FRIDMAN, Ya.B., prof., doktor tekhn.nauk; MOROZOV, Ye.M., kand.tekhn. nauk

Calculating mechanical properties of bimetals. Nauch.dokl.vys. shkoly; mash.i prib. no.1:152-163 '58. (MIRA 12:1)

1. Predstavleno kafedroy "Soprotivleniye materialov" Moskovskogo inzhenerno-fizicheskogo instituta.
(Laminated metals)

MOROZOV, Ye.M., kand.tekhn.nauk; FRIDMAN, Ya.B., doktor tekhn.nauk

Calculating the brittle-breakdown resistance of a disk stretched in all directions. Nauch.dokl.vys.shkoly; mash.i prib. no.2: 29-32 '58. (MIRA 12:10)

1. Predstavleno kafedroy "Soprotivleniye materialov" Moskovskogo inzhenerno-fizicheskogo instituta.
(Strength of materials)

FRIDMAN, Ya.B.; MOROZOV, Ye.M.

Approximate evaluation of concentrated stresses in composite specimens. Nauch.dokl.vys.shkoly; mash.i prib. no.4:82-85 '58. (MIRA 12:5)

1. Stat'ya predstavlena Moskovskim inzhenerno-fizicheskim institutom.

(Strains and stresses)

MOROZOV, Ye.M., kand.tekhn.nauk

Choice of the thickness of the hardened layer of engine piston rings. Trakt. i sel'khozmash. no.5:45-47 My '58. (MIRA 11:6)
(Piston rings)

24.4200 1327 1191

S/145/60/000/009/015/017
D221/D304

AUTHOR: Morozov, Ye.M., Candidate of Technical Sciences

TITLE: On the approximate estimation of temperature stresses of the second kind

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Mashinostroyeniye, no. 9, 1960, 59 - 61

TEXT: The article forms an attempt on analytical determination of thermal stresses of the second kind (micro-stresses). Each grain is assumed to possess two perpendicular axes of symmetry of anisotropic coefficients of linear expansion α_1 and α_2 as well as of the elastic moduli E_1 and E_2, which coincide. During heating, the grains are deformed together, owing to expansion, and therefore, normal and tangent stresses are produced. The indentation of grain boundaries results in shift of elementary volumes along these lines. The deviation of grain boundary S from its initial position is given by

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30254

S/145/62/000/009/005/007
D221/D304

the approximate estimation of ...

$$S \int_0^{a/2} \gamma\, dx \int_0^{a/2} \frac{2\tau_{max}}{a} x\, dx \int_0^{a/2} \frac{2\tau_{max}}{aG} x\, dx \frac{\tau_{max} a}{4G} \qquad (2)$$

The maximum stress is then $\tau = 4G \frac{S}{a}$. The deformation $\frac{S}{a}$, and the normal stress σ are obtained by considering the simultaneous displacements of contact area for two adjacent grains. The normal stress quoted by the author was proposed previously by - Boas and Honeycomb. To evaluate the thermal fatigue, the author assumes that the number of temperature cycles, and thus, of plastic deformation of the second order prior to the appearance of cracks is determined by $N = \frac{K}{(\gamma - \gamma_T)^n}$, where K and n are experimental factors; $\gamma - \gamma_T$ is the plastic deformation of shear per one thermal cycle; γ_T is the deformation at the yield limit of isotropic and homogeneous material of specimen. The author takes t_w as an arbitrary temperature, at which no cracks will be formed when unlimited number of cy-

Card 2/3

On the approximate estim

cles is produced. In the case of an [illegible] matrix [illegible] sink, this thermal fatigue [illegible] stresses [illegible] dered from the qualitative point of view the [illegible] made are arbitrary. The statistical distribution of [illegible] and non homogeneous grains can be made on the basis of [illegible] ries. However, the above analysis of [illegible] close relationship with [illegible] parative evaluation of thermal stresses in [illegible] 2 figures and 5 references, 4 Soviet [illegible] The references to the English language [illegible] W. Boas and R. W. K. Honeycombe, Proc. Roy. S[illegible] L. F. Coffin, Transactions of ASME [illegible]

ASSOCIATION: Moskovskiy [illegible] Engineering Physics Institute

SUBMITTED: July 1[illegible]

Card 3/3

AUTHORS

TITLE

PERIODICAL

TEXT

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001135230001-5"

MOROZOV, Ye.M., kand.tekhn.nauk

Approximate calculation of thermal plastic stresses in a pipe. Izv.vys.ucheb.zav.; mashinostr. no.9:11-18 '61. (MIRA 14:12)

1. Moskovskiy inzhenerno-fizicheskiy institut.
(Thermal stresses)

23760

18 8260 2208 1454, 1016

S/089/61/010/006/005/011
B136/B201

21.1300 (1123, 1425, 1504)

AUTHORS: Frieman, Ya. B., Sobolev, N. D., Borisov, S. V. Yezerov, V. I., Konoplenko, V. P., Morozov, Ye. M. Shapovalov, L. A. and Shorr, B. F.

TITLE: Some problems of thermal strength in reactor construction

PERIODICAL: Atomnaya energiya, v. 10, no. 6, 1961, 606 - 619

TEXT: The general idea of the failure of thermal strength includes two types of fracture: the gradual (subcritical) fracture as a consequence of an extreme deformation or of a great number of cracks or of large-sized cracks; causes and manifestations of these fractures are [illegible], and the loss of elastic or plastic strength on the passage through the critical state. Either type of fracture may be brought about by four causes of stress: 1, mechanical or thermal shock stresses; 2, brief static loads for some minutes or hours; 3, static loads for some months or years; 4, periodic loads. Fig. 1 presents examples in the variation of elastic and plastic conditions in a tube, and a fictitious elastic tension is shown to arise in the plastic zone (dashed line), while the forms of mechanical

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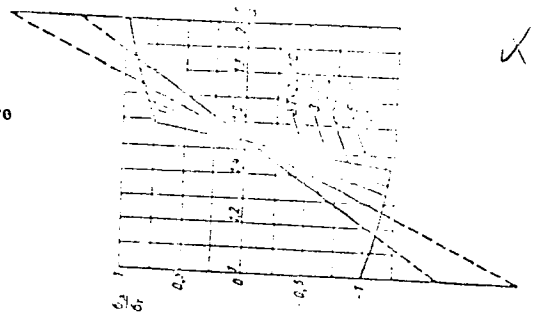
and thermal stress are intercompared in Fig. 4. Creep arises in nonuniformly heated structural elements, and cracks appear as a consequence of plastic information, particularly with materials having a low plasticity at room temperature. For calculating the creeping process the assumption is made on the basis of the creep theory that there is a functional relationship between the rate of creep v_i, the instantaneous stress σ_i, the temperature T, the time τ, and the plastic deformation P, namely, $v_i = v_{i_0}\left(\frac{P}{P_0}\right)^{-\lambda}$. Here, $P = \int_0^{\tau} v_i d\tau$; $v_{i_0} = f_0(\sigma_i, T)$; $P_0 = f_0(\sigma_i, T)$. The thermal fatigue fracture has much in common with the mechanical one. It can be therefore determined from the known mechanical properties of a material. Whereas, however, the thermal fracture appears already after 10^3-10^4 cycles, the technical one takes 10^7-10^5 cycles to appear. A characteristic feature of the thermal fracture is the local deformation in zones with a particularly large temperature difference also in homogeneous fields of stress. This is also related to the appearance of high microstresses (Table 3). For sudden thermal shocks the temperature jump giving rise to a brittle fracture may

be estimated by an equation. Of importance in the practice, however, is the creep character and the durability of the material under combined mechanical and nonsteady thermal loads. Experimental results are illustrated in Fig. 9, where the curves of variation of length-versus-time (scale 400:1) are compared with the cyclic temperature curve II and the thermal and elastic deformation III. As opposed to combined stress conditions, in which the strain-stress characteristic concerned is worsened with increased temperatures, stresses in case of a purely thermal stress are of a thermal origin and lead to bulging of structural elements in the hot zones, without, however, causing their breakdown. The micromechanical properties were checked in two ways. The principle of the second is illustrated in Fig. 13, while the results of the former - for static elongations and at 1400 - 1500°C in vacuum or in a controlled atmosphere, are presented in Fig. 12. In Fig. 13, 1 denotes the sample with a cross section of 2 X 1 or 3 X 1 mm, that is placed in a groove milled out from block 2. The pressure is yielded by stamp 3 made of tungsten briquettes 4. The resulting breakdown is indicated over contact 7. There are 13 figures, 3 tables, and 39 references: 27 Soviet-bloc and 12 non-Soviet-bloc. The three most recent references to English-language publications

read as follows: Fracture, New York, Wiley and Sons, 1959; E. Sternbery, I. Chakravorty, Quart. Appl. Math., 17, no. 2, 205 (1959,; E. Glenny et al. J. Inst. Metals, May (1959,.

SUBMITTED: September 19, 1960



Legend to Fig. 1: Distribution of axial stresses and enlargement of the plastic zone in a thick-walled tube with various temperature jumps: r - radius of an arbitrary point; a - inner radius

Card 4/9 4

MOROZOV, Ye.M.; FRIDMAN, Ya.B.

