NOSKOV, D.G., master domennogo tsekha, Geroy Sotsialisticheskogo Truda.

All through life. Sov.profsoiuzy 16 no.5:10-12 Mr '60.
(MIRA 13:3)

1. Chusovskiy metallurgicheskiy zavod.
(Chusovoy--Steel industry--Labor productivity)

NOSKOV, F.N., assistent

Effect of variation in modulating-voltage amplitude on the results of the measurement of distances with the SVV-1 geodimeter using the null method. Izv. vys. ucheb. zav.; geod. i aerof. no.4:27-39 '64. (MIRA 18:2)

1. Novosibirskiy institut inzhenerov geodezii, aerofotos"yemki i kartografii. Rekomendovana kafedroy fiziki i radiogeodezii.

22025

S/154/61/000/002/001/001
D051/D113

9.9822(1103,1127)

AUTHOR: Noskov, F.P., Assistant

TITLE: On the rotation of the plane of polarization in the lower atmospheric layer

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, geodeziya i aerofotos"yemka, no. 2, 1961, 65-68

TEXT: The author examines whether there is a rotation of the plane of polarization and a consequent distortion in a heterogenous medium (air) of a polarized light beam as used in geodimeters for covering given distances twice. This problem is of practical interest, because it may lead to corrections for refraction. It shall be assumed that the direction of propagation of a plane-polarized beam AO in a first medium (with the refraction index n_1) forms the angle α with the outer normal ON to the boundary surface in the point of incidence O of the beam (fig.1) and that in the second medium (with the refraction index n_2) the beam travels in the direction OB forming an angle i with the inner normal ON'. The angle Δ r=α-i appears as a total refraction. It shall be further assumed (fig.2) that the angle

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On the rotation of the plane of polarization ...

between the plane of oscillation of the electric vector and the plane of incidence of the beam is equal to θ. In this case, the wave falling onto the boundary surface can be conceived as the sum of two waves of identical period with an identical initial phase, but with a different amplitude and different planes of oscillation of the electric vector, the vector of one component wave oscillating in the plane of incidence of the beam and the other in a plane perpendicular to the plane of incidence. The modulus of the amplitude of the electric vector will be

for the first wave

$$E_p = E \cos\theta , \qquad (1)$$

for the second wave

$$E_s = E \sin\theta . \qquad (2)$$

If the directions of both refracted waves are assumed to be coincident, the amplitudes of the waves beyond the boundary will change differently. According to Fresnel's formulae, the amplitudes of the refracted waves E'_p and E'_s are expressed through the amplitudes of the incident waves E_p and E_s

On the rotation of the plane of polarization ...

in the following way

$$\left.\begin{aligned} E'_p &= E_p \frac{2 \sin i \cos\alpha}{\sin(\alpha + i)\cos(\alpha - i)} \\ E'_s &= E_s \frac{2 \sin i \cos\alpha}{\sin(\alpha + i)} \end{aligned}\right\}. \qquad (3)$$

These formulae show that, during the passage through the boundary, both components of the wave lose part of their energy (due to reflection), but in a different way, and, finally, it results that the plane-polarized wave changes the plane of polarization when passing through the boundary. Looking at this phenomenon in greater detail, it can be seen that

in the second medium

$$\left.\begin{aligned} E'_p &= E' \cos\theta' \\ E'_s &= E' \sin\theta' \end{aligned}\right\} \qquad (4)$$

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(Θ' - angle between the plane of refraction (and incidence) and the plane of vector oscillation in the second medium). By substituting formulae (1) and (4) in formula (3), we obtain

$$E' \cos\Theta' = E \cos\Theta \frac{2 \sin i \cos\alpha}{\sin(\alpha + i) \cos(\alpha - i)} \quad (5)$$

$$E' \sin\Theta' = E \sin\Theta \frac{2 \sin i \cos\alpha}{\sin(\alpha + i)} . \quad (6)$$

Dividing (6) by (5), we obtain:

$$\operatorname{tg}\Theta' = \operatorname{tg}\Theta \cos(\alpha - i) = \operatorname{tg}\Theta \cos \Delta r \quad (7)$$

or

$$\cos \Delta r = \frac{\operatorname{tg}\Theta'}{\operatorname{tg}\Theta} . \quad (8)$$

Equation (8) shows how strictly the refraction of the beam and the plane of polarization depend on the passage of the beam through the boundary. The total refraction Δr of a beam in an atmospheric layer near the Earth's

surface is 1.6 minutes at distance of 20 km between the points and a refraction coefficient of 0.15. This means that $\cos\Delta r$ will always be positive and its absolute value near to unity. It also shows that the plane of vector oscillation of a plane-polarized beam always rotates towards the plane of incidence of the beam (independent of the ratio of the refraction indices) and, consequently, we always have the expression:

$$\varphi' = \varphi - \Delta\varphi ,$$

where $\Delta\varphi$ (always positive) - the angle of rotation of the plane of polarization on the passing of the beam through the boundary. Since both Δr and $\Delta\varphi$ are small values, we transform the expression (8) by expanding in a series $\cos \Delta r$ and $tg\, \varphi' = tg(\varphi - \Delta\varphi)$ and limiting ourselves to the initial terms of the expansion. After performing the necessary arithmetical operations we obtain:

$$(\Delta r)^2 = \frac{4\Delta\varphi}{\sin 2\varphi} . \qquad (9)$$

In order to determine the order of the magnitude of the rotation of the

On the rotation of the plane of polarization ...

plane of polarization, we rearrange equation (9) in the following way:

$$\Delta\Theta = \frac{\sin 2\Theta}{4} (\Delta r)^2. \qquad (10)$$

Converting radian measure into angular we obtain:

$$\Delta\Theta'' = \frac{\sin 2\Theta}{4} \frac{(\Delta r)^2}{\rho''}. \qquad (11)$$

Let us assume that the refraction index of the air changes along the path of the beam not steadily, as is actually the case, but suddenly at one particular point of the beam. Let us also assume that $\Delta r = 108$" (see above) and $\sin 2\Theta = 1$. In that case

$$\Delta\Theta = \frac{1,17 \cdot 10^4}{4 \cdot 2} \cdot 10^{-5} = 0''.015.$$

In this way an analysis of the order of the magnitude of $\Delta\Theta$ shows that the rotation of the plane of polarization in an air layer near the Earth's

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surface can be neglected. This also follows from an analysis of formula (9). The study permits the following conclusions to be drawn:

1. The assumption that a plane-polarized beam travelling in an atmospheric layer near the Earth's surface over distances up to 20 km is not exposed to rotation of the plane of polarization, is practically fully justified.

2. Formula (9) shows that with the rotation of the plane of polarization the distortion of the beam can be determined and a correction for refraction obtained. It must be noted that the available devices for measuring the angle of rotation of a plene of polarization are not sufficiently accurate. The best of them permit this angle to be determined only with an accuracy of some tens of seconds. [Abstracter's note: essentially complete translation.] There are 2 figures and 1 Soviet-bloc reference.

ASSOCIATION: Novosibirskiy institut inzhenerov geodezii, aerofotos"yemki i kartografii (Novosibirsk Institute of Engineers of Geodesy, Aerial Photography and Cartography).

SUBMITTED: October 6, 1960

Card 7/8

NOSKOV, F.P., assistant

Zero-point method of interpolating with a GVF-1 geodimeter. Izv. vys. u zav. [illegible] geod. i aerof. no.6:55-63 '63
(MIRA 17:7)

1. Novosibirskiy institut [illegible] geodezii, aerofotos"yemki i kartografii.

NOSKOV, F.P.

Using the method of comparisons in measuring distances with the SVV-1 geodimeter. Geod. i kart. no.8:13-16 Ag '63. (MIRA 16:9)
(Geodimeter)

NOSKOV, F.S.

Significance of conjunctival infection of guinea pigs in the identification of dysentery bacilli. Zhur.mikrobiol.epid.i immun. 30 no.7: 124-125 Jl '59. (MIRA 12:11)
(SHIGELLA)

NOSKOV, F.S.

Use of Perfil'ev-Gabe capillaries for the standardization of microbe suspensions. Lab. delo [7] no.4:41-43 Ap '61. (MIRA 14:3)

(BACTERIOLOGY—TECHNIQUE)

GULYANSKIY, R.A.; NOSKOV, F.S.

Possibility of using some nitrofuran preparations for emergency prevention and treatment of especially dangerous infections. Report No.1: Effect of nitrofuran preparations on the vaccinal strain, P.pestis No.1, 17. Zhur.mikrobiol., epid. i immun. 32 no.10:20-25 O '61. (MIRA 14:10)

(FURAN) (PASTEURELLA PESTIS)

NOSKOV, F.S.

Microbe motility in plane-parallel capillaries. Mikrobiologiia 31 no.6:1092-1093 N-D '62. (MIRA 16:3)

1. Voyskovaya chast' No.09743.
(BACTERIOLOGY—TECHNIQUE) (BACTERIA—MOTILITY)

NOSKOV, F.S.; BOLDASOV, V.K.; GOL'DIN, R.B.; YERMAKOV, N.V.; VOLKOVA, L.A.

Contrast method of immunofluorescent discovery of adenoviruses in the kidney cell culture of guinea pigs. Vop. virus. 10 no.5:613-614 S-O '65. (MIRA 18:11)

1. Voyenno-meditsinskaya ordena Lenina akademiya imeni S.M. Kirova, Leningrad.

L 27116-66 EWT(1)/T JK

ACC NR: AP6004869 (N) SOURCE CODE: UR/0402/65/000/005/0613/0614

AUTHOR: Noskov, F. S.; Boldasov, V. K.; Gol'din, R. B.; Yermakov, N. V.; Volkova, L. A.

ORG: Military Medical Academy im. S. M. Kirov, Order of Lenin, Leningrad (Voyennomeditsinskaya ordena Lenina akademiya)

33
32
B

TITLE: Contrast medium for immunofluorescent detection of adenoviruses in cell cultures of guinea pig kidneys

SOURCE: Voprosy virusologii, no. 5, 1965, 613-614

TOPIC TAGS: virus disease, animal disease, experiment animal, ~~test method, diagnostic instrument~~ serum, cytology, antigen, microscopy

ABSTRACT: Bovine serum albumin labeled with sulforhodamine B fluoride was tested as a contrast medium for adeovirus type 4 infected guinea pig kidney cells stained with fluorescein. The infected cells were exposed to the specific rabbit immune globulin, then added with fluorescein isothiocyanate at a rate of 10 mg fluorochrome per 1 g protein. The phosphate buffered serum albumin was first conjugated with freshly synthesized sulforhodamine B fluoride in an alkaline medium, then purified. The fixated adenovirus preparations were treated

Card 1/2 UDC: 576.858.5.093.3.073.4

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ACC NR: AP6004869

with the mixture of conjugates for 20 minutes, then studied under the luminescent microscope. Normal cells were brick red, the protoplasm lighter than the nucleus; the infected nuclei had a specific green color with bright green sparkling enclosures. Upon single step processing of the preparations, the specific interaction of virus antigen-antibody was not inhibited by the presence of the labeled albumin. The physicochemical absorption of labeled albumin on cells led to nonspecific staining of the backgroud (cells containing no virus antibodies) which did not depress specific fluorescence. This method also permits the detection of single infected cells. Its use is recommended. "The sulforhodamine B fluoride was placed at our disposal by Prof. I. S. Ioffe whom we wish to thank for his courtesy". Orig. art. has: none.

SUB CODE: 06/ SUBM DATE: 26Nov64/ OTH REF: 006

Card 2/2

NOSKOV, G.A.

Use of decoy birds in ornithological field studies. Vest. LGU 20 no.3:147-150 '65. (MIRA 18:2)

MOSKOV, G.M., inzh.

Possibilities for the improvement of centralized control.
Elek. sta. 30 no.3:49-51 Mr '59. (MIRA 12:5)
(Electric power plants)

NOSKOV, G.S.; CHERNYAKOV, G.S.

