2/3 017 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0121682

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE FORMATION OF SOLID SOLNS. OF FE SUB2 TIO SUB4 AND MN SUB2 TIO SUB4 AND THE PHASE EQUIL. PROCESSES OCCURING DURING THE REDN. OF SOLID SOLNS. WERE STUDIED. SYNTHETIC FE SUB2 TIO SUB4 AND MN SUB2 TIO SUB4 WERE PRESSED INTO TABLETS AND HEATED FOR 10 HR AT 1100DEGREES UNDER AN ATM. OF 88 VOL.PERCENT CO AND 12 VOL.PERCENT CO SUB2. THE SAMPLES THEN WERE TEMPERED IN WATER AND ANALYZED BY USING AN X RAY METHOD. FE SUB2 TIO SUB4 AND MN SUB2 TIO SUB4 ARE PERFECTLY MISCIBLE, FORMING A CONTINUOUS SERIES OF SOLID SOLNS. HAVING A CRYSTAL LATTICE OF SPINEL STRUCTURE. THE PERIOD OF THE LATTICE INCREASES WITH INCREASING CONCN. OF MN SUB2 TIO SUB4 IN THE SOLID SOLN. AND RANGES WITHIN THOSE OF PURE FE SUB2 TIO SUB4 AND MN SUB2 TIO SUB4 (8.535-8.679 ANGSTROM). THE STUDY OF THE EQUIL. COMPN. OF THE SAMPLES AS A FUNCTION OF THE AMT. OF O PRESENT WAS PERFORMED BY HEATING THE SAMPLES AT 1000DEGREES UNDER AN ATM. OF H AND H SUB2 O. THE AMT. OF O PRESENT IN THE SAMPLE (EXPRESSED IN PERCENT OF THE TOTAL AMT. OF O PRESENT) WAS CONTROLLED BY CHANGING THE PARTIAL PRESSURE OF H IN THE REDUCING ATM. ON REMOVAL OF 0-25PERCENT O, SPINEL, RHOMBOHEDRAL, AND METALLIC FE PHASES ARE IN EQUIL. THE SPINEL PHASE CONSISTS OF A SOLID SOLN. OF MN SUB2 TIO SUB4 AND FE SUB2 TIO SUB4. THE RHOMBOHEDRAL PHASE CONSISTS OF SOLID SOLN. OF ILMENITE AND PYROPHANITE. ON INCREASING OF THE AMT. OF O REMOVED, THE CONCN. OF FE SUB2 TIO SUB4 IN THE SPINEL PHASE DECREASES AND THE CONCN. OF PYROPHANITE IN THE RHOMBOHEDRAL PHASE INCREASES. AT 25-35PERCENT O REMOVAL, A RHOMBOHEDRAL PHASE EXISTS IN EQUIL. WITH A TIO SUB2 PHASE AND A METALLIC FE PHASE.

UNCLASSIFIED

3/3 017 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0121682

ABSTRACT/EXTRACT--AS THE AMT. OF O REMOVED IS INCREASED, THE AMT. OF ILMENITE PRESENT IN THE RHOMBOHEDRAL PHASE INCREASES.

UNCLASSIFIED

Acc. Nr: AP0049439 Abstracting Service: CHEMICAL ABST. 5/70 Ref. Code: 7UR0370

104620e Thermodynamic analysis of the reduction of solid solutions of iron orthotitanate with magnetite. Shchepetkin, A. A.; Antonov, V. K.; Dvinin, V. I.; Men, A. N.; Chufarov, G. I. (USSR). *Izv. Akad. Nauk SSSR, Metal.* 1970, (1), 51–5 (Russ). The coeffs. of the equation for the equil. O_2 pressure (P_O, given in atm.) vs. c were calcd. for spinel solid solns. $(Fe_3O_4)_c(Fe_2TiO_4)_{1-c}$ in equil. with $FeO_{1+\delta}$ at 1000°: $\ln P_O = 5.11c - 34.11$ (for $0.10 \leq c \leq 0.55$), $\ln P_O = 9c - 36.25$ (for $0.55 \leq c \leq 0.70$), and $\ln P_O = 0.43c - 30.25$ (for $0.70 \leq c \leq 1.0$). The expressions for activities (a) of the components of the system were derived for 2 cases: (*1*) for the equil. of $FeO_{1+\delta}$ with spinel solid soln. of compn. close to that of magnetite: $d(\ln a_1) - 2.21\, d(\ln a_1) - 1.17\, d(\ln a_2) = 0.305\, d(\ln P_O)$; (*2*) for the equil. of $FeO_{1+\delta}$ with a spinel solid soln. of compn. close to that of Fe_2TiO_4: $d(\ln a_4) - 2.678\, d(\ln a_1) - 0.484\, d(\ln a_3) = 0.419\, d(\ln P_O)$, where $a_1 = a_{FeO}$, $a_2 = a_{Fe_{2/3}O}$, $a_3 = a_{Fe_2TiO_4}$, and $a_4 = a_{Fe_3O_4}$. The defect state of $FeO_{1+\delta}$ was expressed in terms of its extreme states FeO and $Fe_{2/3}O$. The activities of the components were then calcd. with the use of the expressions (*1*) or (*2*) and the Gibbs-Duhem equations for the spinel solid solns. and $FeO_{1+\delta}$. Activities exhibit pos. deviations with respect to ideal soln. The activities were calcd. also by a statistical thermodynamic method. The compn. of the solid soln. was expressed as $Fe^{3+}_{\lambda}Fe^{3+}_{1-\lambda}[Fe^{2+}_{2-c-\lambda}Fe^{3+}_{2c-1+\lambda}Ti^{4+}_{1-c}]O_4$, the ions given in brackets being assumed in octahedral positions. L. Kuca

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REEL/FRAME
19801277

SHCHEPETKIN G.V.

AA0052398

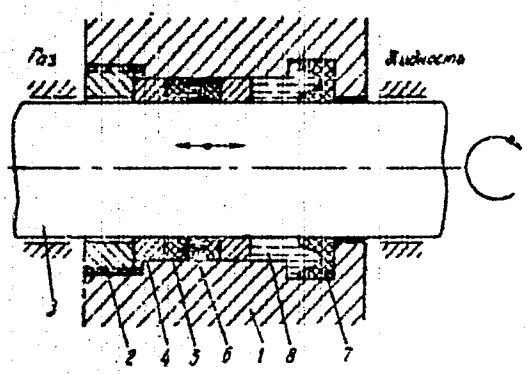
UR 0482

Soviet Inventions Illustrated, Section III Mechanical and General, Derwent, 1-70

241850 SEAL for a rod which has reciprocating and rotating motion improves reliability of the seal separating the gas from the liquid. The rod 3 is fitted in the body 1 with a nut 2. The bronze 4, leather 5 and rubber 6 rings and a cup 7 provide a sealing space. The liquid fills the space 8 between them and provides a hydraulic seal. During the operation, when the liquid pressure exceeds the gas pressure the cup 7 will allow the liquid to pass into the space 8. This compresses the rings and prevents the gas escape into the liquid during the stroke. When the rod is stationary, gas is sealed by the rings which are held by the pressure of fluid in the space 8 maintained by the cup 7.
. 25.1.68 as 1211700/25-8.A.F.KICHIGIN et alia.
KARAG & TECHNICAL INST. (29.8.69) Bul 14/18.4.69.
Class 47f. Int.Cl.F 16j.

19821010

AA0052398



Kichigin, A. F.; Shchepetkin, G. V.; Lazutkin, A. G.; Vakulin, P. N.
Karagandinskiy Politekhnicheskiy Institut

2/2

19821011

1/2 012 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--ADVANTAGES OF FREEZE DRYING IN HISTOCHEMICAL STUDIES -U-

AUTHOR-(03)-SHCHEPETKIN, V.A., LEVAKOVSKAYA, A.I., TEREKHINA, L.YA.

COUNTRY OF INFO--USSR

SOURCE--ARKH. ANAT., GISTOL. EMBRIOL. 1970, 58(2), 89-91

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--FREEZE DRYING, HISTOCHEMISTRY

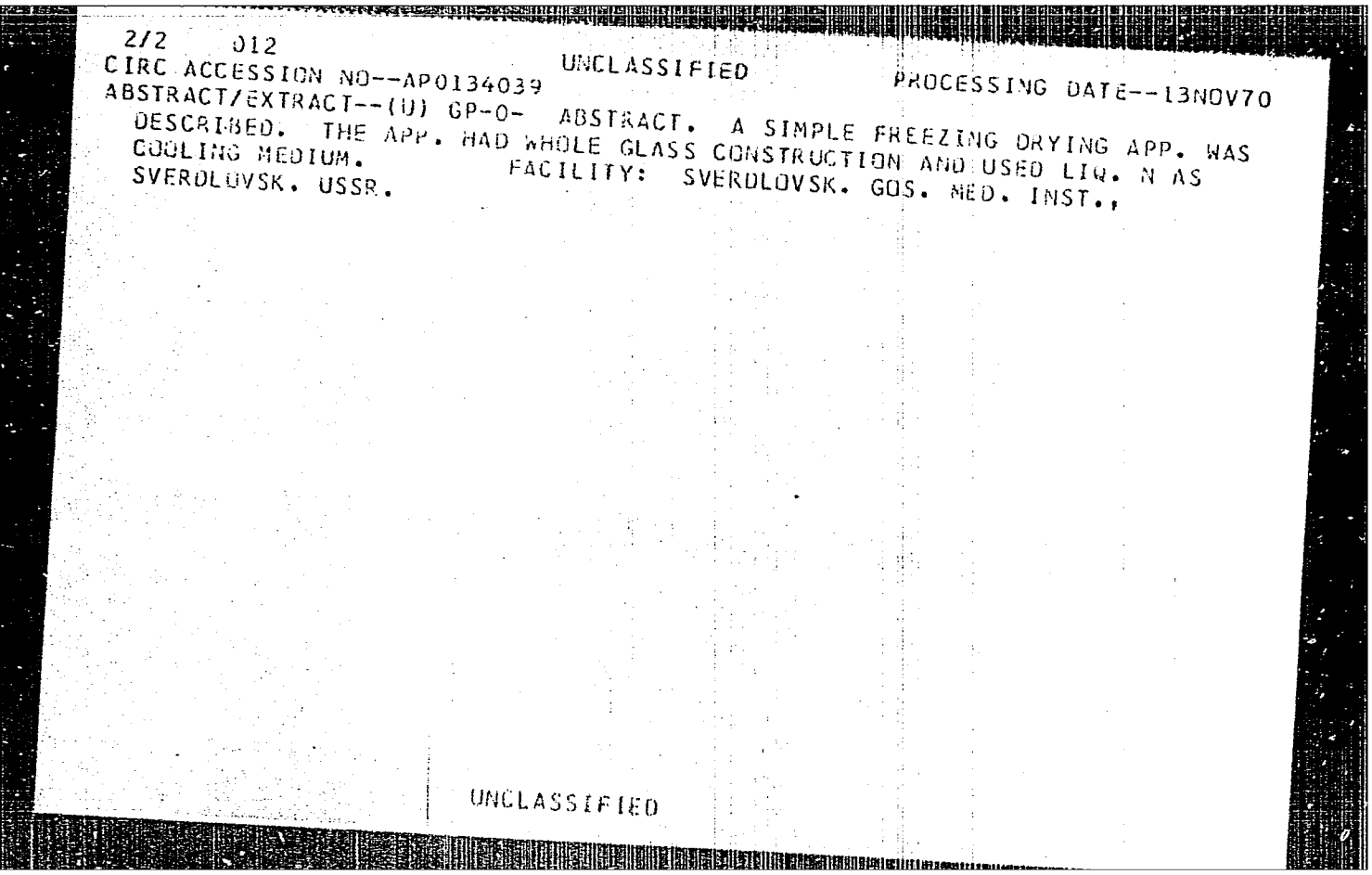
CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3006/0234 STEP NO--UR/9076/70/058/002/0089/0091

CIRC ACCESSION NO--AP0134039

UNCLASSIFIED

APPROVED FOR RELEASE: 07/20/2001 CIA-RDP86-00513R002202910017-7"



2/2 012 UNCLASSIFIED PROCESSING DATE--13NOV70
CIRC ACCESSION NO--AP0134039
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A SIMPLE FREEZING DRYING APP. WAS DESCRIBED. THE APP. HAD WHOLE GLASS CONSTRUCTION AND USED LIQ. N AS COOLING MEDIUM. FACILITY: SVERDLOVSK. GOS. MED. INST., SVERDLOVSK. USSR.

UNCLASSIFIED

SHCHEPETIL'NIKOV, M. I.

Biblio

JPRS 58700

10 April 1973

DETERMINING POWER CONVERSION RATIOS AND THERMAL EFFICIENCIES FOR ATOMIC ELECTRIC POWER PLANT THERMAL LAYOUTS

[Article by Candidate of Technical Sciences, Docent M. I. Shchepetil'nikov, Ivanovo Power Engineering Institute imeni V. I. Lenin; Minsk, Izvestiya Vysshikh Uchebnykh Zavedeniy, Energetika, Russian, No 12, 1972, pp 75-81]

Calculation of the effect of various measures by comparing two heat balances before and after alteration of the layout of atomic power plants is difficult, just as in the case of the layouts of ordinary thermoelectric power plants, and this stimulates the search for methods to simplify such calculations without sacrificing accuracy.

Presented in this article is the derivation of calculation expressions for the change coefficients of power e and heat value ξ in atomic power plant layouts with steam dryers and superheaters, accompanied by an example of their calculation.

We will examine an atomic power plant layout with a separator and two superheaters, illustrated in Figure 1. Preheater stages 1-3, supplied with LPC [low-pressure component] steam, are fundamentally the same as the analogous stages in the thermoelectric power plant (TEP) layout. Therefore the calculation expressions for coefficients e will also be the same as for ordinary TEP layouts [1].

