GENIN, M.Ya.[deceased]; KHOTKEVICH, S.G.; OLEYNIK, L.K., red.

[Machine tools and mechanisms used in sanitary engineering operations] Stanki i mekhanizmy dlia proizvodstva sanitarno-tekhnicheskikh rabot. Moskva, Vysshaia shkola, 1965. 306 p. (MIRA 19:1)

L 17181-63 EWT(1)/EWP(q)/EWT(m)/BDS AFFTC/ASD/ESD-3/IJP(C) JD

S/0185/63/008/005/0591/0594

ACCESSION NR: AP3000238

AUTHOR: Zaytsev, H. A., Khotkevych, V. G.

TITLE: Anisotropy of mean density of dislocations in plastically deformed single crystals of zinc

SOURCE: Ukrayins'kyy fizychnyy zhurnal, v. 8, no. 5, 1963, 591-594

TOPIC TAGS: zinc, selective etching, dislocation density, dislocation, slip, aging, plastic deformation, deformed crystal, dislocation anisotropy

ABSTRACT: The method of selective etching was used to investigated the distribution of the mean density of dislocations in bent (R = 0.5; 1 cm) and stretched (Epsilon 17, 20, 30, 50%) single crystal of zinc (99.999%) with cadmium impurity (0.1%) as a function of the angle Phi between the section plane and the bending axis or the plane containing the easy slip direction and the hexagonal axis, respectively. Upon bending, the mean density of dislocations displays an anisotropy increasing with the curvature, with a maximum at Phi = 90° and a minimum at Phi = 0°. Upon stretching, as the elongation increases, the maximum and minimum of the mean density of dislocations exchange places: Epsilon = 17; 20% when

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L 17161-63

ACCESSION NR: AP3000238

6

Phi = 0° ; 90°, and Epsilon = 30; 50%, when Phi = 90°; 0°. A relation is derived between the dislocation density detected by the etching method and the time and temperature of the aging process in specimens after deformation, in the form of a curve with a maximum. The results are explained on the basis of dislocation theories. "We take this opportunity to express our gratitude to V. N. Stepanova for her assistance in mastering the etching method, to V. N. Aleksandrov for his courtesy in providing us with pure zinc, and to the students of the Khar'kov State University V. P. Ludko and L. Yu. Chernyakova, who took part in the experiments." Orig. art. has: 3 figures.

ASSOCIATION: Kharkivs'ky*y darzhuniversy*tet im. O. M. Hor'kogo (Khar'kov State University im. O. M. Gor'kiy)

SUBMITTED: 23 Oct 62	DATE ACQ: 18 Jun 63	ENCL: 01
SUB CODE: PH	NO REF SOV: 003	OTHER: 000

Card 2/3

L 23937-65 EWT(m)/EWP(b)/T/EWP(t) Pad IJP(c) JD/HW
ACCESSION NR: AP5001557 S/0185/64/009/012/1371/1373

AUTHOR: Pavlyuk, A. O.; Petrenko, M. S.; Pervakov, V. O.; Khotkevych, V. G.

TITLE: On some peculiarities of the temperature dependence of the increase of the electrical resistivity of the deformed alloy Fe + 50% Ni at low temperatures

SOURCE: Ukrayins'kyy fizychnyy zhurnal, v. 9, no. 12, 1964, 1371-1373

TOPIC TAGS: resistivity of deformed alloy, martensitic phase formation, ferrous nickel alloy

ABSTRACT: In the iron-nickel alloy with the nickel content below 40%, martensitic transformation is observed on cooling to a sufficiently low temperature. At higher nickel concentrations, this transformation does not take place. However, it can be expected that deformation and cooling will produce in these alloys local formation of martensitic phase. As an indication of the new phase formation, the electrical resistivity was measured (see L. Kaufman and M. Cohen, Trans. Amer. Inst. Min (Metall.) Eng. 206, 1393 (1956)). Fe + 50% Ni alloy was pre-

Card 1/2

L 23937-65
ACCESSION NR: AP5001557

pared in the form of wires of 0.2 mm diem. and pressed between metal plates, and the resistance compared with that of annealed specimens. It was found that in specimens which were deformed and measured at -196 C, the increase of resistivity was noticeably greater than in specimens which were deformed at room temperature and measured at -196 C. This is attributed to local martensitic phase formation. The authors are grateful to Y. L. Mirkin for the Fe-Ni alloy. Orig. art. has: 1 figure

ASSOCIATION: Kharkivs'kyy derzhuniversytet im. O. M. Gor'kogo (Khar'kov State University)

SUBMITTED: 10Jul64 ENCL: 00 SUB CODE: MM

NR REF SOV: 002 OTHER: 007

Card 2/2

OSITINSKAYA, T.D. [Osytyns'ka, T.D.]; PERVAKOV, V.A. [Pervakov, V.O.]; KHOTKEVICH, V.G. [Khotkevych, V.H.]

Defects of the crystal lattice due to the quenching of silver heated in air. Ukr. fiz. zhur. 8 no.8:921-924 Ag '63. (MIRA 16:11)

1. Khar'kovskiy gosudarstvennyy universitet im. Gor'kogo.

ZAYTSEV, G.A.; STEPANOVA, S.V.; KHOTKEVICH, V.I.

Magnetoresistance and static skin-effect in cadmium single crystals. Zhur. eksp. i teor. fiz. 48 no.2:760-761 F '65. (MIRA 18:11)

1. Khar'kovskiy gosudarstvennyy universitet i Fiziko-tekhnicheskiy institut AN UkrSSR.

GUTERMAN, M.B.; MIRKIN, I.L.; PAVLYUK, A.A.; PERVAKOV, V.A.; PETRENKO, N.S.; KHOTKEVICH, V.I.

Certain characteristics of Ni-Cr, Ni-Cr-Mo, and Fe-Ni-Cr-Mo alloys bound in the K-state. Fiz.-met. i metalloved. 20 no.5:733-740 N '65. (MIRA 18:12)

1. TSentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya, Moskva, i Khar'kovskiy gosudarstvennyy universitet imeni A.M.Gor'kogo. Submitted August 6, 1964.

1ST AND 2ND ORDERS

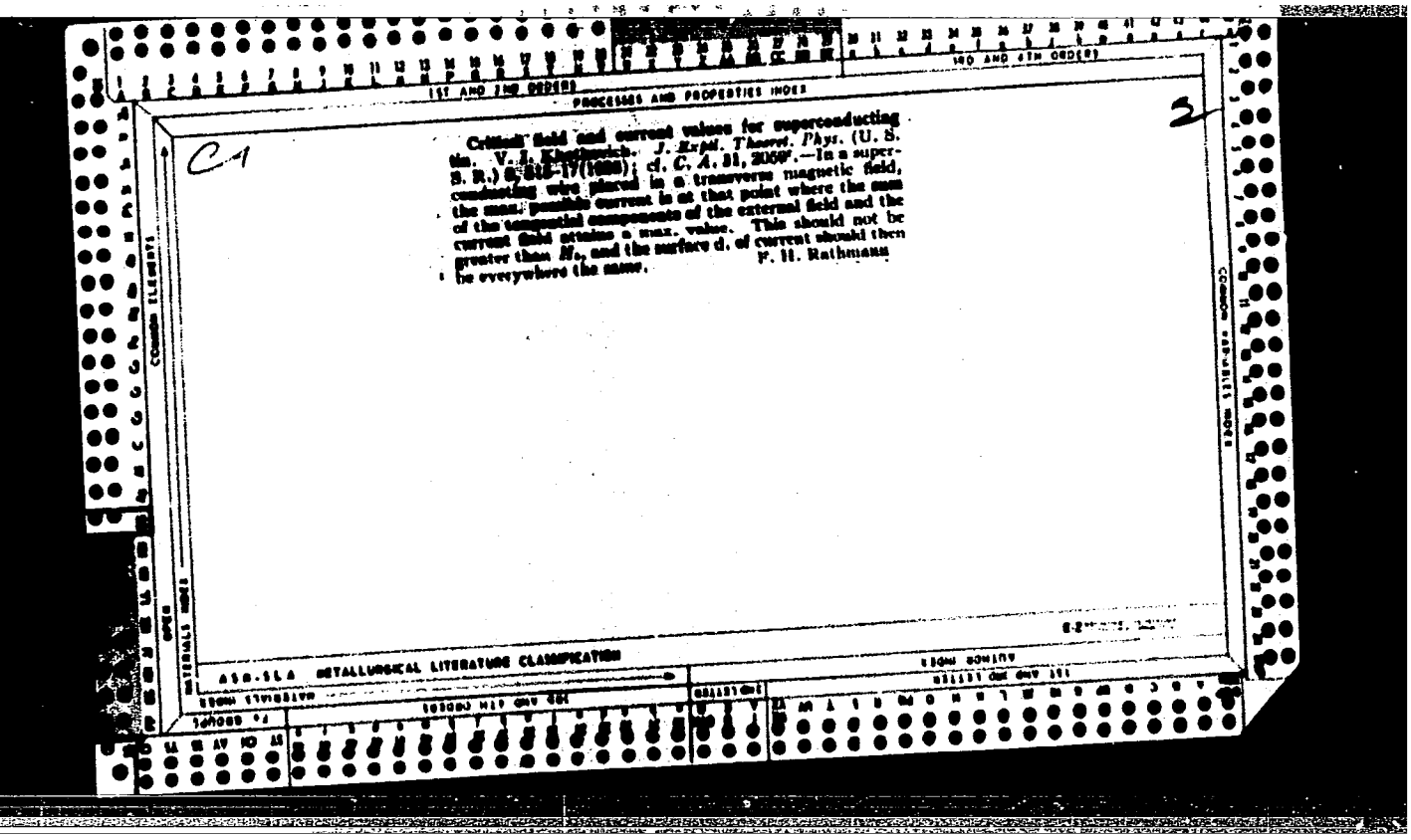
PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

CA

Critical values of the field and current for the superconductivity of tin. L.V. Lubnikov and V.I. Khotkevich. Physik. Z. Sowjetunion 10, 231-41 (1936) (in German).- The effects on supercond. in a rich of Sn of the current flowing through it and of external fields are found to be in agreement with previous observations (cf. C.A. 30, 7992[7])

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



PROCESSES AND PROPERTIES INDEX

C-1

Critical field and current values for superconducting tin. V. L. Ginzburg. *J. Exptl. Theoret. Phys.* (U. S. S. R.) 6, 512-17(1936); cf. *C. A.* 31, 2050⁹.—In a superconducting wire placed in a transverse magnetic field, the max. possible current is at that point where the sum of the tangential components of the external field and the current field attains a max. value. This should not be greater than H_0, and the surface d. of current should then be everywhere the same. P. H. Rathmann

3

A50-5L6 METALLURGICAL LITERATURE CLASSIFICATION

KHOTKEVITCH, V. I.

537.312.62–96 125

Some experiments on superconductivity at radio-frequencies. LASAREV, B. G., GALKIN, A. A., AND KHOTKEVICH, V. I. *C.R. Acad. Sci. URSS*, 55 (*No.* 9) 805–7 (1947).—Alternating currents of either 50 or $2{\cdot}3\times10^4$ to 2×10^7 c/s were superimposed on a direct current in wires of superconducting Tl. A d.c. voltage was observed which went through a max. if the a.c. was increased at const. d.c. At 50 c/s the results can be understood by assuming instantaneous destruction and re-establishment of superconductivity when the critical field is passed. At r.f. the max. becomes more and more flattened as the frequency increases. This behaviour is thought to be due to relaxation phenomena with a time constant of $\sim 10^{-8}$ sec. H. L.

KHOTKEVICH, V. I.

