ULTRAVIOLET SPECTRA AND DIPOLE MOMENTS OF ORGANOSILICON COMPOUNDS

By

J. NAGY and P. HENCSEI

Department of Inorganic Chemistry, Technical University, Budapest

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Investigation on organosilicon compounds has been in progress at the Inorganic Chemistry Department of Technical University of Budapest since 1950. Study of molecular structures including the determination of ultraviolet absorption spectra and dipole moments represents a considerable part of the research work at our department. To now, ultraviolet spectra and dipole moments of more than 100 different organosilicon compounds have been determined. On the basis of the experimental data numerous conclusions have been drawn on the strength and stability of bonds containing silicon atom, on the effect of various substituents, the geometry and conformation of molecules and so on.

In this work the ultraviolet spectra and dipole moments determined up to now at our department have been summarized. Part of these experimental data have already been published, a number of data are, however, still unpublished or were only included in Doctor's Theses. Figures and detailed measured data for most of the ultraviolet spectra can be found in different volumes of the Spectrum atlas edited by L. LÁNG [1]. The ultraviolet spectra were recorded by absorption spectrophotometers type Spektromom 201 and 203, at room temperature, using quartz cells of 0.2—1.0 cm thickness, in solutions with concentrations ranging 10^{-2}—10^{-5} mol/l. The vapour spectra were determined using a home-made cell holder which could be thermostated. The data of ultraviolet spectra for different organosilicon compounds are presented in Table I compiling formulae of the compounds, the solvents, the values of maxima in nm (λ_{max}), the extinction coefficients belonging to the maxima (ε_{max}), in some cases the oscillator strengths calculated from the spectra as well the references, shoulders observed in the spectra are designated by a superscript.* The oscillator strength was calculated from the half-band width ($\Delta\nu^*$) and the extinction coefficient corresponding to the maximum (ε_{max}) according to the following equation:

$$f = 4.32 \cdot 10^{-9} \cdot \varepsilon_{max} \cdot \Delta\nu^* .$$

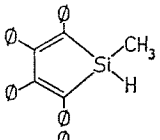
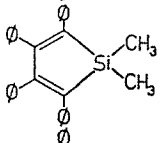
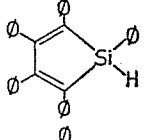
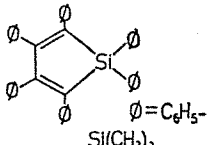
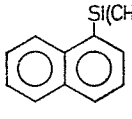
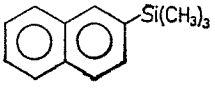
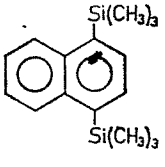
The dipole moments of organosilicon compounds were determined partly in pure liquid state by ONSAGER's method [2], partly in diluted solution of

Table I

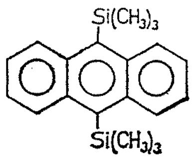
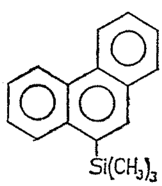
Ultraviolet spectra of organosilicon compounds

Formula	Solvent	λ_{max} (nm)	ε_{max}	f	References
Compounds containing Si—C bond					
$(CH_3)_3SiC_6H_5$	EtOH	211	10 600		[5]
		253	210		
		259	270		
		265	300		
		270	160		
	eH	265.6	220		[6]
	gas	188	9 780		[7]
		211	3 800		
		264	160		
$(C_2H_5)_3SiC_6H_5$	EtOH	212	9 590		[35]
		253	230		
		260	280		
		265.5	230		
		270	150		
$(C_3H_7)_3SiC_6H_5$	EtOH	210*	12 430		[35]
		253.5	200		
		260	290		
		265	280		
		271	160		
$(C_4H_9)_3SiC_6H_5$	EtOH	212.5	7 880		[35]
		253	350		
		260	380		
		264	320		
		270	210		
$(C_5H_{11})_3SiC_6H_5$	EtOH	210*	10 780		[35]
		253	250		
		259	350		
		264	370		
		270	270		
$(C_6H_{13})_3SiC_6H_5$	EtOH	209*	11 670		[35]
		253	340		
		259	430		
		264	430		
		270	320		
		211	45 000		
$(C_6H_5)_4Si$	EtOH	219*	32 050		[8]
		255	1 180		
		261	1 520		
		265	1 480		
		272	1 090		
	cH	265.4	1 520		[6]
$(CH_3)_3SiCH_2C_6H_5$	EtOH	221	8 690		[5]
		261	310		
		267.4	430		
		274	370		

(continued) **Table I**

Formula	Solvent	λ_{max} (nm)	ε_{max}	f	References
$p\text{-}(CH_3)_3SiC_6H_4Si(CH_3)_3$	EtOH	225 258 264 270 276	12 800 330 420 420 330		[35]
$(CH_2{=}CH)(CH_3)_2SiC_6H_5$	cH	219 254 260 266	8 080 180 260 230		[36]
	THF	248 364	22 540 9 100		[9]
	THF	245 359	23 820 8 570		[9]
	THF	230* 247 370	24 000 21 680 8 770		[9]
	THF	230* 248 365	24 000 23 170 8 040		[9]
	Hex	224 272 282 293 314	60 500 5 100 6 100 4 430 390		[33]
	Hex	227 269 277 286* 305 312 320	88 000 6 000 6 300 4 200 530 360 260		[33]
	Hex	228 279 289 300 316 321	38 000 6 300 8 000 5 700 660 420		[33]

