

1/2 021 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--REDUCTION OF THE CUF₂ SUB₂ O SUB₄ -CUCR SUB₂ O SUB₄ SOLID SOLUTION
-U-
AUTHOR-(04)-ZALAZINSKIY, A.G., BALAKIREV, V.F., CHEBOTAYEV, N.M.,
CHUFAROV, G.I.
COUNTRY OF INFO--USSR
SOURCE--ZH. NEORG. KHIM. 1970, 15(5), 1193-5
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--SOLID SOLUTION, CHEMICAL REDUCTION, CRYSTAL STRUCTURE, COPPER
COMPOUND, FERRITE, CHROMATE
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3006/1411 STEP NO--UR/0078/70/015/005/1183/1185
CIRC ACCESSION NO--AP0135085
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0135085

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. REDN. OF CUFE SUB1.75 CR SUB0.25 O SUB4 (SOLID. SOLN. OF TE CUFE SUB2 O SUB4 -CUCR SUB2 O SUB4 SYSTEM) IN H ATM. AT 1000DEGREES GAVE CU, FE, AND FE₂O₃ SUB2 O SUB4. THE REACTION PROCEEDED IN 7 STAGES WITH THE FORMATION OF TRIGONAL CU₂O SUB2 (M EQUALS FE, CR) HAVING CRYST. LATTICE PARAMETERS A 3.028 PLUS OR MINUS 0.005 AND C 17.09 ANGSTROM AND SOLID SOLNS. (CU SUB0.5 FE SUB2.5 O SUB4) SUBI(2.5-Y)-2.5.(CU SUB0.5 CR SUB2.5 O SUB4) SUB(Y-2.5) AND (FE SUB3 O SUB4) SUB0.8.(FE₂O₃ SUB2 O SUB4) SUB0.2 AS THE INTERMEDIATE SPECIES. THE RESULTS ARE ANALOGOUS TO THOSE OBTAINED FOR REDN. OF CUFE SUB1.75 AL SUB0.25 O SUB4. FACILITY: SVERDLOVSK. INST. MET., SVERDLOVSK, USSR.

UNCLASSIFIED

1/2 028 UNCLASSIFIED PROCESSING DATE--18SEP70
TITLE--EQUILIBRIUM COMPOSITION OF PHASES FORMED DURING THE REDUCTION OF
COPPER(I) FERRITE CU SUB0.5 FE SUB 2.5 O SUB4 -U-
AUTHOR-(04)-ZALAZINSKIY, A.G., BALAKIREV, V.F., CHEROTAYEV, N.M.,
CHUFAROV, G.I.
COUNTRY OF INFO--USSR
SOURCE--IZV. AKAD. NAUK SSSR, NEORG. MATER. 1970, 6(1), 162-3
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY, MATERIALS
TOPIC TAGS--COPPER COMPOUND, FERRITE, IRON OXIDE, HYDROGEN, X RAY
ANALYSIS, PHASE ANALYSIS, SPINEL, METAL REDUCTION, VACUUM TECHNIQUE
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY PEEL/FRAE--1984/0165 STEP NO--UR/0363/70/006/001/0162/0163
CIRC ACCESSION NO--AP0054961
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0054961

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. $\text{Cu}_{0.5}\text{Fe}_{2.5}\text{O}_{4}$ WAS PREPD. BY THE CERAMIC SINTERING OF AN EQUIMOLAR RATIO OF Cu_{2}O AND $\text{Fe}_{3}\text{O}_{4}$ IN AIR AT 1040 DEGREES FOR SEVERAL DAYS WITH SUBSEQUENT QUENCHING IN WATER. THE H REDN. WAS CARRIED OUT IN A VACUUM INDUCTION SETUP AT 1000 DEGREES. IN THE 1ST REDN. STAGE (0-6.5 PERCENT), A DECREASE IN THE EQUIL. O PRESSURE IS OBSD. THE PARAMETER OF THE SPINEL PHASE DECREASES (8.414-8.403 ANGSTROM). X RAY PHASE ANAL. SHOWS THAT THE RHOMBOHEDRAL PHASE, $\text{CuFe}_{2}\text{O}_{4}$, PPTS. OUT WITH INCREASED REDN., WHICH IN TURN CAUSES ENRICHMENT OF THE SPINEL PHASE BY MAGNETITE, AS WELL AS A DECREASE IN THE LATTICE PARAMETER. IN THE 2ND REDN. STAGE (6.5-12.3 PERCENT), THE $\text{CuFe}_{2}\text{O}_{4}$ REDUCES TO Cu AND THE ($\text{Cu}_{0.5}\text{Fe}_{2.5}\text{O}_{4}$) $\text{Cu}_{0.30}(\text{Fe}_{3}\text{O}_{4})_{0.70}$ SOLID SOLN. SPINEL, THE LATTICE PARAMETER OF WHICH IS 8.403 ANGSTROM. THE CONC. DEPENDENCE OF THE LATTICE PARAMETER IN THE BINARY ($\text{Cu}_{0.5}\text{Fe}_{2.5}\text{O}_{4}$) SUBL NEGATIVEX TIMES ($\text{Fe}_{3}\text{O}_{4}$) SUBL SOLID SOLN. FORMING DURING THE REDN. PROCESS WAS OBTAINED. THE SLIGHT DEVIATION FROM VEGARD'S LAW IS PROBABLY CAUSED BY THE DIFFERENT TYPES OF SPINEL STRUCTURE.

UNCLASSIFIED

1/2 028 UNCLASSIFIED PROCESSING DATE--16OCT70
TITLE--THE ENERGY BALANCE IN A DENSE FUSION PLASMA CONTAINED BY WALLS -U-
AUTHOR-(03)-ALIKHANOV, S.G., KONKASHBAEV, I.K., CHEBOTAEV, P.Z.
COUNTRY OF INFO--USSR
SOURCE--NUCLEAR FUSION, VOL. 10, MAR. 1970, P. 13-18
DATE PUBLISHED----MAR70

SUBJECT AREAS--PHYSICS
TOPIC TAGS--DENSE PLASMA, PLASMA CONTAINMENT, THERMONUCLEAR REACTION,
HOMOGENEOUS MAGNETIC FIELD, HEAT BALANCE

CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1985/1750 STEP NO--AU/0000/70/010/000/0013/0018
CIRC ACCESSION NO--AP0101803
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0101803

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE AUTHORS CONSIDER THE POSSIBILITY OF A SELF SUSTAINING THERMONUCLEAR REACTION IN A DENSE PLASMA IN GREATER THAN OR EQUAL TO 10 TO THE 16TH CU CM). THE PRESSURE OF THE PLASMA IS CONTAINED BY WALLS AND THE MAGNETIC FIEDL ONLY SERVES TO REDUCE THERMAL CONDUCTIVITY IN A TRANSVERSE DIRECTION. A SOLUTION IS OBTAINED FOR THE PLASMA BALANCE EQUATION THAT MAKES ALLOWANCE FOR RADIATION LOSSES ALONG THE MAGNETIC FIELD, AND IT IS SHOWN THAT THERE IS NO SATISFACTORY SOLUTION ACROSS A UNIFORM MAGNETIC FIELD. THE AUTHORS DISCUSS THE POSSIBILITY OF A STEADY STATE THERMONUCLEAR REACTION WITH A NONUNIFORM MAGNETIC FIELD. FACILITY: AKADEMIIA NAUK SSSR, INSTITUT LADERNOI FIZIKI, NOVOSIBIRSK, USSR.

UNCLASSIFIED

USSR

UDC: 621.375.9:535 /

BETEROV, I. M., MATYUGIN, Yu. A., MILUSHKIN, G. A., TROSHIN, B. I.,
and CHEBOTAYEV, V. P.

"Highly Stable Gas Laser Based on Nonlinear Absorption ($\lambda = 0.63\mu$)"

Novosibirsk, Avtometriya, No 5, 1972, pp 59-70

Abstract: This is the first part of a series, entitled "Frequency Stabilization Methods for Powerful Gas Lasers" and is devoted to a detailed description of the design principles for a powerful, highly frequency-stable He-Ne laser operating at a wavelength of 0.63 microns. The structural and technical characteristics of the laser, electronic systems for stabilizing its frequency, and the results of tests made on it are also discussed. The diagram of an experimental apparatus for obtaining narrow resonances in an external absorption cell is given together with various expressions derived on the basis of it. Various methods for stabilizing the frequency of the lasers are shown in three diagrams and are analytically compared using expressions for the sensitivity of the optical discriminators in each. It is emphasized that the choice of optical discriminator is the result of a compromise between technological and physical requirements.

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USSR

UDC: 621.375.9:535.

BETEROV, I. M., MATYUGIN, Yu. A., MILUSHKIN, G. A., TROSHIN, B. I.,
and CHEBOTAYEV, V. P.

"Highly Stable Gas Laser Based on Nonlinear Absorption ($\lambda = 0.63 \mu$)"

Novosibirsk, Avtometriya, No 5, 1972, pp 71-85

Abstract: This is the second part of a series with the title given above, and subtitled "Selection of Oscillation Types in an He-Ne Laser, $\lambda = 0.63 \mu$," the first part of which appears in this same journal, same issue (pp 59-70). In this part, an analysis is given of two methods for selecting the types of oscillation in gas lasers: the first consists in modifying the optical resonator such that the condition of operation is satisfied for only one type of oscillation; the second consists in using amplification saturation and absorption in the gas under the effects of a strong monochromatic field. A short review of the methods of selecting longitudinal types of oscillation in gas lasers with heterogeneous expansion of amplification lines is discussed. Some results are given of experiments in the investigation of the He-Ne laser spectral radiation at $\lambda = 0.63 \mu$ ($3s_2-2p_4$ Ne transition) together with their
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UDC: 621.375.9:535

BETEROV, I. M., et al, Avtometriya, No 5, 1972, pp 71-85

analysis. The technical characteristics of each element of the laser -- the amplification tube, the inner absorption cell, and the optical laser -- are summarized.

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USSR

UDC 621.373.535 (206.3)

BAGAYEV, S. N., VASILENKO, L. S., MATYUGIN, YU. A., KLEMENT'YEV, V. M.,
TROSHIN, B. I., and CHERDORAYEV, V. P.

"Some Results of a Study of the Generation Frequency Stability of Gas Lasers
on the 0.63, 1.5, 3.39, and 9.6 Micron Wavelengths"

Leningrad, Optika i Spektroskopiya, Vol 32, No 4, Apr 72, pp 802-808

Abstract: The article gives a brief description of the principal results of the authors' study of the frequency stabilization of gas lasers on the 0.63, 1.5, 3.39, and 9.6-micron wavelengths. Various frequency stabilization methods were used: viz., a stabilization method based on the Lamb dip, stabilization methods according to the peak in the output radiation power (a laser with an internal absorption cell) and with an external gas absorption cell in a variable magnetic field. The main purpose of this work was to show that high frequency stability values can be attained in various lasers by various methods. The experimental setup and the measurement procedures used by the authors, as well as the research results will be described in separate

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BAGAYEV, S. N., et al., Optika i Spektroskopiya, Vol 32, No 4, Apr 72, pp 802-803

articles. The main emphasis was placed on the physical principles of the stabilization methods used and the results attained. All the principal results are shown in a table which, besides generation-frequency-stability measurement data, also gives parameters which characterize the physico-technical properties of an optical frequency discriminator.

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Optics and Spectroscopy

USSR

UDC 621.373:535(206.3)

MATYUGIN, Yu. A., TROSHIN, B. I., and CHEBOTAYEV, V. P.

"A Method for Stabilizing the Frequency of an He-Ne Laser on the Basis of Using a Lorentz Loop of Absorption in the External Gas Element"

Leningrad, Optika i Spektroskopiya, Vol 31, No 1, Jul 71, pp 111-115

Abstract: The results of this research were presented at the All-Union Symposium on the Physics of Gas Lasers in Novosibirsk, July 1969. The authors describe a new method for stabilizing the frequency of He-Ne lasers at a wavelength of $0.63 \mu\text{m}$. They base their method on the use of the saturation effect in the external absorbing element. Here they examine a specific stabilization circuit. They scan the absorption lines with a variable magnetic field in order to find the error signal. The preliminary test results of this system are given. On a laboratory model they were able to produce a short-term stability better than 10^{-9} . Figure 1 shows a schematic representation of the experimental set up, and Figure 2 gives the strength of generation and coefficient of absorption as functions of laser frequency; it also depicts the error signal as a function of frequency difference of the laser relative to the center of the absorption line and the generation strength as a function of frequency.

