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Table 1. ^{1}H NMR Data (ppm) for (R)(TMS)NH Compounds[b]

Cmpd. #[a]													
1					2.63 DT			1.36 M		0.84 T	0.38 BS	0.01 S	
2				3.03 M					1.05 D			0.04 S	
3					2.62 DT			1.25 M		0.86 T	0.46 BS	0.04 S	
4					2.43 DD			1.36 M		0.81 D	0.16 BS	0.04 S	
5					2.60 M			1.18 M	0.96 D	0.84 T		0.06 S	-0.06 BS
6									1.08 S		0.39 BS	0.09 S	
7				3.14 M		1.75 M	1.58 M	1.43 M	1.11 M			0.06 S	
8					2.64 DT			1.25 M	0.90 T			0.07 S	
9					2.66 DT		1.58 M	1.21 DT		0.85 T	0.46 BS	0.06 S	
10					2.70 M			1.24 M	0.98 D	0.89 T		0.07 S	-0.05 BS
11					2.49 M		1.37 M	1.09 M	0.85 T	0.81 D	0.12 BS	0.05 S	
12					2.37 M			1.27 M		0.86 T		0.07 S	-0.18 BS
13					2.53 M			1.36 M	0.91 D	0.79 T	0.53 BS	0.05 S	
14								1.27 Q	1.03 S	0.82 T	0.30 BS	0.11 S	
15	7.11 DD	6. 74 DD	6.55 D		3.03 BS							0.10 S	
16				2.55 M	1.80 M	1.61 M	1.47 M	1.17 M	1.05 M	0.94 M	0.25 BS	0.10 S	
17					2.63 DT			1.26 M		0.89 T	0.07 BS	0.06 S	
18				2.70 DT	2.16 T	2.06 S		1.42 M			0.34 BS	0.04 S	
19	7.22 D	7.19 DD	7.09 DD	3.76 D							0.40 BS	0.05 S	
20					2.65 DD			1.27 M		0.89 T		0.07 S	
21							1.63 S	1.33 S	1.00 S		0.43 BS	0.13 S	

[a]See Table 8 for compound identity.

[b]m = multiplet; DT = doublet of triplets; DD = doublet of doublets; D = doublet; BS = broad singlet; S = singlet; T = triplet.

Table 2. ^{13}C NMR Data (ppm) for (R)(TMS)NH Compounds

Cmpd. #[a]																		
1							43.75					27.56				11.03		0.37
2							43.33					28.11						0.62
3							41.65	37.35						20.13	14.07			0.09
4						50.23				32.40				20.16				0.25
5						49.05		34.42				26.05				11.10		0.84
6						48.90			33.23								1.97	
7					54.32			37.92					23.72					0.72
8							42.14	35.04				29.47	23.03			14.40		0.27
9							44.55	40.10					25.63	22.86				0.22
10						47.29	44.31					26.64		20.03	14.49			0.87
11						48.12		38.93				26.96		17.20	11.68			0.18
12					54.79					31.95					10.82			1.00
13						52.59		36.16					22.97	19.10	18.30			0.77
14						51.46		38.54		30.44					8.55	2.33		
15	147.66	129.54	117.96	116.56														-0.03
16						50.85		39.08				26.14	25.90					0.88
17							42.06	35.21		32.12		26.86	23.06		14.24			0.15
18					57.45	45.40		40.00	32.66									-0.20
19	144.61	128.42	127.22	126.61	46.13													0.11
20							42.09	35.28	32.32	29.64	27.17	23.04			14.30			0.18
21					58.83	53.60			33.64	32.09	32.07					3.00		

[a]See Table 8 for compound identity.

Table 3. ^{14}N and ^{29}Si NMR Data (ppm) for (R)(TMS)NH Compounds

Cmpd. #[a]	^{14}N Chemical Shifts	^{29}Si Chemical Shifts
1	-353	2.23
2	-330	7.21
3	-351	2.20
4	-354	2.46
5	-334	0.60
6	-319	-2.62
7	-336	1.11
8	-350	2.21
9	-351	2.23
10	-332	0.53
11	-353	2.58
12	-342	0.82
13	-340	0.69
14	-324	-2.64
15	-321	1.99
16	-334	0.48
17	-353	1.93
18	-316, -353	2.10
19	-352	3.31
20	-356	2.27
21	-321	-3.26

[a]See Table 8 for compound identity.

Table 4. EI MS Data (m/e^+) for (R)(TMS)NH Compounds

Cmpd. #[a]					
1	131	116	102	73	59
2	131	116	100	73	59
3	145	130	102	73	59
4	145	130	102	73	59
5	144	130	116	73	59
6	145	130	114	73	58
7	157	142	128	100	73
8	159	144	102	73	59
9	159	144	102	88	73
10	158	144	116	73	59
11	159	144	102	73	59
12	158	144	130	73	59
13	158	144	116	73	59
14	158	144	130	73	59
15	165	150	134	120	73
16	171	156	128	100	73
17	173	158	102	73	59
18	174	159	85	73	58
19	179	164	135	73	59
20	187	172	102	73	59
21	200	186	130	73	57

[a]See Table 8 for compound identity.

