SIDOROV, V. M., YARVA, V. A., BATUSOV, YU. A., BUNYATOV, S. A.,

"Production of Charged Mesons by 2.5 Mesons on Hydrogen"

paper presented at the Intl Conference on High Energy Physics, Rochester, N. Y. and/or Berkly California, 25 Aug - 16 Sep 1960.

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S/056/60/038/02/18/061
B006/B011

24,6600
21,5200

AUTHORS: Bunyatov, R. F., Bunyatov, S. A., Vishki, T., Merekova, M. P., Sidorov, V. M., Yatsko, V. A.

TITLE: Production of Charged π-Mesons in the Interaction of 9-Bev Protons With Photoemulsion Nuclei

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 38, No. 2, pp 432-440

TEXT: The authors investigated the energy spectrum and the angular distribution of pions arising in the interaction of 9-Bev protons with photoemulsion nuclei. An emulsion chamber with 100 layers of the type NIKFI-R (NIKFI-R) (thickness: 450 μ, area: 10×10 cm²) was exposed to the inner proton beam of the proton synchrotron of the Laboratoriya vysokikh energiy OIYaI (High-energy Laboratory of the OIYaI). Such events were selected for analysis, in which 3 or more fast particles occurred. This selection permitted the separation of events in which several pions were produced. Among the 204 tracks selected for the analysis there were 78 with nonele-

Card 1/4

(12)

$p_0 \leq 650$ Mev/c and 126 with $p_0 > 650$ Mev/c) ionization was determined by a method described in Ref. 12. Fig. 1 shows ionization as a function of plate table supplies data concerning the K-mesons produced in proton - nucleus collisions. The energy distribution is discussed next. Fig. 2 shows the empirical energy spectrum of particles with $p_0 \leq 650$ Mev/c (which corresponds to a pion energy of 340 Mev), and the curve calculated theoretically according to the ... spectrum of pions originating from KN-collisions. Fig. 3 shows the angular distribution of fast pions (ionization $J \geq 1.4\, J_0$ - ionization on the tracks of primary protons) in the laboratory system. Fig. 4 shows the pion energy as a function of the departure angle, and Fig. 5 shows the angular distribution of fast pion ions ($J \geq 1.4\, J_0$). The results of investigation are finally summarized as follows: 1) The energy spectrum of charged pions originating from the reaction investigated here can be described by the empirical formula $n(E_\pi) = E_\pi/(a + E_\pi^2)$, where E_π denotes the kinetic energy of pions in Mv. The coefficients were found to be $a = 0.17 \pm 0.07$, $b = (1.2 \pm 1.4)\cdot 10^{-2}$.

Card 2/4

$a = 2.60 \pm 0.35$ by the method of least squares. 2) The mean total pion energy was $\bar{E}_\pi = (0.70 \pm 0.2)$ Bev, the mean total energy of fast pions was (0.8 ± 0.2) Bev. 3) The mean numbers of fast pions and protons per event were equal to 3.3 ± 0.5 and 1.0 ± 0.5. 0.6 ± 0.2 was obtained for the mean number of pions with energies lower than 60 Mev. 4) The total energy emitted by pions (taking account of π^0-mesons) amounted to $(49 \pm 14)\%$. 5) The ratio of charged π-mesons was 5.0 ± 2.5 in the velocity range $\beta = (0.5 - 0.8)$. 6) The resulting experimental data do not contradict the assumption that the interaction considered here can be regarded as a consequence of collisions. The authors finally thank Professor V. P. Dzhelepov and Professor Ch. Dulluby for interest displayed as well as G. I. Bogorovskiy, L. P. Zakharova, K. D. Tsvetlina, and G. A. Ryazkina for their assistance, T. Vishki thanks Professor Z. Ambeder and E. Fellenier for their discussions. Furthermore, gratitude is expressed to N. N. Govorun for computations carried out on the "Ural" computer, and to V. A. Meshcheryakov for his aid. L. P. Bardadym, N. I. Kostanashvili, and G. A. Shakhulashvili are mentioned. There are 5 figures, 1 table, and 17 references: 9 Soviet, 1 Italian, 5 English, and 3 American.

Card 3/4

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

SUBMITTED: August 30, 1959

Sidorov V.M.

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S/056/60/038/004/043/048
B006/B056

24.6900

AUTHORS: Bogachev, N. P., Bunyatov, S. A., Merekov, Yu. P., Sidorov, V. M., Yarba, V. A.

TITLE: Inelastic Interaction of 9-Bev Protons With Free and Bound Nucleons in Photoemulsions

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 38, No. 4, pp. 1346 - 1348

TEXT: The authors recorded 243 inelastic interactions, viz., 140 pp and 103 pn events in an emulsion chamber irradiated with 9-Bev protons on the proton synchrotron of the Laboratoriya vysokikh energiy Ob"yedinennogo instituta yadernykh issledovaniy (High-energy Laboratory of the Joint Institute of Nuclear Research). For the purpose of determining the energy- and angular distributions of the secondary particles, measurements of the multiple Coulomb scattering and ionization were carried out; the results obtained are briefly discussed. The angular distributions of the charged pions and protons in the rear semi-space (c.m.s.) occurring in pp-interaction are shown in Fig. 1. Both angular

Card 1/3

Inelastic Interaction of 9-Bev Protons With Free and Bound Nucleons in Photoemulsions

S/056/60/038/004/043/048
B006/B056

distributions are anisotropic as is the case also with 6.2-Bev. This is in contradiction to the assumptions of the statistical theory on the isotropy of the angular distribution of secondary particles in the c.m.s. The mean proton and pion numbers (n_p and n_π) occurring per inelastic pp-scattering event in the rear semi-space in the c.m.s. is 1.3 ± 0.3 and 1.9 ± 0.3, respectively. The corresponding values following from the statistical theory are 1.2 and 2.3. The following n-values are obtained for the two kinds of charged pions: $n_{\pi^+} = 1.3 \pm 0.3$ and $n_{\pi^-} = 0.61 \pm 0.06$. Fig. 2 shows the momentum distributions of protons and charged pions from pp interactions. It is shown that the pion spectrum with respect to the theoretical distribution is shifted toward smaller, and the proton spectrum toward greater momenta. The average momenta in the c.m.s. are calculated to be $P^*_p = (1.2 \pm 0.1)$ Bev/c and $P^*_\pi = (0.4 \pm 0.1)$ Bev/c. The statistical theory gives $P^*_p = 0.79$ Bev/c and $P^*_\pi = 0.51$ Bev/c. The primary proton in pp collisions loses $(36 \pm 2)\%$ of

Inelastic Interaction of 9-Bev Protons With Free and Bound Nucleons in Photoemulsions

S/056/60/038/004/043/048
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its energy to the pion production (the statistical theory gives a value of 58%). Fig. 3 shows the angular distributions of the charged secondary particles, taking the correction for geometry into account. The angular distributions (pp interaction) are symmetric in the c.m.s. The angular distributions of the secondary particles from pn scattering are asymmetric, which cannot be explained by the statistical theory. The authors thank Academician V. I. Veksler and Professor V. P. Dzhelepov for their interest in this investigation. There are 3 figures and 7 references: 6 Soviet and 1 Dutch.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

SUBMITTED: January 27, 1960

Card 3/3

BATUSOV, Yu.A.; BUYNATOV, S.A.; SIDOROV, V.M.; YARBA, V.A.

Determining the cross section of recharge of a π^--meson on a π^--meson from the analysis of the reaction $\pi^- + p \to \pi^- + \pi^+ + n$ at an energy of 290 Mev. Zhur. eksp. i teor. fiz. 39 no.2:506-509 Ag '60. (MIRA 13:9)

1. Ob"yedinennyy institut yadernykh issledovaniy.
(Mesons)

88467

S/056/60/039/006/060/063
B006/B063

24.6900

AUTHORS: Batusov, Yu. A., Bunyatov, S. A., Sidorov, V. M., Yarba, V.A.

TITLE: Production of Charged Mesons by 245-Mev π^- Mesons on Hydrogen

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 6(12), pp. 1850-1852

TEXT: This "Letter to the Editor" presents preliminary results of a study of the reaction $\pi^- + p \rightarrow \pi^+ + \pi^- + n$, in which the initial meson had an energy of 245 ± 15 Mev. The experiments were performed in the synchro-cyclotron of the Laboratoriya yadernykh problem OIYaI (Laboratory for Nuclear Problems of the Joint Institute of Nuclear Research). A total of 32 events have been recorded. The cross section for the reaction was found to be 0.10 ± 0.04 mb. The meson production near the threshold can be explained according to A. A. Ansel'm and V. N. Gribov who have shown that the energy dependence of the cross section depends on particle interaction in the final state and is determined by the amplitudes of the charge-exchange reactions $\pi^+ + \pi^- \rightarrow \pi^0 + \pi^0$ and $\pi^+ + n \rightarrow \pi^0 + p$. The angular and

Card 1/4

88467

Production of Charged Mesons by 245-Mev π^- Mesons on Hydrogen

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B006/B063

momentum distributions of the secondary particles in the center-of-mass system, measured at 245 Mev (solid lines), are in Fig. 2 compared with data from Ref. 8 (E_π = 290 Mev)(broken lines). It is noted that the results obtained at 245 Mev do not essentially differ from those obtained at 290 Mev. Numerical results:

	245 Mev	290 Mev
$\overline{\theta^*_{\pi^+\pi^-}}$, deg	103 ± 7	116.7 ± 2.4
$\overline{\theta^*_{\pi^+ n}}$, deg	125 ± 7	113.4 ± 2.5
$\overline{\theta^*_{\pi^- n}}$, deg	131 ± 5	129.3 ± 2.4

V. P. Dzhelepov and L. I. Lapidus are thanked for their interest in the work. There are 2 figures and 8 references: 4 Soviet and 4 US.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

Card 2/4

Sidorov, V. M.

81716
S/020/60/133/01/14/070
B014/B011

24.6900

AUTHORS: Batusov, Yu. A., Bogachev, N. P., Bunyatov, S. A., Sidorov, V. M., Yarba, V. A.

