

On the Problem of the Influence of the Electric
Field in a Cathode on Its Electron Emission

SOV/57-58-8-17/37

the field (and of the current) is not essential in this process. A corresponding generalization of the results from reference 2 is also carried out with respect to the passage of current through electron tubes. The problem of the emission of a gas not in equilibrium can be generalized as follows: If a current I passes through a semiconductor or a metallic cathode two phenomena necessarily occur in the cathode: The heat effect (determined by I^2R) and the effect of the electric field (determined by IR). These effects may occur in three principal quantitative ratios: 1) The heat effect considerably exceeds the "field" effect, 2) Both effects are about equal, 3) The "field" effect considerably predominates above the heat effect. If the cathode is driven by pulses the conditions for a relative increase of the field effect are more favorable. There are 3 references, 3 of which are Soviet.

Card 2/2

VLASOV, Vladimir Fedorovich [deceased]. Prinsipialni uchastiye: BATUSHEV, V.A.;
LEVITIN, S.M.; GALYAS, A.D.; AFANAS'YEVA, A.P.; NIKITIN, N.A.,
otv.red.; BASHCHUK, V.I., red.; MARKOCH, K.G., tekhn.red.

[Electronic and ionic devices] Elektronnyye i ionnyye pribory.
Izd.3., perer. i dop. Moskva, Gos.izd-vo lit-ry po voprosam svyazi
i radio, 1960. 733 p. (MIRA 14:1)
(Electronic apparatus and appliances) (Ions)

MAKSIMOV, Yu.M., kandidat tekhnicheskikh nauk; LEVITIN, S.S.

Generalizing operation practices of open-hearth furnaces with magnesite chrome crowns. Metallurg.no.7:19-21 J1 '56. (MLRA 9:9)

1. Starshiy nauchnyy sotrudnik Tsentral'noye nauchno-issledovatel'skoye instituta chernoy metallurgii (for Maksimov). 2. Rukeyeditel' gruppy Gosudarstvennoye soyuznoye instituta "Stal'proyekt" (for Levitin).
(Open hearth furnaces) (Firebrick)

MANTSEV, Roman Mikhaylovich; CHERNENKO, Mikhail Avksent'yevich;
CHEREPAKHIN, Gennadiy Akinovich, LEJITIN, Solomon
Solomonovich

[Open-hearth furnaces; an atlas] Martenovskie pechi; atlas.
Moskva, Metallurgiya, 1965. 177 p. (MIRA 18:8)

LEVITIN, V.

Introduction of business accounting on Kama Steamship Line vessels.
Rech.transp. 20 no.6:12 Je '61. (MIRA 14:6)

1. Nachal'nik finansovogo otdela Kamskogo parokhodstva.
(Kama River—Inland water transportation—Accounting)

SOV/137-57-6-9845

Translation from: Referativnyy zhurnal, Metallurgiya, 1957, Nr 6, p 75 (USSR)

AUTHORS: Eydis, S., Levitin, V.

TITLE: The State of the Art of the Collection, Processing, and Utilization of Nonferrous Scrap and Wastes (Sovremennoye sostoyaniye sbora, pererabotki i ispol'zovaniya loma i otkhodov tsvetnykh metallov)

PERIODICAL: V sb.: Rats. ispol'zovaniye struzhki i dr. otkhodov chernykh i tsvet. metallov. Moscow, Mashgiz, 1956, pp 378-386

ABSTRACT: Secondary metals occupy a significant position in the total consumption of nonferrous metals. Thus, secondary Cu, Al, and Zn constitute >1/3 of the total of these metals used in this country. It is therefore necessary to adhere strictly to the rules for collection and storage established by a special standard according to which scrap of each metal or alloy must be kept separately. With this purpose, all machine tools are provided with trays and other equipment for scrap collection. There is a complex of measures with the objective of assuring and stimulating careful collection and proper storage, as well as delivery of nonferrous scrap and rejects. Thus, 10% of the monies derived from scrap sale is expended by the

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SOV/137-57-6-9845

The State of the Art of the Collection, Processing, and Utilization (cont.)

various establishments to carry out measures to improve collection and storage. Higher prices are paid for scrap delivered in unmixed form and with a rating sheet than for mixed and contaminated scrap. Thus, the price for clean Cu swarf is 89% higher than for dirty, unrated swarf. The corresponding price differential for brass swarf is 44%, for Sn-bronze 36%, and for Al swarf 61%. Careful preparation of the chip is needed before remelting.

G.S.

Card 2/2

DUBROV, N.; LEVITIN, V.

Results of creative cooperation. NTO 4 no.9:17-18 8 '62.
(MIRA 16:1)

1. Predsedatel' soveta Nauchno-tehnicheskogo obshchestva Ural'skogo nauchno-issledovatel'skogo instituta chernykh metallov (for Dubrov). 2. Uchenyy sekretar' soveta Nauchno-tehnicheskogo obshchestva Ural'skogo nauchno-issledovatel'skogo instituta chernykh metallov (for Levitin).
(Research, Industrial) (Technological innovations)

L 2678-66 EWT(d)/EPF(n)-2/EWP(1) IJP(c) WH/BC

ACCESSION NR: AP5021855

UR/0280/65/000/004/0119/0125

32
B

AUTHOR: Levitin, V. F. (Moscow); Skripkin, V. A. (Moscow)

TITLE: The synthesis of correcting devices of linear systems for a given accuracy at a fixed instant of time

SOURCE: AN SSSR. Izvestiya. Tekhnicheskaya kibernetika, no. 4, 1965, 119-125

TOPIC TAGS: linear automatic control system, linear system, linear control system, control system stability

ABSTRACT: In the majority of cases the structure of the system under design and the distribution of its known loops as well as of the correcting ones (the parameters of which have to be determined) are given in advance. The authors show that for systems the accuracy of which is essential only at fixed instants of time, stationary circuits may be used as correcting loops securing the agreement of the characteristics of the projected system with their optimum values. The notion of equivalent systems having equal accuracies at a fixed instant of time is introduced and the properties of such equivalent systems are studied. Formulas for the determination of the transfer functions of stationary correcting loops are also derived. Orig. art. has: 33 formulas and 3 figures.

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L 2673-66

ACCESSION NR: AP5021855

ASSOCIATION: None

SUBMITTED: 24Mar64

ENCL: 00

SUB CODE: DP, IE

NO REF SOV: 002

OTHER: 002

0

KC
Card 2/2

USSR/Medicine/Experimental Apparatus

Card 1/1 Pub. 17-22/23

Author : Gorkin, V. Z. and Levitin, V. F.

Title : Modification of a photoelectric apparatus for the investigation
 of "electroforegrams" [electrophoresis diagrams] (on the method
 of quantitative microelectrophoresis of proteins on paper)

Periodical : Byul. eksp. biol. i med. 7, 76-79, Jul 1955

Abstract : Authors describe an apparatus for quantitative microelectro-
 phoresis of proteins. This instrument is a simplification of
 Roettger's apparatus (Klinische Wochenschrift Vol 3, p 85, 1953)
 and is built entirely of parts produced by the radio industry of
 the USSR. 14 references, 4 USSR, 15 since 1940. Diagrams,
 Graph, Table.

Institution : Biochemical Laboratory (Head: Dr. Biological Sciences B. S.
 Kasavina), Central Institute of Traumatology and Orthopedics,
 (Dir: Corresponding Member Academy Medical Sciences Prof. N. N.
 Priorov) Ministry of Health USSR, Moscow.

Submitted : 18 Nov 1954

LEVITIN, V.F. (Moskva); SKRIPKIN, V.A. (Moskva)

Synthesis of the correcting devices of linear systems with
given accuracy in a fixed moment of time. Izv. AN SSSR. Tekh.
kib. no.4:119-125 J1-Ag '65. (MIRA 18:11)

ISTRIN, M. A.; LEVITIN, V. Kh.; RUBINSHTEYN, I. G.; BAZILEVSKIY, V. N.

"Secondary Nonferrous Metals (Handbook. Part I- Preparation and Preliminary Working)," Metallurgizdat, 1950. 475 pp.

Comments and evaluation B-77881, 16 Aug 54

ISTRIN, Mikhail Aleksandrovich; LEVITIN, Vul'f Khananovich; RUBINSHTEYN, Iosif Grigor'yevich; MILLER, Solomon Mikhaylovich; MILLER, L.Ye., kandidat tekhnicheskikh nauk, retsenzent; BELOV, V.Ya., redaktor; CHERNOV, A.N., redaktor; ARKHANGEL'SKAYA, M.S., redaktor isdatel'stva; MIKHAYLOVA, V.V., tekhnicheskiy redaktor

[Secondary nonferrous metals] Vtorichnye tsvetnye metally; spravochnik. Izd. 3-e, perer. i dop. Pod red. V.IA.Belova. Moskva, Gos. nauchno-tekhn. izd-vo lit-ry po chernoi i tsvetnoi metallurgii. Pt.1. [Procurement and primary processing] Zagotovka i pervichnaya obrabotka. 1956. 558 p. (MIRA 9:7)
(Nonferrous metals)

LEVITIN, V.P.

On year round economic accountability for river vessels. Rech.
trans. 18 no.8:24 Ag '59. (MIRA 12:12)

1. Nachal'nik finansovogo otdela Kamskogo parokhodstva.
(Inland water transportation--Accounting)

ACCESSION NR: AR401142

8/0137/63/000/012/VOL8/VOL8

SOURCE: RZh. Metallurgiya, Abs. 12V353

AUTHOR: Kagan, A. S.; Levitin, V. S.; Ostrovskaya, Ye. A.

