

USSR

NEPROSHIN, A. Yu., and NIKOLAYEV, A. S., Rybnoye Khozyaystvo, No 6, 1971, pp 14-16

According to T. V. Yegorova (1968), the spawning of red salmon lasts from the end of July to the middle of February. True, in recent years, according to M. M. Selifonov, spawning has begun in early September. The red salmon arrive at the spawning grounds with insufficiently mature sexual products (roe and milt in the third and fourth stage of development). Appearing in the lake, the fish for some time stay in large accumulations in the vicinity of pits and near the river mouth where water temperature is higher than at greater depths.

From the 7th to the 15th of August, 1969, we tested the intensity of bio-acoustical fields of different sectors of the lake in places of accumulation of the red salmon. The number of specimens in the shoal by visual observation varied between 20 and 200. In all sectors various sounds of the types of "tsok," "chok," "klak," "krou," squeaks, and so forth, were recorded.

In the spawning ground at the source of Ozernaya River and in the estuary of Gavryushka, where red salmon were coming to spawn in a steady stream, intensive sounds of the type of "tuk," "ta-ta-ta," and "gkh" were noted.

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NEPROSHIN, A. Yu., and NIKOLAYEV, A. S., Rybnoye Khozyaystvo, No 6, 1971, pp 14-16

A barium titanate hydrophone with a sensitivity of 30 microvolts/microbar was used as sound pickup. Electrical signals were transmitted from it to an amplifier over a coaxial cable 110 meters long. The amplifier, of a semiconductor type, had an inherent noise level of 5-7 microvolt at the input and an amplification factor of 750. The signals were recorded by a Soviet portable "Romantik" tape recorder.

At a site where a shoal of the fish was found the hydrophone was lowered from the launch to a depth of 1.5-2 meters and connected by cable to equipment on shore. Recordings were made every hour for a period of 24 hours, each recording lasting 10 to fifteen minutes.

The 24-hour station made it possible to establish the first appearance of the spawning sounds, the time of their maximal intensity and decrease, the nature of the sounds, and the values of the sound pressure at the point of reception. The spawning sound signals begin appearing at about 10 or 11 o'clock, increasing in intensity toward noon, and then decreasing and stopping altogether by 23 o'clock. Occasionally during the night sounds of the "gkh" type are noted, accompanying, as a rule, the "tuk" and "ta-ta-ta" sounds.

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NEPROSHIN, A. Yu., and NIKOLAYEV, A. S., Rybnoye Khozyaystvo, No 6, 1971, pp 14-16

The presence of a shoal in daytime was recorded visually, and at night -- by splashes and noise. Control was carried out by means of the dynamic loud-speaker of the tape recorder.

The "tuk" type sounds are observed both singly and in series, with 10 to 15 pulses to a series. The level of the signals exceeded that of the noise bandwidth by 25-30 decibels. The value of the sound pressure, computed taking into account the hydrophone's sensitivity and the transmission factor of the receiving channel, was 7 dynes per square centimeter. Signals of the "ta-ta-ta" type represent a continuous shot noise and always precede the appearance of the "tuk" sound. Then an exchange of messages takes place at times assuming the form of a characteristic communication by tapping of two, and more seldom three, specimens (Figure 1). The number of pulses in such a signal varies from units to hundreds. This type of signal exceeds the noise level by as much as 15 decibels. The sound pressure is 2 dynes per square centimeter.

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NEPROSHIN, A. Yu., and NIKOLAYEV, A. S., Rybnoye Khozyaystvo, No 6, 1971, pp 14-16

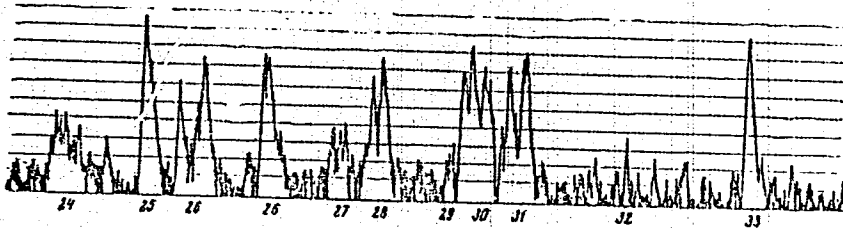


Figure 1. Recording of spawning sounds of the red salmon
Key: 24 and 27 are signals of the "krr" type accompanying the spawning signals; 29 and 32 are the males' "ta-ta-ta" signals; 25, 30, 31, and 33 are the "tuk" signals of the females; 26 and 28 are the combined sounding of the "tuk" and "ta-ta-ta" signals.

Spectral analysis of the signals demonstrated that the "tuk" sounds possess a narrow spectral distribution. This signal attains its maximum value at frequencies of 100 to 150 Hz, after which its level diminishes abruptly to

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NEPROSHIN, A. Yu., and NIKOLAYEV, A. S., Rybnoye Khozyaystvo, No 6, 1971, pp 14-16

zero at a frequency of 500 to 700 Hz (Figure 2,a). The "ta-ta-ta" signals differ strongly in amplitude and possess a complex spectrum, extending to frequencies of 3,000 to 40,000 Hz (Figure 2,b).

The third type of signals is heard as "gkh" with an aspiration. Their relative level reaches 10 to 15 decibels (Figure 2,c).

The main characteristics of the signals listed above are given in the table.

It is well known that the main sound-producing organ in most fish is the swim bladder. In red salmon the swim bladder is quite large, resembles a bag in shape, and is located under the kidneys and spinal column.

When compared to the biological sounds which had regularly been observed over a period of many years in the Black Sea by Ye. V. Shishkova (1956, 1967), it may be assumed that the source of the spawning sounds of red salmon is also the swim bladder.

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NEPROSHIN, A. Yu., and NIKOLAYEV, A. S., Rybnoye Khozyaystvo, No 6, 1971, pp 14-16

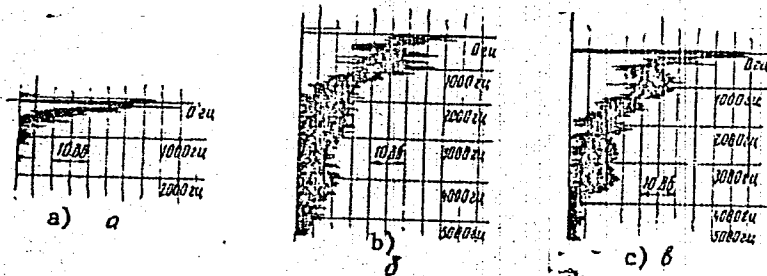


Figure 2. Spectral distribution of signals; a - "tuk"; b - "ta-ta-ta"; c - "gkh."
Key: 1. Hz; 2. decibels

For many fish, including red salmon, spawning is preceded by a lengthy period during which spawning pairs are formed and convenient sites for spawning found.

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NEPROSHIN, A. Yu., and NIKOLAYEV, A. S., Rybnoye Khozyaystvo, No 6, 1971, pp 14-16

As to intraspecies relationships connected with the function of propagation, red salmon may be classified in the biological category of "pair fish" (N. Tinbergen, 1969). As is well known, for these fish signals of sex recognition and attraction of specimens of the opposite sex are very important.

As may be concluded from the data obtained, the sounds of "ta-ta-ta," being of a nature of invitation, belong to the males, which is confirmed by the high frequency distribution of the spectrum of these signals. Such a shift of the spectrum in the direction of high frequencies is explained by the smaller dimensions of the swim bladder in males.

However, as demonstrated by studies made during the life of the red salmon in the sea, the female fish are also acoustically active. It may be assumed that signals of the "tuk" type belong to the females of the red salmon, which is confirmed by the low-frequency nature of the spectrum of the signals peculiar to a large volume of the swim bladder.

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NEPROSHIN, A. Yu., and NIKOLAYEV, A. S., Rybnoye Khozyaystvo, No 6, 1971, pp 14-16

Another important significance of the prespawning sounds is not excluded. They may indicate for the fish the location of the spawning grounds and thereby promote an even distribution of the spawning pairs, decreasing the possibility of loss of the roe from the digging over of the nests.

Analysis of the studies completed permits the conclusion that the red salmon are acoustically active. In order to establish a connection between the sound signals and behavior of individual specimens during spawning, it is necessary to carry out thorough observations with the use of multichannel acceptance recording equipment combined with underwater moving picture photography.

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-USSR-

UDC 541.12:542.61:541.6:547.1'118

KABACHNIK, M. I., LASKORIN, B. N., BERTINA, L. E., MEDVED', T. YA., KOSSYKH, V. G., YUDIN, K. S., BERIGAN, Z. A., and NEPRYAKHIN, A. K., Institute of Hetero-Organic Compounds, USSR Academy of Sciences

"Dependence of the Extraction Ability of the Dioxides of Tetraarylmethylene Diphosphines Upon Their Structure"

Moscow, Izvestiya Akad. Nauk SSSR, Seriya Khimicheskaya, No 1, Jan 72, pp 65-70

Abstract: The connection between extraction ability and structure is currently being widely studied, but so far only in the case of monodentate neutral organophosphorus compounds; the corresponding bidentate compounds, with two phosphoryl groups in the molecule, have gone completely unstudied.

Using the extractant dilution method, the authors determined the composition of the extracting complexes of uranyl nitrate with dioxides of the tetraarylmethylene diphosphines containing various substituents in the meta- and para-positions of the phenyl rings. Effective extraction constants of uranyl nitrate for a series of tetra-substituted dioxides of the methylene-diphosphines were computed. Effective extraction constants for complexes with three molecules of the extractant were found to correlate well with the Hammett constant, and with the σ^+ constant -- something not observed in the case of

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CHNIK, M. I., et al., Izvestiya Akad. Nauk SSSR, Seriya Khimicheskaya,
1, Jan 72, pp 65-70

complexes with two molecules of the dioxide. Finally, the connection between
the extraction ability of the diphosphines and their alkalinity was found to
be a linear one. Various tables and graphs are included in the paper.

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Soviet Inventions Illustrated, Section I Chemical, Derwent, 1-10

241565 GIMBLE MOUNTED ELECTRODE for welding small objects where to ensure parallel positioning of the electrode faces with respect to the work, the lower electrode of the welding machine was mounted in a gimble formed by a shaft 2 frame 9 and fork 7. The gimble sensitivity was increased by using ball-bearings and keeping the axes of the bearings in one plane.

15.6.67 as 1163984/25-27. S.I. SEMERGEEV et alia.
E.O. PATON ELECTRIC WELDING INST. (1.9.69) Bul 14/
18.4.69. Class 21 h, '49 h, Int.Cl.B 23k.

AUTHORS: Semergeyev, S. I.; Shinkarenko, B. P.; and Nepryakhin, V. A.

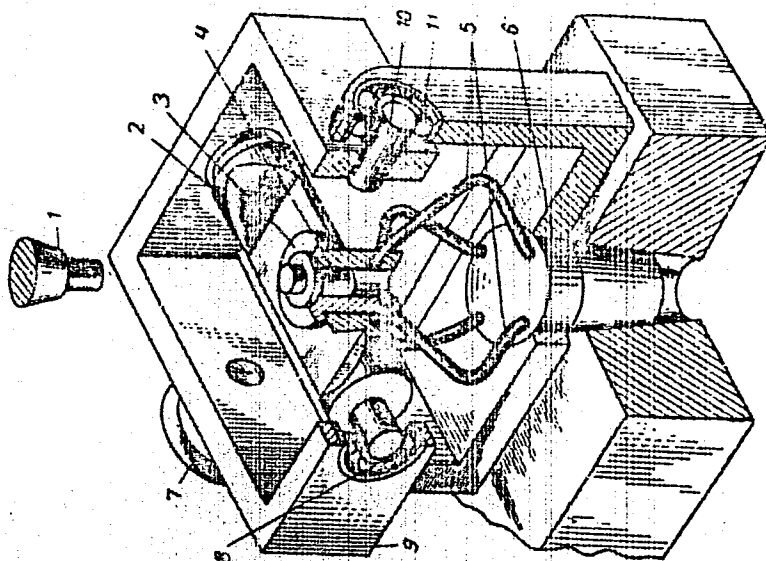
Institut Elektrosvariki imeni Ye. O. Patona

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USSR

UDC: 621.374.73(088.8)

MEL'NIKOV, V. F., NEPUTIN, V. S., KOZEL'CHIKOV, V. V., and
KORCLEV, B. G.