Trajectories of cracks of brittle fracture as geodetic lines on the surface of bodies. Dokl. AN SSSR 139 no.1:87-90 Jl '61. (MIRA 14:7)

1. Predstavleno akademikom G.V. Kurdyumovym.
(Strains and stresses) (Elasticity)

crack growth [illegible]
the Hamilton- [illegible]
and Barenblatt. [illegible]
principle is employed: [illegible]

where: T - kinetic energy of the moving zone [illegible]
crack, and A - work of forces determining the propagation [illegible]

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001135230001-5"

S/020/62/144/002/015/028
B104/B102

Author: Fridman, Ya. B., and Morozov, Ye. M.

Title: Use of the Hamilton-Ostrogradskiy principle in studies of the destruction of metals

Publication: Akademiya nauk SSSR. Doklady, v. 144, no. 2, 1962, 376-377

[illegible] "evolution function" [illegible] defined and used as the [illegible] function of Hamilton's [illegible] principle. It is the "energy [illegible]" near the tip of a crack, and is the "energy absorption" in [illegible]. The crack terminal moves in the direction at which the [illegible] is extreme. The crack develops in the direction of the [illegible] energy absorption. The [illegible] rules are derived for the crack development: (1) If the metric [illegible] is defined by [illegible] = 1, it follows that $\theta/dt = 0$. In this [illegible], the mean rate of the crack development is at a maximum. (2) If the "evolution function" is time-independent, one obtains $\theta/ds = 0$. The metric of this space is defined by [illegible] = 1, and the time of crack development is minimum. If [illegible] = const, the crack trajectory coincides with a geodetic

Card 1/2

[illegible]. According to Griffiths, the potential energy of deformation of a crack is $V = \pi l^2 \sigma^2/4E$. The newly disclosed as new surfaces form during the crack development is $2T\sqrt{x^2+y^2}$. One obtains:

$$\delta \int \left[\frac{\pi (x^2 + y^2) \sigma^2}{4E} - 2T \sqrt{x^2 + y^2} \right] \sqrt{1 + y'^2}\, dx = 0.$$

Conditions of Griffiths and Barenblatt (DAN, 1.7, no. 1 (1959); Zhurn. prikl. mekh. i tekhn. fiz., no. 4 (1961)) are derived.

ASSOCIATION: Moskovskiy inzhenerno-fizicheskiy institut (Moscow Institute of Physics and Engineering)

PRESENTED: December 21, 1961, by G. V. Kurdyumov, Academician

SUBMITTED: December 16, 1961

Card 2/2

S/0020/64/156/003/0537/0540

ACCESSION NR: AP4038521

AUTHOR: Morozov, Ye. M.; Polak, L. S.; Fridman, Ya. B.

TITLE: Variational principles of crack development in solids

SOURCE: AN SSSR. Doklady*, v. 156, no. 3, 1964, 537-540

TOPIC TAGS: [illegible] variational mechanical principle, [illegible], Hamilton principle, [illegible]

[illegible]

Card 1/2

ACCESSION NR: AP4039521

by [illegible] Hamilton, [illegible] function, the Hamiltonian principle [illegible]

Intermediate cases are also considered, [illegible] increase is involved. [illegible] art. has: [illegible] 10, 5 equations.

ASSOCIATION: Moskovskiy Inzhenerno-Fizicheskiy Institut [illegible] and Physics Institute)

SUBMITTED: 02Nov63 DATE ACQ: 09Jun64 ENCL: 00

SUB CODE: ME NO REF SOV: 011 OTHER: 002

2/2

L 06523-67 EWT(m)/EWP(w)/EWP(t)/ETI IJP(c) JD/EM
ACC NR: AP6029856 SOURCE CODE: UR/0032/66/032/008/0977/0984

AUTHOR: Morozov, Ye. M.; Fridman, Ya. B.

ORG: Moscow Engineering-Physics Institute (Moskovskiy inzhenerno-fizicheskiy institut)

TITLE: Crack analysis as a method of determining fracture characteristics

SOURCE: Zavodskaya laboratoriya, v. 32, no. 8, 1966, 977-984

TOPIC TAGS: material fracture, elasticity theory, crack propagation, thermodynamic analysis, variational calculus, approximation method

ABSTRACT: The variational principle of crack analysis based on qualitative experimental and analytical techniques was used to study causes of fracture. Mechanical and thermodynamic methods were employed in determining crack trajectories and their mode of propagation. The functional

$$E = \int_{l_0}^{l(t)} L ds$$

was related to both equilibrium ($\delta E = 0$) and nonequilibrium cracks $\int_{t_0}^{t_1} \delta E \, dt = 0$,

where E is the difference between the energy absorbed $\int \gamma \, dS$ and supplied $\int F \, dS$ to either type of crack. Since cracks form in zones of maximum energy absorption (stress

UDC: 620.17

Card 1/2

L 06593-67
ACC NR: AP6029856

concentrators), different stress concentrating states were analyzed. Eleven conditions are given whereby cracks terminate or propagate along preferred planes or directions. The fracture toughness (K_c) was related to an experimental modulus of cohesion (K). Modifications of the Griffith theory were made in order to include the effect of σ_1, the largest value of stress occurring at the ends of a crack. Approximate variational methods of determining crack trajectories are given and experimentally confirmed on samples with a circular stress concentration. Another approximate technique, the method of cross sections, was used to analyze ellipsoidal notches of various lengths lying at different angles to the principal stress direction. The calculated critical stress, given as a function of crack angle, showed the largest deviation from exact values at lower angles (below 30°). This method was also applied to the case of two adjacent ellipsoidal notches, and the dependence of the calculated critical stress on the ratio a/l was presented for crack propagation on both ends of the cracks. Here, a was the distance between the cracks and l was the crack length. Orig. art. has: 5 figures, 19 formulas.

SUB CODE: 20 / SUBM DATE: none/ ORIG REF: 011/ OTH REF: 004

Card 2/2

MOROZOV, Ye.M., inzh.

Interchangeable equipment for the ETU-353 excavator for digging trenches in frozen ground. Stroi.i dor.mashinostr. 4 no.12:9 D '59. (MIRA 13:3)
(Excavating machinery--Equipment and supplies)

IZMER, I., kand.tekh.nauk; MOROZOV, Ye.M., inzh.; TUKOVSKAYA, V.V., inzh.

Interchangeable equipment for ETU-353 excavators for digging canals with trapezoidal sections. Stroi. i dor. mashinostr. 5 no.8:14-16 Ag '60. (MIRA 13:8)

(Excavating machinery—Equipment and supplies)

VOROBYOV, I.I., inzh.; [illegible]

Trench excavators made at the Dmitrovskii plant for working frozen ground. Stroi. i dor. mash. 6 no.10:14-16 O '61. (MIRA 14:10)

(Excavating machinery)
(Frozen ground)

LUPYANTSEV, V.A.; MOROZOV, Ye.N.; FIGLIN, I.Z.; FILIPOV, A.G.;
VATNIKOV, A.A., kand. tekhn. nauk, retsenzent;
SAVEL'YEV, Ye.Ye., red.izd-va; LYAKOVA, A.F., tekhn.red.

Chain and bucket trenching excavators. Tsepnye transheinye
ekskavatory. Moskva, Mashgiz, 19[illegible]. 12[illegible] p. (MIRA 16:12)
(Trench digging machines)

L 31074-65 EWA(k)/EWT(1)/EEC(k)-2/T/EEC(b)-2/EWP(k)/EWA(m)-2 Po-4/Pf-4/Pi-4
IJP(c) WG/JHB

ACCESSION NR: AP5006441 S/0051/65/018/003/0510/0512

47
B

AUTHOR: Sosinskiy M. L.; Morozov, Ye. N.

TITLE: Attainment of negative absorption on part of a Doppler broadened line

21

SOURCE: Optika i spektroskopiya, v. 18, no. 3, 1965, 510-512

TOPIC TAGS: negative absorption, amplification, population inversion, laser, Doppler broadening, gas laser, second kind collision, photodissociation

ABSTRACT: A method of amplification of electromagnetic radiation is analyzed in which the total population at the upper level is less than the total population at the lower level $N_i < N_k$, but in which the inequality $\Delta N_i(\nu) > \Delta N_k(\nu)$ still holds in some frequency range $\nu, \nu + \Delta\nu$. Stimulated emission exceeding absorption even in the absence of total inverted population can be attained by exciting atoms by means of collisions of the second kind or during photodissociation. In both cases the excess excitation energy is converted into kinetic energy. Therefore, excited atoms will be "hotter" than unexcited atoms and the

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L 31074-65

ACCESSION NR: AP5006441

emission line ν_{ik} will be broader than the absorption line ν_{ki} because the breadth of the latter is determined by the "cold" atoms at the k level. Two methods, resonance exchange of the excitation energy of two similar atoms and the effect of a buffer gas, are considered as means for removing excess kinetic energy of atoms at the lower level, which may even be a metastable or a ground level. A formula is derived for the critical ratio of concentrations at the two levels. Orig. art. has: 4 formulas. [CS]

ASSOCIATION: none

SUBMITTED: 26Feb64 ENCL: 00 SUB CODE: EC,NP

NO REF SOV: 001 OTHER: 000 ATD PRESS: 3198

Card 2/2

SOSINSKIY, M.L.; MOROZOV, Ye.N.

