

2/2 013

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0132181

ABSTRACT/EXTRACT--(U) GP-O- ABSTRACT. A THEORETICAL DISCUSSION IS CARRIED OUT ON THE RATE OF LEACHING OF SOLIDS (WITH BOTH NEUTRAL AND ACID LIQS.) DEPENDING ON THE RATE OF LIQ. FLOW, DIAM. OF THE PARTICLES, CONC. OF ACID, ETC. THE NEUTRAL AND ACID LEACHING OF ZN SINTERS IS DISCUSSED AS AN EXAMPLE, AND THE CONCLUSION IS MADE THAT CHARGING OF THE ZN SINTER PULP FROM THE BOTTOM INTO THE FLUIDIZED BED IS MORE EFFICIENT. AN INCREASE IN ZN EXTN. CAN BE OBTAINED EITHER BY INCREASING THE RESIDENCE TIME OF ZN SINTER PARTICLES IN THE FLUIDIZED BED (AND THUS REDUCING THE PRODUCTIVITY) OR BY INCREASING THE VOL OF THE BED.

UNCLASSIFIED

USSR

UDC 621.391.1:51

D'YACHKOV, A. G., PINSKER, M. S.

"Optimal Linear Method of Transmission Through Gaussian Stable Channel Without Memory with Full Feedback"

Moscow, Problemy Peredachi Informatsii, Vol 7, No 2, 1971, pp 38-46.

Abstract: A linear method of transmission of discrete messages through a Gaussian stable channel without memory with full feedback is described, when the energy of the input signal is assumed limited. It is demonstrated that for both discrete and continuous time, the exponent of the probability of error (reliability) of the linear method constructed at all transmission rates less than the throughput capacity of the channel corresponds to the exponent of the boundary of dense packing.

1/1

- 132 -

USSR

UDC 621.391.1:519.2

D'YACHKOV, A. G.

"Asymptotic Boundaries of the Probability of Error in Transmitting at Zero Velocity Along a Gaussian Channel With Total Feedback"

Moscow, Problemy Peredachi Informatsii, Vol 7, No 3, Jul-Aug-Sep 71, pp 25-29

Abstract: The author finds several of the first terms of the asymptotic expansion of the optimal probability of error during unit transmission  $\exp\{-\tau^\alpha\}$  ( $\tau$  is the length of the unit,  $0 < \alpha < 1$ ) of equally probable messages along a discrete Gaussian stationary channel without memory with total feedback. He investigates the asymptotic expansions when  $\tau \rightarrow \infty$  for both boundaries for the case of zero velocity of transmission. The author examines the lower boundary and the upper boundary separately, stating lemmas involving  $\tau \rightarrow \infty$  and giving the asymptotic expansion for solving the equations concerned. He offers proof, expressed in the form of equations. The article contains 3 bibliographic entries.

1/1

USSR

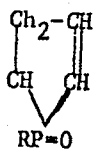
UDC 541.64+547.241

RAFIKOV, S. R., Academician of the Kazakh SSR Academy of Sciences, KAZAKOVA, N. D., D'YACHKOV, G. A., and AGASHKIN, O. V.

"Structure of the Products of Interaction of Aryldichlorophosphines and Divinyl"

Moscow, Doklady Akademii Nauk SSSR, Vol 196, No 4, 1971, pp 831-833

Abstract: The structure of oxides of unsaturated cyclic phosphines has not been established. This paper presents a study of the conditions of formation of cyclic addition compounds. The structure of the corresponding phosphine oxides is established. The interactions of aryldichlorophosphine with divinyl are considered, and the infrared and nuclear magnetic resonance spectra of the products of these interactions including unsaturated cyclic phosphine oxide are presented. Analysis of these spectra indicates the following structure



1/1

- 57 -

USSR

UDC 541.64+547.241

RAFIKOV, S. R., KAZAKOVA, N. D., and D'YACHKOV, G. A., Institute of Chemical Sciences, Academy of Sciences, Kazakh SSR

"Kinetics of Copolymerization of Aryldichlorophosphines With Divinyl"

Moscow, Vysokomolekulyarnyye Soyedineniya, Vol 12, Series A, No 9, Sep 70, pp 2,019-2,024

Abstract: The authors investigate the rate of copolymerization of aryldichlorophosphines with divinyl as a function of the initial composition of the mixture of monomers, the concentration of azo-bis-isobutyric acid dinitrile and the presence of p-benzoquinone. Phenyl, tolyl and dichlorophenyl dichlorophosphines were investigated. It was found that when aryldichlorophosphines are copolymerized with divinyl, the rate of copolymerization depends on the initial composition of the monomer mixture, reaching a maximum with a concentration of 5-10 mol.% aryldichlorophosphines in the monomer mixture. A small quantity of p-benzoquinone accelerates copolymerization of the organophosphorus compounds and divinyl in the presence of azo-bis-isobutyric acid dinitrile, while in large concentrations, p-benzoquinone serves as an effective inhibitor.

1/1

- 54 -

Environmental & Ecological Problems

USSR

BLIZHEYEV, V. I., D'YACHKOV, V. I., LERNER, I. B., MISHIN, V. K., NEKHAMKINA, G.S.  
NEKITINA, Ye. I., DIANOVA, YE. F., and MAKLONOVA, R. Ye.

"Joint Hygienic Study of Atmospheric Pollution in Certain Industrial Centers of  
the Central Volga Region"

Sb. nauch. tr. Kuybyshev, III gigiyeny (Collection of Scientific Works of the  
Kuybyshev Scientific Research Institute of Hygiene), No 7, 1972, pp 92-93  
(from RZh-Geofizika, Svodnyy tom, No 5, 1973, Abstract No 5B504 by L.S.G.)

Translation: A study was made of the contamination of the atmosphere by chem-  
ical and oil-refining complexes and of the impact of pollutants on the health  
and sickness rate of children and on immunohematological indexes of animals.  
Measures have been elaborated for the elimination and reduction of specific  
discharges into the atmosphere, for the organization of sanitary shielding of  
industrial sites, and for improving the health of the child population.

1/1

D'YACHKOV, V. I.

Microelectronics -

MICROELECTRONICS

JPRS 57333  
25 October 1972

Excerpts from Russian-language book edited by F. V. Lukin:  
Mikroelektronika, No 5, 1972, Sovetskoye Radio Publishing House,  
Moscow, UDC 621.382:621.396.6-161.5.

CONTENTS

	PAGE
Annotation.....	1
Obituary of Fedor Viktorovich Lukin.....	2
Foreword.....	3
Abstracts.....	5

- 4 -  
(1 - USSR - 2)

parameters on temperature of the surrounding atmosphere. They give a comparison of the parameters of the photoregulator during operation in longitudinal and transverse modes.  
The article contains 11 figures and 6 bibliographic references.

UDC 621.389.511 + 621.386.6-181.416

Analysis of Several Characteristics of the Operation of a Resonance High-Frequency Heterodyne Amplifier Made According to a Circuit With a Common Emitter. Akseuev, A.I., Dzhurgenko, V.I., Korobovnikov, P.I., Sharshimakov, G.M., and Gilyaev, F.V. Radio Engng. Electron. Phys., 1972, Vol. 17, No. 5, p. 310, Severnaya Radio Publishing House, 1972.

The article cites an analysis of the operation of a resonance microminiature high-frequency amplifier, operating in a linear mode. The authors show that with a constant time of the emitter circuit equal to zero, the magnitude of the capacitance of the blocking condenser is found to be the least. They also established that, for contemporary case-free high-frequency dynamic capacitances on the frequency characteristics of the cascade can be ignored.

The article contains 6 figures, 2 tables, and 6 bibliographic references.

-END-

11.734  
CSG: 0702/73-5



USSR

UDC: 621.391.822

SOLOV'YEV, D. I. and B'YACHKOV, V. I.

"Computing Transient Noise in a Frequency Detector with Mutually Detuned Circuits"

Tr. NII radio (Transactions of the Scientific Research Institute of Radio) 1970, No. 1, pp 46-50 (from RZh-Radiotekhnika, No. 3, March 71, Abstract No. 3A60)

Translation: A method is described for computing transient noise caused by the nonlinearity of the real demodulation characteristic of a frequency detector with mutually detuned circuits. Relationships connecting system parameters with nonlinear signal distortions are derived. Resume

1/1

USSR

UDC: 621.396.4

D'YACHKOVA, M. N. and D'YACHKOV, V, I.

"Effect of Nonlinearity in a High-Frequency Channel of a Radio Relay Line on the Noise Immunity of an Additional Channel Transmitted on a Subcarrier"

Tr. NII radio (Transactions of the Scientific Research Institute of Radio) 1970, No. 2, pp 47-53 (from RZh-Radiotekhnika, No. 3, March 71, Abstract No. 3D463)

Translation: The effects of nonlinearity in the amplitude characteristic of the modulator and the nonuniformity of the group time delay characteristic of the high-frequency channel on the noise immunity of an additional channel transmitted on the subcarrier in TV-radio relay line communication trunks are considered. Resume

1/1

USSR

UDO 621.316.722.1(088.8)

D'YACHKOV, V.I. [Ryansk. radiotekhn. in-t--Ryansk Radio Engineering Institute]

"Voltage Regulator For Hybrid Film Circuit"

USSR Author's Certificate No 262192, filed 15 May 68, published 3 June 70 (from RZh--Elektronika i yeye primeneniye, No 12, December 1970, Abstract No 12B532P)

Translation: A circuit is proposed for parametric voltage regulators which can be used in a hybrid film accomplishment. The circuit uses a transistor (discrete type), the two junctions of which are connected in the forward direction and operate as an ordinary transistor, while the emitter and collector play the role of transistor anodes, and the base -- of a common cathode. The power supply voltage is fed to the emitter and collector across separate thinfilm resistors operating with limiting resistors in the circuit of the parametric regulators, where the emitters and collectors of the p-n junction of the transistor play the role of nonlinear elements. With the use of silicon transistors the output voltage of both regulators is close to 0.7 v. 2 ill. S.D.

1/1

USSR

UDC: 621.316.722.1

D  
D'YACHKOV, V. I., Ryazan Radiotechnical Institute

"A Voltage Stabilizer for a Hybrid Film Circuit"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 6, 1970, p 40, patent No 262192, filed 15 May 68

Abstract: This Author's Certificate introduces a voltage stabilizer for a hybrid film circuit based on a silicon transistor. As a distinguishing feature of the patent, the unit is designed for producing two stabilized voltages. The emitter and collector of the transistor are connected through current-limiting resistors to the power supply, the PN junction being connected in the forward direction.

1/1

USSR

UDC 621.396.6-181.5

D'YACHKOV, V. I., KOROBENNIKOV, P. V., MEL'NIKOV, G. M.

"High-Frequency Parameters of LC Components and Conductors in Hybrid Film Microcircuits"

Kiev, Izvestiya VUZ -- Radioelektronika, No 5, 1970, pp 596-600

Abstract: The film microcircuits are combinations of capacitors, coils and conductors. Tests were made at frequencies of 10-120 MHz. The capacitors have a silicon monoxide dielectric and aluminum plates, and range in capacitance from 15 to 3000 pf. Tunable "matrix" capacitors varied from 6 to 60 pf. Repeated measurements of the Q of this type of capacitor showed that it is practically independent of a capacitance change of 5 to 10 thousand pf/cm<sup>2</sup>. However, the film capacitor Q is in general a function of its capacitance and the signal frequency. The following formula, obtained by generalizing the results of many measurements, is found for the Q of a film capacitor with a capacitance of 50 to 1000 pf and a silicon monoxide dielectric:

$$Q \approx 1.2 \times 10^5 / fC,$$

where f is the operating frequency in MHz and C is the capacitance in pf. In microcircuits operating at high frequencies, the stray inductances of film and wire conductors have an important effect and must be taken into

1/2

USSR

D'YACHKOV, V. I., et al., Izvestiya VUZ -- Radioelektronika, No 5, 1970,  
pp 596-600

account beginning with frequencies of the order of 60 MHz. It is found also that the optimal inside diameter of wire spiral inductances and cores in such circuits for tuning in the 10-150 MHz range varies from 4 to 6 mm. Curves are presented for the variations of capacitance and inductance as functions of different variables, and tables of the parameters of various metals used as conductors in the microcircuits are given. Formulas for the inductance of film conductors are also developed.

