

KRISHTAL, M.A.; GORYACHEV, B.A.

Effect of holding during the induction tempering of low-carbon steel. Izv. vys. ucheb. zav.; chern. met. 5 no.9:178-179 '62.
(MIRA 15:10)

1. Tul'skiy mekhanicheskiy institut.
(Steel—Heat treatment)

S/126/62/014/002/006/018
E111/E192

AUTHORS: Krishtal, M.A., and Mokrov, A.P.

TITLE: Data processing in reaction diffusion

PERIODICAL: Fizika metallov i metallovedeniye, v.14, no.2, 1962,
200-204

TEXT: A general method of determining diffusion coefficients is described and applied to molybdenum and tungsten solutions in α - and γ -iron. The method is especially interesting for elements forming substitutional solid solutions in α - and γ -iron, and relates to the situation where an α -phase layer grows through diffusion on the γ -phase specimen. The diffusion specimens were prepared from electrolytic iron and alloys of Fe + 3% w/w W, and Fe + 1.9% w/w Mo, respectively. The method of melting and annealing was described in FMM, v.12, no.3, 1961, 389. For tungsten the diffusion coefficient in α -iron was 9.6×10^{-11} cm/sec at 1090 °C and 3.2×10^{-9} at 1280 °C; in γ -iron 5.6×10^{-11} at 1090 °C and 1.4×10^{-9} at 1250 °C; for
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Data processing in reaction ... S/126/62/014/002/006/018
E111/E192

molybdenum the values were 7.0×10^{-12} at 800 and 3.3×10^{-9} at 1250 °C in alpha, the values in gamma being substantially the same as for alpha-iron. The activation energy for diffusion of tungsten in alpha- and gamma-iron was 71.0 and 81.0 kcal/g atom, respectively, and the entropy change 17 and 23 cal/g atom. °C, respectively. For Mo the diffusion activation energy is 57.0 kcal/g atom in both alpha- and gamma-iron, the entropy-change values being 9 cal/g atom. °C. There are 2 figures and 2 tables.

ASSOCIATION: Tul'skiy mekhanicheskiy institut
(Tula Mechanical Institute)

SUBMITTED: October 20, 1961, initially, and
March 20, 1962, after revision.

Card 2/2

5/126/62/014/006/013/020
E193/E383

AUTHORS: ~~Krishtal, M.A.~~ and Golovin, S.A.

TITLE: Internal friction of hardened steel

PERIODICAL: Fizika metallov i metallovedeniye, v. 14, no. 6,
1962, 913 - 916

TEXT: A widely held opinion is that the internal-friction peak observed at about 200 °C in heat-treated or work-hardened steel is associated with the diffusion of interstitials (mainly carbon and nitrogen) to the regions of dislocations formed during mechanical or thermal treatment. Since the increase in strength due to either treatment is determined mainly by the density and mobility of dislocations, there should be a direct relationship between the characteristics of the internal-friction peak at 200 °C and the mechanical properties of hardened steel. It was in order to check this hypothesis that the present investigation was undertaken. Using both published and original experimental data, the present authors have constructed curves showing the increase in the UTS of steels 5, 50 and $\gamma 7A$ (U7A) as a function of either the height or the area of the 200 °C peak. Typical
Card 1/3

Internal friction

S/126/62/014/006/013/020
E193/E383

results, which confirmed the authors' hypothesis, are shown in Figs. 4 and 5. In Fig. 4, the increase in the UTS ($\Delta\sigma$, kg/mm²) of steel 5 is plotted against the height ($Q_{200}^{\circ C}$) of the peak studied; the experimental points, denoted by circles, triangles, and dots, relate to specimens hardened, respectively, by a) quenching and furnace-tempering; b) wire-drawing and c) quenching and tempering by passage of electric current. In Fig. 5, $\Delta\sigma$ (kg/mm²) of the same specimens of steel 5 is plotted against the area (S , mm²) of the internal-friction peak. The most interesting fact revealed by these graphs is that points obtained for specimens hardened by thermal and mechanical treatment lie on the same curves. This indicates that the nature of the hardening processes in both types of treatment are basically the same and throws new light on the mechanics of thermomechanical treatment. There are 5 figures.

ASSOCIATION: Tul'skiy mekhanicheskiy institut
(Tula Mechanics Institute)

SUBMITTED: May 25, 1962

Card 2/3

PHASE I BOOK EXPLOITATION

SOV/651C

Krishtal, M. A.

Diffuzionnyye protsessy v zheleznykh splavakh (Diffusion Processes in Iron Alloys) Moscow, Metallurgizdat, 1963. 277 p. Errata slip inserted. 2500 copies printed.

Ed.: A. A. Zhukhovitskiy; Ed. of Publishing House: L. M. Gordon;
Tech. Ed.: G. P. Obukhovskaya.

PURPOSE: This book is intended for scientific research workers and engineers investigating diffusion and diffusion processes. It may also be useful to engineers specializing in heat treatment of metals.

COVERAGE: The book describes methods applied to determine diffusion coefficients and gives specific values for a number of iron-base alloys. Various mechanisms of diffusion are reviewed. The book includes data on diffusion mechanism; Kirkendall effect; formation of porosity in body-centered iron and its alloys; and the effect of alloying elements on parameters of diffusion of carbon,
Card 1/5

Diffusion Processes (Cont.)

SOV/6510

vacancies, and elements which form substitutional solutions in binary, ternary, and quaternary alloys. Methods of determination of the concentration of vacancies are reviewed and pertinent data for a number of alloys are presented. The effect of alloying elements on diffusion and self-diffusion in iron alloys is discussed. The calculation and statistical methods developed for establishing the limiting factors in complex diffusion processes taking place in iron alloys during their heat treatment and thermochemical treatment are described. The author thanks Professors B. Ya. Pines, A. A. Zhukhovitskiy, and I. L. Mirkin. Each chapter is accompanied by references, mostly Soviet.

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AVAILABLE: Library of Congress

SUBJECT: Metals and Metallurgy

Card 5/5

ND/zp/eb
2/4/64

S/148/63/000/001/011/019
E071/E151

AUTHOR: Krishtal, M.A.

TITLE: Microdefects of diffusion layers in iron alloys

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy,
Chernaya metallurgiya, no.1, 1963, 111-116

TEXT: The structure of the diffusion layers formed by the diffusion of molybdenum into iron and its binary alloys was studied in order to confirm the possible occurrence of diffusion porosity in body centred iron phases, and to determine conditions necessary to minimise this porosity. Electrolytic iron and its binary alloys containing 5% (atomic) of tungsten, chromium, vanadium and silicon, with less than 0.05% of carbon, were used. Tungsten wire, 0.07 mm diameter, or molybdenum foil 0.04 mm thick, was spot-welded to specimens prepared by induction melting under argon, followed by forging and homogenising at 1200 °C for 20 hours. Diffusion was brought about by annealing for 10-58 hours in sealed quartz tubes under a vacuum of 10^{-4} mm Hg, followed by water quenching. The structure of the diffusion layers was almost identical at all temperatures, microscopical examination (X 2000)

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Microdefects of diffusion layers...

