ZHELUDEV, I. S., ABDULGAMIDOV, I. S., FRIDKIN, V. M.,

"Testing of photoelectret conditions in activating alkali halogen crystals."

report to be submitted for the 1st Intl. Congress on Reprography, Cologne, West Germany, 14-19 Oct 1963

ZHELUDEV, I. S., YURIN, V. A.,

"Stabilization of Spontaneous Polarization in Ferroelectric Crystals."

report presented at the Symposium on Ferroelectricity and Ferromagnetism, Leningrad, 30 May-5 June 1963.

45676

24,7800

S/070/63/008/001/008/084
E132/E460

AUTHORS: Vlokh, O.G., Zheludev, I.S., Shamburov, V.A.

TITLE: The electro-optical effect in crystals of pentaerythritol $C(CH_2OH)_4$

PERIODICAL: Kristallografiya, v.8, no.1, 1963, 51-56

TEXT: For pentaerythritol, which belongs to the crystal class $\bar{4}$, crystals showing the growth pyramids 10$\bar{1}$ appear to have a twofold axis. [Abstracter's note: The authors state that the crystals appear biaxial optically. This does not appear to be correct as this system must be uniaxial, but it may mean that the ellipsoid of revolution which represents the refractive indices requires two parameters to describe it and has two different axes.] The optical indicatrix is described by the equation:

$$(a_o^2 + r_{12}E_y)x^2 + (b_o^2 + r_{22}E_y)y^2 + (c_o^2 + r_{32}E_y)z^2 + 2r_{52}E_yzx = 1$$

when an electric field E_y is applied along the y-axis. This y-axis is the fourfold inversion axis for the crystal as a whole. a_o, b_o and c_o are the reciprocals of the principal

Card 1/3

refractive indices; r_{ij} are the electro-optical coefficients, 8 being non-zero for this cut. It follows that when an electric field is applied the indicatrix is deformed and rotates in the XZ plane through an angle $\frac{\varepsilon}{2}$. This y-cut crystal was mounted between crossed Nicols and a beam of monochromatic light was passed through the system into a photomultiplier. The plate was adjusted to extinction and a high voltage was applied to the electrodes, the increase in transmitted light being measured. The increase resulted from the rotation of the indicatrix which could reach 22.5° if a field of 220 kV/cm were applied. The material has a high melting point (257°C) and behaves as a linear dielectric with a specific resistance of 10^{15} to 10^{12} ohm cm over the range 30 to 130°C in the absence of surface conductivity. The crystals are not hygroscopic and have a perfect 001 cleavage which corresponds to the y-cut used if it is reckoned that the growth pyramids of the form 10$\bar{1}$ give crystals of the class 2. The moduli were found to be

$r_{52} = (4.38 \pm 0.13) \times 10^{-8}$ cgsu and $r_{32} - r_{12} = (2.09 \pm 0.13) \times 10^{-8}$ cgsu.

The rotation of the indicatrix is about 20 times that produced by the same field in ammonium dihydrogen phosphate. The latter (ADP) has, however, a much greater electro-optical effect when the field is in the Z-direction. There are 3 figures.

ASSOCIATION: Institut kristallografii AN SSSR
(Institute of Crystallography AS USSR)

SUBMITTED: June 26, 1962

Card 3/3

45677

S/070/63/008/001/009/024
E132/E460

24.2130 24.7800)

AUTHORS: Sonin, A.S., Zheludev, I.S.

TITLE: The investigation of certain dielectric properties of single crystals of sodium nitrite

PERIODICAL: Kristallografiya, v.8, no.1, 1963, 57-62

TEXT: Ferroelectricity in $NaNO_2$ was predicted by the authors in 1957. Crystals grown from solution were used first but were unsatisfactory because of high electrical conductivity. The dependence on temperature of dielectric constants, spontaneous polarization, coercive force, electric conductivity and piezo-electric properties of single crystals of sodium nitrite were investigated. The crystals used were made from the melt in closed ampules from salt which had been earlier dried in vacuo at a high temperature. They were non-hygroscopic. They cleaved easily parallel to (101). Plates of other orientations were thus difficult to prepare. Electrodes were applied by evaporating silver. The dielectric constants were measured at 500 Kc/s and, at room temperature, were $\varepsilon_a = 6.8$, $\varepsilon_b = 6.4$ and $\varepsilon_c = 7.8$; at 170°C a λ-point was found in the curve for ε_c

Card 1/2

which rose to above 800. Above the Curie point of 161°C e_c obeys the Curie-Weiss law. e_a and e_b show discontinuities of slope at the Curie point but do not exceed 14. The hysteresis loop was plotted at various temperatures. At room temperature the coercive force is higher than could be applied. Above 120°C the hysteresis loop could be observed. The spontaneous polarization was measured as 8 microcoulombs/cm^2 and at 150°C the coercive force was 2 kV/cm changing linearly with temperature. The piezo-electric moduli were measured, d_{33} being 4.4×10^{-8} cgsu at room temperature. It changed little until above 160°C when a rapid fall to zero occurred. The electrical conductivity followed the law, $\log s = k/T$, giving an energy of activation of 0.72 eV above the Curie point and 0.90 in the ferroelectric region. Nonlinear effects were found when the susceptibility was measured as a function of field at 1 Kc/s. The behaviour of $NaNO_2$ is to be compared with that of KNO_3 where there is also no hydrogen. The ferroelectricity and the transition appears to be connected with ordering of the NO_2 groups. There are 9 figures.

ASSOCIATION: Institut kristallografii AN SSSR (Institute of Crystallography AS USSR).
SUBMITTED: May 5, 1962
Card 2/2

AUTHOR: Zhel'dev [illegible] (Engineer); Terent'yev, B. P. Dr. [illegible]

TITLE: Calibrating properties of ferro[illegible] dielectric-hysteresis loop

SOURCE: Elektrichestvo, no. 8, 1963, [illegible]

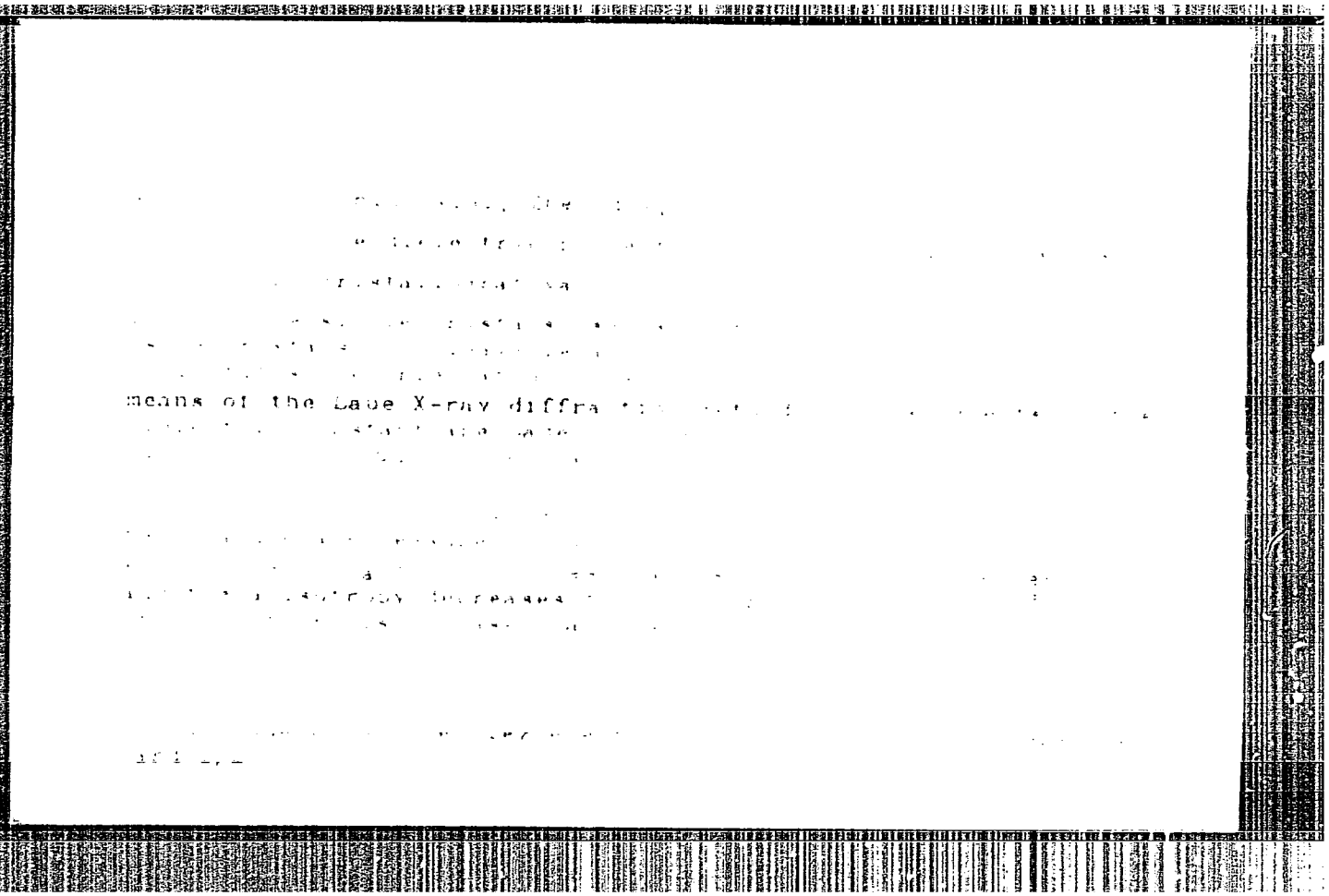
TOPIC TAGS: ferroelectric crystal, hyster[illegible], rectangular hysteresis loop, dielectric hysteresis, triglycine sulfate, [illegible]

ABSTRACT: A [illegible] of standard [illegible] The [illegible] within [illegible] to SG2S gas stabil[illegible]

