

BUBNICKI, Zdzislaw, mgr inż.

Established state of the discrete optimum control system subject
to random disturbances. Automatyka Gliwice no.1:5-23 '61.

BUBNICKI Z

- Survey, Archieva Literatura i Telematika, Vol 9, No 4, 1961.
1. "On Regulator Using a Relay-Link," Pavel SMILJIC and Stjepan KLOBUCIC; pp 371-385 (English summary).
 2. "Analysis of Asady's Converter as a Complex Control System," Metelav ERICIC; pp 389-397 (English summary).
 3. "Some Applications of Speeding Systems of Complement-ary Type with the Operational Element," J. BIJELIC; pp 397-408 (English summary).
 4. "Relay Signal Processors in Telecommunication," Jan TRICIC; pp 409-421 (English summary).
 5. "On a Graphical Method of Analysis of Relay-Contact Systems," Miran BRICOVIC; pp 421-429 (English summary).
 6. "Some Characteristics of a Pulse Controlled DC Motor," Janko STRIMUNIC; pp 432-438 (English summary).
 7. "An Analysis of Follow-up System Operating with DC Motor Controlled by Pulse Duration Modulation," Janko STRIMUNIC; pp 439-448 (English summary).
 8. "On Properties of the System Inverse-Parallel Control with Regenerative Load," Jeraj LUCICIC; pp 449-471 (English summary).
 9. "Load Characterization of Steam Turbine Drivings Motors," Jan SMILJIC and Veselko KALABOUK; pp 473-493 (English summary).
 10. "A Study of Control Properties of Counter-Current Heat Exchanger with One Heat Transferable Flow," Milica TRIVUNIC; pp 493-510 (English summary).
 11. "Self-regulating Ability of Heated Steam Generator with Steam-Water Circulation," Vladislav VEKICIC; pp 511-519 (English summary).
 12. "Transient Temperature Redistribution of the Parallel Flow Heat Exchanger," Veslav CICHANOVIC; pp 520-526 (English summary).

14

TRANSFER OBJECT SERIES 5060

ACCESSION NR: AT4022939

P/2536/63/000/003/0051/0076

AUTHOR: Bubnioki, Zdzislaw

TITLE: Some problems concerning the analysis and synthesis of quantized sampled data control systems

SOURCE: Gliwice. Politechnika Slaska. Zeszyty naukowe, no. 83, 1963. Automatyka (Automation), no. 3, 51-76

TOPIC TAGS: automatic control system, sampled data control system, quantized automatic control system, digital control system, real time digital computer, pulsed control system, digital computer, discrete control system, digital computer control system

ABSTRACT: Some problems connected with digital systems and ordinary sampled data systems with amplitude quantized signals are examined. Control systems with digital elements as well as some sampled data systems with discontinuous response are reduced to quantized sampled data systems. The step transfer function was used to describe the system's dynamic properties. The problems of

Card 1/3

ACCESSION NR: AT4022939

stability and jitter are discussed. Basic definitions are given. A method for the recurrent determination of the control process is given. If the response of the nonlinear element is $\epsilon_0 = f(\epsilon_q)$, then the process Y_n can be defined by the following algorithm:

$$X_0(t) = \sum_{k=0}^{\infty} x_q(kT) \delta(t-kT) \quad (1)$$

The synthesis of linear and nonlinear elements is described. Generally, some elements of the linear member are outlined, thus making it possible during resolution of the synthesis problem to select an additional linear correcting element so that the transfer function of the continuous linear part would amount to $k(t)$. The synthesis of the nonlinear correcting element will be based on finding a static characteristic of the nonlinear element for the given transfer function $k(t)$ of the linear member and for the given control process. A solution to the problem of the synthesis of the nonlinear element by the "step by step" method can be accomplished directly from algorithm (1).

Orig. art. has: 17 figures and 30 equations.

Card 2/3

ACCESSION NR: AT4022939

ASSOCIATION: Katedra Automatyki i Telemechaniki Politechniki Wroclawskiej
(Department of Automation and Telemechanics, Wroclaw Polytechnic)

SUBMITTED: 10Oct61

DATE ACQ: 10Apr64

ENCL: .00

SUB CODE: CG, GE

NO REF SOV: 006

OTHER: 006

Card 3/3

BUBNICKI, Zdzisław

Certain problems of analysis and synthesis of quantized pulse control systems. Automatyka Gliwice no.3:51-76 '63.

1. Department of Automation and Telemechanics of the Technical University, Wrocław.

L 09887-67 EMP(v)/EMP(R)/EMP(N)/EMP(L) EMP(S)
ACC NR: AT6031306 SOURCE CODE: PO/2539/66/000/002/0013/0025 35

AUTHOR: Bubnicki, Zdzislaw (Doctor of engineering; Assistant professor)

ORG: Department of Telemechanics and Automation, Wroclaw Polytechnic Institute (Katedra Telemechaniki i Automatyki, Politechnika Wroclawska)

TITLE: Application of the ⁶game theory to the optimization of certain sampled data control systems 14

SOURCE: Breslaw. Politechnika. Zeszyty naukowe, no. 124, 1966. Automatyka, no. 2, 13-25

TOPIC TAGS: game theory, optimal control, sampled data control system, control signal, control system disturbance

ABSTRACT: The paper deals with the application of the game theory to theoretically simplest sampled data control systems, for which sets of possible disturbances and possible control signals were computed using a finite number of elements. In particular, the problem of determining by the game theory an optimal control for sampled data controls with unknown probability distributions of disturbances was investigated. Methods of establishing an optimal probability distribution of the

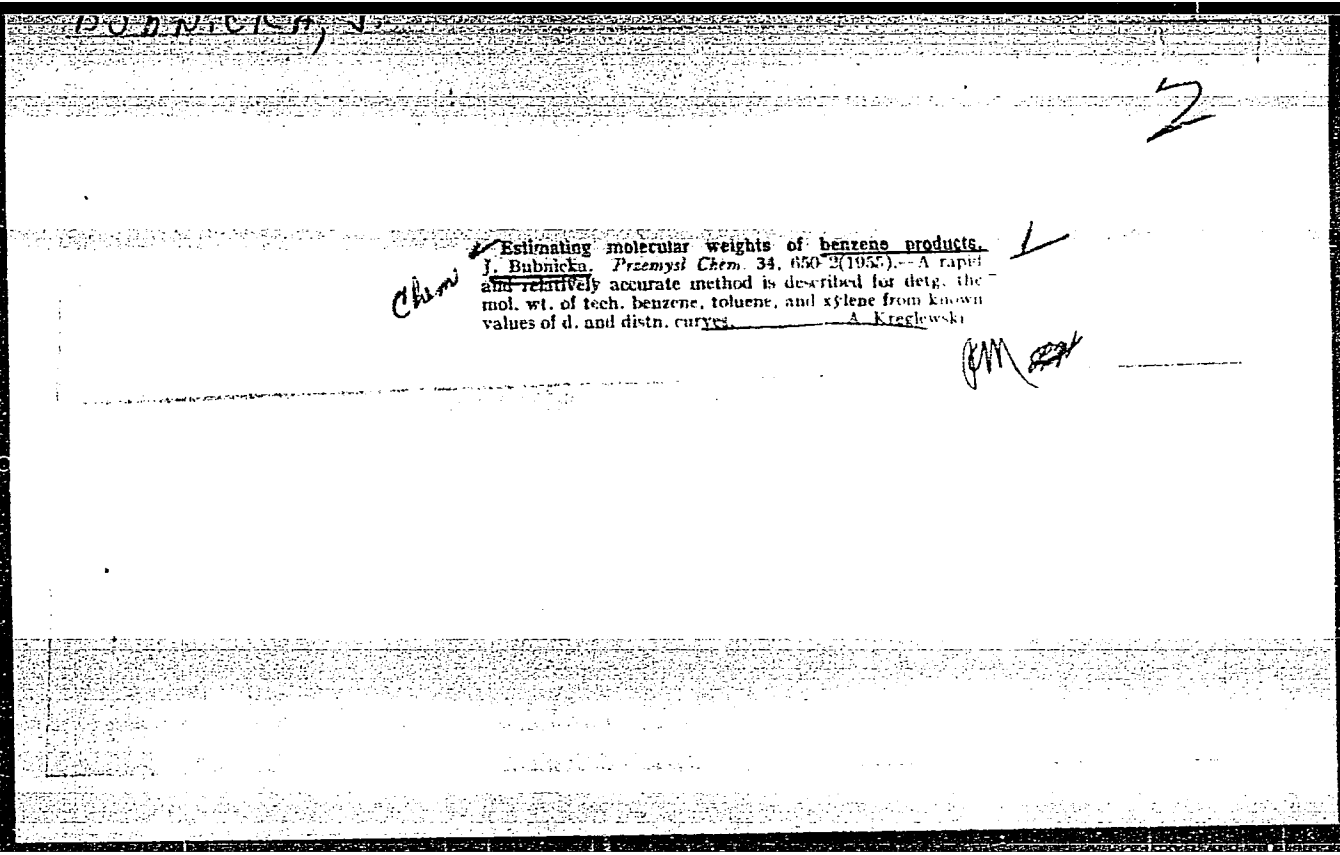
Card 1/2

L 09887-67

ACC NR: AT6031306

control signal for a finite number of possible disturbance and control signal values were given and illustrated by several examples. Application of the game theory as discussed in the paper fits optimization when control evaluation is done for one stage, and for an optimal disturbance compensation. Orig. art. has: 7 figures, 3 tables, and 27 formulas. [Based on author's abstract]

SUB CODE: 09, 12, 13/ SUBM DATE: none/ SOV REF: 001/ OTH REF: 003/



P/031/61/006/004/002/010
D242/D301

16.8000

AUTHOR: Bubnicki, Zdzisław
TITLE: Analysis of Ashby's homeostat as a complex control system
PERIODICAL: Archiwum automatyki i telemekhaniki, v. 6, no. 4, 1961, 389-397

TEXT: Ashby's 4-element homeostat is described. Then the author analyzes the system for conditions of stability assuming that all 4 elements are identical. The following combinations are analyzed and conditions for their stability found: (1) All feedbacks are negative--then $k < 2$; (2) 1 positive, 3 negative--then $k < 4$; (3) 2 positive, 2 negative--then $k < 2$; (4) 3 positive, 1 negative--then $k < 2$; (5) all feedback positive--then $k < 2$, where k is gain in the element. The stability is independent of the time constant. Then the author analyzes a system having n elements. For the stability of a system consisting of n

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Analysis of Ashby's...

