"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

USSR

SAMSON, A. M., KLYUKANOVA, N. A., and KOTOMTSEVA, L. A.

"Formation from Noises of Longitudinal Types of Oscillations of a Laser in the Preoscillation Period"

Minsk, Zhurnal Prikladnoy Spektroskopii, May 1971, pp 809-814

Abstract: The formation of longitudinal types of oscillations from noises having a dispersion boundary were studied. On the basis of recurrent relationships for the intensity of the electrical field analytic expressions for the envelopes of the radiation maxima and the forms of the individual longitudinal mode up to the beginning of oscillation were obtained. The wave properties of the resonator, dispersion of the active region, and dependence of the refractive index on the population inversion were taken into consideration. Losses were assumed to be the same for all modes.

The article includes 24 equations and two figures. There are 5 references

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

1/2 026 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--CHOOSING BLEACHABLE DYE FILTERS TO OBTAIN PERIODIC UNDAMPED OUTPUT POWER OSCILLATIONS IN A LASER -U-

AUTHOR-(02)-SAMSON, A.M., RYBAKOV, V.A.

S

COUNTRY OF INFO--USSR

SOURCE--ZHURNAL PRIKLADNOI SPEKTROSKOPII, VOL. 12, APR. 1970, P. 641-646

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--LASER RADIATION FILTER, LASER EQUIPMENT, PULSE LASER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/1313 STEP NO--UR/0368/70/012/000/0641/0646

CIRC ACCESSION NO--AP0124964

UNCLASSIFIED

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

2/2 026 UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0124964

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ANALYSIS OF THE CONDITIONS OF REALIZATION OF AN AUTOOSCILLATORY REGIME IN A LASER WITH THE AID OF BLEACHABLE DYE FILTERS, BASED ON THE BALANCE EQUATIONS. A PROCEDURE FOR SELECTING THESE FILTERS IS OUTLINED. THE POSSIBILITY OF CONVERTING TO A PULSATING REGIME LASERS WHICH DO NOT HAVE A PEAKED STRUCTURE EVEN UNDER TRANSIENT CONDITIONS IS ALSO CONSIDERED. EXAMPLES ILLUSTRATING THE METHOD OF FILTER SELECTION ARE CITED. THE ANALYTICAL ESTIMATES ARE ILLUSTRATED BY SOLVING THE INITIAL EQUATIONS ON AN ELECTRONIC COMPUTER.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

USSR

SAMSON, A. M., RYBAKOV, V. A.

"Natural Oscillatory Mode of a Laser With a Clarifying Filter"

Minsk, Zhurnal Prikladnoy Spektroskopii, June 1970, pp 997-1006

Abstract: Based on rate equations, conditions for the feasibility of a natural oscillatory mode with the aid of clarifying filters are analyzed. The method used in selecting them is discussed. Formulas imposing the necessary conditions on the parameters of the system for the solution of the problem are derived. Analytic evaluations of the oscillation parameters are obtained, and their dependence on the various parameters of the medium is studied.

The results are illustrated by the solution of the original equations on an electronic computer.

The article includes 1 table and 4 illustrations. There are 7 bibliographic references.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

ACC NR: AP9012174 SOURCE CODE: UR/0363/69/010/003/0443/0448

AUTHOR: Kotomtseva, L. A.; Samson, A. M.

ORG: none

TITLE: Development time and spectral width of a single pulse from a laser with a saturable adsorber

SOURCE: Zhurnal prikladnoy spektroskopii, v. 10, no. 3, 1969, 443-448

TOPIC TAGS: ruby laser, laser pulse, pulse ~~development, generation~~ Generator ~~dynamics~~

ABSTRACT: Balance equations are used to calculate the development time of a single pulse of a ruby laser with a saturable absorber and formulas are estimated for its spectral width. The numerical calculations show that a narrowing (to 0.025) of the spectral width of a single pulse occurs with an increase in the loss coefficient of the active medium caused by an increase in the pulse formation time. The authors thank B. I. Stepanov for attention and advice. Orig. art. has: 2 figures, 9 formulas, and 2 appendices with 9 formulas. [WA-14] [YK]

SUB CODE: 20/ SUBM DATE: none 1930 1123

Card 1/1 UDC: 621.378.3

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

S

ACC NR: AP9009068 SOURCE CODE: UR/0368/69/010/002/0236/0243

AUTHOR: Samson, A. M.; Rybakov, V. A.; Stashkevich, N. K.

ORG: none

TITLE: Nonstationary oscillation of a ruby laser with ruby filter

SOURCE: Zhurnal prikladnoy spektroskopii, v. 10, no. 2, 1969, 236-243

ABSTRACT: A set of nonlinear equations describing potential nonstationary generation of a ruby laser with a ruby filter is derived. A study of made of the mechanism underlying the transition from spiking to single-pulse regime and from generation with a stable stationary regime to generation of undamped spikes. Formulas for pulse frequencies are derived for within the range of the stationary values. Analytical estimates are illustrated by numerical solutions. SUB CODE: 20/

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

USSR

SAMSON, A. M., RYBAKOV, V. A.

"Selection of Clarifying Filters for Obtaining Periodic, Continuous Oscillations of Radiative Power in Lasers"

Minsk, Zhurnal Prikladnoy Spektroskopii, April 1970, pp 641-6

ABSTRACT: On the basis of rate equations conditions are analyzed for the feasibility of a natural oscillation mode by means of clarifying filters, and a method of selecting them is discussed. Also studied is the question of the possibility of shifting to a pulsing mode for lasers which do not have a spiking structure even in a transitional mode. Examples illustrating the method of selecting filters are presented. The analytical evaluations are illustrated by the solution of the original equations on an electronic computer.

The article includes 2 illustrations. There are 5 references.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

USSR

UDC: 535.51

SAMSON, A. M., KOTOMTSEVA, L. A., and MILINKEVICH, A. V.

"Transmission of Short Radiation Pulses Through Linear Amplifying and Absorbent Media"

Minsk, Zhurnal Prikladnoy Spektroskopii, Vol 17, No 2, 1972, pp 228-236

Abstract: A theoretical and rigorous solution is proposed to cover one aspect of the problem of propagating light pulses through various types of media. This single aspect involves the laws of propagating short coherent pulses in linear amplifying or absorbent media, with the pulses defined as those whose spectral width is small compared with the uniform width of the corresponding amplification or absorption band. The solution is obtained through the Laplace transform and yields simple formulas for the electric field intensity as well as the polarization of the medium for any form and frequency of the incident pulse. Among the advantages claimed for the authors' method are its simplicity and the fact that the approximations sometimes required for simplifying the calculations can be made in finite form. The analytic computations for the resonance case are compared on the electronic computer with the solutions of the Maxwell equations and the density matrix, and a good agreement between the two methods is found.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

Acc. Nr. AP0105560 Abstracting Service: CHEMICAL ABST. 6-70 Ref. Code UR0363

127137s Electron paramagnetic resonance in lattice defects in synthetic diamonds. Bratashevskii, Yu. A.; Litvin, Yu. A.; Samsonenko, N. D.; Sobolev, E. V. (Donets. Fiz.-Tekh. Inst., Donetsk, USSR). *Izv. Akad. Nauk SSSR, Neorg. Mater.* 1970, 6(2), 368-9 (Russ). A new type of EPR spectra obtained in nonirradiated synthetic diamonds is discussed. In synthetic diamonds which had been synthesized with various amts. of solvents (Ni, Co, Mn, Fe, Cr) present, at <150°, a spectrum is obsd. consisting of a central narrow isotropic line with one and the same *g*-factor, equal to 2.0324, and of 2 satellites with the very same *g*-factor and a distance between them of 2.7 Oe. The intensity of the spectrum significantly increases for those diamonds, which have probably been grown at a higher rate. A similar spectrum has not been obsd. in nonirradiated natural diamonds. These facts make one assume that this spectrum is caused by lattice defects arising during growth of these crystals. The most probable defect can be interstitial C atoms, the concn. of which can increase with increasing growth rate of the diamonds. The presence of the 2 satellite lines can be assocd. with the hyperfine interaction between electrons with unpaired spins. There is absence of anisotropy in the *g*-factor because the deformation of the surrounding cell by virtue of the Jahn-Teller

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effect is of a dynamic nature; it proceeds at a rate which is significantly higher than the spin relaxation rate, as a result of which a slight averaging of the $g$-factor is obsd. exptl.

S. A. Mersol

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USSR

UDC 54 .47'11:[illegible]

BRATASHEVSKIY, Yu. A., KUZNETSOV, M. F., and [illegible], [illegible], Donst. Physico-Technical Institute of the Academy of Sciences URSSR

"EPR on Optically Excited Vacancies of Zinc in Cubic ZnS Single Crystals"

Moscow, Izvestiya Akademii Nauk SSSR, Neorganicheskiye Materialy, Vol 6, No 6, Jun 70, p 1171

Abstract: The EPR spectrum observed on irradiated samples of single crystals of cubic ZnS with Zn vacancies is analyzed. The samples were [illegible] in S vapor (a) and in Zn vapor (b). The intensity of the EPR spectrum of (b) was considerably lower than that of (a). This indicates an existing correlation between the character of the spectrum and the presence of a Zn vacancy. The experimental data seem to indicate that the Zn vacancy in the EPR spectrum appears as a photoionized donor at the expense of electrons pertaining to tetrahedrons of sulfur.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

USSR

UDC: 621.391.2

RUKHIN, A. L., SAMSONENKO, S. V.

"On a Detection Procedure Which is Invariant Relative to the Intensities of Signal and Interference"

Moscow, Radiotekhnika i Elektronika, Vol 17, No 1, Jan 72, pp 170-172

Abstract: A signal detection procedure is synthesized for Neumann-Pearson optimum detection of a signal with random phase against a background of interference when the signal is invariant relative to the amplitude A and the interference intensity $\sigma$. It is assumed that there are n independent samples $X(x_1; x_2; \ldots; x_j; \ldots; x_n)$. The problem is to verify the hypothesis $H_0$ for which the observed samples $x_j$ have Rayleigh distribution

$$P_0(x) = \frac{x}{\sigma^2} e^{-x^2/2\sigma^2}, \quad x \geqslant 0$$

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USSR

RUKHIN, A. L., SAMSONENKO, S. V., Radiotekhnika i Elektronika, Vol 17, No 1, Jan 72, pp 170-172

for the alternative hypothesis that the samples have generalized Rayleigh distribution ($\mu = A^2/\sigma^2$)

$$P_\mu(x) = \frac{x}{\sigma^2} \exp - \left(\frac{x^2}{2\sigma^2} + \mu\right) I_0\left(\frac{x\sqrt{\mu}}{\sigma}\right), \quad x \geq 0,$$

where the positive values of A and $\sigma$ are unknown. In terms of the parameter $\mu$, the hypothesis $H_0: \mu = 0$, and the alternative $H_1$ $\mu > 0$. If $P_\mu(x)$ $(\mu \geq 0)$ is some density corresponding to one of these hypotheses, then the density of the form $(1/\sigma)P_\mu(x/\sigma)$ also belongs to the same hypothesis for all positive $\sigma$. In view of this invariance of the problem, the analysis is restricted to a class of resolving functions which satisfy the equality

$$\psi(x_1; x_2; \ldots; x_n) = \psi(\sigma x_1; \sigma x_2; \ldots; \sigma x_n).$$

Bibliography of twelve titles.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

USSR

UDC 621.396.9

SAMSONENKO, S. V.

