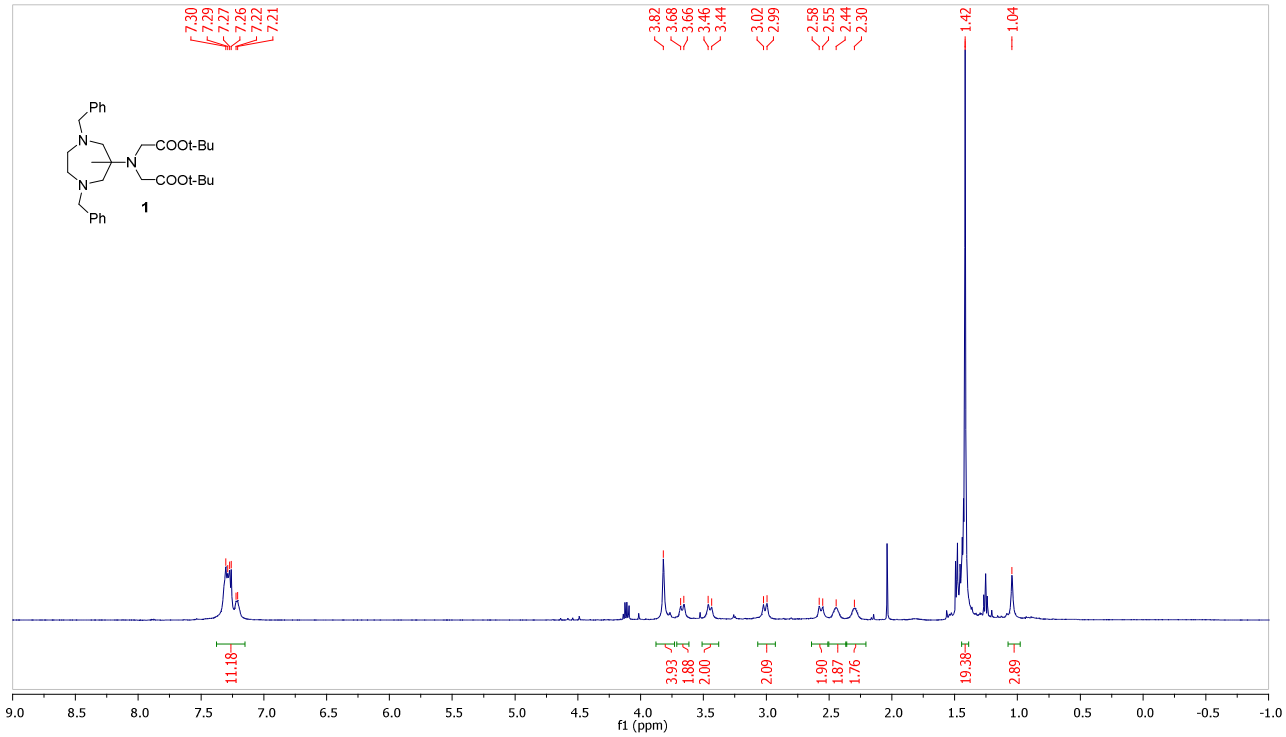

Figure S7. ^{1}H NMR spectrum in $CDCl_3$ of intermediate **1** (resonances from residual solvents are also observable).

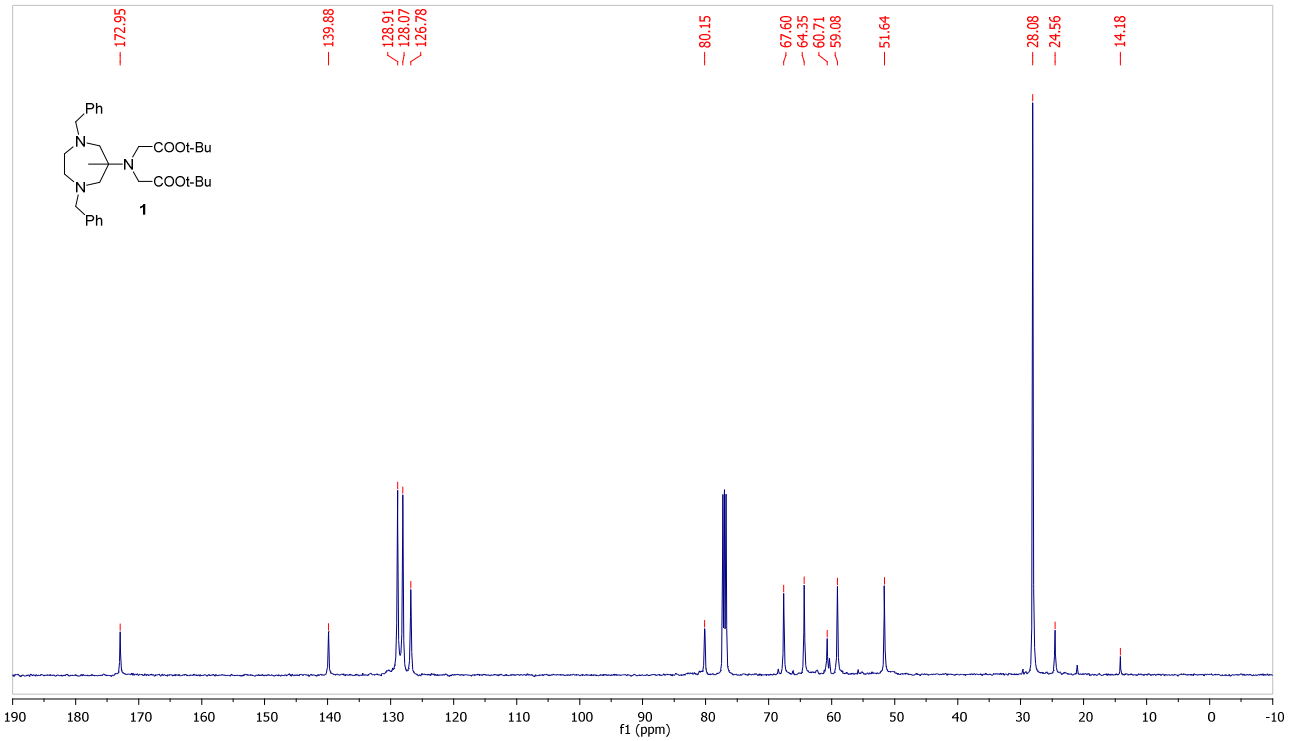

Figure S8. ^{13}C NMR spectrum in $CDCl_3$ of intermediate **1**.

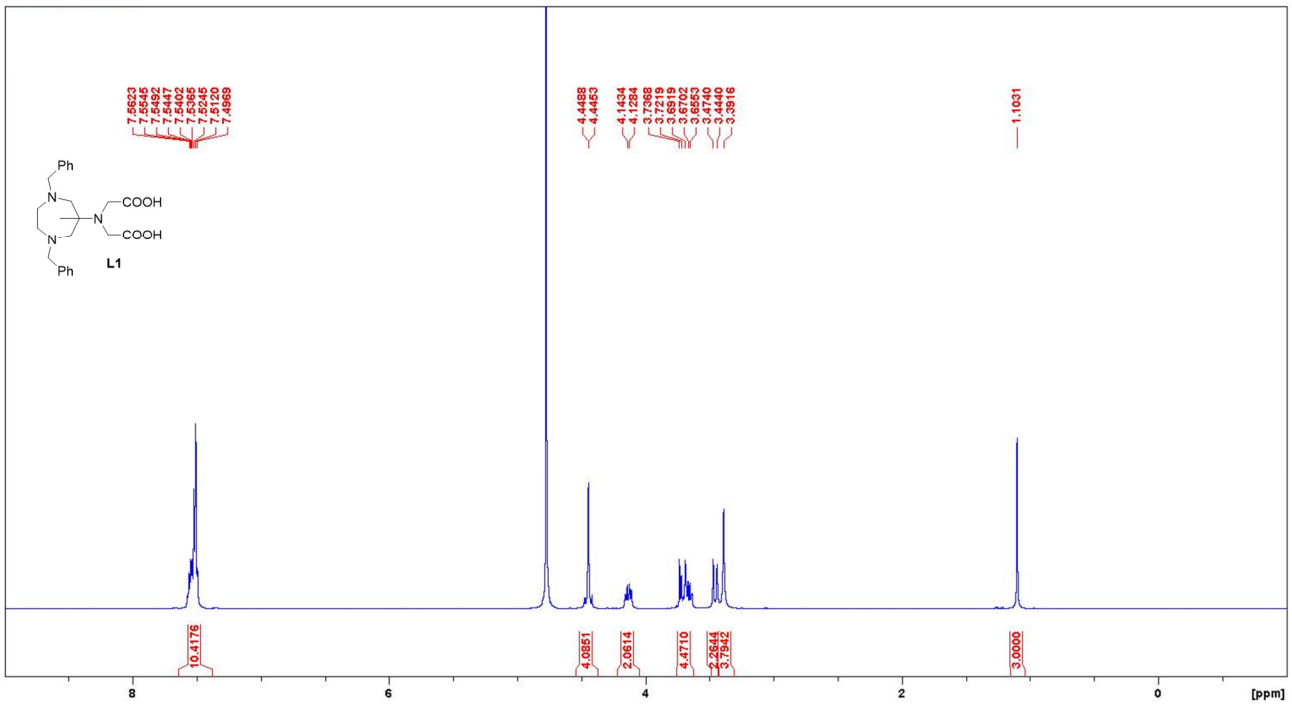

Figure S9. ^{1}H NMR spectrum in D_2O of ligand **L1**.

