AA0040690

on an electric motor, which puts the shutter 8 of the outlet of the measuring channel in its maximum closed position. Correspondingly there is a drop in pressure in the nozzle and the gauge pointer connected to the driving shaft shows the maximum separation of the surface level from the recorder.

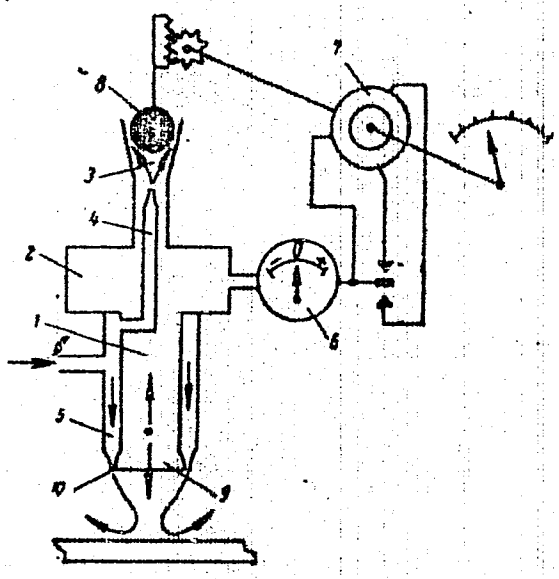
8.1.68 as 1209675/18-10.E.V.LEBEDEV & M.E.PARYLIS. PRODUCTION & TECHNICAL COMBINE "URALENERGOTSVETMET" (29.8.69) Bul 14/18.4.69. Class 42e. Int.Cl.C 01f.

AUTHORS: Lebedev, Ye. V.; and Parylis, M. E.

Proizvodstvenno - Tekhnicheskoye Ob" edineniye "Ural-energotsvetmet"

19750306

AA0040690



3/3

19750307

LO

PASECHNIK, F. I.

III-7. CONDITIONS OF GROWTH OF MONOCRYSTALLINE FILMS OF INDIUM ANTIMONIDE ON DIELECTRIC SUBSTRATES

[Article by V. A. Kas'yan, F. I. Pasechnik, Kishinev; Novosibirsk, III Simpozium po Protsessam Rosta i Sinteza Poluprovodnikovykh Kristallov i Plenok, Russian, 12-17 June 1972, p 166]

According to the published data, the method of thermal recrystallization permits us to obtain films only of a dendritic structure. This method consists in creating a protective layer on the surface of a polycrystalline film, melting it with subsequent recrystallization from the melt.

We have performed a detailed study of the factors affecting the structure and property of the recrystallized films. It is demonstrated that such factors are as follows: 1) the substrate temperature for which the initial polycrystalline film was obtained; 2) the temperature and oxidation time of the film surface for creation of the protective layer; 3) the displacement rate of the liquid phase front; 4) crystallization rates. Metalographic, x-ray structural and electron diffraction studies were made of the films. It was found that depending on the recrystallization conditions it is possible to obtain the films of three types: a) films with dendritic structure; b) monocrystalline films having microprojections and packing defects on the surface; c) monocrystalline films with a smooth surface.

Monocrystalline InSb films were obtained on substrates of mica, quartz and sapphire. The film thickness was from 1 to 6 microns, and the film area reached 30 x 50 mm^2. Their electrical parameters were close to the parameters of massive crystals. Thus, the n-type films with $n = 2 \cdot 10^{16}$ cm^{-3} had a Hall mobility of 63,000 cm^2/vsec at room temperature. The p-type films (alloyed with germanium) with $P = 2 \cdot 10^{16}$ cm^{-3} had a Hall mobility of the acceptors of 4,500 cm^2/v sec at 77° K.

USSR

UDC 621.382:538.652

KAS'YAN, V.A., PASECHNIK, F.I.

"Highly-Sensitive Hall EMF Generators From Monocrystalline InSb Films"

Tr. po fiz. poluprovodnikov. Kishinev. un-t (Works On Semiconductor Physics. Kishinev University), 1971, Issue 3, pp 95-102 (from RZh:Elektrnika i yeye primeneniye, No 7, July 1972, Abstract No 7B366)

Translation: The paper studies the electrical and galvanomagnetic properties of n-type InSb monocrystalline films suitable for creation of Hall emf transducers. Highly-sensitive Hall emf transducers were prepared and their characteristics studied. It is shown that the Hall emf transducers prepared from monocrystalline films of indium antimonide possess a voltage sensitivity of 500 ÷ 700 mkV/oersted and the temperature coefficient of voltage sensitivity is 0.05 percent/degree in the temperature range -50 ÷ 50° C. In a pulse regime of power supply the transducer sensitivity increases to (10 ÷ 13) . 10^3 mkV/oersted. 6 ill. 1 tab. 3 ref. Summary.

1/1

USSR

PASECHNIK, I. I.

"Distribution of Probabilities in Transient Operating Mode of a Queueing System with a Queue of Finite Length"

Sb. Nauch. Tr. Kafedry Vyssh. Mat. Tul'sk. Politekhn. In-t [Collected Scientific Works of the Department of Higher Mathematics, Tula Polytechnical Institute], 1972, No 1, pp 117-129 (Translated from Referativnyy Zhurnal Kibernetika, No 9, 1973, Abstract No 9V31)

Translation: A particular problem from queueing theory is studied, when a finite number of requests may be located in the system. The probabilities of states of the system satisfy a system of linear differential equations with constant coefficients, depending on two parameters of the queueing system. The characteristic polynomial is expressed by means of a linear transform through a special polynomial, the roots of which are independent of the parameters characterizing the queueing system. Finally, a reverse transform is used to find the roots of the characteristic polynomial through which the probabilities of states in the transient process of operation of the queueing system are then expressed. Author's view

UNCLASSIFIED PROCESSING DATE--17JUL70

TITLE--THE EFFECT OF VITAMIN B SUB 6 (PYRIDOXIN) ON THE CONTENT OF GLYCOGEN IN THE LIVER IN ACUTE EXPERIMENTAL HEPATITIS -U-

AUTHOR--PASECHNIK, I.KH.

COUNTRY OF INFO--USSR

SOURCE--PATOLOGICHESKAYA FIZIOLOGIYA I EKSPERIMENTAL'NAYA TERAPIYA, 1970, VOL 14, NR 1, PP 81-82

DATE PUBLISHED--------70

21-5-26

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--HEPATITIS, GLYCOGEN, LIVER, VITAMIN B6

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1982/0613 STEP NO--UR/0396/70/014/001/0081/0082

CIRC ACCESSION NO--AP0052075

UNCLASSIFIED

Acc. Nr: AP0052075 Ref. Code: UR0396

PRIMARY SOURCE: Patologicheskaya Fiziologiya i Eksperimental'naya Terapiya, 1970, Vol 14, Nr 1, pp 81-82

THE EFFECT OF VITAMIN B_6 (PYRIDOXIN) ON THE CONTENT OF GLYCOGEN IN THE LIVER IN ACUTE EXPERIMENTAL HEPATITIS

I. Kh. Pasechnik

In experiments on 130 rats it was established that single administration of pyridoxin in a dose of 3 mg per 100 gm of body weight had no effect on the glycogen level in the liver of healthy rats. Daily administration of pyridoxin in the same dose for a long time (up to 20 days) favoured restoration of glycogen content in the liver of rats with acute hepatitis caused by CCl_4 administration.

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REEL/FRAME
19820613

APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002202330005-4"

1/2 015 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--CHARACTERISTICS OF SEISMIC WAVES IN NUCLEAR EXPLOSIONS AND EARTHQUAKES -U-

AUTHOR--PASECHNIK, I.P.

COUNTRY OF INFO--USSR

SOURCE--KHARAKTERISTIKI SEYSMICHESKIKH VOLN PRI YADERNYKH VZRYVAKH I ZEMLETRYASENIYAKH) MOSCOW, NAUKA, 1970 190 PP

DATE PUBLISHED--------70

SUBJECT AREAS--EARTH SCIENCES AND OCEANOGRAPHY, NUCLEAR SCIENCE AND TECHNOLOGY

TOPIC TAGS--SEISMIC WAVE, EARTHQUAKE, NUCLEAR EXPLOSION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3003/0076 STEP NO--UR/0000/70/000/000/0001/0190

CIRC ACCESSION NO--AM0129345

UNCLASSIFIED

2/2 015 UNCLASSIFIED PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AM0129345

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. TABLE OF CONTENTS: INTRODUCTION 3. CHAPTER I SEISMIC EQUIPMENT USED IN REGISTERING SEISMIC WAVES FROM EXPLOSIONS 7. II THE USE OF FREQUENCY ANALYSIS OF SEISMIC VIBRATIONS FOR THE STUDY OF THE DYNAMIC CHARACTERISTICS OF SEISMIC WAVES 23. III METHODS TO INCREASE THE EFFECTIVE SENSITIVITY OF SEISMIC EQUIPMENT USED IN REGISTERING NUCLEAR EXPLOSIONS 47. IV KINETIC AND DYNAMIC CHARACTERISTICS OF VOLUME WAVES REGISTERED IN THE I ZONE 69. V CHARACTERISTICS OF THE VOLUME WAVES REGISTERED IN THE II, III, IV ZONES 96. VI CHARACTERISTICS OF SURFACE WAVES EXCITED BY EXPLOSIONS OF VARIOUS TYPES 135. VII THE ENERGY OF SEISMIC WAVES AT VARIOUS TYPES OF EXPLOSIONS 173. LITERATURE 178. EXAMINED ARE THE KINETIC AND DYNAMIC CHARACTERISTICS OF VOLUME AND SRUFACE SEISMIC WAVES EXCITED BY NUCLEAR EXPLOSIONS IN VARIOUS MEDIA. INVESTIGATED IS THE LEVEL AND SPECTRAL COMPOSITONS OF MICROSEISMS IN VARIOUS SEISMOGEOLOGICAL REGIONS; DISCUSSES IS ALSO THE QUESTION CONCERNING THE CHOICE OF OPTIMUM PARAMETERS OF SEISMIC EWUIPMENT. SHOWN ARE POSSIBILITIES OF USING THE DATA OBTAINED AT EXPLOSIONS FOR THE STUDY OF THE INTERNAL STRUCTURE OF THE EARTH.

UNCLASSIFIED

1/3 . 017 UNCLASSIFIED PROCESSING DATE--090CT70
TITLE--MAGNITUDE METHOD FOR IDENTIFYING UNDERGROUND NUCLEAR BURSTS,
MAGNITUDE METHOD FOR IDENTIFYING UNDERGROUND NUCLEAR EXPLOSIONS -U-
AUTHOR-(04)-PASECHNIK, I.P., DASHKOV, G.G., POLIKARPOVA, L.A.,
GAMBURTSEVA, N.G.
COUNTRY OF INFO--USSR

SOURCE--INSTITUTE OF PHYSICS OF THE EARTH: MOSCOW, IZVESTIYA AKADEMII NAUK SSSR, FIZIKA ZEMLI, NO. 1, 1970, PP. 28-36
DATE PUBLISHED--------70

SUBJECT AREAS--EARTH SCIENCES AND OCEANOGRAPHY, ORDNANCE

TOPIC TAGS--NUCLEAR WEAPON TEST, UNDERGROUND EXPLOSION, SEISMIC WAVE PROPAGATION, SEISMIC PULSE, EARTHQUAKE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1977/0496 STEP NO--UR/0387/70/000/001/0028/0036

CIRC ACCESSION NO--AP0044043
UNCLASSIFIED

2/3 017 UNCLASSIFIED PROCESSING DATE--09OCT70

CIRC ACCESSION NO--AP0044043

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AT PRESENT SEISMOLOGISTS KNOW THAT FOR EXPLOSIONS AND EARTHQUAKES THERE IS A DIFFERENT NATURE OF THE EXPERIMENTAL RELATIONSHIPS BETWEEN MAGNITUDES M SUBS, DETERMINED FROM RAYLEIGH SURFACE WAVES, AND THE MAGNITUDES M SUBB DETERMINED FROM BODY WAVES, PRIMARILY LONGITUDINAL P WAVES. FOR SUB SURFACE EXPLOSIONS THE MEAN M SUBS VALUES ARE 1.5-0.5 UNITS LESS THAN FOR EARTHQUAKES WITH EQUAL MAGNITUDES M SUBB. THIS MAGNITUDE CRITERION CAN BE SUCCESSFULLY USED IN DIFFERENTIATING THE RECORDS OF UNDERGROUND EXPLOSIONS AMONG THE NUMEROUS RECORDS OF EARTHQUAKES REGISTERED AT TELESEISMIC DISTANCES IN THE RANGE FROM 30 TO 90DEGREES (FROM 3,500 TO 10,000 KM). LEADING SEISMOLOGISTS IN THE WESTERN COUNTRIES FEEL THAT IT IS POSSIBLE TO CHECK ON THE OCCURRENCE OF UNDERGROUND NUCLEAR EXPLOSIONS WITHOUT FIELD INSPECTIONS. HOWEVER, THERE IS STILL NO AGREEMENT AMONG SEISMOLOGISTS AS TO THE MINIMUM THRESHOLD MAGNITUDE M SUBS BEGINNING WITH WHICH UNDERGROUND NUCLEAR EXPLOSIONS CAN BE IDENTIFIED. SOME AMERICAN SEISMOLOGISTS FEEL THAT THE MINIMUM M SUBS AT WHICH SUCH EXPLOSIONS CAN BE DETECTED (FOR PERIODS T EQUALS 20 SEC, MAGNIFICATION OF ABOUT 3,000) IS THE MAGNITUDE OF EXPLOSIONS WITH A POWER OF 20-60 KILOTONS IN SOLID ROCK OF THE GRANITE TYPE (M SUBS GREATER THAN OR EQUAL TO 4). SOME AMERICAN, BRITISH AND CANADIAN SEISMOLOGISTS ACCEPT A LESSER POWER (M SUBS EQUALS 3 OR EVEN M SUBS EQUALS 2).