P/031/61/006/004/002/010
D242/D301

elements of 1st and 2nd order capacitance, the following conditions must be satisfied: $k < n-2$ for $n > 2$ and any $k > 0$ for $n = 1, 2$; the stability is independent of the time constant. Stability of a system consisting of elements of higher order capacitance depends on gain and time constants. There are no ready rules for stability of a system consisting of astatic elements. There are 4 figures and 4 references: 2 Soviet-bloc and 2 non-Soviet-bloc. The references to the English-language publications read as follows: W. R. Ashby, Design for a Brain, Electronic Engineering, 1948, v. 20, no. 250; W. R. Ashby, An Introduction to Cybernetics, London, 1956. ✓
<

SUBMITTED: May 9, 1960

Card 2/2

AUTHOR BUBNIKOV P.P., BARSAKOVSKIY V.P. PA - 2495
TITLE Chemistry and Technology of Silicates in China.
(Khimiya i tekhnologiya silikatov v Kitaye - Russian.)
PERIODICAL Vestnik Akademii Nauk 1957, Vol 27, Nr 2, pp 74-79 (U.S.S.R.)
Received: 5/1957 Reviewed: 5/1957
ABSTRACT The Chinese Academy of Science worked out a plan for scientific work to be accomplished within the next 12 years. The major part of this work shall be devoted to problems of Chemistry and the technology of silicates. Several new scientific institutes are intended to be founded for this purpose the main task of which will be the investigation of various oxides, vitreous substances, and silicate raw materials for the purpose of developing the silicate industry.
The Chinese Peoples' Republic has vast stocks of various valuable silicate materials which have as yet not been scientifically exploited. Chinese kaolin earths are world famous as also such materials as "porcelain stone" and "cast glass stone" in which field research work will be of great importance for Chinese industry. The same may be said about quartz, talcum, gypsum, serpentine, and other materials available in China.

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Chemistry and Technology of Silicates in China. PA - 2495

The main center of research is The Institute for Metallurgy and Ceramics of the Academy of Science at Shanghai with branches at Tshansha and Kunmin. The institute is under the management of professor Chshou-Zhen and has a staff of 300 persons. Apart from experimental stations the institute also possesses industrial objects such as blast furnaces for gray cast iron. Particular success was attained by this institute in the field of the production of fireproof articles, special glass such as electrovacuum glass, glass for steam boilers, special barium glass which allows only ultraviolet rays to pass (at 3000-4000 Å) whilst nearly all others are absorbed, baseproof boron silicate glass, etc.

A second institute of equal importance is at Mukden (under the management of Prof. Li-Siu-In) which has 6 departments: enrichment of ore, science of fireproofness, metallurgical chemistry, metal working, metal physics, and analytical chemistry. Further, there is the Institute for the metalurgy of casting and the Institute for building material. Further, there is the great central laboratory of the Anshan industrial combine, the Institute for Ceramics at Tsindechzhen and others. It was here that at the time of the Min dynasty (1368-1644) the porcelain industry was established, which was

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Chemistry and Technology of Silicates in China. PA - 2495

under the protection of the emperors and aroused the admiration of the entire world. It must be mentioned that, apart from scientifically founded industry, which is making enormous progress at the time, the branches of the old established primitive home industry are still prospering in China the products of which are distinguished by their superb and precise workmanship and hand-painted decorations, particularly as far as chinaware (porcelain) is concerned. This circumstance decided the Chinese government to establish a new high school for the Technology of artistic products and ceramics and to found a special Institute for the Research of Applied Art in Antiquity and Present.

ASSOCIATION: not given
PRESENTED BY: -
SUBMITTED: -
AVAILABLE: Library of Congress

CARD 3/3

BUEMOV, A., navalekrepil'shchik.

~~classified~~

Impertant changes. Mast.ugl. 4 no.11:10 N '55. (MIRA 9:2)
(Moscow Basin--Coal mines and mining)

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BUBNOV, A.

Modernization of pipe-straightening press. Neftianik 7 no.3:
23 Mr '62. (MIRA 15:5)

1. Glavnyy mekhanik Frolovskoy kontory razvedochnogo bureniya
tresta Volgogradneftegazrazvedka.
(Oil well drilling--Equipment and supplies)

92-58-5-21/30

AUTHOR: Bubnov, A. A., Chief Mechanic

TITLE: Replacing the KPP Flexible Coupling Having a SAL-III Reduction Gear Box with the PM-500 Pneumatic Band Clutch (Ustanovka shinnopnevmaticheskikh muft PM-500 vmesto muft elastichnogo stsepleniya KPP s reduktorom SAL-III)

PERIODICAL: Neftyanik, 1958, Nr 5, pp 22-23 (USSR)

ABSTRACT: A rig with the U2-4-3 hoist, powered by the SAL-III motor, is still very often used in drilling oil and gas wells. Only one motor can be used for tool sinking and lifting operations carried out by a rig of this type. The speed of this operation depends on whether the work of the driller and the diesel motor operator is coordinated. In certain drilling offices of the Stalingradneftegazrazvedka trust, pneumatic band clutches were installed in the SAL-III motors instead of the PM-500 flexible couplings, which have reduction gear boxes. This necessitated some modification of the equipment as described by the author and shown in a sketch. As a result of these modifications and the installation of the pneumatic band clutch, it became possible

Card 1/2

92-58-5-21/30

Replacing the KPP (Cont.)

to use two diesel motors and to complete tool sinking and lifting operations much faster. There is a sketch showing the design of the PM-500 pneumatic band clutch.

ASSOCIATION: Frolovskaya kontora bueniya tresta Stalingradneft'erazvedka
(Frolovo Drilling Office of the Stalingradneft'erazvedka Trust)

AVAILABILITY: 1. Drilling operations—USSR 2. Drilling--Coordination

Card 2/2

SOV/92-58-12-16/24

14(5).

AUTHOR: Bubnov, A.A., Chief Mechanic

TITLE: Refilling the Engine-Starting Compressed Air Containers With the Aid of a V2-300 Diesel (Nakachka vozdukh v puskovyye ballony dizelem V2-300)

PERIODICAL: Neftyanik, 1958, Nr 12, p 19 (USSR)

ABSTRACT: To refill the engine-starting compressed air containers of a new 8S230R diesel the above-mentioned containers were usually sent to a special compressor station. Since this operation was taking too much time, the Frolovskaya prospecting office of the Stalingradneftegaz razvedka Trust decided to utilize the V2-300 diesel engine which drives a winch. For this purpose the starting valve of the V2-300 diesel has been remodeled as shown in a sketch and described by the author. He also explains how the remodeled V2-300 diesel engine operates and refills the compressed air engine-starting container in 35-40 minutes. During this time the V2-300 engine has to operate continuously. The utilization of remodeled V2-300 engines for refilling the engine-starting compressed air containers of a 8S230R engine makes it possible to start the drilling rig easily and as soon as needed.

ASSOCIATION: Trest Stalingradneftegazrazvedka (The Stalingradneftegazrazvedka Trust)
Card 1/1

BUBNOV, A.A.

Repairing the case of a circulating pump. Neftianik 5 no.3:
19 Mr '60. (MIRA 14:9)

1. Glavnyy mekhanik Frolovskoy kontory razvedochnogo bureniya
tresta Stalingradneftegazrazvedka.
(Oil well pumps--Repairing)

BUBNOV, A.A.

Device for loading clay into a clay mixer. Neftianik 6
no.3:19-20 Mr '61. (MIRA 14:10)

1. Glavnyy mekhanik Frolovskoy kontory razvedochnogo bureniya
tresta Stalingradneftegasrazvedka.
(Clay) (Mixing machinery)

BUBNOV, A.A.; MORKOVKIN, A.P.

Device for determining the height of the adjusting ring of the
upper section of a sectional turbodrill. Mash. i nef. obor.
no.10:16-17 '63. (MIRA 17:4)

1. Volgogradnefterazvedka.

BUBNOV, Anatolii Aleksandrovich; LESETSKIY, V.A., red.;
KAYESHKOVA, S.M., ved. red.

