

USSR

UDC 681.325.65

BLAZHKEVICH, B. I., VOROBKEVICH, V. Yu., MASLOV, V. S., SOLOMCHAK, V. P.,
and YATSUN, I. A.

"An Analog-Digital Measurement Converter"

Novosibirsk, Konf. po avtomatiz. nauch. issled. na osnova primeneniya EVM,
1972--sbornik (Conference on Automating Computer-Based Scientific Research,
1972--collection of works), 1972, pp 84-90 (from RZh-Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 11, Nov 72; abstract No 11B307)

Translation: The authors consider a servo-type analog-digital converter designed for remote measurement of a slowly varying component of the output voltage of a static electric field strength pickup within limits of ± 640 mV with an error no greater than 0.025% for a transmission channel error of up to 1%. The converter consists of a measurement amplifier, a device for automatic selection of subranges, a control unit, and a power supply. The given measurement range is broken down into 128 partially overlapping subranges; selection of subranges is accomplished by automatic comparison of the input quantity with a discretely variable voltage formed by a code-analog converter from a reference voltage source. One illustration, bibliography of nine titles. L. P.

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UNCLASSIFIED

PROCESSING DATE--23OCT70

TITLE--ULTRAVIOLET FLUORESCENCE OF BIOLOGICAL OBJECTS EXPOSED TO IONIZING RADIATION EFFECTS -U-

AUTHOR--(05)-ALEKSANDROV, S.N., BRUMBERG, I.YE., VOROBTSOVA, I.YE., KOND RATY EVA, T.M., SAFRONOVA, V.G.

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

ABSTRACT. EXPERIMENTAL STUDY OF THE HEREDITARY UV LUMINESCENCE OF CANCEROUS CELLS OF MICE AND LYMPHOSARCOMATOUS CELLS OF RATS TRANSPLANTED TO NONIRRADIATED ANIMALS AFTER EXPOSURE TO A 500 R DOSE OF IONIZING RADIATION. IT IS FOUND THAT THE DAUGHTER CELLS PRODUCED BY SUCH TRANSPLANTED CELLS RETAINED THE FLUORESCENT PROPERTIES OF THEIR PARENT CELLS AND PASSED ON THESE PROPERTIES TO THEIR OFFSPRING DURING THE MULTIPLICATION IN NONIRRADIATED ORGANISMS. THE HEREDITARY TRANSMISSION OF RADIATION INDUCED CHANGES IN THE MYELOCYTES, METAMYELOCYTES AND SEGMENTAL NUCLEUS NEUTROPHILS OF IRRADIATED RATS IS ALSO DEMONSTRATED. THE VARIOUS TYPES OF RADIATION DAMAGE LEADING TO THE INTENSIFICATION OF UV FLUORESCENCE IN IRRADIATED CELLS ARE DISCUSSED.

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USSR

UDC 539.1

VOROB'YEV, A. A., GRACHEV, V. T., KONDUROV, I. A., NIKITIN, A. M., and
SELIVESTROV, D. M., Physicotechnical Institute imeni A. F. Ioffe

"The Formation of Light Nuclei in the Thermal-Neutron Induced Fission
Reaction of Uranium Isotopes"

Moscow, Problemy Fiziki Elementarnykh Chastits i Atomnogo Yadra [(Problems
of the Physics of Elementary Particles and the Atomic Nucleus)], Atomizdat,
Vol. 2, No 4, 1972, pp 939-958

Abstract: Consideration is given to the results of an experimental study of
light nuclei produced in the process of thermal-neutron induced ternary
fission of U^{235} and U^{233} . The experimental installation is described.
Instead of using semiconductor-detector $\Delta E - E$ telescopes for identification
of the particles, a mass spectrometer was used for simultaneous measurement
of the following particle parameters: BP, v , E , $\Delta E/\Delta x$. Data on the yield
and energy spectra of hydrogen, helium, lithium, and beryllium isotopes are
presented. The yields of all the isotopes were measured with respect to
the yield of the alpha-particles. These results are compared with the
theoretical data and with data obtained from fission under the action of
fast protons. 12 figures, 6 tables, 32 references.

1/1

USSR

UDC: 539.121.72

VOROB'YEV, A. A., AREF'YEV, K. P., BOROV'YEV, S. A., FILEV, A. Ya., Tomsk
Polytechnical Institute imeni S. M. Kirov

"Capture of Positrons by F-Centers in Tempered Crystals"

Tomsk, Izvestiya VUZov: Fizika, No 2(129), 1973, pp 141-143

Abstract: Curves of angular correlation of gamma quanta were measured in KCl and NaCl single crystals to determine the influence which tempering of colored crystals has on the process of annihilation of positrons. Angular resolution was approximately 1 mrad with a measurement accuracy of at least 3%. Crystals measuring 20 x 30 x 1 mm were tempered by cooling from 700°C on a massive copper sheet in air. The results of the experiment confirm the possibility of positron capture by color centers induced in crystals by various methods. The method of positron annihilation is apparently an indicator of color centers which are localized on dislocations and other structural defects.

1/1

USSR

UDC 621.384.01

VOROB'YEV, A. A., Tomsk Polytechnical Institute imeni S. M. Kirov

"Possible Schemes of Cyclic Electronic Acceleration Without Radiation"

Tomsk, Izvestiya Vuzov, Fizika, No 10, 1973, pp 10-15

Abstract: This paper was presented 20 May 1971 at a session of a scientific seminar of the Physics Department of Moscow State University, directed by Professor D. D. Ivanenko, and again on 19 May 1972 at a session of the Electron Accelerator Section, Scientific Council of the USSR Academy of Sciences for Accelerators.

The development of synchrotron radiation limits the power potentially achievable by accelerating electrons or positrons in circular orbits. There are two exceptions to this. Electrons moving in Bohr orbits do not radiate continuously. It is also possible, in theory, for the radiation of a multitude of electrons to be cancelled by interference effects; calculations show that at energies of 10^9 ev, 10^{10} polarized electrons uniformly distributed in orbit are enough to obtain complete damping.

The Bohr atomic model leads to a picture of an accelerator with a strong inwardly directed electric field; an earth satellite would be a particularly suitable location for such an installation. In the second concept, a non-radiating accelerator can be achieved if the conditions of thermodynamic

1/2

USSR

VOROB'YEV, A. A., *Izvestiya Vuzov, Fizika*, No 10, 1973, pp 10-15

equilibrium are established. Conceptually, this can be achieved if the circular orbits are considered to consist of a series of straight line movements, with the changes in direction resulting from collisions -- with other electrons, with other particles, or with quanta. Although theory indicates that contemporary 1 - 6 Bev synchrotrons with 10^{12} electrons in orbit should achieve radiation-free operations, radiation is observed. The electrons may be in packets rather than uniformly distributed. When the electrons are channelized and accelerated in uniformly curved crystal lattices, taking advantage of wave guide properties, the necessary conditions of uniform distribution for radiation-free movement will be achieved.

It has been shown that the physically possible schemes for radiation-free cyclic acceleration of electrons and positrons can be achieved only at the large scales necessary in future accelerators.

A. A. Vorob'yev and F. A. Vorob'yev have suggested a plan for such an accelerator, involving the application of coherent radiation sources to establish the necessary interference conditions for the suppression of radiation.

2/2

USSR

UDC 621.384.01

VOROB'YeV, A. A., Tomsk Polytechnical Institute imeni S. M. Kirov

"An Accelerator in Artificial Earth Satellites"

Tomsk, Izvestiya Vuzov, Fizika, No 10, 1973, pp 7-10

Abstract: This paper was presented 19 May 1972 at a session of the Electron Accelerator Section, Scientific Council of the USSR Academy of Sciences for Charged Particle Accelerators.

The continuing development of requirements for accelerators producing larger numbers of more powerful particles is straining society's resources. At the same time, considerable attention has been attracted by the possibility of performing various exotic chemical, biological, and industrial processes in space. The use of particle accelerators in space will also offer advantages. In addition to better conditions for certain experiments that are presently possible, there are a number of experiments (particularly related to the theory of relativity) that cannot conveniently be performed at the earth's surface. Two basic types of accelerator are under consideration. The first type would use the magnetic field of the earth and the wave guide properties of the ionosphere. It is estimated that an accelerator of this type could produce 10^{15} - 10^{16} electrons at a current density of 450 amperes per square centimeter

1/2

USSR

VOROB'YeV, A. A., Izvestiya Vuzov, Fizika, No 10, 1973, pp 7-10

and energies up to 10^{12} electron volts with respect to the earth's surface. The second type would be a conventional accelerator, taking advantage of the cryogenic cold of space and the available vacuum to significantly reduce equipment sizes and costs. The lack of gravity and destabilizing factors would also sharply reduce the strength and weight requirements of the equipment. Of course, new problems would be encountered, but most of these are common to any installation in space and will be solved as such installations are developed.

2/2

USSR

UDG 539.124.17

VOROB'YEV, A. A., YEVDOKIMOV, O. B., and RYZHAKOVA, N. K., NII [Scientific Research Institute], Tomsk Polytechnic Institute imeni S. M. Kirov

"Some General Questions in Fast Electron Transfer. IV. Transfer in Matter in an Electric Field"

Tomsk, Izvestiya Vysshikh Uchebnykh Zavedeniy -- Fizika, No 1, 1973, pp 23-27

Abstract: The article uses the segment model as the basis for a general method for calculating the passage of electrons in a substance in approximation of continuous moderation in a homogeneous electric field. The criterion of a comparatively weak field is derived for determining the Green function for the trajectory segment. A system of recurrent relations is obtained for the momenta of the distribution function. The principal properties of special functions occurring in theory are considered. The problem of electron energy degradation, with allowance for electron multiplication, is solved for an evaluation of the upper limit of the role of secondary electrons.

1/1

- 47 -

USSR

UDC 615.37.032

VOROB'YEV, A. A., NEKRASOV, I. L., and BANDAKOV, L. F.

Bezygol'nyy Sposob Vvedeniya Biologicheskikh Preparatov v Organizm (Needleless Method of Introducing Biological Preparations into the Organism), Moscow, Meditsina, 1972, 104 pp

Translation: Annotation: This work is the first monograph in domestic and foreign literature on the needleless (jet) method of introducing biological preparations into the organism. From a scientific and practical point of view, the authors present their own material and data from the literature concerning needleless injection with due regard for all its characteristics.

The book gives general information on the jet method of introducing vaccines and serums into the organism and describes the working principles and characteristics of various designs of needleless injectors. There is a detailed presentation of data on the reaction-causing properties and immunological effectiveness of various biological preparations introduced by needleless injection.

The monograph is intended for doctors in various specializations (microbiologists, immunologists, clinical doctors, and pharmacologists), as well as for engineers employed in the design of medical equipment.

Introduction
1/2

Table of Contents

Page
3

USSR

YOROB'YEV, A. A., et al., Meditsina, 1972, 104 pp

| | |
|--|----|
| 1. General Information on the Needleless (Jet) Method of Introducing Biological Preparations into the Organism | 5 |
| The Development and State of Research on Needleless Injection | 5 |
| Basic Characteristics of the Method of Jet Injection | 12 |
| 2. Designs of Needleless Injectors and Their Working Principles | 23 |
| Primary Working Processes in the Needleless Injector and Requirements for the Injector | 23 |
| Description of Existing Designs of Needleless Injectors | 28 |
| The Needleless Injector of the All-Union Scientific Research Institute of Surgical Equipment and Instruments | 52 |
| Model No 3 | 52 |
| Model No 4 | 54 |
| 3. Reaction-Causing Property and Effectiveness of Vaccines and Serums Introduced by the Needleless Method | 61 |
| Local and General Reactions to the Introduction of Preparations by the Jet Method | 61 |
| Effectiveness of Biological Preparations Introduced by the Needleless Method | 81 |
| Bibliography | 98 |

2/2

USSR

UDC 610.017.1:[577.23+575](047)

VOROB'YEV, A. A. and KLYUCHAREV, L. A.