If in the LPC the turbines have moisture traps on the blades, usually in front of the regenerative bleeding chambers, then the equations for e will be somewhat different from the usual; this is illustrated below by way of example of separatory stage x.

For this stage, as follows from Figure 1, the power change coefficient e should consider the effect of several different dryers (separator, superheaters), installed in the steam line after the bleeding point, including the removal of moisture from the blades in the LPC. We will note that if there were no separator and blade moisture extractor, but only the superheaters, then their effect is easily considered

[I - USSR - K]

(1)

analogous to the effect of gas superheaters in the usual layout with a correction only for the energy value of the heat used for superheating and for the superheater drainage system. Although the separators and moisture extractors contribute some singularity to the layout, their effect, as shown below, can also be considered identical to that of steam-steam superheaters. This follows from the fact that the amount of extracted moisture d_{ex} is determined by the same expression as the consumption of steam for superheating

[oc=ex;
paб=op; д=d]

$$d_{ex}(i_{op} - q_{d,ex}) = D\delta i_{ex}$$

where D is the flow of steam after the dryer; δi_{ex} is the steam enthalpy increment; $i_{op} - q_{d,ex}$ is the difference of steam enthalpies before the dryer and drainage enthalpy.

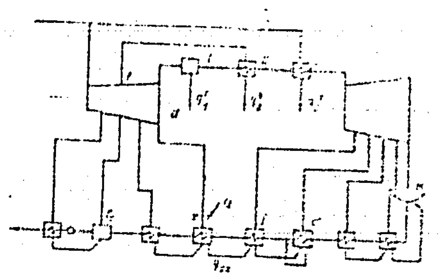


Figure 1. On derivation of calculation equations for power change coefficient e.

Thus the separator can be regarded conditionally as a superheater in which the working steam parameters are the same as those of the heated steam, and its flow rate corresponds to the amount of extracted moisture d_{ex}. This enables us to use in the equations for e the identical subscripts (ex) for values related to dryers and superheaters.

Derivation of calculation equation for e. We will examine the effect of the delivery from outside into preheater x of the amount of heat Q in kW such that the steam flow rate from the bleed is changed by 1 kg/sec, i.e., $Q = i_x - q_{dx}$, and we will determine the change of power in the system assuming Q_0 = const; by definition of coefficient e the power increment should be $e_x(i_x - q_{dx})$.

APPROVED FOR RELEASE: 07/20/2001 CIA-RDP86-00513R002202910017-7"

USSR UDC 576.852.211.095.1(571.1/.5):/616-002.5:19:636.5

SHCHEPILOV, N. S., Professor, KISLENKO, V. N., and L'VOVA, G. F.,
Novosibirsk Agricultural Institute

"Survival of Mycobacterium tuberculosis in a Thick Permanent Litter Inhabited by Tuberculous Birds"

Moscow, Problemy Tuberkuleza, No 8, 1971, pp 78-81

Abstract: Thick sawdust litters (similar to those used on Siberian farms) inhabited by tuberculous ducks in unheated facilities were investigated over a period of 6 years. In winter, the litter was frozen 100 cm deep, and in summer its internal temperature was about 23°C and humidity up to 40%. The sawdust contained large amounts of nitrogen, phosphorus, potassium, and digested proteins and up to 0.26% sodium chloride. Bacteriological tests were performed on samples taken from the surface of the litter and from layers 10, 20, 40, and 80 cm deep. One gram of dry sawdust contained up to 14 million various microbes, including Mycobacterium tuberculosis, which remained viable and pathogenic for chickens, rabbits, and guinea pigs throughout the investigation. It is concluded that this type of litter does not meet current sanitary standards.
1/1

USSR

UDC 62-525:621.375

DVORETSKIY, V. M., MOLCHANOV, G. G., POPOV, A. I., SHCHEPIN, E. K.

"A Fluidics Element"

USSR Author's Certificate No 295910, Filed 21/11/69, Published 9/04/71, (Translated from Referativnyy Zhurnal Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 11, 1971, Abstract No 11 A131 P).

Translation: A fluidics element is suggested, containing two counter connected supply nozzles, a drain chamber, and an output chamber with a nonmoving dividing barrier between them. In order to increase the accuracy, a control chamber with a membrane, on which is fastened a moving barrier which intersects the power stream, is connected to the output chamber of the element.

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USSR

UDC: 621.643.002.2 + 411.4

ZERNOV, A. V., ZAV'YALOV, V. E., INDYUKOV, A. F., IVANTSOV, V. YA., Ural NITI, Chelyabinsk; and SHCHEPKIN, E. V., MITROSHIN, S. S., Nefteprovodmontazh Trust, Ufa.

"Possibility of Automatic Double Welds of the Elbow Joints in Large Diameter Pipelines"

Moscow, Stroitel'stvo Truboprovodov, No 8, Aug 71, pp 15-17

Abstract: The Ural Pipe Industry Research Institute developed a method for producing automatic double-V welds under flux with an overhanging welding head in plates of 6-12 mm thickness with 2-2.5 mm gap.

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USSR

ZERNOV, A. V., et al., Stroitel'stvo Truboprovodov, No 8, Aug 71, pp 15-17

With this method the welding arc is stabilized by a magnetic field created by a solenoid concentric with the electrode. The solenoid winding is in series with the welding circuit. The magnetic field is controlled by varying the distance of the solenoid from the weld.

This method makes it possible to make the initial root weld either from inside or from outside in the elbow joint of a pipe.

Analysis of weld sections showed that the quality of the welds is adequate. The subject solenoids can be installed on existing welding heads. This will result in increased productivity and quality.

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USSR

UDC: 621.643.002.2 + 411.4

ZERNOV, A. V., ZAV'YALOV, V. E., INDYUKOV, A. F., IVANTSOV, V. YA., Ural NITI, Chelyabinsk; and SHCHEPKIN, E. V., MITROSHIN, S. S., Nefteprovodmontazh Trust, Ufa.

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USSR

ZERUOV, A. Y., et al., Stroitel'stvo Truboprovodov, No 8, Aug 71, pp 15-17

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1/2

Acc. Nr.: AP0042645

SHCHEPKIN, L.A.

Ref. Code: UR0203

IPRS 50162

Daytime Variations in Electron Concentration in Equatorial Ionosphere

Diurnal variations in the critical frequencies of the F2 layer (S_f) in the equatorial region have a clearly expressed minimum during the midday hours in the region of the magnetic equator. In the range of latitudes $\pm 10°$ there is a characteristic "two-hump" shape of the Sf curve. Between 10 and 20° in the northern and southern hemispheres a S_f curve with one afternoon maximum is typical in both the northern and southern hemispheres. This paper examines some characteristics of the diurnal change in electron concentration at fixed levels N_h below the maximum of the F2 layer on the basis of N(h) profiles of the ionosphere obtained using observational data obtained on the schooner "Zarya" during December 1962, January 1963 and November 1960 near the equator. During the illuminated hours the curves of diurnal variation $N_h(S_N)$ change singularly both with latitude and with altitude. The diurnal changes in N_h are clearest and have the least scatter at the magnetic equator; here the principal characteristics of change in S_N with altitude are manifested most clearly. The daytime minimum near the maximum of the F2 layer has the greatest depth here and falls at the midday hours. The S_N curves are symmetrical both with respect to the temporal position of the maxima relative to the center of the minimum and with re-

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spect to the small difference in N_h values at the maxima. The S_N curves at geomagnetic latitude 10°S for 8 November 1960 and 3 January 1963, for example, show a clearly expressed peak in S_N. Near the maximum of the F2 layer a "two-hump" shape of S_N occurs not only in those cases when the S_f curve has a similar shape, but also when the latter is characterized by a single maximum. The shape of S_N changes with altitude and the changes are most sharply expressed for the region near the maximum of the F2 layer. Below the 150-170 km level it is most common to observe a "regular" shape of S_N, symmetrical relative to the maximum at midday. A significant minimum begins to appear at great altitudes, attaining a maximum value at an altitude of 250 km and above. The shape of S_f changes rapidly with latitude in the equatorial zone. A similar picture is observed for S_N at levels near the maximum of the F2 layer. For latitudes where there is a predominance of the afternoon peak in the region of the maximum of the F2 layer, in the lower part of the F region (180-240 km) the S_N curves have a pre-midday maximum. With an increase in altitude an afternoon maximum appears in S_N. At altitudes below 150-200 km the daytime changes in N are evidently determined for the most part by photochemical processes, indicating a good

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AP0042645

correlation between electron concentration and solar altitude.
(Abstract: "Some Characteristics of Variations in Electron Concentration in the Equatorial Ionosphere During Daytime," by L. P. Goncharov and L. A. Shchepkin, Institute of Terrestrial Magnetism, Ionosphere and Radio Wave Propagation and Siberian Institute of Terrestrial Magnetism, Ionosphere and Radio Wave Propagation; Moscow, Geomagnetizm i Aeronomiya, Vol X, No 1, 1970, pp 141-143)

19760705

SHCHEPIN, YE. K.

AMPLIFIER

ALL-FLUIDIC OPERATION AMPLIFIER

[G. G. Nolchanov, A. I. Popov, E. K. Shchepin: "Chisto-Struynyy Gidravlicheskiy Operatsionnyy Usilitel'"; Institute of Control Problems, Moscow, Russian, pp 98-108]

The development of hydraulic automation indicates the continuous increase and demands for significant improvement of the reliability of the developed systems. The actual path of satisfaction of those requirements is improvement of the reliability by significant simplification and improvement of the system's lation and control system. For this purpose the Control Prob- lems Institute has developed a fluidic operation amplifier in which moving parts and elastic elements have been completely excluded.

In order to build the fluidic operation amplifier it is necessary to have an element which will ensure one of the basic requirements imposed on the operation amplifiers: $R_{inp} >> R_{out}$, that is, that would have high input impedance. Low output impedance is one of its advantages, and it increases the accuracy of performing the operations.

As a result of experimental studies, it has been established that in solving the stated problem the given conditions are most completely met by the fluidic amplifying element with a concentric control nozzle 1. The input stage of the operation amplifier constructed from this element with the principle of interstage stabilization 2 has quite high input impedance and an inverse characteristic output (fig. 1) in Fig 1 which permits the operation amplifier to be encompassed by negative feedback.

In Fig 2 we have the schematic of a fluidic operation amplifier 3. The amplifier contains the input stage 1 and one or several amplifying stages II, III.

USSR

MUNIN, A. G., SHCHEPOCHKIN, M. A., Moscow

UDC: 534.222.2

"Spectrum of Acoustic Power of a Subsonic Jet"

Moscow, Akusticheskiy Zhurnal, Vol 18, No 2, Apr-Jun 72, pp 292-298

Abstract: The problem of spectral distribution of the power of acoustic radiation of an axisymmetric submerged jet is considered. Expressions are derived for determining the noise spectrum from the initial and main sections of the jet. The solution is extended to the case of an arbitrary segment of a jet from the nozzle section to some fixed cross section. The results can be used for calculating the emission spectrum of noise from any section of a jet between two fixed cross sections.

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1/2 027 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--SOME INDICES OF BLOOD COMPOSITION AND IRON METABOLISM IN HEALTHY WOMEN -U-

AUTHOR-(02)-PETROV, V.N., SHCHERBA, M.M.

COUNTRY OF INFO--USSR

SOURCE--TERAPEVTICHESKIY ARKHIV, 1970, VOL 42, NR 6, PP 47-55

DATE PUBLISHED----------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--IRON, METABOLISM, HEMOGLOBIN, BLOOD SERUM, ERYTHROCYTE, DIETARY MINERAL DEFICIENCY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3002/1893 STEP NO--UR/0504/70/042/006/0047/0055

CIRC ACCESSION NO--AP0129247

UNCLASSIFIED

2/2 027 UNCLASSIFIED

CIRC ACCESSION NO--AP0129247 PROCESSING DATE--30OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE INDICES WERE STUDIED OF THE BLOOD COMPOSITION, HEMOGLOBIN CONCENTRATION IN THE BLOOD AND ERYTHROCYTE, PERCENTAGE OF HEMOTOCRYTE IN 577, AND IRON METABOLISM, IRON LEVEL AND UNSATURATED IRON BOUND CAPACITY OF THE BLOOD SERUM IN 210 PRACTICALLY HEALTHY WOMEN. INCIDENCE OF HYPOFERRIC ANEMIA CONSTITUTED 11PERCENT, LATENT HYPOFERRIA, IRON DEFICIENCY OF THE ORGANISM WITHOUT THE DEVELOPMENT OF ANEMIA, 22PERCENT. IT WAS SHOWN THAT ADDITIONAL LOSS OF IRON FROM THE ORGANISM DUE TO MENSTRUATION, PREGNANCY, DELIVERY, ABORTIONS AND NURSING MAY SERVE AS A CAUSE OF IRON DEFICIENCY. ABSORPTION OF RADIOACTIVE IRON (FE PRIME59) IN THE GASTROINTESTINAL TRACT OF WOMEN (55 PERSONS) IS HIGHER THAN IN MEN (10 PERSONS) CONSTITUTES CORRESPONDINGLY 10.2 AND 8.9PERCENT. COMBINATION OF A DECREASED LEVEL OF HEMOBLOBIN AND IRON WITH A RISE IN UNSATURATED IRON BOUND CAPACITY IN THE BLOOD SERUM AND PERCENTAGE OF IRON ABSORPTION IN SOME WOMEN TESTIFY TO GENUINE IRON DEFICIENCY OF THE ORGANISM.. UNADEQUATE IRON ABSORPTION IN THE ORGANISM ASSOCIATED, APPARENTLY, WITH INSUFFICIENT SUPPLY OF IRON WITH FOOD OR ITS SUPPLY IN A FORM POORLY ASSIMILATED IS A CAUSE OF STEADY IRON DEFICIENCY. FACILITY: KAFEDRA PROPEDEVTIKI VNUTRENNIKH BOLEZNEY I LENINGRADSKOGO MEDITSINSKOGO INSTITUTA IM. PAVLOVA.

