Macrocycle Synthesis by Chloride Templated Amide Bond Formation

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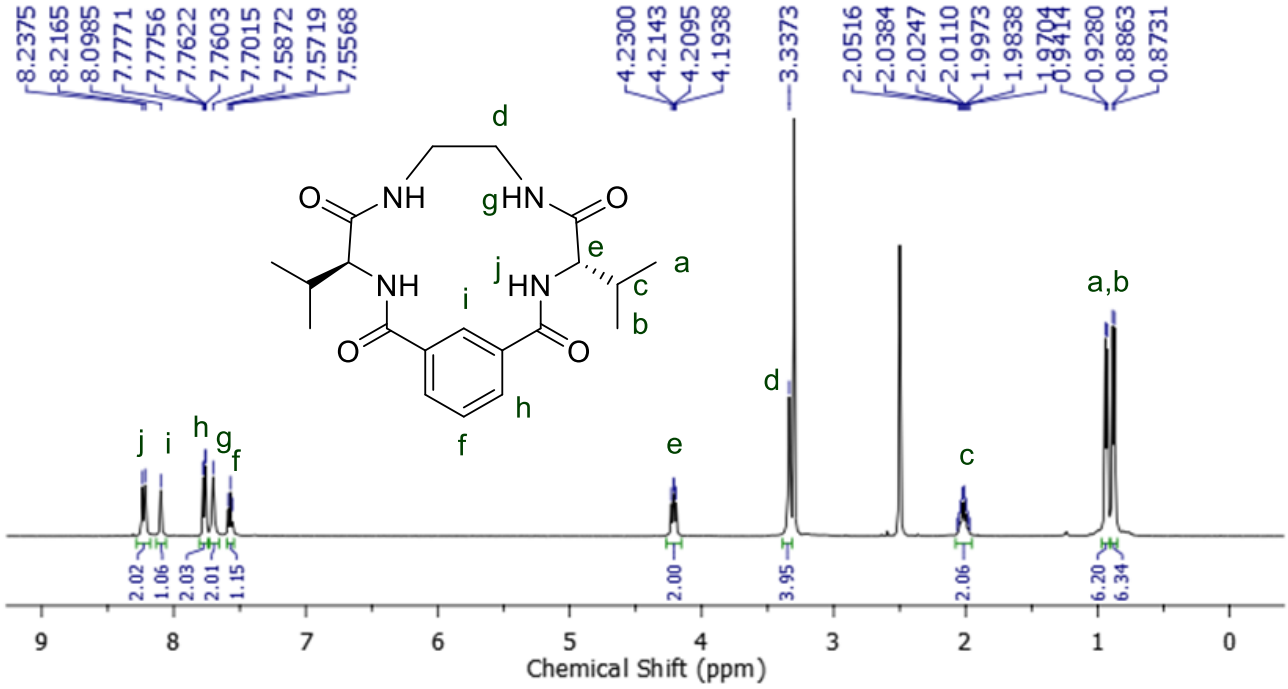
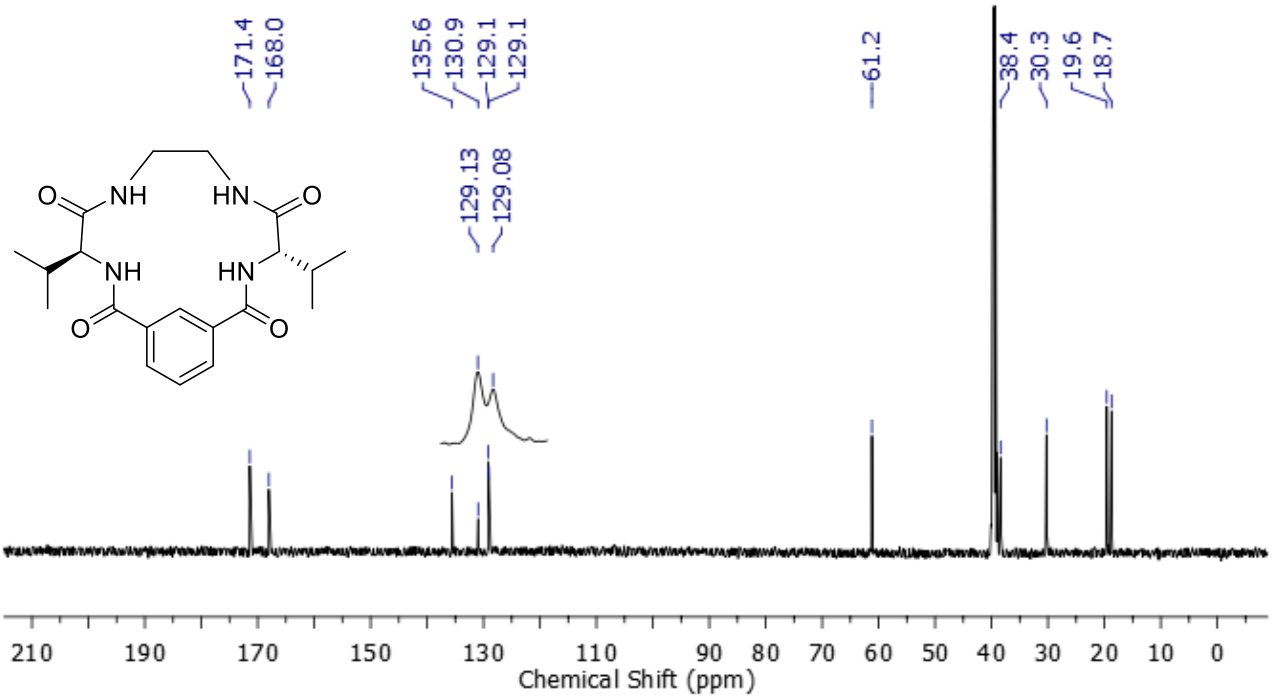
Supporting Information