[Repair of drilling equipment in the drilling bureau] Re-
mont burovogo oborudovaniia v kontore bureniia. Moskva,
Nedra, 1964. 199 p. (MIRA 17:5)

BUBNOV, A.A.

Accessory cooling system for V2-300 and V2-450 engines in
"Uralmash 5D" and "Uralmash 3D" drilling rigs. Mash. i neft.
obor. no.1: 27-28*64 (MIRA 17:7)

1. Kontora razvedochnogo bureniya No.1 tresta "Volgogradnefte-
gazrazvedka".

OSADCHUK, Ye.I.; BUBNOV, A.A.; BLEYKH, B.A.

Increasing the lifting capacity of the VM1-41 derrick.
Mash. i neft. obor. no.7:10-12 '64.

(MIRA 17:11)

1. Trest "Volgogradneftegazrazvedka".

OSADCHUK, Ye.I.; BUBNOV, A.A.; BLEYKH, B.A.

Selecting an efficient design for the foundations beneath drilling
derricks and sub-derrick equipment. Mash. i neft. obor. no.12:3-7 '64.
(MIRA 18:1)

1. Trest "Volgogradneftegazrazvedka".

BUBNOV, A. P.

Bubnov, A. P.

"Lithological Investigation of the Salt Stratum of the Bekhmut Basin."
Min Higher Education Ukrainian SSR. Khar'kov Order of Labor Red Banner
State U ireni A. M. Gor'kiy. Khar'kov, 1955 (Dissertation for the
degree of Candidate in Geologicomineralogical Sciences)

SO: Knizhnaya letopis' No. 27, 2 July 1955

BUBNOV, Andrey Sergeevich; FEDOSEYEV, Ye.A., polkovnik, red.; ANIKINA, R.F.,
tekhn.red.

[The Red Army] O Krasnoi Armii. Moskva, Voen.izd-vo M-va obor.
SSSR, 1958. 237 p. (MIRA 11:7)
(Russia--Army)

BUBNOV, B.N.

BUBNOV, B.N., inzhener

The introduction of preshrinking equipment should be pushed. Tekst.
15 no.9:22-23 S'55. (MLRA 8:11)
(Textile machinery) (Textile finishing)

PROCESSES AND PROPERTIES INDEX

1ST AND 2ND ORDERS

1ST AND 2ND ORDERS

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BUBNOV, D
CA

Production of milk sugar. D. Bubnov. *Molochkovo*
Prav. 9, No. 8, 11-15 (1948).—PRODUCTION Method of lac-
 tose from whey is described. Deproteinization is done at
 90-2° by acid whey addn., filtration, vacuum evapn. to
 60% solids (or open kettle evapn. at 103-4°), and crystn.
 at 6-8° for 18-20 hrs. The product is filtered by pressure
 in canvas sacks and tray-dried at 60-75°. Refining is
 done by soft. at 90-5° and treatment with kieselguhr and
 bone charcoal in the presence of Na₂S₂O₅, followed by
 filtration and crystn. The yield is 2.5% of the wt. of
 whey used.
 G. M. Kosolapoff

ASB-51A METALLURGICAL LITERATURE CLASSIFICATION

COMMON ELEMENTS

COMMON MATERIALS INDEX

COMMON ELEMENTS

COMMON MATERIALS INDEX

CA БУБНОВ, Д.

Nonfat dry substances in molten butter. D. Bubnov
and L. Boldyreva. *Molokhnaya Prom.* 10, No. 10, 23-8
(1949).—The nonfat dry solids in butter is (av.) 0.2%
in standard molten butter, 1.6 in cream butter at collec-
tion points, and 1.2 in standard cream butter.
G. M. Kosolapoff

BUBNOV, D.V.

Translation from: Referativnyy zhurnal, Geografiya, 1957, Nr 6,
p 166 (USSR) 14-57-6-12983

AUTHORS: Mandel'shtam, L. A., Bubnov, D. V.

TITLE: Natural and Economic Divisions in the Balashovskaya
Oblast' (Prirodno-ekonomisheskiye zony Balashovskoy
Oblasti)

PERIODICAL: S. kh. Fovolzh'ya, 1956, Nr 8, pp 7-11

ABSTRACT: The economics of agricultural production and the soil-
climate variations of the district were studied during
the process of dividing the district into natural and
economic-agricultural zones. Collective farm production
was estimated by administrative districts (AD), state
farm production in terms of individual products and
specialized product groups. This resulted in 38 AD's
which were divided into three zones (groups) of similar
units raising similar products. 1) A group of ten AD's

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14-57-6-12983

Natural and Economic Divisions (Cont.)

in the northwest. These grow cereals, numerous winter crops, sun-flowers and beets, and also raise cattle and pigs for milk and meat. 2) A group comprising 13 AD's in the northwest. These raise beets, cereals, and pigs. They also produce winter crops. 3) A group comprising 15 AD's which raise cereals and cattle. Here the bulk of the planting is spring wheat, and cattle and sheep are raised for milk and meat. The article contains a brief description of the basic indices of agricultural economy for each group and an outline map of the area.

Card 2/2

A. M.

ANDREYEV, S.V.; BUBNOV, G.M.; MARTENS, B.K.; MOLCHANOVA, V.A.

Automatic light traps. Zashch. rast. ot vred. i bol. 7 no.1:49-50
'62. (MIRA 15:6)

(Insect traps)

~~BUBNOV, German Petrovich; SHIRYAYEV, N.P., inzh.-major, red.;~~
~~RIKSHVINK, A.M., tekhn. red.~~

[Automatization in antiaircraft defense] Avtomatizatsia v
PVO. Moskva, Voenizdat, 1963. 93 p. (MIRA 16:9)
(Antiaircraft artillery) (Automatic control)

BUBNOV, I.A., polkovnik; KREMP, A.I., inzh.-polkovnik; FOLIMONOV,
S.I., polkovnik v otstavke; KULRYAVTSEV, M.K., general-
leytenant tekhn. voysk, red.; GNEDOVETS, P.P., polkovnik,
red.; Salyayev, S.A., inzh.-podpolkovnik; STREL'NIKOVA,
M.A., tekhn. red.

[Military topography; manual for military schools of the
Soviet Army] Voennaia topografiia; uchebnik dlia voennykh
uchilishch Sovetskoi Armii. Izd.4., perer. i dop. Moskva,
Voen.izd-vo M-va oborony SSSR, 1953. 411 p. (MIRA 15:7)
(Military topography)

BUBNOV, Il'ya Alekseyevich, general-mayor tekhnicheskikh voysk v
otstavke; KREMP, Adrian Ivanovich, inzh.-polkovnik v
otstavke; KALININ, Aleksandr Konstantinovich, polkovnik;
SHLENNIKOV, Sergey Aleksandrovich, podpolkovnik; DUKACHEV,
M.P., red.

[Military topography; a textbook for military schools of
the Soviet Army] Voennaia topografiia; uchebnik dlia voen-
nykh uchilishch Sovetskoi Armii. Moskva, Voenizdat, 1964.
349 p. (MIRA 17:7)

L 12024-65 EWT(d)/EWT(1)/EEG(1)/EED-2/...
Feb IJP(c) GG/BB UR/0286/65/000/007/0131/0131

ACCESSION NR: AP5010947

AUTHORS: Yakubovich, A. M.; Korol'kov, I. V.; Braslavskiy, D. A.; Bubnov, I. A.;
Mironov, B. V. 47
13

TITLE: Operational amplifier. Class 42, No. 169878

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 7, 1965, 131

TOPIC TAGS: amplifier

ABSTRACT: This Author Certificate presents an operational amplifier with parallel amplification channels and with automatic compensation of zero drift. To increase its reliability and accuracy of operation, it contains no less than three amplification channels operating alternately so that at any instant of time two of them are in the amplification mode. Each channel contains a dc amplifier with operation periodization and with discrete-periodic zero drift compensation by a circuit with a storage capacitor. To decrease the effect of a constant spurious signal with the breakdown of one of the channels, each channel contains a decoupling capacitor connecting the amplifier output of the particular channel through a resistance and a switching unit to the common output of the operational amplifier. The switching unit discharges the decoupling capacitor in the zero drift compensation mode.

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L 12024-65

ACCESSION NR: AP5010947

ASSOCIATION: Organizatsiya gosudarstvennogo komiteta po aviatsionnoy tekhnike
(Organization of the State Committee for Aviation Technology)

SUB CODE: EC

SUBMITTED: 08Feb64

ENCL: 00

NO REF SOV: 000

OTHER: 000

Card 2/2 *mm*

BUBNOV, I. G.

Bubnov, I. G. "Building mechanics of ships," Paragraphs 26 and 27 of the exchange
(with editorial notes), Trudy Vses. nauch. inzh.-tekh. o-va sudostroyeniya, Vol. V,
Issue 4, 1948, pp. 3-62

SO: U-3264, 10 April 53 (Letopis 'Zhurnal 'nykh Statey, No. 4, 1949).

BUBNOV
~~Boobnov~~, I. G.