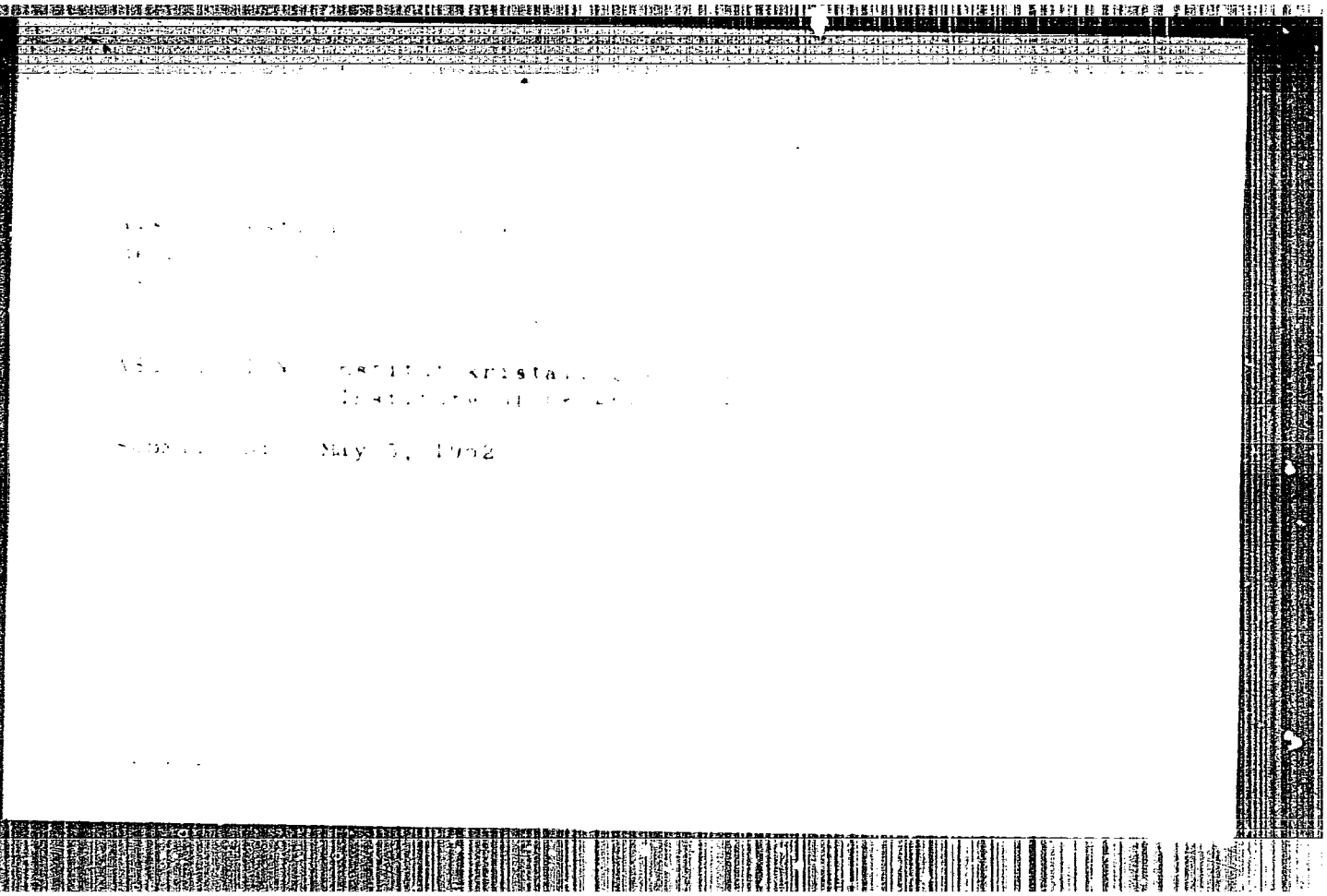
Card 1/2

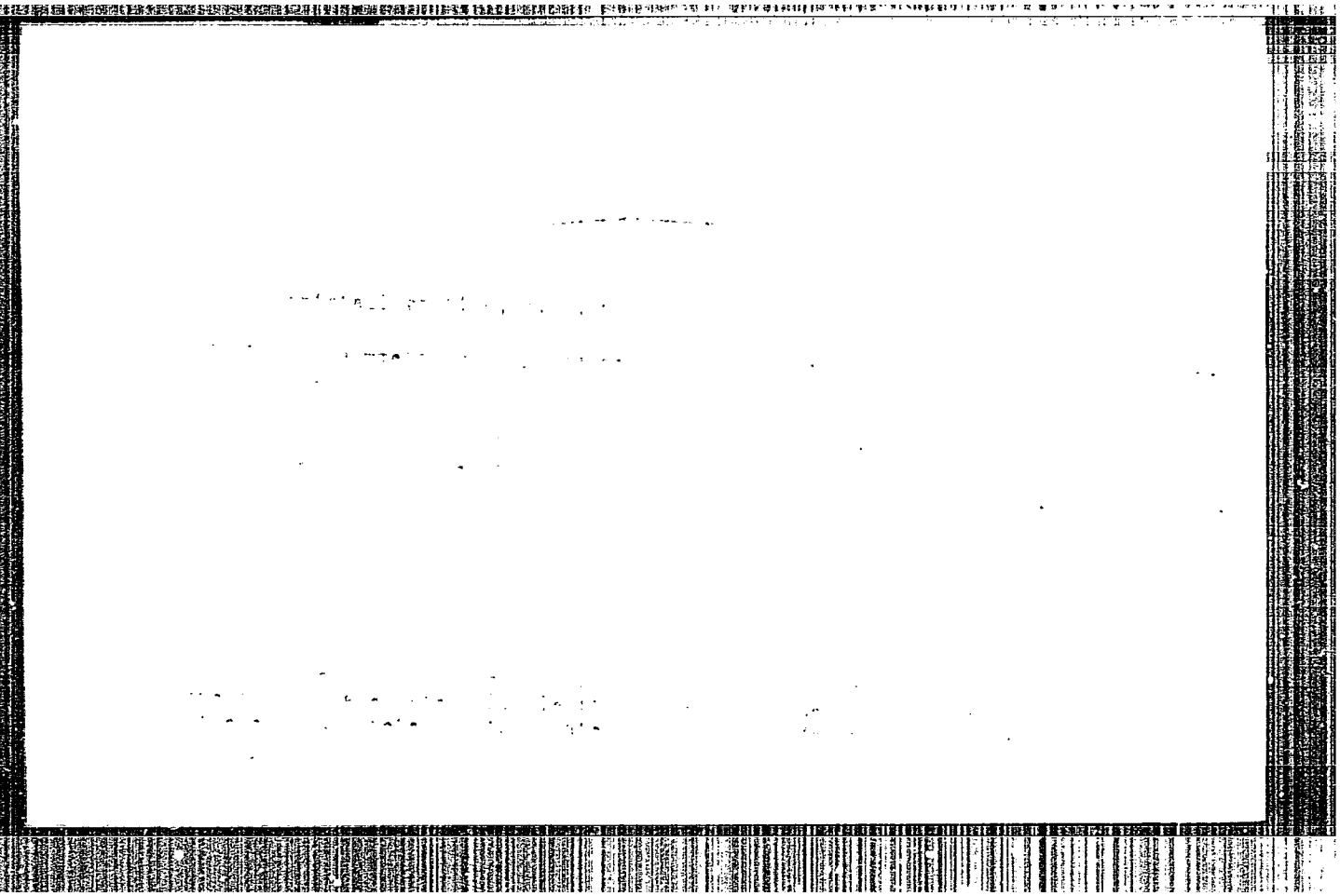
SUB CODE: GE, EE

Card 2/2



means of the Laue X-ray diffra





OTHER: OC1

Card 2/2

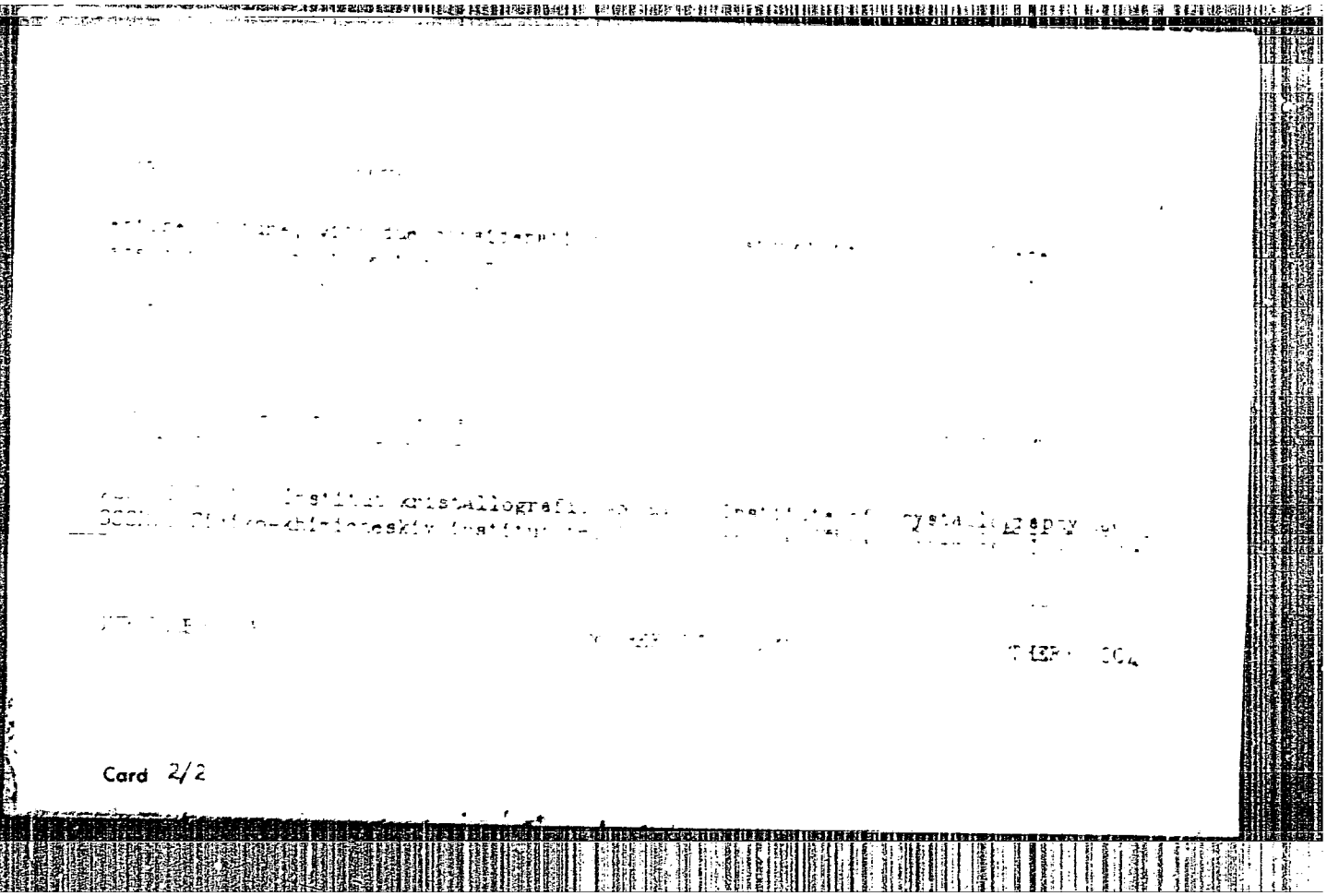
[redacted]

[illegible] features of structural changes [illegible]
materials

[illegible] crystallographic, [illegible]

TOPIC TAGS: antiferroelectric, ferroelectric, [illegible]
structure, [illegible]

[illegible] abstracts are [illegible]
[illegible] development of superlattice [illegible]
during antiferroelectric phase transitions. Their analysis is based [illegible]
of published data relative to [illegible]



Card 2/2

TAMBOVTSEV, D.A.; SKORIKOV, V.M.; ZHELUDEV, I.S.

Production of bismuth titanate single crystals and some of their properties. Kristallografiia 8 no.6:889-893 N-D'63. (MIRA 17:2)

1. Institut kristallografii AN SSSR.

ACCESSION NR: AP4019324 S/0105/64/000/003/0001/0005

AUTHOR: Tambovtsev, D. A. (Engineer); Terent'yev, B. P. (Doctor of technical sciences); Zheludev, I. S. (Doctor of physico-mathematical sciences); Skorikov, V. M. (Engineer); Kucherova, I. V. (Engineer)

TITLE: Voltage and current stabilization by ferroelectrics

SOURCE: Elektrichestvo, no. 3, 1964, 1-5

TOPIC TAGS: ferroelectric, ferroelectric crystal, voltage stabilizer, current stabilizer, ferroelectric voltage stabilizer, ferroelectric current stabilizer, reference voltage, bismuth titanate, barium titanate, triglycine sulfate

ABSTRACT: Procedures for the calculation of ferroelectric-stabilized reference-voltage sources are set forth, a new circuit for voltage stabilization is submitted, and some problems in using ferroelectrics for stabilization purposes are discussed. The new bridge-like circuit (see Enclosure 1) has the advantage

Card 1/3 2

ACCESSION NR: AP4019324

of a high output voltage that can reach one-third of the input voltage; also, a high degree of temperature compensation is possible. The experimentally determined effects of frequency and load on the performance of ferroelectric voltage stabilizers are reported. The possibilities of ferroelectric materials for current stabilization were also explored; a 1-cm^2 barium-titanate plate ensured a stable mean current of 50 ma at 50 cps; bismuth titanate and triglycine sulfate were also tested. Orig. art. has: 9 figures and 6 formulas.

ASSOCIATION: Institut kristallografii AN SSSR (Institute of Crystallography, AN SSSR)

SUBMITTED: 13Sep63 DATE ACQ: 27Mar64 ENCL: 01

SUB CODE: EE NO REF SOV: 006 OTHER: 001

Card 2/3 2

SONIN, A.S.; ZHELUDEV, I.S.

Isomorphism and ferroelectric properties. Rost krist. 4: 203-208 '64. (MIRA 17:8)

ACCESSION NR: AP4019835 S/0181/64/006/003/0764/0770

AUTHORS: Abdulgamidov, S. A.; Zheludev, I. S.; Nosov, V. N.; Fridkin, V. M.

TITLE: On internal field distribution in single crystal photoelectrets

SOURCE: Fizika tverdogo tela, v. 6, no. 3, 1964, 764-770

TOPIC TAGS: internal field distribution, single crystal, photoelectret, photoelectric field, interelectrode spacing, space charge, field distribution

ABSTRACT: The hetero- and homocharge distributions in photoelectrets of single crystals of additive-colored KCl, S, $K_2Cr_2O_7$ and CdS have been investigated, using the light probe technique of M. Y. Ben Sira, B. Pratt, E. Harnik, and A. Many (Phys. Rev. 115, 55, 1929) and Harnik, Ben Sira, Pratt, and S. Peter (J. Appl. Phys., 34,207, 1963). It consists of depolarizing the photoelectret by means of a light probe in a direction perpendicular to the internal photoelectric field. The KCl specimen was polarized first by a 0.5-kv field with exposure of the whole crystal surface to 546m monochromatic light, and subsequently by a 2.0-kv field with central illumination only. Internal field distributions are represented graphically as functions of the interelectrode spacing. Both barrier type and space

Card 1/2

ACCESSION NR: AP4019835

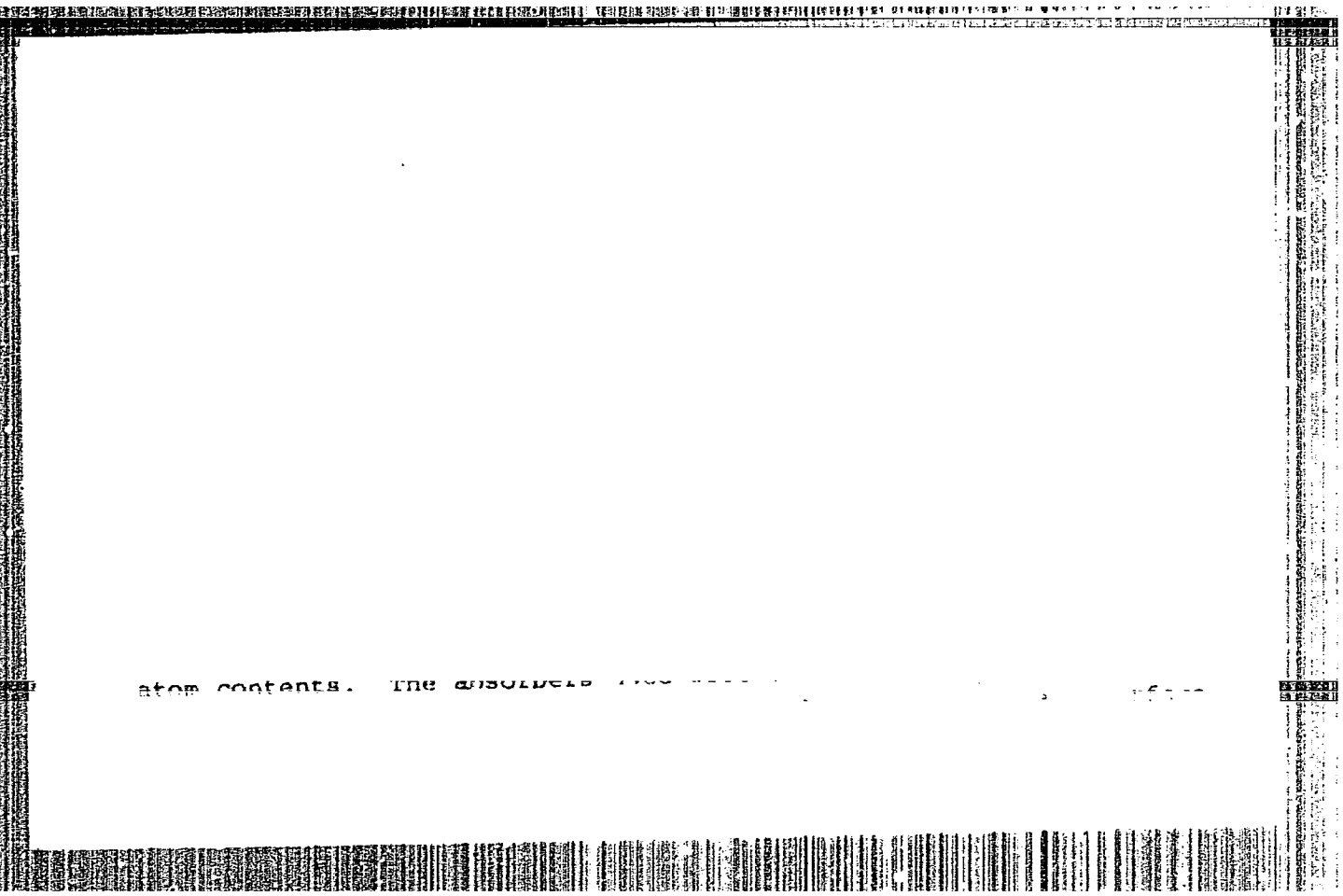
charge type distributions are observed. For the central illumination case an asymmetric field distribution was noticed relative to the crystal center. Similer experiments were performed on the rest of the specimens. In CdS, under all polarization time durations, the field showed an inverse direction at the cathode and a forward, positive direction at the anode. Orig. art. has: 6 figures and 3 formulas.