(continued) **Table I**

Formula	Solvent	λ_{max} (nm)	ε_{max}	f	References
	Hex	218 255 322 350 369 389	16 000 11 600 2 000 6 900 10 000 8 500		[33]
	Hex	212 224 246* 254 276 286 298 316 324 331 339 347	25 300 20 500 29 000 35 000 9 200 7 700 9 200 200 220 210 210 120		[33]
$CH_2{=}CH{-}COOCH_2Si(CH_3)_2$ (with OC_2H_5 on Si)	Hex	196	7 600		[37]
$CH_2{=}CH{-}COOCH_2Si(OC_2H_5)_2$ (with CH_3 on Si)	Hex	196	8 500		[37]
$CH_2{=}C{-}COOCH_2Si(CH_3)_2$ (with CH_3 on C, OC_2H_5 on Si)	Hex	204	8 100		[37]
$CH_2{=}C{-}COOCH_2Si(OC_2H_5)_2$ (with CH_3 on C, CH_3 on Si)	Hex	204	9 700		[37]
Compounds containing Si—O bond					
$(CH_3)_3SiOC_6H_5$	EtOH	218 273	6 200 1 960	0.102 0.023	[10]
	cH	221* 267	4 260 1 160		[36]
$(CH_3)_2Si(OC_6H_5)_2$	EtOH	218 273	10 600 3 060	0.154 0.043	[10]
$CH_3Si(OC_6H_5)_3$	EtOH	211 266 273	17 550 3 100 2 900	0.324 0.035 0.020	[10]
$(C_6H_5O)_4Si$	EtOH	211 273	24 340 5 970	0.664 0.091	[10]
	cH	266 272	3 980 3 380		[36]

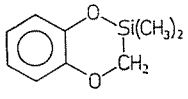
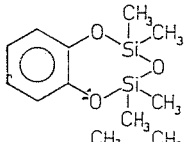
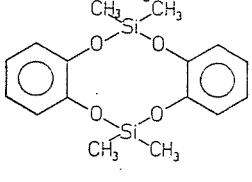
(continued) **Table I**

Formula	Solvent	λ_{max} (nm)	ε_{max}	f	References
o-$C_6H_4[OSi(CH_3)_3]_2$	EtOH	216	7 800	0.145	[11]
		272	1 940	0.022	
m-$C_6H_4[OSi(CH_3)_3]_2$	EtOH	216	7 130	0.152	[11]
		272	1 570	0.017	
p-$C_6H_4[OSi(CH_3)_3]_2$	EtOH	224	5 860	0.111	[11]
		293	2 590	0.042	
o-$CH_3C_6H_4OSi(CH_3)_3$	EtOH	215	6 470	0.103	[12]
		270	930	0.020	
		275	860	0.006	
m-$CH_3C_6H_4OSi(CH_3)_3$	EtOH	217	6 270	0.110	[12]
		270	970	0.013	
		275	960	0.008	
p-$CH_3C_6H_4OSi(CH_3)_3$	EtOH	221	7 160	0.089	[12]
		274	1 390	0.017	
		279	1 320	0.010	
o-$ClC_6H_4OSi(CH_3)_3$	EtOH	217	6.460	0.119	[12]
		277	2 400	0.030	
m-$ClC_6H_4OSi(CH_3)_3$	EtOH	218	7 930	0.123	[36]
		273	1 320	0.018	
		278	1 220	0.009	
	cH	217	9 300		[36]
		273	1 230		
		278	1 100		
p-$ClC_6H_4OSi(CH_3)_3$	EtOH	226	10 200	0.130	[12]
		277	1 180	0.016	
o-$O_2NC_6H_4OSi(CH_3)_3$	EtOH	213	11 660	0.178	[12]
		273	5 810	0.149	
		348	3 210	0.088	
	Hep	210	15 100		[36]
		256	4 000		
		313	2 400		
m-$O_2NC_6H_4OSi(CH_3)_3$	EtOH	211	12 440	0.206	[12]
		229	8 740	0.202	
		271	5 330	0.107	
		330	1 960	0.045	
	Hep	207	24 200		[36]
		223	18 600		
		261	11 100		
		314	4 300		
p-$O_2NC_6H_4OSi(CH_3)_3$	EtOH	226	7 250	0.166	[12]
		314	10 710	0.265	
	Hep	222	10 400		[36]
		289	13 900		
p-$FC_6H_4OSi(CH_3)_3$	EtOH	210	4 470	0.083	[12]
		275	1 630	0.023	
		280	1 550	0.012	

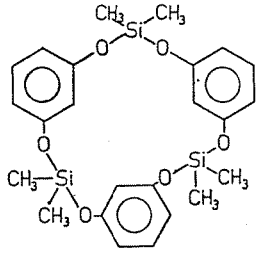
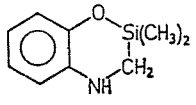
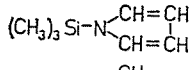
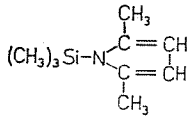
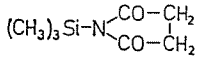
(continued) **Table I**