"Balanced Diode Regenerative Comparator"

Avt. sv. SSSR (Author's Certificate USSR) Class 21a¹, 36/18, (H 03
k 5/20), No. 272368, Application 1.08.67, Publication 10.09.70
(from RZh-Radiotekhnika, No. 3, March 71, Abstract No. 3A355P)

Translation: A balanced diode regenerative comparator, containing
a comparison circuit of diodes and a blocking oscillator using a
transistor triode. The comparator is distinguished in that, for
the purpose of raising the duration of the output pulse, an addi-
tional winding of positive feedback, connected through a diode to
the transistor base, is introduced. E. L.

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USSR

UDC 616.988.75-07:616.1-07

NEPYSHNEVSKAYA, V. V., and SHLYKOVA, S. I., Chair of Infectious Diseases, Voronezh Medical Institute, Voronezh, and 12th Infectious Disease Hospital, Voronezh

"Changes in the Cardiovascular System in Influenza"

Moscow, Sovetskaya Meditsina, No 2, Feb 71, pp 82-85

Abstract: Changes in the cardiovascular system were studied on 133 patients with influenza caused by the virus A₂ (Hong Kong) 68. The principal clinical manifestations of these changes were muteness of cardiac tones, a functional systolic noise above the heart tip, alteration of the frequency of cardiac contractions, and a drop in arterial pressure. The most pronounced changes in the EKG were disrupted rhythm, reduced voltage of the P, R, and T waves, displacement of the RS-T segment with reference to the isoelectric line, a lengthening of the electric systole, and an increase in the systolic index. At the height of the disease 90.2% of the patients exhibited arterial hypoxemia. The decrease in the degree of saturation of the blood with O₂ from the average level for healthy persons varied with the severity of the

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NEPYSHNEVSKAYA, V. V. and SHLYKOVA, S. I., Sovetskaya Meditsina, Vol 34, No 2, Feb 71, pp 82-85

disease. The majority of patients showed an increased permeability of capillaries and a decreased resistance of capillary walls. At the time of convalescence the cardiovascular functions had not yet returned to normal in most patients. The changes in these functions that were observed indicated diffuse dystrophic alterations in the myocardium and in a number of cases inflammatory alterations in the latter.

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Organophosphorous Compounds

USSR

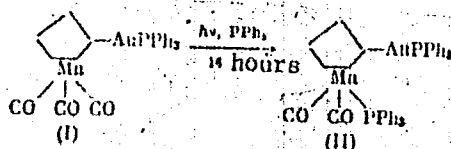
UDC 541.49:547.558.1:541.1'13

NESMEYANOV, A. N., NEREVALOVA, E. G., BAUKOVA, T. V., GRANDBERG, K. I.

"Triphenylphosphine Complex of Cyclopentadienyl (Manganesedicarbonyltriphenylphosphine) Gold"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 11, 1973, pp 2641-2642

Abstract: The triphenylphosphine complex of cyclopentadienyl (manganesedicarbonyltriphenylphosphine) gold (II) was obtained:



The structure of the (II) complex was established on the basis of spectral data and confirmed by the chemical behavior of the compound. In the infrared spectrum of (II) a shift of the two intense absorption bands of the CO groups toward the long-wave range is observed by comparison with the spectrum of

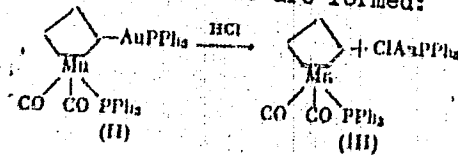
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USSR

NESMEYANOV, A. N., et al., *Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya*, No 11, 1973, pp 2641-2642

cyclopentadienyltricarbonylmanganese (I). This usually occurs on replacement of one of the CO groups in the cymantrene by a stronger electron-donor ligand Kursanov, D. N., et al., *Izv. AN SSSR, Ser. Khim.*, 2842, 1969/. In the paramagnetic resonance spectrum of (II) signals are revealed from the protons of the phosphine groups along with two multiplets of the protons of the substituted cyclopentadienyl ring shifted to the stronger field by comparison with the signals in (I). In the nuclear magnetic resonance spectrum of ^{31}P of (II), two signals of the phosphorus nuclei from nonequivalent triphenylphosphine groupings are observed.

When (II) reacts with concentrated hydrochloric acid, (III) and the triphenylphosphine complex of gold chloride are formed:



The complex (II) is less stable than (I) especially in solutions, and it decomposes during chromatographic studies in a column with aluminum oxide in contrast to (I).

Physical Properties

USSR

UDC 669.1'25'28:669.017.3

NERODENKO, M. M., and NERODENKO, L. M., Institute of Electric Welding imeni Ye. O. Paton, Academy of Sciences UkrSSR

"Changes in Electrical Resistance with the Decomposition of a Supersaturated Solid Solution of K3OM18GSN Alloy"

Moscow, Metallovedeniye i Termicheskaya Obrabotka Metallov, No 12, 1970, pp 46-46

Abstract: The decomposition of supersaturated solid solutions frequently entails changes in electrical resistance, the latter increasing in the early stage of decomposition and then decreasing. Described here is a similar phenomenon which was observed in the age-hardenable iron-cobalt-molybdenum K3OM18GSN alloy. The structure of this alloy, after surface-hardening, consisted of a supersaturated α -solid solution, residual austenite, and α -solid solution -- a complex compound based on the intermetallide Fe_7Mo_6 . The increase in electrical resistivity at an early stage is apparently related to pre-decomposition phenomena and crystal lattice distortions on the formation of the highly disperse particles of the new phase. At 550-600°C there is an intensive drop of resist-

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USSR

NEROKENKO, M. M., and NERODENKO, L. M., *Metallovedeniye i Termicheskaya Obrabotka Metallov*, No 12, 1970, pp 46-47

ivity caused by the depletion of the solid solution in alloying elements, the growth of the new particles, and loss of coherence at the particle-matrix interface. At 650°C the resistivity of the K30M18GSN alloy drops to its minimal value, after which it begins to increase with a further rise in temperature. The latter increase in resistivity may also be due to the thermal vibrations of atoms of the crystal lattice.

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USSR

UDC 539.4

NERODENKO, I. M., GRABIN, V. F., and KAS'YAN, V. V., Kiev

"Metallographic Investigation of Microyielding of Copper and Nickel in the Temperature Interval of 450-650°C"

Moscow, Fizika i Khimiya Obrabotki Metallov, No 1, Jan-Feb 71, pp 66-70

Abstract: Microyielding parameters of pure copper and nickel were investigated at elevated temperatures by metallographic methods. Values of the microscopic elastic limit were determined. The energy of the activation process identifying the formation of slip curves in the microyielding phase was found to be 62.8 ± 5 kcal/mol for nickel and $26.3 \pm$ kcal/mol for copper.

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Heat Treatment

USSR

UDC 621.791.856:669.28

ALEKSEYENKO, G. N., NERODENKO, M. M. (Electric Welding Institute imeni YE. O. PATON, Academy of Sciences Ukrainian SSR), BIRYUKOVA, T. A., DANIYEL'YAN, T. A., MAL'TSEV, M. V., FREZE, N. I., and SHCHUKIN, A. A. (Moscow)

"Effect of Heat Treating on the Properties of Molybdenum-Carbon-Nickel Alloys and Their Weld Joints"

Kiev, Avtomaticheskaya svarka, No 4, Apr 72, pp 47-49

Abstract: The study deals with the properties of intermediate products from TSM-3 structural molybdenum alloy (0.05-0.10% wt % C and 0.01-0.10% Ni) following annealing. The specimens were tensile-tested at room temperature, at $2.5 \cdot 10^{-3}$ sec⁻¹ deformation rates and were arc-welded in a controlled inert-gas atmosphere. The specimens were pre-annealed for 1 hour in vacuum (10^{-5} mm Hg) at 800, 1100, 1200, 1300, 1400, 1500, 1600, and 1700°C. Metallographic examinations indicate that recrystallization begins at 1200°C and is completed at 1400°C. Maximum plasticity was shown by specimens with a completely recrystallized structure. Pre-annealing appears to upgrade the weld quality. Nickel tends to concentrate along the grain boundaries and not only hinders carbon diffusion, but also

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ALEKSEYENKO, G. N., et al, Avtomaticheskaya svarka, No 4, Apr 72, pp 47-49

promotes strengthening of the metal bond in the boundary layers owing to the localized increase of electron concentration. This strengthening of grain boundaries by nickel appears to be the determining factor in raising the plasticity of TSM-3 alloy in recrystallized state. (2 illustrations, 3 tables, 4 bibliographic references)

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Physical Properties

USSR

UDC 669.1'25'28:669.017.3

NERODENKO, M. M., and NERODENKO, L. M., Institute of Electric Welding imeni
~~Ye. O. Paton~~, Academy of Sciences UkrSSR

"Changes in Electrical Resistance with the Decomposition of a Supersaturated
Solid Solution of K3OM18GSN Alloy"

Moscow, Metallovedeniye i Termicheskaya Obrabotka Metallov, No 12, 1970, pp
46-46

Abstract: The decomposition of supersaturated solid solutions frequently en-
tails changes in electrical resistance, the latter increasing in the early stage
of decomposition and then decreasing. Described here is a similar phenomenon
which was observed in the age-hardenable iron-cobalt-molybdenum K3OM18GSN alloy.
The structure of this alloy, after surface-hardening, consisted of a super-
saturated α -solid solution, residual austenite, and α -solid solution -- a com-
plex compound based on the intermetallide Fe_7Mo_6 . The increase in electrical
resistivity at an early stage is apparently related to pre-decomposition pheno-
mena and crystal lattice distortions on the formation of the highly disperse
particles of the new phase. At 550-600°C there is an intensive drop of resist-

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NERODENKO, M. M., and NERODENKO, L. M., Metallovedeniye i Termicheskaya Obrabotka Metallov, No 12, 1970, pp 46-47

ivity caused by the depletion of the solid solution in alloying elements, the growth of the new particles, and loss of coherence at the particle-matrix interface. At 650°C the resistivity of the K3OM18GSN alloy drops to its minimal value, after which it begins to increase with a further rise in temperature. The latter increase in resistivity may also be due to the thermal vibrations of atoms of the crystal lattice.

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USSR

UDC 621.791.856.2.03

GUREVICH, S. M., NERODENKO, M. M., POVOD, A. G., TETERVAK, A. F.,
ASNIS, YE. A., Institute of Electric Welding imeni Ye. O. Paton,
Academy of Sciences UkrSSR, GRISHIN, V. K., FERTIKOV, V. G.,
ESTRIN, V. N., LEVKOVICH, R. M., Moscow

"Equipment for Welding Chemically-Active Refractory Metals in a
Controlled High Purity Helium Atmosphere"

Kiev, Avtomaticheskaya Svarka, No 8, Aug 70, pp 45-47

Abstract: A description is given of equipment for manual and
automatic electric welding of refractory metals in a controlled
atmosphere of high-purity helium. The equipment, which was
developed at the Institute of Electric Welding imeni Ye. O. Paton,
ensures continuous control of oxygen, nitrogen, and water vapor
impurities and helium regeneration. It consists of a welding
chamber with a vacuum system; 2) equipment for helium purification
and 3) a helium purity control system. A photograph and schematic
diagram of the installation are presented. The welding chamber
(700 mm in diameter, volume, approximately 1000 l) is made of
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GUREVICH, S. M., et al., Avtomaticheskaya Svarka, No 8, Aug
70, pp 45-47

1Kh18N9T steel. It is provided with a VN-1 suction pump, making it possible to obtain a 2×10^{-5} torr vacuum in the chamber with full load. A sorption method using activated carbon and zeolite at liquid nitrogen temperature at an absorber pressure of 150 atm is used for helium purification. A KhG-type gas chromatograph is used for helium purity control.

