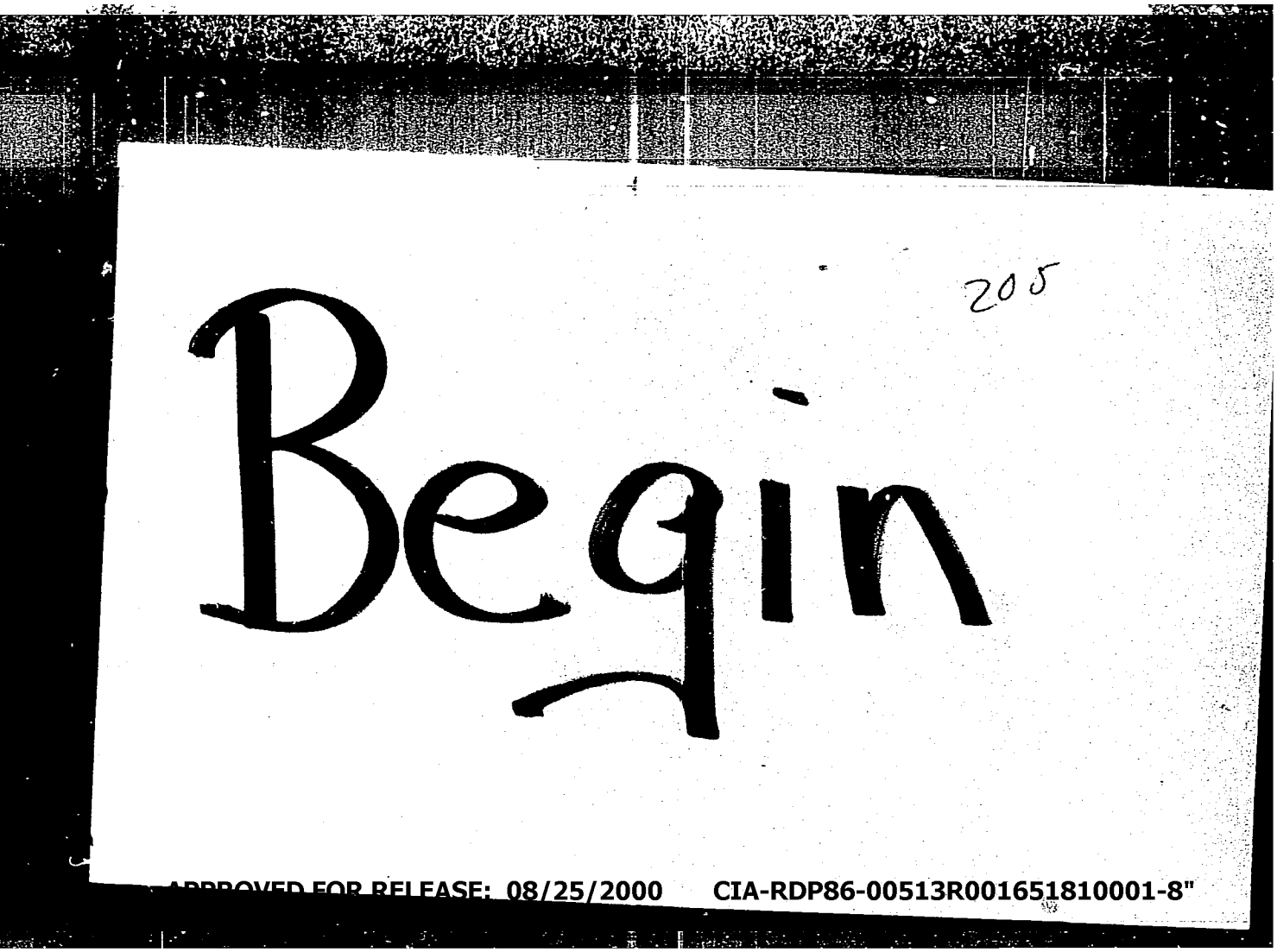
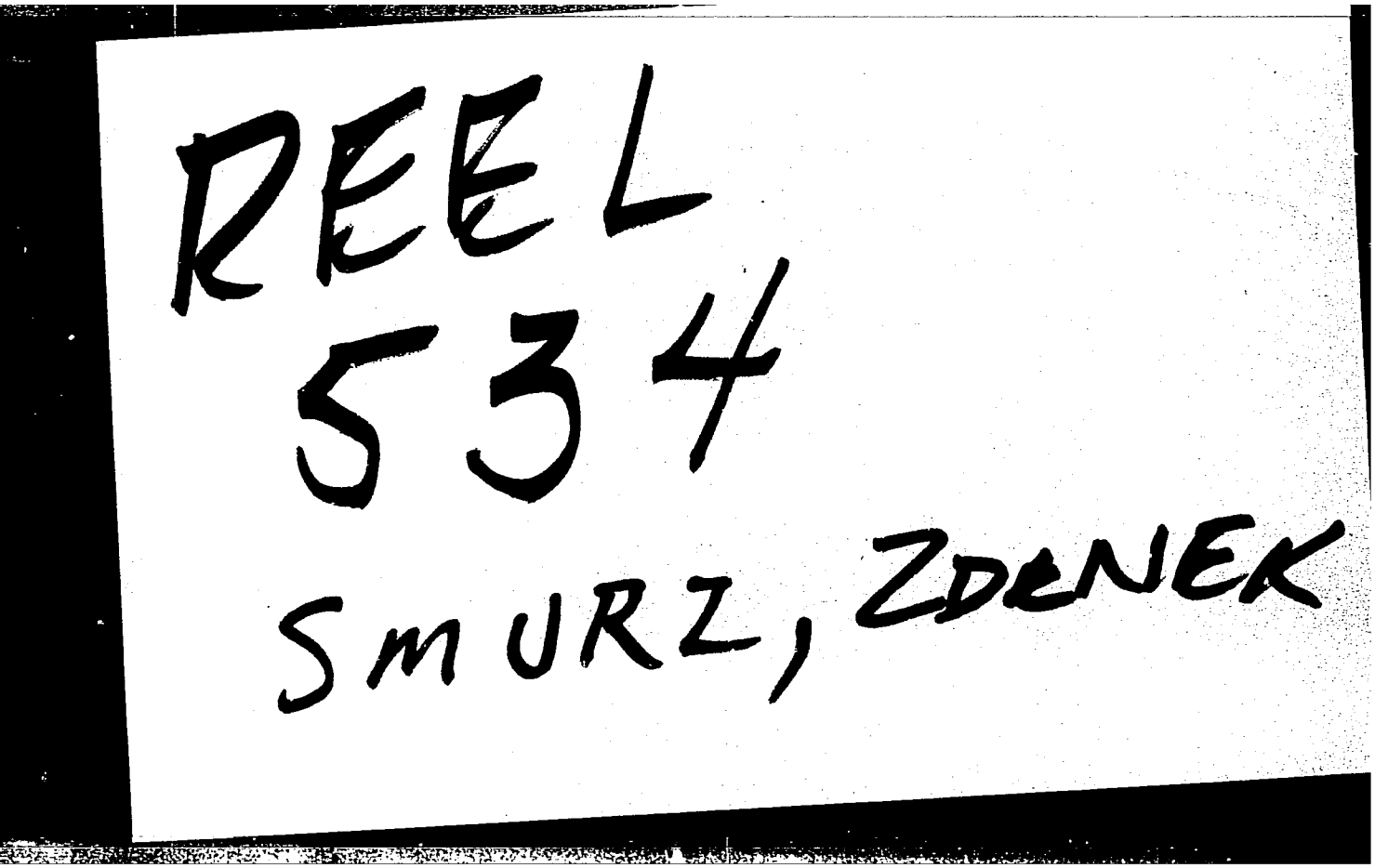




RUZICKA, Vlastimil; KALAL, Jaroslav; SMURZ, Zdenek

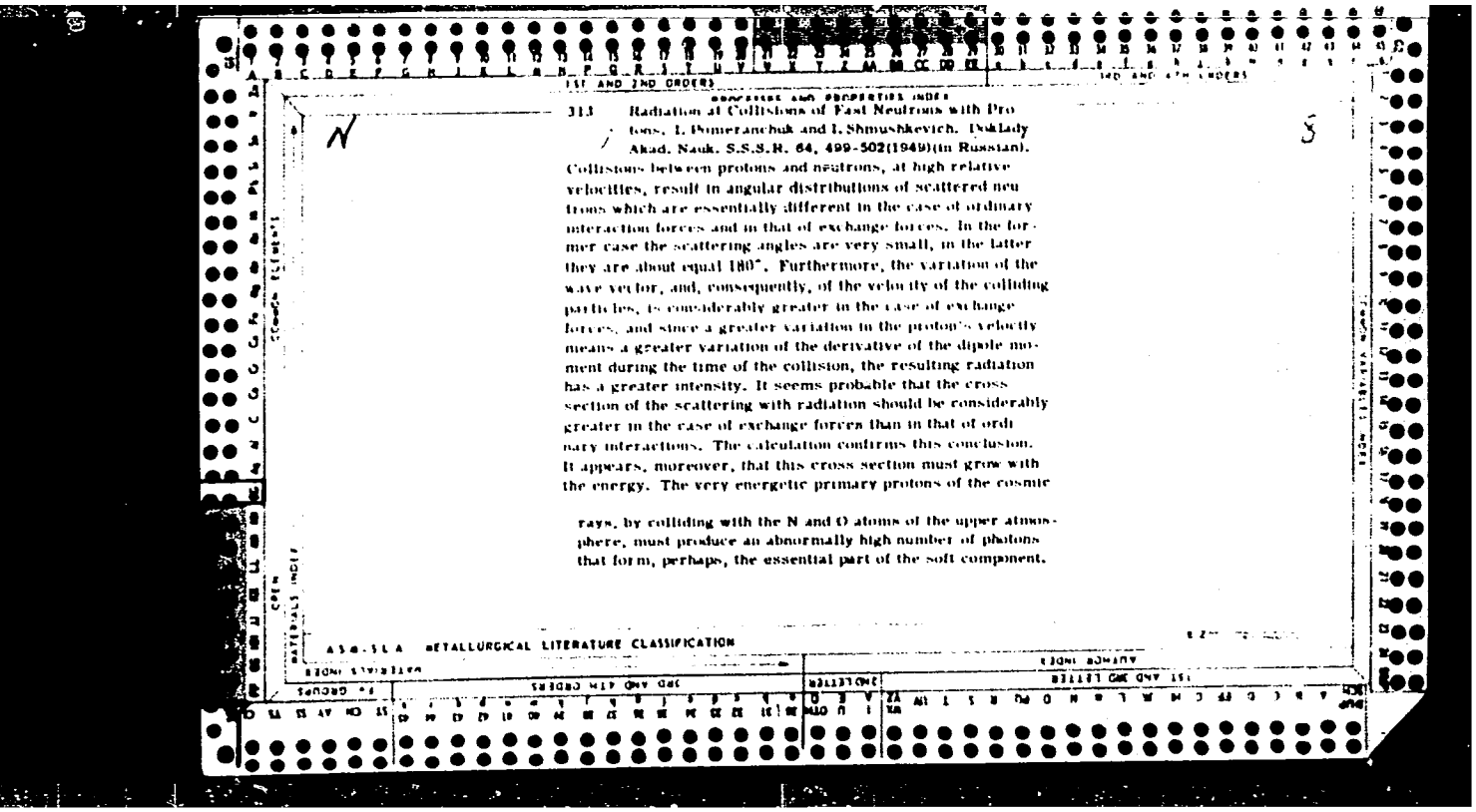
Contribution to the study of catalysts prepared by the decomposition of mixed salts. V. Catalytic hydrogenation of nitrobenzene to aniline in vapor phase at normal pressure. Sbor chem tech 4 no.2:473-489 '60. (EEAI 10:9/10)