"Direction Finding Accuracy during Multi-Level Quantization of a Signal"

Moscow, Radiotekhnika, Vol 26, No 4, 1971, pp 91-94

Abstract: The author calculates direction finding error (the asymptotic dispersion of direction finding estimates using a method described in his earlier article, Radiotekhnika, Vol 25, No 1, 1970). Direction finding error is studied as a function of the number of quantization thresholds. Original article: three bibliographic entries, one figure, and seven formulas.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

1/2 031 UNCLASSIFIED PROCESSING DATE--13NOV70

TITLE--MEASUREMENT OF THE ANGULAR COORDINATE IN MULTILEVEL SIGNAL QUANTIZATION -U-

AUTHOR--SAMSONENKO, S.V.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, RADIOTEKHNIKA, NO 1, 1970, PP 50-54

DATE PUBLISHED--------70

SUBJECT AREAS--NAVIGATION

TOPIC TAGS--DIRECTION FINDING SIGNAL, INTERFERENCE MONITORING, SIGNAL INTERFERENCE, PROBABILITY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1999/1355 STEP NO--UR/0108/70/000/001/0050/0054

CIRC ACCESSION NO--AP0123313

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APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

2/2 031 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0123313

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A STRUCTURE IS GIVEN FOR PROCESSING SAMPLES IN FINDING THE DIRECTION OF SIGNALS WITH UNKNOWN INTENSITY IN THE PRESENCE OF INTERFERENCE. THIS IS DONE ON THE BASIS OF THE PROBABILITY MAXIMUM METHOD. THE ORIGINAL ARTICLE HAS ONE ILLUSTRATION AND THREE BIBLIOGRAPHIC ENTRIES.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

1/2 029 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--SYNTHESIS AND STUDY OF PHOSPHORUS CONTAINING POLYCARBONATES BASED ON PHOSGENE, DIAN, AND METHYLPHOSPHONIC ACID DICHLORIDE -U-

AUTHOR-(03)-SMIRNOVA, O.V., SAMSONIYA, SH.A., KOLESNIKOV, G.S.

COUNTRY OF INFO--USSR

SOURCE--VYSOKOMOL. SOEDIN., SER. B 1970, 12(5), 384-7

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--CHEMICAL SYNTHESIS, CARBONATE, PHOSPHATE ESTER, PHOSGENE, CHLORINATED ORGANIC COMPOUND, X RAY ANALYSIS, IR SPECTRUM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3006/1230 STEP NO--UR/0460/70/012/005/0384/0387

CIRC ACCESSION NO--AP0134904

UNCLASSIFIED

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

2/2 029 UNCLASSIFIED

CIRC ACCESSION NO--AP0134904 PROCESSING DATE--27NOV70

ABSTRACT/EXTRACT--(U) GP-O- ABSTRACT. THE POLYCONDENSATION OF (P HOC SUB6 H SUB4) SUB2 CME SUB2 (I) MEPOCL SUB2, AND CLCL SUB2 AT THE INTERFACE BETWEEN THE ALK. AND ORG. PHASES GAVE POLYCARBONATES CONTG. OP(:O)MEO UNITS. THE POLYMERS CONTG. THESE UNITS ABSORB MORE O IN VACUUM THAN THE POLYCARBONATES BASED ON COCL SUB2 AND I ONLY. THIS IS DUE TO THE REACTIONS OF O WITH THE H ATOMS OF ME GROUPS. X RAY DIFFRACTOMETRY AND IR SPECTROSCOPY SHOWED THAT THE INTRODUCTION OF P DOES NOT SUBSTANTIALLY ALTER THE CRYSTALLINITY AND THE CRYSTAL TYPE OF THESE POLYCARBONATES. FACILITY: MOSK. KHIM.-TEKHNOL. INST. IM. MENDELEEVA, MOSCOW, USSR.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

1/2 016

UNCLASSIFIED

TITLE--SELECTION OF A SPECIMEN FOR CONTROLLING THE EXTENT OF CONTAMINATION OF FERROCHROMIUM -U-

PROCESSING DATE--20NOV70

AUTHOR-(03)-TOPCHIY, S.F., GAREVSKIKH, I.A., SAMSONOV, A.N.

COUNTRY OF INFO--USSR

SOURCE--ZAVOD. LAB. 1970, 36(3), 302-4

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--FERROCHROMIUM, NONMETALLIC INCLUSION, SILICON, METAL INGOT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3001/0530

STEP NO--UR/0032/70/036/003/0302/0304

CIRC ACCESSION NO--AP0126278

UNCLASSIFIED

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

2/2 016 UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0126278

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. IN FECR CONTG. SMALLER THAN OR EQUAL TO 0.1-0.3PERCENT SI THE LEAST NONMETALLIC IMPURITIES WERE FOUND IN THE CENTER OF THE INGOT, WHILE THE TOP CONTAINED MOST OF THE IMPURITIES AND THE BOTTOM WAS BETWEEN THESE TWO. IN FECR CONTG. 1.5-1.7PERCENT SI THE DISTRIBUTION OF IMPURITIES DID NOT FOLLOW ANY PATTERN. THE CONTENT OF GASEOUS IMPURITIES WAS NOT AFFECTED BY THE LOCATION OF THE SAMPLE. GENERALLY, O CONCD. MOSTLY AT THE TOP OF THE INGOT, WHEREAS N WAS CONFINED MOSTLY TO THE BOTTOM OF THE INGOT. IN MOST OF THE INGOTS THE DISTRIBTUION OF SI IN C FREE FECR WAS UNIFORM; HOWEVER, IN EVERY LARGE INGOTS THERE WAS CONSIDERABLE DIFFERENCE IN THE HORIZONTAL AND VERTICAL DISTRIBUTION OF SI. FACILITY: ZAPOROZH. MASHINOSTR. INST. IM. CHUBARYA, ZAPOROZHE, USSR.

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ELECTRONICS

Amplifiers

USSR UDC: 621.375.4

GORBATOV, A. A., SAMSONOV, A. A., VELIKOV, L. V., RUDASHEVSKIY, YE, G.,
Physics Institute, Academy of Sciences of the USSR, Moscow

"A Low-Noise Transistorized Amplifier"

Moscow, Pribory i Tekhnika Eksperimenta, No 2, Mar/Apr 70, pp 134-135

Abstract: The authors describe a transistorized amplifier with an inherent noise level of about 2 microvolts in the 10 Hz-30 kHz frequency band. The voltage gain for various measurement conditions varies over a range of 100-1000. The power to the amplifier is supplied by galvanic cells or storage batteries. Because of its small overall dimensions, the amplifier can be connected in cable lines and located close to the signal source. A small batch of amplifiers has been in satisfactory operation for about a year. The entire unit is accomodated in a box measuring 40 x 100 x 18 mm.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

Acc. Nr.: AT0046532

Ref. Code: UR0144

USSR

UDC 621.318.562.001.24

PEKKER, IOEL' IOSIFOVICH, Candidate of Technical Sciences, Acting Professor, Head of the Department of Automation and Telemechanics of the Novocherkassk Polytechnical Institute, SAMSONOV, BORIS BORISOVICH, Postgraduate of Novocherkassk Polytechnical Institute

"Calculating Switching Circuits with Parallel-Capacitive Commutation of Thyristors"

Novocherkassk, Izvestiya Vysshikh Uchebnykh Zavedeniy, Elektromekhanika (News of the Institutions of Higher Learning, Electromechanics), No 1, 1970, pp 73-78 (from Izvestiya Vysshikh Uchebnykh Zavedeniy, Elektromekhanika, No 1, 1970, p 114).

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AT0046532

Translation: A class of switching circuits with parallel-capacitive commutation of the thyristors is analyzed under the assumption that a thyristor is an ideal breaker switch. The basic calculational relations are derived for the case of an active-inductive load and considering the specifics of operation of the circuits as single and multiple-link DC power commutators. There is 1 table, 4 illustrations and a 4-entry bibliography.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

USSR

UDC:539.125.5.04

NEVEROV, V.A. and SAMSONOV, B.V.

"Experimental Determination of Irradiation Conditions With Minimum Expenditure of Reactor Time"

Tashkent, Sb. Dozimetriya i Radiats. Protsessy v Dozimetr. Sistemakh (Symposium on Dosimetry and Radiation Processes in Dosimetric Systems), 1972, pp 206-210 (from Referativnyy Zhurnal-Yadernyye Reaktory, 1973, Abstract No 3.50.89)

Translation: On the example of SM-2 and MIR nuclear reactors it is shown that knowing the basic values of energy release by one of the materiels (Ni or Cu) with one state of the reactor system it is possible to calculate and predict with definite accuracy and with minimum expenditure of time the irradiation conditions of other arrangements. 1 table. 5 references.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

Materials UDC 621.039.5

VOTINOV, S. N., LOSEV, N. P., PROKHOROV, V. I., SAMSONOV, B. V., TSYKANOV, V. A., FIN'KO, A. G., Melekess

"Estimate of Long Term Strength of Structural Materials in Reactor"

Kiev, Problemy Prochnosti, No 5, May, 1971, pp 61-64.

Abstract: Results are presented, produced in testing of tubular specimens of a number of structural materials under conditions of bombardment in a nuclear reactor. Two hundred hour tests performed with a flux of $2.5 \cdot 10^{12}$ $cm^{-2} \cdot sec^{-1}$ fast neutrons and $6 \cdot 10^{13}$ $cm^{-2} \cdot sec^{-1}$ thermal neutrons showed that the time to rupture for tubing of steels Types OKh16N15M3B, OKh16N15M3BR and Kh18N10T at 650°C decreases in comparison to the time to rupture without bombardment by not over 3-10 times. The deformation at rupture is approximately 1.5 times less than for specimens not bombarded. No changes in durability or ductility of copper and copper with chromium were observed in the reactor at 700°C.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

USSR

SAMSONOV, D. Ye.

UDC 621.385.64

"On Criteria For Selection Of An Optimum Connection Between A Magnetron And A Load"

Elektron. tekhnika. Nauchno-tekhn. sb. Elektron. SVCh (Electronics Technology. Scientific-Technical Collection. Microwave Electronics.) , 1970, No 5, pp 35-38 (from RZh--Elektronika i yeye primeneniye, No 8, August 1970, Abstract No 8A114)

Translation: On the basis of a theoretical analysis of the output characteristics of microwave generators and of test development of magnetrons, two criteria are formulated for a selection of an optimum connection between a magnetron and a load. The first criterion determines the optimum magnitude of the resistance which is introduced into a magnetron through an output resonator. The second criterion determines the conditions during which there occurs in the burdened magnetron the optimum, i.e., the most balanced, distribution of the high-frequency field in the area of interaction. 3 ref. Summary.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

UDC 621.373.826:772.99

BURYAK, G. V., ZAVITNEVICH, Yu. V., MIROVITSKIY, D. I., NAZAROV, V. L., and SAMSONOV, G. A.