TITLE: Formations of Charged Mesons by π^--Mesons With an Energy of 290 Mev on Hydrogen

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 133, No. 1, pp. 52-55

TEXT: The first results obtained from the investigation under review were submitted by B. M. Pontekorvo in July, 1959, at the Conference for the Physics of High-energy Particles held in Kiyev. The authors of the present paper wanted to study the conditions and the energy characteristic of secondary particles in the reaction $\pi^- + p \rightarrow \pi^- + \pi^+ + n$ at an energy of 290 Mev of the primary π^--mesons. The angular and momentum distribution obtained are compared with the statistical theory by Fermi and the isobaric model by Lindenbaum and Sternheimer. The meson production was conducted in pellicle stacks, which were exposed to a π^--meson beam from the synchrocyclotron of the Laboratoriya yadernykh problem Ob"yedinennogo instituta yadernykh issledovaniy (Laboratory of Nuclear Problems of the

Card 1/4

Formations of Charged Mesons by π^--Mesons With an Energy of 290 Mev on Hydrogen

S/020/60/133/01/14/070
B014/B011

Joint Institute of Nuclear Research). 1920 interactions of primary mesons were recorded in the photoemulsion, and in the further analysis only such cases were selected as exhibited only two mesons among the secondary charged particles. 135 interactions satisfied these conditions and in them, the authors measured the energy of the secondary mesons and the angle of their emission. An estimation of the reaction cross section, in which reference was made to a paper by K. S. Bogomolov and M. F. Rodicheva, yielded a value of (0.61 ± 0.13) millibarns. Fig. 1 is a graph depicting the momentum distribution of secondary particles in the studied reaction for π-mesons and neutrons. In these diagrams, measurement results are compared with the curves calculated after the statistical theory and the isobaric model. Theory and experiment agree within the limit of error. The diagrams of Fig. 2 show the experimentally determined angular distributions for π^+-mesons, π^--mesons, and neutrons. Here, the non-isotropic and asymmetrical angular distribution of the reaction products does not agree with the premises of the statistical theory. It follows from the

Formations of Charged Mesons by π^--Mesons With an Energy of 290 Mev on Hydrogen

81716
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B014/B011

analysis of experimental data that the momentum distribution, in the summation over all angles in the center-of-mass system, contradicts neither the statistical theory nor the isobaric model. Fig. 3 is a graph depicting the angular distributions among the momenta of secondary particles in the center-of-mass system from 100 experiments. Brief mention is made of the explanation of the asymmetry of the angular distribution of products, which contradicts the statistical theory by Fermi, with the aid of the isobaric model by Sternheimer and Lindenbaum. The authors thank Professor V. P. Dzhelepov for his aid in carrying out the operations, S. M. Bilen'kom, L. I. Lapidus, and R. M. Ryndin for discussing a number of problems. There are 3 figures and 18 references: 8 Soviet and 10 American.

4

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

PRESENTED: March 14, 1960, by L. A. Artsimovich, Academician

Card 3/4

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Formations of Charged Mesons by π^--Mesons With an Energy of 290 Mev on Hydrogen

S/020/60/133/01/14/070
B014/B011

SUBMITTED: March 5, 1960

4

Card 4/4

S/056/61/040/002/011/047
B102/B202

AUTHORS: Batusov, Yu. A., Bunyatov, S. A., Sidorov, V. M., Yarba, V. A.

TITLE: Production of charged mesons by 290-Mev π^- mesons in hydrogen

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 40, no. 2, 1961, 460-463

TEXT: The present paper is the continuation of a previous paper (Ref. 1: DAN SSSR, 133, 52, 1960), in which the authors studied the momentum and angular distributions of secondary particles of the reaction $\pi^- + p \rightarrow \pi^+ + \pi^- + n$. In the present paper, the authors present the results of an analysis of 250 events of this reaction at a meson energy of (290±15)Mev. The studies were made at the synchrocyclotron of the laboratoriya yadernykh problem OIYaI (Laboratory of Nuclear Problems of the OIYaI) by means of a photo-emulsion chamber. The measured momentum and angular distributions were compared with those obtained by the statistical Fermi theory and the model of Lindenbaum - Sternheimer. Calculations were made by the method of "random stars" and an

Card 1/7

Production of ...

electronic computer. The mean accuracy of the theoretical histograms is approximately 5%. Results are illustrated in figures. A comparison of the diagrams shows that no quantitative agreement with the experiment can be obtained although the statistical theory and the isobaric model correctly reproduce the characteristic features of the spectra. E. g., the maximum of the neutron spectrum (Fig. 1) was found to be shifted toward smaller momenta. The angular distribution (angle between secondary pions - Fig. 2) indicates that the mesons probably depart at larger angles than those found theoretically. The mean angles of emission are the following:

	experiment	statistical theory	isobaric model
$\bar{\theta}^{*}_{p\pi^+\pi^-}$	116.7±2.4	102.2	98.1
$\bar{\theta}^{*}_{\pi^-n}$	113.4±2.5	128.6	123.9
$\bar{\epsilon}^{*}_{p^-n}$	129.3±2.4	129.4	141.0

Fig. 3 shows the angular distribution of secondary particles with respect to the direction of the primary meson; these experimental distributions can be

Card 2/7

Production of ...

explained neither by the statistical theory nor by the isobaric model. It has been shown earlier (ZhETF, 39, 506, 1960) that the distribution with respect to relative momenta of secondary particles is in agreement with the theoretical distribution calculated by A. A. Ansel'm and V. N. Gribov. In this connection, the authors assumed the production of an additional meson near the threshold. On the basis of this theory and by taking account of the interaction of particles in the final state, better agreement with the experiments can be obtained also at these energies. Using the matrix element $S^2 = 1 + ck_{12} + dk_{13}$ the following values are obtained for the mean angles of emission between the secondary particles (calculated according to G. I. Kopylov): $\bar{\theta}^*_{\pi^+\pi^-} = 109.0^\circ$; $\bar{\theta}^*_{\pi^-n} = 119.0^\circ$; $\bar{\theta}^*_{\pi^-n} = 131.0^\circ$. This is in good agreement with the experiment. The authors thank Professor V. P. Dzhelepov and L. I. Lapidus for their interest, and G. I. Popylov for assistance and discussions. There are 3 figures and 5 Soviet-bloc references.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

Card 3/7

BATUSOV, Yu.A.; BUNYATOV, S.A.; SIDOROV, V.M.; YARBA, V.A.

$\pi\pi$-Interection and the cross-sectional ratio of the reactions $\pi N \to \pi\pi N$ at an energy of 290 Mev. Zhur. eksp. i teor. fiz. 40 no.5:1528-1530 My '61. (MIRA 14:7)

1. Ob"yedinennyy institut yadernykh issledovaniy.
(Nuclear reactions) (Protons)
(Mesons)

Bunyatov et al.

BATUSOV, Yu. A., BUNYATOV, S. A., SIDOROV, V. M. and YARBA, V. A.

"The Reaction $\pi^- + p \rightarrow \pi^+ + \pi^- + n$ at 210-310 Mev and $\pi\pi$ -Interaction"

report presented at the Intl. Conference on High Energy Physics, Geneva, 4-11 July 1962

Joint Institute for Nuclear Research
Laboroatory of Nuclear Problems

S/056/62/043/006/007/067
B184/B102

AUTHORS: Batusov, Yu. A., Bunyatov, S. A., Sidorov, V. M., Yarba, V. A.

TITLE: The reaction $\pi^- + p \rightarrow \pi^+ + \pi^- + n$ at energies of 240 Mev and $\pi\pi$-interaction

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43, no. 6(12), 1962, 2015-2018

TEXT: The reaction $\pi^- + p \rightarrow \pi^+ + \pi^- + n$ was studied in a photoemulsion chamber at a mean primary pion energy of 240 ± 15 Mev. The mass spectrum of the $\pi^+\pi^-$ system was taken in the interval between 280 and 350 Mev. Out of the 255 events chosen (selection method in DAN SSSR, 133, 52, 1960) both pions came to rest in 85% of the events; their energy was determined from the track; in the remaining 15% the meson left the chamber. Its energy was determined from the ionization. The measurement accuracy of the mass of the $\pi^+\pi^-$ system was 1.5-3.0 Mev. As compared with the phase volume of all events recorded in the chamber, the experimentally determined mass spectrum is shifted systematically to the side of the higher mass values. If the experimental data are divided by the phase volume at the corresponding points it follows that the matrix element increases with increasing energy

Card 1/2

The reaction $\pi^- + p \rightarrow \pi^+ + \pi^- + n$... S/056/62/043/006/007/067
B184/B102

of the $\pi^+\pi^-$ system and that it does not coincide with the phase volume. The deviation of the mass spectrum from the random distribution is ascribed to the interaction of the pions in the final state. No resonant-type anomalies could be observed in the mass spectrum of the $\pi^+\pi^-$ system within the measurement accuracy in the interval between 280 and 350 Mev. Hence the upper limit of the total production cross section of the ABC meson with the mass 300 ± 10 Mev does not exceed 10^{-29} cm^2 in the reaction (1). In the reaction $p + d \rightarrow He^3 + \pi + \pi$ the deviation of the experimental spectrum of the He^3 nuclei from the 3-particle phase volume is assumed to be due to a dependence of the matrix element of this reaction on the mass of the $\pi^+\pi^-$ system. Also in this reaction, no resonant-type anomalies were observed. Hence the authors conclude that the anomaly is not caused by the formation of a new particle or of a resonance. There are 3 figures.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

SUBMITTED: June 30, 1962

Card 2/2

BATUSOV, Yu.A.; BUNYATOV, S.A.; DO IN SEB; SIDOROV, V.M.; YARBA, V.A.

[Use of the Chew-Low method in studying the $(\pi^+ - \pi^-)$-interaction at low energies] Issledovanie $(\pi^+ - \pi^-)$-vzaimodeistviia pri nizkikh energiiakh metodom Chu i Lou. Dubna, Ob"edinennyi in-t iadernykh issledovanii, 1963. 11p. (MIRA 16:6)

(Nuclear reactions)

BATUSOV, Yu.A.; BUNYATOV, S.A.; DO IN SEB; SIDOROV, V.M.; YARBA, V.A.

Use of Chew and Low's method in studying $\pi^+\pi^-$-interactions at low energies. Zhur. eksp. i teor. fiz. 45 no.4:913-920 O '63. (MIRA 16:11)

1. Ob"yedinennyy institut yadernykh issledovaniy.

ACCESSION NR: AP4019256 S/0056/64/046/002/0817/0818

AUTHORS: Batusov, Yu. A.; Bunyatov, S. A.; Sidorov, V. M.; Yarba, V. A.

TITLE: Double charge exchange of positive pions

SOURCE: Zhurnal eksper. i teor. fiz., v. 46, no. 2, 1964, 817-818

TOPIC TAGS: Pion, Pi meson, positive pion, charge exchange, double charge exchange, positive pion charge exchange, secondary positive pion, emulsion technique

ABSTRACT: The production of a positive pion in collisions between negative pions and nuclei, by double charge exchange, via the reactions

$$\pi^- + p \to \pi^0 + n$$
$$\downarrow$$
$$\pi^0 + p \to \pi^+ + n$$

Card 1/3

ACCESSION NR: AP4019256

or

$$\pi^- + (2p) \rightarrow \pi^+ + (2n).$$

which is difficult to separate in pure form and which yield additional information on the interaction between charged neutral mesons with nucleons in complex nuclei, has been investigated by exposing a pellicle stack ($\bar{Z}$ = 21) in a synchrocyclotron to a beam of 80-MeV positive pions. The pellicles were scanned for the secondary pions produced as energies much lower than the meson production threshold, for only then could the positive pions be produced by double charge exchange. The cross section obtained for double charge exchange at 30--80 MeV was $(5 \pm 1) \times 10^{-28}$ cm^2. There was no double charge exchange for 0--30 MeV primary pions. "The authors are grateful to Prof. V. P. Dzhelepov for a discussion of the results and to V. I. Petrukhin for help in the irradiation of the pellicle stacks."
Orig. art. has: 4 formulas.

Card 2/3

ACCESSION NR: AP4019256

ASSOCIATION: Ob"yedinenny*y institut yaderny*kh issledovaniy (Joint Institute of Nuclear Research)

SUBMITTED: 04Dec63	DATE ACQ: 27Mar64	ENCL: 00
SUB CODE: PH	NO REF SOV: 001	OTHER: 001

Card 3/3

BATUSOV, Yu.A.; BUNYATOV, S.A.; SIDOROV, V.M.; YARBA, V.A.