Compound Characterization

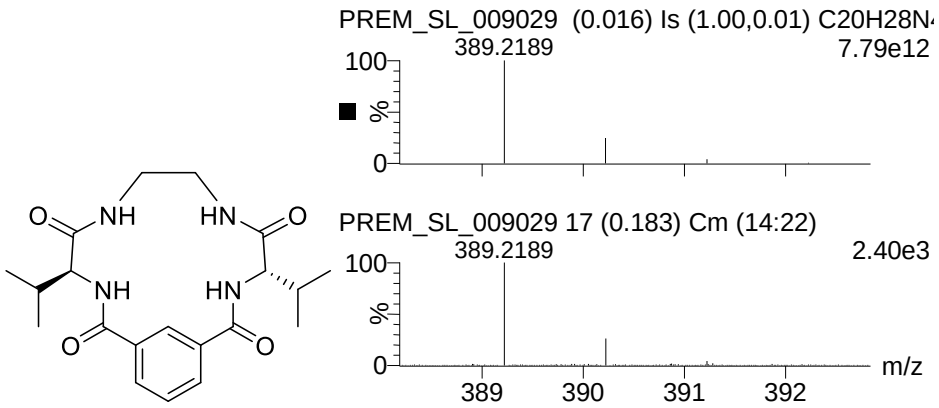
Compound 3a



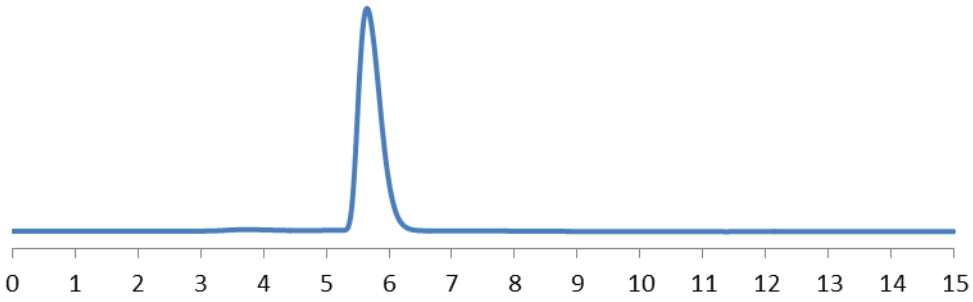
^{1}H NMR of compound **3a** in DMSO-d_6.



^{13}C NMR of compound **3a** in DMSO-d_6.

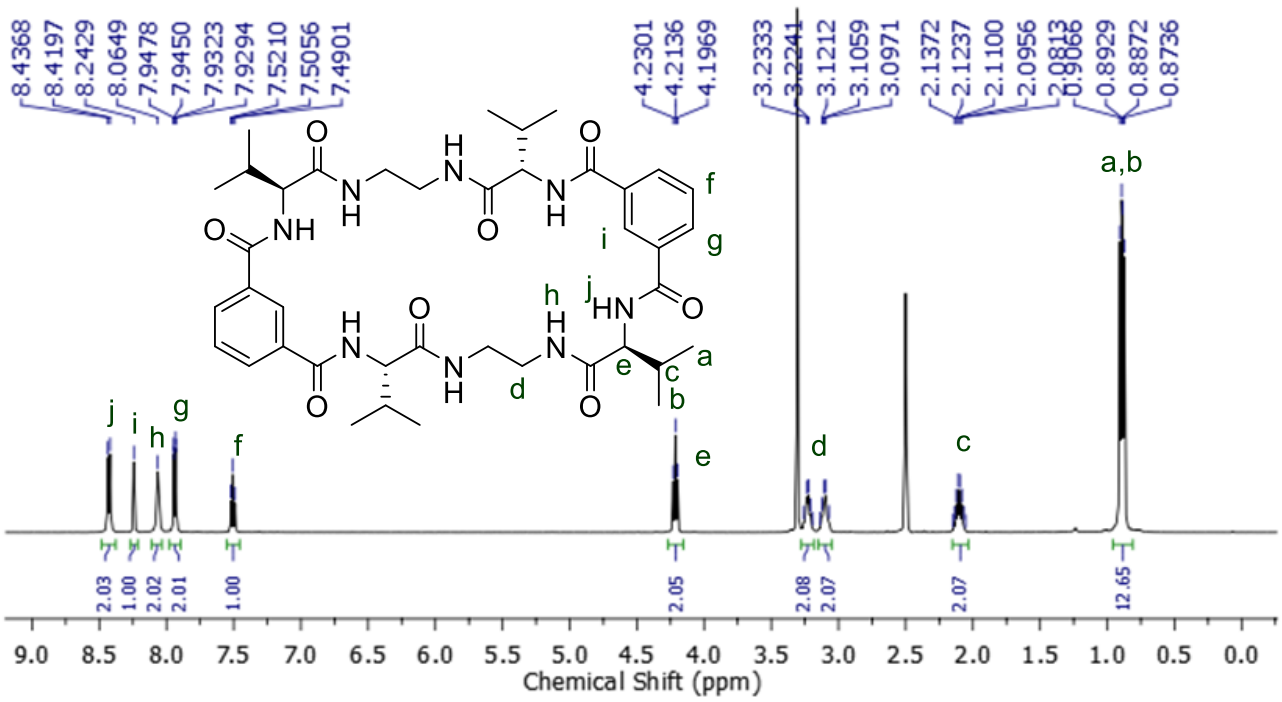


MS of compound **3a**.

