70-3-3-23/36

The Determination in Principal of the Structure of the Isomorphous Group of Compounds $[C(NH_2)_3][M(H_2O)_6]_2$, $[EO_4]_2$ Where M = Al or Cr and E = S or Se

is Soviet and 2 English.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova (Moscow State University imeni M.V. Lomonosov)

SUBMITTED: February 22, 1958

Card 2/2

UMANSKIY, M. M.

"Precision Lattice Parameter Determination" paper to be submitted for the Conference on Precision Lattice Parameter Determination, 10-11 June 1959.

"Methods of Single Crystal X-ray Diffractometry." paper to be submitted for the Conference on Counter Methods for Crystal Structure Analysis, 11-12 June 1959.

both conferences sponsored by Commission on Crystallographic Apparatus of the Intl. Union of Crystallography, 10-12 June 1959, in Stockholm Sweden.

Inst. of Crystallography, Acad. Sci. USSR, Moscow.

UMANSKIY, M. M.

ZHVTE, L. S.; ZOLINA, Z. K.; ZUBENKO, V. V.; KHATKIN, D. N.; UMANSKIY, M.M.

"The Precision Determinations of Lattice Constants"

a report presented at Symposium of the International Union of Crystallography Leningrad, 21-27 May 1959

05430
SOV/120-59-3-1/46

AUTHOR: Umanskiy, M. M

TITLE: Instruments for X-ray Analysis
(Rentgenovskoye priborostroyeniye)

PERIODICAL: Pribory i tekhnika eksperimenta, 1959, Nr 3, pp 3-17 (USSR)

ABSTRACT: This review of instruments deals with all uses of X-rays for physical and chemical purposes, with emphasis on specialized equipment. Fig 1 illustrates a Van der Graaf X-ray generator head; Fig 2 shows the range of thicknesses of steel (in cm) that can be examined with X-rays (140 and 250 kV), with γ-rays from radioisotopes, and with X-rays from a Van der Graaf generator (1 MV and 2 MV). Tab 1 lists X-ray tubes used for structure analysis; the countries (first column) are GB, USA (twice), France and the USSR. The fourth column gives the window material (Be or Be-mica), the fifth and sixth give the size of the focal spot, the seventh gives the working voltage, and the eighth gives the current (mA). Fig 3 gives X-ray transmission coefficients (I - Be (0.25 mm), II - mica (0.012 mm), III - Be + mica window, IV - Al (0.025 mm), V - Lindemann glass (0.25 mm)). Fig 4

Card 1/3

Instruments for X-ray Analysis

shows a rotating-anode tube, which would appear to be of Russian manufacture. It works at 30 kV, 200 mA, with a focal spot 0.1 x 1.0 mm. The anode (300 mm in diameter) turns at 1000 rpm and is water-cooled; the vacuum is about 10^{-5} mm Hg. Fig 5 shows a detail of this tube; The water-cooled shaft of the rotating anode passes through the diffusion pump. Fig 6 gives a general view of a system used in an X-ray shadow microscope; the electron-optics provide a focal spot about 1 μ in diameter. Magnifications up to x 2000 with a limiting resolution of about 100 Å would appear to be possible. The subsequent discussion (on counters and ionization chambers as detectors in structure analysis) is in general terms. Tab 2 lists the parameters of crystals used in X-ray monochromators; the substances are calcite, aluminium, NaCl, quartz, copper, LiF, pentaerythritol and graphite. The column R is the relative intensity for Cu Kα rays; D is the optimum thickness for use in transmission with these rays. Fig 7 illustrates an instrument used to examine the

Card 2/3

Instruments for X-ray Analysis

compositions of volumes of the order of $5\mu^3$; the electron beam excites the X-rays, which are analysed with a bent-crystal spectrometer and counter. Fig 8 gives some results for copper diffusing into zinc and vice versa. Fig 9 illustrates a specialized instrument for fluorescence analysis for three elements simultaneously, in which three mononochromators are used. Other more complex instruments are mentioned. Next the author deals with diffractometers, having first run briefly over stability problems associated with these instruments. Tab 3 lists the countries (top line), which are USA, Japan, France, and USSR; the usual technical details are given. Tab 4 lists the various methods that may be used in the different branches of structure analysis. There are 9 figures, 4 tables and 66 references, 24 of which are Soviet and 42 Western.

ASSOCIATION: Fizicheskiy fakul'tet MGU (Physics Dept. of Moscow State University)

SUBMITTED: March 2, 1959

Card 3/3

SOV/70-4-2-21/36

AUTHORS: Zubenko, V.V., Kvitka, S.S. and Umanskiy, M.M.

TITLE: The High-temperature X-ray Camera RKVT-1200 (Vysokotemperaturnaya rentgenovskaya kamera RKVT-1200)

PERIODICAL: Kristallografiya, 1959, Vol 4, Nr 2, pp 244-247 (USSR)

ABSTRACT: A universal high-temperature camera is difficult to design and it has been found better to divide the range into 20-90°, where the whole camera is thermostatted; 20-400° where protection of the film from heat and light is not difficult and the specimen often needs no protection from the atmosphere and 400 - 1200° where a wire-wound furnace with a simple electrical thermostat can be used. The 20-400° type has been already described: RKVT-400 in the work of Zubenko and Umanskiy (Ref 2).
The RKVT-1200 camera is suitable for examining polycrystalline materials up to 1 200 °C. The specimen is oscillated or rotated and lines from θ = 6 to 84° are recorded on film in a semi-cylindrical cassette. A vacuum of better than 10^{-3} mm Hg can be maintained in

Card1/3

The High-temperature X-ray Camera RKVT-1200

the furnace. The body of the camera is water-cooled. The rotor and gearing of the electric motor drive are inside the vacuum but the stator is outside. The shaft for turning the specimen centering screws enters the camera by a rubber cuff. The film cassette is kinematically clamped. Knife edges cast shadows on the film at standard θ angles. A thermocouple valve LT-2 (Pirani gauge) is built into the camera for vacuum measurement and lies on the opposite side of the working space to the pump. It takes 1.5 - 2 hours to reach working temperature and vacuum. Thermal transformations ($\alpha \rightarrow \gamma$ Fe) and the thermal expansion of CeB_6 have been studied. The latter material has an expansion coefficient of $7.9 \pm 0.4 \times 10^{-6}/^{\circ}C$. The CeB_6 was enclosed in a quartz capillary with walls of thickness 0.02 mm. Exposures took 6 - 10 hours.
There are 4 figures and 4 Soviet references.

Card 2/3

SOV/70-4-2-21/36

The High-temperature X-ray Camera RKVT-1200

ASSOCIATION: Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova (Moscow State University imeni M.V. Lomonosov)

SUBMITTED: August 22, 1958

Card 3/3

SOV/70-4-2-24/36

AUTHORS: Yezhkova, Z.I., Zhdanov, G.S. and Umanskiy, M.M.