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MATYUGIN, Yu. A., et al, Optika i Spektroskopiya, Vol 31, No 1, Jul 71,
pp 111-115

The authors estimate that it is very possible to attain a short-term stability on the order of 10^{-11} . They support their findings with 2 figures and a bibliography of 7 titles.

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USSR

UDC 621.375.9 : 535

BETEROV, I. N., LISITSYN, V. N., and CHEBOTAYEV, V. P.

"Saturation and Mode Selection Phenomena in He-Ne Lasers. I"

Leningrad, Optika i Spektroskopiya, No. 5, May 71, pp 932-939

Abstract: Two approaches to solving the problem of selecting types of oscillations in gas lasers are analyzed. The first approach consists of a modification of the optical resonator of the laser such that the condition for generation can be satisfied for only one type of oscillation. The complications in the design of various types of resonators make practical work with such lasers quite difficult and require the application of additional systems for self-tuning to maintain a stable frequency and amplitude in the output radiation and require constant control of the frequency of the radiation spectrum, especially with respect to transverse types of higher-order oscillations. Particular difficulties arise if smooth frequency tuning of the radiation over wide limits is necessary. The second approach is less obvious and consists of using the saturation characteristics of amplification and absorption in gases under the action of a strong monochromatic

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BETEROV, I. M., et al, Optika i spektroskopiya, No. 5, May 71, pp 932-939

field. In a previous article, the authors describe the operation of a $\lambda = 0.63 \mu$ He-Ne laser in which there was effective selection of the types of oscillations with the aid of the absorbing cell introduced into the resonator. This new selection method is based on the use of the absorption property to be saturated effectively under the action of a strong electromagnetic field. The first section of the article presents general principles for the selection of types of oscillations, the practical achievement of which leads to the development of a single-frequency laser with nonlinear absorption; the experimental setup and the basic experimental results as to both selection of types of oscillations and to the physical phenomena accompanying the operation of a strong He-Ne laser with an absorbing cell in the resonator are described. The second part of the work presents a more rigorous examination of selection of types of oscillations, and the results of experiments are discussed. A selection mode of types of oscillations in a laser with essentially nonhomogeneously amplified lines in the absence of any selecting elements is discussed. The homogeneity of saturation of the amplifying medium which occurs in a strong electromagnetic field is used in the method. The effect of collisions and capture of resonance radiation both in the amplifying medium and in the absorbing cell is also discussed from the aspect of selection of types of oscillations.

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1/2 031 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--ON CAPTURE OF RESONANCE RADIATION IN GAS SYSTEMS -U-

AUTHOR--(04)-BETEROV, I.M., MATYUGIN, YU.A., RAUTIAN, S.G., CHEBOTAYEV,
V.P.
COUNTRY OF INFO--USSR

SOURCE--ZHURNAL EKSPERIMENTAL'NOY TEORETICHESKOY FIZIKI, 1970, VOL 58, NR
4, PP 1243-1258
DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--RESONANCE ABSORPTION, RADIATIVE CAPTURE, ELECTROMAGNETIC
INTERACTION, COLLISION INTEGRAL, VELOCITY DISTRIBUTION, GAS DENSITY,
KINETIC EQUATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1988/1722

STEP NO--UR/0056/70/Q58/004/1243/1258

CIRC ACCESSION NO--AP0106454

UNCLASSIFIED

2/2 031

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0106454

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A THEORETICAL ANALYSIS AND EXPERIMENTAL INVESTIGATION ARE CARRIED OUT ON THE INTERACTION BETWEEN AN ATOM AND ELECTROMAGNETIC FIELD IN THE PRESENCE OF RESONANCE RADIATION CAPTURE. THE COLLISION INTEGRAL IN THE EQUATION FOR THE DENSITY MATRIX DIAGONAL ELEMENT DUE TO CAPTURE IS STUDIED. THE INTEGRAL KERNEL IS OF THE KEILSON STORER TYPE. INTEGRATION PERFORMED ON AN ELECTRONIC COMPUTER SHOWS THAT THE WIDTH OF A KERNEL DESCRIBING A SINGLE EMISSION ACT IS OF THE ORDER OF THE MEAN THERMAL VELOCITY \bar{v} AND THE KERNEL IS ASYMMETRIC. THE SECOND ORDER KERNEL DIFFERS FROM A MAXWELLIAN DISTRIBUTION BY SEVERAL PERCENT. THE KINETIC EQUATION SET UP FOR THE DENSITY MATRIX ELEMENTS IS SOLVED BY TAKING INTO ACCOUNT LEVEL DEGENERACY AND COLLISIONS OF THE RESONANCE EXCHANGE TYPE; THE PRESENCE OF A PLANE MONOCHROMATIC LINEAR POLARIZED STANDING WAVE AND CAPTURE OF RESONANCE RADIATION ARE ASSUMED. THE VELOCITY DISTRIBUTION OF THE ATOMS IN THE PRESENCE OF THE FIELD HAS A NARROW DIP (OR PEAK) AND BANDS WITH THE USUAL DOPPLER WIDTH $k\bar{v}$. AN EXPERIMENT IS DESCRIBED FOR DIRECT OBSERVATION OF EXCITATION DIFFUSION IN VELOCITY SPACE DURING CAPTURE OF RESONANCE RADIATION. THE PARAMETERS OF THE LAMB DIP IN THE GENERATION POWER CURVE ARE ANALYZED FOR x EQUALS 1.15 μ AND λ EQUALS 0.63 μ . THE STRONG COLLISION HYPOTHESIS CAN BE REJECTED IF RADIATION CAPTURE IS TAKEN INTO ACCOUNT. FACILITY: INST. FIZIKI POLUPROVDNIKOV, SIBIRSK. OTD, AN SSSR.

UNCLASSIFIED

1/2 028

UNCLASSIFIED

PROCESSING DATE--04DEC70

TITLE--RESONANT EXCITATION EXCHANGE DURING CAPTURE OF THE RESONANT
EMISSION OF A NEON LASER -U-

AUTHOR--(03)-BETEROV, I.M., MATYUGIN, YU.A., CHEBOTAYEV, V.P.

COUNTRY OF INFO--USSR

SOURCE--OPTIKA I SPEKTROSKOPIIA, VOL. 28, FEB. 1970, P. 357-368

DATE PUBLISHED----FEB70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--NEON LASER, PARTICLE CAPTURE, PHOTON, MULTIMODE LASER, HELIUM
NEON LASER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1992/1478

STEP NO--UR/0051/70/028/000/0357/0368

CIRC ACCESSION NO--AP0112472

UNCLASSIFIED

2/2 028

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0112472

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ANALYSIS OF PHENOMENA ASSOCIATED WITH THE CAPTURE OF RESONANT PHOTONS IN THE EMISSION OF A HELIUM NEON LASER. THE INFLUENCE OF PHOTON CAPTURE ON THE LASER CHARACTERISTICS IS EXAMINED, AND A QUALITATIVE LASER THEORY WHICH TAKES INTO ACCOUNT THE CAPTURE EFFECT IS DEVELOPED. THE THEORY IS USED AS A BASIS FOR DERIVING AN EXPRESSION FOR THE GAIN AS A FUNCTION OF THE FREQUENCY FOR A THREE LEVEL LASER AND AN EXPRESSION FOR THE OUTPUT POWER AS A FUNCTION OF THE FREQUENCY FOR A TWO LEVEL LASER. EXPERIMENTS ARE DESCRIBED IN WHICH CAPTURE OF RESONANT PHOTONS COULD BE OBSERVED DIRECTLY FOR THREE LEVEL LASER. AN EXPERIMENTAL STUDY OF THE CHARACTERISTICS OF THE LAMB DIP AT VARIOUS PRESSURES INDICATES THAT AT GAS PRESSURES ON THE ORDER OF 1 OR 2 MM HG, THE HOMOGENEITY OF SATURATION IS DUE PRIMARILY TO PHOTON CAPTURE AND NOT TO 'STRONG' ATOMIC COLLISIONS.

UNCLASSIFIED

USSR

UDC 537.525.1

VASILENKO, L. S., LISITSYN, V. N., NOTKIN, G. YE., and CHEBOTAYEV,
V. P.

"Disintegration of the 2^1P and 2^3P Levels of He in a Glow Discharge"

Leningrad, Optika i Spektroskopiya, Vol 28, No 6, Jun 70, pp 1085-1093

Abstract: The article describes results of a study of the cross-sections for the disintegration of the 2^1P and 2^3P levels of helium in a dc discharge by atomic collisions. The purpose was to ascertain the channel over which excitation transfer from singlet levels to triplet levels occurs. The study was based on the method of selective optical excitation. It was found that the levels 2^1P and 2^3P of He have a cross-section for disintegration by interatomic collisions of $< 10^{-16}$ sq cm. A study of the magnitude and sign for the modulation of the population of a number of levels, resulting from selective optical excitation of the level 2^1P , indicates the following general pattern for the excitation of helium levels:

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GERASIMOV, F. M., et al., Optika i Spektroskopiya, Vol 28, No 6, Jun 70, pp 1196-1203

a differential. During tests of the ruling engine about 40 diffraction gratings were made with 600, 300, and 200 lines/mm. In most cases the gratings, when studied by the interference method, displayed straight interference fringes and gave high-quality spectral lines in the spectral unit.

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UDC: 620.193.5

KONEV, V. N., ~~CHEBOTIN, V. N.~~ SUNTSOV, N. V., and STAVTSEVA, L. I., Ural State University imeni A. M. Gor'kiy

"Nickel Oxidation in an Atmosphere With Various Amounts of Sulfur Dioxide"

Moscow, Zashchita Metallov, Vol. 6, no. 4, Jul-Aug 70, pp 443-450

Abstract: The presence of sulfur dioxide in the air strongly increases the nickel oxidation rate and causes the formation of scale of a complex composition. However, research in the subject is far from complete. The scale produced in this study at 750 and 800°C comprises three layers. According to x-ray diffraction and microscopic examination data, the outer layer is the most dense, the middle layer is relatively porous and contains a NiO phase, while the inner layer, with a metallic glitter, closely adheres to the metal and comprises the Ni₃S₂ phase. The crystal lattice parameter of NiO decreases with an increase in SO₂ in the oxidizing atmosphere. The growth of scale on the nickel is, under all conditions, described by the parabolic law. The NiO layer grows at the scale-gas boundary. The higher rate of scale growth from NiO with SO₂ in the atmosphere may be explained by an increase in the con-

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KONEV, V. N., et al, Zashchita Metallov, Vol 6, no. 4, Jul-Aug 70, pp 448-450

centration of cation vacancies in the oxide on sulfur dissolution in it. Use is made of the relationship between the constant of the parabolic law K and P_{SO_2} in a mixture of SO_2+O_2 at P_{O_2} = constant obtained in earlier research to explain the formation of Ni_3S_2 phase which grows with a increase in P_{SO_2} .

The results of this study suggest that sulfur is transferred toward the metal through the NiO phase by diffusion through the scale lattice rather than along the microcracks and pores. The disappearance of Ni_3S_2 in the scale when passing from 800 to 850°C is apparently related to a decrease in sulfur solubility in NiO with an increase in temperature. The maximum S solubility in NiO is at 800°C.

