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Notes

New Approach to Silylmercury Compounds by Reaction of Mercury Halides with Decamethylsilicocene[†]

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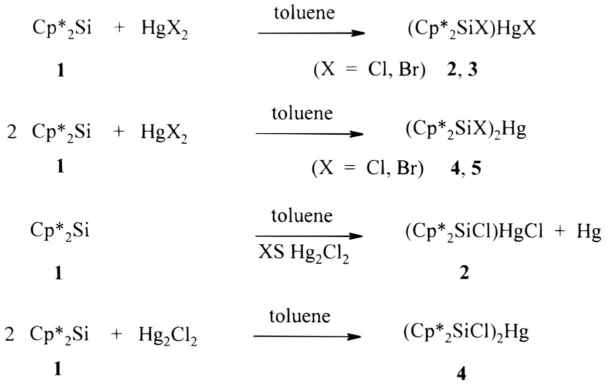
*Summary: Formation of mercury−silicon bonds was effected in the reaction of the mercury halides $HgCl_2$, $HgBr_2$, and Hg_2Cl_2 with decamethylsilicocene, Cp^*_2Si (**1**). Depending on the ratio of the reactants, the single- and double-insertion products $(Cp^*_2SiX)HgX$ (**2**, X = Cl; **3**, X = Br) and $(Cp^*_2SiX)_2Hg$ (**4**, X = Cl; **5**, X = Br), respectively, were obtained. The novel compounds were characterized by ^1H, ^{13}C, and ^{29}Si NMR spectroscopic data and, in the case of **2** and **5**, also by an X-ray crystal structure analysis.*

Introduction

Insertion reactions are typical for the chemistry of silylenes,[1] including that of decamethylsilicocene (**1**),[2] but insertion into a mercury−halide bond has not been observed thus far. Here we report on the reaction of **1** with mercury halides, which results in the synthesis of monosilyl- and disilyl-substituted mercury compounds of the types $(Cp^*_2SiX)HgX$ (**2**, X = Cl; **3**, X = Br) and $(Cp^*_2SiX)_2Hg$ (**4**, X = Cl; **5**, X = Br). This strategy extends the synthetic methods for the formation of silylmercury compounds.[3−6]

Scheme 1



Results and Discussion

The reaction of Cp^*_2Si (**1**) with $HgCl_2$ or $HgBr_2$ in toluene at −70 °C in a 1:1 ratio led to the formation of the monosilyl mercury compounds $(Cp^*_2SiX)HgX$ (**2**, X = Cl; **3**, X = Br) (Scheme 1), which were obtained in about 80% yield as air- and moisture-sensitive yellow powders. Both are soluble in common organic solvents and can be stored in solution (−30 °C) without decomposition for days. In the solid state they decompose even at low temperature within hours. Reaction of 2 equiv of **1** with $HgCl_2$ or $HgBr_2$ at room temperature in toluene led to the formation of the disilyl mercury compounds $(Cp^*_2SiX)_2Hg$ (**4**, X = Cl; **5**, X = Br), which were obtained in almost quantitative yield as air- and moisture-sensitive yellow solids (Scheme 1). They also dissolve in common organic solvents but decompose in solution within days at room temperature; in the solid state they can be stored at low temperature (−30 °C) only for a few days without decomposition. Yellow crystals of **4** and **5** were obtained from toluene solution.

[†] Dedicated to Professor H. Vahrenkamp (Albert-Ludwigs-Universität Freiburg) on the occasion of his 60th birthday.

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(3) Na amalgam procedure: $R_3SiX + Na/Hg \rightarrow (R_3Si)_2Hg + 2NaX$. (a) Wiberg, E.; Stecher, O.; Andrascheck, H.-J.; Kreuzbichler, L.; Staude, E. *Angew. Chem.* **1963**, *75*, 516−524. (b) Mitchell, T. N.; Marsmann, H. C. *J. Organomet. Chem.* **1978**, *150*, 171−177.

