

UDC 62-507

USSR

YAKUBAYTIS, E. A.

"The Special States of a Cyclical Model of a Discrete Device"

Riga, Avtomatika i Vychislitel'naya Tekhnika, No 4, 1971, pp 1-5

Abstract: This article describes a cyclical model of a finite automaton in which a complex logic converter is used to substantially reduce the number of delay elements needed and to simplify the coding of internal states to the maximum degree. The coding of internal states can be simplified because of certain features of the model's transition tables which make it possible to simplify the equations which describe the functioning of the model. The model has $n+2k+m+2$ feedback loops (where n , k , and m are the number of input, intermediate, and output signals, respectively), but only one of them contains a delay element. The model, as described in the article, has numerous memory elements, but this is for the general case: some or all of these can be eliminated with synthesizing models of specific finite automata. Although the discussion is limited to asynchronous automata, the results can easily be extended to synchronous automata.

1/1

- 3 -

USSR

YAKUBAYTIS, E. A., Vice-President of the Academy of Sciences
Latvian SSR, Academician

"Problems Confronting the Latvian Academy of Sciences as a Re-
sult of Technical Progress"

Riga, Izvestiya Akademii Nauk Latviyskoy SSR, No 3, 1970,
pp 43-53

Abstract: The national economy of the USSR has entered the stage in which the most important trend in its development has become the intensification of production. This imposes new demands to be met in the activity of scientific institutions and in the relationship of scientific institutions to production. The Latvian Academy of Sciences is a complex of scientific institutions which, as a rule, successfully combine basic research with investigations for the specific needs of different sectors of the national economy. The most important line of research in the Institute of Physics is developmental work on a theory of the hydrodynamics of incompressible media, which has made possible the creation of electromagnetic pumps for use in atomic reactors, special power plants, and in the metallurgical industry.

1/9

USSR

YAKUBAYTIS, E. A., Izvestiya Akademii Nauk Latvyskoy SSR, No 3,
1970, pp 43-53

MHD devices have been the basis for the realization of a fundamentally new scheme for the industrial reprocessing of mercury which has been tested under operating conditions in the Soviet Union. Research on the interaction of radiation with matter has made possible the creation of thermoluminescent dosimeters for the recording of nuclear radiation as well as recommendations regarding the development of optical memory elements.

The Institute of Electronics and Computer Technology has been studying a number of important problems in cybernetics, including the theory of asynchronous logical automata. The study of statistical optimization theory has led to the creation of methods successfully used by many organizations in the USSR as well as in Bulgaria, Czechoslovakia, Hungary, and the German Democratic Republic. Questions related to the creation of automated control systems have become particularly important. The Physics and Power Engineering Institute is studying problems in power engineering. The institute has developed a series of mathematical

2/9

- 129 -

USSR

YAKUBAYTIS, E. A., Izvestiya Akademii Nauk Latvyskoy SSR, No 3,
1970, pp 43-53

models for planning the development of electric networks. These models were used to draw up schemes for the development of the Integrated Power System of the Northwest of the USSR and the Latvian SSR as well as the Republic of Cuba.

Research in the field of the mechanics of rigid bodies and polymers is being done by the Institute of Polymer Mechanics, with special emphasis on developing a deformation theory and a theory of optimal polymer reinforcement. Staff members of the Radio-astrophysical Observatory of the Latvian Academy of Sciences are working on the solution of problems in modern astrophysics. The Institute of Inorganic Chemistry is engaged in research devoted to the creation of a theory on the interaction of metals with water. The Institute of Wood Chemistry has done research leading to wood reprocessing by the methods of hydrolysis, pyrolysis, and chemical wood modification. Methods developed by the institute for the use of softwood instead of imported hardwood are already being introduced. Research on the creation of models in mathematical economics, begun several years ago at

3/9

USSR

YAKUBAYTIS, E. A., Izvestiya Akademii Nauk Latvyskoy SSR, No 3, 1970, pp 43-53

the Institute of Economics, has made possible the development of an automated water resource control system as well as the solution of problems involving the creation of an automated control system at the Latvian Ministry of Health. In the field of engineering linguistics the Institute of Language and Literature is developing a system for automated processing of speech information for purposes of creating a statistical model of Lettish.

The problems in constructing the material base of communist society require a sharp increase in the effectiveness of scientific research. There are five possible ways of accomplishing this.

1. Organizational measures. This method requires no capital investment and is very fruitful, yet it is receiving insufficient attention. The tendency to work on minor subjects still exists to some extent in all the institutes of the Academy. One of the most important problems of the Academy is to concentrate its forces and resources on the main scientific areas. Particularly

4/9

- 130 -

USSR

YAKUBAYTIS, E. A., Izvestiya Akademii Nauk Latvyskoy SSR, No 3, 1970, pp 43-53

serious attention should be given to subjects directly related to the national economy. The Institute of Polymer Mechanics has begun to take measures to increase the effectiveness of its scientific research and has reorganized its structure. An optimal subject plan needs to be developed, corresponding to the social need for given studies and to the capabilities of the institute. The Planned Production Division needs to improve the system of resource allocation among the scientific institutions of the Academy. The question of incentives and wages for scientific workers demands attention. Attention should be given to organizational and technical measures connected with the development of applied problems and the creation of new processes, materials, machines, and systems. This is the weakest and most difficult sector of the Academy's organizational work. The need to cut down on the time it takes to go from theoretical research through planning and testing to the creation of new technology and techniques requires the unification of all these stages under a single administration. This means the creation of scientific associations which include institutes, planning and design bureaus,

5/9

USSR

YAKUBAYTIS, E. A., Izvestiya Akademii Nauk Latvviyskoy SSR, No 3, 1970, pp 43-53

and experimental enterprises.

2. Strengthening ties with production. There should be special offices in the institutes to find in a theory under development everything that can be utilized in applied projects; to draw up and supervise the plans for these projects; to check on the cooperation of laboratories, design bureaus, workshops, and experimental enterprises; to keep in touch with production enterprises and directive organs; to gather information on actual results, make reports, etc. Almost all design bureaus in the institutes are understaffed, and their work and the coordination of their activity with laboratories, workshops, and experimental enterprises is poorly organized. Planning and design work in the Academy is lagging and constitutes the biggest bottleneck impeding the acceleration of developmental work for the national economy. The only way to overcome this is to attach to institutes relatively large planning-and-design or planning-and-technological bureaus functioning on a cost accounting basis. Putting planning, design, and technological work on a cost

6/9

- 131 -

USSR

YAKUBAYTIS, E. A., Izvestiya Akademii Nauk Latvyskoy SSR, No 3, 1970, pp 43-53

accounting basis will result in businesslike and effective forms of collaboration between scientific institutions and enterprises and industry. Serious attention should be given to the development of an experimental base for the scientific institutions of the Academy.

3. Automation. First steps in this direction are being taken at all the institutes of the Academy. The Academy now has at its disposal four computers and one data processor as well as skilled programming mathematicians and electronic engineers. Work has been begun on the creation of an Academy-wide Scientific Data Processing Center. The question of the creation of an Academy automated scientific data processing system is on the agenda.

4. Enlarging the role of information subdivisions. The Academy needs an information system functioning distinctly as an information service. Most institutes already have information divisions or groups. Information work at the Institute of Economics

7/9

USSR

YAKUBAYTIS, E. A., Izvestiya Akademii Nauk Latvyskoy SSR, No 3, 1970, pp 43-53

is especially good. However, the information system in the rest of the institutes is not effective enough.

5. Raising the skills of staff scientists. Seminars and lectures on the latest achievements in science should be organized at the Academy. The personnel training division must take urgent measures to increase foreign-language instruction.

Finally, the consumers -- production enterprises -- need to change their attitude towards the developmental projects of scientific institutions. For example, in 1964 the Physics and Power Engineering Institute got the idea of creating a genemotor [Transliterated from the Russian]. In 1966 the Institute created a pilot model of the machine, and in 1967 the genemotor was accepted by the Riga Electrical Machine-Building Plant for introduction into production. In 1969, a patent was obtained for the genemotor, and it is not being patented abroad. Three years have passed, but the invention still has not been introduced into

8/9

USSR

YAKUBAYTIS, E. A., Izvestiya Akademii Nauk Latvyskoy SSR, No 3,
1970, pp 43-53

production. There are many such examples. Powerful economic incentives are required to encourage enterprises to make use of the latest scientific achievements.

9/9

USSR

UDC 62-507

YAKUBAYTIS, E. A.

"Cyclic Model of a Discrete Device"

Riga, Avtomatika i Vychislitel'naya Tekhnika, No 6, Nov-Dec 71, pp 1-9

Abstract: An earlier article by the author described a method for reducing the number of external feedback loops by introducing special states instead of ordinary internal states. The present article considers the possibility of further reducing the number of these loops by using information about preceding input states. The author assumes that the reader is familiar with the content of the earlier article. A description is given of a model with potential input signals and one with pulse input signals. The generator is an asynchronous finite automaton with one delay element, whose logic elements satisfy the condition

$$\delta_{\max} \geq \delta_j \geq 0,$$

1/2

USSR

YAKUBAYTIS, E. A., *Avtomatika i Vychislitel'naya Tekhnika*, No 6, Nov-Dec 71, pp 1-9

(where δ_j is the actuation time of the j-th logic element) and the delay element satisfies the condition

$$t_{max} > \tau_j > \epsilon_{max}$$

(where ϵ_{max} is the maximum possible actuation time of the logic converter).
The code length is reduced by special placement of the internal states and storage of the preceding input state.

2/2

USSR

UDC: 62-507

YAKUBAYTIS, E. A.

"Stable Coding of States of Cyclical Model of a Discrete Device"

Riga, Avtomatika i Vychislitel'naya Tekhnika, No 2, 1972, pp 1-6.

Abstract: A method is studied for determining states in a cyclical model of codes providing for elimination of dangerous competition between intermediate signals with minimal length. An example is appended.

1/1

- 3 -

USSR

UDC 577.4

~~YAKUBAVETS, F. A.~~

"Nonredundant Coding of the Internal States of a Finite Automaton"

V sb. Avtomaty, gibridn. i upravlyayushch. mashiny (Automata, Hybrid and Control Machines — collection of works), Moscow, Nauka Press, 1972, pp 79-88 (from RZh-Kibernetika, No 7, Jul 72, Abstract No 7V351)

No abstract

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USSR

UDC: 62-507

YAKUBAYTIS, E. A., KALBERZIN', A. Ya.

"Upper Bound of the Minimum Number of Internal States of One Class of Asynchronous Finite Automata"

Riga, Avtomatika i Vychislitel'naya Tekhnika, No 4, Jul/Aug 72, pp 1-7

Abstract: The authors consider the effect which deviation from an ideal shape of input signals has on operation of asynchronous finite automata based on integrated circuitry. It is assumed that real signals behave in conformity with the conditions

$$t_{0 \rightarrow 1} > 0; t_{1 \rightarrow 0} > 0; 1 > \beta_1 > \beta_0 > 0;$$

where $t_{0 \rightarrow 1}$ is the time of change of a signal from 0 to 1; $t_{1 \rightarrow 0}$ is the time of change of a signal from 1 to 0; β_1 is the signal level above which the signal is perceived by the integrated circuit as a 1; β_0 is the signal level below which the signal is perceived as a 0. Primary tables of transitions in such automata are presented and converted to matrices of input states. A procedure is presented for minimizing the number of lines in such a matrix.

1/1

USSR

YAKUBAYTIS, E. A.

UDC 62-507

"Structure and Effectiveness of a Multifunctional Logic Element"

Riga, Avtomatika i Vychislitel'naya Tekhnika, No 5, Sep/Oct 72, pp 1-8

Abstract: The author analyzes the structure of a multifunctional logic element and derives formulas for determining the effectiveness of using such an element in a finite automaton designed for logical transformation.