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1/2 018 UNCLASSIFIED PROCESSING DATE--300CT70
TITLE--OXIDATION OF A NICKEL ELECTRODE IN CONTACT WITH A SOLID OXIDE
ELECTROLYTE DURING ANODIC POLARIZATION -U-
AUTHOR--(04)-GLUMOV, M.V., CHEBOTIN, V.N., PALGUYEV, S.F., NEUMIN, A.D.
COUNTRY OF INFO--USSR
SOURCE--ELEKTROKHIMIYA 1970, 6(3), 391-4
DATE PUBLISHED--70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--NICKEL, ELECTROLYTIC OXIDATION, METAL ELECTRODE, ELECTROLYTE,
ZIRCONIUM OXIDE, ANODE POLARIZATION
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--2000/0856 STEP NO--UR/0364/70/006/003/0391/0394
CIRC ACCESSION NO--AP0124519
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSICN NO--AP0124519

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A DETAILED ANAL. IS GIVEN OF PHENOMENA OCCURRING AT THE INTERFACE NI ELECTRODE SOLID ELECTROLYTE 0.9 ZRO SUB2 PLUS 0.1 Y SUB2 O SUB3 DURING ELECTROCHEM. OXIDN. OF THE ELECTRODE. THE CHANGES OF THE ANODIC POTENTIAL OF THE ELECTRODE AFTER APPLYING THE POLARIZATION CURRENT WERE DETD. INVESTIGATIONS WERE MADE BY THE OSCILLOGRAPHIC METHOD IN A 0.3 CO PLUS 0.7 CO SUB2 ATM. AT 1000DEGREES. TO PROVIDE SATISFACTORY CONTACT BETWEEN THE ELECTRODE AND THE ELECTROLYTE, THE CONTACTING SURFACES WERE GRIND TO FIT. THE GREAT CHANGE OBSERVED IN THE RELATION BETWEEN OVERVOLTAGE AND THE CURRENT WAS CAUSED BY THE PASSAGE OF IONS THROUGH THE FORMED OXIDE FILM (NiO) DURING THEIR DISCHARGE. CONSIDERING THE DIFFICULTY OF ESTABLISHING A SATISFACTORY CONTACT BETWEEN SOLIDS, GOOD AGREEMENT WAS OBTAINED BETWEEN EXPTL. AND THEORETICAL DATA. FACILITY: INST. ELEKTROKHM., SVERDLOVSK, USSR.

UNCLASSIFIED

USSR

UDC 669.18.046.55:658.562

TERZIYAN, P. G., SABIYEV, M. P., LOSHCHEV, V. Ya., KONDRASHOV, M. M., and
CHUDOVNIKOV, A. G., Kommunarsk Metallurgical Plant; Scientific Research In-
stitute of Mining and Metallurgy

"Effect of the Method of Deoxidation on the Quality of Semi-Killed Steel"

Moscow, Metallurg, No 9, Sep 70, pp 21-22

Abstract: This paper concerns the effect of the method of deoxidation of semi-killed steel on the rejects of the first conversion. Until 1966, it was the practice to deoxidize semi-killed 3 ps steel in the ladle with 45% ferrosilicon at 2.2 kg/t and with aluminum at 250 g/t. In 1966 the procedure was changed to deoxidation in the ladle with ferrosilicon alone, which has been used in correspondingly increased ratios. Deoxidation of 3 ps steel with ferrosilicon alone produces a more stable residual oxygen content in the steel. The test data show that the rejects of the first conversion, using ferrosilicon alone in the ladle, decrease as compared to that resulting from deoxidation with ferrosilicon and aluminum. A study of the macrostructure of ingots of semi-killed steel has demonstrated honeycomb blowholes in a normally deoxidized ingot. The blowholes were observed only in the upper part of the ingot. The formation and growth of honey comb blowholes in both semi-killed and rimmed

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TERZIYAM, P. G., et al, Metallurg, No 9, Sep 70, pp 21-22

steels are related to the ratio of pressure occurring in the blowhole (P_{bl}), which is in contrast to the directional external pressure on the blowhole (P_{ext}), the latter depending on ferrostatic pressure. With an increase in external pressure, the equilibrium concentrations of oxygen increase, creating dissimilar conditions for the reaction $C + 1/2 O_2 \rightarrow CO$ in various zones over the length of the ingot. The presence of blowholes at the surface of the upper part of the ingot is typical of normally deoxidized metal. The lack of such blowholes indicates overdeoxidation and the appearance of a shrinkage cavity.

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1/2 018 UNCLASSIFIED PROCESSING DATE--11SEP70
TITLE--PREPARATION OF AGLOPORIT GRAVEL FROM HEAT AND ELECTRIC POWER PLANT
ASHES BY GAS ROASTING -U-
AUTHOR--CHEBUKOV, M.F., UFIMTSEV, V.M.
COUNTRY OF INFO--USSR
SOURCE--STROIT. MATER. 1970, (2), 13-14
DATE PUBLISHED-----70

SUBJECT AREAS--EARTH SCIENCES AND OCEANOGRAPHY, MECH., IND., CIVIL AND
MARINE ENGR
TOPIC TAGS--GRAVEL, POWER PLANT, ALUMINA, INDUSTRIAL WASTE TREATMENT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REFL/FRAME--1987/0146

STEP NO--UR/0228/70/000/002/0013/0014

CIRC ACCESSION NO--AP0103825

UNCLASSIFIED

2/2 018

UNCLASSIFIED

PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0103825

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. EXPTS. WERE MADE WITH COAL ASH 85, WASTE FROM ALUMINA PRODUCTION 10, AND LIME 5PERCENT. THE CHARGE WAS ARRANGED IN LAYERS BY FRACTIONS; INCREASE IN FRACTION SIZE WAS FROM BOTTOM TO THE TOP. THE CHARGE WAS GAS FIRED. HOT AIR IS DRAWN THROUGH THE CHARGE TO REDUCE THE MOISTURE CONTENT. THE STRENGTH OF THE GRAVEL WAS AS HIGH AS 75-80 KG-CM PRIME2; BULK WT. WAS 650 KG-M PRIME3.

UNCLASSIFIED

1/2 018 UNCLASSIFIED PROCESSING DATE--11SEP70
TITLE--PREPARATION OF AGLOPORIT GRAVEL FROM HEAT AND ELECTRIC POWER PLANT -
ASHES BY GAS ROASTING -U-
AUTHOR--CHEBUKOV, M.F., UFIMTSEV, V.M.
COUNTRY OF INFO--USSR
SOURCE--STROIT. MATER. 1970, (2), 13-14
DATE PUBLISHED-----70

SUBJECT AREAS--EARTH SCIENCES AND OCEANOGRAPHY, MECH., IND., CIVIL AND
MARINE ENGR
TOPIC TAGS--GRAVEL, POWER PLANT, ALUMINA, INDUSTRIAL WASTE TREATMENT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1987/0146

STEP NO--UR/0228/70/000/002/0013/0014

CIRC ACCESSION NO--AP0103825

UNCLASSIFIED

2/2 018 UNCLASSIFIED PROCESSING DATE--11SEP70
CIRC ACCESSION NO--AP0103825
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. EXPTS. WERE MADE WITH COAL ASH 85,
WASTE FROM ALUMINA PRODUCTION 10, AND LIME 5PERCENT. THE CHARGE WAS
ARRANGED IN LAYERS BY FRACTIONS; INCREASE IN FRACTION SIZE WAS FROM
BOTTOM TO THE TOP. THE CHARGE WAS GAS FIRED. HOT AIR IS DRAWN THROUGH
THE CHARGE TO REDUCE THE MOISTURE CONTENT. THE STRENGTH OF THE GRAVEL
WAS AS HIGH AS 75-80 KG-CM PRIME2; BULK WT. WAS 650 KG-M PRIME3.

UNCLASSIFIED

USSR

CHEBURKIN, A. V., STEFANI, D. V., LEBEDEVA, N. N., YESIPENKO, N. V., and
IL'CHENKO, T. P.

"Immunoglobulins in Nasal Secretions of Small Children"

Vopr. Okhrany Materinstva i Detstva (Problems of the Protection of Motherhood
and Childhood), 1973, No 7, pp 53-57 (from RZh - Biologicheskaya Khimiya, No 22,
Nov 73, Abstract No 1704)

Translation: By the method of simple radial immunodiffusion it is not possible
to determine secretory immunoglobulins in the washout of nasal secretions of
one month old babies. After the age of 2 months a small quantity of immuno-
globulins of the class A and G are found. From the six months on -- the level
of IgA is increased, while IgG remains quite low, increasing slightly with age.
The immunoglobulins of the class M in nasal secretions are absent in small
babies. High individual fluctuations of IgA may be explained by the lability
of the system of local immunity. The results obtained support the point of
view of the local synthesis of class A immunoglobulins.

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USSR

UDC 539.376:620.171

MILOSERDIN, Yu. V., NABOYCHENKO, K. V., CHEBURKOV, V. L., NAUMOV, S. G.,
LAVEYKIN, L. I., BORTSOV, A. G., Moscow

"High Temperature Creep of Zirconium Carbide"

Problemy Prochnosti, No 3, 1972, pp 50-53.

Abstract: Results are presented from creep and long-term strength tests of specimens of zirconium carbide in the 2,450-2,810°K temperature range. The nature of behavior of the zirconium carbide in various stages of creep and the relationship between parameters characterizing creep and the test conditions of the material are studied. It is demonstrated that in the 2,450-2,810°K temperature interval with stresses of 0.3-1.0 kg/mm², the stable stage of creep of zirconium carbide is determined by a diffusion process with an activation energy of 116 ± 18 kcal/mol.

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1/2 006 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--PROPERTIES OF HIGH SILICA PORTLAND CEMENTS UNDER VARIOUS HARDENING
CONDITIONS -U-
AUTHOR-(03)-CHEBUKOV, M.F., KOKNAYEV, N.F., PYACHEV, V.A.
COUNTRY OF INFO--USSR
SOURCE--TSEMENT 1970, (1), 18-20
DATE PUBLISHED-----70
SUBJECT AREAS--MATERIALS
TOPIC TAGS--CEMENT, SILICA, CALCIUM OXIDE
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--2000/1693 STEP NO--UR/0101/70/000/001/0018/0020
CIRC ACCESSION NO--AP0125314
UNCLASSIFIED

2/2 006

UNCLASSIFIED

PROCESSING DATE--30UCT70

CIRC ACCESSIGN NU--AP0125314

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE USE POSSIBILITIES OF THE TITLE CEMENTS WERE INVESTIGATED ON THE BASIS OF A STUDY OF THE PHYS. MECH. PROPERTIES OF HIGH SI CEMENTS (LIME SATN. COEFF. 0.78-0.91, FREE CAO 2.06-3.58PERCENT). WITH STEAM CURING (3 HR AT 100DEGREES), AFTER 90 DAYS, SOME CEMENTS WITH LIME SATN. COEFFS. LARGER THAN 0.85 HAD COMPRESSIVE STRENGTHS EXCEEDING AND BENDING STRENGTHS VIRTUALLY EQUIV. TO THOSE OF NORMAL HARDENED CEMENT. THE PROPERTIES OF THE CEMENTS ARE LARGELY GOVERNED BY THE 3CAO.SIO SUB2-2CAO.SIO SUB2 RATIO. FACILITY: URAL. POLITEKH. INST., SVERDLOVSK, USSR.

UNCLASSIFIED

USSR

UDC 576.858.75.097.22:615.332

KANTOROVICH, YE. N., CHEBURKINA, N. V., and PETERSON, O. P., Institute of Virology imeni D. I. Ivanovski, Academy of Medical Sciences USSR, Moscow

"Partial Incorporation of Influenza Virus RNA into an RNA-ase-Resistant Form, and the Effect of Actinomycin D on This Process"

Moscow, Voprosy Virusologii, No 4, Jul/Aug 72, pp 405-408

Abstract: Chick embryo cells were infected with influenza A virus, strain WSN and then labeled with uridine- H^3 so that the fate of virus RNA could be traced and the effect of actinomycin D on this fate could be revealed. It was found that about 20% of the parental RNA becomes incorporated into an RNA-ase-resistant form 4-6 hours after infection. Actinomycin D had no effect on adsorption and elution of the virus, but it completely inhibited transition of parental RNA into the RNA-ase-resistant form. Apparently the drug does not degrade virus RNA. Instead it appears to inhibit either the formation of RNA strands complementary to the parental template, or the combination of such strands into the RNA-ase-resistant form.

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1/2 018

UNCLASSIFIED

PROCESSING DATE--30OCT71

TITLE--EXCRETORY FUNCTION OF THE LIVER AND CHARACTER OF BILE FLOW IN
HEPATOBILIARY PATHOLOGY -U-

AUTHOR--CHEBYKINA, N.V.