Occurrence of negative absorption in a portion of a Doppler-broadened line. Opt. i spektr. 18 no.3:510-512 Mr '65. (MIRA 18:5)

L 14604-66 EWT(m)/T/EWP(t)/EWP(b) IJP(c) JD

ACC NR: AP5025306 SOURCE CODE: UR/0051/65/019/004/0634/0635

54

AUTHOR: Sosinskiy, M. L.; Morozov, Ye. N.

ORG: none

TITLE: Luminescence and absorption associated with the lower terms of cobaltous and nickelous ions in ZnS single crystals

SOURCE: Optika i spektroskopiya, v. 19, no. 4, 1965, 634-635

TOPIC TAGS: zinc sulfide, cobalt, nickel, luminescence spectrum, absorption spectrum, spectral line

ABSTRACT: ZnS-Co and ZnS-Ni single crystals of the wurtzite modification with an activator content of 0.5 to 0.005% (in the initial mixture) were grown by the Bridgman method, and their absorption and luminescence spectra were measured at 10, 20, and 77K (ZnS-Co) and 4.2K (ZnS-Ni). Fig. 1 shows a schematic absorption spectrum associated with the excitation of the lower term of Ni^{2+} ion in ZnS. The spectrum contains three narrow bands with frequencies of 4386, 4374, and 4277 cm^{-1} and several broad bands which may be due to electronic-vibrational transitions. No luminescence of Ni^{2+} could be observed in ZnS. The position of the terms is described by the crystal field theory for reasonable values of the field strength Dq and Racah parameters B and C. The theoretical schemes of the two lower terms of configurations d^7 (Co) and d^8 (Ni), allowing for spin-orbital interaction, are given. The number of lines observed in the absorption spectrum corresponds to the number

Card 1/2 UDC: 535.370

L 11604-66

ACC NR: AP5025306

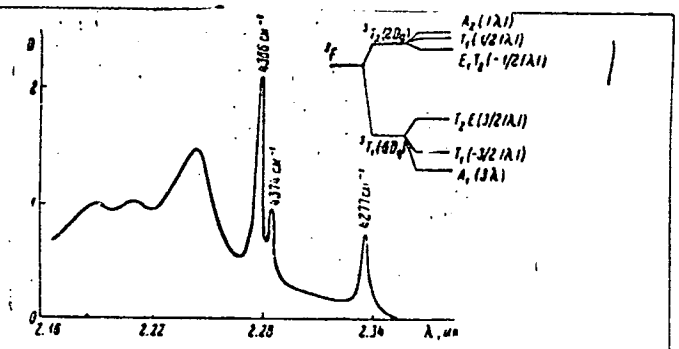

Fig. 1. Absorption spectrum of ZnS-Ni crystal at T = 4.2K.

expected from this scheme (if it is assumed that the broader bands in the spectra of ZnS-Ni crystals are associated with the appearance of phonons). However, no definite comparison between the observed spectral intervals and the structure of the terms $^3T_2$ could be made for Ni^{2+} ion and $^4T_2$ for Co^{2+} ion. Authors express their thanks to M. B. Yepifanov for assistance in the construction of the measuring apparatus. Orig. art. has: 3 figures.

SUB CODE: 20 / SUBM DATE: 16Dec64 / ORIG REF: 005 / OTH REF: 003

Card 2/2

ACC NR: AP6036964 (A,N) SOURCE CODE: UR/0181/66/008/011/3236/3240

AUTHOR: Alferov, Zh. I.; Garbuzov, D. Z.; Morozov, Ye. P.

ORG: Physicotechnical Institute im. A. F. Ioffe, AN SSSR, Leningrad (Fiziko-tekhnicheskiy institut AN SSSR)

TITLE: Effect of heat treatment on the photoluminescence of gallium arsenide

SOURCE: Fizika tverdogo tela, v. 8, no. 11, 1966, 3236-3240

TOPIC TAGS: gallium arsenide, photoluminescence, recombination radiation

ABSTRACT: The effect of heat treatment of n-type and cadmium-doped p-type gallium arsenide on its photoluminescence spectra was studied. The samples were heated for 3 hr at 270, 370, 450, 520, 580, 710 and 880°C, and the spectra were recorded at 77 and 300°K. It was found that the position and intensity of the longwave bands of recombination radiation are determined by the conditions of heat treatment of the crystal. When the latter is heated in quartz ampoules above 700°C, the fraction of radiative recombination decreases sharply, and the entire radiation falls within the narrow band of 1.35 eV. Radiation in this band is due to the recombination of excess carriers across one of the acceptor levels of copper. Heat treatment at lower temperatures (450-600°C) causes a strong luminescence in the 1.28-1.30 eV range and a displacement of the 0.96 eV band in the initial material to an energy of 1.01 eV. These changes are attributed to the introduction of lattice defects during heating in

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ACC NR: AP6036964

the presence of copper. In conclusion, authors are grateful to V. M. Tuchkevich and D. N. Nasledov for their constant interest and attention to this work, A. N. Yermakova for assistance in the experiments, and D. N. Tret'yakov for a number of useful suggestions. Orig. art. has: 4 figures.

SUB CODE: 20/ SUBM DATE: 09Apr66/ ORIG REF: 004/ OTH REF: 007

Card 2/2

MOROZOV, Ye. V. --

"A Study of the Electrode Processes During the Electrolysis of Noncyanite Solutions of Zinc and Nickel." Cand Tech Sci, Moscow Order of Lenin Chemico-technological Inst imeni D. I. Mendeleyev 27 Oct 54. (VM, 13 Oct 54)

Survery of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (10)

SO: Sum. No. 481, 5 May 55

MOROZOV, YE. V.

IZGARYSHEV, N.A.; KUDRYAVTSEV, N.T.; MOROZOV, Ye.V.

Production of shiny nickel deposition from ammonium electrolytes. Dokl. AN SSSR 96 no.1:143-144 My '54. (MLRA 7:5)

1. Chlen-korrespondent Akademii nauk SSSR (for Izgaryshev).
(Electroplating)

MOROZOV, Yu.A.; RYBINSKIY, D.A.

New carburetor of the "Volga" automobile. Avt.prom. 27 no.10: 9-11 O '61. (MIRA 14:10)

1. Gor'kovskiy avtozavod.
(Automobiles--Engines--Carburetors)

RYBINSKIY, Dmitriy Alekseyevich; MOROZOV, Yuriy Aleksandrovich; GUTKIN, Samuil Grigor'yevich; KONEV, B.F., inzh., retsenzent; STROKINA, T.I., red.; UVAROVA, A.F., tekhn. red.

[Caburetors of the GAZ engines] Karbiuratory dvigatelei GAZ. Moskva, Mashgiz, 1962. 254 p. (MIRA 15:7)
(Automobiles—Engines—Carburetors)

PEKHOV, I.S., inzh.; MOROZOV, Yu.A., inzh.

Interference caused by an inductive signal in consolidated networks. Avtom. telem. i sviaz' 3 no.8:29-30 Ag '59. (MIRA 13:2)

1. Nauchno-issledovatel'skaya laboratoriya Novosibirskogo elektrotekhnicheskogo instituta svyazi (for Morozov).
(Coaxial cables) (Electric transformers)

SAVKIN, M.M.; MOROZOV, Yu.A.

Investigations into the causes and nature of electrical troubles in contact networks in mines. Trudy Inst. gor. dela Sib. otd. AN SSSR no.3:240-251 '60. (MIRA 14:4)
(Electricity in mining)

MOROZOV, Yu.A.

Investigating high-frequency interference in contact and power networks of mines. Izv.Sib.otd.AN SSSR no.[illegible]:42-50 '6[illegible]. (MIRA 13:7)

1. Novosibirskiy elektrotekhnicheskiy institut svyazi i Institut gornogo dela Sibirskogo otdeleniya AN SSSR.
(Electricity in mining)
(Remote control)

MOROZOV, Yu. A.

Cand Tech Sci - (diss) "Study of electrical disturbances in contact networks of mines." Moscow, 1961. 18 pp; (Inst of Mining Affairs imeni A. A. Skochinskiy); 200 copies; price not given; (KL, 10-61 sup, 216)

MOROZOV, Yu.A.

High-frequency oscillations and their damping in a mercury rectifier network with ground equalizer. Sbor. rab. po vop. elektromekh. no.5:262-275 '61. (MIRA 14:6)

(Electric current rectifiers)

SIDEL'NIKOV, V.V.; MOROZOV, Yu.A.

Use of power networks for the transmission of information. Vest. AN SSSR 31 no.6:99-100 Je '61. (MIRA 14:6)
(Telecommunication) (Electric lines)

MOROZOV, Yu.A.

Interference generated by the nonlinear elements of electric power distribution networks. Sbor.rab.po vop.elektromekh. no.7:322-326 '62. (MIRA 16:1)
(Electric lines—Overhead) (Telecommunication)

MOROZOV, Yu.A.