1. Katedra organicke technologie, Vysoka skola chemicko-technologicka, Praha.

(Catalysts) (Salts) (Nitrobenzene) (Aniline)

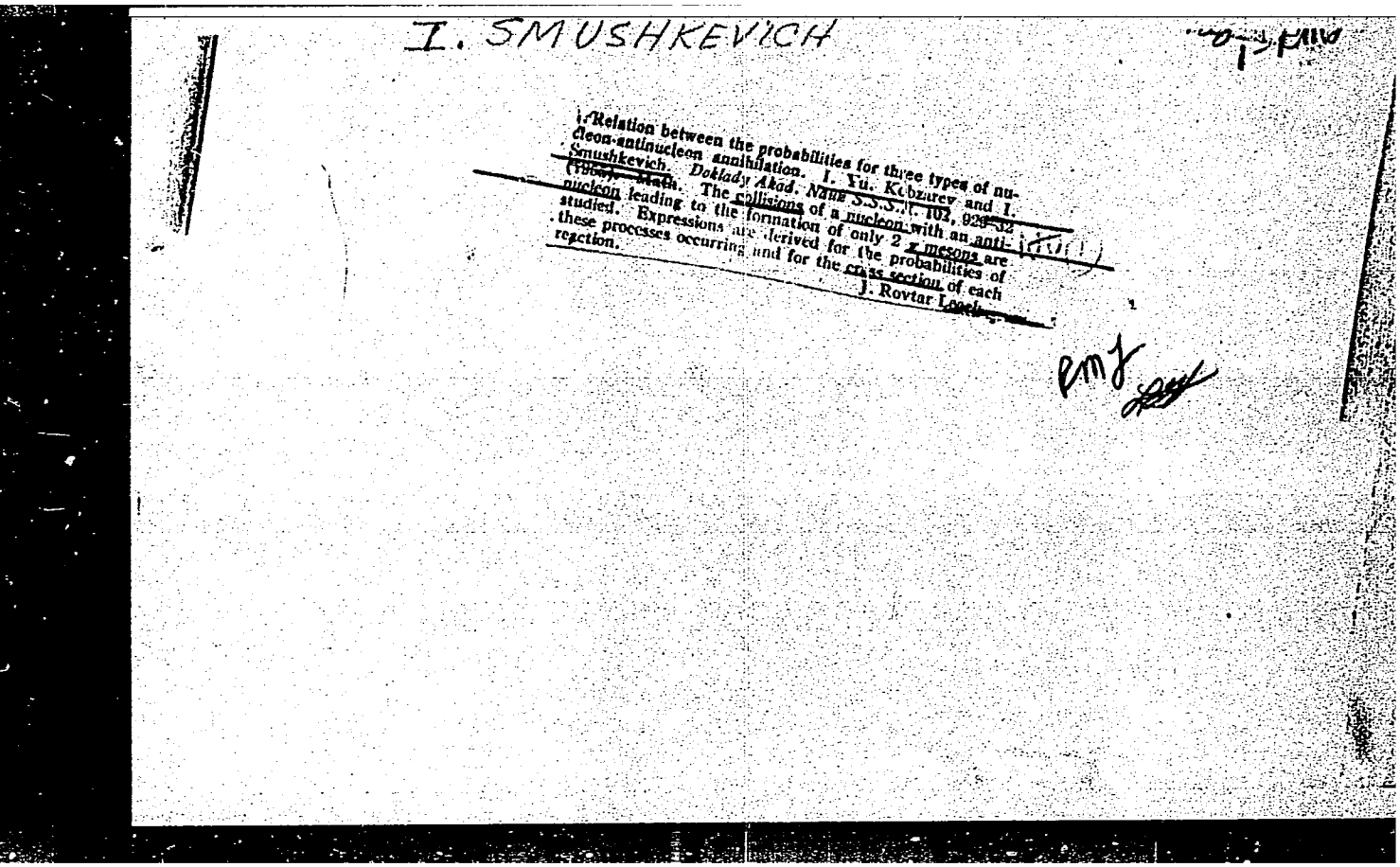
[redacted], Witold Jan

Green sand mold casting of lathe beds from inoculated cast iron. Przegl odlew 14 no.5:149-150 My '64.



313 Radiation at Collisions of Fast Neutrons with Protons. I. Pomeranchuk and I. Shmushkevich. Izvestiya Akad. Nauk. S.S.S.R. 64, 499-502(1949)(in Russian).

Collisions between protons and neutrons, at high relative velocities, result in angular distributions of scattered neutrons which are essentially different in the case of ordinary interaction forces and in that of exchange forces. In the former case the scattering angles are very small, in the latter they are about equal 180°. Furthermore, the variation of the wave vector, and, consequently, of the velocity of the colliding particles, is considerably greater in the case of exchange forces, and since a greater variation in the proton's velocity means a greater variation of the derivative of the dipole moment during the time of the collision, the resulting radiation has a greater intensity. It seems probable that the cross section of the scattering with radiation should be considerably greater in the case of exchange forces than in that of ordinary interactions. The calculation confirms this conclusion. It appears, moreover, that this cross section must grow with the energy. The very energetic primary protons of the cosmic rays, by colliding with the N and O atoms of the upper atmosphere, must produce an abnormally high number of photons that form, perhaps, the essential part of the soft component.



I. SMUSHKEVICH

Relation between the probabilities for three types of nucleon-antinucleon annihilation. I. Yu. Kobzarev and I. Smushkevich. *Doklady Akad. Nauk S.S.S.R.* 102, 929–32 (1955). Math. The collisions of a nucleon with an antinucleon leading to the formation of only 2 π mesons are studied. Expressions are derived for the probabilities of these processes occurring and for the cross section of each reaction.

J. Rovtar

SMUSHKEVICH, I.M. SMUSKEVIC, I.M.

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1782
AUTHOR SMUŠKEVIC, I.M.
TITLE On Momentum Approximation.
PERIODICAL Žurn.eksp.i teor.fis, 31, fasc.4, 725-726 (1956)
Issued: 1 / 1957

K.A.BRUECKNER, Phys.Rev.89, 834 (1953) investigated the scattering of particles by a system with two centers with vanishing effective radius of forces. (Scattering of each of these centers is spherical-symmetric and is characterized by the amplitude $\eta = (1/k) \sin \delta e^{i\delta}$). Here δ denotes the phase of the S-wave in infinity. The expression resulting for the scattering amplitude of this problem is explicitly given. Proceeding herefrom BRUECKNER finds the following by connecting the imaginary part of the amplitude of scattering in a forward direction with the total cross section: The difference between the expression for the total cross section and the corresponding expression obtained by momentum approximation becomes immaterial not at $R \sim 0o$, but at $\delta \to 0$. (Here η is assumed to be equal for both centers). Herefrom he draws the conclusion that it is correct to use momentum approximation without taking multiple scattering into account only in those cases in which also BORN'S approximation is applicable.
In reality, however, this conclusion refers to the total cross section.(Also this applies only with the reservations made in the following). However, computation of the differential cross section of scattering into small angles by means of momentum approximation leads to correct results. Physically, this is apparently connected with the fact that, in the case of small scattering angles,

Zurn.eksp.i teor.fis,31,fasc.4,725-726 (1956) CARD 2 / 2 PA - 1782

the interference of the waves scattered at each of these centers plays a part. This interference is taken into account in momentum approximation. The exact expression for the differential cross section $d\sigma/d\Omega$ resulting from the aforementioned scattering amplitude is explicitly given (referred to the unit of the space angle and averaged over all directions of the vector R). In momentum approximation the following is found without difficulty: $d\vec{\sigma}/d\Omega = 2(d\sigma_o/d\Omega)\{1 + \sin(|\vec{k}_o - \vec{k}|R)/|\vec{k}_o - \vec{k}|R.\}$ In the case of a high energy of the impinging particles $(kR \gg 1)$ and in the case of small scattering angles $(\vartheta \leq 1/kR)$ the approximated expression differs from the exact expression only by small amounts of the order x^{-2}. Consequently, under these conditions $(\eta/R) \ll 1$ leads momentum approximation to correct results. However, in the case of large scattering angles, the second term in the braces of the last formula oscillates considerably, and therefore the contribution it makes towards the total cross section is small, namely of the order x^{-2}. With $kR \gg 1$ the exact formula and the formula obtained by momentum approximation, as expected, lead to a result according to which the total cross section is simply with great accuracy equal to the sum of the cross sections of scattering on each of the centers.

INSTITUTION: Leningrad Physical-Technival Institute of the Academy of Science in the USSR

SMUSHKEVICH, I.Z., inzh.; SHUR, A.I., inzh.

Manufacturing precast concrete pipes for city engineering.
Gor.khoz.Mosk. 36 no.1:33-37 Ja '62. (MIRA 16:1)
(Pipe, Concrete)

27967
S/185/61/006/004/012/015
D274/D303

9,4340

AUTHORS: Babak, L.G., Bochek, S.A., Genkyna, S.M., Dobrolezh, S.O., Zhydkov, V.A. and Smushkevych, V.Z.

TITLE: Commercial silicon-carbide as a material for point contact diodes

PERIODICAL: Ukrayins'kyy fizychnyy zhurnal, v. 6, no. 4, 1961, 541-547

TEXT: The possible use of commercial silicon-carbide (produced by the Tashkent and Zaporozhe plants) for high temperature point contact diodes is considered: This would be economically profitable. Specimens of the black and green modification obtained at the Zaporozhe plant were studied as well as those of the green modification of the Tashkent plant. Spectral analysis showed the presence, in the specimens, of chemical impurities: Fe, Mg, Mn, Al, Ti. It was established that black silicon-carbide crystals have hole-conductivity, and the green - electron conductivity. The resistivity was

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Commercial silicon-carbide...

measured by the four-probe method. A figure shows the resistivity (in statistical %) of the various types of specimens. In studying the rectifying properties of diodes, a low-ohmic contact between metal-electrode and crystal is necessary. Several methods of producing such contacts were investigated. It was found that contacts obtained by cathode pulverization of platinum were most convenient, both with regard to low-ohmic character and temperature stability. The resistance of the contacts with the black crystals was 10^2 - 10^3 ohm, and that of the green crystals - 10^3 - 10^4 ohm. A model of a point-contact diode was constructed and studied. Current voltage characteristics of point-contact tungsten-silicon carbide are then examined. Figures show the characteristics at various temperatures (from 20-520°C). The rectifying factor K is determined. A table shows, for comparison, the rectifying properties of models made of the different types of silicon-carbide. The electrical properties of commercial silicon-carbide were studied with a view to using these materials for high temperature point-contact rectifiers. A study of the temperature dependence of current-voltage character-

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Commercial silicon-carbide...

istics of models showed that the green crystals of the Zaporozhe plant have, at room temperature, a rectifying factor $K = 10^4 - 10^5$ which decreases rapidly with increasing temperature. The black crystals of the Tashkent plant have $K = 10^2 - 10^3$ (at room temperature) which increases with temperature, this increase being the greater, the higher the resistivity of the crystal. The black crystals of the Tashkent plant, with a resistivity exceeding 5 ohm/cm, are the most suitable for point-contact diodes. Diodes, similar to the model ones, could be used for rectifying radio frequency signals of 1-5 volts at temperatures up to 500°C. There are 6 figures, 2 tables and 4 references: 2 Soviet-bloc and 2 non-Soviet-bloc. The reference to the English-language publication reads as follows: Electronics, 74, no. 12, 1960.