UNCLASSIFIED

USSR UDC: 621.777.01

OKHRIMENKO, YA. M., BEREZHNOY, V. L., SHCHERBA, V. N. and SHARIKOV, G. S.

"A New Process of Rapid Extrusion of Low-Plasticity Alloys"

Moscow, Kuznechno-shtampovochnoye proizvodstvo, No 1, Jan 72, pp 6-9

Abstract: Detailed is a new process of high-speed forming of semifinished products, shapes, and pipes without lubricants using the principle of deformation friction between the container and the metal, with the friction oriented in the direction of the outflow of the extrudable metal. The study was conducted on cast AV, V96Ts, AMg6, AD31, D16, A00, LS59-1 and granulated 01435, S97 alloys under both laboratory and plant conditions. Analysis of the process indicates its potentialities in metalworking. The use of high-speed extrusion (as an alternative to direct extrusion) to produce rods from D16 alloy under semicontinuous conditions without lubricants increases the labor productivity 2.5 times as a result of the higher rate of outflow and yield of extrudable product as well as the elimination of some of intermediate operations specified in the current technology for separating the discard. The test results of high-speed extrusion under production conditions support the expediency of its further development and promotion for

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USSR

OKHRIMENKO, YA. M., et al, Kuznechno-shtampovochnoye proizvodstvo, No 1, Jan 72, pp 6-9

the fabrication of semifinished products, shapes, and pipes primarily from low-plasticity and hard-to-form alloys. (3 illustrations, 1 table, 6 bibliographic references).

2/2

USSR

UDC: 681.325

KLISTORIN, I. F., SHCHERBACHENKO, A. M., Siberian Department of the Institute of Automation and Electrometry, Academy of Sciences of the USSR

"A Converter for Changing Low and Very Low Frequencies to Digital Code"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 24, 1970, Soviet Patent No 277415, Class 42, Filed 22 April 1969, p 134

Abstract: This Author's Certificate introduces a converter which changes low and very low frequencies to digital code. The converter contains pulse-potential diodes connected to an OR logic circuit, and a unit for isolating the period of the frequency to be converted. This unit is connected through a key the input of which is connected to the standard frequency oscillator, with the input of the first counter and the "unit" input of the time conversion flip-flop. The output of the conversion time flip-flop is connected to a second key through which the cadence pulse oscillator is connected to the second counter. The converter also contains a third counter in which the output for the most significant digit is connected to the reset terminal of the conversion time flip-flop. As a distinguishing feature of the patent, the conversion range is extended and the device is simplified by connecting

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USSR

KLISTORIN, I. F., SHCHERBACHENKO, A. M., Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 24, 1970, Soviet Patent No 277415, Class 42, Filed 22 April 1969, p 134

the input of the third counter directly to the input of the OR logic circuit, and by connecting the output for each i-th digital place (where i = 1,...,n) in the first counter to the potential input of the i-th diode, the pulse input of this diode being connected to the output of the (n + 1 - i)-th digital place of the second counter.

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USSR

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UDC 621.317.76.029.4

KLISTORIN, I. F., SHCHERBACHENKO, A. M. of Novosibirsk

"A Fast Acting Digital Frequency Meter for Low and Sub-low Frequencies"

Novosibirsk, Avtometriya, No 2, 1970 pp 73-78

Abstract: Instruments of this type produce a frequency readout by measuring the duration of the input signal over one cycle and converting this to a frequency. There are various conversion techniques, but the simplest is repetitive subtraction of the high order bits of the duration value from an arbitrary value which is adjusted during the course of the calculation.

This article describes a frequency code converter on the basis of a digital integrator with sequential carry, applicable also to rapid action frequency meters for low and super low frequencies. This circuit consists essentially of a frequency divider and a digital register, holding the value of the function to be integrated, connected by a group of impulse potential gates, and a counter connected with the outputs of the gates through the logical or circuit. The circuit illustrated has three major components: a cycle length detection circuit which produces two signals, one lasting for one cycle of the input signal and the other occurring at the termination of this cycle; a duration counting circuit, containing an impulse potential switch, a standard frequency generator, and an impulse counter; a computational

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KLISTORIN, I. F., et al, Novosibirsk, Avtometriya, No 2, 1970 pp 73-78

circuit, containing a cyclic frequency generator, an impulse potential switch, a counter which holds an initial standard value, and a logical or circuit. The operation of these elements is described in some detail.

It is also pointed out that the time for calculating frequency can be reduced significantly, not only by increasing the cyclic frequency, but also by taking account of boundaries on the permissible frequency range. This is demonstrated mathematically, showing that if the ratio between maximum and minimum permissible frequencies is 10 to 1, the calculation time can be reduced by 10%.

The instrument error is essentially the error of cycle duration determination, since the error in conversion can be reduced to the desirable level by increasing the number of positions in the counters.

The example given is a binary-decimal frequency -- code converter, operating in a frequency band where the maximum is 9999 times the minimum, with a conversion error of 0.1%. This instrument requires four positions in the initial digital register and frequency converter registers, and three positions in the counter for a standard number of impulses. At a cyclic

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KLISTORIN, I. F., et al, Novosibirsk, Avtometriya, No 2, 1970, pp 73-78

frequency of 1 megahertz, the maximum computation time does not exceed 10 milli-seconds.

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USSR UDC 612.822.1.015.31:546.18]-06:[612.574+612.223.11

BAYEV, V. I., and SHCHERBACHEV, I. P., Scientific Research Laboratory No 5, Military Medical Academy imeni S. M. Kirov, Leningrad

"Metabolism of Some Phosphorus Compounds in the Brain During the First Minutes Following Hyperthermia and Hypercapnia"

Moscow, Patologicheskaya Fiziologiya i Eksperimental'naya Terapiya, Vol 14, No 5, Sep/Oct 70, pp 20-24

Abstract: Shifts in the brain tissues of rats exposed to elevated temperature and other variations in the environment were studied. It was found that a pronounced disruption of the redox balance and blood respiratory function led to considerable shifts in the phosphorus metabolism of brain tissues. The content of adenosine triphosphate, creatine phosphate, and adenosine monophosphate in brain tissues was monitored by paper chromatography. Inorganic phosphorus content and total acid-soluble phosphorus levels were also monitored. The shift in rectal temperature was also measured. The external shifts to which the rats were exposed included a temperature rise from 35 to 38°C, as well as anesthetic (16-20%) and toxic (26-28%) CO_2 concentrations in the atmosphere, with both normal and reduced oxygen content.

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UNCLASSIFIED PROCESSING DATE--23OCT70

1/2 026

TITLE--THERMOSTABILITY OF WHITE MICE IN AN AMBIENT MEDIUM WITH DIFFERENT RATES OF TEMPERATURE VARIATIONS -U-

AUTHOR--SHCHERBACHEV, I.P.

COUNTRY OF INFO--USSR

SOURCE--KOSMICHESKAIA BIOLOGIIA I MEDITSINA, VOL. 4, JAN.-FEB. 1970, P. 18-22

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--THERMAL STRESS, MOUSE, BODY TEMPERATURE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1998/0290 STEP NO--UR/0453/70/004/000/0018/0022

CIRC ACCESSION NO--AP0120979

UNCLASSIFIED

2/2 026 UNCLASSIFIED PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0120979

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. STUDY OF SURVIVAL RATES IN A GROUP OF 309 WHITE MICE EXPOSED TO UPWARD AND DOWNWARD TEMPERATURE VARIATIONS FROM ROOM TEMPERATURE AT RATES FROM 0.01 TO 3 DEG-MIN AT 40-70PERCENT HUMIDITY. THE DEPENDENCE OF THE RECTAL TEMPERATURE ON AMBIENT TEMPERATURE VARIATIONS IS ALSO INVESTIGATED IN THESE MICE. STATISTICAL ANALYSIS OF THE OBSERVATIONS INDICATES THAT THE MICE DIE IN A SHORTER TIME AT HIGHER (OR LOWER) BODY AND AMBIENT TEMPERATURES WHEN THE RATES OF THE TEMPERATURE INCREASE (OR DECREASE) ARE HIGHER.

UNCLASSIFIED

USSR

UDC: 539.385

TERENT'YEV, V.F., MAKHUTOV, N.A., POYDA, V.G. and SHCHERBAK, A.M., Institute of Metallurgy imeni A.A. Baykov, Academy of Sciences USSR

"Influence of Surface Layers and Aging on Bauschinger Effect During Low-Cycle Loading"

Moscow, Sb. "Ustalost' metallov i splavov". "Nauka" Press, 1971, pp 41-48

Translation: This study concerns the influence of removing a grain-size thick surface layer (following the first half-cycle of loading) as well as intermediate aging at 270° C for 2 hours on the Bauschinger effect in low-carbon St.3 steel. It is shown that the Baushinger effect in low-carbon steel is largely due to the presence of a much stronger grain-size thick surface layer as well as surface residual stresses. Removal of the surface layer after the first half-cycle of loading (in the stretch region) or aging after the first half cycle minimizes the Bauschinger effect. In both cases the decrease in Baushinger effect is, most likely, related to the marked decrease in surface residual stresses. (6 illustrations, 18 bibliographic references; summary).

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1/2 026 UNCLASSIFIED PROCESSING DATE--13NOV70

TITLE--RESISTANCE TO LOW CYCLIC LOADING OF A STEEL AFTER ARTIFICIAL AGING -U-

AUTHOR-(02)-MAKHUTOV, N.A., SHCHERBAK, A.M.

COUNTRY OF INFO--USSR

SOURCE--PROBLEMY PROCHNOSTI, VOL. 2, APR. 1970, P. 23-29

DATE PUBLISHED----APR70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--CYCLIC FATIGUE LIFE, STEEL PROPERTY, PLASTIC DEFORMATION, METAL AGING/(U)22K STEEL, (U)16GNM STEEL, (U)TS STEEL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--2000/0253 STEP NO--UR/3663/70/002/000/0023/0029

CIRC ACCESSION NO--AP0124015

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--13NOV70

2/2 026

CIRC ACCESSION NO--AP0124015

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. STUDY OF THE EFFECTS OF PRELIMINARY PLASTIC DEFORMATION AND SUBSEQUENT AGING ON THE FATIGUE CHARACTERISTICS OF 22K, 16GNM, AND TS STEELS SUBJECTED TO CYCLIC DEFORMATION UNTIL RUPTURE. IT IS SHOWN THAT ARTIFICIAL STRAIN AGING INCREASES THE ENDURANCE UNDER A LOW CYCLIC LOADING. FACILITY: GOSUDARSTVENNYI NAUCHNO-ISSLEDOVATEL'SKII INSTITUT MASHINOVEDENIIA, MOSCOW, USSR.

UNCLASSIFIED

1/2 025 UNCLASSIFIED PROCESSING DATE--11SEP70

TITLE--EFFECT OF AGING AND COLD WORKING ON THE RESISTANCE OF STRUCTURAL STEELS TO PLASTIC DEFORMATION DURING LOW CYCLE LOAD -U-

AUTHOR--MAKHUTOV, N.A., SHCHERBAK, A.M., POYDA, V.G., TERENTYEV, V.F.

COUNTRY OF INFO--USSR

SOURCE--PROBL. PROCH. 1970, (1), 42-5

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS, MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--METAL AGING, COLD WORKING, LOW ALLOY STEEL, STRUCTURAL STEEL, METAL DEFORMATION/(U)22K LOW ALLOY STEEL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1984/1408 STEP NO--UR/3663/70/000/001/0042/0045

CIRC ACCESSION NO--AT0100068

UNCLASSIFIED

2/2 025 UNCLASSIFIED PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AT0100068

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. WITH MOST METALS THE BAUSCHINGER EFFECT IS SHOWN IN A RADICALLY DECREASING PLASTICITY IN THE 1ST CYCLE UPON REVERSAL FROM TENSION TO COMPRESSION. THE KNOWN REDN. OF THIS EFFECT BY DEFORMATION AND AGING WAS REEXPLORED WITH BOILER STEEL 22K (C 0,.3, SI 0.26, MN 0.80, NI 0.20, CR 0.12, CU 0.05PERCENT) AND LOW C STEEL DEFORMED AT 0.5-10.0PERCENT THEN AGED FOR 2 HR-270DEGREES. APPLIED FORCE, SIGMA SUBA LARGER THAN SIGMA SUBT, THE ELASTIC LIMIT, IN THE RELATION FOR THE MEAN YIELD STRENGTH, BAR SIGMA, HAD THE USUAL SHARP LINEAR DROP TO ZERO TENSION ELASTICITY, FOLLOWED DURING THE COMPRESSION BY A PARABOLIC DECLINE TO A LOWER ELASTICITY VALUE THAN INITIALLY, IN ITS SIGMA SUBT PRIME CURVE. INITIALLY THE METAL HAD A SIGMA SUBT PRIME VALUE OF 30.8 KG-MM PRIME2, BUT AFTER DEFORMATION BY 0.5, 2.0, 5.0, AND 10.0PERCENT AND AGING 31.8, 37.2, 46.0, AND 52.0 KG-MM PRIME2. WITH BAR SIGMA EQUALS 1.17, 1.32, 1.46, 1.61, AND 1.71, SIGMA SUBT PRIME RANGED DOWN 7.1-3.55, 26.0-3.55, 26.9-7.8, AND 28.3-21., KG-MM PRIME2, RESP., FOR EACH DEFORMED TYPE. THE PHENOMENA WAS ATTRIBUTED TO THE EASE OF BLOCKING OF DISLOCATIONS: AND AS WITH 22K STEEL SIGMA SUBT PRIME BECAME STABILIZED AFTER 5-7 TOTAL CYCLES OR LESS FOR BAR SIGMA EQUALS 1.61. SIMILARLY, THE REMOVAL OF DISLOCATIONS (AND PLASTICITY) AFTER AGING AT 400DEGREES CAUSED REMOVAL OF THE BAUSCHINGER EFFECT; OR SOME REDN. IF AFTER DEFORMATION, A SURFACE LAYER WAS REMOVED ELECTROLYTICALLY.

