PETROV, A.D.; ANDRIANOV, K.A.; GOLUBTSOV, S.A.; PONOMARENKO, V.A.;
CHERKAYEV, V.G.; TARASOVA, A.S.; VAVILOV, V.V.; ZADOROZHNYY, N.A.;
POPELEVA, G.S.

Continuous method of catalytic addition of hydrosilanes to unsaturated compounds. Khim.nauk i prom. 3 no.5:679-661 '58.

1. Institut organicheskoy khimii im. V.D. Zelinskogo.
(Silane) (Unsaturated compounds)

SOV/62-58-8-7/22

AUTHORS: Petrov, A. D., Mironov, V. F., Ponomarenko, V. A.,
Sadykh-Zade, S. I., Chernyshev, Ye. A.

TITLE: Synthesis of New Types of Silicon Containing Monomers (Sintez novykh vidov kremnesoderzhashchikh monomerov)

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye khimicheskikh nauk, 1958, Nr 8, pp. 954-963 (USSR)

ABSTRACT: This lecture was delivered at the General Meeting of the Department of Chemical Sciences of the AS USSR on April 25, 1958. First the previous paper (Ref 1) and the papers written by other authors (Refs 2 and 3) are discussed in short, and then the lecture deals with the three subjects: a) The catalytic binding of hydride silanes with unsaturated and aromatic compounds. b) The condensation of hydride silanes with alkyl-aryl- and alkenyl halides at high temperature. c) The synthesis of polymerizing silicon hydrocarbons (and their derivatives). The result of the experiments carried out is as follows: In the presence of H_2PtCl_6 alkyl dichlorosilanes bind with $CH\equiv CH$, $CH_2=CH_2$, $CH_2=CHCH_3$ (at temperatures of from 20 to

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60°C) in almost quantitative yield. In the presence of platinum catalysts alkyl dichlorosilanes supply higher yields of compound products. In the presence of peroxides higher yields are to be found due to silicochloroform. By means of the condensation (600°C) of alkyl dichlorosilanes and silicochloroform with aryl- and alkenyl halides not accessible di-and trichlorosilanes have been obtained until now. Silicon containing butadiene derivatives, acrylic acid derivatives, derivatives of vinyl esters and acetals were synthesized for the first time, all of which form linear, solid polymers (under atmospheric pressure). There are 1 figure, 3 tables, and 12 references, 10 of which are Soviet.

ASSOCIATION: Institut organicheskoy khimii im. N. D. Zelinskogo Akademii nauk SSSR (Institute of Organic Chemistry imeni N. D. Zelinskiy, AS USSR)

SUBMITTED: May 4, 1958

Card 2/2

SOV/62-58-8-13/22

AUTHORS: Batuyev, M. I., Ponomarenko, V. A., Matveyeva, A. D., Snegova, A. D.

TITLE: The Optical Investigation of the C - H Bond of Some Alkyl Silane and Disilane Chlorides and Their Chlorine Derivatives as Related to the Properties of Their Chlorination (Opticheskoye issledovaniye svyazi C - H nekotorykh alkilsilan- i disilan-khloridov i ikh khlorproizvodnykh v svyazi s osobennostyami ikh khlorirovaniya)

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye khimicheskikh nauk, 1958, Nr 8, pp. 996-1003 (USSR)

ABSTRACT: The chlorination of methyl silane and chloromethyl silane chlorides with simultaneous irradiation was first carried out by Krieble and Elliot (Krible and Elliot) and later on it was investigated in detail by Speier (Speyer, Refs 2-4). Then some phenomena of specifically anomalous character were found. In the present paper the authors report on the result of their investigation of the C - H bond as well as of some alkyl silane and disilane chlorides. It turned out that along with the increase in number of the chlorine atoms in silicon and in the

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SOV/62-58-8-13/22

The Optical Investigation of the C - H Bond of Some Alkyl Silane and Disilane Chlorides and Their Chlorine Derivatives as Related to the Properties of Their Chlorination

alkyl chains of the alkyl silane chlorides a regular increase of the effective electron density of the corresponding C - H bonds takes place. The anomalies in the chlorination of methyl silane chloride and chloromethylsilane chloride found by other authors could not be proved by the authors. Perhaps the direction taken by the mentioned chlorination could be called an anomalous phenomenon. It is assumed that this direction is caused by spatial hindrances which complicate the whole process. There are 7 tables and 8 references, 4 of which are Soviet.

ASSOCIATION: Institut goryuchikh iskopayemykh i Institut organicheskoy khimii im. N. D. Zelinskogo Akademii nauk SSSR (Institute of Mineral Fuels and Institute of Organic Chemistry imeni N. D. Zelinskiy, AS USSR)

SUBMITTED: January 23, 1957

Card 2/2

PONOMARENKO, V.A.

Symposium on organic and nonsilicate chemistry of silicon held in Dresden, May 12 - 14, 1958. Izv. AN SSSR. Otd. khim. nauk no.11: 1401-1403 N '58. (MIRA 11:12)
(Chemistry, Organic)

SOV/20-121-2-31/53

AUTHORS: Petrov, A. D., Corresponding Member, Academy of Sciences, USSR, Ponomarenko, V. A., Odabashyan, G. V.

TITLE: Organofluorosilicic Compounds (Ftorkremniyorganicheskiye soyedineniya) Simple Organofluorosilicic Ethers (Prostyye ftorkremniyorganicheskiye efiry)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol. 121, Nr 2, pp. 307 - 310 (USSR)

ABSTRACT: In earlier articles (Refs 1-3) the authors wrote about the combination reaction of hydrisilanes to fluorolefines in the presence of platinized carbon. The experience gained in those experiments was used by them in the case of the simple ethers of allyl alcohol and of 1,1,2-trifluoro-2-chloro ethanol (I) as well as of 1,1,2,2-tetrafluoro ethanol. The purpose of this investigation was not only the production and the study of the properties of hitherto not described fluorized organosilicic ethers but also the influence exerted by the structure of the hydrisilanes on the course of the combination reaction of compounds having a gradually decreasing number of chlorine

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atoms at the Si besides a Si-H binding. The results of the experiments carried out on comparative conditions (heating to 170-180° for 3 hours) are shown in tables 1 and 2. From table 1 may be seen that the best yields were supplied by the following hydrisilanes: CH_3SiCl_2H, $C_2H_5SiCl_2H$, $(C_2H_5)(CH_3)SiClH$ and Cl_3SiH. The increase of the activity in this hydrisilane series agrees with the earlier observations made by the authors (Ref 2) and by other scientists (Ref 4). The comparison of the data of tables 1 and 2 allows to draw the following conclusions:

1.-The conclusion drawn earlier with regard to the high activity of the hydrisilanes of the type $RSiCl_2H$ and R_2SiClH is confirmed.

2.-The trichloro silane combines with greater difficulty with (I) than $C_2H_5SiCl_2H$ and $(C_2H_5)(CH_3)SiClH$. In the presence of the former the combination of Cl_3SiH to (I) takes place more actively.

3.-The combination of $(C_2H_5)_2(CH_3)SiH$ to (I) together with $C_2H_5SiCl_2H$ and Cl_3SiH takes place in higher yields than without these chlorosilanes.

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SOV/20-121-2-31/53

Organofluorosilicic Compounds. Simple Organofluorosilicic Ethers.

4.-The data of table 2 tend to show that the alkyl chloro siliconhydrides may be arranged in the following order: $R_3SiH > R_2SiClH > RSiCl_2H > Cl_3SiH$. Also in this case an "activation" of the reaction by easily combinable compounds as well as an increase of the yield of the products of combination, as in case 1, seems not impossible. Most of the ethers produced are rather heat resistant. The fluoro-ether group remains untouched in the Grignard reaction and in the hydrolysis. There are 2 tables and 5 references, 3 of which are Soviet.

ASSOCIATION: Institut organicheskoy khimii im. N. D. Zelinskogo Akademii nauk SSSR (Institute of Organic Chemistry imeni N. D. Zelinskiy AS USSR)

SUBMITTED: January 29, 1958

Card 3/3

SOV/20-122-3-23/57

AUTHORS: Ponomarenko, V. A., Vzenkova, G. Ya., Yegorov, Yu. P.

TITLE: Alkyl Germanium Hydrides and Alkyl Germanium Deuterides (Alkilgermaniygidridy i alkilgermaniydeyteridy)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 122, Nr 3, pp 405-408 (USSR)

ABSTRACT: Since 1886 (Ref 1) only few organic (17) and inorganic (13) germanium hydrides have been produced (Ref 2). The germanium deuterides known since 1954 contain no organic ones. Both groups of compounds mentioned are of importance for the elaboration of new methods of production of organogermanium compounds. Moreover, the refraction of the Ge-H and Ge-D bindings had to be determined at least with a certain approximation. In the present paper the production and the properties of the following compounds are described: 1) $CH_3GeH_3 \rightarrow (CH_3)_2GeH_2 \rightarrow (CH_3)_3GeH$. 2. $CH_3GeD_3 \rightarrow (CH_3)_2GeD_2 \rightarrow (CH_3)_3GeD$. 3. $C_2H_5GeH_3 \rightarrow (C_2H_5)_2GeH_2 \rightarrow (CH_3)_2(C_2H_5)GeH$. 4. $C_2H_5GeD_3 \rightarrow (C_2H_5)_2GeD_2 \rightarrow (CH_3)_2(C_2H_5)GeD$. All these organic germanium hydrides and deuterides were produced in a suf-

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ficient yield under conditions which were similar to that of the production of alkyl silane hydrides and deuterides (Ref 6) i. e. from the corresponding alkyl germanium chlorides (bromides) LiH and LiD. The physical properties of these compounds are given on table 1. It may be concluded from it that the refraction of the Ge-H binding is on the average about 3,38 ml/mol, that of the Ge-D binding 3,34 ml/mol. In the production of the initial compounds $(CH_3)_2(C_2H_5)GeCl$ and $(C_2H_5)_2GeCl_2$ by means of the organomagnesium method the exchange reaction of chlorine with bromine was observed (Ref 8). Bromide yield was sufficiently high. It can be concluded from this fact that in germanium chlorine atoms have an increased exchangeability with the bromine atoms in the Grignard reaction. In analogy to the hydrisilanes (Ref 12) the authors proved in the present paper the possibility of application of chloroplatinic acid by using the Karash reaction for the germanium hydride compounds at the example of trichloro germanium. In conclusion the spectra of the combination dispersion of the compounds mentioned in the title are discussed. There are 1 table and 16 references, 5 of which are Soviet.

Alkyl Germanium Hydrides and Alkyl Germanium Deuterides SOV/20-122-3-23/57

ASSOCIATION: Jnstitut organicheskoy khimii im. N. D. Zelinskogo Akademii nauk SSSR (Institute of Organic Chemistry imeni N. D. Zelinskiy, AS USSR) Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute imeni P. N. Lebedev, AS USSR)

PRESENTED: May 9, 1958, by A. A. Balandin, Member, Academy of Sciences, USSR

SUBMITTED: May 5, 1958

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SOV/20-121-2-31/53

Organofluorosilic Compounds. Simple Organofluorosilicic Ethers.

Card 4/4

PONOMARENKO, V. A.

V. A. Ponomarenko, V. G. Cherkayev, G. V. Odabashyan, N. A. Zadorozhnyy and A. D. Petrov, "The Catalytic Adding of Hydrosilanes to Unsaturated Compounds."

Report presented at the Second All-Union Conference on the Chemistry and Practical Application of Silicon-Organic Compounds held in Leningrad from 25-27 September 1958.
Zhurnal prikladnoy khimii, 1959, Nr 1, pp 238-240 (USSR)

PONOMARENKO, V. A.

