

2/2 019

CIRC ACCESSION NO--AP0104206

UNCLASSIFIED

PROCESSING DATE--11SEP70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ELECTRO CHEM. AND CORROSION BEHAVIOR OF A TI BASE COVERED BY PT WAS STUDIED AT PH 0-14 AND 80DEGREES. TOW KINDS OF TI ELECTRODES WERE USED, ONE OF WHICH WAS EMERY CLEANED, DEGREASED, TREATED FOR 20 MIN IN H SUB2 SO SUB4 AT 80DEGREES, RINSED IN WATER, DRIED ON FILTER PAPER, AND KEPT IN THE AIR FOR 24 HR BEFORE USE. THIS ELECTRODE WAS CALLED AIR OXIDIZED. THE OTHER ELECTRODES WERE NOT REMOVED FROM THE SOLN. FOLLOWING ANODIC POLARIZATION AND THESE WERE REFERRED TO AS ANODICALLY OXIDIZED. A STUDY OF THE STATIONARY POTENTIAL SHOWED THAT AN INCREASE IN THE PH OF THE ANOLYTE LOWERED THE PASSIVITY OF TI WHICH WAS AT ITS STRONGEST AT PH 13-14. THE STATIONARY POTENTIAL OF PT COATED TI ANODES AT PH 0-13 WERE VERY MUCH ALIKE AND INDEPENDENT OF THE THICKNESS OF THE PT COATING. THE EFFECT OF THE TI BASE OF TH PT COATED ELECTRODE APPEARED ONLY AT PH 14 AND THIN PT COATINGS, 0.1-1.0 MU. IN A STUDY OF ANODIC POLARIZATION OF TI AND PT COATED TI, THE TI IN ALK. AND CARBONATE SOLNS. PARTICIPATED IN THE ANODIC PROCESS THROUGH PORES IN THE PT COATING. AT THE SAME C.D. THE CURRENT DRAIN THROUGH THE TI OF PT COATED ANODES WAS APPRECIABLY HIGHTER AT PH 13 THAN AT PH 9.5 OR 14. UNLIKE AT PH 9.5 AND 14, THE POLARIZATION CURVES AT PH 13 AND 11.6 ON TI AND PT COATED TI WERE ANALOGOUS, BUT THE CURRENT DRAIN THROUGH TI ROSE. THE EXPTL. RESULTS LEAD TO THE CONCLUSION THAT OXIDN. OF TI IS THP MAIN REASON FOR THE DESTRUCTION OF THE PT COATING IN ALK. AND CARBONATE SOLNS.

UNCLASSIFIED

USSR

UDC 620.193.01:669.29

TSODIKOV, V. V., DANILKIN, V. A., YAKIMENKO, L. M., MALKINA, R. I., and MELESHKINA, YE. P.

"Hydrogenation of Titanium and Platinized Titanium With Cathode Polarization in an Alkaline Medium"

Moscow, Zashchita Metallov, No 4, 1972, pp 446-448.

Abstract: The authors studied the influence of platinum, galvanically deposited on the surface of titanium, the duration of cathode polarization, current density, the presence of potassium bichromate in the solution on the quantity of hydrogen absorbed during cathode polarization. The electrolyte consisted of potassium carbonate and potassium hydroxide. The results indicated that hydrogenation of platinized titanium increases with time according to a parabolic curve. The influence of the platinum layer decreases with the passage of time. The presence of bichromate in the solution decreased the hydrogenation of titanium, with and without the platinum layer. The bichromate probably reacts with the hydrogen on the surface of the electrode, without separation of chromium. When platinized titanium is stored in air, or particularly in the carbonate-alkaline solution being studied, hydrogen content drops rather sharply with the current off.

1/1

- 55 -

USSR

UDC 612.745

IVANOV, K. P., TKACHENKO, Ye. Ya., and YAKIMENKO, M. A., Laboratory of General Physiology, Institute of Physiology, Siberian Branch of the Academy of Sciences USSR, and Laboratory of Thermoregulation, Institute of Physiology imeni I. P. Pavlov, Novosibirsk-Leningrad

"The Temperature Effect of Muscular Contractions After Adaptation to Cold"

Leningrad, Fiziologicheskii Zhurnal SSSR, Vol 56, No 10, Oct 70, pp 1438-1443

Abstract: The effect of the organism's adaptation to cold on the amount of heat generated by muscular contraction was studied. The method used was based on comparison of the index of bioelectrical muscular activity, as depicted in sudden peaks on the electromyogram induced by cold tremors and voluntary contraction, with the value of the increase in muscular temperature. Albino male rats 200-300 grams in weight kept at temperatures of 2 to 4°C in tight individual cages (permitting normal posture but limiting mobility) were used. For comparison purposes, control rats in a vivarium were kept at a constant temperature of 20±2°C. Temperature measurement was accomplished with the help of electrodes attached to musculus tibialis anterior and musculus trapezius. The investigations established that normally higher temperatures in the muscles are the result of muscular contractions.

1/2

USSR

IVANOV, K. P., et al, Fiziologicheskii Zhurnal SSSR, Vol 56, No 10, Oct 70,
pp 1438-1443

After the organism's adaptation to cold, however, the temperature generated by muscular contraction is approximately 1.5-2 times higher than that of the norm. It was found also that this temperature effect is more pronounced in the neck area than in the knee muscles.

2/2

Pathology

USSR

YAKIMENKO, S. A., Kokand Trachoma Dispensary, Fergana Oblast, Uzbek SSR

"Eye Diseases Associated With Leptospirosis"

Tashkent, Meditsinskiy Zhurnal Uzbekistana, No 11, 1971, pp 69-70

Abstract: The author examined and treated 12 persons (11 age 8 to 21 and 1 age 40) who came for treatment of eye disorders that developed 15 days to 8 months after suffering from leptospirosis in the course of an epidemic in 1967-1968 in the Fergana Oblast of the Uzbek SSR. The main eye diseases were serous cyclitis complicated in two cases by toxic neuritis of the optic nerve, exudative iridocyclitis, and acute neuritis of the optic nerve. The leptospiral etiology of these diseases was confirmed serologically. They were differentiated from similar diseases on the basis of anamnesis, symptoms, and laboratory and epidemiological data. Treatment was symptomatic and included antibiotics and fractional blood transfusions. The results were good in all cases.

1/1

175 061 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--MANUALLY CONTROLLED MANEUVERS -U-
AUTHOR--YAKIMENKO, V.
COUNTRY OF INFO--USSR
SOURCE--FBIS DAILY REPORT, SOVIET UNION, 10 JUNE 1970, VOL 3, NR 112 P 0
2, D 3
DATE PUBLISHED-----70
SUBJECT AREAS--SPACE TECHNOLOGY
TOPIC TAGS--MANNED SPACECRAFT, SPACEBORNE EARTH PHOTOGRAPHY, SOLAR
RADIATION, MANEUVERABLE SATELLITE, ORBIT CORRECTION, MANUALLY CONTROLLED
MANEUVER, FLIGHT CONTROL SYSTEM/(U)SOYUZ 9 MANNED SPACECRAFT
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1990/1545 STEP NO--US/0000/70/003/112/0002/0003
CIRC ACCESSION NO--AP0109602
UNCLASSIFIED

2/5 061

UNCLASSIFIED

PROCESSING DATE--13NOV79

CIRC ACCESSION NO--AP0109602

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE FLIGHT OF THE SOYUZ 9 SPACECRAFT IS NOW IN ITS EIGHTH DAY. EACH DAY OF THE COSMONAUTS IS FILLED WITH SCIENTIFIC TECHNICAL EXPERIMENTS, WHICH MAKE A CONTRIBUTION TO THE UNDERSTANDING OF THE UNIVERSE AND THE DEVELOPMENT OF COSMONAUTICS. VARIED IN NATURE, THEY DEMAND DIVERSE DYNAMIC OPERATIONS WITH THE SPACECRAFT. OBSERVATION OF CERTAIN STARS, PHOTOGRAPHING OF THE EARTH'S SURFACE, REGISTRATION OF SOLAR RADIATION, CORRECTIONS, ORIENTATION ON THE SUN FOR THE GENERATION OF ELECTRICITY BY THE SOLAR BATTERIES, FOR INSTANCE, ALL THIS REQUIRES CERTAIN MANEUVERING OF THE SHIP. SHIPS OF THE SOYUZ TYPE POSSESS VERY BIG POSSIBILITIES FOR EVOLUTIONS DURING SPACE FLIGHT, THIS BEING PATENTLY PROVED BY THE CURRENT FLIGHT. ORBIT CORRECTIONS WERE MADE ON THE 5TH AND 17TH ORBITS OF "SOYUZ 9". SUCH OPERATIONS ARE CONNECTED FIRST OF ALL WITH INCREASING THE HEIGHT OF FLIGHT SO THAT THE SHIP WOULD PASS OVER PRE SET AREAS AT A DEFINITE TIME. THIS IS ALSO NECESSARY IN TRYING OUT AND PERFECTING SYSTEMS ENSURING ORBIT CORRECTION AND IN GIVING COSMONAUTS EXPERIENCE IN PILOTING THE SHIP. BUT BEFORE AN ORBIT IS CORRECTED THE SHIP HAS TO BE ORIENTED, THAT IS, MUST OCCUPY A STRICTLY DEFINITE POSITION IN SPACE. THESE OPERATIONS CAN BE ACCOMPLISHED BOTH AUTOMATICALLY AND MANUALLY. THE CREW OF "SOYUZ 9" TWICE ACCOMPLISHED THESE COMPLEX MANEUVERS WHILE PILOTING THE SHIP BY MEANS OF MANUAL CONTROLS. USING MANUAL CONTROLS, THE SPACESHIP'S COMMANDER ANDRIAN NIKOLAYEV IGNITED THE CORRESPONDING JET MICRO ENGINES AND TURNED THE SPACESHIP IN SUCH A WAY THAT THE IMAGE OF THE EARTH OCCUPIED THE CENTRAL PART OF THE SCREEN OF A SPECIAL SIGHT.

UNCLASSIFIED

375 061

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0109602

ABSTRACT/EXTRACT--AT THE SAME TIME THE DIRECTION OF THE EARTH'S MOVEMENT BECAME PARALLEL TO THE SHIP'S LONGITUDINAL AXIS, THAT IS, THE SHIP WAS ORIENTED. THIS POSITION WAS MAINTAINED BY MEANS OF MICRO ENGINES THAT ARE SWITCHED ON FOR CERTAIN PERIODS OF TIME BY COMMANDS FROM GYROSCOPES THAT "REMEMBERED" THE SHIP'S INITIAL ORIENTATION. WASHINGTON TO MOVE TO A NEW ORBIT, THE COSMONAUT PRESSES A BUTTON SWITCHING ON THE ENGINE. "SOYUZ" SPACECRAFT CAN MAKE MANEUVERS TO AN ALTITUDE OF 1,300 KILOMETERS. IT WAS NOTED BY SPECIALISTS AT THE MANNED FLIGHT CONTROL CENTER THAT ALL ACTIONS OF THE CREW OF "SOYUZ 9" DURING THE ORBIT CORRECTION WERE EXCEPTIONALLY PRECISE. THE NEW ORBIT IS VERY CLOSE TO THE PLANNED ONE. ANOTHER TYPE OF MANEUVER WAS CARRIED OUT ON THE THIRD DAY OF FLIGHT WHEN EXPERIMENTS WERE MADE INVOLVING ORIENTATION BY STARS FOR THE AUTONOMOUS NAVIGATION OF THE SHIP WITHOUT THE PARTICIPATION OF GROUND FACILITIES. THIS MANOEUVRE IS BASED ON THE PRINCIPLE THAT IF ONE OF THE AXES OF THE SHIP IS DIRECTED, SAY, AT THE SUN AND THE OTHER AT SOME CELESTIAL BODY, THE SHIP WILL OCCUPY A DEFINITE POSITION IN SPACE. FLIGHT ENGINEER VITALY SEVASTYNOV SELECTED A BRIGHT STAR, THE VEGA, ON THE NIGHT SKY, STARTED THE ORIENTATION ENGINES AND ORIENTED THE SPACESHIP BY AN OPTICAL DEVICE. OF GREAT INTEREST ARE EXPERIMENTS TO DETERMINE THE LOCATION OF THE SHIP BY AUTONOMOUS MEANS, WHICH WERE CONDUCTED ON JUNE FIFTH AND EIGHTH. RESORTING TO THE MANUAL SYSTEM, THE SHIP WAS ORIENTATED ON THE EARTH BEFORE THE FLIGHT ENGINEER MADE THE NECESSARY MEASUREMENTS AND COMPUTED THE PARAMETERS OF THE ORBIT.

UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--13NOV70

4/5 061

CIRC ACCESSION NO--AP0109602

ABSTRACT/EXTRACT--COMPARISON OF THE RESULTS OF THE COMPUTATION WITH THE DATA OBTAINED BY SURFACE FACILITIES BROUGHT OUT THEIR COINCIDENCE. THESE OPERATIONS MAKE IT POSSIBLE TO TEST THE METHODS OF SPACE NAVIGATION, ASSESS THE PRECISION OF INSTRUMENTS AND THEIR PERFECTION OF DESIGN. ANOTHER DYNAMIC MANOEUVRE IS THE "TWISTING" OF THE SHIP AROUND ANY OF ITS AXES, FOR INSTANCE, WITH REGARD TO THE SUN. THIS OPERATION IS MADE BY SWITCHING ON THE SMALL THRUST ENGINE FOR SOME TIME. BEFORE THE BEGINNING OF THE TWIST THE SHIP IS ORIENTATED IN SUCH A WAY THAT THE AXIS PERPENDICULAR TO THE SURFACE OF ITS SOLAR BATTERIES COINCIDES WITH THE DIRECTION TOWARDS THE SUN. IN THIS CASE THE SOLAR BATTERIES RECEIVE A MAXIMUM FLOW OF FLIGHT AND, HENCE ENOUGH ELECTRICITY IS GENERATED FOR CHARGING THE BUFFER CHEMICAL BATTERIES. MUCH FUEL WOULD BE NEEDED TO MAINTAIN THE SHIP IN SUCH A POSITION FOR A LONG ENOUGH TIME. THAT IS WHY IT IS BEING REVOLVED AROUND THE SHIP SUN AXIS AT A SPEED OF SEVERAL DEGREES PER SECOND. THANKS TO THE HYDROSCOPICAL EFFECT, THE SET POSITION IS MAINTAINED FOR A PROLONGED TIME. IN THE COURSE OF FLIGHT ON JUNE 6 AN "OBLIQUE TWIST" OF THE SHIP WAS ALSO CARRIED OUT. AS DIFFERENT FROM THE ONE JUST DESCRIBED, IN THIS PARTICULAR CASE THE AXIS OF TWIST IS PERPENDICULAR TO THE PLANE OF THE PANELS OF SOLAR BATTERIES AND FORMS A CERTAIN ANGLE WITH THE DIRECTION TO THE SUN. USING THE MANUAL ORIENTATION SYSTEM, A COSMONAUT CAN CHANGE THIS ANGLE AND SELECT THE NECESSARY CONDITIONS FOR THE RECHARGING OF THE BUFFER CHEMICAL BATTERIES.

UNCLASSIFIED

5/5 061

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0109602

ABSTRACT/EXTRACT--ALL THESE OPERATIONS WERE CARRIED OUT BY THE COSMONAUTS
IN ACCORDANCE WITH THEIR PROGRAMME, THUS ENSURING A RELIABLE WORK OF THE
POWER SUPPLY SYSTEM. "SOYUZ 9" IS CONTINUING ITS FLIGHT.

UNCLASSIFIED

Acc. Nr.: AN0104957

Ref. Code: UR 9023

AUTHOR-- YAKIMENKO, V., SCIENCE COMMENTATOR

TITLE-- MANEUVERING IN THE ORBIT

NEWSPAPER-- SOVETSKIY PATRIOT, JUNE 10, 1970, P 1, COLS 5-7

ABSTRACT-- IN EVALUATING THE CAPABILITIES OF THE "SOYUZ-9", YAKIMENKO STATES-- "THE SOYUZ-TYPE SHIPS HAVE VERY EXTENSIVE CAPABILITIES FOR BRINGING ABOUT AN EVOLUTION OF SPACE FLIGHT". HE ALSO CLAIMS THAT SOYUZ-TYPE SHIPS ARE CAPABLE OF PERFORMING MANEUVERS AT ALTITUDES UP TO 1300 KILOMETERS. THE AUTHOR PLACES A SPECIAL EMPHASIS ON THE ABILITY OF ASTRONAUTS OF THE SOYUZ-9 TO MANEUVER AND TO ORIENT THEIR SHIP INDEPENDENTLY OF GROUND CONTROL.

1

REEL/FRAME

19871840

12

172 021 UNCLASSIFIED PROCESSING DATE--11SEP70
TITLE--CALCULATION AND STUDY OF THE INFRARED ABSORPTION SPECTRUM OF
THIOHYDANTOIN -U-
AUTHOR--LEBEDEV, R.S., CHUMAKOVA, R.P., YUKHIMETS, V.N., YAKIMENKO, V.I.
COUNTRY OF INFO--USSR
SOURCE--IZV. VYSSH. UCHEB. ZAVED., FIZ. 1970, 13(1), 29-33
DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--IR SPECTRUM, IMIDAZOLE, FREQUENCY VIBRATION, HYDROGEN BONDING,
DIELECTRIC CONSTANT, ORGANIC SULFUR COMPOUND

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--1988/0172

STEP NO--UR/0139/70/013/001/0029/0033

CIRC ACCESSION NO--AT0105248

UNCLASSIFIED

2/2 021

UNCLASSIFIED

PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AT0105248

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE IR SPECTRUM (400-3500 CM PRIME NEGATIVE) OF THIOHYDANTOIN (I) WAS MEASURED; THE FREQUENCIES OF NORMAL VIBRATIONS WERE CALCD. ON THE BASIS OF A MECH. MODEL (SYM. WITH REGARD TO THE RING PLANE, GIVING 18 SYM. A PRIME AND 9 ANTISYM. A DOUBLE PRIME VIBRATIONS) AND COMPARED WITH THE EXPTL. ONES. THE FREQUENCIES AND ASSIGNMENTS TOGETHER WITH THE KINEMATIC COEFFS. OF I ARE TABULATED. THE FREQUENCIES OF ALL INTENSE LINES IN THE SPECTRUM OF I ARE COMPARABLE WITH THE CALCD. ONES. THE BANDS AT 3231 AND 3118 CM PRIME NEGATIVE (WHICH WERE NOT CALCD.) WERE ASSIGNED TO THE INTRA OR INTERMOL. INTERACTIONS. THE EXISTENCE OF AN INTERMOL. H BOND INCREASES IN THE SERIES I, RHODANINE, AND HYDANTOIN. ON THE BASIS OF A COMPARISON OF THE DIELEC. CONSTS. EPSILON AND THE FREQUENCIES OF CH SUB2 SCISSORING VIBRATIONS OF I (EPSILON EQUALS 3), RHODANINE (EPSILON EQUALS 3.06), AND 2,THIO,2,4,OXAZOLIDINEDIONE (EPSILON EQUALS 3.28), THE BAND AT 1412 CM PRIME NEGATIVE WAS ASSIGNED TO THE CH SUB2 SYM. DEFORMATION VIBRATIONS. THE IR SPECTRUM OF I CAN BE INTERPRETED BY CONSIDERING A C SUB3 SYMMETRY TOGETHER WITH A SLIGHT THE WHOLE AND AN APPROX. C SUB2V SYMMETRY TOGETHER WITH A SLIGHT EFFECT OF D SUBSH SYMMETRY FOR THE RING.

UNCLASSIFIED

USSR

YAKIMENKO, V. I., IVANOV, V. I., RUSAK, Yu. M.

UDC: 621.374.5

"A Device for Delaying Radio Pulse Signals"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 32, Nov 71, Author's Certificate No 319060, Division H, filed 5 Feb 70, published 28 Oct 71, p 173

Translation: This Author's Certificate introduces a device for delaying radio pulses. The unit contains a control signal oscillator, a controlling signal pickup and a multistage delay channel where each stage consists of a delay line with uniformly distributed taps, a tap commutator, a memory unit and multichannel analyzer controller. As a distinguishing feature of the patent, the precision and stability of delay are improved by connecting the inputs of the analyzers for all stages of the channel through switches gated by the controlling signal pickup to the corresponding inputs of the tap commutators, the inputs of the reference channels being connected through a switch gated by the controlling signal pickup to the control signal oscillator. The outputs of the analyzer channels are connected

1/2

USSR

YAKIMENKO, V. I. et al., Soviet Patent No 319060

through the corresponding junctions of the memory and controller module to the appropriate inputs of the tap commutators.

2/2

- 75 -

Nitrogen Compounds

USSR

UDC 632.95

MEL'NIKOV, N. N., KHASKIN, B. A., VORONKOVA, V. V., YAKIMENKO, Ye. F., and
SABLINA, I. V.

"Thermal Stability of Quaternary Salts of 4,4'-Dipyridyl"

V sb. Khim. sredstva zashchity rast. (Chemical Protection of Plants --
collection of works), No 2, Moscow, 1972, pp 306-311 (from RZh-Khimiya, No 22,
25 Nov 73, Abstract No 22N572 by V. A. Kozlov)

Translation: A study was made of the thermal stability of compounds with the
general formula (I) $\overline{X} = \text{I, MeOSO}_3, (\text{MeO})_2\text{PO}_2, \text{ and } (\text{MeO})(\text{MeS})-\text{PO}_2$ and II by
paper electrophoresis. Examples. (1) 15 ml of MeI is added to 0.02 mole of
4,4'-dipyridyl (III). The mixture is sealed in an ampul and allowed to stand
at 20° for 24 hours when the crystals are filtered off and washed with ether
to obtain I ($\overline{X} = \text{I}$), yield 72%, melting point 240° (alcohol containing water =
3:7). I ($\overline{X} = (\text{MeO})(\text{MeS})\text{PO}_2$) (Ia) is obtained in a similar manner by heating
to 50° for 12 hours. Purification is carried out by reprecipitation, adding
an acetonitril solution of I a drop at a time to acetone at -50 to -70° to
obtain Ia, yield 34%, melting point 59-61.5°. (2). A mixture of 0.03 mole of
III, 0.04 mole of $(\text{MeO})_3\text{PO}$ and 10 ml of water is heated to 90-100° for 5
1/3

USSR

MEL'NIKOV, N. N., et al., Khim. sredstva zashchity rast, No 2, 1972, pp 306-311

hours in the presence of 0.1 g of alkaline activated carbon (A brand). The carbon is filtered off, the filtrate evaporated in a vacuum, the residue kept in a vacuum (40-50°/0.2 mm) and treated with methyl ethyl ketone. The mass crystallizes and purification is carried out by reprecipitation to obtain I $\overline{X} = (\text{MeO})_2\text{PO}_2$ (Ib), yield 90%, melting point 117-20°. 0.03 mole of III is added to 0.06 mole of $(\text{MeO})_3\text{-PO}$ at 60-65°, heated for 2 hours to 7-80°, left to stand for 7 days at 20° after which the crystals formed are washed with dimethyl formamide, dissolved in MeCN, and poured a drop at a time into AcOEt chilled by dry ice to obtain II $\overline{X} = \text{MeO})_2\text{PO}_2$, yield 53%, melting point 95-102°. I is kept at 90, 120, 150, and 200°. I (X = I, MeOSO_3) when heated for 4 hours to 200° forms a monoquaternary salt and when heated to over 200° it forms the original III. Ib at 90° forms on an electrophoregram the spot of a cation of a monoquaternary salt within 3 hours and at 120 and 150° within 20 to 10 min, respectively. Under these conditions the cation of N-methylpyridinium is formed within 40 and 10 min, respectively. Ia is even less stable at 90, 120, and 150°; the monoquaternary salt is formed within 20 and 5-6 min, respectively, and at 120-150° the cation of N-methylpyridinium is formed within 30 min. II is not broken down at 90° but at 120 and 150° forms

2/3

USSR

MEL'NIKOV, N. N., et al., Khim. sredstva zashchity rast, No 2, 1972,
pp 306-311

III within 60 and 30 min, respectively. The thermal stability of I was shown
to depend on the structure of the anion and falls into the following series:
 $I \sim \text{MeOSO}_3 > (\text{MeO})_2\text{PO}_2 > (\text{MeO})-(\text{Mes})\text{PO}_2$.

3/3

Pathology

USSR

UDC 616.28-001.34-091

PRONIN, L. S., MUDRETSOV, N. I., YAKIMETS, I. M., MOROZOV, V. N., Candidates of Medical Sciences, BUGROV, V. V., and KEVEROVA, G. M., Candidates of Technical Sciences

"Pathomorphology of Trauma of the Auditory Analysor After Single Exposure to Pulsed Noise"

Moscow, Vestnik Otorinolaringologii, No 1, Jan/Feb 72, pp 37-43

Abstract: After a single 1-second exposure to high intensity (155-173 db) sound impulses of a sinusoidal form and a frequency of 10-2000 hz, guinea pigs suffer partial or complete loss of hearing due to mechanical destruction or necrosis of the organ of Corti. Pathological processes terminate within 3 days. Twelve days after exposure to the less traumatic low-frequency waves, the organ of Corti recovers, with vacuolization. Medium frequency sounds cause some damage to the spiral ganglion, and high frequency sounds induce severe, irreversible destruction of the organ of Corti. Middle ear injury is insignificant, and cortical centers of hearing remain intact.

1/1

USSR

UDC 621.373.521.1

YAKIMOV, A. V.