ASSOCIATION: Institut kristallografii AN SSSR Moscow (Institute of Crystallography AN SSSR)

SUBMITTED: 29Aug63 DATE ACQ: 31Mar64 ENCL: 00

SUB CODE: PH NO REF SOV: 006 OTHER: 006

Card 2/2



atom contents. The absorbers

APPROVED FOR RELEASE: 03/15/2001 CIA-RDP86-00513R002064710012-8"

ZHELUDEV, I.S.

Axial tensors of the third rank and the physical effects they describe. Kristallografiia 9 no.4:501-505 Jl-Ag '64.
(MIRA 17:11)

1. Institut kristallografii AN SSSR.

ACCESSION NR: AP4043192 S/0070/64/009/004/0564/0565

AUTHORS: Abdulgamidov, S. A.; Zheludev, I. S.; Fridkin, V. M.

TITLE: On the kinetics of the formation of the photelectret state in additively colored KCl single crystals

SOURCE: Kristallografiya, v. 9, no. 4, 1964, 564-565

TOPIC TAGS: potassium compound, photoelectret, single crystal, color center, F center, polarization, depolarization

ABSTRACT: The tests were made with single crystals having an F-center concentration $\sim 10^{16}$ cm^{-3} with an aim at checking on the theoretical deductions of E. Adirovich (Fiz. tv. tela v. 3, no. 7, 2048, 2050, 1961). The measurements were made with plates having area ~1--2 cm^2 and thickness ~0.15 cm, using barrier contacts to prevent the injection of the carriers from the electrodes into the

Card 1/4

ACCESSION NR: AP4043192

crystal (mica liners). Illumination during the polarization was with monochromatic 546-nm light. The charge was measured by the depolarization method, with the photoelectret illuminated with the undecomposed light from a mercury lamp and with integration of the depolarization current. The time variation of the photoelectret charge was found to be exponential. The reciprocity law was fulfilled over the entire range of light intensity employed. The charge density was found to be linear in the polarizing-field intensity. It is concluded on the basis of these results, and also results by others, that the kinetics of formation of the photoelectret state in colored alkali-halide crystals, as well as their depolarization, are in accord with the deductions of the phenomenological theory. "The authors thank L. M. Shamovskiy for supplying the samples of additively colored single crystals." Orig. art. has: 1 figure.

ASSOCIATION: Institut kristallografii AN SSSR (Institute of

Card 2/4

ACCESSION NR: A 1043192

Crystallography, AN SSSR)

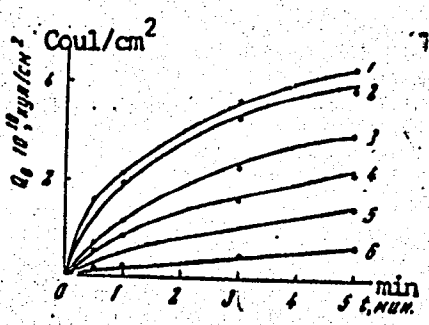
SUBMITTED: 01Nov63 ENCL: 01

SUB CODE: OP, SS NR REF SOV: 002 OTHER: 004

Card 3/4

ACCESSION NR: AP4043192

ENCLOSURE: 01



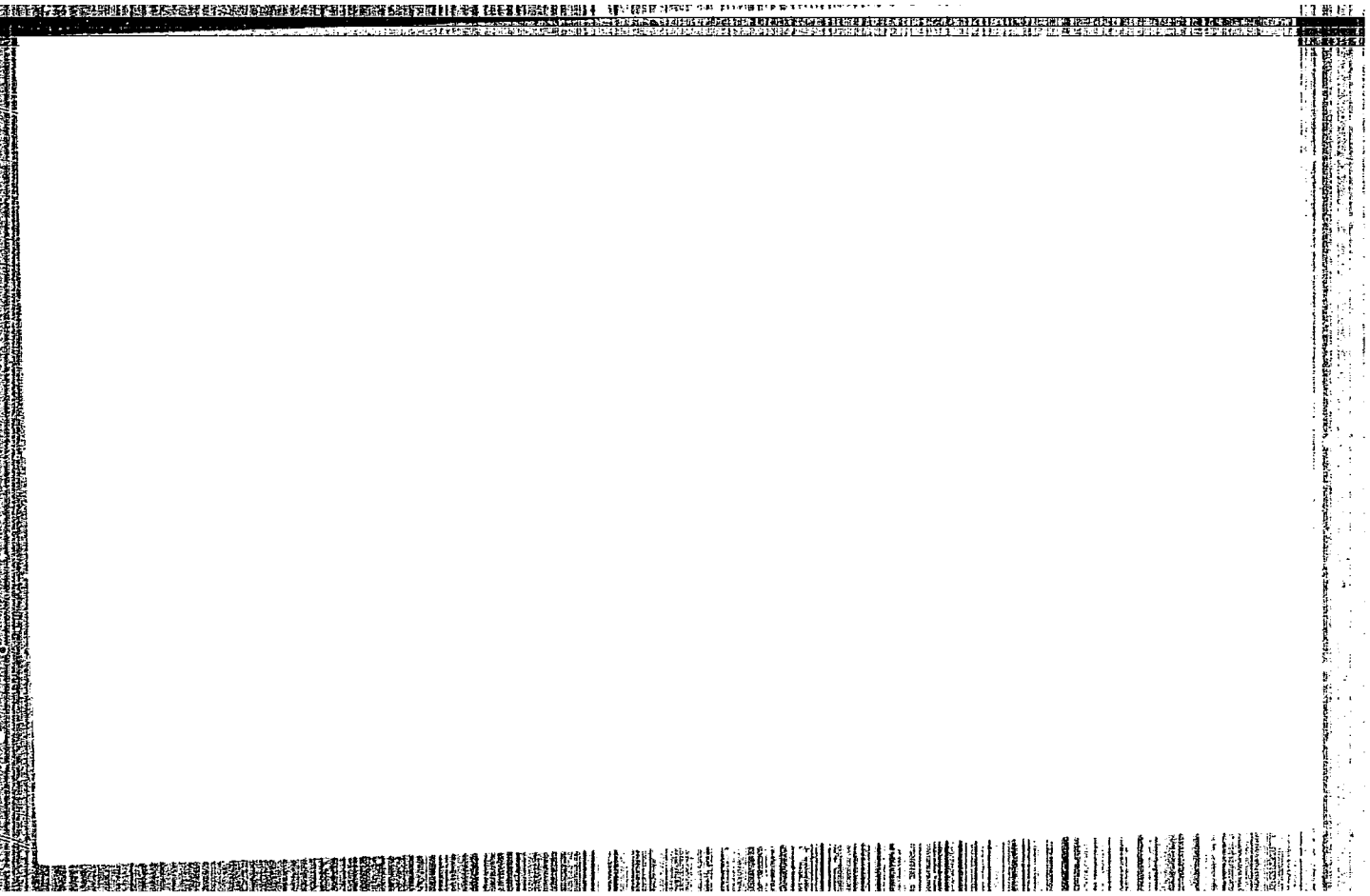
Dependence of the charge of a photoelectret on the illumination, following illumination by different light intensities (additively colored single crystal KCl, T = 120K). The numbers refer to different illuminations.

Card 4/4

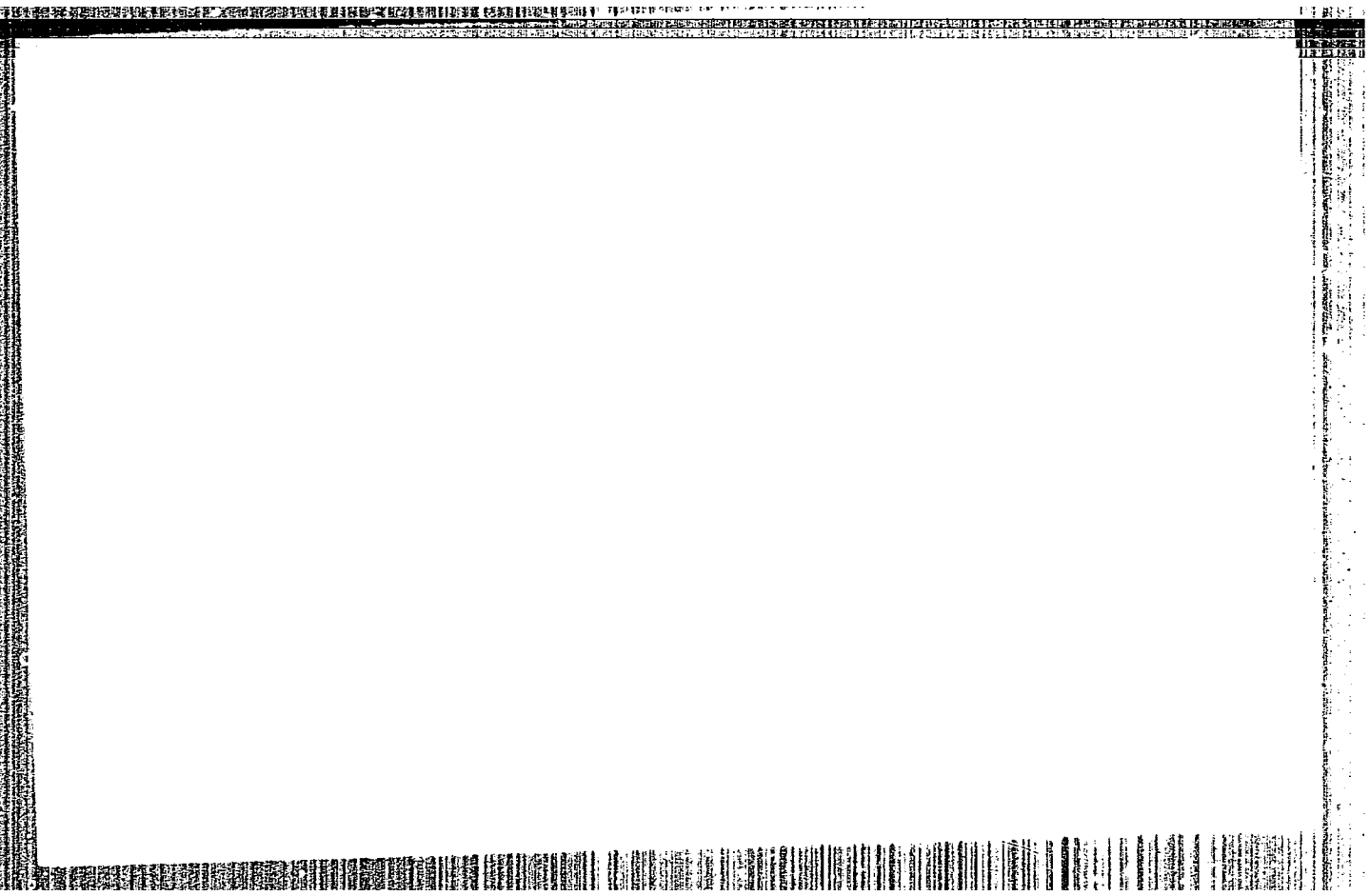
ROMANYUK, N.A.; ZHELUDEV, I.S.

Changes in the dome'n structure of Rochelle salt crystals due to radiation. Kristallografiia 9 no.6:876-878 N-D '64.
(MIRA 18:2)

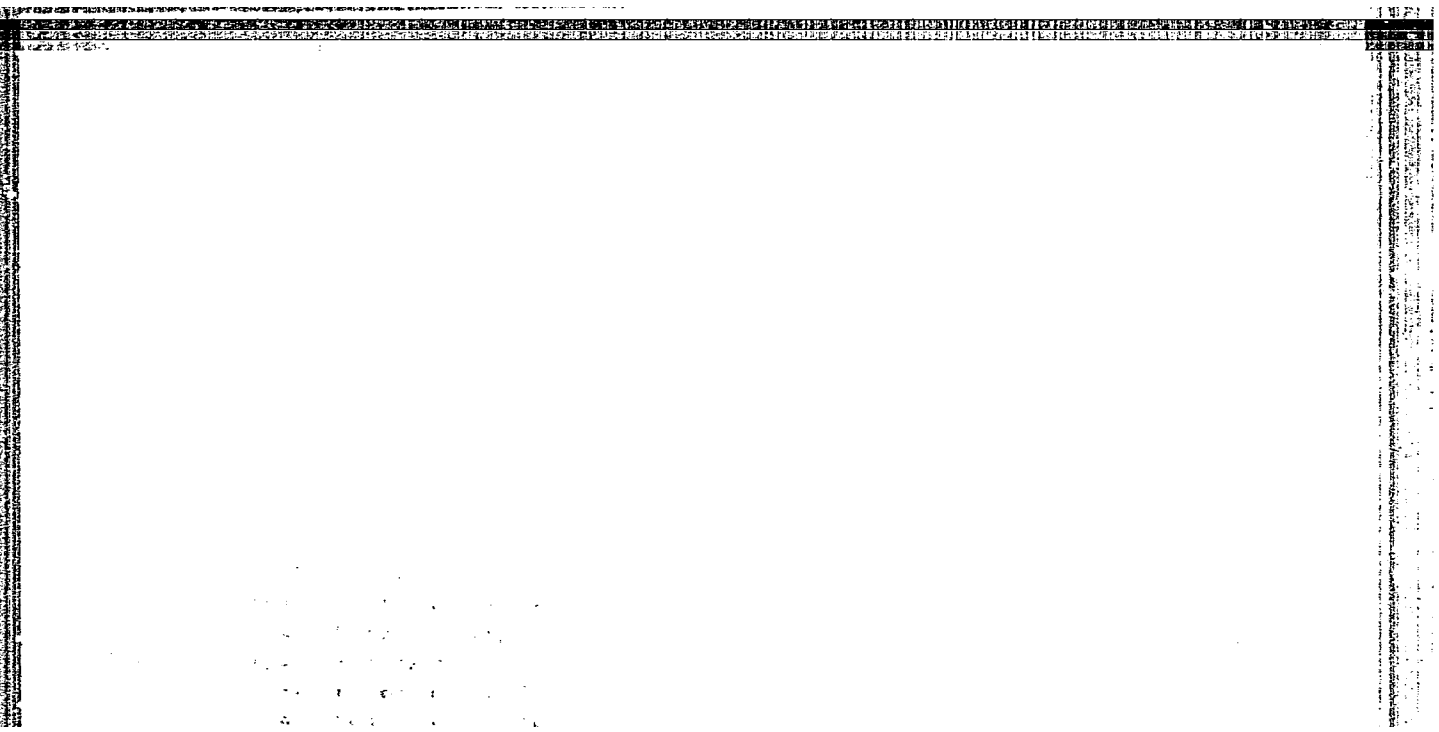
1. L'vovskiy gosudarstvennyy universitet i Institut kristallografii AN SSSR.