The $\pi^- p \rightarrow \pi^+ \pi^- n$ reaction near the threshold, and $\pi\pi$ -interaction. lAd. fiz. 1 no.4:687-692 Ap '65. (MIRA 18:5)

1. Ob"yedinennyy institut yadernykh issledovaniy.

BATUSOV, Yu.A.; BYNYATOV, S.A.; SIDOROV, V.M.; YARBA, V.A.

Total cross sections of the $\pi^- + p \rightarrow \pi^+ + \pi^- + n$ reaction near the threshold and the angular distributions of secondary particles. IAd. fiz. 1 no.3:526-532 Mr '65. (MIRA 18:5)

1. Ob"yedinennyy institut yadernykh issledovaniy.

SIDOROV, V. M. Cand. Sci. Tech.

Dissertation: "Investigation of the Performance of Amplitude Limeters in Radio Receivers."

9 Jan. 49

Moscow Electrical Engineering Inst of Communications

SO Vecheryaya Moskva
Sum 71

SIDOROV, V.

Measuring the operation of an MGSRTU-100 radio receiver and rediffusion set. Radio no.2:23 F '54. (MLRA 7:2)
(Radio measurements) (Radio--Receivers and reception)

PHASE I BOOK EXPLOITATION 1088

Chistyakov, Nikolay Iosafovich, Sidorov, Viktor Matveyevich, and Mel'nikov, Viktor Semenovich

Radiopriyemnyye ustroystva (Radio Receivers) Moscow, Svyaz'izdat, 1958. 895 p. 25,000 copies printed.

Ed. (Title page): Chistyakov, N.I.; Ed. (Inside book): Galoyan, M.A.; Tech. Ed.: Shefer, G.I.

PURPOSE: This monograph is addressed to students and engineering and technical workers in radio.

COVERAGE: The book is based on the program for the course in radio receivers at communications institutes. The authors assume that the reader is familiar with the fundamentals of radio circuit theory (including transient processes), with general methods of amplifier circuit analysis, fluctuation noise in tubes and electric circuits, the operating characteristics of vacuum tubes at very high frequencies, and other related problems. Because of the broad scope of the book the authors have dealt only briefly with certain subjects, e.g., television receiver video tracts, radio relay lines (multichannel reception of very high frequencies), antennas, etc. Transistorized circuit theory has not been fully discussed because of its still early stage of development.

Card 1/14

SOV/106-58-6-5/13

AUTHOR: Sidorov, V.M.

TITLE: The Spectrum of the Voltage at the Output of an Amplitude Limiter with a Beat (Voltage) Acting at its Input (Spektr napryazheniya na vykhode amplitudnogo ogranichitelya pri deystvii biyeniy na ego vkhode)

PERIODICAL: Elektrosvyaz', 1958, Nr 6, pp 30 - 39 (USSR)

ABSTRACT: The spectrum of the output of an ideal limiter was investigated in Ref 1. This article extends the investigation to a limiter which has an arbitrary characteristic. It is assumed that at the input to the limiter acts at a voltage u_{BX} with a slowly changing amplitude and frequency:

$$u_{BX} = U_{BX}(t)\cos[\omega t + \varphi(t)] \qquad (1).$$

The voltage at the limiter output u_o will have a different amplitude U_o but the same frequency as the input voltage, i.e:

$$u_o = U_o(t)\cos[\omega t + \varphi(t)] \qquad (2).$$

Card 1/8

The Spectrum of the Voltage at the Output of an Amplitude Limiter with a Beat (Voltage) Acting at its Input

Eq.(2) and the relationships which follow from it are true because a filter, which passes the instantaneous frequency component $\omega + \varphi'(t)$ but does not pass the frequency components $n(\omega + \varphi')$, where $n = 2, 3$, etc., is connected to the output of the limiter.
For an ideal limiter U_o is constant but, in practice, U_o changes with time and in general the output spectrum can be considered as the spectrum of an amplitude-frequency-modulated voltage.
Dividing Eq.(2) by (1), we obtain:

$$u_o = \frac{U_o(t)}{U_{BX}(t)} u_{BX} \qquad (3) .$$

The output voltage differs from the input voltage by additional amplitude modulation denoted by the slowly changing function $U_o(t)/U_{BX}(t)$. Therefore, the output spectrum can be obtained if all the components of the output spectrum are

The Spectrum of the Voltage at the Output of an Amplitude Limiter with a Beat (Voltage) Acting at its Input

amplitude-modulated by this function.
This method for calculation of the output spectrum is used for the case of a beat voltage acting at the limiter input.

$$u_{BX} = U_1 \sin \omega_1 t + U_2 \sin \omega_2 t \qquad (4) .$$

The amplitude of the input voltage equals:

$$U_{BX} = U_1 \sqrt{1 + \alpha^2 + 2\alpha \cos x} \qquad (5)$$

where

$$\alpha = U_2/U_1; \quad x = \Omega t . \qquad (6) .$$

Here, $\Omega = \omega_2 - \omega_1$ is the beat frequency . Substituting in Eq.(3) the values from Eqs.(4) and (5), we obtain :

The Spectrum of the Voltage at the Output of an Amplitude Limiter with a Beat (Voltage) Acting at its Input

$$u_o = \frac{U_o(t)}{\sqrt{1 + \alpha^2 + 2\alpha\cos x}} (\sin \omega_1 t + \alpha \sin \omega_2 t) \quad (7)$$

i.e. the spectrum of the output voltage equals the sum of the two spectra of amplitude-modulated oscillations. The advantage of this method is that it is not usually difficult to calculate the spectrum of an amplitude-modulated voltage.

Substituting, in Eq.(7), the value of the Fourier expansion of the amplitude term, the following general expression for the spectrum at the output of the amplitude limiter when a beat acts at the input is obtained:

$$u_o = \sum_{k=0}^{\infty} \left\{ U_{\omega_1 - k\Omega} \sin(\omega_1 - k\Omega)t + U_{\omega_2 + k\Omega} \sin(\omega_2 + k\Omega)t \right\} \quad (10)$$

where the amplitudes of the spectrum equal:

The Spectrum of the Voltage at the Output of an Amplitude Limiter with a Beat (Voltage) Acting at its Input

$$\left.\begin{aligned} U_{\omega_1-k\Omega} &= P_k + \alpha P_{k+1} \\ U_{\omega_2+k\Omega} &= \alpha P_k + P_{k+1} \end{aligned}\right\} \qquad (11) .$$

Expressions show that the amplitudes of the spectrum depend on the amplitude characteristic of the limiter. The effect of a beat on a limiter with a polygonal amplitude characteristic is next considered. The polygonal function is considered as the sum of a constant number and a finite number of elemental polygonal functions (Ref 2). The elemental polygonal function consists of two straight lines, one of which lies on the abscissa. For example, the polygonal function denoted in Figure 2 by the points 0, 1, 2 can be presented as the algebraic sum of the two elemental polygonal functions 0,3 and 0,4,5 .
Thus, the amplitude of the voltage U_o at the output of a limiter which has an amplitude characteristic consisting of N linear segments (Figure 1) can be written in the form

Card 5/8

The Spectrum of the Voltage at the Output of an Amplitude Limiter with a Beat (Voltage) Acting at its Input

of the following summation:

$$U_o = \sum_{n=1}^{N} U_n(U_{BX}) \qquad (12) \quad .$$

Figure 5 shows the output spectra of an ideal limiter with different beat ratios α corresponding to 0.2, 0.6, and 1 . The spectra were calculated by Formulae (24) to (27). Figure 5 shows that additional components appear at the output and that the output spectrum is always wider than the input spectrum. The form of the output spectrum depends on α . When $\alpha = 1$, the spectrum is much wider and more symmetrical. The effect of limiting on the magnitudes of the spectrum components is considered, assuming an amplitude characteristic as shown in Figure 4. The degree of limiting is characterised by the coefficient ε , as defined in Eq.(28). Here, $B_o = (S_1 - S_2)A_2$ is the value corresponding to the intersection of the second part of the characteristic produced with the axis of the ordinate (Figure 4).

The Spectrum of the Voltage at the Output of an Amplitude Limiter with a Beat (Voltage) Acting at its Input

$B = B_0 + S_1 U_1$ is the amplitude of the output voltage in the absence of a signal. It is concluded that:
1) if $\varepsilon > 0$, the ratio $U_{\omega_2}/U_{\omega_1}$ is reduced compared with α, which is equivalent to weakening the weak signal.
2) If $\varepsilon = 0$ (linear system), the strong and the weak signals pass without change.
3) If $\varepsilon < 0$ (system increases the coefficient of amplitude modulation), $U_{\omega_2}/U_{\omega_1}$ is greater than α, which is equivalent to weakening the strong signal.
The amplitudes of the other components of the output spectrum are also determined.
To simplify calculations, graphs are produced of the formulae.
The calculated results correspond well with spectrograms obtained experimentally by the authors (Ref 1). Calculations

SOV/106-58-6-5/13

The Spectrum of the Voltage at the Output of an Amplitude Limiter with a Beat (Voltage) Acting at its Input

were also compared with the experimental data obtained by A.M. Semenov.
There are 9 figures and 4 Soviet references.

SUBMITTED: October 22, 1957

1. Limiting amplifiers--Mathematical analysis 2. Voltage--Analysis

Card 8/8

109 13-3-4/13

AUTHOR: Sidorov, V. M.

TITLE: The Effect of Weak Pulse Interference on the Receiver of Frequency Modulated Oscillations (Deystviye slaboy impul'snoy pomekhi na priyemniki chastotnomodulirovannykh kolebaniy)

PERIODICAL: Radiotekhnika, 1958, Vol. 13, Nr 3, pp. 21 - 34 (USSR)

ABSTRACT: This paper investigates the effect of weak pulse interference (which , at the output of the high-frequency filter produces a transient process with a maximum amplitude smaller than that of the intelligence signal) on a frequency modulated receiver with various high-frequency and low-frequency filters with a random signal-frequency at the moment of the interference effect. It is assumed that the frequency modulated receiver consists of a high-frequency filter, a frequency detector and a low-frequency filter. The transmission factor of the high-frequency and low-frequency filter is assumed to be equal to unity with medium frequencies. The effect of the kind of filter in the transmitter on the time course and on the spectral density of the pulse interference at the receiver output is in-

Card 1/3

The Effect of Weak Pulse Interference on the Receiver of Frequency Modulated Oscillations

vestigated. The basic formulae are given and then a receiver with ideal filters, one with idealized and one with real filters, is investigated. The following is found: 1) The voltage curve of the interference at the receiver output depends on the kind of high-frequency and low-frequency filter of the receiver as well as on the signal-frequency at the moment of interference action. 2) The ratio between the signal and the interference maximum values at the output of the frequency modulated receiver in a general case essentially depends on the kind of high-frequency and low--frequency filter as well as on their filtering ranges. In the receiver with ideal filters this ratio does not depend on the filtering range of the high-frequency filter and is dependent only on the filtering range of the low-frequency filter. 3) The interference spectrum at the output of the frequency modulated receiver in a general case not only contains cosinusoidal, but also sinusoidal components. Therefore the maximum value of the interference can not be determined by means of a simple arithmetic addition of these components without taking into account their phases. There are 12 figures and 9 references, 6 of which are Soviet.

