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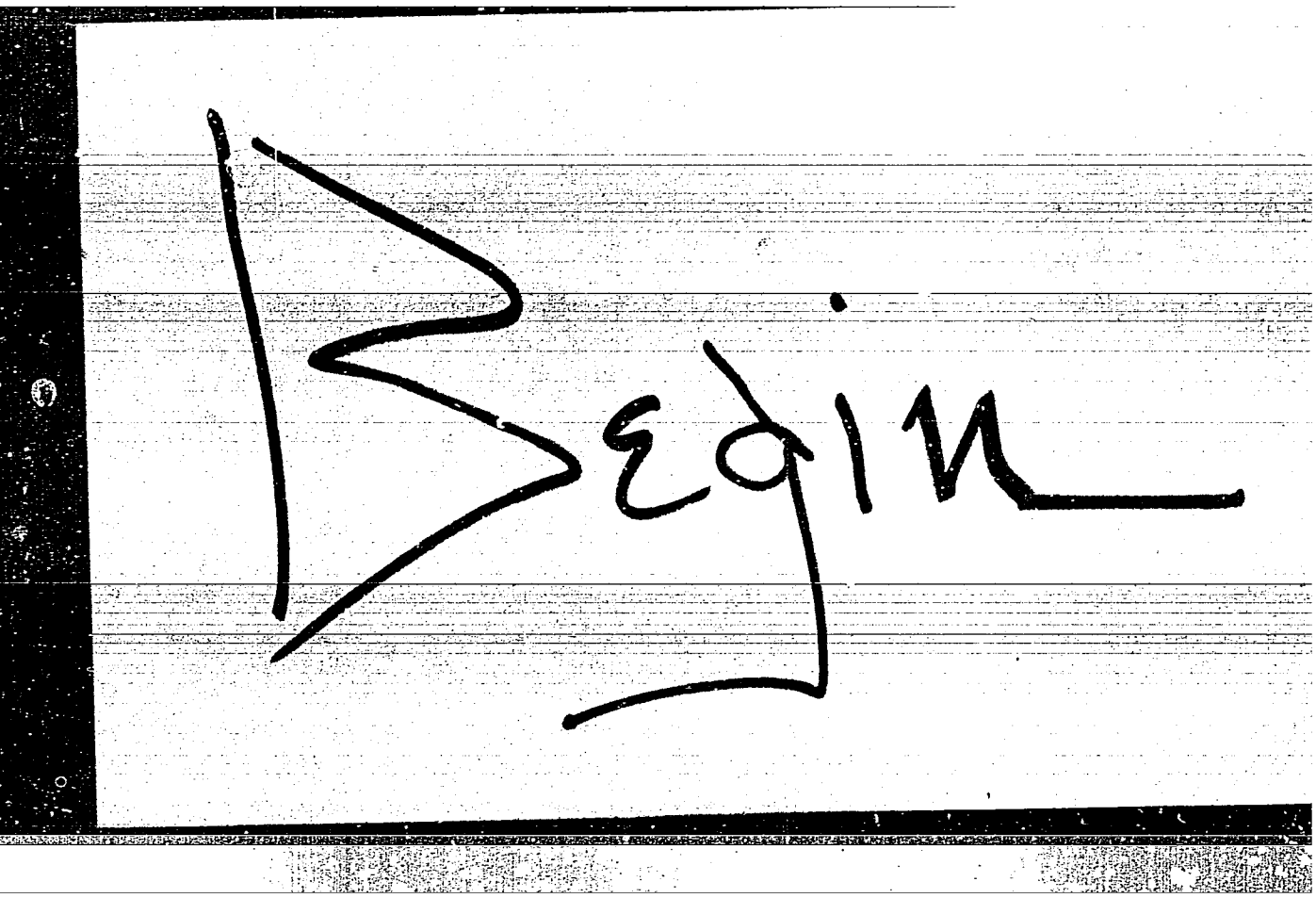

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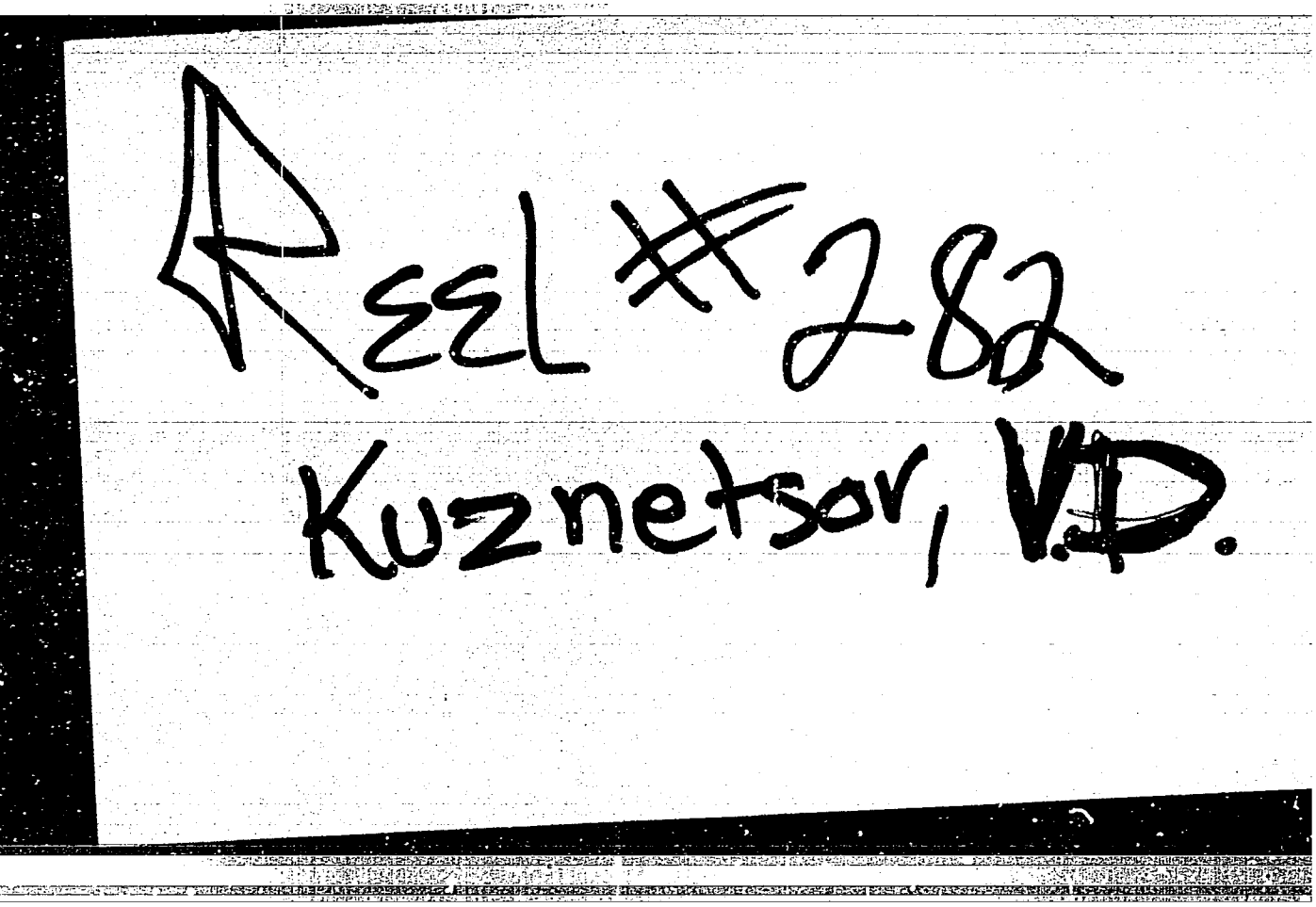

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KUZNETSOV, V.B., inzh.

Measuring the deformation of the elastic axis of sheetpiling under natural conditions. Trudy LIVT no.66:33-38 '64.
(MIRA 19:2)

Leningrad Inst of Water Transport Engineers

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KUZNETSOV, V.B.; CHUVILKIN, O.D.

Long-distance transport of electric power. Vest.Mosk.un.Ser.5: Geog. 20 no.4:80-84 Jl-Ag '65.

(MIRA 18:12)

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"APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000928210001-8

FRUNZE, Mikhail Vasil'yevich; MOZZHUKHIN, Ye.P.; KUZNETSOV, V.B.

[Selected works] Izbrannye proizvedeniia. Moskva, Voenizdat, 1965. 526 p. (MIRA 18:8)

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L 08351-67 EWT(m) IJP(c)

ACC NR: AR6028124 SOURCE CODE: UR/0058/66/000/005/A052/A053

AUTHOR: Kuznetsov, V. B.

46

TITLE: "Total absorption" scintillation spectrometer for the investigation of bremsstrahlung of a betatron

SOURCE: Ref. zh. Fizika, Abs. 5A437

REF. SOURCE: Izv. Tomskogo politekhn. in-ta, v. 138, 1965, 37-41

TOPIC TAGS: betatron, bremsstrahlung, scintillation spectrometer, photoelectron multiplier, absorption spectrum

ABSTRACT: The author describes a scintillation "total absorption" spectrometer, intended for the investigation of the passage of bremsstrahlung from a betatron through different materials. The spectrometer consists of a scintillation pickup placed in a lead shield and recording apparatus. The front shield of the spectrometer is 30 cm thick and the side shield 10 cm. A collimating device is contained in the front shield. To eliminate the influence of the neutron background, a boron absorber is placed ahead of the lead shield. The scintillator used is a NaI(Tl) crystal measuring 100 x 200 mm, coupled to an FEU-49A photomultiplier. The pulses from the photomultiplier are fed through a cathode follower and a preamplifier to a 100-channel analyzer is blocked by a pulse from the synchronization unit, which consists of a plastic scintillator, an FEU-33 photomultiplier and a pulse shaper. L. S. [Translation of Abstract]

Card 1/1 nst SUB CODE: 20

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L 08713-67 EWT(1) JK
ACC NR: AP6033920 SOURCE CODE: UR/0177/66/000/010/0065/0066

AUTHOR: Popov, N. V. (Lieutenant colonel; Medical corps); Kuznetsov, V. B.

ORG: none

TITLE: Rapid influenza diagnosis using fluorescent antibodies

SOURCE: Voyenno-meditsinskiy zhurnal, no. 10, 1966, 65-66

TOPIC TAGS: human ailment, influenza, diagnostic medicine, fluorescent antibody method

ABSTRACT: The use of the fluorescent antibody method for the diagnosis of type A_2 influenza was compared with standard methods with respect to speed, accuracy, and ease. Results showed the serological method to be more sensitive in influenza diagnosis, but in view of the rapidity of the fluorescent antibody method the use of both, one for rapid preliminary diagnosis and the other for confirmation, is recommended. Orig. art. has: 2 tables. [W.A. 50]

SUB CODE: 06/ SUBM DATE: none

Card 1/1 nst UDC: 616.921.5-078

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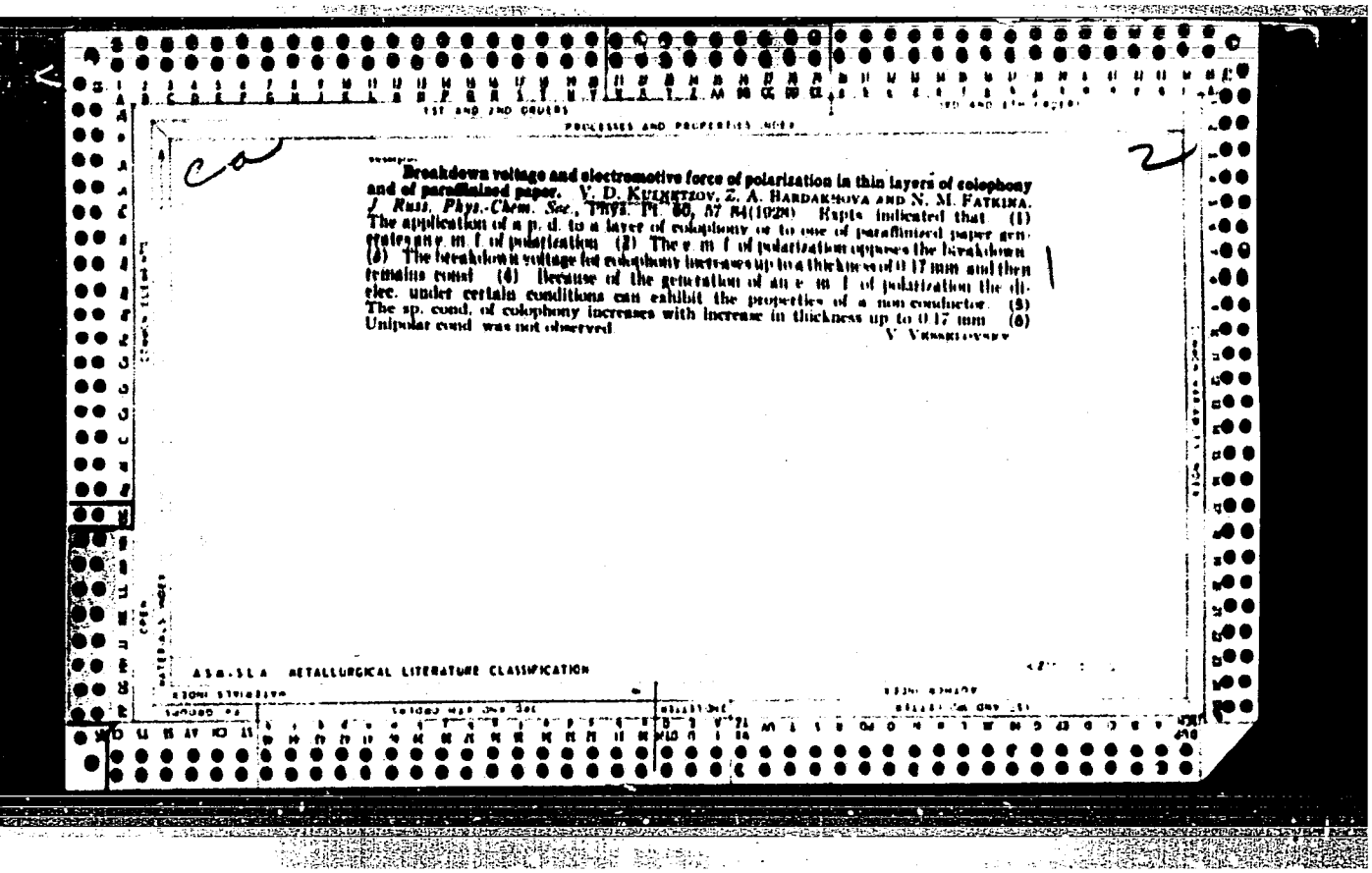

Breakdown voltage and electromotive force of polarization in thin layers of colophony and of paraffinized paper. V. D. KUZNETZOV, Z. A. HARDAKHOVA AND N. M. FATKINA. *J. Russ. Phys.-Chem. Soc.*, Phys. Pt. 60, 57-84(1928). Expts indicated that (1) The application of a p. d. to a layer of colophony or to one of paraffinized paper generates an e. m. f. of polarization. (2) The e. m. f. of polarization opposes the breakdown. (3) The breakdown voltage for colophony increases up to a thickness of 0.17 mm and then remains const. (4) Because of the generation of an e. m. f. of polarization the elec. under certain conditions can exhibit the properties of a non-conductor. (5) The sp. cond. of colophony increases with increase in thickness up to 0.17 mm. (6) Unipolar cond. was not observed.

V. Vassilyevsky

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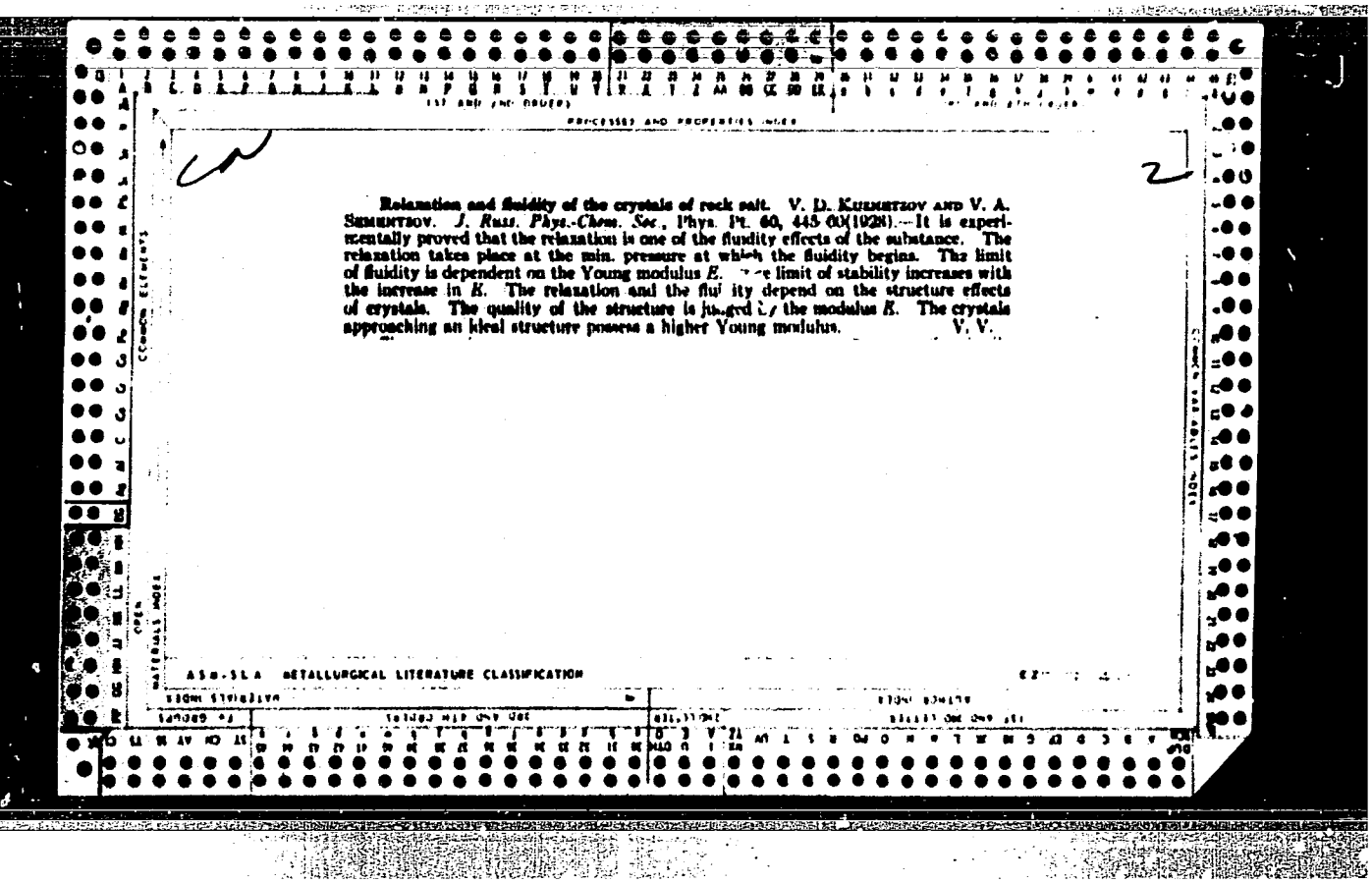

Relaxation and fluidity of the crystals of rock salt. V. D. Kuznetsov and V. A. Sementsov. *J. Russ. Phys.-Chem. Soc.*, Phys. Pt. 60, 445-60(1928).—It is experimentally proved that the relaxation is one of the fluidity effects of the substance. The relaxation takes place at the min. pressure at which the fluidity begins. The limit of fluidity is dependent on the Young modulus *E*. The limit of stability increases with the increase in *E*. The relaxation and the fluidity depend on the structure effects of crystals. The quality of the structure is judged by the modulus *E*. The crystals approaching an ideal structure possess a higher Young modulus. V. V.