"Some Holographic Investigations of Light Dispersion With Models"

Moscow, V sb. X Vses. konf. po rasprostr. radiovoln. Tezisy dokl. (Tenth All-Union Conference on the Propagation of Radio Waves; Report Theses--collection of works) "Nauka," 1972, pp 323-327 (from RZh--Radiotekhnika, No 10, 1972, Abstract No 10D417)

Translation: A holographic imitator of optical and infrared electronic systems, designed for studying the peculiarities of functional connections and set units, radio lines, and processes and phenomena occurring in radio systems, is described. The imitator contains a laser, a set of holographic or spatial models, a group of shaping and transforming optical elements, holographic imitators of range nonuniformities, and a receiver block. The peculiarities of the range over which the radio waves are propagated are modeled through a set of functional amplitude, phase, or complex filters. Results are given of the determination of dispersion diagrams for various objects for a signal path containing nonuniformities. A method is described which measures the dimensions of the object and the distance to it by forming a three-beam diagram of the radiation in which the direction of two beams are fixed while the third performs angular scanning to sense the contour of the investigated object. Bibliography of four. A. L.

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MIROVITSKIY, D. I., SAMSONOV, G. A., SOBOLEV, G. A., and SHANIN, V. I.,
Moscow Institute of Radiotechnology, Electronics and Automation

UDC 535.854

"A Device for Processing the Optical Signals Scattered from Objects"

USSR Author's Certificate No 366444, Filed 22 Jan 71, Published 16 Jan 73
(from Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 7,
Mar (a) 73, Claim No 1617320/26-9)

Translation: A device for the processing of optical signals scattered from objects, containing a source of coherent radiation, an axial optical canal, consisting of a collimater, a phototransparency, a Dove prism and a lens for direct and reverse Fourrier conversions with an adjustable filter mounted between them and a canal for formation of optical signals scattered from objects in a hologram, in series, distinguished by the fact that in order to increase the rapidity of signal processing in the basic optical canal a translucent mirror a lens, a hologram and a rotating mirror have also been placed in series, optically connecting the output of the collimeter with the adjustable filter, while the hollgram and the adjustable filter are recorded on a registering device, for example a thermoplastic.

1/1

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USSR

MIROVITSKIY, D.I., SAMSONOV, G.A., SHANIN, V.I.

UDC 621.391.2

"Interference-Shadow Marking Of Volume Models"

Radiotekhnika i elektronika, Vol XVII, No 6, June 1972, pp 1280-1285

Abstract: The effectiveness is shown of a new method of marking in the problem of identification of volume models or groups of models in coherent light. The marking signals substantially increase the informativeness of their images, decreasing the probability of reductions by the introduction of additional criteria [priznak], which assure a sharper appearance of the boundaries of the multidimensional regions of the distinguishable specimens. Experimental results are obtained with respect to the identification of volume models during their observation in near and far zones by methods of optical matched filtration. 6 fig. 16 ref. Received by editors, 6 May 1971.

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UDC 620.197/.198

SAMSONOV, G. V., and EPIK, A. P.

"Refractory Coatings"

Moscow, Tugoplavkiye Pokrytiya, Moscow, Izd-vo Metallurgiya, 1973, 400 pp

Translation of Foreword. Development of modern technology involves the necessity of using continuously increasing working temperatures, velocities, high and complex loads, as well as the exploitation of individual units and complete machines and mechanisms under conditions of action by aggressive media. This requires improving existing materials and the development of new ones that are distinguished by increased physico-technical and exploitational characteristics, reliability and technological conditions of production. It is mainly therefore that in the Directives of the Twenty-Fourth Congress of the Communist Party of the USSR for the years 1971-1975 special attention is being paid to the creation and mastering of new especially economical

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SAMSONOV, G. V., et al., Tugoplavkiye Pokrytiya, Moscow, Izd-vo Metallurgiya, 1973, 400 pp

materials, and the development and introduction into production of the latest methods of strengthening metals.

Included in the most promising materials of this type along with refractory metals and their alloys are the refractory metal-like and non-metallic compounds such as carbides, borides, nitrides, silicides, aluminides, beryllides, oxides, and sulfides [1-4]. However their direct utilization for manufacturing parts for machines and mechanisms is often limited by technological difficulties, significant brittleness, and low strength properties under conditions of dynamic loads, as well as a relatively high cost.

Therefore it is much more feasible to use the useful properties of refractory compounds applying them in the form of coatings of sufficiently strong and plastic bases. The creation of such coatings in a number of cases is most effective and sometimes

2/10



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SAMSONOV, G. V., et al., Tugoplavkiye Pokrytiya, Moscow, Izd-vo Metallurgiya, 1973, 400 pp

is the only means of solving complex technical problems [52]. Coatings of refractory compounds are distinguished also by another important feature -- they are economically profitable since their use permits in a number of cases simplifying the technology and also replacing expensive and rare metals with less deficient materials without substantial change in the efficiency of parts, structures, and aggregates. Thus, for example, corrosion-resistant high-temperature chrome and chrome-nickel steels in a number of instances are being replaced successfully by carbon steels with chrome, nickel, zinc, and other coatings deposited by various methods.

The use of different types of wear-resistant and antifriction coatings permits increasing the lifetime and increasing the reliability of operation of unlike parts of machines and instruments. Such methods of producing diffusion protective coatings which increase the hardness and wear-resistance of steel

3/10

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SAMSONOV, G. V., et al., Tugoplavkiye Pokrytiya, Moscow, Izd-vo Metallurgiya, 1973, 400 pp

parts such as cementation, nitriding, nitrocementation, and chrome-plating have become traditional in modern machine construction.

Without protective scale-resistant coatings it is impossible to create and use refractory materials on a base of refractory metals of the large set of four (niobium, tantalum, molybdenum, and tungsten) in oxidizing media.

At the present time in the domestic and foreign press hundreds of works appear every year devoted to different types of protective coatings and methods of depositing them. These works are often published in rare and difficult-to-obtain sources, they are scattered and not systematized which to a significant degree makes their use by investigators and industrial workers involved with the development and use of coatings more difficult. In recent years several monographs have appeared which to a

4/10



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USSR

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known degree generalize the accumulated experience in the area of creating and using different types of coatings. Among them it follows especially to mention monographs [6-11]. Furthermore a number of collections [12-23] have been published in the Nauka and Naukova Dumka Publishing Houses which contain the works of scientific conferences and seminars on different questions of the theory and technology of producing coatings as well as their use in practice.

However all these publications have appeared unfortunately in small editions and have already become a bibliographic rarity.

In this work the authors pursued the goal of systematizing and generalizing the data available in the literature as well as their own experience in the field of creating and investigating the properties of coatings on the base of refractory compounds and metals. Here by the term "refractory" they mean metals, alloys, compounds, and composition materials with a melting point

5/10

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as a rule no lower than 1500° C. Exceptions are the boride coatings on alloys of iron, a number of intermetallides, and composition coatings in which the melting points are below 1500° C, but they are finding broad practical use as a consequence of other valuable technological properties (hardness, wear resistance, and corrosion resistance).

The work contains no description of several methods of production and types of coatings which have been described in sufficient detail in the respective monographs [6-9]. Special attention in the book is paid to the following three methods of producing coatings -- diffusion saturation, sputtering, and deposition from the gas and vapor phase as the most widely used and promising methods in practice. Simultaneously they examine several other developing methods including combined ones, that is, representing a set of two or more simple methods.

6/10



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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

USSR

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In describing the properties of refractory compounds and metals attention is paid mainly to those properties which may have value when working with these materials as coatings.

The book includes only those technological variations of depositing coatings and their properties which are most interesting from the scientific viewpoint and important in the practical sense.

More space is devoted to coatings produced by the method of diffusion saturation in comparison to coatings that are sputtered and deposited from the gas and vapor phases, as well as those that are deposited by other methods.

The authors will accept with appreciation all comments pertaining to the content of the book and the form of the discussion.

7/10

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

USSR

SAMSONOV, G. V., et al., Tugoplavkiye Pokrytiya, Moscow, Izd-vo Metallurgiya, 1973, 400 pp

CONTENTS

Foreword..... Page 3
Introduction..... 6
Chapter One. Properties of Refractory Metals and Compounds..... 13
1. General Comparative Characteristics of the Properties of Refractory Metals and Compounds..... 13
2. Physico-Chemical and Mechanical Properties of Refractory Metals and Compounds..... 23
Chapter Two. Methods and Technology of Depositing Coatings 67
1. General Data..... 67
2. Preparation of the Surface..... 70
3. Diffusion Coatings..... 73
4. Coatings Produced by Methods of Sputtering..... 111

8/10



APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

USSR

SAMSONOV, G. C., et al., Tugoplavkiye Pokrytiya, Moscow, Izd-vo Metallurgiya, 1973, 400 pp


Page

Gas-Flame Coatings..... 112
Plasma Coatings..... 118
Detonation Coatings..... 126
5. Coatings Deposited From the Gas and Vapor Phase... 131
Chapter Three. Diffusion Coatings..... 132
1. Metal-Like Diffusion Coatings..... 132
Carbide Coatings..... 132
Nitride Coatings..... 152
Boride Coatings..... 180
Silicide Coatings..... 215
2. Intermetallide Coatings..... 255
Beryllide Coatings..... 255
Aluminide Coatings..... 260
3. Complex Diffusion Coatings..... 283
Coatings on Nickel Alloys..... 283
Coatings on Refractory Metals and Alloys..... 292


9/10

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

USSR

SAMSONOV, G. V., et al., Tugoplavkiye Pokrytiya, Moscow Izd-vo Metallurgiya, 1973, 400 pp

Page

Chapter Four. Coatings Produced by the Method of Sputtering..... 329
1. Plasma Coatings..... 329
2. Detonation Coatings..... 354
Chapter Five. Coatings Deposited From the Gas Phase..... 357
1. General Data..... 357
2. Coatings From Refractory Metals..... 361
3. Coatings From Refractory Compounds..... 362
Chapter Six. Other Methods of Depositing Refractory Coatings..... 371
1. Electrophoretic Method..... 371
2. Method of Producing Combined Electrolytic Coatings 379

10/10



APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

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SAMSONOV, G. V., Teplofizicheskiye Svoystva Tverdykh Veshchestv, Izd-vo Nauka, 1973, 161 pp

These trends have found reflection in the content and directions of reports presented at the Fourth All-Union Thermophysical Conference on the Properties of Materials at High Temperatures. These reports served as the basis of the articles presented in the present collection.

Along with the articles devoted to discussing the results of measurements on thermal conductivity, thermal diffusivity, thermal expansion, as well as a procedure for measuring these characteristics and high temperatures, the collection contains articles on the thermodynamic and electrophysical properties and the theoretical study of the mechanism of heat transport in crystals.

In the materials of the collection considerable attention has been paid to the thermophysical investigations of dielectrics, complex oxide and other natural and synthetic composite materials including those reinforced with fibers, grain-oriented forms of graphite, materials of microelectronics, and other specific high-temperature materials used in real structures.