"Effect of Flicker Interference of Power Supplies on the Stability of Transistor Generators"

Uch. zap. Gorkovsk. un-t (Scientific Notes of Gorkiy University), 1970, vyp. 105, pp 58-62 (from RZh-Radiotekhnika, No 9, Sep 70, Abstract No 9D254)

Translation: The flicker voltage fluctuations of the power supplies of transistor generators affect the stability of the generators. The present paper is devoted to an analysis of the effect of flicker fluctuations of the bias of the collector and emitter junctions on the fluctuations of the amplitude and frequency of the transistorized autogenerator oscillations. There is one illustration and a five-entry bibliography.

1/1

USSR

UDC: 8.74

YAKIMOV, A. Ya.

"Formulation of the Problem of Optimizing a System of Information Communication Channels Between the Functional Modules of a Digital Computer"

V sb. Informatsionno-upravlyayushch. mashiny (Information Control Computers--collection of works), Cheboksary, 1972, pp 42-47. (from RZh-Kibernetika, No 8, Aug 72, Abstract No 8V640)

[No abstract]

1/1

- 66 -

Acc. Nr:

AF0034098

Abstracting Service:
CHEMICAL ABST. 4-70

Ref. Code:

MR 0078

71203: Strontium nitrate-alkali metal nitrate-water systems.
 Y. A.; Zalkind, E. V.; Vlasova, E. P. (USSR). Zh.
 Neorg. Khim. 1970, 15(1), 401-4 (Russ). Solubilities in Sr-
 (NO₃)₂-NaNO₃-H₂O (system I) at 25° and in Sr(NO₃)₂-KNO₃-
 H₂O and Sr(NO₃)₂-CsNO₃-H₂O systems (systems II and III,
 resp.) at 25 and 35° are given. System I has three soly. iso-
 therms, corresponding to Sr(NO₃)₂·4H₂O, Sr(NO₃)₂, and NaNO₃.
 In systems II and III, only Sr(NO₃)₂·4H₂O forms at 25° and only
 Sr(NO₃)₂ forms at 35°. In these systems the soly. of *i*th com-
 ponent increased with increasing concn. of the *k*th component.
 This proves complex-formation in systems II and III and its
 absence in system I.

HMJR

1/7

REEL/FRAME

19710741

18

di

USSR

UDC 155.3+599.88.019.941

NEYSTRUKH, M. N. and YAKIMOV, V. P. (Reviewers)

Pamyat' u Antropoidov. Fiziologicheskiiy Analiz: (Memory in Anthropoids, A Physiological Analysis), by Firsov, L. A., Leningrad, 1972, 231 pp

Leningrad, Fiziologicheskiiy Zhurnal SSSR imeni I. M. Sechenov, Vol 59, No 9, Sep 73, pp 1452-1453

Abstract: As a result of many years of investigation Firsov has concluded that the chimpanzee demonstrates a fuller use of subsequent reactions than other animals. He also maintains that subsequent conditioned reflexes are connected to long-term memory, while delayed reactions are a manifestation of operative, short-term memory. Firsov observes the power of elementary abstraction in chimpanzees, such as generalization and representation. This monograph is considered an important contribution to physiology and primatology by the reviewers.

1/1

- 67 -

USSR

UDC 621.396.6-131.5

SEVSIAN, R. P., YANIKOV, Yu. K.

"Large-Scale Hybrid Integrated Circuits"

Izv. Leningr. elektrotekhn. in-ta (News of the Leningrad Electrical Engineering Institute), 1971, vyp. 92, pp 10-12 (from Radiotekhnika, No 7, Jul 71, Abstract No TV276)

Translation: A comparison is drawn between the two areas of large-scale integration -- the area based on semiconductor microcircuits (LSI) and the area based on hybrid microcircuits (LSHI). The advantages of LSHI in the economic sense and from the standpoint of generality are pointed out. It is noted that the job of developing a circuit board for LSHI may be dealt with as an independent problem. A circuit-board technology is described which combines thin-film and thick-film techniques. An optimum version of a circuit with an overall level of integration of up to 30 and low cost is constructed as an example of developing integrated circuitry for television receivers. One illustration. U. S.

1/1

USSR

UDC 532.5

BONDARENKO, L. A., and YAKIMOV, Yu. L., Moscow

"The Force Acting From the Side of the Fluid Flow on a Curved Thin Body of Circular Cross Section"

Moscow, Izvestiya Akademii Nauk USSR, Mekhanika Zhidkosti i Gaza, No 1, Jan-Feb 73, pp 9-12

Abstract: Results of classical hydromechanics and previously obtained results by one of the authors (Yu. L. Yakinov, Ibid.: 1970, No 2), concerning the streamlining of a cylinder by an arbitrary fluid flow are generalized for the case of the motion of a curved thin body of circular cross section in an arbitrary three-dimensional potential flow of an ideal non-compressible fluid. The solution of the problem is found by determining singularities on the curved axis of the body under the assumption that the functions characterizing the distribution of singularities on a length l of the analyzed section of the body depend slightly on the changing character of the variable along the axis of the body. An expression is derived in which the first three members characterize the force acting on an arbitrary contour of small dimensions in a plane potential flow. Seventeen formulas, five bibliographic references.

1/1

- 36 -

I/2 025 UNCLASSIFIED PROCESSING DATE--27NOV70
TITLE--MOTION OF A CYLINDER IN AN ARBITRARY PLANE FLOW OF IDEAL
INCOMPRESSIBLE FLUID -U-
AUTHOR--YAKIMOV, YU.L.
COUNTRY OF INFO--USSR
SOURCE--ADADEMIIA NAUK SSSR, IAVESTIIA, MEKHANIKA ZHIKOSTI I GAZA,
MAR.-APR. 1970, P. 202-20
DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--INCOMPRESSIBLE FLUID, PLANE FLOW, CYLINDRIC SHELL STRUCTURE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--2000/1338

STEP NO--UR/0421/70/000/000/0202/0204

CIRC ACCESSION NO--AP0124988

UNCLASSIFIED

2/2 025

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0124988

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. DERIVATION OF AN EXACT EXPRESSION DESCRIBING THE FORCE WHICH ACTS ON A CYLINDER WITH A TIME VARIABLE RADIUS WHEN AN ARBITRARY PLANE FLOW OF IDEAL INCOMPRESSIBLE FLUID WITH STEADY VORTICITY IS INCIDENT ON THE CYLINDER. IT IS SHOWN THAT THIS EXPRESSION IS ALSO APPLICABLE TO A RANDOM FLOW VORTICITY WHEN THE CYLINDER IS SUFFICIENTLY SMALL. SEVERAL EXAMPLES OF THE APPLICATION OF THIS EXPRESSION ARE GIVEN. FACILITY: MOSKOVSKII GOSUDARSTVENNYI UNIVERSITET, MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC 616.72-001-008.822.12-073.8

ROKITYANSKIY, V. I. and YAKIMOV, YU. V., Kazan' Pedagogical Institute and Kazan' Institute of Traumatology and Orthopedics

"Proton Relaxation in Joint Tissues After Trauma: Study Based on Nuclear Magnetic Resonance Data"

Moscow, Ortopediya, Travmatologiya i Protezirovaniye, No 9, 1971, pp 35-41

Abstract: The time of proton relaxation in the joint tissues of rats was investigated by the nuclear magnetic resonance spin echo method during the month following the inflicting of a trauma. The tissues of the intact knee joint of white rats have 1 to 2 gram of water per gram of dry substance. They are characterized by absolute values of spin-lattice relaxation (T_1) and spin-spin relaxation (T_2) which are much smaller than those for pure water; the $T_1:T_2$ ratio is about 10. The first 3 days after the trauma were marked by a considerable longer time of proton relaxation (T_1 and T_2) and little change in the $T_1:T_2$ ratio. There was a statistically insignificant increase in water per gram of dry substance and 2 substantial decrease in structural water. Ten days after the trauma there was a moderate decrease

1/2

USSR

ROKITYANSKIY, V. I., and YAKIMOV, YU. V., Ortopediya, Travmatologiya i
Protezirovaniye, No 9, 1971, pp 35-41

in the time of proton relaxation and an increase in the $T_1:T_2$ ratio with a
considerable increase in both total and structural water. A month after the
trauma all the indexes of proton relaxation and total water approached those
of intact joints.

2/2

- 3 -

USSR

UDC 534

NAGAYEV, R. F., YAKIMOVA, K. S.

"Impact Interaction Between a 2-Mass Elastic System and a Nonmoving Plane"

Mekhanika Tverdogo Tela, No 6, 1971, pp 14-24.

ABSTRACT: The process of interaction of a nonmoving plane with a free system consisting of two bodies connected by a linear spring (2-mass system) is studied. It is demonstrated that in the process of the interaction, the number of impacts of one of the bodies of the system with the plane is determined exclusively by the ratios of masses of the body and the velocity restoration factor upon impact R . Using methods developed in an earlier work, the area of change of these dimensionless parameters of the problem within which the number of impacts is infinite and, therefore, quasiplastic impact occurs, is determined. Statements are made concerning the correspondence between initial and final dynamic states of the system and, related to this, the effective velocity restoration factor upon impact. The results of the work can be used in the investigation of the dynamics of a number of vibration-impact mechanisms.

1/1

- 85 -

USSR

UDC 8.74

YAKIMOVA, N. N.

"Simplex-Method Program"

V sb. Mashiny dlya inzh, raschetov, Vyp. 6 (Machines for Engineering Calculations.
Vyp. 5 -- collection of works), Kiev, 1972, pp 94-100 (from RZh-Kibernetika,
No 9, Sep 72, Abstract No 9V631)

No abstract

1/1

172 026 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--NONEQUILIBRIUM NATURE OF THE CONTINUOUS EMISSION OF CLASSICAL
CEPHEIDS AT MAXIMUM BRIGHTNESS -U-
AUTHOR--~~YAKIMOVA, N.N.~~
COUNTRY OF INFO--USSR
SOURCE--ASTRONOMICHESKII ZHURNAL, VOL 47, NO. 2, P. 297-307
DATE PUBLISHED-----70
SUBJECT AREAS--ASTRONOMY, ASTROPHYSICS
TOPIC TAGS--GALAXY, PHOTOMETRY, EMISSION SPECTRUM, OPTIC BRIGHTNESS
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--2000/1484 STEP NO--UR/0033/70/047/002/0297/0307
CIRC ACCESSION NO--AP0125112
UNCLASSIFIED

2/2 026

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0125112

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. STATISTICAL ESTIMATION OF A POSSIBLE EMISSION EXCESS OVER EQUILIBRIUM DURING A MAXIMUM BRIGHTNESS PERIOD OF CLASSICAL CEPHEIDS OF THE GALAXY, TAKING INTO ACCOUNT THE PHASE SHIFT BETWEEN THE MOMENT OF MAXIMUM RADIATION INTENSITY AND THE MOMENT OF MAXIMUM CONTRACTION OF A STAR. A COMPARISON OF PHOTOMETRIC AND GEOMETRICAL RADIAL AMPLITUDES FOR A TOTAL OF 50 VARIABLES SUGGESTS THE PRESENCE OF AN EMISSION EXCESS. CONVECTION IS BELIEVED TO BE A POSSIBLE CAUSE OF EXCESS EMISSION DURING A BRIGHTNESS MAXIMUM.
FACILITY: MOSKOVSKII GOSUDARSTVENNYI UNIVERSITET, MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC 547.26.118

FRIDLAND, S. V., YAKIMOVA, T. YA., and KAMAY, G. Kh. (deceased), Department of Technology of Basic Organic and Petrochemical Synthesis, Kazan' Institute of Chemical Technology imeni S. M. Kirov

"Study of the Reaction between Phosphorus Trichloride and o-Allyl-p-Cresol"

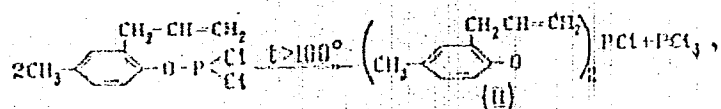
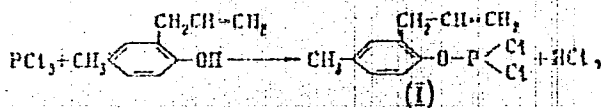
Ivanovo, Izvestiya Vysshikh Uchebnykh Zavedeniy, Khimiya i Khimicheskaya Tekhnologiya, vol. 13, no. 12, 70, pp 1760-1761

Abstract: The reaction of o-allyl-p-cresol with phosphorus trichloride has been studied. Fractionation of the reaction mass yielded, in analytically pure form, two fractions -- diacid chloride of o-allyl-p-cresylphosphorous acid (I) and the acid chloride of di(o-allyl-p-cresyl) phosphorous acid (II). The reaction was conducted in equimolar ratios and the formation of product II may be explained as the reaction of nucleophilic substitution of the second chlorine atom as well as by concurrent disproportionation. The obtained acid chlorides are colorless transparent slightly fuming (in open air) liquids with an odor peculiar to acid chlorides. The acid chlorides were esterified with alcohol in diethyl ether in the presence of triethylamine for combining the liberated hydrogen chloride. This reaction, as well as all other operations

1/2

USSR

FRIDLAND, S. V., et al., Izvestiya Vysshikh Uchebnykh Zavedeniy, Khimiya i Khimicheskaya Tekhnologiya, vol. 13, no. 12, 70, pp 1750-1761



for separating esters, were conducted in an inert gas atmosphere. The separated esters, including their properties, are listed in a table in the original article.

