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EXCHANGE REACTIONS OF BIS (TRIETHYLGERMYL)MERCURY WITH

MERCURY DERIVATIVES OF ACETYLACETONE, DIETHYL MALONATE, AND

RELATED COMPOUNDS

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Bis(triethylgermyl)mercury (I) easily exchanges radicals with R_2Hg compounds [1] to form, depending on the nature of the radicals, the unsymmetrical Et_3GeHgR [2] or Et_3GeR [3, 4], formation of which is accompanied by demercuration.

We have found that the reaction of (I) with mercury acetylacetonate (II) in acetylacetone or THF forms mercury (yield 95%) and triethyl(acetylacetonato)germane (62%). The structure of (II) is disputed, since its composition, as indicated by elemental analysis, depends on the reaction conditions [5]. McCandlish and Macklin [6] consider "mercury acetylacetonate" to be a mixture of compounds whose major component is $(C_5H_7O_2)Hg(C_5H_6O_2)Hg (C_5H_7O_2)$. Conversely Allmann, Flatau, and Musso [7] conclude that the major component of the mixture has the structure of $Hg[CH(COCH_3)_2]_2$ with a covalent C-Hg-C grouping. Tautomeric acid forms with C-Hg-O and O-Hg-O groupings coexist with the β -diketone form of (II), but their contribution is slight. We have synthesized (II) with elemental analysis and IR spectrum identical to Allman, Flatau, and Musso's compound [7]. However the acetylacetonate moiety in the resulting triethyl(acetylacetonato)germane exists mainly in the enol form. Consequently the demercuration process accompanying radical exchange involves transfer of the reaction center.

(Et ₃ Ge) ₂ Hg -	+ Hg[CH(COMe) ₂]	$2 \rightarrow 2Et_3GeHgCH(COMe)_2$			
(I)	(11)	-2Hg			/ 1 \
()	()	2Et ₃ GeOČ(Me)=CHCOMe	(III)	((1)

We confirmed the structure of 2-(triethylgermoxy)pent-2-en-4-one (III) from its IR and PMR spectra. The IR spectrum of (III) contains the C=C stretching band (1565 cm⁻¹) and a band at 1670 cm⁻¹, which should belong to the C=O not involved in secondary interaction. There is also a broad maximum in the 1600 cm⁻¹ region that can be assigned to the C=O group weakly coordinated to the metal atom [6] in the intermediate chelate ring. This interpretation is supported by our finding (Table 1) that with increased solvent polarity the intensity of the band assigned to the uncoordinated C=O group diminishes while the intensity of the coordinated

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TABLE 1. Solvent Dependence of the Frequency and Intensity of the C=C and C=O Bands in $Et_3GeOC(Me)=CHCOMe$ (III) (v, cm⁻¹, A, liter·cm⁻²·mole⁻¹)

Solvent	vC==C	A	^v С==0	A	۰C=0	A	°C=0	A
cyclohexane dioxane chloroform	1570 1570 1560	54050 30500 34200	1610 1620 1610	13500 39800 45300	167 5 167 0 16 70	15500 10500 3400	 1700	_ 4000

C=O band simultaneously increases. The PMR spectrum implies that compound (III) is a 1:4 mixture of the cis and trans isomers. The ratio of integrated intensities shows that the singlets 5.36 (=CH), 2.39 (CH₃C=C), and 2.03 ppm (CH₃C=O) belong to the trans isomer and those at 5.19 (=CH) and 2.08 ppm (CH₃C=C) to the cis isomer. The spectrum also shows a singlet at 1.12 ppm that is characteristic for the $(C_2H_5)_3Ge$ protons in compounds resembling (III). The chemical shifts of the olefinic protons are in good agreement with those evaluated by the additive scheme of [8] for the cis isomer (5.13 ppm) and the trans isomer (5.47 ppm). The inequivalence of the methyl protons in the trans isomer is consistent with the enol form of (III).

The methyl protons in the cis isomer (signal at 2.08 ppm) are equivalent only below -10° C. At -60° C the spectrum contains two signals at 2.36 and 1.96 ppm, which broaden at higher temperatures, coalescing at -10° C. We may attribute these distinctive features to facile 1,5-migration of the Et₃Ge group between the two oxygen atoms. The rearrangement rate is independent of concentration and is not affected by addition of acetylacetone, thus demonstrating the intramolecular nature of the process



Such rearrangement typifies the cis isomers of $Me_3SiOC(CH_3) = CHCOCH_3$ [9], $Me(1-C_{10}H_7)PhSiOC-(CH_3) = CHCOCH_3$ [10], and several other trialkyl(acetylacetonato)silanes [11]. These compounds, like our synthetic compound (III), have a four-coordinate metal heteroatom [12-14], unlike trimethyl(acetylacetonato)tin, in which the metal atom is five-coordinate as a result of the existence of a stable chelate structure [15].