Table 5. IR Data (cm^{-1}) for (R)(TMS)NH Compounds[a]

Comp. #[b]												
1	3411w	2957vs	1457m	1398m	1249s	1126s	1059m	1005m	867m	835vs	745m	681m
	617 w	331vs	247s									
2	3399w	2960vs	1465m	1400s	1381s	1302m	1249vs	1170vs	1127vs	1058m	1016vs	885vs
	843vs	782m	746m	723m	680m	617w	331vs	247vs				
3	3412 m	2960vs	1465m	1396s	1289m	1249vs	1216w	1126vs	1104s	1065m	1038m	979m
	894vs	874vs	841vs	745s	681m	617w	330vs	281vs	248s			
4	3412w	2956vs	1469w	1398m	1374w	1250vs	1128m	1102s	1058m	913m	874s	848vs
	745m	682w	624w	330vs	279w	247m						
5	3397w	2967vs	1456m	1404s	1371m	1289w	1249vs	1162s	1133s	1104m	1045s	1009s
	979w	943s	874vs	839vs	745m	679m	617w	505w	331vs	291w	247vs	
6	3390w	2960vs	1465w	1378s	1361s	1258vs	1229vs	1019vs	870vs	841vs	775m	766m
	678m	617w	452m	331vs	293m	247s						
7	3398m	2967vs	1411s	1248vs	1165s	1124s	1054m	946m	895vs	835vs	745s	681m
	617w	444s	368s	313vs	280s	247vs						
8	3415w	2956vs	1460w	1397m	1248vs	1203w	1121m	1101m	1025w	940w	872s	835vs
	745m	681w	617w	348s	331vs	296vs						
9	3413w	2967vs	1468s	1396s	1367s	1302w	1248vs	1216m	1170w	1130s	1101vs	1032w
	987m	883vs	836vs	745s	681m	617w	466w	397m	310s	289s		
10	3396w	2960vs	1466m	1402m	1289w	1248vs	1159s	1130m	1071w	1039m	1009w	968m
	918m	879s	834vs	788w	745m	716w	679w	624w	505w	330s	279w	247s

[a]w = weak, m = medium, s = strong, vs = very strong.
[b]See Table 8 for compound identity.

Table 5 (Continued). IR Data (cm^{-1}) for (R)(TMS) NH Compounds

Comp. #[b]												
11	3414s	2921vs	1466vs	1400vs	1302s	1256 vs	1111vs	1058vs	1032s	1012s	973m	913vs
	874vs	749vs	683vs	624m	487m	445m	397m	316vs				
12	3398w	2960vs	1456m	1407s	1381m	1341w	1249vs	1163s	1132s	1057s	1011s	889vs
	833vs	775m	745m	729w	679m	624w	519w	331vs	293m	247vs		
13	3401w	2967vs	1466w	1405m	1369m	1248s	1190w	1134m	1117m	1071w	1045m	961m
	907m	866s	836vs	744w	679w	624w	519w	331vs	293s	247vs		
14	3386w	2967vs	1464m	1400s	1378s	1361s	1335m	1289m	1249vs	1201s	1063s	1021vs
	906s	867vs	841vs	758s	677m	617w	492m	448m	375m	331vs	293vs	247s
15	3383s	3041s	2957s	1603vs	1506vs	1476vs	1385vs	1302vs	1264vs	1180m	1157w	1076m
	1030m	997s	907vs	840vs	753vs	693vs	625m	431vs	366vs	299s	259s	226s
16	3395w	2927vs	1453s	1400s	1361w	1295w	1256vs	1111vs	1052w	999m	907vs	887vs
	841vs	795w	749m	683m	617w	492m	456m	379s	332s	290s	246s	
17	3414m	2960vs	1467s	1397s	1249vs	1190w	1131vs	1104vs	1045w	944m	874vs	835vs
	745s	681m	624w	489w	442w	406m	330s	298s				
18	3414m	3329m	2947vs	1466vs	1407vs	1302s	1256vs	1157vs	1111vs	1057vs	973s	841vs
	756vs	681s	624m	512m	445m	388s	352s	331vs	294s	253s		
19	3407w	3028m	2954s	1494m	1452s	1397s	1249vs	1104s	1070s	1028m	871vs	841vs
	748s	729s	697vs	624w	584w	462s	426s	311vs	291s	229m		
20	3414s	2921vs	1467vs	1394vs	1287s	1249vs	1181s	1123vs	1104vs	1055vs	1016s	978s
	950s	858vs	749vs	683vs	615m	521 m	493m	446m	330s	290vs		
21	3415w	3387m	2966vs	1472s	1388s	1381vs	1340m	1315m	1249vs	1229vs	1153s	1019vs
	979w	912vs	834vs	770m	755s	676s	617w	486m	438m	331vs	293s	247s

[a]w = weak, m = medium, s = strong, vs = very strong.

[b]See Table 8 for compound identity.

Table 6. UV/VIS Data for (R)(TMS)NH Compounds

Comp. #[a]	λ_{max} (nm)	ε (l/mol·cm)
1	209.1	1269
2	209.4	1908
3	209.1	2805
4	209.1	2558
5	209.0	4922
6	209.1	2049
7	209.6	1171
8	209.0	1424
9	209.0	1211
10	208.2	1566
11	209.6	709
12	210.2	1594
13	209.9	278
14	209.1	1030
15	242.0	8691
16	209.5	2171
17	209.1	1722
18	209.1	5256
19	210.1	7986
20	210.1	904
21	209.1	1517

[a]See Table 8 for compound identity.

Table 7. Elemental Analyses and Isolated, Purified Yields for (R)(TMS)NH Compounds

Cmpd. #[a]	Carbon		Hydrogen		% Yield
	Theoretical	Experimental	Theoretical	Experimental	
1	54.89	55.03	13.05	12.99	47
2	54.89	54.72	13.05	12.86	53
3	57.85	57.87	13.18	13.30	66
4	57.85	57.93	13.18	13.16	54
5	57.85	58.04	13.18	13.17	59
6	57.85	58.25	13.18	13.29	47
7	61.07	61.01	12.17	12.30	54
8	60.29	60.09	13.28	13.07	70
9	60.29	59.99	13.28	13.48	81
10	60.29	60.06	13.28	13.17	53
11	60.29	60.06	13.28	13.60	34
12	60.29	60.20	13.28	13.02	61
13	60.29	60.22	13.28	13.19	79
14	60.29	60.44	13.28	13.25	82
15	65.39	65.57	9.15	9.38	68
16	63.08	63.48	12.35	12.26	60
17	62.35	62.47	13.37	13.14	74
18	55.10	55.16	12.72	12.63	72
19	66.97	66.98	9.56	9.87	85
20	64.09	64.52	13.45	13.17	80
21	65.59	65.72	13.51	13.43	75

[a]See Table 8 for compound identity.

