USSR

UDC:620.179.152

SHPAGIN, A. P.

"Spectral Sensitivity of X-Ray Vidicon With Lead Oxide Target"

Defektoskopiya, No. 3, 1970, pp. 92-95

Abstract: The spectral sensitivity of x-ray vidicons is determined completely by the ratio of energy absorbed in the semiconductor layer of the target to the incident energy striking the x-ray vidicon. In this article, the spectral sensitivity of an x-ray vidicon with a target of lead oxide is calculated. The relative spectral sensitivity function of the x-ray vidicon with the lead oxide target has two maxima: one in the 30-50 KeV energy range, resulting from the optimal relationship between absorption of radiation in the end glass and in the semiconductor layer, and another in the 90-100 KeV energy range resulting from the photoeffect on the K-shell of the lead atoms. A certain reduction is to be expected in the natural resolving capacity of the target (ignoring aperture distortions) in the area of the second maximum, since a great portion of the energy is absorbed by the photoeffect on the K-shells of the lead atoms.

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USSR

UDC 621.791.011.001.5:669.721 + 669.5

ANTONOV, YE. G., Engineer, POPOV, A. S., Engineer, YAKUSHIN, B. F., Candidate of Technical Sciences, OSOKINA, T. N., Engineer, NIKOLAYEVA, V. S., Technician, MIKHEYEV, I. M., Engineer, SMIRNOVA, YE. I., Engineer, SHPAGIN, B. V., Engineer, and BABADZHANOVA, I. S., Engineer

"Effect of Rare-earth Elements on the Weldability of Magnesium-Zinc and Magnesium-Zinc-Zirconium Alloys"

Moscow, Svarochnoye Proizvodstvo, No 12, Dec 70, pp 6-8

Abstract: The effect of some rare-earth metals on the weldability of magnesium-zinc and magnesium-zinc-zirconium alloys was studied in experimental melts. Sheets of the alloys, 2 mm thick, were obtained by rolling on a "Duo" laboratory mill from flat ingots cast in metal molds. Before rolling, the ingots were heated to 380-400° C (11 intermediate heats, 2-3 passes). Shrinkage was 15-25 percent. After rolling, the sheets were annealed at 260° C for an hour. The filler wire was made of the same material. The results indicate that rare-earth metals (neodymium,

USSR

ANTONOV, YE. G., et al., Svarochnoye Proizvodstvo, No 12, Dec 70, pp 6-8

lanthanum, mischmetal) at the rate of up to 0.6 percent by weight affect the hot-shortness of the studied alloys in different ways during welding. The most probable reason for this is the varying effect of rare-earth metals on the plasticity of the studied alloys in the region of the lower limit of the brittle temperature range, as well as the varying effect on the magnitude of the latter. The weld cracking resistance of the alloys can be increased by alloy additions of lanthanum and cerium mischmetal and the use of filler wire (2 percent Zn, 0.45 percent Zr, 3.44 percent cerium mischmetal, the rest Mg).

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USSR UDC 621.791.019

ANTONOV, Ye. G., POPOV, A. S., YAKUSHIN, B. F., OSOKINA, T. N., MIKHEYEV, I. M., SMIRNOVA, Ye. I., SHPAGIN, B. V., and NIKOLAYEVA, V. S., Moscow

"Metallurgical Action on Seam Strength in Magnesium Alloy Welding"

Kiev, Avtomaticheskaya Svarka, No 2, Feb 71, pp 53-55

Abstract: The problem considered in this paper is the metallurgical means that can be used to deal with cracks in magnesium alloy welds, specifically magnesium alloyed with zinc, and the efficiency of the means. Melts of the VMD3 series and several magnesium-zinc melts were the subjects of the experimentation; the defect of the first class of alloys is the tendency of its welds to develop heat cracks caused by the change in the lanthanum content. It was assumed in these tests that the introduction of rare earth metals into the alloys would improve their resistance to the formation of cracks since magnesium forms eutectics with these metals. A conclusion reached by the authors is that one cause of cracks forming in the welds that did not contain zirconium is the large crystalline structure of the weld metal, and that the resistance of the weld to cracks could be improved by the addition of 0.55% Zr.
1/1

USSR

UDC 669.725:539.374

IVANOV, V. YE., TIKHINSKIY, G. F., SHPAGIN, I.V., KORNIYENKO, L.A., KHRISTENKO, I.N., and NIKOLAYENKO, A.A., Physicotechnical Institute of the Academy of Sciences USSR

"The Effect of Admixtures on the Cold Brittleness of Beryllium"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 31, No 6, Jun 71, pp 1286-1292

Abstract: The dependence of the transition temperature of beryllium from the brittle into the plastic state on the metal purity is investigated. This dependence is very sharply expressed at low concentrations (~0.05%) of the admixtures. By the replica method and the transmitting electron-microscopy method, the deformation mechanism and the desintegration character of beryllium at temperatures corresponding to the brittle and plastic states was studied. The contribution of turning to deformation and the potential to brittle failure on cleavage elements decrease with increasing purity; further, in the pure metal there appears the possibility of a light slipping on grain boundaries. The strength of beryllium increases with increasing bending test temperature up to the transition temperature from there brittle to the plastic state, which is connected with the decreased tendency of beryllium to brittle failure on cleavage elemtns. Six illustr., one table, 21 biblio. refs.

1/1

USSR

UDC 569.725: 539.292

IVANOV, V. Ye., TIKHINSKIY, G. F., SHPAGIN, I. V., and KHRISTENKO, I. N., Physicotechnical Institute of the Academy of Sciences, Ukrainian SSR

"The Effect of Grain Size on Cold Brittleness of Beryllium"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 31, No 6, Jun 71, pp 1281-1285

Abstract: An investigation was made of the dependence of the brittle-plastic transition temperature (T_b) of high-purity beryllium (99.95%), determined from bending test results, on the grain size d. In the scope of the theory of R.W. Armstrong this dependence is characterized by the equation $T_b = A - B d^{-\frac{1}{2}}$, where A and B are constants. The limiting possibility of lowering T_b for the metal under consideration by a decrease of the grain size is analyzed. The cross-breaking strength and the yield point near T_b change in relation to the grain size in accordance with presented functions. The coefficients of these functions are determined for three types of the metal, the distilled, hot-pressed, and hot-pressed deformed types. On the basis of calculations and the analysis of results, an attempt is made to determine the deformation mechanism and the breakdown c.aracte of p re beryllium. The bending strain of beryllium is brought about principally as a result of realization of the mechanism characterized by high breaking stresses. Three illustr., one table, four formulas, 15 biblio. refs.
1/1

1/2 037 UNCLASSIFIED PROCESSING DATE--11DEC70

TITLE--ELECTRONIC COMPUTERS AND IMAGE IDENTIFICATION -U-

AUTHOR--SHPAK, G.

COUNTRY OF INFO--USSR

SOURCE--GUDOK, SEPTEMBER 20, 1970, P 4, COLS 4-8

DATE PUBLISHED--20SEP70

SUBJECT AREAS--NAVIGATION, ELECTRONICS AND ELECTRICAL ENGR.

TOPIC TAGS--MATHEMATIC PERSONNEL, IMAGE INTENSIFIER, SIGNAL IDENTIFICATION, COMPUTER APPLICATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY FICHE NO----FD70/605011/B04 STEP NO--UR/9002/70/000/009/0004/0004

CIRC ACCESSION NO--AN0140169

UNCLASSIFIED

2/2 037 UNCLASSIFIED

CIRC ACCESSION NO--AN0140169 PROCESSING DATE--11DEC70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ACCORDING TO THE ARTICLE, THE IMAGE IDENTIFICATION RESEARCH IN THE SOVIET UNION IS BEING CONDUCTED BY SEVERAL INSTITUTES. ONE OF THEM IS THE INSTITUTE OF MATHEMATICS OF THE SIBERIAN BRANCH OF THE ACADEMY OF SCIENCES, USSR. THE WORK IS DONE AT ITS LABORATORY HEADED BY DOCTOR OF TECHNICAL SCIENCES NIKOLAY ZAGORUYKO.

UNCLASSIFIED

2 018 UNCLASSIFIED PROCESSING DATE--27NOV70
E--OXIDATION OF TRIVALENT CHROMIUM -U-

AUTHOR-(05)-YAKOBI, V.A., BOCHKAREVA, T.P., KOZOREZ, L.A., GNUSOVA, L.L., SHPAK, L.P.

COUNTRY OF INFO--USSR

SOURCE--U.S.S.R. 262,106

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

DATE PUBLISHED--26JAN70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--METAL OXIDATION, CHROMIUM, CHEMICAL PATENT, OZONE

CONTROL MARKING--NO RESTRICTIONS

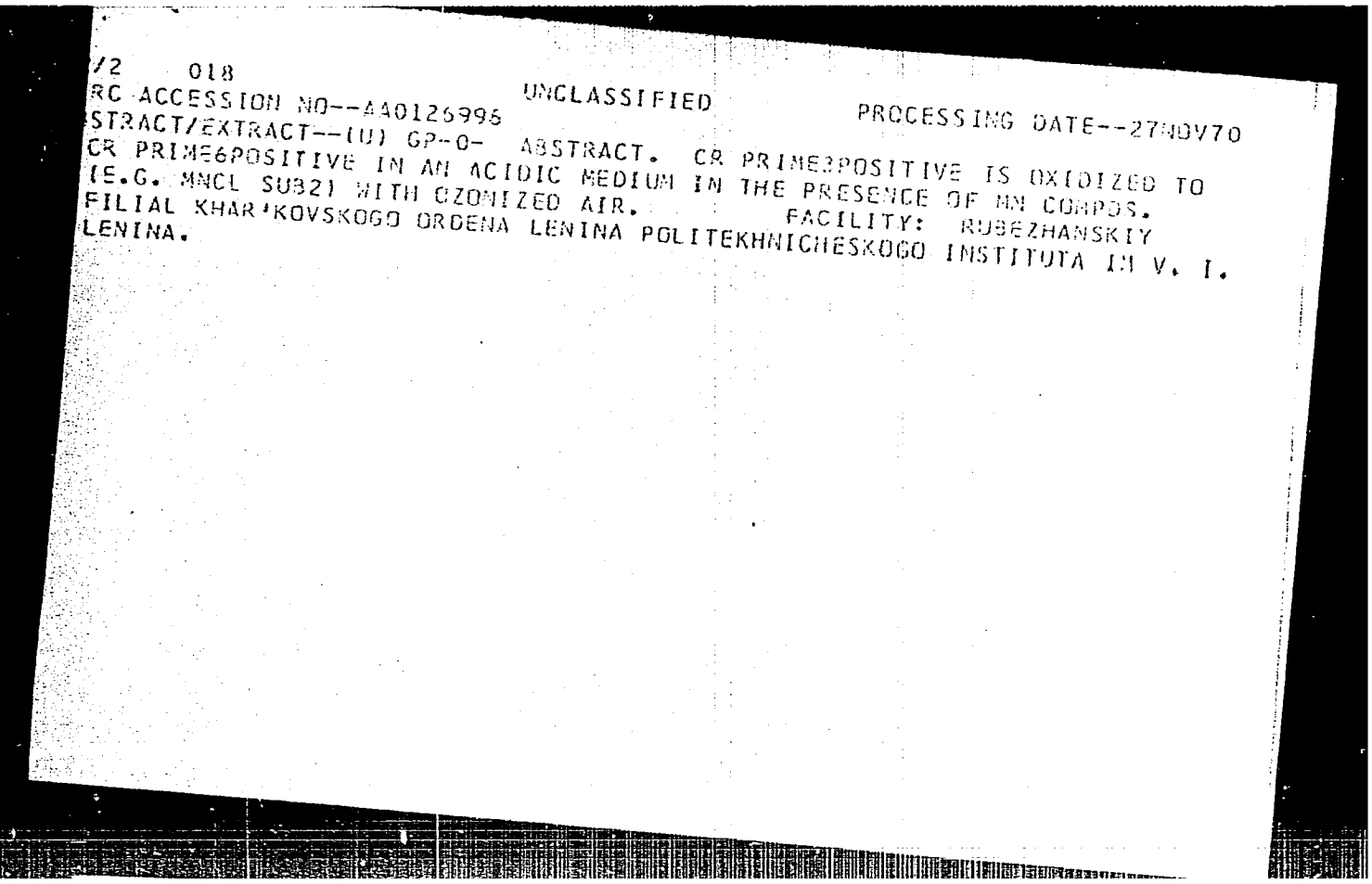
DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3001/1465 STEP NO--UR/0482/70/000/000/0000/0000

AIRC ACCESSION NO--AA0126996

UNCLASSIFIED

Shpak, L.P. S



/2 018 UNCLASSIFIED
RC ACCESSION NO--AA0126996 PROCESSING DATE--27NOV70
STRACT/EXTRACT--(U) GP-0- ABSTRACT. CR PRIME3POSITIVE IS OXIDIZED TO
CR PRIME6POSITIVE IN AN ACIDIC MEDIUM IN THE PRESENCE OF MN COMPDS.
(E.G. MNCL SUB2) WITH OZONIZED AIR. FACILITY: RUBEZHANSKIY
FILIAL KHAR'KOVSKOGO ORDENA LENINA POLITEKHNICHESKOGO INSTITUTA IM V. I.
LENINA.

