[illegible]ve to the rate of growth [illegible] a maximum at ~ 0.02 g/cm^2 [illegible] saturation
[illegible] .02 - 0.08 g/cm^3 [illegible]

SOV/70-3-4-20/26

AUTHORS: Dvoryankin, V.F. and Vaynshteyn, B.K.

TITLE: A Low-temperature Crystal Holder for the Electronograph EG (Nizkotemperaturnyy kristalloderzhatel' dlya elektronografa EG)

PERIODICAL: Kristallografiya, 1958, Vol 3, Nr 4, pp 504-506 (USSR)

ABSTRACT: A crystal holder attachment for the standard EG horizontal-beam electronograph of the Institute of Crystallography is described which can enable a specimen grid to be cooled to liquid N_2 temperature (with drawing). The grid holder is at the end of a tube, which can be filled with liquid N_2, protruding into the specimen space. The channel through which the beam passes along the axis of the instrument can be rotated about the cooling tube to cut off the beam which may heat the specimen very noticeably. The cooling tube entering the camera is surrounded by a double-walled screen also entering the camera which can also be filled with liquid N_2 to act as a guard tube. The copper crystal holder is itself surrounded, except for entrance and outlet apertures, with a copper box connected to the cooled guard tube. Operation without a guard tube proved

Card 1/2

A Low-temperature Crystal Holder for the Electronograph EG

unsatisfactory. A Cu-constantan thermocouple is provided to measure the specimen temperature. The mechanism by which the specimen carrier can be moved is, except for rotation about the tube, mentioned but not described. It is recommended that a cold trap immediately above the pump should also be fitted as otherwise any condensible vapours will contaminate the specimen slightly in spite of the guard chamber. Specimen pictures from NH_4Br phases (II) and (III) are reproduced.
There are 7 references, 3 of which are Soviet, 1 in English and 3 Scandinavian.

ASSOCIATION: Institut kristallografii AN SSSR
(Institute of Crystallography of the Ac.Sc.USSR)

SUBMITTED: May 12, 1958

AUTHOR: Dvoryankin, V.F. SOV/70-4-3-32/32

TITLE: Low-temperature Methods in Electronography

PERIODICAL: Kristallografiya, 1959, Vol 4, Nr 3, pp 441-459 (USSR)

ABSTRACT: Comprehensive review of foreign and Soviet work. Various experimental arrangements for examining specimens at low temperatures (liquid air) are described and illustrated. The examination of thin metal films evaporated onto a cold substrate is described. Superconductors examined at liquid helium temperature are discussed and work on the structure of hexagonal and cubic ice is reviewed at length. It is concluded that the use of low temperatures in electronography significantly widens the region susceptible to electron diffraction techniques and is suitable for the solution of the following problems:

1) Study of first- and second-order phase transitions in thin films at low temperatures.

2) Determination of the structures of thin metallic and non-metallic layers obtained by condensation on a cooled substrate.

Card1/3

3) Elucidation of the dependence of the physical properties of thin films on their structures, which may change with changes in the temperature of the condensation surface.
4) Investigation of the structures of super-conducting films of metals and alloys.
5) Determination of the structure of ice, obtained by condensation of water vapour on a cooled substrate, and also the investigation of the character of ice deposits as they depend on the temperature and nature of the substrate. Probably it will be possible to study the crystal structures of other liquids by condensing their vapours onto cold substrata.
6) Study of the thermal vibrations of atoms.
7) Studies of the influence of temperature on the structures of polymers.

Low-temperature Methods in Electronography SOV/70-4-3-32/32

There are 13 figures, 6 tables and 105 references, 18 of which are Soviet, 7 international, 56 English, 1 Japanese, 2 Dutch, 1 Swedish, 1 Norwegian, 1 Czech, 17 German and 1 Swiss.

ASSOCIATIONS: Institut kristallografii AN SSSR (Institute of Crystallography of the Ac.Sc., USSR)
Sibirskoye otdeleniye AN SSSR (Siberian Branch of the Ac.Sc., USSR)
Institut neorganicheskoy khimii (Institute of Inorganic Chemistry)

SUBMITTED: February 19, 1958

Card 3/3

24.2000

77123
SOV/70-4-6-24/31

AUTHOR: Dvoryankin, V. F.

TITLE: Electron Diffractional Detection of Phase Transition in Thiourea at Low Temperatures. Brief Communications

PERIODICAL: Kristallografiya, 1959, Vol 4, Nr 6, pp 925-926 (USSR)

ABSTRACT: Electron diffraction photographs of oblique texture type from a thin thiourea specimen were taken at different temperatures and compared in order to study a phase transition from paraelectric to ferroelectric in thiourea at different temperatures. A low-temperature crystal holder was used. (V. F. Dvoryankin, B. K. Vaynshteyn, Kristallografiya, 3, 5, 504, 1958). The electron diffraction pictures of thiourea specimens at room temperature (before cooling) and at low temperature, -140° C (after cooling) were taken on the same photographic plate. For the unit cell of thiourea at +20° C, the following measurements were obtained: a = 5.52 A, b = 7.65 A, c = 8.53 A; the space group D_{2h}^{16} = Pbnn.

Card 1/2

Electron Diffractional Detection of Phase Transition in Thiourea at Low Temperatures. Brief Communications

77123
SOV/70-4-6-24/31

For the low-temperature phase of thiourea (-140° C) the measurements of unit cell are: a = 5.49 A, b = 7.58 A, c = 8.58 A; space group C_{2v}^2. It can be assumed that the phase transition from paraelectric into the ferroelectric in thiourea is determined ether by the molecules' displacement, by rotation of amino groups, or by both. The author expresses his gratitude to B. K. Vaynshteyn for the supervision of this work. There is 1 figure; and 7 references, 1 U.S., 2 U.K., 1 German, 3 Soviet. The U.S. and U.K. references are: N. R. Kunchur, M. R. Truter, J. Chem. Soc., 2551-2557, 1958; A. L. Solomon, Phys. Rev., 104, 1191, 1956; J. W. Ensley, A. S. Smith, Proc. Chem. Soc., 53, 1958.

ASSOCIATION: Institute of Crystallography of the Academy of Sciences USSR and Institute of Inorganic Chemistry of the Siberian Branch of the Academy of Sciences USSR (Institut kristallografii AN SSSR i Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR)

SUBMITTED: July 19, 1959

Card 2/2

DVORYANKIN, V. F., VAINSHTEIN, B. K.

"~~16~~3. Electron Diffraction Investigation of Thiourea at 20° C. and --140°C."

paper submitted for 5th Gen. Assembly, Symposium on Lattice Defects, Intl. Union of Crystallography, Cambridge U.K. Aug 1960.

DVORYANKIN, V.F.; VAYNSHTEYN, B.K.

Electron diffraction study of thiourea. Kristallografiia 5 no.4: 589-599 Jl-Ag '60. (MIRA 13:9)

1. Institut kristallografii AN SSSR i Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.
(Urea—Diffraction)

DVORYANKIN, V.F.