2/10



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USSR

SAMSONOV, G. V., Teplofizicheskiye Svoystva Tverdykh Veshchestv, Izd-vo Nauka, 1973, 161 pp

The materials in this collection reflect the growing methodical and scientific level of research on thermophysical properties, and a close examination of the interpretation of results obtained, in which not only molecular and atomic mechanisms and concepts are employed but subatomic ones as well. This indicates the undoubted beginning of a qualitative jump in understanding the nature of the thermophysical properties of solids at high temperatures.

CONTENTS

Foreword..... Page 5
Thermophysical Properties of Solids (Samsonov, G. V.)..... 6
THERMAL PROPERTIES
Investigation of Thermal Expansion of Monocrystalline Aluminum Oxide (Corundum) (Petukhov, V. A., Chekhovskoy, V. Ya., and Puchkova, G.A.) 12
Experimental Determination of the Dimensional Dependence of Surface Tension of Crystals (D'yachenko, A. M.)..... 14

3/0

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

USSR

SAMSONOV, G. V., Teplofizicheskiye Svoystva Tverdykh Veshchestv, Izd-vo Nauka, 1973, 161 pp

Page

Interference Dilatometer for the Temperature Range of 300-1400° K and the Results of an Investigation on Several Materials in a Wide Temperature Range (Amatuni, A. N., Malyutina, T. I., and Shevchenko, Ye.B. 19

Special Optical Pyrometers for Precise Measurement of the High Temperature of Materials in the Condensed Phase During Thermophysical Investigations (Kisel', A. N., Matveyeva, V. P., and Finkel'shteyn, V. Ye.)..... 26

Determination of the Thermophysical Characteristics of Solids by Electromodeling of the Solutions to Inverse Problems of Nonstationary Thermal Conductivity (Kozdoba, L. A. and Krivoshey, F. A.)..... 28

Generalization and Justification of Several Methods of Determining Thermophysical Characteristics (Shashkov, A. G., Kozlov, V. P., and Volokhov, G. M..... 31

4/10



APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

USSR

SAMSONOV, G. V., Teplofizicheskiye Svoystva Tverdykh Veshchestv, Izd-vo Nauka, 1973, 161 pp

Page

Behavior of Lattice Thermal Conductivity in the Region of Phase Transitions
(Vishnevskiy, I. I. and Skripak, V. N.)..... 44

Vacancy Mechanism of Heat Transport in Crystals
(Zinov'yev, V. Ye. and Masharov, S. I.)..... 49

Results of Investigations on the Thermal Properties of Refractory Metals
(Filippov, L. P., Trukhanova, L. N., Makarenko, I. N. and Artyunov, A. V.)..... 51

Method of Determining the Thermophysical Properties of Unbaked Refractory Products in the Process of Their Heat Treatment
(Semenenko, A. I., Tayts, N. Yu., and Radchenko, I. I... 56

5/10

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

USSR

SAMSONOV, G. V., Teplofizicheskiye Svoystva Tverdykh Veshchestv, Izd-vo Nauka, 1973, 161 pp

Page

Temperature Dependence of Thermal Conductivity, Electrical Conductivity, and Mechanical Strength of Iron-Graphite Materials Alloyed With Nickel (Pozdnyak, N. Z.) ..... 63

Determination of the Thermophysical Properties of Steels and Other Materials (Tayts, N. Yu.) ..... 67

Several Thermophysical Properties of Pyrographite (Petrov, V. A., Petrova, I. I., and Chekhovskoy, V. Ya.) 74

Thermal Capacitance and Thermal Conductivity of an Electro-contact Metal Ceramic as a Function of Temperature (Serykh, G. M., Yelema, V. A., Demidchenko, V. I., Vinskovskiy, V. P., and Ivanov, V. A.) ..... 80

Investigation of the Thermophysical Properties of Dielectrics at High Temperatures (Yurchak, R. P., Tkach, G. F., Petrunin, G. I., and Makhmud Mebet) ..... 83

6/10



APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

USSR

S AMSONOV, G. V., Teplofizicheskiye Svoystva Tverdykh Veshchestv, Izd-vo Nauka, 1973, 161 pp

Page

Thermal Conductivity of Several Materials Used as Substrates of Resistors and Film Microcircuits (Yegorov, B. N. and Kondratenkov, V. I.)..... 87

Combined Investigation of the Thermophysical Properties of Fibrous Heat Insulators (Yegorov, B. N. and Kilesso, V. S.)..... 90

Investigation of the Structure and Electrical Conductivity of the Ternary System $ZrO_2$-$CeO_2$-CoO at High Temperatures (Dontsov, G. V.)..... 92

Investigations of the Characteristics of Energy Transport in Semitransparent Materials (Bezrukova, Ye. N., Men', A. A., Sergeyev, O. A., and Settarova, Z. S.)..... 97

7/10

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

USSR

SAMSONOV, G. V., Teplofizicheskiye Svoystva Tverdykh Veshchestv, Izd-vo Nauka, 1973, 161 pp

Investigation of the Coefficient of Thermal Conductivity of Natural and Artificial Mica
(Yegorov, B. N., Kindratenkov, V. I., and Anikin, I. N.)..... 101
Investigations of the Thermal Conductivity of Several Metal-Impregnated Reinforced Composites Based on Synthetic Resins
(Klimenko, V. S. and Karpinos, D. M.)..... 105
Investigation of the Thermophysical Characteristics of Several Antifriction Composite Materials
(Klimenko, V. S., Karpinos, D. M., and Pugina, L. I.)..... 110

THERMAL EMISSION

Measuring the Integral Degree of Blackness by the Method of Reflection
(Schcherbina, D. M.)..... 117

8/10



APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

USSR

SAMSONOV, G. V., Teplofizicheskiye Svoystva Tverdykh Veshchestv, Izd-vo Nauka, 1973, 161 pp

Page

Experimental Investigation of the Integral Normal Radiation Capacity of Partially Transparent Materials (Petrov, V. A. and Reznik, V. Yu.)..... 120

THERMODYNAMIC PROPERTIES

Investigations of Temperature of Equilibrium Between the Solid and Liquid Phases of Aluminum Oxide (Kenisarin, M. M. and Chekhovskoy, V. Ya.)..... 126

Experimental Investigation of the Enthalpy of Molybdenum in the Solid and Liquid States (Chekhovskoy, V. Ya. and Berezin, B. Ya.)..... 128

Combined Investigation of the Thermophysical Properties of Refractory Materials (Bolgar, A. S., Gordiyenko, S. P., Guseva, Ye. A., Turchanin, A. G., Fenochka, B. V., and Fesenko, V.V.) 135



APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

USSR

SAMSONOV, G. V., Teplofizheskiye Svoystva Tverdykh Veshchestv, Izd-vo Nauka, 1973, 161 pp

The Character of Evaporation of Carbides of Transition Metals (Bolgar, A. S.) ..... Page 142

Thermodynamic Functions of Nonstoichiometric Vanadium Monocarbides at High Temperatures (Turchanin, A. S., Guseva, Ye. A., Morozov, V. V., Ordan'yan, S. S., Bolgar, A. S., and Fesenko, V.V.) .. 147

Evaporation of Monsulfides of Rare-Earth Metals (Gordiyenko, S. P. and Fenochka, B. V.) ..... 151

10/10



APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

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SAMSONOV, G. V., KAZAKOV, V. K., GORODETSKIY, S. S., and KISLYY, P. S., Institute of Problems of Material Sciences, Academy of Sciences UkrSSR

"Mechanical Properties of Nitride-Oxide Materials in the System $Al_2O_3$-$Si_3N_4$"

Kiev, Poroshkovaya Metallurgiya, No 2, Feb 74, pp 60-63

Abstract: The dependence of mechanical properties of materials in the system $Al_2O_3$-$Si_3N_4$ on composition, sintering temperature and test temperature was studied. The nitride-oxide materials were produced by pressing with subsequent sintering in a medium of nitrogen. Silicon dioxide, apparently present in the form of a fine film on the surface of the silicon nitride particles plays a significant role in sintering and, interacting with the aluminum oxide, forms mullite, which activates the sintering process. The addition of titanium dioxide to the aluminum oxide also activates sintering. The strength characteristics of substances in the system were studied at 20 and 1000° C. The strength of the materials decreases with increasing $Al_2O_3$ content. The optimal sintering temperatures are determined for the production of materials with maximum strength.

1/1



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USSR

SAMSONOV, G. V., Resp. Editor, Corresponding Member, Academy of Sciences USSR

Zashchitnyye pokrytiya na metallakh (Protective Metal Coatings,), Kiev, "Naukova Dumka," 1973, 215 pp

Translation of Annotation: The collection contains articles on theoretical and practical problems of surface alloying and creating protective coatings primarily on metals and alloys. It is intended for broad readership by materials science specialists working on the development of modern materials for various branches of technology, as well as for engineers and technicians in machine building, metallurgy, chemistry, and other branches of industry.

Table of Contents:

PAGE

General and Theoretical Questions of Diffusion Impregnation and Coating Formation

SAMSONOV, G. V., "The Situation and Prospects for Creating Platings on Metals and Alloys from Refractory Phases" 6

LYAKHOVICH, L. S., VOROSHNIN, L. G., MARTYNYUK, M. A., BORISENOK, G. V., and DEVOYNO, N. G., "Optimization of Diffusion Plating Processes" 15

SAMSONOV, G. V., and ZHUNKOVSKIY, G. L., "Several Principles in the Initial Stages of Reaction Diffusion" 21



APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

USSR

SAMSONOV, G. V., Zashchitnyye pokrytiya na metallakh, Kiev, "Naukova Dumka," 1973, 215 pp

GRUZIN, P. L., and ZEMSKIY, S. V., "Diffusion Processes for Several Metal Platings for Metals" 33

KRISHTAL, M. A., MOKROV, A. P., and ZAKHAROV, P. N., "Diffusion Processes in Non-Contact Vacuum Metallurgy" 41

SHCHERBEDINSKIY, G. V., TRUBCHIKOV, V. V., ISAKOV, M. G., "A Method for Determining the Coefficients of Diffusion and Mass Transfer in Ternary Alloys of the Type Fe-Me-C" 49

SHCHERBEDINSKIY, G. V., ISAKOV, M. G., and TRUBCHIKOV, V. V., Simultaneous Impregnation or Combustion of Two Elements in Alloys of Three Components of Outlet Velocity of Mass Transfer on the Surface" 57

KIVA, I. S., and KAYDASH, N. G., "On the Question of the Electron-Phonon Mechanism of Diffusion in Solid Matter" 63

GONCHAROVA, V. V., and LYAPICHEV, I. G., "Features of Thermochemical Processing of Magnetic Hardened Alloys" 67

KOLOMOYETS, G. G., OGNEV, R. K., PEREVYAZKO, A. I., and VORONKIN, V. YE., "Kinetics of Titanium Oxidation Under Boiling Layer Conditions" 70

Borating, Carbidization and Siliconizing

2/9



APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

USSR

SAMSONOV, G. V., Zashchitnyye pokrytiya na metallakh, Kiev, Naukova Dumka," 1973, 215 pp