2

Book—2843. ^{2f}Boobnov, I. G. Contributions to plate theory ^{Plap}
[Trudy po Teorii plastin] (in Russian), Moscow, Gosud. Izdat.
Tekh. Teor. Lit., 1953, 423 pp., 12.70 rubles. ^{Stave}

The work of I. G. Boobnov on plate theory is well-known to western scientists through two sources, (a) The English translation of certain of his work that appeared in the *Transactions of the Institution of Naval Architects*, 1902, and (b) frequent references to his work in S. Timoshenko's "Theory of plates and shells." Boobnov's work appeared in a total of thirty research papers together with his "Theory of structure of ships", all written in Russian.

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The present volume gathers together the highlights of most of his papers and presents them in a unified form. The initial chapter presents a detailed exposition of cylindrical bending of rectangular plates. In most of these treatments stretching of the middle surface of the plate is considered. Composites as well as partial uniform loads are considered, together with several boundary conditions. Deflection and moment coefficients are presented for each of these cases.

Boobnov, I.G.

The next chapter presents the solutions of a number of problems involving rectangular plates. First, a uniformly loaded plate having two opposite edges simply supported, one edge free, and the fourth edge clamped is treated. Deflection and moment coefficients are presented for various aspect ratios of the plate. Next, stresses and deflections in a clamped rectangular plate subject to a uniformly distributed load are determined. Rectangular plates with a variety of boundary conditions and subject to simultaneous normal load and tensile or compressive loadings in the plane of the plate are next considered. As a consequence of this, the buckling load of a compressed plate is determined (no mention is made of Bryan's solution to this problem in 1891). Lastly, the buckling of simply supported rectangular plates subject

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to combined bending and compression in the plane of the plate is considered.

The last one-quarter of the book presents a detailed biography of Boobnov (1872-1919) with emphasis on his contributions to the field of naval architecture. The book concludes with a listing of

J.H.M.

Boobnov, I G.

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Boobnov's published research. Although most of these original papers are unavailable to western readers, the current volume evidently presents the important aspects of each. However, it is to be remarked that the important results of Boobnov's work may be found in either aforementioned (a) or (b), although the present volume is considerably more detailed and present studies of some additional loadings and boundary conditions other than may be found in either of these sources.

3/3

W. A. Nash, USA

omf

~~RUBNOV, Ivan Ginzburgovich~~; SHIMANSKIY, Yu.A., akademik, redaktor;
DORMIDONTOV, F.K., nauchnyy redaktor; FRUMKIN, P.S., tekhnicheskiy
redaktor

[Selected works] Izbrannye trudy. Pod red. i s predisl. IU.A.
Shimanskogo. Leningrad, Gos. sciuznoe izd-vo sudostroit. promyshl.,
1956. 438 p. (MIRA 10:1)
(Shipbuilding)

L 55153-65 EEO-2/ENG(j)/EWT(d)/FSS-2/ENG(r)/EWZ(l)/EWT(m)/FS(v)-3/EWP(w)/
 EEC(k)-2/EEC(f)/EWP(v) I-2/ENG(a)-2/EWP(k)/EWG(c)/EWA(h)/EWG(v) Po-4/Pe-5/Pq-4/
 Pac-4/Pf-4/Pae-2/Peb/Pi-4 TI/WW/DD/EM/GW
 ACCESSION NR AM5001721 BOOK EXPLOITATION

S/

Bubnov, Igor' Nikolayevich; Kamanin, Lev Nikolayevich

64
B-1

Manned space stations (Obitayemye kosmicheskiye stantsii), Moscow, Voenizdat
 M-va obor. SSSR, 1964, 188 p. illus., biblio. 27,000 copies printed. Series
 note: Nauchno-populyarnaya biblioteka

TOPIC TAGS: ¹⁶space station, secondary power source, artificial gravity,
 radio communication

PURPOSE AND COVERAGE: The successes of modern astronautics permit us today to raise the curtain of the future and get a glimpse into the future of science and technology. This book tells of the problems that must be solved in the next stage of mastering space—the creation of manned space stations in orbits around the earth. Such stations will permit extensive research on the space near the earth and geophysical and astronomical observations and many other types of scientific experiments. Orbiting stations will be the starting platforms for launching space ships to other planets. On the basis of a study and critical analysis of materials published in the Soviet and foreign press, the authors tell of the difficulties to be surmounted by scientists and engineers in the creation of space stations. The reader will find a description of some planned

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L 55153-65
ACCESSION NR AM5001721

named space stations. The book is intended for a broad audience interested in the conquest of space.

TABLE OF CONTENTS [abridged]:

- Ch. I. Man in space and what is next -- 3
- Ch. II. Why are orbital space stations necessary? -- 17
- Ch. III. Orbit, rockets, and orbital space stations -- 47
- Ch. IIII. Long-time existence in orbit -- 97
- Ch. V. Electricity in space -- 140
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SUBMITTED: 29 May 64

SUB CODE: AA, SV, LS

NO REF SOW: 009

OTHER: 026

Card 2/2

BUBNOV, M.A. (Deceased)

See ILC

Surgery

BUBNOV, M.A.

~~Ecology of the oyster catcher Haematopus ostralegus L. Zool.~~
zhur. 38 no.8:1270-1271 Ag '59. (MIRA 12:11)
(Oyster catchers (Birds))

BUBNOV, N.

Improving the contact system of autotransformers. Radio no.9:55
S '56. (MLRA 9:11)
(Radio--Apparatus and supplies)

BORODIN, Yevgeniy Ivanovich; BUBNOV, N.A., red.; BUKOVSKAYA, N.A.,
tekh.n.red.

[Unity and friendship; how the national economy of the Soviet
republics will be developed during the seven-year plan] Edinstvo
i druzhba; kak budet rasvivat'sia narodnoe khoziaistvo sovetskikh
respublik v semiletke. Moskva, Voen.isd-vo M-va obor.SSSR,
1960. 86 p. (MIRA 13:5)

~~(Russia--Economic policy)~~

PETROV, Valeriy Nikolayevich, yefreytor; BUBNOV, N.A., red.; KRASAVI-
NA, A.M., tekhn.red.

[Hello, army! A soldier's diary] Zdravstvui, armia! Iz sol-
datskogo dnevnika. Moskva, Voen.izd-vo M-va obor.SSSR, 1960.
60 p.

(MIRA 14:5)

(Russia--Army)

MINAYEV, Vladislav Nikolayevich; BUENOV, N.A., red.; KOKINA, N.N.,
tekh. red.

[What is secret becomes manifest] Tainoe stanovitsia iavnym.
Izd.2., dop. Moskva, Voenizdat, 1962. 372 p. (MIRA 15:8)

1. Chlen Soyuza pisateley SSSR (for Minayev).
(United States--Espionage)

BUBNOV, N. I.

Technology

Proizvodstvo kirpicha i cherepitsy (Production of brick and tile). Moskva, Rosgizmestprom, 1951. 280 p.

9. Monthly List of Russian Accessions, Library of Congress, November 1953² Unclassified.

USSR/Diseases of Farm Animals. Noninfectious
Diseases.

R-2

Abs Jour : Ref Zhur-Biol., No 20, 1958, 92714

Author : Bubnov, N. M.

Inst : Omsk Veterinary Institute.

Title : The Results of Heat Treatment of Suppurative Synovial Arthritis in Horses Supplemented by Drainage.

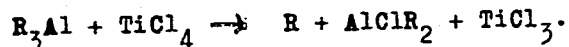
Orig Pub : Sb. stud. nauchno-issled. rabot. Omskiy vet. in-t, 1957, vyp. 1, 21-23

Abstract : A protracted (10 days) draining of the sal-tatory joint was used in the presence of suppurative synovitis. A rubber drainage tube with lateral apertures was passed through contraperture incisions of the

Card : 1/2

AUTHORS: Shilov, A. Ye., Bubnov, N. N. 62-58-3-29/30
TITLE: Letters to the Editor (Pis'ma redaktoru)
Electron Paramagnetic Resonance in the System $R_3Al-TiCl_4$
(Elektronnyy paramagnitnyy rezonans v sisteme
 $R_3Al-TiCl_4$)
PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Khimicheskikh Nauk,
1958, Nr 3, pp. 381-381 (USSR)

ABSTRACT: Of late great interest has been shown in the above mentioned systems as they are used as initiators of the polymerization of certain olefines. It had to be assumed that the primary interaction of the molecules of compounds belonging to the initiator finds its expression in the bimolecular reaction with simultaneous formation of a free radical



This reaction, as it is, can not be classified as a usual one as the polymerization in many a respect is different

Card 1/3

Letters to the Editor

62-58-3-29/30

Electron Paramagnetic Resonance in the System $R_3Al-TiCl_4$

from the usual free-radical one. It is, apart from other properties, of a heterogenous character. It could be assumed that the primary formation of the radicals would have an effect on the nature of the (forming) heterogenous catalyst. The authors of this letter found an electron paramagnetic resonance with a g-factor around 2. In the system $Al(i-C_4H_9)_3-TiCl_4$, for instance, a resonance absorption can be observed at room temperature. The reaction products $TiCl_4$ with $Al(C_2H_5)_3$ and $Al(C_2H_5)_2$, also show a tendency to paramagnetic resonance. The presence of a resonance absorption proves that radicals are formed. It is assumed that these radicals are connected with the process or the flow polymerization in a peculiar way.