"Molecular-Genetic Aspects of Immunogenesis: a Review of the Literature"

Moscow, Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii, No 10, 1972,
pp 26-31

Abstract: The formation of specific antibodies responsible for humoral immunity is now generally believed to take place in the following manner. Antigen as a foreign substance is absorbed by macrophages and destroyed by fermentation, giving rise to specific "immune" RNA capable of inducing the differentiation and synthesis of antibodies in various types of plasma cells. Mature plasma cells possess the necessary apparatus for intensive protein synthesis and antibodies are formed by the usual mechanisms. Polypeptide chains of antibodies are synthesized in polysomes on matrices of information RNA whose appearance is induced by preformed antigen. Antibodies then leave the plasma cells and enter the lymph and blood stream where they may specifically bind antigen, thereby performing their protective function. Recent published data relating to the molecular mechanisms of immunogenesis and antigen specificity add new details on the processes by which sensitive cells bind antigen and on the transmission of information and differentiation of somatic cells capable of producing antibodies.

1/1

USSR

UDC 615.276.2(031)(049.3)

VOROB'YEV, A. A. (Reviewer)

Immunodepressory (Immunosuppressants) by R. V. Petrov and V. M. Man'ko, Moscow, 1971, 299 pp

Moscow, Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii, No 10, 1972, pp 153-154

Abstract: This monograph is the first systematization in any language of published data pertaining to the effects of immunosuppressants on the various immunological systems. More than 350 substances differing in nature and origin are set forth in alphabetical order in two tables. Information is given on the immunological systems affected by the preparations, animals used (species, sex, weight, age, line), schedule of administration (dose, number of times and methods of use), toxicity, efficacy according to different criteria (antibody formation, cytological and morphological changes, effect on resistance to pathogenic agents, on transplantation immunity, etc.). Included are evaluations of the preparations used in the treatment of autoimmune diseases, allergies, enoplasms, and organ transplants in man. The monograph is further enhanced by a subject index (which includes synonyms), index of animals used, index of immunological systems, and index of investigators. The introduction describes the current status of the problem and suggests future lines of research.

1/1

USSR

UDC 615:372:576.852.23].012.8

KHAVKIN, Yu. A., AKATOVA, E. N., and VOROB'YEV, A. A., Ufa Institute of Vaccines and Sera imeni Mechnikov

"A Method of Obtaining Highly Purified Diphtheria Toxin"

Moscow, Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii, No 11, 1971, pp 91-96

Abstract: A new method of producing large quantities of pure diphtheria toxin is described. The method includes removal of porphyrin and other ballast substances from the crude toxin through adsorption on charcoal; a 50-70-fold concentration of the filtrate by ultrafiltration through molecular sieves; separation of the ultrafiltrate (2-3% proteins) into three fractions on sephadex gel columns; elimination of two fractions through precipitation with ammonium sulfate; and purification of the middle-peak fraction through sephadex ion-exchange chromatography. The product has a specific activity of 2,700-3,400 Lf/mg of total nitrogen and 40-50 MLD/Lf. It contains no admixtures of somatic antigens and is homogeneous, as indicated by electrophoresis in polyacrylamide, ultracentrifugation, thin-layer gel filtration, and precipitation in agar. The purified toxin is composed of four to six discrete components with isoelectric points at a pH of 4.5-5.0. All the components have toxic and nuclease properties and are neutralized and precipitated with pure anti-toxin.

1/1

MEDICINE

VOROB'YEV, A.A.

PREPARATION OF THE VACCINAL EV STRAIN THROUGH THE ORAL MUCOSA AFTER PERORAL
ADMINISTRATION OF ANTIBIOTICS

UDC 613.572.031.311-025.73

SPMS 56216
9 Nov 73

Developed by A. A. Vorob'yev, V. I. Dolgov, Ye. H. Zerkov, and A. D. Ukrainskiy.
Soviet Journal of Microbiology, 1971, 13, 2, 103-104.

An important factor in peroral immunization is the permeability of
initial stage in the complex process of immunogenesis. In an earlier commu-
nication (Vorob'yev and Dolgov, 1971) we studied a possible route by which
antibiotics can penetrate through the oral mucosa into the organism.
Only the tetracycline route, in a matter of a few days, and naphthylmethane
resonance compound (NMC) route, in a matter of a few days, were shown to be
effective. In 1963 and Khankin, 1964; Lyubchik and Andreyeva, 1965; Vygon-
ov et al., 1966; Zakovch et al., 1967; Zakovch and Andreyeva, 1968; La Brec-
Arlet and Hoffmann, 1970). The other mechanism of microbial permeability

Our previous studies showed that the introduction of live vaccine
from the EV strains into the oral cavity of guinea pigs, stimulated the
vaccinal process which resulted in complete immunity. We indicated the
1959). The purpose of this work was to study the permeability of the oral
of the plaque vaccinal EV strain through the oral mucosa of experimental
animals.

Guinea pigs (250 to 300 g) and rabbits (2 to 2.5 kg) were immunized
perorally with freshly prepared suspensions of the plaque vaccinal EV strain
in a special needle and olive oil which a rubber tube was placed to prevent
injury to the mucosa (Vorob'yev et al., 1970). The vaccine dose contained
20 billion live microbial cells for the guinea pigs and 57 to 70 billion
cells for the rabbits.

VOROB'YEV, A. A.

medicine

CHARACTERISTICS OF THE COURSE OF ACCLIMATIZATION PROCESSES AMONG CREW IN THE POLAR REGIONS

P. A. Proberskiy and A. A. Vorob'yev,
Scientific Research Institute of Polar
Transport Hygiene, USSR Health Ministry

SPRS 56852
15 JUNE 73

Our investigations for studying the functional state of seamen were conducted during a voyage beyond the Arctic Circle during the autumn-winter months. The outside temperature was in the range -10° - 50° C, relative humidity was up to 90%, and wind velocity on individual days attained 20-30 m/sec.

Under these conditions it was possible to detect changes in different physiologic systems in the bodies of deck crews.

Investigation of higher nervous activity was by the chronoreflexometric method. At the beginning of the voyage the mean duration of the generator reaction for those seamen was 0.64±0.06 sec. By the end of the first month in the acclimation process the reaction time decreased to 0.49±0.13 sec. By the third month of the voyage in the process of acclimation of latitude the response reaction time increased to 0.51±0.05 sec. The number of cases of disturbance of differentiation increased.

The functional state of the cardiovascular system was evaluated by registering the pulse rate, level of arterial pressure, and determining the circulation time by the oxysymometric method.

The initial pulse rate for the seamen was in the range 64-82 beats per minute. By the end of the first month of the voyage there was some thinning of the frequency of cardiac contractions, but at the end of the voyage the pulse rate had increased in individual subjects.

USSR

UDC 615.371:576.851.45/.015.2:615.835.5/.015.4:612.112.3

OSIPCV, V. I., VOROB'YEV, A. A., IGONIN, A. M., ZEMSKOV, Ye. M., and
PATRIKEYEV, G. T.

"Electron Microscopic Studies of Phagocytosis Kinetics of Plague Vaccine
Strain EV by Pulmonary Macrophages in Guinea Pigs on Intratracheal
Immunization"

Moscow, Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii, No 9, 1973,
pp 42-44

Abstract: Electron microscope studies were conducted on phagocytosis of a
live plague vaccine, strain EV, administered into the tracheas of guinea
pigs. The results showed that 5 to 15 minutes after administration the
majority of the bacterial cells adhered to the surfaces of alveolar macrophages.
This was followed by the formation of pseudo-pods, invagination, and vesicle
formation. After 45 to 60 minutes the vast majority of the bacterial cells
were within the macrophages, with only individual microbes located extra-
cellularly. After 90 minutes the endocytic vesicles contained only amorphous
masses and in only a few cases could residues of the vaccine be identified.

1/1

- 33 -

USSR

UIC: None

VOROB'YEV, A. A., BOEUDAYEV, A. Ya., VOROB'YEV, S. A., and KAPLIN, V. V.

"Scattering of Electrons by Monocrystals"

Leningrad, Fizika Tverdogo Tela, vol 14, No 7, 1972, pp 2157-2159

Abstract: This paper is the consequence of an earlier one (H.C.H. Nip et al, Phys. Lett., 28A, 1968, p 324) in which the possibility of the existence of stable trajectories for fast electrons scattered by a monocrystal was discussed. Such an effect should result in the anomalous passage of electrons through the crystal if the axis of the incident beam coincides with one of the crystallographic directions of the target. This paper describes measurements made to detect such an anomalous electron flow. The electron beam was obtained from a radioactive source, (Sr+Y)⁹⁰, with the angular scattering of the electron beam incident on the target reduced to 0.5° through strong collimation. NaCl monocrystals were used as the target, and the recording device was the USD-1 scintillation counter. A curve is plotted for the electron scattering by a 190-μ-thick NaCl crystal as a function of the rotational angle of the crystal axis with respect to the direction of the incident beam. The authors, members of the S. M. Kirov Polytechnical Institute at

1/2

USSR

VOROB'YEV, A. A., et al, Fizika tverdogo tela, vol 14, No 7, 1972,
pp 2157-2159

Tomsk, express their gratitude to I. A. Tsekhanovskiy for his comments on the experimental results.

2/2

- 42 -

USSR

VOROB'YEV, A. A., MURASHKO, L. T., Tomsk Polytechnical Institute imeni S. M. Kirov

"Formation of Cavities in the Breakdown of Ionic Crystals"

Leningrad, Fizika Tverdogo Tela, Vol. 14, No. 1, Jan 72, pp 256-258

Abstract: Three stages in the electrical breakdown of solid dielectrics are considered: the stage of discharge formation, the stage of completion of the discharge, and the post-breakdown stage. It is noted that mechanical breakdown of the dielectric between electrodes is characteristic of the stage of discharge completion and the post-breakdown stage and appears in the form of breakdown channel formation and crack formation. The authors observed that a different type of mechanical breakdown of the structure of a sample was observed in the breakdown of alkali-halide crystals: the formation of cavities within the crystal. This cavity formation was observed in the breakdown of NaCl, KCl, and KBr. The samples were subjected to a pulsed voltage of from 2.5 to 4 kv, and cavity formation occurred in the majority of the samples. The size and number of the pores were different. Single pores were formed in some samples, and in others there were whole clusters; the largest pores were

1/2

USSR

VOROB'YEV, A. A., MURASHKO, L. T., Fizika Tverdogo Tela, Vol. 14, No. 1, Jan 72, pp 256-258

observed in KBr samples, and their linear dimensions were as high as 50 μ . Pore formation was observed only in those samples where electric breakdown occurred. Cavities were not observed in samples subjected to voltage but that did not break down. It is hypothesized -- on the basis of this fact and the fact that the shape of the boundaries of the segment on which the pores are formed, which are close to circular in shape, -- that pore formation is associated with the two last stages in the breakdown: the stage of the completion of the discharge and the post-breakdown stage, which end with the rise of the shock wave. The shock wave has spherical symmetry if the diameter of the breakdown channel is commensurable with the distance between the electrodes. It is concluded that (1) quantitative estimates are still difficult and can only be very approximate, since a large number of dislocations are formed, together with vacancies, in the plastic deformation of a sample in an electric field by the shock wave and that (2) the mechanism for the formation of cavities in metals and ionic crystals is far from clear and therefore the study of the formation of cavities in electric breakdown and the possibility of their visual observation can provide new information for an understanding of this mechanism.

2/2

- 54 -

USSR

VOROB'YEV, A. A.; et al (Tomsk Polytechnical Institute im. S. M. Kirova)

"Orientation Effects of the Scattering of Beta Particles in Single, Thick Crystals"

Leningrad, Fizika Tverdogo Tela; November, 1972; pp 3310-5

ABSTRACT: The effect of the orientation of single crystals of the NaCl type on the passage and back scattering of electrons from a beta source (Sr-Y)⁹⁰ is studied. The discharge of electrons scattered by orientation is explained in terms of classical mechanics by the focussing effects of the electrons by atomic chains. The anomalous passage of electrons which was discovered is explained by their capture on stable trajectories of motion. A study of the orientation effects of the electron scattering in single, thick crystals shows that the yield of back scattering is more sensitive than scattering at small angles to the influence of the crystalline structure.