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- 5 -

172 025 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--MODIFICATION OF UNSATURATED POLYMERS AND COPOLYMERS OF
1,3,BUTADIENE -U-
AUTHOR--(03)-TIKHOMIROV, B.I., KLOPOTOVA, I.A., YAKUBCHIK, A.I.
COUNTRY OF INFO--USSR
SOURCE--U.S.S.R. 265,432
REFERENCE--OTKRYTIYA, IZOBRET., PRGN. OBRATSY, TOVARNYE ZNAKI 1970,
DATE PUBLISHED--09MAR70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--BUTADIENS, CHEMICAL PATENT, POLYMER, COPOLYMER, CATALYTIC
HYDROGENATION, ORGANIC PHOSPHORUS COMPOUND, RHODIUM COMPOUND
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--3002/1426 STEP NO--UR/0482/70/000/000/0000/0000
CIRC ACCESSION NO--AA0128825
UNCLASSIFIED

2/2 025

CIRC ACCESSION NO--AA0128825

UNCLASSIFIED

PROCESSING DATE--13NOV70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. UNSATD. POLYMERS AND COPOLYMERS OF
1,3,BUTADIENE ARE MODIFIED BY HOMOGENEOUS HYDROGENATION IN A HYDROCARBON
SOLVENT IN THE PRESENCE OF A CATALYST, I.E.
TRIS(TRIPHENYLPHOSPHINE)CHLORORHODIUM.
A., STATE UNIVERSITY, LENINGRAD.

FACILITY: ZHDANOV, A.

UNCLASSIFIED

1/2 037
UNCLASSIFIED
TITLE--CALCULATION OF POLYBUTADIENE AVERAGE EXTENT OF CYCLIZATION
ACCORDING TO OZONE ABSORPTION CURVES -U-
AUTHOR--(02)-SHAGOV, V.S., YAKUBCHIK, A.I. PROCESSING DATE--27NOV70
COUNTRY OF INFO--USSR
SOURCE--VYSOKOMOL. SOEDIN., SER. B 1970, 12(4), 261-4
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--POLYBUTADIENE, CYCLIZATION, MOLECULAR STRUCTURE, OZONE,
MOLECULAR WEIGHT, SORPTION, CHEMICAL BONDING, NUCLEAR MAGNETIC
RESONANCE, IR SPECTRUM
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3006/1253 STEP NO--UR/0460/70/012/004/0261/0264
CIRC ACCESSION NO--AP0134927
UNCLASSIFIED

2/2 037

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0134927

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A METHOD WAS DEVELOPED FOR DETG. THE AV. DEGREE OF CYCLIZATION OF HIGH MOL. WT. CIS,1,4,POLYBUTADIENE (97PERCENT UNSATN.) AND LOW MOL. WT. CIS,1,4,POLYBUTADIENE (II) (95PERCENT UNSATN.) FROM O SUB3 ABSORPTION RATE CURVES (Y., ET AL., 1955). THE NO. OF DOUBLE BONDS CAN BE CALCD. FROM THE RATIO OF LINEAR DOUBLE BONDS TO CYCLIZED DOUBLE BONDS PROVIDED THE TOTAL UNSATN. IS KNOWN. THE METHOD DEVELOPED WAS SUPERIOR TO IR AND (OR) NMR SPECTROSCOPIC DETNS. FACILITY: LENINGRAD. GOS. UNIV. IM. ZHDANOVA, LENINGRAD, USSR.

UNCLASSIFIED

USSR

UDC 621.382.23

LIBERMAN, L.S., SESTRORETSKIY, B.V., SHPIRT, V.A., YAKUBENI, L.M. [Members
Scientific-Technical Society Of Radio Engineering, Electronics, And
Communications imeni A.S. Popov]

"Semiconductor Diodes For Control Of Microwave Power"

Radiotekhnika, Vol 27, No 5, May 1972, pp 9-24

Abstract: The paper discusses the thermal and electrical effects in switching and limiter diodes at high and low levels of microwave power, the system of parameters of the diodes, and the methods for their measurement. The principal statements of the theory of devices for control of microwave power are discussed. Planning of one- and multichannel regulator units based on switching and limiter devices is described. It is concluded that use of switching and limiter diodes in microwave technology makes it possible to reduce the dimensions and weight of apparatus, to increase its speed of response, to reduce the power with respect to control goals, and to increase the reliability. 15 fig. 22 ref. Received 3 Jan 1972.

1/1

USSR

Precision Mechanical and Optical
UDC 535.822.2

BRUMBERG, Ye. M., Doctor of Sciences, YAKUBENAS, V. A. A., Candidate of Sciences

"Contact Microscopy in Reflected Light"

Optiko Mekhanicheskaya Promyshlennost', No 12, 1972, pp 27-30.

Abstract: A method is described for contact microscopy in reflected light. Various methods of illumination of total biological preparates are studied when this method is used. This is essentially a new type of microscopy, requiring the development of special apparatus and methods of preparation of the objects to be studied, including living biological specimens. In many cases, the method can be used as an independent, simple method of investigation of pathological-anatomical material. The device allowing contact microscopy in reflected light can be made by construction of a simple addition to an ordinary microscope using a low-power incandescent bulb as the light source. The method eliminates the need for microtones, material freezing systems, reduces the need for reagents and eliminates the necessity of a laboratory assistant.

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USSR

UDC 616.988.75+616.2-036.11-022.6]-097.3

SHADRIN, A. S., YAKUBENKO, A. A., MALYSHEVA, A. M., NAYKHIN, A. N., GROMOVA, M. I., RUMEL', N. B., and SMORODINTSEV, A. A., All-Union Scientific Research Institute of Influenza, Leningrad

"The Effect of Serum Antiviral Inhibitors on Resistance to Influenza and Acute Respiratory Diseases"

Moscow, Voprosy Virusologii, No 5, Sep/Oct 72, pp 582-586

Abstract: A study conducted on about 1000 men, women, and children living in Leningrad and Murmansk and on 129 volunteers revealed that the presence of beta-inhibitors in the blood significantly reduces the proportion of clinically severe forms of influenza and parainfluenza (a fall by a factor of 2.5), decreases the frequency of severe forms of experimental influenza (down by a factor of 2), and slows the development of immune response to vaccination with highly attenuated influenza strains. Beta-inhibitors do not exert an anti-infectious effect, that is, they do not prevent contraction of the diseases. Their protective value stems from their antitoxic effect, that is, reduction of the severity of influenza and parainfluenza without hindering the body's specific reaction to the infection.

1/1

- 21 -

YAKUBENYA, M.P.

SPRS 52018
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8

Article by L. G. Izrael, Yu. M. Kopylov, Yu. G. Katayev, L. M. Krasnitskiy, V. A. Lutsenko, Yu. M. Mikhaylov, A. G. Shukrov, N. E. Yakubeniya, *Plazmafizika*, No. 1, 1973, pp. 1-17.

Under the action of the electric field and the distribution of the electric field with respect to thickness of the autoepitaxial layers of palladium within the range of 600-750° C here, the thermodynamic superheating was kept constant.

For the stationary section, the optimal temperature range (675-700° C) was observed at which the layers grow more perfect with respect to structure and with maximum adhesion concentration and maximum electron mobility. In the case of a reduction in the crystallization temperature from optimal, the growth rates are exhibited more weakly, the growth rate drops, and the alloying level increases. The increase in temperature above optimal leads to local isolation of the second phase, inhibition of the growth stages in these sections and decrease in the growth rate. Here, the growth rate decreases, and the alloying level increases.

USSR

UDG 615.332 (Rifampicinum).015.44, 576.851.252+576.851.42

BOBROVSKIY, M., DZERZHANOVSKAYA, D., YAKUBICH, P., and BOROVSKIY, YE., Chair of Microbiology, University Medical School, Bialystok, Poland

"Rifampicin Activity Against Clinical Strains of Staphylococci and Gram-Negative Bacilli"

Moscow, Antibiotiki, No 12, 1971, pp 1072-1077

Abstract: Study of 282 bacterial strains isolated from pus, sputum, urine, and feces showed that all 120 Staphylococcus aureus strains were highly sensitive to rifampicin in concentrations ranging from 0.005 to 0.05 μ g/ml. Among the gram-negative bacteria, E. coli and Proteus were the most sensitive to the antibiotic. Salmonella and Shigella were somewhat less sensitive, while Klebsiella and Ps. aeruginosa proved to be resistant. The minimum inhibitory concentration of rifampicin varied with the amount of bacteria tested and the pH of the medium. Resistant variants growing in the presence of high concentrations of the antibiotic appeared at the rate of 1 per 10^7 cells. The sensitivity of many of the gram-negative strains was intensified by increasing the acidity of the medium. It is suggested that the therapy of urological infections can be made more effective by acidifying the patient's urine.

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USSR

UDC 8.74

TUKHWATOV, M. B., YAKUBOV, A. R., ABDIKHAKIMOV, N. A.

"Program for Execution of the Weighting Algorithm for Solving the Problem of Boolean Programming on the Minsk-22 Computer"

Nauch. zap. Tashkent. in-t nar. kh-va (Scientific Notes of Tashkent Institute of the National Economy), 1971, vyp. 60, pp 27-42 (from RZh-Kibernetika, No 7, Jul 72, Abstract No 7V609)

No abstract

1/1

- 71 -

USSR

YAKUBOV, E. M.

"Optimization of Operation of Hydrolyzate for Growth of Yeasts"

Vopr. Kibernetiki [Problems of Cybernetics -- Collection of Works], No 50, Tashkent, 1972, pp 124-126 (Translated from Referativnyy Zhurnal, Kibernetika, No 1, 1973, Abstract No 1 V776).

Translation: A simple problem in linear programming.

1/1

- 62 -

USSR

KHAMIDOV, A., ASER'YANTS, B. S., and YAKUBOV, I. M., Chair of Microbiology,
Andizhan Medical Institute, Andizhan

"Clinical and Epidemiological Characteristics of Q-Fever in Rishtanskiy Rayon,
Ferganskaya Oblast"

Tashkent, Meditsinskiy Zhurnal Uzbekistana, No 1, Jan 73, pp 38-39

Abstract: In Mar-Apr 69 an outbreak of Q-fever occurred at a village in the Rishtansk Rayon, Fergana Oblast', among pupils and teachers of a school, of whom 77 were affected. The majority of the patients (64) were 8-15 years of age. There were 69 mild cases and 8 cases of medium severity. The patients exhibited a positive reaction of complement fixation with an antigen derived from *Rickettsia burnetti*, with the titer of the reaction increasing as the disease progressed. This indicated with certainty that the disease in question was Q-fever. Ten of 76 heads of cattle kept by private owners in the vicinity of the school had a positive complement fixation reaction towards *R. burnetti*. Furthermore, *R. burnetti* were isolated from the placenta of one cow. Evidently the outbreak occurred as a result of contact with infected cattle and because of the consumption at the school of raw milk and dairy products derived from such cattle.

1/1

- 11 -

USSR

ZHELEZNYAK, M. B., MNATSAKANYAN, A. KH., YAKUBOV, I. T. (Moscow)

"Relaxation and Nonequilibrium Radiation Behind Shock Waves in Air"

Moscow, Mekhanika Zhidkosti i Gaza, No 4, Jul-Aug 70, pp 161-174

Abstract: The article deals with relaxation behind shock waves in air at velocities of 8-12 km/sec. Profiles of the gas parameters behind the front are obtained. The population densities of radiant states of atoms and molecules are computed. The spectral radiation distributions of the relaxation zone are found. In a number of spectrum intervals the radiation intensity passes through a maximum which is in excess of the equilibrium level. A comparison is made with experimental data obtained in shock tubes. The radiant fluxes of heat from the relaxation zone are computed. Estimates are made of the contribution of this radiation to the radiation heating of blunt bodies in a hypersonic streamline flow. In the first two sections of the article are written the equations of molecular and ionization relaxation, the 1/2

USSR

ZHELEZNYAK, M. B., et al, Mekhanika Zhidkosti i Gaza, No 4,
Jul-Aug 70, pp 161-174

velocity values of the basic processes are presented. In the third section are discussed the initial conditions which are determined by the state of the gas before the front. The results of calculation of the kinetics of relaxation are presented in the fourth section. The fifth and sixth sections deal with calculation of the nonequilibrium zone in atomic lines and molecular bands. A comparison is made with experimental data; this is a necessary stage which permits correction of the theoretical results. In the seventh and eighth sections, nonequilibrium radiant fluxes of heat are computed. The contribution of nonequilibrium radiation to aerodynamic heating is compared with equilibrium radiation and convective heating. 1 table, 7 figures, 41 bibliographic entries.