Second conference on the use of electronic calculating machines in the structural analysis of crystals. Zhur.strukt khim. 2 no.4:518 Jl-Ag '61. (MIRA 14:9)
(Electronic calculating machines--Congresses)

24.2200 1160 1164 1137
15.8091

30174
S/070/61/006/006/006/008
E132/E135

AUTHORS: Dvoryankin, V.F., and Vaynshteyn, B.K.

TITLE: An electron diffraction study of the structure of the low-temperature ferroelectric phase of thiourea

PERIODICAL: Kristallografiya, v 6, no.6, 1961, 949-959

TEXT: G.J. Goldsmith and J.G. White (Ref.7: J. Chem. Phys., Vol.31, 1175-1187, 1959) have shown that there are 5 phases of thiourea: I ferroelectric (f.e.) up to 169 °K; II anti-ferroelectric (a.f.e.) 169-176 °K; III f.e. 176-180 °K; IV a.f.e. 180-202 °K; V a.f.e. above 202 °K. They also found the positions of the heavy atoms in phase I by X-ray methods simultaneously with the present authors who used electron diffraction methods. A detailed structural study at 133 °K has now been made, (Ref.6: Kristallografiya, Vol.4, 6, 925, 1959). The unit cell has the space group $Pb2_1m = C_{2v}^2$ with $Z = 4$ and much the same dimensions as at room temperature, although the space group then is D_{2h}^{16}. Oblique texture photographs were taken at 133 °K and spot intensities were measured to about 15%

Card 1/3

30174
An electron diffraction study of the... S/070/61/006/006/006/008
E132/E135

for 6 layer lines. 250 reflexions were measured (188 at room temperature). Phases were calculated for a trial structure including H atoms. Corrections for dynamic effects were necessary. An anisotropic temperature factor was introduced and a reliability factor of 18% was finally obtained. Various Fourier sections, projections and difference syntheses were constructed. Coordinates of the atoms were found from these and are compared with those of Goldsmith and White who only estimated the H positions from standard bond lengths and angles. The correspondence is very close. The H-bonding system and the nature of the ferroelectric transition are discussed. On the basis of the non-planarity of the molecules when ferroelectric mechanisms are suggested for the phases II, III and IV.
Acknowledgments are expressed to F.A. Brusentsov for his assistance. Z.V. Zvonkova and Yu. Tashpulatov are mentioned in connection with their contributions to the study of the structure of thiourea.
There are 7 figures, 2 tables and 23 references: 11 Soviet-bloc and 12 non-Soviet-bloc. The four most recent English language

Card 2/3

An electron diffraction study of the...

references read as follows:

Ref. 7: as in text above.
Ref.13: G.A. Jeffrey, R. Shino. Acta crystallogr., Vol.12, 447-455, 1959.
Ref.19: Costain, Downing. J. Chem. Phys., Vol.32, 158, 1960.
Ref.23: Chiba, M. Toyama, I. Morino. J. Phys. Soc. Japan, Vol.14, 379-380, 1959.

ASSOCIATION: Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR (Institute of Inorganic Chemistry, Siberian Filial AS USSR)
Institut kristallografii AN SSSR (Institute of Crystallography, AS USSR)

SUBMITTED: August 18, 1961

Card 3/3

24.7100 1160, 1136, 1562

27877
S/020/61/140/001/013/024
B104/B109

AUTHORS: Vaynshteyn, B. K., and Dvoryankin, V. F.

TITLE: Mechanism of a ferroelectric phase transformation in thiocarbamide at 133° K

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 140, no. 1, 1961, 111-114

TEXT: The character of C - S bond in thiocarbamide ($CS(NH_2)_2$) has been studied repeatedly. In previous papers the authors described structural analyses of thiocarbamide by means of electron diffraction studies. (Kristallografiya, 4, 925, (1959); 5, 589 (1960); 3, 504 (1958)). Similar studies were made by G. J. Goldsmith et al. (J. Chem. Phys., 31, 1175 (1959)) who proved the existence of five phases. Using the terminology introduced by Goldsmith, the authors proved a phase transition at 133° K in the ferroelectric phase I which exists below 169° K. In the anti-ferroelectric phase V which exists above 201° K they electronographically localized the position of a hydrogen atom. The structural formula of

Card 1/4.

Mechanism of a ferroelectric ...

phase V of thiocarbamide which is shown in Fig. 1 is discussed at length. A threedimensional representation of the potential levels is made for exactly determining the hydrogen atoms in the phases I and V. It could be proved for both phases that the H_{II} atom does not lie in the same plane as the other heavy atoms. It is suspected that in all five phases of thiocarbamide this hydrogen atom does not lie in the plane of the other atoms. In a detailed study of the structural change of thiocarbamide in a ferroelectric phase transition it is demonstrated that the ferroelectric properties of phase I result from the unevenness of its molecule and from the formation of strong hydrogen bonds at low temperatures. The molecules of phase I are less symmetric than those of phase V. Finally, the authors discuss possible variants of the structure of the phases II, III, and IV of thiocarbamide. Z. V. Zvonkova and Yu. Tashpulatov (Kristallografiya, 3, 553 (1958)) are mentioned. There are 3 figures and 16 references: 7 Soviet and 9 non-Soviet. The references to English-language publications read as follows:

Mechanism of a ferroelectric ...

N. R. Kunchur at al., J. Chem. Soc., 1958, July (517), 2551; P. Vaughan, et al., Acta Cryst., 5, 532 (1954); H. J. Grenvill-Wells, Acta Cryst., 9, 709 (1956); J.W. Emsley at al., Arch. Sci., 12, 122 (1959).

ASSOCIATION: Institut kristallografii Akademii nauk SSSR
(Institute of Crystallography of the Academy of Sciences USSR)

Institut neorganicheskoy khimii Sibirskogo otdeleniya Akademii nauk SSSR
(Institute of Inorganic Chemistry of the Siberian Department of the Academy of Sciences USSR)

SUBMITTED: April 29, 1961, by N. V. Belov, Academician
April 24, 1961

Card 3/4

DVORYANKIN, V.F.

Dissertation defended for the degree of Candidate of Physicomathematical Sciences at the Institute of Crystallography in 1962:

"Electronographic Structual Investigation of High-Temperature and Low-Temperature Thiourea Phases."

Vest. Akad. Nauk SSSR. No. 4, Moscow, 1963, pages 119-145

DVORYANKIN, V.F.; BRUSENTSEV, F.A.