2/2

Devices

UDC 681.327

~~U.S.S.R.~~
DOLGOVESOV, B. S., KOVALEV, A. M., KOTOV, V. N., LUBKOV, A. A., NESTERIKHIN,
YU. YE., OBERTYSHEV, K. P., TOKAREV, A. S., ~~YAKIMOVICH, A. P.~~, Novosibirsk

"Problems of Constructing Devices for Operative Interaction of Man with a Computer"

Novosibirsk, Avtometriya, No 2, 1972, pp 35-39

Abstract: Two types of devices corresponding to the basic requirements for systems for operative interaction of man with a computer -- a computer operating in the time sharing mode and peripheral devices numbering from 1 to 1,000 -- have been developed at the Institute of Automation and Electrometry of the Siberian Department of the USSR Academy of Sciences. One of these devices -- the Ekran -- was discussed previously [B. S. Dolgovesov, et al, Avtometriya, No 4, 1971; B. S. Dolgovesov, et al., Avtometriya, No 4, 1971; A. H. Kovalev, et al., Avtometriya, No 4, 1971]. The other -- the Simbol -- is investigated in the present article. A block diagram of the Simbol alphanumeric system is presented, and the algorithms for the various operating modes of the system are discussed. The algorithms of all nodes of the system are executed by means of a microprogram control circuit. An effort was made to achieve the fastest possible system for which the principal cycle of the microprogrammed control unit was reduced to a minimum. Where possible the single pulse instructions

R

OLGOVESOV, B. S., et al., *Avtometriya*, No 2, 1972, pp 35-39

are processed simultaneously; a very high cycle frequency is selected -- 2.5 millihertz. The operating logic of the device can be changed. One of the basic parameters of the operative interaction device along with broad functional possibilities is the information capacity. Thus, much attention was given to the high speed of individual units, in particular, the speed of the symbol generator. The programmed segment method was used as the basis for constructing the symbol generator which provides 1,024 symbols with an image regeneration frequency of 50 hertz. An example image photograph from the Simbol screen is shown.

2/2

1/2 028 UNCLASSIFIED PROCESSING DATE--27NOV70
TITLE--STRESS CONCENTRATION IN THE CASE OF A PARTIALLY STRENGTHENED
CIRCULAR HOLE -U-
AUTHOR--(03)-TULCHIY, V.I., YAKIMOVICH, G.I., RUDENKO, A.G.
COUNTRY OF INFO--USSR
SOURCE--PRIKLADNAIA MEKHANIKA, VOL. 6, APR. 1970, P. 93-98
DATE PUBLISHED-----70
SUBJECT AREAS--PHYSICS
TOPIC TAGS--STRESS CONCENTRATION, REINFORCED SHELL STRUCTURE, FLAT PLATE,
TENSILE STRESS
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--2000/1328 STEP NO--UR/0198/70/000/006/0093/0098
CIRC ACCESSION NO--AP0124978
UNCLASSIFIED

2/2 028

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0124978

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. APPLICATION OF A CONTOUR SMOOTHING TECHNIQUE TO THE FORULATION AND SOLUTION OF TWO STRESS CONCENTRATION PROBLEMS FOR (1) A HOLE STRENGTHENED ALONG ONE SEMICIRCLE AND (2) A HOLE SYMMETRICALLY STRENGTHENED AT TWO (OPPOSITE) PARTS OF ITS CONTOUR. CALCULATIONS FOR THE LATTER CASE ARE PERFORMED FOR STRENGTHENING MATERIALS SIMILAR TO AND DIFFERING FROM THAT OF THE PLATE. IT IS SHOWN THAT FOR A PLATE EXPERIENCING UNIXIAL TENSION, THE WEIGHT OF THE STRENGTHENING ELEMENT CAN BE REDUCED (WITH THE AID OF PARTIAL STRENGTHENING) WITHOUT A NOTICEABLE INCREASE IN THE STRESS CONCENTRATION FACTOR AT THE EDGE OF THE HOLE. FACILITY: NIKOLAEVSKII KORABLESTROITEL'NYI INSTITUT, NIKOLAEV, UKRAINIAN SSR.

UNCLASSIFIED

USSR

UDC 536.45

SHPIL'RAYN, E. E., YAKIMOVICH, K. A., and TSITSARKIN, A. F.

"Investigation of Boron Oxide Density at High Temperatures by the Hydrodynamic Weighing Method"

Moscow, Teplofizika Vysokikh Temperatur, Akademiya Nauk SSSR, Vol 9, No 1, Jan-Feb 1971, pp 67-73

Abstract: The hydrodynamic weighing method consists of immersing a molybdenum sphere suspended by a thin wire from a balance into liquid boron oxide; the sphere moves up or down depending on the pull of the balance; the movement is slow due to the high viscosity of boron oxide. The velocity of this motion is plotted versus the balance pull. The equilibrium condition corresponds to zero velocity, it is used to calculate the density of the boron oxide.

The density obtained by this method in the temperature range from 850 to 2000°C is presented. The relative error is within 0.25%.

1/1

1/2 008 UNCLASSIFIED PROCESSING DATE--18SEP70
TITLE--ISOMERIZATION OF ALPHA-(N-(BETA-CYANOETHYL)AMINO) KETONES TO
FUNCTIONAL DERIVATIVES OF PYRROLIDINE -U-
AUTHOR--(04)-FAVORSKAYA, T.A., ARTAMONOVA, I.L., DEMETYEVA, L.P.,
YAKIMOVICH, S.L.
COUNTRY OF INFO--USSR
SOURCE--KHM. GETEROTSIKL. SOEDIN. 1970. (2), 280-1
DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--ISOMERIZATION, HETEROCYCLIC NITROGEN COMPOUND, CYANIDE, AMINE,
KETONE, PYRROLIDINE

CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1987/1108 STEP NO--UR/0409/70/000/002/0280/0281
CIRC ACCESSION NO--AP0104506
UNCLASSIFIED

2/2 008

UNCLASSIFIED

PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0104506

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE TITLE COMPO. ME SUB2 CACNR(CH
SUB2)SUB2CN (I, R EQUALS H OR ME) GAVE THE CORRESPONDING II AND III WITH
ALK. CATALYSTS. THUS, I (R EQUALS H) IN 50 ML ABS. ETOH CONTG.
CATALYTIC AMT. KOH WAS HEATED 6 HR AT 35DEGREES TO YIELD 20PERCENT II (R
EQUALS H), M. 114-15DEGREES. I (R EQUALS ME) IN 20 ML ETOH AND 0.5 G
ETONA ISOMERIZED COMPLETELY IN 2 DAYS TO II (R EQUALS ME), M.
36-7DEGREES AND III (R EQUALS ME), B SUB7 86-7DEGREES, N PRIME20 SUBO
1.4795, D PRIME20 0.9439.

UNCLASSIFIED

2/2 020

UNCLASSIFIED

PROCESSING DATE--04DEC76

CIRC ACCESSION NO--AP0140527

ABSTRACT/EXTRACT--(U) GP-C- ABSTRACT. A NEW METHOD IS SUGGESTED FOR LOCALIZATION OF A FALSE MACULA WHICH INCLUDES THE STUDY OF FIXATION CHARACTER ON A CAMPIMETER. THE TRIAL OF THE METHOD SHOWED IT TO BE SIMPLE AND ACCESSIBLE FOR ITS CLINICAL USE. A CLINICAL TRIAL OF THE CAMPIMETRIC METHOD OF LOCALIZATION OF FALSE MACULA WAS PERFORMED ON A NEW DEVICE PLEOPTOCAMPIMETER. A COMPARATIVE EVALUATION OF THESE CAMPIMETRIC AND OPHTHALMOSCOPIC METHODS USED FOR THE DETERMINATION OF FIXATION CHARACTER WAS PERFORMED IN 55 PATIENTS WHO SUFFERED FROM AMBLYOPIA. FOVEAL AND PARAFOVEAL FIXATION IS REVEALED MORE FREQUENTLY WHEN STUDIED WITH THE CAMPIMETRIC METHOD RATHER THAN WITH THE OPHTHALMOMETRIC ONE. THIS IS CONNECTED WITH THE BREAK OF NON STABLE FOVEAL OR PARAFOVEAL FIXATION DUE TO A BRIGHT LIGHT FROM A BIG OPHTHALMOSCOPE WHICH BLINDS THE EYE. THE CAMPIMETRIC METHOD FOR DETERMINATION OF FIXATION CHARACTER IS CONSIDERED UNDER MORE EXPRESSED PHYSIOLOGIC CONDITIONS TO ALLOW REVEALING LOCALIZATION OF FIXATION IN AN AMBLYOPIC EYE. THE DETERMINATION OF FIXATION PERFORMED IN GRADES MAKES IT POSSIBLE TO REGISTER THE FINDINGS OF THE INVESTIGATION AND TO OBSERVE THE DYNAMICS OF THE TREATMENT APPLIED. FACILITY: V. P. FILATOV ODESSA RES. INST. EYE DIS. TISSUE THER., ODESSA, USSR.

UNCLASSIFIED

1/2 014 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--ORGANOSILICONE RESINS -U-
AUTHOR-(03)-KAMENSKIY, I.V., KORSHAK, V.V., ~~YAKIMOVICH, V.I.~~ Y
COUNTRY OF INFO--USSR
SOURCE--USSR, 262,393
REFERENCE--UTKRYTIYA, IZOBRET., PROM. OBRAZTSY, TOVARNYE ZNAKI 1970,
DATE PUBLISHED--06JAN70
SUBJECT AREAS--CHEMISTRY, MATERIALS
TOPIC TAGS--SILICONE RESIN, THERMAL EFFECT, FURAN, ORGANIC SILANE,
CHEMICAL PATENT
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3002/1449 STEP NO--UR/0482/70/000/000/0000/0000
CIRC ACCESSION NO--AA0128848
UNCLASSIFIED

2/2 014

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AA0128848

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ORGANOSILICONE RESINS ARE PREPD.
BY THERMAL RESINIFICATION OF DIETHOXYBIS(FURFURYLOXY)SILANE AT
240-60DEGREES, WITH DISTN. OF VOLATILE SUBSTANCES.

UNCLASSIFIED

USSR

UDC 621.396.61:621.396.2(088.8)

YAKIMOVICH, V. I.

"Device for Suppression of Higher Harmonics"

USSR Author's Certificate No 248782, Filed 15 Feb 67, Published 7 Jan 70
(from RZh-Radiotekhnika, No 9, Sep 70, Abstract No 9D220P)

Translation: This author's certificate introduces a device for suppression of higher harmonics in ultrashortwave and decimetric wave radio transmitters executed on the basis of utilization of band-elimination filters. In order to improve the stability of the active input impedance in harmonics with simultaneous insurance of a high value of the traveling wave coefficient in the operating frequency range, the output load was connected to the radio transmitter via a balanced two-conductor bridge executed in the form of two plane buses with geometric length equal to one-fourth the average wavelength of the transmitter. Absorbing resistors are connected to the terminals of the second diagonal of the mentioned bridge via band-elimination filters or high-frequency filters.

1/1

Polymers and Polymerization

USSR

UDC 678.742-13

KURYLENKO, A. I., and YAKIMTSOV, V. P., Belorussian State University Imeni V. I. Lenin

"Inhibited Radiation Grafting Polymerization of Acrylonitrile in Polyethylene Films"

Minsk, Doklady Akademii Nauk BSSR, Vol 16, No 10, Oct 72, pp 901-904

Abstract: The effect of hydroquinone on graft polymerization of acrylonitrile in polyethylene films was studied. It was shown that addition of such an inhibitor does not lower the effectiveness of the influence of graft polymer on the properties of the materials, that it does counteract the formation of homopolymer and acids in regulating the distribution of the graft polymer throughout the entire material. This polymerization inhibition method may be used with various initiators. The inhibitor makes it possible to select optimal chain length of the graft materials as well as gradients of the polymerization rates in microregions differing by their densities and properties.

1/1

USSR

UDC: 621.396.69:621.319.4(088.8)

KAZAR'YAN, G. S., YAKIRIN, R. V., SHVETSOV, A. I., Leningrad Production Union "Radiodetal"

"A Fixed Capacitor of the Mansbridge Type"

USSR Author's Certificate No 266071, filed 17 Feb 66, published 6 Jul 70 (from RZh-Radiotekhnika, No 1, Jan 71, Abstract No 1V301 P)

Translation: This Author's Certificate introduces a capacitor equipped with a rectangular metal housing and insulating packing gaskets located between the inner walls of the housing and the outer surface of the capacitor section. As a distinguishing feature of the patent, the assembly process is simplified by making the insulation gaskets in the form of two hollow sections of a thermoplastic material such as polyethylene with edges which fit into each other and side walls fitted with longitudinally arranged extrusions, the protruding elements of these extrusions being directed partly toward the inside of the hollow section and partly toward the outside.