S/148/63/000/001/011/019
E071/E151

showing the absence of intermetallic compounds. In the diffusion zones of molybdenum and tungsten, diffusion porosity was observed (minimum microhardness). Tungsten sharply increased the diffusion of molybdenum and inhibited pore formation. The diffusion porosity in the α -solid solution of molybdenum in iron, and the linear rate of advance of the porous zone with annealing time, provide direct experimental proof of the vacancy mechanism of diffusion in body centred iron. This was also confirmed by the diffusion of chromium into iron. There are 8 figures and 1 table.

ASSOCIATION: Tul'skiy mekhanicheskiy institut
(Tula Mechanical Institute)

SUBMITTED: April 1, 1961

Card 2/2

KRISHTAL, M.A.; FIRSANOV, I.A.; VAYNER, Yu.I.; GOLOVIN, S.A.;
MAKSIMOV, S.K.

Mechanical properties of statically and dynamically deformed
alloys. Fiz. met. i metalloved. 15 No.2:305-309 F '63.
(MIRA 16:4)

1. Tul'skiy mekhanicheskiy institut.
(Alloys—Testing)

KRISHTAL, M.A.; MOKROV, A.P.

Mechanism of diffusion in body-centered iron. *Fiz.met.i metalloved.*
15 no.3:456-458 Mr '63. (MIRA 16:4)

1. Tul'skiy mekhanicheskiy institut.
(Crystal lattices) (Diffusion)

KRISHTAL, M.A.; GORYACHEV, B.A.

Characteristics of changes in the properties of hardened steel
during induction heating. Fiz. met. i metalloved. 15 no.6:
819-823 Je '63. (MIRA 16:7)

1. Tul'skiy mekhanicheskiy institut.

(Steel--Testing) (Induction heating)

KRISHTAL, M.A.; BARANOVA, V.I.

Temperature dependence of vacancy concentration in iron-chromium,
iron-molybdenum alloys. Fiz. met. i metalloved. 16 no.4:626-628
0 '63. (MIRA 16:12)

1. Tul'skiy mekhanicheskiy institut.

S/020/63/149/001/011/023
B104/B186

AUTHORS: Zhukhovitskiy, A. A., Krishtal, M. A.

TITLE: On one case of a realization of the theoretical strength

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 149, no. 1, 1963, 88 - 89

TEXT: Plastic deformation and destruction of metals and alloys occur usually at tensions less than that obtained in the theory of interatomic bond; this divergence is caused by the dislocations. Here it is shown that the range of plasticity of different materials is decreased at high deformation rates. When the frequency of deformation is within the spectrum of solid body vibrations the energy is accumulated on the gliding planes and destruction ensues. If the rate of shear deformation is greater than the velocity of sound the energy is dispersed along the gliding planes. It is possible that in the range of subsonic deformation rates the Newton law is satisfied; it is assumed that the energy removal is proportional to the square of the shear deformation rate. The expression $\eta = k\dot{\gamma}^2$ for the coefficient of viscosity may be used for treating results obtained in

Card 1/2

On a case of a realization ...

S/020/63/149/001/011/023
B104/B186

experiments using pulsation methods with great deformation rates. Here, ρ is the density, c is the sound velocity, τ is the lattice period and k is a factor.

ASSOCIATION: Tul'skiy mekhanicheskiy institut (Tula Mechanical Institute)

PRESENTED: October 23, 1962, by P. A. Rebinder, Academician

SUBMITTED: October 18, 1962

Card 2/2

ACCESSION NR: AR4041607

S/0137/64/000/005/1040/1041

SOURCE: Ref. zh. Metallurgiya, Abs. 51242

AUTHOR: Krishtal, M. A.; Golovin, S. A.; Pudoveyeva, V. P.

TITLE: Measurement of threshold of cold brittleness of metal by method of internal friction

CITED SOURCE: Sb. Relaksats. yavleniya v met. i splavakh. M., Metallurgizdat, 1963, 120-122

TOPIC TAGS: cold brittleness, metal, internal friction

TRANSLATION: Internal friction was investigated at low temperatures (from -90 to +20°) of steel 5 and low-carbon steel (0.09% C); in parallel was studied a_k of given steels. Flat samples (S) were attached cantilever-wise and placed in chamber cooled with liquid N₂. Free oscillations of sample gave fast removal of load applied toward the end of sample. Vibrograms of free oscillations of

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ACCESSION NR: AR4041607

sample were recorded by optical method and processed by usual method. Values of decrement were taken with maximal normal stress $\sim 6 \text{ kg/mm}^2$. Temperature dependences of internal friction were removed during heating of cooled chamber. Sample of low-carbon steel before measurements was subjected to hardening and subsequent plastic flow by extension of 15%. In interval from -30 to -75° for this steel sharp lowering of internal friction is observed, caused by manifestation of cold brittleness in steel. Measurements of a_k show its drop in the same interval of temperatures and confirm that the indicated temperatures are, for given steel, the upper and lower thresholds of cold brittleness. Analogous temperature dependence of internal friction is obtained for steel 5 preliminarily annealed in vacuum at 100° for 1 hour. Data on change of internal friction show that upper threshold of brittleness for steel 5 amounts to -75° and lower, to -90° . Results of measurements will agree with data on a_k of a sample without notches. The conclusion was made that by the method of internal friction it is possible rapidly and sufficiently reliably to show the upper and lower thresholds of cold brittleness of steel.

SUB CODE: MM

ENCL: 00

Card 2/2

... of the ...
... intensity of the ...
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... initial state ...
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... Plastic deformation ...

~~mechanisms - strengthening and weakening~~

[Faint, mostly illegible text, possibly a document header or introductory paragraph]

S/0000/63/000/000/0353/0356

ACCESSION NR: AT4040403

AUTHOR: Krishtal, M. A.; Golovin, S. A.; Pudoveyeva, V. P.

TITLE: Energy dissipation in some alloys at low temperatures

SOURCE: Nauchno-tekhnicheskoye soveshchaniye po voprosam kolebaniy s ucheton rasseyaniya energii. 4th, 1962. Rasseyaniye energii pri kolebaniyakh uprugikh sistem. (Energy dissipation during vibrations of elastic system); trudy* soveshchaniya. Kiev, Izd-vo AN UkrSSR, 1963, 353-356

TOPIC TAGS: steel No. 5, steel 35 GS, low carbon steel, cold brittleness threshold, low temperature energy dissipation, damping decrement, impact toughness

ABSTRACT: Damping decrements in flat samples of steel No. 5 (vacuum annealed 1 hr. at 1000C), steel 35GS (normalized) and a low carbon steel (0.09% C, hardened, deformed 15%) were measured in relation to temperatures ranging from -100 to 20C (methodology described). Analysis of the results obtained, placed the cold brittleness thresholds of the three named alloys at -75 to -90, -58 to -85 and -30 to -75C, respectively. Parallel measurement of impact toughness produced closely corresponding results, especially for unnotched

Card 1/2

ACCESSION NR: AT4040403

samples; the damping decrement method is therefore recommended for measurements of cold brittleness thresholds. Orig. art. has: 4 figures.