1/1

- 43 -

Mining and Petroleum

USSR

UDC 553.98.001.5:550.37

VOROB'YEV, A. A., Tomsk

"Energy Conversion, Electrization of Rock and Discharges in the Interior Parts of the Earth"

Kishinev, Elektronnaya Obrabotka Materialov, No 1 (43), 1972, pp 49-56

Abstract: A study was made of some properties of rock -- its electrization and the possibility of occurrence of electric discharges in it. New scientific data are used for a broader investigation of the problem of electrization than was performed previously [E. I. Parkhomenko, Elektricheskiye svoystva pornykh porodakh, Moscow, Nauka Press, 1965; Yavleniya elektrizatsii v gornykh porodakh, Moscow, Nauka Press, 1968]. The possibility of converting various forms of energy into the energy of a high-intensity electrostatic field in the interior parts of the Earth is demonstrated. Some possible methods of the formation of free electric charges and electric fields as a result of deformation or destruction of dielectric minerals and rock in the interior parts of the Earth, friction, radioactive decay, metamorphism, and so on are discussed. When the field intensity reaches a value equal to the electric strength of the medium, electric discharges can take place which are capable of causing seismic phenomena in the Earth's crust, melting the rock and causing the eruption of molten magma, plasmochemical reactions of the decomposition of compounds with the

1/2

USSR

VOROB'YEV, A. A., Elektronnaya Obrabotka Materialov, No 1 (43), pp 49-56

formation of free chemical elements or the reactions of obtaining complex chemical compounds, the processes of atomization of substances in a strong electric field and also electrical working of the rock.

The phenomenon of electric discharge in the Earth's crust can be realized artificially by various technical media, and the possibility is obtained of artificial formation of oil in a discharge plasma, opening of channels and tunnels in the interior parts of the Earth in a given direction, and so on. Operations with respect to removal of the rock from the longwall must be performed simultaneously.

2/2

- 55 -

Nuclear Physics

USSR

UDC 621.384.6

VOROB'YEV, A. A., NIKITIN, M. M., and KOZHEVNIKOV, A. V.

"Experimental Study of Linear Polarization of Synchrotron Radiation of High-Energy Electrons"

Moscow, Atomnaya Energiya, Vol 29, No 5, Nov 70, pp 389-391

Abstract: The article continues the authors' study of synchrotron radiation on the Tomsk Polytechnic Institute synchrotron for an energy of 1.5 Gev. The linear polarization of synchrotron radiation was studied according to the method of F. A. KROLEV, O. F. KULIKOV, and A. S. YAROV. Typical examples of the angular intensity distribution of the polarization components in the vertical plane for various accelerated electron energies are given. There is good agreement between experimental and theoretical results for the σ -component. The angular distribution of the π -component differs from the theoretical and depends on accelerator adjustment. A characteristic peculiarity of the angular distribution of the π -component is the absence of radiation in the direction of instantaneous velocity (tangent to the

1/2

USSR

VOROB'YEV, A. A., et al., Atomnaya Energiya, Vol 29, No 5, Nov 70, pp 389-391

electron orbit). This is confirmed experimentally; however, in some cases at $\lambda = 4350 \text{ \AA}$ the intensity in the minimum of the π -component does not equal zero, though it is very small. Measurements showed good agreement between the intensity distributions of the σ - and π -components of synchrotron radiation linear polarization and theoretical results up to energies of 1 Gev.

The authors thank A. N. DIDENKO and O. F. KULIKOV for their interest and assistance.

2/2

- 113 -

USSR

UDC 539.1.01

VOROB'YEV, A. A., VOROB'YEV, V. A., TARASOV, G. P., Tomsk Polytechnical Institute
Imeni S. M. Kirov

"On the Question of Evaluating the Variation in Bremsstrahlung Behind a Plane Layer With a Cylindrical Cavity"

Tomsk, Izvestiya Vysshikh Uchebnykh Zavedeniy - Fizika, No. 12, 1970, pp 123-125

Abstract: This treatment of the problem assumes a source with a continuous spectrum with a Schiff distribution; previous studies assumed a monoenergetic source. An expression is given for the perturbation in the intensity of bremsstrahlung behind a layer with a cylindrical cavity (on the axis of the cavity) under irradiation of the layer by a plane perpendicular beam. The coefficients of the expression for iron are graphed as a function of the thickness of the layer for bremsstrahlung with maximum energies 6 Mev and 30 Mev. The coefficients determine the perturbation and intensity on the axis of the cavity where the contribution of the scattered component should be greatest due to the symmetry of the problem. It is pointed out that the effect of the scattered component is slight, and it is therefore concluded

1/2

USSR

VOROB'YEV, A. A., et al, Izvestiya vysshikh uchebnykh zavedeniy - fizika, No. 12, 1970, pp 123-125

that if a plane layer with a cavity is irradiated by a perpendicular beam of bremsstrahlung, the effect of the position of the cavity and its shape on the magnitude of the perturbation in intensity behind the layer is slight. The contribution to the total variation of the scattered component, which gives information on the position and shape of the cavity, is of a magnitude no less than the second order compared with the contribution of the direct component, which carries information on the ray dimension of the cavity (both components being considered infinitesimals).

2/2

- 82 -

Electricity & Magnetism

USSR

VOROB'YEV, A. A., YEVDOKIMOV, O. B., and TUBALOV, N. P., Tomsk Polytechnical
Institute imeni S. M. Kirov

"Effect of Overcharge of a Dielectric Charge by an Electron Beam"

Leningrad, Fizika Tverdogo Tela, No 12, Dec 71, pp 3691-3692

Abstract: It is shown for the first time that a change in the sign of the effective space charge can occur in plexiglass in the course of time. It is noted that it was known that a negative space charge of thermally insulated electrons is produced upon the irradiation of high-ohmic dielectrics by fast electrons, and this appears in the development of discharge diagrams and is applied in studying the electrical properties of dielectrics. Plexiglass discs 4.5 mm thick and coated with 5-micron aluminum foil were irradiated by 0.8-1.2 Mev electrons at a current density of $0.5 \mu\text{amp}/\text{cm}^2$ for 15-20 sec, and then the space charge was tested using the effect of an electric field on the passage of beta particles through a dielectric. The charge samples were periodically irradiated by beta particles from a strontium-iridium source, and the number of passing beta particles was measured. The figure is given showing the relative change in the number of passing beta particles due to the electric field as a function of time

USSR

VOROB'YEV, A. A., et al., Fizika Tverdogo Tela, No 12, Dec 71, pp 3691-3692

after irradiation. The figure shows that the change in sign of the effective space charge is observed if the maximum in the distribution of the stopped electrons shifts to one of the surfaces of the plate. In this case a positive space charge arises in the region of the dielectric not occupied by the negative space charge due to injection from the surface. Overcharge is attributed to leakage of the negative space charge more rapidly than leakage of the positive space charge. The observed overcharge effect is related to the electric state of the plexiglass, just as in polystyrene, which, as distinct from plexiglass, does not yield an electret state and overcharge is not observed.

2/2

- 67 -

USSR

UDC 616.981.452-034.47

AGAFONOV, V. I., BABKIN, Ye. I., VDOVIN, D. G., VOROBEYCHIKOV, V. M.,
VOROB'YEV, A. A., GAMBLESKO, Kr. P., GAPOCHKO, K. G., GEFEN, H. Ye., YEVSTIGNEYEV,
V. I., YEKEL'YANOVA, O. V., ZEMSKOV, Ye. M., IMANALIYEV, O. G., KAMALOV, I. I.,
KVIRIKADZE, V. V., KUTYEV, P. A., MISHNIKOV, O. P., PUSHKAREV, V. P., and
ROZDESTVENSKIY, D. A., Military Medical Academy imeni S. M. Kirov, Leningrad

"A Comparative Efficiency Characteristic of Different Immunization Methods
Against Plague Infection"

Moscow, Zhurnal Mikrobiologii Epidemiologii i Immunobiologii, No 11, 1972,
pp 106-112

Abstract: Analysis of the available literature data led to the conclusion
that oral, aerogenic, and jet immunization methods are the most efficient
compared with subcutaneous and skin methods. The average number of patients
inoculated against plague infection was 517, 817 (419), and 937 per hr for jet
injectors, aerogenic method liquid and dry vaccine, and oral method (tablets),
respectively, compared with only 43 and 28 for the subcutaneous and skin
methods, respectively.

1/1

USSR

UDC 615.37.032.3

VOROB'YEV, A. A.

"Current Practical and Theoretical Status of Peroral Vaccinations"

Moscow, Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii, No 7, 1973,
pp 3-15

Abstract: Per os vaccinations have not received the attention they should have in recent times, although they offer a number of advantages. Chief advantages are that immunization in this manner is simple, can readily be employed on a mass scale, the side effects and reactions are usually relatively mild, and the danger of transmitting malaria, syphilis, or infectious hepatitis is eliminated. Peroral vaccines have been shown to elicit effective immunity against bacterial, viral, and rickettsial diseases, and are not limited to enteric infections but also apply to percutaneous, hemogenous, and respiratory infections. The vaccines must be prepared in such a manner that they are not inactivated by the chemical environment of the gastrointestinal tract, or by the intestinal flora. Generally speaking, the vaccine dose required for oral vaccination is about 100 times as great as that employed for other routes of immunization. The mechanisms which have been proposed and are being studied for the transfer of the antigens

1/2

USSR

VOROB'YEV, A. A., Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii,
No 7, 1973, pp 3-15

from the intestinal lumen to the immune system are pinocytosis, phagocytosis, defects in the epithelium, and intercellular passage. Both live and killed vaccines are in current use. Presently in the USSR studies are being conducted on live oral smallpox, plague, and encephalitis vaccines.

2/2

- 26 -

VOROB'YEV A.A.

nuclear physics

SPAS 58011
18 Jan 73
(2)

THE SYNCHROCYCLOTRON OF THE LENINGRAD INSTITUTE OF NUCLEAR PHYSICS

UDC: 539.1

[Article by N. K. Abegajinov and A. A. Vorob'yev; Moscow, *Izvestiya Akademii Nauk SSSR. Russian, Vol. 17, No. 1, February 1972, pp. 42-51.*]

The arsenal of research resources of Soviet physicists is constantly expanding. One of the latest major novelties is a 1-Gev proton synchrocyclotron, which recently went into operation at the Leningrad Institute of Nuclear Physics (see B. P. Konstantinov of the AS USSR. Now that accelerator (Figure 1), equipped with a computer center based on the Minsk-27 computer, is being successfully operated.

Design. The synchrocyclotron has the limiting energy of accelerated protons for that type of accelerator (1 GeV) and high efficiency of the system for extraction of the beam from the accelerator chamber (35%), which permitted obtaining an external proton beam with an intensity of 10¹² protons/second at a small emittance and a relatively small current of the internal beam; this is extremely important from the point of view of radiation safety during operation. In the accelerator a half-wave resonance system is used, with a rotary frequency variator which for design considerations is divided into two independent sections, connected by a common shaft and connected directly to the drive. The necessary overlapping in frequency of the accelerating voltage, equal to 2.3, is achieved by suitable selection of the distribution of the wave resistance along the longitudinal axis of the dees and also by the design and method of connection of the frequency variator (Figure 2). Additional inductances and stubs are used to increase the coefficient of overlapping of the capacitance of the frequency variator.

The Institute of Experimental Physics (Inst. D. V. Yefremov participated in its development and start-up.

USSR

UDC 539.144.6:539.1.083

KOMAR, A. P., Academician of the Academy of Sciences Ukrainian SSR,
VOROB'YEV, A. A., ZALITE, YU. K., and KOROLEV, G. A., Physicotechnical
Institute imeni A. F. Ioffe, Academy of Sciences USSR, Leningrad

"Lifetimes of Excited Nuclear States Occurring in Alpha-Decay of Ra-
223 and Bi-211"

Moscow, Doklady Akademii Nauk SSSR, Vol 191, No 1, 1970, pp 61-63

Abstract: Existing methods for measuring the short lifetimes of excited states in the region of heavy alpha-active nuclei have a number of important limitations. The authors used a microwave method developed in their laboratory. The device consists of two time superhigh-frequency shutters -- for alpha particles and for conversion electrons e_c , a time-delay system between the shutters, and the measuring apparatus. The source, set on thin (5-micron) aluminum foil, is placed between modulating resonators. A double-focusing magnetic-sector beta spectrometer, with a pulse resolution of 0.75 percent, is tuned to the conversion line peak. When the superhigh-frequency modulation is switched on, the energy of e_c flying through the resonator gap changes

1/2

USSR

KOMAR, A. P., et al., Doklady Akademii Nauk SSSR, Vol 191, No 1, 1970, pp 61-63

according to the superhigh-frequency phase. As a result, the detector of the beta spectrometer records only those e_{β} which did not change their energy. The time shutter for the alpha particles is another resonator which simulates the energy of secondary-emission electrons formed by alpha particles during passage through the foil and accelerated in the gap between the foil and the resonator to ~ 2 kev. As they pass through the resonator, the electrons are analyzed for energy with the aid of an electrostatic analyzer and an open-type electron multiplier. Chosen for the lifetime measurement were the level 269 kev of Ra-223 , formed in alpha-decay of Ra-223 , and the level 350 kev of Tl-207 , formed in alpha-decay of Bi-211 .