Table 8. Alkyl Substituent Identities, Preparation Methods, and Boiling Point Data for (R)(TMS)NH Compounds

Cmpd. #	Alkyl Group	Preparation Method[a]	Boiling Point (°C)[b]	Boiling Point (°C / mmHg) [Lit.]
1	*n*-propyl	A	110	86 / 11[30]
2	*i*-propyl	A, B	101	98 / 760[14]
3	*n*-butyl	A	142	111 / 11[30]
4	*i*-butyl	A	121	
5	*s*-butyl	B	125	
6	*t*-butyl	A, B	118	55 / 85[14]
7	*c*-pentyl	B	162	
8	*n*-pentyl	B	159	161.4-162.4 / 760[31]
9	*i*-pentyl	B	151	
10	1-methylbutyl	B	142	
11	2-methylbutyl	B	147	
12	1-ethylpropyl	B	145	
13	1,2-dimethylpropyl	B	134	
14	*t*-pentyl	B	138	35-40 / 10^{-2} [32]
15	phenyl	B	199	63 / 3[33]
16	*c*-hexyl	B	185	59 / 5[33]
17	*n*-hexyl	B	180	
18	N,N-dimethyl-3-aminopropyl	B	177	
19	benzyl	B	198	95-96 / 15[31]
20	*n*-heptyl	B	197	
21	1,1,3,3-tetramethylbutyl	B	192	190-195 / 760[34]

[a]See experimental section for details for methods A and B.
[b]Determined by DSC; for procedure see experimental section.

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Table 9. ^{1}H NMR Data (ppm) for Zn[N(R)(TMS)]$_2$ Compounds[d]

Cmpd. #[a,c]											
22		3.13 M	2.79 M						0.92 T	0.80 T	0.30 S	0.26 S
22[b]			3.05 T		1.63 BS					0.86 T		0.25 S
23		3.19 M						1.10 D				0.16 S
24		3.20 M	3.05 M	1.75 M		1.52 M	1.37 M	1.26 M	0.98 T	0.91 T	0.34 S	0.29 S
24[b]		3.12 T			1.66 BS		1.32 M			0.93 T		0.27 S
25			2.85 D				1.42 M			0.93 D		0.22 S
26			2.81 M				1.38 M	1.18 M	1.09 D	0.92 T		0.16 S
27								1.25 S				0.21 S
28		3.40 M		1.97 M	1.63 M		1.45 M		1.00 M			0.17 S
29		3.13 M	3.01 M				1.47 M		0.92 T	0.87 T	0.30 S	0.21 S
29[b]			3.08 DD		1.64 BS		1.30 M			0.89 T		0.24 S
30		3.23 M	3.13 M		1.63 M				0.99 D	0.93 D	0.36 S	0.30 S
30[b]		3.17 T			1.61 M					0.94 D		0.28 S
31			2.91 M				1.30 M	1.11 D		0.90 T		0.17 S
32			2.91 M				1.30 M	1.11 D		0.90 T		0.17 S
33			2.55 M			1.51 M			1. 01 M	0.93 T		0.16 S
34			2.69 M					1.22 M	1.08 D	0.99 D	0.88 D	0.18 S
35							1.43 Q	1.18 S		0.90 T		0.23 S
36[b]	7.04 BS	6.79 BS										0.16 S
37			2.74 M	2.50 M	1.62 M	1.50 M		1.21 M		0.92 M	0.87 M	0.18 S
38		3.10 M	3.00 M			1.57 M		1.29 M		0.87 DT	0.29 S	0.19 S
38[b]			3.07 DD		1.63 BS			1.29 M		0.86 T		0.22 S
39		3.20 DD	2.15 DD	2.00 S			1.43 M					0.36 S
40[b]	7.11 M	3.82 S										0.04 S
41		3.25 M			1.68 M		1.30 M			0.90 DT	0.33 S	0.25 S
41[b]		3.12 DD			1.68 BS		1.30 M			0.88 T		0.26 S
42					1.69 S		1.38 S		1.01 S			0.28 S

[a]Ambient spectrometer temperature, unless indicated otherwise. [b]Spectrometer temperature = 353 K. [c]See Table 14 for compound identity. [d]M= multiplet, BS = broad singlet, DD = doublet of doublets, S = singlet, Q = quartet, T = triplet.

