Electronic Supplementary Material (ESI) for RSC Advances.

Synthesis and properties of chiral nanoparticles based on (pS) - and (pR) - decasubstituted pillar[5]arenes containing secondary amide fragments

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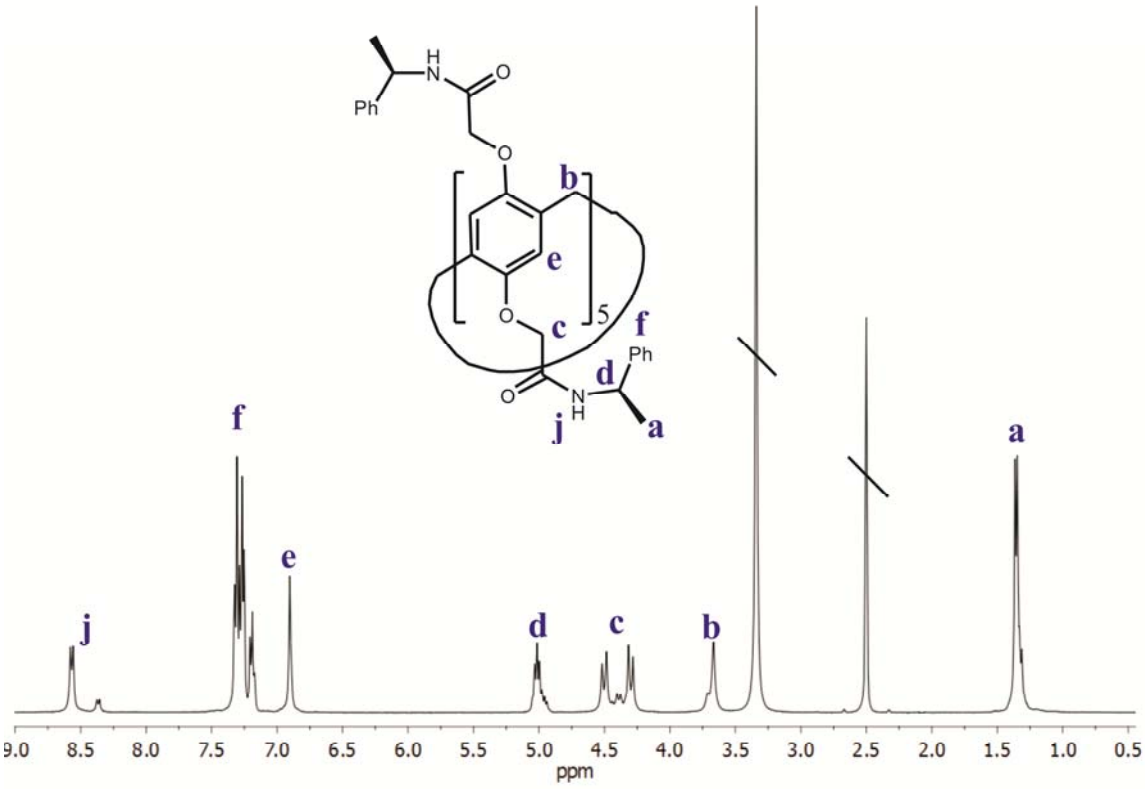
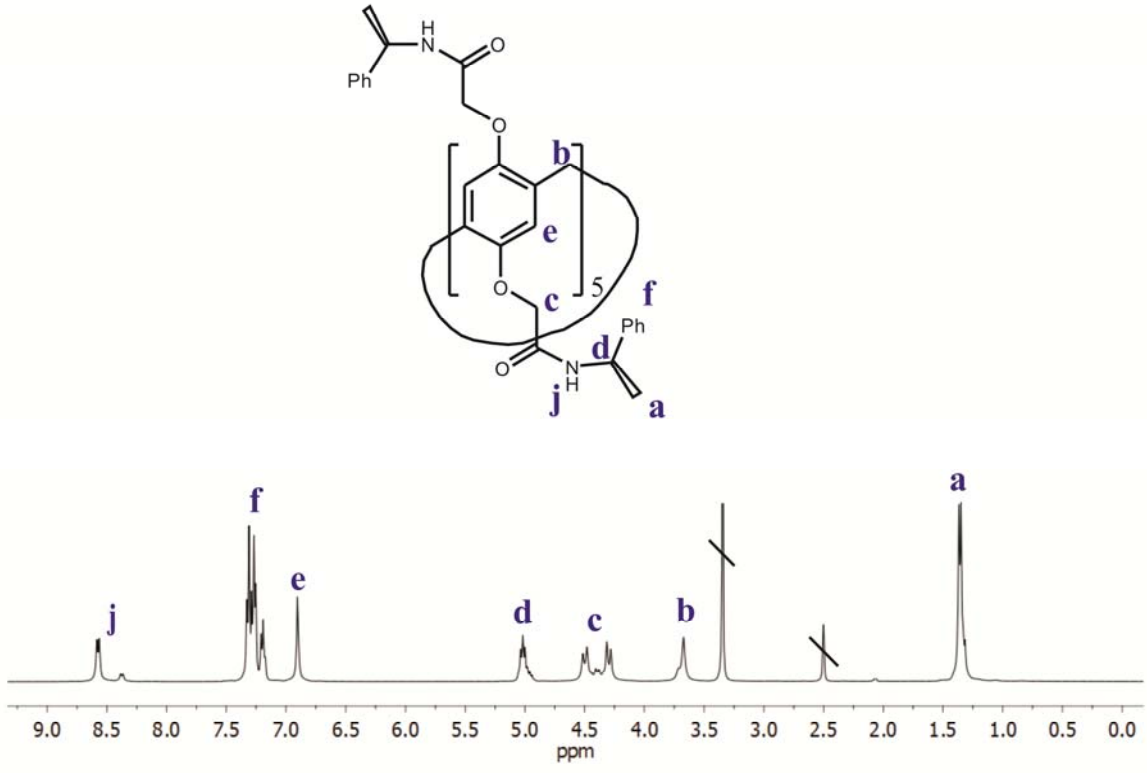
Electronic Supplementary Information

