

Physical Properties

UDC 669.14:669.04

USSR

BAUM, B. A., D'YAKONOVA, L. V., YERMANOVICH, N. A., TYAGUNOV, G. V., and KHASIN, G. A., Sverdlovsk, Zlatoust

"Physical Properties of Molten High-Alloy Steels and Special Alloys"

Moscow, Fizika i Khimiya Obrabotki Materialov, No 5, Sep-Oct 70, pp 43-48

Abstract: The article determines the kinematic viscosity, electrical resistivity, and density of specimens of more than 20 industrial brands of steels and alloys. The properties were measured after 5-15 minute isothermal holding periods, beginning with a temperature increase to 1700-1800° C and then followed by a temperature decrease down to crystallization of the melt. In some cases this measurement cycle was repeated (reheating and then cooling the specimen) without bringing the specimen to solidification. The specimens studied included NZhVI alloy (99.66 percent Fe), EI435, EI437 nickel-base alloys, alloys Kh28, Kh18N10T, EI811, ShKh15, EI736, 12Kh2N4A, iron-base alloys U10, ShKh15, R18, 9Kh18 high-carbon steels, 4Kh9S2, E4,

1/3

USSR

BAUM, B. A., et al., Fizika i Khimiya Obrabotki Materialov, No 5, Sep-Oct 70, pp 43-48

and 30KhGSNA steels, and alloy 60. The effect of the chemical composition of the specimens, nonmetallic inclusions, and production method on the physical properties was considered.

The results indicate that the kinematic viscosity, electrical resistance, and density of molten steels and special alloys depend mainly on the chemical composition and production method. The phenomenon of hysteresis of properties is observed, indicating differences in the structure of a molten specimen during its heating and cooling. The magnitude of the hysteresis may serve as one of the characteristics of a given specimen along with data on its physical properties. The structure of melts before crystallization (composition and properties of microvolumes, coordination of the atoms in them, etc.) should be regarded as one of the metallurgical heredity factors capable of influencing a number of the service characteristics of the solid metal.

2/3

- 41 -

USSR

BAUM, B. A., et al., Fizika i Khimiya Obrabotki Materialov, No
5, Sep-Oct 70, pp 43-48

The authors thank P. V. GEL'D for his advice and in-
terest in the work.

3/3

1/2 015 UNCLASSIFIED PROCESSING DATE--09OCT70
TITLE--FUNCTIONAL ORGANIC PEROXIDES. V. HALOACYL PEROXIDES -U-
AUTHOR--(04)--SHREYBERT, A.I., KHARDIN, A.P., KIBALNIKOVA, R.I.,
YERMARCHENKO, V.I.
COUNTRY OF INFO--USSR
SOURCE--ZH. ORG. KHIM. 1970, 6(3) 466-8
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY, ORDNANCE
TOPIC TAGS--ORGANIC PEROXIDE, EXPLOSIVE, BENZENE DERIVATIVE, SODIUM
COMPOUND
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1992/1576 STEP NO--UR/0366/70/006/003/0466/0468
CIRC ACCESSION NO--APO112570
UNCLASSIFIED

2/2 015

UNCLASSIFIED

PROCESSING DATE--09OCT70

CIRC ACCESSION NO--A0112570

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE REACTION OF 2RCOCL WITH NA
SUB2 O SUB2 GAVE 55-60PERCENT (RCO) SUB2 O SUB2 (R IS ME-CCL SUB2, CLCH
SUB2 CCL SUB2, BRCH SUB2 CH SUB2, OR ME SUB2 CCL). SIMILARLY, 2 RC-OCL
REACTED WITH BZQONA TO GIVE RCO SUB2 OBZ (R AS ABOVE). THESE COMPOS.
EXPLODE DURING SOTRAGE AT 20-5DEGREES.

UNCLASSIFIED

89

USSR

ALEKSANDROV, I. A., et al., Atomnaya Energoya, Vol. 29, No 1, Jul 70, pp 29-34

are presented. The limiting solid capture angle of the secondary particles by the channel is 32 microsteradians. The best resolution with respect to momentum is 0.3 percent without decreasing the capture angle. The channel was investigated primarily using a secondary beam with a momentum of $p = 50$ giga-electron volts/second. The procedure for adjusting the channel and the calculated data are described. The differences between the calculated operating conditions of the elements and the conditions after adjustment together do not exceed the errors of the fringing field of the accelerator, the magnetization curve, and the curve for calibrating the bypasses of the magnet. On the whole, the beam parameters agree well with the calculated data.

A detailed diagram of the channel layout is presented, and graphs are presented for the radial position of the targets and the production angle as functions of the momentum of the secondary particles, the optical system of the channel and path of the beams in the horizontal and vertical planes, the momentum

2/3

- 46 -

USSR

ALEKSANDROV, I. A., et al., *Atomnaya Energiya*, Vol 29, No 1,
Jul 70, pp 29-34

resolution of the channel, the beam profile with momentum of 50 gigaelectron volts/second in the parallel section and slit width of the aperture collimators of +20 mm and the pulse collimator +6mm, the beam profile with momentum of 50 gigaelectron volts/second in the final representation on including the lens doublet, and the beam profile with momentum of 50 gigaelectron volts/second in the final representation on including a lens triplet.

3/3

USSR

YERMEYEV, V. I.

"Equation for the State of Viscous Structural Instability of a Medium"

Tr. Ural'sk. Politekhn. In-ta [Works of Urals Polytechnical Institute],
Collection 202, 1971, pp 90-93, (Translated from Referativnyy Zhurnal,
Mekhanika, No 4, 1972, Abstract No 4 V652 by L. Kh. Papernik).

Translation: A model is suggested, describing the process of hot plastic
deformation of metal and considering the rheology of the process. An equa-
tion is produced for the state of the nonlinearly viscous structurally in-
elastic medium with nonlinear deformation hardening:

$$\sigma = P_0 (1 - (h/h_0)^k) [1 - Ae^{\alpha \xi} - C(1 - e^{\lambda \xi})]$$

Here $h/h_0 = e^\xi$, where ξ is deformation, ξ is the deformation rate, P_0 is
constant load. Constants k , α , A , C and λ characterize the material in
question with constant temperature and are defined in approximation of
the hardening curves. 9 Biblio. Refs.

1/1

USSR

UDC 541.15+539.163

ROMANOV, V. I., and YERMEYEVA, L. V.

"Test Method for Determining Yttrium Carrier in Radiochemical Analysis of Strontium-90"

Issled. v obl. fiz. okeana (Investigations in the Area of Physics of the Ocean -- Collection of Works), pp 98-105, Svastopol', 1969, (from Referativnyy Zhurnal Khimiya, No 3, Vol I, 10 Feb 70, Abstract No 3 B706)

Translation: A photographic method is suggested for quantitative spectral determination of the Y carrier in the concentration interval 0.2-2.4 mg/ml during radiochemical determination of Sr⁹⁰ in sea water. The solution being analyzed, 30 ml in volume, is placed in a fulfurator and fed through the lower electrode into the discharge zone. The distance between the electrodes is 3 mm, the arc current is 8 a. Photography of the spectra is performed using an ISP-28 spectrograph with a three-lens slit illumination system in order to increase the resolving capacity of the instrument. The exposure time when "spectral type 1" photographic plates with a sensitivity 1/2

USSR

ROMANOV, V. I., et al., Issled. v obl. fiz. okeana, pp 98-105, Sevastopol', 1969

of O.S. GOST (All Union State Standard) units are used for the selected analytic pair of lines $\lambda_{Y} 3710.29 \text{ \AA}$ and $\lambda_{Zr} 3991.13 \text{ \AA}$ is 30 sec. The measurement of each specimen is performed three times. The concentration of Y is determined using a calibrated graph constructed on the basis of standard solutions in coordinates $\Delta S = S - S_0$, $\log C$, where S is the darkening of the analytic line, S_0 is the darkening of the comparison line, C is the concentration of Y. The arithmetic mean error of the method is $\pm 7.7\%$.

A. Pozdnyakov

2/2

YERMILOV, A.A.

SPACE FLIGHT PROGRAM

YERMILOV, A.A.

Book edited by Doctor of Physical and Mathematical Sciences G. S. Martynov; Moscow, U.S.S.R. Kozhicheskikh Korably i Orbitalnyye Stantsii, Russian, Tekhnicheskoye Izdatel'stvo Mashinostroyeniya, Moscow, 1969, 80 pp.

FROM SPACESHIPS TO ORBITING STATIONS
- USSR -

JPRS 48526
31 JULY 1969
PAGES: 1
PAGES: 1
PAGES: 1

CONTENTS

Foreword	Page 1
I. Principal Stages in Soviet Cosmonautics	1
II. Programs of Manned Ships "Vostok" and "Voshkod"	3
III. Program of Manned "Soyuz" Ships	10
IV. Principal Flight Stages of the "Soyuz" Ships	18
V. World's First Experimental Space Station and Prospects for Orbital Flights	43
	53

[I - USSR - A]

UDC 629.788.001.5:523.3(023)

Authors

Professor A. Yu. Del'tsyov, Candidate of Technical Sciences V. P. Dots'ov,
Scientific Specialists A. A. Zhornitskiy, A. A. Korotkiy, B. I. Zhelezbin,
K. Ye. Orlov, A. V. Kiselev, V. A. Tol'yakov and I. L. Kondov

Spaceflight Program

Annotation

This book tells of the Soviet manned spaceflight program. The authors discuss the principal stages in the development of Soviet "Soyuz" ships. They also describe the construction and outfitting of "Soyuz" ships, its operation and the experiments involving crew movement from one ship to another through open space and testing of methods for assembling a station and conducting scientific research. Future possible trends in the development of orbital stations are discussed.

27 illustrations

1/2 008 UNCLASSIFIED PROCESSING DATE--18SEPT0
TITLE--INTENSIFIED PREPARATION OF WHITE ENAMELS IN BEAD MILLS -U-
AUTHOR--(05)-ZAKHARYCHEV, V.P., IOFFE, G.S., NEVZOROV, E.N., MIRONOV, B.V.,
YERMILOV, P.I.
COUNTRY OF INFO--USSR
SOURCE--LAKOKRASOCH. MATER. IKH. PRIMEN. 1970 (1) 74
DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--INDUSTRIAL PRODUCTION, ENAMEL, TITANIUM OXIDE, VARNISH,
UREA/(U)MCH181 ENAMEL, (U)MCH025 VARNISH

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--1989/0546

STEP NO--UR/0303/70/000/001/0074/0074

CIRC ACCESSION NO--AP0107151

UNCLASSIFIED

2/2 008

UNCLASSIFIED

PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0107151

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A RHEOL. METHOD WAS DEVELOPED FOR THE DETN. OF THE OPTIMUM TIO SUB2-ALKYD UREA MCHO25 VARNISH RATIO DURING THE PRODUCTION OF MCH181 ENAMEL (I) IN BEAD MILLS. THE OUTPUT OF THE BEAD MILLS INCREASED BY A FACTOR OF 2.23 WHEN THE OLDER FORMULATION WAS REPLACED BY THE I FORMULATION DEVELOPED FROM RHEOL. DATA.

UNCLASSIFIED

89

USSR

UDC 621.372.851

AVDEYEV, Ye. V., VOSKRESENSKIY, G. V., YERMILOV, V. T.