V. F. Mironov, V. A. Ponomarenko, G. Ya. Vzenkova, I Ye. Dolgiy and A. K. Petrov, "The Synthesis of Germanium-organic Compounds."

Report presented at the Second All-Union Conference on the Chemistry and Practical Application of Silicon-Organic Compounds held in Leningrad from 25-27 September 1958.
Zhurnal prikladnoy khimii, 1959, Nr 1, pp 238-240 (USSR)

STAVITSKIY, I.K.; BORISOV, S.N.; PONOMARENKO, V.A.; SVIRIDOVA, N.G.;
ZUYEVA, G.Ya.

Polydimethylgermanasiloxanes. Vysokom.soed. 1 no.10:
1502-1506 O '59. (MIRA 13:3)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut sinteticheskogo kauchuka i Institut organicheskoy khimii AN SSSR.
(Siloxanes) (Germanium compounds)

5.3700

77085
SOV/62-59-12-29/43

AUTHORS: Batuyev, M. I., Ponomarenko, V. A., Matveyeva, A. D., Vzenkova, ~~O. Ya.~~

TITLE: Optical Investigation of Alkylgermanium Chlorides in Connection With Some Peculiarities of Their Chemical Behavior

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 12, pp 2226-2233 (USSR)

ABSTRACT: Several studies of similar content were published by the authors previously (Zh. obshch. khimii, 1956, Vol 26, p 2336; this journal, 1956, p 1070; ibid., 1957, p 515; ibid., 1958, p 996). The authors showed that many chemical characteristics distinguishing organosilicon compounds from carbon compounds are also present, and even more pronounced, in organogermanium compounds (this journal, 1956, p 1146; ibid., 1957, Nr 8, p 994; ibid., Nr 2, p 199; Dokl. AN SSSR, 1954, Vol 94, p 485; this journal, 1957, Nr 3, p 310). Methyltrichlorogermane and methyltrichlorosilane, unlike ethyltrichlorogermane

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and ethyltrichlorosilane, could not be chlorinated with sulfuryl chloride. Ethyltrichloro-compounds of both germanium and silicone were easily chlorinated but the β-directing effect of the $GeCl_3$-group was considerably stronger than that of the $SiCl_3$-group. Chlorination of CH_3GeCl_3, $(CH_3)_2GeCl_2$, and similar compounds to di- and trichlorides proceeded more rapidly than the chlorination of the corresponding silicon compounds. The yield of germanium monochlorides was lower than that of the corresponding silicon compounds. Dehydrochlorination of $Cl_3GeCH_2CH_2Cl$ with quinoline yielded $Cl_3GeCH{=}CH_2$ as main product, and also $GeCl_4$, whereas practically no $SiCl_4$ was obtained on dehydrochlorination of $Cl_3SiCH_2CH_2Cl$. This can be explained by an easier β-elimination in β-chloroethyltrichlorogermane than in β-chloroethyltrichlorosilane. These

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peculiarities of the chemical behavior of Ge are due in the first place to its physicochemical properties; some of these were optically investigated by the authors (this journal, 1956, p 1243). The present study deals with investigation of the vibrational frequencies of C—H bonds in methylene and methyl groups of tetraethylgermane, and ethyl-, methyl-, chloroethyl- and chloromethylgermanium as compared with vibrational frequencies of the corresponding silicon compounds and normal paraffins. Spectrograph ISP-51 was used in the study, and Raman spectra of 11 germanium compounds were investigated. A possible explanation for the behavior of Ge and Si compounds is advanced. In chlorination of $CH_3CH_2GeCl_3$, the electrophilic Cl-atoms of SO_2Cl_2 should be apparently directed toward electronegative C—H bonds at atoms adjacent to the germanium atom. However, Ge has a larger electron shell than Si; also, the negative pole of the $CH_3CH_2GeCl_3$ molecule is concentrated in the region of Cl-atoms. These factors do not allow the

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other, more negative, end of SO_2Cl_2 molecule to approach the region of the methylene C—H bonds; the molecule moves away from the methylene bond region toward the methyl group, and the chlorination proceeds in the β-position to a much greater extent than in the chlorination of $CH_3CH_2SiCl_3$. The ratio of α to β isomers in the chlorination of $CH_3CH_2GeCl_3$ with sulfuryl chloride in presence of benzoyl peroxide was 1:9, whereas in chlorination of $CH_3CH_2SiCl_3$ this ratio was only 1:2.5. It is also evident that the deflection of the SO_2Cl_2 molecule from the methyl group adjacent directly to Ge-atom in CH_3GeCl_3 due to the above factors hinders the chlorination of this compound. The Raman spectrum of β-chloroethyltrichlorogermane showed a considerably higher number of lines (15 lines more) than the number expected theoretically, and a twofold increase of the vibrational frequency of methylene C—H bonds. This indicated the possible

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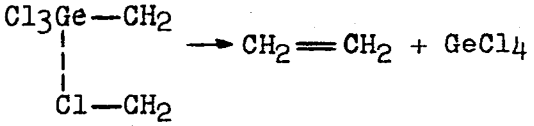
existence of the above compound in two isomeric forms:

$$\begin{array}{ll} Cl_3Ge - CH_2 \\ \;\; \vdots \qquad | \\ \;\; Cl - CH_2 \end{array} \qquad \begin{array}{l} Cl_3Ge - CH_2 \\ \qquad\quad | \\ \qquad\quad CH_2 - Cl \end{array}$$

(cis) (trans)

Intramolecular interaction Ge....Cl in the cis-isomer can promote β-elimination:



$$\begin{array}{l} Cl_3Ge - CH_2 \\ \;\; \vdots \\ \;\; Cl - CH_2 \end{array} \longrightarrow CH_2 = CH_2 + GeCl_4$$

The formation of $GeCl_4$ on dehydrochlorination of chloroethyltrichlorogermane with quinoline can thus be explained. There are 8 tables; and

5(2, 3)

AUTHORS: Petrov, A. D. Corresponding Member, AS USSR, Ponomarenko, V. A., Odabashyan, G. V., Krokhmalev, S. I.

SOV/20-124-4-30/67

TITLE: Organic Fluosilicates (Ftorkremniyorganicheskiye soyedineniya). Investigation of the Addition Reaction of Alkyl Silicon-chloride Hydrides to 1,1,2,2- Tetrafluoro-ethyl Allyl Ether (Izucheniye reaktsii prisoyedineniya alkilkhlorkremniygidridov k 1,1,2,2-tetra-ftoretilallilovomu efiru)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 124, Nr 4, pp 838-841 (USSR)

ABSTRACT: In a previous paper (Ref 1) the authors proved that the addition of alkyl silicon-chloride hydrides to $(CH_2=CHCH_2OCF_2CF(Cl)H)$ (A) in the presence of platinized coal is an uncomplicated method of synthesizing (simple) organic silicon fluoride ethers. In the present paper this reaction was studied more in detail with the substances mentioned in the subtitle. All experiments were performed under comparable conditions (Tables 1, 2). The respective results confirmed those earlier obtained (Fig 1), i. e. it was proved

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Organic Fluosilicates. Investigation of the Addition Reaction of Alkyl Silicon-chloride Hydrides to 1,1,2,2-Tetrafluoro-ethyl Allyl Ether

SOV/20-124-4-30/67

that alkyl silicon-chloride hydrides form, according to their relative yields of addition products, the following series:

$(CH_3)(C_2H_5)_2SiH > (CH_3)(C_2H_5)(Cl)SiH > (C_2H_5)(Cl)_2SiH > Cl_3SiH$

In the case of an addition of the product mentioned first to the ether mentioned in the subtitle, their yield cannot be increased either by drying the catalyst at 300° in vacuum, or by treatment with C_2H_5OH, or by removal of the possible humidity by $(CH_3)_2SiCl_2$, whereas even a small addition of $C_2H_5SiHCl_2$ rapidly increases the yield of addition products. Thus, it may be assumed that 1) the reaction of addition to platinized coal might be a radical chain-reaction; 2) the adsorbent powers of the reagent molecules on the surface of the catalyst evidently play an important part therein; 3) the levity of formation and the activity of silyl radicals depends on the nature of the substituents located at the Si. The above-mentioned particularities of the reaction of addition can be explained by the different activity of the individual silyl

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Organic Fluosilicates. Investigation of the Addition Reaction of Alkyl Silicon-chloride Hydrides to 1,1,2,2-Tetrafluoro-ethyl Allyl Ether

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radicals (besides other factors). The structure of the addition products was proved by a counter-synthesis. A comparison of the Raman spectra and other physical properties confirms the linearity of the products obtained in two ways. In conclusion, the synthesis, constants and yield (in part) of 11 addition products are discussed. There are 2 figures and 2 references, 1 of which is Soviet.

ASSOCIATION: Institut organicheskoy khimii im. N. D. Zelinskogo Akademii nauk SSSR (Institute of Organic Chemistry imeni N. D. Zelinskiy of the Academy of Sciences, USSR)

SUBMITTED: July 14, 1958

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5 (2,3)

AUTHORS: Petrov, A. D., Corresponding Member AS USSR, Ponomarenko, V. A., Odabashyan, G. V. SOV/20-126-5-27/69

TITLE: The Synthesis of Organosilicon Monomers From Dichlorosilane (Sintez kremneorganicheskikh monomerov iz dikhlorsilana)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 126, Nr 5, pp 1009 - 1012 (USSR)

ABSTRACT: It was to be assumed that dichlorosilane is a compound lending itself to many reactions. This might be concluded from the steric effect of the substituents, reduced to a minimum, as compared with the alkyl dichlorosilanes (Refs 1,2). At the same time, these transformations promised new possibilities which are interesting both from the theoretical and the practical point of view. The few fields of application of dichlorosilane hitherto rendered accessible, are enumerated (Refs 3,4). As could be foreseen in consequence of the two Si-H bonds, the authors - according to the conditions of the experiments, have obtained the two series of compounds $RSiHCl_2$ and R_2SiCl_2. They are interested in the first series, and in particular in

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$C_6H_5SiHCl_2$ as these led to the synthesis of new monomers ($RR'SiCl_2$) with various radicals on the silicon atom (in particular of such as contain fluorine). In spite of relatively severe temperature conditions of the reaction (600-680°) phenyl-dichlorosilane constitutes the chief product. Table 1 shows the results of the experiments. Dichlorosilane enters also into the reaction of the thermal condensation with vinyl dichlorosilane at 535-545°C. The only stable reaction product was vinyl dichlorosilane (yield 20%). The formation of a mixture of reaction products boiling at a high temperature indicates the complicated character of this reaction. The possibility proved in this manner of producing silanes of the type $RSiHCl_2$ from dichlorosilane and RCl, even at very high temperatures, extends the reactions of thermal condensation (Ref 5). The dichlorosilane addition to unsaturated compounds as ethylene and propylene (in the presence of H_2PtCl_6) may be considerably deflected and controlled in the direction of the compounds of $RSiHCl_2$ (Table 2). The yields were high and in some cases al-

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most quantitative. With an excess of unsaturated compounds only dialkyl-dichlorosilanes (R_2SiCl_2) are formed. In this connection the addition of the Cl_2SiH_2 was investigated not only in the simplest of the olefins, but also in more complicated, unsaturated compounds (the fluorated ether $-CH_2=$ $=CHCH_2OCF_2CFClH$). The $RSiHCl_2$ production under consideration, therefore, signifies an important evolution of the synthesis methods of this kind of monomers. With acetylene the reaction of the Cl_2SiH_2 is more complicated, as polymer products are formed. Under the given conditions of investigation the authors have not succeeded in obtaining vinyl- and divinyl-dichlorosilanes by this method. The result has always been a mixture of liquid and solid polymers boiling at a high temperature. Table 3 shows the physical properties of the products obtained by the addition of the phenyl-dichlorosilanes as well as of $p-FC_6H_4SiHCl_2$ to the $CH_2=CHCF_3$ (Table 2). They formed with excellent yields in the presence of H_2PtCl_6. There are 3 tables and 6 references, 3 of which are Soviet.