108-13-3-4/13

The Effect of Weak Pulse Interference on the Receiver of Frequency Modulated Oscillations

SUBMITTED: September 25, 1957

Card 3/3

KUYBYSHEV, B.; PONOMAREV, I., inzh.; SIDOROV, V., deputat Kirovskogo raysoveta (g. Kopeysk); CHUGUNOV, I., inzh.

Eliminate the shortcomings in television servicing. Radio no.2: 14-15 F '59. (MIRA 12:4)

1. Nachal'nik Upravleniya priyemnoy televizionnoy seti, radiofikatsii i vnutrirayonnoy elektrosvyazi Ministerstva svyazi SSSR (for Kuybyshev). 2. Azerbaydzhanskiy nauchno-issledovatel'skiy institut po dobyche nefti, Baku (for Chugunov).
(Television--Maintenance and repair)

89827

6.4800
9.3273

S/106/60/000/011/001/010
A055/A033

AUTHOR: Sidorov, V.M.

TITLE: F.m.-Discrimination and Amplitude Detection of Beats of Two Harmonic Voltages

PERIODICAL: Elektrosvyaz', 1960, No. 11, pp. 3 - 14

TEXT: When analyzing various problems and, in particular, the noise-proof feature of radio receivers, it is necessary to determine the time-dependence and the spectrum of the voltage at the output of a f.m.-discriminator or of an amplitude detector when beats occur at its input. This determination is well-known in the case of an ideal f.m.-discriminator and of an amplitude detector without limiter. But the more general case of an unsymmetrical f.m.-discriminator with a non-ideal limiter has not been given sufficient attention in technical literature. An analysis is usually effected, in this more general case, with the aid of the frequency characteristic of the discriminator, and this method is not strictly correct when a non-ideal limiter is used. The author undertakes therefore to work out formulae allowing to determine the timedependence, the extreme values and

Card 1/5

F.m.-Discrimination and Amplitude Detection of Beats of Two Harmonic Voltages

the spectrum of the rectified voltage in the case of any degree of limiting and unbalancing of a f.m.-discriminator when beats occur at its input (see Fig.1a, where a "Two-cycle" f.m.-discriminator is represented schematically. In establishing his formulae, the author assumes that: 1) - the amplitude characteristic of the limiter, showing the dependence of the amplitude of the first harmonic of limiter-current I upon the amplitude of the input voltage U_{inp}, has the shape of the broken line 0 1 2 (see Fig.1b), where U_0 is the threshold of limiting; 2) - the transmission impedances of the linear system, for the first and the second output respectively, are:

$$\left.\begin{aligned} \dot{z}_1(\Omega) &= \frac{\dot{U}_1}{\dot{I}} = j\left[A_1 + B_1(\Omega - \omega_0)\right] \\ \dot{z}_2(\Omega) &= \frac{\dot{U}_2}{\dot{I}} = j\left[A_2 + B_2(\Omega - \omega_0)\right] \end{aligned}\right\} \qquad (1)$$

where ω_0 is the mean frequency of the frequency characteristic (see Fig. 1c). 3) - the amplitude detectors work under conditions of "linear" detection.

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A055/A033

F.m.-Discrimination and Amplitude Detection of Beats of Two Harmonic Voltages

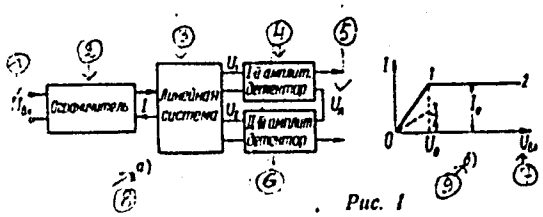
To simplify the formulae, the transmission factors of these detectors have been taken equal to unity. The formulae derived by the author for the detector output voltage, for the extreme values of the rectified voltage and for the rectified voltage spectrum are valied for any values of the constant $\underline{U}_0$, $\underline{A}_1$, $\underline{B}_1$, $\underline{A}_2$ and $\underline{B}_2$, i.e., for any degree of limiting and any unbalancing of the f.m.-discriminator. Having worked out these formulae for the general case, the author applies them to the particular cases of a balanced "two-cycle" f.m.-discriminator ($\underline{A}_1 = \underline{A}_2$; $\underline{B}_1 = \underline{B}_2$), of a "single-cycle" f.m.-discriminator ($\underline{A}_2 = \underline{B}_2 = 0$) and of a "linear" amplitude detector with or without limiter ($\underline{B}_1 = \underline{A}_2 = \underline{B}_2 = 0$). In each case, he analyzes the obtained formula in detail. When (the best frequency being great) it is impossible to consider $\underline{Z}(\Omega_1)$ as equal to $\underline{Z}(\Omega_2)$, the output voltages of the f.m.-discriminator and of the amplitude detector have different shapes, the difference being the greater the greater the beat frequency. Several curves show the shape of the discriminator output voltage. Other curves show the coefficients appearing in the expressions that state the constant component and the amplitude of the first harmonic of the voltage spectrum. In the first appendix to his article, the author investigates the peculiarities of the voltage spectra at the output

Card 3/5

F.m.-Discrimination and Ampitude Detection of Beats of Two Harmonic Voltages

of the f.m.-discriminator with an ideal and a non-ideal limiter respectively. In the second appendix, he calculates an integral used in the derivation of his general formulae. In the conclusion, the author gives a comparative survey of the advantages and peculiarities of the various systems analyzed in his article. There are 6 figures and 5 Soviet references.

SUBMITTED: June 11, 1960.



Puc. 1

Fig. 1:
1) - U_{inp}
2) - Limiter
3) - Linear system
4) - First amplitude detector
5) - U_d
(6) - Second amplitude detector

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A055/A033

F.m.-Discrimination and Amplitude Detection of Beats of Two Harmonic Voltages

Fig. 1 (continued) (7) - U_{inp}, (8) a), (9) b), (10) c).

[ABSTRACTER'S NOTE: Subscript inp (input) is the translation of the original "вх", and subscript d (detector) is the translation of the original "д".]

Card 5/5

SIDOROV, V.M.

Process of transition to the reception of an interfering station by a receiver of frequency-modulated signals. Radiotekhnika 18 no.11:35-44 N '63. (MIRA 16:12)

1. Deystvitel'nyy chlen Nauchno-tekhnicheskogo obshchestva radiotekhniki i elektrosvyazi imeni Popova.

L 56559-65 EWT(l)/EWA(h) Pet

ACCESSION NR: AP5017811 UR/0286/65/000/011/0042/0042
621.376.33

AUTHOR: Sidorov, V. M.; Kubitskiy, A. A. 11 8

TITLE: A balanced fm discriminator. Class 21, No. 171442 25

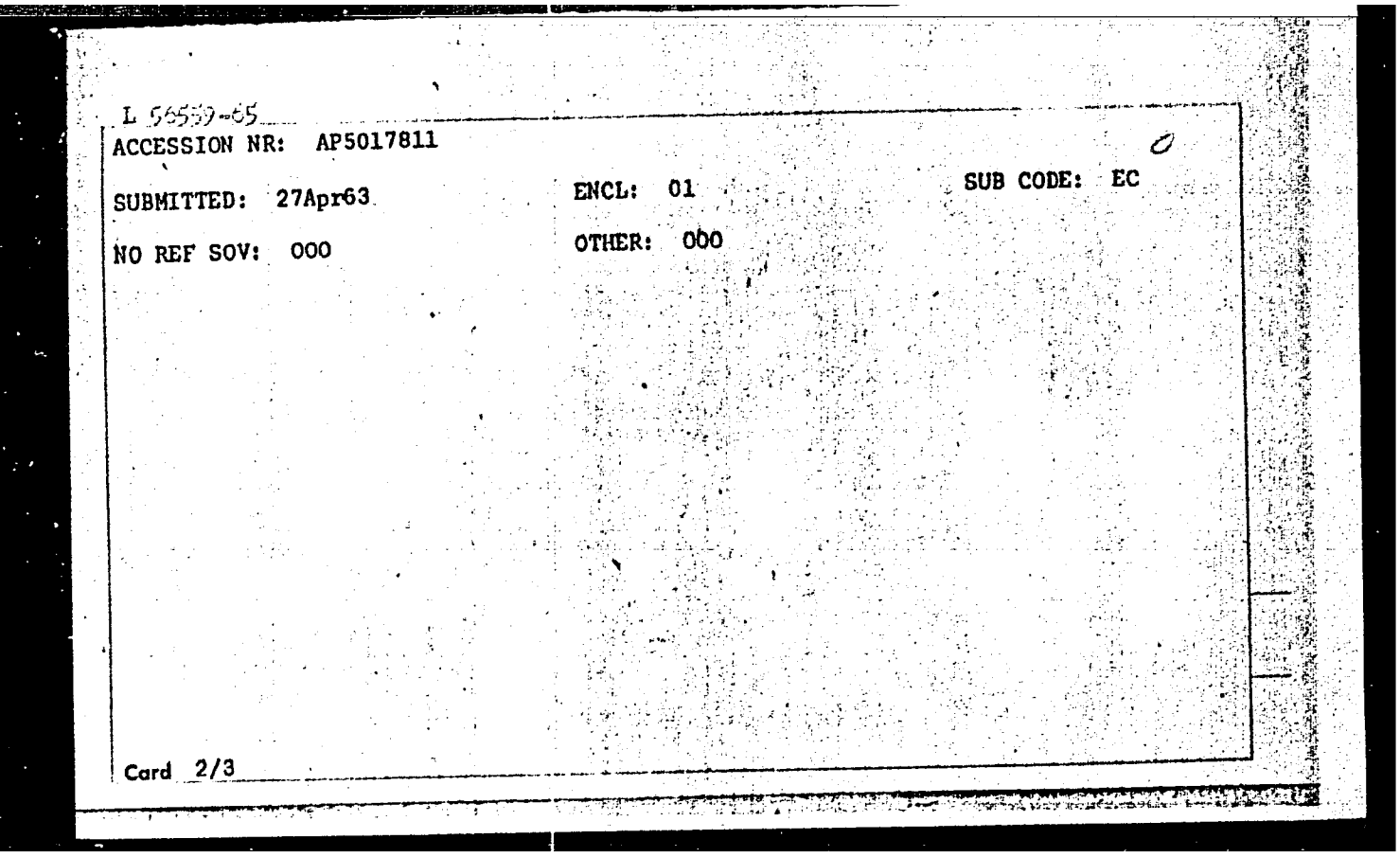
SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 11, 1965, 42

TOPIC TAGS: fm detector technology, electronic circuit, tuned circuit

ABSTRACT: This Author's Certificate introduces a balanced fm discriminator which contains an amplitude limiter, frequency dependent linear element and two rectifiers all connected in series. The circuit is simplified by using a wide band tank circuit as the frequency dependent linear element. The tank circuit is tuned to the average deviation frequency and passes higher harmonics. Two peak detectors are connected to the common output of the tank circuit (without centertap). The peak detectors operate across a common load resistor and are connected in a balanced circuit.