2/2

USSR

UDC 669.295.548.526

TIKHOMIROV, V. I., and D'YACHKOV, V. I., Leningrad State University named A. A. Zhdanov

"The Oxidation of Metals in a Nonstationary (Transitional) Region at High Temperatures. Part 3. Method for Calculating the Diffusion Factor of Oxygen in a Metal (Titanium)"

Sverdlovsk, Akademiya Nauk SSSR, Fizika Metallov i Metallovedeniye, Vol. 30, No 1, Jul 70, pp 111-115

Abstract: On the basis of an analysis of equations of the phenomenological system of metal oxidation in a nonstationary region, a method for calculating the diffusion factor of oxygen in the metallic phase is presented. The method takes into account the relocation of the oxidation process on the boundary of the phase separation. Results of titanium oxidation dynamics previously obtained by the method of continuous weighing were used for the deduction of a formula for calculating the diffusion factor. Calculated diffusion factors of oxygen in titanium at various temperatures (750-1050° C) and in the  $\alpha$ -phase of titanium at 900° C and various  $O_2$ -pressures are presented. The magnitude of the diffusion activation energy is approximately evaluated.

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USSR

UDC 669.094.3

D  
D'YACHKOV, V. I., and TIKHOMIROV, V. I., Leningrad State University imeni A. A. Zhdanov

"The Effect of Oxidation Conditions of Titanium on the Temperature Regime of Its Initial (Nonisothermal) Period"

Sverdlovsk, Akademiya Nauk SSSR, Fizika Metallov i Metallovedeniye, Vol 30, No 1, Jul 70, pp 97-104

Abstract: An investigation was made of the effect of temperature, partial pressure of oxygen, specific surface and character of preliminary treatment of the investigated specimens, and the composition and conditions (static or dynamic) of the oxidizing atmosphere on the temperature regime of the initial stage of oxidation of titanium. It was found that the initial stage is often complicated, due to a considerable overheating of the specimen's surface which causes a deviation of the oxidation kinetics from the established rule. Oxygen saturation of the metal's surface layer prevents overheating, and a prolonged vacuum annealing with prior surface etching decreases the degree of overheating considerably. It is assumed that a significant overheating of the specimen's surface is principally related to an intensive oxygen dissolution in the metal. Probable sources affecting the temperature conditions are discussed.

1/1



USSR

UDC: 621.396.67:624.97(088.8)

SOKOLOV, A. Ye., USANOV, A. P., SHAPIRO, A. Z., D'YACHKOV, V. K., KUTYAYKIN, V. Ya., MUROKH, G. L., NARYSHKOV, V. M.

"A Device for Suspending the Radiating Element of Rotating Antennas"

USSR Author's Certificate No 262198, filed 20 May 68, published 3 Jun 70  
(from RZh-Radiotekhnika, No 11, Nov 70, Abstract No 11B77 P)

Translation: This Author's Certificate introduces a device for suspending the radiating element of rotating antennas. The device contains a girder designed for fastening the radiating element, this girder being fastened to the reflector or antenna array by rod supports equipped with hinges. In order to reduce the effect which deformations of the elastic elements have on the electrical parameters of the antenna, the girder is connected to the rod supports through bearings, and to the reflector or antenna array through auxiliary guys, the lines which connect the points of fastening of these guys to the reflector or antenna array and to the girder forming a parallelogram. Two illustrations. Resumé.

1/1

- 15 -

D

USSR

UDC 621.396.67:624.074

SOLOV, A. Ye., B'YACHKOV, V. K., GOL'DYAYEV, K. Ya., BALANDIN, V. V.

"A Device for Limiting the Angle of Turn of an Antenna Mast "

USSR Author's Certificate No 255375, Filed 19 Jun 68, published 8 Apr 70 (from RZh-Radiotekhnika, No 10, Oct 70, Abstract No 10B94 P)

Translation: The proposed device for limiting the angle of turn of an antenna mast contains shock absorbers and a stopper mechanism made in the form of a threaded ring which is fitted on the faces with teeth which mesh at the extreme positions of the column with teeth on the support rings. To simplify the design and reduce the overall dimensions of the device, the threaded ring is rigidly fastened inside a yoke which is fixed by hinge fastening to the stationary base of the antenna mast through the shock absorbers. Two illustrations.

1/1

- 18 -

USSR

D UDC 621.396.67:624.074 M

SOKOLOV, A. Ye., USANOV, A. P., SHAPIRO, A. Z., D'YACEKOV, V. K., KUTYAYKIN, V. A.  
MUROKH, G. L., NARYSHKOV, V. M.

"A Device for Suspension of the Primary Radiating Element of Rotating Antennas"

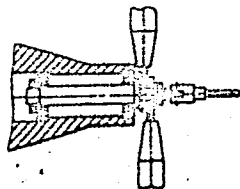
Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 6,  
1970, p 41, patent No 262198, filed 20 May 68

Abstract: This Author's Certificate introduces a device for suspension of the primary radiating element of a rotating antenna. The unit contains a girder designed for holding the radiating element. This girder is fastened to the reflector or antenna array by means of rod supports equipped with hinges. As a distinguishing feature of the patent, the effect which deformations of the elastic elements in the device have on the electrical properties of the antenna is reduced by connecting the girder to the rod supports by means of bearings, and connecting it to the reflector or antenna array by means of additional guys. The connection lines of the points of fastening of the guys to the reflector or antenna array and to the girder form parallelograms.

1/2

USSR

SOKOLOV, A. Ye., et al., Otkrytiya, Izobreneniya, Promyshlennyye Obraztsy,  
Tovarnyye Znaki, No 6, 1970, p 41, patent No 262198, filed 20 May 68



2/2

USSR

UDC 612.8+014.423

KOSTANDOV, E. A., D'YACHKOVA, G. I., and TIMOFEYEVA, L. V., Central Scientific Research Institute of Forensic Psychiatry imeni V. P. Serbskiy, Moscow

"Characteristics of Cortical Potentials Evoked by Weak Soundware Stimuli in Man"

Moscow, Doklady Akademii Nauk SSSR, Vol 196, No 2, 1971, pp 471-474

Abstract: The study of the behavior of cortical potentials induced by sound stimuli has only recently become feasible, through the use of computers for the analysis of weak signals produced by sound. The minimum sound intensity at which a signal is produced in the surface of the cranium is of interest. The mean induced potential was observed in 12 healthy men 22-40 years of age with sound stimuli of threshold or above-threshold intensity. In the occipital region, this potential was deflected in all of the cases studied, but not consistently. A cortical potential was recorded even when the noise stimuli did not reach the threshold level. Considerable differences were found in the latent period and in the potential amplitude. Nevertheless, it is impossible to link shifts in these parameters to the process of stimulus perception.

1/1

- 57 -

USSR

UDC: 621.396.4

D'YACHKOVA, M. N. and D'YACHKOV, V. I.

"Effect of Nonlinearity in a High-Frequency Channel of a Radio Relay Line on the Noise Immunity of an Additional Channel Transmitted on a Subcarrier"

Tr. NII radio (Transactions of the Scientific Research Institute of Radio) 1970, No. 2, pp 47-53 (from RZh-Radiotekhnika, No. 3, March 71, Abstract No. 3D463)

Translation: The effects of nonlinearity in the amplitude characteristic of the modulator and the nonuniformity of the group time delay characteristic of the high-frequency channel on the noise immunity of an additional channel transmitted on the subcarrier in TV-radio relay line communication trunks are considered. Resume

1/1

Semiconductor Technology

USSR

UDC 546.681'19:548.522

IVANYUTIN, L. A., NISHANOV, D. N., D'YACHKOVA, N. N., SABININ, A. G., and ANDREYEV, V. M.

"Study of Silicon Migration During the Deposition of Epitaxial Layers of Gallium Arsenide From the Gaseous Phase"

Moscow, Neorganicheskiye Materialy, Vol 9, No 12, 1973, pp 2116-2119

Abstract: A study was made of the transfer of the short-lived radioisotope  $Si^{31}$  from the arsenous chloride and of the source of gallium during the epitaxial accretion of GaAs. The system  $H_2-AsCl_3-Ga$  was used as the gaseous phase and either irradiated quartz or elemental silicon mixed with the Ga was the Si source. Six runs were made under varying conditions and the amount of  $Si^{31}$  varied from below detection limits to  $2 \times 10^{20} \text{ cm}^{-3}$ . The greatest concentration of Si in the epitaxial layer was observed when the elemental Si or crushed quartz was thoroughly mixed with a liquid containing 3-4% Ga. In this case, values for Si were similar to those for  $SiO_2$ . The proposed method for Si transfer is via the molecular species SiAs and SiO.

1/1

Oncology

USSR

UDC 616-006.4:615.28

KONOVALOVA, N. P., D'YACHKOVSKAYA, R. F., and KISELEVA, Ye. G., Order of Lenin  
Institute of Chemical Physics, Academy of Sciences USSR

"Toxicity and Antitumor Properties of a New Analogue of Thio-TEPA"

Leningrad, Voprosy Onkologii, Vol 19, No 1, 1973, pp 58-63

Abstract: Since a number of stable free radicals are known to have antitumor activity and relatively low toxicity, a paramagnetic analogue of thiophosphamide (PAT) was synthesized by the substitution of an iminoxyl radical for one of the ethylenimine groups on thio-TEPA. Comparison of the toxic effects of PAT and thio-TEPA and their therapeutic effectiveness showed that the former offered a number of advantages over the latter. Studies with rat erythromyelosis showed that when equimolar quantities of PAT (5 mg/kg) and thio-TEPA (2 mg/kg) were injected 3 days after tumor transplantation, both sets of animals showed a tumor regression constant of  $0.21 \text{ day}^{-1}$ . However, if the preparations were administered on the 8th post-transplant day and continued for 10 days, PAT evoked an immediately apparent tumor regression with a constant of  $0.15 \text{ day}^{-1}$ , while in animals treated with thio-TEPA the tumors continued to grow for a couple of days before regression set in with a constant of  $0.11 \text{ day}^{-1}$ . These

1/2



USSR

KONOVALOVA, N. P., et al, Voprosy Onkologii, Vol 19, No 1, 1973, pp 58-63

differences in the rate constants were significant on the basis of regression analysis. The chemotherapeutic indexes of PAT and thio-TEPA for rat erythro-myelosis, expressed as the ratio of LD<sub>20</sub> to the dose required for complete tumor inhibition were, respectively, 6.0 and 2.0. PAT also showed greater effectiveness than thio-TEPA against various solid and ascitic tumors of rats and mice. PAT was also more effective than thio-TEPA in affecting division of Ehrlich ascites tumor cells in male and female random bred mice (e.g., in terms of decreasing the mitotic index, increasing the number of abnormal mitoses, and in altering the relationship among the mitotic stages).

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- 35 -

1/2 020

UNCLASSIFIED

PROCESSING DATE--30OCT70

TITLE--ANTITUMOR ACTIVITY OF NEW PREPARATIONS OF THE CHLURETHYLAMINE GROUP  
NOT INFLUENCING HAEMOPOESIS -U-

AUTHOR--(05)--VASILYEVA, L.S., DYACHKOVSKAYA, R.F., SCHUPPE, N.O.,  
PARKHOMENKO, I.I., SURKOVA, N.I.

COUNTRY OF INFO--USSR

SOURCE--IZVESTIYA AKADEMII NAUK SSSR, SERIYA BIOLOGICHESKAYA, 1970, NR 3,  
PP 459-463

DATE PUBLISHED-----70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--ANTITUMOR DRUG EFFECT, HEMATOPOIESIS, AMINE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3001/1608

STEP NO--UR/0216/70/000/003/0459/0463

CIRC ACCESSION NO--AP0127099

UNCLASSIFIED

2/2 020

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0127099

ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. ANTITUMOR ACTION OF  
 CHLORALHYDRATES N,N,DI(2,CHLORETHYL)PINOCAMFILAMINE (I),  
 N,N,DI(1,CHLORETHYL)PINILAMINE(II) AND 3,5,DI,TRETBYL,4,OXI,N, NI,DI  
 (BETA,DHLCRETHYL BENZILAMINE) (III) WAS STUDIED BOTH IN EXPERIMENTS ON  
 ANIMALS AND IN TISSUE CULTURE. IT WAS FOUND THAT THE COMPOUND II  
 DISPLAYED MAXIMAL ACTIVITY. THE INFLUENCE OF THE COMPOUND II ON THE  
 PROCESS OF PROTEIN BIOSYNTHESIS IN TUMOR CELLS WAS REGISTERED. IT WAS  
 FOUND THAT THE SUBSTANCES STUDIED DO NOT INFLUENCE NORMAL HAEMOPOESIS.  
 FACILITY: INSTITUTE OF CHEMICAL PHYSICS, ACADEMY OF SCIENCES,  
 USSR.