ASSOCIATION: Institut organicheskoy khimii im. N. D. Zelinskogo Akademii nauk SSSR (Institute of Organic Chemistry imeni N. D. Zelinskiy of the Academy of Sciences, USSR)

SUBMITTED: April 3, 1959

5.3700

78082
SOV/62-60-1-28/37

AUTHORS: Ponomarenko, V. A., Snegova, A. D.

TITLE: Brief Communications. Synthesis of Organosilicon Monomers From Hexachlorocyclopentadiene and 5,5-Difluorotetrachlorocyclopentadiene

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1960, Nr 1, pp 135-138 (USSR)

ABSTRACT: Preparation of organosilicon monomers (see Table 3) from hexachlorocyclopentadiene (I) and 5,5-difluorotetrachlorocyclopentadiene (II) by Diels-Alder reaction was studied. It was found that II reacts more readily than I, with vinyl- and allylchlorosilanes in the Diels-Alder reaction, particularly when the silicon is bound to hydrogen. There is a difference between the experimentally determined and calculated molar refractions for the compounds obtained (see Table 3). Using the experimental data, more accurate group refractive indexes were calculated for the bonds shown in Table 1.

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SOV/62-60-1-28/37

Brief Communications. Synthesis of Organosilicon Monomers From Hexachlorocyclopentadiene and 5,5-Difluorotetrachlorocyclopentadiene

The starting compounds and the conditions of reaction are shown in Table.2. The new compounds obtained and their characteristics are given in Table 3. There are 3 tables; and 8 references, 4 U.S., 2 U.K., 1 German, 1 Soviet. The 5 most recent U.S. and U.K. references are: L. Goodman, R. M. Silverstein, C. W. Gould, J. Organ. Chem. 22, 596 (1957); British Patent 776706 (1957); M. Kleiman, U.S. Patent 2697089 (1954); C. W. Roberts, Chem. and Ind. , 111 (1958); E. T. McBee, D. K. Smith, H. E. Ungnade, J. Am. Chem Soc. , 77, 387 (1955).

ASSOCIATION: N. D. Zelinskiy Institute of Organic Chemistry, Akademy of Sciences USSR (Institut organicheskoy khimii im. N. D. Zelinskogo Akademii nauk SSSR)

SUBMITTED: June 15, 1959

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Key to Table 1. (a) Nrs, (b) group, (c) group refraction, determined experimentally; (d) group refraction, calculated from refractions for the bonds.

(a)	(b)	(c)	(d)
1		[illegible]	[illegible]
2		[illegible]	[illegible]

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Key to Table 2. (a) Nrs; (b) starting products; (c) diene; (d) in g; (e) dienophile; (f) reaction temperature in ° C; (g) reaction time in hr; (h) weight of the products of reaction, in g; (i) yield of product of diene-synthesis; (*) compounds prepared by G. V. Odabashyan.

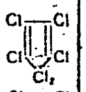
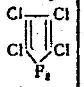
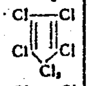
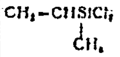
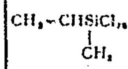
(a)	(b)				(f)	(g)	(h)	(i)	
	(c)		(e)	(d)				(d)	[illegible]
1		54,8	$CH_2-CHSiCl_3$	33,2	190	6,5	83,7	42,7	49,0
2		3,5	$CH_2-CHSiCl_3$	2,4	130—150	5,3	5,9	3,3	56,0
3		54,8	 $CH_2-CH\underset{CH_3}{SiCl_2}$	28,2	138—190	3,25	79,4	59,8	72,4
4		2,7	 $CH_2-CH\underset{CH_3}{SiCl_2}$	1,6	105—150	8	4,1	—	—

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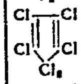
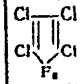
Table 2. (Cont'd.)

5		4,1	$CH_2{-}CH{-}\underset{C_2H_5}{\underset{\mid}{Si}}Cl_2$	2,3	146,5—202	4,2	6,0	3,2	50,0
6		9,8	$\cdot\ CH_2{-}CH\underset{H}{\underset{\mid}{Si}}Cl_2$	5,2	137—194	1,6	12,2	—	—
7		6,8	$CH_2{-}CH{-}CH_2\underset{H}{\underset{\mid}{Si}}Cl_2$	3,5	123—134	3,75	8,8	4,3	41,7
8		5,4	$CH_2{-}CH{-}CH_2\underset{H}{\underset{\mid}{Si}}Cl_2$	3,2	128—250	1,8	7,8	4,2	48,8
9		3,5	$\cdot\ CH_2{-}CH\overset{CH_3}{\underset{H}{\underset{\mid}{\overset{\mid}{Si}}}}Cl$	1,6	72—152	0,8	4,7	2,9	58,8

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78082, SOV/62-60-1-28/37

Key to Table 3. (a) Nrs; (b) compound; (c) bp in ° C (pressure in mm of Hg); (d) found; (e) calculated.

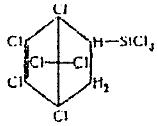
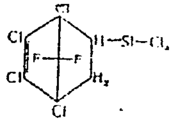
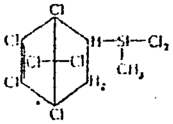
(a)	(b)	(c)	n_D^{20}	d_4^{20}	MR	
					(d)	(e)
1		138 (2)	1,5573	1,7362	80,56	81,26
2		130 (10)	1,5141	1,7010	71,05	71,64
3		136—137 (2)	1,5530	1,6457	80,47	81,63

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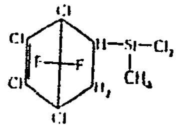
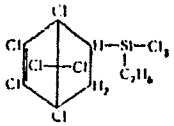
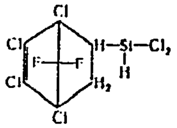
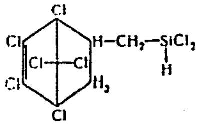
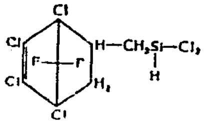
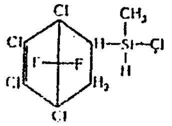
Table 3 (Cont'd) 78082, SOV/62-60-1-28/37

4		130 (8)	1,5120	1,6041	71,25	72,01
5		160 (7)	1,5520	1,6065	85,10	86,26
6		88 (16)	1,4326	1,4474	65,83	67,64

Card 7/8

Table 3 (Cont'd) 78082, SOV/62-60-1-28/37

7		152 (6)	1,5500	1,6370	80,53	81,89
8		102—103(2,5)	1,5110	1,5982	71,40	72,27
9		122 (8)	1,5066	1,5355	67,12	68,01

Ponomarenko, V.A.

82043
S/062/60/000/02/06/012
B003/B066

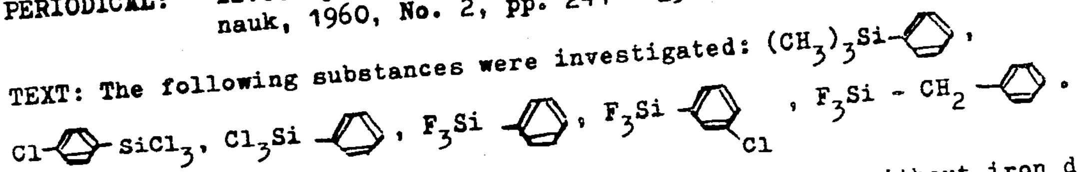
5.3700

AUTHORS: Ponomarenko, V. A., Snegova, A. D., Yegorov, Yu. P.

TITLE: Direction of the Chlorination and Bromination of Phenyl Silanes Containing SiF_3 and $Si(CH_3)_3$ Groups

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1960, No. 2, pp. 244 - 250

TEXT: The following substances were investigated:



The halogenation reactions were performed both with and without iron dust catalysts. The resultant products were identified by synthesizing them also by another method and by comparing the Raman spectra. The syntheses and the halogenation of the compounds mentioned are described in detail in the experimental part of the paper. Results: On chlorination of

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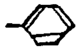
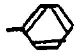
Direction of the Chlorination and Bromination of Phenyl Silanes Containing SiF_3 and $Si(CH_3)_3$ Groups

S/062/60/000/02/06/012
B003/B066

$(CH_3)_3Si$  in the presence of metallic iron, the $(CH_3)_3Si$ group proves to be directed toward the ortho- and para-positions. Substitution of the more electronegative chlorine or fluorine for the CH_3 groups bound to the Si-atom gives substitutions in the meta-position. The chlorination of Cl_3Si  or Cl $SiCl_3$ to dichlorides yields a mixture of reaction products under the given conditions. On photochemical chlorination of $(CH_3)_3Si$  in the absence of iron dust only the H-atoms at the CH_3 groups are substituted, whereas the phenyl radical remains unchanged. Contrary to the trichloro silyl group, the F_3Si group and other groups which are directly linked by the Si-atom to the aromatic ring are rather easily split from the ring on chlorination or bromination. This behavior is apparently due to the steric or inductive effect caused by the substituents on the Si-atom and to the course of the reaction according

Direction of the Chlorination and Bromination of Phenyl Silanes Containing SiF_3 and $Si(CH_3)_3$ Groups

82043
S/062/60/000/02/06/012
B003/B066

to the ionic mechanism. There are 1 figure, 1 table, and 8 references: 4 Soviet and 4 American.

ASSOCIATION: Institut organicheskoy khimii im. M. D. Zelinskogo Akademii nauk SSSR (Institute of Organic Chemistry imeni M. D. Zelinskiy of the Academy of Sciences USSR)

SUBMITTED: July 12, 1958 (initially)
November 21, 1959 (after revision)

Card 3/3

85603

5.2600 2209, 1273 1043

S/062/60/000/006/022/025/XX
B020/B060

AUTHORS: Ponomarenko, V. A., Yegorov, Yu. P.

TITLE: Vibration Frequencies of Si - H and Si - D Bonds and Electronegativity of Silyl Groups

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1960, No. 6, pp. 1133-1135

TEXT: In a number of previous papers (Refs. 1 - 4) the authors have already established the dependence of the vibration frequencies of the Si - H and Si - D bonds on the nature of atoms and groups bound to silicon. There is no precise relationship between the vibration frequencies of Si - H bonds and the sum of electronegativities. Better results are obtained by making use of electronegativities of groups, determined from the vibration frequencies (Ref. 6). However, as may be seen from Table 1, the empirical relation developed also holds for silicon hydrides. If the data obtained are recorded in a diagram, a straight line is obtained, whose equation reads: $\nu_{Si - H} = 1011 . X_c$ (1).

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85603

Vibration Frequencies of Si - H and Si - D Bonds and Electronegativity of Silyl Groups

S/062/60/000/006/022/025/XX
B020/B060

This equation serves for calculating the mean values of the electronegativities of the silyl groups on the basis of the values indicated in Table 1. The same equation can also be used to calculate the vibration frequencies of Si - H bonds in other silicon hydrides, if the electronegativities of the silyl groups are known. The "effective" electronegativity of an arbitrary silyl group containing given atoms or organic groups can be determined from the data indicated in the Table, and hence, the desired vibration frequency of the Si - H bond by substituting into equation (1). This is clearly indicated by the data given in Table 2. For silicon deuterides the equation reads: $\nu_{Si-D} = 734.X_c$. For hydrides and deuterides of germanium the same relation holds on principle, the coefficients only being different. There are 2 tables and 10 references: 5 Soviet, 3 US, 1 British, and 1 French.