UNCLASSIFIED

3/3 017 UNCLASSIFIED

CIRC ACCESSION NO--AP0044043 PROCESSING DATE--09OCT70

ABSTRACT/EXTRACT--HOWEVER, IN THE UNITED STATES, SWEDEN AND ELSEWHERE THE MAGNIFICATION OF LONG PERIOD SEISMOGRAPHS FOR PERIODS T EQUALS 20 SEC HAS BEEN INCREASED TO 100,000 AND THEY HAVE BEEN PLACED IN UNDERGROUND CHAMBERS AND EMPLOY FILTERS IN THE REGION OF PERIODS 3-10 SECONDS. THIS INDICATES THAT A THRESHOLD VALUE M SUBS EQUALS 2 FOR THE REGISTRY OF SURFACE WAVES AT TELESEISMIC DISTANCES IS ALREADY ENTIRELY FEASIBLE. A VALUE M SUBS EQUALS 2 IS OBSERVED FOR UNDERGROUND EXPLOSIONS WITH A POWER OF SEVERAL KILOTONS IN SOLID ROCK. THIS PAPER GIVES DATA ON THE RELATIONSHIP BETWEEN M SUBS AND M SUBB FOR UNDERGROUND NUCLEAR BURSTS AS DETERMINED AT SEISMIC STATIONS IN THE USSR. THE AUTHORS COMPARE THESE RELATIONSHIPS WITH THOSE FOR EARTHQUAKES AND ANALYZE THE POSSIBILITY OF IDENTIFYING UNDERGROUND NUCLEAR BURSTS ON THE BASIS OF THE MAGNITUDE CRITERION. COMPARISON OF EXPRESSIONS OF THE FORM M EQUALS M(MP) FOR EXPLOSIONS AND EARTHQUAKES OBTAINED FROM SOVIET SEISMIC DATA REVEALED THAT FOR BURSTS WITH MP FROM 4.2 TO 6.0 THE M VALUES ARE 1.5-0.5 UNIT(S) OF MAGNITUDE LOWER ON THE M EQUALS M(MP) GRAPHS THAN FOR EARTHQUAKES. THUS, UNDERGROUND NUCLEAR BURSTS CAN BE DETECTED FROM SEISMIC RECORDS WITHOUT ON THE SPOT INSPECTION. FACILITY: INSTITUTE OF PHYSICS OF THE EARTH.

UNCLASSIFIED

1/2 017 UNCLASSIFIED PROCESSING DATE--11SEP70

TITLE--SEISMIC WAVE DETECTION -U-

AUTHOR--PASECHNIK, I.P.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW SOVIET RUSSIA 12 MAR 70 P 4 1

DATE PUBLISHED--12MAR70

SUBJECT AREAS--EARTH SCIENCES AND OCEANOGRAPHY, NUCLEAR SCIENCE AND TECHNOLOGY

TOPIC TAGS--SEISMIC WAVE, EARTHQUAKE, NUCLEAR EXPLOSION, AUTOMATIC CONTROL SYSTEM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1987/1843 STEP NO--UR/9022/70/000/000/0004/0004

CIRC ACCESSION NO--AN0104960

UNCLASSIFIED

2/2 017 UNCLASSIFIED PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AN0104960

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. IN IT THE AUTHOR POINTS OUT THASOVIET SCIENTISTS HAVE PROPOSED AND DEVELOPED A WHOLE NUMBER OF IDEAS THAT HAVE SPURRED RESEARCH INTO THE FIELD OF FORMULATING THE SEISMIC METHOD OF DETECTING NUCLEAR EXPLOSIONS AND DETERMINING THEIR NATURE. USING AN AUTOMATED CONTROL SYSTEM, THE SEISMIC METHOD MAKES IT POSSIBLE TO ESTABLISH THE FACT OF A NUCLEAR EXPLOSION WITHIN 20 TO 30 MINUTES, AND CAN BE EMPLOYED FOR BOTH SHORT AND LONG DISTANCES.

UNCLASSIFIED

USSR

UDC: 621.373:530.145.6

KOZAK, O. V., PASECHNIK, L. L.

"Investigation of an Intense Quasistationary Discharge Plasma in a Magnetic Field"

V sb. Vopr. fiz. nizkotemperaturn. plazmy (Problems of Low-Temperature Plasma Physics--collection of works), Minsk, "Nauka i tekhn.", 1970, pp 206-209 (from RZh-Radiotekhnika, No 1, Jan 71, Abstract No 1D186)

Translation: The paper is a report on the results of an experimental study of a dense plasma with charge concentration of 10^{12}-10^{15} cc^{-1} created by an intense quasistationary cold-cathode discharge in a magnetic field with a strength of up to 5,000 oersteds. A study was made of the radial distribution of plasma density N_e and electron temperature T_e under various experimental conditions. The diffusion coefficient is found as a function of the magnetic field by comparing experimental and theoretical relationships for $N = N(r)$. Two illustrations, bibliography of six titles. Resumé.

1/1

USSR

PASECHNIK, L. L.; POPOVICH, A. S. (Physics Institute of the Ukrainian Academy of Sciences, Kiev)

"Study of the Effect of the Instability of a Type of Longitudinal Ambipolar Sound on the Time of Motion of Particles of a Plasma across a Magnetic Field"

Leningrad, Zhurnal Tekhnicheskoy Fiziki; July, 1971; pp 1382-5

ABSTRACT: The article describes the first attempt to use a phase method, developed earlier for the study of the motion of ions in a natural gas, for the study of the transfer of charged particles of a plasma across a magnetic field. It is shown that the instability, identified earlier by the authors as a modification of longitudinal ambipolar sound, leads to a substantial decrease in the time of transfer of particles to the wall. At the same time, the "lifetime" of electrons as well as ions appears to be on the order of the period of the oscillations caused by the indicated instability and agree with the theoretical evaluations obtained from dimensional considerations.

The article includes three figures. There are 10 references.

1/1

1/2 022 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--LUBRICANT -U-

AUTHOR-(05)-PASEHCNIK, M.S., KAMINSKIY, N.A., OSEYKO, N.I., CHAMIN, I.A., PETROVSKIY, A.A.

COUNTRY OF INFO--USSR

SOURCE--U.S.S.R. 266,987

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

DATE PUBLISHED--01APR70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--CHEMICAL PATENT, SURFACTANT, METALWORKING LUBRICANT, COLD WORKING, HOT WORKING, VEGETABLE OIL, ESTER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3003/1805 STEP NO--UR/0482/70/000/000/0000/0000

CIRC ACCESSION NO--AA0130638

UNCLASSIFIED

2/2 022 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AA0130638

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A LUBRICANT FOR COLD AND HOT METAL WORKING WAS PREPD. FROM CORIANDER FATTY OIL BY HEAT TREATMENT AT 150-330DEGREES AND 5-500 MM AND MIXING WITH MINERAL OR VEGETABLE OIL OR WITH A SURFACTANT, SUCH AS A SYNTHETIC ESTER.

UNCLASSIFIED

USSR

VERTEBNYY, V. P.; KAL'CHENKO, A. I.; PASECHNIK, M. V. (Institute of Nuclear Research, Ukrainian Academy of Sciences)

"Level Density of Compound Nuclei in the Region A = 130-200 and Other Nuclear Properties"

Moscow, Yadernaya Fizika; July, 1972; pp 38-41

ABSTRACT: Recently at the WR-M reactor of the Institute of Nuclear Research of the Ukrainian Academy of Sciences some data on neutron resonance for a considerable number of nuclei over the range of mass numbers A = 130-192 were obtained by the time-of-flight method. These data were used to calculate the level density of compound nuclei close to the excitation energy equal to the binding energy. This paper presents data on the dependence of the mean distance between levels for a fixed excitation energy as a function of the number of neutrons in a nucleus.

1/1

USSR

PASECHNIK, M. V.; et al (Institute of Nuclear Research of the Ukrainian Academy of Sciences, Kiev)

"Neutron Resonances of Isotopes Ce^{136} and Ce^{142}"

Kiev, Ukrainskiy Fizicheskiy Zhurnal; December, 1970; pp 2050-3

ABSTRACT: The transmission of samples of natural cerium and its isotopes Ce^{136}, Ce^{138}, Ce^{140}, and Ce^{142} with a maximum resolution of 50 nsec/m in the energy range of 0.01-5000 ev was measured on the VVR-M reactor of the Institute of Physics of the Ukrainian Academy of Sciences. The following resonances were discovered in the region measured: for Ce^{136} -- 66.3, 135.7, 181, 187, 232, 274, 533, 633, 876; for Ce^{142} -- 1290 and 4380. Several bases exist for assuming that in the case of Ce^{142} there also exist levels with energies of 1640 and 2740 ev. With the results obtained it is possible to determine the dis-

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USSR

PASECHNIK, M. V., et al, Ukrainskiy Fizicheskiy Zhurnal; December, 1970; pp 2050-3

tance between the levels (Ce^{136} -- 58 ev, Ce^{138} -- 200 ev, Ce^{142} -- 1000 ev), to calculate one of the basic parameters of the leval density and to compare it with theoretically predicted values for this quantity.

The measurements were carried out by the method of the time of flight, the advantage of which in the given case is being able to operate with a small sample. This is especially important in the study of isotopes of low propagation. Thus, a natural mixture contains 0.19% Ce^{136} and 0.26% Ce^{138}. With the data obtained it was possible to determine the dependence of the level density of cerium on the particular isotope.

2/2

USSR

PASECHNIK, M. V., KORZH, I. A., KASHUBA, I. Ye., MISHCHENKO, V. A., PRAVDIVYY, N. M., and SANZHUR, I. Ye., Institute of Physics of the Academy of Sciences Ukrainian SSR

"Study of the Elastic Scattering of Neutrons in the 0.3-4.1 Mev Energy Region by Ti and Cr Nuclei Using the Optical Model of the Nucleus"

Moscow, Yadernaya Fizika, Vol 11, No 5, May 70, pp 958-966

Abstract: The angular distributions of neutrons elastically scattered by Ti and Cr nuclei were measured over the angles 20-145° for neutron energies 2, 2.5, and 3 Mev, and data are given on the polarizing capacity of these nuclei for neutron energies of 1.5 and 2.0 Mev. The data are compared with the angular distributions of elastically scattered neutrons and with polarization occurring under elastic scattering as calculated on the basis of the six-parameter optical model of the nucleus. The purpose of this comparison was to make a systematic study of the variation with energy of the parameters of the optical potential, which function describes the interaction between the neutron and the nucleus. The values of the optimal parameters V_c and W_c were obtained by a least-squares fitting of data on the angular distributions of elastically scattered neutrons.
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USSR

PASECHNIK, M. V., et al, Yadernaya Fizika, Vol 11, No 5, May 70, pp 958-966

A comparison of calculated and experimental total cross sections showed satisfactory agreement between the two. The values of the optimal parameters of the optical model were calculated by a three-parameter analysis; the forms of the angular distributions calculated by the three-parameter variation method did not greatly differ from the angular distributions calculated with a two-parameter variation. This is said to indicate that the parameters of the optical potential most sensitive to the magnitude and form of the angular distributions are the values of the real and imaginary parts of the central potential.