Table 10. ^{13}C NMR Data (ppm) for $Zn[N(R)(TMS)]_2$ Compounds

Cmpd. #[a,c]																
22	51.54	50.83						33.08	32.63				11.67	11.41	2.92	2.01
22[b]	51.06								32.33					11.28		2.43
23					47.19			33.34								2.31
24				49.35	48.86	42.90	41.82			21.15	21.05		14.66	14.04	3.04	2.14
24[b]					48.82		41.70				20.87			13.89		2.51
25	55.92							35.83			20.58					1.85
26	53.04					39.86	39.79	31.45	31.33					11.73		2.39
27	53.14						37.54									5.19
28	58.86					43.27				23.53						2.35
29				49.49	48.99	40.25	39.35	30.07	30.04	23.35	22.82		14.48	14.27	2.92	2.04
29[b]				49.16			39.19		30.00		22.83			14.01		2.50
30		49.87	47.83	47.67	47.40	27.95	27.28	23.45	23.33	23.34	22.92	22.81	3.14	3.00	2.44	2.22
30[b]				49.35	47.34				27.47		22.83					2.65
31	51.15	51.13	50.05	50.01				31.87	31.76	20.57	20.55		14.44	14.40		2.40
32	54.60					42.47	38.93		27.96			18.02		11.73		2.58
33	58.89						37.23							11.31		2.66
34	57.32	57.28				40.78	40.71	28.74	28.47	20.46	20.43	19.46	19.44			2.43
35	55.57					42.55		34.28							9.94	5.33
36[b]	129.64	126.92	123.61	120.04												2.42
37	55.34				45.51				26.59	26.11						2.53
38				49.52	49.02	40.53	39.64	32.59	31.92	27.58	23.26	23.01	14.30	14.08	2.89	2.03
38[b]					49.19		39.53		32.03	27.45	22.86			13.83		2.51
39	62.89			49.13	47.85			32.16								2.44
40[b]	148.29	129.48	128.15	127.32	51.19											1.27
41	49.67	49.15	40.75	39.82	32.61	32.27	30.21	29.55	28.01	27.96	23.11	22.96	14.39	14.29	3.03	2.15
41[b]				49.30		39.72		32.24	29.60	27.89	22.79			13.94		2.60
42	65.34	57.47					36.12	32.21	32.08							5.60

[a]Ambient spectrometer temperature, unless indicated otherwise. [b]Spectrometer temperature = 353 K. [c] See Table 14 for compound identity

Table 11. ^{14}N and ^{29}Si NMR Data for $Zn[N(R)(TMS)]_2$ Compounds[d]

Cmpd. #[a,c]	^{14}N Chemical Shifts	^{29}Si Chemical Shifts
22	-339	9.71, 0.73
22[b]	ND	8.59 (B), 0.41 (B)
23	-298	0.27
24	-348	9.65, 0.67
24[b]	ND	8.48 (B), 0.11 (B)
25	-337	2.55 (B)
26	-305	0.55
27	-291	-4.70
28	-308	1.12
29	-352	9.55, 0.60
29[b]	ND	9.21(B), 0.67(B)
30	-333	9.47, 0.67
30[b]	-332	9.33(B), 1.05(B)
31	-299	0.55
32	-359	2.95 (B)
33	-314	0.99
34	-311	0.71, 0.69
35	-296	-4.55
36	-267	9.84 (B), 0.07 (B)
36[b]	-293	4.83(B)
37	-298	0.32
38	-350	9.55, 0.59
38[b]	ND	9.38(B), 0.79(B)
39	-349	-2.85
40	-351	8.16, 6.20 (B), 3.71, 2.66 (B)
40[b]	ND	7.93
41	-346	9.59, 0.64
41[b]	ND	9.22(B), 0.53(B)
42	-284	-6.01

[a]Ambient spectrometer temperature, unless indicated otherwise; [b]Spectrometer temperature = 353 K; [c]See Table 14 for compound identity; [d]ND = not determined. B = broad.

Table 12. EI MS Data (m/e^+) for $Zn[N(R)(TMS)]_2$ Compounds[a]

Cmpd. #[b]					
22	324	309	295	224	194
23	323	309	293	194	180
24	352	337	309	208	166
25	351	337	309	208	166
26	351	337	323	208	194
27	352	337	208	192	152
28	376	361	347	220	192
29	380	365	323	222	180
30	380	365	323	222	166
31	380	365	337	222	180
32	380	365	324	222	166
33	380	365	351	222	208
34	380	365	337	222	194
35	380	365	351	250	222
36	392	377	283[c]	243	228
37	404	389	361	234	206
38	408	393	337	236	224
39	411	395	338	236	166
40	420	405	343	311[c]	242
41	437	422	352	250	224
42	465	449	393	264	208

[a]All fragments represent zinc-containing species, unless indicated otherwise; [b]See Table 14 for compound identity; [c]Fragment does not contain zinc.

Table 13. IR Data (cm^{-1}) for $Zn[N(R)(TMS)]_2$ Compounds[a]

Comp. #[b]												
22	1456vs	1401s	1370vs	1354s	1302s	1242vs	1157vs	1080vs	1051vs	1009vs	899vs	836vs
	742vs	677vs	625m	553s	479vs	467vs	447vs	381vs	327s	294m	269s	230s
23	2921vs	1464vs	1433vs	1386vs	1358vs	1300s	1256vs	1202vs	1041vs	1018vs	883vs	849vs
	786vs	747vs	673vs	633vs	540m	521w	481vs	430s	370vs	349s	323s	261vs
24	1361m	1253vs	1158m	1073vs	1036s	978s	949s	835vs	751vs	677s	625w	550s
	496s	472s	418s	312s								
25	1466vs	1390vs	1363s	1244vs	1159m	1062vs	1009vs	947vs	923vs	848vs	767vs	746vs
	678s	663vs	622w	572m	548s	517vs	463vs	426s	409s	396s	338vs	238m
26	2950vs	1452m	1390w	1368s	1347m	1297w	1246vs	1165vs	1136s	1120s	1053vs	1009vs
	974m	949vs	895vs	830vs	779w	741s	675m	626w	578w	547w	436w	383w
27	1464vs	1388s	1361vs	1298w	1247vs	1198vs	1044vs	1020vs	884vs	830vs	790s	747vs
	670vs	636m	538w	480vs	431s	368s	349m	323m	260vs			
28	2950vs	1472m	1439m	1395m	1357s	1287m	1245vs	1197m	1171s	1123vs	1058s	1027s
	975vs	911vs	829vs	742s	675s	613m	486w	406m	372w	348w	255w	
29	2914vs	1464vs	1401s	1378vs	1359vs	1298s	1250vs	1214s	1159s	1149s	1115s	1073vs
	995vs	860vs	753vs	681vs	625s	559vs	474vs	445vs	364s	328s	303m	290m
30	1467vs	1367vs	1341w	1302m	1248vs	1241vs	1159s	1126m	1067vs	1019vs	988vs	943vs
	855vs	786s	749vs	678vs	624w	552vs	486s	454vs	402m	379s	324m	305m
31	2934vs	1451vs	1368vs	1348vs	1248vs	1160vs	1140vs	1070vs	1040vs	1005vs	974vs	925vs
	892vs	826vs	741vs	675vs	623m	572m	546m	505m	454m	373m	344m	258m
32	2960vs	1473s	1361m	1256s	1150m	1078s	1025s	940s	907m	848vs	749s	716m
	683m	624w	565m	525m	478m	442m	335m	302m				

[a]w = weak, m = medium, s = strong, vs = very strong; [b]See Table 14 for compound identity.