2/2

- 11 -

USSR

UDC 533.601.155/.9

BIBERMAN, L. M., MNATSAKANYAN, A. Kh., and YAKUBOV, I. T., Institute of High Temperatures, Academy of Sciences USSR

"Ionization Relaxation Behind Strong Shock Waves in Gases"

Moscow, Uspekhi Fizicheskikh Nauk, No 3, Nov 70, pp 431-462

Abstract: The results of recent research in the field of ionization relaxation is summarized and problems as yet unsolved are pointed out. It is noted that relaxation phenomena behind shock waves have been discussed in surveys and monographs but that problems of ionization relaxation were not given sufficiently complete coverage because the basic results in this field were obtained only in recent years. These successes have resulted in intensive experimental studies at large Mach numbers and progress in the theory of kinetics in a low-temperature plasma. Problems of ionization kinetics in a plasma, initial ionization mechanisms, the structure of the relaxation zone, and radiation of the nonequilibrium zone are discussed in the survey. The table of contents of this survey follows:

2. Ionization Kinetics in a Low-Temperature Plasma. 2.1 Ionization and
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USSR

BIBERMAN, L. M., et al, Uspekhi Fizicheskik Nauk, No 3, Nov 70, pp 431-462

Recombination in an Atomic Plasma Under Collisions With Electrons. 2.2. Effect of Radiation and Interatomic Collisions on Ionization and Recombination Kinetics. 2.3. Electron Energy Balance. 3. Ionization in the First Stage of Relaxation. 3.1. Ionization in Atomic-Molecular Collisions. 3.2 Ionization Caused by Radiation Transfer. 3.3. Effect of Admixtures on Initial Ionization. 4. Structure of Relaxation Zone. 4.1. Profiles of Plasma Parameters in the Relaxation Zone. 4.2. Comparison of Calculated and Measured Values of Relaxation Times in Atomic Gases. 4.3 Ionization Relaxation Behind Strong Shock Waves in Molecular Gases. 4.4. Stronger Shock Waves. 5. Radiation of the Relaxation Zone. 5.1 Distribution of Atoms With Respect to Excited States in a Nonequilibrium Plasma. 5.2. Nonequilibrium Radiation in Spectral Lines and the Continuum. Maximum of Nonequilibrium Radiation. 5.3 Effective Processes in the Relaxation Zone on Aerodynamic Heating in a Hypersonic Flow. It is noted that there is not now any satisfactory theory for the radiation maximum in a nonequilibrium zone and that this is due to the variety and complexity of elementary processes in a molecular plasma. It is also pointed out that studies have shown that the contribution of nonequilibrium radiation to aerodynamic heating can be disregarded, but this result was obtained for motion in the earth's atmosphere and may be different for other planets.

2/2

Magnetohydrodynamics

UDC 533.951.8

USSR

KRUZHILIN, N. A., and YAKUBOV, I. T.

"Conditions for the Appearance of Ionization Instability in a Nonstationary Plasma without Two-Temperature Approximation"

Moscow, Teplofizika Vysokikh Temperatur, Vol 8, No 4, 1970, pp 712-715

Abstract: The plasma under discussion in this article is uniform, in crossed electric and magnetic fields. The conditions under which there is no "two-temperature" approximation -- that is, when the electron concentration is not connected by the Saha relation with the electron temperature -- are considered. The authors begin their calculations by writing the equations of ionization kinetics under these conditions and obtain an expression for a plasma in crossed electric and magnetic fields in which the average Hall current is zero. They also find relationships between the time of development of heterogeneities and the background relaxation time. The authors note that with no magnetic field perpendicular to the electric field, an ionization instability peculiar to a two-temperature plasma may arise. They express their gratitude to V. S. Vorob'yev, A. M. Dykhne, and V. A. Kas'yanov for their valuable comments.

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1/2 026

TITLE--THEORY OF A WEAKLY IONIZED PLASMA WITH STRONG INTERACTION -U-
UNCLASSIFIED
PROCESSING DATE--27NOV70

AUTHOR--YAKUBOV, I.T.

COUNTRY OF INFO--USSR

SOURCE--ZHURNAL EKSPERIMENTAL'NOY I TEORETICHESKOY FIZIKI, 1970, VOL 58,
NR 6, PP 2075-2078

DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--ION, PLASMA, PARTICLE INTERACTION, LITHIUM, MERCURY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/2224

STEP NO--UR/0056/70/058/006/2075/2078

CIRC ACCESSION NO--AP0125802

UNCLASSIFIED

2/2 026

CIRC ACCESSION NO--AP0125802
ABSTRACT/EXTRACT--(U) GP-0-

UNCLASSIFIED

PROCESSING DATE--27NOV70

ABSTRACT. A NONGENERATE PLASMA WHOSE
NONIDEALITY IS DUE TO CHARGE, NEUTRAL PARTICLE INTERACTION IS
CONSIDERED. THE ELECTRON STATE DENSITY AND EQUATION FOR IONIZATION
EQUILIBRIUM ARE OBTAINED IN THE CASE OF STRONG NONIDEALITY. THE
NONIDEAL PLASMA IS FOUND TO ACQUIRE SEMICONDUCTOR PROPERTIES. A LARGER
NUMBER OF LOCALIZED ELECTRONS APPEAR AND THE ELECTRIC CONDUCTIVITY
SHARPLY RISES. CONCRETE ESTIMATES ARE MADE FOR LITHIUM AND MERCURY
PLASMAS. FACILITY: INSTITUT VYSOKIKH TEMPERATUR AN SSSR.

UNCLASSIFIED

USSR

TUBAYEV, T. T., et al, *Uzbekskiy Biologicheskij Zhurnal*, Vol 16, No 3, 1972, pp 43-44

carotene and crude protein 55.9, crude fat 10.4, ash 10-17, monosaccharides 0.13, maltose 1.2, dextrans 1.9, starch 2.02, hemicellulose 0.49, and cellulose 0.54. As far as the yield and the chemical composition of the biomass are concerned, *S. obliquus* is not inferior to *Chlorella*. Furthermore, it surpasses *Chlorella* with respect to some useful properties. *S. obliquus* contains chondrillasterone (0.23% of dry matter), which can be used as a starting material for the synthesis of cortisone. On the basis of the results obtained, the cultivation of *S. obliquus* under the open sky looks very promising.

2/2

UDC 582.264:576.809.33

USSR

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203620001-5
 TUBAYEV, T. T., VASIGOV, T., RAHIMOV, A., and ...
 Microbiology, Academy of Sciences Uzbek SSR

"Mass Cultivation of *Scenedesmus* Under the Open Sky"

Tashkent, *Uzbekskiy Biologicheskij Zhurnal*, Vol 16, No 3, 1972, pp 43-44

Abstract: Experiments were conducted on the cultivation on a large scale under the open sky of the local mesothermal strain UA-2-6 of the alga *Scenedesmus obliquus* (Turp.) Kuetz., which had been isolated from the soil of irrigated fields in the vicinity of Tashkent. Cultivation was carried out on an experimental plot of the Institute of Botany, Academy of Sciences Uzbek SSR. The algae were grown on installations of a type developed at Leningrad State University. The layer thickness was 8-10 cm. The inorganic nutrient medium (cf. Ye. I. Milogradova and A. M. Mizafarov, p 9, in the symposium *O Proizvodstvennoy Kul'ture Odnokletochnykh Vodorosley - The Cultivation of Single-Cell Algae on a Production Scale* -, Fan, Tashkent) was used. CO₂ was fed in by means of a centrifugal pump. The average daily yield of *S. obliquus* from May to Sep corresponded to 18.4 g dry matter per sq. m. vs. 17.2 g for *Chlorella vulgaris* Beyer 157. The biomass of *S. obliquus* contained 750.2 mg/kg

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1/2 - 007 UNCLASSIFIED
TITLE--COMPLEXING OF IRON, III, WITH PHENOL -U- PROCESSING DATE--13NOV70
AUTHOR--(05)--NIKOLSKIY, B.P., PALCHEVSKIY, V.V., CHEGODAYEVA, A.D.,
YAKUBOV, KH.N., SAMBUR, T.V.
COUNTRY OF INFO--USSR
SOURCE--DOKL. AKAD. NAUK SSSR 1970, 192(1), 102-4
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--IRON COMPOUND, COMPLEX COMPOUND, PHENOL
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3006/1204 STEP NO--UR/0020/70/192/001/0102/0104
CIRC ACCESSION NO--AT0134878
UNCLASSIFIED

2/2 007

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AT0134878

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE COMPLEXING OF FE(III) WITH PHOH AND THE POSSIBLE FORMATION OF THE (FEOPH) PRIME2POSITIVE COMPLEX WAS STUDIED BY MEASURING THE CHANGE IN THE OXIDN. POTENTIAL OF THE FE(III)-FE(II) SYSTEM (USING FE(CLO SUB4) SUB3 AND FE(CLO SUB4) SUB2 IN NACLO SUB4 SOLN.) AT 25DEGREES AS A FUNCTION OF PH, THE ADDUACT CONC., AND THE CONCNS. OF THE OXIDIZED AND REDUCED FE. THE PH DEPENDENCE CURVES OF THE OXIDN. POTENTIAL IN THE PRESENCE AND IN THE ABSENCE OF PHOH INDICATE THAT PHOH HAS NO EFFECT ON THE HYDROLYSIS OF FE(III). THE BLUE COLOR WHICH APPEARS AT PH GREATER THAN OR EQUAL TO 0.9 CHANGES TO YELLOW AT PH GREATER THAN 2. ADDNL. SPECTROPHOTOMETRIC STUDY OF THE FE(III) PHENOL SYSTEM AT 550 NM REVEALED THAT THE ABSORBANCE OF THE SYSTEM INCREASES WITH INCREASING PHOH CONC. AND WITH PH OF THE SYSTEM. THE EXPTL. DATA SUGGEST THAT THE COMPLEX RESPONSIBLE FOR THE BLUE COLOR IS FORMED BY THE ADDN. OF PHOH TO THE PRODUCTS OF THE PRIMARY HYDROLYSIS OF FE(III) COMPS.: (FE (H SUB2 O) SUB6) PRIME3POSITIVE FORMS AND IS FORMED FROM (FE(OH)(H SUB2 O) SUB5)PRIME2POSITIVE PLUS H PRIMEPOSITIVE, (FE(OH)(H SUB2 O) SUB5) PRIME2POSITIVE PLUS PHOH FORMS AND IS FORMED FROM FE(OH)(H SUB2 O) SUB4 PHOH) PRIME2POSITIVE.

FACILITY:
 LENINGRAD. GOS. UNIV. IM. ZHDANOVA, LENINGRAD, USSR.