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1/2 011 UNCLASSIFIED PROCESSING DATE--02OCT70

TITLE--APPARATUS FOR PURIFYING STEAM GAS DISCHARGES -U-

AUTHOR-(05)-MAKSIMOV, V.F., TORF, A.I., ISYANOV, L.M., PASECHNIK, S.P., LESOKHIN, V.B.

COUNTRY OF INFO--USSR

SOURCE--BUM. PROM. 1970, (2) 20-1

DATE PUBLISHED--------70

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

TOPIC TAGS--SULFUR, INDUSTRIAL FURNACE, AIR POLLUTION CONTROL, AIR PURIFICATION EQUIPMENT, STEAM BOILER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1989/1372 STEP NO--UR/0329/70/000/002/0020/0021

CIRC ACCESSION NO--AP0107845

UNCLASSIFIED

2/2 011 UNCLASSIFIED PROCESSING DATE--020CT70

CIRC ACCESSION NO--AP0107345

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. WHEN THE SMELT FROM A SODA RECOVERY FURNACE IS DISSOLVED (IN WEAK WHITE LIQUOR), A CONSIDERABLE AMT. OF A MIXT. OF STEAM AND GAS IS EVOLVED. THE MIXT. IS DISCHARGED INTO THE ATM. THROUGH AN EXHAUST PIPE AND CONTAINS SOLID PARTICLES ENTRAINED BY THE FLOW, WHICH CAUSE POLLUTION. THE APP. DESCRIBED WAS DESIGNED TO PURIFY THE MIXT. FROM THE ENTRAINED PARTICLES AND ALSO FROM GASEOUS S COMPONENTS. FROM THE TANK CONTG. THE SOLN., THE STEAM GAS MIXT. GOES TO A SCRUBBER CONSISTING OF A MIXING TUBE AND A GRAVITY CONDENSATE TRAP. THE WEAK WHITE LIQUOR FROM THE CAUSTICIZATION ROOM IS PUMPED, AT 1.5-2 BARS, INTO THE LOWER CONE OF THE CONDENSATE TRAP, WHERE THE LIQUOR USED FOR SPRAYING THE MIXING TUBE ALSO COLLECTS. THE LIQUOR FED IS CONTROLLED BY VALVES, AND A DEFINITE VOL. OF WEAK WHITE LIQUOR CIRCULATES CONTINUOUSLY THROUGH THE APP. THE APP. REMOVES 95PERCENT OF THE SOLID PARTICLES, AND NEARLY 100PERCENT OF THE S COMPDS.

UNCLASSIFIED

USSR UDC 661.183

PASECHNIK, V. A., MOSKVICHEV, B. V., and SAMSONOV, G. V.

"Selectivity of the Ion Exchange Processes in Case of Partial Inaccessibility of the Sorption Centers"

Leningrad, Zhurnal Prikladnoy Khimii, Vol 46, No 8, Aug 73, pp 1758-1763

Abstract: Many important ion exchange processes occur under conditions in which some of the sorption centers are inaccessible, so that the sorption exhibits strong non-ideal characteristics. The authors propose a method for calculating thermodynamic functions of similar processes of ion exchange: standard enthalpy and entropy as well as the coefficients of the activity of the components. A theoretical mathematical treatment of the formulae is given with implicit consideration of the effect of inaccessible centers on selectivity.

1/1

USSR P UDC 541.11

PASECHNIK, V. A., SAMSONOV, G. V., and YEL'KIN, G. E., Institute of High Molecular Compounds, Leningrad, Academy of Sciences USSR

"Thermodynamic Study of Ion-Exchange Equilibrium With Consideration for Solvation in the Ion-Exchange Resin"

Moscow, Zhurnal Fizicheskoy Khimii, Vol 44, No 4, Apr 70, pp 1065-1070

Abstract: A thermodynamic equation has been derived to correlate the constant of ion-exchange equilibrium and the difference of free swelling energy of ion-exchange resins in monoionic forms. The method proposed for analyzing the relation between the selectivity and swelling capacity of ionites is based on a new selection of standard states provided by dehydrated monoionic forms of ion-exchange resins. Use is made of a hypothetical model the admissibility of which for describing real systems may be questionable. The method fails to consider the totality of solvation effects in the exchange resin.

1/1

USSR UDC: 621.317.335.3

PASECHNIK, V. F., KUKUSH, V. D.

"Measuring the Complex Dielectric Constant by Using Parameters of the Polarization Ellipse of a Reflected Signal"

Radiotekhnika. Resp. mezhved. nauchn.-tekhn. sb. (Radio Engineering. Republic Interdepartmental Scientific and Technical Collection), 1970, vyp. 13, pp 183-190 (from RZh-Radiotekhnika, No 5, May 71, Abstract No 5A238)

Translation: Theoretical relationships and computational formulas are presented for finding the complex dielectric constant. An installation for making the measurements is described as well as the measurement procedure. It is shown that the maximum relative error of the method is no more than 3.4 percent. Nomograms are given for facilitating computation of the dielectric constant from the measured quantities. Four illustrations, bibliography of eleven titles. Resumé.

1/1

USSR UDC: 621.317.335.3

PASECHNIK, V. F., DUDUSH, V. D.

"Polarization Methods of Measuring the Electromagnetic Parameters of Substances in the Millimeter Wave Band"

Dokl. Vses. nauchno-tekhn. konferentsii po radiotekhn. izmereniyam. T. 1 (Reports of the All-Union Scientific and Technical Conference on Radio Engineering Measurements. Vol. 1), Novosibirsk, 1970, pp 144-145 (from RZh-Radiotekhnika, No 1, Jan 71, Abstract No 1A369)

Translation: The authors discuss a method of measuring the complex permittivity of materials in the millimeter wave band. The procedure is based on measuring the parameters of the polarization ellipse of a reflected signal. Formulas for determining permittivity are given as well as a block diagram of the measurement installation. E. L.

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USSR

USSR 621.317.335.3

PASECHNIK, V. F., KUKUSH, V. D.

"Measuring the Complex Dielectric Constant in the Millimeter Wave Band"

Radiotekhnika. Resp. mezhved. nauchno-tekhn. sb. (Radio Engineering. Republic Interdepartmental Scientific and Technical Collection), 1970, vyp. 14, pp 114-118 (from RZh-Radiotekhnika, No 4, Apr 71, Abstract No 4A295)

Translation: A brief review of the accuracy of measuring the dielectric constant ε' by various methods is presented. Theoretical relations and the calculation formulas of the method permitting measurement of the complex values of the dielectric constant are presented. A description of the device and the measurement procedure are presented. There are 2 illustrations and a 10-entry bibliography.

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USSR UDC: 621.317.374

PASECHNIK, V. F., KUKUSH, V. D.

"A Method of Measuring Complex Permittivity at Superhigh Frequencies in Free Space"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 29, 1970, Soviet Patent No 281569, Class 21, filed 23 Jun 69, p 61

Abstract: This Author's Certificate introduces a method of measuring complex permittivity on superhigh frequencies in free space. As a distinguishing feature of the patent, measurement precision is improved by exposing the dielectric specimen at an angle of incidence of 45° with a wave polarized at an angle of 45° to the plane of incidence, and determining the ellipticity and angle of inclination of the major axis of the ellipse of the reflective polarization.

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USSR UDC: 621.317.353(088.8)

PASECHNIK, V. F., KUKUSH, V. D.

"A Method of Measuring Complex Permittivity"

USSR Author's Certificate No 266875, filed 18 Nov 68, published 15 Jul 70 (from RZh-Radiotekhnika, No 2, Feb 71, Abstract No 2A357 P)

Translation: This Author's Certificate introduces a method of measuring permittivity in the millimeter wavelength range. The procedure is based on the effect of reflection of an electromagnetic wave from the interface between two media. The authors point out the disadvantages of existing methods of permittivity measurement based on this same principle. In the proposed method, precision is improved by measuring the amplitudes of the orthogonal components of the reflected signal, and determining the real and imaginary components of permittivity from the ratio of these amplitudes and the phase difference. E. L.

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Biophysics

USSR

PASECHNIK, V. I. and SOKOLOV, V. S., Moscow State University

"Change in Permeability of Modified Bimolecular Phospholipid Membranes Following Periodic Expansion"

Moscow, Biofizika, No 4, 1973, pp 655-660

Abstract: Changes in the impedance of modified bimolecular ox brain phospholipid membranes were studied after periodic alteration of the area of the membranes by application of 10^{-3} M dibarenyl mercury solution in ethyl alcohol. A fairly rapid change in the surface of the modified biomolecular phospholipid membranes caused them to expand and become more permeable. Variations in permeability were found to depend both on the properties of the membranes and on the voltage applied to them. The observed phenomenon is suggested as a model of primary acts of mechanoreception.

1/2 030 UNCLASSIFIED PROCESSING DATE--11SEP70

TITLE--IMPURITY PHOTOCONDUCTIVITY OF A GERMANIUM SURFACE DOPED WITH METALS -U-

AUTHOR--PASECHNIK, YU.A., SNITKO, O.V.

COUNTRY OF INFO--USSR

SOURCE--UKR. FIZ. ZH. (RUSS. ED.) 1970, 15(1), 70-6

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--GERMANIUM SEMICONDUCTOR, IR PHOTOCONDUCTOR, PHOTOCONDUCTIVITY, SEMICONDUCTOR IMPURITY, GOLD, COPPER, ZINC, CRYSTAL SURFACE, SEMICONDUCTOR BAND STRUCTURE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1989/1344 STEP NO--UR/0185/70/015/001/0070/0076

CIRC ACCESSION NO--AP0107817

UNCLASSIFIED

2/2 030 UNCLASSIFIED PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0107817

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE IMPURITY IR PHOTOCOND. (SIGMA SUBPH) OF N AND RHO,GE SURFACE DOPED WITH AU, CU, AND ZN FROM CP. SOLN. WAS STUDIED AT 80DEGREES K. THE SPECTRAL DISTRIBUTION OF SIGMA SUBPH, SIGMA SUBPH VS. LIGHT INTENSITY, AND SIGMA SUBPO VS. TIME CURVES WERE OBTAINED AND ARE DISCUSSED. AN EXTERNAL ELEC. FIELD CHANGED CONSIDERABLY THE STEADY STATE SIGMA SUBPH VALUE AND AFFECTED SLIGHTLY THE UNSTEADY STATE SIGMA SUBPH VALUE OF THE AU DOPED SURFACE. A QUANT. INTERPRETATION OF THE EXPTL. DATA WAS MADE FOR AU DOPED GE SURFACES IN TERMS OF A SIMPLE MODEL OF THE SURFACE WITH A BAND OF TAU LEVELS CREATED BY AU MICROPARTICLES AT THE SEMICONDUCTOR OXIDE INTERFACE. THE POSITION OF THE TAU LEVELS WAS ESTD. AS 0.30-0.32 EV ABOVE THE VALENCE BAND, AND THEIR CONCN. WAS DETD. TO BE 3 TIME 10 PRIME19 CM PRIME NEGATIVE2. FROM THE EXPTL. RESULTS, SOME GE SURFACE PARAMETERS WERE OBTAINED, AND THE SPECTRAL DEPENDENCE OF THE CAPTURE CROSS SECTION OF PHOTONS ON THE SURFACE CENTERS WAS CALCD.

UNCLASSIFIED

Acc. Nr: AP0052507 Abstracting Service: CHEMICAL ABST. 5-70 Ref. Code: UR0420

101605t Electron-microscopic and optical study of the surfaces of amorphous polymer chips. Bezruk, L. I.; Lipatov, Yu. S.; Ivashchenko, V. K.; Lipatova, T. E.; Pasechnik, Yu. V. (Inst. Khim., Vysokomol. Soedin., Kiev, USSR). *Vysokomol. Soedin., Ser. B* 1970, 12(1), 35-7 (Russ). Polyurethane rubber (I) samples were exposed to silent elec. discharge in O and obsd. by electron microscopy. Spherulite-like structures of 3 types appeared: hyperbolic, polygonal, and ellipsoidal. Other methods of sample prepn. for electron microscopy, x-ray diffraction, and birefringence failed to reveal any signs of spherulite-like structures. Anal. of the results showed that the spherulite-like structures are due to inhomogenities on the I surface and not to the existence of spherulites; I have a globular amorphous structure. CPJR

REEL/FRAME 19821148

USSR

UDC 621.396.626

PASECHNYY, S. V., Active Member of the Scientific and Technical Society of Radio Engineering, Electronics and Communications

"Noiseproofness of the Receiving Channel when Detecting a Bundle of Signals in the Presence of Noise and Spatial Interference"

Moscow, Radiotekhnika, Vol 26, No 10, 1971, pp 25-30

Abstract: The noiseproofness of a standard detection channel was determined for incoherent accumulation of a fluctuating bundle of pulse signals against a background of noise and reverberation interference. The result is illustrated by graphs for standard cases of sonar.