(4) Hydride method: $R_3SiH + ({}^tBu)_2Hg \rightarrow (R_3Si)_2Hg + 2{}^tBuH$. (a) Vyazankin, N. S. *Organomet. Chem. Rev. A* **1968**, *3*, 323. (b) Bettler, C. R.; Sendra, J. C.; Urry, G. *Inorg. Chem.* **1970**, *5*, 1060−1065. (c) Hovland, A. K.; Schaaf, T. F.; Oliver, J. P. *J. Organomet. Chem.* **1976**, *120*, 171−187. (d) Hengge, E.; Mitter, F. K. *Z. Anorg. Allg. Chem.* **1985**, *529*, 22−28.

(5) Metathesis reactions: $HgX_2 + 2R_3SiLi \rightarrow (R_3Si)_2Hg + 2LiX$. Wiberg, N.; Amelunxen, K.; Lerner, H.-W.; Nöth, H.; Appel, A.; Knizek, J.; Polborn, K. *Z. Anorg. Allg. Chem.* **1997**, *623*, 1861−70.

(6) Ligand exchange: $(Me_3Si)_2Hg + RHgX \rightarrow (Me_3Si)HgR + (Me_3Si)HgX$. (a) Vyazankin, N. S.; Glayshev, E. N.; Arkhangel'skaya, E. A.; Razuvaev, G. A. *J. Organomet. Chem.* **1969**, *17*, 340−344. (b) Mitchell, T. N. *J. Organomet. Chem.* **1974**, *71*, 27−38.

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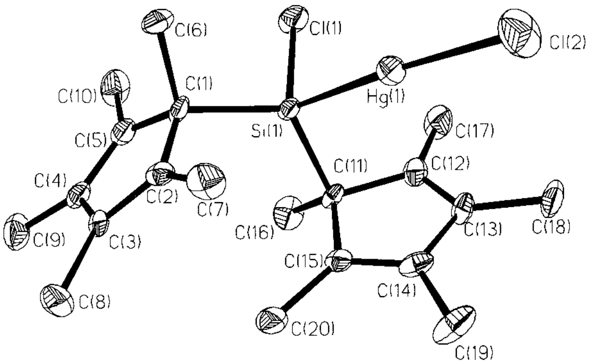

Figure 1. Molecular structure of (Cp^*_2SiCl)HgCl (**2**). Thermal ellipsoids are given at 50% probability.

Reaction of **1** with Hg_2Cl_2 in a 2:1 ratio yielded compound **4** together with elemental mercury in nearly quantitative yield. If the reaction was carried out in a 1:1 ratio, a mixture of compounds **2** and **4** (1:3) was obtained. Exclusive formation of **2** can only be observed when a large excess of Hg_2Cl_2 is used (Scheme 1).

The new compounds **2**−**5** were characterized by spectroscopic data. No satisfactory elemental analyses could be obtained; this is most probably due to the high reactivity of the compounds toward even trace amounts of air and moisture and their thermal instability in the solid state. Crystals of **2**, **4**, and **5** suitable for X-ray structure analysis were grown from toluene solution at −60 °C.[7]

The molecular structure of **2** is presented in Figure 1. Crystallographic data are given in Table 1, and selected bond lengths and angles are collected in Table 2.

Compound **2** crystallizes in the triclinic space group $P\bar{1}$. The silicon atom is coordinated in a distorted tetrahedral configuration by two σ-bonded Cp* rings, a chlorine atom, and a Hg−Cl unit. The Hg−Si bond length of 2.4076(16) Å, which compares with 2.437(3) Å in $^tBu_3SiHgCl$ (**6**), is the shortest Hg−Si bond reported thus far.[5] The Si−Hg−Cl(2) unit is nearly linear (172.16(6)°). The intermolecular Hg−Cl distances are approximately 3.7 Å (sum of van der Waals radii 3.3 Å).[8] The only other structurally investigated compound with a Si−Hg−Hal unit is **6**, which crystallizes as a tetramer with Cl−Hg−Cl interactions in the range of 3.1 Å and with Si−Hg−Cl angles varying from 157.6 to 160.9°.[5] The conformation of the planar Cp* rings in **2** differs from the parallel arrangement generally found in $Cp^*_2SiR_2$ compounds.[2c−e,9] One Cp* ring is orientated toward the Hg atom which is located above the Cp* ring plane. The $Cp^*_{Centroid}$−Hg distance (3.158(8) Å) is only slightly shorter than the van der Waals distance (sum of van der Waals radii 3.2 Å).[8,10] Since no anomaly in the C−C bond lengths of the Hg-oriented Cp* ring could be observed (Table 2), we assume only weak interactions between the Hg atom and the Cp* system.