"Study of the Properties of the Characteristic Waves in Iris Wave Guides"

Tr. Vses. soveshchaniya po uskoritelyam zaryazhen. chastits, 1968, T 2 (Works of the All-Union Conference on Charged Particle Accelerators, 1968, Vol 2), Moscow, VINITI Press, 1970, pp 188-193 (from RZh-Radiotekhnika, No 8, Aug 70, Abstract No 8B134)

Translation: This article contains an investigation of propagation of natural waves of the HE_{11} type in a round wave guide periodically loaded with diaphragms. A calculation of the dispersion relations of the natural waves is presented. The geometry of the natural wave fields is analyzed, and their energy characteristics are obtained. There are seven illustrations and a four-entry bibliography.

1/1

- 300 -

1/2 018
UNCLASSIFIED
PROCESSING DATE--16OCT70
TITLE--CONTROL PROGRAMMING WITH ALLOWANCE FOR THRUST LIMITATION TO
ACCOMPLISH SATELLITE RENDEZVOUS BY THE METHOD OF FREE TRAJECTORIES --U-
AUTHOR--YERMILOV, YU.A.
COUNTRY OF INFO--USSR
SOURCE--KOSMICHESKIE ISSLEDOVANIYA, VOL. 8, MAR-APR. 1970, P. 243 --250
DATE PUBLISHED-----70
SUBJECT AREAS--ELECTRONICS AND ELECTRICAL ENGR., SPACE TECHNOLOGY
TOPIC TAGS--COMPUTER PROGRAMMING, PROGRAMMED AUTOMATIC CONTROL, SPACECRAFT
RENDEZVOUS, FREE FLIGHT TRAJECTORY
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--1994/1753
STEP NO--UR/0293/70/008/000/0243/0250
CIRC ACCESSION NO--AP0115582
UNCLASSIFIED

2/2 018

UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0115582

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

ABSTRACT. DESCRIPTION OF THE PROGRAMMED CONTROL OF SATELLITE RENDEZVOUS BY METHOD OF FREE TRAJECTORIES (BALLISTIC TRANSFER), ENSURING THE PROPER THRUST IMPULSE FOR ACHIEVING ENCOUNTER IN SPECIFIED TIME INTERVAL. THE PROBLEM INVOLVES THE DETERMINATION OF THE DURATION, MAGNITUDE, AND TIME OF CONTROL IMPULSES FOR INITIATING, CORRECTING, AND TERMINATING THE TRANSFER MANEUVER. SIMPLE FORMULAS ARE DERIVED WHICH MAKE IT POSSIBLE TO DETERMINE THE CONTROL PULSE APPROXIMATION ERRORS AND TO SPECIFY THE FINITE THRUST CORRECTIONS IN CASES WHERE (AFTER COMPLETION OF THE PROGRAMMED VELOCITY CORRECTIONS) THE THRUST VECTOR IS STABILIZED EITHER IN AN INERTIAL OR IN A ROTATING ORBITAL COORDINATE SYSTEM.

UNCLASSIFIED

USSR

UDC 621.791.856:669.15-194

2

CHEKATILO, I. V., MARTYN, V. M., ARTAMONOV, V. L., Institute of Electric Welding imeni Ye. O. Paton, YERMILOV, YU. F., MASKIMOV, V. T., and PCHELIN, YU. I., Biysk "Elektropech" Plant

"Welding of Heat Resistant Kh25N2OS2, Kh23N18, and Kh25N13 Steels in Protective Gases"

Kiev, Avtomaticheskaya Svarka, No 8, Aug 70, pp 50-53

Abstract: An investigation was conducted at the Institute of Electric Welding imeni Ye. O. Paton for the purpose of developing a technology for the gas-arch welding of Kh25N2OS2 steel and its combinations with Kh23N18 and Kh23N13 steels in argon, CO₂, and technical nitrogen containing 3-5%O₂. The use of EP532 austenitic boride wire 1.2 and 2 mm in diameter containing 0.45-0.75 B and 2.5-3.0% Si made it possible to obtain welds without cracks. Welding techniques in different gases are described. Tables are presented which show the chemical contents of steels and wire and the transient mechanical properties of rolled EI253 steel joints welded with EP532 wire in protective gases, and figures show the microstructure of a butt weld and the microstructure of the metal deposited by EP532 wire. The results show that the strength of welds made with EP532 wire in argon, CO₂,
1/2

USSR

CHEKATILO, I. V., et al., Avtomaticheskaya Svarka, No 8, Aug 70,
pp 50-53

and nitrogen is equal to that of the basic metal and that
austenization increases weld plasticity.

2/2

5

USSR

TAKIBAYEV, ZH. S., BOOS, E. G., SAN'KO, L. A., SEMIRALIYEV, T., ANTONOV, M. G., YERMILOVA, D. I., MUKHORDOVA, T. I., KHOLMETSKAYA, A. V., and FEDOSEYENKO, V. V., Institute of Nuclear Physics, Academy of Sciences Kazakh SSR

"Study of Dynamics of Resonance Production in Four-Track Proton-Proton Interactions at Momentum of 10 GeV/c"

Moscow, Yadernaya Fizika, Vol 13, No 1, 1971, pp 113-123

Abstract: The article gives an analysis of 1800 four-track proton-proton interactions recorded in an 81-cm Saclay hydrogen bubble chamber irradiated with protons with a momentum of 10.01 ± 0.01 GeV/c on the CERN synchrotron. The following reactions are considered:

- $pp \rightarrow pp\pi^+\pi^-$ (1)
- $pp \rightarrow pp\pi^+\pi^-\pi^0$ (2)
- $pp \rightarrow pn\pi^+\pi^+\pi^-$ (3)

1/2

USSR

TAKIBAYEV, ZH. S., et al., Yadernaya Fizika, Vol 13, No 1, 1971, pp 113-123

Nucleon and meson resonance production cross-sections are determined and the contribution of two-particle reactions studied. It is shown that pion production in all the channels considered is accompanied in most cases by nucleon resonance production. The contribution of boson resonances, which is greatest in the channel with π^0 meson production, does not exceed 10 percent of the reaction channel cross-section. The use of the maximum momentum method permits estimates of the cross-sections for different quasi-two-particle reactions. The cross-sections of the dynamic states being observed differ considerably in channels (2) and (3), where the number of pions and nucleons coincides. This may be due to changes in the nucleon charge in inelastic pp interactions.

2/2

1/2 040 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--HYDROXYETHYL CYANOETHYL CELLULOSE -U-

AUTHOR--(05)-KATALEVSKAYA, I.V., YERMILOVA, I.I., SMIRNOVA, G.N., KHIN,
N.N., PROKOFYEVA, M.V.
COUNTRY OF INFO--USSR

SOURCE--PLAST. MASSY 1970, (2), 23-5

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY, MATERIALS

TOPIC TAGS--HYDROXYL RADICAL, CELLULOSE RESIN, CYANIDE, CHEMICAL
SYNTHESIS, POLYMER, TRANSITION TEMPERATURE, PLASTIC FILM, TENSILE
STRENGTH, DIELECTRIC PROPERTY, ADHESION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1997/0673

STEP NO--UR/0191/70/000/002/0023/0025

CIRC ACCESSION NO--AP0119581

UNCLASSIFIED

2/2 040

CIRC ACCESSION NO--AP0119581
ABSTRACT/EXTRACT--(U) GP-0-

UNCLASSIFIED

PROCESSING DATE--23OCT70

ABSTRACT. THE SYNTHESIS AND PHYSICOCHEM. PROPERTIES OF THE TITLE POLYMER (I) (USED AS A BINDER FOR ELECTROLUMINOPHORS) WERE STUDIED. THE MOST EFFECTIVE METHOD OF PREPG. I INVOLVED CYANOETHYLATION OF TECH. HYDROXYETHYL CELLULOSE (II) (3.5 MOLES OF CH SUB2:CHCN-ELEMENTARY UNIT OF II) AT 30DEGREES FOR 3 HR. I HAD A GLASS TRANSITION TEMP. OF SIMILAR TO 40DEGREES AND A VISCOELASTIC TRANSITION TEMP. OF 100DEGREES. COLORLESS AND TRANSPARENT FILMS WERE PREPD. FROM SOLNS. OF I. THE FILMS EXHIBITED HIGH TENSILE STRENGTH, RELATIVE ELONGATION AT BREAK, AND GOOD DIELEC. PROPERTIES, AND WERE READILY BONDED TO GLASS, METALS, AND OTHER MATERIALS.

UNCLASSIFIED

3

USSR

UDC 911.3.616.9.576.895.771(571.56)

TIMOFEYEVA, L. V., MITROFANOV, A. M., VINOGRADSKAYA, O. N., RASNITSYN, S. P.,
PETRUCHUK, O. Ye., RYAZANTSEV, V. A., and YERMISHEV, Yu. V.

"Organizational Principles in the Struggle Against Blood-Sucking Midges and
Aedes Mosquitoes on the Basis of Their Biological Characteristics"

V sb. Materialy Nauchn. konferentsii, posvyashch. 50-letiyu In-ta med.
parazitol. i tropich. med., 1970 (Proceedings on the Conference Commemorat-
ing the 50th Anniversary of the Institute of Medical Parasitology and
Tropical Medicine 1970 -- collection of works), Moscow, 1970, pp 50-51
(from RZh-36. Meditsinskaya Geografiya, No 1, Jan 71, Abstract No 1.36.75)

[No abstract]

1/1

BIOLOGY

Agriculture

USSR

UDC 614.449.57:615.285.7]:576.895.77+595.771

KRIVTSOVA, Ye. N., MITROFANOV, A. M., KOZIN, N. P., TIMOFFEYeva, L. V.,
TULUPOVA, A. M., VINOGRADSKAYA, O. N., YERMISHEV, Yu. V., PLOTNIKOVA, A. S.
and RYAZANTSEV, V. A., Institute of Medical Parasitology and Tropical Medicine
Imeni Ye. I. Martynovskiy, Ministry of Health USSR, and Institute of Agri-
cultural and Specialized Application of Civil Aviation

"Testing of Some Organophosphorus Compounds and Carbamates against Larvae of
Aedes Mosquitoes (Culicidae) in Experiments with Aerial Spraying"

Moscow, Meditsinskaya Parazitologiya i Parazitarnyye Bolezni, Vol 39, No 5,
Sep/Oct 70, pp 599-603

Abstract: The use of organophosphorus compounds and carbamates against
mosquito larvae was tested in the Yakut ASSR, in the area of the villages of
Novy, Aikhal, and Mirny, and the Udachnaya deposits. Water reservoirs were
treated by aerial spraying from an AN-2 plane. The following pesticides were
tested: bytex, methylnitrophen, trolen, sevine, and dipterex; DDT was used as
the reference. Comparatively uniform marshy territories with occasional for-
ests and bushes were selected. Bytex was shown to be especially effective as
a larvicide, a dose of 40 g/hectare proving to be sufficient. Methylnitrophen

1/2

USSR

KRIVTSOVA, Ye. N., et al., Meditsinskaya Parazitologiya i Parazitarnyye Bolezni, Vol 39, No 5, Sep/Oct 70, pp 599-603

required a 100 g/hectare dose to be effective; trolen in doses 40 and 80 g/hectare reduced the density of mosquito larvae only insignificantly. Dipterex and sevin proved ineffective as larvicides, being significantly inferior to DDT. The effect of mosquito larvae eradication with organophosphorus compounds lasts for 7-14 days.