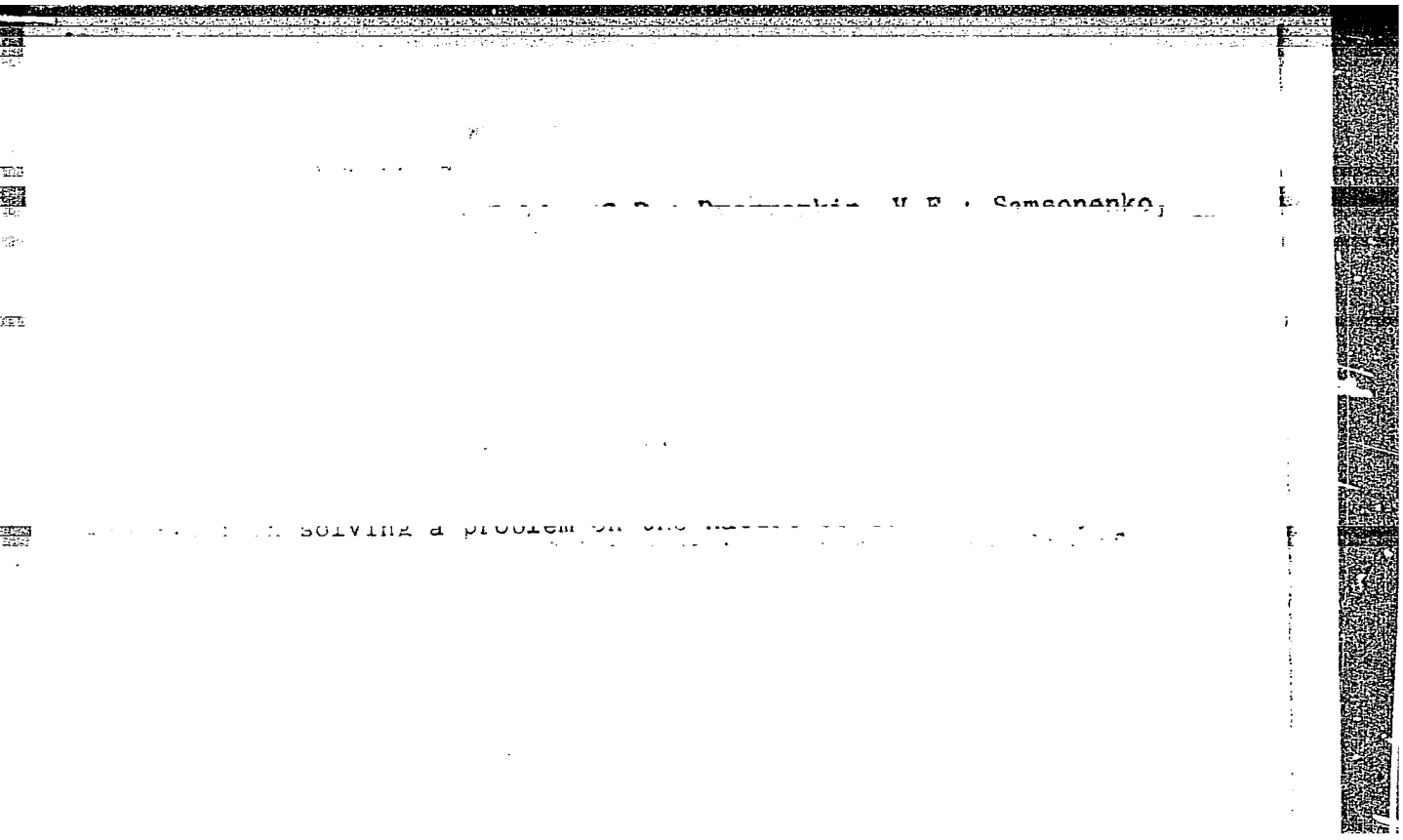
Corrections to normal equations in the least squares method for more accurate definition of crystalline structures. Kristallografiia 7 no.6:954-956 N-D '62. (MIRA 16:4)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.
(Least squares) (Differential equations)

BRUSENTSEV, F.A.; DVORYANKIN, V.F.

Analytical representation of the atomic factors of scattering for electrons. Kristallografiia 8 no.2:260-263 Mr-Ap '63. (MIRA 17:8)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.



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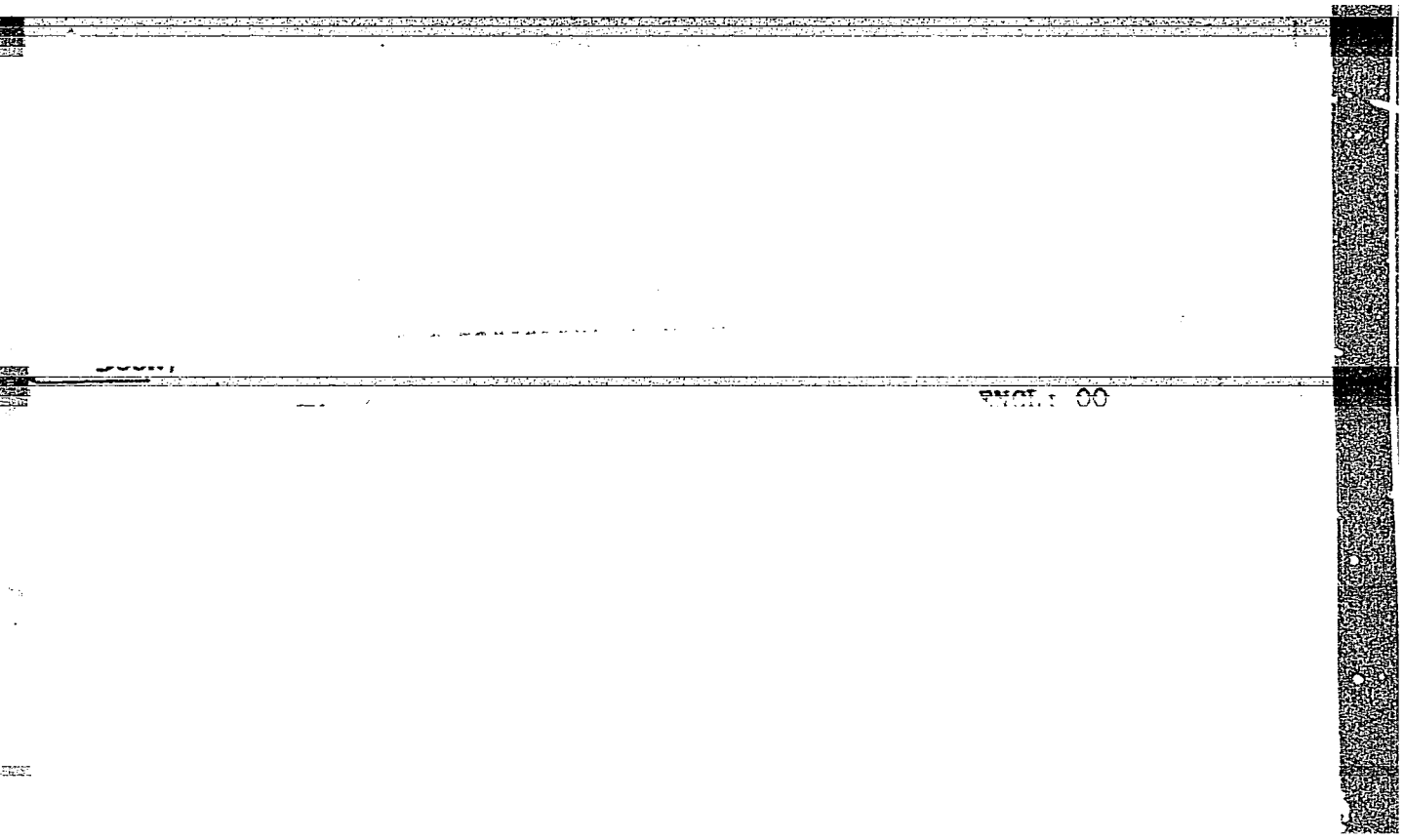

ACCESSION NR: AP4012272 S/0070/64/009/001/0020/0025

AUTHOR: Dvoryankin, V. F.