SOSNOVSKIY, I. A., EPIK, A. P., and TVERDOKHLEB, V. S., "Investigation of Borating Processes for Molybdenum and Niobium" 73

LOSKUTOV, V. F., PERMYAKOV, V. G., PISARENKO, V. N., TRUSH, I. KH., YAKOVCHUK, YU. YE., and AMIRKHANOVA, T. V., "Borating of Steels and Irons in a Technical Borate Carbide" 77

LYAKHOVICH, L. S., KOSYACHEVSKIY, L. N., KULIK, A. YA., SURKOV, V. V., TUROV, YU. V., "On Calculating the Texture for Diffusion Coatings in Selecting the Temperature for Borating" 80

OGNEV, R. K., VORONKIN, V. YE., PEREVYAZKO, A. I., and KOLOMOYETS, G. G., "Investigation of a Carbidization Process of Titanium in a Boiling Stratum" 83

AFONSKIY, I. F., NIKITIN, A. A., and MAKAREVICH, I. K., "On the Diffusion Problem of Nitrogen, Hydrogen and Oxygen in Carbonization" 85

KAPLINA, G. S., SOSNOVSKIY, L. A., SHARIVKER, S. YU., and EPIK, A. P., "Conditions for Achieving Non-Porous Coatings in Powder Siliconizing" 87

BYALOBZHESKIY, A. B., KRASILOV, B. I., and TSIRLIN, M. S., "Modified Diffusion Siliciding for Protecting Molybdenum from Oxidation" 90

3/9

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

USSR

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PEREVERZEV, V. M., and KOROTKOV, V. D., "On the Role of Oxygen in Processes of Gas Siliconizing of Steel"

Nitriding and Aluminizing 93

PERMYAKOV, V. G., BELOTSKIY, A. V., and BARABASH, R. I., "Investigation of the Formation of a Solid Solution of Nitrogen in Ferrite Alloy" 95

DUBININ, G. N., KARPMAN, M. G., GOLOVKINA, N. A., STAROKOZHEV, B. S., and KAL'NER, V. D., "The Structure and Properties of the Alloy VKh4 After Alloying" 97

KIDIN, I. N., ANDRYUSHECHKIN, V. I., and OPALEV, S. B., "Titanium Alloying During Rapid Electroheating" 100

KIDIN, I. N., ANDRYUSHECHKIN, V. I., and LEVTONOVA, N. M., "Features of Alloy Layer Formation on Steel During Electroheating" 104

POKHMURSKIY, V. I., ZAMIKHOVSKIY, V. S., BRODYAK, D. D., and POTAPOV, V. V., "Increasing the Cyclic Strength of Austenite Stainless Steel with the Help of Alloying"

Titanium and Chrome Plating 107

4/9



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USSR

SAMSONOV, G. V., Zashchitnyye pokrytiya na metallakh, Kiev, Naukova Dumka," 1973, 215 pp

ZEMSKOV, G. V., KOGAN, R. L., KOSS, YE. V., KHMELEVSKAYA, M. YE., MILYUKHINA, L. V., and VIDERMAN, V. S., "Diffusion Titanium Plating of Carbon Steels" 110

YAKHNINA, V. D., VETCHANINA, L. I., "Titanium-Tungsten Plating of High Chrome Steel" 113

SHAPOVALOV, V. P., GORBUNOVA, N. S., "Diffusion Titanium Plating of Steel" 116

MUDROVA, A. G., GORBUNOV, N. S., and MARININ, A. A., "Investigation of a Diffusion Titanium Plating Process for Brass" 119

SHAPOVALOV, V. P., and GORBUNOV, N. S., "The Structure of Diffusion Titanium Platings" 121

PONOMARENKO, YE. P., DOMIO, A. A., KUZNETSOV, A. A., "Technological Features of Chrome Plating and Subsequent Rolling of Steel Products" 122

MAKAROVA, V. I., DUBININ, G. N., SKIBINA, G. V., and SAPEROV, V. P., "Gas Separation in Steels Which Have Undergone Diffusion Chrome Plating" 127



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Multi-Component Diffusion Platings

VENEVTSEV, YU. M., PASECHNIK, S. YA., KOROTKOV, V. D., and RYAZHKIKH, K. B., "Electrolytic Boron Alloying of Steel" 135

KIDIN, I. N., ANDRYUSHECHKIN, V. I., GORBUNOV, I. P., and VASILEVICH, I. S., "Aluminum-Silicide Steels in Electrical Heating" 137

VAVILOVSKAYA, N. G., STARODUBTSEVA, L. A., "Alumo- and Ferrosilicide Treatment of Copper" 140

KUDROVA, A. G., and GORBUNOV, N. S., "Investigation of a Diffusion Flooding Method on Steel for Titanium, Nickel and Tungsten" 142

POKHMURSKIY, V. I., MOKROVA, A. M., and DALISOV, V. B., "Determination of Elements in Diffusion Layers During Chrome Silicide Treatment" 144

KRIULIN, A. V., and LIKHACHEVA, N. A., "The Structure of a Diffusion Layer Formed on Carbon Steel When Bathed in Sulfacyanide Treatment Based on Sodium Cyanate" 146

6/9



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ABACHARAEV, M. M., "The Economic Effectiveness of Replacing Galvanized Chrome Plating of Cylinder Walls in High-Speed Diesels with Diffusion Chrome-Manganese Plating" 149

Properties of Protective Castings

ARKHAROV, V. I., IGNATENKO, P. I., KUSHNIR, M. P., "The Effect of a Sulphide Regime on the Texture of Chrome Electroplating" 152

ARKHAROV, V. I., and IGNATENKO, P. I., "Investigation of the Effect of a Sulphide Regime on the Phase State and the Properties of Chrome Electroplatings" 154

SEMENOV, A. P., POZDNYAKOV, V. V., and KRAPOSHINA, L. B., "Properties of Surface Coatings Acquired by Eutectic Alloying Methods" 159

SHARIVKER, S. YU., ASTAKHOV, YE. A., and CARDA, A. P., "The Durability of Couplings Based on Platings Made by Plasma and Detonation Methods" 162

SUROVTSEV, A. P., SHCHERVEDINSKIY, G. V., and GOLOVANENKO, S. A., "Investigation of Redistributing Carbon in Plated Steels" 165

GENEL', V. A., GORBUNOV, N. S., and GORYACHEV, P. T., "The Process of Corroding Steel With Diffusion Chrome Plating in a Medium of Solid Chemical Reagents" 172

7/9

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0"

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USSR

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PROSKURKIN, YE. V., ZHOLUDEV, M. D., GORBUNOV, N. S., and PLESKACHEVSKIY, M. A., "Corrosion Resistance of Zinc Plates in Hot Flowing Water Pipes" 177

GENEL', V. A., SAVITSKIY, A. V., GORYACHEV, P. T., and GORBUNOV, N. S., "Corrosion Resistance of Diffusion Chrome Platings on Steel in a Medium of Solid Salts of Inorganic Chemicals" 180

GORYACHEV, P. T., GORBUNOV, N. S., and GENEL', V. A., "Durability of Diffusion Platings Acquired from Copper Oxides" 184

GOLEGO, N. L., GOLEGO, N. N., and LABUNETS, V. F., "A New Method for Producing Composite Boride Structures and Investigating Their Durability" 187

BORSYAKOV, A. S., KOROTKOV, V. D., and PASECHNIK, S. YA., "The Effect of Diffusion Platings on Internal Friction of Nickel" 191

YEVTUSHOK, T. M., and ZHUNKOVSKIY, G. L., "Interaction of Boride Platings With Carbon on Molybdenum and Tungsten" 192

SHARIVKER, S. YU., ASTAKHOV, YE. A., KRASNOV, A. A., and GARDA, A. P., "Interaction of Powders with the Surrounding Medium During High-Temperature Spraying" 196

8/9



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USSR

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CHERNYSHEV, O. G., BYKOV, A. A., ZAYTSEV, V. V., CUB, V. M., and ZEMSKIY, S. V., "The Structure and Properties of a Plated Material" 203

9/9

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MHD

(9)

JPRS 61609

29 March 1974

RESEARCH ON MATERIALS FOR THE MANUFACTURE OF OPEN-CYCLE MHD GENERATOR ELECTRODES

[Article by G. V. Samsonov, V. M. Sleptsov, G. G. Gnesin, V. S. Fomenko, I. A. Podchernyayeva, Yu. K. Lapshov (Institute of Problems of Hylology, Academy of Sciences UkrSSR), G. M. Shegolev, Yu. P. Kukota (Institute of Industrial Thermophysics, Academy of Sciences UkrSSR), E. P. Strashinin (Institute of Electrodynamics, Academy of Sciences UkrSSR); Kiev, Issledovaniye Materialov dlya MGDG Otkrytogo Tsikla, Russian, 1971, pp 393-409]

Annotation

Presented in this paper are the results of testing of gas-permeable blown electrodes under model MHD conditions. The tests revealed that the erosion resistance of protected materials is increased by a factor of 80 to 100 while the current density is 2-3 A/cm² (in the distributed discharge mode) and up to 20 A/cm² in the arc mode.

The interaction between air plasma containing compounds of alkali metals as additive, and the surface of electrodes, protected by blowing and without protection, was investigated. The results of tests of electrodes made of nonporous polycrystalline silicon carbide, produced by the reaction sintering method, are presented in this work. The physical properties which govern the operational performance of the electrodes are analyzed. It is established that long-term operation of the electrodes does not result in change of the phase composition and properties of polycrystalline silicon carbide. Erosion and chemical destruction occurs only on the surface of electrodes.

The composition of the film formed on the surface of a silicon carbide electrode during operation in contact with plasma containing potassium additive is analyzed. It is shown that the continuously forming silicate film substantially increases the emissivity of silicon carbide.

The electrode of an MHD generator should satisfy two main requirements: a) resistance to the aggressive action of the plasma jet for a long



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Samsonov, G.V.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

USSR

UDC 661.183

PASECHNIK, V. A., MOSKVICHEV, B. V., and SAMSONOV, G. V.

"Selectivity of the Ion Exchange Processes in Case of Partial Inaccessibility of the Sorption Centers"

Leningrad, Zhurnal Prikladnoy Khimii, Vol 46, No 8, Aug 73, pp 1758-1763

Abstract: Many important ion exchange processes occur under conditions in which some of the sorption centers are inaccessible, so that the sorption exhibits strong non-ideal characteristics. The authors propose a method for calculating thermodynamic functions of similar processes of ion exchange: standard enthalpy and entropy as well as the coefficients of the activity of the components. A theoretical mathematical treatment of the formulae is given with implicit consideration of the effect of inaccessible centers on selectivity.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

USSR

UDC 66.067.38:62-278

SAMSONOV, G. V., ROZHANSKAYA, T. I., MOSKVICHEV, B. V., MARGOLINA, N. A., SELEKHOVA, G. B., KOZHEVNIKOVA, P. YE.