UNCLASSIFIED

USSR

UDC 541.49:546.73 + 541.31

DYACHKOVSKIY, E. S., KHRUSHCH, N. YE., SHILOV, A. YE., Institute of Chemical Physics, Moscow, Academy of Sciences USSR

"Reaction of Methyl(tris)triphenylphosphine Cobalt With Unsaturated Compounds"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 8, Aug 70, pp 1726-1730

Abstract: At room temperature the toluene solution of  $\text{CH}_3\text{Co}(\text{PPh}_3)_3$  (I) gradually changes its color from orange to brown, producing methane, ethane, toluene, benzene, and some  $\text{PPh}_3$  in the reaction vessel. At  $-120^\circ\text{C}$  such solutions are relatively stable. When (I) is reacted with a series of olefines and organic bases, a rapid color change takes place with liberation of gases, their quantity depending on the olefine used. In general, it is shown that the reaction of (I) with unsaturated compounds results in an interaction of the cobalt methyl group with the olefines in the coordination sphere of the metal without intermediary formation of free radicals. When hexene and divinyl are reacted with (I),  $\eta$ -allyl derivatives  
1/2


- 57 -

USSR

D.YACHKOVSKIY, F. S., et al, Zhurnal Obshchey Khimii, Vol 40,  
No 8, Aug 70, pp 1726-1730

of cobalt are formed. The reaction rate of organic and unsaturated compounds with (I) increases with an increased trend in the transition  $d\pi \rightarrow p\pi$  from metal to the olefine.

2/2

1/2 014 UNCLASSIFIED PROCESSING DATE--27NOV70  
TITLE--ELECTRODIALYSIS STUDY OF ANIONIC POLYMERIZATION CATALYSTS -U-  
AUTHOR--(02)-BABKINA, O.N., DYACHKOVSKIY, F.S.   
COUNTRY OF INFO--USSR  
SOURCE--VYSOKOMOL. SOEDIN., SER. B 1970, 12(4), 301-3  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--ELECTRODIALYSIS, POLYMERIZATION CATALYST, STYRENE,  
ORGANOLITHIUM COMPOUND, GUANIDINE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--3006/1238 STEP NO--UR/0460/70/012/004/0301/0303  
CIRC ACCESSION NO--AP0134912  
UNCLASSIFIED

2/2 014

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0134912

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. SEVERAL ANIONIC CATALYSTS, E.G.,  
ETI. C SUB10 H SUB8 LI, AND LIVING POLYSTYRENE (RLI PLUS C SUB8 H  
SUB8) WERE STUDIED BY ELECTRODIALYSIS IN A 3 COMPARTMENT DIALYZER AT  
20DEGREES UNDER AR. MAX. POLYSTYRENE (I) YIELDS WERE OBTAINED IN THE  
PRESENCE OF LI PRIME POSITIVE; OTHER IONS SUCH AS NH SUB4 PRIME  
POSITIVE, NR SUB4 PRIME POSITIVE, AND CN SUB3 H SUB6 PRIME POSITIVE  
(GUANIDINIUM) WERE LESS EFFECTIVE. THE YIELD OF I WAS PROPORTIONAL TO  
THE QUANTITY OF ELECTRICITY PASSING THROUGH THE SOLN. AND MONOMER CONC.  
ANIONIC POLYMN. OF PHCH:CH SUB2 MAY OCCUR WITHOUT METALLIC ANTIIONS.  
FACILITY: FILIAL INST. KHIM. FIZ., CHERNOGOLOVKA, USSR.

UNCLASSIFIED

USSR

D UDC 678.5.06-419.8:66.085.3/.5 RS

P'YANKOV, G. N., MOROZOV, A. V., OMEL'CHENKO, S. I., ~~KABAKCHI, A. M.~~, BESSONOV, V.G.,  
CEBRVETSOVA, I. N., VIDENINA, N. G., DYACHOK, V. T., and GOLODNYI, YU. F., Institute  
of Physical Chemistry imeni L. V. Pissarzhevskiy, Kiev, Academy of Sciences  
Ukrainian SSR, and Institute of Chemistry of High Molecular Compounds, Kiev,  
Academy of Sciences Ukrainian SSR

"Radiation Technology of Manufacturing Glass-Plastics"

Kiev, Khimicheskaya Promyshlennost' Ukrainy, No 4, 1970, pp 8-10

Abstract: Production of glass plastics using electron accelerators as radiation sources is described. The operating principle is explained with an example of the manufacture of a cylindrical sheet of cross winding. The mandrel speed, feed pitch, and dose strength are selected so that during the time of passage of the winding section across beam cross-section the required degree of polymerization of the binder is attained. The degree of polymerization between layers wound on top of each other is regulated by the energy of the impinging radiation and beam current. The source of fast charged particles in the model setup is an accelerator with maximum electron energy of 0.4 Mev. Electrons at this energy ensure radiation polymerization of a 0.2-0.3 mm layer of glass-plastics. In this layer, when the density of the current of the beam is several tens of microamperes per square centimeter, dose strength of  $10^6$ - $10^7$  rads/sec is produced.

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- 47 -



USSR

UDC 576.851.132.095:576.858.8

BOBYR, A. D., and DYACHOK, V. V., Institute of Microbiology and Virology,  
Academy of Sciences Ukrainian SSR

"Antiviral Properties of Some Bacteria of the Genus Pseudomonas"

Kiev, Mikrobiologicheskii Zhurnal, Vol 33, No 5, Sep/Oct 71, pp 562-568

Abstract: The effect of culture liquids of 24 strains of Pseudomonas belonging to 15 species was determined in tests conducted in vitro with tobacco mosaic virus and in vivo with isolated leaves of Nicotiana glutinosa infected with the virus. The culture liquids of seven strains (Ps. aeruginosa 16 l. and 36 l., Ps. radiobacter Samosudov and 137/2, Ps. syringae 465, and Ps. fluorescens 1152 and 8326) inhibited the virus to the extent of 42.2-79.2 percent. In tests with infection of N. glutinosa leaves, the prophylactic effect of the culture liquids was more pronounced than their therapeutic effect. The composition of the culture medium (Hottinger broth or a potato decoction), the length of time of contact of the liquid with the virus in vitro, and the state of the viral infection, had a definite effect on the antiviral activity of the bacterial metabolic products. The culture liquids of Ps. radiobacter 137/2, Ps. aeruginosa 16 l., and Ps. aeruginosa 36 l., applied to tobacco and potato plants under field conditions to determine the prophylactic effect, reduced the accumulation of 5-6 phytopathogenic viruses (tobacco mosaic virus, 1/2

USSR

BOBYR, A. D., and DYACHOK, V. V., *Mikrobiologicheskiy Zhurnal*, Vol 33, No 5, Sep/Oct 71, pp 562-568

tomato bronzing virus, and viruses X, Y, S, and M of potato mosaic) by 35-80 percent. When potato tubers had been soaked in the culture liquid of *Ps. aeruginosa* 16.1. before planting, the potato yield was increased. Five-fold spraying of plants in the field with the culture liquid of *Ps. aeruginosa* 16.1. or *Ps. radiobacter* 137/2 not only was ineffective in increasing the yield of tobacco of the Havana variety or of potatoes of the variety Priyekul'skiy ranniy, but even reduced the yield in some cases, while spraying with the culture liquids that had been combined with the antibiotic imanin increased the yields by 13.8-16.7 percent.

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- 23 -

1/2 021 UNCLASSIFIED PROCESSING DATE--04DEC70  
TITLE--PROCESSES FOR INITIATING COLUMN CHARGES OF THE SIMPLEST EXPLOSIVES

-U-  
AUTHOR--(06)-DYADECHKIN, N.I., LOSEV, V.G., ZHELTETSKIY, A.YE., BAYDA,  
V.I., NAZARCHUK, M.N., SEMKO, G.I.  
COUNTRY OF INFO--USSR

SOURCE--GORN. ZH. 1970, 145(3), 36

DATE PUBLISHED-----70

SUBJECT AREAS--ORDNANCE

TOPIC TAGS--AMMONIUM NITRATE, DIESEL FUEL, DETONATION, COMMERCIAL  
EXPLOSIVE/(U)AS8 GRANULIT EXPLOSIVE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--3007/0753

STEP NO--UR/0127/70/145/003/0036/0036

CIRC ACCESSION NO--AP0136200

UNCLASSIFIED

2/2 021

UNCLASSIFIED

PROCESSING DATE--04DEC70


CIRC ACCESSION NO--AP0136200

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. COLUMN CHARGES OF IGDANIT (A MIXT. OF 7 L. DIESEL FUEL WITH 100 KG GRANULATED NH SUB4 NO SUB3), GRANULIT AS-8, AND ZERNOGRANULIT (THE COMPN. OF THE LAST TWO EXPLOSIVES IS NOT GIVEN) WERE INITIATED. TO AVOID DUST FORMATION WHEN FILLING THE BLAST HOLES WITH ZERNOGRANULIT, 4PERCENT WATER OR DIESEL FUEL WAS ADDED TO THIS EXPLOSIVE. THE EXPTS. WERE DONE IN MINES UNDERGROUND, IN STEEL PIPES 4-4.5 M TIMES 100 MM DIAM., WITH 2.5-MM WALLS. THE EXPLOSIVES DETONATED WHEN INITIATED BY 2 LINES OF DETONATING CORD PLACED ALONG THE WHOLE LENGTH OF THE CARTRIDGES, OR BY TWO DONOR CHARGES (MIN. WEIGHT OF 0.4 KG EACH), CONNECTED BY TWO LINES OF DETONATING CORD.  
FACILITY: KRIVOROZH. GORNORUD. INST., KRIVOI ROG, USSR.

UNCLASSIFIED

USSR

UDC 621.382.1.029.6 -

  
PROKHOROV, E. D., DYADCHENKO, A. V., SHALAYEV, V. A. and BELETSKIY, N. I.,  
Academy of Sciences of the USSR in Moscow

"An Experimental Investigation of the Width of Gunn Diode Voltage-Current Characteristics"

Moscow, Radiotekhnika i Elektronika, Vol. 15, No. 4, April 1970, pp. 795-796

Abstract: In these experiments, the authors varied the voltage applied to Gunn diodes from a level corresponding to pure Gunn oscillations, through the development of shock ionization in the domain to breakdown. They determined the width of the voltage current characteristic by a formula expounded by Prokhorov, Shalayev, Beletskiy and Arendar' in the previous issue of Radiotekhnika i Elektronika, as a function of the concentration of primary carriers, the field strength outside the domain, the critical strength of the electrical field in the domain (the strength at which zone-zone shock ionization develops) the average maximum drift speed of electrons and the mobility of the primary carriers. Their experimental results fitted the curve calculated by this formula fairly well; they attribute the discrepancies to the approximate determination of primary carrier concentration and mobility. Their results show the voltage current characteristic width to decrease with increasing concentration and decreasing mobility.

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USSR

PROKHOROV, et al, Radiotekhnika i Elektronika, Vol 15, No 4, April 1970, pp.793-796

They also investigated recombination radiation in the diodes under various conditions. The spectrum of the radiation detected included a peak and a relatively long tail, indicating a fairly high number of levels at the base of the conductivity zone and the top of the valence zone. At voltage levels up to the width of the voltage current characteristic and somewhat beyond the radiation was proportional to the concentration of shock ionized carriers; with intense radiation beginning at voltages above this width. The radiation intensity increases sharply at higher voltage levels, as breakdown is approached.

At voltage levels near the voltage current characteristic width, the radiation is most intensive at the cathode end, indicating shock ionization as the primary cause; at higher voltages, approaching the breakdown level and beyond it, the radiation is most intense in the center of the diode sample, indicating heating as the primary cause.

Diffusing copper at the anode at a temperature of 400°C for 10-20 minutes increased the resistance of the samples and reduced the characteristic width. The authors explained this seeming contradiction by the fact that the copper compensates some of the doping admixtures in the GaAs, but reduces carrier mobility.

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USSR

PROKHOROV, et al, Radiotekhnika i Elektronika, Vol. 15, No. 4, April 1970, pp. 793-796

The duration of the afterglow was found to increase with increasing voltage from the characteristic width to breakdown. In the experimental samples used, the duration of the radiation increased after breakdown, but its intensity remained constant as the voltage increased. The authors take this as an indication that at temperatures of 100°C and higher the concentration of electrons in their samples did not change.

The authors conclude that shock ionization is the primary determinant of the voltage current characteristic width in Gunn diodes, but that heat breakdown also has an effect.