TITLE: The effect of thermal movement of atoms on the distribution of the atomic potential

SOURCE: Kristallografiya, v. 9, no. 1, 1964, 20-25

TOPIC TAGS: thermal movement, atomic thermal movement, atomic potential, potential distribution, Fourier transformation, hydrogen

ABSTRACT: Strong thermal movement of atoms sometimes makes it impossible to locate precisely the position of atoms or, even more, to determine their electron states. Because of this an investigator is forced to use a low-temperature technique. In knowing how thermal movement affects the potential distribution of an atom, however, one may define the approximate optimal experimental levels at which the position of the atom may be determined and its electron state ascertained. To compare theoretically computed with experimental distribution, it is necessary to consider the effect of a break in the Fourier series. In this study the author has examined the effect of thermal movement on distribution of potential both with

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ACCESSION NR: AP4012272

consideration of the break in the Fourier series and without consideration of the break. The first, which is found to be essential, yields a distribution function that may be written

$$[\varphi_r(0)]_{br} = \Phi(x_{max})\left(\frac{b}{2\pi}\right)^{3/2}\int_0^\infty D(t)\exp\left(-\frac{1}{2}bt^2\right)dt,$$

where $D(t) = 4\pi r^2(r)$, $r = t$, $b = \frac{8\pi^2}{B}$, and $x = \frac{\sin\theta}{\lambda}$. The author then applies this function to the specific example of the hydrogen atom. Orig. art. has: 35 formulas.

ASSOCIATION: Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR (Institute of Inorganic Chemistry Siberian Department AN SSSR)

SUBMITTED: 15Apr63 DATE ACQ: 19Feb64 ENCL: 00

SUB CODE: PH NO REF SOV: 005 OTHER: 003

Card 2/2

ACCESSION NO: AP4012273 S/0070/64/009/001/0026/0031

AUTHORS: Dvoryankin, V. F.; Kolomiychuk, V. N.

TITLE: The effect of thermal movement of the hydrogen atom on the distribution of its potential

SOURCE: Kristallografiya, v. 9, no. 1, 1964, 26-31

TOPIC TAGS: thermal movement, potential distribution, atomic thermal movement, hydrogen thermal movement, hydrogen potential

ABSTRACT: This is a completion of V. F. Dvoryankin's immediately preceding article (Kristallografiya, 9, 1, p. 20, 1964). The authors have used the function for distribution of potential for the hydrogen atom derived in the indicated paper, and they have made computations for different values of the isotropic temperature factor and different values of $(\frac{\sin\theta}{\lambda})_{max}$. The results are presented in several long tables. From these results the authors conclude that isotropic thermal movement of a hydrogen atom clearly affects its distribution of potential. With increase in the temperature factor, there occurs, first, a decline in the distribution function and, secondly, a "smearing" of the potential. Concerning the

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ACCESSION NO: AP4012273

break in the Fourier series, this clearly affects the distribution of potential also. With increase in the temperature factor, the effect of this break declines. Decrease in temperature factor leads to increased distortion of the potential distribution, and diminution in the break may occur at lower temperatures. Cooling a sample, therefore, causes decrease in value of the temperature factor and increase in the value of $\left(\frac{\sin\Theta}{\lambda}\right)_{max}$. The problem lies in selecting the optimal conditions. Orig. art. has: 2 figures, 4 tables, and 7 formulas.

ASSOCIATION: Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR (Institute of Inorganic Chemistry Siberian Department AN SSSR)

SUBMITTED: 15Jun63 DATE ACQ: 19Feb64 ENCL: 00

SUB CODE: PH NO REF SOV: 004 OTHER: 004

Card 2/2

KOLOMIYCHUK, V.N.; DVORYANKIN, V.F.

Electron diffraction determination of the position of hydrogen atoms in NH_4Br. Kristallografiia 9 no.1:50-56 Ja-F '64. (MIRA 17:3)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.

ACCESSION NR: AP4024984

S/0070/64/009/002/0167/0170

AUTHOR: Dvoryankin, V. F.

TITLE: Analytical representation of the integral characteristics for distribution of electron density and potential in atoms

SOURCE: Kristallografiya, v. 9, no. 2, 1964, 167-170

TOPIC TAGS: atomic factor, atomic factor curve, analytical representation, electron density, distribution density, potential distribution, integral characteristic, scattering

ABSTRACT: The author begins with two basic expressions for analytical representation of curves for atomic factors in scattering:

$$f(x) = \sum_{i=1}^{n} A_i \exp(-b_i x^2) \quad (1)$$

$$f(x) = \sum_{n=0}^{k} a_n x^n. \quad (2)$$

Card 1/2

ACCESSION NR: AP4024984

In these formulas, $x = \sin\theta/\lambda$, and the corresponding coefficients are computed by the method of least squares. On the basis of these formulas and on the basis of formulas for computing integral characteristics, the author has obtained analytical representation for the integral characteristics. These characteristics for scattered material in atoms and for continuous and discontinuous Fourier series are designated $G_{n\,co}$ and $G_{n\,dis}$. Expressions are then obtained for these two for all values of n from 1 to 8. Orig. art. has: 19 formulas.