We have also examined the exchange reactions of the germylmercury compound (I) with mercuribis(diethyl malonate) (IV), mercuribis(ethyl cyanoacetate) (V) give the C-germylation products (VII) and (VIII). The O-germylated isomers, $Et_3GeOC(OEt) = CHR$ (R = COOEt and CN), judging from the IR spectra, are formed in small quantities

(3)

For example the IR spectrum of (VII) is characterized by ester stretching bands at 1252, 1255, 1732, and 1750 cm⁻¹ and CH stretching bands of the Et_3Ge group (545, 585, and 700 cm⁻¹). The C=C bands (1612 and 3090 cm⁻¹) characteristic for the O-isomer are extremely weak and are completely absent from the spectrum of compound (VIII).

We got the same ratio of C- and O-germylated isomers from an independent synthesis, based on the reaction of triethylbromogermane with diethyl sodiomalonate and ethyl cyanosodioacetate

 $[EtOOCCHR]^-Na^+ + Et_3GeBr \rightarrow NaBr + Et_3GeCHCOOEt$ $\downarrow R$ (VII) (VIII)

Conversely the reaction of triethylchlorosilane with the same sodium derivatives forms mainly the ethyl ester (IX) and the nitrile (X) of 2-ethoxy-2-(triethylsiloxy)acrylic acid, as is confirmed by IR spectroscopy

$$\begin{bmatrix} \text{EtOOCCHR} \end{bmatrix}^{-}\text{Na}^{+} + \text{Et}_{3}\text{SiCl} \rightarrow \text{NaCl} + \text{Et}_{3}\text{SiOC} = \text{CHR} \\ & \downarrow \\ \text{OEt} \quad (\text{IX}) (X) \\ \text{R} = \text{COOEt} \quad (\text{IX}); \quad \text{CN} \quad (X) \qquad (4) \end{bmatrix}$$

Thus, the IR spectra of compounds (IX) and (X) show intense bands at 1605^{-1} and 1610 cm^{-1} respectively and a weak maximum at 3100 cm^{-1} , which should be assigned to stretching modes of the conjugated C=CH bond [16]. The reaction of diethyl sodiomalonate with trimethylchlorosilane gives a compound resembling (IX), whose IR spectrum also shows an intense band at 1610 cm⁻¹ [16].

Mercuribis(diethyl malonate) (IV) and the related compounds (V) and (VI) were prepared in THF at $10-20^{\circ}$ C by the reactions of bis[bis(trimethylsilyl)amino]mercury with respectively diethyl malonate (pK = 16.7), ethyl cyanoacetate (pK = 13.8), and malanonitrile (pK = 12.2 [17]). Elemental analysis implies that the desired product may be contaminated by more highly mercurated compounds, which is probably due to the strong carbon acidity of malonic derivatives and the susceptibility of both methylene hydrogens in these compounds to substitution by metal.

Finally we have found that (triethylgermyl)acetonitrile is formed in high yield in the following reactions

$$(Et_{3}Ge)_{2}Hg + Hg(CH_{2}CN)_{2} \xrightarrow{\text{THF}} 2Et_{3}GeHgCH_{2}CN \xrightarrow{b} 2Et_{3}GeCH_{2}CN$$
(5)

$$(Et_{3}Ge)_{2}Hg + ClHgCH_{2}CN \xrightarrow{G_{6}H_{6}} 2Hg + Et_{3}GeCl + Et_{3}GeCH_{2}CN$$
(6)

 $Et_{3}GeH + Hg(CH_{2}CN)_{2} \xrightarrow{160-200^{\circ}} Hg + CH_{3}CN + Et_{3}GeCH_{2}CN$ (7)

These reactions involve the intermediacy of (triethylgermyl)mercuriacetonitrile, $Et_3GeHgCH_2$ -CN (XI), demercuration of which follows Eq. (5b) without transfer of the reaction center. This type of decomposition typifies compounds of the series Et_3GeHgR , where R is an electronaccepting substituent [3, 4]. In addition to nitrile (XI) reaction (6) forms the unstable (triethylgermyl)mercuric chloride, which decomposes to mercury and Et_3GeC1 [18]. Unlike $Hg(CH_2COOMe)_2$, which reacts with organogermanium hydrides by an equation equivalent to (7) [19], the reactions of mercuribis(acetaldehyde) and mercuribis(acetone) with R₃GeH involve transfer of the reaction center and form R₃GeOC(R') = CH₂, where R' = Hor Me [20].

