"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

Logic & Game Theory

USSR

PETROSYAN, A. A., Leningrad State University

UDC: 518.9

"Pursuit Games With Information Delay for the Pursuing Player"

Yerevan, Izvestiya Akademii Nauk Armyanskoy SSR: Matematika, Vol 8, No 2, 1973, pp 93-101

Abstract: The author formulates and studies a differential game of pursuit with incomplete information. The duration of the game is predetermined, as is the delay of information to player P (the pursuer). The state of information in the game is as follows: Some positive number l is assigned as the information delay. At every instant of time t from the initial moment up to and including l player P knows his own state $x(t)$, the time t, and the state of the opposing player E (the evador) at time $t-l$ i. e., $y(t-l)$. At each instant of time t player E knows $x(t)$, $y(t)$, and t. The payoff for E is equal to the distance between players after the preassigned duration for the game T has elapsed, this distance being $\rho(x(T),y(T))$. The game is antagonistic. Since information is incomplete, there is no solution in pure strategies. It is proved that optimum mixed and pure strategies exist for E and P respectively, and a method of determining such strategies is given.

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USSR

UDC 543.062+546.791+547.86

TARAYAN, V. M., OVSEPYAN, Ye. N., and PETROSYAN, A. A., Yerevan State University

"Extraction of the Benzoic Acid -- Uranium (VI) Anion Complex With Some Thiazine Dyes"

Yerevan, Armyanskiy Khimicheskiy Zhurnal, Vol 23, No 10, 1970, pp 957-958

Abstract: A study was carried out on the possibilities of utilizing thionine type dyes for extraction-photometric determination of uranyl ion. Methylene green (MG), azure I (AzI) and toluidine blue (TB) were examined using sodium benzoate as the reactive anion in forming the acido complex of uranium (VI). Maximum optical density of a constant level was found at pH 3.9-5.0 for MG, 4.5-5.2 for AzI, and 4.4-5.2 for TB. To achieve a complete extraction of the complex a $2.8 \cdot 10^{-5}$ to $6.9 \cdot 10^{-5}$ M concentration of MG is needed, the values for AzI and TB being $3.2 \cdot 10^{-5}$-$8.0 \cdot 10^{-5}$ and $3.3 \cdot 10^{-5}$-$6.6 \cdot 10^{-5}$ respectively. The best solvent system consisted of a mixture of dichloroethane-trichloroethylene, the optical density being constant in it for at least 2 hrs. Average apparent molar extinction coefficients for the extracts of uranium (VI) acido complexes were $7.3 \cdot 10^{-4}$ (MG), $7.2 \cdot 10^{-4}$ (AzI) and $8.4 \cdot 10^{4}$ (TB).

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USSR

UDC 621.3.032.26

PENZYAKOV, V.V., PETROSYAN, A.I.

"Shaping Of Electron Beam By Electrostatic Lenses"

Elektron. tekhnika. Nauchno-tekhn. sb. Elektron SVCh (Electronic Technology. Scientific-Technical Collection. Microwave Electronics), 1970, Issue 9, pp 79-85 (from RZh--Elektronika i yeye primeneniye, No 1, 1971, Abstract No 1A14)

Translation: A method is proposed for computation of electrostatic lenses based on equations of the theory of synthesis of electronoptical systems. These equations make it possible to find a distribution of the current density of the beam cross section such that the trajectories of the electrons in the beam have a period equal to the period of a system of electrostatic lenses. The lenses computed were modeled on a digital computer. Satisfactory agreement was obtained between the results of modeling and computation, which indicates the possibility of computation of electrostatic lenses by the proposed method and in the case when the condition of smallness $\Delta U/U$ is violated, i.e., the ordinary methods of computation of periodic electrostatic focusing in traveling wave tubes becomes inapplicable (Δ U-focusing of potential differences; U - average potential of the beam). 9 ill. 8 ref. G. B.

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1/2 022 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--ELECTROLYTE FOR THE ELECTROCHEMICAL POLISHING OF TUNGSTEN -U-

AUTHOR-(05)-DANILINA, G.A., PETROSYAN, A.K., VASILYEV, V.G., KANEVSKIY, YU.L., GAVRILOV, V.M.

COUNTRY OF INFO--USSR

SOURCE--U.S.S.R. 260,789

REFERENCE--OTKRYTIYA, IZOBRET., PROM. OBRAZTSY, TOVARNYE ZNAKI 1970,

DATE PUBLISHED--06JAN70

SUBJECT AREAS--MATERIALS, MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--CHEMICAL PATENT, ELECTROLYTE, TUNGSTEN, ELECTROLYTIC POLISHING

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1994/1993

STEP NO--UR/0482/70/000/000/0000/0000

CIRC ACCESSION NO--AA0115792

UNCLASSIFIED

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CIRC ACCESSION NO--AA0115792

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ELECTROLYTE USED IN THE ELECTROCHEM. POLISHING OF W WITH ABRASIVE DISKS ON A METALLIC BINDER CONSISTED OF: NA SUB2 HPO SUB4 10-15, NA SUB2 CO SUB3 5-7, AND WATER 78-85PERCENT. FACILITY: SPECIAL DESIGN TECHNOLOGICAL BUREAU OF INVENTIONS OF THE COUNCIL OF MINISTERS, U.S.S.R.

UNCLASSIFIED

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PETROSYAN A.K.

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3-90 UR 0482

Soviet Inventions Illustrated, Section I Chemical, Derwent,

236175 TOOL ELECTRODE comprises two identical steel plates of any shape made from hard cermet material which accounts for 25-40% of the volume of the electrode. When fixing the tool to the machine, the cermet plate is placed higher than the steel plate, in relation to the axis of rotation of the wheel being dressed. Current is supplied through the steel in the usual manner. 31.10.67. as 1194944/25-8. Pogodin-Alekseev, G.I et al. Special Design Office of Committee of Inventions and Discoveries of the Council of Ministers of the USSR. (12.6.69.) Bul.6/24.1.69. Class 48a. Int.C C23b.

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AA0040759

AUTHORS: Pogodin - Alekseyev, G. I.; Gavrilov, V. M.; Vasil'yev, V. G.; Kanevskiy, Yu. L.; Petrosyan, A. K.; Ivanov, A. D.

Osoboye Konstruktorsko - Tekhnologicheskoye Byuro Komiteta po Delam Izobreteniy i Otkrytiy pri Sovete Ministrov SSSR

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

USSR

UDC 617-001.28-07:616-008.932.691-074

PETROSYAN, E. P., KORINTELI, V. I., and YARMONENKO, S. P., Institute of Experimental and Clinical Oncology, Academy of Medical Sciences USSR

"Kinetics of Changes in Endogenous SH-Groups in Primary Processes of Radiation Damage"

Moscow, Meditsinskaya Radiologiya, Vol 17, No 7, Jul 72, pp 29-32

Abstract : By using a specially designed semi-automatic set-up, changes in the content of endogenous SH-groups in a rat spleen homogenate were determined directly during irradiation of the latter with gamma-rays. The homogenate was prepared in an Ar atmosphere. The concentration of SH-groups was determined by automatic titration. Irradiation was accompanied by a decrease in the level of SH-groups, which reached its lowest point (corresponding to a decrease by 20%) upon absorption of a dose of approximately 500 rad. Further increases in the absorbed dose up to 2500 rad did not produce any significant additional changes in the SH-group level. No more than 20% of the SH-groups were converted, because simultaneous reduction of the disulfide groups that formed took place. After irradiation had been stopped, intensive regeneration of the SH-groups occurred, with the initial level being restored in 20 min. The phenomena in question, although observed in experiments with a homogenate consisting of destroyed cells, probably did not differ from those taking place during irradiation in vivo in view of the fact that most

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USSR

PETROSYAN, E. P., et al., Meditsinskaya Radiologiya, Vol 17, No 7, Jul 72, pp 29-32

enzymes are extremely resistant to the effects of radiation.

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

USSR

UDC: 621.317:621.396.62

PETROSYAN, F. N.

"Using a Bolometer as a Mixer for a Superhet Receiver"

Tr. VNII fiz.-tekhn. i radiotekhn. izmereniy (Works of the All-Union Scientific Research Institute of Physicotechnical and Radio Engineering Measurements), 1970, vyp. 2(32), pp 131-145 (from RZh-Radiotekhnika, No 5, May 71, Abstract No 5A259)

Translation: The author considers operation of a bolometer as a microwave signal mixer. The results of an investigation of conversion losses of the mixer are presented together with the noise factor of a receiver with a hot-wire mixer. One illustration, bibliography of nine titles. Resumé.

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

USSR

UDC: 621.317.741

PETROSYAN, F. N.

"A Precision Instrument for Measuring Low and Moderate Attenuations in the Microwave Band"

Tr. VNII fiz.-tekhn. i radiotekhn. izmereniy (Works of the All-Union Scientific Research Institute of Physicotechnical and Radio Engineering Measurements), 1970, vyp. 2(32), pp 41-49 (from RZh-Radiotekhnika, No 5, May 71, Abstract No 5A211)

Translation: The article describes a method and equipment for precision measurement of attenuations of 0-20 DB with an accuracy of the order of ±0.01 DB. One illustration, bibliography of five titles. Resumé.

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USSR

UDC: 621.317:621.372.852.3

PETROSYAN, F. N., DEVYATKOV, G. K., YUDINA, O. S.

"A Speed Reducer for a Polarization Attenuator With Uniform Scale in Decibels"

Tr. VNII Fiz.-tekhn. i radiotekhn. izmereniy (Works of the All-Union Scientific Research Institute of Physicotechnical and Radio Engineering Measurements), 1970, vyp. 2(32), pp 66-71 (from RZh-Radiotekhnika, No 5, May 71, Abstract No 5A209)

Translation: The paper describes a speed reducer designed for making a polarization attenuator with uniform scale in decibels, which is especially convenient for use in systems with automatic recording of a change in signal level. Two illustrations, one table.

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

USSR

UDC: 621.372.852:621.317

PETROSYAN, F. N., ZHDANOVA, T. Ya.

"Error Analysis in a Microwave Polarization Phase Shifter, and Methods of Certification"

Tr. VNII fiz.-tekhn. i radiotekhn. izmereniy (Works of the All-Union Scientific Research Institute of Physicotechnical and Radio Engineering Measurements), 1970, vyp. 2(32), pp 102-106 (from RZh-Radiotekhnika, No 5, May 71, Abstract No 5A215)

Translation: The paper presents the results of an analysis of partial and total errors in microwave polarization phase shifters. An estimate is given of the certification error in the output spectrum of the phase shifters due to mismatches in the measurement channel. One illustration, bibliography of five titles. Resumé.

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

USSR

UDC: 621.317.616:621.391.822

PETROSYAN, G. G.

"Investigation of the Frequency Dependence of the Spectral Power Density of Radio Noise From Type G2-6B Coaxial Gas-Discharge Oscillators"

Tr. VNII fiz.-tekhn. i radiotekhn. izmereniy (Works of the All-Union Scientific Research Institute of Physicotechnical and Radio Engineering Measurements), 1970, vyp. 2(32), pp 122-124 (from RZh-Radiotekhnika, No 5, May 71, Abstract No 5A258)

Translation: The paper presents the results of an investigation of the frequency dependence of the spectral power density of radio noise from type G2-6B oscillators. These data confirm the high quality of the new coaxial receptacle design. Three illustrations, bibliography of one title. Resumé.

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

USSR

UDC: 621.317:621.391.822

PETROSYAN, G. G.