Formula	Solvent	λ_{max} (nm)	ε_{max}	f	References
$p\text{-}BrC_6H_4OSi(CH_3)_3$	EtOH	226 277	12 900 1 210	0.164 0.018	[12]
$C_6H_5OSi(OC_2H_5)_3$	EtOH	266 273	2 330 2 050		[36]
$(C_6H_5)_3SiOC_2H_5$	EtOH	218* 267 271.5	22 960 4 210 4 430		[35]
$(C_6H_5)_2Si(OC_2H_5)_2$	EtOH	208 219 254 260 264 271	30 460 30 600 460 630 730 570		[13]
$C_6H_5Si(OC_2H_5)_3$	EtOH	211 253 259 264 270	8 060 240 330 400 320		[13]
$(CH_3)_2(C_6H_5)SiOC_2H_5$	iO	254 260 264 270	130 190 180 130		[36]
$(p\text{-}FC_6H_4)_2Si(OC_2H_5)_2$	EtOH	211 257 262 269	9 660 460 480 380		[13]
$p\text{-}FC_6H_4Si(OC_2H_5)_3$	EtOH	210 256 261 269	7 560 280 320 260		[13]
$CH_3(C_6H_5)Si(OC_2H_5)_2$	EtOH	211 253 259 264 270	7 450 190 280 330 260		[35]
$[C_6H_5(CH_3)_2Si]_2O$	iO	254 259 265 270	350 440 400 270		[36]
$[C_6H_5O(CH_3)_2Si]_2O$	EtOH	212 266	13 290 1 800		[36]
$[C_6H_5NHCH_2(CH_3)_2Si]_2O$	cH	246 296	21 390 3 700		[36]

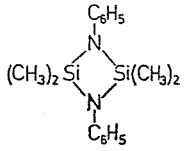
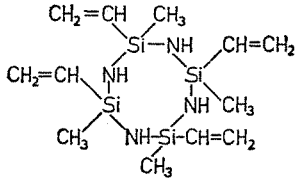
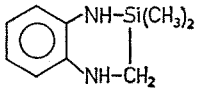
(continued) **Table I**

Formula	Solvent	λ_{max} (nm)	ε_{max}	f	References
$C_6H_5(CH_3)_2SiOSiOSi(CH_3)_2C_6H_5$ (CH$_3$ above, C_6H_5 below the central Si)	EtOH	210 253 259 264 270	10 220 260 360 350 270		[35]
$C_6H_5(CH_3)_2SiO[SiO]_3Si(CH_3)_2C_6H_5$ (C_6H_5 above, CH$_3$ below the central Si)	EtOH	211 253 259 264 270	35 350 730 1 080 1 120 820		[35]
	EtOH Hex	219 277 220* 276	6 900 2 970 5 600 1 990		[36] [37]
$C_6H_5CH_2Si(OC_2H_5)_3$	EtOH	212 259.5 265 272	12 140 320 380 290		[35]
$(C_6H_5CH_2)_2Si(OC_2H_5)_2$	EtOH	219 261 266 273	17 510 590 720 580		[35]
$CH_2{=}CHCH_2Si(OC_2H_5)_3$ $(CH_2{=}CHCH_2)_2Si(OC_2H_5)_2$ $(CH_2{=}CHCH_2)_3SiOC_2H_5$	gas gas gas	188 194 199	57.9 128.3 265.9		[14] [14] [14]
$(C_6H_5)_2Si(OH)_2$	EtOH	217* 254 260 264 271	13 020 380 540 570 400		[35]
	EtOH	216 277	6 340 2 110		[36]
	EtOH	212* 272 277	25 540 4 170 4 450		[36]

(continued) **Table I**

Formula	Solvent	λ_{max} (nm)	ε_{max}	f	References
	EtOH	208 272	72 100 5 000		[36]
	Hex	244 293	7 400 3 200		[37]
	EtOH	240 291	8 500 3 300		[37]
Compounds containing Si—N bond					
$C_6H_5NHSi(CH_3)_3$	cH	241 287 299	11 780 1 790 1 300	0.175 0.026	[15]
$C_6H_5N[Si(CH_3)_3]_2$	cH	235 266 272 298*	3 980 470 450 100	0.095 0.011 0.011	[16]
$C_6H_5N[SiH(CH_3)_2]_2$	cH	216 236 270	5 100 5 270 530	 0.077 0.012	[17]
$C_6H_5CH_2N[Si(CH_3)_3]_2$	cH	216 254 260	4 560 310 300		[36]
o-$C_6H_4[NHSi(CH_3)_3]_2$	cH	245 294	10 500 3 690	0.121 0.052	[18]
m-$C_6H_4[NHSi(CH_3)_3]_2$	cH	225 250* 296	18 600 6 260 3 440	0.063 0.037	[18]
p-$C_6H_4[NHSi(CH_3)_3]_2$	cH	257 320	9 440 2 380	0.312 0.038	[18]
p-$[(CH_3)_3Si]_2NC_6H_4N[Si(CH_3)_3]_2$	Hex	239 279* 314	10 140 910 480		[18]
	cH	217	7 130		[19]
	cH	215	5 360		[19]
	cH	231 236	90 100		[36]