UNCLASSIFIED

1/2 012 UNCLASSIFIED PROCESSING DATE--09OCT70
TITLE--FATTY ACID AND GLYCERIDE COMPOSITION OF BUTTERFAT -U-
AUTHOR-(03)-YAKUBOV, M.K., GLADKAYA, V.F., ATRAMENTOVA, V.G.
COUNTRY OF INFO--USSR
SOURCE--MOLOCH. PROM. 1970, 31(2), 19-21
DATE PUBLISHED-----70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--FATTY ACID, FAT, FOOD ANALYSIS, GLYCERIDE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--1993/0253

STEP NO--UR/0333/70/031/002/0019/0021

CIRC ACCESSION NO--AP0113188

UNCLASSIFIED

2/2 012

UNCLASSIFIED

PROCESSING DATE--09OCT70

CIRC ACCESSION NO--AP0113188

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. BUTTERFAT CONTG. 23.65 AND 36.05
MOL. PERCENT UNSATD. ACIDS CONSISTED MAINLY OF DI AND TRISATD.
GLYCERIDES. MONOSATD. AND TRIUNSATD. GLYCERIDES WERE NOT FOUND IN
WINTER FAT, AND IN SUMMER FAT ONLY 8.17 AND 0.31PERCENT, RESP., WERE
FOUND. FACILITY: KHAR'KOV, POLITEKH. INST. IM. LENINA, KHARKOV,
USSR.

UNCLASSIFIED

YAKOVLEV, N.K.

cybernetics/linguistics-

31 Mar 71

109

PROG:ZEMURTYCS b6/b7c

I. Mathematical Problems of Semiotics

331. Uzun
N.C. cybernetics/linguistics

59: FOREIGN PRESS
31 Mar 71 DISSEM

000 000:51

"Automatic Combination of Uzbek Morphemes in the Proper Word Form"
Vopr. kibernet. i vychisl. matem. [Problems of Cybernetics and Computer Mathematics -- Collection of Papers], No 37, Tashkent, 1970, pp 63-71. (Translated from 323 Kibernetika, No 12, 1970, Abstract No 121041)
Translation: Problems of machine translation into Uzbek (semantics?) See abstract.

1/1

USSR

YAKUBOV, Sh. Kh., and SEMENOV, B. E., Institute of Poliomyelitis and Virus Encephalitides, Academy of Medical Sciences USSR, and Uzbek Scientific Research Institute of Epidemiology, Microbiology, and Infectious Diseases

"The Hemagglutinating Properties and Cytopathic Activity of Some Little- Investigated Arboviruses"

Tashkent, Meditsinskiy Zhurnal Uzbekistana, No 1, Jan 73, pp 26-30

Abstract: In a study conducted with the arboviruses Chenunda (I), Kvaranfil (II), N'yamanini (III), Bandia (IV), Uulruniemi (V), Okola (VI), and Ingvavura (VII), the pathogenicity of the viruses to various cell cultures and the effectiveness of methods for the extraction of hemagglutinins associated with the viruses were studied. Cultures of the fibroblasts of chicken embryos (FKE), of pig embryo kidney cells (PES), of cells of the kidney epithelium of green marmosets (Vero), of cells of the kidney epithelium of hamster embryos (VHK-21), and cells of carcinoma of the cervix uteri (HeLa) were infected with the viruses. As an auxiliary means used with the purpose of obtaining hemagglutinating antigens from the cell cultures, medium 199 based on Earl's solution without serum was applied. Infection of cell cultures proved unsuitable for obtaining hemagglutinating antigens from the viruses. I and VII at sufficiently high titers produced

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- 43 -

USSR

YAKUBOV, Sh. Kh. and SEMENOV, B. F., Meditsinskiy Zhurnal Uzbekistana, No 1, Jan 73, pp 26-30

degenerative changes in PES, VNK-1, Vera, and FKE. II, III, IV, V, and VI, when present at high titers, had a cytopathic activity only towards some of the cell cultures. By applying various procedures for extraction from the brain of infected newborn mice, the hemagglutinating antigens of II, IV, V, VI, and VII were obtained. However, the antigen derived from VII was not always extracted, had low titers, and was very unstable. No hemagglutinins derived from I or III could be detected on extraction from brain tissue by any method.

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USSR

YAKUBOV, Sh. Kh., SEMENOV, B. F., MAKSUMOV, S. S., KARASEVA, P. S., SADYKOVA, V. D., and CHUNIKHIN, S. P., Institute of Poliomyelitis and Viral Encephalitis Academy of Medical Sciences USSR; and Uzbek Scientific Research Institute of Epidemiology, Microbiology, and Infectious Diseases

"Serological Data on the Circulation of Virus of the Tachina Fly (Larvaevoridae) in the Uzbek SSR"

Tashkent, Meditsinskiy Zhurnal Uzbekistana, No 4, 1971, pp 27-30

Abstract: A serological study was carried out to determine the possible foci of the Tachina virus in Uzbekistan. Human and domestic animal sera were collected in Tashkent'skaya, Surkhandar'yinskaya, Samarkand'skaya and Kashkadar'inskaya Oblasts, and in the Karakalpak Autonomous Soviet Socialist Republic. Virus-neutralizing antibodies were found in all areas studied in 16.7% of the human population and 15.5% of animals with titers of 1:10-1:80. Immunity was lower in people inhabiting mountainous and foothill regions than in the plains, except for Kashkadar'yinskaya oblast', where the percentage of antibodies in the plains was lowest probably because of weakly developed irrigation and resultant lesser number of flies. Statistically, immunity was higher among older inhabitants. The presence of antibodies proved that the virus

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YAKUBOV, SH. Kh., et al, Meditsinskiy Zhurnal Uzbekistana, No 4, 1971,
pp 27-30

does circulate within Uzbekistan, as it apparently also does in other southern
regions of the USSR, where investigations showed similar results.

2/2

- 38 -

USSR

UDC: None

YAKUBOV, S. Ya.

"The Cauchy Problem for Nonlinear, Hyperbolic Second-Order Equations"

Baku, Izvestiya Akademii Nauk Azerbaydzhanskoy SSR-- Seriya Fiziko-Tekhnicheskikh i Matematicheskikh Nauk, 1970, No. 3, pp 16-21

Abstract: This mathematical article is devoted to investigating the solvability of the Cauchy problem for the hyperbolic equation

$$u''(t) + A(t, u(t))u(t) = f(t), \quad u(t_0) = u_0, \\ u'(t_0) = u_1,$$

in Hilbert space H . The problem presented by this equation was first considered in an earlier paper by the same author (DAN SSSR --Reports of the Academy of Sciences USSR--176, 1, 1967) where a theorem concerning its solvability was presented without proof. In the present paper the problem is investigated, by the method proposed in the earlier article, under less limiting conditions, and a deeper examination is made of the special form of that equation,

$$u''(t) + g(t, u(t))Au(t) = f(t), \quad u(t_0) = u_0, \\ u'(t_0) = u_1.$$

1/1

CZECHOSLOVAKIA

UDC 615.334(PENICILLINUM).012.6.002.62

FUSKA, YA., YAKUBOVA, A., GALYAMA, D. V., and BUCHKO, M., Chair of Technical Microbiology and Biochemistry, Chemico-Technological Faculty, Slovak Technological Institute, Bratislava, and Biotika, Slovenska Lyupcha

"Production of 6-Aminopenicillanic Acid"

Moscow, Antibiotiki, Vol 17, No 9, Sep 72, pp 775-778

Abstract: The possibility of producing 6-aminopenicillanic acid (I) directly in connection with the production of penicillin was studied. A filtrate of a production culture synthesizing benzylpenicillin was extracted with butyl acetate. The butyl acetate extract was stirred with an aqueous suspension of cells of *E. coli*, strain ATCC 9637, at pH 7.2-7.4. As a result of enzymatic hydrolysis of benzylpenicillin, I formed. On separation of the *E. coli* cells by centrifuging and changing the pH to 2.0-2.2, unconverted penicillin (benzylpenicillin) and the phenylacetic acid that formed were transferred from the aqueous into the butyl acetate phase, while I remained in the aqueous phase. I crystallized from the aqueous solution after $(\text{NH}_4)_2\text{SO}_4$ had been added to it, the pH brought to 4.2-4.3, and the solution kept

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USSR

FUSKA, YA., et al., Antibiotiki, Vol 17, No 9, Sep 72, pp 775-778

at 0-5°. The yield of I in the two solvents system depended on the volume ratio of the solvents. A yield of 85% was reached at the optimum ratio after 6 hrs of conversion. I with a purity of 92-95% was obtained. The advantage of the method described is that I, which is used in the synthesis of new penicillins, is obtained directly from the production culture without isolating penicillin.

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USSR

KARTUSHINA, L. I., ROZHKOVA, A. M., DAVRONOVA, A. M., SAMSONOVA, Z. F., and YAKUBOVA, M. YA., Uzbek Scientific Research Institute of Epidemiology, Microbiology, and Infectious Diseases, and Bacteriological Department, Children's Railroad Hospital No 3, Tashkent

"A Placenta and Yeast Hydrolysate as the Basis for a Nutrient Medium for Growing Pathogenic Microbes"

Tashkent, Meditsinskiy Zhurnal Uzbekistana, No 1, 1970, pp 81-83

Abstract: Numerous substitutes for nutrient materials also include placental fluid hydrolyzed with yeast. In this investigation, we determined the feasibility of using placental tissue as nutrient material, by hydrolyzing it with brewer's yeast. A mixture of 1 kg of ground placenta 2 l of brewer's yeast, and 2 l of tap water was kept at 50° C for 6 days, with periodic stirring. Then, the supernatant fluid was decanted. This placenta and yeast hydrolysate, with a high amine nitrogen (400-420 mg%) and peptone (2.3-2.5%) content, was inactivated at 80° C. To prepare nutrient media, the hydrolysate was appropriately diluted, the pH was adjusted, and wither salt or glucose was added. Control media were made from the 1/2

USSR

KARTUSHINA, L. I., et al., Tashkent, Meditsinskiy Zhurnal Uzbekistana, No 1, 1970, pp 81-83

Khottinger's broth. Various strains of Shigella, Salmonella, Escherichia, and Staphylococcus were cultured in sugar media, totaling 225 cultures. In 24 hours, the yields from the experimental and control cultures were equal. Salt media were used as elective nutrients to isolate Staphylococci from feces and vomitus of patients with acute gastrointestinal disorders. Sixty-five parallel tests were carried out. In 24 cases, the Staphylococci were simultaneously isolated from the experimental and the control cultures. This indicates that salt-containing nutrient media made from a placenta and yeast broth have elective properties matching those of media made from the Khottinger's broth.

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USSR

UDC 51:801

YAKUBOVA, N., TAYMETOV, K.

"Automatic Generation of Nominal Word Combinations"

V sb. Vopr. kibernetiki (Problems of Cybernetics -- collection of works),
vyp. 46, Tashkent, 1971 (1972), pp 201-205 (from RZh-Kibernetika, No 7, Jul 72,
Abstract No 7V676)

Translation: An effort is made to propose NS-rules describing the simplest
type of name groups in the Uzbek language. The article contains obscurities
and linguistic errors.

- END -

10845

CSO: 1843-W

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USSR

UDC 632.95

ZAKHIDOV, A. Z., KHASANOV, YU. U., YAKUBOVA, R. A.

"Aldrin Content in Soil, Cotton Plants, and Their Products"

Moscow, V. sb. Vopr. gigiyeny i toksikol. pestitsidov (Problems of the Hygiene and Toxicology of Pesticides), "Meditsina", 1970, pp 262-263 (from RZh-Khimiya, No 24(II), 25 Dec 70, Abstract No 24N632, by P. V. Popov)

Translation: After aircraft spraying of cotton plantings with aldrin (I), I residues in soil varied from 0.5 to 1.1 mg/kg. After application to soil containing seeds, the amount of I in the 0-30 cm layer varied within the limits 0.017-0.2 mg/kg, and in the 70-100 cm layer, within the limits 0.002-0.04 mg/kg. Planting cotton with seeds treated with I (0.5-0.75 kg/hect) led to contamination of oil with I (0.3 mg/l), and also to I contamination of oil cake, pods, seed kernels, and seeds (0.09-0.15 mg/kg). I residues were found also in cotton a year after planting I treated seeds: 0.05-0.6 mg/l in oil, 0.05-0.4 mg/kg in seeds, and 0.05-0.3 mg/kg in pods and oil cake.