COUNTRY OF INFO--USSR

SOURCE--VRACHEBNOYE DELO, 1970, NR 4, PP 124-126

DATE PUBLISHED-----70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--LIVER FUNCTION TEST, DIAGNOSTIC DRUG, CIRRHOSIS, CANCER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3001/1595

STEP NO--UR/0475/70/000/004/0124/0126

CIRC ACCESSION NO--AP0127086

UNCLASSIFIED

2/2 018
CIRC ACCESSION NO--AP0127086

UNCLASSIFIED

PROCESSING DATE--30OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. RESULTS OF ASSOCIATED BROMSULFALEIN TEST IN 55 PATIENTS WITH HEPATOBILIARY PATHOLOGY WERE SUBDIVIDED INTO 4 VARIANTS: I ST VARIANT (NORMAL LIVER FUNCTION, NORMAL BILE FLOW) WAS OBSERVED IN MOST PATIENTS; II ND (ABNORMAL LIVER EXCRETORY FUNCTION, NORMAL BILE FLOW), IN PATIENTS WITH CALCULOUS CHOLECYSTITIS, POST CHOLECYSTECTOMY SYNDROME, LIVER CIRRHOSIS; III RD (NORMAL EXCRETORY FUNCTION, ABNORMAL BILE FLOW), IN PATIENTS WITH CHRONIC CHOLECYSTITIS AND SLOW CONTRACTILE FUNCTION OF THE GALLBLADDER, IN CHOLANGITIS; IV TH (BOTH ABNORMAL EXCRETORY LIVER FUNCTION AND BILE FLOW), MAINLY IN PATIENTS WITH CALCULOUS CHOLECYSTITIS, CIRRHOSIS AND CANCER OF THE LIVER. FACILITY: DNEPROPETROVSKOGO NAUCHNO ISSLEDOVATEL'SKOGO INSTITUTA GASTROENTEROLOGII.

UNCLASSIFIED

CHEBYSMEV, A. Ye.

Spacecraft
Engineering

QUALITY EVALUATION OF ERGATIC PROCESSES IN SPACE VEHICLE CONTROL

10:3PM 5434D
28 Oct 71

¹¹ A. D. Korotkov, V. A. Turan, R. V. Komolovskiy, V. P. Solov'yev, A. Ye. Chebyshev (Spacecraft Engineering Institute)

pp 1-7

Abstract: The problem of quantitative evaluation of capacity for work by a human operator in a space vehicle control system is currently quite important. Such an evaluation is required for determining the level of the operator's training, to predict his reliability, to carry out professional selection, etc. The proposed method for evaluating the work capacity of a human operator is based on probability-iterative methods and the mathematical theory of linear differential transforms. The method takes into account human adaptability in the course of professional training and makes it possible to determine the probability of successful implementation of a task in the course of one control cycle under both normal and emergency flight conditions. The high information yield of this method is supported by a number of experiments.

The creation of modern and promising systems for controlling space vehicles is impossible without organizing optimum relationships among the functions of mechanisms, apparatus, equipment and other "nonliving" devices, on the one hand, and the human being controlling them, on the other. At whatever control level the man-operator may be situated, he must solve information-logic problems and appropriately impart carefully calculated reactions to the control organs.

CHEBYSHEV, A. Ye.

Human Engineering

SO:JPRS 53801
12 Aug 71

UDC 612.812/629.78.07:658.52.011.56/.001.57

MODELS OF A MAN-OPERATOR IN INVESTIGATING SPACESHIP MANUAL CONTROL
(Article by R. V. Komaritskiy, S. A. Minayev and A. Ye. Chebyshev; Moscow, Kozhicheva Biologiya i Meditsina, Vol. 5, No. 3, 1971; pp 45-50, submitted 1 July 1970)

Abstract: This paper discusses the possibility and feasibility of replacing a man-operator with an appropriate model and surveys the current models in accordance with the main classes of operator's activity. When possible the authors give mathematical descriptions of models and instructions on how to use models in studying manual operation of a spacecraft.

The experience of spaceflights in our country and abroad has convincingly demonstrated the possibility and desirability of including man in the ship control system. Despite a number of advantages of a machine, identification of images, flexibility and adaptability to changing and unexpectedly arising conditions.

The reliability requirements and the high cost of experimentation under actual conditions dictate use of the method for investigating a manual control system in the planning stage by statistical modeling and means of ground trainer-research complexes with the participation of a group of operators. The objective of the investigation was to establish the qualitative and quantitative characteristics of the information necessary to the operator for making a decision on each specific problem, determine the time for the reception and analysis of information, match the time parameters of man and machine, etc. Statistical modeling with man's participation can be performed only on a real time scale and usually over an extremely long time and is in team-combats. In addition, the difference in individual characteristics of operators predetermines the scatter of investigated parameters of the projected system and necessitates a great number of experiments for attaining statistically reliable results. Accordingly, it is desirable to replace a man-operator by his model, making possible a substantial decrease in the duration of the

USSR

UDC 621.396.67

CHEBYSHEV, V. V., Moscow Institute of Radio Engineering, Electronics and Automation

"Inverse Electrodynamic Problem for an Asymmetric Excited Impedance Cylinder"

Gor'kiy, Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, Vol XV, No 9, 1972, pp 1407-1416

Abstract: A study was made of the inverse electrodynamic problem for an infinite impedance cylinder excited by a ring with a traveling current wave. The integral expression was obtained which relates the radiation pattern to the distribution of the surface impedance along the generatrix of the cylinder. This expression is used to propose a method for synthesizing the impedance antenna permitting the reactance distribution with the limits of the given strip on the cylinder to be obtained when the radiation pattern is given in the form of a Kotel'nikov series. The application of the solution obtained to design funnel antennas and antennas with rotating polarization and an axial-emission radiation pattern is discussed.

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USSR

UDC 621.396.677(02) 6

ARDAB'YEVSKIY, A. I., VOLKOV, O. A., VOSKRESENSKIY, D. I., GOSTYUKHIN, V. L.,
GRANOVSKAYA, R. A., GRINEVA, K. I., KRITSYN, V. A., MYAKISHEV, B. YA., FILIPPOV,
V. S., CHEBYSHEV, V. V.

"Microwave Antennas and Devices. Calculation and Design of Antenna Arrays
and their Radiating Elements. Textbook for Students at the Radiotechnical
Specialized Institutions of Higher Learning"

Antenny i ustroystva SVCh. Raschet i proyektirovaniye antenykh reshetok i ikh
izluchayushchikh elementov. Uchebn. posobiye dlya stud. radiotekhn. spets. vyzov
(cf. English above), Moscow, Soviet Radio, 1972, 320 pp, ill., 75 k. (from RZh-
Radiotekhnika, No 6, Jun 72, Abstract No 5B32K)

Translation: Methods of calculating the basic parameters of antenna arrays
with electric rocking of the radiation pattern and frequency and commutation
methods of controlling the radiation pattern are discussed. A study is made
of the structure of the optimal arrays with Dolf-Chebyshev distribution, the
design of irised-wave guide and horn arrays and also methods of calculating
the array elements: dielectric, rod, spiral, horn and director antennas.

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Antennas

USSR

UDC 612.396.677.833.061.1

CHERYSHEV, V. V.

"Synthesis of an Impedance Band on a Symmetrically Excited Cylinder"

Moscow, Antenny, No 12, 1971, pp 25-33

Abstract: The inverse problem of an infinite impedance cylinder (antenna) excited by a loop of cophased magnetic current which forms a cone-shaped radiation pattern is analyzed. The field of this external source is described by the Bessel and Hankel functions derived from Green's function. By the method of steepest descents, an expression is derived which relates the radiation pattern to a one-dimensional surface impedance distribution along the cylinder elements according to the location of the excitation source. The Dirac-delta function reduces the problem to that of selecting a radiation pattern function which provides for pure reactance of the impedance. Then the surface impedance corresponding to a given radiation pattern is calculated by using a Fourier transformation and convergent Mathieu functions of either even or odd order. In synthesizing an impedance antenna, a rather close approximation to a given radiation pattern can then be made by examining the closeness of the derived expansion to a given function determining the behavior of the radiation pattern. The latter function can be assigned

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USSR

CHEBYSHEV, V. V., Antenny, No 12, 1971, pp 25-33

by selecting Mathieu harmonic curves according to the partial radiation pattern method. A comparison of the design function and an experimental radiation pattern shows that, depending on the pattern shape, main lobe deflection, and cylinder radius, the inverse problem for symmetrical excitation can be solved and the impedance band can be reduced to an equivalent impedance strip. For 10-15° deflection angles, the permissible radius is 0.6 times the wavelength or less, depending on an increased deflection and reduced level near the axial directions. The cylinder can be a finned structure, and its impedance band radius must be at least 3 wavelengths.

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USSR

UDC 621.396.677.001.24

CHEBYSHEV, V. V.

"Formulation and Solution of Inverse Electrodynamics Problems During Synthesis of Antennas Using Impedance Boundary Conditions"

Tr. Mosk. in-ta radiotekhn., elektron. i avtomatiki (Works of the Moscow Institute of Radio-Engineering, Electronics and Automation), 1972, vyp.55, pp 155-171 (from RZh-Radiotekhnika, No 11, Nov 72, Abstract No 11 B11)

Translation: An analysis is made of the formulation of inverse, electrodynamic problems during the synthesis of antennas with a steady radiation pattern using impedance boundary conditions as the most general type of boundary conditions. Inverse problems are studied with respect to the utilization of the integral transformation method for their solution. Original article: seven bibliographic entries. Resume.

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USSR

UDC 621.372.8.092.22.001.24

CHEBYSHEV, V. V.

"Qualitative Study of Impedance Surfaces in the Synthesis of Electrodynamc Systems"

Tr. Mosk. in-ta radiotekhn., elektron. i avtomatiki (Works of the Moscow Institute of Radic Engineering, Electronics and Automation), 1972, vyp.55, pp 172-183 (from RZh-Radiotekhnika, No 11, Nov 72, Abstract No 11 B106)

Translation: A qualitative study is presented of impedance surfaces for various structures of a field being supported by these surfaces. Original article: three illustrations and seven bibliographic entries. Resume.

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USSR

UDC 621.396.677.001.24

CHEBYSHEV, V. V.

"Synthesis of a Flat Surface-Wave Antenna"

Tr. Mosk. in-ta radiotekhn., elektron. i avtomatiki (Works of the Moscow Institute of Radioengineering, Electronics and Automation), 1972, vyp.55, pp 137-154 (from RZh-Radiotekhnika, No 11, Nov 72, Abstract No 11 B13)

Translation: An expression is derived which makes it possible to calculate the distribution of the surface impedance along a given radiation pattern for a model of an antenna in the form of an impedance band in an unbounded, conducting shield and excited by TM-wave sources. This expression is used for calculating surface wave antennas under excitation by one slit, by aperture excitation, and multislit excitation. It is noted that the proposed methodology can be extended to antennas with a radial impedance structure forming a funnel-shaped radiation pattern.
Original article: seven illustrations and four bibliographic entries. N.S.

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WELDING

USSR

UDC 621.791.052.011:669.15-194.12+669.786+669.292

MATSNEV, E. P., Engineer, ASTAF'YEV, A. S., Candidate of Technical Sciences, STRUKOVA, N. S., Engineer (Central Scientific Research Institute for Ferrous Metallurgy imeni I. P. Bardin), CHECHEKIN, YU. F., Engineer (Plant imeni Lenin), and NABATOVA, K. A., Candidate of Technical Sciences (Central Scientific Research Automobile and Auto Engine Institute)

"Properties of Welded Joints of Commercial 12G2 Steel Alloyed With Nitrogen and Vanadium"

Moscow, Svarochnoye Proizvodstvo, No 11, Nov 70, pp 27-29

Abstract: Results are presented from a study of the properties of welded joints made under conditions similar to those used for side members of motor vehicle frames from a 100-ton commercial melt of steel produced in an open hearth furnace at the Chelyabinsk Metallurgical Plant. The chemical composition of the metal was: 0.13% C, 1.19% Mn, 0.12% Cr, 0.10% Ni, 0.12% V, 0.02% N, 0.09% Cu, 0.018% S, 0.008% P. Welded joints produced
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USSR

MATSNEV, E. P., et al., Svarochnoye Proizvodstvo, No 11,
Nov 70, pp 27-29

in the sheet steel by manual arc welding were equal in strength to the base metal. The fatigue strength of the welded joints was 15-20% higher than the fatigue strength of welded joints in 30T steel.