2/2

- 1 -

USSR

MARKIN, V. S., GRIFOR'YEV, P. A., and YERMISHKIN, L. N., Institute of Electrochemistry, Academy of Sciences USSR, Moscow, and Institute of Biological Physics, Academy of Sciences USSR, Pushchino

"Direct Passage of Ions Through Lipid Membranes. I. Mathematical Model"
Moscow, Biofizika, Vol 16, No 6, Nov/Dec 71, pp 1,011-1,018

Abstract: A mathematical model containing seven parameters -- constant of ion diffusion into the membrane, constant of ion diffusion out of the membrane, saltatory velocity of ions jumping from one potential pore in the membrane to another, pore width coefficient, surface capacitance, volume capacitance, and saturation concentration -- is established. The parameters are measured under the given experimental conditions, and the figures are substituted into the model to calculate the permeability of a lipid membrane to any lipid-soluble ions. Equations for volt-ampere curves, admittance, and the coefficient of partition between water and lipid are given. Tests suitable for verifying the theory are suggested.

1/1

- 2 -

Composite Materials

USSR

UDC 669.71:539.4

IVANOVA, V. S., KON'YEV, I. M., BUSALOV, YU. YE., and YERMISHKIN, V. A., Moscow

"Deformation and Rupture Characteristics of Composite Materials With Work Hardenable and Slightly Work Hardenable Matrix"

Moscow, Fizika i Khimiya Obrabotki Materialov, No 3, May/June 73, pp 116-121

Abstract: Resistance to deformation and rupture of an Mg-Li (8 wt% Li) alloy reinforced with USA steel wire was studied by a stepwise loading method. When the amount of steel wire was 1 volumetric percent, the Mg-Li alloy behaved as a matrix, but when the amount of steel wire was increased to 8-15% the behavior of the alloy was typical for metals with a body-centered cubic lattice. In other words, steel wire (fibers) determined the properties of the alloy. A generalized rupture scheme of the composite material is suggested together with the mechanical rheological model of the material behavior, taking into account the matrix deformation properties. Application of the additivity rule for computation of the parabolic strengthening coefficient of the composite material based on a nonhardenable matrix during deformation makes it possible to plot actual deformation curves of composite materials with different volumetric percentage of matrix. Using the deformation diagrams of the matrix

1/2

USSR

IVANOVA, V. S., KON'YEV, I.M., BUSALOV, YU. YE., and YERMISHKIN, V.A., Moscow
Fizika i Khimiya Obrabotki Materialov, No 3, May/June 73, pp 116-121

fibers and composite material plotted in actual coordinates, it is possible to predict the nature of the fiber rupture and to determine the local deformation within its rupture zone. The parabolic strengthening coefficient, like the elasticity modulus, obeys the additivity rule for composite materials with a low-hardenable matrix.

2/2

- 9 -

USSR

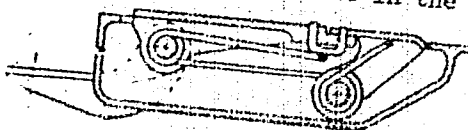
YERMOKHIN, I. G., GAZIYEV, R.

UDC 629.7.023.8

"A Lock for Hatch Covers"

Moscow, Otkrytiya, Izobreneniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 21, Jul 73, Author's Certificate No 380534, Division B, filed 7 Jan 71, published 15 May 73, p 67

Translation: This Author's Certificate introduces a lock for hatch covers which contains two spring-loaded levers mounted on axles: the first lever opens and closes the hatch and is made up of a toggle and clamp, and the second lever holds the first in the closed position. As a distinguishing feature of the patent, operating reliability is improved by enclosing the lock in a housing with a trough-shaped cross section, and making the clamp of the opening and closing lever so that it projects outside the lock housing. A clip catch is located in a hole made in the lever toggle.



1/1

USSR

UDC: 621.372

VARFOLOMEYEV, I. N., ~~YERMOLEYEV, A. A.~~, ROZANOV, M. Ya., STRAUT-MANIS, G. F.

"A Generalized Method of Analyzing Active Microelectronic RC Filters"

Teor. elektrotehnika. Resp. mezhved. nauch.-tekhn. sb. (Theoretical Electrical Engineering. Republic Interdepartmental Scientific and Technical Collection), 1971, vyp. 11, pp 86-93 (from RZh-Radiotekhnika, No 3, Mar 72, Abstract No 3A128)

Translation: The paper shows the necessity of four basic steps in design of microelectronic active RC filters. Particular attention is given to the first stage of design -- analysis. A generalized method is proposed for analyzing microelectronic RC filters in the steady-state mode on the BESM-4 digital computer. Three illustrations, five tables, bibliography of five titles. Resumé.

1/1

- 159 -

Combustion

USSR

UDC 541.126

GOSTINTSEV, YU. A., YERMOLAYEV, B. S., and POKHIL, P. F.

"The Powder: (Solid-Propellant) Engine as a Homogeneous Chemical Reactor"

Moscow, Doklady Akademii Nauk SSSR, Vol 199, No 5, 11 Aug 71, pp 1118-1121

Abstract: Earlier approaches to problems of variable combustion of powder in rocket engines have been based on the assumption that the chemical reactions involved proceed within a narrow zone of high-temperature flame. This would mean that the flame temperature depends upon internal engine pressure as well as upon the temperature gradient in the powder condensation phase. However, in a great many cases (such as in the presence of sharp pressure drop in the chamber) the flame temperature may fall so low that the characteristic chemical reaction time t_{chem} will be of the same order as the gas residence time t_{eng} . For such cases, therefore, any model based on the notion of a narrow flame zone is contrary to reality.

To avoid such errors, the authors derived a series of equations to represent gas state, thermal conductivity in the condensation phase, and thermal balance and pyrolysis products in that phase, as well as some other factors.

t/2

USSR

GOSTINTISEV, YU. A., et al., Doklady Akademii Nauk SSSR, Vol 199, No 5, 11 Aug
71, pp 1118-1121

These equations afford a description of all known states encountered when the ratio t_{chem}/t_{eng} is on the order of 1. Such states would include extinction, steady flameless combustion, auto oscillation in the chemical reactor, and repeated ignition -- all very probably encountered in connection with chamber pressure drop.

2/2

- 23 -

USSR

UDC:536.468

YERMOLAYEV, B. S., KOROTKOV, A. I., FROLOVE, Yu. V., Moscow

"Regularities of Combustion of Condensed, Stratified Systems"

Novosibirsk, Fizika Goreniya i Vzryva, Vol. 6, No. 3, Sep 70, pp. 277-285

Abstract: This work presents an experimental study of the structure of the flame and the regularities of combustion of multilayered systems. The dependence of combustion rate on pressure, layer thickness, type and relationship of components is studied. The results produced are analyzed within the framework of the thermal theory of combustion.

1/1

USSR

UDC 621.373.326:038.8

YERMOYAYEV, E. A., SHELEKHIN, YU. L., VOTINOV, M. P.

"Interaction of a Ruby with Ionizing Radiation"

Tr. Leningr. politekhn. in-ta (Works of the Leningrad Polytechnic Institute),
No 325, 1971, pp 78-80 (from RZh-Radiotekhnika), No 1, 1972, Abstract No ID325)

Translation: A rose ruby (0.05 percent Cr_2O_3 in burden) was irradiated by Co^{60} γ -rays (a dosage of 10^8 roentgens) and thermal neutrons (10^{16} - 10^{17} neutrons/cm²) at room temperature, and single crystals of corundum (and ruby) were irradiated by x-rays (10^4 roentgens) at the liquid nitrogen level. The irradiated crystals acquired an orange tint. Two additional absorption bands with centers at 370 and 460 nm appeared in the optical spectrum, the Cr^{3+} content decreased by 11-18 percent, and the nonuniformity of the intracrystalline field increased by 30-40 percent. It is confirmed that the induced coloring is connected with a change in the valence state of the chromium and the formation of centers of color in the matrix defects. There is 1 illustration and a 7-entry bibliography.

1/1

- 110 -

1/2 019 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--URANIUM HYDRIDE -U-
AUTHOR--YERZOLAYEV, M.I. Y
COUNTRY OF INFO--USSR
SOURCE--ZH. NEORG. KHIM. 1970, 15(3), 607-11
DATE PUBLISHED--70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--CHEMICAL SYNTHESIS, URANIUM COMPOUND, HYDRIDE, HYDROGENATION,
SOLUBILITY, THERMAL DECOMPOSITION
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1994/1873 STEP NO--UR/0078/70/015/003/0607/0611
CIRC ACCESSION NO--AP0115692
UNCLASSIFIED

272 019

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0115692

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

ABSTRACT. UH SUB3 WAS PREPD. BY
HYDROGENATION OF METALLIC U WITH H AT 250DEGREES. UH SUB3 DECOMPS.
456-60DEGREES AND IS SOL. IN H SUB4 P SUB2 O SUB7. PRESENCE OF SOME
METALLIC U IN SAMPLES OF UH SUB3 GAVE ERRANEQUS CONCLUSION THAT THE
HYDRIDE IS A NONSTOICHIOMETRIC COMPD.

UNCLASSIFIED

1/2 008 UNCLASSIFIED PROCESSING DATE--27NOV70
TITLE--SOLUBILITY OF LANTHANUM SULFITE -U-
AUTHOR-(02)-YERMOLAYEV, M.I., KUDRINA, L.T.
COUNTRY OF INFO--USSR
SOURCE--ZH. NEORG. KHIM. 1970, 15(5), 1436-8
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--SOLUBILITY, SULFITE, LANTHANUM COMPOUND, SODIUM NITRATE,
BUFFER SOLUTION
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA4E--3006/1400 STEP NO--UR/0078/70/015/005/1436/1438
CIRC ACCESSION NO--AP0135074
UNCLASSIFIED

2/2 008

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--A0135074

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

ABSTRACT. THE SOLY. OF LA SUB2 (SO SUB3) SUB3.4H SUB2.0 IN NANO SUB3 SOLNS. IN AGO PRIME NEGATIV AND NO SUB3 PRIME NEGATIVE BUFFERS, AND IN THE PRESENCE OF SMALL AND AGE CONCNS. OF NA SUB2 SO SUB3 WERE DETD. AND THE RESULTS ARE PRESENTED GRAPHICALLY. FACILITY: VORONEZH. TEKHNOL. INST., VORONEZH, USSR.

UNCLASSIFIED

USSR

UDC 546.791

YERMOLAYEV, M. I., Voronezh Technical Institute, Voronezh, Ministry of Higher Education USSR

"Nature of Precipitates Formed When Metallic Uranium Is Dissolved in Non-Oxygen Acids"

Moscow, Zhurnal Neorganicheskoy Khimii, Vol 15, No 3, 1970, pp 745-748

Abstract: Dissolving metallic uranium in hydrochloric and also hydrobromic and hydroiodic acids is accompanied by the formation of an insoluble precipitate. This precipitate readily dissolves in anhydrous pyrophosphoric acid, where the dissolution is accompanied by the evolution of hydrogen. When heated in hydrogen atmosphere at constant pressure, the insoluble precipitate breaks down into hydrogen and metallic uranium at 456-460°C, that is, at the same temperature conditions at which uranium hydride decomposes. Consequently, the dissolution of metallic uranium in non-oxygen acids is accompanied by its hydrogenation.

1/1

- 84 -

USSR

UDC 546.791.3

YERMOLAYEV, M. T., Voronezh Technical Institute, Voronezh, Ministry of Higher Education USSR

"Uranium Hydride"

Moscow, Zhurnal Neorganicheskoy Khimii, Vol 15, No 3, 1970, pp 607-611

Abstract: Uranium hydride was prepared by hydrogenation of metallic uranium at 250°C. Freshly prepared uranium hydride instantly self-inflames in air, but if it is placed for 3-5 minutes in an atmosphere of dry carbon dioxide its activity drops off markedly and it can be exposed to air for 10-15 minutes. Uranium hydride is readily soluble in oxyacids, practically insoluble in halogen acids in the absence of air oxygen, and in water slowly hydrolyzes with formation of poorly settling insoluble precipitate. Uranium hydride quantitatively disintegrates in the 456-460°C range. By dissolving the compound in pyrophosphoric acid and thermally decomposing it, it was possible to find metallic uranium, which correspondingly reduced the hydrogen content in the hydride. It was established that uranium hydride corresponds compositionally to the formula UH_3 .