Sep 48

USSR/Electricity
Superconductivity
Tantalum

"Some Particulars of the Superconductivity of Tantalum," B. G. Lazarev, V. I. Khotkevich, Phys-Tech Inst, Acad Sci Ukrainian SSR, 5 pp

"Zhur Eksper i Teoret Fiz" Vol XVIII, No 9 pp 807-11

Preliminary research on superconductivity of tantalum demonstrates high superconductivity of this metal under various lattice distortions. Shows anomalous superconducting properties of tantalum as representative of solid superconductors.

9/49148

KHOTKEVICH, V. I.

Mar 49

USSR/Physics
Superconductivity
Tantalum

"Changes in the Superconductive Properties of Tantalum During Saturation by Hydrogen," V. R. Golik, B. G. Lazarev, V. I. Khotkevich, Phys Tech Inst, Acad Sci Ukrainian SSR; 4½ pp

"Zhur Eksper i Teoret Fiz" Vol XIX, No 3

Investigates alteration of superconductive properties of tantalum under influence of electrolytic saturation by hydrogen. Shows that, as tantalum is saturated by hydrogen, temperature and magnetic transition intervals widen considerably. At high saturations there is no superconductivity as far as 1.85° K. Shows reversibility of process when specimen is annealed. Discusses possibility of formation of compounds. Submitted 29 Jul 48.

PA32/49T96

PA 160T105

KHOTKEVICH, V. I.

USSR/Physics - Superconductivity
Deformation, Plastic

May 50

"Influence of Plastic Deformation Upon the Superconductivity of Metals," V. I. Khotkevich, V. R. Golik, Physicotech Inst, Acad Sci USSR, 10 pp

"Zhur Eksper i Teoret Fiz" Vol XX, No 5 pp 427-37

Studies influence of compression upon superconductivity of Sn, In, Tl, Hg. Shows critical temperature is considerably increased thereby in the case of Sn, In, Tl; but in the case of Hg T_k does not vary. Polymorphic Tl-II, Tl-III may possibly occur for all-sided compression. Submitted 11 Nov 49.

160T105

Khotkevich, V. I.

"Impulse Method of Determining Specific Heat. V. I. Khotkevich and N. N. Bagrov (Doklady Akad. Nauk S.S.S.R., 1951, 81, (6), 1055–1057).—[In Russian]. By using very high rates of heating, thermal losses were minimized. A very short rectangular D.C. impulse was sent through a wire (0·08–0·3 mm. in dia., 50–15 mm. long) of the metal to be tested, the current through and the voltage drop across the specimen being recorded photographically with the aid of a revolving-mirror oscilloscope. From the current/time and voltage/time curves and the temp. coeff. of resistance, the temp. and heat content of the specimen at each instant could be calculated, and hence the sp. heat at each temp. Rates of heating of from 1×10^4 to 5×10^4 °C./sec. and impulse times of from 1×10^{-4} to $1{\cdot}5 \times 10^{-3}$ sec. were used, and the heat losses did not exceed 3% (even at 600° C. with an impulse time of 5×10^{-3} sec.), so that it was not necessary to isolate the specimen thermally or to apply corrections. The sp. heats of Cu, W, Mo, and Cd at various temps., determined by this method, did not differ from the published values by >3%. The method can be used to investigate phase transformations; as an example, the oscillogram obtained for In–24 at.-% Pb alloy is given to show that the curves reveal the formation of the liq. phase at 160°–170° C.—G. V. E. T.

KHOTKEVICH, V. I.

Metals at Low Temperatures

Structure of metals that have undergone plastic deformation at low temperature. Zhur. tekh. fiz. 22 no. 3, 1952.

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

KHOTKEVICH, V.I., BAGROV, N.N.

"The Application of the Oscillograph for Calorimetric Research," Uch. zap. KhGU, V. 48, Tr. Fiz. otd., No. 4, Kh. St. Univ. publication, 1953

KHOTKEVICH, V. I.; Bagrov, N. N.

"Use of the Oscillograph for Calorimetric Investigations"
Uch. Zap. Khar'kovsk. Un-ta, T. 49, Tr. Fiz. Otd. Fiz.-Matem. Fak., No 4, 1953, 155-159

Describes apparatus and method for measuring the heat capacity of fine wire samples of Cu, W, Mo, and Cd. A rectangular pulse of direct current is applied to the sample and the strength and duration of the current then recorded on the oscillograph. This data, in conjunction with temperature coefficients of resistance for the material, is used to calculate the heat capacity. (RZhKhim, No 3, 1955)

SO: Sum-No 845, 7 Mar 56

KHOTKEVICH, V. I.

✓*Latent Energy of Deformation of Metals [Cadmium, Lead, and Copper] at Low Temperatures. V. I. Khotkevich, E. F. Chaikovsky, and V. V. Zashkvara (Doklady Akad. Nauk S.S.S.R., 1954, 96, (3), 483-486).—[In Russian]. The latent energy of deformation of Cd and Pb at −196° C. and of Cu at room temp. was measured by the method of K. and Bagrov (*ibid.*, 1951, 81, 1055). The method was based on the measurement of a differential current, I_d, passing between the mid-points of a bridge, two branches of which are formed by a deformed and an undeformed specimen of identical compn., shape, and size; the I_d is due to the difference in resistance between the deformed and the undeformed specimen. The latent energy of deformation was released during annealing, causing an increase in temp. of the deformed specimen and a corresponding change of I_d, which was recorded. The method was capable of measuring quantities of heat of the order of 10^{-3} cal., with an error of 7%. The abs. magnitude of the latent heat of deformation increased with the degree of deformation, and for 65·8% deformation amounted to 1·13 cal./g. for Cd, 0·53 for Pb, and 0·77 for Cu. The ratio of the latent heat of deformation to the total energy expended in effecting deformation was ≅1 for small deformations and decreased rapidly with increase in the degree of deformation. This indicated that the initial stage of plastic deformation occurs with the formation of imperfections in the cryst. metal lattice, stable at the temp. of deformation, and that the work of deformation is stored in the form of the potential energy of imperfections. At a later stage, macroscopic displacements accompanied by the evolution of heat decrease the ratio of the latent energy to the work of deformation.—S. K. L.

Evaluation B-82533

KHOTKEVICH, V. I.

608

Energy absorption during low-temperature deformation of metals. V. I. Khotkevich, B. F. Chalkovskii, and V. V. Zashkvara (V. N. Gor'kii State Univ., Kharkov). *Fiz. Metal. i Metalloved.* 1, 200–18(1955).—A deformed specimen was connected in series with a fully annealed standard having the same shape and dimensions, forming 2 branches of a Wheatstone bridge. A strong d.c. was passed through the bridge for 0.01–0.02 sec., and differential current was recorded oscillographically. The current was selected to cause annealing of the deformed sample, which released the latent heat of deformation; thus its temp. was slightly increased over that of the annealed standard when the current was passed. The difference was expressed as $\Delta W = I_x I(4R_x + 2R + r)(2R - r)/4R$, where I_x and R_x are current and resistance in the specimen branch of the bridge, I and R those in the standard branch, r total resistance of the circuit. Latent heat of deformation Q was then obtained from the equation $Q = \int_{T_0}^{T_1} cdT - (1/m)\int_0^t (W_1 - W_2)dt$, where T_1 and T_2 are temp. of the test and of the standard specimens at the end of the impulse, t time, c heat capacity, m mass of the sample, T temp. Since the impulse caused a complete annealing of the sample, it was possible to hold that its temp. coeff. of elec. resistance at this time was the same as of the unde-

V. I. Khotkevich

formed metal. If the resistance of specimens at the end of the impulse and their temp. coeff. of resistance were known, the temp. of each could be detd. and their heat capacity for the T_1-T_2 interval; thus one member of the equation was detd., and the 2nd was obtained by graphic integration. Working scheme and operational steps are fully described. Curves for Cd, Pb, and Cu show the changes of latent heat of deformation with its increase up to 75%, the max. values being 1.13, 0.83, and 0.77 cal./g., resp. During the initial stages of plastic deformation, distortion of space lattice, stable at the deformation temp., takes place. Further deformation lowers activation energy of its elimination so that some distorted lattices are partially eliminated; thus a corresponding latent heat is released. This is helped by macroscopic motion of the body along the slippage planes; again with release of some heat. The theory is developed in detail.

J. D. Gat

2/2

AMITIN,Ye.B.; MIL'NER,A.S.; KHOTKEVICH,V.I.

Determination of small quantities of ferromagnetic admixtures in weak magnetic compositions. Zav.lab.21 no.6:693-695 '55. (MLRA 8:9)

1. Khar'kovskiy gosudarstvennyy universitet im. A.M.Gor'kogo
(Ferromagnetism)

KHOTKEVICH V.I.

VERKIN, B.I.; MIL'NER, A.S.; ROZENTSVEYG, L.E.; FAYNBERG, Ya.B.; KHOTKEVICH, V.I.; SHKLYAREVSKIY, I.N.

Sections of Experimental, Theoretical, and General Physics at the Department of Physics and Mathematics, 1930-1955. Uch.zap.KhGU 60:63-79 '55. (MLRA 10:1)

(Kharkov University--History)
(Physics)

SOV/137-57-11-22171

Translation from: Referativnyy zhurnal, Metallurgiya, 1957, Nr 11, p 214 (USSR)

AUTHOR: Khotkevich, V.I.

TITLE: The Pressure Coefficient of Electrical Resistance of Certain Metals at the Temperature of Liquid Helium (Koeffitsiyent davleniya elektrosoprotivleniya nekotorykh metallov pri temperature zhidkogo geliya)

PERIODICAL: Uch. zap. Kharkovsk. un-t, 1955, Vol 64, pp 151-152

ABSTRACT: The pressure coefficient of the electrical resistance of Ag, Cu, Au, Pt, and Pb was measured at the temperature of liquid He. A wire of the metal investigated 0.1-0.3 mm diam and 20 mm long was placed between the polished flat parallel plates of a press. The pressure within the metal is assumed to be equal to the specific load. The mean value for the coefficient $\alpha = [(R_p - R_o)/PR_o] \cdot 10^6$ for Ag, Cu, Au, Pt, and Pb in the range of pressures from one atmosphere to several tens of thousands atmospheres was found to be equal to -5.0, -2.5 ["2" and "5" are spaced apart in the Russian original. Tr. Ed. Note], -3.4, -2.1, and -9.0, respectively. The values cited differ little from the Bridgman data obtained at a temperature

Card 1/2

Khotkevich, V.I.

Category : USSR/Atomic and Molecular Physics - Low Temperature Physics. D-5

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6359

Author : Khotkevich, V.I., Golik, V.R.
Title : Effect of Inhomogeneous Elastic Deformation on Superconductivity

Orig Pub : Uch. zap. Khar'kovsk. un-t, 1955, 64, 153--157

Abstract : An investigation was made of the change of the superconducting properties of Sn and Tl as a result of inhomogeneous elastic and elastic-plastic deformation (twisting and compression). The twisting was performed by stretching spirals (6 mm in diameter) made of wire of the investigated metals (of diameters 0.23 and 0.5 mm respectively) at helium temperature. To produce compression, specimens in the form of tin wires 0.1 -- 0.2 mm in diameter and approximately 30 mm long were compressed between glass plates. Curves are given to illustrate the effects of the deformation. Analysis of the results leads the authors to the conclusion that the shift in the critical temperature T_c under the action of inhomogeneous elastic deformation is determined by the portions of the specimen under

Card : 1/2

Category : USSR/Atomic and Molecular Physics - Low Temperature Physics D-5

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6359

maximum stress, close to the yield point. The type of deformation with which these stresses are obtained is unimportant here. The shift of T_c does not depend on the gradient of the stresses and is the same in twisting as in compression or tension.

Card : 2/2

Khotkevich, V.I.

USSR/Solid State Physics - Mechanical Properties of Crystals E-10
and Polycrystalline Compounds

Abs Jour : Referat Zhur - Fizika, No 5, 1957, 11897

Author : Khotkevich, V.I.
Inst : -
Title : Elastic and Plastic Limit of Certain Metals at Temperature of Liquid Helium.