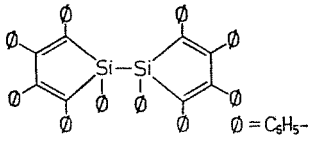
(continued) **Table I**

Formula	Solvent	λ_{max} (nm)	ε_{max}	f	References
	Hep	258 282 287 299	45 000 3 940 3 900 2 490	1.079 0.095 0.094 0.060	[20]
	cH	252	15		[36]
	Hex	212 244 294	68 900 17 800 7 370		[37]
	EtOH	244 296	9 600 3 300		[37]
$(CH_3)_3SiNCS$	Hex	200 246	2 960 300		[34]
	D	239	650		[34]
$(CH_3)_2Si(NCS)_2$	Hex	199 247	23 490 1 700		[34]
$CH_3Si(NCS)_3$	Hex	198 246	10 960 2 080		[34]
$Si(NCS)_4$	Hex	247	5 370		[34]
Compounds containing Si-halogene bond					
$C_6H_5SiF_3$	Hex	210 252* 258 264 271	4 790 270 500 700 620		[21]
$C_6H_5SiCl_3$	Hex	218 254* 260 266 273	7 650 290 480 670 590		[21]
$C_6H_5SiBr_3$	Hex	223 256* 263 269 275	8 980 310 470 620 580		[21]
$(C_6H_5)_2SiF_2$	Hex	210* 254* 259 265 271	14 560 670 980 1 300 1 080		[21]

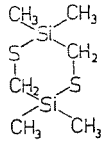
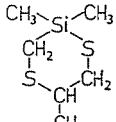
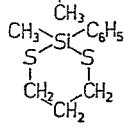
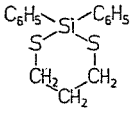
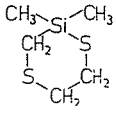
(continued) **Table**

Formula	Solvent	λ_{max} (nm)	ε_{max}	f	References
$(C_6H_5)_2SiCl_2$	Hex	219	16 910		[21]
		255*	760		
		260	1 030		
		266	1 310		
		273	1 110		
$(C_6H_5)_2SiBr_2$	Hex	222*	21 430		[21]
		256*	600		
		261	830		
		267	1 050		
		274	850		
$CH_3(C_6H_5)SiF_2$	Hex	211	6 820		[21]
		253*	240		
		258	400		
		264	550		
		270	460		
$CH_3(C_6H_5)SiCl_2$	Hex	216	7 610		[21]
		254*	240		
		259	370		
		265	480		
		272	400		
$CH_3(C_6H_5)SiBr_2$	Hex	218	5 420		[21]
		255*	250		
		260	360		
		266	440		
		273	340		
$(C_6H_5)_3SiCl$	Hex	210	25 400		[21]
		253	670		
		260	920		
		263	950		
		270	700		
$(C_6H_5)_3SiBr$	Hex	213	27 800		[21]
		254	680		
		261	940		
		265	980		
		271	740		
Compounds containing Si—H bond					
$C_6H_5SiH_3$	cH	216	3 750		[6]
		255	130		
		261	190		
		264.6	320		
		267	180		
		272	160		
	gas	262.5	210		[7]
$(C_6H_5)_2SiH_2$	cH	219	15 960		[6]
		244	800		
		249	850		
		254	900		
		261	980		
		264.8	960		
		272	740		

(continued) **Table I**

Formula	Solvent	λ_{max} (nm)	ε_{max}	f	References
$(C_6H_5)_3SiH$	cH	220 224 255* 261 265.2 272	29 670 28 670 650 930 1 030 830		[6]
$CH_3(C_6H_5)SiH_2$	cH	213 216 255 261 264.4 274	8 210 7 980 190 260 280 260		[6]
$(CH_3)_2(C_6H_5)SiH$	cH	215 254 260 264.4 266 270	4 240 200 220 230 180 120		[6]
Compounds containing Si—Si bond					
$C_6H_5Si(CH_3)_2-Si(CH_3)_2C_6H_5$	Hex	235	19 920		[35]
p-$CH_3C_6H_4Si(CH_3)_2-Si(CH_3)_2C_6H_4CH_3$-p	Hex	238	29 360		[35]
p-$CH_3OC_6H_4Si(CH_3)_2-Si(CH_3)_2C_6H_4OCH_3$-p	Hex	241 276 283	45 890 2 990 2 090		[35]
p-$(CH_3)_2NC_6H_4Si(CH_3)_2-Si(CH_3)_2C_6H_4N(CH_3)_2$-p	EtOH	208 275	40 660 50 210		[36]
	THF	230* 359	57 500 10 620		[9]