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USSR

UDC 621.979.07

TYLKIN, M. A., ALEKSANDROV, V. P., and CHECHEKIN, Yu. F.

"Durability of Stamps During Hot Stamping on Presses"

Plasticheskaya Deformatsiya Metallov i Splavov, Moscow, No 64, "Metallurgiya,"
1970, pp 211-216

Translation: An analysis is made of the effect of a number of basic factors on the durability of the tool of crank hot stamping presses. On the basis of extensive factual material, the effect of the mass of forged pieces, mass, productivity of the press, and other factors on the durability of press inserts is evaluated. A classification of forged pieces by groups, for which the intervals of stamp durability are determined, is made according to the results of a study of worn out stamps. Two figures, one table, and 11 bibliographic entries.

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- 31 -

1/2 032

UNCLASSIFIED

PROCESSING DATE--11SEP70

TITLE--COLD BRITTLENESS OF STEELS USED FOR AUTOMOBILE CHASIS -U-

AUTHOR--CHECHEKIN, YU.F., ZELENOVA, V.D., NABATOVA, K.A., SHERMAZAN, I.V.

COUNTRY OF INFO--USSR

SOURCE--METALLOVED. TERM. OBRAB. METAL 1970, (2), 5-8

DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--IMPACT STRENGTH, CRACK PROPAGATION, METAL BRITTLENESS, HOT ROLLING, MANGANESE STEEL/(U)10G2B MANGANESE STEEL, (U)15GYUT LOW ALLOY STEEL, (U)12G2AF LOW ALLOY STEEL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAE--1988/1308

STEP NO--UR/0129/70/000/002/0005/0008

CIRC ACCESSION NO--AP0106085

UNCLASSIFIED

2/2 032

UNCLASSIFIED

PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0106085

ABSTRACT/FXTRACT--(U) GP-0- ABSTRACT. STEELS 12G2AF, 15GYUT, 10G2B, AND 30T WERE STUDIED UNDER 2 STRUCTURAL CONDITIONS: (1) FOLLOWING NORMALIZING AT 910DEGREES, GRAIN SIZE MARK 10-11; (2) IN THE HOT ROLLED STATE, TEMP. OF FINAL ROLLING 880-910DEGREES, GRAIN SIZE MARK 8, SIGMA EQUALS 53-6 KG-MM PRIME². OVERALL IMPACT FUNCTIONS, TAKEN FROM THE COMPONENTS ONSET AND CRACK PROPAGATION FUNCTIONS, WERE INDEXED FOR ALL OF THE STEELS. A METHOD OF INDEXING BASED ON DETG. THE VALUE OF IMPACT STRENGTH AT TEMP. BELOW THE THRESHHOLD OF COLD BRITTLENESS WAS APPLIED. THE HIGHEST ONSET AND CRACK PROPAGATION FUNCTIONS WERE OBSD. IN STEELS 12G2AF AND 15GYUT. ELECTRON MICROSCOPIC ANAL. DETD. NOT ONLY THE COLD BRITTLENESS THRESHOLD BUT ALSO THE PECULIAR FINE STRUCTURE OF THE FRACTURE. A MICROFRACTOGRAPH OF THE VISCOUS FRACTURE OF STEEL 12G2AF IN THE HOT ROLLED AND IN THE NORMALIZED STATES IS SHOWN. IN THE AREA OF DUCTILE FRACTURE, A DIFFERENT DISPERSION OF THE CUP SHAPED STRUCTURE WITH DEPENDENCE ON HEAT TREATMENT WAS OBSD. STEELS IN THE NORMALIZED STATE DISPLAYED MORE DISPERSION OF THE CUP SHAPE STRUCTURE THAN IN THE HOT ROLLED AND ANNEALED STATE.

UNCLASSIFIED

1/2 022

UNCLASSIFIED

PROCESSING DATE--30OCT70

TITLE--INCREASING THE MECHANICAL PROPERTIES OF SIDE SILL STRIP 30T STEEL
FOR TRUCKS -U-

AUTHOR--(03)-CHECHEKIN, YU.F., VOZLINSKIY, A.G., KUZMENKO, V.S.

COUNTRY OF INFO--USSR

SOURCE--STAL' 1970, 30(2), 166-7

DATE PUBLISHED-----70

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

TOPIC TAGS--MECHANICAL PROPERTY, TENSILE STRENGTH, CARBON STEEL, MANGANESE
STEEL, SILICON STEEL, TRUCK/(U)30T STEEL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1994/1865

STEP NO--UR/0133/70/030/002/0166/0167

CIRC ACCESSION NO--AP0115684

UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0115684

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE MECH. PROPERTIES OF STEEL
CONTG. C 0.26-0.33, MN 0.5-0.8. SI 0.08PERCENT, WERE INCREASED TO 52-58
KG-MM PRIME2 TENSILE STRENGTH, 37.5-42 KG-MM PRIME2 YIELD POINT, AND
21-5PERCENT ELONGATION BY NORMALIZING AT 830-860DEGREES IN A CONTINUOUS
INSTALLATION WHICH IS DESCRIBED. FACILITY: MOSK. AVTOZAVOD IM.
LIKHACHEVA, MOSCOW, USSR.

UNCLASSIFIED

AN0027860⁻

C

UR9030

AUTHOR-- CHECHEL, D., CORRESPONDENT

TITLE-- FOG SUPPRESSION

NEWSPAPER-- NEDELYA, FEBRUARY 9-15, 1970, NR 7, P 8, COLS 1-4,
AND P 9, COLS 1-4

ABSTRACT-- IN THIS INTERVIEW, F. S. TERZIYEV, HEAD, ADMINISTRATION OF THE HYDROMETEOROLOGICAL SERVICE IN MURMANSK, REVEALED THAT FOG SUPPRESSING EXPERIMENTS HAVE BEEN STARTED OVER THE AREA OF SEVERAL SQUARE KILOMETERS. THE TECHNIQUE OF SPREADING ACTIVE MOLECULAR FILMS OVER THE WATERS OF THE KOLA BAY WAS DEVELOPED BY TERZIYEV, S ADMINISTRATION IN COLLABORATION WITH THE UKRAINIAN HYDROMETEOROLOGICAL INSTITUTE.

RESEARCH IN THIS AREA IS CONDUCTED ALSO BY THE INSTITUTE OF APPLIED PHYSICS AND THE CENTRAL AEROLOGICAL OBSERVATORY UNDER THE DIRECTION OF ACADEMICIAN YE. K. FEDOROV, AND A TEAM GUIDED BY I. I. GAYVORONSKIY.

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EXPERTS OF THE STATE INSTITUTE OF CIVIL AVIATION, UKRAINIAN HYDRO-METEOROLOGICAL INSTITUTE, AND KIEV UNIVERSITY ARE TAKING PART IN THESE STUDIES.

ACCORDING TO V. M. KOSENKO, HEAD, AVIATION SERVICE DEPARTMENT OF THE MAIN ADMINISTRATION OF THE HYDROMETEOROLOGICAL SERVICE UNDER THE COUNCIL OF MINISTERS, U.S.S.R., REVEALED THAT THE DIOXIDE FOG SUPPRESSION EXPERIMENTS WERE NOT SUCCESSFUL, AND THAT THIS PROMPTED THE EXPERIMENTS WITH NEWLY DEVELOPED MOLECULAR FILMS.

YU. A. SEREGIN, LAUREATE OF THE STATE PRIZE, DEPUTY CHIEF, DEPARTMENT OF ACTIVE MEASURES, MAIN ADMINISTRATION OF THE HYDROMETEOROLOGICAL SERVICE, SOUNDED A BIT SKEPTICAL OF THE OUTCOME OF EXPERIMENTS, ALTHOUGH TERZIYEV DESCRIBED THE RESULTS AS "HOPEFUL".

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19671145

AN0017047

C

UR 9030

AUTHOR-- CHECHEL, D., CORRESPONDENT

TITLE-- ASSAULT OF THE ICE BARRIER

NEWSPAPER-- NEDELYA, JANUARY 19-25, 1970, P 2, COLS 1-4

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17*

ABSTRACT-- THE AUTHOR INTERVIEWED A. F. NIKOLAYEV, DOCTOR OF TECHNICAL SCIENCES, PROFESSOR OF THE GOR, KIY POLYTECHNIC INSTITUTE, LAUREATE OF THE STATE PRIZE, AND A WELL KNOWN DESIGNER OF ANTARCTIC VEHICLES. HE HEADED THE TRACTOR-SLED TRAIN OF THE 3RD SOVIET ANTARCTIC EXPEDITION THAT REACHED THE GEOMETRICAL CENTER OF THE ANTARCTICA.

NIKOLAYEV REVEALED THAT DESIGNERS OF THE GOR, KIY POLYTECHNIC INSTITUTE HAVE DEVELOPED A SNOW VEHICLE, THE "PINGUIN", WHICH IS UNDERGOING TESTS. THE IDEA OF THE "PINGUIN" VEHICLE NIKOLAYEV PERCEIVED WHEN HE WAS OBSERVING PENQUINS IN THE ANTARCTICA. LIKE PENQUINS, THE VEHICLE IS MADE TO SLIDE ON ITS BOTTOM, MADE OF FLUORINE PLASTIC BY PADDLES EXTENDING FROM ITS BODY.

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AN0017047

UR 9030

NIKOLAYEV ALSO SAID THAT PLANS CALL FOR WINTER TESTING OF A ROTOR-SCREW-PROPELLED VEHICLE WHICH IS FILLED WITH FOAM PLASTIC. THIS VEHICLE CAN TRAVEL OVER WATER, SWAMPS OR ICE. IT WILL BE USED TO PROPELL ICE-CUTTING MACHINES WHICH ARE ALSO DESIGNED BY THE INSTITUTE. ONE SUCH MACHINE, THE GPI-34, CAN CUT SLITS IN ICE AT THE RATE OF QTP METERS PER HOUR.

THREE PHOTOGRAPHS ARE GIVEN WHICH SHOW AN ICE CUTTING MACHINE, THE LFM-GPI-52, A VEHICLE FOR ICE FISHING, AND THE NEW ROTOR-SCREW-PROPELLED VEHICLE, RESPECTIVELY.

2/2

19600210

mk

USSR

UDC 621.316.56

CHECHEL'NITSKIY, N. P.

"A Contact Device"

USSR Author's Certificate No 315235, filed 10 Nov 69, published 3 Nov 71
(from RZh-Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 9,
Sep 72, Abstract No 9A19)

Translation: A contact device is proposed for connecting radio components with axial leads to measuring instruments. The device contains a rotating ring with contact elements, radially arranged rotating spring-loaded levers, and a base with a slot for the switch on the housing of the component being measured. Lugs on the rotating levers fit into inner grooves in the ring. To improve the reliability and increase the durability of the device, contacts are fastened on the free ends of the rotating levers, and triangular lugs on the levers near the contacts guide the lead of the component to the corresponding contact. The spring-loaded supports are located in the body of the other arms of the levers and interact with a recess on the adjacent lever. Two illustrations.

1/1

USSR

UDC: 621.396.6.049.7

REKEVICHUS, K. I., CHECHEL'NITSKIY, N. P.

"A Vernier-Scale Device"

USSR Author's Certificate No 28245 , filed 28 Jun 69, published 11 Dec 70
(from RZh-Radiotekhnika, No 6, Jun 71, Abstract No 6V413 P)

Translation: The proposed vernier-scale device contains a control element equipped with a drum on which a flexible element such as a wire is wound. This flexible element connects the control element to the pointer which moves along the scale. As a distinguishing feature of the patent, the readout accuracy is improved and the design is simplified by pressing the flexible element against the drum by means of an elastic element such as a nylon tape with the end connected to a leaf spring. One end of the flexible element is fastened to the drum, and the other end fits into a transparent (e. g. glass) tube in front of the scale, and acts as the pointer.

1/1

Optics & Spectroscopy

USSR

UDC: 535.51:621.378.3

CHEKALINSKAYA, Yu. I. and CHECHENINA, Ye. P.

