

2/2 023

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AT0133833

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. RESULTS OF INVESTIGATIONS OF THE
ABSORPTION OF A RADIO SIGNAL BY A SYSTEM CONSISTING OF ROCK AND ICE
SUGGEST THAT IT MIGHT BE POSSIBLE TO DEVELOP METHODS OF INVESTIGATING
PERMAFROST BY MEANS OF RADIO WAVES.

UNCLASSIFIED

USSR

UDC 772.99:681.3

FEDOROV, B. F., Candidate of Sciences, EL'MAN, R. I., Doctor of Sciences

"Computer Synthesis of Holograms"

Moscow, Optiko-Mekhanicheskaya Promyshlennost', No. 4, 1972, pp 21-23

Abstract: In connection with the expansion of the possibilities of optical information processing systems, it is proposed that the use of machine holograms is effective in cases in which it is difficult or impossible to obtain holograms by ordinary optical means, such as obtaining optimal holographic filters for recognition devices and the holography of hypothetical, calculated machine images of objects. The possibilities of existing computer techniques for the synthesis of holograms are evaluated to analyze trends in the development of machine holography and its use in electron optics systems. The possibilities of producing double Fourier holograms was evaluated using the BESM-4 computer with the ATsFU-128 alphanumeric printout. The word format of the printout unit has 128 positions. Examination of the reproduced image showed that it has a periodic nature due to the discrete nature of the Fourier transformation. Each individual image has a weak, centrally symmetric component due to a loss in the sign of the phase. The total machine time expended on obtaining one hologram was 15 mins. Experience in the machine synthesis of holograms indicates the possibility of a detailed study of the holographic process by modeling it with the aid of a computer.

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USSR

UDC 772.99

FEDOROV, B. F., Candidate of Sciences, EL'MAN, R. I., Doctor of Sciences

"Differentiating Effect of a Binary Hologram"

Leningrad, Optiko-Mekhanicheskaya promyshlennost', No 7, 1972, pp 3-4

Abstract: The mathematical function of the transparency of a binary hologram is derived from the Fourier hologram equation in the form:

$$t(p, q) = A = B h^2(p, q) - h(p, q) \cos [\alpha p + \varphi(p, q)],$$

where p, q are the spatial frequencies, $h(p, q)$ is the amplitude spectrum of the initial transform, $\varphi(p, q)$ is the phase spectrum of the initial transform, α is the angle of inclination of the reference beam, A, B are the arbitrary parameters which depend on the intensity of the reference beam and the contrast of the photographic film. The transparency function of the binary hologram has the form

$$\theta(p, q) = \begin{cases} 1 & \text{for } t(p, q) \geq A, \\ 0 & \text{for } t(p, q) < A. \end{cases}$$

It is demonstrated that such a binary hologram has a differentiating effect. In the presented proof, only the points lying on the envelope of the spatial spectrum, that is, the harmonics carrying the greatest energy are considered, and it is shown that raising of this envelope takes place. This

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FEDOROV, B. F., et al., Optiko-mekhanicheskaya promyshlennost', No 7, 1972, pp 3-4

characterizes the increase in proportion of high spatial frequencies at least for the indicated points and their neighborhoods and generates the tendency toward differentiation. The differentiating effect can be regulated within certain limits by varying the parameters B and A threshold.

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UDC 772,99

FEDOROV, B. F., Candidate of Sciences, EL'MAN, R. I., Doctor of Sciences

"Differentiating Effect of a Binary Hologram"

Leningrad, Optiko-Mekhanicheskaya promyshlennost', No 7, 1972, pp 3-4

Abstract: The mathematical function of the transparency of a binary hologram is derived from the Fourier hologram equation in the form:

$$t(p, q) = A - Bh^2(p, q) - h(p, q) \cos [\alpha p + \phi(p, q)],$$

where p, q are the spatial frequencies, $h(p, q)$ is the amplitude spectrum of the initial transform, $\phi(p, q)$ is the phase spectrum of the initial transform, α is the angle of inclination of the reference beam, A, B are the arbitrary parameters which depend on the intensity of the reference beam and the contrast of the photographic film. The transparency function of the binary hologram has the form

$$\theta(p, q) = \begin{cases} 1 & \text{for } t(p, q) \geq A, \\ 0 & \text{for } t(p, q) < A. \end{cases}$$

It is demonstrated that such a binary hologram has a differentiating effect. In the presented proof, only the points lying on the envelope of the spatial spectrum, that is, the harmonics carrying the greatest energy are considered, and it is shown that raising of this envelope takes place. This

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USSR

FEDOROV, B. F., et al., Optiko-mekhanicheskaya promyshlennost', No 7, 1972, pp 3-4

characterizes the increase in proportion of high spatial frequencies at least for the indicated points and their neighborhoods and generates the tendency toward differentiation. The differentiating effect can be regulated within certain limits by varying the parameters B and $A_{\text{threshold}}$

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USSR

UDC 621.382.333.34

TERPIGOR'YEV, V. V., FEDORKOV, B. G.

"A Device for Automatic Measurement of the Loss Resistance of Tunnel Diodes"

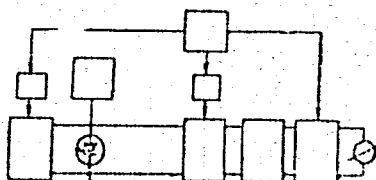
Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, 1970, No 36, Soviet Patent No 288155, class 21, filed 1 Sep 69, published 3 Dec 70, p 85

Translation: This Author's Certificate introduces a device for automatic measurement of the loss resistance of tunnel diodes. The device contains a sinusoidal current generator and a DC bias source. As a distinguishing feature of the patent, precision is improved and the measurement process is automated by adding an amplifier with gain control, connecting the DC bias source and amplifier through electronic switches to a synchronizer, and connecting a high-frequency filter-detector and a synchronous detector in series with the amplifier. The detectors convert high-frequency voltage to DC voltage which is proportional to the loss resistance of the tunnel diode being measured.

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TERPIGOR'YEV, V. V., FEDORKOV, B. G., Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, 1970, No 36, Soviet Patent No 288155, class 21, filed 1 Sep 69, published 3 Dec 70, p 85



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USSR

UDC 615.21+612.178

PARIN, V. V., Academician (Deceased), FEDOROV, B. M., GRANBERG, I. I.,
BATULIN, Yu. M., and PODREZOVA, N. A., Institute of Medical-Biological
Problems, Moscow

"Myorelaxation of Animals by the Injection of 3,5-Dimethyl-4-bromopyrazole and
the Effect of Extracardial Nerve Stimulation Under These Conditions"

Moscow, Doklady Akademii Nauk SSSR, Vol 200, No 5, 1971, pp 1,252-1,253

Abstract: Intraperitoneal administration of 3,5-dimethyl-4-bromopyrazole in
a dose of 200-400 mg/kg to rabbits or in a dose of 300-500 mg/kg to dogs pro-
duced a state of profound myorelaxation, from which the animals recovered
within a time that increased with increasing doses of the drug. A dose of
450-500 mg/kg and > 500 mg/kg was lethal for rabbits and dogs, respectively.
Study of the effects of direct stimulation of the vagus or of sympathetic
nerves effecting adrenergic innervation of the heart, which was carried out in
experiments on dogs to which 350-500 mg/kg of the drug had been injected,
showed that the state of myorelaxation did not affect the action produced by
direct stimulation of the extracardial nerves.

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FEDOROV, B. M.

JPRS 56030
18 May 72

UDC 617-091.16-07:616.12-08.1-077-1
CARDIAC ACTIVITY CHANGES IN SOON DURING ACUTE OVERHEATING AND THE PROGNOSTIC
IMPORTANCE OF ELECTROCARDIOGRAPHIC DATA

(Article by B. M. Fedorov, E. A. Melnik, N. V. Antravitsky and V. P. Kravtsov
Moscow, Travnikhskoe Meditsinskoe Institut, Russia, Vol. 6, No. 2, March-
April 1972, pp. 22-25, submitted for publication 5 February 1971)

Abstract: Abstentized dogs were exposed to acute over-
heating and their cardiovascular changes were examined in
comparison with respiratory variations. The prognostic sig-
nificance of the ECG ventricular spikes was noted during the
period preceding the development of heat-induced collapse.
The changes in the voltage of the Rg waves during acute over-
heating were shown to be associated with several factors, the
most important of which were adrenaline and heat. The
heating and work in drying late heating periods during early
collapse were periods of overheating and the cardiac activity
then and afterwards the cardiovascular disturbances accom-
panying hyperthermia.

During acute overheating acute overheating can arise in allured situ-
tions, particularly during emergency accidents of biological animals, as carried
immediately after landing.

Man is subjected to overheating when working in hot shops, in closed
cabins in the ships or during landing of heat-protecting systems, and also
when performed considerable physical work in insulating suits and spacesuits.

The experimental investigation of overheating in human subjects yielded
valuable information on tolerance to heat stresses and on the influence of
hyperthermia on man's performance (M. Yu. Marchak and N. V. Kravtsov, In. A.
U. G. Melnik, A. G. Melnik, A. G. Melnik, A. G. Melnik, In. A.
U. G. Melnik, et al., and others). However, man's overheating in an extreme
heat usually is stopped when he reaches the point of sweating; this limits

FEDOROV, B. M.

SO:JPRS 53448
24 JUNE 91

UDC 612.89.012.45/.014.426

CHANGES IN THE SYMPATHICOADRENAL SYSTEM CAUSED BY EXPOSURE IN A PERMANENT MAGNETIC FIELD

M. S. (S. A. S. A. S. A.)

(Article by B. M. Fedorov and V. S. Nevetnyyeva; Moscow, Kosmicheskaya Biologiya i Meditsina, Vol. 5, no. 2, 1974, pp. 35-42, submitted for publication 21 September 1970)

Abstract: The effect of a permanent magnetic field on the sympathoadrenal system in animals (rabbits) was investigated. The experiments produced a stimulating effect on the sympathetic nervous system. Twenty-four hour exposure to hypokinetic conditions considerably reduced the noradrenaline content in the hypothalamus and myocardium, but exerted no effect on the adrenal gland. Twenty-four hour exposure to a permanent magnetic field of 1,000 G prevented any decrease in the noradrenaline content in the hypothalamus and myocardium of hypokinetic rabbits.

The problem of the effect of natural magnetic fields on the human nervous and cardiovascular system assumed particular importance for medicine as a result of the studies made by A. L. Chizhevskiy (1922-1930) and a number of other Soviet and foreign scientists. They demonstrated that an increase in solar activity causes strong disturbances of terrestrial magnetism (geomagnetic storms), accompanied by a considerable increase in the incidence of myocardial infarction, increased frequency of reactive strokes, and a change in body tolerance to the agents of infectious diseases. These observations are also confirmed by the results of labor investigations (V. N. Yagodnikov, V. N. Pogoditskiy and V. S. Serabryanskiy, and others).

