ZEFIROV, L.N.; POLETAYEV, G.I.

Some mechanisms of reflex contracture of the anterior abdominal wall.
Fiziol.zhur. 44 no.1:45-51 Ja '58 (MIRA 11:3)

1. Kafedra normal'noy fiziologii Meditsinskogo instituta, Kazan.
(ABDOMINAL WALL, physiology,
contraction mechanism (Rus)

ZEFIROV, L.N., KOCHNEV, O.S.

Participation of acetylcholine in the process of accommodation and parabiosis of a nerve trunk [with summary in English]. Biul.eksp. biol. i med. 45 no.4:3-7 Ap '58 (MIRA 11:5)

1. Iz kafedry normal'noy fiziologii (ispolnyayushchaya obyazannosti zaveduyushchego - doktor med.nauk I.N. Volkova) Kazanskogo meditsinskogo instituta. Predstavlena deystvitel'nym chlenom AMN SSSR V.N. Chernigovskim.

(ACETYLCHOLINE, effects
on accomm. & parabiosis in sciatic nerve in frog (Rus))
(NERVES, physiology
accomm. & parabiosis in isolated frog nerve, eff. of acetylcholine (Rus))

ZEFIROV, L.N.; POLETAYEV, G.I.

Effect of 2-methylnaphthoquinone on various elements of the nerve-muscle apparatus in cold-blooded animals. Biul.eksp. biol. i med. 47 no.6:68-72 Je '59. (MIRA 12:8)

1. Iz kafedry fiziologii (zav. - doktor med.nauk I.N.Volkova) Kazanskogo meditsinskogo instituta. Predstavlena deystvitel'-nym chlenom AMN SSSR V.N.Chernigovskim.

(VITAMIN K, eff.
on nerve-musc. prep. (Rus))
(NERVE MUSCLE PREPARATION, eff. of drugs on
vitamin K (Rus))

ZEFIROV, L.N.; POLETAYEV, G.I.

Effect of pancreatectomy and of acetylcholine on the peripheral reflex arch in cold-blooded animals. Biul.eksp.biol. i med. 48 no.7:3-6 Jl '59. (MIRA 12:10)

1. Iz kafedry fiziologii (zav. - doktor med.nauk I.N.Volkova) Kazanskogo meditsinskogo instituta. Predstavlena deystvitel'nym chlenom AMN SSSR V.N.Chernigovskim.
(PANCREAS - physiology)
(ACETYLCHOLINE - pharmacology)
(MYONEURAL JUNCTION - physiology)

-ALATYREV, V.I.; ZEFIROV, L.N.

Effect of diplacin on the phasic and tonic activity of the neuromuscular apparatus in frogs. Nauch. trudy Kaz. gos. med. inst. 14:71-72 '64. (MIRA 18:9)

1. Kafedra fiziologii (zav. - prof. I.N.Volkova) Kazanskogo meditsinskogo instituta.

ZEFIROV, L.N.

Importance of acetylcholine in the synaptic transmission of excitation. Nauch. trudy Kaz. gos. med. inst. 14:179-180 '64.
(MIRA 18:9)

1. Kafedra fiziologii (zav. - prof. I.N.Volkova) Kazanskogo meditsinskogo instituta.

ZEFIROV, L.N.

Mechanism of tetanized single responses and post tetanic changes of irritability in nerve trunks. Fiziol. zhur. 50 no.3:319-327 Mr '64. (MIRA 18:1)

1. Kafedra normal'noy fiziologii Meditsinskogo instituta, Kazan'.

ALATYREV, V.I.; ZEFIROV, L.N.

Effect of acetylcholine metabolism disorders on the dynamics of threshold cathodic parabiosis and functional resistance of a nerve trunk. Biul. eksp. biol. i med. 55 no.3:6-10 Mr '63.
(MIRA 18:2)

1. Iz kafedry normal'noy fiziologii (zav. - prof. I.N. Volkova) Kazanskogo meditsinskogo instituta. Submitted April 9, 1962.

ZEFIROV, L.N.

Characteristics in the development of parabiosis caused by changes in the nerves induced by choline-active substances. Fiziol. zhur. 49 no.9:1092-1098 S '63. (MIRA 17:12)

1. Kafedra normal'noy fiziologii Meditsinskogo instituta, Kazan'.

ZEFIROV, L.N.

Simple method for the production of paired impulses and the study of refractiveness. Fiziol. zhur. 46 no.10:1295-1297 O '60.
(MIRA 13:11)

1. Kafedra normal'noy fiziologii meditsinskogo instituta, Kazan'.
(ELECTROPHYSIOLOGY) (NERVES)

ZEFIROV, L.N.; TUKHVATULLINA, L.V.

Effect of 2-methylnaphthoquinone on the parasympathetic innervations and activity of the heart of cold-blooded animals. Biul. eksp. biol. i med. 49 no. 4:71-75 Sp '60.
(MIRA 13:10)

1. Iz kafedry fiziologii (zav. - doktor meditsinskikh anuk I.N. Volkova) Kazanskogo meditsinskogo instituta.
(VITAMIN S-K) (HEART)

84872

S/079/60/030/010/008/030
B001/B075

11.1210

AUTHORS: Yur'yev, Yu. K., Zefirov, N. S., and Minacheva, M. Kh.

TITLE: Investigation of the Furan Series. VIII. Tetramethylfuran in Diene Synthesis

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol. 30, No. 10, pp. 3214-3217

TEXT: Following the papers of Refs. 1-9 on the behavior of furan and its derivatives in diene synthesis, the authors studied the behavior of tetramethylfuran in diene synthesis. On the basis of Refs. 10-11, they assumed that diene synthesis in the furan series proceeds according to the ionic mechanism. They observed a vigorous reaction of tetramethylfuran with fumaric nitrile. The principal purpose of the present work was to determine the qualitative difference between the reactivities of tetramethylfuran and furan, and to select those dienophiles which react only with the former. Thus, it was found that tetramethylfuran reacts with methyl maleic anhydride under the formation of a crystalline adduct, whereas furan, 2-methylfuran, and 2,5-dimethylfuran do not react with this dienophile. Chloro- and bromo maleic anhydrides, together with tetramethyl-

X

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84872

Investigation of the Furan Series. VIII. Tetramethylfuran in Diene Synthesis

S/079/60/030/010/008/030
B001/B075

furan, lead to the corresponding addition products, contrary to the non-reactive phenyl maleic anhydride. Phenyl-β-benzoyl-vinyl sulfone and phenyl-β-acetyl-vinyl sulfone also react with tetramethylfuran only. However, contrary to the former, the latter reacts with the furan itself. Thus, it is shown that there is a great difference between the reactivity of tetramethylfuran and that of furan. Attempts to react the former with dimethyl maleic anhydride, benzal malonic acid ester, acrolein, methyl isopropenyl ketone, acrylonitrile, and cinnamic acid aldehyde failed. Apparently, tetramethylfuran and furan are not so reactive as to react with dienophiles whose double bond is activated only from one side (Refs. 14-16). H. Wienhnhaus and H. Dässlep (Ref. 17) used menthofuran for the reaction with acrolein and crotonic acid aldehyde, taking this reaction for a diene synthesis. The failure of the authors' attempt to react tetramethylfuran with acrolein indicates that the data mentioned by the authors (Refs. 15, 16) are possibly incorrect. Further investigations are therefore necessary. There are 17 references: 5 Soviet, 9 US, and 3 German.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: November 20, 1959

Card 2/2

AUTHORS: Yur'yev, Yu. K., Belyakova, Z. V., Zefirov, N. S. 79-12-19/43

TITLE: Tetraacyloxysilanes in Organic Synthesis
(Tetraatsiloksisilany v organicheskom sinteze).
X. Comparative Effect of Catalysts on the Occasion of Acylation Reaction of Benzene and Thiophene With Tetraacyloxysilanes
(Sravnitel'noye deystviye katalizatorov v reaktsii atsilirovaniya benzola i tiofena tetraatsiloksisilanami).