(continued) Tabl

Formula	Solvent	λ_{max} (nm)	ε_{max}	f	References
Compounds containing Si—S bond					
	Hex	207 239	3 680 420		[35]
	Hex	200 240*	3 700 260		[37]
	Hex	199 214* 266 272	32 900 14 500 520 360		[37]
	Hex	194 217 260 266 272	54 000 13 900 890 820 540		[37]
	Hex	199 244*	5 160 250		[37]

various concentrations by HEDESTRAND's method [3]. In most cases cyclohexane was used as solvent, but measurements were also carried out in decaline and benzene solutions. Earlier the measurements were carried out in a capacity-measuring instrument constructed at our department [4], then a WTW DM-01 dipolmeter was used since 1970. For determining the dipole moment, the sum of atom polarization and electron polarization ($P_A + P_e$) was calculated from the molar refraction (MR_D) as follows:

$$P_A + P_e = f \cdot MR_D, \quad \text{where} \quad f = 1.05 \quad \text{or} \quad 1.10.$$

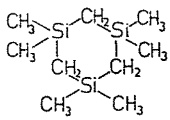
The dipole moment values for various organosilicon compounds are summarized in Table II, including the formulae of the compounds, the solvent, the temperature, the dipole moment and the reference. For measurements

Table II

Dipole moments of organosilicon compounds

Formula	Solvent	Temperature (°C)	Dipole moment (D)	References
Compounds containing Si—C bond				
$CH_2=CH-Si(CH_3)_3$	L	25	0.23	[22]
	L	25	0.33	[23]
$CH_2=CH-Si(C_6H_5)_3$	cH	25	0.31	[22]
$CH_2=CH-Si(CH_3)_2(C_6H_5)$	L	25	0.20	[22]
$CH_2=CH-CH_2Si(CH_3)_3$	L	25	0.58	[23]
$CH_2=CH-CH_2CH_2Si(CH_3)_3$	L	25	0.46	[23]
$C_6H_5Si(CH_3)_3$	L	25	0.25	[24]
$C_6H_5CH_2Si(CH_3)_3$	L	25	0.62	[24]
$(CH_3)_3Si-CH(CH_2)CH_2$	cH	25	0.00	[38]
$(CH_3O)_2Si(CH_3)-CH(CH_2)CH_2$	cH	25	1.12	[39]
$(CH_3O)_3Si-CH(CH_2)CH_2$	L	25	1.65	[39]
	cH	25	1.55	[39]
$(CH_3O)_3Si-CH(CF_2)CH_2$	cH	25	2.77	[38]
$Cl_2Si(CH_3)-CH(CF_2)CH_2$	cH	25	2.14	[38]
$Cl_3Si-CH(CF_2)CH_2$	cH	25	2.11	[38]
$F_2Si(CH_3)-CH(CF_2)CH_2$	cH	25	2.27	[38]
$Cl_3Si-C(Cl)(CF_2)CH_2$	cH	25	2.03	[38]
$Cl_2CHSi(Cl)-CH(CF_2)CH_2$	cH	25	2.22	[38]
$(CH_3)_3SiCH_2CH(CH_2)CH_2$	cH	25	1.35	[38]
$Cl_2Si(CH_3)-CH_2CH=CF_2$	cH	25	2.20	[38]

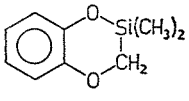
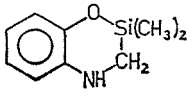
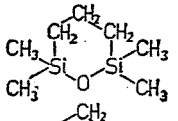
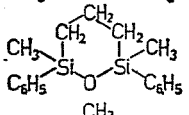
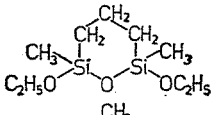
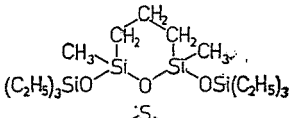
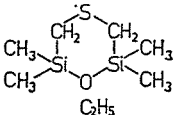
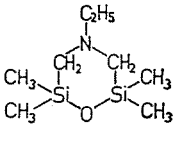
(continued) **Table II**