The matter of the specific peculiarities of changes in cosmic radiation, atmospheric electricity and magnetic fields responsible for impairments in the nervous and cardiovascular systems during periods of increased solar activity has not yet been solved. However, it has been noted that these impairments are manifested more sharply when there is reduced body adaptability (A. L. Chizhevskiy and Yu. G. Shishkin; V. P. Kozlovskiy, et al.).

space medicine

1/2 019 UNCLASSIFIED PROCESSING DATE--09OCT70
TITLE--THE IMPORTANCE OF MEDIASTINOSCOPY IN DETERMINATION OF THE PULMONARY
CANCER SPREAD -U-
AUTHOR-(02)-~~FEDOROV~~, B.N., KUZNETSOV, B.V. F
COUNTRY OF INFO--USSR
SOURCE--VESTNIK KHIRURGII IMENI I. I. GREKOVA, 1970, VOL 104, NR 5, PP
17-19
DATE PUBLISHED-----70
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--LUNG, CANCER, DIAGNOSTIC METHODS, LYMPHATIC SYSTEM
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
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UNCLASSIFIED

2/2 019

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PROCESSING DATE--09OCT70

CIRC ACCESSION NO--AP0109173

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ANALYSIS OF DATA OF 54
MEDIASTINOSCOPIES IN PATIENTS WITH THE ESTABLISHED DIAGNOSIS OF
PULMONARY CANCER IS PRESENTED. IT IS CONCLUDED THAT MEDIASTINOSCOPY IS
A VALUABLE ADJUNCT IN COMPLEX INVESTIGATION OF PATIENTS WITH CANCER OF
THE LUNG, AND IT SHOULD BE INDICATED IN ALL CASES OF PULMONARY CANCER.
THE POSSIBILITIES OF MEDIASTINOSCOPY ARE LESS RELIABLE IN CANCER
LOCATING IN THE LOWER LOBE OF THE LEFT LUNG, AND IT COULD BE MORE
VALUABLE IN TUMOR LOCATION IN THE UPPER PULMONARY LOBES. GROSS CHANGES
IN MEDIASTINAL CELLULAR TISSUE WITH ENLARGED MEDIASTINAL LYMPH NODES ARE
CONSIDERED AS ONE OF INDIRECT SIGNS OF CANCER INVOLVEMENT OF THE
MEDIASTINUM. FACILITY: GOSPITAL'NOY KHIRURGICHESKOY KLINIKI
ARKHANGEL'SKOGO MEDITSINSKOGO INSTITUTA NA BAZE ARKHANGEL'SKOY OBLASTNOY
KLINICHESKOY BOL'NITSY.

UNCLASSIFIED

USSR

GROSS, the late Ye. F., FEDOROV, D. L., and SHEKHMAMET'YEV, R. I., Leningrad State University imeni A. A. Zhdanov, Physicotechnical Institute imeni A. F. Ioffe of the Academy of Sciences USSR, Leningrad

"Effect of Uniaxial Deformation on Absorption Spectrum of Bismuth Iodide Crystals"

Leningrad, Fizika Tverdogo Tela, Vol 14, No 11, Nov 72, pp 3252-3255

Abstract: In previous articles the authors reported observing a hydrogen-like series of lines in the absorption spectrum of bismuth iodide crystals at 4.2°K which converge towards the long-wave side instead of the short-wave side, as usually the case. The frequencies ν_n of these lines obey the inverse serial relation of the hydrogen-like atom

$$\nu_n = \nu_\infty + \frac{R_1}{n^2}$$

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USSR

GROSS, the late YE. F., et al., Fizika Tverdogo Tela, Vol 14, No 11, Nov 72, pp 3252-3255

The present article describes results of the further experimental study of the inverse series viz., the effect of directed, uniaxial elastic deformation of BiI_3 single crystals at 4.2°K on the absorption spectrum. Deformation of the crystal along the optical axis C_3 results in a shift of the absorption lines of the inverse series towards the long-wave side, together with a successive decrease in line intensity, beginning with the higher members of the series. At the same time, there is continuous deformation absorption moving from the short-wave side with a considerably higher (in absolute value) shift coefficient.

The authors thank N. V. STAROSTIN for discussing the results, V. T. AGEKYAN for his assistance and advice in the creation of a special-design press, and A. N. PAVLOV for taking part in the experiments.

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USSR

UDC: 543.42.062

MIRONOV, V. A., FEDOROV, B. V., SHICHKOV, V. V., YACHIN, V. M.

"Universal Spectral Analyzer for Liquid Media"

Optich. i Titrometrich. Analizatory Zhidk. Sred [Optical and Titrometric Analyzers for Liquid Media], Reports of All Union Conference, 1971, Part 1, Tbilisi, 1971, pp55-60 (translated from Referativnyy Zhurnal Metrologiya i Izmeritel'naya Tekhnika, No 2, 1972, Abstract No 2.32.1093 by V. S. Krasnova)

Translation: The Special Design Bureau of the Weather Bureau, Academy of Sciences, USSR has developed an experimental model of a universal spectral analyzer (A) for liquid media for measurement of action spectra (characteristic and effective). The A includes a two-wave radiator with controlled output spectra, a thermostated cuvette with regulator and temperature measuring device, interchangeable converters and electronic measuring devices and a recording potentiometer. The outputs of both channels of the radiator produce spectra of equal power with an error of equalization relative to the maximum standard level of not over 5% in the 300-760 $m\mu$ wave range. The A allows curves of the change of electrical conductivity, partial oxygen pressure and photo-potentials to be measured as functions of wavelength of the incident radiation, radiation intensity, temperature and composition of liquid and gas media, surrounding the objects studied.

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USSR

UDC 539.126.34+530.145

FEDOROV, F. I., Institute of Physics, Academy of Sciences of the BSSR

"On the Theory of Spin"

Minsk, Izvestiya Akademii Nauk BSSR, Seriya Fiziko-Matematicheskikh Nauk,
No 1, 1973, pp 86-91

Abstract: A general theory of spin states of arbitrarily moving, free particles is developed on the basis of complex vector parametrization of a Lorentz group. By transformation of the vector-parameter of a small Lorentz group, an expression is obtained for the spin vector operator $S(p)$ of a particle with any momentum whose projection $\sigma(p, c) = cS(p)$ in arbitrary direction c may have a certain value, the conventional commutation relations for momentum being satisfied. It is shown how this spin projection operator is transformed with an arbitrary Lorentz transformation. The author finds the Lorentz transformations which bring about the transition $\sigma(p, c) \rightarrow \sigma(p, c')$: i. e., which arbitrarily change the axis of spin projections without changing the momentum, and also transformations $\sigma(p, c) \rightarrow \sigma(p', c)$ which arbitrarily change the momentum without a change in c . Lorentz transformations are found which change given p and c

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USSR

FEDOROV, F. I., Izv. AN BSSR, Ser. Fiz.-Mat. Nauk, No 1, 1973, pp 86-91

to any other p' and c' : $\sigma(p,c) \rightarrow \sigma(p',c')$. It is shown how these operators may be used to simplify calculation of matrix elements by reducing the latter to a trace of the product of matrices of wave equations and infinitesimal operators of the corresponding transformation of a Lorentz group. This reduces computations in comparison with expressions for the squares of the moduli of matrix elements in terms of traces. This method is used to find a general relation from which by direct substitution expressions can be derived for the matrix elements for the Compton effect and a number of other processes with arbitrarily polarized electrons and photons.

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USSR

BOGUSH, A. A., FEDOROV, F. I., Institute of Physics, Academy of Sciences of the BSSR

"Vector Parametrization of the Complex Lorentz Group"

Moscow, Teoreticheskaya i Matematicheskaya Fizika, Vol 13, No 1, Oct 72, pp 67-74

Abstract: It is shown that the complex Lorentz group can be parametrized by using two independent, complex, three-dimensional vectors. In this regard there is a far-reaching analogy with the real Lorentz group. General expressions are derived for finite transformations of irreducible finite-dimensional representations of the complex Lorentz group.

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USSR

UDC 530.1+539.12

FEDOROV, F. I.

"Subgroups of a Complex Group of Revolution and of the Lorentz Group"

Minsk, Izvestiya Akademii Nauk BSSR--Seriya Fiziko Matematicheskikh Nauk,
No 2, 1973, pp 63-72

Abstract: In earlier papers, the author demonstrated the general transformation of the group $SO(3, C)$ (F. I. Fedorov, DAN BSSR, 2, 1958, p 408, etc.). In the literature, the Lorentz group is described by $SL(2, C)$. The present paper shows how the elements of the Lorentz group can be expressed through the vector parameter \bar{q} in which the $SO(3, C)$ group is expressed. It also analyzes the subgroups of the $SO(3, C)$ group and their structure using the characteristics of the three-dimensional complex vector parameter and the law of composition. This analysis, the author concludes, can be considered still another confirmation of the effectiveness of vector parametrization.

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USSR

UDC 539.12

PLETYUKHOV, V. A., and FEDOROV, F. I., Institute of Physics, Academy of Sciences Belorussian SSR, and Brest State Pedagogic Institute imeni A. S. Pushkin

"On First- and Second-Order Relativistic Wave Equations"

Minsk, Izvestiya Akademii Nauk BSSR, Seriya Fiziko-Matematicheskikh Nauk, No 6, 1972, pp 59-64

Abstract: The article considers the question of the nonuniqueness of the transition from second-order relativistic wave equations of the type

$$\gamma_{ik}^{\alpha\beta} \nabla_k \nabla_i \psi_\alpha = 0$$

($i, j, k, l, \dots = 1, 2, 3, 4; \mu, \nu, \lambda, \dots = 1, 2, \dots, S$).

to first-order equations. Methods are found for converting to simplest first-order systems; i.e., those with the minimum possible number of equations and wave function components. Proca equations are given as an example.

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USSR

FEDOROV, F. I., FILLIPOV, V. V.

"Trajectories and Flux Lines of Inhomogeneous Wave Energy in an Isotropic Transparent Medium"

Leningrad, Optika i Spektroskopiya; September, 1972; pp 530-6

ABSTRACT: The trajectories and flux lines of the energy of inhomogeneous waves of arbitrary polarization in an isotropic transparent medium are found. In the general case the energy shift rate u and phase velocity v of such a wave are different; this condition leads to a distortion of the trajectories of the energy motion. The trajectories can be of two types, depending on whether the projection of the vector u in the v direction is larger or smaller than the phase velocity. The beam velocity of an inhomogeneous wave is always less than or equal to the beam velocity of a homogeneous wave in the same medium. Special cases of the polarization of an inhomogeneous wave, as well as the energy motion of an inhomogeneous wave with complete internal reflection, are considered.

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USSR

UDC 539.126.34+530.145

KUVSHINOV, V. I., FEDOROV, F. I., Institute of Physics of the Academy of Sciences BSSR

"Diagram Technique in Scattering Theory for a Combined Scalar Electrodynamics Field"

Minsk, Izvestiya Akademii Nauk BSSR, Seriya Fiziko-Matematicheskikh Nauk, No. 3, 1972, pp 56-66

Abstract: A general diagram technique for the combined electrodynamic field of scalar mesons

$$\Psi(x) = (\Psi_{,l}(x)) = \begin{pmatrix} \psi^1(x) \\ \bar{\psi}^1(x) \\ \psi^2(x) \end{pmatrix}$$

$$A = \alpha, \bar{\alpha}, k', |kl|; \alpha, \bar{\alpha} = 0, 1, 2, 3, 4; k, k', l = 1, 2, 3, 4,$$

is considered. In previous studies a classical theory of the field Ψ was constructed including the field equations and conservation laws, secondary quantization of Ψ was carried out, and the scattering amplitude of second-order perturbation theory was analyzed. In this approach the scattering process was

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USSR

KUVSHINOV, V. I., FEDOROV, F. I., Izvestiya Akademii Nauk BSSR, Seriya Fiziko-Matematicheskikh Nauk, No. 3, 1972, pp 56-66

considered as the self-action of the combined field caused by its nonlinearity. Results show that this approach has greater information value than the ordinary approach and makes it possible to consider from this aspect the theory of interacting fields and establish many specific properties of this theory. A perturbation theory formalism for the scattering of the combined field Ψ is constructed and it is shown that the amplitude of the N -tail has $N!$ terms differing in the arrangement of the external pulses. The impulse portion of the amplitude is invariant to crossing and twisting transformations. Those diagrams which are connected by a reflection from the axis of symmetry among the $N!$ terms of the amplitude are equal to one another.