ASSOCIATION: none

SUBMITTED: 23Nov63

DATE ACQ: 28May64

ENCL: 00

SUB CODE: MM

NO REF SOV: 002

OTHER: 000

Card 2/2

KRISTAL, Mikhail Aronovich; FIGUZOV, Yueiy Vasil'yevich; GOLOVIN,
Stanislav Alekseyevich; GARBER, R.I., prof., retsenzent

[Internal friction in metals and alloys] Vnutrennee trenie
v metallakh i splavakh. Moskva, Izd-vo Metallurgiya, 1964.
245 p. (MIRA 17:6)

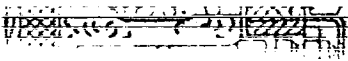
TITLE: ~~Measuring the cold brittleness threshold of metals by the~~
14

"APPROVED FOR RELEASE: 06/14/2000

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ACCESSION NR: AR4045886

... indicating an increase in ...
... the various alloys was determined from the slope of the
... dependence of internal friction on the ...

... placement of the vacant sites but also due to other defects in

AMC, 01/1/70

SECRET

TITLE. Investigation of the mechanism of creep in Fe-alloys
Card 112

at 1120 and 1220C for 25-225 and 10-200 hrs. It was
found that the zone where maximum pore formation had occurred was also that of
maximum saturation of vacancies. The author attributes the mechanism of mark-
er displacement to the theory of dislocations. It is suggested that not all the

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"APPROVED FOR RELEASE: 06/14/2000

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KRISHTAL, M.A.; BARANOVA, V.I.

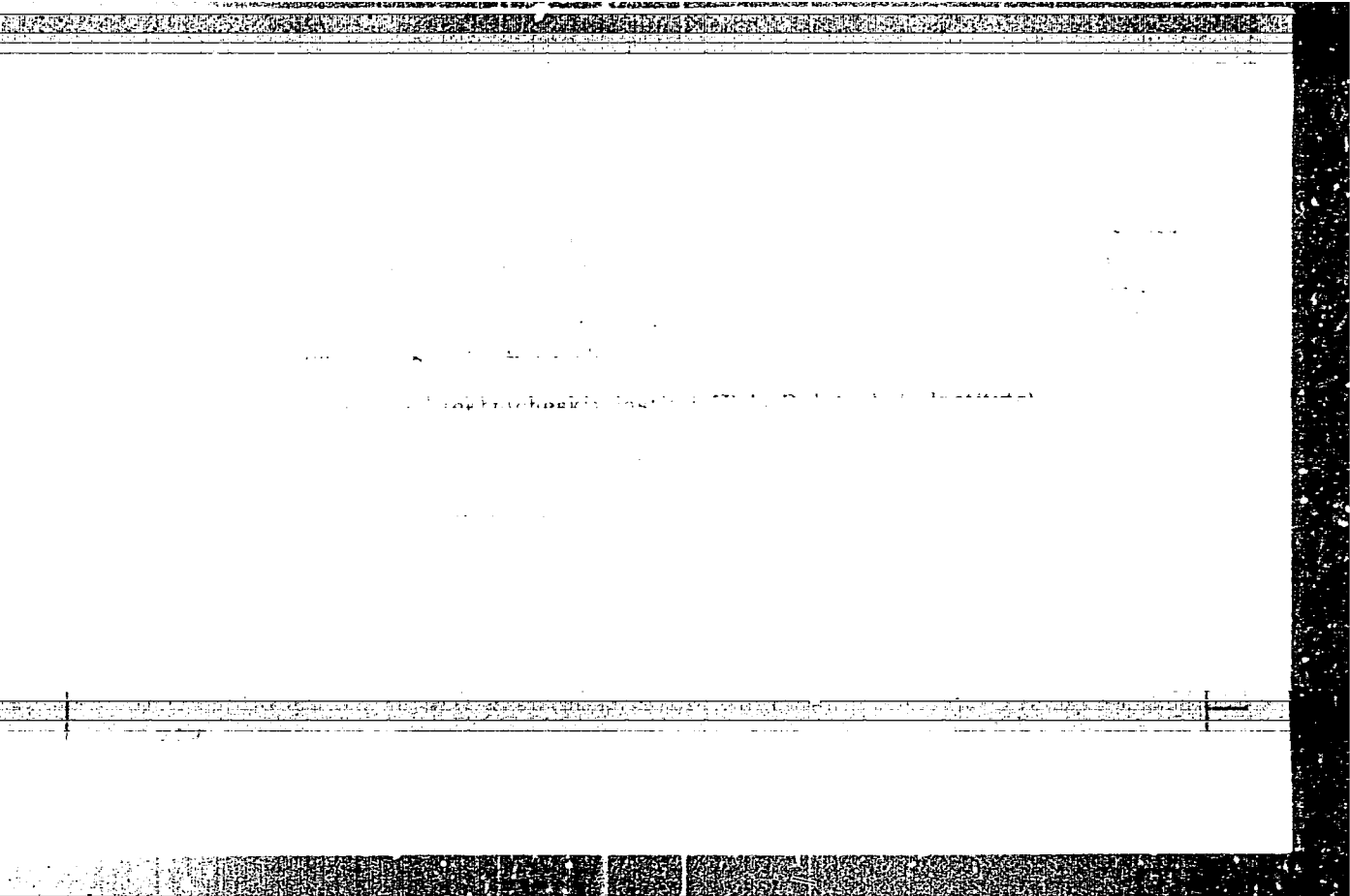
Peaks of internal friction in alloyed ferrite. Fiz. met. i metalloved.
18 no.3:464-467 S '64. (MIRA 17:11)

1. Tul'skiy politekhnicheskii institut.

KRISHTAL, M.A.; DAVYDOV, Yu.I.; KORVACHEV, V.D.

Local spectral method of the quantitative determination of carbon
in steel. Zav. lab. 30 no.8:950-952 '64. (MIRA 18:3)

1. Tul'skiy mekhanicheskiy institut.



L 12170-66 EWT(m)/EWP(t)/EWP(b) IJP(c) JD/JW/JG

ACC NR: A76000175

UR/0148/65/000/009/0133/0138

AUTHOR: Krishtal, M. A.; Davydov, Yu. I.

51
B

ORG: Tula Polytechnic Institute (Tul'skiy politekhnicheskiy institut)

TITLE: Effect of chromium and tungsten on the thermodynamic activity of carbon in iron alloys

SOURCE: IVUZ. Chernaya metallurgiya, no. 9, 1965, 133-138

TOPIC TAGS: thermodynamic characteristic, carbon, iron base alloy, chromium containing alloy, tungsten containing alloy, austenite, metal bonding

ABSTRACT: Since the experimental determination of the activity of C in Fe alloys usually involves a time-consuming study of the equilibrium concentration of C in a melt with a gaseous mixture (CO-CO₂ or CH₄-H₂) of known composition, the authors offer a quicker method of determining the relative activity coefficient (f_C^{melt}) of C in multicomponent systems compared with the binary system Fe-C for which the C activities have been satisfactorily measured. Given the same atomic concentrations N_C of C in iron and in alloy, f_C^{melt} may be determined as follows:

$$f_C^{melt} = \left(\frac{a_C^{melt}}{a_C} \right) N_C = const'$$

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UDC: 669.112.3.66-971

L 12170-66

ACC NR: AP6000175

where a_C^{melt} and a_C^{Fe} are the C activities in the alloy and in iron, respectively. The effect of Cr and W on the thermodynamic activity of C in Fe-base alloys was investigated in specimens containing up to 6.3% Cr and 11.6% W following their annealing at 950 and 1150°C. It was found that the equiatomic concentrations of Cr and W have a virtually identical effect on the activity of C but their effect on the diffusion of C differs greatly. For example, a 4% (at.) Cr concentration (3.7% by wt.) reduces the effective diffusion coefficient D_e in the alloy by 50% as compared with D_e in iron and D_e of W (12% by wt.), by 90%. The corresponding changes in the true diffusion coefficient D_t of C are 10 and 80%, respectively. Hence, the retardation of the diffusion of C in the presence of Cr is chiefly due to the effect of Cr on the thermodynamic diffusion factor. Like Cr, W reduces the activity of C, but it reduces even further the mobility of C atoms (kinetic factor), which is apparently attributable to the greater increase in the bonding forces in austenite on alloying with W as compared with Cr. Orig. art. has: 3 figures, 8 formulas.