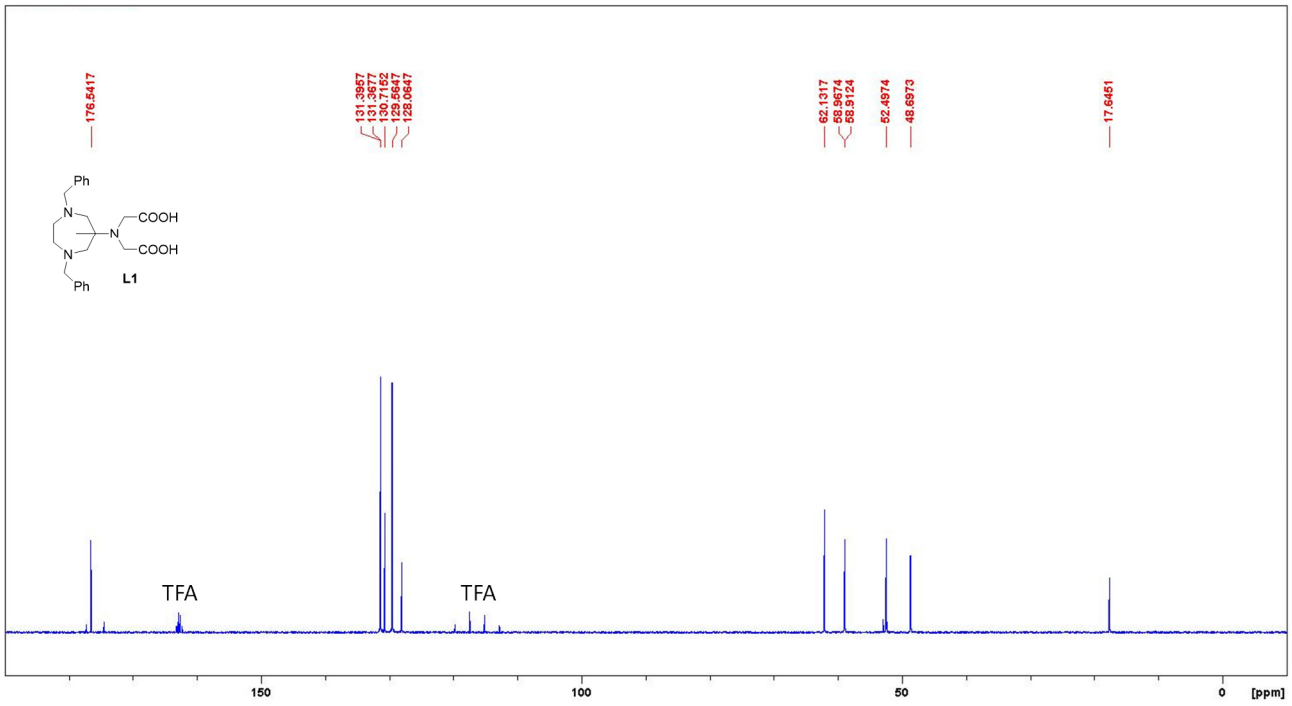

Figure S10. ^{13}C NMR spectrum in D_2O of ligand **L1** (TFA as counterion is also observable).

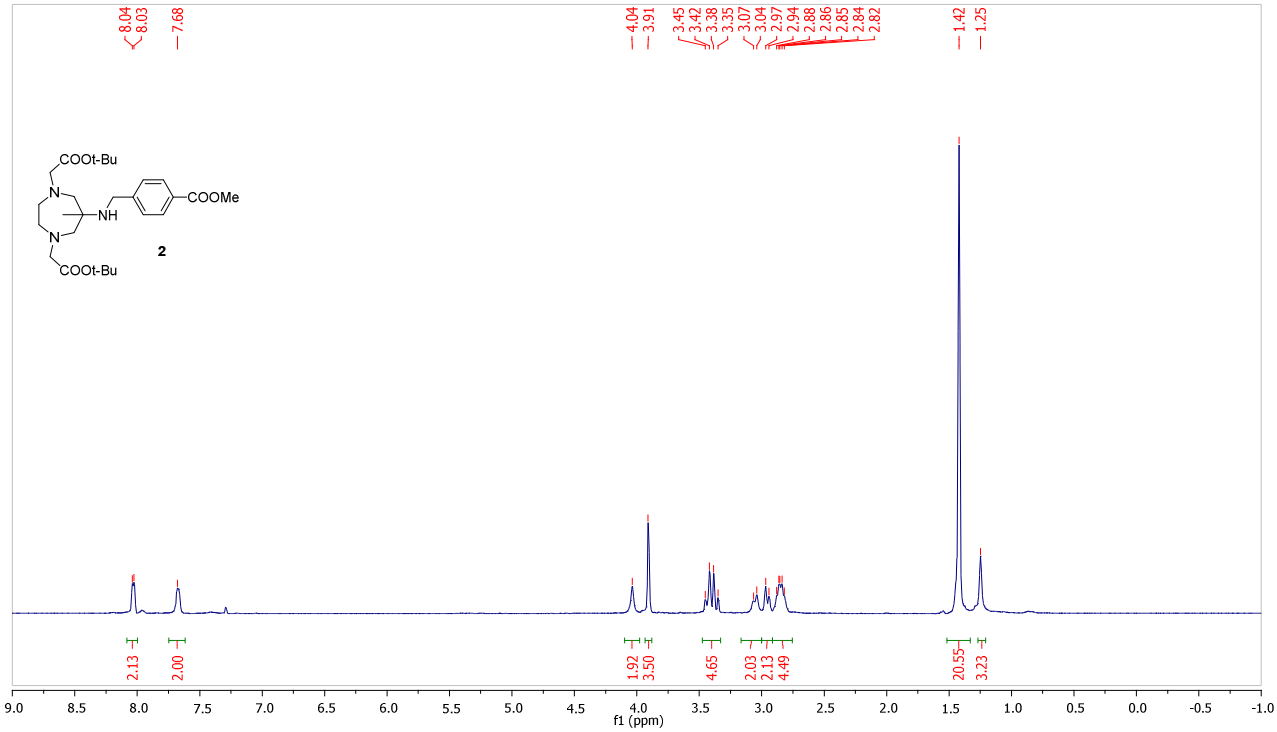

Figure S11. ^{1}H NMR spectrum in $CDCl_3$ of intermediate **2**.

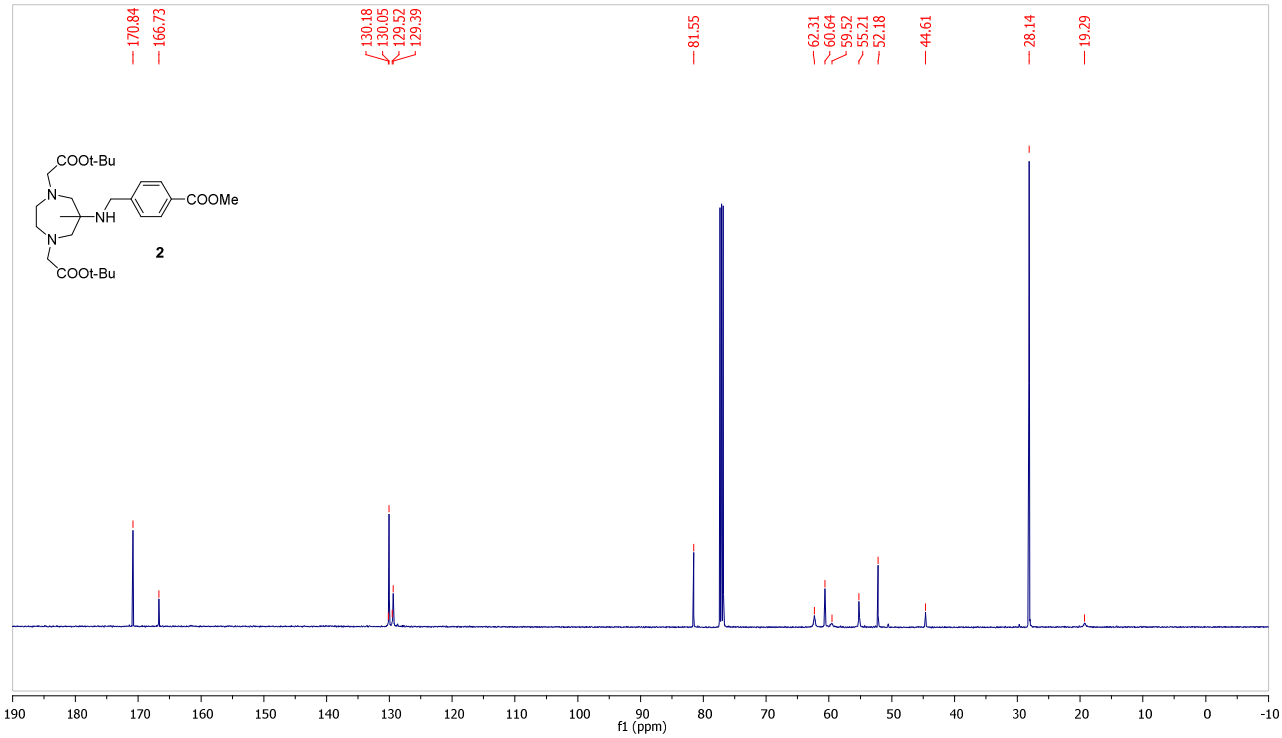

Figure S12. ^{13}C NMR spectrum in $CDCl_3$ of intermediate **2**.

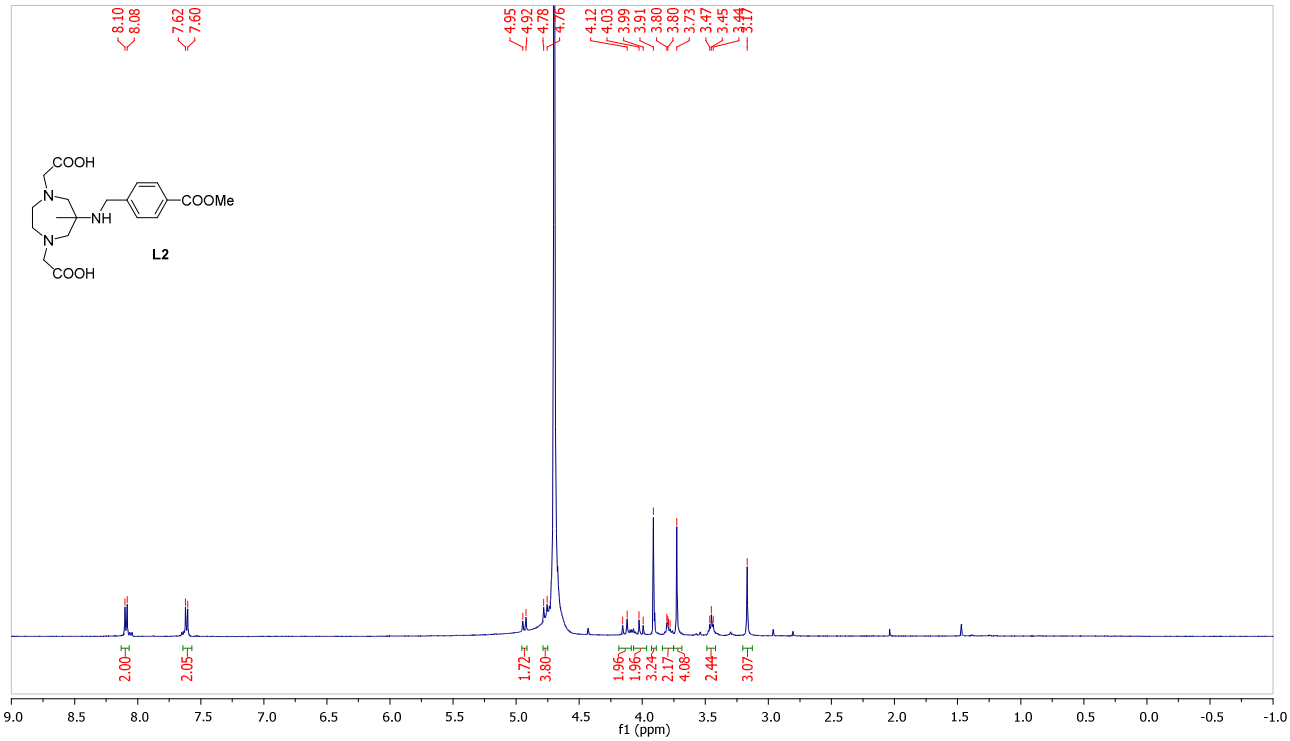

Figure S13. ^{1}H NMR spectrum in D_2O of ligand **L2**.