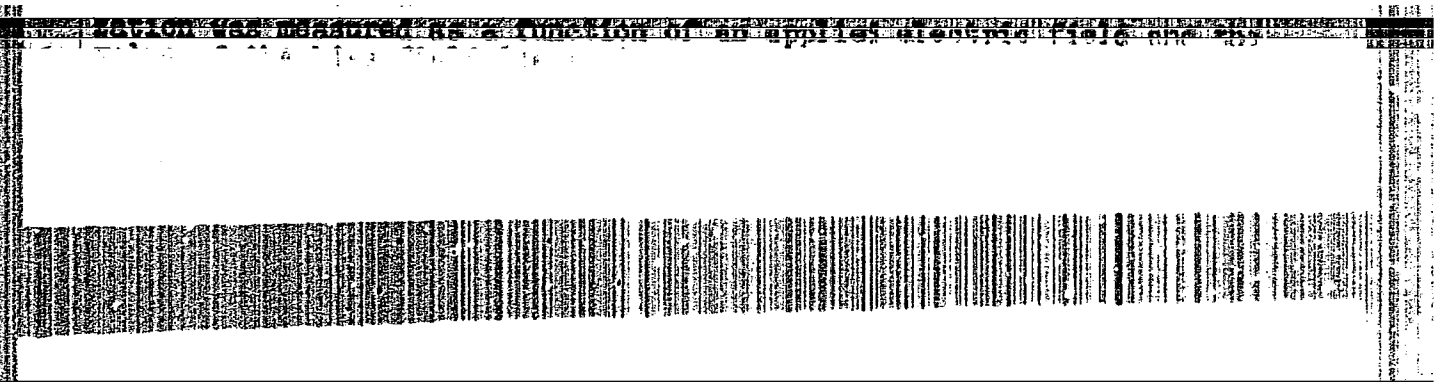
APPROVED FOR RELEASE: 03/15/2001 CIA-RDP86-00513R002064710012-8"

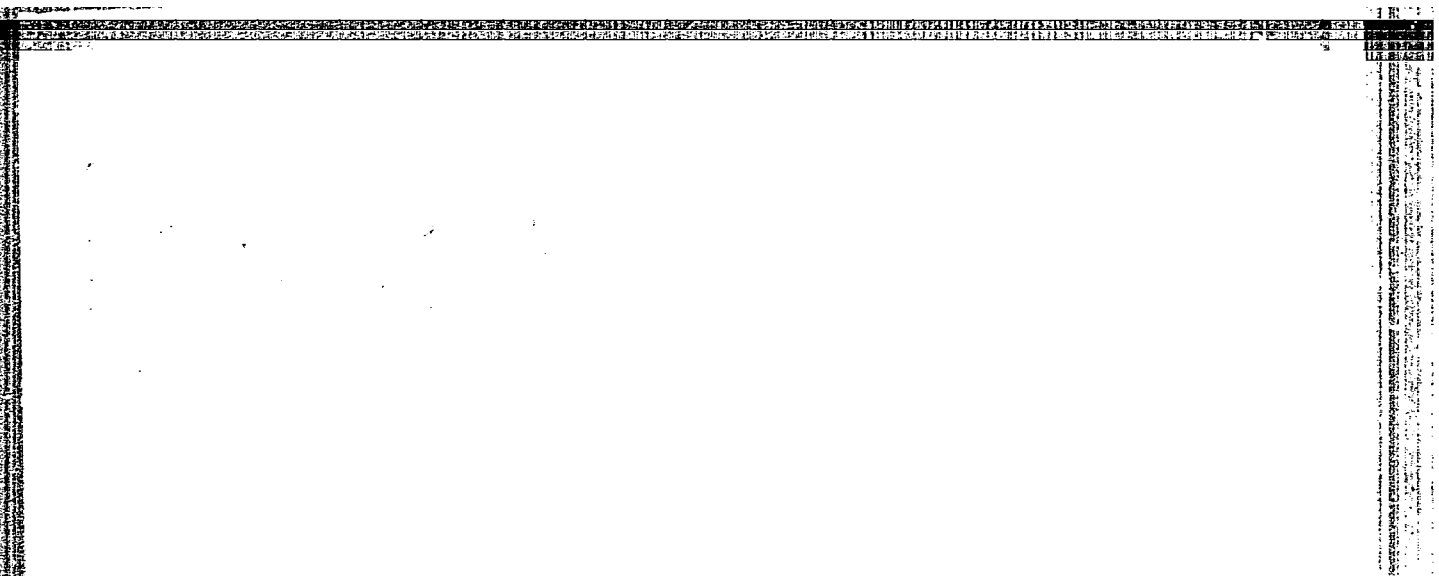


APPROVED FOR RELEASE: 03/15/2001 CIA-RDP86-00513R002064710012-8"

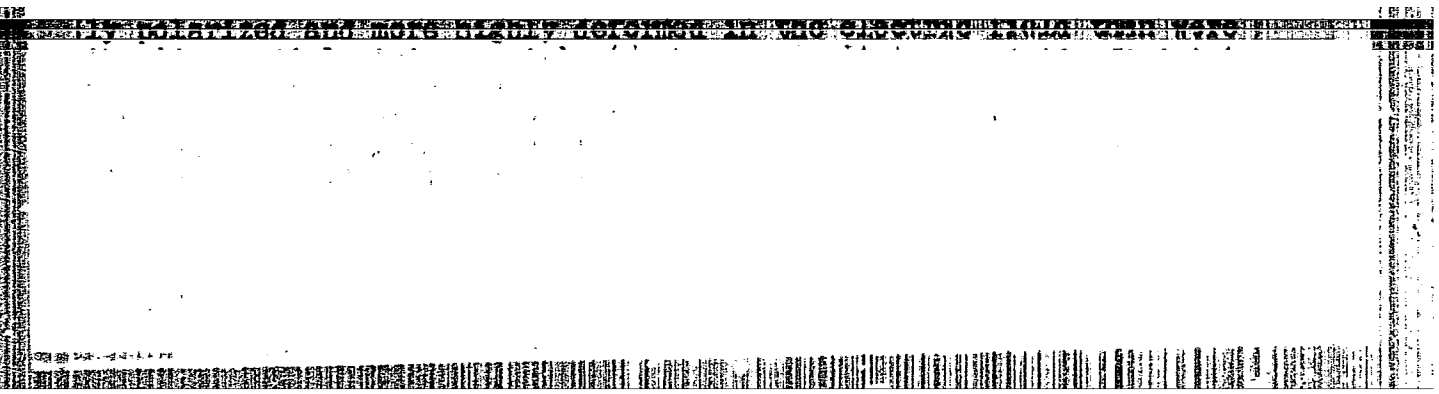


APPROVED FOR RELEASE: 03/15/2001 CIA-RDP86-00513R002064710012-8"

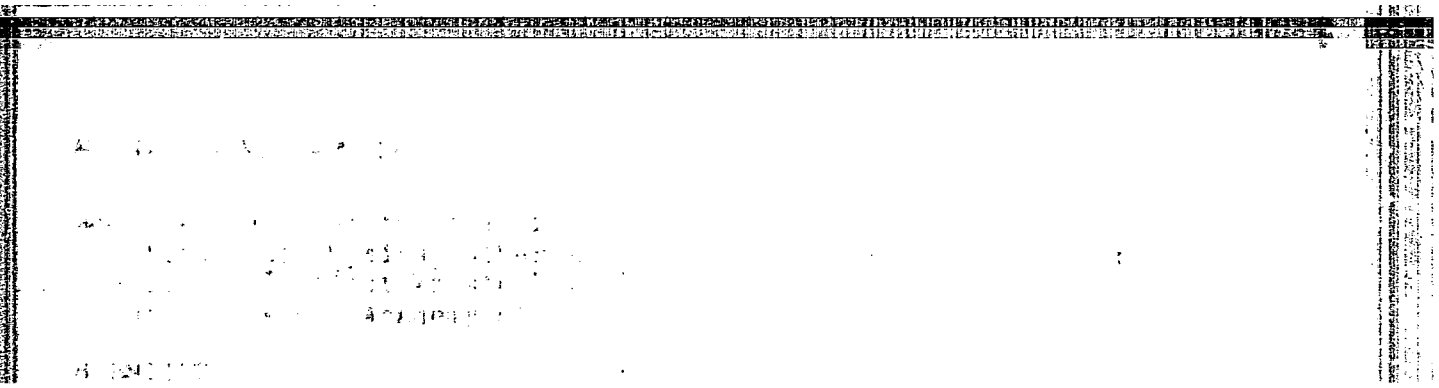




APPROVED FOR RELEASE: 03/15/2001 CIA-RDP86-00513R002064710012-8"



APPROVED FOR RELEASE: 03/15/2001 CIA-RDP86-00513R002064710012-8"



APPROVED FOR RELEASE: 03/15/2001 CIA-RDP86-00513R002064710012-8"

L 2119-66 EWT(1)/T/EED(b)-3 IJP(c)
ACCESSION NR: AP5022732 UR/0181/65/007/009/2834/2836

AUTHOR: Aref'yev, I. M.; Bazhulin, P. A.; Zheludev, I. S.

TITLE: Longwave infrared transmission spectra of $NH_4H_2PO_4$

SOURCE: Fizika tverdogo tela, v. 7, no. 9, 1965, 2834-2836

TOPIC TAGS: transmission spectra, improved transmission spectra, dielectric

ABSTRACT: Transmission spectra of polycrystalline samples of $NH_4H_2PO_4$ were obtained in the frequency range from 20 to 235 cm^{-1}. The curve of optical density D = -lgK (where K is the transmission coefficient) showed ten absorption levels in the investigated range of the spectrum. A wide, intense level of absorption with a maximum in the region of 40—55 cm^{-1} was observed in the low-level part of the spectrum. No changes in the parameters of the 40—55 cm^{-1} level were evident from temperature measurements in the range from room temperature to 148K. The experiments demonstrated the presence of oscillations, which in

ACCESSION NR: AP5022732

great measure characterize the dielectric properties of the crystal.
Orig. art. has: 1 table, 1 figure, and 1 formula.

ASSOCIATION: Siberian Institute [illegible]
Physics Institute, AN [illegible]

L 4271-66 EWT(1)/EPA(s)-2/EWT(m)/EWP(t)/EWP(b) IJP(c) JD

ACCESSION NR: AP5024569 UR/0070/65/010/005/0764/0766

548.0:537.226.1

AUTHOR: Zheludev, I. S.; Ludupov, Ts-Zh.

TITLE: Complex dielectric constant of RbH_2PO_4 in the 8×10^2 - 3.86×10^{10} cps frequency range

SOURCE: Kristallografiya, v. 10, no. 5, 1965, 764-766

TOPIC TAGS: rubidium compound, dielectric constant

ABSTRACT: The article reports on measurements of the complex dielectric constant $\varepsilon^* = \varepsilon' + j\varepsilon'$, i.e., measurements of the quantities ε_3^* and $\varepsilon_1^* = \varepsilon_2^*$, in RbH_2PO_4 single crystals. Measurements at low and high frequencies were made with a low-frequency RFT bridge and a PEMEL low-capacitance meter, respectively. Measurements at 15 Mc were made with a Ye9-5 Q-meter. It was found that the values of the electric constants of samples cut out of different portions of the same crystal are the same. However, ε' may change with the conditions of growth of the crystal. A marked decrease (dispersion) of the dielectric constant occurs in the 9.6×10^9 - 3.86×10^{10} cps range; at these frequencies, a substantial increase in the loss-angle tangent begins. The nature of this dis-

Card 1/2

L 4271-66

ACCESSION NR: AP5024569

persion can probably be determined by measurements at higher frequencies. Orig. art. has: 1 figure, 1 table, and 4 formulas.

ASSOCIATION: Institut kristallografii AN SSSR (Institute of Crystallography, AN SSSR)

SUBMITTED: 05Mar65 ENCL: 00 SUB CODE: SS, GM

NO REF SOV: 004 OTHER: 001

Card 2/2

L 21129-66 EWT(m)/EWP(j) RM

ACC NR: AP6011959 SOURCE CODE: UR/0070/65/010/003/0335/0337

AUTHOR: Arbatskaya, A. N.; Zheludev, I. S.; Zirnit, U. A.; Sushchinskiy, M. M.

ORG: Institute of Crystallography, AN SSSR (Institut kristallografii AN SSSR)

TITLE: Low-frequency vibrational spectra of triglycine sulphate and rochelle salt monocrystals during phase transitions

SOURCE: Kristallografiya, v. 10, no. 3, 1965, 335-337

TOPIC TAGS: phase transition, Raman spectrum, Curie point, light scattering, crystal lattice vibration, quartz crystal, crystal symmetry, single crystal

ABSTRACT: Raman scattering spectra of monocrystals of triglycine sulfate are studied near the Curie temperature (+49°C); and those of Rochelle salt, near the upper Curie point (+24°C). According to the Ginsburg-Levanyuk theory, the spectral structure of the scattered light should change markedly near the phase transition points of the second kind. This change should be characterized by a decrease in the frequency of certain lattice vibrations when the temperature is raised. At the transition point of the second kind the frequency of these vibrations should become zero and the corresponding Raman lines intensify. Experiments with quartz appear to support the G-L theory.
Triglycine sulfate undergoes a change in symmetry upon passing through the Curie point. A right-angle prismatic monocrystal was illuminated along the Y and then along the Z axis, and the scattered light was observed along the Z axis in both cases. A line at 47 cm^{-1} appeared in the Raman spectra when the direction of

Card 1/2 UDC: 548.0: 537

L 21127-66

ACC NR: AP6011959

illumination is changed from the Y to the X direction. Features of the spectra are compared with published data in a table. In order to observe the expected increase in scattered light intensity the temperature of the sample was varied slowly through the phase transition, but no change was observed in the Raman spectra. Similar experiments were conducted with piezoelectric salt crystals with similar results. Orig. art. has: 2 tables. [JPRS]

SUB CODE: 20 / SUBM DATE: 08Jun64 / ORIG REF: 008 / OTH REF: 004

Card 2/2 dda

L 21222-66 EWT(m)/EWP(t) IJP(c) JD
ACC NR: AP6003812 SOURCE CODE: UR/0181/66/003/001/0272/0274

AUTHORS: Aref'yev, I. M.; Bazhulin, P. A. (deceased); Gavrilova, I. V.; Zheludev, I. S.