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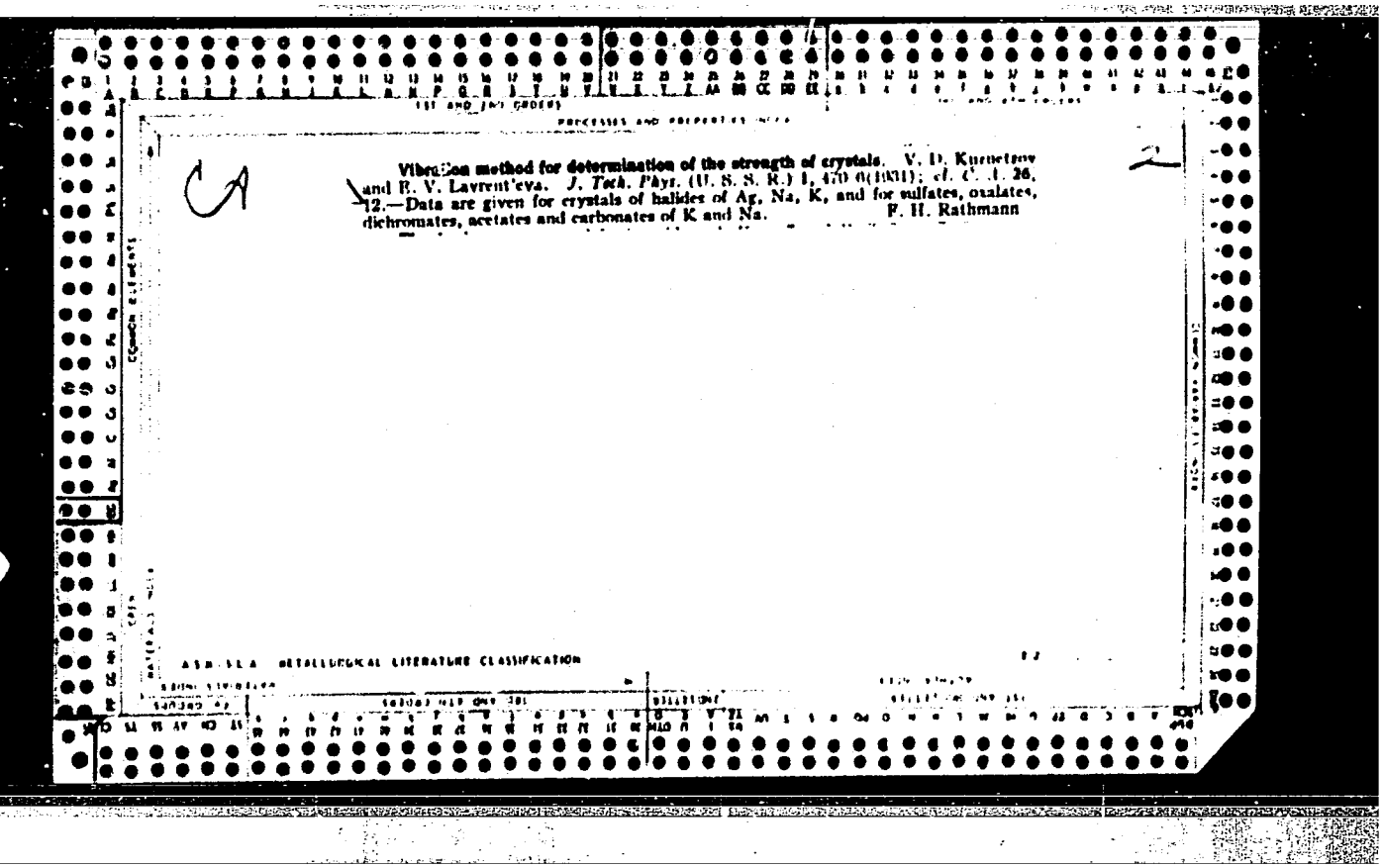

CA

Vibration method for determination of the strength of crystals. V. D. Kuznetsov and E. V. Lavrent'eva. *J. Tech. Phys.* (U. S. S. R.) 1, 470-9(1931); *cf. C. A.* 26, 12.—Data are given for crystals of halides of Ag, Na, K, and for sulfates, oxalates, dichromates, acetates and carbonates of K and Na. F. H. Rathmann

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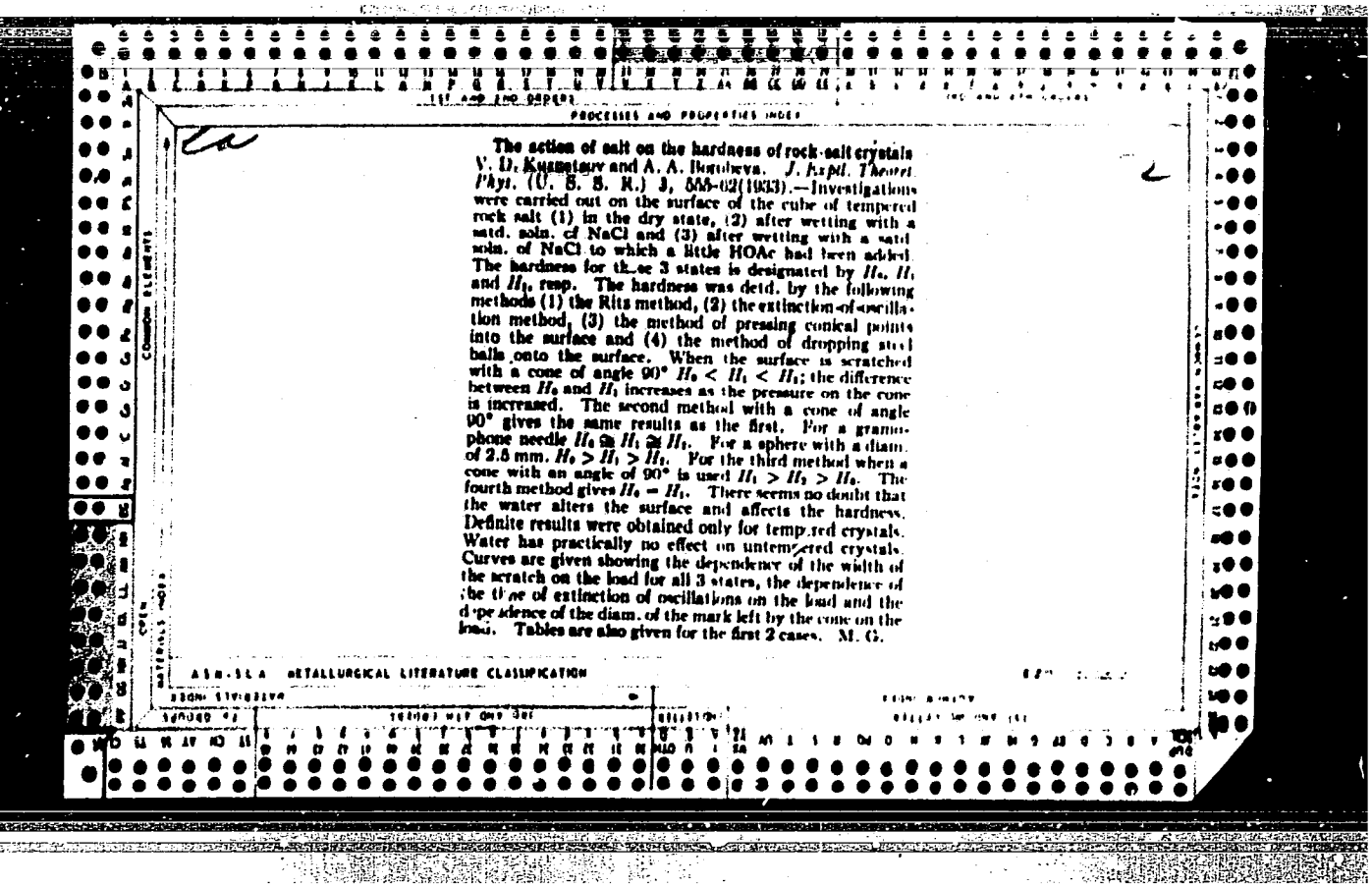

The action of salt on the hardness of rock-salt crystals. V. D. Kuznetsov and A. A. Bundova. *J. Exptl. Theoret. Phys.* (U. S. S. R.) 3, 555-62(1933).—Investigations were carried out on the surface of the cube of tempered rock salt (1) in the dry state, (2) after wetting with a satd. soln. of NaCl and (3) after wetting with a satd. soln. of NaCl to which a little HOAc had been added. The hardness for these 3 states is designated by H_0, H_1 and H_2, resp. The hardness was detd. by the following methods (1) the Rits method, (2) the extinction-of-oscillation method, (3) the method of pressing conical points into the surface and (4) the method of dropping steel balls onto the surface. When the surface is scratched with a cone of angle 90° $H_0 < H_1 < H_2$; the difference between H_0 and H_1 increases as the pressure on the cone is increased. The second method with a cone of angle 90° gives the same results as the first. For a gramophone needle $H_0 \cong H_1 \cong H_2$. For a sphere with a diam. of 2.5 mm. $H_0 > H_1 > H_2$. For the third method when a cone with an angle of 90° is used $H_1 > H_2 > H_0$. The fourth method gives $H_0 = H_1$. There seems no doubt that the water alters the surface and affects the hardness. Definite results were obtained only for tempered crystals. Water has practically no effect on untempered crystals. Curves are given showing the dependence of the width of the scratch on the load for all 3 states, the dependence of the time of extinction of oscillations on the load and the dependence of the diam. of the mark left by the cone on the load. Tables are also given for the first 2 cases. M. G.

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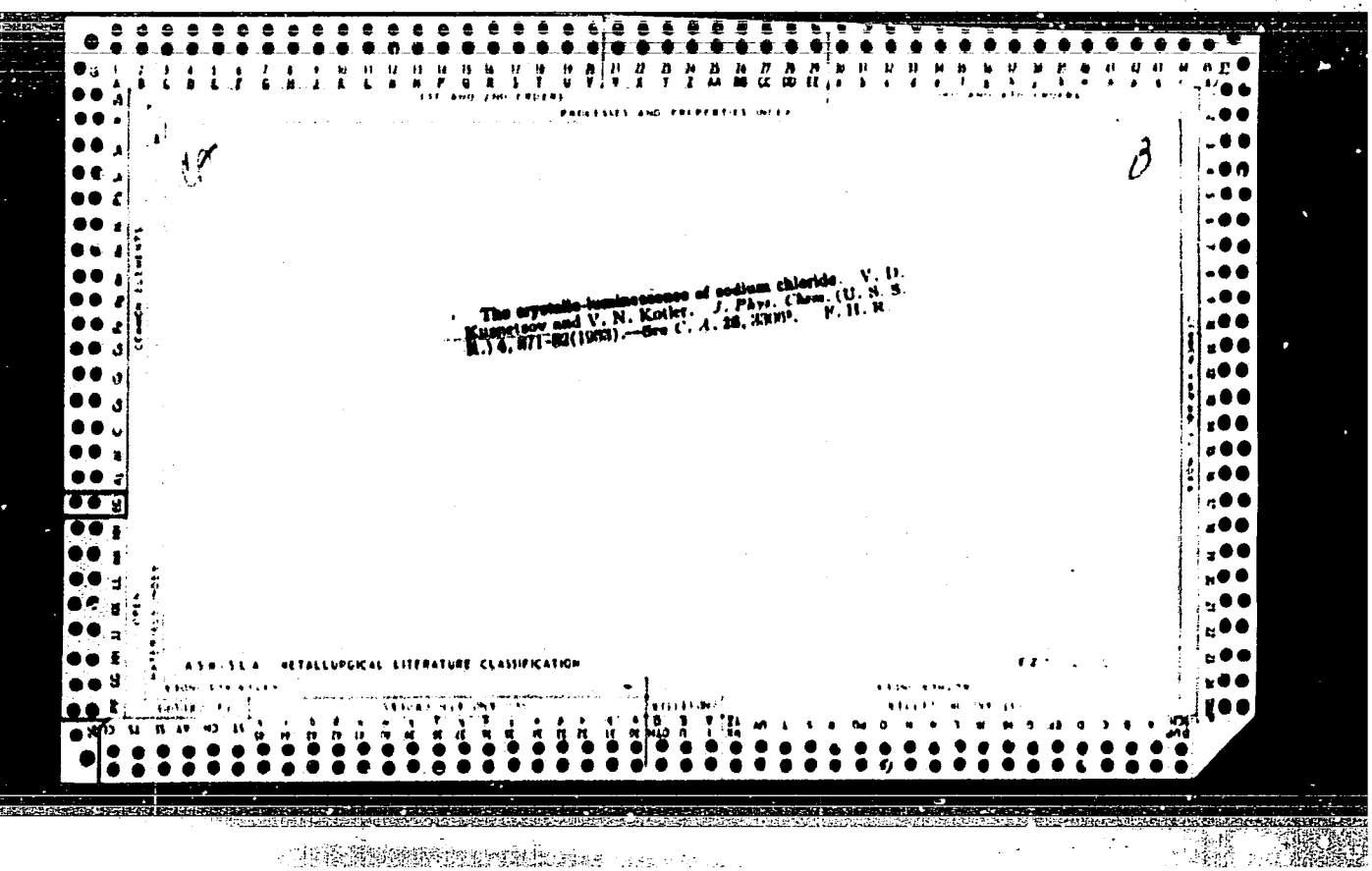

The crystallo-luminescence of sodium chloride. V. D. Kuznetsov and V. N. Kotler. J. Phys. Chem. (U. S. S. R.) 6, 871-82(1935).—See C. A. 28, [illegible]. M. II. R.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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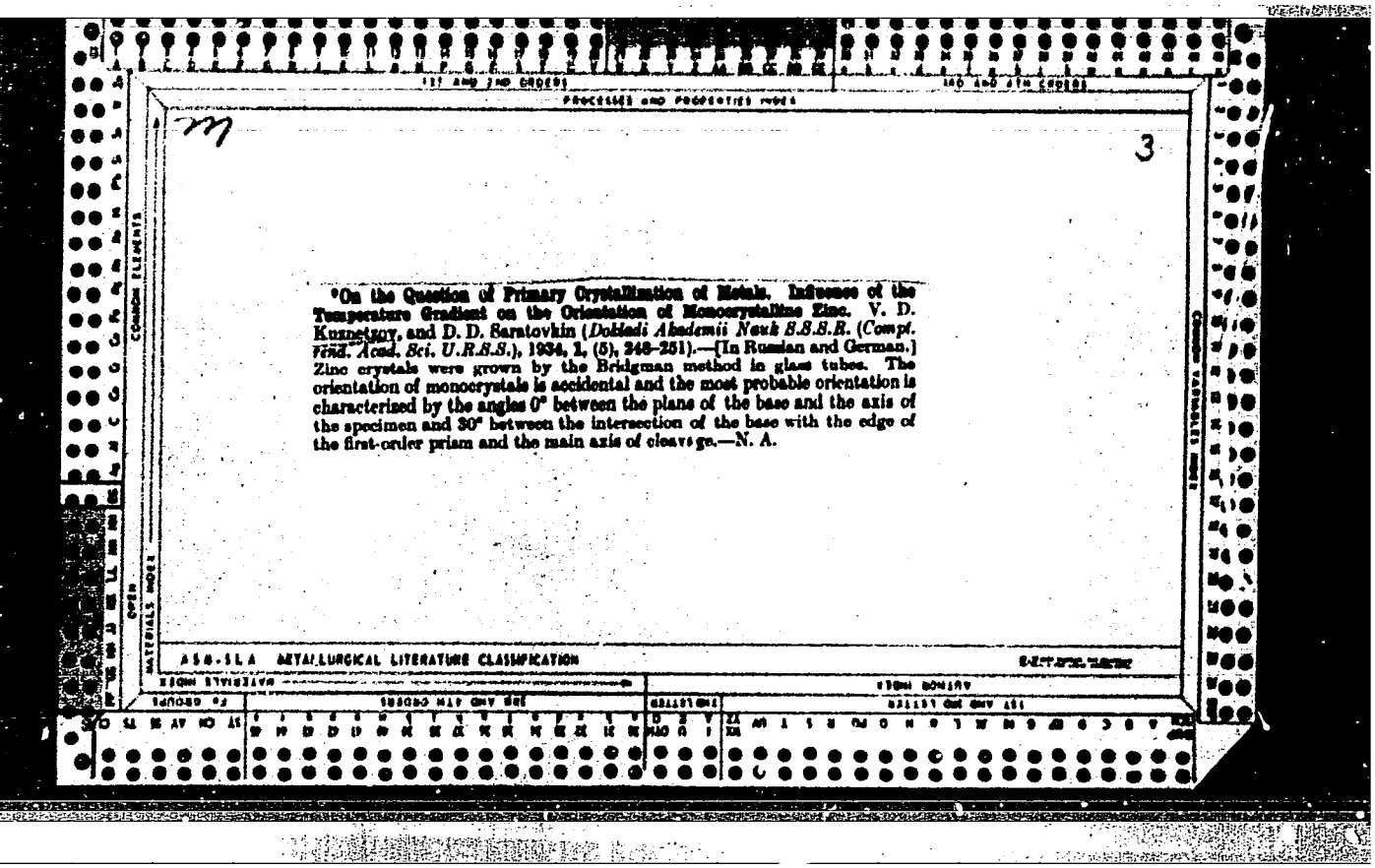

3

"On the Question of Primary Crystallization of Metals. Influence of the Temperature Gradient on the Orientation of Monocrystalline Zinc. V. D. Kuznetsov, and D. D. Saratovkin (*Dokladi Akademii Nauk S.S.S.R. (Compt. Rend. Acad. Sci. U.R.S.S.)*, 1934, 1, (5), 248–251).—[In Russian and German.] Zinc crystals were grown by the Bridgman method in glass tubes. The orientation of monocrystals is accidental and the most probable orientation is characterized by the angles 0° between the plane of the base and the axis of the specimen and 30° between the intersection of the base with the edge of the first-order prism and the main axis of cleavage.—N. A.

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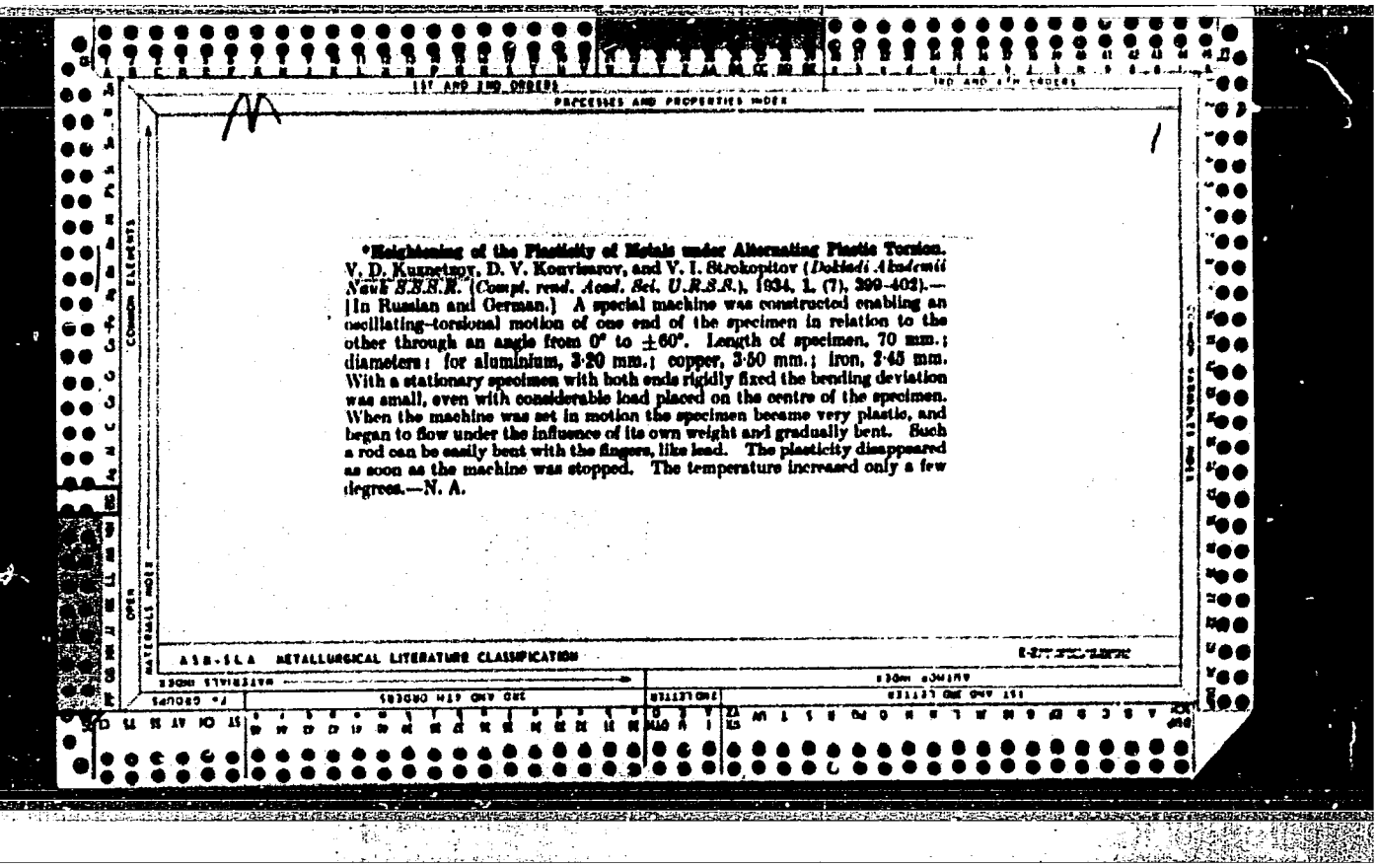

PROCESSES AND PROPERTIES INDEX

***Heightening of the Plasticity of Metals under Alternating Plastic Torsion.** V. D. Kuznetsov, D. V. Konvisarov, and V. I. Strokopitov (*Dokladi Akademii Nauk S.S.S.R.* (*Compt. rend. Acad. Sci. U.R.S.S.*), 1934, 1, (7), 399-402).—[In Russian and German.] A special machine was constructed enabling an oscillating-torsional motion of one end of the specimen in relation to the other through an angle from 0° to ±60°. Length of specimen, 70 mm.; diameters: for aluminium, 3·20 mm.; copper, 3·50 mm.; iron, 3·45 mm. With a stationary specimen with both ends rigidly fixed the bending deviation was small, even with considerable load placed on the centre of the specimen. When the machine was set in motion the specimen became very plastic, and began to flow under the influence of its own weight and gradually bent. Such a rod can be easily bent with the fingers, like lead. The plasticity disappeared as soon as the machine was stopped. The temperature increased only a few degrees.—N. A.