Incoherent accumulation of a fluctuating bundle of pulses of different frequency against a background of additive white reverberation interference leads to a gain in noiseproofness. When $n = 5$ and $\beta = 0.1$ (n is the number of pulses in the bundle and $\beta = \sigma^2_{\text{reverberation}}/\sigma^2_{\text{noise}}$, σ is the dispersion of the reverberation and noise, respectively, at the preselector output), the gain when accumulating the bundle as compared to detection of a single pulse of equal power is 3-4 decibels; the gain when accumulating a bundle and with $\beta > 0$ compared to detecting a single pulse with an energy equal to the energy of the

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USSR

PASECHNYY, S. V., Radiotekhnika, Vol 26, No 10, 1971, pp 25-30

entire bundle is 7-8 decibels. Accumulation of the bundle when $\beta = 0$ is equivalent to detecting a single pulse of equal energy. Increasing the nonoptimalness coefficient M from 10 to 100 requires an increase in the signal energy at the system output by 5-6 decibels to retain the noiseproofness of the channel when detecting a bundle against a background of white noise ($\beta = 0$). The noiseproofness of the channel does not change in practice on increasing the nonoptimalness coefficient M with an increase in reverberation interference ($\beta \geq 0.5$).

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USSR

UDC 621.391.81

BOZHOK, Yu. D., PASECHNYY, S. V.

"On the Evaluation of the Gain Due to Filtration of a Signal In a Background of Noise and Reverberation Interference"

Vestn. Kiyev. politekhn. inta. Ser. radiotekhn. i elektroakust. (Bulletin of the Kiev Polytechnical Institute. Radio Engineering and Electroacoustics Series), 1971, No 8, pp 61-64 (from RZh-Radiotekhnika, No 9, Sep 1971, Abstract No 9A51)

Translation: The paper analyzes the gain due to filtration-type preselecters of a pulse signal in a background of an additive mixture of non-white noise and reverberation interference. The amplitude of the signal and the dispersion of the total noise are determined at the output of an ideal band-pass filter, a filter with a bell characteristic and a single resonance circuit. Computed formulas are obtained which make it possible to evaluate the gain because of filtration with respect to the criterion of the signal-to-noise ratio and a comparison is made of the effectiveness of the use of various preselectors. 2 ill. 1 ref. Summary.

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USSR

UDC 621.391.8

GATKIN, N. G., KRASNYY, L. G., and PASECHNYY, S. V.

"Detection of Signals in Reverberation Noise"

Kiev, Izvestiya VUZ--Radioelektronika, vol. 14, No. 7, 1971, pp 758-761

Abstract: The reverberation referred to in the title of this article is the sea return, for which a nonstationary random process of the form $N(t) = m(t)n(t)$ is assumed, where $m(t)$ is a defined function and $n(t)$ is a stationary random process with the correlation function $K(\tau) = \sigma_p^2 (1 - |\tau|/\tau_u)\cos \omega_0 \tau$. These formulas are obtained from "Statisticheskiye svoystva morskoy reverberatsii" (Statistical Characteristics of Sea Return) by Ol'shevskiy, V. V., published in 1966 by Nauka. The authors of the present article derive an expression describing the structure of an optimal detector of this signal and estimate the noise immunity of the detector. They then determine the loss in noise immunity possible in the use of a nonoptimal receiver instead of an optimal one with either the nonwhiteness of the noise or the nonstationary quality of the noise taken into account. They conclude that, in practical applications, it is best to use receivers with single resonance circuits.

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USSR UDC 621.317.799:537.311.33

PASHAYEV, A.M., TURKIN, I.N., BAKSHIYEV, I.I., GUSEYNOV, G.D.

"Devices For Investigation Of The Conductivity Of Heavily Doped Semiconductors"

Za tekhn. progress (For Technical Progress), 1970, No 6, pp 6-8 (from RZh--Elektronika i yeye primeneniye, No 11, November 1970, Abstract No 11B437)

Translation: A device is described for a noncontact method of measurement of electrical conductivity, which is based on measurement of the losses in an oscillatory circuit during introduction of a specimen. The device is intended for checking of semiconductor disks [shaybs] and ingots under production conditions. The generator feeding the sensor [datchik] circuit with a HF current is assembled using one transistor. By virtue of the elimination of a d-c amplifier and regulators of the anode and filament power supply from the device, a simple portable unit is created. The voltage at the indicator is supplied from a rectifier diode loosely coupled with the circuit; the compensation voltage is supplied from a highly-stable standard cell. Checking of the resistivity is accomplished in the range of 10^{-2} -- 10 ohm.cm. Reproducibility of the results is better than 1% [sic]. The reliability and stability of operation of the device were checked by tests with prolonged uninterrupted operation (from 50 to 150 hours). 3 ref. I.R.

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1/2 027 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--WATERPROOFING OF MATERIALS BY ORGANOSILICON COMPOUNDS. XVIII. AGING OF FILM FORMING SOLUTIONS OF HYDROLYZED TETRAETHOXYSILANE -U-

AUTHOR-(04)-VORONKOV, M.G., PASHCHENKO, A.A., TISHCHENKO, V.T., ZAGATA, L.

COUNTRY OF INFO--USSR

SOURCE--ZH. PRIKL. KHIM. (LENINGRAD) 1970, 43(3), 611-15

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS, CHEMISTRY

TOPIC TAGS--WATERPROOFING, ORGANOSILICON COMPOUND, ORGANIC SILANE, ACID CATALYSIS, HYDROLYSIS, HYDROGEN ION CONCENTRATION, METAL COATING

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1995/1463 STEP NO--UR/0080/70/043/003/0611/0615

CIRC ACCESSION NO--AP0116900

UNCLASSIFIED

2/2 027

CIRC ACCESSION NO--AP0116900

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. INCREASES IN H SUB2 O CONCN. IN AQ. ME SUB2 CO AND AQ. DIOXANE SOLNS. OF SI(OET) SUB4 (I) RETARDED CONDENSATION REACTIONS AND INTENSIFIED THE ACID CATALYZED INITIAL HYDROLYSIS PROCESS WITH THE RESULT THAT THE MAX. IN THE ISOTHERMAL CURVES FOR THE VARIATION OF N SUBD PRIME2O WITH TIME WERE SHIFTED TO THE RIGHT. THE EFFECT OF CATALYTIC AMTS. OF ACIDS LASTED ONLY BRIEFLY WHEN HCL AND HNO SUB3 WERE USED AND FOR 300 DAYS WHEN H SUB3 PO SUB4 WAS USED BECAUSE SOLNS. CONTG. THE FORMER RAPIDLY APPROACHED PH 7 WHEREAS THOSE CONTG. THE LATTER REMAINED AT PH IS SMALLER THAN 7. ISOTHERMAL TIME VARIATIONS OF ALL OF THE PROPERTIES TESTED (D SUB2O, N SUBD PRIME2O, VISCOSITY, AND OPTICAL D.) EXHIBITED MAX. CORRESPONDING TO THE HIGHEST CONCNS. OF SIOH GROUPS, THE AMT. OF WHICH WERE REDUCED LATER BY CONDENSATION REACTIONS. METAL COATING PROPERTIES OF PARTIALLY HYDROLYZED I WERE BEST WHEN ME SUB2 CO SOLNS. CONTG. I, H SUB2 O, AND HNO SUB3 IN AMTS. OF 0.1-1.0, 2-3, AND 0.015-0.04 MOLE-L WERE USED.

APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002202330005-4"

Glass and Ceramics

USSR P UDC 661.184 + 678.84

PASHCHENKO, A. A., YEMEL'YANOV, B. M., SHILO, A. YE., and KRUGLITSKAYA, V. YA.
Kiev Polytechnical Institute, Kiev, Ministry of Higher and Secondary Specialized Education USSR

"Interaction of Diamond, Cubic Boron Nitride, and Graphite with Glass Melt"

Moscow, Doklady Akad. Nauk SSSR, Vol 190, No 6, Jan 70, pp 645-646

Abstract: The authors studied the behavior of fused glass in contact with the surfaces of diamond, cubic boron nitride, and graphite, determining its wetting contact angle and adhesion. It was determined that the diamond and cubic boron nitride differ markedly from graphite by their contact angle, which is $< 90^{\circ}$ and $> 90^{\circ}$, respectively. Substituting K_2O for Na_2O in the glass results in drastic decrease of its wetting capacility of diamond and boron nitride surfaces. BaO improves slightly the wetting of diamond, and TiO_2 - both of the abrasive agents. The contact angle is lowered considerably on introduction of V_2O_5. Substituting PbO for B_2O_3 has a detrimental effect on the diamond but improves the wetting of boron nitride. Best results are obtained by increasing the B_2O_3 content; in the case of diamond and cubic boron nitride the angle becomes almost zero, and in the case of graphite it is lowered to below 90°.

USSR

PASHCHENKO, A. P.

"Some Problems of Control of a VTOL Aircraft in Transient Modes"

Stroit. Mekh., Gazoaerodinamika i Proiz-vo Letatel'n. Apparatov, Vyp. 1 [Structural Mechanics, Gas-Aerodynamics and Production of Flight Vehicles, No 1 -- Collection of Works], Voronezh, 1970, pp 164-177, (Translated from Referativnyy Zhurnal, Mekhanika, No 4, 1972, Abstract No 4 B249 by the author).

Translation: A qualitative analysis is presented of the control of an aircraft with vertical takeoff and landing in transient modes and in ordinary flight. It is demonstrated that, in contrast to ordinary flight, during vertical takeoff and landing control of the aircraft is difficult due to the slight air damping. A diagram for automatic stabilization of the angular velocity of the aircraft in transient modes is suggested, i.e., "artificial damping" is introduced. It is noted that when there is a stabilization system, control of the aircraft by the pilot in transient modes becomes natural (similar to ordinary flight). A mathematical analysis of the stability of the aircraft for damping of the angular velocity of involuntary rotation is also performed.

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USSR UDC 621.762.001.669.541.45

PASHCHENKO, I. S., PETROV, G. I., KRAPUKHIN, V. V., SHIGINA, L. N., MINAKOV, A. T., and GALKIN, P. N.

"Study of Certain Properties of GeO_2 and Powdered Germanium"

Kremniy i germaniy [Silicon and Germanium -- collection of works], No. 2, Moscow, Metallurgiya Press, 1970, pp. 67-70, (Translated from Referativnyy Zhurnal-Metallurgiya, No. 1, 1971, Abstract No 1 G429 by the authors).

Translation: The properties of GeO_2 produced by various methods of hydrolysis of $GeCl_4$ are studied. The influence of particle size of GeO_2 and powdered Ge on changes in bulk mass, picnometric density, gas permeability, specific surface, and friability is demonstrated. 4 tables; 6 biblio. refs.

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USSR

UDC 621.791.75:621.3.014.3:669.715

PASHCHENKO, K. P. and BARANOV, Ye. N., Engineers

"Welding of Aluminum Alloys in an Impulse-arc Mode with the A-547U Semi-Automatic Welding Machine"

Moscow, Svarochnoye Proizvodstvo, No 4, Apr 72, p 48.

Abstract: In contrast to ordinary argon-arc welding, pulsed-arc welding with fusible electrodes allows the process to be reformed at low currents with fine-drop transfer of the electrode metal, improving seam formation, decreasing spraying of the liquid metal, oxidation of impurities and the quantity of smoke produced in the arc zone. This increases the productivity of labor in comparison to welding with infusible electrodes by 2 to 4 times, decreases argon consumption and the cost of welding. In this study, AMg6 aluminum alloy 2.5-3 mm thick was welded with a series-produced A-547U semi-automatic welder, arc voltage 17-18 V, wire diameter 1.5 mm, feed rate of wire 145 m/hr, argon flow rate 8-9 l/min, reverse polarity. Satisfactory joint quality was produced.

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USSR UDC 547.525.2'023'245:542.957.2

ODABASHYAN, G. V., ROMASHKIN, I. V., and PASHCHENKO, L. Ye.