1/1

USSR

YERMOLAYEV, M. M.

UDC 77.528.7

"Application of a Holographic Method of Correlation for the Determination of Parallaxic Shifts on a Stereogram"

Leningrad, Optiko-Mekhanicheskaya Promyshlennost', No 6, Jun 73, pp 17-21

Abstract: It is shown that parallaxic shifts of parcels on stereograms can be measured by means of holographic correlation analysis of the images. Consideration is given to the requirements imposed upon the quality of the optical system of the correlator. Parallaxes are measured on actual aerial photographs 60 x 90 mm in size, and the results are compared with the data of measurements conducted on a stereocomparator. The differences does not exceed ± 6 microns. 3 figures. 1 table. 8 references.

1/1

- 137 -

1/2 017 UNCLASSIFIED PROCESSING DATE--16OCT70
TITLE--DETERMINATION OF THE ACTIVITY OF PHENYLALANINE HYDROXYLASE IN THE
HEPATIC TISSUE -U-
AUTHOR--(05)-POKROVSKIY, A.A., USACHEVA, N.T., MILOVA, G.N., YERMOLAYEV,
M.V., YERMOLOV, A.S.
COUNTRY OF INFO--USSR
SOURCE--BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY, 1970, VOL 69,
NR 5, PP 122-124
DATE PUBLISHED-----70
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--LIVER, ENZYME ACTIVITY, BIOPSY, PHENYLALANINE
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1998/0207 STEP NO--UR/0219/70/069/005/0122/0124
CIRC ACCESSION NO--AP0120905
UNCLASSIFIED

2/2 017

UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0120905

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE AUTHORS HAVE ELABORATED A
MICROMETHOD OF DETERMINING THE ACTIVITY OF PHENYLALANINE,4, HYDROXYLASE
OF THE LIVER WHICH ENABLES TO EVALUATE THE ENZYMATIC ACTIVITY IN SEVERAL
MILLIGRAMS OF TISSUE OBTAINED DURING BIOPSY. THE ENZYMATIC ACTIVITY WAS
DETERMINED IN THE HEPATIC TISSUE OF DIFFERENT ANIMALS, ADULT PERSONS AND
CHILDREN SUFFERING FROM PHENYLPYRUVIC OLIGOPHRENIA. FACILITY:
INSTITUTE OF NUTRITION OF THE ACADEMY OF MEDICAL SCIENCES OF THE USSR,
MOSCOW.

UNCLASSIFIED

1/2 018 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--AUTOMATIC CONTROL OF THE PARAMETERS OF OXYGEN CONVERTER MELTING -U-
AUTHOR--(05)-BEYTELMAN, L.S., BELENKIY, YU.YA., IZHAYLOV, G.A., YERMOLAYEV,
G.A., KULKOV, S.V.
COUNTRY OF INFO--USSR
SOURCE--STAL' 1970, 30(3), 225-8
DATE PUBLISHED-----70
SUBJECT AREAS--MATERIALS, MECH., IND., CIVIL AND MARINE ENGR
TOPIC TAGS--METAL OXYGEN CONVERTER, METAL MELTING, AUTOMATIC CONTROL
SYSTEM, STEEL MANUFACTURE PROCESS
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1996/1993 STEP NO--UR/0133/70/030/003/0225/0228
CIRC ACCESSION NO--AP0118952
UNCLASSIFIED

272 018

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO---AP0118952

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A SCHEME OF AN AUTOMATIC CONTROL IS PRESENTED, IN WHICH ALL MAJOR PARAMETERS OF BLOWING ARE CONTROLLED AS A FUNCTION OF GAS VOL. AND ITS CO SUB2 CONTENT. INDUSTRIAL TRIALS SHOWED THE VELOCITY AND ACCURACY OF THE SYSTEM SUFFICIENT FOR THE PRODUCTION OF THE DESIRED BLOWN METAL.

UNCLASSIFIED

1/2 009 UNCLASSIFIED PROCESSING DATE--16OCT70
TITLE--THE DEVELOPMENT OF PHONiatrics AS ONE OF THE INDICES OF THE
CONSTANTLY RISING LEVEL OF THE PEOPLE'S CULTURAL INHERITANCE -U-
AUTHOR--YERMOlayEV, V.G.
COUNTRY OF INFO--USSR
SOURCE--VESTNIK OTORINOLARIGOLOGII, 1970, NR 3 PP 3-10
DATE PUBLISHED-----70
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES, BEHAVIORAL AND SOCIAL
SCIENCES
TOPIC TAGS--SPEECH, SOCIAL STRUCTURE, CULTURAL RELATION, LINGUISTICS
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAme--1989/1247 STEP NO--UR/0607/70/000/003/0003/0010
CIRC ACCESSION NO--AP0107723
UNCLASSIFIED

2/2 009

UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0107723

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

ABSTRACT. THE SUTHOR DEMONSTRATES THAT BETWEEN THE DEVELOPMENT OF THY NATIONAL CULTURE AND MEDICINE THERE EXISTS A DEFINITE CORRELATION. THE LATTER IS PARTICULARLY NOTICABLE BETWEEN THE DEVELOPMENT OF MEDICINE AND CULTURE, ESPECIALLY WITH REGARD TO SCIENCE. IN RESPECT TO LITERATURE AND ARTS THIS CORRELATION IS LESS MERKED. HOWEVER, THERE ARE SUCH DOMAINS OF MEDICINE WHICH ARE ASSOCIATED WITH ARTS VERY CLOSELY, AND THEIR DEVELOPMENT IS CLOSELY DEPENDENT UPON EACH OTHER. PHONIATRICS, FOR INSTANCE, COULD BE REFERRED TO BRANCHES OF MEDICINE. THE INTERRELATION BETWEEN ARTS, PRIMARILY VOCAL SPEECH AND PHONIATRICS, COULD BE DETERMINED AS A CONNECTION BETWEEN DEMAND AND SUPPLY. THE HIGHER THE LEVEL OF VOCAL SPEECH ARTS, THE GREATER THE REQUIREMENT IN PHONIATRICS. SUCH A RELATION IS ESPECIALLY NOTICABLE IN OUR COUNTRY, WHERE IN ACCORDANCE WITH V. I. LENIN'S INHERITANCE AND DIRECTIONS ARTS BELONGS TO THE PEOPLE. THIS EXPANDS GREATLY THE REQUIREMENT IN PHONIATRIC AID. IN OUR COUNTRY FAVORABLE CONDITIONS ARE CREATED FOR THE SPEEDY DEVELOPMENT OF PHONIATRICS. IN 1970 WHEN ALL PROGRESSIVE MANKIND WITH CELEBRATE THE CENTENARY OF V. I. LENIN'S BIRTH, SHOULD BE THE YEAR OF THE GREAT CHANGE IN RESPECT TO THE MAXIMAL DEVELOPMENT OF PHONIATRICS. PHONIATRICS SHOULD BE A WIDELY ACCEPTED FORM OF MEDICAL AID TO MILLIONS OF PERSONS, INCLUDING CHILDREN AND ADDESCENTS LEARNING TO SING.

UNCLASSIFIED

USSR

UDC 547.1'13

YERMOLAYEV, V. I., SOROKIN, YU. A., GLADYSHEV, YE. N., VYAZANKIN, N. S.,
and RAZUVAYEV, G. A., Institute of Chemistry, Academy of Sciences USSR

"Triethyl(triphenylphosphine- π -cyclopentadienylnickel)germane"

Leningrad, Zhurnal Obshchey Khimii, Vol 41, No 8, Aug 71, p 1878

Abstract: Previously unknown triethyl(triphenylphosphine- π -cyclopentadienylnickel)germane was synthesized by the authors by two new methods:

1. An equimolar mixture of π -C₅H₅ (C₆H₅)₃P NiCl and bis(triethylgermyl)-mercury is allowed to stand in 25 ml benzene for one hour at $\sim 20^\circ$. After separation of the mercury the solvent is boiled down under vacuum. The residue is crystallized twice from hexane at -75° .
2. The same compound is obtained by adding 7.7 g bis(triethylgermyl)-mercury to a solution of 2.9 g nickelocene and 3.9 g triphenylphosphine in 50 ml benzene (molar ratio of reactants 1:1:1) and heating the mixture to 40° (70 hours). The mercury is separated from the mixture and the product isolated, as above.

1/1

USSR

UDC 535.373.3096

YeRMOLAYeV, V. L., KRASHENINNIKOV, A. A. and ShABLYa, A. V.

"The Effect of Temperature on the Luminescence Quenching Constant in Complexes with a Hydrogen Bond"

Leningrad, Optika i Spektroskopiya, Vol 34, No 6, Jun 73, pp 1232 - 1234

Abstract: In Volume 32 of this Journal, page 564, the authors described a process in which first a proton and then an electron are transferred along the hydrogen bond. Processes occurring between the pair of radicals thus formed reduce the complex to the ground state with a radiation loss of electron excitation. It was also shown that the rate of quenching depends on the rates of three sequential processes: complex formation, proton migration, and electron migration. Considering the last two processes, proton migration is seen to be three orders of magnitude slower, to begin with, and further impeded by the small difference in oxidation-reduction properties of the complex units, leading to the conclusion that it is the limiting process. Since tunnelling is the most likely mechanism of proton transport, it is concluded that the effect of temperature on tunnelling probability will be the determining factor.

Experiments were conducted with strong solutions of diphenylimid-pyridine and 2-naphthol-pyridine at 77°K and 4°K. The results were in reasonable agreement with the assumption that the determining factor is the effect of temperature on
1/2

- 90 -

USSR

YARMOLAYEV, V. L., et al., Leningrad, Optika i Spektroskopiya, Vol 34, No 6,
June 73, pp 1232 - 1234

the populations of proton oscillation levels.

2/2

USSR

UDC 535.373.2

SHAKHVERDOV, T. A., YERMOLAYEV, V. L.

"Nonradiative Energy Transfer From Rare Earth Ions to Dyes. II. Liquid Solutions"

Leningrad, Optika i Spektroskopiya, Vol 33, No 5, Nov 72, pp 941-949

Abstract: In their previous paper (Opt. i Spekt., v. 30, p 648, 1971) the authors investigated quenching of luminescence of rare earth ions by dyes in solid solutions at 77°K. It was shown that quenching is due to inductive resonance energy transfer with a critical distance (R_0) corresponding to 500-700 nm. It was also noted that the effectiveness of this type of energy transfer increases considerably in liquid solutions. In this second part of their work, the authors study quenching of luminescence of $Tb(Sal)_3$ and $Tb(NO_3)_3$ ($^5D_4 + ^7F_3$) in methanol by organic dyes at room temperature. Quenching constants (k_q) are determined. It is shown that quenching is due to nonradiative inductive resonance energy transfer from the stimulated Tb^{3+} to these dyes. The values of k_q are compared with the constants calculated by formulas derived by Galanin-Frank, Tunitskiy-Bagdasar'yan, and Rozman in which the influence of diffusion on energy transfer is taken into account.

1/1

UDC: 535.373.2

USSR

YERMOLAYEV, V. I., GRUZDEV, V. P., and TACHIN, V. S.