"Experimental Verification of the Feasibility of Using the Engel-Steenbeck Formula to Determine the Spectral Power Density of Radio Noise From Gas-Discharge Noise Generators"

Tr. VNII fiz.-tekhn. i radiotekhn. izmereniy (Works of the All-Union Scientific Research Institute of Physicotechnical and Radio Engineering Measurements), 1970, vyp. 2(32), pp 125-129 (from RZh-Radiotekhnika, No 5, May 71, Abstract No 5A257)

Translation: The paper presents experimentally determined values of the spectral power density of radio noise from various types of gas-discharge microwave oscillators. It is shown that these experimentally determined values do not coincide with those determined by the Engel-Steenbeck formula. The discrepancies between theoretical and experimental data differ for various oscillators, the magnitude of the discrepancy depending on the losses in the SHF receptacle. Also presented are typical values of the spectral power density of radio noise for serially produced gas-discharge noise generators. The results are compared with the data given in K. Olson's paper. See RZh-Radiotekhnika, 1971, abstract No 5A186. Three illustrations, one table, bibliography of three titles.

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

USSR

UDC 624.131.532:622.361

PETROSYAN, G. M., Engineer

"The Manifestations of Rock Pressure in Diatomite Clays"

Moscow, Gidrotekhnicheskoye Stroitel'stvo, No 3, Mar 1973, pp 32-34.

Abstract: Results are presented from a laboratory study of the mechanical properties of diatomite clays through which the tunnel of Shanbskaya Hydroelectric Power Plant is being driven. Data for measurement of pressure at depths of 40 m from the surface using an improved pressure-measuring device are presented. The clays are shown to be weak and highly deformable. However, it was also shown that the clay can retain its stability for 24 to 36 hours in the cross section being used. Therefore, the tunnel is driven in 2 meter sections, without temporary reinforcement, with the reinforced concrete liner installed in 2 meter sections. The distribution of pressure in the clays around the contour of the tunnel was found to be near even.

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USSR

UDC 547.416'141:547.435'141

REUTOV, O. A., GUDKOVA, A. S., and PETROSYAN, T. V., Moscow State University imeni M. V. Lomonosov

"Hydrobromides of 2-Bromo-1-Amino-2-Metnylpropane and 1-Amino-2-Methylpropanol-2"

Moscow, Izvestiya Akad. Nauk SSSR, Seriya Khimicheskaya, No 1, Jan 72, p 213

Abstract: (letter to editor): The writers claim to have obtained the hydrobromide of 2-bromo-1-amino-2-methylpropane by several methods; heating of 1-amino-2-methylpropanol-2 in a sealed ampoule with 48%-HBR at 70-80°, and substitution of the hydroxyl in the hydrobromide of 1-amino-2-methyl-propanol-2 by bromine with the help of PBr_3 in various solvents; also without a solvent, or with $SOBr_2$ in $CHCl_3$.

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USSR

UDC 681.325.65

MKRTCHYAN, S. O., PETROSYAN, K. A., et al.

"A Threshold Element"

USSR Author's Certificate No. 271570, Filed 28/04/69, Published 15/09/70. (Translated from Referativnyy Zhurnal Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No. 4, 1971, Abstract No. 4B181P).

Translation: Threshold elements are known which contain input current switches, each of which consists of an information and a reference transistor and an output switch. The threshold element suggested differs as follows: The collectors of the information transistors of the input current switches corresponding to the exciting inputs and the collectors of the reference transistors of the input current switches corresponding to the inhibiting inputs are interconnected and connected to the base of the first output current switch transistor. The collectors of the reference transistors of the input current switches corresponding to the exciting inputs and the collectors of the information transistors of the input current switches corresponding to the inhibiting inputs are interconnected and connected to the base of the second output switch transistor. This allows the functional capabilities of the element to be expanded. 1 fig.

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USSR

PETROSYAN, L. G., Yerevan State University

UDC 538.4

"Boundary-Layer Equations of Magnetohydrodynamics With Instantaneous Stresses"

Yerevan, Izvestiya Akademii Nauk Armyanskoy SSR, Vol 26, No 1, 1973, pp 25-30

Abstract: A study is made of the basic equations of magnetohydrodynamics with instantaneous stresses (asymmetric magnetohydrodynamics). A system of such equations, which describes the isothermal movement of an electrically conductive medium in the presence of a magnetic field, consists of the equations of motion of a viscous, incompressible fluid with instantaneous stresses that contain terms of electromagnetic origin, Maxwell equations, and the equations of Ohm's law for moving media. A study is made of the two-dimensional boundary layer equations of the magnetohydrodynamics of a viscous incompressible fluid with instantaneous stresses, an asymmetrical stress tensor, and intrinsic inertia of the particles. Consideration is given to various types of the equations of a two-dimensional boundary layer in the case of a fluid with great or infinite electrical conductivity, as well as in the case of a fluid with very low electrical conductivity. 5 references.

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USSR

UDC 542.91+547.233+547.572

GEVORGYAN, G. A., PETROSYAN, L. M., and MNDZHOYAN, O. L., Institute of Fine Organic Chemistry ~~imeni A. L. Mndzhoyan~~, Academy of Sciences Armenian SSR, Yerevan

"Derivatives of Aminoketones. VIII. alpha-(p-Alkoxyphenyl)-gamma-diethylamino- and alpha-(p-Alkoxyphenyl)-gamma-(N-pentamethyleneimino)butyrophenones"

Yerevan, Armyanskiy Khimicheskiy Zhurnal, Vol 24, No 10, 1971, pp 892-899

Abstract: By the interaction of p-alkoxybenzyl cyanides with diethylaminoand pentamethyleneiminoethyl chlorides in the presence of NaH_2N, the corresponding 2-(p-alkoxyphenyl)-4-diethylamino- and 2-(p-alkoxyphenyl)-4-pentamethyleneiminobutyronitriles were obtained, which by the reaction with phenylmagnesium bromide were converted into alpha-(p-alkoxyphenyl)-gamma-diethylamino- and alpha-(p-alkoxyphenyl)-gamma-(N-pentamethyleneeimino)butyrophenones. In the reaction of the p-alkoxybenzyl cyanides with the aminoethyl chlorides, the disubstituted compounds $RC_6H_4C(CN)(CH_2CH_2R')_2$ also formed to a minor extent. The oximes of the aminoketones were prepared. gamma-Aminoketones are known to have an increased analgesic activity as compared with betaaminoketones. The compounds synthesized and their physical properties are listed in tables.

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USSR

UDC: 621.762:669.018.5(088.8)

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DAVIDOVICH, Ya. G., GLUSKIN, A. Ya., TEMKIN, I. V., AVROROVA, G. V., PETROSYAN, L. S., KOZHEVNIKOV, V. I.

"Method of Manufacture of Metal-Graphite Brushes"

USSR Author's Certificate Number 353303, Filed 13/10/70, Published 24/10/72 (Translated from Referativnyy Zhurnal Metallurgiya, No 8, 1973, Abstract No 8G434P).

Translation: A method is suggested for the manufacture of metal-graphite brushes, for example copper-graphite brushes, by mixing of graphite and pitch in the solid state with the addition of Cu powder and subsequent pressing of the mixture. In order to improve the characteristics of the brushes, the Cu powder is mixed with the prepared mixture of graphite and pitch.

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USSR

UDC 577.3

ALIKHANYAN, M. A., MARTIROSOV, S. M., and PETROSYAN, L. S., Yerevan Institute of Physics

"Determination of the Movement of Hydrogen, Potassium, and Sodium Ions Across Bacterial Membranes Using Cation-Selective Electrodes"

Yerevan, Biologicheskiy Zhurnal Armenii, No 5, 1973, pp 27-30

Abstract: The proposed method is based on the fact that the surface:volume ratio in a bacterial suspension is substantial ($\sim 10^5$ cm^{-1}) and even slight changes in ion transport can be readily detected from change in their activity in the medium. An experiment was performed with Streptococcus faecalus to reveal the relationship between the transport of hydrogen and sodium ions and the absorption of potassium ions. During the first 1-1/2 hours there was no glucose in the solution and, accordingly, no energy-dependent escape of H^+ from the bacteria, although the potassium ions left the cells fairly rapidly. The addition of glucose to the medium resulted in the bacteria releasing H^+ in exchange for K^+. However, when the micro-organisms accumulated high intracellular potassium concentrations by the third hour, further energy-dependent release of H^+ became necessary in order to maintain this high concentration for 3 to 4 hours longer.

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UR 0482

Soviet Inventions Illustrated, Section III Mechanical and General, Derwent, 1-70

240973 CRANE GRIP comprising crescent levers pivoted to each other and to tie-rods, and suspension, differing in the lower ends of the levers having cams with radius of curvature corresponding to that of the internal cavity of the item to be lifted, and holding it by bracing forces. This enables perforated plates etc. to be lifted. To lift a plate, the complex of grips suspended from the crane hook is introduced into slots in the upper part of the plate. The item is held by the cams.

26.12.66. as 1122318/27-11, PETROSYAN, L.V. (21.8.69) Bul. 13/1.4.69. Class 35b, Int. Cl. B 66c.

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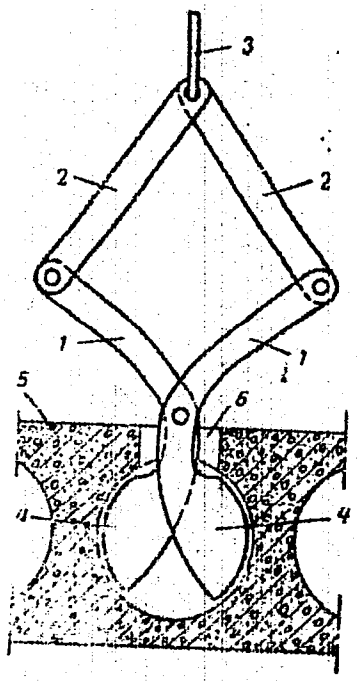

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

USSR

PETROSYAN, M. L.

UDC: 621.384.633.6

"On the Kinematic Theory of Multistage Bunching of Charged Particles"

Moscow, Radiotekhnika i Elektronika, Vol 17, No 4, Apr 72, pp 826-829

Abstract: The width of charged particle bunches is important in accelerator technology and in the field of millimeter and submillimeter wave oscillation. The possibilities of multistage bunching to reduce this width have not been adequately studied. The greatest problem to be overcome in multistage klystrons is that of attaining a high coefficient of power amplification. In this paper the author considers multistage single-frequency bunching with an infinite number of stages. The parameters are found which ensure ideally narrow bunching (bunching at a single point). The limits of applicability of the kinematic theory of multistage bunching are discussed, and it is shown that a factor must be introduced to account for the influence of the space charge when the length of the drift space exceeds the quantity $\sqrt{mv_0^3/4\pi e j_0}$, where j_0 is initial beam current density, and v_0 is initial electron velocity. It is shown that this corresponds to a current density of about $1.4/10^{2n}$ A/cm^2 at 3000 MHz and an accelerating voltage

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PETROSYAN, M. L., Radiotekhnika i Elektronika, Vol 17, No 4, Apr 72, pp 826-829

of 40 kV, where n is the number of bunching stages. At current densities of this order, the coefficient sin hl/hl must be introduced to account for the effect of the space charge on the bunching parameters, where h is the reciprocal of the drift length limit given above, and l is the length of the drift space.

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

USSR

UDC 531.76:615.371.004.68:612.014

STEPANYAN, E. D., PETROSYAN, R. A., and GRIGORENKO, L. P., Institute of Zoology, Armenian Academy of Sciences

"The Time Factor in Postvaccinal Shifts in Mitosis of Bone Marrow Cells"

Yerevan, Biologicheskiy Zhurnal Armenii, No 8, 1971, pp 82-88

Abstract: In Wistar rats inoculated once intravenously with brucellosis or paratyphoid cultures, bone marrow cell mitosis increased sharply within 24 hours and did not return to normal until 12 to 16 days later. Revaccination at this time with the same antigen failed to stimulate mitosis. However, the injection of paratyphoid antigen 12 to 16 days after vaccination with brucellosis antigen intensified cell division markedly. The lack of a reaction to repeated injection of the same bacterial agent in the early period after vaccination is ascribed mainly to nonspecific immunological processes and in the later period to specific processes.