ASSOCIATION: Instytut metalokeramiky i spetsial'nykh splaviv AN USSR, Kyyiv (Institute for Metal Ceramics and Special Alloys, AS UkrSSR, Kiyev)

SUBMITTED: November 26, 1960

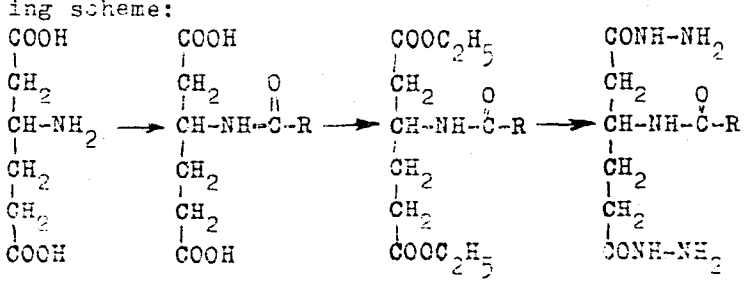
Card 3/3

AUTHORS: Kleyev, B. V., Smushkevich, Yu. I. SOV/156-58-4-39/49

TITLE: The Production of Dihydrazine of the N-Acylated Derivatives of β-Amino Adipinic Acid (Polucheniye digidrazidov N-atsilirovannykh proizvodnykh β-aminoadipinovoy kisloty)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Khimiya i khimicheskaya tekhnologiya, 1958, Nr 4, pp 751-753 (USSR)

ABSTRACT: In the present paper the hydrazines of the N-acylated derivatives of β-amino adipinic acid were prepared. The following dihydrazines of N-benzoylic, N-acetylic and N-carbethoxy-β-amino adipinic acids were synthesized according to the following scheme:



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SOV/156-58-4-35/49

The Production of Dihydrazine of the N-Acylated Derivatives of β-Amino Adipinic Acid

The acylation of β-amino adipinic acid was carried out according to the method developed by Schotten-Baumann in a yield of 58-77%. The hydrazines were converted with phenylthio-isocyanate into corresponding bis-(4-phenyl-thiosemicarbacide)-N-acyl-amino adipinic acids. The preparations have no distinct melting point temperature. The elementary analysis was carried out with all preparations. There are 7 references, 2 of which are Soviet.

ASSOCIATION: Kafedra organicheskoy khimii Moskovskogo khimiko-tekhnologicheskogo instituta im. D. I. Mendeleyeva (Chair of Organic Chemistry at the Moscow Chemical and Technological Institute imeni D. I. Mendeleyev)

SUBMITTED: July 4, 1958

Card 2/2

KLEYEV, B.V.; SMUSHKEVICH, Yu.I.; GOL'DOVSKIY, A.Ye.

Synthesis and transformations of (N-benzoyl-2-pyrrolidinone-5-yl)-acetic acid. Derivatives of β-aminoadipic acid in a β'-carboxylic group. Zhur.ob.khim. 31 no.8:2595-2599 Ag '61. (MIRA 14:8)

1. Moskovskiy khimiko-tekhnologicheskiy institut imeni D.I. Mendeleyeva.

(Adipic acid)
(Pyrrolidinone)
(Acetic acid)

SMUSHKEVICH, Yu.I.; BELOV, V.N. [deceased]; KLEYEV, B.V.; GOLGER, A. Ya.

Reaction of aldehydes with olefins. Part 1: Reaction of aldehydes with cyclohexene. Zhur. ob. khim. 34 no.11:3815-3817 N '64 (MIRA 18:1)

1. Moskovskiy khimiko-tekhnologicheskiy institut imeni D.I.Mendeleyeva.

SMUSHKEVICH, Yu.I.; BELOV, V.N.; KLEYEV, B.V.; AKIMOVA, A.Ya.

Reaction of olefins with aldehydes. Part 2: Reaction of chloroacetaldehyde with cyclopentene. Zhur.org.khim. 1 no.2:288-289 F '65. (MIRA 18:4)

1. Moskovskiy khimiko-tekhnologicheskiy institut imeni D.I. Mendeleyeva.

SMUSHKOV, I.V., GEGUZIN, Ya.Ye., PINES, B.Ya.

"Microstrains in a Crystal Lattice and the Sintering of Metallic Powders," Uch. zap. KhGU, V. 48, Tr. Fiz. otd., No. 4, Kh. St. Univ. publication, 1953.

SMUSHKOV, I. V., GEGUZIN, Ya. Ye. and PINES, B. Ya.

"Microtension in the Crystal Lattice and Calcining Metallic Powders". Uch. Zap. Khar'kovsk. Un-ta, T. 49, Fiz. Otd. Fiz.-Matem. Fak., Vol. 4, pp 111-117, 1953.

Studied structural changes during the calcining process by means of X-ray analysis of samples of compressed powder of electrolytic copper and of nickel powder. The samples were calcined at various temperatures for various periods of time in a deoxygenated atmosphere. Analysis indicates that at temperatures below 400° for copper and below 700° for nickel, microtension is totally removed, and therefore these temperatures have no effect on the calcining process. (RZhKhim, No. 4, 1955)

SO: Sum No 884, 9 Apr 1956

SMUSHKOV, I. V.

62 Distortion of the crystal lattice and sintering of metal powders. L. I. Gal'perina, Ya. E. Geguzin, B. Ya. Pines, and I. V. Smushkov (A. M. Gor'kii State Univ., Kharkov). *Doklady Akad. Nauk S.S.S.R.* 88, 265–8(1953)[Brutcher Translation No. 3088].—Changes in the stresses and distortion in metal powders as a result of annealing were studied by x-rays and sp.-heat measurements. The sp. heat was detd. during heating at 2.0 to 2.8 degrees/min. with a high-temp. adiabatic calorimeter. A Cu compact made of 100-μ powder with a porosity of 20% evolved 6.25 cal./g. with the max. rate at 350°. 40–50-μ powder with 35% porosity evolved 11.25 cal./g. with the max. at 275°. 10–20-μ Ni powder with 15% porosity evolved 14.00 cal./g. with a 550° max. Thirty-μ Fe powder with 10% porosity evolved 12.00 cal./g. with a 330° max. This release of energy corresponded to decreases in stresses of the 2nd and 3rd kinds and was not caused by decrease in the surface area of the pores. X-ray measurements were made on specimens 6.2 mm. in diam. and 2 mm. long pressed from 40–50-μ electrolytic Cu powder or from 10–20-μ Ni powder. For Cu the elastic energy, estd. from line breadth, decreased from 4.2×10^{-3} cal./g. to nearly zero in >400 min. at 100°, 100 min. at 150°, 40 min. at 200°, and 10 min. at 250°. If a diffusion process caused the decrease in microstresses, the activation energy was 20,000 cal./mol., close to the 12,000 cal./mol. characteristic of the initial stage of diffusive sintering. Since the microstresses were eliminated at a low temp. they could have little effect on the sintering process compared to the effect of the initial energy of distortion. Distorted regions in the lattice could increase the concn. of vacancies and decrease the activation energy for self-diffusion. A. G. Guy

(3)

SMUSHKOV, I. V.: Master Phys-Math Sci (diss) -- "The development of an X-ray method of determining the coefficients of heterodiffusion". Khar'kov, 1958. 16 pp (Min Higher Educ Ukr SSR, Khar'kov Order of Labor Red Banner State U im A. M. Gor'kiy), 150 copies (KL, No 8, 1959, 134)

AUTHORS: Pines, B. Ya., Smushkov, I. V. 57-28-3-30/33

TITLE: The X-Ray Determination of the Heterodiffusion Coefficients in Alloys With Components Considerably Differing in X-Ray Absorption (Rentgenograficheskoye opredeleniye koeffitsiyentov geterodiffuzii v splavakh komponent s rezko razlichayushchimsya pogloshcheniyem rentgenovskikh luchey)

PERIODICAL: Zhurnal Tekhnicheskoy Fiziki, 1958, Vol. 28, Nr 3, pp. 661-667 (USSR)

ABSTRACT: The method described in references 1 and 2 is here applied to the case of metal alloys with different absorption coefficients and different scattering power, and is further developed. The computation of a "mirror image" of the radiograph of a sample of binary alloys is investigated. In the case where the alloy components differ with regard to the X-ray absorption coefficients μ and the "reflective" power the alloy has a variable concentration with respect to pth. Equation (4) is derived. It represents the relation between the intensity dI of the X-rays which are reflected by the layer with the concentration

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The X-Ray Determination of the Heterodiffusion Coefficients in Alloys With Components Considerably Differing in X-Ray Absorption

57-28-3-30/33

c and the depth x in which this layer is located. This equation can only be solved according to the method of successive approximations. It is shown that the zero-th approximation cannot be selected very far from the actual distribution-curve of ox. Beside the function c(x) of the concentration-distribution the gradient values of the concentrations in the interior of the sample are directly obtained, without differentiating the $c = c(x)$ - curve. With the aid of the quantities thus determined the heterodiffusion-coefficients in dependence on the concentration can be determined. At the end an example for the computation of the c(x)-function of a Cu-Mo-alloy is given.
There are 6 figures, 1 table and 2 Soviet references.

$\frac{dc(x)}{dx}$

ASSOCIATION: Gosudarstvennyy universitet im. A. M. Gor'kogo, Khar'kov (Khar'kov, State University imeni A. M. Gor'kiy)

SUBMITTED: April 1, 1957.

Card 2/2 1. Alloys--Diffusion 2. X-rays--Absorption 3. Alloys--Absorptive properties

AUTHORS: Pines, B. Ya., Smushkov, I. Y. 57-28-3-31/33

TITLE: X-Ray Determination of Heterodiffusion Coefficients in Cr-Mo and Ni-W Systems (Rentgenograficheskoye opredeleniye koeffitsiyentov geterodiffuzii v sistemakh Cr-Mo i Ni-W)

PERIODICAL: Zhurnal Tekhnicheskoy Fiziki, 1958, Vol. 28, Nr 3, pp. 668-673 (USSR)

ABSTRACT: The method of X-ray analysis for the determination of heterodiffusion coefficients D was applied here to the case of the Cr-Mo and Ni-W systems. The solid molybdenum and wolfram samples were covered with thin chromium or nickel films and subjected to a diffusion-annealing at different temperatures. After the annealing the samples were investigated by X-ray analysis, the X-ray spectrographs were evaluated photometrically and the photometric curves were computed according to the formulae given in ref. 1. In the Cr-Mo system data on the dependence of the diffusion coefficients on the concentration were obtained at 4 temperatures. The concentration dependence of the activation energy Q (c) and of the factor in front of the exponential function $D_o(c)$ were computed and

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X-Ray Determination of Heterodiffusion Coefficients in Cr-Mo and Ni-W Systems 57-28-3-31/33

the latter was compared to the value computed according to the formula from ref. 7. After the concentration dependence $D_o = D_o(c)$, the energy of mixture in the solid phase was determined for the Cr-Mo system and by means of this constant the computed equilibrium diagram of Cr-Mo was set up. The melting points of the Cr-Mo alloys determined by experiments coincide well with its liquidus curve. In the case of the Ni-W system the D values were measured in dependence on c, $D = D(c)$ at 4 temperatures, subsequently, $Q(c)$ and $D_o(c)$ were computed and the energy of mixing in the solid phase was determined. As to its order of magnitude the latter agrees with the values obtained from the Ni-W phase diagram. It was observed that the quantity $D_o(c)$ in the Ni-W system becomes zero at a concentration corresponding approximately to the limit of solubility. There are 7 figures and 11 references, 10 of which are Soviet.

SUBMITTED: April 1, 1958

1. Chromium-molybdenum-nickel-titanium systems--Diffusion
2. Chromium-molybdenum-nickel-titanium systems--X-ray analysis

Card 2/2

PINES, B.Ya.; SMUSHKOV, I.V.

X-ray investigation of heterodiffusion in Cu-Ni alloys. Fiz. tver. 1 no.6:939-945 Je '59. (MIRA 12:10)

1.Khar'kovskiy gosudarstvennyy universitet im. A.M. Gor'kogo.
(Copper-nickel alloys) (Diffusion)

80892

S/126/60/009/06/025/025

E073/E335

18.1250

AUTHORS: Smushkov, I.V. and Karakulin, I.Ye.