Raise road design to the level of modern problems. Avt.dor. 26 no.4:1-3 Ap '63. (MIRA 16:4)

(Roads—Design)

NOSKOV, I., podpolkovnik

Loader of a tank gun. Voen. znan. 40 no.6:13 Je '64.
(MIRA 17:7)

NOSKOV, I., podpolkovnik

Successes don't come easy. Komm. Vooruzh. Sil 46 no.4:66-70 F '65. (MIRA 18:5)

NOSKOV, I., podpolkovnik

The gas scout. Voen. znan. 41 no.4:11 Ap '65. (MIRA 18:3)

NOSKOV, I., podpolkovnik

Seeing, but unseen. Voen. znan. 41 no.9:12-13 S '65. (MIRA 18:10)

NOSKOV, I., podpolkovnik

Without a miss. Voen.-znan. 41 no.12:12-13 D '65. (MIRA 18:12)

NOSKOV, I., podpolkovnik

Tankmen conduct accurate fire. Komm. Vooruzh. Sil 46
no.20:53-55 O '65. (MIRA 18:12)

AUTHOR: Noskov, I. A., Engineer 105-58-6-9/33

TITLE: On the Determination of Torques of Turbine Generators During Nonsynchronous Operation (K opredeleniyu velichiny momentov pri nesinkhronnom vklyuchenii turbogeneratorov)

PERIODICAL: Elektrichestvo, 1958, Nr 6, pp. 36-38 (USSR)

ABSTRACT: With asynchronous connecting of the generator, the maximum instantaneous value of the electromagnetic moment will depend on a series of factors. It is attempted here to obtain a simple formula for the moment which takes account of all these factors, or at least of those which do not introduce any essential error. Such a formula can be obtained with sufficient accuracy from equation (1) expressed in relative unities. The amount of the moment with asynchronous connection - formula (2) can be obtained by taking account of all factors enumerated here (initial phase-angle-error, - difference between the EMK of the generator E and the line voltage U, amount of the effective resistances in the stator-circuit and the amount of the initial slip), - as well as of the attenuation of the

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aperiodical stator-current component. Formula (2) does not take account of the rotor-asymmetry. The analysis of the formula for the moment with asynchronous connecting which takes account of the rotor-asymmetry shows that even with the minimum admissible external reactances, the error does not exceed 5% in case of not taking account of the rotor-asymmetry. The investigation of the influence of individual factors on the maximum value of the moment shows that in the practically interesting cases where the amount of slip is within the range of from zero to 10%, the influence of the slip must not be taken into consideration. Formula (2) is simplified by this to formula (3). The amount of the effective resistances in the stator-circuit or the value of the angle φ exercizes an essential influence. Investigating (2), the angle corresponding to the maximum-value of the moment can be found. It is pointed out that a change of the generator-EMK influences the amount of the moment much more than the change of the line-voltage. The analysis of (2) and (3) for the power delivered by the generator

under different symmetric asynchronous connections and the comparison of the same with the formulae (2) and (8) from reference 2, show the following: 1) The maximum occurs at an initial phase-angle-error of θ_o = 12o to 135°. 2) The amount of admissible amperage with asynchronous connecting determined from the condition of the extreme moment in comparison with the nominal amounts to from 6 9 to 6, 4. The amount of the minimum admissible external reactances is within the range of (1, 58 to 1, 68)x''_{dg} in dependence on the impedance-angle. 3) Disregarding of the values s (slip), φ (angle of the full resistance) and k (ratio of the line-voltage-values to the generator-e.m.f.) in the formulae for the moment leads in the most unfavorable case to an error of from 15 to 2o% in direction of the underrated calculation-value. 4) Disregarding of the attenuation of the aperiodic stator-current component leads to an error of the same order in direction of an overrating of the moment. 5) The formulae recommended in reference 1,

On the Determination of Torques Turbine Generators During Nonsynchronous Operation 105-58-6-9/33

which takes account of the asymmetry of both the longitudinal- and transversal axis according to the machine is inadequate with turbogenerators on account of the complicated calculation-formulae. 6) Formula (3) is recommended for technical calculations of the moment with asynchronous connecting of the turbogenerators. 7) The simplified formulae by Kirshbaum-Luter can be recommended for the approximated calculation (Reference 1).
There are 3 figures and 2 references, 1 of which is Soviet.

ASSOCIATION: L'vovskiy politekhnicheskiy institut
(L'vov Polytechnical Institute)

SUBMITTED: July 5, 1957

1. Generators--Performance 2. Torque--Measurement 3. Mathematics

Card 4/4

NOSKOV, I. G.

Noskov, I. G. "A case of Asiatic locusts flying to the Kzyl-Kuma sands," Doklandy Akad. nauk UzSSR, 1948, No. 12, p. 34-35

SO: U-3566, 15, March 53 (Letopis 'Zhurnal 'nykh Statey, No. 14, 1949).

USPENSKIY, F.M., kand. biol. nauk; SOMOV, I.A.; MUMINOV, A.M., kand. sel'khoz. nauk; IVANOV, Ye.N., kand. biol. nauk; VASIL'YEV, A.A., kand. sel'khoz. nauk; SOLOV'YEVA, A.I., kand. sel'khoz. nauk; ZAPROMETOV, N.G., doktor sel'khoz. nauk; YAKHONTOV, V.V., doktor biol. nauk; KAPUSTINA, R.I.; STROMM, N.G.; POLEVSHCHIKOVA, V.N., kand. sel'khoz. nauk; KARIMOV, M.A., doktor biol. nauk; [redacted], kand. sel'-khoz. nauk; KHODZHAYEV, A.Kh.; ALEYEV, B.G., kand. sel'khoz. nauk; YAKHONTOV, V.V., doktor biol. nauk; STEPANOV, F.A.; LYUBETSKIY, Kh.Z., kand. med. nauk; GUREVICH, B.E.; KONDRAT'YEV, V.I.; SUDARS, L.P.; KOSTENKO, I.R., zasl. agr. Uzbekskoy SSR; GORELIK, I.M., red.; BAKHTIYAROV, A., tekhn. red.

[Manual on controlling the pests, diseases and weeds of cotton, corn, and legumes] Spravochnik po bor'be s vreditelyami i boleznyami khlopchatnika, kukuruzy i bobovykh kul'tur. Izd.2., perer. i dop. Tashkent, Gos.izd-vo UzSSE, 1963. 325 p. (MIRA 16:5)

(Field crops—Diseases and pests)
(Weed control)

NOSKOV, I.G., inzh.

Sizing sleeves for electrode covering. Svar. proizv. no.8:27 Ag '62. (MIRA 15:11)

1. Ural'skiy zavod khimicheskogo mashinostroyeniya.
(Electrodes)

NOSKOV, I.G.

Easily pulverized complex alloys as hard facing materials. Avtom. svar. 16 no.4:71-72 Ap '63. (MIRA 16:4)

1. Ural'skiy zavod khimicheskogo mashinostroyeniya.
(Metal powders) (Flux (Metallurgy))

NOSKOV, I.G.

Using complex alloys in electrode coatings in place of iron powder.
Avtom. svar. 17 no.3:76-79 Mr '64. (MIRA 17:11)

1. Ural'skiy zavod tyazhelogo khimicheskogo mashinostroyeniya.

NOSKOV, I.G., kand.sel'skokhoz.nauk (Tashkent); PONOMARENKO, G.Ya.; ZAKRIVIDOROGA, S.P.; ZAKRIVIDOROGA, Z.S.; LIPSITS, D.V.; LYUBOVSKAYA, P.I.; POLOTAY, V.A.; TARAKHOVSKIY, M.L.; FASTOVSKIY, V.L.

Letters to the editor. Zashch. rast. ot vred. i bol. 6 no.8:10 Ag '61. (MIRA 15:12)

1. Vsesoyuznaya stantsiya po raku kartofelya Vsesoyuznogo instituta zashchity rasteniy i Chernovitskiy meditsinskiy institut.

(Plants, Protection of)
(Synchytrium—Toxicology)

1. MOSKOV, I. P., MOLCHANOV, V. F.

2. USSR (600)

4. Arctic Regions - Forests and Forestry

7. More complete utilization of timber resourses of the arctic regions. Les. khoz. 6, no. 1, 1947.

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

MOSKOV, I. P.; MOLCHANOV, V. F.

Forests and Forestry - Arctic Regions

More complete utilization of timber resources of the arctic regions, Les. khoz. 6, No. 1 1953.

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

NOSKOV, L.

Use the example of best practice to train. Sov. profsoiuzy 19 no.7: 20 Ap '63. (MIRA 16:4)

1. Starshiy instruktor organizatsionnogo otdela Bryanskogo oblastnogo soveta professional'nykh soyuzov.
(Bryansk—Trade unions)

ACC NR: AP7000353 (A) SOURCE CODE: UR/0413/66/000/022/0118/0118

INVENTOR: Sheynin, I. S.; Noskov, L. D.

ORG: none

TITLE: A method for determining the breaking of the bond between reinforcement and concrete in building structures. Class 42, No. 188744

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 22, 1966, 118

TOPIC TAGS: reinforced concrete, concrete, structural engineering, structure stability, BONDING PROPERTY

ABSTRACT: An Author Certificate has been issued for a method for determining the breaking of the bond between reinforcement and concrete in building structures by using sensors to register the acoustic impulse originating in the broken-bond area between the reinforcement and concrete. To determine the location of this area, the difference in the sonic-wave travel of the acoustic impulse to pickups located on opposite sides of the test structure is measured.

SUB CODE: 13, 14/ SUBM DATE: 11 Sep64/

Card 1/1 UDC: 666.982:693.554:620.171.2-868.6

NOSKOV, L. N.

Noskov, L. N.

"Contact-free magnetic regristration and reproduction." Min Communications USSR. Moscow Electrical Engineering Inst of Communications. Moscow, 1956. (Dissertation for the Degree of Candidate in Technical Sciences)

Knizhnaya letopis'
No. 25, 1956. Moscow

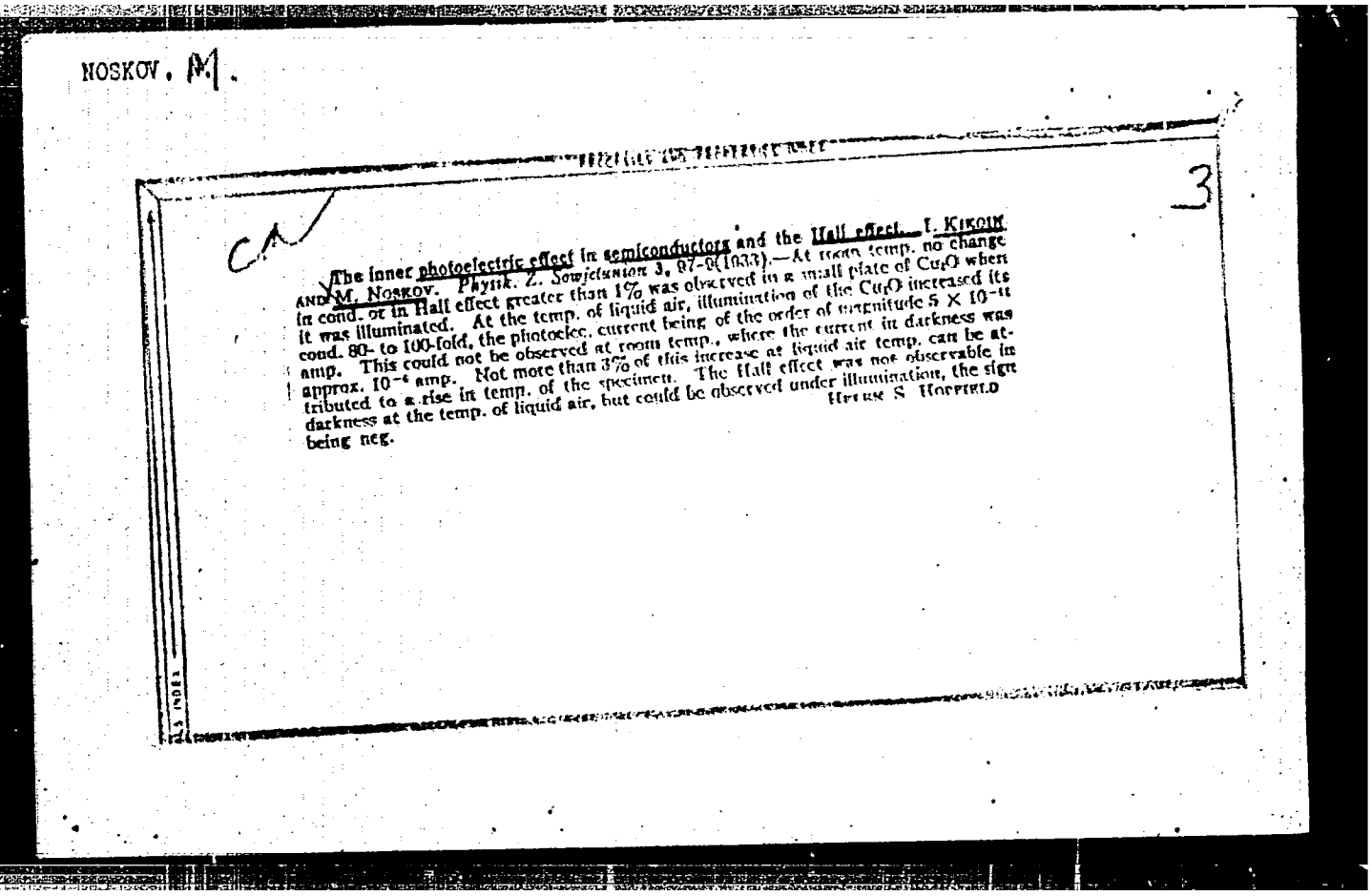
1. GUZMAN, G.; NOSKOV, M.