PERIODICAL: Zhurnal Obshchey Khimii 1957, Vol. 27, Nr 12, pp. 3264-3270 (USSR)

ABSTRACT: In the present work the comparative effect of a series of catalysts in the acylation reaction of thiophene with tetraacetoxysilane with the mixed anhydride of the orthosilicic acid and acetic acid is investigated. The cabality of reacting of the two anhydrides to be exspected was examined in order to known whether the actual acylation of thiophene, selenophene and benzene is due to the silico-anhydrides of the organic acids only or whether also chloroanhydrides participate, since they also occur on the occasion of the reaction of silicium-tetrachloride on the siliciumanhydride which has already formed (see formulae!). The acylation of thiophene with the above anhydride does not only occur under the presence of

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79-12-19/43

Tetraacyloxysilanes in Organic Synthesis.
X. Comparative Effect of Catalysts on the Occasion of Acylation
Reaction of Benzene and Thiophene With Tetraacyloxysilanes.

anhydrous zinc beryllium chloride and boron fluoride, with
yields of 25,5-46,5 % but also under the presence of tetra-
titanium chloride with a yield of 93,5 %. The acylation of
benzene with anhydride occurs under the presence of anhydrous
aluminium chloride, as well as of anhydrous iron chloride. No
acylation of benzene takes place under the presence of an-
hydrous zinc chloride, beryllium chloride, boron fluoride and
titanium tetrachloride. The acylation of benzene and thiophen
leads to the same results in the solvent with pure mixed an-
hydride of silicic and acetic acid, gained from siliciumtetra-
chloride and acetic acid anhydride, also from silicium tetra-
chloride and acetic acid with the same results, which is a
convincing prove that the acylating agent is in fact the an-
hydride. On this basis the acylation process of the thiophen
nucleus could be proved by means of the mentioned anhydrides.
There are 2 tables and 33 references, 9 of which are Slavic.

79-12-19/43

Tetraacyloxysilanes in Organic Synthesis.
X. Comparative Effect of Catalysts on the Occasion of Acylation Reaction of Benzene and Thiophene with Tetraacyloxysilanes.

ASSOCIATION: Moscow State University
(Moskovskiy gosudarstvennyy universitet).

SUBMITTED: November 22, 1956

AVAILABLE: Library of Congress

1. Tetraacyloxysilanes - Synthesis 2. Benzene - Chemical reactions 3. Thiophene - Chemical reactions 4. Cyclic compounds - Chemical reactions

Card 3/3

YUR'YEV, Yu.K.; ZEFIROV, N.S.; PRIKAZCHIKOVA, L.P.

3,6-Endoxocyclohexanes and -cyclohexenes. Part 11: Cis-hydroxymercuration of dimethyl ester of exo-cis-3,6-endoxo- Δ^4 -tetrahydrophthalic acid. Zhur.ob.khim. 33 no.6:1793-1801 Je '63. (MIRA 16:7)

1. Moskovskiy gosudarstvennyy universitet imeni M.V.Lomonosova. (Cyclohexenedicarboxylic acid) (Mercuration) (Stereochemistry)

ZEFIROV, N.S.; KADZYAUSKAS, P.P.; YUR'YEV, Yu.K.; BAZANOVA, V.N.

Chlorination stereochemistry of 5-chloromercuric derivatives of dimethyl ester of 7-oxabicyclo[2,2,1]-2,3-heptanedicarboxylic acid. Zhur. ob. khim. 35 no.8:1499-1500 Ag '65. (MIRA 18:8)

1. Moskovskiy gosudarstvennyy universitet.

ZEFIROV, N.S.; YUR'YEV, Yu.K.; PRIKAZCHIKOVA, I.P.; BYKHOVSKAYA, M.Sh.

3,6-Endoxo-cyclohexanes and -cyclohexenes. Part 12: Stereochemistry of nucleophilic addition on a C=C bond in the systems of 3,6-endoxo-cyclohexene and 3,6-endoxo-cyclohexadiene. Zhur.ob.khim. 33 no.7:2153-2158 Jl '63. (MIRA 16:8)
(Cyclohexene) (Cyclohexadiene) (Stereochemistry)

ZEFIROV, N.S.; DAVYDOVA, A.F.; YUR'YEV, Yu.K.

3,6-Endoxocyclohexanes and -cyclohexenes. Part 23: Stereochemistry of chlorination of dimethyl esters of 3.6-endoxotetrahydrophthalic and -dihydrophthalic acids in nonpolar solvents. (MIRA 18:8)
Zhur. ob. khim. 35 no.8:1375-1379 Ag '65.

1. Moskovskiy gosudarstvennyy universitet.

YUR'YEV, Yu.K.; ZEFIROV, N.S.; SHTEYNMAN, A.A.

Furan series. Part 26: Relation between the reaction of diene synthesis and substitution addition in the furan series. Zhur.ob. khim. 33 no.4:1150-1156 Ap '63. (MIRA 16:[illegible])

1. Moskovskiy gosudarstvennyy universitet imeni M.V.Lomonosova.
(Furan) (Unsaturated compounds) (Substitution (Chemistry))

YUR'YEV, Yu.K.; ZEFIROV, N.S.

3,6-Endoxo-cyclohexens and -cyclohexanes. Part 8: Wagner-Meerwein rearrangement during the halogenation of derivatives of 3,6-endoxo-cyclohexene, 3,6-endoxo-cyclohexene.. Zhur.ob.khim. 33 no.3:804-813 Mr '63. (MIRA 16:3)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova.

(Cyclohexene) (Halogenation)
(Rearrangements (Chemistry))

YUR'YEV, Yu.K.; ZEFIROV, N.S.; SHAYDEROVA, L.P.

3,6-Endoxo-cyclohexanes and -cyclohexenes. Part 10: Acetoxymercuration of dimethyl ester of 3,6-endoxo-Δ^{4}-tetrahydrophthalic acid. Zhur.ob.khim. 33 no.3:818-820 Mr '63. (MIRA 16:3)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova.

(Cyclohexenod icarboxylic acid)

(Mercuration)

ZEFIROV, N.S.; IVANOVA, R.A.; FILATOVA, R.S.; YUR'YEV, Yu.K.

Deamination of methyl ester of exo-cis-2-amino-3.6-endoxo-hexahydrophthalic acid. Zhur.ob.khim. 33 no.10:3440-3441 O '63. (MIRA 16:11)

1. Moskovskiy gosudarstvennyy universitet.

ZEFIROV, N.S.; IVANOVA, R.A.; FILATOVA, R.S.; YUR'YEV, Yu.K.