The authors thank B. V. GRIGOR'YEV, A. K. LEBEDEV, and V. A. SMIRNOV for their assistance in the work and A. I. YEGOROV and L. M. VASIL'YEVA for preparing the sources.

2/2

- 120 -

1/2 014 UNCLASSIFIED PROCESSING DATE--16OCT70
 TITLE--LIFETIMES OF EXCITED NUCLEAR STATES ARISING DURING THE ALPHA DECAY
 OF RADIUM-223 AND BISMUTH-211 -U-
 AUTHOR--(04)-KOMAR, A.P., VOROBYEV, A.A., ZALITE, YA., KOROLEV, G.A.
 COUNTRY OF INFO--USSR
 SOURCE--DOKL. AKAD. NAUK SSSR 1970, 191911, 61-3
 DATE PUBLISHED-----70
 SUBJECT AREAS--PHYSICS, NUCLEAR SCIENCE AND TECHNOLOGY
 TOPIC TAGS--NUCLEAR ENERGY LEVEL, EXCITED NUCLEUS, HALF LIFE, ALPHA DECAY,
 RADON, BISMUTH, NUCLEAR SPIN
 CONTROL MARKING--NO RESTRICTIONS
 DOCUMENT CLASS--UNCLASSIFIED
 PROXY REEL/FRAE--1992/0948 STEP NO--UR/0020/70/191/001/0061/0063
 EIRC ACCESSION NO--AT0112110
 UNCLASSIFIED

272 014

UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AT0112110

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

ABSTRACT. BY USING A MICROWAVE METHOD, THE
 HALF LIFE OF THE EXCITED STATE OF THE 269 KEV LEVEL IN THE ALPHA DECAY
 OF PRIME223 RA TO PRIME219 RN WAS DETD. AS 27 PLUS OR MINUS 3 PSEC, AND
 THE MEAN HALF LIFE OF THE 350 KEV LEVEL IN PRIME211 BI TO PRIME207 TL AS
 0.43 PLUS OR MINUS 0.1 PSEC. FOR PRIME207 TL, FIRST EXCITED AND GROUND
 STATE SPIN VALUES OF 3-2 PLUS AND 1-2 PLUS WERE ASSIGNED AND IDENTIFIED
 AS 2D 3-2 AND 3S 1-2, RESP.
 IOFFE, LENINGRAD, USSR. FACILITY: FIZ.-TEKH. INST. IM.

UNCLASSIFIED

Publications

USSR

KUDRIN, A. N., Professor; VOROB'YEV, Docent (Editors)

Moscow, Aktual'nyye Problemy Farmakologii i Farmatsii. Vsesoyuznaya nauchnaya konferentsiya, posvyashchennaya pamyati M. P. Nikolayeva i V. V. Nikolayev. (Urgent Problems of Pharmacology and Pharmacy. All Union Scientific Conference Dedicated to the Memory of M. P. Nikolayev and V. V. Nikolayev), Ministerstvo Zdravookhraneniya SSSR, 1971, 198 pp

Translation:

Table of Contents

| | <u>Page</u> |
|--|-------------|
| Foreword | 3 |
| KUDRIN, A. N., "The Life and Activities of Professor M. P. NIKOLAYEV" | 6 |
| NAUMOV, M. V., KUDRIN, A. N. and SANGAYLO, A. K., "The Life and Activities of Professor V. V. Nikolayev" | 18 |

1/7

USSR

KUDRIN, A. N., et al, Aktual'nyye Problemy Farmakologii i Farmat-
sii. Vsesoyuznaya nauchnaya konferentsiya, posvyashchennaya
pamyati M. P. Nikolayeva i V. V. Nikolayev, 1971, 198 pp

KUDRIN, A. N., NAUMOV, V. M. and SANGAYLO, A. K., "Some
new trends in Scientific Investigations in Pharmacology
and Pharmacy"

25

GOLIKOV, S. N., "The Search for Cholinolytic Drugs
with Selective Action on the Central Nervous System"

33

IL'YUCHENOK, R. YU., Some Aspects of the Pharmacology
of Memory"

37

SANGAYLO, A. K., "Some Means of Development of Phar-
macology of Pain in the Light of Sensographic
Investigations"

43

SHADURSKIY, K. S., "Radiation Pharmacology, Its
Tasks and Prospects"

50

2/7

USSR

KUDRIN, A. N., et al, Aktual'nyye Problemy Farmakologii i Farmat-
sii. Vsesoyuznaya nauchnaya konferentsiya, posvyashchennaya
pamyati M. P. Nikolayeva i V. V. Nikolayev, 1971, 198 pp

KOROZA, G. S. and KUDRIN, A. N., "Mechanisms of the
Stimulating Effect of Vetrazine on the Uterus"

56

SLYUSAR', N. G. and KUDRIN, A. N., "The Role of Reci-
procal Influences of alpha- and beta-Adrenoreceptors,
and Choline and Histamine Receptors in the Development
of the Anesthetizing Action of Dicaine on the Cornea"

62

RYAZHENOV, V. V. and BABKINA, T. A., "Search for Pre-
parations Alleviating Arterial Hypertension Induced
by Hypertensin"

72

VOROB'YEV, V. G., "Prospects for the Discovery of
Hypotensive and Vasodilator Drugs Among Amino Ketones"

78

YASNETSOV, V. S., "Problem of the Pharmacology of Intra-
ocular Pressure and Prospects for its Development"

83

3/7

USSR

- KUDRIN, A. N., et al, Aktual'nyye Problemy Farmakologii i Farmatsii. Vsesoyuznaya nauchnaya konferentsiya, posvyashchennaya pamyati M. P. Nikolayeva i V. V. Nikolayev, 1971, 198 pp
- LEVSHIN, B. I., "New Hepatotropic Substances from Selenium Preparations" 90
- SENOV, P. L., "Some Stages in the Further Development of Pharmaceutical Analysis" 98
- PONOMAREV, V. D., "Some Principles of Optimization of Pharmaceutical Technological Processes" 105
- BELIKOV, V. G., "Utilization of Mathematical Methods of Planning an Experiment and the Development of Optimum Conditions of Analysis of Pharmaceutical Preparations" 112
- BATRAK, G. YE., KHRUSTALEV, S. I., and KOLOMOYTSEV, L. F., "The Relative Reactivity of the Cerebral Cortex and Subcortical Centers in Dogs Under Conditions of Ether Anesthesia Depending on the Oxygen Regimen" 116
4/7

USSR

- KUDRIN, A. N., et al, Aktual'nyye Problemy Farmakologii i Farmat-
sii. Vsesoyuznaya nauchnaya konferentsiya, posvyashchennaya
pamyati M. P. Nikolayeva i V. V. Nikolayev, 1971, 198 pp
- ZALUKAYEV, L. P. and ZAVRAZHNOV, V. I., "New Aspects
of the Problem of the Link Between the Structure and
Biological Reactivity of Organic Molecules" 124
- KATORGINA, I. F. and KUDRIN, A. N., "The Mechanism of
the Coordinated Movements of Cilia in Paramecia" 133
- TUMANYAN, A. A., "The Effect of Vetrazine on the
Contractile Explants of the Myocardium of Chick
Embryos" 142
- KOROZA, G. S., "The Role of Adrenoreceptors in the
Mechanism of the Effect of Oxytocin on the Uterus" 144
- IVANOV, D. D., "The Effect of Vetrazine, a MAO
Inhibitor, on the Quantitative Content of Biogenic
Amines in the Nervous System of Experimental Animals" 147
5/7

USSR

KUDRIN, A. N., et al, Aktual'nyye Problemy Farmakologii i Farmat-
sii. Vsesoyuznaya nauchnaya konferentsiya, sosvyashchennaya
pamyati M. P. Nikolayeva i V. V. Nikolayev, 1971, 198 pp

IVANOV, D. D., "The Effect of Vetrazine, a MAO Inhibitor,
on the Noradrenalin and Dofamin Content in the Posterior
Lobe of the Hypophysis in White Rats" 152

KOSTYUCHENKOV, V. N., YASNEPSOVA, N. M., and BOZHEFATOV,
A. S., "Concerning the Effect of Adreno- and Sympatho-
lytic Drugs on the Ophthalmotonus" 155

SULTANOV, M. B., "Results and Prospects of Pharma-
cological Investigations of Indole Alkaloids of Plants
of Vinca L." 159

POLYAKOV, N. G., "Results of Laboratory Work for the
Biological Standardization of Drugs at TSANII /Central
Pharmaceutical Scientific Research Institute?" 168

6/7

USSR

KUDRIN, A. N., et al, Aktual'nyye Problemy Farmakologii i Farmat-
sii. Vsesoyuznaya nauchnaya konferentsiya, posvyashchennaya
pamyati N. P. Nikolayeva i V. V. Nikolayev, 1971, 190 pp

KOMPANTSEV, N. N., KAMILOV, I. K., KAMBULIN, N. A. and
KRYZHENKOV, A. N., "Study of Some Medicinal and Toxic
Plants of Central Asia"

177

CHELOMBIT'KO, V. A. and MURAV'YEVA, D. A., "The Phar-
macology of the Alkaloid Chelerythrine Isolated from
Chelidonium majus"

183

STANISHEVSKAYA, A. V. and VOLKOVA, I. V., "Barbamyl
Content in Organs of Rats Upon Spontaneous Awakening
and Awakening Under the Influence of an Analeptic
Mixture"

188

KRENDAL', F. P., "The Possibility of Study of
Behavioral Reactions of Rats Upon Direct Introduction
of Biologically Active Substances Into the Brain"

194

7/7

UDC 681.327.11

USSR

VOROB'YEV, A. D., KUDRYAVTSEVA, A. A., PRYADKIN, A. M., PATS, V. B.,
~~SHAMURINA, R. Z.~~

"Mosaic Printer"

Moscow, Otkrytiya izobreteniya, promyshlennyye obraztsy, tovarnyye
znaki, No. 17, May 72, p 159

Translation: Patent No. 339925, class G 06k 15/02 was granted for a mosaic printer containing a mechanism for feeding paper and ribbon, a carriage, and a unit of metal tapes insulated from one another and placed in a magnetic field. The ends of the tape are connected to an excitation unit. The printer is distinguished by the fact that a fulcrum is fastened to it on the carriage at an angle to the metal tape unit located on the opposite side of the paper in order to increase the speed of the device.

1/1

- 39 -

USSR

UDC 51:330.115

VOROB'YEV, A. F., LATUSHKO, N. A., SMAKOTINA, T. A.

"Mathematical Economics Formalization of Storage Problems"

Tr. Mosk. Ekon.-Statist. In-ta, [Works of Moscow Economics and Statistics Institute], No 3, Part 2, 1970, pp 39-48, (Translated from Referativnyy Zhurnal Kibernetika, No 5, 1971, Abstract No. 5V579).

No Abstract.

1/1

- 39 -

1/2 008 UNCLASSIFIED
TITLE--ON ERRORS IN SPLENOPTOGRAPHY -U- PROCESSING DATE--18SEP70
AUTHOR--(02)-SAMOFALOV, V.P., VOROBYEV, A.F. ✓
COUNTRY OF INFO--USSR
SOURCE--KHIRURGIYA, 1970, NR 2, PP 91-994
DATE PUBLISHED-----70
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--APLEEN, DIAGNOSTIC METHODS, X RAY TECHNIQUE, X RAY CONTRAST
MEDIUM
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--1983/1327 STEP NO--UR/0531/70/000/002/0091/0094
CIRC ACCESSION NO--AP0054211
UNCLASSIFIED

2/2 008

CIRC ACCESSION NO--AP0054211

UNCLASSIFIED

PROCESSING DATE--18SEP70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. IN THE A. A. POLYANTSEV CLINIC OF GENERAL SURGERY FROM NOVEMBER 1956 TO DECEMBER 1968 A TOTAL OF 115 SPLENOPORTOGRAPHIES WERE PERFORMED. THE ARTICLE ANALYZES THE MAIN ERRORS COMMITTED DURING SPLENOPORTOGRAPHY. IN 13 CASES ERRORS CAUSED UNSUCCESSFUL INVESTIGATION. NO COMPLICATIONS WERE OBSERVED. ACCORDING TO THE STAGE OF THE INVESTIGATION THERE ARE ERRORS OF INDICATIONS, PREPARATION TO THE INVESTIGATION, PUNCTURE OF THE SPLEEN, ADMINISTRATION OF THE CONTRAST MEDIUM AND ROENTGENOGRAPHY. AMONG THE CAUSES OF UNSUCCESSFUL SPLENOPORTOGRAPHY THE MOST FREQUENT ARE ERRORS COMMITTED DURING PUNCTURE OF THE SPLEEN, ROENTGENOGRAPHY AND ADMINISTRATION OF THE CONTRAST MEDIUM. LEAVING THE NEEDLE IN THE SPLEEN UNTIL THE RESULTS OF SPLENOPORTOGRAPHY ENABLES WHEN NECESSARY TO REPEAT THE ADMINISTRATION OF THE CONTRAST MEDIUM AND THUS PREVENT SOME FAILURES OF THE INVESTIGATION.