2. USSR (600)

4. Cotton Growing

7. Chief tasks of cotton workers.
Khlopkovodstvo no. 8, 1952

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



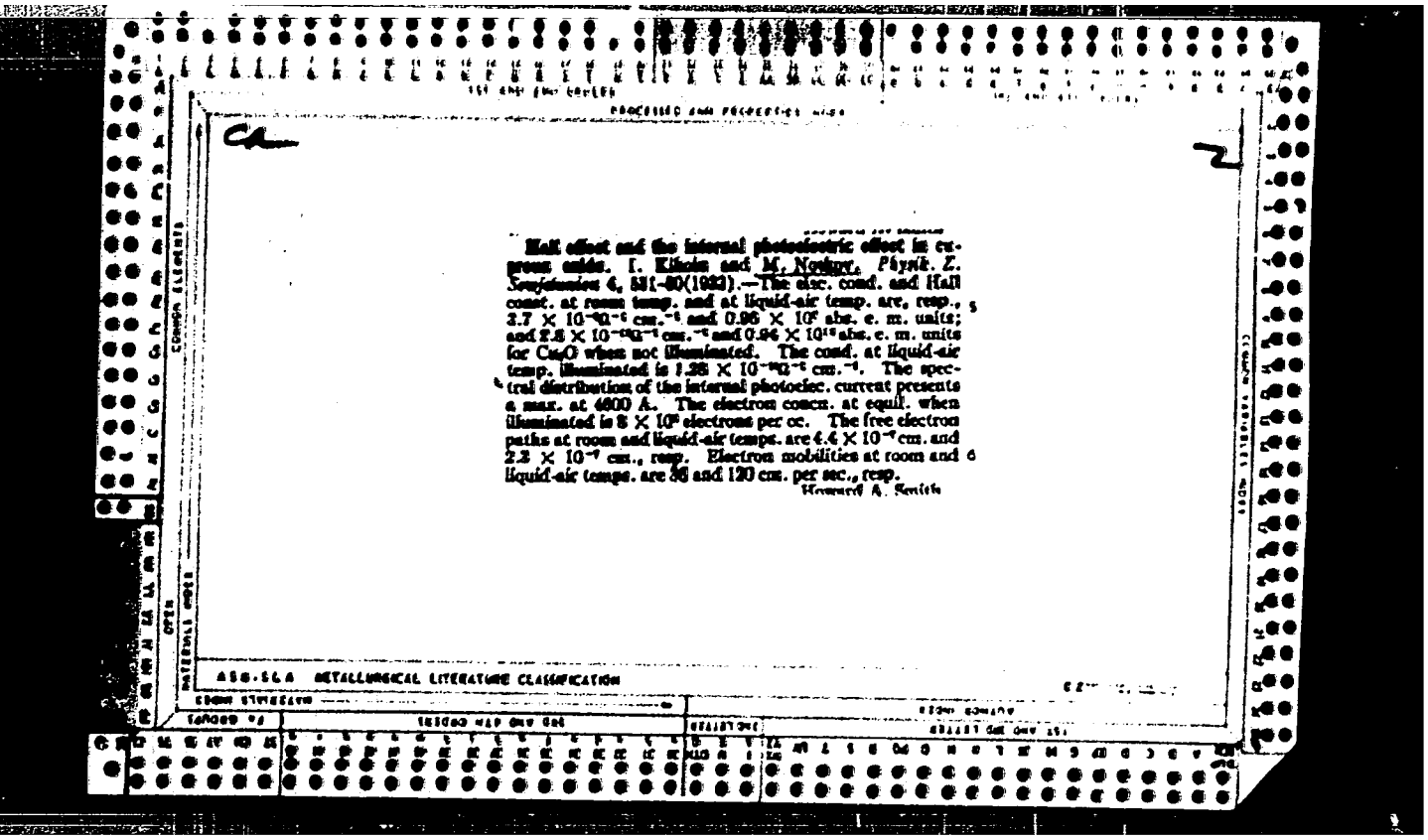
NOSKOV, M.

3

CA

The inner photoelectric effect in semiconductors and the Hall effect. I. Kikoin and M. Noskov. *Physik. Z. Sowjetunion* 3, 87-96 (1933).—At room temp. no change in cond. or in Hall effect greater than 1% was observed in a small plate of Cu_2O when it was illuminated. At the temp. of liquid air, illumination of the Cu_2O increased its cond. 80- to 100-fold, the photoelec. current being of the order of magnitude 5×10^{-11} amp. This could not be observed at room temp., where the current in darkness was approx. 10^{-6} amp. Not more than 3% of this increase at liquid air temp. can be attributed to a rise in temp. of the specimen. The Hall effect was not observable in darkness at the temp. of liquid air, but could be observed under illumination, the sign being neg.

Herbert S. Hoffield



Hall effect and the internal photoelectric effect in cuprous oxide. I. Klein and M. Neuberg. *Physik. Z. Sowjetunion* 4, 531-40(1933).—The elec. cond. and Hall const. at room temp. and at liquid-air temp. are, resp., 3.7 × $10^{-10}\Omega^{-1}$ cm.$^{-1}$ and 0.96 × 10^{8} abs. e. m. units; and 2.8 × $10^{-10}\Omega^{-1}$ cm.$^{-1}$ and 0.94 × 10^{10} abs. e. m. units for Cu_2O when not illuminated. The cond. at liquid-air temp. illuminated is 1.38 × $10^{-10}\Omega^{-1}$ cm.$^{-1}$. The spectral distribution of the internal photoelec. current presents a max. at 4600 A. The electron concn. at equil. when illuminated is 8 × 10^{8} electrons per cc. The free electron paths at room and liquid-air temps. are 4.4 × 10^{-7} cm. and 2.3 × 10^{-7} cm., resp. Electron mobilities at room and liquid-air temps. are 36 and 120 cm. per sec., resp.

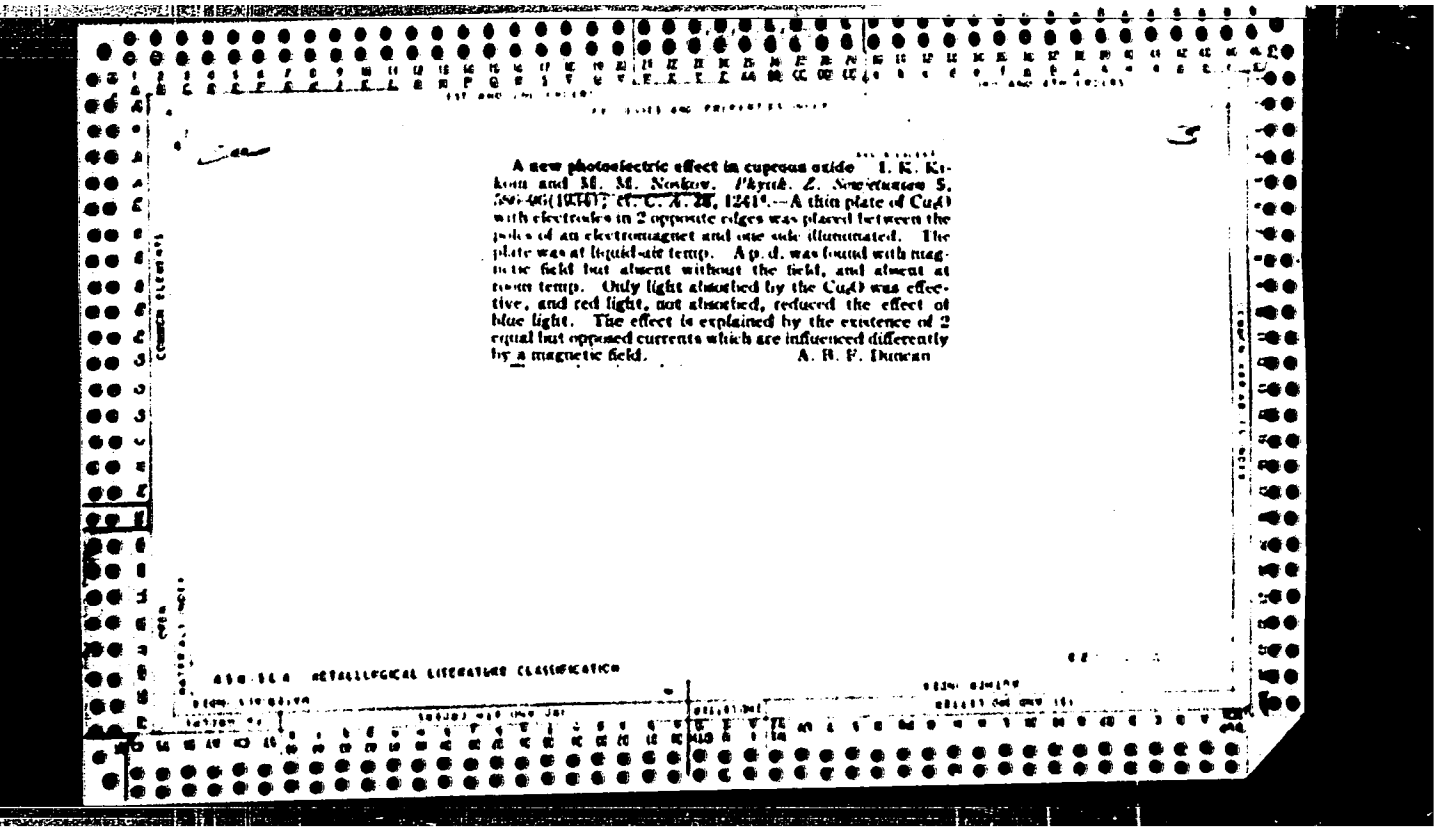
Howard A. Smith

NOSKOV, M. M

KIKOIN, I. K.; Noskov, M. M.

New Photoelectric Effect in Curpous Oxide

Nature 131, 725, 1933



A new photoelectric effect in cuprous oxide I. K. Kikoin and M. M. Noskov. *Physik. Z. Sowjetunion* 5, 586-96(1934); cf. C. A. 28, 1241⁹.—A thin plate of Cu_2O with electrodes in 2 opposite edges was placed between the poles of an electromagnet and one side illuminated. The plate was at liquid-air temp. A p.d. was found with magnetic field but absent without the field, and absent at room temp. Only light absorbed by the Cu_2O was effective, and red light, not absorbed, reduced the effect of blue light. The effect is explained by the existence of 2 equal but opposed currents which are influenced differently by a magnetic field. A. B. F. Duncan

NOSKOV, M. M.

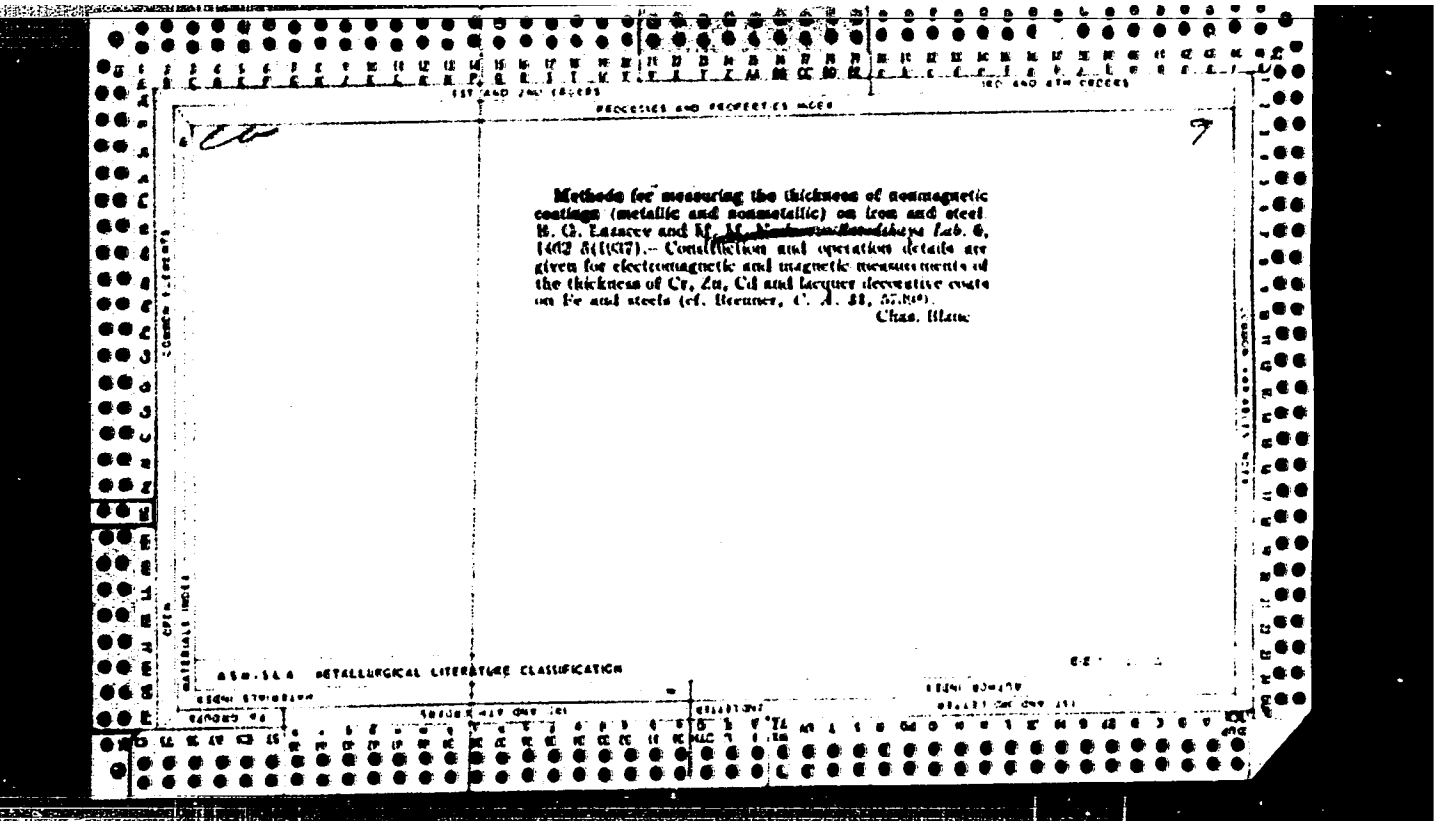
Thermoelectric and Galvanomagnetic Properties of Semiconductors.

Leningrad Physico-Technical Institute, 1936.