Use of the contact network of electrified railroads for high-frequency telecommunications. Sbor.rab.po vop.elektromekh. no.7:326-330 '62. (MIRA 16:1)
(Electric railroads—Wires and wiring) (Telecommunication)

MOROZOV Yu. A

109-3-4/23

AUTHORS: Shul'man, A.R., Zakirova, I.R., Morozov, Yu.A. and Fridrikhov, S.A.

TITLE: The Problem of the Method of Investigation of Secondary Electron Emission of Non-metallic Substances (K voprosu o metode issledovaniya vtorichnoy elektronnoy emissii nemetallicheskikh veshchestv)

PERIODICAL: Radiotekhnika i Elektronika, 1958, Vol. III, No.3, pp. 329 - 338 (USSR).

ABSTRACT. Description of a method of the measurement of secondary electron emission is given. The method is characterised by the following features: reduction in the time necessary for the experiments, increased accuracy, good stability of the measuring system and the target and elimination of the ternary electrons. The main component of the experimental equipment used in the measurements is a spherical, glass bulb fitted with apertures for a target and an electron gun. Diameter of the sphere is 145 mm. The electron gun is of the standard type and is provided with a focusing electrode; it is also furnished with a reflecting diaphragm which eliminates the scattered electrons from the beam of the gun. The diaphragm is given a potential near to that of the cathode. The gun is screened by means of a nickel cylinder. The target is

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The Problem of the Method of Investigation of Secondary Electron Emission of Non-metallic Substances

in the form of a round, flat box having a diameter of 16 mm and is fitted with a helical heater. The target is fixed on to molybdenum supports and provided with a pair of leads for supplying the current to the heater. The heater can be earthed. The supporting wires of the target are taken to the input of an amplifier. The effect of ternary electrons is reduced by placing a spherical molybdenum grid, having a diameter of 125 mm, between the collector and the target. The transparency of the grid is of the order of 0.9. The grid has an aperture with a diameter of 40 mm for the leads of the target; another aperture, having a diameter of 16 mm, is provided for the primary electron beams (impinging on the target). Both the glass sphere and the grid are coated with silver by means of an evaporation process carried out in vacuum. For the analysis of secondary electron energies, a de-celerating potential U_3 is applied between the target and the grid; a potential U_g is applied between the grid and the collector, which accelerates the secondary electrons and slows down the ternary ones. The full experimental equipment (which was built around the spherical condenser) is shown in Fig.1. This consists of

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The Problem of the Method of Investigation of Secondary Electron Emission of Non-metallic Substances

the above mentioned electron gun, the collector and the anti-dynatron grid and contains the following units: supplies for the electron gun, a rotary potentiometer, supplies for the potentiometer, a synchronous motor, a registering instrument, a delay circuit, a rectangular pulse generator, an amplifier, a pulse lengthener, an oscillograph with a triggered time base; an automatic switching device and a synchronous motor driving the tape of the registering device. The functioning of the equipment and its applicability to the measurement of the secondary electron emission was thoroughly investigated. It was found that the equipment could be used for single-pulse measurements as well as for the investigation by means of periodically repeated pulses; in particular, it was possible to obtain good reproducibility of the secondary emission coefficient. The effect of the anti-dynatron grid on the secondary emission current is illustrated by the curves of Figs. 5, 6, 7 and 8. From these, it is concluded that U_g should be of the order of 100 V. The stability of the primary electron current is an important factor in the equipment, especially when the de-celerating potential U_3 is varied;

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it was found that the primary current as a function of U_3 did not vary more than 1 to 2%. Some measurements on the distribution of the secondary electron energies were carried out. The resulting curves are shown in Fig. 12. The Curve 1 of Fig.12 was taken for Ni at $U_3 = - V_p$ (where V_p is the accelerating potential of the primary electrons); this curve is in good agreement with the results obtained by R. Warnecke (Ref.11), which are represented by Curve 2.
There are 12 figures and 12 references, of which 6 are English, 5 Russian and 1 German.

SUBMITTED: February 18, 1957

AVAILABLE: Library of Congress

Card 4/4

AUTHORS: Shul'man, A. R., Zakirova, I. R., Morozov, Yu. A., Fridrikhov, S. A.

57-1-1/30

TITLE: Secondary Electron Emission of Nickel (Vtorichnaya elektronnaya emissiya nikelya)

PERIODICAL: Zhurnal Tekhnicheskoy Fiziki, 1958, Vol. 28, Nr 1, pp. 87-96 (USSR)

ABSTRACT: The task of the present work was to close the gaps existing in literature regarding the energy spectra of secondary electrons emitted by metals, as well as to obtain data on the distribution of secondary electrons according to energies in nickel. That is to say of all those which are emitted within the whole range of secondary electron energy at various V_p (energy of primary electrons) of from 200 to 2000 V with nickel. Starting from the data on the distribution of secondary electrons according to energies the problem of the importance of the quantities obtained at the investigation of the basic dependence (which characterizes the secondary emission characteristics of the material - of the dependence of the coefficients of the electron emission on V_p) is dealt with. The method of spherical condenser with a spheric

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suppressor grid was used. The method of the automatic recording of measuring results, as described in reference 2, was also used. As result of the investigation the following can be stated: 1) Tertiary electrons emitted from the collector exercise an essential influence on the measuring results of secondary current in the retarding field. The introduction of the suppressor grid offers the possibility to essentially decrease the influence of tertiary electrons and thereby to obtain much more reliable data than was earlier the case. The distribution of the secondary electrons according to the energies of from 0 to V_p was investigated. Complete lag curves for nickel were obtained at V_p of from 2oo to 2ooo V. 2) In the spectrum of the secondary electrons it is not possible to draw a limiting line between the reflected primary and the real secondary electrons. Apparently both kinds of electrons are represented in all parts of the spectrum. With small energies of secondary electrons assumption that real secondary electrons are of dominating importance is reasoned. For the analysis of the energy spectrum of electrons (of nickel) an assumed border between slow and quick secondary electrons, equal to

Secondary Electron Emission of Nickel 57-1-13/30

100 eV, is chosen. 3) The basic fact resulting from the measurements is that in the spectrum of secondary electrons of metals the relative number of quick electrons can be compared with that of slow electrons. The width of the maximum corresponding to the slow real secondary electrons is a little greater than was earlier assumed. In order to mark the number of quick secondary electrons magnitude are introduced as follows: γ - the part of quick electrons in secondary current and η - the ratio between the number of quick electrons and the quantity of the primary current. γ increases linearly with the increase of V_p and reaches up to 26% of the total number of secondary electrons at 1600. η is only little dependent on V_p and is equal to 33% of the primary current value at 1600. 4) The retardation curves in relative coordinates coincide with one-another only if V_p is greater than 1200 V. If V_p values are smaller the curves differ. 5) With all values applied for V_p an elastic reflexion of primary electrons takes place. The reflection coefficient at V_p > 800 V is not greater than 3% of the total number of primary electrons. 6) When primary current is measured in the circuit of the target in the case of not complete

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blanking of secondary electrons for the coefficient of secondary emission σ_m a value was obtained which differs from that of total retardation of secondary electrons. 7) In order to mark the emission of slow electrons the magnitudes σ_T and δ can be used (coefficient of the emission of slow electrons). As the existing theories only take into account the stimulation of secondary electrons by primary electrons and as inelastic reflection of primary electrons and the formation of slow secondary electrons with the motion of quick secondary and of inelastically reflected primary electrons are not taken into account, the comparison between theoretical and experimental data can not be carried out with sufficient exactness. There are 12 figures and 8 references, 2 of which are Slavic.

ASSOCIATION: Leningrad Polytechnical Institute imeni M. I. Kalinin (Leningradskiy politekhnicheskiy institut imeni M. I. Kalinina)

S/181/63/005/003/020/046
B102/B186

AUTHORS: Shul'man, [illegible], and Petrov, I. N.

TITLE: Secondary electron emission from tungsten, tantalum and yttrium oxide in the presence of a thermoemission current

PERIODICAL: Fizika tverdogo tela, v. 5, no. 3, 1963, 839-842

TEXT: To find the reason for the great differences observed in the temperature dependences of the secondary electron emission (coefficient σ), the authors determined the dependence of σ on the primary electron energy (V_p) the target temperature (T) and the pulse durations (t) of the primary current pulses, using the method described in ZhTF, 22, 1342, 1952. t was varied from [illegible] to [illegible] μsec, V_p from [illegible] to 2200 ev and all measurements were made in vacuo ($5 \cdot 10^{-7}$ mm Hg). The targets were annealed at 2200°C (W) 1[illegible]-1[illegible] (Ta) and 1900-1950°C (YO). It was found that, despite the presence of thermoemission currents of up to the 10^4 times greater than the electron-emission current, σ was temperature-

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[illegible]/[illegible]/00/[illegible]/[illegible]/[illegible]/046

Secondary electron [illegible]

independent for [illegible] for Ta-for yttrium oxide
σ fell slightly with temperature [illegible]. The shape of the
secondary current [illegible] for all samples, independent
of t. By comparison with the results obtained for barium oxide, it is
concluded that neither the presence of a thermoemission current nor a
high temperature are sufficient or even necessary conditions for
distortion of the secondary current [illegible] or for increase in σ with T.
The anomalies observed at oxide [illegible] must therefore be related to
specific properties of the emitter. There are 5 figures.