1/1

- 30 -

YAKOBASHVILI, V. A.

Public Health

~~Handwritten mark~~
Cable

SO:JPRS 54354
29 OCT 71

UDC: 616-036.86:001.8

MAIN DIRECTIONS OF IN-DEPTH INVESTIGATION OF DISABILITY

(Article by Professor V.A. Yakobashvili, ^{AC} (Public Health) ^{AC} Chair of Social Hygiene and Public Health Organization, V.A. Yakobashvili, Chair of Social Hygiene and Public Health Organization (Headed by Professor V.A. Yakobashvili), Tbilisi Medical Institute, Lenini Ave., Krasnodar, Moscow, Novosibirsk, Zhigansk, Obshchestvennoye Zdravie, Ruzhitskaya, No 9, 1971, submitted 16 February 1971, pp 17-20)

The significant loss to the health of the population and national economy caused by disability is the reason for the urgency of improving the sociological methods of investigating this problem, which has been done by A.P. Trakhtakov, A.Ya. Anurbakh, Ya.M. Shagal, N.Yu. Magaril with respect to developing methodological approaches in the study of disability, particularly in the last decade. One of the popular methods is dynamic determination of primary disability status on the basis of Vitek (Medical Commission for Determination of Disability). In Krasnodar, the indices of primary resignation due to disability dropped from 51.6 per 10,000 workers to 44.3 from 1964 to 1970, and the figures for individuals of employable age dropped from 47.4 to 40.9, respectively.

The age and sex coefficients of disability status progress with age, both for men and women, and reach a maximum in the decade preceding retirement age: 64 years for men and 55 years for women (Table 1).

As up to 10 years of age the indices are much higher than in the age group from 30 to 39 years, because of the greater number of invalids since childhood who became entitled to a pension in 1967. In the age groups up to 39 years, the indices are much higher for men than women, and in the next two age groups (40-49 and 50-59 years) they are, on the contrary, higher for women. On the whole, the disability indices referable to employable age groups constituted 45.1 for men and 36.7 for women per 10,000 workers.

The method we have proposed, by analogy to mortality tables, of compiling disability tables to evaluate the load caused by disability indicates that even with relatively low disability indices in 1967, the period of gainful employment (44 years for men and 39 years for women) will be three years shorter.

The most important causes of disability among men are circulatory diseases (26.9%), accidents, poisoning and trauma (17.5%), neoplasms (12.5%),

USSR

UDC 542.65:546.212

KIRGINTSEV, A. N., YAKOBI, N. YA., and SHAVINSKIY, B. M., Institute of Inorganic Chemistry, Siberian Branch of the Academy of Sciences USSR

"Directed Crystallization of "Sea" Water"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 10, Oct 71, pp 2318-2320

Abstract: Distribution of the main components of "sea" water in solid phase was studied during directed crystallization of a solution with following composition: NaCl -- 2.7%; $MgSO_4$ -- 0.33%; $CaCl_2$ -- 0.11%. Distribution of these components in solid phase is determined by total concentration and not by the concentration of a single component. All the components have practically identical coefficients of distribution regardless of the concentration. The coefficient of distribution is practically constant in the range of the crystallization rate from 0.4 to 1.8 cm/hr. In this range stirring has very little effect on the coefficient of distribution.

1/1

- 79 -

1/2 018

UNCLASSIFIED

PROCESSING DATE--27NOV70

TITLE--OXICATION OF TRIVALENT CHROMIUM -U-

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

COUNTRY OF INFO--USSR

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

REFERENCE--OTKRYTIYA, IZOBRET., PROM. OBRATZSY, 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/FRAE--3001/1465

STEP NO--UR/0482/70/000/000/0000/0000

CIRC ACCESSION NO--AA0126996

UNCLASSIFIED

2/2 018

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AA0126996

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

ABSTRACT. CR PRIME3POSITIVE IS OXIDIZED TO
CR PRIME6POSITIVE IN AN ACIDIC MEDIUM IN THE PRESENCE OF MN COMPS.

(E.G. MNCL SUB2) WITH OZONIZED AIR.

FACILITY: RUBEZHANSKIY

FILIAL KHAR'KOVSKOGO ORDENA LENINA POLITEKHNICHESKOGO INSTITUTA IM V. I.
LENINA.

UNCLASSIFIED

USSR

UDC 535.343.1

SOLUKHIN, R. I., YAKOBI, Yu. A., and KOMIN, A. V., Institute of Theoretical and Applied Mechanics, Siberian Branch of the Academy of Sciences of the USSR

"Discussion of Some Results of the Calculations"

Opticheskiye Kharakteristiki Vodorodnoy Plazmy, Novosibirsk, "Nauka" (Siberian Branch), 1973, pp 40 - 48

Abstract: The special characteristics obtained are based on modern theoretical concepts and do not require extensive commentary. A few interesting results may be noted. At a temperature of 0.6 electron volts the Doppler mechanism begins to predominate for the $L\alpha$ and $L\beta$ resonance lines at 1 atmosphere and for the $L\gamma$ lines at 10 atmospheres because of the low electron density at this temperature and the deep locations of the levels corresponding to these lines. At 10 and 20 atmospheres the lines are clearly visible against the background; at high temperatures they become narrower again because of the reduced electron density.

Although much energy is in the Lyman lines and continuum, self-absorption reduces radiation in these regions quite strongly, particularly at low temperatures.

The lines of the Balmer and Lyman series tend to fuse even at relatively low quantum numbers. There is some question about the boundary between discrete, 1/3

USSR

SOLUKHIN, R. I., et al., Opticheskiye Kharakteristiki Vodородnoy Plazmy, 1973, pp 40-48

continuous spectra and the relative displacement of this boundary due to Coulomb interactions and the smearing of lines as a result of transitions from high energy levels. The authors' calculations show that the spectral lines begin to fuse significantly earlier than the Coulomb "trimming" of the discrete spectrum.

In addition to the spectral curves, the authors calculated integral energy losses for hydrogen plasma over the range of parameters used. Special calculations were made to relate their work to that of D. B. Olfe, reported in J. Quant. Spec. Rad. Trans. 1,104, 1961, and satisfactory agreement was found.

The use of lasers to probe plasma requires quantitative information about the relationship between transparency and plasma temperature and density. These calculations were performed in two ways, assuming constant pressure and at a given initial particle density. The first procedure is necessary because the plasma has significant absorption only at relatively high pressures, yielding a condition without significant pressure gradients, but with high temperature and density gradients as the plasma is forced against the walls. Although there is an overall tendency toward absorption at longer wave lengths, there are anomalies due to the existence of strong absorption lines which are more or less active, depending on pressure and temperature. The second form of calculation

2/3

USSR

SOLUKhIN, R. I., et al., Opticheskiye Kharakteristiki Vodородnoy Plazmy, 1973, pp 40-48

is more appropriate when the laser beam is directed along the long axis of the plasma chamber, as well as in evaluating the transparency of a plasma under laser heating.

3/3

USSR

UDC 535.343.1

SOLUKHIN, R. I., YAKOBI, Yu. A., and KOMIN, A. V., Institute of Theoretical and Applied Mechanics, Siberian Branch of the Academy of Sciences of the USSR

"The Continuum"

Opticheskiye Kharakteristiki Vodorodnoy Plazmy, Novosibirsk, "Nauka" (Siberian Branch), 1973, pp 23 - 29

Abstract: Continuous spectra are generated by transitions to, from, or within the unbound ("free") state. At temperatures below 5000 degrees these represent free atoms (the total continuous radiation is small) while at higher temperatures free electrons are a primary radiation mechanism. At electron temperatures much less than 500 eV a semiclassical treatment is appropriate, yielding the so-called Kramer's formulas with the Gaunt factor as a quantum mechanical corrective. A formula for recombination radiation can be obtained by applying Kirchhoff's law for local thermal equilibrium to the formulas for photo-ionization absorption. This radiation is characterized by significant intensity close to the line series and an exponential decay in the direction of short waves. Bremsstrahlung extends indefinitely in the direction of long waves. The ratio of these two effects can be calculated for a given temperature and frequency. Another factor is so-called multi-quantum recombination occurring as a result of triple recombination. In a nonequilibrium plasma this can substantially influence the distribution of electrons in levels and the number of free electrons, but in an equilibrium plasma a

1/2

USSR

SOLUKhIN, R. I. et al, Opticheskiye Kharakteristiki Vodorodnoy Plazmy, Novosibirsk, "Nauka" (Siberian Branch), 1973, pp 23 - 29

Boltzmann distribution in the levels is established, uniquely determined by temperature equilibrium. At fairly high pressures and temperatures below $10,000^{\circ}\text{K}$ a significant role is played by the formation of negative hydrogen ions, accompanied by radiation. At still lower temperatures continuous molecular spectra appear. There is also the so-called quasi-molecular continuum, which is due to the transition of a hydrogen molecule from an initial unstable state (occurring as the result of a collision between atoms with parallel spins) to a stable state.

In addition to the true continuum, there are quasi-continua, resulting from the overlapping of large numbers of broadened lines. These occur as various bands. At temperatures below 1000°K induced rotational transitions are significant; although the radiation of gases at low temperatures is very low, the coefficient of absorption is quite significant.

2/2

- 54 -

USSR

UDC 535.343.1

SOLUKHIN, R. I., YAKOBI, Yu. A., and KOMIN, A. V., Institute of Theoretical and Applied Mechanics, Siberian Branch of the Academy of Sciences of the USSR

"Spectral Lines"

Opticheskiye Kharakteristiki Vodorodnoy Plazmy, Novosibirsk, "Nauka" (Siberian Branch), 1973, pp 16 - 23

Abstract: Three factors determine the nature of spectral lines: population, transition probability, and form of the line. Although many processes contribute to population distribution, collision with electrons and spontaneous radiation are usually dominant. At low plasma densities secondary collisions can be ignored and radiative transitions are dominant, while in dense plasmas nonradiative de-excitation predominates. When the electron density becomes sufficiently high, radiation intensity becomes independent of it; the plasma becomes a Boltzmann radiator.

Spectral lines from a plasma are all broadened as a result of interaction with fluctuating internal microfields. The extension can be considered in terms of two components; one described as the result of a linear Stark effect due to the interaction of ions with other, relatively slow ions, and the other due to collision broadening (also with a Stark effect component) from interactions with faster-moving electrons. The electron effect is most significant at the center of the broadened line; the statistical effect, at its edges. The center is also somewhat displaced

1/2

USSR

SOLUKHIN, R. I., et al., Opticheskiye Kharakteristiki Vodorodnoy Plazmy, Novosibirsk, "Nauka" (Siberian Branch), 1973, pp 16 - 23

from what would be obtained from an isolated atom. Although theoretical calculations for the edges of the broadened line show good agreement with experiments, computations for the central portion are considerably less satisfactory. In this area the authors base their work on a theory developed by Sobel'man, extended to cover also broadening due to collisions with other particles.

When the concentration of charged particles is low, Doppler broadening becomes significant. The integral expression for combined Doppler and dispersion broadening is not in finite form, so that calculation by approximation method is required.

2/2

- 53 -

USSR

UDC 535.343.1

SOLUKHIN, R. I., YAKOBI, Yu. A., and KOMIN, A. V., Institute of Theoretical and Applied Mechanics, Siberian Branch of the Academy of Sciences of the USSR

"Method of Performing the Calculations"

Opticheskiye Kharakteristiki Vodородной Plazmy, Novosibirsk, "Nauka" (Siberian Branch), 1973, pp 33 - 39

Abstract: Five mechanisms were considered in the computer programs used:

- 1) bound-bound electron transitions (linear radiation from atoms);
- 2) free-free and free-bound electron transitions in the field of protons (the H continuum);
- 3) free-free and free-bound electron transitions in the field of atoms (H⁻ continuum);
- 4) free-free and free-bound proton transitions in the field of atoms (the H⁺ continuum);
- 5) continuous radiation of quasi-molecular hydrogen

(H^{quasi}₂ continuum). Previous studies have lumped line spectra in two or three groups. The present work considers all transitions between discrete levels in the hydrogen atom that realistically exist in the plasma. Within the limits of the parameters chosen, this number varies from less than 10 to several tens of levels; the number of spectral lines is proportional to the square of this number. Each line is considered in its broadened form. The results are presented on a wave scale. Variable step sizes are used to keep the calculation error approximately constant over the entire spectrum. Step sizes were based on relative values of the derivative 1/2

USSR

SOLUKHIN, R. I., et al., Opticheskiye Kharakteristiki Vodorodnoy Plazmy, Novosibirsk, "Nauka" (Siberian Branch), 1973, pp 33 - 39

of spectral intensity, except where the contribution of the maximum line was less than 1/10 the background radiation, where the step size was based on the continuum. In each step the calculation of step size was based on the line making the strongest contribution, rather than the line with the nearest center.