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USSR,

UDC 621.791.011:669.28

GUREVICH, S. M., NERODENKO, M.M., ALEKSEYENKO, G. N., Institute of Electric Welding imeni Yu. O. Paton, Academy of Sciences, Ukrainian SSR, BIRYUKOVA, T. A., and SHCHUKYN, A. A., Moscow

"Weldability of Some Molybdenum Alloys"

Kiev, Avtomaticheskaya Svarka, No 3, Mar 71, pp 27-29

Abstract: A study was made of the weldability of molybdenum alloyed with carbon and group VIII elements (iron, cobalt, nickel, and irridium). The test procedure is described, and the mechanical properties of welded joints of the molybdenum alloys are tabulated. It was found that iron, cobalt, nickel, and irridium refine the structure of the weld. Group VIII elements increase the difference between the ultimate strength and yield point of joints made of alloys of molybdenum with carbon. In the entire investigated range of concentrations of these elements, the ratio $\sigma_{0.2}/\sigma_b$ during bending is minimal for joints of molybdenum-

carbon-nickel and molybdenum-carbon-irridium alloys. With an increase in iron content the ultimate strength of the joints of 1/2

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GUREVICH, S. M., et al., *Avtomaticheskaya Svarka*, No 3, Mar 71,
pp 27-29

molybdenum-carbon-iron alloys increases.

The mean hardness of welded joints of molybdenum alloys with $\delta = 1$ mm at various distances from the weld is plotted. These data show that an increase in hardness along the axis of the weld and a decrease at the fusion line are especially characteristic for alloys of the molybdenum-carbon system. Group VIII alloying of molybdenum with carbon leads to a smoother variation of hardness with respect to joint cross section; irridium and nickel have the most favorable effects.

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USSR

N
UDC 621.791.011:669.293

GUREVICH, S. M., NERODENKO, M. M., ASNIS, YE. A., and SMIRNOV, S. V.

"Durability of Niobium Welds under Varying Loads"

Kiev, Avtomaticheskaya Svarka, No 6, 1970, pp 72-73

Abstract: This short article presents the results of tests on the fatigue of niobium and its alloys performed by the Electric Welding Institute imeni Ye. O. Paton. Such tests are important because niobium is a prominent factor in the alloying of refractory metals. The tests were performed to compare welded compounds and the basic metal, and used niobium films 2 mm thick which had not undergone thermal processing, as well as annealed niobium tubes 28 mm in diameter with a wall thickness of 1 mm. The welding was done in a chamber with a controlled atmosphere of type-A argon. A table showing the mechanical characteristics of the metal and the welding is given. The tubes were tested for fatigue in bending in a special adaptation of the Afanas'yev method, all tests being conducted on the basis of $2 \cdot 10^6$ cycles. A photograph showing a niobium film which has undergone the tests is reproduced.

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USSR

UDC 621.791.754:669.28

ALEKSEYENKO, G. N., ~~NEBODENKO, M. M.~~ Institute of Electric Welding imeni Ye. O. Paton; BIRYUKOVA, T. A., Mal'ISEV, M. V., and SHCHUKIN, A. A., Moscow

"Properties of Mo-C, Mo-Zr-C, and Mo-Ti-C Weld Joints"

Kiev, Avtomaticheskaya Svarka, No 9, Sep 72, pp 20-22

Abstract: The effect of zirconium and titanium on the properties of weld joints for a molybdenum-carbon alloy was investigated. Ingots of the alloys were produced in an electron-beam furnace and rolled into sheet 1 mm thick. The sheets were welded using a tungsten electrode in a controlled helium atmosphere. One heat of the Mo-C alloy contained 0.06% C (heat 1); two heats of the Mo-Zr-C alloy were made, one containing 0.04 wt% C, 0.16 wt% Zr (heat 2), the other --0.5 wt % C, 0.34 wt.% Zr (heat 3); and two heats of the Mo-Ti-C alloy, one containing 0.05 wt % C, 0.014 wt % Ti (heat 4), the other--0.055 wt % C, 0.026 wt % Ti (heat 5). Alloying with Ti and Zr increased the weld joint ductility but reduced cold brittleness. Ti was less effective than Zr, which is probably associated with the fact that small additions of Ti increase solubility of carbon in Mo in the solid state or bond the carbon into carbides. Ti and Zr also increase strength of the weld joints and seam hardness. Both elements refine the seam metal structure and positively influence the structure of the heat-affected zone, diminishing the extent of the heat-affected zone

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USSR

ALEKSEYENKO, G. N., et al., *Avtomaticheskaya Svarka*, No 9, Sep 72, pp 20-22

and grain size near the fusion lines. In the study of weld joint mechanical properties it was established that the alloys containing Ti failed primarily in the seam and that these alloys tend to form hot cracks during welding. In contrast to this, weld joints made from the Mo-Zr-C alloys undergo failure both in the seam and along the fusion lines. In summary, additions of Zr refine the structure of the seam metal and heat-affected zone, facilitate the formation of a substructure, and increase strength and ductility of the weld joints, while Ti additions have a lesser effect on the ductility of weld joints made using the Mo-C alloy. 1 Figure, 2 tables, 6 bibliographic references.

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USSR

UDC: 621.396.621.59:621.396.669.8(088.8)

POSYAKOV, S. N., NERONOV, V. V., LITVIN, V. M.

"A Reception Device for Radio Communications Lines With 'Floating' Frequency"

USSR Author's Certificate No 259969, filed 26 Jul 68, published 4 May 70
(from RZh-Radiotekhnika, No 11, Nov 70, Abstract No 11D55 P)

Translation: This Author's Certificate introduces a device which contains a wide-band amplifier with automatic control of the transfer constant, a frequency converter, a heterodyne with "floating frequency", a controlled synchronization module, and a narrow-band IF amplifier. To improve the effectiveness of suppressing concentrated interference and prevent this type of interference from overloading the signal processing channel, the device is equipped with an additional frequency converter and a stable fixed frequency oscillator which together effect transfer of the output signal spectrum from the wide-band amplifier into the range of variation of the floating-frequency heterodyne. The heterodyne voltage and the output voltage of the additional frequency converter are fed to the inputs of a low-frequency beat detector made in the form of a frequency converter, low-frequency filter and inertial amplitude detector connected in series. The output voltage of the inertial amplitude detector is fed to the transfer constant control circuit of the wide-band amplifier through an isolating capacitor which prevents the possibility of zero beats between the heterodyne voltage and signals from the radio line transmitter. To prevent the possibility of these low-fre-

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POSYAKOV, S. N. et al., USSR Author's Certificate No 259969

quency beats in the case of a low degree of synchronism, the heterodyne is connected to the frequency converter in the main channel through a delay line which introduces a time lag greater than the ratio of the passband of the narrow-band IF amplifier to the rate of change in the "floating" frequency, but less than the time constant. N. S.

2/2

- 78 -

USSR

UDC: 621.396.669(088.8)

HEPOMOV, V. V.

"A Receiver for Frequency-Modulated Signals"

USSR Author's Certificate No 263687, filed 2 Sep 68, published 4 Jun 70
(from RZh-Radiotekhnika, No 11, Nov 70, Abstract No 11D50 P)

Translation: This Author's Certificate introduces a receiver with a detector in the form of a phase AFC ring, and an amplifier for the detected signal with a low-frequency filter. To improve sensitivity and reduce threshold ratios in reception of signals with both sinusoidal and frequency pulse modulation, the detector utilizes a pulse-phase AFC ring which operates in the frequency division mode. For this purpose, the oscillator is tuned to the N-th sub-harmonic of the intermediate frequency ($N > n$, where n is the maximum index of modulation of the input signal). The voltage from the tuned oscillator is fed to the amplifier of the detected signal and to the reference input of a phase detector through a shaping stage which converts this voltage to a pulse signal with frequency-amplitude modulation.

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- 57 -

USSR

UDC: 621.373.442

NERONOV, V. V., IVANOV, O. V., VOROB'YEVA, L. N.

"A Low-Frequency Pulse Generator"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obratztsy, Tovarnyye Znaki, No 22, 1970, Soviet Patent No 275156, Class 21, filed 26 Nov 68, p 38

Abstract: This Author's Certificate introduces a low-frequency pulse generator made in the form of a transistorized multivibrator. As a distinguishing feature of the patent, the effect of destabilizing factors on frequency change is eliminated by connecting the collector of one of the transistors in the multivibrator to the base of a matching stage based on two transistors. Connected between the emitter of the output transistor and the positive pole of the power supply is the winding of a resonance relay made in the form of an energizing winding in an oscillatory system and a commutating contact pair which connects the collector of the multivibrator transistor to the positive pole of the power supply during relay operation.

1/1

USSR

UDC: 621.396.621.59:621.396.669.8

LOSIAKOV, S. N., NERONOV, V. V., LITVIN, V. M.

"A Reception Device for Radio Communication Lines with 'Floating' Frequency"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obratzsy, Tovarnyye Znaki, No 3, 1970, p 50, patent No 259969, filed 26 Jul 68

Abstract: This Author's Certificate introduces: 1. A reception device for radio communication lines with "floating" frequency. The device contains a wide-band amplifier with automatic transmission factor control, a frequency converter with a mixer and beat oscillator with "floating" frequency controlled by a synchronization unit, and an intermediate-frequency narrow-band amplifier. As a distinguishing feature of this patent, the effectiveness of lumped interference suppression is improved and overloading of the signal processing line channel by this kind of interference is prevented by incorporating into the device an auxiliary mixer and a stable fixed-frequency oscillator. These additional elements shift the frequency spectrum of the signal from the output of the wide-band amplifier to the frequency range of the beat oscillator. The beat oscillator voltage and the output voltage of the auxiliary mixer are fed to the inputs of a low-frequency beat detector made in the form of a mixer, low-frequency filter and inertial amplitude detector connected in series. The output voltage of the amplitude detector is

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USSR

LOSIAKOV, S. N., et al, Otkrytiya, Izobreneniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 3, 1970, p 50, patent No 259969, filed 26 Jul 68

fed to the transmission factor control circuit of the wide-band amplifier through a blocking capacitor which prevents the possibility of zero beats between the beat oscillator voltage and signals from the radio line transmitter. 2. A modification of this device in which the distinguishing feature is prevention of the possibility of low-frequency beats between the beat oscillator voltage and signals from the radio line transmitter at a low degree of synchronism by connecting the beat oscillator with "floating" frequency to the mixer in the main channel through a delay line with a lag time which is greater than the ratio of the pass-band of the narrow-band IF amplifier to the rate of change in the "floating" frequency, but is less than the time constant of the inertial amplitude detector.

2/2

Acc. Nr: **AP0047225**

Ref. Code: UR 0216

PRIMARY SOURCE: Izvestiya Akademii Nauk SSSR, Seriya
Biologicheskaya, 1970, Nr 1, pp 77-82

~~S. I. IBRAGIMOVA, N. M. NERONOVA~~

**INFLUENCE OF AN EXCESS OF A SUBSTANCE (LACTATE) ON THE
DEVELOPMENT AND FORMATION OF VITAMIN B₁₂ BY PROPIONOBACTERIUM
SHERMANII**

Institute of Microbiology, Academy Sciences USSR

The influence of various concentrations of lactate in the medium on the develop-
ment of Propionobacterium shermanii, correlation of propionic and acetic acids as well
as that of vitamin B₁₂ were studied under stationary growth conditions. Lactate added
in large quantities to a 24 hours old culture causes a shift in the correlation of the acids
formed with a prevalence of propionic acid resulting in a higher output of vitamin B₁₂
but 96 hours later it hinders further development of the bacteria as well as the final
output of vitamin B₁₂ counting from the beginning of the experiment.

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Corrosion

USSR

UDC 669.71.472

NEROSLAVSKAYA, L. L., ISAYEV, YU. A., NAZVICH, M. G.

