to parameters σ and ν are derived as

$$\chi^2 = \psi^2 \eta \sin^2 \beta_2 [\rho + \varphi^2 (1 - \rho) + \mu^2 \nu^2 - 2\varphi\nu \sqrt{1 - \rho} \cos \alpha_1],$$

$$\mu = \frac{u_1}{u_2};$$

and

$$\chi = \frac{F_1}{F_2} \varphi \sin \alpha_1 \frac{[1 + \rho(\sigma^m - 1)]^{\frac{1}{m}} [\sigma^m - \eta_{ad}(\sigma^m - 1)]}{\sigma^m - \varphi^2 (1 - \rho)(\sigma^m - 1)} \sqrt{1 - \rho},$$

(where ϕ and ψ = velocity coefficients of inlet cascade and turbine wheel respectively; η_{ad} = adiabatic efficiency) which can be used for both axial and radial turbines. To determine the working parameters in different operating regimes $\rho = f(\nu, \sigma)$ has to be determined. This can be simplified by using Fig. 1, which gives $A = f(\sigma, \rho)$ (where

$$A = \left(\frac{\gamma F_2}{F_1 \varphi \sin \alpha_1} \right)^2).$$

The procedure for finding $\rho = f(\nu, \sigma)$ becomes: for several realistic values of ν, ρ_{min} is obtained (with $\sigma = 1$); β_1 is determined for several $\rho > \rho_{min}$ and then $\psi = f(\beta_1)$ is found from experimental or theoretical data; after calculating χ^2 and A the "operating line" is drawn for each ν in Fig. 1. Corrections to A are given for turbine parameters other than k = 1.33, ϕ = 0.96, and η_{ad} = 0.88 which is the case shown in Fig. 1.

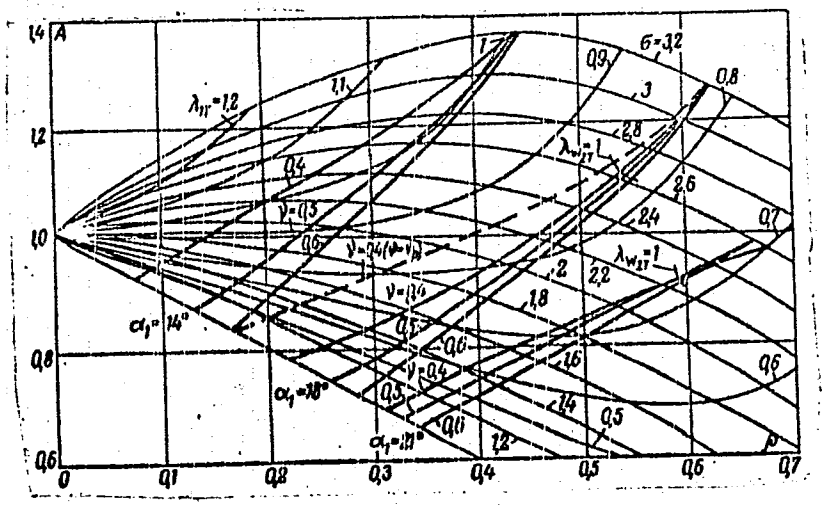


Fig. 1. "Operating lines" diagram. The operating lines of a Type I turbine are shown for different inlet vane angles.

An equation for the theoretical exit velocity in relative motion is derived as

$$\lambda_{w_{2T}} = \frac{\chi}{\psi}\sqrt{\frac{k+1}{k-1}\cdot\frac{1}{\chi^2+\sin^2\beta_1\left(\frac{\sigma^{ad}}{\sigma^{ad}-1}-\eta_{ad}\right)}}.$$

Card 3/4

L 8082-66

ACC NR: AP5025569

and can be used to complete the turbine characteristics as shown, for example, in Fig. 2.

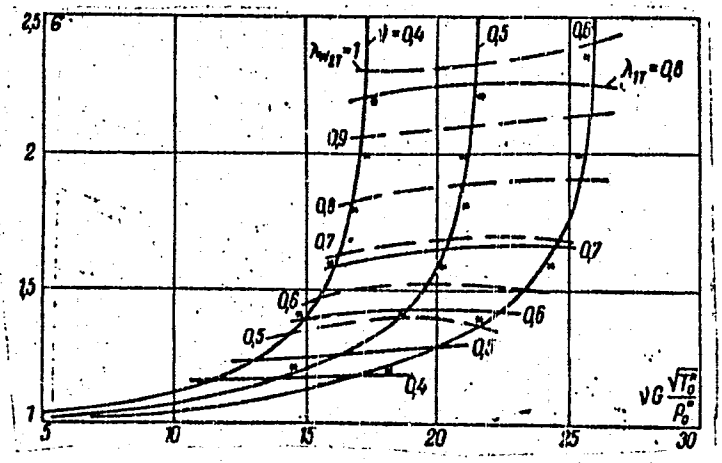


Fig. 2. Operating characteristics of a Type II (reactive stage) turbine; * = experimental points

Orig. art. has: 16 formulas and 5 figures.

SUB CODE: PR/ SUBM DATE: 30May64/ ORIG REF: 004

nw

Card 4/4

PANCHENKO, G.M., elektromekhanik; DEKHTENKO, Yu.K., elektromekhanik

A protective arc for telegraph apparatus. Avtom., telem.i sviaz' 6 no.8:39 Ag '62. (MIRA 15:8)

1. Khar'kovskaya distantsiya signalizatsii i svyazi Yuzhnoy dorogi.
(Telegraph—Equipment and supplies)

DEKHTEREV, V. (Leningrad).

Operations of mine rescuers. Pozh.delo 3 no.8:13 Ag '57.
(MLRA 10:8)

(Mine fires)

DEKHTYAREV, Vladimir Vladimirovich; BUDILOV, G.S., red.; UCHITEL', I.Z., red.izd-va; NAZAROVA, A.S., tekhn.red.

[Gas masks used in fire extinction; types, composition of absorbents, maintenance and operation] Protivogazy, primeniaemye v pozharnoi okhrane; ustroistvo, soderzhanie, ekspluatatsiia. Moskva, Izd-vo M-va kommun.khoz.RSFSR, 1959. 106 p. (MIRA 13:9)

(Gas masks) (Fire departments--Equipment and supplies)

DEKHTEREVA, L.

DEKHTEREVA, L.

How it occurred. IUn.nat. no.11:34-35 N '57. (MIRA 10:10)
(Nature study)

DEKHTEREVA, L.V.

[Collect medicinal plants] Sobiraite lekarstvennye rasteniia. Moskva, Institut sanitarnogo prosveshcheniia, Min. Zdr. SSSR, 1953. 23 p. (MLRA 7:11)

(Botany, Medical)

GILEV, S.S.; DEKHTEREVA, V.V.

Resolving power of some types of printing paper. Zhur. nauch. i prikl. fot. i kin. 10 no.4:296-297 Jl-Ag '65. (MIRA 18:7)

1. Gosudarstvennyy opticheskiy institut imeni Vavilova.

DEKHTERINSKIY, L. V. (Engr)

DEKHTERINSKIY, L. V. (Engr) -- "Investigation of Means of Reconditioning Pinion Split Gears in Automobile Gear Housings." Sub 19 Jan 52, Moscow Motor Vehicle and Road Inst imeni V. M. Molotov (Dissertation for the Degree of Candidate in Technical Science)

SO: Vechernaya Moskva, January-December 1952

ZELENKOV, Georgiy Ivanovich, kand.tekhn.nauk, dotsent; KRIVSHIN, Aleksandr Pavlovich, kand.tekhn.nauk, dotsent; FRAYENOV, Pavel Semenovich, kand.tekhn.nauk, dotsent; DEKHTERINSKIY, Lev Vladimirovich, kand.tekhn.nauk, dotsent; VOSKRESENSKIY, N.N., red.; STEPANOV, V.M., red.izd-va; DONSKAYA, G.D., tekhn.red.

[Principles of designing repair shops and repair of road machinery] Remont dorozhnykh mashin i osnovy proektirovaniia remontnykh predpriiatii. Moskva, Nauchno-tekhn.izd-vo M-va avtomobil'nogo transp. i shosseinykh dorog RSFSR, 1961. 500 p. (MIRA 14:6)
(Road machinery--Repairing)

ARKHANGEL'SKIY, V.M.; AFANAS'YEV, L.L., doktor tekhn.nauk; DEKHTERINSKIY, L.V.; ILARIONOV, V.A.; SERGEYEV, N.M.; TSUKERBERG, S.M.; ANOKHIN, V.I., kand. tekhn. nauk, retsenzent; TSETENKO, V.G., inzh., retsenzent; YEGORKINA, L.I., red.izd-va; NAKHIMSON, V.A., red.izd-va; SOKOLOVA, G.F., tekhn. red.

[Motor vehicles; working principle operation and repair] Avtomobili; ustroistvo, ekspluatatsiia i remont. Moskva, Izd-vo "Mashinostroenie," 1964. 510 p. (MIRA 17:4)

ARKHANGEL'SKIY, V.M.; AFANAS'YEV, L.L., doktor tekhn. nauk.; ILARIONOV, V.A.; SERGEYEV, [illegible]; TSUKERBERG, S.M., DEKHTERINSKIY, L.V.; ANOKHIN, V.I., kand. tekhn. nauk, retsenzent; TSETENKO, V.G., retsenzent

[Motor vehicles; their design, operation and repair] Avtomobili; ustroistvo, ekspluatatsiia i remont. Moskva, Mashinostroenie, 1965. 510 p. (MIRA 18:8)

DEKHTERMAN, B.A.; BATRAKOVA, I.A., inzh.

Processing high-acidity commercial fats. Masl. - zhir. prom. 27 no.12:41 D '61. (MIRA 14:12)

1. Vinnitskiy maslozhirovoy kombinat.
(Oil and fats)

DEKHTO, L.Ya.

Some results of the work of public health organs and institutions in Uzbekistan during the first 2 years of the 7-year plan. Med. zhur. Uzb. no.1:91-93 Ja '62. (MIRA 15:3)

1. Nachal'nik otdela meditsinskoy statistiki Ministerstva zdravookhraneniya UzSSR.
(UZBEKISTAN--PUBLIC HEALTH)

DEKHTRIKYAN, S.A.

Determination of germanium in molybdenites and other sulfides.
Dokl. AN Arm. SSR 28 no.5:213-216 '59. (MIRA 12:10)

1.Institut geologicheskikh nauk Akademii nauk Armyanskoy SSR.
Predstavleno akademikom AN Armyanskoy SSR I.G. Magak'yanom.
(Germanium--Analysis)

DEKHTRIKYAN, S.A.

Photocolorimetric determination of bismuth in iron sulfides and copper thiourea. Izv. AN Arm.SSR Nauki o zem. 17 no.6:53-57 '64
(MIRA 18:2)

1. Institut geologicheskikh nauk AN ArmSSR.

DEKHTSUNYAN, K.M.

Eradication of malaria in Kafan District, Armenia. Med.paraz.i paraz. bol. 37 no.5:536-540 S-O '59. (MIRA 13:4)
(MALARIA prev. & control)

DEKHTSUNYAN, K.M.