Formula	Solvent	Temperature (°C)	Dipole moment (D)	References
$(CH_3)_3SiCH-CH_2$ CF_2-CF_2 (ring)	cH	25	3.21	[38]
	L	25	0.42	[38]
Compounds containing Si—O bond				
$CH_3OSi(CH_3)_3$	L	25	1.21	[25]
$C_2H_5OSi(CH_3)_3$	L	20	1.15	[40]
	L	25	1.18	[25]
$C_2H_5OSi(C_2H_5)_3$	L	20	1.14	[40]
$C_2H_5OSi(CH_2CH=CH_2)_3$	L	25	1.21	[41]
$C_3H_7OSi(CH_3)_3$	L	25	1.13	[25]
i-$C_3H_7OSi(CH_3)_3$	L	25	1.16	[25]
$C_4H_9OSi(CH_3)_3$	L	25	1.10	[25]
sec-$C_4H_9OSi(CH_3)_3$	L	25	1.09	[25]
$C_6H_{13}OSi(CH_3)_3$	L	25	1.12	[25]
$C_6H_5OSi(CH_3)_3$	L	25	1.22	[26]
o-$CH_3C_6H_4OSi(CH_3)_3$	L	25	1.17	[42]
	cH	25	1.19	[42]
m-$CH_3C_6H_4OSi(CH_3)_3$	L	25	1.17	[42]
	cH	25	1.15	[42]
p-$CH_3C_6H_4OSi(CH_3)_3$	cH	25	1.24	[42]
o-$ClC_6H_4OSi(CH_3)_3$	cH	25	1.92	[42]
m-$ClC_6H_4OSi(CH_3)_3$	cH	25	2.20	[42]
p-$ClC_6H_4OSi(CH_3)_3$	L	25	2.15	[42]
	cH	25	2.38	[42]
o-$O_2NC_6H_4OSi(CH_3)_3$	cH	25	4.10	[42]
m-$O_2NC_6H_4OSi(CH_3)_3$	cH	25	4.50	[42]
p-$O_2NC_6H_4OSi(CH_3)_3$	cH	25	4.86	[42]
p-$FC_6H_4OSi(CH_3)_3$	cH	25	2.14	[38]
p-$BrC_6H_4OSi(CH_3)_3$	cH	25	2.27	[38]
$(CH_3O)_2Si(CH_3)_2$	L	25	1.37	[25]
$(CH_3O)_2Si(C_2H_5)_2$	L	20	1.47	[40]
$(C_2H_5O)_2Si(CH_3)_2$	L	25	1.34	[25]
	L	20	1.36	[40]
$(C_2H_5O)_2Si(C_2H_5)_2$	L	20	1.33	[40]
$(C_2H_5O)_2Si(CH_3)-C_6H_5$	L	25	1.24	[40]
$(C_2H_5O)_2Si(CH_2CH=CH_2)_2$	L	25	1.58	[41]
$(C_3H_7O)_2Si(CH_3)_2$	L	25	1.31	[25]
$(i\text{-}C_3H_7O)_2Si(CH_3)_2$	L	25	1.39	[25]
$(C_3H_7O)_2Si(C_2H_5)_2$	L	20	1.29	[40]
$(C_4H_9O)_2Si(CH_3)_2$	L	25	1.28	[25]
$(i\text{-}C_4H_9O)_2Si(CH_3)_2$	L	25	1.29	[25]
$(sec\text{-}C_4H_9O)_2Si(CH_3)_2$	L	25	1.39	[25]
$(C_4H_9O)_2Si(C_2H_5)_2$	L	20	1.26	[40]
$(i\text{-}C_4H_9O)_2Si(C_2H_5)_2$	L	20	1.16	[40]
$(C_5H_{11}O)_2Si(C_2H_5)_2$	L	20	1.26	[40]
$(C_6H_5O)_2Si(CH_3)_2$	L	0	1.21	[26]

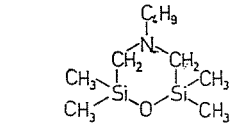
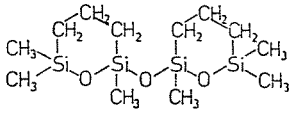
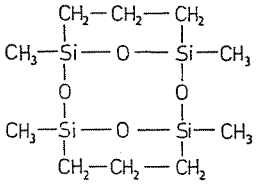
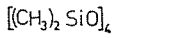
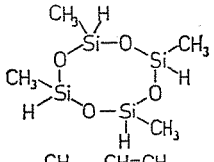
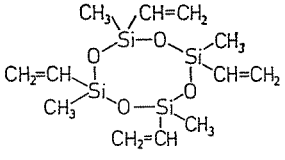
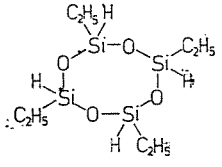
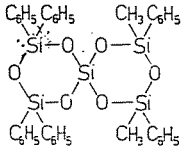
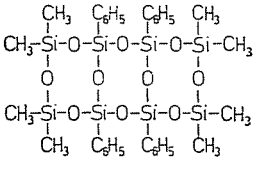
(continued) **Table II**

Formula	Solvent	Temperature (°C)	Dipole moment (D)	References
	L	15	1.25	[26]
	L	25	1.28	[26]
	L	40	1.31	[26]
	L	60	1.35	[26]
	L	80	1.40	[26]
	cH	25	1.22	[26]
$(C_6H_5O)_2Si(C_2H_5)_2$	L	20	1.28	[40]
$(C_{12}H_{25}O)_2Si(C_2H_5)_2$	L	20	1.26	[40]
$(CH_3O)_3SiCH_3$	L	25	1.78	[25]
$(C_2H_5O)_3SiCH_3$	L	25	1.71	[25]
	L	20	1.68	[40]
$(C_2H_5O)_3SiC_2H_5$	L	20	1.64	[40]
$(C_2H_5O)_3SiCH_2CH{=}CH_2$	L	25	1.86	[41]
$(C_2H_5O)_3SiC_6H_5$	L	20	1.54	[40]
$(C_3H_7O)_3SiCH_3$	L	25	1.64	[25]
$(i\text{-}C_3H_7O)_3SiCH_3$	L	25	1.65	[25]
$(C_4H_9O)_3SiCH_3$	L	25	1.63	[25]
$(sec\text{-}C_4H_9O)_3SiCH_3$	L	25	1.54	[25]
$(C_6H_{13}O)_3SiCH_3$	L	25	1.61	[25]
$(C_6H_5O)_3SiCH_3$	L	25	1.42	[26]
	cH	25	1.45	[26]
$(CH_3O)_4Si$	L	25	1.93	[27]
$(C_2H_5O)_4Si$	L	25	1.73	[27]
	L	20	1.74	[40]
$(C_3H_7O)_4Si$	L	25	1.60	[27]
$(i\text{-}C_3H_7O)_4Si$	L	25	1.55	[27]
$(C_4H_9O)_4Si$	L	25	1.57	[27]
$(sec\text{-}C_4H_9O)_4Si$	L	25	1.22	[27]
$(C_5H_{11}O)_4Si$	L	25	1.60	[27]
$(C_6H_5O)_4Si$	L	60	1.59	[26]
	cH	25	1.36	[38]
$(CH_3)_3SiOSi(CH_3)_3$	L	25	0.65	[28]
	L	25	0.37	[38]
	cH	25	0.36	[38]
$(C_2H_5)_3SiOSi(C_2H_5)_3$	L	25	0.70	[40]
$[C_6H_5OCH_2(CH_3)_2Si]_2O$	L	25	1.78	[28]
$[C_6H_5NHCH_2(CH_3)_2Si]_2O$	L	25	2.43	[28]
$[C_6H_5(CH_3)_2Si]_2O$	cH	25	0.53	[38]
$(CH_3)_3SiOSi(CH_3)_2OSi(CH_3)_3$	L	20	0.90	[40]
	L	25	0.97	[29]
$(CH_3)_3SiOSi(C_6H_5)OSi(CH_3)_3$	L	25	0.93	[29]
$(C_2H_5)_3SiOSi(C_2H_5)_2OSi(C_2H_5)_3$	L	20	0.86	[40]