ASSOCIATION: Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR (Institute of Inorganic Chemistry, Siberian Division, AN SSSR)

SUBMITTED: 15Apr63 DATE ACQ: 16Apr64 ENCL: 00

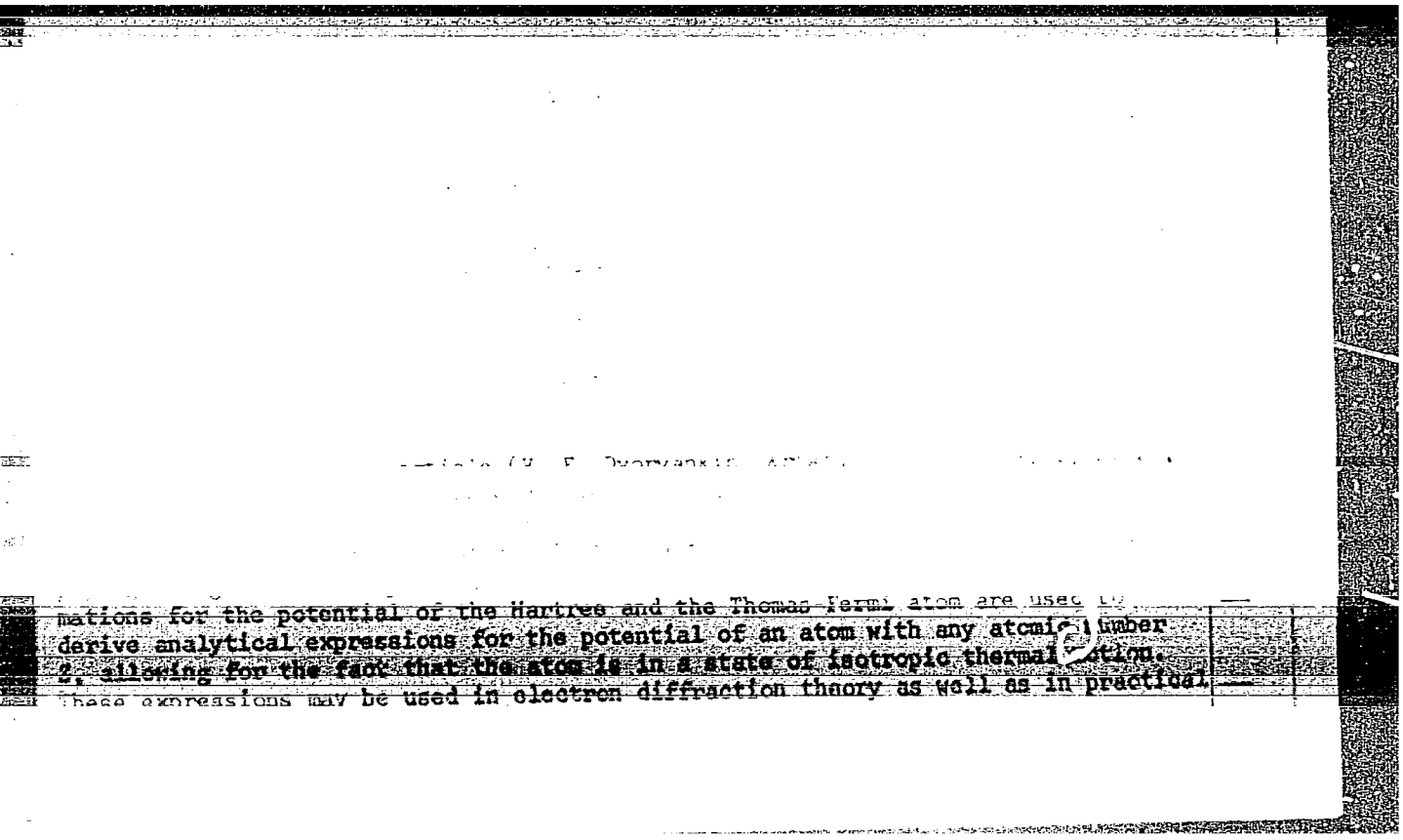
SUB CODE: PH NO REF SOV: 003 OTHER: 006

Card 2/2

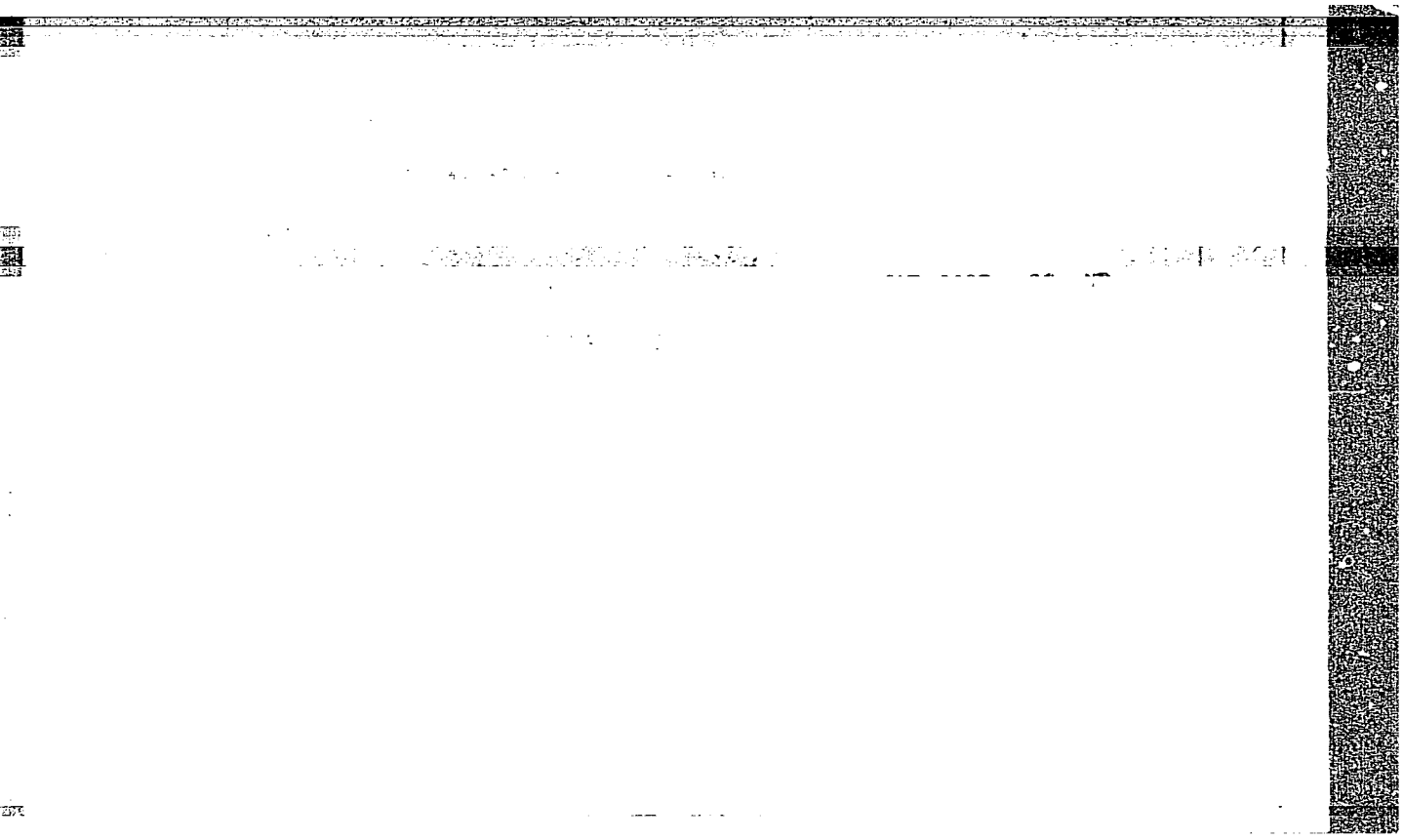
DVORYANKIN, V.F.; BRUSENTSEV, F.A.