USSR

UDC 535.44:621.378

BELOKRINITSKIY, N. S., GNATOVSKIY, A. V., DANILEYKO, N. V., ZAKHAROV, V. P., and SHPAK, M. T.

"Holographic Recording of Information on Amorphous Semiconductor Films"

Leningrad, Doklady Akademii Nauk SSSR, Vol 209, No 2, 1973, pp 330-332

Abstract: This paper is a report on the application of local variations in the structural and optical characteristics of InSb, InSe, InTe, GaTe, GeTe, and Te for holographic information recording. In an earlier paper (N. S. Belokrinitskiy, et al, Pis'ma v ZhETF, 15, No 4, 1972, p 198) it was found that in GeTe films under strong light pulses a growth of crystallites was observed, accompanied by changes in the physical and optical characteristics of the compound. Similar characteristics, including the transmission and absorption spectra, were explored in the present paper for the compounds listed above. The equipment used for the holographic recording is shown in schematic form. Records of objects measuring 2X2 mm^2 to 15X15 mm^2 were made by illuminating them directly with neodymium and ruby lasers. Samples of the images obtained are shown. The authors thank V. N. Pavlyuk for running the experiment.

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USSR

UDC 541.14+535.34-15+535.373

MEL'NIK, V. I., PUCHKOVSKAYA, G. A., KHARCHENKO, N. P., and SHPAK, M. T.

"Peculiarities of IR Absorption and Phosphorescence of Products of Benzophenone Photochemical Reactions"

Leningrad, Optika i Spektroskopiya, Vol 34, No 1, Jan 73, pp 101-105

Abstract: The authors isolated in pure form the products of the benzophenone-benzpinacone photochemical reaction, studied their IR absorption and phosphorescence spectra, and compared the results with benzophenone data. The effect of low temperatures and solution concentrations on photochemical reaction efficiency was studied. There was found to be considerable weakening of the photochemical transformations of benzophenone at low temperatures.

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USSR

UDC: 535.373.3

ASLANIDI, Ye. B., TIKHONOV, Ye. A., and SHPAK, M. T.

"The Quenching Mechanism of Fluorescent Organic Dye Solutions in Two-Photon Excitation"

Leningrad, Optika i Spektroskopiya, December 1972, pp 1105-1108

Abstract: A description is given or experiments to determine the mechanism of fluorescence quenching in organic dye solutions under two-photon excitation from a ruby laser. Three dyes of the xanthene group were used in the experiments; their solutions have a quantum fluorescence output of approximately unity, and the spectral position of their maximum long-wave absorption band corresponds approximately to resonance for two-photon absorption of a neodymium laser radiation. Curves plotted for the intensity of the fluorescence as a function of change in excitation power are found to deviate from the square law, and seven causes are listed and explained for this deviation. The diagram of the experimental setup is reproduced along with a textual explanation. It was found that the radiation intensity of the solution is strengthened at the fundamental frequency, thus confirming the presence of a phenomenon of forced emission at this frequency.

USSR

UDC 535.370 : 548.0

LISOVENKO, V. A., and SHPAK, M. T.

"Fluorescence of Anthracene Single Crystals Whose Surface is Disturbed by an Impurity"

Leningrad, Optika i Spektroskopiya, Vol 32, No 4, Apr 72, pp 735-739

Abstract: The article describes results of a study of the fluorescence and absorption spectra of anthracene single crystals on whose surface impurities (particularly carbazole) are sputtered. When carbazole is applied to the surface of an anthracene single crystal, there is a significant change in the fluorescence spectrum of the anthracene crystal; along with exciton fluorescence of crystalline anthracene, a new broad-band spectrum appears, shifted to the long-wave region from the start of the exciton fluorescence. The more carbazole sputtered on the anthracene, the greater the intensity of the new luminescence. The intensity of the exciton fluorescence diminishes. A saturation effect is observed. Additional structureless absorption is observed from the long-wave side in the absorption spectrum of the anthracene crystals

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USSR

LISOVENKO, V. A., and SHPAK, M. T., Optika i Spektroskopiya, Vol 32, No 4, Apr 72, pp 735-739

with sputtered carbazole as compared to the absorption spectrum of unsputtered crystals. The bands of the new luminescence are almost completely depolarized. The pure electronic band of exciton fluorescence of the anthracene crystal is also depolarized in this case. Similar results were obtained by applying naphthalene and diphenylene oxide to the surface of anthracene crystals.

A comparison of theoretical predictions and the above experimental results indicates that the long-wave luminescence is the result of the split-off of local levels from the exciton band. Experiments show that the implantation of carbazole molecules in the anthracene lattice does not lead to the formation of local states below the exciton band. During solidification of the anthracene-carbazole mixture, part of the carbazole forms a solid solution with the anthracene, while the rest is eliminated on the surface of the

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USSR

LISOVENKO, V. A., and SHPAK, M. T., Optika i Spektroskopiya, Vol 32, No 4, Apr 72, pp 735-739

microblocks, microcrystals of anthracene. The latter portion of the carbazole is responsible for the broad-band spectrum.

The authors thank N. I. OSTAPENKO for useful discussion of the results.

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USSR

UDC: 535.373.2

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

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

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

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

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USSR

UDC: 535.373.2

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

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

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USSR

BELOKRINITSKIY, N. S., GNATOVSKIY, A. V., DANILEYKO, M. V., ZAKHAROV, V. P., KOZLOV, A. V., and SHPAK, M. T., Physics Institute, Academy of Sciences Ukrainian SSR

"Recording of Optical Information on Amorphous Films of Semiconducting Compounds"

Moscow, Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 15, No 4, 20 Feb 72, pp 198-200

Abstract: The article describes a new optical information method based on local variations in structural and optical characteristics of some semiconducting compounds under the action of laser radiation. This opens up the possibility of creating carriers with a high recording speed (10^{-4}-10^{-5} sec) and high spatial resolution without the need for subsequent processing. Amorphous GeTe and InSb films, vacuum-evaporated on glass and NaCl substrates, were used by the authors as carriers for optical signal recording. Laser radiation by a semitransparent mirror was separated into two beams approximately equal in intensity and directed at the sample at a convergence angle of ~55° for GeTe

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BELOKRINITSKIY, N. S., et al., Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 15, No 4, 20 Feb 72, pp 198-200

and ~ 250 for InSb. The interference hologram grating of the radiation field was recorded on the film. Samples were exposed to radiation pulses of a free-running ruby (λ = 0.69 micron) and neodymium (λ = 1.06 microns) laser. Given a sufficiently homogeneous laser field amplitude distribution, interference gratings with a spatial frequency of up to 1000 lines/mm were obtained, representing alternating segments with different spectral and structural properties. There was found to be a relation between the sample preparation conditions and the maximum attainable spatial frequency. There are optimal radiation energies for the pulse-mode recording of gratings (e.g., ~ 0.1 J/sq mm for recording on CdTe films with pulsed neodymium laser radiation ~ 500 microseconds in duration). The authors observed two forms of film structural changes accompanying the information recording, depending on the density of the recorded grating. In the recording of gratings with a spatial frequency of ~ 100-200 lines/mm, the lines represent bands of polycrystalline material, films in an amorphous state divided in segments. In the recording of gratings with a spatial frequency of

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USSR

PEIOKRINITSKIY, N. S., et al., Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 15, No 4, 20 Feb 72, pp 198-200

~1000 lines/mm, grain enlargement is observed over the entire area of the film exposed being irradiated with luminous radiation, but the optical density of the interference grating lines differs, making it possible to obtain a grating with sufficient efficiency in this case as well.

Work is continuing on the further kinetic study of the amorphous state-polymerization [illegible] tion of the above-indicated materials and a number of others, as well as study of their use as carriers for recording information [illegible] region of the spectrum.

The authors thank V. S. SAMOYLOV for useful discussions of the results.

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USSR

SHPAK, M. T., Corresponding Member of the Academy of Sciences Ukrainian SSR, and TIKHONOV, YE. O., Candidate of Physicomathematical Sciences

"The Study of Nonlinear Phenomena in Organic Dye Solutions and Their Use for the Creation of Highly Efficient Frequency-Tunable Lasers"

Kiev, Visnyk Akademii Nauk Ukrains'koi RSR, No 11, Nov. 71, pp 9-18

Abstract: Studies on the physics of organic dye solution lasers were begun at the Institute of Physics, Academy of Sciences Ukrainian SSR, in 1966, based on the use of passive dye-solution Q-switches. The work has been done in conjunction with the Institute of Organic Chemistry, Academy of Sciences Ukrainian SSR, which has supplied various types of cyanine dyes for experiments. The principal results of these studies are as follows:

A theoretical and experimental study was made of the mechanism for light intensification and generation by solutions of complex organic molecules, and optimal conditions were found for development of the generation

USSR

SHPAK, M. T., and TIKHONOV, YE. O., Visnyk Akademii Nauk Ukrains'koi RSR, No 11, Nov 71, pp 9-18

process on singlet-singlet electron-vibrational transitions of these molecules. A number of resonance-induced nonlinear effects in organic dye solutions were found and studied for the first time; viz., superluminescence, resonance induction of Rayleigh scattering and Raman effect, the effect of a solution with intensive Raman effect bands on the generation process and spectrum. Highly effective organic dyes were found which permit fine-frequency-tuning generation in the visible and near infrared wavelength range by varying the composition of the active molecules and their concentration in solutions and by the use of selective cavity elements. Recently the authors have been studying the possibility of employing complex organic compounds in the crystal phase for the second-harmonic generation of ruby and neodymium lasers. An intensive harmonic is found to be generated by triphenylmethane, diphenylmethane, anthraquinone, and some cyanine dyes.

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USSR

UDC: 621.373:530.145.6

BELOKRINITSKIY, N. S., ZUBRILIN, N. G., SHPAK, M. T.

"Investigation of the Transfer of Excitation Energy Between Impurity Centers in Neodymium Under Forced Emission Conditions"

V sb. Peredacha energii v kondensirovan. sredakh (Energy Transmission in Condensed Media--collection of works), Yerevan, 1970, pp 73-82 (from RZh-Radiotekhnika, No 5, May 71, Abstract No 5D228)

Translation: The authors studied the spectral composition of forced emission of trivalent neodymium cation on the transition $^4F_{3/2} \rightarrow {}^4I_{11/2}$ in phosphate glasses and inorganic liquid $POCl_3$-$SnCl_4$ as a function of the shape of the curve for effective laser amplification for the case of dispersion cavities based on Fabry-Perot interferometers. When the cavity is tuned to a region close to the maximum of the luminescence band, a frequency shift was observed in the minimum of curves for the frequency dependence of threshold pumping energy, as well as a flattening of the peak in the vicinity of the minimum, leading to broad-band emission (~100 cm^{-1} for triple the pumping energy above the threshold value). As the tuning frequency moves away from the luminescence maximum toward longer waves, two extrema may be produced. In the short-wave arm of the luminescence band, there is no retuning of the working frequency or broadening of the forced emission spectrum. The nature

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BELOKRINITSKIY, N. S., et al., Peredacha energii v kondensirovan. sredakh, Yerevan, 1970, pp 73-82

of broadening of the transition $^4F_{3/2} \rightarrow {}^4I_{11/2}$ and the way in which the spatial nonhomogeneity of the field of modes generated and the transfer of excitation energy affect the spectral composition of forced emission are analyzed. It is assumed that in the media under study, exchange of excitation energy between optical centers takes place over time intervals no shorter than the times which are typical for peak emission ($\sim 10^{-6}$ s). A. K.

2/2

1/2 043 UNCLASSIFIED

TITLE--SUPERLUMINESCENT EMISSION OF LIGHT FROM ORGANIC DYE SOLUTIONS -U-

PROCESSING DATE--27NOV70

AUTHOR-(02)-TIKHONOV, YE.A., SHPAK, M.T.

COUNTRY OF INFO--USSR

SOURCE--UKR. FIZ. ZH. (RUSS. ED.) 1970, 15(2), 344-7

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS, PHYSICS

TOPIC TAGS--DYE, LUMINESCENCE, RUBY LASER, LASER RADIATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/2203

STEP NO--UR/0185/70/015/002/0344/0347

CIRC ACCESSION NO--AP0125783

UNCLASSIFIED

2/2 043 UNCLASSIFIED PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0125783

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EMISSION PROPERTIES OF 10 PRIME NEGATIVE5 M SOLNS. OF 1,1PRIME, DIMETHYLINDOLETRICARBOCYANINE IODIDE IN GLYCEROL AT 300DEGREESK WAS STUDIED. EXCITATION WAS EFFECTED WITH A PULSED RUBY LASER POLARIZED LINEARLY. THE RELATION BETWEEN THE EXCITATION SPECTRA AND THE EMISSION SPECTRA IS DISCUSSED. COHERENCE OF THE EMISSION WAS DETD. BY YOUNG'S METHOD.