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USSR

FEDOROV, F. I.; SOLODUKHIN, A. M.; KUZ'NITSKIY, V. A. (Belorussian State University)

"Application of the Effective Radial Potential to the Calculation of Atomic Levels"

Minsk, Vestsi Akademii Navuk BSSR: Seryya Fizika-Matematychnykh Navuk; May-June, 1972; pp 49-55

ABSTRACT: The effective radial potential, introduced in a previous paper by F. I. Fedorov (Vestsi AN BSSR, Seryya Fizika-Matematychnykh Navuk; No. 3, 129, 1968), is used for the calculation of the energy levels of atoms with several electrons. In the first approximation in perturbation theory an equation with an effective potential is solved for an arbitrary $n\ell m$ -state of an electron in a multielectron atom, taking into account the effect of the remaining electrons. By means of an approximate Hamiltonian the energy of the ground states of the helium, lithium, and beryllium atoms is calculated.

The article includes 46 equations. There are 9 bibliographic references.

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UDC 535.324+535.341

USSR

FEDOROV, F. I.

"Determining the Parameters of Optically Isotropic Absorbing Media in Reflected Light"

Leningrad, Optika i Spektroskopiya, No. 3, Mar 71, pp 528-531

Abstract: Two new methods for measuring the optical constants of isotropic absorbing media in reflected light are proposed. It is noted that although the problem has received some attention, determination of optical constants of absorbing isotropic media in cubic crystals on the basis of the properties of the light reflected by them has not been widely applied. The reason for this is attributed to the relative complexity and low accuracy of classical procedures for determining the characteristics of reflected, elliptically polarized light with the aid of a compensator and analyzer. The situation has changed with the development of methods for measuring the orientation of the axes of the polarization ellipse and the ellipticity which are based on the use of the Faraday effect in conjunction with electronic circuits having considerably higher accuracy than ordinary methods with a Nicol prism. The methods described here, while simpler than known

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FEDOROV, F. I., Optika i spektroskopiya, No. 3, Mar 71, pp 528-531

methods in the experimental respect, are entirely universal and their accuracy is restricted only by the accuracy of the measurements. Each method requires two measurements with a fixed arbitrary angle of incidence for two different linear polarizations of the incident light. The reflection coefficients are measured in the first method, and the orientation of the major axis of the ellipse of fluctuations of reflected light is measured in the second. The parameters from the measurements are calculated on the basis of exact, simple formulas. In both methods two measurements are used for the same arbitrary angle of incidence but for two different azimuths of the linear polarization of incident light. In the first method the reflection coefficients are measured for perpendicular and parallel planes of incidence of the amplitudes of the incident wave. In both methods, especially the second, there is offered a simple, fairly accurate determination of the parameters of absorbing isotropic media which can be used for the diagnostics of isotropic absorbing minerals in reflected light.

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USSR

TKHAREV, Ye. Ye. and FEDOROV, F. I., Minsk Radiotechnical Institute

"Partial Wave Analysis on the Basis of Complex Vector Parametrization"

Moscow, Teoreticheskaya i Matematicheskaya Fizika, Vol 7, No 3, Jun 71,
pp 322-331

Abstract: Using the base of a complex vector parametrization of the Lorentz group, the authors give a partial analysis of one- and two-particle states. By interpreting the transformations of the small group, within the framework of such an approach, as rotations in the respective complex three-dimensional space of parameters of this group, the authors find it is possible to conveniently construct states of a two-particle system with certain values of the total moment and its projections. On this basis they expand the scattering matrices over partial waves. Beginning with unitary representations of the Poincaré group, wherein they present a theorem covering such case, the authors continue on to analyzing the one-particle state and the two-particle state. In each instance they support their findings mathematically. The article contains a bibliography of 12 titles.

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USSR

FEDOROV, F. I.; KUVSHINOV, V. I.

"Laws for the Preservation of Scalar Electrodynamics in the Formalism of a Unified Field"

Minsk, Vestsi Akademii Navuk BSSR: Seryya Fizika-Matematychnykh Navuk; No. 1, 1971; pp 83-9

ABSTRACT: The authors consider the Lagrangian of the unified field

$$L = \frac{1}{2} \Psi (\beta^k \partial_k + \beta^0) \Psi + \frac{ie}{6} P \Psi \Psi \Psi;$$

where Ψ includes the wave functions of a scalar particle, an antiparticle, and a Maxwellian field (in 10-dimensional formalism); β^k are antisymmetrical matrices, β^0 is a symmetrical matrix, $P = (P_{ABC})$ is a matrix of the third rank, symmetrical with respect to all indices.

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USSR

FEDOROV, F. I., and KUVSHINOV, V. I., Vestsi Akademii Navuk
BSSR: Seryya Fizika-Matematychnykh Navuk, No 1, 1971, pp 83-89

On the basis of this Lagrangian, laws for the preservation of the energy-momentum, the angular momentum, and the current for a unified field, as well as the charge conjugation are considered.

The article includes 49 equations. There are 7 references.

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USSR

UDC: 548.1

FEDOROV, F. I.

"Dimensions of Tensor Space in Crystals"

Moscow, Kristallografiya, Vol. 15, No. 4, 1970, pp 631-637

Abstract: A method is presented for obtaining simple, closed, general formulas for the spatial dimensions of tensors of arbitrary rank in crystals with all types of symmetry. The polyadic representation of the tensors is used on the basis of the actual crystallography as well as on the circular or axial basis. Relationships are found and proved for the numbers of independent components in tensors of even and odd rank for various groups of symmetry. With these relationships, the problem of finding the tensor space dimensions is greatly simplified. A table of formulas for the dimensionality of general and fully symmetrical tensors is given. The author promises to explain the method for obtaining closed formulas for the dimensionality of invariant spatial tensors of arbitrary internal symmetry in the paper succeeding this one in the same issue of the same journal. He is connected with the Belorussian State University.

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USSR

UDC 539.12.01

LOBKO, S. I. and FEDOROV, F. I., Belorussian State University imeni V. I. Lenin

"Particle With Variable Spin 1/2-3/2 in the Field of a Plane Electromagnetic Wave"

Minsk, Izvestiya Akademii Nauk BSSR, Seriya Fiziko-Matematicheskikh Nauk, No. 5, 1970, pp 76-81

Abstract: A general method proposed in a previous paper for finding exact solutions to the problem of a particle with arbitrary spin in the field of a plane electromagnetic wave is applied to a particle with variable spin 1/2-3/2. The final solution for a particle in any spin state is given in the form

$$\psi = F(\varphi) \left(-\frac{i b^2 + m}{m^2} \right) [(b^2 + m^2)(b^2 \lambda^2 + m^2) - (m^2 + b^2 - b^2 \lambda^2) b^2 + b^4 k \lambda] \exp \left(i p x - \frac{i}{2 k p m^2} \int (b^2 + m^2)(b^2 \lambda^2 + m^2) d\varphi \right).$$

and systems of equations are given for determining the constant vector χ_0 . From the form of the constant vector χ_0 under different mass and spin states it is concluded that transitions between these states are possible in the field of a plane electromagnetic wave, which is in agreement with the probability of transition between different states of a particle in an electromagnetic field being different from zero as perturbation theory predicts.

1/1

USSR

UDC 539.12.01

LOBKO, S. I. and FEDOROV, F. I., Belorussian State University imeni V. I. Lenin

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Minsk, Izvestiya Akademii Nauk BSSR, Seriya Fiziko-Matematicheskikh Nauk, No. 5, 1970, pp 76-81

Abstract: A general method proposed in a previous paper for finding exact solutions to the problem of a particle with arbitrary spin in the field of a plane electromagnetic wave is applied to a particle with variable spin 1/2-3/2. The final solution for a particle in any spin state is given in the form

$$\psi = F(\eta) \left(-\frac{i b^2 + m}{m^2} \right) [(b^2 + m^2)(b^2 \lambda^2 + m^2) - (m^2 + b^2 - b^2 \lambda^2) b^2 + b^4 k \lambda_0] \exp \left(i p x - \frac{i}{2 k p m^2} \int (b^2 + m^2)(b^2 \lambda^2 + m^2) d\eta \right),$$

and systems of equations are given for determining the constant vector χ_0 . From the form of the constant vector χ_0 under different mass and spin states it is concluded that transitions between these states are possible in the field of a plane electromagnetic wave, which is in agreement with the probability of transition between different states of a particle in an electromagnetic field being different from zero as perturbation theory predicts.

1/1

USSR

UDC: 548.1

FEDOROV, F. I.

"Eigen-Tensors and the Dimensionality of Space Tensors in Crystals"

Moscow, Kristallografiya, Vol. 15, No. 4, 1970, pp 632-644

Abstract: This paper is a continuation of its immediate predecessor in the pages of this issue of the journal named above (pp 631-637) by the same author. In the present paper, he obtains closed formulas for the dimensionality of tensors with arbitrary or mixed internal symmetry. He defines eigen-tensors for a particular transformation of symmetry as tensors multiplied by a number as a result of the transformation affecting the crystal symmetry group: i.e., the eigen-tensor is defined by

$$S(T(\lambda)) = \lambda T(\lambda),$$

where T is the tensor and S the symmetry group operation. The invariant tensor may be regarded as the eigen-tensor corresponding to the particular value of $\lambda = 1$. The eigen-tensor is significant in that it forms a natural tensor basis in the corresponding tensor space of a crystal of specified symmetry. It is emphasized, however, that the complete basis of tensor space consisting of eigen-tensors exists for only 16 of 32 classes of crystal symmetry.

1/1

USSR

BOKUT', B. V.; SERDYUKOV, A. N.; FEDOROV, F. I. (Institute of Physics, Belorussian Academy of Sciences)

"Phenomenological Theory of Optically Active Crystals"

Moscow, Kristallografiya; September-October, 1970; pp 1002-6

ABSTRACT: The authors derive equations for an electromagnetic field in optically active crystals which are distinguished by the fact that from them is obtained the law for the conservation of energy, in which the energy density of the field has a form different from $ED + HB$, while the vector of the energy flow is expressed in the ordinary manner. The general equation of the normals for planar waves propagated in such media is derived, and several of its special forms are considered.

The article includes 24 equations. There are 10 bibliographic references.

1/1

USSR

UDC 535.39.01

FEDOROV, F. I., and FILIPPOV, V. V.

"Amplitude Relationships for Light Waves at the Boundary Between a Uniaxial Crystal and an Isotropic Medium"

Leningrad, Optika i Spektroskopiya, Vol 30, No 2, 1971, pp 318-322

Abstract: Simplified general expressions are presented for the fields of light waves reflected and refracted at the boundary between a uniaxial transparent crystal and an isotropic medium. Cases are analyzed in which one or both reflected waves are absent.

1/1

1/2 010 UNCLASSIFIED PROCESSING DATE--16OCT70
TITLE--VECTOR PARAMETER AND RELATIVISTIC KINEMATICS -U-

AUTHOR--FEDUROV, F.I.

COUNTRY OF INFO--USSR

SOURCE--TEORETICHESKAYA I MATEMATICHESKAYA FIZIKA, 1970, VOL 2, NR 3, PP
343-349

DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--PARTICLE INTERACTION, RELATIVISTIC PARTICLE, LORENTZ
TRANSFORMATION, VECTOR FUNCTION, SPIN SYSTEM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1985/2022

STEP NO--UR/0646/70/002/003/0343/0349

CIRC ACCESSION NO--AP0102051

UNCLASSIFIED

2/2 010
CIRC ACCESSION NO--AP0102051

UNCLASSIFIED

PROCESSING DATE--16OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. IT IS SHOWN THAT BY USING THE
COMPLEX VECTOR PARAMETRIZATION OF THE LORENTZ GROUP ONE CAN SOLVE QUITE
SIMPLY A NUMBER OF BASIC PROBLEMS OF RELATIVISTIC KINEMATICS, IN
PARTICULAR: THE DETERMINATION OF PARAMETERS OF THE SO CALLED WIGNER
ROTATION, DETERMINATION OF THE TRANSFORMATION LAW OF SPIN STATE UNDER
ARBITRARY LORENTZ TRANSFORMATION, AND CLASSIFICATION UNDER SPIN STATES
OF THE ARBITRARY TWO PARTICLE SYSTEM IN SCATTERING PROCESS.