Table 1. Crystallographic Data for (Cp^*_2SiCl)HgCl (2) and ($Cp^*_2SiBr)_2Hg$ (5)

	2	5
empirical formula	$C_{20}H_{30}Cl_2HgSi$	$C_{40}H_{60}Br_2HgSi_2$
fw	570.02	975.47
cryst color, habit	colorless, irregular	yellow, irregular
cryst size, mm^3	0.50 × 0.25 × 0.20	0.40 × 0.20 × 0.15
temp, K	173(2)	
wavelength	Mo Kα 0.71073 Å (graphite monochromator)	
space group	$P\bar{1}$	$P2_1/n$
unit cell dimens		
a, Å	8.2620(10)	17.855(5)
b, Å	11.356(2)	13.537(3)
c, Å	12.004(4)	18.404(5)
α, deg	77.40(2)	90
β, deg	86.11(2)	112.78(2)
γ, deg	80.94(2)	90
V, Å^3	1084.8(4)	4101.3(18)
Z	2	4
density (calcd), Mg/m^3	1745	1551
θ range for data collecn, deg	1.74−27.06	1.92−25.00
no. of rflns collected	5118	7458
no. of indep rflns	4779 (R_{int} = 0.0318)	7211 (R_{int} = 0.0680)
abs cor	empirical from ψ-scans	
final *R*(*F*) ($I > 2\sigma(I)$)	0.0828 (4134)	0.0996 (4521)
$R_w(F^2)$(all data)	0.0873	0.1170
no. of params	227	421
largest diff peak and hole, e Å^{-3}	0.923 and −1.105	0.885 and −0.774
diffractometer used	Siemens P2(1) diffractometer	
programs used	Siemens SHELXTL plus/SHELXL-97	
structure refinement	full-matrix least squares on F^2	

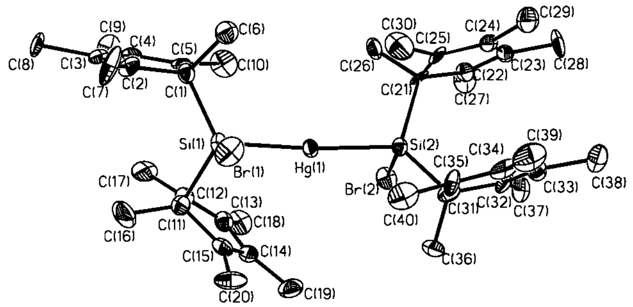

Figure 2. Molecular structure of ($Cp^*_2SiBr)_2Hg$ (**5**). Thermal ellipsoids are given at 50% probability.

The molecular structure of **5** is presented in Figure 2. Crystal structure parameters are given in Table 1, and selected bond lengths and angles are summarized in Table 3.

Compound **5** crystallizes in the monoclinic space group $P2_1/n$. Both silicon atoms are coordinated in a distorted-tetrahedral arrangement by two σ-bonded Cp* rings, a bromine atom, and a Hg−silyl unit. The Hg−Si distances are 2.466(3) and 2.479(3) Å. These values correspond to those found for other Hg−Si compounds.[5,11] The two silyl units are nearly linearly coordinated to the mercury atom (Si(1)−Hg−Si(2) = 174.87(10)°). Interestingly, the two silyl subunits show different arrangements of the Cp* substituents. The conformation of the two Cp* rings at Si(1) is comparable to that found in **2**; the $Cp^*_{Centroid}$−Hg distance (3.279(14) Å) is longer than the sum of van der Waals

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[7] A discussion of bond lengths and angles of **4** is not admissible due to the poor quality of the obtained crystals. Nevertheless, the connectivity could be proven.