FACILITY: INST. FIZ., KIEV, USSR.

UNCLASSIFIED

1/2 026 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--LOCAL EXCITON STATES IN A NAPHTHALENE CRYSTAL CONTAINING IMPURITIES -U-

AUTHOR-(02)-OSTAPENKO, N.I., SHPAK, M.T.

COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK SSSR, SER. FIZ. 1970, 34(3), 552-6

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY, PHYSICS

TOPIC TAGS--EXCITON, ABSORPTION SPECTRUM, LUMINESCENCE SPECTRUM, NAPHTHALENE, SINGLE CRYSTAL, INDOLE, FURAN, SULFUR, CHEMICAL PURITY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/2022 STEP NO--UR/0048/70/034/003/0552/0556

CIRC ACCESSION NO--AP0125610

UNCLASSIFIED

2/2 026 UNCLASSIFIED

CIRC ACCESSION NO--AP0125610 PROCESSING DATE--30OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ABSORPTION AND LUMINESCENCE SPECTRA IN POLARIZED LIGHT WERE STUDED OF NAPHTHALENE SINGLE CRYSTALS CONTG. INDOLE, THIANAPHTHENE, OR BENZOFURAN, AT 4.2, 20.4, AND 77DEGREESK. EXCITON SERIES IN THE SPECTRA ARE DISCUSSED, I. E. THEIR VARIATION WITH TEMP. AND IMPURITY CONCN. (SMALLER THAN OR EQUAL TO 10PERCENT). FACILITY: INST. FIZ., KIEV, USSR.

UNCLASSIFIED

UNCLASSIFIED

TITLE--LUMINESCENCE OF PHENANTHRENE WITH AN ANTHRACENE IMPURITY ADSORBED ON NAY ZEOLITE -U-

PROCESSING DATE--17JUL70

AUTHOR--DENISENKO, G.I., LISOVENKO, V.A., SHPAK, M.T.

COUNTRY OF INFO--USSR

SOURCE--ZH. PRIKL. SPEKTROSK. 1970, 12(1), 108-12

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--LUMINESCENCE, ANTHRACENE, ZECLITE, ADSORPTION, HEPTANE, CHEMICAL SEPARATION, PHENANTHRENE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1984/1323

STEP NO--UR/0368/70/012/001/0108/0112

CIRC ACCESSION NO--AP0055994

UNCLASSIFIED

Acc. Nr: AP0055994

Abstracting Service: CHEMICAL ABST. 6-70

Ref. Code: GR 0365

116417g Luminescence of phenanthrene with an anthracene impurity adsorbed on NaY zeolite. Denisenko, G. I.; Lisovenko, V. A.; Shpak, M. T. (USSR). *Zh. Prikl. Spektrosk.* 1970, 12(1), 108–12 (Russ). Fluorescence and phosphorescence spectra were recorded at 77°K. The samples were prepd. as described (G. I. Denisenko, 1968). The initial concn. of phenanthroline, contg. traces of anthracene in heptane and in zeolite was 10^{-4} and 10^{-2}–10^{-3} g/cm³. Changes of the spectra on evacuation, exposure to air, and washing with heptane indicate that on exposure to air, the hydrocarbons are forced on the zeolite surface where they form aggregates similar to mixed crystals. This phenomenon can be used to remove traces of anthracene from phenanthrene. V. Zitko

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REEL/FRAME
19841323

USSR

UDC 535.33

YERMAKOVA, YE. G.; KRASNOVA, T. L., MALYKHINA, N. N., KOSIN, A. M., ONOPRIYENKO, M. I., CHERNYSHEV, YE. A., and SHPAK, M. T., Institute of Physics, Academy of Sciences Ukrainian SSR, Kiev

"Electron-Vibrational Absorption Spectra in the Near UV of Phenylsilane and Methylphenylsilanes"

Kiev, Ukrainskiy Fizicheskiy Zhurnal, Vol 17, No 5, May 72, pp 811-817

Abstract: The article describes results of a study of electronic vapor and crystal absorption spectra for phenylsilane $C_6H_5SiH_3$ and methylphenylsilanes $C_6H_5SiH_2CH_3$, $C_6H_5SiH(CH_3)_2$, $C_6H_5Si(CH_3)_3$, as well as a comparison of the effect of the silicon atom on the aromatic ring with the effect of carbon in hydrocarbon molecules similar in structure. It was found that replacement of the carbon atom by silicon in the molecules investigated results in a 300-360 cm^{-1} increase in the spectrum shift to the long-wavelength region and intensification of the transition considered. This indicates great distortion of the hexagonal symmetry of the pi cloud of the phenyl ring in organosilicon

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USSR

YERMAKOVA, YE. G., et al., Ukrainskiy Fizicheskiy Zhurnal, Vol 17, No 5, May 72, pp 811-817

molecules as compared to the analogous hydrocarbon molecules. The spectral data suggest that there is hyperconjugation between the Si-H bonds and the phenyl ring. Electronic excitation is found to have a greater effect on the silyl group than on the alkyl group, possibly due to the $(p - d)_{\pi}$-interaction between silicon and the pi electrons of the aromatic ring.

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USSR

GANDEL'MAN, I. L. SAPA, V. T., TEKHONOV, YE. A., and SHPAK, M. T.

UDC 621.373.826

"Transient Generation of Organic Dye Solutions During Picosecond Optical Pumping"

V sb. Nelineyn. protsessy v optike (Nonlinear Processes in Optics -- collection of works), Vyp.2, Novosibirsk, 1972, pp 70-74 (from RZh-Radiotekhnika, No 11, Nov 72, Abstract No 11 D148)

Translation: None.

1/1

USSR

UDC 539.194

BABKOV, L. M. KOVNER, M. A., MEL'NIK, V. I., PUChKOVSKAYa, G. A., KhARChENKO, N. P., and ShPAK, N. T.

"Vibration, Luminescence, and Absorption Spectra of Benzophenone and Their Interpretation"

Leningrad, Optika i Spektroskopiya, Vol 35, No 1, Jul 73, pp 58 - 64

Abstract: Benzophenone has a number of properties that are presently of interest: significant piezoelectric effect, 100% conversion from the excited singlet level to the triplet state, high photochemical activity in hydrogen-containing solvents, and effective transfer of excitation energy. The majority of these effects are due to the characteristics of the electron structure of the benzophenone molecule.

In this study, infra-red spectra and luminescence and absorption spectra of benzophenone are obtained and their oscillatory structure is resolved. The problem of normal molecular oscillations of benzophenone in the ground electron state is solved. On the basis of a calculation of the frequencies and shapes of oscillations the frequencies are related to types of symmetry of the C_2 group and to oscillations of bonds and angles. The changes in the oscillatory frequencies with excitation to the singlet and triplet electron states are determined and an interpretation of the vibron transitions is suggested.

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USSR

Hematology

SHPAK, R. S., Kiev Institute of Advanced Training for Physicians, Kiev

UDC 615.384

"Classification and Use of Blood-Extender Solutions"

Kiev, Farmatsevtichniy Zhurnal, Vol 27, No 3, May/Jun 72, pp 25-29

Abstract: On the basis of data given in the literature, the properties of blood-extender solutions are reviewed. The composition of a great number of salt solutions, solutions containing components derived from human blood, solutions containing colloids foreign to the organism, and combined solutions that are used or have been proposed for use as blood extenders is given. It is stated that A. A. Rabskiy and A. G. Sonnovskiy (Vestnik Khirurgii, 52, 16, 1937) developed a method for the preparations from sea water of solution AM-4 (NaCl 9, KCl 0.2, $CaCl_2$ 0.2, $NaHCO_3$ 1, $MgCl_2$ 0.1, NaH_2PO_4 0.05, glucose 1 g) for this purpose. At the 12th International Congress of Blood Transfusion held at Moscow in Aug 1969, a functional classification of blood-extender solutions was proposed which subdivides them into antishock solutions, solutions for detoxification, and solutions for parenteral nutrition. The particles in antishock solutions, which should circulate in the blood for 1-3 days, must have a molecular weight of 60,000-70,000, while those in solutions for detoxification, which should be eliminated from the blood within 24 hrs, must have a

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USSR

SHPAK, R. S., Farmatsevtichniy Zhurnal, Vol 27, No 3, May/Jun 72, pp 25-29

molecular weight of 10,000-20,000. At the Kiev Institute for the Advanced Training for Physicians, procedures have been developed for the preparation of stable concentrated plasma substitutes packaged in ampules. This includes Ringer solution, Ringer solution with glucose, Ringer solution with novocain, Ringer solution with ascorbic acid, and Ringer-lactate solution. On the basis of the research that has been conducted, industrial production of the solutions mentioned can be organized. At present only the pharmacies of the Ukrainian SSR prepare these solutions in an amount exceeding 200 tons per year.

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USSR

UDC 615.451.014.45

SHPAK, R. S., Kiev Institute for the Advanced Training of Physicians, Kiev

"Effect of the Conditions of Sterilization on the Stability of Concentrated Blood Plasma Extender Solutions in Ampules"

Kiev, Farmatsevtichniy Zhurnal, Vol 26, No 6, Nov/Dec 71, pp 37-40

Abstract: The effects of sterilization at 119-121°C with steam under pressure on the properties of concentrated blood plasma extender solutions were studied. Ringer's solution (18.0 g NaCl/ml), Ringer's solution with glucose (18.0 g NaCl/ml), Ringer's solution with novocain (9.0 g NaCl/ml), and Ringer's solution with Na Lactate (9.0 g NaCl/ml) were subjected to the action of steam under pressure at 119-121°C for 5, 7, 10, 15, and 20 min. The sterility of the solutions that had been treated was determined according to procedures of the USSR Pharmacopoeia for the testing of blood extenders. The pH, the content of physiologically active substances in these solutions, and the concentration of products of decomposition of these substances in the solutions were also determined. The results showed that sterilization under these conditions (autoclaving) of Ringer's solution for 5 min, Ringer's solution with glucose of 10 min, Ringer's solution with novocain for 7 min, and Ringer's 1/2

USSR

SHPAK, R. S., Farmatsevtichniy Zhurnal, Vol 26, No 6, Nov/Dec 71 pp 37-40

solution with lactate for 5 min did not change significantly the physico-chemical and physiological properties of the solutions. The concentrated Ringer's solution was sterile after autoclaving for 5 min.

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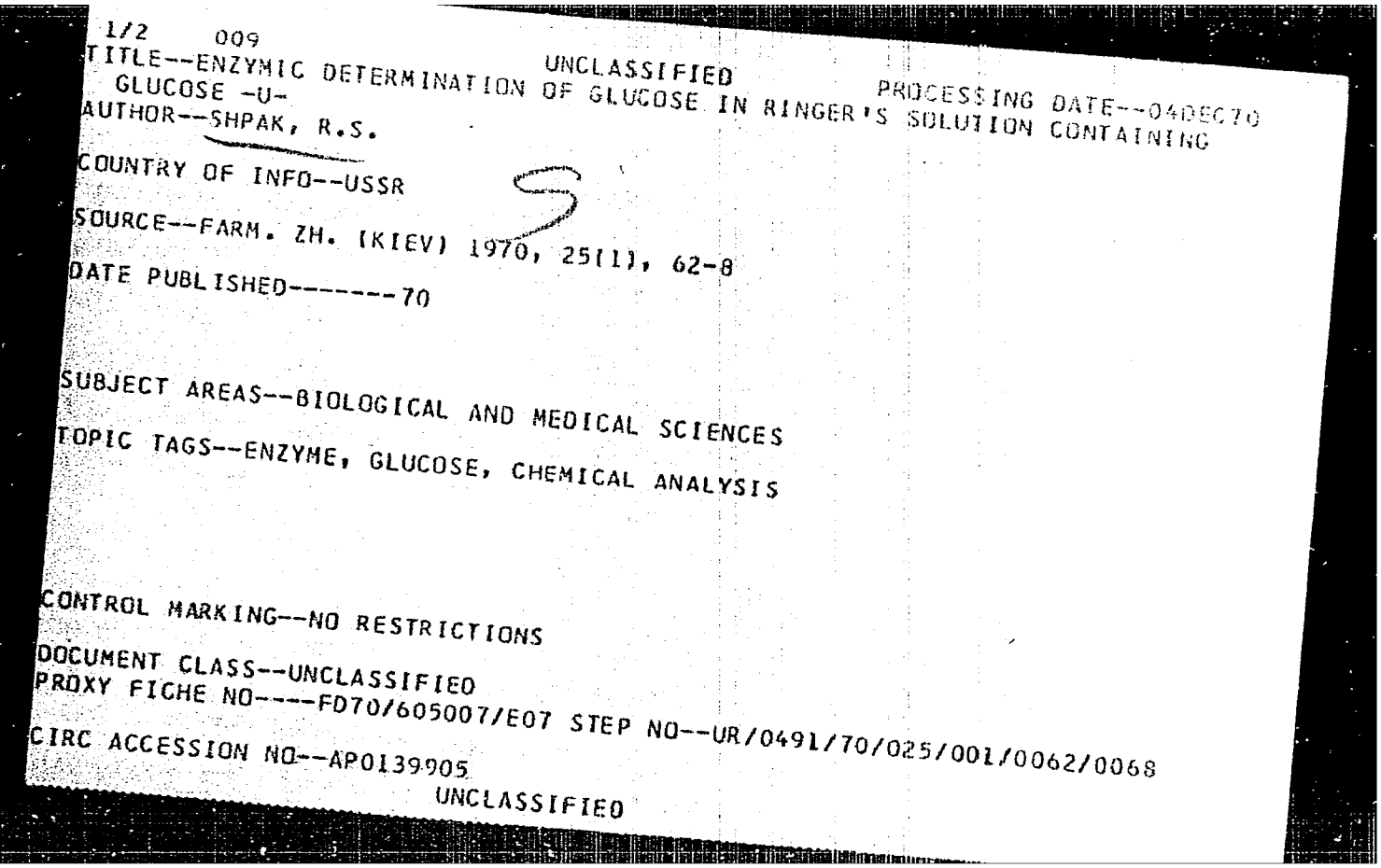

1/2 009 UNCLASSIFIED PROCESSING DATE--04DEC70
TITLE--ENZYMIC DETERMINATION OF GLUCOSE IN RINGER'S SOLUTION CONTAINING GLUCOSE -U-
AUTHOR--SHPAK, R.S.