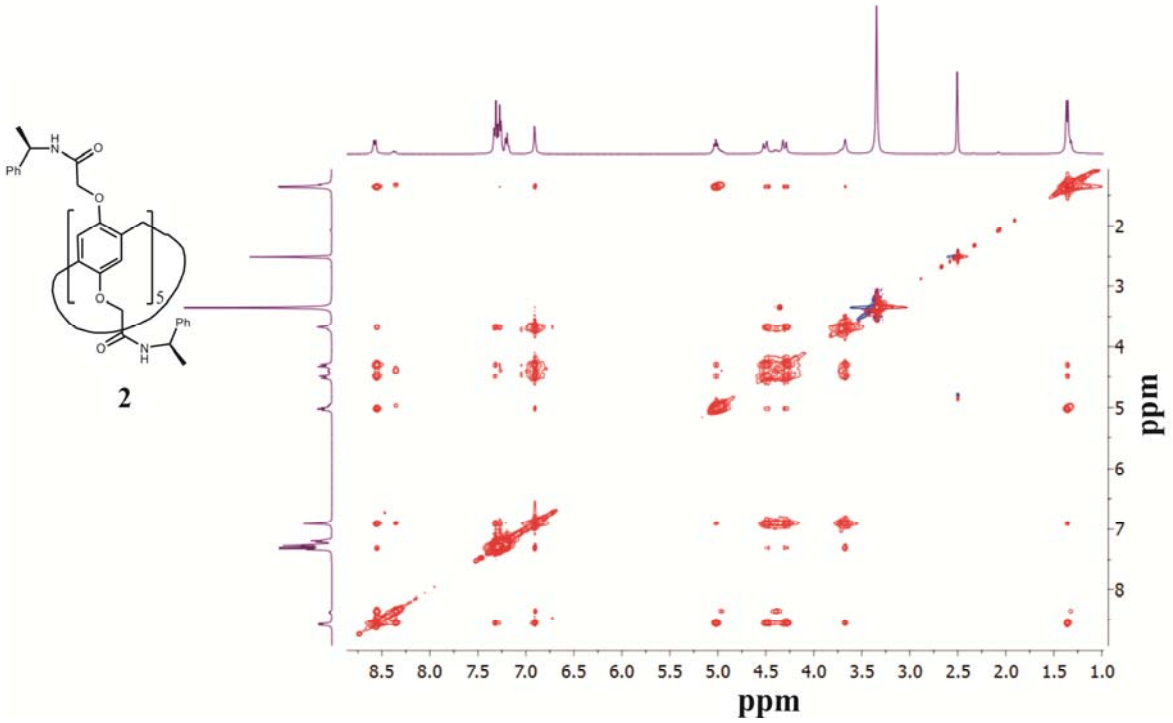
^{1}H NMR spectrum of 4,8,14,18,23,26,28,31,32,35-deca-[(R)-(+)-(1'-phenylethyl-1'-amidocarbonyl)methoxy]-pillar[5]arene (2), DMSO-d_6, 298 K, 400 MHz



^{1}H NMR spectrum of 4,8,14,18,23,26,28,31,32,35-deca-[(S)-(-)-(1'-phenylethyl-1'-amidocarbonyl)methoxy]-pillar[5]arene (3), DMSO-d_6, 298 K, 400 MHz



^{1}H-^{1}H NOESY NMR spectrum of 4,8,14,18,23,26,28,31,32,35-deca-[(R)-(+)-(1'-phenylethyl-1'-amidocarbonyl)methoxy]-pillar[5]arene (2), DMSO-d_6, 298 K, 400 MHz