UNCLASSIFIED

L/2 009 UNCLASSIFIED PROCESSING DATE--27NOV70
TITLE--COVARIANT FORM OF FOURTH ORDER TENSORS IN CRYSTALS -U-

AUTHOR--(02)-FEDOROV, F.I., BARKOVSKIY, L.M.

COUNTRY OF INFO--USSR

SOURCE--ZH. PRIKLAD. SPEKTROSK (USSR), VOL. 12, NO. 4, P. 726-34, APRIL
1970

DATE PUBLISHED----APR70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--CRYSTAL SYMMETRY, VECTOR, TENSOR

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3007/1113

STEP NO--UR/0368/70/012/004/0726/0734

CIRC ACCESSION NO--AP0136533

UNCLASSIFIED

2/2 009

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0136533

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CONSIDERATION OF POLAR TENSOR IN THE HIGHER RANK BY ANALYSIS OF INDIVIDUAL COMPONENTS BECOMES TOO CUMBERSOME, AS FOR EXAMPLE IN CRYSTALS WITH 32 SYMMETRY CLASSES. THE APPLICATION OF MATRICES ALSO HAS DRAWBACKS, AND THE PROPOSED METHOD IS BASED ON PRESENTATION OF TENSORS OF RANK ABOVE THE SECOND ORDER BY A COMBINATION OF PRODUCTS. THESE INCLUDE TENSOR OF THE SECOND RANK UNIT VECTORS ORIENTED ALONG THE CRYSTAL SYMMETRY ELEMENTS. THE SECOND RANK TENSORS ARE DERIVED FROM THE CONDITION OF INVARIANCE OF TENSOR AS FAR AS THE SYMMETRY GROUP TRANSFORMATIONS. THE PROCEDURE CAN BE EXTENDED TO HIGHER RANK TENSORS.

UNCLASSIFIED

USSR

UDC 548.0:535.01

F
FEDOROV, F. I. and FILIPPOV, V. V.

"Heterogeneous Waves at the Boundary of a Uniaxial Crystal and an Isotropic Medium"

Leningrad, Optika i Spektroskopiya, Vol 29, No 1, 1970, pp 56-61

Abstract: In an earlier paper by these same two authors (Zhurnal prikladnoy spektroskopii, 9, 1031, 1968) a solution was obtained, by means of covariant methods, of the problem of refraction and reflection of light incident on an isotropic medium after passing through a transparent uniaxial crystal. This article is devoted to the conditions under which the refracted or reflected waves become heterogeneous waves. The authors begin their analysis by rigorously defining, in vector form, the angle of incidence and the boundary angle at which the heterogeneous waves originate. They consider complete reflection, with heterogeneous waves in the isotropic medium, and then consider heterogeneous waves in the crystal. Finally, they consider the reverse case, in which the incident light emerges from the isotropic medium and strikes the interface between medium and crystal. They derive an equation which gives the condition for limiting angles of refraction for an unusual wave in the crystal and which leads also to the condition of full reflection and a correspondingly limited angle of incidence.

1/1

F
Higher Algebra and Geometry & Topology

UDC 539.12

USSR

FEDOROV, F. I., PLETYUKHOV, V. A., Belorussian State University imeni V. I. Lenin

"Wave Equations With Multiple Lorentz Group Representations. Half-Integral Spin"

Minsk, Izvestiya Akademii Nauk BSSR, Seriya Fiziko-Matematicheskikh Nauk, No 3,
1970, pp 78-83

Abstract: The structure of the matrices of relativistic wave equations of the first order describing particles with half-integral spin is considered. The equations are constructed using repeating or multiple Lorentz group representations. Conditions are given under which certain links in the wave equation reduce to zero. If these conditions do not occur, the wave equation found does not break down and describes a particle with a new set of mass and spin states.

1/1

USSR

FEDOROV, F. I., KUVSHINOV, V. I. (Institute of Physics, Belorussian Academy of Sciences)

"Nonlinear Equations of the Electrodynamics of Scalar Mesons"

Minsk, Vestsi Akademii Navuk BSSR: Seryya Fizika-Matematychnykh Navuk; No. 5, 1970; pp 69-75

ABSTRACT: Equations for interacting electromagnetic and scalar meson fields are derived in general form: $(\gamma^{\mu}\partial_{\mu} + \gamma^0)\psi + \psi\Lambda\psi = 0$, where the square matrices γ^{μ}, γ^0 and the matrix of the third rank Λ have a dimension of 20. The properties of these matrices are considered. A Lagrangian function for the total field and projective operators which distinguish the possible states in the case of noninteracting fields are obtained.

The article includes 44 equations. There are 5 references.
1/1

USSR

F
FEDOROV, F. I. (Institute of Physics, Belorussian Academy of Sciences)

"A Vector Parameter and Relativistic Kinematics"

Moscow, Teoreticheskaya i Matematicheskaya fizika, March 1976, pp. 343-349

Abstract: It is shown that it is possible, with the help of complex vector parametrization of a Lorentz group, to solve very simply a number of basic problems of relativistic kinematics: in particular, the determination of the parameters of the "Wigner rotation," determination of the variation of the spin state under an arbitrary Lorentz transformation, and classification by spin states of an arbitrary system of two particles in a scattering process.

The article includes 20 equations. There are 10 references.

1/1

USSR

UDC 612.014.482-087.
891.6

MOISEYEV, I. E., FEDOROV, G. A., and BAMBLEVSKIY, V. P., Moscow Engineering-Physical Institute, Moscow

"A Method of Recording by Means of a Spectrometer of Gamma-Quanta Emitted From the Human Body"

Moscow, Meditsinskaya Radiologiya, Vol 18, No 8, Aug 73, pp 42-47

Abstract: A method was developed which makes it possible to record gamma-quanta emitted by a radionuclide in the human body with results independent of the location of the source of radiation in the body. Calculations carried out on a computer on the basis of results obtained by measuring with an eight-crystal gamma spectrometer radiation emitted by 140-1460 keV ¹³⁷Cs sources placed in various locations within the phantom showed that at a distance of the eight (NaI(Tl) crystals amounting to 10-30 cm from an elliptical cylinder air- or water-filled phantom (20-40 cm from the main axis of the phantom) the error in determinations of absolute activities in the range of $\sim 10^{-7}$ C did not exceed 5%. The crystals were placed in a straight line parallel to the main axis of the phantom at distances of 25 cm from each other. The time of measurement was 2.5 min. The ellipse forming the cross-section of the phantom had a short axis of 20 and a long axis of 30 cm, 1/2

USSR

MOISEYEV, I. E., et al., Meditsinskaya Radiologiya, Vol 18, No 8, Aug 73, pp 42-47

respectively. A geometric mean of two measurements (above and below the phantom) was taken. On placement of the eight crystals along a straight line at a height of 10 cm from the phantom surface, a distance of 25 cm between the detectors, and gamma radiation in the 300-700 kev range, the ratio of the lengths of time of recording had to be 1:25:1:1:1:1:1:1.25. At this ratio the maximum variation of the count was 9 and 35% with changes of the position of the source in the direction of the length and over the cross-section of the phantom, respectively.

2/2

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USSR

UDC: 53.07/08+53.001.5

FEDOROV, G. A., SLAVYAGIN, P. D., MOISEYEV, I. F., ANTONOV, V. A., TSURGANOV, S. V.

"Using the Geometry of Linear and Spiral Scanning in Human Radiation Spectrometers"

V sb. Voopr. dozimetrii i zashchity ot izluch. (Problems of Dosimetry and Radiation Shielding--collection of works), vyp. 12, Moscow, Atomizdat, 1971, pp 173-178 (from FZh-Fizika, No 4, Apr 72, Abstract No 4A714)

Translation: A study was made of the spatial effectiveness of registration of gamma quanta by a human radiation spectrometer as a function of the energy of the isotopes utilized by the detector, the length and height (or radius) of scanning, and the region of the recorded spectrum for linear and spiral scanning geometries. M. L.

1/1

USSR

UDC 669.715'782'243'74'721:669.018.2

KISIN, I. L., BUZAYEVA, I. N., KAUSHANSKIY, D. Ya., and FEDOROV, G. A.

"Modification of Aluminum-Silicon Alloy for the Production of Piston Alloy"

V sb. Modifitsir. siluminov (Modification of Silumins -- Collection of Works), Kiev, 1970, pp 158-159 (from RZh-Metallurgiya, No 12, Dec 70, Abstract No 12 1748 by I. NABATOVA)

Translation: The authors developed and introduced a technology of modifying hypereutectic Silumin for pistons. An investigation was conducted on the alloy containing (in %) Si 17.0, Ni 1.1, Mn 0.66, Cu 1.87, Mg \leq 0.3, Zn $<$ 0.3, Fe $<$ 1.0. Of the modifiers tried (PCl₅, AlP, Cu₃P), Cu₃P was found technologically most effective, convenient in production, and economical. Modification raised the mechanical properties of the alloy (breaking point by \sim 5 kg/mm²) and the purity of the piston surface after machining, as well as reducing wear on the cutting tool. One illustration. Bibliography of one title.

1/1

2/2 027

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0136574

ABSTRACT/EXTRACT--(U) GP-0-- ABSTRACT. THE CONCNS. OF PRIME109 CD IN FALLOUT AND IN SURFACE AIR AT OBSERVATION POINTS IN THE SOVIET UNION DURING 1964-7 ARE SUMMARIZED. ANAL. OF THESE DATA AND THEIR COMPARISON WITH RESULTS FROM EXPTS. ON PRIME102 RH SUGGEST THAT THE MEAN RESIDENCE TIME OF FINELY DIVIDED AEROSOLS IN THE ATM. ABOVE 21 KM FROM SOURCES ABOVE 100 KM IS 14 YR. ANAL. OF THE PRIME238 PU FALLOUT DATA INDICATES THAT THE MEAN RESIDENCE TIME OF AEROSOLS INJECTED AT SIMILAR TO 40-60 KM ALTITUDE IS SIGNIFICANTLY LOWER, POSSIBLY SIMILAR TO 4 YR.

UNCLASSIFIED

USSR

FEDOROV, G. B., et al

"Physical and Mechanical Properties of Uranium-Zirconium Alloys at Low Temperatures"

Moscow, Atomnaya Energiya; February 1973; pp 85-8

Abstract: The physical properties (resistivity, thermoelectromotive force, internal friction, and modulus of elasticity of annealed uranium-zirconium alloys were investigated. The resistivity was measured at temperatures of 295, 77.4 and 4.2°K; the other properties were measured in the range of temperatures from that of liquid nitrogen to room temperature.

The maximum resistivity and thermal electromotive force, as well as an anomalous (negative) resistivity temperature coefficient, were observed in the range of compositions corresponding to the δ_1 phase.

On the basis of the results obtained and previously published data, the authors conclude that there exists a hybrid-type metallic-covalent chemical bond in the δ_1 phase of uranium-zirconium alloys.

The article included five figures. There are 16 bibliographic references.