"Polarization Characteristics of a Regenerative Laser Amplifier
by a Faraday Cell and a Partial Polarizer"

Minsk, Zhurnal Prikladnoy Spektroskopii, No 6, 1973, pp 989-997

Abstract: This article is the continuation of an earlier article published by the first of the authors named above (in the collection Kvantovaya elektronika i lazernaya spektroskopiya -- Quantum Electronics and Laser Spectroscopy -- Minsk, 1971, p 552) in which a method was proposed for computing the polarization characteristics of a regenerative laser amplifier based on the matrix description of anisotropic optical elements. This same method is used in the present paper to investigate the characteristics of a regenerative laser amplifier with a linear resonator whose anisotropic element consists of a Faraday cell and a partial polarizer. The advantage of such an element is that its parameters can be varied to produce various forms of polarization: linear, elliptical, and circular. With the polarization characteristics of the amplifier known, the effect of noise on the polarization characteristics of lasers with anisotropic elements can be evaluated. The authors
1/2

USSR

UDC: 535.51:621.378.3

CHEKALINSKAYA, Yu. I., et al, Zhurnal prikladnoy spektroskopii,
No 6, 1973, pp 989-997

thank B. I. Stepanov of the Belorussian Academy of Sciences and
V. S. Rubanov for their advice and discussions.

2/2

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USSR

UDC 621.375.8

CHEKALINSKAYA, Yu. I., and CHECHENINA, Ye. P.

"On Calculating the Output Power of Gas Lasers"

Minsk, Zhurnal Prikladnoy Spektroskopii, vol 15, No 5, Nov 71, pp 925-926

Abstract: An approximation expression is derived for calculating the output power of gas lasers over a broad range of variations in the length of the active element. One table, bibliography of two titles.

1/1

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L/2 039 UNCLASSIFIED PROCESSING DATE--20NOV70
TITLE--AMPLIFICATION OF A SIGNAL OF BROAD SPECTRAL COMPOSITION BY AN
OPTICAL QUANTUM AMPLIFIER -U-
AUTHOR--(02)--CHEKALINSKAYA, YU.I., CHECHENINA, YE.P.
COUNTRY OF INFO--USSR
SOURCE--ZHURNAL PRIKLADNOI SPEKTROSKOPII, VOL. 12, APR. 1970, P. 657-667
DATE PUBLISHED-----70
SUBJECT AREAS--PHYSICS
TOPIC TAGS--QUANTUM DEVICE, LASER POWER AMPLIFIER, SIGNAL FREQUENCY,
RESONATOR Q FACTOR
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--2000/1311 STEP NO--UR/0368/70/012/000/0657/0667
CIRC ACCESSION NO--AP0124962
UNCLASSIFIED

2/2 039

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0124962

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. STUDY OF THE EFFECT OF THE INTENSITY OF AN AMPLIFIED SIGNAL OF BROAD SPECTRAL COMPOSITION AND OF THE EFFECT OF THE RESONATOR PARAMETERS ON THE FREQUENCY CHARACTERISTICS OF A REGENERATIVE OPTICAL QUANTUM AMPLIFIER. THE PROBLEM IS SOLVED TAKING INTO ACCOUNT SATURATION OF THE AMPLIFICATION FACTOR OF THE ACTIVE MATERIAL IN THE CASE OF HOMOGENEOUS LINE BROADENING. IN A REGION SUFFICIENTLY CLOSE TO THE LASING THRESHOLD IN THE PRESENCE OF SMALL INCIDENT SIGNALS THE GAIN PASSBAND CONTOURS ARE DISTINCTLY EXPRESSED. WITH INCREASING DISTANCE FROM THE LASING THRESHOLD, OR WITH AN INCREASE IN THE SIGNAL, THESE CONTOURS BROADEN. AN EXPRESSION IS PRESENTED FOR THE OPTIMAL SIGNAL CORRESPONDING TO MAXIMUM ENERGY REMOVAL FROM THE ACTIVE ELEMENT OF THE AMPLIFIER.

UNCLASSIFIED

Rare Metals

USSR

UDC 546.664'24:621.317.412

PECHENNIKOV, A. V., KUPRIYANOV, B. A., CHECHERNIKOV, V. I., ABRIKOSOV, N. KH.,
and ZINCHENKO, K. A., Moscow State University imeni M. V. Lomonosov, Institute
of Metallurgy imeni A. A. Baykov, Academy of Sciences USSR

"Magnetic Properties of Dysprosium Tellurides"

Moscow, Neorganicheskiye Materialy, Vol 6, No 8, Aug 70, pp 1528-1529

Abstract: There is interest in a study of the magnetic properties of the r.e.m. Chalcogenides of the yttrium subgroup, most elements in which have a complex magnetic structure. The authors therefore studied compounds of dysprosium with tellurium: DyTe, Dy₃Te₄, Dy₂Te₃, Dy₄Te₇, Dy₄Te₉, and Dy₄Te₁₁. Measurement of the temperature dependence of magnetic susceptibility of dysprosium tellurides was performed using a pendulum balance in the 80-900°K temperature interval with a magnetic field intensity of about 10 koe. The investigations showed that the dependence of the inverse specific magnetic susceptibility on temperature is linear for all dysprosium tellurides. The results of the studies of the magnetic properties showed that these compounds have different electrical properties from metallic dysprosium and a significantly different nature of exchange interactions, indicating that the sf exchange interaction is significant in the formation of complex magnetic structures in the r.e.m.

1/1

Acc. Nr: AP0038030

Ref. Code: UR 0056

PRIMARY SOURCE: Zhurnal Eksperimental'noy i Teoreticheskoy
Fiziki, 1970, Vol 58, Nr 1, pp 80-84

MAGNETIC PROPERTIES OF URANIUM AND THORIUM COMPOUNDS
CONTAINING IRON, NICKEL OR COBALT

Chechernikoy, V. I.; Pletyushkin, V. A.; Shavishvili, T. M.;
Slovyanskikh, V. K.

The magnetic susceptibility has been measured for the following actinoid compounds with 3d-metals: UFe_2 , UCo_2 , UNi_3 , $ThNi$, $ThNi_3$, $ThCo_5$. Compounds which are isomorphic with respect to their crystal structure are found to possess different magnetic properties. Thus UFe_2 and $ThCo_5$ are ferromagnetic substances whereas UCo_2 and $ThNi_3$ are temperature-independent paramagnetic substances. The rigid band model is employed for interpreting the results obtained.

REEL/FRAME

19731071

21

08

1/2 017 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--END WINDOW MINIATURE COUNTER FOR SOFT BETA RADIATION -U-

AUTHOR--(04)-BESKORSKIY, A.I., PERUYSHEV, E.V., MADUYEV, V.L., CHECHETINA,

~~N.A.~~
COUNTRY OF INFO--USSR

SOURCE--PRIB. TEKH. ENSP. 1970, 1, 66-7

DATE PUBLISHED-----70

SUBJECT AREAS--NUCLEAR SCIENCE AND TECHNOLOGY

TOPIC TAGS--BETA PARTICLE DETECTOR, GAMMA BACKGROUND, MICA, RADIATION
COUNTER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1989/1881

STEP NO--UR/0120/70/001/000/0066/0067

CIRC ACCESSION NO--AP0108211

UNCLASSIFIED

2/2 017

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0108211

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A MINIATURE BETA COUNTER WITH AN END WINDOW IS DESCRIBED WHICH IS CONVENIENT FOR CONTROLLING BETA RADIATION ON GAMMA BACKGROUND NOISE IN VACUUM. THE DIMENSIONS AND THICKNESS OF THE MICA WINDOW OF THE COUNTER ARE SIGNIFICANTLY SMALLER THAN IN INDUSTRIAL VERSIONS OF SIMILAR DEVICES. THE CONSTRUCTION AND PARAMETERS ARE GIVEN.

UNCLASSIFIED

USSR

UDC: 681.3

CHECHETKIN, N. I., ILARIONOVA, R. M., TUDER, G. M.

"On a Method of Diagnosing an Arithmetic Device"

V sb. Konstruir. i vnedreniye novykh sredstv vychisl. tekhn. vvp. 2
(Design and Introduction of New Computer Technology Facilities. No 2),
Kiev, 1970, pp 162-166 (from RZh-Kibernetika, No 9, Sep 71, Abstract
No 9V556)

[No abstract]

1/1

USSR

UDC: 681.3

CHECHETKIN, N. I.

"Representing the Arithmetic Device of the 'Minsk-22' Computer in the Language of Microprograms"

V sb. Konstruir. i vnedreniye novykh sredstv vychisl. tekhn. Vyp. 2
(Design and Introduction of New Computer Technology Facilities. No 2),
Kiev, 1970, pp 148-161 (from RZh-Kibernetika, No 9, Sep 71, Abstract
No 9V545)

[No abstract]

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Chechetkin, Yu.V.

JPRS 50288

16 June 1972

EDC: 621.1 8.152

IRRIGATION OF CONDENSATE WITH STRONGLY FUNCTIONING ION-EXCHANGER FILTERS AT THE VR-50 ATOMIC ELECTRIC POWER PLANT

[Article by Candidates of Technical Sciences A.V. Izrael', P.P. Zakhov, and Yu.V. Chechetkin, Engineer I.P. Sechin, Candidate of Chemical Sciences A.I. Zhelezin, and engineers Yu. P. Karaman, L.P. Rodionovskaya, and L.N. Masnyay, Moscow, Teplotekhnika, Tashkent, 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 purification of the condensate of an atomic electric power plant from dissolved and suspended impurities, and also to verify the design of individual elements of an ion-exchanger filter, a scale-work installation with separately functioning ion-exchanger filters (two meters in diameter), with a separator-exchanger and anion-exchanger resins, connected in series, was installed and tested on the bypass of the condensate loop of the VR-50 Atomic Electric Power Plant.

The filters were identical in their design. The drainage and distribution systems of the filters were of the siphon type. The siphon at the end of the system were formed of a coil of stainless steel with a diameter of 0.8 cm. The coil was so made that the stem of the siphon was 0.1 m in the middle of the lower system and 0.2 m in 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 resistance of the filters, and the resistance of the drainage system) and also the physicochemical composition of the condensate (the pH value, electrical conductivity, hardness, the content of elements of corrosion products and the total beta-activity). The electrical 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 621.039.534.44:620.193.23

MARTYNOVA, O. I., NAZAROV, A. I., CHECHETKIN, Yu. V., KOBZAR', I. G.,
SAMOYLOV, Yu. F., and PETROVA, T. I.

"Transition of Zinc Corrosion Products From Boiling Water Into Steam and
Distribution of the Active Component on the Circuit of the VK-50 Boiling
Water Reactor"

Moscow, Atomnaya Energiya, Vol 29, No 2, Aug 70, pp 82-86

Abstract: Values are presented for the distribution coefficient (K_d) of Zn corrosion products at 180 atm (355°C) and 100 atm (310°C) and are compared with experimental data of the visible Zn distribution coefficient in the VK-50 boiling water reactor according to measurements with the Zn^{65} isotope. Insofar as K_d ($K_d = 11.6$ at 70 atm) and the half-life of Zn^{65} ($T_{1/2} = 245$ days) are very high, the Zn^{65} activity is assumed to represent the principal part of the activity of corrosion products in the steam-condensate cycle of the VK-50 reactor. This is shown from data on the activity of several blocks of the steam-condensate cycle. Steam washing and replacing brass parts in the turbine condenser and preheaters with parts made from other alloys are considered effective means for reducing Zn activity.

1/1

USSR

UDC 551.510.721:539.12.08:621.039.524.4-97

KNYAZEV, V. A., KOTIKOV, P. I., ~~LAPTEV, V. G.~~ and CHECHETKIN, YU. V.

"Control of the External Environment of Atomic Electric Power Plants With a Boiling Water Reactor"

Moscow, Atomnaya Energiya, Vol 29, No 1, Jul 70, pp 18-21

Abstract: A brief outline is given of the program used to control the external environment of an atomic electric power plant with a boiling water reactor. Data are presented on the mean diurnal discharge intensity, the wind rose diagram, and the amount of atmospheric precipitation during operation of atomic electric power plants with fuel elements which are not gas-tight, the mean annual results of measuring the β -activity of samples of the external environment taken at distances of 1 and 65 km from the ventilation pipes of atomic electric power plants compared with data on the discharge intensity of radioactive gases, and the intensity of the radiation exposure dose locally caused by flaring radioactive gases under various meteorological conditions and for various intensities of discharge through the ventilation pipe.