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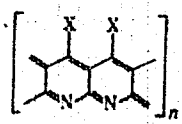
"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

Acc. Nr. AP0048838 Abstracting Service: CHEMICAL ABST. Ref. Code UR0459

91106h **Polymer-analogous reactions of poly(α-chloroacrylonitrile).** Chukhadzhyan, G. A.; Kalaidzhyan, A. E.; Petrosyan, V. A. (Vses. Nauch.-Issled. Inst. Polim. Prod., USSR). *Vysokomol. Soedin., Ser. A* 1970, 12(1), 171-6 (Russ). The dehydrochlorination of $[-CH_2C(CN)Cl-]_n$ (I) (K. Kubushiro, *et al.*, 1964) in $HCONMe_2$ soln., with LiCl, NEt_3, or pyridine at ~60° gave $[-CH{:}C(CN)-]_n$ (II) which is sol. in $HCONMe_2$ and at 150-250° cyclizes to III, which is a semiconductor (sp. vol. resis-



(III, X = H)
(VI, X = Cl)

tivity 8×10^6), not sol. in $HCONMe_2$, and stable ≤600°. III was pyrolyzed at >600° to a graphite-like stable substance. Heating I gave III directly, but $[CH_2C(CONH_2)Cl]_n$ on heating lost NH_3 and partly decompd. The reaction of I with H_2S gave $[-CH_2C(CSNH_2)Cl-]_n$ which on dehydrochlorination gave $[-CH{:}C(CSNH_2)-]_n$. The chlorination of II in $HCONMe_2$ gave $[-CHClC(CN)Cl-]_n$ (IV), which at room temp. lost HCl, forming $[-CCl{:}C(CN)-]_n$ (V). Thermal dehydrochlorination of IV or cyclization of V gave VI which is a thermally stable semiconductor. Chlorination of V in $HCONMe_2$ gave $[-CCl_2C(CN)Cl-]_n$.

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

USSR UDC: 621.315.592 3

MOLIN, V. N., VASIL, O. I., SKRIPKINA, P. A., ASEYEV, A. L., PETROSYAN, V. I., STENIN, S. I., and TAVGER, B. A., Institute of Semiconductor Physics, Novosibirsk

"Connections of the Electrophysical Characteristics and Structure of Dimension-Quantized InSb Films"

Leningrad, Fizika i tekhnika poluprovodnikov, No 8, 1972, pp 1447-1451

Abstract: The purpose of this paper is to establish a connection between the structure and the electrical characteristics of InSb films with quantum dimensional effects. In the form of wedges, the specimens were prepared by pulse sputtering in a vacuum of 10^{-5} mm Hg on mica sheets measuring 10X80 mm. The specimens were given two types of structure by two modes of annealing. A photograph of these structures is reproduced, and curves are plotted for the mobility as a function of the thickness of the InSb films for the two structural types and for nonstoichiometric films with excess Sb, for the mobility as a function of the polycrystalline film temperature and the textured film temperature. The authors express their gratitude to E. I. Dagman and L. M. Rodnikova for their assistance.

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XVI-4. DYNAMICS OF CONDENSATION AND STRUCTURAL TRANSFORMATION OF THIN InSb FILMS

[Article by F. A. Skripkina, O. I. Vasin, V. I. Petrosyan, S. I. Strain, Novosibirsk; Novosibirsk, III Simposium po Protsessam Rosta i Sinteza Poluprovodnikovykh Kristallov i Plenok, Russian, 12-17 June 1972, p 223]

The method of impulsive evaporation and the study of the dynamics of the condensation process of InSb films by continuous measurement of the conductivity and electron diffraction analysis on reflection was developed.

The process parameters such as the vapor dispersion rate (ν - 1/sec), the time (Δt 0.2 0.8 sec) and the condensation temperature (ΔT < 400°C) were defined. The variation of the stoichiometric composition with respect to film thickness (Sb-In) was observed during the deposition process.

The formation of the film structure from amorphous in the initial stages to polycrystalline or texture in the final stage takes place in the condensation process. The final stage depends sharply on the substrate temperature.

The films obtained had electron mobilities from 50 to $(1-5)\cdot 10^3$ cm^2/v-sec in the thickness range of 300-2,000 Å. The correlation of the structural and electrophysical parameters is detected, and it is demonstrated that the scattering of the charge carriers takes place basically on the structural defects — the grain and dislocation boundaries.

PETROSYAN, V. I.

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

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UDC 669.76:539.216.2:5317.311.3

PETROSYAN, V. I., MOLIN, V. N., DAGMAN, E. I., TAGVER, B. A., SKRIPKINA, P. A., and ALEKSANDROV, L. N., Institute of Semiconductor Physics, Siberian Department of the Academy of Sciences USSR

"Characteristics of Quantum Size Effects in Thin Untextured Polycrystalline Films of Bismuth Produced by the Electric Explosion Method"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 31, No 4, Apr 71, pp 725-730

Abstract: Possibilities of the occurrence of quantum size effects (QSE), their peculiarities in untextured polycrystalline bismuth films, and the role of crystallographic anisotropy in QSE were investigated on the basis of oscillation (period ~200 Å) dependences of the specific resistance ρ and the Hall constant R on the thickness in untextured polycrystalline foils. The foils were produced by the electric explosion method in the thickness interval of 50-700 Å. In contrast to previous findings, the Hall constant was found to be negative. The experimental results are discussed by reference to diagrams showing temperature dependences of ρ and R and densities of electron and hole conditions as functions of the film thickness. Control measurements made on the same films, annealed at 70°C, on which the texture

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PETROSYAN, V. I., et al., Fizika Metallov i Metallovedeniye, Vol 31, No 4, Apr 71, pp 725-730

originated, demonstrated that the derived characteristics are related to a polycrystallinity. Three figures, six formulas, eight bibliographic refs.

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

1/2 032 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--PECULIARITIES OF FORMATION AND PROPERTIES OF SEMICONDUCTOR FILMS DEPOSITED BY ELECTRICAL EXPLOSION -U-

AUTHOR-(05)-ALEKSANDROV, L.N., DAGMAN, E.I., ZELEVINSKAYA, V.I., PETROSYAN, V.I., SKRIPKINA, P.A.

COUNTRY OF INFO--USSR

SOURCE--THIN SOLID FILMS 1970, 5(1), 1-6

P

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS, MATERIALS

TOPIC TAGS--THIN FILM SEMICONDUCTOR, TEMPERATURE DISTRIBUTION, CRYSTALLIZATION, INDIUM ANTIMONIDE, INDIUM ARSENIDE, ELECTRON DIFFRACTION, ELECTRON MOBILITY, CRYSTAL GROWING, ELECTRIC DISCHARGE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/1221 STEP NO--NE/0000/70/005/001/0001/0006

CIRC ACCESSION NO--AP0124875

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

2/2 032 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0124875

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A CALCN. AND EXPTL. INVESTIGATION OF THE TEMP. DISTRIBUTION IN THIN FILMS DEPOSITED BY THE ELEC. EXPLOSION METHOD WERE MADE. AS A RESULT OF RELEASING THE CONDENSATION ENERGY, CRYSTN. PROCESSES OCCUR FROM THE MELT. FILMS OF INSB AND INAS DEPOSITED ON ISOLATED NONORIENTED SUBSTRATES WERE INVESTIGATED BY ELECTRON IDFFRACTION, AND THEIR MOBILITY, CARRIER CONCN., AND COND. WERE MEASURED. THE UNUSUALLY SMALL VALUES OF MOBILITY ARE DISCUSSED IN TERMS OF THE DIMENSIONAL EFFECT IN VERY THIN FILMS. FACILITY: INST. SEMICOND. PHYS., NOVOSIBIRSK, USSR.

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USSR

UDC 541.49:547.354.9'131:547.1'118

PETROSYAN, V. S., BASHILOV, V. V., and REUTOV, O. A., Moscow State University imeni M. V. Lomonosov, Moscow

"A Complex of Trans-β-Chlorvinylmercury Chloride and Hexamethyltriamidophosphate"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 2, 1973, p 481

Abstract: The addition of 0.489 g of hexamethyltriamidophosphate (HMTAP), in 1.5 ml petroleum ether, to 0.807 g of trans-β-chlorvinylmercury chloride (CVMC) (1 ml petroleum ether) -- 1:1 molar ratio -- results in the formation of white crystals which, after washing with 3 ml hexane and filtration, are obtained in a 1.2 g (100%) yield, and have a m.p. of 45-46°. According to analytical data and PMR spectra the complex has the following composition: $C_2H_2HgCl_2 \cdot [(CH_3)_2N]_3PO$. The complex is highly soluble in HMTAP, DMSO, and dioxane. Proton shifts indicate that in solution the complexes dissociate into the components. Analogous conclusions were previously reached with CVMC-pyridine complexes in ether and DMSO. 1/1

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

1/2 013 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--SOLVENT EFFECTS OF PMR SPECTRA OF METHYL DERIVATIVES OF SILICON, GERMANIUM, TIN, LEAD, AND MERCURY -U-

AUTHOR-(03)-PETROSYAN, V.S., REUTOV, O.A., VOYAKIN, A.S.

P

COUNTRY OF INFO--USSR

SOURCE--ZH. ORG. KHIM. 1970, 6(5), 889-93

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--SPECTROSCOPIC ANALYSIS, PROTON MAGNETIC RESONANCE, ORGANIC SOLVENT, ORGANOTIN COMPOUND, ORGANOGERMANIUM COMPOUND, ORGANOSILICON COMPOUND, ORGANOLEAD COMPOUND, ORGANOMERCURY COMPOUND

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3002/0421 STEP NO--UR/0366/70/006/005/0889/0893

CIRC ACCESSION NO--AP0127992

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2/2 013 UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0127992

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. PMR SPECTRA WERE OBTAINED OF SIME SUB4, GEME SUB4, SNME SUB4, AND HGME SUB2 IN ET SUB2 O DIMETHOXYETHANE, PYRIDINE, DIOXANE, HCONME SUB2 ACETONE, PO(NME SUB2) SUB3, CYCLOHEXANE, CCL SUB4, CHCL SUB3, CH SUB2 CL SUB2, THIOPHENE, ME SUB2 SO SUB2, TETRAMETHYLETHYLENEDIAMINE, ET SUB2 S, PET SUB3, TETRAHYDROFURAN, OR NET SUB3. THE CHEM. SHIFTS OF ME GROUP PROTONS COULD NOT BE CORRELATED WITH THE SOLVATING ABILITY OF THESE SOLVENTS. HOWEVER, A CORRELATION WAS FOUND BETWEEN THE SPIN SPIN CONSTS. OF METAL ME GROUP PROTONS INTERACTIONS AND THE ELECTRON DONOR PROPERTIES OF THE SOLVENTS.

FACILITY: MOSK. GOS. UNIV. IM. LOMONOSOVA, MOSCOW, USSR.

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Atomic power MAR. 73

JPRS # 58374
2 Mar 73

NEW BOOK ANALIZES ATOMIC POWER IN SOVIET UNION

[Book*review by Doctor of Economic Sciences Yu. Koryakin; Moscow, Pravda, Russian, 3 January 1973, p 3]

One of the remarkable discoveries of our century is atomic power. It is shown in A. Petros'yants' new book that the work of collectives of Soviet atomic scientists, engineers, technicians and workers has now led to the fact that atomic power in USSR is serving the people and the building of communism extensively and with great benefit.

A complete and scientifically strict survey, at the same time accessible to a wide circle of readers, of the current state of research in the field of atomic power, its practical results and the ensuing problems is a complex matter. This is especially true under conditions of the rapid development of atomic power and technology. The author has coped with this problem successfully.

Publication of the book is dedicated to the 50th anniversary of the USSR. It summarizes the activities of Soviet specialists in the field of the study and application of atomic power.

Main attention is devoted to the practical results of this and primarily of atomic power engineering. Beginning with the start-up in 1954 of the world's first small atomic electric power plant with a capacity of 5,000 kilowatts in Obninsk, the USSR has switched over erection of a number of current nuclear power engineering giants during the current five-year plan -- atomic electric power plants with output blocks of 1 million kilowatts. The annual generation of electric power by operating atomic power plants in the USSR will comprise 11.7 billion kilowatt-hours in 1973, and in the near future -- hundreds of billions. This is a very perceptible contribution to the power balance of the national economy!