TITLE: The Thermal Expansion of Crystals of Triglycinesulphate in the Region of Their Ferro-electric Transition (Termicheskoye rasshireniye kristalla triglitsinsul'fata v oblasti segnetoelektricheskogo perekhoda)

PERIODICAL: Kristallografiya, 1959, Vol 4, Nr 2, pp 249-253 (USSR)

ABSTRACT: $(CH_2NH_2COOH)_3H_2SO_4$ is monoclinic with $a = 9.15$, $b = 12.69$, $c = 5.73 \pm 0.03$ Å, $\beta = 105^\circ 40' \pm 20'$ with space group $P2_1$ below the Curie point at 47° and $P2_1/m$ above. $Z = 2$ $d_{obs} = 1.69$ and the ferro-electric axis is [010] (according to Wood and Holden - Ref 6). Here, the thermal expansion of single crystals has been measured from X-ray single-crystal oscillation photographs. The most accurate values were obtained from $d_{900}(FeK_\alpha)$ with $\theta \sim 81^\circ$, $d_{007}(Cu\ K_\alpha)$ with $\theta \sim 78^\circ$, $d_{505}(Ni\ K_\alpha)$ with $\theta \sim 81^\circ$ and $d_{0,14,0}(Co\ K_\alpha)$ with $\theta \sim 83^\circ$. Absorption corrections (for the 0.4 mm dia

Card1/3

The Thermal Expansion of Crystals of Triglycinesulphate in the Region of Their Ferro-electric Transition

crystal were not applied. The accuracy was estimated at $\pm$ 0.0015 kX. β was calculated. The components of the thermal expansion tensor (principal components) were calculated as follows, where φ is the angle of α_{11} to the a axis of the crystal. At 25 °C $\alpha_{11} = -37$, $\alpha_{22} = 5$, $\alpha_{33} = 142$ (in each case $deg^{-1} \times 10^{-6}$) and $\varphi = 22^{\circ}$. At 42.5 $\alpha_{11} = -20$, $\alpha_{22} = 36.5$, $\alpha_{33} = 119$ and $\varphi = 7^{\circ}20'$. Between 51 and 75° $\alpha_{11} = 40$, $\alpha_{22} = 64$, $\alpha_{33} = -12^{\circ}5$ and $\varphi = 5^{\circ}40'$. The cell volume changes smoothly over the whole temperature range. It is concluded that the phase transition is of the second order and that a marked redistribution of the hydrogen bonds parallel to the ac plane occurs at the ferro-electric transition. There are 4 figures, 3 tables and 7 references, 2 of which are Soviet, 4 English and 1 international.

SOV/70-4-2-24/36

The Thermal Expansion of Crystals of Triglycinesulphate in the Region of Their Ferro-electric Transition

ASSOCIATION: Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova (Moscow State University imeni M.V. Lomonosov)

SUBMITTED: October 13, 1958

Card 3/3

SOV/70-4-3-14/32

AUTHORS: Umanskiy, M.M., Kheyker, D.M. and Zevin, L.S.

TITLE: Precision Measurement of Unit Cell Parameters With a Diffractometer

PERIODICAL: Kristallografiya, 1959, Vol 4, Nr 3, pp 372-381 (USSR)

ABSTRACT: It is recommended that the positions of diffraction peaks should be measured from the positions of their centres of gravity. A method of finding such positions with a diffractometer is described. Here, wavelengths, not of the emission intensity maxima but of the centres of gravity of the spectral lines must be used. The corrections for the Lorentz, polarisation and angular dispersion factors are examined. A focusing monochromator was fitted to the URS-50I diffractometer which enabled it to record up to $2\theta = 168^{\circ}$ and had an inappreciable vertical divergence. As an example, the parameter of the unit cell of tungsten was found, using CuKβ radiation with this technique. At 25 °C it was found to be $a = 3.16526 \pm 0.00005$ Å (including the refraction correction). This was for a wavelength of CuKβ of 1.39223 Å for its centre of gravity. The following

Card1/3

sources of error have been minimised by calculation and experiment: 1) departure of the plane of the specimen from the surface giving point focusing; 2) penetration of the X-rays into the specimen; 3) displacement of the reflecting plane from the goniometer axis; 4) vertical divergence of primary and reflected beams; 5) errors in the zero setting of the counter position; 6) electrical errors connected with the integrating circuit and recorder inertia. Various adjusting jigs for setting the specimen and finding the zero position to $\pm$ 0.2' are described. Calculated curves of a) measurement time against distance from the line centre of gravity; b) magnitude of relative error in intensity measurement against distance from line centre of gravity; c) magnitude of relative error in intensity measurement against intensity are given calculated for the geometrical parameters used.
Read at the 6th All-Union Conference on the Application of X-rays to the Study of Materials, June 6, 1958.

SOV/70-4-3-14/32
Precision Measurement of Unit Cell Parameters With a Diffractometer

There are 7 figures, 1 table and 12 references, of which 3 are Soviet, 7 English, 1 French and 1 international.

ASSOCIATIONS: Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova (Moscow State University imeni M.V. Lomonosov)
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Card 3/3

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75994
SOV/70-4-5-16/36

AUTHORS: Yezhkova, Z. I., Zhdanov, G. S., Umanskiy, M. M.

TITLE: An X-Ray Diffraction Method for the Determination of the Thermal Expansion Tensors of the Crystals of Low Symmetry

PERIODICAL: Kristallografiya, 1959, Vol 4, Nr 5, pp 723-726 (USSR)

ABSTRACT: If the principal expansion directions, that determine the diagonal tensor α_{ii}, are the orthogonal coordinate axes X', Y', Z', the thermal-expansion coefficient in i direction is described by

$$\Delta_i = \alpha_{11}c_{i1}^2 + \alpha_{22}c_{i1}^2 + \alpha_{33}c_{31}^2 \qquad (3)$$

where c_{11}, c_{21}, c_{31} are direction cosines of i. In cubic, tetragonal, hexagonal, rhombohedral and orthorhombic crystals, the expansion coefficients along one, two, or three crystallographic axes suffice to determine the tensor. In monoclinic crystals only

Card 1/6

[010] coincides with one of the expansion tensor components, and in triclinic crystals, none. Consequently, the determination of the thermal expansion tensor in monoclinic crystals requires the data on the expansion of interplanar spacings of 4 different hkl, more conveniently of d_{010} and of three spacings of d_{hkl} type, and in triclinic crystals of 6 different spacings, more conveniently of d_{100}, d_{010}, d_{001}, d_{110}, d_{101}, d_{011}. In a coordinate system X,Y,Z of which the first two are parallel to [100] and [010], respectively, and the third is normal to (010), the thermal expansion of a monoclinic crystal in the direction parallel to (010) and under angle φ to the X axis is described by

$$\Delta_\varphi = a_{11}\cos^2\varphi + a_{33}\sin^2\varphi + 2a_{13}\cos\varphi\cdot\sin\varphi. \quad (2a)$$

Here, the values are determined by the following three

equations:

$$2\alpha_{11} = a_{11} + a_{33} + \frac{a_{11} - a_{33}}{\cos 2\psi}; \quad 2\alpha_{33} = a_{11} + a_{33} - \frac{a_{11} - a_{33}}{\cos 2\psi};$$

$$\tan 2\varphi = 2\alpha_{13} : (a_{11} - a_{33})$$

where ψ is the angle between α_{11} and X-axis. The orthogonal coordinate axes X,Y,Z for triclinic crystals must be choosen as follows: X coincides with the reciprocal-lattice axis a*, Y is in the a*b* plane, and Z is normal to that plane and coincides with c-axis. Referred to this set of coordinates, the thermal-expansion tensor is described by the expression:

$$a_{ik} = \begin{vmatrix} a_{11} & a_{12} & a_{13} \\ a_{12} & a_{22} & a_{23} \\ a_{13} & a_{23} & a_{33} \end{vmatrix}. \qquad (1)$$

the 6 subscripts in which are determined by the thermal expansions of the mentioned 6 interplanar spacings as follows:

$$\Delta_{100} = \alpha_{11},$$

$$\Delta_{010} = a_{11}\cos^2\gamma^* + a_{22}\sin^2\gamma^* + 2a_{12}\cos\gamma^*\sin\gamma^*,$$

$$\Delta_{110} = a_{11}\cos^2(a^*H_{110}) + a_{22}\sin^2(a^*H_{110}) + 2a_{12}\sin(a^*H_{110})\cos(a^*H_{110}),$$

$$\Delta_{001} = a_{11}\cos^2\beta^* + a_{22}\cos^2(c^*Y) + a_{33}\cos^2(cH_{001}) + 2a_{12}\cos\beta^*\cos(b^*Y) + 2a_{13}\cos\beta^*\cos(c^*c) + 2a_{23}\cos(c^*Y)\cos(c^*c),$$

$$\Delta_{101} = a_{11}\cos^2(a^*H_{101}) + a_{22}\cos^2(H_{101}Y) + a_{33}\cos^2(H_{101}c) + 2a_{12}\cos(a^*H_{101})\cos(H_{101}Y) + 2a_{13}\cos(H_{101}a^*)\cos(H_{101}c) + 2a_{23}\cos(H_{101}Y)\cos(H_{101}c), \quad (5)$$

$$\Delta_{011} = a_{11}\cos^2(H_{011}a^*) + a_{22}\cos^2(H_{011}Y) + a_{33}\cos^2(H_{011}c) + 2a_{12}\cos(H_{011}a^*)\cos(H_{011}Y) + 2a_{13}\cos(H_{011}a^*)\cos(H_{011}c) + 2a_{23}\cos(H_{011}Y)\cos(H_{011}c).$$