3/3

USSR

UDC:669.018.95:537.311

DYADENKO, N. S., LUN'KO, A. I. and KHOLOPTSEVA, T. V., "Radiopribor"  
Plant, Kiev

"Electrical Resistance of Copper-Graphite Powder Compositions"

Kiev, Poroshkovaya Metallurgiya, No 12, Dec 73, pp 62-66

Abstract: This article studies the change in electrical resistance during the process of pressing of copper-graphite powder compositions with "open" graphite and graphite covered with copper. For comparison, experiments were also performed with pure copper. Furthermore, the evenness of distribution of the components in pressings produced at the greatest pressures was determined. The change in resistivity of copper-graphite compositions during the process of their pressing shows that a sharp reduction in resistivity of all compositions studied is observed at pressing pressures of 1.2-1.6 t/cm<sup>2</sup>, while resistivity decreases more smoothly above this pressure. Compositions containing graphite granules clad with copper have significantly lower resistivity than compositions with "open" graphite, as a result of the formation of a solid copper framework in the first case, and a graphite frame in the second.

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- 48 -



USSR

UDC 621.822.002.3:621.762

YAS', D. S., OSVETIMSKIY, I. A., DYADENKO, N. S., ZAPOROZHETS, A. A., and BELEWISOVA, N. A., Ukrainian Scientific Research Institute of the Textile Industry

"Copper-Graphite Materials with Additives of Graphite Granules Plated with Copper"

Kiev, Poroshkovaya metallurgiya, No 5, May 71, pp 70-75

Abstract: A new method for improving the antifriction properties of materials intended for operation under conditions of dry friction, for manufacturing sliding contacts and low-load sliding bearings, developed at the metal ceramics laboratory of the Ukrainian Scientific Research Institute of the Textile Industry was applied to obtain metal ceramic of copper-graphite material with additives of graphite granules plated with copper. The results, presented in graphs and photographs of microstructure of copper-graphite materials with various graphite content, show that the addition of copper-plated graphite reduces the material electric conductivity and increases its compression strength, and with 6% content the hardness and bending strength increase. Thus, for a material with 15 wt% content of plated graphite, hardness and compression and bending strength increase by 30, 80, and 100%, respectively, while 1/2

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YAS', D. S., et al., Poroshkovaya metallurgiya, No 5, May 71, pp 70-75

the specific electric resistance and the dry friction coefficient decrease by 60 and 27%, respectively, in comparison with the same material with exposed graphite.

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- 48 -

USSR

UDC 616.441+416.453]-008.6:615.777./779

DYADICHEVA, T. V., Kiev Scientific Research Institute of Industrial Hygiene  
and Occupational Diseases

"Effect of Prolonged Action of Carbamic Acid Pesticides on Thyroid and  
Adrenocortical Function"

Kiev, Vrachebnoye Delo, No 2, 1971, pp 120-122

Abstract: The effects of derivatives of carbamic (sevin), thio (yalan), and dithiocarbamic (TMTB) acids were studied in chronic experiments (4 months) on white rats. Injected into the stomach, all the compounds (sevin 36 mg/kg, yalan 33 mg/kg, TMTB 14.8 mg/kg) increased thyroid function. In addition, sevin increased androgen and mineralocorticoid function of the adrenal cortex while decreasing its functional reserves. Yalan stimulated mineralocorticoid, androgen, and to a lesser degree, glucocorticoid function of the adrenal cortex while decreasing its functional reserves. TMTB after stimulating thyroid function increased androgen and mineralocorticoid function but decreased glucocorticoid function of the adrenal cortex and exhausted its functional reserves. Thus, the three insecticides related but with different chemical structures, exhibited common features as well as individual characteristics in their effects on the endocrine glands.

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USER

UDG 621.52.C01

GSL', E.P., DYAD'KIN, I.G., ZHUKOVA, S.A.

"Carrying Capacity Of Glass Stem With A Constriction For Flow Of Highly Rarified Gasees"

Elektron. tekhnika. Nauchno-tekhn. sb. Elektron. SVCh (Electronic Technology. Scientific-Technical Collection. Microwave Electronics), 1970, No 1, pp 137-142 (from RZh--Elektronika i yeye primeneniye, No 7, July 1970, Abstract No 7A26)

Translation: The paper computes by the Monte-Carlo method the carrying capacity of a stem with a restriction of various types for the flow of rarified gasees. An empirical formula is obtained for the dependence of the carrying capacity on the geometrical dimensions of the constriction. Data are presented on the density of impacts of the molecules with the surface of the stem for all of its length. 3 ref. Summary.

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- 70 -

USSR

DERGACHEV, P. B., DYAD'KIN, V. P., SAVIN, N. S., SEVEROV, L. A., and  
TARAN, Yu. A.

"Principal Characteristics of the Random Rolling of Heavy Aircraft During  
Flight in Turbulent Atmosphere"

Tr. Leningr. in-t aviats. priborostr. (Works of Leningrad Institute of  
Aircraft Instrument Manufacture), 1970, vyp. 66, pp 174-179 (from RZh-  
Mekhanika, No 1, Jan 71, Abstract No 1B392 by G. V. Vronskiy)

Translation: The article considers equations of motion of aircraft equipped  
with an automatic pilot which maintains horizontal flight at a constant speed  
despite exposure to random vertical and transverse uncorrelated gusts of wind  
possessing the same spectral density. The solution was accomplished with  
the help of analog computers; at the same time the generation of random  
gusts with prescribed spectral density was effected by means of a shaping  
filter of the "white" noise produced by a random signal generator. During  
simulation, pitch-, bank- and yaw-angle signals, as well as their angular  
velocities and accelerations were simultaneously tape-recorded on a multi-  
channel oscillograph. After processing on the correlator, autocorrelation  
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USSR

DERGACHEV, P. B., et al., Tr. Leningr. in-t aviats. priborostr. (Works of Leningrad Institute of Aircraft Instrument Manufacture), 1970, vyp. 66, pp 174-179 (from RZh-Mekhanika, No 1, Jan 71, Abstract No 1B392 by G. V. Vronskiy)

functions of these signals were obtained, which are represented in the form

$$R(\tau) = D [e^{-\alpha_1|\tau|} \cos \beta_1 \tau + \mu e^{-\alpha_2|\tau|} \sin |\beta_2 \tau|]$$

The authors present a table of coefficients  $\alpha_1, \alpha_2, \beta_1, \beta_2, \mu$ , corresponding to the above-indicated signals.

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- 9 -

EQUIPMENT

Gyroscopic

USSR

531.385

SEVEROV, L. A., SAVIN, N. S., DYAD'KIN, V. P.

"Errors of Adjustable Gyroscopic Devices With Limitation of Zone of Linearity of Adjustment Circuit"

Leningrad, IVUZ Priborostroyeniye, Volume 13, No. 2, 1970, pp 72-76.

Abstract: The errors of an adjustable gyroscopic device are analyzed. It is shown that saturation of the adjustment circuit has a filtering influence on perturbations applied to the sensing element.

Furthermore, it is shown that static errors of the device caused by perturbations applied to the gyroscope increase sharply when the adjustment circuit is saturated.

USSR

UDC: 536.24:532.54

BARULIN, Yu. D., VIKHREV, Yu. V., DYADYAKIN, B. V., KOBYAKOV, A. N.,  
KON'KOV, A., LOKSHIN, V. A., SINITSYN, I. T., Editorial Staff of Inzh.  
fiz. zh., Academy of Sciences of the Belorussian SSR

"Heat Exchange During Turbulent Flow of Water With Supercritical Parameters  
of State in Vertical and Horizontal Pipes"

Teplootdacha pri turbulentnom techenii v vertikal'nykh i horizontal'nykh  
trubakh vody sverkhkriticheskikh parametrov sostoyaniya (cf. English above),  
Minsk, 1970, 16 pp, ill. (No 2315-70 Dep.) (from RZh-Mekhanika, No 4, Apr  
71, Abstract No 4B739 DEP)

Translation: The paper presents the results of an experimental study of  
heat transfer during rising, descending and horizontal flow of water with  
supercritical parameters of state in circular tubes. The experimental  
values of the coefficients of heat transfer were found in the following  
ranges of working parameters: pressure 225-265 bars; mass flowrates 480-  
5000 kg/cm<sup>2</sup>·s; Reynolds number (12.5-450)·10<sup>3</sup>; specific thermal load 0.2-  
6.5 MW/m<sup>2</sup>; flow temperature +50-500°C; wall temperature +60-750°C; inside

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- 60 -



BARULIN, Yu. D. et al., Teplootdacha pri turbulentnom techenii v vertikal'nykh i gorizonta'nykh trubakh vody sverkhkritichskikh parametrov sostoyaniya, Minsk, 1970 (No 2315-70 Dep.)

diameter of the tubes (3, 8, 20)·10<sup>-3</sup> m; relative length up to 300. Experimental data are obtained on the effect which the direction of motion of the liquid flow has on heat exchange in the supercritical region. A study is made of the nature of the change in the coefficient of heat exchange on the initial section and around the perimeter of horizontal tubes. Bibliography of twelve titles. Authors' abstract.

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USSR

UDC 547.558.1:543.42

DYADYUSHA, G. G., KOZLOV, E. S., and KHOMENKO, D. P., Institute of Organic Chemistry, Acad. Sc. Ukrainian SSR, Kiyev

"IR Spectra and Calculations of the Vibrations of Phosponitrile Chloride Trimer and of the Phosphorus Acid Phosphazo Derivatives With Isotopes  $^{14}\text{N}$  and  $^{15}\text{N}$ "

Kiyev, Teoreticheskaya i Eksperimental'naya Khimiya, Vol 9, No 4, 1973, pp 535-540

Abstract: An investigation was carried out of the IR spectra of phosphonitrile chloride trimer  $(\text{PNCl}_2)_3$  (I), trichlorophosphazotrichlorophosphonium hexachlorophosphonate  $[\text{Cl}_3\text{PNPCl}_3]^+\text{PCl}_6^-$  (II) and trichlorophosphazodichlorophosphonyl  $\text{Cl}_3\text{P}=\text{NPOCl}_2$  (III) with nitrogen isotopes  $^{14}\text{N}$  and  $^{15}\text{N}$  and the relationship between the absorption bands in (I) has been refined. Calculations of the vibrations of (I) were used in determining the force constants of the rings ( $10^6 \text{ cm}^{-2}$ ):  $K_{\text{PN}} = 10.13$ ;  $H_{\text{PN}}^{\text{PN}}$  (through the phosphorus) =  $-0.35$ ;  $H_{\text{PN}}^{\text{PN}}$  (through the nitrogen) =  $0.266$ . The value of the PN bond interactions through the nitrogen was used to calculate the vibrations in II and III. It was shown that the PNP angle in these compounds should be in the range of  $130-140^\circ$ . The  $\text{POCl}_2$  group in compound III should be capable of conjugation with the P=N bond.

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USSR

UDC: 535.373.2

DYADYUSHA, G. G., PRZHONSKAYA, O. V., TIKHONOV, Ye. A., and SHPAK, M. T.

"Investigating the Laws of Radiation Transitions from the Second Excitation Singlet State of Dye Molecules"

Moscow, Izvestiya AN SSSR -- Seriya Fizicheskaya, vol 36, No 5, 1972, pp 945-950

Abstract: This paper is based on an earlier article written by the authors named above and published in the Journal of Experimental and Theoretical Physics (ZhETF, 14, 330, 1971). The earlier article announced the discovery of intense shortwave radiation from molecular solutions of cyanine dyes, which was interpreted as radiation from the second electron-state excitation  $^1S_2 \rightarrow ^1S_0$ , and showed experimentally that this radiation is not connected with photochemical transformations or the presence of contaminants. In the present paper, the authors clarify the laws of shortwave fluorescence by investigating two homologous cyanine dye molecules. In the first, oscillation of the  $\pi$  electron system is possible in two mutually perpendicular directions, along the axis of symmetry and at right angles to it; the second type is characterized by a much greater linearity of oscillation of the  $\pi$  electron system. The results of experimentation with both

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USSR

UDC: 535.373.2

DYADYUSHA, G. G., et al, Izvestiya AN SSSR -- Seriya Fizicheskaya, vol 36, No 5, 1972, pp 945-950

molecules, excited by the mercury lamp type DRSh-250 with excitation wavelengths of 313, 366, and 405 nm, are given. Information regarding the mutual positioning of absorption and radiation oscillators of the molecules was obtained by investigating the polarization spectra. It is concluded that since the second excitation triplet state cannot be higher than the second singlet state, it is probably either in resonance or close to it.