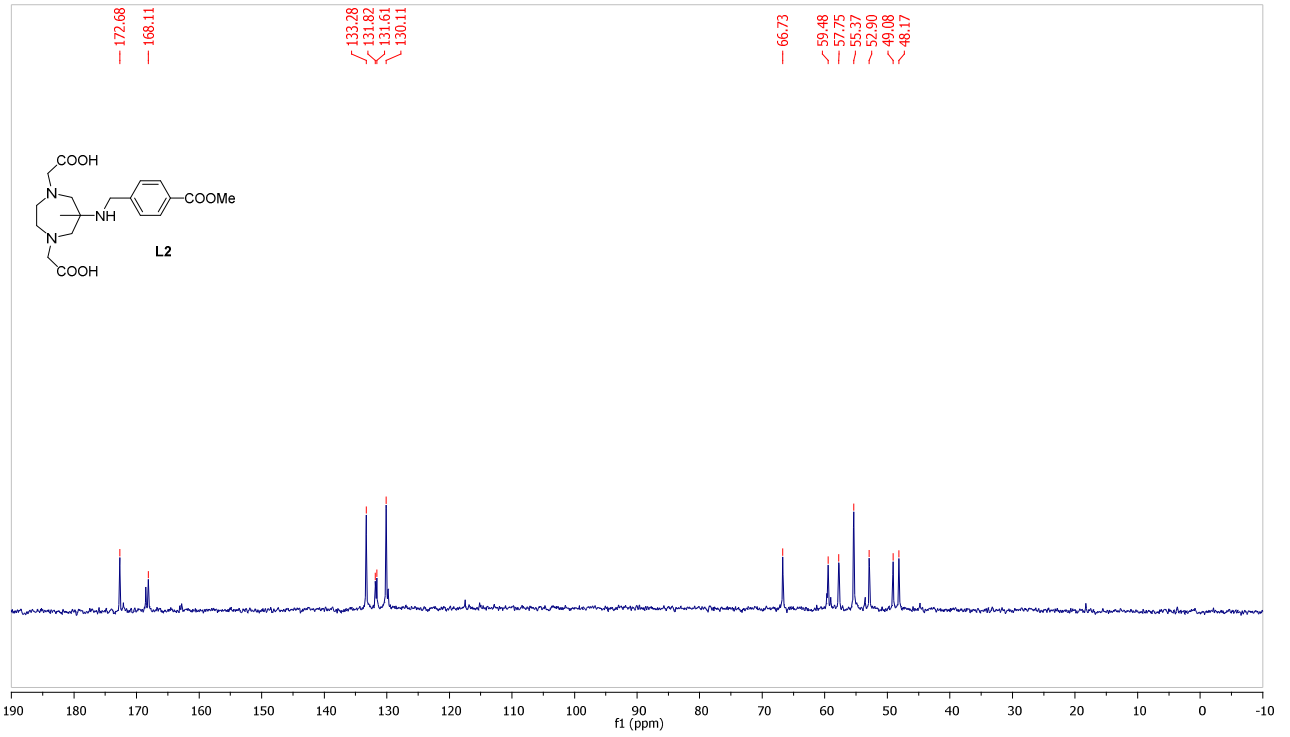

Figure S14. ^{13}C NMR spectrum in D_2O of ligand **L2** (TFA as counterion is also slightly observable).

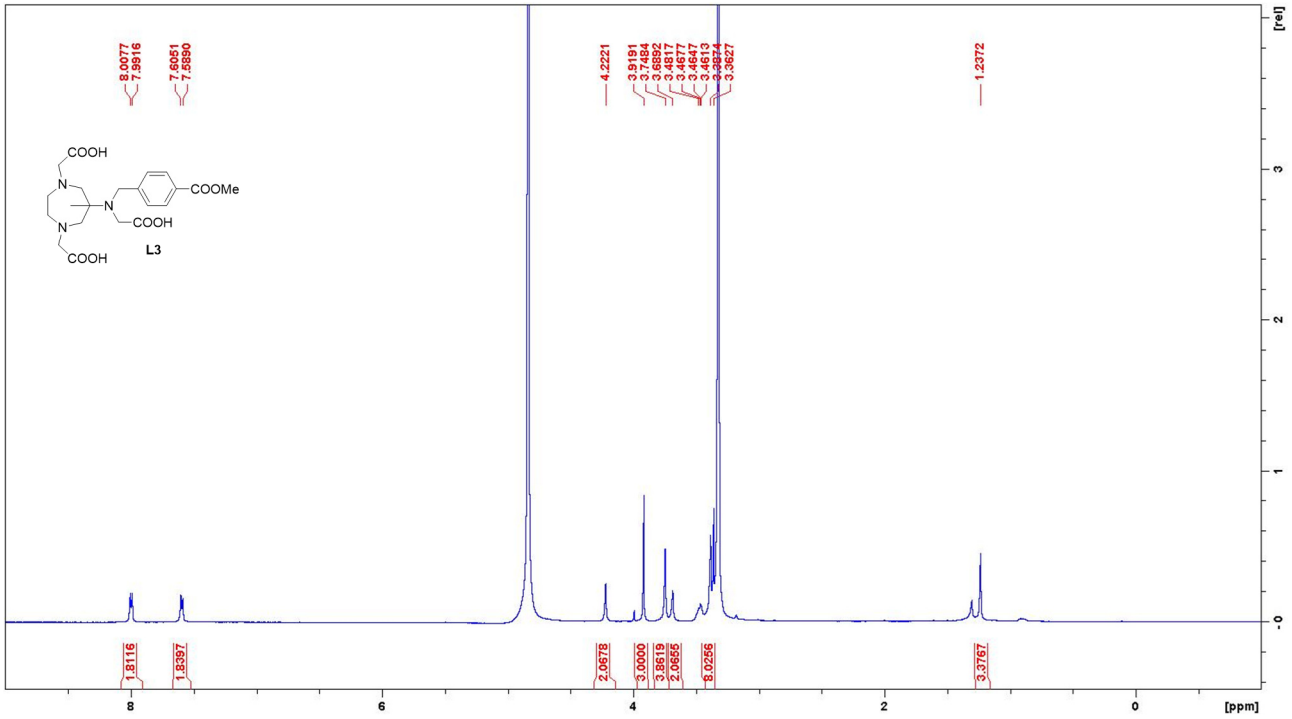

Figure S15. ^{1}H NMR spectrum in CD_3OD of ligand **L3**.

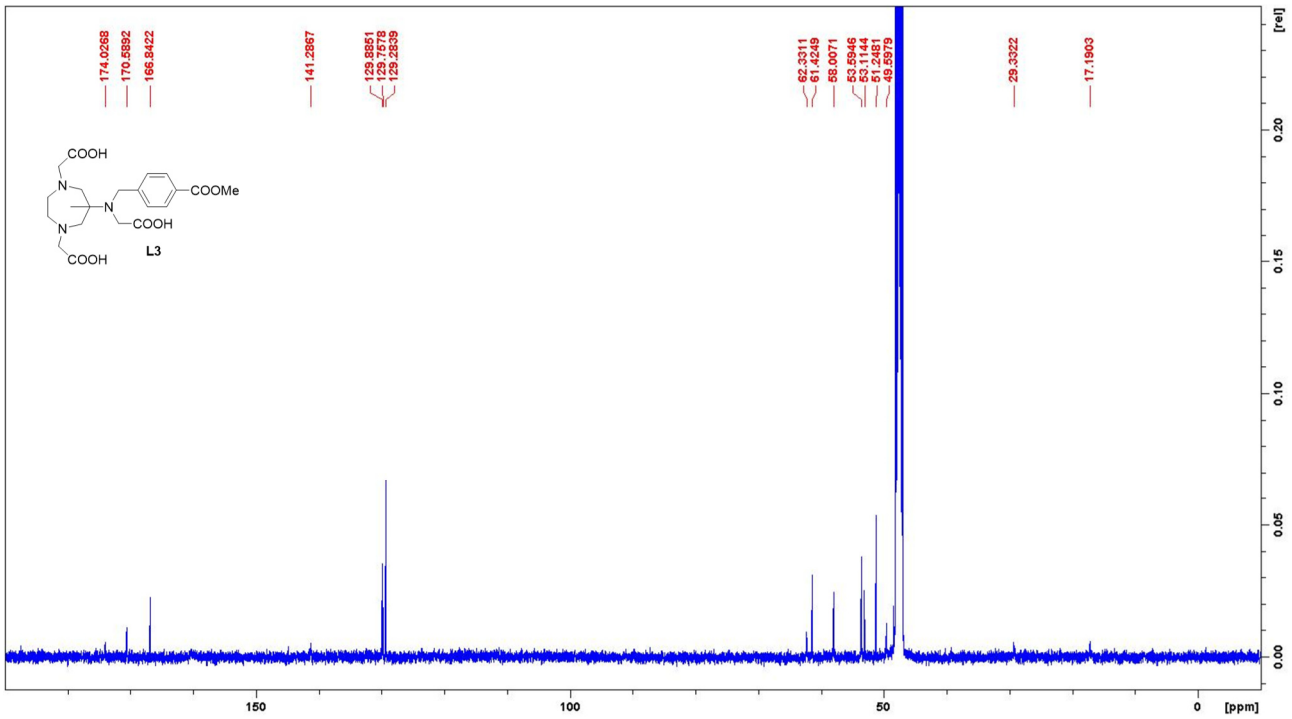

Figure S16. ^{13}C NMR spectrum in CD_3OD of ligand **L3**.