SUB CODE: 11, 20/ SUBM DATE: 23Mar65/ ORIG REF: 009/ OTH REF: 004

HW
Card 2/2

FRISHTAL, M.A.; DRAPKIN, B.M.

Unit for the simultaneous determination of the elasticity moduli,
shear, and vibration decrement within a wide temperature range.
Zav. lab. 31 no.11:1391-1393 '65. (MIRA 19:1)

1. Tul'skiy politekhnicheskiy institut.

1-1973H-66 ENT(N)/EWP(W)/EWA(O)/EWP(V)/T/EWP(L)/EWP(Y)/EWP(Z)/EWP(D) MFW/JD/44
ACC NO: AP6003307 (N) SOURCE CODE: UR/0129/66/000/001/0037/0042

AUTHOR: Krishtal, M. A.; Titenskiy, E. G.; Sirenko, T. A.

ORG: Tula Polytechnic Institute (Tul'skiy politekhnicheskiy institut)

TITLE: Embrittlement of austenitic steel in welded joints

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 1, 1966, 37-42

TOPIC TAGS: austenitic steel, steam boiler, welded joint, brittleness, creep mechanism, metal grain structure, solid solution / 1 Kh14Ni4V2M (EI257) austenitic Cr-Ni steel

ABSTRACT: The authors present the results of an investigation of the changes in the structure and properties of 1Kh14Ni4V2M (EI257) austenitic Cr-Ni steel in the welded-joint zones of boiler steam lines following prolonged operation at steam parameters of 580-585°C and pressure of 180 atm. The outside diameter of the steam line was 219mm and the tube wall thickness, 27 mm. When originally delivered the tubes of this steel had an austenite structure with isolated inclusions of excess phases and a pronounced nonuniformity of grain sizes of austenite; this nonuniformity reduces the steel's operating qualities and eventually leads to decomposition of the γ -solid solution. As the time of operation of the steamlines grows longer, grain-boundary creep arises and leads to the formation of cracks and embrittlement in the near-weld zone. This can

Card 1/2

UDC: 669.15-194:669.24'26:620.178.2

L 15704-66

ACC NR: AP6003307

be prevented by periodically repeating the heat treatment of the welded joints at intervals of 18,000, 24,000 and 50,000 hr of operation of the steam lines: 1-hr austenitizing at 1050-1100°C eliminates the internal stresses that had arisen during the work of the steamline and thus increases relative elongation by 15% and impact strength by 65%, thus roughly restoring the original strength characteristics of the steel. This also leads to the dissolution of the excess phases previously forming at the grain boundaries and within the grains, to a greater coherence between austenite grains and to a sharp deterioration in the etchability of the steel, which is a sign of increase in the homogeneity of the solid solution and of a restoration of the steel's original structure. Orig. art. has: 6 figures, 2 tables.

SUB CODE: 11, 13, 20/ SUBM DATE: none/ ORIG REF: 004/ OTH REF: 000

Card 2/2 SM

L 07891-67 EWT(m)/EWP(k)/EWP(w)/EWP(v)/EWP(t)/ETI IJP(c) JD/DM/HW

ACC NR: AP6024817 (N) SOURCE CODF: UR/0096/66/000/008/0027/0031

AUTHOR: Krishtal, M. A. (Doctor of technical sciences, Professor); Kryzhanovskiy, V. A. (Engineer); Sironko, T. A. (Candidate of technical sciences); Titenskiy, E. O. (Candidate of technical sciences) ⁵³₄₈ B

ORG: Tula Polytechnic Institute, Tulaenergo (Tul'skiy politekhnicheskiy institut--Tulaenergo)

TITLE: Change in the structure and properties of heat resistant steels in the welded joints of steam pipes 16 18

SOURCE: Teploenergetika, no. 8, 1966, 27-31

TOPIC TAGS: austenitic steel, heat resistant steel, phase transition, metal heat treatment, pipe, elastic stress / 1Kh18N12T austenitic steel, 1Kh14N14V2M austenitic steel

ABSTRACT: The article reports on the effect of length of service and of subsequent repeated heat treatment (austenizing) on the structure, phase composition and parameters of the crystal lattice, as well as the elastic and strength characteristics, of austenitic steels Types 1Kh14N14V2M and 1Kh18N12T. Steam pipes made of these steels, with an outside diameter of 220 mm and a wall thickness of 27 mm, were worked up to the appearance of failures in the zone around the joints, for different times (from 18,000 to 50,000 hours) at a temperature of 580°C and a pressure of 180 atmospheres. Results of the metallurgical and structural analyses are shown in tabular

Card 1/2

UDC: 620.183:669.14.018.45.621.791.053

L 07891-67

ACC NR: AP6024817

5

and graphic form. It was found that the nonhomogeneity of the initial structure of the austenite in the steels investigated lowers their use characteristics. Long service under extreme conditions brings about decomposition of the gamma solid solution, and the separating out of secondary phases (complex alloyed carbides, ⁷ intermetallic compounds, and secondary ferrite); this is more intense in the zone around the joints. In the process of working the steels, the elastic and strength properties are improved, but the ductility is decreased; this is a sign of coarsening of the grain structure in the zone around the joints, and is one of the reasons for failure of the steels. In operation with these steels under extreme conditions, there are observed processes of shear and grain boundary diffusional creep. In general, the data from the metallographic analyses, the tests of the mechanical properties, and tests of the long term strength confirm the possibility of regenerating the structure and properties of austenitic steels to values close to the initial ones, and of increasing their service life by periodic austenizing. Orig. art. has: 8 figures and 2 tables.

SUB CODE: 11/ SUBM DATE: none/ ORI: REF: 005

Card 2/2 *gd*

ACC NR: AN6032638

(A)

Monograph

UR/

Krishtal, Mikhail Aronovich; Mirkin, Iosif L'vovich

Creep and fracture of alloys (Polzuchest' i razrusheniye splavov)
Moscow, Izd-vo "Metallurgiya," 1966. 190 p. illus., biblio.
5,000 copies printed.