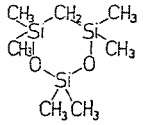
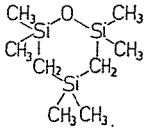
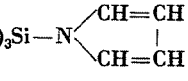
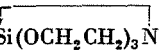
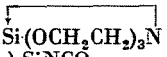
(continued) **Table II**

Formula	Solvent	Temperature (°C)	Dipole moment (D)	References
$(CH_3)_3Si[O-\underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{\overset{\displaystyle |}{\underset{\displaystyle |}{Si}}}}-]_2OSi(CH_3)_3$	L	20	1.12	[40]
$(C_2H_5)_3Si[OSi(C_2H_5)_2]_2OSi(C_2H_5)_3$	L	20	1.04	[40]
o-$C_6H_4[OSi(CH_3)_3]_2$	L	25	1.23	[26]
	L	50	1.27	[26]
m-$C_6H_4[OSi(CH_3)_3]_2$	L	25	1.70	[26]
	L	50	1.73	[26]
p-$C_6H_4[OSi(CH_3)_3]_2$	cH	25	1.61	[26]
	L	25	1.98	[38]
	cH	25	1.95	[38]
	L	25	2.44	[39]
	L	25	0.98	[30]
	L	25	1.03	[30]
	L	25	1.70	[30]
	L	25	1.13	[30]
	L	25	1.11	[30]
	L	25	1.13	[30]

(continued) **Table II**

Formula	Solvent	Temperature (°C)	Dipole moment (D)	References
	L	25	1.08	[39]
	L	25	1.46	[30]
	B	25	1.07	[30]
	cH cH	25 25	0.44 1.09	[38] [32]
	L cH	25 25	0.92 0.87	[38] [38]
	L cH	25 25	0.33 0.35	[38] [38]
	L cH	25 25	1.03 0.92	[38] [38]
	cH	25	1.33	[38]
	cH	25	1.21	[38]

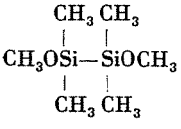
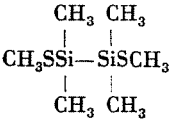
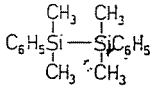
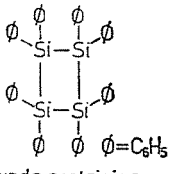
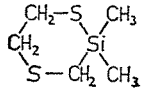
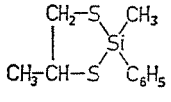
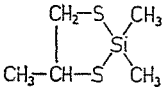
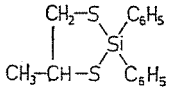
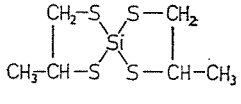
(continued) **Table II**