Orig Pub : Fiz. metallov i metallovedeniye, 1956, 3, No 2, 321-325

Abstract : Under conditions of a compression deformation at a temperature of liquid helium, the author investigated 16 metals. It is shown that Pl, In, Hg, Pb, Cu, Mg, Al, Cd, Sn, Ag, Au, Pt, Ni, Mo, Ta, and Fe, under experimental conditions, retain their plasticity. By way of parameters that determine the degree of plasticity of deformation of the specimen, a relative measurement of the electric resistivity of the metal, R/R_0, was measured with increasing load P. It is shown that the curves R/R_0 (P) fit very well a power

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Kharkov State Univ. im A.M. Gorkiy

V. I. KHOTKEVICH

21(0) SOV/53-67-4-7/7

AUTHOR: Chestsov, R.

TITLE: The Fifth All-Union Conference on the Physics of Low Temperatures (5-ye Vsesoyuznoye soveshchaniye po fizike nizkikh temperatur)

PERIODICAL: Uspekhi fizicheskikh nauk, 1959, Vol 67, Nr 4, pp 743-750 (USSR)

ABSTRACT: This Conference took place from October 27 to November 1 at Tbilisi; it was organized by the Otdeleniye fiziko-matematicheskikh nauk Akademii nauk SSSR (Department of Physico-mathematical Sciences of the Academy of Sciences, USSR), the Akademiya nauk Gruzinskoy SSR (Academy of Sciences, Gruzinskaya SSR), and the Tbilisskiy gosudarstvennyy universitet im. Stalina (Tbilisi State University imeni Stalin). The Conference was attended by about 300 specialists from Tbilisi, Moscow, Khar'kov, Kiyev, Leningrad, Sverdlovsk, and other cities as well as by a number of young Chinese scientists at present working in the USSR. About 50 lectures were delivered which were divided according to research fields.

. . . V. Various Questions.

One of the most interesting lectures delivered at this Conference was that by I. A. Gindin, B. G. Lazarev, Ya. D. Starodubov and V. I. Khotkevich (KhPTI) on the polymorphism of metals at low temperatures; P. L. Kapitsa commented on this topic during the discussion. R. F. Bulatova, V. S. Kogan and B. G. Lazarev (KhPTI) investigated the system hydrogen-deuterium by the methods of low-temperature-radiography, thermal analysis, and the visual observation of crystallization. Kh. I. Amirkhanov, Sh. Kh. Amirkhanova and R. I. Bashirov investigated the thermomagnetic properties of compounds of the type $A^{III}B^{V}$ and $A^{II}B^{VI}$, and dealt with the phenomenon of the "photon

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wind" predicted by Gurevich; the investigation was carried out at the Dagestanskiy filial AN SSSR (Dagestan Branch, AS USSR). N. E. Zeynov and A. P. Smirnov (LPTI - Leningrad Physico-technical Institute) gave a report on the measurement of the electricity limit of tin- and indium polycrystals at very low temperatures (1°K), and N. M. Zeynov and E. I. Krivko (LPTI) spoke about attempts made to find the expected diamagnetic resonance on polarons in cuprous oxide. G. R. Khutsishvili (TGU i Institut fiziki AN Gruzinskoy SSR - Tbilisi State University and Institute of Physics AS Gruzinskaya SSR) carried out a theoretical investigation of the Overhauser effect in non-metals. Lomkadze investigated the electron- and nuclear (proton) resonance in diphenylpicryl hydracyl at helium temperature. B. N. Samoylov spoke about experiments he carried out concerning the orientation of Co^{60}- and Au^{198}-nuclei (in iron) at extremely low temperatures. B. P. Zakharchenya and Ye. F. Gross (LPTI) investigated the absorption spectrum of a cuprous oxide crystal in the magnetic field at helium temperature and observed the effect of magneto-optical oscillations. V. P. Peshkov and K. P. Malkov gave information concerning scientific work of Soviet scientists in foreign countries (zagranichnaya nauchnaya komandirovka), and E. V. Shpol'skiy spoke about the abstracting journal "Fizika". The head of the department for problems of the physics of low temperatures, Academician P. L. Kapitsa and the President of the Academy of Sciences Gruzinskaya SSR, Academician N. I. Muskhelishvili closed the Conference. The 6. All-Union Conference on the Physics of Low Temperatures will be held in June and July 1959 in the city of Sverdlovsk.

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18(0)
AUTHORS: Gindin, I. A., Lazarev, B. G., Starodubov, Ya. D., Khotkevich, V. I.

SOV/56-35-3-46/61

TITLE: The Low-Temperature Polymorphism of Metals (Nizkotemperaturnyy polimorfizm metallov)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol 35, Nr 3, pp 802 - 804 (USSR)

ABSTRACT: In the present paper (unlike the practice adopted by several earlier papers dealing with the same subject) the method of mechanical tests is used, in which the compression diagram of lithium, sodium, cesium, bismuth, and beryllium samples with subsequent heating are investigated. Also the variations of volume in inverse transformation are recorded. These tests were carried out on a one-ton machine with a rigid dynamometer, which is suited for carrying out measurements at helium temperatures. The velocity of deformation was constant and amounted to 0,03 mm/sec. A graph gives a typical diagram of the deformation in the coordinates "stress - absolute compression" for lithium. At 77°K this is the melting curve with consolidation of the shape at high degrees of deformation. There are no singular points indicating a

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transformation. If the deformation temperature drops to 20°K and less (down to 1,4°K), a characteristic discontinuity is observed on the curve with a sharp decrease of resistivity against deformation. The most direct proof of the polymorphous transformation in the tests discussed are the variations of volume in inverse transition while the deformed sample is being heated. Similar curves were obtained also for sodium. In the case of cesium no polymorphous transformation is observed on the deformation diagram even at 1,4°K. Nevertheless, the shape of the curve of heating allows us to conclude that, to a small extent, such a transformation actually exists. This behavior of the three alkali metals is apparently connected with the reduction of characteristic temperature and leads to the conclusion that polymorphism exists in the entire group of alkali metals. The discontinuity of stress in the compression diagram is observed also in the case of beryllium at temperatures of 4,2°K and less. All this seems to indicate an extensive occurrence of low-temperature polymorphism, which is observed in the case of tin, sodium, lithium, cesium, bismuth, and beryllium. There are 2 figures and 6 references, 4 of which are Soviet.

The Low-Temperature Polymorphism of Metals SOV/56-35-3-46/61

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR (Physico-Technical Institute of the Academy of Sciences, Ukrainskaya SSR)

SUBMITTED: June 7, 1958

Card 3/3

31515

SOV/137-59-5-10790

18.8200

Translation from: Referativnyy zhurnal, Metallurgiya, 1959, Nr 5, p 190 (USSR)

AUTHORS: Khotkevich, V.I., Sirenko, O.A., Mikhel'son, M.L.

TITLE: Absorption of Energy During Low Temperature Deformation of Nickel

PERIODICAL: Uch. zap. Khar'kovsk. Un-t, 1958, Vol 98, Tr. Fiz. otd. fiz.-matem. fak., Vol 7, pp 359 - 363

ABSTRACT: The authors investigated the effect of the deformation temperature on the magnitude of latent Ni deformation energy within the temperature range of liquid N_2 and room temperature. The following pulse method was used for measurements. Deformed and standard specimens were connected to a bridge circuit and current pulses of a short duration (0.01 - 0.02 sec) were passed through. The pulse intensity was sufficient to anneal the hard-faced specimen. During the annealing process, due to the liberation of latent deformation energy, the bridge balance changed; this served as a criterion to calculate the latent deformation energy. The error of measurement was about ~7%. The specimens consisted of wires of 0.25 mm diameter and ~50 mm length. They were deformed by

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SOV/137-59-5-10790

Absorption of Energy During Low Temperature Deformation of Nickel

compression between two plane parallel plates. It was established that a decrease in the deformation temperature caused an increase of the latent deformation energy from 0.53 cal/g at room temperature to 2.2 cal/g at 77°K. The energy consumed for deformation did not remain constant, but decreased from 17.5 to 5.38 cal/g, respectively. Consequently, during constant work the temperature dependence of the latent deformation energy will be still more pronounced. Results obtained confirm the assumption that relaxation processes occur with sufficient intensity even at room temperature. In the investigated range of temperatures the linear dependence between the increment $1/\rho$ and the magnitude of latent deformation energy for Ni was established.

L.B.

Card 2/2

KHOTKEVICH, V. I.

24(6) PHASE I BOOK EXPLOITATION SOV/2385

Akademiya nauk SSSR

Nekotoryye problemy prochnosti tverdogo tela; sbornik statey (Some Problems in the Strength of Solids; Collection of Articles) Moscow, Izd-vo AN SSSR, 1959. 386 p. Errata slip inserted. 2,000 copies printed.

Ed. of Publishing House: V. I. Aver'yanov; Tech. Ed.: R. S. Pevzner; Editorial Board: A.F. Ioffe, Academician; G. V. Kurdyumov, Academician; S. N. Zhurkov, Corresponding Member, USSR Academy of Sciences; B. P. Konstantinov, Corresponding Member, USSR Academy of Sciences; F. F. Vitman, Doctor of Physical and Mathematical Sciences, Professor (Resp. Ed.); L. A. Glikman, Doctor of Technical Sciences, Professor; N. A. Zlatin, Doctor of Physical and Mathematical Sciences; V. A. Stepanov, Doctor of Technical Sciences; Ya.B. Fridman, Doctor of Technical Sciences, Professor; B. S. Ioffe, Candidate of Technical Sciences (Deputy Resp. Ed.).

PURPOSE: This book is intended for construction engineers, technologists, physicists and other persons interested in the strength of materials.

COVERAGE: This collection of articles was compiled by the Otdeleniye fiziko-matematicheskikh nauk AN SSSR (Department of Physical and Mathematical Sciences) and the Fiziko-tekhnicheskiy institut AN SSSR (Institute of Applied Physics, Academy of Sciences, USSR) in commemoration of the 80th birthday of Nikolay Nikolayevich Davidenkov, Member of the Ukrainian Academy of Sciences, founder and head of the Otdel prochnosti materialov (Department of the Strength of Materials) at the Institute of Applied Physics, Academy of Sciences, USSR, founder of the Fakul'tet fizicheskogo metallovedeniya (Department of Physical Metallurgy) at the Leningradskiy politekhnicheskiy institut (Leningrad Polytechnic Institute), recipient of the Stalin Prize (1943), the Order of the Red Banner of Labor (1945) and the Order of Lenin (1953). The articles deal with the strength of materials, phenomena of imperfect elasticity, temper brittleness, hydrogen embrittlement, cold brittleness, influence of deformation speed on the mechanical properties of materials, fatigue of metals, and general problems of the strength, plasticity, and mechanical properties of nonmetals. Numerous personalities are mentioned in the introductory profile of Professor Davidenkov. References are given at the end of each article.

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SOV/126-7-5-25/25

AUTHORS: Gindin, I. A., Khotkevich, V. I. and Starodubov, Ya. D.