Modification of the method of least squares in the structural analysis of crystals. Kristallografiia 9 no.4:548-550 Jl-Ag '64. (MIRA 17:11)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.



mations for the potential of the Hartree and the Thomas-Fermi atom are used to
derive analytical expressions for the potential of an atom with any atomic number
Z, allowing for the fact that the atom is in a state of isotropic thermal motion.
These expressions may be used in electron diffraction theory as well as in practical



SOBOLEV, Ye.V.; BOKIY, G.B.; LISOYVAN, V.I.; DVORYANKIN, V.F.

Nature of extra reflections of the "tenon" type on Laue diffraction patterns of natural diamonds. Zhur. struk. khim. 6 no.3:468-469 My-Je '65. (MIRA 18:8)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR i Institut radiotekhniki AN SSSR.

BORONIKOVA, K.I.; DVORYANKIN, V.F.

Determination of the substructure of thin films by the electron diffraction method. Izv. SO AN SSSR no.7 Ser. khim. nauk no.3:63-70 '65. (MIRA 18:12)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR, Novosibirsk. Submitted April 27, 1964.

L 01283-67 EWT(1) JM

ACC NR: AP6031316 SOURCE CODE: UR/0185/66/011/007/0785/0793

AUTHOR: Dvoryankin, V. V.

ORG: Donets State University (Donets'kyy derzhuniversytet)

TITLE: Magnetron lens with a loop-forming cathode. Part I.

SOURCE: Ukrayins'kyy fizichnyy zhurnal, v. 11, no. 7, 1966, 785-793

TOPIC TAGS: magnetron lens, proton beam, field strength, electric field, photon emission, charge density, Poisson equation

ABSTRACT: The radial distribution of the electric field strength in a lens cloud with the anode current cut off and a pressure of $(3.6—7) \times 10^{-6}$ mm Hg was investigated experimentally. Thin beams of protons were transmitted through an electron cloud of a magnetron lens with a loop-forming cathode and the shifting of these beam traces were measured on a fluorescent screen with the anode voltage turned on, i.e., in the presence of a magnetic field and emission. The charge density distribution was determined from the Poisson equation by graphical differentiation. The cathode was positioned so that the magnetic flow through its cross section was equal to zero. With large cathode emissions, the cloud charge density did not remain constant but

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L 01283-67

ACC NR: AP6031316 2

decreased while advancing from the cloud axis along the radius to the anode. The radial distribution of the electric field strength in the cloud is not linear, and the potential difference between the anode and the axis does not practically differ from that between the anode and cathode. With small cathode emissions (imcomplete cloud charge), the charge density and the potential difference between the anode and the axis proved to be less than in the case of a complete charge. However, the distribution form was unchanged, which indicates that the structure of the clouds is homogeneous in both cases. The author thanks Ya. B. Faynberg for suggesting the subject and V. Ye. Ivanov for his interest in the work. Orig. art. has: 10 figures and 10 formulas. [Based on author's abstract.] [NT]

SUB CODE: 20/ SUBM DATE: 29Jul65/ OTH REF: 002

Card 2/2 mjs

L 45762-66 EWT(1)/EWT(m)/T DS/JM
ACC NR: AP6028711 SOURCE CODE: UR/0185/66/011/008/0882/0895

35
33
B

AUTHOR: Dvoryankin, V. V.

ORG: Donetsk State University (Donets'kyy derzhuniversytet)

TITLE: Magnetron lens with a loop-shaped cathode. Part 2

SOURCE: Ukrayins'kyy fizychnyy zhurnal, v. 11, no. 8, 1966, 882-895

TOPIC TAGS: magnetron lens, cathode, loop shaped cathode, electron cloud, electron

ABSTRACT: An approximate analytical distribution function was found by using an experimentally obtained radial distribution of the electrical field intensity in an electron cloud of a magnetron lens having a loop-shaped cathode. The function is used to determine the electron trajectories in the middle part of the cloud (where the magnetic field is homogeneous) and also to calculate the formula for its focal distance, taking into consideration the expansion of the focussed beam caused by the effect of the repulsive forces between the ions. The author expresses thanks

Card 1/2

L 45762-66

ACC NR: AP6028711

2

to Ya. B. Faynberg for proposing the topic and for consultations and to V. E. Ivanov for interest in the work. Orig. art. has: 47 formulas and 6 figures. [FM]

[Author's abstract]

SUB CODE: 20/ SUBM DATE: 29Jul65/

SOV/70-3-4-6/26

AUTHORS: Dvoryankina, G.G. and Pinsker, Z.G.

TITLE: Investigation of the Structure of Fe_4N (Issledovaniye struktury Fe_4N)

PERIODICAL: Kristallografiya, 1958, Vol 3, Nr 4, pp 438-443 (USSR)

ABSTRACT: Fe_4N has been the subject of previous investigations but the N atoms were not properly localised. The main difficulty is to prepare polycrystalline specimens without preferred orientation and suitable for electron diffraction examination. Specimens were made from iron films evaporated in vacuo on to NaCl crystals. They were nitrided in a current of dry NH_3 at 400-450 °C for 1-2 hours. To prevent the occurrence of the γ' phase, the ammonia was previously dissociated to the extent of 80-85%. A polished irrational face of the NaCl helped to prevent orientation effects. The electronograms were microphotometered, 44 reflections being observed. They could be indexed on a primitive cubic cell with $a = 3.8$ A. A three-dimensional line summation along [111] was carried out with signs calculated from the expected positions Fe (0,0,0), (1/2, 1/2, 0), (1/2, 0, 1/2), (0, 1/2, 1/2) and N (1/2, 1/2, 1/2). Observed and calculated potential

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amplitudes gave a reliability factor (without temperature factor) of 35%. The series of $\phi_{calc.}$ was observed to fall much sharper than that for $\phi_{exp.}$ and it was necessary to investigate possible deviations from the kinetic law of scattering. Blackman's method was used. A corrected value of the potential $\phi_{exp.}^{corr.} = (I_{exp.}/pd^2 : d(A))^{1/2}$. A value of B (the temperature factor exponent) of 0.5 was found for Fe and 0.7 for N. The reliability factor then became 10%. In the section in the 110 plane, there was a discrepancy of 2% between the potentials of Fe atoms at the origins and at the centres of faces. The bonds might be non-equivalent. It seems from the observed potentials (1250 and 350) that some slight increase in the scattering power of the Fe with respect to the N takes place possibly explained by

Investigation of the Structure of Fe_4N SOV/70-3-4-6/26

the presence in the latter of an excess of electron density, that is, to an anionic state.
There are 5 figures, 1 table and 8 references, 6 of which are Soviet and 2 English.