ASSOCIATION: none

Card 1/3



L 56559-65

ACCESSION NR: AP5017811

SUBMITTED: 27Apr63 ENCL: 01 SUB CODE: EC

NO REF SOV: 000 OTHER: 000

Card 2/3

ACC NR: AP7001382 (A,N) SOURCE CODE: UR/0413/66/000/021/0054/0054

INVENTOR: Balashov, Ye. P.; Sidorov, V. M.

ORG: none

TITLE: A magnetic element. Class 21, No. 187835 [announced by Leningrad Electrotechnical Institute im. V. I. Ul'yanov (Leningradskiy elektrotekhnicheskiy institut)]

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 21, 1966, 54

TOPIC TAGS: logic element, pulse storage

ABSTRACT: An Author Certificate has been issued for a magnetic element for storing a pulse count. The device contains a transfluxor with several aperatures with a

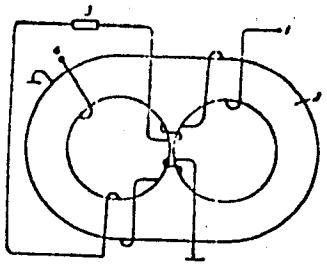


Fig. 1. Magnetic element

1 - Input; 2 - core; 3 - delay line; 4 - output.

Card 1/2 UDC: 681.142.07

ACC NR: AP7001382

priming, a read-write, and an output winding (see Fig. 1). To increase reliability it is equipped with a delay element. The priming winding is mounted on one end cross-connector and a central cross-connector of the transfluxor and, through the delay element, is connected to the read-write winding which is mounted on the central and the second end cross connector. The output winding also lies on this last cross-connector. The cross section of the central cross-connector is not equal to that of the end cross-connectors. Orig. art. has: 1 figure. [JR]

SUB CODE: 09/ SUBM DATE: 22Nov65/ ATD PRESS: 5110

Card 2/2

ZININ, Il'ya Fedorovich, insh.; SIDOROV, V.N., insh., red.;
ATTOPOVICH, M.K., tekhn. red.

[Distributing the repair of metallurgical equipment; from the practices of the "Serp i Molot" Plant] Rassredotochennye remonty metallurgicheskogo oborudovaniia; iz opyta zavoda "Serp i molot." Moskva, Metallurgizdat, 1954. 97 p.
(MIRA 16:8)
(Metalworking machinery--Maintenance and repair)

S/856/62/000/000/003/011
E194/E135

AUTHORS: Zolotykh, B.N., and Sidorov, V.N.

TITLE: A demountable sharp-focus impulse X-ray tube

SOURCE: Problemy elektricheskoy obrabotki materialov. Tsentr. nauchnoissl. labor. elek. obrab. mat. AN SSSR. Ed. by B.R. Lazarenko. Moscow, Izd-vo AN SSSR, 1962. 86-90.

TEXT: To investigate the dynamics of the erosion process in a liquid dielectric with short pulses and short gaps (10 - 100 microns) it was necessary to develop a sharp-focus (some tenths of a millimetre) X-ray tube of relatively long wavelength. High intensity was not required but long tube life was necessary. Impulse X-ray tubes of sealed-off type are of short life, difficult to repair and not easily made for the longer wavelengths. Accordingly, TsNIL-ELEKTROM AN SSSR developed a demountable tube. The conical or needle-shaped anode, made of tungsten, molybdenum or copper, is arranged vertically 12.5 m above the top sharp edge of a hollow cylindrical stainless steel cathode. The ignition electrode is insulated from the cathode by

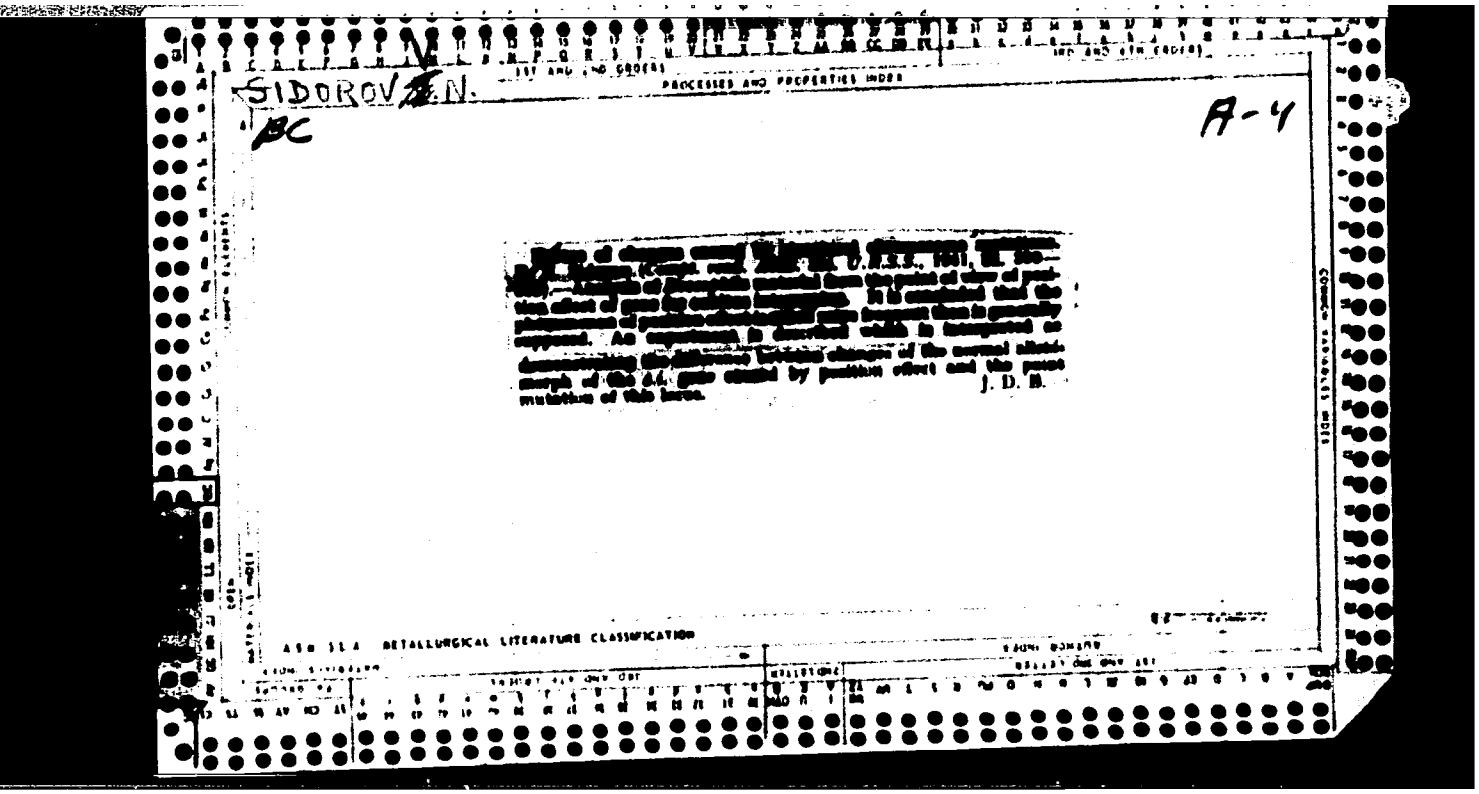
Card 1/2

KOZLOV, Sergey Sergeyevich; SIDOROV, V.N., ved. red.; STAROSTINA, L.D., tekhn. red.

[Remote control in main pipelines] Telemekhanizatsiia magistral'nykh truboprovodov. Moskva, Gostoptekhizdat, 1963. 79 p. (MIRA 17:1)

SIDOROV, V. N.

"Spontaneous Mutations in the Scute Inversion in Drosophila Melanogaster," Dok. AN, 30, No. 3, 1941. Mbr., Inst. Experimental Biology, Acad. Sci., -1941-.



SIDOROV, B. N.

IA 53T54

USSR/Medicine - Chromosomes
Medicine - Flies

Aug 1947

"Fission of the X-Chromosome Chains of the Drosophila Melanogaster of Different Lineages," B. N. Sidorov, Inst Cytology, Histology, and Embryol, Acad Sci USSR, 3 pp

"Dok Akad Nauk SSSR, Nova Ser" Vol LVII, No 4

Brief description of results of experiments conducted to explain process of crossing over and conjugation using Y and X-chromosomes. Submitted by Academician L. A. Orbeli, 22 Feb 1947.

53T54

SIDOROV, N.N. : SOKOLOV N.N.

"Female Form of the Ricinus Communis," Dok. AN, 57, No.5, 1947

SIDOROV, V. N.

Mbr., Institute Cytology, Histology, and Embryology, Acad. Sci., -1947-

"Genotypical Control of the Mosaic in the Drosophila Melanogaster," Dok. AN, 58, No. 9, 1947

"Severance of Connected - Chromosomes in the Drosophila Melanogaster in Lines of Different Origin," Dok. AN, 57, No. 4, 1947

17 (4), 17 (20)

AUTHORS: Dubinin, N. P., Corresponding Member, SOV/20-126-2-48/64
AS USSR, Sidorov, ~~B. N.~~ V. N., Sokolov, N. N.

TITLE: Protection Mechanism Against Genetic Effects of Radiation
(O mekhanizme zashchity ot geneticheskikh effektov radiatsii)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 126, Nr 2,
pp 400-403 (USSR)

ABSTRACT: In numerous tests on the chemical protection of nuclei, against the photodynamic effects (Phd. E.), the authors have established a powerful protective of hyposulphite (Table 1). In a test with X-ray irradiation, however, the protective effect could not be observed (Table2). One may say that the protective mechanism of hyposulphite by Phd. E. is not necessarily connected with the oxygen-neutralization. Previously (Ref 2) a certain similarity of the Phd. E. with the results of the water radiolysis through ionized radiation was indicated. Here also a free HO_2-radical is formed as end effect, although in another way. The tests, carried out by the authors, have shown that hyposulphite protects either, against the hydroperoxide-radical HO_2 or the HO_2-radical plays no

Card 1/4

essential part, or finally that a connection exists between the ionized, and the normal states of the oxygen molecules, whereby there is a difference in the protective effect of the hyposulphites against the Phd. E. on one hand and against the X-ray irradiation on the other. Thio-urea is effective against ionized radiation, but offers no protection to the chromosomes against Phd. E. (Table 3). One must admit that the protective effect of the thio-urea is not connected with the neutralization of the free HO_2-radical, if it arises by the X-ray action as well as with the Phd. E. Although this conclusion seems to contradict the current opinion about the role of the thio-urea in radiobiological effects, it may nevertheless be true (Ref 3). There is a connection between photodynamic activity and luminescence. Luminescent pigments are, as a rule, active, whereas the pigments which are not luminescent are, in this reaction inactive (Ref 3). Hence the authors became aware of the fact that hyposulphite extinguishes the luminescence. This is known to be in some way connected with the obstructing process of the photo-

reaction, and goes parallel to the latter process. The authors have tested, as protection against Phd. E. several luminescent extinguishers (KJ, KBr, hydroquinones) under the application of rivanol and methylene-blue (Table 4). M. I. Mekshenkov has verified the contrasting value of the authors' methylene-blue solution as a luminescence extinguisher. He obtained the following amount of quantum-yield (kvantovyy-vykhod): Hydroquinone 62, hyposulphite 78, KJ - 84, KBr - 86. As is seen by table 4, the degree of protective effect of these substances corresponds to their difference in luminescence extinguish. KJ and hyposulphite do not offer any protection against the results of X-ray irradiation to the chromosomes (Tables 2, 5). Those substances which protected against Phd. E. were ineffective against X-rays (thio-urea). The main test with germinated seeds of the onion (Allium cepa) and of Nigella damascena showed a greater resistance on the part of the latter against Phd. E. (Table 6) as well as against X-rays. Nigella was also more resistant than the onion against the chemical reaction of age and against factors which are brought about by the natural process of mutation. Such a distinction

Protection Mechanism Against Genetic Effects of Radiation SOV/20-126-2-48/64

is established here for the first time. The nature of the resistance remains unknown for the time being. Several opinions to its clarification have been offered. There are 6 tables and 7 references, 4 of which are Soviet.