TITLE: X-ray Investigation of Ni-Cr Alloys

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol 9, Nr 6, pp 943 - 945 (USSR)

ABSTRACT: Brief communication on the study of Ni-Cr alloys within a wide range of concentrations, the aim of which was to determine the dependence of the lattice parameters of alloys on the concentration and also to elucidate the phase composition of the alloys. The specimens were prepared from carefully mixed powders of Cr and Ni, which were pressed and fused in a cryptol furnace under a layer of boron anhydride and were quenched from the liquid phase in oil. During subsequent heat treatment and X-ray investigation, discs of 6 mm dia, 4 to 5 mm high, cut from the central part of this casting, were used. The Cr content of the alloys amounted to 3, 20.6, 27.2, 44.5, 56.3 and 62.8 at.%. It was found that specimens with low Cr contents (3, 20.6 and 27.2%) had a cubic face-centred lattice in the quenched state, the parameter of which varies monotonously with the concentration. Subsequent

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X-ray Investigation of Ni-Cr Alloys

annealing at 600, 700 and 800 °C does not change the lattice parameter. The alloy with 44.5% Cr also had a cubic face-centred lattice in the quenched state. However, after annealing at 600 °C additional lines were detected on the X-ray diffraction patterns. Alloys with 56.3 and 62.8% Cr also had a cubic face-centred lattice in the quenched state. However, as a result of subsequent annealing the solutions decomposed into two phases with a cubic face-centred lattice and a cubic body-centred lattice, the latter with a lattice parameter approaching that of pure Cr. Thus, it is concluded that Ni-Cr alloys containing up to 62.8 at.% Cr represent homogeneous γ-solutions under the conditions pertaining during the experiments; this indicates that available diagrams of state are not entirely reliable and should be revised.

Acknowledgments are made to B. Ya. Pines for his assistance and evaluation of the results and to M.P. Fuks, Docent, who made the chemical analysis of the alloys.

There are 1 figure and 10 references, 3 of which are Soviet, 1 German and 6 English.

Card2/3

4

80892
S/126/60/009/06/025/025
E073/E335

X-ray Investigation of Ni-Cr Alloys

ASSOCIATION: Khar'kovskiy gosudarstvennyy universitet im. A.M. Gor'kogo (Khar'kov State University imeni A.M. Gor'kiy)

SUBMITTED: December 23, 1959

Card 3/3

S/126/60/010/002/027/028/XX
E031/E413

18 7500

18

AUTHOR: Smushkov, I.V.

TITLE: On the Problem of Determining Diffusion Coefficients in Alloys

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol.10, No.2, pp.313-316

TEXT: In the experimental determination of the diffusion coefficient D using the method of radioactive isotopes, solutions of the (one-dimensional) diffusion equation are used in which it is assumed that D is independent of the concentration. There are clearly cases when this assumption is invalid and then the solution given by Eq.(3) must be used. A comparison of the two solutions is made in the case when D depends linearly on the concentration. The expression (3) is evaluated by the method of successive approximations. The comparison shows that the first solution for D approaches the true value only for such values of the concentration where reliable measurements of the concentration are impossible. The discrepancy thus revealed is viewed from another aspect by considering the expression

$$\ln\left[-\frac{d\left(\frac{c}{c_0}\right)}{d\lambda}\right]$$

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S/126/60/010/006/014/022
E193/E483

AUTHORS: Pines, B.Ya., Grebennik, I.P. and Smushkov, I.V.

TITLE: Electron and X-Ray Diffraction Studies of the Heterodiffusion Coefficients in the Nickel-Chromium System

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol.10, No.6, pp.879-885

TEXT: In the first stage of the present investigation, the heterodiffusion in the Ni-Cr system was studied with the aid of a high-temperature electron diffraction camera. The experimental specimens were prepared by vacuum deposition, an NaCl substrate having been used to deposit consecutive layers of quartz, nickel, chromium and quartz. (The layers of quartz served to prevent preferential oxidation of chromium during the diffusion annealing). The total thickness of the Cr-Ni layer was 1.7×10^{-6} cm, chromium having been deposited in such a quantity that on the completion of the diffusion annealing an alloy, containing 20 to 25 at.% Cr, was formed. Two variants of the specimens were made:
(1) "equilibrium" nickel - "equilibrium" chromium and
(2) "equilibrium" nickel - "non-equilibrium" chromium. The variant

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S/126/60/010/006/014/022
E193/E483

Electron and X-Ray Diffraction Studies of the Heterodiffusion Coefficients in the Nickel-Chromium System

(1) specimens were prepared by rapid deposition of nickel from strongly super-heated source on to a substrate pre-heated to about 400°C, followed by rapid deposition of chromium on to the nickel layer whose temperature was about 300°C. To produce the variant (2) specimens, nickel was deposited in the same way as in variant (1) but was allowed to cool to room temperature before the deposition of chromium was carried out. The electron diffraction pattern of the variant (1) specimens consisted of two systems of narrow lines, whereas those obtained for variant (2) specimens had narrow nickel lines and diffuse chromium lines. The mean value of the diffusion coefficient D for the variant (1) specimens varied from 24.1×10^{-15} cm^2/sec at 600°C to 0.415×10^{-15} cm^2/sec at 520°C; in the case of the variant (2) specimens, D varied from 48.2×10^{-15} cm^2/sec at 550°C to 2.41×10^{-15} cm^2/sec at 450°C. The activation energy for diffusion and the pre-exponential factor, calculated from these data, were Q = 51500 cal/mol and $D_o = 0.18$ cm^2/sec for the variant (1) specimens, the corresponding

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S/126/60/010/006/014/022
E193/E483

Electron and X-Ray Diffraction Studies of the Heterodiffusion Coefficients in the Nickel-Chromium System

values for the variant (2) specimens being 34600 cal/mol and 1.6×10^{-5} cm^2/sec. The specimens used for X-ray diffraction analysis consisted of 1.5 mm thick discs of electrolytic nickel (vacuum-annealed at 1400°C) on which a 5 to 6 micron thick layer of chromium had been electrodeposited. The diffusion annealing (at 700, 800 and 900°C) was carried out in a bath of molten boric oxide. The concentration-dependence of D, determined by X-ray diffraction, was similar for all three test temperatures, D decreasing with increasing concentration of chromium. At 900°C, D decreased from approximately 1×10^{-10} cm^2/sec at 4 at.% Cr to 0.3×10^{-10} cm^2/sec at 33 at.% Cr. The activation energy Q varied between 30 and 40 kcal/mol, the Q versus concentration curve having a maximum of 40 kcal/mol at 18% Cr and a local minimum of 33.5 kcal/mol at 30% Cr. The D_o versus concentration curve also passed through a maximum at about 18% Cr. The graph, illustrating the relationship between log D and 1/T, and constructed from data obtained by electron diffraction on the

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S/126/60/010/006/014/022
E193/E483

Electron and X-Ray Diffraction Studies of the Heterodiffusion Coefficients in the Nickel-Chromium System

variant (1) specimens and by X-ray diffraction on electrolytic specimens, constituted a single straight line, indicating a close agreement between the results obtained by both methods. The students Yu.Krot, V.Solunskiy and D.Sherman participated in the work. There are 6 figures, 3 tables and 11 references 9 Soviet and 2 non-Soviet (one of which is translated into Russian).

ASSOCIATION: Khar'kovskiy gosudarstvennyy universitet imeni A.M.Gor'kogo (Khar'kov State University imeni A.M.Gor'kiy)

SUBMITTED: March 11, 1960

Card 4/4

PINES, Boris Yakovlevich; SMUSHKOV, I.V., kand. fiz.-mat. nauk, otv. red.: TRET'YAKOVA, A.N., red.; ALEKSANDROVA, G.P., tekhn. red.

[Physical metallurgy] Ocherki po metallofizike. Khar'kov, Izd-vo Khar'kovskogo gos.univ. im. A.M.Gor'kogo, 1961. 314 p. (MIRA 14:12)

(Physical metallurgy)

S/181/61/003/001/017/042
B006/B056

AUTHORS: Pines, B. Ya. and Smushkov, I. V.

TITLE: Self-diffusion coefficients in alloys

PERIODICAL: Fizika tverdogo tela, v. 3, no. 1, 1961, 146-153

TEXT: The present paper deals with a theoretical estimation of the self-diffusion coefficient D_i^{sd} of the i-th component of an alloy. The studies are based upon the following equations of the diffusion theory: For the flux of the i-th component, $q_i = -D_i \partial c_i/\partial x$ holds, where c_i denotes the concentration and D_i the diffusion coefficient of the component; D_i is a partial diffusion coefficient. The "mean" heterodiffusion coefficient of a binary alloy is given by $D = c_1 D_2 + c_2 D_1$. D_i is related to D_i^{sd}, which is also described as being a partial self-diffusion coefficient, by the relation (3): $D_i = D_i^{sd}(1+\partial \ln f_i/\partial \ln c_i)$, where f_i is the activity

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Self-diffusion coefficients in alloys

coefficient of the i-th component. If the solid solution is regular, $D_i = D_i^{sd}\left[1 - \frac{2U_o}{kT} c(1-c)\right]$ holds, where U_o is the mixing energy of the alloy. For describing the heterodiffusion, it is therefore necessary to know D_i^{sd}. The estimation of D_i^{sd} is carried out for various simple cases. First, a binary alloy of inhomogeneous concentration distribution is studied; A is assumed to contain a radioactive isotope of the concentration $c_1(x)$; the non-radioactive isotopes of the component A have the concentration $c_2(x)$; the component B has the concentration $(1-c)$, where $c = c_1+c_2$. For the volume flux of the radioactive atoms one obtains: $\Delta Q = -\delta^2(\alpha\frac{dc_1}{dx} + c_1\frac{d\alpha}{dx})$ or $\Delta Q = -\delta^2(\alpha - c_1\frac{d\alpha}{dc_1})\frac{dc_1}{dx}$, where δ is the interatomic distance, and α is the concentration-dependent transition probability of a radioactive atom from one plane to another (at the distance δ). The cases are now investigated, in which $c_1(x)$ and $c_2(x)$ are variable, but $c = c_1 + c_2$ is constant. The following is obtained: $\Delta Q = -\delta^2\alpha\frac{dc_1}{dx}$, where

Card 2/5

Self-diffusion coefficients in alloys

$D_A^{sd}(c) = -\delta^2\alpha$ is the "radioisotopic" self-diffusion coefficient. If also $c=c(x)$, then $\Delta Q = -\left[D_A^{sd}(c) + c_1 \frac{dD_A^{sd}}{dc}\frac{dc}{dc_1}\right]\frac{dc_1}{dx}$. If $c_2 \simeq 0$ and $c_1 \simeq c$, ther

$\Delta Q \simeq -\left[D_A^{sd}(c) + c\frac{dD_A^{sd}}{dc}\right]\frac{dc}{dx}$. If $c_2=0$ and $c_1=c$, the partial heterodiffusion coefficient is defined by $D_A^{hd}(c) = D_A^{sd}(c) + c\frac{I_A^{sd}(c)}{dc}$ (11). From (11) and (3) one obtains $D_A^{sd}(c) = L_A^{sd}(1)f(c)$, where $D_A^{sd}(1)$ is the self-diffusion coefficient in pure metal. If the interatomic distance is a function of concentration, $D_A^{sd}(c) = \frac{\delta^2(1)}{\delta^2(c)}D_A^{sd}(1)f(c)$, where $\delta(1)$ is the interatomic distance in the pure metal A. In a regular solid solution, the activity coefficient $f(c) = \exp\frac{U_o}{kT}(1-c)^2$, and one obtains

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S/181/61/003/001/017/042
B006/B056

