GERSHTEYN, L.A.

Changes in the chemical composition of oranges during ripening and storage. Biokhim.pl.i ovoshch. no.7:160-180 '62.
(MIRA 16:1)

1. Sukhumskaya opytnaya stantsiya subtropicheskikh kul'tur Vsesoyuznogo instituta rasteniyevodstva.
(Orange--Storage) (Fruit--Ripening)
(Fruit--Chemical composition)

GERSHTEYN, L.A.

Biochemical characteristics of the fruit of nucellar orange seedlings. Trudy po prikl. bot., gen. i sel. 37 no. 1:119-129 '65 (MIRA 19:1)

S/141/62/005/002/023/025
E192/E382

9.2574

AUTHORS: Gersamoyn, L.I. and Plechkov, V.M.

TITLE: Frequency standard using a molecular oscillator (maser)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, v. 5, no. 2, 1962, 403 - 408

TEXT: The standard produces a basic frequency of 1 Mc/s, whose stability is 10^{-9}. The system is stabilized by employing a specially designed maser as the stable-frequency reference source. The basic frequency of 1 Mc/s is generated by a quartz-crystal oscillator and this is multiplied up to a frequency of 23868 Mc/s, first up to 52 Mc/s by a vacuum-tube multiplier and then by means of an automatic phase frequency control klystron system up to 7956 Mc/s; next, the resulting signal is multiplied by a tripler and then applied to a balanced mixer. The second input of the balanced mixer receives a signal from the maser operating at a frequency f_N = 23870, 12942 Mc/s. The resulting difference frequency from the mixer is amplified in an intermediate

4

Card 1/3

S/141/62/005/002/023/025
E192/E382

Frequency standard ....

frequency amplifier and then applied to another mixer whose second input receives the signal from the quartz-crystal oscillator. The signal of the second mixer has a frequency of 129.42 kc/s (this being the difference between 2.12942 Mc/s and the second harmonic of the crystal oscillator). The frequency 129.42 kc/s is applied to a 100-times divider and the resulting signal of 1.2942 kc/s is applied to a phase-detector whose second input receives a signal of 1.2942 kc/s from an auxiliary quartz-crystal oscillator. The output of the phase-detector is followed by a filter and a reactance tube which controls the frequency of the standard crystal oscillator. If the instability of the auxiliary oscillator is of the order of 10^{-5}, it causes an instability of $\pm 0.5 \times 10^{-10}$ in the principal frequency of 1 Mc/s. This stabilized frequency is applied to various multipliers and dividers in order to obtain a set of required standard frequencies.

Card 2/3

Frequency standard S/141/62/005/002/023/025
E192/E382

The authors express their gratitude to V.S. Troitskiy for useful advice relating to the construction of the standard.
There are 2 figures.

ASSOCIATION: Nauchno-issledovatel'skiy radiofizicheskiy institut pri Gor'kovskom universitete (Scientific Research Radiophysics Institute of Gor'kiy University)

SUBMITTED: November 24, 1961

Card 3/3

L 4421-66 EWT(d)/FSS-2/EWT(1)/EEC(k)-2/EWA(h)
ACCESSION NR: AP5022801

UR/0141/65/008/004/0771/0774
621.396.628:523.164

57

B

AUTHOR: Gershteyn, L. I. 44

25

TITLE: Centimeter-band radiometer with elimination of the effects of spurious signals by automatic frequency control of the heterodyne

B

SOURCE: IVUZ. Radiofizika, v. 8, no. 4, 1965, 771-774

TOPIC TAGS: radiometer, automatic frequency control, receiver image rejection

10 8,44

ABSTRACT: The author shows that automatic control of the heterodyne frequency, such that the mixer-current component at the modulation frequency is kept at zero, eliminates completely the spurious-signal component due to unequal reflection of the heterodyne power from the input and from the modulator, and at the same time suppresses the component due to unequal reflection of the noise at the receiver-channel frequency. A block diagram of such a radiometer is shown in Fig. 1 of the Enclosure. It covers a range from 11.1 to 17.5 Gc, and is adjustable by simply varying the heterodyne frequency. The output drift is 1--10 deg/hr, and its sensitivity (at a time constant of 1 second) is from 2° to 4° over the entire

Card 1/3

L 4421-66

ACCESSION NR: AP5022801

range. The use of this design obviates the need for rectifiers and double bridges. Orig. art. has: 1 figure and 2 formulas. [02]

ASSOCIATION: Nauchno-issledovatel'skiy radiofizicheskiy institut pri Gor'kovskom universitete (Scientific Research Radio Physics Institute at Gorky University) 44

SUBMITTED: 07Dec64 ENCL: 01 SUB CODE: EC

NO REF SOV: 001 OTHER: 000 ATD PRESS: 4125

Card 2/3

L 4421-66
ACCESSION NR: AP5022801

ENCLOSURE: 01

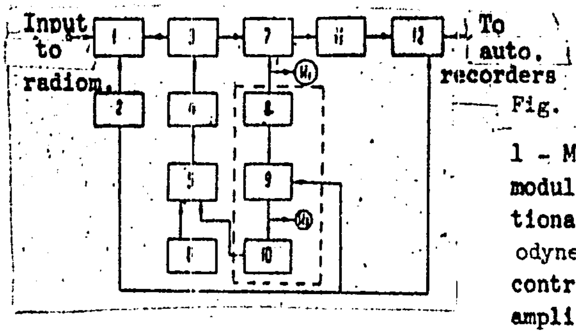

Fig. 1. Block diagram of radiometer

1 - Mechanical waveguide modulator; 2 - modulation frequency generator; 3 - directional coupler; 4 - heterodyne; 5 - heterodyne power supply; 6 - power supply manual control; 7 - single crystal mixer; 8 - amplifier for modulation frequency; 9 - phase detector; 10 - automatic frequency control filter; 11 - if amplifier; 12 - low frequency block of radiometer; И_1 - mixer current indicator; И_2 - afc system indicator. The units enclosed by the dashed line pertain only to the afc system.

Card 3/3

GERSHTEYN, L. M.

"The Topography of Alpha-Acylamidecarboxyl and Amino Groups of Proteins in the Microstructures of Individual Formations of the Skin-Motor Analyzer of the Cat."

report submitted for the First Conference on the problems of Cyto and Histochemistry, Moscow, 19-21 Dec 1960.

Laboratory of Histochemistry of the Institute of the Brain, Academy of Medical Sciences USSR, Moscow.

GERSHTEYN, L.M.; TSVETKOVA, I.V.

Method for the detection of α-acylamidocarboxyl protein groups. TSitologiia 2 no.2:201-207 Mr-Ap '60. (MIRA 14:5)

1. Laboratoriya gistokhimii Instituta mozga AMN SSSR.
(PROTEINS)

PORTUGALOW, W.W. [Portugalov, V.V.] (Moscow); GERSTEIN, L.M. [Gershteyn, L.M.] (Moscow); PORCZYNSKI, J.M. [Porchinskiy, Yu. M.] (Moscow)

The behavior of mitochondria in some physiological and pathological states of nervous cells. Folia Morphologica 12 no. 2/3:137-146 '61.

1. Instytut Badan Mozgu, Akademia Nauk Medycznych Z.S.R.R., Moskwa, B-120, Obucha 5.

GERSHTEYN, L.M.; TSVETKOVA, I.V.

Nature of thiol compounds demonstrated by histochemical methods. TSitologiia, 6 no.3:366-369 My-Je '64. (MIRA 18:9)

1. Laboratoriya biogistokhimii Instituta mozga AMN SSSR, Moskva.

GERSHTEYN, L.M.

Comparative chemical architectonic of functional protein groups of cortical nuclei of the cutaneous and motor analysors in cats. Zhur. vys. nerv. deiat. 14 no.2:346-350 Mr-Ap '64. (MIRA 17:6)

1. Laboratory of Biohistochemistry, Institute of Brain, U.S.S.R. Academy of Medical Sciences, Moscow.

"Change in the nerve cell proteins in dogs during reanimation from the state of clinical death."

report submitted for 2nd Intl Cong, Histochemistry & Cytochemistry, Frankfurt, 16-21 Aug 64.

Moscow.
Inst of Brain, AMS USSR per Obucha [illegible], Moscow B-120.

GERSHTEYN, L.M.

Topography of the amino and carboxyl groups of proteins in the neurons of cutaneous and motor analysors in cats. Arkh. anat., gist. i embr. 48 no.1:88-93 Ja '65. (MIRA 18:11)

1. Laboratoriya biogistokhimii (zav. - chlen-korrespondent AMN SSSR prof. V.V. Portugalov) Instituta mozga AMN SSSR, Moskva. Adres avtora: Moskva, ul. Obukha, 5, Institut mozga AMN SSSR, laboratoriya biogistokhimii. Submitted Nov. 4, 1963.

94-13-7-3/25

AUTHORS: Gershteyn, M. G., Engineer and Rutenberg, G. G., Engineer

TITLE: Improvements to the Ceiling Lining of Boilers Type DKV (Usovershenstvovaniye potolochnoy obmurovki kotlov tips DKV)

PERIODICAL: Promyshlennaya Energetika, 1958, Vol 13, Nr 7, pp 6-7 (USSR)

ABSTRACT: A number of type DKV boilers have recently been installed in industrial power stations and a number of defects in them have been found in operation. A weak point in these boilers is the poor design of the joint between the ceiling and wall linings of the boilers shown in Fig.1. The design is such that the tubes expand upwards on heating so that cracks are formed in the lining and air leaks in. Attempts to stop up the leaks were only temporarily successful. It was accordingly proposed to attach the ceiling lining of the boiler to the tube system so that the lining is displaced as a whole and not broken. The method by which this has been done on a number of boilers of this type since 1954 is illustrated in Fig.2 and has proved very advantageous. However, in some boilers with sharp temperature changes leaks were

Card 1/2

94-13-7-3/25

Improvements to the Ceiling Lining of Boilers Type DKV

found to occur and an improved method of making the joint between the ceiling and walls is shown in Fig.3. A steel sheet 0.5 - 1 mm thick is spot welded to the frame carrying the ceiling liner. This construction has been very successful.
There are three figures.

Card 2/2 1. Boilers - Design 2. Boilers - Equipment

GERSHTEYN, M.G., inzh.; SOKOLOV, P.I., inzh.

Steam superheater for DKV and DKVR boilers. Prom. energ. 19 no. 4:29-30 Ap '64. (MIRA 17:5)

VIL'SHANSKAYA, F.L.: GERSHTEYN, M.I.