ASSOCIATION: Institut tsitologii i genetiki Sibirskogo otdeleniya Akademii nauk SSSR (Institute for Zytology and Genetics of the Siberian Branch of the Academy of Sciences, USSR)

SUBMITTED: February 23, 1959

Card 4/4

SOV/20-126-1-49/62

17(4)
AUTHORS: Dubinin, N. P., Corresponding Member AS USSR, Sidorov, [illegible] N.,
Sokolov, N. N.

TITLE: The Genetic Consequence of the Aftereffect of Visible Light
(Geneticheskiy effekt posledeystviya vidimogo sveta)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 126, Nr 1, pp 179-182
(USSR)

ABSTRACT: The photodynamic process of visible light causes a great number of re-arrangements of chromosomes. The analysis of the after-effect of irradiated solutions of coloring matter is of great interest for the explanation of the nature of this phenomenon. The aftereffect mentioned, was found in the hemolysis (Refs 1-5): weak solutions of fluorescing colors showing no darkness reaction, can endanger erythrocytes after they have been exposed to light, while the effect itself takes place in darkness. The question arose, whether re-arrangements of chromosomes could be achieved through solutions treated in the described way. As test objects served the roots of onions treated in darkness with solutions of Rivanol or toluidine-blue which had been exposed to light before (Table 1). A remarkable increase of re-

Card 1/3

The Genetic Consequence of the Aftereffect of Visible Light

arrangements of chromosomes was noted in all experiments. The degree of the aftereffect can be considerably increased by certain additions (boric acid) (Table 2). This supports the idea that in this case the mutagenic effect of the coloring matter is related to some sort of long existing combinations which develop under the influence of light. These can neither be the effected molecules of coloring matter nor the active radicals OH and HO_2. Table 3 shows the results of additional experiments which were meant to show the consequence of the aftereffect at different moments after the exposition to light. As can be seen from this, the consequence of the aftereffect lasts 15 min but completely disappears after 30 min. The life of the mutagenic factor seems to be 15-20 min after the time which the dyestuff needs to penetrate into the root has been deducted. The authors give a survey of the work on the mutagenic effect of the irradiated medium on microorganisms (Refs 7-11). In reference 10 the conclusion is arrived at that the mutagenic effect of the medium treated with H_2O_2 or with u.-v.-rays is related to the development of organic peroxides. This is also proved in ref-

erences 12 and 13. The authors assume that in the case of an aftereffect of visible light, the mutagenic effect is related to peroxide products. The latter develop due to the addition of molecular oxygen to the color molecule. These are the so-called photo-oxydes, the existence of which has been chemically proved in the cases of certain dyestuffs (Ref 14). In this work the authors have proved at least three different mechanisms of the mutagenic effect of color molecules: a) The effect of active radicals (photodynamic effect), b) the effect of photo-oxides (aftereffect of irradiating color molecules with visible light), and c) probably a direct reaction of color molecules with the nuclein (darkness-reaction). There are 3 tables and 13 references, 2 of which are Soviet.

ASSOCIATION: Institut tsitologii i genetiki Sibirskogo otdeleniya Akademii nauk SSSR (Institute of Cytology and Genetics of the Sibir' Branch of the Academy of Sciences USSR)

SUBMITTED: February 25, 1959

30 (1), 17 (4)

AUTHORS: Dubinin, N. P. Corresponding Member AS USSR, Sidorov, V. N., Sokolov, N. N. SOV/20-128-1-46/58

TITLE: Genetic Effect of Free Radicals

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 128, Nr 1, pp 172-175 (USSR)

ABSTRACT: Considering that the experimental proof of the radiobiological effect of free radicals is of greatest importance for the whole theory of the primary radiation effect on living cells, the authors carried out the following experiments. Chromosome transformation in the cells of bulbs is caused by an influence of free radicals produced by a chemical process in the cell. The first experiment was carried out by introducing bivalent iron and hydrogen into the cell. It is known (Refs 21, 22) that OH- and HO_2 radicals develop under these conditions. The occurrence of OH and HO_2 radicals involves strongly oxidative properties of Fenton's reagent. In the first test series frequencies of chromosome transformations were investigated in five control series: 1.) Seeds not treated. 2.) Seeds treated with 0.001 M $FeSO_4$ solution; 3.) Seeds treated with 0.006 M or 0.01 M

Card 1/3

Genetic Effect of Free Radicals

H_2O_2. 4.) Seeds treated with a solution of 0.001 M $FeSO_4$ and 0.006 M H_2O_2 immediately after the production of the mixture. 5.) The same - 15 minutes after the production of the mixture. Table 1 shows that the free radicals produced by a chemical process in the cell, have a strongly genetic effect. Figure 1 (insert sheet to page 73) shows photomicrographies of cells in which chromosome transformations were caused by free radicals chemically produced in the cell. Table 2 gives results of the second experiment. As can be seen, the free OH and HO_2 radicals produced in the cell by the reaction of ascorbic acid with hydrogen peroxide, and those produced under the influence of Fenton's reagent, are considerably effective in causing chromosome transformations. By transforming chromosomes it could be proved for the first time that free OH and HO_2 radicals have an effective influence on the structures of living cells. The problem regarding the intensity of the effect of free radicals under the influence of ionizing radiation on the cells, cannot be solved by experiments with chemically produced radicals. It is possible, however, to identify exactly the effect of the

Card 2/3

chemical protection by extinguishing the effect of certain radicals. It will become possible to find a concrete relation between a direct and an indirect effect of radiation on genetic structures by defining the relation between the chemical protection against free radicals chemically produced in the cell, and against the effect of ionizing radiation. Besides it will be possible to approach in a new way the analysis of different radiosensitivity. Experiments in this connection are still going on. There are 2 tables and 24 references, 5 of which are Soviet.

ASSOCIATION: Institut biofiziki Akademii nauk SSSR (Institute of Biophysics of the Academy of Sciences, USSR)

SUBMITTED: April 8, 1959

81734
S/020/60/133/01/62/070
B011/B126

21.6300

AUTHORS: Dubinin, N. P., Corresponding Member AS USSR, Sidorov, B. N., Sokolov, N. N.

TITLE: Experimental Analysis of the Original Mechanism of the Effect of Radiation on the Cell Nucleus

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 133, No. 1, pp. 221-224

TEXT: The primary effects of radiation are caused either by the energy which is absorbed within the molecules of the structure to be changed (direct effect), or by free radicals, which form in the solution as a result of water ionization (indirect effect). These criteria were, however, refuted by the proved effect of radiation on water-free polymers. The authors were able to analyze directly the rôle of direct and indirect radiation effects, since the genetic activity of the free radicals, which were produced chemically in the cell (Ref. 15), was proved. The authors wanted to discover the chemical protection against the OH-radicals, which

Card 1/4

forms on electron transmission in reductive systems. The use of the same protection against the ionizing radiation must extinguish that part of the protection which is activated by the effect of the radicals forming through the ionization of the H_2O molecules. The authors have proved a chemical protective action (Ref. 16) through hydroquinone, iodine ion, and other substances. But they were unable to characterize the chemical protective effect until they had chemically produced free radicals in the cell. The Fenton reaction takes place as follows:

$Fe^{2+} + H_2O_2 \longrightarrow Fe^{3+} + OH^- + OH$. The iodine- and bromine ions introduced into the small roots of onions suppress the genetic effect of both the Fenton reagent and the mixture of ascorbic acid with H_2O_2. The iodine ion does not shield the chromosomes against conversions (Table 1). The Fenton reagent is genetically more effective. Ascorbic acid alone, as acceptor of free radicals, is able to shield the chromosomes. The iodine ions raise the whole effect of the free radicals from the latter reaction (100%), and leave about half of the free radicals in the Fenton reaction unbound. The iodine ion binds on the one hand the free hydroxyl radicals

Experimental Analysis of the Original Mechanism of the Effect of Radiation on the Cell Nucleus

in this reaction, and on the other hand raises the number of free radicals, converting divalent iron into trivalent. From their experiments the authors could not confirm the statements that the reaction of trivalent iron with H_2O_2 leads to the formation of a chromosome conversion. At the same time the mutation process can be initiated by the solution of trivalent iron with H_2O_2, which has no genetic effect (Table 4). Thio-urea shields the chromosomes against direct and indirect radiation effects (Table 5), whilst shielding them against the chemically produced free radicals. Thio-urea does not, however, shield against H_2O_2. In all cases the effect takes place inside the cell nucleus. Iodine ions and quinone shield the molecules at low concentrations (experiments by M. I. Mekshenkov). It follows from the results that the main effect during shielding against ionizing radiation is direct. The genetic effect of the radiation is predominantly bound up with the direct effect of the energy on the chromosomes. Finally the authors indicate promising directions for research. There are 6 tables and 33 references: 6 Soviet, 7 British, 19 US, and 1 German.

4

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Experimental Analysis of the Original Mechanism of the Effect of Radiation on the Cell Nucleus

S/020/60/133/01/62/070
B011/B126

ASSOCIATION: Institut biofiziki Akademii nauk SSSR (Institute of Biophysics of the Academy of Sciences, USSR)

SUBMITTED: January 9, 1960

4

Card 4/4

SIDOROV, V.N.

Simplified method of multiple implantation of electrodes in the subcortical structures of the brain. Zhur. vys. nerv. deiat. 15 no.5:943-946 S-O '65. (MIRA 18:11)

1. Kafedra normal'noy fiziologii Gor'kovskogo gosudarstvennogo meditsinskogo instituta im. S.M. Kirova.

SOV-129-58-6-7/17

AUTHORS: Sidorov, V.P., (Engineer), and Ryabchenkov, A.V.(Dr.Chem. Sc.Prof.)