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USSR

KNYAZEV, V. A., et al., Atomnaya Energiya, Vol 29, No 1, Jul 70, pp 18-21

The results of measuring the radioactive fallout and radiometric analysis of the snow, soil, and vegetation samples permit the conclusion to be drawn that with a gas discharge intensity up to 1,000 curies/day, the contribution of the eliminated radioactive waste to the total activity of various objects of the external environment is not noticeable against the background of global fallout. The experimental values of the exposure dose intensity were used to calculate the absorbed radiation doses caused by an active cloud in the vicinity of the atomic electric power plant in a year. These estimates demonstrated that with a radioactive gas discharge intensity of 1,000 curies/day the absorbed radiation dose at a distance of more than 3 km from the ventilation center does not exceed 0.05 rads/year.

From the investigated data and the operating experience it has been concluded that two programs must be developed for controlling the external environment: for normal operating conditions of the atomic electric power plant, and for the occurrence of emergency discharge of radioactive substances into the external environment. Both control programs are outlined.

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USSR

KNYAZEV, V. A., et al., Atomnaya Energiya, Vol 29. No 1, Jul 70, pp 18-21

It is noted that the total number of samples and measurements is multiplied by 5 or 10; times in the case of an emergency situation.

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1/2 023 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--SELECTIVE REMOVAL OF DISPERSED PARTICLES INTO A STEAM AREA -U-

AUTHOR--(03)-MARTYNOVA, O.I., NAZAROV, A.I., CHECHETKIN, YU.V.

COUNTRY OF INFO--USSR

SOURCE--TEPLOENERGETIKA 1970, 17(3), 51-4

DATE PUBLISHED-----70

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

TOPIC TAGS--PARTICLE DISTRIBUTION, IMPURITY LEVEL, SURFACE ACTIVE AGENT,
STEAM BOILER, MASS TRANSFER/(U)VK50 REACTOR LOOP

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1992/0386

STEP NO--UR/0096/70/017/003/0051/0054

CIRC ACCESSION NO--AP0111579

UNCLASSIFIED

2/2 023

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--APO111579

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE CONTAMINATION OF STEAM WITH SOLID PARTICLES, CARRIED ON BUBBLES, WAS STUDIED BY THE USE OF RADIOSOTOPES ON A VK-50 BOILING WATER REACTOR LOOP OPERATING AT STEAM PRESSURES OF 70 KG,CM PRIME2. VARIOUS ACTIVITY DISTRIBUTION DETNS. SHOWED THAT THE CONTAMINATION WAS NOT PROPORTIONAL TO THE STEAM MOISTURE. THE PRESSURE OF SURFACE ACTIVE AGENTS IN THE BOILING LIQ. (HEAT TRANSFER AGENT), AND THEIR EFFECT ON THE SELECTIVE TRANSFER OF DISPERSED PARTICLES INTO THE STEAM WAS OBSD. FACILITY: MOSK. ENERG. INST., MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC 619:616.988.43:636.22/.28

TOLSTYAK, I. Ye., BAKUMENKO, M. D., CHECHETKINA, N. P., KONOZENKO, P. A., and
OMELAVENKO, A. A., Ukrainian Scientific Research Institute of Experimental
Veterinary Medicine

"Epizootiology of Food-and-Mouth Disease Variant A₂₂"

Moscow, Veterinariya, No 5, May 71, pp 45-46

Abstract: The history of foot-and-mouth disease variant A₂₂ in the Ukraine can be separated into two periods: the prevaccination period, when the fight against the infection consists primarily of veterinary sanitation measures, and the vaccination period, characterized by widespread use of aluminum hydroxide formaldehyde vaccine from lapinized A₂₂ virus. Still, active immunization of animals in the Ukraine was required. The development of the disease in recent years (1966-1969) in various regions of the Ukraine is reviewed. It was concluded that the establishment of immune zones for cattle, using the above vaccine, might solve the foot-and-mouth disease problem for all animals within a given region.

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USSR

UDC 621.357.7.035.4.669.128(088.8)

BABENKO, B. A., DUNISHCHEV, P. A., MITRYAKOVA, A. V., CHECHETKINA, V. A., and SHILOVSKIYA, V. P., Saratov Polytechnical Institute

"A Process for the Reduction of Oxidized Chloride Electrolyte for Iron Plating"

Author's Certificate No 346389, filed 25 Dec 70, published 22 Aug 72 (from Referativnyy Zhurnal -- Khimiya, No 8(II), 1973, Abstract No 8L316P)

Translation: The process is patented for the reduction of oxidized chloride electrolyte of iron plating during its purification by electrolysis. It is improved in that in order to increase the speed of the reduction, the process is carried out with the application of ultrasonic vibrations having frequencies of 18-22 kHz and an intensity of 0.8-1.5 watts/cm² for a ratio of the anode to cathode surface of 3:1 and D_a 10-30 amps/decimeter². The application of the ultrasonic vibrations speeds up the process of the reduction of the oxidized chloride electrolyte during the iron plating 7 to 10 fold.

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Beryllium

USSR

UDC 669.725.621.039.5

GOL'TSEV, V. P., CHECHETKINA, Z. I., SERNYAYEV, G. A.

"Radiation Damage to Beryllium With Low-Temperature Neutron Bombardment"

Radiatsion. Fiz. Tverd. Tela. i Reaktornoye Materialoved. [Solid State Radiation Physics and Reactor Materials Science -- Collection of Works], Moscow, Atomizdat Press, 1970, pp. 213-220. (Translated from Referativnyy Zhurnal Metallurgiya, No. 5, 1971, Abstract No. 5 I807 by V. B.).

Translation: The bombardment of hot-pressed Be with an integral fast neutron flux of about $5 \cdot 10^{21} \text{ cm}^{-2}$ causes no notable changes in mechanical properties. Increasing the dose to $4 \cdot 10^{22} \text{ cm}^{-2}$ causes a decrease in density of 1.5% as a result of the appearance of microfissures and discrete cavities along the grain boundaries. 3 figs; 4 biblio refs.

1/1

Beryllium

USSR

UDC 669.725:621.039.5

ZAVGORODNIY, A. YA., GOL'TSEV, V. P., CHECHETKINA, Z. I., SERNYAYEV, G. A.

"Kinetics of Gas Swelling of Irradiated Beryllium"

Radiatsion. fiz. tverd. tela i reaktornoye materialoved. -- V sb. (Radiation Solid State Physics and Reactor Material Science -- collection of works), Moscow, Atomizdat Press, 1970, pp 221-231 (from RZh-Metallurgiya, No 4, Apr 71, Abstract No 4I834)

Translation: Dilatometric and metallographic methods were used to study the kinetics of gas swelling of hot-extruded Be irradiated at 70° with doses of $3.7 \cdot 10^{21}$ - $2 \cdot 10^{22}$ neutrons/cm² in the temperature range of 100-900°. The presence of three sections on the temperature-swelling curves of irradiated beryllium was detected. The bibliography has 1 entry.

1/1

Beryllium

USSR

UDC 621.039.532.5

CHECHETKINA, Z. I., GOL'TSEV, V. P., KAZAKOV, V. A., SERNYAYEV, G. A., and
~~BAZUKHAN, V. G.~~

"Radiation Damage to Beryllium by High-Temperature Irradiation"

Moscow, Atomnaya Energiya, Vol 30, No 5, May 71, pp 434-438

Abstract: Radiation damage to beryllium by high-temperature irradiation is aggravated by the fact that the atoms of helium and tritium forming in the irradiation process, by having sufficient diffusion mobility and by combining, form a nucleus of gas bubbles which under certain conditions may lead to significant swelling of the material and to changes in its mechanical properties.

This article is concerned with the experimental results of studying the physico-mechanical properties of beryllium following irradiation at various temperatures by an integrated fast neutron flux of $6 \cdot 10^{20}$ neutron/cm². The authors give six illustrations to demonstrate their findings.

On the basis of their study the authors make several conclusions. Radiation damage is manifested in beryllium in its swelling and hardening. The swelling attained in the process of irradiating beryllium depends to a large degree both on its structural state and on the temperature of the
1/2

USSR

CHECHETKINA, Z. I., et al., *Atomnaya Energiya*, Vol 30, No 5, May 71, pp 434-438

irradiation. The fused material in the entire investigated temperature range does not undergo substantial swelling. Materials hot-extruded from powder with dimensions less than 60 and 600 μ m do not undergo extensive swelling in the temperature range below 600° C. Hot-extruded materials begin to swell noticeably at a temperature of 600° C and continue to swell as the temperature of irradiation is elevated. A material, hot-extruded from powder with dimensions less than 600 μ m has a greater tendency to swelling than does a material obtained from a powder with dimensions less than 60 μ m.

The strength properties of beryllium depend to a very large degree on the irradiation temperature. Electron microscopic studies show that the characteristics of change in the properties of the materials correlate well with the characteristics of the behavior of the helium accumulated in them. The behavior of this same helium in materials prepared by various techniques is predetermined to a large degree by their structural states.

This article contains 6 figures and a bibliography of 6 titles.

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USSR

UDC 621.039.532.5:621.039.553

CHECHETKINA, Z. I., GOL'TSEV, V. P., KLIMENKOV, V. I., VOTINOV,
~~S. N.~~, and TSYKANOV, V. A.

"Behavior of Metallic Beryllium in the SM-2 Reactor"

Moscow, Atomnaya Energiya, Vol 29, No 3, Sep 70, pp 174-177

Abstract: Metallic beryllium has been used in the SM-2 reactor since 1962 in the system for expelling water from the neutron trap. The expulsion system consists of four inserts placed between the fuel assemblies and the central channel located in the neutron trap. Each insert consists of two blocks. The bottom part of the safety rods is also made of beryllium. In 1964 the reactor design was modified by replacing the beryllium oxide reflector with metallic beryllium. Since then experimental material has been accumulated on the stability of metallic beryllium under SM-2 conditions. The article presents some of the data. Experiments were conducted on specimens cut out of the inserts and safety rods before and after being held in the reactor. The inserts were made of hot-pressed blocks of dis-

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USSR

CHECHETKINA, Z. I., et al., Atomnaya Energiya, Vol 29, No 3, Sep 70, pp 174-177

tilled powder beryllium, the safety rods fabricated by hot extrusion from hot-pressed blocks. The investigated parts found in the neutron trap underwent the maximum irradiation. The thermal-neutron flux over the cross section of the inserts was $1.5 \cdot 10^{15}$ - $5 \cdot 10^{14}$ nv, the fast-neutron flux $1 \cdot 10^{15}$ nv and energy release through gamma absorption 100 w/g. The main emphasis was on dimensional stability, density, structural changes, and mechanical properties of beryllium.

It was found that the surface condition depends on the water quality, the total time spent in the water by the beryllium, and the integral irradiation dose. A photograph taken of the inserts during the 1962-1964 period shows extensive pitting regions, while a photograph taken subsequently, when the quality of the medium was improved, shows only individual traces of pitting. An increase in the irradiation dose on the surface of the

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USSR

CHECHETKINA, Z. I., et al., Atomnaya Energiya, Vol 29, No 3, Sep 70, pp 174-177

blocks produces macrocracks in addition to the pitting. No changes were found in the geometric dimensions of the investigated parts even after irradiation with fast neutrons to an integral dose of $(3-4) \cdot 10^{22}$ neutrons/sq cm. The density of the beryllium remained constant in all cases up to doses of $(5-7) \cdot 10^{21}$ neutrons/sq cm. A decrease in density to 1.5 percent was found in individual specimens cut out of blocks irradiated with doses of 10^{22} neutrons/sq cm or more. There is practically no change in the density of hot-extruded beryllium at the above doses. Up to $5 \cdot 10^{21}$ neutrons/sq cm there is no appreciable change in the microstructure of hot-pressed beryllium. At an integrated flux of about 10^{22} neutrons/sq cm there are twins, slip lines, microcracks and appreciable discrete porosity, primarily along the grain boundaries. Higher doses result in fur-

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USSR

CHECHETKINA, Z. I., et al., Atomnaya Energiya, Vol 29, No 3,
Sep 70, pp 174-177

ther porosity development and the spread of microcracks over the grain boundaries, as well as the grains themselves. No appreciable changes are found in the microstructure of hot-extruded beryllium irradiated with an integrated flux of up to $1.5 \cdot 10^{22}$ neutrons/sq cm; there are no microcracks. There is a sharp increase in microhardness up to an integrated flux of $(3-5) \cdot 10^{21}$ neutrons/sq cm. The compression strength remains practically unchanged up to a dose of $(3-5) \cdot 10^{21}$ neutrons/sq cm, but declines with a higher dose. Yield point is unchanged up to 10^{20} neutrons/sq cm, but rises with a higher dose. The influence of the build-up of helium and tritium products is considered.