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Table 2. Selected Bond Lengths (Å) and Angles (deg) for 2

Hg(1)−Si(1)	2.4076(16)	Si(1)−C(1)	1.904(6)
Si(1)−Cl(1)	2.094(2)	Si(1)−C(11)	1.929(5)
C(1)−C(2)	1.510(7)	C(11)−C(12)	1.519(8)
C(1)−C(5)	1.513(8)	C(11)−C(15)	1.502(8)
C(2)−C(3)	1.354(8)	C(12)−C(13)	1.351(9)
C(3)−C(4)	1.460(8)	C(13)−C(14)	1.446(8)
C(4)−C(5)	1.356(8)	C(14)−C(15)	1.349(9)
		Hg(1)−Cp*$_{Centroid}$	3.158(8)
Cl(2)−Hg(1)−Si(1)	172.16(6)	C(1)−Si(1)−Hg(1)	113.20(19)
C(1)−Si(1)−C(11)	121.4(2)	C(11)−Si(1)−Hg(1)	105.04(17)
C(1)−Si(1)−Cl(1)	104.63(18)	Cl(1)−Si(1)−Hg(1)	104.09(7)
C(11)−Si(1)−Cl(1)	107.06(18)		
C(2)−C(1)−C(5)	103.2(4)	C(12)−C(11)−C(15)	102.7(5)
C(2)−C(1)−C(6)	109.0(5)	C(12)−C(11)−C(16)	117.2(5)
C(5)−C(1)−C(6)	110.6(5)	C(15)−C(11)−C(16)	116.6(5)
C(2)−C(1)−Si(1)	112.3(4)	C(12)−C(11)−Si(1)	102.3(4)
C(5)−C(1)−Si(1)	114.3(4)	C(15)−C(11)−Si(1)	103.6(4)
C(6)−C(1)−Si(1)	107.4(4)	C(16)−C(11)−Si(1)	112.5(4)

Table 3. Selected Bond Lengths (Å) and Angles (deg) for 5

Hg(1)−Si(1)	2.466(3)	Hg(1)−Si(2)	2.479(3)
Br(1)−Si(1)	2.295(3)	Br(2)−Si(2)	2.293(3)
Si(1)−C(1)	1.940(11)	Si(2)−C(21)	1.920(11)
Si(1)−C(11)	1.947(12)	Si(2)−C(31)	1.919(10)
C(1)−C(2)	1.489(14)	C(21)−C(22)	1.504(15)
C(1)−C(5)	1.519(14)	C(21)−C(25)	1.542(14)
C(2)−C(3)	1.354(14)	C(22)−C(23)	1.364(15)
C(3)−C(4)	1.474(15)	C(23)−C(24)	1.441(15)
C(4)−C(5)	1.312(14)	C(24)−C(25)	1.339(14)
C(11)−C(12)	1.492(15)	C(31)−C(32)	1.495(15)
C(11)−C(15)	1.513(15)	C(31)−C(35)	1.540(14)
C(12)−C(13)	1.344(15)	C(32)−C(33)	1.359(14)
C(13)−C(14)	1.498(15)	C(33)−C(34)	1.466(16)
C(14)−C(15)	1.343(15)	C(34)−C(35)	1.341(15)
Hg(1)−Cp*$_{Centroid}$	3.279(15)		
Si(1)−Hg(1)−Si(2)	174.87(10)		
C(1)−Si(1)−C(11)	120.5(5)	C(21)−Si(2)−C(31)	118.3(5)
C(1)−Si(1)−Br(1)	102.4(3)	C(31)−Si(2)−Br(2)	105.5(3)
C(11)−Si(1)−Br(1)	106.6(4)	C(21)−Si(2)−Br(2)	106.5(4)
C(1)−Si(1)−Hg(1)	114.4(3)	C(31)−Si(2)−Hg(1)	115.4(4)
C(11)−Si(1)−Hg(1)	108.9(4)	C(21)−Si(2)−Hg(1)	108.2(3)
Br(1)−Si(1)−Hg(1)	101.61(11)	Br(2)−Si(2)−Hg(1)	101.12(11)
C(2)−C(1)−Si(1)	115.3(7)	C(22)−C(21)−Si(2)	114.1(7)
C(5)−C(1)−Si(1)	109.6(7)	C(25)−C(21)−Si(2)	104.8(7)
C(6)−C(1)−Si(1)	105.7(7)	C(26)−C(21)−Si(2)	110.2(7)
C(12)−C(11)−Si(1)	101.7(7)	C(32)−C(31)−Si(2)	114.5(8)
C(15)−C(11)−Si(1)	100.5(7)	C(35)−C(31)−Si(2)	108.5(7)
C(16)−C(11)−Si(1)	114.0(9)	C(36)−C(31)−Si(2)	110.1(7)