TITLE: Corrosion Cracking of Austenitic Steels at Elevated Temperatures and Pressures (Korrozionnoye rastreskivaniye austenitnykh staley pri povyshennykh temperaturakh i davleniyakh)

PERIODICAL: Metallovedeniye i Obrabotka Metallov, 1958, Nr 6, pp 25-32 (USSR)

ABSTRACT: The aim of the work described in this paper was to develop a method of corrosion tests under stress pertaining in steam superheaters and steam piping. The austenitic steels 1Kh18N12T, 1Kh18N9T and EI257 were investigated. The chemical analyses of these are given in Table 1, p.26 and the heat treatment regimes and mechanical properties in Table 2, p.26. In developing a method of investigation it was necessary to reproduce the effect of all the fundamental operational factors pertaining inside steam generation equipment. The experiments were carried out by the method of recording the curves of long duration corrosion strength using a UIM-5 test machine, a sketch of which is shown in Fig.1, p.27. Due to the high demands regarding the hermeticity of the specimens, it was necessary to use

Corrosion Cracking of Austenitic Steels at Elevated Temperatures and Pressures

welded joints. A tubular specimen was used for combining the functions of the autoclave and the specimen (invention of the authors of this paper). During the manufacture of the specimen transverse scratches on the internal surface were eliminated by lapping by hand. The tensile stresses in the specimen were produced by the tensile forces of the machine and by means of internal pressure. The influence was investigated of mechanical stresses, of the composition and concentration of the solutions, and of the influence of heat treatment. The graph Fig.2 shows the results of long duration corrosion strength tests on the investigated boiler type austenitic steels. In Fig.4 the dependence is graphed of the time to failure of a specimen on the concentration of a solution of NaOH (stress; 30 kg/mm^2). In Fig.5 the dependence is graphed of the time to failure of a specimen of the same steel on the concentration of NaCl in a 3% solution of NaOH. In Fig.6 the dependence is graphed of

Corrosion Cracking of Austenitic Steels at Elevated Temperatures and Pressures

the time to failure of a specimen on the test temperature. The tests carried out by means of the technique for testing the long duration corrosion strength of austenitic steels in aqueous solutions at elevated temperatures and pressures allow the following conclusions to be made: (1) The steels 1Kh18N12T, 1Kh18N9T and EI257 tend to corrosion cracking in alkali solutions (the character of the failure is predominantly transcrystalline); this tendency is greatest for the steel EI257 and weakest for the steel 1Kh18N12T. (2) Of all the investigated steels, the corrosion cracking in a pure distillate with access of oxygen at 100°C occurred only for the steel EI257 during the tests lasting 1000 hours. (3) The action of the pure distillate at 300°C for 500 hours with a limited access of oxygen did not cause corrosion cracking of the investigated steels. The solutions of NaCl, Na_3PO_4, Na_2HPO_4, Na_2SO_4, Na_2SO_3 in absence of oxygen or in presence of a limited access of oxygen, do not cause corrosion cracking of austenitic steels. (4) The concentration curve of long duration corrosion strength of austenitic steels in alkali media does show a limit. Thus, the critical concentra-

Corrosion Cracking of Austenitic Steels at Elevated Temperatures and Pressures

tion of alkali for the steel 1Kh18N9T at 210°C and σ = 30 kg/mm^2 is 3% and at 330°C it approaches 1%. (5) Addition of NaCl to alkali solutions showed an inhibiting effect on the processes of corrosion cracking. (6) The relation between the time to failure and the absolute test temperature in corrosion cracking tests in alkaline media show an exponential character. (7) Even if the heat treatment does not show an appreciable influence on the corrosion strengths of the steels 1Kh18N9T and EI257 inside alkali media, it can prevent corrosion cracking since it results in the removal of internal stresses. There are 7 figures, 4 tables and 8 references, of which 6 are Soviet, 1 English and 1 German.

ASSOCIATION: TsNIITMASH

1. Steel - Corrosion 2. Steel - Test methods

Sidorov, V.P.

18(7) PHASE I BOOK EXPLOITATION SOV/2296

Tsentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya

Korroziya i zashchita metallov v mashinostroyenii (Corrosion and Protection of Metals in the Machine-building Industry) Moscow, Mashgiz, 1959. 347 p. (Series: Its: [Sbornik] kn. 92) 3,500 copies printed.

Ed.: A. V. Ryabchenkov, Doctor of Chemical Sciences, Professor; Ed. of Publishing House: A. I. Sirotin, Engineer; Tech. Ed.: B. I. Model'; Managing Ed. for Literature on Heavy Machine Building (Mashgiz): S. Ya. Golovin, Engineer.

PURPOSE: This collection of articles is intended for designers, technologists, and industrial and research workers concerned with corrosion and corrosion protection of metals.

COVERAGE: This collection of articles deals with problems of corrosion and metal protection under investigation at TsNIITMASh during the past two years. The articles discuss stress corrosion, intergranular corrosion, scale and heat resistance of austenitic steels in gaseous media, protective coating, fretting corrosion, and resistance of metals to cavitation. No personalities are

~~Card 1/7~~

mentioned. References follow each article.

TABLE OF CONTENTS:

SOV/32-25-2-37/78

18(7)

AUTHORS: Ryabchenkov, A. V., Sidorov, V. P.

TITLE: The Methodology of Continuous Corrosion Investigations in Liquid Media at Increased Temperatures and Pressures (Metodika dlitel'nykh ispytaniy na korroziyu v zhidkikh sredakh pri povyshennykh temperaturakh i davleniyakh)

PERIODICAL: Zavodskaya Laboratoriya, 1959, Vol 25, Nr 2, pp 2o4 - 2o5 (USSR)

ABSTRACT: An investigation was made of the tendency toward destructions of austenite boiler steel caused by corrosion in liquids in correspondence with the working conditions in steam superheaters and steam pipes of the boilers SVP. This investigation was carried out in order to examine the resistance of these steels at simultaneous effects of increased pressure, high temperature, and mechanical stress in the corrosion medium. An appropriate testing method was developed (Ref 1). An apparatus of the UIM-5 type was used for recording the diagrams of the continuous corrosion resistance at increased pressure and temperature, since the apparatus normally used (Ref 2) as well as the attachments to the IP-2 apparatus

Card 1/2

(Ref) suggested by V. N. Gulyayev and A. V. Ratner are insufficient. The sample was welded into a tube with a corrosion liquid consisting of 3% NaOH + 0.15% NaCl (Fig 1) and tested at 330° and a pressure of approximately 130 atmospheres. Austenite steel EI 257, 1Kh18N12T, 1Kh18N9T and a ferrite-martensite steel EI 754 (with 11% Cr and slight Ni, V, Mo and Nb additions) were tested. The test results show that the steel 1Kh18N12T has the highest resistance, while the steel EI 257 exhibits the lowest resistance (Fig 2). It was found that the presence of a welding seam has no effect on the continuous corrosion resistance (Fig 3). There are 3 figures and 4 references, 3 of which are Soviet.

ASSOCIATION: Tsentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya (Central Scientific Research Institute of Technology and Machine Building)

SIDOROV, V.P., inzh.

Investigating the effect of some factors on corrosion cracking of austenitic steels used for boilers. Trudy TSNIITMASH 92:42 '59. (MIRA 12:8)
(Steel--Corrosion) (Metallography)

S/129/62/000/007/003/008
E073/E135

AUTHORS: Ryabchenkov, A.V., Doctor of Chemical Sciences, Professor, and Sidorov, V.P., Engineer.

TITLE: Creep strength of the steel 1X14H14B2M (1Kh14N14V2M) operating in high pressure steam

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, no.7, 1962, 31-33 (+ 1 plate)

TEXT: The effect of high pressure steam on the creep strength of this steel (composition: 0.13% C; 0.54% Si; 0.59% Mn; 0.019% S; 0.024% P; 13.43% Cr; 13.83% Ni; 2.3% W; 0.44% Mo) in the austenised state was studied under conditions pertaining during normal operation in very high pressure steam superheaters. The proneness to intercrystallite corrosion was determined by boiling standard specimens in a solution containing 70 ml H_2SO_4, 30 ml HNO_3, and 10 g $CuSO_4$ per litre. Superheated steam (580 °C, 185 atm) lowers somewhat the creep strength and the plasticity of the steel. Specimens tested in high pressure steam showed a greater number of cracks than those tested in air. In both cases the cracks were intercrystalline.

Card 1/ 0 2

Fig.1 gives the creep strength ($\sigma_{\partial\lambda}$, kg/mm^2) of specimens tested at 580 °C in steam of 185 atm pressure (line 2), and in air (line 1), as a function of the time to failure. Fig.2 gives the curves of the relative total deformation (in %) of tubular specimens of this steel tested at 580 °C in high pressure steam (curves 2, 3 and 4) and of reference specimens tested in air at the same temperature (curves 1, 5 and 6), as a function of the test duration, hours. There are 3 figures.

ASSOCIATION: TsNIITMASh

Fig.2. 1 - σ = 24 kg/mm^2, 6 hours; 2 - σ = 24 kg/mm^2, 28 hours;
3 - σ = 20 kg/mm^2, 332 hours;
4 - σ = 22 kg/mm^2, 253 hours;
5 - σ = 22 kg/mm^2, 1247 hours;
6 = σ = 20 kg/mm^2, 4071 hours.

ACCESSION NR: AP5009921 UR/0032/65/031/004/0501/0503

AUTHORS: Ryabchenkov, A. V.; Sidorov, V. P.; Gerasimov, V. I.; Pongil'skiy, N. F.

TITLE: Apparatus for testing steel for corrosive cracking in aqueous solutions with known concentration of salts and oxygen

SOURCE: Zavodskaya laboratoriya, v. 31, no. 4, 1965, 501-503

TOPIC TAGS: steel, steel corrosion, corrosive cracking, oxygen / Kh18N10T steel, EP17 steel, EI695R steel, EP184 steel

ABSTRACT: An apparatus for high-temperature testing of steels for their tendencies to corrosive cracking in aqueous solutions with known concentrations of salts and oxygen was developed (see Fig. 1 on the Enclosure). It consists of an autoclave 1 with the specimens, a convection loop 2 with a heater 3 and a cooler 4, a pressure stabilizer 5, a pump 6, a doser 7, a tester 8, and an intermediate tank 9. Experiments are conducted on crescent-shaped specimens. The necessary oxygen concentration is achieved by using compressed gas. At 350C a pressure of 200 atm is maintained in the system. The interchange of liquid between the autoclave and the pressure regulator is caused by periodic temperature oscillations during the process of regulation. The salt content is

Card 1/3

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ACCESSION NR: AP5009921

corrected with the doser which is also used for a more intensive liquid exchange. The intermediate tank serves for adding gas to the stabilizer in the course of an experiment. Austenite steels Kh18N10T, EP17, EI695R, and EP184 were tested in a solution containing 500 g/liter of chloride ions and 0.4 mg/liter of oxygen. It was found that under these conditions cracking may occur very rapidly (in 500 hr). Steels EI695R and EP184 proved to be most resistant. An addition of nickel in steel increased its resistance. This method may be applied to testing for general, contact, and intercrystalline corrosion in water with a known oxygen content. Orig. art. has: 1 diagram.

ASSOCIATION: Tsentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya (Central Scientific Research Institute of Technology and Machine Construction)

SUBMITTED: 00 ENCL: 01 SUB CODE: MM

NO REF SOV: 001 OTHER: 002

Card 2/3

ACCESSION NR: AP5009921 ENCLOSURE: 01

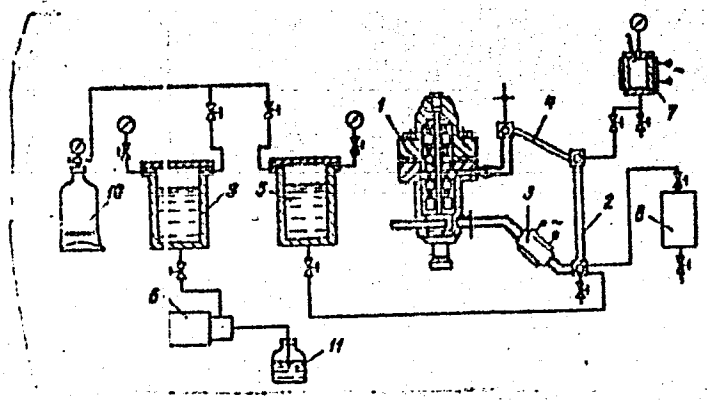

Fig. 1.