ORG: Physics Institute im. P. N. Lebedev AN SSSR, Moscow (Fizicheskiy institut AN SSSR)

TITLE: Temperature dependence of the intensity of light scattering in oriented single crystals of KH_2PO_4 and Rochelle salt

SOURCE: Fizika tverdogo tela, v. 8, no. 1, 1966, 272-274

TOPIC TAGS: ferroelectric crystal, phase transition, light scattering, temperature dependence, light polarization, elastic modulus, crystal lattice vibration, Curie point, paraelectricity, piezoelectric property

ABSTRACT: The purpose of the measurement of the temperature dependence was to check whether the ferroelectric phase transition in these crystals is connected with instability of the crystal against optical lattice vibrations. The experiment was made with a spectrometer

Card 1/3

(DFS-12) whose output was photoelectrically recorded. The illumina-
tor and the sample-cooling system are described elsewhere (A. V.
Rakov, Tr. FIAN v. 27, 111, 1964). The investigated crystals were
transparent with cross sections 7.5 x 7.5 mm and lengths 20, 23, and
49 mm. The Rochelle-salt crystals measured 7.5 x 7.5 x 30 mm. The
intensity of scattering was measured at the maximum of the Hg 4358 Å
line under smooth variation of the temperature. The results were
strongly dependent on the polarization, and in the case of one type
of polarization the intensity of the scattered light had a variation
similar to that of the reciprocal of the elastic constant. It is
concluded on this basis that the scattering is produced by anomalous
acoustic vibrations. In the case of Rochelle salt, the effect is
less pronounced in KH_2PO_4, and no increase in the scattering intensity
is observed at the second Curie point. This indicates that the
structure of the Rochelle salt crystal is different in the two para-
electric phases. No low-frequency Raman scattering spectrum was ob-
served, and it is therefore deduced that the increase in the scat-
tering intensity of the Curie point is connected with the anomalous
behavior of the acoustic lattice vibrations. It is concluded on the

L 21222-66
ACC NR: AP6003812

basis of these results and earlier data by the authors (PTT v. 7, 2413, 1965) that the ferroelectric phase transition in both salts is due to the instability of the crystal against the acoustic and optical vibrations of the lattice, which are interelated by the piezoeffect. The authors thank G. P. Motulevich and D. G. Sannikov for a useful discussion. Orig. art. has: 2 figures

SUB CODE: 20/ SUBM DATE: 02Aug65/ ORIG REF: 005/ OTH REF: 003

Card 3/3

L 36407-66 EWT(l)/EWT(m)/T/EWP(t)/ETI IJP(c)

ACC NR: AP6018770 SOURCE CODE: UR/0070/66/011/003/0415/0418

AUTHOR: Zheludev, I. S.; Gladkiy, V. V.

ORG: Institute of Crystallography, AN SSSR (Institut kristallografii AN SSSR)

TITLE: The pyroelectric effect in single crystals of Rochelle salt

SOURCE: Kristallografiya, v. 11, no. 3, 1966, 415-418

TOPIC TAGS: Rochelle salt, single crystal, pyroelectric effect, Curie temperature, elastic stress, polarization

ABSTRACT: Pyroelectric coefficients of Rochelle salt single crystals were measured between -30° and +30°C after polarization by mechanical straining. The pyroelectric charge was measured in a Tepler thermostat by the compensation method using slow heating rates. Temperatures were measured with Cu-constantan thermocouples to 1 or 2°C beyond the Curie point. The polarization P of the strained crystals was obtained from

$$P = P_{sp}\frac{S_1 - S_2}{S} + P'$$

where P_{sp} is the spontaneous polarization; P' is the elastic polarization; S_1, S_2 are cross-sectional areas of domains having unlike signs in the crystal face, perpendicu-

UDC: 548.0 : 537.227

Card 1/2

L 36407-66

ACC NR: AP6018770

lar to the X axis; $S_1 + S_2 = S$ (area of the sample). The variables P_{sp}, P', S_1 and S_2 depended on T and Y_z the polarizing stress. Pyroelectric coefficients (p), obtained from $p=dP/dT$, were given as a function of temperature T for values of Y_z ranging from 0 to 4100 g/cm^2. From -30° to 0°C p was positive, from 0° to 30°C--negative. Cusps occurred near the Curie temperatures (T_k= -18°C and +24°C), the exact position being dependent on Y_z. The magnitude of p was also dependent on Y_z, rising steadily to Y_z^0 which corresponded to a critical value of S_1-S_2, whereupon it decreased slightly. Close to the Curie points, p was maximum (300 CGSE units at -18°C and 340 CGSE units at +24°C) corresponding to the monodomain state in the salts, or equivalently $Y_z = Y_z^0$=2280 g/cm^2. Increasing Y_z to 4100 g/cm^2 lowered p insignificantly. Orig. art. has: 1 figure, 4 formulas.

SUB CODE: 20/ SUBM DATE: 04Jul65/ ORIG REF: 003/ OTH REF: 004

Potassium
27

Card 2/2 MLP

L 2417-66 EWT(m)/EWA(d)/T/EWP(t) IJP(c) JD

ACC NR: AP6010980 SOURCE CODE: UR/0056/66/050/003/0595/0604

AUTHORS: Yamzin, I. I.; Sizov, R. A.; Zheludev, I. S.; Perekalina, T. M.; Zalesskiy, A. V.

ORG: Institute of Crystallography, Academy of Sciences SSSR (Institut kristallografii Akademii nauk SSSR)

TITLE: Spin ordering and magnetocrystalline anisotropy in single crystals of $BaCo_xFe_{18-x}C_{27}$ ferrites

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 50, no. 3, 1966, 595-604

TOPIC TAGS: ferrite, single crystal, magnetic anisotropy, neutron diffraction, nuclear spin, Curie point, temperature dependence, spin wave theory

ABSTRACT: This is a continuation of earlier work by the authors (ZhETF v. 46, 1985, 1964). In this paper new data are presented on the magnetic anisotropy energy of the ferrite system under discussion. The crystals were grown by the Verneuil method and were the same as

Card 1/2

L 2[illegible]-66
ACC NR: AP6010980

used in the earlier investigation. In view of the fact that the ferrites investigated exhibit various types of magnetic anisotropy at low temperatures, the authors used a neutron diffraction method to investigate the influence of the cobalt ions on the positions of the spin ordering axis in these crystals in the temperature range from 77K to the Curie temperature. The temperature dependence of the magnetic anisotropy constants was investigated in the same range of temperatures and compared with the theory. The same samples were used to obtain neutron diffraction patterns as were used in the investigation of the magnetic anisotropy. The results show that the spin directions coincide with the directions of the total magnetization vectors of the crystals. The data also indicate that the experimental results can be fully reconciled with a theoretical formula deduced by Ye. A. Turov from the phenomenological theory of spin waves (Fizicheskiye svoystva magnitouporyadochennykh kristallov [Physical Properties of Mangetically Ordered Crystals], AN SSSR, 1963), without need to make allowance for any particular structure model. Orig. art. has: 7 figures, 3 formulas, and 3 tables.

SUB CODE: 20/ SUBM DATE: 25Oct65/ ORIG REF: 003/ OTH REF: 009

Card 2/2 UDC

L 24321-66 EWT(l)/EWT(m)/EWP(w)/EEC(k)-2/T/EWP(t IJP(c) JD
ACC NR: AP6007268 SOURCE CODE: UR/0053/66/088/002/0253/0286

AUTHOR: Zheludev, I. S.

ORG: Institute of Crystallography, AN SSSR (Institut kristallografii AN SSSR) 52

TITLE: Electro-optical phenomena in crystals E

SOURCE: Uspekhi fizicheskikh nauk, v. 88, no. 2, 1966, 253-286

TOPIC TAGS: electrooptical effect, refractive index, absorption coefficient, light absorption, electric field, crystal

ABSTRACT: This is a review article dealing with electro-optical effects, defined as the changes induced in the optical properties (refractive index and absorption coefficient) by application of an electric field. The different types of electro-optical effects are described (linear, quadratic, spontaneous), and the equations for these effects are derived in a matrix formulation for crystals of various symmetries (orthorhombic, monoclinic, triclinic, tetragonal, trigonal, and hexagonal). This is followed by a discussion of the optical systems used for the investigation of the electro-optical effect, and methods used to determine directly the electro-optical coefficients. Data are presented on the linear electro-optical effect in linear dielectrics and ferroelectrics, and on the quadratic electro-optical effect in crystals with central symmetry. Practical uses of the electro-optical properties of crystals for high-frequency light modulation and optical shutters, for sound recording, and for narrow-band interference-polarization light filters are discussed. Orig. art. has: 16 figures, 36 formulas, and 5 tables.

SUB CODE: 20/ ORIG REF: 011/ OTH REF: 057 UDC: 535.5

Card 1/1 VM

L 09461-67
ACC NR: AP6024666 SOURCE CODE: UR/0070/66/011/004/0604/0609

AUTHOR: Gorelik, V.S.; Zheludev, I. S.; Sushchinskiy, M. M. 51

ORIG: Physics Institute im. P. N. Lebedev AN SSSR (Fizicheskiy institut AN SSSR); Institute of Crystallography AN SSSR (Institut kristallografii AN SSSR)

TITLE: Study of the Raman spectrum of $NaNO_2$ single crystal near the phase transition point.

SOURCE: Kristallografiya, v. 11, no. 4, 1966, 604-609

TOPIC TAGS: sodium compound, Raman spectrum, phase transition, ferroelectricity, temperature dependence, line broadening, crystal lattice vibration

ABSTRACT: This is a continuation of an earlier study (Kristallografiya v. 10, no. 3, 335, 1965) and deals with the behavior of most lines of the Raman spectrum of single-crystal $NaNO_2$ in the temperature interval from 30 to 178C. Principal attention was paid to the small temperature range ($\pm$ 20°) near the phase transition point (160C). The single crystal was a rectangular prism 3 x 7 x 10 mm, cut so that its smallest side was oriented along the ferroelectric axis z. The Raman spectra were photographed with a spectrograph, using the 4358 Å mercury line for excitation.

Card 1/2 UDC: 548.0:535.36

L 09461-67
ACC NR: AP6024666

Seven lines were registered, whose frequencies agreed essentially with those published earlier. The Raman spectrum obtained near the transition point differed noticeably from that obtained at 30C. The low-frequency lines shifted in linear fashion, while the higher frequency lines exhibited practically no shift. All observed lines broadened with increasing temperature, but the broadening of the low-frequency lines was larger. Some of the lines vanished with increasing temperature. A group-theoretical analysis of the spectrum for both the high and the low frequency parts of the spectrum is used to interpret the results. The vanishing and the intensity variations of the spectra agree with the selection rules, and the broadening is due to ordinary temperature effects connected with the increase of the interaction between the lattice oscillators themselves and the interaction between the lattice oscillators and other degrees of freedom of the crystal. The authors thank Professor P. A. Bazhulin for interest in the work and also V. I. Mursin for valuable advice. Orig. art. has: 4 figures, 1 formula, and 2 tables.

SUB CODE: 20/ SUBM DATE: 03AUG65 ORIG REF: 012/ OTH REF: 005

Card 2/2

L 38900-66 EWT(1)

ACC NR: AP6029724 SOURCE CODE: UR/0109/66/011/005/0966/0967

AUTHOR: Zernov, D. V.; Timofeyev, P. V.; Fursov, V. S.; Migulin, V. V.; Spivak, G. V.; Spasskiy, B. I.; Nilender, R. A.; Grozdover, S. D.; Shemayev, A. M.; Solntsev, G. S.; Kuzovnikov, A. A.; Zaytsev, A. A.; Vasil'yeva, M. Ya.; Mitsuk, V. Ye.; Dubinina, Ye. M.; Zheludeva, G. A.

ORG: none

TITLE: Nikolay Aleksandrovich Kaptsov

SOURCE: Radiotekhnika i elektronika, v. 11, no. 5, 1966, 966-967

TOPIC TAGS: electric engineering personnel, magnetron, klystron, corona discharge, gas conduction, gas discharge plasma

ABSTRACT: N. A. Kaptsov passed away 10 February 1966. He was a student of the famous P. N. Lebedev, and performed many fundamental investigations in the development of modern electronics. He was the creator and leader of the chair of electronics of Moscow State University. He developed the concept of phase grouping of electrons. His ideas are the basis for the development of the magnetron and klystron. He developed the concept explaining the phenomenon of corona discharge. He also developed ideas connected with formation of gas conduction and phenomena in a gaseous-discharge plasma. Kaptsov served for years as the head of the physical laboratory and consultant to the Moscow Electron Tube Plant. He was the author of numerous books, including "Physical Phenomena in Vacuum and in Gases, which was translated into foreign languages; he also created and taught numerous electronics courses. [JPRS: 36,501]

SUB CODE: 05, 09 / SUBM DATE: none

Card 1/1 mlp

0212 0203

L 09462-67 EWT(1)/EWT(m)/EWP(t)/ETI IJP(c) JD/GG
ACC NR: AP6024667 SOURCE CODE: UR/0070/66/011/004/0610/0613

AUTHOR: Zheludov, I. S.; Romanyuk, N. A.

ORIG: L'vov State University (L'vovskiy gosudarstvennyy universitet); Institute of Crystallography AN SSSR (Institut kristallografii AN SSSR)

TITLE: Dielectric properties of clamped Rochelle-salt crystals

SOURCE: Kristallografiya, v. 11, no. 4, 1966, 610-613

TOPIC TAGS: ferroelectric crystal, piezoelectric crystal, electric hysteresis, dielectric constant, pressure effect, Curie point, electric polarization

ABSTRACT: The authors report an investigation of the domain structure, the hysteresis loop, and the initial dielectric constant of Rochelle-salt crystals in the region of the upper Curie temperature for different degrees of compression of the samples. The tests were made on square polished plates with 45° X-cut, measuring 10 x 10 x (0.4 -- 0.7) mm. The samples were measured on a microscope stage in a thermostat equipped with a device for simultaneous or successive compression of the crystals in two mutually perpendicular directions. This apparatus was described in an earlier paper (Kristallografiya v. 4, no. 5, 710 -- 717, 1959). The

Card 1/2 UDC: 548.0:537.226

L 09462-67
ACC NR: AP6024667

dielectric constant was measured with a bridge and a hysteresis loop was by means of a Sawyer-Tower circuit. The domain structure was observed visually and photographed when necessary. The results showed that the dielectric constant decreased with increasing compression, the upper Curie point increased in the case of unilateral compression and decreased in the case of bilateral compression, and the hysteresis loops gradually contracted to lines with increasing compression. The results agree with modern theoretical notions concerning the laws governing polarization of ferroelectrics and explain the radiative changes occurring in the dielectric properties of ferroelectric materials. The results also serve as a confirmation of the frequently used "internal field" model for the explanation of the polarization of the ferroelectric. Orig. art. has: 3 figures.