"Study of the Permeability of Ultrafiltration Diaphragms"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 11, 1973, pp 2589-2592

Abstract: The results are presented from a study of the physical-chemical properties of Soviet anisotropic diaphragms based on cellulose acetate: the permeability and filtration rates as functions of the concentration and pressure gradients and the composition of the solution. The degree of trapping of the material by a given diaphragm depends primarily on the molecular weight of the material. The filtration rate depends on the type of diaphragm, the magnitude of the pressure gradient, the concentration and composition of the filtered solution. The dimensions of the ultrafilter pores are estimated. Integral pore distribution curves with respect to dimensions in the active layer of the membrane are plotted and interpreted. The active layer of the tested diaphragm is characterized predominantly by pores corresponding with respect to permeability to materials with a macromolecule diameter of 20-40 Å. The performed studies make it possible efficiently to select ultrafilters suitable for the concentration of biological preparations of defined molecular weight.

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USSR

BOZHKO, S. A., et al, Poroshkovaya Metallurgiya, No 2 (86), Feb 70, pp 46-52

The nature of this dependence is analogous to that found for the activation energy of collective recrystallization of titanium carbide, but quantitatively the recrystallization activation energy is lower by a factor of 2.5. This is probably due to thermodynamic instability determined by excess energy at grain boundaries, even at room temperature. It is assumed that collective recrystallization is the result of an atomic mechanism of grain boundary migration in titanium carbide caused by local melting at grain boundaries. Nonlocalized electrons which account for energy exchange between atoms apparently play an important part in the process of grain boundary migration.

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USSR

BOZHKO, S. A., and SAMSONOV, G. V., Institute of Problems of Material Science, Academy of Sciences UkrSSR

"On the Mechanism of Collective Recrystallization in Titanium Carbide"

Kiev, Poroshkovaya Metallurgiya, No 2 (86), Feb 70, pp 46-52

Abstract: Hot-pressed sintered titanium carbide specimens with various carbon concentrations and porosities of 2-8% were used for studying collective recrystallization. It was found that collective recrystallization begins after surface hardening at 1500-1600°C. The increase in grain size for defective carbides starts at lower temperatures and is more intensive than for carbides approaching the stoichiometric composition. The motive force for collective recrystallization is excess grain-boundary energy. It was found that the activation energy for the recrystallization process is appreciably dependent on the degree of development of this process, the heating rate, and the degree of plastic deformation. These various factors are characterized by the limiting activation energy, which is related to the electronic structure of the material. It was found that the limiting activation energy for titanium carbide in the homogeneity region at high temperatures increases as the stoichiometric composition is approached.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

1/2 025 UNCLASSIFIED PROCESSING DATE--11SEP70

TITLE--THEORY AND TECHNOLOGY OF PRODUCING THE MATERIALS OF ELECTRODE TOOLS FOR ELECTROEROSION MACHINING. 4. STRUCTURAL AND PHASE COMPONENTS OF

AUTHOR--SAMSONOV, G.V., MUKHA, I.M., GLOBA, L.V.

COUNTRY OF INFO--USSR

S

SOURCE--POROSH. MET. 1970, 10(1), 71-5

DATE PUBLISHED--------70

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

TOPIC TAGS--ELECTRON MICROSCOPY, ELECTROEROSION MACHINE TOOL, TOOL STEEL, CRYSTAL STRUCTURE, TUNGSTEN CARBIDE, COBALT, COPPER/(U)VK ALLOY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1989/0588 STEP NO--UR/0226/70/010/001/0071/0075

CIRC ACCESSION NO--AP0107185

UNCLASSIFIED

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2/2 025 UNCLASSIFIED PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0107185

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE STRUCTURES OF THE COMPNS. WERE STUDIED, FOR THE BASES OF WHICH SERVED THE WASTES OF THE VK TYPE SOLID ALLOYS CONTG. CU, NI, AND BN ADDNS. AN ELECTRON MICROSCOPE AT MAGNIFICATIONS OF 100-1150X WAS USED FOR THIS STUDY. MICROSECTIONS WERE EXAMD. BOTH BEFORE AND AFTER ETCHING. THE NO. OF CU INCLUSIONS IN WC,CO,CU COMPNS. AND THEIR SIZES INCREASE WITH THEIR INCREASING CONTENT IN THE ALLOYS. THE HIGH EROSION STABILITY OF WC,CO,CU,BN COMPNS. CAN BE EXPLAINED BY THE FORMATION OF A PECULIAR HONEYCOMBED STRUCTURE, IN WHICH THE LOW MELTING CU AND CO ARE ENCLOSED IN THE REFRACTORY BN CELLS. THE HIGH EROSION STABILITY OF THE MATERIAL MADE OF CU WITH ADDN. OF 2-3 WT. PERCENT BN IS GENERALLY ASSOCD. ALSO WITH THE EXTINGUISHING OF THE ARC BY THE VAPORS OF THE EASILY DISSOCD. BN. IT IS OBVIOUS THAT THIS TAKES PLACE ALSO WHEN SUCH MATERIAL IS EMPLOYED FOR ELECTRODE TOOLS.

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1/2 018 UNCLASSIFIED PROCESSING DATE--18SEP70

TITLE--IONIC COMPONENT OF THE CATHODIC SPUTTERING OF A COPPER SINGLE CRYSTAL -U-

AUTHOR-(05)-BUKHANOV, V.M., YURASOVA, V.YE., SYSOYEV, A.A., SAMSONOV, G.V., NIKOLAYEV, B.I.

COUNTRY OF INFO--USSR

SOURCE--FIZ. TVERD. TELA 1970, 12(2), 394-7

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS, PHYSICS

TOPIC TAGS--COPPER CRYSTAL, NEON, ION, CATHODE SPUTTERING, METAL SINGLE CRYSTAL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1984/0144 STEP NO--UR/0181/70/012/002/0394/0397

CIRC ACCESSION NO--AP0054940

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2/2 018 UNCLASSIFIED PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0054940

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. INVESTIGATION IS DESCRIBED OF THE ANGULAR AND ENERGY DISTRIBUTIONS OF SECONDARY POS. IONS, KNOCKED OUT FROM THE (100) FACE OF CU BY NE IONS WITH ENERGIES OF 5 AND 20 KEV.

89

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

1/2 025 UNCLASSIFIED PROCESSING DATE--18SEP70

TITLE--MECHANISM OF THE COARSENING RECRYSTALLIZATION IN TITANIUM CARBIDE -U-

AUTHOR-(02)-BOZHKO, S.A., SAMSONOV, G.V.

COUNTRY OF INFO--USSR

SOURCE--POROSHKOVAIA METALLURGIIA, VOL. 10, FEB. 1970, P 46-52

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--CHEMICAL REACTION MECHANISM, CRYSTALLIZATION, ACTIVATION ENERGY, TITANIUM CARBIDE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1989/0591 STEP NO--UR/0226/70/010/000/0046/0052

CIRC ACCESSION NO--AP0107188

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2/2 025 UNCLASSIFIED PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0107188

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. STUDY OF THE COARSENING RECRYSTALLIZATION IN A COMPACTED POWDER OF TITANIUM CARBIDE WITHIN THE HOMOGENEOUS REGION. THE RELATION BETWEEN THE INITIAL ACTIVATION ENERGY AND THE COMPOSITON OF TIC IS DETERMINED. THE RESULTS OBTAINED ARE DISCUSSED TAKING INTO CONSIDERATION THE ROLE OF NONLOCALIZED ELECTRONS IN THE ENERGY EXCHANGE BETWEEN ATOMS DURING MIGRATION OF GRAIN BOUNDARIES.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0



USSR

UDC 669.162.212

SAMSONOV, G. V., YEROSHENKO, A. I., OSTROVERKHOV, V. I., KRAT, V. A., and DUBOVIK, T. V., Institute of Problems of Material Science, Academy of Sciences Ukr SSR and Brovary Powder Metallurgy Plant

Kiev, Poroshkovaya Metallurgiya, No 12, Dec 72, pp 46-48

Abstract: The technology for production of large-scale parts from boron carbonitride with a diameter of 100-300 mm has been developed jointly by the Department of Refractory Materials at the Institute of Problems of Material Science and the Brovary Powder Metallurgy Plant. The following maximum and minimum values of the different properties are presented:

| | |
|---|---|
| Electrical resistance, ohm-cm at 20°C | $10^{13}$ |
| at 2000°C | $2x10^4$ |
| Coefficient of thermal conductivity, v/m, at 300°C | 27.0 |
| at 2000°C | 9.8 |
| Coefficient of thermal expansion, $deg^{-1}$, at 20-300°C | $0.77x10^{-6}$ |
| at 1000-2000°C | $4.5x10^{-6}$ |
| Dielectric permeability at $\lambda$ = 4.6 cm, at 20°C | 1.9-2.1 |
| Tangent angle of dielectric loss at $\lambda$ = 4.6 cm, at 20°C | 0.017-0.14 |



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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

USSR

SAMSONOV, G. V., et al., Poroshkovaya Metallurgiya, No 12, Dec 72, pp 46-48

| | |
|---|---|
| Vaporization rate, $g/cm^2$-sec at 1515°C | $6.78 \times 10^{-9}$ |
| at 1927°C | $4.43 \times 10^{-6}$ |
| Compressive strength, $kg/mm^2$, at 20°C | 1.59 |
| at 2020°C | 4.75 |
| Bend strength, $kg/mm^2$, at 20°C | 1.80 |
| Modulus of normal elasticity, $kg/cm^2$, at 20°C | 138300 |
| at 1800°C | 122500 |

The physical and engineering properties of boron carbonitride allow it to be recommended for use as refractory and electrical insulation material for crucibles, vats, pipe for transfer of molten metals, alloys slags and salts, jackets for thermocouples, refractory lining plates and high-temperature electrical insulators at temperatures up to 2000-2500°C. One table, 5 bibliographic references.

2/2



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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

USSR UDC 621.791.046

SAMSONOV, G. V., YURCHENKO, D. Z., and BOVAUN, G. A.

"Investigating the Possibility of Using Refractory Alloys for Welding."

Kiev, Avtomaticheskaya Svarka, No 10, Oct 70, pp 70-72

Abstract: Research conducted by the Institute for Problems of Material Science, Academy of Sciences UkrSSR, on developing alloys for welding, particularly those based on chromium carbides and borides, is described. Type numbers of such alloys are KBKh, BKh-2, KhR-19N, CK-15, and TBKKh. These alloys are wear-resistant. The purpose of the research was to consider the possibility of using the borides $TiB_2$, $CrB_2$, $Mo_2B_5$, and $W_2B_5$ as basic compounds of the alloys. To improve the alloy characteristics, the borides were mixed with type PZhlM iron powder. To increase the wear-resistance of welded layers, the alloys were strengthened by the addition of 15% by volume of $B_4C$. The article is illustrated by photographs of the microstructure of alloys consisting of 20% $TiB_2$, 15% $B_4C$, and iron. A table of various alloys and their relative wear-resistance after welding is also presented. The authors conclude that the addition of $TiB_2$ and $B_4C$ gives optimal results for strengthening steel surface welding.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

1/2 031 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--THE TERNARY SYSTEMS METAL CARBON HYDROGEN AND METAL NITROGEN HYDROGEN -U-

AUTHOR-(03)-SAMSONOV, G.V., ANTONOVA, M.M., MOROZOV, V.V.