Card 2/3

Letters to the Editor

Electron Paramagnetic Resonance in the System $R_3Al-T_iCl_4$

62-58-3-29/30

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR
(Institute for Chemical Physics, AS USSR)

SUBMITTED: January 9, 1958

Card 3/3

AUTHORS: Chernyak, N. Ya., ~~Bubnov, N. M.~~ SOV/20-120-2-34/63
Voyevodskiy, V. V., Polak, L. S., Tsvetkov, Yu. D.

TITLE: The Formation of Free Radicals and of Atoms in the Radiolysis of Hydrocarbons at a Temperature of 77°K (Ob obrazovanii svobodnykh radikalov i atomov pri radiolize uglevodorodov pri temperature 77°K)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol. 120, Nr 2, pp. 346 - 348 (USSR)

ABSTRACT: References are made in publications to free radicals formed during the action of ionizing radiation, as by X-rays, γ -radiation, fast electrons etc. This is caused by a rupture of C - C and of C - H bindings. When fluid hydrocarbons are radiolysed, the life of the free radicals is very short. The main products of radiolysis, apart from liquid products with one or two conjugated double bindings, are H₂ and C₁₄H₃₀. The latter compound is considered to be a dimer of the heptyl radical. The method of determining the radical is shortly described. The following hydrocarbons were investigated: hexane,

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The Formation of Free Radicals and of Atoms in the
Radiolysis of Hydrocarbons at a Temperature of 77°K

SOV/20-120-2-34/63

heptane, octane, dodecane, cetane, isooctane, cyclohexane, benzene and toluene. In all cases intensive signals of paramagnetic electron resonance with a g-factor of $\sim 2,0$ are observed. In paraffin-type hydrocarbons and in cyclohexane a hyperfine structure was very clearly observed. According to the attached photographs the hyperfine structure is considerably changed if the structural properties of the initial molecule change. Another peculiarity of the spectra of paramagnetic electron resonance of the hydrocarbons which are irradiated in a frozen state is the existence of considerable concentrations of hydrogen atoms. This is also indicated by two narrow signals which are located symmetrically at a distance of about 250 Oersted (Ersted) from the signals of the alkyl radical. The hydrogen atoms probably do not become stabilized in the volume of the frozen hydrocarbons but on the internal surface of the quartz ampoule. In a table the quantitative measurements performed on the basis of the example of heptane concerning the concentration of the free radicals with a dose of $\sim 10^7$ r are compared with the data of the chemical analysis of a sample irradiated under absolutely identical conditions. The results

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The Formation of Free Radicals and of Atoms in the
Radiolysis of Hydrocarbons at a Temperature of 77°K

SOV/20-120-2-54/65

obtained by both measurements agree in a satisfactory manner.
There are 2 figures, 1 table, and 4 references, 2 of which are
Soviet.

ASSOCIATION: Institut nefti AN SSSR (Petroleum Institute, AS USSR) Institut
khimicheskoy fiziki, AN SSSR (Institute of Chemical Physics
AS USSR)

SUBMITTED: January 11, 1958

1. Hydrocarbons--Temperature factors 2. Free radicals
--Production 3. Atoms--Production 4. Hydrocarbons
--Test results

Card 3/3

5(4)

SOV/20-122-4-25/57

AUTHORS: D'yachkovskiy, F. S., Pubnov, N. N., Shilov, A. Ye.

TITLE: The Investigation of the Recombination of Triphenylmethyl Radicals by the Method of Electron Paramagnetic Resonance (Izucheniye kinetiki rekombinatsii trifenilmetil'nykh radikalov metodom elektronnoogo paramagnitnogo rezonansa)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 122, Nr 4, pp 629-631 (USSR)

ABSTRACT: According to K. Ziegler et al. (Ref 1), the inverse reaction of the recombination of triphenylmethyl radicals must proceed with an activation energy which is equal to the difference between the activation energy of the dissociation and the dissociation heat of hexaphenylethane (6 - 8 kcal). By the method of paramagnetic electron resonance, this conclusion could be confirmed by immediate measuring of the dimerization rate of triphenylmethyl radicals in the solution. A capillary with a solution of hexaphenylethane in toluene was heated to 100° and then it was rapidly cooled down to the temperature of the experiment. This operation was carried out in a thermostat which was placed within the resonator of the EPR -spectro-

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SOV/20-122-4-25/57

The Investigation of the Recombination of Triphenylmethyl Radicals by the Method of Electron Paramagnetic Resonance

meter. In this way, noticeable superequilibrium concentrations of the triphenylmethyl radicals were obtained, and their recombination rate could be measured. The carrying out of the experiments is discussed in short. A figure shows 2 kinetic curves of the recombination of triphenylmethyl radicals at -64° and -35° . The recombination rate increases noticeably with temperature. An equation for the kinetics of the radical recombination is given, the inverse reaction is taken into account. The second diagram demonstrates the temperature dependence of the equilibrium constant and the third diagram shows the temperature dependence of the constant of the dimerization rate. The Arrhenius (Arrhenius) dependence is well satisfied. Thus, the direct determination of the dimerization rate of triphenylmethyl radicals confirmed not only the existence of an activation energy of this reaction but also its value (which coincides with the difference between the activation energy of the dissociation and the energy necessary for the breaking of the C-C bond of hexaphenylethane). The authors thank V. V. Voyevodskiy (Corresponding Member, Academy of Sciences, USSR) for his interest in this paper. There are 3

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SOV/20-122-4-25/57
The Investigation of the Recombination of Triphenylmethyl Radicals by the
Method of Electron Paramagnetic Resonance

figures and 3 references, 1 of which is Soviet.

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

PRESENTED: May 23, 1958, by V. N. Kondrat'yev, Academician

SUBMITTED: May 14, 1958

Card 3/3

5(4)

SOV/20-122-6-27/49

AUTHORS:

Tsvetkov, Yu. D., Bubnov, N. N., Makul'skiy, M. A.,
Lazurkin, Yu. S., Voyevodskiy, V. V., Corresponding Member,
AS USSR

TITLE:

The Investigation of the Spectra of the Electron Paramagnetic
Resonance of Some Polymers Which Were Irradiated at 77°K
(Issledovaniye spektrov e.p.r. nekotorykh polimerov, obluchennykh
pri 77°K)

PERIODICAL:

Doklady Akademii nauk SSSR, 1958, Vol 122, Nr 6, pp 1053-1056
(USSR)

ABSTRACT:

The authors carried out the above investigation for the purpose of solving several problems connected with the structure and chemical behavior of organic radicals in the solid phase as well as with the mechanism of chemical transformations in solid organic bodies under the influence of ionizing radiation. Polyethylene, polyvinyl chloride, "Teflon" (polyethylene tetrafluoride), polydimethyl siloxane, polyisobutylene, polymethyl methacrylate and natural rubber were investigated. Carrying out of the experiments is described in short. At 77°K a very intensive signal of paramagnetic electron resonance

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SOV/20-122-6-27/49

The Investigation of the Spectra of the Electron Paramagnetic Resonance of
Some Polymers Which Were Irradiated at 77°K

with a g -factor near 2.0036 was observed in all samples. After "thawing" of the sample down to room temperature the signal was in all cases found to change. In some cases, the signal vanished completely as a result of "thawing" (polyisobutylene, polydimethyl siloxane, natural rubber). In the case of other materials the character of the signal and its fine structure changed considerably. A comparison of all data obtained gave the following result: The character of the spectra obtained by investigating not "thawed" samples can be fully explained by the assumption that the predominant primary chemical act in irradiation is the stripping of one of the C-H bonds in the main chain (or in the absence of a main chain the stripping of a C-H bond in a lateral chain). The spectrum of paramagnetic electron resonance recorded at 77°K consists of 6 components. The even number of the spectrum in this as well as in other cases is connected with the formation of the radical $\sim\text{CH}_2-\dot{\text{C}}\text{H}-\text{CH}_2\sim$. The authors then discuss several details, especially such as concern the investigation of Teflon. By the irradiation of Teflon at low temperatures it is possible

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SOV/20-122-6-27/49

The Investigation of the Spectra of the Electron Paramagnetic Resonance of
Some Polymers Which Were Irradiated at 77°K

to obtain materials with fully satisfactory mechanical
properties. These substances contain a large quantity
(~0.1 %) of free radicals. There are 2 figures and 7 refer-
ences, 4 of which are Soviet.

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

SUBMITTED: July 24, 1958

Card 3/3

5(4)

AUTHORS:

SOV/20-123-5-28/50
D'yachkovskiy, F. S., Bubnov, N. N., Shilov, A. Ye.