Self-diffusion coefficients in alloys

$D_A^{sd}(c_A) = D_{oA}\exp\left[-\frac{Q_A - U_o(1-c_A)^2}{kT}\right]$, where Q_A is the activation energy of self-diffusion in pure metal. Aproximatively, $D_o^{sd} \simeq \delta^2 \nu \exp(\Delta s/k)$, where ν is the frequency of atomic vibrations, and Δs is the entropy of self-diffusion activation, $D_o = D_{oA}$. For diffusion in infinite dilution ($c_A = 0$), $Q_A(0) = Q_A(1) - U_o$ holds. If by $D^{sd} = c_1 D_1 + c_2 D_2$ one denotes the coefficient of self-diffusion of "averaged" alloy atoms, one obtains the following relation in the approximation of the regular solution:
$D^{sd} = c_A D_A^{sd}(1)\exp\left[\frac{U_o}{kT}(1-c_A)^2\right] + c_B D_B^{sd}(1)\exp\left[\frac{U_o}{kT}(1-c_B)^2\right]$; and for the activation energy of self-diffusion of the alloy it follows that

$$Q_{alloy}^{sd} = -\frac{\partial \ln D^{sd}}{\partial\left(\frac{1}{kT}\right)} = \frac{c_A D_{oA}\left[Q_A - U_o(1-c_A)^2\right]\exp\left[\frac{Q_A - U_o(1-c_A)^2}{kT}\right]}{D^{sd}} + \frac{c_B D_{oB}\left[Q_B - U_o(1-c_B)^2\right]\exp\left[-\frac{Q_B - U_o(1-c_B)^2}{kT}\right]}{D^{sd}}.$$

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S/181/61/003/001/017/042
B006/B056

Self-diffusion coefficients in alloys

Q as a function of Al concentration for an Ag-Al alloy is calculated from the last-mentioned formula, and is compared with experimental data. Agreement, especially for small concentrations, is good. There are 1 figure and 10 references: 8 Soviet-bloc and 2 non-Soviet-bloc.

ASSOCIATION: Khar'kovskiy gosudarstvennyy universitet im. A. M. Gor'kogo (Khar'kov State University imeni A. M. Gor'kiy)

SUBMITTED: May 27, 1960

Card 5/5

S/181/62/004/007/020/037
B102/B104

AUTHORS: Pines, B. Ya., Ivanov, I. G., and Smushkov, I. V.

TITLE: The partial diffusion coefficients and the self-diffusion coefficients of alloys of the copper-nickel system

PERIODICAL: Fizika tverdogo tela, v. 4,no. 7, 1962, 1882-1890

TEXT: The values of the experimentally determined heterodiffusion coefficients (Pines, Smushkov, FTT, 1, 6, 939, 1959) and the calculated ratios of the partial diffusion coefficients are used to determine the partial diffusion coefficients of Ni and Cu in dependence on the concentration of the components at 1000, 900, 800, and 700°C. $D_{al}^{sd} = c_A D_A + c_B D_B$ and $D_{al}^{hd} = c_B D_A + c_A D_B$; D_{al}^{sd} and D_{al}^{hd} are the self- and heterodiffusion coefficients of the alloy, $c_{A,B}$ and $D_{A,B}$ are the atomic concentrations and the partial diffusion coefficients of the components. The partial diffusion coefficients obtained are used to calculate the self-diffusion coefficients of Cu-Ni alloys as dependent on the concentration. The calculations are

Card 1/3

The partial diffusion coefficients...

carried out in regular-solution approximation (Pines, ZhTF, 24, 8, 1521, 1954), where $D_A^{al} = D'_A \xi L_A$; ξ is the vacancy concentration in the alloy of given concentration, L_A a thermodynamic factor

$$L_A = 1 - \frac{2z\tilde{U}_0 c_B(1-c_B)}{kT}, \quad D'_A = \frac{\delta^2}{6\tau} \exp\left[(W_A - G_A)/kT\right];$$

U_0 is the displacement energy, z the coordination number in the alloy lattice, δ the interatomic distance, τ the shortest lattice vibration period, G_A the change in potential energy of the alloy when an A atom is displaced "to infinity", W_A is the same when the atom is brought from infinity to the "potential barrier vertex". An atom located at this vertex has the coordination number z' so that $G_A - W_A = -(z-z')\left[c_B U_{AB} + (1-c_B)U_{AA}\right]$, where $U_{AB,AA}$ are the mutual potential energies. $\xi = \exp(-\Delta F_0/2kT)$, ΔF_0 is the change in free energy,

$$\Delta F_0 = -(z-z')\left[(1-c_B)^2 U_{AA} + c_B^2 U_{BB} + 2c_B(1-c_B)U_{AB}\right]. \quad (5a)$$

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z" is the effective coordination number of an alloy atom situated between two lattice nodes. The self-diffusion coefficients are obtained from

$$\left.\begin{aligned} D_{Cu}^{Cu} &= M\exp\frac{1}{kT}\left[\frac{z-z''}{2}+z-z'\right]U_{CuCu};\\ D_{Cu}^{Ni} &= M\exp\frac{1}{kT}\left[\frac{z-z''}{2}U_{NiNi}+(z-z')\right]U_{CuNi};\\ D_{Ni}^{Cu} &= M\exp\frac{1}{kT}\left[\frac{z-z''}{2}U_{CuCu}+(z-z')\right]U_{CuNi};\\ D_{Ni}^{Ni} &= M\exp\frac{1}{kT}\left[\frac{z-z''}{2}+z-z'\right]U_{NiNi}, \end{aligned}\right\} \quad (9)$$

$$\left.\begin{aligned} \mu &= \frac{D_{Ni}^{Cu}}{D_{Cu}^{Ni}} = \exp\frac{z-z''}{z}\frac{1}{kT}(q'_{Ni}-q'_{Cu});\\ \nu &= \frac{D_{Cu}^{Cu}}{D_{Ni}^{Ni}} = \exp\frac{1}{kT}\frac{z-z''+2(z-z')}{z}(q'_{Ni}-q'_{Cu});\\ \frac{\nu}{\mu} &= \exp\frac{2(z-z')}{z}\frac{1}{kT}(q'_{Ni}-q'_{Cu}), \end{aligned}\right\} \quad (9a)$$

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where $q'_{Ni}-q'_{Cu}$ is the difference of the latent evaporation heats per atom, $N(q'_{Ni}-q'_{Cu}) = q_{Ni}-q_{Cu} \approx 15$-16 kcal/g-at, $(z-z'')/2 = 2.38$, $z-z' = 1.62$. $zU_o \sim 2.6 \cdot 10^{-13}$ erg/part. There are 4 figures.

ASSOCIATION: Khar'kovskiy gosudarstvennyy universitet im. A. M. Gor'kogo (Khar'kov State University imeni A. M. Gor'kiy)

SUBMITTED: February 22, 1962

Fig. 3. Self-diffusion coefficients as dependent on the Ni concentration (at%). 1, 1', 1", 1'" - experimental curves, 2, 2', 2", 2'" calculated (equilibrium) curves.

Fig. 4. Experimental (1 and 3) and calculated (2 and 4) equilibrium partial diffusion coefficients (D^{al}_{Cu} and D^{al}_{Ni}) as dependent on the Ni concentration.

KOVALENOK, L.V.; SMUSHKOV, I.V.

Methodology and accuracy of harmonic analysis of the shape of interference lines. Kristallografiia 8 no.3:494-496 My-Je '63. (MIRA 16:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut monokristallov, stsintillyatsionnykh materialov i osobo chistykh veshchestv.

L 52999-65 EWT(m)/EWP(1)/T/EWP(t)/EWP(b)/EWA(c) JD

ACCESSION NR: AP5010830 UR/0020/65/161/004/0821/0823

AUTHOR: Podlesnaya, A. D.; Raykhel's, Ye. I.; Smushkov, I. V.; Trembach, V. M.

TITLE: On the dislocational structure of the surface layer of alkaline-halide monocrystals

SOURCE: AN SSSR. Doklady, v. 161, no. 4, 1965, 821-823

TOPIC TAGS: crystal physics, monocrystaline structure

ABSTRACT: The structure of the layer near the surface in monocrystals of LiF and NaCl formed by annealing is studied. Graphical results are offered for the density of dislocations expressed in terms of the distance from the surface of a LiF crystal annealed at 775° for 24 hours and for 1.5 hours both in a vacuum and in an atmosphere of saturated steam in a vacuum. The experiments indicated that, near the surface of an annealed crystal, a layer is formed having a dislocation structure very different from that observed in the body of the crystal. "The authors express their gratitude to Prof. Ya. Ye. Geguzip for his valuable advice and helpful discussion of the results obtained." Orig. art. has: 1 formula, 3 figures.

Card 1/2

L 52999-65

ACCESSION NR: AP5010830

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut monokristallov, stsintillyatsionnykh materialov i osobo chistykh khimicheskikh veshchestv (All-Union Scientific Research Institute of Monocrystals, Scintillating Materials, and Specially Pure Chemical Substances)

SUBMITTED: 28Nov64 ENCL: 00 SUB CODE: SS

NO REF SOV: 008 OTHER: 004

Card 2/2

[illegible], SMOSHKOV, I.V., TREMBACH, V.V.

[illegible] structure of the surface layer of alkali halide single [illegible]. Fiz. i khim. obr. materialov no.4:101-102 '65. (MIRA 18:5)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut monokristallov, osobo chistykh poluprovodnikovykh materialov i osobo chistykh khimicheskikh veshchestv.

DUBININ,G., inzhener; SMUSHKOV,P., inzhener

Slag removal with skip apparatus. Zhel.dor.transp. no.8:83-84 Ag'47. (MLRA 8:12)

(Locomotives)

Shushlov, ?. I.

Kontrol'nyye probki parovoznykh kotlov (Steam boiler safety plugs) 2d ed., Rev. Moskva, Transzheldorizdat, 1952.
99 p. diagrs.

SHUSHKOV, P.I., redaktor; KANDYKIN, A.Ye., tekhnicheskiy redaktor.

[Provisional regulations for operating repairs of narrow-gauge locomotives. Vremennye pravila tekushchego remonta parovozov uzkoi kolei. Moskva, Gos.transp.zhel-dor. izd-vo, 1955 174 p. (MLRA 8:11)

1. Russia (1923- U.S.S.R.) Ministerstvo putey soobshcheniya. Glavnoye upravleniye lokomotivnogo khozyaystva
(Locomotives--Repairs)

SHUSHKOV, P.I., redaktor; KANDYKIN, A.Ye., tekhnicheskiy redaktor/

[Provisional regulations for moderate repairs of narrow-gauge locomotives (750 mm.track)] Vremennye pravila srednego remonta parovozov uzkoi kolei (Kolei 750 mm). Moskva, Gos.transp.zheldor.izd-vo, 1955. 183 p. (MLRA 8:11)

(Locomotives--Repairs)

SMUSHKOV, Petr Ivanovich, inzhener; SAZONOV, A.G., inzhener, redaktor; KHITROV, P.A., tekhnicheskiy redaktor

[Repair of smoke and fire tubes of locomotive boilers; practices of yards and locomotive repair shops] Remont dymogarnykh i zharovykh trub parovoznykh kotlov; opyt depo i parovozoremontnykh zavodov. Moskva, Gos. transp. zhel-dor. izd-vo, 1956. 110 p. (MLRA 10:1)
(Locomotive boilers)

LOSHCHILIN, Andrey Vasil'yevich; TERENT'YEV, Nikolay Konstantinovich; TYURIKOV, Aleksandr Ivanovich; RAKITIN,G.A., retsenzent; OZEMBLOVSKIY, Ch.S., retsenzent; SHCHERBACHEVICH, G.S., retsenzent; SMUSHKOV,P.I., retsenzent; SHILKIN,P.M., retsenzent; FEDOSEYEV,N.P., retsenzent; RESHETNIKOV, V.Ye., retsenzent; PESKOVA,L.N.,red.; ZHDANOV,P.A.,red.; KHITROV, P.A., tekhn. red.