Table 13 (Continued). IR Data (cm^{-1}) for $Zn[N(R)(TMS)]_2$ Compounds

Comp. #[b]												
33	2967vs	1464s	1352s	1308m	1246vs	1159s	1124vs	1061vs	1013s	917vs	864s	827vs
	794s	741s	674s	622m	606m	583m	481m	444m	374m	351m	317m	247m
34	2956vs	1458vs	1384vs	1368vs	1246vs	1181s	1153vs	1131vs	1107vs	1072vs	1051s	1010
	988vs	971vs	953vs	906vs	832vs	742vs	676vs	591s	508m	454s	386s	308s
35	2946vs	1464vs	1377vs	1358vs	1290s	1248vs	1223vs	1186vs	1171vs	1065vs	1024vs	911vs
	878vs	829vs	761s	747vs	670vs	631s	530w	475m	428m	396m	363m	267s
36	1586m	1462vs	1377s	1243vs	1184s	1079w	1030w	996w	923s	882m	847s	834s
	791m	752m	704m	693m	625w	584w	562w	515w	505w	401w	338w	319w
37	2935vs	1447vs	1393s	1361vs	1345s	1244vs	1148vs	1103vs	1048s	996vs	932vs	828vs
	743vs	674vs	649s	612vs	505m	455s	393vs	351m	312w	277w	253m	226s
38	2921vs	1466vs	1401s	1379vs	1360vs	1296vs	1250vs	1198s	1148vs	1119vs	1076vs	1018vs
	993vs	850vs	750vs	679vs	625m	563vs	477vs	445s	399s	353m	325m	306s
39	1473vs	1362m	1304w	1274m	1237vs	1174vs	1157s	1107vs	1059vs	1029m	1014m	988vs
	969s	914vs	886vs	852vs	830vs	767s	735s	668m	521w	474m	445m	408w
40	3033vs	2953vs	1953m	1874m	1815m	1749w	1604s	1493vs	1452vs	1354vs	1249vs	1190vs
	1057vs	1011vs	847vs	756vs	701vs	630s	607s	523s	500s	466vs	388s	323s
41	2927vs	1469vs	1399s	1380s	1359s	1300s	1254vs	1191m	1077vs	1010vs	934vs	881vs
	839vs	778vs	751vs	723vs	679s	625m	563s	497vs	479vs	427s	309s	
42	2951vs	1479s	1437m	1397m	1380s	1364s	1342w	1246vs	1143vs	1037s	1020vs	961s
	938m	915s	871vs	826vs	747s	670s	646w	599w	505w	478w	446w	279w

[a]w = weak, m = medium, s = strong, vs = very strong; [b]See Table 14 for compound identity.

Table 14. Alkyl Substituent Identities and UV/VIS Data for $Zn[N(R)(TMS)]_2$ Compounds

Comp. #	$Zn[N(Si(CH_3)_3)(R)]_2$	λ_{max} (nm)	ε (l/mol·cm)
22	*n*-propyl	209.2	4608
23	*i*-propyl	215.2	6509
24	*n*-butyl	209.2	3315
25	*i*-butyl	209.2	4641
26	*s*-butyl	209.3	8978
27	*t*-butyl	210.6	9643
28	*c*-pentyl	209.2	6945
29	*n*-pentyl	214.1	4484
30	*i*-pentyl	209.2	12505
31	1-methylbutyl	210.1	10434
32	2-methylbutyl	210.0	2597
33	1-ethylpropyl	209.1	7865
34	1,2-dimethylpropyl	209.0	9571
35	*t*-pentyl	209.2	6088
36	phenyl	246.4	20460
37	*c*-hexyl	209.2	7191
38	*n*-hexyl	210.0	10388
39	N,N-dimethyl-3-aminopropyl	213.0	7744
40	benzyl	211.5	18088
41	*n*-heptyl	209.3	3168
42	1,1,3,3-tetramethylbutyl	208.3	11561

Table 15. Elemental Analyses and Isolated, Purified Yields for $Zn[N(R)(TMS)]_2$ Compounds

Cmpd. #[a]	Carbon		Hydrogen		%Zn		% Yield
	Th.[c]	Exp.[c]	Th.[c]	Exp.[c]	Th.[c]	Exp.[c]	
22	44.21	44.44	9.90	9.64	20.06	20.17	45
23	44.21	44.15	9.90	9.79	20.06	20.00	82
24	47.50	47.41	10.25	10.25	18.47	18.42	55
25	47.50	47.35	10.25	10.01	18.47	17.95	89
26	47.50	47.45	10.25	9.91	18.47	18.43	70
27	47.50	47.72	10.25	10.26	18.47	18.77	66
28	50.83	50.56	9.60	9.82	17.30	17.09	45
29	50.29	50.37	10.55	10.90	17.11	17.47	72
30	50.29	50.31	10.55	10.64	17.11	16.58	30
31	50.29	50.29	10.55	10.80	17.11	16.97	74
32	50.29	50.28	10.55	10.65	17.11	17.50	31
33	50.29	50.09	10.55	10.53	17.11	16.96	71
34	50.29	50.13	10.55	10.39	17.11	17.44	79
35	50.29	50.50	10.55	10.41	17.11	16.91	82
36	54.87	54.56	7.16	7.00	16.60	16.92	31
37	53.23	53.28	9.93	9.54	16.10	15.86	25
38	52.71	52.89	10.81	10.69	15.94	15.89	73
39	46.63	46.80	10.27	10.61	15.87	15.74	78
40	56.91	57.24	7.64	7.41	15.49	15.49	68
41	54.82	55.25[b]	11.04	10.69[b]	14.92	13.79[b]	39[b]
42	56.67	56.67	11.24	11.23	14.03	14.05	70

[a]See Table 14 for the compound identity; [b]Product contained trace free amine, which was not removed, after repeated purification; [c]Th. = theoretical values, Exp. = experimental values.