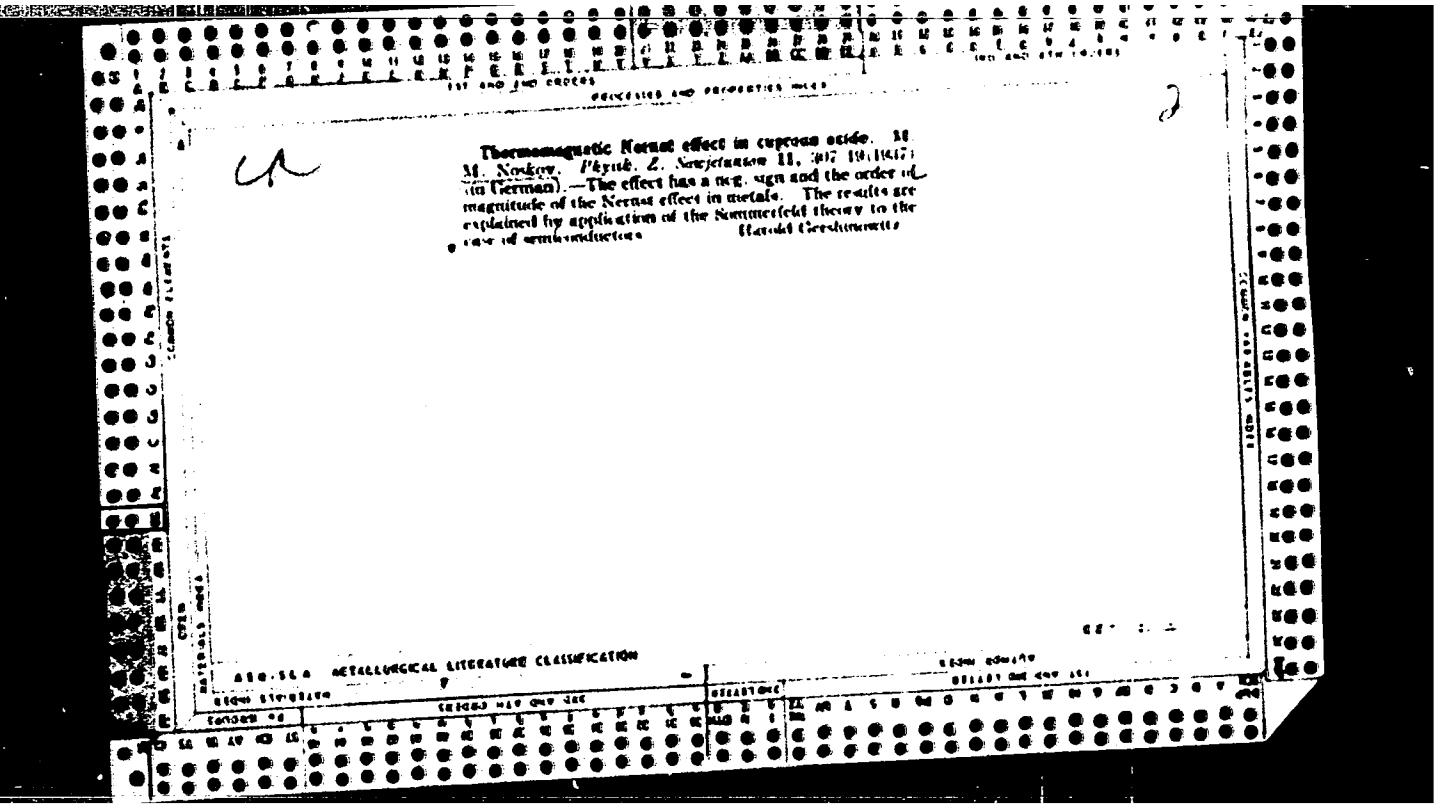
So: U-1837, 14 April 52.

NOSKOV, M. M.

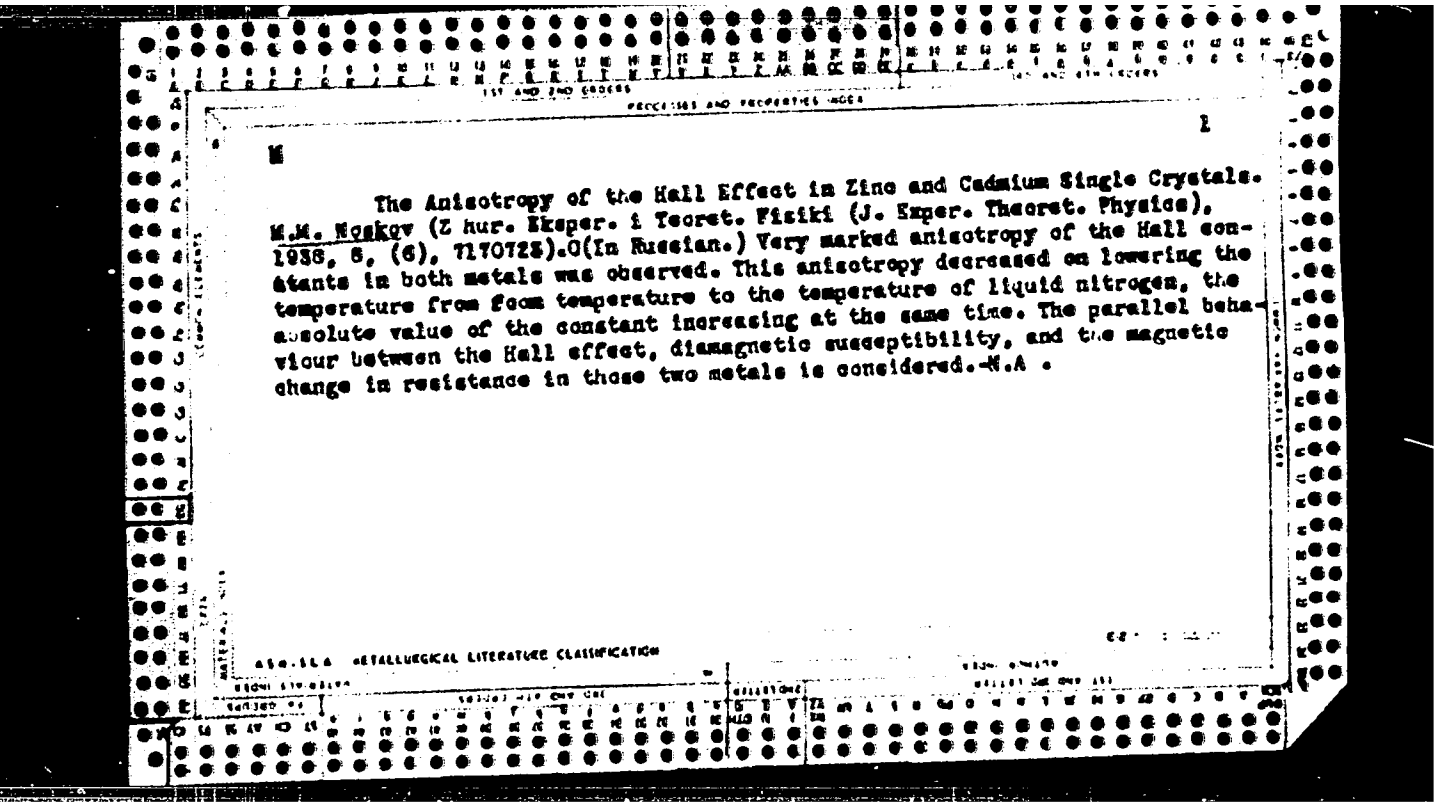
Hall's Effect in Nickel Higher than Curie's Point. Sow. Phys. 9, 1, 1936.



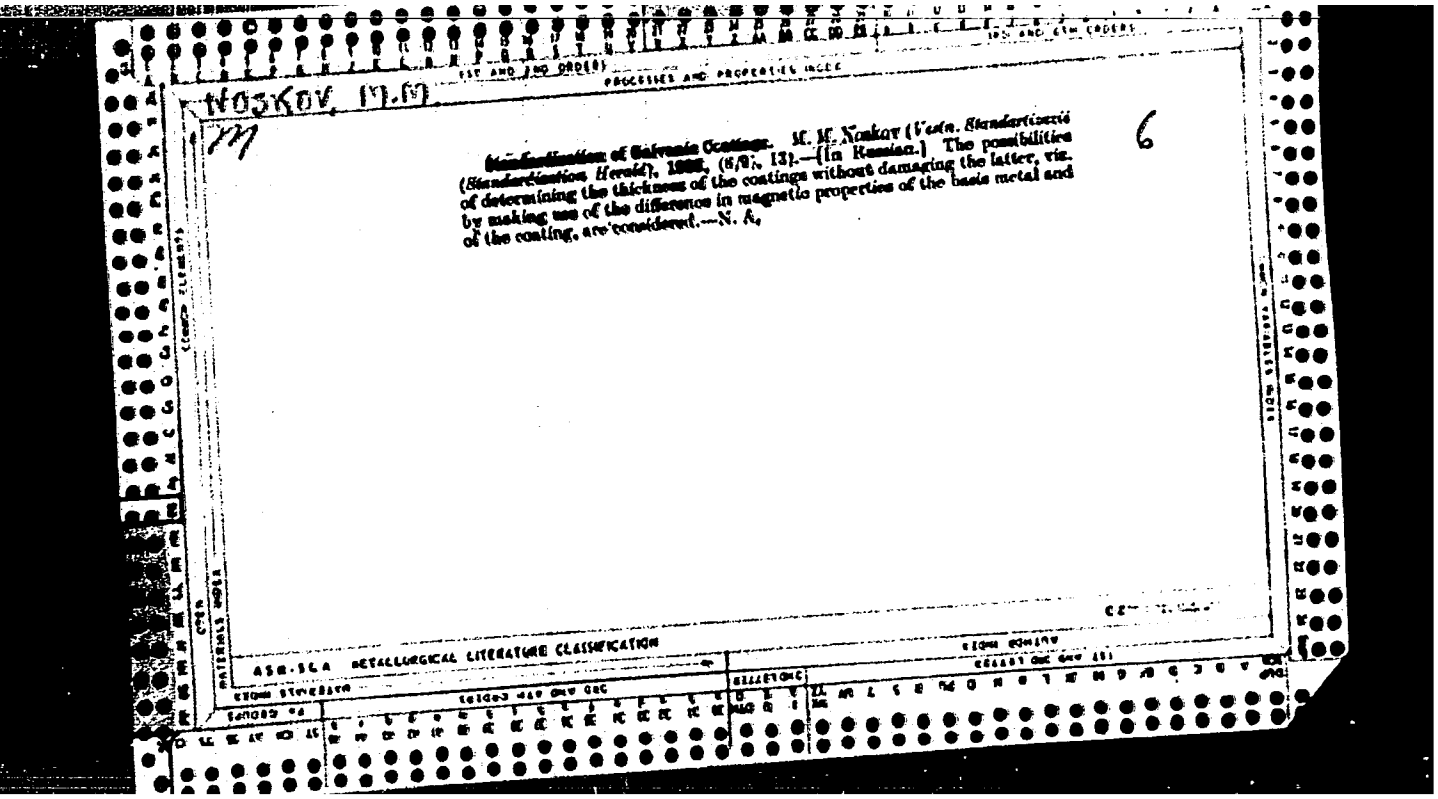
Methods for measuring the thickness of nonmagnetic coatings (metallic and nonmetallic) on iron and steel. B. G. Lazarev and M. M. [illegible] *Lab.* 6, 1402 8(1937).— Construction and operation details are given for electromagnetic and magnetic measurements of the thickness of Cr, Zn, Cd and lacquer decorative coats on Fe and steels (cf. Brenner, C. A. 31, 5746⁸). Chas. Blanc



Thermomagnetic Nernst effect in cuprous oxide. M. M. Noskov. *Physik. Z. Sowjetunion* 11, [illegible] (in German).—The effect has a neg. sign and the order of magnitude of the Nernst effect in metals. The results are explained by application of the Sommerfeld theory to the case of semiconductors. Harold Geerlings