TITLE: Some properties of vacuum steel used in the production of instrument bearings

CITED SOURCE: Tr. Vses. n.-i. konstrukt.-tekhnoi. in-ta podshipnik. prom-sti, no. 1 (33), 1963, 49-53

TOPIC TAGS: Instrument bearing steel, vacuum steel, vacuum steel remelting, steelmaking

TRANSLATION: ShKh15P steel for the production of precision instrument bearings is made by the following methods: 1. Double vacuum remelting of consumable electrodes made from high-purity charge materials (carbonyl Fe, spectroscopically pure C, crystalline Si, etc.). 2. Single vacuum remelting of consumable electrodes which were first subjected to electroslag remelting. The billets for

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ACCESSION NR: AR4011142

electroslag remelting are melted by the usual process in electric arc furnaces.
3. Single vacuum remelting of consumable electrodes melted by the usual process in electric arc furnaces. Investigations of the quality of the metal melted by these methods showed that the metal melted by the first method is the purest with respect to nonmetallic inclusions. Steel made by the second method is contaminated with point nitride inclusions, for the elimination of which a double vacuum remelting of the electroslag metal is proposed. G. Lyubimova.

DATE ACQ: 09Jan64

SUB CODE: ML

ENCL: 00

Card 2/2

LEVITIN, V. V.

USSR/Physics - Technical Physics

Card : 1/1

Authors : Palatnik, L. S., and Levitin, V. V.

Title : X-ray investigation of alloys Sn-Se, Zn-Se, Cd-Se and Ag-Se

Periodical : Dokl. AN SSSR, 96, Ed. 5, 975 - 978, June 1954

Abstract : In the present article, the authors present the results of the chemical and thermal investigations of the binary systems of alloys, as listed in the heading of this article. The preparation of the types of samples used in testing by means of X-rays is dealt with, and the effect of the various heat treatments on the properties of the individual alloys, relative to their stability aging, and transparency of some of the vitreous films, is described. Five references published in USSR (1936-1942), and one German reference of 1931. One table.

Institution : The A. N. Gorkiy State University of Kharkov

Presented by: Academician, S. A. Vekshinskiy, April 10, 1954

18(3), 18(7), 24(2)

SOV/126-7-2-32/39

AUTHORS: Levitin, V. V. and Syreyshchikova, V. I.

TITLE: The Influence of Boron on the Nature of Carbide Separation in Austenitic Steels During Tempering
(O vliyanii bora na kharakter vydeleniya karbidov v austenitnoy stali pri otpuske)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1959, Vol 7, Nr 2, pp 308-310 (USSR)

ABSTRACT: Heating of austenitic stainless steels containing carbon in solid solution up to temperatures of 500-800°C causes formation of chromium carbide in the grain boundaries, as a result of which the steel ceases to be resistant to intercrystalline corrosion. The authors investigated the influence of small additions of boron on the nature of the separation of the carbide phase during tempering and on the tendency of chromium manganese nickel steel containing N to intercrystalline corrosion. The above steel has been studied in the work of Levitin et. al. (Ref.). Ingots to which various quantities of boron have been added were melted in a high frequency furnace and forged into rods. The specimens for metallographic investigation and for

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intercrystalline testing made from the rods were heated to various temperatures in the range 950-1250°C, held for one hour and quenched in water. Tempering was carried out under the usual conditions (Ref 3), for two hours at 650°C. The tendency to intercrystalline corrosion of cylindrical specimens of 3.4 mm diameter was determined after boiling them in a standard solution (Ref 3) by the loss of metallic sound on falling and by the increase in electric resistance. The investigation has shown that boron slows down the formation of the carbide network along the austenitic grain boundaries. In steels containing no boron, tempering for 2 hours at 650°C causes formation of a continuous chain of carbides along the grain boundaries (Fig 1a). In steel containing 0.004% boron, the carbide phase separates in the form of fragments; the grain boundaries remain pure along considerable lengths (Fig 1b). At concentrations lower than 0.003% or above 0.010% boron has no influence on the formation of the carbide network. A retardation of the decomposition of the solid solution in the boundaries under the influence

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of boron is observed when heating for quenching is carried out to temperatures of 1075-1150°C. At lower or higher quenching temperatures, the carbide network formation occurs in the same way as in steel without boron addition. The influence of boron is the greater the lower the carbon content of the steel: in 0.06% C steel boron practically completely prevents formation of carbides that can be seen under the optical microscope; at a carbon content of 0.14%, the influence of boron becomes negligible. From the Table it can be seen that steels containing optimum boron contents resist intercrystalline corrosion tests according to GOST 6032-51. The results of the investigation obtained agree with V. I. Arkharov's theory of preferential distribution of impurities in the grain boundaries as a result of the tendency of the alloy to lower its excess surface energy (Ref 4 and others). According to V. I. Arkharov (Ref 5), the mechanism of the influence of boron on the ability of structural steels to be tempered consists in the fact that the enrichment of intercrystalline boundaries

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with boron leads to a decrease in the distortion of the crystal lattice, as a result of which the work for the formation of critical nucleation of the separating phase increases. This explanation is applicable apparently also to the effect shown in this work. The decrease in diffusion rate in the grain boundary zone (Ref 6), in this case of carbon under the influence of boron, and the ejection of carbon from the boundary zones can also be factors influencing the retardation of carbide particle formation. Let us note that boron retards the separation of excess phases from austenite of different composition (carbon and alloy steels, austenitic steel). The surface activity of boron is apparent in nickel base alloys (Ref 7) and in iron (Ref 8). Among the number of factors influencing intercrystalline adsorption (Ref 9), in the case of boron the determining factor is a geometrical one. The atomic radius of boron is smaller than the radius of atoms forming a substitutional solid solution in the alloys listed, but is

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greater than the radius of atoms going into solution interstitially. This is bound to lead to a greater solubility of boron in distorted grain boundary zones as compared with the solubility in the grain bodies. It appears that in the construction of intercrystalline boundaries boron atoms play a smaller role as "structure material" than metallic atoms. There are 1 figure, 1 table and 9 references, 8 of which are Soviet, 1 English.

(Note: This is a complete translation except for the figure caption and table)

ASSOCIATION: Ural'skiy nauchno-issledovatel'skiy institut
chernykh metallov (Ural Scientific Research Institute
of Ferrous Metals)

SUBMITTED: May 12, 1958

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SOV/129-59-1-7/17

AUTHORS: Mironov, L.V., Engineer, Sazonov, V.G., Candidate of Technical Sciences, Levitin, V.V., Engineer and Rodigin, N.M., Candidate of Physico-mathematical Sciences

TITLE: Influence of Electric Heating on the Properties of Cold-rolled Stainless Steels (Vliyaniye elektronagreva na svoystva kholodnokatanykh nerzhaveyushchikh staley)

PERIODICAL: Metallovedeniye i Termicheskaya Obrabotka Metallov, 1959, Nr 1, pp 26 - 30 (USSR)

ABSTRACT: The influence was studied of electric annealing of the cold-rolled steels 1Kh18N9, 1Kh18N9T and Kh13N4G9 on their mechanical properties, the recrystallisation processes and the resistance of these steels against intercrystallite corrosion. The compositions and the main data of these steels are entered in Table 1, p 26. The specimens were heated with speeds of 100, 300, 600 and 1 000 °C/sec up to 900-1 400 °C and immediately after that were cooled in air. From thus-treated strips (20 x 200 mm), specimens for mechanical tests were prepared. The results of tensile tests are graphed in Figure 1, p 27 and it can be seen that the desired mechanical properties can be ensured by electric heating with speeds of 100 to 1 000 °C/sec without subsequent

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Stainless Steels**

holding at the particular temperature. The optimum properties are obtained after heating to 1 150 - 1 200 °C. In Figure 2, p 28, microphotos are reproduced of the structure of the steel 1Kh18N9T after annealing with electric heating as well as with ordinary heating. On the basis of the results of investigations of the resistance of materials to intercrystallite corrosion, the authors conclude that the process of recrystallisation of cold-rolled austenitic stainless steels, under conditions pertaining to electric heating, proceeds with a very high speed but at a higher temperature than in the case of ordinary heating: softening and the desired mechanical properties of the steels 1Kh18N9, 1Kh18N9T and Kh13N4G9 at heating speeds of 100 - 1 000 °C/sec are attained at 1 150 - 1 200 °C. On the basis of corrosion studies, it is concluded that the necessary resistance against intercrystallite corrosion can be ensured with any of the investigated heating speeds for steels 1Kh18N9 and Kh13N4G9 and with heating speeds of 100 and 300 °C/sec in

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in the case of the steel 1Kh18N9T; if higher heating speeds are used, the carbon in this steel has to be combined first into titanium carbide.

There are 4 figures, 2 tables and 6 Soviet references.

ASSOCIATIONS: Ural'skiy institut chernykh metallov (Ural Institute of Ferrous Metals) and Institut fiziki metallov UFAN (Institute of Physics of Metals of the Ural Branch of the Ac.Sc.)

Card 3/3

S/137/60/000/011/041/043
A006/A001

Translation from: Referativnyy zhurnal, Metallurgiya, 1960, No.11, p.265, # 27364

AUTHORS: Levitin, V.V., Guterman, S.G.

TITLE: Mechanical Properties of Cold-Rolled Stainless Chrome-Manganese-Nickel Steel Containing Nitrogen

PERIODICAL: Byul. nauchno-tekhn. inform. Ural'skiy, n.-i. in-t chern. metallov, 1959, No. 6, pp. 77 - 79

TEXT: The authors studied the effect of the degree of cold deformation (15 - 40%) on mechanical properties (σ_b, δ) and corrosion resistance of two heats of cold rolled Cr-Mn-Ni steel containing in %: C 0.13; Cr 17.7 - 18.0; Mn 6.7 - 7.9; Ni 3.5 - 4.8; Si 0.3 - 0.4; N 0.12 - 0.24. It was established that the steel investigated showed a better combination of strength and ductility than 1X18H9 (1Kh18N9) steel and that it was able to withstand intercrystalline corrosion tests by the method given in A-1 GOST 6032-51. There are 2 references. T.F. ✓

Translator's note: This is the full translation of the original Russian abstract.