[Safety engineering and industrial sanitation in railroad transportation; handbook]Tekhnika bezopasnosti i proizvodstvennaia sanitariia na zheleznodorozhnom transporte; spravochnaia kniga. Pod obshchei red. P.A.Zhdanova. Moskva, Vses.izdatel'sko-poligr.ob"edinenie M-va putei soobshcheniia, 1961. 455 p. (MIRA 14:12)

(RAILROAD--SAFETY MEASURES) (RAILROADS--SANITATION)

LYUBOV, V.Ya., inzh.; NECHAYEVSKIY, M.R., inzh.; SHUSHKOV, P.I., inzh., red.; MEL'NIKOV, V.Ye., red.; VOROB'YEVA, L.V., tekhn. red.

[Repair of locomotives on hoists; experience of the Donetsk Railroad] Pod"emochnyi remont parovozov; opyt Donetskoi dorogi. Moskva, Transzheldorizdat, 1963. 53 p. (MIRA 17:2)

D'YACHENKO, P.Ye.; SMUSHKOVA, T.V.

Effect of the direction of machining treatment marks on the lead bronze wearability. Tren.i izn.mash. no.7:56-71 '53. (MLRA 9:9)
(Mechanical wear) (Lead bronze)

Smushkova, T. V.

USSR/Engineering - Metallurgy FD-1094

Card 1/1 Pub. 41-6/17

Author : D'yachenko, P. Ye., and Smushkova, T. V.

Title : Wear resistance and residual stresses in the surface layers of metal.

Periodical : Izv. AN SSSR. Otd. tekh. nauk 4, 73-79, Apr. 1954

Abstract : Studies effect of residual stresses in surface layer of steel journal on wear of the latter, using ring-like specimens of carbon and chromium-nickel-molybdenum steels in which residual stresses were created by turning with hard-alloy cutters. Diagrams. One reference.

Institution :

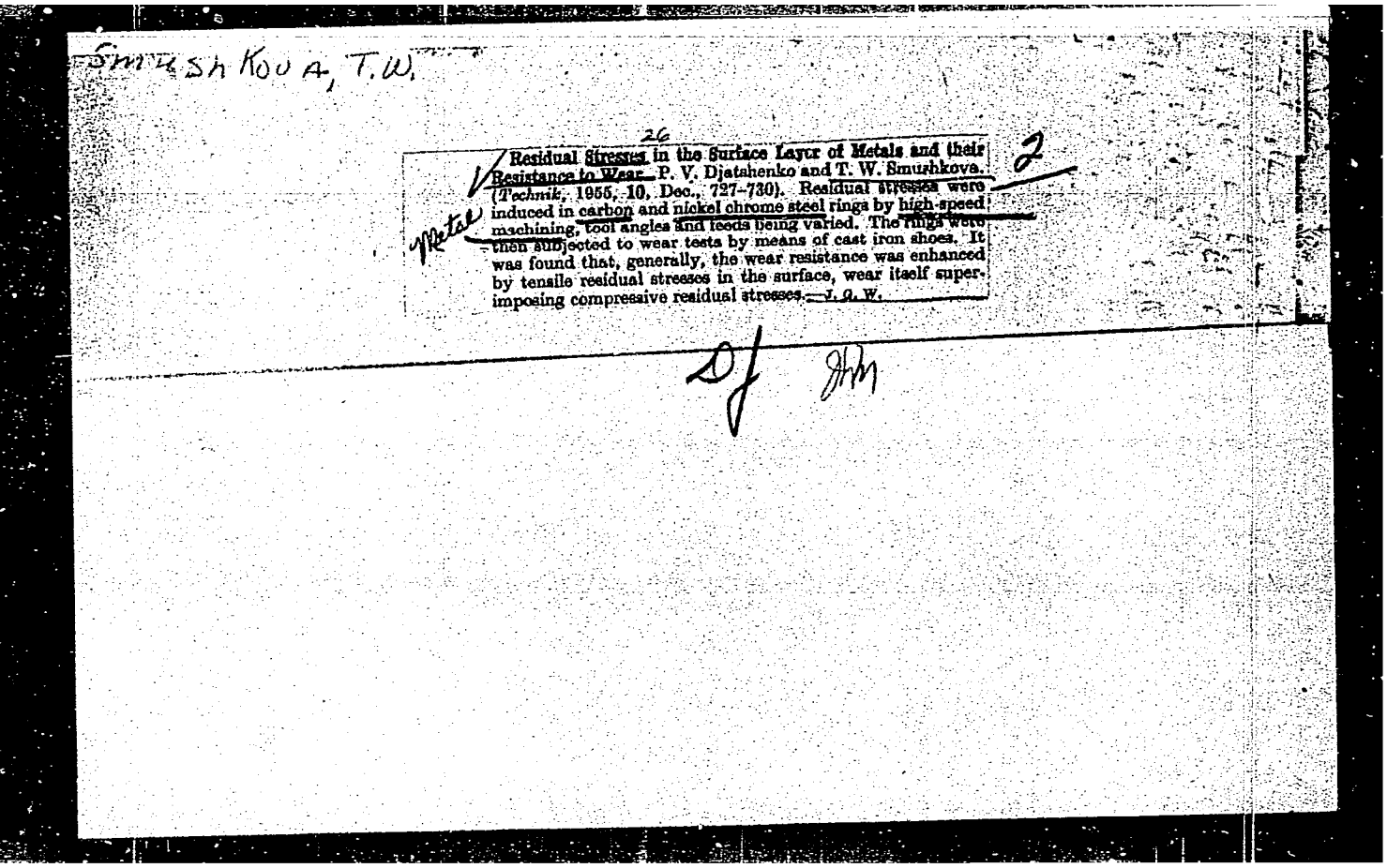
Submitted : By I. A. Oding, Corr. Mb. AN USSR March 10, 1954

SMUSHKOVA,T.V., inzhener

Effect of residual stresses on the wear of steel surfaces subjected to imperfect lubrication. [Izd.] LONITOMASH no.34:26-40 '54. (MLRA 8:10)

1. Vsesoyuznyy nauchno-issledovatel'skiy instrumental'nyy institut.

(Surfaces (Technology))



SMYSHKOVA, T.W.

26

Residual Stresses in the Surface Layer of Metals and their Resistance to Wear. P. V. Djatshenko and T. W. Smurshkova. (*Technik*, 1955, 10, Dec., 727–730). Residual stresses were induced in carbon and nickel chrome steel rings by high-speed machining, tool angles and feeds being varied. The rings were then subjected to wear tests by means of cast iron shoes. It was found that, generally, the wear resistance was enhanced by tensile residual stresses in the surface, wear itself superimposing compressive residual stresses.—*I. Q. W.*

2

Metal

2 of

SMUSHKOVA, T. V.

USSR/ Engineering - Metals

Card 1/1 Pub. 128 - 13/35

Authors : D'yachenko, P. Ye., Dr. Tech. Sc., Prof., and Smushkova, T. V. Engineer

Title : Residual strains in the surface layers of metal increases its resistance to wear

Periodical : Vest. mash. 35/3, 38 - 40, Mar 1955

Abstract : The nature of residual surface strain, as caused by unequal application of heat, pressure in machining, etc., is explained. The materials are indicated that were used in a wide range of experiments, which are described in detail and the conclusion is reached that strain resulting from machining actually increases resistance to wear. One USSR reference (1946).

Institution : .....

Submitted : .....

SMUSHKOVA, V. V.

Hybridization

Utilization of increased vitality of hybrids in the crossing of three breeds. Zhur. ob. biol., 12 no. 6, 1951.

Monthly List of Russian Accessions, Library of Congress, March 1952. Unclassified.

SMUSHKOVICH, B.L.; FRENKEL', M.D.; GROMOV, S.S.

New apparatus for determining the heat resistance of plastics. Plast. massy no.12:53-54 '63. (MIRA 17:2)

SMUSHKOVICH, B.L.; GOLUBKOV, V.S.

Machines for testing friction and wear of materials. Zav.lab. 29 no.7:890-893 '63. (MIRA 16:8)

1. Spetsial'noye konstruktorskoye byuro po razrabotke avtomaticheskikh sredstv izmereniya mass i priborov ispytatel'noy tekhniki Ivanovskogo soveta narodnogo khozyaystva.
(Testing machines)

SMUROVICH, B.I.

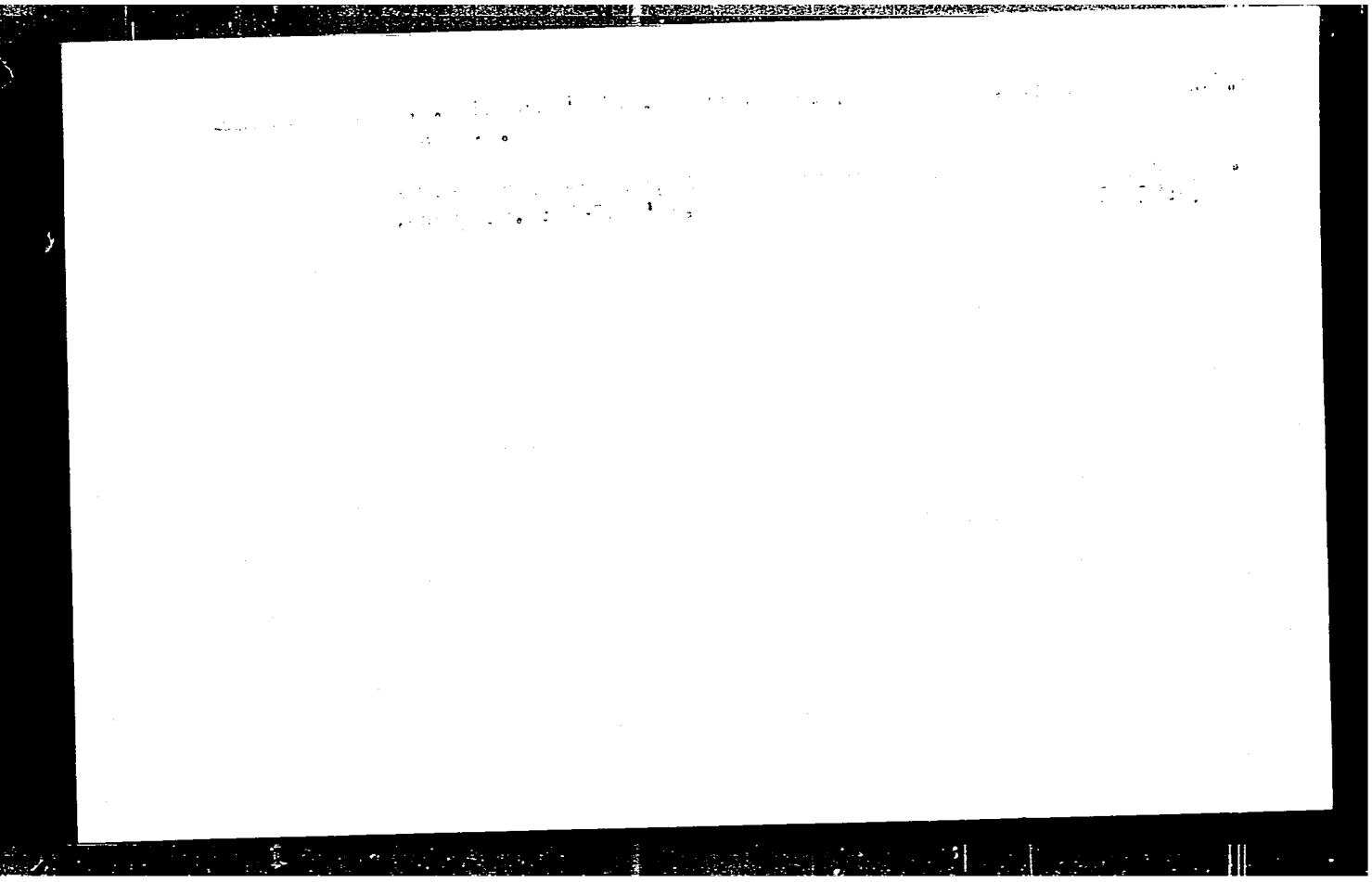
New machinery for technological tests. Zav.lab. 30 no.3:379-381 '64. (MIRA 17:4)

1. Spetsial'noye konstruktorskoye byuro po razrabotke avtomaticheskikh sredstv izmereniya mass i priborov ispytatel'noy tekhniki.