TITLE: Investigation of the Plastic Properties of Aluminium at Low Temperatures (Issledovaniye plasticheskikh svoystv alyuminiya pri nizkikh temperaturakh)

PERIODICAL: Fizika metallov i metallovedeniye, Vol 7, Nr 5, pp 794-800 (USSR)

ABSTRACT: Pure aluminium (99.994% Al) and technical aluminium containing up to 1% impurities (Si, Mn, Fe) were used for the investigation. The specimens were in the shape of plates of 2.5 x 2.5 mm cross-section and 17 mm working length, widening at the ends for ease of gripping in the testing machine. After grinding and polishing, all specimens were annealed in vacuum for one hour at 300°C. The average linear grain size in pure aluminium was 1.0 to 1.5 mm, and in technical aluminium 0.3 to 0.5 mm. Deformation was carried out in a vertical-type tensile testing machine using mechanical loading, being specially adapted for low temperature work. Tensile tests were carried out at 293, 77, 20, 4.2, 2.06 and 1.4°K. In this apparatus it was possible to carry out tensile and compression tests in liquid hydrogen as well as

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Investigation of the Plastic Properties of Aluminium at Low Temperatures.

in liquid helium at 4.2°K and below. A temperature of less than 4.2°K was obtained by evacuating helium. The layout of the apparatus is shown in Fig.1. A study of the macro- and microstructure of fractured specimens has shown that the nature of plastic deformation of aluminium changes fundamentally with change in temperature from 20 - 4.2°K and below. Fig.2 shows the microstructure of an aluminium specimen (99.994%), fractured at 20°K. Fig.3 shows the microstructure of a similar specimen fractured at 4.2°K. In Fig.4 the macrostructure of aluminium specimens (99.994% Al) fractured at 20°K (a) and 4.2°K (b) is shown. In Fig.5 load-extension curves for cylindrical specimens of technically pure aluminium of 3 mm diameter (annealed at 300°C for one hour, grain size 0.3 mm) are shown for various temperatures. In Fig.6 load-extension curves for flat pure aluminium specimens of 2.5 x 2.5 mm section (annealed at 300°C for one hour, grain size 1-1.5 mm) are shown for various temperatures. Fig.7 shows load-extension curves for specimens of technically pure aluminium at 4.2°K after various preliminary treatments. In Fig.8 a micro-interference picture of the polished surface of a pure aluminium specimen, deformed at 1.4°K, is shown.

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Fig.9 is a photomicrograph of the polished surface of a pure aluminium specimen deformed at 1.4°K. The deflection of a scratch at the boundary of large blocks is visible. Fig.10 shows the deflection of interference lines at the boundary of large blocks of a pure aluminium specimen deformed at 1.4°K. In Fig.11 the dependence of the mechanical properties of aluminium on temperature in the range 1.4 to 293°K is shown. The authors arrive at the following conclusions:
1. It has been found that a sharp difference exists in the macro- and microscopic nature of plastic deformations of specimens of pure aluminium if the temperature at which they are strained is changed from 20 to 4.2°K and below. A lowering in the temperature of testing leads to an intensification of the inhomogeneity of plastic deformation; i.e. to the formation of large blocks the sizes of which exceed those of the average metal grain.
2. The plastic deformation of aluminium at 4.2°K and below is characterized by an unstable flow which is expressed the more clearly, the lower the testing temperature. Preliminary cold working of the specimens intensified the interrupted

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nature of flow.
3. At 4.2°K and below the formation of mechanical twins is observed in aluminium. It is possible that the instability of plastic flow is associated with the formation of mechanical twins.
4. The mechanical properties of aluminium in the temperature range 77-1.4°K have been determined. It has been found that the true strength of specimens of pure and technical aluminium tested to fracture at 4.2°K are close to one another. The ultimate tensile stress σ_s is practically independent of temperature. The residual elongation has a maximum in the range 20 to 4.2°K.
There are 11 figures and 9 references, of which 6 are Soviet and 3 English.

ASSOCIATION: Khar'kovskiy fiziko-tekhnicheskiy institut AN USSR
(Khar'kov Physico-Technical Institute AS Ukr.SSR)

SUBMITTED: March 12, 1958

USCOMM-DC-61,699

KHOTKEVICH, V.I. [Khotkevych, V.H.]; PERVAKOV, V.A. [Pervakov, V.O.]

Investigating the temperature dependence of the electric resistance of plastically deformed copper during cooling. Ukr. fiz.zhur. 4 no.6:755-759 N-D '59. (MIRA 14:10)

1. Khar'kovskiy ordena Trudovogo Krasnogo Znameni gosudarstvennyy universitet im. A.M.Gor'kogo i Fiziko-tekhnicheskiy institut AN USSR.
(Metals at low temperature) (Deformations (Mechanics))
(Copper--Electric properties)

SOV/126-8-2-12/26

AUTHORS: Golik, V.R., Sirenko, G.A. and Khotkevich, V.I.

TITLE: X-ray Study of Deformation of Metal Crystal Lattices, Deformed at Low Temperatures

PERIODICAL: Fizika metallov i metallovedeniye, 1959, Vol 8, Nr 2, pp 235 - 239 (USSR)

ABSTRACT: Deformation at 77 °K of commercially pure iron and aluminium and spectrographically pure lead was studied. The specimens were initially free from distortion and were deformed by uni-axial compression at both room temperature and temperature of liquid nitrogen. The latter samples were investigated in a low-temperature X-ray chamber (Figure 1). The specimen was partly immersed and also sprayed by liquid nitrogen, giving a variation of less than $\pm$ 0.2°. An approximate method (B. Ya. Pines - Ref 8) was used to distinguish between the effects of "fine dispersion" and "micro-distortion". Figure 3 shows that even at small deformations (2-5%) a fine dispersion is developed with coherent regions of approximately 10^{-5} cm. With greater deformation these

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regions increase in size by 2-3 times. Figures 4 and 5 show the relation between micro-deformations and distance for aluminium and armco iron. Similar curves were obtained for lead. These show that the main effect of distortion of the crystal lattice is obtained at the very beginning of deformation. Deformation at low temperatures produces more micro-distortion than at room temperature. Curves of relative micro-deformation at low temperature are shown in Figure 6. These show it is inhomogeneous and passes through a maximum. This maximum increases with increasing deformation and decreasing temperature. Micro-stresses in the samples were calculated and an attempt was made to relate them to creep limit. It was shown that the micro-stresses are always less than the creep limit. Figure 7 shows that a linear relationship exists between the micro-deformation of the lattice and the creep limit. A similar relationship occurs with

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hardness. From the obtained data, the mean values of the elastic energy of deformation were calculated. With 50% deformation at 77 °K there are 0.02, 0.09 and 0.34 cal/mol for lead, aluminium and iron, respectively. These values are only small percentages of the total latent energies of deformation . There are 7 figures and 14 references, of which 10 are Soviet and 4 English.

ASSOCIATIONS: Ukrainskiy institut metallov(Ukrainian Institute of Metals)
Kharkovskiy gosudarstvennyy universitet (Khar'kov State University)

SUBMITTED: April 9, 1958

67757

SOV/126-8-5-9/29

IP 9000

AUTHORS: Sirenko, G.A., and Khotkevich, V.I.

TITLE: X-Ray Crystallographic Study of the Temperature Dependence of Metallic Crystal Lattice Distortions

PERIODICAL: Fizika metallov i metallovedeniye, Vol 8, 1959, Nr 5, pp 700-704 (USSR)

ABSTRACT: It has been shown in previous papers (Refs 1, 2) that a lowering of deformation temperature leads to a considerable decrease in the size of coherent scattering regions and to an increase in micro-stresses. A more detailed study was intended of the nature of the dependence of these factors on the deformation temperature in a wide temperature range, particularly at small deformations. Massive specimens of technically pure aluminium and spectroscopically pure lead were plastically deformed by uniaxial compression at 90, 195, 255 and 293 °K. Immediately after deformation, without intermediate annealing, the specimen was placed in a low-temperature chamber (see Ref 1) and its X-ray diffraction pattern was photographed. It was kept at liquid-nitrogen temperature during the X-ray exposure in order to exclude the influence of relaxation. X-ray

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irradiation was carried out by the inverse exposure method in a copper radiation with a sharp-focus X-ray tube having an adjustable focal spot. The (511) lines of aluminium and the (620) lines of lead were studied. The average linear size of the coherent scattering regions and the micro-stresses were found by harmonic analysis of the shape of interference lines. The method of X-ray irradiation and treatment of results has been described more fully by Golik et al (Ref 2). In Figs 1a and 2a the dependence of the average linear size of the coherent scattering regions D on the percentage deformation is shown graphically for the investigated metals at the above temperatures. In Figs 1b and 2b the dependence of the average linear size of the coherent scattering regions on deformation temperature is shown. In Fig 3 the same dependence is shown for aluminium. Apart from $D_{\ldots}$ the values of the absolute $\sqrt{\Delta L^2}$ and relative $\sqrt{\Delta L^2}/L = \varepsilon$ deformation were also calculated. The nature of change of these factors with drop in

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X-ray Crystallographic Study of the Temperature Dependence of Metallic Crystal Lattice Distortions

temperature agrees with the data given by Golik (Ref 2), i.e. a decrease in deformation temperature steadily increases $\sqrt{\overline{\Delta L}^2}$ and $\bar{\varepsilon}$. The average percentage deformation ε was calculated by graphic integration and averaging along the depth of the column (600 and 800 Å for Pb and Al, respectively). A graph representing the dependence of this factor on the degree of deformation for lead specimens deformed at various temperatures is shown in Fig 4. If the value of ε is known, the average residual micro-stress can easily be calculated. It is obvious that the modulus of elasticity for a given crystallographic direction and temperature should be included in the calculation. This has proved to be possible for aluminium (Refs 6-8). The results of this calculation are shown in Fig 5, where $\sqrt{\overline{\sigma}^2}$ is plotted against degree of deformation for various temperatures of deformation.

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There are 5 figures and 8 references, of which 7 are Soviet and 1 is English.

KHOTKEVICH, Vladimir I. and PERVAKOV, V. A.

"Calorimetric Determination of the Energy of Formation of Vacancies in Gold."

report read at the Intl. Conference on Semiconductor Physics.
Prague, Czech., 29 Aug - 2 Sep 1960.

Khar'kov State University im. A M. Gor'kiy

S/126/60/009/06/022/025
E073/E335

AUTHORS: Golik, V.R., Sirenko, G.A., Khotkevich, V.I. and Pines, B.Ya.

TITLE: On the Problem of X-ray Deformation of Distortions in the Crystal Lattice

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol 9, Nr 6, pp 937 - 938 (USSR)

ABSTRACT: This is a reply to the criticism of Smirnov (see pp 936 - 937 of this issue) by the authors of the two papers referred to, i.e. "X-ray Diffraction Studies of Lattice Distortions in Metals Deformed at Low Temperatures" by Golik, Sirenko and Khotkevich and the paper published in Dokl.Ak.nauk SSSR, 1955, Nr 103, p 601, by B.Ya. Pines.

ASSOCIATIONS: Khar'kovskiy gosudarstvennyy universitet im. A.M. Gor'kogo (Khar'kov State University im A.M. Gor'kiy)
Ural'skiy institut metallov (Ural Institute of Metals)

SUBMITTED: January 15, 1960

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87212
S/126/60/010/001/025/027/XX
E032/E314

18.8100 1045, 1418, 1138

AUTHORS: Pervakov, V.A., Khotkevich, V.I. and Shepelev, A.G.

TITLE: Latent Heat of Plastic Deformation of Silver at -196 and +20 °C

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol. 10, No. 1, pp. 117 - 121

TEXT: The present authors have measured the latent heat of deformation Q, on the degree of deformation $\Delta d/d$ and the work A done in compressing silver specimens at temperatures between -196 and 20 °C. The pulse method described by the second of the present authors et al in Ref. 1 was employed. 99.99% pure silver wires, having a diameter of 0.1 mm and length of 60 mm were used. The deformation was produced by compression between polished steel plates. Fig. 1 shows the dependence of Q (cal/g) on $\Delta d/d$ at -196 °C (Curve 1) and +20 °C (Curve 2). Fig. 2 shows the latent heat Q as a function of A (cal/g) at the same temperatures as in Fig. 1. Fig. 3 shows Q/A as a function of A and Fig. 4

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shows the latent heat Q as a function of the relative change in the resistance of the specimens.

Acknowledgments are expressed to N.L. Zheldakov for assistance in building the apparatus and in the measurements.

There are 4 figures and 7 references: 5 Soviet and 2 non-Soviet.