Comparative effectiveness of the insecticide DDT used in massive and barrier type treatments of rooms. Izv. AN Arm. SSR. Biol. nauki 13 no.10:89-95 '60. (MIRA 13:12)
(DDT (INSECTIDICE)) (MOSQUITOES—EXTERMINATION)

PAPOYAN, S.A., prof.; ZIL'FYAN, V.N., starshiy nauchnyy sotrudnik; DEKHTSUNYAN, K.M., kand. med. nauk

Immunobiological changes in irradiated guinea pigs with tularemia
Vop. radiobiol. [AN Arm. SSR] 3/4:205-215 '63. (MIRA 17:6)

PAPOYAN, S.A.; ZIL'FYAN, V.N.; DEKHTSUNYAN, K.M.

Effect of active immunization with a live tularemia vaccine on the radioresistance of animals. Zhur. eksp. i klin. med. 3 no.5:25-32 '63. (MIRA 17:2)

1. Sektor radiobiologii, Institut rentgenologii i onkologii AMN SSSR, i kafedra epidemiologii Yerevanskogo meditsinskogo instituta.

69685
S/126/60/009/03/005/033
E032/E414

24.2200

AUTHOR: Dekhtyan, M.V.

TITLE: Antiferromagnetic Properties of the Alloy Ni_3Fe in Connection with Atomic Ordering

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol 9, Nr 3, pp 345-352 (USSR)

ABSTRACT: In previous papers (Ref 1 to 3), the author established a coupling between atomic and antiferromagnetic ordering in nickel-iron alloys. The present paper is concerned with a more detailed study of this effect. The temperature dependence of an ordered Ni_3Fe alloy has been measured and compared with the anomalous temperature behaviour of the magnetic properties of this alloy in the unordered state, which was discovered earlier (Ref 1,2). Low field measurements show, when considered together with the high field measurements reported earlier, that antiferromagnetic coupling of spins is present in the above alloy. Experiments indicate that the appearance of short-range order in an unordered alloy away from the temperature of transition to the paramagnetic state (580 to 600°), and

Card 1/4

69685

S/126/60/009/03/005/033
E032/E414

Antiferromagnetic Properties of the Alloy Ni_3Fe in Connection with Atomic Ordering

well below the order temperature (510°). is accompanied by a rapid change in the magnitude of the magnetic moment. At room temperature and up to 300°C the antiferromagnetic coupling of spins is destroyed by weak fields in the case of the unordered alloy but is unaffected in the ordered alloy. As the temperature of the unordered alloy increases beyond 300°, the degree of short-range order increases and antiferromagnetic exchange interaction appears and causes a strong reduction in the magnetic moment in a weak field. The results obtained are summarized in six figures, for which the figure captions are as follows:

Fig 1:- Residual magnetization of Ni_3Fe (vertical axis) as a function of temperature in °C (horizontal axis). Curve 1 refers to an ordered alloy annealed for 60 hours at 480°; curve 2 refers to an unordered alloy annealed for 2 hours at 1200° and then quenched in water; curve 3 refers to the magnetization of an ordered alloy in a field H = 135 oe. The Neel point is at 600°.

Card 2/4

Antiferromagnetic Properties of the Alloy Ni_3Fe in Connection with Atomic Ordering

Fig 2:- Dependence of the coercive force H_c of Ni_3Fe on the temperature. Curve 1 refers to an ordered alloy annealed for 60 hours at 480°; curve 2 refers to an unordered alloy annealed for 2 hours at 1200° and then quenched in water.

Fig 3:- Dependence of the maximum susceptibility of Ni_3Fe on the temperature (1 - ordered alloy; 2 - unordered alloy).

Fig 4:- Dependence of the magnetization of an ordered alloy on the temperature in various magnetic fields (in oersteds) as indicated.

Fig 5:- Dependence of the magnetization of an unordered alloy on the temperature in various magnetic fields (in oersteds) as indicated.

Fig 6:- Dependence of the residual magnetization I_r and the coercive force H_c on the temperature of annealing (a - I_r of an ordered alloy, б - H_c of an ordered alloy, B - I_r of an unordered alloy, г - H_c of an unordered alloy.

69685
S/126/60/009/03/005/033
E032/E414

Antiferromagnetic Properties of the Alloy Ni_3Fe in Connection with Atomic Ordering

There are 6 figures and 22 references, 14 of which are Soviet, 6 English and 2 German.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova (Moscow State University imeni M.V.Lomonosov)

SUBMITTED: August 17, 1959

Card 4/4

DEKHTYAR', A.I., inzh.

Precast monolithic three-dimensional roofing for industrial buildings. Prom. stroi. 43 no.9:20-25 '65. (MIRA 18:9)

DEKHTYAR', A.I., inzh.; SUKHANOV, P.S., inzh.; VYZHIGIN, G.V., inzh.

New construction decisions on multistory industrial buildings.
Prom. stroi. 41 no.2:2-6 F '64. (MIRA 17:3)

DEKHTYAR', A.I., inzh.; SHISHKIN, R.G., inzh.

Ten years' development of structural designing for industrial construction. Prom. stroi. 41 no.8:5-8 Ag '64. (MIRA 17:11)

DEKHTYAR', A.L. (Odessa)

Anticoagulation activity of heparin in the blood of patients with obliterating atherosclerosis of the blood vessels of the lower extremities. Klin. med. 41 no.6:38-43 Je '63. (MIRA 17:1)

1. Iz kafedry fakul'tetskoy khirurgii lechebnogo fakul'teta (zav. - prof. M.P. Sokolovskiy) Odesskogo meditsinskogo instituta imeni N.I. Pirogova.

DEKHTYAR', A.L.

Fibrinolytic activity of the blood in arteriosclerosis obliterans of the vessels of the legs. Kardiologiia 4 no.6:35-37 N-D '64. (MIRA 18:8)

1. Kafedra fakul'tetskoy khirurgii (zav. - prof. M.P.Sokolovskiy) lechebnogo fakul'teta Odesskogo meditsinskogo instituta imeni N.I. Pirogova.

DEKHTYAR', A.S. (Kiyev)

Limit equilibrium of shallow shells with a flat contour.
Prikl. mekh. 1 no.8:68-73 '65. (MIRA 18:9)

1. Nauchno-issledovatel'skiy institut stroitel'nykh konstruktsiy Gosstroya SSSR.

GEORGADZE, S.; MATLIN, M.; MIRGORODSKIY, I., starshiy instruktor; CHERNYSHEV, G., student (Zhdanov); DEKHTYAR, B., metodist; VYSOTSKIY, V., instruktor; KANUKOV, G. (g. Shakhty, Rostovskoy obl.); MCHEDLISHVILI, T. (Tbilisi); BABENKO, P. (Poltavskaya obl.)

Readers relate; advise and criticize. Sov. profsoiuzy 18 no.19:30-31 O '62. (MIRA 15:9)

1. Nachal'nik otdela truda i zarabotnoy platy rudnika "Nittis-Kumuzh'ye" kombinata "Severonikel'", Murmanskaya obl. (for Matlin). 2. Orgmassovyy otdel Krasnodarskogo kraysovprofa (for Mirgorodskiy). 3. TSentral'nyy Dom kul'tury zheleznodorozhnikov, g. Rostov-na-Donu (for Dekhtyar). 4. Gorodskoy komitet Kommunisticheskoy partii Sovetskogo Soyuza; g. Omsk (for Vysotskiy). 5. Neshtatnyy korrespondent zhurnala "Sovetskiye profsoyuzy" (for Kanukov).
(Tiflis--Engraving) (Trade unions) (Weddings)

DEKHTYAR, B.A.

Hypoid automobile transmissions. Avt.i trakt.prom. no.4:8-14 Ap '57. (MLRA 10:5)

1.Gor'kovskiy avtozavod imeni Molotova.
(Automobiles--Transmission devices)

S/113/60/000/002/002/009
D207/D306

AUTHOR: Dekhtar, B. A.

TITLE: The calculation of hypoid gears

PERIODICAL: Avtomobil'naya promyshlennost', no. 2, 1960, 10-14

TEXT: The article explains the methods used at the Gor'kovskiy avtozavod (Gor'kiy Automobile Plant) for selecting the starting data and calculating the geometrci parameters of hypoid bevel gears in automobile back-axle drives. The methods agree with the instructions of the Glissom firm [Abstracter's note: No other data given] for drives manufactured by the spun or semi-spun methods and with an inter-axial angle of 90°. The calculation covers all data needed for designing the drive and for preparing blueprints of the gear-wheels. Such data can be used as the basis for setting the gear-milling machines. The author demonstrates the method as it would be used to design a gear of ratio i = 4.1 for a light car of the ГАЗ-12 (GAZ-12) class. The material used for the gear wheels, which are scheduled for cementation, is 20ХНМ (20KhNM) steel. The diameter of the driven shaft is calculated from the formula

Card 1/3

The calculation of hypoid gears

D_d = 0.665 M, where M is the maximum torque transmitted by the driven shaft in kg/cm. For heavy trucks the formula D_d = (0.58 ÷ 0.66) M is recommended. The crown width of the driven shaft F is calculated from the formula F = 0.155 D_d. Another method is to calculate F from F = $(\frac{1}{8} \div \frac{1}{6})$ D_d, using the $\frac{1}{8}$ factor for driven shafts about 400 mm in diameter and $\frac{1}{6}$ for shafts with a diameter around 230 mm. The guide angle for the initial cone of the driven shaft can be determined from the formula tg $G_1' = i$, while the approximate cone diameter at its smaller base can be taken as equal to $D_d - 2F \sin G_1'$. The author rejects as unreliable the common practice of calculating the main transmission from the maximum engine torque, suggesting instead that the calculation be based on the vehicle's coupling weight which determines the true loading applied to the gear. The gear-wheel should be designed for the maximum number of teeth without, however, reducing the tooth thickness excessively. For cars and light trucks a hypoid shift of $E \leqslant 0.2D_d$ is recommended, and for heavier trucks, busses and tractors

Card 2/3

The calculation of hypoid gears

$E \leqslant 0.125D_d$. Guide data are given on the height of the driven shaft's tooth head; the diameter of the smoothing tool tip; the spiral angle of the shaft and the side clearance in the gear-wheel set. The article will be concluded in Avtomobil'naya promyshlennost', no. 3, 1960. There are 7 figures and 1 table.

ASSOCIATION: Gor'kovskiy avtozavod (Gor'kiy Automobile Plant)

Card 3/3

VASSERMAN, G.; DEKHTYAR, B. A.

Rear axle of the "Volga" automobile. Avt.transp. 38 no.2:45-47 F '60. (MIRA 13:6)
(Automobiles--Axles)

DEKHTYAR, B.A.

Calculating hypoid gears. Avt.prom. no.3:26-31 Mr '60. (MIRA 13:6)

1. Gor'kovskiy avtozavod.
(Gearing)

DEKHTYAR, B.A., inzh.; VINOGRADOVA, I.E., kand.tekhn.nauk

Increasing the wear resistance of cardan shaft hinges. Vest. mash. 42 no.4:56-58 Ap '62. (MIRA 15:4)
(Shafting)

DEKHTYAR, B.

Repairing the back axle of the M-21 "Volga" automobile. Avt. transp. 41 no.1:29-30 Ja '63. (MIRA 16:2)

1. Gor'kovskiy avtomobil'nyy zavod.
(Automobiles—Maintenance and repair)

CHERVONOBRODOV, P.L.; DEKHTYAR, B.A.