X

ASSOCIATION: Institut organicheskoy khimii im. N. D. Zelinskogo Akademii nauk SSSR (Institute of Organic Chemistry imeni N. D. Zelinskiy of the Academy of Sciences USSR)

Card 2/3

87123
S/062/60/000/009/011/021
B023/B064

5.3700 2209, 1273, 1236

AUTHORS: Ponomarenko, V. A., Cherkayev, V. G., and Zadorozhnyy, N. A.

TITLE: Characteristics of the Addition of Alkyl Chloro Silicon Hydrides to Unsaturated Compounds in the Presence of Platinum Hydrochloric Acid

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye khimicheskikh nauk, 1960, No. 9, pp. 1610-1618

TEXT: The authors studied the course of the addition reaction with platinum hydrochloric acid being the catalyst. In the competitive addition of hydride silanes to ethylene in the presence of H_2PtCl_6, the silane activity was determined both by the induction effect and the steric effect of the silyl groups. In this connection, the role of the steric factor is of special importance in contrast to the addition in the presence of platinum on carriers. It was found that the substituents exert a deactivating effect upon the capability of the double bond of the unsaturated compound to add silicon hydride in the presence of H_2PtCl_6

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87123

Characteristics of the Addition of Alkyl Chloro Silicon Hydrides to Unsaturated Compounds in the Presence of Platinum Hydrochloric Acid

S/062/60/000/009/010/021
B023/B064

and Pt on carriers. This is said to be due to the steric and induction effect of these substituents. The data known at present on the behavior of the silicon hydrides toward unsaturated compounds both in the presence of H_2PtCl_6 and also of Pt on carriers, are in a better agreement with the assumption of a radical than of an ionic mechanism. This process is characteristic because of the particular role of the catalyst surface or the forces of complex formation. A convenient and highly productive method of synthesizing a number of organosilicon compounds of practical importance was worked out on the basis of the addition reaction of silicon hydrides to unsaturated compounds in the presence of H_2PtCl_6 and Pt on carriers. This includes: addition of methyl chloro silane to vinylidene fluoride; addition of methyl dichloro silane to trifluoro chloro ethylene; addition of methyl chloro silane to tetrafluoroethylene. Table 5 shows the conditions and results of the most characteristic experiments. The addition of silicon hydrides to olefines and acetylene in the presence of platinum hydrochloric acid is given in Table 6. N. S. Andreyev has taken the spectra of silicon hydrides for which the authors thank him. There are

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5.3700B

80104
S/080/60/033/04/35/045

AUTHORS: Rodzevich, N.Ya., Grinevich, K.P., Odavashyan, G.V., Ponomarenko, V.A.

7

TITLE: The Synthesis and the Investigation of the Properties of Polyorganosiloxanes Containing the Groups n-FC_6H_4-, -$(CH_2)_3$-O-CF_2CFClH and -$(CH_2)_3$-O-CF_2CF_2H

PERIODICAL: Zhurnal prikladnoy khimii, 1960, Vol 33, Nr 4, pp 957 - 961

TEXT: The study of the reaction of cohydrolysis of trimethylchlorosilane, dimethyldichlorosilanemethylphenyldichlorosilane with various fluorosilicon-organic chlorosilanes showed that the reaction proceeds mainly in the direction of obtaining cohydrolysis products of linear structure. The viscosity 7 of these products is somewhat increased in comparison with the viscosity of pentamers not containing fluorine atoms. The study of the properties of the compounds containing five silicon atoms in the molecule showed that the freezing points of the fluoroorganosilixanes 7 lie within the range (-65) - (70)°C, i.e. approximately on the same level as for polymer 6 which does not contain fluorine atoms. The energy of the viscous flow of fluoroorganooxy-

Card 1/2

PONOMARENKO, V.A.; ODABASHYAN, G.V.; LIFANOVA, I.N.; PETROV, A.D.

Synthesis of fluorine-silicon organic compounds by the addition of silicon hybrides to unsaturated fluorine-containing compounds in the presence of platinum catalysts. Zhur. prikl. khim. 33 no.12:2751-2757 D '60. (MIRA 14:1)

1. Institut organicheskoy khimii imeni N.D. Zelinskogo AN SSSR.
(Silicon organic compounds)
(Fluorine organic compounds)

5.3700 (B) (c)
~~5(2), 5(3)~~

67568

SOV/20-130-2-24/69

AUTHORS: Ponomarenko, V. A., Odabashyan, G. V., Petrov, A. D., Corresponding Member AS USSR

TITLE: Synthesis of Organosilicon Monomers From Methylchlorosilane 1

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol 130, Nr 2, pp 333 - 335 (USSR)

ABSTRACT: In the present paper, the authors used CH_3SiH_2Cl which can be produced easily and in good yields by disproportionation of CH_3SiHCl_2 in the presence of cyanamide catalysts (Ref 3). The carrying out of the reactions on one or both Si-H bonds of methylchlorosilane promised the realization of a nonorganometallic synthesis of several organosilicon monomers (see Scheme). To realize scheme (1) the reaction of thermal condensation of methylchlorosilane with chlorobenzene and with vinyl chloride at 550-650° and atmospheric pressure was chosen. As compared with dichlorosilane, methylchlorosilane reacts more difficultly in thermal condensation with C_6H_5Cl and with $CH_2=CHCl$. The

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yield in reaction products with the first Si-H bond is much smaller in this case. In this respect, the same picture prevails as in the reactions of Cl_3SiH and CH_3SiHCl_2 with chlorobenzene (Ref 4). Besides, up to 10% of the interaction product with both Si-H bonds was isolated at a time in thermal condensation of dichlorosilane with chlorobenzene. On the other hand, it was not possible to produce methyldiphenylchlorosilane from methylchlorosilane. Table 1 shows that scheme (2) can be realized much more easily than scheme (1). Methylchlorosilane reacts almost as easily with ethylene and propylene as dichlorosilane. This concerns the reaction on one and two Si-H bonds of methylchlorosilane to the same extent. The $(CH_3)(C_2H_5)SiHCl$ developing in a sufficiently good yield is easily transformed into $CH_3(C_2H_5)(Cl)SiCH_2CH_2Si(Cl)(C_2H_5)CH_3$ in the presence of H_2PtCl_6 in the reaction with acetylene. $(CH_3)(C_2H_5)SiHCl$ usually reacts with $CH_2{=}CHCF_3$ under the

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Synthesis of Organosilicon Monomers From Methylchlorosilane SOV/20-130-2-24/69

same conditions. A fluorine-containing compound of the type RR'R"SiCl develops here. Methylchlorosilane adds to trifluoropropylene more difficultly than to propylene. In this respect, CH_3SiH_2Cl behaves similarly as Cl_2SiH_2. In the above investigation, the authors succeeded in realizing a nonorganometallic synthesis of such alkyl-(aryl-)-silane- and disilane chlorides as $(CH_3)(R)SiHCl$, $(CH_3)(R)_2SiCl$, $(CH_3)(R')(R")SiCl$ and $(CH_3)(Cl)(R)SiCH_2CH_2Si(R)(Cl)(CH_3)$, where R, R', and R" are the groups $CH_2{=}CH—$, $C_6H_5—$, $C_2H_5—$, $C_3H_7—$, $CF_3CH_2CH_2—$ and others. Table 1 gives a survey of results of the addition of silicon hydrides to unsaturated compounds. Table 2 indicates the physical properties of the compounds produced. Three of them are novel. There are 2 tables and 4 Soviet references.

4

Card 3/4

MAYRANOVSKIY, S.G.; PONOMARENKO, V.A.; BARASHKOVA, N.V.; SNEGOVA, A.D.

Polarographic study of iodomethyltrialkylsilanes. Unusual polarographic maximum on the iodomethylphenyldimethylsilane. Dokl.AN SSSR 134 no.2:387-390 S '60. (MIRA 13:9)

1. Institut organicheskoy khimii im. N.D.Zelinskogo Akademii nauk SSSR. Predstavleno akademikom A.A.Balandinym.
(Silane)

86395

S/020/60/135/002/022/036
B016/B052

5.3700 2209

AUTHORS: Ponomarenko, V. A., Snegova, A. D., Pitina, M. R., and Petrov, A. D., Corresponding Member of the AS USSR

TITLE: High-temperature Chlorination of Phenyl Trichlorosilane

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 135, No. 2, pp. 339 - 341

TEXT: The authors report on high-temperature chlorination (200-500°C) of phenyl trichlorosilane. This reaction has not been described so far. The principal aim of their work was to study the possibility of using a continuous process and determine the quantitative proportion of the ortho-, meta-, and para-isomers formed. The first experiments made in a tube filled with quartz, gave a 19% yield of monochloro derivatives referred to the amount of initial substance passed through, or a 58% yield referred to the reacting phenyl trichlorosilane. The quantitative proportion of the isomers obtained is given as o-: m-: p- = 22 : 39 : 39. This indicates that the meta-orientating property of the $SiCl_3$ group

X

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86395

High-temperature Chlorination of Phenyl Trichlorosilane

S/020/60/135/002/022/036
B016/B052

(Ref.2) has no effect. The amount of the meta-isomer in the mixture hardly changes with an increase of temperature up to 450°C, although the quantitative proportion of ortho- and para-isomers changes in favor of ortho-chlorophenyl trichlorosilane. The application of activated carbon instead of quartz hardly affects the quantitative proportion of the isomers at equal temperatures, although the reaction sets in at lower temperatures and is accompanied by a slight destruction of phenyl trichlorosilane on the Si-C bond. Furthermore, it is shown that dimethyl dichlorosilane mixed with $SiCl_4$ is easily chlorinated on both activated carbon and quartz at 250-400°C. In all cases, a considerable cleavage of the Si-C bond took place, and di- and trichlorides were formed. High-temperature chlorination is thought to be a homolytic reaction, and the changed quantitative proportion of the isomers (like in high-temperature halogenation of chloro- and bromobenzenes) is due to the temperature-dependent change of activation energy in the chlorination of the various positions on the benzene ring. There are 2 tables and 8 references: 4 Soviet, 3 US, 1 British, and 1 Dutch.

SUBMITTED: August 11, 1960

Card 2/2

PETROV, Aleksandr Dmitriyevich; MIRONOV, Vladimir Florovich; PONOMARENKO, Vasiliy Andreyevich; CHERNYSHEV, Yevgeniy Andreyevich; TOPCHIYEV, A.V., akademik, otv. red.; POVAROV, L.S., red. Izd-va; LAUT, V.G., tekhn. red.; STRELETSKIY, I.A., tekhn. red.

[Synthesis of organosilicon monomers] Sintez kremniiorganicheskikh monomerov. Moskva, Izd-vo Akad. nauk SSSR, 1961. 550 p. (MIRA 14:5)

(Silicon organic compounds)

S/661/61/000/006/018/081
D205/D302

AUTHORS: Ponomarenko, V. A., Petrov, A. D., Krokhmalev, S. I. and Odabashyan, G. V.