"A Study of the Reaction of p-Dibromodimagnesiumbenzene with Fluoroalkyl-(Aryl)chlorosilance"

Leningrad, Zhurnal Obshchey Khimii, Vol 41, No 11, Nov 1971, pp 2,454-2,457

Abstract: Although the bifunctional Grignard reagents have become widely used in the synthesis of various organosilicon compounds, very little information has been published on their possible use in obtaining organofluorosilicone monomers.

In this connection, the reactions of p-dibromodimagnesiumbenzene with certain alkyl(aryl)chlorosilanes, containing 3,3,3-trifluoropropyl and m-trifluoromethylphenyl radicals, were studied, especially as regards the effect of various substitutions for the silicon atom in the chlorosilane. Also investigated was the optimal ratio of p-dibromobenzene and magnesium and the reaction time for assuring high yield of p-dibromodimagnesiumbenzene.

Thirteen monomers were produced with yields ranging up to 50%. Physical data are given for these, along with details of laboratory procedures.
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USSR

UDC 621.791.927

YUZVENKO, YU. A., PASHCHENKO, M. A., and KORITSKIY, G. G., Institute of Electric Welding imeni Ye. O. Paton, Academy of Sciences Ukrainian SSR

"Application Characteristics of High-Melting Compounds for Arc Welding"

Kiev, Avtomaticheskaya Svarka, No 2, 1973, pp 1-4

Abstract: An all-weld metal produced by electrodes GK-15 (85% Cr_3C_2 and 15% Ni), GK-30 (70% Cr_3C_2 and 30% Ni) with metalloceramic core and B0 wire consisting of 60% Cr_3C_2 powder enclosed in a nickel shell was studied in the perpendicular and horizontal cross-sections. The obtained results were compared with the matalloceramic alloys KKhN-15, KKhN-30, KKhN-40, and KKhN-50 containing from 50 to 85% Cr_3C_2 and 15-50% Ni. The microstructure of the all-weld metal consisted of the primary carbides and eutectic carbides. The ditrigonal shape of the primary carbides distorted by various growth defects was characteristic for Cr_3C_2 and Cr_7C_3 carbides. The total concentration of carbides was close to that in the electrodes. The ratio between volumes of the solid solution and eutectic carbides always remained at 5 : 1. Sizes and shape of carbide grains in the parallel and perpendicular cross-sections differed considerably. The columnar structure was characteristic for the

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USSR

YUZVENKO, YU. A., et al, Avtomaticheskaya Svarka, No 2, 1973, pp 1-4

parallel cross-sections, and disoriented for the perpendicular cross-sections. The size of the carbide phase and the total structure of the all-weld metal differed from that of metalloceramic alloys. Sizes of the primary carbides in the weld metal were by one order larger than in the alloys. When BO wire was used for welding of steel the built-up metal contained a noticeable amount of Cr_7C_3 carbide in addition to Cr_3C_2, which was alloyed with iron and nickel. In some cases up to 50% of the electrode carbide was transformed into Cr_7C_3 carbide, with 15-20% Fe and some amount of free carbon. When high-melting compounds (borides, carbides, silicides, and others) are introduced into the molten bath they undergo dissolution, either partial or complete, in the alloy matrix which becomes alloyed with boron, chromium, carbon, and silicon. This could lead to brittliness of the obtained alloy and appearance of cracks. The wear-resistance of the weld metal was much lower compared with the metalloceramic alloys. In order to eliminate the undesirable characteristics of the weld metal produced by the above electrodes, it is recommended to use induction and electroslag welding with a comparatively low linear welding energy, as well as to use liquid addition and penetrating agents. In the case of arc welding

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YUZVENKO, YU. A., et al, Avtomaticheckaya Svarka, No 2, 1973, pp 1-4

the high-melting metal should be supplied as an addition agent (powders, rods, mixtures) at the end of the molten bath. The use of high-melting compounds in electrodes is undesirable.

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1/2 020 UNCLASSIFIED PROCESSING DATE--16OCT70

TITLE--EFFECT OF SOME TECHNOLOGICAL PARAMETERS OF AN OXYGEN CONVERTER MELT ON THE STABILITY OF TAR DOLOMITE MAGNESITE LINING -U-

AUTHOR-(05)-KUZNETSOV, A.F., SHAN, P.I., PASHCHENKO, N.K., BOLSHAKOV, V.A., ZELTSER, I.G.

COUNTRY OF INFO--USSR

SOURCE--OGNEUPORY 1970, 35(2), 35-9

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--METAL OXYGEN CONVERSION, SLAG, PIG IRON, CORROSION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1996/0873 STEP NO--UR/0131/70/035/002/0035/0039

CIRC ACCESSION NO--AP0118045

UNCLASSIFIED

2/2 020 UNCLASSIFIED PROCESSING DATE--16OCT70
CIRC ACCESSION NO--AP0118045
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AS A LINING FOR O CONVERTERS IN THE REFINING OF PIG IRON, A MIXT. OF 65PERCENT DOLOMITE AND 35PERCENT MAGNESITY, TO WHICH WAS ADDED 5PERCENT TAR CONTG. 70-5PERCENT PITCH, WAS USED. THE CORROSION OF THE LINING DURING EXPLOITATION IS CONNECTED WITH DECARBONIZATION OF THE WORKING LAYER AND DIFFUSION OF OXIDES FROM THE SLAG INTO THE LINING, WITH FORMATION OF EASY MELTING COMPDS. (FERRITES, BROWNMILLERITE, ETC.). MOST INFLUENCE IN THESE PROCESSES HAVE FE OXIDES, AS THEY EFFECT THE DECARBONIZATION; CA FERRITES FORMED HAVE A LOW M.P. AN INCREASE OF THE TEMP. OF THE MELT ACCELERATES THE CORROSION OF THE LINING. THE CORROSION OF THE LINING IS DECREASED BY INCREASING CAO CONTENT OF THE SLAG, AS A CONSEQUENCE OF A DECREASE OF OTHER COMPDS. PRESENT. THE RATE OF DISSOLN. OF CAO IS NOT CONST. DURING BLOWING AND DEPENDS ON THE FE OXIDE CONTENT OF THE SLAG. IN ORDER TO PROMOTE THE RATE OF DISSOLN. OF CAO, IT IS RECOMMENDED TO ADD A 2ND PORTION OF CAO BEFORE THE INTENSIVE DISSOLN. OF THE 1ST PORTION BEGINS, THAT IS 4-6 MIN AFTER BEGINNING OF THE BLOWING. THE RATE OF DISSOLN. OF THE LINING DURING THE 1ST HALF OF THE PERIOD OF BLOWING IS CONST., DURING THE 2ND HALF OF THE PERIOD IT INCREASES, DEPENDENT ON TEMP. AND FE OXIDE CONTENT OF THE SLAG. OVER OXIDN. OF THE SLAG DURING THE 2ND PERIOD IS UNDESIRABLE. THE CORROSION OF THE LINING DEPENDS ON THE BLOWING REGIME AND THE CONSTRUCTION OF THE NOZZLE AND INCREASES WITH PROLONGATION OF THE BLOW. FACILITY: ZHDANOV. MET. INST., ZHDANOC, USSR.

UNCLASSIFIED

USSR

PASHCHENKO, N. A.

"Automatic Indexing of Coherent Texts of 'Retrieval Annotations' of Documents in Order to Search for Semantic Information"

Nauch.-Tekhn. Inform. Sb. Vses. In-t Nauch. i Tekhn. Inform. [Scientific and Technical Information, Collection of All-Union Institute for Scientific and Technical Information], 1972, Series 2, No 11, 38-45 (Translated from Referativnyy Zhurnal Kibernetika, No 4, 1973, Abstract No 4V749, by the author).

Translation: The problem of extraction and expression of the primary semantic content of documents in order to allow retrieval of semantic information is studied. A method is suggested for special abstracting, consisting in composition, together with the abstract, of a special "retrieval annotation" (RA), the coherent text of which contains the basic semantic content of the abstracted document. Formalized rules for construction of RA text at the intellectual level are presented. The principles of automatic indexing of RA are described, consisting in automatic translation of RA texts into INFORM information language, specially developed for this purpose.

A formal description of INFORM is presented. Principles of the structure, general structure and individual sections of the algorithm for automatic translation of RA texts into INFORM are described.

1/2 016 UNCLASSIFIED PROCESSING DATE--02OCT70

TITLE--ORGANOSILICON FINISHING FOR SYNTHETIC DIAMONDS -U-

AUTHOR-(03)-PASHCHENKO, O.O., KOGOSOV, L.P., YEMELYANOV, B.M.

COUNTRY OF INFO--USSR

SOURCE--KHIM. PROM. UKR. 1970, (1) 57-8

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--ORGANOSILICON COMPOUND, DIAMOND, ORGANOSODIUM COMPOUND, SURFACE PROPERTY, ABRASIVE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1992/1506 STEP NO--UR/0436/70/000/001/0057/0058

CIRC ACCESSION NO--AP0112500

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--02OCT70

2/2 016

CIRC ACCESSION NO--AP0112500

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. SYNTHETIC DIAMONDS WERE TREATED WITH DIL. SOLNS. OF NA ORGANOSILICONATES RSI(OH) SUB2 ONA (I) (R EQUALS ME, ET, CH SUB2:CH, AND PH), THEN HEATED TO 150-200DEGREES FOR 2 HR AND WASHED. DIAMOND ABRASIVE INSTRUMENTS WERE OBTAINED FROM SILICONIZED DIAMONDS BY USING POWD. BAKELITE AS BINDER. SILICONIZATION OF THE DIAMONDS RESULTS IN THE HYDROPHOBIZATION OF THE SURFACE AND IMPROVED ADHESION TO THE BINDER. EXPTS. WITH SILICONIZED DIAMONDS SHOWED THAT THIS TREATMENT REDUCES THE WEAR OF DIAMOND IN ABRASIVE INSTRUMENTS. THE BEST RESULTS WERE OBTAINED WITH I (R EQUALS ME), FOLLOWED BY I (R EQUALS CH SUB2:CH) AND I (R EQUALS ET). THE USE OF I (R EQUALS PH) DID NOT IMPROVE THE PROPERTIES OF THE ABRASIVE.

UNCLASSIFIED

1/2 018 UNCLASSIFIED PROCESSING DATE--18SEP70

TITLE--INTERACTION OF DIAMOND CUBIC BORON NITRIDE, AND GRAPHITE WITH GLASS MELTS -U-

AUTHOR-(04)-PASHCHENKO, O.O., YEMELYANOV, B.M., SHILO, A.E., KRUGLITSKAYA, V.YA.

COUNTRY OF INFO--USSR

SOURCE--DOKL. AKAD. NAUK SSSR 1970, 190(3), 645-6

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY, MATERIALS

TOPIC TAGS--GLASS COMPOSITION, DIAMOND, BORON NITRIDE, SURFACE TENSION, ADHESION STRENGTH, ABRASIVE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1984/1564 STEP NO--UR/0020/70/190/003/0645/0646

CIRC ACCESSION NO--AT0100182

UNCLASSIFIED

2/2 018 UNCLASSIFIED PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AT0100182

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. SMALL PIECES (APPROX. 0.05 G) OF GLASSES OF VARIOUS COMPNS. WERE PLACED ON HORIZONTAL POLISHED SURFACES OF DIAMOND AND CUBIC BN, HEATED IN AN AR ATM. TO 800DEGREES, AND THEN THE WETTING ANGLE (THETA) AND SURFACE TENSION (SIGMA) MEASURED. WORK OF ADHESION (A) WAS CALCD. BY THE EQUATION A EQUALS SIGMA (1 PLUS COS THETA). THESE DATA ARE IMPORTANT FOR THE MANUF. OF CERAMIC ABRASIVE TOOLS BECAUSE THE BETTER THE WETTING, THE HIGHER THE BONDING STRENGTH BETWEEN ABRASIVE GRAINS AND THE VITREOUS MATRIX. THE K SUB2 O CONTENT OF THE GLASS IMPAIRS WETTING TO A HIGH EXTENT.

UNCLASSIFIED

USSR

KOLEMAYEV, V. A., PASHCHENKO, P. D.

"Application of the Results of Modeling of a Three-Phase Queueing System"

Ekonomika i Mat. Metody [Economics and Mathematical Methods], 1973, Vol 9, No 1, pp 170-175 (Translated from Referativnyy Zhurnal Kibernetika, No 6, 1973, Abstract No 6V232, by the authors).

Translation: Modern production is characterized by combined functioning of machines automatically performing the basic working operations, and man, who controls the machines and adjusts them. This article studies a man-machine system consisting of m identical devices (machine tools, apparatus) and a human operator who performs the initial and final operations (for example, places the blank in the machine and removes the finished part from the machine). Each requirement arriving at the system passes through three successive phases of servicing, the servicing time in each phase being a random quantity with a fixed distribution. Problems related to optimization of such a system are studied.