Take into consideration and stimulate the increase of lifetime of a motor vehicle and its units. Avt. prom. 29 no.8:3-5 Ag '63. (MIRA 16:11)

1. Moskovskiy avtodorozhnyy institut i Gor'kovskiy avtozavod.

KOPELEVICH, L.Kh., inzh.; BLEKHMAN, I.Ye., inzh.; MASENKO, I.D., inzh.; OVCHAROV, V.I., kand. tekhn. nauk; DEKHTYAR, D.E., kand. tekhn. nauk; VAKUSOV, V.G., inzh.; FINKINSHTEYN, V.A., inzh., red.

[Technology of manufacturing large prestressed concrete elements for industrial construction] Tekhnologiia izgotovleniia krupnorazmernykh predvaritel'no napriazhennykh zhelezobetonnykh konstruktsii dlia promyshlennogo stroitel'stva. Moskva, Gosstroiizdat, 1963. 99 p. (MIRA 17:7)

1. Moscow. Nauchno-issledovatel'skiy institut organizatsii, mekhanizatsii i tekhnicheskoy pomoshchi stroitel'stvu.

DEKHTYAR, D.I., inzh.; ROGACHEV, V.P.

Automation in enterprises of the chemical industry of the Latvian Economic Council. Mekh.i avtom.proizv. 16 no.12:9-11 D '62. (MIRA 16:1)
(Latvia—Chemical industries) (Automation)

DEKHTYAR, D. Yu., DOMBUR, A. Ya., ROGACHEV, V. P., POZDNIKOV, V. N., YANUSHKOVSKIY, V. A., and BANASHEK, V. E.

"Checking of the Process of Cementing in Foundations of Large-Scale Hydrotechnical Constructions Through Radioactive Isotopes"

paper presented at the All-Union Seminar on the Application of Radioactive Isotopes on Measurements and Instrument Building, Frunze (Kirgiz SSR), June 1961

So: Atomnaya Energiya, Vol 11, No 5, Nov 61, pp 468-470

DEKHTYAR, D. Yu., DOMBUR, A. Ya., POGACHEV, V. P., POZDNIKOV, V. N., and YANUSHKOVSKIY, V. A., BANASHEK, V. E.

"Application of Relay Action Radioactive Instruments for Automatic Systems in Technological Processes of the Chemical Industry of the Latvian SSR, Sovnarkhoz"

paper presented at the All-Union Seminar on the Application of Radioactive Isotopes in Measurements and Instrument Building, Frunze (Kirgiz SSR), June 1961)

So: Atomnaya Energiya, Vol 11, No 5, Nov 61, pp 468-470

TSEYTLIN, A.A.; FEL'DMAN, Z.D.; BUZNITSKIY, Ye.V.; DEKHTYAR, E.M.

Machine for making curvilinear reinforced concrete products. Suggested by A.A.TSeytlin, Z.D.Fel'dman, E.V.Buznitskii, E.M.Dekhtiar. Rats. i izobr. predl. v stroi. no.15:41-43 '60. (MIRA 13:9)

1. Po materialam Tekhnicheskogo upravleniya Ministerstva stroitel'stva USSR.

(Concrete panels)

BOGDANOVICH, Galina Nikolayevna, kand. tekhn. nauk; BULAKOVSKIY, Vadim Ivanovich, kand. tekhn. nauk; GOLOVCHENKO, Pavel Sergeyevich, kand. tekhn.nauk; DEKHTYAR, Etya Mikhaylovna, inzh.; KARNAUKHOV, Nikolay Petrovich, inzh.; KLIMANOVA, Yekaterina Antonovna, kand. tekhn. nauk; KRAVTSOV, Boris Konstantinovich, kand. tekhn. nauk; LIBERMAN, Al'fred Davidovich, kand. tekhn. nauk; LUKASHENKO, Ivan Andreyevich, kand.tekhn. nauk; POGREBNYAK, Zinaida Feofanovna, kand. tekhn. nauk; ROKHLIN, Il'ya Aleksandrovich, kand.tekhn.nauk; TRET'YAKOV. Lev Dmitriyevich, kand. tekhn. nauk; TSATSKINA, Frida Naumovna; REZNICHENKO, I.Ye., red.; LEUSHCHENKO, N.L., tekhn.red.

[Handbook for construction laboratories]Spravochnik dlia stroitel'-nykh laboratorii. Pod red. B.K.Kravtsova. Kiev, Gosstroiizdat, 1962. 821 p. (MIRA 16:3)

1. Nauchnyye sotrudniki Akademii stroitel'stva i arkhitektury Ukr.SSR (for all except Reznichenko, Leushchenko).
(Building research--Handbooks, manuals, etc.)

DEKHTIAR, G.

"Valeur clinique des derivations thoracales on electrocardiographie." Foguelson, L., Dekhtiar, G., Starobinetz, K., et Timachouk, L. (p. 323)

SO: Journal of General Chemistry (Zhurnal Obshchei Khimii) 1940, Volume 18, no. 4.

DEKHTYAR', G.Ya.

Vector principle in the analysis of electrocardiograms. Vop. pat. serd. sos.sist. 3 no.6:3-9 '54. (MLRA 8:3)
(ELECTROCARDIOGRAPHY)

DEKHTYAR, G.Ya.

[Electrocardiography] Elektrokardiografiia. Izd. 2-oe, perer. i dop. Moskva, Medgiz, 1955. 440 p. (MLRA 9:4)
(ELECTROCARDIOGRAPHY)

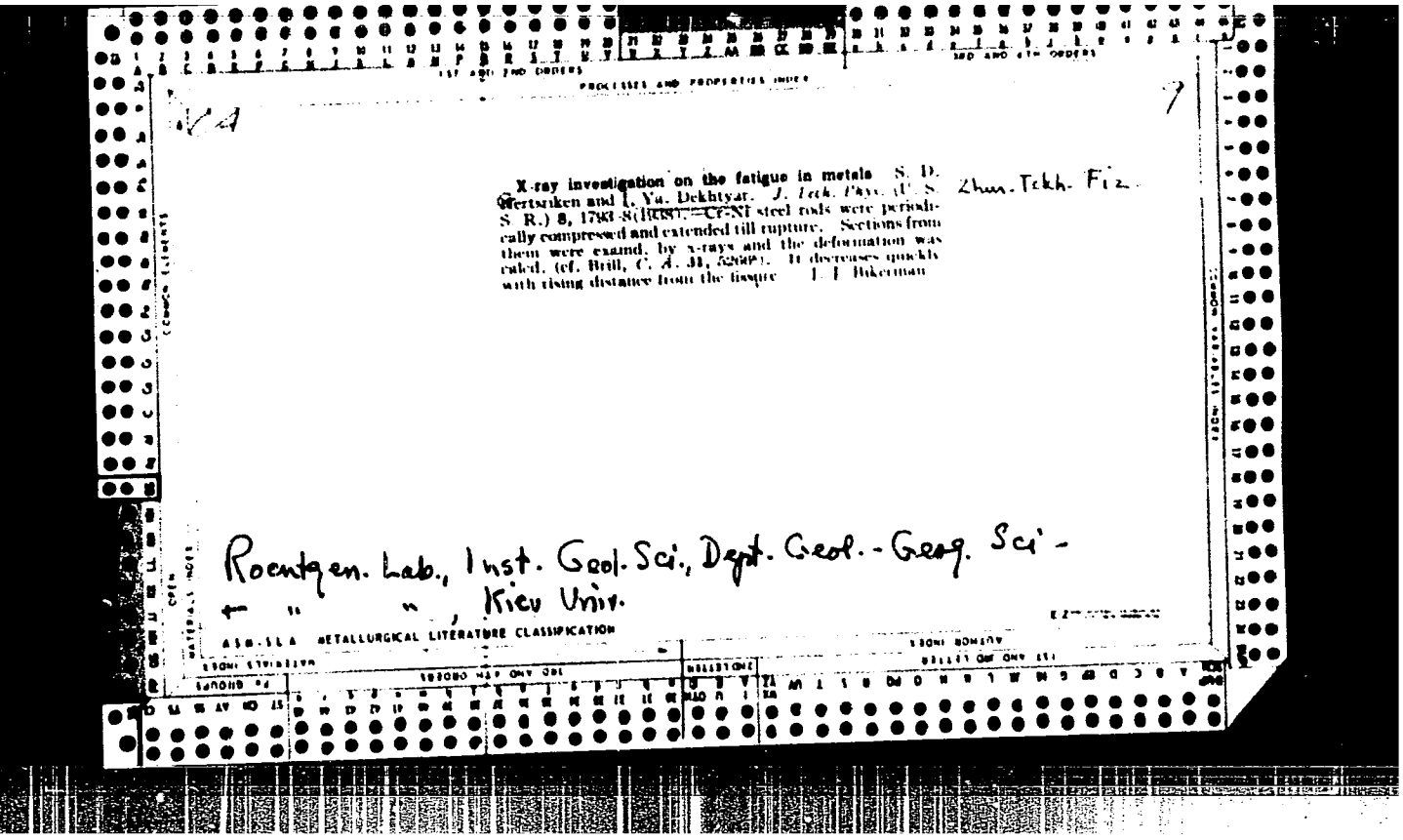
DEKHTYAR, G.Ya.

Ballistocardiography and its clinical value; based on material from foreign periodical literature. Vop.pat.serd.-sos.sist. 4 no.3:3-10 '55. (MLRA 8:8)
(BALLISTOCARDIOGRAPHY, clin. value)

KOLTUNOVSKAYA, B.M., inzh.; DEKHTYAR', L.A., inzh.

Making and using "microporite" at the "Zaporozhaliuminstroi" Trust. Nov. v proizv. stroi. mat. no.1:13-21 '59. (MIRA 12:12)