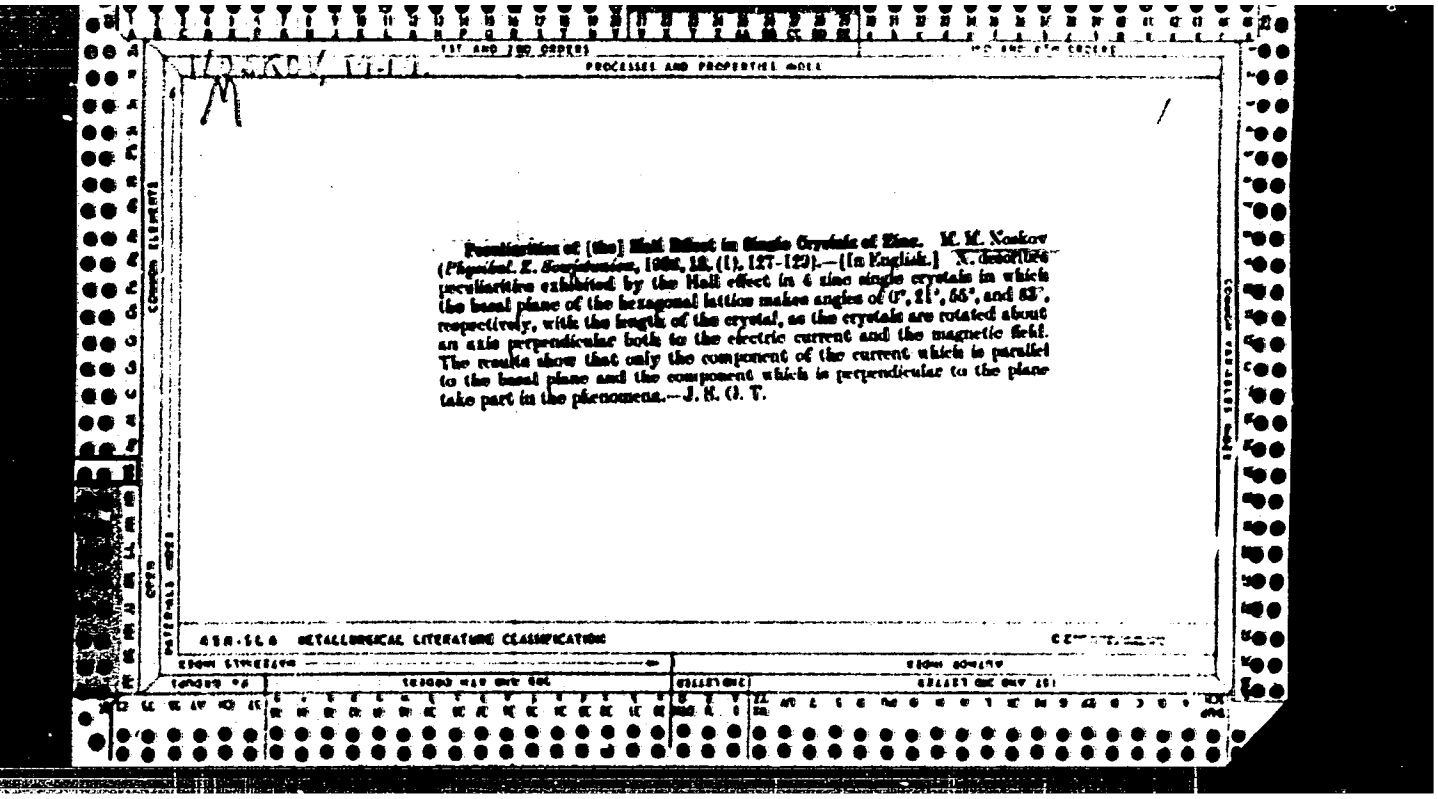
The Anisotropy of the Hall Effect in Zinc and Cadmium Single Crystals. M.M. Noskov (Z hur. Eksper. i Teoret. Fiziki (J. Exper. Theoret. Physics), 1938, 8, (6), 717-725).-O(In Russian.) Very marked anisotropy of the Hall constants in both metals was observed. This anisotropy decreased on lowering the temperature from room temperature to the temperature of liquid nitrogen, the absolute value of the constant increasing at the same time. The parallel behaviour between the Hall effect, diamagnetic susceptibility, and the magnetic change in resistance in these two metals is considered.-M.A .



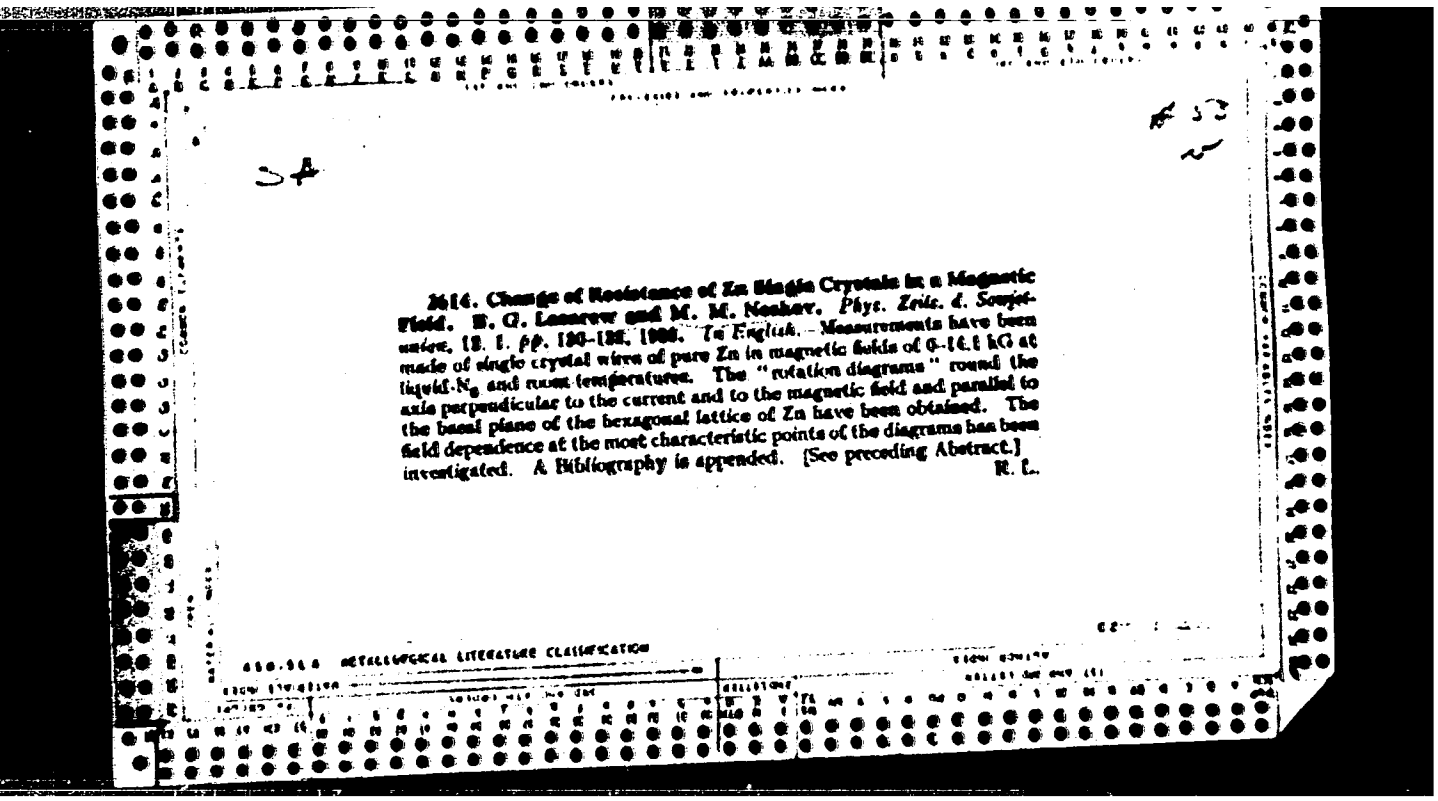
NOSKOV, M.M.

Standardization of Galvanic Coatings. M. M. Noskov (*Vestn. Standartizatsii* (*Standardization Herald*), 1955, (6/8), 13).—(In Russian.) The possibilities of determining the thickness of the coatings without damaging the latter, viz. by making use of the difference in magnetic properties of the basis metal and of the coating, are considered.—N. A.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

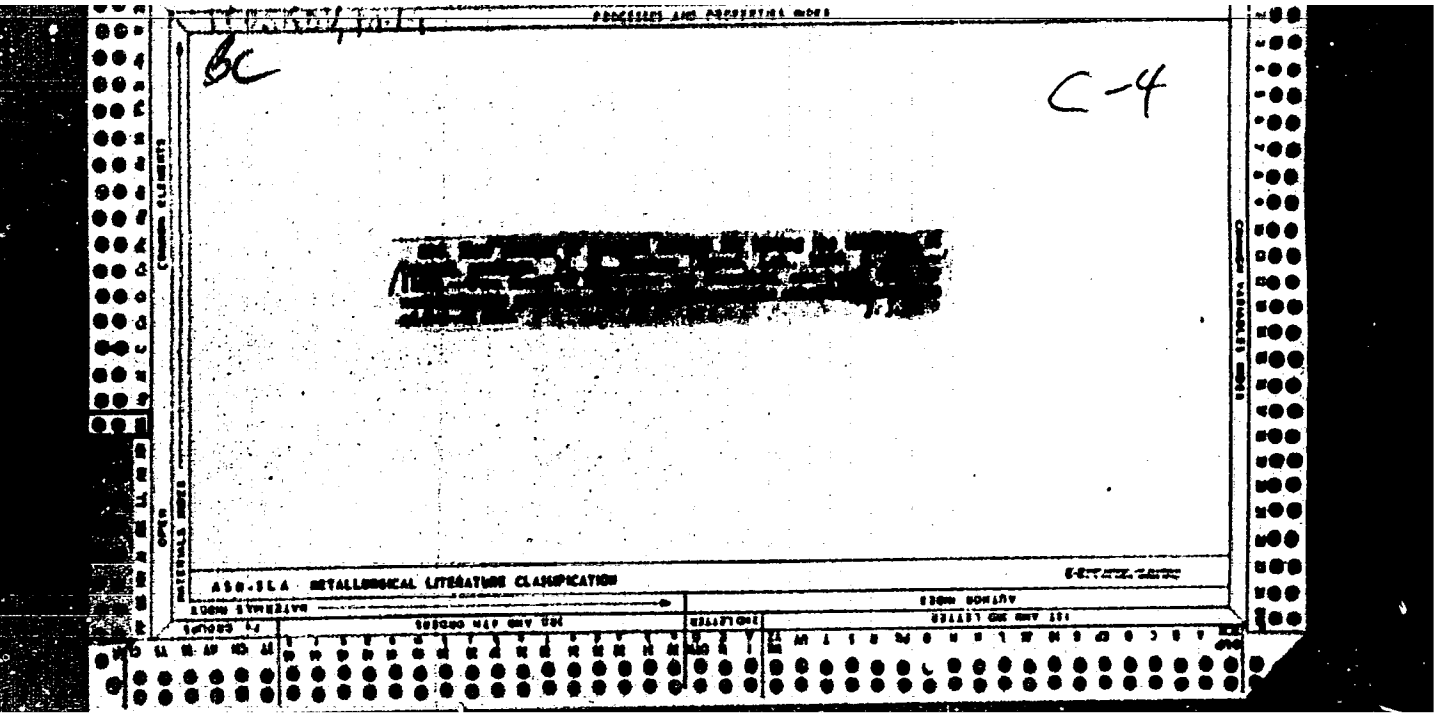


Penetration of [the] Hall Effect in Single Crystals of Zinc. M. M. Noskov (*Physikal. Z. Sowjetunion*, 1936, 10, (1), 127-129).—[In English.] X. describes peculiarities exhibited by the Hall effect in 4 zinc single crystals in which the basal plane of the hexagonal lattice makes angles of 0°, 21°, 55°, and 83°, respectively, with the length of the crystal, as the crystals are rotated about an axis perpendicular both to the electric current and the magnetic field. The results show that only the component of the current which is parallel to the basal plane and the component which is perpendicular to the plane take part in the phenomena.—J. R. (J. T.



3614. **Change of Resistance of Zn Single Crystals in a Magnetic Field.** E. G. Lazarew and M. M. Nesher. *Phys. Zeits. d. Sowjetunion*, 13. 1. pp. 130–138. 1938. *In English.* – Measurements have been made of single crystal wires of pure Zn in magnetic fields of 0–16.1 kG at liquid-N_2 and room temperatures. The "rotation diagrams" round the axis perpendicular to the current and to the magnetic field and parallel to the basal plane of the hexagonal lattice of Zn have been obtained. The field dependence at the most characteristic points of the diagrams has been investigated. A Bibliography is appended. [See preceding Abstract.]
R. L.

669.94.4 METALLURGICAL LITERATURE CLASSIFICATION



NOSKOV, M. M.

"The Influence of Thin Dielectric Films on the Magneto-Optical Kerr Effect in Ferromagnetic (Nickel, Permalloy, Iron) Mirrors," M. M. Noskov (*Compt. rend. (Doklady) Acad. Sci. U.R.S.S.*, 1941, 31, 111-115; *C. Abs.*, 1943, 37, 803).—[In English.] Films of cellulose, Bakelite, or liquid oil some tenths of a μ thick applied to the surface of nickel, Permalloy, or iron specimens multiplied the magnetic rotation effect twice or 1·5 times. The increase depended on the thickness of the film. After the film was removed the original value was restored. The greatest increase, 2·0 times, was obtained with a film 0·10 μ thick; on either side of this value the increase drops. This effect is discussed.

NOSKOV, M.M.

USSR 7505.

"On the Influence of Thin Films upon the Magneto-optical Kerr Effect" published in Comptes Rendus (Doklady) Vol. LIII, No. 5, dtd 1946.

SO: [redacted]-B-2293, 17 March 1948 [redacted] 446581

[redacted] FILES

USSR/Phys Nov/Dec 1947
Ferromagnetism
Magnetic Fields

"Magneto-Optic Methods of Studying Ferromagnetic Alloys," M. M. Noskov, Inst Phys of Metals, Ural Br, Acad Sci USSR, 4 pp

"Izv Akad Nauk SSSR, Ser Fiz" Vol XI, No 6

Discusses influence of magnetic field on distribution of light in substance.

57T88

of several compds.