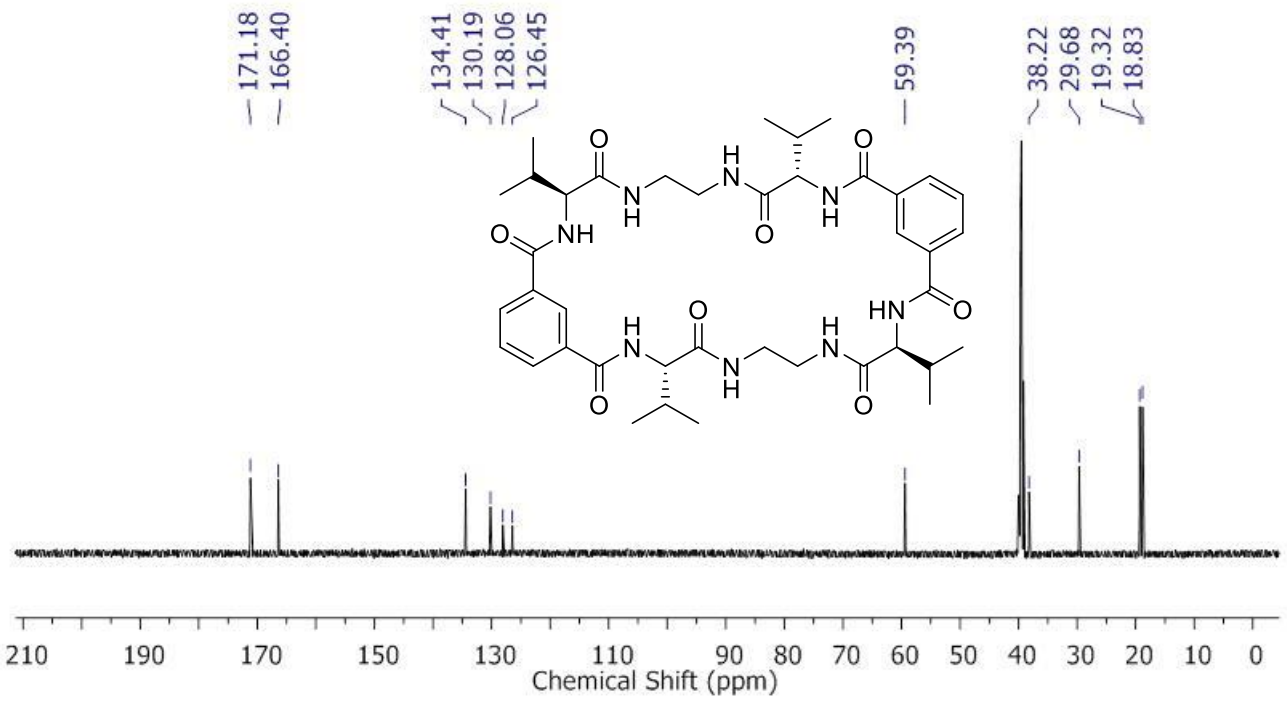


HPLC trace of compound **3a**. Protonsil 120-5-C18 AQ 5.0 micrometers 250 × 4.6 mm column, 0.0 min 80% ACN 20 %H_2O 0.5 mL/min, 7.5 min 85% ACN 15 % H_2O 0.5 mL/min, 15.0 min 95% ACN 5 %H_2O 0.5 mL/min. UV λ = 210 nm.

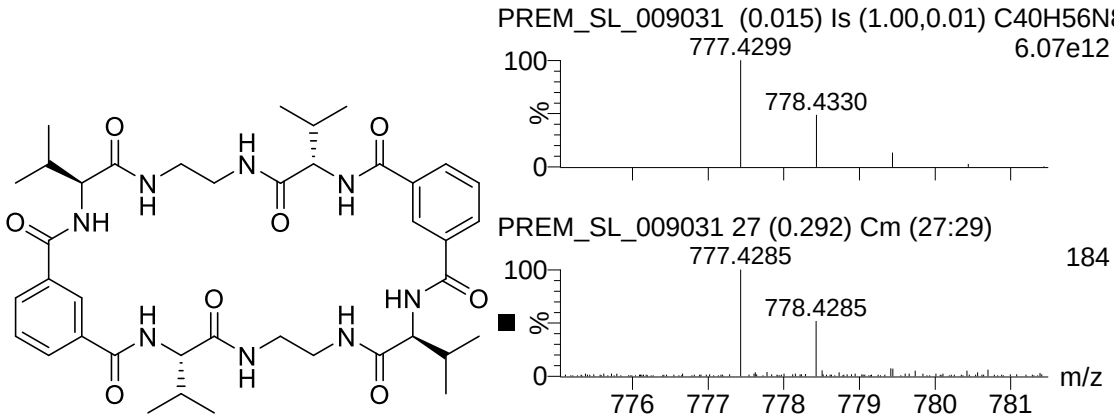
Compound 4a



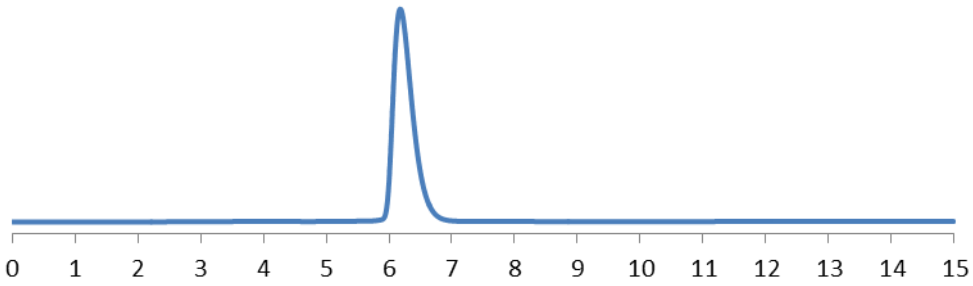
^{1}H NMR of compound **4a** in DMSO-d_6.



^{13}C NMR of compound **4a** in DMSO-d_6.



MS of compound **4a**.