Food intoxication caused by Staphylococcus aureus. Vop.pit. 14 no.2:50 Mr-Ap '55. (MIRA 8:6)

1. Iz laboratorii sanitarno-epidemiologicheskoy stantsii, Moskva.
(MICROCOCCAL INFECTIONS,
food pois.)
(FOOD POISONING, bacteriology,
Micrococcus aureus)

VOL'MIR, A.S. (Moskva); [illegible], M.S. (Moskva)

Behavior of elastic cylindrical shells under the action of a plane acoustic wave. Inzh. zhur. 5 no.6:1127-1130 '65.
(MIRA 19:1)

1. Submitted June 15, 1965.

L 16518-66 EWT(d)/EWT(1)/EWT(m)/EWP(w)/EPF(n)-2/EWP(v)/EWP(k)/EWA(h)/ETC(m)-6
ACC NR: AP6002630 IJP(c) (N) SOURCE CODE: UR/0258/65/005/006/1127/1130
WW/EM

AUTHORS: Vol'mir, A. S. (Moscow); Gershteyn, M. S. (Moscow) 77

B

ORG: none

TITLE: The behavior of elastic cylindrical shells under the action of a planar acoustic wave 26,55

21,44,55

SOURCE: Inzhenernyy zhurnal, v. 5, no. 6, 1965, 1127-1130

TOPIC TAGS: acoustic wave, shock wave, shell, shell deformation, circular cylindrical shell, transient response

ABSTRACT: An investigation is made of the behavior of a circular cylindrical shell of infinite length under the action of a planar acoustic wave. The shell (see Fig. 1) is immersed in a fluid and has a wall thickness h and radius R. The equation of motion of the annular shell is given as

$$\frac{1}{R}\frac{\partial M}{\partial y}-\frac{\partial N}{\partial y}-\rho_1 h\frac{\partial^2 v}{\partial t^2}=0,$$

$$\frac{\partial^2 M}{\partial y^2}+\frac{N}{R}+\frac{\partial}{\partial y}\left(N\frac{\partial w}{\partial y}\right)-p+\rho_1 h\frac{\partial^2 w}{\partial t^2}=0,$$

Card 1/4 UDC: 533.601.342 Z

L 16518-66
ACC NR: AP6002630

6

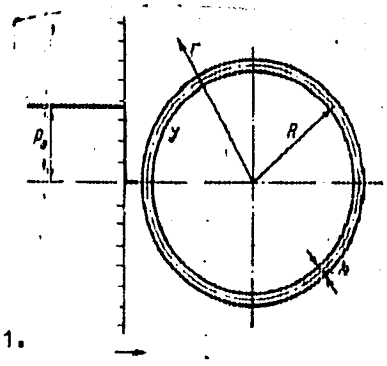

Fig. 1.

where y is an arc distance coordinate, v and w are deflections of the median surface along an arc and in the radial direction, ρ_2 is the density of the shell material, and p is fluid pressure on the shell. Shear moment M and normal force N in a segment of the shell are expressed in terms of strains. This results in the system

$$\left(1+\frac{h^2}{12R^2}\right)\frac{\partial^2 v}{\partial y^2}+\frac{h^2}{12R}\frac{\partial^3(w-w_0)}{\partial y^3}-\frac{1}{R}\frac{\partial(w-w_0)}{\partial y}+$$
$$+\frac{\partial w}{\partial y}\frac{\partial^2 w}{\partial y^2}-\frac{\partial w_0}{\partial y}\frac{\partial^2 w_0}{\partial y^2}-\rho_2\frac{1-\mu^2}{E}\frac{\partial^2 v}{\partial t^2}=0,$$

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L 16518-66
ACC NR: AP6002630

O

$$\frac{h^2}{12R}\frac{\partial^3 v}{\partial y^3}-\frac{1}{R}\frac{\partial v}{\partial y}+\frac{h^2}{12}\frac{\partial^4 (w-w_0)}{\partial y^4}+\frac{w-w_0}{R^2}-\frac{1}{2R}\left[\left(\frac{\partial w}{\partial y}\right)^2-\left(\frac{\partial w_0}{\partial y}\right)^2\right]-$$

$$-\frac{\partial w}{\partial y}\left[\frac{\partial^2 v}{\partial y^2}-\frac{1}{R}\frac{\partial (w-w_0)}{\partial y}+\frac{\partial w}{\partial y}\frac{\partial^2 w}{\partial y^2}-\frac{\partial w_0}{\partial y}\frac{\partial^2 w_0}{\partial y^2}\right]-$$

$$-\frac{\partial^2 w}{\partial y^2}\left[\frac{\partial v}{\partial y}-\frac{w-w_0}{R}+\frac{1}{2}\left(\frac{\partial w}{\partial y}\right)^2-\frac{1}{2}\left(\frac{\partial w_0}{\partial y}\right)^2\right]-p\,\frac{1-\mu^2}{Eh}+\rho_1\frac{1-\mu^2}{E}\frac{\partial^2 w}{\partial t^2}=0\,,$$

where E and μ are the modulus of elasticity and Poisson's coefficient for the shell material. The problem is simplified by means of the relationship

$$p=\frac{\rho_1 c^2}{R}\left(\frac{w-w_0}{2}-\frac{R}{c}\frac{\partial w}{\partial t}\right)-\rho_1\left[\frac{\partial \varphi}{\partial t}+c\frac{\partial \varphi}{\partial r}-\frac{c^2}{2}\int_0^t\frac{\partial \varphi}{\partial r}\,dt_1\right]_{r=R}$$

developed by E. I. Grigolyuk and V. L. Prisekin (Dinamicheskoye vzaimodeystviye ortotropnoy tsilindricheskoy obolochki s akusticheskoy udarnoy volnoy. Izv. AN SSSR, Mekhanika i mashinostroyeniye, No. 6, 1963). The coordinate r is the polar system radius vector; ϕ is the velocity potential of the incipient wave. These equations were converted to dimensionless form, written as finite difference equations, and solved on an electronic digital computer. Distortions occurring in the shell are discussed and plotted as shown, for example, in Fig. 2.

Card 3/4

L 16518-66
ACC NR: AP6002630

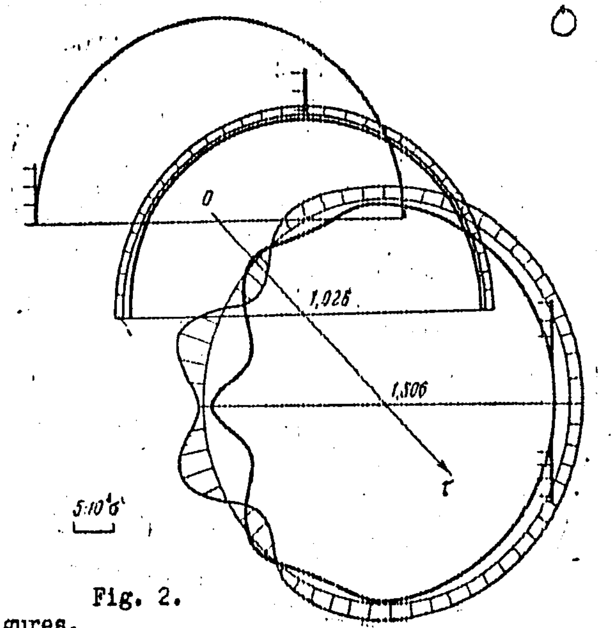


Fig. 2.

Orig. art. has: 8 equations and 4 figures.

SUB CODE: 20, ~~13~~ SUBM DATE: 15Jun65/ ORIG REF: 002/ OTH REF: 002

Card 4/4 TS

L 05844-67 EWT[illegible]/EWT[illegible]/EWP(w)/EWT[illegible]/EWP(f) IJP(c) WW/EM

ACC NR: AP6028214 SOURCE CODE: UR/0430/66/019/001/0008/0012

AUTHOR: Vol'mir, A. S.; Gershteyn, M. S. -- Herschtein, M. S. 39 B

ORG: Military Air Engineering Academy im. Prof. N. Ye. Zhukovskiy (Voyenno-vozdushnaya inzhenernaya akademiya)

TITLE: On the behavior of blood vessels as elastic shells

SOURCE: AN ArmSSR. Izvestiya. Mekhanika, v. 19, no. 1, 1966, 8-12

TOPIC TAGS: blood pressure, finite difference, shell theory, nonlinear elasticity

ABSTRACT: The authors consider the behavior of blood vessels considered as shells with nonlinear elasticity during rapid hemodynamic processes. The study is based on the use of dynamic equations for shells with considerable radial displacement. Blood motion is considered as a laminar flow of Newtonian liquid. Numerical results are given for a number of examples using the method of finite differences with a digital computer. The resultant pressure curves may be used for evaluating the effect of blood vessel rigidity on localized pressure increase during arterial embolism. The proposed method may be used for studying hemodynamic phemonena both under ordinary conditions and under high acceleration. Orig. art. has: 4 figures, 8 formulas.

SUB CODE: 06, 20/ SUBM DATE: 19Jul65/ ORIG REF: 004

Card 1/1 egh

"Research in the Field of Acetylenic Chlorohydrines and the Corresponding Dioxides and Erythrites," Zhur. Obshch. Khim., 9, No. 4, 1939. Laboratory of Organic Synthesis, Institute of Organic Chemistry, Academy of Sciences USSR, Moscow. Received 23 June 1938.

Report U-1517, 22 Oct 1951

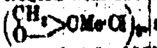
1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

OC

A-3

Acetylene chlorohydrins and their corresponding dioxides and erythritols. N. A. GRISCHKEVICH. (J. Gen. Chem. Russ., 1939, 9, 361—368).—$COMe\cdot CH_2Cl$ and $(C\cdot MgBr)_2$ in Et_2O yield *αζ-dichloro-βε-dimethyl-Δγ-hexine-βε-diol*, which could not be purified by distillation, owing to decomp. The diol treated with KOH yields two stereoisomeric *dioxides*,



$\left({}^{CH_2}_{O}>CMe\cdot C\right)_2$, m.p. 44·5—45°, and b.p. 95—100°/12 mm., 104·5—106°/18 mm., respectively; these dioxides yield α-methylglyceric acid when oxidised ($KMnO_4$ or O_3), and give two isomeric *βε-dimethyl-Δγ-hexine-αβεζ-tetraols*, m.p. 113·5—114° (*tetra-acetate*, b.p. 171°/6 mm.) and 130—131° (*tetra-acetate*, b.p.

with HNO_3 gives a substance, $C_{10}H_9O_6N_2$, m.p. 177—178°. R. T.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

3RD AND 4TH ORDERS

PROCESSES AND PROPERTIES INDEX

BC

a-3

[illegible] [illegible] [illegible] ether. N. A. [illegible] ([illegible] Chem. [illegible], 1948, 18, 114—121).—The [illegible] condensation of COMe·CH$_2$Cl with C$_2$H$_2$ in presence of KOH gives COMe·CH$_2$·O·CH:CHCl instead of the expected acetylenic alcohol. A mechanism involving CHCl:CH·OK is [illegible].

The reaction [illegible] [illegible] ether, C$_5$H$_7$O$_2$Cl, b.p. [illegible] [illegible] [semicarbazone, m.p. 213—215° [illegible]]; the structure follows from oxidation by O$_3$ and KMnO$_4$ to HCO$_2$H and H$_2$C$_2$O$_4$ and hydrolysis by 1% H$_2$SO$_4$ to COMe·CH$_2$Cl and COMe·CH$_2$·OH. E. A. H.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

MATERIALS INDEX

AUTHOR INDEX

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

BC

A

Isomerisation reactions of acetylenic (ethylene) oxides and diols. N. A. [illegible] (*J. Gen. Chem. Russ.*, 1948, **18**, 1327—1340).—Acetylenic [illegible] oxides undergo the expected isomerisation to the aldehydes on treatment with $ZnCl_2$ or H_2SO_4. Thus $\mathrm{CH{\vdots}C{\cdot}CMe}{<}\genfrac{}{}{0pt}{}{\mathrm{CH_2}}{\mathrm{O}}$ affords CH⋮C·CHMe·CHO and a dimer, probably CHO·CHMe·C⋮C·[illegible]·CHO.