ASSOCIATION: Leningradskiy politekhnicheskiy institut im. M. I. Kalinina (Leningrad Polytechnic Institute imeni M. I. Kalinin)

SUBMITTED: May 11, 1962 (initially)
October 8, 1962 (after revision)

Card 2/2

L 11287-63 EWT(1)/BDS—AFFTC/ASD S/0109/63/008/006/1045/1049

ACCESSION NR: AP3001004

52
50

AUTHOR: Morozov, Yu. A.

TITLE: Automated method for investigating the secondary-emission properties of materials

SOURCE: Radiotekhnika i elektronika, v. 8, no. 6, 1963, 1045-1049

TOPIC TAGS: automatic recording, secondary emission, emission characteristics

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ABSTRACT: An automatic pulse method for investigating secondary-electron emission is discussed. The system developed for the purpose uses a pulsed primary electron beam and a collector which is grounded through the input resistance of a secondary-emission amplifier. The beam target is kept positive in relation to the grounded collector when the delay curves of the secondary electrons are registered. Moreover, in order to eliminate the misleading effects of variations in the primary-electron current, the energy of primary electrons hitting the target is held constant by causing the potential of the electron-gun anode to vary along with the target potential. Secondary-emission voltage pulses are amplified and recorded and may be viewed on an oscilloscope. By varying

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ACCESSION NR: AP3001004

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primary-electron energy V_p it is possible to determine the following characteristics: 1) the dependence of the primary current on V_p, 2) the dependence on V_p of the secondary current (these characteristics indicate the dependence on V_p of the coefficient of secondary emission σ, and 3) the dependence on V_p of the number of electrons having an energy greater than 50 ev (nonelastic particle reflection factor) or close to V_p (elastic particle reflection factor). Moreover, at a given value of V_p, the circuit makes it possible to vary with time the difference (V_k) between collector and target potentials. This permits investigation of: 1) the dependence on V_k of the secondary current in the V_k interval from +0.1 V_k to -1.1 V_p, which yields the so-called complete curve of secondary-electron delay, and 2) the details of secondary-electron energy spectra as a function of V_k. "In conclusion the author expresses his gratitude to A. R. Shul'man for his help in the project." Orig. art. has: 4 figures and 1 table.

ASSOCIATION: Leningradskiy politekhnicheskiy institut im. M. I. Kalinina (Leningrad Polytechnic Institute)

SUBMITTED: 14May62 Date ACQ: 01Jul63 ENCL: 00

SUB CODE: SD NO REF SOV: 002 OTHER: 001

ls/
Card 2/2

L 32458-65 EWT(m)/EWP(v)/T/EWP(t)/EWP(k)/EWP(b) Pf-4 JD/HM

ACCESSION NR: AP4049515 S/0125/64/000/011/0022/0027

AUTHOR: Shvartser, A. Ya. (Candidate of technical sciences); Morozov, Yu. D. (engineer)

TITLE: Electroslag welding process with a free forming of the filler metal

SOURCE: Avtomaticheskaya svarka, no. 11, 1964, 22-27

TOPIC TAGS: horizontal weld, electrode slip, tapered electrode, circular heat source

ABSTRACT: Horizontal electroslag welding has been considered impossible but may be carried out by various methods. Whatever the method employed, the electrode slip should also occur either in transverse or in longitudinal direction. A tapered electrode makes the surfacing of differently shaped areas possible using a vertical electrode travel only. In approximation the heat source may be assumed to be as linear, circular and with a continuously increasing diameter. Inside such circular heat source a characteristic cooling process takes place. There are no thermal flows in radial direction. The crystallization of the hot metal occurs only from the bottom upward and the process sets in only after energy is

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ACCESSION NR: AP4049515

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disconnected. Thus, the filler metal remains liquid until welding is completed. Furthermore, a free spreading of the filler metal along the horizontal surface of the part takes place. The hot metal wets the surface being built up. The authors succeeded in eliminating the defects which characterize imperfect fusion by investigating the laws that govern the spreading of the hot metal in the electric slag welding on a horizontal surface. The free forming of the filler layer and the observation of the rules of feeding electrode metal to the pool secure high-quality welds. Care should be taken to provide for transverse wire electrode vibrations to occur along a curve that corresponds to the outline of the freely spreading edge of the layer. When cylindrical electrode is used its edge should follow the shape of the edge of the built-up layer so that the zone in which the drop of the electrode metal occurs, coincides with the edge of that layer. The rate of electrode feeding should always conform to the rate of surfacing. The advantage of the method is that it assures a fine surfaced layer, while the productivity of the process is high. Orig. art. has: 7 figures and 4 equations.

ASSOCIATION: Donetskiy politekhnicheskiy institut (Donets Polytechnic Institute)

SUBMITTED: 17Mar64 ENCL: 00 SUB CODE: MM

NR REF SOV: 005 OTHER: 000

Card 2/2

MOROZOV, Yu.D.; KORITSKIY, G.G.

Classification of instruments for electric arc and electric slag welding and hard facing. Avtom. svar. 17 no.3:62-64 Mr '64.

1. Donetskiy politekhnicheskiy institut.

DRITOV, L.A., inzh.; MOROZOV, Yu.F., inzh.

Thawing frozen ground with electric points. Transp. stroi. 11 no.1:22-24 Ja '61. (MIRA 14:1)
(Frozen ground) (Electric heating)

MOROZOV, Yu.F., inzh.; DYMCHENKO, V.A., inzh.

Properties and use of cermet parts in machinery manufacture. Mashinostroenie no.1 Ja-F '62. (MIRA 15:2)

1. Laboratoriya poroshkovoy metallurgii Nauchno-issledovatel'skogo i proyektno-tekhnologicheskogo instituta mashinostroyeniya.
(Machinery industry)
(Ceramic metals)

MOROZOV, Yu.F. [deceased]

Latency of the larvae of Physocephalus sexalatus (Molin, 1860) established experimentally. Uch. zap. GGPI 48:39-51 '64. (MIRA 18:4)

MOROZOV, Yu. F.

MOROZOV, Yu. F.: "The helminths of rodents and insectivora of the USSR and an attempt at their ecological-geographical analysis." Min Agriculture USSR. All-Union Inst of Helminthology imeni Academician K. I. Skryabin. Moscow, 1956. (DISSERTATION FOR THE DEGREE OF CANDIDATE IN BIOLOGICAL SCIENCE)

So.: Knizhnaya letopis' No 15, 1956, Moscow

USSR / Zooparasitology. Parasitic Worms. G-2

Abs Jour : Ref Zhur - Biol., No. 8, 1958, No 33935

Author : ~~Morozov, Yu. P.~~
Inst : Not given
Title : Three New Hymenolepidids from Burozubka (Sorex). -- Tri novye gimenolepididy ot bur zubka-kroshki.

Orig Pub : Uch. zap. Gorkovsk. gos. ped. in-t, 1957, 19, 35-42.

Abstract : A description and drawings of Hymenolepis longiburseata sp. n., Cucurbitelpis sorex sp. n. and Diorchotaenia furcata sibirica ssp. n. from burozubka of the Yakut Aso. SSR.

Card 1/1

MOROZOV, Yu.F.

Discovery of larvae of Macrocanthorhynchus hirudinaceus (Pallas) in dorbeetles in the Byalovezhska Pushcha. Dokl.AN BSSR 3 no.10:430-431 O '59. (MIRA 13:2)

1. Predstavleno akademikom AN BSSR V.A.Leonovym.
(Byalovezhska Pushcha--Acanthocephala)
(Parasites--Dung beetles)

MOROZOV, Yu.F.

Two new species of nematodes from rodents. Trudy Gel'm. lab. 9:196-202 '59. (MIRA 13:3)
(Megino-Kangalasskiy District--Nematoda)
(Byalovezhska Pushcha--Nematoda) (Parasites--Field mice)

MOROZOV, F.N.; MOROZOV, Yu.F.

Morphology of the larvae of Dictyocaulus viviparus (Bloch, 1782), D.Eckerti Skrjabin, 1931. Uch.zap.GGPI no.27:13-15 '60. (MIRA 15:3)

(Nematoda)

MOROZOV, Yu.F.

Biological cycle of Rictularia amurensis Schulz, 1927 (Nematoda, Rictulariidae). Uch.zap.GGPI no.27:17-28 '60. (MIRA 15:3)
(Nematoda)

MOROZOV, Yu.F.

Changes in the system of the family Physalopteridae Leiper, 1908 in connection with the study of Pseudophysaloptera soricina Baylis, 1934. Zool.zhur. 39 no.3:327-329 '60. (MIRA 13:6)

1. Helminthological Laboratory of the U.S.S.R. Academy of Sciences, Moscow, and Wild Life Preserve "Belovezhskaya Pushcha", Brest region. (Nematoda)

MOROZOV, Yu.F. [Marozau, IU.F.]