Card 1/1

87442

S/123/60/000/024/002/C14
A005/A001

198200

Translation from: Referativnyy zhurnal, Mashinostroyeniye, 1960, No. 24, p. 16,
132065

AUTHORS: Meandrov, L.V., Gol'dshteyn, M.I., Levitin, V.V.

TITLE: The Determination of Deformation Resistance of Alloyed Steels at High
Temperatures

PERIODICAL: Byul. nauchno-tekhn. inform. Ural'skiy n.-1. in-t chern. metallov,
1959, No. 7, pp. 59-66

TEXT: Results are presented from the determination of deformation resistance
of steels 40XН (40KhN), 40XН 2М (40KhN2M), and 40 X2H2M (40Kh2N2M) under static
tension and dynamic compression. The diameter of the tension samples was 8 mm,
the gauge length was 60 mm, the tension speed was 1.0-1.5 mm/min, the test tem-
peratures were 900, 1,000, 1,150 and 1,200°C. The compression tests were conduct-
ed on the frictional pressing machine. The cylindric samples were 20 mm in dia-
meter and 14 mm in height. The downstroke speed of the press slider with the
striker was 180 mm/sec which corresponds to the deformation rate of 7-8 sec⁻¹.

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87442

S/123/60/000/024/002/014
A005/A001

X

The Determination of Deformation Resistance of Alloyed Steels at High Temperatures

All steels showed at small deformation degrees the strain-hardening being the greater the higher alloyed the steel and the lower the temperature. The highest strain-hardening was observed with steel 40Kh2N2M, the lowest with steel 40KhM, which is obviously connected with the decrease of re-crystallization speed in steel 40Kh2N2M under the action of elements Cr and Mo originating carbide. For each temperature exists a deformation degree beginning from which the weakening processes compensate the strain-hardening processes. The deformation degree corresponding to the maximum strain-hardening decreases with increasing temperature for all steels from 25-30% at 900°C down to 10-15% at 1,200°C. An increase in the content of elements Cr and Mo, originating carbide in the investigated steels, increases the hardenability of the steel as well as its deformation resistance. There are 6 figures and 2 references.

M.G.N.

Translator's note: This is the full translation of the original Russian abstract.

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66736

~~10(3)~~ 18.9100

AUTHORS: Levitin, V. V., Susloparov, G. D.

SOV/20-129-2-22/66

TITLE: Electron Microscope and Electron Diffraction Pattern Studies of Carbide Particles in Stainless Austenite Steel

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 129, Nr 2, pp 318-320 (USSR)

ABSTRACT: The present paper deals with the distribution of carbide particles in steel and their crystal structure. The steel used for the investigation contained 0.09 % C; 17.7 % Cr, 10.9 % Ni, 1.2 % Mn, 0.2 % Si, 0.022 % P, 0.014 % S. These samples were quenched in water from 1050° and tempered at 600; 650; 700 and 750° for two hours. The specimens were blanched with a solution of bromine in methanol with only the metallic base having been dissolved. In this treatment the carbides rose above the surface of the ground section and maintained the position they occupied already in the steel. The collodion prints with the "captured" particles were examined in an electron microscope for stereophotographs. Carbide particles at the grain boundaries and a relief of the blanched surface were investigated. The character of the carbide precipitates is almost unchanged along the entire boundary between

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two grains, there exist, however, differences between the individual boundaries. Dispersity decreases with decreasing temperature of tempering. In all cases the plane of the increase of the particles agrees with the boundary between the grains. At tempering temperatures of 600 and 650° carbide precipitates were observed not only at the boundaries but also within the grains. The intergranular, much more dispersed particles are found where the uniform orientation of the blanching patterns is disturbed. The carbide particles had the shape of two-dimensional dendrites ($2 \cdot 10^{-4}$ cm to $7 \cdot 10^{-4}$ cm long, maximum thickness of the order of 10^{-6} cm). The point electron diffraction patterns which belong to the lattice of the cubic carbide $(Cr,Fe)_23C_6$ were used for determining the crystallographical planes and the direction of particle growth. The branches of different orders of the dendrites of carbide belong, as a rule, to different planes for the particle is formed due to a mosaic like growing together of monocrystals. The results of the determination of the planes and of the growth directions of the carbide particles formed at 650 and 700° are listed in a table. The angles between the directions

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of the branches of growth and between the crystallographical directions are in satisfactory agreement. All directions of growth of the carbide particles are in those planes which belong to the form $\{100\}$. In more than half of the cases the growth takes place in parallel with $[100]$. The carbide particles grow along the intergranular boundaries since in these ranges the activation energy of the decay of the oversaturated solution is reduced. At the sites of the intragranular disturbances of the crystal structure of austenite higher dispersed particles are separated. There are 2 figures, 1 table, and 6 references, 3 of which are Soviet.

ASSOCIATION: Ural'skiy nauchno-issledovatel'skiy institut chernykh metallov
(Ural Scientific Research Institute for Ferrous Metals)

PRESENTED: July 8, 1959, by N. V. Belov, Academician

SUBMITTED: July 1, 1959

Card 3/3

18.7100

81878

18.1130

S/129/60/000/08/005/009

E073/E135

AUTHORS: Levitin, V.V., and Syreyshchikova, V.I. (Engineers)TITLE: Rejection of Carbides¹ at the Grain Boundaries² during Tempering of Austenitic Steel³PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, 1960, No 8, pp 20-25

TEXT: The work described in this paper was devoted to studying the influence of small additions of various elements on the character of rejection of carbides during tempering of austenitic stainless steels and the stability of such steels against inter-crystallite corrosion. For the investigation a nitrogen-containing, chromium-manganese-nickel steel was chosen (0.09-0.12% C; 16-18.6% Cr; 3.3-5.5% Ni; 6-9.5% Mn; 0.12-0.35% N; max 0.6% Si, max 0.04% P, max 0.03% S. After quenching from 1050 °C the mechanical properties were as follows: $\sigma_s = 34-39 \text{ kg/mm}^2$; $\sigma_b = 73-79 \text{ kg/mm}^2$; $\delta = 47-53\%$; $a_k = 24 \text{ kgm/cm}^2$.

The additions used for preventing rejection of carbides at the grain boundaries and for preventing the tendency to inter-crystallite corrosion can be subdivided into the following two groups:

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admixture which combine with carbon to form strong carbides; admixtures which reduce the excess energy of the inter-crystallite transient zone. As elements of the first group the authors chose Mo, Nb and Ta; as elements of the second group they chose Be, Ca, Ag, Ce and B. Grade A electrical iron, nitrated ferro-chromium, low-carbon ferro-chromium and metallic manganese were chosen as charge materials for the laboratory high-pressure furnace, whilst carbide-forming elements were introduced into the steel in quantities which are required for carbide formation. Other additions were introduced in quantities between thousandths and a tenth of one percent. The ingots were machined off to a depth of 3-5 mm and forged into rods from which specimens were cut out. Specimens for micro investigations were heated in a salt bath to temperatures between 950 and 1250 °C in steps of 50 °C for one hour and then quenched in water. The tempering was by heating for two hours at 650 °C. In some cases additional tempering for 15 minutes and two hours was carried out at 700 and 750 °C. The quenching temperature at which the smallest quantity of carbides separated at

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E073/E135

Rejection of Carbides at the Grain Boundaries during Tempering of Austenitic Steel

the boundaries was determined metallographically. Following that, specimens were treated according to this regime and used for determining the tendency to inter-crystallite corrosion, which was determined after boiling of the specimens in a standard solution and inspecting the crack formation caused by subsequent bending, and by measuring the increase in electrical resistance. In some of the steels the carbide phase was separated electrolytically in a saturated solution of sodium chloride which was acidified by hydrochloric acid. The thus produced precipitates were subjected to X-ray analysis using cobalt radiation. Six microstructure photographs of various steels (without and with additions) after quenching and tempering at 650 °C for a duration of 2 hours are reproduced on p 21. The results of investigations of the tendency to develop inter-crystallite corrosion after quenching and tempering at 650 °C are entered in a Table on p 23 for steels from 26 heats. On the basis of the obtained results the following conclusions are arrived at. Rejection of the carbides during tempering of the investigated Card 3/4

✓

81878

S/129/60/000/08/005/009

E073/E135

Rejection of Carbides at the Grain Boundaries during Tempering of Austenitic Steel

steels can be prevented by reducing the carbon content from 0.09-0.12% to 0.04% and also by introducing molybdenum, niobium and tantalum. The resistance to inter-crystallite corrosion during tests in a standard solution is maintained in low carbon steel and also in steel containing tantalum to an extent of 20 times the carbon content. Addition of tungsten and also an increase in the niobium content in excess of 10 times the carbon content leads to ferrite formation. Beryllium accelerates the rejection of carbides during tempering of hardened steel, whilst calcium, silver and cerium do not influence this process within the range of investigated quantities. Boron (0.003-0.10%) prevents the formation of a carbide network in the case of tempering at 650 °C, but assists such formation at more elevated temperatures. The influence of boron depends on the quenching temperature and on the carbon content of the steel.

There are 1 figure, 1 table and 12 references: 9 Soviet, 2 English and 1 German.

ASSOCIATION: Ural'skiy institut chernykh metallov
(Ural Institute for Ferrous Metals)

Card 4/4

X

S/081/62/000/001/034/067
B102/B101

18.1130

AUTHORS: Levitin, V. V., Syreyshchikova, V. I.