H_{hkl} means reciprocal-lattice vector; $\alpha^*, \beta^*, \gamma^*$ and other angles can be expressed in terms of the crystallographic interaxial angles according to known equations. The transformation of the found tensor a_{ik} into the diagonal tensor α_{ik}, i.e. reference of the tensor to the set of X',Y',Z' axes, is achieved using

$$D(\alpha) = -\alpha^3 + S_1\alpha^2 - S_2\alpha + S_3, \qquad (6)$$

$$S_1 = a_{11} + a_{22} + a_{33},$$

$$S_2 = \begin{vmatrix} a_{11} & a_{12} \\ a_{12} & a_{22} \end{vmatrix} + \begin{vmatrix} a_{11} & a_{13} \\ a_{13} & a_{33} \end{vmatrix} + \begin{vmatrix} a_{22} & a_{23} \\ a_{23} & a_{33} \end{vmatrix},$$

$$S_3 = \begin{vmatrix} a_{11} & a_{12} & a_{13} \\ a_{12} & a_{22} & a_{23} \\ a_{13} & a_{23} & a_{33} \end{vmatrix}.$$

There are 3 figures; and 5 references, 4 Soviet, 1 U.K. The U.K. reference is: Y. A. Wooster, Textbook on Crystalphysics, Oxford, 1938.

An X-Ray Diffraction Method for the Determination of the Thermal Expansion Tensors of the Crystals of Low Symmetry

75994
SOV/70-4-5-16/36

ASSOCIATION: Moscow State University imeni M. V. Lomonosov (Moskovskiy gosudarstvennyy universitet imeni M. V. Lomonosova)

SUBMITTED: May 21, 1959

Card 6/6

PHASE I BOOK EXPLOITATION SOV/5021

Umanskiy, Mark Moiseyevich

Apparatura rentgenostrukturnykh issledovaniy (Apparatus for X-Ray Diffraction Analysis) Moscow, Fizmatgiz, 1960. 348 p. 6,500 copies printed. (Series: Fiziko-matematicheskaya biblioteka inzhenera)

Ed.: A. L. Chernyak; Tech. Ed.: S. N. Akhlamov.

PURPOSE: This book is intended for the scientific and technical personnel of institute and plant laboratories concerned with x-ray analysis. It may also be used by students majoring in crystallography, physical metallurgy, and x-ray analysis at schools of higher education.

COVERAGE: The book reviews modern equipment and methods used in x-ray analysis. X-ray goniometers, x-ray cameras for high and low temperatures, x-ray cameras for single and polycrystals, and cameras with monochromatized radiation are described. No personalities are mentioned. There are 186 references: 71 Soviet, 97 English, 13 German, and 5 French.

Card 1/9

PHASE I BOOK EXPLOITATION SOV/4164

Vsesoyuznoye soveshchaniye po splavam redkikh metallov. 1st, Moscow, 1957

Redkiye metally i splavy; trudy... (Rare Metals and Alloys; Transactions of the First All-Union Conference on Rare-Metal Alloys) Moscow, Metallurgizdat, 1960. 438 p. 3,150 copies printed.

Sponsoring Agencies: Akademiya nauk SSSR. Institut metallurgii; USSR Komissiya po redkim metallam pri nauchno-tekhnicheskom komitete.

Ed.: I.I. Shapovalov; Ed. of Publishing House: O.M. Kamayeva; Tech. Ed.: P.G. Islent'yeva.

PURPOSE: This collection of articles is intended for metallurgical engineers, physicists, and workers in the machine-building and radio-engineering industries. It may also be used by students of schools of higher education.

COVERAGE: The collection contains technical papers which were presented and discussed at the First All-Union Conference on Rare-Metal Alloys, held in the Institute of Metallurgy, Academy of Sciences USSR in November 1957. Results of investigations of rare-metal alloys, titanium, and copper-base alloys with additions of rare metals are presented and discussed along with investigations of rhenium, vanadium, niobium, and their alloys. The effect of rare-earth metals on properties of magnesium alloys and steels is analyzed. The uses of rhenium as a dehydrating catalyst, electroplating material, and material suitable for making plugs for automobile electrical systems are discussed. Also, the effect of the addition of certain elements on the properties of heat-resistant steel is examined and alloys with special physical properties (particularly semiconductive alloys) are discussed. No personalities are mentioned. Soviet and non-Soviet references accompany some of the articles.

PART II. TITANIUM, AND COPPER-BASE ALLOYS WITH RARE-METAL ADDITIONS

Rare Metals (Cont.) SOV/4164

PART VI. ALLOYS WITH SPECIAL PHYSICAL PROPERTIES

PART VII. RESOLUTION

AVAILABLE: Library of Congress
Card 4/8

VK/wrc/efm
10/14/60

(14)

Umanskiy, M.M.

24.7100

78093
SOV/70-5-1-7/30

AUTHORS: Umanskiy, M. M., Zubenko, V. V., Zolina, Z. K.

TITLE: Concerning the Precision Measurement of Unit Cell Parameters

PERIODICAL: Kristallografiya, 1960, Vol 5, Nr 1, pp 51-55 (USSR)

ABSTRACT: A commission of the International Union of Crystallography allowed laboratories in 16 different countries to determine the identity periods of silicon, tungsten, and diamond, and found 0.013% difference in the results (which was considerably higher than the errors considered possible by various authors). Having received the same tungsten from W. Parrish, previously studied by the above laboratories, the authors studied it using well-adjusted cameras RKU-95 and RKU-114, whose diameters at various points did not differ by more than 0.02 mm. Narrow pinholes reduced the vertical divergence of beams to 0.3 to 0.6°. By placing the cameras in an air thermostat and controlling it by precise thermocouples, a stable temperature within ±0.2°C was provided. The

Card 1/5

powder cylinders were 0.1 mm except for 1 specimen of 0.4 mm. The diffraction photographs were measured by comparator IZA-2 supplemented with an ocular of higher magnifying power. The diffraction line spacings for the sensitive regions ($\theta > 55^\circ$) of the same powder photographs of silicon and tungsten, were measured by 10 persons independently, 2 to 3 times by each; consequently, over 500 experimental values of θ were calculated and differed within $\pm 0.007^\circ$ ($25''$); while those based on 1 person's measurements varied within $\pm 0.003^\circ$ ($11''$). 43 photographs were taken from 11 powder specimens at 25° C by Cu, Ni, Co, W, and Fe radiation and an identity period, a, was computed assuming it a linear function of

$$\xi = \frac{1}{2}\left(\frac{\cos^2\theta}{\sin\theta} + \frac{\cos^2\theta}{\theta}\right)$$