UNCLASSIFIED

Publications

USSR

UDC 616.5-084.876

TARASENKO, N. YU., KHODYREVA, M. A., and VOROB'YEV, A. M.

Zashchita i Ochistka Kozhnykh Pokrovov ot Radioaktivnykh Zagryazneniy
(Protection and Cleansing of the Skin from Radioactive Contaminants),
"Meditsina", Moscow, 1972, 176 pp

Annotation

Translation:

The book deals with one of the important aspects of radiation hygiene - protection and cleansing of the skin from contamination by radioactive substances. It sets forth the hygienic and radiobiological characteristics of this type of action.

There are data on the qualitative and quantitative parameters of the levels of percutaneous resorption of some radioactive substances in the body, factors that affect the degree of resorption. General and specific methods of protecting and cleansing the skin from radioactive contamination are described.

The book contains information on the principles for differential selection of means of decontamination and evaluation of their effectiveness. It examines the basis for developing cleansing agents, methods of preparing them, and criteria for evaluating them.

1/4

USSR

TARASENKO, N.YU., et al., Meditsina, 1972, 176 pp

The book may be highly useful in substantiating radiation safety measures to be observed by those engaged in producing radioisotopes or using them in medicine and in the economy.

The book is intended for hygienists, health officers, biologists, physicists, chemists, and industrial workers producing and using radioisotopes.

Contents

| | |
|---|----|
| Introduction ... | 3 |
| Chapter I. The Skin As a Possible Route of Entry Into The Body of Various Chemical and Radioactive Substances | 7 |
| The Skin, a Protective Organ... | 8 |
| Routes of Penetration of Radioactive Substances Through Skin..... | 14 |
| Penetration of Chemical and Radioactive Substances Through Skin... | 20 |
| Methods of Studying the Penetration of Substances Through Skin.... | 47 |
| Chapter II. Hygienic Significance of Contamination of Skin by Radioactive Substances... | 54 |
| Types and Nature of Radioactive Contamination of Skin... | 54 |
| Contamination of Skin as a Factor in Exposure to Radiation... | 61 |
| Irradiation of Skin... | 62 |
| Resorption of Radioactive Substances Through Skin... | 66 |

2/4

USSR

TARASENKO, N. YU, et al., Meditsina, 1972, 176 pp

| | |
|--|-----|
| Entry of Radioactive Substances from the Hands Into the Gastro-intestinal Tract and Lungs..... | 70 |
| Chapter III. Protection of the Skin While Handling Radioactive Substances..... | 72 |
| Maximum Permissible Levels of Contamination of Skin | 74 |
| Radiometric Monitoring of Skin... | 76 |
| Individuals Means of Protection ... | 78 |
| "Biological" Creams | 88 |
| Wash Rooms.... | 95 |
| Chapter IV. Development of Formulas For Cleaning Agents..... | 99 |
| Brief Information on Substances Used to Decontaminate Skin... | 99 |
| Development of Formulas for Cleansing Agents to Remove Radioactive Contaminants from Skin... | 111 |
| Formulas for Some Cleansing Agents and Methods of Preparing Them... | 120 |
| Chapter V. Effect of Cleansing Agents on Skin... | 124 |
| Chapter VI. Cleansing Skin from Radioactive Contaminants... | 135 |
| Methods of Cleansing Skin from Radioactive Contaminants... | 144 |
| Standard Methods Used to Evaluate Preparations Intended for Cleansing Skin... | 145 |

3/4

USSR

TARASENKO, N. YU. et al., Meditsina, 1972, 176 pp

Comparative Evaluation of Cleansing Agents for Removing
Radioactive Contaminants from Skin...
Bibliography....

161

161

4/4

172 027 UNCLASSIFIED
 TITLE--TEMPERATURE CHANGES IN THE TRANSMISSION OF QUARTZ IN THE VISIBLE
 AND ULTRAVIOLET SPECTRAL REGIONS DURING HEATING TO 1100DEGREES -U-
 AUTHOR--(02)-VOROBYEV, A.N., DANIEL, YE.V.
 COUNTRY OF INFO--USSR
 SOURCE--ZH. PRIKL. SPEKTROSK. 1970, 12(12) 347-9
 DATE PUBLISHED-----70
 SUBJECT AREAS--PHYSICS
 TOPIC TAGS--QUARTZ, IR SPECTRUM, LIGHT TRANSMISSION
 CONTROL MARKING--NO RESTRICTIONS
 DOCUMENT CLASS--UNCLASSIFIED
 PROXY REEL/FRAME--1980/1061
 CIRC ACCESSION NO--AP0049254
 STEP NO--UR/0368/70/012/002/0347/0349
 UNCLASSIFIED

2/2 027

UNCLASSIFIED

PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0049254

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE TRANSMISSION OF 4 DIFFERENT SAMPLES OF QUARTZ WAS STUDIED AS A FUNCTION OF TEMP. (20-1100DEGREES) AT 220-550MMU. MEASUREMENTS WERE PERFORMED BOTH DURING HEATING AND COOLING OF THE SAMPLES. THE TRANSMISSION OF QUARTZ DECREASED NOTICEABLY IN THE UV REGION AT HIGH TEMP. WHEREAS ONLY A NEGLIGIBLE DECREASE WAS OBSD. IN THE VISIBLE REGION.

USSR

VOROB'YEV, A. P.

"Application of the Gaussian Principle to the Dynamics of Systems with Random Forces"

Vestn. Leningr. Un-ta. [Herald of Leningrad University], 1972, No 19, pp 83-87 (Translated from Referativnyy Zhurnal, Kibernetika, No 3, Moscow, 1973, Abstract No 3 V229 by the author).

Translation: The Gaussian principle of the minimum force is applied to mechanical systems with random forces. It is shown under which conditions placed on the elementary work of the system for its possible movement the principle is correct for the dispersion of force.

1/1

USSR

UDC 621.317.727.1.024

VOROB'YEV, A. V., NALBANDOV, L. V.

"Precision High Constant Voltage Divider for Measuring the Kerr Constant"

Tr. metrol. in-tov SSSR (Works of the USSR Metrology Institute), 1971, No 115 (175), pp 107-112 (from RZh-Metrologiya i Izmeritel'naya Tekhnika, No 10, Oct 71, Abstract No 10.32.1556)

Translation: Experience in the development and study of the characteristics of a precision high voltage divider based on the series manufactured MVSG-1 resistors is presented. The error of the divider when measuring voltages up to 20 kilovolts is $\pm 0.002\%$. Designed for measuring the Kerr constant, it can also be used for other electrical measurements to expand the measurement limits of class 0.001 compensators, for example, type R345. There are 3 illustrations and a 7-entry bibliography.

1/1

- 177 -

USSR

UDC:519.46

VOROB'YEV, A. V., MUNINA, A. L.

"Some Problems of the Connectedness of Semimoduli"

Uch. Zap. Mosk. Obl. Ped. In-t [Scientific Writings of Moscow Oblast Pedagogics Institute], Vol. 269, 1969 (1970), pp. 200-205 (Translated from Referativnyy Zhurnal Matematika, No. 12, 1970, Abstract No. 12A121 by L. Shneperman)

Translation: Several simple conditions are proven which are sufficient for a subsemigroup of a commutative topological group generated by a connected subset to have a finite number of components. For example,

Theorem 2. Let X be a connected set in Euclidean space E_n . If $\text{Int}(X) \neq \emptyset$, the subsemigroup generated by set X consists of a finite number of components.

1/1

- 13 -

USSR

UDC: 539.385

VOROB'YEV, A. Z., OL'KIN, S. I., STEBENEV, V. N.

"Effect of Preliminary Creep on the Endurance of AK4-1-Ti Alloy"

Uch. zap. Tsentr. aerogidrodinam. in-ta (Scientific Notes of Central Aerohydrodynamics Institute), 1972, 3, No 2, pp 120-126 (from RZh-Mekhanika, No 9, Sep 72, Abstract No 9V870)

Translation: The authors studied the mechanism of the influence of preliminary creep on the fatigue characteristics of notched specimens of AK4-1-Ti alloy. Selected from among the set of creep components was the effect caused by temperature action. The tests were done on solid cylindrical specimens with circular boring, and on flat specimens with a central hole. The specimens were preheated for a long period with and without loading. The fatigue test results on specimens with stress concentrators at temperatures of 150 and 175°C showed different qualitative effects of preliminary creep action. It is shown that for structural elements working on tension, preliminary creep has a favorable effect, producing cold hardening of the surface layers of the metal in the zone of stress concentration. Under a compressive load, the effect of creep is harmful, accelerating destruction under fatigue conditions. G. P. Mel'nikov.

1/1

USSR

UDC 669.71:620.172.251.226

VOROB'YEV, A. Z., GAVRILOVA, Ye. A., DOISENKO, A. M., and YEKIMENKOV, L. N.

"On the Form of Fatigue Curves for Some Aluminum Alloys"

Moscow, Zavodskaya Laboratoriya, Volume 7, 1971, pp 832-834

Abstract: Although the initial fatigue process which terminates in the formation of macro cracks is relatively insensitive to the frequency of the applied strain, this is not true of the subsequent stage, the propagation of the cracks to destruction. In addition to frequency, other factors such as periodic overload and long-term exposure to higher temperatures were found to have different effects on the durations of the two stages in the fatigue process. In general, the equations normally used to describe the complete process of fatigue breakdown, e.g., $N (\sigma - \sigma_R)^m = \text{constant}$, describe the process of crack formation fairly accurately, but do not reflect the effect of various factors on the second process.

1/1

- 63 -

1/2 026 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--AUTOMATIC POWER SOURCES FOR KRR30-60 EQUIPMENT -U-
AUTHOR--(02)-KUZOVLEV, S.A., VOROBYEV, B.A.
COUNTRY OF INFO--USSR
SOURCE--MOSCOW, AVTOMATIKA, TELEMEXHANIKA I SVYAZ, NO 2, 1970, PP 25-27
DATE PUBLISHED-----70
SUBJECT AREAS--ENERGY CONVERSION (NON-PROPULSIVE), NAVIGATION
TOPIC TAGS--TELEPHONE EQUIPMENT, ELECTRIC POWER SOURCE, AUTOMATION,
COMMUNICATION EQUIPMENT, RAILROAD
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAHE--3005/0599 STEP NO--UR/0223/70/000/002/0025/0027
CIRC ACCESSION NO--AP0132759
UNCLASSIFIED

2/2 026

CIRC ACCESSION NO--AP0132759
ABSTRACT/EXTRACT--(U) GP-0-

UNCLASSIFIED

PROCESSING DATE--13NOV70

ABSTRACT. THE AUTHORS HAVE DESIGNED AND
GUILT AN AUXILIARY POWER SOURCE FOR KRR30-60 EQUIPMENT. THE EQUIPMENT
IS AUTOMATICALLY SWITCHED OVER TO THE AUXILIARY POWER SOURCE IN CASE OF
THE MAIN POWER SUPPLY FAILURE. THE KRR30-60 EQUIPMENT IS BEING USED FOR
COMMUNICATION AT THE MICHURINSK DISTRICT OF THE SOUTHEAST RAILROAD. THE
POWER SOURCE IS BEING USED FOR THE PAST THREE YEARS. THE POWER SOURCE
USES HIGH Q, FACTOR ANODE FILTERS AND GENERATES VOLTAGE OF 21.6 V.

UNCLASSIFIED

USSR

UDC: 621.396.66.018.4.001.5

VOROB'YEV, B. F., SHAKHTARIN, B. I.