Triethylsilane is known [21] to react easily with di-t-butylmercury to form bis(triethylsilyl)mercury in high yield. Conversely (pentafluorophenyl)silanes react with di-tbutylmercury only under forcing conditions by an equation equivalent to (7)

$$\frac{Me_n(C_6F_5)_{3-n}SiH + (t-C_4H_9)_2Hg \to Hg + i-C_4H_{10} + Me_n(C_6F_5)_{3-n}SiC_4H_9 - t}{n = 1, 2}$$
(8)

The anomalous course of reaction (8) is probably caused by the reduction in the reactivity of the silanes induced by the perfluoroaromatic substituent. This is consistent with our finding* that in the catalytic decomposition of ethyl (triethylgermyl)diazoacetate over copper in the presence of dimethyl(pentafluorophenyl)silane the resulting carbene $Et_3GeCCOOEt$ is inserted into the SiH bond

$$Et_{3}GeC(N_{2})COOEt + Me_{2}(C_{6}F_{5})SiH \rightarrow N_{2} + CHCOOEt$$

$$Me_{2}(C_{6}F_{5})Si$$
(9)

However in the equivalent reaction with methylbis(pentafluorophenyl)silane insertion into the Si-H bond does not occur; instead the reaction forms 1,4-bis(ethoxycarbonyl)-1,4-bis(triethylgermyl)-2,3-diazabuta-1,3-diene (XII) in yields of up to 90%. This azine is known [22] to be formed by addition of the carbene $Et_3Ge\ddot{C}COOEt$ to a molecule of the original diazoester.

^{*}I. B. Fedot'eva participated in this part of the work.

EXPERIMENTAL

Reactions were carried out on a vacuum line with the equipment and by the procedure of [23].

Bis(acetylacetonato)mercury (II). To a stirred solution of [(Me₃Si)₂N]₂Hg (3.24 g) in absolute ether (30 ml) was rapidly added acetylacetone (12.02 g) (tenfold excess) in ether (50 ml). After 1 h the crystalline precipitate was filtered off, washed with ether, and dried under vacuum. We obtained (II) (2.51 g, 100%), decomposing at 250-254°C. Found, %: C 29.93; H 3.48; Hg 50.56%. C10H14HgO4. Calculated, %: C 30.12; H 3.53; Hg 50.30%.

Mercuribis (malononitrile) (VI). Under the conditions of the preceding synthesis addition of malononitrile (8.01 g) in ether (70 ml) to a solution of [(Me₃Si)₂N]₂Hg (3.50 g) in ether (30 ml) (VI) (2.22 g, ∿100%), decomposing at 230°C. Found, %: C 21.97; H 0.67; Hg 60.42%. C₆H₂HgN₄. Calculated, %: C 21.79; H 0.61; Hg 60.65%. IR spectrum (∨, cm⁻¹): 2205, 2240 (CN), 2920 (≥CH).

In the same way [(Me₃Si)₂N]₂Hg (5.21 g) in ether (40 ml) and NCCH₂COOC₂H₅ (22.5 g) in ether (50 ml) gave (V) (3.80 g, 89.6%), decomposing at 240-244°C. Found, %: C 26.70; H 2.65; Hg 48.96; N 5.96%. C10H12HgN2O4. Calculated, %: C 28.27; H 2.85; Hg 47.22; N 6.59%. IR

spectrum (v, cm⁻¹): 2205, 2230 (CN), 1190, 1250, 1660, 1705 (C

2-(Triethylgermoxy)pent-2-en-4-one (III). To a degassed solution of (II) (3.99 g) in THF (20 ml) was added bis(triethylgermyl)mercury (5.21 g). The mixture was warmed to 65°C for 8 h. We obtained mercury (3.91 g, 97.3%) and compound (III) (3.21 g, 61.9%), bp 71-72°C (1 mm); np²° 1.4765. Found, %: C 50.74; H 8.48; Ge 28.57%. C₁₁H₂₂GeO₂. Calculated, %: C 51.03; H 8.56; Ge 28.04%.