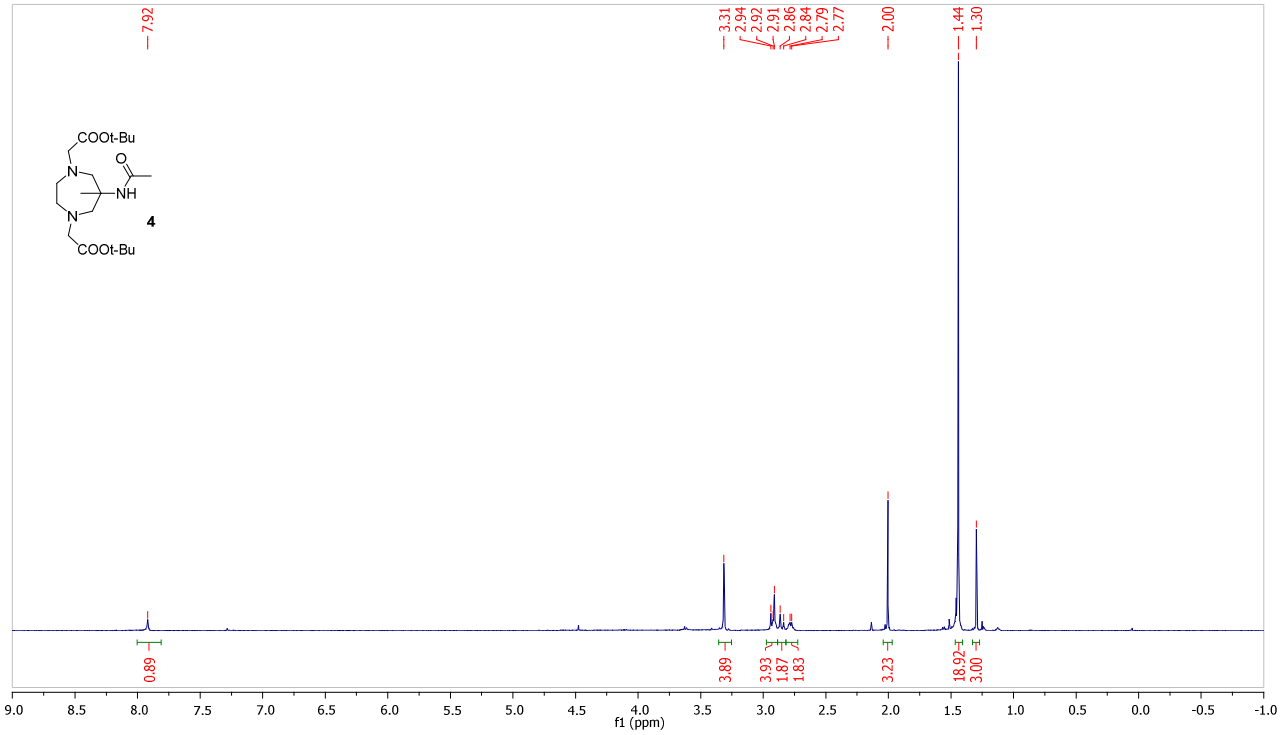

Figure S17. ^{1}H NMR spectrum in $CDCl_3$ of intermediate **4**.

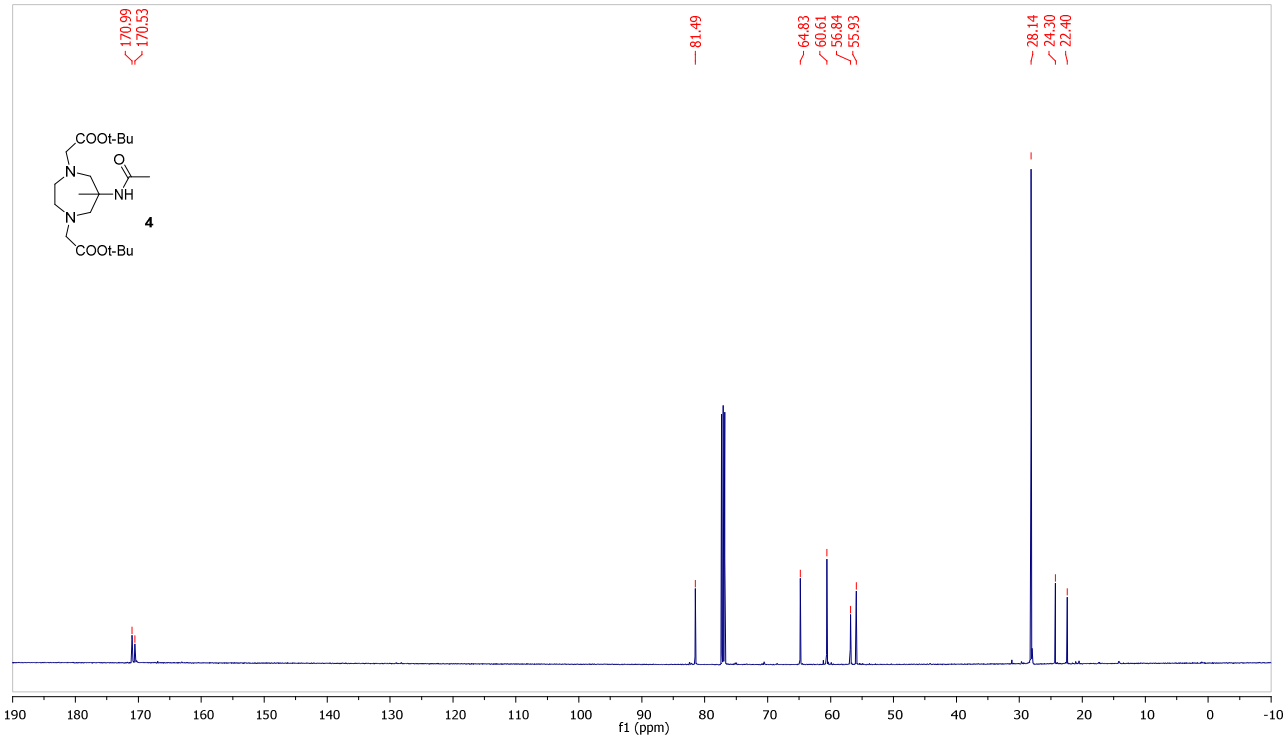

Figure S18. ^{13}C NMR spectrum in $CDCl_3$ of intermediate **4**.

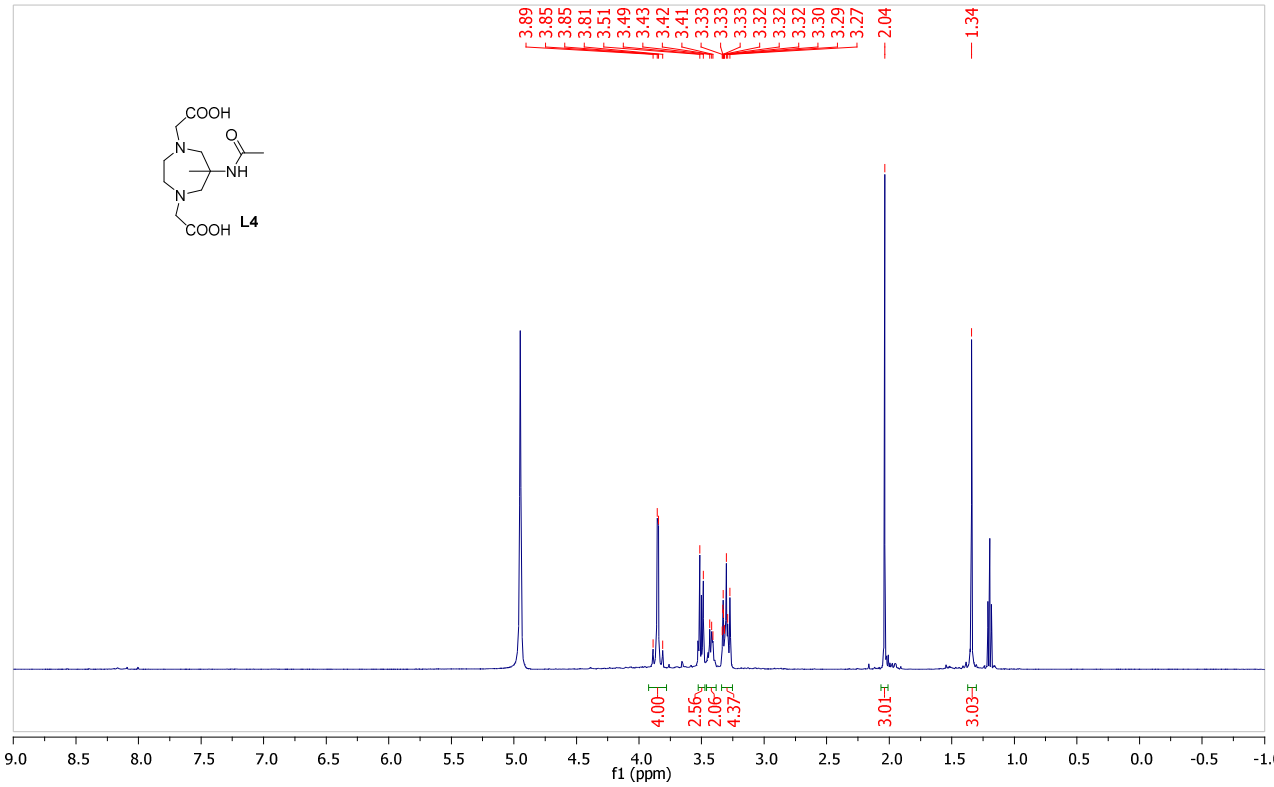

Figure S19. ^{1}H NMR spectrum in CD_3OD of ligand **L4** (residual Et_2O from precipitation is also observable).

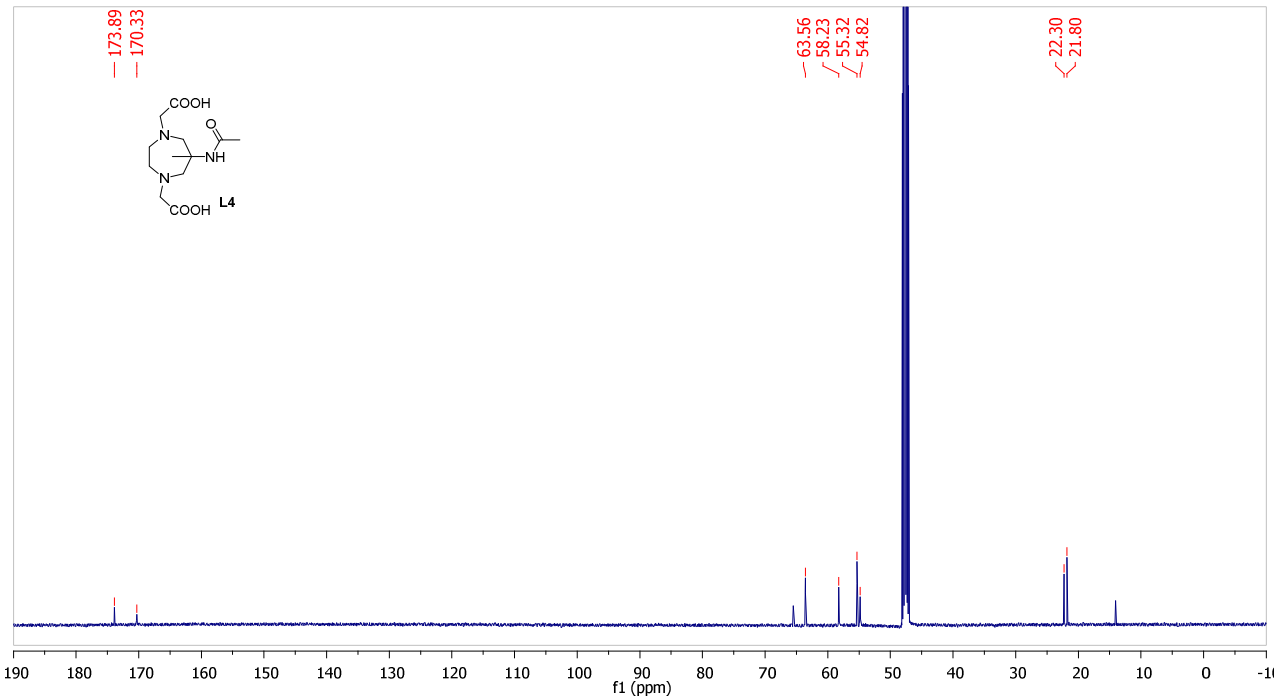

Figure S20. ^{13}C NMR spectrum in CD_3OD of ligand **L4** (residual Et_2O from precipitation is also observable).