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USSR

UDC 678.675'52'74

YAKUBOVICH, A. YA. (DECEASED), YAKUBOVICH, V. S., and BRAZ, G. I.

"Polybenzoxazoles -- Novel Thermally Stable Film- and Fiber-Forming Polymers"

Moscow, *Plasticheskiye Massy*, No 9, 1970, pp 17-19

Abstract: Polybenzoxazoles were obtained from aromatic bis-(o-hydroxyamines) and dicarboxylic acyl halides. Polyhydroxyamides were obtained from low temperature polycondensation in dimethyl acetamide or in N-methylpyrrolidone then converted to polybenzoxazoles by thermal treatment. Two representatives of the new class of thermally stable polymers were obtained by reacting 3,3'-dihydroxybenzidine with isophthallyl chloride and 4,4'-dihydroxy-3,3'-diaminodiphenylsulfone with tetraphthallyl chloride, yielding PB-1 and Sn-PB-T respectively. Both are yellow polymers, insoluble in most organic solvents, soluble in concentrated sulfuric acid. They begin to decompose in air at about 450°C. With respect to strength and thermal stability, PB-1 is comparable to polypyromellitimide. Films made from

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YAKUBOVICH, A. YA., et al, *Plasticheskiye Massy*, No 9, 1970, pp 17-19

PB-1 are also resistant to thermooxidative reaction. Both PB-1 and Sn-PB-T have high hydrolytic resistance and they appear to have good dielectric properties. The only problem with polybenzoxazole covers is that they are not sufficiently elastic.

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1/2 020 UNCLASSIFIED PROCESSING DATE--04DEC70
TITLE--REACTION SCHEME AND NATURE OF THE POLYCONDENSATION OF
CHLOROPHOSPHONYL, ALKYL, ARYL, PHOSPHAZENES -U-
AUTHOR-(04)-YAKUBOVICH, A.YA., FILATOVA, I.M., ZAYTSEVA, YE.L.,
YAKUBOVICH, V.S.
COUNTRY OF INFO--USSR
SOURCE--VYSOKOMOL. SOEDIN., SER. A 1970, 12(3), 585-91
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--POLYCONDENSATION, CHLORINATED ORGANIC COMPOUND, ORGANIC
PHOSPHORUS COMPOUND, NITROGEN COMPOUND
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3007/0718 STEP NO--UR/0459/70/012/003/0585/0591
CIRC ACCESSION NO--AP0136157
UNCLASSIFIED

272 020

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0136157

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE CONDENSATION MECHANISM OF THE
 TITLE COMPS. WAS STUDIED AT ELEVATED TEMPS. PH SUB2 PCL DOUBLE BOND
 NP(O)CL SUB2 (I) FAILED TO GIVE POLYPHOSPHAZENES EVEN WHEN HEATED TO
 320DEGREES, HOWEVER, WHEN I WAS HEATED WITH CL SUB3 P DOUBLE BOND
 NP(O)CL SUB2 (II) POLY(CHLOROPHOSPHAZENES (III, X EQUALS PH, Y EQUALS
 CL) WERE FORMED. ET SUB3 P DOUBLE BOND NP(O)CL SUB2 REACTED WITH II TO
 GIVE III (X EQUALS Y EQUALS ET). WHEN LINEAR
 POLY(DICHLOROPHOSPHAZENES (, CL(PCL SUB2 DOUBLE BOND N) SUBN P(O)CL SUB2,
 WERE HEATED WITH I, CLPPH SUB2 DOUBLE BOND N-RADICALS WERE SUBSTITUTED
 FOR CL ATOMS WITH THE EVOLUTION OF POCL SUB3. A THERMAL CONDENSATION
 MECHANISM WAS PROPOSED. FACILITY: FIZ.-KHIM. INST. IM. KARPOVA,
 MOSCOW, USSR.

UNCLASSIFIED

1/2 017 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--TELOMERIZATION OF TETRAFLUOROETHYLENE BY DIPHENYL DISULFIDE -U-
AUTHOR--(04)-YAKUBOVICH, A.YA., ZAYTSEVA, YE.L., ROZANTSEVA, T.V.,
CHICHERINA, I.I.
COUNTRY OF INFO--USSR
SOURCE--ZH. ORG. KHIM. 1970, 6(4), 886-7
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--THIOPHENE, OXIDATION, FLUORINATED ORGANIC COMPOUND,
TAUTOMERISM
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--3006/1275 STEP NO--UR/0366/70/006/004/0886/0887
CIRC ACCESSION NO--AP0134949
UNCLASSIFIED

272 017

CIRC ACCESSION NO--AP0134949

UNCLASSIFIED

PROCESSING DATE--13NOV70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE TITLE REACTION (AT 175DEGREES)
 GAVE 30.3PERCENT PHSCF SUB2 CF SUB2 SPH (I), 8.7PERCENT PHS(CF SUB2)
 SUB4 SPH, AND SMALL AMTS. OF PHSCF SUB2 CF SUB2 H (II) AND
 2,2,3,3,TETRAFLUORODIHYDROBENZOTHIOPHENE. THE OXIDN. OF I OR II WITH
 CRD SUB3 IN ACOH SOLN. GAVE PHSO SUB2 CF SUB2 CF SUB2 SO SUB2 PH OR PHSO
 SUB2 CF SUB2 CF SUB2 H, RESP. FACILITY: FIZ.-KHIM. INST. IM.
 KARPOVA, MOSCOW, USSR.

UNCLASSIFIED

1/2 018
UNCLASSIFIED
TITLE--DIRECT FLUOROALKENYLATION. VI. IMPROVEMENT IN A METHOD FOR
SYNTHESIZING FLUOROALKENYL AMINES -U- PROCESSING DATE--30OCT70
AUTHOR--(03)--SERGEYEV, A.P., NOVOZHILOVA, T.I., YAKUBOVICH, A.YA.
COUNTRY OF INFO--USSR
SOURCE--ZH. ORG. KHIM. 1970, 6(4), 747-54
DATE PUBLISHED--70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--FLUORINATED ORGANIC COMPOUND, AMINE, ORGANIC SYNTHESIS,
ORGANOLITHIUM COMPOUND, ZINC
CENTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--2000/1955
STEP NO--UR/0366/70/006/004/0747/0754
CIRC ACCESSION NO--AP0125544
UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--30OCT70

2/2 018

CIRC ACCESSION NO--AP0125544

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE SYNTHESIS CONDITIONS WERE WORKED OUT FOR THE PREPN. OF RNR PRIME1 R PRIME2 (WHERE R ARE F SUB2 C:CF, ClFC:CF, F SUB2 C:CF CF SUB2, FHC:CF, F SUB2 HCCF SUB2, ClFHCCF SUB2, F SUB3 CCHFCF SUB2, FBRHCCF SUB2, F SUB2 HCCO, ClFHCCO, F SUB3 CCHFCF SUB2, OR BRFHCCO, AND NR PRIME1 R PRIME2 ARE NBU SUB2, PIPERIDINO, MORPHOLINO, NME SUB2, NET SUB2, NACPH, NHPH, OR NMEPH). EXAMPLES: THE REACTION OF HNBU SUB2 WITH BULI IN HEXANE GAVE LINBU SUB2 WHICH WITHOUT ISOLATION WAS CONDENSED WITH F SUB2 C:CF SUB2 IN AN AUTOCLAVE AT 90-150DEGREES TO GIVE F SUB2 C:CFNBU SUB2. THE DISPERSION OF LI IN TETRAHYDROFURAN WAS TREATED WITH PHNHAC TO GIVE PHNACLI, WHICH WITHOUT ISOLATION WAS TREATED WITH CF SUB2:CF SUB2 TO GIVE CF SUB2:CFNACPH. THE DEHYDROGENATION OF BRFHCCFHNACPH WITH POWD. ZN GAVE FHC:CFNACPH. THE HYDROLYSIS OF PHNACCF:CFX OR OF PHNACCF SUB2 CHEX (X IS H, F, OR CL) GAVE PHNHCOCHFX.

UNCLASSIFIED

USSR

UDC: 541.64:678.86

YAKUBOVICH, A. YA. (DECEASED), FILATOVA, I. M., ZAVTSEVA, YE. L., YAKUBOVICH, V. S., Scientific Research Physico Chemical Institute imeni L. Ya. Karpov, Moscow, State Committee for Chemistry

"Reaction Scheme and Peculiarities of Polycondensation of Alkyl(aryl)phosphazenechlorophosphonyls"

Moscow, Vysokomolekulyarnyye Soyedineniya, Vol XII, No 3, Mar 70, pp 585-591

Abstract: The behavior of some 1-dichlorophosphonyl-2,2,2-alkyl(aryl)chlorophosphazenes was studied at high temperatures to determine the mechanism of condensation of compounds in this series to polyphosphazenes. It was found that 1-dichlorophosphonyl-2,2,2-diphenylchlorophosphazene remains unchanged with no conversion to polyphosphazenes when heated to 320°C. When this compound is heated together with 1-dichlorophosphonyl-2,2,2-trichlorophosphazene, a polychlorophosphazene is formed which contains chlorodiphenylphosphazene groups as substituents. In analogous experiments, 1-dichlorophosphonyl-2,2,2-triethylphosphazene forms a polychlorophosphazene which contains triethylphosphazene groups as substituents of the principal polymer chain. It is shown that heating linear polydichlorophosphazenes with 1-dichlorophenyl-2,2,-

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USSR

YAKUBOVICH, A. YA., et al, *Vysokomolekulyarnyye Soyedineniya*, Vol XII, No 3, Mar 70, pp 585-591

2-diphenylchlorophosphazene initiates a reaction with substitution of chloro-diphenylphosphazene radicals for chlorine atoms and release of phosphorus chloroxide. With an excess of 1-dichlorophosphonyl-2,2,2-diphenylchlorophosphazene, the maximum substitution reaches 50% of the total chlorine content in the polydichlorophosphazene. A reaction scheme is proposed for thermal condensation of 1-dichlorophosphonyl-2,2,2-alkyl(aryl)chlorophosphazenes to polyphosphazenes as a two-stage process with formation of the polydichlorophosphazene on the first stage, and substitution of a chloroalkyl(aryl) substituted phosphazene radical for the chlorine atoms in the compound in the second stage.

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- 108 -

Acc. Nr. ✓

AP0055633

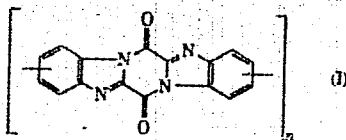
Abstracting Service:
CHEMICAL ABST. ✓

6-70

Ref. Code

4R0460

111955w Dependence of the properties of rigid-chain polymers on their structure. 2,2'-Dicarboxy-5,5'(6,6')-bibenzimidazole and its polymerization. Yakubovich, A. Ya.; Voznesenskaya, N. N.; Braz, G. I. (Fiz.-Khim. Inst. im. Bartova, Moscow, USSR). *Vysokomol. Soedin., Ser. B* 1970, 12(2), 156-8 (Russ). 5,5'(6,6')-Bibenzimidazole - 2,2'-dicarboxylic acid dichloride (obtained by treating the Na salt with SOCl₂) readily entered into autocondensation to give a double-chain polymer I, sol. in concd. H₂SO₄ and 5% NaOH soln. Ir absorption bands, characteristic of benzimidazoles and polybenzimidazoles, confirmed its



structure. I began to decomp. in the air at 350-400°.