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- 33 -

1/2 011 UNCLASSIFIED PROCESSING DATE--04DEC70  
TITLE--BASICITY AND ELECTRON STRUCTURE OF PYRANONES -U-  
AUTHOR--(03)-TOLMACHEV, A.I., DYADYUSHA, G.G., SHULEZHKO, L.M.  
COUNTRY OF INFO--USSR  
SOURCE--TEOR. EKSP. KHIM. 1970, 6(2), 185-91 D  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--MOLECULAR STRUCTURE, MOLECULAR ORBITAL, AROMATIC KETONE,  
HETEROCYCLIC OXYGEN COMPOUND  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY FICHE NO----FD70/605013/B03 STEP NO--UR/0379/70/006/002/0185/0191  
CIRC ACCESSION NO--AP0140343  
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0140343

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. HUECKEL LCAO MO CALCNS. WERE PERFORMED FOR PYRANONES, CHROMONES, BENZOCHROMONES, XANTHONES, COUMARINS, AND THEIR PROTONATED SPECIES. PARAMETERS USED WERE BY PARISER, PARR, AND POPL; PK SUBBH PRIME POSITIVE WAS PLOTTED AS A FUNCTION OF PI ELECTRON ENERGY OF PROTONATION ( $\Delta\epsilon_{PI}$ ). PI ELECTRON D. AND PI BOND ORDERS OF THESE COMPS. WERE CALCD. AND THE LOCALIZATION ENERGIES FOR ELECTROPHILIC, RADICAL, AND NUCLEOPHILIC SUBSTITUTION IN PYRANONES WERE DETD. THE CALCD. VALUES VERIFY THE EXPTL. FINDINGS THAT FOR ELECTROPHILIC SUBSTITUTION POSITION 3 IS PREFERRED, WHILE POSITION 2 IS FAVORED IN RADICAL AND NUCLEOPHILIC SUBSTITUTION. FACILITY: INST. ORG. KHIM., KIEV, USSR.

UNCLASSIFIED

1/2 031 UNCLASSIFIED PROCESSING DATE--27NOV70  
TITLE--COMPARISON BETWEEN THE AUGMENTED WAVE AND GREEN'S FUNCTION METHODS  
IN THE ZONE THEORY OF SOLIDS -U-  
AUTHOR--(04)-DYAKIN, V.V., YEGOROV, R.F., ZVEZDIN, V.K., SHIROKOVSKY, V.P.  
COUNTRY OF INFO--USSR  
SOURCE--FIZIKA METALLOV I METALLOVEDENIE, MAR. 1970, 29, (3), 579-483  
DATE PUBLISHED-----70  
SUBJECT AREAS--PHYSICS, MATERIALS  
TOPIC TAGS--ELECTRON SPECTRUM, WAVE FUNCTION, ENERGY BAND STRUCTURE,  
METAL CRYSTAL, CALCULATION, GREEN FUNCTION, VARIATIONAL METHOD  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--3002/1819 STEP NO--UR/0126/70/029/003/0479/0483  
CIRC ACCESSION NO--AP0129187  
UNCLASSIFIED

2/2 031 UNCLASSIFIED PROCESSING DATE--27NOV70  
CIRC ACCESSION NO--A0129187

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE MATHEMATICAL PROBLEM OF FINDING THE ELECTRON ENERGY SPECTRUM AND WAVE FUNCTIONS OF METAL CRYSTALS AND DERIVING THE ELECTRICAL AND OTHER PROPERTIES FROM THESE IS CONSIDERED THEORETICALLY IN TWO FORMS BASED ON THE AUGMENTED PLANE WAVE AND GREEN'S FUNCTION METHODS, RESP. IT IS PROVED THAT IN BOTH THE RELATIVISTIC AND NONRELATIVISTIC CASES BOTH METHODS MAY BE DERIVED FROM A SINGLE BASIC VARIATIONAL PRINCIPLE. SOME OF THE SIMILARITIES AND DIFFERENCES BETWEEN THE TWO METHODS ARE DISCUSSED.

UNCLASSIFIED



USSR

UDC 621.789:669.15"24"26

ROMANIV, O. N., ~~DYAKIV, I. B.~~, and KUKLYAK, N. L., Institute of Physics  
Mechanics, Academy of Sciences, Ukrainian SSR, L'vov

"Influence of Heat and Mechanical Treatment on Rupture Work of Medium-Alloy  
Steel"

Kiev, Fiziko-Khimicheskaya Mekhanika Materialov, No 2, 1971, pp 24-27

Abstract: Earlier studies have indicated the primary influence of high-temperature heat and mechanical treatment on the brittle strength of machine building steels. This article studies the question of the criteria of the favorable influence of this treatment on the crack propagation resistance of these steels. The studies were performed using chrome-silicon and chrome-nickel steels. A comparative estimate was made of the work of rupture of bar specimens with stress concentrators and with fatigue cracks formed at the mouths of the concentrators under impact loading. The resistance to crack propagation was found to increase only if the temperature at which the tests were performed was below the upper threshold of cold brittleness of the specimens. The optimal degree of compression during high-temperature heat and mechanical treatment depends not only on the chemical composition and treatment mode of the steel, but also on the conditions of subsequent mechanical testing. As the test conditions become more rigid, the influence decreases.

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USSR

D

VAYNSHTEYN, B. K., Corresponding Member of the Academy of Sciences USSR, D'YAKON, I. A., and ABLOV, A. V., Academician of the Academy of Sciences Moldavian SSR, Institute of Crystallography of the Academy of Sciences USSR, Moscow, Institute of Applied Physics of the Academy of Sciences Moldavian SSR, Kishinev

"Electron-Diffraction Determination of Structure of DL- $\alpha$ -Cupric Alaninate"

Moscow, Doklady Akademii Nauk SSSR, Vol 193, No 2, 1970, pp 330-332

Abstract: Continuing their study of copper salts of  $\alpha$ -amino acids, the authors describe the results of an electron-diffraction study of the anhydrous copper salt of DL- $\alpha$ -alanine  $\text{Cu}(\text{H}_2\text{NCH}(\text{CH}_3)\text{COO})_2$ , which is isolated in the form of very thin brittle plates closely abutting one another. Electron-diffraction patterns from textured polycrystal and point diffraction patterns were obtained on the EG electron-diffraction camera of the Institute of Crystallography, Academy of Sciences USSR.

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USSR

UDC 547.26'118

ZAVLIN, P. M., RODNYANSKAYA, E. R., ~~D'YAKONOV, A. I.~~, and AL'BITSKAYA, V. M.,  
Leningrad Institute of Motion-Picture Engineers

"Reaction of Alkylphosphorous Acid Monochlorides With Thioethylene Glycol"

Leningrad, Zhurnal Obshchey Khimii, Vol 41, No 8, Aug 71, pp 1874-1875

Abstract: In the reaction of alkylphosphorous acid monochlorides with thioethylene glycol in the presence of a hydrogen chloride acceptor -- triethylamine -- first the hydroxy group reacts to give  $\beta$ -mercaptoethyl alkyl phosphites, whose presence in the reaction products is confirmed by IR and PMR spectra.  $\beta$ -Mercaptoethyl alkyl phosphites are converted in the cold to the corresponding 1,3,2-oxathiaphospholane derivatives. The reaction of ethyleneglycolphosphorous acid chloride with thioethylene glycol gives a spiran derivative.

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Acc. Nr.: AP0048493

D

Ref. Code: UR 0009

JPRS 49937

Geological Cross Section of Superdeep Hole in Ciscaucasia

(Abstract: "Geological Cross Section of Super deep Well in Ciscaucasia," by G. M. Aladator, A. I. D'yakonov and S. I. Gorlov, All-Union Scientific Research Institute of Petroleum, Moscow, Geologii Nefti i Gaza, No 1, 1970, pp 55-57)

Deep drilling was begun in 1964 in Krasnoyarskiy Kray in the Medvedovskaya fold, situated in the northern part of the Timashevskaya formation, for detailed study of tectonic structure and determining the petroleum and gas deposits in Mesozoic deposits. Two boreholes were drilled there (position shown in Fig. 1, a geological cross section of the area). The first, passing through rocks of Cenozoic and Late Cretaceous age, in the interval 4,106-4,515 m encountered sedimentary and igneous-sedimentary formations (tuffs and tuff sandstones). The second hole was drilled to a depth of 6,320 m. It encountered a complex of deposits of Cenozoic, Cretaceous and Jurassic age and a stratum of rocks of volcanic origin tentatively assigned to the Upper Paleozoic-lower Mesozoic. The depth reached by hole No. 2 is among the record depths reached in the USSR and is the greatest reached in Ciscaucasia. Figure 2 is a geological cross section of hole No. 2; this cross section is discussed in detail in the text. The work has shown that

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holes can be drilled as deep as 6,000 m in this region and that at such depths there are collectors favorable for saturation by petroleum and gas. The presence of a thick stratum of rocks of igneous types is evidence of intensive volcanic activity in the region. Periods of active volcanism occurred in western Ciscaucasia and on the northern slope of the Greater Caucasus during the Middle Devonian, Permian, Lower Jurassic and Albian. The massive nature of these rocks of volcanic origin and the almost complete absence of sedimentary formations in the series of rocks of volcanic origin makes it difficult to determine their age. The data collected from rock cores indicate that in the southern part of the Timashevskaya formation conditions exist for the formation of lithologic-stratigraphic deposits of petroleum and gas. For exploring these deposits it is necessary to drill holes to the south of the Medvedovskaya area in the direction of the northern edge of the Western Kuban downwarp.

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UDC 547.26'118

ZAVLIN, P. M. D'YAKONOV, A. N., AL'BITSKAYA, V. M., and BABKINA, E. I.,  
Leningrad Institute of Cinematographic Engineers

"Reaction of Dithioesters of Cyclohexylphosphonous and Thiophosphonic  
Acids With Decyl Alcohol"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 12, Dec 73, p 2788

Abstract: Heating S-phenyl-SObenzylcyclohexyldithiophosponite or its  
trithio homolog with decyl alcohol at 210° for 6 hrs yields the respective  
thiophenol and O-decyl-S-benzylcyclohexylthiophosponite. When S-heptyl-  
S-benzylcyclohexyldithio(trithio)phosponite is heated with decyl alcohol,  
the products are heptylmercaptain and O-decyl-S-benzylcyclohexylthiophos-  
ponite.

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UDC 547.26'118

ZAVLIN, P. M., D'YAKONOV, A. N., AL'BITSKAYA, V. M., and BABKINA, E. I.,  
Leningrad Institute of Cinematographic Engineers

"Reaction of Nonsymmetric Diesters of Phosphonous Acids With Nucleophilic  
Reagents"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 7, Jul 73, p 1651

Abstract: Reactions of nonsymmetric diesters of cyclohexylphosphonous acid with decyl alcohol were studied. In the process of equilibrium transesterification, this equilibrium is shifted in the direction of the low-boiling product. In contrast to the derivatives of phosphonic acids, the phosphonous acids show apparently no effect of the vacant 3d orbitals of tricoordinated phosphorus atom on the direction of transesterification processes.

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- 42 -

Acc. Nr.

AP0041503

Abstracting Service:

CHEMICAL ABST.

4170

Ref. Code

UR 0366

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89919p Reactivity of diphenylcarbene in reactions with olefins. ~~D'vletov, I. M.; Stroiman, L. M.; Vitenberg, A. G.~~ (Leningrad. Gos. Univ., Leningrad, USSR). *Zh. Org. Khim.* 1970, 6(1), 42-5 (Russ). Ph<sub>2</sub>C: has electrophilic character and it also has greater reactivity when it is formed from Ph<sub>2</sub>CN<sub>2</sub> by photolysis than when it is formed by catalytic decompn. The reaction of H<sub>2</sub>C:CHOBu (I) with Ph<sub>2</sub>C: produced by irradiation gave 35.2% 1,1-diphenyl-2-butoxycyclopropane (II), 12% Ph<sub>2</sub>C:N<sub>2</sub>, and 14.4% Ph<sub>2</sub>CO. In the reaction of I with Ph<sub>2</sub>C: produced by heating Cu stearate-PhCN<sub>2</sub> complex 16.7% II was obtained. The reaction of 1-heptane with photolytically produced Ph<sub>2</sub>C: gave 4.5% 1,1-diphenyl-2-amylcyclopropane, 12% Ph<sub>2</sub>CO, and 36.4% Ph<sub>2</sub>CHCHPh<sub>2</sub>. CPJR

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Acc. Nr.

AP0053768

Abstracting Service:  
CHEMICAL ABST.