*Ot Nauchnogo Poiska k Atomnoy Promyshlennosti, A. Petros'yants, Atomizdat, Moscow, 1972.

PETROS'YANTS, A.

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

The economic effect of use of radioactive isotopes is considerable. The range of their applied use is unusually extensive -- from agriculture and medicine to space technology. No less important is the fact that the key to problems, which are not subject to solution by other means, is being found with the aid of radioisotopes. Problems of diagnostics and treatment in medicine occupy an important place among them. Research in the field of high-energy physics, and on the search for and synthesis of chemical elements not found in nature are interesting and promising. Thermonuclear research has an alluring future. The successes here are so significant that posession of an unlimited power source -- controlled thermonuclear fusion -- has become a real hope.

The author characterizes the specific contribution of specific people and collectives to one or another trend of research. This is not only a tribute of respect for people, but also a fine example for youth who wish to devote themselves to atomic power.

The author has a large number of impressions of the joint work and contacts with many outstanding Soviet and foreign scientists. His brief description of his meetings and conversations with them makes the book easy to understand to enliven it.

On the whole the book is a unique document about the achievements of the Soviet Union in the new and progressive field of science and technology, where the USSR occupies one of the leading positions in the world.

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AUTHORS-- PETROS YANTS, A., CHAIRMAN OF THE STATE COMMITTEE ON THE UTILIZATION OF ATOMIC ENERGY, U.S.S.R., DOLLEZHAL, N., ACADEMICIAN, AND NEVSKIY, V., DIRECTOR OF THE BELYY YAR ATOMIC POWER PLANT

TITLE-- PROGRESS IN ATOMIC ENERGETICS

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NEWSPAPER-- SOTSIALISTICHESKAYA INDUSTRIYA, JANUARY 30, 1970, P 1, COLS 1-4

ABSTRACT-- THE FIRST SECTION OF THE BELYY YAR ATOMIC POWER PLANT WAS ACCEPTED BY A GOVERNMENT COMMISSION IN DECEMBER OF 1969 AND ITS RATED POWER OUTPUT HAS REACHED 300,000 KW. THE SECOND REACTOR OF THE PLANT IS OF THE SAME SIZE AS THE FIRST BUT PRODUCES TWICE THE AMOUNT OF POWER /200,000 KW/. THE EXPERIENCE OF THE BELYY YAR PLANT HAS SHOWN THAT THE DEPTH OF THE BURNOUT HAS EXCEEDED THE EXPECTATIONS. THIS WILL MAKE IT POSSIBLE TO REDUCE THE COST OF THE GENERATED POWER.

THE TYPE OF THE BELYY YAR REACTOR IS REFERRED TO AS "CHANNEL" REACTOR, I.E., A REACTOR THAT DOES NOT REQUIRE A VESSEL. TWO PHOTOGRAPHS SHOW THE POWER ROOM AND THE REACTOR ROOM OF THE PLANT.

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

USSR

UDC: 681.333.519.2

DOLGOV, G. S., KOMANDROVSKIY, V. G., PETROSYANTS, A. A., and STEPIN, Yu. P.
(I. M. Gubkin Institute of Oil Chemistry and Gas, Moscow)

"Device for Digital Recording of a Stationary Random Process"

Avt. sv. SSSR. kl. G 06 g 7/52, No 338909, zayavl. 6.11.70, opubl. 16.06.72 (Author's Certificate, USSR, class G 06 g 7/52, No 338909, claimed 6 November 1970, published 16 June 1972) from RZh--Avtomatika, telemekhanika i vychislitel'naya tekhnika, No 2, 1973, Abstract No 2A457P)

Translation: A device is proposed for the digital recording of a stationary random process, containing a random signal sensor, a registration unit, a signal unit random in follow-up time and single-signalled per cycle of registration unit operation, a unit for controlling the transmission time, and a general control unit. Three illustrations.

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PETROS'YANTS, A. M., ALEKSANDROV, A. P., DOLLEZHAL', N. A., and LEYPUNSKIY, A. I. (State Committee on the Use of Atomic Energy in the USSR)

"Prospects for the Development of Nuclear Power in the USSR"

Moscow, Atomnaya Energiya, Vol 31, No 4, Oct 71, pp 315-323

Abstract: According to a talk presented at the Fourth UN Conference on the Use of Atomic Energy for peaceful purposes, the USSR is well furnished with natural sources of energy, particularly in view of the new discoveries of coal, petroleum, and natural gas, but the location of sources of energy does not coincide with the location of industrial centers, the main users of power. With an anticipated increase in the rate of use of power of 7 to 8% per year, it is expected that such regions as the European or Central Ural part of the country will soon require additional sources of atomic power for producing electricity.

It is anticipated that emphasis will be placed, in the first stage of development, on the reactors with thermal neutrons, followed later by reactors with fast neutrons, as the second stage of development. Reactors of two types are at present in existence and are being considered for future development: the tank-type and the canal-type reactors.

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USSR

PETROS'YANTS, A. M., Atomnaya Energiya, Vol 31, No 4, Oct 71, pp 315-323

The tank-type reactors, operating at present in Central Russia, Kola Peninsula, the Caucasus, and the Ukraine, have their main tanks and covers built of steel. They operate on one and two circuits, with water brought to boiling in the active part and steam produced in steam generators.

Canal-type reactors with graphite moderators were first built in 1954. They now usually operate with super-heated steam. Their main advantages over the tank-type reactors consist in the use of zirconium instead of steel and in possessing higher unit power and a more efficient use of fuel up to 18,000 Mw·day/ton. They are also safer, as their active zone is split into individual channels. Their main disadvantage consists in greater size and consequently higher cost. These are the areas where improvement is anticipated.

Canal-type reactors are better suited for adaptation to work with fast neutrons, the main area of anticipated development of Soviet nuclear engineering. An intensive research is now being conducted in this field, with some experimental reactors and small pilot plants having already been built and operating. It is expected that after 1985 the whole European part of the country will have only the fast neutron type reactors.

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

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PETROS'YANTS, A. M., Atomnaya Energiya, Vol 31, No 4, Oct 71, pp 315-323

It is anticipated that from now to the year 2000 construction of new thermal power stations will have stopped, with the main emphasis on the development of fast neutron reactors, while building of thermal neutron reactors will continue at a decreasing rate. It is also anticipated that the application of nuclear power will be extended beyond the production of electricity to the production of heating, refrigeration, chemicals, and finally, to desalinization of sea water.

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

USSR

UDC: None

PETROS'YANTS, A. M., Chairman of the State Committee on the Use of Atomic Energy, USSR

"Nuclear Energy in the Soviet Union"

Moscow, Atomnaya Energiya, No. 3, 1971, pp 243-247

Abstract: This article is the abridged text of a report given on 5 October 1970 at the plenary session of the SEV (Council for Mutual Economic Aid) Scientific-Technical Conference of the organization's member nations in Ul'yanovsk. Tracing the history of obtaining electric power through atomic energy in the Soviet Union, it also reviews the present status of nuclear energy power in that country. December 1970 marked the 50th anniversary of the first electrification plan, a Leninist principle observed even now in plans for the development of the Soviet national economy. On that anniversary date, the total power of all power stations in the country was expected to be 167 million kW with a production capacity of 740 billion kW-hr. Nuclear power has played an essential role in the development of the national economy of the USSR since 1954, with the appearance of the first developed atomic energy station of 5 thousand kW. Two types of reactors are now being developed and perfected in the USSR: the vessel and channel types. The first

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

PETROS'YANTS, A. M., Atomnaya Energiya, No. 3, 1971, pp 243-247

consists of a thick-walled metallic vessel with water under a pressure of from 100-125 atmospheres -- later to be increased to 160 atmospheres -- with a temperature of up to 325° C at the reactor output, and a fuel magazine inside the vessel containing enriched uranium. The channel type of reactor uses the cheap material of graphite as the moderator, with the nuclear fuel placed in the channels penetrating the moderator. Water under pressure flows through the channels and boils, removing the heat from the uranium. The reactors of this type have received further development in the reactors of the first and second blocks of the Beloyarsk Atomic Energy Station with a total power of 300 MW.

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

USSR UDC 621.382.3

PETROSYANTS, K.O.

"Nonlinear Model Of Bipolar One- And Multiemitter Transistor For Analysis And Design Of Integrated Circuits With The Aid Of An Electronic Computer"

Elektron.tekhnika. Nauch.-tekhn.sb. Mikroelektronika (Electronic Technics. Scientific-Technical Collection. Microelectronics), 1971, Issue 5(31), pp 115-122 (from RZh:Elektronika i yeye primeneniye, No 5, May 1972, Abstract No 5B185)

Translation: A model is considered of an integrated bipolar transistor and a multiemitter transistor with an insulating p-n junction, which is described by modified Ebers-Moll equations. Summary.

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

1/2 011 UNCLASSIFIED PROCESSING DATE--11SEP70

TITLE--UTILIZATION OF RADIOACTIVE TRACERS IN THE STUDY OF GLOBAL ATMOSPHERIC PROCESSES -U-

AUTHOR--KAROL, I.L., KRASNOPEVTSEV, YU.V., MALAKHOV, S.G., PETROSYANTS, M.A.

COUNTRY OF INFO--USSR

SOURCE--METEOROLOGIYA I GIDROLOGIYA, 1970, NR 4, PP 92-101

DATE PUBLISHED--------70

SUBJECT AREAS--ATMOSPHERIC SCIENCES

TOPIC TAGS--RADIOACTIVITY, RADIOACTIVE TRACER, AIR, ATMOSPHERIC PRECIPIATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1987/1042 STEP NO--UR/0050/70/000/004/0092/0101

CIRC ACCESSION NO--AP0104440

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

2/2 011 UNCLASSIFIED PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0104440

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE PROGRAMME OF UTILIZING THE OBSERVATIONS OF AIR RADIOACTIVITY AND RADIOACTIVE PRECIPITATION FOR THE STUDY OF GENERAL ATMOSPHERE CIRCULATION DURING THE PERIOD OF GARP IMPLEMENTATION IS STATED.

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

Acc. Nr: AP0043760 Ref. Code: UR 0050

PRIMARY SOURCE: Meteorologiya i Gidrologiya, 1970, Nr 3, pp 18-33

MODIFICATION OF ATMOSPHERIC PROCESSES

G. K. Sulakvelidze, M. A. Petrosyants

Results of the work on modification of atmospheric processes in the USSR and some other countries are stated. The ways of the development of this research in the future are suggested.

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1/2 039 UNCLASSIFIED PROCESSING DATE--02OCT70

TITLE--THE SOYUZ SPACESHIPS CONVERSE THROUGH A SATELLITE -U-

AUTHOR-(02)-PETROV, A., VASILYEV, V.