"Experimental Study of a Stochastic Phase AFC System"

Moscow, Radiotekhnika i Elektronika, Vol 17, No 4, Apr 72, pp 758-766

Abstract: The paper gives an analysis of the results of an experimental investigation of the statistical characteristics of a phase AFC system. A description is given of the experimental set-up used to determine the probability density function of the error signal and the average time to synchronization cut-off in first, second and third order systems. It is shown that conventional analytical descriptions of the distribution laws are only approximations. Experimental expressions are also found for the time to departure from the intervals $(-\pi/2, \pi/2)$, $(-\pi, \pi)$ in first, second and third order systems. It is shown that conventional formulas for these statistical characteristics are asymptotic.

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1/2 017

UNCLASSIFIED

PROCESSING DATE--16OCT70

TITLE--VARIANTS OF THE COURSE OF MYOCARDIAL INFARCTION -U-

AUTHOR--(02)-VOROBYEV, B.I., MAYOROVA, T.YE.

COUNTRY OF INFO--USSR

SOURCE--TERAPEVTICHESKIY ARKHIV, 1970, VOL 42, NR 4, PP 72-73

DATE PUBLISHED-----70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--HEART DISEASE, STATISTIC ANALYSIS, DIAGNOSTIC MEDICINE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1990/0559

STEP NO--UR/0504/70/042/004/0072/0073

CIRC ACCESSION NO--AP0108774

UNCLASSIFIED

2/2 017

UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0108774

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

ABSTRACT. A CLINICO STATISTICAL ANALYSIS OF THE PECULIARITIES OF THE COURSE OF MYOCARDIAL INFARCTION IN 300 PATIENTS WAS MADE. THE COURSE OF MYOCARDIAL INFARCTION, COMPLICATIONS AND PROGNOSIS DEPEND UPON THE VARIANTS OF THE DISEASE. THE AUTHORS MAKE AN ATTEMPT TO SYSTEMATIZE VARIOUS CLINICAL MANIFESTATIONS OF THE COURSE OF THE DISEASE AND COMPLICATIONS ON THE BASIS OF THIS ANALYSIS. IT IS EMPHASIZED IN THE ARTICLE THAT AT PRESENT NO CORRECT TACTICS AND PROGNOSIS IN MYOCARDIAL INFARCTION CAN BE MADE WITHOUT THE DETERMINATION OF THE VARIANTS OF THE COURSE OF THIS DISEASE.

FACILITY:
KAFEDRA FAKUL'TETSKOY TERAPII ROSTOVSKOGO NA DONU MEDITSINSK. INSTITUTA.

UNCLASSIFIED

USSR

UDC 669.295-492.8

VOROB'YEV, B. YA., OLESOV, YU. G., USTINOV, V. S., PETRUN'KO, A. N., KONOVALOV, V. K., and ZAPADNYA, V. I.

"Assembly-Line Manufacture of Construction Parts From Titanium Powder by the Metal-Ceramic Process"

Moscow, Tsvetnyye Metally, No 7, Jul 70, pp 65-66

Abstract: The titanium powder discussed in this article is made from reworking the wastes formed in the production of parts and semi-finished titanium materials by an electrolytic refining process. The article describes the metal-ceramic method by which the powder is first pressed into bricks and baked in a vacuum at 1100° C. The materials for the finished parts is then pressed on P-472, P-474, and D-2334 hydraulic equipment with a force of 100-250 tons, used normally for the production of plastic parts. The process for producing the finished parts is described and the hourly rates for making disks, rings, and flanges 57 mm in diameter and 12-15 mm high, are specified. The article is illustrated with a cross-sectional sketch of the modernized EVT-15 vacuum oven in which the parts are baked before finishing. Dimensions of the oven are given in this sketch, 1/2

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VOROB'YEV, B. YA., et al., Tsvetnyye Metally, No 7, Jul 70,
pp 65-66

and the various parts identified. A photograph of some of the
parts manufactured by the metal-ceramic process is also shown.

2/2

USSR

UDC 669.71.472(088.8)

BELOV, Yu. I., VOROB'YEV, D. N., SOBOL', I. I., AYUSHIN, B. I., and
ZYRYANOV, L. P.

"Method of Utilizing the Spent Carbon-Material Lining of Aluminum Electro-
lyzers"

USSR Author's Certificate No 261701, Filed 30/10/68, Published 28/08/70
(Translated from Referativnyy Zhurnal-Metallurgiya, No 2, 1971, Abstract
No 2 G158 P)

Translation: To reduce the cost of production of Al, the used lining made
of carbon materials is ground to a grain size of 0.2 mm, then used to make
up 2-5% of the dry charge used to make the anode mass.

1/1

- 4 -

USSR

UDC [537.226+537.311.33]:[537+535]

BARANOV, A. V., ~~VOROB'YEV, G. A.~~, PERVUKHIN, N. P., and KHOROMENKO, A. A.

"Study of the Breakdown of Silicon Monoxide Films at Constant Voltage"

Izv. Tomsk. politekhn. in-ta (News of Tomsk Polytechnical Institute), 1971, Vol 180, pp 84-88 (from RZh Fizika, No 12, Dec 71, Abstract No 12Yel233)

Translation: The thickness of the SiO films was $d = 300-5000 \text{ \AA}$. It was observed that E_{br} rises with a decrease in d and that E_{br} drops when the upper electrode is the cathode. These facts support the electrical character of the breakdown of SiO film.

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- 48 -

USSR

UDC: 621.319.4-416

VOROB'YEV, G. A., MOTOSHKIN, V. V., MUKHACHEV, V. A., MUKHACHEVA, N. S.

"On the Mechanism of Breakdown of Thin-Film Capacitors at High Frequencies"

Moscow, Radiotekhnika i Elektronika, Vol 16, No 1, Jan 71, pp 210-211

Abstract: A preliminary investigation is made of the frequency dependence of the electric strength of thin-film capacitors. It is found that the breakdown voltage of thin-film capacitors remains constant up to a frequency of about 600 kHz. At higher frequencies, the puncture voltage drops sharply. The loss tangent decreases with increase in frequency in the 1-100 kHz. range.

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USSR

UDC: 621.396.6-181.5

~~VOBOBYEV, G. A.~~; DANILINA, T. I.

"Production of Dielectric Films in a Low-Voltage Penning Discharge and Their Investigation"

Elektron. tekhnika. Nauchno-tekhn. sb. Upr. kachestvom i standartiz. (Electronic Technology. Scientific and Technical Collection. Quality Control and Standardization), 1970, vyp. 5, pp 85-89 (from RZh-Radiotekhnika, No 2, Feb 71, Abstract No 2V304)

Translation: The paper is devoted to the production and investigation of SiO₂ films. The films were produced by using the method of reactive cathode vaporization in a Penning discharge (a system of two opposed block electrodes -- the cathodes -- and an anode in a magnetic field). Graphs are presented for the rate of film deposition as a function of discharge power, and for the dielectric parameters of the film and capacitors made on the basis of the film as a function of conditions of vaporization, and also for the results of a study of the film structure. MgO, TiO₂ and PbO films were also studied. It is shown that the described method can also be used successfully for making capacitors based on SiO₂, SiO₂+PbO, and MgO films. Eight illustrations, one table, bibliography of four titles. N. S.

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1/2 023

UNCLASSIFIED

PROCESSING DATE--27NOV70

TITLE--STUDY OF THE LUMINESCENCE OF ROCK SALT IN A SUPERSTRONG ELECTRICAL
FIELD WITH AN ELECTRONIC CONTACT -U-

AUTHOR--(02)-VOROBYEV, G.A., YEKHANIN, S.G.

COUNTRY OF INFO--USSR

SOURCE--LENINGRAD, SOLID STATE PHYSICS; MAY 1970; PP 1487-9

DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--LUMINESCENCE, ROCK SALT, ELECTRIC FIELD, ELECTRON

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAE--3006/1726

STEP NO--UR/0181/70/000/000/1487/1489

CIRC ACCESSION NO--AP0135308

UNCLASSIFIED

2/2 023

CIRC ACCESSION NO--A0135308

UNCLASSIFIED

PROCESSING DATE--27NOV70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. BY MEANS OF A METHOD OF AN ELECTRONIC CONTACT IT WAS POSSIBLE TO MAKE STUDIES UNDER VERY CONTROLLED CONDITIONS (CONTROLLING, WITHIN WIDE LIMITS, THE NUMBER OF INJECTED ELECTRONS AND DISTINGUISHING BETWEEN THE EFFECTS OF A STRONG FIELD AND A SPACE CHARGE). THE STUDIES SHOWED THAT THE LUMINESCENCE IS CAUSED BY THE CURRENT OF ELECTRONS FLOWING THROUGH THE LAYER. THE BRIGHTNESS CURRENT RELATION HAS A LINEAR CHARACTER. THE DEPENDENCE OF THE BRIGHTNESS OF THE LUMINESCENCE ON THE VOLTAGE OF A FIELD WITH AN ELECTRONIC CONTACT IS WEAKER THAN IN THE CASE OF ELECTROLYTIC ELECTRODES. THIS CAN BE EXPLAINED BY THE FACT THAT THE NUMBER OF ELECTRONS ENTERING A LAYER WITH THE ELECTRONIC CONTACT, IN CONTRAST WITH THE CASE OF ELECTROLYTIC ELECTRODES, DEPENDS PRACTICALLY NOT AT ALL ON THE VOLTAGE OF THE FIELD IN THE LAYER, WHILE THE ELECTRON MULTIPLICATION, IN THE FIELDS AND LAYERS USED, IS NEGLIGIBLE. THE AUTHORS EXPRESS THEIR GRATITUDE TO N. G. BASOV FOR HIS VALUABLE ADVICE IN THE WORK.

FACILITY: TOMSK INSTITUTE OF RADIO ELECTRONICS AND ELECTRONIC ENGINEERING.

UNCLASSIFIED

Electricity and Magnetism

USSR

VOROB'YEV, G. A.; YEKHANIN, S. G.; et al (Tomsk Institute of Radio Electronics and Electronic Engineering)

"Study of the Luminescence of Rock Salt in a Superstrong Electrical Field with an Electronic Contact"

Leningrad, Solid State Physics; May 1970; pp 1487-9

ABSTRACT: By means of a method of an electronic contact it was possible to make studies under very controlled conditions (controlling, within wide limits, the number of injected electrons and distinguishing between the effects of a strong field and a space charge).

The studies showed that the luminescence is caused by the current of electrons flowing through the layer. The brightness-current relation has a linear character. The dependence of the brightness of the luminescence on the voltage of a field with an electronic contact is weaker than in the case of electrolytic electrodes. This can be explained by the fact that the number of electrons entering a layer with the electronic contact, in contrast with the case of electrolytic electrodes, depends practically not at all on the voltage of the field in the layer, while the electron multiplication, in the fields and layers used, is negligible.

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USSR

VOROB'YEV, G. A., YEKHANIN, S. G., Solid State Physics; May 1970, pp 1487-9

The authors express their gratitude to N. G. Basov for his valuable advice in the work. The article includes three figures. There are 7 bibliographic references.

2/2

SO: FOREIGN PRESS DIGEST

31 Aug 71

87

FPD: CYBERNETICS

65. USSR

UDC 002.001:007

VOROB'YEV, G. G.

"Documentalistics and Scientific Information"

Novosibirsk, Probl. Informatiki. Zauchn. Seminar -- Sbornik (Problems of Informatics. A Correspondence Seminar -- Collection of Works), Vypusk 1, "Nauka," 1970, pp 24-33 (from R-Zh -- Informatika, No 4, Apr 71, Abstract No 71.4.11 (71R--4421))

Translation: Documentalistics is viewed as an independent branch of cybernetics. Certain problems of documentalistics are presented from the aspect of scientific information; the parameters which characterize a document are defined and analyzed; the problems of the modern provision of documents to specialists are considered.

Single Crystals

USSR

UDC 669-172

VOROB'YEV, G. M., GORIN, D. I., and KHOROSHUN, L. K., Minsk

"Anisotropy of Wear Resistance of a Single Crystal"

Moscow, IAN SSSR, M tally, No 2, Mar-Apr 71, pp 176-177

Abstract: Anisotropy in wear resistance of single crystals was studied using a single crystal of Fe + 4% Si with the friction surface corresponding to the crystallographic planes along which sheet usually occurs in metals with a body centered cubic lattice: (110), (112). Wear tests were studied with a specific load of 150 kg/cm², slipping rate 0.94 m/sec. The experiments established that the minimum wear is observed when the plane of friction and slipping plane are parallel and there are no steps on the friction surface. The maximum wear is observed when plastic deformation is facilitated in the surface layer, accompanied by the formation of steps.