3,6-Endoxocyclohexanes and -cyclohexenes. Part 26: Wagner-Meerwein rearrangement in deamination of 3,6-endoxohexahydroanthranilic acid and its methyl ester. Zhur. ob. khim. 35 no.10:1798-1801 O '65. (MIRA 18:10)

1. Moskovskiy gosudarstvennyy universitet.

ZEFIROV, N.S.; YUR'YEV, Yu.K.

3,6-Endoxocyclohexanes and -cyclohexenes. Part 27: Reaction of γ-elimination in the series of halo derivative esters of 3,6-endoxohexahydrophthalic acid. Zhur. ob. khim. 35 no.10: 1802-1806 O '65. (MIRA 18:10)

1. Moskovskiy gosudarstvennyy universitet.

L 1817-66 EWT(m)/EPF(c)/EWP(j) RM

ACCESSION NR: AP5025127

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547.592.12.2:547.463

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B

AUTHOR: Zefirov, N. S.; 44,55 Filatova, R. S.; 44,55 Yur'yev, Yu. K. 44,55

TITLE: 3,6-Endooxacyclohexanes and -cyclohexenes. 28. Reactions of exo- and endo-dimethyl esters of 1-bromo-7-oxabicyclo[2,2,1]cycloheptane-2,3-dicarboxylic acid

SOURCE: Zhurnal obshchey khimii, v. 35, no. 10, 1965, 1807-1811

TOPIC TAGS: oxabicyclic compound, heterocyclic compound, 7,44,55 reaction mechanism, solvolysis

ABSTRACT: This work is a continuation of research on bicyclic compounds bearing a halogen atom at the bridge. Nucleophilic substitution is usually strongly inhibited in this class of compounds. Reactions following the SN_2 mechanism cannot take place because the back-side approach of the nucleophile preceeding the Walden inversion is prevented. The SN_1 reactions, on the other hand, require the formation of a planar carbonium-ion intermediate, prevented by the rigid cage structure. It was of interest to determine whether more stable carbonium ions could be formed by bridge-halogenated oxabicyclic compounds, in which the carbonium ion would be stabilized by the adjacent ether function. The preparation of the exo(I) and

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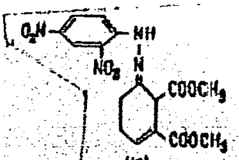
endo-dimethyl esters of 1-bromo-7-oxabicyclo[2,2,1]heptane-2,3-dicarboxylic acid(II) had been described in an earlier paper. Solvolysis of both I and II is extremely slow. Boiling of I and II with aqueous ethanol in the presence of silver nitrate does not produce a precipitate of silver bromide, not even after several hours. Treatment with sodium acetate in acetic acid causes cis-trans isomerization of I. Alkaline hydrolysis leads to saponification without removing the bromine atom. Treatment of I and II with sodium methoxide in methanol, however, produced a rapid appearance of bromide ions in solution. An unstable oil is formed which readily yields a 2,4-dinitrophenylhydrazone. Infrared and ultraviolet spectral data indicate that the structure of the hydrazone is



(III)

Orig. art. has: 2 formulas.

[VS]

ASSOCIATION: Moskovskiy gosudarstvenny universitet (Moscow State University)

Card 2/3

L 1817-66

ACCESSION NR: AP5025127

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SUBMITTED: 23Dec64 ENCL: 00 SUB CODE: OC,GC

NO REF SOV: 004 OTHER: 012 ATD PRESS: 4111

Card 3/3

ZEFIROV, N.S.; PRIKAZCHIKOVA, L.P.; BONDAREVA, M.A.; YUR'YEV, Yu.K.

Hydroxymercuration of dimethyl ester of exo-1-methoxy-3,6-endoxo-Δ^4-trans-tetrahydrophthalic acid. Zhur.ob.khim. 33 no.12:4026-4027 D '63. (MIRA 17:3)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.

ZEFIROV, N.S.; IVANOVA, R.A.; KECHER, R.M.; YUR'YEV, Yu.K.

Bromination of adducts of 2-methyl- and 2,5-dimethylfuran with maleic anhydride. Zhur.ob.khim. 33 no.10:3439-3440 O '63. (MIRA 16:11)

1. Moskovskiy gosudarstvennyy universitet.

ZEFIROV, N.S.; PRIKAZCHIKOVA, L.P.; YUR'YEV, Yu.K.

Stereochemistry of the addition of mercury salts to olefins studied by the use of the mercury salt of trinitromethane. Dokl. AN SSSR 152 no.4:869-871 O. '63. (MIRA 16:11)

1. Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova. Predstavleno akademikom A.N. Nesmeyanovym.

YUR'YEV, Yu.K.; ZEFIROV, N.S.; IVANOVA, R.A.

3,6-Endoxo-cyclohexanes and cyclohexenes. Part 9: Synthesis of amino derivatives of the 3,6-endoxo-cyclohexane series. Zhur.ob.khim. 33 no.3:813-817 Mr '63. (MIRA 16:3)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova.

(Cyclohexene)
(Amino compounds)

5.3400

77861
SOV/79-30-2-12/78

AUTHORS: Yur'yev, Yu. K., Zefirov, N.S., Shteynman, A. A., Gurevich, V. M.

TITLE: Study of the Furan Series. III. Reaction of 2-Methyl- and 2-Ethylfuran with Mesityl Oxide

PERIODICAL: Zhurnal obshchei khimii, 1960, Vol 30, Nr 2, pp 411-415 (USSR)

ABSTRACT: The authors synthesized 1,1-dimethyl-1-(5-methylfuryl-2) butanone-3 (I) and 1,1-dimethyl-1-(5-ethylfuryl-2) butanone-3 (II) by reacting mesityl oxide with 2-methyl- and 2-ethylfuran, respectively, demonstrating that the furan ring can react with β, β-dimethylvinyl group of the α - β-unsaturated ketones (see scheme A).

Card 1/5

Study of the Furan Series. III. Reaction of 2-Methyl- and 2-Ethylfuran with Mesityl Oxide

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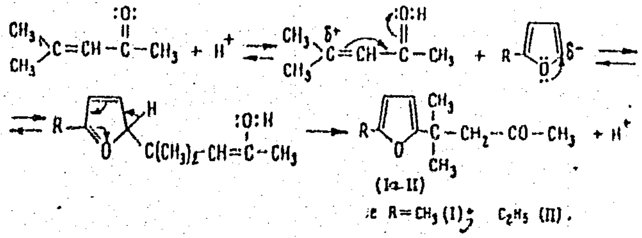

Scheme A

This reaction was conducted in a round-bottom flask provided with a mixer and a reflex condenser. The reaction mixture (the reagents were dissolved in hydroquinone) was heated for 8 hr on the water bath. The reaction mass was then diluted with ether, washed with sodium carbonate and water, and dried over $CaCl_2$. The best catalysts were found to be concentrated sulfuric acid and boron trifluoride etherate. Repeated distill-

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Study of the Furan Series. III. Reaction of 2-Methyl- and 2-Ethylfuran with Mesityl Oxide

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ation yielded the addition products. Characteristics of 1,1-dimethyl-1-(5-methylfuryl-2)butanone-3 (I): bp 106-107° (15 mm); n_D^{20} 1.4700; d_4^{20} 0.9723; its semicarbazone, white leaflets, mp 136-137°, 2,4-dinitrophenylhydrazone, yellow needles; mp 109.5-110°, was characterized by infrared spectrum. The 1,1-dimethyl-1-(5-ethylfuryl-2)butanone-3 (II): bp 114° (13 mm); n_D^{20} 1.4682; d_4^{20} 0.9577; 2,4-dinitrophenylhydrazone, orange needles; mp 90.5-91°, characterized by infrared spectrum. Reactions of prepared ketones were studied on example of 1,1-dimethyl-1-(5-methylfuryl-2)butanone-3. Scheme B shows the reactants and the products of the five reactions studied.