Table 16. Melting Point Data, Purification Methods, and Thermal Analysis Data for $Zn[N(R)(TMS)]_2$ Compounds

Cmpd. #[a]	Melting Point (°C)[d]	Purification Method[b]	Boiling Point (°C)[d]/Torr	TGA onset (°C)	TGA 50% (°C)	TGA final (°C)
22	51	R(Et_2O, -80 °C), S, D	123 /10^{-2}	188	212	230[c] (12%)
23	ND	D	54 /6·10^{-2}	58	145	171
24	36-37	S(110°C /10^{-2} Torr)	ND	207	231	249[c] (12%)
25	76-77	D	75 /10^{-2}	97	182	207
26	ND	D	53 /3·10^{-2}	78	167	181
27	47	D	65 /5·10^{-2}	83	175	190
28	ND	D	114 /10^{-3}	201	231	255
29	ND	D	122 /10^{-5}	205	239	257[c] (17%)
30	103	R(Et_2O, -80 °C), D	159 /7·10^{-3}	191	220	244
31	ND	D	92 /10^{-3}	177	205	229
32	ND	D	80 /10^{-3}	173	203	228
33	ND	D	113 /2·10^{-2}	180	206	230
34	ND	D	85 /10^{-3}	179	207	231
35	ND	D	110 /10^{-3}	177	209	236
36	116-117	S(120 °C /10^{-3} Torr)	ND	227	263	281[c] (20%)
37	ND	D	129 /10^{-2}	225	254	280
38	ND	D	127 /10^{-5}	212	240	207[c] (17%)
39	97	R(Et_2O, -80 °C), S(100 °C /10^{-2} Torr)	ND	213	245	266
40	ND	D	155 /10^{-4}	205	252	277[c] (20%)
41	ND	D, R(Hexane, -80 °C)	135 /10^{-4}	219	253	281[c] (15%)
42	ND	D	140 /10^{-3}	235	258	283

[a]See Table 14 for the compound identity; [b]R = Recrystallization, S = Sublimation, D = Distillation; [c]Decomposition observed, with residual weight percent in parentheses; [d]ND = not determined.