"The Role of Electrostatic and Covalent Interactions in Energy Transitions in Solutions"

Moscow, Izvestiya AN SSSR -- Seriya Fizicheskaya, vol 36, No 5, 1972, pp 984-987

Abstract: Investigations conducted by the authors for the last few years in the area of radiationless energy transitions in liquid solutions with triple-charged ions of lanthanum have shown that Coulomb interactions strongly affect the velocity constant of energy transition if the donor and acceptor have an uncompensated charge and the covalent interactions occur directly between the donor and acceptor or through the links of the structure. In this article they prove the importance of the Coulomb and covalent interactions in energy transitions from the excited REI₁ to the unexcited REI₂, and from the triplet states of aromatic molecules to the REI, as well as from excited REI to the aromatic molecules, with conversion of the latter to the triplet state. Here, REI represents the rare-earth ion. The authors also find that the radiationless energy transition with the participation of the REI is an effective method for studying coordinate chemical processes in solutions.

UDC 535.373.3

USSR

YERNOLAYEV, V. L., KRASHENINNIKOV, A. A., and SHABLYA, A. V.

"Mechanism of Quenching of Carbazole and Pyrazine Luminescence During Hydrogen Bond Formation"

Leningrad, Optika i Spektroskopiya, Vol 32, No 4, Apr 72, pp 831-833

Abstract: Carbazole, N-methyl carbazole, and pyrazine were the luminescent molecules studied; pyridine, quinoline, and indole, the quenchers. The only combinations used were those in which the fluorescent level of the luminescent molecule was situated below the first singlet excitation level of the quencher molecule. Measurements were made in solid solutions at 77° K. It was found that carbazole luminescence is quenched in the presence of quinoline and pyridine; pyrazine luminescence, in the presence of indole. The quenching magnitude I_0/I is linearly dependent on the quencher concentration. Quenching constants (complexing constants) are obtained from the slope of the I_0/I lines. In the carbazole-quinoline, pyrazine-indole systems no sensitized phosphorescence of the quenchers quinoline and indole was found.

1/2

USSR

YERMOLAYEV, V. I., et al., Optika i Spektroskopiya, Vol 32, No 4, Apr 72, PP 831-833

whereas it takes place for the N-methyl carbazole-quinoline system. This fact, as well as the fact that the concentration quenching curves and complexing constants are the same both for fluorescence and for phosphorescence, indicates that the processes of deactivation of the excitation electronic state as a result of the H bond take place in the singlet excitation state and are not due to intensification of intercombination conversion. It is believed that luminescence quenching in the investigated toluene solutions at 77° K is due to the formation of H-bond complexes. The disappearance of quenching in the transition to N-methyl carbazole and data in the literature confirm this viewpoint. A physical model is suggested to explain luminescence quenching during H-bond formation in a solid solution. Fluorescence quenching in the complex cannot be related to radiationless energy transfer over singlet levels. The most probable process to explain such quenching is electron transfer. The necessity of an H bond for quenching indicates the role of local interactions through an unshared electron pair.

2/2

- 72 -

UDC 535.373.2

USSR

~~YERMOLAYEV, V. L.~~, KAZANSKAYA, N. A., MOSHINSKAYA, A. V.,
KHERUZE, Yu. I.

"Velocity Constants of Intramolecular Energy Transfer in Complex
Ions of Rare-Earth Metals With Aromatic Acids"

Leningrad, Optika i Spektroskopiya, No. 1, 1972, pp 82-85

Abstract: This article is subtitled "II, Effect of Introducing
Insulating Methylene Groups." In the first part of the article,
published in the same journal named above (vol 28, 1970, p 1150),
the authors determined the velocity constants of the intramolecu-
lar energy transfer from the organic part to the rare-earth ion
for a large number of complexes of Tb^{3+} , Eu^{3+} , Sm^{3+} , and Dy^{3+} , with
the derivatives of benzoic acid, and found that the energy trans-
fer was the result of exchange-resonance interactions. The
present, second part of the paper investigates the effect of the
introduction of one or two methylene groups (CH_2) between the
aromatic group and the carboxyl group on the velocity constant of
energy transfer in complex rare-earth ions with aromatic acids.

1/2

USSR

YERMOLAYEV, V. L. et al, Optika i Spektroskopiya, No 1, 1972,
pp 82-85

A table of the measured velocity constants is given for various types of acids and rare-earth complexes, and it is found that an exchange-resonance mechanism is involved here as well.

2/2

- 109 -

USSR

YERMOLAYEV, V. L.; ANIPIENKO, B. M.

"The Role of a Solvent in Radiationless Transfer of Energy between Rare Earth Ions"

Leningrad, Optika i Spektroskopiya; January, 1971; pp 75-80

ABSTRACT: The constants of the rate of radiationless transfer of energy (k_t) from Tb^{3+} ions (donor) to Nd^{3+} , Ho^{3+} , and Eu^{3+} ions (acceptors) in 22 different solvents were determined. It was shown that the changes k_t (approximately two orders of magnitude) are not caused by variations in the viscosity of the solvent but are connected with the chemical properties of its molecules. The following factors contribute to the radiationless transfer of energy: (1) a low donor number and (2) a low dielectric constant of the solvent. The role of the steric factor, not taken into account in the donor number, is not important. A comparison of the dependence of k_t on the concentration of added acetate anions in water and ethyl alcohol was made.

1/1

- 83 -

UDC: 535.370

USSR

SVESHNIKOVA, Ye. V., and YERMOLAYEV, V. I.

"Mechanism of Nonradiative Reactivation of Excited Rare Earth Ions in Solutions"

Leningrad, Optika i Spektroskopiya, Vol 30, No 2, 1971, pp 379-380

Abstract: The authors attempted to determine the extent to which nonradiative deactivation of rare element ions results from inductive-resonance interactions between the excited rare earth ions and the surrounding molecules of the solution. The data presented indicated that inductive-resonance transfer of energy from rare earth ions to oscillations of the solvent makes a significant contribution to the process of nonradiative deactivation of the ions. In their calculations, the authors ignored the quadrupole-dipole interactions, fluctuations of the solvent, and the presence of electron oscillation bands in the spectra of the ions. These simplifications prevent the authors from answering the question as to whether the entire process of nonradiative deactivation of the ions can be explained by inductive-resonance interactions of this type.

1/1

UDC 535.373.2

USSR

KAZANSKAYA, N. A., YERMOLAYEV, V. L., MOSHINSKAYA, A. V., PETROV, A. A., and KHERUZE, YU. I.

"Rate Constants of Intramolecular Energy Transfer in Complexes of Rare Earth Ions With Aromatic Acids"

Leningrad, Optika i Spektroskopiya, Vol 28, No 6, Jun 70, pp 1150-1158

Abstract: The triplet-triplet transfer method was used to determine the rate constants for radiationless energy transfer (k_t) from an organic ligand to rare earth ions in complexes of Tb^{3+} , Eu^{3+} , Sm^{3+} , and Dy^{3+} with benzoic acid and its derivatives in methanol at 293° K. The absorption spectra of the rare earth ions in the complexes and the phosphorescence spectra of complexes with Gd^{3+} were measured, and evaluations were made of the integrals for the overlapping of the spectra for the energy donor by those of the acceptor (rare earth ion). It was found that the introduction of electron-donor substituents increases k_t and

USSR

TRIFONOV, YE. D. (Reviewer), *Elementarnaya Teoriya Kolebatel'noy Struktury Primesnykh Tsentrov Kristallov*, by K. K. Rebane, Moscow, "Nauka" Press, 1968, 232 pp

tween the theory of electron-vibrational transitions and the theory of the Mössbauer effect. A detailed comparison is made of the parameters characterizing the spectra of inorganic and organic phosphor crystals, on the one hand, and the Mössbauer spectrum, on the other. Chapter Four considers deviation from the Condon approximation, allowance for anharmonicity and for variations in elastic constants in electronic transition, the influence of crystal inhomogeneities.

The book contains few errors. However, some additional sections should have been included, such as one on the group-theoretical analysis of luminescence spectra. The book is written with great skill and a clear and detailed style. An English translation is supposed to appear in the near future, published by Plenum Press, New York.

o/e

1/2 022

UNCLASSIFIED

PROCESSING DATE--04DEC70

TITLE--SINGLET TRIPLET ENERGY TRANSFER IN LIQUID SOLUTIONS -U-

AUTHOR--(02)-YERMOLAYEV, V.L., SVESHNIKOVA, YE.B.

COUNTRY OF INFO--USSR

SOURCE--LENINGRAD, OPTIKA I SPEKTROSKOPIYA, VOL. 28, NO 3, MAR 70, PP

601-603

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY, PHYSICS

TOPIC TAGS--FLUORESCENCE, ANTHRACENE, NAPHTHALENE, BENZENE, STILBENE,
ELECTRON ENERGY LEVEL, ELECTRON SINGLET STATE, ELECTRON TRIPLET STATE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--3006/1787

STEP NO--UR/0051/70/028/003/0601/0603

CIRC ACCESSION NO--AP0135352

UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--04DEC70

272 022

CIRC ACCESSION NO--AP0135352
ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. QUENCHING OF THE FLUORESCENCE OF ANTHRACINE DERIVATIVES IN A LIQUID SOLUTION AT 293DEGREEK UPON THE ADDITION OF NAPHTHALENE WAS STUDIED. THE FLUORESCENCE OF 9,10,DIBROMOANTHRACINE WAS MOST STRONGLY QUENCHED BY THE NAPHTHALENE. IT WAS CONCLUDED IN A PREVIOUS STUDY THAT THIS IS CAUSED BY NONRADIATIVE SINGLET TRIPLET TRANSFER OF ENERGY FROM ANTHRACINES TO NAPHTHALENES. FURTHER STUDIES WERE MADE OF QUENCHING AND SHORTENING OF THE FLUORESCENCE DAMPING TIME OF 9,10,DICHLORO, AND 9,10,DIBROMOANTHRACINE IN TOLUENE AT 293DEGREEK BY NAPHTHALENE, FLUORENE, DIPHENYL, AND STILBENE. IT WAS SHOWN THAT THE HIGH CONSTANT OF SINGLET TRIPLET AND TRIPLET SINGLET TRANSFER IN LIQUID SOLUTIONS IS CAUSED BY THE CLOSE INTERACTION OF DONOR AND ACCEPTOR MOLECULES. A DIAGRAM IS GIVEN OF THE ELECTRON LEVELS OF MOLECULES WHICH ILLUSTRATES ENERGY TRANSFER FROM A SINGLET EXCITED LEVEL OF A DONOR MOLECULE TO A TRIPLET LEVEL OF AN ACCEPTOR MOLECULE.

UNCLASSIFIED

USSR

UDC 535.373.4

YERMOLAYEV, V. L.; TACHIN, V. S.

"Quenching Rare Earth Ion Luminescence by Organic Compounds in Liquid Solutions"

Leningrad, Optika i Spektroskopiya, Vol 29, No 1, 1970, pp 93-99

Abstract: Asserting that the quenching of rare earth ion luminescence has barely been studied heretofore, the authors give an account of their researches into quenching of luminescence in liquid solutions of the nitrate salts of Eu^{3+} , and Dy^{3+} in acetone by organic compounds whose triplet level is below or near the luminescence level of the rare earth ion. The glow emitted by Ru^{3+} salts is also quenched by the addition of molecules with low ionization potentials. The authors investigated both quenching effects for the purpose of understanding their mechanism. They also looked into the effect of rare earth ion complex formation in the quenching process. Details of the experiments are given: the reduction in luminescence output and the shortening of the attenuation time as functions of the quencher concentration were measured, the relative intensity of the luminescence output was determined by the Hitachi MPP-2, and the duration of the luminescence was measured with a device using the pulse lamps ISSh-400 and ISSh-100. The first lamp emits flashes of 4 joules of

1/2

USSR

YERMOLAYEV, V. L., et al., Optika i Spektroskopiya, Vol 29, No 1, 1970, pp 93-99

energy with a flash duration of 20 μ s; the second, a strobe lamp, has a flash of 1 μ s duration at a repetition frequency of 100 Hz. The attenuation was recorded with the FEU-27 photomultiplier and either the S1-4 or S1-19 oscillograph. The authors found that the quenching constants obtained varied within the limits of 10^4 and 10^6 M⁻¹ sec⁻¹. Two tables of results are given, one of quenching constants and the other of quenching velocity constants for various quenchers.