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USSR

UDC 689.14.014.16:60.145.44

LEV, I. Ye., POZYVAY, L. A., SAKHAROV, Yu. M., FOROB'EV, G. M., and ADAM, L. S., Dnepropetrovsk Metallurgical Institute

"Influence of Oxygen and Alloying Elements on Structure, Phase Composition, and Heat Resistance of Stamping Steels"

Novokuznetsk, Izv. VUZ, Chern. Metallurgiya, No 10, 1970, pp 99-103

Abstract: Specimens were cut from annealed and forged billets of 12 types of stamping steels, and were subjected to electrolysis in 0.3 n HCl at 18-25° C with a current density of 0.02 a/cm². In the annealed state, the structure of the steels consisted of sorbite-like pearlite plus excess carbides. The least carbide heterogeneity was in the specimens containing moderate quantities of chromium, tungsten, and carbon (excess carbides increased with increasing quantity of these elements). The carbide phase consisted primarily of types Me₂₃C₆ and Me₆C compounds, the ratio between them depending on the composition and heat treatment. The greatest resistance to overheating was shown by the steels with predominate Me₆C carbides, as well as compositions with 2-4% Cr. Most of the steels studied showed a clearly expressed secondary hardening effect, the intensity and temperature intervals of which increased with an

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USSR

LEV, I. Ye., et al, Izv. VUZ, Chern. Metallurgiya, No 10, 1970, pp 99-103

increasing content of chromium and tungsten. The alloying elements which did not noticeably influence the initial stages of decomposition of martensite during tempering at 455-675° K, increased heat resistance of the steels with higher heating.

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- 63 -

Acc. Nr:

AP0047669

Abstracting Service:
CHEMICAL ABST. 5/70

Ref. Code:

UR 0032

V

104859q Determining lattice spacing in textured material.
Vorob'ev, G. M.; Krivusha, L. V. (Dnepropetrovsk Gos.
Univ., Dnepropetrovsk, USSR). *Zavod. Lab.* 1970, 36(1),
35-8 (Russ). Conditions for producing x-ray patterns of Si-
Fe samples by means of the reverse x ray technique are considered.
The samples must have a sharp texture and large grains. An
attachment to the KROS-1 camera is described which gives
the sample a zero position and a rotation motion within a given
interval.
J. Hejduk

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USSR

BIRZNIYEV, L.V., VOROB'YEV, I.A.

UDC 621.314.58

"Thyristorized Pulse D-C Converter With Continuous Output Voltage"

V sb. Poluprovodniki i ikh primeneniye v elektrotekhn. (Semiconductors And Their Application In Electrical Engineering--Collection Of Works), No 4, Riga, "Zinatna," 1970, pp 219-232 (from RZh--Elektronika i yeye primeneniye, No 10, October 1970, Abstract No 10B344)

Translation: The thyristorized pulse converter with continuous output voltage considered is intended for the power supply of a traction motor with series excitation. A L-shaped filter is provided at the input. The series-connected capacitor and motor and also a counter-series connected thyristor and semiconductor diode are connected in parallel with the input capacitor. A common point of the motor and capacitor, and a thyristor cathode are connected via a smoothing choke. For computation an equivalent circuit is composed in which the input filter and motor are replaced by a counter EMF. A method is presented for an approximate determination of the smoothing inductance and capacitance (on the assumption of ideal smoothing of the current in the motor). In conformity with this method, computed dependences are given for determination of the pulsations of voltage and current in the elements of the circuit. 4 ill. 3 tab. 1 ref. I.R.

1/1

chenko, Kiev, USSR). *Izv. Vyssh. Ucheb. Zaved.*, 1976, 13(1), 55-9 (Russ). The luminescence spectrum of the uv-irradiated phosphor PK-4 (88% ZnS-12% CdS-Cu) at 77°K consists of bands at 21,300 (G-band) and 17,700 cm⁻¹ (Z-band). The rise of temp. to 293°K caused a 20-30% or a considerable decrease of intensity of the Z or G band. At 77°K the duration of lighting of the G-band is $\leq 10^{-7}$ sec whereas the Z-emission extinguishes according a nonexponential law in $> 10^{-7}$ sec. When PK-4 was excited at a wavelength of 480-580 nm, the intensity of the Z-emission decreased sharply. The phosphor PK-2 (ZnS-Cu) gave bands with max. at 22,300, and 19,200 cm⁻¹. The ratio of the intensities of the bands $\alpha = I_z/I_G$ is 2 times as great as that of PK-4. One band only, with a max. at 21,800 cm⁻¹, was observed in the phosphor PK-1 (ZnS-Ag). The shape of the band is independent of the temp., and its intensity decreases 20% in going from 77 to 293°K. The quantum yields of luminescence of the G and Z bands (B_G and B_Z) and the value α depend on the intensity of the exciting light (L): A decrease of a factor of 16,000 in L caused in PK-4 a 2 or 3 fold increase of B_Z or B_G , resp. As a consequence α changed from 2 to 12 in going from L_0 to $L_0/16,500$. When the temp. changed from 77 to

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REEL/FRAME
19810487

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Acc. Nr:

A70050504

Abstracting Service:
CHEMICAL ABST. 5-70

Ret. Code:

4R0139

F 94966f Effect of temperature, intensity of exciting light, and infrared bias lighting on the luminescence of PK (crystalline phosphor-luminophors. Vorob'ev, K. I.; Gasyak, L. A.; S. Korotkov, P. A.; Paivysk, A. N. (Kiev. Gosuniv. im. Shchyrbchenko, Kiev, USSR). *Izv. Vyssh. Ucheb. Zaved.*, 1970, 13(1), 55-9 (Russ). The luminescence spectrum of the uv-irradiated phosphor PK-4 (88% ZnS-12% CdS) consists of two bands at 21 200 and 21 500 cm⁻¹.

AT0050504

293°K the dependence of the quantum yield on L increased considerably. When L increased the quenching rate of the Z -emission in the 1st stage increased and after 7-9 sec the quenching rates became the same for various L . Equations for calc. B_0 and B_z from the resp. L values were derived, and a good agreement with the expt. was obtained. The total quantum yield of the luminescence and α changed considerably when the ir-bias lighting of wavelength 800-2000 nm was applied. The ir-bias lighting on FK-4 caused a greater decrease of B_z than of B_0 . The B_0 is changed very little in FK-3, and B_z is decreased more than in FK-4. The intensity of luminescence decreased in FK-1 at moment of the ir-bias lighting by a factor of ~ 3 at 77°K and ~ 1.5 at 293°K. The above effects of the ir-bias lighting were attributed to the rearrangement of the vacancy sites between the Z , G , and quenching centers which caused the decrease of the intensity of luminescence and the change in the distribution of the spectral energy. This rearrangement depends on the compa. of the phosphor and on temp.

E. Svatek *47C*

2/2

19810488

21

USSR

UDC: 535.31

VOROB'YEV, K. I., KARPENKO, S. G., KOROTKOV, P. A., and POGORELOV,
V. Ye.

"Electro-Optical Modulator Using Barium Titanate"

Tomsk, Izvestiya VUZ--Fizika, No 7, 1973, pp 35-38

Abstract: A fundamental parameter of electrooptical modulators is the controlling critical intensity of the electric field to provide close to 100% modulation. In this first article, subtitled "Estimation of the Controlling Critical Intensities," of the series with the general title given above, the authors describe research to determine these critical intensities for a BaTiO₃ crystal for various mutual orientations of the crystal's optical axis, the vector of the controlling field intensity, and the vector of the modulated radiation wave, for the cases of linear and square electro-optical effect. The phase shift between oscillations in the two beams propagated in the crystal is determined for various directions of the external electric field in the linear effect, and a table of the results obtained in investigating the linear effect is given. It is concluded that the linear effect in the BaTiO₃ crystal should be good for modulating lasers operating in the visible spectrum.

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- 88 -

1/2 012
UNCLASSIFIED
PROCESSING DATE--04DEC70
TITLE--EXTRACTION OF SCANDIUM FROM CHLORIDE SOLUTIONS USING TRIBUTYL
PHOSPHATE -U-
AUTHOR--(05)-FAVORSKAYA, L.V., PRESNETSOVA, V.A., PUTILIN, YU.M., BAYBEKOV,
M.K., VOROBYEV, L.I.
COUNTRY OF INFO--USSR
SOURCE--ZH. PRIKL. KHIM. (LENINGRAD) 1970, 43(5), 1158-60
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY, MATERIALS
TOPIC TAGS--SOLVENT EXTRACTION, SCANDIUM, ORGANIC SOLVENT, PHOSPHATE ESTER
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--3004/0940
STEP NO--UR/0080/70/043/005/1158/1160
CIRC ACCESSION NO--AP0131525
UNCLASSIFIED

2/2 012

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIR. ACCESSION NO--AP0131525

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EXTN. OF SC FROM HCL SOLNS. WAS STUDIED IN THE PRESENCE OF FE(II), FE(III), AND OTHER IONS GENERALLY PRESENT WITH SC IN ITS ORES. THE COMPN. OF THE ARTIFICIALLY PREPD. SAMPLE WAS MGCL SUB2 30, FECL SUB2 9, TICL SUB4 2, FECL SUB3 2, KCL PLUS NACL 21, CACL SUB2 3, SC SUB2 0 SUB3 0.02, ALCL SUB3 3PERCENT. THE EXTN. WAS WITH 70PERCENT BU SUB3 PD SUB4 SOLN. IN KEROSENE. THE RATIO OF THE ORG. AND AQ. PHASES WAS 1:3. THE MIXT. WAS STIRRED MECH. FOR 5 MIN. THE SC WAS REEXTD. WITH 3:1 ORG. TO WATER PHASE RATIO 1ST WITH 2N HCL AND THEN WITH H SUB2 0. HYDROXIDE WAS PPTD. BY NH SUB3 FROM THE 1ST REEXT. SC CAN BE EFFECTIVELY EXT. FROM THE ABOVE ARTIFICIALLY PREPD. MIXT. IN A TYPICAL EXPT. THE 1ST REEXT. PORTION CONTD. 5.3-6PERCENT SC SUB2 0 SUB3 AND THE 2ND, 20-30PERCENT SC SUB2 0 SUB3. FACILITY: KAZ. NAUCH.-ISSLED. INST. MINER. SYR'YA, ALMA-ATA, USSR.

UNCLASSIFIED

USSR

UDC 669.295.48(088.8)

SOLODISOV, D. K., CHIKODANOV, A. I., and VOROB'YEV, L. I.

"Method for Degreasing Titanium Alloy Scrap"

USSR Author's Certificate No 261095, filed 31 Jun 68, published 6 May 70
(from RZH-Metallurgiya, No 11, Nov 70, Abstract No 11G158 P)

Translation: A method is proposed for degreasing Ti-alloy scraps in smelting. To increase refining quality, the treatment is conducted in the spent melt of electrolytic magnesium baths. A method is described for distribution of the material incentives between shops and sectors. 2 tables. [Moscow Institute of Steel and Alloys]
A. Shmeleva

1/1

USSR

V
UDC: 621.373:530.1-5.6:621.317.17

YUCOV, V. A., VOROBYEV, L. K., KUBAREV, A. V., POTAPOV, I. S.

"A Thin-Film Laser Emission Measurement Receiver"

Dokl. Nauchno-tekhn. seminar "Metrol. v radioelektron." Tekhn. Ch. 1 (Reports of the Scientific and Technical Seminar on Metrology in Radio Electronics. Summaries, Part 1), Moscow, 1970, pp 131-136 (from RZh-Radiotekhnika, No 7, Jul 70, Abstract No 7D244)

Translation: The authors give the design and technical characteristics of a thin-film receiver designed for precision measurements of low levels of the power of radiation flux from continuous-emission lasers. The indicator film is made from a semiconductor material with a high temperature coefficient of resistance such as germanium by the method of vaporization in a vacuum. The range of measurable emission powers is 10^{-2} - 10^{-5} [W] in the wave band of 0.4-14 μ . The limiting sensitivity is 0.1 μ W. A. K.