CKJR

11

REEL/FRA
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1/3 041 UNCLASSIFIED PROCESSING DATE--090C170
TITLE--HEAT RESISTANT CAST IRONS FOR GLASS MOLDS -U-
AUTHOR--(05)--YAKUBOVICH, B.I., POGODINA ALEKSEYEVA, K.M., UDALTSOV, V.I.,
LUPATKINA, L.I., KULINICH, V.P.
COUNTRY OF INFO--USSR
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SUBJECT AREAS--MATERIALS, MECH., IND., CIVIL AND MARINE ENGR
TOPIC TAGS--HEAT RESISTANT METAL, CAST IRON, MOLDING MATERIAL, PYREX
GLASS, ANNEALING, SILICON, PHOSPHORUS, NICKEL CONTAINING ALLOY,
GRAPHITE, GRAIN BOUNDARY, PLASTICITY
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
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UNCLASSIFIED

PROCESSING DATE--09OCT70

2/3 041

CIRC ACCESSION NO--AP0112924

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECT OF CHEM. COMPN. OF FERRITIC ANNEALED CAST IRONS CONTG. GLOBULAR GRAPHITE ON THE RESISTIVITY OF THE DIES TO THERMAL FATIGUE DURING THE MOLDING OF ARTICLES FROM PYREX TYPE GLASS WAS INVESTIGATED. THE EXPTL. CAST IRONS WERE MELTED IN AN INDUCTION ELEC. FURNACE AND WERE TWICE SUBJECTED TO GRAPHITIZING ANNEALING UNDER SIMILAR CONDITIONS (HEATING TO 1000DEGREES, HOLDING THERE FOR 4 HR, COOLING AT A RATE OF 50DEGREES PER HR TO 700DEGREES, HOLDING THERE FOR 4 HR, COOLING IN THE FURNACE TO 350DEGREES, AND COOLING IN AIR). AFTER THE ANNEALING, A SMALL PORTION OF THE PEARLITE REMAINED ONLY IN THE PHOSPHIDE EUTECTIC INCLUSIONS. ALL CAST IRONS STUDIED CONTAINED SMALLER THAN 0.01PERCENT S, 0.25-0.35PERCENT MN, AND SIMILAR TO 0.8PERCENT NI. THE C, SI, AND P CONTENT, IN ORDER TO INVESTIGATE THEIR EFFECT ON THE THERMAL STABILITY, WAS VARIED WITHIN THE FOLLOWING LIMITS: C 3.35-3.7, SI 1.7-2.1, AND P 0.05-0.35PERCENT. IN ORDER TO OBTAIN GLOBULAR GRAPHITE, THE CAST IRONS WERE MODIFIED WITH MG. PLUNGERS WERE PREPD. FROM THE EXPTL. CAST IRONS, AND THERMAL STABILITY OF THE CAST IRONS WAS STUDIED. THE CAST IRON CONTG. THE LEAST AMT. OF SI AND P WAS THE MOST STABLE THERMALLY. SI AND P ARE THE ELEMENTS WHICH DECREASE THE THERMAL STABILITY OF FERRITIC MOLDING CAST IRONS. ALLOYING WITH NI INCREASED THE THERMAL STABILITY OF THE CAST IRON WITH INCREASED P CONTENT. ANALGOUS RESULTS WERE OBTAINED WHEN TESTING CASTINGS OF UNALLOYED CAST IRONS CONTG. GLOBULAR GRAPHITE AND MODIFIED WITH CE-MG 1.

UNCLASSIFIED

3/3 041

CIRC ACCESSION NO--AP0112924

UNCLASSIFIED

PROCESSING DATE--09OCT70

ABSTRACT/EXTRACT--THERMAL FATIGUE CRACKS WERE OBSD. PRIMARILY ALONG THE BOUNDARIES OF THE FERRITE GRAINS AT THE SPOTS OF THE DEPRESSIONS IN THE SURFACE OF THE PLUNGERS AND AT THE SPOTS WHERE GRAPHITE GLOBULES WERE CLOSE TO THE SURFACE. AS THEY PROPAGATE, THE CRACKS INTERSECT THE GRAINS. THE HARMFUL EFFECT OF SI AND P ON THERMAL STABILITY OF ANNEALED CAST IRONS IS APPARENTLY ASSOCD. WITH THE ENRICHMENT OF THE GRAIN BOUNDARIES BY THESE ELEMENTS. WITHIN THE RANGE INDICATED IN THIS WORK, P SHARPLY REDUCES THE PLASTICITY OF CAST IRON. FACILITY: VSES. ZAOCH. POLITEKH. INST., MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC 621.762.002.5

MITIN, I. I., KHAVSKIY, N. N., SOKOLOV, M. A., KIRILLOV, O. D., YAKUBOVICH, I. A.,
PREOBRAZHENSKIY, N. A.

"Acoustic Vortex Disperser to Obtain Finely Dispersed Metal Powders"

V sb. Primeneniye ul'trazvuka v metallurg. protsessakh (Application of Ultrasound
in Metallurgical Processes -- collection of works), Moscow Steels and Alloys
Institute, 67, Moscow, 1972, pp 171-173 (from RZh-Metallurgiya, No 4, Apr 72,
Abstract No 4G424)

Translation: A description of an acoustic eddy atomizer used to obtain finely
dispersed metal powders is presented. One illustration.

1/1

USSR

UDC 621.762.01

MITIN, I. I., KIRILLOV, O. D., KHAUSKIY, N. N., SOKOLOV, M. A., YAKUBOVICH, I. A.,
PREOBRAZHINSKIY, N. N.

"Problem of Using Sound Vibrations in Powder Metallurgy"

V sb. Primeneniye ul'trazvuka v metallurg. protsessakh (Application of Ultra-
sound in Metallurgical Processes -- collection of works), Moscow Steel and
Alloys Institute, 67, Moscow, 1972, pp 147-149 (from RZh--Metallurgiya, No 4,
Apr 72, Abstract No 46387)

Translation: The prospects for using sound vibrations in powder metallurgy are
demonstrated. 4-entry bibliography.

1/1

- 32 -

USSR

UDC 621.762.2:669.5

MITIN, I. I., SOLOV, M. A., KHAUSKIY, N. N., PREOBRAZHENSKIY, N. A., YAKUBOVICH,
I. A., KIRILLOV, O. D.

"Obtaining Zinc Powder by an Acoustic Eddy Disperser"

V sb. Primeneniye ul'trazvuka v metallurg. protsessakh (Application of Ultra-
sound in Metallurgical Processes -- collection of works), Moscow Steels and
Alloys Institute, 67, Moscow, 1972, pp 149-151 (from RZh--Metallurgiya, No 4,
Apr 72, Abstract No 46403)

Translation: A new procedure is described for obtaining finely dispersed Zn-
powder from a melt using an eddy acoustic pneumatic atomizer. Two illustra-
tions.

1/1

USSR

UDC: 550.837

VAKUL'SKIY, A. A., KAMENETSKIY, F. M., LABZHINSKIY, S. I., LUTSYSHIN, A. S.,
MIZYUK, L. Ya., TIMOFEYEV, V. M., YAKUBOVSKIY, Yu. V., Institute of Physical
Mechanics, Academy of Sciences of the Ukrainian SSR

"A Device for Aerogeoelectric Prospecting"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obratzsy, Tovarnyye Znaki,
No 9, Mar 72, Author's Certificate No 331356, Division G, filed 12 May 69,
published 7 Mar 72, p 144

Translation: This Author's Certificate introduces a device for aerogeoelectric prospecting by the method of transient processes. The device consists of a current pulse generator which contains a source of direct current, a master multivibrator, a frequency divider, a power amplifier, a current commutator and an oscillator tank circuit; and a meter which contains a receiving tank circuit, a preamplifier, a gating module, an accumulator, a DC amplifier, a registration unit, and a circuit for control and synchronization of the gating module. As a distinguishing feature of the device, interference suppression is improved, the measurement error is reduced and the stability of compensation of transient processes caused by the conduc-

1/2

- 154 -

KUL'SKIY, A. A. et al., USSR Author's Certificate No 331356

ive fuselage of the aircraft is increased by connecting coincidence gates in the current pulse generator between the frequency divider and power amplifier. Some inputs of the coincidence gates are connected to the output of the master multivibrator, and the other inputs are connected to the outputs of the frequency divider. A band filter is connected in the meter between the preamplifier and the gating module, and a secondary gating block is connected between the pulse amplifier and the DC amplifier. The secondary gating block is connected to the control and synchronization circuit, and is made in the form of parallel-connected compensation and measurement strobe pulse multivibrators which are connected through a broad strobe pulse shaping multivibrator to the primary gating module. Multivibrators for delay and shaping of narrow strobe pulses [are connected] to coincidence gates with some inputs connected to the outputs of the oscillator frequency divider, while the other inputs are connected to the multivibrator for shaping narrow strobe pulses, and the outputs of these coincidence gates are connected to the secondary gating block.

2/2

USSR

UDC 669.71.053.4.094

PREOBRAZHENSKIY, N. A., KHAVSKIY, N. N., ~~YAKUBOVICH, I. A.~~, SAMOYLOVA, L. I.,
KIRILLOV, O. D., ULANOV, V. I.

"Studies of the Influence of Ultrasound on the Process of Sulfuric Acid
Leaching of Phosphorite"

Primeneniye Ul'trazvuka v Metallurg. Protsessakh [Use of Ultrasound in
Metallurgical Processes -- Collection of Works], Moscow, 1972, pp 72-74,
(Translated from Referativnyy Zhurnal, Metallurgiya, No 5, 1972, Abstract
No 5 G214 by the authors)

Translation: It is demonstrated that US oscillations, breaking down the film
of phosphogypsum, intensify the process of sulfuric acid leaching of phospho-
rites. 1 Table.

1/1

- 74 -

USSR

UDC:622.7:321.9.004

AKOPOVA, K. S., DOKSHINA, I. D., TYUTYUNNIK, N. D., YAKUBOVICH, I. A.,
ZADOROZHNYI, V. G., BELOGAY, P. D., DEGTYARENKO, A. V., TISHCHENKO, A. G.

"Use of Ultrasound in Enrichment of Titanium-Zirconium Deposits"

Moscow, Tsvetnyye Metally, No. 11, Nov 70, pp. 86-89

Abstract: A method has been developed for application of acoustical oscillations to minerals to change their surface properties before enrichment. This article presents results of an investigation of the influence of ultrasonics on the minerals in titanium-zirconium placer deposits. It has been established that 1-3 minutes action of ultrasound at 20 KHz and an intensity of 3.8 W/cm^2 greatly activates the flotation of minerals by the flotation oil. The yield of minerals in the foam product increases as follows: zirconium from 18.6 to 98.9%, rutile from 3.0 to 97.5%, ilmenite from 0 to 94%, staurolite from 0 to 90%. The expenditure of collectors is also reduced and the flotation properties of minerals from different deposits are made more similar.

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- 47 -

USSR

UDC: 678.5.05-419.8.004.678.026.3

GOLOVKO, L. I., GRUZHARG, K. A., YAKUBOVICH, S. V.

"Protection of Fiberglass Plastics by Polyurethane Coatings"

Kiev, Khimicheskaya Tekhnologiya, No 1(61), Jan/Feb 72, pp 26-29

Abstract: The authors investigate the feasibility of using polyurethanes to improve the weather resistance and the durability of polyester plastics reinforced with fiberglass. The paper gives the results of a study of the water and chemical resistance of hardened copolymers of an unsaturated oligoester with styrene, coated with polyurethane. PN-1 binder was used for the study (polydiethyleneglycol maleate phthalate with styrene) with cold-setting UR-19 polyurethane lacquer. The coatings were applied with an atomizer in two layers to make a total thickness of 30-40 microns. The prepared specimens were kept in distilled water for 100-700 hours at 25°C. Losses of static bending strength amounted to 41-56% for unprotected specimens and 3-16% for coated specimens. Loss of impact strength for unprotected plastic was 75% after 700 hours, the corresponding loss for coated plastic being only 26%. The strength of the protected plastic was 2-3 times that of the initial oligoester specimens at the end of the tests. Swelling of unprotected specimens reaches 3-3% after 1400 hours at 25°C without stabilizing; after 800 hours, swelling of protected

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USSR

GOLOVKO, L. I., et al., Khimicheskaya Tekhnologiya, No 1(61), Jan/Feb 72,
pp 28-29

specimens levels off at 2.5%. Protected copolymers also show appreciably
greater resistance to the effects of caustic soda.