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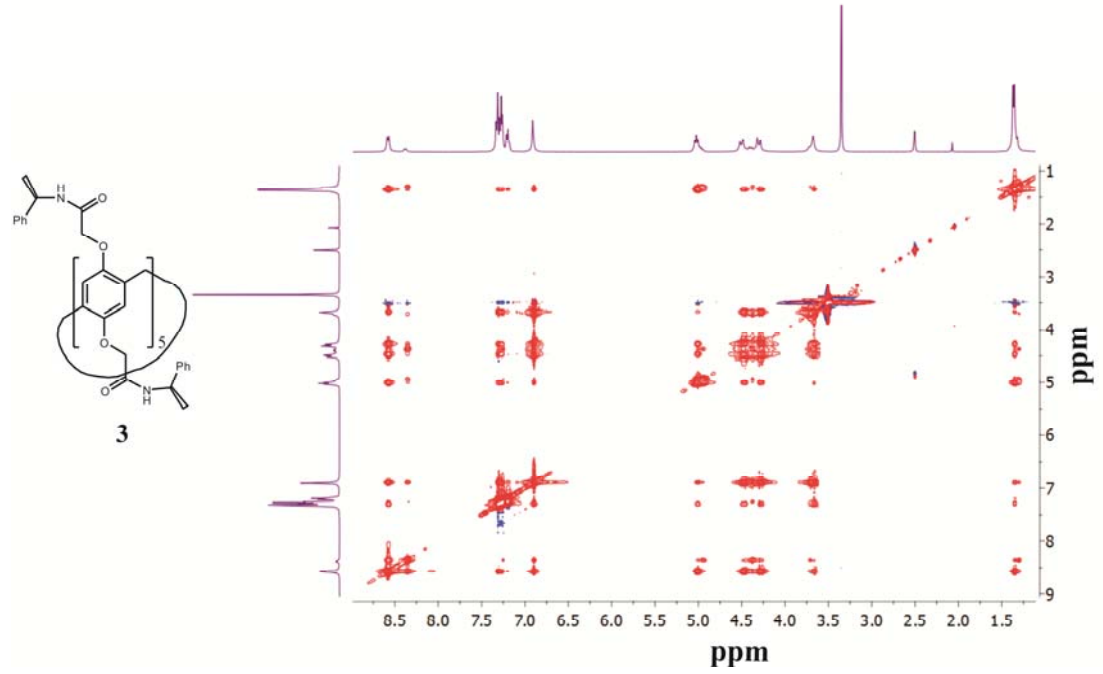
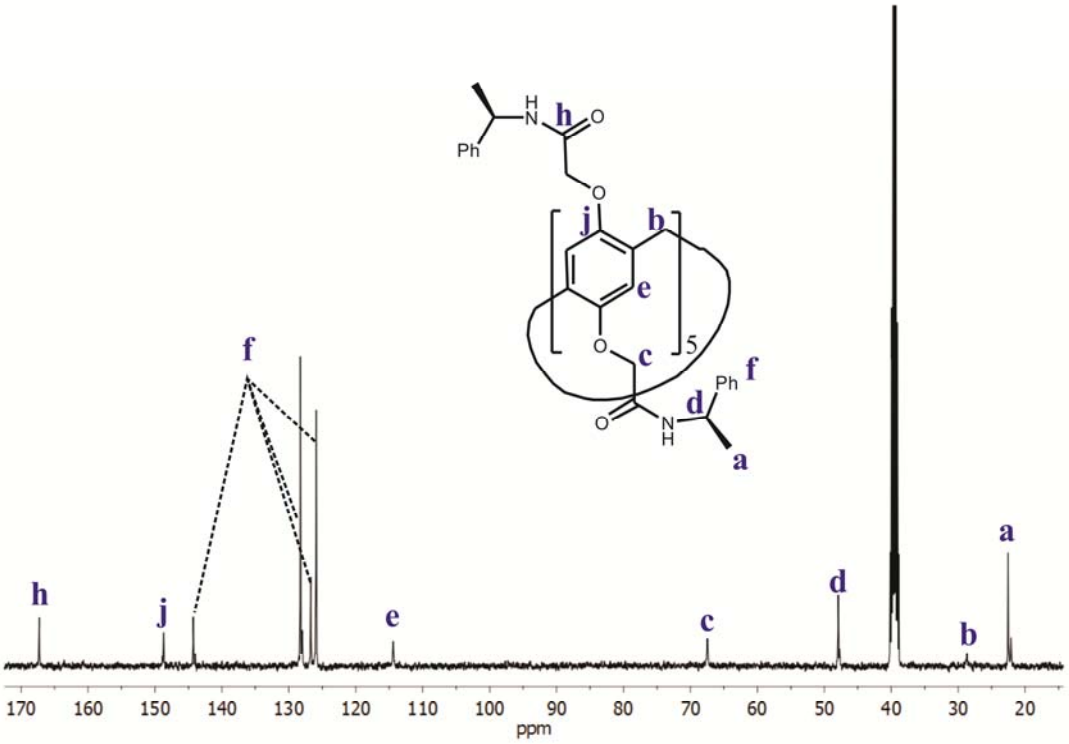


^{13}C NMR spectrum of 4,8,14,18,23,26,28,31,32,35-deca-[(R)-(+)-(1'-phenylethyl-1'-amidocarbonyl)methoxy]-pillar[5]arene (2), DMSO-d_6, 298 K, 100 MHz