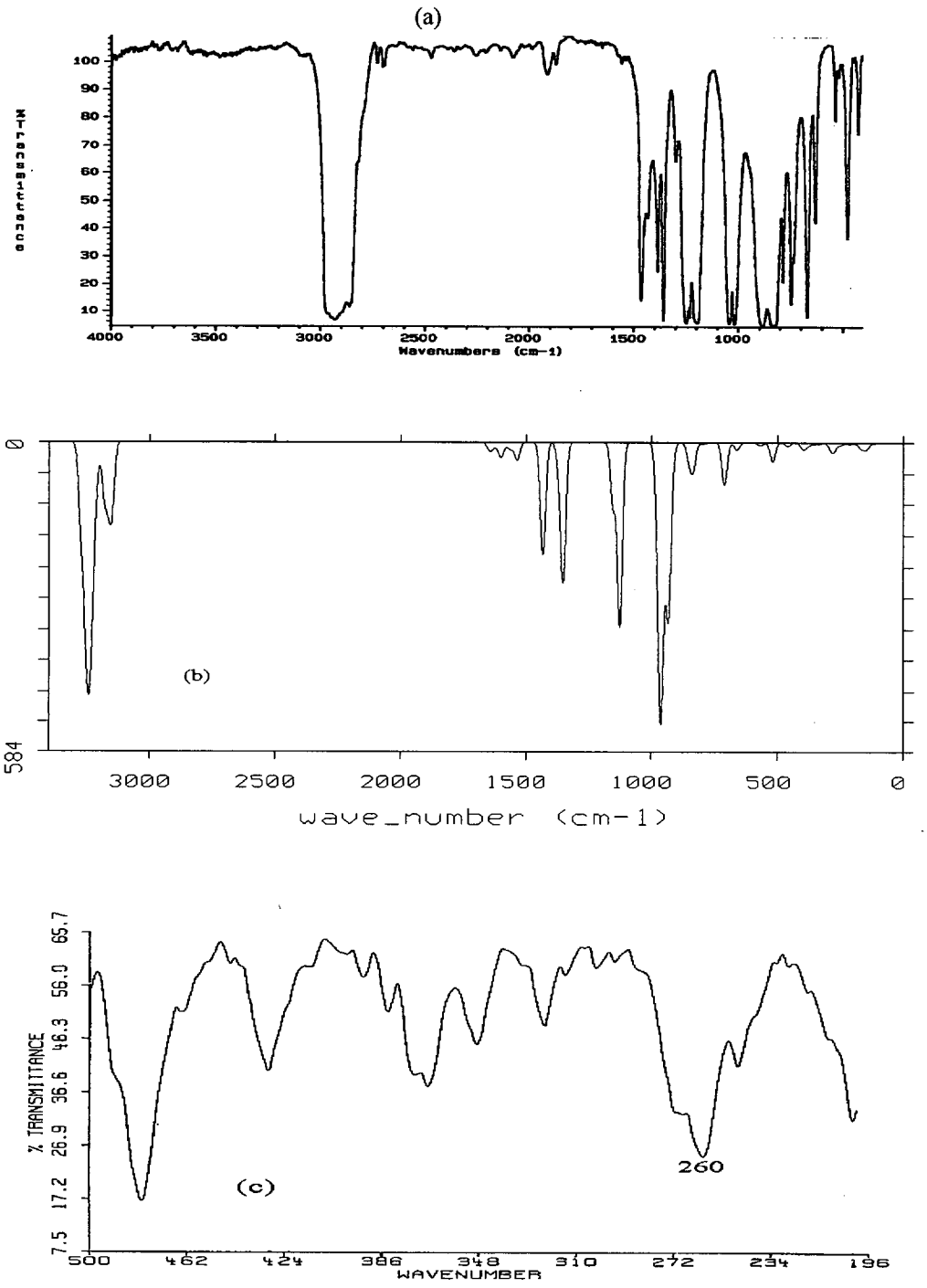


Figure 4. IR Spectra for Zn[(*t*-Bu)(TMS)]$_2$, **27**; (a) calculated, (b) observed range of 4000-400 wavenumbers, (c) observed range of 500-200 wavenemubers.

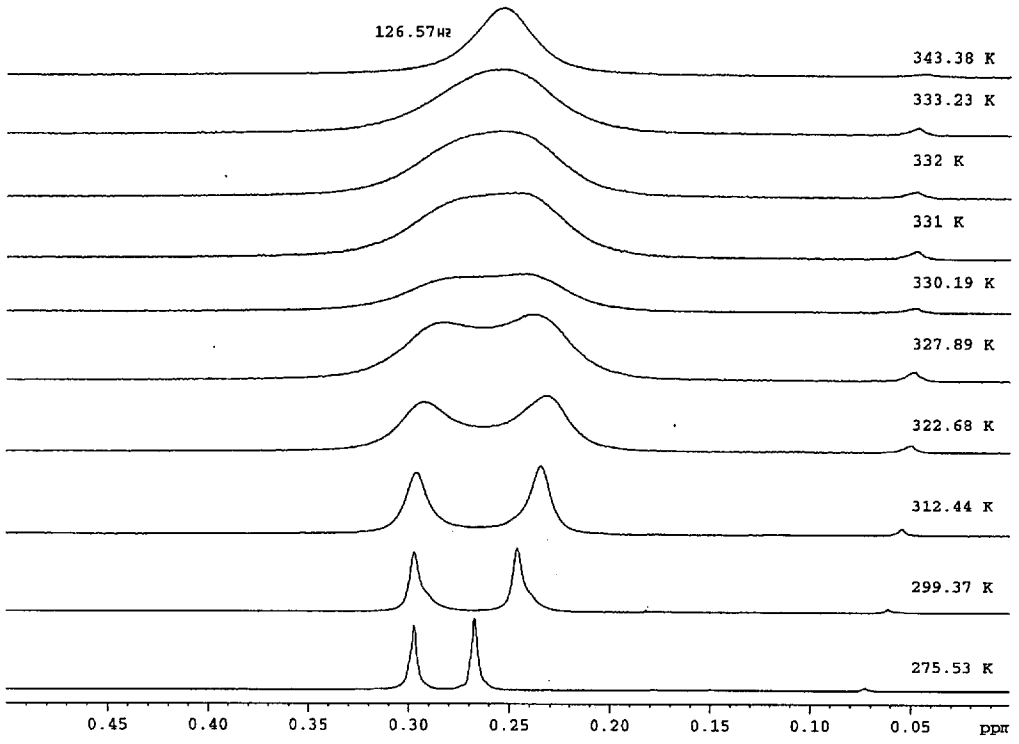
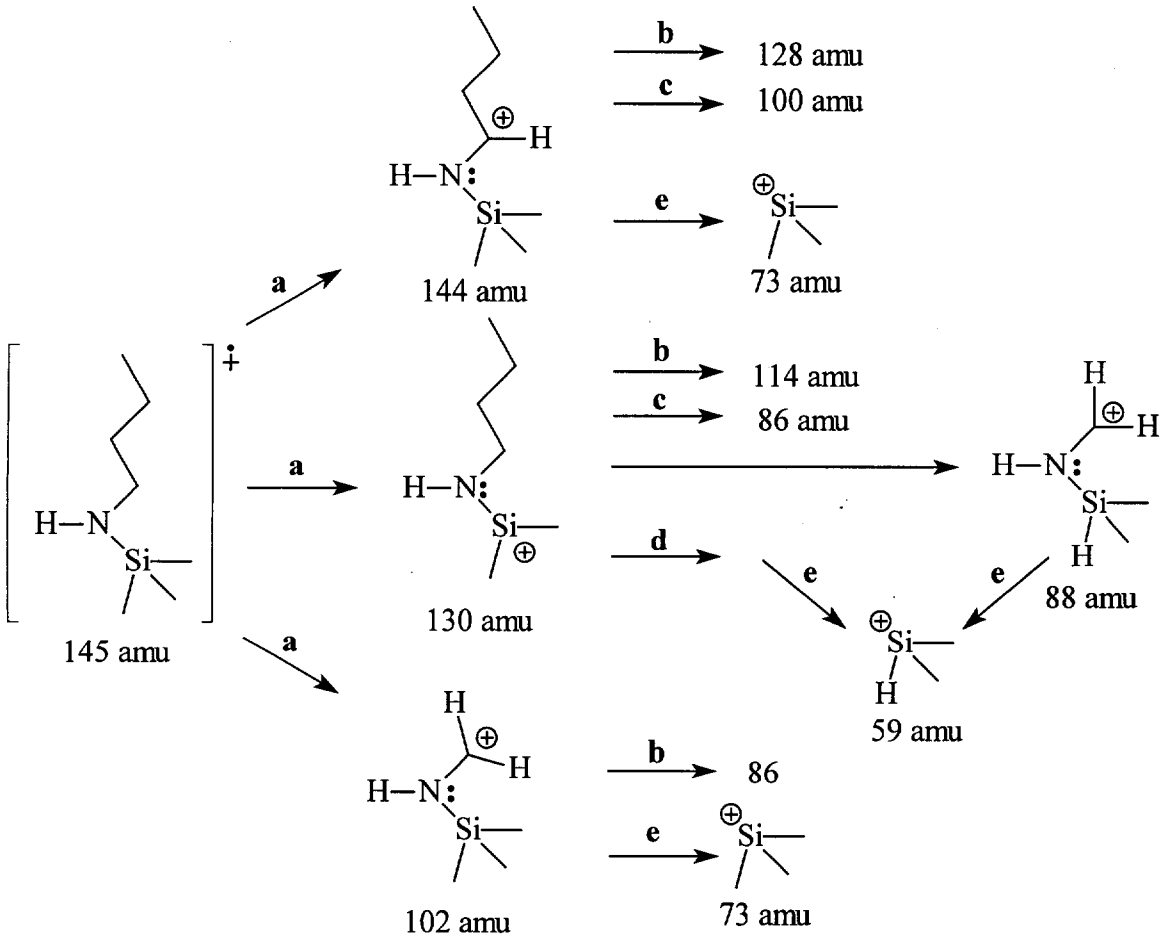