1/1

1/2 028 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--DETERMINATION OF THE AMOUNT OF HYDROGEN IN CATALYSTS AT HIGH
TEMPERATURES BY THE HYDROGENATION OF ETHYLENE -U-
AUTHOR-(05)-IZMAYLOV, R.I., FEDOROV, G.I., KHAYRULLINA, R.Z., BORISOVA,
V.V., DAVLESUPOVA, R.G. F
COUNTRY OF INFO--USSR
SOURCE--IZV. AKAD. NAUK SSSR, SER. KHIM. 1970, (2), 369-72
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--HYDROGEN, HYDROGENATION, ISOMERIZATION, HYDROCARBON,
PALLADIUM, NICKEL, CATALYST, SORPTION, HIGH TEMPERATURE EFFECT,
ETHYLENE, PLATINUM, CHROMATOGRAPHY
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1997/0639 STEP NO--UR/0062/70/000/002/0369/0372
CIRC ACCESSION NO--AP0119551
UNCLASSIFIED

2/2 028

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0119551

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A DETAILED DESCRIPTION IS GIVEN FOR THE CONSTRUCTION AND OPERATION OF APP. FOR DETG. SORBED H AT 150-500DEGREES, I.E. UNDER CONDITIONS USUALLY USED FOR HYDROGENATION AND ISOMERIZATION REACTIONS OF HYDROCARBONS. THE APP. CONSISTS OF A REACTION VESSEL CONTG. A 2-3 MG SAMPLE OF THE CATALYST BEING TESTED, PLACED IN A FLOW SYSTEM SIMILAR TO THAT OF A CHROMATOGRAPH AND PROVIDED WITH SWITCHABLE SOURCES OF ARGON, H, AND C SUB2 H SUB4. THE AMT. OF SORBED H ON 12 TYPICAL PT, PD AND NI CATALYSTS ON VARIOUS SUPPORTS WAS TABULATED AS WAS THE INFORMATION OF SORPTION OF H AT VARIOUS TEMPS. ON PT AND NI AND PD CATALYSTS UP TO 500DEGREES. PROMOTION BY SALTS OF MN AND CR ENHANCES THE STRENGTH OF BONDING OF H TO THE METAL.
FACILITY: INST. ORG. FIZ. KHIM. IM. ARBUZOVA, KAZAN, USSR.

UNCLASSIFIED

USSR

UDC: 538.6:537.311.31:669.15'292 -
192:669.245:669.255

VOLOSHINSKAYA, N. M., FEDOROV, G. V.

"The Kerr and Hall Effects in Ferromagnetic Alloys"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 36, No 5, Nov 73, pp
946-956.

Abstract: Normal and anomalous Hall effects, as well as the Kerr effect, were measured in ferromagnetic alloys Fe-V, Co-Al and Ni-Al in the 0.4-18 μ spectral interval. It is shown that the overall course of dispersion of the nondiagonal component of the dielectric permeability tensor can be described in the wave length interval studied on the basis of the mechanism of absorption within bands. This approach agrees with optical data and the results of measurement of the coefficient of the anomalous Hall effect.

1/1

USSR

UDC: 621.373.431(088.8)

RABINOVICH, G. V., FEDOROV, G. V.

"A Generator Which Produces Series of Pulses With Controllable Intervals Within the Series"

USSR Author's Certificate No 263661, filed 26 Sep 68, published 5 Jun 70 (from RZh-Radiotekhnika, No 11, Nov 70, Abstract No 11G182 P)

Translation: This Author's Certificate introduces an Oscillator which generates pulse trains with controllable intervals within a train. The device contains a self-oscillating multivibrator which sets the prf for a series, a dipp oscillator which determines the length of a pulse series and is connected to an AND circuit, and an accumulator device. To control the length of intervals within a series, an inhibit circuit is connected to the output of the AND circuit in parallel with the accumulator device. The input of the inhibit circuit is connected to the output of a slave multivibrator which is triggered by the output signal of the accumulator device.

1/1

1/2 020 UNCLASSIFIED PROCESSING DATE--04DEC70
TITLE--HALL EFFECT IN A TERBIUM SINGLE CRYSTAL -U-
AUTHOR--(02)-FEDOROV, G.V., VOLKENSHTEYN, N.V.
COUNTRY OF INFO--USSR F
SOURCE--FIZ. TVERD. TELA 1970, 12(5), 1374-9
DATE PUBLISHED-----70
SUBJECT AREAS--PHYSICS
TOPIC TAGS--SINGLE CRYSTAL, TERBIUM, HALL EFFECT, THERMAL EFFECT
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--3003/0167 STEP NO--UR/0181/70/012/005/1374/1379
CIRC ACCESSION NO--AP0129423
UNCLASSIFIED

2/2 020

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0129423

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. BY USING 2 SPECIMENS CUT FROM SINGLE CRYSTAL TB (99.9PERCENT PURE) AT 4.2-350DEGREESK AND AT MAGNETIC INDUCTION (B) LESS THAN OR EQUAL TO 34 KG, MEASUREMENTS WERE CARRIED OUT OF THE HALL EFFECT. SP. HALL EMF. FOR THE SPECIMEN WITH MAGNETIC FIELD (H) PARALLEL TO THE (0001) DIRECTION AT ALL TEMPS. DEPENDS LINEARLY ON INDUCTION IN THE SPECIMEN. FOR SPECIMENS WITH H PARALLEL TO (1 BAR 2 10) IN THE REGION OF THE EXISTENCE OF THE FERROMAGNETIC STATE, THE DEPENDENCE OF SP. HALL EMF. ON B HAS THE FORM CHARACTERISTIC FOR FERROMAGNETS. IN THE PARAMAGNETIC REGION, THE SPONTANEOUS, (R SUBS) AND CONVENTIONAL (R SUBO) HALL COEFFS, FOR BOTH SPECIMENS WERE SEPD., AND THE PRESENCE WAS ESTABLISHED OF ANISOTROPY OF THESE COEFFS. IN THE FERROMAGNETIC REGION, THIS SEPN. WAS CARRIED OUT ONLY FOR SPECIMENS WITH H PARALLEL TO (1 BAR 2 10). BOTH COMPONENTS OF THE HALL COEFF. CHANGE SIGN TWICE WITH DECREASING TEMP. FACILITY: INST. FIZ. METAL., SVERDLOVSK, USSR.

UNCLASSIFIED

USSR

UDC 577.3+612.816

SMIRNOV, A. V., BURLAKOVA, Ye. V., KOL'S, O. R., SVERDLOVA, Ye. A., and
FEDOROV, G. Ye., Moscow State University

"Changes in Nerve Fiber Mitochondria of the Crab During Conduction Blocked by
Different Agents"

Moscow, Doklady Akademii Nauk SSSR, No 1, 1972, pp 214-125

Abstract: Isolated nerve from an extremity of the green crab *Carcinus maenas* was stimulated after the conduction of excitation was blocked by (a) a constant current (2 to 3 v), (b) elevation of temperature to 37 to 40°C, (c) 10⁻³ M dinitrophenol solution. Examination of mitochondria from the control (resting) nerve showed them to be elongated with distinct external and internal membranes. The cristae were close together. The same picture was observed after 5 minutes of electrical stimulation of the nerve except that the cristae were somewhat farther apart. However, stimulation of the nerve after conduction was blocked by high temperature or by treatment with dinitrophenol caused the mitochondria to swell and become rounded. The cristae shortened considerably and in places became fragmented. In some cases the changes were so pronounced that the mitochondria resembled vacuoles.

1/1

Organ and Tissue Transplantation

5

USSR

UDC 616.12-089.843-0.6:616.12-003.315-0.8:725.51

BALLYUZEK, F. V., SHANIN, Yu. N., KOSTYUCHENKO, A. L., SHCHELKUNOV, V. S.,
VOLKOV, Yu. N., FEDOROV, G. Z., and SUPRUNENKO, Yu. F., Clinic of Hospital
Surgery, Military Medical Academy imeni S. M. Kirov, Leningrad

"A Sterile Room for the Reanimation of Patients After Homotransplantation of the
Heart"

Moscow, Eksperimental'naya Khirurgiya i Anesteziologiya, No 2, Mar/Apr 70, pp 84-87

Abstract: After transplantation of the heart, respiratory infections constitute one of the principal dangers to the patients because of their lowered resistance and immunity. J. Phillips and G. Spencer estimated that respiratory infections caused the death of 1/4 of patients dying after surgery involving extracorporeal blood circulation. A sterile chamber (3.7 X 3 X 2.5 m) has been designed for the reanimation and intensive care of patients after surgery involving extensive trauma and requiring rigorous antibacterial protection. The chamber is constructed of plastic sheets welded together and has an entrance lock consisting of two overlapping, suspended plastic sheets. The chamber has connections for O₂, N₂O, and vacuum, a telephone line, and electric connections for a defibrillator and an automatic system which records and transmits outside data on the condition of the patient. Equipment for the intubation of the trachea, healing of the tracheo-

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USSR

BALLYUZEK, F. V., et al, Eksperimental'naya Khirurgiya i Anesteziologiya, No 2, Mar/Apr 70, pp 84-87

bronchial passages, and for producing artificial coughs is located in it. Air that has been sterilized by irradiation is pumped into the chamber, in which the air pressure is higher by 7-10 mm than that outside. After 2-3 hrs. of operation of the chamber, the air in it contains no more than 0-2 possibly pathogenic bacteria per cubic meter and no pathogenic bacteria. The chamber is equipped with windows of transparent plastic, has translucent walls, and is lit from the outside. After adequate sterilization measures, a nurse who takes care of the patient may stay in the chamber and other medical personnel may enter it. The chamber ought to be adequate for the care of patients who have undergone heart transplants.

2/2

- 43 -

1/2 035 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--RECEPTION OF SIGNALS, AS A WHOLE, IN SYSTEMS WITH QUANTIZATION -U-
AUTHOR--(02)-GOLOVIN, O.B., FEDOROV, I.B. F
COUNTRY OF INFO--USSR
SOURCE--MOSCOW, RADIOTEKHNIKA, NO 1, 1970, PP 44-49
DATE PUBLISHED-----70
SUBJECT AREAS--ELECTRONICS AND ELECTRICAL ENGR., NAVIGATION
TOPIC TAGS--SIGNAL RECEPTION, COMMUNICATION JAMMING, INTERFERENCE IMMUNITY
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1999/1357 STEP NO--UR/0108/70/000/001/0044/0049
CIRC ACCESSION NO--AP0123315
UNCLASSIFIED

2/2 035

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0123315

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. INVULNERABILITY TO JAMMING IS DETERMINED FOR THE RECEPTION OF CODED SIGNALS (AS A WHOLE) IN A SYSTEM WITH QUANTIZATION. THIS FORM OF RECEPTION IS SHOWN TO BE MOST INVULNERABLE TO JAMMING UNDER CONDITIONS OF FLUCTUATING INTERFERENCE.

UNCLASSIFIED

USSR

UDC 612.015.39:612.766.02

FEDOROV, I. V., Department of Biochemistry, Yaroslav Medical Institute,
Yaroslav, USSR

"Metabolism in Hypodynamia"

Moscow, Biologicheskiye Nauki, No 12, (108), 1972, pp 24-36

Abstract: A review of the literature shows that hypodynamia introduces significant changes in the metabolism of man and animals. In many respects inactivity, whether due to spaceflight, a sedentary occupation, or immobilization as a result of illness, evokes similar metabolic alterations. Within 1 to 2 days of immobilization, the human body goes into negative nitrogen balance, as indicated by increased urinary urea, amino acids, creatine, and ammonia, although the net effect on body weight after several weeks would be an increase in weight due to increased lipid deposits in the organism. Bed rest for 2 to 7 weeks results in increased diuresis in the amounts of 200 to 300 ml per day, and is accompanied by redistribution of body fluids with the net effect that the blood volume in the pulmonary circulation is increased and, as a result of pressor mechanisms, vasopressin secretion by the posterior pituitary is depressed. The latter factor then potentiates urinary salt and water loss.

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USSR

FEDOROV, I. V., Biologicheskiye Nauki, No 12, (103), 1972, pp 24-36

Variable results have been obtained with regard to carbohydrate metabolism, although generally it is agreed that glycogen stores are depleted and glycogenesis seems to be accelerated. Concomitant with obesity in man, blood levels of total lipids, cholesterol, and beta lipoproteins increase. Thus, muscular activity is an essential prerequisite for good health and cannot be replaced by any drug regimen. It is important in the maintenance of the cardiovascular, respiratory, and nervous system at their optimum functional states and prevents premature aging.