TITLE:

Formation of Free Radicals in Bimolecular Reactions (Obrazovaniye svobodnykh radikalov v bimolekulyarnykh reaktsiyakh)
The Reaction Between Triphenylchloromethane and Ethyl Lithium (Reaktsiya mezhdru trifenilkhlormetanom i etillitiiem)

PERIODICAL:

Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 5, pp870-873 (USSR)

ABSTRACT:

The authors first mention some previous papers on this subject. They investigated the interaction of triphenylchloromethane with ethyl lithium, the first act of which must be exothermic if it proceeds according to the scheme. The reaction was carried out in a thin-walled test tube which was placed in the resonator of a EPR-spectrometer. In this reaction radicals were actually observed. The hyperfine spectrum of these radicals exactly corresponds to the spectrum of absorption of triphenylmethyl radicals. A diagram shows the kinetic curves for the variation of the concentration of triphenylmethyl radicals in the course of the reaction at -44, -54, and -80°. In the first instant of the reaction, the concentration has a distinctly marked maximum and it decreases behind this maximum. The descending parts of the curve represent the recombination of the

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SOV/20-123-5-28/50

Formation of Free Radicals in Bimolecular Reactions. The Reaction Between Triphenylchloromethane and Ethyl Lithium

triphenylmethyl radicals (formed in the first act of the reaction) before reaching the equilibrium concentration. The descending part of the curves represents the recombination of the triphenylmethyl radicals

$$2(\text{C}_6\text{H}_5)_3\text{C}\cdot \rightleftharpoons (\text{C}_6\text{H}_5)_3\text{C} - \text{C}(\text{C}_6\text{H}_5)_3$$

in the first act of the reaction. The experimental results prove the primary formation of the above-mentioned radicals. The maximum of the kinetic curves is not caused by an increase in temperature of the reaction mixture. The character of the kinetic curves corresponds to an accumulation of the intermediate product in the successive bimolecular reactions. The constants of velocity and the activation energy of the reaction of radical formation can be calculated from the kinetic curves found in this paper. According to these results, elementary reactions of the type $\text{R}'\text{X} + \text{YR}'' \rightarrow \text{R}'\cdot + \text{XY} + \cdot\text{R}''$ under suitable energy conditions can proceed with the formation of free radicals of insignificant energy. It has hitherto not been possible to generalize the results of the present paper for any reaction of halogen

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SOV/20-123-5-28/50

Formation of Free Radicals in Bimolecular Reactions. The Reaction Between
Triphenylchloromethane and Ethyl Lithium

alkyls with metalorganic compounds. There are 2 figures, 1
table, and 12 references, 5 of which are Soviet.

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

PRESENTED: July 16, 1958, by V. N. Kondrat'yev, Academician

SUBMITTED: July 12, 1958

Card 3/3

SOV/120-59-1-23/50

AUTHORS: Semenov, A. G., Bubnov, N. N.

TITLE: An Electron Spin Resonance Spectrometer (Spektrometr dlya nablyudeniya elektronogo paramagnitnogo rezonansa)

PERIODICAL: Pribory i tekhnika eksperimenta, 1959, Nr 1, pp 92-96 (USSR)

ABSTRACT: The spectrometer is of the double field modulation type, with automatic frequency control (AFC) applied to the klystron. The AFC signal is obtained by applying about 15 mV at 630 kc/s to the reflector of the 3.2 cm klystron; the resulting output signal is amplified and is detected by a phase-sensitive detector, and thus gives a control signal, which is used to tune the klystron automatically over a range of about 60 Mc/s. The second field modulation (at 975 kc/s) is produced by using a coil carrying about 40 A outside the cavity, which has 2.5 mm slots in it; these slots reduce the Q from about 10 000 to about 8000. The field produced by this coil at the centre of the cavity is about 2 oersted. The sensitivity is about 4×10^{-10} mole of diphenylpicrylhydrazyl at 77°K. Fig 1 shows the block diagram; Fig 2 is a general view of the instrument, Fig 3 shows the cavity and 975 kc/s

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SOV/120-59-1-23/50

An Electron Spin Resonance Spectrometer

cable, Fig 4 shows the oscillator circuit, and Fig 5 shows the circuit of the amplifiers used to handle and detect the high-frequency signals. There are 5 figures and 2 references, of which 1 is Soviet and 1 English.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR (Institute of Chemical Physics, Academy of Sciences, USSR)

SUBMITTED: January 24, 1958.

Card 2/2

SOV/30-59-3-10/61

5(0)

AUTHORS:

Semenov, A. G., Bubnov, N. N.

TITLE:

The New Magnetic Radiospectrometer (Novyy magnitnyy radio-spektr). Electronic Paramagnetic Resonance in Chemical Investigations (Elektronnyy paramagnitnyy rezonans v khimicheskikh issledovaniyakh)

PERIODICAL:

Vestnik Akademii nauk SSSR, 1959, Nr 3, pp 55-58 (USSR)

ABSTRACT:

The usual magnetic radiospectrometers are very sensitive to the slightest mechanical oscillations and temperature changes and require tiresome adjustment before each measurement, which renders their application for the solution of various chemical problems very difficult. In order to overcome these difficulties, some types of magnetic radiospectrometers were designed and tested by the Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences, USSR). A radiospectrometer with a transmission resonator, automatic adjustment of the frequency of the klystron generator and a high-frequency modulation of the magnetic field proved to be best. It is easily operable, sensitive and, compared to other types, secures reliable work. A block scheme of it is given

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SOV/30-59-3-10/61

The New Magnetic Radiospectrometer. Electronic Paramagnetic Resonance in
Chemical Investigations

in figure 1 and then described in detail. Figure 2 shows the spectrum of the free triphenyl-methyl radical $(C_6H_5)_3C$. Further, the authors describe a number of experiments which were carried out by means of this radiospectrometer and which demonstrated its wide range of applicability in various chemical fields. There are 2 figures and 1 reference.

Card 2/2

24(7), 5(3)

SOV/51-6-4-26/29

AUTHORS: Chernyak, N. Ya., Bubnov, N.N., Polyak, L.S., Tsvetkov, Yu. D. and
Voyevodskiy, V.V.

TITLE: On Certain Regularities in the Electron Paramagnetic Resonance Spectra
of Alkyl Radicals (O nekotorykh zakonomernostyakh v spektrakh
elektronnogo paramagnitnogo rezonansa alkil'nykh radikalov)

PERIODICAL: Optika i Spektroskopiya, 1959, Vol 6, Nr 4, pp 564-565 (USSR)

ABSTRACT: In the study of the electron paramagnetic resonance (e.p.r.) spectra
of radicals formed on γ -irradiation or frozen hydrocarbons (at 77°K), it
was found that the hyperfine structure (h.f.s.) varies with the position
of the hydrocarbon in its homologous series. Fig 1 shows the spectra
of radicals of normal paraffin hydrocarbons from C₁₁H₂₃ to C₁₆H₃₃
obtained under conditions described earlier (Ref 1). The samples were
of 97-98% purity. Fig 1 shows that h.f.s. of the even (C₁₂H₂₅, C₁₄H₂₉,
C₁₆H₃₃) and odd (C₁₁H₂₃, C₁₃H₂₇, C₁₅H₃₁) hydrocarbons differ
considerably. In odd hydrocarbons the h.f.s. is well resolved and the
intensities of the central components differ only slightly from one
another. In even hydrocarbons the resolution is much poorer and the
intensity distribution is close to binomial. In paraffin hydrocarbons
from n-C₅ to n-C₁₀ the spectra are more complex and more similar to

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SOV/51-6-4-26/29

On Certain Regularities in the Electron Paramagnetic Resonance Spectra of Alkyl Radicals

one another. Two of them are shown in Fig 2, where curves 1 and 2 represent the e.p.r. spectra of C_6H_{13} and C_7H_{15} respectively. The spectra of radicals of cyclic hydrocarbons (with five or six C atoms, shown in Fig 3) are in many respects similar to the corresponding spectra of the odd and even terms of the series $C_{11}-C_{16}$. The simplest spectrum is that of cyclo- C_6 . The hyperfine splitting and component intensities may be explained by assuming that the spectrum is a triplet (with 37 oersted splitting and 1:2:1 ratio of intensities of the components) and each components of the triplet is split into two lines (20 oersted separation). Such a spectrum occurs in the radical cyclo- C_6H_{11} . Following Ingram (Ref 3) it is assumed here that of four hydrogen atoms in the β -position, the free valence, only two take part in the hyperfine splitting. This produces a triplet. Interaction with a hydrogen atom in the α -position produces the doublet splitting of each triplet component. In the case of cyclo- C_5H_{10} the molecule is almost planar and both hydrogen atoms of the β -groups CH_2 in the radical should be equivalent with respect to free valence and the number of h.f.s. components should increase. The spectra shown in Fig 3 confirm these deductions. The authors conclude by pointing out that the e.p.r. spectra

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SOV/51-6-4-26/29

On Certain Regularities in the Electron Paramagnetic Resonance Spectra of Alkyl Radicals

can be used in molecular structure studies and in chemical analysis. There are 3 figures and 3 references, 2 of which are Soviet and 1 English.

SUBMITTED: August 28, 1958

Card 3/3

24(7), 21(1)

SOV/51-5-4-27/29

AUTHORS: Bubnov, N.N., Voyevodskiy, V.V., Polyak, L.S. and Tsvetkov, Yu. D.