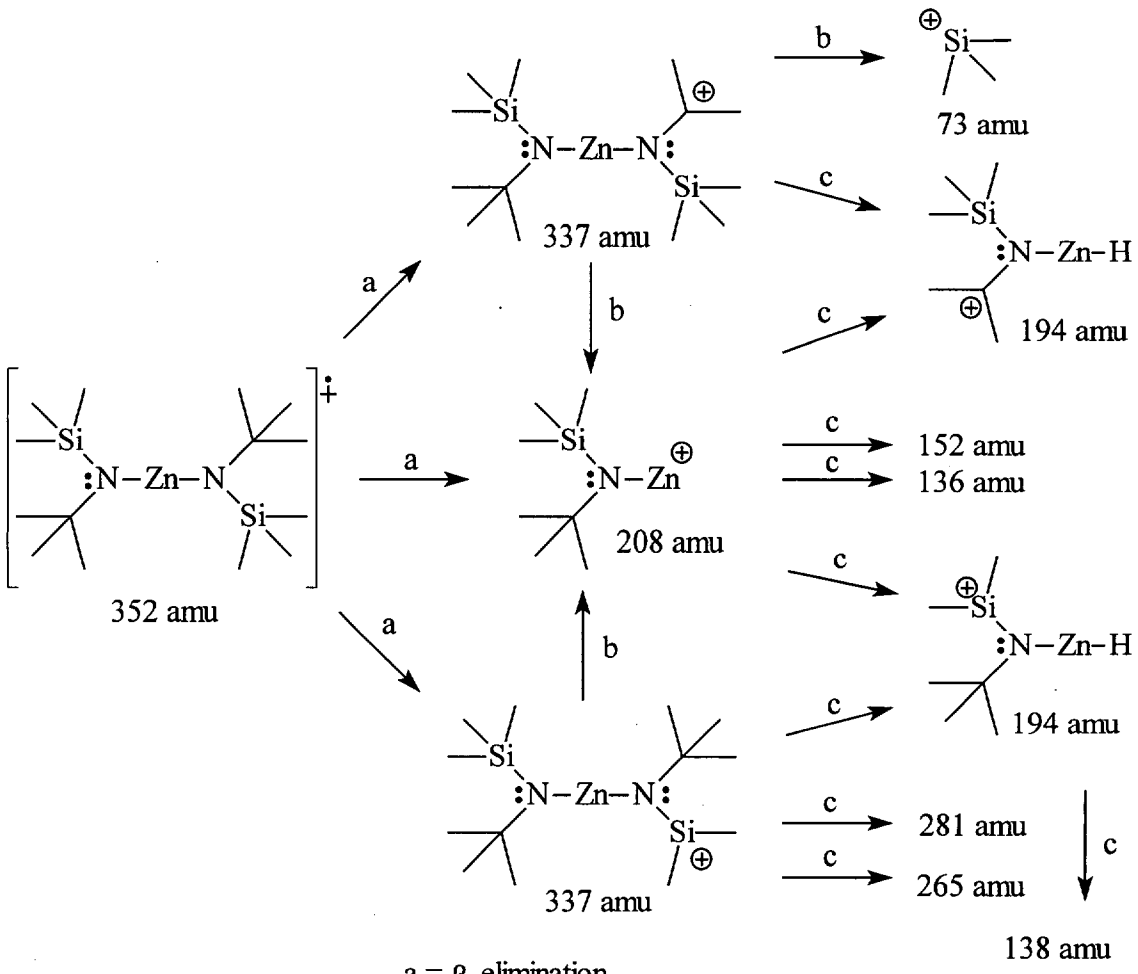
Figure 5. Variable temperature NMR data for $Zn[N(n\text{-propyl})(TMS)]_2$, **22**.

Scheme 4. Proposed Fragmentation Pathways for HN(*n*-butyl)(TMS), **3**



a = β-Elimination of a radical species
b = Loss of methane
c = Loss of propane
d = Hydride shift
e = Bond cleavage

Scheme 5. Proposed Fragmentation Pathways for Zn[N(*t*-butyl)(TMS)]$_2$, **27**



a = β-elimination
b = Bond cleavage
c = Hydride shift and fragment loss