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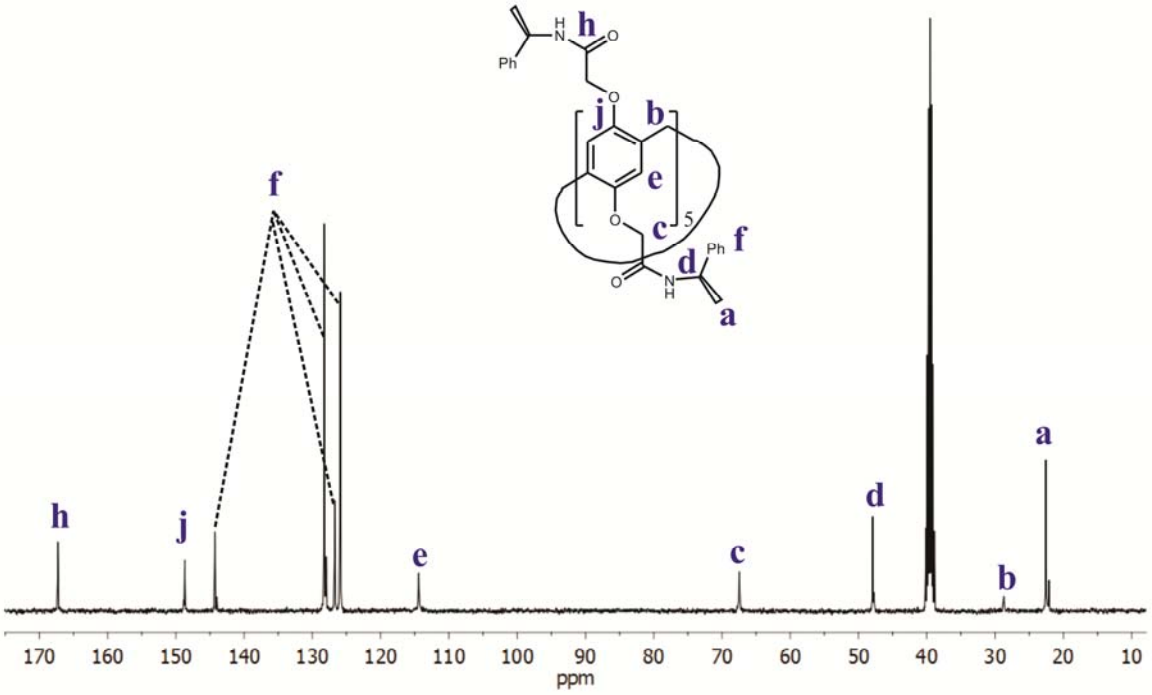
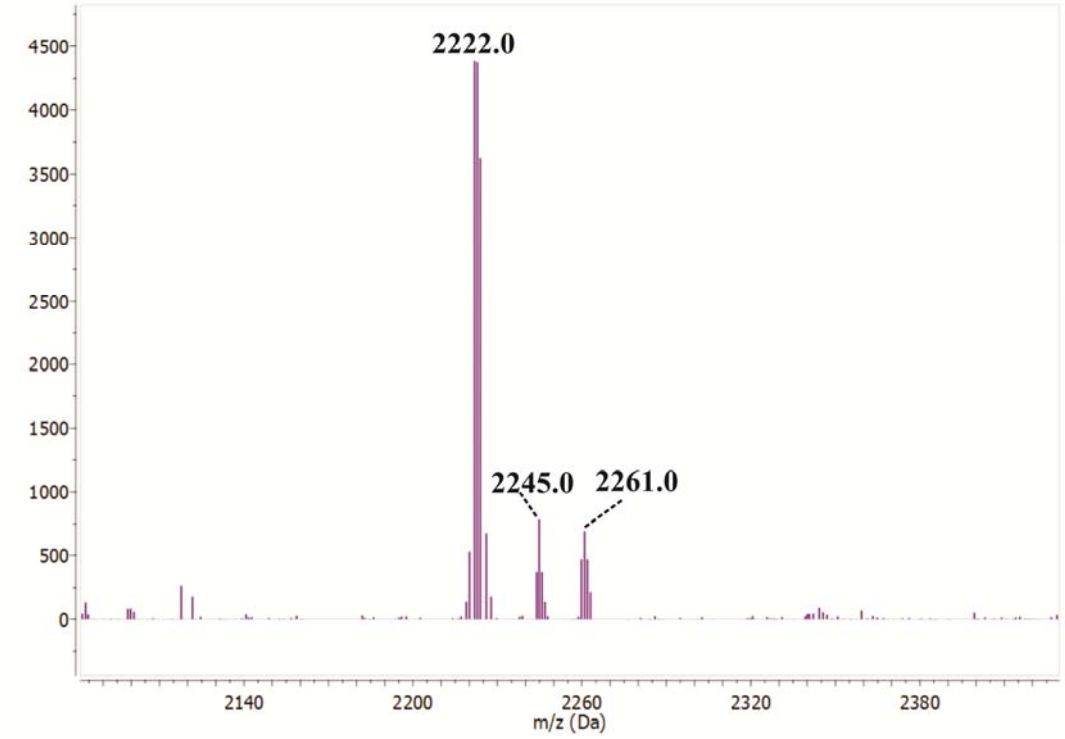
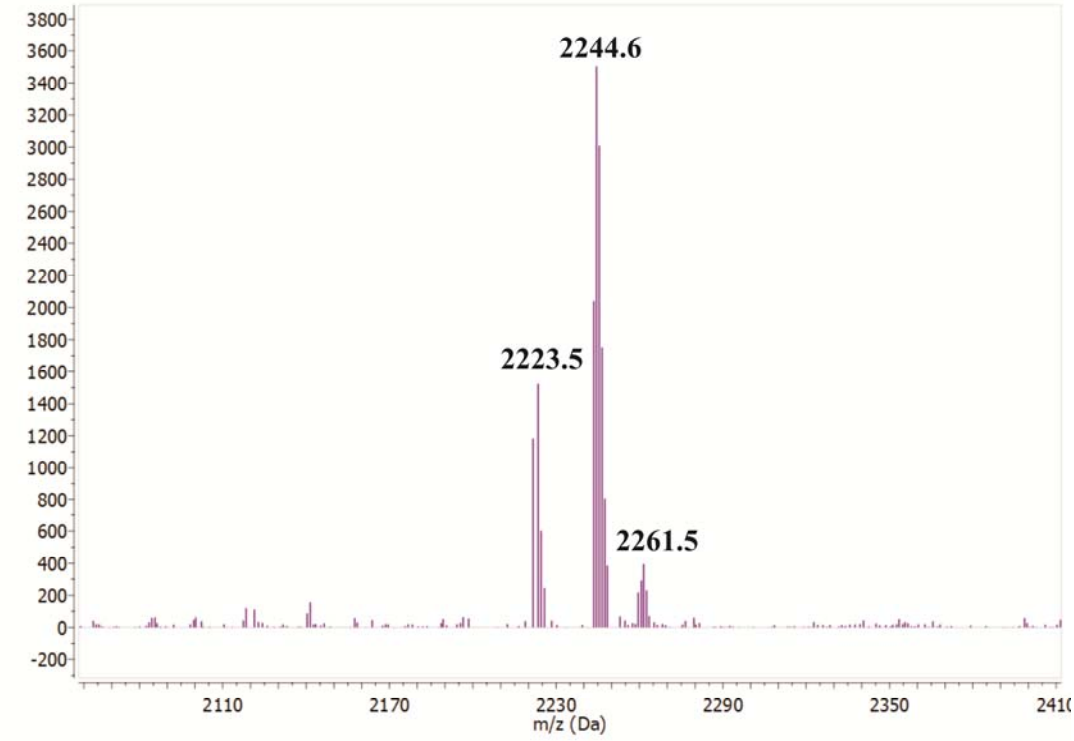