2/2

USSR

UDC 535.373.2

ANTIPENKO, B. M. and YERMOLAYEV, V. L.

"Effect of Anion Concentration Variation on Radiationless Energy Transfer Between Rare Earth Ions in Liquid Solutions"

Leningrad, Optika i Spektroskopiya, Vol 29, No 1, 1970, pp 90-92

Abstract: This is the second installment of a series begun by an article in this journal (28, p 931, 1970) in which the authors shows that an increase in the anion concentration of several salts (Cl^- , SO_4^{2-} , NO_3^- , and SCN^-) in a water solution of 293° K leads to a marked growth in the velocity constant of the radiationless energy transfer between the various rare earth ions. In the present paper, the authors find that there is still greater increase in the velocity constant between the rare earth ions with salts of aliphatic carboxylic acids (acetic, formic, and carbonic) present. Their method was to measure the quenching and the shortening of the attenuation time of the luminescence energy donor Tb^{3+} as functions of the ion concentration of the acceptor Nd^{3+} , Eu^{3+} , and Ho^{3+} in the presence of various concentrations of potassium salts of carbonic acid. The luminescence intensity of Tb^{3+} and Eu^{3+} was measured on the MPF-2 spectrofluometer of the Japanese Hitachi firm, and the attenuation

1/2

USSR

ANTIPENKO, B. M., et al., Optika i Spektroskopiya, Vol 29, No 1, 1970, pp 90-92
time was measured with a device consisting of the pulse lamp ISSh-100 and the S1-4 oscillograph. They conclude with the comment that the dependence of the velocity constant on the anion concentration, which they discovered, can be used as a simple and sensitive method for studying the formation of complex rare earth ions in solution.

2/2

Acc. Nr:

AP0045501

Abstracting Service: CHEMICAL ABST.

4-70

Ref. Code:

UR0051

84536b Charge transfer bands in complexes of rare-earth ions with aromatic acids. Ermolaev, V. L.; Kazanskaya, N. A.; Petrov, A. A.; Kheruze, L. L. (USSR). *Opt. Spektrosk.* 1970, 28(1), 208-10 (Russ). The electronic absorption and luminescence spectra of the complexes of rare-earth metal ions (Sm^{2+} , Eu^{3+} , Tb^{3+} , Dy^{3+} , and Yb^{3+}) with benzoic, salicylic (I), 2,4-dihydroxybenzoic (II), 2-methoxybenzoic, phthalic, anthranilic (III), dimethylantranilic, and other aromatic acids were measured in MeOH contg. MeONa at 293°K. The uv spectra of the complexes of Eu with I-III and of Sm with II contained addnl. long-wavelength bands which were not present in analogous Tb complexes. The long-wavelength bands were characterized as charge-transfer bands. Also the formation of a new short-wavelength band in the uv spectra of the complexes was obsd.; however, these bands were not interpreted. Upon excitation in the ligand absorption-band region, the complexes of Sm, Eu, Tb, and Dy with aromatic acids gave an intense luminescence due to an intramol. energy transfer from the triplet energy level of the complex to the resonance level of the respective ion. No luminescence was obsd. with complexes of Eu and Sm. C. Parkanyi

K

LD

7

REEL/FRAME
19780467

1/2 026 UNCLASSIFIED PROCESSING DATE--18SEP70
TITLE--INDEPENDENCE OF THE QUANTUM YIELD OF RARE EARTH LUMINESCENCE FROM
THE WAVELENGTH OF EXCITING LIGHT IN HYDROGEN AND DEUTERIUM CONTAINING
AUTHOR--(02)-YERMOLAYEV, V.L., SVESHVIKOVA, YE.B.

COUNTRY OF INFO--USSR

SOURCE--OPT. SPEKTROSK. 1970, 28(1) 186-9

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY, NUCLEAR SCIENCE AND TECHNOLOGY, PHYSICS

TOPIC TAGS--RARE EARTH METAL, LUMINESCENCE SPECTRUM, ABSORPTION SPECTRUM,
SOLVENT ACTION, DEUTERIUM, WATER, ACETONITRILE, COMPLEX MOLECULE, LIGHT
EXCITATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1984/1910

STEP NO--UR/0051/70/028/001/0186/0189

CIRC ACCESSION NO--AP0100478

UNCLASSIFIED

2/2 026

UNCLASSIFIED

PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0100478

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE LUMINESCENCE AND ABSORPTION SPECTRA OF TRIVALENT RARE EARTH ELEMENTS WERE COMPARED. IN ALL INVESTIGATED SOLVENTS (MECN, ME SUB2 CO, ME SUB2 NCHO, ME SUB2 SO, H SUB2 O, D SUB2 O), THE LUMINESCENCE AND ABSORPTION SPECTRA WERE SUPERIMPOSABLE. ANALOGOUS TO COMPLEX ORG. MOLs., THE RARE EARTH IONS HAVE RADIATIONLESS TRANSITIONS IN H AND D CONTG. SOLVENTS. IN COMPLEX ORG. MOLs. INTRAMOL. INTERACTIONS PLAY A MAJOR ROLE IN THE TRANSITION PROCESSES (ELECTRONIC ENERGY INTO VIBRATIONAL ENERGY) WHEREAS FOR RARE EARTH IONS, INTERACTIONS OF THE VIBRATIONS OF THE SOLVATE SHELL WITH THE RARE EARTH IONS ARE RESPONSIBLE FOR THE ENERGY TRANSFER.

UNCLASSIFIED

UDC 535.34+535.37

USSR

YERMOLAYEV, V. L., KAZANSKAYA, N. A., PETROV, A. A., KHERUZE, Yu. I.

"Charge-Transfer Bands in Complexes of Rare-Earth Ions With Aromatic Acids"

Leningrad, Optika i Spektroskopiya, Vol 28, No 1, Jan 70, pp 208-210

Abstract: The authors studied the electron absorption spectra and luminescence of solutions of complexes of rare-earth ions with aromatic acids (benzoic acid, o-hydroxybenzoic acid, 2,4-dihydroxybenzoic acid, o-methoxybenzoic acid, phthalic acid, anthranilic acid, dimethylantranilic acid) in methanol at 293° K. The absorption spectra of complexes of europium with salicylic, β -resorcylic, and anthranilic acids and samarium with β -resorcylic acid revealed additional long-wave bands which were absent in the same complexes of terbium. The dependence of the position of the new long-wave absorption bands on the reduction potentials of triply charged ions of the rare-earth elements, their width, and intensity indicate that these bands are due to electron charge-transfer transitions from organic ligands to rare-earth ions. The appearance of the charge-transfer bands is accompanied by disappearance of the luminescence of the complexes.

1/2

USSR

YERMOLAYEV, V. L., et al., Optika i Spektroskopiya, Vol 28, No 1, Jan 70,
pp 208-210

The authors thank A. V. Moshinskaya for preparing the rare-earth nitrates
and salicylates.

2/2

USC

UDC 535.373.2

YERMOLAYEV, V. L.; SVESHNIKOVA, Ye. B.

"Non-Dependence of Quantum Yield of Rare Earth Luminescence on Wavelength of Exciting Light in H- and D-Containing Solvents"

Leningrad, Optika i Spektroskopiya, Vol 28, No 1, Jan 70, pp 186-189

Abstract: The article considers the question whether the quantum yield of rare-earth ion luminescence depends on the frequency of the absorbed light in liquid H- and D-containing solvents. The most direct way of solving the question of the pathways of degradation of electron energy is to compare excitation spectra with absorption spectra under the same conditions. This was the method used by the authors, who investigated solutions of nitrates of Sm^{3+} , Eu^{3+} , Tb^{3+} , and Dy^{3+} in acetone, as well as Tb^{3+} in acetonitrile, dimethylformamide, dimethyl sulfoxide, H_2O and D_2O , and Eu^{3+} -tetrakis benzoylacetate with piperidine in ethanol. It was found that for all the studied rare-earth ions, regardless of the force of their interaction with the surroundings, the excitation spectra coincide with the absorption spectra. This indicates that in the studied cases there is no direct radiationless transition from high excited levels to ground level: i. e., there is a cascade transition to the resonance level, from which

1/2

USSR

YERMOLAYEV, V. L., SVESHNIKOVA, Ye. B., Optika i Spektroskopiya, Vol 28, No 1, Jan 70, pp 186-189

there is radiation and degradation of energy. The Vavilov law (non-dependence of quantum luminescence yield on frequency of exciting light) is met for rare-earth ions in H- and D-containing solvents if the interval between excited levels is $\leq 6000 \text{ cm}^{-1}$.

The absorption spectrum measurements of Eu^{3+} -tetrakis benzoylacetate with piperidine was carried out by N. A. Kazanskaya.

2/2

- 71 -

USSR

UDC 575.373.2

4
YERMOLAYEV, V. I. and SVESHNIKOVA, YE. B.

"Singlet-Triplet Energy Transfer in Liquid Solutions"

Leningrad, Optika i Spektroskopiya, Vol. 28, No 3, Mar 70, pp 601-603

Abstract: Quenching of the fluorescence of anthracene derivatives in a liquid solution at 293°K upon the addition of naphthalene was studied. The fluorescence of 9,10-dibromoanthracene was most strongly quenched by the naphthalene. It was concluded in a previous study that this is caused by nonradiative singlet-triplet transfer of energy from anthracenes to naphthalenes. Further studies were made of quenching and shortening of the fluorescence damping time of 9,10-dichloro- and 9,10-dibromoanthracene in toluene at 293°K by naphthalene, fluorene, diphenyl, and stilbene. It was shown that the high constant of singlet-triplet and triplet-singlet transfer in liquid solutions is caused by the close interaction of donor and acceptor molecules. A diagram is given of the electron levels of molecules which illustrates energy transfer from a singlet excited level of a donor molecule to a triplet level of an acceptor molecule.

1/1

1/2 038

UNCLASSIFIED

PROCESSING DATE--02OCT70

TITLE--X RAY SOURCES IN MILITARY RADIO ELECTRONIC EQUIPMENT -U-

AUTHOR--(02)--YERMOLAYEV, YE.A., KOVACH, R.I.

COUNTRY OF INFO--USSR

SOURCE--VOENNO MEDITSINSKII ZHURNAL, FEB. 1970, P 59-62

DATE PUBLISHED-----70

SUBJECT AREAS--ELECTRONICS AND ELECTRICAL ENGR., NUCLEAR SCIENCE AND TECHNOLOGY

TOPIC TAGS--BREMSSTRAHLUNG, X RAY, ELECTRONIC EQUIPMENT, MEASUREMENT, VACUUM TUBE, THYRATRON, KLYSTRON, X RAY EMISSION, SAFETY ENGINEERING, RADIATION PROTECTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRA--1990/2068

STEP NO--UR/0177/70/000/000/0059/0062

CIRC ACCESSION NO--A00110000

UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--02OCT70

2/2 038

CIRC ACCESSION NO--AP0110000

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. REVIEW OF PUBLISHED PAPERS CONCERNING X RAY BREMSSTRAHLUNG IN ELECTRONIC EQUIPMENT USED IN MILITARY INSTALLATIONS. METHODS OF MEASURING THESE EMISSIONS IN VARIOUS VACUUM ELECTRONIC DEVICES ARE DISCUSSED. THYRATRON AND KLYSTRON AMPLIFIERS ARE INDICATED AS ESPECIALLY HAZARDOUS SOURCES OF X RAYS. RADIATION PROTECTION AND SAFETY STANDARDS DURING THE OPERATION OF THESE AND SIMILAR DEVICES ARE ALSO DISCUSSED.