Formula	Solvent	Temperature (°C)	Dipole moment (D)	References
	L	25	1.14	[38]
	L	25	0.99	[38]
$[(CH_3)_2SiO]_3$	cH	25	0.24	[38]
$[(CH_3)_2SiO]_5$	cH	25	1.35	[32]
$[(CH_3)_2SiO]_6$	cH	25	1.56	[32]
$[(CH_3)_2SiO]_7$	cH	25	1.78	[32]
$[(CH_3)_2SiO]_8$	cH	25	1.96	[32]
$(CH_3)_3SiO[Si(CH_3)_2O]_nSi(CH_3)_3$				
M (molecular weight): 1 730	cH	25	3.07	[32]
5 350	cH	25	6.93	[32]
12 590	cH	25	9.08	[32]
20 000	cH	25	11.54	[32]
28 670	cH	25	13.66	[32]
70 230	cH	25	21.48	[32]
$HO[(CH_3)_2SiO]_nH$				
M 29 930	cH	25	13.62	[32]
51 300	cH	25	18.24	[32]
78 500	cH	25	22.24	[32]
86 000	cH	25	22.71	[32]
117 200	cH	25	25.70	[32]
330 000	cH	25	43.74	[32]
515 000	cH	25	53.77	[32]
Compounds containing Si—N bond				
$C_6H_5NHSi(CH_3)_3$	L	25	1.33	[15]
$C_6H_5N[Si(CH_3)_3]_2$	L	25	1.56	[15]
	cH	25	2.22	[19]
	B	25	5.77	[39]
	B	25	5.08	[38]
$(CH_3)_3SiNCO$	L	25	2.74	[43]
	cH	25	2.76	[43]
$(CH_3)_2Si(NCO)_2$	cH	25	2.99	[43]
$CH_3Si(NCO)_3$	L	25	2.64	[43]
	cH	25	2.67	[43]
$Si(NCO)_4$	L	25	0.97	[43]
	cH	25	0.93	[43]
$(CH_3)_3SiNCS$	cH	25	3.72	[43]
$(CH_3)_2Si(NCS)_2$	cH	25	3.17	[43]
$CH_3Si(NCS)_3$	cH	25	2.38	[43]
$Si(NCS)_4$	cH	25	1.14	[43]
$(CH_3)_3SiNHSi(CH_3)_3$	L	25	0.71	[38]
	cH	25	0.55	[38]

(continued) **Table II**

Formula	Solvent	Temperature (°C)	Dipole moment (D)	References
$[(CH_3)_2SiNH]_3$	L	25	0.89	[38]
	cH	25	0.88	[38]
$[(CH_3)_2SiNH]_4$	cH	25	0.80	[38]
$(CH_3)_3Si-N<^{CO-CH_2}_{CO-CH_2}$	L	25	1.17	[38]
Compounds containing Si—Si bonds				
$HSi(CH_3)_2Si(CH_3)_2H$	cH	25	1.25	[31]
$FSi(CH_3)_2Si(CH_3)_2F$	cH	25	1.91	[31]
	Dec	20	1.96	[39]
	Dec	30	1.97	[39]
	Dec	40	1.98	[39]
	Dec	50	1.99	[39]
	Dec	60	2.00	[39]
	Dec	70	2.01	[39]
	Dec	80	2.02	[39]
	Dec	90	2.03	[39]
$ClSi(CH_3)_2Si(CH_3)_2Cl$	cH	25	1.97	[31]
	Dec	20	2.07	[39]
	Dec	30	2.09	[39]
	Dec	40	2.09	[39]
	Dec	50	2.10	[39]
	Dec	60	2.13	[39]
	Dec	70	2.15	[39]
	Dec	80	2.16	[39]
	Dec	90	2.17	[39]
$BrSi(CH_3)_2Si(CH_3)_2Br$	cH	25	1.78	[31]
	Dec	20	1.64	[39]
	Dec	30	1.67	[39]
	Dec	40	1.70	[39]
	Dec	50	1.73	[39]
	Dec	60	1.77	[39]
	Dec	70	1.80	[39]
	Dec	80	1.83	[39]
	Dec	90	1.85	[39]
$ISi(CH_3)_2Si(CH_3)_2I$	cH	25	1.47	[31]
	Dec	20	1.36	[39]
	Dec	30	1.39	[39]
	Dec	40	1.44	[39]
	Dec	50	1.48	[39]
	Dec	60	1.51	[39]
	Dec	70	1.55	[39]

(continued) **Table II**

Formula	Solvent	Temperature (°C)	Dipole moment (D)	References
	Dec	80	1.59	[39]
	Dec	90	1.62	[39]
	cH	25	1.39	[31]
	Dec	20	1.42	[39]
	Dec	30	1.43	[39]
	Dec	40	1.43	[39]
	Dec	50	1.43	[39]
	Dec	60	1.43	[39]
	Dec	70	1.43	[39]
	Dec	80	1.44	[39]
	Dec	90	1.44	[39]
	cH	25	1.86	[31]
	Dec	25	1.86	[31]
	Dec	40	1.80	[31]
	Dec	55	1.74	[31]
	Dec	70	1.76	[31]
	cH	25	0.00	[38]
	CCl_4	25	0.00	[38]
Compounds containing Si–S bond				
	L	25	0.59	[39]
	L	25	0.46	[39]
	cH	25	0.57	[39]
	L	25	0.59	[39]
	cH	25	0.55	[39]
	cH	25	0.54	[39]

carried out by Onsager's method, letter L indicates liquid state. Tables apply the following abbreviations for the solvents used in ultraviolet and dipole moment measurements:

EtOH : ethylalcohol
Hex : n-hexane
Hep : n-heptane
iO : i-octane
cH : cyclohexane
THF : tetrahydrofurane
D : dioxane
B : benzene
Dec : decaline
CCl_4 : carbontetrachloride.

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Summary

Data of experimental ultraviolet absorption spectra and dipole moments of over 100 various organosilicon compounds are presented. All the experimental data were determined by reaserchers at the Department of Inorganic Chemistry, Technical University, Budapest.

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42. FARKAS, R.: unpublished data
43. BARTA, I.: unpublished data

Assoc. Prof. Dr. József NAGY
Dr. Pál HENCSEI
H-1521 Budapest, Hungary