Since the reliability of a, computed on the basis of different θ values and relative intensity I of diffractions, varies proportional to Itanθ, the value of a, extrapolated to θ maximum, was obtained according to

$$a = \frac{CD - BE}{AD - B^2},$$

where

$$A = \sum I_i \operatorname{tg} \theta_i; \quad D = \sum \xi_i^2 I_i \operatorname{tg} \theta_i;$$
$$B = \sum \xi_i I_i \operatorname{tg} \theta_i; \quad E = \sum a_i \xi_i I_i \operatorname{tg} \theta_i;$$
$$C = \sum a_i I_i \operatorname{tg} \theta_i.$$

The obtained values of a were then corrected for refraction of X-rays according to $a_{corrected} = a_{extrapolated}$ $(1 + \delta)$, where

Card 3/5

$$\delta = 1 - n = 2{,}70 \cdot 10^{-6} \frac{Z\rho}{A} \lambda$$

n is refraction index; Z is atomic number, ρ is density; A is atomic weight. The figures, taking into account the average error $\Delta\theta = 25''$, are compiled in Table 3. The error ratio a:a = 0.0016% can perhaps be reduced if maximum θ approaches 90°, but larger θ require corrections for dispersion, polarization, and Lorentz factors. The error in the a determination increases rapidly with decreasing θ, as was the case using Fe radiation. The precision measurements by the use of diffractometers are still in the experimental stage and are expected to increase the accuracy of measurements. There are 3 tables; and 10 references, 4 Danish, 2 Soviet, 2 U.K., 1 U.S., 1 German. The U.S. and U.K. references are: W. Parrish, Precision Measurement of Lattice Parameters, Report Nr 2, 1958; E. R. Pike, A. J. C. Wilson, Brit. J. Appl. Phys., 10, 57-68, 1959; J. B. Nelson,

Concerning the Precision Measurement of Unit Cell Parameters

78098
SOV/70-5-1-7/30

Table 3. Summary of unit cell parameters for tungsten obtained by different radiations

RADIATION	θ_{HKL}	$a_{CALCULATED}$	Δa. $\times 10^4$	CORRECTION FOR REFRACTION	a, Å
Cu	79°35'	3,16514	6	0,00016	3,16530
Ni	79°11'	3,16502	6	0,00018	3,16520
Co	78°51'	3,16506	7	0,00021	3,16527
W	82°45'	3,16504	4	0,00014	3,16518
				AVERAGE	3,16524±5
Fe	75°44'	3,16491	8	0,00025	3,16516

D. P. Riley, Proc. Phys. Soc., 57, 160, 1945.

ASSOCIATION: Moscow State University imeni M. V. Lomonosov (Moskovskiy gosudarstvennyy universitet imeni M. V. Lomonosova)

SUBMITTED: September 3, 1959

Card 5/5

ZEVIN, L.S.; UMANSKIY, M.M.; KHEYKER, D.M.; PANCHENKO, Yu.M.

Diffractometric methods in precision measurements of the parameters of elementary cells. Kristallografiia 6 no.3:348-356 My-Je '61. (MIRA 14:8)

1. NIIasbesttsement i Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova.
(X rays--Diffraction) (Crystallography)

S/032/61/027/009/004/019
B117/B101

AUTHORS: Bogomolov, K. S., Zubenko, V. V., Kondakhchan, A. O., and Umanskiy, M. M.

TITLE: Comparison characteristics of new X-ray films

PERIODICAL: Zavodskaya laboratoriya, v. 27, no. 9, 1961, 1117-1122

TEXT: The photochemical industry of the USSR recently started the production of new X-ray films with different photographic properties. (The new X-ray films were elaborated at the Shostkinskiy khimzavod (Shostka Chemical Plant) by A. O. Kondakhchan, S. A. Verkhovets, V. V. Vasil'yev, L. A. Khomich, Z. I. Pavlenko, and tests were conducted by I. I. Shal'nov and N. P. Blok. At the Kazanskiy zavod (Kazan' Plant), the films were elaborated by I. A. Novik, and B. B. Tsyrlina, and the tests were conducted by G. V. Derstuganov). The object of the present study was to determine the main characteristics of the new films, including sensitometric characteristics of the visible light, white X radiation at 80 kv tube voltage and soft monochromatic radiation of different wavelengths. Most of the methods of determining the characteristics mentioned are generally

Card 1/

Comparison characteristics of ...

known. Only the method of determining the sensitometric characteristics with soft X radiation is described. The monochromatic radiation was obtained by the reflection from the monochromator crystal. Quartz (reflecting face 101), silicon (111) and, in some cases, LiF (100) were used. A narrow spectral range corresponding to the maximum of white radiation at 40 kv tube voltage was isolated for radiation with a wavelength of $\lambda = 0.45$ Å. The radiation intensity was kept constant by stabilizing the voltage of the entire installation and the anodic current of the tube. This was controlled by counting the impulses with a Geiger counter placed directly behind the film. To find the characteristic curve, a series of markings with different exposure times was obtained on the film. The temperature of the developer was kept constant at $18 \pm 0.5^{\circ}C$. Developing time was 8 min according to recommendations by manufacturers. A standard developer for X-ray film, and a developer of the zavod "Chistyye soli" (Plant "Chistyye soli") were used. The developed films were photometrically investigated on a microphotometer of the МФ-4 (MF-4) type. On the basis of data obtained, characteristic curves D = f(logE) were plotted, where D = density of the blackening, and E = exposure. The relative film sensitivity $S_{d=0.85}$ and $S_{g=1.0}$, constant γ and the background density were determined from the characteristic curve.

Card 2/

Comparison characteristics of ...

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B117/B101

The sensitivity for monochromatic X radiation was determined in a similar way in combination with an УФДМ(UFDM) intensifying screen. The investigations showed that the relative sensitivity of different films depended on the wavelength. The difference in sensitivity of films is reduced as the wavelength increases. The same is observed when using intensifying screens. The intensification coefficient of the screen increases with increasing light sensitivity of films. The new types of X-ray films can be used for X-ray structural, X-ray spectrum analyses, material tests (defectoscopy), etc. The main characteristics of the X-ray films investigated are listed in Table 1, the sensitivity of some X-ray films for monochromatic X radiation of different wavelengths in Table 2, and the sensitivity when using intensifying screens in Table 3. There are 6 tables, and 1 non-Soviet reference.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)
Nauchno-issledovatel'skiy kinofotoinstitut (Scientific Research Institute of Motion Picture Photography)

Card 3/6

ZEVIN, L.S.; UMANSKIY, M.M.; KHEYKER, D.M.

Geometrical aberrations and optimum conditions for X-ray diffraction measurements of polycrystals. Kristallografiia 8 no.4:663-673 Jl-Ag '63. (MIRA 16:9)

1. Nauchno-issledovatel'skiy institut asbesta, slyudy, asbestotsementnykh izdeliy i proyektirovaniya stroitel'stva predpriyatiy slyudyanoy promyshlennosti i Moskovskiy gosudarstvennyy universitet imeni Lomonosova.

(X-ray crystallography)

ZEVIN, L.S.; UMANSKIY, M.M.

Technique of allowing for vertical divergence in diffractometric measurements of the parameter of an elementary cell. Kristallografiia 9 no.3:399-402 My-Je '64. (MIRA 17:6)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova i Nauchno-issledovatel'skiy institut asbesta, slyudy, asbesto-tsementnykh izdeliy i proyektirovaniya stroitel'stva predpriyatiy slyudyanoy promyshlennosti.

UMANSKIY, M.M.; ZOLINA, Z.K.; ZUBENKO, V.V.; KOZLOVSKIY, V.F.