UNCLASSIFIED

USSR

UDC: 621.396.367(047)

YERMOLAYEV, YE. A. and KOVACH, R.I.

"Sources of X-ray Radiation in Military Radio Electronic Apparatus; Review of the Literature"

Moscow, Voenno-Meditsinskiy Zhurnal, No 2, 1970, pp 59-62

Abstract: Military radio electronic apparatus makes extensive use of vacuum and gas-filled electronic devices (kenotrons, thyratrons, oscillator tubes, etc.) based on an intense charged particle flux and high potential differences at the electrodes of hundreds of kilovolts. Retardation of the charged particles at the electrodes gives rise to bremsstrahlung. Hence some electric vacuum devices become sources of X-ray radiation. Thyratrons and klystrons which operate at high anode voltages and marked anode currents are particularly dangerous in this respect. Several ways of protecting personnel against bremsstrahlung are suggested.

1/1

USSR

UDC: 51:330.115

MIKHALEVICH, V. S., YERMOL'YEV, Yu. M.

"On Some Mathematical Problems in Analysis and Synthesis of Complex Systems"

V sb. Nauch. i prakt. probl. bol'shikh sistem. Sekts. Bol'shiye sistemy. Teoriya, metodol. modelir. (Scientific and Technical Problems of Large Systems--collection of works. Large Systems Section. Theory, Methodology, Modeling), Moscow, "Nauka", 1971, pp 158-163 (from RZh-Kibernetika, No 12, Dec 71, Abstract No 12V861)

Translation: The paper deals with problems of using mathematical methods and models for analyzing and synthesizing complex systems. On the basis of the analysis, recommendations are made on the mathematical solution of many problems of practical importance. Authors' abstract.

1/1

USSR.

UDC: 51:330.115

MIKHALEVICH, V. S., YERMOL'YEV, Yu. M.

"On Some Mathematical Problems in Analysis and Synthesis of Complex Systems"

V sb. Nauch. i prakt. probl. bol'shikh sistem. Sekts. Bol'shiye sistemy. Teoriya, metodol. modelir. (Scientific and Technical Problems of Large Systems--collection of works. Large Systems Section. Theory, Methodology, Modeling), Moscow, "Nauka", 1971, pp 158-163 (from RZh-Kibernetika, No 12, Dec 71, Abstract No 12V861)

Translation: The paper deals with problems of using mathematical methods and models for analyzing and synthesizing complex systems. On the basis of the analysis, recommendations are made on the mathematical solution of many problems of practical importance. Authors' abstract.

1/1

USSR

UDC: 621.375.530.145.6

YERMOLAYEV, Yu. M.

"On Calculation of a Photoacoustic Amplifier in the Hydrodynamic Approximation"

Elektron. tekhnika. Nauchno-tekhn. sb. Elektron. SVCh (Electronics Technology. Scientific and Technical Collection. SHF Electronics), 1970, vyp. 3, pp 8-18
(from RZh-Radiotekhnika, No 7, Jul 70, Abstract No 7D190)

Translation: The author calculates the effectiveness of excitation of an elastic wave by a flow of charge carriers in a piezosemiconductor crystal using the method of predetermined current. It is concluded on the basis of the computational results that it is possible to set up a solid-state analog of a photoelectric traveling wave tube -- a photoacoustic amplifier. With respect to its operating principle, this amplifier is a wide-band device. The bandwidth may be greater than an octave: the working frequency may lie in the SHF range. The size of the reception area has no effect on bandwidth. The parameter R_{eq} in the photoacoustic amplifier may be of the same order of magnitude as in a photoelectric traveling-wave vacuum tube (10^5 - $10^6 \Omega$). R_{eq} is directly proportional to the size of the reception area. The photoacoustic amplifier may operate in the near and far infrared spectral regions. Since the efficiency of the amplifier is independent of the mechanism for producing

1/2

YERMOLAYEV, Yu. M., Elektron. tekhnika. Nauchno-tekhn. sb. Elektron. SVCh, 1970,
Vyp. 3, pp 8-10

a variable flux of charge carriers in the crystal, the photocurrent may be pre-
multiplied, and hence a solid-state analog of the photoelectric traveling wave tube
with multiplication may be set up. Seven illustrations, bibliography of six titles.
G. B.

USSR

UDC: 621.396.6-181.5

YERMOLAYEV, Yu. P., SHISHOV, V. V., KUTLIN, N. Kh.

"Combination Possibilities of Frequently Used Modules Based on Unified Hybrid Film Circuits"

Tr. Kazan. aviats. in-ta (Works of the Kazan' Aviation Institute), 1970, vyp. 129, pp 39-45 (from RZh-Radiotekhnika, No 6, Jun 71, Abstract No 6V188)

Translation: The authors consider various modifications for making up modules for substrates of different dimensions with a predetermined number of microcircuits of various types in order to find the relationship between the maximum number of variations of solutions and the number of substrates of different dimensions. N. S.

1/1

- 123 -

USSR

UDC 632.95

ZHARKOV, V. I., STONOV, L. D., and YERMOLAYEVA, A. S.

"Results of a Study of Anti-Wild-Oat Herbicides"

V sb. Khin. sredstva rashchity rast. (Chemical Plant Protectants -- collection of works), vyp 1, Moscow 1970, pp 241-247 (from RZh-Khimiya, No 13, 10 Jul 72, Abstract No 13N530 by T. A. Belyayeva)

Translation: The article describes results of tests of karbin (I), avadex (II), triallate (III), and yalan (IV) an anti-wild-oat herbicides. III and IV in a dose of 1-1.5 kg/ha and 4-6 kg/ha respectively eradicate wild oats and have a favorable effect on wheat and barley yields. III and IV must be incorporated into the soil with a cultivator to a depth of at least 7 cm. I and II eradicate wild oats, but have an adverse effect on wheat and barley. The activity of I declines in drought years.

1/1

USSR

UDC 669.71.046.44

ARLYUK, B. I., KIRILLOVA, T. A., YERMOLAYEVA, E. M., SMIRNOV, N. N., FIRFAROVA, I. B.

"Analysis of the Phase Composition of Aluminate Cakes and Slurry by the Chemical Method"

Tr. Vses. n.-i. i proyekt. in-ta alyumin., magn. i elektrodn. prom-sti (Works of the All-Union Scientific Research and Planning and Design Institute of Aluminum, Magnesium and Electrode Industry), 1970, No 70, pp 43-50 (from RZh-Metallurgiya, No 4, Apr 71, Abstract No 4G126)

Translation: On the basis of investigation of the solubility of compounds contained in the cakes and slurries of alumina production, a procedure is proposed for successive leaching out of them in alkaline and acid solutions for quantitative phase analysis. The correspondence of the analysis results by the given procedure and also the results from x-ray micrography and crystal-optical methods is demonstrated. The basic causes of incompleteness of extraction of the Al_2O_3 and Na_2O from the cakes is the formation of Ca-aluminates and Na-Ca-silicates during the sintering process and also the occurrence of secondary reactions when leaching out the crushed cake leading to the formation of hydrogarnates and tricalcium hydroaluminate. 1 illustration and 5 tables.

1/1

X Extraction and Refining

USSR

UDC 553.411(471.117.25)

SINITSYN, A. V., and YEMOLANINA, L. A., Northwestern Geological Administration

"Gold-Bearing Prospects of the Southeastern Part of the Baltic Shield"

Moscow, Razvedka i Okhrana Nedr, No 5, May 70, pp 1-4

Abstract: A schlich map of the southeastern part of the Baltic Shield shows the gold-bearing capacity of the Quaternary deposits of the region. Several zones and clusters with increased gold-bearing capacity can be distinguished. It is concluded that a vein of quartz-carbonaceous albitites which carry sulfide and auriferous mineralization exists within the borders of the Southwestern Slope of the Windy Belt.

1/1

USSR

UDC: 51

YERMOL'YEVA, L. G.

"Concerning One Method of Solving a Linear Problem of Vector Minimization"

V sb. Mat. metody issled. i optimiz. sistem (Mathematical Methods of Studying and Optimizing Systems--collection of works), Kiev, 1971, pp 10-14 (from RZh-Kibernetika, No 8, Aug 72, Abstract No 8VS11)

Translation: An algorithm is proposed which utilizes a simplex procedure for finding some effective point (Pareto optimum) of the vector function $F(x) = (c_1(x), \dots, c_r(x))$, assuming the constraints

$$\sum_{j=1}^n a_{lj}x_j < b_l, \quad l=1, \dots, m;$$
$$x_j > 0, \quad j=1, \dots, n.$$

The minimizing functions $c_1(x), \dots, c_r(x)$ are assumed to be linear.
M. Kazakova.

1/1

1/2 009 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--VINYL AZO ALKANES AND THEIR REACTION WITH METHYL VINYL KETONE -U-
AUTHOR--(03)--ZELENIN, K.N., MATVEYEVA, Z.M., YERMOLAYEVA, L.YU.
COUNTRY OF INFO--USSR
SOURCE--ZH. ORG. KHIM. 1970, 6(4), 723-7
DATE PUBLISHED--70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--AZO COMPOUND, ALKANE, ALIPHATIC KETONE, CHROMATOGRAPHIC SEPARATION, CONDENSATION REACTION, EPR SPECTRUM
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--2000/1964 STEP NO--UR/0366/70/006/004/0723/0727
CIRC ACCESSION NO--AP0125553
UNCLASSIFIED

272 009

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0125553

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

ABSTRACT. THE CONDENSATION OF H SUB2 C:CHN:NR (R IS ME, ET, PR, OR ISO-PR) WITH H SUB2 C:CHCOME GAVE MIXTS. OF I, (R, SUBSTITUTED), 5, ACETYL, DELTA PRIME2, TETRAHYDROPYRIDAZINE (II) WITH ITS 6, ACETYL ANALOGS (III). THE MIXTS. WERE SEPD. BY GAS CHROMATOG.; I AND II WERE IDENTIFIED BY EPR SPECTROSCOPY. THE RELATIVE AMTS. OF I AND II DEPEND ON R; MORE BULKY R DECREASE THE AMT. OF II IN PRODUCTS.

FACILITY: VOENNO-MED. AKAD. IM. KIROVA, LENINGRAD, USSR.

UNCLASSIFIED

USSR

UDC 541.128.2:547.241

NEYMYSHEVA, A. A., YERMOLAYEVA, M. V., and KNUNYANTS, I. L.

"Nucleophilic Substitution in a Series of Derivatives of Phosphorus Acid.
VII. The Effect of Water Concentration on Acetone in the Rate of Hydrolysis
of Phosphorus Acid Chloride"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 12, Dec 73, pp 2608-2612

Abstract: It was established that during hydrolysis of acid chlorides of dialkylphosphinous, dialkylthiophosphinous, alkylphosphonous, alkylthiophosphonous and dialkylphosphoric acids in aqueous acetone general third-order kinetics are followed: first in respect to the acid chloride and second in respect to water. The reaction order in respect to water is lowered with decreasing number of C-H bonds at the carbon atom in α -position with respect to the phosphorus atom. This is probably due to steric hindrance or to the partial input of the S_N1 mechanism.