Helminth fauna of bats in the Byalovezhska Pushcha. Vestsi AN BSS... Ser. biial. nav. no.2:92-98 '61. (MIRA 14:7)
(BYALOVEZHSKA PUSHCHA--WORMS, INTESTINAL AND PARASITIC)
(PARASITES--BATS)

STRYUK, V. S. ; MO[illegible] V., Ye.P. [illegible]NOVA, A.A., red. ; BORISOVA, K.V., red.

[Exhibition on the subject "Rapid development workings in U.S.S.R. coal mines"; a guidebook] Tematicheskaia vystavka "Skorostnoe provedenie podgotovitel'nykh vyrabotok na ugol'nykh shakhtakh SSSR"; putevoditel'. Moskva, 1965. 88 p. (MIRA 18:7)

1. Moscow. Vystavka dostizheniy narodnogo khozyaystva SSSR. 2. Tsentral'nyy nauchno-issledovatel'skiy institut informatsii i tekhniko-ekonomicheskikh issledovaniy ugol'noy promyshlennosti (for Ponova, Borisova).

L 61917-65 EWG(j)/EWP(e)/EWT(m)/EPF(c)/EWP(i)/EWA(d)/T/EWP(t)/EWP(k)/EWP(z)/EWP(b)/EWA(c) Pf-4/Pr-4/Ps-4 IJP(c) JD/WW/JAJ/WH

ACCESSION NR: AP5016033 UR/0226/65/000/006/0018/0023 44 44 B

AUTHOR: Dymchenko, V. A.; Morozov, Yu. F.

TITLE: Structure formation in iron-graphite compositions

SOURCE: Poroshkovaya metallurgiya, no. 6, 1965, 18-23

TOPIC TAGS: powder metallurgy, powder metal blending, iron alloy, austenitic transformation, wear resistant sintered metal

ABSTRACT: For antifriction materials, the pearlitic-graphitic structure remains the best; however, in practice it is difficult to attain. At sintering temperatures of 1050-1100°C, the austenite dissolves too much carbon, and for normal cooling rates this results in the metastable decomposition of secondary cementite. The kinetics of the above process were studied by changing graphite content and thermal treatments. By varying the cooling rate from 15 to 1 deg/min, no changes in phase composition were observed. The rate of graphite solubility was determined by the value of the contact surface of iron-graphite. Curves are presented, showing the change in quantity of dissolved carbon as a function of time at 1050°C for varying graphite contents (1.5 and 3%), and for different graphitic particle sizes (0.063-

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ACCESSION NR: AP5016033

0.25 mm). The rate of solubility of graphite increases with decrease in particle size. Microstructures are shown of specimens held for different times at 1050°C, with varying granulometric compositions of graphite. The structures vary with composition, from pearlitic-ferritic to pearlitic-cementitic. The use of larger particle sizes permits considerably reducing the content of structurally free cementite. The holding time at sintering should be controlled relative to the particle size for better regulation of the structure; usually 10-15 min suffices.

ASSOCIATION: NIIPTMASH Kramatorsk

SUBMITTED: 06Mar64 ENCL: 00 SUB CODE: MM

NO REF SOV: 003 OTHER: 000

Card 2/2

30381

S/532/61/000/005 00- 0
D222/D306

97000

AUTHOR: Morozov, Yu. I., and Petrov, A. A. (Moscow)

TITLE: A compiler-type programming system ПСК-1 (PSK-1)

SOURCE: Problemy kibernetiki, no. 5, Moscow, 1961, [illegible]

TEXT: This paper briefly describes a compiler system written for the "Strela" computer by the authors, L. F. Kovaleva, V. I. Kr[illegible] and others. The system was completed in 1957 and has been in use since then. The basic components are a compiler program and a library of so-called "standard programs" which are stored in the form of punched cards. The system uses the operator method of programming, in which groups of instructions of a program are designated as operators. The construction of an operator scheme, showing the operators and the links between them, is the first step in using PSK. Information on this scheme is loaded into the computer by using a code system (the so-called symbolic numbers). Some of the operators will have their corresponding standard programs in the library

Card 1/3

30381

S/582/61/000/005/0[illegible]012
D222/D306

A compiler-type programming ...

(standard operators), while others will have to be formulated individually (nonstandard operators). The library contains standard programs for mathematical and logical operations and for executing certain programming procedures. Most of the standard programs contain a self processing part which executes all processing that can be done by the compiler. The final form of the standard program in which they are incorporated into the master program is obtained according to the symbolic and absolute parameters supplied with them. PSK-1 at present contains routines for matrix and [illegible] operations, interpolation of functions, solution of equations, evaluation of elementary functions, organization of loops, logical and control operations, and so on. The compiler program consists of the master program independently as with the following functions: input of initial parameters; input of title lines (specifying the type of operator and other data), and input of next operator and its information; processing of operators (insertion of absolute addresses, etc.); storing the operators in a sequence; processing of constants; restoration of modified instructions in the compiler;

Card 2/3

A compiler-type programming ... [illegible]

processing the links between operators; [illegible] operators; output of program. In addition to the compiler [illegible] a "table of characteristics" is also put out in [illegible]. This table contains the absolute addresses of the [illegible] individual operators.

SUBMITTED: February [illegible]

Card [illegible]

S/194/61/000/012/018/097
D201/D303

9,7150

AUTHOR: Morozov, Yu. I.

TITLE: Standard programs

PERIODICAL: Referativnyy zhurnal, Avtomatika i radioelektronika, no. 12, 1961, 4, abstract 12B21 (V sb. Probl. kibernetiki, 5, M., Fizmatgiz. 1961, 137-153)

TEXT: Some ideas about standard programs (P) and about programming automation are given. For the problem to be solved on a digital computer it is necessary to set up the program from the algorithm of solution. The problem of program automation consists in that, having assumed the necessary information about the algorithm of the problem solution, the P be obtained by means of the machine itself. It is shown that the efficiency of the method of programming automation is determined by the simplicity with which the information about the solution algorithm is assumed and by the ease with which the control of assuming the information to be true is achieved. Application of standard P represents great possibilities

B

Card 1/3

S/194/61/000/011/014/047
D201/D303

Standard programs

in satisfying the two requirements above. In the article the standard P's are subdivided into groups according to the following features: 1) For what purpose are the standard P used; 2) the method of use in their application. The discussed material is divided according to the following: 1) Subsidiary standard P. It is shown that setting of any subsidiary P for the given one is an unnecessary operation. It is recommended setting up P, for which the necessary information is supplied always in the same and standard form; 2) standard P for increasing the computer range of operations. The set of elementary operations and how to obtain from these more complex operations is given; 3) classification of distribution of information in memory systems. The concept of an operator and of operator systems is given. The following problems are considered: Symbols and notation, the description of operation of certain commands of the "Strela" computer, standard and operating units, classification of information, distribution in the memory system, the concept of P operators and operator networks; 4) standard P numerical solutions of simple mathematical problems; 5)

Card 2/3

S/194/61/000/011/018/037
D201/D303

Standard programs

standardization of program acceptance; 6) processing of standard P. The following problems are considered: Externally processed standard P; self-processing standard P, amalgamation of a group of standard P into a single standard P; 7) automatic programming of arithemtical operators; 8) automatic conversion of standard P into a single P. The following problems are considered: Stages in setting-up; the standard P library, pseudo-command, pseudo-code, pseudo-program; compiling and interpreting P; 9) program automation. Programming systems. [Abstractor's note: Complete translation.]

B

Card 3/3

97000

S/044/62/000/008/070/072
C111/C444

AUTHORS: Vyazalov, L. Zh., Morozov, Yu. I.

TITLE: [illegible] Stand-Program for the Setting-up of SPA-1

PERIODICAL: [illegible] Zhurnal, Matematika, no. 8, 1962, 70, Abst. 8V475. ("Probl. kibernetiki", no. 6, M., 1961, 103-107)

TEXT: [illegible] the written standard-program from SPA-1 [illegible] the computing machine "Strela". The [illegible] SPA-1 carried out the following tasks according to the information given to it: the introduction of the machine from the [illegible] the [illegible] the transmission of the [illegible] from the [illegible] memory [illegible] the delivery of the control to the [illegible] M_{i+1}; d.) the [illegible] of the control signal into the 36-th memory cell. During the set-up of the program by aid of SPA-1 the programmer decomposes the program which is to be set up into parts. Each knot separating these parts is a transition point from the program which is to be set up to SPA-1. After the choice of the knot one puts up the informa-

Card 1/2

An Auxiliary Standard-Program ... S/044/62/000/005/076/076
C111/C444

tion about the question which of the four given operations in each unit of the program which has to be set up, are to be carried out. The length of the program SPA-1 contains 156 three-times codes. SPA-1 is set up in relative addresses, therefore it has to be worked out during the introduction into the memory in order to substitute the relative addresses by the real ones; for this purpose there exists a special introduction program for SPA-1. One describes in detail the coding system of the information in SPA-1. The block-diagram of connection of the program SPA-1 is given.

[Abstracter's note: Complete translation.]

Card 2/2

24.2120 (3717, 3817, 1538)

S/057/61/031/006/012/019
B103/B207

AUTHORS: Imshennik, V. S., Morozov, Yu. I.