COUNTRY OF INFO--USSR

SOURCE--FARM. ZH. (KIEV) 1970, 25(1), 62-8

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--ENZYME, GLUCOSE, CHEMICAL ANALYSIS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY FICHE NO----FD70/605007/E07 STEP NO--UR/0491/70/025/001/0062/0068

CIRC ACCESSION NO--AP0139905
UNCLASSIFIED

2/2 009 UNCLASSIFIED PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0139905

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A MODIFIED METHOD FOR AN ENZYMIC DETN. OF GLUCOSE (I) IN A STABILIZED RINGER SOLN., IS PRESENTED IN DETAIL. PREP. REAGENT BY ADDING 2 MG GLUCOSE OXIDASE AND 10 MG CRYST. HB TO 25 ML K PHOSPHATE BUFFER OF PH 5.9. MIX. ADD 1 ML 1PERCENT ALC. SOLN. OF O DIANISIDINE. DIL. WITH H SUB2 O TO 100 ML. ADD 3 ML OF REAGENT TO 1 ML OF DILD. (1:400) TEST SOLN. HEAT ON A WATER BATH AT 45DEGREES FOR 30 MIN. COOL IN ICE WATER. AD 50PERCENT H SUB2 SO SUB4 TO 10 ML VOL. MEASURE THE COLOR INTENSITY OF THE SOLN. COLORIMETRICALLY WITH A GREEN LIGHT FILTER OR AT 532 NM. CALC. THE I CONCN. FROM THE FORMULA X EQUALS (Y PLUS 0.003)-0.006, WHERE X IS I CONCN., AND Y IS THE ABSORBANCE. THE ACCURACY OF I DETN. IS PLUS OR MINUS 2PERCENT WITH LIGHT FILTERS, AND PLUS OR MINUS 1PERCENT AT 532 NM. FACILITY: KIEV. INST. POSTGRAD. TRAINING PHYSICIANS, KIEV, USSR.

UNCLASSIFIED

USSR

SHPAK, S. A.

UDC: 621.391.81:519.272

"On Autocorrelation Processing of a Pulse Signal With Stepped Triangular Shape"

V sb. Materialy Nauch.-tekhn. konf. Leningr. elektrotekhn. in-t svyazi. Vyp. 3 (Materials of the Scientific and Technical Conference of Leningrad Electrical Engineering Institute of Communications--collection of works, No 3), Leningrad, 1971, pp 155-157 (from RZh-Radiotekhnika, No 3, Mar 72, Abstract No 3A65)

Translation: The paper discusses the form of the autocorrelation function of a triangular pulse, as well as the change in position of the maximum of the function as the pulse shape changes. Resumé.

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USSR

UDC 547.446

SHEVCHUK, M. I., SHPAK, S. T., and DOMBROVSKIY, A. V., Chernovtsy State University

"ω-Halo-ω-isonitrosoacetophenones and Their Conversion to Aroylcyanides by Reactions With Triphenylphosphine"

Leningrad, Zhurnal Organicheskoy Khimii, Vol 7, No 5, May 71, pp 1004-1007

Abstract: Reaction of bromomethylarylketones with alkylnitrites and gasseous HCl or HBr gives good yields of ω-chloro- or ω-bromo-ω-isonitrosoacetophenones. Nitrosyl chloride formed in this reaction from isopropylnitrite and HCl reacts with ω-bromo-ω-isonitrosiacetophenones replacing the ω-bromine with a chlorine atom to yield their ω-chloro derivatives. The products obtained are stable crystalline materials, soluble in common organic solvents. Heating equimolar amounts of ω-chloro derivatives with triphenylphosphine (TPP) results in a vigorous exothermic reaction leading to the formation of TPP oxide and aromatic ketoacid nitriles. The ω-bromo derivatives react much less vigorously in this reaction.

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USSR

SHPAK, V. D.

"Markov Recovery Processes with External Transitions Forming a Semi-Markov Process"

Mat. Metody Issled. i Optimizatsii Sistem [Mathematical Methods of Investigation and Optimization of Systems], Preprint 73-37, Kiev, 1973, 56 pp (Translated from Referativnyy Zhurnal Kibernetika, No 10, 1973, Abstract No 10V58)

Translation: This article suggests a class of random processes -- Markov recovery processes with external transitions, forming a semi-Markov process. These processes, in addition to their discrete components, are characterized by two continuous components. The method of imbedded semi-Markov processes is applied to these processes to produce analytic formulas for determination of their basic characteristics (probabilities of states and time spent in a fixed area of a phase space) which, as in the case of semi-Markov processes, satisfy the Markov recovery equation. The only significant limitation used in concluding these formulas is that when the first (controlling) of the continuous components vanishes, the second (controlled) continuous component also vanishes.

As an illustration of the application of the processes, a queueing system of M|G|1 with a limted number of waiting positions and intensi-

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USSR

SHPAK, V. D., Mat. Metody Issled. i Optimizatsii Sistem, Preprint 73-37, Kiev, 1973, 56 pp

ties of arrival and servicing times of requests dependent on line length is studied. In terms of Laplace transforms, the probabilities of states of the system in the transient and stable modes, the distribution of the busy interval, and also the distribution of time to first loss of a request are determined. The solution of these problems in each case is reduced to analysis of a system of linear algebraic equations which is called a standard system. The corresponding recurrent formulas are produced for solution of the standard system. In the case of the busy interval, recurrent formulas are also produced for calculation of higher order moments of this random quantity.

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From the introduction

USSR

SHPAK, V. D.

"Distribution Rule of Busy Period of Supplementary Channel in M/M/2 Queueing System"

Kibernet. i Vychisl. Tekhn. Resp. Mezhved. Sb. [Cybernetics and Computer Technology. Republic Interdepartmental Collection], 1972, No 18, pp 49-58 (Translated from Referativnyy Zhurnal Kibernetika, No 4, 1973, Abstract No 4V99, by the author).

Translation: Methods of embedded semi-Markov processes are used to define the generating function of the busy period of a supplementary channel in queueing systems with random utilization of channels of type M/M/2, when the stream of arriving requests is nonordinary and there is a delay in connection of the supplementary channel.

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USSR

Magnesium

UDC: 669.721.41

KECHIN, V. A., VYATKIN, I. P., CHUKHROV, M. V., SHPAKOV, V. I.

"Relationship Between Quality of Magnesium and its Degree of Degassing During Refining"

Liteyn. Proiz-vo, Metalloved. i Obrabotka Met. Davleniyem [Foundry Production, Metal Science and Pressure Working of Metals -- Collection of Works], No 6, Krasnoyarsk, 1972, pp 46-48 (Translated from Referativnyy Zhurnal Metallurgiya, No 8, 1973, Abstract No 8G205, by the authors).

Translation: The influence of the degree of oxidation of Mg on the effect of its degassing during refining is demonstrated. The degassing effect of Mg raw material is twice that of bar remelt. It is recommended that raw Mg be used as the raw material for the manufacture of Mg-based working alloys. 1 table, 5 biblio. refs.

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USSR

KOZLOV, Yu. M., LESKOV, V. G., SHPAKOV, V. M. UDC 62-55

"An Adaptive Linear System"

USSR Author's Certificate No 308417, filed 11 Aug 69, published 2 Aug 71 (from RZh-Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 7, Jul 72, Abstract No 7A167 P)

Translation: This Author's Certificate introduces an adaptive automatic linear control system with stability-boundary output. The system contains a main loop and an adaptive loop whose output is connected to the input of the main loop unit with the paremeter to be varied, while the input of the adaptive loop is connected to the output of the main loop of the system. To improve the accuracy and stability of the system when the parameters of the main loop vary over a wide range, the adaptive loop is made in the form of a series circuit comprised of a first filter, a frequency doubler, a second filter, and a phase shifter.

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USSR

UDC 533.69.01

BORISENKO, V. I., SHPAKOVA, S. G., Institute of Mechanics, Academy of Sciences UkrSSR, Kiev

"Investigation of the Interaction Between a Fluttering Circular Wing and the Flow of an Ideal Fluid"

Kiev, Prikladnaya mekhanika, Vol. VIII, No. 7, Jul 72, pp 86-91

Abstract: A method proposed earlier by one of the authors for solving the three-dimensional problem with the vibrations of a circular wing in the flow of an ideal liquid and based on the extension of the theory of a circular wing developed by Kochin to the problem of steady-state vibrations of such a wing is used to study the interaction between a wing and a fluid at low-frequency oscillations. A method was developed for solving the three-dimensional problem of oscillations of a circular wing in the flow of an ideal liquid and the hydrodynamic forces acting on the oscillating membrane were determined. Expressions are obtained for the lift and the longitudinal moment in the case when the frequency of the oscillations is small and the shape of oscillations of the membrane coincides with the first or second form of oscillations in a vacuum. It is noted that this problem was solved by E. Van Spigel using the acceleration potential method and that

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USSR

BORISENKO, V. I., SHPAKOVA, S. G., Prikladnaya mekhanika, Vol. VIII, No. 7, Jul 72, pp 86-91

in final analysis the solution of the problem reduced to an infinite system of algebraic equations. The advantage of the method presented in this paper is that the expression obtained makes it possible to express hydrodynamic forces in explicit form in terms of the coefficients determining the wing shape. This facilitates the study of complex modes of motion when the shapes of the oscillations are unknown beforehand, as, for example, in solving problems in hydroaeroelasticity.

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1/2 011 UNCLASSIFIED PROCESSING DATE--13NOV70

TITLE--COMPLEXING IN CALCIUM METAPHOSPHATE BARIUM METAPHOSPHATE AND CADMIUM METAPHOSPHATE BARIUM METAPHOSPHATE SYSTEMS -U-

AUTHOR-(03)-BUKHALOVA, G.A., TOKMAN, I.A., SHPAKOVA, V.M.