UNCLASSIFIED

USSR

UDC 577.153.9.014.05

ROZENGART, V. I., CHINGISOVA, R. A., SHMELEVA, V. G., and SHCHERBAK, I. G., Chair of Biochemistry, First Leningrad Medical Institute imeni I. P. Pavlov

"Breakdown of an Organophosphorus Cholinesterase Inhibitor in Animal Tissues"

Moscow, Voprosy Meditsinskoy Khimii, No 3, 1971, pp 266-270

Abstract: The purpose of the work was to study the ability of rat tissues (liver, kidneys, brain) and blood to detoxify LG-63 (O-ethyl-S-hexyl methylthiophosphonate), an organophosphorus cholinesterase inhibitor. A mixture of tissue and LG-63 was incubated at 37°C for up to 6 hours, after which the amount of free inhibitor was determined by an enzymatic method based on chromatographic separation of the inhibitor and its subsequent detection from its ability to inhibit esterase. Regardless of the original concentration of the inhibitor, the various tissues could not decompose more than 50 to 60% in 6 hours; blood decomposed only 25 to 30% of the substance in the same period of time. From practical point of view, therefore, LG-63 cannot be effectively detoxified because the symptoms of poisoning develop very rapidly and the inhibition of cholinesterase by the tissues ends completely within one hour.

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Pharmacology and Toxicology

UDC 577.153

USSR

NOVGORODSKAYA, A. M., ROZENGART, V. I., and SHCHERBAK, I. G., Chair of Biochemistry, First Medical Institute imeni Akad. I. P. Pavlov, Leningrad

"In vivo Inhibition of Cholinesterase Activity by the Organophosphorus Compound LG-63"

Moscow, Biokhimiya, No 1, 1971, pp 72-80

Abstract: The inhibitory effect of LG-63 (O-ethyl-S-hexy methylthiophosphonate) on cholinesterase activity was studied in various tissues (small intestine, myocardium, skeletal muscle, brain, blood hemolysate, gastric wall, lung, kidney, liver) of rats injected intraperitoneally or intramuscularly with different doses of the compound. A sublethal dose (5 mg/kg) markedly inhibited the enzyme in all the tissues studied except the kidneys regardless of the mode of administration. A much smaller dose (0.25 mg/kg), on the other hand, altered the distribution of LG-63 considerably and the more of administration was a major factor. For example, cholinesterase activity in the liver and gastric wall was inhibited more by intraperitoneal injection of LG-63 than by intramuscular injection. The highest concentrations of LG-63 were invariably found in the liver, whereas no significant amounts could be detected in the kidneys. The latter phenomenon suggests that either the

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APPROVED FOR RELEASE: 07/20/2001 CIA-RDP86-00513R002202910017-7"

USSR

NOVGORODSKAYA, A. M., et al., Biokhimiya, No 1, 1971, pp 72-80

kidneys take no part in the elimination of unchanged LG-63 molecules from the body or the inhibitor bypasses the site of cholinesterase localization in the organ. No relationship was observed between the distribution of LG-63 and the original level of chloinesterase activity or tissue sensitivity to the substance.

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SHCHERBAK, I.G.

JPRS 58183

8 February 1973

UDC 615.217.32-015.46

INACTIVATION OF O-ALKYL-S-HEXYLMETHYLTHIOPHOSPHONATES BY ANIMAL BODY TISSUES

[Article by V.I. Rozengart, R.A. Chinzisova, V.G. Shmeleva, and I.G. Shcherbak, Department of Biochemistry, 1st Leningrad Medical Institute imeni I.P. Pavlov; Moscow, Voprosy Meditsinskoy Khimii, Russian, Vol 17, No 5, 1972, pp 533-537]

The rate of detoxification of anticholinesterase compounds was evaluated by the reduction in concentration of unaltered inhibitor, the residual quantity of which was determined by thin-layer chromatography.

In all tissues the rate of inactivation of LG-63 (O-ethyl-S-hexylmethylthiophosphonate) was proportional to the concentration of inhibitor within the range of 1-5 micromoles. Further increase in toxin concentration led to an increase in the rate of its detoxification in liver and blood homogenates, and to a reduction of the rate in kidney homogenates. In 6 hours of incubation the degree of inhibitor inactivation did not exceed 30-40 percent in blood and 60-74 percent in brain, liver, and kidneys. Under similar conditions O-hexyl-S-hexylmethylthiophosphonate was inactivated at an identical rate for all tissues studied, normally by not more than 35-45 percent within 6 hours. When LG-63 was injected intraperitoneally its concentration in tissues decreased by approximately 50 percent within the period from 30 minutes to 2 hours after injection.

As is known, the toxicity of organophosphorous compounds stems from their ability to suppress cholinesterase. However, we do not always observe a direct correlation between the anticholinesterase activity of organophosphorous compounds and

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(3)

toxic toxicity. This is explained by the fact that a great number of factors are involved in the manifestation of a toxin's toxic properties within the body. The most important of these factors are enzymatic detoxification of the inhibitor and, possibly, nonspecific binding of organophosphorous compounds with various proteins. These processes cause a more or less rapid reduction in the concentration of free inhibitor in tissues. Obviously the rates of detoxification are different for different organophosphorous compounds. However, the published data on this problem are relatively limited and often contradictory [1-3].

We studied the detoxifying ability of some tissues from white rats in regard to two structurally similar compounds of the O-alkyl-S-hexylmethylthiophosphonate series, synthesized in the laboratory of Academician M.I. Kabachnik at the Institute of Organo-Elemental Compounds, USSR Academy of Sciences.

Procedure

Lord 3 (O-ethyl-S-hexylmethylthiophosphonate) and GA-95 (O-hexyl-S-hexylmethylthiophosphonate) were studied. The former is one of the most active anticholinesterase compounds of the O-ethyl-S-alkylmethylthiophosphonate series [4,5]. We had previously studied the distribution of this compound within the bodies of white rats after various means of its administration at different doses [6,7]. GA-95 is very similar in structure to LO-63 and differs from it by having a longer O-alkyl radical.

The synthesis and investigation of the anticholinesterase properties of these compounds had been described earlier [4,5,8].

We evaluated the detoxifying ability of tissues in regard to organophosphorous compounds on the basis of the reduction in active inhibitor concentration after its addition to a homogenate of the tissue under investigation. Blood, as well as brain, liver, and kidney tissue from adult male white rats, carefully ground in a mortar while cold, were mixed in volumetric ratios of 1:10 with 1/15 M pH 7.5 phosphate buffer and physiological solution containing the needed quantity of organophosphorous compound. A fourfold volume of ethyl alcohol was added immediately after mixing or after various periods of incubation at 37°C. The mixture was ground for 3 minutes in a glass homogenizer, allowed to stand chilled for 30 minutes, and then centrifuged for 5 minutes at 3,000 rpm. We determined the concentration of organophosphorous compound in the supernatant (the extract) by thin-layer chromatography employing our modification [11] of Ackermann's method [9,10].

USSR

UDC 621.791.001.5:669.14:62-408.3:669.295

SHCHERBAK, M. A. (Engineer), ARISTOV, V. S. (Cand. of Techn. Sciences), SHEYKO, V. I. (Engineer) and PROKHOROV, P. A. (Cand. of Techn. Sciences)

"Problems of Welding Titanium-Clad Steel"

Moscow, Svarochnoye proizvodstvo, No 2, Feb 72, pp 19-20

Abstract: Automatic welding is finding expanding application in the fabrication of structures from clad steel. Of some interest therefore is the use of automatic welding of structures from titanium-clad steel. The experimental material in this study was St.3 steel clad with 3-4 mm VT1 titanium, the combined thickness being 10-20 mm. The experimental welding was performed under linear energies of 2300-8500 cal/cm. It is shown that the boundary layer of titanium-clad steel may be heated up to 700°C without affecting the mechanical properties. Heating the steel above that temperature causes a reduction of resistance to direct pull and shear. Discussed also is the need of lap-welded strap-reinforced facings to eliminate faulty fusions in the cladding layer. Tensile tests on both manual and automatic welded specimens showed 40.0-47.5 kg/mm^2. Static bend tests at a 160-degree angle performed on specimens of butt joints with longitudinal welds both manual and automatic failed to separate the cladding layer in the weld area. (2 illustr., 1 table, 5 biblio. references)

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UNCLASSIFIED PROCESSING DATE--20NOV70

1/2 029

TITLE--APPARATUS FOR STUDYING THE THERMAL AND MECHANICAL PROPERTIES OF POLYMER FILMS -U-

AUTHOR-(04)-BORISOV, D.G., OBUKHOVICH, V.A., FADEYEVA, A.V., SHCHERBAK, P.N.

COUNTRY OF INFO--USSR

SOURCE--ZAVOD. LAB. 1970, 36(5), 615-17

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS, METHODS AND EQUIPMENT

TOPIC TAGS--PLASTIC FILM, MATERIAL TESTING EQUIPMENT, POLYTETRAFLUOROETHYLENE, THERMAL EFFECT, ANNEALING, PLASTIC MECHANICAL PROPERTY/(U)FTOROPLAST 4M FLUORINE PLASTIC

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

STEP NO--UR/0032/70/036/005/0615/0617

PROXY REEL/FRAME--3004/1970

CIRC ACCESSION NO--AP0136231

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--20NOV70

2/2 029

CIRC ACCESSION NO--AP0132231

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE SAMPLE FILMS WERE HELD HORIZONTALLY BY A FORCE JUST ADEQUATE TO PREVENT SAGGING DUE TO GRAVITY. DURING HEATING THE HORIZONTAL POSITION WAS MAINTAINED BY THE DISPLACEMENT OF THE HOLDING CLAMPS. THE TEMP. VS. DEFORMATION (EPSILON) CURVES WERE OBTAINED FOR POLY(TETRAFLUOROETHYLENE) (FTOROPLAST 4M) FILMS ANNEALED AT VARIOUS TEMPS. THE FILMS ANNEALED AT 255DEGREES OR 280DEGREES HAD POS. EPSILON, AS WELL AS NEG. EPSILON (SHRINKAGE). THE FILMS ANNEALED AT 265DEGREES HAD ONLY POS EPSILON. FACILITY: NAUCH.-ISSLED. PROEKT. INST. POLIM. PLASTMASS, LENINGRAD, USSR.

UNCLASSIFIED

1/2 014 UNCLASSIFIED PROCESSING DATE--18SEP70

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

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

COUNTRY OF INFO--USSR

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

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS, PHYSICS

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

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

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

CIRC ACCESSION NO--AP0055625

UNCLASSIFIED

2/2 - 014 UNCLASSIFIED PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0055625

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

UNCLASSIFIED

USSR

UDC 621.373.029.7

NEKRASHEVICH, V.B., SHTEYNSHLEYGER, V.B., SHCHERBAK, V.F., SL'KIND, S.A.

"8-mm Wave Band Maser With Microcooler Creating A 35° K Temperature"

Radiotekhnika i elektronika, Vol XVII, No 7, July 1972, pp 1544-1545

Abstract: The paper describes work conducted on a 8-mm wave band maser operating at a ruby temperature on the order of 30--40° K. It was possible to obtain such a temperature from comparatively simple small-sized closed-cycle refrigerating machines (microcoolers). The resonator unit contains signal waveguides, pump waveguides, active resonators, passive resonators, coupling for connection with the microcoder, and the ruby. The amplifier contains a MO-8 microcooler, a vacuum chamber, the resonator unit described above, a magnet, a circulator, and a pumping bridge-divider. The authors thank M.P. Stolpyanskiy who participated in working out the design of the amplifier. 2 fig. 5 ref. Received by editors, 23 July 1971.

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SHCHERBAK, V. I.

(6)

JPRS 60973

14 January 1974

RADIATION STEEL

UDC: 621.039.531:669.012.8

RADIATION SWELLING OF STEEL OKh18N9T

[Article by V.M. Bykov, A.G. Yakhein, V.D. Dmitriyev, L.G. Kostromin, A. Ya. Ladygin, V.I. Shcherbak; Moscow, Atomnaya Energiya, Russian, Vol 35, No 2, 1973, publication date unknown, pp 235-237]

Many works pertaining to the investigation of the radiation strength of austenitic steels after irradiation in fast reactors and ion bombardment in accelerators [1, 2] have been published in recent times. The swelling of types 304 and 316 stainless steel has been subjected to most thorough investigation. Information on the swelling of OKh18N9T steel is limited to data for individual temperatures and integral doses [3]. The results of electron-microscopic analysis of the radiation porosity of OKh18N9T steel are presented in this article.

Experimental Material and Technique

The specimens for electron-microscopic analysis were discs 3.5 mm in diameter and 0.4 mm thick, cut from various fuel element jackets made of OKh18N9T steel and irradiated with integral fluxes of up to $4.4 \cdot 10^{22}$ neutron/cm^2 in the 430-500°C temperature range. The method of thinning of the specimens in a stream of electrolyte (60% H_3PO_4 + 40% H_2SO_4) is described in [4].

Processing of the results was accomplished directly from the negatives with the aid of an instrumental microscope. The measurement error of cavity diameters was 20 Å. The concentration of the pores in the specimen was determined by measuring at least 600 cavities in a specimen with a thickness of 1,500 Å. The summary error of determination of the swelling of the material was 50%, but the scattering of the values from the arithmetic mean value for several measurements of the same specimen did not exceed 20%.