COUNTRY OF INFO--USSR

SOURCE--POROSHKOVAYA MET., APR. 1970,(4), 66-79

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--PHASE EQUILIBRIUM, HYDRIDE, CHEMICAL BONDING, ELECTRON STRUCTURE, X RAY DIFFRACTION ANALYSIS, NEUTRON DIFFRACTION, NITROGEN, CARBIDE PHASE, METAL CONTAINING GAS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3006/0556 STEP NO--UR/0226/70/000/004/0066/0079

CIRC ACCESSION NO--AP0134998

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APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0

2/2 031 UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0134398

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE NATURE OF THE TERNARY HYDRIDES FORMED IN THE ME, C, H AND ME, N, H SYSTEMS WAS STUDIED BY X RAY AND NEUTRON DIFFRACTION FOR CASES IN WHICH ME IS EQUAL TO TI, ZR, HF, V, NB, LA, OR YT. PRIOR TO THE INTRODUCTION OF H THE CARBIDES IN THE ME, C, H SYSTEMS WERE IN A DISORDERED STATE; ON INCREASING THE H CONTENT ORDERING SET IN RAPIDLY. THESE RESULTS AND CORRESPONDING RESULTS OBTAINED FOR THE ME, N, H SYSTEMS ARE INTERPRETED ON THE BASIS OF THE STABLE ELECTRON CONFIGURATIONS CHARACTERIZING THE CHEMICAL BONDS IN THE ASSOCIATED NITRO AND CARBOHYDRIDES.

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1/2 029 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--RELATION BETWEEN THE DISLOCATION AND ELECTRON STRUCTURES OF SOLIDS -U-

AUTHOR-(02)-SAMSONOV, G.V., VAULIN, YU.S.

COUNTRY OF INFO--USSR

SOURCE--POROSHKOVAYA MET., MAR, 1970, (3), 67-71

DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS, MATERIALS

TOPIC TAGS--ELECTRON STRUCTURE, SEMICONDUCTOR MATERIAL, SILICON, GERMANIUM, SINGLE CRYSTAL, CRYSTAL LATTICE STRUCTURE

CONTROL MARKING--NO RESTRICTIONS

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CIRC ACCESSION NO--AP0134386

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE RELATION BETWEEN THE DISLOCATION STRUCTURE OF SOLID MATERIALS (METALS AND SEMICONDUCTORS) AND THE ELECTRON STRUCTURES OF THE CORRESPONDING ELEMENTS IS DISCUSSED IN THE LIGHT OF THE LATEST THEORETICAL AND EXPERIMENTAL DATA. THUS FOR EXAMPLE A TYPICAL DISLOCATION DENSITY IN SI AND GE, WHICH HAVE STABLE SP PRIME3 ELECTRON CONFIGURATIONS, IS 10 PRIME2-10 PRIME3 CM PRIME NEGATIVE2, WHEREAS IN METAL SINGLE CRYSTALS, WHICH HAVE STABLE CONFIGURATIONS OF THE D PRIME5, D PRIME10, ETC. TYPES, TYPICAL DISLOCATION DENSITIES ARE FAR HIGHER (10 PRIME8 CM PRIME NEGATIVE2 AFTER ANNEALING).

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1/2 027 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--COLLECTIVE RECRYSTALLIZATION IN FREELY POURED POWDERS OF ZIRCONIUM CARBIDE -U-

AUTHOR-(02)-SAMSONOV, G.V., BOZHKO, S.A.

COUNTRY OF INFO--USSR

SOURCE--POROSH. MET., AKAD. NAUK UKR. SSR; NO. 3, 35-8(MAR 1970)

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS, PHYSICS

TOPIC TAGS--ZIRCONIUM CARBIDE, RECRYSTALLIZATION, NONSTOICHIOMETRIC COMPOUND, ACTIVATION ENERGY, LATTICE DEFECT

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CIRC ACCESSION NO--AP0127741

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. IT WAS ESTABLISHED THAT IN FREELY POURED POWDERS OF NONSTOICHIOMETRIC PHASES OF ZIRCONIUM CARBIDE THE ACTIVATION ENERGY OF THE COLLECTIVE RECRYSTALLIZATION DECREASED WITH AN INCREASE IN THE IMPERFECTION OF CARBON SUBLATTICE. THE GROWTH OF THE ACTIVATION ENERGY FROM TIC SUBX TO NBC SUBX AND FURTHER TO ZRC SUBX WAS IN AGREEMENT WITH THE TYPE OF ELECTRONIC INTERACTION IN THESE PHASES.

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1/2 022 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--ELECTRON STRUCTURE AND PROPERTIES OF LANTHANIDES -U-

AUTHOR--SAMSONOV, G.V.

COUNTRY OF INFO--USSR

SOURCE--UKRAIN. KHIM. ZHUR., MAR. 1970, 36, (3), 227-233

DATE PUBLISHED----MAR70

SUBJECT AREAS--CHEMISTRY, MATERIALS

TOPIC TAGS--PHYSICAL CHEMISTRY PROPERTY, ELECTRON STRUCTURE, LANTHANUM, HARDNESS, LUTETIUM, CERIUM, PRASEODYMIUM, NEODYMIUM, PROMETHEUM, SAMARIUM, EUROPIUM, GADOLINUM, TERBIUM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3008/0366 STEP NO--UR/0073/70/036/003/0227/0233

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CIRC ACCESSION NO--AP0137470 PROCESSING DATE--04DEC70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE PHYSICAL AND CHEMICAL PROPERTIES OF THE LANTHANIDE METALS (LA, CE, ... LU) ARE DISCUSSED IN RELATION TO THEIR ELECTRON STRUCTURES. THE THERMAL EXPANSION, IONIC RADIUS, M.P., THERMIONIC EMISSION WORK FUNCTION, MAGNETIC MOMENT, AND HARDENSS OF THESE METALS FORM SERIES OF VARYING DEGREES OF SMOOTHNESS WHEN PLOTTED AGAINST ATOMIC NUMBER. IN GENERAL, THE STRUCTURES AND PROPERTIES OF THESE METALS ARE DIRECTLY RELATED TO THE STATE OF THE 4F ELECTRONS.

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USSR

[illegible]

SAMSONOV, G. V., [illegible], V. A., and [illegible], A. I., Institute of Problems of Material Science, Academy of Sciences UkrSSR

"Effect of Transition Metals on the Size of the Titanium Grain"

Moscow, Metallovedeniye i Termicheskaya Obrabotka Metallov, No 11, Nov 70, pp 30-31

Abstract: A study was made of the effect of transition metals in the refinement of the grain of cast titanium alloys. Titanium sponge of the following composition was used as the source material: 0.2% Al; 0.04% Fe; 0.03% Si; 0.04% V; 0.03% Cr; 0.09% Cu; [illegible] Mn and Ni -- traces. Additions of V, Cr, Fe, Ca, Mo, La, Y, Zr, [illegible] Pd, Os [illegible] were introduced into titanium in quantities of [illegible] 1.3; 1.5 wt.%, respectively. The hydrogen content in [illegible]. It is shown that, of the transition metals iridium, [illegible], nickel, paladium, and platinum are most effective in refining the macrostructure of cast titanium.

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Acc. Nr: AT0049892 Abstracting Service: CHEMICAL ABST. 5/70 Ref. Code: UR0441

92550s Formation of graphite in FeCe cast iron. Samsonov, G. V.; Lotakov, A. A. (Inst. Probl. Materialoznavstva, Kiev, USSR). *Dopov. Akad. Nauk Ukr. RSR, Ser. A* 1970, 1, 80–3 (Ukrain). The transformation of the graphite inclusions was studied as a function of the amt. of ferrocerium, temp., and delay time, by using the metallographic method. The formation of globular graphite is explained by the electron donor capacity of the rare-earth atoms owing to the $4f^n \rightarrow 4f^{n-1}5d^1$ electron transitions and by the selective acceptor capacity of the C atoms in Vertman-Samaric clusters, nuclei, and crystals.

M. Shelef

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Acc. Nr. AP0049306 Abstracting Service: CHEMICAL ABST. 5-70

Ref. Code UR 0226

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103083v Activation of tungsten sintering by platinum group metals. ~~Samsonov, G. V.;~~ Yakovlev, V. I. (Inst. Probl. Materialoved., Kiev, USSR). *Porosh. Met.* 1970, 10(1), 37-44 (Russ). The effect of the Pt group metals (Ru, Rh, Pd, Os) on the sintering of W at 1000-2000° was investigated. The activating effect of the additive is increased as follows: Os > Ru > Rh > Pd. An electronic mechanism of activated sintering is considered on the basis of a model of configuration localization of valence electrons. The activating action of the additives results in the localization of nonlocalized electrons of W atoms near the cores of the additive atoms, with a general decrease in the stored energy of the system as a whole. The electronic transitions from the W atoms to the addn. atoms cause the high soly. of W in the Pt-group metals and their preferential (up to being unipolar) diffusion into W. S. A. Mersol

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Acc. Nr.: AP0029512

Ref. Code: UR 0240

PRIMARY SOURCE: Gigiyena i Sanitariya, 1970, Nr 1, pp 42-45

# COMPARATIVE ASSESSMENT OF THE EFFECT PRODUCED ON THE BODY BY SILICIDES OF THE TRANSITION METALS

I. T. Brakhnova, G. V. Samsonov

A high fibrogenic activity and dystrophic changes were detected in the parenchymatous organs of albino rats under the action of disilicides of titanium, molybdenum and tungsten. Their maximum permissible concentrations are recommended. The toxicity proved to diminish starting from titanium silicide to molybdenum and tungsten silicides; it was inversely related to the increase of static weight of stable electronic $d^5$- and $Sp^3$-configurations formed in the interaction of silicon atoms and transitory metal; and besides it depended on the symmetry of crystallic lattice.

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UDC 669.018.4:537.311.621.762.4

SAMSONOV, G. V., BOGOMOL, I. V., L'VOV, S. N., and LESNAYA, M. I., Institute of Problems of Material Science, Academy of Sciences Ukr SSR and the Kherson Pedagogical Institute

"Electrophysical Properties of TiC-Nb, TiC-Ta, TiC-Mo, and TiC-W Cermets"

Kiev, Poroshkovaya Metallurgiya, No 10, Oct 72, pp 62-67

Abstract: The temperature function of specific electrical resistance $\rho$ and coefficient of thermal emf $\alpha$ of TiC-Nb, TiC-Ta, TiC-Mo, and TiC-W cermets, with a varying content of cementizing metal, was investigated at 20-1100°C. The Hall coefficient R was also measured at room temperature. Cermet samples were made by sintering, plus hot extrusion at 2000-2500°C at a pressure of 300 kg/cm$^2$ for 10-15 minutes. Extremes were observed in the concentration relationships at 50 at.% Nb(Ta) and 25 at.% Mo(W). The linear nature of the temperature function $\rho = \rho(t), \alpha = \alpha(t)$ was shown for the investigated cermets, which testifies to the metallic character of their conductivity. The specific electrical resistance of TiC-Nb and TiC-Ta exceeds the resistance of the initial metals (Nb--16 and Ta--14.7 micro-ohm-cm) by 7-14 times and is 2-4 times greater than in TiC (53 micro-ohm-cm). In the TiC-Mo and TiC-W cermets the specific electrical resistance is an order higher than in the initial materials

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SAMSONOV, G. V., et al., Poroshkovaya Metallurgiya, No 10, Oct 72, pp 62-67

and 1-3 times higher than in TiC, with the exception of compositions 25TiC-75Mo or 25TiC-75W, where the electrical resistance is somewhat less than in TiC. 3 figures, 1 table, 12 bibliographic references.