radii.[8,10] The two Cp* rings at Si(2) are located in a nearly parallel arrangement.

In solution, compounds **2**−**5** exhibit the expected sigmatropic rearrangements of the Cp* units,[12] as indicated by one broad resonance for all methyl groups of the Cp* systems in the ^{1}H and ^{13}C NMR spectra. NMR data are given in Table 4. The ^{29}Si NMR resonances are found in the expected range[3b,5] at 53.4 (**2**), 51.4 (**3**), 94.48 (**4**), and 98.84 (**5**) ppm, respectively.

By the approach described in this paper it is possible to prepare both monosilyl- and disilyl-substituted mercury compounds in very good yields without any side reactions. Investigation of insertion reactions of **1** into other metal−halide bonds is currently in progress.

Table 4. Selected NMR Data (ppm) for 2−5[a]

	2	3	4	5
^{1}H NMR	1.67 (br)[b]	1.61 (br)[c]	1.81 (br)[b]	1.80 (br)[c]
^{13}C NMR				
$C_5(CH_3)_5$	12.0 (br)[b]	12.0 (br)[c]	13.3 (br)[c]	13.8 (br)[b]
$C_5(CH_3)_5$	139.4 (br)[b]	139.4 (br)[c]	137.8 (br)[c]	137.0 (br)[b]
^{29}Si NMR	53.40[b]	51.40[c]	94.48[c]	98.84[c]

[a] Measured at room temperature. [b] Measured in C_6D_6. [c] Measured in C_7D_8.

Experimental Section

General Comments. All manipulations were carried out under a purified argon atmosphere using standard vacuum techniques. The solvents were commercially available, were purified by conventional means, and were distilled immediately prior to use. Cp*$_2$Si was prepared according to the literature.[13] The melting point determinations were performed using a Büchi 510 melting point apparatus. The NMR spectra were obtained on a Bruker Avance DRX 500 spectrometer (^{1}H, 500.1 MHz; ^{13}C{^{1}H}, 125.8 MHz; ^{29}Si{^{1}H}, 99.4 MHz); ^{1}H and ^{13}C NMR data were referenced to residual solvent peaks and are reported relative to TMS. ^{29}Si NMR data were referenced to external TMS. Chemical shifts are reported in ppm. Mass spectrometry was performed using a VG Autospec spectrometer (70 eV, 200 μA emission). Only characteristic fragments and isotopes of highest abundance are listed.

Preparation of (Cp*$_2$SiCl)HgCl (2) and (Cp*$_2$SiBr)HgBr (3) by Reaction of 1 with HgX$_2$ (X = Cl, Br). A solution of 1 mmol (0.30 g) of **1** in toluene (10 mL) was added dropwise to a suspension of 1 mmol of the corresponding HgX$_2$ compound (X = Cl, 0.27 g; X = Br, 0.36 g) (1 mmol) in toluene (20 mL) at −70 °C. While the reaction mixture was warmed to room temperature, the color of the suspension changed from yellow to gray. All volatile components were removed in vacuo. The yellow-gray residue was treated with *n*-hexane and the resulting solution filtered. Again all volatile components were removed in vacuo to give (Cp*$_2$SiCl)HgCl (**2**) and (Cp*$_2$SiBr)HgBr (**3**), respectively, as yellow residues in 78% (X = Cl) and 89% (X = Br) yields, respectively. Compound **2** was crystallized at −60 °C from toluene.