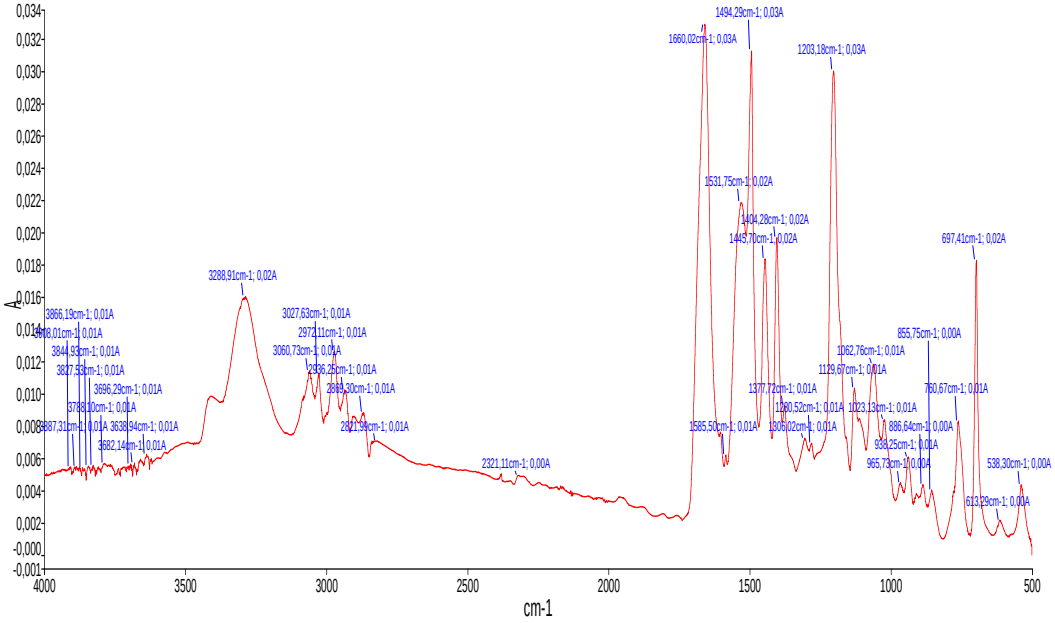
Mass spectrum (MALDI-TOF, 4-nitroaniline matrix) of 4,8,14,18,23,26,28,31,32,35-deca-[(R)-(+)-(1'-phenylethyl-1'-amidocarbonyl)methoxy]-pillar[5]arene (2).



Mass spectrum (MALDI-TOF, 4-nitroaniline matrix) of 4,8,14,18,23,26,28,31,32,35-deca-[(S)-(-)-(1'-phenylethyl-1'-amidocarbonyl)methoxy]-pillar[5]arene (3).



IR spectrum of 4,8,14,18,23,26,28,31,32,35-deca-[(R)-(+)-(1'-phenylethyl-1'-amidocarbonyl)methoxy]-pillar[5]arene (2).



IR spectrum of 4,8,14,18,23,26,28,31,32,35-deca-[(S)-(-)-(1'-phenylethyl-1'-amidocarbonyl)methoxy]-pillar[5]arene (3).

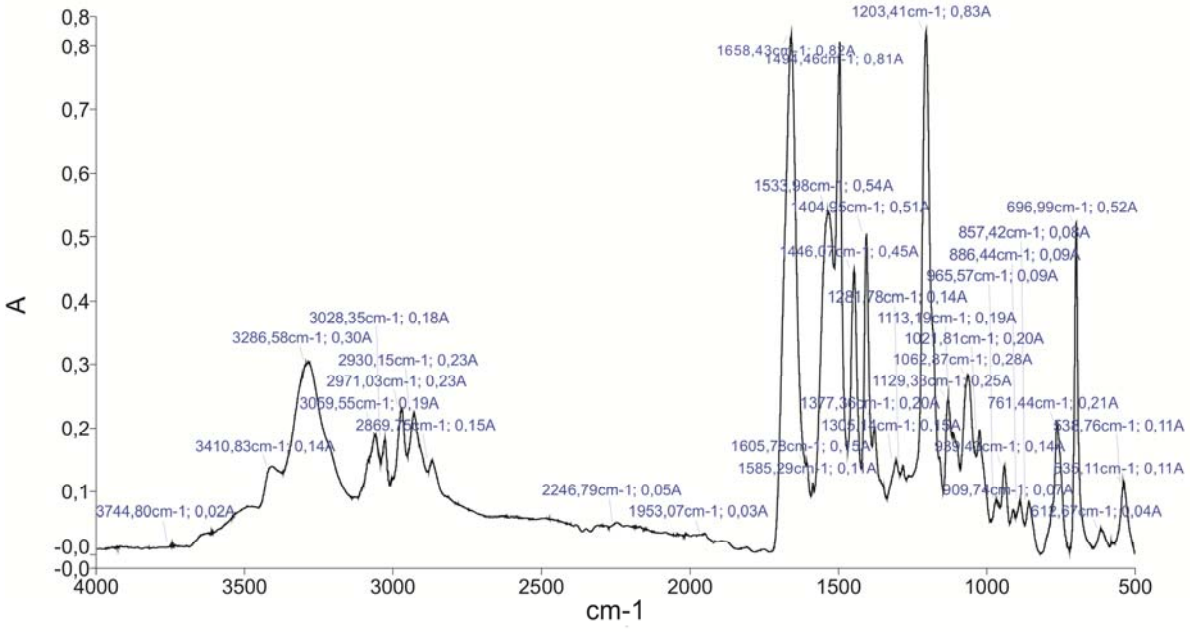
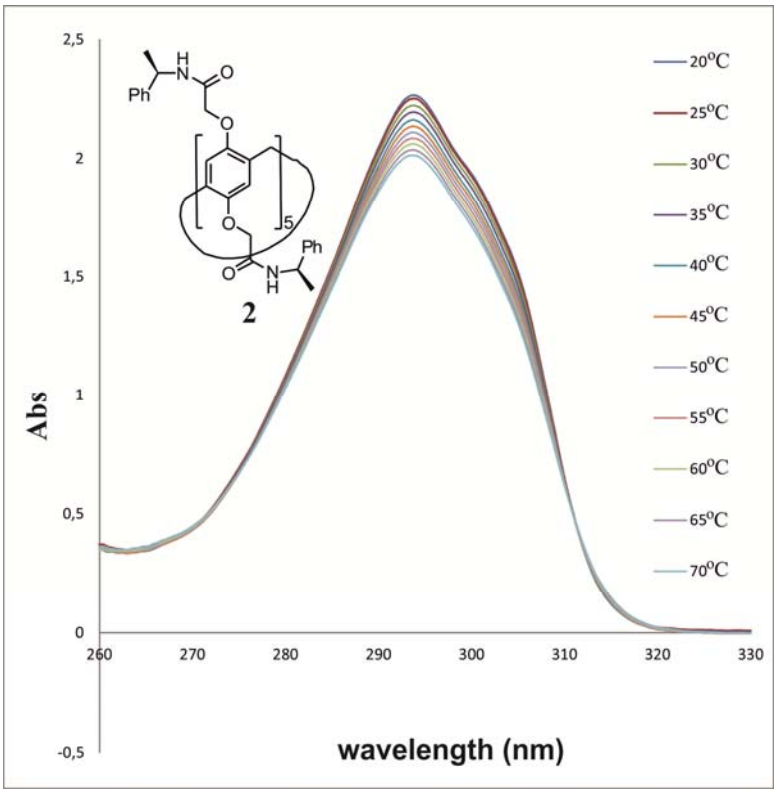