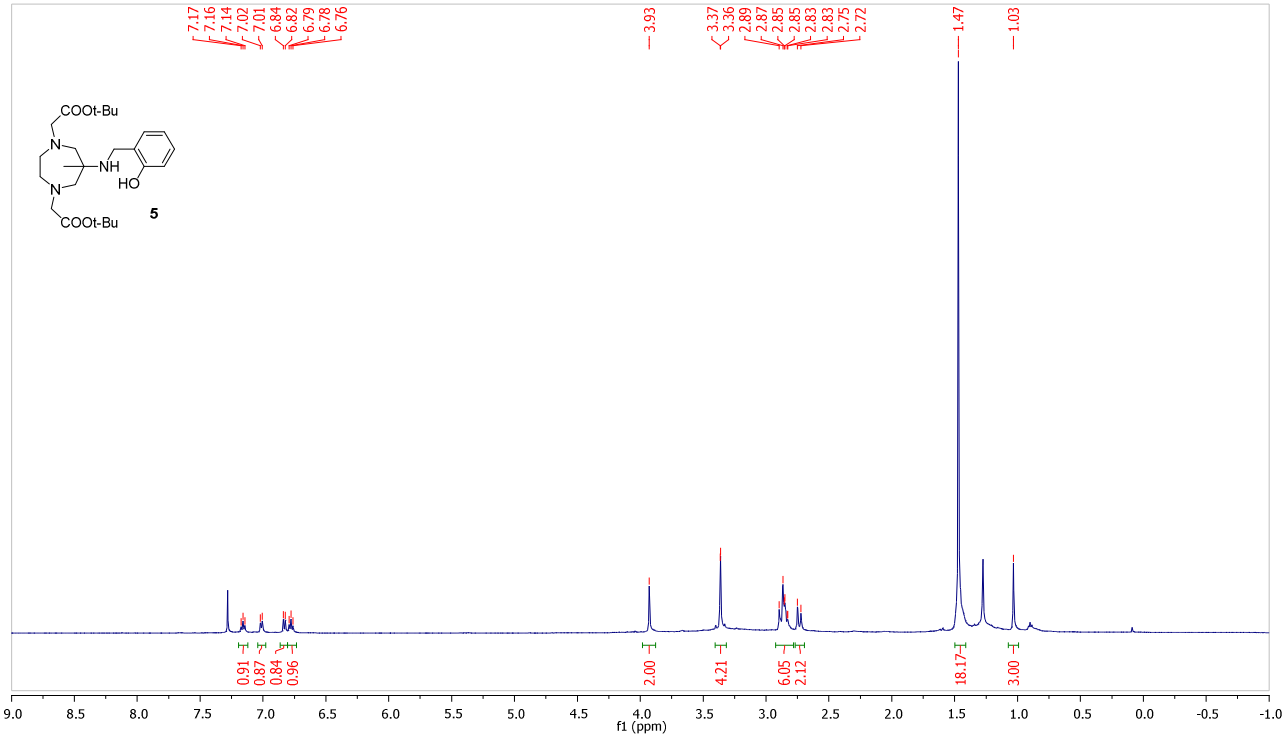

Figure S21. ^{1}H NMR spectrum in $CDCl_3$ of intermediate **5**.

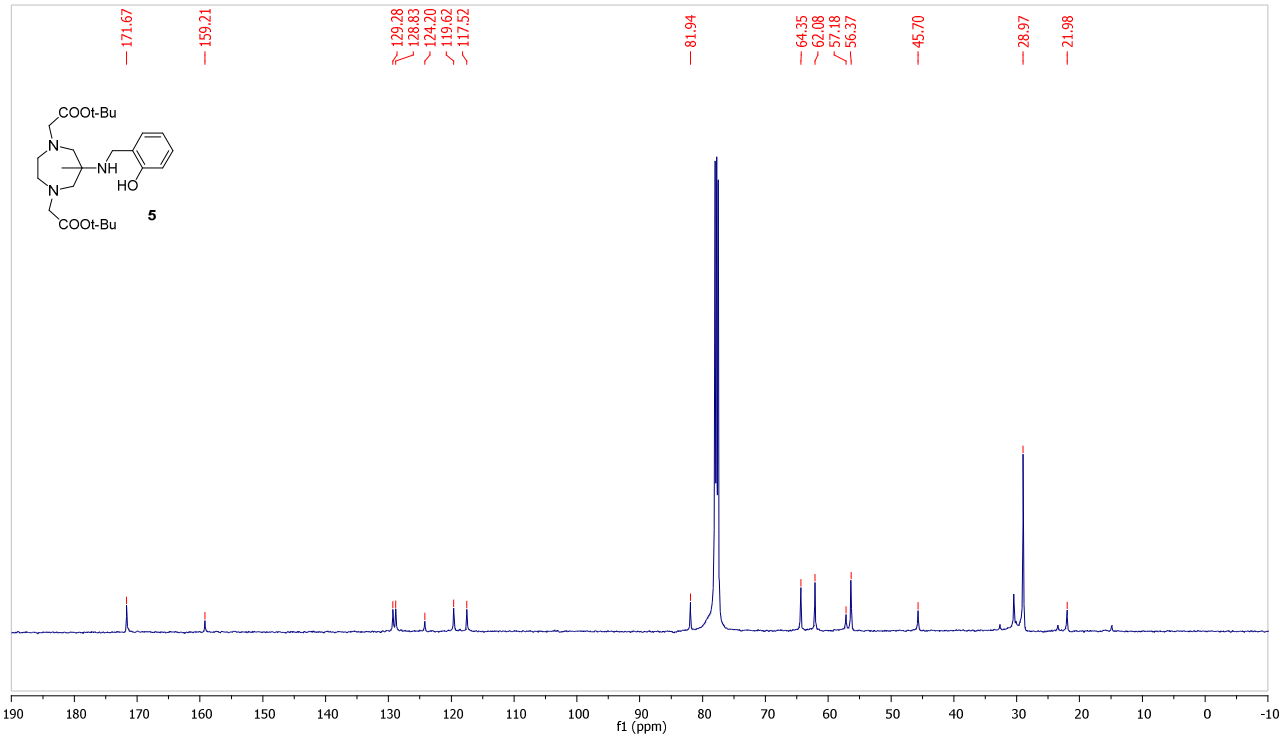

Figure S22. ^{13}C NMR spectrum in $CDCl_3$ of intermediate **5**.

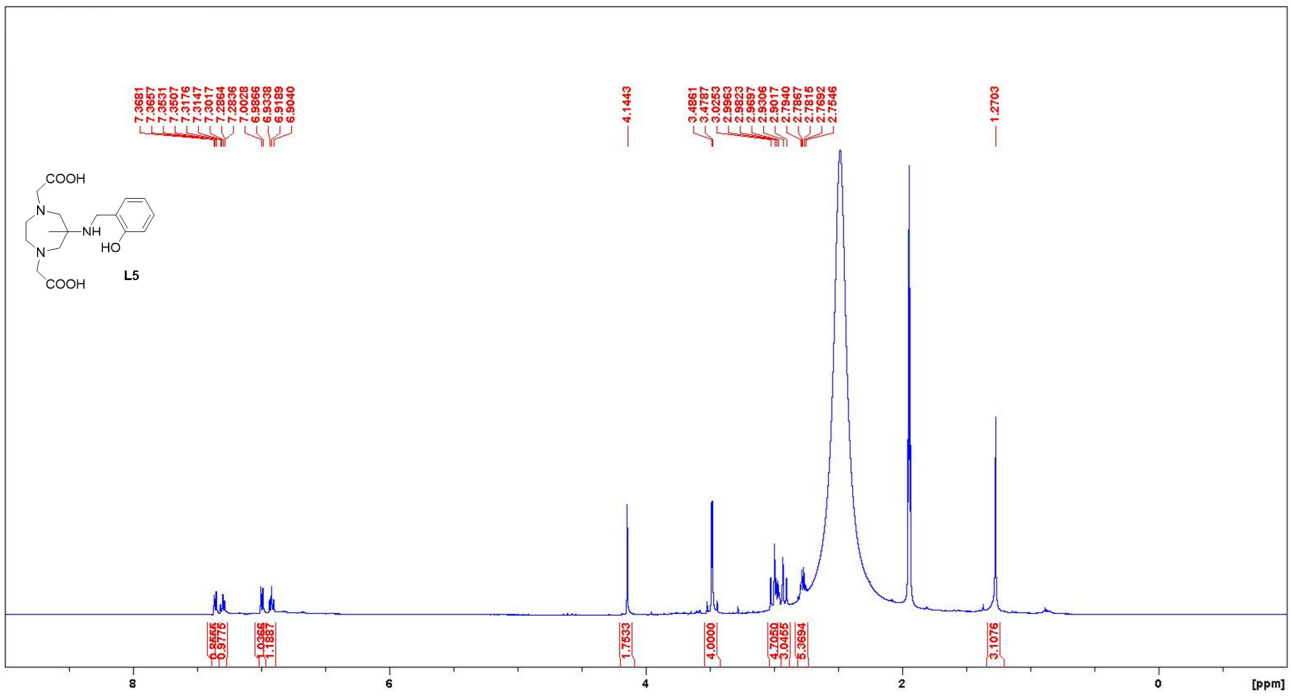

Figure S23. ^{1}H NMR spectrum in CD_3CN of ligand **L5**.