Card 3/5

Study of the Furan Series, III. Reaction of 2-Methyl- and 2-Ethylfuran with Mesityl Oxide

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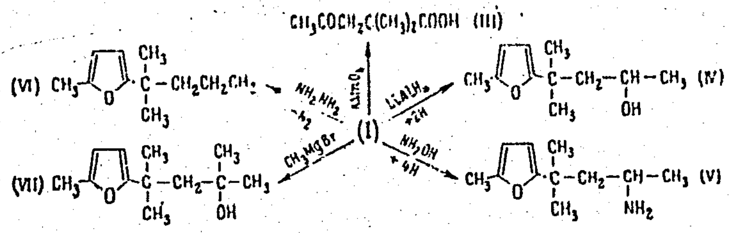

Scheme B

The constants of the derived compounds: (1) α, α dimethyllevulinic acid (III): mp 76-76.5°; (2) 1,1-dimethyl-1-(5-methylfuryl-2)butanol-3 (IV), bp 106° (10 mm), n_D^{20} 1.4770, d_4^{20} 0.9690, characterized by infrared spectrum; (3) 1,1-dimethyl-1-(5-methylfuryl-2)-3-aminobutane (V), bp 104-105° (10 mm), n_D^{20} 1.4580, d_4^{20} 0.8814; (4) 1,1-

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Study of the Furan Series. III. Reaction of 2-Methyl- and 2-Ethylfuran with Mesityl Oxide

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SOV/79-30-2-12/78

-dimethyl-1-(5-methylfuryl-2)butane (VI): bp 75-76° (20 mm), n_D^{20} 1.4529, d_4^{20} 0.8738; (5) 1,1,3-trimethyl-1-(5-methylfuryl-2)butanol-3 (VII): bp 89-90° (6mm), n_D^{20} 1.4800, d_4^{20} 0.9703. The authors thank L. A. Kazitsyna for measurement of spectra. There are 8 references, 3 Soviet, 3 German, 1 French, 1 U.S. The U.S. reference is Ch. A., 47, 1744 (1953).

ASSOCIATION: Moscow State University (Moskovskiy gosudarstvennyy universitet)

SUBMITTED: February 4, 1959

Card 5/5

ZEFIROV, N.S.; DAVYDOVA, A.F.; YUR'YEV, Yu.K.

Cis-bromination of dimethyl ester of 3,6-endoxodihydrophthalic acid. Zhur. ob. khim. 34 no. 5:1681 My '64. (MIRA 17:7)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.

ZEFIROV, N.S.

Stereochemistry of hydroxymercuration of olefins. Usp. khim. 34 no.7:1272-1292 Jl '65. (MIRA 18:7)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova.

ZEFIROV, N.S.; KRUTETSKAYA, G.P.; PRIKAZCHIKOVA, L.P.; YUR'YEV, Yu.K.

3,6-Endoxocyclohexanes and endoxo cyclohexenes. Part 24: Dipole moments of dimethyl ester derivatives of 3,6-endoxohexahydrophthalic acid. Zhur. ob. khim. 35 no.9:1687-1690 S '65.

(MIRA 18:10)

1. Moskovskiy gosudarstvennyy institut.

ZEFIROV, N.S.; FILATOVA, R.S.; YUR'YEV, Yu.K.

Behavior of dimethyl ester of 3-bromo-3,6-endoxohexahydrophthalic acid in solcolysis. Zhur. ob. khim. 34 no.7: 2468-2469 Jl '64 (MIRA 17:8)

1. Moskovskiy gosudarstvennyy universitet imeni M.V.Lomonosova.

ZEFIROV, N.S.; IVANOVA, N.A.; YUR'YEV, Yu.K.

3,6-Endoxocyclohexanes and -cyclohexenes. Part 17: Configuration of the adducts of 2-methyl- and 2,5-dimethylfuran with maleic anhydride and their epoxydation. Zhur. ob. khim. 35 no.1:58-61 Ja '65. (MIRA 18:2)

1. Moskovskiy gosudarstvennyy universitet.

ZEFIROV, N.S.; IVANOVA, R.A.; KECHER, R.M.; YUR'YEV, Yu.K.

3,6-Endoxocyclohexanes and -cyclohexenes. Part 18: Wagner-Meerwein rearrangement during halogenation of 3-methyl- and 3,6-dimethyl-3,6-endoxocyclohexenedicarboxylic acids. Zhur. ob. khim. 35 no.1: 61-67 Ja '65. (MIRA 18:2)

1. Moskovskiy gosudarstvennyy universitet.

YUR'YEV, Yu.K.; ZEFIROV, N.S.; MINACHEVA, M.Kh.

Furan series. Part 8: Tetramethylfuran in the reaction of diene synthesis. Zhur.ob.khim. 30 no.10:3214-3217 O '61. (MIRA 14:4)

1. Moskovskiy gosudarstvennyy universitet.
(Furan)

YUR'YEV, Yu.K.; ZEFIROV, N.S.

Furan series. Part 21: Wagner-Meerwein rearrangement in 3,6-endoxocyclohexane. Zhur.ob.khim. 32 no.3:773-782 Mr '62. (MIRA 15:3)

(Norbornane) (Rearrangements)

YUR'YEV, Yu.K.; ZEFIROV, N.S.

Furan series. Part 15: Sterochemistry of the addition to the C=C bond in the series of 3,6-endoxocyclohexene. Zhur. ob. khim. 31 no.4:1125-1131 Ap '61. (MIRA 14:4)

1. Moskovskiy gosudarstvennyy universitet.
(Endoxocyclohexene)

YUR'YEV, Yu.K.; ZEFIROV, N.S.; GUREVICH, V.M.

Furan series. Part 19: Reactions of alkylfurans with -unsaturated ketones. Zhur. ob. khim. 31 no. 11:3531-3534 N '61. (MIRA 14:11)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova.
(Furan) (Ketones)

5.3600

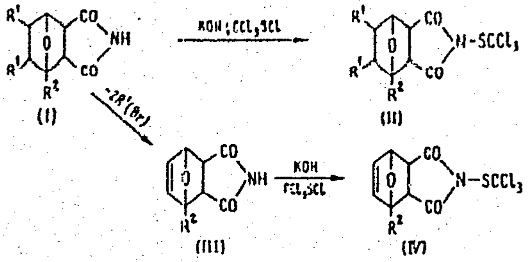
78270
SOV/79-30-3-24/69

AUTHORS: Yur'yev, Yu. K., Zefirov, N. S.

TITLE: Investigation of Furan Series. V. Synthesis of Derivatives of N-Trichloromethylmarcaptoimide of 3,6-Endoxohexahydrophthalic Acid

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol 30, Nr 3, pp 855-859 (USSR)

ABSTRACT: The following two methods were used in the synthesis of the above derivatives.