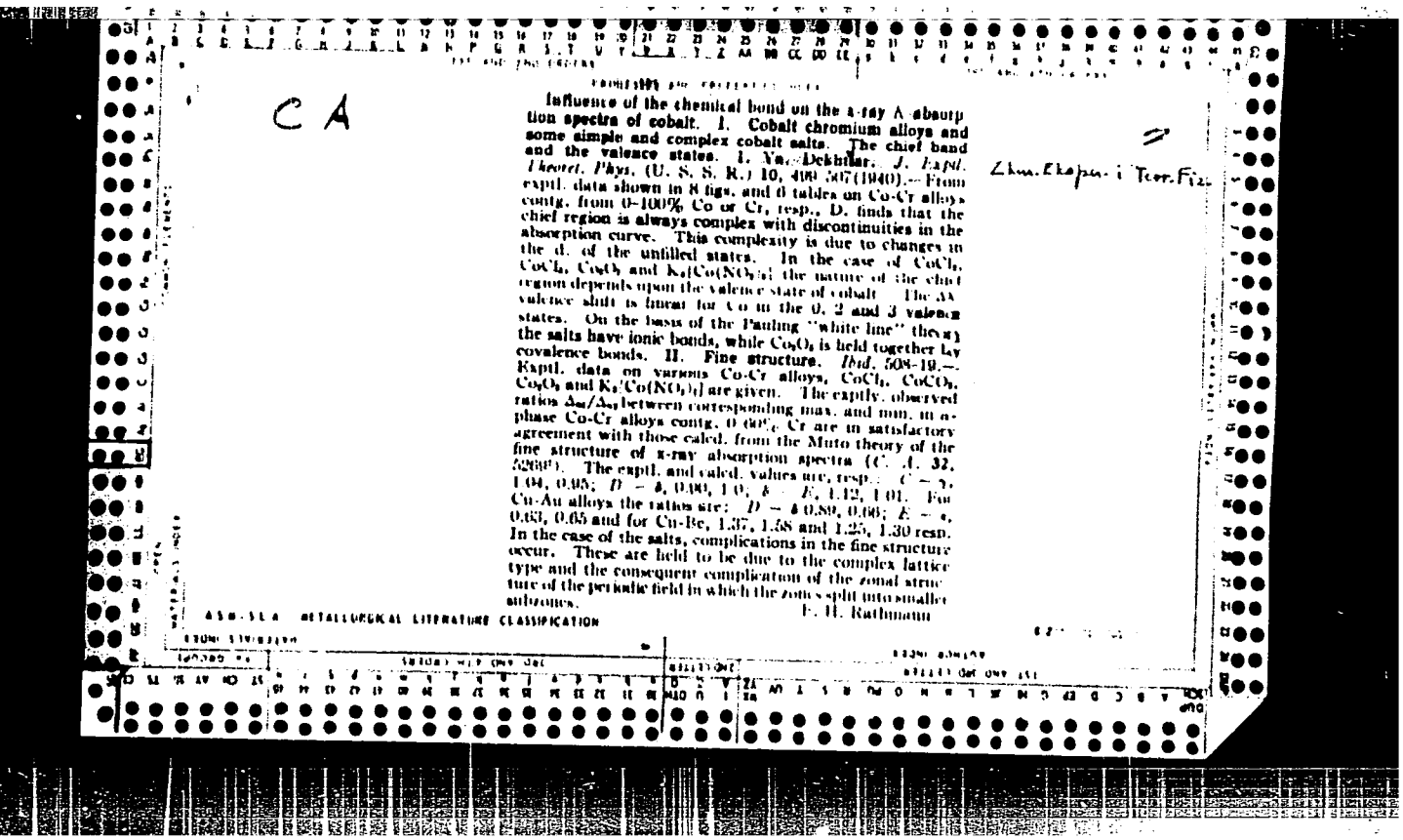
(Zaporozh'ye--Insulating materials)



X-ray investigation on the fatigue in metals. S. D. Gertsriken and I. Yu. Dekhtyar. *J. Tech. Phys. (U. S. S. R.)* 8, 1793-8(1938).—Cr-Ni steel rods were periodically compressed and extended till rupture. Sections from them were exaind. by x-rays and the deformation was ruled. (cf. Brill, *C. A.* 31, 5260⁹). It decreases quickly with rising distance from the fissure. I. J. Bikerman

Zhur. Tekh. Fiz.

Roentgen. Lab., Inst. Geol. Sci., Dept. Geol.-Geog. Sci.-
" " ", Kiev Univ.



CA

Influence of the chemical bond on the x-ray K absorption spectra of cobalt. I. Cobalt chromium alloys and some simple and complex cobalt salts. The chief band and the valence states. I. Ya. Dekhtiar. *J. Exptl. Theoret. Phys.* (U. S. S. R.) 10, 498-507(1940).—From exptl. data shown in 8 figs. and 6 tables on Co-Cr alloys contg. from 0–100% Co or Cr, resp., D. finds that the chief region is always complex with discontinuities in the absorption curve. This complexity is due to changes in the d. of the unfilled states. In the case of $CoCl_2$, $CoCl_3$, CoO_3 and $K_3[Co(NO_2)_6]$ the nature of the chief region depends upon the valence state of cobalt. The $\Delta\lambda$ valence shift is linear for Co in the 0, 2 and 3 valence states. On the basis of the Pauling "white line" theory the salts have ionic bonds, while Co_3O_4 is held together by covalence bonds. II. **Fine structure.** *Ibid.*, 508–19.—Exptl. data on various Co-Cr alloys, $CoCl_2$, $CoCO_3$, Co_3O_4 and $K_3[Co(NO_2)_6]$ are given. The exptly. observed ratios Δ_M/Δ_m between corresponding max. and min. in α-phase Co-Cr alloys contg. 0 60% Cr are in satisfactory agreement with those calcd. from the Muto theory of the fine structure of x-ray absorption spectra (*C. A.* 32, 5280⁹). The exptl. and calcd. values are, resp.: $C - 2$, 1.04, 0.95; $D - 3$, 0.80, 1.0; $E - 4$, 1.12, 1.01. For Cu-Au alloys the ratios are: $D - 3$ 0.89, 0.66; $E - 4$, 0.63, 0.65 and for Cu-Be, 1.37, 1.58 and 1.25, 1.30 resp. In the case of the salts, complications in the fine structure occur. These are held to be due to the complex lattice type and the consequent complication of the zonal structure of the periodic field in which the zones split into smaller subzones.

F. H. Rathmann

Zhur. Eksper. i Teor. Fiz.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

CA

2

Diffusion coefficients. S. D. Gertsriken and I. Ya Dekhtyar (Ukrainian Acad. Sci., Kiev). *Zhur. Tekh. Fiz.* 17, 871–80(1947).—When values for the diffusion coeff. D expt. obtained in the investigation of 2- and 3-component alloys are used in the equation of Dushman and Langmuir (*C.A.* 17, 2817), this equation yields values for the at. distances that do not correspond to the min. distance between the atoms in the lattice. Better values are obtained with the formula of Wynne-Jones and Eyring (*C.A.* 29, 6491[1]), which takes into account also the activation entropy ΔS. The energy of activation E is always less than the binding energy W_0. In the diffusion of Al, Si, and Be into Cu the effect of ΔS is predominant; in the diffusion of Sn into Cu that of E is predominant. W_0 increases with increase in the concn. of the 2nd component throughout. With the appearance of a 3rd component, however, it may remain const. or even decrease, depending on the effect of the 3rd component on ΔS or E. The effect of a third element on diffusion in the solid state. *Ibid.* 881–90.—When Hg diffuses from Pb amalgam, its rate of diffusion is higher, the higher is the temp. and the greater is the content of alloying Mg. The addn. of Mg increases the diffusion coeff. D 2–12 fold. The addn. of Sb reduces D, especially at high temps. This reduction is practically independent of the amt. of Sb added. In both cases the effect of the increase or decrease in activation entropy is of greater importance than the decrease in energy of activation. These results agree qualitatively with those to be expected from the calcn. of the binding energy. Through *Chem. Zentr.* (Russian Zone Ed.) 1948, II, 1288.

M. G. Moore

DEKHTYAR, I. Ya

GERTSRIKEN, S.D.; DEKHTYAR, I.Ya.

Diffusion constants. Sbor. nauch. rab. Lab. metallofiz. no.1:125-134 '48. (MLRA 8:9)

(Diffusion)

DEKHTYAR, I. Ya.

GERTSRIKEN, S.D.; DEKHTYAR, I.Ya.

Effect of the third element on diffusion in the solid state.
Sbor. nauch. rab. Lab. metallofiz. no.1:135-147 '48.
(Diffusion) (Solids) (MLRA 8:9)

GERTSRIKEN, S.D.; DEKHTYAR, I.Ya.; KUMOK, L.M.

Study of the diffusion of chromium in ternary alloys: iron--chromium--carbon. Dop. AN URSR no.2:48-52 '49. (MLRA 9:9)

1. Laboratoriya metalofiziki AN URSR. Predstaviv diysniy chlen AN URSR G.V. Kurdyumov.
(Iron--Chromium alloys)

Dekhtyar I. Ya.

GERTSRIKEN, S.M.; DEKHTYAR, I.I.

Mechanism of diffusion in solid solutions of substitution. Dop. AN URSR no.5:53-56 '49. (MLRA 9:9)

1. Kiiv, Laboratoriya metalofiziki AN URSR.
(Diffusion) (Solutions, Solid)

Dekhtyar I. Ya

GERTSRIKEN, S.M.; DEKHTYAR, I.Ya

Self-diffusion in metals. Dop.AN URSR no.5:57-67 '49. (MLRA 9:9)

1.Kiiv, Laboratoriya metalofiziki AN URSR.
(Diffusion) (Metals)

DEKHTYAR, I.

USSR/Metals Jul 49
Zinc
Brass

"Study of the Diffusion of Zinc in Alpha-Brass in the Temperature Interval 400 - 750° C," S. Gertsriken, I. Dekhtyar, L. Kunok, Lab of Metallophys, Acad Sci Ukrainian SSR, Kiev, 4 pp

"Zhur Tekh Fiz" Vol XIX, No 7

PA 51/49T43

Showed that a discontinuity appears at about 450° C in the curve of temperature versus coefficient of diffusion of zinc in alpha-brass. Determined constants of diffusion, i.e., activation energy [redacted]

51/49T43

USSR/Metals (Contd) Jul 49

and activation entropy for both loops of this curve. Effect is due to local internal distortions in the alloy lattice. Submitted 19 Jul 46.

Mbr., Kab. Metallophysics, Ukr. Acad. Sci.

51/49T43

GERTSRIKEN, S.D.; DEKHTYAR, I.Ya.; GDALEVS'KA, TS.M.

Investigating small diffusion coefficients in Ag-Cd alloys in the 275-450° C temperature range. Nauk. zap. Kiev. un. 9 no.2:41-48 '50. (MLRA 9:12)

(Silver-cadmium alloys) (Diffusion)

C. A.

Effect of the valence of the third element on diffusion in silver-cadmium alloys. S. D. Gertsriken and I. Dekhtyar (Metal Phys. Lab., Acad. Sci. U.S.S.R., Kiev). *Zhur. Tekh. Fiz.* 20, 235–44(1950); cf. *C.A.* 44, 7740i; 45, 7840i.—Ag-Cd alloys of compns. in the range of the ε-phase were homogenized 24 hrs. at 550°. Diffusion coeffs. *D* of Cd were detd. between 610 and 820°K. by the evapn. of Cd from 3–4-μ thin foils on heating in a high vacuum. The pure binary alloy contained 14.80 at. % Cd; the alloy with 3 at. % Zn, 11.88 at. % Cd; alloy with 3 at. % Al, 13.50 at. % Cd; alloy with 3 at. % Sn, 12.22 at. % Cd; another set of alloys was prepd. with the Cd content varying from 9.86 to 21.8 at. %. The following are data of *E* and ΔS (with the 3rd element), E_0 and ΔS_0 (without the 3rd element), ΔE ($=E - E_0$) and $\Delta\Delta S$ ($=\Delta S - \Delta S_0$): AgCd + Zn, 25.84 and −10.62, 23.20 and −11.40, +2.04 and +0.78; AgCd + Al, 29.25 and −10.53, 26.00 and −10.90, +0.25 and +0.23; AgCd + Sn, 24.10 and −11.91, 26.50 and −10.40, −1.70 and −1.51; AgCd + Sb, 23.60 and −11.16, 27.50 and −9.00, −3.90 and −2.86. Plots of ΔE and of $\Delta\Delta S$ as a function of the valence *n* of the 3rd element (Zn, Al, Sn, Sb, *n* = 2, 3, 4, 5) show linear decrease of both ΔE and $\Delta\Delta S$ with increasing *n*.

N. Thon

C.A.