2/2

FEDOROV, I. V.

LOWEN

SO: JPRS 54396
03 NOV 71

UDC 612.43-06:612.766.2

HYPODYNIA AND HORMONAL ACTIVITY

in *Pravopis*

[Article by I. V. Fedorov; Moscow, Kosmicheskaya Biologiya i Meditsina (Space Biology and Medicine), Russian, Vol 5, No 4, pp 59-61, 1971, submitted for publication 9 December 1970]

Abstract: Data in the literature on changes in the production of hormones (corticosteroids, adrenalin, and corticotrophic hormone, antidiuretic hormones, and 5-hydroxyindoleacetic acid) during hypodynamia are reviewed. Potential results of changes in hormonal activity are discussed.

A change in functioning of the internal secretion glands undoubtedly plays an important role in the pathogenesis of numerous metabolic and functional impairments during hypokinesia. In this article we generalize data in the literature on the effect of hypokinesia on hormonal activity and an attempt is made to clarify its importance in the development of impairments characteristic for this state.

The initial period of hypokinesia is usually regarded as a singular stress factor (M. R. Mergenovich; A. V. Korobkov; V. V. Portugalov, et al., 1968). Beitzak, et al., in investigating four subjects during a period of immobilization lasting six to seven weeks did not find substantial changes in the urine content of 17- α -steroids (17-KS). There was no correlation between the elimination of corticosteroids and nitrogen in the urine. Katz, who observed many subjects over a period of 10 to 70 days of immobilization, failed to detect changes in 17-KS content in the plasma and in the elimination of 17-hydroxycorticosteroids (17-OCS) with the urine. As was also observed by Weber during 12-hour immobilization.

Caldas, et al, determined the diurnal dynamics of the 17-OCS dynamics in the blood of human subjects in an ordinary state and after three days of bed confinement. In both cases the diurnal rhythm was the same, but at 2600 hours after hypodynamia there was a small decrease in content of the hormone in the sample. V. M. Gerdzyenko (1965), who studied children with a distended hip, immobilized with a plaster cast, discovered in the blood an

Space
Physiology

FEDOROV, I. V.

space physiology

SO: JIN 54468
dx bec 71

QDC 612.765.2.015.349

INTENSITY OF TISSUE AUTOLYSIS IN ANIMALS DURING HYPOKINESIA

Article by I. V. Fedorov, ^{and} ~~I. V. Fedorov~~ ^{S. Ya. Pysheby} Moscow, ~~Kosichanskaya~~ ^{Kosichanskaya} Biologiya i Medicina, ~~Vol 5, No 5, 1970~~, submitted for publication 9 November 1970, pp 82-84.

In animals in a state of hypokinesia there is a considerable decrease in the intensity of synthesis of tissue proteins (I. V. Fedorov, et al., 1967, 1968, 1970). Only indirect data are available concerning the intensity of tissue decay. Tissue decay can be judged from the intensity of its autolysis. Earlier only the autolysis of muscle tissue was investigated (I. V. Fedorov, et al., 1970).

Research Method

The experiments were made on male rats weighing 160-180 g. The animals were immobilized by placing them in plaster jackets (I. V. Fedorov, et al., 1967a). Autolysis intensity was determined in tissues of the liver, kidney, heart, skeletal muscles, and brain of the healthy animals and in animals killed on the 13th-22d and 51st-59th days of hypokinesia. Autolysis intensity was judged from the increase in free amino acids in the tissue homogenate after 4-hour incubation at 37° in a phosphate buffer with pH 4.9 (the duration of incubation for skeletal muscle tissues was 24 hours). The content of free amino acids was determined spectrophotometrically with a SF-6A instrument at a wavelength of 280 nm. A standard curve was constructed from a tryptophan solution.

Results

The total content of free amino acids in the rat tissues prior to incubation and after 13-22 days of hypokinesia was at the same level as in the healthy animals (Table 1), virtually coinciding even in absolute mean numbers. On the 51st-59th days of hypokinesia the content of free amino acids in all the investigated tissues exhibited a reliable decrease (p < 0.05).

1/2 019 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--ACTIVITY OF CERTAIN BLOOD SERUM ENZYMES IN RATS DURING A PROLONGED
HYPOKINESIA -U-
AUTHOR-(02)-SIMONOV, YE.YE., FEDOROV, I.V.
COUNTRY OF INFO--USSR
SOURCE--KOSMICHESKAIA BIOLOGIIA I MEDITSINA, VOL. 4, JAN.-FEB. 1970, P.
16-18
DATE PUBLISHED-----70
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--HYPODYNAMIA, BLOOD SERUM, ENZYME ACTIVITY
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1997/0065 STEP NO--UR/0453/70/004/000/0016/0018
CIRC ACCESSION NO--AP0119061
UNCLASSIFIED

2/2 019

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0119061

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. STUDY OF THE ACTIVITY OF GLUTAMATE ASPARAGIN AND GLUTAMATE ALANINE AMINOTRANSFERASES, KETUDO, L, PHOSPHATE ALDOSE, LACTATE DIHYDROGENASE, AND NONSPECIFIC CHOLINE ESTERASE IN THE BLOOD SERUM OF A GROUP OF 39 WHITE RATS SUBJECTED FOR 1, 15 AND 60 DAYS OF HYPOKINESIA. THE ACTIVITY OF ALL THESE ENZYMES WAS HIGHER IN EXPERIMENTAL RATS THAN IN CONTROL RARS DURING THE EARLY STAGE OF HYPOKINESIA AND CONTINUED TO INCREASE (AMINOTRANSFERASES) OR DECREASED (THE REST OF ENZYMES) DURING THE LATER STAGE OF THE EXPERIMENT. THEORIES ARE PROPOSED TO EXPLAIN THESE OBSERVATIONS.

UNCLASSIFIED

1/2 028 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--ANISTROPY OF GALLIUM ANITMONIDE ETCHING STUDIED BY MEANS OF LIGHT
FIGURES -U-
AUTHOR--(02)-VYATKIN, A.P., FEDOROV, K.N.
COUNTRY OF INFO--USSR
SOURCE--IZV. VYSSH. UCHEB. ZAVED., FIZ. 1970, 13(2), 107-10
DATE PUBLISHED-----70
SUBJECT AREAS--MATERIALS, PHYSICS
TOPIC TAGS--GALLIUM ANTIMONIDE, ANISOTROPY, CRYSTALLOGRAPHY, ETCHED
CRYSTAL
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1997/1399 STEP NO--UR/0139/70/013/002/0107/0119
CIRC ACCESSION NO--AT0120192

UNCLASSIFIED

2/2 028

UNCLASSIFIED

PROCESSING DATE--23 OCT 70

CIRC ACCESSION NO--AT0120192

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. PREORIENTED GASB SINGLE CRYSTALS HAVING SURFACES PARALLEL TO THE PLANES (111), (110), AND (100) WERE ETCHED BY SOLNS. OF THE FOLLOWING COMPN.: $H \text{ SUB}^2 O \text{ SUB}^2 H \text{ SUB}^2 SO \text{ SUB}^4 HCL$ EQUALS 10:3:25 BY VOL. DISTINCT LIGHT FIGURES WERE THUS OBTAINED ON THE MAIN CRYSTALLOGRAPHIC PLANES THAT YIELDED DISTINCT REFLECTION DIAGRAMS. WITH PROLONGED ETCHING, A PROGRESSIVE LEVELING OUT OF THE ANISOTROPY OF THE SINGLE CRYSTAL DISSOLN. WAS OBSD. THE FORM OF THE LIGHT REFLECTION FIGURES DIFFERED MOST FROM THOSE OBTAINED WITH OF AND SI AND ALSO WITH GAAS, ALTHOUGH, ACCORDING TO THE SYMMETRY ORDER, THE CORRESPONDING GASB PLANES COINCIDED WITH THOSE OF GAAS. THE ETCHING RATES ON GASB SINGLE CRYSTAL PLANES B(111), (100), (110) AND A(111) AT ROOM TEMP. WERE MEASURED ACCORDING TO THE THICKNESS OF THE DISSOLVED LAYER. THE NUMERICAL VALUES OF THE RATES ($\mu\text{-MIN}$) OF ETCHING WERE: $V \text{ SUB}^8(111)$ EQUALS 11.5, $V \text{ SUB}(100)$ EQUALS 7.5, $V \text{ SUB}(110)$ EQUALS 7.2, $V \text{ SUB}^4(111)$ EQUALS 5.7. AN OPTICAL METHOD OF THE SINGLE CRYSTAL ORIENTATION ACCORDING TO THE MAIN CRYSTALLOGRAPHIC PLANES, APPLICABLE TO GASB, WAS WORKED OUT. FACILITY: SIB. FIZ. TEKH. INST. IM. KUZNETSOVA, TOMSK, USSR.

REF ACCESSION

USSR

UDC 539.193.547.242

KOPAYEVICH, YU. L., STUMBREVICHUTE, Z. A., FEDOROV, L. A., and GERMAN, L. S.

"NMR Spectra and Structure of Polyfluoroalkylarsines"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 5, May 73, pp 1140-1147

Abstract: Derivatives of bis(pentafluoroethyl)arsinous acid, of mixed tertiary arsines, derivatives of bis(α -chlorotetrafluoroethyl)arsinous acid, and tertiary arsines were studied by NMR ¹⁹F spectroscopy. Spectral characteristics originating from the presence of chiral and prochiral centers in the compounds studied have been observed and discussed. The As-Hlg bonds were shown to be very labile. Inversion of the arsenic atom was shown to be slow (in the NMR time scale).

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USSR

UDC 543.422.27:547.1'127

FEDOROV, L. A., KYSHIN, V. I., and ZAKHARIN, L. I., Institute for Organometallic Compounds, Academy of Sciences SSSR

"Nuclear Magnetic Resonance Studies of the Methylmercury Derivatives of 1-Phospha-7-; 1-Phospha-12-; 1-Arsa-7-; and 1-Arsa-12-carbaoclosedodecaboranes (11)"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 3, 1972, pp 536-538

Abstract: From data based on the cleavage of the C-C bond, the electron affinity of keto-borane increases in the following order: m-carborane ($m\text{-B}_{10}\text{H}_{10}\text{C}_2\text{H}_2$) < m-carboarsa borane ($m\text{-B}_{10}\text{H}_{10}\text{AsCH}$) < m-carbophosphaborane ($m\text{-B}_{10}\text{H}_{10}\text{PCH}$). It has also been shown in NMR spectra that the spin-spin interaction constants $J_{\text{Hg}^{199}\text{-CH}_3}$ of the metal derivatives of carboranes change to

the electron affinity of the carborane group connected with the mercury atom. m- and p-carbophospha- and m- and p-carboarsa-boranes were prepared in the

following way: m-, p- $\text{B}_{10}\text{H}_{10}\text{ECH} \xrightarrow{\text{RLA}}$ m-, p- $\text{B}_{10}\text{H}_{10}\text{ECLA} \xrightarrow{\text{CH}_2\text{HgBr}}$ m-, p- $\text{B}_{10}\text{H}_{10}$

ECHgCH_3 where E = P, As; R = n - C_4H_9 , C_6H_5 . The ortho forms could not be

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USSR

FEDOROV, L. A., et al., Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 3, 1972, pp 535-538

prepared by this method. The measured spin-spin coupling constants $J_{\text{Hg}^{199}\text{-C-H}}$ are given below.