COUNTRY OF INFO--USSR

SOURCE--ZH. NEORG. KHIM. 1970, 15(6), 1691-3

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--PHASE DIAGRAM, PHOSPHATE, CADMIUM COMPOUND, BARIUM COMPOUND, CALCIUM PHOSPHATE, METAL COMPLEX COMPOUND

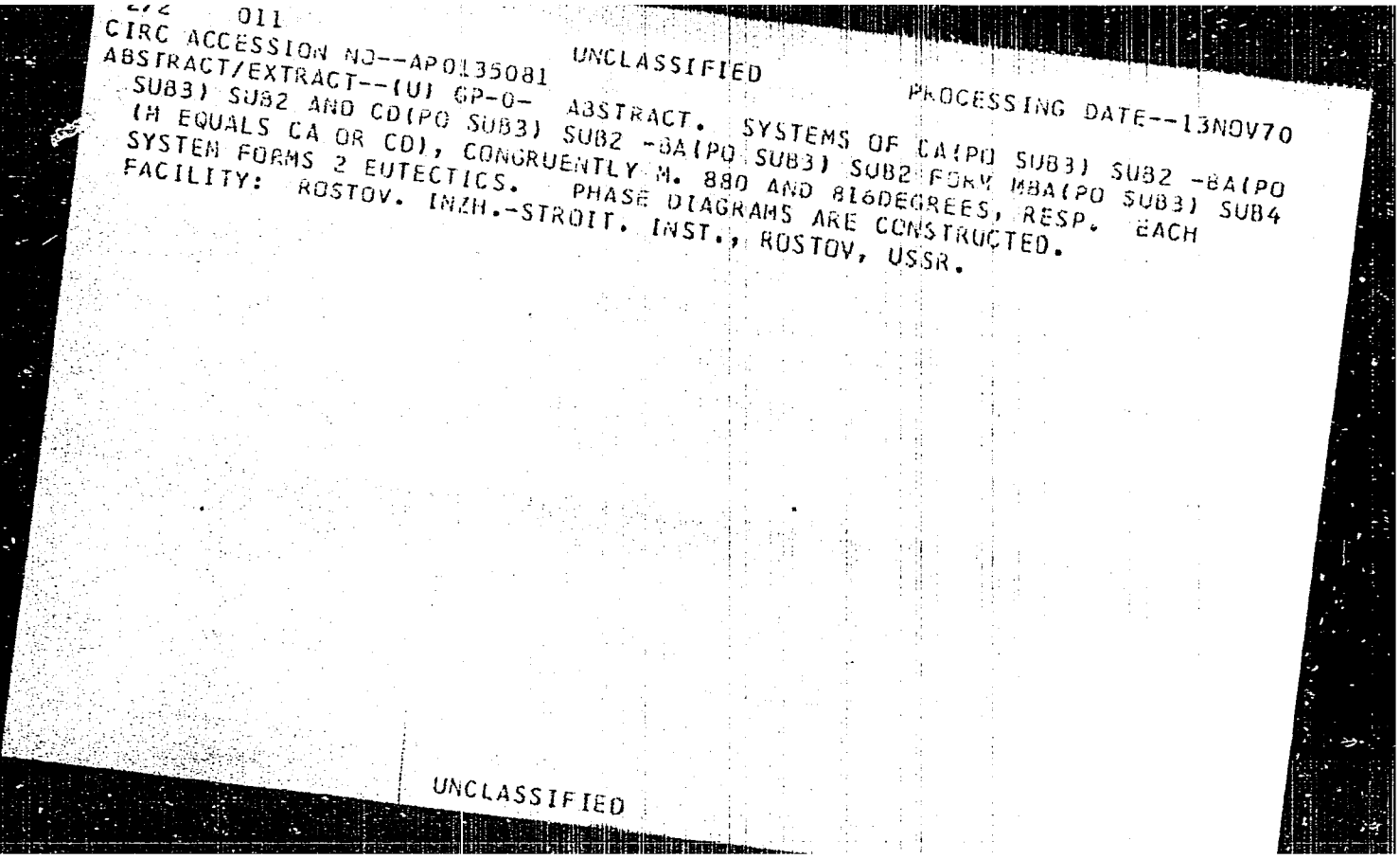
CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3006/1407 STEP NO--UR/0078/70/015/006/1691/1693

CIRC ACCESSION NO--AP0135081

UNCLASSIFIED



272 011
UNCLASSIFIED
CIRC ACCESSION NO--AP0135081 PROCESSING DATE--13NOV70
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. SYSTEMS OF CA(PO SUB3) SUB2 -BA(PO SUB3) SUB2 AND CD(PO SUB3) SUB2 -BA(PO SUB3) SUB2 FORM MBA(PO SUB3) SUB4 (M EQUALS CA OR CD), CONGRUENTLY M. 880 AND 816DEGREES, RESP. EACH SYSTEM FORMS 2 EUTECTICS. PHASE DIAGRAMS ARE CONSTRUCTED.
FACILITY: ROSTOV. INZH.-STROIT. INST., ROSTOV, USSR.

UNCLASSIFIED

5

USSR

SHEAKOV, YU., Pravda Correspondent, Chelyabinsk

"Electric Leader Along the Blue Track"

Moscow, Pravda, 20 Mar 70, p 5

Translation: "In a newspaper I read an article describing an imaginary swimming pool which is equipped with an electronic system of operative monitoring and control of the training process," writes I. Yegorov of Odessa to Pravda. "Soon after I heard that such a system is already in operation in Chelyabinsk. If this is true, please tell us about this innovation."

An electronic training system that swimmers dream about is no longer a legend but a reality. It has appeared at the plant stadium in Chelyabinsk, in the Elektrometallurg swimming pool. The nation's first device which trains athletes on a qualitatively new level has been assembled and put in operation.

How does this new device work? Here a swimmer is getting ready to start a race. The coach issues the command and at the same

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USSR

SHPAKOV, YU., et al., Moscow, Pravda, 20 Mar 70, p 6

time depresses a button on the panel. Immediately pulsating red lights begin to travel along the water track; these are alternately lighting light bulbs stretched in a chain along the edge of the pool. The athlete tries not to lag behind the lights, tries to catch up to them...And the coach can set the speed at any level, up to world's record. Thus, there is no longer any need to encourage the swimmer, the "electroleader" will let him know how he is doing, how fast he is swimming.

During competitions the judges will no longer need chronometers. The time the swimmers took to swim over the distance is accurately indicated on light panels which correspond to each track. The swimmer merely has to touch the textolite screen at the edge of the pool for the instruments to indicate the moment he turns. And the electronic "memory" records his results.

"This system," states D. A. Kamenov, director of the pool, "was developed by enthusiasts. Credit is due mainly to a small group of workers in one of the laboratories at the metallurgical

2/3

USSR

SHPAKOV, YU., et al., Moscow, Pravda, 23 Mar 70, p 6

plant. They designed, assembled the equipment and adjusted it. And they did this in their spare time not during working hours. In its complexity this system could be compared with a small electronic computer."

I am introduced to the main author and developer of the new device, Igor' Levitskiy, a short young man in spectacles; he works as an electric assembler, and is very interested in computer technology. He drafted the blueprint, assembled the control device, and himself developed the original construction of the finish line pick-ups using piezo-elements. There are none to equal them in reliability and sensitivity.

There are also other curious innovations in the pool: wave suppressing tracks where the water surface remains mirror smooth, and a universal light panel for water polo. A unit to ozonize the water is planned and also equipment to investigate the functional characteristics of athletes, and a special chair in which divers will be tested similar to the one used to train cosmonauts.
3/3

1/2 014 UNCLASSIFIED PROCESSING DATE--18SEP70

TITLE--EFFECT OF ORIENTATION ON THE ELECTRICAL STRENGTH OF POLYMER FILMS -U-

AUTHOR-(05)-ROMANOVSKAYA, O.S., SHCHERBAK, P.N., VOROBYEV, V.P., YARTSEVA, E.E., SHPAKOVSKAYA, G.B.

COUNTRY OF INFO--USSR

SOURCE--VYSOKOMOL. SOEDIN. SER. B 1970, 12(1), 27-31

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS, PHYSICS

TOPIC TAGS--POLYSTYRENE RESIN, COPOLYMER, PLASTIC FILM, ELECTRIC PROPERTY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1984/0927 STEP NO--UR/0460/70/012/001/0027/0031

CIRC ACCESSION NO--AP0055625

UNCLASSIFIED

2/2 014 UNCLASSIFIED PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0055625

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE INCREASE OF POLYSTYRENE (I) OR STYRENE-ALPHA-METHYLSTYRENE COPOLYMER (II) FILM ORIENTATION, AS INDICATED BY THE INCREASE IN THE BIREFRINGENCE SMALLER THAN OR EQUAL TO 5 TIMES 10 PRIME NEGATIVE3, ALSO INCREASES THE ELEC. BREAKDOWN VOLTAGE (E) 30-50PERCENT. A FURTHER INCREASE IN THE ORIENTATION HAS NO EFFECT ON THE E OF II AND DECREASES THE E OF I.

UNCLASSIFIED

SHPARKOVSKAYA, M.L.

UDC: 614.23+614.253.5]:655.386.3(477.62)

ORGANIZATION OF ADVANCED TRAINING FOR PHYSICIANS AND PARAMEDICAL PERSONNEL IN DONETSKAYA OBLAST

[Article by G.P. Kobets, head of Donetskaya Oblast Health Department, V.V. Shchuchkin, deputy head of Donetskaya Oblast Health Department, M.L. Shparkovskaya, head of the organizational and methodological office, Donetskaya Oblast Health Department, Donetsk, Russian, No 9, 1972, submitted 6 April 1972, pp 53-54]

Further improvement of medical care for the people and safeguarding their health, systematic extension of the period of active employment of Soviet people, depend, in many respects, on the competence of public health workers. They solve problems that require profound special knowledge, keeping regularly informed on modern advances in medicine and practice, a high degree of awareness, and a communist attitude toward work.

In our country, the allocations for public health are increasing every year; its material base is expanding; the quantity of medical specialists is growing, and they should be so used as to best meet the demands of working people with regard to accessible and highly qualified medical care. This obligates the administrators of public health organizations and institutions to be properly trained in the field of management, scientific planning, and economics of public health, and to have high personal standards.

There are more than 12,290 physicians and 44,000 paramedical personnel in Donetskaya Oblast. It is a complex task to advance their qualifications and it cannot be fulfilled by referring specific categories of individuals to courses (with absence from work), to institutes or faculties for advanced training of physicians. For this reason, we are searching for new forms of advanced training for medics, using local bases, and we believe that our experience merits attention.

Advanced training of public health organizers in the object, their attendance in classes of modern management methods are offered in three independent groups. A two-year school for public health organizers was established as far back as 1968 for the first group, which included all the

JPRS 57351

27 Oct 72

USSR

UDC 534.232

DZYGALO, V. I., KONOVALOV, G. P., INOZEMTSEV, V. M., SHPALTAKOV, V. F., MALAKHOV, YU. V., Institute of Metallurgy and Enrichment, Academy of Sciences of the Kazakh SSR

"A Piezoelectric Radiator"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 23, 1970, Author's Certificate No 276552, Filed 11 Nov 68, p 147

Abstract: This author's certificate introduces a piezoelectric radiator which contains a piezoelectric element and electrode plates. As a distinguishing feature of the patent, the reliability is improved by making each of the windings in the device in the form of a conductive layer of liquid which is isolated from the ambient medium by an acoustically transparent membrane tightly connected to the piezoelectric element around the periphery.

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1/2 024 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--ONSET OF THE HYDROGEN ABSORPTION OF STEEL DURING CORROSION IN HYDROGEN SULFIDE ELECTROLYTES -U-

AUTHOR-(02)-SHPARBER, I.S., SHREYDER, A.V.

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COUNTRY OF INFO--USSR

SOURCE--ZH. PRIKL. KHIM. (LENINGRAD) 1970, 43(4), 905-7

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY, MATERIALS

TOPIC TAGS--HYDROGEN, ABSORPTION, STEEL, AQUEOUS SOLUTION, SODIUM CHLORIDE, SULFATE, HYDROGEN SULFIDE, CORROSION RATE, THERMAL EFFECT, ELECTRODE POTENTIAL/(U)ST3 STEEL, (U)OKH13 STEEL, (U)KH18N10T STEEL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3004/0973 STEP NO--UR/0080/70/043/004/0905/0907

CIRC ACCESSION NO--AP0131558

UNCLASSIFIED

2/2 024 UNCLASSIFIED

CIRC ACCESSION NO--AP0131558 PROCESSING DATE--04DEC70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. STEEL CAN BE DESTROYED AS A RESULT OF H ABSORPTION AT THE SAME TIME THAT THE STEEL IS BEING CORRODED. THIS POSSIBILITY WAS EXAMD. FOR STEELS IMMERSED IN AQ. SOLNS. OF NA PRIME POSITIVE, CL PRIME NEGATIVE, AND SO SUB4 PRIME2NEGATIVE (APPROXIMATING DRAINAGE WATER) AT A PH 5, WITH OR WITHOUT H SUB2 S, AND WITH BUBBLING OR WITHOUT BUBBLING OF AIR OR N THROUGH THE SOLNS. STEADY STATE POTENTIALS OF STEEL ELECTRODES WERE MEASURED AT 30-90DEGREES AND THE VALUES WERE COMPARED WITH CALCD. VALUES FOR THE H SUB2 -H PRIME POSITIVE AND FE-FE PRIME2POSITIVE ELECTRODES; WHEN THE MEASURED POTENTIAL IS LESS NEG. THAN THE VALUE FOR FE BUT MORE NEG. THAN THE H VALUE, THE 2 PROCESSES MIGHT OCCUR SIMULTANEOUSLY. STEEL ST. 3 CAN ABSORB H WHILE IT IS CORRODED UNDER ALL THE CONDITIONS USED. WITH OKH13 STEEL, H FORMATION IS NOT POSSIBLE DURING CORROSION IN H SUB2 S FREE SOLNS. AT 70DEGREES AND 90DEGREES AND IS BARELY POSSIBLE AT 30DEGREES AND 50DEGREES, WHILE IN SOLNS. SATD. WITH H SUB2 S, SIMULTANEOUS CORROSION AND H FORMATION CAN OCCUR READILY. ON THE BASIS OF POTENTIALS MEASURED WITH KH18N10T STEEL, LOCATING THE PROBE AT SOME DISTANCE FROM THE SAMPLES, H SHOULD NOT BE FORMED DURING, CORROSION BUT IT ACTUALLY IS; THERE ARE DISCRETE ACTIVE AND PASSIVE SITES, THE LATTER BECOMING MORE DOMINANT AS THE TEMP. INCREASES.