TITLE: Methods to prevent intercrystalline corrosion in stainless austenitic steels containing nitrogen

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 1, 1962, 307, abstract 11193 (Byul. nauchno-tekhn. inform. Ural'skiy n.-i. in-t chern. metallov, no. 8, 1960, 62-67)

TEXT: Methods of preventing the tendency to intercrystalline corrosion in N₂-containing austenitic steels were investigated. These are based on reducing the C content in the steel and on the adoption of carbide developers which do not remove N₂ from the solid solution. It was found that the separation of Cr carbides in the drawing of austenitic Cr-Mn-Ni-steels which contain N₂ can be prevented by reducing; the C content in such steels from 0.09-0.12 to 0.04% or by adding Mo, Nb or Ta to them.

[Abstracter's note: Complete translation.]

X

Card 1/1

S/137/61/000/012/130/149
A006/A101

AUTHOR: Levitin, V.V.

TITLE: Investigation of particles on grain boundaries of boron-containing stainless steels

PERIODICAL: Referativnyy zhurnal. Metallurgiya, no. 12, 1961, 12, abstract 12I96 ("Byul. nauchno-tekhn. inform. Ural'skiy n.-1. in-t chern. metallov", 1960, no. 8, 74 - 77)

TEXT: Electron-microscopical and electronographical investigations were made of 1X18H9 (1Kh18N9) and X17H4Γ8A (Kh17N4O8A) steel grades, containing B. The specimens were water-quenched from 1,100°C and tempered at 600 - 750°C. It was established that when 0.0005% B was added, multiple dispersed carbide particles were formed on the grain boundaries, instead of relatively coarse ($1-7 \cdot 10^{-4}$ cm) dendritic carbide particles (CrFe)₂₃C₆. There are 8 references.

T. Fedorova

[Abstracter's note: Complete translation]

Card 1/1

S/137/61/000/011/095/123
A060/A101

AUTHOR:1 Levitin, V. V.

TITLE: On the study of boron distribution in alloys by the method of neutron activation

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 11, 1961, 36, abstract 111245 ("Byul. nauchno-tekhn. inform. Ural'skiy n.-i. in-t chern. metallov", 1960, no. 8, 78-80)

TEXT: An investigation was carried out upon the boron distribution in Fe-B and stainless steel. A liquid emulsion A-2 was deposited by dipping upon micro-sections, by the method worked out at the NIKFI. The specimens were irradiated by thermal neutrons; a Po-Be source with power of $\sim 3 \cdot 10^5$ neutrons/sec was used. A nonuniform distribution of B was noted in the Fe-B; in stainless steel no zones of intercrystallite B absorption were discovered, apparently because of their small thickness and insufficient resolving power of the radiographic method. ✓

G. Belyayeva

[Abstracter's note: Complete translation]

Card 1/1

CEVILLO, V.V.

82645

18-7500

S/126/60/010/02/017/020
E111/E352

AUTHOR: Levitin, V.V.

TITLE: Influence of Boron¹ on Diffusion¹ of Iron² in Austenitic Steels¹

PERIODICAL: Fizika metallov i metallovedeniya 1960, Vol. 10, No. 2, pp. 294-297

TEXT: In this letter to the editor the author reports his study by the tracer method of the influence of boron in stainless austenitic steels on the diffusion coefficient of iron. For measuring the activity of the integral residue he used the method of Borisov et al (Ref. 6) which has advantages over that of Fisher. Two steels, types 1Kh18N9 and Kh17N4G8A, were used, respective percentage compositions being 0.08, 0.08 C; 18.0, 17.5 Cr; 9.3, 3.8 Ni; 1.2, 7.6 Mn; 0, 0.20 N; 0.20, 0.50 Si; 0.015, 0.012 P; 0.018, 0.013 S. One heat of the first steel contained in addition 0.0005% B and one 0.005% B; and of the second 0.005 and 0.009% B. After annealing and forging 12 x 12 x 10 mm specimens were hardened to give a grain size of 19-22 and 25-26 μ , respectively, and a 2-6 μ thick layer of

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82645

S/126/60/010/02/017/020

E11/E352

Influence of Boron on Diffusion of Iron in Austenite Steels

radioactive Fe⁵⁹ was electrodeposited on a polished surface. Figs. 1 and 2 show for 1Kh18N9 and Kh17N4G8A steel, respectively, plots of the ratio of specimen radioactivity after removal of a layer of thickness y to its initial value against $y/2b$, where b is the average grain size. Calculated values of the diffusion coefficient and other diffusion parameters are shown in Table 2, values calculated by Fisher's method being shown in Table 3. For each steel the first addition of boron produced a considerable influence, the next comparatively little. The author has previously observed with V.I. Syreyshchikova (Ref 11) that boron effects carbide-phase precipitation kinetics; this is probably due to its effect on diffusion. There are 3 tables and 11 references: 9 Soviet and 2 English.

ASSOCIATION: Ural'skiy nauchno-issledovatel'skiy institut
chernykh metallov (Ural Scientific Research
Institute for Ferrous Metals)

SUBMITTED: April 3, 1960
Card 2/2

1.2300

21095
S/135/61/000/000/007/011
AG06/A101AUTHORS: Levitin, V. V., and Platova, T. A., Engineers

TITLE: The welding of stainless austenitic steels with reduced nickel content

PERIODICAL: Svarochnoye proizvodstvo, no. 5, 1961, 21-22

TEXT: Previously, investigations were made of austenitic stainless steels with reduced content of nickel, alloyed with manganese and nitrogen. (Ref. 1-4). The authors of the present article studied the welding of 1X17H4Г8А (1Kh17N4G8A) steel containing: $\leq 0.12\%$ C; 16.5 - 18.5% Cr; 3.7 - 5.5% Ni; 6 - 9% Mn; 0.12 - 0.24% N; $\leq 0.6\%$ Si; $\leq 0.030\%$ S; and $\leq 0.035\%$ P. The corrosion resistance of this steel approaches that of chrome-nickel steels and its strength characteristics are higher. To study the weldability of 1Kh17N4G8A steel 16 kg ingots melted in an induction furnace were forged to 16 mm thick plates which were water quenched from 1,050°C. Electrode wire of the following steel grades was employed: 0X18H9 (OKh18H9), 0X18H9C2 (OKh18H9C2), X25H3 (Kh25N13), X20H16Г6 (Kh20N16Г6), 0X17H4Г8А (OKh17N4G8A), and 1X18H9Б (1Kh18N9L). The coating contained cerium, niobium, ferromolybdenum, ferrovanadium, ferromanganese and ferrosilicon. ЗАН (Ф -1)

Card 1/2

21095

S/135/61/000/005/007/011
A006/A101

X

The welding of stainless austenitic steels ...

(EAI (F-1)), 3A 2 (3HTY-3) (EA2(ENTU-3)) and 3A1BC (A38M) (EA1ES (L38M)) electrodes were also used. The proneness of the steel to hot cracking was tested on tee-joints welded on d-c of reverse polarity (150-170 amp). Specimens cut from the welded joints were corrosion tested in 65% boiling nitric acid during several 50-hour cycles. Intercrystalline corrosion tests were made for 72 hours by method A GOST 6032-58. It was found that austenitic chrome-manganese-nickel steels containing nitrogen were not prone to hot cracking during welding. Welding by all variants investigated produced tight, fine-grained, high-quality welds with the following mechanical properties: $\sigma_B \geq 73 \text{ kg/mm}^2$; $\alpha_n \approx 9 \div 20 \text{ kgm/cm}^2$; bending angle 180° . Satisfactory corrosion resistance of the weld is obtained by welding with electrodes whose rods are made of OKh18N9 wire and whose coatings contain ferroniobium and ferromolybdenum. To assure satisfactory resistance to intercrystalline corrosion in the heat affected zone, it is recommended to maintain the carbon content in the steel at a level not exceeding 0.06%. There are 3 tables, 2 figures and 6 references: 4 Soviet and 1 non-Soviet.

ASSOCIATION: Ural'skiy institut chernykh metallov (Ural Institute of Ferrous Metals)

Card 2/2

01219

S/126/61/011/005/006/017
E111/E435

18 7520 1115, 1116

AUTHOR: Levitin, V.V.TITLE: Investigation of the Influence of Boron on
Decomposition of the Supersaturated Solid Solution at
Grain Boundaries of Austenitic AlloysPERIODICAL: Fizika metallov i metallovedeniye, 1961. Vol.11, No.3,
pp.392-399

TEXT: The precipitation of $(Cr,Fe)_{23}C_6$ in austenitic stainless steels is a typical example of solid-solution decomposition stimulated by grain boundaries. The present author with G.D.Susloparov (Ref.4) and other investigators, e.g. E.M.Mahla and N.A.Nielsen (Ref.1), A.B.Kinzel (Ref.2), have studied the nature of the decomposition products. It was shown (Ref.4) that the flat dendritic crystals grow in planes coinciding with the inter-grain boundaries of the matrix phase; the dendrites branch along those crystallographic directions in the carbide lattice which have the densest packing of carbon atoms. On the theory of intergranular internal absorption (Ref.5) carbide formation at grain boundaries should be greatly affected by adsorption-active impurities, including boron (Ref.6 - 13). The object of the
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S/126/61/011/003/006/017
E111/E435

Investigation of ...

present work was to study the effect of boron on the decomposition of the supersaturated solid solution in intergrain junction zones of austenitic steels. Quantitative metallographic, electron-microscopic and electron-diffraction methods were used. Two steels were used, melted in a basic induction furnace: type 1X18H9 (1Kh18N9) (%: 0.08 C, 18.0 Cr, 9.3 Ni, 1.2 Mn, 0.2 Si, 0.015 P, 0.018 S, zero, 0.005 or 0.0005 B) and X17H4Г8A (Kh17N4G8A) (%: 0.08 C, 17.5 Cr, 13.8 Ni, 7.6 Mn, 0.2 N, 0.5 Si, 0.012 P, 0.013 S, zero, 0.005 or 0.009 B). 16 kg Ingots were forged into 12 x 12 mm bars. Before hardening the specimens were treated for one hour in a salt bath and then tempered in a lead bath. For each electrolytically etched hardened polished section the overall length of grain boundaries was determined by the random intercept method and on tempered sections the boundary length was determined on which precipitation had occurred. The effect of boron was estimated from the change in the ratio of these two lengths which occurred when boron was present. Fig.1 shows for 1Kh18N9 steel the values of this ratio (length of grain boundaries on which precipitation has occurred to total grain-boundary length $\Sigma P_K / \Sigma P_2$) as functions of the tempering temperature for hardening

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11219

Investigation of ...