Effect of the thickness and the optical constants of thin dielectric films on the magnetooptical Kerr effect. I. M. M. Noskov. *Zhur. Eksptl. Teoret. Fiz.* 17, 1061-8 (1947).—The angle of rotation α of the plane of polarization on reflection of filtered polarized light (blue, green, yellow, and red) from a ferromagnetic surface (steel, Ni, or Co) is altered by thin films of SiO_2, CaF_2, ZnS, AgI, Cu_2O, HgS, MoS_2, PbS, and TlO_2, produced by evapn., or by films of the oxides of the metals, Fe_2O_3, NiO, CoO, produced by superficial oxidation. With increasing thickness of the wedge-shaped film, the relative α/α_0 (α_0 = angle without film) varies periodically, passing from an increase ($\alpha/\alpha_0 > 1$) to a decrease ($\alpha_0/\alpha < 1$), and then increasing again. The shape of the curve of a given dielectric varies with the color. In contrast to transparent films, absorbing oxides give rise, at a certain thickness, to a reversal of the rotation ($\alpha/\alpha_0 < 0$). The normal effect taking place with a transparent film is satisfactorily accounted for by the theory of Frenkel (*C.A.* 37, 4283[8]), which attributes it to interference within the film, and gives, for the total angle of rotation, $\alpha = \alpha_{12}(1 - r^2)/(1 + r^2 - 2r \cos 2ka)$, where $r = -(n - 1)/(n + 1)$ (n = refractive index), $k = 2\pi/\lambda$, a = thickness, and α_{12} is the change of the angle of rotation between the front and the back of the film (film/metal boundary), due to the magnetization of the metal. Absorption within the film changes the ratio of amplitudes $\eta = A/B$ of the elliptic polarization. At small α_{12}, the total angle of rotation in the presence of absorption is $\alpha = \alpha_{12}(1 + \eta \cos \delta)/[(1 + \eta \cos \delta)^2 + (\eta \sin \delta)^2]$, where the phase difference $\delta = 2ka - \varphi$, with φ = phase jump on reflection at the metal/film boundary. Neg. values of α arise if $\eta > 1$ and $\cos \delta = -1$. This point of view is borne out by expts. in which a steel sample with an oxide layer, and a strongly neg. effect, showed the normal pos. and periodic α when covered by an addnl. wedge-shaped SiO_2 film. On the other hand, with a steel + SiO_2 film sample, with a normal pos. α, coating with an addnl. Ag film gave rise to the anomalous neg. effect. In the 1st case, the addnl. film resulted in an increase of η, in the 2nd case, in its decrease. These phenomena constitute a not commonly considered instance of interference of 2 waves with polarization planes slightly rotated relative to each other. II. M. M. Noskov and A. V. Sokolov. *Ibid.* 969-75.—The foregoing conclusions relative to the effect of absorption within the film on α/α_0, are established rigorously by math. analysis, resulting in a general formula that extends Frenkel's original theory for transparent films, and relates α with n, k, a, and the absorption coeff. ϵ. For films of celluloid, SiO_2, or ZnS on steel, of ZnS on Ni, and of CaF_2 on Co, the calcd. α/α_0 at the max. and at the min. are in fair agreement with the exptl. values. For absorbing films (Fe_2O_3), there is a satisfactory qual. agreement.

N. Thon

MOSKOV, M. M.

"Magnetooptical Properties of Ferromagnetic Metals and heir Modification Under the Influence of Nonmetallic Films." Thesis for degree of Dr. Physicomathematical Sci. Sub 28 Jun 49, Physics Inst imeni P. N. Lebedev, Acad Sci USSR.

Summary 82, 18 Dec 52, Dissertations Presented For Degrees in Science and Engineering in Moscow in 1949. From Vechernyaya Moskva, Jan-Dec 1949.

NOSKOV, M. M.

Chemical Abst.
Vol. 48 No. 8
Apr. 25, 1954
Metallurgy and Metallography

Problems on optics of metallic alloys. M. M. Noskov. *Trudy Inst. Fiz. Metal. Ural. Filial, Akad. Nauk SSSR*, No. 12, 80-93(1949).—A review. 21 references.
A. G. Guy

N05KDV, M.M.

8

24

PROCESSES AND PROPERTIES INDEX

A Very Simple Temperature Regulator for Laboratory Furnaces. M. M. Noskov. (*Zavodskaya Laboratoriya*, 1949, vol. 15, Oct., pp. 1257–1258). [In Russian]. A simple apparatus for the regulation of the temperature of laboratory furnaces to within 0·5–1° C. is described; in this the thermal expansion and contraction of a stretched Nichrome wire are mechanically amplified and used to actuate a system of relays.—G. K.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

NOSKOV, M. M.

USSR/Physics
Silver Alloys
Reflecting Materials

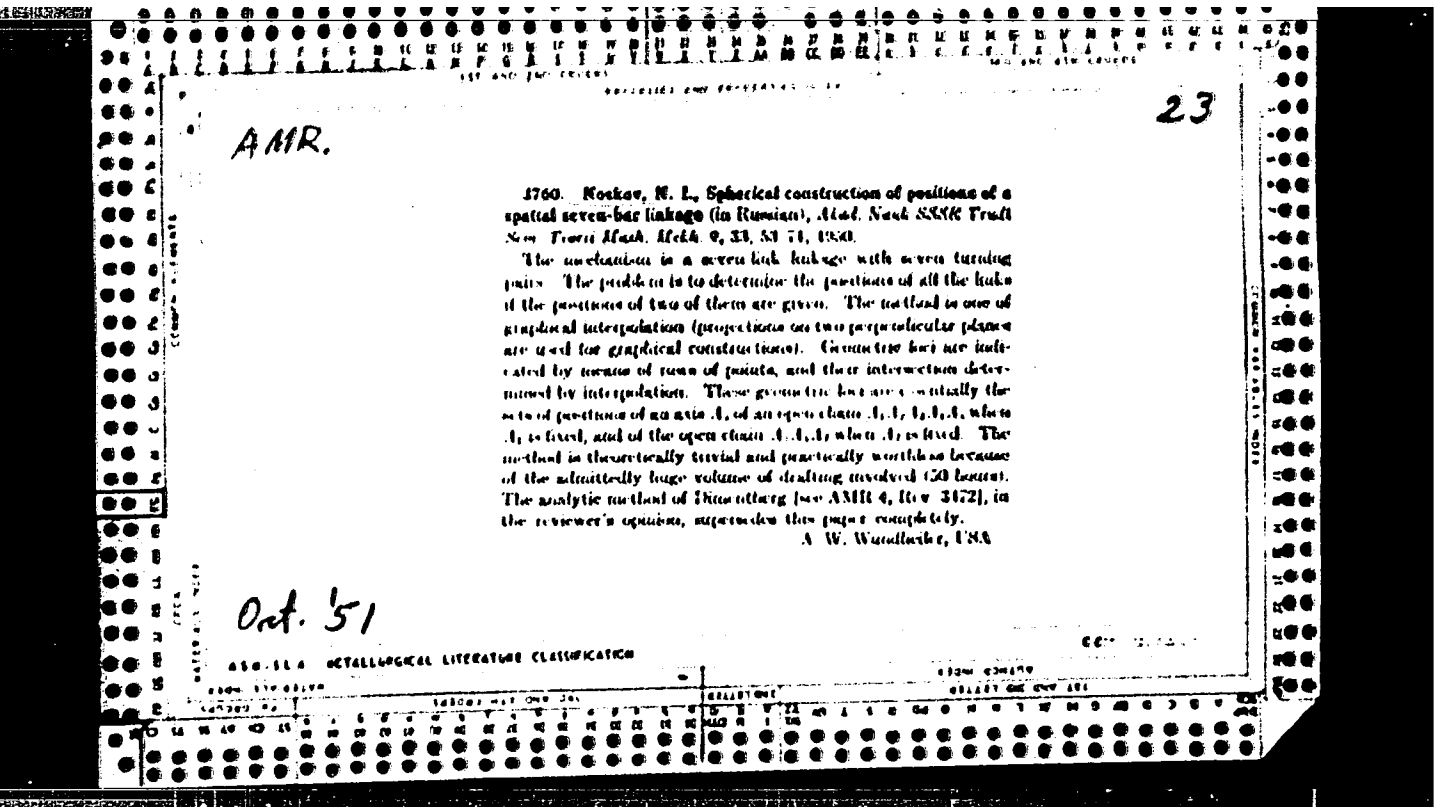
Feb 49

"Reflectivity of Certain Silver Alloys Near the Ultraviolet Range," M. M. Noskov, G. P. Skornyakov, Inst Phys of Metals, Ural Affiliate, Acad Sci USSR, 3 pp

"Dok Ak Nauk SSSR" Vol LXIV, No 6-$\int$. 8eq-11

There is a sharp minimum in the reflectivity of pure silver near $\lambda = 3,200$ angstroms. Attempts to determine how metallic mixtures, introduced in the state of unregulated, solid solutions, influence the optical behavior of silver in this anomalous region. Submitted by Acad S. I. Vavilov, 11 Dec 48.

29/49T101



23

AMR.

3760. Noskov, N. L., Spherical construction of positions of a spatial seven-bar linkage (in Russian), *Akad. Nauk SSSR Trudi Sem. Teori Mash. Mekh.* 9, 33, 51–71, 1950.

The mechanism is a seven link linkage with seven turning pairs. The problem is to determine the positions of all the links if the positions of two of them are given. The method is one of graphical interpolation (projections on two perpendicular planes are used for graphical constructions). Geometric loci are indicated by means of runs of points, and their intersections determined by interpolation. These geometric loci are essentially the sets of positions of an axis A_1 of an open chain A_1, A_2, A_3, A_4 when A_1 is fixed, and of the open chain A_7, A_6, A_5 when A_7 is fixed. The method is theoretically trivial and practically worthless because of the admittedly huge volume of drafting involved (50 hours). The analytic method of Hrastelberg [see AMR 4, Rev 3672], in the reviewer's opinion, supersedes this paper completely.

A. W. Wundheiler, USA

Oct. '51

A50.11.4 METALLURGICAL LITERATURE CLASSIFICATION

CA NOSKOV, M.M.

Spectral distribution of reflected light in silver alloys. M. M. Noskov and G. P. Skoryakov *Izvest. Akad. Nauk S.S.S.R., Ser. Fiz.* 14, 757-61(1950); cf. *C.A.* 48, 4919e.—Ag was alloyed with Al, Cu, Au, Zn, Cd, Tl, Sn, Sb, Pd, Pb, Bi; in most cases the amt. of addnl. metal was 1, 2.5, or 5%, except where the soly. was smaller than 5%. Min. of reflection in the ultraviolet (~3200 A.) are tabulated as well as other data including measurements of the Hall coast. It is shown that the min. shifts to smaller wave lengths and the depth of the well decreases with the addn. and amt. of alloying metals. This effect is attributed to a local distortion of the electron band system in Ag.
S. Pakswer

Noskov, M.M.

USSR/Physics - Infrared Emission   Sep/Oct 53

"Infrared Emission of Metallic Alloys," M. M. Noskov, Acad Sci Uk SSR

Iz Ak Nauk, Ser Fiz, Vol 17, No 5, pp 632-635

Attempts to clarify law, forecast theoretically, showing dependence of intensity of infrared emission of binary alloys on their compn. The results are presented graphically, showing that the rising of emission with temp of alloys is much steeper than that of black body.

274T97

MOSKOV, M. M.

8

TRUDY INSTITUTA FIZIKI METALLOV, AKAD. NAUK. URALSKII FILIAL, 1954, NO. 15 M G

On the relation between the intensity of magnetization and magneto-optical rotation (Kerr effect) in nickel and its alloys with copper by M. M. Moskov (p. 57-59) - The effects of temperature variation (0° - 400°C) and composition (100 to 73.7% Ni) on the magnitude of the Kerr effect are experimentally investigated. The results

confirm theoretical deductions based on the s-d electron interaction model proposed by S. V. Vonsovskii and A. V. Sokolov.

USSR/Physics - Metallurgy

Card 1/1 Pub. 43 - 21/97

Authors : Noskov, M. M., and Skornyakov, G. P.

Title : About certain characteristics of an arc discharge cloud

Periodical : Izv. AN SSSR. Ser. fiz. 18/2, page 257, Mar-Apr 1954

Abstract : The effect of a false electrode on the relative line intensity of a basic arc electrode material and upon the sensitivity and accuracy of a spectral analysis was investigated. The intensity distribution of individual lines was investigated along an arc cloud in the case of uniform Cu electrodes and in cases where one of the electrodes was made of C, Al, Mg, Zn, Fe, Mo, Ni and W. It was found that in the case where the arc burns between Cu-electrodes there is a distinctly expressed near-electrode intensification of the Cu line and a less distinctly expressed intensification of other lines. In the case where one of the above mentioned elements serves as an anode, the emission of Cu (cathode) is concentrated mostly at the Cu electrode which also serves as a cathode. No Cu emission was seen near the anode.

Institution : Academy of Sciences USSR, Ural Branch, Physics of Metals Institute

Submitted : .....

AFANAS'IEVA, L.A.; NOSKOV, M.M.; CHEREPANOV, V.I.