"Anticorrosion Protection of Smokestacks of Aluminum Electrolysis Shops"

Tr. Vses. n.-i. i proyekt. in-ta alyumin., magn. i elektrodn. prom-sti
(Works of the All-Union Scientific Research and Planning and Design Institute
of Aluminum, Magnesium and Electrode Industry), 1970, No 71, pp 231-238 (from
RZh-Metallurgiya, No 4, Apr 71, Abstract No 4G162)

Translation: The state of the art in problems of corrosion resistance of
smokestacks, their operating conditions, application of protective media, and
also the results of investigation and selection of means of chemically pro-
tecting smokestacks from corrosion and lengthening their service lives are
discussed. Tests were run under natural and laboratory conditions to con-
sider the characteristics of the medium in which the smokestacks of the
aluminum electrolysis shops operate. The test results were estimated visually
by analytical means and by measuring the degree of corrosion of the smoke-
stack materials and protective materials. Thus, various groups of protective
materials were tested: organic materials and coatings, metal materials and
coatings, paint and varnish coatings, polymer materials, and so on. It was
determined that the basic means of improving the service life of smokestacks
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USSR

NEROSLAVSKAYA, L. L., et al., Tr. Vses. n.-i. i proyekt. in-ta alyumin., magn. i elektro. prom-sti, 1970, No 71, pp 231-238

consists in improving the gas purification system. Structural improvement insuring convenience and simplicity of observing the state of the smokestacks and operation of them have little significance. Chemically stable materials can also be used: structural steels types EI-943 and EI-629, coatings made of cold-congealing Nairit, type E-4100 lacquer with graphite (hot drying). The quality of preparing the metal shaft of the smokestacks plays a significant role. There are 3 tables and 1 illustration.

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USSR

UDC 669.721.074.2

NEROSLAVSKAYA, L. L.

"Influence of Chloride Salts and Gaseous Chlorine on Corrosion of Titanium in Hydrochloric Acid Solution"

Tr. Vses. N-i. i Projektn. In-ta. Alyumin., Magn. i Elektrodn. Prom-sti [Works of All-Union Scientific Research and Planning Institute of the Aluminum, Magnesium and Electrode Industry], 1970, No. 72, pp. 237-244. (Translated from Referativnyy Zhurnal Metallurgiya, No. 5, 1971, Abstract No. 5 G205 by the author).

Translation: Results are presented from studies performed in order to clarify the possibility of using Ti as a structural material for gas purification installations in Mg production. $MgCl_2$ increases, while gaseous Cl decreases the corrosion of Ti at temperatures below 60° ; at higher temperatures, Cl facilitates acceleration of corrosion. A gradual increase in the concentration of an aerated HCl solution allows the limits of application of Ti as a structural material to be increased. 4 figs; 1 table.

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1/2 031

UNCLASSIFIED

PROCESSING DATE--16OCT70

TITLE--MULTIPARAMETER AUTONOMOUS EEG ANALYZER FOR OPERATIVE TESTING OF THE
FUNCTIONAL STATE OF A HUMAN OPERATOR -U-
AUTHOR--(05)-ATABEKYANTS, A.I., AKHUTIN, V.M., BUNDZEN, P.V., KUCHUK, G.A.,
NEROSLAVSKIY, I.A.
COUNTRY OF INFO--USSR

SOURCE--FIZIOLOGICHESKII ZHURNAL SSSR, VOL. 56, MAR. 1970, P 443-446
DATE PUBLISHED-----70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--MEDICAL APPARATUS, ELECTROENCEPHALOGRAPHY, BRAIN, BIOPOTENTIAL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1996/0676

STEP NO--UR/0239/70/056/000/0443/0446

CIRC ACCESSIGN NO--AP0117901

UNCLASSIFIED

2/2 031

UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NG--AP0117901
ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. BRIEF DESCRIPTION OF A PORTABLE AUTONOMOUS COMPLEX EEG ANALYZER WHICH MAKES IT POSSIBLE TO PERFORM CONTINUOUS PROCESSING OF BRAIN BIOPOTENTIALS WITH RESPECT TO A NUMBER OF AMPLITUDE, PHASE, AND FREQUENCY PARAMETERS. THE DEVICE CONSISTS OF THREE PAIRED FREQUENCY FILTERS; THREE CHANNELS FOR MEASURING PHASE SHIFTS BETWEEN ANY TWO EEG LEADS, AND A CHANNEL FOR ANALYZING THE OSCILLATION FREQUENCY OF THE ENVELOPE OF THE MAIN RHYTHM. THE DEVICE IS DISTINGUISHED BY THE POSSIBILITY OF PERFORMING CONTINUOUS COMPLEX MEASUREMENTS OF BIOELECTRIC ACTIVITY WITHOUT THE USE OF EXPENSIVE COMPUTER HARDWARE AND WITHOUT REQUIRING THE PARTICIPATION OF HIGHLY QUALIFIED ENGINEERING PERSONNEL IN THE EXPERIMENTS. FACILITY:
AKADEMIIA MEDITSINSKIKH NAUK SSR SEVERO ZAPADNYI ZADCHNYI
POLITEKHNICHESKII INSTITUT, LENINGRAD, USSR.

UNCLASSIFIED

AA0044746

NEROVNAYA

I.V.

UR 0482

2

Soviet Inventions Illustrated, Section II Electrical, Derwent,

241063 TEMPERATURE AND LUMINESCENCE METHOD OF LEAK
DETECTION, for hollow components, can be
 applied as a test method for fluid-tightness by
 completely filling the component with a luminescent
 liquid, for example, a penetrant, sealing it up
 and exposing it to UV irradiation. Any leakage of
 the penetrant fluid, resulting in gathering of fluid
 on the outer surface, will be visually detected by
 luminescence. In order to provide excess internal
 pressure the component, after filling and sealing is
 placed in a heating chamber, for a given time at a
 given temperature, to cause volumetric expansion of
 the contained detector fluid.
 20.3.67 as 1142371/25-28. I.L. LYAPKALO et alia.
 DNIETROPETROVSK UNIVERSITY. (15.8.69) Bul 13/1.4.69
 Class 42k. Int.Cl.G 01n.

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19771506

AA0044746

AUTHORS: Lyapkalo, I. L.; Bantsarevich, V. G.; Belyayev, N. M.; Narovnya, I. V.;
Slipchenko, V. S.; Kobylkin, V. V.

Dnepropetrovskiy Gosudarstvennyy Universitet

19771507

3/2

1/3 011 UNCLASSIFIED PROCESSING DATE--02OCT70
 TITLE--METHOD FOR DETECTING LAYERS OF REDUCED VELOCITY IN THE EARTH'S
 CRUST AND MANTLE, METHOD FOR DISCRIMINATING THE CRUST AND MANTLE LAYER
 AUTHOR--(03)-LUKK, A.A., NERSESOV, I.L., CHEPKUNAS, L.S.
 N
 COUNTRY OF INFO--USSR
 SOURCE--MOSCOW, IZVESTIYA AKADEMII NAUK SSSR, FIZIKA ZEMLI, NO. 2, 1970,
 PP. 15-20
 DATE PUBLISHED-----70

SUBJECT AREAS--EARTH SCIENCES AND OCEANOGRAPHY
 TOPIC TAGS--EARTH CRUST, EARTH MANTLE, EARTHQUAKE, EPICENTER, SEISMIC WAVE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
 PROXY REEL/FRAME--1990/0028

STEP NO--UR/0387/70/000/002/0015/0020

CIRC ACCESSION NO--AP0108413
 UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--02OCT70

2/3 011

CIRC ACCESSION NO--AP0108413
ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. A METHOD IS DESCRIBED FOR DISCRIMINATING LAYERS WITH REDUCED VELOCITIES IN THE CRUST AND MANTLE FROM THE BODY WAVES OF EARTHQUAKES. THE METHOD IS APPLICABLE IN THE CASE OF DETAILED SEISMIC OBSERVATIONS. ITS EFFECTIVE USE REQUIRES A QUITE DENSE NETWORK OF STATIONS FOR THE SUFFICIENTLY PRECISE DETERMINATION OF THE COORDINATES OF EARTHQUAKE FOCI. THE ACCURACY OF THEIR DETERMINATION MUST MAKE IT POSSIBLE TO SEPARATE EARTHQUAKE FOCI BY DEPTH EACH 5 KM IN THE CRUST AND EACH 20 KM IN THE MANTLE AND DETERMINE THE COORDINATES OF EPICENTERS WITH AN AVERAGE ACCURACY OF PLUS OR MINUS 5 KM. IT IS ALSO NECESSARY TO HAVE A PROFILE OF STATIONS ALONG THE LINE WHERE A CROSS SECTION IS TO BE CONSTRUCTED WHICH HAS A LENGTH AT LEAST FOUR TIMES GREATER THAN THE MAXIMUM DEPTH OF THE FOCI OF THE USED EARTHQUAKES. THE MAXIMUM LENGTH OF THE OBSERVATION PROFILE IS LIMITED BY THE EXTENT OF THE REGION IN WHICH DIRECT FORWARD WAVES ARE TRACED IN THE FIRST ARRIVALS. THE QUALITY OF THE INITIAL DATA MUST BE SUCH AS TO ENSURE AN ACCURACY IN DETERMINING THE TIME OF FIRST ARRIVALS IN THE RANGE PLUS OR MINUS 0.05-0.1 SEC. THE QUANTITY OF INITIAL DATA IS DETERMINED BY THE NUMBER OF SOURCES; FOR EACH SUCH SOURCE THERE MUST BE 8-10 EARTHQUAKES, THEREBY MAKING POSSIBLE A RELIABLE DETERMINATION OF THE TRAVEL TIME CURVE FOR A SOURCE WITH A FIXED DEPTH. A GROUP OF SOURCES WITH UNIFORM DISTRIBUTION IN DEPTH IS REQUIRED BOTH IN THE LAYER ITSELF AND ABOVE AND BELOW IT FOR A RELIABLE DETECTION OF THE LAYER OF REDUCED VELOCITY OF PROPAGATION OF BODY WAVES.

UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--02OCT70

3/3 011

CIRC ACCESSION NO--AP0108413

ABSTRACT/EXTRACT--THE ACCURACY IN DETERMINING EARTHQUAKE HYPOCENTERS IS OF PARTICULAR IMPORTANCE AND MUST BE CAREFULLY INVESTIGATED IN EACH SPECIFIC CASE. THIS PAPER GIVES THE RESULTS OF APPLICATION OF THIS METHOD TO STUDY OF THE CRUST AND MANTLE IN THE GARM REGION AND THE PAMIR HINDUKUSH EPICENTRAL ZONE.

UNCLASSIFIED

USSR

BOLOTNIKOVA, T. N., GUROV, F. I., NERSESOVA, G. N.

"Distribution of Molecules According to Radiative Centers in Frozen n-Parafin Solutions"

Leningrad, Optika i Spektroskopiya, Mar 72, pp 531-534

ABSTRACT: The concentration of a solution prepared at room temperature determines the total number of molecules in a frozen polycrystalline medium which is distributed according to the different types of radiative centers. In this work an attempt is made to evaluate the concentration of molecules showing thin-line spectra according to the measurement of the quasi-line intensity (I_q) in the luminescence spectra of anthracene in n-heptane over a wide range of concentrations. The experimental results obtained show that under conditions of an increased rate of crystallization of the solution the number of molecules corresponding to quasi-bright-line spectra increases and the region of linear dependence of I_q on the concentration increases. As the rate of crystallization (for example, the freezing of a large volume of the solution) decreases, the method suggested makes it possible to evaluate also the number of molecules which are not isolated by the matrix.

The article includes three figures. There are 6 bibliographic references.