Effect of the valence of the third element on diffusion in copper-zinc alloys. S. D. Gertsriken and I. Dekhtyar (Metal Phys. Lab. Acad. Sci. Ukr. S.S.R., Kiev). *Zhur. Tekh. Fiz.* 20, 45-52(1950); cf. preceding abstr.—Linear variation of both δE and $\delta\Delta S$ with the valence n of the 3rd element, but, in contrast to the Ag-Cd alloys, with δE and $\delta\Delta S$ *increasing* linearly with n, was established by the same procedure, between 870 and 1020°K., for Cu-Zn alloys (homogenized 30 hrs. at 850°) with: Zn 6.57; Zn 6.67, Mn 2; Zn 6.695, Ni 2; Zn 6.675, Au 2; Zn 6.76, Sn 2; Zn 5.86, Sb 2 at. %, the valences of Mn, Ni, Au, Sn, Sb, in these alloys are taken n = 0, 0.6, 1, 4, 5. Au alone falls out of the straight line. The data of E and ΔS for the above 6 samples are: 28.3 kcal./g. at. and −14.23 cal./g. at. degree; 25.0 and −15.02; 27.5 and −14.22; 34.2 and −7.1; 34.7 and −7.24; 37.0 and −6.89. The linear variation of δE and $\delta\Delta S$ with n is paralleled by a linear variation of the coeff. b^2 in Braune's (*C.A.* 18, 3504) relation $D = D_0 e^{-b^2 T_f/T}$ (where T_f = melting temp.), $b^2 = E/3RT_f$, as a function of r^3 (at. radius of the diffusing element). In the diffusion of Cu, Cd, Sn, and Sb into Ag, b^2 decreases linearly with increasing r^3, whereas in the diffusion of Be, Zn, Al, and Sn in Cu, and of Ag, Cd, Hg, and Te in Pb, b^2 increases linearly with r^3, and the same direction of the linear variation of b^2 with r^3 is found in the interstitial diffusion of H_2, N_2, and C in γ-Fe. The activation energy E of a ternary alloy ABC can be expressed as a function $\Phi(E_F, E_A, E_B \ldots)$ of the Fermi energy E_F and the energies E_A, E_B .... E_F = $(h^2/8m\pi^2)(3/\pi)^{2/3}n^{2/3}$, and the no. of electrons per atom $n = c'_A n_A + c_B n_B + c_C n_C$, where c = concn. of the component indicated by the subscript, and $c'_A = c_A - c_C$. The change of E with the valence of the 3rd component is found by differentiation of E_F with respect to n, which finally gives $\delta E = (\partial\Phi/\partial E_F)(2/3)(3/\pi)^{2/3}(h^2/8m\pi^2)n^{-1/3}[c_C(n_C - n_A)] + \ldots$, with further terms contg. the factor $c_C(n_C - n_A)$. Since δE is proportional to that factor, δE must vary linearly with the valence n_C of the 3rd element if its concn. c_C remains const. The terms of the polynomial of the bond energy have different signs, and, consequently, δE can be either pos. or neg. The deviation of Au from the linear relations may indicate that Au in the Cu-Zn alloy has a valence different from 1. The same 3rd element can increase the diffusion coeff. D in a binary alloy in one temp. range, and decrease it in another range. Thus, at 660°K., for Ag-Cd, $10^9 D$ = 0.076 cm.²/24 hrs., Ag-Cd-Al 0.045, Ag-Cd-Sn 0.054, and at 730°K., $10^9 D$ = 0.46, 1.05, and 0.37, resp., i.e., both Al and Sn lower D of Cd → Ag at 660°K., whereas at 730°K., Al increases D by a factor of over 2, and Sn lowers D. The effect of a 3rd element on D is detd. by its effects on both E and ΔS.

N. Thon

CA

Diffusion of chromium in iron-chromium alloys with impurities. S. Ostrakhov and I. Ya. Dekhtyar (*Metal Phys. Lab., Acad. Sci., Ukr. S.S.R., Kiev*). *Zhur. Tekh. Fiz.* **20**, 1083–14(1950); cf. *C.A.* **44**, 1322*i*, 1323*b*.—The diffusion coeffs. *D* were detd., by the previous method of high-vacuum evapn. of Cr from the alloys, between 960 and 1072°, in alloys of Fe (contg. 0.02% C) with Cr (contg. up to 1% Al), of the compn. (Cr in wt. %, 3rd element in at. %): (I) Cr 7.58; (II) Cr 8.39, Ni 1; (III) Cr 8.43, Be 1; (IV) Cr 8.80, Sn 1; (V) Cr 7.36, Ti 1; (VI) Cr 8.75, Si 1; (VII) Cr 8.44, Nb 1; (VIII) Cr 6.58, W 1; these compositions correspond to Cr 9.5 at. %, 3rd element 1 at. %, balance Fe. The alloys were annealed 50 hrs. at 1200° and rolled into foils 7–20 μ thick. Rapid. data of 10⁸ *D* (Cr) (sq. cm./24 hrs.) at 950, 980, 1010, 1018, 1050, 1041, 1072°, are (I) 1.04, 1.92, 6.16, 11.47, 14.0, 26.4, 52.4; (II) 0.76, 1.42, 4.17, —, —, 15.1, 37.1; (III) 0.56, 1.14, 3.75, —, —, 10.1, 13.1; (IV) 6.55, 10.58, 24.6, —, 31.7, 54.1, 67.3; (V) 0.36, 0.80, 1.63, —, —, 2.00, 5.11; (VI) 0.91, 1.10, 2.18, —, 2.10, 4.7, 5.9; (VII) 0.50, 0.80, 2.21, —, —, 4.35, 12.5; (VIII) 1.21, 2.43, 6.70, 9.63, 15.0, 23.5, 56.4. Values of *E* (kcal./g. atom) and ΔS (cal./g. atom degree) are (I) 112.0, 36.0; (II) 105.0, 29.8; (III) 85.3, 13.87; (IV) 75.5, 10.55; (V) 66.1, −2.0; (VI) 80.8, −8.14; (VII) 91.3, 17.56; (VIII) 111.2, 35.5. As functions of the valence *n* of the 3rd element (*n* = 0, 0.6, 2, 4, 4, 4, 5, 6 in alloys I–VIII), *δE* and *δΔS* (cf. *loc. cit.*) decrease linearly with increasing *n* down to *n* = 4, then increase linearly from *n* = 4 to *n* = 6; the point for Sn lies higher than the points for Ti and Si (deepest). At const. valence, as functions of log *Z* (at. no.), *δE* and *δΔS* increase linearly in the series Si, Ti, Ge, Sn. The effects of Ti, Si, and Nb on *E* and ΔS are opposed, with the effect of the entropy factor on the rate prevailing, whereas with Sn it is the effect of the activation energy that prevails. That the linearity of *δE* holds in the series Ni, Be, Si, and along the series Ti, W, Cr, is due to the favorable dimension factor, and the same factor is responsible for the differences of *δE* between the equivalent elements, Si, Ti, and Sn. For W, the dimension factor is favorable, but W causes almost no change of *D*, possibly by reason of its contributing the same no. of electrons to the alloy as does Cr. The linearity between *δE* (or *δΔS*) and log *Z* holds also for the series Al, Ga, In, in the previously investigated Ag-Zn alloys (*C.A.* **44**, 7740*f*). The value of *E* for pure Cr-Fe, 112 kcal., is higher than the bond energy W of both pure Fe (94) and pure Cr (88). As *E* must be a definite fraction of *W*, it follows that the Cr-Fe alloy must have *W* > 112. The proportionality factor *k* between *E* and *W* thus appears to be characteristic not only of the bond strength but also of the nature of the bond in an alloy. For alloys with a typical metallic bond (α solid solns. Cu-Zn, Ag-Cd, Ag-Zn, and pure metals) *k* = tan α/*Ac*, where *c* = at. concn. of the 3rd element, tan α = slope of *δE* as a function of *n*, and *A* depends on the Fermi energy of the alloy. Presence of a partly filled *d* band should strengthen the bonding in the alloy, and a 3rd element, particularly Si, Ti, and Sn, appears to weaken that bonding strength. A practical implication of these findings is that Ti and Si, which lower the rate of diffusion of Cr, and, consequently, should also lower the oxidizability, are desirable in heat-resistant Fe-Cr alloys, whereas Sn should be undesirable. On the other hand, all 3 elements (Ti, Si, Sn) should be undesirable in Fe-Cr intended to be creep-resistant at high temps. Nb should increase the heat resistance; no prediction can be made with regard to W. A further practical implication is the obvious possibility of praisiring, on the basis of the observed effect of a 3rd element on *E* of diffusion, the time necessary to attain, at a given temp., homogenization of an alloy if that time is known for the pure binary alloy.

N. Thon

(A

Diffusion and bonding in metallic alloys. I. Ya. Dekhtyar (Metal Phys. Lab., Acad. Sci., Ukr. S.S.R., Kiev). *Zhur. Tekh. Fiz.* 30, 1015-24(1960); cf. preceding abstr.—Survey of data of the activation energy E of self-diffusion and of the bond energy W (identified with the heat of sublimation) for pure metals shows a proportionality $E = bW$, with the following values of b: Pb 0.60, Bi $\perp$ 0.63, Zn $\parallel$ 0.63, Zn $\perp$ 0.64, Au 0.66-0.68, Cu 0.62-0.70, Ag 0.68, Al 0.68, γ-Fe 0.51, α-Fe 0.33. Within the limits of uncertainty, $b = 2/3$ for face-centered metals with the coördination no. $z = 12$, and, as far as can be judged from the single example of α-Fe, $b = 0.33$ for a body-centered metal with $z = 8$. The constancy of b for the same type of crystal indicates a common mechanism of self-diffusion over vacancies. Estn. of b for binary alloys from diffusion data can be done by comparing the change of E with the electron concn., and, on the other hand, the change of the Fermi energy E_F, at the same compn., with the electron concn. Calcn. of E_F in a solid solns. Ag-Cd and Ag-Zn was done following the procedure of Jones (*C.A.* 31, 5379) for Cu alloys. That treatment leads to a theoretical expression showing ΔE to be proportional to the concn. c_s and to the valence n_s of the 3rd element, in agreement with the exptl. data of Gertsriken and D. (cf. preceding abstr.). That same theoretical expression permits calcn. of b from the slope of the linear plots of ΔE as a function of n_s. The result, for the diffusion of Zn in brass, Cd in Ag-Cd, and Zn in Ag-Zn, is $b = 0.69$, 0.62, and 0.50, resp. This is close to $b = 0.66$ for pure metals with $z = 12$, and indicates a mechanism of diffusion identical with the mechanism of self-diffusion in these metals. The fact that $b < 1$, i.e. E is a fraction of W, indicates that the most probable mechanism of the diffusion in face-centered metals and substitutional alloys is diffusion through lattice vacancies; in the case of diffusion through exchange, b would be > 1.

N. Thon

EA

7

High-temperature strength of alloys. I. Dekhtyar (Acad. Sci., U.S.S.R., Kiev). *Doklady Akad. Nauk S.S.S.R.* 73, 303-5(1950).—Theoretical predictions of creep strength are made on the basis that the activation energy for creep and that for self-diffusion are the same. The activation energy for diffusion is related to the energy of binding in the lattice, and the latter energy is connected with the N(E) curve for the metal or alloy. Qual. illustrations are given for Ag and Cu and for alloying of ferrite and austenite. A. G. Guy

Mem., Lab. Metallophysics, Ukr. Acad. Sci., - c 1949 -.

Evaluation B-62251

1957

DEKHTYAR, I. YA.