Соединение Compound	Растворитель $J_{\text{Hg}^{199}\text{-C-H}}$				
	CCl_4	CHCl_3	CH_2Cl_2	C_6H_6	20-масел
<i>m</i> -HCB ₆ H ₄ CH ₂ CH ₃ [5]	136,4	138,7	140,9	140,9	145,0
<i>m</i> -AsB ₆ H ₄ CH ₂ CH ₃	136,5	139,3	141,8	141,2	145,0
<i>m</i> -PB ₆ H ₄ CH ₂ CH ₃	137,3	139,8	142,7	142,2	146,9
<i>p</i> -HCB ₆ H ₄ CH ₂ CH ₃ [5]	133,7	135,5	138,6	138,3	141,3
<i>p</i> -AsB ₆ H ₄ CH ₂ CH ₃	133,7	135,5	137,7	138,5	141,7
<i>p</i> -PB ₆ H ₄ CH ₂ CH ₃	134,4	139,5	140,9	142,6	145,1

These agree with earlier values.

2/2

1/2 020 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--POLYADDITION REACTIONS OF SOME ORGANOVINYLCHLOROSILICON HYDRIDES
-U
AUTHOR--(05)--KOBRAKOV, K.I., FEDROV, L.A., KUZMIN, O.V., NAMETKIN, N.S.,
CHERNYSHEVA, T.I.
CCOUNTRY OF INFO--USSR
SOURCE--DOKL. AKAD. NAUK SSSR 1970, 18(3), 607-19 (CHEM)
DATE PUBLISHED--70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--POLYMERIZATION, ORGANOSILICON COMPOUND, OLIGOMER, CHLORINATED
ORGANIC COMPOUND, DIMERIZATION, EPR SPECTRUM, CYCLOHEXANE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/0725

STEP NO--UR/0020/70/191/003/0607/0610

CIRC ACCESSION NO--AT0124395

UNCLASSIFIED

2/2 020

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AT0124395

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE POLYMN. OF MESI(CH=CH
SUB2)CL, ETSI(CH=CH SUB2)CL, PHSI(CH=CH SUB2)CL, OR SII(CH=CH SUB2) CL
SUB2 IN SEALED TUBES AT 100-50DEGREES IN THE PRESENCE OF H SUB2 PTCL
SUB6.6H SUB2 O AND PT-C GAVE OLIGOMERS CONTG. ONLY (CHMESIRCL) SUBN (I)
(R SI CL OR PH) STRUCTURES OR I AND (CH SUB2 CH SUB2 SIRCL) SUBN (II) (R
SI ME OR ET) STRUCTURES. BESIDES I AND (OR) II (N IS 9-11) THE POLYMN.
ALSO GAVE DIMERS SUCH AS 1,4,DICHLORO,1,4,DIMETHYL,1,4,DISILACYCLOHEXANE
(III) OR 1,1,4,4,TETRAMETHYL,1,4,DISILACYCLOHEXANE (V). EPR SPECTRA
GAVE THE CONFORMATION OF III AND SHOWED THAT IV CONTAINS ISOMERIC
1,3,DICHLORO,1,2,3,TRIMETHYL,1,3,DISILACYCLOPENTANE. FACILITY:
INST. NEFTEKHIM. SIN. IM. TOPCHIEVA, MOSCOW, USSR.

UNCLASSIFIED

1/2 008 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--STRUCTURE OF CYCLOPENTADIENYL COMPOUNDS OF NONTRANSITION METALS OF
PERIODS 5 AND 6 REVIEWED FROM NMR SPECTROSCOPIC DATA, SANDWICH NATURE OF
AUTHOR--(03)--FEDIN, E.I., FEDOROV, L.A., MATERIKOVA, R.B.

COUNTRY OF INFO--USSR

SOURCE--ZH. STRUKT. KHIM. 1970, 11(1), 174-92

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--CYCLIC GROUP, NMR SPECTRUM, METAL COMPLEX COMPOUND

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/1652

STEP NO--UR/0192/70/011/001/0174/0192

CIRC ACCESSION NO--AP0125274

UNCLASSIFIED

2/2 008 UNCLASSIFIED PROCESSING DATE--30DCT70
CIRC ACCESSION NO--AP0125274
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A REVIEW OF THE NMR SPECTROSCOPIC
DATA PERTAINING TO CYCLOPENTADIENYL DERIVS. OF NON TRANSITION METALS OF
PERIOD 5 AND 6 IS PRESENTED. 80 REFS. FACILITY: INST.
ELEMENTORG. SOEDIN., MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC 629.735.33.01
629.735.33.016

FEDOROV, L. P.

"Determining the Basic Aircraft Parameters for a Flight at Constant Altitude and Given Speed"

Kazan', Izvestiya Vysshikh Uchebnykh Zavedeniy, Aviatsionnaya Tekhnika, No 3, 1971, pp 99-102

Abstract: A problem of approximate determination of the minimum flight weight of an aircraft equipped with jet engines for given values of flight range, altitude and speed, is considered. Equations are derived for determining the optimal parameters of an aircraft and power plant, such as wing load, wing area, engine midsection area, engine modes, drag, lift, etc. The method presented here may be used, for example, in a preliminary design stage for approximate determination of basic parameters of low altitude or passenger planes at given altitude.

1/1

1/2 029 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--NEW BOOKS ABOUT AVIATION -U-
AUTHOR--FEDUROV, M. F
COUNTRY OF INFO--USSR
SOURCE--KRASNAYA ZVEZDA, AUGUST 12, 1970, P 2, COLS 5-8
DATE PUBLISHED--12AUG70
SUBJECT AREAS--SPACE TECHNOLOGY, AERONAUTICS
TOPIC TAGS--ASTRONAUTICS, HANDBOOK
CENTRAL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--2000/1918 STEP NO--UR/9003/70/000/000/0002/0002
CIRC ACCESSION NO--AN0125511
UNCLASSIFIED

2/2 029 UNCLASSIFIED PROCESSING DATE--30OCT70
CIRC ACCESSION NO--AN0125511
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE DOSAAF PUBLISHING HOUSE HAS
PUBLISHED THE CONQUEST OF THE SKY (POKORENIYE NEBA), 1970, BY L. A.
GIL'BERG. ACCORDING TO THE REVIEW, THE FACTUAL ASPECT OF THE BOOK WILL
MAKE IT OF INTEREST TO ANYONE WHO FOLLOWS THE DEVELOPMENT OF AVIATION
AND ASTRONAUTICS.

UNCLASSIFIED

USSR

UDC 53.07/.08+53.001.5

KONYUSHKOV, G. V., YEREKIN, V. M., FEDOROV, M. I.

"Effectiveness of Diffusion Joining of Metals in the Stemless Pumping of Electro-vacuum Devices"

Vakuumn. tekhnika. Nauchno-tekhn. sb. (Vacuum Technology. Scientific-Technical Collection), No. 2, Kazan', 1970, pp 117-124 (from RZh-Fizika, No 1, Jan 71, Abstract No 1A140)

Translation: To obtain a vacuum up to 10^{-9} mm Hg in the working space of domestic electrovacuum devices and to maintain this vacuum during use of the device, diffusion welding of the components of the device in stemless pumping after degassing is recommended instead of sealing the stem by soldering or cold welding. Comparative characteristics of the vacuum state in samples sealed by various methods over the course of a day, week, and month, and also metallographic studies of seams obtained by the diffusion method and by soldering are given. It was shown that the sealing of metaloceramic electrovacuum devices with a diffusion joint makes it possible to obtain a quality-reliable joint in these components. Yu. N. Kogan.

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Water Treatment

USSR

UDC 551.463:352.13/.14:537.311

MASHOVETS, V. P., PUSHKOV, L. V., SMAYEV, V. N., FEDOROV, M. K., and FEDOTOV, N. V.

"Density, Viscosity and Electroconductivity of Sea Water at Temperatures Up to 300-350°"

Leningrad, Zhurnal Prikladnoy Khimii, Vol 46, No 8, Aug 73, pp 1865-1868

Abstract: Investigation of density, viscosity and electroconductivity of sea water at various temperatures $d = d_0 + 0.0105 c^{1/2}$, where d_0 = density of pure water at a given temperature and c = salinity of sea water (weight-%). The logarithm of the viscosity of sea water ($\lg n_{sw}$) is related to the logarithm of the viscosity of pure water ($\lg n_{H_2O}$) by $\lg n_{sw} = 0.913 \lg n_{H_2O} - 0.00597$. The electronegativity increases with temperature reaching a maximum at 250°. The curve in the temperature range 10-160° can be described by the equation $x = 0.027 + 10^{-3} t$, where x = conductivity, t = temperature.

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1/2 019 UNCLASSIFIED PROCESSING DATE--11DEC70
TITLE--VISCOSITY OF AQUEOUS POTASSIUM HYDROXIDE SOLUTIONS TO 90DEGREES -U-
AUTHOR--(03)-PUCHKOV, L.V., SARGAYEV, P.M., FEDOROV, M.K.
COUNTRY OF INFO--USSR
SOURCE--ZH. PRIKL. KHIM. (LENINGRAD) 1970, 43(3), 677-80
DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY, PHYSICS
TOPIC TAGS--HYDROXIDE, POTASSIUM COMPOUND, AQUEOUS SOLUTION, FLUID
VISCOSITY, ENTHALPY, ENTROPY, HYDROGEN BONDING

CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--3004/0960 STEP NO--UR/0080/70/043/003/0677/0680
CIRC ACCESSION NO--AP0131545
UNCLASSIFIED

2/2 019

UNCLASSIFIED

PROCESSING DATE--11DEC70

CIRC ACCESSION NO--AP0131545

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE VISCOSITY OF AQ. 5.01-60.92
WT. PERCENT SOLNS. OF KOH WAS MEASURED AT 25, 50, 75, AND 90 DEGREES BY
USING AN OSTWALD VISCOSIMETER. THE ENTHALPY ΔH PRIME PLUS OR MINUS
AND ENTROPY ΔS PRIME PLUS OR MINUS OF THE ACTIVATION OF THE VISCOUS
STREAM WERE CALCD. THE PLOTS OF ΔH PRIME PLUS OR MINUS AND ΔS
PRIME PLUS OR MINUS VS. MOL. CONC. OF KOH, M, AT VARIOUS
TEMPS. SHOW. MIN. AT APPROX. M EQUALS 10 TO 12 MOLE PERCENT KOH. THE
DECREASE IN ΔH PRIME PLUS OR MINUS AND ΔS PRIME PLUS OR MINUS
ON INCREASING M FROM 0 TO 12 IS DUE TO A DESTRUCTION OF . BONDS BETWEEN
H. SUB2 O MOLS. BY HYDROXIDE MOLS. IN CONCD. SOLNS., A MOL. SPACE
ORIENTATION IS ASSUMED AGAIN DUE TO AN INCREASE IN ELECTROSTATIC
INTERACTIONS BETWEEN THE MOLS. FACILITY: Leningrad. Tekhnol.
INST. IM. LENSOVETA, Leningrad, USSR.

UNCLASSIFIED

USSR

UDC 614.484

BAUMAN, V. M., OBREKHT, S. D., SAAKOV, G. T., Col Med Serv; and FEDOROV, M. N.,
Candidate of Medical Sciences

"Gaseous Methods of Disinfection"

Moscow, Voenno-Meditsinskiy Zhurnal, No 10, 1972, pp 54-57

Abstract: Because there has been heretofore no practical solution to the problem of disinfecting synthetic materials, documents, currency devices, and small-size expensive apparatus, the authors devote this article to the status of the gaseous method of disinfection which they regard as the solution since, as recent research has shown, it is convenient and has no negative qualities. In this chamberless method, a promising disinfectant is a mixture of ethylene oxide and methyl bromide (known under the Russian acronym of OKEBM) which is prepared under industrial conditions and consists of one part ethylene and 2.5 parts methyl bromide by weight. It is a uniform, transparent fluid with a pungent odor, a liquid below +8.5° C under ordinary air pressure conditions, and is capable of being stored for long periods. A table of the antiseptic properties of the gas acting on various materials under various conditions is presented. The results of tests made to determine
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USSR

BAUMAN, V. M., et al., Voyenno-Meditsinskiy Zhurnal, No 10, 1972, pp 54-57

its germicidal capacity are also given together with a sketch of the equipment used for administering it. Research performed by the authors shows that the gaseous method of disinfection may become standard under field and barracks conditions. It is also applicable to surgery and other hospital procedures.