S/126/61/011/003/006/017
E111/E435

from 950, 1100 and 1200°C (graphs A, b, and B respectively) and for boron contents of 0, 0.0005 and 0.005% B (curves 1, 2 and 3 respectively). The corresponding graphs for Kh17N4G8A are shown in Fig.2, the hardening temperatures here being 1060, 1100 and 1140°C and the boron contents 0, 0.005 and 0.009%. For both steels small boron additions lower the ratio when hardening and tempering temperatures are relatively low: with higher boron contents and hardening and tempering temperatures, the ratio (i.e. the proportion of boundaries occupied by the excess phase) rises. Electron micrographs showed that in lKh18N9 steel without boron, tempered at 700°C for 2 hours, fairly large dendrites are formed at grain boundaries: much finer crystals in greater numbers are formed when boron is present. Similar effects are observed with tempering at 650°C for 30 minutes. Electron diffraction results indicate that the boundary product in boron-containing steel has the same cubic carbide lattice with the same period (within the experimental error); this applies to both steels with the maximum boron content. Chemical analysis gave indecisive results for lKh18N9 steel but for Kh17N4G8A steel.

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S/126/61/011/003/006/017
E111/E435

Investigation of ...

hardened from the temperatures of 950 and 1100°C, a tendency for the quantity of precipitating phase to decrease under the influence of boron was observed. The author concludes that the observed effects of boron are due to two sets of opposing factors:
1) those reducing the excess energy of the intergranular zone and, by reducing boundary diffusion, delaying decomposition,
2) those increasing the degree of supersaturation of the solid solution and thus accelerating decomposition. Acknowledgments are expressed to Professor V.I. Arkharov for his valuable suggestions. There are 5 figures, 3 tables and 20 references: 13 Soviet and 7 non-Soviet.

ASSOCIATION: Ural'skiy nauchno-issledovatel'skiy institut
chernykh metallov (Ural Scientific Research
Institute for Ferrous Metals)

SUBMITTED: August 22, 1960

Card 4/5

21363

188200 141B 3515 4016

S/126/61/011/004/010/023
E073/E535

AUTHOR: Levitin, V. V.

TITLE: Influence of Small Boron Additions on the Low Temperature Impact Strength of Austenitic Steel

PERIODICAL: Fizika metallov i metallovedeniye, 1961, Vol.11, No.4, pp. 564-567

TEXT: Decomposition of the saturated solid solution at the grain boundaries of austenitic stainless steel does not lead to a drop in plasticity at normal temperatures but it leads to brittle fracture at sub-zero temperatures. Small additions of boron have a great influence on the process of decomposition of solid solutions in austenitic steels and, therefore, they should also influence the process of impact fracture at low temperatures. The investigations were made on Cr-Ni steel containing 0.08% C, 18.0% Cr, 9.3% Ni, 1.2% Mn, 0.2% Si, 0.015% P and 0.018% S. 0.0005 and 0.005% boron were introduced in the second and third ingots and, from the forged rods, specimens 10 x 10 x 55 mm were cut out. The heat treatment consisted of quenching from 950, 1100 and 1200°C followed by tempering in the range 600 to 750°C. After

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Influence of Small Boron ...

S/126/61/011/004/010/023
E073/E535

heat treatment a V-shaped notch with a depth of 2 mm and an angle of 6° was cut on one side of the specimens and these were then soaked in liquid nitrogen and tested on an impact test machine having an impact load of 18 kgm. On a part of the specimens the magnetic induction after 20 min holding in liquid nitrogen was measured prior to making the notch. The results show that the impact strength of austenitic chromium nickel steel, after two hours tempering, is sharply reduced at the liquid nitrogen temperature. The steel is prone to brittle fracture, which appears to be intercrystalline. Introduction of small quantities of boron brings about an increase in the impact strength from 1.6-4.5 to 6.8-12.0 kgm/cm² and this favourable influence is sustained for all the investigated quenching and tempering temperatures. An increase of the tempering duration to 100 and 500 hours will lead to embrittlement of the boron containing steels but the impact strength will still be somewhat higher than it is for steel of the same composition without boron. Graphs, Fig. 3, were also plotted of the impact strength, a_k , kgm/cm², as a function of the induction, B, Gauss. It can be seen that with increasing induction, i.e. with increasing content of the magnetic phase in Card 2/4

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E073/E535

Influence of Small Boron ...

the specimen there is indeed a decrease in the impact strength. However, the measured induction, determined by the total quantity of the α -phase, is not an unequivocal function of the impact strength. The plot, Fig.3a, applies to steel without boron, the plot β applies to steel with 0.0005% boron, the plot β applies to steel with 0.005% boron. Heat treatment regimes were as follows (see symbols in the figure): 1 - 600°C, 2 hours; 2 - 600°C, 100 hours; 3 - 600°C, 500 hours; 4 - 650°C, 2 hours; 5 - 650°C, 100 hours; 6 - 650°C, 500 hours; 7 - 700°C, 2 hours; 8 - 750°C, 2 hours. In boron-containing steels small particles of the cold brittle ferrite will be present instead of large branchings of this ferrite. However, long duration tempering leads to an increase in the size of these particles and thus to a decrease in impact strength. There are 3 figures, 2 tables and 4 references: 3 Soviet and 1 non-Soviet.

ASSOCIATION:

Ural'skiy nauchno-issledovatel'skiy institut
chernykh metallov (Ural Scientific Research Institute
for Ferrous Metals)

SUBMITTED:
Card 3/4

August 22, 1960

35917

S/126/62/013/001/007/018
E111/E580

18.11.30

AUTHORS: Levitin, V.V. and Tananayeva, A.N.

TITLE: Contribution to the theory of the intergranular corrosion of stainless steels

PERIODICAL: Fizika metallov i metallovedeniye, v.13, no.1, 1962, 82-85

TEXT: The most widely accepted theory of the susceptibility of austenitic stainless steels to intergranular corrosion is based on the idea that solid-solution zones adjacent to the precipitated carbide phase are impoverished in chromium. The present work attempts to prove experimentally this theory. The method was based on the difference between the electrode potentials of the impoverished zone and solid solution (Ref.13: Schafmeister P. Arch. Eisenhüttenw., 1937, 10, 405) under intergranular-corrosion test conditions. The average thickness h of the zone is given (though not very accurately) by:

$$h = \frac{P}{cds \sum L} \quad (1)$$

where P is the weight of dissolved chromium, c the average Card 1/3

X

Contribution to the theory of ...

S/126/62/013/001/007/018
E111/E580

concentration, d the density, S the surface of the specimen, ℓ the depth (small compared with specimen size) of corrosion penetration, Σ the area of intergranular boundary per unit volume of specimen. Specimens 9 x 9 x 10 mm were machined from 12 x 12 mm forged bars of type 1X18H9 (1Kh18N9) steel (0.08% C, 18.0% Cr, 9.3% Ni, 1.2% Mn, 0.20% Si, 0.015% P and 0.018% S). After hardening and tempering each specimen was polished with emery, weighed and refluxed for 24, 48 or 72 hours in 40 ml of a solution of 55 ml H_2SO_4 and 110 ml $CuSO_4 \cdot 5H_2O$ per litre water. Iron, chromium and nickel were determined colorimetrically, ℓ metallographically and ΣL by the random-intercepts method. h was found to be 950-1530 Å for 48 hours treatment and depended little on tempering temperature. After 72 hours treatment h became 910-4060 Å. The latter is attributed to the greater distance between carbide particles and zones with more chromium. Although this investigation confirms the impoverishment theory, the authors note that this does not exclude the likelihood of other factors making steel liable to intergranular corrosion. There are 1 figure and 3 tables.

Card 2/3

Contribution to the theory of ...

S/126/62/013/001/007/018
E111/E580

ASSOCIATION: Ural'skiy institut chernykh metallov
(Ural Institute of Ferrous Metals)

SUBMITTED: May 10, 1961

Card 3/3

36597

S/126/62/013/003/009/023
E091/E135

18.451

AUTHORS: Syreyshchikova, V.I., Levitin, V.V., and
Farafonov, V.K.

TITLE: On the influence of grain size of austenitic steels
on their refractoriness and nature of fracture in
creep

PERIODICAL: Fizika metallov i metallovedeniye, v.13, no.3,
1962, 394-398

TEXT: The influence of grain size and the properties of
grains of varying dimensions in forgings of steel ЭВ612К
(EI612K), with respect to refractoriness and nature of cracks at
650 and 700 °C was studied. The chemical composition of this
steel (in %) is as follows: 0.09 C; 0.34 Si; 1.19 Mn;
15.0 Cr; 36.5 Ni; 1.5 Ti; 3.2 W; 4.1 Co; 0.012 B; 0.013 P;
0.004 S. An ingot 2.1 tons in weight was forged into a rod of
300 mm diameter. The forging was cut into longitudinal templets
of 20 mm thickness. Specimen billets were cut from peripheral
portions of the latter, in order to exclude the influence of

Card 1/5

On the influence of grain size ...