(I; II): $R^1 = R^2 = H$; $R^1 = Cl$, $R^2 = H$; $R^1 = Cl$, $R^2 = CH_3$; $R^1 = Br$, $R^2 = H$; $R^1 = H$, $R^2 = CH_3$; $R^1 = H$, $R^2 = CH_2OCOCH_3$; (III; IV): $R^2 = H$;

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Investigation of Furan Series. V.

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The reaction of perchloromethylmercaptan with an alkaline solution of the imide of 3,6-endoxyhexahydrophthalic acid or its derivatives is preferred because of a high yield (80-90%) of corresponding N-trichloromethylmercapto derivatives (without forming the amide salt). The following compounds were synthesized: N-trichloromethylmercaptoimide of exo-3,6-endoxohyxahydrophthalic acid, mp 157.5-158°; N-trichloromethylmercaptoimide of exo-3,6-endoxo-Δ^4-tetrahydrophthalic acid (yield 83%), mp 132-132.5°; N-trichloromethylmercaptoimide of exo-4,5-dibromo-3,6-endoxohexahydrophthalic acid (yield 87%), mp 184-185°; N-trichloromethylmercaptoimide of exo-4,5,-dichloro-3,6-endoxohexahydrophthalic acid (yield 81%), mp 169.5-170°; N-trichloromethylmercaptoimide of 3-methyl-3,6-endoxohexahydrophthalic acid (yield 85%), mp 148.5-149°; N-trichloromethylmercaptoimide of 4,5-dichlor-3-methyl-3,6-endoxohexahydrophthalic acid (yield 83%), mp 214-215°; N-trichloromethylmercaptoimide of 3-acetoxymethyl-3,6-endoxohexa-

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Investigation of Furan Series. V.

78270
SOV/79-30-3-24/69

hydrophthalic acid (yield 78%), mp 158°. There are 17 references, 13 U.S., 2 Soviet, 2 German. The 5 most recent U.S. references are: Groxall W., Shropshire, E., Lo C., J. Am. Chem. Soc., 75, 5420 (1953); Stoltz E., Rogers C., Ch. A., 48, 9085 (1954); Kittleson A., J. Agr. Food Chem., 1, 677 (1953); Berson, J., Swidler R., J. Am. Chem. Soc., 76, 4060 (1954); Kwart H., Burchuk J., J. Am. Chem. Soc., 74, 3094 (1952).

ASSOCIATION: Moscow State University (Moskovskiy gosudarstvennyy universitet)

SUBMITTED: March 12, 1959

Card 3/3

5(3)

AUTHORS: Yur'yev, Yu. K., Zefirov, N. S. SOV/79-29-9-31/76

TITLE: Investigation in the Series of Furan.
II. Reaction of Compounds of the Furan Series With the Diethyl Ester of Azodicarboxylic Acid

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 29, Nr 9, pp 2954-2960 (USSR)

ABSTRACT: On the basis of a number of papers quoted in references 1-30 the authors investigated the reactions of the diethyl ester of azodicarboxylic acid with furan, 2-methyl furan (silvane), and furyl alcohol. After the experiments were finished, P. Baranger and J. Levisalles (Ref 8) published a paper describing the failed experiment in which the attempt had been made to cause furan, 2-methyl furan, and 2,5-dimethyl furan to react with the above ester. The mentioned research workers did not succeed in isolating the formed adducts and in carrying out an alkali and acid hydrolysis of the reaction products. In the experiment described the reaction of furan and 2-methyl furan with the above ester was found to proceed like a diene synthesis in which compound (I) and, accordingly, (II) result qualitatively. A large quantity of ether

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has to be used for these reactions as without a solvent they would proceed vigorously and cause resinification. Adducts (I) and (II) are non-crystalline, solid, glassy products, softening in powder form at 50-60°, in contrast to the adduct of the same ester with the diacetate of furfurole (Ref 9). The adducts (I) and (II) add easily to bromine, yielding glassy dibromides (III). The reaction with phenyl azide (Refs 31-32) leads to a crystalline triazoline derivative (IV), but only in the adduct (I). Hydrogen is added to the adducts (I) and (II) which yield dark, glassy products (V). In vacuum distillation a pyrolysis takes place (compound (VI)). When heated with phosphorus pentoxide (I) and (II) resinify, developing CO_2, ethylene and forming a small amount of diethyl ester of hydrazo dicarboxylic acid, which in turn decomposes under the formation of ethylene, CO_2, and nitrogen. The chemical properties of the adducts (I) and (II) and especially the formation of the crystalline addition product of phenyl azide to adduct (I) indicate that the reaction of

Investigation in the Series of Furan. SOV/79-29-9-31/76
II. Reaction of Compounds of the Furan Series With the
Diethyl Ester of Azodicarboxylic Acid

furan and silvane with azodicarboxylic ester proceeds according to the normal diene synthesis. There are 1 figure and 35 references, 3 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: July 17, 1958

Card 3/3

ZEFIROV, N.S.

YUR'YEV, Yu.K.; BELYAKOVA, Z.V.; ZEFIROV, N.S.

Tetraacyloxysilanes in the organic synthesis. Part 10: Comparative action of the catalysts in the acylation reaction of benzene and thiophene with tetraacyloxysilanes. Zhur. ob. khim. 27 no.12:3264-3271 D '57. (MIRA 11:3)

1. Moskovskiy gosudarstvennyy universitet.
(Catalysis) (Benzene) (Thiophene) (Acylation)

ZEFIROV, N.S.

YUR'YEV, Yu.K.; YELYAKOV, G.B.; ZEFIROV, N.S.; VYSOKOSOV, A.N.

Tetraacyloxysilanes in organic synthesis. Part 8. Silicic anhydrides of saturated monobasic organic acids in the synthesis of ketones of the thiophene series. Zhur.ob.khim. 26 no.12:3341-3344 D '56. (MIRA 10:7)

1. Moskovskiy gosudarstvennyy universitet.
(Silicic anhydrides) (Ketones)

ZEFIROV, N.S.; DAVYDOVA, A.F.; YUR'YEV, Yu.K.

3,6-Endoxocyclohexanes and -cyclohexenes. Part 21: Stereochemistry of bromination of 3,6-endoxodihydrophthalic acid and its dimethyl ester. Zhur. ob. khim. 35 no.5:814-822 My '65. (MIRA 18:6)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.

ZEFIROV, N.S.; PRIKAZCHIKOVA, L.P.; YUR'YEV, Yu.K.

3,6-Endoxocyclohexanes and -cyclohexenes. Part 22: Stereochemistry of oxymercuration of dimethyl ester of 1-methoxy-3,6-endoxotetrahydrophthalic acid. Zhur. ob. khim. 35 no.5:822-827 My '65. (MIRA 18:6)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.

YUR'YEV, Yu.K.; ZEFIROV, N.S.; OSADCHAYA, R.A.

Furan series. Part 17: Synthesis of amino alcohols of the 3,6-endoöxocyclohexane. Zhur.ob.khim. 31 no.9:2898-2902 S '61. (MIRA 14:9)

1. Moskovskiy gosudarstvennyy universitet.
(Cyclohexane) (Alcohols)

YUR'YEV, Yu.K.; ZEFIROV, N.S.

Furan series. Part 14: Reactivity of α-oxides of the 3,5 endomethylene-and 3,6-endoxoclohexane series. Zhur. ob. khim. 31 no.3:840-844 Mr '61. (MIRA 14:3)

1. Moskovskiy gosudarstvennyy universitet.
(Norbornane)

YUR'YEV, Yu.K.; ZEFIROV, N.S.; SHTEYNMAN, A.A.; RYBOYEDOV, V.I.