2: ^{1}H NMR (C_6D_6) δ 1.67 (broad signal, 30H, $C_5(CH_3)_5$); ^{1}H NMR (toluene-d_8, 70 °C) δ 1.60 (s, 30H, $C_5(CH_3)_5$); ^{1}H NMR (toluene-d_8, −40 °C) δ 0.97 (s, 6H, $C_5(CH_3)_5$), 1.72 (broad signal, 18H, $C_5(CH_3)_5$), 1.83 (s, 6H, $C_5(CH_3)_5$); ^{13}C NMR (C_6D_6) δ 12.0 (broad signal, $C_5(CH_3)_5$), 139.4 (broad signal, $C_5(CH_3)_5$); ^{29}Si NMR (C_6D_6) δ 53.40; MS/CI (*m/z* (relative intensity, %)) 435 (2) [M − Cp*]$^+$, 368 (57) [M − Hg]$^+$, 333 (100) [M − HgCl]$^+$, 233 (75) [M − HgCp*]$^+$, 199 (5) [Hg]$^+$, 163 (62) [Cp*Si]$^+$, 135 (73) [Cp*]$^+$.

3: ^{1}H NMR (toluene-d_8) δ 1.61 (broad signal, 30H, $C_5(CH_3)_5$); ^{1}H NMR (toluene-d_8, 100 °C) δ 1.61 (s, 30H, $C_5(CH_3)_5$); ^{1}H NMR (toluene-d_8, −55 °C) δ 1.07 (s, 6H, $C_5(CH_3)_5$), 1.75 (3 s, 18H, $C_5(CH_3)_5$), 1.93 (s, 6H, $C_5(CH_3)_5$); ^{13}C NMR (toluene-d_8) δ 12.0 (broad signal, $C_5(CH_3)_5$), 139.4 (broad signal, $C_5(CH_3)_5$); ^{29}Si NMR (toluene-d_8) δ 51.40; MS/CI (*m/z* (relative intensity, %)) 658 (<1) [M]$^+$ (with the correct isotopic pattern), 458 (11) [M − Hg]$^+$, 375 (32) [M − HgBr]$^+$, 163 (100) [Cp*Si]$^+$, 135 (57) [Cp*]$^+$.

Preparation of (Cp*$_2$SiCl)$_2$Hg (4) and (Cp*$_2$SiBr)$_2$Hg (5) by Reaction of 1 with HgX$_2$ (X = Cl, Br). A solution of 2 mmol (0.60 g) of **1** in toluene (10 mL) was added dropwise to a suspension of 1 mmol of the corresponding HgX$_2$ species (X = Cl, 0.27 g; X = Br, 0.36 g) (1 mmol) in toluene (20 mL) at room temperature. While the reaction mixture was stirred for 3 days, the suspension changed into a yellow solution. All volatile components were removed in vacuo. The yellow residue

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was crystallized at −60 °C from toluene to give $(Cp^*_2SiCl)_2Hg$ (**4**) in 99% yield and $(Cp^*_2SiBr)_2Hg$ (**5**) in 100% yield, respectively.