SUB CODE: 20/ SUBM DATE: 15Jul65/ ORIG REF: 003/ OTH REF: 006

Card 2/2 LC

L 09461-67
ACC NR: AP6024656 SOURCE CODE: UR/0070/66/011/004/0604/0609

AUTHOR: Gorelik, V.S.; Zholudev, I. S.; Sushchinskiy, M. M. 51 B

ORIG: Physics Institute im. P. N. Lebedev AN SSSR (Fizicheskiy institut AN SSSR); Institute of Crystallography AN SSSR (Institut kristallografii AN SSSR)

TITLE: Study of the Raman spectrum of $NaNO_2$ single crystal near the phase transition point.

SOURCE: Kristallografiya, v. 11, no. 4, 1966, 604-609

TOPIC TAGS: sodium compound, Raman spectrum, phase transition, ferroelectricity, temperature dependence, line broadening, crystal lattice vibration

ABSTRACT: This is a continuation of an earlier study (Kristallografiya v. 10, no. 3, 335, 1965) and deals with the behavior of most lines of the Raman spectrum of single-crystal $NaNO_2$ in the temperature interval from 30 to 178C. Principal attention was paid to the small temperature range ($\pm$ 20°) near the phase transition point (160C). The single crystal was a rectangular prism 3 x 7 x 10 mm, cut so that its smallest side was oriented along the ferroelectric axis z. The Raman spectra were photographed with a spectrograph, using the 4358 Å mercury line for excitation.

Card 1/2 UDC: 548.0:535.36

L 09461-67
ACC NR: AP6024666

Seven lines were registered, whose frequencies agreed essentially with those published earlier. The Raman spectrum obtained near the transition point differed noticeably from that obtained at 30C. The low-frequency lines shifted in linear fashion, while the higher frequency lines exhibited practically no shift. All observed lines broadened with increasing temperature, but the broadening of the low-frequency lines was larger. Some of the lines vanished with increasing temperature. A group-theoretical analysis of the spectrum for both the high and the low frequency parts of the spectrum is used to interpret the results. The vanishing and the intensity variations of the spectra agree with the selection rules, and the broadening is due to ordinary temperature effects connected with the increase of the interaction between the lattice oscillators themselves and the interaction between the lattice oscillators and other degrees of freedom of the crystal. The authors thank Professor P. A. Bazhulin for interest in the work and also V. I. Murzin for valuable advice. Orig. art. has: 4 figures, 1 formula, and 2 tables.

SUB CODE: 20/ SUBM DATE: 03AUG65 ORIG REF: 012/ OTH REF: 005

Card 2/2 JC

ZHELUDEV, I.S.

Electro-optical effects in crystals. Usp. fiz. nauk 88 no.2: 253-286 F '66. (MIRA 19:2)

1. Institut kristallografii AN SSSR.

ARBATSKAYA, A.N.; ZHELUDEV, I.S.; ZIRNIT, U.A.; SUSHCHINSKIY, M.M.

Low-frequency vibrational spectra of single crystals of triglycine sulfate and Rochelle salt in phase transitions. Kristallografiia 10 no.3:335-337 My-Je '65. (MIRA 18:7)

1. Institut kristallografii AN SSSR.

ZAYTSEVA, M.P.; ZHELUDEV, I.S.; ZHEREBTSOVA, L.I.; POTCHENKOV, A.A.

Intensity of an electric field required to bring about polarization equal to spontaneous polarization. Izv. AN SSSR. Ser. fiz. 29 no.6:948-950 Je '65. (MIRA 18:6)

1. Institut fiziki Sibirskogo otdeleniya AN SSSR i Institut kristallografii AN SSSR.

L 7981-66 EWT(d)/EWT(l)/EEC(k)-2

ACC NR: AP5028512

AUTHORS: Vlokh, O. G.; Zheludev, I. S.; Shamburov, V. A.

ORG: none

TITLE: Electrooptical modulator. Class 42, No. 175272

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 19, 1965, 85

TOPIC TAGS: electrooptic effect, electric field

ABSTRACT: This Author Certificate describes an electrooptical modulator consisting of crossed polarizers between which is situated a crystal in an electric field. The direction of the electric field is parallel to the direction of light and the axis of symmetry. To eliminate the treatment of the crystal surface and the influence of temperature and moisture of the surrounding medium on its performance and also to eliminate turning the optical axis through an angle of 22.5° under nonresonance condition, use is made of a pentaerythritol crystal.

SUB CODE: OP/ SUBM DATE: 26Jan63

Card 1/1 UDC: 621.376.9

AREF'YEV, I.M.; BAZHULIN, P.A.; ZHELUDEV, I.S.

Long-wave infrared transmission spectra of $NH_4H_2PO_4$. Fiz. tver. tela 7 no.9:2834-2836 S '65. (MIRA 18:10)

1. Fizicheskiy institut imeni P.N.Lebedeva AN SSSR, Moskva.

ZHELUDEV, N.A., kandidat tekhnicheskikh nauk.

Computation of hydrometric air-vanes. Sbor.trud.Len.Gidrometeorol.inst. no.2:71-92 '50. (MLRA 6:8)
(Hydrometer)

ZHELUDEV, N.A., kandidat tekhnicheskikh nauk.

Computation of corrections for the calculations of natural pitching and rolling of ships at anchor. Sbor.trud.Len.Gidrometeorol.inst. no.2:93-120 '50. (MLRA 6:8)

(Anchorage) (Stability of ships)

ZHELUDEV, N.A.

"Determination of the Equilibrium Form of a Cable Loaded with n loads"
Sb. Tr. Leningr. Gidrometeorol. In-ta, No. 3, 1954, 125-147

The author carries out the theoretical determination of the equilibrium form of a cable attached at one end with loads suspended alon; its length. The cable is in a steady state horizontal homogenous flow. The Equilibrium equations are integrated under various assumptions. The author derives formulas for the approximate determination of the tensile strength and equilibruim form of the cable. (RZhMekh, no. 9, 1955)

AUTHOR: Zheludev, P. I. (Moscow) SOV/179-59-3-38/45

TITLE: On the Supersonic Flow Past a Flat Quasi-triangular Short Wing (K sverkhzvukovomu obtekaniyu ploskikh kvazitreugol'nykh kryl'yev malogo udlineniya)

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Mekhanika i mashinostroyeniye, 1959, Nr 3, pp 202-203 (USSR)

ABSTRACT: The work is based on Zheludev's work (Ref 1) describing a method of determining the velocity potential in supersonic flow past thin bodies. The complex potential, Eq (1), is taken from Ref 2, where 2a(x) - wing span (- and + = upper and lower half-planes respectively). The limiting conditions for the velocity potential is given as Eq (2), the partial solution of which is defined as Eqs (3) and (4) and their harmonic functions as Eqs (5) and (6). The latter can be expressed in the form of the series (7) and (8). The coefficient of pressure for the triangular wing, c_p, can be shown as Eq (9) for $a(x) = x/tg\,\chi$, where χ - the wing's angle, z - coordinates of the span. This coefficient

Card 1/2

On the Supersonic Flow Past a Flat Quasi-triangular Short Wing

is given as Eq (10) in Ref 1, where $z \neq a(x)$.
There are 2 references, 1 of which is Soviet and 1 English.

SUBMITTED: December 10, 1958

Card 2/2

AUTHOR: Zheludev, P. I. (Moscow)

ORG: none

TITLE: Aerodynamic characteristics of a thin finned body

SOURCE: AN SSSR. Izvestiya. Mekhanika, no. 6, 1965, 122-123

TOPIC TAGS: aerodynamics, aerodynamic characteristic, aerodynamic coefficient, complex function

ABSTRACT: The aerodynamic moments and coefficients are calculated for a cross-finned body at angle of attack and side-slip in supersonic flow (see Fig. 1).

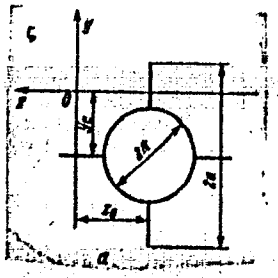


Fig. 1.

Card 1/2

ACC NR: AP6002327

A potential flow analysis is used with the flow potential defined by

$$w(\zeta)=\frac{1}{2\pi}\frac{dS}{dx}\ln(\zeta-\zeta_0)+\bar{\alpha}\left[\left(\zeta-\zeta_0-\frac{R^2}{\zeta-\zeta_0}\right)^2+\left(a+\frac{R^2}{a}\right)^2\right]^{1/2}+$$

$$+i\beta\left[\left(\zeta-\zeta_0-\frac{R^2}{\zeta-\zeta_0}\right)^2-\left(a-\frac{R^2}{a}\right)^2\right]^{1/2}-(\alpha+i\beta)(\zeta-\zeta_0)+b(x).$$

This potential is then expanded in inverse powers of ζ and the following forces and moments are calculated: the side and lift forces Z, Y, the three moments M_x, M_y, M_z, and the corresponding coefficients, e.g.,

$$C_y=\frac{2\pi(b^4+R_1^4-R_1^2b^2)}{R_1^2b^2},\qquad C_z=\frac{2\pi(b^4+R_1^4+R_1^2b^2)}{R_1^2b^2}$$

$$C_{mx}=-4\alpha\beta\left[1-\frac{1}{R_1^2}\int_0^1 R^2(x)\,dx\right].$$

Orig. art. has: 8 equations and 2 figures.

SUB CODE: 20/ SUBM DATE: 10Jul64/ OTH REF: 002

Card 2/2 Fw

ZHELUDEV, P.I. (Moskva)

Unsteady supersonic flow about bodies of revolution and their bending flutter. Izv.AN SSSR. Mekh.i mashinostr. no.1:158-162 Ja-F '64. (MIRA 17:4)

ACCESSION NR: AP4018437 S/0179/64/000/001/0158/0162

AUTHOR: Zheludev, P. I. (Moscow)

TITLE: Unsteady flow past and flexing flutter of solids of revolution in a supersonic stream

SOURCE: AN SSSR. Izv. Otd. tekh. nauk. Mekhanika i mashinostroyeniye, no. 1, 1964, 158-162

TOPIC TAGS: fluid dynamics, fluid mechanics, aerodynamics, unsteady flow, flutter, flexure

ABSTRACT: In the statement of the theory of a thin body (See Ward, G. N., Supersonic Flow Past Slender Pointed Bodies, Quart. G. Mech. Appl. Math., 1949, vol. 2, No. 75) there is an examination of supersonic flow past solids of revolution which describe harmonic elastic oscillations and expressions are found for the velocity potential, pressure coefficient and the transverse force distributed along the length of the solid. In this article there is a further examination of the elastic flexing oscillations of solids of revolution such as beams of variable cross section with free boundaries and beams with one tightly closed end. The aerodynamic force is given from an earlier determined expression for the transverse force of the

Card 1/2

ACCESSION NR: AP4018437

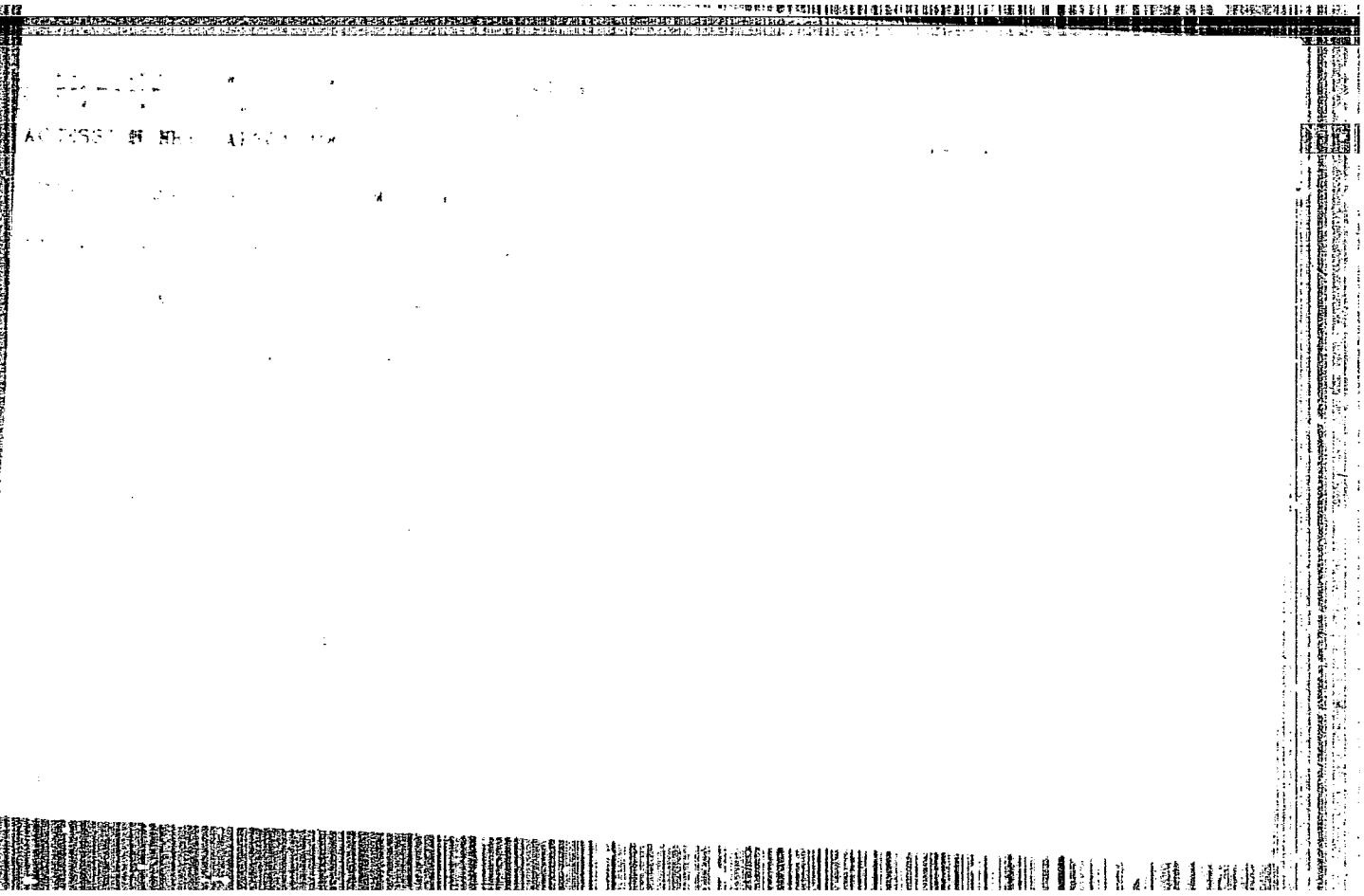
unsteady flow past the beam. The differential equation for the oscillations is solved by the Bubnov-Galerkin method. An expression is obtained for calculation of the natural oscillations and examples are given of calculation of the speed of flutter for a thin-walled conical beam. Orig. art. has: 2 figures, 22 formulas.