S/126/62/013/003/009/023
E091/E135

defects in the central zone. The templets were soaked at 1200 °C for 2 hours and quenched. They were then ground on two opposite sides and etched in order to expose the nature and size distribution of the grains. Etching was carried out at room temperature in a solution consisting of a mixture of 20 weight parts of hydrochloric, 10 parts of nitric acid, and one part of potassium dichromate. The average grain size on the surface of billets of 20 x 20 mm cross section was determined by measuring the diameter of 200 grains. Selected billets were tempered in three stages: at 850 °C for 10 hours; at 700 °C for 20 hours; and at 650 °C for 30 hours. For the purpose of testing for refractoriness, specimens of 10 mm diameter and 100 mm working length were cut from the billets. The tests were carried out at 700 °C at loads of 22 and 18 kg/mm², and at 650 °C at loads of 30 and 26 kg/mm². Four specimens with various grain characteristics were tested for each load. The surfaces of the specimens after failure and their fractures were studied both visually and with the aid of a binocular microscope. Sections for metallographic study were made in the axial plane of the specimens. Card 2/5

On the influence of grain size ...

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E091/E135

These were polished electrolytically and etched in a sulphuric-phosphoric-chromic electrolyte. It was found that creep occurs under the above conditions both by viscous flow along inter-crystalline boundaries and by slip within the grains. During deformation, internal cracks develop along intercrystalline boundaries in the specimens in a direction perpendicular to the applied load. Large grains lying in the path of cracks so as to oppose their propagation perpendicular to the specimen axis, temporarily retard their spreading. No strengthening occurs, however, since failure develops further due to the formation of intercrystalline cracks in other places. The large grains, having stopped propagation of the cracks, are stress-relieved by slip, probably after they have rotated somewhat into a more favourable position. Vacancies accumulate along the slip planes, cracks form and cleavage occurs. Under the conditions investigated, failure occurs along the most closely packed planes of the type (111). The nature of failure (intra- or inter-crystalline) is determined essentially by the grain size in the specimen cross-section. As the grain size increases, the

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X

On the influence of grain size ...

S/126/62/013/003/009/023
E091/E135

development of intercrystalline cracks becomes more difficult and the destruction acquires an intracrystalline character. So long as the grain size is small as compared with the diameter of the specimen, the stability of the latter does not decrease. In specimens, the cross section of which contain large grains (3-5 mm) comparable with the diameter of the specimen, cleavage in the large grains drastically weakens the cross section, as a result of which the specimen fails quite rapidly. Regions containing small, as well as large, grains exhibit different plastic properties, owing to localised predomination of different mechanisms of deformation. These result in the appearance of deflecting loads at the boundaries between these regions, which decrease the stability. There are 4 figures and 2 tables.

Card 4/5

X

On the influence of grain size ... S/126/62/013/003/009/023
E091/E135

ASSOCIATION: Ural'skiy nauchno-issledovatel'skiy institut
chernykh metallov
(Ural Scientific Research Institute of Ferrous
Metals)
Institut tyazhelogo mashinostroyeniya pri UZTM
(Institute of Heavy Machinery at UZTM)

SUBMITTED: Initially, June 5, 1961, and
after revision, July 10, 1961.

Card 5/5

S/126/62/014/001/015/018
E071/E135

AUTHORS: Levitin, V.V., and Syreyshchikova, V.I.

TITLE: An investigation of the strengthening phase of a complexly alloyed steel ЭИ612К (EI 612K)

PERIODICAL: Fizika metallov i metallovedeniye, v.14, no.1, 1962, 144-146

TEXT: The form of crystallites, structure and composition of the phase which separates during ageing and during retention under load were studied for the steel EI 612K. This steel, after hardening and ageing, possesses properties which are high for austenitic class steels. Electron microscopy and electron radiography studies and chemical analysis were made of the isolated phase of specimens cut out from an ingot containing: 0.09% C; 15.0% Cr; 36.5% Ni; 4.1% Co; 3.2% W; 1.5% Ti; 0.18% Al; 0.012% B; 1.2% Mn; 0.34% Si; 0.013% P; 0.004% S. The specimens were hardened from 1200 °C and annealed in three stages: 850 °C - 10 hours; 700 °C - 20 hours; 650 °C - 30 hours. For the heat resistance tests specimens with a gauge length of 100 mm, 10 mm in diameter, were used. The phase, separating on ageing, is so
Card 1/2

An investigation of the ...

S/126/62/014/001/015/018
E071/E135

highly dispersed that an optical microscope could not be used for its study. This phase has a cubic face centred lattice with a period $a = 3.59 \text{ \AA}$. Apparently, the phase represents a solid solution based on intermetallic compound Ni_3Al . The phase $\text{Ni}_3(\text{Al},\text{Ti})$ with a face centred cubic lattice (referred to as α' -phase in Soviet literature) was observed in nickel based alloys. The chemical composition of the phase could not be established accurately. It contained mainly Ni, Al, Ti and small quantities of Fe and Cr but no Co or W. On increasing the time of retention under load to a few thousand hours, the phase is enriched in titanium, whereupon the ratio of atomic concentrations of titanium and aluminium increases from 0.9 to 2. There is 1 figure.

ASSOCIATION: Ural'skiy nauchno-issledovatel'skiy institut
chernykh metallov (Ural Scientific Research Institute
of Ferrous Metals).

SUBMITTED: February 13, 1962

Card 2/2

SYREYSHCHIKOVA, V.I.; LEVITIN, V.V.; FARAFONOV, V.K.

Investigating processes of hardening, creep, and rupture of austenitic steel. Issl. po zharoproch. splav. 10:116-123 '63. (MIRA 17:2)

S/126/63/015/003/005/025
E021/E135

AUTHORS: Syreishchikova, V.I., and Levitin, V.V.

TITLE: Investigation of intra-granular structure of austenitic steel after fracture during creep

PERIODICAL: Fizika metallov i metallovedeniye, v.15, no.3, 1963, 352-356

TEXT: The authors have previously shown that in type ЭМ612К (EI612K) complex-alloyed heat-resisting steel the development of inter-crystallite cracks during high-temperature deformation is hindered and the fracture acquires an intra-granular character. The aim of the present work was to study the creep mechanism of this steel by investigating the intra-crystallite cleavage planes and grains in the axial part of the specimens after fracture. Fracture temperatures were 650 and 700 °C. Fractures were studied by back-reflection X-ray and microscopic methods. The results showed that with comparatively brief tests at 650 °C individual large grains fracture along slip planes (like single crystals). The plane of easiest slip is the {111} plane of the austenite lattice. With increasing test time and temperature the importance

Card 1/2

Investigation of intra-granular ...

S/126/63/015/003/005/025
E021/E135

of inter-granular flow increases and elastic bending of individual crystallites can occur. The relaxation of stress in these crystallites occurs through their breakdown into sub-grains, the extent of fragmentation increasing with increasing proximity of the given grain to the fracture zone. It appears that insufficient importance has previously been attributed to fragmentation, as a particular case of polygonization, in creep; this process needs further study. The mechanism of the intra-crystallite fracture of the grain undergoing fragmentation has not been explained: the intra-crystallite crack may successively 'jump' from one sub-grain to the next, following changes in the orientation of the crystallographic plane; it is not impossible, however, that the intra-crystallite crack proceeds along sub-grain boundaries. There are 4 figures and 1 table.

ASSOCIATION: Ural'skiy institut chernykh metallov
(Urals Institute of Ferrous Metals)

SUBMITTED: July 11, 1962

Card 2/2

ACCESSION NR: AT4013938

S/2659/63/010/000/0116/0123

AUTHOR: Sy*reyshechkova, V. I.; Levitin, V. V.; Farafonov, K. K.

TITLE: Investigation of strengthening, creep and failure processes in austenite steel

SOURCE: ANSSSR* Institut metallurgii. Issledovaniya po zharoprochny*m splavam, v. 10, 1963, 116-123

TOPIC TAGS: steel strengthening, steel creep, steel failure, austenite steel, steel plastic deformation, polygonization

ABSTRACT: The process of failure under creep was previously investigated for nonferrous metals, but only a few analyses have been made of heterogeneous alloys. This paper describes the investigation of the strengthening phase of a complex austenite steel alloy and studies the plastic deformation and failure of this steel under creep conditions. The influence of grain size on heat resistance was also investigated. The testing procedure was carried out on an IP-4M machine. Ingots of 2.1 tons were fastened to rods 300 mm. in diameter. They were then hardened and tempered (850C for 10 hours, 700C for 20 hours, and 650C for 30 hours). High-temperature samples were cut from blanks with

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ACCESSION NR: AT4013936

different sized grains. The samples had a diameter of 10 mm and a working length of 100 mm at temperatures of 650C and 700C. Data on sample failure is tabulated. Samples containing relatively coarse grains (2-5mm) in a section with uniform grains (0.15-0.25 mm) were the weakest. The strongest samples had sections with uniform grains of 0.2-1.0 mm. Finally X-ray studies of failure under creep revealed polygonization. Orig. art. has 3 figures and 2 tables.