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USSR UDC: 669.187.2

KRASNORYADTSEV, N. N., LEVIN, A. M., GLAZOV, A. N., PASHCHENKO, V. Ye., KONOVALOV, K. N., VERSHININ, V. I.

"Decreasing the Loss of Titanium During Production of Stainless Steel"

Moscow, Metallurg, No 10, Oct 73, pp 18-19.

Abstract: Balance melts performed in a 40 ton arc furnace at the Kuznetsk Metallurgical Combine have shown that when type Kh18N10T stainless steel is produced by the ordinary technology (using up to 70% of waste of this type of steel in the charge, blowing of oxygen through the bath, running off of slag at the end of the melt and introduction of new lime and spar, alloying with 30% ferrotitanium in the furnace), the titanium losses are approximately as follows: 56% by interaction with oxides, 13% with oxygen and nitrogen in the metal, 27% with oxygen in the air, other losses 4.0%. Replacement of 30% ferrotitanium with 65% and alloying the metal in the ladle rather than in the furnace reduced the mean titanium loss from 57.0 to 52.0%. Several series of experimental melts were performed to find additional means of reducing and stabilizing titanium loss, without success. Success was finally achieved by modifying the technology quite basically. The primary features of the new technology are that the slag is not run

USSR

Krasnoryadtsev, N. N., Levin, A. M., Glazov, A. N., Pashchenko, V. Ye., Konovalov, K. N., Vershinin, V. I., Moscow, Metallurgy, No 10, Oct 73, pp 18-19.

off from the furnace after melting of the ferrochromium, but rather poured into the ladle with the metal at a high temperature (averaging about 1640° C), reducing the length of the reduction period and increasing the degree of reduction of chromium from the slag. The metal is poured from the first ladle into a second ladle through a tap hole 100-110 mm in diameter, and alloyed with 65% ferrotitanium in the second ladle, preventing contact between titanium and slag. Titanium loss was further reduced from 52 to 40.9% by the new technology, and the stability of the titanium content was increased.

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USSR UDC 669.187.2

VERSHININ, V. I., LEVIN, A. M., GLAZOV, A. N., KRASNORYADTSEV, N. N., and PASHCHENKO, V. Ye., Kuznetsk Metallurgical Combine and Siberian Metallurgical Institute

"Alloying Steel With Aluminum in Pouring From Ladle Into Ladle"

Moscow, Stal', No 6, Jun 73, pp 517-518

Abstract: Three smelting variants of manganese-aluminum steel were investigated in order to determine the most optimum variant. The investigation results are discussed by reference to curves of the magnesium content (in %) dependence on periods of smelting and pouring. Smelting manganese-aluminum steel without drawing off the slag, with double pouring over and alloying with aluminum in the second ladle, makes it possible to get in the ready-made metal in the average 0.0024% Mg; this decreases the melting duration by 15-20 min and reduces the waste due to stratification. By the standard technology with aluminum alloying in the ladle,

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USSR

VERSHININ, V. I., et al., Stal', No 6, Jun 73, pp 517-518

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the steel contains 0.0076% Mg; by introducing aluminum into the furnace it contains 0.011% Mg. Other quality characteristics, as mechanical properties, purity of the surface, homogeneity of the metal relative to aluminum and other elements, are practically identical in smelting by all variants and satisfying the technological requirements. Two figures, seven bibliographic references.

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USSR UDC 621.372.413

TERESHCHENKO, A. I. and PASHCHENKO, ZH. F.

"Natural Frequencies and Fields of Cavity Resonators of Trapezoidal Form"

Radiotekhnika. Resp. mezhved. temat. nauch.-tekhn. sb. (Radio Engineering. Republic Interagency Thematic Scientific-Technical Collection of Articles), 1972, vyp.21, pp 135-141 (from RZh-Radiotekhnika, No 11, Nov 72, Abstract No 11 B124)

Translation: The resonator under study is a cavity which is bounded by flat metal surfaces with two out of these being trapezoids and the rest rectangles. The boundary value problem for this type of resonator was solved by using an approximate method (method of oblique-angled coordinates). In varifying the calculations, several trapezoidal resonators were produced with varying dimensions, but having the same resonance wave length for H_{10} type oscillations. Experimental measurements of frequency did not deviate by more than 1 percent from the theoretical expectation. Original article: three illustrations, one table, and two bibliographic entries. Resume.

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USSR

UDC: 629.78.017.2

PASHCHINTSEV, V. T.

"One Method of Construction of Approximately Optimal Trajectories for Hypersonic Vehicles in the Atmosphere"

Uch. Zap. Tsentr. Aero-Gidrodinam. In-ta [Scientific Writings of Central Institute of Aerodynamics and Hydrodynamics], 1973, Vol 4, No 1, pp 45-54 (Translated from Referativnyy Zhurnal Raketostroyeniye, No 6, 1973, Abstract No 6.41.89, from the Resume).

Translation: A simple method is suggested for construction of one class of approximately optimal control rules, based on the use of the oscillating properties of the trajectories of hypersonic vehicles in the atmosphere at suborbital velocities. Based on the method suggested, it is hypothesized that it is possible to replace the ordinary concept of optimality of control with a certain concept of the optimal degree of damping of oscillations in the flight altitude function. 4 figures, 8 biblio. refs.

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USSR UDC 621.314.61

NOVIKOV, M. N., PASHENTSEV, I. D. and ZAV'YALOV, V. A.

"Calculation of the Distribution of Pulse Voltage in a Network of Semiconductor Rectifiers in Series"

Sb. tr. Leningr. In-t inzh. zh.-d. transp. (Leningrad Institute of Railroad Transportation Engineers -- Collection of Works), Issue 293, pp 29-38 (from RZh-Elektronika i yeye primeneniye, No 1, Jan 70, Abstract No 1B355)

Translation: The problem of the effect of barrier capacitances of particular rectifiers on the character of the pulse voltage distribution is considered. A method is developed for calculation of pulse voltage distribution in the circuit of type VK^2-200 rectifiers which do not have protecting elements and equalizing elements. The results of the calculated and experimental data are compared. Four illustrations and five references. Summary

1/2 029 UNCLASSIFIED PROCESSING DATE--02OCT70

TITLE--EXPERIMENTAL AND MORPHOLOGICAL EVALUATION OF COPOLYMER ON THE BASIS OF METHYLMETACRYLATE AND RUBBER PROPOSED AS BASIS MATERIAL FOR THE

AUTHOR-(04)-PANIKAROVSKIY, V.V., YAGUDIN, A.D., PASHININ, B.P., POYUROVSKYAY, I.YA.

COUNTRY OF INFO--USSR

SOURCE--STOMATOLOGIYA, 1970, VOL 49, NR 2, PP 57-60

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--DENTISTRY, PROSTHESIS, METHYL METHACRYLATE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1986/0328 STEP NO--UR/0511/70/049/002/0057/0060

CIRC ACCESSION NO--AP0102790

UNCLASSIFIED

2/2 029 UNCLASSIFIED PROCESSING DATE--020CT70
CIRC ACCESSION NO--AP0102790
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. SUMMARY. THE AUTHORS STUDIED REACTION OF THE ANIMAL TISSUES ON THE IMPLANTED SAMPLES OF COPOLYMER ON THE BASIS OF METHYLMETACRYLATE AND RUBBER. IT WAS ESTABLISHED THE INDIFFERENCE OF THE REFERRED TO COPOLYMER IN RESPECT TO THE TISSUES OF ANIMALS, THIS MAKING IT POSSIBLE TO USE THIS MATERIAL AS A BASIS FOR THE PREPARATION OF REMOVABLE PLATE DENTAL PROSTHESES.

UNCLASSIFIED

UDC 621.318

USSR

Engineers DENISOV, A.G., ZINAKOV, V.K., PASHEV, V.A.

"Magneto-Controlled Contacts--Contemporary Switching Elements"

Moscow, Pribory i sistemy upravleniya, No 11, Nov 1971, pp 13-15

Abstract: The paper shows the basic advantages of magneto-controlled sealed contacts (MC) as compared with electromagnetic and semiconductor switching elements, the principles of their operation, the basic parameters (including those of five native MC), the construction of MC with dry contacts and contacts wetted by mercury, and the basic trend of growth. 3 ref. 3 fig. 3 tab.

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Semiconductors and Transistors

UDC 621.382.2

USSR

MIKITSEY, YA. I., PASHIN, YU. N., STRUKOV, I. A.

"Noise of Semiconductor Diodes in the Presence of a Microwave Pulse"

Elektron. tekhnika. Nauchno-tekhn. sb. Elektron. SVCh (Electronic Technology. Scientific-Technical Collection. Microwave Electronics), 1970, Issue 10, pp 137-139 (from RZh-Elektronika i yeye primeneniye, No 3, March 1971, Abstract No 3B107)

Translation: The excess (over the thermal) noise radiation of a semiconductor device under the effect of pulsed microwave power was investigated. The investigation was conducted on germanium diffused semiconductor diodes with a breakdown voltage of 18--25 v and on silicon epitaxial semiconductor diodes with a breakdown voltage of 36 v. A highly-sensitive Dicke radiometer was employed as a noise indicator. The experimental results showed that the intensity of the excess noise radiation increases linearly with an increase of the current flowing across the semiconductor diode. With a filling frequency /chastota zapolneniya/

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USSR

MIKITSEY, YA. I., et al, Elektron. tekhnika. Nauchno-tekhn. sb. Elektron. SVCh, 1970, Issue 10, pp 137-139

f = 1.8 GHz, a linear dependence of the noise power on the magnitude of the pulse current was observed for all the semiconductor diodes investigated. 3 illustration, 4 references. K.P.

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Acc. Nr.: AP0041334 P Ref. Code: UR 0025

USSR

PASHINA, YU.

"Invented, Developed, Made in the Moldavian SSR"

Moscow, Nauka i Zhizn', No 1, 1970, pp 7-9

Abstract: Some new Moldavian inventions, exhibited at the Exposition of the Achievements of the National Economy, are presented.

A die constructed in 24 replaceable sections, for cutting electric-motor stator and rotor plates out of sheet steel, has twice the service life of its predecessor; worn or damaged sections can be replaced without dismantling the entire die.

An installation for producing glass-clad microwires, 0.001 to 0.030 microns /sic/ in diameter, capable of operating in a vacuum and in aggressive media at a temperature of up to 500° C, capacity 52 to 500 m/minute.

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Reel/Frame
19751191

AP0041334

A new material for the production of multilayer printed circuits, is a glass textolite faced on one or two sides with copper electrolytic foil.

A new "minature" electric water pump for pumping household water from wells, consuming not more than 450 watts, the pump can deliver up to 1700 liters of water per hour, lifting it, if necessary, to 40 meters.

The casting machine plant imeni S. N. Kirov in Tirasopol' is producing a centrifugal casting machine for casting bushings from copper alloys and iron. Such a machine produces up to 14 castings per hour, each weighing as much as 50 kg.

The Kishinev Pump Plant imeni G. I. Kotovskiy is producing several different types of centrifugal, immersed, multistage electric pumps.

19751192

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UDC: None

USSR

KRASYUK, I. K. and PASHININ, P. I.

"Breakdown in Argon and Nitrogen With a Picosecond, 0.35μ Wavelength Laser Pulse"

Moscow, Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, No 8, 20 April 1972, pp 471-475

Abstract: This letter represents the continuation of earlier papers by the authors mentioned above in which it was experimentally shown that a picosecond laser pulse with a wavelength of 0.69 μ produces optical puncture in argon, helium, or nitrogen, due to multiphoton ionization of the atoms or molecules. The present letter describes investigations to clarify the mechanism for the formation of breakdown in argon and nitrogen with a picosecond laser beam with a wavelength of 0.35 μ. In this investigation, the threshold intensity of the breakdown was measured as a function of the gas pressure. The schematic of the experimental apparatus is given in one of the early papers (ZhETF, 9, 581, 1969). Analysis of the experimental results shows that the relative increase in the probability of photoionization with increasing frequency of the radiation is satisfactorily given in the paper by L. V. Keldysh in the ZhETF, 47, 1945, 1964. The authors conclude that the theory of avalanche

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UDC: None

USSR

KRASYUK, I. K., et al, Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, No 8, 20 April 1972, pp 471-473

breakdown could be improved by taking into account the specific qualities of processes in the optical range: in particular, the effect of resonance transitions between oscillatory states, self-focusing effects, and the like. Members of the P. N. Lebedev Physics Institute, they express their gratitude to V. I. Vovchenko and M. V. Yevteyev for their help with the experiments, and to V. M. Marchenko for setting up the equipment for measuring the duration of the laser pulse.