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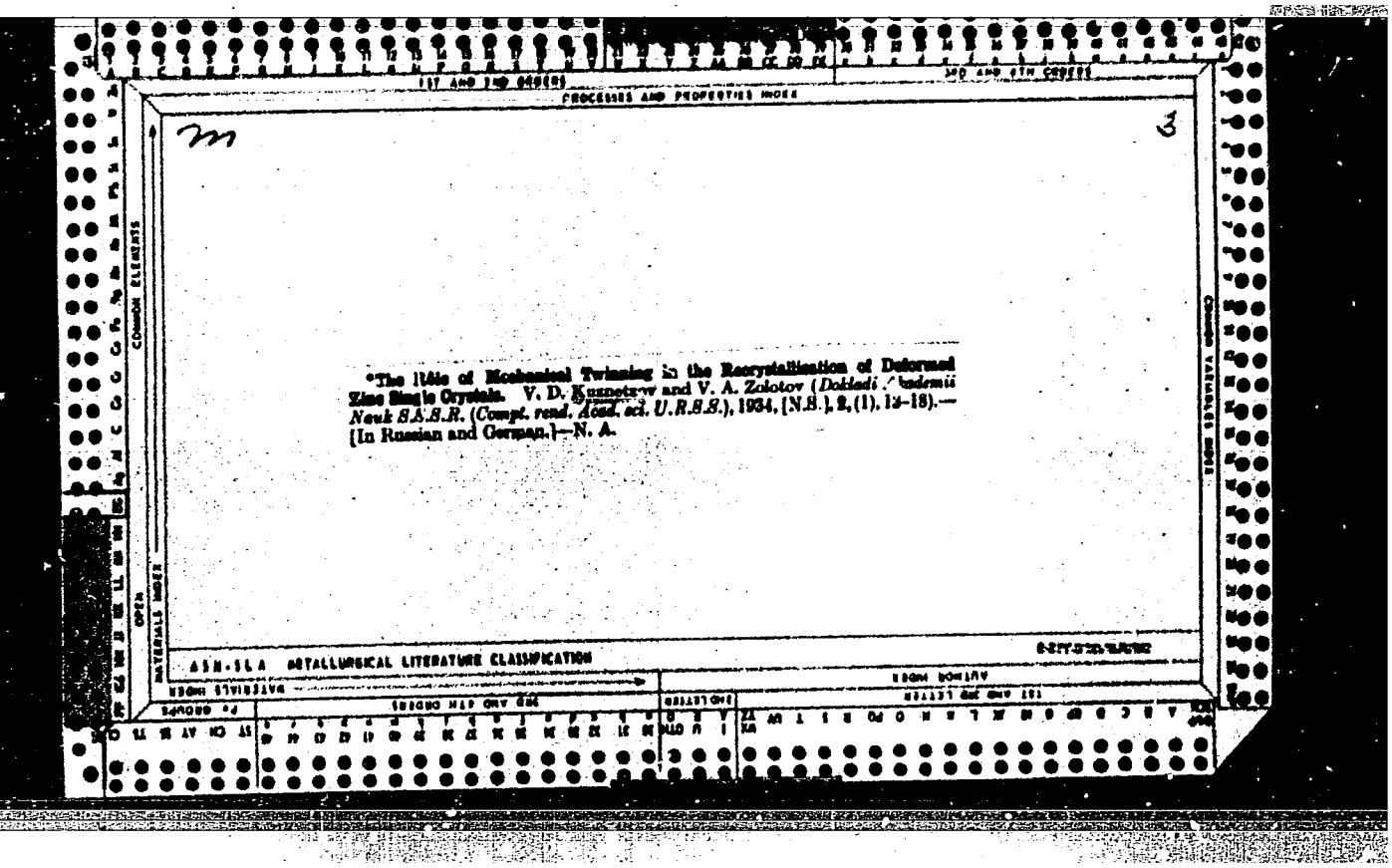

"The Rôle of Mechanical Twinning in the Recrystallisation of Deformed Zinc Single Crystals. V. D. Kuznetsov and V. A. Zalotov (*Doklady Akademii Nauk S.S.S.R.* (*Compt. rend. Acad. sci. U.R.S.S.*), 1934, [N.S.], 2, (1), 13–18).—[In Russian and German.]—N. A.

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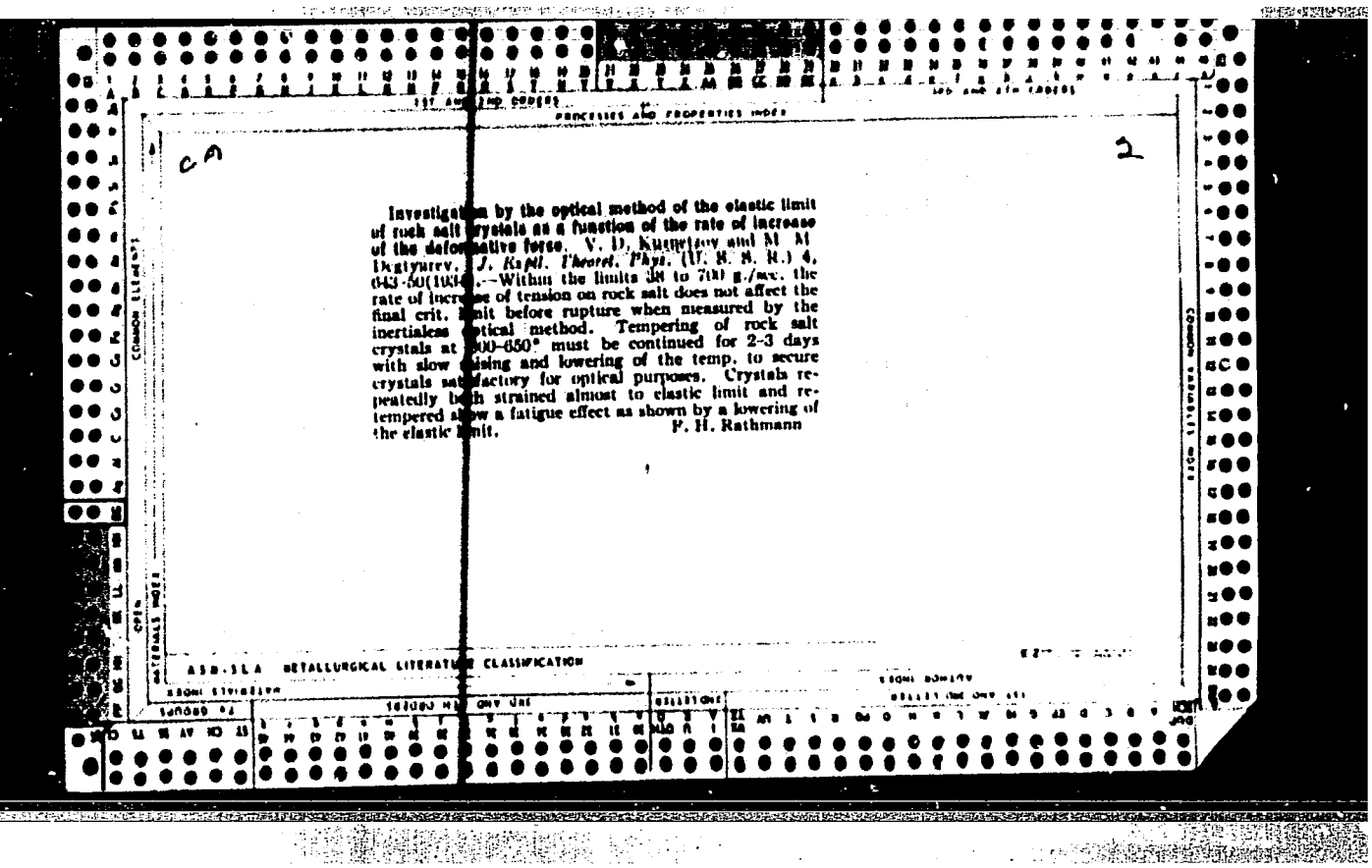

Investigation by the optical method of the elastic limit of rock salt crystals as a function of the rate of increase of the deformative force. V. D. Kuznetsov and M. M. Dagiyurev. *J. Exptl. Theoret. Phys.* (U. S. S. R.) 4, 643-50(1934).—Within the limits 38 to 700 g./mm.² the rate of increase of tension on rock salt does not affect the final crit. limit before rupture when measured by the inertialess optical method. Tempering of rock salt crystals at 600–650° must be continued for 2–3 days with slow raising and lowering of the temp. to secure crystals satisfactory for optical purposes. Crystals repeatedly both strained almost to elastic limit and retempered show a fatigue effect as shown by a lowering of the elastic limit.

P. H. Rathmann

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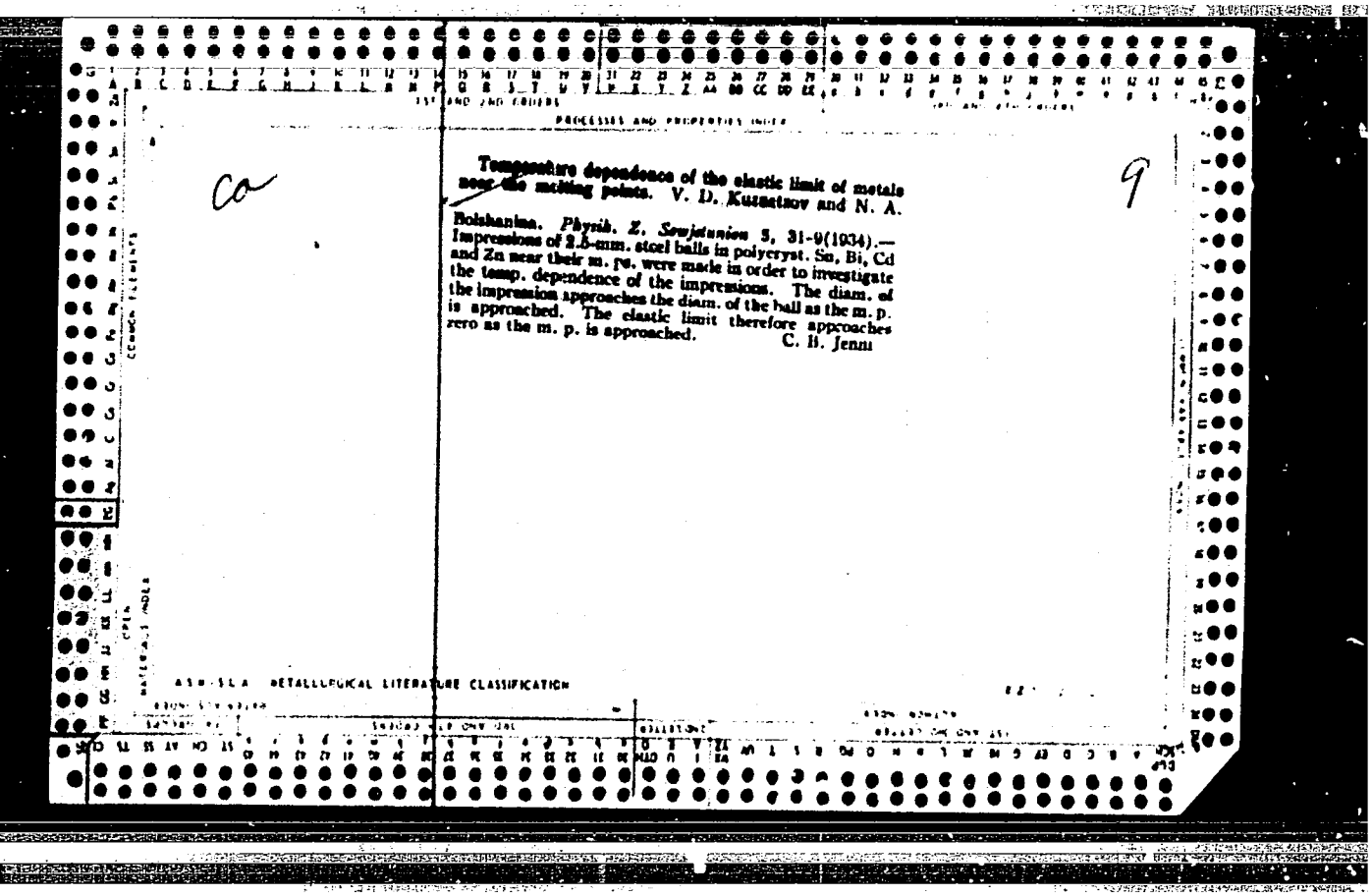

Ca

9

Temperature dependence of the elastic limit of metals near the melting points. V. D. Kuznetsov and N. A. Bolshanina. *Physik. Z. Sowjetunion* 5, 31-9(1934).—Impressions of 2.5-mm. steel balls in polycryst. Sn, Bi, Cd and Zn near their m. pts. were made in order to investigate the temp. dependence of the impressions. The diam. of the impression approaches the diam. of the ball as the m. p. is approached. The elastic limit therefore approaches zero as the m. p. is approached.
C. B. Jennu

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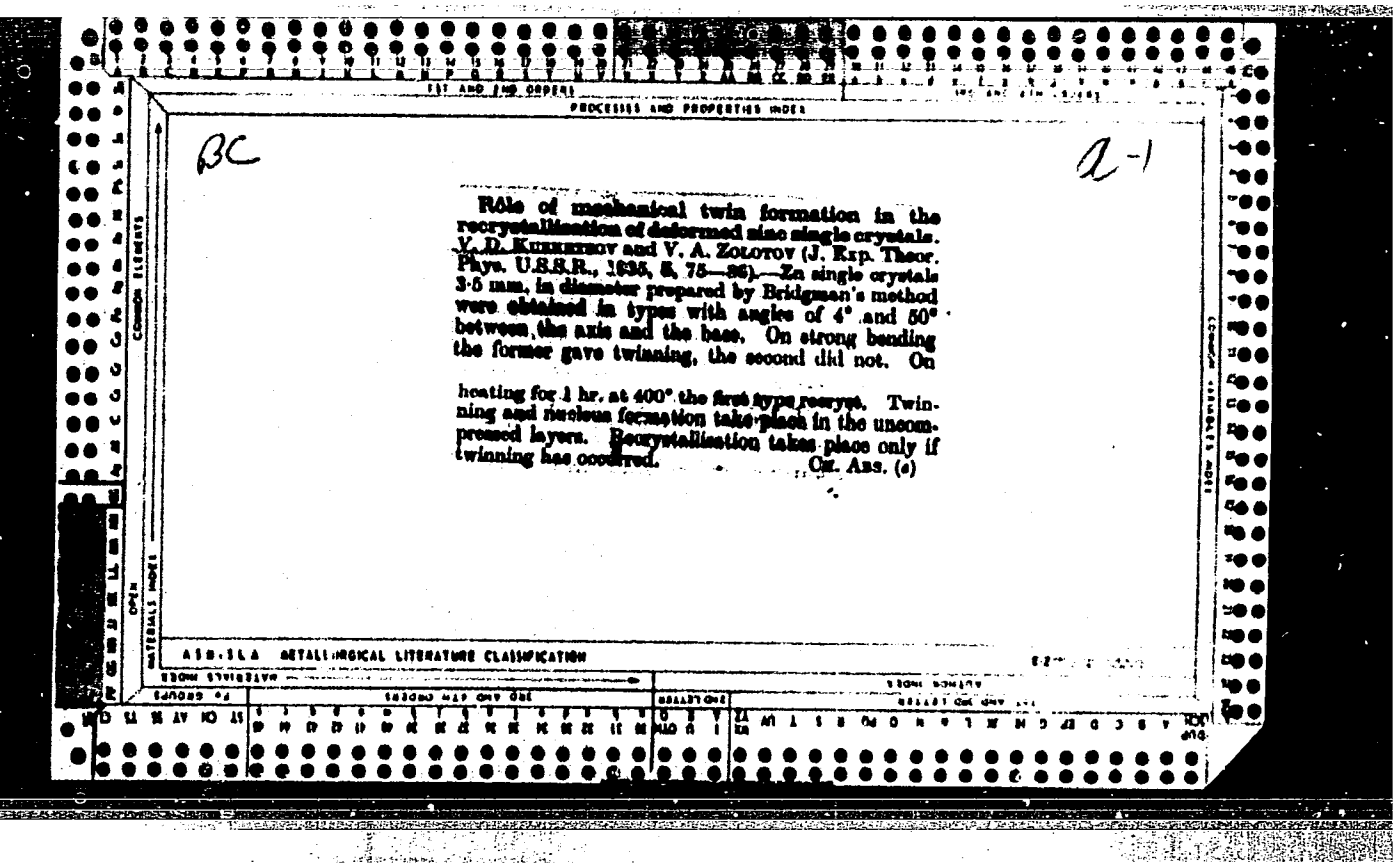

BC

a-1

Rôle of mechanical twin formation in the recrystallisation of deformed zinc single crystals. V. D. KUZNETSOV and V. A. ZOLOTOV (J. Exp. Theor. Phys. U.S.S.R., 1935, 5, 75—86).—Zn single crystals 3·5 mm. in diameter prepared by Bridgman's method were obtained in types with angles of 4° and 50° between the axis and the base. On strong bending the former gave twinning, the second did not. On heating for 1 hr. at 400° the first type recryst. Twinning and nucleus formation take place in the uncompressed layers. Recrystallisation takes place only if twinning has occurred. Cr. Ans. (e)

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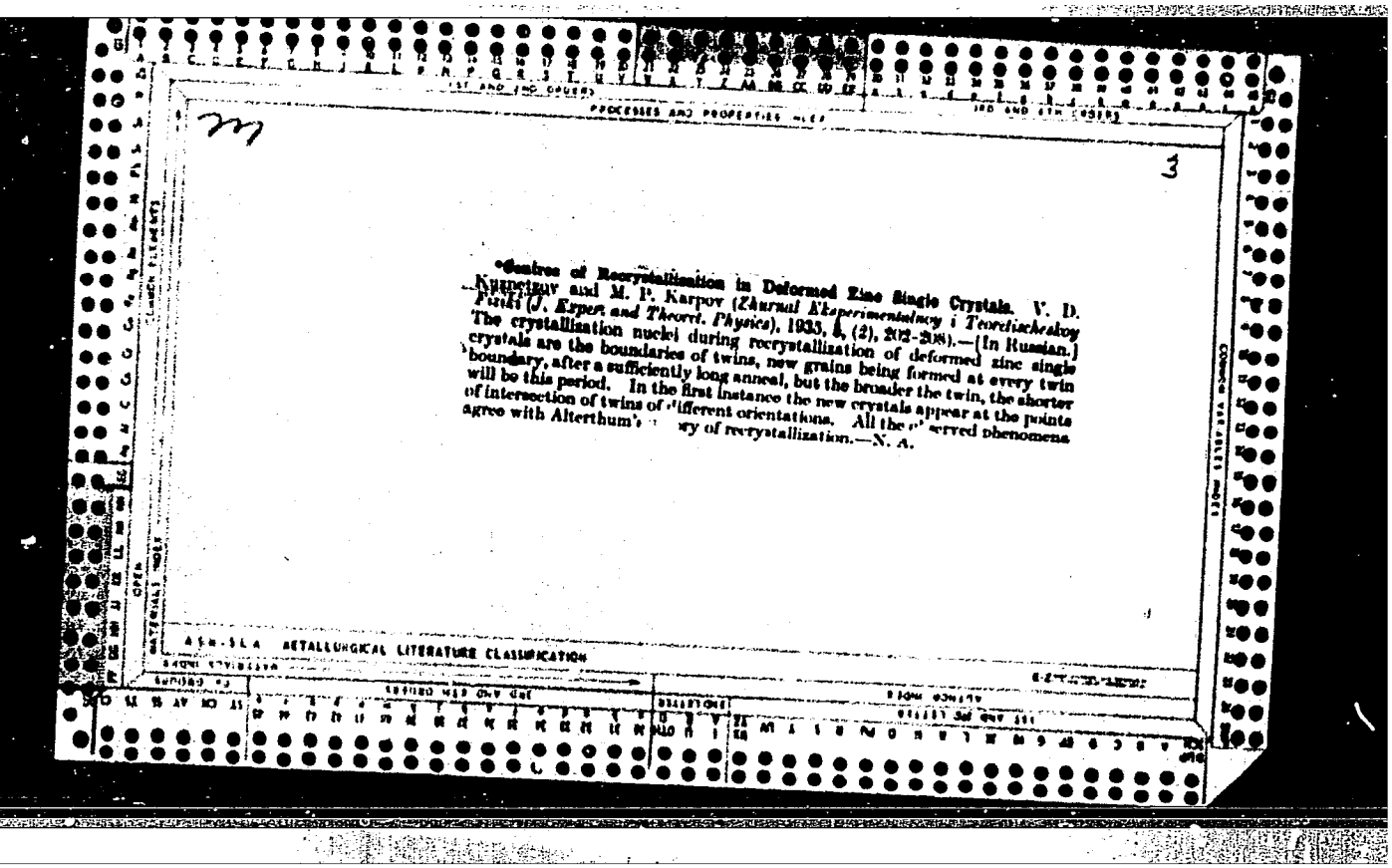

PROCESSES AND PROPERTIES INDEX

3

Centres of Recrystallisation in Deformed Zinc Single Crystals. V. D. Kuznetsov and M. P. Karpov (*Zhurnal Eksperimentalnoy i Teoreticheskoy Fiziki* (*J. Exper. and Theoret. Physics*), 1935, **5**, (2), 202-208).—(In Russian.) The crystallisation nuclei during recrystallisation of deformed zinc single crystals are the boundaries of twins, new grains being formed at every twin boundary, after a sufficiently long anneal, but the broader the twin, the shorter will be this period. In the first instance the new crystals appear at the points of intersection of twins of different orientations. All the observed phenomena agree with Alterthum's theory of recrystallization.—N. A.