TOPIC TAGS: iron alloy, lattice defect, dislocation migration,
creep mechanism, alloy creep mechanism, metal heat treatment,
alloy heat treatment, heat resistant material

PRUPOSE AND COVERAGE: This book is intended for scientific workers
and engineers concerned with special alloys, and also for engineers
specializing in metal and alloy heat treatment. The book contains
information on the changes in the structures and properties of
alloys, particularly of iron alloys, induced by prolonged use at
high temperatures and stresses. The problem discussed appears to
be of considerable importance inasmuch as it is connected with theory
and practices adopted for the use of heat-resistant materials in
power-machine building, aircraft and rocket production, and in some
other branches of industry. Different creep mechanisms specific
for prolonged use of alloys at various levels of temperature and
stress are compared and respective quantitative kinetic principles
are discussed. Publications dealing with the change in the struc-
ture and properties of alloys under the affect of prolonged use for

Card 1/4

UDC: 669.011.7

ACC NR: AN6032638

many thousand hours are summarized, and ways of selecting the proper alloying elements and structure of iron alloys suitable for work at high temperatures and stresses are indicated. The authors thank Professor A. A. Zhukovitskiy for his valuable comments.

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Ch. I. Crystal Lattice Defects at Creep and Failure of Metals and Alloys -- 16

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ACC NR 15032-38

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ACC NR: AM6032638

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SUB CODE: 11,29/ SUBM DATE: 21May66/ ORIG REF: 141/ OTH REF: 105/

Card 4/4

KRISHTAL', N.D., inzh.

Nomograms for determining the coefficient of heat release
during the laminary flow of water in ducts. Sudostroenie 30
no.5:32-33 My '64. (MIRA 17:6)

KRISHTAL', N.D., inzh.

Nomogram for determining the coefficient of heat release by water
during boiling. Sudostroenie 29 no.10:40 0 '63. (MIRA 16:12)

KRISHTAL', N.D.

Nomogram for the determination of the logarithmic mean temperature
difference; Sudostroenie 28 no.7:37-38 J1 '62. (MIRA 15:8)
(Heat exchangers) (Nomography (Mathematics))

KRISHTAL', N.D., inzh.

Graphic calculation of heat transmission coefficients. Sudostroenie
29 no.7:27-30 J1 '63. (MIRA 16:9)

(Heat—Transmission)
(Marine engineering—Graphic methods)

KRISHTAL', O.P., dotsent

~~Myriapoda in the Kanev Biogeographical Preserve.~~ Nauk.zap.Kiev.un.
8 no.6:13-26 '49. (MLRA 9:10)

(Kanev District--Myriapoda)

KRISHTAL', O.P. [Kryshtal', O.P.], doktor biol.nauk, otv. red.;
NIKONOVA, R.S., red.; RIZHKO, V.P. [Ryzhko, V.P.], red.;
KHOKHANOVSKAYA, T.I. [Khokhanovs'ka, T.I.], tekhn. red.

[Materials for studying the history and natural resources of the
Kanev Preserve] Materialy do vyvchennia istorii ta pryrody raionu
Kanivs'koho zapovidnyka. Kyiv, Vyd-vo Kyivs'koho univ., 1962.
151 p. (MIRA 16:1)

(Kanev Preserve)

KRISHTAL', V. I.

Determining optimal juice level in evaporating apparatus. Sakh.prom. 27
no.9:23-24 '53. (MLSA 6:11)

1. Gruppovaya laboratoriya Kurakogo sakhsveklotresta. (Sugar industry)

KRISHTAL', V.I.

Improving the operation of boiler units. Sakh. prom. 32 no.5:29-31
My '58. (MIRA 11:6)

1. Kurskiy sakhsvoklotrest.
(Boilers)

KRISHTAL', V.I.

"Information bulletin on optimum thermal and operating conditions
and thermal control in beet-sugar factories." Reviewed by V.I.
Krishtal'. Sakh. prom. 33 no.1:76-77 Ja '59. (MIRA 12:1)
(Sugar industry--Equipment and supplies)

KRISHTAL', V.I.

Efficient methods of burning liquid fuels. Sakh.prom. no.4:45-49
Ap '60. (MIRA 13:8)

1. Gruppovaya laboratoriya Kurskogo sovnarkhoza.
(Liquid fuels) (Heat engineering)

KRISHTAL', V.I.

Improvement of the condensate system. Sakh.prom. 34 no.6:58-59
Je '60. (MIRA 13:7)

1. Gruppovaya laboratoriya Kurskogo sovnarkhoza.
(Kursk--Sugar manufacture)

ACC NR: AT6030871

SOURCE CODE: UR/0000/66/000/000/0176/0188

AUTHOR: Krishtal', V. Z.; Ostianu, V. M.

ORG: none

TITLE: Synthesis of relay systems which are insensitive to component defects and distortions of the input excitations

SOURCE: Moscow. Institut avtomatiki i telemekhaniki. Abstraktnaya i strukturnaya teoriya releynykh ustroystv (Abstract and structural theory of relay devices). Moscow, Izd-vo Nauka, 1966, 176-188

TOPIC TAGS: system reliability, statistic method, boolean algebra, boolean function, mathematic analysis

ABSTRACT: It is assumed that the relay system is insensitive to d failures of a certain type, if for r failures of the type ($c \leq r \leq d$) the system realizes a given algorithm accurately and that there will be at least one $(d + 1)^{\text{th}}$ failure of the same type which will cause the system to realize incorrectly the same algorithm. The failure of two state system elements may be defined as $1 \rightarrow 0$, or $0 \rightarrow 1$. The failure of the system is defined as an incorrect realization of the value of the variable. It is further assumed that the distortion of the input signals and the failures of the components are independent and that failures of a given type have identical probability

Card 1/2

ACC NR: ATo030871

of occurrence. The failure is said to be symmetrical if the probability of $1 \rightarrow 0$ is equal to the probability of $0 \rightarrow 1$, and nonsymmetrical if the converse is true. The terms d -stable system, and (d_0, d_1) -stable system are defined as describing systems insensitive to d symmetrical failures, and those insensitive to d_0 and d_1 nonsymmetrical failures respectively ($d_0 + d_1 = d$). The following cases are considered: Synthesis of d -stable relay systems for reliable (distortion-free) input signals. Synthesis of (d_0, d_1) -stable relay systems for reliable input signals. Realization of redundant configurations in minimal disjunct normal form and minimal parenthesis form for the case of symmetrical failures. Realization of noncontact d -stable relay systems. Synthesis of d -stable relay systems with distorted input signals. Each case is analyzed and a mathematical expression defining the desired system is synthesized. Boolean functions are used. Orig. art. has: 4 figures, 7 formulas.