UNCLASSIFIED

1/2 020 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--RELATIONSHIP BETWEEN PROCESSES OF EXCITATION AND INTERNAL INHIBITION IN TRACE CONDITIONED REFLEXES -U-

AUTHOR-(02)-BOSYY, M.K., SHPARKOVSKIY, I.A.

COUNTRY OF INFO--USSR

SOURCE--ZHURNAL VYSSHEY NERVNOY DEYATEL'NOSTI, 1970, VOL 20, NR 3, PP 578-584

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES, BEHAVIORAL AND SOCIAL SCIENCES

TOPIC TAGS--CONDITIONED REFLEX, NEUROPHYSIOLOGY, SALIVARY GLAND, INHIBITION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1997/1908 STEP NO--UR/0247/70/020/003/0578/0584

CIRC ACCESSION NO--AP0120565

UNCLASSIFIED

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USSR

UDC 612.833.81

BOSYY, M. K. and SHPARKOVSKIY, [illegible], Chair of Human and Animal Physiology, Cherkassy Pedagogical Institute

"Relationship Between the Processes of Excitation and Internal Inhibition in Trade Conditioned Reflexes"

Moscow, Zhurnal Vysshey Nervnoy Deyatel'nosti, No 3, 1970, pp 578-584

Abstract: The interaction of excitation and inhibition was studied in dogs during the formation and stabilization of trace conditioned reflexes by the thermoelectric and secretory methods. During the formation of trace conditioned reflexes, the amount of secretion in response to the positive signal decreased substantially, regardless of the method employed to form the reflex. There was a temporary disinhibition of differentiation in the stabilization period. Changes in the temperature of the parotid gland, secretion, and reaction of the animal to the stimuli of the trace reflexes varied with the method of their formation, individual traits and the state of the animal during the experiment. The trace conditioned reflex formed from a pre-existing reflex by gradually lengthening the pause was characterized by a rise in temperature of the gland in response to the conditioned stimulus. When a trace conditioned reflex was formed directly in re-

2/2 020 UNCLASSIFIED

CIRC ACCESSION NO--AP0120565 PROCESSING DATE--23OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE CHARACTERISTICS OF TRACE CONDITIONED REFLEXES AON THE DYNAMICS OF NERVOUS PROCESSES IN THE PERIODS OF THEIR FORMATION AND STABILIZATION WERE STUDIED ON SEVEN DOGS. SECRETORY AND THERMOELECTRIC METHODS WERE APPLIED. IN THE FIRST PERIOD THERE WAS A CONSIDERABLE DECREASE IN THE MAGNITUDES OF PRELIMINARILY ELABORATED POSITIVE CONDITIONED REFLEXES, AND IN THE SECOND THEY WERE OFTEN DISINHIBITED FOR A SHORT TIME. IT HAS BEEN ESTABLISHED THAT THE NATURE OF THE TRACE CONDITIONED REFLEX, OF TEMPERATURE CHANGES IN THE PAROTIC GLAND, OF SECRETION AND THE BEHAVIOUR OF THE DOG IN RESPONSE TO THE STIMULUS OF A TRACE REFLEX DEPEND ON THE MANNER OF ITS FORMATION, ON THE ANIMAL'S INDIVIDUAL PROPERTIES AND ITS STATE DURING THE EXPERIMENT. FACILITY: CHAIR OF HUMAN AND ANIMAL'S PHYSIOLOGY, PEDAGOGICEL INSTITUTE, CHERKARSY.

USSR

UDC 669.29:620.183

TIRASPOL'SKIY, V. I., KOTLYAR, A. A., GRODSKIY, E. A., MIRONOVA, O. YA., RATNER, L. A., and SHPARO, N. B.

"Thin Structure and Properties of Deformed and Annealed Tungsten Single Crystals"

Sverdlovsk, Akademiya Nauk SSSR, Fizika Metallov i Metallovedeniye, Vol 29, No 1, Jan 70, pp 175-179

Abstract: Structural changes occurring in tungsten single crystals during hot rolling and subsequent annealing were investigated, using the methods of X-ray diffraction microscopy and by measuring the microhardness and residual electrical resistance at the liquid nitrogen temperature (78°K). The experimental technique and procedure for producing tungsten single crystals are described. X-ray photographs are presented of single crystal structure before and after rolling, and also of samples strained at 30% and annealed at various temperatures (1200 to 2400°). They show that the dislocation density inside the subgrains increases with strain, and at ε = 25% the subgrain boundaries are no longer discernible. This state is conditionally characterized as prefragmentary. At ε = 27% a qualitatively new fragmentary state occurs. The substructure and properties of deformed (up to 30%) tungsten single crystals after annealing at various temperatures are studied.

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USSR

TIRASPOL'SKIY, V. I., et al, Akademiya Nauk SSSR, Fizika Metallov i Metallovedeniye, Vol 29, No 1, Jan 70, pp 175-179

The variation of the residual electrical resistance and microhardness of samples deformed at 25 and 30% and annealed at 900° are presented in graphs and analyzed. The results show that hot rolling with 30% strain produces a prefragmentary or fragmentary substructure, depending on strain. The step-by-step annealing of single crystals with a prefragmentary substructure induces only relaxation and polygonalization. In the case of a fragmentary substructure it also induces recrystallization, which leads to a total softening and a perfect structure. Orig. art. has: 5 figures.

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USSR

UDC 547.419.1

YURCHENKO, P. I., ZHMUROVA, I. N., SHPARTUN, L. N., and KIRSANOV, A. V., Institute of Organic Chemistry, Academy of Sciences, Ukraine in SSR

"The Auxochromic Effect of the Triphenylphosphinomethylene Group"

Leningrad, Zhurnal Obshchey Khimii, Vol 42(104), Vyp 11, 1972, pp 2354-2359

Abstract: The wave length of maximum absorption -- in the range of 400-600 nanameters -- was measured for axobenzenes of the general formula 4,4'-$YC_6H_4N{=}NC_6H_4X$ in acetonitrile benzene and heptane. Y groups generally had the form of $(CH_3)_2N$ and various triphenylphosphine groups. The X groups were generally hydrogen or organic acids. The synthesis is given for several of these compounds not previously reported in the literature. For the Y group $(C_6H_5)_3P{=}N$ the wave length of maximum absorption was slightly higher than or equal to compounds containing the Y group $(CH_3)_2N$; however, λ_{max} for both of these groups is significantly less than for the $(C_6H_5)_3P{=}CH$ group. The wave length of maximum absorption was also determined for a series of azostilbenes of the form $YC_6H_4CH{=}CHC_6H_4N{=}NC_6H_4X$.

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USSR

YURCHENKO, P. I., et al., Zhurnal Obshchey Khimii, Vol 42(104), Vyp 11, 1972, pp 2354-2359

These compounds can be prepared from the corresponding azobenzene as follows:

$$(C_6H_5)_3\overset{+}{P}-CH_2C_6H_4N{=}NC_6H_4X\ Br^- \xrightarrow[-NaBr,\,-NH_3]{NaNH_2} (C_6H_5)_3P{=}CHC_6H_4N{=}NC_6H_4X$$

The λ_{max} for the azostilbenes is in general about 20 nanometers longer than the λ_{max} for the corresponding azobenzene. Preparative procedures and physical data are given.

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1/2 012 UNCLASSIFIED PROCESSING DATE--020CT70

TITLE--IMPLEMENTATION OF LENIN'S OUTLINES IN THE ARCTIC RESEARCH -U-

AUTHOR-(02)-TRESHNIKOV, A.F., SHPAYKER, A.O.

COUNTRY OF INFO--USSR, ARCTIC OCEAN

SOURCE--OKEANOLOGIYA, 1970, VOL 10, NR 2, PP 198-212

DATE PUBLISHED-------70

SUBJECT AREAS--EARTH SCIENCES AND OCEANOGRAPHY, ATMOSPHERIC SCIENCES

TOPIC TAGS--GEOPHYSIC EXPEDITION, ARCTIC CLIMATE, ARCTIC GEOLOGY, OCEANOGRAPHIC DATA, METEOROLOGIC DATA

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1990/1392 STEP NO--UR/0213/70/010/002/0198/0212

CIRC ACCESSION NO--AP0109458

UNCLASSIFIED

2/2 012 UNCLASSIFIED PROCESSING DATE--020CT70

CIRC ACCESSION NO--AP0109458

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. V. I. LENIN GAVE MUCH ATTENTION TO THE ARCTIC STUDIES FROM THE FIRST DAYS OF THE SOVIET POWER. ON THE 2ND OF JULY, 1918, AT THE MEETING OF THE COUNCIL OF PEOPLE'S COMMISSARS HE SUPPORTED A PROPOSAL TO ORGANIZE THE HYDROGRAPHIC EXPEDITION TO THE ARCTIC OCEAN. BUT THE INTERVENTION INTERFERED. ON THE 4TH OF MARCH, 1920, BY LENIN'S PERSONAL ORDER THE PRESIDIUM OF THE SUPREME COUNCIL OF NATIONAL ECONOMY DECIDED TO ORGANIZE THE NORTHERN SCIENTIFIC COMMERCIAL EXPEDITION WHICH WAS LATER REORGANIZED INTO THE INSTITUTE OF NORTHERN STUDIES, THE ARCTIC AND ANTARCTIC RESEARCH INSTITUTE, THIS EXPEDITION ALSO GAVE BIRTH TO THE INSTITUTE OF ARCTIC GEOLOGY. ON THE 10TH OF MARCH, 1921, V. I. LENIN SIGNED A DECREE ON THE ORGANIZATION OF THE FLOATING MARINE RESEARCH INSTITUTE WHICH TOGETHER WITH THE CENTRAL INSTITUTE OF FISHERIES RESEARCH GAVE BIRTH TO THE ALL UNION INSTITUTE FOR FISHERIES RESEARCH AND OCEANOGRAPHY. AS AN IMPLEMENTATION OF LENIN'S OUTLINES A WIDE PROGRAM OF INTEGRAL OCEANOGRAPHIC AND HYDROMETEOROLOGICAL OBSERVATIONS IN THE ARCTIC BASIN AND IN THE MARGINAL ARCTIC SEAS WAS COMPLETED. THE STUDY AND ANALYSIS OF THE OBTAINED DATA YIELDED INFORMATION OF GREAT THEORETICAL VALUE. NAVIGATIONAL AIDS AND REFERENCE MANUALS ARE THE PRACTICAL OUTCOME COVERING THE OPERATIONAL REQUIREMENTS OF THE SHIPBUILDERS, PORT SPECIALISTS AND OTHERS CONCERNED. FACILITY: ARKTICHESKIY I ANTARKTICHESKIY N-I INSTITUT.

UNCLASSIFIED

Single Crystals

USSR UDC 621.315.592(088.8)

GORYUNOVA, N. A., CHLOV, V. N., SOKOLOVA, V. I., TSVETKOVA, YE. V., and SHREN'KOV, G. V., Physicotechnical Institute imeni A. F. Ioffee

"Method of Preparing Copper-, Tin-, and Phosphorus-Base Single Crystals"

USSR Authors' Certificate No 252289, Cl. 12c, 2, (BoI[d]), filed 11 Jun 68, published 30 Jul 70 (from RZh-Metallurgiya, No 3. Mar 71, Abstract No 3G529)

Translation: The method of preparing Cu, Sn-, and P-base single crystals, for example $Cu_3SnP_{0.5}$, at high temperatures is unique in that, in order to obtain a semiconductor compound possessing photoelectric sensitivity in the IR region of the spectrum, the crystallization process is carried on from solution in an Sn melt, with charge components taken in the following ratios (wt.%): Cu 35.7-37.7, Sn 17-17,8, P 44.6-46. Phosphorus is taken with an excess of 1-1.5 wt.% as compared with calculations. The process is conducted at 1000-1050° for 1-1.5 hr with subsequent slow cooling at a rate of 20± 5 deg/hr.

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USSR

UDC 621.376.2

BRONNIKOVA, YE. G., LARIONOV, I. M., SHPENTSER, B. I.

"Problem of Planning and Designing High-Frequency Single-Layer Single-Side Band Filters"

Elektron. tekhnika. Nauchno-tekhn. sb. (Electronic Engineering. Scientific and Technical Selection), 1970, ser. 9, vyp. 2, pp 45-58 (from RZh-Radiotekhnika, No 9, Sep 70, Abstract No 9D230)

Translation: This article contains an investigation of three possible schematics for single-layer single-side band filters. The difficulties in planning and designing such filters for high-frequencies are demonstrated. The basic problems arising when designing such filters are listed. There are 11 illustrations and a four-entry bibliography.