COUNTRY OF INFO--USSR

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CIRC ACCESSION NO--AP0112182 PROCESSING DATE--02OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE TERRITORY OF THE USSR OCCUPIES 4.4PERCENT OF THE EARTH'S SURFACE. THE BEST DISTRIBUTION OF TRANSMITTING AND RECEIVING STATIONS OVER THIS AREA WOULD ENSURE CONTINUOUS COMMUNICATION WITH SPACESHIPS ONLY 10PERCENT OF THE TIME. OBVIOUSLY, STATIONS THROUGHOUT THE WORLD WOULD BE DESIRABLE. ONE SOLUTION IS THE USE OF COMMUNICATION SATELLITES FOR MAINTAINING CONTACT BETWEEN SPACESHIPS AND GROUND STATIONS. SOME RECEIVING AND TRANSMITTING STATIONS CAN BE PLACED ON VESSELS. THE SCIENTIFIC RESEARCH VESSEL "KOSMONAUT VLADIMIR KOMAROV" IS AN EXAMPLE OF SHIPS WHICH ARE BEING USED FOR THIS PURPOSE. ALL THE INFORMATION RECEIVED BY THIS VESSEL FROM A SPACESHIP IS TRANSMITTED TO THE SPACEFLIGHT CONTROL CENTER. THE CONTROL SIGNALS ARE TRANSMITTED FROM THE CENTER THROUGH THE LINE: "COMMUNICATIONS SATELLITE VESSEL SPACESHIP". THIS METHOD IS USED WHEN THE SPACESHIPS ARE BEYOND THE RANGE OF RADIO VISIBILITY OF USSR STATIONS. TELEVISION INFORMATION FROM SATELLITES CAN BE TRANSMITTED IN THE SAME WAY. HOWEVER, THE INTERMEDIATE LINK OF A VESSEL AT SEA CAN BE DISPENSED WITH USING DIRECT RELAYING BETWEEN A SPACESHIP AND A COMMUNICATIONS SATELLITE AND THE SPACEFLIGHT CONTROL CENTER. NO GREAT TECHNICAL DIFFICULTIES ARE INVOLVED IN SOLVING THIS PROBLEM. IN ORGANIZING CONTINUOUS RADIO COMMUNICATION BETWEEN A COMMUNICATIONS SATELLITE AND A SPACESHIP WHEN IT IS PRESENT AT ANY POINT OVER THE EARTH'S SURFACE THE COMMUNICATIONS SATELLITES MUST BE PUT INTO ORBIT IN SUCH A WAY THAT THEIR ZONES OF RADIO VISIBILITY COVER THE EARTH'S ENTIRE SURFACE AT THE SAME TIME.

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USSR

UDC 547.341

RAZUMOVA, N. A., GRUK, M. P., and PETROV, A. A., Leningrad Technological Institute imeni Lensovet

"Phosphorus Containing Heterocyclics. Condensation of Glycol and Catechol Esters of Arylphosphonous Acids With α,β-Unsaturated Ketones"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 7, Jul 73, pp 1475-1479

Abstract: Reactions of propyleneglycol and catechol esters of phenyl, p-tolyl, and p-chlorophenylphosphonous acids with methylvinyl ketone and mesitylene oxide leads to the formation of products whose structures may be represented by a resonating system of pentacovalent and ionic forms. The phosphorus compound in these condensations acts as a nucleophile. The reactivity of the glycol esters of arylphosphonous acids is 40-50 times as great as that of the catechol esters.

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USSR

UDC 547.341

GALISHEV, V. A., CHISTIKLETOV, V. N., PETROV, A. A., and TAMM, L. A., Leningrad Technological Institute imeni Lensovet

"1,3-Dipolar Addition to Unsaturated Compounds. XXXI. Reactions of Organic Azides With α,β-Unsaturated Compounds of Trivalent Phosphorus"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 7, Jul 73, pp 1470-1472

Abstract: The reactions of organic azides of α,β-unsaturated phosphines were investigated. It was shown that in the cases studied, the double bond is not involved in the reaction so that novel unsaturated phosphineimines are formed.

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USSR UDC 547.26'118

KRUGLOV, S. V., IGNAT'YEV, V. M., IONIN, B. I., and PETROV, A. A., Leningrad Technological Institute imeni Lensovet

"Synthesis of Symmetric and Mixed Esters of Diphosphonous Acids"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 7, Jul 73, pp 1480-1490

Abstract: A series of symmetric and mixed acetylene-, allene-, 1,3-diene- and alkendiphosphonates was synthesized. It was shown that hydrogenation of 1,3-dienephosphonates occurs selectively on the 1,4-position. It was established that the Arbuzov rearrangement of trialkyl phosphites with 1,4-dibromobutyne leads to the formation of a symmetric acetylenediphosphonate, while from the 1,4-dichlorobutyne a diphosphonate with a terminal allene group is formed, i.e. the reaction is accompanied by an acetylene-allene isomerization.

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USSR

UDC 547.241

KONOTOPOVA, G. P., CHISTOKLETOV, V. N., and PETROV, A. A., Leningrad Technological Institute imeni Lensoveta

"The Reaction of Nitrilimines with Phosphines"

Leningrad, Zhurnal Obshchey Khimii, Vol 42(104), Vyp 11, 1972, pp 2412-2415

Abstract: A study was made of the influence of the substitutions in nitrilimines having the general formula $RCCl{=}N{-}NHC_6H_5$ on the direction of the reaction with $(C_2H_5)_3N$ as follows:

$$RCCl{=}N{-}NHC_6H_5 + (C_2H_5)_3N \rightleftharpoons \underset{(A)}{R{-}\overset{+}{C}{=}N{-}\overset{-}{N}{-}C_6H_5} + (C_2H_5)_3N \cdot HCl$$

$$(A) + R'_2PR'' \longrightarrow \begin{matrix} R'_2 \\ R'' \end{matrix}\!\!>\!\overset{+}{P}{-}\underset{\underset{R}{|}}{C}{-}N{=}N{-}C_6H_5 \longleftrightarrow \begin{matrix} R'_2 \\ R'' \end{matrix}\!\!>\!\overset{+}{P}{-}\underset{\underset{R}{|}}{C}{=}N{-}\overset{-}{N}{-}C_6H_5$$

The R' and R" groups were mainly short chain alkanes or aromatics. The R group was general either an aromatic or an ester. It was determined that the nature of the substitutions on the phosphorus atoms did not change the path

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KONOTOPOVA, G. P., et al., Zhurnal Obshchey Khimii, Vol 42(104), Vyp 11, 1972, pp 2412-2415

of the reaction significantly; however, the substitution on the carbon atom in the nitrilimines governed whether the products were azoylides or phosphonous salts. An R group such as C_2H_5OOC resulted in the former and C_6H_5 in the latter. Preparations, physical data and IR spectra are given.

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USSR UDC 541.67:547.341

ZAKHAROV, V. I., BELOV, YU. V., IONIN, B. I., and PETROV, A. A., Leningrad Technological Institute imeni Lensovet

"Study of the Spin-Apin Coupling in Fluoroanhydrides of Phosphoric Acids by the Method of Double and Triple Nuclear Magnetic Resonance"

Moscow, Doklady Akademii Nauk SSSR, Vol 209, No 6, Apr 73, pp 1343-1346

Abstract: Analysis of double and triple resonance spectra was carried out by the method of subspectra: selective exposure to a high frequency field H_2 of one of the subspectra in the resonance of the nucleus X leads to the merging of resonance lines of other nuclei in the same subspectrum. For example, in the spectrum of the difluoroanhydride of methanephosphonic acid, when the low frequency subspectrum P^{31} is exposed to high frequency field, the high frequency lines of the triplets H^1 merge, and conversely, when the high frequency subspectrum P^{31} is exposed, the low frequency H^1 triplet lines become merged. It follows from this that the constants H-F and F-P have the opposite signs, the constant $3_{J_{HF}}$ being positive. To perform similar analysis in case of the 2-chloro-X-propene-1-phosphonic acid difluoride, it is necessary to solve the spin-spin coupling of the ethylene proton with the protons of the methyl group, that is under conditions of triple resonance.

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USSR

UDC 547.341

KONOTOPOVA, S. P., CHISTOKLETOV, V. N., and PETROV, A. A., Leningrad Technological Institute Imeni Lensovet

"Reactions of Trivalent Phosphorus Acid Amides With Nitrileamines"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 5, May 73, pp 987-991

Abstract: The reactions of trivalent phosphorus acid amides with nitrileimines was studied by reacting tripiperidyl-, trimorpholyl-, hexaethyl-, hexamethyltriamides of phosphorous acid, phenyldipiperidyl diamide of phosphonous acid and diphenyldimethylamide of phosphinous acid with C-carbethoxy-, C-acetyl-, C-(4-nitrophenyl)- and C-phenyl-N-acylnitrylimines. It was established that the substituents on the phosphorus component have no effect on the course of the process, the C-atom substituents leading to the formation of azomethylene phosphoranes or salts. For example, C-carbethoxy- and C-acetyl-N-arylnitrileimines form stable azomethylenephosphoranes with all the amides studied, while C-phenyl- and C-(4-nitrophenyl)-N-phenylnitrylimines yield salts.

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USSR

UDC 547.341

BAGROV, F. V., RAZUMOVA, N. A., and PETROV, A. A.

"Condensation of the Glycol and Catechol Esters of Aryl Phosphinous Acids With 1,3-Dienes"

Leningrad, Zhurnal Obshchey Khimii, Vol 42(104), Vyp 4, 1972, pp 792-797

Abstract: The condensation of the catechol esters of p-dimethylbenzil (I), p-chlorophenyl (II), and p-dimethylaminophenylphosphorus acid (III), the ethyl glycol esters of compound I(IV), and p-(chlorophenyl) phosphorous acid (V) with butadiene and isoprene groups was used to study the influence of trivalent phosphorous groups on the rate and mechanism of the condensation. In every case the condensation went via a pentacovalent intermediate. The vinyl group reacted with the catechol esters of phenylphosphorous acid twice as fast as with I or II; it reacted with III only under vigorous conditions (180°C). The reactions of ethyl gylcols showed the same pattern. NMR, IR, and other techniques were used to examine intermediates and products. Tables give the constants from the former and the theoretical and actual elemental composition of the products.

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USSR

UDC 547.351

TAMM, L. A., CHISTOKLETOV, V. N., and PETROV, A. A., Leningrad Technological Institute

"1,3-Dipolar Addition to Unsaturated Compounds. XXIX. Reactions of α,β-Alkynylphosphines with Nitrileimines"

Leningrad, Zhurnal Obshchey Khimii, Vol 42 (104), No 9, Sep 72, pp 1926-1930

Abstract: An investigation of the structural effects of C,N-substituted nitrileamines on the course of their reactions with various α,β-acetylenephosphines was carried out. It was established that the reactions of α,β-acetylenephosphines with nitrileamines, in contrast to α,β-ethylenephosphines, are less sensitive to the steric hindrance at the β-carbon atom of the ethynyl group and towards the nature of substituents at the carbon atom of the nitrileamines. For example, in the reaction of ethynyl-, propynyl-, and phenylethynyldiphenylphosphines with C-(p-nitrophenyl)- and C-carboethoxy-N-phenylnitrylimines, only cyclic phosphonium salts are formed. This probably due to higher activity of the sp-hybridized carbon atom in the reactions with nucleophilic reagents.

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RAZUMOVA, N. A., GRUK, M. P., and PETROV, A. A., Leningrad Technological Institute Imeni Lensovet

"Reaction of Glycol and Pyrocatechol Esters of Phenylphosphonous Acid With Methyl Vinyl Ketone"

Leningrad, Zhurnal Obshchey Khimii, Vol 42 (104), No 9, Sep 72, p 2114

Abstract: Ethyleneglycol ester of phenylphosphonous acid reacted with methyl vinyl ketone yields 2-phenyl-(2,2-ethylenedioxy)-5-methyl-1,2-isoxaphospholene, m.p. 61°. When the pyrocatechol ester was used in this reaction, the product was 2-phenyl-(2,2-phenylenedioxy)-5-methyl-1,2-isoxaphospholene, b.p. 158-160°/1 mm. The structures of these products were supported by NMR and IR spectroscopic data.

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UDC 547.341

DOGADINA, A. V., IONIN, B. I., and PETROV, A. A., Leningrad Technological Institute Imeni Lensovet

"Reaction of Phosphorus Pentachloride With 1,3-Enynes"

Leningrad, Zhurnal Obshchey Khimii, Vol 42 (104), No 9, Sep 72, pp 1919-1925

Abstract: Reaction of phosphorus pentachloride with 1,3-enynes is accompanied by addition of hydrogen chloride, yielding 2,4-dichloro-2-alkenylphosphonic acid dichlorides which upon dehydrochlorination with triethylamine produce 2-chloro-1,3-butadienyl derivatives with the chlorine atom and the phosphorus containing group trans to each other. The structures of individual products were derived from PMR and NMR spectroscopical data.