Fig.1

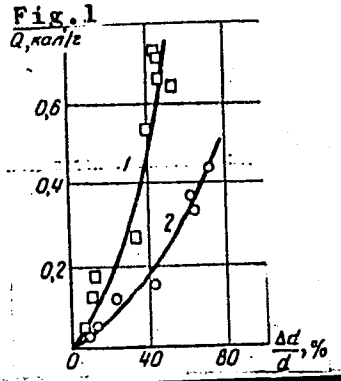

Fig.2

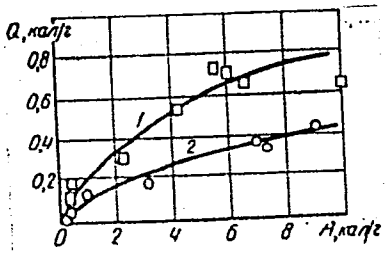

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Fig.2

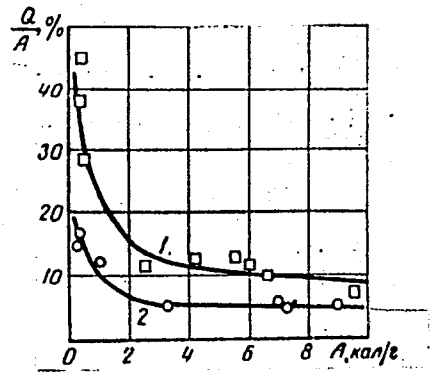
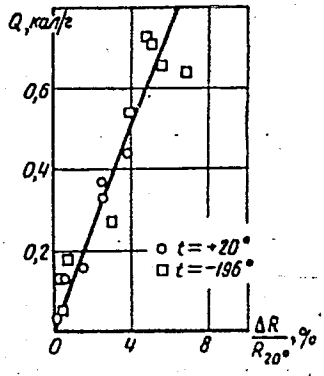


Fig.4



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S/126/60/010/001/025/027/XX
E032/E314

Latent Heat of Plastic Deformation of Silver at -196 and +20 °C

ASSOCIATIONS: Fiziko-tekhnicheskiy institut AN UkrSSR (Physicotechnical Institute of the AS Ukrainian SSR)
Khar'kovskiy gosudarstvennyy universitet imeni A.M. Gor'kogo (Khar'kov State University imeni A.M. Gor'kiy)

SUBMITTED: February 15, 1960

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PERVAKOV, V.A.; KHOTKEVICH, V.I.

Colorimetric determination of the energy of formation of vacancies in gold. Dokl. AN SSSR 134 no.6:1328-1330 O '60. (MIRA 13:10)

1. Fiziko-tekhnicheskiy institut Akademii nauk USSR i Khar'kovskiy gosudarstvennyy universitet im. A.M.Gor'kogo. Predstavleno akademikom A.F.Ioffe.

(Gold)

KHOTKEVICH, V.I.; PERVAKOV, V.A.; MERISOV, B.A.

Temperature relation of the electric resistance in plastically deformed silver and copper. Fiz. met. i metalloved. 9 no. 4:637-639 Ap '60. (MIRA 14:5)

1. Khar'kovskiy gosudarstvennyy universitet im. A.M. Gor'kogo i Fiziko-tekhnicheskiy institut AN SSSR.
(Electric conductivity)
(Nonferrous metals—Cold working)

KHOMYAKOV, K. G.

PHASE I BOOK EXPLOITATION SOV/4893

Vsesoyuznoye soveshchaniye po fizike, fiziko-khimicheskim svoystvam ferritov i fizicheskim osnovam ikh primeneniya. 3d, Minsk, 1959

Ferrity; fizicheskiye i fiziko-khimicheskiye svoystva. Doklady (Ferrites; Physical and Physicochemical Properties. Reports) Minsk, Izd-vo AN BSSR, 1960. 655 p. Errata slip inserted. 4,000 copies printed.

Sponsoring Agencies: Nauchnyy sovet po magnetizmu AN SSSR. Otdel fiziki tverdogo tela i poluprovodnikov AN BSSR.

Editorial Board: Resp. Ed.: N. N. Sirota, Academician of the Academy of Sciences BSSR; L. P. Belov, Professor; Ye. I. Kondorskiy, Professor; E. M. Polivanov, Professor; R. V. Telesnin, Professor; G. A. Smolenskiy, Professor; M. M. Sholits, Candidate of Physical and Mathematical Sciences; E. M. Smolyarenko; and L. A. Bashkirov; Ed. of Publishing House: S. Zholyavskiy; Tech. Ed.: I. Volokhanovich.

PURPOSE: This book is intended for physicists, physical chemists, radio electronics engineers, and technical personnel engaged in the production and use of ferromagnetic materials. It may also be used by students in advanced courses in radio electronics, physics, and physical chemistry.

COVERAGE: The book contains reports presented at the Third All-Union Conference on Ferrites held in Minsk, Belorussian SSR. The reports deal with magnetic transformations, electrical and galvanomagnetic properties of ferrites, studies of the growth of ferrite single crystals, problems in the chemical and physicochemical analysis of ferrites, studies of ferrites having rectangular hysteresis loops and multicomponent ferrite systems exhibiting spontaneous rectangularity, problems in magnetic attraction, highly coercive ferrites, magnetic spectroscopy, ferromagnetic resonance, magneto-optics, physical principles of using ferrite components in electrical circuits, anisotropy of electrical and magnetic properties, etc. The Committee on Magnetism, AS USSR (S. V. Vonsovskiy, Chairman) organized the conference. References accompany individual articles.

Ferrites (Cont.) SOV/4893

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PERVAKOV, V.A. [Pervakov, V.O]; KHOTKEVICH, V.I. [Khotkevych, V.H.]

Thermal capacity of plastically deformed copper. Ukr. fiz. zhur. 6 no.2:240-244 Mr-Ap '61. (MIRA 14:6)

1. Fiziko-tekhnicheskiy institut AN USSR i Khar'kovskiy gosudarstvennyy universitet im. A.M. Gor'kogo.
(Copper--Thermal properties)
(Deformations (Mechanics))

PERVAKOV, V.A. [Pervakov, V.O.]; KHOTKEVICH, V.I. [Khotkevych, V.H.]

Application of the pulse calorimetric method for determining the solvation energy of oxygen in silver. Ukr. fiz. zhur. 6 no.3:408-411 My-Je '61. (MIRA 14:8)

1. Fiziko-tekhnicheskiy institut AN USSR, g. Khar'kov, i Khar'kovskiy gosudarstvennyy universitet im. Gor'kogo.
(Solvation)
(Oxygen)
(Silver)

KHOTKEVICH, V.I.; PERVAKOV, V.A.; GENKIN, Ya.Ye.

Low-temperature press. Prib.i tekh.eksp. 6 no.5:201-202 S-O '61. (MIRA 14:10)

1. Fiziko-tekhnicheskiy institut AN USSR i Khar'kovskiy gosudarstvennyy universitet.
(Low-temperature research—Equipment and supplies)

PERVAKOV, V.A.; MERISOV, B.A.; KHOTKEVICH, V.I.

Effect of the characteristics of crystal lattice distortions on the temperature dependence of the electric resistance of silver and gold. Fiz. met. i metalloved. 12 no.1:38-41 Jl '61. (MIRA 14:8)

1. Khar'kovskiy gosudarstvennyy universitet imeni A.M.Gor'kogo i fiziko-tekhnicheskiy institut AN USSR.
(Precious metals--Metallography)
(Metals, Effect of temperature on)

S/126/61/012/003/020/021
E073/E335

AUTHORS: Pervakov, V.A., Petrenko, N.S. and Khotkevich, V.I.

TITLE: Influence of the plastic deformation on eliminating excess vacancies in quenched gold

PERIODICAL: Fizika metallov i metallovedeniye, v. 12, no. 3, 1961, 460 - 461

TEXT: According to M.A. Bol'shanina (Ref. 1 - Ivz. AN SSSR, ser. fiz., 1950, 14, 223) plastic deformation of metal does not only cause formation of crystal-lattice distortions but also leads to their elimination. According to published work a sufficiently high deformation at room temperature in Al and Au leads to a decrease in the concentration of the excess vacancies. Data are given in this paper on the influence of deformation, at the rate of 10%/min and 10^5 %/min (impact) at 20 and -196 °C, on the increase in the resistance caused by preliminary quenching. The investigations were made on 60 mm long, 0.05 mm dia. wire, made of pure gold (99.99%), which was determined by compressing the wire with two polished steel plates. The quenching was by rapid submersion of the specimens in water. Fig. 1 shows the dependence

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Influence of the ....

of the relative increase in the resistance as a function of the rate of deformation for specimens which were annealed prior to the experiments (Curve 1) and for specimens which were quenched prior to the experiments (Curve 2); these curves were obtained at low rates of deformation at room temperature. In the medium range of deformation rates intensive elimination of vacancies occurs and at high rates of deformation excess vacancies are completely absent and the process of deformation is practically the same in the quenched and annealed specimens. Fig. 2 shows similar curves plotted for specimens which were deformed by impact (rate of deformation 10^5 %/min) at room temperature. In spite of the possibility of the specimens being heated during the process of deformation, an appreciable elimination of the vacancies occurs at considerably higher rates of deformation. Curves are also given in the paper for specimens deformed at -196 °C; at this temperature practically no elimination of vacancies was observed. Assuming that the behaviour of the excess vacancies during deformation does, to some extent, reflect the behaviour of the vacancies forming during the deformation

33458
S/126/61/012/006/020/023
E073/E535

18.8100 1144 1164

AUTHORS: Zaytsev, G.A. and Khotkevich, V.I.

TITLE: On the influence of excess vacancies and dislocation loops on the Hall field in aluminium at 20°K

PERIODICAL: Fizika metallov i metallovedeniye, v.12, no.6, 1961, 917-919

TEXT: No published data are available on the galvanomagnetic phenomena in metals with a certain type of crystal lattice defect. Therefore, the authors investigated: the influence of excess vacancies and dislocation loops on the Hall "constant" R; the ratio of the potential of the Hall field E_y to the potential in the longitudinal direction of the specimen E_x; the relative change of the electric resistance in a magnetic field $\Delta\rho/\rho(0)$. They confined their investigations to the range of weak and intermediate magnetic fields $H \leqslant H_o$, where H_o is the magnetic field for which the radius of the electron orbit is equal to the length of the free path. The measurements were made at the hydrogen temperature using fields up to 3.5 kOe, generated by reversing the polarity of a permanent magnet. The

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polycrystalline aluminium specimens were 0.045 x 4 x 65 mm with a resistance ratio $\rho_{20°K}/\rho_{273°K} = 5 \cdot 10^{-4}$ and the potential and current leads formed an integral part of the specimens. Defects of a specific type were produced by quenching the aluminium from near-fusion temperatures in methylated spirit which had been cooled to a temperature approaching the solidification temperature. Due to coagulation of the vacancies during annealing at room temperature, dislocation loops with a density up to 10^{10} cm^{-2} were produced. The curves of the changes in the electric resistance of aluminium in a magnetic field proved to be in good agreement for the following specimens: hardened as described above; aged at room temperature; annealed at 600°C for 90 to 120 min. This confirms that the Köhler rule is fulfilled for the given range. Typical results are presented in Figs. 1 and 2. It can be seen that in specimens saturated with vacancies, $E_y/E_x(H)$ and R(H) decrease and there is also a change in sign. The authors also investigated the changes in the electric resistance and in the ratio E_y/E_x during isochronous annealing,

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the results are plotted in Fig.3. Acknowledgments are expressed to M. Ya. Azbel for his comments and criticisms and to V. G. Volotska and N. Ya. Fogel' for carrying out the measurements. There are 3 figures and 9 references: 2 Soviet-bloc and 7 non-Soviet-bloc. The four-latest English-language references read as follows: Ref.2: Silcox J., Whelan M. J. Phil.Mag., 1960, 5,1; Ref.4: Vandervoort R., Washburn J. Phil.Mag., 1960, 5, 24; Ref.8: Siemmons R.O., Balluffi R.W. Phys.Rev., 1960, 117,62; Ref.9: Howle A. Phil.Mag., 1960, 5, 251.