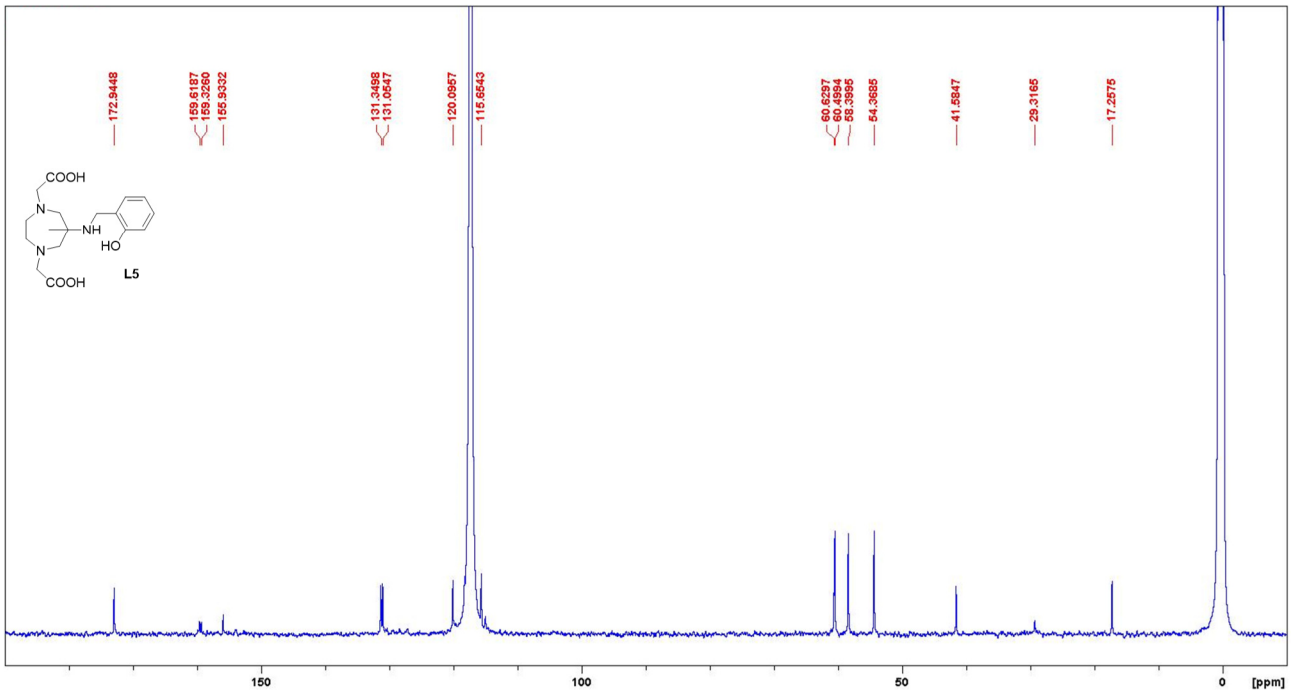

Figure S24. ^{13}C NMR spectrum in CD_3CN of ligand **L5**.

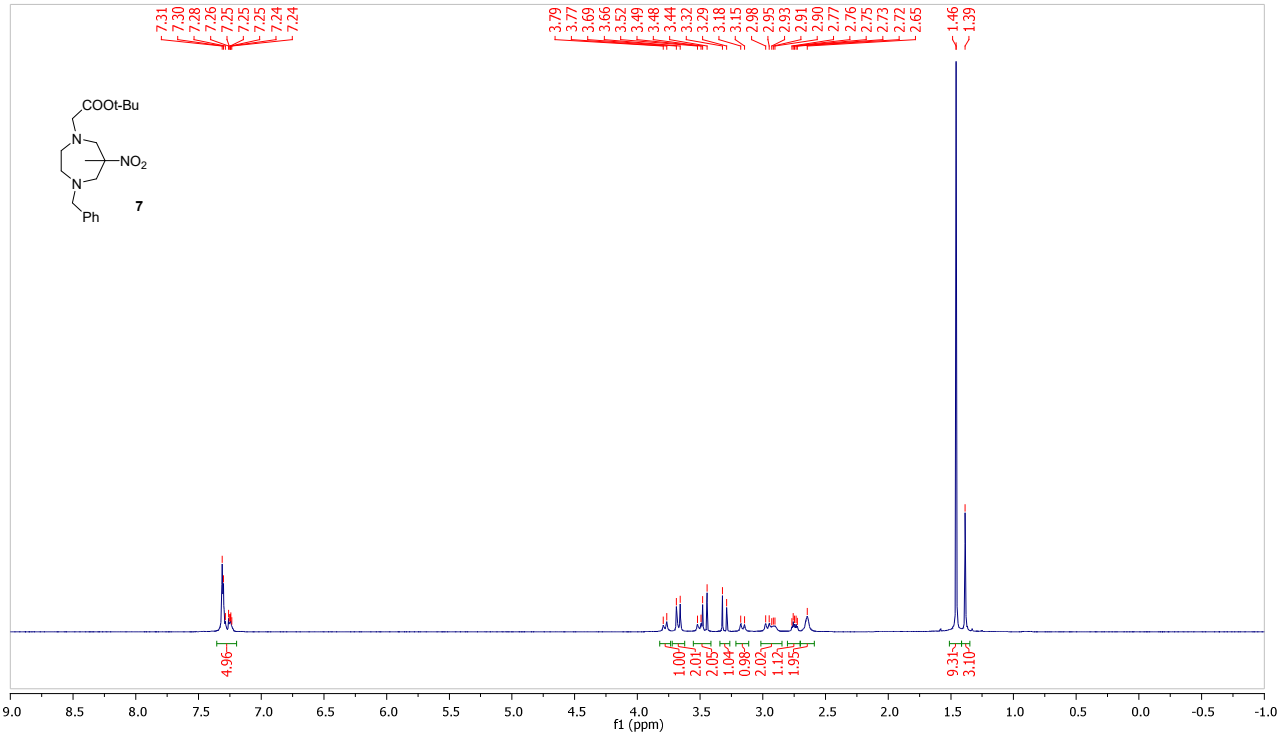

Figure S25. ^{1}H NMR spectrum in $CDCl_3$ of intermediate **7**.

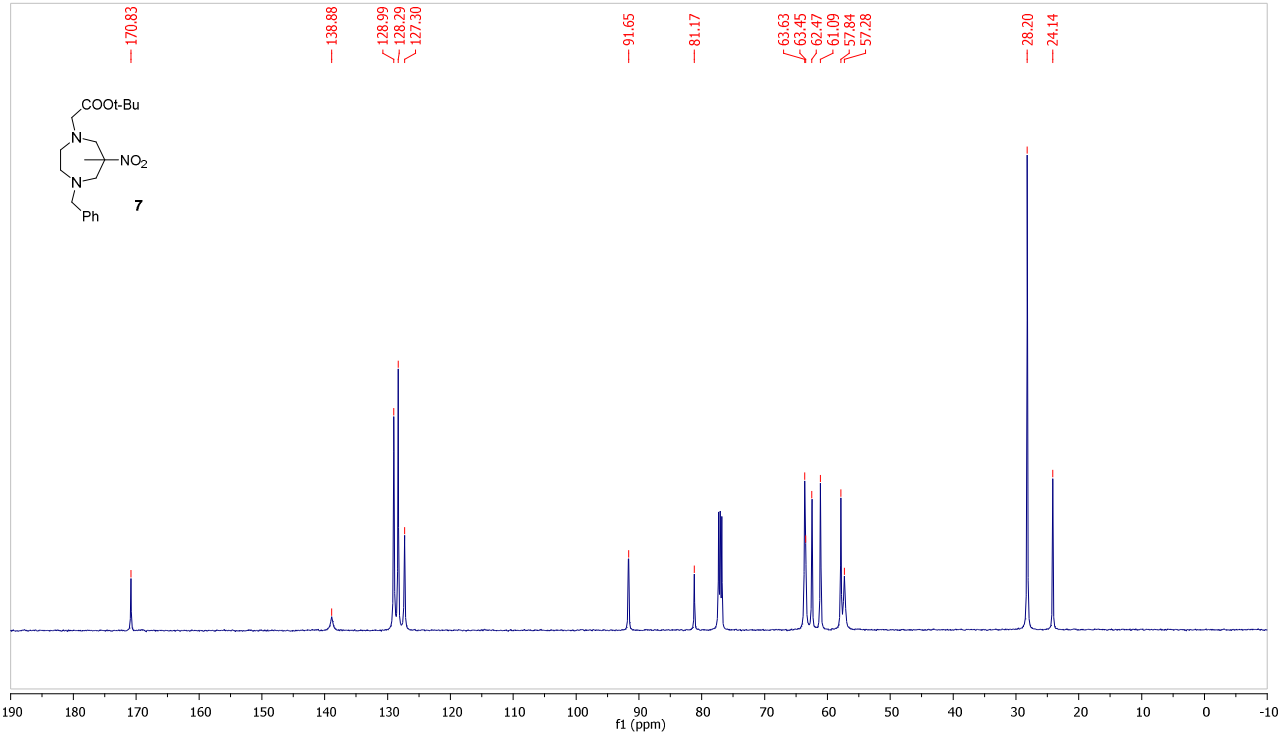

Figure S26. ^{13}C NMR spectrum in $CDCl_3$ of intermediate **7**.

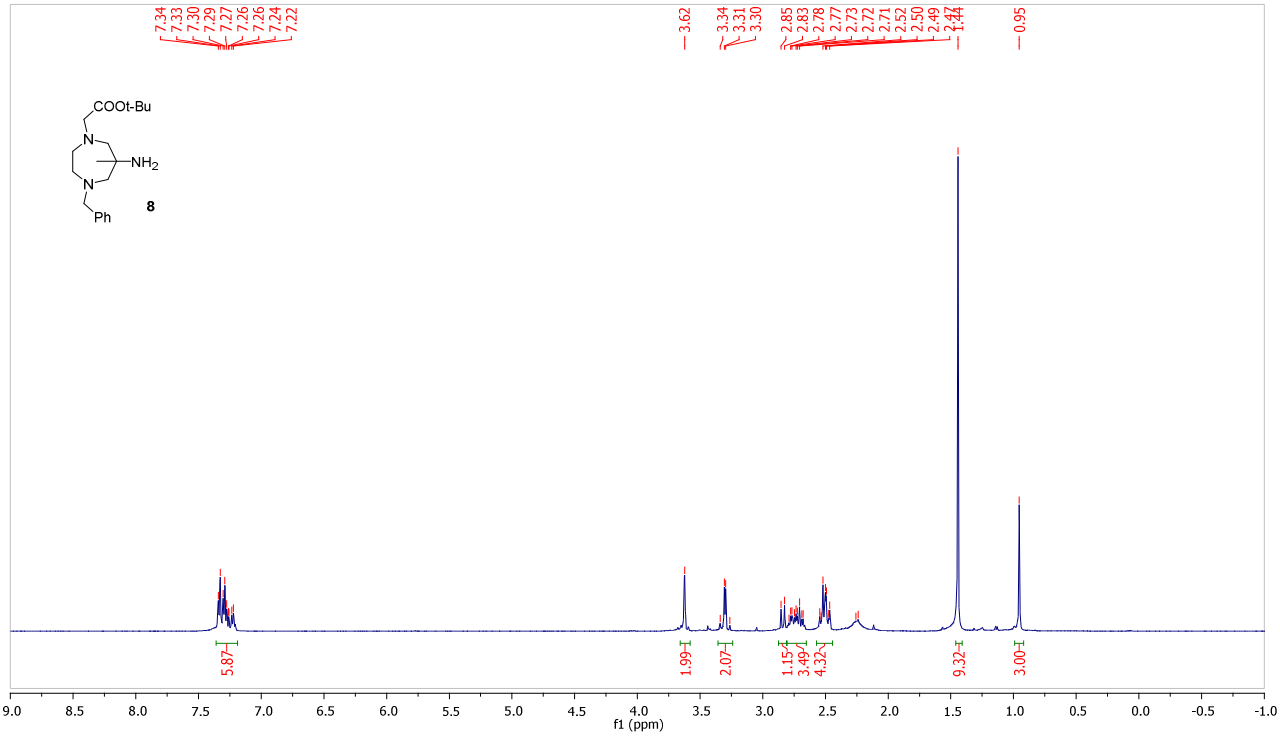

Figure S27. ^{1}H NMR spectrum in $CDCl_3$ of intermediate **8**.