Comparison of the efficiencies of BSV-1, BSV-2, BSV-4, BSV-6, BSV-8, and BSV-9 tubes in structure studies. Kristallografiia 8 no.2:300-301 Mr-Ap '63. (MIRA 17:8)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.

VINNIK, I.D., inzh.; UMANSKIY, M.P., inzh.

Basic parameters of exit nozzle design for marine steam turbines. Sudostroenie 27 no.6:27-32 Je '61. (MIRA 14:6)
(Marine turbines)

AMELYUSHKIN, V.N., inzh.; UMANSKIY, M.P.

Effect of the spin on the efficiency of a rectilinear diffuser. Energomashinostroenie 9 no.12:18-21 D '63. (MIRA 17:1)

ACCESSION NR: AP4007243 S/0114/63/000/012/0018/0021

AUTHOR: Amelyushkin, V. N. (Engineer); Umanskiy, M. P. (Engineer)

TITLE: Effect of flow vortex on the efficiency of a curvilinear diffuser

SOURCE: Energomashinostroyeniye, no. 12, 1963, 18-21

TOPIC TAGS: vortex effect, diffuser efficiency, curvilinear diffuser, vortex flow, diffuser, turbine, diffuser design, vortical flow

ABSTRACT: An experimental investigation of the curvilinear outlet diffuser of a jet gas-turbine engine is described. Shaped according to dp/dx = const (see Enclosure 1), the diffuser has an expansion ratio of n = 3. Eight longitudinal stiffening ribs, 7-mm thick, were mounted in the diffuser gas path. In the course of tests, the ribs were trimmed by $\bar{\delta} = \delta / l$ equal to 0.3, 1.0, 3.1, where l is the duct height in cross-section II-II. The distance $\delta = 9.1$ corresponded to the case where the ribs were removed from the diffuser and 8 stud bolts, 10-mm in diameter, were mounted in section III-III instead. Twisting grids (cascades) permitted varying the outlet angles from 16° to 90°. Nonuniformity of the velocity fields at II-II was 1.01-1.03 with a swirl angle of 90°-35°, and 1.05-1.08 with

Card 1/3

ACCESSION NR: AP4007243

16° and 28°. The Mach number varied within 0.16-0.28, Reynolds number $(3.5\text{-}4.0)\times10^5$. The diffuser efficiency was assessed by $\eta=\frac{1-\zeta_n}{1-\frac{1}{n^2}}$, and also by $\zeta_n=\zeta_{n.p}-\zeta_p$, where $\zeta_{n.p}=\frac{p_{01}-p_3}{k^a_{2r}}$ is the total loss factor covering the energy loss in the twisting grid; $\zeta_p=\frac{p_{01}-p_{02}}{k^a_{2r}}$ is the resistance factor of the twisting grid; p_{01} and p_{02} are the total pressures, kg/m², in I-I and II-II; p_3 is the static pressure in III-III; $k^a_{2r}=\frac{G^2}{2g\rho^2F_2^2\sin^2\alpha_2}$ is the kinetic energy of the flow in II-II calculated with an allowance for twisting. It was found that the lowest losses occur in the diffuser without ribs; experimental data on losses and efficiency for various rib replacements and vortex angles are supplied. Orig. art. has: 5 figures and 6 formulas.

ASSOCIATION: Leningradskiy Kirovskiy zavod (Leningrad Kirov Plant)

SUBMITTED: 00 DATE ACQ: 24Jan64 ENCL: 01

SUB CODE: PR NO REF SOV: 002 OTHER: 000

Card 2/3

L 19552-65

ACCESSION NR: AP4048330 S/0114/64/000/010/0008/0011

AUTHOR: Umanskiy, M. P. (Engineer

TITLE: Investigation of axial-radial diffuser

SOURCE: Energomashinostroyeniye, no. 10, 1964, 8-11

TOPIC TAGS: turbomachine, diffuser, diffuser design, diffuser characteristics

ABSTRACT: Four types of radial-axial diffusers (see Enclosure 1) were tested on an outfit that had an equated velocity field. The quality of the diffusers was evaluated by two coefficients: the total loss factor and the efficiency. These results are reported: (1) With a specified input-flow velocity, the optimum expansion of the diffuser varies, depending on its size and type (e.g., 3.45, 3.20, and 2.90 for types B, C, and D, respectively; (2) The total expansion can be [illegible]

n_8 = 1.3—1.4; these aperture angles are [illegible]

Card 1/3

ACCESSION NR: AP4048336

$\gamma_0 = 10-12^\circ$ $\beta_0 = 0^\circ$ or $\gamma_0 = 15^\circ$ $\beta_0 = 5^\circ$ [illegible] in axial-radial diffusers with $n_p \leq 1.5$ the introduction of an annular blade wheel yields little effect. [illegible] and 4 formulas

ASSOCIATION: none

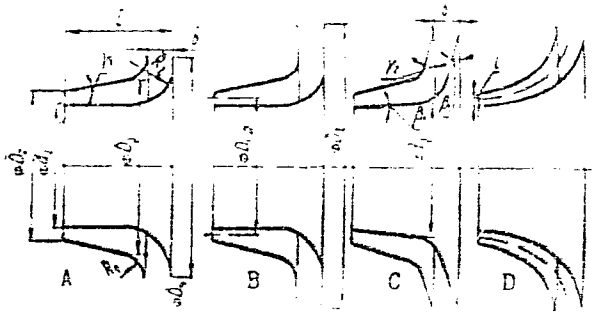
SUBMITTED: 00 ENCL: 01

SUB CODE: PR NO REF SOV: 003 OTHER: 000

Card 2/3

L 19552-65
ACCESSION NR: AP4048330

ENCLOSURE: 1



Four axial-radial diffuser types

Card 1/3

UMANSKIY, M.S.

V.L. Chervanev increases the efficiency of precise instruments. Mashinostroitel' no.2:24-26 F '57. (MLRA 10:5)

1. Khar'kovskiy traktornyy zavod.
(Measuring instruments)
(Chervanev, V.L.)

UMANSKIY, M.Ya.

Graphic and analytic methods for determining combination frequencies in superheterodyne receivers. Radiotekhnika 14 no.2:31-38 F '59. (MIRA 12:1)

(Radio--Receivers and reception)

UMANSKIY, N.

We are masters here. Sov. profsoiuzy 18 no.3:21 F '62. (MIRA 15:3)

1. Predsedatel' fabrichnogo komiteta Khersonskogo tekstil'nogo kombinata.

(Kherson--Textile workers)

UMANSKIY, N.A., inzh.; POLISHCHUK, V.V., inzh.

Aerodynamic attachment to a wool carder. Khim.mashinostr. no.3: 43-45 My-Je '63. (MIRA 16:11)

UMANSKIY, N.G., kand.arkhitektury

Designing and building meat combines and dairy plants. Prom. zdan. no.1:16-29 '59. (MIRA 13:8)
(Dairy plants) (Meat industry)

UMANSKIY, N.L.; KOLESOVA, B.B., redaktor; LYUDKOVSKAYA, N.I., tekhnicheskiy redaktor

[Conveying machinery in the molding of cement and sand tiles] Konveiernaia mashina dlia formovaniia tsementno-peschanoi cherepitsy. [Moskva] Gos. izd-vo lit-ry po stroit. materialam, 1956. 31 p. (Conveying machinery) (Tiles) (MLRA 10:1)

UMANSKIY, Naum L'vovich; PAL'KOV, Iosif Azraelevich [deceased]; SOKOLOV, Yu.B., nauchnyy redaktor; SHPAYER, A.L., redaktor; PYATAKOVA, N.D., tekhnicheskiy redaktor.