Furan series. Part 10: 2-Methylfuran in a reaction of substitutive addition with α,β-unsaturated aliphatic ketones. Zhur. ob. khim. 30 no.11:3755-3759 N'60. (MIRA 13:11)

1. Moskovskiy gosudarstvennyy universitet.
(Furan) (Ketones)

YUR'YEV, Yu.K.; ZEFIROV, N.S.

Furan series. Part 13: New stereospecific method of synthesizing cyclitols. Zhur. ob. khim. 31 no. 2:685-686 F '61.
(MIRA 14:2)

(Cyclitols)

YUR'YEV, Yu.K.; ZEFIROV, N.S.; PRIKAZCHIKOVA, L.P.

Stereochemistry of the oxymercuration of dimethyl ester of exo-cis-3, 6-endoxo-Δ^{4}-tetrahydrophthalic acid. Zhur.ob.khim. 32 no.8:2744-2745 Ag '62. (MIRA 15:9)

1. Moskovskiy gosudarstvennyy universitet.
(Phthalic acid) (Mercuration) (Stereochemistry)

ZEFIROV, N. S.

Dissertation defended for the degree of Candidate of Chemical Sciences at the Institute of Organic Chemistry imeni N. D. Zelinskiy in 1962:

"Compounds of the Furnace Series in the reaction of Diene Synthesis and Substitutional Additions."

Vest. Akad. Nauk SSSR. No. 4, Moscow, 1963, pages 119-145

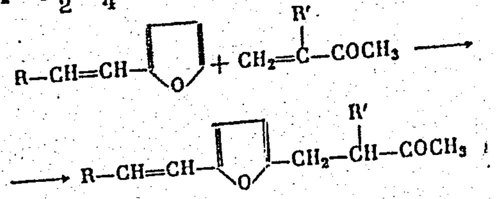
S/079/61/031/011/003/015
D202/D305

AUTHORS: Yur'yev, Yu. K., Zefirov, N. S., and Gurevich, V. M.

TITLE: Investigation of the furan series XIX. The reaction of 2-vinyl furans with α, β -unsaturated ketones

PERIODICAL: Zhurnal obshchey khimii, v. 31, no. 11, 1961, 3531-3534

TEXT: In this work, the authors found that 2-vinyl furan reacts with α, β -unsaturated ketones which have a substituted methyl group, in the presence of traces of H_2SO_4 as a catalyst, according to the scheme:



(I)

Ia $R = R' = H$; Iб $R = C_3H_7$, $R' = H$; Iв $R = H$, $R' = CH_3$

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where R = H, or C_3H_7 , R_1 = H or CH_3 . Similar furan derivatives react in the same way; as those reactions proceed with the formation of resinous side-products, the yield is low, but the method is considered an easy way of preparing furan ketones. Ketones substituted with 2-furyl acetylene were not prepared. The ketones obtained react with maleic anhydride giving additional products. Hydration of the vinyl side chain of furan proceeds smoothly when palladium or $BaSO_4$ are used as a catalyst, and it is easy to obtain an additional product linked to the furan vinyl double bond. Preparation of the following compounds is given: 2-vinyl furan, by a previously known method. Reaction of vinyl furan with thiophenol: a mixture of 4.2 g of thiophenol and 3.8 g of vinyl furan was left in a closed vessel for a few days; the product distilled in vacuo yielded 7.5 g of sulfide (92%); b.p. 146 - 148°C (6 mm); n_D^{20} 1.5811; d_4^{20} 1.0017; MR_D 60.88, calcul. 60.22 . $C_{12}H_{12}OS\Gamma_5$ /Abstracter's note: "Г" probably means fraction/, 1-(5-vinyl furyl-2)-butanone-3 (cpd. Ia). To a flask containing 0.2 g of hydroquinone, Investigation of...

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14 g of methyl vinyl acetone and 2 drops of conc. H_2SO_4, 14.1 g of 2-vinyl furan was added (at ≤ 25°C). The mixture was stirred for 1 hour, diluted with ether, washed with $NaHCO_3$ and water, and dried over anh. $MgSO_4$; the yield was 5 g (20.5%) after distillation in vacuo in a stream of nitrogen; b.p. 109-110°C (5 mm); n_D^{20} 1.5171; d_4^{20} 1.0301; MR_D 48.22; calcul. 46.39 . The additional product of Ia ketone and maleic anhydride: 0.82 g of Ia was added to a concentrated solution of 0.49 g of maleic anhydride in absolute ether; after 12 - 15 hours, white crystals were formed, with b.p. 110 - 111°C (from benzene). They decomposed after a few hours in contact with air. 2-methyl-1-(5-vinyl furyl-2)-butanone-3 was obtained in the same way, as compound Ia, from 14.1 g vinyl furan and 16.4 g of methyl iso-propylene ketone, yielding 5.1 g of the product; b.p. 105 - 107°(9 mm); n_D^{20} 1.5080; d_4^{20} 1.0390; MR_D 52.16; calcul. 51.01; $C_{11}H_{14}O_2F_3$. By the same method, 1-(5-pente-

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D202/D305

Investigation of...

nyl-1-furyl-2)-butanone-3 was obtained from 20.4 g pentenyl furan and 14 g methyl vinyl ketone; the yield = 6.8 g (23%); b.p. 121 - 122° (5 mm); n_D^{20} 1.5081; d_4^{20} 1.0511; MR_D 62.29; calcul. 60.29 . 2-ethyl furan was obtained from 9.4 g of vinyl furan, hydrated in 50 ml of methyl alcohol with 0.1 g Pd on $BaSO_4$ (5% Pd). After the amount of H_2, equivalent to one double bond has been absorbed, the hydration reaction stopped abruptly. The yield was 8.7 g (90%); physical properties were in good agreement with data given in Western literature. 1-(5-ethyl furyl-2)-butanone-3 was prepared by two methods: (a) 3.5 g of ketone I, in 40 ml of methane were hydrated as above, with yield of 2.95 g (81%); b.p. 95° (5 mm); n_D^{20} 1.4726; d_4^{20} 0.9986; MR_D 46.67; calcul. 46.88 . (b) From 9.6 g of ethyl furan and 10.5 g methyl vinyl ketone with 0.15 ml of concentrated H_2SO_4 by a method described previously for the preparation of 2-methyl furan. 8.6 g of compound identical with that

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obtained by method (a) given above. The above experiments prove that the reactions of alkenyl furans with unsaturated ketones belong to the type of addition-substitution ones. There are 15 references: 6 Soviet-bloc and 9 non-Soviet-bloc. The 4 most recent references to the English-language publications read as follows: J. Webb, G. Borcherdt, U.S. Pat. 2,640,057 (1953); J. Bachman, L. Heisey, J. Am. Chem. Soc. 71, 1985 (1949); D. Coffman, P. Barrick, R. Cramer, M. Raasch, J. Am. Chem. Soc. 71, 490, (1949); E. Breault, O. Dremer, Ch. A., 43, 2616 (1949).

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University im. M. V. Lomonosov)

SUBMITTED: December 16, 1960

Card 5/5

YUR'YEV, Yu.K.; ZEFIROV, N.S.