TITLE: Electron Paramagnetic Resonance Spectrum of Hydrogen Atoms Stabilized on Solid Surfaces (O spektrakh elektronogo paramagnitnogo rezonansa atomov vodoroda, stabilizirovannykh na tverdykh poverkhnostyakh)

PERIODICAL: Optika i Spektroskopiya, 1959, Vol 6, Nr 4, pp 565-566 (USSR)

ABSTRACT: It was reported (Refs 1, 2) that H atoms, formed on γ -irradiation of frozen hydrocarbons and other compounds, can be stabilized on various surfaces. The present paper reports studies of the effect of the nature of the stabilizing surface on the magnitude of h.f.s. splitting of the electron paramagnetic resonance (e.p.r.) spectra of H atoms and the width of the e.p.r. absorption lines. The H atoms were stabilized on quartz, silica gel and molybdenum glass. They were formed by irradiation of these three substances with γ -rays at 77°K. It may be assumed that formation of H atoms is due to rupture of bonds in H₂O molecules adsorbed on these surfaces or rupture of bonds in SiOH groups (Ref 3). The magnitude of h.f.s. splitting in all the three cases was found to be close to 500 oersted which does not differ greatly from splitting in a free H atom (Ref 4). Width of the components of the hydrogen doublet depends strongly on the nature of the surface: on

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SOV/51-6-4-27/29

Electron Paramagnetic Resonance Spectrum of Hydrogen Atoms Stabilized on Solid Surfaces

quartz it is close to 0.8 oersted (curve 1 in a figure on p 566), on silica gel it is near 2.4 oersted (curve 2) and on molybdenum glass it is 4.5 oersted (curve 3). Since the hyperfine splitting in the e.p.r. spectra of H atoms stabilized on various surfaces is close to the hyperfine splitting of free atoms, the binding of H atoms to these surfaces does not alter greatly the spin density of the unpaired electron in hydrogen. On the other hand, dependence of the width of the hydrogen doublet components on the nature of the stabilizing surface indicates that there is a definite interaction between the unpaired electron and the surface. In view of this the authors suggest further studies of the nature of binding of H atoms to solid surfaces. This is an abridged translation. There is 1 figure and 4 references, 2 of which are Soviet and 2 English.

SUBMITTED: August 29, 1958

Card 2/2

5(3), 5(4), 24(7)

SOV/51-7-1-19/27

AUTHORS: Bubnov, N.N., Kibalko, L.A., Tsepalov, V.F. and Shlyapintokh, V.Ya.

TITLE: On the Nature of the Intermediate Product in the Reaction of Photo-reduction of Eosin (O prirode proezhutochnogo produkta v reaktsii fotovosstanovleniya eosina)

PERIODICAL: Optika i spektroskopiya, 1959, Vol 7, Nr 1, pp 117-119 (USSR)

ABSTRACT: Eosin solution in pyridine (10^{-4} mole/litre) was photoreduced in the presence of ascorbic acid (10^{-3} mole/litre). A SVDSH-250 lamp was used as the light source and the reaction was studied using an electron-paramagnetic-resonance (e.p.r.) spectrometer with high-frequency modulation of the magnetic field. The e.p.r. spectrum (the upper figure on p 118) was a triplet with the component intensities in the ratio 1:2:1 (the hyperfine-structure splitting was $\Delta H = 4.6 \pm 0.2$ oersted). The e.p.r. spectrum was due to an intermediate product in the photo-reduction reaction; the shape of the spectrum confirmed earlier

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SOV/51-7-1-19/27

On the Nature of the Intermediate Product in the Reaction of Photoreduction of
Eosin

suggestions (Refs 1, 2) that (1) the intermediate product is eosin semiquinone, and that (2), in the photochemically-active state, eosin is a metastable biradical. There are 2 figures and 10 references, 4 of which are Soviet, 3 German, 2 English and 1 French.

SUBMITTED: November 25, 1958

Card 2/2

24 (7), 5 (4)

AUTHORS:

Bubnov, N. N., Sorokin, Yu. A.,
Solodovnikov, S. P., Chibrikin, V. M.

SOV/48-23-10-35/39

TITLE:

Investigation of the Dibenzene-chrome Derivatives by the
Method of Paramagnetic Electron Resonance

PERIODICAL:

Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959,
Vol 23, Nr 10, pp 1263 - 1264 (USSR)

ABSTRACT:

In earlier papers (Refs 1-3) it has already been shown that in highly diluted dibenzene chrome solutions the interaction between the unpaired electron and the protons of the benzene rings, which are in direct connection with the metal (chrome-) atom, manifest themselves by a distinct hyperfine structure of the spectrum of paramagnetic electron resonance. It has already been shown that the introduction of a substituent into the benzene ring influences neither the g-factor of the compound nor the amount of the hyperfine splitting (3.6 ± 0.5 Gs). It was further found that the dissolving temperature, the nature of the solvent or that of the substituent introduced into the benzene ring influences the width of the hyperfine structure component. Further investigations concerned the spin density distribution of the unpaired electron in the molecule, the

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hyperfine splitting, as well as the width of the hyperfine structure component. In this connection, several details, which were obtained from references 1-8 are briefly discussed. Further investigations concerning hyperfine splitting were carried out with the cation of dibenzene chrome with cyclohexyl substituents in both rings. It was found that at low temperatures of the solution of this compound an additional triplet splitting (1 ± 0.5 Gs) of each hyperfine structure component occurs. It is caused by the interaction of the unpaired electron with two protons of a cyclohexyl substituent. An investigation of the influence exerted by various factors on the width of the hyperfine structure component gave the following result: A considerable dilution of the solution with a reduction of temperature leads to a monotonic improvement of the spectral resolving power, i.e. the width of the hyperfine structure component decreases. In some solvents (e.g. alcohols) an anomalous temperature dependence of the spectral resolving power is found; this might be explained by a complex formation between the dibenzene chrome cations and the molecules of the

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solvent. There are 8 references, 5 of which are Soviet.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of
Chemical Physics of the Academy of Sciences, USSR). Institut
khimi pri Gor'kovskom gos. universitete (Institute of
Chemistry at Gor'kiy State University)

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24 (7)

AUTHORS:

Bubnov, N. N., Tsepalov, V. F.,
Shlyapintokh, V. Ya.

SOV/48-23-10-36/39

TITLE:

The Spectra of Paramagnetic Electron Resonance of Eosin
Semiquinone in a Live Leaf

PERIODICAL:

Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959,
Vol 23, Nr 10, pp 1265 - 1266 (USSR)

ABSTRACT:

The present paper intends to explain the nature of the intermediate products in the photochemical reactions of eosin and chlorophyll. The investigations were carried out at room temperature with high-frequency modulation of the magnetic field. Method and apparatus are described in references 1 and 2. First, some results concerning the photoreduction of eosin are discussed. This reaction consists in the transformation of the dye into a leuco-compound and has already been potentiometrically and spectroscopically investigated (Refs 3,4). The authors assumed that a comparatively stable intermediate product is formed (semiquinone dye), which may have a life of several seconds at room temperature. An investigation of the paramagnetic electron resonance spectrum of eosin (solvent: piridine, reducer: ascorbic acid) showed a

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triplet splitting (intensity ratio 1:2:1, $\Delta H = 4.6 \pm 0.2$ Gs) which is caused by the interaction between the unpaired electron and two protons. The photochemical reaction which develops by way of a biradical, is shown schematically and has already been described by Schenck (Ref 5). The authors of the present paper were the first to investigate the resonance spectrum of a live leaf. A leaf of *agrophyrum repens* was used for this purpose. The resonance signal showed a doublet, hyperfine splitting amounted to $\Delta H = 1.8 \pm 0.2$ Gs. There are 5 references, 4 of which are Soviet.

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

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5(4); 24(7)

SOV/76-33-8-37/39

AUTHORS: Bubnov, N. N., Chibrikin, V. M.

TITLE: On the Temperature Dependence of the Width of the Component of Superfine Structure in Electron Paramagnetic Resonance Spectra

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 8, pp 1891-1892 (USSR)

ABSTRACT: In order to clarify the mechanism of the extension of the component of superfine structure, the effect of temperature on the spectrum of the electron-paramagnetic resonance of the cations of chromium dibenzene $(C_6H_6)_2Cr^+$ (I) and chromium-bis-diphenyl $[(C_6H_5)_2]Cr^+$ (II) was investigated. The studies were made with concentrated solutions (more than 0.02 mol/l) (solvents - ethanol, pyridine, acetone) by means of a spectrometer with a high-frequency modulation of the magnetic field (Ref 5). It was observed that at the gradual lowering of temperature, the width of the superfine structural component (ΔH) of (I) and (II) is constantly reduced, and reaches a minimum at $-50, -80^\circ C$. When the temperature is lowered beyond that, the width increases again. In all solutions of (I) and (II) investigated, two additional lines were observed. They

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came about by a superfine fission at the Cr⁵³ isotope. It is stated that there exists an anisotropy of the g-factor and a superfine structure in the chromium--aromatic compounds. Besides the temperature reduction, there are two more reasons for the extension of the component of superfine structure: One is due to the formation of stable complexes or solvate shells, and the other one is in no connection with the exchange interaction. In order to solve this problem it will be necessary to carry out studies with diluted solutions in which the latter effect is negligible. It is ascertained that a temperature reduction may cause a better dissolution of the superfine structure than a dilution, and if this comes about it can be observed with less sensitive instruments. Finally, the authors thank Yu. N. Molin, A. I. Burshteyn and V. V. Voyevodskiy. There are 2 figures and 8 references, 4 of which are Soviet.