2/2

USSR

UDC 612.824.1+577.44

YAKUBOVICH, T. G., and GETSEL', KH. A., Chair of Labor Hygiene and Central Scientific Research Laboratory of the Leningrad Sanitary Hygiene Medical Institute

"The Effect of Vibration on the Permeability of the Blood-Brain Barrier"

Leningrad, Fiziologicheskii Zhurnal SSSR, Vol 58, No 6, 1972, pp 845-850

Abstract: Experiments performed on rats revealed that vibration increases the permeability of the blood-brain barrier and temporarily reduces protein synthesis in the cerebellum and pons. The measurements were made with methionine-³⁵S injected intraperitoneally immediately after exposure to vibration. To determine the permeability, the animals were decapitated 15 min later, and tissue slices were prepared for autodiagrams. To determine protein synthesis, the animals were decapitated 24 hrs after injection of the indicator. In the 15-min determinations made after a single exposure to vibration (whole body for 5 hrs at 50 cps and a vertical amplitude of 0.8 mm), much larger quantities of the indicator were accumulated in the cerebellum and pons than in control slides. After repeated vibrations (identical exposure once per day for 90 days), the concentration of the indicator in the nervous tissue was still higher, with the maximum increase occurring in the molecular layer of the cerebellum

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USSR

YAKUBOVICH, T. G. and GETSEL', KH. A., Fiziologicheskii Zhurnal SSSR, Vol 53, No 6, 1972, pp 845-850

(by a factor of 7) and in pontine nuclei (by a factor of 6). In the 24-hr determinations made after a single exposure to vibration, the accumulation of methionine (incorporated into proteins) in the cerebellum and pons was much smaller than in control rats; however, after repeated vibrations, the indicator concentration in all structures investigated increased to levels somewhat above the control. It is concluded that the nervous tissue proper is able and the blood-brain barrier unable to adapt to mechanical stress.

2/2

- 61 -

USSR

UDC 612.824.1+612.83

GETSEI", KH., A., NOVIKOVA, YE. F., and YAKUBOVICH, T. G., Central Scientific Research Laboratory, Department of Biochemistry and Department of Labor Hygiene, Leningrad Sanitary Hygiene Medical Institute

"Age-Induced Alterations of the Permeability of the Blood-Brain Barrier and of Protein Metabolism in the Cerebellum and the Pons Varoli"

Leningrad, Fiziologicheskii Zhurnal SSSR imeni I. M. Sechenov, Vol 59, No 8, Aug 73, pp 1,176-1,182

Abstract: An increase in the permeability of the blood-brain barrier to methionine was demonstrated by autoradiography in new-born and 2-year-old rats, either 15 minutes or 24 hours after administration of S35 methionine. In addition a decrease in the intensity of cerebral protein synthesis was observed in the intensity of cerebral protein synthesis was observed in 2-year-old animals, compared to 6-month-old mature ones. In comparing macroautoradiography, which presented an overall picture of layers and structure, and micro-autoradiography, which showed fine structure, the authors found that both gave identical results.

1/1

USSR

UDC 612.13:612.35.014.45

ANDREYEVA-GALANINA, Ye. Ts., DOLGOVA, M. A., and YAKUBOVICH, T. G., Leningrad
Sanitary-Hygiene Medical Institute

"The Effect of General Vertical Vibration on the Liver Vascular Bed"

Moscow, Gigiyena Truda i Professional'nyye Zabolevaniya, No 12, 1971, pp 22-25

Abstract: The effect of vertical vibration of rabbits on the vascular bed of the liver was studied. Three rabbits were subjected to vibration of 50 Hz with an mm amplitude of 1.3 mm for 120 days, four rabbits, for 40 days, and four rabbits served as controls. Histological studies showed that the total area of the liver blood vessels and capillaries increased by 26% and 58% after 40 and 120 days of vibration, respectively. Arterioles were affected more profoundly than capillaries in this respect in both cases. Their area increased by 34 and 70% after 40 and 120 days of vibration, respectively. Number of capillaries and arterioles also increased. Interlobular veins, main veins, and capillaries were dilated and distended with blood, and the presence of perivascular infiltrations and hemorrhages was detected in all experimental animals.

1/1

USSR

UDC 613.644-07:616.33-018.73+612.32.014.15

YAKUBOVICH, T. G., and ZHUKOVA, N. M., Chair of Labor Hygiene, Leningrad
Sanitary Hygiene Medical Institute

"The Effect of Whole-Body Vertical Vibration on the Gastric Mucosa of White
Rats"

Moscow, Gigiyena i Sanitariya, No 12, 1970, pp 98-100

Abstract: The dynamics of histological and histochemical shifts was traced in the gastric mucosa of white rats exposed to whole-body vertical vibration (frequency of 50 hz and amplitude of 0.8 mm) for up to 180 days. Within 30 minutes of the start of vibration, the secretion of all varieties of epithelial cells in the gastric mucosa increased. A large quantity of Schiff-positive substances appeared on the surface of the mucosa. Pepsinogen granules were found in the chief cells of the terminal ends of the fundic glands. The changes intensified but then stabilized after the 10th day as adaptation developed. But by the 60th day, the regenerative capacity of the epithelium of the gastric mucosa became exhausted. The thickness of the membrane decreased in places and the number of secretory cells diminished. By the 90th day extensive degenerative changes were evident in the mucosa of the fundus ventriculi and attenuation of the mucosa became general.

1/1

USSR

UDC 517.9

YAKUBOVICH, V. A.

"Frequency Conditions of Natural Oscillations in Nonlinear Systems With a Single Stationary Nonlinearity"

Moscow, Sibirskiy Matematicheskiy Zhurnal, Vol 14, No 5, Sep/Oct 73, pp 1100-1129

Abstract: The author examines special nonlinear systems of differential equations with one nonlinearity:

$$\frac{dx}{dt} = Px + q\xi; \quad \sigma = r^*x. \tag{1}$$

$$\xi = \varphi(\sigma). \tag{2}$$

Here $x=x(t)$ is a vector (of order n) of the "state" of the system; P is a fixed, real $n \times n$ matrix; q, r are fixed, real vector columns of order n (of course, q and r are non-zero). The asterisk denotes transposition (and also Hermitian association in the case of complex quantities) so that σ in 1/2.

USSR

YAKUBOVICH, V. A., Sibirskiy Matematicheskiy Zhurnal, Vol 14, No 5, Sep/Oct 73, pp 1100-1129

(1) is a real number. The quantity ξ is also a real number in (1) and (2). Such systems of equations may describe processes in control systems with a single nonlinear link. The author defines $[-\alpha, \beta]$ -natural-oscillatory solutions with respect to output σ . Sufficient conditions are found for the $[-\alpha, \beta]$ -natural-oscillatory property of all solutions, for this property for almost all initial values, and for initial values from some cone. These conditions are formulated in terms of the frequency response of the linear part of the system.

2/2

- 5 -

USSR

UDC 519.9+62-50

ANDREYEV, V. A., KAZARINOV, YU. F., ~~YAKUBOVICH, V. A.~~, Leningrad State University imeni A. A. Zhdanov

"Synthesis of Optimal Controls for Linear Inhomogeneous Systems in the Problem of Minimizing the Mean Value of a Quadratic Functional"

Moscow, Doklady Akademii Nauk SSSR, Vol 202, No 6, 1972, pp 1247-1250

Abstract: A study was made of the control system described by a differential equation of the type

$$\frac{dx}{dt} = Ax + b\sigma + f(t), \tag{1}$$

where x is the vector (of order n) of state of the system, σ is the control vector (of order m) of the system, A is a permanent matrix of dimensionality $n \times n$, b is a permanent matrix of dimensionality $n \times m$, and $f(t)$ is a vector function of perturbations of order n . All the matrices and vectors are real. It is assumed that the function $f(t)$ is measurable and bounded in $[0, \infty)$ and that the pair (A, b) is controllable; that is, that among the columns of the matrices $b, Ab, \dots, A^{n-1}b$ there are n linearly independent columns. The real vector function $\sigma(x, t)$ is called the admissible control if equation (1) with $\sigma = \sigma(x, t)$ under the given initial condition $x(0) = a$ has the solution $x = x(t)$ in $[0, \infty)$. The set of admissible controls is denoted by \mathcal{U}_a ; $c^*x \in \mathcal{U}_a$ if $1/2$

USSR

ANDREYEV, V. A., et al., Doklady Akademii Nauk SSSR, Vol 202, No 6, 1972, pp 1247-1250

the matrix $A + bc^*$ is Hurwitz. The quality criterion of the control $\sigma \in \mathcal{X}$ is defined by the functional $J(\sigma) = \lim_{T \rightarrow \infty} T^{-1} J_0^T(\sigma, a)$. Three theorems are stated and proved in order to study the problem of minimizing the functional $J(\sigma)$ in the set \mathcal{X}_a . The control $\sigma_0 \in \mathcal{X}_a$ is called optimal if $J(\sigma_0) \leq J(\sigma) \forall \sigma \in \mathcal{X}_a$. In connection with the fact that if the optimal control exists it is not unique, the concept of a local optimal control is introduced.

2/2

- 74 -

YAKUBOVICH, V.A.

Human Engg

ADAPTIVE HUMAN OPERATOR MODEL IS ONE PURSUIT TRACKING PROBLEM
Article by V.A. Yakubovich and A.N. Litvinov, Kiev, Vysokomol. fiz. i khim. fiz., No 7, 1970, pp 55-58

SO: JPRS 55937
09 MAY 72

GLORIA

Recently, special attention has been given to the study of "human factors" in the manual control, guidance, and stabilization of a broad class of dynamic systems - automobiles, submarines, aircraft, and space ships.

This paper attempts a mathematical description of the operation of an adaptive system which models the activity of the human operator in a pursuit tracking situation on the basis of the mathematical apparatus of [1, 2].

Stating the Problem and Describing the Model

Suppose the operator sees on his indicator screen a section of the trajectory of motion of his target. The operator then has the possibility of directing the cursor on the screen through a control device. The problem of the human operator is to match the cursor with the target in the neighborhood of the target.

Let us proceed to a formal statement of the problem of constructing an adaptive human operator model. Let us imagine the screen of an indicator on which, at discrete moments of time $t = 0, 1, 2, \dots$, the "cursor" and "target" points light up. We consider the indicator screen to be circular, with a radius of L , and with its center at the coordinate origin. The positions of the cursor and the target are shown on the plane by points (complex numbers) z_t ("cursor") and z_t^* ("target"). The operator has the possibility of acting manually on the cursor through an executing instrument, i.e., maintaining the condition $|z_t - z_t^*| < \epsilon$. To do this, obviously, the operator must correctly predict the behavior of the target in the next moment of time.

USSR

UDC 62-50

PENEV, G. D., and YAKUBOVICH, V. A.

"Some Adaptive Control Problems"

Moscow, Doklady Akademii Nauk SSSR, Vol 198, No 4, 1971, pp 787-790

Abstract: The authors investigated the digital control system

$$x_{t+1} = A(\xi)x_t + b(\xi)u_t + f(t, x_t, \xi), \quad \zeta_t = c(\xi)^* x_t;$$

where t assumes values of $0, 1, \dots$; ξ is the unknown vector of the variable parameters which assumes values in the given set M ; $A(\xi)$ is a quadratic matrix of order n ; u_t is a real variable called the "control"; $f(t, x, \xi)$ is a real vector function ("small disturbance") with a value in R^n ; $b(\xi)$, $c(\xi) \in R^n$, $x_t \in R^n$; ζ_t is a real variable. The problem is considered in the example of a bicycle-riding robot which must learn to ride a bicycle moving at constant speed. "Brain equations" are derived, and four theorems are proved. Experiments were performed in computerized simulation of the self-training process of the bicycle-riding robot the brain equations of which were taken from one of the theorems presented in this article. The parameters of an ordinary bicycle were used. The bicyclist fell six times
1/2

- 4 -

USSR

PENEV, G. D., and YAKUBOVICH, V. A., Doklady Akademii Nauk SSSR, Vol 198, No 4, 1971, pp 787-790

and, beginning with the seventh game, learned to ride. In other experiments a control delay of $\Delta t = 0.01-0.1$ second was introduced, and the bicycle rider learned to ride in 10-20 games.