TITLE: Catalytic addition of hydrosilanes to unsaturated compounds

SOURCE: Khimiya i prakticheskoye primeneniye kremneorganicheskikh soyedineniy; trudy konferentsii, no. 6, Doklady, diskussii resheniye. II Vses. Konfer. po khimii i prakt. prim. kremneorg. soyed., Len. 1958. Leningrad. Izd-vo AN SSSR. 1961, 95-99

TEXT: The reactions of Cl_3SiH, $(CH_3)Cl_2SiH$, $(C_2H_5)Cl_2SiH$, $(C_3H_7)Cl_2SiH$, $CH_3(C_2H_5)ClSiH$, and $CH_3(C_2H_5)_2SiH$ with $CH_2{=}CHCH_2OCF_2CF_2H$ (i) were performed at 160 - 180°C and 10 - 16 atm., during 3 hours in the presence of 0.3 g of 1% platinized carbon. The total charge of the reactants was 90 g. The highest yield of 63% was obtained with $(C_2H_5)Cl_2SiH$, while with $CH_3(C_2H_5)_2SiH$ only traces of the

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PONOMARENKO, V.A. 4

S/661/61/000/006/019/081
D205/D302

AUTHORS: Tarasova, A. S., Petrov, A. D., Andrianov, K. A., Golubtsov, S. A., Ponomarenko, V. A., Cherkayev, V. G., Zadorozhnyy, N. A. and Vavilov, V. V.

TITLE: Continuous addition of hydrochlorosilanes to unsaturated compounds

SOURCE: Khimiya i prakticheskoye primeneniye kremneorganicheskikh soyedineniye; trudy konferentsii, no. 6, Doklady, diskussii resheniye. II Vses. Konfer. po khimii i prakt. prim. kremneorg. Soyed., Len. 1958. Leningrad, Izd-vo AN SSSR. 1961, 99-100

TEXT: For practical application of the addition reactions of methyl dichlorosilane, ethyl dichlorosilane and trichlorosilane to liquid and gaseous unsaturated compounds an apparatus was designed and optimum conditions of synthesis were established. The chlorosilane and the gas are fed into a reactor. The products are discharged via a cooler into a receiver equipped with a reflux. Dur-

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4

Continuous addition of ...

S/661/61/000/006/019/081
D205/D302

ing the reaction the reactor and cooler are cooled by water, the receiver and the reflux by brine. The arrangement was tested on the reaction of ethylene with methyl dichlorosilane and ethyl dichlorosilane. The experiments have shown that in the 35 - 200°C temperature range the reaction is unchanged giving a 65 - 75% yield. No by-products are formed and the output is high (> 6 kg of methyl ethyl dichlorosilane/hr/l of reactor volume). The process is amenable to automation owing to its insensitivity to temperature changes. There are 1 figure and 1 table.

✓

Card 2/2

PONOMARENKO, V.A.; ZUYEVA, G.Ya.; ANDREYEV, N.S.

Inductive effect and oscillatory frequencies of Ge - H and Ge - D bonds. Izv.AN SSSR.Otd.khim.nauk no.10:1758-1762 O '61.
(MIRA 14:10)

1. Fizicheskiy institut im. P.N.Lebedeva AN SSSR.
(Germanium hydride) (Electrochemistry)

LEYTES, L.A.; YEGOROV, Yu.P.; ZUYEVA, G.Ya.; PONOMARENKO, V.A.

Dependence of the oscillation frequency of the Ge - C bond in spectra of alkylgermanes on the nature of substituents. Izv. AN SSSR Otd.khim.nauk no.12:2132-2140 D '61. (MIRA 14:11)

1. Institut organicheskoy khimii im. N.D.Zelinskogo Akademii nauk SSSR i Fizicheskiy institut im. P.N.Lebedeva Akademii nauk SSSR.
(Germanium organic compounds--Spectra)

26280
S/074/61/030/008/001/002
B117/B226

5.3700

AUTHORS: Obadashyan, G. V., Ponomarenko, V. A., and Petrov, A. D.

TITLE: Silicofluoro-organic compounds

PERIODICAL: Uspekhi khimii, v. 30, no. 8, 1961, 941 - 981

TEXT: The authors criticized the papers on the production of organic silicon fluorides. The following problems are discussed with respect to the physical properties of these compounds: Energy, length, and oscillation frequency of the Si-F bonds, chemical displacement in the spectra of nuclear magnetic resonance, refraction of the Si-F bond, the dipole moments of silicofluoro-organic compounds, and complex compounds of silicon fluorides. Silicofluoro-organic compounds, which contain fluorine atoms bound to silicon, can be synthesized by various methods. (a) replacement of halogens of the Si-X bond by F (X = Cl, Br, I); (b) replacement of oxygen of the Si-O bond by F; (c) replacement of nitrogen of the Si-N bond by F; (d) splitting of the Si-C bond, with formation of the Si-F bond; (e) replacement of hydrogen of the Si-H bond by F; (f) splitting of the Si-Si bond with formation of the Si-F bond. All known reactions of silicon fluorides

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can be classified according to the following principal types: Replacement of fluorine of the Si-F bond by (a) the elements of the IV-th group; (b) the elements of the V-th group; (c) the elements of the VI-th group; (d) the elements of the VII-th group and hydrogen; (e) reactions, in which the Si-F bond remains unchanged. It can be concluded from the chemical reactions of organic and inorganic silicon fluorides that as compared to other halogens, the silicon bound to fluorine shows a number of specific features corresponding to the physical peculiarities of the Si-F bond. A considerable number of silicofluoro-organic compounds with fluorine atoms bound to silicon have hitherto been obtained. Although their physical and chemical properties have been investigated to a certain degree, they are almost not practically applied for technical purposes. Organosilicon compounds containing fluorine atoms in organic radicals seem to be more promising in this respect. At present, the following principal methods of producing these compounds are available: (a) elemental-organic method; (b) replacement of hydrogen of the Si-H bond by organic radicals; (c) reaction according to Svarts; (d) direct synthesis; (e) reactions of alkenyl silanes, and (f) all other reactions. The reactions of silicofluoro-organic com-

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pounds containing fluorine atoms in organic radicals can be classified as follows: (a) Reactions in which the Si-C bond is split; (b) effect of acids and alkalis upon fluorinecontaining polysiloxanes; (c) reactions of silicofluoro-organic hydrides; (d) reactions of silicofluoro-organic halides. In the last ten years, the development of the chemistry of silicofluoro-organic compounds has been essentially governed by the requirements of practical purposes. This becomes evident from numerous patents. It is proposed to produce heat-resistant rubbers, vulcanized rubbers, lubricants, hydraulic liquids, dielectrics, and electric insulating materials, insecticides and herbicides on the basis of fluoropolyorganosiloxanes. Table 4 gives the physical properties of all silicofluoro-organic compounds known at present. The following authors are mentioned: V. A. Ponomarenko, Yu. P. Yegorov, M. G. Voronkov, G. V. Medoks, N. Z. Kotelkov, V. S. Chugunov, A. D. Snegova, A. Ya. Yakubovich, V. A. Ginsburg, I. L. Knunyants, B. A. Sokolov, V. G. Cherkayev, A. D. Petrov, G. V. Odabashyan, N. A. Zadorozhnyy, L. D. Shchukovskaya, V. F. Mironov, V. V. Pisarenko, G. V. Motsarev, A. Ya. Yakubovich, and B. N. Dolgov. There are 4 Tables and 254 references: 44 Soviet and 210 non-Soviet. The three most recent references to English-language publications read as follows: G. M. Konkle, Rubber Age, 84, No 16,

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20360

S/020/61/136/005/021/032
B004/B058

53780 2209, 1273, 1274

AUTHORS: Afanas'yev, V. A., Ponomarenko, V. A., and Zadorozhnyy, N. A.

TITLE: Adsorbability and catalytic activity of platinized carbon with regard to the addition of some silanes to unsaturated compounds

PERIODICAL: Doklady Akademii nauk SSSR, v. 136, no. 5, 1961, 1123-1126

TEXT: In previous publications (Refs. 1 to 3) on the addition of alkyl- and chloro-alkyl silanes on halogenated allyl ether it was found that the adsorption interaction of the reacting molecules with the catalyst surface has a great effect on the addition reaction. This effect was checked in the present study by investigating the capacity of platinized carbon (1% Pt) to adsorb $(C_2H_5)_3SiH$ (I), $CH_3(C_2H_5)_2SiH$ (II), $C_2H_5(C_3H_7)_2SiH$ (III), Cl_3SiH (IV), $C_2H_5SiHCl_2$ (V), and $CH_3(C_2H_5)SiHCl$ (VI). The experiments were conducted in a continuous apparatus at atmospheric pressure and 20°C. The relative partial pressure of the vapors was varied between 0 and 0.5. Nitrogen served as carrier gas. Before the experiment, the catalyst was

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heated to 300°C in a vacuum (approximately 10^{-4} mm Hg). The pressure P_s of the saturated vapor of I - VI was determined in the same apparatus. P_s was determined from the equation $P_s/P = v/V$. P is the total pressure (atmospheric pressure) in the system, v the volume of the substance vaporized per unit time, and V is the rheometrically measured total volume of the mixture. A linear increase of adsorption with increasing length of experiment was found for all alkyl silanes. P_s was calculated at $v_1 = 1$ ml/min (velocity of silane vapor) and $v_2 = 20$ ml/min (velocity of the carrier gas). The experimental data for the compounds I - VI are compared in Table 1 with the values calculated according to Haas and Newton and Antoine. Fig. 2 shows the adsorption isotherms at 20°C for P/P_s from 0 to 0.5. A different adsorbability of the substances was found. Chloroalkyl silanes are adsorbed more intensively than alkyl silanes. A quantitative estimate of adsorbability was made by a comparison of the various areas ω_0 occupied by the molecules. ω_0 was calculated from the BET equation by using ω_0 for benzene (40 A^2). These data were compared with the reactivity of the compounds in the case of simultaneous addition to 1,1,2-trifluoro-2-chloro-ethyl allyl ether (Table 2). With increasing

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B004/B058

Adsorbability and catalytic ...

ω_0 (decreasing adsorbability) of the silane, and increasing yield of its addition products resulted. For substances with equal ω_0, the yield of addition products is equal, too. The following interpretation is given for concurrent reactions: Owing to the increased adsorbability of chloroalkyl silanes, highly active chloro-silyl radicals ($Cl_3\dot{S}i$ and $Cl_2\dot{S}iC_2H_5$) form on the catalyst surface. They seize upon the hydrogen of the trialkyl silane under the formation of a less active trialkyl-silyl radical. Only the latter reacts with the unsaturated bond of the ether. Apart from this, however, also a direct addition of the chloro-silyl radical to the unsaturated compound takes place. With the concurrent addition reaction of $(CH_3)(C_2H_5)(Cl)SiH$ with Cl_3SiH or $C_2H_5SiHCl_2$, the higher adsorbability of $(CH_3)(C_2H_5)(Cl)SiH$ and its weak Si-H bond, as compared with the other two compounds, causes the predominant formation of the radicals $(CH_3)(C_2H_5)(Cl)\dot{S}i$ on the catalyst surface. These radicals are, however, unable to seize upon the more strongly bound hydrogen of Cl_3SiH or

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Adsorbability and catalytic ...

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$C_2H_5SiHCl_2$. Inspite of the stronger adsorbability of $CH_3C_2H_5ClSiH$, a predominant addition of this compound to the unsaturated ether sets in in this case. This interpretation may also be valid for the forming radicals X_3SiCH_2-CH-R ($X = Cl$, $R = CH_2OCF_2CFClH$). There are 2 figures, 2 tables, and 5 Soviet-bloc references.