The program was written in ALPHA, a modification of ALGOL. Calculations were performed at the computer center of the Siberian Branch, Academy of Sciences of the USSR.

2/2

USSR

UDC 535.343.1

SOLUKHIN, R. I., YAKOBI, Yu. A., and KOMIN, A. V., Institute of Theoretical and Applied Mechanics, Siberian Branch of the Academy of Sciences of the USSR

"Energy Structure of the Hydrogen Molecule"

Opticheskiye Kharakteristiki Vodородnoy Plazmy, Novosibirsk, "Nauka" (Siberian Branch), 1973, pp 12 - 14

Abstract: Quantum mechanical analysis shows that the diatomic hydrogen molecule is not stable unless the ends of the two electrons are in an antiparallel orientation. Although the two electrons of the molecule can be in various energy states, they are within an axially symmetric field whose axis of symmetry is the line connecting the two nuclei. In this case what is significant is not the absolute value of the orbital moment, but its projection on the axis $\lambda\hbar$, where \hbar is Planck's constant and λ is a quantum number similar to the magnetic quantum number m in atoms.

In addition to the electron degrees of freedom, the molecule has oscillatory and rotational degrees of freedom. For each characteristic electron state, there is a set of discrete oscillatory states, which can be obtained as the solution of Schroedinger's equation for a harmonic oscillator. Consideration of non-harmonic oscillations leads to a more complex expression. Rotation is also

1/2

USSR

SOLUKHIN, R. I., et al., *Opticheskiye Kharakteristiki Vodorodnoy Plazmy*,
Novosibirsk, "Nauka (Siberian Branch), 1973, pp 12 - 14

characterized by a discrete selection of energy states, describable in terms of the rotational quantum number, the molecular constant, and a coefficient which characterizes the relationship of rotation to oscillation (nonrigidity of the rotator). Since the hydrogen molecule does not have a constant dipole moment, it cannot in isolation have oscillatory and rotational transitions, but in a real gas this prohibition is removed because of induced electric dipole moments occurring in collisions. Although any transition can occur, transitions of ± 1 are most common. For electron-oscillatory spectra, the relative probability of various transitions is determined by the Franck-Condon principle.

2/2

51

USSR

UDC 535.343.1

SOLUKHIN, R. I., YAKOBI, Yu. A., and KOMIN, A. V., Institute of Theoretical and Applied Mechanics, Siberian Branch of the Academy of Sciences of the USSR

"Total Radiation from Hydrogen at Temperatures Below 10,000 Degrees"

Opticheskiye Kharakteristiki Vodородnoy Plazmy, Novosibirsk, "Nauka" (Siberian Branch), 1973, pp 29-33

Abstract: Calculating the radiational characteristics of gases at relatively low temperatures requires primarily consideration of molecular radiation. Detailed calculations for this were made by Olfe in 1961. For a thin layer of plasma in which self-absorption can be ignored, radiation from rotational transitions predominates up to 1000°; that from oscillation-rotational transitions between 1000 and 5000°. At higher temperatures negative hydrogen ions and positive molecular ions appear, the former more significant by an order of magnitude from 3000 to 10,000°K. At higher temperatures linear radiation becomes significant. When the plasma is of significant density and thickness, the results must be adjusted to account for the varying degrees of absorption at different frequencies and by different mechanisms.

1/1

USSR

UDC 535.343.1

SOLUKHIN, R. I., YaKObI, Yu. A., and KOMIN, A. V., Institute of Theoretical and Applied Mechanics, Siberian Branch of the Academy of Sciences of the USSR

"Energy Structure of the Hydrogen Atom"

Opticheskiye Kharakteristiki Vodorodnoy Plazmy, Novosibirsk, "Nauka", (Siberian Branch), 1973, pp 9-12

Abstract: Schroedinger's equation yields solutions only for negative values of E for which

$$E_n = - \frac{2\pi^2 m e^4}{h^2 n^2} = \frac{R h}{n^2},$$

where n is a whole number and R is the Rydberg constant. m must be replaced by $\frac{mM}{m+M}$,

where m is the mass of the electron and M is the mass of the nucleus, to account for movement of the nuclear mass. Relativistic generalization of Schroedinger's equation requires that azimuthal quantum numbers be considered in addition to the primary number n. In the presence of an external field, the

USSR

SOLUKhIN, R. I., et al., Opticheskiye Kharakteristiki Vodородnoy Plazmy, 1973, pp 9-12

magnetic quantum number must also be considered (Zerman effect). However, not all transitions described by this scheme are found in spectroscopic observation. According to quantum mechanics, the following types of optical dipole transitions are possible: change in azimuthal quantum number = ± 1 ; change in magnetic quantum number = 0 ± 1 ; change in $m = 0$; change in internal quantum number (| azimuthal $\pm m_s$ |) = 0 ± 1 .

2/2

- 48 -

USSR

UDC 535.343.1

SOLUKHIN, R. I., YAKOBI, Yu. A., and KOMIN, A. V., Institute of Theoretical and Applied Mechanics, Siberian Branch of the Academy of Sciences of the USSR
"The Composition of Hydrogen Plasma"

Opticheskiye Kharakteristiki Vodородnoy Plasmy, Novosibirsk, "Nauka"
(Siberian Branch), 1973, pp 5-9

Abstract: A plasma of pure hydrogen can contain ten different kinds of particles -- H_2 and H_3 molecules, positive and negative ions of these molecules, atoms, positive and negative ions of the atoms, and free electrons. Diagrams are given to show the relative contribution of each of these particles as a function of temperature and pressure. The law of mass action gives the relative amounts of large particles and their breakdown products as functions of the degrees of freedom of each such component. There are four types of freedom: electron, oscillatory, rotational, and translational. The product of the first three is the statistical sum of internal degrees of freedom, called the statistical weight of the particle. There are formulas for finding each of these as the sum of a series in terms of energy of excitation, electron level, natural oscillation frequency, oscillatory quantum number, and other factors. Translational freedom can also be expressed in terms of mass and relative volume.

1/2

USSR

SOLUKHIN, R. I., et al., *Opticheskiya Kharakteristiki Vodorodnoy Plasmy*, 1973, pp 5-9

Since dissociation and ionization ordinarily begin at temperatures significantly below the corresponding binding energy, because of the high statistical sum of the free state, in the majority of cases only the basic electron term need be considered and the unharmonic nature of hydrogen molecule oscillations can be ignored. Several studies have determined ionization energy in a plasma and its reduction due to the total electric field of charged particles around the atom, particularly Ecker and Kroell (1963). The thermodynamic calculations of plasmic composition made in the present work yielded results close to those obtained by Patch in 1969.

2/2

- 47 -

USSR

UDC 535.343.1

SOLUKHIN, R. I., YAKOBI, Yu. A., and KOMIN, A. V., Institute of Theoretical and Applied Mechanics, Siberian Branch of the Academy of Sciences of the USSR

"On the Thermodynamics of Radiation"

Opticheskiye Kharakteristiki Vodородnoy Plazmy, Novosibirsk, "Nauka" (Siberian Branch), 1973, pp 14-16

Abstract: The primary obstacle to establishing equilibrium in a system including radiation is the loss of energy by radiation outside the system. An excited particle can lose energy either through a damping collision or by spontaneous radiation. If there is any significant ionization, the majority of collisions are with electrons. Thus, given the damping collision cross-section of the particle and its radiational lifetime (considering also stimulated emission), the relative probabilities of damping and radiation can be calculated. If damping is more probable, local thermodynamic equilibrium may be established. Overall equilibrium will depend on the volume absorption coefficient and the relative probability of damping. The calculations for absorption must consider re-radiation, so that "absorption" implies a sufficient number of collisions to make the probability of damping high. If this total path length is much greater than the dimensions of the volume, the result is

1/3

- 45 -

USSR

SOLUKhIN, R. I., et al., Opticheskiye Kharakteristiki Vodородnoy Plazmy, 1973, pp 14-16

volume radiation; if it is much less, surface radiation. Equilibrium radiation of a surface plasma radiator is equivalent to that of an absolute black body and is referred to as Planck radiation. Volume equilibrium in the sense of local thermodynamic equilibrium yields so-called Boltzmann radiation, since the nature of the radiation is determined by the Boltzmann distribution of electrons in levels. While a special form of Kirchhoff's law applies to the latter case and the black body radiation is determined from Planck's formula, nonequilibrium radiation can be analyzed only by solving an enormous system of kinetic equations, since nature depends on the probabilities of a large number of elementary processes.

In a moderately dense plasma local thermodynamic equilibrium is the most probable state; it is sufficient for the probability of collision processes to exceed the probability of radiation processes by an order of magnitude. In fact, the rigidity of this condition for a resonance transition with maximum probability of spontaneous radiation can be significantly reduced in the majority of real cases by the trapping of radiation in the optically dense plasma. Since most experimental installations produce a plasma for a short time, it is necessary to verify that the time to establish equilibrium is brief in comparison with the time to establish a quasi-stable state. This can be

2/3

USSR

SOLUKhIN, R. I., et al., Opticheskiye Kharakteristiki Vodorodnoy Plazmy, 1973,
pp 14-16

done by considering the slowest process, the relaxation of the resonance level.
Under experimental conditions, radiation scattering (primarily Thomson
scattering) is ignored, since the mean free path is very long; under actual
physical conditions, this factor may be important.

3/3

- 46 -

USSR

UDC 535.343.1

SOLUKHIN, R. I., YAKOBI, Yu. A., and KOMIN, A. V., Institute of Theoretical and Applied Mechanics, Siberian Branch of the Academy of Sciences of the USSR

Opticheskiye Kharakteristiki Vodorodnoy Plazmy (Optical Characteristics of Hydrogen Plasma), Novosibirsk, "Nauka" (Siberian Branch), 1973, 82 pp

Abstract: Results are given from detailed calculations of the special characteristics of hydrogen plasma over a wide range of parameters, considering all significant radiation mechanisms. The material on the computation is preceded by a brief systematic summary of information about the hydrogen atom and molecule and the composition and thermodynamic and gas dynamic properties of the hydrogen plasma. Radiation processes are covered in detail, including radiation from nonisothermic plasma, which requires simultaneous consideration of radiation and thermal conduction. In this connection, the results of the calculations are discussed, recommendations for their practical use are made, and some questions of the diagnostics of hydrogen plasma are examined.

This material will be useful to a broad group of engineer-physicists and graduate students and students in senior courses specializing in spectroscopy, plasma physics, astrophysics, and physical gas dynamics.

1/3

USSR

SOLUKHIN, R. I., et al., Opticheskiye Kharakteristiki Vodorodnoy Plazmy, 1973,
82 pp

CONTENTS

	<u>Page</u>
Introduction	3
1. The Composition of Hydrogen Plasma	5
2. Energy Structure of the Hydrogen Atom	9
3. Energy Structure of the Hydrogen Molecule	12
4. On the Thermodynamics of Radiation	14
5. Spectral Lines	16
6. The Continuum	23
7. Total Radiation from Hydrogen at Temperatures Below 10,000 Degrees	29
8. Method of Performing the Calculations	33
9. Discussion of Some Results of the Calculations	40
10. Optical Diagnostics of Plasma	48
11. Radiation of a Nonisothermic Plasma. Transfer Coefficients	55
12. Radiation of a Quasi-Equilibrium Hydrogen Plasma, Considering Conductive Thermal Conductivity	59
13. Gas Dynamic Properties and Elements of Radiation Gas Dynamics	61
14. Laser Heating of a Plasma	69

2/3

- 14 -

USSR

SOLUKhIN, R. I., et al., Opticheskiye Kharakteristiki Vodorodnoy Plazmy,
1973, 82 pp

15. The Role of Hydrogen Plasma Radiation in the Problem of
Thermonuclear Fusion
Appendix

73
79

3/3

USSR

UDC 535.343.1

SOLUKHIN, R. I., YaKObI, Yu. A., and KOMIN, A. V.; Institute of Theoretical and Applied Mechanics, Siberian Branch of the Academy of Sciences of the USSR

"Optical Diagnostics of Plasma"

Opticheskiye Kharakteristiki Vodородnoy Plazmy, Novosibirsk, "Nauka"
(Siberian Branch), 1973, pp 48-55

Abstract: Plasma characteristics (primarily the concentration and temperature of various components) are determined from active and passive optical analysis. Passive methods, in which the plasma is illuminated by external sources, have the advantage of causing less perturbation to the plasma than other sampling techniques, although nonlinearities must be considered when such strong light sources as lasers are used.

The most developed methods are based on measurement of radiative and absorptive properties, although measurements of the index of refraction are also used. Due to the complexity of optical processes in a plasma, the most widely used method is to begin with rough measurements based on one of the basic radiation mechanisms and proceed to more detailed analysis. Although in some particularly clear situations this method is expedient, there are many cases in which the preliminary determination of the primary mechanism is quite

1/3

USSR

SOLUKHIN, R. I., et al., Opticheskiye Kharakteristiki Vodородnoy Plazmy, Novosibirsk, 1973, pp 48-55

difficult or even meaningless. In addition, the overwhelming majority of these methods assume an optically rare plasma; when self-absorption must be considered, this analytical approach leads to very complex expressions. A more general approach, ignoring only those components whose contribution is obviously unimportant, is clearly necessary. The use of computer calculations over a broad range of parameters provides this more general approach, serving as a "mathematical experiment" to relate the results of different studies and serve as a guide for future research.