2/2

USSR

UDC 51:155.001.57:518.9

YAKUBOVICH, V. A., TIMOFEYEV, A. V.

"Adaptive Human Operator Model in One Problem of Pursuit Tracking"

Kibernet. i Vychisl. Tekhn. Resp. Mezhd. Sb. [Cybernetics and Computer Engineering, Republic Interdepartmental Collection], No 4, 1970, pp 56-58, (Translated from Referativnyy Zhurnal, Kibernetika, No 6, 1971, Abstract No 6 V657 by the authors).

Translation: An adaptive model of the behavior of a human operator is suggested in one problem of pursuit tracking. The operator is modeled by a system consisting of input sensors (visual sensors), and adaptive regulator (the "brain") and an actuating organ (mechanical arm). Primary attention is turned to the problem of synthesis of the "brain" in correspondence with certain arbitrary criteria of "intelligence." The model suggested is capable of adapting itself both to changes in the medium and to changes in the dynamics of the control object and internal parameters of the model itself. The model has been imitated on a computer. Results are presented from similar psychophysiological experiments with a group of operators.

1/1

- 70 -

1/2 007 UNCLASSIFIED PROCESSING DATE--09OCT70
TITLE--A NOTE TO THE FLOJET, I YAPUNOV'S THEOREM -U-
AUTHOR--YAKUBOVICH, V.A.
COUNTRY OF INFO--USSR
SOURCE--VESTNIK LENINGRADSKOGO UNIVERSITETA, NO 1, MATEMATIKA, MEKHANIKA,
ASTRONOMIYA, 1970, NR 1, PP 88-92
DATE PUBLISHED--70
SUBJECT AREAS--MATHEMATICAL SCIENCES
TOPIC TAGS--MATRIX FUNCTION, NUMERIC SOLUTION
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1984/0392 STEP NO--UR/0043/70/000/000/0088/0092
CIRC ACCESSION NO--AP0055177
UNCLASSIFIED

2/2 007

UNCLASSIFIED

PROCESSING DATE--09OCT70

CIRC ACCESSION NO--APO055-177

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. LET $A(t)$ IS THE REAL MATRIX, A MAGNITUDE OF EPSILON $L(0, t)$, AND $X(t)$ IS AN ARBITRARY MATRIX OF THE FUNDAMENTAL SYSTEM OF THE SOLUTIONS OF THE EQUATION (1). THEN THE FORMULA (3) IS TRUE, WHERE K IS THE REAL CONSTANT MATRIX, $P(t)$ IS THE REAL T , PERIODIC MATRIX AND (6) IS FULFILED WITH A CONSTANT MATRIX R SATISFYING THE EQUATIONS (7). IF $P(t)$, K , R ARE THE ARBITRARY MATRIXES SATISFYING THE ABOVE MENTIONED CONDITIONS AND $\det P(t)$ IS NOT EQUAL TO 0, THEN THE MATRIX (3) IS THE MATRIX OF THE FUNDAMENTAL SYSTEM OF THE SOLUTIONS OF THE EQUATION (1), WHERE $A(t)$ IS THE REAL, T , PERIODIC MATRIX.

UNCLASSIFIED

USSR

UDC: 8.74

TIMOFEYEV, A. V., KHARICHEV, V. V., SHMIDT, A. A., YAKUBOVICH,
V. A.

"A Problem in Pattern Recognition and Description"

Kiev, Biol., med. kibernet. i bionika, sbornik (Biology, Medical
Cybernetics and Bionics--collection of works), 1971, pp 364-375
(from RZh-Kibernetika, No 10, Oct 72, abstract No 10V660 by E.
Vagner)

Translation: In the teaching mode, images are presented to a
computer, each of which is accompanied by its "description" in
word form. The "content" of the words of the descriptions is
not communicated to the computer, and it learns on its own to
"understand" the simplest concepts. In the recognition mode,
only the images are presented to the computer; the machine itself
constructs their descriptions, which become the "output". In
this connection, the computer also constructs descriptions which
have not been presented during teaching. The words of the de-
scription are broken down in the teaching process into "adjec-

1/2

USSR

TIMOFEYEV, A. V. et al., Biol. med. kibernet. i bionika, 1971, pp 364-375

tives" associated with different groups of image transformations, and "nouns" which are invariant with respect to these groups. Each image is a set of n points, where n is always less than some fixed N . In other words, a set of n complex numbers is assigned. A family of transformations consisting of a group of rotations about the coordinate source, similarity transformations, and horizontal and vertical translations can be applied to this set. A complete system of invariant functions can be constructed, which are given on the set of all images and do not change their value with any transformations of any image. In the recognition mode, the computer calculates the values of the invariants of the image presented, compares them with the corresponding values for the images of the teaching sequence, and determines the noun of the description. Then, in accordance with the recognition of the center of gravity of the image, its dimensions, and the angle of turn, the adjectives are found.

272

- 61 -

USSR

FRADKOV, A. L., YAKUBOVICH, V. A.

"S-Procedure Relationship of Duality in Nonconvex Problems of Quadratic Programming"

Vestn. Leningr. Un-ta [Leningrad University Herald], 1973, No 1, pp 81-87
(Translated from Referativnyy Zhurnal Kibernetika, No 6, 1973, Abstract No 6V520, by the authors).

Translation: The following problem is studied. In set X , the real functions $F(x), G_1(x), \dots, G_m(x)$ are fixed. The problem is to determine which of conditions $F(x) \geq 0$ with $G_1(x) \geq 0, \dots, G_m(x) \geq 0, x \in X$, indicates that there exist $\tau_j \geq 0, j = 1, \dots, m$ for which $F(x) = \sum_{j=1}^m \tau_j G_j(x) > 0, x \in X$. If this is so, it indicates that for inequality $F(x) \geq 0$ with limitations $G_1(x) \geq 0, \dots, G_m(x) \geq 0$, the S procedure is harmless if $m = 2, X$ is a complex linear space, while $F(x), G_1(x), G_2(x)$ are quadratic functionals in X , where $G_1(x_0) > 0, G_2(x_0) > 0$ for a certain $x_0 \in X$. It is demonstrated that the

1/2

USSR

Fradkov, A. L., Yakubovich, V. A., Vestn. Leningr. Un-ta, 1973, No 1, pp 81-87.

harmlessness of the S procedure in this case is related to the duality in the extremal problems. The correctness of the theorem of duality for a number of nonconvex problems of quadratic programming is established.

2/2

- 61 -

USSR

UDC 678.675'52'74

YAKUBOVICH, A. YA. (DECEASED), YAKUBOVICH, V. S., and BRAZ, G. I.

"Polybenzoxazoles -- Novel Thermally Stable Film- and Fiber-Forming Polymers"

Moscow, Plasticheskiye Massy, No 9, 1970, pp 17-19

Abstract: Polybenzoxazoles were obtained from aromatic bis-(o-hydroxyamines) and dicarboxylic acyl halides. Polyhydroxyamides were obtained from low temperature polycondensation in dimethyl acetamide or in N-methylpyrrolidone then converted to polybenzoxazoles by thermal treatment. Two representatives of the new class of thermally stable polymers were obtained by reacting 3,3'-dihydroxybenzidine with isophthallyl chloride and 4,4'-dihydroxy-3,3'-diaminodiphenylsulfone with tetraphthallyl chloride, yielding PB-1 and Sn-PB-T respectively. Both are yellow polymers, insoluble in most organic solvents, soluble in concentrated sulfuric acid. They begin to decompose in air at about 450°C. With respect to strength and thermal stability, PB-1 is comparable to polypyromellitimide. Films made from

1/2

USSR

YAKUBOVICH, A. YA., et al, *Plasticheskiye Massy*, No 9, 1970, pp 17-19

PB-1 are also resistant to thermooxidative reaction. Both PB-1 and Sn-PB-T have high hydrolytic resistance and they appear to have good dielectric properties. The only problem with polybenzoxazole covers is that they are not sufficiently elastic.

2/2

- 86 -

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UNCLASSIFIED

PROCESSING DATE--04DEC70

TITLE--REACTION SCHEME AND NATURE OF THE POLYCONDENSATION OF
CHLOROPHOSPHONYL, ALKYL, ARYL, PHOSPHAZENES -U-

AUTHOR--(04)-YAKUBOVICH, A.YA., FILATOVA, I.M., ZAYTSEVA, YE.L.,
YAKUBOVICH, V.S.

COUNTRY OF INFO--USSR

SOURCE--VYSOKOMOL. SOEDIN., SER. A 1970, 12(3), 585-91

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--POLYCONDENSATION, CHLORINATED ORGANIC COMPOUND, ORGANIC
PHOSPHORUS COMPOUND, NITROGEN COMPOUND

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3007/0718

STEP NO--UR/0459/70/012/003/0585/0591

CIRC ACCESSION NO--AP0136157

UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0136157

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE CONDENSATION MECHANISM OF THE TITLE COMPOUNDS WAS STUDIED AT ELEVATED TEMPERATURES. PH SUB2 PCL DOUBLE BOND NP(O)CL SUB2 (I) FAILED TO GIVE POLYPHOSPHAZENES EVEN WHEN HEATED TO 320 DEGREES, HOWEVER, WHEN I WAS HEATED WITH CL SUB3 P DOUBLE BOND NP(O)CL SUB2 (II) POLY(CHLOROPHOSPHAZENES) (III, X EQUALS PH, Y EQUALS CL) WERE FORMED. ET SUB3 P DOUBLE BOND NP(O)CL SUB2 REACTED WITH II TO GIVE III (X EQUALS Y EQUALS ET). WHEN LINEAR POLY(DICHLOROPHOSPHAZENES), CL(PCL SUB2 DOUBLE BOND N) SUBN P(O)CL SUB2, WERE HEATED WITH I, CLPPH SUB2 DOUBLE BOND N-RADICALS WERE SUBSTITUTED FOR CL ATOMS WITH THE EVOLUTION OF POCL SUB3. A THERMAL CONDENSATION MECHANISM WAS PROPOSED. FACILITY: FIZ.-KHIM. INST. IM. KARPOVA, MOSCOW, USSR.

UNCLASSIFIED

1/2 032 UNCLASSIFIED PROCESSING DATE--02OCT70
TITLE--CORRELATION OF THE BEHAVIOR OF RIGID CHAIN POLYMERS WITH THEIR
STRUCTURE. AROMATIC POLYBENZOXAZOLES CONTAINING SEVERAL OXYGEN OR SULFUR
AUTHOR--(05)--YAKUBOVICH, V.S., ASKADSKIY, A.A., SHALYGIN, G.F., MALINSKIY,
YU.M., MZHELSKIY, A.I.
COUNTRY OF INFO--USSR
SOURCE--VYSOKOMCL. SOEDIN., SER. A 1970, 12(3) 656-62
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY, MATERIALS
TOPIC TAGS--POLYMER STRUCTURE, POLYCONDENSATION, BENZENE DERIVATIVE,
HETEROCYCLIC OXYGEN COMPOUND, HETEROCYCLIC NITROGEN COMPOUND, ORGANIC
AZOLE COMPOUND, POLYAMIDE COMPOUND, SULFONE, ELASTICITY, TENSILE
STRENGTH, ELONGATION
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--1992/0297 STEP NO--UR/0459/70/012/003/0656/0662
CIRC ACCESSION NO--AP0111491
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