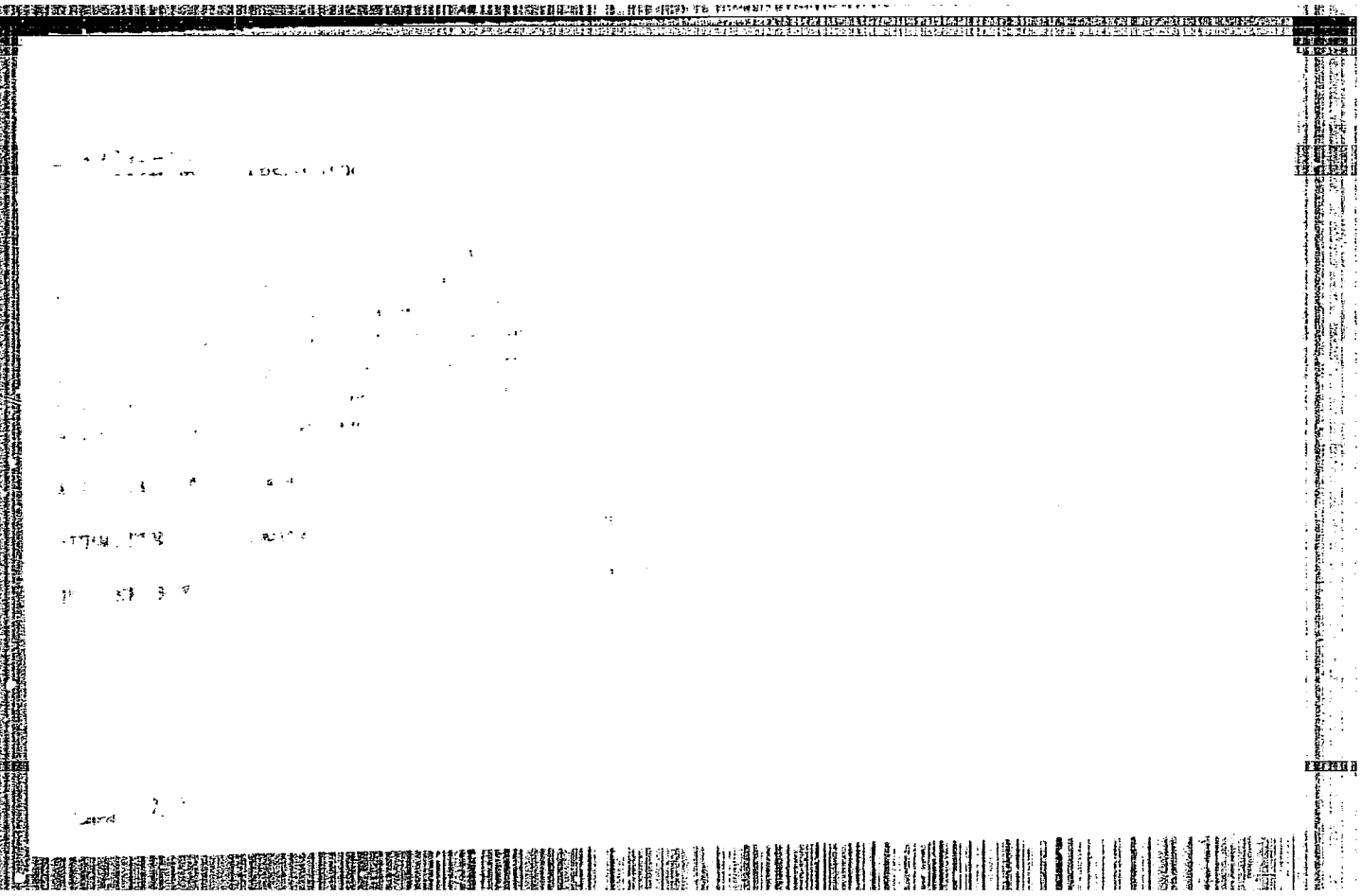
ASSOCIATION: none

SUBMITTED: 22Jul63 DATE ACQ: 23Mar64 ENCL: 00

SUB CODE: AI NO REF SOV: 003 OTHER: 002

Card 2/2





APPROVED FOR RELEASE: 03/15/2001 CIA-RDP86-00513R002064710012-8"

ZHELUDEV, P. I., Candidate Tech Sci (diss) -- "Supersonic flow around certain thin bodies". Moscow, 1959. 5 pp (Acad Sci USSR, Dept of Tech Sci, Inst of Mech), 130 copies (KL, No 26, 1959, 125)

67599

10.6000 SOV/179-59-5-20/41

AUTHOR: Zheludev, P. I. (Moscow)

TITLE: On Supersonic Flow Past a Cylindrical Slender Body of Revolution

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Mekhanika i mashinostroyeniye, 1959, Nr 5, pp 118-121 (USSR)

ABSTRACT: The flow past a thin pointed body of revolution with thin wings of small aspect ratio is considered. The equation of motion is given as Eq (1.1) for the limiting conditions of the potential velocity $\varphi = \varphi_0 + \varphi_2$ defined as Eq (1.2). After substituting the derivates of $\varphi_0 = \frac{1}{2}(w + \bar{w})$ in the right term of Eq (1.1), the Poisson equation can be obtained, the solution of which can be shown as Eq (1.3). The potential velocity with the first approximation can be shown as Eq (1.5), where $2a(\chi)$ - span of wing, α - angle between the axis of the body and an undisturbed flow, R = const - radius of the body. The limiting conditions for φ_2 can be derived from Eq (1.2) and presented as Eq (1.6,a) for the surface of the body, and as Eq (1.6b) for the surface of the wing. An effect of the term $M_\infty^2 - 1)\partial^2\varphi/\partial\chi^2$ in Eq (1.1) can be

Card 1/2

On Supersonic Flow Past a Cylindrical Slender Body of Revolution

67599
SOV/179-59-5-20/41

derived from Eq (2.1) which is obtained from Eq (1.3). Since Eq (1.1) cannot be described by the conditions, Eq (1.6), the limiting conditions are given as Eqs (2.2) and (2.3), which can be written as Eq (2.4) for the function φ_2^*. The solution of the latter in respect to the upper and lower half-planes are given by Eqs (2.5) and (2.6), respectively. An effect of the component in the second bracket of the righthand part of Eq (1.1) can be found from Eqs (3.1) and (3.2). An effect of the component in the third bracket of Eq (1.1) can be obtained from Eqs (4.1) and (4.2). The sum of the latter two equations gives the potential velocity with the second approximation. The formulae (3.2) and (4.2) can be represented as series, the coefficients of which can be derived from the limiting conditions in the form of Eq (1.4) as shown at the bottom of p 121.

There are 3 references, 1 of which is Soviet and 2 English.

SUBMITTED: December 10, 1958

Card 2/2

4

AUTHOR: Zheludev, P.I. (Moscow) SOV/24-58-9-10/31

TITLE: The Supersonic Flow Round Slender Bodies of Rotation With and Without Tail Units (Sverkhzvukovoye obtekaniye operennykh i neoperennykh tonkikh tel vrashcheniya)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, 1958, Nr 9, pp 74 - 82 (USSR)

ABSTRACT: The bodies are assumed to have an angle of attack α and to have their tail units inclined at an angle β to the vertical. A solution for the second approximation in slender body theory (Ref 1) is constructed. The frame of reference is chosen with the y axis vertically upwards and the velocity in the direction of increasing x. Forces on bodies of revolution having 2, 3 or 4 plane wings of small thickness with their trailing edges in the plane $x = 1$ are given. The solution from which these are derived is regarded as the first approximation and it is shown that the problem of finding the second approximation can be reduced to that of finding harmonic functions (as in the case of the first approximation). Hence, it is possible to solve the problem of finding the velocity potential of the second approximation for bodies of arbitrary transverse and longitudinal cross-

sections satisfying conditions imposed on the maximum thickness and angle which any tangent plane to the surface of the body makes with the direction of the undisturbed flow. These quantities must be of the order of the maximum thickness of the body which in its turn must be very much less than the length of the body. In addition, the radius of curvature of an arbitrary transverse section must be of the order of d^{-1}, where d is the maximum thickness of the section. This condition is imposed on convex sections but not on concave ones. As an example, a circular cone of apex angle $2\beta_1$ is considered. The expression for the pressure coefficient at zero angle of attack coincides with that obtained by Broderick (Ref 2) with the exception that a term of the form:

$$[(\varkappa + 1)/(M_\infty^2 - 1)] M_\infty^4$$

does not appear. This term can be introduced into the expression by using results of Van Dayk (Van Dyke) who

The Supersonic Flow Round Slender Bodies of Rotation With and Without Tail Units

considered the case of an elliptic cone at zero angle of attack. The results for the revised formula are given graphically in which they are compared with the results of exact theory and the first approximation. The comparison shows that for sufficiently slender cones the second approximation gives better results than the first approximation. A similar graphical comparison is made where the abscissa is an angular co-ordinate in the plane x = constant rather than the Mach number. The second approximation again gives good results and the overall conclusion is that for $\beta_1 < 15^0$ a better agreement with experiment can be expected from the second approximation. There are 6 figures and 6 English references.

SUBMITTED: February 7, 1958

Card 3/3

ZHELUDEV, P.I. (Moskva)

Theory of a slender body. Izv.AN SSSR.Otd.tekh.nauk.Mekh.i mashinostr. no.6:172-174 N-D '61. (MIRA 14:11)
(Aerodynamics, Supersonic)

L 44441-66 EWT(1)/EWP(m) WW

ACC NR: AP6024194 SOURCE CODE: UR/0424/66/000/002/0160/0165

AUTHOR: Zheludev, P. I. (Moscow)

58

B

ORG: none

TITLE: Bending flutter of rotating elongating bodies

SOURCE: Inzhenernyy zhurnal. Mekhanika tverdogo tela, no. 2, 1966, 160-165

TOPIC TAGS: elasticity theory, supersonic flow, unsteady flow, aeroelasticity, vibration

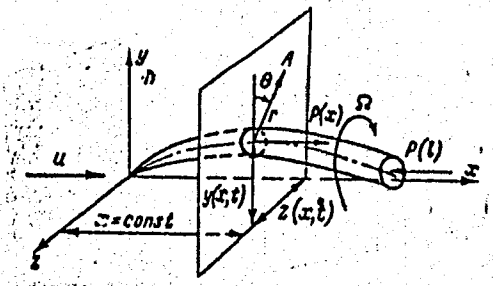
ABSTRACT: An analysis is made to determine the effect of longitudinal acceleration and spinning motion on the elastic bending vibrations of an elongating body in a low supersonic flow. As shown in Fig. 1, small unsteady motions $y(x,t)$ and $z(x,t)$ are added to the variable longitudinal motion U and the body is assumed to be an elastic beam of variable cross section. The governing equations of motion are given by

$$\frac{\partial^2}{\partial x^2}\left[EI(x)\frac{\partial^2 y}{\partial x^2}\right]+\frac{\partial}{\partial x}\left[P(x)\frac{\partial y}{\partial x}\right]+\rho S(x)\frac{\partial^2 y}{\partial t^2}-\frac{\partial}{\partial x}\left[\rho I(x)\frac{\partial^3 y}{\partial x\,\partial t^2}\right]-$$
$$-\Omega^2 l\frac{\partial^2}{\partial x^2}\left[\rho I(x)\frac{\partial y}{\partial x}\right]-2\Omega\rho S(x)\frac{\partial z}{\partial t}=Y(x,t)$$
$$\frac{\partial^2}{\partial x^2}\left[EI(x)\frac{\partial^2 z}{\partial x^2}\right]+\frac{\partial}{\partial x}\left[P(x)\frac{\partial z}{\partial x}\right]+\rho S(x)\frac{\partial^2 z}{\partial t^2}-\frac{\partial}{\partial x}\left[\rho I(x)\frac{\partial^3 z}{\partial x\,\partial t^2}\right]-$$
$$-\Omega^2 l\frac{\partial^2}{\partial x^2}\left[\rho I(x)\frac{\partial z}{\partial x}\right]+2\Omega\rho S(x)\frac{\partial y}{\partial t}=Z(x,t)$$

Card 1/2

ACC NR: AP6024194

Fig. 1.



where the aerodynamic forces Y and Z are determined from the slender body theory with terms added to account for flow circulation. The solution is obtained in an approximate manner using the Bubnov-Galerkin method. The critical flutter speed is calculated for the first vibration mode of the beam, and for a finite angular speed Ω it is expressed by

$$U_* = \left(\frac{E\alpha\delta_1}{\rho_0}\frac{1}{k_2c_{22}^{(2)}+2d_{22}^{(1)}}\right)^{1/2}\left\{\frac{\rho l^2\Omega^2}{k_2 E}\left\{\left[\frac{2a_{22}^{(1)}}{\alpha^2}-k_2\left(k_2c_{22}^{(2)}+3d_{22}^{(2)}\right)+\frac{a_{22}^{(2)}}{\alpha\delta_1}\frac{\rho_0}{\rho}\right]\times\right.\right.$$
$$\times\left(\frac{k_2d_{22}^{(2)}}{k_2d_{22}^{(2)}+a_{22}^{(1)}}\right)^2+\frac{2}{\alpha}\left(\frac{2a_{22}^{(1)}}{\alpha}-\frac{a_{22}^{(2)}}{\delta_1}\frac{\rho_0}{\rho}\right)\frac{k_2d_{22}^{(2)}}{k_2d_{22}^{(2)}+a_{22}^{(1)}}-$$
$$\left.\left.-k_2\left[k_2\left(k_2b_{22}^{(2)}+6c_{22}^{(2)}\right)+6d_{22}^{(1)}\right]\right\}-k_2\left[k_2\left(k_2a_{22}^{(2)}+6b_{22}^{(2)}\right)+6c_{22}^{(1)}\right]\right\}^{1/2}.$$

Orig. art. has: 23 equations and 1 figure.