ASSOCIATION: Institut kristallografii AN SSSR
(Institute of Crystallography, Ac.Sc.USSR)

SUBMITTED: May 12, 1958

Card 3/3

80055
S/020/60/132/01/29/064
B014/B014

24.7200

AUTHORS: Dvoryankina, G.G., Pinsker, Z.G.

TITLE: Electron Diffraction Study of Fe_3O_4

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 132, No. 1, pp. 110-113

TEXT: First, the authors refer to papers (Refs. 1-6) in which the structure of magnetite was found to be an "inverse" spinel. This model offers a good explanation for its electric and magnetic properties. The oxygen parameter u, which equals 0.375 in the case of a perfect spinel, has hitherto not been determined. The present paper is intended to study the structure of Fe_3O_4 by electron diffraction studies on thin layers. The preliminary treatment of Fe_3O_4 samples is briefly described. The electron diffraction pictures taken on three polycrystal samples show that the lattice constant is 8.40 ± 0.01 A. The photometric determination of the intensity of 74 lines, corresponding to 153 reflections, permits a comparison between Φ_{theor} and Φ_{exp}. The introduction of a dynamic correction was found to be necessary. A comparison between Φ_{theor}

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Electron Diffraction Study of Fe_3O_4

S/020/60/132/01/29/064
B014/B014

and Φ_{exp} after the introduction of the correction yielded a divergence factor of R = 18.5%. For the following studies the authors used samples with kinematic (functional) dispersion, which permitted a more objective determination of the parameter u. 16 reflections were used to determine the oxygen parameter u, and a very small factor, R = 11.7%, was obtained for u = 0.263. An oxygen parameter u = 0.258 ± 0.002 is finally obtained by minimizing the factor R. Good agreement between the individual values of the above-mentioned parameter was obtained by calculating the spacings between the O^{2-}-ions and the adjacent iron ions in tetrahedral and octahedral positions for the parameter u = 0.258 as well as by a comparison with the sums of ionic radii according to Gol'dshmidt (Ref. 18). There are 1 figure and 18 references, 4 of which are Soviet.

ASSOCIATION: Institut kristallografii Akademii nauk SSSR (Institute of Crystallography of the Academy of Sciences of the USSR). Institut neorganicheskoy khimii Sibirskogo otdeleniya Akademii nauk SSSR (Institute of Inorganic Chemistry of the Siberian Branch of the Academy of Sciences of the USSR)

PRESENTED: December 29, 1959, by N.V. Belov, Academician

DVORYANKINA, G.G.; PINSKER, Z.G.

Ordering in the nitride phases of iron. Kristallografiia 5 no.2:253-256 Mr-Ap '60. (MIRA 13:9)

1. Institut kristallografii AN SSSR i Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.
(Iron nitride)

S/070/62/007/003/019/026
E132/E460

AUTHORS: Dvoryankina, G.G., Pinsker, Z.G.

TITLE: Investigation of the structures of phases in the system Ni-Te in thin layers

PERIODICAL: Kristallografiya, v.7, no.3, 1962, 458-461

TEXT: An electron diffraction study has been made of Ni-Te alloys in the composition region of 50 to 66.7% Te. Thin films were prepared by vacuum evaporation from two sources onto a crystal of NaCl followed by annealing at 250 to 300°C for 3 to 10 hours. Because of the distance between the sources the composition of the film changes from pure Ni at one end to pure Te at the other. Many electronograms were recorded. Four electrograms were then chosen for photometry and detailed study. The hexagonal cell dimensions were between a = 3.88 with c = 5.31 and a = 3.95 with c = 5.40 Å. Patterson and Fourier lines [00z] were constructed for each and the peak heights were estimated. Near the 50% composition a complex superstructure was present besides the phase of composition $Ni_{1+x}Te_2$, where x is between 0 and 1, which had the CdI_2 structure. In the latter, because of the difference

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in composition from $NiTe_2$, the parameter must differ from 0.25. For the specimen with the smallest cell (quoted) z_{Te} was found to be 0.253 (here the R factor was 19%). This gives distances Te-Te = 3.44 Å and Ni-Te = 2.51 Å. There are 5 figures.

ASSOCIATIONS: Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR (Institute of Inorganic Chemistry of the Siberian Branch AS USSR)
Institut kristallografii AN SSSR (Institute of Crystallography AS USSR)

SUBMITTED: September 25, 1961

L 19459-63 EWP(q)/EWT(m)/EWP(b)/BDS AFFTC/ASD Pad RDW/JD/HW
ACCESSION NR: AP3004094 S/0070/63/008/004/0556/0560

63
60

AUTHORS: Dvoryankina, G. G.; Pinsker, Z. G.

TITLE: Investigation of the phase structures in the system Ni-Te in thin layers. Investigation of the Beta-phase of NiTe

SOURCE: Kristallografiya, v. 8, no. 4, 1963, 556-560

TOPIC TAGS: structure, phase, Beta-phase, Ni, Te, order, disorder, lattice, electron diffraction

ABSTRACT: This work is based on electron diffraction studies of one phase in the system Ni-Te, found within a region recent investigations by the authors indicated to be homogeneous (Kristallografiya, 7, 3, 458-461, 1962). Two structures of the Beta-phase in the system NiTe have been discovered. Structure I was determined by the method of φ^2 and the φ -series. The lattice parameters are: $a_o = 3.88$ Å; $c_o = 20.2$ Å; space group D_{3d}^5; Z - 6 for the ideal composition NiTe; Te and Ni atoms occupy the position 6(c) when $z_{Te} = 0.257 \pm 0.002$ and $z_{Ni} = 0.129 \pm 0.002$. The atomic arrangement in planes parallel to the base is only partly ordered. It should be noted that the phase transition between the two structures is unusual and

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ACCESSION NR: AP3004094

cannot be referred to transitions of the order-disorder type. Structure II has a period of $a = a_0\sqrt{3}$ and has an ordered arrangement of atoms in the basal planes, but strict periodicity along the c axis is disturbed. The composition of the Beta-phase is near $Ni_4(Ni_2Te_4)$ or Ni_3Te_2. It is possible that this phase exists only in films (all earlier studies were made on powders). Orig. art. has: 6 figures.

ASSOCIATION: Institut neorganicheskoy khimii SO AN SSSR (Institute of Inorganic Chemistry, Siberian Department, Academy of Sciences, SSSR); Institut kristallografii AN SSSR (Institute of Crystallography, Academy of Sciences, SSSR)

SUBMITTED: 04Apr63 DATE ACQ: 15Aug63 ENCL: 00
SUB CODE: PH NO REF SOV: 001 OTHER: 003

Card 2/2

AKHRAMOVICH, Roman Timofeyevich; DVORYANKOV, N.A., otv. red.; GASRATYAN, M.A., red. izd-va; TSVETKOVA, S.V., tekhn. red.