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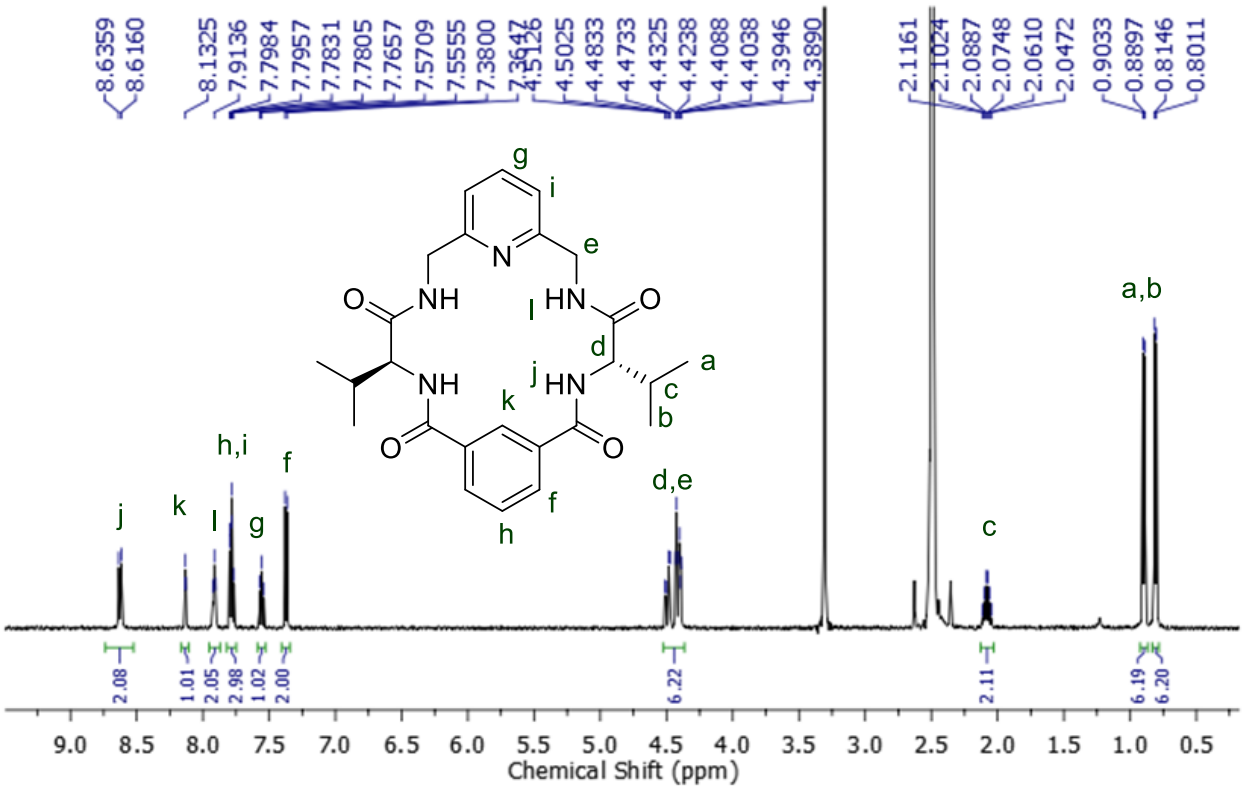
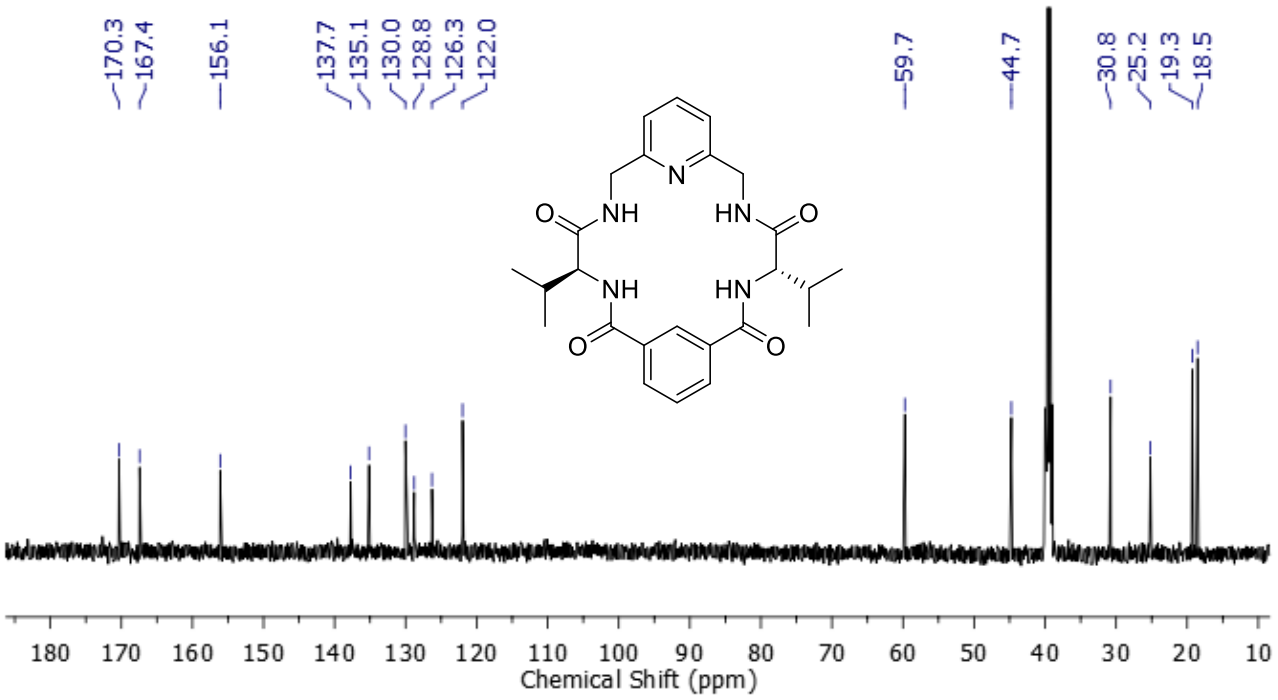
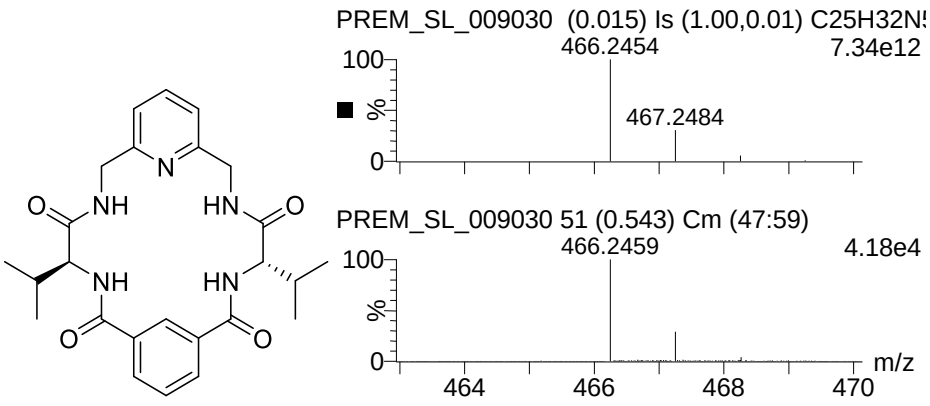
Compound 3b



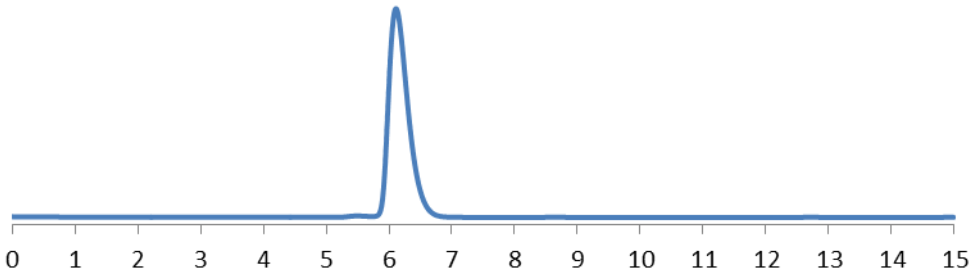
^{1}H NMR of compound **3b** in DMSO-d_6.