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UDC: 612.822.3.08

USSR

DUDKIN, K. N. and SHPERL, L. V., Physiology of Vision Laboratory (Headed by V. D. Glezer) and the Scientific-Technical Division (Headed by N. S. Slepchuk) of the I. P. Pavlov Institute of Physiology, USSR Academy of Sciences, Leningrad

"Construction of Poststimulus Histograms on the 'Neuron-1' Analyzer"

Leningrad, Fiziologicheskiy zhurnal SSSR im. I. M. Sechenova, No 10, vol 58, 1972, pp 1636-1638

Abstract: Histograms of the poststimulus time (PST) are used in many neurophysiological investigations in the analysis of neuron responses to stimuli, these histograms being obtained through measurement of the time of the pulses in response to the stimulus, and the accumulation of the measured time intervals repetition of the same stimulus. The purpose of this article is to show how such histograms can be constructed with the "Neuron-1" analyzer. A block diagram of this instrument in the mode of time interval synchronous summation, the mode in which poststimulus histograms are constructed, is given together with a description of the equipment's operation. A sample of the poststimulus histogram of a

USSR UDC: 612.822.3.08

DUDKIN, K. N., et al, Fiziologicheskiy zhurnal SSSR im. I. M. Sechenova, No 10, vol 58, 1972, pp 1636-1638

light-stimulated neuron is shown.

USSR

SHPET, G.

Biologicheskiye osnovy i metody massovogo kul'tirovaniya kormovykh bespozvonochnykh (Biological and Methods of Mass Cultivation of Invertebrate Feed, by I. V. Ivleva, Moscow, Nauka, 1969, 171 pp.

Kiev, Gidrobiologicheskiy Zhurnal, Vol 6, No 3, May/Jun 70, pp 136-137

Abstract: Cultivation of invertebrates is of utmost interest in connection with their use as feed for fish production. Crayfish, worms, and other species are used to feed young fish under artificial conditions. Mass production of larvae, free-living nematodes, artemisia, daphnia and other species are described, together with the necessary equipment, proper food, incubation periods, maturation periods, the density of the cultures, maintenance of developmental conditions, etc. According to the title of the book, one would expect to find in it data on the cultivation of various worms used for fish bait, as well as data on the incubation of various species. However, the material contained in this book is limited to invertebrate feed in fishraising.

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1/2 008 UNCLASSIFIED PROCESSING DATE--13NOV70

TITLE--SYNTHESIS OF NITROGENOUS DERIVATIVES OF PHENOXYACETIC ACID. 1. AZOMETHINES -U-

AUTHOR-(02)-SHPEYER, L.F., PAVLOVSKAYA, M.YE.

COUNTRY OF INFO--USSR

SOURCE--UKR. KHIM. ZH. 1970, 36(1), 75-7

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--ORGANIC SYNTHESIS, ORGANIC NITROGEN COMPOUND, AZO COMPOUND

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/1974 STEP NO--UR/0073/70/036/001/0075/0077

CIRC ACCESSION NO--AP0125563

UNCLASSIFIED

2/2 008 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0125563

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. P-HOC SUB6 H SUB4 CHO AND M AND O H SUB2 NC SUB6 H SUB4 OH FORM, AFTER 15-20 MIN AT 50DEGREES, M AND P,(4,HOC SUB6 H SUB4 CH:N)C SUB6 H SUB4 OH, M. 230DEGREES AND 52DEGREES, RESP. AFTER 40-50 MIN, THE LATTER MIXT. GAVE A COMPD. OF THE SAME ANAL. M. 146DEGREES. (LONGER HEATING CAUSED DECOMPN. OF THE AZOMETHINE). THE FOLLOWING Y,(X,HOC SUB6 H SUB4 CH:N)C SUB6 H SUB4 OCH SUB2 CO SUB2 H WERE SIMILARLY PREPD. (X,Y, AND M.P. GIVEN): O,M, 171-3DEGREES; O,P, 190DEGREES; P,M, 113DEGREES; P,P 219DEGREES. X,HO SUB2 CCH SUB2 OC SUB6 H SUB4 CHO AND Y,H SUB2 NC SUB6 H SUB4 OHC SUB2 CO SUB2 H LIKEWISE GAVE AZOMETHINES (X,Y, AND M.P. GIVEN); O,M, 156DEGREES; 9,P, 224DEGREES; P,M, 143DEGREES; P,P, 248DEGREES. THE SAME COMPDS. M. 154DEGREES, 228DEGREES, 146DEGREES, AND, WERE PREPD. BY REACTION OF X,HOC SUB6 H SUB4 CH:NC SUB6 H SUB4 OH,Y WITH CLCH SUB2 CO SUB2 H, BUT THE YIELDS WERE POORER. FACILITY: KHAR'KOV. SEL'SKOKHOZ. INST. IM. DOKUCHAEVA, KHARKOV, USSR.

UNCLASSIFIED

1/2 030 UNCLASSIFIED PROCESSING DATE--04DEC70
TITLE--CREEP OF METALS IN TENSION AND COMPRESSION -U-

AUTHOR-(02)-STEPANOV, V.A., SHPEYSMAN, V.V.

COUNTRY OF INFO--USSR

SOURCE--FIZIKA METALLOV I METALLOVEDENIE, FEB. 1970, 29, (2), 375-380

DATE PUBLISHED----FEB70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--CREEP MECHANISM, TENSILE STRESS, COMPRESSIVE STRESS, LEAD ALLOY, COPPER ALLOY, ALUMINUM ALLOY, HIGH TEMPERATURE EFFECT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3003/0337 STEP NO--UR/0126/70/029/002/0375/0380

CIRC ACCESSION NO--AP0129569

UNCLASSIFIED

2/2 030 UNCLASSIFIED PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0129569

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE RELATION BETWEEN THE CREEP CHARACTERISTICS OF PB, CU, AND AN AL ALLOY UNDER TENSION AND COMPRESSION (AT THE SAME ABS. STRESS) WAS STUDIED. THE STEADY CREEP VELOCITY ATTAINED UNDER COMPRESSION AND TENSION, RESP., DIFFERED MARKEDLY IN EACH CASE. THIS DIFFERENCE WAS ATTRIBUTED TO THE EXISTENCE OF AT LEAST TWO DIFFERENT ATOMIC MECHANISMS CONTROLLING THE CREEP PROCESS, THE RELATION BETWEEN THESE MECHANISMS BEING SENSITIVE TO THE SIGN OF THE APPLIED STRESS. THE DIFFERENCE BETWEEN CREEP IN THE TWO DIRECTIONS WAS GREATEST AT LOW TEMP.; AT HIGH TEMP. ONE OF THE ATOMIC MECHANISMS WAS DOMINANT AND TENSILE AND COMPRESSIVE CREEP WERE MORE SIMILAR.

UNCLASSIFIED

USSR UDC 621.81:621.78

VORONINA, L. V., SHPEYZMAN, V. M., BABEY, YU. I., and VEYNGARTEN, A. M.

"Influence of Surface Hardening on Properties of Structural Steels"

Sudostroyeniye, No 2, Feb 71, pp 47-53

Abstract: Studies were performed to determine the influence of the form of microirregularities on the physical properties of surface-hardened steel specimens. Specimens of type 20 steel and type 12 KhN_3A steel were subjected to carburizing with surface rolling, while specimens of type 40 Kh steel were subjected to induction hardening. Microhardness and surface smoothness of the specimens were measured. Carburized type 20 steel was found to have a maximum microhardness of about 900 kg/mm^2 at 0.1-0.3 mm from the surface. Surface rolling was found to increase surface smoothness, increasing the radius of curvature of peaks and hollows, thus improving the operational properties of the metal. Fatigue tests were also performed in air and in a 3% aqueous solution of sodium chloride. The surface rolling increased

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USSR

VORONINA, L. V., et al., Sudostroyeniye, No 2, Feb 71, pp 47-53

fatigue strength, particularly in the salt solution. Type 20 steel carburized with subsequent surface rolling was found to be equal to alloy steels in fatigue strength. The fatigue strength of type 40 Kh steel was increased by almost 50% by induction hardening. The hardening processes were also found to decrease the coefficient of friction of the metal surfaces. Corrosion resistance was little changed by the treatment, however.

2/2

Converters

USSR

UDC 621.374.5(088.8)

GUROVITS, L. S., KHAYUTIN, S. G., SHPICHINETSKIY, YE. S.

"Procedure for Combining a Piezoconverter with the Acoustic Line of an Ultrasonic Delay Line"

USSR Author's Certificate No 278746, Filed 29 Jul 68, Published 16 Nov 70 (from RZh-Radiotekhnika, No 4, Apr 71, Abstract No 4G269P)

Translation: A procedure is proposed for connecting a piezoconverter to the acoustic line of a delay line by a matching layer of indium alloys under pressure and thermal conditions. In order to increase the pass band of the delay line, the piezoconverter and the acoustic line are connected by a layer of indium-thalium-silver alloy containing 0.3-5.0 percent thalium, 0.3-2.5 percent silver and under a pressure of 25-30 kg/mm^2 at 130-135° C, and they are held under the indicated conditions for 3-6 hours. In order to increase the sound propagation rate in the matching layer, the latter is cut in the form of a plate of alloy rolled into foil at an angle of 40-45° to the rolling direction.

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USSR

UDC: 533.9...16

BEREZHETSKIY, M. S., GREBENSHCHIKOV, S. Ye., KOSSYY, I. A., SBITNIKOVA, I. S., SHPIGEL', I. S.

"Electrostatic Probe Measurements on the L-1 Stellarator"

Tr. Fiz. in-ta AN SSSR (Works of the Physics Institute, Academy of Sciences of the USSR), 1973, 65, pp 82-99 (from RZh-Fizika, No 6, Jun 73, abstract No 6G356)

Translation: The paper describes methods of using electrostatic probes to measure the parameters of a plasma injected into the L-1 stellarator by a spark source. Isolated Langmuir probes, an emitting probe, a multigrid electrostatic probe, and double probes were used to measure the plasma potential, electron temperature, ion temperature, ion concentration, fluctuating ion flow to the wall of the chamber, and quasiconstant ion fluxes. The probe designs and electrical measurement setup are described, and the possibilities of the probe method under conditions typical for the L-1 stellarator are discussed. A brief review is given of the principal results of measurements. Bibliography of 22 titles.

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USSR

UDC: 533.9...16

LANILKIN, I. S., SHPIGEL', I. S.

"A New Double-Path Stellarator Design"

Tr. Fiz. in-ta AN SSSR (Works of the Physics Institute, Academy of Sciences of the USSR), 1973, 65, pp 50-64 (from RZh-Fizika, No 6, Jun 73, abstract No 6G344)

Translation: A number of requirements are formulated for toroidal systems. A new double-path stellarator design is proposed which is capable of satisfying these requirements. The new system differs from preceding designs in the high stability of the field configuration as to structural errors and has improved properties which ensure confinement of plasma and individual particles. The design of the system gives ready access to the working volume and provides excellent vacuum conditions, as well as having light mechanical loading of the most complicated elements of hardware. Bibliography of 11 titles.

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USSR

UDC: 533.9...16

SHPIGEL', I. S.

"Concerning a Governing Principle of Plasma Diffusion in Stellarators"

Tr. Fiz. in-ta AN SSSR (Works of the Physics Institute, Academy of Sciences of the USSR), 1973, 65, pp 5-10 (from RZh-Fizika, No 6, Jun 73, abstract No 6G363)

Translation: Within the framework of the present conception of the collision mechanism of plasma diffusion in toroidal systems, an analysis is made of a number of published experiments on plasma containment in stellarators. Calculations of diffusion conditions made on the basis of the theory showed that in the cases analyzed there should be an actual observable experimental linear relation between the time of plasma containment and the rotational conversion angle of a line of force of the magnetic field.

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USSR

UDC: 531.1

AL'PERIN, L. B. and SHPIGEL'BURD, I. Ya.