Table S1. Size of particles based on self-associates obtained with macrocycles **2** and **3** by using NTA method.

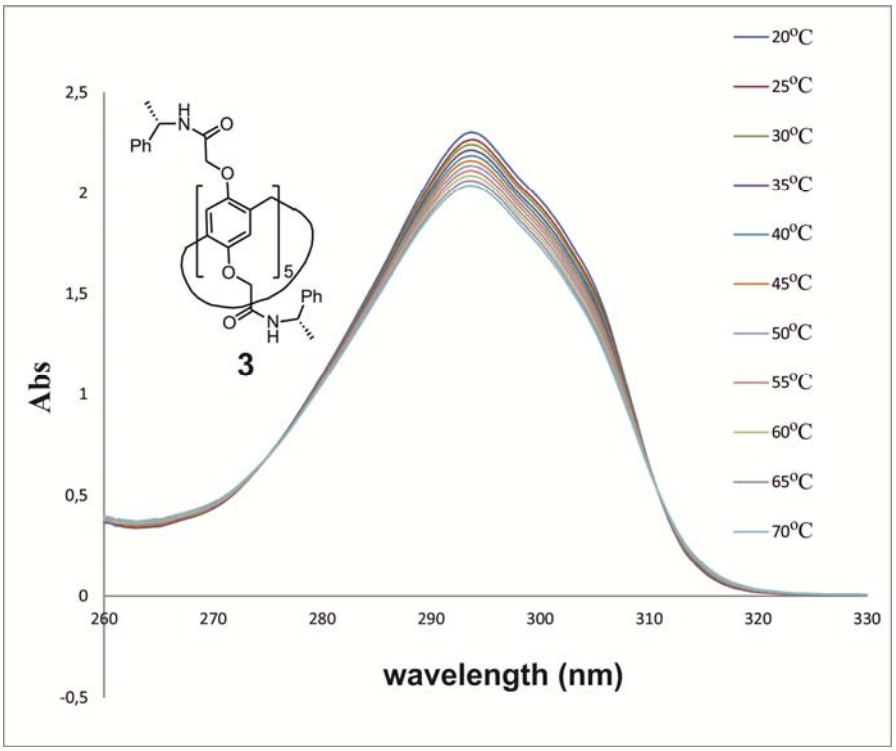
Compound	Time (days)	Bin Centre (nm)	Concentration (10^6 particles/ml)	Average D_h (nm)	Average concentration (10^6 particles/ml)
2	1	10	7.056	120.9 ± 26	193 ±-21
		30	10.827		
		50	7.478		
		70	6.006		
		90	5.378		
		110	5.031		
		130	5.266		
		150	5.342		
		170	5.786		
		190	4.674		
		210	5.211		
		230	4.945		
		250	4.770		
		270	4.143		
		290	3.946		
		310	4.097		
		330	3.930		
		350	3.682		
		370	3.350		
		390	2.781		
		410	1.997		
3	1	10	0.277143	84.9 ±0.6	256 ± 13
		30	3.063906		
		50	10.82114		
		70	21.50186		
		90	23.46743		
		110	18.21214		
		130	15.20357		
		150	13.95486		
		170	10.91029		
		190	8.756857		
		210	5.8		
		230	4.326		
		250	3.034963		
		270	1.729857		
		290	1.227596		
		310	0.849999		
		330	0.922233		
		350	1.021327		
		370	0.867843		
		390	0.43192		
		410	0.00033		
		430	0.000135		

		450	0		
2	7	10	49.31	56.4 ± 3.6	1530 ±128
		30	197.60		
		50	178.31		
		70	129.35		
		90	93.37		
		110	60.26		
		130	42.19		
		150	32.99		
		170	17.12		
		190	6.70		
		210	3.86		
		230	3.91		
		250	3.62		
		270	2.19		
		290	1.02		
		310	0.80		
		330	0.28		
		350	0.00		
		370	0.00		
		390	0.27		
		410	0.00		
		430	0.00		
		450	0.00		
3	7	10	15.05	67.2 ± 7.4	1680 ± 21
		30	126.31		
		50	172.81		
		70	165.27		
		90	154.26		
		110	125.60		
		130	79.42		
		150	52.52		
		170	33.14		
		190	20.01		
		210	12.11		
		230	8.46		
		250	5.57		
		270	2.34		
		290	1.82		
		310	1.41		
		330	0.81		
		350	0.60		
		370	0.45		
		390	0.35		
		410	0.00		
		430	0.00		
		450	0.00		
		470	0.00		