ASSOCIATION: Institut metallurgi AN SSSR (Institute of Metallurgy AN SSSR)

SUBMITTED: 00

DATE ACQ: 27Feb64

ENCL: 00

SUB CODE: MM

NO REF SOV: 007

OTHER: 001

Card 2/2

ACCESSION NR: AP4038900

S/0114/64/000/005/0034/0036

AUTHOR: Blyum, E. E. (Engineer); Levitin, V. V. (Candidate of physico-mathematical sciences)

TITLE: Stainless steel resistance to cavitation damage and sand erosion

SOURCE: Energomashinostroyeniye, no. 5, 1964, 34-36

TOPIC TAGS: steel, stainless steel, cavitation, cavitation resistance, erosion, sand erosion, sand erosion resistance, turbine, hydraulic turbine

ABSTRACT: An experimental investigation of the resistance of austenitic steels Kh17N4G8A and (stainless) 1Kh18N9 to cavitation and to wear by sand-water pulp is reported. The Kh17N4G8A steel has 2-2.5 times less Ni and a considerably higher strength than the stainless steel. The cavitation resistance was tested on an impact-erosion outfit in which specimens fastened to a rotating disk cut a water jet in the cavitation zone (see Zavodskaya laboratoriya, 1954, no. 6).

Card 1/2

ACCESSION NR: AP4038900

After 8 hrs of testing, the stainless steel was found to have serious cavitation damage with pits up to 4-mm deep; the Kh17N4G8A steel developed cavitation pits only after 26 hrs. Sand-wear resistance was tested in a centrifugal-jet bowl device where other steels (2x13, 4x13, St 35, Kh15N9Yu, 30KhGSA) were also simultaneously tested. 2Kh13, 4Kh13, and Kh17N4G8A proved to be the most wear-resistant, and 30KhGSA the least resistant. Further wear-resistance tests included the 330-hr sand-water operation of an RO15GM84 hydraulic turbine in whose guide case 4 blades were made from stainless steel and 6 blades from Kh17N4G8A steel; the wear resistance of the latter steel proved to be 1.2-1.4 times as high as that of the stainless steel. Orig. art. has: 5 figures and 2 tables.

ASSOCIATION: none

SUBMITTED: 00

DATE ACQ: 05Jun64

ENCL: 00

SUB CODE: MM

NO REF SOV: 010

OTHER: 002

Card 2/2

L 32703-66 EWT(m)/T/EWP(t)/ETI IJP(c) JD/DJ

ACC NR: AP6014424

SOURCE CODE: UR/0381/65/000/005/0057/0061

AUTHORS: Rachok, A. Ya.; Levitin, V. V.; Kovalenko, N. K.

36
B

ORG: Ukrainian Scientific Research Institute for Special Steels, Alloys and Ferro Alloys, Zaporozhe (Ukrainskiy nauchno-issledovatel'skiy institut spetsial'nykh stalov, splavov i ferrosplavov)

TITLE: The influence of the depth of the decarbonized layer in ball-bearing steel on the total resistance of an induction coil

16

14

SOURCE: Defektoskopiya, no. 5, 1965, 57-61

TOPIC TAGS: steel, alloy steel, metallurgic testing machine / ShKh15 steel

ABSTRACT: The effect of the depth of the decarbonized layer in objects made from cold-drawn ShKh15 steel on the total resistance of an induction coil was determined. A schematic of the experimental installation is presented. The experimental results are presented graphically (see Fig. 1). It is shown that the depth of the decarbonized layer in steels may be successfully controlled by the method of eddy currents. Control was performed in the calibration shop of Dnepropetsstal' factory with V. M. Bolotnyy and S. Z. Yefremenko participating.

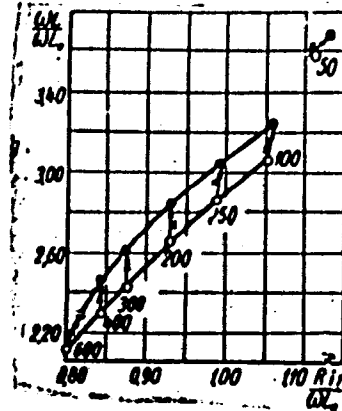
Card 1/2

UDC: 620.119.(14:6)

L 32703-66

ACC NR: AP6014424

Fig. 1. Influence of the depth of the decarbonized layer on the total resistance of the measuring induction coil for the frequency range 50—600 cycles. Depth of decarbonization: open circles - 0; crosses - 0.09 mm; black circles - 0.21 mm. $\omega L/\omega L_0$ - total reactive resistance; $R_{in}/\omega L_0$ contributed active resistance by the coil.



Orig. art. has: 1 table and 3 graphs.

SUB CODE: 11, 13/ SUBM DATE: 26Jun65/ ORIG REF: 002

Cord 2/2 BLG

SYREYSHCHIKOVA, V.I., LEVITIN, V.V., BLYUM, E.E., KHUSNOYAROV, K.B.

Effect of the methods of smelting and heat treatment on the heat resistant properties of boiler pipe of 12Kh1MF and 15Kh1MF steel. Stal' 25 no.4:351-354 Ap '65.

(MIRA 18:11)

1. Ural'skiy nauchno-issledovatel'skiy institut chernykh metallov.

FORM 1-67 EWP(m)/EWP(t)/ETI/EWP(k) IJP(c) JD/RW

ACC NR: AP6027791 (A) SOURCE CODE: UR/0126/66/022/001/0101/0107

49
42

AUTHOR: Levitin, V. V.; Yershova, L. S.

ORG: Ukrainian Scientific Research Institute of Special Steels, Alloys and Ferroalloys
(Ukrainskiy NII spetsial'nykh staley, splavov i ferrosplavov)

TITLE: X-ray analysis of the effect of deformation and annealing on the structure of mono-
crystal specimens of a high-temperature alloy

SOURCE: Fizika metallov i metallovedeniye, v. 22, no. 1, 1966, 101-107

TOPIC TAGS: high temperature alloy, crystal structure analysis, x ray diffraction analysis,
polygonization development / KhN77TYuR high-temperature alloy

ABSTRACT: Methods of x-ray diffraction topography and measurement of reflection intensity were used to investigate the structure of monocrystal specimens of KhN77TYuR alloy (20.7% Cr, 2.54% Ti, 0.83% Al, 0.05% C, 0.26% Mn, 0.48% Si, 0.009% P, 0.005% S, 0.0064% B), obtained by recrystallization. Reflections from the same crystals were successively investigated in three states: original state, after ~6-12% deformation (impact hardening), and after vacuum annealing at 600°C for 8 hr. Findings: the original crystals consist of weakly

Card 1/2

UDC: 548.73:669.15

L 09011-67

ACC NR: AP6027791

1
disoriented fragments or subgrains. Deformation results in changes in the reflex structure, integral intensity and angles of disorientation; these changes differ for the different reflections. Thus, e.g. in the presence of low tangential stresses (characteristic of the planes (111) and (111) of the investigated crystal) integral intensity and angle of disorientation increase as then impurities or subgrain boundaries function as barriers to the movement of dislocations. If the applied tangential stresses are high, on the other hand, these barriers are eliminated and the measured integral intensity sharply decreases. Annealing results in an increase in integral intensity, angles of disorientation and the number of intense spots in the structure of the reflexes, which is attributed to polygonization. These effects apparently may be attributed to the redistribution of dislocations, decrease in their density and the arraying of dislocations into "walls" with the formation of polygonal substructure. Orig. art. has: 4 figures, 2 tables.

SUB CODE: 11, 20 / SUBM DATE: 22May65/ ORIG REF: 008/ OTH REF: 003

Cards 2/2 nat

L 10431-67 EWT(m)/EWP(t)/ETI LJP(c) JD/HW
ACC NR: AFG032201 SOURCE CODE: UR/0133/66/000/010/0949/0949

AUTHOR: Levitin, V. V. 30

ORG: Ukrainian Scientific Research Institute of Special Steels, Alloys, and
Ferroalloys (Ukrainakiy nauchno-issledovatel'skiy institut spetsial'nyk staley,
splavov i ferrosplavov)

TITLE: Development of methods for improving the heat resistance of KhN77TYuR alloy

SOURCE: Stal', no. 10, 1966, 949

TOPIC TAGS: NICKEL BASE ALLOY, CHROMIUM CONTAINING ALLOY,
nickel chromium alloy, heat resistant alloy, alloy rupture life,
alloy mechano-thermal treatment/KhN77TYuR ~~nickel chromium alloy~~

ABSTRACT: Statistical methods were used to establish the quantitative relationship between the heat-resistance characteristics of KN77TYuR alloy and 13 factors, such as chemical composition, impurity content, pouring temperature, pouring rate, grain size, and conditions of heat treatment. The pouring rate and temperature were found to affect primarily the top and bottom part of the ingot. High heat resistance is associated with a certain optimum grain size and with the diffusion mechanism of deformation. The specimens with a low heat resistance were distinguished by the great total length of slip lines and a significant disorientation of the sub-structure, both of which indicate an intensive deformation within grains. Mechano-thermal treatment (low-reduction deformation at room temperature followed by

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UDC: 669.14.018.25.001.5

L 10431-67

ACC NR: AP6032201

annealing at 600C) between annealing and aging brings about a polygonization, which pro-
longs significantly the rupture life of the alloy. [DV]

SUB CODE: 11, 13/ SUBM DATE: none

Card

2/2 ^{byp}

LEVITIN, V.Ya., assistant

Role of psychic trauma in the pathogenesis of myocardial
infarct. Med. zhur. Uzb. no.5:82-83 My '60. (MIRA 15:3)

1. Iz kafedry patologicheskoy anatomii (zav. - dotsent
P.D. Tulyaganov) Andizhanskogo gosudarstvennogo meditsinskogo
in stituta.

(HEART--INFARCTION)
(CORONARY VESSELS--DISEASES)

LEVITIN, V.Ya.; FUZAYLOV, Yu.M.

Some materials for the study of endemic goiter in Andizhan Province. Med. zhur. Uzb. no.6:22-25 Je '60. (MIRA 15:2)

1. Iz kafedry patologicheskoy anatomii (zav. - dotsent P.D.Tulyaganov) i kafedry biokhimi (zav. - dotsent M.G.Mirzakarimov) Andizhanskogo gosudarstvennogo meditsinskogo instituta.
(ANDIZHAN PROVINCE...GOITER)

FUZAYLOV, Yu.M.; LEVITIN, V.Ya.

