

20	458	12.1	-13.0	6.0	-6.4	459	34.8	13.1	8.6	3.3	456	18.1	1.9	2.7	0.3	457	28.1	-7.3	3.1	-0.8
19	435	44.5	-11.2	21.9	-5.5	437	76.0	-30.2	18.8	-7.5	438	40.6	-21.8	6.1	-3.3	438	27.7	-8.5	3.1	-0.9
18	431	25.8	-3.0	12.7	-1.5	430	7.8	4.1	1.9	1.0	433	32.6	-3.5	4.9	-0.5	430	37.3	-11.5	4.1	-1.3
17	403	2.5	-3.5	1.2	-1.7	375	4.9	-14.6	1.2	-3.6	398	6.3	-4.0	0.9	-0.6	383	7.6	-1.6	0.8	-0.2
16	376	25.1	-0.9	12.4	-0.4	352	10.4	3.2	2.6	0.8	365	1.9	-6.0	0.3	-0.9	360	16.5	-3.5	1.8	-0.4
15	334	1.7	13.0	0.8	6.4	333	50.3	1.7	12.5	0.4	326	36.3	7.5	5.4	1.1	326	17.3	7.5	1.9	0.8
14	305	28.3	-11.4	13.9	-5.6	316	1.1	1.8	0.3	0.5	295	33.6	26.4	5.0	4.0	297	56.1	15.3	6.2	1.7
13	285	70.6	20.9	34.8	10.3	273	100.1	70.9	24.8	17.6	272	90.0	28.9	13.5	4.3	269	43.6	-0.8	4.8	-0.1
12	245	44.8	24.6	22.1	12.1	271	66.4	-19.9	16.5	-4.9	239	25.5	3.2	3.8	0.5	254	75.1	32.4	8.3	3.6
11	219	122.0	-62.5	60.1	-30.8	227	41.1	-22.2	10.2	-5.5	216	24.5	-19.5	3.7	-2.9	212	38.1	-37.0	4.2	-4.1
10	198	0.4	-3.2	0.2	-1.6	198	5.9	-14.2	1.5	-3.5	197	33.8	-25.3	5.1	-3.8	199	11.0	-10.4	1.2	-1.2
9	156	19.1	1.1	9.4	0.5	160	91.2	-12.2	22.6	-3.0	169	35.1	-23.3	5.3	-3.5	178	88.2	-2.2	9.7	-0.2
8	150	9.2	8.4	4.5	4.1	155	2.1	-7.1	0.5	-1.8	144	20.4	0.3	3.1	0.1	143	34.6	-20.5	3.8	-2.3
7	94	6.7	1.4	3.3	0.7	109	4.3	0.3	1.1	0.1	105	8.1	7.5	1.2	1.1	105	8.6	-0.1	1.0	-0.0
6	86	0.1	-0.6	0.1	-0.3	73	6.7	-5.3	1.7	-1.3	84	4.1	-2.6	0.6	-0.4	88	3.7	-0.3	0.4	-0.0
5	58	0.1	0.1	0.1	0.1	61	35.3	9.2	8.7	2.3	61	32.8	4.8	4.9	0.7	62	6.7	0.8	0.7	0.1
4	49	0.4	0.8	0.2	0.4	51	0.0	-0.1	0.0	-0.0	48	15.1	0.3	2.3	0.1	40	44.7	3.1	4.9	0.3
3	26	14.6	-0.8	7.2	-0.4	21	20.0	-2.6	5.0	-0.6	29	49.2	-1.8	7.4	-0.3	30	62.1	-1.4	6.9	-0.2
2	23	46.3	-7.1	22.8	-3.5	9	97.1	-4.3	24.1	-1.1	14	72.3	-4.2	10.8	-0.6	15	51.9	-5.1	5.7	-0.6
1	17	62.2	6.6	30.6	3.3	8	10.2	-0.9	2.5	-0.2	10	14.4	-1.8	2.2	-0.3	10	38.1	-2.8	4.2	-0.3

<sup>a</sup> Frequencies in  $\text{cm}^{-1}$ ; dipole strengths  $D$  in  $10^{-40} \text{ esu}^2 \text{ cm}^2$ ; rotational strengths  $R$  in  $10^{-44} \text{ esu}^2 \text{ cm}^2$ .  $R$  are for the (+)-**1** enantiomer. Calculated parameters are for conformers I, II, III and IV. The second column of  $D$  and  $R$  was multiplied by the predicted percentages of the population (see Table 2).