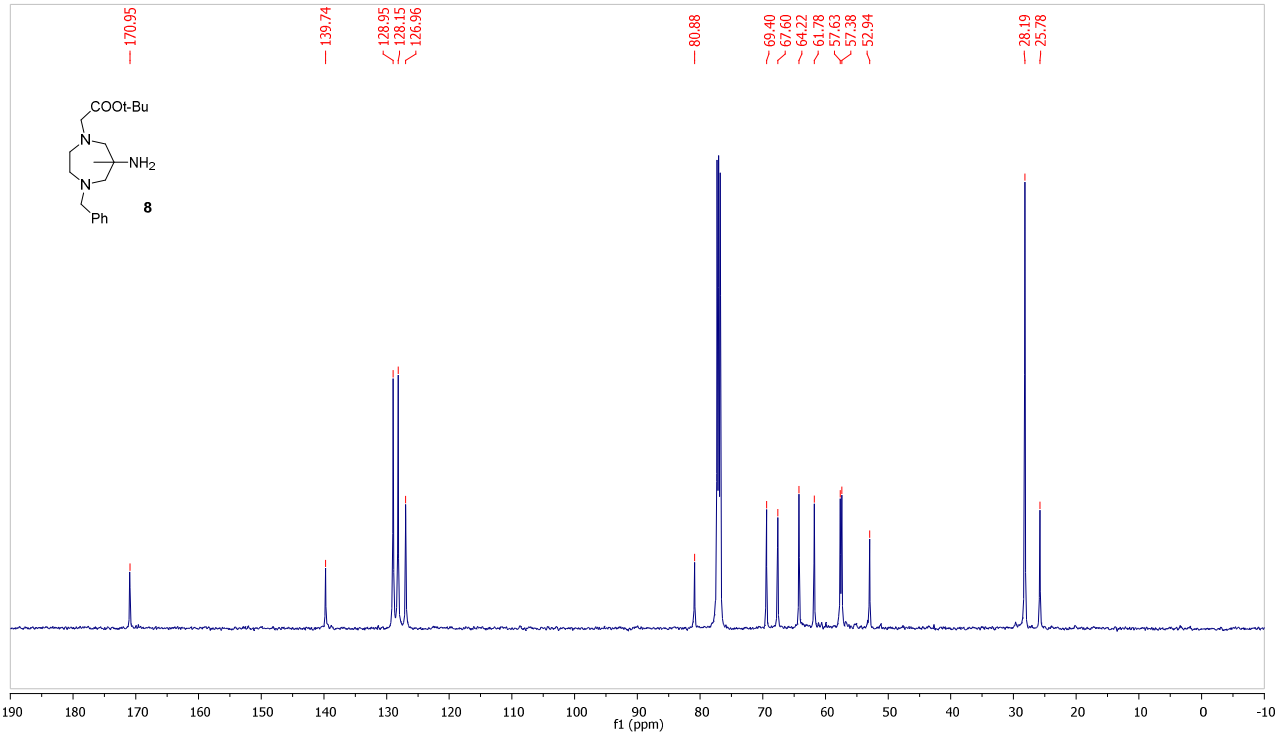

Figure S28. ^{13}C NMR spectrum in $CDCl_3$ of intermediate **8**.

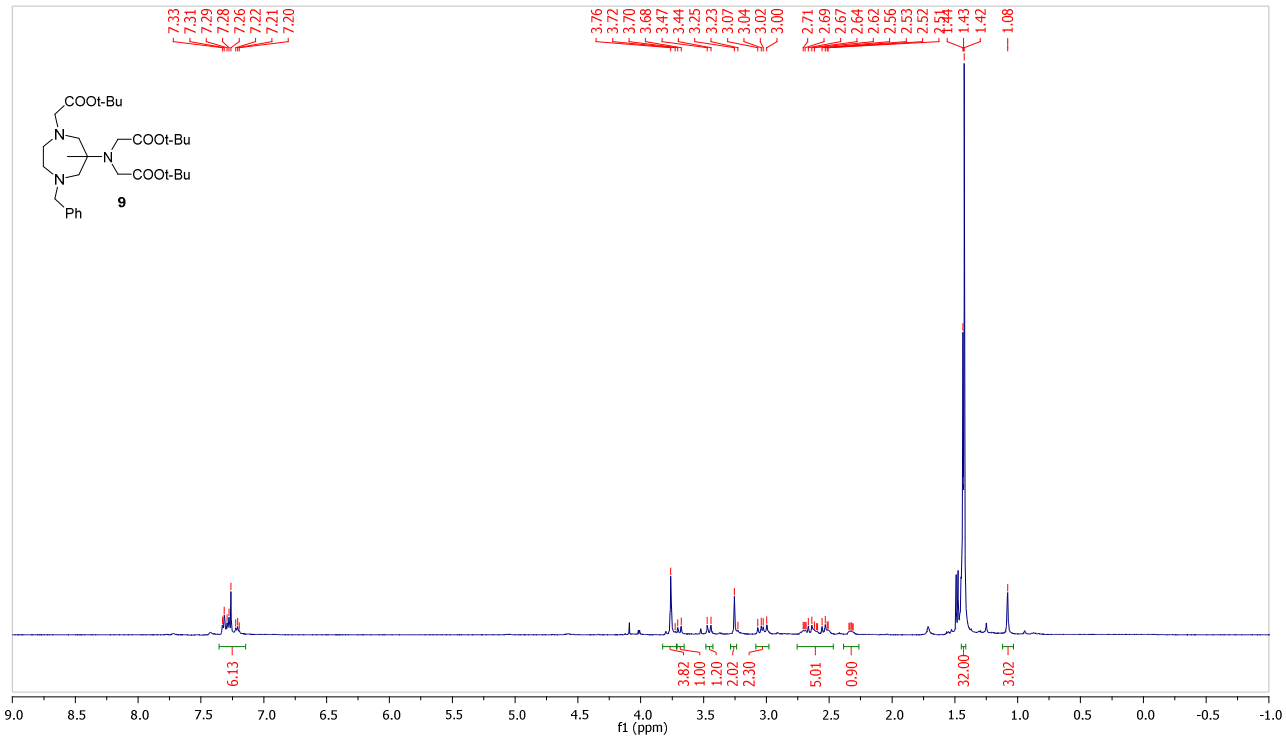

Figure S29. ^{1}H NMR spectrum in $CDCl_3$ of intermediate **9**.

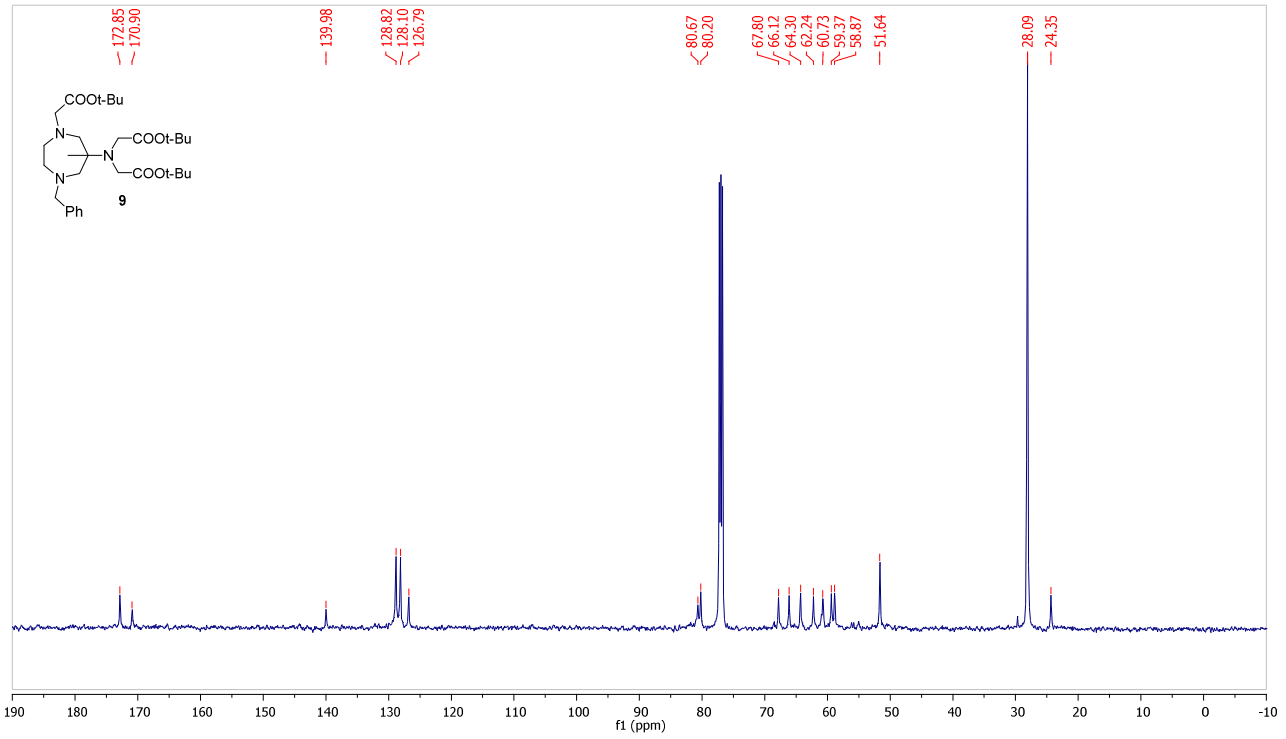

Figure S30. ^{13}C NMR spectrum in $CDCl_3$ of intermediate **9**.