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USSR

UDC 669.295'27.2

SAMSONOV, G. V., CHAPLYGIN, F. I., VITRYANYUK, V. K., and ABRAMOVA, V. S.,
Kiev

"Physico-Mechanical Properties of Tungsten Titanate Solid Alloys With Carbon Deficit in the Lattice of the Carbide Solid Solution"

Moscow, Izvestiya Akademii Nauk USSR, Metally, No 5, Sep-Oct 72, pp 158-162

Abstract: An investigation was made of the production conditions of solid solutions of the T15K6 type based on composite carbides 0.6 $TiC_{1.0}$-0.4 WC, 0.6 $TiC_{0.8}$-0.4 WC, and 0.6 $TiC_{0.6}$-0.4 WC. The alloys, after sintering in a hydrogen medium, possess satisfactory physico-mechanical properties, but caking in vacuum results in embrittlement due to the vaporization of cobalt. A decrease in the carbon content in the composite carbide $TiC_{x \leq 1}$-WC results in increased coercivity, increased specific electric resistance, slightly increased hardness, and decreased bending strength. In alloys produced on the basis of $TiC_{0.6}$-WC composite carbide the $\eta_1$ phase is present, as in WC-Co alloys. The cutting properties of the investigated alloys in processing steel 50 are 30-40% higher than those of the standard T15K6 alloy. Four figures, two tables, eight bibliographic references.

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Coatings

USSR
SAMSONOV, G. V. [Editor in Chief]

UDC: 669.715

"Protective Coatings on Metals"

Zashchitnyye Pokrytiya na Metallakh [English version above], 5th Edition, Naukova Dumka Press, Kiev, 1971, 212 pp.

Translation of Annotation: This collection discusses problems of the theory and practice of diffusion separation and formation of protective coatings on metals and alloys.

Results are presented for technological processes for application of protective coatings. The technological properties of coatings are described and areas of their application are indicated.

The book is designed for materials scientists working on the creation of modern materials for various branches of technology. It may also be useful to engineering and technical workers at enterprises in the machine building, metallurgical, chemical and other branches of industry.

TABLE OF CONTENTS

General and Theoretical Problems of Diffusion Saturation and Formation of Coatings

Arkharov, V. I., Balanayeva, N. A., Bogoslovskiy, B. N., Stafeyeva, N. M., Development of Concepts Concerning the Mechanism of Reaction Diffusion . . 5

1/8

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Krishtal, M. A., Mokrov, A. P., Some Problems of the Theory of Diffusion in Multicomponent Systems . . . . . 11
Gruzin, P. L., Zemskiy, S. V., The Influence of Specific Properties of Diffusion Processes on Diffusion Saturation of Polycrystalline Materials . 17
Shcherbedinskiy, G. V., Kondrachenko, L. A., Diffusion Growth of Phases in Three-Component Systems with Mutual Influence Among the Elements . . . . . 23
Kupalova, I. K., Zemskiy, S. V., Isakov, M. G., Peculiarities of Diffusion Saturation of Steels Containing a Second Phase with Saturating Component . . . . . 30
Kontorovish, I. Ye., Phase and Structural Conversions in Chemical and Heat Treatment . . . . . 32
Arzamasov, B. N., Theoretical Problems of Diffusion Metallization from Halogenide Gas Media . . . . . 37
Dovzhenko, L. D., Borisov, V. T., Padomysel'skiy, I. D., Study of the Kinetics of Homogenization in the Production of Alloyed Powders . . . . . 41

2/8



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Lazareva, I. Yu., Prokoshkin, D. A., Vasil'yeva, Ye. V., Skotnikov, S. A., Study of Reaction Diffusion upon Oxidation of Alloys of Tungsten in an Atmosphere with High Nitrogen Content . . . . . 47

Shmykov, A. A., Regularities in the Process of Internal Oxidation of Alloys Without Formation of External Oxides on the Surface . . . . . 50

Astakhov, Ye. A., Krasnov, A. N., Study of the Technology of Detonation Application of Coatings of Powdered Materials . . . . . 57

Golego, N. N., Labunets, V. F., New Method and Installation for Chemical-Heat Treatment of Metals and Alloys in a Vacuum and in Gas Media . . . . 62

Kulyba, N. A., Reva, A. T., Production of Carbide Coatings on Steels and Cast Iron at Reduced Pressure Using Carbon Tetrachloride . . . . . 65

Kantor, S. I., Shmykov, A. A., The Role of Methane in the Process of Carburization of Steel . . . . . 68

Asaturov, S. A., Gorbunov, N. S., The Mechanism of Formation of Zirconium Carbide on Graphite from a Metal Melt . . . . . 74

Pereverzev, V. M., Barbot'ko, A. I., Siliciding of Gray Cast Iron . . . . . 77

3/8

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Nitriding and Calorizing

Samsonov, G. V., Kaplina, G. S., Surface Nitriding of Vanadium . . . . . 80
Lakhtin, Yu. M., Fetisova, I. P., Influence of High Temperature Nitriding on Mechanical Properties of Heat-Resistant Steels . . . . . 83
Larikov, L. N., Fal'chenko, V. M., Polishchuk, D. F., Ryubov, V. R., Lozovskaya, A. V., Study of the Mobility of $Al^{26}$ Atoms in the Intermetallic Phases Produced by Calorizing Steel . . . . . 88
Ryabov, V. R., Dzykovich, I. Ya., Yumatova, V. I., Chemical Heterogeneity of Coatings Produced by Liquid Calorizing . . . . . 89
Artyushchenko, I. I., Low-temperature Deposition of Aluminum Coatings by Thermal Decomposition of Organic Aluminum Compounds . . . . . 95

Titanium and Copper Coating

Kidin, I. N., Andryushechkin, V. I., Ragimov, M. M., Gas Titanium Coating of Iron with Rapid Electric Heating . . . . . 100
Gorbunov, N. S., Goryachev, P. G., Diffusion Copper Coatings . . . . . 103

Chromizing

Pronomarenko, Ye. P., Mokrov, A. P., Vodop'yanov, V. N., Domio, A. A., Determination of the Coefficient of Diffusion of Chromium into Iron from the Vapor Phase with Parabolic Change of Concentration of Chromium on the Surface . . . . . 107

4/8



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Shestakov, A. I., Zemskov, G. V., Electrochemical Phenomena in Diffusion Chrome Plating in the Gas Phase of Halides . . . . . 112

Vinitskiy, A. G., Malinov, L. S., Moshnyagul, V. V., Influence of Resorption of Diffusion Layer on Structure and Certain Properties of Chrome-plated Steels . . . . . 114

Belov, Yu. A., Afonskiy, I. F., The Influence of Carbon in Diffusion Chrome Plating in Pastes . . . . . 117

Permyakov, V. G., Trush, I. Kh., Krivenko, L. F., Complex Saturation of Multicomponent Diffusion Coatings . . . . . 120

Veksler, Yu. G., Kupriyanov, I. L., Complex Surface Saturation of ZHS6-K Technical Iron with Boron and Silicon . . . . . 124

Pasechnik, S. Ya., Kopotkov, V. D., Lokatosh, O. V., Afanas'yev, A. A., Obednin, L. F., Khabarov, A. V., Borsyakov, A. S., The Problem of the Mechanism of Electrolytic Saturation of Steels with Boron, Chromium, Aluminum and Zirconium . . . . . 127

Prosvirin, V. I., Gerasimov, L. V., Borocalorizing with Pastes Containing Small Quantities of Aluminum . . . . . 132

Kriulin, A. V., Likhacheva, N. A., Influence of Technological Parameters of the Sulfocyanation Process on Structure of the Diffusion Layer . . . 139

5/8

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Ugol'nikova, T. A., Moiseyev, A. I., Study of the Kinetics of Deposition of Niobium and $Nb_3Sn$ from the Gas Phase . . . . . 145

Borisov, Yu. S., Fishman, S. L., Diffusion Processes in Protective Coatings Properties of Protective Coatings . . . . . 150

Zemskov, G. V., Kogan, R. L., Shestakov, A. I., Shevchenko, I. M., Resistance of Nickel Aluminides . . . . . 155

Novik, A. A., Krylov, V. I., Petrichenko, A. A., Increasing the Strength of Diffusion Coatings in Melts of Brass and Aluminum . . . . . 158

Gorenbeyn, A. Ye., Skripnik, V. A., Fedorovskaya, L. F., Epik, A. P., Study Mold Parts for Casting of Aluminum Alloys Under Pressure by Chemical and Heat Treatment . . . . . 161

Petrovskaya, L. M., Ponomarenko, Ye. P., Kolomytsev, P. T., Potapov, V. D., Of Certain Refractory Compounds as Electrode Materials . . . . . 165

Zhunkovskiy, G. L., Yevtushok, T. M., Protection of Niobium and Tantalum Increasing the Heat Resistance of Niobium-based Alloys . . . . . 169

6/8 from Carburization . . . . . 169



APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002202810006-0"

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Pokhmurskiy, V. I., Vagula, R. G., Gribovskiy, Ya. S., Zamikhovskiy, V. S., Influence of Boron-copper Coating on Strength and Wear Resistance of Medium-carbon Steel . . . . . 172

Karpenko, G. V., Pokhmurskiy, V. I., Dalisov, V. B., Cyclical Strength of Carbon Steels Subject to Cementation and Diffusion Chrome Plating . . . . 175

Vavilovskaya, N. G., Timonina, L. G., Oxidation Resistance and Wear Resistance of Copper, Diffusion Saturated with Aluminum, Nickel, Zirconium . . 177

Podstrigach, Ya. S., Shevchuk, P. R., Influence of Thin Coatings and Intermediate Layers on Diffusion Processes and Stressed State in Solids . . . . . 180

Protsik, V. G., Brodyak, D. D., Zamikhovskiy, V. S., Pokhmurskiy, V. I., Karpenko, G. V., Study of the Influence of Chemical Composition of Steel on Structural-stress State and Strength after Boriding . . . . . 185

Golego, N. N., Epik, A. P., Derkach, V. D., Labunets, V. F., Wear Resistance of Diffusion Boride Coatings in a Vacuum and Gas Media . . . . . 189

Veksler, Yu. G., Kupriyanov, I. L., Osinovskiy, V. A., Study of Coatings in the System Nickel-chromium-boron, Applied by Plasma Sputtering . . . . . 192



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Malinov, L. S., Vinitskiy, A. G., Yanenskiy, N. Ye., Thermal Diffusion Surfaced Protective Coatings . . . . . 194

Kidin, I. N., Andryushechkin, V. I., Kholin, A. S. Spirin, M. F., Maksimenko, G. U., Petrova, O. S., Introduction of Nitrocementation from Pastes with High Frequency Induction Heating . . . . . 198

8/8



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