^{13}C NMR of compound **3b** in DMSO-d_6.

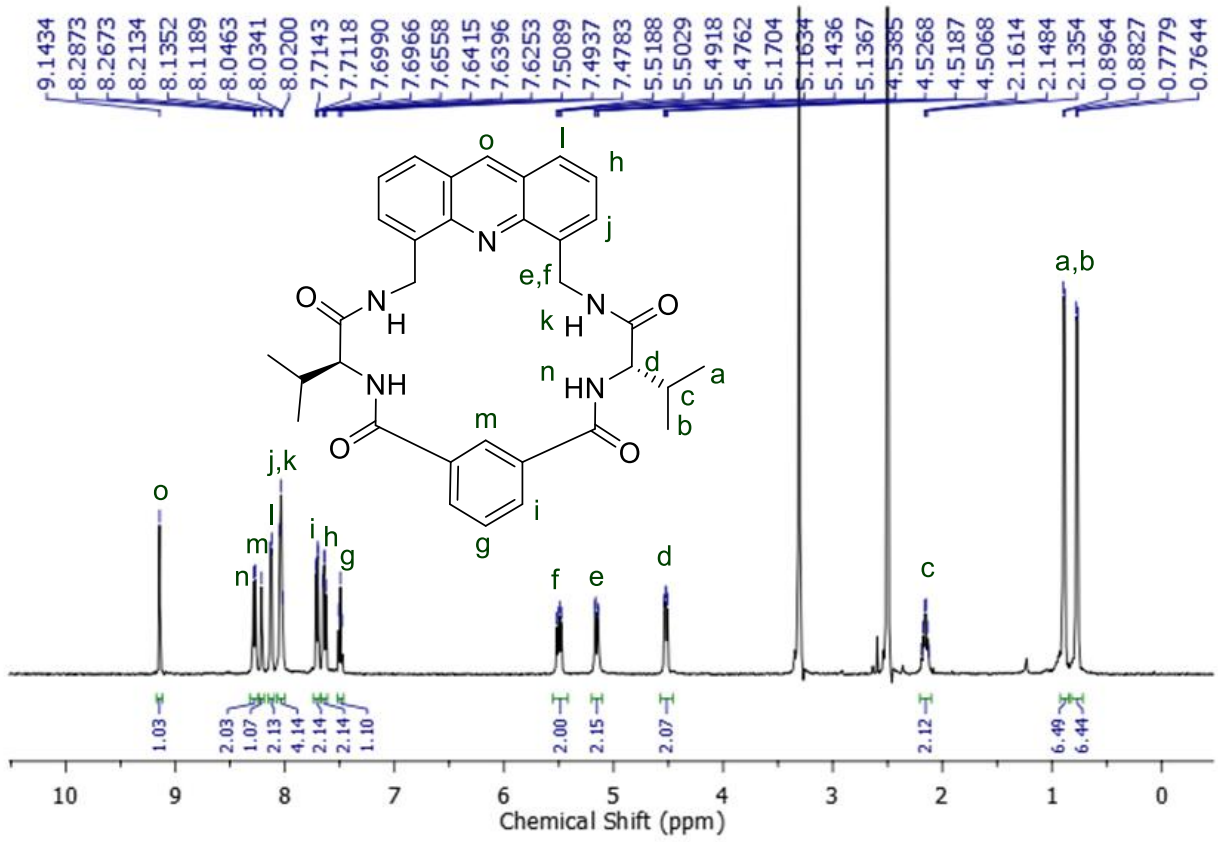


MS of compound **3b**.