ASSOCIATION: Institut organicheskoy khimii im. N. D. Zelinskogo Akademii nauk SSSR (Institute of Organic Chemistry imeni N. D. Zelinskiy, Academy of Sciences USSR)

PRESENTED: September 17, 1960, by A. A. Balandin, Academician

SUBMITTED: September 14, 1960

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20360

Adsorbability and catalytic ...

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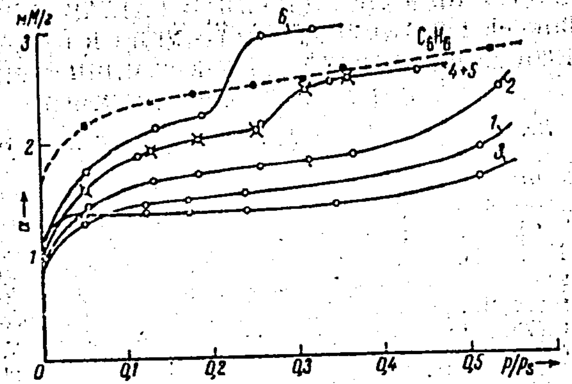
B004/B058



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Adsorbability and catalytic ...

Таблица 1

№№ соединений 1	Кремнийгидрид 2	Мол. вес 3	Т. кип. °C 4	P, мм	5 P_s (при 20°)		
					опытн. 6	вычисл. по методу Хаяса и Ньютона 7	вычисл. по уравн. Антуана 8
I	$(C_2H_5)_3SiH$	116,28	107,0	745	27,0	28,1	29,1
II	$CH_3(C_2H_5)_2SiH$	102,25	78,0	748,5	83,4	80,3	84,0
III	$C_3H_7(C_2H_5)_2SiH$	126,19	152,5	754	33,0	33,4	36,4
IV	Cl_3SiH	135,47	31,8	766	467,8	498,5	495,0
V	$C_2H_5SiHCl_2$	129,07	76,0	770	86,9	91,8	91,1
VI	$CH_3(C_2H_5)SiHCl$	108,65	69,0	769	114,0	121,2	120

Table 1

Legend to Table 1. 1) no. of compound; 2) silane; 3) molecular weight; 4) boiling point; 5) P_s at 20°C; 6) found experimentally; 7) calculated according to Haas and Newton; 8) calculated according to Antoine.

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Adsorbability and catalytic ...

Таблица 2

№№ п. п. 1	Компоненты 2	№№ соединений по табл. 1 3	Выход, % 4	Относит. активность 5	ω, (A°)
1	Cl_3SiH	IV	42		50
	$C_2H_5SiHCl_2$	V	42	1	50
2	Cl_3SiH	IV	20		50
	$(CH_3)(C_2H_5)_2SiH$	II	33	1,7	58
3	Cl_3SiH	IV	31		50
	$(C_2H_5)_3SiH$	I	51	1,7	64
4	Cl_3SiH	IV	29		50
	$(C_6H_5)(C_2H_5)_2SiH$	III	63	2,2	70
5	Cl_3SiH	IV	32		50
	$(CH_3)(C_2H_5)SiHCl$	VI	35	1,1	40
6	$C_2H_5SiHCl_2$	V	27		50
	$(CH_3)(C_2H_5)SiHCl$	VI	33	1,2	40
7	$C_2H_5SiHCl_2$	V	25		50
	$(CH_3)(C_2H_5)_2SiH$	II	47	1,9	58

Table 2

Legend to Table 2. 1) running no.; 2) components; 3) designation of compound according to Table 1; 4) yield; 5) relative activity.

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20137

S/020/61/137/002/012/020
B103/B215

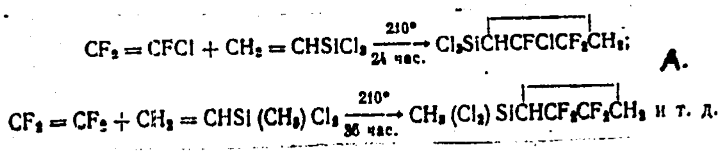
158115 2209

AUTHORS: Odabashyan, G. V., Ponomarenko, V. A., Kovalev, Yu. N. and Petrov, A. D. Corresponding Member AS USSR

TITLE: Organo-silicon monomers with cyclobutyl rings containing fluorine

PERIODICAL: Doklady Akademii nauk SSSR, v. 137, no. 2, 1961, 338-340

TEXT: Following British and US papers on the synthesis of organosilicon monomers with cyclobutyl rings containing fluorine (Scheme A, at 210°C, for 24-36 hr),



$$CF_2=CFCl + CH_2=CHSiCl_3 \xrightarrow[24\ \text{час.}]{210^\circ} Cl_3Si\overline{CHCFClCF_2CH_2};$$

$$CF_2=CF_2 + CH_2=CHSi(CH_3)Cl_2 \xrightarrow[36\ \text{час.}]{210^\circ} CH_3(Cl_2)Si\overline{CHCF_2CF_2CH_2}\ \text{и т. д.}$$

A.

the authors studied a new method of synthesis (Scheme B: (I), (II)).

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Organo-silicon monomers with... S/020/61/137/002/012/020
B103/B215

$$CH_2=CH-CH=CH_2+CF_2=CF_2 \rightarrow CH_2=CH\overline{CHCF_2CF_2CH_2}; \quad B \qquad (I)$$

$$R_nCl_{3-n}SiH+CH_2=CH\overline{CHCF_2CF_2CH_2} \xrightarrow{H_2PtCl_6} R_nCl_{3-n}SiCH_2CH_2\overline{CHCF_2CF_2CH_2}; \qquad (II)$$

$$R = CH_3,\ C_2H_5,\ C_6H_5;\ n = 0, 1, 2, 3.$$

They found that butadiene can easily be condensed by ethylene tetrafluoride (I). The yield of $CH_2=CH\overline{CHCF_2CH_2CH_2}$ was 90% (Ref. 5., D. D. Goffman, P. L. Barrik et al., J. Am. Chem. Soc. 71, 490 (1948)). From Table 1 it follows that high yields of the silicon hydrides used by the authors are added to vinyltetrafluorocyclobutane in the presence of chloroplatinic acid. The authors succeeded in adding dichlorosilane to two molecules of vinyltetrafluorocyclobutane under harder conditions (in the autoclave at 130°C and in the presence of the above acid. The corresponding monomer (no. 7) was obtained in a yield of 46%. It is noted that the polymers produced from the above monomers show valuable properties according to non-Soviet publications. There are 1 table and 5 non-Soviet-bloc references. The reference

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20739

Organo-silicon monomers with... S/020/61/137/002/012/020
B103/B215

to English language publications reads as follows: J. D. Park, J. D. Groves, J. R. Lacher, J. Org Chem., 25, no. 9, 1628 (1960).

ASSOCIATION: Institut organicheskoy khimii im. N. D. Zelinskogo Akademii nauk SSSR (Institute of Organic Chemistry imeni N. D. Zelinskiy, Academy of Sciences USSR)

SUBMITTED: December 7, 1960

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20739

Organo-silicon monomers with...

S/020/61/137/002/012/020
B103/B215

Таблица 1

№№ п. п.	Кремний-гидрид	Колич., г (мол.)	Винилтетрафторциклобутан, г (мол.)	Колич. 0,1 М раствора H_2PtCl_6, мл	Вес продукт. реакции, г	Продукты реакции	Выход	
							г	%
1	Cl_3SiH	13,8 (0,1)	15,4 (0,1)	0,1	27,5	$Cl_3SiCH_2CH_2CHCF_2CF_2CH_2$	26,5	91,0
2	CH_3SiCl_2H	14,0 (0,12)	16,5 (0,11)	0,2	29.5	$CH_3(Cl_2)SiCH_2CH_2CHCF_2CF_2CH_2$	25.8	91,0
3	$C_2H_5SiCl_2H$	8,0 (0,06)	9.0 (0,06)	0,1	16,0	$C_2H_5(Cl_2)SiCH_2CH_2CHCF_2CF_2CH_2$	13,9	82,0
4	$CH_3(C_6H_5)SiClH$	10,9 (0,1)	15.4 (0,1)	0,1	25.7	$CH_3(C_6H_5)(Cl)SiCH_2CH_2CHCF_2CF_2CH_2$	20,6	70,0
5	$CH_3(C_2H_5)_2SiH$	10,5 0,1)	15,4 (0,1)	0,1	24,5	$CH_3(C_2H_5)_2SiCH_2CH_2CHCF_2CF_2CH_2$	18,3	72,0
6	$C_6H_5SiCl_2H$	6,8 (0,04)	8,0 (0,04)	0.05	11,3	$C_6H_5(Cl_2)SiCH_2CH_2CHCF_2CF_2CH_2$	8,9	70,0
7	Cl_2SiH_2	7,5 (0,075)	23,2 (0,15)	0,3	25,6	$Cl_2Si(CH_2CH_2CHCF_2CF_2CH_2)_2$	14,2	46,0
1	2	3	4	5	6	7	8	9 Tab. 1

Legend to Table 1: 1) current number; 2) silicon hydride;, 3) quantity in g (moles); 4) vinyltetrafluorocyclobutane in g (moles); 5) quantity of the 0.1 M solution of H_2PtCl_6, ml; 6) weight of the reaction products, g; 7) reaction products; 8) yield, g; 9) yield, %.

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33272
S/062/62/000/001/013/015
B101/B110

5 3700

AUTHORS: Petrov, A. D., Ponomarenko, V. A., and Odabashyan, G. V.

TITLE: Synthesis of bis(γ-trifluoro-propyl) dichloro silane

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye khimicheskikh nauk, no. 1, 1962, 174 - 176

TEXT: An improved method of synthesizing $(CF_3CH_2CH_2)_2SiCl_2$ (I) is described. The addition of dichloro silane to $CF_3CH=CH_2$ described before (Dokl. AN SSSR, 126, no. 5, 1009 (1958)) yielded only <26% of I in the presence of H_2PtCl_6. It was found that with competitive addition of silanes to unsaturated compounds the addition of the one silane was accelerated while that of the other one was retarded. Experiments confirmed that the reaction between H_2SiCl_2, $HSiCl_3$, and $CH_2=CHCF_3$, or between H_2SiCl_2, CH_3SiHCl_2, and $CH_2=CHCF_3$ yielded between 31 and 36% after 2-3 hr in the presence of H_2PtCl_6. The reaction components are filled in the X

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B101/B110

Synthesis of bis(γ-trifluoro-propyl) ...

autoclave at dry-ice temperature, and heated to 160°C. $Cl_3SiCH_2CH_2CF_3$ or $CH_3(Cl_2)SiCH_2CH_2CF_3$ are formed as by-products. The reaction $CF_3CH_2CH_2SiHCl_2 + CH_2=CHCF_3$ was also studied; it took 5 hr. the yield of I was 37%. $CF_3CH_2CH_2SiHCl_2$ was synthesized in cooled ethereal solution by dropwise addition of $CF_3CH_2CH_2MgCl$ (produced from $CF_3CH_2CH_2Cl$ + Mg) to $HSiCl_3$, yield 20.5%. The infrared spectra showed that the silyl group added to the terminal carbon atom of the double bond. Compound I is considered to be a promising monomer for fluorinated polyorganosiloxanes. There are 1 table and 8 references: 4 Soviet and 4 non-Soviet. The four references to English-language publications read as follows: E. T. McBee, C. W. Roberts, G. F. Judd, T. S. Chao, J. Amer. Chem. Soc., 77, 1292 (1955); A. M. Geyer, R. N. Haszeldine, K. Leedham, R. J. Marklow, J. Chem. Soc., 1957, 4472; R. N. Haszeldine, M. J. Newlands, J. B. Plumb, Proc. Chem. Soc., no. 4, 147 (1960); English Patent 805028 (1958), Chem. Abstrs. 53, 9059h (1959).