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Optics & Spectroscopy

USSR

DONCHENKO, V. A., ZUYEV, V. YE., KRASYUK, I. K., PAL'YANOV, P. A., PASHININ, P. P., PROKHOROV, A. M., KABANOV, M. V.

"Energy Attenuation of Supershort Pulses of Optical Emission by Dispersive Media"

Moscow, Pis'ma v ZhETF, Vol 18, No 4, 1973, pp 230-232

Abstract: Preliminary results are presented from direct measurements of one of the basic characteristics of a dispersive medium -- the attenuation coefficient -- on its interaction with a supershort pulse of optical emission. A decrease in attenuation of the supershort pulse by comparison with the case of emission which is continuous in time was detected experimentally. The results of measurements of the optical thickness of suspensions of polystyrene latexes and lycopodium spores are tabulated for continuous and pulsed emission. The observed "transparency" of the medium which is three times as great in the case of a laser pulse by comparison with continuous radiation is not connected with such effects as the thermal effect on the properties of the medium, the spectroscopic effect of saturation and self-focussing.

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USSR

IL'ICHEV, N. N., et al., Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 15, No 4, 20 Feb 72, pp 191-194

substances except CS_2 and nitrobenzene. The superbroadening effect was also observed in a number of glasses and crystals (in K-8, F-1, I-26, K2SS-7 glasses and in fused quartz and calcium tungstate). It is suggested that the observed superbroadening is due to strong laser phase modulation rather than four-photon interaction.

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USSR

IL'ICHEV, N. N., KOROBKIN, V. V., KORSHUNOV, V. A., MALYUTIN, A. A., OKROASHVILI, T. G., and PASHININ, P. P., Physics Institute imeni P. N. Lebedev, Academy of Sciences USSR

"Superbroadening of Spectrum of Ultrashort Pulses in Liquids and Glasses"

Moscow, Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 15, No 4, 20 Feb 72, pp 191-194

Abstract: Experiments conducted by the authors showed that superbroadening of the spectrum of picosecond pulses at rather high radiation powers can be observed in practically any transparent dielectric. A neodymium self-mode-locking laser and two amplifier stages (length of active elements ~ 300 mm) were used in the experiments, permitting radiation with a total energy equal to 0.1-0.2 j in a train of 10-15 ultrashort pulses. ISP-51 and STE-1 type spectrographs were used to observe the spectral broadening. Liquids with various types of molecules and optical properties were used: carbon disulfide, nitrobenzene, benzene, toluene, isopropyl alcohol, carbon tetrachloride, water, and liquid nitrogen. Superbroadening of the spectrum was found in all these

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USSR

KRASYUK, I. K., PASHININ, P. P., and PROKHOROV, A. M., Physics Institute imeni P. N. Lebedev, Academy of Sciences USSR

"Experimental Observation of Induced Compton Absorption of Laser Emission in a Spark"

Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki (Letters to the Journal of Experimental and Theoretical Physics), Vol 12, No 9, 5 Nov 1970, p 439-442

Abstract: The first experiments of the observation of induced Compton absorption (ICA) of laser emission by a plasma are reported. The total number of radiated quanta remains constant, but the radiation energy is transfered to the electrons in the plasma by the change in frequency of the scattered quanta. The spectrum of the radiation that has passed through the plasma should, owing to the ICA, be shifted in the longwave direction. The experimental equipment, shown in a diagram, consists basically of a ruby laser that produces picosecond pulses (50 nsec), an optical amplifier, a plasma chamber with associated filters and optical elements, and a spectrograph. A beam splitter diverts part of the energy to a high-speed oscillograph. The energy density at the focus of the lens system was 2×10^{14} watt/cm^2, which is considerably greater than a spark in helium. Half

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USSR

KRASYUK, I. K., Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 12, No 9, 5 Nov 1970, p 439-442

of the pulse energy is passed through the plasma, is collimated, and enters the top half of the spectrograph slit. The other half is diverted around the chamber to the lower half of the spectrograph slit. An arc spectrum of iron was photographed simultaneously for reference. Spectra obtained for helium and aluminum foil plasmas exhibit longwave shifts and short-wave absorption. Part of the energy is absorbed across the entire spectrum. Normalizing the curves for bremsstrahlung absorption in helium, the integral absorption for the spectrum is 1.3 ($\pm$0.3) x 10^{-5}, and the mean absorption is 0.26 x 10^{-2} cm^{-1}. Similar results are obtained when aluminum foil is placed at the focus in the plasma chamber. The authors conclude that the spectrum shift is due to induced Compton scattering. Other possible mechanisms are ruled out because of time considerations. The effect, therefore, can play a dominant role in plasma heating by electromagnetic radiation and under given conditions can greatly exceed the classical bremsstrahlung absorption, which is weakened by nonlinear effects in strong fields. Effective quantities of energy can be injected into the plasma only if the emission spectrum width is comparable to the radiation frequency. The authors thank F. V. Bunkin for discussions. Orig. art. has 2 figs. and 7 refs.

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USSR

KRASYUK, I.K., KULEVSKIY, L.A., PASHININ, P.P., and PROKHOROV, A.M., Physics Institute imeni P.N. Lebedev, Academy of Sciences, USSR

"Application of Picosecond Ruby Laser Pulses for Measuring Damping Time of the Luminescence Band of the First Phonon Repetition of Exciton A in CdS"

Moscow, Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 59, No 2(8), 1970, pp 546-549

Abstract: The object of this paper was to determine experimentally the attenuation time of a luminescence band in CdS generated as a result of radiation recombination of a free exciton with a simultaneously emitted photon and one longitudinal optical phonon. A previously described ruby laser generating picosecond pulses was used as a source of double-photon excitation in CdS. The ruby laser generated a series of picosecond pulses from which, by means of a special gate, a single pulse was discriminated. The discriminated pulse was directed at the

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USSR

KRASYUK, I. K., et al., Zhurnal Eksperimental'noy i Teoriticheskoy Fiziki, Vol 59, No 2(8), 1970, pp 346-349

CdS sample mounted in a cryostat at a temperature of 77°K. The CdS luminescence induced by the ruby laser was directed at the ELU-F7 photomultiplier the electric signal from which was recorded by means of one of the beams of the 6LOR-02 high-speed oscillograph. The oscillograph also recorded, simultaneously, the generated radiation pulse, a portion of which was directed at a coaxial photoelement FEK-15. A portion of CdS radiation was focused on the slit of a ISP-51 spectrograph. By placing a proper filter before the photomultiplier it was possible to observe green radiation from CdS or a blue band of the first phonon repetition of exciton A. The experimental value of the atenuation time was 1.3 nanosec. It is concluded that the use of picosecond laser pulses for investigating relaxation processes in solids will make it possible to obtain a series of new data.

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USSR

UDC: 621.373:530.145.6

VANYUKOV, M. P., ISAYENKO, V. I., PASHININ, P. P., SEREBRYAKOV, V. A., SIZOV, V. N., STARIKOV, A. D.

"Shaping of High-Power Pulses With a Steep Leading Edge in a Laser System With Passive Nonlinear Elements"

V sb. Kvant. elektronika (Quantum Electronics--collection of works), No 1, Moscow, 1971, pp 35-41 (from RZh-Radiotekhnika, No 5, May 71, Abstract No 5D177)

Translation: An investigation is made of the change in duration of light pulses during passage through illuminated media of different transparencies. A nonmonotonic reduction in pulse duration after passage through the medium is observed when there is a change in the density of the light load. A relationship is established between the region of maximum constriction of the light pulse and the magnitude of the light load for different concentrations of transilluminated media. An anomaly is found in the curve for the process of transillumination of a metallized film when it is exposed to intense light flux. Recommendations are made on using the observed effects for shaping short pulses with a steep leading edge, leading to development of a laser system based on neodymium glass with a pulse length of 5-7 nsec with a rise time of approximately 1 nsec and emission power of 20 GW. Five illustrations, bibliography of ten titles. Resumé.

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USSR

VANYUKOV, M. P., ISAYENKO, V. I., PASHININ, P. P., SEREBRYAKOV, V. A. SIZOV, V. N., STARIKOV, A. D.

UDC 621.375.82

"Formation of Powerful Pulses With a Steep Leading Front in a Laser System With Passive Nonlinear Elements"

V sb. Kvant. elektronika (Quantum Electronics -- Collection of Works), No. 1, Moscow, 1971, pp 35-41 (from RZh-Fizika, No 7, Jul 71, Abstract No 7D1147)

Translation: The change in the length of light pulses in passage through an illuminating medium of varying transparency was investigated. A nonmonotonic shortening of the length of the trailing pulse was observed under a change in the density of the light load. There was established a dependence of the region of maximum contraction of the light pulse on the magnitude of the light load for various concentrations of the illuminating solutions. There was also established an anomalous change in the process of illumination of a metallized film under its illumination by powerful light radiation. It is proposed that the effects observed be used for the formation of short pulses with a steep leading front. A neodymium glass laser system with a pulse length of 5-7 nsec, a steepness of the leading front of ~ 1 nsec, and a radiation power of 20 Gw was developed. 10 ref. Authors abstract

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USSR

PASHININ, P. P., PROKHOROV, A. M., Physics Institute imeni P. N. Lebedev, Academy of Sciences USSR

"Producing a High-Temperature Dense Plasma Under Laser Heating of a Special Gas Target"

Moscow, Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, No. 5, May 71, PP 1630-1636

Abstract: The problems of using lasers to produce a dense plasma of thermonuclear temperatures are discussed in connection with quantum electronics and the increasing interest in controlled thermonuclear fusion. Four types of plasma heating through the use of lasers are considered. The first version discussed is the focusing of high-intensity laser radiation on the surface of a semi-infinite target of a solid or liquid mixture of heavy isotopes of hydrogen or tritium. In the second version, the target is a small condensed particle introduced to or slowly entering a vacuum through the laser radiation focusing region. The third version assumes the use of a gas medium in which, under the focusing of laser radiation, there occurs optical breakdown and further heating of the plasma. The fourth is

USSR

PASHININ, P. P., PROKHOROV, A. M., Zhurnal eksperimental'noy i teoreticheskoy fiziki, No. 5, May 71, pp 1630-1636

based on the application of a CO_2 laser with a wavelength $\lambda = 10.6\ \mu$ which, in principle, permits heating of the plasma with a density of $10^{19}\ cm^{-3}$. In this case in the field of thermonuclear temperatures, one can speak of magnetic containment of a plasma with magnetic fields that can be technically achieved in the foreseeable future. This last version, however, is very difficult to discuss now, since the experimental base is in the very initial stages of development, although in addition to the above it is also very attractive in view of the possibility of producing appropriate lasers with a fairly high efficiency of 10-20%. The first two approaches are said to be the most promising, since they involve the use of an ultrahigh-density plasma with $n_i \sim 5 \cdot 10^{22}\ cm^{-3}$. It is noted that the use of a superhigh-density plasma makes it possible to considerably lower the volume of matter but that this, in turn, leads to a too rapid cooling of the plasma upon expansion in a vacuum, requiring lasers with a pulse length of $\leq 10^{-9}$ sec. It is also pointed out that a final evaluation of the promise of these two versions is still very indeterminate due to the inadequacy of knowledge concerning the interaction of intense laser radiation with a superdense plasma, electron heat conductivity in a dense plasma with a

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USSR

PASHININ, P. P., et al, Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, No 5, May 71, pp 1630-1636

considerable temperature and density gradient, and many other problems. It is pointed out that, by optimistic estimates, to obtain a positive yield of thermonuclear energy with respect to the energy in the laser beam for these versions it is necessary to have a laser with a pulse energy of 10^6 joule with a pulse duration of 10^{-9} sec, under the assumption that all of the laser energy goes into the plasma. Since the upper boundary of energy for such glass lasers with neodymium predicted for the next 5-10 years is in the range 10^4-10^6 joule, it is suggested that the other versions be given more attention, particularly the third version in which a gas target is used. It is shown that in using a magnetic field of the order of 10^6 oe it is necessary to use a laser pulse of length $\sim 10^{-7}$ with an energy of $3 \cdot 10^5$ joule to obtain a positive energy yield with respect to laser radiation in a thermonuclear fusion reaction in a mixture of deutorium and tritium isotopes. It is noted, in conclusion, that if an ultrastrong retardation of laser beams in a

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USSR

PASHININ, P. P., et al, Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, No 5, May 71, pp 1630-1636

dense plasma is observed in experiments with electron beams due to collective effects, targets with radial inertial containment, magnetic thermal insulation, and longitudinal gas flow into the vacuum can be used in this method of heating of plasma; one more parameter of the initial target -- the density of the gas -- can also be controlled by the experiment through a change in pressure in the channel.