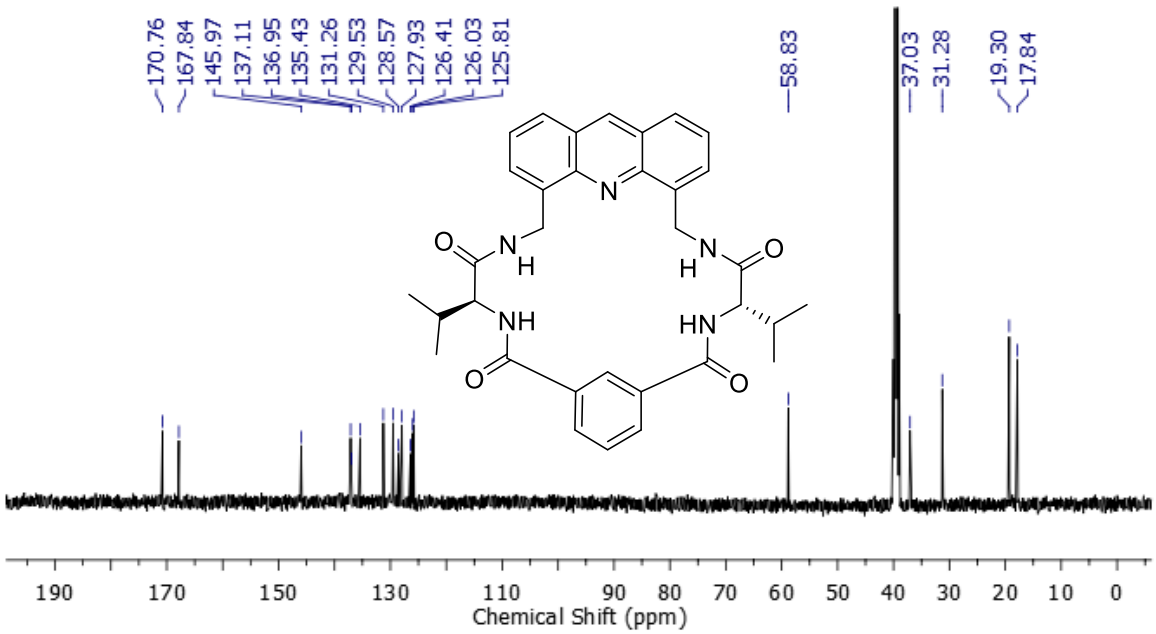


HPLC trace of compound **3b**. Protonsil 120-5-C18 AQ 5.0 micrometers 250 × 4.6 mm column, 0.0 min 80% ACN 20 %H_2O 0.5 mL/min, 7.5 min 85% ACN 15 % H_2O 0.5 mL/min, 15.0 min 95% ACN 5 %H_2O 0.5 mL/min. UV λ = 210 nm.

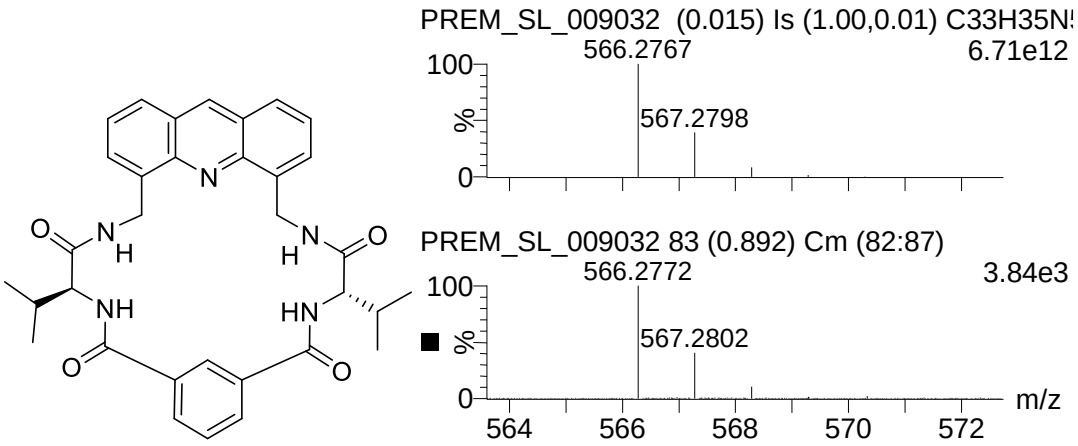
Compound 3c



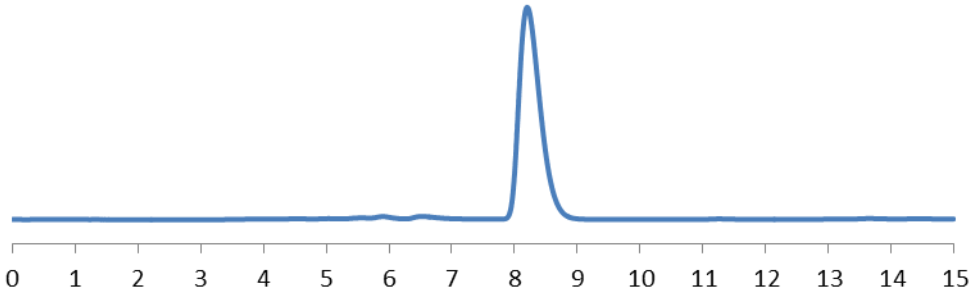
^{1}H NMR of compound **3c** in DMSO-d_6.



^{13}C NMR of compound **3c** in DMSO-d_6.

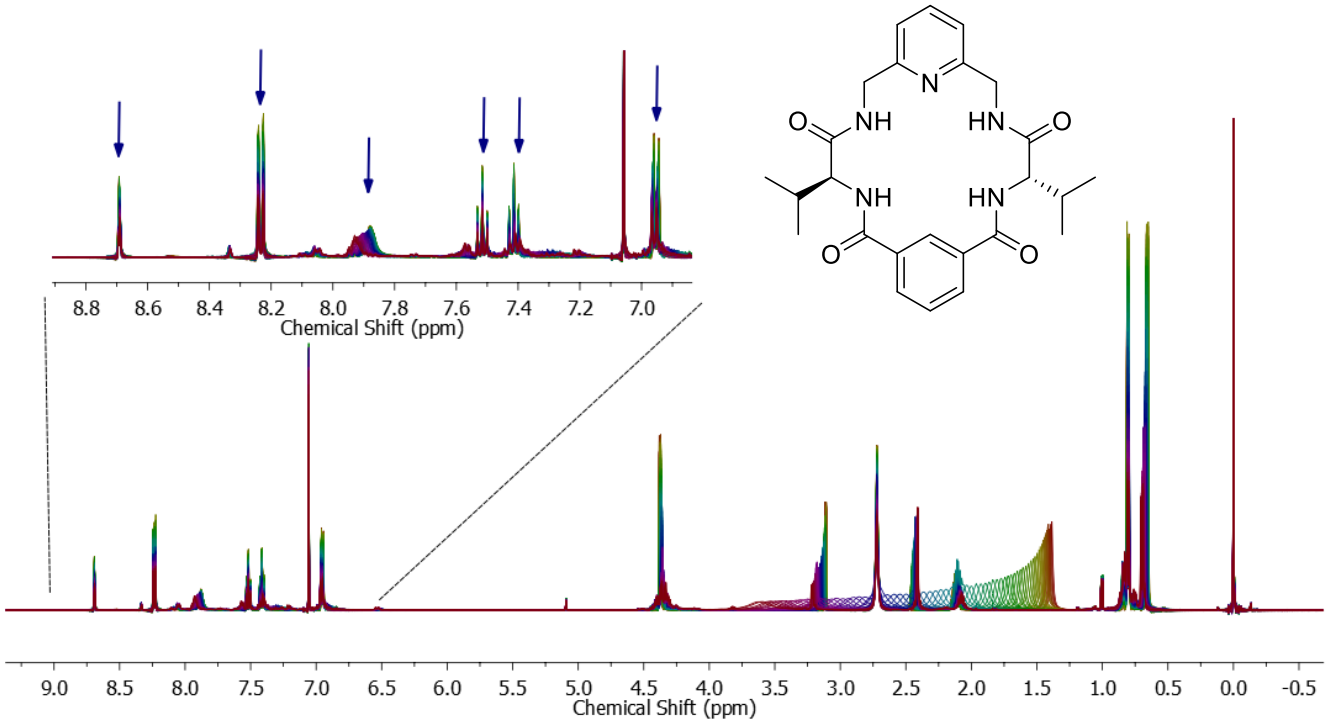


MS of compound **3c**.