5770

Ref. Code

UR0366

D

110857d Equivalence of carbon atoms of the three-membered ring of the triphenylcyclopropenylium cation. D'yakonov, L. A.; Kostikov, R. R.; Molchanov, A. P. (Leningrad. Gos. Univ. im. Zhdanova, Leningrad, USSR). Zh. Org. Khim. 1970, 6(2), 316-21 (Russ). The action of *tert*-BuOK on Ph<sup>14</sup>CHCl<sub>2</sub> gave the carbene Ph<sup>14</sup>CCL, which condensed with PhC:CPh to give triphenylcyclopropenylium chloride (I). Treatment of I with *tert*-BuOH, H<sub>2</sub>O, and HBr gave triphenylcyclopropenylium bromide (II). The opening of the II ring with KOH at 80° gave equal amts. PhCH:CPh<sup>14</sup>COPh (III), PhCH:<sup>14</sup>CPhBz (IIIa), and Ph<sup>14</sup>CH:CPhBz (IIIb). The positions of the labeled C atoms in III-IIIb were detd. by degrading them to labeled BzOH and Ph-CHCO<sub>2</sub>H (H<sub>2</sub>O<sub>2</sub> oxidn. to epoxides, epoxide ring opening with BF<sub>3</sub>·Et<sub>2</sub>O, and oxidn. with H<sub>2</sub>O<sub>2</sub>) or to labeled BzH and Bz<sub>2</sub> (by ozonolysis of III-IIIb). CPJR

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1/2 014 UNCLASSIFIED PROCESSING DATE--09OCT70  
TITLE--ANTIPROTON DEUTERON INELASTIC INTERACTION IN A PULSED APPROXIMATION  
-U-  
AUTHOR--(02)--NEMIROVSKIY, P.E., DYAKONOV, I.A.  
COUNTRY OF INFO--USSR  
SOURCE--YAD. FIZ. 1970, 11(1), 131-9  
DATE PUBLISHED--70  
SUBJECT AREAS--PHYSICS  
TOPIC TAGS--INELASTIC INTERACTION, ANTIPROTON, DEUTERON, APPROXIMATION  
METHOD, NUCLEAR CROSS SECTION, PARTICLE ANNIHILATION  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1976/0427 STEP NO--UR/0367/70/011/001/0131/0139  
CIRC ACCESSION NO--AP0042463  
UNCLASSIFIED

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PROCESSING DATE--09OCT70

CIRC ACCESSION NO--AP0042463

ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. THE INELASTIC DISINTEGRATION IS STUDIED WHICH IS INDUCED BY INCIDENT BAR P AND CHARGE EXCHANGE OF BAR P TO THE D WITHIN THE ENERGY RANGE OF THE INCIDENT BAR P OF SIMILAR TO 25-100 MEV. INELASTIC DISINTEGRATION CROSS SECTIONS AND CHARGE EXCHANGE ARE CALCD. NUMERICALLY, BY USING APPROX. METHODS. A CRITERION FOR ESTG. THE VALUE OF THE CROSS SECTION OF BAR P D ANNIHILATION IS GIVEN. THE CHARGE EXCHANGE AND ANNIHILATION IN BAR P D PROCESSES ARE COMPARED WITH CORRESPONDING CROSS SECTIONS OF THE BAR P N PROBLEM FOR EQUIV. ENERGIES. FACILITY: MOSK. INZH.-FIZ. INST., MOSCOW, USSR.

UNCLASSIFIED

DYAKONOV, L. I.

SPRS 59008

6-73

2

VII-1a. APPLICATION OF THE METHOD OF CONTINUOUS WATCHING FOR STUDYING THE ETCHING AND GROWTH PROCESSES IN THE Ga-AsCl<sub>3</sub>-H<sub>2</sub> SYSTEM

SESSION VII

Article by L. I. Dyakonov, E. S. Koptilovich, V. N. Maslov, V. Ya. Repel'son, A. L. Ruda, Ye. V. Shilov'yeva, Norevoj Novosibirsk, III Simpozium po Prebrasheniya Rosal i Spivozn Tolnykovodnykh Kriestallov i Plenu, Krasnoy, Kasstani, 12-17 June, 1972, p 83

A simple method of continuous watching has been developed to investigate the etching rates of gallium and the growth of the epitaxial layer of GaAs. On completion of the period of saturation of the gallium with arsenic, the composition of the gas phase is changed sharply, and the gallium content in the gas flow under stationary conditions corresponds to the equilibrium above the solid gallium arsenide, and the arsenic content is determined by the amount of AsCl<sub>3</sub> introduced into the reactor. In contrast to the available published data it has been found that the growth rate of the GaAs layer is established practice immediately with respect to completion of the saturation period. Parameters indicates that the growth of GaAs takes place in the diffusion-limited region. The temperature profile in the reactor was determined for which the radial gradients are eliminated which cause uncontrolled nucleation of the GaAs on the reactor walls in the substrate zone. A study was made of the effect of the conditions of the growth process on the structure and the electrical properties of the unalloyed epitaxial layers of GaAs. The electron mobility in the layers grown under optical conditions reached 8350 cm<sup>2</sup>/V-sec at 300°K and 53,000 cm<sup>2</sup>/V-sec at 77°K with a concentration of them of 3·10<sup>16</sup> cm<sup>-3</sup>.

D'YAKONOV, L. I.

SPNS 57068

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VII-1b. PROPERTIES OF ALLOYED EPITAXIAL LAYERS OF CALCIUM ARSENIDE GROWN IN THE Ga-AsCl<sub>3</sub>-H<sub>2</sub> SYSTEM

Article by L. I. D'yakonov, L. A. Zhukova, E. S. Kopylovich, V. M. Maslov, V. Yu. Popelznev, B. I. Kuda, Ye. V. Solov'yeva, Vascon; Novosibirsk, III Sibirskiy nauchnyy tsentr, Poluprovodnikovaya Kristalloya I Pleni, Novosibirsk, 12-17 June, 1972, p 86

Layers of gallium arsenide grown in the Ga-AsCl<sub>3</sub>-H<sub>2</sub> system were alloyed either by thermal evaporation of the impurity (Fe, In) or by introduction of it in the form of a ternary compound (H<sub>2</sub>Se, (C<sub>2</sub>H<sub>5</sub>)<sub>2</sub>Zn). The dependence of the carrier concentration in the layers on the admixture concentration in the gas phase was found. With an increase in the tellurium concentration in the rate of the layer drops almost to zero whereas the zinc practically has no effect on the growth rate. The use of diethyl zinc does not lead to worsening of the electrophysical parameters of the layers by comparison with the growth by the method of thermal evaporation of zinc. The concentration of the alloying carriers in the layers alloyed with tellurium and selenium is reduced in the direction of the carrier flow whereas in the layers alloyed with zinc, the concentration of the carriers increases a little. This difference is connected with the difference in the coefficients of the vapor-crystal junction. According to the data of electrophysical studies, the degree of compensation of the donor in the layers alloyed with selenium is constant and close to 0.5. An increase in the tellurium concentration in the layer leads to an increase in the dislocation density and the number of growth pyramids. In the specimens alloyed with selenium with a carrier concentration of the type of 5·10<sup>18</sup> cm<sup>-3</sup>, either an increase in the dislocation density to 1·10<sup>6</sup> cm<sup>-2</sup> or the appearance of specific microdefects was observed. At low alloying levels with selenium (5·10<sup>18</sup> cm<sup>-3</sup>) and in the entire range of alloying with zinc using diethyl zinc, the dislocation density in the layer is close to the dislocation density in the substrate; the morphology of the layers does not change.

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UDC 621.315.592

YUROVA, YE. S., SOLOV'YEVA, YE. V., KISTOVA, YE. M., D'YAKONOV, L. I., IGLITSYN, M. I., KEVORKOV, M. N.

"Autocompensation of Donors in Gallium Arsenide and the GaAs<sub>1-x</sub>P<sub>x</sub> Solid Solution"  
Leningrad, Fizika i Tekhnika Poluprovodnikov, Vol 6, No 3, 1972, pp 498-501

Abstract: A study was made of the autocompensation phenomenon (constancy of the degree of compensation in a broad alloying range) detected in films of GaAs<sub>1-x</sub>P<sub>x</sub> alloyed with Te and Se and GaAs alloyed with Se. The dependence of the degree of compensation and the concentration of the compensating centers in the neutral state was obtained as a function of the composition of the solid solution. A deep level connected with compensating centers was detected, and the dependence of its activation energy on the composition of the solid solution was determined.

The study was made in the entire composition range of the solid solution and also in films of gallium arsenide alloyed with Se. The temperature range was expanded to 800° K. The degree of compensation in the GaAs<sub>1-x</sub>P<sub>x</sub> close with respect to composition to GaP was determined by the curve for the temperature dependence of the charge carrier concentration by the same procedure as used

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YUROVA, YE. S., et al., Fizika i Tekhnika Poluprovodnikov, Vol 6, No 3, 1972, pp 498-501

earlier [M. I. Iglitsyn, et al., FTP, No 4, 230, 1970]. Graphs are presented showing the degree of compensation and the concentration of the compensating defects in the neutral state as functions of the composition of  $\text{GaAs}_{1-x}\text{P}_x$  crystals, the concentration of the ionized detectors as a function of the electron concentration in the films of GaAs alloyed with Se, the temperature dependence of the charge carrier concentration in the compensated samples of  $\text{GaAs}_{1-x}\text{P}_x$ , and the dependence of the approximate activation energy of the  $D'$  level on the composition of the  $\text{GaAs}_{1-x}\text{P}_x$  crystals. The divergence between the degree of compensation observed in the GaAs crystals ( $K \approx 0.5$ ) and the value of  $K$  obtained by extrapolating the function  $K(x)$  for the solid solution to  $x = 0$  is explained by the difference between the growth temperatures of these crystals  $\approx 200^\circ$ . The calculation of  $N_v^0$  from the value of  $K$  in GaAs by the previously obtained formula

$$K = \frac{N_A}{N_D} = \frac{N_v^0}{N_c} e^{(E_a - E_g)/kT},$$

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- 145 -

USSR

YUROVA, YE. S., et al., Fizika i Tekhnika Poluprovodnikov, Vol 6, No 3, 1972, pp 498-501

leads to a value of the same order as the value of  $N_v^0$  in  $\text{GaAs}_{1-x}\text{P}_x$  determined on heat treatment of the crystals at a temperature close to the growth temperature of the GaAs films ( $N_v^0$  is the concentration of the compensating defects in the neutral state,  $N_c$  is the effective density of the states of the conduction band, and  $E_g$  is the width of the forbidden band).

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1/2 026 UNCLASSIFIED PROCESSING DATE--02OCT70  
TITLE--EFFECTIVENESS OF TREATMENT OF PATIENTS WITH ECZEMA, PSORIASIS AND  
NEURODERMATITIS AT THE VANGOW SPA RESORT -U-  
AUTHOR--(03)--YAKONOV, M.F., BEDA, S.A., LESNIKOV, G.A. D  
COUNTRY OF INFO--USSR  
SOURCE--VESTNIK DERMATOLOGII I VENEROLOGII, 1970, NR 3, PP 39-42  
DATE PUBLISHED-----70  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--DERMATITIS, VITAMIN, PROPHYLAXIS, NERVOUS SYSTEM DISEASE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1986/0691 STEP NO--UR/0206/70/000/003/0039/0042  
CIRC ACCESSION NO--AP0102675  
UNCLASSIFIED

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PROCESSING DATE--02OCT70

CIRC ACCESSION NO--AP0102675

ABSTRACT/EXTRACT--(U) GP-C- ABSTRACT. THERE WERE 1701 PATIENTS UNDER OBSERVATION, OF THEM 857 WITH CHRONIC ECZEMA, 678 WITH PSORIASIS, 165 WITH NEURODERMATITIS. THE PATIENTS RECEIVED COMPOSITE TREATMENT: GENERAL BATHS OF MINERAL WATER AT A TEMPERATURE OF PLUS 35DEGREES TO 38DEGREESC, OF 10 TO 15 MINUTES' DURATION, A COURSE CONSISTING OF 12 TO 20 BATHS; SHOWERS, HELIC AEROTHERAPY. SOME PATIENTS WERE GIVEN DESENSITIZING THERAPY AND VITAMINS. THE FOLLOWING IMMEDIATE RESULTS WERE OBTAINED: FOR PATIENTS WITH CHRONIC ECZEMA CLINICAL CURE IN 33.7PERCENT, CONSIDERABLE IMPROVEMENT IN 15.5PERCENT, IMPROVEMENT IN 47.3PERCENT, NO CHANGE IN 2.5PERCENT, EXACERBATION IN 1PERCENT; FOR PATIENTS WITH PSORIASIS CLINICAL CURE IN 28.9PERCENT, SIGNIFICANT IMPROVEMENT IN 28.6PERCENT; IMPROVEMENT IN 41.3PERCENT, NO CHANGES IN 1.2PERCENT. IN NEURODERMATITIS CLINICAL CURE WAS OBSERVED IN 27PERCENT, CONSIDERABLE IMPROVEMENT IN 20PERCENT, IMPROVEMENT IN 49.4PERCENT, NO CHANGES IN 3.6 PERCENT OF THE PATIENTS.