α-*Chloro-β-methyl*[illegible]*-β-ol*, C_6H_9OCl (I), b.p. 60—60·5°/10 mm., [illegible] from CH₂Cl·COMe and (⋮C·MgBr)₂, is converted [illegible] into the *acetate*, b.p. 71·5—72°/10 mm., d^{20} 1·083, n^{20} 1·44[illegible], and thence (KOAc) into *β-methylbut-γ-yne-αβ-diol diacetate*, b.p. 93°/10 mm., d^{20} 1·0168, n^{20} 1·433. (I) is hydrated (cf. A., 1932, I, 1106) to *α-chloro-β-methylbutan-γ-on-β-ol*, $C_5H_9O_2Cl$, b.p. 80°/26 mm., d^{20} 1·002, n^{20} 1·4490 (*semicarbazone*, m.p. 148°). With KOH–Et₂O (1—2 hr.) (I) affords 68% of *α-methyl-α-ethynylethylene oxide*, C_5H_6O, b.p. 91—91·5°/760 mm., d^{20} 0·9[illegible], n^{20} 1·4305, which is converted by boiling aq. 50% $ZnCl_2$ (3 hr.) into *α-formyl-γ-methylbut-α-yne*, b.p. 60—66°/360 mm., d^{20} 1·0075 (*semicarbazone*, m.p. 101—102°), and a *dimer*, b.p. 100—118°/760 mm., 79—80°/44—45 mm., n^{20} 1·420. 1 : 6-*Dichloro-2 : 5-dimethylhex-3-yne-2 : 5-diol*, b.p. 148—150°/7 mm., d^{20} 1·1678, n^{20} 1·5046, the main product in the prep. of (I), affords two *dioxides*, m.p. 44° and b.p. 67—69°/9—10 mm., d^{20} 1·0032, n^{20} 1·4666, which are hydrated to the erythritols (cf. A., 1939, II, 356). The latter, on treatment with 30% H_2SO_4 give the *dialdehyde*, (?) (⋮C·CHMe·CHO)₂, b.p. 78—80°/18—20 mm., d^{20} 1·0241, n^{20} 1·4298 (*phenylhydrazone*, m.p. 124—125°), which with Ag_2O and H_2–Pt–C gives (?) αα′-dimethyladipic acid. F. A. B.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

[illegible]

"[illegible] ethers. Part I." by [illegible] [illegible], and [illegible]

SO: Journal of General Chemistry (Zhurnal Obshchei Khimii), [illegible], Volume [illegible], No. 6

GERSHTEYN, N. A.

USSR/Chemistry - Acetals
Chemistry - Synthesis

Jul/Aug 48

"Synthesis of Unsaturated Acetals," M. F. Shostakovskiy, N. A. Gershteyn, Inst Org Chem, Acad Sci USSR, 4 pp

"Iz Ak Nauk SSSR, Otdel Khim Nauk" No 4

Describes first synthesis of a series of unsaturated acetals. Lists properties of compounds prepared, which are determined by the presence of a conjugate system of double and triple bonds in the molecult. Submitted 16 Apr 1948.

PA 8/49T21

PROCESSES AND PROPERTIES INDEX

C/1

10

Synthesis of unsaturated acetals. IV. M. F. Shostakovskii and N. A. Gershtein. *Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* (Bull. acad. sci. U.R.S.S., Classe sci. chim.) 1949, 453-6; cf. C.A. 41, 1998.—Freshly distd. CH_2:CHC:CC(OH)Me_2, b_8 37.5-8°, n_D^{20} 1.4783, (140 g.) at −9.5° treated with 77 g. CH_2:CHOMe, precooled to −14°, then at −14° with stirring with 0.1 g. 33% HCl, the temp. maintained below 13.5° until the reaction subsided, and the mixt. let stand overnight, neutralized with K_2CO_3, and distd. in a N atm. in the presence of a stabilizer (unstated) gave 198 g. (88.8%) *CH_2:CHC:CCMe$_2$OCHMeOMe*, $b_{2.5}$ 43-3.5°, d_0^{20} 0.8940, d_4^{20} 0.8824, n_D^{20} 1.4530; hydrolysis by 2% H_2SO_4 readily gave AcH (95-6%). Similarly, 229.5 g. CH_2:CHC:CC(OH)Me_2 and 149.9 g. CH_2:CHOEt (mixed at 24.5°) gave 90.6% *CH_2:CHC:CCMe$_2$OCHMeOEt*, $b_{14.5}$ 102.2-3.5°, b_5 51.2-1.5°, d_0^{20} 0.8880, d_4^{20} 0.8865, n_D^{20} 1.45195; in this case the max. reaction temp. was allowed to reach 66°. Similarly iso-BuOCH:CH_2 gave 81.34% *CH_2:CHC:CCMe$_2$OCHMeOBu-iso*, b_{4} 78.6-9.2°, b_2 59.6-60°, d_0^{20} 0.8692, d_4^{20} 0.8678, n_D^{20} 1.4475; in this instance the original mixt. was allowed to attain a max. temp. of 42°. The mol. refractions of these acetals show an exaltation equal to that introduced by a double bond.

G. M. Kosolapoff

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

GERSHTEYN, N. A.

PA 59T13

USSR/Chemistry - Acetyls
Chemistry - Synthesis

Mar 1948

"Conversions of Simple Vinyl Esters. II. Mechanism of the Interaction of Vinyl-Alkyl Esters and Alcohols in the Synthesis of Acetals. The Significance of the Hydrogen Bond in Reactions Forming New Compounds," N. A. Gershteyn, M. F. Shostakovskiy, Inst Org Chem, Acad Sci USSR, Lab of Vinyl Compounds, $7\frac{1}{2}$ pp

"Zhur Obshch Khim" Vol XVIII (LXXX), No 3, pp. 451-8.

New method for synthesis of acetyls from vinyl esters and alcohols, without aid of catalysts, but due to influence of heat. Formulas for complex hydrogen bonds which occur due to esterification reaction which occurs during synthesis of acetyls. Submitted 21 Feb 1947. [redacted]

59T13

C/

10

Transformations of vinyl ethers III Reaction of vinyl ethers with organic acids. N. A. Gershtein and M. F. Shostakovskii. *Zhur. Obshchei Khim.* (J. Gen. Chem.) **18**, 1080-90(1948); cf. C.A. **42**, 7213h. Vinyl **ethers react with org. acids even without catalysts at room temp., but such addn. is very slow. The reaction probably proceeds by intermediate formation of CH_2:CHO(...HO-**

COR)R. CH_2:CHOEt treated at -5 to -10° with 1 mol. HCO_2H (the temp. rises to 11°), stirred 2-3 hrs., and let stand overnight gives 92.7% *$HCO_2CH(OEt)Me$*, b. 38.5-40°, d$_4^{20}$ 0.9751, n$_D^{20}$ 1.3871. An equimolar mixt. of CH_2:CHOEt and AcOH (mixed at room temp., warmed to 60° 2-3 hrs., and let stand overnight) gave 90.4% *MeCH-(OEt)OAc*, b 51.2-1.3°, d$_4^{20}$ 0.9402, n$_D^{20}$ 1.3960. Similar procedures gave 90-7% yields of the following *1-butoxyethyl esters* from *CH_2:CHOBu*: *formate*, b 72.2-2.5°, d$_4^{20}$ 0.9252, n$_D^{20}$ 1.4020; *acetate*, b 51.5-1.8°, d$_4^{20}$ 0.911, n$_D^{20}$ 1.4045, *propionate*, b 42.5-3.2°, d$_4^{20}$ 0.9058, n$_D^{20}$ 1.4075, *isobutyrate*, b 52.2-2.5°, d$_4^{20}$ 0.8961, n$_D^{20}$ 1.4080; *isovalerate*, b 66.8-67°, d$_4^{20}$ 0.8871, n$_D^{20}$ 1.4140; the last 2 were prepd. in an autoclave 5-6 hrs. at 150-65°; omission of heating of the CH_2:CHOBu and $EtCO_2H$ mixt. and merely letting it stand 7 months in a sealed tube give 97% of the condensate. CH_2:CHOPh with AcOH 8-10 hrs. at 200-10° in an autoclave gave 49% *MeCH(OPh)OAc*, b 78.5-79°, d$_4^{20}$ 1.075, n$_D^{20}$ 1.4905, and 33% *MeCH(OPh)_2*, b 117.2-17.5°, d$_4^{20}$ 1.087, n$_D^{20}$ 1.5568. Analysis of the products is simply done by hydrolysis with aq. 0.2 N $NaHSO_3$ and titration of the residual bisulfite with iodine.

G. M. Kosolapoff

METALLURGICAL LITERATURE CLASSIFICATION

GERSHTEYN, N. A.

USSR/Chemistry - Vinyl Ethers
Chemistry - Chlorohydrins

Mar/Apr 49

"Interaction of Vinylalkyl Ethers and Halohydrins," M. F. Shostakovskiy, N. A. Gershteyn, A. K. Gorban, Inst of Org Chem, Acad Sci USSR, 8 pp

"Iz Ak Nauk, SSSR, Otdel Khim Nauk" No 2

Studies reaction of vinylethyl and vinylbutyl ethers with ethylene chlorohydrin. Chlorine derivatives of the corresponding acetals were obtained. Submitted 16 Apr 48.

PA 43/49T29

SHOSTAKOVSKIY, M.F.; CHEKULAYEVA, N.A.; GERSHTEYN, N.A.

Synthesis of transformation of vinyl ethers ethanolamines;
effect of vinyl on monoethanolamine. Izv.Akad.nauk.SSSR;
Khim.otd. no.3:328-333 May-June 1951. (CLML 20:9)

1. Institute of Organic Chemistry of the Academy of Sciences USSR.

CA

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Transformations of vinyl ethers. V. Chemical properties of partial acylals of the type $CH_3CH(OR)OCOR'$. M. F. Shostakovskiĭ and N. A. Gershtein. *Zhur. Obshcheĭ Khim.* (J. Gen. Chem.) 21, 1152-60(1951); cf. C.A. 43, 3785i.—To 50 g. boiling $BuOCH:CH_2$ was added dropwise over 1.5 hrs. 23 g. HCO_2H and distn. after standing 24 hrs. gave 0.8 g. AcH, 3 g. *HCO_2Bu*, b. 106.5-7.4°, d_{20}^{20} 0.8995, d_4^{20} 0.8975, n_D^{20} 1.4012, 1.45 g. HCO_2H, 50.4 g. *$MeCH(OBu)O_2CH$*, b_{22} 62-2.5°, d_{20}^{20} 0.9340, d_4^{20} 0.9323, n_D^{20} 1.4020 (product can be distd. only in a N atm. under reduced pressure; with H_2O a rapid hydrolysis occurs), and 0.45 g. $(BuO)_2CHMe$. When the addn. of HO_2CH was more rapid (5 min.), similar results were obtained. A similar reaction with AcOH, but with reverse order of mixing, gave a little AcH, a little BuOAc, and 85% *$MeCH(OBu)OAc$*, b_7 42.5-3.0°, d_{20}^{20} 0.9210, d_4^{20} 0.9193, n_D^{20} 1.4040, and a trace of $(BuO)_2CHMe$. Heating 36 g. $EtOCH:CH_2$ and 44 g. $PrCO_2H$ in sealed tube 15 hrs. to 100° gave 94% *$MeCH(OEt)O_2CPr$*, b_{20} 81-1.5°, $b_{4.5}$ 37.5-8.0°, d_{20}^{20} 0.9237, d_4^{20} 0.9221, n_D^{20} 1.4030; $BuOCH:CH_2$ gave 91% *$MeCH(OBu)O_2CPr$*, b_7 71.5-5.2°, $b_{1.5}$ 59-0.1°, d_{20}^{20} 0.9032, d_4^{20} 0.9016, n_D^{20} 1.4118. Possibly the formation of acetals and esters is the result of decompn. of the acylals to vinyl ethers and vinyl esters, the former reacting with ROH to yield the acetals, the latter with free acids to form ethylidene esters, which are hydrolyzed to the aldehyde and the acids, the latter reacting with ROH to form the esters. G. M. K.