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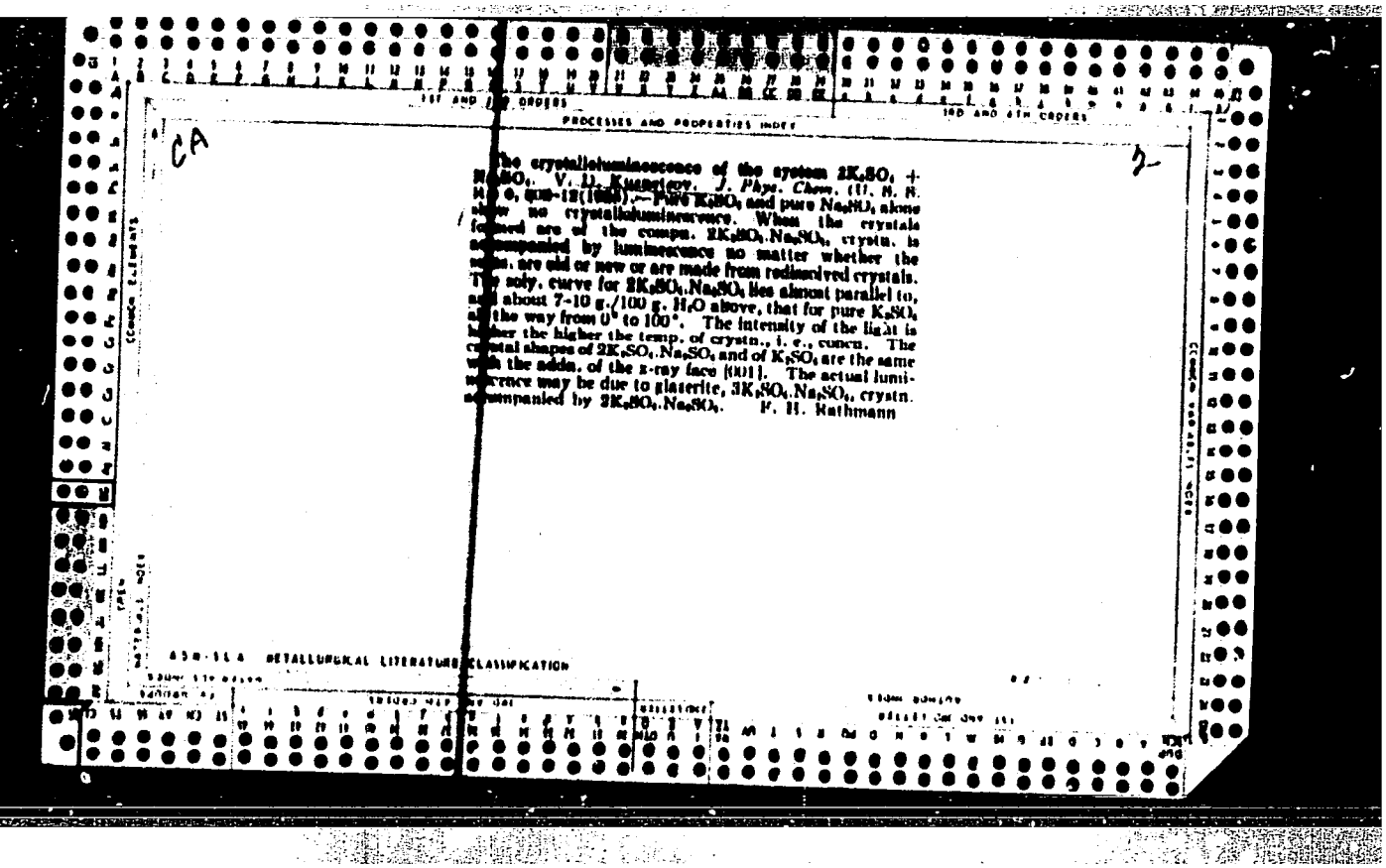

PROCESSES AND PROPERTIES INDEX

CA

2-

The crystalloluminescence of the system $2K_2SO_4$ + Na_2SO_4. V. D. Kuznetsov. *J. Phys. Chem. (U. S. S. R.)* 9, 905–12(1937).—Pure K_2SO_4 and pure Na_2SO_4 alone show no crystalloluminescence. When the crystals formed are of the compn. $2K_2SO_4.Na_2SO_4$, crystn. is accompanied by luminescence no matter whether the solns. are old or new or are made from redissolved crystals. The solv. curve for $2K_2SO_4.Na_2SO_4$ lies almost parallel to, and about 7–10 g./100 g. H_2O above, that for pure K_2SO_4 all the way from 0° to 100°. The intensity of the light is higher the higher the temp. of crystn., i. e., concn. The crystal shapes of $2K_2SO_4.Na_2SO_4$ and of K_2SO_4 are the same with the addn. of the x-ray face (001). The actual luminescence may be due to glaserite, $3K_2SO_4.Na_2SO_4$, crystn. accompanied by $2K_2SO_4.Na_2SO_4$. F. H. Rathmann

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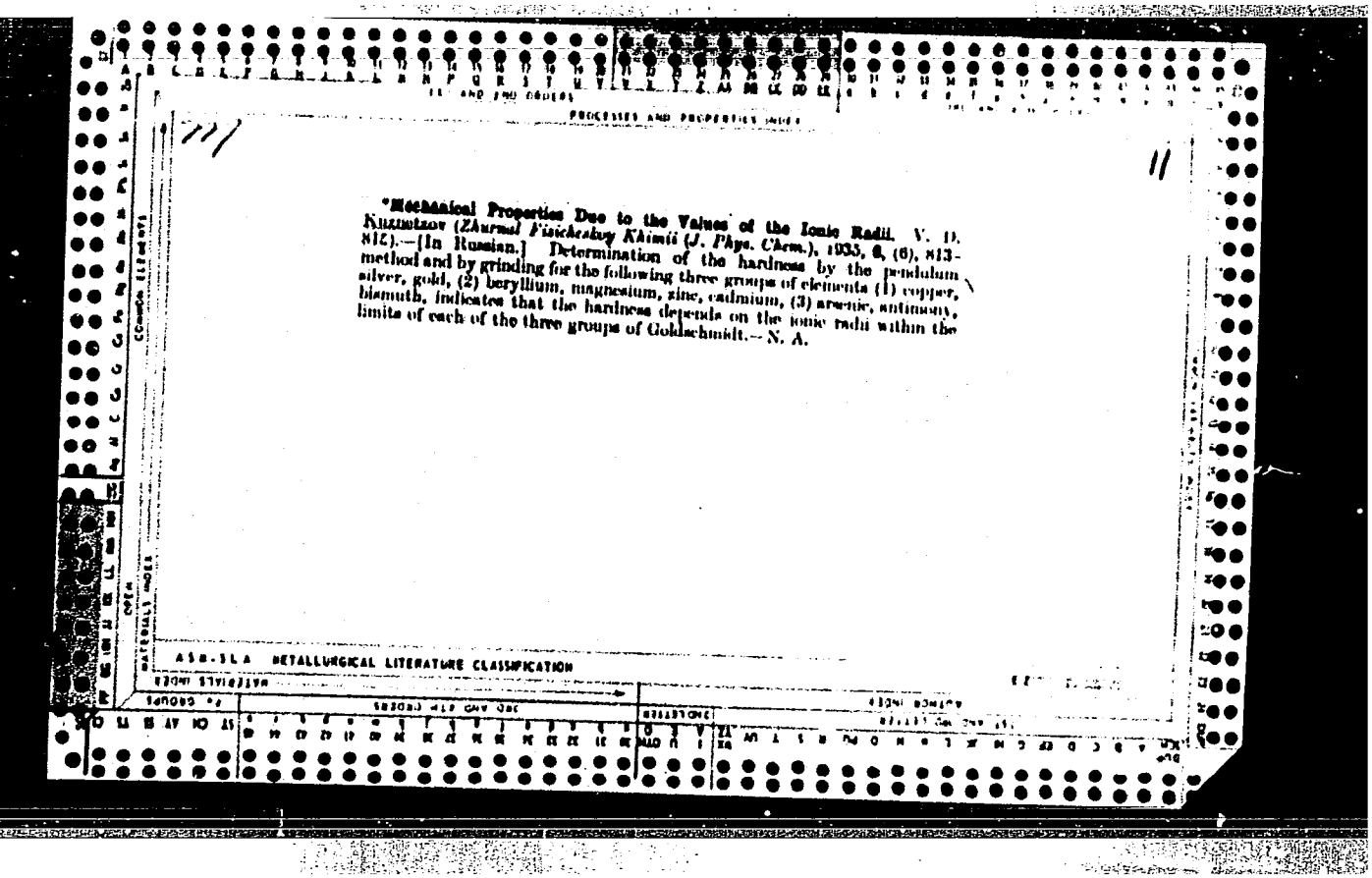

"**Mechanical Properties Due to the Values of the Ionic Radii.** V. D. Kuznetzov (*Zhurnal Fizicheskoy Khimii* (*J. Phys. Chem.*), 1933, 6, (6), 813-815).—[In Russian.] Determination of the hardness by the pendulum method and by grinding for the following three groups of elements (1) copper, silver, gold, (2) beryllium, magnesium, zinc, cadmium, (3) arsenic, antimony, bismuth, indicates that the hardness depends on the ionic radii within the limits of each of the three groups of Goldschmidt.—N. A.

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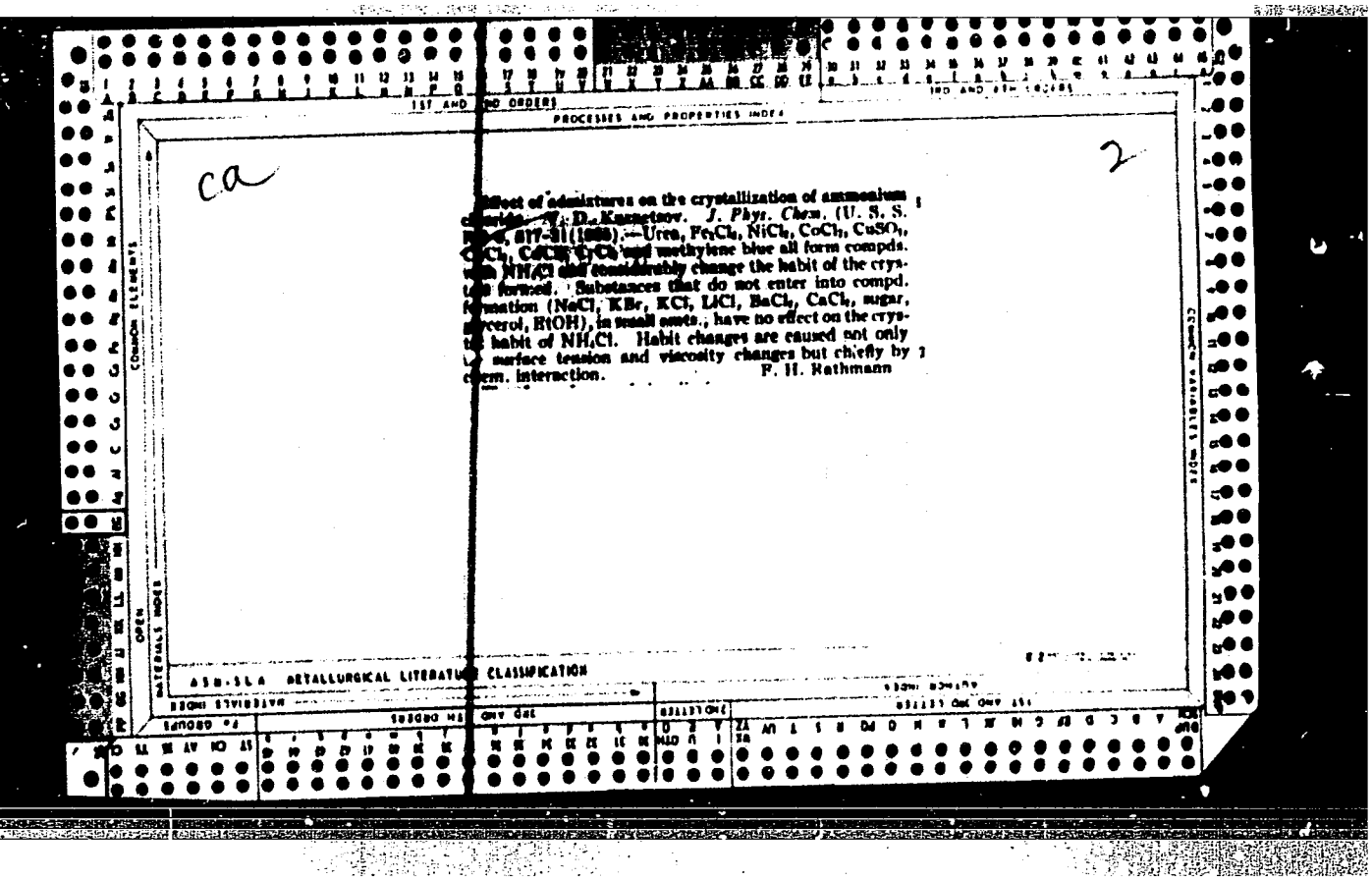
1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS



ca

2

Effect of admixtures on the crystallization of ammonium chloride. V. D. Kuznetsov. *J. Phys. Chem.* (U. S. S. R.) 6, 817-31 (1935).—Urea, Fe_2Cl_6, $NiCl_2$, $CoCl_2$, $CuSO_4$, $CrCl_3$, $CdCl_2$, $CrCl_3$ and methylene blue all form compds. with NH_4Cl and considerably change the habit of the crystals formed. Substances that do not enter into compd. formation (NaCl, KBr, KCl, LiCl, $BaCl_2$, $CaCl_2$, sugar, glycerol, EtOH), in small amts., have no effect on the crystal habit of NH_4Cl. Habit changes are caused not only by surface tension and viscosity changes but chiefly by chem. interaction. F. H. Rathmann

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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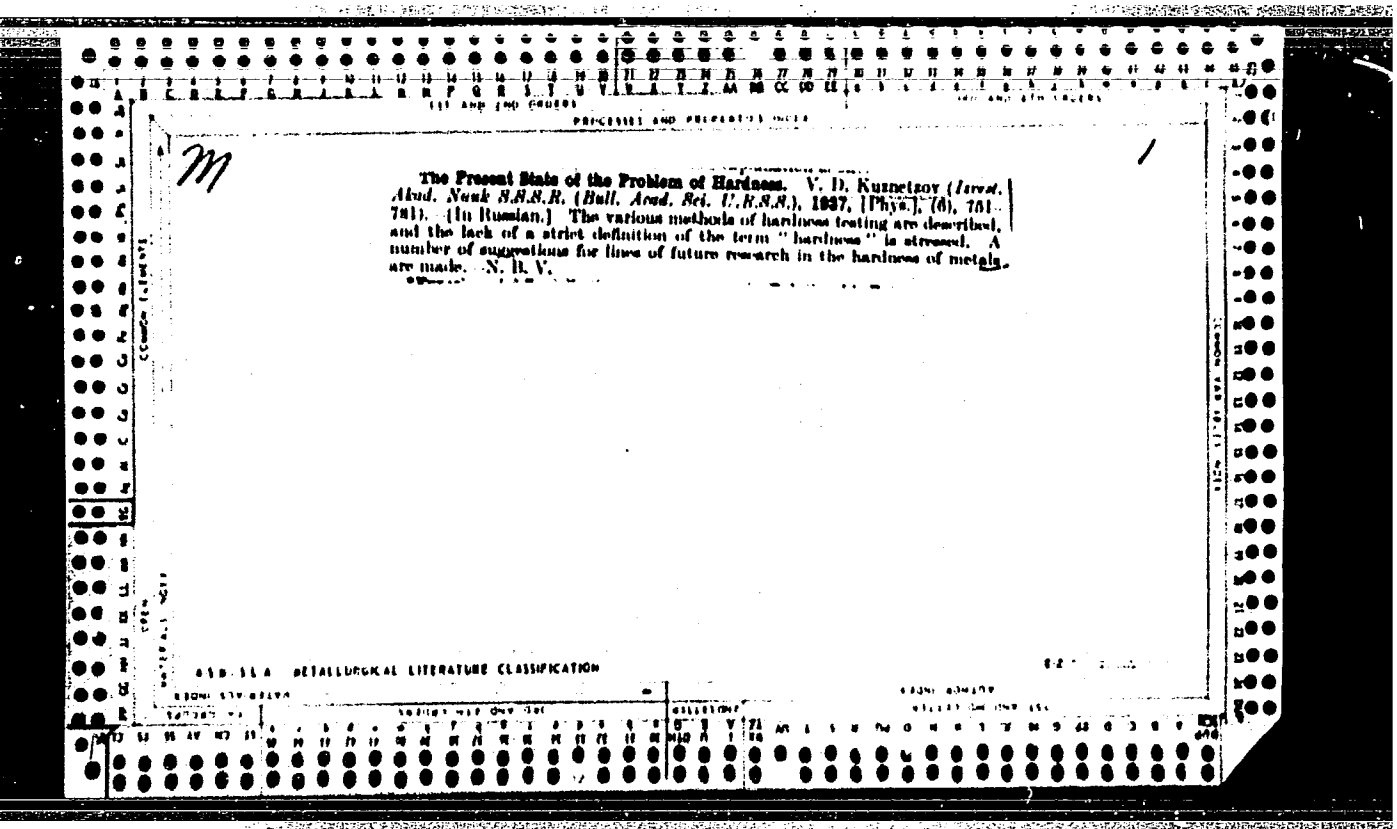

The Present State of the Problem of Hardness. V. D. Kuznetzov (*Izvest. Akad. Nauk S.S.S.R.* (*Bull. Acad. Sci. U.R.S.S.*), 1937, [Phys.], (6), 781–781). (In Russian.) The various methods of hardness testing are described, and the lack of a strict definition of the term "hardness" is stressed. A number of suggestions for lines of future research in the hardness of metals are made. N. B. V.