[Manufacture and use of tiles made of cement and sand] Proizvodstvo i primenenie tsementno-peschanoi cherepitsy. Moskva, Gos.izd-vo lit-ry po stroit.materialam, 1957. 103 p. (MIRA 10:11)
(Tiles, Roofing)

UMANSKIY, N. L.

PHASE I BOOK EXPLOITATION SOV/5822

Alekseyev, Semen Mikhaylovich, Yakov Vladimirovich Balkind, Aleksandr Mironovich Gorshkovich, Veniamin Semenovich Yeremin, Aleksandr Solomonovich Povitskiy, and Naum L'vovich Umanskiy

Sovremennyye sredstva avariynogo pokidaniya samoleta (Modern Facilities for the Emergency Abandonment of an Airplane) Moscow, Oborongiz, 1961. 450 p. Errata slip inserted. 4000 copies printed.

Reviewer: A. G. Brunov, Engineer; Ed.: A. I. Sokolov, Engineer; Ed. of Publishing House: A. G. Belovtsova; Tech. Ed.: P. V. Shcherbakov; Managing Ed.: S. D. Krasil'nikov.

PURPOSE: This book is intended for engineering and technical personnel in the aircraft industry, scientific workers, and flying and technical personnel of the Soviet Air Force.

COVERAGE: Based on non-Soviet sources, the book reviews briefly the development of flyers' escape equipment, describes the construction of ejection seats, and gives design and calculation

Card 1/12

Modern Facilities (Cont.) SOV/5822

data for ejection seats and ejection-seat parachutes. Information is included on the calculation of the trajectory of the ejected seat, its stabilization, and the aerodynamic loads involved. Attention is given to methods of escaping from aircraft flying at high speeds and at high and low altitudes. Information on problems connected with oxygen equipment, protective clothing, and testing facilities is also included. No personalities are mentioned. The authors thank A. G. Brunov, D. D. Tkachov, and N. I. Aleksandrova, Engineers, for valuable suggestions; and N. A. Lobanov, Candidate of Technical Sciences, for writing Subheading 9 of Ch. III. There are 34 references: 31 Soviet (5 translations), and 3 English.

TABLE OF CONTENTS:

Card 2/12

UMANSKIY, N.S. (Kishinev)

Device for vibration massage of the gums. Stomatologiia 42 no.4:99 Jl-Ag'63 (MIRA 17:4)

DUSHIN, B.M. [Dushyn, B.M.]; LITVINOV, M.R. [Lytvynov, M.R.]; UMANSKIY, O.A. [Umans'kyi, O.A.]

Refining of chrome leather with grain defects. Leh.prom. no.1:31-32 Ja-Mr '63. (MIRA 16:4)

1. Kiyevskiy kozhevennyy kombinat No.6.

DUSHIN, B.M. [Dushyn, B.M.]; GERSHENGORN, M.S.; UMANSKIY, O.A. [Umans'kyi, O.A.]; DERBAREMDIKER, M.R., kand.tekhn.nauk

Refining of Russian leather and large hides with deep grain defects. Leh.prom. no.3:15-16 Jl-S '63. (MIRA 16:11)

1. Kiyevskiy kozhevennyy kombinat No.6.

FEDOROV, A.M., kand. tekhn. nauk; IVANOV, A.M., inzh.; LYUL'KO, Ye.V., inzh.; UMANSKIY, P.Ya., inzh.

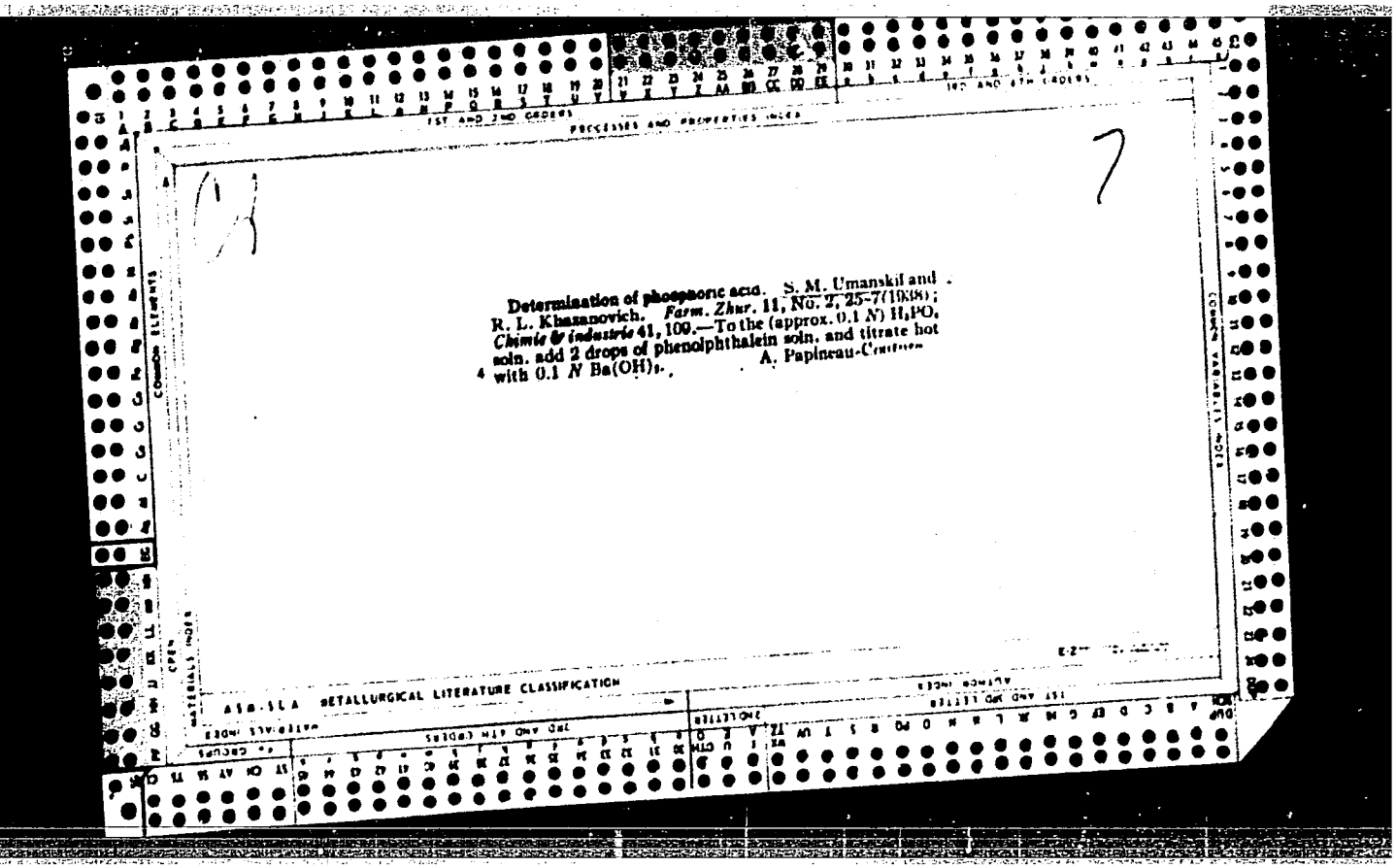
Simplify and put in good order the bookkeeping and settlement of general expenses in mining. Shakht. stroi. 9 no.9:6-8 S '65. (MIRA 18:9)

1. Gosudarstvennyy komitet po toplivnoy promyshlennosti pri Gosplane SSSR (for Fedorov). 2. Gosudarstvennyy institut po proyektirovaniyu shakht v yuzhnykh rayonakh SSSR (for Ivanov, Lyul'ko, Umanskiy).

UMANSKIY, P.Ya., gornyy inzh.; KHMURA, A.I., gornyy inzh.