ASSOCIATION: Akademiya nauk SSSR, Institut khimicheskoy fiziki, Moskva (Academy of Sciences USSR, Institute of Chemical Physics, Moscow)

SUBMITTED: August 25, 1958
Card 2/2

BUBNOV, N.N.; KRASNOVSKIY, A.A.; UMRIKHINA, A.V.; TSEPALOV, V.E.;
SHLYAPINOTOKH, V.Ya.

Electron paramagnetic resonance spectra observable during the
illimination of plant leaves and photoreduction of chlorophyll
and its analogues. Biofizika 5 no. 2:122-126 '60. (MIRA 14:4)

1. Institut khimicheskey fiziki AN SSSR i Institut biokhimi im.
A.N. Bakha AN SSSR, Moskva.

(CHLOROPHYLL)

(PARAMAGNETIC RESONANCE AND RELAXATION)

83566

S/020/60/134/001/019/021
B004/B060

5.4500
AUTHORS:

Shelimov, B. N., Rubnov, N. M., Fok, N. V.,
Voyevodskiy, V. V., Corresponding Member AS USSR

TITLE:

Detection of Hydrogen Atoms in the Phototransfer Reactions
of the Electron R/

PERIODICAL:

Doklady Akademii nauk SSSR, 1960, Vol. 134, No. 1,
pp. 145 - 148

TEXT: The authors proceed from the photochemical reaction in the aqueous medium: $M + H_2O + h\nu \rightarrow M^+ + OH^- + H(1)$, where M may be metal ions of variable valency, or anions. The formation of hydrogen atoms in this reaction had been hitherto proved indirectly only. The authors wanted to give direct evidence of H-atoms by means of electric paramagnetic resonance (epr). Because of the strong reactivity and mobility of the H-atoms, investigations were conducted at 77°K in aqueous solutions of H₂SO₄ or H₃PO₄ (in concentrations between 40 and 96%), which contained small quantities of FeSO₄ or KI. The samples were irradiated for 1 hour

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with the ultraviolet light of a ПPK-7 (PRK-7) mercury vapor lamp. The epr signals were recorded by means of a previously described (Ref. 7) epr spectrometer. It was possible to give evidence of the H-doublet. To check the correctness of reaction (1) definitely, experiments were made in solutions which contained heavy water. As is shown by Fig. 1, the D-triplet was observed besides the H-doublet. Further experiments were conducted in the system $C_6H_6 - H_2O - H_2SO_4$. Here as well (Fig. 2) the H-doublet occurred. The central part of this spectrum, the quadruplet shown in Fig. 3, could not be explained yet, but it might be due to a paramagnetic particle whose free valency is localized on the aromatic ring. Weaker components were detected in the epr spectrum of the H-atom (Fig. 4), which are ascribed to the spin reversal of protons surrounding the H-atom. While the H-lines were strongly saturated in the experiments with benzene, saturation did not take place in the presence of Fe^{2+} due to higher concentration of the paramagnetic ions of a short relaxation time. The study of saturation and intensity distribution between the main and secondary lines in the epr spectrum of H \cdot may serve to clarify specific features of its weak interaction.

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with adjacent molecules, and also to establish the distance between
H⁺-atoms and primary particles releasing an electron under the action
of light. There are 4 figures and 12 references: 3 Soviet, 8 US, and
2 British.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova
(Moscow State University imeni M.V. Lomonosov). Institut
khimicheskoy kinetiki i goreniya Sibirskogo otdeleniya
Akademii nauk SSSR (Institute of Chemical Kinetics and
Combustion of the Siberian Branch of the Academy of
Sciences, USSR)

SUBMITTED: April 27, 1960

Card 3/3

BUBNOV, N.N.; VOYEVODSKIY, V.V.; FOK, N.V.; SHEIMOV, B.N.

Study of electron phototransfer reactions in the solid phase
by the electron paramagnetic resonance method. Opt. i spektr.
11 no.1:78-83 JI '61. (MIRA 14:10)
(Paramagnetic resonance and relaxation)
(Photomuclear reactions)

ZHIDOMIROV, G.M.; SUBNOV, N.N.

Electronic paramagnetic resonance spectrum of the cyclopentyl
radical. Opt. i spektr. 12 no.3:445-446 Mr '62. (MIRA 15:3)
(Cyclopentane--Spectra) (Paramagnetic resonance and relaxation)

BUBNOV, N. N.

Dissertation defended for the degree of Candidate of Chemical Sciences
at the Joint Academic Council on Chemical Sciences; Siberian Branch 1962.

"Application of the Electron Paramagnetic Resonance Method in Studying the
Formation and Properties of Free Radicals."

Vestnik Akad. Nauk, No. 4, 1963, pp 119-145

BUBNOV, N.N.; BAZHIN, N.M.; VOYEVODSKIY, V.V.

Photosensitized decomposition of saturated hydrocarbons
and alcohols in the solide phase. Kin. i kat. 5 no.2:357
Mr-Ap '64. (MIRA 17:8)

1. Institut khimicheskoy kinetiki i goreniya Sibirskogo
otdeleniya AN SSSR.

EUBNOV, N.N.; BAZHIN, N.M.; VOYEVODSKIY, V.V.

Formation of alkyl radicals in the phototransfer of electrons.
Kin. i kat. 5 no.3:568 My-Je '64. (MIRA 17:11)

1. Institut khimicheskoy kinetiki i goreniya Sibirskogo otdeleniya
AN SSSR.

I 39696-65 EFP(c)/EWP(j)/EWT(m)/EWP(b)/EWP(t) Pc-4/Pr-4 IJP(c)/RPL RM/JD
 S/0195/65/006/001/0056/0064
 41
 40
 B

ACCESSION NR: AP5006773

AUTHOR: Zhuzhgov, E. L.; Bubnov, N. N.; Voyevodskiy, V. V.

TITLE: Formation and reactions of free radicals in silicon organic compounds which have been irradiated with ultraviolet light. I. Polyphenylmethylsiloxane

SOURCE: Kinetika i kataliz, v. 6, no. 1, 1965, 56-64

TOPIC TAGS: ultraviolet light, ultraviolet radiation, silicon organic polymer

ABSTRACT: Using the method of electron paramagnetic resonance, kinetic investigations were made of the formation and reactions of free radicals in polyphenylmethylsiloxane. At 77°K the CH_3 and R-CH_2 radicals were identified. The study of the kinetic patterns of the accumulation of free radicals depending on the intensity of ultraviolet light shows that the process of the formation of the methyl radicals, which requires the rupture of the silicon-carbon chemical bond, is of a two-quantum nature; whereas the process of the formation of the R-CH_2 radicals, which comes with the rupture of the carbon-hydrogen bond, is of a one-quantum nature. The constants for the speed of the reactions of methyl radicals were determined. Orig. art. has: 6 figures, 22 equations.

Cord 1/2

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ACCESSION NR: AP5006773

ASSOCIATION: Institut khimicheskoy kinetiki i goreniya CO AN SSSR (Institute of
Chemical Kinetics and Combustion of Carbon Monoxide, Academy of Sciences SSSR)

SUBMITTED: 20Apr64

ENCL: 00

SUB CODE: GC, OC

NO. REF SOV: 003

OTHER: 007

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L 60261-65 EPF(c)/EWP(j)/EWT(m) Pc-4/Pr-4 RPL JAJ/RM
ACCESSION NR: AP5011680 UR/0195/65/006/002/0229/0236
541.515 29
28
6

AUTHORS: Zhuzhgov, E. L.; Bubnov, N. N.; Semenova, Ye. A.; Zhinkin, D. Ya.;
Voyevodskiy, V. V.

TITLE: Formation and reaction of free radicals in organosilicon compounds
irradiated with ultraviolet light 2. Silazanes

SOURCE: Kinetika i kataliz, v. 6, no. 2, 1965, 229-236

TOPIC TAGS: silazane, free radical, epr spectroscopy, uv spectroscopy,
organosilicon compound

ABSTRACT: The present investigation was undertaken to extend the currently avail-
able information of the effect of UV radiation on siloxanes to silazanes. The
following compounds were studied: hexamethyldisilazane, hexamethylcyclo-trisilazane,
octamethylcyclotetro silazane, trimethylcyclotrimethyl silazane, and tetromethyl-
cyclotetramethyl silazane. The EPR spectra were recorded after UV irradiation at
77K. The experimental method was that of E. L. Zhuzhgov, N. N. Bubnov, and V. V.
Voyevodskiy (Kinetika i kataliz, 6, 56, 1965). From the nature of the EPR spectra
(as the results of mass-spectroscopic analysis irradiation products) it is concluded

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I. 60261-65
ACCESSION NR: AP5011680

that the formation of free radicals in UV irradiated silazanes takes place via rupture of Si-C, Si-H, and C-H bonds. Orig. art. has: 4 graphs and 31 equations.

ASSOCIATION: Institut khimicheskoy kinetiki i goreniya, SO AN SSSR (Institute for Chemical Kinetics and Combustion, SO AN SSSR)

SUBMITTED: 27Jul64

ENCL: 00

SUB CODE: GC

NO REF SOV: 002

OTHER: 003

8/80
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