1/3 042

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PROCESSING DATE--04DEC70

TITLE--ELEMENTS OF THE THEORY OF DIRECTION FINDING OF A CELESTIAL BODY
WITH A PLANE FROM A MOVING PLATFORM -U-

AUTHOR--VOROBYEV, L.M.

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

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ABSTRACT. A METHOD HAS BEEN DEVELOPED FOR THE DIRECT EVALUATION OF THE EFFECT OF THE DIRECTION FINDING PLANE ON THE ACCURACY IN MEASURING AN ANGLE. THE AUTHOR ANALYZES THE CONDITIONS AND DETERMINES THE CHARACTERISTICS OF DIRECTION FINDINGS OF A CELESTIAL BODY FROM A MOVING PLATFORM USING COMPLEX ASTRONOMICAL DIRECTION FINDING SYSTEMS. IT IS SHOWN THAT STUDY OF THE EFFECT OF SOME ROTATION ON THE DIRECTION FINDING SYSTEM IS REDUCED TO FINDING THE REDUCTION FUNCTIONS FOR THIS ROTATION FOR THE COORDINATE PLANE IN WHICH THE POSITION OF THE SPACECRAFT IS DETERMINED AND FINDING THE PROPER COEFFICIENTS FOR THE DERIVED FORMULAS. IF THE VECTOR CHARACTERIZING THE ROTATION OF THE DIRECTION FINDING PLANES IS AT SOME ANGLE TO THE COORDINATE PLANE AND THE AXIS OF MAXIMUM RESPONSE LIE IN THE COORDINATE PLANE, REGARDLESS OF THEIR DIFFERENCE IN "AZIMUTHS," THE VECTOR ERROR IN DETERMINING POSITION OF THE OBJECT IS EQUAL IN ABSOLUTE VALUE TO THE PROJECTION OF THE VECTOR OF THE CONSIDERED ROTATION ONTO THE COORDINATE PLANE AND HAS AN OPPOSITE DIRECTION. IF THE ROTATION PLANE AND THE AXES OF MAXIMUM RESPONSE LIE IN THE COORDINATE PLANE, REGARDLESS OF THE DIFFERENCE IN "AZIMUTHS" OF THE AXES OF MAXIMUM RESPONSE THE VECTOR ERROR IN DETERMINING POSITION IS EQUAL IN ABSOLUTE VALUE TO THE CONSIDERED VECTOR AND HAS THE OPPOSITE DIRECTION. THE LATTER TWO CONCLUSIONS ARE DIRECTLY APPLICABLE TO HORIZONTAL ASTRO ORIENTATION DEVICES IN WHICH THE PROBLEM OF DETERMINING THE COORDINATES OF THE POSITION OF AN OBJECT IS SOLVED BY MEASURING THE ALTITUDES OF TWO CELESTIAL BODIES.

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ABSTRACT/EXTRACT--THE VECTOR ERROR CORRESPONDING TO A PARTICULAR ROTATION OF THE DIRECTION FINDING PLANES WILL BE MINIMUM WHEN DETERMINING THE POSITION COORDINATES OF AN OBJECT USING THE SAME DIRECTION FINDING SYSTEM FOR WHICH THE AXES OF MAXIMUM RESPONSE LIE IN THE COORDINATE PLANE. THIS IMPORTANT CIRCUMSTANCE MUST BE TAKEN INTO ACCOUNT PARTICULARLY WHEN EVALUATING AND COMPARING DIFFERENT ASTRONOMICAL SYSTEMS FOR DETERMINING SPACECRAFT POSITION. IF THE VECTORS OF THE CONSIDERED ROTATIONS LIE IN THE DIRECTION OF THE AXES OF MAXIMUM RESPONSE OF THE DIRECTION FINDING SYSTEM, REGARDLESS OF THE TYPE OF DIRECTION FINDING SYSTEM THE VALUE OF THE VECTOR ERROR IN DETERMINING THE COORDINATES OF THE POSITION OF THE OBJECT ARE DEPENDENT ON THE DIFFERENCE IN THE "AZIMUTHS" OF THE AXES OF MAXIMUM RESPONSE AND THE RATIO OF THE ABSOLUTE VALUES OF THE VECTORS OF THE CONSIDERED ROTATIONS.

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USSR

VOROB'YEV, L. M., K TEORII POLETA RAKET (On the Theory of Rocket Flight), Moscow, "Mashinostroyeniye", 1970, 224 pp, illus, biblio, 2,700 copies printed

| | | |
|---|--|-----|
| Foreword | | 3 |
| Introduction | | 4 |
| Explanation of Symbols | | 7 |
| Chapter I. Some Modifications of the Analytical Methods of Studying the Dynamic Equations of Flight | | 11 |
| Chapter II. Simulated Motion of a Rocket | | 47 |
| Chapter III. Determining the Flight Characteristics of A Rocket During Rectilinear Motion | | 60 |
| Chapter IV. Determining the Flight Characteristics of a Vehicle During Curved Flight | | 78 |
| Chapter V. On the Theory of Parametric Optimization of the Trajectory and Design of a Vehicle. Direct Method of Investigation | | 110 |
| Chapter VI. Optimum Parameters of a Vehicle With Vertical Active Portion of the Trajectory | | 123 |
| Chapter VII. Optimum Parameters of a Vehicle With Curvilinear Active Portion of the Trajectory | | 156 |
| Chapter VIII. Variation Method of Determining Optimum Flight. Indirect Method of Investigation | | 167 |

USSR

BOOK

UDC 629.76 : 629.7.015.001.2 ³⁵⁵

VOROB'YEV, L. M.

K TEORII POLETA RAKET (On the Theory of Rocket Flight), Moscow, "Mashinostroyeniye"
1970, illus, biblio, 224 pp, 2,700 copies printed

In the treatment of the dynamics of rocket flight within the active portion of the trajectory, emphasis is placed on analytic methods of determining the characteristics of motion of the center of mass of the vehicle. Some new modifications of the method of integrating differential equations based on the ideas of Newton and Chaplygin are presented, and procedures for employing these modifications to determine the flight characteristics of rectilinear and curved motions of a rocket. Solutions are provided for the dynamics of flight of an aircraft, the kinematics of a guided missile, external ballistics, etc. The problem of optimizing the flight characteristics and design parameters of multi-staged missiles is approached by the method of parametric optimization. The rational uses of single-, two-, and three-stage rockets are discussed. A method of trigonometric transformations for solving nonclassical type variation problems to determine the optimum flight regime of a rocket is explained; numerical data are presented in several graphs and tables.

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1/2 030
 UNCLASSIFIED
 TITLE--DIRECTIONAL INERT SHIFT OF ENDOLYMPH IN SEMICIRCULAR CANALS IN THE
 COURSE OF MAN'S ROTATION PROVIDING THE SUBJECTS MOVEMENT OF THE HEAD
 AUTHOR--(03)--SGLODOVNIK, F.A., VOROBYEV, L.M., PLATONOV, N.B. PROCESSING DATE--30OCT71
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ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE HORIZONTAL AND VERTICAL COMPONENTS OF NYSTAGMIC REACTIONS WERE REGISTERED IN THE COURSE OF MAN'S ROTATION PROVIDING THE MOVEMENT OF THE SUBJECTS HEAD IS IN THE FRONTAL PLANE. THE AUTHORS CARRIED OUT A THEORETICAL ANALYSIS OF THE ORIGIN OF CORIOLIS FORCES IN SEMICIRCULAR CANALS AND ESTIMATED THE DIRECTION OF THE INERT SHIFT OF THE ENDOLYMPH, WHICH CORRESPONDS THE DIRECTION OF THE NYSTAGMIC REACTION. WHEN MAN ROTATES RIGHTWARD HIS HEADS MOVEMENT FROM THE LEFT SHOULDER TO THE RIGHT ONE INCITES AMPULOPETAL FLOW IN THE ANTERIOR SEMICIRCULAR CANALS AND AMPULOFUGAL GLOW OF ENDOLYMPH IN THE POSTERIOR ONES. THE HEADS MOVEMENT FORM THE RIGHT SHOULDER TO THE LEFT ONE CAUSES AMPULOFUGAL FLOW IN THE ANTERIOR SEMICIRCULAR CANALS AND AMPULOPETAL FLOW OF ENDOLYMPH IN THE POSTERIOR ONES. ROTATION IN THE LEFTWARD DIRECTION CAUSES AN ENDOLYMPH FLOW IN AN OPPOSITE DIRECTION. WHEN THE HEAD IS RAISED THE ENDOLYMPH OF THE HORIZONTAL SEMICIRCULARS CANALS SHIFTS IN AN OPPOSITE DIRECTION OF THE ROTATION OF THE TESTING SET UP AND WHEN THE HEAD IS TILTED THE ENDOLYMPH SHIFTS IN THE DIRECTION OF THE ROTATION.

UNCLASSIFIED

USSR

SOLODOVNIK, F.A., VGRUBYEV, L.M., PLATONOV, N.B.

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JDC: 611.85:613.693

"The Direction of Inertial Shift of Endolymph in Semicircular Canals During Rotation of a Man with Head Movements in the Frontal Plane"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Biologicheskaya, No 3, May/Jun 70, pp 337-347

Abstract: The horizontal and vertical components of nystagmic reactions were recorded in the course of rotation when movements of the subject's head were in the frontal plane. A theoretical analysis was conducted of the origin of Coriolis forces in the semicircular canals, and the direction of inertial shift of the endolymph was estimated, which corresponds with the direction of the nystagmic reaction. When a man rotates his head from the left shoulder to the right, the movement incites ampulopetal flow in the anterior semicircular canals, and ampulofugal flow of endolymph in the posterior semicircular canals. The movement of the head from the right shoulder to the left causes ampulofugal flow in the anterior and ampulopetal flow of endolymph in the posterior semicircular canals. Rotation to the left causes flow of endolymph in the opposite direction. When the head is raised the endolymph in the horizontal semicircular canals shifts in the opposite direction of rotation; and when the head is tilted, the endolymph shifts in the direction of rotation.

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USSR

VOROB'YEV, L. Ye., KOMISSAROV, V. S., and STAFEYEV, V. I., Leningrad Polytechnical Institute imeni M. I. Kalinin UDC: 621.315.592
"Double Beam Refraction With Hot Electrons in the Infrared Region in Degenerate InAs"
Leningrad, Fizika i tekhnika poluprovodnikov, vol 6, No 6, 1972,
pp 1153-1155

Abstract: This brief communication is based on an earlier paper by the three authors named above (Phys. St. Sol., 50, 1972) in which it was shown that the dielectric permeability becomes an anisotropic quantity in strong electric fields as the result of the anisotropy of the distribution function of hot current carriers, and of the nonparabolicity of the conductive zone. The anisotropy of the index of refraction leads to a shift in phase for light polarized parallel and perpendicular to the strong field. In the present paper, double refraction is investigated in n-type InAs at a temperature of 800 K. The carrier concentration in the InAs is $1.5 \cdot 10^{16}$ per cc, and the electronic gas is weakly degenerate. The experimental method is fully described in another earlier paper by these same authors (Letters, ZhETF, 13, 1971, p 140). Curves are plotted for the anisotropy of the index of refraction and for the electron temperature as functions of the electric field intensity; good agreement between the measured and computed values is shown.

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USSR

UDC 669.822:621.039.5

GOLOVCHENKO, YU. M., VOROB'YEV, M. A., BYCHKOV, B. A., DAVIDENKO, A. S., PORT-
NOV, V. F.

"Mechanical Properties of Uranium Irradiated to 0.45 Atomic % Burn-up"

Radiatsion. fiz. tverd. tela i reaktornoye materialoved. -- V sb (Radiation
Solid State Physics and Reactor Material Science -- collection of works),
Moscow, Atomizdat Press, 1970, pp 185-191 (from RZh-Metallurgiya, No 4, Apr
71, Abstract No 4I825)

Translation: Uranium samples containing < 0.3 weight % of admixtures (Fe, Si, Al, and C) were irradiated to 0.45 atomic % burn-up with a maximum temperature of 500°. Mechanical tensile, compressive, bending, and fatigue testing was carried out at temperatures up to 500°. The properties of the irradiated uranium depend essentially on the type ("rigidity") of the tests. This is not only connected with the difference in the stress state but also the characteristic features of accumulation of the defects. For uranium irradiated at higher temperatures, σ_T is lower. This is explained by annealing the defects of the first and second type. However, even at an irradiation temperature of 350 and 450°, σ_T is higher than for the unirradiated samples since
1/2