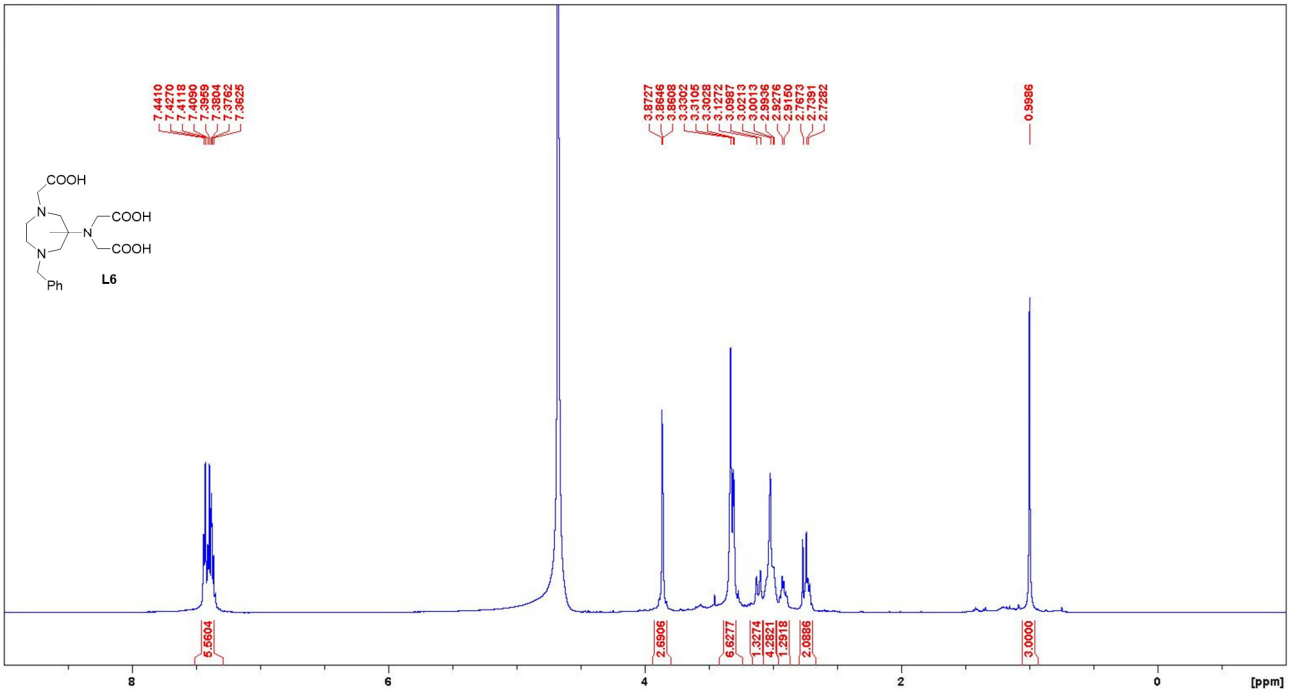

Figure S31. ^{1}H NMR spectrum in D_2O of ligand **L6**.

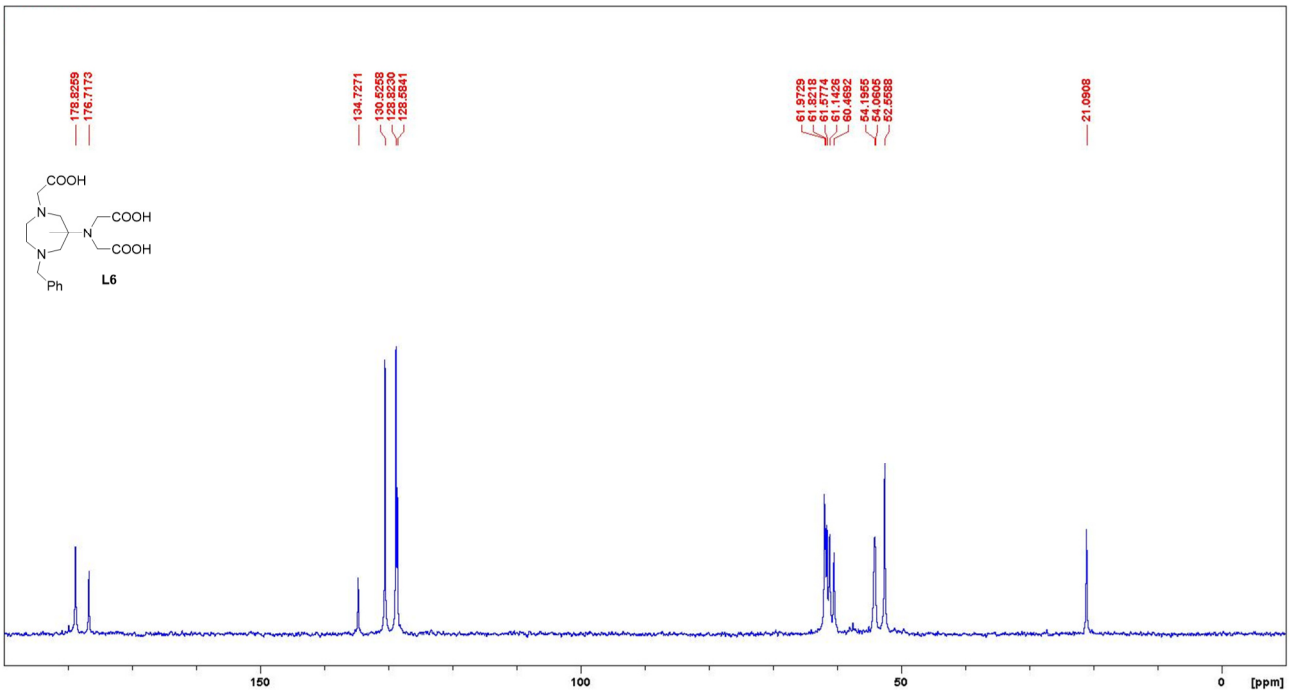

Figure S32. ^{13}C NMR spectrum in D_2O of ligand **L6**.

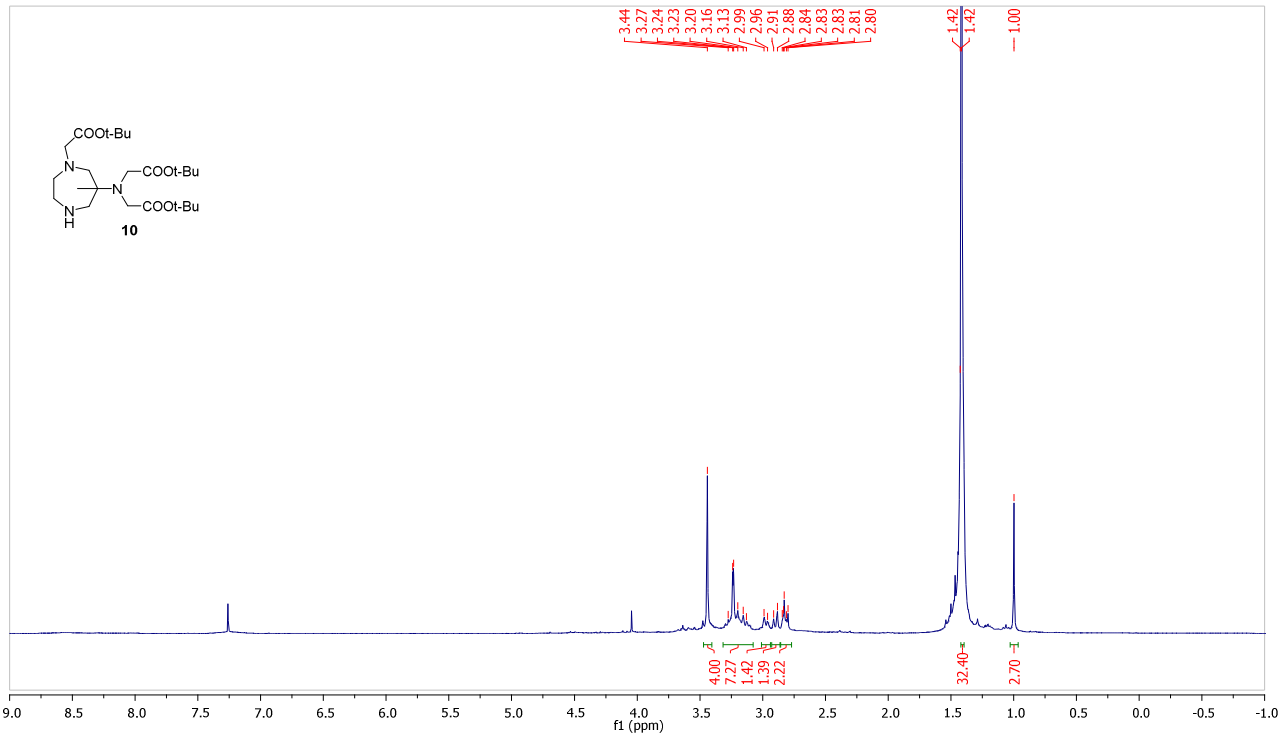

Figure S33. ^{1}H NMR spectrum in $CDCl_3$ of intermediate **10**.

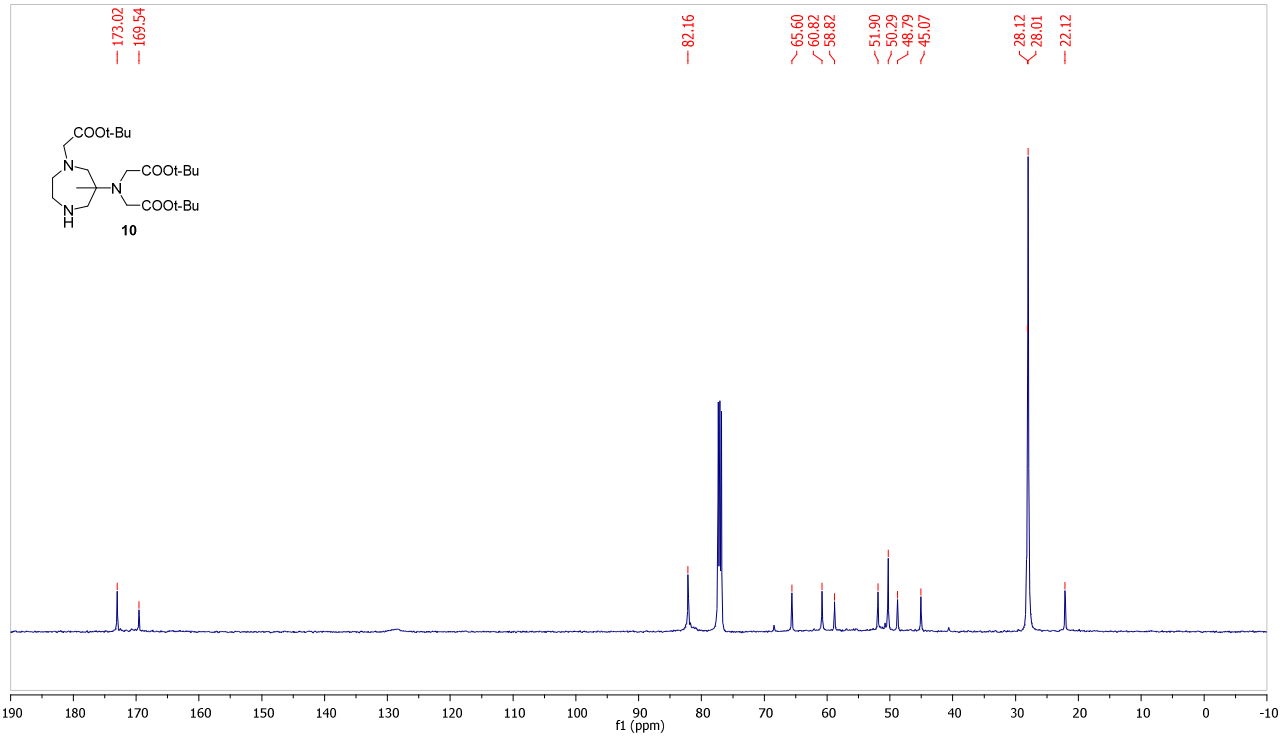

Figure S34. ^{13}C NMR spectrum in $CDCl_3$ of intermediate **10**.