A new method, "peripheral intersecting", for optical constant determination in metals. Fiz.met. i metalloved. 1 no.3:566 '55. (MIRA 9:6)

1.Ural'skiy gosudarstvennyy universitet imeni A.M.Gor'kogo.
(Metals--Optical properties) (Optical measurements)

Category : USSR/Optics - Physical optics K-5

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 2304

Author : Domonskiy, E.I., Noskov, M.M.
Inst : Ural' State University, USSR
Title : Determination of the Optical Constants of Metals, Using the Autocollimation Method

Orig Pub : Fiz. metallov i metallovedeniye, 1955, 1, No 3, 567

Abstract : The autocollimation method (O'Bryan H.M., J. Opt. Soc. America, 1936, 26, 122) is used in the infrared region. Light is reflected from the specimen twice in the forward path and in the return path, and passes twice through the same Se polarizer, which is slowly rotated by an electric motor. A recording infrared spectrometer automatically records the intensity, the minimum deviation of which is used to find the principal azimuth φ_0 and the principal angle of incidence φ_0 with a probable error of $\pm$ 35' for φ_0 and $\pm$ = 15' for φ_0 in each individual measurement. The optical constants of mirrors obtained by evaporation of Sb, Cu, Ag, Al, and Zn in vacuum were measured for λ 2.45 μ .

Card : 1/1

MOSKOV, M.M.

Relation between magnetizability and magnetooptical rotation in nickel and in its copper alloys. Trudy Inst. fiz. met. no.15: 57-59 '55. (MLRA 8:6)
(Nickel-copper alloys--Magnetic properties)

NOSKOV, M.M.

FD-3190

USSR/Physics - Interferometry

Card 1/1 Pub. 153-20/21

Authors : Noskov, M. M. and Yasinetskiy, A. I.

Title : Measurement of striction phenomena with the aid of a three-slit interferometer

Periodical: Zhur. tekh. fiz., 25, No 8 (August), 1955, 1518-1519

Abstract : The authors discuss the measurement of the dimensions of solid bodies during magnetic and electric striction, during thermal expansion, elastic deformation and when subjected to a load. They outline existing methods of measurement and describe a new three-slit interferometer which is specifically designed to permit accurate measurements in the most difficult range, namely from 30 Angstrom units to 1 micron. The physical and optical characteristics of the new interferometer are outlined in detail.

Submitted : January 4, 1955

Category : USSR/Optics - Physical optics K-5

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 2303

Author : Afanas'yeva, L.A., Noskov, M.M., Cherepanov, V.I.
Inst : Ural' State University, USSR
Title : New "intersecting-Circle" Method for the Determination of the Optical Constants of Metals

Orig Pub : Fiz. metallov i metallovedeniye, 1956, 1, No 3, 566

Abstract : Description of a variant of a method of measuring the optical constants of metals using the reflection of polarized infrared light. A recording monochromator is used to determine the value of ρ (the ratio of the ability of the specimen to reflect light parallel to the plane of incidence to the reflecting ability for the perpendicularly-polarized light), at least for two angles of incidence. To find the optical constants, the authors propose an approximate method based on a graphic solution of the system $(x - x_i)^2 + y^2 = R_i^2$, which results from the Fresnel equations for metal. Here

$$\alpha_i = \alpha_i \left[(1+\rho_i)/(1-\rho_i)\right], \quad R_i = (x_i^2 - \alpha_i^2)^{1/2}, \quad \alpha_i = \tan\varphi_i \sin\varphi_i$$

and φ_i is the angle of incidence ($i = 1, 2$). The abscissas of the intersection points of two circles with radii R_1 and R_2 yield the values of the index of refraction n, and the ordinates yield the absorption coefficient k. The method was tested with Bi, Sb, and their alloys in the range of λ from 2 μ to 12 μ.

Card : 1/1

LEVKOV, A.N.; MOSKOV, M.M.

Magentooptical Kerr effect and the structure of surface layer of mechanically polished metal. Izv. vys. ucheb. zav.; fiz. no.3:76-81 '58. (MIRA 11:9)

1. Ural'skiy gosuniversitet imeni A.M. Gor'kogo.
(Metallography) (Magnetooptics)

SHERSTKOV, Yu.A.; MOSKOV, M.M.

Photoelectric method for registering the contours of spectrum lines in a d.c. arc. Fiz.sbor. no.4:188-190 '58. (MIRA 12:5)

1. Ural'skiy gosudarstvennyy universitet imeni A.M.Gor'kogo.
(Spectrophotometry)

51-4-3-15/30

AUTHORS: Levkov, A.N. and Noskov, M.M.

TITLE: Magneto-Optical Rotation in Alloys of Nickel with Palladium. (Magnetoopticheskoye vrashcheniye v splavakh nikelya s palladiyem.)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol.IV, Nr.3, pp.378-382 (USSR)

ABSTRACT: The present paper reports measurements on the magneto-optical Kerr effect (rotation of the plane of polarization of light on reflection by ferromagnetics). This effect is due to a difference in the degree of damping inside a magnetized ferromagnetic of electromagnetic waves polarized in two mutually perpendicular directions. Nickel-palladium alloys were studied. These two metals form a continuous series of solid solutions in which the mean distance between atoms increases uniformly with increase of Pd content. The samples were in the form of disks with from 0 to 90 atomic % of Pd. Uniformity of the samples was checked by X-ray analysis of their structure. Ferromagnetic Curie points (Fig.3) of the samples were found to decrease monotonically with increase of Pd content. Mirror surfaces on samples

Card 1/4

Magneto-Optical Rotation in Alloys of Nickel with Palladium.

were prepared by mechanical polishing. The apparatus used is shown in Fig.1. An Iceland spar crystal was used to separate the reflected light into two mutually perpendicularly polarized beams. The ratio of the relative intensities of these two beams altered by the Kerr effect had its original value re-established by a rotation of the plane of polarization by means of a cell filled with distilled water and placed inside a solenoid. Current in the solenoid was proportional to the measured Kerr rotation. Re-establishment of the original value of the intensity ratio was observed by balancing a photoelectric bridge with a quadrant electrometer as a null indicator. A mercury lamp was used as the source. The results of photoelectric measurements were partly checked visually. All measurements were made at room temperature. The optical constants of samples were determined by B.Ya. Silant'ev. Measurements of the dependence of the Kerr effect on the alloy composition (Fig.2) were made in a magnetic field of 8000 oersted in which, in all cases, magnetic saturation was reached and a limiting value of

Magneto-Optical Rotation in Alloys of Nickel with Palladium.

the angle of rotation α_s was obtained. At 50-65% Pd the Kerr effect varies slowly with the alloy composition, but on both sides of this region the Kerr effect depends strongly on the amount of Pd in the alloy. Values of the saturation magnetization I_s are given in Fig.3. These values were used to calculate the Kerr constant $R = \alpha_s/I_s$. The dashed curve in Fig.3 gives the values of I_{so}, which is the saturation magnetization reduced to the absolute zero of temperature. The third curve in Fig.3 gives the dependence of the Curie point on the Pd content. Fig.4 shows the dependence of the optical constants of Ni-Pd alloys on their composition. The strong dependence of the magneto-optical Kerr effect on the Pd concentration seems to contradict the constancy of the atomic magnetic moment and of optical constants of Ni-Pd alloys when the Pd content is varied. The theory given in Ref.1 does not solve this problem, probably because of simplified assumptions on which this theory is based. Furthermore this theory is appli able to

Magneto-Optical Rotation in Alloys of Nickel with Palladium.

pure ferromagnetic metals and not to alloys. A tentative explanation of the dependence of the Kerr constant R on the Pd content in Ni-Pd alloys is sought in the dependence of R on the relative magnetization $y = I_s/I_{s0}$ which falls with increase of Pd in the alloys. In a separate experiment the authors found that annealing in an atmosphere of hydrogen (both Ni and Pd can absorb large quantities of hydrogen) at 700°C affected strongly the Kerr angle of rotation in Ni-Pd alloys with 20, 50 and 57 atomic % of Pd (Fig.5). The effect of hydrogen is reversible; annealing in vacuum at 900°C re-established the original values of the Kerr angle of rotation. There are 5 figures and 7 references, of which 4 are Soviet, 1 German, 1 French and 1 American.

ASSOCIATION: Ural State University, Sverdlovsk.
(Ural'skiy gosudarstvennyy universitet, g. Sverdlovsk.)

SUBMITTED: June 3, 1957.

Card 4/4

1. Nickel-palladium alloys—Reflective effects 2. Magneto-optic rotation

SOV/137-59-3-6548

Translation from: Referativnyy zhurnal. Metallurgiya, 1959, Nr 3, p 229 (USSR)

AUTHOR: Noskov, M. M.

TITLE: Substitutes for Nonferrous Metals (Zameniteli tsvetnykh metallov)

PERIODICAL: Zh-d. transport, 1958, Nr 6, pp 87-88

ABSTRACT: The TsAM9-1.5 alloy consisting of Zn with 8-10% Al, 1-2% Cu, and 0.03-0.06% Mg, has a low melting point (395°C), exhibits good plastic characteristics, lends itself readily to machining, rolling, or press forming, and possesses antifrictional properties comparable to those of bronzes and babbitts. Performance tests on floating bushings manufactured of the TsAM9-1.5 alloy are progressing satisfactorily under actual operational conditions in locomotives of the series L, SO, FD, and IS. For purposes of increasing their fatigue strength, the three-layer floating bushings have a steel casing.

I N

Card 1/1

65707
SOV/139-59-2-6/30

24.2600

AUTHORS: Zverev, L.P., Noskov, M.M. and Shur, M.Ya.

TITLE: The Effects of an Electric Field on the Spectral Response Curve for Photoconductivity in Cuprous Oxide

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1959, Nr 2, pp 39-42 (USSR)

ABSTRACT: Polycrystalline Cu_2O is used at 77°K in this work. The spectral response is examined at high dispersion (6 Å/mm) with a grating spectrograph and the absorption spectra are also recorded. Only two field strengths (300 and 6000 V/cm) are used. Fig 1 shows spectral response curves (uncorrected for the energy distribution in the exciting spectrum); the wavelength scale is in mμ; Fig 2 shows a small region at higher resolution. Fig 3 shows the effect of the field for one specimen; curve I relates to 300 V/cm and curve II to 6000 V/cm. The first exciton line occurs in absorption at 612.53 mμ but it can be detected only in thick specimens; it is not seen in Fig 4b. (Fig 4a is merely Fig 3 on a larger scale.) Figure 4c is at the top right and relates to 6000 V/cm; Fig 4b is at the bottom right (300 V/cm). The second and third exciton lines lie at 579.2 and 575.6 mμ respectively

Card 1/2

18.8100

SOV/126-7-3-40/44

AUTHORS: Zhuravleva, L. I. and Noskov, M. M.

TITLE: On the Method of Measuring Optical Constants of Metals (K metodike izmereniya opticheskikh konstant metallov)

PERIODICAL: Fizika metallov i metallovedeniye, 1959, Vol 7, Nr 3, pp 475-476 (USSR)

ABSTRACT: A high-precision variant of the polarimetric method of measuring optical constants of metals was described earlier (Ref 1). Later this variant was improved and used to study invisible surface layers on metals. The latter application is described in the present paper. A monochromatic light beam passed through two mechanically coupled polaroids. The polaroids were replaced by selenium polarizers for measurements in the infrared region. Four mirrors made of the metal investigated were placed between the polaroids in such a way that light was reflected from each of the mirrors at the same angle, whose value was between 45 and 80°. To determine the reduced polarization azimuth Ψ and the phase difference Δ between the polarized components (Ψ and Δ are necessary to calculate the optical constants), it is sufficient to carry out measurements at one value of this reflection

On the Method of Measuring Optical Constants of Metals

angle. When the coupled polaroids are uniformly rotated about the optical axis the intensity at the entry slit of a light receiver (a photoelectric photometer) varies with the angle of rotation α according to

$$y = A + 2B \sin^2 \alpha + C \sin^4 \alpha$$

Between zero and 90° three extrema of y are observed (they are a, b and c). The relationships between Ψ and Δ and the values a, b and c are given by

$$\operatorname{tg} \Psi = (a/c)^{1/8}; \quad \cos 4\Delta = \frac{b - \sqrt{(a - b)(c - b)}}{\sqrt{ac}}$$

Here $a < c$ (i.e. $\Psi < 45°$) and $0° < \Delta < 90°$. In the presence of films on the metal surface another pair of values Ψ' and Δ is obtained; these, together with Ψ and Δ, make it possible to calculate the thickness and the refractive index of the surface layer (Ref 2).

Card 2/3

On the Method of Measuring Optical Constants of Metals

If the number of mirrors is less than four, the missing samples are replaced by standard mirrors, e.g. of gold deposited on glass for which the value Ψ_o and Δ_o are measured separately. The method can be used to detect and measure thicknesses of very thin film of the order of 10 Å. In vacuo the method can be used to study adsorption of gases on metals. Since no phase compensators are employed the method can be used also to measure the optical constants of metals in the ultraviolet and infrared regions.
There are 2 Soviet references.

ASSOCIATION: Ural'skiy gosudarstvennyy universitet imeni A.M.Gor'kogo (Ural State University imeni A.M.Gor'kiy)

SUBMITTED: January 8, 1959

84619

S/181/60/002/010/049/051
B019/B056

24.7700 (1043, 1143, 1559)

AUTHORS: Zverev, L. P., Noskov, M. M., and Shur, M. Ya.