SUB CODE: 09,12/ SUBM DATE: 06Jun66/ ORIG REF: 007/ OTH REF: 001

Card 2/2

L 06537-67 EWT(1) TG

ACC NR: AP6016137

SOURCE CODE: UR/0103/66/000/005/0103/0116

AUTHOR: Krishtal', V. Z. (Moscow)

46
B

ORG: none

TITLE: Method of synthesizing relay mechanisms insensitive to asymmetric failures

SOURCE: Avtomatika i telemekhanika, no. 5, 1966, 103-116

TOPIC TAGS: system reliability, circuit reliability, delay mechanism, circuit failure, logic element

ABSTRACT: To improve the reliability of relay systems and minimize failures, structural redundancy was introduced into the delay block and into the logical block simultaneously. In this study, all distortions and possible damages to the element were reduced to the element's output. Thus, a failure was defined as an erroneous translation of a variable at at least one output of the element. Failures are said to be symmetric when the failure probability of the type $1 \rightarrow 0$ equals the failure probability of the type $0 \rightarrow 1$; in the opposite case, the failures are said to be asymmetrical. With a certain set of conditions, a relay system B is insensitive to d_0 failures of the $1 \rightarrow 0$ type, and to d_1 failures of the $0 \rightarrow 1$ type; when the system is $(d_0 d_1)$, it is failproof, provided that certain additional conditions are satisfied. The synthesis of $(d_0 d_1)$ -failproof relay systems with reliable inputs was made. Boolean functions of a certain

UDC: 62-507

Card 1/2

L 06537-67

ACC NR: AP6016137

type in a minimal disjunctive normal form were obtained, defining the failproof state of the system. Algorithms for the minimization of the obtained Boolean functions were constructed. A method of introducing redundant inputs and structural redundancy with unreliable inputs was also studied. Orig. art. has: 6 formulas, 3 figures, 1 table.

SUB CODE: 13/

SUBM DATE: 25Apr65/

ORIG REF: 006/

OTH REF: 003

Card 2/2 *egh*

DANILOV, V.I.; KRISHTAL, Yu.A., kand.fiz.mat.nauk

Spontaneous crystallization of mannite and orthochloronitrobenzol.
Probl. metaloved. i fiz. met. no. [1]:45-61 '49. (MIRA 11:4)

1. Laboratoriya kristallisatsii Tsentral'nogo nauchno-issledovatel'skogo
instituta chernoy metallurgii. 2. Chlen-korrespondent AN USSR (for
Danilov).

(Solidification) (Mannite) (Benzene)

KRISHTAL, Yu.A., kand.fiz.-mat.nauk

Method of calculating surface tension and activation energy by
the rate of crystal nuclei formation curves. Probl.metalloved.
i fiz. met. no.[1]:62-69 '49. (MIRA 11:4)

1.Laboratoriya kristallizatsii TSentral'nogo nauchno-issledovatel'skogo
instituta chernoy metallurgii.
(Metal crystals) (Solification)
(Surface tension)

Apr 49

USSR/Physics
Liquids, Supercooled
Crystallization

PA 38/49TI09

"The Formation of Crystallization Centers in Super-cooled Liquids: VI. Spontaneous Crystallization of Mannite and Ortho-Chloronitrobenzene," V. I. Danilov, Yu. A. Krishtal, Inst Metallophys, Cent Sci Res Inst of Ferrous Metal, 9 pp

"Zhur Eksper i Teoret Fiz" Vol XIX, No 4

Studied dependency of speed of formation of crystallization centers upon super-cooling in mannite and ortho-chloronitrobenzene. Obtained curves for this dependency. Evaluated energy of activation

38/49TI09

USSR/Physics (Contd)

Apr 49

and surface tension on the nucleus-liquid boundary. Submitted 23 Sep 48.

38/49TI09

KRISHTAL, YU. A.

KRISHTAL, YU. A.

USSR/Physics - Crystallography

Card 1/1 Pub. 22 - 19/48

Authors : Krishtal, Yu. A.

Title : The problem of experimental testing of the crystal growth theory

Periodical : Dok. AN SSSR 98/3, 395-397, Sep 21, 1954

Abstract : The relation between the rate of growth of o-chloronitrobenzene and the temperature (supercooling), was investigated. The role of the rate of growth factor, in determining the structure of polycrystalline substances, is discussed. In the case of substances void of any foreign admixtures the growth factor depends largely upon the temperature at which crystallization takes place. Formulas expressing the rate of crystal growth are included. Seven references: 5-USSR and 2-German (1929-1951). Table; graphs.

Institution : ...

Presented by: Academician G. V. Kurdyumov, April 22, 1954

5(3)

AUTHOR:

Kristal, Yu. A.

SOV/163-58-4-34/47

TITLE:

On the Temperature Dependence of the Speed of Growth of
t-Nitrobenzaldehyde and Benzophenone Crystals (O temperaturnoy
savisimosti skorosti rosta kristallov t-nitrobenzal'degida i
benzofenona)

PERIODICAL:

Nauchnyye doklady vysshey shkoly. Metallurgiya, 1958, Nr 4,
pp 197-202 (USSR)

ABSTRACT:

The dependence of growth speed on subcooling in the range of the
small ΔT was investigated here for t-nitrobenzaldehyde and
benzophenone crystals by way of experiment. The data obtained
were compared with the theoretical formulae (1) and (2). On
account of such comparison, the constants K_2 and K_3 as well as
the activation energy Q were estimated. K_2 is the activation
energy of the transition of the molecules from the melt to the
crystal face, evaluated to 1 mole of material. K_3 is a quantity
proportional to the work required for the formation of a two-
dimensional nucleus. The growth speed of the crystals was

Card 1/2

On the Temperature Dependence of the Speed of Growth of *p*-Nitrobenzaldehyde and Benzophenone Crystals SOV/163-58-4-34/47

measured by the method formerly described in the paper (Ref 3). There are 4 figures, 1 table, and 9 references, 4 of which are Soviet.

ASSOCIATION: Dnepropetrovskiy Institut inzhenerov zh.-d. transporta (Dnepropetrovsk Institute for Railway Traffic Engineers)

SUBMITTED: January 11, 1958

Card 2/2

85808

S/148/60/000/003/012/018
A161/A029

18.7500

1413, 1555

AUTHOR: Krishtal, Yu.A.TITLE: On Diffusion-Free Crystallization of Binary Metal AlloysPERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. - Chernaya metallurgiya,
1960, No. 3, pp. 110 - 116

TEXT: The phenomenon of the so-called diffusion-free crystallization which is possible along with crystallization corresponding to the equilibrium diagram (diffusion crystallization) at a high rate of cooling of liquid alloys is discussed. The possibility of such a crystallization has been shown by Popov (Ref. 1) Both crystallization mechanisms have been revealed also in some solid transformations, e.g., austenite decomposition in steel (Ref. 2). The author suggests a theoretical calculation for the $T_0(x)$ curve in the phase diagram determined by the equality of the thermodynamic potentials of the solid and liquid phases, and calculates the $T_0(x)$ curves for the $Ag-Cu$, $Al-Si$, $Bi-Sb$ and $Fe-Cr$ (Fig. 2) systems. The shape of the $T_0(x)$ curves between the liquidus and the solidus lines (dotted lines in Figure 2 diagrams) proves the reality of the overcooling values necessary for diffusion-free crystallization; in diagrams with eutectic point

Card 1/4

85808

S/148/60/000/003/012/018

On Diffusion-Free Crystallization of Binary Metal Alloys A161/A029

(Figs. 2, a and b) lesser overcooling values suit the Ag-Cu system with higher solubility and the $T_0(x)$ line is nearer to the liquidus line. Both crystallization mechanisms were revealed in experiments with the Bi-Sb system (Fig. 2, b). The interdendrite segregation in the solid solutions obtained in this system was investigated by polarization of light reflected from the surface (method suggested by M.A. Krishtal) and by microhardness (Ref. 9). Details of both methods are given. In both methods the proof was obtained that both mechanisms of crystallization were acting. There are 4 figures and 9 references: 7 Soviet, 2 English.