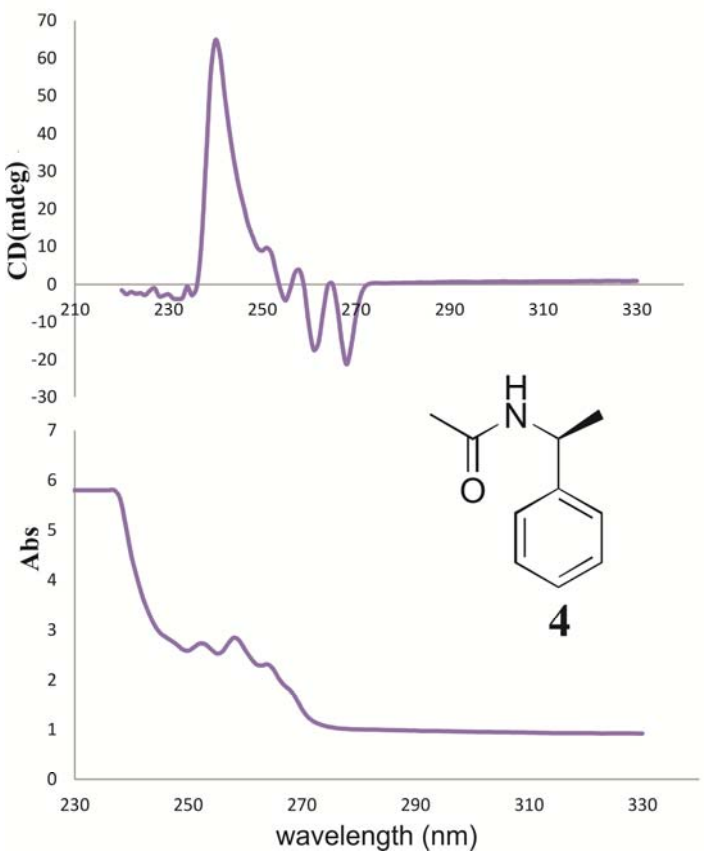
Variable-temperature UV spectra of 4,8,14,18,23,26,28,31,32,35-deca-[(R)-(+)-(1'-phenylethyl-1'-amidocarbonyl)methoxy]-pillar[5]arene (2), in DMSO (C=1×10^{-4} M).



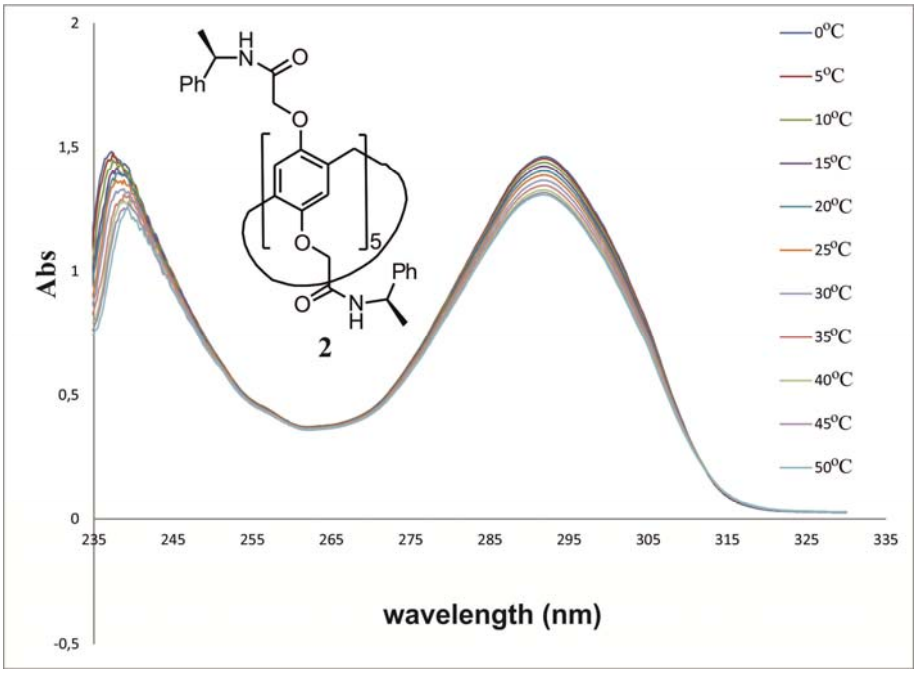
Variable-temperature UV spectra of 4,8,14,18,23,26,28,31,32,35-deca-[(S)-(-)-(1'-phenylethyl-1'-amidocarbonyl)methoxy]-pillar[5]arene (3), in DMSO (C=1×10^{-4} M).



The CD and UV spectra of the (S)-N-(1-phenylethyl)acetamide (4) (model compound) in $CHCl_3$ (C = 1×10^{-4} M) at 25 °C



Variable-temperature UV spectra of 4,8,14,18,23,26,28,31,32,35-deca-[(R)-(+)-(1'-phenylethyl-1'-amidocarbonyl)methoxy]-pillar[5]arene (2), in $CHCl_3$ (C = 1×10^{-4} M).



Variable-temperature UV spectra of 4,8,14,18,23,26,28,31,32,35-deca-[(S)-(-)-(1'-phenylethyl-1'-amidocarbonyl)methoxy]-pillar[5]arene (3), in $CHCl_3$ (C = 1×10^{-4} M).