TITLE: On the Contour of the Exciton Absorption Bands in Cuprous Oxide

PERIODICAL: Fizika tverdogo tela, 1960, Vol. 2, No. 10, pp. 2643 - 2646

TEXT: In the introduction the results obtained by investigations of the optical properties of crystals, especially of the absorption spectra, are discussed. Among others, E. I. Rashba, A. S. Davydov, and Ye. F. Gross are mentioned. The authors of the present paper experimentally investigated the contour of the second band of the yellow series of exciton absorption bands and of thin cuprous oxide single crystals at temperatures of from 4.2 - 190°K. The measurements were carried out on a diffraction spectograph of the type АФС-4 (DFS-4) with high dispersion and photoelectric recording. The three samples investigated had a thickness of 9, 30, and 110 μ, respectively, and were produced from thin copper foils by oxidation in air at 1030°C. The contours of the exciton

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On the Contour of the Exciton Absorption Bands in Cuprous Oxide

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B019/B056

absorption bands (n = 2) in all three samples investigated showed good agreement. The maximum absorption coefficient was measured at 77.5°K as amounting roughly to 180 cm^{-1}. The temperature dependence of the exciton absorption line width is graphically represented in Fig. 1, and from the contour of the absorption line showed in Fig. 2 the good agreement of the measured results with those obtained from the formula (1) given by Toyozawa (Ref.3) for the absorption coefficient may be recognized. Thus, the opinion expressed by Toyozawa that the broadening of the exciton absorption bands is caused by the exciton-phonon interaction, is confirmed. Furthermore, it is also confirmed that the lifetime of the photoexcitons at temperatures below 55°K is principally determined by zero-vibrations of the lattice. From the good agreement between the experimental data with the theory, the conclusion may be drawn that only the acoustic branch of the lattice-vibration spectrum plays an essential part in exciton-phonon interaction. The authors thank N. V. Volkenshteyn for his assistance in the experiments and G. G. Taluts for discussing the results obtained. There are 2 figures and 10 references: 5 Soviet, 4 US, and 1 German.

Card 2/3

67899

S/126/60/010/003/006/009/XX
E201/E391

6.3200 (also 2804)

AUTHOR: Noskov, M.M.

TITLE: A Reflecting Phase Compensator for Optical Measurements on Metals

PERIODICAL: Fizika metallov i metallovedeniy, 1960, Vol. 10, No. 3, pp. 487 - 488

TEXT: The optical constants of a metal may be found by measuring the rotation of the plane of polarization on reflection of plane-polarised light by a metal mirror. The author describes phase compensators suitable for such determinations of the optical constants of metals at infrared frequencies. The compensators are mirrors of Cr, Nb, Ta and Pt, which have low conductivities and are stable in air. The optical constants of the compensator mirrors must be measured accurately in the required range of wavelengths. The optical constants of the compensators are used to find the values of the phase difference introduced on reflection and of the ratio of reflection coefficient for two components

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87899
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E201/E391

A Reflecting Phase Compensator for Optical Measurements on Metals

of light polarised at rightangles to each other. The author concludes with a calculation illustrating the case of plane-polarised light reflected once from a test sample and once from a compensator.

ASSOCIATION: Ural'skiy gosudarstvennyy universitet imeni A.M. Gor'kogo (Ural State University imeni A.M. Gor'kiy)

SUBMITTED: June 6, 1960

Card 2/2

9,4178 (1035, 1114, 1482)

30808
S/181/61/003/011/056/056
B109/B102

AUTHORS: Zverev, L. P., Noskov, M. M., and Shur, M. Ya.

TITLE: Photomagnetoelectric effect and band structure in cuprous oxide

PERIODICAL: Fizika tverdogo tela, v. 3, no. 11, 1961, 3556-3558

TEXT: Owing to the lack of an appropriate monochromatic light source the spectral behavior of the photomagnetoelectric effect (PME) could so far not be sufficiently studied. These difficulties could be overcome by using a Д-3 (D-3) lamp with strong monochromators (pass band 15 to 40 Å). The measurements were made with 150-300-micron thick cuprous oxide platelets at 77°K in 25-koe fields between 4000 and 7000 Å. In this case the dark conductivity was much lower than photoconductivity. Fig. 1 shows the measurement results which clearly indicate three spectral ranges: (1) No PME occurs above 5800 Å. This can be explained by the fact that electrons are produced in the polaron state. As compared to the free electrons their mobility is lower and their diffusion length is shorter. (2)

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Between 5800 and 4900 Å the PME is due to the production of free carriers. Its monotonic rise is determined by the dispersion of the absorption coefficient and the quantum yield of the internal photoeffect. (3) Below 4900 Å the behavior of the PME corresponds to the wavelength dependence of the PME near the fundamental absorption edge, which is typical of semiconductors. This phenomenon is connected with the abrupt increase of the diffusion length, in this case determined by the electron parameters, and suggests the existence of a new band-to-band transition in which electrons with other diffusion characteristics are produced. The conduction band splitting in Cu_2O was suspected already by S. A. Moskalenko (FTT, 2, 1755, 1960)[2]. Also the data by I. Pastrnyak, P. A. Titov (FTT, 3, 861, 1961), I. Pastrnyak (FTT, 1, 971, 1959), A. L. Rvachev (ZhTF, 28, 45, 1958), and N. B. Gornyy (ZhETF, 35, 281, 1958) speak in favor of this assumption. The authors thank I. M. Tsidil'kovskiy for discussions. There are 1 figure and 9 references: 7 Soviet and 2 non-Soviet. The two references to English-language publications read as follows: I. Kikoni, M. Noskov. Nature, 131, 725, 1933; W. Gartner. Phys. Rev., 105, 823, 1957.

30808
S/181/61/003/011/056/056
Photomagnetoelectric effect and band ... B102/B102

ASSOCIATION: Ural'skiy gosudarstvennyy universitet im. A. M. Gor'kogo Sverdlovsk (Ural State University imeni A. M. Gor'kiy Sverdlovsk)

SUBMITTED: August 25, 1961

Fig. 1. Spectral dependence of the photoconductivity (σ) and of the short-circuit current of the PME (α,σ) for Cu_2O.
Legend: (1) I_{sc} short-circuit current; σ_{ph}, photoconductivity in arbitrary units; σ is the first part of curve α on an enlarged scale.

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NOSKOV, M.

Sofia, Doklady Bolgarskoy Akademii Nauk, Vol 14, No 6, 1961 (continued)

Irradiated with a Lethal Dose of X-Rays," I. Nikolov and I. Baev (In English with Russian summary); pp 647-650.

23. "Electrophoretic Studies of Ascaris Suum Protein Fractions," C. Nachkova and L. Georgieva (In English with Russian summary); pp 651-654.

24. "Brynza (White Cheese) as a Means of Protection against Goitre in Rats," A. Zhmudinov, M. Noskov and I. Vasilev (In Russian with French summary); pp 655-658.

25. "An Investigation of the Radioprotective Effect of Certain Amidines on Rats Preliminarily Treated with Cysteamine," I. Nikolov (In English with Russian summary); pp 659-662.

BLAGONRAVOV, S.I.; BREK, B.M.; BYAKOV, P.T.; VIKTOROV, V.S.; VAGANOV, V.I.; GUSEV, S.A.; GLEBOV, V.V.; GURILEV, A.M.; DANILOV, G.D.; ZAV'YALOV, V.G.; IOFFE, Ye.F.; IZVEKOV, G.M.; KONOVALOV, S.A.; KULIGIN, A.S.; KASATKIN, A.P.; KUZNETSOV, N.I.; LEBEDEV, A.I.; LEMPERT, Ye.N.; MARGEVICH, Ya.I.; MAYZEL', M.A.; MITYAKOV, V.S.; MOSKOV, M.M.; RYABCHIKOV, M.Ya.; RATSMAN, N.I.; TVOROGOV, M.K.; UGOL'NIKOV, V.Ya.; KHAR'KOV, G.I.; CHADOV, S.L.

Lev Mil'evich Matveev; obituary. Torf. prom. 38 no.4:38 '61. (MIRA 14:9)

(Matveev, Lev Mil'evich, 1914-1961)

32271
S/126/62/013/005/030/031
E073/E535

24.3200

AUTHORS: Kirillova, M.M., Noskov, M.M. and Charikov, B.A.

TITLE: Influence of heat treatment on the optical properties of metallic layers

PERIODICAL: Fizika metallov i metallovedeniye, v.13, no.5, 1962, 798-799

TEXT: The effect of heat treatment was investigated for 0.25-0.35 μ thick films of gold, copper, silver and cadmium deposited at a vacuum of 10^{-5} to 10^{-6} mm Hg onto a glass base at room temperature. The annealing was in vacuum at 110-120°C and in some cases up to 200°C. Before and after annealing, the following were determined: density (by measuring the thickness and weight), resistivity and the optical constants n and k, which were measured according to the method of J. R. Beattie (Phil. Mag., 1955, 46, 235) at the wavelengths 0.423, 0.542 and 0.550 μ in several points between 2 and 9 μ. Measurements have shown that:
1) Freshly deposited non-transparent layers of Ag, Au and Cu on glass have a density 5 to 10% lower than that of the cast metal.

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The density increases after vacuum annealing for 10 to 15 hours at 110-120°C to the values given in the table. The metal with the lowest melting point, cadmium, did not show any change in density after annealing.

	Density, $g \cdot cm^{-1}$			Resistivity 10^{-17} CGSE		
	Initial state	Annealed	Massive	Initial state	Annealed	Massive
Gold	18.3	19.1	19.3	2.2	3.5	4.06
Copper	8.65	8.90	8.95	2.1	5.0	5.35
Silver	9.50	10.4	10.5	2.65	5.1	5.60

2) The refractive index n of gold and copper shows hardly any change, after annealing, for short-wave radiation (λ = 0.423 μ) but drops by a factor of 1.5 to 2 times in the long-wave part of the visible spectrum and in the infrared range. The attenuation index k increases approximately by 20% in the same range in which n decreases. The optical constants of cadmium

change only insignificantly after annealing.
3) The changes in the optical constants correspond to a decrease by about 1.5 to 2 times in the absorption capacity A = 1 - R. The changes in the optic . constants with annealing are virtually terminated after 2 to 3 hours but, for obtaining stable values of density and resistivity, the annealing had to be continued for 10 to 15 hours. Then, it can be assumed that the structure of the metal in the optical layer in the neighbourhood of the surface is satisfactorily normalised.
The normalising effect of the heat treatment is particularly noticeable on metals with a relatively high melting point, whilst metals with low melting points will deposit in vacuum at a sufficient initial density and the effect of heat treatment is negligible. Annealing has also little effect on the optical constants of gold and copper in the short-wave range of the visible spectrum in which lattice defects are not of great importance due to the quantum nature of the excitation of the electrons by light. Calculation of the classical depth of penetration $\delta = \lambda / 2\pi k$ from the values of k yields the following values: $\delta = 0.0335\ \mu$ for $\lambda = 0.55\ \mu$ and $\delta = 0.0283\ \mu$ for $\lambda = 7\ \mu$ (0.35 μ thick annealed

gold). Since in the range 2-9 μ, k is almost proportional to the wavelength, the depth of penetration will be practically independent of the wavelength. In the near-infrared range the optical properties of gold can be approximately expressed by the formulae of Drude-Ziner and therefore, for an approximate estimation of the collision frequency, the relation $\gamma = 2nk\,\omega/1_{-}\, n^2 + k^2$ can be applied, from which we obtain $\gamma \approx 0.8 \cdot 10^{14}$. Prior to annealing, γ is about twice as high and δ is about 20% higher than in the normalised annealed state. There is 1 table.

ASSOCIATION: Institut fiziki metallov AN SSSR
(Institute of Physics of Metals AS USSR)

SUBMITTED: January 17, 1962

39760
S/126/62/013/006/002/018
E202/E492

9.5370

AUTHORS: Bolotin, G.A., Voloshinskiy, A.N., Kirillova, M.M., Noskov, M.M., Sokolov, A.V., Charikov, B.A.

TITLE: Optical properties of titanium and vanadium in the infrared spectral region

PERIODICAL: Fizika metallov i metallovedeniye, v.13, no.6, 1962, 823-831

TEXT: Experimental data of the magnitude and frequency dependence of the real and imaginary components of the complex permittivity ε' for titanium, vanadium and gold were studied in the region of 2 to 10 μ, and room temperature. The changes in the state of polarization occurring during reflections from the surfaces of the metals were measured. Mirrors were prepared from 99.99% pure vanadium and titanium iodide by mechanical polishing in an acidic medium. Measurements of static electro-conductivity at room and liquid nitrogen temperatures confirmed the high purity of the samples used. Gold mirror was prepared by vacuum deposition and was used for comparison. Parallel beam of polarized infrared light was reflected in turn from four metallic

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Optical properties of ...

mirror surfaces and the ratio of the parallel and perpendicular intensities and phase differences of the polarized component were evaluated. Emerging from the analyser, the beam was focused on the slit of the infrared spectrometer type ИКС-12 (IKS-12). The ellipticity components were evaluated by the method of parallel polarizers. Almost complete data of n, k and the real ε_1 and imaginary ε_2, component dependency on frequency was tabulated at 0.5 μ intervals for Ti, Va and Au. Plots of reflectivity and dispersive power versus wavelength were also included. The above experimental data were used in a detailed theoretical analysis of relations existing between the dielectric permittivity and wavelength, using the elaborate method of approximating polynomials. Polynomials satisfying the experimental data gave the following values for the respective coefficients:

Titanium: $\varepsilon_1 = -6.84\lambda^{-4} + 54.8\lambda^{-2} - 57.2 + 4.62\lambda^2 - 0.0154\lambda^4$;

$\varepsilon_2 = 43.94\lambda^{-1} + 11.16\lambda + 0.20\lambda^3$; (6)

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