Endemic goiter in Osh Province. Probl. endok. i gorm. 6 no.6:95-
98 '60. (MIRA 14:2)

(OSH PROVINCE—GOITER)

LEVITIN, V.Ya.; ABDUSATOROVA, Sh.A.

Some controversial questions on specific prophylaxis in endemic goiter. Probl. endok. i gorm. 6 no.6:116-118 '60. (MIRA 14:2)
(GOITER)

LEVITIN, V.Ya. (Namangan)

Study of the properties of thyroid gland colloid using the
Gram-Weigert reaction. Arkh. pat. 24 no.11:66-72 '62.
(MIRA 18:12)

1. Iz patomorfologicheskoy laboratorii (zav. V.Ya.Levitin)
Namanganskogo filiala Uzbekskogo nauchno-issledovatel'skogo
instituta tuberkuleza (dir. - dotsent R.P.Pulotov, nauchnyy
rukovoditel' rabotoy - zasluzhennyy deyatel' nauki UzSSR prof.
S.A.Masumov).

LEVITIN, Ya.

A new cutter-loader stands the test. Mast.ugl. 5 no.6:21-22 Ja '56.
(MLRA 9:8)

(Moscow Basin--Coal mining machinery)

LERMAN, L.; LHVITIS, Ya...

Methane for service to man. Mast.ugl. 7 no.4:26-27 Ap '59.

(Methane)

(MIRA 11:4)

LEVITIN, Ya.; LERMAN, L.

Miners' committee president. Mast. ugl. 7 no. 5:11-13 My '58.

(MIRA 11:7)

(Mine management)

LERMAN, L.; LEVITIN, Ya.

Technical councils in mines. Mast. ugl. 7 no. 7:17 J1 '58.

(MIRA 11:8)

(Coal mines and mining)

LEVITIN, Ya.; LERMAN, L.

Ionized air. Mast. ugl. 7 no.6:20 Ag '58.
(Air, Ionized--Therapeutic use)
(Karaganda--Coal miners--Diseases and hygiene)

(MIRA 11:9)

LERMAN, L.; LEVITIN, Ya.

With a Communist Youth Leagues pass. Mast. ugl. 7 no.10:25-26. 0 '58.
(Karaganda--Coal mines and mining) (MIRA 11:11)

AUTHOR: Levitin, Ya., Lerman, L. SOV-25-58-10-16/48

TITLE: Scientists for the Sovnarkhoz (Uchenyye - sovnarkhozu)

PERIODICAL: Nauka i zhizn', 1958, Nr 10, pp 29 - 32 (USSR)

ABSTRACT: The author describes the activities of scientists of the Karaganda Sovnarkhoz in the Kazakhstan SSR. New independent scientific institutions ("Giprouglegormash" and Giprotsvetmet") have been founded and the Kazakhstan Academy of Sciences will open a new branch in Karaganda which will include an institute of mining and energetics. Academicians of the USSR Academy of Sciences A.A. Skochinskiy, A.M. Terpigorev, L.D. Shevyakov and Member-correspondents of the USSR Academy of Sciences A.A. Spivakovskiy and N.V. Mel'nikov helped to solve actual problems in the development of mining districts of Central Kazakhstan. Plans have been made to achieve an output of 30 - 40 million tons of coal in Ekibastuz - the biggest coal field of Kazakhstan. Engineers D.W. Lyuboshinskiy and V.A. Brenner, Co-workers of the Karagandskiy nauchno-issledovatel'skiy ugol'nyy institut Karagandinsky Scientific Research Institute of Coal) are engaged in research work to

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Scientists for the Sovnarkhoz

SOV-25-58-10-16/48

find a means of reducing the waste of coal. Ye. I. Preobrazhenskaya and M.M. Levin developed a method for the artificial degasification of coal seams. Large copper industries have recently been founded in Central Kazakhstan - Dzheshkazganskiy i Balkhashskiy gornometallurgicheskiye kombinaty (the Dzheshkazganskiy and Balkhashskiy Mining and Metallurgical Combines). Co-workers of Gosudarstvennyy nauchno-issledovatel'skiy institut tsvetnykh metallov (The State Scientific Research Institute of Non-ferrous Metals) elaborated a technology for the concentration of oxidized copper ores according to the method of Professor V.Ya. Mostovich, which is suitable for Dzheshkazgan conditions. These are only a few examples of research work being done by the Technical Economical Council of the Karaganda Sovnarkhoz which includes the following members: K.I. Satpayev, President of the Kazakhstan Academy of Sciences, P.Ye. Ryabov, A.V. Dokukin, Director of the Vsesoyuznyy ugol'nyy institut (All-Union Mining

Card 2/3

Scientists for the Sovnarkhoz

SOV-25-59-10-16/48

Institute). M.F. Voznyy, M.L. Rudakov, Professor of the Karagandinskiy gornyy institut (Karaganda Mining Institute) and N.D. Skvorchevskiy, Chief Engineer of the Kounradskiy mine. There are 3 photographs.

1. Scientific personnel--USSR

Card 3/3

TSIGEL'NIK, A.Ya.; KOSTINA, Z.I.; GRIGOR'YEVA, V.I.; AFANAS'YEV, I.V.
LEVITIN, Ya.M.; SHAPIRO, B.Ya. (Leningrad)

Pathogenesis of amyloidosis in tuberculous patients and diagnosis
of its reversible forms. Klin.med. no.12:14-21 '61.

(MIRA 15:9)

1. Iz kafedry tuberkuleza (zav. - prof. A.Ya. TSigel'nik) i
Leningradskogo meditsinskogo instituta imeni I.P. Pavlova.
(TUBERCULOSIS) (AMYLOIDOSIS)

LEVITIN, Ya.M., aspirant

Functional pathology of the kidneys in tuberculosis of the
lungs. Probl. tub. no.1: 82 '63. (MIRA 16:5)

1. Iz kafedry legochnogo tuberkuleza (zav.-prof. A.Ya.TSigel'-
nik) Pervogo Leningradskogo meditsinskogo instituta imeni akad.
I.P. Pavlova.
(KIDNEYS—DISEASES) (LUNGS—TUBERCULOSIS)

Name - LEVITIN, Ye. A.

Author of book, "Receiver - Amplifier Tubes". The first part consists chiefly of questions on the theory of electron tubes with their applications. The second part deals with the statistical characteristics and data of electron tubes. In addition circuit arrangements describe the functions of these tubes.

REF: R. F. #17-18, p.94, 1938

LEVI/TIN, Ye. A.

PA 78784

USER/Radio Equipment
Machines, Testing

Feb 1948

"Tester TT-1," Ye. A. Levitin, M. Sh. Berkovich, 5 pp

"Radio" No 2

Describes TT-1 tester or multimeter which can be used to determine current, voltage and resistance of radio equipment. TT-1 has sensitivity of 5,000 ohms per volt. Gives performance data, the principles of the circuit, voltmeter for DC and AC, and briefly describes simple construction of the TT-1.

ID

78784

LEVITIN, E. A.

Parameters and the characteristics of radio receivers Moskva, Gos. energ. izd-vo, 1949.
88 p. (Massovaya radiobiblioteka, vyp. 46.) (50-39421)

TK6563.L447

LEVITIN, E. A., GIRSHCORN, Sh. I., KRAKAU, V. N., and PEVTSOV, V. P.

"Radio-Receivers", published by State Cooperation Publishers, Moscow, 1949.

LEVITIN, Ye.

20709. Levitin, Ye. Preobrazovatel'nyye Kaskady. Radio, 1949, No. 6, s. 17-20, 20

SO: LETOPIS ZHURNAL STATEY - Vol. 28, Moskva, 1949

LEVITIN, Ye.

PA 51/49T101

USSR/Radio

Jul 49

Vacuum Tubes
Publications

"Review of Lieutenant Colonel S. P. Fedorov's
'Radio Tube Handbook,'" Ye. Levitin, 1 p

"Radio" No 7

Favorable review of subject book, of which three chapters are devoted to Soviet-constructed tubes (amplifiers, oscillators, kenotrons, thyratrons, etc.) and three chapters to Western European and American tubes. Describes a new system of designating tubes which is now used in Soviet industry.

51/49T101

LEVITIN, YE.

29022 Skhemy preobrazovatel'nykh Kaskadov. Radio, 1949, No 9, S. 30-34

30: Letopsi' Zhurnal'nykh Statey, Vol. 39, Moskva, 1949

LEVITIN, Ye.

FA 157T91

USSR/Radio - Radio Receivers
Radio, Reception

Dec 49

"The Salyut Receiver," Ye. Levitin, A. Irzhavskiy, 4 $\frac{1}{4}$ pp

"Radio" No 12

Describes receiver in detail. Will receive local and neighborhood stations, and employs two tubes in tuned RF reflex circuit operating on AC through selenium rectifier. Receives long and medium waves with output of 0.5 watt. Uses dynamic type loudspeaker with permanent magnet. Includes six sketches.

157T91

LEVITIN, E. A.

The working principles of tubes in radio receivers Mosdva, Gos. energ. izd-vo, 1950.
47 p. (Massovaia radiobiblioteka, vyp. 61). (51-22355).

TK6565.V3L4

KOMAROV, A.V.; LEVITIN, Ye.A.; TARASOV, F.I., red.; BABOCHKIN, S.N., tekhn.red.

[Radio receivers; the "Moskvich" radio receiver and the "Kama"
radio-phonograph combination] Radioveshchatel'nye priyemniki;
radiopriemnik "Moskvich," radiola "Kama." [Moskva, 1952] 11 p.
(Massovaya radiobiblioteka, no.141) (MIRA 10:12)
(Radio--Receivers and reception)