ASSOCIATION: Dnepropetrovskiy institut inzhenerov zheleznodorozhnogo transporta
(Dnepropetrovsk Institute of Railroad Transport Engineering)

SUBMITTED: December 26, 1958

Card 2/4

KRISHTAL, Yu.A.

Effect of the temperature of hardening on the internal friction
in Fe - Si alloys. Fiz. met. i metalloved. 19 no.1:111-116 Ja
'65. (MIRA 1894)

1. Dnepropetrovskiy metallurgicheskiy institut.

KRISHTALEV, V.V.

Preparation of microsections of rayon fibers. Khim. volok.
no.4:64-65 '65. (MIRA 18:8)

1. Cherkasskiy zavod iskusstvennogo volokna.

KRISHTALEVICH, A.N.

KRISHTALEVICH, A.N.

Basic physical qualities of the artificial ear. Probl.fiziol.
akust. 2:101-108 '50 (MIRA 10:11)

1. Akusticheskaya laboratoriya Vsesoyuznogo Nauchno-issledovatel'skogo
instituta metrologii, Leningrad.
(HEARING AIDS)

KRISHTALEVICH, A.N.; RIMSKIY-KORSAKOV, A.V.

Remarks on the determination of microphone sensitivity by the reciprocity method. Trudy Kom. po akust. 8:46-50 '55.
(MLRA 8:8)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut metrologii im. D.I.Mendeleyeva.
(Microphone)

KRISHTALEVICH, A.N.

Testing "artificial ear" instruments. Trudy Kom. po akust.
8:82-92 '55. (MIRA 8:8)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut metrologii
D.I.Mendeleyeva.

(Microphone)

KRISTALYUKH, A.M.

24(0); 5(4); 6(2) PHASE I BOOK EXPLOITATION SOV/2215
 Vsesoyuzny nauchno-issledovatel'skiy institut metrologii imeni
 D.I. Mendeleeva
 Referaty nauchno-issledovatel'skikh rabot; sbornik No. 2 (Scientific
 Research Abstracts; Collection of Articles, Nr 2) Moscow,
 Standartgiz, 1958. 139 p. 1,000 copies printed.
 Additional Sponsoring Agency: USSR. Komitet standartov, ser 1
 imerial'nykh priborov.
 Ed.: S. V. Reshetina; Tech. Ed.: M. A. Kondrat'yeva.

PURPOSE: These reports are intended for scientists, researchers,
 and engineers engaged in developing standards, measures, and
 pages for the various industries.
 COVERAGE: The volume contains 128 reports on standards of measure-
 ment and control. The reports were prepared by scientists of
 institutes of the Komitet standartov, ser 1 imerial'nykh
 priborov pri Sovetskom Ministre SSSR (Commission on Standards,
 Measures, and Measuring Instruments under the USSR Council of
 Ministers). The participating institutes are: VNIIT D.I.
 Mendeleeva (All-Union Scientific Institute of Standards and
 Measuring Instruments) in Leningrad; Sverdlovsk branch
 of the institute; VNIIT - Vsesoyuzny nauchno-issledovatel'skiy
 institut Komiteta standartov, ser 1 imerial'nykh priborov
 (All-Union Scientific Research Institute of the Commission
 on Standards, Measures, and Measuring Instruments), created
 from VNIITP - Moskovskiy gosudarstvennyy institut ser 1
 imerial'nykh priborov (Moscow State Institute of Measures
 and Measuring Instruments) October 1, 1955; VNIITPI -
 Vsesoyuzny nauchno-issledovatel'skiy institut fiziko-tekhnicheskikh i radiotekhnicheskikh izmereniy (All-Union Scientific
 Research Institute of Physico-Technical and Radio-Technical
 Measurements in Moscow); VNIITP - Moskovskiy gosudarstvennyy
 institut ser 1 imerial'nykh priborov (Moscow State Institute
 of Measures and Measuring Instruments); and VNIITP - Novosibirskiy
 gosudarstvennyy institut ser 1 imerial'nykh priborov
 (Novosibirsk State Institute of Measures and Measuring Instru-
 ments). No personalities are mentioned. There are no references.

Buzinoy, V.S., and L.A. Pervezhetz (VNIITPI). Developing Methods
 Card 25/27
 and Apparatus for Checking Noise Meters in the 0.16 - 20 Megacycle
 Range 132
 Acoustic Measurements (Brodskiy, A.D., Editor, Candidate of
 Technical Sciences) (VNIIM). Extending the Method of Measuring
 Kaluzhinya, M.A. Sound Pressures up to 20 - 100 Bars at High and Low Frequencies
 by the Standing-Wave Method 134
 Kaluzhinya, M.A. (VNIIM). Developing the Calibration of Micro-
 phones in the 2000 Field by the Reciprocity Method 135
 Buzakov, I.O., and A.M. Krystal'yukh (VNIIM). Developing Quality
 Control Methods for Microphones and Telephones 136
 Krystal'yukh, A.M. (VNIIM). Developing Methods for Determining
 the Frequency Characteristics of Loud-speakers and for Testing
 Microphones by Directivity 137
 Kaluzhinya, M.A. (VNIIM). Developing the Method of Checking
 Card 26/27

Noise Meters Under Conditions of the Noise and Speech
 Spectrum

KRISHTALEVICH, A. N.

"On Improvement of Accuracy of Microphone Calibrations in the Field at
X Low Frequencies."

paper presented at the 4th All-Union Conf. on Acoustics, Moscow, 26 May - 4 Jun 58.

KRISHTALEVICH, A.N.

Increase in the accuracy of calibrating microphones at low frequencies. Trudy inst. Kom. stand., mer. i izm. prib. no.61: 29-36 '62. (MIRA 16:4)

(Microphone) (Electroacoustics)

KRISHTALEVICH, A.N.; PUSTOVALOVA, T.A.

Works to insure the uniformity of audiometric measurements.
Trudy inst. Kom. stand., mer. i izm. prib. no.73:5-12 '63.
(MIRA 17:6)
1. Vsesoyuznyy nauchno-issledovatel'skiy institut metrologii
im. D.I. Mendeleeva.

KRISTALIK, I. I.

3 3

True solutions in mixed solvents. I. I. Kristalik.
Izvest. Sektora Fiz.-Khim. Anal. Akad. Nauk S.S.S.R.
 20, 376-82 (1960).—Hildebrand's equation for calc. the
 activity coeff. of components of a true soln. is developed
 farther to include multicomponent true solns. A general
 equation is derived for the soly. of a substance in a mixt. of
 2 solvents. Upon some simplification of this equation it
 becomes identical with that of Krichevskij (C.A. 31,
 4186): $\ln N_s = N_s^* \ln N_s^* + N_1^* \ln N_1^*$, where N_s is the
 soly. of the substance in the mixed solvent, N_s^* and N_1^*
 are the solubilities of the substance in the 1st and 2nd sol-
 vents, resp., by themselves, and N_1^* and N_2^* are the mole
 fractions of solvent 1 and 2 in the mixt. The applicability
 of this equation was tested on the soly. of S in benzene + $C_{11}H_8$,
 $C_{11}H_8$, and toluene + $C_{11}H_8$, $HgCl_2$ in benzene + $C_{11}H_8$,
 Cl_2 , $HgBr_2$ in benzene + $C_{11}H_8$, and naphthalene in ben-
 zene + CS_2 . The exptl. results were in good agreement
 with the theory. M. Hosh

KRISHTALIK, L.I.