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UDC 547.341:541.454 + 541.67

SKVORTSOV, N. K., TERESHCHENKO, G. F., IONIN, B. I., and PETROV, A. A., Leningrad Technological Institute Imeni Lensovet

"Investigation of the Protonation of Tertiary Phosphine Oxides by the Nuclear Magnetic Resonance Method"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 5, May 73, pp 981-987

Abstract: Protonation of phosphine oxides and related compounds was studied by the NMR method using the chemical shifts of ^{1}H and ^{31}P. It was shown that protonshift data can be described by the amide function of acidity H_A. To describe results obtained from the chemical shifts of phosphorus, a new acidity function for phosphoryl compounds H_{PO} was developed. It shows a slow growth with increased concentration of sulfuric acid than the known functions H_o and H_A.

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UDC 547.341

MASHLYAKOVSKIY, L. N., ZAGUDAYEVA, T. A., IONIN, B. I., OKHRIMENKO, I. S., and PETROV, A. A., Leningrad Technological Institute Imeni Lensovet

"Synthesis of Derivatives of Thionephosphonic Acids With Conjugated Dienes"

Leningrad, Zhurnal Obshchey Khimii, Vol 42 (104), No 12, Dec 72, pp 2648-2656

Abstract: Gradual replacement of the halogen atoms in $PSCl_2$ by alkoxyl radicals produced new ester-acid chlorides and diesters of 2-methylbutadiene-1,3-thionephosphonic acid and bis-1,3-dienethionephosphonates. The ester acid chlorides of 1,3-dienethionephosphonic acids have higher thermal stability than the phosphoryl analogs because of the weaker basic properties of the P:S group and lower electrophilic strength of the phosphorus atom. Comparative analysis of the PMR spectra of the derivatives of 2-methylbutaduene-1,3-phosphonic and thionephosphonic acids showed that these compounds represent mixtures of various quantities of cis- and trans- isomers. The latter are stabilized by an intramolecular hydrogen bond with the chlorine atoms of the $PSCl_2$ group. P:S participates to a considerably lesser degree in formation of hydrogen bonding than the P:O group.

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USSR UDC 547.26'118 + 547.379.1

PETROV, M. L., and PETROV, A. A., Leningrad Technological Institute Imeni Lensovet

"Reactions of Trialkylphosphites With Ethylthioacetylene"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 3, Mar 73, p 691

Abstract: A mixture of 0.05 g-mole of ethylthioacetylene and 0.05 g-mole of trialkylphosphite in 50 cc of the respective absolute alcohol was refluxed for 10 hrs. The reaction mixture was left standing overnight, the alcohol was then evaporated and the product was isolated by vacuum distillation, yielding the dimethyl ester of 2-ethylthioethylene-1-phosphonic acid, b.p. 124-126°/0.5 mm, d_4^{20} 1.1890, n_D^{20} 1.5060, and the diethyl ester, b.p. 120-122°/2 mm, d_4^{20} 1.1130, n_D^{20} 1.4922.

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USSR UDC 547.341

GRUK, M. P., RAZUMOVA, N. A., and PETROV, A. A., Leningrad Technological Institute Imeni Lensovet

"Condensation of Glycol and Pyrocatechine Esters of Ethylphosphonous Acid With Methylvinyl Ketone"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 4, Apr 73, p 945

Abstract: Glycol and pyrocatechine esters of various arylphosphonous acids react with α,β-unsaturated ketones forming compounds with pentacovalent phosphorus atom. The reactions of ethylphosphonous acid esters are even faster, going to completion in seconds to minutes. Two compounds have been synthesized: 2-ethyl(2,2-ethylenedioxy)-5-methyl-1,2-isoxaphospholanes, b.p. 78-79°/1 mm, d_4^{20} 1.1579, n_D^{20} 1.4870 and 2-ethyl(2,2-phenylenedioxy)-5-methyl-1,2-isoxaphospholene, b.p. 98-99°/1 mm, d_4^{20} 1.2311, n_D^{20} 1.5480.

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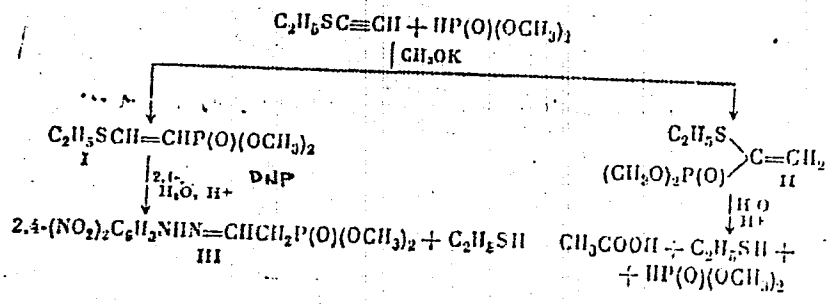
UDC 547.26'118+547.379.1

PETROV, M. L., and PETROV, A. A., Leningrad Technological Institute imeni Lensoveta

"Reaction of Dimethyl phosphite with Ethylthioacetylene"

Leningrad, Zhurnal Obshchey Khimii, Vol 42(104), Vyp 10, 1972, p 2345

Abstract: The reaction of dimethyl phosphite with ethylthioacetylene in the presence of an equivalent amount of potassium methoxide yielded dimethyl 2-ethylthioethenylphosphonate:



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PETROV, M. L., and PETROV, A. A., Zhurnal Obshchey Khimii, Vol 42(104), Vyp 10, 1972, p 2345

Properties of (I) are: b.p. 130-132°C (2 mm); d_4^{20} 1.1881, n_p^{20} 1.5069, MR_D 49.09. Hydrolysis of (I) in the presence of 2,4-dinitrophenylhydrazine yielded compound (III), b.p. 172-173°C. Hydrolysis of the reaction product (II) yielded acetic acid, ethyl mercaptana, and dimethyl phosphite.

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UDC 547.341

DOGADKINA, A. V., MINGALEVA, K. S., IONIN, B. I., and PETROV, A. A., Leningrad Technological Institute imeni Lensoveta

"Addition of Phosphorus Pentachloride to Acetylenes"

Leningrad, Zhurnal Obshchey Khimii, Vol 42 (104), Vyp 10, 1972, pp 2186-2193

Abstract: Formation of acid chlorides, esters, and phosphine oxides during the reaction of PCl_5 with acetylenic hydrocarbons is described. Oxidative phosphorylation of acetylenic hydrocarbons is also presented for comparison. The reaction of PCl_5 with tert-butylacetylene in benzene takes place at room temperature and after treatment with SO_2 yields the acid dichloride of 3,3-dimethyl-2-chloro-1-Z-butyl-phosphonic acid, (I), $C_6H_{10}Cl_3OP$, b.p. 110° C (1 mm). Methylacetylene with PCl_5 under identical reaction conditions yields the acid dichloride of 2-chloro-Z-propenylphosphonic acid (II) $C_3H_4Cl_3OP$, b.p. 72-75° (1 mm), d_4^{20} 1.5014, n_D^{20} 1.5120, as well as the allyl isomer (III) and the acid dichloride of 2,2-dichloroporpylphosphonic acid (IV)

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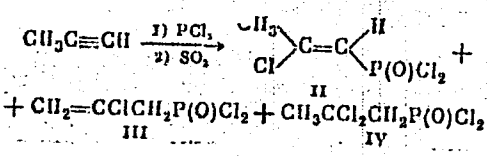
DOGADKINA, A. V., et al., Zhurnal Obshchey Khimii, Vol 42(104), Vyp 10, 1972, pp 2186-2193



Reaction of PCl_5 with ethylacetylene yields exclusively the acid dichloride of 2-chloro-2-butenylphosphonic acid (V), $C_4H_6Cl_3OP$, b.p. 95°C (1 mm), d_4^{20} 1.4265, n_D^{20} 1.5132. A noticeable amount of E-isomer (VI) was obtained in the reaction of PCl_5 with methylacetylene. Ethoxyacetylene easily reacts with PCl_5 by forming the acid dichloride of 2-chloro-2-ethoxy-2-vinylphosphonic acid (VII), b.p. 82-83°C (1 mm), d_4^{20} 1.4630, n_D^{20} 1.5140.

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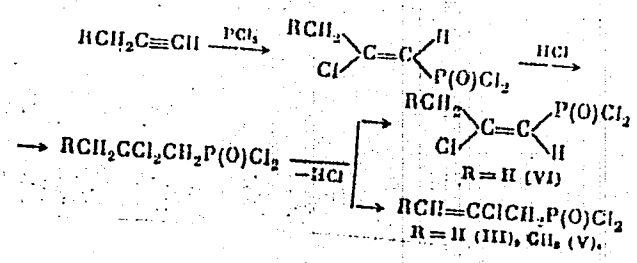
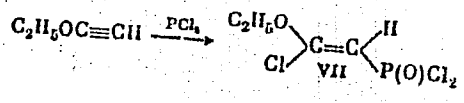
DOGADKINA, A. V., et al., Zhurnal Obshchey Khimii, Vol 42(104), Vyp 10, 1972, pp 21-86-2193





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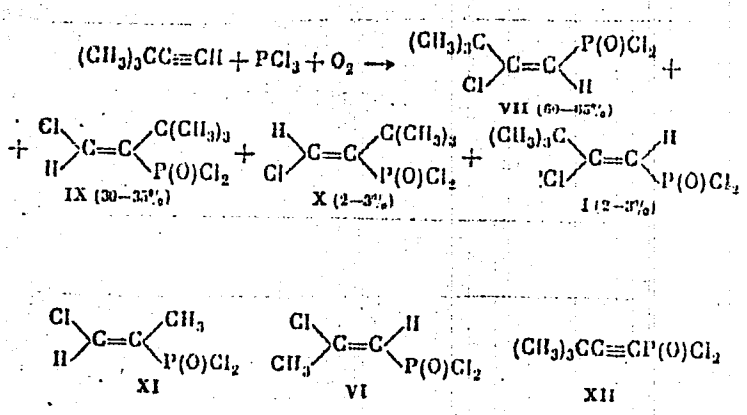
DOGADKINA, A. V., et al., Zhurnal Obshchey Khimii, Vol 42(104), Vyp 10, 1972, pp 2186-2193

Other acid dichlorides (VIII-XII) were prepared in the course of the following reactions:



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USSR

DOGADKINA, A. V., et al., Zhurnal Obshchey Khimii, Vol 42(104), Vyp 10, 1972, pp 2186-2193

Reaction of the obtained acid dichlorides with ethanol in the presence of pyridine yields corresponding diethyl phosphonates. Some acid dichlorides (I-IV), (XII) react with ethylmagnesium bromide yielding 2-chloro-Z-alkenyl and alkynyl phosphine oxides. Properties of all prepared compounds along with their PMR and NMR are given.

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USSR

UDC 51

IVANILOV, YU. N., PETROV, A. A.

"Analysis of the Maximum Production Growth Rates for Given Finite Consumption of Products"

V sb. Issled. operatsiy. Modeli, sistemy, resheniya. Vyp. 3 (Operations Research. Models, Systems, Decisions. Vyp. 3 -- collection of works), Moscow, 1972, pp 3-19 (from RZh-Kibernetika, No 9, Sep 72, Abstract No 9V512)

Translation: A study is made of the problem of determining the growth rates of multibranch production which is described by a dynamic model. It is proposed that the production is divided into two sectors one of which produces the product going only to satisfy a finite demand. A maximum production growth rate is defined for a given finite demand. If the possible finite demand is given by a system of linear inequalities, it turns out to be possible to construct an algorithm which offers the possibility of calculating the maximal production growth rate in a finite number of iterations.

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USSR

UDC 577.4

IVANILOV, YU. P., PETROV, A. A.