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1/2 051 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--INVESTIGATION OF BREAKDOWN IN ARGON AND HELIUM PRODUCED BY A PICOSECOND RUBY LASER LIGHT PULSE -U-

AUTHOR-(03)-KRASYUK, I.K., PASHININ, P.P., PROKHOROV, A.M.

COUNTRY OF INFO--USSR

SOURCE--ZHURNAL EKSPERIMENTAL'NOY I TEORETICHESKOY FIZIKI, 1970, VOL 58, NR 5, PP 1606-1608

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--ARGON, HELIUM, RUBY LASER, PICOSECOND PULSE, IONIZATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3002/0002 STEP NO--UR/0056/70/058/005/1606/1608

CIRC ACCESSION NO--AP0127652

UNCLASSIFIED

2/2 051 UNCLASSIFIED

CIRC ACCESSION NO--AP0127652 PROCESSING DATE--20NOV70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE THRESHOLD FLUX FOR BREAKDOWN IN ARGON AND HELIUM INDUCED BY A 50 PICOSECOND RUBY LASER PLUSE IS INVESTIGATED. THE RESULTS SHOW THAT BOTH FOR ARGON AND HELIUM THERE EXIST PRESSURE RANGES IN WHICH BREAKDOWN OCCURS EITHER AS THE RESULT OF THE AVALANCHE MECHANISM OR AS A RESULT OF MULTIPHOTO IONIZATION OF THE GAS ATOMS IN THE FIELD OF A STRONG LIGHT WAVE. THE TWO MECHAMISMS CAN BE DISTINGUISHED THANKS TO THEIR DIFFERENT DEPENDENCE ON GAS PRESSURE. THE MAGNITUDES OF THE MULTIPHOTON IONIZATION PROBABILITIES ARE ESTIMATED FOR THRESHOLD VALUES OF THE BREAKDOWN FLUXES. THE EXPERIMENTAL BREAKDOWN THRESHOLDS AND IONIZATION PROBABILITIES ARE COMPARED WITH THOSE CALCULATED ON BASIS OF THEORETICAL DATA AVAILABLE IN THE LITERATURE. FACILITY: FIZICHESKIY INSTITUT IM. P. N. LEBEDEVA, AKADEMII NAUK SSSR.

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USSR

UDC 547.26'118 + 547.442.2

GAZIZOV, T. Kh., KIBARDIN, A. M., PASHINKIN, A. P., and PUDOVIK, A. N., Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov, Academy of Sciences USSR

"Reaction of Dialkyl Acyl Phosphites With Diacetyl"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 12, Dec 73, pp 2626-2631

Abstract: Reactions of dialkyl acyl phosphites with diacetyl and benzyl was studied showing that basically they yield dialkyl α-methyl-β-methyl-β-acyloxyvinyl phosphates. As the acid strength of the carboxylic acid comprising the acyl phosphite is increased, the direction of the reaction is shifted partially towards the formation of an alkyl carboxylate and a cyclic alkyl α,β-dimethylvinyl phosphate, respectively.

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"Reactions of the Acyl Culonides of Trivalent-Phosphorus Acids with α, β-Unsaturated Acids"

Leningrad, Zhurnal Obshchey Khimii, Vol 42(104), Vyp 8, 1972, pp 1730-1733

Abstract: A detailed study was made of the mechanism of the title reactions with special reference to behavior of the P atom of the chlorophosphines. The simultaneous reaction of the acrylic acid with equimolar mixtures of phenyl- and ethyldichlorophosphine (PDP and EDP, respectively) and the subsequent reaction with ethanol and triethylamine to form the ethyl ester of ethyl-β-carboethoxyethylphosphonic acid (45% yield) proceeds as follows:

$$(C_2H_5PCl_2 + C_6H_5PCl_2) + CH_2{=}CH{-}COOH \longrightarrow$$

$$\longrightarrow C_2H_5\overset{\overset{O}{\|}}{\underset{\underset{Cl}{|}}{P}}CH_2CH_2COCl + C_6H_5PCl_2$$

$$\xrightarrow{2(C_2H_5OH + (C_2H_5)_3N)} C_2H_5\overset{\overset{O}{\|}}{\underset{\underset{OC_2H_5}{|}}{P}}CH_2CH_2COOC_2H_5 + 2(C_2H_5)_3N \cdot HCl$$

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GAZIZOV, T. KH., et al., Zhurnal Obshchey Khimii, Vol 42(104), Vyp 8, 1972, pp 1730-1733

An analagous reaction occurs between PDP and ethyldichlorophosphite. On the other hand, EDP, when treated with a mixture of acrylic and metacrylic acids reacts only with the former which is a strong electrophil. These two observations support the assumption that the P atom has a nucleophilic character. Thermal analysis and NMR data on P^{31} were used to elucidate the nature of the intermediates. IR spectra were also discussed.

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UDC 547.26'118 + 547.442.2

GAZIZOV, T. Kh., KIBARDIN, A. M., PASHINKIN, A. P., SUDAREV, Yu. I., and PUDOVIK, A. N., Institute of Organic and Physical Chemistry Imeni A. Ye. Arbuzov, Academy of Sciences, USSR

"Reactions of the Trimethylsilyldiethyl Ester of Phosphorous Acid With Diacetyl"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 3, Mar 73, pp 679-680

Abstract: Reacting trimethylsilyldiethyl ester of phosphorous acid with diacetyl at a temperature below 20° yields diethyl-α-trimethylsiloxy-α-acetoethylphosphonate, b.p. 84-86°/1 mm, d_4^{20} 1.1180, n_D^{20} 1.4335. The structure was confirmed by an independent synthesis from diethyl-α-hydroxy-α-acetoethylphosphonate and trimethylchlorosilane and by IR and NMR ^{31}P spectroscopic analysis.

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GAZIZOV, T. Kh., PASHINKIN, A. P., and PUDOVIK, A. N.

"Reaction of Tetraethyl Pyrophosphite With the Halogens, Acetyl Chloride, and Acrylic Acid"

Leningrad, Zhurnal Obshchey Khimii, Vol 41, No 11, Nov 1971, pp 2,418-2,420

Abstract: The published information on the reactivity of tetraalkyl pyrophosphites toward various electrophilic reagents is limited; here the reactions of tetraethylpyrophosphite with chlorine, bromine, acetyl chloride and acrylic acid are studied. In the reaction with the first three reagents, the corresponding acyl halides were formed in addition to diethyl halophosphates and diethyl acetophosphonate. In the case of the reaction with acrylic acid, diethylphosphorous acid was formed, along with diethyl acryloylphosphite.

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100826d Thermal isomerization of a mixed anhydride of diethyl phosphorous and acrylic acids. Gazizov, T. Kh.; Pashinkin, A. P.; Pudovik, A. N. (USSR). *Zh. Obshch. Khim.* 1970, 40(1), 31-2 (Russ). $(EtO)_2POC(O)CH:CH_2$ (I) formed from thermal isomerization of the mixed anhydride of $(EtO)_2POH$ and $CH_2:CHCO_2H$ heated with excess abs. EtOH in the presence of a drop of Et_3N 2 hr gave 48% $(EtO)_2PHO$ and 61.3% $(EtO)_2P(O)CH_2CH_2CO_2Et$, $b_{1.5}$ 109-10°, d^{20} 1.1016, n_D^{20} 1.4310. Passing $CH_2:CO$ into $(EtO)_2P(O_2CCH:CH_2)$ 50 min at room temp. resulted in an exothermic reaction that yielded 59.9% $(EtO)_2P(O)C(:CH_2)O_2CCH:CH_2$, $b_{0.04}$ 84-5°, 1.1089, 1.4510.

G. M. Kosolapoff

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UDC 547.26'118

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"Diethylacetylphosphite Reaction With Amines"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 9, Sep 70, p 2130

Abstract: Reaction of diethylacetylphosphite (I) with diethylamine (II) carried out in petroleum ether at -5° gave diethylammonium acetate and diethylphosphorous acid diethylamide when the reagent ratio was 1:3. A 1:1 ratio of (I) to (II) gave a mixture of diethylphosphorous acid (III) and diethylamide of acetic acid. Reaction of (I) with dibutylamine is also dependent on the ratio of reagents. When aniline was reacted with (I), acetanilide and (III) were formed, but when the reaction was carried out in the presence of triethylamine, the anilide of (III) was obtained. It is proposed that the reaction between dialkylacylphosphites and amines is a reversible reaction.

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"Some Reactions of Mixed Anhydrides of Carboxylic and Dialkylphosphorous Acids"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 7, Jul 70, pp 1481-1485

Abstract: The authors studied the interaction of chloral with mixed anhydrides of diethylphosphorous acid and formic, isobutyric, pivalic and acrylic acids, as well as the mixed anhydride of diisopropylphosphorous and acetic acids. It was found that the reaction of chloral with the mixed anhydride of diethylphosphorous acid and formic acid follows an Arbuzov reaction scheme to give the ester of formic acid and diethoxyphosphonotrichloromethylcarbinol. The reactions with the other mixed anhydrides proceed analogously. The reactions with the mixed anhydride of diethylphosphorous acid and benzoic acid or its p-substituted derivatives reacts with chloral in two directions, viz. according to the Ar-

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PASHINKIN, A. P., et al., Zhurnal Obshchey Khimii, Vol 40, No 7, Jul 70, pp 1481-1485

buzov scheme and the Perkov scheme. If a methyl group possessing a positive inductive effect is introduced into the p-position, there is an increase in the yield of the Perkov scheme product and a decrease in the Arbuzov scheme product. The introduction of a nitro group possessing a negative inductive effect directs the reaction completely towards the formation of a phosphonate.

The reactions of the mixed anhydrides of dialkylphosphorous and carboxylic acids with iodine, bromine and acetyl halides were studied. It was found that the reactions of diisopropyl acetylphosphite and diethyl benzoylphosphite with bromine at a low temperature proceed according to the Arbuzov scheme to give carboxylic and dialkylphosphoric acid halides, which subsequently interact to give an alkyl halide.

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USSR

UDC 542.944 + 546.14 + 661.718.1

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"Ethyl o-Benzoylenephosphite Reaction With Bromine"

Moscow, Izvestiya Akademii Nauk USSR, Seriya Khimicheskaya, No 2, Feb 71, pp 437-439

Abstract: The reaction of ethyl o-benzoylenephosphite with bromine follows the Arbuzov reaction, forming ethyl o-bromoformylphenylphosphonic acid bromide which then decomposes to ethyl bromide and o-benzoylenephosphonic acid bromide. Bromine was added slowly to ethyl o-benzoylenephosphite, the temperature was then brought up to 100°, ethyl bromide was evaporated, the residue treated with an equimolar mixture of ethanol and triethylamine in benzene. The mixture was refluxed in benzene for 2 hrs, filtered and ethyl o-benzoylenephosphate isolated by distillation. When the same reaction was carried out at temperatures below -10°C, the product was diethyl o-carbethoxyphenylphosphate, b.p. 124-125°/0.006 mm, d_4^{20} 1.1893, n_D^{20} 1.4843.

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UDC: 547.26+547.233+546.185.325

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"Rupture of the Phosphorus-Carbon Bond in Alpha-Ketophosphonate Esters"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 1, Jan 70, pp 28-30

Abstract: Reactions of alpha-ketophosphonate esters (I), where R at P is methyl, isopropyl, tert-butyl, or phenyl with nucleophilic agents, such as alcohols and amines, proceed under relatively mild conditions and result in rupture of the P-C bond. Nucleophilic substitution is thought to be the mechanism of the bond rupture. The composition of the reaction products is greatly affected by the ratio of the reactants. Adding 2-3 drops of triethylamine to a 1:1 mixture of (I) and ethanol gave diethylphosphorous acid (yield 31.9%) and diethyl alpha-diethylphosphonethyl phosphate (II) (yield 55.5%). Apparently, II was formed by phosphonate-phosphate isomerization under the influence of the basic catalyst. Formation of (II) may be minimized by the presence of a large excess of the nucleophilic agent. The reactions with primary aliphatic amines proceed similarly but much easier, and the exothermic effect is significantly higher than with ethanol. Dialkylphosphorous acid and an amide of the corresponding carboxylic acid are formed.

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