Diethyl (Triethylgermyl)malonate (VII). a) Under the conditions of the preceding synthesis mercuribis(diethyl malonate) (2.39 g) and bis(triethylgermyl)mercury (2.41 g) in THF (10 m1) gave mercury (1.85 g, ~100%) and (VII) (1.11 g, 37.4%), bp 100-102°C (1 mm); np²⁰ 1.4645.

b) To a suspension of Na (2.3 g), toluene (25 ml), and THF (25 ml) was added dropwise at 0°C diethyl malonate (16.1 g). The mixture was stirred at \sim 20°C for 6 h, whereupon triethylbromogermane (24.0 g) in pentane (30 ml) was added; after stirring for a further 3 h the mixture was left overnight. Distillation of the organic layer yielded compound (VII) (13.1 g, 40.6%), bp 101-102°C (1 mm); $n_D^{2°}$ 1.4620. Found, %: C 48.70; H 8.17; Ge 22.57%. C₁₃G₂₆GeO₄. Calculated, %: C 48.96; H 8.22; Ge22.76%. IR spectrum (ν , cm⁻¹): 1612, 3100

C₁₃G₂₆GeO₄. Calculated, ... Calculated

4.11 q (OCH₂, J = 6.5 Hz), 1.25 t (CH₃, J = 6.5 Hz).

Ethyl (Triethylgermyl)cyanoacetate (VIII). Under the conditions of the preceding synthesis compound (V) (3.51 g) and (Et₃Ge)₂Hg (4.28 g) in THF (10 ml) gave mercury (3.21 g, 97.0%) and (VIII) (1.40 g, 31.2%), bp 94-95°C (1 mm): nD²⁰ 1.4650. Found, %: C 48.49; H 7.76; Ge 26.08%. C₁₁H₂₁GeNO₂. Calculated, %: C 48.59; H 7.78; Ge 26.70%. IR spectrum (v, cm⁻¹): 2240 (CN), 1250, 1730 $\begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix}$, 550, 595, 705 [(C₂H₅)₃Ge]. PMR spectrum (δ , ppm):

3.12 s (\geq CH), 1.00 t [(C₂H₅)₃Ge], 4.14 q (OCH₂, J = 6.8 Hz), 1.28 t (CH₃, J = 6.8 Hz).

Ethyl 2-Ethoxy-2-(triethylsiloxy)acrylate (IX). To diethyl sodiomalonate, prepared from Na (2.3 g) and diethyl malonate (16.01 g), was added triethylchlorosilane (15.07 g). The usual treatment gave (IX) (11.30 g, 41.3%), bp 108°C (1-2 mm); $n_D^{2\circ}$ 1.4590. Found, %: C 56.76; H 9.49; Si 10.17%. C13H2604Si. Calculated, %: C 56.89; H 9.55; Si 10.23%. IR

spectrum (v, cm⁻¹): 1605, 3100 (C = CH), 1250, 1715 $\begin{pmatrix} 0 \\ C \end{pmatrix}$.

The same procedure gave (X), yield 22.2%, bp 110°C (1 mm); n_D^{20} 1.4600. Found, %: C 58.08; H 9.28; N 6.33; Si 12.20%. C11H21NO2Si. Calculated, %: C 58.10; H 9.30; N 6.16; Si 12.35%. IR spectrum (v, cm⁻¹): 1615, 3105 (C = CH), 1020, 1250, 1750 C

), 2227 (CN).

<u>(Triethylgermyl)acetonitrile.</u> a) To a mixture of mercuribis(acetonitrile) (2.81 g) and benzene (10 ml) was added $(Et_3Ge)_2$ Hg (4.81 g). An exothermal reaction ensued, depositing mercury (3.71 g, \sim 100%). Distillation of the organic layer gave Et_3GeCH_2CN (2.75 g, 74.7%), bp 49-50°C (1 mm); $n_D^{2^\circ}$ 1.4666. Found, %: C 48.06; H 8.54; Ge 36.34; N 6.79%. $C_8H_{17}GeN$. Calculated, %: C 48.08; H 8.58; Ge 36.33; N 7.00%.

b) Under the conditions of the preceding synthesis $ClHgCH_2CN$ (2.52 g) and $(Et_3Ge)_2Hg$ (4.71 g) in THF (10 ml) gave mercury (3.64 g, $\sim 100\%$). We also isolated triethylchlorogermane (1.71 g, 96.6\%), bp 58-60°C (15 mm); $n_D^{2\circ}$ 1.4640; and Et_3GeCH_2CN (1.42 g, 77.4%), bp 49-50°C (1 mm); $n_D^{2\circ}$ 1.4649.