"Model of Planned Development of Manpower"

V sb. Issled. operatsiy (modeli, sistemy, resheniya). Vyp. 1 (Operations Research (Models, Systems, Solutions). Vyp. 1 — collection of works), Moscow, Computation Center of the USSR Academy of Sciences, 1970, pp 5-9 (from RZh-Kibernetika, No 7, Jul 72, Abstract No 7V527)

Translation: A study was made of the dynamic model of the planned development of manpower. The model belongs to the balance sheet models. Many of the sociological factors which determine the dynamics of manpower are not considered in explicit form. These factors are considered given, and to some degree they are taken into account by the structure of the model. The model describes centralized manpower planning.

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USSR

UDC: 51:330.115

IVANILOV, Yu. V., PETROV, A. A.

"Dynamic Model of Expansion and Rearrangement of Production (π-Model)"

V sb. Kibernetiku -- na sluzhbu kommunizmu. T. 6 (Cybernetics in the Service of Communism--collection of works. Vol 6), Moscow, "Energiya", 1971, pp 23-50 (from RZh-Matematika, No 11, Nov 71, Abstract No 11V751)

Translation: A dynamic model is constructed for expansion and rearrangement of production, taking account of the possibilities for a change in the structure of production due to accumulation and conversion of the facilities of one sector for producing another type of goods and the possibilities of inhibiting and deinhibiting of facilities with regard to lags in time, noncoincidence of the production cycle in sectors, etc. D. Epshteyn.

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

USSR

UDC 537.563:547.23

FRIDLYANSKIY, G. V., PAVLENKO, V. A., VINOGRADOV, B. A., GRISHIN, N. N., BOGOLYUBOV, G. M., and PETROV, A. A., Leningrad Technological Institute imeni Lensovet

"Organic Derivatives of Group V-VII Elements. XX. Exact Composition of Ions in Mass Spectra of Alkylphosphine Sulfides and P=S Bond Strength"

Leningrad, Zhurnal Obshchey Khimii, Vol 41, No 8, Aug 71, pp 1707-1709

Abstract: The article describes results of the measurement of mass numbers of ions in mass spectra for triethylphosphine sulfide and tetraethyldiphosphine disulfide on a double-focusing mass spectrometer. The dissociation energy of the P-P bond in tetraethyldiphosphine disulfide was previously found by the authors from the appearance potential of the ion $(M/2)^+$. Precise measurement of the mass in the present article confirms the composition assigned to this ion. The dissociation energy of the P=S bond was found to be equal to 3.7 ev or 85 kcal/mole, which is in satisfactory agreement with the value obtained from the thermal effect of the tripropylphosphine oxidation reaction (91.6 kcal/mole). Determination of the exact composition of ions in the mass spectra of alkylphosphine sulfides shows the resistance of the P=S bond to the action of an electron impact. This resistance is characteristic of the chemical bonds between atoms of Group V and VI elements possessing unshared electron pairs.

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Biophysics

USSR UDC 577.3

PETROV, A. A.

"Algorithms for Preliminary Treatment of Data on Signals in the Visual Analysor System"

Moscow, Biofizika, Vol 16, No 3, May/Jun 71, pp 512-519

Abstract: Application of the method of formulating optimal algorithms is proposed for studying the functional organization of branches of the nervous system and mechanisms of their operation with particular attention to the visual analysor system. A model has been developed for the visual analysor and an optimal algorithm for the treatment of receptor signals reaching neuron assemblies of the visual analysor formulated on the basis of this model. The theoretical relations derived are consistent with experimental data on the properties of neurons and their assemblies in the visual analysor system of higher animals.

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

PETROV, A. A.

COLEEN

96. USSR

UDC 611--0.8.82 : 519.92+519.95

PETROV, A. A. and PIYANZINA, L. Ya.

SO: FOREIGN PRESS DIGEST 29 OCT 1971

"Elements of a Mathematical Theory of Neurons and Neuron Networks"

Kibernetischeskiye Aspekty v Izuchenii Raboty Mozga (Cybernetic Aspects of the Study of the Brain's Functioning), Moscow, Nauka Publishing House, 1970, pp 223-230

Abstract: The goal of the present work is to construct a mathematical model of a nerve cell, distinguished by a minimal number of characteristics selected for the description of the information properties of a biological neuron. This makes the model more simple than other well-known mathematical models and therefore suitable for analytical description of the functioning of simple neural networks.

Mathematical expressions were obtained which represent the processes whereby a continuous input action is converted by the neuron (receptor) into an impulse code and the impulse code is converted by the neuron's synapses into a continuous post-synaptic potential.

The relationships connecting the frequency of excitation of the neuron with the parameters of the input action (which is continuous for the receptor and pulsed for

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

USSR

PETROV, A. A., P'YANZINA, L. Ya., Kiberneticheskiye Aspekty v Izuchenii Raboty Mozga, Nauka Publishing House, 1970, pp 223-230

the neuron's synapse) and with the characteristics of the neuron (receptor) were found.

The coincidence of the theoretical results with the quantitative data from neurophysiological experiments is used as the criterion of adequacy of the model.

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

PETROV, A. A.

COLEEN

103. USSR

UDC 611--018.8 : 621.391.81+519.21

PETROV, A. A. and SARKISYAN, A. A.

"A Probabilistic Analysis of the Transmission of a Signal Through Elementary Neuron Nets"

SO: FOREIGN PRESS DIGEST 29 OCT 1971

Kibernetycheskiye Aspekty v Izuchenii Raboty Mozga (Cybernetic Aspects of the Study of the Brain's Functioning), Moscow, Nauka Publishing House, 1970, pp 244-255

Abstract: The goal of this work is an analysis of the probabilistic characteristics of the passage and processing of signals by certain elementary neuron nets in the brain, which are well-known in neurophysiological literature. The analysis will be based on the notion that the excitation of a neuron is a random event with a given probability of happening. This kind of analysis allows us to take the structural organization of neurons as a basis for explaining certain functional capabilities of the structure with respect to processing signals entering at the inputs.

The conditional structures with stimulating and inhibiting connections are examined. Comparison of the structures shows that in both cases the processing of sensory information consists of the transmission of signals for which the probability of an impulse occurring is high to the output of the neuron (these correspond to "useful" signals, represented by batches of impulses) and of a reduction in the possibility of dissemination of signals for which this probability is low (single, "noisy" impulses).

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

USSR

UDC 547.341

DOGADINA, A. V., NECHAYEV, YU. D., IONIN, B. I., and PETROV, A. A., Leningrad Technological Institute imeni Lensovet

"NMR Spectra and Structure of α-Chlorostyrene-β-phosphonate Derivatives"

Leningrad, Zhurnal Obshchey Khimii, Vol 41, No 8, Aug 71, pp 1662-1668

Abstract: The addition of phosphorus pentachloride to phenylacetylene, α-chlorostyrene, acetophenone and α-bromostyrene gives 2-phenyl-2-chlorovinylphosphonic acid dichloride (I). The purpose of the present article was to establish the geometric configuration of I and a series of derivatives obtained from it by comparing parameters of the NMR spectra for these compounds with data for other styrylphosphonic derivatives whose structure was previously established by the authors. It was found that this reaction leads to the formation of products with a cis arrangement of chlorine and the phosphorus-containing group.

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

USSR

UDC 537.563:547.242

BOGOLYUBOV, G. M., GRISHIN, N. N., and PETROV, A. A., Leningrad Technological Institute imeni Lensovet

"Organic Derivatives of Group V-VII Elements. XXI. Mass Spectra of Trialkylarsines and Tetraalkyldiarsines. Effect of Alkyl Substitution on Bonding Strength of Adjacent Heteroatoms"

Leningrad, Zhurnal Obshchey Khimii, Vol 41, No 8, Aug 71, pp 1710-1714

Abstract: The authors took mass spectra of triethyl-, tripropyl-, tributylarsines and tetraethyl-, tetrapropyl-, tetrabutyldiarsines and determined appearance potentials of the basic ions. The mass spectra of trialklylarsines and tetraalkyldiarsines display features characteristic of alkyl derivatives of Group V and VI elements of the thirs and higher periods, i.e. high intensity of molecular ions and predominance of ions formed with cleavage of E-C bonds as compared to ions formed with cleavage of E-E bonds (where E is an atom of a Group V or VI element possessing unshared electron pairs). A comparison of dissociation energies of E-Ebonds in alkyl derivatives with dissociation energies of diatomic molecules E_2 indicates that alkylation weakens the bond strength of adjacent heteroatoms.

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

USSR

UDC 537.563:547.341

BOGOLYUBOV, T. M., ZUBTSOVA, L. I., GRISHIN, N. N., RAZUMOVA, N. A., and PETROV, A. A., Leningrad Technological Institute imeni Lensovet

"Organic Derivatives of the V-VII Group Elements. XVII. Mass-Spectra of Phosphine Derivatives"

Leningrad, Zhurnal Obshchey Khimii, Vol 41 (103), No 3, Mar 71, pp 527-530

Abstract: Fragmented ions formed during mass-spectroscopical analysis of phosphines and phosphine oxides retain the positive charge on fragments containing heteroatoms. In this paper mass-spectra of phospine oxides are reported, where this tendency does not exist. The spectra show high intensity of the molecular ion and fragmented hydrocarbon ions, in contrast to phosphates, phosphonates, and phosphine oxides. The predominance of fragmented hydrocarbon ions may be related to the presence of electron accepting substituents of the phosphorus atom. The intensity of the fragment ion m/e 54 correlates qualitatively with the activity of organophosphorus compounds in nucleophilic substitution reactions at the tetrahedral phosphorus atom.

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

USSR UDC 547.242

BOGOLYUBOV, G. M., PETROV, A. A., Leningrad Technological Institute imeni Lensovet, Leningrad, Ministry of Higher and Secondary Specialized Education USSR

"Organic Derivatives of the V and VI Group Elements. XIV. Ammoniacal Synthesis of Tetraalkyldiarsines"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 8, Aug 70, pp 1795-1796

Abstract: Metallic arsenic may be alkylated in an ammonia solution of alkali metals; this appears to be a useful preparative route for arsines and polyarsines. One g-atom of lithium was slowly added to 0.5 g-atom of ground arsenic in 1 liter liquid ammonia; the mixture was stirred until a light greenish-yellow solution was formed. Then 1 g-mole of ethylbromide was added dropwise, the solution changing to red and finally to gray. Most of the ammonia was evaporated, 200 ml of absolute ether added, and the mixture stirred until the color ceased bleaching out. The ether solution was decanted under an atmosphere of argon, the solvent evaporated, and 1/2

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BOGOLYUBOV, G. M., et al, Zhurnal Obshchey Khimii, Vol 40, No 8, Aug 70, pp 1795-1796

tetraethyl diarsine distilled under reduced pressure. Alkyl chlorides, bromides, or iodides may be used in this reaction. The activity of V and VI group elements in this ammoniacal synthesis is proportional to their semiconductive properties.

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

USSR

UDC 547.341

YEVTIKHOV, Zh. L., SHURUKHIN, B. B., RAZUMOVA, N. A., and PETROV, A. A.
Leningrad Technological Institute imeni Lensovet

"Reaction of Phenyl Ester of Ethyleneglycolphosphorous Acid With 1,3-Dienes"

Leningrad, Zhurnal Obshchey Khimii, Vol 41 (103), No 2, Feb 71, pp 480-481

Abstract: Investigation of the condensation of phenylethylene phosphite with 1,3-dienes showed that the reaction occurs without the elimination of the blycol radical and that it goes faster than an analogous reaction with alkyl esters. This indicates that beside the p_π-d_π interactions the p-π conjugation must also be important, so that the P-OPh bond is more labile than the P-OCH_3. Physical properties of two compounds are reported: 1-(2-phenoxyethoxy)-3-phospholine-1-oxide, m.p. 47-48°, b.p. 180°/1.0 mm, d_4^{20} 1.2201, n_D^{20} 1.5525; and 1-(2-phenoxyethoxy)-3-methyl-3-phospholine-1-oxide, m.p. 49-50°, b.p. 204°/1.0 mm, d_4^{20} 1.1902, n_D^{20} 1.5480.