"Free Movement of a Gyroscope with Flexible Axis on a Movable Base"

Sb. Nauchn. tr. Novosib. elektrotekhn. in-t (Scientific Transactions of the Novosibirsk Electrical Engineering Institute--collection of works) 1970, No. 2, pp 144-161 (from RZh-Mekhanika, No. 2, Feb 71, Abstract No. 2A77)

Translation: The equations of motion are given for an incompletely symmetrical gyroscope with a flexible axis, set up on a movable base, with nonlinear internal friction forces, periodic components of transmitted accelerations of the base, and other disturbing factors taken into account. By means of these equations, on the basis of asymptotic methods of the theory of nonlinear oscillations, a study is made of the various modes of the gyroscope motion including transient ones (in transitions through fundamental and parametric resonance). The paper considers a symmetrical gyroscope with a flexible axis under a longitudinal compressive force caused by a slowly varying component of the longitudinal progressive acceleration of the base. V. V. Krementulo

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Acc. Nr: AP0034220

Abstracting Service: CHEMICAL ABST. 4-70

Ref. Code: 24R 0078

S

71269s Complexing of titanium with N-benzoyl- and N-cinnamoylphenylhydroxylamines studied by an extraction method. Lobanov, F. I.; Savostina, V. M.; Fes'kova, V. M.; Shpigun, O. A.; Peshkova, V. M. (Mosk. Gos. Univ., Moscow, USSR). *Zh. Neorg. Khim.* 1970, 15(1), 181–4 (Russ). Ti(IV) was extd. from 6*N* $HClO_4$ by C_6H_6 soln. of *N*-benzoylphenylhydroxylamine (HA) or *N*-cinnamoylphenylhydroxylamine (HA'). Extn. consts. (k_e) by HA and HA', given as log k_e, are 9.61 ± 0.04 and 9.94 ± 0.04, resp. Stability consts. (K_1 to K_4 and β), detd. by the Bjerrum or by the L. Sillen-D. Dyrssen (1953) are tabulated. For HA-Ti(IV) complex, log β_4 is ~46.2 and for HA'-Ti(IV) complex ~52.0. HMIR

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REEL/FRAME

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USSR

SHPIL'BERG, A. YA., et. al.

expression $k(\tau)=\sum_{i,j,i-j+\tau=0}^{n}\lambda_i\lambda_j$ i.e., $k(\tau) = 0$ where $|\tau| \geq n$. A method is suggested for determining the weight vector $\vec{\lambda}$ if the values of the autocorrelation function $k(\tau)$ are fixed where $|\tau| < n$, allowing a shift register with linear feedback to be used to construct simple process generators for processes with fixed, rapidly attenuating autocorrelation functions.

USSR

UDC 631.811:632.95.026

SHPILER, L. Kh., Plant Genetics Department of the Academy of Sciences of the Moldavian SSR

"Effect of Liquid Top-dressing with Trace Elements on the Damage of Beans by Bacteriosis"

Moscow, Khimiya v Sel'skom Khozyaystve, No 9, 1971, pp 43-44

Abstract: A study was made in 1966-1968 of the effectiveness of liquid top dressing under the conditions of Moldavia where beans are damaged annually by bacteriosis. The experiments were performed with a regionized variety Kishinevskiy Shtamboviy 1 and a prospective variety Kishinevskiy Bomba 5. Data are presented for control lots (sprayed with water) and lots on which NPK, PK, K and N macrofertilizers and trace elements in the form of $CuSO_4$, $ZnSO_4$, $MnSO_4$ $(NH_4)MoO_4$ and H_3BO_3 were applied.

In the experiment with trace elements, the lowest amount of damage to both varieties of beans from bacteriosis took place in the version using phosphorus fertilizer. Liquid top-dressing with nitrogen fertilizer in 1968 had a low effect. The damage to the leaves of the beans in this version was higher than in the control version. In all versions, with the application of

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USSR

SHPILER, L. Kh., Khimiya v Sel'skom Khozyaystve, No 9, 1971, pp 43-44

trace elements the damage to the leaves and beans themselves from bacteriosis was reduced. The leaf damage was lowest in the versions using copper and zinc. The solutions were applied in the amount of 600-800 liters/hectare of 2 percent mineral fertilizer and 0.05 percent trace element salt.

2/2

USSR

UDC 681.3

ADAVICH, P. N., MEYTIL'SH, A. L., SHPILETZKAYA, Z. V.

"Mathematical Model of Binary Channels Considering Actual Statistics of Distribution of Failures"

Metody. I Sredstva Tekhn. Kibernet., [Methods and Equipment of Technical Cybernetics--Collection of Works], No 10, Riga, 1970, pp 31-41, (Translated from Referativnyy Zhurnal Kibernetika, No 5, 1971, Abstract No. 5V599).

No Abstract.

1/1

USSR

SHPILEVOY, A. YA.

"Use of Method of Conformal Mappings for Construction of Filtration Flows in One Class of Piecewise-homogeneous Media"

Tr. Kafedry Teor. i Eksperim. Fiz. Kaliningr. Un-t. [Works of the Department of Theoretical and Experimental Physics, Kalingrad University], 1970, Vol 3, pp 97-104. (Translated from Referativnyy Zhurnal Mekhanika, No 1, 1972, Abstract No 1B1225 by M. W. Khmel'nik).

Translation: A solution is presented to the planar problem of determination of complex potentials of filtration flows in a piecewise-homogeneous medium, the division boundary of the homogeneous zones of which is a curve defined by the equations

$$x=\frac{ca}{2}\left(1+\frac{1}{a^2+t^2}\right),\ y=\frac{ct}{2}\left(1-\frac{1}{a^2+t^2}\right) \quad (1)$$

where $a>1$, $c>0$ $(-\infty<t<+\infty)$. The flow is defined with respect singular points through a complex flow potential created by these points in the homogeneous medium. For this, the author first studies the Rieman surface, consisting of 2 examples of flow plane $z=x+iy$ and, using a Zhukovskiy transform

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USSR

SHPILEVSKIY EDUARD

"Optimal Classification of Observations of Random Processes"

Stat. Probl. upr. Tr. Seminara. Vyp. 1 [Statistical Problems of Control, Works of a Seminar, No 1 -- Collection of Works], Vil'nyus, 1971, pp 61-75 (Translated from Referativnyy Zhurnal, Kibernetika, No 1, 1973, Abstract No 1 V344 by A. Dorogovtsev).

Translation: The random vector process θ_t of class A_i is defined by a system of linear stochastic equations:

$$d\theta_t = a_0(\xi_t, u_t, t)\,dt + a_1(\xi_t, u_t, t)\,\theta_t dt + b(\xi_t, u_t, t)\,dw_1,$$
$$d\xi_t = A_0(\xi_t, t)\,dt + A_1(\xi_t, t)\,\theta_t dt + B(\xi_t, t)\,dw_2$$

with independent vinerian multidimensional processes $w_1(t)$, $w_2(t)$, $i = 1, \ldots, N$. It is assumed that the a priori probabilities p_i of values u_i, $i = 1, \ldots, N$ and the loss function l_{ij} -- losses when process θ_t is related to class A_j if θ_t actually belongs to class A_i -- are known. The problem consists in determining the class to which the process θ_t belongs

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SHPILEVSKIY EDUARD, Stat. Probl. upr. Tr. Seminara. Vyp. 1, Vil'nyus, 1971, pp 61-75.

based on observation ξ_s in [0, t]. The optimal classification is that in which the decision that θ_t belongs to class A_k is made if

$$\sum_{i=1}^{N} l_{ik} P(A_i|\xi_s) < \sum_{i=1}^{N} l_{ij} P(A_i|\xi_s), \quad j=1, \ldots, N.$$

Based on the results of R. Sh. Liptser and A. N. Shiryayev (RZhMat, 1969, 7V48), equations are produced for the a posteriori probabilities $P(A_i|\xi_s)$. Examples are studied.

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UDC: 621.317.77

MAYEVSKIY, S. M., BATUREVICH, Ye. K., SHPIL'KO, V. N., TKACHENKO, L. F., TROKHIMETS, A. P.

"A Wide-Band Automatic Phase Meter Frequency Converter"

Dokl. Vses. nauchno-tekhn. konferentsii po radiotekhn. izmereniyam. T. 2 (Reports of the All-Union Scientific and Technical Conference on Radio Engineering Measurements. Vol. 2), Novosibirsk, 1970, pp 99-101 (from RZh-Radiotekhnika, No 12, Dec 70, Abstract No 12A332)

Translation: To measure phase displacements over a broad frequency range, frequency conversion is used in many phase meters in order to transfer the measured displacement to a fixed low frequency. The authors describe one circuit for this kind of conversion with a frequency shifter as the heterodyne voltage source. Block diagrams are presented, and the properties of the shaper and converter are described. The proposed circuit was used by the authors to transfer measured phase shifts to a frequency of 277 Hz in the frequency band from 500 Hz to 100 kHz. An estimate is given for the phase error when the voltages to be compared are distorted by odd harmonics. Bibliography of one title. E. L.

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Mining, Petroleum, Geological

USSR

UDC 553.982.003.12:56.07

NESTEROV, I. I., SHPIL'MAN, V. I.

"Procedure for Evaluating Predicted and Prospective Reserves"

Moscow, Geologiya nefti i gaza, No 6, 1972, pp 1-6

Abstract: A procedure for evaluating predicted and prospective oil and gas reserves is outlined. The procedure is a general one but is discussed specifically as applied to Western Siberia. Predicted and prospective reserves are distinguished as the area estimates of the reserves of any section as a whole without indicating where accumulations of oil and gas can be discovered within the section and a specific discovered but not drilled out trap respectively. The subdivision of Western Siberia into districts for purposes of applying the procedure is discussed. In performing the evaluation, the reserve density -- the ratio of the total explored geological reserves of hydrocarbons to the area of the standard (gas is recalculated into oil)--and the largest possible number of geological, geochemical and hydrogeological parameters founded from the genetic point of view are determined with respect to each standard section for the oil and gas-bearing complex. Correlation analysis and the least squares method are then applied. Formulas are derived which can be used to estimate the density of the reserves within the limits of a prospective territory.

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NESTEROV, I. I., et al., Geologiya nefti i gaza, No 6, 1972, pp 1-6

Qualitative prediction or analysis of the standards using pattern recognition algorithms can be used to draw the boundary of prospective areas. The evaluation of the proportion of oil, gas and condensate in potential resources and the isolation of prospective structures are also discussed from the qualitative and quantitative points of view.

The level of geological knowledge permits evaluation of the prospective reserves of a trap which has not been drilled out only very approximately. The evaluation procedure can be used at this time not so much to evaluate the potential possibilities of a region as to establish the order of exploratory drilling.

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USSR

UDC 518.5:681.3.06

GORBACHEVA, R. M., PLAVNIK, G. I., SHPIL'MAN, V. I.

"Use of Digital Computers to Analyze the History of Formation of Upthrusts (and Algorithm)"

Tr. Zap.-Sib. N-i. Geologo-razved. Neft. In-t [Works of Western Siberian Geological Prospecting Scientific Research Institute], No 36, 1970, pp 198-203, (Translated from Referativnyy Zhurnal, Kibernetika, No 6, 1971, Abstract No 6 V635 by the authors).

Translation: An algorithm is described and a block diagram is presented of a program allowing paleotectonic analysis to be performed by digital computer. The initial data used are the structural maps of the contemporary surfaces. Processing of these data by digital computer on the basis of the program presented allows the values of morphological parameters of paleographic upthrusts to be produced (marking of closed isohypses of paleographic upthrusts, number of complicating domes, area of upthrusts, its amplitude, etc.) and produces paleostructural maps.

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USSR

UDC 621.313.12:538.4

MOROZOV, A. Ye., SYAS'KIN, Yu. M., SHPIL'RAYN, E. E.

"Analysis and Optimization of the Cycles of Atomic Liquid-Metal MHD Installations"

V sb. Magnitogidrodinam. metod polucheniya elektroenergii (Magnetohydrodynamic Method for Producing Electrical Energy -- Collection of Works), No. 3, Moscow, "Energiya", 1972, pp 268-282 (from RZh-50. Yardernyye reaktory, No 11, Nov 72, Abstract No 11.50.32)

Translation: A technique is presented for optimizing the cycles of atomic liquid-metal MHD installations by an analysis of the expended electrical energy. The cycle of an MHD injector installation is investigated. It was found that for a given surface of the scram system of the nuclear reactor and the maximum permissible temperature at the center of the fuel elements and also for the condition of independence of the effectiveness of the two-phase nozzle of the injector from the initial stage of steam dryness, the optimum cycle should be the cycle in which the initial point of the process of steam expansion is located in the left boundary curve. The effect of the fuel

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MOROZOV, A. Ye., et al, Magnitogidrodinam. metod polucheniya elektroenergii, No. 3, Moscow, "Energiya", 1972, pp 268-282

component cost of electrical energy on the selection of optimal parameters of the cycle is analyzed. It is shown that with an increase in the fuel component the initial parameters of the cycle also rise. The case when the upper temperature of the cycle is limited by structural considerations is considered. In this case the optimal dryness of the vapor is in the range 0-0.1. 5 ill., 10 ref.

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USSR

UDC 536.722

SHPIL'RAYN, E. E., KAGAN, D. N., BARKHAMOV, L. S.

"Experimental Study of Thermodynamic Properties of Berillium Oxide in Liquid and Solid Phases"

Teplofizika Vysokikh Temperatur, Vol 9, No 5, 1971, pp 926-928.

Abstract: A mixing method using a calorimeter with an evaporating liquid is used to measure the enthalpy of berillium oxide in liquid and solid phases in the 2,000-3,200°K interval. The material studied was under its own vapor pressure in sealed ampules of tungsten and molybdenum. The results of measurements are used to produce the heat of melting and heat capacity of the liquid phase of berillium oxide, which have not been published previously in the literature.

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