1951

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CA

Transformations of vinyl ethers. V. Chemical properties of partial acylals of the type MeCH(OR)OCOR. M. F. Shostakovskii and N. A. Gershtein. *J. Gen. Chem. U.S.S.R.* 21, 1581-7(1951)(Engl. translation). See C.A. 46, 3001a. B. R.

GERSHTEYN, N. A.

191T38

USSR/Chemistry - Vinyl Compounds Sep 51

"Conversions of Simple Vinyl Ethers. VI. Chemical Properties of Incomplete Acylals of the Type $CH_3CH\begin{smallmatrix}OR\\OCOR_1\end{smallmatrix}$," M. F. Shostakovskiy, N. A. Gershteyn, Lab Vinyl Compds, Inst Org Chem, Acad Sci USSR

"Zhur Obshch Khim" Vol XXI, No 9, pp 1602-1610

Investigation of interaction of incomplete acylals ($CH_3CH\begin{smallmatrix}OR\\OCOR_1\end{smallmatrix}$) with alcs ROH showed that products are esters (R_1COOR) and acetals ($CH_3CH(OR)_2$). Interaction of incomplete acylals

191T38

USSR/Chemistry - Vinyl Compounds (Contd) Sep 51

with org acids R_1COOH yielded esters and complete acylals ($CH_3CH(OCOR_1)_2$), which were hydrolyzed under specified conditions. Proposes reaction mechanisms.

191T38

GERSHTEYN, N. A.

Chem Abs. V48
1-25-54
Organic Chemistry

β-Aminoethyl isopropyl acetal. M. F. Shostakovskii, I. A. Chekulaeva, and N. A. Gershtein. Izvest. Akad. Nauk S.S.S.R., Inst. Org. Khim., Sintezy Org. Soedinenii, Sbornik 2, 15-17(1952); cf. C.A. 43, 6159e.—Into a pre-cooled autoclave was charged 16.4 g. $MeCH(OCHMe_2)OCH_2CH_2Cl$ and 50 ml. liq. NH_3; the mixt. was heated 6 hrs. at 140-50° (110 atm. max. pressure) and filtered after cooling, release of NH_3 pressure and washing the app. with Et_2O. Distn. gave 47% $MeCH(OCHMe_2)OCH_2CH_2NH_2$, b_{14} 71-6°, b_{20} 75-6°, d_{20} 0.9123, n_D^{20} 1.4240. Similarly from $MeCH(OCH_2CHMe_2)OCH_2CH_2Cl$ were obtained: $MeCH(OCH_2CHMe_2)OCH_2CH_2NH_2$, b_8 83-4°, d_{20} 0.9000, n_D^{20} 1.4246; $[MeCH(OCH_2CHMe_2)OCH_2CH_2]_2NH$, b_{12} 100-5°, d_{20} 0.9210, n_D^{20} 1.4320; and $[MeCH(OCH_2CHMe_2)OCH_2CH_2]_3N$, b_4 210-20°, d_{20} 0.9322, n_D^{20} 1.4350. Among the by-products in prepn. of the iso-Pr deriv. there were found: $[MeCH(OCHMe_2)OCH_2CH_2]_2NH$, b_4 147-53°, d_{20} 0.9321, n_D^{20} 1.4300, and $[MeCH(OCHMe_2)OCH_2CH_2]_3N$, b_4 185-95°, d_{20} 0.9307, n_D^{20} 1.4410, in 29% and 8.5% yields, resp. Heating for 10 hrs. or longer increases the yield of the mono-NH_2 deriv. to over 45%, while lowering the proportion of NH_3 to 4 moles to 1 mole of chloro deriv. raises the yield of the secondary amine to 40%. G. M. Kosolapoff

Chem Abs V 48

1-25-54

Organic Chemistry

✓ α-Butoxyethyl [illegible]

Shostakovskii, [illegible]

Sintez Org. Soedinenii [illegible] 2, [illegible] (1952); cf. C.A. 45, 3785i. Heating [illegible] and Bu-OCH:CH$_2$ 5-6 hrs. at [illegible] MeC[illegible] O$_2$CCHMe, b$_{10}$ 52-5[illegible], n_D^{20} 1.4[illegible] distn. is done in dry N atm. [illegible] 59.1% MeC[illegible] (OBu)$_2$CCH:CHM[illegible] [illegible] 1.4[illegible]; 49.4% MeC[illegible] [illegible] 1.4[illegible], d_{20} 1.075; by-product [illegible] MeC[illegible] (OPh)$_2$, b$_{\text{}}$ 117.2 [illegible] G. M. K.

Chem Abs V48
1-25-54
Organic Chemistry

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5 Chem

α-Butoxyethyl methacrylate. [illegible] Shostakovskiĭ, N. A. Gershtein [illegible] (Inst. Org. Chem. Acad. Nauk S.S.S.R.) [illegible] Sintez Org. Soedinenii, Sbornik 2, 92 [illegible] Heating 25 g. $BuOCH:CH_2$ and [illegible] $CH_2:CMeCO_2H$ in sealed tube [illegible] in N atm [illegible] bp [illegible] O_2CMe [illegible] 1.4347.

[illegible] 54

ГЕРШТЕЙН, Н. А.

Chem Abs v 48
1-25-54
Organic Chemistry

[illegible] acetate. M. F. [illegible], N. A. Gershtein, V. V. [illegible] and [illegible] P. Shishkov. Akad. Nauk S.S.S.R. [illegible], Sintezy Org. Soedinenii, Sbornik 2, [illegible] 1950; cf. C.A. 43, 3785e.—Three [illegible] $BuOCH:CH_2$ was added [illegible] room temp. [illegible] AcOH, after which the [illegible] and allowed to stand over-night [illegible] (I). [illegible] was added dropwise 20 g. [illegible], after which the mixt. was [illegible] allowed to stand overnight, distn. [illegible] which was washed 3 [illegible] and dried; distn. gave 85% I. [illegible] AcOH [illegible] and [illegible] BuOH 0.21 g. [illegible] soln. was kept in [illegible] Distn. [illegible] acetate. Pure I, [illegible] 1.4049. Similarly [illegible] from EtOCHBrMe and [illegible] from $AcOCH:CH_2$ and EtOH [illegible] 0.9112 [illegible] from $AcOCH:CH_2$ and [illegible] and [illegible]-AmOH with [illegible] G. M. Kosolapoff

(5) Chem.

4-23-54

GERSHTEYN, N.

Chem 4

Chem Abs V47
1-25-54
Organic Chemistry

Vinyl 2-aminoethyl ether. M. F. Shostakovskii, I. A. Chekulaeva, and N. A. Gershtein. *Akad. Nauk S.S.S.R., Inst. Org. Khim., Sintezy Org. Soedinenii, Sbornik* 2, 33-4 (1952); cf. C.A. 38, 330⁵.—To 72 g. $HOCH_2CH_2NH_2$ was slowly added 2.8 g. K and the product in 150 ml. C_6H_6 was placed into an autoclave; C_2H_2 was added to 14-16 atm. and the mixt. was heated to 120-40° 4-6 hrs.; after cooling to 20-30° the C_2H_2 pressure was again restored and heating repeated until the calcd. amt. is consumed. Distn. gave 85% $H_2NCH_2CH_2OCH:CH_2$ crude, b. 110-20°, which was treated with Na in the cold and redistd. yielding the *pure product*, 57 g., b_{758} 115-16°, n_D^{20} 1.4390, d_{20} 1.9018 (sic). The autoclave must not have any Cu parts in order that explosions be averted.

G. M. Kosolapoff

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4-20-54

GERSHTEYN, N. A.

Chem Abs
v. 48 25 Jan 54

Organic Chem

Vinyl benzyl ether. M. F. Shostakovskiĭ and N. A. Gershtein. *Akad. Nauk S.S.S.R., Inst. Org. Khim., Sintezy Org. Soedinenii, Sbornik* 2, 35-6(1952); cf. C.A. 38, 330°.—Heating 80 g. PhCH$_2$OH and 6.4 g. powd. KOH in autoclave under initial C$_2$H$_2$ pressure of 15-18 atm., to 140-50° 1 hr., followed by cooling, and renewing the C$_2$H$_2$ pressure repeatedly until absorption ceased, gave after diln. of the product with Et$_2$O, washing the soln. with H$_2$O and distn. 68% *PhCH$_2$OCH:CH$_2$*, b$_{13}$ 81.5°, b$_4$ 47.2-7.5°, d$_{20}$ 0.9711, n^{20}_D 1.5185. Similarly can be obtained 68-70% *vinyl cyclohexyl ether*, b$_{12}$ 52-4°, b$_{17}$ 63°, b$_{754}$ 148.5-8.7°, d$_{20}$ 0.888, n^{20}_D 1.4547. The autoclave must not have any Cu parts, or Ag parts. G. M. Kosolapoff