c) A mixture of triethylgermane (3.22 g) and mercuribis(acetonitrile) (2.82 g) in an evacuated sealed ampul was heated to 160°C for 8 h and then at 200°C for 10 h. We isolated mercury (1.98 g, 99.0%), acetonitrile (0.41 g, \sim 100%), Et₃GeCH₂CN (1.46 g, 73.4%), bp 49-51°C (1 mm); n_D^{2°} 1.4654. IR spectrum (ν , cm⁻¹): 550, 585, 705 [(C₂H₅)₃Ge], 2230 (CN). PMR spectrum (δ , ppm): 1.56 s (CH₂), 1.02 m [(C₂H₅)₃Ge].

 $\begin{array}{l} \label{eq:linearconstruct} \underline{\text{Dimethyl}(\text{t-butyl})(\text{pentafluorophenyl})\text{silane.} & \text{A mixture of } \text{Me}_2(\text{C}_6\text{F}_5)\text{SiH}(2.26\text{ g}) \text{ and } \text{distructury}(1.71\text{ g}) \text{ was heated at } 180\,^\circ\text{C} \text{ for } 50\text{ h}. & \text{We isolated mercury}(1.08\text{ g},\, \text{$\sim}100\%) \text{ and isobutane}(120\text{ ml},\, \text{$\sim}99\%). & \text{Distillation of the organic layer gave dimethyl(t-butyl)-}(\text{pentafluorophenyl})\text{silane}(1.26\text{ g},\, 82.9\%), & \text{bp } 145-148\,^\circ\text{C}(2\text{ mm})\text{; } n_{\text{D}}^{2\,^\circ}1.4730. & \text{Found},\,\%\text{:} \text{C} 51.15\text{; H} 5.11\text{; F} 33.78\%. & \text{C}_{12}\text{H}_{15}\text{F}_{5}\text{Si.} & \text{Calculated},\,\%\text{:} \text{C} 51.06\text{; H} 5.31\text{; F} 33.68\%. \end{array}$

 $\begin{array}{l} \underline{\mathsf{Methyl}(\mathsf{t}-\mathsf{butyl})\mathsf{bis}(\mathsf{pentafluorophenyl})\mathsf{silane.}}_{\mathsf{di-t}-\mathsf{butylmercury}} & \mathsf{A} \ \mathsf{mixture} \ \mathsf{of} \ \mathsf{Me}(\mathsf{C}_{6}\mathsf{F}_{5})_2\mathsf{SiH} \ (4.31 \ \mathsf{g}) \ \mathsf{and} \\ \mathtt{di-t}-\mathsf{butylmercury} \ (3.62 \ \mathsf{g}) \ \mathsf{was} \ \mathsf{heated} \ \mathsf{at} \ 200^\circ\mathsf{C} \ \mathsf{for} \ 50 \ \mathsf{h}. \ \mathsf{In} \ \mathsf{the} \ \mathsf{usual} \ \mathsf{way} \ \mathsf{we} \ \mathsf{isolated} \\ \mathtt{mercury} \ (2.11 \ \mathsf{g}, \ 92.1\%), \ \mathsf{isobutane} \ (250 \ \mathsf{ml}, \ 97.7\%), \ \mathsf{and} \ \mathsf{methyl}(\mathsf{t}-\mathsf{butyl})\mathsf{bis}(\mathsf{pentafluorophenyl})-\\ \mathsf{silane} \ (4.51 \ \mathsf{g}, \ 90.9\%), \ \mathsf{bp} \ 133-135^\circ\mathsf{C} \ (1 \ \mathsf{mm}); \ \mathsf{n}_D^{2^\circ} \ \mathsf{1.4801}. \ \mathsf{Found}, \ \%: \ \mathsf{C} \ 47.20; \ \mathsf{H} \ 2.63; \ \mathsf{F} \ 43.66\%. \\ \mathsf{C}_{17}\mathsf{H}_{12}\mathsf{F}_{10}\mathsf{Si}. \ \mathsf{Calculated}, \ \%: \ \mathsf{C} \ 47.00; \ \mathsf{H} \ 2.76; \ \mathsf{F} \ 43.77\%. \end{array}$

Ethyl(t-butyl)bis(pentafluorophenyl)silane. A mixture of Et(C₆F₅)₂SiH (4.97 g) and dit-butylmercury (2.02 g) was heated at 180°C for 70 h. We obtained mercury (1.27 g, 100%), isobutane (140 ml, 98.6%), and Et(C₆F₅)₂SiCMe₃ (2.61 g, 91.6%), bp 151-152°C (2 mm); n_D^{2°} 1.4820. Found, %: C 48.53; H 3.27; F 42.42%. C₁₈H₁₄F₁₀Si. Calculated, %: C 48.21; H 3.12; F 42.41%.