1/1

- 43 -

USSR

UDC 541.128.2:547.241

NEYMYSHEVA, A. A., YERMOLAYEVA, M. V., KNUNYANTS, I. L.

"Nucleophilic Substitution in a Series of Phosphorus Acid Derivatives. V. Effect of the Solvent on the Kinetics of Phosphorus Acid Chlorides Alcoholysis. Catalytic Action of Hydrogen Chloride"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 9, Sep 70, pp 2022-2028

Abstract: Study of the kinetics of alcoholysis of the ethyl ester of methylphosphonic acid showed it to be of the overall zero order, HCl catalysing the reaction. It was postulated that the zero order may be the result of three separate processes superimposed: a) reaction of acyl chloride with methanol, b) formation of a complex, and c) reaction of the complex with methanol. It was shown in this study that alcoholysis of the phosphorus acid chlorides in nonpolar solvents -- dioxane, toluene, tetrahydrofuran -- is catalyzed with HCl. Catalytic action of HCl depends on the basicity of the oxygen atom at the phosphoryl group and hence it diminishes in the order: diethylphosphinyl chloride, ethylmethylchlorophosphonate,
1/2

- 76 -

USSR

NEYMYSHEVA, A. A., et al, Zhurnal Obshchey Khimii, Vol. 40, No 9,
Sep 70, pp 2022-2028

S-ethylmethylthiochlorophosphonate, dimethylchlorophosphonate,
phosphorus oxychloride. Alcoholysis of phosphorus thiooxychloride
is practically unaffected by HCl.

2/2

USSR

UDC 547.26'118 + 541.127

NEYMYSHEVA, A. A., YERMOLAYEVA, M. V., and KNUNYANTS, I. L.

"Nucleophilic Substitution in Series of Phosphorus Acid Derivatives.
IV. Kinetics of Hydrolysis of Chlorophosphonates"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 4, Apr 70, pp 798-803

Abstract: As is known, the rate of hydrolysis declines in the transition from dialkylphosphinic acid chlorides to chlorophosphonates. Using the conductometric method, the authors made a detailed kinetic study of the hydrolysis of chlorophosphonates. A comparison of the reactivity of the dialkylphosphinic acid $R(R'CH_2)POCl$ and the chlorophosphonates $R(R'O)POCl$, where R and R' are identical substituents, showed that the decline in the reaction rate is of a regular character. The decline is due to the presence of $p\pi-d\pi$ conjugation of the oxygen atom of the alkoxy group, which can be judged from the spectral characteristics of the substances. The mesomeric influence of the alkoxy group depends on the nature of other substituents at the phosphorus atom.

1/1

- 64 -

UNCLASSIFIED

PROCESSING DATE--JULY 70

TITLE--EFFECT OF PH AND INORGANIC PHOSPHATE OF THE INCUBATION MEDIUM ON
THE DECOMPOSITION OF LYMPHOID CELL DEOXYRIBONUCLEOPROTEINS -U-

AUTHOR--YERMOLAYEVA, N.V.

COUNTRY OF INFO--USSR

Y

SOURCE--BIOKHIAMIYA 1970, 35(1), 17-26

DATE PUBLISHED-----70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--LYMPHOID TISSUE, COBALT ISOTOPE, GAMMA RADIATION, TISSUE
CULTURE, SMALL INTESTINE, THYMUS GLAND, HYDROGEN ION CONCENTRATION, DNA,
PHOSPHATE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAE--1998/0628

STEP NO--UR/0218/70/035/001/0017/0026

CIRC ACCESSION NO--AP0121295

UNCLASSIFIED

025

CIRC ACCESSION NO--A0121295
ABSTRACT/EXTRACT--(U) GP-0-

UNCLASSIFIED

PROCESSING DATE--30OCT70

ABSTRACT. THE LYMPHOID CELLS ISOLATED FROM APPENDIX AND THYMUS OF RABBITS (BODY WT. 2.5-3.0 KG) 15-30 MIN AFTER IRRADN. WITH PRIME60 CO GAMMA RAYS (DOSE 800 K) WERE INCUBATED IN BALANCED SALT SOLN. (CF. J. F. SCAIFE AND H. BROHEE, 1967) AT 37DEGREES. THE PH OF THE SOLN. WAS CHANGED BY ADDN. OF SMALL AMTS. OF 0.1N HCL OR 0.1N NAOH. THE INCUBATION CAUSED A DECOMP. OF DEOXYRIBONUCLEOPROTEINS (DNP) FOLLOWED BY A RELEASE OF DNA, WHICH WAS MORE PRONOUNCED IN THE APPENDIX CELLS AND WAS MAX. AT PH 6.0-6.2. IN THYMOCYTES INCUBATED AT PH 6.0-6.2 THE INITIAL INCREASE OF DNP DECOMP. WAS FOLLOWED BY AN INHIBITION. THE DISINTEGRATION BY OSMOTIC SHOCK PRIOR TO INCUBATION INCREASED THE RATE OF DNP DECOMP. IN APPENDIX CELLS. THE DECREASE OF THE INCUBATION TEMP. TO 0-4DEGREES SUPPRESSED THE DECOMP. ALMOST COMPLETELY. THE ADDN. OF 1.25MM MGSO SUB4 TO CRUDE PREPNS. OF DNP OF THE STUDIED ORGANS INCREASED THEIR DECOMP. AT PH 7.2 AND 8.0, INHIBITED IT AT PH 6.6, AND WAS WITHOUT INFLUENCE AT PH 6.2. THE GBSO. DEPENDENCE OF THE DNP DECOMP. ON PH, TEMP., AND MG PRIME2 POSITIVE INDICATED THAT THE PROCESS INVOLVED CELLULAR ENZYMES, PARTICULARLY ACID AND NEUTRAL DNASES AND AN ENZYMIC FACTOR DESCRIBED EARLIER (N. V. ERMOLAEVA, 1966). THE INCUBATION OF THE CRUDE PREPNS. OF DNP IN THE PRESENCE OF NA SUB2 HPO SUB4 (0.03-0.06M) RELEASED DNA ONLY INSIGNIFICANTLY.

FACILITY: INST. BIOPHYS., MOSCOW, USSR.

UNCLASSIFIED

1/2 024

UNCLASSIFIED

PROCESSING DATE--30OCT70

TITLE--DEPLETION OF THYMUS AND SPLEEN CELLS OF RATS DURING REACTION TO STRESS -U-

AUTHOR--(02)-ZIMIN, YU.I., YERMOLAYEVA, N.V.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, PROBLEMY ENDOKRINOLOGII, NO 1, 1970, PP 96-101

DATE PUBLISHED-----70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--PHYSIOLOGIC STRESS, THYMUS GLAND, SPLEEN, EDEMA, HYPEREMIA, MITOSIS, BONE MARROW

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1998/0817

STEP NO--UR/0502/70/000/001/0096/0101

CIRC ACCESSION NO--AP0121449

UNCLASSIFIED

2/2 024

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0121449

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

ABSTRACT. THREE HOURS' ELECTRICAL STIMULATION OF RATS REDUCED THE NUMBER OF CELLS IN THE THYMUS AND SPLEEN. MORPHOLOGICAL STUDY OF THESE ORGANS 3 AND 6 HOURS AFTER THE START OF STIMULATION REVEALED SLIGHT EDEMA, HYPEREMIA, AND DECREASE IN MITOSIS, WHICH RETURNED TO NORMAL AFTER 9 HOURS, BUT THERE WERE NO INDICATIONS OF AN INCREASE IN THE NUMBER OF DISINTEGRATING CELLS. THE THREE HOUR'S STIMULATION INCREASED THE NUMBER LYMPHOCYTES IN BONE MARROW WHILE DECREASING THE COUNT IN THE THYMUS AND SPLEEN. THE LOSS OF CELLS FROM THE THYMUS AND SPLEEN IS ATTRIBUTED TO THE INHIBITION OF LYMPHOCYTOPOIESIS IN THESE ORGANS AND INTENSIFIED MIGRATION OF THE CELLS FROM THE EXTRAMEDULLARY SOURCES. FACILITY: INSTITUTE OF BIOPHYSICS, MINISTRY OF HEALTH USSR.

UNCLASSIFIED

USSR

UDC 616.438+616.441]-018.1-007.23-02:616.45-001.1/.3

ZIMIN, Yu. I. and YERMOLOVA, N. V., Institute of Biophysics, Ministry of Health USSR

"Depletion of Thymus and Spleen Cells of Rats During Reaction to Stress"

Moscow, Problemy Endokrinologii, No 1, 1970, pp 96-101

Abstract: Three hours' electrical stimulation of rats reduced the number of cells in the thymus and spleen. Morphological study of these organs 3 and 6 hours after the start of stimulation revealed slight edema, hyperemia, and decrease in mitosis, which returned to normal after 9 hours, but there were no indications of an increase in the number of disintegrating cells. The three hours' stimulation increased the number of lymphocytes in bone marrow while decreasing the count in the thymus and spleen. The loss of cells from the thymus and spleen is attributed to the inhibition of lymphocytopoiesis in these organs and intensified migration of the cells from the extramedullary sources.

1/1

- 124 -

UDC 612.821

USSR

YERMOLAYEVA-TOMINA, L. B.

"Evaluating Equilibrium of the Nervous System by the Galvanic Skin Indicator"
Leningrad, Metodiki Otsenki Svoystv Vysshey Nervnoy Deyatel'nosti, "Nauka,"
1971, pp 11-25

Abstract: An evaluation was made of the rate of development of positive and differentiation reflexes and the extinguishing of the orientation reaction and positive reflex using 254 subjects in different series of experiments with variation in the intensity and nature of reinforcement, the stereotype of the stimuli in the experiment, and the forms of recording according to the galvanic skin reflex. It turned out that two indicators -- rate of development of differentiation and the extinguishing of the orientation reflex -- were stable and independent of changes in experimental conditions, that is, they were most reliable in evaluating nerve processes; on the other hand the rate of development of the positive reflex and extinguishing it by failure to reinforce depended completely on the quality of reinforcement. The evaluation of equilibrium, which is a result of the ratio in the rate of formation of positive and inhibitory reflexes, also cannot be sufficiently reliable. Five illustrations, three tables, and 11 bibliographic entries.

1/1

USSR

UDC 615.331(Prodigosanum).015.46

YERMOL'YEVA, Z. V., VAYSBERG, G. YE., TARANENKO, L. A., EYDEL'SHTEYN, S. I.,
Laboratory of Medical Cytology, Chair of Microbiology, and PROKHOROVA, I. I.
Central Institute of Advanced Training of Physicians and Aerosol Laboratory,
All-Union Scientific Research Institute of Antibodies

"Effect of Experimental Inhalation of Prodigiosan Aerosols on Some Indices of
Immunobiological Reactivity"

Moscow, Antibiotiki, No 12, 1971, pp 1076-1081

Abstract: Inhalation of the bacterial polysaccharide prodigiosan (a stimulant of the reticuloendothelial system) resulted in satisfactory absorption of the substance and a pronounced systemic reaction in rabbits. A single inhalation (1 μ g/ml) caused the number of leukocytes in 1 mm of peripheral blood to double within 24 hours and remain at that level for 6 to 8 days. Single inhalation also greatly increased the number of neutrophils and stab cells for several days. Twenty-four hours after inhalation, serum opsonin-phagocytic activity increased almost 3-fold and did not return to the original level until day 10. Intramuscular injection of prodigiosan produced similar blood shifts. Inhalation of prodigiosan (50 to 200 μ g/ml) had no effect on the ciliated epithelium of isolated kitten and puppy tracheas. These results warrant clinical trials of prodigiosan as a prophylactic agent.

1/1