1/1

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1/2 015 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--POSSIBLE OCCURRENCE OF A DISTURBANCE IN THE INDEPENDENCE OF
COMPOUND NUCLEUS DECAY FROM THE ENTRANCE CHANNEL SPIN -U-
AUTHOR--(04)-KARADZHEV, K.V., MANKO, V.N. NERSESYAN, A.N., CHURKREYEV,
F.YE.
COUNTRY OF INFO--USSR
SOURCE--PIS'MA ZH. EKSP. TEGR. FIZ. 1970, 11(2), 88-92
DATE PUBLISHED-----70
SUBJECT AREAS--PHYSICS, NUCLEAR SCIENCE AND TECHNOLOGY
TOPIC TAGS--COMPOUND NUCLEUS, NUCLEAR SPIN, ANGULAR DISTRIBUTION,
RADIOACTIVE DECAY SCHEME, PARITY PRINCIPLE, NUCLEAR RESONANCE, PROTON
BOMBARDMENT
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1988/0704 STEP NO--UR/0386/70/011/002/0088/0092
CIRC ACCESSION NO--AP0105678
UNCLASSIFIED

2/2 015

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0105678

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. MEASUREMENTS OF THE ANGULAR DISTRIBUTIONS OF REACTIONS ON NUCLEI WITH NONZERO SPIN MAKE IT POSSIBLE TO VERIFY THE INDEPENDENCE OF THE DECAY MODE OF A COMPD. NUCLEUS ON THE ENTRANCE CHANNEL OF THE REACTION. THE CASE OF A WELL ISOLATED, SINGLE RESONANCE WITH AN ANGULAR MOMENTUM AND A PARITY J^{π} IS CONSIDERED AS FOUND IN THE INTERACTION OF A N WITH A TARGET NUCLEUS HAVING SPIN I. IN THIS CASE, THE DIFFERENTIAL CROSS SECTION OF THE REACTION (A,B) IS AN INCOHERENT MIXT. OF 2 PARTS CORRESPONDING TO 2 ENTRANCE CHANNELS WITH THE SPINS $I = I_1 - 1/2$ AND $I = I_1 + 1/2$. FROM THE INDEPENDENTLY MEASURED ANGULAR DISTRIBUTIONS OF A RESONANCE, THE EXACT PARAMETER OF SPIN MIXING T IS OBTAINED. ONE OF THE SIMPLEST CASES IS CONSIDERED; WHEN THE BOMBARDING PARTICLES ARE P, THE SPIN AND THE PARITY OF THE TARGET NUCLEUS IS $1/2^+$, AND THE STATE OF THE COMPD. NUCLEUS HAS AN ANGULAR MOMENTUM AND A PARITY OF 1^- . THIS STATE CAN BE CREATED ONLY BY THE CAPTURE OF P WITH AN ORBITAL MOMENTUM OF $L_{SUBP} = 1$. IN THIS CASE, THE ORBITAL MIXING IN THE ENTRANCE CHANNELS OF THE REACTION IS ABSENT. IN THE REACTIONS (P,P), (P, ALPHA), AND (P,GAMMA) ON A $31P$ NUCLEUS, A SINGLE ISOLATED NARROW RESONANCE WAS FOUND THAT HAD A MOMENTUM AND A PARITY OF 1^- AT AN ENERGY OF THE INCIDENT P OF 2114 KEV. DISCREPANCIES IN THE VALUES OF T_{SUBP} , $T_{SUBALPHA}$, AND $T_{SUBGAMMA}$ INDICATE THAT THE DECAY OF A COMPD. NUCLEUS MAY DEPEND ON THE ENTRANCE CHANNEL.

FACILITY: INST. AT. ENERG. IM.
KURCHATOVA, MOSCOW, USSR.

UNCLASSIFIED

Analysis and Testing

USSR

NERSESYANTS, A. B., ZAKHAROV, Ye. L., (deceased), and BYSTROYA, Z. A., All-Union Scientific Research and Planning and Design Institute of Aluminum, Magnesium and the Electrode Industry

"Gas Chromatographic Analysis of Aluminum and Aluminum Carbide"

Moscow, Zavodskaya Laboratoriya, Vol 36, No 9, 1970, pp 1043-1044

Abstract: A method of gas chromatographic analysis of aluminum and aluminum carbide is proposed for use in industrial aluminum production. The method consists in gas chromatographic analysis of the H_2 and CH_4 separated out during hydrochloric acid decomposition of the sample in a gas volumeter in amounts equivalent to the aluminum and aluminum carbide content. The mechanism of this reaction and the formulas used to calculate the aluminum and aluminum carbide content are presented. A schematic of the VANI gas volumeter used in the method is illustrated. The accuracy of the method is 3.5 percent for Al and 2.7 percent for Al_4C_3 , and the measurement range is from 100 to 0.1 wt %.

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Power

N UDC 621.362:523.72-531.9

USSR

SHERMAZANYAN, YA. T., TARNIZHEVSKIY, B. V., GRIGORYAN, R. S., NERSISYAN, T. A.,
RODICHEV, B. YA.

"A Device for Supplying Powers to Equipment From a Solar Battery with Photo-
voltaic Cells"

Moscow, Otkrytiya, Izobreneniya, Promyshlennyye Obraztsy, Tovarnyye Znaki,
No 18, 1970, Author's Certificate No 271619, Filed 25 Jan 68, p 46

Abstract: This author's certificate introduces a device for powering equip-
ment from a solar battery with photovoltaic cells. The device contains a
commutator for connecting the load to the battery. As a distinguishing fea-
ture of the patent, the reliability of the device is improved by using relays
and power pickups in the commutator with their contacts connected in the
relay coil circuits. The contacts of the elements divide the solar battery
into several sections, each of which is connected to each piece of equipment
through the contacts of this relay.

1/1

USSR

POGRANICHNAYA, R. M., ~~NERUBASHCHENKO, V. V.~~, and GONCHAROVA, V. P.

"Determining the Active Magnesium in Granulated Magnesium"

Moscow, Zavodskaya laboratoriya, No. 5, 1971, pp 537-538

Abstract: Metallic magnesium in the granulate is used to desulphurize and modify cast iron. The purpose of the experiments described in this paper was to determine the granulated magnesium obtained from electrical metallic magnesium, a primary granulate practically free of impurities, as well as the granulated magnesium, a secondary granulate containing a large quantity of impurities, obtained from magnesium alloys and the wastes of magnesium production processes. The tests were made with a probe of granulated magnesium rid of chlorides and oxides of magnesium by processing with a 5% solution of chromic anhydride. Chlorine ions were introduced in the form of a solution of carnallite. Curves are given for the determinations of the active magnesium as a function of the chlorine ion concentration. A table is given comparing the results of the primary granulate analysis obtained by the

1/2

USSR

POGRANICHNAYA, R. M., et al., Zavodskaya laboratoriya, No 5, 1971, pp 537-538

method given in this paper and by the gas-volumetric method. The authors are associated with the All-Union Titanium Scientific Research and Design Institute.

2/2

USSR

UDC 613.6:615.187.5.012

2

AYZENSHEAD, V. S., DOLMATOVA-GUSEVA, E. G., PERKHUROVA, V. P.,
SHTIFELMAN, A. V., BOGOMOLOVA, I. M., and NERUBAY, S. M., Institute of
Hygiene, Kuybyshev

"Labor Hygiene and the State of the Workers' Health in the Malathion Industry"

Moscow, Gigiyena truda i professionalnyye zabolevaniya, No 3, Mar 71, pp 49-51

Abstract: In the reactor section of a large malathion plant, the atmosphere was found to contain xylene, hydrogen sulfide, maleic anhydride, methanol, ethanol, malathion, as well as dimethyl dithiophosphoric acid, and diethyl maleate. More than 3,500 air samples were analyzed for the above compounds and the results reported in tabular form for the various process stages. It was established that contamination of the air in the plant was due to insufficient automation, the use of manual labor in the handling of poisonous materials, imperfect control devices, and so forth. Time studies showed that laboratory workers were in contact with poisons for 59-92% of their working time. Malathion was detected in washings from the hands and in the work clothes. It was established that laundering of the work clothes in a 1% caustic soda solution is 10 times as effective as the sodium tripolyphosphate 1/2

USSR

AYZENSHTAD, V. S., et al., Gigiyena truda i professionalnyye zabolevaniya,
No 3, Mar 71, pp 49-51

wash used in the plant. It was recommended that plant ventilation be improved by installation of suction filtration devices at all points of high pesticide concentrations in the air. Also, the state of health of the workers was studied: 18 people had dermatitis and conjunctivitis, the number of cases of nervous system disorders increased from 10 to 38 over a 1 1/2 year period. Gastrointestinal disturbances increased from 5 to 23 cases over the same period. Rapid introduction of sanitary-hygienic measures was recommended plus repeated checks of the work conditions after their introduction.

2/2

USSR

UDC 537:226:537:311:33]:538

KOSHKIN, L. I., DUNAYEVA-MITLINA, T. A., TROITSKAYA, G. V., NAYDENKO, V. N.,
MITLINA, L. A., DUBENSKAYA, N. Ye., Uch. zap. kuybyshevsk. gos. ped. in-t.,
[Scientific Writings of Kuybyshev State Pedagogics Institute], No 67, 1969,
pp 75-97

deteriorates sharply. Alloying with lithium and zinc increases the total electrical conductivity. The optical absorption of the films shows two maxima in the area of 0.9 μ and 1.1 μ , which fact is explained by the election transitions in the Fe^{3+} , Mn^{2+} and Fe^{2+} , Mn^{3+} ions respectively.

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USSR

UDC 539.3

NERUBAYLO, B. V. and SIBIRYAKOV, V. A.

"Stresses in Round Cylindrical Shell Under Local Radial Load"

Moscow, Prochnost' i Ustoychivost' Tonkostennykh Aviatsionnykh Konstruktsiy, 1971, pp 25-44

Abstract: The round cylindrical shell of finite length is subject to a local radial load which is assumed to be distributed over a square element.

The general differential equations between forces and displacements are solved by expanding them into Fourier trigonometric series.

The solutions are presented in the form of nomographs on fig. 10 to 15 giving the forces and bending moments per unit of length in the longitudinal and circumferential direction as functions of the size of the load carrying square and of the radius/wall $1/2$

USSR

NERUBAYLO, B. V. and SIBIRYAKOV, V. A., Prochnost' i Ustoychivost' Tonkostennykh Aviatsionnykh Konstruktsiy, 1971, pp 25-44.

thickness ratio. All quantities are in nondimensional form. There are separate nomographs for individual points of the load carrying square.

The distance of the load carrying square from the end of the cylinder is taken into account by means of correction coefficients shown on fig. 16 to 19.

2/2

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USSR

UDC: 620.10

NERUBAYLO, B. V., Candidate of Technical Sciences, SIBIRYAKOV, V. A.,
Candidate of Technical Sciences, Docent

"Calculation of a Cylindrical Shell under the Effect of a Localized Radial
Load"

Moscow, IVUZ, Mashinostroyeniye, No 1, 1971, pp 20-23

Abstract: V. Z. Vlasov's moment theory of shells is taken as a basis for
analyzing the effect of a radial localized load on a cylindrical shell
structure. It is assumed that the shell is hinged at the transverse edges.
The solution of the problem is given in the form of double trigonometric
Fourier series, which are suitable for numerical digital computer input
information. Nomograms are given for finding annular forces and moments for
a broad range of relative wall thicknesses ($15 \leq R/h \leq 1000$) and dimensions
of the loaded area ($0.25 \geq \delta_0 \geq 0.005$). Nomograms are also given for
determining the annular forces and moments on a generatrix and on an arc
passing through the center of the shell.

1/1

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USSR

UDC 539.3

NERUBAYLO, B. V., Candidate of Technical Sciences, and SIBIRYAKOV, V. A.,
Candidate of Technical Sciences, Docent

"Concerning a Case of the Flexure of a Cylindrical Shell by a Radial Load"
Moscow, Izvestiya Vysshikh Uchebnykh Zavendeniy -- Mashinostroyeniye, No 2,
1971, pp 5-7

Abstract: The article deals with a freely supported, thin circular cylindrical shell under the action of a radial local load. A study is made of the influence of the point of application of the load upon the value of the radial shift, the forces and the bending moments. The solution is constructed in the form of double trigonometric series on the basis of V. Z. Vlasov's moment technical theory of shells. 3 figures, 1 table.

1/1

USSR

NERUKH, A. G. and KHIZHNYAK, N. A.

UDC: 538.566

"Integral Maxwell Equations in Wave Dispersion Problems of Moving Media"

Leningrad, Zhurnal Tekhnicheskoy Fiziki, No 6, 1973, pp 1113-1120

Abstract: The purpose of this theoretical paper is to generalize results obtained in an earlier article (N. A. Khizhnyak, ZhTF, vol 23, 1958, p 1592). The Maxwell equations are obtained in integral form for moving media. Their effectiveness in solving diffraction problems with varying boundary values is illustrated by an example of radio-wave dispersion in a small dielectric or ideally conducting body formed in variable ellipsoid deformations. In deriving the integral Maxwell equations, the authors consider a nonconducting body of limited dimensions in a vacuum, with the configurations of the body variable in time. It is assumed that the velocity of the medium is small, such that $v/c \ll 1$, where v is the velocity and c the speed of light. Three particular cases of electromagnetic wave dispersions are solved.