TITLE: Analysis of the instability of a beam of charged particles in an electron plasma

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 31, no. 6, 1961, 643-649

TEXT: In continuation of papers by D. Bohm, E. P. Gross (Phys. Rev., 75, 1851, 1949), A. I. Akhiyezer, Ya. B. Faynberg (ZhETF, 11, 1262, 1951), and G. V. Gordeyev (ZhETF, 27, 24, 1954), the instability caused by excitation of longitudinal electron vibrations is studied on the assumption that the velocity of the beam particles be considerably higher than the thermal velocity of plasma electrons. According to L. D. Landau and M. Ye. Gertsenshteyn, the dispersion relation reads

$$\frac{4\pi ie^2}{km}\int_{-\infty}^{\infty}\frac{df_0}{du}\frac{du}{p+iku}=1 \qquad (1),$$

where $p=\Gamma-i\Omega$; the distribution function reads

Card 1/10

$$f_0 = n_0\left\{\frac{1}{\sqrt{2\pi}V_0}\exp\left[-\frac{u^2}{2V_0^2}\right] + \frac{\alpha}{\sqrt{2\pi}V_1}\exp\left[-\frac{(u-U)^2}{2V_1^2}\right]\right\}. \qquad (2)$$

($\alpha = mn_1/Mn_0$; M denotes the mass of the beam particles, m the electron mass, n_1 the density of the beam particles, n_0 the density of the electron plasma, and U the beam velocity).

$$\frac{1}{\mu x^2}(1 + i\sqrt{\pi}\xi_0 W(\xi_0)) + \frac{\alpha}{\nu x^2}(1 + i\sqrt{\pi}\xi_1 W(\xi_1)) = -1, \qquad (3)$$

is obtained from (1) and (2), where

$$\left.\begin{aligned} &\mu^{1/2} = \frac{V_0}{U} = \frac{1}{U}\sqrt{\frac{k_0T_0}{m}};\quad \nu^{1/2} = \frac{V_1}{U} = \frac{1}{U}\sqrt{\frac{k_0T_1}{M}};\quad x = \frac{kU}{\Omega_0};\\ &\Omega_0 = \sqrt{\frac{4\pi n_0 e^2}{m}},\\ &\xi_0 = \frac{\omega}{\sqrt{2}\mu x} + i\frac{\gamma}{\sqrt{2}\mu x};\quad \xi_1 = \frac{1}{\sqrt{2}\nu x}\left(\frac{\omega}{\gamma} - 1\right) + i\frac{\gamma}{\sqrt{2}\nu x};\\ &\omega = \frac{\Omega}{\Omega_0};\quad \gamma = \frac{\Gamma}{\Omega_0}. \end{aligned}\right\} \qquad (4);$$

Analysis of the inst[illegible]

W denotes the functi[illegible]

$$W(t) = [illegible] \qquad (5)$$

investigated by V. N. Pal[illegible] V. V. Turentsev (Ability mechanics integrals veroyatnost[illegible] M., 1[illegible]. If (5) is applied to the case of [illegible] cell [illegible], the following equation holds:

$$\frac{1}{t^2 - 3t^2} + [illegible] \qquad (6)$$

from which

$$\frac{1}{\sqrt{2}} [illegible] \qquad (7)$$

follows for the limit [illegible] of asymptotic approximations, and from which at [illegible] = 0, [illegible]

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$$\chi_{max} = [illegible]$$
$$\omega(\chi_{max}) = [illegible] \qquad (10)$$

follows, where $\chi_{max}(\alpha)$ [illegible] limit of vibration excitations. Furthermore,

$$\chi_{opt} \approx 1 + \frac{3}{2^{1/3}} \alpha^{1/3} - \frac{1}{3} \alpha,$$
$$\omega(\chi_{opt}) \approx 1 - \frac{1}{2^{1/3}} \alpha^{1/3} + \frac{3}{2^{1/3}} \alpha^{2/3} - \frac{5}{16} \alpha, \qquad (11)$$
$$\nu(\chi_{opt}) \approx \frac{3^{1/3}}{2^{1/3}} \alpha^{1/3} - \frac{3^{1/3}}{2^{1/3}} \alpha^{2/3} + \frac{3^{1/3}}{16} \alpha.$$

(Fig. 1a), where χ_{opt} = [illegible] (Fig. 1б: $\gamma(\alpha)$, (α) at $\chi = \chi_{opt}$). Fig. 2 [illegible] $\gamma(\alpha)$, (α) at $\alpha = 10^{-4}$. In first approximation, the best-[illegible] ($\alpha \neq 0$, [illegible] $\neq 0$) are for $\alpha \ll 1$ read

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$$\left.\begin{aligned} x_{\text{опт.}} &\approx 1 + \frac{3}{2}\mu + \frac{3\cdot 2^{1/3}}{\alpha^{1/3}}\nu, \\ \omega(x_{\text{опт.}}) &\approx 1 + \frac{3}{2}\mu + \frac{3}{2^{1/3}\alpha^{1/3}}\nu, \\ \gamma(x_{\text{опт.}}) &\approx \frac{3^{1/2}}{2^{1/3}}\alpha^{1/3}\left(1 - \frac{\mu}{2}\right) - \frac{3^{1/2}}{2^{1/3}\alpha^{1/3}}\nu. \end{aligned}\right\} \quad (15).$$

For $\alpha = 1$ one has

$$x_{\text{опт.}} \approx \sqrt{3} + \frac{7\cdot 3^{1/2}}{2}\nu, \quad \omega(x_{\text{опт.}}) \approx \frac{\sqrt{3}}{2} + \frac{7\cdot 3^{1/2}}{4}\nu, \quad \gamma(x_{\text{опт.}}) \approx \frac{1}{2} - \frac{9}{4}\nu. \quad (16).$$

Assuming $\mu = \nu$ and using (10) one obtains

$$\begin{aligned} x_{\max} &= (1 + \alpha^{1/3})^{3/2} + \frac{3}{2}(1 + \alpha^{1/3})^{1/2}\mu + \frac{3}{2}(1 + \alpha^{1/3})^{1/2}\frac{1}{\alpha^{1/3}}\nu, \\ \omega(x_{\max}) &= (1 + \alpha^{1/3})^{1/2} + \frac{1}{2}(1 + \alpha^{1/3})^{1/2}(3 + 4\alpha^{1/3})\mu - \frac{1}{2}(1 + \alpha^{1/3})^{3/2}\frac{1}{\alpha^{1/3}}\nu. \end{aligned} \quad (17).$$

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In accordance with (7), these equations lead to

$$\frac{\nu^{1/2}}{\alpha^{1/3}} \ll 1, \quad \mu^{1/2} \ll 1 \qquad (18).$$

If, however,

$$\frac{\nu^{1/2}}{\alpha^{1/3}} \gg 1, \quad \mu^{1/2} \ll 1 \qquad (19),$$

$$\Gamma = \frac{\pi}{2} \frac{\Omega^3}{k^2} \frac{df_0}{du}\Big|_{u=\frac{\zeta}{k}} \qquad (20a)$$

is obtained from (3) in first approximation. This permits a simple estimation of the maximum γ; χ_{opt} is determined from the condition $(\chi - \omega)^2 = \nu\chi^2$, so that for $\omega \ll 1$ one finds $\gamma \approx \frac{\alpha}{\nu}$. R. I. Izraileva (unpublished paper) determined the limits of the range of vibration excitations on the basis of (3); Fig. 3 shows the dependence of the limits

χ_{lower} (I), χ_{upper} (II), $\chi_{hydro} = \chi_{max}$ (III) on . at $\alpha = 10^{-3}$, $\mu = 0.5 \cdot 10^{-4}$. The comparatively great difference between χ_{hydro} and χ_{upper} is due to (18). If

$$\varrho = n_0 a_0 \exp[i(\vec{k}\vec{r}) + pt], \quad \varrho_1 = \alpha' n_1 a_1 \exp[i(\vec{k}\vec{r}) + pt] \quad (I)$$

is substituted for the perturbed values of the plasma and the beam,

$$\left|\frac{a_1}{a_0}\right| = \frac{M(\alpha)}{\alpha'}, \quad M(\alpha) = \sqrt{[\omega^2 + \gamma^2 - 1]^2 + 4\gamma^2},$$

$$\operatorname{tg}\varphi = \pm \frac{2\gamma\omega}{\omega^2 - \gamma^2 - 1}, \quad \cos\varphi = \pm \frac{\omega^2 - \gamma^2 - 1}{M(\alpha)}, \quad \alpha' = \frac{n_1}{n_0}. \quad (21)$$

follows from the hydrodynamic equations on the assumption that (19) holds for the amplitude and phase of vibrations (+ electron beam, - ion beam). If only $\alpha = 1$ (electron beam) is considered, equation

$$
\left.
\begin{aligned}
E &= E_0 \exp\left(\frac{\Omega_0 t}{2}\right)\cos\psi,\\
\rho_1 &= n_0 E_0 \frac{e\sqrt{3}}{mU\Omega_0}\exp\left(\frac{\Omega_0 t}{2}\right)\cos\left(\psi-\frac{\pi}{6}\right),\\
\rho_0 &= n_0 E_0 \frac{e\sqrt{3}}{mU\Omega_0}\exp\left(\frac{\Omega_0 t}{2}\right)\cos\left(\psi-\frac{5}{6}\pi\right),\\
u_1 &= E_0 \frac{e}{m\Omega_0}\exp\left(\frac{\Omega_0 t}{2}\right)\cos\left(\psi-\frac{4}{3}\pi\right),\\
u_0 &= E_0 \frac{e}{m\Omega_0}\exp\left(\frac{\Omega_0 t}{2}\right)\cos\left(\psi-\frac{2}{3}\pi\right).
\end{aligned}
\right\} \qquad (22)
$$

is obtained for the electric field E and for velocity perturbations in the plasma u_0 and in the beam u_1 in the particular case of an asymptotic wave; here

$$\psi = \sqrt{3}\,\frac{\Omega_0}{U}\,x - \frac{\sqrt{3}}{2}\,\Omega_0 t \qquad \text{(II)},$$

wherefrom all other properties of the waves can be deduced. The authors thank Yu. I. Kuznetsov, L. I. Shibarshov, Yu. A. Romanov, E. Z. Tarumov, V. A. Teplyakov, and G. F. Filippov for valuable advice. There are 3