4: ^{1}H NMR (C_6D_6) δ 1.81 (broad signal, 60H, $C_5(CH_3)_5$); ^{1}H NMR (toluene-d_8, 60 °C) δ 1.75 (s, 60H, $C_5(CH_3)_5$); ^{1}H NMR (toluene-d_8, −40 °C) δ 1.29 (s, 12H, $C_5(CH_3)_5$), 1.90 (broad signal, 36H, $C_5(CH_3)_5$), 2.07 (s, 12H, $C_5(CH_3)_5$); ^{13}C NMR (toluene-d_8) δ 13.3 (broad signal, $C_5(CH_3)_5$), 137.8 (broad signal, $C_5(CH_3)_5$); ^{13}C NMR (toluene-d_8, 60 °C) δ 13.5 (s, $C_5(CH_3)_5$) (the signal of the Cp* ring atoms was not observed); ^{13}C NMR (toluene-d_8, −40 °C) δ 11.6, 11.9, 13.4, 14.2, 16.1 ($C_5(CH_3)_5$), 62.6 (broad signal, *vinyl-C* of $C_5(CH_3)_5$), 139.8 (broad signal), 140.4 (s) (*allyl-C* of $C_5(CH_3)_5$); ^{13}C NMR (toluene-d_8, −80 °C) δ 11.3, 11.6, 14.2 ($C_5(CH_3)_5$), 60.6−64.4 (broad signals, *vinyl-C* of $C_5(CH_3)_5$), 137.1 (broad signal, *allyl-C* of $C_5(CH_3)_5$); ^{29}Si NMR (toluene-d_8) δ 94.48.

5: ^{1}H NMR (toluene-d_8) δ 1.80 (broad signal, 60H, $C_5(CH_3)_5$); ^{1}H NMR (toluene-d_8, 60 °C) δ 1.77 (s, 60H, $C_5(CH_3)_5$); ^{1}H NMR (toluene-d_8, −60 °C) δ 1.39 (s, 12H, $C_5(CH_3)_5$), 1.91 (broad signal, 36H, $C_5(CH_3)_5$), 2.09 (s, 12H, $C_5(CH_3)_5$); ^{13}C NMR (C_6D_6) δ 13.8 (br, $C_5(CH_3)_5$); 137.0 (broad signal, $C_5(CH_3)_5$); ^{13}C NMR (toluene-d_8, 60 °C) δ 13.8 (s, $C_5(CH_3)_5$) (the signal of the Cp* ring atoms was not observed); ^{13}C NMR (toluene-d_8, −40 °C) δ 12.1 (broad signal, $C_5(CH_3)_5$), 61.3 (broad signal, *vinyl-C* of $C_5(CH_3)_5$), 139.2, 140.4 (broad signals, *allyl-C* of $C_5(CH_3)_5$); ^{13}C NMR (toluene-d_8, −80 °C) δ 12.1 (broad signal, $C_5(CH_3)_5$), 61.2 (broad, *vinyl-C* of $C_5(CH_3)_5$) (the signal of the *allyl-C* of the Cp* ring atoms was not observed); ^{13}C NMR (toluene-d_8, −100 °C) δ 12.2 (broad signal, $C_5(CH_3)_5$), 59.5−63.6 (broad signals, *vinyl-C* of $C_5(CH_3)_5$) (the signal of the *allyl-C* of the Cp* ring atoms was not observed); ^{29}Si NMR (toluene-d_8) δ 98.84.

Preparation of 2 by Reaction of 1 with Hg_2Cl_2. A solution of 1 mmol (0.30 g) of **1** in toluene (20 mL) was added dropwise to a suspension of 20 mmol (9.4 g) of Hg_2Cl_2 in toluene (1.5 L) at room temperature. After 2 h the color of the suspension changed from yellow to gray. All volatile components were removed in vacuo. The yellow-gray residue was treated with *n*-hexane (50 mL) and filtered. Again all volatile components were removed in vacuo to give $(Cp^*_2SiCl)HgCl$ (**2**) in 62% yield. The analytical data correspond to those described above.

Preparation of 4 by Reaction of 1 with Hg_2Cl_2. A solution of 2 mmol (0.60 g) of **1** in toluene (20 mL) was added dropwise to a suspension of 1 mmol (0.47 g) of Hg_2Cl_2 in toluene (20 mL) at room temperature. The suspension changed from yellow to gray. The suspension was filtered, and all volatile components were removed in vacuo to give $(Cp^*_2SiCl)_2Hg$ (**4**) in 100% yield.. The analytical data correspond to those described above.

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Supporting Information Available: Tables of crystal data, positional and thermal parameters, and bond lengths and angles. This material is available free of charge via the Internet at http://pubs.acs.org.

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