Reaction of Ethyl (Triethylgermyl)diazoacetate with Dimethyl(pentafluorophenyl)silane. A mixture of Et₃GeC(N₂)COOEt (2.51 g), dimethyl(pentafluorophenyl)silane (2.01 g), freshly precipitated copper powder (\circ 0.5 g), and hexane (10 ml) was heated to 100-120°C for 10 h. Nitrogen (200 ml, \circ 100%) was evolved. Distillation of the organic layer gave ethyl (tri-ethylgermyl) [dimethyl(pentafluorophenyl)silyl] acetate, (2.22 g, 51.3%), bp 120-121°C (1 mm); np^{2°} 1.4801. Found, %: C 45.80; H 5.86; F 20.15; Ge + Si 21.29%. C₁₈H₂₇F₅GeO₂Si. Calculated, %: C 45.89; H 5.77; F 20.16; Ge + Si 21.36%. IR spectrum (\vee , cm⁻¹): 1690, 1705,

 $1250 \begin{pmatrix} C \\ 0 \end{pmatrix}$, 800, 1250 (Me₂Si); group of bands at 1000-1200, 1510, 1640 (C₆F₅). PMR spectrum

(\$, ppm): 0.50, 0.52 s (Me₂Si), 0.99 m (Et₃Ge), 1.11 t (Me, J = 7.0 Hz), 2.10 s (\geq CH), 3.89 q (OCH₂, J=⁷ Hz).

Reaction of Ethyl (Triethylgermyl)diazoacetate with Methylbis(pentafluorophenyl)silane. A mixture of Et₃GeC(N₂)COOEt (3.41 g), methylbis(pentafluorophenyl)silane (4.6 g), copper powder (0.7 g), and hexane (15 ml) was heated to 100-120°C for 13 h. Nitrogen (126 ml, 45%) was evolved. The organic layer was fractionated. We obtained the starting silane (4.41 g, 95.9%), bp 66-68°C (1 mm); $n_D^{2\circ}$ 1.4635. Found, % : C 46.51; H 7.78%. C₂oH₄oGe₂N₂O₄. Calculated, %: C 46.39; H 7.74%. We also obtained azine (XII) (2.91 g, 90.1%), bp 141-142°C (1 mm); $n_D^{2\circ}$ 1.4932.

<u>Bis[dimethyl(pentafluorophenyl)silyl]mercury.</u> A mixture of $Me_2(C_6F_5)SiH$ (4.77 g) and bis[bis(trimethylsilyl)amino]mercury (5.49 g) in an evacuated sealed ampul was heated to 265-270°C for 50 h. We obtained hexamethyldisilazane (3.39 g, $\sim 100\%$) and the silylmercury compound (3.01 g, 43.7%), bp 145-149°C (0.5 mm); $n_{D}^{2\circ}$ 1.4140; the light yellow liquid deposited mercury on UV irradiation. Found, %: F 28.84%. $C_{16}H_{12}HgF_{10}Si_2$. Calculated, %: F 29.18%.

Bis[ethylbis(pentafluorophenyl)silyl]mercury. A mixture of C₂H₅(C₆F₅)₂SiH (7.50 g) and bis[bis(trimethylsily1)amino]mercury (5.01 g) was heated to 200°C for 72 h. We obtained hexamethyldisilazane (3.08 g, 100%) and the silylmercury compound (8.44 g, 89.9%), bp 180-181°C (0.5 mm); nD²⁰ 1.4320; the yellow liquid deposited mercury on UV irradiation. Found. %: F 37.95%. C₂₈H₁₀Si₂F₂₀Hg. Calculated, %: F 38.65%.

CONCLUSIONS

1. Radical exchange between bis(triethylgermyl)mercury and mercury acetylacetonate is accompanied by demercuration and forms 2-(triethylgermoxy)pent-2-en-4-one, the cis isomer of which shows 1,5-migration of the Et₃Ge group between the two oxygen atoms of the acety1acetonate moiety.

2. Mercuribis(diethyl malonate), mercuribis(ethyl cyanoacetate), mercuribis(malononitrile), and mercuribis (acetonitrile) easily undergo exchange reactions with bis (triethylgermyl)mercury; these are accompanied by demercuration.

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