669.15.1.A METALLURGICAL LITERATURE CLASSIFICATION

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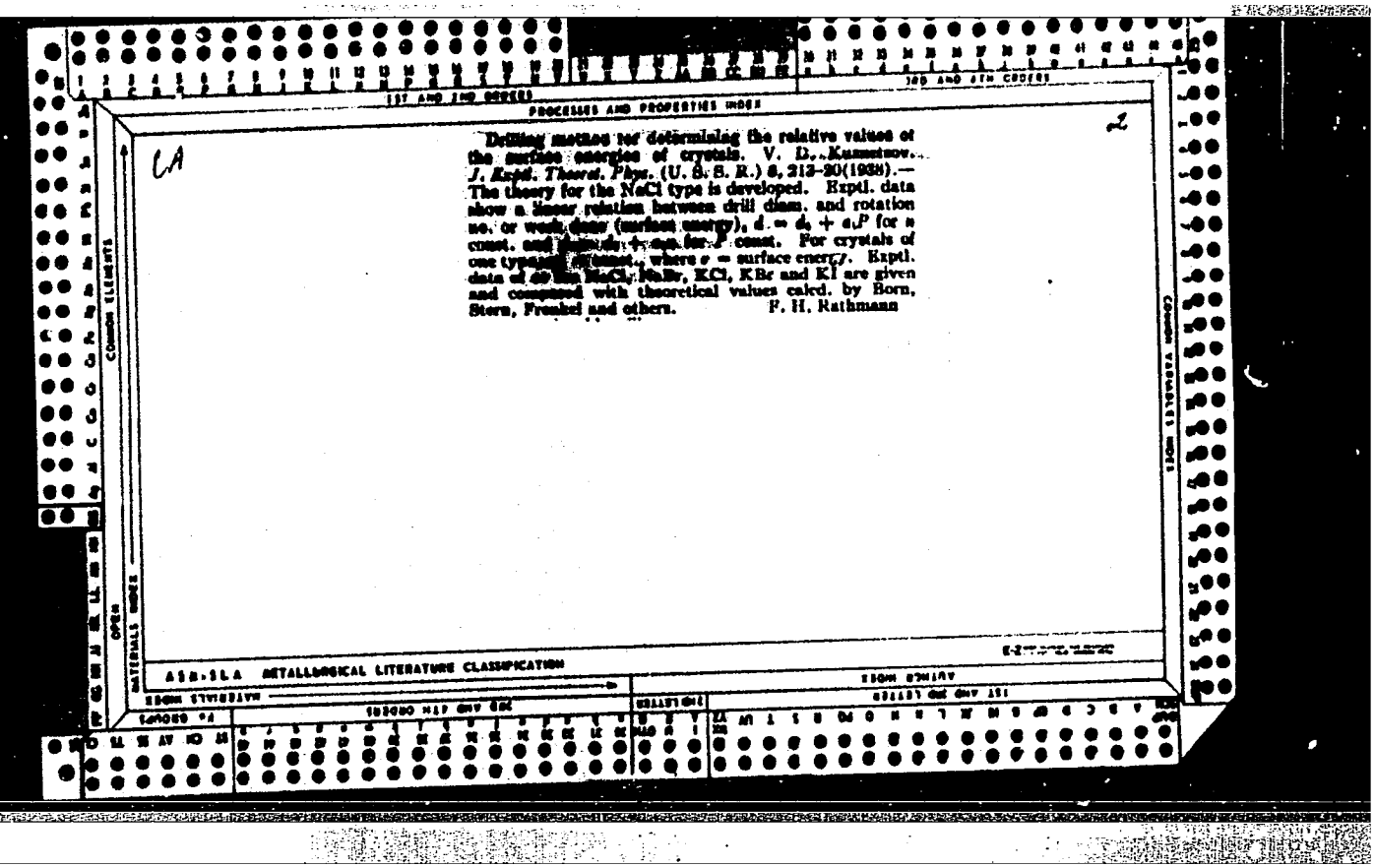
1ST AND 2ND ORDERS

3RD AND 4TH ORDERS



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CA

2

Drilling method for determining the relative values of the surface energies of crystals. V. D. Kuznetsov. *J. Exptl. Theoret. Phys.* (U. S. S. R.) 8, 213-20(1938).—The theory for the NaCl type is developed. Exptl. data show a linear relation between drill diam. and rotation no. or work done (surface energy), $d = d_0 + a_1P$ for n const. and $d = d_0 + a_2n$ for P const. For crystals of one type [illegible] const., where σ = surface energy. Exptl. data of [illegible] NaCl, NaBr, KCl, KBr and KI are given and compared with theoretical values calcd. by Born, Stern, Frenkel and others. F. H. Rathmann

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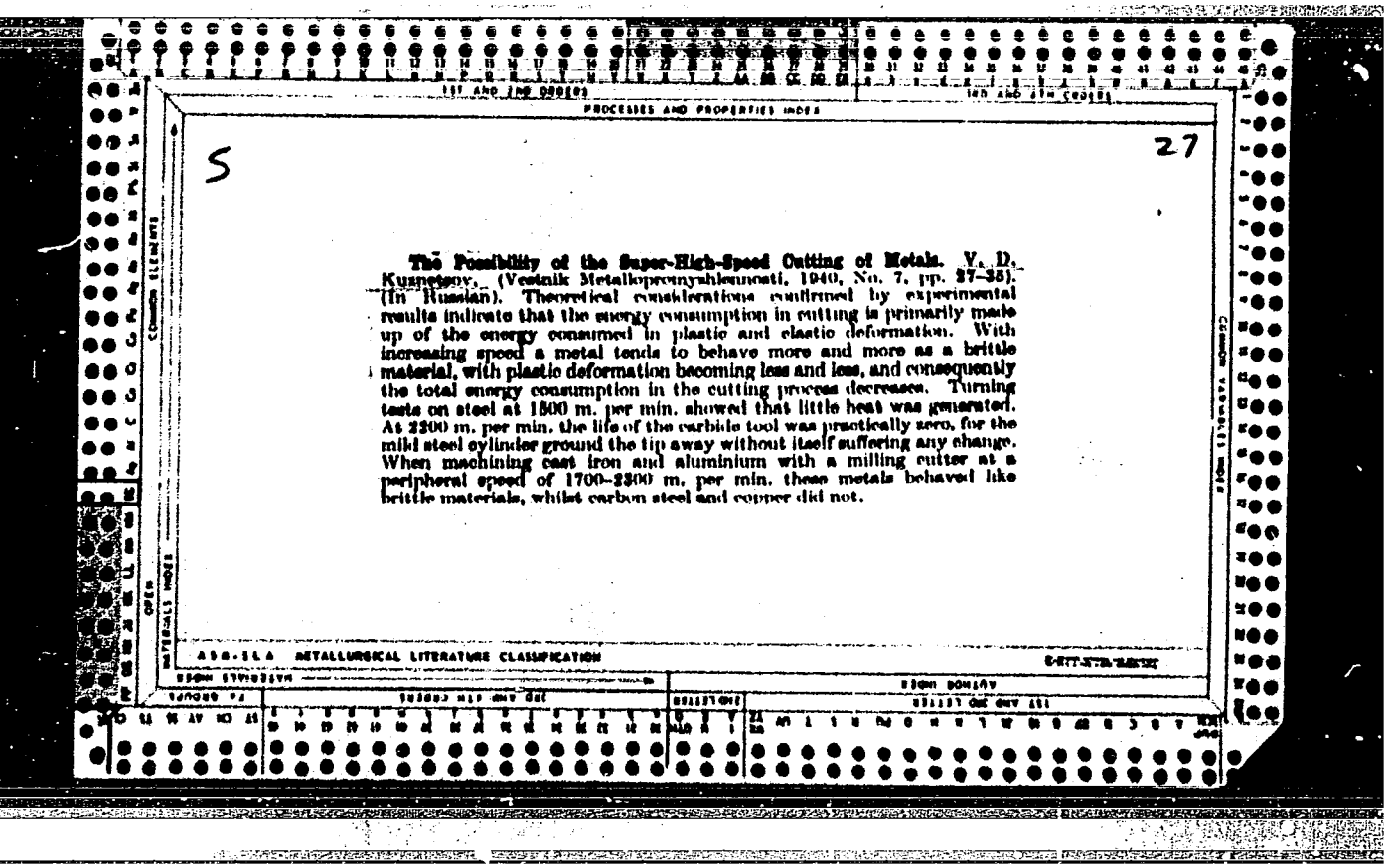

S

27

The Possibility of the Super-High-Speed Cutting of Metals. V. D. Kuznetsov. (Vestnik Metallopromyshlennosti, 1940, No. 7, pp. 27–38). (In Russian). Theoretical considerations confirmed by experimental results indicate that the energy consumption in cutting is primarily made up of the energy consumed in plastic and elastic deformation. With increasing speed a metal tends to behave more and more as a brittle material, with plastic deformation becoming less and less, and consequently the total energy consumption in the cutting process decreases. Turning tests on steel at 1800 m. per min. showed that little heat was generated. At 2300 m. per min. the life of the carbide tool was practically zero, for the mild steel cylinder ground the tip away without itself suffering any change. When machining cast iron and aluminium with a milling cutter at a peripheral speed of 1700–2300 m. per min. these metals behaved like brittle materials, whilst carbon steel and copper did not.

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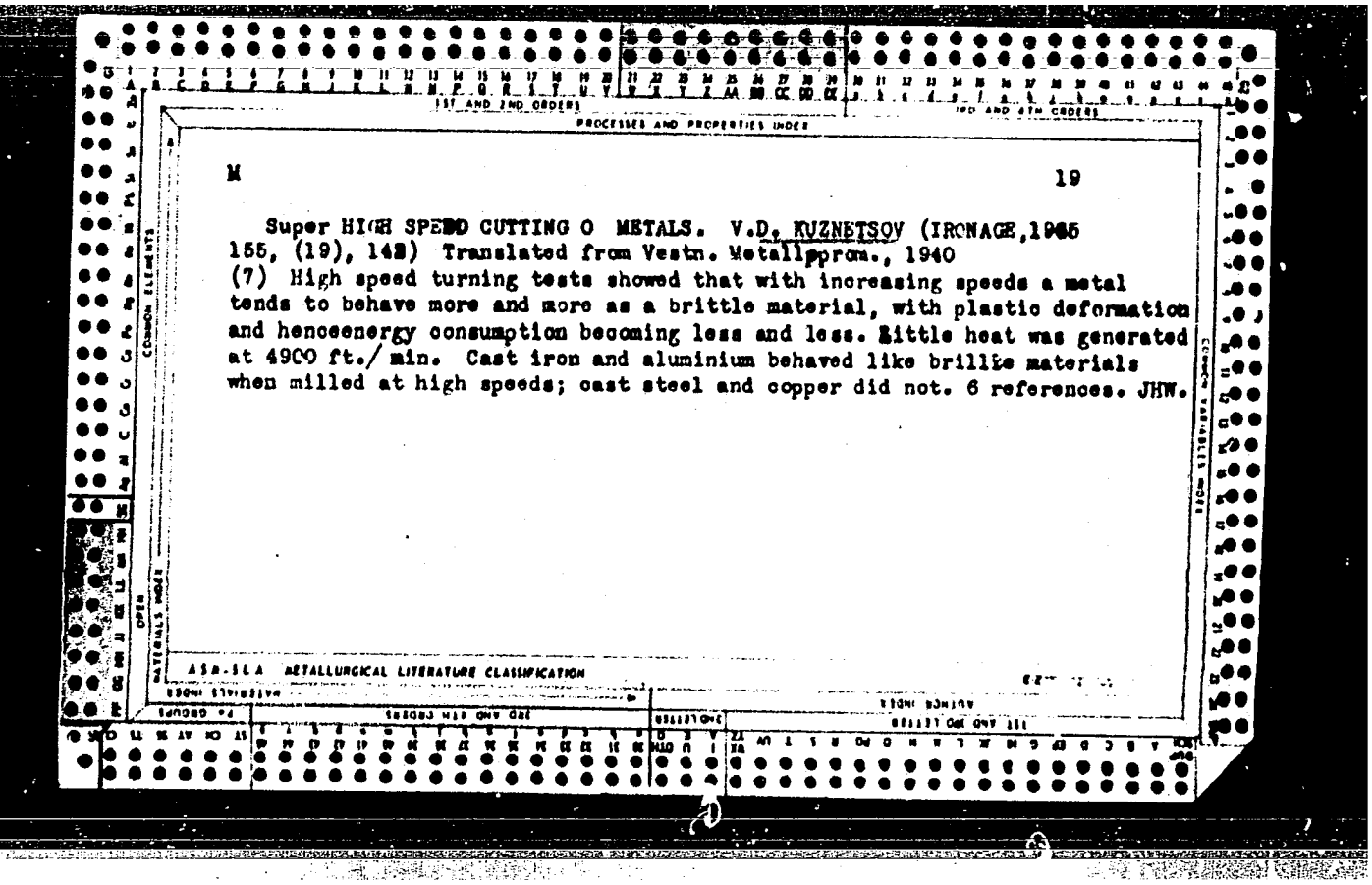

M 19

Super HIGH SPEED CUTTING O METALS. V.D. KUZNETSOV (IRONAGE,1965 155, (19), 148) Translated from Vestn. Metallprom., 1940 (7) High speed turning tests showed that with increasing speeds a metal tends to behave more and more as a brittle material, with plastic deformation and hencesenergy consumption becoming less and less. Little heat was generated at 4900 ft./ min. Cast iron and aluminium behaved like brittle materials when milled at high speeds; cast steel and copper did not. 6 references. JHW.

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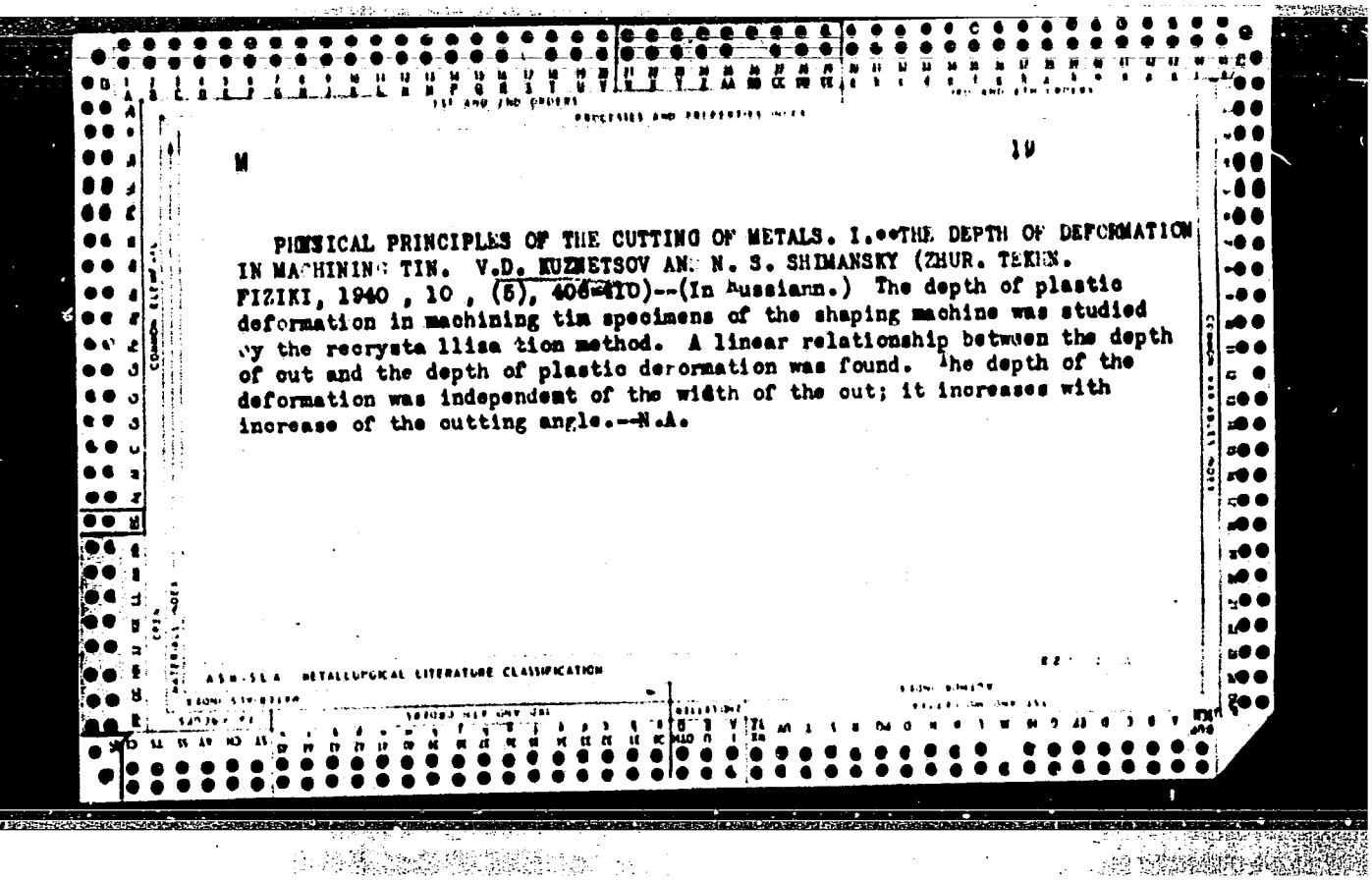

M 10

PHYSICAL PRINCIPLES OF THE CUTTING OF METALS. I. THE DEPTH OF DEFORMATION IN MACHINING TIN. V.D. KUZNETSOV AND N. S. SHIMANSKY (ZHUR. TEKHN. FIZIKI, 1940 , 10 , (5), 406-410)--(In Russiann.) The depth of plastic deformation in machining tin specimens of the shaping machine was studied by the recrystallisation method. A linear relationship between the depth of cut and the depth of plastic deformation was found. The depth of the deformation was independent of the width of the cut; it increases with increase of the cutting angle.--N.A.

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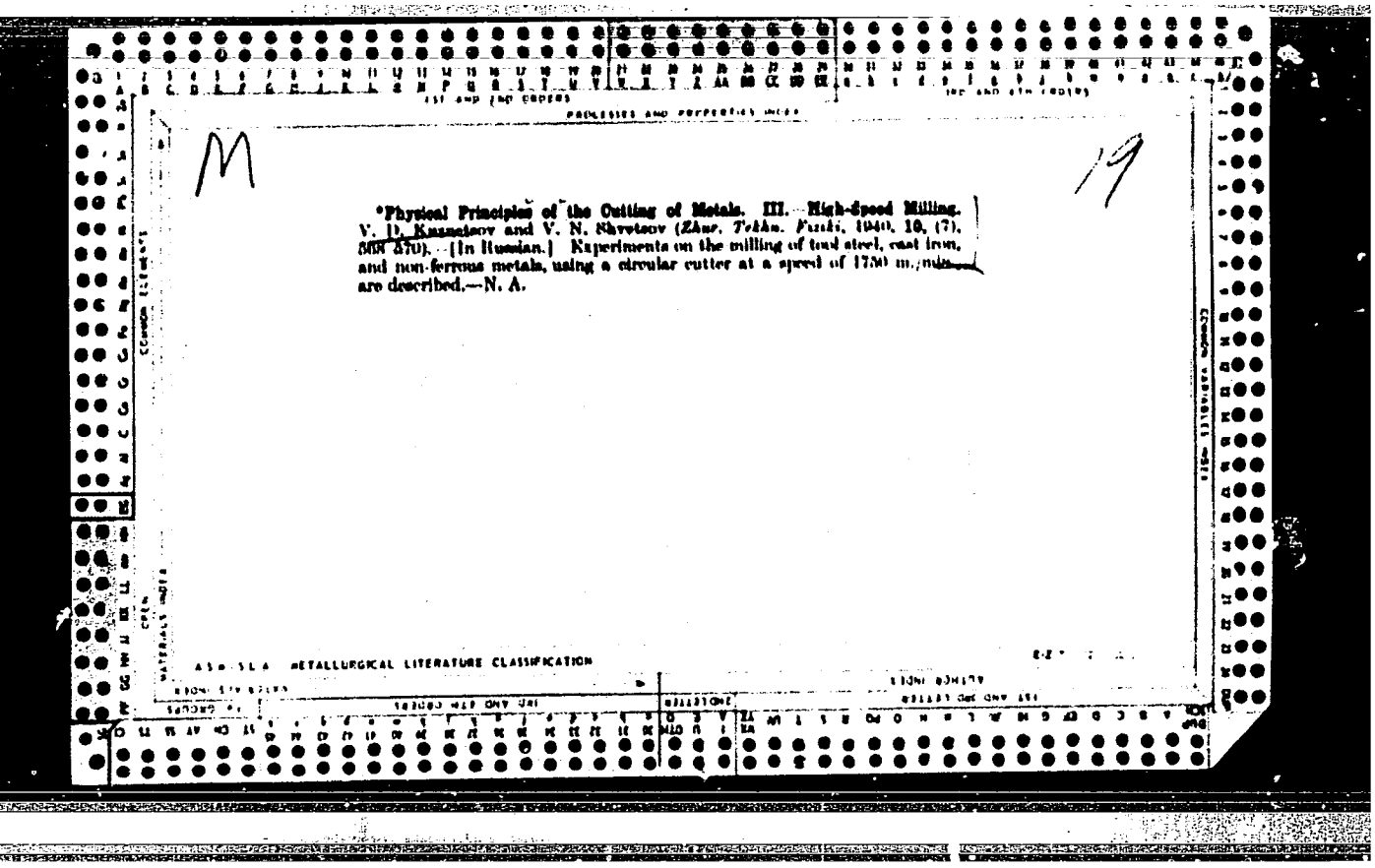

M

19

***Physical Principles of the Cutting of Metals. III. High-Speed Milling.** V. D. Kuznetsov and V. N. Shvetsov (*Zhur. Tekhn. Fiziki*, 1940, 10, (7), 569–570). [In Russian.] Experiments on the milling of tool steel, cast iron, and non-ferrous metals, using a circular cutter at a speed of 1750 m./min., are described.—N. A.