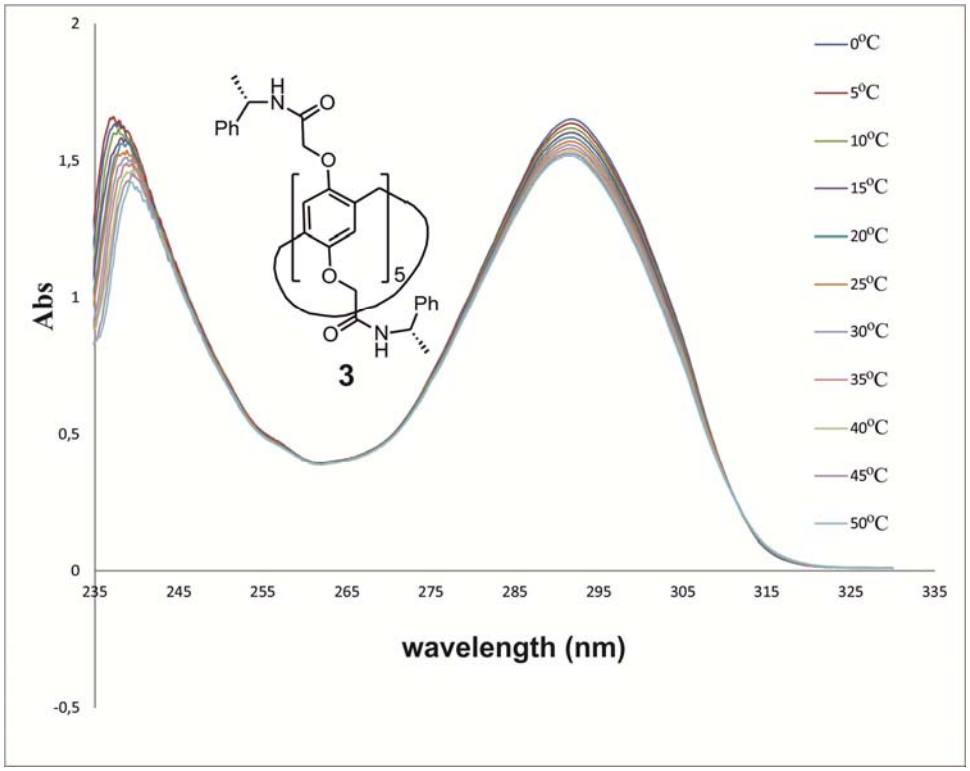
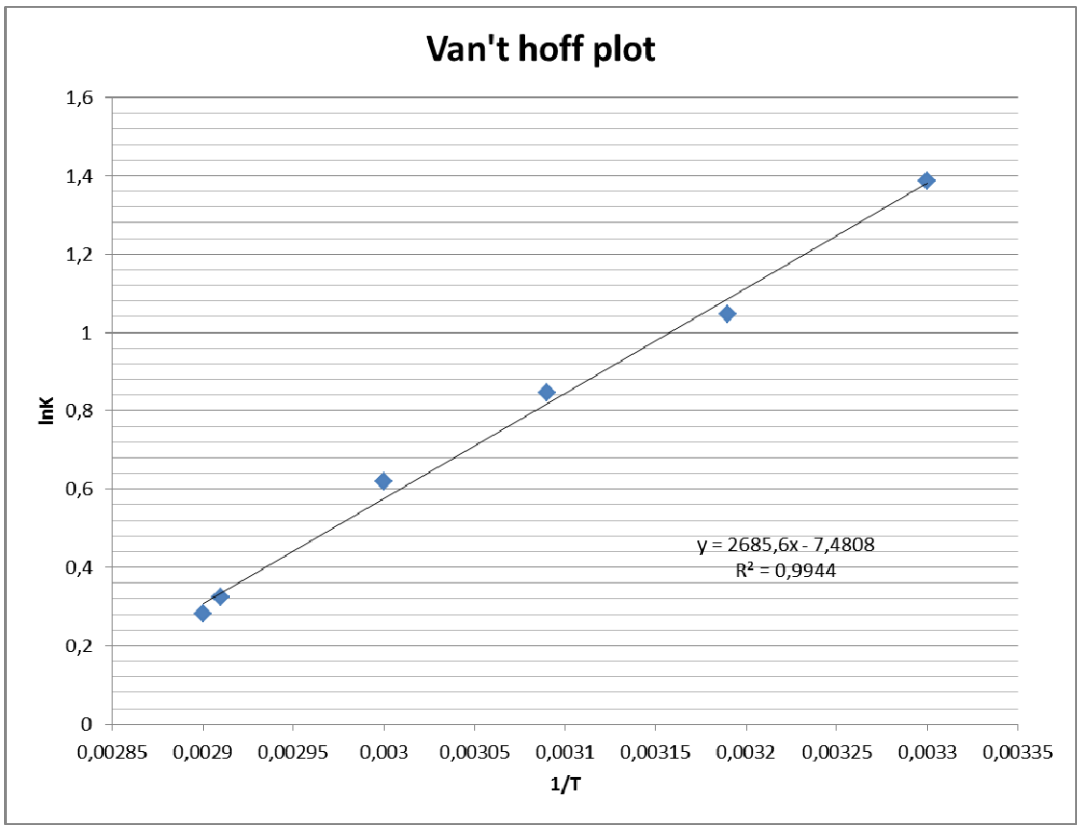


Table S2. Dependence of equilibrium constant on temperature for pSR / pRS and pRR / pSS diastereomers.

Temperature °C	the proportion of form pSR / pRS in%	the proportion of form pRR / pSS in %	Temperature K	1/T	lnK
30	80	20	303.15	0.00330	1.38629
40	74	26	313.15	0.00319	1.04597
50	70	30	323.15	0.00309	0.84730
60	65	35	333.15	0.00300	0.61904
70	58	42	343.15	0.00291	0.32277
72	57	43	345.15	0.00290	0.28185


Van't hoff plot
1,6
1,4
1,2
1
0,8
0,6
0,4
0,2
0
lnK
y = 2685,6x - 7,4808
R² = 0,9944
0,00285
0,0029
0,00295
0,003
0,00305
0,0031
0,00315
0,0032
0,00325
0,0033
0,00335
1/T