Apparatus 3-V for testing corrosion under stress at a constant deformation in aqueous solutions of high parameters at a known oxygen concentration: 10- tank with compressed gas; 11- feeding container. For other designations see text.

Card 3/3

L 64373-65 EWT(d)/EWT(m)/EWP(w)/EPF(c)/EWA(d)/EWP(v)/T/EWP(t)/EWP(k)/EWP(h)/EWP(z)/EWP(b)/EWP(l) MJW/JD/WB

ACCESSION NR: AP5019122 UR/0032/65/031/008/1019/1020
620.197-111

AUTHORS: Ryabchenkov, A. V.; Sidorov, V. P.; Pongil'skiy, N. F.

TITLE: Apparatus for recording long-duration corrosion strength of small-section specimens in water at high pressures and temperatures

SOURCE: Zavodskaya laboratoriya, v. 31, no. 8, 1965, 1019-1020

TOPIC TAGS: corrosion strength testing, corrosion strength, steel property, metal property, Kh18N10T steel, EP17 steel

ABSTRACT: To improve the accuracy of previous experimental apparatus designs (W. C. Schroeder and A. A. Berk. Metals Technology, No. 1, 1963; A. V. Ryabchenkov and V. P. Sidorov. Zavodskaya laboratoriya, XXV, 2, 1959), a new apparatus for recording corrosion strength of small specimens (0.5-1.0 mm thick) in water (up to 350C and 200 atm) was developed (see Fig. 1 on the Enclosure). It consists of an autoclave 1 with specimen 2, container 3, weight 4, sleeve 5, upper support 6, bracket 7, weight support 8, load release 9, and contacts 10 which signal the failure of the specimen. Sample experiments were performed with steels Kh18N10T and EP17 in a solution containing 1000 mg/liter NaCl and 40 mg/liter O_2 at a

Card 1/3

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ACCESSION NR: AP5019122

3

stress of 40 kg/mm^2, temperature 350C and pressure 200 atm. Failure occurred after 1150 and 3330 hours respectively. The apparatus proved easy to use and service. Orig. art. has: 1 figure.

ASSOCIATION: Tsentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya (Central Scientific Research Institute of Technology and Machine Construction)

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SUBMITTED: 00 ENCL: 01 SUB CODE: MM

NO REF SOV: 002 OTHER: 001

Card 2/3

L 64373-65

ACCESSION NR: AP5019122

ENCLOSURE: 01

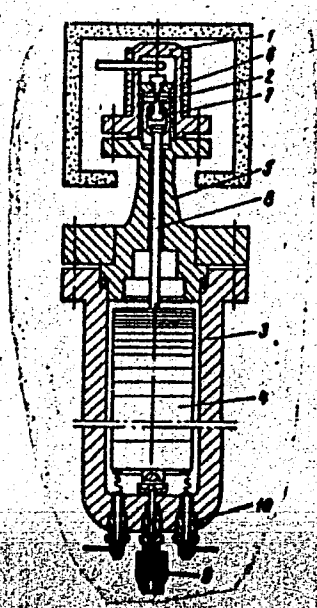

Fig. 1. Schematic of apparatus

Card 3/3

L 7727-66 EWT(1)/EWP(m)/ETC/EPF(n)-2/EWG(m)/EPA(w)-2 IJP(c) AT

ACC NR: AP5025883 SOURCE CODE: UR/0057/65/035/010/1749/1754

AUTHOR: Sidorov, V.P.; Soldatenkov, T.R.

ORG: none

TITLE: Entrainment of a plasma by a rotating electromagnetic field

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 35, no. 10, 1965, 1749-1754

TOPIC TAGS: plasma stability, plasma dynamics, magnetohydrodynamics, rotation, rotating magnetic field

ABSTRACT: The entrainment of a plasma cylinder in a uniform magnetic field by a rotating electromagnetic field is discussed in the magnetohydrodynamic approximation. The calculations were undertaken because rotation of a plasma cylinder can be useful in prolonging its life, in suppressing flute instability, and possibly in heating it. The rotating electromagnetic field discussed is that due to currents proportional to exp i(ft + mθ) in the z direction on a cylindrical surface coaxial with the plasma cylinder. Here r, θ, z are cylindrical coordinates, f is the frequency, and m is an integer. The magnetohydrodynamic equations are solved by a successive approximation method based on expansion in powers of the ratio of the strength of the alternating magnetic field to that of the uniform axial magnetic field. In the zeroth approximation the plasma is assumed to be at rest. The first approximation describes the distribution of the high frequency fields in the plasma, but the plasma motion appears only in the

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ACC NR: AP5025883

15

second approximation. In order to obtain the second approximation it is assumed that the entrainment time is long compared with the period of the high frequency field, and all quantities are separated into slowly-varying and high-frequency parts. In the second approximation there appear radial and azimuthal motions of the plasma, a radial electric field, and an azimuthal current. The second approximation describes only the initial stages of the plasma entrainment because the reaction of the plasma motion on the field appears only in higher order approximations, which are not calculated in general form. The entrainment time is estimated under further restrictive assumptions. The effect on the entrainment process of the finite plasma lifetime and the possibility of instabilities due to the rotational velocity gradients and the azimuthal currents must be further investigated. The authors thank R.A.Demirkhanov and T.I.Gutkin for suggesting the problem and for their stimulating interest, and A.A.Rukhadze, L.I.Rudakov, and D.P.Kostomarov for valuable discussions. Orig. art. has: 41 formulas.

SUB CODE: ME/ SUBM DATE: 09Nov64/ ORIG REF: 001/ OTH REF: 002

Card 2/2

RYABCHENKOV, A.V.; SIDOROV, V.P.; GERASIMOV, V.I.; PONGIL'SKIY, N.F.

Unit for testing steels for corrosion cracking in aqueous solutions of a given concentration of salts and oxygen. Zav.lab. 31 no.4:501-503 '65.

(MIRA 18:12)

1. TSentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya.

L 56542-65

ACCESSION NR: AP5016733

UR/0286/65/000/010/0117/0117
629.135/138

4
B

AUTHOR: Pevzner, S. A.; Sidorov, V. F.

TITLE: An aircraft passenger seat. Class 62, No. 171272

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 10, 1965, 117

TOPIC TAGS: aircraft seat, passenger aircraft

ABSTRACT: This Author's Certificate introduces: 1. An aircraft passenger seat which is made up of a frame, a support, a chair with reclining back, headrest and armrest, a lock for fastening the support to guide rails, and a stop for locking the back. The seat is designed for use in airplanes with various bases for rail mountings and for improved reliability in the fastening between support and rail. The supports have guides with index pins for moving them along a girder on the frame. The shaft of the lock which fastens the support to the guide rail has a flattened head on the lower end, and is equipped with a U-shaped clamp which goes over the top of the rail. 2. A modification of this design with provision for changing the position of the reclining back without pressing a control lever. The position lock

Card 1/3

L 56542-65

ACCESSION NR: AP5016733 0

for the reclining back has a fork lever mounted on the pivot. This lever is stopped by a traction nut.

ASSOCIATION: none

SUBMITTED: 08Apr64 ENCL: 01 SUB CODE: AC

NO REF SOV: 000 OTHER: 000

Card 2/3

L 56542-65

ACCESSION NR: AP5016783 ENCLOSURE: 01

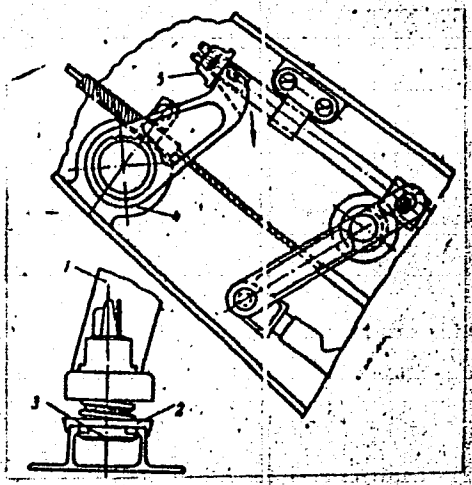

Fig. 1. 1--movable support for the seat with guides and index pin; 2--U-shaped clamp which goes over the top of the rail; 3--flattened head on the lock shaft; 4--back pivot fork lever; 5--traction nut

Card 3/3

L 62557-65 EWT(1)/EWP(m)/EPF(c)/EPF(n)-2/EWG(m)/FCS(k)/EWA(1) Pd-1/Pr-4/Ps-4/
Pi-4/Pu-4 WW

ACCESSION NR: AT5016479 UR/2649/65/000/189/0033/0041 45 44 Br1

AUTHOR: Konakov, P. K.; Kumskov, V. T.; Sidorov, Yu. P.; Sidorov, V. S.

TITLE: Solution to the problem of complex heat exchange in a moving Gray medium with low optical density based on boundary layer equations

SOURCE: Moscow. Institut inzhenerov zheleznodorozhnogo transporta. Trudy, no. 189, 1965. Issledovaniye teploobmena v teploenergeticheskikh ustanovkakh i v ustanovkakh dlya polucheniya poluprovodnikovykh materialov (Investigation of heat exchange in thermal power units and in equipment for producing semiconductor materials), 33-41

TOPIC TAGS: heat exchange, grey body radiation, optical density, boundary layer

ABSTRACT: This article presents a solution to the problem of complex heat exchange in a moving gray medium with low optical density. The solution is based on boundary layer equations. The complex transfer of energy from the gray medium to a plate is examined. A medium with density ρ, kinematic viscosity ν and temperature T_0 runs against the plate with velocity w_0. A boundary layer is formed near the surface of the plate. Let the temperature of the wall equal T_w. It is assumed that the boundary layer which is formed is laminar. The nonisothermal motion of the fluid is des-

Card 1/3

cribed by the following system of boundary layer equations:

$$\frac{\partial w_x}{\partial x}+\frac{\partial w_y}{\partial y}=0;$$

$$w_x\frac{\partial w_x}{\partial x}+w_y\frac{\partial w_x}{\partial y}=\nu\frac{\partial^2 w_x}{\partial y^2};$$

$$w_x\frac{\partial T}{\partial x}+w_y\frac{\partial T}{\partial y}=a\frac{\partial^2 T}{\partial y^2}.$$

The solution to this system of equations is:

$$T=T_w+0.982(T_0-T_w)\sqrt[3]{\mathrm{Prn}_t}-0.0982(\sqrt[3]{\mathrm{Pr}})^4\eta_t^4.$$

This solution describes the temperature field in the boundary layer for convective transfer of thermal energy. In this article, the solution is obtained for the resulting flow of energy in the boundary layer during motion of an absorbing-radiating fluid medium with an absorption factor k, for the case of complex heat exchange. It was found that when the optical density of the gray medium is increased, the radiated flow of energy in the boundary layer is diminished. In the case of thermodynamic