SMUSHKOVICH, B.L.; IL'IN, G.N.; NIZOV, A.A.

Automation of a device for cupping test of sheet metals. Zav.lab. 30 no.4:491-492 '64. (MIRA 17:4)

1. Spetsial'noye konstruktorskoye byuro po razrabotke avtomaticheskikh sredstv izmereniya mass i priborov ispytatel'noy tekhniki Verkhne-Volzhskogo soveta narodnogo khozyaystva.



L 45468-65 EPF(c)/EPR/EWP(j)/EWT(m) Pc-4/Pr-4/Ps-4 RM/WW

ACCESSION NR: AP5009326 S/0191/65/000/004/0070/0071

31
B

AUTHORS: Smushkovich, B. L.; Vinogradov, B. I.

TITLE: Machine for fatigue testing plastics

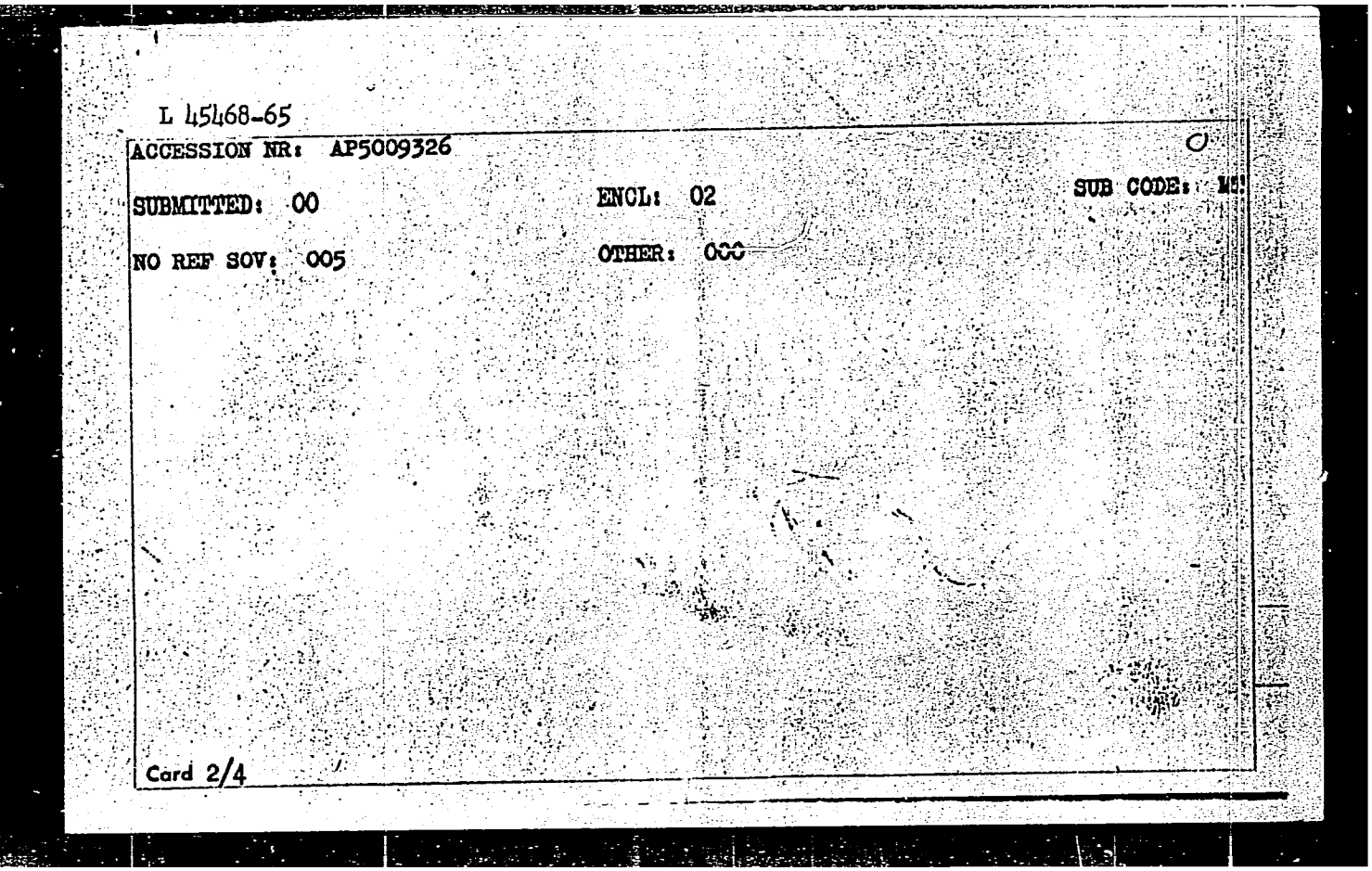
SOURCE: Plasticheskiye massy, no. 4, 1965, 70-71

TOPIC TAGS: plastic, plastic strength, plastic technology, material testing, fatigue testing/ IPR 5000 machine

ABSTRACT: Testing machine IPR-5000, designed for fatigue testing plastic materials, is described. The machine is capable of performing tests using cantilever or simple deflections. Machine construction is shown in Figs. 1 and 2 on the Enclosure. In the figures, 7 is the specimen held by clamps 6 and 9 of rotating spindles (simple deflection) or by clamp 6 (cantilever deflection). The spindles rotate on headstocks 5 and 10 powered by the electric motor 1 through the elastic clutch 4. Additional parts described are the frequency selector dials 13 and 14, cycle counter 2, the loading system 11, 12, 15, counterbalances 3, heater 8 (20 to 3000), and optical adapter 16. A discussion of the measurements which can be made using the machine is presented. The authors thank A. V. Stinskas for his constant attention to their work. Orig. art. has: 2 figures and 2 equations.

ASSOCIATION: none

Card 1/4



L 45468-65

ACCESSION NR: AP5009326

SUBMITTED: 00 ENCL: 02 SUB CODE: MS

NO REF SOV: 005 OTHER: 000

Card 2/4

L 45468-65

ACCESSION NR: AP5009326

ENCLOSURE: 01

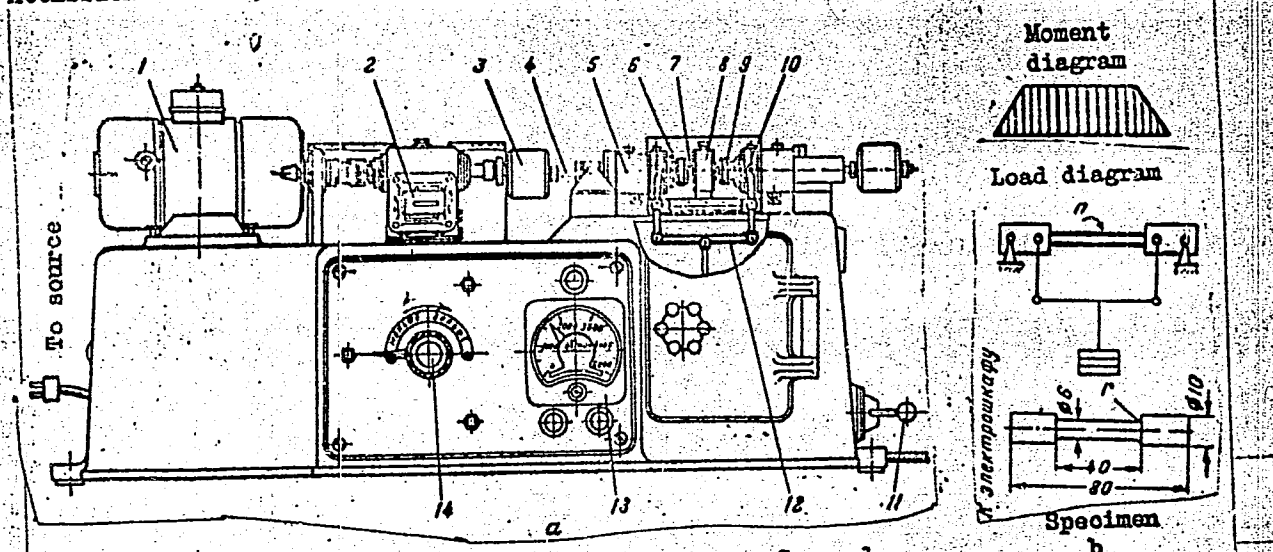


Fig. 1. Machine for fatigue testing of plastics. General view (a) and loading diagram (b) for simple deflection

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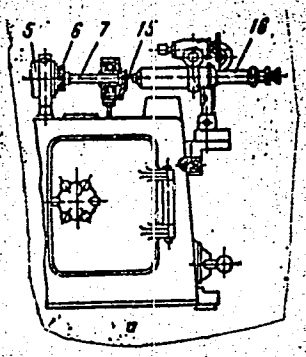
L 45468-65

ENCLOSURE: 02

ACCESSION NR: AP5009326



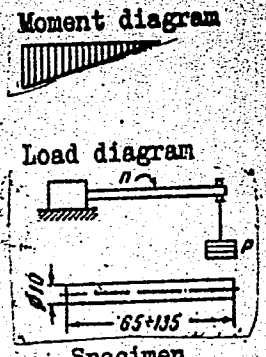


Fig. 2. General view of the machine with optical system (a) and loading diagram (b) for cantilever deflection

Card 4/4 MB

L 58978-65 EWT(m)/EPF(c)/EWP(j) Pc-4/Pr-4 RM

ACCESSION NR: AP5014695 UR/0191/65/000/006/0050/0052 678.01: 539.42

AUTHOR: Smushkovich, B.L.; Frenkel', M.D.; Mukhin, Ye. P.; Bobrov, S.L.; Matrosov, A.N.; Dvorkina, T.V.

TITLE: New instrument for determining the brittle temperature of plastics

SOURCE: Plasticheskiye massy, no. 6, 1965, 50-52

TOPIC TAGS: brittle point, polyvinyl chloride, plastic mechanical property, brittle temperature determination

ABSTRACT: The PKhP-1 instrument for determining the brittle temperature of plastics is described in detail. This instrument is designed for testing 10 specimens simultaneously under identical conditions, and thus the reproducibility of the results is greatly enhanced. It is also capable of operating under both static and dynamic conditions. The cooling system using liquid nitrogen is also described. The time required to bring the test specimen to any given temperature is reduced to a minimum both in heating and in cooling. The instrument is built as a table model (1140 mm long, 700 mm wide, 1330 mm high; weight 190 kg). As an example, the results of testing plasticized polyvinyl chloride under static

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L 58978-65

ACCESSION NR: AP5014695

and dynamic conditions are cited. The brittle temperature was calculated from the formula

$$T_x = T' + \Delta T\left(\frac{S}{100} - \frac{1}{2}\right)$$

where T_x is the temperature corresponding to the failure of 50% of the test samples; T' is the highest temperature at which all the samples fail; ΔT is the selected temperature interval for consecutive tests (e.g., 2C); and S is the sum of the fractured samples from the temperature at which none of the samples failed up to T' inclusive. As expected, the results show that the brittle temperature is significantly affected by the rate of the applied mechanical action. The method and instrument employed yield highly reproducible data. Orig. art. has: 3 figures, 1 table, and 1 formula.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: MT

NO REF SOV: 005 OTHER: 000

Card 2/2

L 23477-66 EWP(j)/EWP(k)/EWT(d)/EWT(m)/T/EWP(l)/EWP(v)/EWP(h) RM/DJ
ACC NR: AP6008410 (A) SOURCE CODE: UR/0374/66/000/001/0151/0153

AUTHOR: Smushkovich, B. L.