[Afghanistan after the Second World War; historical study] Afganistan posle vtoroi mirovoi voiny; ocherk istorii. Moskva, Izd-vo vostochnoi lit-ry, 1961. 175 p. (MIRA 14:8)
(Afghanistan--Politics and government) (Afghanistan--Economic conditions)

DVORYANKOV, S. M.

ALEKSANDROV, Nikolay Nikolayevich; VZNUZDAYEV, Sergey Vasil'yevich; DVORYANKOV, Sergey Mikhaylovich; KEMNITS, Yuriy Vladimirovich; MASLOV, Aleksey Vasil'yevich; MURASHEV, Sergey Iustinovich; SOMMERAYSKIY, Konstantin Stanislavovich; MURASHEV, S.A., redaktor; KHROMCHENKO, F.I., redaktor izdatel'stva; KUZ'MIN, G.M., tekhnicheskiy redaktor

[Precise calculations in topographical surveys of irrigation districts] Raschety tochnosti topograficheskikh s"emok v raionakh orosheniia. Moskva, Izd-vo geodezicheskoi lit-ry, 1956. 48 p.
(Topographical surveying) (MIRA 10:1)
(Irrigation)

V

DVORYANKOV, S. M. Cand Tech Sci -- (diss) "Problems of geodesic work in connection with ~~the controlling~~ mastery of the flood-lands of the Oka River" Mos, 1957. 18 pp 22 cm. (Min of Agric USSR. Mos Institute of Land-Exploitation Engineers (Engineers of Soil Improvement)), 100 copies

(KL, 20-57, 83)

Engineers of Land Improvement

Hold For Checking

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DVORYANKOV, S.M.

Selecting the scale for a topographic survey and the contour interval for planning a drainage net. Geod.i kart no.2:40-47 F '57.
(MLRA 10:5)

(Topographical surveying)
(Drainage)

DVORYANKOV, S.M.

Estimating the accuracy of a topographic map needed in designing irrigation systems with deep wide-spaced canals. Trudy MIIZ no.10:9-14 '60. (MIRA 16:12)

DVORYANKOV, S.M.

Calculating the coordinates of points of analytic nets without adjacent angles and sides. Geod.i kart. no.6:14-22 Je '62. (MIRA 15:8)

(Surveying)

S/270/63/000/002/012/020
A001/A101

AUTHOR: Dvoryankov, S. M.

TITLE: Conformal reduction of photogrammetric networks

PERIODICAL: Referativnyy zhurnal, Geodeziya, no. 2, 1963, 25, abstract 2.52.175 ("Tr. Mosk. in-ta inzh. zemleustroystva", 1962, no. 16, 29 - 34)

TEXT: The author considers the problem of analytic reduction of photogrammetric networks on the basis of conformal transformation. To solve the problem, it is necessary to know coefficients whose values are determined from the coordinates of the reference points. If one of the reference points is adopted for the origin of conditional coordinates, then in reduction by two reference points, two coefficients must be determined, in reduction by three reference points - four coefficients, and in reduction by four reference points - 6 coefficients. An example of reduction of a photopolygonometric traverse by three reference points is presented.

V. Orlov

[Abstracter's note: Complete translation]

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SOBERAYSKIY, Konstantin Stanislavovich; SIROTA, Ivan Fedorovich; BATRAKOV, Yuriy Grigor'yevich; VZNUZDAYEV, Sergey Vasil'yevich; DVORYANKOV, Sergey Mikhaylovich; MASLOV, A.V., red.; VASIL'YEVA, V.I., red.izd-va; ROMANOVA, V.V., tekhn. red.

[Geodesic works for the construction of irrigation and drainage systems] Geodezicheskie raboty dlia stroitel'stva orositel'nykh i osushitel'nykh sistem. [By] K.S.Soberaiskii i dr. Moskva, Gosgeoltekhizdat, 1963. 203 p. (MIRA 16:12)

(Surveying) (Irrigation) (Drainage)

DVORYANKOV, S.M.

Adjustment of analytical nets using the formulas for conformal conversion of coordinates. Geod. i kart. no.7:25-33 Jl '63. (MIRA 16:8)

(Triangulation) (Coordinates)

DVORYANKOV, S.M.; YUNOSHEV, L.S.

Constructing a linear-angular analytical net in a semi-enclosed location. Geod. i kart. no.8:27-32 Ag '64.
(MIRA 17:11)

DVORYANOV, P.A., kandidat tekhnicheskikh nauk.

Effect of metallic impurities in tempered steel ShKh15 on wear due to fatigue. Podshipnik no.5:13-19 My '53. (MLRA 6:5)
(Bearings (Machinery))

BROMLEY, N.Ya.; DVORYANOV, V.N.; KIM, M.P., red.

[Rise in the material prosperity of the Soviet people and achievements in the field of public health, physical education, and sports in the U.S.S.R. 1945-1960; index to the literature] Pod"em material'nogo blagosostoianiia Sovetskogo naroda i dostizheniia v oblasti zdravookhraneniia, fizkul'tury i sporta v SSSR, 1945-1960 gg.; ukazatel' literatury. Pod red. M.P.Kima. Moskva, In-t istorii Akad.nauk SSSR, 1961. 55 p. (MIRA 14:6)

1. Chlen-korrespondent AN SSSR (for Kim).
(Bibliography--Russia--Economic conditions)
(Russia--Economic conditions--Bibliography)
(Bibliography--Public health)

DVORYANSKAYA, N.V.

DELIMARSKIY, Yu.K.; DVORYANSKAYA, N.V.

Satinite production from Glukhov kaolin. Bum.prom. 29 no.4:11-13 Ap '54. (MLRA 7:6)

1. Institut obshchey i neorganicheskoy khimii Akademii nauk USSR.
(Sizing (Paper)) (Kaolin)

L 31150-66 EWT(d) IJP(c)

ACC NR: AP5019455 SOURCE CODE: UR/0378/65/000/003/0044/0052

AUTHOR: Melikhov, A. N.; Dvoryantsev, Yu. A.

ORG: none

TITLE: Expansion of graphs and finite automata with respect to the operation of multiplication

SOURCE: Kibernetika, no. 3, 1965, 44-52

TOPIC TAGS: graph theory, multigraph, isomorphism

ABSTRACT: The multiplication of two graphs together is considered. It is demonstrated that this operation can be extended to finite automata. It is associative and satisfies the rule of commutativity with a precision approaching isomorphism. Two theorems are formulated setting forth necessary and sufficient conditions for expansion of a graph into the product of two graphs. The application of these results to the expansion of finite automata into the product of two automata are discussed and a theorem governing this expansion is presented. Orig. art. has: 8 figures, 19 formulas.

SUB CODE: 12/ SUBM DATE: 28Dec64/ ORIG REF: 003/ OTH REF: 001

UDC: 519.95-519.14

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