ASSOCIATIONS: Khar'kovskiy gosudarstvennyy universitet im. A.M. Gor'kogo (Khar'kov State University imeni A. M. Gor'kiy) and
Fiziko-tekhnicheskiy institut AN UkrSSR (Physico-technical Institute AS UkrSSR)

SUBMITTED: July 15, 1961

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3779

S/120/62/000/001/049/061
E039/E485

24,7700

AUTHORS: Khotkevich, V.I., Zabara, M.Ya.

TITLE: A new induction method of measuring electrical conductivity

PERIODICAL: Pribory i tekhnika eksperimenta, no.1, 1962, 189-191

TEXT: The electrodeless inductive method of measuring electrical conductivity described here has definite advantages compared with the usual methods. It permits a comparatively quick measurement of the electrical conductivity of solids and liquids over a wide temperature range. The sample is supported at the end of a straight metal wire about 80 cm length from a magnetic suspension. Near the upper end of this wire is an aluminium rotor by means of which a rotary motion is communicated to the system. The sample is in a magnetic field and its temperature can be altered over a wide range by means of a furnace. The whole arrangement is evacuated to a pressure of about 10^{-5} mm Hg. It is shown that the electrical conductivity σ is given by the expression:

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$$\sigma = \frac{15}{2\pi} \frac{C^2 I}{H_o^2 R^5} \frac{\varepsilon}{\omega} \qquad (3)$$

4

where I is the moment of inertia of the system, R is the radius of the sample, H_o is the intensity of the magnetic field and ω its angular velocity, ε is the angular acceleration of the sample. Electrical conductivity measurements were made for copper, tin, zinc and aluminium and also of the thermal resistance coefficient for aluminium on cylindrical samples of different diameters. The results show that at the working frequency of the system and for samples of radius up to 1 cm, the influence of the self induced current does not introduce a noticeable error. The values obtained are in good agreement with the accepted values for these materials. Analysis shows that the absolute accuracy of the method is up to 0.1%. The method is suitable for the measurement of electrical conductivity over the range 10^{-6} to 10^{8} ohm^{-1} cm^{-1}. There is 1 figure.

Card 2/3

S/120/62/000/001/049/061
E039/E485

A new induction method ...

ASSOCIATION: Khar'kovskiy gosudarstvennyy universitet
(Khar'kov State University)

SUBMITTED: May 15, 1961

Card 3/3

SIRENKO, G.A.; KHOTKEVICH, V.I.

Accuracy of determining the dimensions of coherent scattering regions and the magnitude of microstresses by the method of harmonic analysis of interference line shapes. Fiz. met. i metalloved. 14 no.1:55-60 Jl '62. (MIRA 15:7)

1. Khar'kovskiy gosudarstvennyy universitet.
(Crystal lattices) (X rays--Scattering)

S/126/62/014/004/009/017
E132/E135

AUTHORS: Sirenko, G.A., and Khotkevich, V.I.

TITLE: An X-ray study of the kinetics of the release of strains in the crystal lattices of plastically deformed metals.

PERIODICAL: Fizika metallov i metallovedeniye, v.14, no.4, 1962, 542-547.

TEXT: Fourier analysis of the profiles of the X-ray diffraction lines was used to study the kinetics of the relief of the distortions of the lattices of Cu, Ni and Al during low temperature recovery from plastic deformation produced at the temperature of liquid nitrogen. It was established that dependence of the mean dimensions of the regions of coherent scattering on the time of the isothermal treatment was non-monotonic. The magnitude of the microdeformations of the lattice decreases monotonically in the process of relaxation. Specimens were first annealed at a high temperature to stabilise their structures and were then deformed by a maximum of 60-65%, at liquid nitrogen temperature, applying uniaxial compression with a constant loading rate.

Card 1/2

An X-ray study of the kinetics of ... S/126/62/014/004/009/017
E132/E135

They were examined in a special low-temperature X-ray camera without being allowed to warm up. Recording was photographic, using (222) reflexions for Ni and Cu, (400) for Al, and (400) and (600) for Pb. The $K\alpha_1$ component of the doublet was used, Pines' method of Fourier inversion being applied. Kurdyumov-Lysak's method of using two orders of reflexion was applied for Pb as a control, good agreement being obtained. The curves of the dependence of the dimensions of the coherent scattering regions on time of relaxation showed, particularly in cases of low (5%) deformation, a minimum after some 40 hours followed by a linear increase with $T^{1/2}$ thereafter.
There are 5 figures.

ASSOCIATION: Khar'kovskiy gosudarstvennyy universitet
(Khar'kov State University)

SUBMITTED: February 26, 1962.

Card 2/2

GINDIN, I.A.; KOZINETS, V.V.; STARODUBOV, Ya.D.; KHOTKEVICH, V.I.

Structural changes in copper depending on low-temperature deformation and subsequent annealing. Fiz.met.i metalloved. 14 no.6:864-873 D '62. (MIRA 16:2)

1. Fiziko-tekhnicheskiy institut AN UkrSSR i Khar'kovskiy gosudarstvennyy universitet.
(Copper--Metallography)
(Metal, Effect of temperature on)

24,7100

S/056/62/042/003/049/049
B108/B102

AUTHORS: Kogan, V. S., Khotkevich, V. I.

TITLE: Temperature dependence of the isotopic effect in the lattice constant of Li

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 3, 1962, 916-917

TEXT: Data from Ref. 1 (see below) on the isotopic effect in the magnitude of the Li lattice constant refer to a temperature of 300°K. At this temperature, the lattice constant of the light isotope ($a(Li^6) = 3.5107 \pm 0.0009$ Å) is by 0.0015 Å greater than that of the heavy isotope ($a(Li^7) = 3.5092 \pm 0.0006$ Å). The relative difference in the volumes $\Delta V/V$ is about 0.1%. It has been shown for Ni isotopes that this difference between the lattice constant of the light isotope and that of the heavy one becomes less at higher temperature, and may even turn zero and reverse its sign. Consequently, the isotopic effect in Li should be more distinct at low temperatures. In order to verify this the authors

Card 1/3

took a number of X-ray diffraction patterns of the Li isotopes at 20, 78, and 300°K. Low-temperature exposure was made in a cryostat in which specimen and film were either completely (liquid hydrogen) or partially (liquid nitrogen) immersed in the cooling liquid. The X-ray beam entered the cryostat through plane beryllium windows sealed into the walls of a dewar. The diameter of the casing was 57.3 mm. The accuracy of determination ($\Delta a = \pm 0.001$ Å) was not high enough to state the difference in the lattice constants of the Li isotopes at room temperature. At low temperatures, however, this difference was clearly expressed:

$T = 20°K$	$a(Li^6) = 3.480$ Å	$a(Li^7) = 3.478$ Å
$T = 78°K$	$a(Li^6) = 3.483$ Å	$a(Li^7) = 3.482$ Å

The nature of the bonding forces in the lattice obviously has a decisive influence on the isotopic effect. In metals this effect is much weaker than in crystals with purely Van der Waals bonding forces. [Abstracter's note: Essentially complete translation.] There are 5 references: 4 Soviet and 1 non-Soviet. The reference to the English-language publication reads as follows: Ref. 1: E. J. Convington, D. J. Montgomery. J. Chem. Phys., 27, 1030, 1957.

S/056/62/042/003/049/049
B108/B102

Temperature dependence of the ...

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR (Physicotechnical Institute of the Academy of Sciences Ukrainskaya SSR)

SUBMITTED: January 24, 1962

Card 3/3

KHOTKEVICH, V. I., KOBUSHKO, V. S., MERISOV, G. M. and ZLOBINTSEV, G. M. (Kharkov State University)

"An experimental method of determination of coefficients of thermal capacity of short metallic rods in wide ranges of temperatures."

Report presented at the Section on Thermal-physical Properties and Non-stationary Thermal Capacity, Scientific Session, Council of Acad. Sci. Ukr SSR on High Temperature Physics, Kiev, 2-4 Apr 1963.

Reported in Teplofizika Vysokikh temperatur, No. 2, Sep-Oct 1963, p. 321, JPRS 24,651. 19 May 1964.

ZAYTSEV, O.A. [Zaitsev, H.A.]; KHOTKEVICH, V.I. [Khotkevych, V.H.]

Anisotropy of the mean density of dislocations in plastically deformed zinc single crystals. Ukr. fiz. zhur. 8 no.5:591-594 My '63. (MIRA 16:8)

1. Khar'kovskiy gosudarstvennyy universitet im. Gor'kogo.

BLYASHENKO, G.S. [Bliashenko, H.S.]; PETRENKO, M.S. [Petrenko, M.S.]; PERVAKOV, V.A. [Pervakov, V.O.]; KHOTKEVICH, V.I. [Khotkevych, V.H.]

Latent energy of deformation of nickel containing small admixtures of tin. Ukr. fiz. zhur. 8 no.11:1279-1280 N '64. (MIRA 17:9)

1. Fiziko-tekhnicheskiy institut AN UkrSSR, Khar'kov, i Khar'kovskiy gosudarstvennyy universitet.

L 41780-65 EWT(1)/EPA(s)-2/EWT(m)/EWP(w)/EPF(n)-2/EWG(v)/EWA(d)/EPR/T/EWP(t)/EWP(b)/EWA(1) Pe-5/Pg-4/Pt-7/Pu-4 JD/WW

ACCESSION NR: AP5005764 S/0170/65/008/001/0058/0063

52
51
B

AUTHOR: Kobushko, V. S.; Merisov, B. A.; Khotkevich, V. I.

TITLE: Method of determining the coefficient of thermal conductivity of metals at high temperatures

SOURCE: Inzhenerno-fizicheskiy zhurnal, v. 8, no. 1, 1965, 58-63

TOPIC TAGS: thermal conductivity, heat conduction, temperature distribution

ABSTRACT: The authors determine the heat balance of a wire heated with electric current in vacuum, whose ends are kept at constant temperature. The amount of heat carried away by the wire supports is estimated by comparing the temperatures at the mid-point of an infinitely long wire and of a supported wire of finite length, and an expression is obtained for the ratio of these temperatures. It is then suggested that the thermal conductivity can be measured by determining the resistance of the mid portions of the wire as a function of the total length of the wire. The proposed method was checked by means of experiments on thin platinum wire, and was found to be accurate to 5%. It is stated that the method can be used

Card 1/2

L 41780-65
ACCESSION NR: AP5005764

for temperatures ranging from somewhat above room temperature to somewhat below the melting point. Orig. art. has: 3 figures and 16 formulas.

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

SUMBITTED: 15Apr64 ENCL: 00 SUB CODE: TD

NR REF SOV: 001 OTHER: 001

Card 2/2

L 52200-65 EWT(d)/EWT(l)/EWT(m)/EPF(c)/EEC(k)-2/EPF(n)-2/EWA(d)/EPR/T/EWP(t)/EWP(k)/EWG(c)/EWP(b)/EWA(c) Pf-4/Pr-4/Pu-4 IJP(c) JD/WW/HW/GS

ACCESSION NR: AT5010254 UR/0000/65/000/000/0107/0109

60
B+1

AUTHORS: Donde, A. L.; Fomenko, N. S.; Khotkevich, V. I.