Jolivet's work "Study of 3,6-endoxo- Δ^4-tetrahydrophthalic anhydride" reviewed by IU.K.IUr'ev, N.S. Zefirov. Zhur. ob. khim. 31 no. 11:3840-3841 N '61. (MIRA 14:11)

1. Moskovskiy gosudarstvennyy universitet.
(Phthalic anhydride)

FEDOROV, A. (Voronezh); ZEFIROV, V. (Sverdlovsk); TEREKHOV, N. (Moskva);
RYABCHIKOV, A. (Nizhniy Tagil)

Repaired by amateurs. Radio no.2:51 F '63. (MIRA 16:2)
(Television—Maintenance and repair)
(Radio—Maintenance and repair)

ZEFIROV, N.S.; PRIKAZCHIKOVA, L.P.; YUR'YEV, Yu.K.

3,6-endoxocyclohexanes and -cyclohexenes. Part 20: Acetoxymercuration of demethyl ester of 3,6-endoxodihydrophthalic acid. Zhur. ob. khim. 35 no.4:639-641 Ap '65.

(MIRA 18:5)

1. Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova.

ZEFIROV, N.S.; KADZYAUSKAS, P.P.; BAZANOVA, V.N.; YUR'YEV, Yu.K.

Stereochemistry of the nitrosochlorination of 2,3-dicarbomethoxy-7-oxabicyclo-[2,2,1]-5-heptene. Zhur. ob. khim. 35 no.4:752-753 Ap '65. (MIRA 18:5)

1. Moskovskiy gosudarstvennyy universitet im. V.M. Lomonosova.

ZEFIROV, Yu.N.

Changes in the activity of cholinesterase of whole blood in acute leukemia in children. Vop. gemat. v pediat. no.3:310-316 '64.

Changes in the cholinesterase activity of the blood elements in lymphogranulomatosis in children. Ibid.:439-447

(MIRA 18:7)

ZEFIROVA, A.

Pepsin- [illegible]

Consultation. Mias ind. 23 no, 4, Jl-Ag '52

Monthly List of Russian Accessions, Library of Congress, December 1952 UNCLASSIFIED

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S/153/60/003/02/09/034
B011/B003

5.3200

AUTHORS: Burlakova, Ye. B., Dzantiyev, B. G., Zefirova, A. K., Sergeyev, G. B., Emanuel', N. M.

TITLE: The Thermal and Radiolytic Oxidation of Methyl Oleate

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya, 1960, Vol. 3, No. 2, pp. 265-271

TEXT: The authors studied the kinetics of the accumulation of products of the thermal and radiolytic oxidation of the methyl oleate by atmospheric oxygen at 50 - 120°. For this purpose a vessel was used which was analogous to that described in Ref. 10. The peroxide amount was determined iodometrically. The acids were determined by titration of the oxidate dissolved in neutral ethanol with an 0.05 N-solution of alcohol-alkali solution. An x-ray apparatus of type RUP 1-M-2, 200 kW was used as radiation source. Air was blown through at a rate of 5 - 7 l/h. The authors proved that the principal amount of the oxidation products is formed by conversion of the hydroperoxides (Refs. 1-4).

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The Thermal and Radiolytic Oxidation of Methyl Oleate

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A large amount of oxides was also found, however. The authors assume that in addition to peroxides, oxides represent primary oxidation products of the methyl oleate. Furthermore, the authors studied the decomposition kinetics of the organic peroxides in dependence on the oxidation time of the methyl oleate (Fig. 3). They determined that peroxides decompose after the reaction of second order. The constant of the decomposition rate decreases with the intensity of oxidation (Fig. 3). The authors pointed out that a short radiation effect on the oxidation process is mainly expressed by the reduction of the induction period of the peroxide-, acid-, and oxide formation. The reduction in the induction period is proportional to the radiation dose (Fig. 5) in the case of peroxides, but is independent of the radiation dose in the case of oxides. Finally, the authors proved that the amount of peroxide yield subject to radiation is largely dependent on temperature (Fig. 7). The elimination of the radiation source strongly effects the kinetics of the accumulation of peroxides at comparatively low temperatures. Above 80° this influence cannot be observed (Fig. 6). The authors thank Professor N. A. Bakh, and

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The Thermal and Radiolytic Oxidation of Methyl Oleate

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B. B. Sarayeva for having supplied the radiation source. There are 8 figures and 15 references, 6 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet imeni M. V. Lomonosova; Kafedra khimicheskoy kinetiki (Moscow State University imeni M. V. Lomonosov; Chair of Chemical Kinetics)

SUBMITTED: August 4, 1958

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89731

5.3700 2209, 1153, 1164

S/020/61/136/003/015/027
B016/B052

AUTHORS: Zefirova, A. K. and Shilov, A. Ye.

TITLE: Kinetics and Mechanism of the Interaction Between Aluminum Alkyls and Titanium Halides

PERIODICAL: Doklady Akademii nauk SSSR, 1961, Vol. 136, No. 3, pp. 599-602

X

TEXT: The authors report on the interaction mechanism and on the structure of particles taking part in the reduction process of the following compounds: $(C_5H_5)_2TiCl_2$ with 1) $Al(C_2H_5)_3$, 2) $Al(CH_3)_3$, and 3) $Al(C_2H_5)_2Cl$ (the examination of 3) was started together with E. W. Randall and L. E. Sutton in Oxford). Ad 1): in this fast reaction titanium is reduced under the formation of a light blue complex (4): $(C_5H_5)_2TiCl_2$ $Al(C_2H_5)_2$. Ethane forms in amounts which correspond to half of the $(C_5H_5)_2TiCl_2$ used, thus corresponding to a disproportionation of the ethyl groups. Ethylene

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89731

Kinetics and Mechanism of the Interaction Between Aluminum Alkyls and Titanium Halides

S/020/61/136/003/015/027
B016/B052

always forms in smaller amounts than ethane. Butane is not formed. Aluminum alkyls and $TiCl_4$ show a similar reaction although titanium here is reduced to valences lower than 3+. The lower yields of ethylene are generally explained by its partial polymerization. The authors found that the products of reaction 1) yield approximately 20% of butane by the decomposition by water. They explain this by the fact that ethylene enters the Me-C bond only once during the reduction. Ad 2): titanium is slowly reduced when toluene solutions of the reagents are mixed. The light blue complex (4) does not form. The red coloring rapidly turns light blue in the presence of ethylene. Thus, methane is liberated and ethylene is absorbed. The complex of the type (4) is sublimable and has the empirical formula of $(CH_3)_2AlCl\cdot(C_5H_5)_2TiCl$. Propylene, butylene-1, amylene-1, and other α-olefins react in a similar way, and approximately equimolar amounts of ethylene are absorbed. From the formation of propane and butane during the decomposition of the reaction products by water (in the presence of ethylene), the authors conclude that the reaction takes place in accordance with the scheme of disproportionation of the alkyl groups. Here, however, the olefin first enters the Me-C bond and forms a

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Kinetics and Mechanism of the Interaction Between Aluminum Alkyls and Titanium Halides
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disproportionable alkyl radical. The olefins formed during the disproportionation also enter the Me-C bond. Ad 3): the reaction follows the known scheme of Refs. 1,3 at a measurable rate. From Fig. 1 the authors conclude that the reaction proceeds according to order 1/2 until a conversion of 70-80% is reached. Then it follows the first order. On the basis of their own results and the published data, the authors regard the free radical reaction mechanism of the above reduction of titanium halide as being refuted. However, they mention a number of data supporting the ion mechanism. The scheme enclosed illustrates the reaction mechanism suggested by the authors. There are 2 figures and 8 references: 2 Soviet, 4 US, 1 British, and 1 International.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences USSR)