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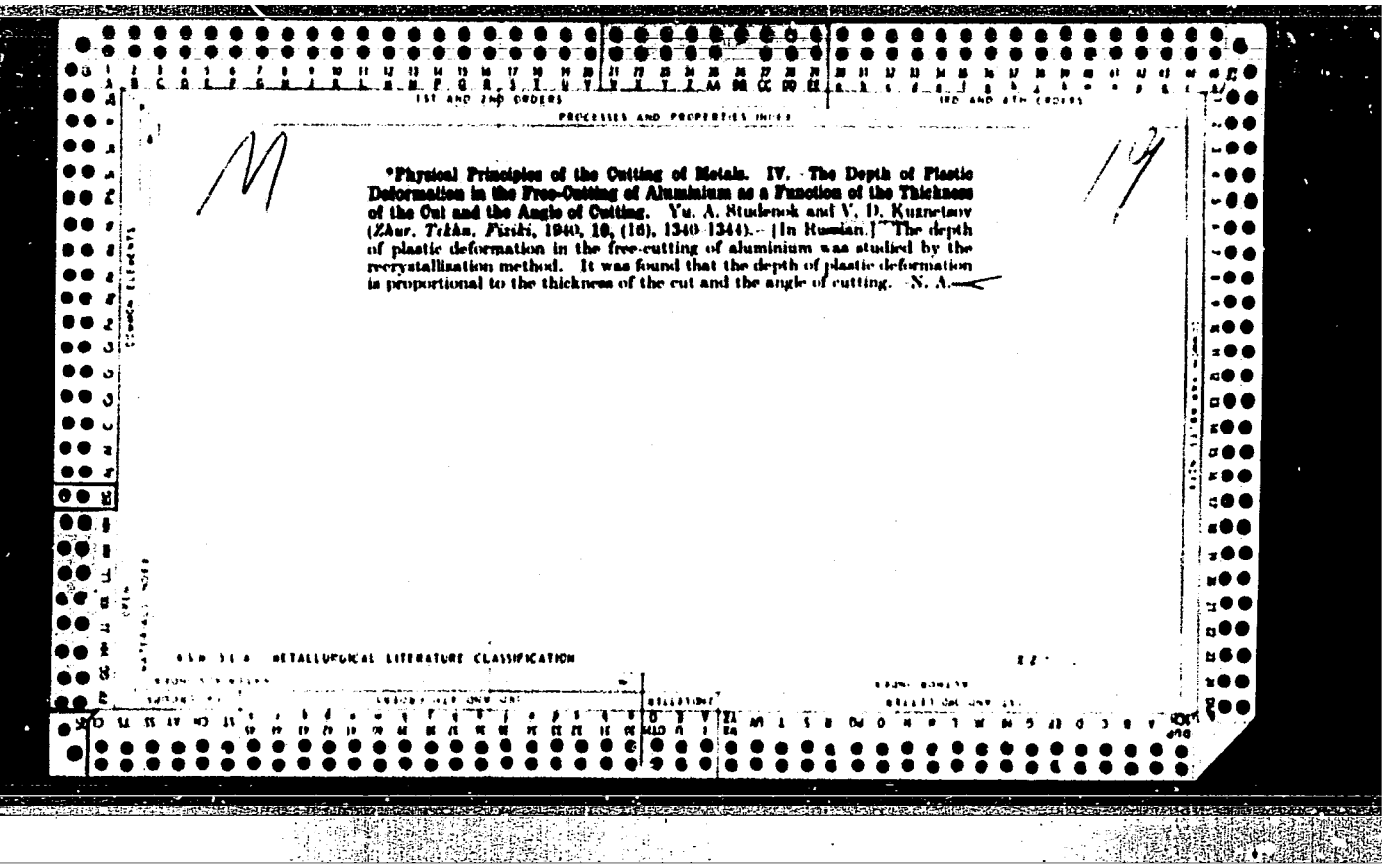

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14

***Physical Principles of the Cutting of Metals. IV. The Depth of Plastic Deformation in the Free-Cutting of Aluminium as a Function of the Thickness of the Cut and the Angle of Cutting.** Yu. A. Studenok and V. D. Kuznetsov (*Zhur. Tekhn. Fiziki*, 1940, **10**, (16), 1340–1344).—[In Russian.] The depth of plastic deformation in the free-cutting of aluminium was studied by the recrystallisation method. It was found that the depth of plastic deformation is proportional to the thickness of the cut and the angle of cutting.—N. A.

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MA

1

Works on the Physics of Solids in the U.S.S.R. V. D. Kuznetzov (*J. Physics (U.S.S.R.)*, 1941, 5, (5/6), 209–317).—[In English.] A general review of recent work carried out in the U.S.S.R. The influence of various factors on the crystallization of undercooled liquids (mainly organic) is described together with a section on the plasticity and strength of ionic crystals, where the influence of twinning is discussed. Plastic deformation of polycrystalline metals from the point of view of rate of deformation, the physics of compression, and the interrelation of various forms of deformation in the light of recent work are discussed briefly, and the dependence of the cold brittleness of steel on temperature and impact-velocity is dealt with. Recent work on the mechanical properties of single crystals and polycrystalline metals is described, and the importance of twinning again stressed. Also included is a brief description of experiments on the physical foundations of metal cutting, as references.—G. V. R.

1943

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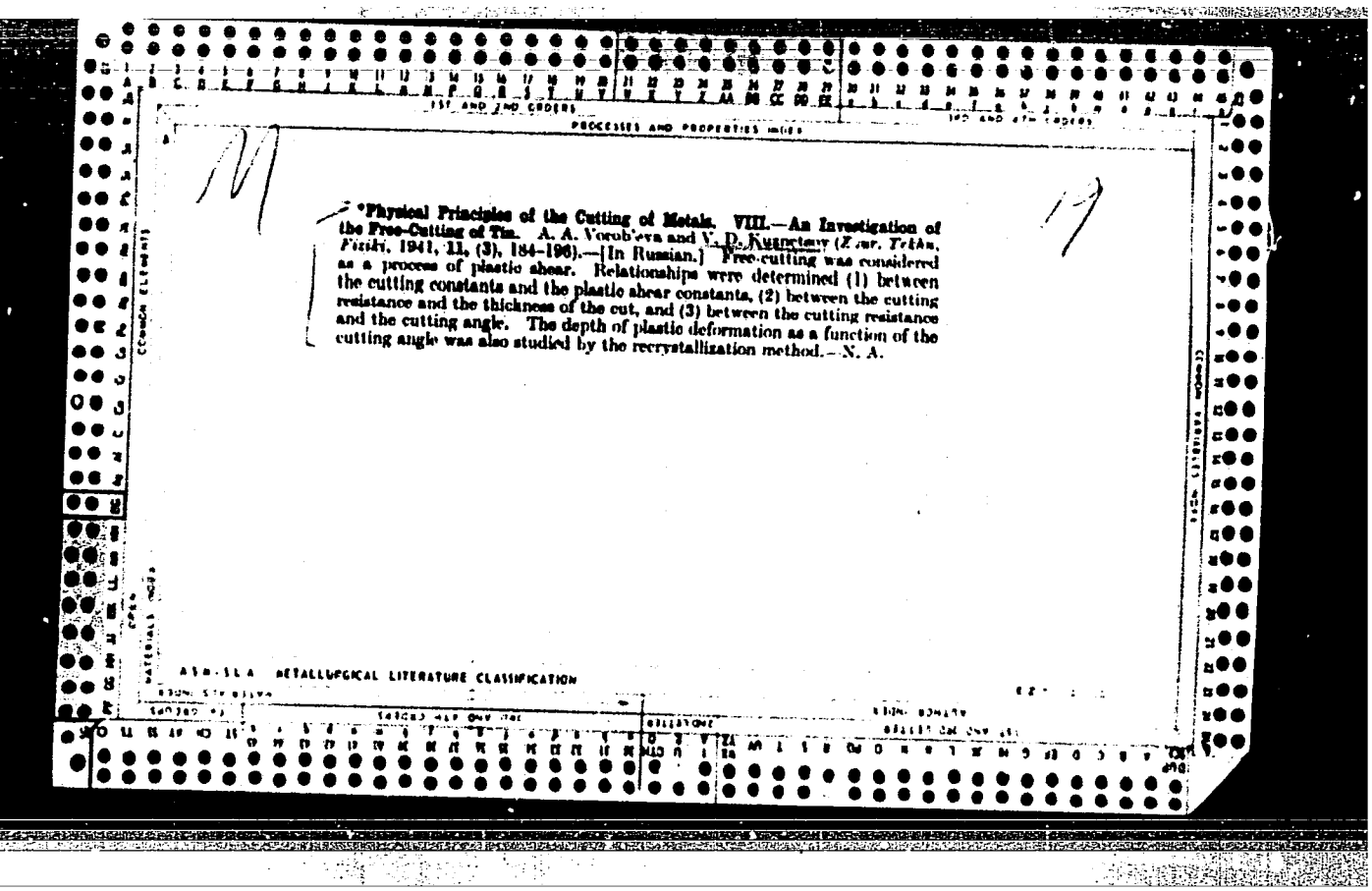

*Physical Principles of the Cutting of Metals. VIII.—An Investigation of the Free-Cutting of Tin. A. A. Vorob'eva and V. D. Kuznetsov (*Zhur. Tekhn. Fiziki*, 1941, 11, (3), 184–196).—[In Russian.] Free-cutting was considered as a process of plastic shear. Relationships were determined (1) between the cutting constants and the plastic shear constants, (2) between the cutting resistance and the thickness of the cut, and (3) between the cutting resistance and the cutting angle. The depth of plastic deformation as a function of the cutting angle was also studied by the recrystallization method.—N. A.

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KUZNETSOV, V.D. Prinimali uchastiye: KOSTYLEVA, A.I., dotsent, kand. fiz.-mat.nauk; KARPOV, G.I., starshiy nauchnyy sotrudnik, kand. fiz.-mat.nauk; DOBROVIDOV, A.N., prof., doktor tekhn.nauk; DEGTYAREV, V.P., dotsent; BOL'SHANINA, Mariya Aleksandrovna, prof., doktor fiz.-mat.nauk, laureat Stalinskoy premii, otv.red.

[Solid state physics] Fizika tverdogo tela. Tomsk, Izd-vo Poligrafizdat. Vol.4. [Materials on the physics of external friction, wear, and internal friction in solids] Materialy po fizike vneshnego treniia, iznosa i vnutrennego treniia tverdykh tel. 1947. 542 p. Vol.5. [Materials on the physics of the plasticity and brittleness of metals] Materialy po fizike plastichnosti i khrupkosti metallov. 1949. 699 p.
(MIRA 14:4)

1. Tomskiy gosudarstvennyy universitet (for Kostyleva, Bol'shanina). 2. Sibirskiy fiziko-tekhnicheskiy institut (for Karpov). 3. Tomskiy politekhnicheskiy institut (for Dobrovidov). 4. Sibirskiy metallurgicheskiy institut, g. Stalinsk (for Degtyarev).
(Solids)

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1. KUZNETSOV, V. D.; ZHDANOV, V. A.

2. USSR (600)

4. Physics and Mathematics

7. Physical Fundamentals of Metal Science. By Ya. S. Yamanskiy, B. N. Finkel'shteyn, and M. Ye. Blanter. (Atomic Structure of Alloys, Moscow, Metallurgy Press, 1949). Reviewed by V. D. Kuznetsov and V. A. Zhdanov. Sov. Kniga, No. 4, 1950.

9. [redacted] Report U-3081, 16 Jan. 1953. Unclassified.

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USSR/Physics - Plasticity May 50

"Problem Concerning the Paths Taken in the Development of the Theory of Plasticity," V. D. Kuznetsov, Corr Mem, Acad Sci USSR

"Iz Ak Nauk SSSR, Otdel Tekh Nauk" No 5, pp 760-769

Kuznetsov replies to article by A. A. Il'yushin, criticizing it for erroneous quotations from his own works. Kuznetsov advocates separation of the theory of plasticity into two essentially distinct types: physical and mechanicomathematical. Submitted 15 Feb 50.

163T72

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"APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000928210001-8

KUZNETSOV, O.A.

Role of the Aleutian cows in the formation of ice conditions in the Chukchi Sea. Probl.Sev. no.3:10-15 '59. (MIRA 13:4)

1. Institut okeanologii AN SSSR.
(Chukchi Sea--Ice) (Cyclones)

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"APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000928210001-8

KUZNETSOV, V. D.

USSR/Physics - Crystals, Polishing Sep 52

"Mutual Polishing of Brittle Bodies," V.D. Kuznetsov, Siberian Phys-Tech Inst, Tomsk State U

"Zhur Tekh Fiz" Vol 22, No 9, pp 1409-1427

Discusses elementary theory of mutual polishing, with intermediate abrasive powder, of 2 brittle crystals or semi-crystals. Describes tests with semicryst halides of alkaline metals. Determines values of relative surface energies and describes tests of mutual polishing of (1) various facets of cryst salt, (2) various facets of calcium and salt, (3) semicryst carbonates of various metals. Received 7 Apr 52.

227T91

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"APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000928210001-8

KUZNETSOV, V.D.

Crystallography

Surface energy of crystals. Priroda 41, no. 9, 1952.

9. Monthly List of Russian Accessions, Library of Congress, [illegible] 1952 ~~1953~~, Unclassified.

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"APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000928210001-8

KUZNETSOV, V. D.

223T97

SR/Physics - Surface Energy of Crystals 11 Jun 52

Method of Mutual Polishing of Crystals for Deter-
mination of Relative Values of Surface Energies," V.D.
uznetsov, Corr Mem, Acad Sci USSR, Siberian Phys-Tech
nst, Tomsk State U imeni Kuybyshev

"Dok Ak Nauk SSSR" Vol LXXXIV, No 5, pp 927-930

Considers 2 crystals of alkali halides (e.g., NaCl,
NaBr, KCl, KBr, KI) which are mutually polished with
e certain abrasive sprinkled between them, carried out
either mechanically or manually. During polishing a
certain amt of energy U is consumed, as a result of
which a decrease in vol, V1 and V2, occurs. Gives
the values in grams of debris due to polishing and
ratios of mutually polished masses in the case of the
mentioned halides, from which subject surface energy
is detd. Submitted 7 Apr 52.

223T97

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"APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000928210001-8

USSR/Physics - Polishing of Crystals 21 Jun 52

"Mutual Polishing of the Cube's Face With Other Faces of Rock-Salt Crystals," V. D. Kuznetsov, Corr Mem, Acad Sci USSR, Siberian Phys-Tech Inst, Tomsk State U imeni Kuybyshev

"Dok Ak Nauk SSSR" Vol LXXXIV, No 6, pp 1151-1153

In the preceding issue ("Dok Ak Nauk SSSR" Vol LXXXIV, No 5, 1952) [223T97] the author described a method of mutual polishing of crystals for detg the relative values of surface energies. In this method 2 crystals are polished by hand one against the other with some abrasive powder. Here the author

223T99

considers how the value of surface energy of the plane inclined to the cube's face at angle A depends upon this angle. Submitted 21 Apr 52.

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KUZNETSOV, V. D.

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"APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000928210001-8

UZNETSOV, V.D.

224T98

USSR/Physics - Anisotropy, Crystal Polishing 1 Jul 52

"Anisotropy During Mutual Polishing of Crystals," V. D. Kuznetsov, Corr Mem, Corr-Mem Acad Sci USSR, Siberian Phys-Tech Inst, Tomsk State U imeni V. V. Kuybyshev Acad Sci USSR

"Dok Ak Nauk SSSR" Vol LXXXV, No 1, pp 63-65

Acknowledges that part of the expts in this work was performed by D. A. Mikhaylova and N. P. Dolzhenko. States that the process governing the polishing by abrasive can be considered as a set of a large number of scratchings (abrasions); consequently there must be a close connection between polishing and scratching. Studies the hardness "rose" for the case of gypsum crystals; also the "rose" showing ratio of gypsum mass polished off to mass of rock salt, as compared with the "rose" of inverse hardness. Subclose connection between the various roses. Submitted 29 Apr 52.

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"APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000928210001-8

KUZNETSOV, V. D.

PA 227T79

USSR/Physics - Polishing of Crystals 1 Aug 52

"Mutual Polishing of Polycrystalline Natural Carbonates," V. D. Kuznetsov, Corr Mem, Acad Sci USSR, Siberian Phys-Tech Inst, Tomsk State U

"Dok Ak Nauk SSSR" Vol 85, No 4, pp 761-764

Continuation of work on the method of mutual polishing of crystals for detg relative values of surface energies and its application to polycrystals. Author describes application of this method to the detn of surface energies of various faces of crystals of natural carbonates ($PbCO_3$, $CaCO_3$, $MnCO_3$, $ZnCO_3$, $MgCO_3$) for various ratios of the 2

227T79

mixed with the abrasive. Finds that the ratio of masses polished off is independent of the abrasive used and abs value of masses being polished. Submitted 4 Jun 52.

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KUZNETSOV, V. D.

✓ Study of minerals according to the scale of hardness by the method of abrasion. V. D. Kuznetsov (Siberian Phys.-Tech. Inst., V. V. Kuibyshev State Univ., Tomsk). *Doklady Akad. Nauk S.S.S.R.* 87, 739–42(1952).—Corundum, topaz, feldspar, apatite, fluorspar, calcite, and gypsum were abraded with vitreous quartz, the volume of quartz removed was divided by the volume of the mineral removed, and the result multiplied by 1000, to express the hardness. Volumes removed by abrasion were detd. from the losses of wt. and the ds. of the two materials. Hardness of corundum is thus 1000. Hardness of topaz on abrasion of the pinacoid face of the crystal is 893, but abrasion of the pinacoid face of one topaz crystal with the prism face of another gave a topaz hardness of 1380. Consequently, a definite hardness refers not to a given crystal, but only to a definite face. The detn. of hardness also depends on the type of motion used in abrasion. Some crystals (gypsum, mica) show a marked anisotropy on abrasion; others (quartz, K alum) show none.
—Sonya G. Machelson

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KUZNETSOV, V.D.

PHASE I TREASURE ISLAND BIBLIOGRAPHICAL REPORT AID 466 - I

BOOK Call No.: AF617421

Author: KUZNETSOV, V. D.
Full Title: CRYSTALS AND CRYSTALLIZATION
Transliterated Title: Kristally i kristallizatsiya

PUBLISHING DATA

Originating Agency: None
Publishing House: State Publishing House of Technical - Theoretical Literature
Date: 1953 No. pp.: 411 No. of copies: 4,000
Editorial Staff: None

TEXT DATA

Coverage: This book outlines present day knowledge of crystals, their nucleation, growth and solution, the nature of real crystals and how they differ from perfect crystals, what part the grain surface energy plays during crystallization, and how additional components influence the crystals' growth. The phenomena of polymorphism and isomorphism are briefly explained as far as they relate to the problem of crystallization. The book conveys short information about some specific methods developed for artificial crystal production (Ch. VI, 6,7,8, 9, 10, 11); some specific examples of crystallization are mentioned, such as acicular crystallization, the part played in crystallization by addition of some components, modifying agents, etc , which are

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considered by the author of great importance at the present time.