7-29-54

Chem Abs V48
1-25-54
Organic Chemistry

~~Ethyl butyl acetal.~~ M. F. Shostakovskii and M. A. [illegible] Akad. Nauk S.S.S.R., Inst. Org. Khim., Sintezy Org. Soedinenii, Sbornik 2, 154-61(1952); cf. C.A. 41, 1009c; 41, 3786i.—To 100 g. BuOCH:CH_2 is added with stirring 46 g. abs. EtOH containing 1 drop concd. HCl (temp. rises to 90°) and the mixt. is stirred until the temp. drops to room level. After allowing the mixt. to stand overnight, it is neutralized with K_2CO_3 and distd. yielding 16% MeCH$(OEt)_2$, b. 103-4°, 45% MeCH(OEt)OBu, b. 148-9°, and 20% MeCH$(OBu)_2$, b.183.5-5.0°. In another procedure 300 g. BuOCH:CH_2 and 92 g. abs. EtOH are heated in a rotating autoclave 8-10 hrs. at 100-20°; distn. yields 24% MeCH$(OEt)_2$, 45.7% MeCH(OEt)OBu and 19.2% MeCH$(OBu)_2$, along with BuOH and AcH. Pure *MeCH(OBu)OEt*, b_{760} 148-9°, d_{20} 0.8312, n^{20}_D 1.3991. The following acetals can be readily prepd. by this procedure and the following cases are listed (% yield, acetal, b.p., d_{20}, and n^{20}_D given): 92.8, MeCH$(OEt)_2$, 103-4°, 0.8254, 1.3820; 68.7, *MeCH$(OCHMe_2)_2$*, 125-8°, 0.8142, 1.3882; 81-5, *MeCH$(OBu)_2$*, 184-6°, 0.8267, 1.4090; 60, *MeCH(OMe)OEt*, 84.5-5.5°, 0.8204, 1.3765; 68.2, *MeCH(OEt)OCHMe$_2$*, 116-18°, 0.8144, 1.380; 65.6, *MeCH(OEt)OCH$_2$CHMe$_2$*, 155-8°, 0.8216, 1.3810; 50, *MeCH(OBu)OMe*, 130-1.5°, 0.8370, 1.3890; 57.3, *MeCH(OBu)OPr*, 160-5°, 0.8292, 1.4038; 74.5, *MeCH(OBu)OCHMe$_2$*, 156-6.5°, 0.8233, 1.3998; 91.2, *MeCH(OBu)OCH$_2$CHMe$_2$*, b_{20} 74-6°, 0.8235, 1.4002; 60.9, *MeCH(OBu)OCMe$_3$*, b_{20} 64-5°, 0.8250, 1.4068; 44.5, *MeCH(OBu)OCH$_2$CH$_2$CHMe$_2$*, b_{10} 135-8°, 0.8313, 1.4120; 35.5, *MeCH(OBu)OC$_7$H$_{15}$*, b_{20} 130-30.5°, 0.8397, 1.4210; 43.5, *MeCH(OBu)OC$_8$H$_{17}$*, b_{20} 158-60°, 0.8364, 1.4235; 44, *MeCH(OBu)OC$_8$H$_{16}$*, b_{20} 162-4°, 0.8288, 1.4260; 37, *MeCH(OBu)OC$_6$H$_{11}$*, b_{10} 123-5°, 0.8957, 1.4415; 81.6, *MeCH(OBu)OPh*, b_3 107-7.5°, 0.9588, 1.4830; 90.3, *MeCH(OBu)OC$_{10}$H$_7$-2*, b_3 163-5°, b_{10} 187-7.5°, 1.0643, 1.5548; 83.5, *MeCH(OBu)OCH$_2$CH:CH$_2$*, b. 162-5°, 0.8456, 1.4140; 89.3, *MeCH(OBu)OCMe$_2$C:CH*, 181-2°, 0.8579, 1.4190; 88.8, *MeCH(OMe)OCMe$_2$C:CCH:CH$_2$*, $b_{1.5}$ 43-5°, b_3 30.7-7.2°, 0.8934, 1.4530; 90.6, *MeCH(OEt)OCMe$_2$C:CCH:CH$_2$*, b_3 51.2-1.5°, 0.8855, 1.4520; 73, *MeCH(OBu)OCMe$_2$C:CCH:CH$_2$*, b_{10} 103-5.5°, 0.8727, 1.444; 80.3, *MeCH(OCH$_2$CHMe$_2$)OCMe$_2$C:CCH:CH$_2$*, $b_{1.5}$ 78.6-9.2°, 0.8678, 1.4475; 86, *MeCH(OBu)OC$_{10}$H$_{17}$*, b_{20} 146-58°, 0.8670, 1.4498. G. M. K.

1/8/54
B

Chem abs V47
11-25-54
Organic Chemistry

✓ **Ethyl 2-chloroethyl acetal.** M. F. Shostakovskii and N. A. Gershtein. ✓ Akad. Nauk S.S.S.R., ✓ Inst. Org. ✓ Khim., *Sintezy Org. Soedinenii, Sbornik* 2, 168-70(1952); cf. C.A. 43, 6150c.—To 101 g. $HOCH_2CH_2Cl$ was added in 3 hrs. 144 g. $EtOCH{:}CH_2$ (temp. rises to 30°); after 10-12 hrs. the mixt. was distd. in N yielding 40.5% $MeCH(OEt)OCH_2CH_2Cl$, b_{16} 71.8-2.0°, b_1 23.2-3.8°, d_{20} 1.0191, n_D^{20} 1.4216. $MeCH(OEt)_2$ and $MeCH(OCH_2CH_2Cl)_2$, b_{13} 122-2.5°, are the by-products also formed. Similarly are prepd.: 60.8% $MeCH(OBu)OCH_2CH_2Cl$, b_3 70-1°, b_2 55-6°, d_{20} 0.9838, n_D^{20} 1.4280, along with 12.7% $MeCH(OCH_2CH_2Cl)_2$.

G. M. Kosolapoff

4-20-54

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Chem Abs V48
1-25-54
Organic Chemistry

α-Ethoxyethyl formate. N. A. Gershtein and M. F. Shostakovskii. Akad. Nauk S.S.S.R., *Inst. Org. Khim. Org. Soedinenii, Sbornik* 2, 179-80(1952); cf. *C.A.* 43, 3785i; Voronkov, *C.A.* 43, 6576d.—To 72 g. $EtOCH:CH_2$ was added with stirring at cooling below −5° (max. temp. must be under 11° at the end of addn.) 46 g. HCO_2H (b. 100-1°). After stirring 2-3 hrs. the mixt. was left overnight, when distn. *in vacuo* under N gave 92% *MeCH(OEt)O₂CH*, b_{14} 38-9°, d_{20} 0.9751, n_D^{20} 1.3874. Similarly is prepd. 85.7% *MeCH(OBu)O₂CH*, b_{22} 72.2-2.5°, d_{20} 0.9273, n_D^{20} 1.4020. G. M. Kosolapoff

SHOSTAKOVSKIY, M.F.; CHEKULAYEVA, I.A.; GERSHTEYN, N.A.

Synthesis and transformations of vinyl ethers of ethanolamines. II. Synthesis of amino acetals. Bull. Acad. Sci. U.S.S.R., Div. Chem. Sci. '52., 185-92 [Engl. translation].
(CA 47 no.19:9911 '53)

Chemical Abst.
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May 10, 1954
Organic Chemistry

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Chem

Synthesis and properties of 1-alkoxyethyl esters of unsaturated carboxylic acids (acylals). —M. F. Shostakovskii, N. A. Gershtein, Kh. L. Raskin, and L. B. Ostroumova. *Bull. Acad. Sci. U.S.S.R., Div. Chem. Sci.* 1952, 453-8 (Engl. translation).—See *C.A.* 47, 4850a. H. L. H.

SHOSTAKOVSKIY, M.F.; GERSHTEYN, N.A.; VOLKOVA, Z.S.

Synthesis of acetals of ethylene glycol. Izvest. Akad. Nauk S.S.S.R., Otdel.
(MLRA 5:9)
Khim. Nauk '52, 671-81.
(CA 47 no.20:10472 '53)

"Investigation of [illegible]. VII. Transformation of acetals of [illegible] [illegible] aldehyde, and [illegible]. [illegible] Khim. 23, 110-7; cf. C.A. 47, 8004. — HOCH$_2$CH$_2$OCH:CH$_2$ (I) (30 g.) with [illegible] (28 g.) contg. 1 drop 30% HCl gave a rapidly exothermic reaction after the addn. of the 1st few drops, and after standing overnight yielded 80% *MeCH(OCH$_2$)* (II), b$_{10}$ 82.0-2.2°, n_D^{20} 1.3981, d_{20} 0.9812, readily hydrolyzed by 3% H$_2$SO$_4$. Heating 34 g. MeCH(OEt)OCH$_2$CH$_2$OH, b$_4$ 50.2°, n_D^{20} 1.4230, d_{20} 0.9718 with 10 g. IA in an autoclave 10.5 hrs. at 200-20° gave 21.1 g. unchanged II and EtOH sepd. after treatment with Na. Heating [illegible] g. IA and 70 g. HOCH$_2$CH$_2$OCH:CH$_2$ in an autoclave 12 hrs. at [illegible] gave 70% III, MeCH(OEt)OCH$_2$CH$_2$ [illegible] g. [illegible] g. IA with 0.025 g. [illegible] HCl gave 67% II. Heating [illegible] g. [illegible] H$_2$O in an autoclave 4 hrs. at [illegible] gave 27.5 g. II, [illegible] and CH$_2$:CHOCH$_2$ [illegible]. Heating 47 g. MeCH(OCH$_2$CH$_2$Cl)$_2$ with 30 g. [illegible] 80 ml. H$_2$O 4.25 hrs. at 140-147° and [illegible] hrs. at [illegible] in autoclave gave much gas (88% [illegible] 0.4% unsatd. [illegible] 0.8% CO, 34% H$_2$) and 250 g. liquid products, which gave [illegible] g. IA and small amt. Under milder conditions the results were the same, and MeCH(OCH$_2$CH$_2$OH)$_2$ could not be obtained. To 17 g. O(CH$_2$CH$_2$OH)$_2$, III was added [illegible] HCl then 23 g. I and the mixt. allowed to stand [illegible] days after the exothermic reaction yielding 91.2% [illegible] III and 19.5 g. II, as well as [illegible] g. viscous product [illegible] on attempted distn. Similarly, 10.4 g. III and 18 g. EtOCH$_2$CH$_2$ [illegible] gave 7.8 g. EtOH, and 1.8 g. MeCH(OEt)$_2$; attempts to distil the residue failed, but a residue after removal of Et$_2$O extn. gave a viscous liquid, d_{20} 1.1087, n_D^{20} [illegible] provisionally assigned the structure *MeCH[OCH$_2$CH$_2$OCH$_2$CH$_2$OCH(Me)OCH$_2$CH$_2$OCH$_2$CH$_2$OH]$_2$*. (CH$_2$OCH:CH$_2$)$_2$ (28 g.) treated in 45 min. with 15.6 IA contg. a little HCl and the mixt. stirred 1.5 hrs. and let stand overnight, gave 87.7% II. G. M. Kosolapoff

[illegible]

Transformation of alkyl ethers. Chemical properties of [illegible] acetals. [illegible] and N. [illegible] ([illegible] Inst. Org. Chem. Acad. Sci. U.S.S.R., Moscow). [illegible] Khim. Nauk 1958 [illegible] 45 [illegible] 57 g. KOH in [illegible] EtOH [illegible] 77 g. MeCH- [illegible] and [illegible] at 40° and [illegible] CH_2CH_2OEt [illegible] d_{20} 0.8818, n_D^{20} [illegible] 48 g. KOH [illegible] EtOH, and 47 g. [illegible] CH_2Cl [illegible] gave 10 g. [illegible] n_D^{20} 1.4181, [illegible] Hydrolysis of the products readily gave AcH, [illegible] method.