USSR/Metals - Diffusion 21 Oct 51

"Certain Laws Governing Diffusion and Physical (Mechanical) Properties of Metals," I. Ya. Dekhtyar, Lab of Metallophys, Acad Sci Ukrainian SSR, Kiev

"Dok Ak Nauk SSSR" Vol LXXX, No 6, pp 875-878

Attempts to clarify observed effects of decreased energy of activation with increased stress (tension), diffusion, and deformation on the basis of the theory of reaction speed Cf. Glasstone, etc., "Theory of Absolute Speed of Reaction" (translated 1948 into Russian); Kauzman, "Metals Technology" 8, 1301, 1941. Submitted 15 Aug 51 by Acad A. F. Ioffe.

217T44

DEKHTYAR, I. Ya.

PA 235T17

USSR/Chemistry - Alloys, Atomic Struc- 21 Jul 52
ture

"Interaction Between Atoms in Alloys Based on Elements of Period IV of Mendeleyev's Periodic System," I.Ya. Dekhtyar, Metal Phys Lab, Acad Sci Ukrainian SSR

"Dokl Ak Nauk SSSR" Vol 85, No 3, pp 583-586

The interatomic energies and the manner in which atoms of transitional metals are held together in alloys are worked out on the basis of relationships derived from atomic structure and the position of the elements in question in the periodic table. Presented by Acad I.I. Chernyayev 23 May 52.

235T17

DEKTYAR, I. YA.

Solid State Physics, Thermodynamics (1900)
Vopr. Fiz. Metallov i Metallovedeniya A. N. Ukrainskoy SSR, No 1, 1953, pp49-54
Dektyar, I, Ya., and Kumok, L. M.
Onthe Mechanism of Alloy Oxidation

By reading weight increments of specimens, oxidized in air in an electric furnace at a temperature of 750-860°C, kinetics of the growing oxide layer, thermal dependence of the exidation constant, and the diffusion of Mn in the alloy Ni-Mn were studied.

So: "oscow, Referativnyy, Zhurnal -- Fizika, No 5, 1954 W-31059

Dekhtyar, I. Ya.

1-RB

1

Dependence of the diffusion coefficient on atomic interaction in metals and alloys. I. Ya. Dekhtyar. Voprosy Fiz. Metal. i Metalloved., Akad. Nauk Ukr. S.S.R., Sbornik Nauch. Trudov 1953, No. 4, 49-8.—The calcns. developed concern the elucidation of the phys. significance of the parameter D_0 which dets. the diffusion rate D given by the equation $D = D_0 e^{-E_0/RT}$. Since D_0 depends, among other factors, on the coeff. of thermal expansion, which in turn is the function of the character and magnitude of interatomic reactions, D_0 should depend on the character of interat. bonds. The general formula derived for D_0 shows that it is a function of activation energy, the temp. of the m.p., and the relative change of binding energy during the heating up to the m.p. The values of the diffusion coeff. for various metals, derived theoretically by the application of the formula established, are in satisfactory agreement with the exptl. results. The expression for the entropy of activation is also derived. The calcns. show that the values of D_0 and E_0 are ruled by the interat. bonds; consequently the diffusion coeff. for metals and alloys is some complex function of the interat. binding forces. N. Kholdorski

Mt

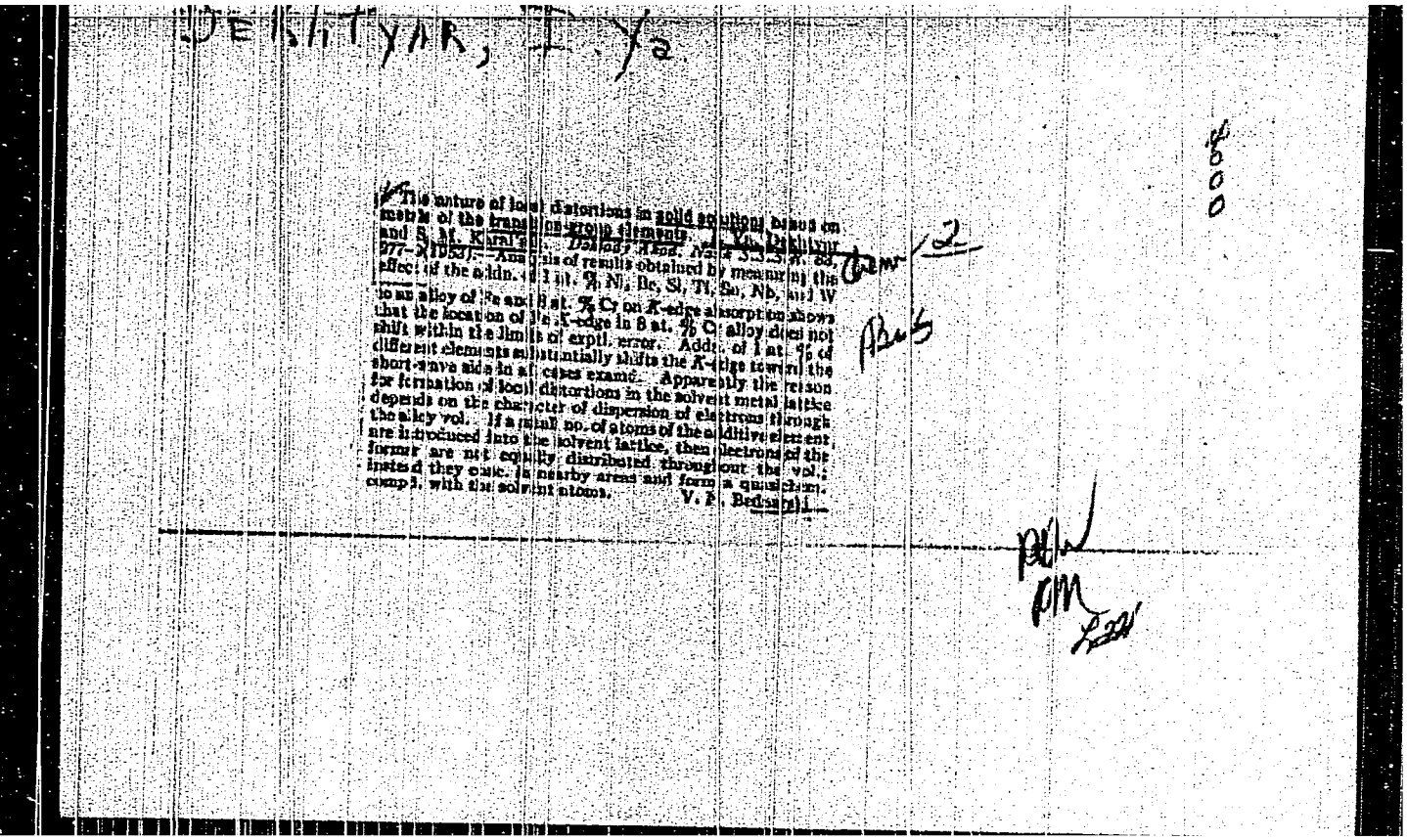
Struct

MT

USSR.

Mechanism of alloy oxidation. I. Ya. Dekhtyar and L. M. Kamch... Voprosy Fiz. Metal. i Metalloved., Akad. Nauk Ukr. S.S.R. 1953, No. 4, 49-54; Referat. Zhur., Khim. 1954, No. 24213.—The growth kinetics of the oxide layer and the temp. relation of the oxidation const. were studied for Ni-Mn alloys contg. 16 at. % Mn. Specimens 0.03 cm. thick and having an area of 4.4 and 3.8 sq. cm. were oxidized in air in an elec. furnace at normal pressure. The increase in wt. in mg. was measured in relation to the time of exposure at 750-850°. The oxidation process follows a parabolic curve. The energy of activation of the oxidation process E is 31,000 cal./mol. High-temp. oxidation of pure Mn showed that up to 900° the oxides are predominantly Mn_3O_4 and E is 391,000 cal./mol. E for oxidation of Mn is practically independent of the presence of Ni in the alloy. A study of diffusion of Mn in a Ni-Mn alloy with 15.35 at. % Mn by the method of evapn. in high vacuum showed that the rate of reaction occurring on the alloy-oxide boundary is proportional to the heat of soln. of Mn in the oxide.

M. Hoch



DEKHTYAR, I. Ya.

Metallurgical Abst.
Vol. 21 May 1954
Properties of Metals

Applied Mechanics Review
June 1954

(PA 56 no. 671:7968 '53)

*The Dependence of the Diffusion Coefficient on Atomic Interaction in Metals and Alloys. I. Ya. Dekhtyar (*Doklady Akad. Nauk S.S.S.R.*, 1953, 89, [1], 49-52).—[In Russian]. The following expression, which agrees with observation, is derived for the coeff. D_0 in the diffusion equation $D = D_0\exp(-E_a/RT)$; $D_0 = \left(\frac{kT}{h}\right)\left(\frac{T}{\theta}\right)^{\frac{1}{3}}\frac{\delta^2}{2}[1-\Phi(y)]\exp(\beta\alpha\chi^{-1}v_a/2R)$, where θ = characteristic temp., δ = average interatomic distance, $\Phi(y)$ = Gauss error function, α = coeff. of expansion, χ^{-1} = compressibility modulus, and v_a = vol./g.-atom. The expression is extended to the form

$$\ln D_0 = \ln\left\{\left(\frac{kT}{h}\right)\left(\frac{T}{\theta}\right)^{\frac{1}{3}}\frac{\delta^2}{2}[1-\Phi(y)]\right\} + \frac{Q}{E_s}\cdot\frac{E_a}{RT_m},$$

where $Q = \int_0^{T_m} C_p dT$, E_a = activation energy, E_s = binding (sublimation) energy, T_m = m.p. Plots of $\ln D_0$ versus E_a/T_m for dil. soln. in Cu, Ag, Au, and Pb confirm the dependence of slope on Q/E_s. It is concluded that both the activation energy and diffusion coeff. are dependent on the nature and magnitude of interatomic binding. 10 ref. (Translated by the U.S. National Science Foundation (NSF-tr-25)).

—D. M. P.

DEKHTYAR, I. Ya.

277/104

569.24.74 :537.312.8

Variations on Electrical Conductivity of Ni-Mn Alloys in Magnetic Fields Depending on Composition

Dokl. Akad. Nauk SSSR 93(4), 637-639 1953

I. Ya. Dekhtyar

U.S.S.R.

Index
Aeronauticus
April 1954
Metallurgy

Electrical phenomena in ferromagnetic substances are investigated as affording valuable evidence of the relationship between ferromagnetism and electrical conductivity. The temperature relationship of electrical conductivity of a ferromagnetic substance is assumed to proceed by interaction between the conducting electrons and the phonons, as well as by the perturbations due to the d electrons. These effects can be taken as indicative of the microstructure of metals and alloys. On the one hand, investigation of the same effects in a number of ferroalloys has led to the conclusion that characteristic chemical bands are present in such solid solutions; alternatively, radiospectrography of the same alloys indicates the possible formation of quasi-chemical structures by interaction between transient components in the alloy stage. The experiments here described, confirm such relationship between the first-named effects (named in their totality, the "Goldhammer" effect) and the character of the interatomic phenomena in transitional alloys. (Bibl. 9)

GERTSRIKEN,S.D., doktor fiz.-mat. nauk; DEKHTYAR,I.Ya., kandidat fiz.-mat. nauk; KUMOK,L.M.