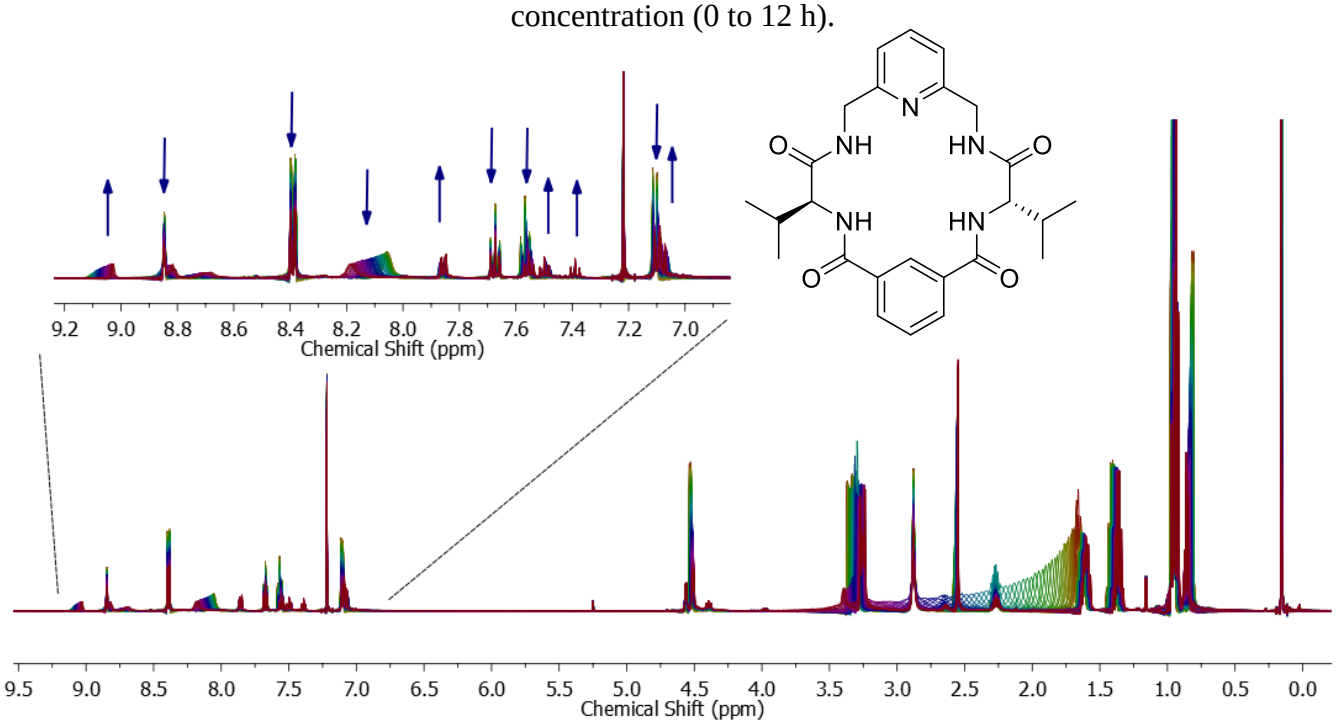


HPLC trace of compound **3c**. Protonsil 120-5-C18 AQ 5.0 micrometers 250 × 4.6 mm column, 0.0 min 80% ACN 20 %H_2O 0.5 mL/min, 7.5 min 85% ACN 15 % H_2O 0.5 mL/min, 15.0 min 95% ACN 5 %H_2O 0.5 mL/min. UV λ = 210 nm.

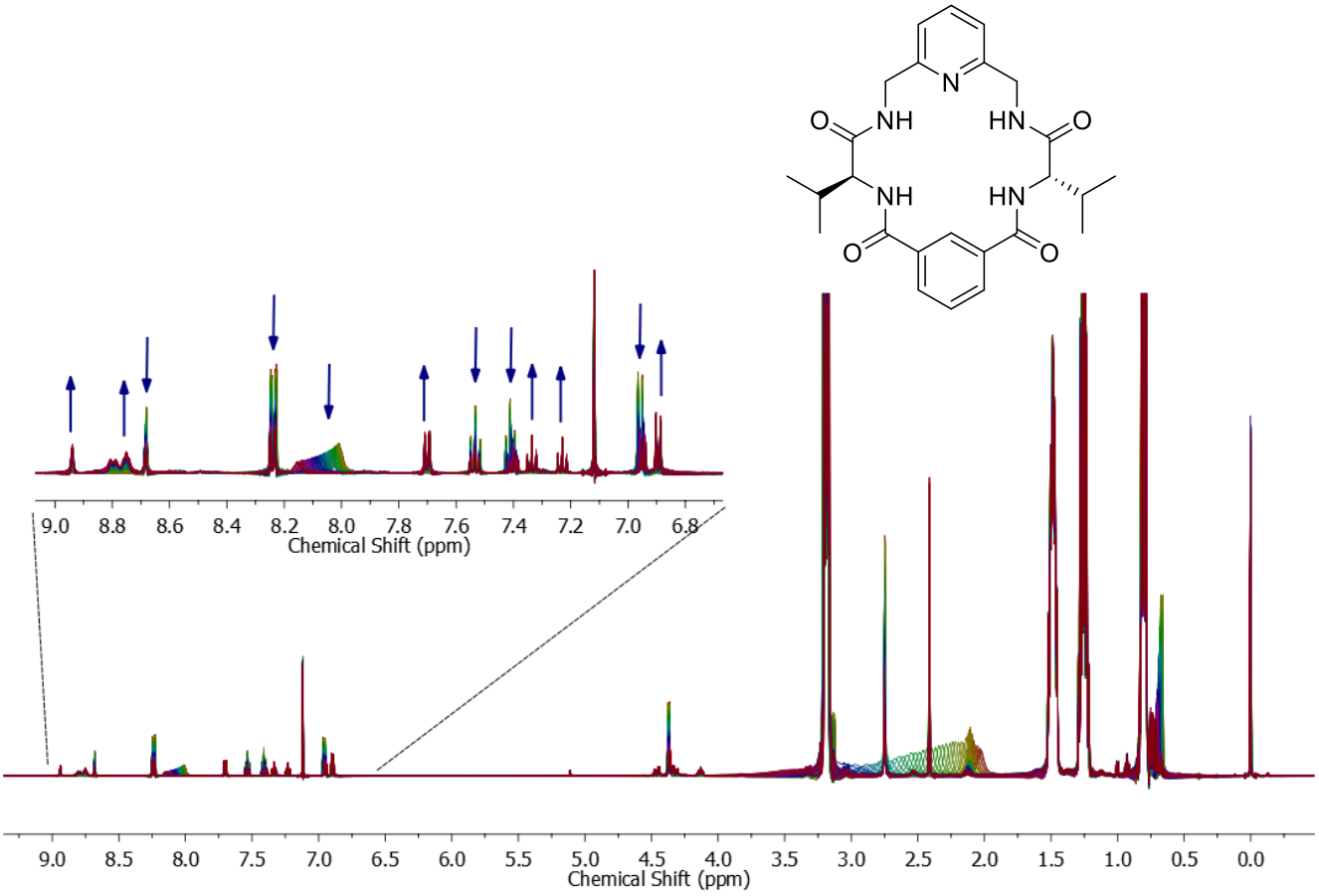
^{1}H NMR macrocyclization reaction kinetics