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USSR

UDC 547.341

YEVTIKHOV, Zh. L., RAZUMOVA, N. A., and PETROV, A. A., Leningrad Technological Institute Imeni Lensovet

"Condensation of Alkylphosphonous Esters With 1,3-Dienes"

Leningrad, Zhurnal Obshchey Khimii, Vol 41 (103), No 2, Feb 71, pp 479-480

Abstract: Alkylphosphonous acid esters condense with 1,3-dienes analogously to arylphosphonous acid esters. The IR spectra of the products show bands corresponding to the C=C bond frequencies at 1612-1613 cm^{-1}, P-C at 1236 cm^{-1}, and P-O-C at 1058-1062 cm^{-1}; no P:O band was observed. Physical properties of two compounds are reported: 1-methyl-1,1-glycol-3-phospholine, b.p. 60°/1.0 mm, d_4^{20} 1.1320, n_4^{20} 1.5010; and 1-ethyl-1,1-glycol-3-methyl-3-phospholine, b.p. 72°/1mm d_4^{20} 1.0728, n_D^{20} 1.4910. The condensation is faster than that of ethylenechlorophosphate and isothiocyanate, but slower than that of the glycol esters of phenylphosphonic acid, which may be due to the absence of the conjugation of the methyl group with phosphorus, resulting in vacant d-orbitals.

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USSR

UDC 547.558.1

KOSOVTSEV, V. V., CHISTOKLETOV, V. N., PETROV, A. A., Leningrad Technological Institute imeni Lensovet, Leningrad, Ministry of Higher and Secondary Specialized Education RSFSR

"Reaction of Triphenylphosphine With Nitrilimines"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 9, Sep 70, pp 2132-2133

Abstract: It was shown that nitrilimines with electron-accepting groups at the C-atom react with triphenylphosphine yielding stable azoilides. The reaction begins by a nucleophilic attack of a phosphine molecule on the nitrilimine carbon atom. The unstable bataine formed converts to the azo-ilide whose stability is due to the electron-accepting group at the ilide carbon atom.

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PETROV A.A.

Acc. Nr.: AN0104123 Ref. Code: UR9003

TITLE-- ANNOUNCEMENT OF THE COMMITTEE ON LENIN AND STATE PRIZES, U.S.S.R.

49

NEWSPAPER-- IZVESTIYA, MAY 28, 1970, P 4, COLS 1-5

ABSTRACT-- NINETY ONE BASIC AND APPLIED RESEARCH WORKS HAVE BEEN NOMINATED FOR THE STATE PRIZES. TWO OF THESE, "THE MULTI-PURPOSE INDUSTRIAL HELICOPTER KA-26", BY N. I. KAMOV, V. B. AL.PEROVICH, V. B. BARSHEVSKIY, A. A. DMITRIYEV, G. I. IOFFE, M. A. KUPFER, L. A. POTASHNIK, N. N. PRIOROV, A. G. SATAROV, I. M. VEDENEYEV, S. B. BREN, AND V. A. NAZAROV, AND "THE DEVELOPMENT OF TURBOFAN JET ENGINES NK-8 AND NK-8-4, AND THE DEVELOPMENT AND REDUCTION TO SERIAL PRODUCTION A SYSTEM OF TECHNOLOGICAL PROCESSES WHICH ASSURED WIDE USES FOR TITANIUM ALLOYS", BY N. D. KUZNETSOV, M. T. VASILISHIN, V. A. KURGANOV, P. M. MARKIN, V. D. RADCHENKO, P. A. SUKHOV, A. A. MUKHIN, V. G. SHITOV, G. I. MUSHENKO, L. A. SHKODO, AND G. P. DOLGOLENKO, HAVE BEEN SUBMITTED BY THE MINISTRY OF THE AVIATION INDUSTRY.

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

Acc. Nr.: AN0104123

"A SERIES OF INVESTIGATIONS INTO THE DYNAMICS OF A BODY WITH FLUID-FILLED CAVITIES", /65-68/, BY N. N. MOISEYEV, A. A. PETROV, V. V. RUMYANTSEV AND F. L. CHERNOUS,KO AND "ULTRA HIGH PRECISION JIG BORING MILLS WITH 1,000 X 1,600 AND 1,400 X 2,240 MM PLATENS", BY A. I. KIR,YANOV, V. G. ABRAMOVICH, I. V. GUTKIN, A. S. ALIMPIYEV, G. B. PAUKOV, AND A. S. YEGUDKIN, HAVE BEEN SUBMITTED BY THE COMPUTATION CENTER OF THE ACADEMY OF SCIENCES AND THE MINISTRY OF THE MACHINE TOOL CONSTRUCTION AND TOOL INDUSTRY, RESPECTIVELY.

"THE RADICALLY IMPROVED MELTING TECHNOLOGY OF CRITICAL-PURPOSE HIGH-ALLOY STEELS AND ALLOYS OF IMPROVED QUALITY ACHIEVED BY THE INERT GAS TREATMENT OUTSIDE THE FURNACE", BY YU. V. GERASIMOV, O. M. CHEKHOMOV, N. V. SIDOROV, S. K. FILATOV, B. A. CHEREMNYKH, R. M. KHAYRUTDINOV, I. P. BARMOTIN, L. K. KOSYREV, K. P. BAKANOV, N. N. VLASOV, P. I. MELIKHOV, AND N. A. TULIN, HAS BEEN SUBMITTED BY THE ZLATOUST METALLURGICAL PLANT.

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UNCLASSIFIED

TITLE--PHOSPHINE OXIDES CONTAINING A 1,3,DIENT GROUPING AT THE PHOSPHORUS ATOM -U-

PROCESSING DATE--13NOV70

AUTHOR-(04)-MASHLYAKOVSKIY, L.N., IONIN, B.I., OKHRIMENKO, I.S., PETROV, A.A.

COUNTRY OF INFO--USSR

SOURCE--ZH. OBSHCH. KHIM. 1970, 40 (4), 804-8

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--PHOSPHORUS OXIDE, DIENE, ORGANOMAGNESIUM COMPOUND, CATALYTIC HYDROGENATION, BUTADIENE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3002/1371

STEP NO--UR/0079/70/040/004/0804/0808

CIRC ACCESSION NO--AP0128771

UNCLASSIFIED

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

2/2 010 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0128771

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. TO PHMGBR FROM 3 G MG PREPD. IN ET SUB2 O WAS ADDED WITH COOLING 10.8 G MECH:CHCH:CHP(O)CL SUB2, AND THE MIXT. HEATED 3 HR, THEN REFLUXED IN (SHOWN ON MICROFICHE). THE CRUDE REACTION PRODUCT OF II AND PHMGBR WAS TREATED WITH ALC. KOH 20 HR AT ROOM TEMP. AND 0.5 HR AT 50DEGREES TO YIELD 22PERCENT CH SUB2:CHCH:CHP(O)PH SUB2, M. 105-7DEGREES. THE PRODUCTS OF HYDROGENATION WERE MIXED CIS-TRANS FORMS IN CASE OF DERIVS. OF 2,METHYL,1,3,BUTADIENE, BUT IA WAS THE TRANS ISOMER, AS WAS ITS PRECURSOR DIENE DERIV.

FACILITY: LENINGRAD. TEKHNOL. INST. IM. LENSOVETA, LENINGRAD, USSR.

UNCLASSIFIED

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

019

UNCLASSIFIED

TITLE--DEHYDRATION AND DESALTING OF PETROLEUM -U- PROCESSING DATE--13NOV70

AUTHOR-(04)-SHIRNOV, YU.S., PETROV, A.A., LEZOV, O.F., POLYANTSEV, V.S.

COUNTRY OF INFO--USSR

SOURCE--U.S.S.R. 263,795

REFERENCE--OTKRYTIYA, IZOBRET., PROM. OBRAZTSY, TOVARNYE ZNAKI 1970,

DATE PUBLISHED--10FEB70

SUBJECT AREAS--CHEMISTRY, MATERIALS

TOPIC TAGS--CHEMICAL PATENT, PETROLEUM DESALTING, PETROLEUM DEHYDRATION, BLOCK COPOLYMER, ETHYLENE OXIDE, ALIPHATIC AMINE, PROPYLENE OXIDE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3005/0886

STEP NO--UR/0482/70/000/000/0000/0000

CIRC ACCESSION NO--AA0132976

UNCLASSIFIED

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

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CIRC ACCESSION NO--AA0132976 UNCLASSIFIED PROCESSING DATE--13NOV70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. PETROLEUM IS DEHYDRATED AND DESALTED BY INTRODUCING A CATION ACTIVE DEMULSIFIER, E.G., A HIGHER ALIPHATIC PRIMARY AMINE HYDROCHLORIDE, AND A NONIONIC SURFACTANT, E.G., BLOCK COPOLYMER OF ETHYLENE OXIDE AND PROPYLENE OXIDE. THE RATIO OF THE FIRST COMPONENT TO THE SECOND IS 3:1 TO 5:1.

UNCLASSIFIED

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0"

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202410019-0

1/2 012 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--CATION ACTIVE DEMULSIFER -U-

AUTHOR-(02)-GORUDNOV, V.P., PETROV, A.A.

COUNTRY OF INFO--USSR

SOURCE--U.S.S.R. 266,984
REFERENCE--OTKRYTIYA, IZOBRET., PROM. OBRAZTSY, TOVARNYE ZNAKI, 1970,
DATE PUBLISHED--01APR70

SUBJECT AREAS--MATERIALS

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CIRC ACCESSION NO--AA0130630 PROCESSING DATE--30OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A CATION ACTIVE DEMULSIFIER OF PETROLEUM EMULSIONS WAS PREPD. BY TREATING AN AMINO ALC. WITH LOW-MOL.-WT. ORG. OR INORG. ACIDS, FOLLOWED BY ESTERIFICATION OF THE RESULTING SALT WITH C SUB7-9 OR C SUB10-16 SYNTHETIC FATTY ACIDS. MONO, DI, OR TRIETHANOLAMINE, TRIMETHYLOLAMINOMETHANE, ETHYLOLDIMETHYLAMINE, AND ETHYLOLDIETHYLAMINE WERE THE AMINO ALCS. BENZENE, P-TOLUENE OR NAPHTHALENESULFONIC ACIDS WERE THE ORG. ACIDS, AND H SUB2 SO SUB4 AND H SUB3 PO SUB4 WERE THE INORG. ACIDS. FACILITY: STATE DESIGN AND PLANNING SCIENTIFIC RESEARCH INSTITUTE FOR THE PETROLEUM EXTRACTION INDUSTRY.

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TITLE--BICYLIC NAPHTHENES, C SUB8-9, IN PETROLEUMS OF THE DAGADZHIK AND GRYAZEVAYA SOPKA DEPOSITS -U-

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CIRC ACCESSION NO--AP0138682

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. BICYLIC C SUB8-9 NAPHTHENES COMPRISING 5.2 AND 16.5PERCENT OF DAGADZHIK AND GRYAZEVAYA SOPKA PETROLEUMS WERE SEPD. FROM FRACTIONS B. 120-60DEGREES BY SUCCESSIVE ADSORPTION ON SILICA GEL AND THERMAL DIFFUSION. IN THE RESP. PETROLEUMS THE C SUB8 BICYCLIC NAPHTHENES WERE: (SHOWN ON MICROFICHE). IN EQUIL. MIXTS. FROM ISOMERIZING BICYCLO(4.3.0)NONANE THE CONTENT OF METHYLBICYCLO(3.3.0), METHYLBICYCLO(3.2.1.), AND METHYLBICYCLO(2.2.2)OCTANCES CHANGED FROM 18.3, 60.8, AND 7.3 TO 39.1, 38.6, AND 10.9 AS THE TEMP. WAS INCREASED FROM 35 TO 150DEGREEES. AT 150DEGREES THE CONTENT OF THE RESP. (SHOWN ON MICROFICHE). THUS, THE PETROLEUM BICYCLIC NAPHTHENE WERE NOT EQUIL. MIXTS. AT ANY TEMP.

FACILITY: INST. GEOL. RAZRAB. GORYUCH. ISKOP., MOSCOW, USSR.

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