"Preparation of documentation for estimates and accounting procedures in main mine construction" by L.IA.Furberov, A.A. Turin, N.L.Topil'skii. Reviewed by P.IZ.Umanskii, A.I.Khmura. Ugol' Ukr. 6 no.11:44-45 N '62. (MIRA 15:12)

1. Gosudarstvennyy institut po proyektirovaniyu shakhtnogo stroitel'stva v yuzhnykh rayonakh SSSR.
(Mining engineering)
(Furberov,L.IA.) (Turin,A.A.) (Topil'skii, N.L.)



Determination of phosphoric acid. S. M. Umanskii and R. L. Khasanovich. *Farm. Zhur.* 11, No. 2, 25-7(1938); *Chimie & industrie* 41, 109.—To the (approx. 0.1 *N*) H_3PO_4 soln. add 2 drops of phenolphthalein soln. and titrate hot with 0.1 *N* $Ba(OH)_2$. A. Papineau-Couture

UMANSKIY, R.G., inzh.

Factory lighting in foreign countries. Prom. stroi. 39 no. 2:56-61. '61. (MIRA 14:2)

(Factories—Lighting)

UMANSKIY, R.G., inzh.

Construction of new and expansion of existing machinery plants. Opyt zarub. stroi. no.4:31-68 '62. (MIRA 16:7)

(Machinery industry)
(Factories--Design and construction)

UMANSKIY, R.G., inzh.

Features of three-dimensional plans and design details of instrument and electrical engineering plants. Prom.stroi. 40 no.6:53-57 '62. (MIRA 15:6)
(Factories--Design and construction)

UMANSKIY, Roman Grigor'yevich, polkovnik zapasa, chlen Kommunisticheskoy partii Sovetskogo Soyuza; BARANOV, N.V., red.; ANIKINA, R.F., tekhn.red.

[On the battle line] Na boevykh rubezhakh. Moskva, Voen.izd-vo M-va obor.SSSR, 1960. 286 p. (MIPA 13:9)
(Military engineering)

TABLE OF CONTENTS:

Card 1/2

ACCESSION NR AM5012943

SUBMITTED: 16Sep64 SUB CODE: PH, LS

Card 2/2

UMANSKIY, Semen Petrovich; LEVASHOV, V.V., kand. med. nauk, polkovnik, retsenzent; LATYNIN, Ye.B., red.

[Endurance barrier of a pilot] Bar'er vynoslivosti letchika. Moskva, Mashinostroenie, 1964. 169 p. (MIRA 18:1)

LUTAY, N.V., inzh.; UMANSKIY, S.P., inzh.

Automatic line for machining pipes. Mekh. i avtom. proizv. 18 no.6:3-4 Je '64. (MIRA 17:9)

86-58-4-17/27

AUTHOR: Umanskiy, S. P., Engineer

TITLE: Safety Equipment for High-altitude Flights (Zaschitnoye snaryazheniye dlya vysotnykh poletov)

PERIODICAL: Vestnik vozdushnogo flota, 1958, Nr 4, pp 64-68 (USSR)

ABSTRACT: This article deals with the special equipment used by air crews in high-altitude flights. First the author describes the physical characteristics of the atmosphere at various altitudes and then gives a general idea about the physiology of flight at high altitudes. This is followed by a brief and general description of oxygen masks and pressure suits and their use at high altitudes. Three diagrams.

AVAILABLE: Library of Congress

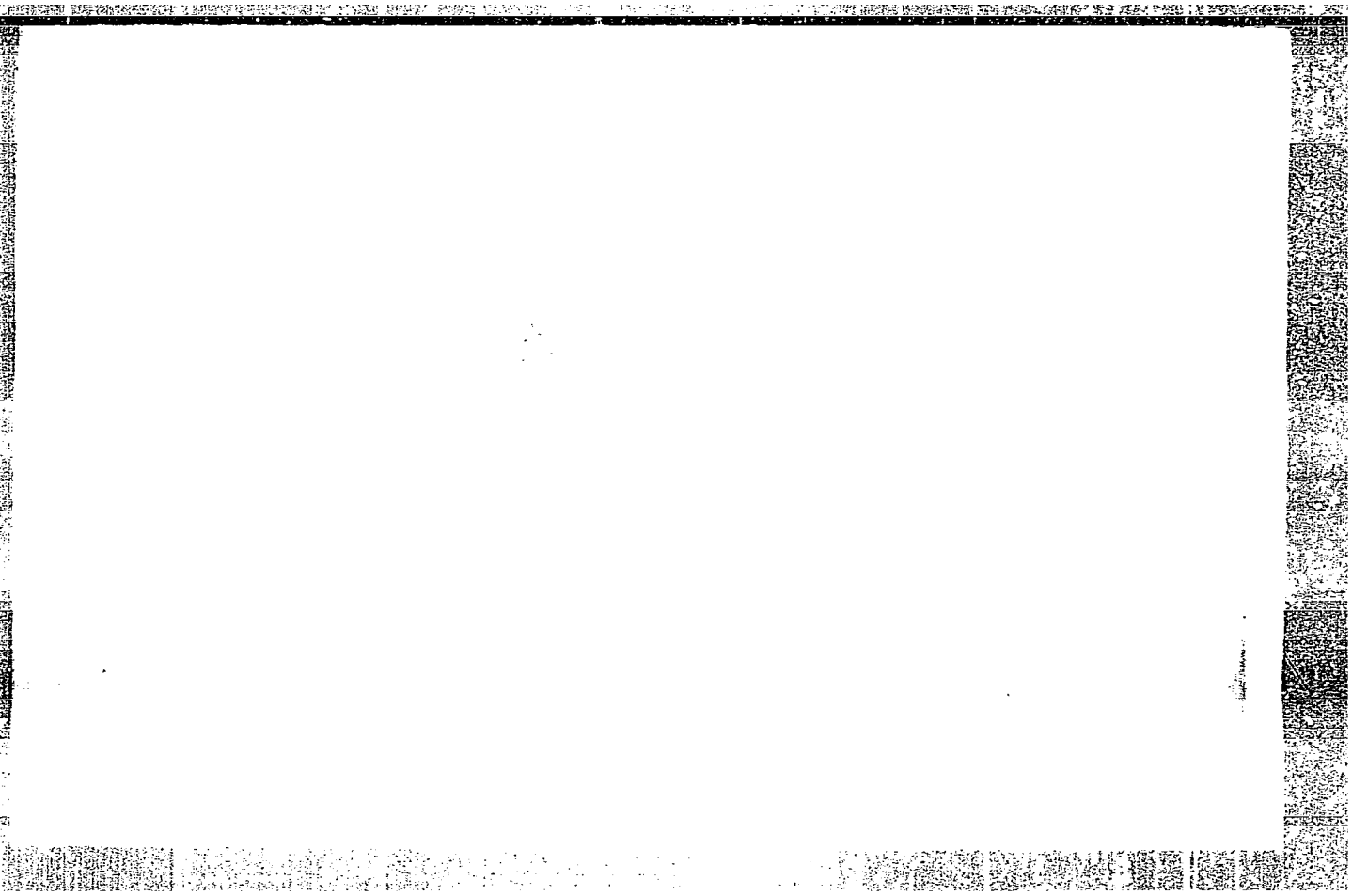
1. High altitude flights - Hazards 2. High altitude flights - Safety equipment 3. High altitude flights - Physiological effects

Card 1/1

TITLE: Suits of flyers and cosmonauts

SOURCE: Aviatsiya i kosmonavtika, no. 7, 1965, 54-60

ABSTRACT: This article is concerned with the evolution of flight suits and spa[illegible]. The first suits [illegible] by N. Yemshanov, Engineer-Colonel [illegible] balloon (19,000-m altitude) in 1933 to improved models of the [illegible] TsAGI-8** suits used at the present time. [illegible] development of flight suits commenced in 1937 with the TsAGI-1.