The book is based on a very extensive literature, 329 Russian and 349 foreign items (English, German and French) listed at the end of the book according to chapters. This book must be considered as a serious compilation, covering the entire subject of physical crystallography (except the purely geometrical), but does not bring new theories on dislocation in crystals (W. R. Read, A. R. Verma), x-ray crystal investigation methods (such as those outlined by K. Lonsdale, Crystals and X-Rays. London, Bell, 1948), and the newest nuclear theories of crystal structures (such as those outlines by Wlm. Hume-Rothery in Electrons and Metals and Atomic Theory), neither any original methods or theories of its own.

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Kristally i kristallizatsiya

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Purpose: This book is intended mainly for research workers who are studying various physical properties of crystals in order to improve methods of artificially growing crystals. It can be also of use to industrial engineers faced with problems of crystallization, metallurgical engineers interested in crystallization of casts and their structure, mineralogists and crystallographers.
Facilities: Many Russian researchers are mentioned.
No. of Russian and Slavic References: (after 1939) 108
Available: A.I.D., Library of Congress

7/7

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"APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000928210001-8

1. [redacted], V. D.

2. USSR (600)

4. Crystallography

7. Reci rocal polishing of various crystals, Dokl. AN SSSR No. 2, 1953.

9. Monthly List of Russian Accessions, Library of Congress, June 1953. Unclassified.

APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000928210001-8"

"APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000928210001-8

KUZNETSOV, V.D., chlen-korrespondent.

Method of reciprocal abrasion of hard bodies. Priroda 42 no.11:82-84 N '53. (MLRA 6:11)

1. Akademiya nauk SSSR. (Hardness) (Friction)

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"APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000928210001-8

KUZNETSOV, V.D.

c Mutual polishing of different crystals. V. D. Kuznetsov (V. V. Kuibyshev State Univ., Tomsk). *Doklady Akad. Nauk S.S.S.R.* 89, 271–4(1953)(Engl. translation issued as *U.S. Atomic Energy Comm.* NSF-tr-51, 1–4(1953)).—The method of scratching used to reveal anisotropy of crystals has been replaced by a method of mutual polishing because of greater simplicity and definiteness of results. Black or green carborundum of 170 grit was generally used as the abrasive medium. Results are described for cyanite d (Al_2SiO_5), gypsum, mica-muscovite, lithium sulfate, iron pyrite, quartz, alum, magnetite, and wilnite.

K. R. Hesse

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"APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000928210001-8

Kuznetsov, V. D.

USSR

Application of the method of mutual grinding for the investigation of glasses. V. D. Kuznetsov (V. V. Kuibyshev State Univ., Tomsk). *Doklady Akad. Nauk S.S.S.R.* 90, 537–40(1953); cf. *C.A.* 47, 10910e.—The glasses used in this investigation are (1) a K Pb glass (with PbO 30, SiO_2 55%); (2) a glass of unknown comm.; (3) a Na silicate glass (Na_2O 7, SiO_2 93%); (4) a Na Ca Mg silicate glass of common type; and (5) a borosilicate glass (with B_2O_3 20.3, SiO_2 66.9%). For wear-resistant glass the mutual grinding method gives data for the detn. of the thickness of the moisture-swollen surface layer. Glass 1 ground with green SiC on steel shows a decrease of the ratio of the abraded material from 76.6:1 to 57.9:1, which indicates the transition from the softer swelling layer (of 1.18-mm. thickness) to the unchanged material of the inner glass. Glass 1 ground with green SiC against glass 2 shows different abrasion ratios if ground in the dry state (3.59) and wet (3.65); it is therefore concluded that in 1 H_2O penetrated to even deeper levels than into the swollen layer. In EtOH the final ratio of abrasion of 1 on steel is higher (57.6) than the initial ratio (49.7). The ratio of the surface energy of different glasses $\sigma_2/\sigma_1 = M_1d_1/M_2d_1$ is detd. in the same way as it was previously done (*loc. cit.*) for metals and alkali halides. For glass on NaCl crystal the value $d_{NaCl} = 2.15$; $\sigma_{NaCl} = 150$ ergs/sq. cm. gives for σ_{glass} the following exptl. results: (1) 380; (2) 516; (3) 574; (4) 756; (5) 952 ergs/sq. cm. (cf. Berdennikov, *Zhur. Fiz. Khim.* 5, 358(1934)). The σ_{glass} values are also valid for expts. of mutual grinding of different glasses on one another. The σ data depend also on the liquid medium in which the grinding is made; H_2O decreases σ by about 14%; EtOH increases it by 33%. For glass 3 these effects are qualitatively the same, but less pronounced. W. Eitel

Siberian Physico-Tech. Inst.

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"APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000928210001-8

KUZNETSOV, V. D., Corr Mb Acad Sci USSR

1 Sep 53

USSR/Metallurgy - Metal Processing, Grinding

"Effect of Water and Alcohol on Metal Grinding," V. D. Kuznetsov, Corr Mb Acad Sci USSR, V. D. Taranenko, Siberian Phys-Tech Inst, Tomsk State U im V. V. Kuybyshev

DAN SSSR, Vol 92, No 1, pp 49-52

Investigates effect of water and ethyl alcohol on process of grinding Al, Cu, and Zn, conception, pro-results are in contradiction with coworkers, ac-noted by Acad P. A. Rebinder and his cording to which effect of surface-active substances is manifested by metal loosening in surface zone. Authors state that effect of liquids on metal grinding is still not clarified.

27[illegible]54

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"APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000928210001-8

PHASE X TREASURE ISLAND BIBLIOGRAPHICAL REPORT AID 656 - X

Call No.: AF637874

BOOK

Author: KUZNETSOV, V. D.

Full Title: SURFACE ENERGY OF SOLIDS

Transliterated Title: Poverkhnostnaya energiya tverdykh tel

PUBLISHING DATA

Originating Agency: None

Publishing House: State Publishing House of Technical and Theoretical Literature

Date: 1954 No. pp.: 220 No. of copies: 8,000

Editorial Staff: None

PURPOSE AND EVALUATION: This book is intended mainly for scientific workers in the field of physics of solids but can also be of interest to production engineers and metallurgists working with crystalline and amorphous non-plastic solids and in the field of cold working of materials. The treatment is mostly descriptive, with only occasional mathematical analysis. It is based principally on the experimental work of Soviet laboratories and on some foreign literature of not too recent a date. The book is mostly based on experimental technique and does not attempt to give a comprehensive theoretical explanation to the phenomena of surface energies and brings to the treatment of this subject neither the mathematical analysis of the surface excess

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Poverkhnostnaya energiya tverdykh tel

energy level where electric fields exist, nor the latest atomic and electronic theories of the density of free atoms with unoccupied unsaturated valencies. Many problems connected with the phenomena of surface energy which have been discussed in our literature (American Society for Metals. Metal Interfaces, 1952, National Research Council Structure and Properties of Solid Surfaces, 1952) are not mentioned in this book. The application of the theory of surface energy in powder and welding metallurgy is also not presented.

TEXT DATA

Coverage: This book outlines the nature of surface energy in plastic and non-plastic (brittle) solids, especially crystals, in order to explain some physical, mechanical and electrical properties such as disintegration, scratching, grinding, drilling, etc., as well as electrical puncture of dielectrics, dielectrical losses, etc. Disintegration (dispersion of material) of a solid due to scratching, grinding, drilling, etc., is defined as a process of creating new surfaces and therefore is connected with the surface energy. Strength and hardness of a solid must also be connected with its surface energy. Various methods of measuring surface energies of a solid mostly by mechanical processes (working on its surfaces) are described.

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Poverkhnostnaya energiya tverdykh tel AID 656 - X

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3. Determination of the relation of surface energies of different faces of rock-salt crystals by the grinding method 101
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Ch. Five Method of mutual grinding 140
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No. of References: 87 Russian (1923-1952) and 34 non-Slavic (1921-1936).
Facilities: A. A. Vorob'yev, Professor, Polytechnical Institute in Tomsk, (research on the electrical puncture of crystals of haloids of alkali metals); K. A. Vodop'yanov and his associates from the

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Poverkhnostnaya energiya tverdykh tel

AID 656 - X

Siberian Institute of Physics and Technology (research on the relation between the tangent of the angle of dielectrical losses and the surface energy in crystals of haloids of alkali metals); D. N. Popov, head of the laboratory of molecular physics of the Siberian Institute of Physics and Technology.

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"APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000928210001-8

KUZNETSOV, V D

KRISTALLY I KRISTALLIZATSIYA (CRYSTALS AND CRYSTALLIZATION) MOSKVA, GOS. IZD-VO TEKHNIKO-TEORETICHESKOY LIT., 1954.
411 P. DIAGRS., TABLES.
"LITERATURA": P. (382) - 404.

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SOV/124-57-8-9722

Translation from: Referativnyy zhurnal. Mekhanika, 1957, Nr 8, p 154 (USSR)

AUTHOR: Kuznetsov, V. D.

TITLE: 25 Years of the Work of the Department of Solid-body Physics of the Siberian Physical-technical Institute (25 let raboty Otdela fiziki tverdogo tela Sibirskogo fiziko-tekhnicheskogo instituta)

PERIODICAL: Tr. Sibirsk. fiz.-tekhn. in-ta pri Tomskom un-te, 1955, Nr 34, pp 3-21

ABSTRACT: A survey report read at the scientific conference of physicists dedicated to the 25th anniversary of the Siberian Physical-technical Institute (January 24-30, 1954). The report examines the results of work devoted to problems of crystallization, internal friction of metals, the mechanical properties of rock-salt crystals, plasticity and strength, hardness, the cutting of metals, external friction and wear, abrasive grinding, and the effect of surface-tension-lowering substances on the process of evolution and dispersion. No bibliographic references are given.

D. M. Vasil'yev

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"APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000928210001-8

KUZNETSOV, Vladimir Dmitriyevich; KUZNETSOVA, Ye.B., redaktor; AKHLAMOV, S.N., tekhnicheskiy redaktor

[Built-up edge under cutting and friction] Narosty pri rezanii i trenii. Moskva, Gos. izd-vo tekhniko-teoret. lit-ry, 1956. 284 p. (MLRA 10:3)
(Metal cutting)

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"APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000928210001-8

KUZNETSOV, V.D.

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

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6808

Author : Kuznetsov, V.D., Loskutov, A.I.
Inst : Siberian Physical-Technical Institute, USSR
Title : Concerning the Problem of the Effect of Lubricating Media on the Process of Penetration of a Sharpened Indentor into a Plastic Metal,

Orig Pub : Fiz. metallov i metallovedeniye, 1956, 2, No 3, 509-513

Abstract : The effect of lubricants on the process of measuring the microhardness on the different loads was investigated with commercially pure iron, copper, and zinc. The measurements were carried out dry and with vaseline (inactive media), and also in 0.2% solutions of olein and stearine acids in vaseline oil (active media). The loading range was from 20 grams to 4 kg. According to the measurement results, curves of the "depth of indentor penetration vs. load" were plotted for each medium. It was established that the curves without lubricant and with vaseline-oil lubricants are identical.

Card : 1/2

KUZNETSOV, V.D.

APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000928210001 B-13

Category: USSR

Abs Jour: RZh--Kh, No 3, 1957, 7704

Author : Kuznetsov, V. D., Loskutov, A. I., and Kisurina, L. M.
Inst :
Title : On the Effect of Lubricants on the Friction Process

Orig Pub: Dokl. AN SSSR, 1956, Vol 109, No 1, 124-126

Abstract: A modification of the apparatus of V. P. Lazarev and B. V. Deryagin (Tr. 2 Vses. konfer. po treniyu i iznosu v mashinakh, 1947, Vol 1, 77) was used to measure the wear of copper, brass, and bronze rings when a copper wire is rubbed against them; the time required for the rupture of the wire was also measured. The lubricants used consisted of solutions of stearic acid (I) in transformer oil and of solutions of aromatic soaps containing 72% sodium soleate (II) in distilled water. In every case increasing the concentration of I in the oil increased the wear on both the ring and the wire; an increase in the concentration of II in the water gives the opposite effect. The increase in the wear with increasing concentrations of I is explained

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SOV/137-58-8-18033

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 8, p 261 (USSR)

AUTHORS: Kuznetsov, V. D., Loskutov, A. I., Kogan, Yu. I.

TITLE: Effect of Lubrication on the Process of Scratching of Metals (Vliyaniye smazok na protsess tsarapaniya metallov)

PERIODICAL: Izv. vyssh. uchebn. zavedeniy. Fizika, 1957, Nr 1, pp 32-35

ABSTRACT: The hardness of Cd, Al, Zn, and brass was measured by the method of scratching by a cone of ShKh15 steel having a 90° apex angle and a 15 μ radius of tip curvature in the dry state, in refined transformer oil (inactive medium), and in a 0.2% solution of oleic acid in transformer oil (active medium). It was established that the presence of any lubrication leads to a decrease in hardness, which indicates the prevailing lubricating action of media in the process of scratching.

M. G.

1. Metals—Mechanical properties
2. Metals—Test methods 3. Lubrication—Metallurgical effects

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KUZNETSOV, V.D.

Problems in the field of grinding and surface friction. Trudy Sem. po kach. poverkh. no.3:29-41 '57. (MLRA 10:11)
(Grinding and polishing) (Friction)

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"APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000928210001-8

AUTHOR: SHEFTAL, N.

TITLE: V.D. KUZNETSOV. "Crystals and Crystallization" ("Kristally i kristallizatsiya", Russian), State Publishing House for Theoretical, Technical Literature, Moscow, 1954, 411 p, 19 roubles. 53-2-7/9

PERIODICAL: Uspekhi Fiz. Nauk, 1957, Vol 62, Nr 2, pp 187 - 191 (U.S.S.R.)

ABSTRACT: N.Sheftal discusses the book "Crystals and Crystallization", which is a continuation in supplementation of the book by the same author on "Physics of Solids" published 1937.
The book has 6 chapters:
1) Formation of Crystals
2) Growth and Dissolution of crystals
3) Real crystals
4) The part played by surface energy and additions
5) Allotropy, polymorphosm, isomorphism
6) Artificial crystal breeding.

The reviewer is of the opinion that in this book the experimental part is more important than the theoretical part, and that the author brings no new ideas, with the only exception of perhaps the mechanism of the influence of additions in connection with crystallization. Theoretical works of the last ten years are nearly completely neglected. The book lacks compactness. In

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53-2-7/9

V.D.KUZNETSOV: "Crystals and Crystallization".

spite of certain deficiencies the book is, however, valuable, because it is the first of its kind and gives at least a useful survey of this difficult matter.

ASSOCIATION: Not given
PRESENTED BY:
SUBMITTED:
AVAILABLE: Library of Congress

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APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000928210001-8"

"APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000928210001-8

AUTHOR KUZNETSOV V.D., Corresponding Member of the Academy PA - 3021
FLEROV V.I.,

TITLE On the Problem of the Dependence of the Friction Coefficient Upon Velocity. (K voprosu o zavisimosti koeffitsienta treniya ot skorosti -Russain)

PERIODICAL Doklady Akademii Nauk SSSR, 1957, Vol 113, Nr 5, pp 1050-1052 (U.S.S.R.)
Received 6/1957 Reviewed 7/1957

ABSTRACT The present paper investigates the influence exercised by protuberances upon the velocity dependence of the friction coefficient in connection with the gliding friction of steel on steel and of the hard alloy T15K6 on steel. For this purpose a spherical sample of a radius of 2,5 mm was rubbed against a cylindrical rod made of steel used for the production of truck axles. The experimental results are given in diagrams and are as follows. The dependence of the friction coefficient upon velocity is in reality essentially determined by reciprocal interlocking and by the forming of protuberances. If the sample of the hard alloy is under a stress of 1,2 kg, no protuberances are observed because of the slightness of friction and the friction coefficient is independent of velocity. In all other cases a maximum of the friction coefficient is observed on the curve of the velocity dependence. This maximum may be explained by the interlocking and by the forming of protuberances. Such protuberances occur at velocities of from 1-2 mm upwards. The position of the maximum depends upon the respective temperature dependence of the plasticity of the investigated steel. As a result of interlocking and the forming of protuberances the surface layer becomes plastically de-

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On the Problem of the Dependence of the Friction Coefficient PA - 3021
Upon Velocity.

formed. The work to be expended on plastic deformation is attains a maximum in the case of such velocities in which teh friction coefficient is the highest (~10 m/min.). Thus the maximum of the friction coefficient at velocities of from 6 to 10 m/min is explained by interlocking and by the forming of protuberances.
In the case of the pair steel - steel (in the case of stresses of 1,2 and 3,0 kg) the friction coefficient increases within the velocity interval of from 200 to 600 m/min and attains values that are higher than the initial maximum. Here probably the friction coefficient increases as a result of the increase of the actual contact surface. In the cases of the friction of steel on steel and stresses of 10,0 and 20,0 kg, and in the case of friction of the hard alloy on steel many protuberances are formed. More details are discussed.
(1 ill.. and 1 table)

ASSOCIATION Siberian Physical-Technical Institute of the State University of Tomsk
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SUBMITTED 10.10.1956
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"APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000928210001-8

KUZNETSOV, V.D., akademik; LOSKUTOV, A.I.; PAVLOVA, S.N.

Hardening of metals in cutting with lubrication. Dokl.AN SSSR 123 no.2:272-274 N '58. (MIRA 11:12)
(Metals--Hardening)

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"APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000928210001-8

18(6)
AUTHORS: Kuznetsov, V. D., Academician, Loskutov, A. I., Pavlova, S. N.

SOV/20-123-2-17/50

TITLE: The Problem of the Cold Hardening of Metals When Cutting With a Lubricant (K voprosu o naklepe metallov pri rezanii so smazkoy)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 2, pp 272-274 (USSR)

ABSTRACT: First, a short report is given on some earlier papers dealing with this subject. The present paper seeks a final solution of this problem. As described by a previous paper by N. A. Pleteneva et al. (Ref 9), cold hardening was investigated by measuring microhardness on the plane bottom of the cavities drilled out by means of a special drill from R 18 steel and by using various lubricants. Investigations were carried out in brass, copper, aluminum, zinc, and cadmium with solutions of stearic acid in paraffin oil and of sodium oleate in distilled water, the drill performing 450 revolutions per minute. In the case of brass, copper, and aluminum, also solutions of oleic acid and stearic acid in purified mineral oil and toluene were used. In the latter case the drill

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performed 8 revolutions per minute. Microhardness was measured by means of the device PMT-3. The results obtained by the experiments are given by 4 tables. Table 1 contains the microhardness values of surfaces after drilling in solutions of stearic acid in paraffin oil with a velocity of 450 revolutions per minute. Each value given in this table is an average value obtained from 20 to 40 measurements. In the case of brass, copper, and aluminum a very weak tendency towards an increase of microhardness with increasing concentration of the stearic acid is observed. In the case of drilling in solutions of sodium oleate in distilled water, the influence exercised by surface-active substances upon the strengthening of metals was even less. In this case, a very weak tendency towards a decrease of microhardness was found in aluminum. In the aforementioned cases the presence of surface-active substances in the lubricant has thus practically no influence upon the strengthening of metals. Similar results were obtained also when drilling was carried out with a speed of 8 revolutions per minute. In the case of the drilling of brass, copper, and aluminum in solutions of oleic acid and stearic acid in purified mineral

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oil, the strength of the bottom of the cavities was the same in all concentrations. However, when the same materials were drilled with solutions of oleic acid and stearic acid in toluene, a weak tendency towards an increase of microhardness with an increase of the content of surface-active substances was observed in a non-active solvent. Only in the case of drilling aluminum with the use of solutions of sodium oleate in distilled water, was a decease of strength observed, but to an extent of not more than 7 %. The results obtained by the experiments discussed in this paper agree well with the conclusions drawn by S. Ya. Veyler (Ref 10). There are 4 tables and 10 references, 9 of which are Soviet.

SUBMITTED: July 17, 1958

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"APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000928210001-8

KUZNETSOV, V.D

PHASE I BOOK EXPLOITATION SOV/3559

Akademiya nauk SSSR. Institut metallurgii. Nauchnyy sovet po probleme zharoprochnykh splavov

Issledovaniya po zharoprochnym splavam, t. 5 (Investigations of Heat-Resistant Alloys, Vol 5) Moscow, Izd-vo AN SSSR, 1959. 425 p. Errata slip inserted. 2,000 copies printed.

Ed. of Publishing House: V.A. Klimov; Tech. Ed.: I.F. Kuz'min; Editorial Board: I.P. Bardin, Academician, G.V. Kurdyumov, Academician, N.V. Ageyev, Corresponding Member, USSR Academy of Sciences (Resp. Ed.), I.A. Oding, I.M. Pavlov, and I.F. Kudin, Candidate of Technical Sciences.

PURPOSE: This book is intended for metallurgical engineers, research workers in metallurgy, and may also be of interest to students of advanced courses in metallurgy.