AUTHOR: Krishtalik, L.I. (Moscow) 76-11-4/35

TITLE: On the Theory of the Retarded Discharge (K teorii zamedlennogo rasryada)

PERIODICAL: Zhurnal Fizicheskoy Khimii, 1957, Vol. 31, Nr 11, pp. 2403-2413 (USSR)

ABSTRACT: By means of the method of the activated complex, the dependence of the overvoltage of hydrogen on the nature of the metal and that of the solvent is investigated within the framework of the theory of the retarded discharge. A procedure similar to that suggested by M.I. Tempin [Ref.5] is used, and an equation, with the aid of which it is possible to calculate the absolute amount of over-voltage is obtained. The lacking of a direct relation between the overvoltage and the potential jump value at the limit of electrode dissolution as well as with the amount of the chemical electron potential in the metal and the solvation energy of the proton is shown. An immediate dependence of overvoltage on the energy of the specific adsorption of solvent molecules as well as of hydrogen ions in acid or basic ions in alkaline solutions is found. It is shown that the Morze function for the adsorbed hydrogen can be represented in form

Card 1/2

On the Theory of the Retarded Discharge

76-11-4/35

of an expression with only one parameter - the energy of the bond metal/hydrogen. The computed amounts of overvoltage and of the activation energy agree with experimental data. There are 4 figures and 43 references, 25 of which are Slavic.

SUBMITTED: April 5, 1956

AVAILABLE: Library of Congress

Card 2/2

5 (4)

AUTHOR:

Krishtalik, L. I. (Moscow)

SOV/76-33-8-7/39

TITLE:

The Rate of the Elementary Stages and the Mechanism of the Cathodic Separation of Hydrogen. I

PERIODICAL:

Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 8, pp 1715-1725 (USSR)

ABSTRACT:

Various possibilities of electrolytic separation of hydrogen are discussed. The author starts from a theoretical calculation of the stationary rate values of the elementary processes of the transformation of hydrogen ions into adsorbed atomic and molecular hydrogen and the reverse reactions by the method of an activated complex. The calculations were carried out on the assumption of simple adsorption (without interaction of atoms on a homogeneous surface). The stationary values of the degree of filling of the surface, the density of the polarization current, and the current densities of the direct and back reactions of discharge, of electrochemical desorption, and catalytic recombination were calculated as functions of the potential. The results obtained for metals with different adsorptive energies pointed to the following mechanisms of electrolytic hydrogen separation: (I) A retarded non-activated electrochemical desorption (D). (II) a retarded discharge with electrolytic,

Card 1/2

The Rate of the Elementary Stages and the Mechanism of the Cathodic Separation of Hydrogen. I SOV/76-33-8-7/39

or (III) catalytic removal of hydrogen atoms from the metal surface. (IV) a retarded electrochemical (D) of hydrogen atoms adsorbed from the gaseous phase (adsorption-chemical mechanism). (V) a retarded electrochemical (D) taking place after discharge, and (VI) a retarded discharge with a very small free surface determined by an electrochemical (D). In case of some cathodes, there are probably two branches of the polarization curve, either parallel to each other ((III) and (IV)), or intersecting ((I) and (II), (VI) and (V)). The dependence of the over-tension on the binding energy $M - H$ has a minimum conditioned by the simultaneous influence of E_{M-H} on the activation energy

as well as by the degree of surface filling. It is assumed that marginal currents of the discharge (and of the electrochemical (D)) of a high absolute value (order of magnitude 10^5 a/cm² and up) are effective here. There are 11 figures and 11 references, 6 of which are Soviet.

SUBMITTED: November 27, 1957

Card 2/2

5 (4)
AUTHOR:

Krishtalik, L. I. (Moscow)

S/076/60/034/01/019/044
B008/B014

TITLE:

The Rates of the Elementary Stages and the Mechanism of Cathodic Separation of Hydrogen. II

PERIODICAL:

Zhurnal fizicheskoy khimii, 1960, Vol 34, Nr 1, pp 117-126 (USSR)

ABSTRACT:

In continuation of an earlier paper (Ref 1) several possible mechanisms of cathodic hydrogen separation are investigated here. The fact is taken into account that also the activation energy of the inverse process, i.e., ionization is finite. Furthermore, it is assumed that the ionization rate is independent of the potential. Thus, the ordinary discharge process ($\alpha = 1/2$) can take place only in a certain potential range. Activationless discharge and barrierless ionization must take place in the negative range ($\alpha = 0, \beta = 1$), and barrierless discharge and activationless ionization in the positive range ($\alpha = 1, \beta = 0$). Similar considerations also hold for electrochemical desorption and adsorption. The conclusions drawn in this paper are based on the ordinary scheme

Card 1/2

The Rates of the Elementary Stages and the
Mechanism of Cathodic Separation of Hydrogen. II

S/076/60/034/01/019/044
B008/B014

of potential curves (Fig 1). The limits of the various types of discharge and electrochemical desorption are illustrated in figure 2. Two ways of calculation are suggested. The limits of ranges with different mechanisms of hydrogen separation calculated in the first way are shown in figures 3 and 4, those obtained in the second way, in figures 5 and 6. Figure 7 illustrates the values of exchange currents. Current density and the degree of surface occupation are shown in figures 8 and 9. Figure 10 contains the calculated values of constant a for various mechanisms of hydrogen separation. A table lists the experimental values of constant a and b . The calculated values are in close agreement with experimental data. M. I. Temkin is mentioned in this paper. There are 10 figures, 1 table, and 25 references, 13 of which are Soviet.

SUBMITTED: April 16, 1958

Card 2/2

KRISTALIK, L.I.; MELIKOVA, G.L.; KALININA, Ye.G.

Effect of electrolysis conditions on the stability of graphite anodes
in a chlorine bath, Zhur.prikl.khim. 34 no.7:1537-1542 JI '61.

(MIRA 14:7)

(Electrodes, Carbon) (Electrolysis) (Chlorine)

KRISHTALIK, L.I.; MELIKOVA, G.L.; KALININA, Ye.G.

Effect of electrolysis conditions on the stability of graphite anodes
in a chlorine bath. Zhur.prikl.khim. 34 no.7:1543-1547 J1 '61.

(MIRA 14:7)

(Electrodes, Carbon) (Electrolysis) (Chlorine)

KRISHTALIK, L.I.

Effect of electrolysis conditions on the stability of
graphite anodes in a chlorine bath. Zhur.prikl.khim.
34, no.8:1807-1814, Ag '61. (MIRA 14:8)
(Chlorine) (Electrolysis) (Electrodes, Carbon)

KRISHTALIK, L.I.

Dependence of the permeability of an asbestos diaphragm on the
pressure in the absence of an electric current. Zhur. prikl.
khim. 36 no.8:1776-1782 Ag '63. (MIRA 16:11)