Investigation of the Swelling of OKh18N9T Steel

Electron-microscopic analyses of the specimens revealed pores, homogeneously distributed through the body of the grain, the concentration

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UDC 595.754:616-091.8:632.937.14

USSR

ROMASHEVA, L. F., SHCHERBAK, V. P., and VIDOMSKIY, E. V., Institute of Biology, Academy of Sciences Kirgiz SSR

"The Action of the Bacterial Preparations Entomobacterin-3 and Dendrobacillin and of the Boverine Fungus on Bedbugs"

Frunze, Izvestiya Akademii Nauk Kirgizskoy SSR, No 3, May-Jun 72, pp 63-67

Abstract: The toxicity of the standard bacterial preparations entomobacterin-3 and dendrobacillin to bedbugs was studied. The bedbugs were sprayed under laboratory conditions with aqueous suspensions of the preparations at concentrations of 0.5-2.0%, whereupon the length of time within which 90% of the insects perished was determined. The effect produced increased with increasing concentrations of the suspensions; it was generally the same for a 1.5% as a 2.0% suspension. The effect varied with the season, it was least pronounced in August, when the bedbugs were well-fed on blood, and more pronounced in March, when the bedbugs were underfed, and September, when their vitality was lower than in the summer. The action of the two bacterial preparations was similar, because both belonged to the same group of sporiferous and crystal-forming microorganisms, i.e., Bac. thuringiensis. The effective concentrations of boverine were in the 1-2% range and the optimum

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USSR

ROMASHEVA, L. F., et al., Izvestiya Akademii Nauk Kirgizskoy SSR, No 3, May-Jun 72, pp 63-67

months for its application Jan and Sep, in which the humidity is highest and the physiological activity of the bedbugs is at the lowest level. A higtological study was carried out on bedbugs that had been treated with 1-2% suspensions of dendrobacillin. Within 21-24 hrs after the treatment, sporiferous and crystal-forming bacteria were present in the insect bodies. Their greatest accumulation was in the outer fatty tissue, in the region of tracheae, between the malpighian bodies, and within and around the intestine. Gradually necrosis of the tissues in which the bacteria concentrated and destruction of the organs took place. The death of the insects after penetration of the crystal-forming bacteria into their body was apparently due to the action of bacterial toxins. On application of low doses of the bacterial preparations, septicemia predomoniated, while after application of high doses septicemia almost did not have time to develop. Entomobacterin-3 was obtained from the Agricultural Technology/Administration/ of the Kirgiz SSR, dendrobacillin from the Problem Laboratory of Irkutsk State University (Prof. Ye. V. Talalayev), and boverine from the Biological Method Laboratory at Minsk (T. T. Bezdenko, I. T. Korol), where it was prepared.

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USSR

POLYAKOV, V. S. and SHCHERBAK, V. T.

"The Problem of Processing of the Results of a Study"

K Voprosu Obrabotki Rezul'tatov Issledovaniya [English Version Above], Leningrad Polytechnical Institute, Leningrad, 1972, 16 pages (Translated from Referativnyy Zhurnal Kibernetika, No 9, 1973, Abstract No 9V761 DEP).

Translation: An algorithm and program are presented, written in ALGOL and designed for the TA-IM translator, for determination of the analytic form of the solution of mechanics problems in the form of number files. The analytic dependence, approximately describing the number file in question, is sought in the form of an exponential polynomial with minimal (within the limits of the permissible error of approximation) number of terms. The possibility is studied of processing number files of both one and several independent variables. A s an example, a file of values of the load factor of a split bearing is processed. Authors' view

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USSR

UDC 621.791:533.9

VOROPAY, N. M., Cand. Tech. Sci., SHCHERBAK, V. V., and GRIGOR'YEV, A. A., Engrs.

"Pulse Microplasma Welding of Thin Aluminum Gaskets"

Moscow, Khimicheskoye i Neftyanoye Mashinostroyeniye, No 11, Nov 71, p 19

Abstract: Gaskets consisting of an Al shell with a wall thickness of 0.2-0.3 mm filled with asbestos and having a diameter $\leq$ 600 mm are used in chemical and petroleum conversion equipment. Difficulties have been encountered in the butt welding of the thin Al sheets because of the formation of burn holes and the failure of the sheets to join. A satisfactory method of pulse microplasma butt welding of the Al sheets has been developed by the Institute of Electric Welding imeni Ye. O. Paton jointly with the VNIIPT of Chemical and Petroleum Conversion Equipment. In the procedure, Ar is used as the plasma-forming gas and He as a protective gas which compresses the arc radially. Melting of the metal takes place during the positive potential pulse and dispersion of the oxides that have formed on the surface during the negative potential pulse. The pulse of the current of direct polarity has a higher amplitude than that of the current of reverse polarity. Equipment for manual and mechanized (automatic) welding by this method has been

APPROVED FOR RELEASE: 07/20/2001 CIA-RDP86-00513R002202910017-7"

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VOROPAY, N. M., et al., Khimicheskoye i Neftyanoye Mashinostroyeniye, No 11, Nov 71, p 19

developed. Use of a thin welding wire is preferable to welding without a wire, because the Al foil then does not have to be cut as precisely. The diameter of the nozzle for the plasma-forming Ar is 0.8-1.9 mm. In mechanized welding of Al sheets 0.3 mm thick, the current is 12-15 A, the rate of welding 30-40 m/hr, the flow of Ar 0.6-0.8 l./hr,the flow of He 2-3 l./hr. The burners are water-cooled. W electrodes with a diameter of 1.0-1.5 mm and a conically pointed tip are applied. Besides its application in the production of Al gasket shells, the procedure can be used quite generally for the welding of Al, Mg, and Al and Mg alloys to produce flat gaskets and parts and articles of other shapes with a wall thickness of 0.2-1.5 mm.

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USSR UDC 621.372.822:621.385.63

SHCHERBAK, V. V.

"Diffraction Radiation of a Two-Dimensional Electron Flux on a Strip Diagram in a Rectangular Wave Guide"

Radiotekhnika. Resp. mezhved. nauchno-tekhn. sb. (Radio Engineering. Republic Interdepartmental Scientific and Technical Collection), 1970, vyp. 14, pp 3-12 (from RZh-Radiotekhnika, No 4, Apr 71, Abstract No 4B127)

Translation: The problem of transient and diffraction emission of a two-dimensional modulated electron flux is investigated in the approximation of a given current. There are 2 illustrations and a 5-entry bibliography.

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USSR

UDC 616.981.42-07:616.15-097.5-074

CHERNYSHEVA, M. I., KNYAZEVA, E. N., DUYSENOV, K. D., and SHCHERBAK, Yu. F., Institute of Epidemiology and Microbiology imeni Gamaleya and Central Institute for the Advanced Training of Physicians

"Use of the Cysteine Test to Detect 7S(IgG) Antibodies in Acute, Chronic, and Residual Brucellosis Patients"

Moscow, Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii, No 10, 1971, pp 102-105

Abstract: The indirect hemagglutination test revealed the presence of the microglobulin 7S(IgG) in the cysteine-treated serums of all 35 patients with acute or subacute brucellosis and in 64 of 160 patients (40%) with chronic brucellosis (especially during exacerbation of the disease). The antibody was not found in those with residual brucellosis. The presence of this antibody is thus an indicator of the activity and severity of the course of the infection.

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USSR UDC 616.981.42-036.12-078.7

CHERNYSHEVA, M. I., KNYAZEVA, E. N., and SHCHERBAK, Yu. F., Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, Academy of Medical Sciences USSR, Brucellosis Laboratory Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, Scientific Research Group, Academy of Medical Sciences USSR

"A Comparative Study of the Diagnostic Usefulness of Serological Reactions in Chronic and Residual Brucellosis"

Moscow, Sovetskaya Meditsina, No 12, 1971, pp 82-86

Abstract: The common medical tests for chronic or residual brucellosis, the agglutination reaction, the Huddleson test, and the allergic skin test of Burnet were considered not sensitive enough to defect brucellosis antibodies in blood serum. Three new serological tests have been developed recently (the indirect hemagglutination reaction, immunofluorescence reaction, and Coombs test), and their diagnostic effectiveness has been clinically evaluated. The experimental group consisted of 164 hospitalized brucellosis patients -- men, women, young, and old, chronic cases, mild, moderate, and severe forms, and residual cases. Brucellosis was diagnosed in these patients by means of clinical observation, epidemiological anamnesis, and

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CHERNYSHEVA, M. I., et al., Sovetskaya Meditsina, No 12, 1971, pp 82-86

positive results from laboratory tests. The allergic skin test of Burnet gave a positive reaction with 59% of these subjects. Positive serological reactions were obtained in 84% of all patients, chronic and residual, when the Coombs test was tried. The immunofluorescence method identified 61%, with indirect hemogglutination next in effectiveness at 53%. The agglutination reaction was the least sensitive (35%). When analyzed according to the various states of brucellosis, chronic mild, chronic moderate and severe, and residual, the Coombs test was most sensitive in detecting incomplete antibodies. The immunofluorescence reaction and the indirect hemagglutination reaction were also effective in detecting brucellosis. The agglutination reaction usually gave less than 50% positive reactions. All tests had the least number of positives in residual brucellosis. The Coombs test and immunofluorescence were able to detect brucellosis antibodies no matter how the antigen entered the patient (vaccine therapy, preventive inoculation, original infection, or repeat infection). Actually, serological reactivity even increased after vaccine therapy.

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USSR UDC 616.932-08:616-092

NIKIFOROV, V. N., Professor, SHCHERBAK, Yu. F., Candidate of Medical Sciences, LEVITOV, T. A., Docent, and MARCHUK, L. M.

"Modern Fundamentals of Pathogenetic Therapy of Cholera"

Moscow, Sovetskaya Meditsina, Vol 33, No 7, Jul 70, pp 10-17

Abstract: Patients with algid cholera suffer from acute intoxication, acidosis, loss of body fluids and salts, and disrupted intermediary metabolism, and therefore require immediate treatment. A study was undertaken in which 66 cholera patients were divided into several groups and treated with bacteriophages (administered enterally or intramuscularly), with or without intramuscular tetracycline. For each group, an appropriate control subgroup was treated with a placebo. Blood tests and stool analyses were performed on each patient before and during the treatment. The bacteriophages were found to be no more effective than the placebo. Tetracycline definitely improves the condition of the patient, however. The basic treatment is still intravenous administration of salt solutions (rehydration), accompanied by enterally administered tetracycline. Immediate intravenous infusion of 5-4-1 salt solution (5 g NaCl, 4 g $NaHCO_3$, and 1 g KCl per liter of double distilled water) is recommended. The total dose shall be about 10 percent of the patient's body weight or, more precisely: 4×10^3 x (specific

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NIKIFOROV, V. N. et al, Sovetskaya Meditsina, Vol 33, No 7, Jul 70, pp 10-17

gravity of patient's plasma - 1.025) x patient's weight in kilograms = milliliters of salt solution to be administered. The solution should be infused as follows: first liter over a period of 10 min, second liter, 20 min, and the remainder, 30-60 min. The solution is subsequently infused in volumes equal to the total loss of body fluids (feces, urine, and vomitus). If EKG disturbances develop, the 5-4-1 solution should be temporarily replaced with 6-4 solution (6 g NaCl and 4 g $NaHCO_3$ per liter of double distilled water). No cardiovascular drugs are necessary. Initial, drastic recovery is observed 20-25 minutes after treatment is begun; 8-12 hours later, patients are able to sit up in bed and eat. Tetracycline becomes effective after 24 hours, helping the body to rapidly eliminate the Vibrio comma.

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UDC: 534.232

USSR

SHIBAYEVA, A. V., POPKO, G. I., SHCHERBAK, Yu. M., Belorussian "Order of the Red Banner of Labor" State University imeni V. I. Lenin

"A Method of Making Thin-Film Ultrasonic Transducers"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 7, Mar 72, Author's Certificate No 329653, Division H, filed 11 Apr 70, published 9 Feb 72, p 221

Translation: This Author's Certificate introduces a method of making thin-film ultrasonic transducers. The procedure is based on vacuum vaporization of material. As a distinguishing feature of the patent, the reliability of the transducers is improved and their resistance to mechanical effects is increased while simplifying the manufacturing technique at the same time by using selenium as the initial material.