PRESENTED: July 3, 1960, by V. N. Kondrat'yev, Academician

SUBMITTED: July 20, 1960

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89731

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B016/B052

0) $[Al(C_2H_5)_2Cl]_2 \rightleftarrows Al(C_2H_5)_2^+ + Al(C_2H_5)_2Cl_2^-$
1) $2\,(C_5H_5)_2TiCl_2 + [Al(C_2H_5)_2Cl]_2 \rightleftarrows 2\,(C_5H_5)_2TiCl_2 \cdot Al(C_2H_5)_2Cl$ (II)
2) $II \rightleftarrows (C_5H_5)_2Ti(C_2H_5)Cl \cdot Al(C_2H_5)Cl_2$ (III)*
3) $III \rightleftarrows (C_5H_5)_2TiC_2H_5^+ + Al(C_2H_5)Cl_3^-$
4) $(C_5H_5)TiC_2H_5^+ + Al(C_2H_5)_2Cl_2^- \rightarrow (C_2H_5)_2Ti(C_2H_5)_2 + Al(C_2H_5)_2Cl_2$
4') $(C_5H_5)_2Ti(C_2H_5)_2 + Al(C_2H_5)_2^+ \rightarrow (C_5H_5)_2Ti\overset{+}{C}_2H_5 + Al(C_2H_5)_3$
5) $(C_5H_5)_2Ti(C_2H_5)_2 \rightarrow (C_5H_5)_2Ti + C_2H_6 + C_2H_4$
6) $(C_2H_5)_2Ti + II \rightarrow (C_5H_5)_2TiCl + (C_5H_5)_2TiCl_2Al(C_2H_5)_2$

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81702
S/020/60/132/05/30/069
B011/B126

5.3831
5.3100

AUTHORS: Zefirova, A. K., Tikhomirova, N. N., Shilov, A. Ye.

TITLE: The Structure of Some Products of the Interaction of Aluminum Alkyls With Derivatives of Titanium (IV)

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 132, No. 5, pp. 1082 - 1085

TEXT: The authors have extended their previously (Ref. 1) observed rule governing the spectra of paramagnetic electron resonance (PER) of the products of the reaction of tri-isobutylaluminum with dicyclopentadienyl-titanium dichloride, to other compounds. Thus they have been able to draw some conclusions on the structure of the reaction products. They analyzed the interaction of aluminum alkyls and aluminum aryls: $Al(C_2H_5)_3$, $Al(C_6H_5)_3$, $Al(Iso-C_3H_7)_3$, $Al(CH_3)_3$, $Al(Iso-C_4H_9)_3$, $Al(C_2H_5)_2Cl$, with derivatives of titanium (IV): $(C_5H_5)_2TiCl_2$, $(C_5H_5)_2TiBr_2$, $(C_5H_5)_2TiI_2$. With a reagent ratio of 1 : 1 in a toluenic

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solution, similar PER signals were received in all cases. Their g-factor was 1.975. With lower concentrations of the reagents (under 1 $\cdot$ 10^{-3} M/l), the signals have a characteristic appearance (Fig. 1), which can be explained by the presence of an undefined super-fine structure. It can be seen from the PER spectra of other Al/Ti ratios that all Al-alkyls and Al-aryls can be divided into two groups. The signals I (Fig. 1) for $Al(CH_3)_3$, $Al(C_6H_5)_3$, and $AlCl(C_2H_5)_2$ are not noticeably changed by a rising Al/Ti ratio. On the other hand, new signals form with the remaining Al-alkyls and -aryls, which have a well defined super-fine structure. On a change in these systems from an Al : Ti ratio of 1 : 1 to $\sim$ 20 : 1, the signals I change into signals II (Fig. 2a). This latter is a doublet with a g factor of 1.985. If the ratio is increased further to $\sim$ 50 : 1, signal II is converted into signal III. Here g = 1.988 and there are eight components. In the Al-alkyls of the second group, the form of signals II and III is as independent of the nature of the alkyl as it is from the nature of the halogen atom in titanium halide. The conversion I $\rightarrow$ II $\rightarrow$ III led the authors to suppose that the Al-alkyls

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contain similar admixtures, whose quantity equates that of the titanium derivative when the Al/Ti ratio is raised, and which forms new complexes therewith. Such admixtures can be hydrides which easily form in the first group of substances analyzed, but which are totally absent in the second group. The authors tested and confirmed this hypothesis. In this case the doublet II can be explained by splitting on the hydrogen atom of the complex, which contains one molecule of $AlH(Iso-C_4H_9)_2$. It can be seen from Fig. 3a that signal III consists of some six equally intensive lines and two lines which are three to four times less intense. Here, the super-fine structure has a natural explanation: the molecule of the reaction product contains two H atoms from two molecules of the Al-hydride. Figs. 2b and 3b show the PER spectra of the products of the reaction of $AlD[CH_2CD(CH_3)_2]_2$ with $(C_5H_5)_2TiCl_2$. From this it follows that, due to the substitution of D for H, the super-fine structure completely disappears in both cases. The authors draw conclusions on the structure of the complex produced, from their results and from data in

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the publications. They thank V. V. Voyevodskiy, Corresponding Member AS USSR for discussions, and O. P. Okhlobystin and V. V. Gavrilenko (Institut elementoorganicheskikh soyedineniy AN SSSR (Institute of Elemental-organic Compounds of the AS USSR)) for help in the syntheses. There are 3 figures and 4 references: 2 Soviet and 2 American.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Physical Chemistry of the Academy of Sciences, USSR)

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5(4)

AUTHORS: Shilov, A. Ye., Zefirova, A. K., Tikhomirova, N. N.

TITLE: Paramagnetic Electron Resonance in the System $Al(iso\text{-}C_4H_9)_3 - Ti(C_5H_5)_2Cl_2$

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 9, pp 2113 - 2114 (USSR)

ABSTRACT: A. Ye. Shilov and N. N. Bubnov (Ref 1) found paramagnetic electron resonance absorption (PERA) with a g-factor of about two in the precipitate formed by the reaction of aluminum trialkyls with titanium chlorides. The homogeneous system $Al(iso\text{-}C_4H_9)_3$ (I) - $Ti(C_5H_5)_2Cl_2$ (II) in toluene was investigated here at room temperature. At the applied concentration of (I) of 2.10^{-4} mol/l and ratios of (I):(II)=2:1, 10:1, 50:1 and 100:1, the authors found resonance absorption (Fig 1). The results lead to the assumption that the free electrons are located on the atoms of Al or Ti in the system under discussion. The number of basic lines of the hyperfine structure of the (PERA)-spectrum (Fig 2) indicates that the free electron reacts with the nucleus possessing a spin of 5/2, which would

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correspond to the Al atom. In this connection, the free electron interacts with two protons and a hyperfine structure of the spectrum is formed due to fission on the atoms of Al and H. In conclusion, the authors thank L. I. Zakharkin and V. V. Gavrilenko for supplying substance (I). There are 2 figures and 1 Soviet reference.

SUBMITTED: February 6, 1959

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