Card 2/3

PONOMARENKO, V.A., kand.tekhn.nauk; PAVLOV, M.S., inzh.; GORELIK, I.S., inzh.

Industrial tests of an experimental set of TKP-2 pushers.
Sbor.DonUGI no.23:190-199 '62. (MIRA 16:2)
(Mine railroads--Equipment and supplies)

34974
S/080/62/035/002/014/022
D204/D302

11.9200

AUTHORS: Petrov, A. D., Zakharov, Ye. P., Zadorozhnyy, N. A. and Ponomarenko, V. A.

TITLE: Synthesis of organosilicon monomers containing nitrile groups

PERIODICAL: Zhurnal prikladnoy khimii, v. 35, no. 2, 1962, 385-389

TEXT: The authors studied the catalytic effects of bis(ß-cyanoethyl)-cyanamide (I), dimethylaminoacetonitrile (II) and dimethylaminoproionizrile (III) on the addition of unsaturated nitriles to trichlorosilane. Compounds II and III were found to be most effective, giving 60% yields of the substituted products (cyanoalcyl trichlorosilanes). Identification of the latter by infrared spectroscopy proved unsuccessful owing to the great similarity of the spectra. Addition reactions of Cl_3SiH to -CN and acrylonitrile with the above catalysts, as well as in the presence of H_2PtCl_6 and benzoyl or tert.-butyl peroxides were studied. The

Card 1/2

SOBOLEVSKIY, M.V.; RODZEVICH, N.Ye.; GRINEVICH, K.P.; PETROV, A.D.;
PONOMARENKO, V.A.; SNEGOVA, A.D.

Preparation and properties of organosiloxanes containing hexachlorobicycloheptenyl radicals. Zhur.prikl.khim. 35 no.10:2302-2307 O '62. (MIRA 15:12)
(Silicon organic compounds)

KHIDEKEL', M.L.; YEGOROCHKIN, A.N.; PONOMARENKO, V.A.; ZADOROZHNYY, N.A.;
RAZUVAYEV, G.A.; PETROV, A.D.

Nuclear magnetic resonance of silicon hydrides. Izv. AN SSSR. Otd.khim.nauk no.6:1130-1132 Je '63. (MIRA 16:7)

1. Institut organicheskoy khimii imeni Zelinskogo AN SSSR.
(Silicon hydrides--Spectra)

4

L 57874-65 EWT(d)/FSS-2/ESC-4/EEC(t) Pn-4/Pp-4/Pac-4
ACCESSION NR: AP5016723 UR/0286/65/000/010/0041/0041
621.315.052.7

47
46
B

AUTHOR: Berkman, N. A.; Gontar', V. M.; Gurov, V. S.; Darova, P. I.; Yetrukhin, N. N.; Zolotarev, Ya. M.; Zrazhevskiy, S. P.; Kopp, V. M.; Pasechnik, N. D.; Ponomarenko, V. A.; Pugach, A. B.; Raykin, P. S.; Sergeyev, I. V.

TITLE: System for measuring the duration and number of interruptions in a communication channel. Class 21, No. 171023

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 10, 1965, 41

TOPIC TAGS: noise measurement, frequency meter, communication channel, pulse meter

ABSTRACT: The proposed measuring device converts the spectrum of the investigated pilot (measuring) frequency to a region of higher frequencies and uses a filter to separate the side band containing information on the signal envelope. Provision is made for simultaneous analysis of pulse noise and decline in the level of the pilot frequency with respect to voltage and duration. Information on interruption time is transmitted in the form of quantized pulse packets to a measuring circuit consisting of flip-flops, AND gates, and registers. Orig. art. has: 1 figure. [DW]

Card 1/2

L 57874-65
ACCESSION NR: AP5016723

ASSOCIATION: Kiyevskoye otdeleniye Tsentral'nogo nauchno-issledovatel'skogo instituta svyazi Ministerstva svyazi SSSR (Kiev Department of the Central Scientific Research Institute of Communications of the Ministry of Communications, SSSR)

SUBMITTED: 10Nov63
ENCL: 00
SUB CODE: EC

NO REF SOV: 000
OTHER: 000
ATD PRESS: 4038

Card 2/2

L 4902-66 EWT(d)/FSS-2/FCS(f)

ACC NR: AP5023279

UR/0302/65/000/003/0054/0055
620.1.087.4

AUTHOR: Berkman, N. A.; Bobreshov, Ye. N.; Ponomarenko, V. A.; Raykin, P. S.
44 44 44 44

56
B

TITLE: Multichannel recorder

SOURCE: Avtomatika i priborostroyeniye, no. 3, 1965, 54-55

TOPIC TAGS: data recording, data processing, multichannel analyzer, multitrack recording, statistic analysis, data transmission, electronic device, communication equipment
9,44

ABSTRACT: Numerous processes are investigated by statistical analyzers which incorporate devices for the registration of results. The majority of such devices are either extremely cumbersome and expensive or utilize single channels preventing the simultaneous registration of data. The present article describes a comparatively simple recorder which simultaneously registers, with a reasonable degree of accuracy, the results of the analysis of random quantities in twenty channels. This device, developed at the Kiyevskoye otdeleniye Tsentral'nogo nauchno-issledovatel'skogo instituta svyazi (Kiev Department, Central Scientific-Research Institute of Communications) is based on the scaling of electrical impulses arriving from statistical analyzers. The block diagram of the recorder and the basic triggering scaler circuit are presented and their operation is described. The device is presently in use at the Kiev and Moscow communication centers in conjunction with the study of statistical characteristics of interferences and interruptions during transmission of data. Orig. art. has: 2 figures.

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GC

Card 2/2

L 4902-66

ACC NR: AP5023279

8

ASSOCIATION: None

SUBMITTED: 00 ENCL: 00 SUB CODE: DP, IE, EC

NO REF SOV: 002 OTHER: 000

Card 2/2

KADINA, M.A.; PONOMARENKO, V.A.

Photochemical chlorination of trifluoropropylchlorosilanes and the synthesis of unsaturated trifluoroalkylchlorosilanes. Izv. AN SSSR. Ser. khim. no.4:654-659 '65. (MIRA 18:5)

1. Institut organicheskoy khimii im. N.D.Zelinskogo AN SSSR.

PONOMARENKO, V.A.; SNEGOVA, A.D.; SERGEYEV, I.A.

Preparation of fluoroarylhalosilanes by high temperature condensation. Izv. AN SSSR. Ser. khim. no.9:1684-1687 '65. (MIRA 18:9)

1. Institut organicheskoy khimii im. N.D. Zelinskogo AN SSSR.

L 10786-66 EWT(d)/EWP(l) IJP(c) BB/GG/JXT(CZ)
ACC NR: AP6001515

SOURCE CODE: UR/0302/65/000/004/0031/0032

AUTHOR: Bobreshov, Ye. N.; Zolotarev, Ya. M.; Ponomarenko, V. A.; Raykin, P. S.
44 44 44 44

ORG: none*

TITLE: Counter for conversion of numbers from the binary to the decimal system

SOURCE: Avtomatika i priborostroyeniye, no. 4, 1965, 31-32

52
B

TOPIC TAGS: pulse counter, binary code

16,44

ABSTRACT: A binary-to-decimal converter, particularly useful for the conversion of large numbers, was developed at the Kiev branch of the Central Scientific Research Institute of Communication. A block diagram is shown in Figure 1. Input circuit 1 after the entry of the binary number to be converted causes pulse generator 4 (1 Mc) to send pulses to binary counter 7 and decimal counter 6 through inhibit circuit 3. When the count in 7 is equal to the number at the input, block 2 causes inhibit circuit with memory 3 to close the gate connecting generator 4 with the two counters. After the decimal equivalent stored in 6 has been read out, both counters are reset to 0, and the inhibit signal in 3 is lifted. The capacity of the converter is limited by the capacity of the binary counter, which is $2^{21} - 1$. The counters use nonsaturating

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UDC: 681.142.621

L 10786-66

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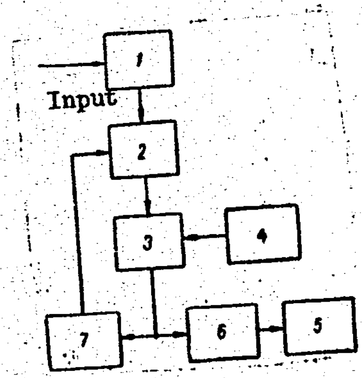

Fig. 1. Binary-to-decimal converter

complementary flip-flops with P416 transistors. Display unit 5 consists of a decade gas-discharge tube with associated transistor drive circuits. The temperature limits for the converter are -10 to +50C. Orig. art. has: 2 figures. [BD]

SUB CODE: 09/ SUBM DATE: none/ ATD PRESS: 4168

HW

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L 45457-66 EWT(m)/EWP(j)/T IJP(c) DJ/RM

37
13

ACC NR: AP6011281 (A) SOURCE CODE: UR/0413/66/000/006/0158/0158

INVENTOR: Sobolevskiy, M. V.; Rodzevich, N. Ye.; Grinevich, K.; Bogacheva, I. P.; Ponomarenko, V. A.; Uspenskaya, Ye. A.

ORG: none

TITLE: Preparation of liquid polyorganosiloxanes. Class 23, No. 142368 15

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 6, 1966, 158

TOPIC TAGS: siloxane, polyorganosiloxane, liquid polyorganosiloxane, POLYSILOXANE

ABSTRACT: This Author Certificate introduces a method for preparing liquid polyorganosiloxanes. To increase high-temperature oxidation resistance and the lubricating property because of introducing fluoroalkyl and fluoroaryl radicals into the polymer structure in both the end groups and the basic chain, liquid polyorganosiloxanes are prepared by either cohydrolysis or heterofunctional condensation of corresponding monomers. [LD]

SUB CODE: 11/ SUBM DATE: 25Jan61/

Card 1/1

L 05788-67 EWT(1) IJP(c)

ACC NR: AT6033192 SOURCE CODE: UR/3138/66/000/433/0001/0008

AUTHOR: Dolgov, A. D.; Ponomarev, L. A.

39

37

ORG: none

B+1

2/

TITLE: Three-photon decay of particles with 0 and 1 spin

SOURCE: USSR. Gosudarstvennyy komitet po ispol'zovaniyu atomnoy energii. Institut teoreticheskoy i eksperimental'noy fiziki. Doklady, no. 433, 1966. O raspade chastits so spinom 0 i I na tri fotona, 1-8

TOPIC TAGS: photon, matrix element, particle

ABSTRACT: A form of three-photon amplitude decay of particles with 0 and 1 spin is studied. It is shown that the decay amplitude of a scalar particle is determined by two form factors if spatial parity is maintained, and by four form factors if parity is not maintained. The minimum degree of impulse in the matrix element is equal to seven. The decay amplitude of the vector particle depends on six (or twelve, if the R parity is interrupted) form factors. It is shown that if the minimum (fourth) degree of impulse in the matrix element is used, than only two (four) independent form factors remain. The authors are deeply grateful to L. B.

Card 1/2 [illegible]

L 05788-67

ACC NR: AT6033192

2

L. B. Okyn' for the attention he gave to the work and to A. V. Tarasov for useful discussions. Orig. art. has: 10 formulas.

SUB CODE: 20/ SUBM DATE: 23Mar66/ ORIG REF: 001/ OTH REF: 002/

Card 2/2

ACC NR: AP6033682 SOURCE CODE: UR/0106/66/000/010/0031/0037

AUTHOR: Kopp, V. M.; Ponomarenko, V. A.; Yevtushenko, V. V.; Raykin, P. S.