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USSR

UDC 621.315.592

GEL'MONT, B. L., D'YAKONOV, M. I.

"Acceptor Levels in a Semiconductor with Diamond Structure"

Leningrad, Fizika i Tekhnika Poluprovodnikov, Vol 5, No 11, 1971, pp 2191-2193

Abstract: Results are presented from a numerical calculation of the energy of the basic acceptor level as a function of the ratio of masses of light and heavy holes. The calculation was performed for the case of small acceptor levels the energies of which are small by comparison with the width of the forbidden zone and the magnitude of the spin-orbit splitting. For any ratio of the masses of the light and heavy holes, the energy of the ground state is on the order of the Bohr energy of the heavy hole.

In a recent paper [N. O. Lipari, et al., Phys. Rev. Lett., No 25, 1660, 1970] the energy of the ground state was determined from the same set of equations derived here using the variation method. However, the limiting value of the ground state energy for  $(m_e/m_h) \rightarrow 0$  [ $m_e$  and  $m_h$  are the masses of the light and heavy holes, respectively] was not calculated, and it was not shown that this energy is on the order of the Bohr energy of the heavy hole. The results obtained in the present paper permit calculation of the ground state

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GEL'MONT, B. L., et al., Fizika i Tekhnika Poluprovodnikov, Vol 5, No 11, 1971, pp 2191-2193

energy of the acceptor if the zonal parameters  $\gamma_1$  and  $\gamma$  introduced by Luttinger [Phys. Rev., No 102, 1030, 1956] are known.

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- 76 -

Acc. Nr: **AP0043642**

Ref. Code: UR 0056

PRIMARY SOURCE: Zhurnal Eksperimental'noy i Teoreticheskoy  
Fiziki, 1970, Vol 58, Nr 3, pp 1090-1097

**EFFECT OF RESONANCE RADIATION CAPTURE  
ON THE CHARACTERISTICS OF A GAS LASER**

M. I. Diakonov, V. I. Perel'

The nonlinear polarizability of an active gas medium is calculated by taking into account capture of resonance radiation. Radiation capture results in efficient mixing of the velocity distribution for atoms at the upper working level and also in leveling out of the population in the Zeeman sublevels of the atoms. It is shown that along with formation of Bennet holes generation leads to a general lowering of the amplification contour, and the saturation effect acquires some properties which are characteristic for uniform broadening. It is shown that radiation capture alters the dependence of the generation intensity on resonator tuning (shape of Lamb dip). It is shown that the parameters characterizing the dip depend on the total moments of the operating levels and on polarization of the laser radiation.

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UDC 541.91:547.1'118'128

D'YAKOV, V. M., and VORONKOV, M. G., Irkutsk Institute of Organic Chemistry, Siberian Branch of the Academy of Sciences USSR

"Trialkylsilyl Esters of Polyfluoracylphosphonic Acids"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 2, 1973, pp 399-402

Abstract: Studies were conducted on the reactions of tris(trialkylsilyl) phosphites with trifluoroacetyl chloride (I) and  $\alpha$ -hydrohexafluoroisobutyryl chloride (II), with the formation of the corresponding bis(trialkylsilyl)per(poly)fluoroacylphosphonates in 31-52% yields. The following were synthesized: bis(trimethylsilyl) trifluoroacetylphosphonate (III), bis(triethylsilyl) trifluoroacetylphosphonate (IV), bis(trimethylsilyl) -  $\alpha$ -hydrohexafluoroisobutyrylphosphonate (V), and bis(triethylsilyl) -  $\alpha$ -hydroperfluoroisobutyrylphosphonate (VI). The products were viscous, colorless, liquids with weak characteristic odors; they had low indexes of refraction in comparison with organic and silicoorganic  $\alpha$ -keto-phosphonates. Their structures were confirmed by IR, NMR, and PMR spectra. Compound III was synthesized by percolating a solution  
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D'YAKOV, V. M. and VORONKOV, M. G., Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 2, 1973, pp 399-402

of (27.6 g of I through 20.0 g of tris(trimethylsilyl) phosphite at 40°; a residue was obtained which, on fractional distillation, gave III and 8.5 g of a fraction with a b.p of 88-93° (7 mm), consisting of unreacted tris(trimethylsilyl) phosphite, bis(trimethylsilyl) phosphite, and fluorine-containing products. IV was synthesized in a similar manner from 10.0 g of tris(triethylsilyl) phosphite and 9.3 g of I; the yield of IV was 3.0 g (31.3%)[b.p. 123-126° (5 mm),  $n_D^{20}$  1.4436,  $d_4^{20}$  1.070]. In addition, 3.1 g of an unidentified fraction (b.p. 145-148° (5 mm)) were obtained, as well as 1.9 g (54.4%) of triethylchlorosilane. V was prepared by the dropwise addition of 19.0 g of fresh  $\alpha$ -hydrohexafluorbutyryl chloride acid over a 15 min period to 20.0 g of tris(trimethylsilyl) phosphite at 40°. Distillation of the residue yielded V. VI was prepared by the dropwise addition of 9.0 g of fresh  $\alpha$ -hydroperfluorisobutyryl chloride over a 3 min period to 10.0 g of tris(triethylsilyl)phosphite at 40°. The reaction mixture became opalescent and the temperature rose to 65°; the system was rapidly and carefully vacuum evaporated to remove  $(C_2H_5)_3SiCl$  and unreacted

- 50 -

USSR

D'YAKOV, V. M. and VCRONKOV, M. G., Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 2, 1973, pp 399-402

$\alpha$ -hydroperfluorisobutyryl chloride. Subsequent fractional distillation yielded VI and 1.1 g of an unidentified fraction (b.p. 90-105° (2 mm)).

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USSR

UDC 669.046.5

GUREVICH, Yu. G., D'YAKONOV, V. M.

"Removal of Titanium Nitrides From Liquid Steel"

Moscow, V sb. "Sovremennyye problemy kachestva stali" (MISiS). (Collection of Works. Modern Problems of Steel Quality)(Moscow Institute of Steel and Alloys) Izd-vo "Metallurgiya," No 61, 1970, pp 51-53

Translation of Abstract: Results are presented of an analysis of separate stages of the process of removing impurities from liquid steel. The floating of titanium nitrides into slag under the effect of convective flows is considered. The results of a study on the kinetics of titanium nitrides solution in slags of various composition are presented. 2 figures, 2 references.

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- 47 -

ДЯКОНОВ V. N.

Power Eng. Inst.  
(Semiconductors)

JPRS 58301  
26 February 1971

STUDY OF VOLT-AMPERE CHARACTERISTICS OF AN OPTICALLY  
CONTROLLED AVALANCHE TRANSISTOR

Article by V. P. Dyakonov, V. A. Tsiganokov, Seolensk Branch of Moscow Power  
Engineering Institute, USSR, 1970, pp 1367-1372

The possibility of effective optical control of the shape of  
S-type volt-ampere characteristics of an avalanche transistor  
is demonstrated. An analysis is presented of the equivalent  
circuit, and the equations for the volt-ampere and light  
triggering characteristics are obtained. Results are presented  
from an experimental study of experimental models of avalanche  
phototransistors.

The utilization of optical and electrical phenomena in a prospective  
area in radiophysics and electronics [1, 2]. Modern light sources, for ex-  
ample, injection lasers and light diodes, have very high speed reaching  $10^{11}$   
nanoseconds. At the same time, a deficiency is perceived in photoreceivers  
with good switching characteristics having the same speed. The existing at-  
tempts, for example, phototransistors and photothyristors [1-3] have  $10^2$ -  
orders lower speed which reduces to no real advantage of many of the fastest  
and logical optoelectronic devices over their ordinary analogs.

Among the switching devices with the S-type volt ampere characteristics,  
avalanche transistors play a special role [4]. Modern avalanche transistors  
which have very high speed (on the order of 0.01-1 nanoseconds) have found  
application in a number of devices [5]. Special types of avalanche transis-  
tors have been developed and are being industrially manufactured abroad and in  
the USSR. However, up to now no effort has been made to utilize avalanche  
transistors in optoelectronic devices.

Accordingly, there is a great deal of interest in the possibility of  
optical control of the shape of the volt-ampere characteristics of an ava-  
lanche transistor which is demonstrated in the present paper. This possibil-  
ity significantly expands the areas of application of avalanche transistors.  
First, the possibility of efficient matching of the light radiators and

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UDC: 681.142.621(047.1)

ALI-ZADE, G. A. and D'YAKONOV, V. P.

"Using Negative-Resistance Devices in Information-Measurement and Pulse Techniques"

Moscow, Izmeritel'naya tekhnika, No 3, 1972, pp 43-46

Abstract: Some new possibilities in the use of devices, principally of the semiconductor type, with negative resistance, are discussed. The use of such devices leads to the structural simplicity of electronic circuits, increases the rapidity of their action, and improves their parameters. The main matter of the article is devoted to analog-digital converters, which are the most important part of information-measurement systems and are least equipped with negative resistance devices. Under this general heading are discussed analog-digital converters with controlled step-voltage oscillators, converters with nonlinearly varying voltage oscillators, integrating converters, complex systems for information-measurement techniques using negative resistance devices and improving stability through their application.

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- 75 -

USSR

UDC: 621.382.3

~~D.YAKONOV, V. P.~~, BOSYY, V. I., KOSTRYUKOV, A. S., and TSIGANKOV,  
V. A.

"Parameters and Characteristics of Special Avalanche Transistors"

Leningrad, Priborostroyeniye, No 6, 1972, pp 5-10

Abstract: The special avalanche transistors discussed in this paper are of the GT338 type, with very high-speed operation, now being mass produced in the Soviet Union. They have already been used in electronic measuring devices such as the stroboscopic oscillographs S1-45 and S1-60, and the block S1-15/8 for use in the oscillograph S1-15. The transistors are germanium diffusion-alloyed mesoepitaxial high-frequency p-n-p-p<sup>+</sup> devices which, in relaxation circuits, form pulses with a rise time of less than 1 ns and an amplitude of up to 15 volts on a 75-ohm load. They can be used in fast pulse and logic circuits, in rapid-operation computers, in nuclear and quantum electronics, in fast optical-electronic circuits, and the like. Specifications as well as details of the construction of these devices are given together with circuit diagrams indicating possible applications. The authors are associated with the Smolensk Branch of the Moscow Power Institute.  
1/1

USSR

UDC: 621.373.5

D'YAKONOV, V. P. and ALI-ZADE, D. G.

"Relaxation Oscillator Using an Avalanche Transistor With Quartz Autosynchronization"

Moscow, Fizyber i Tekhnika Eksperimenta, No. 3, 1971, pp 108-110

Abstract: Since ordinary oscillators suffer from low frequency instability due to variations in supply voltage, temperature, and transistor parameters, the oscillator described in the present article incorporates the feature of autosynchronization. This is supplied by the inclusion of a quartz crystal in the relaxation oscillator circuit. The circuit of the oscillator, as indicated by the schematic given, is quite simple. The amplitude of the pulses at the circuit output is about three volts with a rise time of less than 50  $\mu$ s. At a quartz crystal frequency of 100 kHz and at the fundamental oscillatory frequency, the frequency stability is  $2 \cdot 10^{-7}$  with a change of  $\pm 10\%$  in the supply voltage. The efficiency of the oscillator was checked with crystal frequencies of 50 kHz to 5 MHz. The authors are connected with the Smolensk branch of the Moscow Power Institute.

1/1

USSR

UDC: 621.373

D'YAKONOV, V. P.

"Pulse Oscillator With High Repetition Rate"

Moscow, Pribory i tekhnika eksperimenta, No. 2, 1971, pp 124-127

Abstract: The instrument introduced in this article is distinguished by its ability to produce series of pulses at a repetition rate of up to 150 MHz. Such oscillators are useful in nuclear physics and in computer engineering. The design of the oscillator discussed eliminates the difficulties inherent in pulse oscillators with a repetition rate higher than 20 MHz through the use of relaxation oscillator circuits with emitter-base avalanche transistors. The negative resistance section of the emitter volt-ampere characteristic is used. Schematics of various possible arrangements of this scheme together with oscillograms of the pulse trains they produce are shown and discussed, and a table of several transistor types with specifications for operation in this manner is given. The author, a member of the Smolensk branch of the Moscow Energy Institute, claims for these oscillators the advantages of design simplicity and the ability to operate efficiently in a temperature range of -60 to +60° C.