COVERAGE: This book, consisting of a number of papers, deals with the properties of heat-resisting metals and alloys. Each of the papers is devoted to the study of the factors which affect the properties and behavior of metals. The effects of various elements such as Cr, Mo, and W on the heat-resisting properties of various alloys are studied. Deformability and workability of certain metals as related to the thermal conditions are the object of another study described. The problems of hydrogen embrittlement, diffusion and the deposition of ceramic coatings on metal surfaces by means of electrophoresis are examined. One paper describes the apparatus and methods used for growing monocrystals of metals. Boron-base metals are critically examined and evaluated. Results are given of studies of interatomic bonds and the behavior of atoms in metal. Tests of turbine and compressor blades are described. No personalities are mentioned. References accompany most of the articles.

Batagov, B.N., V.N. Martynov, and M.Ya. Kulashov. Production of Forgings for Turbine and Compressor Blades 277

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KUZNETSOV, V.D.; KASHCHEYEV, V.N.

Hardness of metals and their wear in a stream of abrasive particles. Inzh.-fiz.zhur. no.10:93-96 O '59.
(MIRA 13:2)

1. Sibirskiy fiziko-tekhnicheskiy institut, Tomsk.
(Hardness) (Mechanical wear)

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18(4) SOV/20-126-1-18/62

AUTHORS: Kuznetsov, V. D., Academician, Loskutov, A. I.

TITLE: Effect of a Preliminary Deformation on the Plasticity of Aluminum (Vliyaniye predvaritel'noy deformatsii na plastichnost' alyuminiya)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 126, Nr 1, pp 70-73 (USSR)

ABSTRACT: At first, the authors report on some previous papers on this subject by Kishkin, Zhurkov, Pavlov, Vshivtseva, Mirkin, Trunin et al. The object of the present paper is the solution of the problem of reversibility of structural defects occurring in a preliminary deformation by stretching. The authors investigated the influence of a preliminary deformation with subsequent annealing on the total relative stretching δ and on the limit of strength σ_B in fracture. The influence of

a) the temperature of the preliminary deformation, and b) of the degree of preliminary deformation at a constant temperature on the above-mentioned mechanical properties was investigated. The preliminary and the final deformation was carried out by

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stretching (3.5 mm/sec) by means of the machine RMP-500. Copper of the M-1 brand, and aluminum of the A-1 brand, served as test objects. In the investigation of the influence of temperature on the characteristics of plasticity and strength of the material, the samples were stretched until about the same degree of deformation at different temperatures: for copper at 20 and 250°, for aluminum at 20, 100, 150, 275 and 330°. In the investigation of the influence of the degree of preliminary deformation, the aluminum samples were stretched at a constant, increased temperature (330°) and at uniform deformation until reaching different degrees of deformation: 6, 10, 14, 18, 20 and 25 %. After the preliminary deformation, the samples were annealed in a nonoxidizing medium (copper at 500° and aluminum at 400°). The results of the first series of experiments are indicated in a table. A preliminary stretching at different temperatures causes, in the material, certain changes which are not eliminated by annealing, and reduce the plasticity. In aluminum, this phenomenon is observed at all temperatures of the preceding test, also at room temperature. In copper, however, the plasticity is only reduced after a preliminary deformation at 250° at least. The influence of

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Effect of a Preliminary Deformation on the Plasticity of Aluminum

SOV/20-126-1-18/62

the degree of preliminary deformation at a constant temperature was investigated in aluminum. The results of these series of experiments for 330° and 100° are compiled in 2 tables. In both cases, the total relative elongation in fracture decreases very much in a linear way at an increase of the degree of preliminary deformation. There are 1 figure, 2 tables, and 12 references, 11 of which are Soviet.

ASSOCIATION: Sibirskiy fiziko-tekhnicheskiy nauchno-issledovatel'skiy institut pri Tomskom gosudarstvennom universitete im. V. V. Kuybysheva)(Siberian Physico-technical Scientific Research Institute at the Tomsk State University imeni V. V. Kuybyshev)

SUBMITTED: February 16, 1959

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~~18 (6)~~ 18.8000, 18.1270 66165

AUTHORS: Kuznetsov, V. D., Academician, SOV/20-128-5-17/67
Surnacheva, A. I., Rozhkova, L. P.

TITLE: The Influence Exerted by the Constants of Cyclic Thermal Treatment Upon the Mechanical and Physical Properties of Zinc

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 128, Nr 5, pp 927 - 929 (USSR)

ABSTRACT: Thermal fatigue means the destructive effect of cyclic thermal stresses, i.e. the material is destroyed under the action of repeated heatings and coolings. Thermal fatigue has so far been tested but little. The English school of metallographers has made an attempt to develop a method for standard tests of thermal fatigue, which has, however, not yielded positive results as yet. Metallographers are now supposed to detect the mechanism of thermal fatigue so that these phenomena may be combatted. For this purpose it is first necessary to collect experimental data on various metals and alloys, to explain the empirical relationships, and to develop finally the theory of this mechanism. The largest number of data have been gathered on the thermal fatigue of uranium. According to A. A. Bochvar and P. K. Novik (Ref 2), zinc samples are elongated and widened by thermal

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The Influence Exerted by the Constants of Cyclic Thermal Treatment Upon the Mechanical and Physical Properties of Zinc

treatment. Kudryavtseva found that great changes occur on the grain boundaries during mechanical tests of zinc within the range of higher temperatures. The present article deals with the influence exerted by the constants of cyclic thermal treatment upon various mechanical and physical properties of zinc (degree of purity: 99.95%). The authors chose the temporary resistance σ_B and the relative elongation as the specific features of variation in the mechanical properties. The specific electric resistance ϱ was chosen as a measure of the variation in the physical properties. The authors changed the maximum temperatures T_{max} of the cycles and the time τ for which the samples were maintained at the maximum temperature. Four varieties of thermal cycles were chosen: I - $T_{max} = 130^{\circ}$, $\tau = 1$ min; II - $T_{max} = 250^{\circ}$, $\tau = 1$ min; III - $T_{max} = 250^{\circ}$, $\tau = 3$ min; IV - $T_{max} = 300^{\circ}$, $\tau = 3$ min. The samples subjected to cycles of thermal treatment were elongated by means of a Schoper machine.

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The Influence Exerted by the Constants of Cyclic Thermal Treatment Upon the Mechanical and Physical Properties of Zinc

Within the temperature range 130-10° (where the samples were maintained at 130° for one minute) the investigated samples remain unchanged up to 175 cycles. Maximum temperature rise of the cycle to 250° (τ = 1 min) deteriorates the mechanical properties of zinc and increases the specific electric resistance. Already after forty cycles it was found that Q of variation II increases. When the samples are maintained at the maximum temperature of the cycle (250°) for 30 minutes instead of for 1 minute, the curve of specific electric resistance is shifted toward great values of Q. The curve corresponding to case III runs almost parallel to the curve of case II. In case III the specific electric resistance rises by 1.5% already after 25 cycles. In case IV the samples broke after twelve cycles, and the specific electric resistance rose sharply. In case II grain boundaries were found to appear on the polished surface already after one cycle. Accordingly, these and other results indicate the following: (1) A rise in the maximum temperature of the cycle from 130° to 250° (where the samples are maintained at these temperatures for 1 minute) strongly diminishes the spe-

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KUZNETSOV, V.D.

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Conference on Semiconducting Alloys, Jan 6 (Investigations of Semiconductors and Semiconducting Alloys). Moscow, 1960. 319 p. Errata slip inserted. 3,000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut metallurgii imeni A. A. Baykova. Ministry not given.

Editorial Board: I. P. Bardin (Deceased), Academician, G. V. Kurdyumov, B. Ya. Pines, Corresponding Member, Academy of Sciences USSR (Resp. Ed.); I. A. Nekrasov, Candidate of Technical Sciences; I. I. Novikov, and I. F. Yudin; Candidate of Technical Sciences; Ch. Ed.: Publishing House: V. A. Klimov; Tech. Ed.: G. M. Gibshman; Ed. of Publishing House: V. V. Rubin.

PURPOSE: This book is intended for research workers in the field of physics of metals and for metallurgists, particularly those working on semiconducting alloys.

CONTENTS: This collection of 33 articles deals with various problems in the physics of semiconducting alloys. Special attention is paid to the production of semiconducting alloys, their structure, properties, and electronic processes. Methods and techniques of determination of such properties are analyzed, and means for increasing the accuracy and reliability are described. Considerable attention is given to the semiconducting properties of alloys in the solid state. Various problems connected with the theory of semiconductors are discussed, including the energy band structure and plasticity of semiconducting alloys, depending on the type of chemical bond. Some attention is devoted to the electronic theory of metals, etc. No personalities are mentioned. References follow each article.

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"APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000928210001-8

KUZNETSOV, V.D.; LOSKUTOV, A.I.; GOLOZUBTSEVA, A.N.

Effect of cyclic thermal processing on the mechanical properties of aluminum. Izv.vys.ucheb.zav.;fiz. no.2:57-63 '60. (MIRA 13:8)

1. Sibirskiy fiziko-tekhnicheskiy institut pri Tomskom gosuniversitete im. V.V. Kuybysheva. (Aluminum)

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KUZNETSOV, V.D.; LOSKUTOV, A.I.

Effect of temperature and degree of prestressing of the plasticity of aluminum and copper. Issl. po zharopr. splav. 6:34-37'60. (MIRA 13:9)

(Aluminum--Cold working) (Copper--Cold working)
(Plasticity)

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KUZNETSOV, V.D.; SAVITSKIY, K.V.; ZAGREBENNIKOVA, M.P.

Effect of dispersivity of $CuAl_2$ particles on the temperature-velocity relation of the mechanical properties of duralumin during compression. Issl. po zharopr. splav. 6:49-55 '60. (MIRA 13:9)
(Duralumin--Metallography) (Deformations (Mechanics))

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KUZNETSOV, V.D.; SAVITSKIY, K.V.; SUKHARINA, N.N.; ZHDANOVA, V.N.; TOPOROV, G.V.; SAVITSKIY, A.P.

Effect of temperature variations and the speed of deformation on properties of steels with a varying dispersivity of carbide inclusions. Issl. po zharopr. splav. 6:56-63 '60. (MIRA 13:9)
(Steel--Hardening) (Metals, Effect of temperature on)

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KUZNETSOV, V.D.; POLOSATKIN, G.D.; KALASHNIKOVA, M.P.

Studying the cutting process at superhigh speeds. Fiz. met. i metalloved. 10 no.3:425-434 S '60. (MIRA 13:10)

1. Sibirskiy fiziko-tekhnicheskiy nauchno-issledovatel'skiy institut.
(Metal cutting)

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S/139/61/000/004/017/023
E021/E480

AUTHORS: Loskutov, A.I., Kuznetsov, V.D., Zhukova, V.M.

TITLE: The influence of thermal cycling on the microstructure of cadmium

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniye. Fizika, no.4, 1961, 134-139 + 4 plates

TEXT: Investigations were carried out on commercially pure cadmium. Samples of 70 mm length and cross sections of 10 x 5, 10 x 2 and 10 x 1 mm were rolled. Specimens were electropolished in a 50% aqueous solution of orthophosphoric acid. A 1 mm diameter region was marked on the specimens using a diamond. The changes in relief of the surface were studied in this region during thermal cycling. Samples were held for 1 minute at 10°C and for 3 minutes at 185°C. Changes were followed on a horizontal metallographic microscope and on an interference microscope. Microphotographs were taken. Thermal cycling developed a relief at the grain boundaries. Grain boundaries, invisible at first, appeared after only 2 cycles and those boundaries which were initially visible became more marked. This indicates displacement of grains relative to one another. Slip lines were also present in the

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grains after only 2 cycles. With an increasing number of cycles, the grain boundaries became much sharper and the number of slip lines increased and they became more marked. The difference between the levels of several grains was measured after various times. In one case, after 20 cycles the displacement was 10 microns and, after 35 cycles, 12 microns. It was also shown that after 20 cycles many fine grains appeared in addition to the original grains. The breaking-up of the grains was complete after about 300 cycles. The newly formed grains were associated in groups and the boundaries of the groups corresponded to the boundaries of the original grains. The fact that the original grain boundaries were more strongly marked than the new grain boundaries might be explained by higher thermal stresses in those regions. Macro changes were also observed. The length of samples increased with the number of cycles; after 400 cycles, the length of 1 mm thick samples increased by about 2.5%, that of the 2 mm ones by about 1.2% whilst the 5 mm thick sample remained essentially unchanged. There are 19 figures and 7 references: 2 Soviet and 5 non-Soviet. The four most recent references to English language publications read as follows.

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The influence of thermal ...

Ref.2: L.Lloyd and R.Mayfield. Trans of ASM, v.50, 954, 1958; Ref.3: W. Boas, R. Honeycombe. Proc. Roy. Soc., A186, No.1004,57-71, 1946; Ref.5: W. Boas, R. Honeycombe. Proc. Roy. Soc., A188, No.1015, 28, 1947; Ref.6: W. Boas, R. Honeycombe. Journ. Inst. Met., 73, No.7, 433, 1946-1947.

ASSOCIATION: Sibirskiy fiziko-tekhnicheskiy institut pri Tomskom gosuniversitete imeni V.V.Kuybysheva
(Siberian Physicotechnical Institute at Tomsk State University imeni V.V.Kuybyshev)

SUBMITTED: May 15, 1961

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S/139/61/000/004/020/023
E073/E535

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AUTHORS: Loskutov, A.I., Kuznetsov, V.D. and Semion, L.A.

TITLE: Influence of the parameters of cyclic heat treatment on the irreversible changes in the dimensions of aluminium specimens

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, no.4, 1961, 154-156

TEXT: Cyclic heat-treatment changes the shape and dimensions of the specimens. The changes in the dimensions depend on a number of factors, nature of the material, its structure and properties, the chemical composition, the character of the preliminary heat treatment, the shape and dimensions of the specimens and the parameters of the cyclic heat-treatment. Some authors have found that materials with body-centred cubic lattices tend to assume after cyclic heat-treatment, a spherical shape, whilst materials with a face-centred cubic lattice or with anisotropic properties tend to change their shape in such a way, that the maximum dimensions increase and the minimum dimensions decrease. However, metals appear to have a more complicated behaviour pattern. The shape and

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Influence of the parameters of ...

dimensions of the specimens may have a great importance since they affect the magnitude and the distribution of the stresses during the thermal cycling. The dependence of the changes in the specimen dimensions on the geometrical parameters was observed on β-brass and on Armco iron. Under equal conditions, no change in the direction of "growth" was observed for aluminium. It would appear that materials with a cubic face-centred lattice can change their dimensions only in the direction of the maximum dimension. Available data indicate that under appropriate thermal cycling conditions it is possible to obtain a decrease of the maximum dimensions of a specimen instead of an increase. Since the available experimental data are inadequate to permit any definite conclusions, very little attention has been paid to this fact. It could be assumed that the direction of growth is determined by the thermal cycling parameters and particularly by the combination of the speeds of heating and cooling. The present investigations were carried out to clarify this problem. Specimens of circular cross-section, which are generally used for tensile tests, were used in the investigations. The diameter of the 39 mm gauge length equalled 6.5 mm. The specimens were subjected to cyclic heat-treatment in which the

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Influence of the parameters of

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maximum and minimum temperatures of the cycle were 500°C and 20°C. During the experiments the speed of heating and cooling was varied by using differing heating and cooling media, as follows:
1. Heating in an electric furnace in air, cooling in running water;
2. Heating under similar conditions and cooling by a jet of air of room temperature using a blower,
3. Heating in a saltpetre bath, cooling with a jet of air from a blower, and
4. Heating in a saltpetre bath, cooling in alcohol at room temperature.

In addition to measuring the dimensions, tensile tests were made to determine the strength and elongation. Fig.1 shows the relative percentual changes in the dimensions as a function of the number of thermal cycles, whilst Fig.2 shows the mechanical properties (σ_B, kg/mm^2 and $\Delta\ell$ k/ℓ_0, %) versus number of thermal cycles. The numbers on the curves indicate the respective heat-treatments as listed above. It can be seen from Fig.1 that the magnitude and sign of the dimensional changes during cyclic heat-treatment are determined by the combination of the speeds of

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Influence of the parameters of

heating and cooling. The greatest change is observed during slow heating and fast cooling, rapid heating and slow cooling has an opposite effect and this leads to a shortening of cylindrical specimens. If in both cases the rate of heating is the same, the effect will increase with decreasing cooling speed. If slow heating is combined with slow cooling, there will be no residual change in the length of the specimens. The results show that either evidence of a deep in the maximum dimensions of aluminium specimens was not accidental. It was found that for materials with both cube face-centred as well as body-centred crystal lattices the sign of the change in the dimensions is determined by the conditions of carrying out the cyclic heat-treatment. Residual changes in the dimensions are explained by stress relaxation produced during rapid heating and cooling. If the conditions of heating and cooling are altered, the temperature distribution, the thermal stresses and the strength properties along the cross-section change. Any thermal cycling will lead to elastic-plastic deformations, unless the temperature range is very narrow. Hence there will be residual changes in the dimensions of the specimen

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The data plotted in Fig.2 indicate the presence of plastic deformation, since the strength increases and the plasticity decreases. As already noted, the magnitude and direction of the change in dimensions depend on the dimensions of the specimen and the parameters of the thermal cycling. Furthermore, this characteristic is exhibited not only by materials with cubibic body-centred lattices but also by materials with face-centred lattices, such as aluminium, the causes being the same in both cases. There are 2 figures and 9 references: all Soviet.

[Abstractor's Note: Abridged translation.]

ASSOCIATION: Sibirskiy fiziko-tekhnicheskiy institut pri Tomskom universitete imeni V. V. Kuybysheva (Siberian Physico-Technical Institute, Tomsk State University imeni V. V. Kuybyshev)

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"APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000928210001-8

S/139/62/000/001/005/032
E026/E435

AUTHORS: Kuznetsov, V.D., Loskutov, A.I., Zhukova, V.M.

TITLE: The effect of thermal cycling on the microstructure of Cd. II

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Fizika, no.1, 1962, 36-40 + 4 plates

TEXT: The effects of plastic deformation, set up by thermal cycling over the range -196 to +8°C, on the microstructure of Cd are studied. Cross-slip is observed after only one cycle; slip taking place in two and, with further cycling, three directions, usually at 60 to 70° to each other. Further deformation up to 50 cycles shows that one of the slip systems tends to predominate over the others. Twinning is also observed, the width of the twins increasing as the deformation increases. Sub-grain formation takes place within the original grains, the disorientation being shown up by microinterferometric studies. Micro-relief effects are also observed when complex slip systems operate in two adjacent grains. This behaviour is different from that in the temperature range 10 to 185°C, since

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the material is below the recrystallization temperature and grain-boundary migration is practically absent. In the upper temperature range only one slip system apparently operates and very little twinning is observed, indicating that the strain resulting from thermal cycling in this temperature range must be considerably less than that from cycling in the low-temperature range, due to the recrystallization taking place.
There are 15 figures.

ASSOCIATION: Sibirskiy fiziko-tekhnicheskiy institut pri Tomskom gosuniversitete imeni V.V.Kuybysheva
(Siberian Physicotechnical Institute at Tomsk State University imeni V.V.Kuybyshev)

SUBMITTED: June 3, 1961

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"APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000928210001-8

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E073/E535

AUTHORS: Kuznetsov V.D., Loskutov, A.I. and Surnacheva, A.I.

TITLE: Influence of cyclic heat treatment on some physico-mechanical properties of zinc

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, no.5, 1962, 23-25

TEXT: Earlier cyclic heat treatment experiments (heating in molten saltpetre, quenching in water) have shown that an increase in the maximum temperature and in the duration of holding at that temperature lower the mechanical properties of the zinc and increase its electric resistivity. This was attributed to crack formation and was confirmed by special microstructural investigations. Since the corrosive effect of the heating and cooling liquids might have been a contributing factor in the (intercrystalline) crack formation, the following thermal cycling experiments were carried out: 1.4 mm diameter, 10 mm long wire specimens were heated to 250°C in a glass test-tube, which was submerged in saltpetre for seven minutes and, following that, the specimens were cooled in air for seven minutes. The following

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[illegible] Fiziko-tekhnicheskiy institut pri Tomskom gosuniversitete imeni V. V. Kuybysheva
(Siberian Physico-Technical Institute of the Tomsk State University imeni V. V. Kuybyshev)

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KUZNETOV, V.D. [Kuznetsov, V.D.]

Basic problems relative to the mechanical properties of refractory alloys. Analele metalurgie 16 no.1:88-153 Ja-Mr '62.

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