ORG: none

TITLE: Pulse noise analyzer for multiple high frequency telephone channel systems used for data transmission

SOURCE: Elektrosvyaz', no. 10, 1966, 31-37

TOPIC TAGS: multichannel telephone system, carrier frequency telephone, data transmission, transmission line, noise analyzer, random noise signal, ergodic theory, statistic analysis, statistic distribution

ABSTRACT: Technical characteristics, design principles, and the operation of a pulse noise analyzer for use with digital data in multichannel transmission links are described. The analyzer generates an integral distribution function of the instantaneous amplitude values of pulse noise and, simultaneously, the probability distribution of noise pulse durations at a predetermined amplitude level. The integral distribution function of noise pulses is determined by measuring the dwell time of the instantaneous values of their amplitudes at the seven following voltage levels: 18, 24, 36, 54, 72, 108, and 144 millivolts. The lower value was selected to eliminate the effect of the demodulator offset while the upper value was based on preliminary experiments.

UDC: 621.317.795.3

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ACC NR: AP6033682

The integral distribution function, assuming that the random process is stationary and ergodic, is determined through instrumentation as a result of the measurement of the relative dwell time of one of its states above a predetermined level. To this end, the random signals are fed into an amplitude threshold discriminator. Every excursion of the input signal above the preset trigger level of a particular threshold discriminator causes an output pulse to be generated, the duration of which equals the dwell time of the random pulse at this level. The additive dwell time of such pulses during the experiment equals the total process time. It is expedient to measure this parameter digitally. Hence, the dwell pulses are converted into pulse trains by using the former as gates for clock pulses. The number of clock pulses in each train corresponds to the dwell time of the original noise pulse. The clock pulses are counted and the relative process time is obtained as a ratio of the total noise time to the total duration of the experiment. In addition to this result, the probability density of the dwell time at a given voltage level is generated by counting the pulses in the individual trains and recording the original pulses in appropriate time increment channels in accordance with their dwell times. The analyzer based on these principles is described in some detail, including a block diagram, and an example is used to illustrate the operation of the instrument. The authors conclude that for the statistical analysis of noise in a multichannel communication link it is sufficient to determine the total dwell time of the noise pulses above a given level. The analysis of the instantaneous amplitudes and durations of the noise pulses provides the

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ACC NR: AP6033682

possibility to compute the two-dimensional probability distribution of this noise. Orig. art. has: 3 figures.

SUB CODE: 09,17/ SUBM DATE: 09Nov65/ ORIG REF: 004

Card 3/3

L 10958-67 EWT(1) SCTB DD/GD
ACC NR: AT6036564 SOURCE CODE: UR/0000/66/000/000/0173/0174

32

AUTHOR: Zavalova, N. D.; Ponomarenko, V. A.

ORG: none

TITLE: Psychophysiological characteristics of human activity in an automated control system [Paper presented at the Conference on Problems of Space Medicine held in Moscow from 24 to 27 May 1966]

SOURCE: Konferentsiya po problemam kosmicheskoy meditsiny, 1966. Problemy kosmicheskoy meditsiny. (Problems of space medicine); materialy konferentsii, Moscow, 1966, 173-174

TOPIC TAGS: man machine communication, space psychology, psychophysiology, cosmonaut training

ABSTRACT: It is known that in automatic flight the basic activity is monitoring, while active functions occur during an ejection or emergency situation. Such functional distribution is of practical importance to the pilot-cosmonaut in that the flow of afferent impulses from the motor analyzer, important to control, is almost entirely suspended during automated flight. Here the motor analyzer of the pilot plays the unusual role of maintaining a constant state of readiness for action. A similar condition described by A. A. Ukhtomskiy is considered as a state of operator inactivity. Apparently, the level of operator inactivity will affect reaction time when intervention in a control process is necessary. The problem of operator activity is closely related to the problem of maintaining operator "vigilance," since a state of preparedness on a back-

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L 10958-67

ACC NR: AT6036564

ground of even partial sensory impoverishment is characterized by lowere d human tonus.

Results of an experiment involving pilot-operator reliability during a process of transition from a state of lowered activity to an extremal situation with a stress background (flight experiment) will be summarized in a separate report. Here, special attention is accorded to a study of the effectiveness of human inclusion in a control process as a function of an information model. The work capacity criteria are time characteristics, the level of physiological reserves, and the quality of activity. On the basis of the characteristics of an operator acting as a compensatory link in an automatic control system, psychophysiological recommendations relative to man-machine functions distribution principles under specific flight conditions are enumerated. [W.A. No. 22; ATD Report 66-116]

SUB CODE: 05, 06 / SUBM DATE: 00May66

Card 2/2 bjo

Ponomarev, V.A.

PHASE I BOOK EXPLOITATION SOV/3857

Moscow. Dom nauchno-tekhnicheskoy propagandy imeni F. E. Dzerzhinskogo

Vysokoproizvoditel'naya tekhnologicheskaya osnastka (High-Productivity Auxiliary Processing Equipment) Moscow, Mashgiz, 1960. 174 p. 8,000 copies printed.

Sponsoring Agency: Obshchestvo po rasprostraneniyu politicheskikh i nauchnykh znaniy RSFSR.

Ed. (title page): V. V. Kuz'min; Ed. (inside book): S. L. Martens; Tech. Ed.: L. P. Gordeyeva; Managing Ed. for Literature on Metal-working and Machine-Tool Construction (Mashgiz): V. V. Rzhavinskiy, Engineer.

PURPOSE: This collection of articles is intended for technical personnel engaged in the development of auxiliary equipment for metal processing.

COVERAGE: This collection contains articles dealing with modern machine-tool auxiliary equipment, methods of manufacture, and data on the introduction of such equipment into production. The engineering and economic aspects of the use of standardized auxiliary equipment are also discussed. No personalities are mentioned. References follow each article.

(13)

S/020/60/132/03/36/066
B011/B008

5.3700(B)

AUTHORS: Ponomarenko, V. A., Zakharov, Ye. P., Zadorozhnyy, N. A., Petrov, A. D., Corresponding Member AS USSR

TITLE: On the Peculiarities of the Effect of the Silyl-groups. The Chlorination of the Alkyl-chloro-silicon-hydrides

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 132, No. 3, pp. 619-622

TEXT: In the paper under review the authors continued their investigations on the induction influence of the silyl- and germyl-groups on the properties of the bond neighboring the Si, as well as of that further away from it. In the further development of these investigations they studied the photochemical chlorination of the alkyl-silane-chlorides of the following series: $(C_2H_5)_2SiH_2$, $(C_2H_5)_3SiH$, $(CH_3)(C_2H_5)_2SiH$, $(CH_3)(C_2H_5)(Cl)SiH$, $(C_2H_5)\cdot(Cl_2)SiH$, $(CH_3)(Cl)_2SiH$ and Cl_3SiH. SO_2Cl_2 served for the chlorination under conditions worked out lately by M. G. Voronkov and V. P. Davydova (Ref. 11). Furthermore, the 4

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On the Peculiarities of the Effect of the Silyl-groups. The Chlorination of the Alkyl-chloro-silicon-hydrides

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authors wanted to study the influence of the electric negativity of the chlorine atoms, and of the alkyl- and aryl-groups on the oscillation frequencies of the Si-H bonds in some silicon mono- and dihydrides. The data in Table 1 concerning the "competing" chlorination of the Si-bonds of the hydrides mentioned above proved the expectations of the authors. They expected that the transition from $(C_2H_5)_3SiH$ to Cl_3SiH must retard the chlorination of the Si-bonds rapidly. The series of the relative activity thus corresponds completely to the increasing electric negativity of the silyl-groups (Table 2). It is surprising that only the Si-H-bonds are chlorinated here, but never the C-H-bonds of the alkyl-chloro-silicon—hydrides, although they can, as a rule, also be chlorinated, as known. This differing behavior of both bonds is connected with the specificity of the Si-H-bond and the Si-atom itself. The Si-atom distinguishes itself, contrary to carbon, by an increased electrophily. On the basis of these data, the formation of mainly $(C_2H_5)_2SiHCl$ could be expected at the photochemical radical-

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On the Peculiarities of the Effect of the Silyl-groups. The Chlorination of the Alkyl-chloro-silicon-hydrides

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chlorination of the diethyl-silane with SO_2Cl_2. At the chlorination of the $(C_2H_5)_2SiH_2$ the authors obtained actually only diethyl-chlorine-silane. An analogous result was obtained at the "competing" chlorination of a mixture from $(C_2H_5)_2SiH_2$ and $(C_2H_5)_3SiH$. The separation of the induction-, the steric- and other effects of the group R_nX_{-3n} on the basis of the data of the reactivity is difficult. The data on the oscillation frequencies of the Si-H-bond may to some degree be helpful for the solution of this difficult problem (Refs. 7,8). According to the opinion of the authors it would be best to utilize the group-electric negativities of the silyl-groups for the transition from the oscillation frequencies to the electric negativities. They refer to their previous papers (Refs. 13,14) and state in conclusion that the effective electric negativity of the silyl-group is considered to be the sum of the influences of the 3 substituents connected with Si. The effective electric negativity of other silyl-groups is determined by the summation of the values of the 3 substituents which form the

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On the Peculiarities of the Effect of
the Silyl-groups. The Chlorination of
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corresponding silyl-group. The values of the oscillation frequencies of the Si-H- and Si-D-formations are easily determined on the basis of the equation mentioned. Table 2 shows a good agreement of the computed and the experimentally determined values. The substances produced by the authors are: di-(m-trifluoro-methyl-phenyl)-silane(I), di-p-tolyl-silane (II), bis(γ,γ,γ,-trifluoro-propyl)-silane (III), methyl-(m-trifluoro-methyl)-phenyl-silane (IV), methyl-p-tolyl-silane (V), methyl-γ,γ,γ-trifluoro-propyl-silane (VI), methyl-vinyl-silane (VII). There are 2 tables and 14 references, 10 of which are Soviet.

ASSOCIATION: Institut organicheskoy khimii im. N. D. Zelinskogo Akademii nauk SSSR (Institute of Organic Chemistry imeni N. D. Zelinskiy of the Academy of Sciences, USSR)

SUBMITTED: February 17, 1960

Card 4/4

-4/Pi-4 RM/RM

Ponomarenko, V. A.

UR/0062/65/000/004/0654/0659
542.91+546.287+546.16

ochemical chlorination of trifluoropropyl chlorosilanes and the

is of unsaturated trifluoroalkyl chlorosilanes

43
40
B

SOURCE: AN SSSR. Izvestiya. Seriya khimicheskaya, no. 4, 196

TOPIC TAGS: chlorosilane, photochemical reaction,
nuclear magnetic resonance/ YNM C 60 nuclear

ABSTRACT: The photochemical chlori
$CF_3CH_2CH_2SiCl_3$ (I) and CF_3CH_2CH
chlorination products
the end products fr
$CF_3CHClCHClSi$
dehydro

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ACCESSION NR: AP5012449

trifluoromethyl group. Photochemical chlorination of II yielded $CF_3CH_2CHClSiCl_2CH_3$ (and a number of related chlorides). Dehydrochlorination of this compound showed that HCl may be split off by quinoline. In the chlorination process, it was discovered that if the beta-orienting radicals $-SiCl_3$ or $-SiCl_2CH_3$ and $-CF_3$ are present in the molecule, $-CF_3$ proves to be the more potent factor. When aluminum chloride is present, dehydrochlorination of