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1/6 030 UNCLASSIFIED PROCESSING DATE--11SEP70
TITLE--PERSONAL CONFLICTS CAN DISRUPT SCIENTIFIC WORK -U-

AUTHOR--SHCHERBAKOV, A.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW LITERARY GAZETTE NO 19, 6 MAY 70 P 12 1

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CIRC ACCESSION NO--AN0100604

UNCLASSIFIED

2/6 030 UNCLASSIFIED PROCESSING DATE--11SEP70
CIRC ACCESSION NO--AN0100604
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. OFTEN, AND NOT WITHOUT GROUNDS, IT IS SAID THAT WITH A TALENTED LEADER IN THE COLLECTIVE NO SITUATIONS OF CONFLICT ARISE. BUT THE DIFFICULT TASK IN TO SELECT FROM THE MASS OF ASPIRANTS TO WORK IN INSTITUTES NOT ONLY TALENTED BUT ALSO PSYCHOLOGICALLY COMPATIBLE PEOPLE, TO BE ABLE TO UNITE THEM TO FULFILL ONE IDEA, AND TO CORRECTLY ORGANIZE THEIR LABOR. ALTHOUGH IT WOULD SEEM THAT EVERYBODY IS STRIVING FOR THIS, IN SOME COLLECTIVES A PURELY IMAGINARY CALM EXISTS, AND FROM TIME TO TIME REAL "PSYCHOLOGICAL EXPLOSIONS" TAKE PLACE THERE. A SITUATION OF CONFLICT IN WHICH A SCIENTIFIC WORKER CONSIDERS HIMSELF UNDESERVEDLY OFFENDED AND INSULTED UNSETTLES HIM FOR A LONG TIME. MOREOVER, SCIENTIFIC LABOR, AS IS WELL KNOWN, IS THE LEAST REGULATED IN COMPARISON WITH OTHER TYPES OF ACTIVITY. HERE A PERVERSE SENTIMENT EXERTS A FAR MORE POWERFUL INFLUENCE ON WORK RESULTS. THEREFORE A STUDY OF THE REASONS FOR CONFLICTS IS A SERIOUS TASK IN ORGANIZING SCIENTISTS' LABOR. WHAT DID QUESTIONING THE NOVOSIBIRSK SCIENTIFIC RESEARCH INSTITUTE'S WORKERS INDICATE IN THIS RESPECT? WHAT ARE THE REASONS FOR CONFLICTS? THE RESULTS OF THE INVESTIGATION PROVIDE AN INSUFFICIENTLY COMPLETE ANSWER TO THIS QUESTION. IN THE FIRST PLACE THERE ARE PURELY SUBJECTIVE REASONS DEPENDING ON THE WORKERS THEMSELVES, THE DISINCLINATION OR INABILITY TO BEHAVE PROPERLY IN THE COLLECTIVE, THE INABILITY TO LEAD SCIENTIFIC WORKERS, PRECISELY TO "LEAD" AND NOT TO "COMMAND". I SHOULD LIKE TO DWELL IN DETAIL ON THIS SECOND GROUP OF REASONS.

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3/6 030 UNCLASSIFIED

CIRC ACCESSION NO--AN0100604 PROCESSING DATE--11SEP70

ABSTRACT/EXTRACT--AS A RESULT OF THE INVESTIGATION IT HAS BEEN ESTABLISHED THAT 13 PERCENT OF THE SITUATIONS OF CONFLICT AROSE BECAUSE OF INABILITY ON THE PART OF LEADERS TO ORGANIZE THE WORK OF THEIR SUBORDINATES. IN SCIENTIFIC COLLECTIVES THE AUTHORITY OF THE LEADER IS BASED ABOVE ALL ON KNOWLEDGE AND TALENT, ON SCIENTIFIC, ORGANIZATIONAL ABILITY AND, AS IT TURNED OUT, PERSONAL CHARM PLAYS FAR FROM A SUBSIDIARY ROLE. A CONSIDERABLE PROPORTION OF CONFLICTS IS CAUSED BY THE ORGANIZATIONAL SYSTEM: AN INCORRECT OR INACCURATE REPRESENTATION OF THE DUTIES AND RIGHTS, BOTH ONE'S OWN, AND THOSE OF OTHERS (10.5 PERCENT), AN IMPRECISE DEMARCATION OF EACH PERSON'S SHARE IN CARRYING OUT JOINT RESEARCH (THE SAME NUMBER), NEGLIGENCE OR ERRORS IN WORK (8.8 PERCENT), AND SO FORTH. WE ARRIVED AT THE CONVICTION THAT THE LEADER'S ORGANIZATIONAL TALENT PLAYS A DECISIVE ROLE IN CREATING A NORMAL "PSYCHOLOGICAL CLIMATE". ONLY HIGHLY EDUCATED, CULTURED LEADERS WHO ARE ABLE TO RESPECT A SUBORDINATE, PEOPLE WHO ARE TACTFUL, AND AT THE SAME TIME DETERMINED CAN HEAD A SCIENTIFIC ESTABLISHMENT. BUT PEOPLE POSSESSING VICES SUCH AS OMNISCIENT AIRS, LACK OF HUMILITY, AN/ CALLOUS PEOPLE WILL THEMSELVES CAUSE SITUATIONS OF CONFLICT. THE SCIENTIFIC AND TECHNICAL REVOLUTION HAS PLACED ON THE AGENDA THE NEED FOR A NEW TYPE OF LEADER, A SCIENTIST AND ORGANIZER, IN WHOM TALENT AND KNOWLEDGE ARE COMBINED WITH THE ABILITY TO LEAD A SCIENTIFIC COLLECTIVE.

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CIRC ACCESSION NO--AN0100604 PROCESSING DATE--11SEP70

ABSTRACT/EXTRACT--BUT IN THE MEANTIME THESE PEOPLE ARE SELF TAUGHT, FOR NOBODY HAS EVER TRAINED THEM IN ECONOMICS, ADMINISTRATIVE AND LEGAL QUESTIONS, ORGANIZATION, PSYCHOLOGY, PHYSIOLOGY, AND SOCIOLOGY OF SCIENTIFIC LABOR, AND ALSO PRINCIPLES OF MANAGING A COLLECTIVE. HOWEVER, CAN ONE ALTOGETHER AVOID CONFLICTS IN SCIENTIFIC ESTABLISHMENTS? THE OPINIONS OF THE INVESTIGATION PARTICIPANTS WERE DIVIDED: THE MAJORITY, 59.4 PERCENT, THOUGHT THAT THEY NECESSARILY ACCOMPANIED THE LIFE OF SCIENTIFIC ESTABLISHMENTS. THE REST WERE SURE THAT THE MAJORITY OF IMMINENT CONFLICTS CAN BE AVOIDED IF THE CAUSES ARE ELIMINATED IN TIME. IS IT POSSIBLE TO IMAGINE A SITUATION WHERE INTERESTS, VIEWS, AND THE MOTIVES OF PEOPLE'S BEHAVIOR COINCIDE COMPLETELY? THE CLASH OF IDEAS AND JUDGEMENTS IS QUITE NATURAL. THEY ARE NO MORE THAN ONE MANIFESTATION OF THE DIALECTIC METHOD OF RECOGNIZING THE ESSENCE OF THINGS AND PHENOMENA. IT IS PEOPLE'S NATURE TO MAKE MISTAKES, BUT CLASHES OF OPINIONS AND IDEAS CAN BECOME MANIFEST IN SUCH A FORM WHERE THEY WILL NOT GIVE RISE TO SITUATIONS OF CONFLICT, CAUSE PEOPLE SPIRITUAL PAIN, CLOUD THE JOY OF LABOR AND CREATION. THERE WILL ALWAYS BE QUARRELS, BUT THEY MUST BE RESOLVED BEFORE THEY BLOSSOM INTO CONFLICTS. IT IS DIFFICULT TO SPEAK ABOUT WAYS AND MEANS OF PREVENTING SITUATIONS OF CONFLICT. INDEED WE ARE DEALING WITH SUCH A MOST DELICATE AND COMPLEX FIELD AS HUMAN NATURE, AND THE SCIENTIST'S SPIRITUAL WORLD.

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5/6 030 UNCLASSIFIED PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AN0100604

ABSTRACT/EXTRACT--BUT IF ONE MAY SPEAK ABOUT CERTAIN GENERAL RECOMMENDATIONS, THEY IT IS PROBABLY MOST DANGEROUS TO SWEEP CONFLICTS UNDER THE CARPET, AND IN FACT MOST USEFUL, THE DATA FROM THE QUESTIONNAIRE ALSO INDICATE THIS TO DISCUSS WIDELY SPECIFIC CAUSES AND CONSEQUENCES OF CONFLICT. LET US TAKE FOR EXAMPLE, A WORKER'S LEAVING THE ESTABLISHMENT. SHOULD NOT SUCH A FACT UPSET THE WHOLE SCIENTIFIC COLLECTIVE, AND NOT JUST THE ADMINISTRATION? IN EXACTLY THE SAME WAY IT IS FAR FROM USELESS TO SUBMIT FOR OTHER WORKERS' APPROVAL INCLUSION OF A SPECIALIST ON THE STAFF. IN SHORT, MEMEBERS OF THE COLLECTIVE MUST BE SURE THAT THEIR OPINION IS OF INTEREST TO THE LEADERS, AND THAT SO FAR AS POSSIBLE IT WILL ALWAYS BE TAKEN INTO CONSIDERATION BY THEM. AT THE MOMENT, FOR EXAMPLE, THE COLLECTIVE IS NOT INFORMED OF THE DECISION OF THE COMPETITION COMMISSIONS (WHEN IT IS A QUESTION OF ACCEPTANCE FOR WORK). BUT AT THE SAME TIME, IT WOULD BE EXTREMELY USEFUL TO EXAMINE THE RECOMMENDATIONS OF THESE COMMISSIONS AT GENERAL MEETINGS OF LABORATORIES, SECTIONS, AND THE LIKE. SUCH A DISCUSSION WOULD PLACE RESPONSIBILITY ON THE WHOLE COLLECTIVE, AND THE NEW WORKER WOULD BE SHOWN THAT HIS FUTURE COLLEAGUES ARE NOT INDIFFERENT TO HIS ARRIVAL. ALL THIS WOULD GUARANTEE CORRECT SELECTION OF CADRES IN SCIENTIFIC ESTABLISHMENTS AND NOMINATION OF LEADERS FROM AMONG CAPABLE AND TALENTED WORKERS. AT THE SAME TIME, THIS WOULD FACILITATE AN INCREASE IN THE COHESION OF SCIENTIFIC COLLECTIVES AND STRENGTHEN THEIR RELATIONS OF FRIENDSHIP AND CREATIVE COOPERATION. HOW WERE INSTANCES OF CONFLICT RESOLVED ACCORDING TO THE DATA OF THE INVESTIGATION MATERIALS?

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6/6 030 UNCLASSIFIED PROCESSING DATE--11SEP70
CIRC ACCESSION NO--AN0100604
ABSTRACT/EXTRACT--ONE QUARTER OF THEM WAS ELIMINATED WITHOUT ANY OFFICIAL EXAMINATION, THAT IS, THROUGH COMPROMISES, MUTUAL APOLOGIES, AND SO FORTH. JUST AS MANY CONFLICTS REQUIRED INTERVENTION BY THE ADMINISTRATION, WHICH HAD TO RECONCILE THE DISPUTANTS, PROCLAIM PUNISHMENT, AND EVEN DISMISS. IN PUBLIC ORGANIZATIONS 16.1 PERCENT OF ALL CONFLICTS WERE EXAMINED. ALMOST 17PERCENT RESULTED IN TERMINATION OF EMPLOYMENT, IN THE MAJORITY OF CASES, "OF ONE'S OWN ACCORD". THESE FIGURES ARE A VIVID INDICATION OF HOW LITTLE USE IS STILL BEING MADE OF SCIENTIFIC PUBLIC FORCES TO ELIMINATE INSTANCES OF CONFLICT. THE IDEAS SET OUT HERE, OF COURSE, DO NOT EXHAUST THE DIVERSITY AND COMPLEXITY OF THE PROBLEM, BUT ONE THING IS CLEAR: THE CAUSES OF CONFLICT MUST BE STUDIED, AND CONSTANT, PERSISTENT WORK MUST BE CARRIED OUT TO ELIMINATE THEM COMPLETELY. THE FATE OF THE "PSYCHOLOGICAL CLIMATE" IN THE SCIENTIFIC COLLECTIVE IS ULTIMATELY IN THE HANDS OF THE COLLECTIVE ITSELF.

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AUTHOR-- SHCHERBAKOV, A.

TITLE-- OUR FIRST JET-PROPELLED AIRPLANE

NEWSPAPER-- KOMSOMOL,SKAYA PRAVDA, FEBRUARY 25, 1970, NR 46, P 2, COLS 3-6

ABSTRACT-- THE PRINCIPLES OF A ROCKET-PROPELLED FLIGHT WERE EXPRESSED BY S. P. KOROLEV IN HIS BOOK "ROCKET-PROPELLED FLIGHT IN THE STRATOSPHERE" PUBLISHED IN THE EARLY 30,S.

THE DECISION TO INSTALL A ROCKET ENGINE ON A GLIDER DESIGNED BY B. I. CHERANOVSKIY WAS TAKEN BY KOROLEV AND HIS COLLEAGUES FROM GIRD. HOWEVER, AFTER IT HAD BEEN FOUND THAT THE CHERANOVSKIY MODEL WAS TOO OLD AND WORN OUT, KOROLEV DECIDED TO MAKE USE OF A GLIDER "SK-9"

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/SERGEY KOROLEV-9/ AND THE ORM-65 ROCKET ENGINE DESIGNED AT THE RNII /JET PROPULSION RESEARCH INSTITUTE/.

BETWEEN 1937 AND 38 THIS ENGINE MOUNTED ON THE "SK-9" GLIDER WENT THROUGH SCORES OF STATIC TESTS THAT SHOWED ITS POOR RELIABILITY. AS A RESULT, A MODIFIED VERSION OF THE ORM-65, RDA-1-150, WAS DEVELOPED BY ENGINEERS L. S. DUSHKIN AND A. V. PALLO, ET AL. A GLIDER POWERED BY THE RDA-150 WAS NAMED "RP-318". THE "RP-318" WAS FLIGHT TESTED BY V. P. FEDOROV ON FEBRUARY 28, 1940.

THE AUTHOR OF THE ARTICLE, A. SHCHERBAKOV, REFERS TO HIMSELF IN IT AS DEPUTY CHIEF DESIGNER.

19660852

USSR

UDC: 621.396.62

SHCHERBAKOV, A. F.

"Nonlinear Distortions in a Traveling Wave Tube Amplifier for the Case of Simultaneous Transmission of Multichannel Telephone and Television Signals"

Tr. Mosk. elektrotekhn. in-ta svyazi (Works of the Moscow Electrical Engineering Institute of Communications), 1970, vyp., pp 37-42 (from RZh-Radiotekhnika, No 11, Nov 70, Abstract No 11D10)

Translation: The author describes one modification of simultaneous transmission of multichannel telephone and TV signals, and also a means of suppressing nonlinear distortions in a traveling wave tube amplifier, where the distortions are due to transformation of parasitic amplitude and frequency modulation. Graphs are presented for the distribution of products of nonlinear distortions. Bibliography of four titles. P. U.