1/1

USSR

UDC:629.78.015:533.697:621.4

DAVIDSON, V. Ye., NESHCHERET, P. A., GLINKIN, B. A:

"Exhaust of an Underexpanded Supersonic Jet into a Cylindrical Pipe with a Step"

Gidraeromekh. i Teoriya Uprugosti. Mezhvuz. Nauch. Sb. [Hydroaeromechanics and the Theory of Elasticity. Inter-University Scientific Collection], 1973, No 16, pp 38-41 (Translated from Referativnyy Zhurnal Raketostroyeniye, No 9, 1973, Abstract No 9.41.92)

Translation: Results are presented from experimental studies of the flow of an underexpanded stream from a conical nozzle at numbers $M_n=1.6-3.0$ with half-aperture angle $\alpha=15^\circ$. The flow occurs into a cylindrical pipe up to 10 calibers in length along its axis. The geometric structure of the wave picture is studied and curves of the distribution of pressure along the generatrix of the pipe are presented in the self-similar flow mode for ratios of diameters of nozzle and pipe $d-0.1-1.0$. Approximating dependences are produced for the pressure curves. 5 Figures; 1 Biblio Ref. Resume

1/1

USSR

UDC 621.762.5:669.29:669.018.4:620.18

KISLYY, P. S., SHVAB, S. A., GAYEVSKAYA, L. A., NESCHETNYI, V. A., and BUTUZOV, S. S., Institute of Problems of Material Science, Academy of Sciences Ukrainian SSR

"Structure and Properties of Titanium Diboride With 20% Titanium Carbide"
Kiev, Poroshkovaya Metallurgiya, No 9, Sep 73, pp 35-38

Abstract: Samples of titanium diboride powder with 20% titanium carbide (particle size of initial powder = 1 micron) with a porosity of almost 32% were sintered in a graphite resistance furnace in hydrogen at 2000-2300°C for 0 to 180 minutes. After a specified soaking time at a given temperature the samples were cooled, and grain size, bend strength, porosity and electric resistance were determined. It was found that grain size increases with sintering time (the higher the temperature the larger the grain size). Bend strength increases with sintering time up to a point (around 40 minutes) and then starts declining. The highest bend strength value is achieved for a sintering temperature of 2300°C but after the 40-minute mark it diminishes more quickly than a sample sintered at 2200°C. Porosity curves were the opposite of the bend strength curves with porosity dropping during the first 40 minutes and then increasing. Electrical resistance curves followed the same pattern

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USSR

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KISLYY, P. S., et al., Poroshkovaya Metallurgiya, No 9, Sep 73, pp 35-38

as the porosity curves although samples sintered at 2300°C reach a low value after 40 minutes of sintering and this value remains constant for the subsequent sintering time. The conclusion was reached that titanium diboride samples with 20% titanium carbide possess the best qualities after sintering at 2200-2250°C for 40 minutes. 6 figures, 1 table, 3 bibliographic references.

2/2

1/2 050

UNCLASSIFIED

PROCESSING DATE--30OCT70

TITLE--EFFECT OF THE VELOCITY OF MOTION OF AN OXIDIZING MEDIUM ON THE IGNITION OF HEATPROOF AND HEAT RESISTANT STEELS AND ALLOYS -U-

AUTHOR--(03)-NESGOVOROV, L.YA., PROZOROV, YU.A., KHOLIN, V.G.

COUNTRY OF INFO--USSR

W

SOURCE--IZVESTIYA, SERIYA FIZICHESKIKH I TEKHNICHESKIKH NAUK, NO. 1, 1970, P. 95-101

DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS, PHYSICS

TOPIC TAGS--HEAT RESISTANT STEEL, ALLOY DESIGNATION, OXYGEN, IGNITION, GAS FLOW/(U)EIALT HEAT RESISTANT STEEL, (U)E1445P NICKEL BASE ALLOY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1997/0024

STEP NO--UR/0371/70/000/001/0095/0101

CIRC ACCESSION NO--AP0119020

UNCLASSIFIED

2/2 050

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0119020

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

ABSTRACT. EXPERIMENTAL STUDY OF THE EFFECT OF THE VELOCITY OF MOTION OF OXYGEN AT VARIOUS PRESSURES ON THE IGNITION OF HEATPROOF AND HEAT RESISTANT STEELS AND ALLOYS. AN ESTIMATE IS MADE OF THE RESISTANCE TO IGNITION OF EIAIT STEEL AND EI445P ALLOY DURING HIGH TEMPERATURE TESTS IN THE PRESENCE OF AN OXYGEN FLOW AND IN A STATIONARY OXYGEN MEDIUM. THE MINIMUM IGNITION TEMPERATURE OF SAMPLES EXPOSED TO AN OXYGEN FLOW IS FOUND TO BE CONSIDERABLE LESS THAN THAT OF SAMPLES IN A STATIONARY OXYGEN MEDIUM.

FACILITY: AKADEMIIA NAUK
LATVIISKOI SSR.

UNCLASSIFIED

USSR

UDC: 51:155.001.57:681.3.06

LBOV, G. S., NESGOVOROVA, G. P.

"Program of Selection of Informative Characteristics by the Method of Random Search With Adaptation for the Minsk-22 Computer"

V sb. Vychisl. sistemy (Computer Systems--collection of works), vyp. 45, Novosibirsk, "Nauka", 1971, pp 95-104 (from RZh-Kibernetika, No 11, Nov 71, Abstract No 11V868)

Translation: A program is compiled for selecting from a predetermined n-dimensional subspace of characteristics -- the effective subspace of lowest dimensionality whose use minimizes the number of errors α . The characteristics of the program are described and a verifying example is given.

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USSR

UDC: 518.5:681.3.06

SAMOKHVALOV, K. F., NESGOVOROVA, G. P.

"Programs of Random Search With Adaptation for the BESM-6 Computer"

V sb. Vychisl. sistemy (Computer Systems--collection of works), vyp. 45, Novosibirsk, "Nauka", 1971, pp 84-94 (from RZh-Kibernetika, No 12, Dec 71, Abstract No 12V984)

Translation: Three programs are presented for solving problems on the BESM-6 computer: 1) "SPA" random search (with adaptation); 2) "Loss Criterion Module" random search; 3) "Pseudo" random search (random number generator). "Loss Criterion Module" random search does not depend on the "SPA" program, whereas "SPA" random search necessarily includes "Pseudo" random search. In utilizing the proposed programs, they should be recorded on any zone of the tape. The programs are described in detail, and a control example is presented.

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UDC: 51.155.001.57:681.3.06

USSR

LBOV, G. S., NESGOVOROVA, G. P.

"Program for Selection of Informative Features by the Method of Random Search With Adaptation for the Minsk-22 Computer"

V sb. Vychisl. sistemy (Computer Systems--collection of works), vyp. 45, Novosibirsk, "Nauka", 1971, pp 95-104 (from RZh-Matematika, No 11, Nov 71, Abstract No 11V868)

Translation: A program is set up for selecting from a given n-dimensional subspace of distinctive features the subspace of least dimensionality whose utilization minimizes the number of errors α . The characteristics of the program are described and an illustrative example is given.

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USSR

UDC 616.45-011.1/3:355

NESHEV, G., Dr., Candidate of Medical Sciences

"The Problem of Stress in Military Medicine"

Moscow, Voyenno-Meditsinskiy Zhurnal, No 10, 1972, pp 42-44

Abstract: This article, subtitled "Review of the Literature," devotes short paragraphs to the findings of various researchers, mostly non-Soviet, in different areas of the effect of stress in military medicine. The areas covered are the psychic reactions of combatants at the front in both world wars, cardiovascular and respiratory reactions, and endocrine reactions.

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NESHKOV, P.F.

JPRS 56788
16 June 1972

UDC: 621.1.8.152

PURIFICATION OF CONDENSATE WITH SEPARATELY FUNCTIONING
ION-EXCHANGER FILTERS AT THE VV-50 ATOMIC ELECTRIC POWER PLANT

Article by Candidates of Technical Sciences A.M. Andrii, P.E. Bessyev,
and Yu. V. Chebutkin, Engineer I.P. Sokhina, Candidate of Chemical
Sciences A.I. Zabelin, and engineers Ye. P. Barontkin, L.N. Rudakovsk-
skaya, and I.N. Kuznyak; Moscow, Tekhnicheskii, Russian, No 3, May
1972, pp 13-15]

Experience in the operation of thermal and atomic electric power
plants has shown that purification of the entire stream of condensate of
dissolved and mechanical impurities is a necessary condition for reliable
functioning of the plant [1,2].

To investigate the functioning of ion-exchange resins in the purifi-
cation of the condensate of an atomic electric power plant from dissolved
and suspended impurities, and also to verify the design of individual ele-
ments of an ion-exchanger filter, a semi-work installation with separate
functioning ion-exchanger filters (two meters in diameter), with cation-
exchanger and anion-exchanger resins, connected in series, was installed
and tested on the bypass of the condensate loop of the VV-50 Atomic Electric
Power Plant.

The filters were identical in their design. The drainage and dis-
tribution systems of the filters were of the silt-tube type. The silt on
the wall of the system were formed of a coil of circular wire with a dia-
meter of 0.8 mm. The coil was so made that the width of the gap was 0.1 mm
on the wall of the lower system and 0.4 mm on those of the upper system.

During the time the filters functioned the following thermodynamic
indicators were monitored (the flow rate of the condensate, the total re-
sistance of the filters, and the resistance of the drainage systems) and
also the physicochemical composition of the condensate (the pH value, electri-
cal conductivity, hardness, the content of elements of corrosion products,
and the total beta-activity). The chemical composition of the condensate
was stable during the entire course of functioning of the filters, except
during the start-up period of the reactor (0.02-0.04 mg/liter of Fe (total)).

USSR

UDC: 681.3

NESHOKOTSAS, E., CHIRITSA, V., KILDA, B. V.

"Concerning the Construction of an Analog-Digital Complex Based on the MN-14 and Razdan-3 Computers and the UP-1 Converter"

V sb. Analogovaya i analogo-tsifr. vychisl. tekhn. (Analog and Analog-Digital Computer Technology--collection of works), vyp. 4, Moscow, "Sov. radio", 1971, pp 3-8 (from RZh-Kibernetika, No 9, Sep 71, Abstract No 9V550)

Translation: The paper deals with the problems of constructing a combination computer system which provides controllable accuracy and speed. Authors' abstract.

UDC 620.178.3-41

USSR

NESIPOR, G. S., MIKLYAYEV, P. G. and KUDRYASHOV, V. G.

"Effect of the Sequence of Producing Fatigue Cracks and Heat Treating on the Failure Kinetics of Sheet Material Specimens"

Moscow, Zavodskaya laboratoriya, Vol 38, No 4, 1972, pp 479-482

Abstract: It is shown that the procedural sequence of producing a fatigue crack and heat treating centrally notched sheet material specimens cut along the direction of rolling from VML5 β -titanium alloy sheets affects the property of resistance to growth of the initial crack in subsequent tensile tests, the ultimate breaking stress, and the critical crack length; the values of the stress intensity factor (failure ductility) are practically unaffected. The heat treatment consisted of hardening from 800°C for 10 min and aging at 480°C for 25 hrs. The central notch was 1.0 mm long and 0.26 mm wide. The fatigue stresses, under cyclic conditions, were applied at 800 cycle/min at a minimum of 2 kg/mm² and a maximum of 15 kg/mm². (3 illustrations, 6 biblio. references)

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UDC 620.178.3-41

USSR

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NESHPOR, G. S., MIKLYAYEV, P. G., and KUDRYASHOV, V. G.

"Method of Evaluating the Kinetics of Fatigue Crack Growth in Sheet Specimens of Anisotropic Materials"

Moscow, Zavodskaya Laboratoriya, No 10, 1970, pp 1245-1248

Abstract: A study is made of the relationship between fatigue crack growth and variations in the coefficient of stress intensity in the apex of cracks during a cycle in sheet specimens of the alloys D16-AT, 01911-T1, and VII-14 dissimilarly oriented to the direction of rolling. It is shown that anisotropy of failure parameters in cyclic loading can be evaluated by determining these parameters for one direction, after which values of these parameters can be calculated, using the equation derived, for any other direction.

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USSR

UDC 620.172:620.182

NESHFOR, G. S., MIKLYAYEV, P. G., and KUDRYASHOV, V. G.