[illegible] M. Kosolapoff

Transformation of vinyl ethers. Synthesis of halo acetals on the basis of vinyl ethers. M. F. Shostakovskii and N. A. Gershtein (Inst. Org. Chem., Acad. Sci. U.S.S.R., Moscow). Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk 1953, 1043-7; cf. C.A. [illegible] 8150i.—Mixing alkyl vinyl ethers with $HOCH_2CH_2Cl$ [illegible] gave the following acetals, $MeCH(OR)OCH_2CH_2Cl$, which were analyzed by hydrolysis with dil. H_2SO_4 (R, % yield, b.p./mm., d_{20}, and n_D^{20} given): Me, 41, 53.2-3°/40, 1.0541, 1.4231; Pr, 64.8, 65-7°/20, 0.99[illegible], 1.4233; Me_2CH, 64.8, 42.5-4°/3, 0.9848, 1.4226; iso-Bu, 77.6, 48.0°/7, 0.9796, 1.4844; iso-Am, 63.2, 60-3°/1.5, 0.9573, 1.4312. Low yields (8-15%) of the corresponding sym. acetals were also formed in the reaction, as expected. The sym. products were $MeCH(OCH_2CH_2Cl)_2$, b_{10} 105.5-6.0°, d_{20} 1.1703, n_D^{20} 1.4500; and $MeCH(OCHMe_2)_2$, b_{760} 125.5-7.5°, d_{20} 0.8183, n_D^{20} 1.3900.

G. M. Kosolapoff

USSR/Chemistry - Organic chemistry

Card 1/1 Pub. 22 - 25/45

Authors : Shostakovskiy, M. F.; Gershteyn, N. A.; and Neterman, V. A.

Title : Reaction of benzoyl peroxide with vinyl ethers

Periodical : Dok. AN SSSR 103/2, 265-268, Jul 11, 1955

Abstract : Investigation was conducted to determine the reaction between benzoyl peroxide and vinyl ether and to establish the characteristics of the liquid phase and the composition of the gaseous phase. It was found that vinyl ethers react well with benzoyl peroxide forming acylali addition products. The reaction products obtained during low peroxide concentration were found to be low molecular vinyl ether polymers similar to telomers. Twelve references: 8 USSR, 3 USA and 1 German (1925-1954). Tables; graph.

Institution : Acad. of Sc., USSR, Inst. of Orga. Chem. im. N. D. Zelinskiy

Presented by : Academician B. A. Kazanskiy, February 16, 1955

SHOSTAKOVSKIY, M.F.; GERSHTEYN, N.A.; NETERMAN, V.A.

Exchange reactions of acetaldehydedibutyl acetal. Izv.AN SSSR.Otd. khim.nauk no.3:378-381 Mr '56. (MLRA 9:8)

1. Institut organicheskoy khimii imeni N.D. Zelinskogo Akademii nauk SSSR.

(Acetaldehyde)

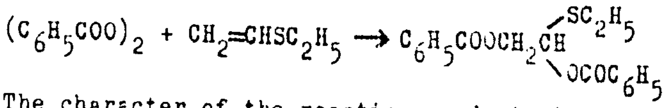
5(3)

AUTHORS: Shostakovskiy, M. F., Prilezhayeva, Ye. N., SOV/62-59-5-22/40
Gershteyn, N. A., Karavayeva, V. M.

TITLE: The Synthesis of Sulfurous Substances on the Basis of Vinyl Ethers and Acetylene (Sintez sernistykh veshchestv na osnove vinilovykh efirov i atsetilena). Report 22. On the Reaction of Vinyl-ethyl Sulfide With Benzoyl Peroxide (Soobshcheniye 22. O reaktsii viniletilsul'fida s perekis'yu benzoila)

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 5, pp 904-909 (USSR)

ABSTRACT: The reaction mentioned in the subtitle is investigated. It develops strictly exothermically and begins without previous heating, the reaction product being formed practically completely from the initial product: The corresponding thioacylal (1-ethylmercapto-1.2 dibenzoate ethane)



$$(C_6H_5COO)_2 + CH_2{=}CHSC_2H_5 \rightarrow C_6H_5COOCH_2CH\begin{matrix}\diagup SC_2H_5\\ \diagdown OCOC_6H_5\end{matrix}$$

Card 1/2 The character of the reaction products is shown by table 1.

The Synthesis of Sulfurous Substances on the Basis of Vinyl Ethers and Acetylene. Report 22. On the Reaction of Vinyl-ethyl Sulfide With Benzoyl Peroxide

SOV/62-59-5-22/40

The reaction is so rapid that no polymerization of the vinyl-ethyl sulfide cannot take place. The benzoyl peroxide can therefore not be used as initiator for this polymerization. The simple radical may, however, lead to a slow low polymerization of the vinyl sulfide (system of equations 2 - 7) which develops in form of a chain reaction. Furthermore, it was possible to carry out polymerization with ditertiary butyl peroxide also with formation of low-molecular polymers. It was, however, not possible to obtain affiliation products. In the experimental the individual syntheses and reactions are described. There are 2 tables and 14 references, 7 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: July 30, 1957

Card 2/2

GERSHTEYN, N.A.

Chromatographic analysis of the products of dehydrogenation and dehydration. Trudy Kom.anal.khim. 13:231-238 '63. (MIRA 16:5)

1. Institut organicheskoy khimii imeni N.D.Zelinskogo AN SSSR.
(Dehydration (Chemistry)) (Dehydrogenation) (Chromatographic analysis)

[illegible], I. [illegible]; [illegible], N.A.; [illegible], [illegible]

Gas-liquid chromatography of aromatic compounds. Part 1: Alkylbenzenes. Izv. SO AN SSSR no.7 Ser. khim. nauk no.2: 111-117 '64 (MIRA 18:1)

1. Novosibirskiy institut organicheskoy khimii Sibirskogo otdeleniya AN SSSR.

KOPTYUG, V.A.; ISAYEV, I.S.; GERSHTEYN, N.A.; BEREZOVSKIY, G.A.

Mechanism of dichlorobenzene isomerization. Zhur. ob. khim. 34 no.11:3779-3783 N '64 (MIRA 18:1)

1. Novosibirskiy institut organicheskoy khimii Sibirskogo otdeleniya AN SSSR.

SOKOLENKO, V.A.; ORLOVA, L.V.; GERSHTEYN, N.A.; YAKOBSON, G.G.

Kinetics of the reaction of hexafluorobenzene with sodium methylate.
Kin. i kat. 6 no.2:365 Mr-Ap '65. (MIRA 18:7)

1. Novosibirskiy institut organicheskoy khimii Sibirskogo otdeleniya AN SSSR.

VOL'SKIY, L.N.; DUBOVENKO, Zh.V.; GERSHTEYN, N.A.; PENTEGOVA, V.A.

Study of the composition of essential oils of some coniferous species of Siberia by gas-liquid chromatography. Khim. prirod. soed. no.6:382-384 '65. (MIRA 19:1)

1. Novosibirskiy institut organicheskoy khimii Sibirskogo otdeleniya AN SSSR. Submitted July 8, 1964.

[illegible], ...

"Treatment of Hymenolepidsis by a Combined Method" Sov. Med., No. 4, 1949. Moscow

GERSHTEYN, R.A.

Coloscopy in the diagnosis of cancer and precancerous states of the cervix uteri. Sov. zdrav. Kir. no.6:17-19 N-D'62.
(MIRA 16:6)

1. Iz Kirgizskogo nauchno-issledovatel'skogo instituta onkologii i radiologii (dir. - prof. A.I.Sayenko).
(COLPOSCOPY) (UTERUS—CANCER)

SYTNIK, Z.P.; DEYCHMEYSTER, M.V.; GERSHTEYN, R.A.; ZHILINA, L.D.

Study in the series of merocyanines, derivatives of azolones. Part 10: Color of the quaternary salts of dimethinemerocyanines. Zhur. ob. khim. 35 no.4:641 Ap '65.

(MIRA 18:5)

L 23322-66 EWP(k)/EWT(d)/EWT(m)/EWP(h)/EWA(m)-6/T/EWP(1)/EWP(v)/EWP(t)/ETI

ACC NR: AP5023387 (A) IJP(c) DJ/JD SOURCE CODE: UR/0317/65/000/005/0062/0066

AUTHOR: Vovk, F. (Major general of engineering-technical service); Gayenko, A. (Engineer, Lieutenant Colonel); Gutman, M. (Engineer, Lieutenant Colonel); Gershteyn, S. (Engineer, Lieutenant Colonel)

50

45

B

ORG: None

TITLE: Prolongation of machine life 14

SOURCE: Tekhnika i vooruzheniye, no. 5, 1965, 62-66

TOPIC TAGS: ordnance engineering, military tank, internal combustion engine

ABSTRACT: The present paper, consisting of three separate articles, deals with the operation, maintenance and repair of armored tanks, engines and auxiliary equipment. The authors of the first article, F. Vovk and A. Gayenko, do not recommend overhauling new engines of the B-2 type until a general overhauling of the entire tank is required. However, meticulous checking of engine parts between general overhauls is strongly recommended. In connection with this subject, an example of the monthly discussions at the Ul'yanov Guard Armored Tank School was mentioned. Reducing-gear bearings of heavy tanks are to be checked after a run of 200 to 300 km. The level of liquid in the engine cooling system must be checked every 2 or 3 hours. A regular replacement of track

2

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L 28382-66

ACC NR: AP5023387

4

chain pins can increase the run distance by 600 to 800 km. The caterpillars service life can be twice as long if they are kept well adjusted and maintained. A set of gages for caterpillars was proposed by Officer Lopatin. This set was shown in a figure, as well as a device for changing pins. In conclusion, further development of special commissions for inspection of tanks was strongly recommended. The second article, by M. Gutman, deals with the repair of engines and their parts at an automobile-repair plant. Mechanical cleaning of oil pipes and channels, use of diamond drills for honing, careful cleaning of parts (including ultrasonic method) and other improvements were recommended. Filters, oil radiators and fuel equipment were cleaned by using the UZG-10M device. Mass production methods were introduced for cleaning and polishing operations. A special automatic device was invented for honing operations of YaAZ engines. The advantages of diamond honing were stressed. The machining of crankshafts was organized in cooperation with the Khar'kov Automobile-Road Institute. Following the experience of the Khar'kov and Yaroslavl' engine plants, the tightening of bolts were checked by dynamometric wrenches. A table was presented showing the wrench types and tightening forces to be applied to different engine parts. The third article, by S. Gershteyn, contains some critical observations on various suggestions such as: keeping the heating system connected in summer or muffling the engine if the temperature of cooling liquid is 80 C. Ex-

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L 28382-66

ACC NR: AP5023387

cessive inspection and duplication in control checking was also criticized. The successful maintenance and repair practice of Omsk Armored Tank Technical School was mentioned. Orig. art. has: 2 figures and 1 table.

SUB CODE: 19 / SUBM DATE: None / ORIG REF: 000 / OTH REF: 000

Card 3/3 vv

GERSHTEYN, S. M.

36652. Shlakobetonny Ye Plity v Mezhduetazhnykh Perekrytiyakh. Materialy Po Kommunal. Khozyu, 1949, Sb. 4, c. 16-21.

SO: Letopis' Zhurnal'nykh Statey, Vol. 44, Moskva, 1949

"A test in plastering the facades under winter conditions," Construction Industry, 1952.

VYPOV,A.I.; KAPLAN,M.Ya., redaktor; GERSHTEYN,S.M., kandidat tekhnicheskikh nauk, dotsent, redaktor; PUL'KINA,Ye.A., tekhnicheskiy redaktor

[New level tool designs] Novye konstruktsii stroitel'nykh urovnei. Leningrad, Gos.izd-vo lit-ry po stroitel'stvu i arkhitekture, 1955. 51 p. (MLRA 9:1)

(Level (Tool))

GERSHTEYN, S.M.