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USSR

UDC 669.187.2.083

GOTIN, V. N., ZAYTSEV, B. YE., SHCHERBAKOV, A. I., ZHITKOV, N. K., OKOROKOV, G. N., BOYARASHINOV, V. A., VOYNOVSKIY, YE. B., TOPILIN, V. V., SHALIMOV, AL. G., OSIPOVA, L. M., CHERNOV, YU. V., ROZANOVA, T. S., and LAKTIONOV, V. S.

"Influence of Wall Thickness of Crystallizer and Consumption of Cooling Water on Conditions of Formation of Ingot During Vacuum Arc Remelting"

Proizvodstvo Chernykh Metallov [Production of Ferrous Metals--Collection of Works], No 75, Metallurgiya Press, 1970, pp 178-180

Translation: In a vacuum arc furnace in a crystallizer (C) 160 mm in diameter with a current of 2.0-3.7 ka, the influence of wall thickness of C and temperature of cooling water on conditions of formation of ingot of complexly alloyed nickel-based alloys is studied. C with wall thicknesses of 30 and 18 mm were studied, the temperature on the outer surface of the C reaching 75°C in the first case, 105°C in the second. The temperature of the internal surface of the C was identical, 140-150°C. Neither a change in C thickness nor a change in water consumption from 11 to 22 m^3/hr influenced the depth of the liquid metal bath, i.e., both repeated rolling of the C and reduced water consumption were permissible. 2 figures.

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USSR

UDC:669.187.5

ZAYTSEV, B. Ye., GOTIN, V. N., SHCHERBAKOV, A. I., SERGYEV, A. B., ZHITKOV, N. K., OKOROKOV, G. N., BOYARSHINOV, V. A., TULIN, N. A., VOYNOVSKIY, Ye. V., TOPILIN, V. V., POZDEYEV, N. P., SHALIMOV, Al. G., OSIPOVA, L. A., CHERNOV, Yu. V., and RAZANOV, T. S.

"Specifics of Vacuum Arc Remelting of Nickel-Based Alloys and Stainless Steels With Reverse Arc Polarity"

Proizvodstvo Chernykh Metallov [Production of Ferrous Metals--Collection of Works], No 75, Metallurgiya Press, 1970, pp 181-183

Translation: Results are presented from a study of vacuum arc remelting of nickel alloys in a crystallizer 380-480 mm in diameter with thermocouples calked in length and height. The rate of melting with reverse polarity is 20% higher with identical bath depth of liquid metal. This is a result of more intensive heat transfer from the walls of the crystallizer during melting with reverse polarity. The macrostructure, chemical composition N, O, H and mechanical properties of the metal produced by melting with forward and reverse polarity are identical. The ingot produced with reverse polarity had no corona. 2 figures; 1 table; 1 biblio. ref.
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USSR UDC: 621.391.822

BANKET, V. L., SERYKH, V. I., SHCHERBAKOV, A. I.

"On the Probability Distribution of Noise at the Output of a Receiver of FM Signals"

V sb. Metody pomekhoustoychivogo priyema ChM i FM (Methods of Interference--Free FM and PM Reception--collection of works), Moscow, "Sov. radio", 1970, pp 71-79 (from RZh-Radiotekhnika, No 12, Dec 70, Abstract No 12A67)

Translation: S. O. Rice's model for noise in FM receivers is used as the basis for finding the probability distribution of noise at the output of the low-frequency filter in a standard demodulator in the case of an unmodulated carrier. It is shown that in the case of operation in the threshold vicinity and below, the noise probability density differs appreciably from normal. The limits of applicability of the resultant expressions for probability density are determined. Resumé.

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SHCHERBAKOV, A.P.

Pathological Anatomy

JPRS 57706

7 December 1972

UDC 616.831-091.81-02:616.217.32.099

SIGNIFICANCE OF CHOLINERGIC REACTIONS IN BRAIN NEURON PATHOLOGY BROUGHT ON BY ANTICHOLINESTERASE INTOXICATION

[Article by A.P. Shcherbakov, Department of Pathological Anatomy, Ryazan Medical Institute imeni I.P. Pavlov, Moscow, Zhurnal Nevropatologii i Psikhiatrii, No 7, 1972, pp 1068-1072]

Changes of brain neurons in response to intoxication by anticholinesterase compounds were studied. Experiments were conducted on 60 white rats subjected to lethal doses of metaphos (40 animals) and tabun (20 animals). Data were obtained that indicated a relationship between neuron pathomorphological changes and disturbance of acetylcholine and electrolyte metabolism.

The purpose of this work was to study brain neuron pathology affected by anticholinesterase compounds.

Experiments were conducted on 60 whitemts, 40 of which were subjected to lethal doses of metaphos and 20 of which were given tabun. The chemicals -- 4 mg/kg tabun and 20 mg/kg metaphos -- were injected intraperitoneally. A control group of animals (6) was given 1 ml intraperitoneal injections of warm, sterile water. Rats poisoned with tabun normally die after 20-30 minutes, while those poisoned with metaphos die after 12-15 minutes. In the tabun experiments some of the animals (6) were given atropine (1.5 ml, 0.1 percent solution) as an antidote.

The animals were killed at various periods from the start of the experiment -- in 14-30 minutes when poisoned with tabun and in 12-15 minutes when poisoned with metaphos. The brain was fixed in neutral 12 percent formalin and set in celloidin. The celloidin sections were stained with thionin by the Nissl and Selye [translitteration] methods. In addition unfixed brain tissue sections were used for histochemical

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UDC 616.8-003.8-02:/615.917:547.241

SHCHERBAKOV, A. P. Chair of Pathological Anatomy, Ryazan Medical Institute imeni Pavlov

"Degenerative Changes in the Central and Peripheral Nervous System Following Acute Poisoning with Organophosphorus Compounds"

Moscow, Zhurnal Nevropatologii i Psikhiatrii imeni S.S. Korsakov, No 1, 1970, pp 60-64

Abstract: White rats injected intraperitoneally with a nonlethal dose (0.4 mg/100 g) of metaphos (methyl parathion mixture of parathion and) exhibited the clinical picture of mild organophosphorus poisoning (symptoms disappeared within two hours of administration of the poison). The animals were sacrificed after 2 hours, 1, 21, and 30 days. Histological examination revealed distinct signs of widespread degeneration of elements of the central and peripheral nervous systems: fragmentation of myelin fibers, loss of [illegible] bodies, dehydration, vacuolization, and lysis of nerve cells. These changes may be related to the development of autoimmune and autoallergic degenerative processes in the form of myelopathy, encephalopathy, and degeneration of nerves and roots.
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APPROVED FOR RELEASE: 07/20/2001 CIA-RDP86-00513R002202910017-7"

Acc. Nr. AP0029115 Ref. Code: UR 0246

PRIMARY SOURCE: Zhurnal Nevropatologii i Psikhiatrii, 1970, Vol 70, Nr 1, pp 60-64

DYSTROPHIC PROCESS IN THE CENTRAL AND PERIPHERAL NERVOUS SYSTEM IN CONNECTION WITH ACUTE INTOXICATION BY PHOSPHORUSORGANIC SUBSTANCES

A. P. Shcherbakov

Investigations have shown that phosphorusorganic substances (POS) even in small doses may become the reason of dystrophic processes in the nervous system developing in the postintoxicational period. Experiments accomplished on 24 white rats, who received intramesentherically metaphos 0,4 mg/100 g of weight, exhibited clinical pictures of a light intoxication. In the central and peripheral nervous system there were symptoms of dystrophy of the myeline structures and nervous cells. The morphological changes in the nervous elements remained expressed even up till the 30th day after the intoxication by POS. The author thinks it possible to correlate these changes with the development of autoimmune processes in the organism of the animals and evaluate them in the remote period after intoxication as an autoallergical encephalopathy and myelopathy.

REEL/FRAME
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USSR

LYAKHOVICH, L. S., VOROSHNIN, L. G., SHCHERBAKOV, E. D., and PANICH, G. G.

"Siliconizing of metals and Alloys"

Silitsirovaniye metallov i splavov (English version above), Minsk, Nauka i Tekhnika Press, 1972, 280 pp

Translation of Foreword: With the broad application of high temperatures and pressures, corrosive media, vacuum, etc. in modern machines, parts and units must frequently meet a combination of demands which cannot or should not be met from the economic standpoint by volumetric alloying of steels or creation of new alloys. In this case, the solution to the problem is frequently the creation of various protective coatings on the surfaces of products.

Diffusion coatings play a leading role in this respect. Chemical and heat treatment radically changes the physical and chemical properties of surface layers, i.e., of those layers in which breakdown processes are primarily developed.

This book analyzes the methods and technological principles of siliconizing of ironcarbon alloys, and the regularities of formation, structure, and properties of diffusion layers. Silicide coatings on steels and alloys allow significant increases in corrosion resistance, high-temperature oxidation resistance, and hardness and wear resistance, and sometimes allow these pro-

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LYAKHOVICH, L. S., et al., Silitsirovaniye metallov i splavov, Minsk, Nauka i Tekhnika Press, 1972, 280 pp

perties to be produced in favorable combinations.

Siliconizing is presently used very little in industry. Probably the main reason for this is the lack of suitable technological methods for applying diffusion coatings, as well as the limited information available on the properties of these coatings. Therefore, the authors have turned their attention to the development and description of new methods of saturation and compositions of saturating mixtures and to the study and systematization of the properties of silicon-containing diffusion coatings on metals and alloys.

Due to the limited volume of this monograph, the authors were not able to describe fully the problems of siliconizing of nonferrous and refractory metals, so important from the practical point of view. However, the general principles of formation of diffusion coatings and compositions of saturating mixtures presented in the work can be used for the treatment of nonferrous and refractory metals and alloys.

This book also discusses certain little-studied problems of the thermodynamics and mechanism of formation of diffusion coatings by electrolytic and liquid saturation of metals and alloys from melts of salts and oxides. The authors hope that these materials will be useful in the development and study of processes of diffusion saturation with other elements.

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LYAKHOVICH, L. S., VOROSHNIN, L. G., SHCHERBAKOV, E. D., and PANICH, G. G., Silitsirovaniye metallov i splavov, Minsk, Nauka i Tekhnika Press, 1972, 280 pp

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LYAKHOVICH, L. S., VOROSHNIN, L. G., SHCHERBAKOV, E. D., and PANICH, G. G., Silitsirovaniye metallov i splavov, Minsk i Tekhnika Press, 1972, 280 pp

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LYAKHOVICH, L. S., VOROSHNIN, L. G., SHCHERBAKOV, E. D., and PANICH, G. G., Siliitsirovaniye metallov i splavov, Minsk, Nauka i Tekhnika Press, 1972, 280 pp

Chapter 8

Industrial Application of Siliconizing

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SHCHERBAKOV, G.I.

ELECTRICAL DISCHARGE BETWEEN COAXIAL COPPER ELECTRODES

JPRS 61504

18 March 1974

EXPERIMENTAL STUDY OF THE CHARACTERISTICS OF ELECTRICAL DISCHARGE BETWEEN COAXIAL COPPER ELECTRODES IN A MAGNETIC FIELD

[Article by V. I. Alferov, O. N. Vitkovskaya, Yu. S. Ustinov, G. I. Shcherbakov, Moscow, Teplofizika Vysokikh Temperatur, Russian, Vol 11, No 6, 1973, signed to press 4 July 1972, pp 1172-1176]

The results of experimental investigations of electrical discharge in the annular gap between cooled copper electrodes are presented in this article. The experiments were conducted at pressures of 0.5-7 abs.atm with magnetic induction of 0.1-1 T, current of 400-1,000 A and electrode gap of 10-20 mm. Empirical formulas are presented for determination of discharge voltage and discharge velocity in an annular gap.

Electrical discharge, rotating in an annular gap in a transverse magnetic field, is used extensively at the present time in aerodynamic systems and in various chemical industry installations. However the characteristics of such discharge, determined by various authors [1-5], especially the velocity and volt-ampere characteristics, vary substantially. The existing experimental results were obtained for narrow ranges of change of magnetic field and discharge current, basically at atmospheric pressure. Described in this article are studies of discharge characteristics at pressures less than and greater than atmospheric, and with discharge stabilized by means of a magnetic lens. This method of stabilization eliminates axial movement and deformation of the discharge channel, which reduces pulsations of current and deformation of the discharge variations of the rate of rotation. In addition, an increase of magnetic induction in the radial direction prevents shunting of discharge.

Experimental Method. The experimental investigations were conducted on an apparatus representing a coaxial plasmatron with discharge rotated by a magnetic field. The apparatus is described in detail in [6]. The diameter of the external copper electrode is 50-60 mm and the diameter of the central electrode is 50-90 mm, which provides for variation of the electrode gap from 10 to 20 mm.

(6,b,c)

The investigations were conducted in air at flow rates $G = (0.5-7) \cdot 10^{-3}$ kg/s, pressures $p = 0.5-7$ absaten, currents $I = 100-1,000$ A and magnetic induction $B = 0.1-1$ T. The distribution of the axial component of the magnetic field in the discharge zone is illustrated in figure 1 for various coil currents.

The solenoid that developed the magnetic field was powered either consecutively with the discharge or from an independent power source. In the latter case the equivalent active and inductive resistances were included in the discharge power circuit.

During experiments the gas flow rate, chamber pressure, current and voltage of discharge and magnetic induction were measured. Current and voltage were recorded with N-ON; N-105 and OK-17M oscillographs. Current and speed photography of discharge with an SFR-2M camera was conducted synchronously with recording of discharge current and voltage using a scheme that precluded the possibility of double exposure [1].