"Application of Diagrams of Macroscopic Destruction in Evaluating the Quality of Materials"

Moscow, Zavodskaya Laboratoriya, Vol 38, No 7, 1972, pp 864-868

Abstract: Mechanical characteristics obtained in standard tensile tests of smooth samples and in blow-bending tests of notched and cracked samples were compared with kinetic characteristics determined under conditions of developing destruction. Investigations were carried out on sheets from AlMg6 aluminum alloy (5.8% Mg; 0.6% Mn; 0.1% Cu; 0.4% Fe; 0.3% Si; 0.15% Zn, base Al), 2 mm thick, annealed at 320°C for 1 hr, with 30 and 80% of cold working. The results showed that in evaluating the quality of materials and in choosing optimum conditions for working them it is indispensable to use the diagrams of macroscopic destruction alongside the standard mechanical characteristics. Four figures, 1 table, 7 references.

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USSR

UDC 529.26

ZHURAKOVSKIY, YE. A., NESHFOR, V. S., BONDARENKO, T. N., and NIKITIN, V. P.,
Institute of the Problems of Material Sciences, Academy of Sciences UkrSSR

"X-Ray Spectral Investigation of the Electron Structure of Non-Stoichiometric
Titanium Carbide"

Kiev, Poroshkovaya Metallurgiya, No 6(126), Jun 73, pp 75-79

Abstract: Investigation results are presented of a detailed x-ray spectral investigation of titanium carbide of limiting composition and in the region of homogeneity: K-emission lines of titanium and carbon genetically combined with the p-component (with admixture of d-states) of the valent zone of both atoms in its occupied part, L_{III} -line of titanium emission reflecting basically d-states of the valent zone of titanium, and K-region of titanium emission reflecting p- and d-like conditions above the Fermi level. At the lower boundary of the homogeneity region of the L_{III} -line of emission, in contrast to other spectra, the parameters of which do not depend on the carbon concentration, on the top of the L_{III} -line an additional substructure is observed which is interpreted as a redistribution of d-states in the abundance of vacancies with respect to carbon. Three figures, one table, twenty-three bibliographic references. 1/1

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USSR

UDC 546.261

NESHPOB, V. S., NIKITIN, V. P., and SKALETSKAYA, N. A., State Institute of Applied Chemistry

"Electrical Properties of Non-Stoichiometric Titanium Carbide"

Kiev, Poroshkovaya Metallurgiya, No 8, Aug 73, pp 54-57

Abstract: Electrical conductivity, Hall effect, and thermal emf of titanium carbide in the region of its homogeneity at low temperatures were studied. Samples were produced by direct synthesis of powder titanium with a purity of 99.5% which contained (in %): 0.068 N, 0.055 C, 0.065 Si, 0.18 Fe, 0.11 Ni, and 0.55 Ca, and acetylene carbon black with a purity of 99.995% in a vacuum of 10^{-5} - 10^{-6} mm Hg at 1800°C. Samples for study were made by extrusion of the synthesized powders under a pressure of about two tons/cm² and sintering in a vacuum of 10^{-5} mm Hg at 2200°C. It was found that the titanium carbide samples with the composition $TiC_{0.91}$ - $TiC_{0.46}$ have a metallic conductivity of the n-type with a strong degeneration of current carriers. With increased concentration of carbon vacancies a decrease of the Hall Coefficient and thermal emf can be observed which changes sign at the lower boundary of the TiC_x region of homogeneity. The electrical resistance of TiC_x is slightly decreased with an increase in the number of 1/2

USSR

MESHFOR, V. S., et al., Poroshkovaya Metallurgiya, No 8, Aug 73, pp 54-57

carbon vacancies which was associated with the increased concentration. The Hall coefficient increases slightly with temperature, and electrical resistance and thermal emf grow linearly in absolute magnitude as the theory of metals requires. An exception to this exists for compositions close to the boundary of the region of homogeneity for which thermal emf changes sign with temperature and deviates somewhat from the linear temperature relationship. The change in sign for the thermal emf in TiC_x with composition and temperature is explained by assuming a shift in the conductivity strip to the side of the smallest energies relative to the Fermi level for a large increase in the concentration of carbon vacancies. Three figures, one table, eleven bibliographic references.

2/2

USSR

UDC 536.212

FRIDLENDER, B. A., NESHFOR, V. S., YERMAKOV, B. G., SOXOLOV, V. V., State
Institute of Applied Chemistry, Leningrad

"Temperature and Heat Conductivity of Pyrolytic Titanium and Niobium
Carbides and Titanium Nitride at High Temperature"

Minsk, Inzhenerno-Fizicheskiy Zhurnal, Vol 24, No 2, Feb 73, pp 294-296.

Abstract: Results are presented from measurement of the temperature
conductivity and calculation of heat conductivity of monolithic specimens
of $TiC_{0.94}$, $NbC_{0.77}$ and $TiN_{0.94}$ produced by chemical gas-phase deposition,
in the temperature range from 1500 to 2200-2400°C. The specimens of
titanium and niobium carbide had large-crystal columnar dendritic micro-
structure, the long axes of the crystals oriented perpendicular to the sur-
face of deposition. The specimens of titanium nitride had similar micro-
structure, but were not dendritic. The temperature and heat conductivities
of TiC and NbC are significantly lower than that of TiN , resulting from the
significantly lower electrical conductivity of the carbides and the corres-
pondingly lower contribution of electron heat transport, with similar con-
tributions of lattice heat transport.

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USSR

UDC: 536.2

PETROV, V. A., PETROVA, I. I., NESHFOR, V. S., FRIDLINDER, B. A., KAPRALOV, V. K., BELIK, R. V., Institute of High Temperatures of the Academy of Sciences of the USSR, State Institute of Applied Chemistry

"Some Thermophysical Properties of Isotropic Pyrolytic Graphite"

Moscow, Teplofizika Vysokikh Temperatur, Vol 11, No 2, Mar/Apr 73, pp 308-313

Abstract: A study is done on the electrical resistance, thermal conductivity and radiative characteristics of pyrolytic graphite which lacks a preferred orientation of the crystallographic planes with respect to the deposition surface. The measurements were made on specimens with densities ranging from 1.76 to 2.19 g/cc over a wide temperature interval. The behavior of the properties as a function of density and temperature is explained in terms of peculiarities of the defect structure of isotropic pyrographite.

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USSR

UDC 536.2.023

FRIDLENDER, B. A., and NESHFOR, V. S., Institute of Applied Chemistry, Leningrad

"The Direction Dependence of High-Temperature Thermal Conductivity of Crystal-Oriented Pyrolytic Graphite"

Moscow, Teplofizika Vysokikh Temperatur, Vol 10, No 2, Mar-Apr 72, pp 313-317

Abstract: The vector effect of thermal conductivity of specimens of pyrolytic graphite (PG), 2.26 g/cm³ density, was investigated by the phase method. The specimens were obtained by the chemical gas-phase method of precipitation by 400 °C with a high degree of primary orientation of the basal plane. They were cut from 12 mm thick PG plates under different angles θ between the directions of perpendiculars to the specimen's plane and the precipitation surface. The perpendicular to the surface of the specimen was coincident with the heat flow direction, the thickness of the

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USSR

FRIDLENDER, B. A., and NESHFOR, V. A., *Teplofizika Vysokikh Temperatur*, Vol 10, No 2, Mar-Apr 72, pp 313-317

specimens was 0.450--0.120 mm. For comparison, the thermal conductivity was investigated in the perpendicular direction to the precipitation surface of the pyrographite, which was subjected to thermomechanical processing and possessed a more perfect structure. The investigation results are discussed by reference to diagrams showing the temperature- and θ -dependences of the thermal conductivity of pyrographite and its calculated values in the directions of a- and c-axes. Five illustr., three formulas, one table, nine biblio. refs.

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52

USSR

UDC 546.821'261:541.67

NESHPOR, V. S., NIKITIN, V. P. and NOVIKOV, V. I., Institute of Semiconduc-
tors, Academy of Sciences USSR

"Superconductivity and Residual Resistance of Titanium Carbide"

Moscow, Izvestiya Akademii nauk SSSR, Neorganicheskiye materialy, Vol 7,
No 10, Oct 71, pp 1743-1747

Abstract: The study concerns the electric conductivity and Hall effect of titanium carbide in its homogeneity region at below-zero temperatures as well as its transition to the superconductive state in strong magnetic fields. The experimental titanium carbide was of the composition $Ti_{0.91}Ti_{0.46}C$. The study revealed a very weak temperature dependence of the conductivity at 300-4.2°K, indicating that the specific resistance at room temperature is almost completely governed by residual resistance. Both the resistance and the Hall coefficient decrease with the carbon content in the TiC_x phases. With a sufficiently high concentration of carbon defects, the increase in the density of states near the Fermi level makes possible the appearance of a superconducting gap in the energy spectrum.

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USSR

NESHPOR, V. S., et al, Izvestiya Akademii nauk SSSR, Neorganicheskiye materialy, Vol 7, No 10, Oct 71, pp 1743-1747

which might explain the transition of homogeneous titanium carbides (observed only in compositions $TiC_{0.52}$ and $TiC_{0.46}$) to the superconductive state. (4 illustrations, 23 bibliographic references).

2/2

1/3 029 UNCLASSIFIED PROCESSING DATE--16OCT70
TITLE--STATE DISTRIBUTION OF ELECTRONS IN HOMOGENEITY REGIONS FOR SOME
REFRACTORY CARBIDES -U-
AUTHOR-(03)-ZHURAKOVSKIY, E.A., NESHPOR, V.S., DZEGANOVSKIY, V.P.
COUNTRY OF INFO--USSR
SOURCE--IZV. AKAD. NAUK SSSR, NEORG. MATER. 1970, 6(2), 207-13
DATE PUBLISHED-----70
SUBJECT AREAS--MATERIALS
TOPIC TAGS--REFRACTORY COMPOUND, CARBIDE, VANADIUM COMPOUND, CHEMICAL
BONDING, METAL BONDING
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1996/1663 STEP NO--UR/0363/70/006/002/0207/0213
CIRC ACCESSION NO--AP0118642

UNCLASSIFIED

2/3 029

UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0118642

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE 2 KNOWN CARBIDES IN THE V-C SYSTEM, VC SUB1-X AND V SUB2 C SUB1-X, WERE INVESTIGATED. THE BACKGROUND, THE PROPERTIES, AND THE BONDING IN THESE CARBIDES ARE DISCUSSED AND COMPARED WITH SIMILAR PROPERTIES AND THE BONDING IN OTHER TRANSITION METAL CARBIDES. THE EMISSION L SUB1,2 BANDS, IN WHICH THE TRANSITION FROM THE D STATES (D YIELDS P) IS A DIPOLE ONE AND STRONG, WERE STUDIED IN ADDN. TO THE K BETA AND THE K ALPHA EMISSION BANDS OF C IN HOMOGENEOUS VC SUB1-X AND V SUB2 C SUB1-X, WITH THE SIMULTANEOUS INVESTIGATION OF THESE SAMPLES OF ELEC. COND., HALL COEFF., AND THERMAL EMF. IDENTICAL CONDITIONS FOR THE EXCITATION OF THE L ALPHA SUB1,2 BANDS WERE PRODUCED BY NORMALIZING THEIR INTENSITY RELATIVE TO THE INTENSITY OF THE L SUB1 LINE. IN BOTH V CARBIDES THERE TAKES PLACE A 3 LAYER STRUCTURE OF THE ENERGY SPECTRUM, WHICH CONSISTS OF: (A) A RELATIVELY NARROW HYBRID 3D GAMMA 2P SIGMA BAND, THE STATES OF WHICH ARE LOCALIZED ON THE POLARIZED COVALENT M-C BONDS; (B) A DIFFUSED 4S, 3D EPSILON, 2P PI CONDUCTION BAND (THE M-M BONDS); AND (C) A LOW ENERGY 2S BAND LOCALIZED PRIMARILY AROUND THE IONIC CORES OF THE CARBON (C PRIME POSITIVE) ATOMS AND, TO THE LESSER DEGREE, AT THE V PRIME NEGATIVE IONS. UPON THE TRANSITION FROM THE LOWER TO THE HIGHER CARBIDE THERE TAKES PLACE A REDISTRIBUTION OF THE ELECTRON D., ACCOMPANIED BY A CHANGE IN THE NATURE OF THE BOND FROM THE PREDOMINANTLY METALLIC BONDING IN V SUB2 C TO THE COVALENT METALLIC BONDING IN VC SUB1-X; ALSO INSIDE THE HOMOGENEITY REGIONS OF BOTH CARBIDES IN PROPORTION TO THE FILLING UP BY THE C VACANCIES.