The results indicate that the permissible irradiation dose for beryllium parts which carry no external mechanical loads is an integrated fast-neutron flux of $2 \cdot 10^{22}$ neutrons/sq

cm.
4/4

1/2 027 UNCLASSIFIED PROCESSING DATE--16OCT70
TITLE--THE COMPETITION OF HETEROLOGOUS ANTIGENS IN THE MICROMODIFICATION
OF OUCHTERLONY'S PRECIPITATION REACTION IN GEL -U-
AUTHOR--CHECHIK, B.E. C
COUNTRY OF INFO--USSR
SOURCE--BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY, 1970, VOL 69,
NR 5, PP 112-115
DATE PUBLISHED-----70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--ANTIGEN, MONKEY, DAIRY CATTLE, SPLEEN, LEUKEMIA, LEUKOCYTE

CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1998/0210 STEP NO--UR/0219/70/069/005/0112/0115
CIRC ACCESSION NO--AP0120908
UNCLASSIFIED

2/2 027

UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0120908

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. WHEN ANTIGENS ARE LOCATED IN ADJACENT ALVEOLI THE TISSUE EXTRACTS OF MONKEYS AND COWS ARE ENDOWED WITH A CAPACITY TO INHIBIT THE PRECIPITATION REACTION IN GEL BETWEEN THE ANTISERUM OF SPLEEN OF MAN DEAD OF CHRONIC MYELOLEUKEMIA AND ONE OF THE LEUKOCYTIC ANTIGENS. CALF TISSUE EXTRACTS INHIBITED THE REACTION OF HEMOCYTOBLASTIC ANTIGEN, CONTAINED IN HUMAN AND MONKEY TISSUES, WITH THE RESPECTIVE ANTISERA. COMPETITION OF ANTIGENS LIE AT THE BASIS OF THE ACTION OF INHIBITORS IN BOTH SYSTEMS. FACILITY: MOSCOW P. A. GUERTZEN ONCOLOGICAL INSTITUTE.

UNCLASSIFIED

1/2 034 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--REACTION OF BUTADIENE NITRILE RUBBERS WITH PHENOLFORMALDEHYDE
RESINS IN THE PRESENCE OF HEXAMETHYLENETETRAMINE -U-
AUTHOR-(04)-DINZBURG, B.N., CHECHIK, L.E., KOMISSAROV, S.A., BARAMBOYM,
N.K.
COUNTRY OF INFO--USSR
SOURCE--KAUCH. REZINA 1970, 29(2), 10-12
DATE PUBLISHED-----70
SUBJECT AREAS--MATERIALS
TOPIC TAGS--BUTADIENE, NITRILE RUBBER, PHENOL FORMALDEHYDE RESIN,
HEXAMETHYLENETETRAMINE, IR SPECTRUM, COPOLYMER, VULCANIZATE, PLASTIC
FABRICATION, MOLECULAR STRUCTURE, SPECTROMETER/(U)SKN40 NITRILE RUBBER,
(U)NOVOLAK PHENOLIC RESIN, (U)UR10 SPECTROMETER, (U)UKC14 SPECTROMETER
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1997/0461 STEP NO--UR/0138/70/029/002/0010/0012
CIRC ACCESSION NO--AP0119397
UNCLASSIFIED

2/2 034

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0119397

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE REACTION OF SKN-40 RUBBER (I) WITH A PHENOL CH SUB2 O NOVOLAK RESIN 18 (II), HEXAMETHYLENETETRAMINE (III), AND S WAS STUDIED BY IR SPECTROSCOPY. MODEL I-II-III MIXTS. WERE MILLED AT 30-40DEGREES AND MOLDED AT 155DEGREES FOR 20 HR, AND THE PRODUCTS WERE EXAMD. IN UR-10 AND UKC-14 SPECTROMETERS OVER A WIDE RANGE OF FREQUENCIES. I AND II REACTED DURING MILLING TO GIVE 8-II COPOLYMERS (THE AMT. OF COPOLYMERS FORMED DEPENDS ON THE I-II RATIO AND PROCESSING CONDITIONS). MOLDING AND HEAT TREATMENT OF I COMPNS. WAS ACCOMPANIED BY HARDENING OF II WITH III, A REACTION BETWEEN I, II, AND III, AS WELL AS A REACTION BETWEEN S, I, AND II. THE REACTION LED TO THE FORMATION OF SUPRAMOL. STRUCTURES WHICH IMPROVED THE PHYSICOMECH. PROPERTIES OF THE VULCANIZATES.

FACILITY: VSES. NAUCH.-ISSLED. INST. PLENOCHNYKH. MATER. ISKUSSTV. KOZHI, MOSCOW, USSR.

UNCLASSIFIED

1/2 030 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--ANODIC OXIDATION OF POLYFLUOROALKOXY ACIDS -U-
AUTHOR--(03)-CHECHINA, O.N., LEVIN, A.I., SOKOLOV, S.V.
COUNTRY OF INFO--USSR
SOURCE--ZH. VSES. KHIM. OBSHCHEST. 1970, 15(1), 120
DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--ELECTROLYTIC OXIDATION, FLUORINATED ORGANIC COMPOUND,
ALKOXIDE, ORGANIC ACID, IR SPECTRUM

CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--2000/1632 STEP NO--UR/C063/70/015/001/0120/0120
CIRC ACCESSION NO--AP0125254
UNCLASSIFIED

2/2 030

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0125254

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ELECTROLYSIS OF 20 ML OF 1.5M
SOLN. OF H(CF SUB2 CF SUB2) SUB2 CH SUB2 UCH SUB2CH SUB2 CO SUB2 H IN
3:1 MEQH PYRIDINE AT ANODIC C.D. 10 A-DM PRIME2 AND 30-5DEGREES WITH PT
ANODE FOR 1.5 HR WITH A P.D. OF 43-80 V GAVE ON DILN. 30PERCENT (H(CF
SUB2 CF CUB2) SUB2 CH SUB2 OCH SUB2 CH SUB2) SUB2, B SUB10 135-6DEGREES,
N PRIME24 SUBD 1.3467. THE IR SPECTRUM FAILED TO SHOW ANY HO OR C TIMES
C BANDS. FACILITY: URAL. POLITEKH. INST. IM. KIROVA,
SVERDLOVSK, USSR.

UNCLASSIFIED

USSR

UDC 533.916

VOLOSHKO, A. Yu., SOLODOVCHENKO, S. I., CHECHKIN, V. V.

"Heating a Moving Plasma With Fast, High-Amplitude 'Whistlers'"

Kiev, Ukrainskiy Fizicheskiy Zhurnal, Vol 16, No 11, 1971,
pp 1822-1828

Abstract: An investigation is made of the absorption of high-frequency energy by a moving plasma at the resonant frequency of the fast, high-amplitude magnetoacoustical waves known as "whistlers." A Doppler shift of the whistler resonance frequency is discovered; it is caused by the motion of the plasma. It is found also that a plasma with a density of about 10^{15} /cm or higher is heated to a temperature of about 100 ev, a temperature rise requiring a high expenditure of the energy stored in the high-frequency arrangement. With further motion of the heated plasma bunching along the fundamental magnetic field, there is a reduction in plasma temperature of less than 10% at distances

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VOLOSHKO, A. Yu. et al, Ukrainskiy Fizicheskiy Zhurnal, Vol 16,
No 11, 1971, pp 1822-1826

of the order of 100 cm from the heated portion. This heated bunching does not go beyond the magnetic barrier, the height of which is three times the value of the fundamental magnetic field. The experimental method is described and the results of the measurements are given. The work was done in the Khar'kov Physico-Technical University.

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Acc. Nr: APO038026

C

Ref. Code: UR 0056

PRIMARY SOURCE: Zhurnal Eksperimental'noy i Teoreticheskoy
Fiziki, 1970, Vol 58, Nr 1, pp 45-50

INVESTIGATION OF PLASMA INSTABILITY IN A STRONG
ALTERNATING ELECTRIC FIELD

Grigor'eva, L. I.; Smerdov, B. I.; Stepanov, K. N.;
Cherbkin, V. V.

The frequency spectrum is obtained for the previously discovered high frequency small-scale instability excited in a plasma by a high amplitude fast magnetosonic wave. The dependence of noise amplitude on field strength of the wave is investigated and it is shown that the dependence is of the threshold type.

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REEL/FRAME
19731067

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1/2 030 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--INVESTIGATION OF RESONANCE EXCITATION OF HIGH AMPLITUDE WAVES IN A
PLASMA -U-
AUTHOR--(03)-GRIGORYEVA, L.I., SMERDOV, B.I., CHECHKIN, V.V.
COUNTRY OF INFO--USSR
SOURCE--ZHURNAL EKSPERIMENTAL'NOY I TEORETICHESKOY FIZIKI, 1970, VOL 58,
NR 4, PP 1234-1242
DATE PUBLISHED----- 70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--PLASMA WAVE, MAGNETIC RESONANCE, ACOUSTIC WAVE, PLASMA
OSCILLATION, HIGH FREQUENCY CURRENT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRA--1988/1720

STEP NO--UR/0056/70/058/004/1234/1242

CIRC ACCESSION NO--AP0106453

UNCLASSIFIED

2/2 030

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0106453

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. EXCITATION OF HIGH AMPLITUDE WAVES IN A PLASMA CYLINDER IS INVESTIGATED EXPERIMENTALLY FOR FREQUENCIES Ω SMALLER THAN Ω SMALLER THAN $(\Omega$ SUBHI Ω SUBHE) PRIMEONE HALF. THE WAVE IS EXCITED BY A HIGH FREQUENCY AZIMUTHAL, AXIALLY PERIODIC CURRENT FLOWING IN A COIL ENCIRCLING THE PLASMA. THE SPECTRUM OF MAGNETIC FIELD OSCILLATIONS, WHICH APPEAR IN THE PLASMA WHEN THE EXCITING CURRENT IS SWITCHED ON, IS OBTAINED. IT IS DEMONSTRATED EXPERIMENTALLY THAT IN THE REGION OF RESONANCE EXCITATION OF A FAST MAGNETO ACOUSTIC WAVE (WHISTLE) IN THE PLASMA, BESIDES THE PURELY FORCED OSCILLATIONS, TWO PROPER OSCILLATIONS (WHISTLE) ARE ALSO EXCITED, THE WAVELENGTH OF ONE OSCILLATION AND THE FREQUENCY OF THE OTHER DIFFERING RESPECTIVELY FROM THE AXIAL PERIOD AND THE FREQUENCY OF THE EXCITING CURRENT. EXCITATION OF PROPER OSCILLATIONS IS DUE TO THE FINITE WIDTH OF THE EXCITING CURRENT SPECTRA IN WAVE NUMBER SPACE AND FREQUENCY SPACE. IT IS ALSO FOUND THAT A WHISTLE WITH A FREQUENCY DIFFERING FROM THAT OF THE EXCITING CURRENT DECAYS INTO A WHISTLE AND A FAST SOUND (CYCLOTRON SOUND) WAVE. THE CONDITIONS FOR SUCH DECAY IN A BOUNDED PLASMA ARE DISCUSSED. FACILITY: FIZIKO-TEKHNICHESKIY INST., AN UKR. SSR.

UNCLASSIFIED

Analysis and Testing

USSR

UDC 620.175

MILOSERDIN, Yu. V., KUL'BAKH, A. A., CHECHKO, V. N., and SEMENOV, B. D., Moscow

"Method of Performing Cyclical Elastic-Plastic Tests of Refractory Materials
by Twisting at Normal and High Temperatures"

Kiev, Problemy Prochnosti, No 12, Dec 70, pp 51-57

Abstract: This work deals with problems of the low-cycle testing of refractory materials by torsion. A method is described and two installations are studied which perform repeated tests automatically at normal and elevated temperatures. The results are presented from the deformation and molybdenum at temperatures in the 293-1600°K range.

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