TITLE: Cryostat for x-ray structure investigations of deformed metals at low temperatures

SOURCE: Mashiny i pribory dlya ispytaniya metallov i plastmass (Machines and instruments for testing metals and plastics); sbornik statey. Moscow, Izd-vo Mashinostroyeniye, 1965, 107-109

TOPIC TAGS: metal, metal deformation, metal structure, x ray structure analysis, x ray technique, cryostat, cryogenic gas

ABSTRACT: A metallic cryostat was developed for testing the structural characteristics of metals deformed at low temperatures. The cryostat (see Fig. 1 on the Enclosure) features beryllium windows 11 for x-ray propagation and glass windows 15 set on the opposite side of a Dewar flask for viewing a fluorescent screen at the outlet aperture of the x-ray chamber. The cryostat consists of a Dewar flask 3 filled with liquid helium or hydrogen. The upper portion of the flask is attached to Dewar flask 5 filled with nitrogen. Thermal protection of the lower part of Dewar flask 3 is rendered by a copper screen 9, whose temperature is that of liquid nitrogen. Specimens are deformed by means of the wrench 19 applied through the

Card 1/3

L 52200-65
ACCESSION NR: AT5010254

force transmitting system 6 and 7 to the specimen held between two plates at 8. Additional elements are for positioning the specimen for x-ray readings and for controlling ambient conditions during the execution of readings. Orig. art. has: 1 figure.

ASSOCIATION: none

SUBMITTED: 15Dec64 ENCL: 01 SUB CODE: MM

NO REF SOV: 000 OTHER: 000

Card 2/3

L 52200-65

ACCESSION NR: AT5010254

ENCLOSURE: 01

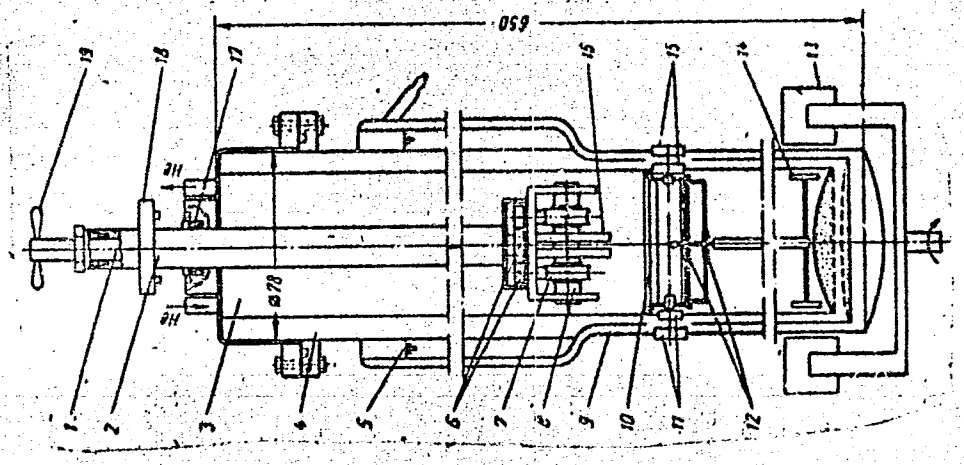


Fig. 1. Diagram of cryostat for x-ray structural investigations of deformed metals at low temperatures

Card 3/3

L 43747-65 EWT(l)/EWT(m)/T/EWP(t)/EEC(b)-2/EWA(c)/EWP(b) Pi-4 IJP(c) JD/JG
ACCESSION NR: AP5006533 S/0056/65/048/002/0760/0761

27
B

AUTHOR: Zaytsev, G. A.; Stepanova, S. V.; Khotkevich, V. I.

TITLE: Magnetoresistance and statistical skin-effect in cadmium monocrystals

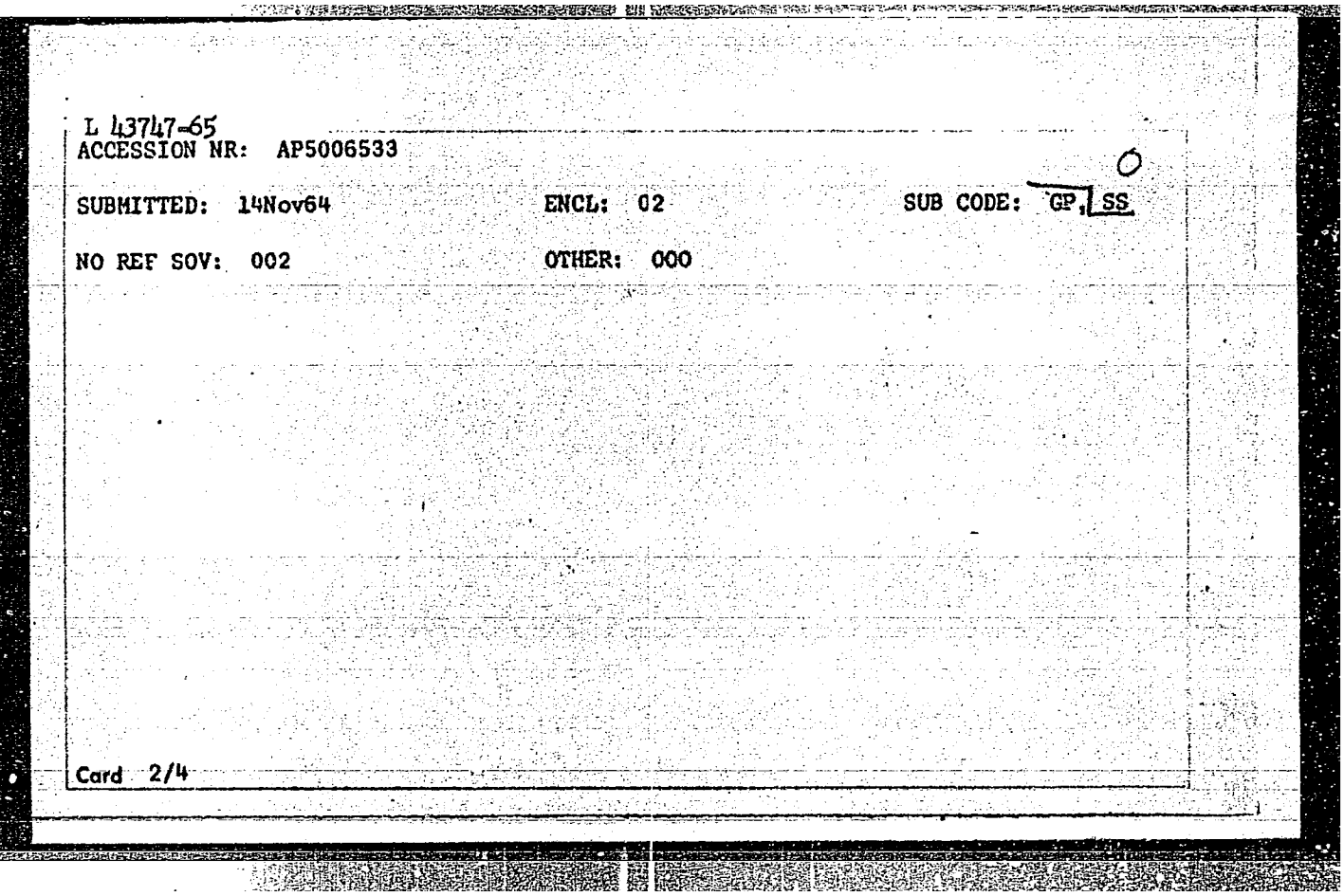
SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 48, no. 2, 1965, 760-761

TOPIC TAGS: magnetoresistance, skin effect, statistical skin effect, ballistic method, cadmium monocrystal

ABSTRACT: The relationship between magnetoresistance and an inclined external magnetic field was measured in cadmium monocrystals with a resistance ratio $R(4.2^\circ)/R(293^\circ) \approx 10^{-5}$. Statistical skin effect was detected by the ballistic method. Results are given in figs. 1 and 2 of the Enclosure. "We take this opportunity to express gratitude to I. G. D'yakov who courteously rendered assistance in our measurements." Orig. art. has: 2 figures.

ASSOCIATION: Khar'kovskiy gosudarstvennyy universitet (Khar'kov State University); Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR (Physico-technical Institute of the Ukrainian Academy of Sciences)

Card 1/4



L 43747-65
ACCESSION NR: AP5006533

SUBMITTED: 14Nov64 ENCL: 02 SUB CODE: GP, SS

NO REF SOV: 002 OTHER: 000

Card 2/4

L 43747-65
ACCESSION NR: AP5006533

ENCLOSURE: 01

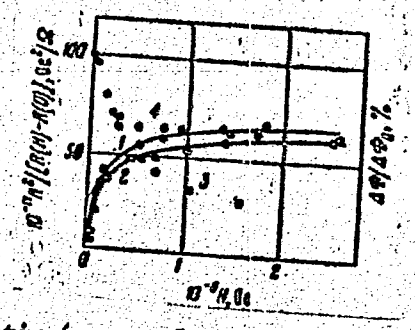


Fig. 1. Results of ballistic (curves *3* and *4*) and resistometric (curves *1* and *2*) measurements of cadmium monocrystals. Curves for specimens with smooth (*1*, *3*) and damaged (*2*, *4*) surfaces are shown. Legend of points: ●--curve *1*; O--curve *2*; ◐--curve *3*; ◒--curve *4*

Card 3/4

L 43747-65
ACCESSION NR: AP5006533

ENCLOSURE: 02

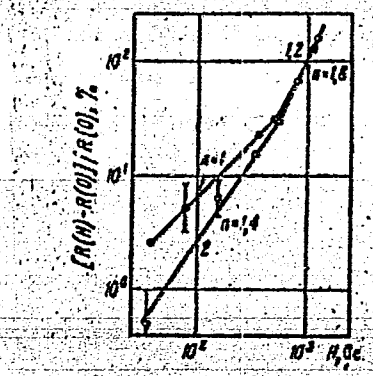


Fig. 2. Magnetoresistance of a cadmium monocrystal versus H (Oersteds) for specimens with smooth (1) and damaged (2) surfaces; n is the power of function R(H)

Card 4/4

PAVLYUK, A.A. [Pavliuk, A.O.]; PERVAKOV, V.A. [Pervakov, V.O.]; KHOTKEVICH, V.I. [Khotkevych, V.H.]

Effect of an oxygen admixture on the heat capacity of silver. Ukr. fiz. zhur. 10 no.2:237-238 F '65. (MIRA 18:4)

1. Khar'kovskiy gosudarstvennyy universitet.

L 32967-66 EWT(1)/EWT(m)/T/EWP(t)/ETI IJP(c) JH/JD

ACC NR: AT6015896 (N) SOURCE CODE: UR/0000/65/000/000/0032/0039

AUTHOR: Zaytsev, G. A.; Khotkevich, V. I. (Doctor of physico-mathematical sciences)

ORG: Khar'kovsky Research Institute im. A. M. Gor'kiy (Khar'kovskiy gosudarstvennyy universitet); Physico-Technical Institute, AN UkrSSR (Fiziko-tekhnicheskiy institut AN UkrSSR)

TITLE: Magnetic resistance and the Hall effect in aluminum with crystal lattice defects at temperatures of 20 and 4°K

SOURCE: AN UkrSSR. Issledovaniye energeticheskogo spektra elektronov v metallakh (Study of the energy spectrum of electrons in metals). Kiev, Izd-vo Naukova dumka, 1965, 32-39

TOPIC TAGS: Hall effect, crystal lattice vacancy, metal physics, crystal lattice defect, aluminum

ABSTRACT: Hall effect measurements were made at 20 and 4°K on polycrystalline aluminum samples (99.997% pure) which were either quenched from 873°K or deformed at 78, 20 and 4°K. These treatments introduced nonequilibrium vacancies which significantly affected the magnetic resistance $\Delta\rho/\rho_0$ (where ρ_0 is the specific resistivity of aluminum in the absence of a magnetic field at 20 and 4°K). Isochronal annealing curves are shown for various sample conditions. Two and three stage annealing behavior were ob-

Card 1/2

served for quenched and cold worked samples (78°K), respectively; the stages coincided with atom diffusion, vacancy coagulation and dislocation annealing. Measurements of $\Delta\rho/\rho_0 = f(H^2)$ were given for the quenched and deformed samples after aging at 290°K and room temperature. The magnetic results were plotted on a Korel diagram and little of the data deviated from the universal curve. Only after 50% deformation at 78°K did the data deviate significantly; however, after aging at room temperature for 250 hrs or at 473°K for 30 min, the deviation disappeared. A correlation was made between the Hall coefficients and the Korel rule, i. e.,

$$R-R_0 = f(H\rho_k/\rho_{ot})$$

where $R = \lim_{H\to 0} K$ is the Hall constant and ρ_k/ρ_{ot} is the ratio of specific resistivity at room temperature to that at the measured temperature. The value of R_0 extrapolated to zero field. These experiments confirmed that the symmetry principle of kinetic coefficients depended on the crystal lattice defects. Orig. art. has: 6 figures, 2 formulas.