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figures, 1 table, and 16 references: 7 Soviet-bloc and 9 non-Soviet-bloc.

SUBMITTED: September 16, 1960

Legend to Fig. 1a:
1) χ_{max}, χ_{opt}.

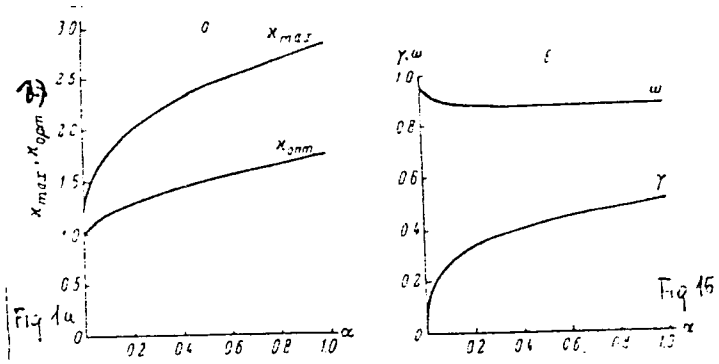

Fig 1a

Fig 1б

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L 15571-63 EWA(b)/EPF(c)/EWT(1)/EPF(n)-2/BDS AFFTC/ASD/AFWL/SSD
Pa-4/Pr-4/Pu-4

ACCESSION NR: AP3002798 S/0207/63/000/003/0003/0010

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AUTHORS: Imshennik, V. S.; Morozov, Yu. I. (Moscow)

TITLE: Tensor of energy-impulse radiation in a moving medium under conditions close to equilibrium

SOURCE: Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki, no. 3, 1963, 3-10

TOPIC TAGS: radiation, hydrodynamics, relativity, tensor

ABSTRACT: In a system of hydrodynamic equations at high temperatures there must be included terms which take into account the role of radiation and also an equation describing the transfer of radiation. Thus it is possible to arrive at an equation of radiational hydrodynamics. The basic problem to be solved consists of the formulation of a relativistically covariant kinetic equation of transfer of radiation with consideration of the motion in the medium. The most significant contributions to this problem were made by L. H. Thomas (The radiation field in a fluid in motion. The Quarterly Journal of Mathematics, Oxford Series, 1930 vol. 1.) and D. L. Sindzh (Relyativistskiy gaz. M., GIIL, 1960). A system of equations

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of radiational hydrodynamics for the general relativistic case was written by V. A. Prokof'yev (Uravneniye perenosa v relyativistskoy radiatsionnoy gidrodinamike DAN SSSR, 1961, 140, str. 1033.). In equations describing motion in a medium, radiation occurs in the form of a divergence tensor of energy-impulse radiation. Generally speaking, the form of this tensor is very complicated and must be considered simultaneously with equations of the medium and the equation of transfer of radiation. Under conditions close to equilibrium, this tensor can be computed by successive approximations. The authors consider a general equation obtained from a sum of tensors--medium and radiation. Such a procedure greatly simplifies problems of radiational hydrodynamics. By restricting computation of the tensor of energy-impulse to the second approximation (considering hydrodynamic variable terms linear in the gradient), a generalization of the approximation of the radiational heat conductivity is obtained by introducing the mean according to Rosseland; see S. Chandrasekar (Vvedeniye v ucheniye o stroyenii zvezd. M., IL, 1950) and D. A. Frank-Kamenetskiy (Fizicheskiye protsessy* vnutri zvezd. M., Gos. izd. fiz.-mat. lit., 1959). The authors compute the tensor of energy-impulse of radiation in this approximation. This tensor was computed earlier by Thomas (op. cit.) but his computational procedure is nonstandard and leads to a cumbersome integral.

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The basis of the authors' method is computation of the tensor of energy-impulse of radiation in the natural system of reference and then its transformation to a fixed system of reference by the formula of tensor computation. Thus, the solution of a very wide class of problems of radiational hydrodynamics can be obtained on the basis of several of the derived equations and, for the elementary Galilean case, from some other formulas. Orig. art. has: 51 formulas.

ASSOCIATION: none

SUBMITTED: 14Mar63 DATE ACQ: 16Jul63 ENCL: 00

SUB CODE: PH, AI NO REF SOV: 006 OTHER: 001

Card 3/3

ACCESSION NR: AP4034267 S/0207/64/000/002/0008/0021

AUTHORS: Imshennik, V. S. (Moscow); Morozov, Yu. I. (Moscow)

TITLE: Shock-wave structure including momentum transfer and radiation energy

SOURCE: Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki, no. 2, 1964, 8-21

TOPIC TAGS: shock wave front, radiation transfer, absorption coefficient, radiation hydrodynamics, shock wave, viscous discontinuity, radiation equilibrium, Eddington method, diffusion approximation

ABSTRACT: The nonlinear problem of shock-wave front structure with radiation transfer at relatively small speeds, when $\beta = v/c \ll 1$, has been considered. The following simplifying assumptions are made: the undisturbed medium with constant density ρ_0 has zero temperature, the absorption coefficient is independent of frequency, the equation of state of an ideal gas is used, and the angular radiation intensity distribution is given according to the Eddington method. Using the following nondimensional coordinates

$$A = \frac{kT_1}{D^2}, \quad q = \frac{D}{c}, \quad \eta = \frac{\rho_0}{\rho}, \quad r = \frac{\gamma - 1}{\gamma + 1}, \qquad (1)$$

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the set of nonrelativistic radiation hydrodynamic equations according to Eddington are written as

$$At = \eta\left(1 - \eta - \frac{K}{2}\right), \qquad S = \frac{q}{r}\left[(1-\eta)(\eta - r) - K\eta\frac{1+r}{2}\right]$$
$$\frac{dK}{d\tau} = -S - q\eta(K + 3\delta_1 t^4) \tag{2}$$
$$\frac{dS}{d\tau} = -3(K - \delta_1 t^4) - q\eta[S + q\eta(K + 3\delta_1 t^4)]$$

under initial equilibrium boundary conditions

$$K = S = t = 0, \qquad \eta = 1 \tag{3}$$

and final equilibrium boundary conditions

$$K = \delta_1, \quad S = -4q\eta_1\delta_1, \quad t = 1, \qquad \eta = \eta_1 . \tag{4}$$

To solve those equations approximately, the shock-wave region is divided into

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three parts: the region of strong nonequilibrium, radiation-heated equilibrium region before the viscous discontinuity, and region behind the viscous discontinuity with constant radiation density. For each region a value of η is calculated by applying the appropriate approximations ($K \gg \delta_1 t^4$, $K = \delta_1 t^4$ and $K = \delta_1$, respectively). A qualitative analysis is then proposed for the diffusion approximation of the Eddington equations. The K and S are assumed to be independent variables in a KS plane phase analysis, and the Eddington equations are written in the form of an expansion, or

$$\begin{aligned} dK / d\tau &= a(K_j, S_j)(K - K_j) + b(K_j, S_j)(S - S_j) \\ dS / d\tau &= c(K_j, S_j)(K - K_j) + d(K_j, S_j)(S - S_j) \end{aligned} \quad (5)$$

A qualitative representation of integral curves calculated for $\delta_1 \ll 1$, $\delta_1 \sim 1$, $\delta_1 \gtrsim 12/7$ is given graphically. Appendices are added for the angular approximation of the radiation transfer equations and a mean transfer equation when $\beta \neq 0$. Orig. art. has: 3 figures and 84 formulas.

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ACCESSION NR: AP4034267

ASSOCIATION: none

SUBMITTED: 10Jan64 ATD PRESS: 3060 ENCL: 00

SUB CODE: ME NO REF SOV: 008 OTHER: 003

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MOROZOV, Yu.I.

Experimental study of heat exchangers in a "falling arresting bed" type two-phase counterflow flux. Khim.prom. [Ukr.] no.2:45-47 Ap-Je '65. (MIRA 18:6)