SUB CODE: 20/ SUBM DATE: 15Nov65/ ORIG REF: 002/ OTH REF: 002

Card 2/2

FILIPENKO, A.N. (st.Torzhok, Oktyabr'skoy dorogi); ZHELUDEV, R.I. (st.Torzhok, Oktyabr'skoy dorogi)

Chemical weed control on the track. Put' i put.khoz. 6 no.6:25-26 '62. (MIRA 15:7)

(Railroads--Maintenance and repair) (Herbicides)

KOLESOV, A.P., prof.; ZHELUDEV, S.I.; DAVIDENKO, V.A.

Mediastinal and mediastinal-pulmonary form of sarcoidosis in the surgical clinic. Khirurgiia 40 no.1:11-16 Ja '64.

(MIRA 17:11)

1. Khirurgicheskaya klinika dlya usovershenstvovaniya vrachey No.1 Voyenno-meditsinskoy ordena Lenina akademii imeni Kirova.

ZHELUDEVA, G. A.

AUTHOR: Zheludeva, G.A. 109-3-10/23

TITLE: Work Function of the Antimony-caesium Cathode (O rabote vykhoda sur'myano-tseziyevogo katoda)

PERIODICAL: Radiotekhnika i Elektronika, 1958, Vol.III, No.3, pp. 395 - 399 (USSR).

ABSTRACT: The investigation reported was primarily concerned with the determination of the photo-electric work function of the Sb-Cs cathode as a function of the wavelength of the illuminating source. The magnitude of the work function was evaluated from the Einstein equation and attention was focused on the magnitude of the relative value of the work function rather than its absolute value. The investigation was done by the spherical-condenser method and two types of photo-cathodes were prepared. One of the photo-cathodes was a cylinder having 1 cm dia. and a length of 1 cm, while the second cathode was in the form of a glass sphere of 1 cm diameter. The cathodes had the usual "dark cherry" colour if deposited on glass and a grey-green colour if deposited on nickel. The collectors of the spherical condenser were in the form of spherical bulbs, having a diameter of 12 or 15 cm and were coated with a layer of aluminium plus a thin layer of soot (to eliminate the reverse currents). The photo currents were measured by the potentiometer

Card1/3

method by using an electrometer, so that a sensitivity of 10^{-13} A could be obtained. A quartz monochromator was used as a source of spectral lines. Current voltage curves were taken for the following wavelengths: 5791, 5461, 4047, 3651, 3130, 2804, 2482, 2200 Å; the curves are shown in the figure on p. 397. The work function can be determined from these curves by finding their intersection points with the horizontal (voltage) axis. It was found that the work functions of both the cathodes are independent of the illuminating wavelength for the range 5791 to 4047 Å. In the range 3130 to 2200 Å, the work function is also constant, but its value is somewhat lower than that for the range of the longer waves. An attempt was also made to determine the "red boundary" of the photo effect and it was found that the Fowler method could not be used for this purpose. The author expresses gratitude to Professor N.A. Kaptsov for directing this work. There are 1 figure, 1 table and 10 references, 6 of which are Russian and 4 English.

ASSOCIATION: Chair of Electronics of Moscow State University imeni M.V. Lomonosov (Kafedra elektroniki Moskovskogo universiteta im. M.V. Lomonosova)

Work Function of the Antimony-caesium Cathode 109-3-10/23

SUBMITTED: December 19, 1956

AVAILABLE: Library of Congress

Card 3/3

ZHELUDEVA, G.A.

AUTHORS: Zheludeva, G.A. and Akhmatova, N.A. 109-3-11/23

TITLE: Energy Distribution of the Photo-electrons in the Antimony-caesium Cathode during Various Stages of its Formation (Raspredeleniye fotoelektronov po energiyam dlya sur'myano-tseziyevogo katoda na raznykh stadiyakh yego formirovaniya)

PERIODICAL: Radiotekhnika i Elektronika, 1958, Vol.III, No.3, pp. 400 - 404 (USSR).

ABSTRACT: The investigation of the energy distribution of the photo-electrons was done by the spherical-condenser method. The investigated cathodes were prepared as follows: a layer of Sb was deposited by evaporation on to a glass sphere. The layer had a thickness of 1 500 Å and was not transparent. The activation process followed the standard technique, i.e. the Sb layer was treated by Cs vapours at a temperature of 180 °C. Three types of the activated film were prepared. The first stage was characterised by a straw-yellow colouring of the emissive surface; the sensitivity of the surface was 0.1 that of the normal Sb-Cs cathode. The second film, corresponding to the second activation stage, had a light-red colouring and its sensitivity was 0.6 that of the standard cathode. Finally, the third cathode had a cherry-red colouring and the standard

Card1/3

Energy Distribution of the Photo-electrons in the Antimony-caesium Cathode during Various Stages of its Formation

sensitivity (its sensitivity was taken as unity). Current voltage curves of the three cathodes were taken at the following wavelengths: 5 461, 4 047, 2 805, 2 482 and 2 300 Å. The resulting curves are shown in Figs. 1a, 6 and b. The curves were used to evaluate the work functions of the cathode by employing the Einstein equation and it was found that these were 1.78 ± 0.05, 1.56 ± 0.05 and 1.51 ± 0.05 eV for the first, second and third activation stages, respectively. These values are valid for the wavelength of 2 805 Å. By differentiating the current voltage curves of Fig. 1, it was possible to obtain the curves of the photo-electron energy distribution; these are shown in Figs. 2a, 6 and b; curves of Fig. 2a correspond to the wavelength of 4 047 Å, those of Fig. 26 are for the wavelength of 2 805 Å, while Fig. 2b corresponds to the wavelength of 2 300 Å. The authors thank Professor N.A. Kaptsov for directing this work. There are 2 figures and 4 references, 2 of which are Russian and 2 English.

ASSOCIATION: Chair of Electronics of the Physics Faculty of the Moscow State University im. M.V. Lomonosov (Kafedra elektroniki fizicheskogo fakul'teta

109-3-11/23

Energy Distribution of the Photo-electrons in the Antimony-caesium Cathode during Various Stages of its Formation

Moskovskogo gosudarstvennogo universiteta im. M.V. Lomonosova)

SUBMITTED: January 19, 1957

AVAILABLE: Library of Congress

Card3/3

26.1632 3202
9,4160 (1137,1331)

83929
S/188/60/000/004/003/014
B005/B060

AUTHORS: Zheludeva, G. A., Lyuy Bin-i

TITLE: Energy Distribution of Photoelectrons of an Antimony - Cesium Cathode During Its Treatment With Oxygen

PERIODICAL: Vestnik Moskovskogo universiteta. Seriya 3, fizika, astronomiya, 1960, No. 4, pp. 26-31

TEXT: The authors of the present paper studied the energy distribution of photoelectrons of an antimony - cesium cathode under three different conditions: prior to sensitization with oxygen, after sensitization up to the peak value of the photocurrent, and after poisoning of the cathode by excess oxygen. This poisoning was carried on until the sensitivity of the cathode became equal to, or a little lower than, that before sensitization. The method of the retarding field in a spherical condenser was used to draw the energy distribution curves of the photoelectrons and to measure the contact potential difference between cathode and anode. The experimental arrangement is described. Fig. 1 has

Card 1/3

83929

Energy Distribution of Photoelectrons of an Antimony - Cesium Cathode During Its Treatment With Oxygen

S/188/60/000/004/003/014
B005/B060

three diagrams showing the retardation curves of the antimony - cesium cathode under the three above conditions for the following wavelengths of light: 5461 A, 3130 A, 2804 A, 2482 A. The analysis of these curves yielded the following results: When sensitizing the cathode with oxygen up to a peak value of the photocurrent, the value of the saturation potential rises by 0.6 ± 0.1 v. Investigations revealed that this growth is mainly brought about by a decrease in the thermionic work function of the cathode on a treatment with oxygen. This decrease is about 0.4 ev. On a further treatment of the cathode with oxygen (poisoning), the saturation potential does not change until the sensitivity of the cathode has dropped to the pre-sensitization value. The saturation potential rises little with further poisoning. The mentioned decrease in the thermionic work function of the cathode on sensitization is a consequence of a reduced potential threshold, and fits the change in the threshold frequency of the photoeffect. Fig. 2 shows the spectral characteristics of the antimony - cesium cathode prior to and after sensitization in a (log I, hν) diagram (I = photocurrent; hν = energy in

Card 2/3

83929

Energy Distribution of Photoelectrons of an Antimony - Cesium Cathode During Its Treatment With Oxygen

S/188/60/000/004/003/014
B005/B060

ev). By graphically differentiating the curves shown in Fig. 1, the authors obtained the corresponding curves for the energy distribution of the photoelectrons of the antimony - cesium cathode under the three conditions investigated. Fig. 3 shows these curves for the wavelength 2804 A. It may be seen that the changes in the energy distribution curves of the photoelectrons due to cathode sensitization can be solely explained by a decrease in the work function of the cathode. The energy structure of the cathode need not necessarily change in this connection. It is only on the poisoning of the cathode with excess oxygen and when the cathode loses its sensitivity, that the character of the energy spectrum of the electrons, and thus also the energy structure of the cathode, undergo a change. There are 3 figures and 5 Soviet references.

ASSOCIATION: Moskovskiy universitet Kafedra elektroniki (Moscow University, Chair of Electronics)

SUBMITTED: November 27, 1959

Card 3/3

40405

S/109/62/007/009/015/018
D409/D301

9.4175

AUTHOR: Zheludeva, G.A.

TITLE: Influence of fatigue of Sb-Cs cathode on the energy distribution of photoelectrons

PERIODICAL: Radiotekhnika i elektronika, v. 7, no. 9, 1962, 1637 - 1642

TEXT: The author studied the influence of cathode fatigue on the energy distribution of photoelectrons by the method of delay curves. The experimental apparatus was similar to that described by the author in an earlier work. The cathodes were prepared on various bases (electrolytically-pure nickel, quartz, molybdenum-glass). The delay curves were plotted at 3 different moments of time: Immediately after the preparation of the experimental tube, one month later, and after 10 months. The study of cathode fatigue started 3-4 weeks after the preparation of the experimental tubes, i.e. after the properties of the cathode were fully stabilized. The fatigue resulted from continuous illumination of the cathode. The measurements of the cathode characteristics were conducted before and

Card 1/2

after the fatigue process. The results of the measurements of all the investigated cathodes are similar; the integral sensitivity of the cathodes with nickel base was reduced to half its value as a result of the fatigue (which lasted about 200 hours). In the case of cathodes with molybdenum-glass base, the sensitivity decreased to 68 % of its initial value. The photoelectric work function increased slightly after the fatigue process. The energy spectrum of the photoelectrons after fatigue, differs from the energy spectrum prior to it. The maximum of the energy-distribution curves is shifted towards lower energies, i.e. the energy of the electrons decreases as a result of the fatigue. It is noted that this change in the energy distribution is very similar to that, corresponding to a transition of the cathode from a state of normal activation to a state of de-activation. In both processes (fatigue and de-activation), the relative number of fast electrons increases, whereas the number of slow electrons decreases. The obtained results lead to the conclusion that cathode fatigue is a bulk process, i.e. the fatigue (under the action of light and the applied voltage) involves substantial changes in the cathode material itself. There are 6 figures.

SUBMITTED: October 20, 1961

11553
S/188/62/000/005/001/008
B102/B108

24.2600

AUTHOR: Zheludeva, G. A.

TITLE: Effect of the electron yield depth of a thick antimony-cesium cathode on the nature of their energy distribution

PERIODICAL: Moscow. Universitet. Vestnik. Seriya III. Fizika, astronomiya, no. 5, 1962, 3 - 9

TEXT: The photoelectron energy distribution under frontal illumination was studied on Sb-Cs cathodes of different thicknesses (test series 1), as well as the effect of the direction of illumination on this energy distribution (test series 2), the cathodes having been produced under completely equal conditions. Cathodes of different thicknesses, however, have different sensitivities. A cathode of ordinary thickness (~1500 Å) is more sensitive than a thinner one, and if the cathode thickness exceeds the effective electron yield depth the "thickness effect" ceases to be observable. The sensitivity of a cathode (I) 5300 Å thick was 40 μa/lm and that of a cathode (II) 1200 Å thick was only half as much, although at such a thickness no thickness effect should occur. The measurements were

4

Card 1/3

Effect of the electron yield...

made in the range of wavelengths of 2200 - 4047 Å on cathodes of the thicknesses of 490, 1080, 1200, 1600 and 5300 Å. All cathodes were produced in the same tube on a quartz backing according to a method described in "Izv. AN SSSR" ser. fiz. 12, no. 2, 126 - 143, 1948. A comparison between the results obtained with the cathodes I and II shows that the photoelectric work function of II is higher than that of I, also δ of II was higher by about 0.1 ev than that of I. δ is the distance, measured in ev, between the top of the filled band and the electrochemical potential level. The energy distributions of the electrons from I and II are different: II emits more numerous fast and fewer slow electrons than I. Hence, it can be concluded that even if the thicknesses of the electrodes under consideration is such as to exclude a thickness effect, they still differ in their most important physical properties. In the second test series the difference in frontal and backward illumination was studied in I and II with light of 2482 Å.. Some of the results were unexpected: e.g., the energy spectrum of the "low" electrons contains more numerous fast and fewer slow electrons than that of the "surface" electrons. The energy distributions of the "low" electrons are the same for I and II. In order

to explain the results it is assumed that the cathodes have inhomogeneous thicknesses and that the Sb-Cs cathodes act as gray filters on the excited electrons. This inhomogeneity also explains the unexpectedly high photocurrent yield in the case of backward illumination, because the photoactive layer is on the cathode surface and the depth to which the light penetrates is only about 500 Å. The "gray filter effect" influences essentially the energy distribution, both with frontal and backward illumination. There are 6 figures.

4

ASSOCIATION: Kafedra elektroniki (Department of Electronics)

SUBMITTED: October 28, 1961 (initially),
February 10, 1962 (after revision)