SUB CODE: 11,20/ SUBM DATE: 16Oct64/ ORIG REF: 009/ OTH REF: 011

Card 2/2

L 24474-66 EWT(m)/EWP(w)/T/EWP(k)/EWP(t) IJP(c) GS/HW/JD
ACC NR: AT6010579 (N) SOURCE CODE: UR/0000/65/000/000/0137/0142

AUTHOR: Kozinets, V. V.; Khotkevich, V. I.

ORG: Kharkov State University im. A. M. Gorky (Khar'kovskiy gosuniversitet); Physicotechnical Institute, AN UkrSSR (Fiziko-tekhnicheskiy institut AN UkrSSR)

TITLE: Investigation of the structural and mechanical characteristics of copper after thermomechanical treatment

SOURCE: AN UkrSSR. Mekhanizm plasticheskoy deformatsii metallov (Mechanism of the plastic deformation of metals). Kiev, Naukova dumka, 1965, 137-142

TOPIC TAGS: material deformation, copper, mechanical heat treatment, grain size, yield stress, metal grain structure

ABSTRACT: The authors study changes in the structure and mechanical properties of specimens with identical initial structure after thermomechanical treatment in a wide range of degrees of deformation, deformation temperatures and subsequent annealing processes. Industrially pure copper specimens measuring 12×2×1.5 mm were studied. The experimental procedure is briefly described. A curve for the average

Card 1/2

L 24474-66

ACC NR: AT6010579

volume of the subgrain as a function of annealing temperature for specimens subjected to preliminary deformation at 20°C shows a reduction in grain size for low annealing temperatures to about 300°C with a subsequent increase reaching 1.5-2 times the initial subgrain size after 700°C. Specimens subjected to strong deformation (15 and 32%) show no minimum on these curves. The same relationship for specimens subjected to preliminary deformation at -196°C show practically no difference with respect to shape. The maximum angles for disorientation of the subgrain and the yield stress were also studied as functions of annealing temperature. The curves for these relationships are strikingly similar. This indicates that the angles of disorientation of the subgrains have a predominant effect on the yield stress. No relationship was established between the subgrain or grain size and the yield stress. The tensile strength of all specimens was approximately identical regardless of the degree of deformation, deformation temperature or subsequent annealing processes. Orig. art. has: 4 figures.

SUB CODE: 11/ SUBM DATE: 26Nov64/ ORIG REF: 010/ OTH REF: 003

Card 2/2 PB

L 14998-66 EWT(m)/EWP(w)/T/EWP(t)/EWP(k)/EWP(z)/EWP(b)/EWA(h) IJP(c) JD/HW/JG

ACC NR: AP5028563 (N) SOURCE CODE: UR/0126/65/020/005/0733/0740

AUTHOR: Guterman, M. B.; Mirkin, I. L.; Pavlyuk, A. A.; Pervakov, V. A.; Petrenko, N. S.; Khotkevich, V. I.

ORG: TsNII of Technology and Machine Building, Moscow (TsNII tekhnologii i mashinostroyeniya); Kharkov gosuniversitet im. A. M. Gor'kiy (Khar'kovskiy gosuniversitet)

TITLE: Certain features connected with the K-state in Ni-Cr, Ni-Cr-Mo and Fe-Ni-Cr-Mo alloys

SOURCE: Fizika metallov i metalloyedeniye, v. 20, no. 5, 1965, 733-740

TOPIC TAGS: metal physics, ordered alloy, mechanical property, resistivity, nonferrous metal alloy, ferrous alloy, metal heat treatment, heat resistant alloy, high temperature strength, metal hardening

ABSTRACT: Changes in electrical resistivity in Ni + 15% Cr, Ni + 15% Cr + 18% Mo and Fe + 25% Ni + 16% Cr + 6% Mo alloys were studied as a function of low temperature deformation (from +20° to -196°C) and annealing rate (from 2 to 10^6 deg/min). Decomposition of the K-state in the alloys was observed. The effect of the K-state on high temperature strength was also noted. The K-state causes microscopic inho-

UDC: 539.4.015

Card 1/2

L 14998-66
ACC NR: AP5028563

mogeneities which retard the motion of dislocations. In this work, the influence of the decomposition of the K-state was studied in terms of high temperature strength. The temperature dependence of electrical resistivity was obtained as a function of temperature and heating rate. For each alloy, the resistivity increased initially and at 500°C reached a peak, whereupon it dropped to a minimum (about 700° to 900°C depending on the alloy) and rose again. The drop in resistivity was associated with the decomposition of the K-state. Deformation by compression (60 to 70%) in the temperature interval from -196 to +20°C showed that the decomposition of the K-state was practically independent of deformation temperature. At higher temperatures (between 500° and 1000°C) and at high rates of heating, the decomposition of the K-state was studied by increasing the heating rate to 10^6 deg/min. The interval for the maximum decomposition was displaced to higher temperatures (300 to 450° higher), depending on the type of alloy. In the K-state region a significant strengthening was also noted when the speed of deformation was increased from 0.03%/min to 0.3%/min, while in the region of K-state decomposition no effect on strength was apparent. For fast heating rates, the rise in strength was maintained at higher temperatures than for slow heating rates. In particular, for Ni-Cr this region was expanded to 700°C, while for the other alloys to 900 or 1000°C. Where the K-state was decomposed at room temperature, no additional strengthening occurred upon pulse heating. Orig. art. has: 4 figures.

SUB CODE: 11/ SUBM DATE: 06Aug64/ ORIG REF: 011/ OTH REF: 003

Card 2/2

ZAYTSEV, G.A.; KHOTKEVICH, V.I.

Effect of the anisotropic distribution of dislocations on the rotation diagram of transverse magnetic resistance in a single crystal of zinc. Fiz. met. i metalloved. 20 no.4:626-628 O '65. (MIRA 18:11)

1. Khar'kovskiy gosudarstvennyy universitet imeni A.M. Gor'kogo i Fiziko-tekhnicheskiy institut AN UkrSSR.

KHOTKINA, M.L.; POZDNOV, S.S.; [illegible]; [illegible], M.S.; KABANOVA, V.I.; PETROVA, G.A.

Changes in gastric secretory function in diseases of the stomach during a prolonged use of mineral water at Arshan Health Resort. Sbor. nauch. rab. vrach. san.-kur. uchr. profsoiuzov no.1:84-89 '64. (MIRA 18:10)

1. Kafedra fakul'tetskoy terapii (zaveduyushchiy kafedroy S.S.Pozdnov) Irkutskogo meditsinskogo instituta i kurorta Arshan (glavnyy vrach V.A.Lisina).

KHOTKINA, M.L.

USSR/Pharmacology. Toxicology. Various Preparations V

Abs Jour : Ref Zhur-Biol., No 8, 1958, 37629

Author : Khotkina M. L.
Inst : Irkutsk Medical Institute
Title : Bee Honey in the Therapy of Patients with Gastric Ulcers (Pchelinyy med v terapii bol'nykh s yazvennoy bolezn'yu zheludka)

Orig Pub : Sb. tr. Irkut. med. in-ta, Irkutsk, Knigoizdat, 1955, 252-262

Abstract : Experiments on dogs established that feeding honey caused an increase in the quantity of gastric juice and its greater acidity. Therapy of patients with ulcers caused a rise in the acidity of the gastric juice in persons suffering from hypoacidity, and its diminution in persons suffering from hyperacidity. In the majority of the patients the disappearance of pains and gastrointestinal disturbances was noted.

Card 1/1

KHOT'KO, A. I.

"The Fundamental Problems of the Agrotechnology of Sugar Beets in the Peat-Marsh Soils of the Belorussian SSR." Cand Agr Sci, Inst of Socialized Agriculture, Acad Sci Belorussian SSR, Minsk, 1953. (RZhBiol, No 8, Dec 54)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (12)
SO: Sum. No. 556, 24 Jun 55

USSR / General and Specialized Zoology. Insects. P

Abs Jour: Ref Zhur-Biol., No 2, 1958, 6749.

Author : Kipenvarlits, A. F., Khot'ko, A. I.
Inst : Institute of Socialist Agriculture, AS BSSR.
Title : The Role of Entrapping Baits in the Control of Injurious Insects in Turfy Podzolic Soils.

Orig Pub: Sb. nauchn. tr. In-ta, sots. s.-kh. AN BSSR, 1956, vyp. 4, 269-281.

Abstract: Entrapping baits made of cereal vegetation with the admixture of various grasses concentrate the insects and also myriapods and spiders. Beetles predominate among the insects: 81 species are listed, among which 44 were injurious. Numerically, among those attracted by the bait, first place is occupied by the Elateridae; second place - by phytophagous carabidae. On the turfy podzo-

Card 1/2

USSR/Cultivated Plants. Potatoes, Vegetables, Melons. M

Abs Jour: Ref Zhur-Biol., No 17, 1958, 77666.

Author : ~~Khotko, A.I.;~~ Tishkovich, A.A.
Inst : Belorussian Scientific-Research Institute of Melioration and Water Economy.
Title : Influence of Methods and Density of Planting as Well as that of Management Upon Potato Crops.

Orig Pub: V sb.: Osnovnye rezul'taty nauchno-issled. raboty Belorussk. n.-i. in-ta melior. i vodn. kh-va za 1956 g. Minsk, AN BSSR, 1957, 116-120.

Abstract: In the experimental farm of the institute, in 1952, 1953 and 1956, the potato harvest in square-nest planting (70 x 70 cm) was 6, 33 and 12 c/ha higher than in row planting (70 x 35 cm). In 1951 in connection with drought, a harvest increase was obtained

Card : 1/2

USSR/Cultivated Plants. Potatoes, Vegetables, Melons. M

Abs Jour: Ref Zhur-Biol., No 17, 1958, 77666.

of 29 c/ha by row planting. In variants of nest planting 70 x 70 cm and 70 x 60 cm, there was no special difference noted, as regards harvest of starchiness and quantity of small tubers. In addition, it was established that large tubers (weight over 100 g) can be set out per one tuber in each nest. Increase of the quantity of cultivations and earthing up to 4-5 had no positive influence on the harvest of the Kameraz No 1 variety. -- Ye. A. Okorokova.

Card : 2/2

SKOROPANOV, S.G., glavnyy red.; PECHKUROV, A.F., kand.sel'skokhoz.nauk, red.; KHOT'KO, A.I., kand.sel'skokhoz.nauk, red.; IVITSKIY, A.I., doktor tekhn.nauk, red.; BEL'SKIY, B.B., kand.sel'skokhoz. nauk, red.; MARIKS, L., red.izd-va; VOLOKHANOVICH, I., tekhn.red.

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(White Russia--Peat soils)

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(White Russia--Drainage research)
(White Russia--Agricultural research)

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[Cultivation practices for growing field crops on peat-bog soils] Agrotekhnicheskie trebovaniia po vozdelyvaniiu sel'skokhoziaistvennykh kul'tur na torfiano-bolotnykh pochvakh. Minsk, Izd-vo Akad.sel'khoz. nauk BSSR, 1960. 79 p. (MIRA 14:1)

1. Minsk. Navukova-das'ledchy instytut meliaratsyi i vodnai haspadarki.
(Field crops) (Peat soils)