The index of refraction is the foundation of another group of methods, primarily interferometry and Schlieren methods. These methods can determine the density and density gradient of a single type of particle when this type has primary influence on the effects of refraction. The relative sensitivity of these two methods depends on the effective radius of the plasma formation, the diameter of the focal point, the focal length of the lenses used in the Schlieren method, and the wave length of light employed.

Primary attention is currently on the use of infra-red and x-ray-probe wave lengths. Infra-red is particularly sensitive to the charged particle components, including the electron continuum. Passive x-ray diagnosis can be used in determining parameters of a high-temperature plasma along the discharge

2/3

USSR

SOLUKHIN, R. I., et al., Opticheskiye Kharakteristiki Vodorodnoy Plazmy, Novosibirsk, 1973, pp 48-55

axis.

As a rule, the diagnostic methods produce information about the plasma in a given element of the volume at a specific moment in time. Local discrimination is achieved usually by using the Abel transform and assuming axial symmetry of the plasma formation. Time discrimination is achieved by using various types of time scanning. Optical analysis of hydrogen plasma is characterized by four specific factors: 1) absence of a constant dipole moment; 2) relatively high availability of electrons, so that the continuum in the initial stages of ionization is determined primarily by radiation related to negative ions; 3) the Stark effect as a primary determinant of the spectral line broadening; 4) complete ionization at high plasma temperatures.

3/3

- 43 -

USSR

UDC 535.343.1

SOLUKHIN, R. I., YaKOBI, Yu. A., and KOMIN, A. V., Institute of Theoretical and Applied Mechanics, Siberian Branch of the Academy of Sciences of the USSR

"The Role of Hydrogen Plasma Radiation in the Problem of Thermonuclear Fusion"

Opticheskiye Kharakteristiki Vodorodnoy Plazmy, Novosibirsk, "Nauka" (Siberian Branch), 1973, pp 73-76

Abstract: In the majority of thermonuclear installations radiation is the primary source of heat loss, since the times involved are too short for convection losses (particularly when viscosity is increased by a magnetic field), and conductive heat loss can be ignored when the plasma is separated or distant from the walls. For a deuterium-tritium plasma the necessary conditions can be achieved at temperatures over 5 kev, while for pure deuterium they cannot be achieved at all unless the magnetic field is used only for thermal insulation, not retention of the plasma, or measures are taken to reduce radiation loss (use of an optically thick plasma or radiation-reflecting walls).

Quantitative information about radiation capacity of the plasma makes it possible to determine the minimum power of a steady-state reactor and the minimum temperature of its center in the general case of combined heat transfer

1/3

USSR

SOLUKHIN, R. I., et al., Opticheskiye Kharakteristiki Vodородnoy Plazmy, 1973, pp 73-76

and radiation losses. Assuming the plasma is not separated from the wall and its lifetime is not limited by instabilities, the zone of maximum brightness will be a hollow cylinder at a temperature of several electron volts. Calculations indicate a minimal temperature of about 7 kev at the center of a reactor without magnetic field, using a 50% deuterium-tritium mixture. The dimensions of such a reactor must be on the order of several kilometers and the heat loads on its walls must greatly exceed the capacity of modern materials.

Calculations show that an equilibrium reactor with a magnetic field would not produce energy at the center sufficient to compensate losses at the exterior due to the poor heat transfer properties of the magnetized plasma and that reflecting shells would be difficult to obtain, since most of the radiation is in the form of x-rays.

Since continuous operation is apparently impossible, attention is currently focused on various short-term processes. One main line of research involves the use of relatively long laser pulses for supplementary heating of plasma in various magnetic containment devices, while a second line is directed toward the use of very short-powerful laser pulses to bring targets

2/3

USSR

SOLUKHIN, R. I., et al., Opticheskiye Kharakteristiki Vodorodnoy Plazmy, 1973, pp 73-76

to the threshold of useful fusion without auxiliary containment. Unfortunately laser efficiencies at the wave length needed for this second process are very low. There is also work being done on combined fusion-fission mechanisms, using the fusion to produce additional neutrons for improved fission output.

3/3

- 40 -

USSR

UDC 535.343.1

SOLUKHIN, R. I., YAKOBI, Yu. A., and KOMIN, A. V., Institute of Theoretical and Applied Mechanics, Siberian Branch of the Academy of Sciences of the USSR

"Radiation of a Quasi-Equilibrium Hydrogen Plasma, Considering Conductive Thermal Conductivity"

Opticheskiye Kharakteristiki Vodorodnoy Plazmy, Novosibirsk, "Nauka" (Siberian Branch), 1973, pp 59-61

Abstract: Only conductive and radiant heat transfer are considered in this book, although convective transfer is important in a number of cases, because convective heat transfer has not been adequately studied, either theoretically or experimentally. There are, however, many cases in which convective transfer does not occur.

The relative contributions of radiant and convective heat transfer for a plasma without interior directed velocities can be determined from the differential equation of radiation transport and the law of energy conservation. If the absorbed energy is much less than the radiated energy, the system of descriptive equations can be reduced to two equations; an expression for heat transfer which determines the state of matter throughout the entire volume, and an expression of radiation transfer which can be used to find the spectral density of radiation. This occurs in an optically thin system without external

USSR

SOLUKHIN, R. I., et al., *Opticheskiye Kharakteristiki Vodorodnoy Plazmy*,
1973, pp 59-61

radiation flows. A similar separation can be obtained if the absorbed energy is greater than the radiated energy, but the total absorption of the radiation flow throughout the entire volume is less than the flow of energy related to heat transfer and is thus incapable of changing the temperature distribution. Truly radiative transfer states also exist, described by the so-called diffusion or radiant heat transfer approximations. Although the assumption that radiant heat transfer exceeds conductive transfer is correct in the overwhelming majority of cases, there is a region in which this is not true.

2/2

USSR

UDC 535.343.1

SOLUKHIN, R. I., YAKOBI, Yu. A., and KOMIN, A. V., Institute of Theoretical and Applied Mechanics, Siberian Branch of the Academy of Sciences of the USSR

"Radiation of a Nonisothermic Plasma. Transfer Coefficients"

Opticheskiye Kharakteristiki Vodorodnoy Plazmy, Novosibirsk, "Nauka", (Siberian Branch), 1973, pp 55-58

Abstract: In the presence of a substantially nonisothermic plasma, radiation transfer is described with the aid of special coefficients, calculated, in turn, from the spectral characteristics of isothermal plasmas. In an optically thin layer, the divergence of radiation flow can be described by using modified Planck coefficients, while an optically dense plasma is described by Rosseland's equation. In the general case of arbitrary optical density, the radiation transfer is computed by using the so-called modified emission capacity. Although the calculations are simpler for extremely thin plasmas in which lines predominate or extremely thick plasmas in which the continuum is dominant, real situations usually require dealing with the more complex calculations of intermediate cases.

1/1

USSR

UDC 535.343.1

SOLUKHIN, R. I., YAKOBI, Yu. A., and KOMIN, A. V., Institute of Theoretical and Applied Mechanics, Siberian Branch of the Academy of Sciences of the USSR

"Laser Heating of a Plasma"

Opticheskiye Kharakteristiki Vodorodnoy Plazmy, Novosibirsk, "Nauka" (Siberian Branch), 1973, pp 69 - 72

Abstract: Laser heating is one of the proposed methods of attaining a controlled thermonuclear reaction. The necessary conditions are the opposite of those necessary for optical analysis without perturbation. There are varying difficulties in this process. At low temperatures, there are many energy-absorbing transitions to be passed through, and radiation losses begin to be significant as the plasma is heated. At higher temperatures, effective heating is also reduced by the increase in transparency of the plasma. The heating must be rapid to prevent loss of heat to the walls and the development of instabilities. Use of a solid or liquid target, although it requires additional energy for melting and evaporation, makes attainment of the Lawson criterion easier because of the high initial plasma density; if evaporation takes place from all sides simultaneously, a significant compression factor can be added.

At thermonuclear temperatures, only inverse bremsstrahlung is effective for heating. For plasmas of moderate density (less than or equal to 10^{19}cm^{-3}),

1/2

USSR

SOLUKHIN, R. I., et al., Opticheskiye Kharakteristiki Vodородnoy Plazmy, 1973, pp 69-72

infra-red lasers are significantly more effective, but short-wave lasers are most effective for heating solid targets. The decrease in the coefficient of absorption at very high temperatures may be compensated by the inverse cyclotron effect. Heat absorption may also be increased by several new types of non-linearities that have recently been reported.

2/2

- 38 -

USSR

UDC 535.343.1

SOLUKhIN, R. I., YAKOBI, Yu. A., and KOMIN, A. V., Institute of Theoretical and Applied Mechanics, Siberian Branch of the Academy of Sciences of the USSR

"Gas Dynamic Properties and Elements of Radiation Gas Dynamics"

Opticheskiye Kharakteristiki Vodorodnoy Plazmy, Novosibirsk, "Nauka" (Siberian Branch), 1973, pp 61-69

Abstract: In many cases, gas dynamic properties of plasmas must be considered along with radiative properties. The authors arbitrarily distinguish two thermodynamic regions: a) temperature less than 10 electron volts and pressure less than 1 atmosphere -- radiation is not blocked and the pressure of the photon gas may be ignored; b) a "black" plasma at high temperatures and densities -- radiation energy and pressure must be considered. There are also such cases as the propagation of shock waves with high radiation flow, in which it is necessary to consider changes in the thermodynamic properties of the gas ahead of the front due to absorption of the flow of advance radiation from the hot gas behind the front. Knowledge of some thermodynamic and gas dynamic properties of low-temperature hydrogen plasma is therefore also necessary. Where there is overall flow of matter in an optically thin plasma, the usual hydrodynamic equations must be supplemented by a radiant energy factor which represents a volume energy source. For an optically thick body in which the radiant heat transfer approximation holds, the state of the matter is determined solely by its optical properties. In other cases, as in the problem

1/2

USSR

SOLUKHIN, R. I., et al., Opticheskiye Kharakteristiki Vodorodnoy Plazmy, 1973, pp 61-69

without material flow, a complete system of equations must be solved.

The equilibrium concepts used by the authors are applicable to quasi-equilibrium processes, since the time to establish equilibrium between radiation and matter is of the same order as the lifetime of the photon, which is usually very much less than the characteristic times of hydrodynamics, which are equal to or less than the thermal velocities of the molecules. Of course, the usual conditions of quasi-equilibrium must be supplemented by a condition that the radiation absorbed by matter in the time interval of interest does not change the state of the matter.

2/2

- 37 -

USSR

UDC: 533.9...15

SOLOUKHIN, R. I., YAKOBI, Yu. A.

"Methods of Infrared Diagnosis and Laser Interferometry in Gas Dynamics"

Novosibirsk, Aerofiz. issledovaniya--sbornik (Aerophysical Research--collection of works), 1972, pp 27-32 (from RZh-Fizika, No 6, Jun 73, abstract No 6G128 by V. Ch.)

Translation: Optical methods were used to study a pulse discharge plasma in shock tubes. Laser interferometry and schlieren photography were used. A diagram is given of the experimental equipment, which enables rapid conversion from one research method to another or a combination of different methods. The principal components are a carbon dioxide laser and a Michelson interferometer. The authors give the radial distributions of electron density in the forward pulse discharge, as well as a schlieren signal oscillogram which shows a series of sequential radial perturbations. Experiments for measuring absorption in a pulsed discharge of molecular hydrogen emission on a wavelength of 10.6 μ m are briefly described. Detailed calculations of the absorption coefficient of the plasma were made for interpretation of these measurements. The following are obtained and presented for the shock tube: an oscillogram of the phase advance, the profile of the electron concentration behind the shock wave front, and the variation of maximum electron concentration with temperature.

1/1

USSR

UDC 621.375.9

SKOVORODKO, P. A., YAKOBI, Yu. A., Novosibirsk

"Inverse Population and Emission Density in a Q-Switched CO₂ Laser"

Moscow, Zhurnal Prikladnoy Mekhaniki i Tekhnicheskoy Fiziki, No 6, Nov/Dec
72, pp 18-23

Abstract: Processes which take place in a CO₂ laser with Q-switching are numerically analyzed on the basis of a system of kinetic equations for laser level populations and the density of radiant energy in the cavity. It is shown that the process of laser Q-switching is oscillatory. The time of relaxation of emission density to the steady state depends on the difference between losses in the terminal and initial states and varies for a CO₂ laser over a range of 0.1-1 ms; this corresponds in order of magnitude to the relaxation time of the upper laser level. The authors thank R. I. Soloukhin for constant interest and assistance with the work.