Macrocyclization reaction kinetics of **1b** in the absence of templating anion in $CDCl_3$ at 30 ºC at 10 mM concentration (0 to 12 h).



Macrocyclization reaction kinetics of **1b** in the presence of 1 equivalent of chloride anion in $CDCl_3$ at 30 ºC at 10 mM concentration (0 to 12 h).

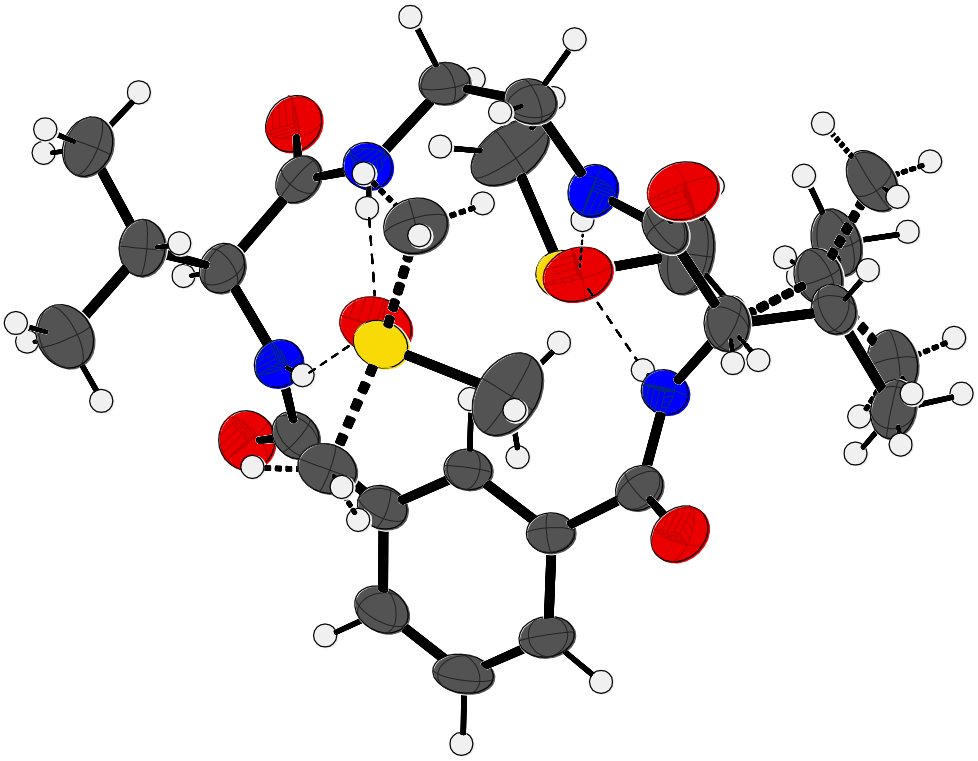


Macrocyclization reaction kinetics of **1b** in the presence of 10 equivalents of chloride anion in $CDCl_3$ at 30 ºC at 10 mM concentration (0 to 12 h).

X-Ray crystallography

Crystal data and structure refinement for **3a**.

Empirical formula	$C_{24}H_{40}N_4O_6S_2$
Formula weight	544.72
Temperature/K	200.0
Crystal system	monoclinic
Space group	$P2_1$
a/Å	9.61329(18)
b/Å	9.54113(15)
c/Å	16.1853(3)
α/°	90
β/°	96.3113(18)
γ/°	90
Volume/Å^3	1475.55(5)
Z	2
ρ_{calc}g/cm^3	1.226
μ/mm^{-1}	1.984
F(000)	584.0
Crystal size/mm^3	0.3463 × 0.3184 × 0.2471
Radiation	CuKα (λ = 1.54184)
2Θ range for data collection/°	9.256 to 145.628
Index ranges	$-11 \leq h \leq 11$, $-11 \leq k \leq 11$, $-19 \leq l \leq 19$
Reflections collected	26325
Independent reflections	5814 [R_{int} = 0.0526, R_{sigma} = 0.0256]
Data/restraints/parameters	5814/1/374
Goodness-of-fit on F^2	1.052
Final R indexes [I>=2σ (I)]	R_1 = 0.0438, wR_2 = 0.1215
Final R indexes [all data]	R_1 = 0.0448, wR_2 = 0.1231
Largest diff. peak/hole / e Å^{-3}	0.25/-0.23
Flack parameter	-0.001(7)



The solid state molecular structure of **3a** (50% probability ellipsoids).