2/2

Molecular Biology

USSR

UDC 577.11

KRITSKIY, G. A., BATISHCHEV, A. I., ALEKSANDROV, S. V., FEDOROV, N. A., and
ABRAMOV, R. Ye., Institute of Biochemistry imeni A. N. Bakh, Academy of
Sciences USSR, Moscow

"Comparative Characteristics of Nucleotide Blocks of DNA After Radiation Injury
and in Leukemia"

Moscow, Doklady Akademii Nauk SSSR, No 1, 1972, pp 233-236

Abstract: DNA was isolated from bone marrow of Wistar rats irradiated at 500 r and from spleens of C57Bl₆ mice 6 days after induction of L₁₂ leukemia. Determination of the pyrimidine nucleotide blocks of the DNA by paper chromatography revealed good separation of most of the spots, 7 and 8 in particular. The changes in distribution of the pyrimidine nucleotide blocks were found to be the same in both DNA's. There was a significant increase in the relative content of spot 10 material compared with the total content of the material of all the spots as well as a maximum decrease in the nucleotide blocks corresponding to chromatographic spot 7. The destruction of these portions of DNA resulted in an increase in the amount of material corresponding to spots 8 and 10. The similarity of the changes in nucleic acids produced by irradiation and leukemia may account for the increased frequency of tumors and especially leukemias after exposure to ionizing radiation.

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1/2 025 UNCLASSIFIED PROCESSING DATE--04DEC70
TITLE--EFFECT OF TOTAL X RAY IRRADIATION AND CAFFEINE ON THE EXCRETION OF
EXOGENOUS 3 PRIME, 5 PRIME AMP PRIME32 P, 5 PRIME AMP PRIME32 P, AND 3
AUTHOR--(03)-FEDOROV, N.A., ABAKUMOVA, O.YU., KOTOV, N.N.
COUNTRY OF INFO--USSR
SOURCE--RADIOBIOLOGIYA 1970, 10(2), 307
DATE PUBLISHED-----70
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--X RAY RADIATION BIOLOGIC EFFECT, URINE, RAT, NUCLEOTIDE,
CENTRAL NERVOUS SYSTEM STIMULANT, PHOSPHORUS ISOTOPE
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY FICHE NO----FD70/605004/812 STEP NO--UR/0205/70/010/002/0307/0307
CIRC ACCESSION NO--AP0139608
UNCLASSIFIED

2/2 025 UNCLASSIFIED PROCESSING DATE--04DEC70
CIRC ACCESSION NO--AP0139608
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. EFFECT OF TOTAL X IRRADN. (DOSE NOT GIVEN) AND CAFFEINE ON THE URINARY EXCRETION OF EXOGENOUS 3 PRIME, 5 PRIME, AMP PRIME32 P (I), 5 PRIME (II), 5 PRIME AMP PRIME32 P (III), AND 3 PRIME, 5 PRIME AMP PRIME3 H (III) HAS BEEN STUDIED IN RATS. AN INCREASED RADIOACTIVITY EXCRETION FOLLOWING THE ADMINISTRATION OF I AND III, AND A DECREASED RADIOACTIVITY EXCRETION FOLLOWING THE ADMINISTRATION OF II WAS OBSD. IN IRRADIATED ANIMALS AS WELL AS IN ANIMALS GIVE CAFFEINE. A PORTION OF EXOGENOUS I AND II WAS EXCRETED IN UNCHANGED FORM. QUANT. AND QUAL. DIFFERENCES WERE NOTED IN THE EXCRETION OF RADIOACTIVITY AFTER THE ADMINISTRATION OF LABELED NUCLEOTIDES AND NA USB2 H PRIME32 PO SUB4. FACILITY: TSENT. INST. USOVERSH. VARACH., MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC 546.623'882'5

FEDOROV, N. F., ANDREYEV, I. F., KASPARYAN, R. M., and SMORODINA, T. P.

"Phase Equilibria in the System $Al_2O_3-Nb_2O_5$ "

Moscow, Neorganicheskiye Materialy, Vol 7, No 4, Apr 71, pp 643-647

Abstract: The phase diagram of the $Al_2O_3-Nb_2O_5$ system was constructed. The system contains three individual compounds. $AlNbO_4$, $AlNb_{11}O_{29}$, and $AlNb_{49}O_{124}$. The first compound melts with decomposition at $1569^\circ C$, the two others -- without decomposition -- at 1450 and $1460^\circ C$, respectively. The peritectic has a composition equal to 65 mol.% Nb_2O_5 + 35 mol.% Al_2O_3 , while the eutectic corresponds to a composition of 73 mol.% Nb_2O_5 + 27 mol.% Al_2O_3 at $1425^\circ C$ and 95 mol.% Nb_2O_5 + 5 mol.% Al_2O_3 at $1435^\circ C$.

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- 4 -

USSR

UDC: 669.295

BARKHATOV, G. A., FEDOROV, N. G.

"Automatic Control System for Chlorination of Titanium Slags Based on 'Center' Pneumatic Complex"

Moscow, Tsvetnyye Metally, No 7, Jul 73, pp 54-57.

Abstract: An automatic control system has been developed, based on the "Center" pneumatic complex. The specific features of the connections between sections, arrangement of components, hierarchical structure for assembly and processing of information and control structure are described. Information is output from the system only if the operator needs to interfere or if a disruption of the proper mode occurs. This eliminates the need for the operator to process "excess" information direct from the sensors when the apparatus is operating normally. This control complex, put on stream at the Ust'-Kamenogorsk Titanium-Magnesium Combine, is an intermediate stage on the path to total automation of the combine under electronic computer control. The pneumatic control system was selected partially because the older, non-automated control system was pneumatic.

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1/2 014 UNCLASSIFIED PROCESSING DATE--11DEC70
TITLE--EFFECT OF RESIN CANCER ON THE RESPIRATION INTENSITY AND ACTIVITY OF
PINE OXIDATIVE ENZYMES -U-
AUTHOR--(03)--FEDOROV, N.I., RAPTUNOVICH, E.S., VORONKOVA, N.G.
COUNTRY OF INFO--USSR
SOURCE--MIKLL. FITOPATOL. 1970, 4(1), 44-50
DATE PUBLISHED-----70
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--PROCESSED PLANT PRODUCT, FUNGUS, PLANT DISEASE, ENZYME
ACTIVITY, SEASONAL VARIATION
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY FICHE NO----FD70/605001/E12 STEP NO--UR/9063/70/C04/001/0044/0050
CIRC ACCESSION NO--AP0139384
UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--11DEC70

2/2 014

CIRC ACCESSION NU--AP0139384

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

ABSTRACT. CHANGES IN THE ACTIVITIES OF THE OXIDATIVE ENZYMES AND IN THE RESPIRATION OF PINE TREES INFECTED WITH RESIN CANCER, CAUSED BY THE GROWTH AND DEVELOPMENT OF THE RUST FUNGI CRONARTIUM FLACCIDUM AND PERIDERMUM PINI, WERE STUDIED. AN INFECTION WITH THE ABOVE MENTIONED FUNGI INCREASED THE RESPIRATION OF THE PINE NEEDLES, ESP. DURING THE SPRING. DURING THE SUMMER, THE 2 YEAR OLD NEEDLES OF INFECTED PINES HAD A HIGHER RESPIRATION THAN THE NEEDLES OF HEALTHY TREES. THE RESPIRATION OF THE OXIDATIVE ENZYMES IN THE NEEDLES OF INFECTED TREES CHANGED ACCORDINGLY TO THE TIME OF ANAL.

FACILITY: TEKHNOL. INST. IM. KIROVA, MINSK, USSR.

UNCLASSIFIED

172 024 UNCLASSIFIED PROCESSING DATE--20NOV70
TITLE--NATURE OF ACTIVE CENTERS DURING BUTADIENE POLYMERIZATION ON COBALT
CATALYSTS -U-
AUTHOR--(04)--BYRIKHIN, V.S., FEDOROV, N.P., ALEKSANDROVSKAYA, O.I.,
MEDVEDEV, S.S.
CCOUNTRY OF INFO--USSR
SOURCE--DOKL. AKAD. NAUK SSSR 1970, 191(30), 589-92
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--BUTADIENE, POLYMERIZATION, COBALT COMPLEX, CATALYST, ALUMINUM
COMPOUND, THIOPHENE, POLYBUTADIENE
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--3005/0224 STEP NO--UR/0020/70/191/003/0589/0592
CIRC ACCESSION NO--AT0132496
UNCLASSIFIED

2/2 024

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AT0132496

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. KINETIC STUDIES REVEALED THAT ONE OF THE LIGANDS FROM THE CO(ALCL SUB4)SUB2 COMPLEX WERE READILY SUBSTITUTED BY ALCL SUB3 THIOPHENE (I) TO GIVE A CATALYST CAPABLE OF INITIATING CIS 1,4 POLYMER. OF BUTADIENE. THE MOL. WT. OF POLYBUTADIENE INCREASED WHENEVER THE CONCN. OF COCL SUB2 ALCL SUB3 I WAS INCREASED, PRESUMABLY DUE TO HIGHER CONCN. OF THE CATALYST AND OF ALCL SUB3 I, WHICH WAS ALWAYS FORMED ALONG WITH THE CATALYST. FACILITY: MOSK. INST TCKOI KHIM. TEKHNOL. IM. LOMONOSOVA, MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC (546.824.41/43+546/831/4'41/43)5541.452

FEDOROV, N. F., KOZHEVNIKOVA, L. V., and LUNINA, N. M., Leningrad Technological Institute imeni Lensovet

"Synthesis and Properties of Materials Based on Titanates and Zirconates of Ca, Sr, Ba and Aqueous Acid Solutions"

Moscow, Neorganicheskiye Materialy, Vol 9 , No 10, Oct 73, pp 1773-1777

Abstract: Titanates and zirconates of alkaline-earth metals were synthesized in an attempt to produce binders of materials which possessed dielectric properties. It was shown that there is an advantage in using semi-dry pressing of powders of Ca, Sr, and Ba titanates and zirconates to produce materials with a good combination of high strength and good electrophysical properties. Materials were synthesized which had a compressive strength of 3600 and bend strength of 500 kg/cm². Electrical properties of the investigated composites were within the following limits: resistance -- 10⁷-10¹¹ ohm-cm; tg δ = 0.05-0.1, ϵ = 15-800. Zirconates of alkaline-earth elements were stable to temperature effects up to 1000°C. A new and highly effective compound for producing parts of oxide compounds was a mixture of sulfuric and phosphoric acids where the best results were achieved at a content of the initial acids of 40-60% H₃PO₄ and 60-40% H₂SO₄. Three figures, two tables, five bibliographic references.

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USSR

UDC 621.385.032.269

PEREVODCHIKOV, V.I.*, FEDOROV, O.L., YUMATOV, K.O. [*Transliterated from Ukrainian]

"Pulsed Electron Gun With Current Up To 1 ka"

Ukr.fiz.zh. (Ukrainian Journal Of Physics), 1971, 16, No 6, pp 971-976 (from RZh--Elektronika i yeye primeneniye, No 11, Nov 1971, Abstract No 11A24)

Translation: A pulsed electron gun (EG) is considered, with a cathode of lanthanum boride, which assures a choice of electron current densities up to 300 a/cm^2 . The construction is described of an EG for current up to 1 ka, and a number of advantages are shown of EG with thermocathodes as compared with EG with cathodes operating in prebreakdown regimes. The requirements are determined for the high-voltage power supply of a pulsed EG. 4 ref. Summary.

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