Figure 1. Distribution of axial component of magnetic field in discharge zone for various coil currents: 1 -- 100; 2 -- 200 A; 3 -- 400; 4 -- 600; 5 -- 1,000; discharge zone is cross hatched.

Experimental results. Analysis of data taken from the films of discharge revealed that even for $B \geq 0.1$ T the discharge zone is not a distinct pinched column, but is blurred in the direction of rotation so that its width is of the same order of magnitude or greater than the electrode gap. As the magnetic induction increases at constant current and pressure, the rate of rotation of the discharge zone increases and the width of the zone in the direction of rotation and its structure remain the same.

At currents of 400-600 A and pressure of 5-6 absaten the discharge gap does not have the characteristic contracted channel and the near-electrode regions glow more brightly than the discharge column. When pressure is decreased to 0.5 absaten the larger part of the electrode gap, but its structure remains unchanged. At the same time the discharge velocity increases.

As current increases the discharge zone expands in the direction of rotation and the column begins to glow more brightly and is comparable with the glow of the near-electrode regions. The rate of rotation of discharge increases.

It may be concluded that when $B \geq 0.1$ T discharge in the investigated range of currents and pressures cannot be considered an arc discharge in the

USSR

UDC: 621.315.3

SHCHERBAKOV, G. P., TROSHKOVA, I. I., TOLMACHEVA, A. Ye., NEKRASOV, V. A., PAVLOVA, N. N.

"The Drop Method of Removing the Glass Insulation From Microwires and its Possibilities"

Elektron. tekhnika. Nauchno-tekhn. sb. Radiokomponenty (Electronic Technology. Scientific and Technical Collection. Radio Components), 1970, vyp. 1, pp 153-158 (from RZh-Radiotekhnika, No 5, May 71, Abstract No 5V421)

Translation: The authors evaluate the possibilities of using the drop method of removing glass insulation to produce a contact joint in making filament resistors and voltage dividers, and in adjusting resistors to their rated value. It is experimentally shown that organic insulation of the Teflon type can be applied to the wire. Some characteristics of the molten drop are given (rate of glass destruction, etc.), together with the strength parameters of the wire. Resumé.

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USSR

UDC: 621.315.3

SHCHERBAKOV, G. P., NEKRASOV, V. A., PERLOVA, A. I.

"On the Problem of Heat Treating Grades MLS60N and MLS72N Microwires"

Elektron. tekhnika. Nauchno-tekhn. sb. Radiokomponenty (Electronic Technology. Scientific and Technical Collection. Radio Components), 1970, vyp. 1, pp 83-89 (from RZh-Radiotekhnika, No 5, May 71, Abstract No 5V418)

Translation: A method is proposed for heat treating microwire in glass insulation by moving a microfurnace along the wire. A peculiarity of the method is the brevity of wire heating (tenths of a second). A study is made of the effect which repeated heating-cooling cycles, tension, temperature and time of heating have on the resistance, temperature coefficient of resistance and mechanical characteristics of specimens. Resumé.

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USSR

UDC: 535.373.2

OSIKO, V. V., PROKHOROV, A. M., and SHCHERBAKOV, I. A.

"Transmission of Excitation Energy Among Three-Valent Ions of Rare Earth Elements in Ion Crystals"

Moscow, Izvestiya Akademii Nauk SSSR--Seriya Fizicheskaya, No 4, 1973, pp 768-771

Abstract: Results are given of an investigation into the interaction effectiveness of Nd^{3+} ions as a function of the temperature. While there are various ideas in the literature regarding the temperature effect on energy transmissions among TR^{3+} ions in crystals and glasses, the authors of the present paper have chosen as the subjects of their investigation CaF_2 with the paired M-centers of Nd^{3+}-Nd^{3+}, $YAlO_3$-Nd^{3+}, and LaF_3-Nd^{3+}. In the investigation of the first pair, involving a single ion system, the migration process of donor ions was excluded and the act of cross relaxation was directly observed. For the second crystal, the dependence of the interaction probability on temperature is determined by the increase in probability of multiphonon transitions with acoustical excitation and by the difference in probability of electron-phonon interaction transitions from basic and excitation Stark components. The third crystal is treated in somewhat the same way as the CaF_2. It is

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OSIKO, V. V., et al., Izvestiya Akademii Nauk SSSR--Seriya Fizicheskaya, No 4, 1973, pp 768-771

concluded that the dependence of the cross relaxation on temperature is the result of the population in the basic and excitation Stark component levels, the inclusion of new interacting transitions, and the thermal stimulation of electron-phonon transitions.

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Lasers & Masers

USSR

UDC: 535.343+535.371

VORON'KO, Yu. K., OSIKO, V. V., PROKHOROV, A. M., SHCHERBAKOV, I. A.

"Some Questions of Spectroscopy of Laser Crystals With Ionic Structure"

Moscow, Trudy Ordena Lenina Fizicheskogo Instituta imeni P. N. Lebedev Akademii Nauk SSSR. Spektroskopiya Lazernykh Kristallov s Ionnoy Strukturoy, Vol 60, 1972, pp 3-30

Abstract: The paper analyzes the basic spectroscopic characteristics of ionic laser crystals (structure of absorption and luminescence spectra, quantum yield, kinetics of intracenter relaxation, processes of excitation energy transfer) which have a direct influence on emission parameters. The authors discuss the effect which the distribution of impurity ions of rare-earth elements with respect to centers of different structure has on these characteristics. Methods are outlined for analyzing the complex Stark structure of the absorption and luminescence spectra of trivalent rare-earth ions.

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USSR

VORON'KO, Yu. K., OSIKO, V. V., PROKHOROV, A. M., and SHCHERBAKOV, I. A., Physics Institute imeni P. N. Lebedev, Academy of Sciences USSR

"Study of the Mechanism of an Elementary Act of Excitation Energy Transfer Between Rare Earth Ions in Crystals"

Moscow, Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 60, No 3, Mar 71, pp 943-954

Abstract: The micromechanism of the interaction of impurity ions in crystals with one another and with the crystal lattice matrix is investigated. The variation with temperature of the probability of excitation energy transfer between rare earth ions was studied using doubly activated fluorite to exclude the effect of energy migration along donor ions. It is shown that the transfer process varies directly with temperature, even in the case of the absence of spectral resonance of electron transitions of the donor and acceptor. It is concluded that the results indicate that the probability of excitation energy transfer in the absence of overlapping of donor and acceptor spectra is determined by the density of phonon states in the frequency region corresponding to the Stokes resonance detuning. The mechanism of temperature activation is associated with the population of the phonon state
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VORON'KO, Yu. K., et al, Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 60, No 3, Mar 71, pp 943-954

corresponding to the acoustical branch of the dispersion diagram. It is noted that these effects also appear in the infrared absorption spectra as a function of temperature, both of crystals of the fluorite type and of crystals of alkali-halide and other compounds.

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USSR

UDC: 533.95

FINAT'YEV, Yu. P., SHCHERBAKOV, L. A., FILIN, V. T.

"Investigation of the Gasdynamic Structure and Electron Distribution in a High-Temperature Supersonic Jet With Solid Phase"

V sb. Teplo- i massoperenos (Heat- and Mass-Transfer--collection of works), T. 1, Minsk, 1972, pp 227-231 (from RZh-Mekhanika, No 7, Jul 72, Abstract No 7B118)

Translation: The article presents the results of investigations of the position of the central shock wave (Mach disc) in the first "barrel" of a jet which is produced when condensed systems with an admixture of aluminum powders are ignited in the prechember of a vacuum installation. Data are also given on the concentration of electrons in the zones of the nozzle tip and the Mach disc. The experiments included motion picture photography of the inherent luminescence of the jet as well as determining the schlieren pattern of the jet; electron concentration was determined by radioscopy of the jet. The results of experiments on determining $\bar{x} = x_c/d_a$ (x_c is the distance from the nozzle tip to the Mach disc, d_a is the nozzle diameter at the tip) lead to the expression $\bar{x} \approx (2 \div 3) M_a^{1.2} n^{0.4} / (M_a^2 + 1)$ $(n = P_a/P_\infty$

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FINAT'YEV, Yu. P. et al., Teplo- i massoperenos, T. 1, Minsk, 1972, pp 227-231

is the degree of deviation of the conditions of escape from the nozzle from the calculated conditions). The experimental results did not reveal any influence of the solid phase on $\bar{x}$ or on k -- the adiabatic exponent-- nor on the electron concentration.

The calculations and experiments showed that frozen-flow conditions are realized beginning with M = 1.5-2. Bibliography of ten titles. V. L. Azarov.

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USSR

UDC 536.244:533.5

NOVIKOV, P. A., SHCHERBAKOV, L. A.

"Study of Process of Heat Exchange and Hydraulic Resistance During Flow of Air Through Narrow Rectangular Channels"

Inzhenerno-fizicheskiy Zhurnal, Vol 22, No 3, 1972, pp 450-455.

Abstract: Results are presented from experimental studies of heat exchange during forced movement of air through narrow channels of rectangular cross section with a distance between plates h = 1.5, 3, 5 and 8 mm.

The studies were performed with cooling of the air in the range of Reynolds numbers 360-32,000 and pressures of $(0.133\text{-}10)\cdot10^4$ n/m^2.

Analysis of the experimental data produced and comparison of these data with the data of a number of other authors indicate that inertial forces are more strongly manifested in narrow channels than in channels with larger characteristic dimensions. In the criterial dependences produced, the exponent with the Reynolds criterion, according to our experimental data, is higher, particularly in the area of laminar flow than is the case for channels with larger characteristic dimensions.

Based on these experimental data on heat exchange, it is established that the loss of stability of laminar flow at Reynolds numbers of over 1,800

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UDC 536.244:533.5

NOVIKOV, P. A., SHCHERBAKOV, L. A., Inzhenerno-fizicheskiy Zhurnal, Vol 22, No 3, 1972, pp 450-455.

increases at some distance from the input cross section of the channels. For very short channels (1/h < 50) in the area of Reynolds numbers from 1,800 to 5,600, the experimental data on heat exchange can be described by equations characteristic for the laminar flow area.

The work also studies the influence of free convection on heat exchange with air flow in the area of Grasshoff numbers from 0.25 to 2,300.

The experimental data on heat exchange are presented in criterial dependences.

The experimental data on hydraulic resistance agrees satisfactorily with the well-known data of other investigators. 1 Table; 2 Figures; 6 Biblio. Refs.

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USSR

UDC 536.244:533.5

NOVIKOV, P. A., SHCHERBAKOV, L. A.

"Study of Hear Transfer in a Flow of Rarefied Gas in Narrow Channels"

Minsk, Inzhenerno-Fizicheskiy Zhurnal, Vol. 20, No. 5, May, 1971, pp 879-883

Abstract: Heat transfer at forced air flow in narrow channels with diameters of 1.5, 3, 4, and 8 mm in a wide range of velocities and pressures is studied experimentally. The experiments were carried out in heat exchangers of copper tubes. To determine the behavior of average heat transfer coefficient within the starting length of channels the experiments have been carried out with various relative channel lengths. It was established that the change in average heat transfer coefficients takes place within the channel length less than 100 diameters. Within the channel length more than 100 diameters the average heat transfer ceofficient remains constant and the experimental data may be approximated by criterial relationships. It was also found that at Reynolds numbers 1700 through 2250 heat transfer coefficient increases sharply.

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USSR

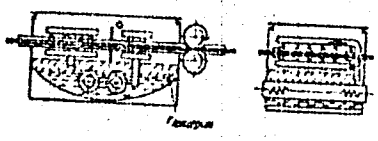
UDC: 621.3.049.75

MARKIN, N. I., SHCHERBAKOV, L. U., SOLOV'YEV, V. I., SADOVNIKOV, I. T.

"A Method of Coating Two-Sided Printed-Circuit Boards with Solder"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, No 10, Apr 71, Author's Certificate No 298089, Division H, filed 29 Jun 68, published 11 Mar 71, p 198

Translation: This Author's Certificate introduces a method of coating two-sided printed-circuit boards with solder in an inert gas atmosphere. As a distinguishing feature of the patent, the process is mechanized and the quality of the coating is improved by jet-spraying both sides of the board with low-melting solder as it moves continuously in the tank, followed by jet-spray rinsing of the excess solder in glycerin.



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USSR

UDC 539.89

KABALKINA, S. S., SHCHERBAKOV, M. O., VERESHCHAGIN, L. F., Academician, Institute of High Pressure Physics of the Academy of Sciences USSR

"On the Question of Polymorphous Transformation in AgCl at High Pressure"

Moscow, Doklady Akademii Nauk SSSR, Vol. 193, No. 5, 11 Aug 70, pp 1015-1018

Abstract: X-ray studies of the effect of high pressure on the crystalline structure of AgCl showed that the crystalline structure of the high-pressure phase of AgCl II is most likely a distorted version of a rhombic structure of the HgO type. The diffraction picture obtained in the experiment shows that the rhombic structure is closer to the experiment than the B9 structure. There was not a complete analogy in this case, however: the diffraction pictures differ in that strong reflections on HgO (210), (201), and (221) were either very weak or entirely unobserved in AgCl II pictures; analysis of interatomic distances shows that the position of atoms in both structures cannot be the same. The distances between neighboring atoms of Ag and Cl in AgCl II would be 2.25 Å in a chain and 2.7 and 3.4 Å in different chains. The corresponding values between atoms of Hg and O in HgO were equal to 2.03, 2.86, and 2.86 Å. With complete structural similarity one would expect one distance 2.3 Å and two different distances 3.1-3.3 Å in AgCl II. The authors note that it is still impossible to determine the true nature of the distortion, due to the limited amount of roentgenographic data.