ORG: SKB IMIT, Ivanovo

TITLE: MAST-1 machine for evaluating the antifriction properties of MAST-1 plastics

SOURCE: Mekhanika polimerov, no. 1, 1966, 151-153

TOPIC TAGS: vibration test, test equipment, friction coefficient, plastic strength, antifriction material, structural plastic

ABSTRACT: A MAST-1 machine designed by the SKB IMIT as a modification of the KT-2 IMASh and mass-produced by the ZIP plant at Ivanova is described. The machine determines the friction force of plastics in contact with various materials over a wide temperature range both in dry friction and under various lubrication conditions and indicates critical temperatures at which the boundary layer of the lubricant breaks up. The measuring system of the machine consists of a vibrational system with one degree of freedom; under the influence of periodically changing friction force, this system executes torsional vibration about some equilibrium position determined by the average value of the friction force. The operation of the machine is automated, and two modes of testing, periodic and continuous, are possible. The work of R. M. Matveyev and S. B. Ratner contributed substantially to the adoption of the MAST-1 machine in the testing of plastics. Orig. art. has: 2 figures.

SUB CODE: 11/ SUBM DATE: 07Jul65/ ORIG REF: 004/ OTH REF: 000

Card 1/1 UDC: 678:620.178.162.1.05

L 32673-66 EWT(m)/T/EWP(t)/ETI IJP(c) JD/GD
ACC NR: AT6013570 (N) SOURCE CODE: UR/0000/65/000/000/0331/0338

AUTHOR: Smushkevich, V. Z.; Kravets, V. A.; Bochek, S. A.

ORG: Institute of Material Science Problems, AN UkrSSR (Institut problem materialovedeniya AN UkrSSR)

TITLE: Results of the statistical determination of technical parameters for single crystals of silicon carbide to be utilized in production of new types of semiconductor devices

SOURCE: AN UkrSSR. Institut problem materialovedeniya. Vysokotemperaturnyye neorganicheskiye soyedineniya (High temperature inorganic compounds). Kiev, Naukova dumka, 1965, 331-338

TOPIC TAGS: ~~single crystal~~, silicon carbide, semiconductor single crystal, light source, SEMICONDUCTOR DEVICE, SPECIFIC RESISTANCE, ELECTRIC CONDUCTIVITY

ABSTRACT: The quality of the commercial single crystals of silicon carbide are analyzed statistically. Out of 30,000 commercial samples of SiC approximately 6000 were selected for a quality check to determine which of them were of sufficiently high quality to be used in the manufacture of semiconductor devices. These selected SiC single crystals were first ground with boron carbide powder to 200-300 micrometer and treated with a $KOH-KNO_3$ melt at 650°-700°C. Specific resistance and the number of crystal lat-

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tice defects were determined for each sample. It was found that 10-30% of SiC samples exhibit mixed types of electrical conductivity. Some 20-30% of the samples were found to suffer from ununiform specific resistance characteristics. About 40% of the SiC samples had inclusions of carbon (1-100 micrometers in diameter). Only 10-30% of the SiC samples tested could pass the specific resistance and conductivity type standards. No conclusion was reached as to what fraction of the commercial SiC samples would be in the 1-10 ohm·cm specific resistance range, i. e., acceptable for the production of digital and symbol indicators. It was estimated that only 5-10% of the commercial SiC single crystals would meet the quality standards for the production of high temperature diodes. Inclusions of carbon were found to be the major objection to SiC crystals with respect to quality standards, since these inclusions facilitate p-n transitions. Some 50% of the commercial SiC single crystals were found to be acceptable for the production of pulse light sources. The statistical distribution for commercial SiC single crystals according to specific resistance is graphed. Orig. art. has: 3 figures, 2 tables.

SUB CODE: 07,20,09/ SUBM DATE: 03Jul65/ ORIG REF: 002

Card 2/2 BLG

SMUSIN, Ya.S.

Oxytocic effect of quinine. Sbor.nauch.trud.Kaf.akush. i gin. 1 LMI no.2:359-361'61. (MIRA 16:7)
(LABOR (OBSTETRICS)) (QUININE) (CHOLINESTERASE)

SMUSIN, Ya.S.

Detection of cholinesterase inhibition in tissues during the action of reversible inhibitors. Biul. eksp. biol. i med. 54 no.12:111-114 D'62. (MIRA 16:6)

1. Iz kafedry sudebnoy meditsiny (zav. - kand.med.nauk Ya S.Smusin) Chelyabinskogo meditsinskogo instituta i laboratorii farmakologii (zav. - prof. M.Ya Mikhel'son) Instituta evolyutsionnoy fiziologii imeni I.M.Sechenova, An SSSR. Predstavlena akademikom V.N.Chernigovskim.
(CHOLINESTERASES) (ANESTHETICS)

SMUSIN, Ya.S.

Depression of the cholinesterase activity of organs and tissues in experimental armin poisoning. Farmakol. toksik. 26 no.3: 358-361 My-Je'63 (MIRA 17:2)

1. Kafedra sudebnoy meditsiny (zav. - kand. med. nauk Ya.S. Smusin) Chelyabinskogo meditsinskogo instituta i laboratoriya biokhimii i farmakologii biologicheski aktivnykh veshchestv (zav. - prof. M.Ya. Mikhel'son) Instituta evolyutsionnoy fiziologii AN SSSR.

SMUSIN, Ya.S.; FRUYENTOV, N.K.

Intravital and postmortem diagnosis of poisonings by anti-cholinesterase substances; survey of the literature. Sud. - med. ekspert. 6 no.3:28-33 Jl-S'63. (MIRA 16:10)

1. Kafedra sudebnoy meditsiny (zav. - dotsent Ya.S.Smusin) Chelyabinskogo meditsinskogo instituta i laboratoriya farmakologii (zav. - prof. M.Ya.Mikhel'son) Instituta evolyutsionnoy fiziologii AN SSSR.
(PHOSPHORUS ORGANIC COMPOUNDS — TOXICOLOGY)
(CHOLINESTERASES) (MEDICAL JURISPRUDENCE)

1. [illegible], N. S.; SMUSIN, V. I.
2. USSR (600)
4. School Hygiene
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9. Monthly List of Russian Accessions, Library of Congress, February 1953. Unclassified.

SMUSZKIEWICZ, Alfred

20 years of dental service in the Rzeszow District. Czas. stomat.
18 no.3:205-212 Mr '65

SMUTCHUK, A.

The need for a new methodology for determining the indices of planned operation of ports. Mor. flot 25 no.4:12-13 Ap '65.
(MIRA 18:6)

1. Nachal'nik planovogo otdela Murmanskogo torgovogo porta.

24(2,4) PHASE I BOOK EXPLOITATION CZECH/2433

International Polarographic Congress. 1st, Prague, 1951

Sborník I. Mezinárodního polarografického sjezdu. Díl 3: Hlavní referaty prednesene na sjezdu. Proceedings...Vol 3: Reviews Read at the Congress. Praha, Přirodovědecke vyd-ví [1952] 774 p. 2,000 copies printed.

Resp. Ed.: Jiří Koryta, Doctor; Chief Ed. of Publishing House: Milan Skalník, Doctor; Tech. Ed.: Oldřich Dunka.

PURPOSE: The book is intended for chemists, chemical engineers, and physicists.

COVERAGE: The book is a collection of reviews and original papers read at the International Polarographic Congress held in Prague in 1951. Uses of polarography in organic and inorganic analysis, biochemistry, medicine, and industrial chemistry are discussed. In the section, Reviews Read at the Congress, Russian and either German or English translations of each review are presented. In the section, Original Papers Read at the Congress, only those translations in Russian, German, and English which have not been published in Volume I are presented. The following scientists participated in the opening of the Congress: Professor Wiltor Kemula, Dean of the Faculty of Sciences, Warsaw; Doctor Jaromir Dolansky, Minister of Planning; Professor Jaroslav Heyrovsky, Chairman of the Congress; and Professor Jaroslav Pukatko, Chairman of the Center for Scientific Research and Technical Development. References follow each paper.

Card 12/14

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Kinetics of electrode processes. Part 2. Slow electrode processes [in English with summary in Russian]. Sbor.Chekh.khim.rab. 18 no.2: 171-182 Ap '53. (MLRA 7:6)

1. Urxovy zavody, Ostrava.
(Electrodes) (Laplace transformation)

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Kinetics of electrode processes. Part 5. Two-step electrode reactions [abstract; in English]. Sbor.Chekh.khim.rab. 18 no.6:885 D '53. (MLRA 7:6)

1. Urkhovy zavody, Ostrava. (Electrodes)

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Chemical Abst.
Vol. 48
Apr. 10, 1954
Electrochemistry

Kinetics of electrode processes. IX. Electrolysis preceded by chemical reaction. Josef Pliva and Miloš Smutek (Ústav org. chemie ČSAV, Prague, Czech.). *Chem. Listy* 47, 953-62(1953).—The theory of an electrode process is formulated, the rate of which is controlled by the rates of the following 3 elementary processes: diffusion, proper electrode reaction (I), and the chem. reaction (II) in the soln. by which an electrode-active form of the depolarizer can be formed. The problem is solved for one-dimensional diffusion and a plane immobile electrode. The final expression for the c.d. results for 2 limiting cases in equations previously published: when I is fast (Koutecký and Brdička, *C.A.* 43, 48*h*) or when II is fast (S., *Chem. Listy* 45, 241(1951)). X. Polarographic behaviors of systems involving any given number of substances interconnected by rapid chemical reactions in solution. Jaroslav Koutecký (Lab. fys. chemie ČSAV, Prague, Czech.). *Ibid.* 1293-8.—Expressions for the total instantaneous and av. current are derived for a system, the substances of which may be interconnected by electrode reactions according to any given scheme. The electrode reactions may be slow eventually. The reactions of the substances in the soln. are assumed to be of first order, consecutive reactions being excluded. The derived formulas can be expressed as a linear combination of time functions known from more simple problems. The soln. is thus reduced to an algebraic problem. From the soln. for the plane immobile electrode, the soln. for the dropping electrode follows at once. XI. The polarographic current due to an electrode process preceded by a chemical reaction in solution between reactants differing in their diffusion coefficients. *Ibid.* 1758-61.—Expressions for the av. current are derived for 2 depolarization schemes: in the first case, only one substance is electrode-active in the given potential range, in the second case, both substances are active. The chem. reaction in the soln. is supposed to be very rapid and of the first order. E. Erdös

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Chemical Abst.
Vol. 48
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Electrochemistry

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Note on electrolysis at constant current density. Miloš Šmutek (Ústav silnoproudé elektrotechniky, Ostrava, Czech.). *Chem. Listy* 47, 865–6(1953).—A criticism of the work of Gorbachev (*C.A.* 45, 5543a; 47, 4767a) concerning the polarization of a plane electrode during electrolysis at const. c.d. The formulation of the problem and its soln. given by G are corrected.

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Kinetics of the electrode processes. VI. Kinetic derivation of expressions for the electrode layer. Miloš Smutek (Urx Works, Ostrava, Czech.). *Collection Czechoslov. Chem. Communs.* 19, 24-30(1954)(in English).—See *C.A.* 47, 2020*i*. B. J. C.

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KRZEWKI, R.; SMUTEK, M.

Research Institute for the Chemistry of Tar (Forschungsinstitut für Teerchemie), Urxovy zavody, Ostrava

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