Semiconductor variant of an integral pulsimeter. Trudy Len. Gidromet. inst, no.15:196-199 '63. (MIRA 17:1)

R/0375/65/000/006/0076/0079

[illegible], Yu. (Doctor of

[illegible]

[illegible]

[illegible] hydrophones are positioned
[illegible] attached to the torpedo is tracked in
[illegible] tracking, numerical
[illegible] of the torpedo.
[illegible]
[illegible] rocket projectile tests,
[illegible] Portable and stationary
[illegible]
[illegible]

SUB CODE: [illegible], 15

Card 2/2

USSR/Nuclear Physics   Meson Field   FD-[illegible]

Card 1/1   Pub. 146-20/28

Author : Gershteyn S. S. and Zeldovich Ya. B.

Title : Meson corrections in the theory of beta-decay (Letter to the editor)

Periodical : Zhur. Eksp. i Teor. Fiz., 29, No 5, 698-699, 1955

Abstract : A criticism of the article by R. J. Finkelstein and S. A. Moszkowski, (Phys. Rev., 95, 1695, 1954) with particular emphasis on that the computation does not take under consideration the normalization of the wave function of the nucleon nor the beta-transition of a meson. Meson corrections are introduced by using the invariant theory of perturbation with a pseudoscalar bond of the π-meson with the nucleon. Eight references, including 6 foreign.

Institution : --

Submitted : June 8, 1955

GERSHTEYN, S. S.

20-6-9/47

AUTHOR: Gershteyn, S. S.

TITLE: The Cross Section of the Passage of a μ-Meson from a Proton to a Deuton (Effektivnoye secheniye "peremanivaniya" μ-mezona ot protona k deytony).

PERIODICAL: Doklady AN SSSR, 1957, Vol. 117, Nr 6, pp. 956-958 (USSR)

ABSTRACT: The dependence observed in the test of the catalysis of the nuclear reaction $p + D = He^3$ by μ-mesons in hydrogen on the concentration of deuterium mainly depends on the process of the "luring away" of a μ- meson from a proton to a deuton. The present paper calculates the cross section of this process. First the Hamiltonian and the wave function of the system $pD\mu$ are explicitly written down. Then the author sets up equations for the coefficients occurring in this wave function. The author also gives an equation for 2 functions which describe the motion of the deuton with regard to the mesohydrogen and of the proton with regard to the mesodeuterium. When it is assumed that the collisions take place at thermal speeds, it is sufficient to take into account the S-wave in the case of a relative motion. Then the equations for the radial function are written down. The system $pD\mu$ has a level with an energy lying very close to zero. Therefore resonance occurs. An expression is given for the cross section of the "luring

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The Cross Section of the Passage of a μ- Meson From a Proton to a Deuton. 20-6-9/47

away"; this cross section approximately amounts to $\sigma = 1,5\pi k_0/k$. Finally reference is made to several earlier works dealing with the same subject. There are 4 references, 2 of which are Slavic.

PRESENTED: August 15, 1957, by L. D. Landau, Academician

SUBMITTED: August 1, 1957

AVAILABLE: Library of Congress

Card 2/2

GERSHTEYN, S. S. Cand Phys-Math Sci -- (diss) "Nuclear reactions [illegible] connected with mu-mesons. ~~in hydrogen.~~" Mos, 1958. 8 -- (Inst of Physical Problems, Acad Sci USSR), 120 copies. Bibliography at end of text (17 titles).

(KL, 13-58, 92)

26-58-4-2/45

AUTHOR: Gershteyn, S.S.

TITLE: The Catalysis of Nuclear Reactions (Kataliz yadernykh reaktsiy)

PERIODICAL: Priroda, 1958, Nr 4, pp 13-20 (USSR)

ABSTRACT: The authors discusses the possibilities of bringing about the synthesis of light nuclei with the help of the catalysis of nuclear reaction and their possible use for peaceful purposes. The first experiments in this direction were conducted in England in 1947. It was found that mesons were capable of effecting muclear reactions among hydrogen isotopes. The problem of mu-mesons calling forth nuclear reactions in liquid hydrogen as well as the possiblity of observing such a nuclear reaction was discussed by Soviet scientists A.D. Sakharov and Ya.B. Zel'dovich in 1954, who theoretically predicted that a catalyzation process would be caused. Such a process was unexpectedly observed by Alvarez at Berkeley (USA) in 1956. Unfortunately the catalyzation method is useless for obtaining nuclear chain reactions. Detailed investigations have shown that mu-mesons are too shortlived to cause more than two or three nuclear reactions, and other mesons with a longer life do not exist. As the catalysis of nuclear reaction with the help of mesons

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The Catalysis of Nuclear Reactions 26-58-4-2/45

cannot produce nuclear power, it is only of interest for studying nuclear reactions under specific circumstances. There are 5 figures and 3 Soviet references.

ASSOCIATION: Institut fizicheskikh problem imeni S.I. Vavilova Akademii nauk SSSR (Moskva) (Institute of Problems in Physics imeni S.I. Vavilov of the USSR Academy of Sciences (Moscow)

AVAILABLE: Library of Congress

Card 2/2 1. Nuclear reactions--Catalysis 2. Nuclei-Synthesis-USSR

56-2-25/51

AUTHOR: Gershteyn, S. S.

TITLE: The Transition Between the Levels of Hyperfine Structure in a Hydrogen μ-Mesonic Atom (Perekhod mezhdu urovnyami sverkhtonkoy struktury v μ-mezoatome vodoroda)

PERIODICAL: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1958, Vol 34, Nr 2, pp 463 - 468 (USSR)

ABSTRACT: The distance between the upper and the lower level of the hyperfine structure for a myon, which is on the K-orbit of a hydrogen mesic atom, is $\Delta\varepsilon = 0{,}25$ eV. Because of the smallness of this distance the radiation transition into the lower state is not very probable. But because of the neutrality of mesic hydrogen a very efficient mechanism exists according to which during the lifeof the myon a complete transition into the lower state of hyperfine structure takes place. Such a mechanism is the possible "flashing over" of the myon of hyperfine structure taking place at the same time. This transition is irreversible. This work gives an estimation of the cross section of this transition. First the Hamiltonian of

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56-2-25/51

The Transition Between the Levels of Hyperfine Structure in a Hydrogen μ-Mesonic Atom

the interaction of the myon with two protons with regard to the interaction between the spins of the myon and of the protons is written down in mesoatomic units. The author here neglects the spin-spin interaction between the protons and also between the myon, which is at a proton, with the other proton. The spin of the system remains constant. The spin of the system which consists of 2 protons and one myon can have the values 3/2 and 1/2. But the transitions into the lower state of the hyperfine structure are possible only in case of the states with the spin 1/2. The wave function of such a state here is explicitly written down, discussed and substituted into a Schrödinger equation. The determination of the cross section of the "flashing over" of the myon is in its essence a problem of the inelastic scattering of slow particles. The process of the computation is pursued step by step and the so found term of the cross section in the lower state of the hyperfine structure is written down explicitly. Also for the transition probability into this lower state a formula is written down. The u-mesatom changes during the life of the myon completely into the lower state of hyperfine structure. Out of this, two peculiar conclu-

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56-2-25/51

The Transition Between the Levels of Hyperfine Structure in a Hydrogen μ-Mesonic Atom

sions result: For the first the negative myons, which impinge upon the hydrogen, must depolarize completely . Secondly the neutrons, which were obtained at the trapping of a myon by a proton (reaction $\mu^- + p = n + \nu$), must be polarized completely in their direction of motion. This fact is a consequence from the conservation theorems. There are 5 references, 4 of which are Slavic.

ASSCCIATION: Institute for Problems in Physics of the AS USSR
(Institut fizicheskikh problem Akademii nauk SSSR)

SUBMITTED: August 12, 1957

AVAILABLE: Library of Congress

1. Myons-Structure 2. Hydrogen mesons-Transistion-Theory

Card 3/3

56-34-4-31/60

AUTHOR: Gershteyn, S. S.

TITLE: The Depolarization of Myons in Hydrogen (Depolyarizatsiya μ--mezonov v vodorode)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol. 34, Nr 4, pp. 993 - 994 (USSR)

ABSTRACT: In a previous work by the same author it was shown that in the case of the collision of a hydrogen mesoatom with a free proton the cross section of the transition of the μ-mesoatom from the upper state of the hyperfine structure (with the momentum F = 1) into the lower state (F = 0) is sufficient. It leads to a complete depolarization of the mesons in hydrogen. In real hydrogen this process is determined by the collision with the molecule H_2. The collision of a μ-mesoatom with the molecule H_2 can be investigated by a method which is similar to a method suggested by Fermi for the computation of the scattering of slow neutrons by molecules. To begin with, an expression is written down for the potential of interaction of a μ-mesoatom with the molecule H_2. The energy of the hyperfine structure of the μ-mesoatom (0,183 eV) does not suffice for the excitation

Card 1/3

56-34-4-31/60

The Depolarization of Myons in Hydrogen

of the vibrational levels of H_2, but the excitation of the first 4 rotational levels is possible. For the initial state and the final state of the system expressions are written down and briefly discussed. Also for the cross section of the scattering of the μ-mesoatom a formula is written down. By summation of the spin matrix elements, expressions for the differential cross section of the transition in para-hydrogen and ortho-hydrogen are obtained, and from that expression the corresponding total cross sections of the transition of the μ-mesoatom into the deeper state of the hyperfine structure are obtained by summation. The calculations carried out confirm the final conclusions drawn in the author's above mentioned previous work concerning the complete depolarization of the myons in hydrogen. In principle, this makes it possible to determine the polarization of the neutrino emitted in the process $\mu^- + p \rightarrow n + \nu$ by measuring the polarization of the neutron in the direction of its motion. In conclusion, the author thanks Ya.B. Zel'dovich and L.D.Landau for their valuable advice. There are 2 references, 1 of which is Soviet.

Card 2/3

The Depolarization of Myons in Hydrogen 56-34-4-31/60

ASSOCIATION: Institut fizicheskikh problem Akademii nauk SSSR (Institute for the Study of Problems in Physics, AS USSR)

SUBMITTED: December 10, 1957

1. Mesons--Nuclear reactions

Card 3/3

21(C)
AUTHORS: Zel'dovich, Ya. B., Gershteyn, S. S. SOV/56-35-3-14/61

TITLE: The Formation of H[illegible] Mesic Molecules (Obrazovaniye
[illegible])

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, [illegible],
Vol 35, Nr [illegible], pp [illegible] - [illegible] (USSR)

ABSTRACT: The formation of hydrogen μ-mesic molecules is of interest for the theory of μ-mesic catalysis of nuclear reactions for two reasons: Firstly, because the yield of nuclear reactions depends essentially on the probability of the formation of mesic molecules, and secondly, because the formation of mesic molecules $(pp)^+_\mu$ introduces the process. $(pp)^+_\mu$-formation is also of importance for investigations of the elementary $(pn\mu\nu)$-interactions and problems connected with the theory of weak interaction. In the present paper a mechanism for the formation of hydrogen mesic molecules is theoretically described. This mechanism is based on the assumption of a dipole transition from the S-wave in the repulsion state to the rotational level K= 1 with transfer of the

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energy to a conversion electron. An analysis for W (Formula 2) after some intermediate steps (c.f. also figures 1,2, potential curves E(R), effective potentials for the Σ_g-state for K=0 and K=1 in consideration of the correction because of nuclear motion, Morse (Morse)-function (Ref 7), E and R in meso-atomic units) leads to the result: $W \approx 1{,}5 \cdot 10^{6}\,sec^{-1}$ for the probability of formation of a mesic molecule $(pp)^{+}_{\mu}$ in liquid hydrogen. The mechanism described in the present paper applies to the catalysis of pd nuclear reactions as well as for the $\mu^- + p \rightarrow n + \nu$ process in liquid hydrogen. The influence exercised by reciprocal orientations of the proton- and meson spins upon the probability of the $\mu + p \rightarrow n + \nu$ process will be dealt with by the authors in a later paper. There are 2 figures and 7 references, 4 of which are Soviet.