Study of manganese diffusion based on admixtures in the ternary alloy: nickel-manganese-third element. Sbor. nauch. rab. lab. metallofiz. no.5:71-77 '54. (MLRA 8:9)
(Nickel-manganese alloys)

DEKHTYAR, I.Ya., kandidat fiz.-mat. nauk

Thermodynamic criteria for the resistance of metal alloys to deformation. Sbor. nauch. rab. Lab. metallofiz. no.5:97-103 '54. (MLRA 8:9)

(Deformations (Mechanics)) (Metals at high temperatures)

DEKHTYAR, I. YA.

137-58-2-4155

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 2, p 270 (USSR)

AUTHOR: Dekhtyar, I. Ya.

TITLE: The Temperature Dependence of the High-temperature Strength of a Solid Solution (O temperaturnoy zavisimosti zharoprochnosti tverdogo rastvora)

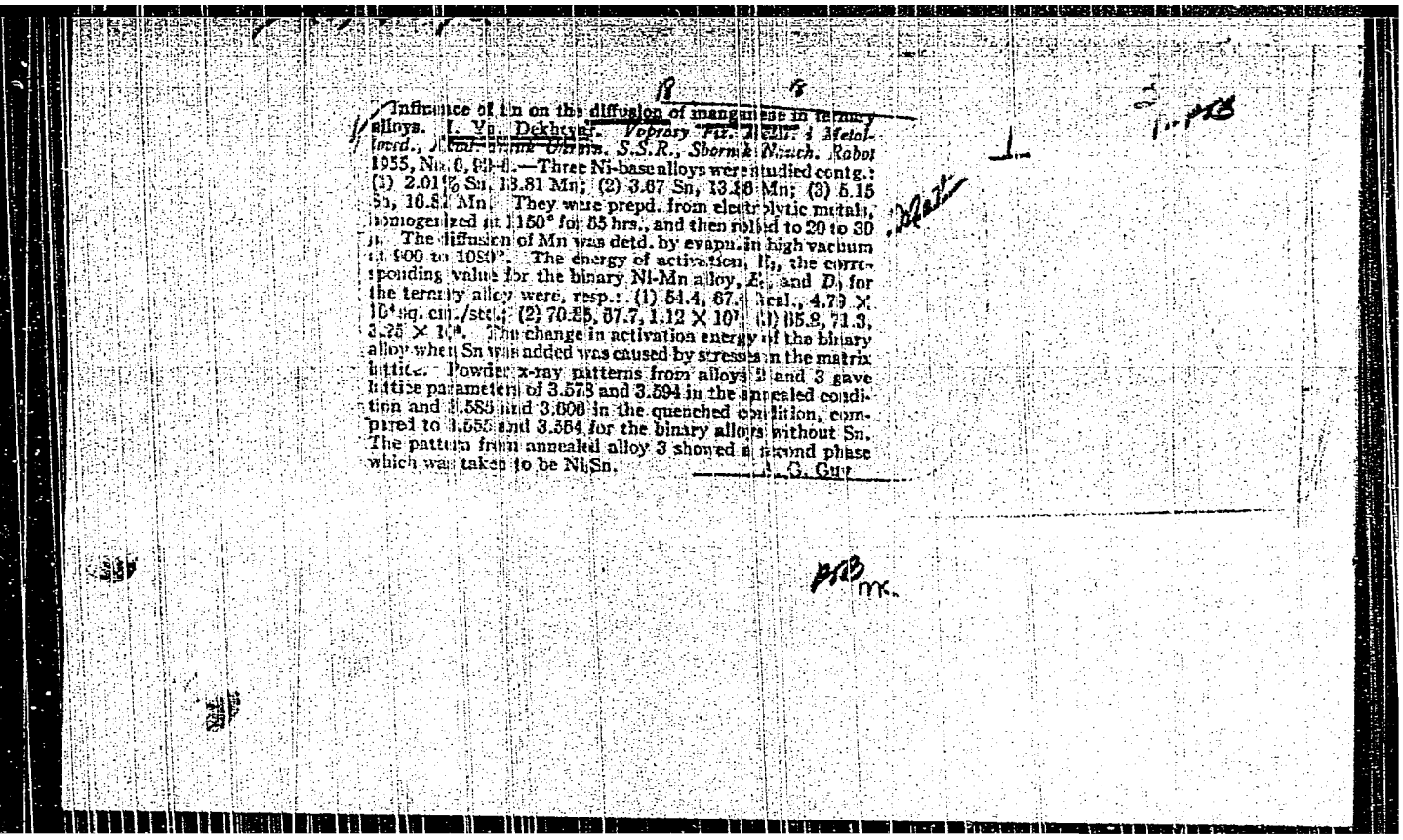
PERIODICAL: Sb. nauchn. rabot In-ta metallofiziki AN UkrSSR, 1955, Nr 6, pp 85-91

ABSTRACT: Based on the connection between diffusion phenomena and resistance to deformation at high temperatures, an examination was made of the relationship between the composition of a solid solution and its heat resistance. A formula is proposed for determining the composition of an alloy possessing its maximum strength at a given temperature. A numerical example is offered. Bibliography: 5 references.

T.F.

1. Alloys--Properties 2. Alloys--Deformation 3. Alloys--Temperature effects

Card 1/1



Influence of Sn on the diffusion of manganese in ternary alloys. I. Ya. Dekhtyar. *Voprosy Fiz. Metallov i Metalloved., Akad. Nauk Ukr. S.S.R., Sbornik Nauch. Rabot* 1955, No. 6, 83–6.—Three Ni-base alloys were studied contg.: (1) 2.01% Sn, 13.81 Mn; (2) 3.67 Sn, 13.18 Mn; (3) 5.15 Sn, 10.81 Mn. They were prepd. from electrolytic metals, homogenized at 1150° for 55 hrs., and then rolled to 20 to 30 μ. The diffusion of Mn was detd. by evapn. in high vacuum at 900 to 1050°. The energy of activation, E_a, the corresponding value for the binary Ni-Mn alloy, E_0, and D_0 for the ternary alloy were, resp.: (1) 54.4, 67.4 kcal., 4.79×10^{-1} sq. cm./sec.; (2) 70.25, 67.7, 1.12×10^{1}; (3) 65.2, 71.3, 3.25×10^{0}. The change in activation energy of the binary alloy when Sn was added was caused by stresses in the matrix lattice. Powder x-ray patterns from alloys 2 and 3 gave lattice parameters of 3.573 and 3.594 in the annealed condition and 3.583 and 3.600 in the quenched condition, compared to 3.555 and 3.564 for the binary alloys without Sn. The pattern from annealed alloy 3 showed a second phase which was taken to be Ni_3Sn. —A. G. Guy

DEKHTYAR, I.Ya.

Rate of removing unbalanced distortions in metal lattices. Sbor.nauch. rab.Lab.metallofiz. no.6:97-102 '55. (MLRA 9:7)
(Metal crystals) (Alloys--Heat treatment)

DEKHTYAR, I Ya.

USSR/Optics - X-Rays. K-8

Abs Jour : Referat Zhur - Fizika, No 3, 1957, 8029

Author : Gertsriken, G.D., Dekhtyar, I.Ya., Karal'nik, S.M., Kutsenko, Ye.

Inst : Kiev University, USSR.

Title : K Edge of Absorption of Components of Triple Alloys with a Nickel-Cobalt Base.

Orig Pub : Nauk. zap. kuvo'k. un-t, 1955, 14, No 8, 121-123

Abstract : It is established that the K absorption edges of all the components of the Ni-Co-Mn and Ni-Mn-Fe shift towards the shortwave side upon transition from the pure metals of the alloy, and also that the structure of the K-edge of the manganese becomes more conplicated. These data cannot be explained by the band theory of metals.

Card 1/1

DEKHTYAR, I.Ya.

Conference on diffusion in metals and alloys. Usp.fiz.nauk 57 no.3: 517-524 N '55. (MLRA 9:2)
(Diffusion) (Kiev--Physical metallurgy--Congresses)

Dekhtyar, I. Ya.

USSR/Solid State Physics - Mechanical Properties of Crystals and Polycrystalline Compounds, E-9

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 34895

Author: Dekhtyar, I. Ya., and Osipov, K. A.

Institution: None

Title: On the Breakdown of Metals at High Temperatures

Original Periodical: Dokl. AN SSSR, 1955, 104, No 2, 229-232

Abstract: The phenomenon of breakdown of metals is considered as a process of an increase in the breakdown of the regularity of the crystal structure, developing with time under the influence of the stress and of thermal motion. The kinetics of the breakdown process are examined in connection with the following basing assumptions: (1) the destruction zone is the region in which the crystalline lattice loses its stability most rapidly, approaching in its state to the liquid phase; (2) the breakdown of the metal is due to the formation of a certain critical number of "melting centers" within the breakdown zone; and (3) in order to

Card 1/2

USSR/Solid State Physics - Mechanical Properties of Crystals and Polycrystalline Compounds, E-9

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 34895

Abstract: break down the metal it was enough to bring this zone to a state analogous to the melting state. To determine the time prior to the breakdown it is proposed that the velocity of the accumulation of "melting centers" in the breakdown zone, under the influence of the stresses and of the thermal motion, is proportional to the initial concentration of the vacancies. The role of the stresses is reduced to a disordering action. The above considerations make it possible to obtain an equation for the time t_p prior to the breakdown. Analysis of the equations obtained shows that, starting with a temperature close to approximately 0.8 T_s (T_s is the melting temperature) the dependence of ($\ln t_p$) on ($1/P$) begins to deviate substantially from a straight line. The time prior to breakdown increases with the strength of the interatomic bonds and increases with diminishing mobility of atoms at a given temperature.

Card 2/2

SOV/137-57-11-22324

Translation from: Referativnyy zhurnal, Metallurgiya, 1957, Nr 11, p 239 (USSR)

AUTHOR: Dekhtyar, I.Ya.

TITLE: The Influence of Crystal Structure Defects on Metal Failure (Vliyaniye defektov kristallicheskogo stroyeniya na razrusheniye metallov)

PERIODICAL: V sb.: Prochnost' metallov, Moscow, AN SSSR, 1956, pp 27-35

ABSTRACT: The results of experiments to study the major regularities of failure of the following metals and alloys: Ag, Cu, Al, and manganin, are presented. Annealed specimens in the form of sized wires of 0.5-1.5-mm diam and 120-mm length are subjected to tension at various stresses and temperatures in a vacuum of ~10^{-2} mm Hg. The temperature interval in which the tension is applied is 400-1000°C (to within an error of ±1.5°). The time elapsing until failure of the specimen (at a given tension) was measured by stopwatch and ranged from 10^4 to 1 sec. The data are presented in the form of graphs for the ratio of time until failure versus temperature (at constant tension) and time until failure versus tension (at constant

Card 1/2

Physical Metallurgy Lab AS USSR

The Influence of Crystal Structure Defects on Metal Failure

temperature). A table for the values of the energies of activation of the process of failure at low tensions is also presented, as is a coefficient characterizing the stress concentration for the given materials. The experimental and literature data are drawn upon for a series of hypotheses on the mechanism of failure of plastic materials and in particular on the relationship between practical and theoretical strengths and the formation and motion of vacancies and dislocations. An estimate is made of the size of microcracks along the grain boundaries and the number of holes accumulating in the failure zone in high-temperature testing.

V.Sh.

DEKHTYAR, I. YA.