1/1

USSR

YAKOBI, Yu. A.

UDC: 621.373.029.7.001.5

"Phase Relations in a Michelson Laser Interferometer"

Moscow, Radiotekhnika i Elektronika, Vol 17, No 4, Apr 72, pp 787-793

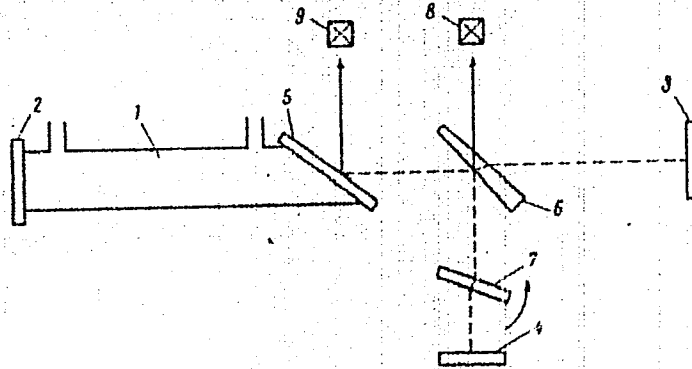
Abstract: The author studies the phase relations between the modulating signal, the radiation density in the cavity and the emission power of a Michelson CO₂ laser interferometer. The optical system of the installation is shown in the figure. The unit is supported by a massive stand and all mirrors are flat. A rock salt beam splitter in the form of a two-degree wedge is used to ensure interference on only one face. The interferometer is sharply asymmetric since the intensities of the radiant fluxes going from mirror 2 to mirrors 3 and 4 amount to 99 and 1% respectively as shown by Fresnel's formulas. The beam splitter acts as a power decoupler. A change in the optical length of one of the legs of the Michelson interferometer changes the phase shift between the radiant fluxes reflected from mirrors 3 and 4, which results in variation of the output power. Thus only the energy coupled out of the cavity is modulated rather than all the energy stored in the laser. This increases the width of the modulation band. The

1/2

USSR

YAKOBI, Yu. A., Radiotekhnika i Elektronika, Vol 17, No 4, Apr 72, pp 787-793

phase relations derived in this paper should be taken into account when using laser interferometers for studying rapidly alternating processes. The author thanks R. I. Soloukhin for continued interest in the work and for constructive criticism, and P. A. Skovorodko for the computer calculations.



1--laser discharge tube; 2, 3, 4--mirrors; 5--Brewster window; 6--NaCl Beam Splitter; 7--rotating BaF₂ plate; 8, 9--photoresistors

2/2

USSR

UDC 621.384.66

PAPADICHEV, V. A., and YAKOBI, Yu. A. (Novosibirsk)

"Measurement of Magnetic Field in Charged-Particle Accelerators by Paired Coil Method"

Novosibirsk, Avtometriya, No 3, May-Jun 70, pp 76-80

Abstract: In the variable magnetic field in the vacuum chamber of a charged-particle accelerator the field gradient can be measured by means of two induction coils whose axes are parallel and directed along the Z-axis. The article describes methods which assure the required accuracy even in the case of comparatively rough adjustment of the coil sensitivities and parallelism. These methods also permit the elimination of errors due to interference from the magnetic field source. One of the methods (the turn method) compensates for measurement errors by turning the sensor 180° about the Z-axis. The second method (the "effective distance" method) provides error compensation by replacing the quantity Δz_0 (the distance between the axes of the coils) with the parameter Δz_{eff} . The latter is determined from measurement of the "median plane" separately for each coil.

1/1

YAKOBLESON, V.

Medicine

Sci: Airway Neural System
12 Jan 72
U.S. 013.01(07.07).001.68

FOR MOST EFFECTIVE STUDY BY STUDENTS OF SOME PROBLEMS OF CONTROL OF THE CONDITIONS OF LEVEL OF PERSONNEL OF TRAINING AND VISITING THE LEVEL OF ASSISTANCE BY THEM TO DEVELOP-ED A PROGRAMMED TRAINER (PICTURE 1).

Articles by Lieutenant Colonel A. A. Chikobava, and V. Ya. Yakobleson, Medical Services, Moscow, *VOYENNO-MEDITSINSKIY zhurnal*, No. 3, 1971, submitted for Volume 1972, pp. 88-90.

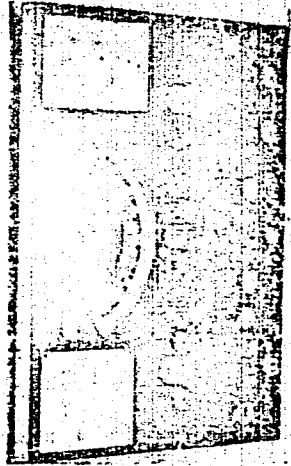


Figure 1. General View of Trainer

- 140 -

11/12/72

USSR

UDC: 620.179.15

YAKOBSON, A. M., LEONOV, B. I., KANTER, B. M., and KOPELIOVICH, M. Kh.

"Comparative Experimental Estimate of Various Visual X-Ray Introsopic Systems Using Electronic Devices"

Sverdlovsk, Defektoskopiya, No. 4, 1970, pp 137-139

Abstract: The authors of this brief communication, members of the Scientific Research Institute of Introscopy, discuss the laboratory model of the RIUS UM-92 Introscope, and offer indices by which this instrument can be compared with the RTI, an x-ray television introscope with a monocrystalline screen, described in an earlier article by the first-named author in collaboration with K. M. Dzhgalyan (Zavodskaya laboratoriya, 1962, No. 5). The RIUS UM-92 described in the present article is also an x-ray introscope with a monocrystalline screen, and uses an electron-optical light amplifier of the UM-92 type. A simple diagram of the instrument given in this article shows that the radiation from an x-ray source is projected through the specimen under examination onto the monocrystalline screen, the x-rayed image being converted to a light image by the screen and then put through the light amplifier and a telescope to the observer's eye. A third instrument containing
1/2

- 88 -

USSR

UDC 616.936-084.4(470.41)

CHUYEVA, S. V., and YAKOBSON, B. L., Republic Sanitary Epidemiological Station of the Tartar ASSR, Kazan'

"Organization of Malaria Control, Eradication of Malaria, and Prophylaxis of this Disease in the Tartar ASSR"

Moscow, Meditsinskaya Parazitologiya i Parazitarnyye Bolezni, Vol 41, No 6, Nov/Dec 72, pp 747-750

Abstract: During 1920-70 there were two significant rises in the incidence of malaria in the Tartar ASSR, one in 1923 and another in 1935. In 1936-43 the incidence of malaria steadily decreased. There was a slight increase in 1943-44 as a result of conditions due to World War II, but the increase brought about by the war was insignificant, because measures for the control of this disease were not interrupted. In 1951 malaria was eliminated as a mass disease in the Tartar ASSR. In 1962 there was only a single case of malaria there that originated locally. In 1966-70 there were individual cases of malaria among USSR citizens who had returned from assignments in African and Asian countries and had become infected there. In 1962 there were 32 antimalaria stations, which in 1955 were incorporated in the sanitary epidemiological stations. Mass examination of the population for the presence of malaria was carried out; in the period after World War II, up to 600-800 thousand persons per year were

1/2

USSR

CHUYEVA, S. V. and YAKOBSON, B. L., Meditsinskaya Parazitologiya i Parazitarnyye Bolezni, Vol 41, No 6, Nov/Dec 72, pp 747-750

examined. In 1954, the number of persons examined had been increased to 910 thousand to establish reliably that malaria as a mass disease had been actually eradicated. In regions in which the chances of infection with malaria were great, chemoprophylaxis was carried out on an extensive scale. Dusting against mosquitoes and draining of areas covered with stagnant water were applied. While malaria has been eliminated, the danger of the development of new foci of infection still exists. In connection with the construction of the Volga Reservoir imeni V. I. Lenin and its filling starting with 1956, shallow flooding developed in areas at Kazan', Chistopol', and Zelenodol'sk as well as in 13 rayons with the result that favorable conditions for the breeding of Anopheles mosquitoes were created. However, because of the effective measures taken, malaria did not appear in the regions in question. Great attention is being paid to the prevention of malaria at the site of the construction of the Kama Automobile Plant at Nabrezhnyye Chelny, which will be located in an area in which malaria may develop, and in the 3 km zone of populated localities downstream from there, which will be affected by the construction of the dam of the Lower Kama Hydroelectric Station.

2/2

USSR

UDC 678.06-419:677.521.01:53

SHISHKO, V. I., BARANOVSKIY, V. V., AVRASIN, YA. D., NERST, V. B., YAKOBSON, B. V., ZANDELWICH, V. N., and VALULENKO, YE. G.

"Glasstextolites Based on Non-Woven Fiberglass Reinforced Materials"

Moscow, *Plasticheskiye Massy*, No 3, 1972, pp 70-73

Abstract: Properties are described of the binding, suturing non-woven fiber-glass materials and glasstextolites made from them for structural materials, and electrical insulation. It was established that it is economically feasible to use the nonwoven materials in production of glasstextolites for various purposes. Production of non-woven fiberglass reinforced materials from non-twisted glass thread facilitates the production expansion of the glasstextolites and reinforced plastics, both in regard to the volume and variety of materials. One of the most promising materials, in this area is the VPS-10 reinforcing material consisting of two glass laminated systems, in which 10 layers are overlaid at 95°, stitched with glass thread.

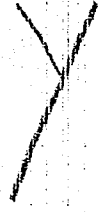
1/2 026

UNCLASSIFIED

PROCESSING DATE--18SEP70

TITLE--PREPARATION OF BLOCK COPOLYMERS OF PROPYLENE AND ALPHA OLEFINS -U-
AUTHOR--(05)-YAKOBSON, F.I., AMERIK, V.V., PETROVA, V.F., SHTEYNBAK, V.SH.,
IVANYUKOV, D.V.

COUNTRY OF INFO--USSR



SOURCE--PLAST. MASSY 1970, (3), 11-13

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY, MATERIALS

TOPIC TAGS--COPOLYMER, PROPYLENE, CATALYTIC POLYMERIZATION, TITANIUM
CHLORIDE, INTRINSIC VISCOSITY, ETHYLENE, ISOBUTENE, STYRENE,
CYCLOHEXANE, FREEZING, IMPACT, STRENGTH

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1986/0259

STEP NO--UR/0191/70/000/003/0011/0013

CIRC ACCESSION NO--AP0102309

UNCLASSIFIED

2/2 026

UNCLASSIFIED

PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0102309

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE INFLUENCE OF REACTION CONDITIONS (TIME (5 MIN, 5 HR), CONC. OF MONOMER AND TiCl₃, MACRO CHAINS IN POLYMER. OF PROPYLENE (II) (MIXED WITH PROPANE) CATALYZED BY 4:1 ET SUB₂ AlCl₃ AND TiCl₃ MIXTS. WAS STUDIED. MOL. WTS., CALCD. FROM POLYMER INTRINSIC VISCOSITY DETNS. IN DECALIN, INCREASED ABRUPTLY WITH REACTION TIME AND TEMP. WHETHER MONOMER CONC. WAS DECREASING OR CONST. INCREASING TiCl₃ CONC. (0.4 TO 3.5 TIMES 10² PRIME NEGATIVE² MOLE⁻¹.) DID NOT INFLUENCE CHAIN VIABILITY, BUT DECREASED INTRINSIC VISCOSITY, PROBABLY DUE TO INCREASED NOS. OF ACTIVE CENTERS. THE LINEAR DEPENDENCE OF POLYMER YIELD ON MOL. WT. AT DIFFERENT REACTION TIMES AND TiCl₃ CONCNS., EXCLUDING INITIAL NON STEADY STATE REGIONS, INDICATED FREEDOM FROM MOL. CHAIN TERMINATION AND AFFIRMED THE EXISTENCE OF LIVING MACROMOLS. IN THE SYSTEM. SUCCESSIVE POLYMER. OF II WITH ETHYLENE (0.13 TO 1 PERCENT), ISOBUTYLENE (III) (4 TO 4.8 PERCENT), VINYL CYCLOHEXANE, AND STYRENE (1 TO 1.2 PERCENT) AND III (3 TO 4.1 PERCENT) GAVE BLOCK COPOLYMERS HAVING RESISTANCE TO FREEZING IMPACT STRENGTH 2 TO 4 AND 2 TO 3 TIMES, RESP., GREATER THAN THOSE OF I.

UNCLASSIFIED

USSR

YAKOBSON, G. E.

"Generalized Problem of Successive Decomposition of Finite Automata"

Sb. Nauch-tekhn. Statey. N.-i i Proyektno-tekhnol. In-t Sistem Planir. i upr. v elektronrom-sti [Collected Scientific Articles of Scientific Research and Planning-Technological Institute for Systems of Planning and Control in the Electronics Industry], No 14, 1971, pp 114-119. (Translated from Referativnyy Zhurnal, Kibernetika, No 2, 1972, Abstract No 2 V420).

NO ABSTRACT.

1/1