1/1

- 111 -

USSR

UDC: 621.382.3

ALI-ZADE, D. G. and D'YAKONOV, V. P.

"Analysis of the N-Shaped Voltampere Characteristic of an Avalanche Transistor"

Moscow, Radiotekhnika, Vol 26, No 2, 1971, pp 87-91

Abstract: A little-studied aspect of avalanche transistors is the N-shaped input characteristic in the common emitter circuit, which is interesting since its consideration permits a more thorough analysis of already known circuits, and promotes the development of new design principles using this type of transistor. The necessary condition for obtaining the N-shaped characteristic is that the voltage applied to the collector exceed the transistor breakdown voltage, with the base punctured. Analysis of the volt-ampere characteristics is based on the equivalent circuit of the transistor operating under avalanche conditions; a sketch of the circuit is shown. To check the results of their analysis, the authors performed experiments on transistors of the MP39-MP42B series, among others. A table comparing the theoretical and experimental results shows close agreement between the two. It is asserted that special types of these transistors are just as fast as tunnel diodes, and are consequently very promising.

1/1

- 99 -

USSR

UDC: 621.373.531

D'YAKONOV, V. P., ALI-ZADE, D. G.

"Pulse Circuits Based on Avalanche Transistors"

Uch. zap. Azerb. in-t nefti i khimii (Scientific Notes of the Azerbaydzhan Institute of Petroleum and Chemistry), 1970, ser. 9, No 1, pp 80-82 (from RZh-Radiotekhnika, No 2, Feb 71, Abstract No 2G239)

Translation: The authors discuss relaxation oscillators and sawtooth voltage generators based on avalanche transistors. Attention is called to the specific features of avalanche transistor circuits, their simplicity, short switching time, etc. Bibliography of two titles. H. S.

1/1



USSR

UDC: 621.373.531(088.8)

DIVAKONOV, V. P., Azerbaydzhan Institute of Petroleum and Chemistry imeni  
M. Azizbekov

"A Short-Duration Square Pulse Generator"

USSR Author's Certificate No 262157, filed 25 Dec 67, published 3 Jun 70  
(from RZh-Radiotekhnika, No 11, Nov 70, Abstract No 11G179 P)

Translation: This Author's Certificate introduces a short-duration square pulse generator based on an avalanche diode. To increase the steepness of the leading and trailing edges and cut down the recovery time, a semiconductor diode with charge accumulation is connected to the collector of the transistor through a storage capacitor. The output load is connected to the cathode of this semiconductor diode, and the biasing source is connected to the anode through a decoupling inductor and a resistor.

1/1

- 37 -

Pulse Technique

USSR

UDC 621.373.52

D'YAKONOV, V. P.

"A Pulse Series Shaper"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, No 8, Mar 71, Author's Certificate No 296237, division H, filed 21 May 69, published 12 Feb 71, p 185

Translation: This Author's Certificate introduces a pulse series shaper based on an avalanche transistor. The device contains a relaxation oscillator which consists of a charging resistor and capacitor both connected to the collector of the avalanche transistor. The relaxation oscillator also contains a discharge resistor and a resistor in the base circuit of the transistor. As a distinguishing feature of the patent, provision is made for triggering the shaper by a short pulse, with a linear relationship between the number of pulses in the series and the amplitude of the triggering pulse. Three diodes are connected in series to the emitter of the avalanche transistor. Connected between the diode closest to the emitter and the next diode is a grounding capacitor, while the triggering pulse source is connected between the center diode and the one furthest from the emitter, and a resistor is connected between the emitter of the avalanche transistor and the power supply.

1/1

USSR

UDC 661.2:621.382.3.004.12

D'YAKONOV, V. P., ALI-ZADYE, D. G.

"Cathode-Ray Curve Tracer for Observing the Volt-Ampere Characteristics of Avalanche Transistors"

Voronezh, Izmeritel'naya Tekhnika, No 4, 1971, pp 57-59

Abstract: A detailed study is made of the volt-ampere characteristics of avalanche transistors, and the schematic of a cathode-ray curve tracer for controlling them is described. The possibility of using the tracer not only for qualitative but also for quantitative estimates is demonstrated, and experimental data are presented.

The operation of the tracer, possible causes of error, means of eliminating them and calibration procedures are described. The error in measuring the volt-ampere characteristics was entirely determined by the error in the oscillograph which does not exceed  $\pm 10$  percent on calibrating the amplifiers.

1/1

USSR

UDC 621.396.69:621.316.543(088.8)

D'YAKONOV, V. P.

"An AC Switch"

USSR Author's Certificate No 259960, Filed 30 Jul 68, Published 4 May 70 (from RZh-Radiotekhnika, No 10, Oct 70, Abstract No 10V366 P)

Translation: The proposed AC switch contains a controllable voltage divider connected in parallel with the input and output terminals. As a distinguishing feature of the patent, the device is designed for bistable switching. The voltage divider contains a series circuit consisting of a resistor and an avalanche transistor. Blocking and control voltages are sent to the base of this transistor.

1/1

USSR

UDC 621.396.6

ALI-ZADE, D. G., D'YAKONOV, V. P., Azerbaydzhan Institute of Petroleum and Chemistry, Baku

"Amplitude Pulse Discriminators Based on Avalanche Transistors"

Moscow, Pribory i Tekhnika Eksperimenta, No 2, Mar/Apr 70, pp 108-110

Abstract: The authors describe amplitude pulse discriminators based on avalanche transistors with a minimum discrimination threshold of approximately 20 mV with a threshold overlap factor of several hundred. Methods are described for controlling the discrimination threshold and reducing the discrimination time to 100 nsec. The results of an experimental study of discriminator circuits are given. The discriminators may be used for a pulse duration of the order of a few nsec and higher.

1/1

USSR

D

UDC 621.373.43

D'YAKONOV, V. P., Azerbaijan Institute of Petroleum and Chemistry imeni M. ~~Azizbekov~~

"A Generator of Short Square Pulses"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obratzysy, Tovarnyye Znaki, No 6, 1970, p 32, patent No 262157, filed 25 Dec 67

Abstract: This Author's Certificate introduces a generator of short square pulses based on an avalanche transistor. As a distinguishing feature of the patent, the steepness of the pulse front is increased and recovery time is reduced by connecting a charge-storage diode to the collector of the transistor through a storage capacitor. The output load is connected to the cathode of this diode, and a bias source is connected to the anode through a decoupling inductance and resistor.

1/1

USSR

UDC 533.6.011

D'YAKONOV, YU. N., PECHLINA, D. V. and SANDOMIRSKAYA, I. D.

"On the Calculation of the Supersonic Flow Past Bodies Under Large Angles of Attack"

Moscow, Sb. rabot Vychisl. tsentra Mosk. un-ta (Collection of Works of the Computer Center of Moscow University) No 19, 1972, pp 64-70 (from Referativnyy Zhurnal -- Mekhanika, No 4, 1973, Abstract No 4B295 by G. L. Stenichikov)

Translation: A method for calculating the flow past long, blunt bodies under a large angle of attack is described: the method is used when peculiarities of the type of shock wave, flow separation, etc., arise in the shadow region of the current. Outside the separation zone the flow is calculated with the aid of the ideal gas model, which, as is well known, in this case describes the process well. The distribution of pressure in the separation zone is given on the basis of experimental data and the results of calculations obtained for the region of smooth flow. For the calculation of three-dimensional steady flow in the supersonic region the grid method is used. The boundaries of the separation zone are considered flat and previously set. It is assumed that the gas flow in the separation region does not show influence on the purely gas-dynamic region, that is, no additional conditions are placed on the zone boundary.

1/2

USSR

D'YAKONOV, YU. II., et al., Sb. rabot Vychisl. tsentra Mosk. un-ta, No 19, 1972, pp 64-70

However it is indicated that such a formulation in the case when the component of peripheral velocity normal to the separation surface is less than the local speed of sound, but comparable to it in value, is also incorrect but gives results close to reality.

Results of the calculation of a flow past a blunt cone under various angles of attack are presented. The use of the scheme practically removes the substantial limits which existed earlier on the length of the body calculated. The scheme is easily generalized to the case when the boundary of the zone of separation is given or is in the form of a function determined by the results of experimental investigations or found with the aid of gas-dynamic parameters obtained in the process of solving the problem.

2/2

- 19 -



USSR

UDC: 621.43.011:533+621.5:533

D'YAKONOV, Yu. N., USKOV, v. I.

"Calculation of Supersonic Jets of Ideal Gas by the Net-Point Method"

Nauch. tr. In-t mekh. Mosk. un-ta (Scientific Works of the Institute of Mechanics, Moscow University), 1970, No 5, pp 73-87 (from RZh-Mekhanika, No 7, Jul 71, Abstract No 7B404)

Translation: The procedure and results are presented for calculation of supersonic jets of ideal gas by the net-point method over a wide range of variation in parameters:  $M_\infty = 0-10$ ; pressure drop at the nozzle tip  $n = p_a/p_\infty = 10^3-10^7$ ;  $M_a = 3-5$ ; the angle between the generatrix and the axis of symmetry  $\phi_a = 0-20^\circ$ ; ratio of specific heats of the inner  $\kappa_a = 1.3-1.5$  and outer flows  $\kappa_\infty = 1.4$ . In calculating escape of a jet into a submerged space, no consideration was given to development of a central shock, and flow beyond the triple point was not considered. In calculating a jet with regard to the wake, the contact surface passing through the triple point was replaced by a line parallel to the axis of symmetry, and impermeability to flow was taken as the boundary condition on this line.

1/2

D'YAKONOV, Yu. N., USKOV, V. I., Nauch. tr. In-t mekh. Mosk. un-t, 1970, No 5, pp 73-87

A difference equation was used in the calculations, and the sweep method was applied in the bidirectional modification. The peculiarities of application of the method to the problem of jets are considered. The results of calculation of leakage of a jet into a submerged space are presented. The velocity and pressure fields are given for predetermined ranges of variation of parameters. The results of calculation of the interaction between a jet and an external flow are outlined. It is shown how the Mach number  $M_\infty$  and the pressure drop affect the shape of the jet boundary, the head, trailing and reflected shock wave. Consideration is given to the case of calculation of a jet boundary when the angle of inclination of the jet at large differentials may become greater than the limiting angle, and the usual computational scheme is not realized. The results of calculation of a detached flow are presented. Yu. F. Dityakin.

2/2

- 29 -

ACC NR: AT9012706

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AUTHOR: Ashratov, E. A.; Bondarev, Ye. N.; Volkonskaya, T. G.; D'yakonov, Yu. N.;  
Uskov, V. I.

ORG: none

TITLE: Investigation of supersonic gas jets

SOURCE: Vsesoyuznyy s"yezd po teoreticheskoy i prikladnoy mekhanike, 3d. Moscow, 1968. Annotatsii dokladov, 27-28

TOPIC TAGS: gas jet, supersonic flow

ABSTRACT: The discharge of a nonviscous ideal gas from an axisymmetric supersonic nozzle into a stationary environment as well as into concurrent flow is considered. Different methods (the method of characteristics and the method of networks) were used for solving the problem which made it possible to conduct the calculations in a wide range of change of the unratated discharge output of  $P=0.5$  to  $10^7$  and obtain a detailed concept on the flow structure and the distribution of gas parameters. [Partial translation of abstract].

[AD]

SUB CODE: 01/ SUBM DATE: none

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Circuit Theory

USSR

UDC 621.374.32:621.382

D. YAKONOV, V. P. [Member, Scientific-Technical Society of Radio Engineering, Electronics, and Communications imeni A.S. Popov]

"Analysis of Stability and Regime of Impulse Circuit Based on Avalanche Transistor"

Radiotekhnika, Vol 27, No 6, June 1972, pp 37-44

Abstract: The theory is discussed of the stability of an impulse circuit based on an avalanche transistor, which is shown in the paper. Consideration is given to the voltampere characteristics (VAC) of an avalanche transistor, low-signal equivalent circuits, and an analysis of the stability of working points. An analysis of the stability makes it possible to conclude that the regimes of the circuit considered are analogous in many respects to the regimes of impulse units based on other devices with a S-shaped VAC. However, regimes exist with a stable condition of the working point of the initial condition at a section of the VAC with negative differential resistance, which makes it possible to create a number of new impulse circuits based on avalanche transistors. 6 fig 11 ref. Received by editors, 12 October 1970; after further improvement, 22 October 1971.

1/1