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UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0118642

ABSTRACT/EXTRACT--WITH INCREASING C CONC. THE CONTRIBUTION OF THE 3D ELECTRONS TO THE M-M BONDS GRADUALLY DIMINISHES AND THEIR PARTICIPATION IN THE M-C BONDS INCREASES. THE SHORTWAVE DISPLACEMENT OF THE C K ALPHA BAND AND THE LONGWAVE DISPLACEMENT OF THE V K BETA SUB5 AND THE V L ALPHA SUB1.2 BANDS INDICATES, ACCORDING TO PREVIOUS CALCNS., THAT THE CHARGE D. DECREASES IN CASE OF THE C ATOM, WHEREAS IT INCREASES IN CASE OF THE V ATOM. THE CLOSENESS BETWEEN THE POSITION OF THE C K ALPHA BAND IN THE CARBIDE VC SUB1-X AND THAT IN DIAMOND (THE DIFFERENCE BEEN 0.35 EV) MAKES IT POSSIBLE TO PRESUME A CERTAIN SIMILARITY OF THE ENERGY STATES FOR THE C ATOM IN THESE PHASES. WITH INCREASING NO. OF C VACANCIES PRESENT IN THE CARBIDES THE SHAPE OF THE FERMI SURFACE EXPERIENCES A CERTAIN SIMPLIFICATION. MATERIALOVED., KIEV, USSR. FACILITY: INST. PROBL.

UNCLASSIFIED

1/2 030 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--THERMAL CONDUCTIVITY OF PYROLYTIC ZIRCONIUM DIBORIDE AT HIGH
TEMPERATURES -U-
AUTHOR-(03)-NESHFOR, V.S., FRIDLENDER, B.A., SHARUPIN, B.N.
COUNTRY OF INFO--USSR
SOURCE--INZH. FIZ. ZH. 1970, 18(3), 527-30
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY, MATERIALS
TOPIC TAGS--ZIRCONIUM BORIDE, THERMAL CONDUCTIVITY, CHEMICAL REDUCTION,
REFRACTORY COMPOUND, POWDER METALLURGY
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1997/0326 STEP NO--UR/0170/70/013/003/0527/0530
CIRC ACCESSION NO--AP0119313
UNCLASSIFIED

2/2 030

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0119313

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE THERMAL DIFFUSIVITY ALPHA OF ZRB SUB2 LAYER (THICKNESS 0.3 MM), PREPD. BY THE CHEM. GAS PHASE REDN. OF ZR AND B HALIDES BY H IN VACUUM (10 PRIME NEGATIVES TORR) AT 1200DEGREES, WAS MEASURED AT 1500-2300DEGREES BY USING THE PHASE METHOD. THE VALUES OF ALPHA WERE USED FOR CALCG. THE THERMAL COND. LAMBDA WHICH DECREASED FROM 105 TO 95 W-M DEGREE AT 1500-2300DEGREES. THE DATA ARE COMPARED WITH LAMBDA VALUES OF SIMILAR TO 30 W-M DEGREE REPORTED FOR ZRB SUB2 SAMPLES PREPD. BY USING THE METHODS OF POWDER METALLURGY; THE REASONS FOR THESE DIFFERENCES ARE DISCUSSED.

UNCLASSIFIED

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TITLE--SUPERCONDUCTIVITY OF ZIRCONIUM NITRIDE SINGLE CRYSTALS -U-

AUTHOR--(03)-NESHPOR, V.S., NOVIKOV, V.I., SOKOLOV, V.V.

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ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. SINGLE CRYSTAL ZN NITRIDE SAMPLES OF THE COMPN. ZRN SUB0.95 GROWN BY CHEM. GAS PHASE DEPOSITION FROM A VAPOR GAS MIXT. N SUB2 PLUS ZRCL SUB4 PLUS H SUB2 UNDER THE CONDITIONS OF SLOW GAS STREAM RATE HAVE AN ACICULAR SHPAE WITH THE AXIS OF THE NEEDLE COINCIDING WITH THE (111) CRYSTALLOGRAPHIC DIRECTION. AT A PERFECT SURFACE SHAPE OF THE SAMPLE, A SHARP TRANSITION WAS DETD. FOR THEM INTO THE SUPERCONDUCTING STATE AT 9.6DEGREEK. THE CRIT. MAGNETIC FIELD FOR THESE SAMPLES IS 2.5-3.0 KOE. FOR NONHOMOGENEOUS LENGTH AND IMPERFECT STRUCTURE OF THE SURFACE OF THE ZR NITRIDE CRYSTALS, THEIR TRANSITION INTO THE SUPERCONDUCTING STATE PROCEEDS AT A SOMEWHAT LOWER TEMP. THE T SUBC VALUE FOR ZR NITRIDE SINGLE CRYSTALS IS CLOSE TO THE CORRESPONDING T SUBC VALUE FOR POLYCRYST. SAMPLES OF THE SAME CHEM. COMPN. THE DISRUPTION OF THE SUPERCOND. BY A MAGNETIC FIELD TAKES PLACE OVER A WIDER FIELD STRENGTH INTERVAL FOR POLYCRYST. SAMPLES COMPARED TO SINGLE CRYSTALS. INVESTIGATION OF THE SINGLE CRYSTALS STUDIED BY ELECTRON MICROPROBE SHOWED THAT THEY DO NOT CONTAIN IMPURITIES OF THE FOLLOWING ELEMENTS: FE, MG, HF, TI, NB, W, AND SI. LOCALIZED IMPREGNATIONS OF CU, C, AND O, AND A CU CONTG. PHASE (ZR PLUS CU) WERE OBSD. AT THE SURFACE OF THE SAMPLES. THE LATTER INCLUSIONS WERE NOT PRESENT IN BULK OF THE SAMPLE. FACILITY: GOS. INST. PRIKL. KHIM., USSR.

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USSR

UDC: 546.831'17:537.312.62

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"Superconductivity of Zirconium Nitride Single Crystals"

Moscow, Neorganicheskiye Materialy, Vol 6, No 3, 1970, pp 425-428

Abstract: The superconductivity of zirconium nitride crystals produced by crystallization of the nitride from the gas phase was studied. X-ray diffraction phase analysis showed only one phase of cubic mononitride, with a lattice period of 4.612 Å. The crystals, with the composition $ZrN_{0.95}$, grown by chemical gas phase precipitation from a vapor-gas mixture ($N_2 + ZrCl_4 + H_2$) at low gas flow velocity were needle shaped with needle axis corresponding to the $\langle 111 \rangle$ crystallographic direction. A sharp transition to the superconducting state at 9.6°K was noted, and the critical magnetic field was 2.5-3.0 koe. With structural imperfections on the crystal surface, the transition to the superconducting state is at a somewhat lower temperature. The value of T_K for the single crystals is similar to the corresponding value for polycrystals of the same chemical composition. Disruption of superconductivity by a magnetic field occurs over a broader interval of intensities for the polycrystalline specimens than for the single crystals.

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UDC 546.831:17:536.2.023

FRIDLENDER, B. A., ~~NESHFOR, V. S.~~, State Institute of Applied Chemistry

"The Temperature Conductivity of Pyrolytic Zirconium Nitride"

Moscow, Neorganicheskiye Materialy, Vol 6, No 5, May 70, pp 1004-1006

Abstract: The authors studied temperature conductivity of zirconium nitride obtained by means of chemical gas phase precipitation on a pyrographite base, from a vapor-gas mixture containing $ZrCl_4$, nitrogen, hydrogen, and argon at $1400^\circ C$. X-ray analysis showed that the product has only one phase of cubic zirconium nitride with a lattice period $a=4.574 \text{ \AA}$. The specimens obtained showed a coarsely crystalline, porous-free microstructure. Temperature conductivity was carried out by the phase method based on radiotechnical determination of phase differences between the periodic heat stream and temperature waves on the opposite surfaces of a thin sample. It was determined that both the temperature and heat conductivity of pyrolytic zirconium nitride decrease with temperature elevation in

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FRIDLENDER, B. A., NESHFOR, V. S., Neorganicheskiye Materialy,
Vol 6, No 5, May 70, pp 1004-1006

the temperature range studied -- 1500-2300°C. Such a functional relationship is typical of metallic conductors with low electroresistance. For comparison, a temperature conductivity study of zirconium carbide was carried out analogously and it was found that its temperature conductivity is very low and temperature-independent.

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UDC 519.281

NESHUMOVA, L. A.

"The Problem of the Application of the PAO and S-Method of Sheffe in an Orthogonal Complex"

Opyt. Primeneniya Mat.-Statist. Metodyv v Proiz-ve, [Experience in Application of Mathematical Statistics Methods to Production--Collection of Works], Moscow, Mashinostroyeniye Press, 1970, pp 221-237, (Translated from Referativnyy Zhurnal Kibernetika, No 5, 1971, Abstract No. 5V181 by Ye. Markova).

Translation: The question is analyzed as to whether dispersion analysis programs composed for a nonorthogonal complex can be considered universal and used in an orthogonal complex. The problem of the nonorthogonal complex arises when a matrix of observations contains a certain number of empty squares. Algorithms and programs using the Pao and S methods have been constructed for these situations (RZhMat. 1964, 1V108). In this article, the possibility is proven of applying these methods in an orthogonal complex, and a method is developed for applying the S method in the case of an equal number of observations in each square.

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UDC 681.327

ABAKUMOV, V. G., and NESIN, S. P.

"Automatic Accumulators in Devices for Processing Experimental Data"

Avtomatiz. Proyektir. v Elektronike. Resp. Mezhved. Nauchno-Tekhn. Sb. [Automation of Planning in Electronics, Republic Interdepartmental Scientific and Technical Collection], No 1, 1970, pp 98-100 (Translated from Referativnyy Zhurnal Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 5, 1971, Abstract No 5B 349 by T. D.)

Translation: This concerns a study of the problem of the use of magnetic tape storage units for recording of experimental data. It is shown that it is expedient to design accumulators so that they are compatible with computer magnetic tape drives. Requirements which must be satisfied by recording documents in order to provide compatibility are studied. The tape transport rate during recording may vary; measures should be taken to assure that the longitudinal recording density does not exceed the nominal value for the magnetic tape accumulator of the computer in question. The construction of compatible recorders allows the time required to input data to the computer to be greatly reduced and significantly simplifies the input procedure.

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USSR

UDC: 539.3

KOSMODAMIANSKIY, A. S., NESKORODEV, N. M., Donetsk

"Stressed State of an Anisotropic Half-Plane With a Finite Number of Curvilinear Openings"

Moscow, Izvestiya AN SSSR: Mekhanika Tverdogo Tela, No 4, Jul/Aug 71, pp 97-102

Abstract: This paper presents an approximate small parameter method for solving problems of the stressed state of an anisotropic plate weakened by curvilinear holes with a shape which deviates from elliptical (or circular). Two small parameters are introduced to account for this shape deviation for holes which are close to elliptical, giving a solution which converges rapidly to the exact solution. The accuracy of the approximation is established by checking the boundary conditions at a large number of points on the curvilinear contours. It is assumed that the openings are located close to the rectilinear boundary of an anisotropic half-plane. Stress distribution is analyzed for stretching of a half-plane with a rectangular opening. It is found that the influ-

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KOSMODAMIANSKIY, A. S., NESKORODEV, N. M., IAN SSSR: Mekhanika Tverdogo Tela, No 4, 1971, pp 97-100

ence of the edge of the half-plane becomes appreciable when the distance between this edge and the boundary of the opening is shorter than a side of the opening. As the opening is brought closer to the edge of the half-plane, there is a strong increase in stresses at points of the "bridge" close to the opening. If the opening is reinforced by an absolutely rigid ring, the stress concentration decreases appreciably, and varies slowly as the opening approaches the boundary of the half-plane.

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