ASSOCIATION: Institut fizicheskikh problem Akademii nauk SSSR (Institute for Physical Problems of the Academy of Sciences, USSR)

SOV/56-35-3-57/61

21(7)

AUTHORS: Zel'dovich, Ya. B., Gershteyn, S. S.

TITLE: The Universal Fermi Interaction and the Capture of a μ-Meson by a Proton (Universal'noye Fermi-vzaimodeystviye i zakhvat μ-mezona protonom)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol 35, Nr 3, pp 821-823 (USSR)

ABSTRACT: Gell-Mann and Feynman (Ref 1) and also E. C. G. Suderman and R. E. Marshak (Ref 2) independently suggested principles which lead to a certain variant of the form of interaction between 4 fermions. According to whether A, B, C, D are "particles" or "antiparticles", these principles offer two different possibilities: either an interaction (V - A) (which is invariant with respect to the process of the pair-wise joining of the particles)

$H_1 = 8^{1/2}G(\bar{\Psi}_A\gamma_\mu a\,\Psi_B)(\bar{\Psi}_C\gamma_\mu a\,\Psi_D)$ or a (V + A)-interaction

$H_2 = 8^{1/2}G(\bar{\Psi}_A\gamma_\mu \bar{a}\,\Psi_B)(\bar{\Psi}_C\gamma_\mu a\,\Psi_D)$. In the case of H_1

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SOV/56-35-3-57/61

The Universal Fermi Interaction and the Capture of a μ-Meson by a Proton

Ψ_A, Ψ_B, Ψ_C, Ψ_D are the wave functions of the "particles" and it holds that $a = (1 + \gamma_5)/2$. In the case of H_2, Ψ_A and Ψ_B are the wave functions of the antiparticles and it holds that $\bar{a} = (1 - \gamma_5)/2$. In the case of a different manner of joining the particles in pairs, H_2 has the (S - P) shape: $H_2 = 2.8^{1/2}G(\Psi_A a \Psi_D)(\bar{\Psi}_C \bar{a} \Psi_B)$. The present paper in all formulae investigates only one and the same process $A + C = B + D$, and it is agreed that such particles are described as "particles" as have a left longitudinal polarization at $v/c = 1$. The antiparticles then have the opposite sign of polarization. The difference between the interactions H_1 and H_2 is particularly marked in the case of transition to the last-mentioned formula. The ideas discussed here furnish the following result: In the variant V + A the (S - P) probabilities of capture in the states $F = 0$ and $F = 1$ (where F denotes the total spin of the proton and the myon) are exactly equal to each other. However, in the variant V - A

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The Universal Fermi Interaction and the Capture of a μ-Meson by a Proton

the probability of capture from F = 1 is equal to zero, whereas for the capture from F = 0 it amounts to four times the value averaged over the spins. In the case of the capture of a myon by a proton, this capture is effected from a state with the hyperfine structure F = 0. In this state the spins of the myon and of the proton are antiparallel to each other. Measurement of the absolute yield of the reaction $\mu^- + P \rightarrow N + \nu$ in hydrogen at the capture from F = 0 makes it possible to determine the relative sign of V and A in the elementary law of interaction $(\mu \nu PN)$. Expressions are written down for the Hamiltonian of the interaction of real nucleons with $(\mu\nu)$ and also for the absolute yield of the reaction $\mu^- + P \rightarrow N + \nu$ from the state F = 0. As the production of meso-molecule-ions $(pp)^+_\mu$ in liquid hydrogen complicates the representation of the capture of myons by protons, experiments must be carried out at such densities of hydrogen as are from 20 to 30 times lower than the density of liquid hydrogen at 20°K. There are 11 references, 4 of which are Soviet.

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The Universal Fermi Interaction and the Capture of a μ-Meson by a Proton

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SUBMITTED: July 26, 1958

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AUTHOR: Gershteyn, S. S

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TITLE: The Ranges of μ^--Mesic Atoms of Hydrogen in Hydrogen Chambers (Probegi μ^--mezoatomov vodoroda v vodorodnykh kamerakh)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 4, pp 1309-1311 (USSR)

ABSTRACT: In the present "Letter to the Editor" the author compiles the results obtained by a number of papers, which are connected with a phenomenon observed by Alvarez et al. (Ref 1). Nuclear reactions which were catalyzed by μ^--mesons were observed in hydrogen chambers, in which often the beginning of the track of the μ^--meson (which carries off the reaction energy) is separated by the end of this track by a gap (of ~ 1 mm width). Such a gap frequently also separates the beginning of the track of an electron which had been formed in the decay of the μ^--meson, from the stopping point of the μ^--meson. In reference 1 this fact was explained by assuming that by a μ^--meson exchange between proton and deuteron, the mesic atom of the deuterium receives additional kinetic energy ($\approx$45 ev) at the expense of which the gaps are formed. This opinion agrees with the $d_\mu + p$ and $d_\mu + d$ scattering cross sections

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calculated by Cohen et al., which fact is discussed in detail. It is shown that in the case of scattering of p_μ on protons transition in the mesic atom between hyperfine structure levels may occur. For the case in which the energy ε of such a scattering is considerably higher than that of hyperfine splitting, an expression is given for the $p_\mu + p$ scattering cross section (Ref 2). (Energy of hyperfine splitting: $\Delta\varepsilon \approx 0.183$ ev). If the energy is comparable to that of the hyperfine structure, the scattering cross section will depend upon the hyperfine structure state of p_μ. For the (elastic) scattering cross section of p_μ in the state $F = 0$ a formula is as well given (Ref 6). Finally, for the case in which $\varepsilon = \frac{1}{4}\Delta\varepsilon$, the (inelastic) cross section of the mesic molecule formation (pp_μ) according to reference 5 is given as amounting to $2.4 \cdot 10^{-22}$ cm^2, and a formula is also given for $d_\mu + d$ scattering. The values of the respective ranges are

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given and discussed. For the latter case, e.g. the free length of path of the mesic atom is about

$F = 1 \rightarrow F = 0$: $\lambda \approx 1/N\sigma_{tot} \approx 0.5$ mm; such a "gap" may thus occur also in pure hydrogen. There are 8 references, 5 of which are Soviet.

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24.6100, 24.6200, 16.8100,
16.7500

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AUTHORS: Belyaev, V. B., Gershteyn, S. S., Zakhar'ev, B. N., Lomnev, S. P.

TITLE: μ-Mesic Molecular Processes in Hydrogen

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 6, pp 1652-1662 (USSR)

ABSTRACT: A theoretical analysis was made of the mesic atomic and mesic molecular processes in a medium of hydrogen isotopes (the formation of mesic molecules, $H_{\mu}^{(1)} + H^{(2)} \longrightarrow (H^{(1)} H^{(2)})_{\mu}$; elastic collisions and charge exchange of mesic atoms, $H_{\mu}^{(1)} + H^{(2)} \longrightarrow H_{\mu}^{(1)} + H^{(2)}$, $H_{\mu}^{(1)} + H^{(2)} \longrightarrow H^{(1)} + H_{\mu}^{(2)}$). The calculations were performed on the BESM electronic machine with compensation for the motion of the nuclei.

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The magnitude of the correction was of the order of m_{μ}/M. The mesomolecular processes of μ^--mesons with hydrogen are due to the neutrality of mesic atoms. This is owing to the fact that at distances greater than Bohr's orbits of mesoatoms (2.57 x 10^{-11} cm), the nuclear charge is practically fully shielded by the charge of the meson. Such a condition results in a peculiar catalysis of reactions in hydrogen (or its isotope mixtures), which was predicted by A. D. Sakharov (Report Phys. Inst. Acad. Sciences USSR, Moscow, 1948), and was experimentally investigated by A. Ashmore, R. Nordhagen, K. Strauch, and B. M. Townes (Proc. Phys. Soc., 71, 161, 1958). The effective cross section of the charge exchange (ch.e.) was determined in asymptotic form for R ⟶ ∞, and it could be represented as follows:

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$\sigma_{ch.e.} = 4\pi r a_{\mu}^{2} v_{o}/v$, where v is velocity before

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collision; $v_0 = \sqrt{\Delta E/M_{12}}$; $a_\mu = \hbar^2/m_\mu e^2$. For the processes:

$p_\mu + d \longrightarrow d_\mu + p$, $p_\mu + t \longrightarrow t_\mu + p$, and $d_\mu + t \longrightarrow t_\mu + d$, the values of f were found to be, respectively: 2.11, 0.84, and 0.0067. In Table 5 are listed levels of the mesic molecules.

	$l = 0$		$l = 1$		$l = 2$	$l = 3$
	$v = 0$	$v = 1$	$v = 0$	$v = 1$	$v = 0$	$v = 0$
$(pp)_\mu$	252		100			--
$(dd)_\mu$	330	40	226	7	88	
$(tt)_\mu$	367	86	288	45	170	55
$(pd)_\mu$	220	--	90			
$(pt)_\mu$	213	--	98			
$(dt)_\mu$	319	32	232		102	

Table 5. Levels of mesic molecules.

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Mesic Molecular Processes in Hydrogen

[illegible]
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The levels are given in electron volts; for mesic molecules with different nuclei the energy levels are calculated from the level of the heavier isotope. There are 3 tables, 1 graph, and 18 references, [illegible] Soviet, 5 U.K., 1 German, 1 Italian, 2 U.S. The [illegible] most recent U.S. and U.K. references are: L. W. Alvarez, H. Bradner, F. S. Crawford, Jr., J. A. Crawford, P. Falk-Vairant, M. L. Good, J. D. Gow, A. H. Rosenfeld, F. Solmitz, M. L. Stevenson, H.K. Ticho, R. D. Tripp, Phys. Rev., 105, 1127, 1957; A. Ashmore, R. Nordhagen, K. Strauch, B. M. Townes, Proc. Phys. Soc., 71, 161, 1958; S. Cohen, D. L. Judd, R. I. Riddell, Phys. Rev., 110, 1471, 1958; M. Shimizu, Y. Mizuno, T. Izuyama, Progr. Theor. Phys., 20, 777, 1958; A. Dalgarno, R. McCarroll, Proc. Roy. Soc., 237, 383, 1956.

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