6
4E2c

Diffusion of cobalt in cobalt-aluminum alloys. [illegible] and I. Ya. Dekhtyar. *Fiz. Metal. i Metalloved.* 4, 242-8(1956).—Alloys of pure carbonyl Co and 99.9% Al were melted in an Al atm. After melting, the alloys were tempered at 1100-50° in vacuo for 80 hrs. Diffusion of Co^{60} was studied by β-absorption and β-activity measurements with 0.1-μ-thick layers of electrolytically pptd. $CoSO_4$ soln. partly contg. Co^{60}. The diffusion coef. (d.c.) was calcd. by applying the additivity rule and was dependent upon the compn., with a min. in the neighborhood of the compd. CoAl. The increase of d.c. with Al concn. was much stronger than with Co concn. This indicates the formation of structural Co vacancies at higher Al concns. The d.c. minimum was 2.17×10^{-7} sq. cm./day at 1100° and 2.88×10^{-7} 1200°. The addn. of Al increased the activation energy of Co diffusion, probably because of an increased bond energy between the Al and the Co atoms. S. Pakswitch

DEKHTYAR, I. YA.

Category : USSR/Solid State Physics - Mechanical Properties of Crystals and Polycrystalline Compounds E-9

Abs Jour : Ref Zhur - Fizika, No 2, 1957 No 3992

Author : Dekhtyar, I.Ya., Paderno, V.N.
Inst : Institute of Metal Physics, Academy of Sciences USSR
Title : On the Parameters of the Failure of Metals at High Temperatures

Orig Pub : Izv. AN SSSR, Otd. tekhn. n., 1956, No 5, 144-147

Abstract : In order to check experimentally the deductions, obtained in a previous work (Referat Zh. Fizika, 1956 34895), a study was made of the basic laws of the failure of Ag, Cu, Al, and of the alloy manganin. Specimens in the form of caldbrated wires with a diameter of 0.5 -- 1.5 mm and a length of 12 cm were subjected to tension at various stresses and temperatures in vacuum of 10^{-2} mm mercury. The time required for failure (t_f) was determined in the temperature range of 400 -- 1000°, depending on the metal. The curves for the dependence of log t_r on 1/T are straight lines over a wide temperature range, but at high temperatures one observes a considerably deviation from the linear relationship, this being in agreement with the theory. Experimental data were used to determine

Card : 1/2

Category : USSR/Solid State Physics - Mechanical Properties of Crystals and Polycrystalline Compounds E-9

Abs Jour : Ref Zhur - Fizika, No 2, 1957 No 3992

the energy of activation of the failure process at low stresses, the energy of formation of vacancies, and the energy of activation of the constant creep. For pure metals, the first parameter turned out to be close to the sublimation energy. An exponential dependence of the time prior to failure on the stress was experimentally determined. The data obtained indicate that the laws of the failure of metals are satisfactorily represented by the derived equations, and that the relationship between the basic parameters of the process -- energy of vacancy formation and the energy of activation of the constant creep -- remain approximately constant (0.35 -- 0.45).

Card : 2/2

SOV/124-58-1-1397

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 1, p 172 (USSR)

AUTHOR: Dekhtyar, I. Ya.

TITLE: On the Role of Crystalline-structure Defects in the Course of Certain Processes in Metals (O roli defektov kristallicheskogo stroyeniya v techenii nekotorykh protsessov v metallakh)

PERIODICAL: Sb. nauchn. rabot In-ta metallofiz. AN UkrSSR 1956, Nr 7, pp 53-76

ABSTRACT: A description of defects and an analysis of their influence on deformation, fracture, and diffusion processes. The creep in metals is discussed in detail. An assumption is made relative to the prevalence of the influence of the vacancies. Rupture of a metal at elevated temperatures is assumed to be related to the generation of a disproportionately large number of "liquid"-phase nuclei in the rupture zone. The author states the problem of the connection between the practical and the theoretical strength of metals; he then proceeds to analyze the influence of microfissures on the strength of a metal. In examining the diffusion process in metals the author focuses his attention on the role of the vacancies. He evaluates the effect of foreign atoms of the evolution of diffusion processes and on the state of the atoms of

Card 1/2

On the Role of Crystalline-structure Defects (cont.)

the base component.

V. M. Kardonskiy

X-ray investigation of alloys in conjunction with their magnetic state. S. M. Karal'nik, I. Ya. Dekhtyar, D. M. Kovalkii, V. G. Chuprina, and L. G. Nikolaeva. Izvest. Akad. Nauk S.S.S.R., Ser. Fiz. 20, 811-14(1956).—The K-absorption edge of the components were investigated simultaneously with the at. magnetic moments obtained from measurements of satn. magnetization of the alloys (1) Ni 84.2 + Mn 13.8 + Sn 2%, (2) Ni 82.5 + Mn 13.8 + Sn 3.7, and Ni 78 + Mn 16.8 + Sn 5.2%. The at. magnetic moment of Ni decreases linearly with increase of Sn. The K edge is shifted to shorter wave length, explained by a transfer of valence electrons from Sn to the 3d band of Ni. The K bands Mn are also shifted to shorter wave length, contradictory to expectation. S. Pakswer

Clipped from Chemical Abstracts

Diffusion parameters and x-ray absorption spectra of atoms and alloys. I. Ya Dekhtyar. *Doklady Akad. Nauk S.S.S.R.* 109, 1109-11(1956).—The connection between the diffusion parameters and the K absorption spectra of Co in alloys with Cr was studied. The interat. interaction was previously investigated in Ni-Mn alloys by Lepeshkov and Bodaleva (*C.A.* 46, 9902i) in relation to the filling of vacancies, expressed by the filling criterion α, which was found to increase with an increase in the diffusion activation energy. The same rule held also for Co-Cr alloys, where α was detd. from the magnetic moment changes with the changes in the alloy compn. A comparison of results with results obtained in the x-ray absorption spectra of Co autodiffusion in Co-Cr alloys shows that the greater the activation energy, the greater is also the Co K-region displacement toward the high-energy side (short wave length). This is explained by the filling of the d vacancies of Co and Cr. In a homogeneous solid soln., the K-region displacement towards the short waves corresponds to the interat. energy increase, which can be evaluated in the diffusion energy increase, as well as an increase in α with the increase in the Cr content in the alloys. V. M. Sternberg

Inst. for the physics of metal of the Academy of Science in the Ukrainian SSR.

DEKHTYAR, I. YA.

137-58-5-10597

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 5, p 247 (USSR)

AUTHOR: Dekhtyar, I. Ya.

TITLE: The Influence of Defects in Crystal Structure Upon the Failure of Metals (Vliyaniye defektov kristallicheskogo stroyeniya na razrusheniye metallov)

PERIODICAL: V sb.: Issled. po zharoprochn. splavam, Vol 2. Moscow, AN SSSR, 1957, pp 57-65

ABSTRACT: Bibliographic entry. Ref. RzhMet, 1957, Nr 11, abstract 22324

1. Metals--Failure 2. Crystal structure--Effectiveness

Card 1/1

DEKHTYAR, I.Ya.

DEKHTYAR, I.Ya.

Effect of defects in crystal structure on metal failure. Issl. po zharopr. splav. 2:57-65 '57. (MIRA 11:2)
(Metal crystals) (Deformations (Mechanics))

DEKHTYAR, I.Ya.

126-1-3/40

AUTHOR: Dekhtyar, I.Ya.

TITLE: Atomic States in Alloys of Transition Elements (O sostoyanii atomov v splavakh perekhodnykh elementov)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1957, Vol.V, Nr 1, pp.17-22 (USSR)

ABSTRACT: The study of the magnetic properties of alloys of transition elements is one of the methods of determining their electron structure. Such studies yield macroscopic magnitudes which characterise the electron structure (e.g., magnetic moment) but cannot determing the state of separate atoms. Neutron scattering,on the other hand, leads to information on the structure of the outer shells of atoms and consequently on their states. In the case of disordered ferro-magnetic alloy the intensity of scattered neutrons by an alloy of given composition is proportional to the square of the difference of the atomic magnetic moments of the components of the alloy (Ref.1). On the other hand, the mean magnetic moment per atom of an alloy can be obtained from magnetic saturation experiments and is given by:

$m = cm_a + (1 - c)m_b$, (1) , where m is the mean moment,

Card 1/4

Atomic States in Alloys of Transition Elements.

c is the concentration of atoms of kind a , and m_a and m_b are the atomic magnetic moments of the components. Knowing the magnetic moments of the atoms of the different components of the alloy, one can calculate the coefficient of filling up of d-vacancies (Ref.2). Up to now this coefficient was determined from the mean magnetic moment of atoms of the alloy according to the formula:

$$\bar{q} = \frac{d_o - \bar{m}}{d_o} \qquad (2),$$

where d_o is the number of d-vacancies which is calculated from the formula: $d_o = cd_{o_a} + (1 - c)d_{o_b}$. The quantities d_{o_a} and d_{o_b} characterise the electronic structure of isolated atoms and are known from spectroscopic data. To determine the analogous coefficient for separate atoms one can use the analogous formula:

Atomic States in Alloys of Transition Elements.

$$q_i = \frac{d_{o_i} - m_i}{d_{o_i}} \quad (3),$$ where m_i are the magnetic moment of atoms of the different components of the alloy which can be determined from data on magnetic scattering of neutrons (Ref.1). Only the positive values of the moments are considered. Thus it is possible to answer such questions, as for example: how do the atomic states change with changes in the concentration of alloys? Such calculations have been carried out for the systems Fe-Cr and Ni-Fe. Another method of studying atomic states is through X-ray absorption spectra. It was shown in Ref.4 that displacement of the absorption edge for atoms in alloys of transition elements can be connected with the effective value of the fill-up coefficient $\bar{q}$. Thus it is possible to obtain information on atomic states in alloys of ferro-magnetic metals both from magnetic scattering of neutrons and X-ray absorption studies. Calculations based on the latter are carried out for binary alloys of the type $c_i + c_j = 1$. Results

126-1-3/40

Atomic States in Alloys of Transition Elements.

of neutron scattering experiments show that both in the case of pure metals and the components of alloys the atomic magnetic moments do not have whole number values. This is due to the interaction of d and s electrons. There are 3 figures, 2 tables and 9 references, of which 8 are Slavic.

SUBMITTED: May 30, 1956.
In Final Form November 24, 1956.

AVAILABLE: Library of Congress.

Card 4/4

137-58-6-13095

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 6, p 273 (USSR)

AUTHOR: Dekhtyar, I.Ya.

TITLE: Diffusion and Interatomic Interaction in Alloys Based on Transition Elements of the Iron Group (Diffuziya i mezhatomnoye vzaimodeystviye v splavakh na osnove perekhodnykh elementov gruppy zheleza)

PERIODICAL: Sb. nauchn. rabot In-ta metallofiz. AN UkrSSR, 1957, Nr 8, pp 77-90

ABSTRACT: An examination of various characteristics of interatomic bonds in alloys of transition elements of the Fe group. It is shown that the activation energy of self-diffusion (E) is proportional to the modulus of compressibility. It is assumed that the dependence of E on the composition of the solid solution corresponds to the dependence of the energy level of interatomic interaction on the composition. Interatomic cohesion in alloys of the Fe group is examined in connection with the criterion of filling d- vacancies, taking into account interaction between the s- and the d-electrons of the atoms. It is shown that in Co-Cr, Co-Al, Ni-Cr, Ni-Mo, Ni-Mn, Fe-Cr, and Fe-Ni alloys E

Card 1/2