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ACCESSION NR: AP5017034

equipped with a "complex regeneration system." The TsAGI-4 was tested

Towards the end of 940, the TsAGI-3 was [illegible] Prewar flight suits were

Card 3/3

ACCESSION NR:

cosmonaut to maneuver in all directions in space is powered by hydrogen-peroxide

L 56495-65
ACCESSION NR: AP5017034

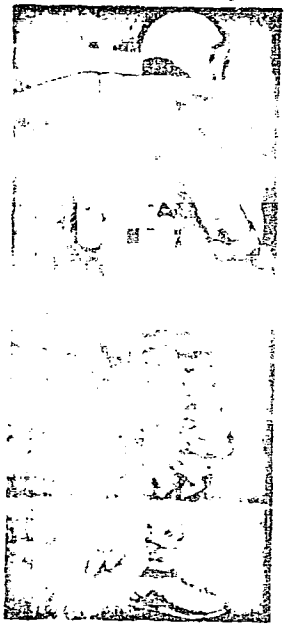


Fig. 2. Spacesuit with autonomous life-support system.

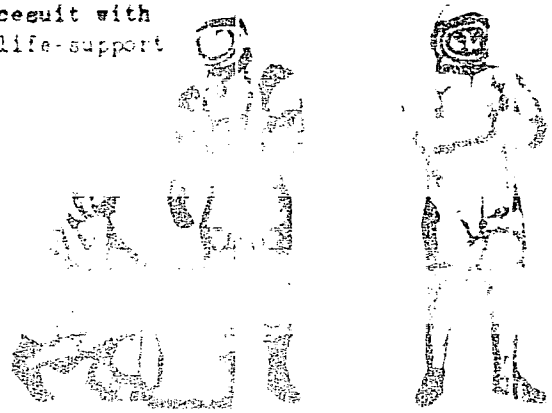
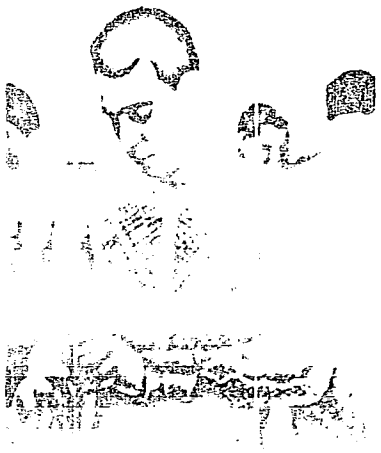


Fig. 3. Suit for space explorers

Card 5/9

ACCESSION NR



ACCESSION NR. [illegible]

by a tool which is either carried in the hand or on the spacesuit belt.

In speculating on future lunar flights, a diagram showing how the suit [illegible] of Enclosure 1.

type suits.

**Central Aerodynamic Research Institute imeni Zhykovskiy.

Orig. art. has: 5 figures.

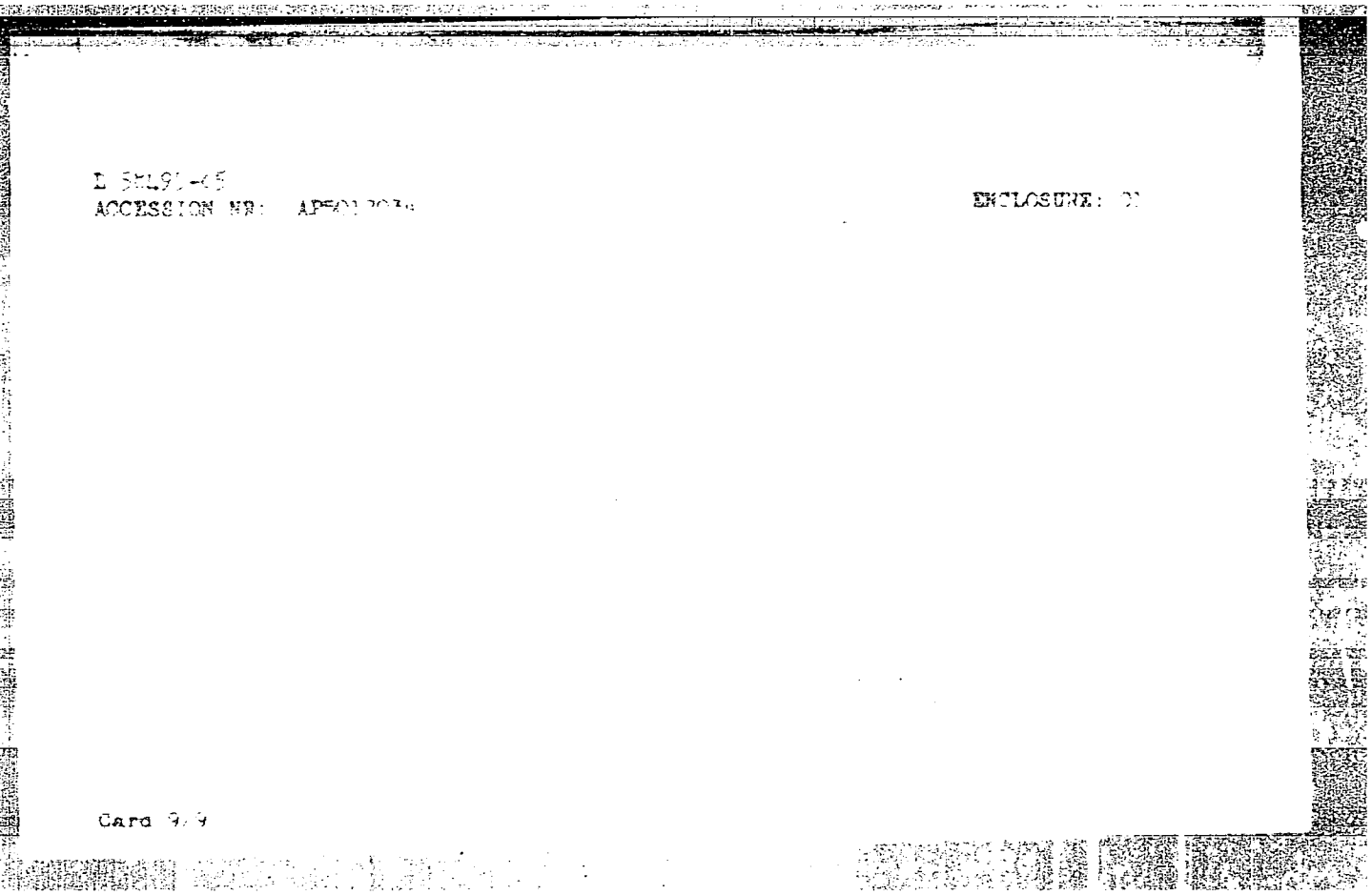
Card 7/9

L [illegible]
ACCESSION NR: AP5017034

[illegible]

SUBMITTED: [illegible] [illegible] [illegible]

[illegible]



IZAKSON, I., inzh.; KHARIF, B., inzh.; UMANSKIY, V., inzh.

The TO-2 continuous production line with lateral displacement of cars. Avt. transp. 37 no.8:19-22 Ag '59. (MIRA 12:12)
(Automobiles--Maintenance and repair)

UMANSKIY, Viktor Borisovich

(Electrical housting machines) Khar'kov, Gos. nauchnotekhn.

izd-vo. Ukrainy, 1935. 334 p.

UMANSKIY, Viktor Borisovich

(Mine hoisting equipment; a collection of articles)

Moskva, Ugletekhizdat, 1949. 210 p.

(51-18518)

Tn339.U5

UMANSKIY, V. B.

Harderability of 45 steel quenched in oil. Stan. i instr. 35 no.5:39 My '64. (MIRA 17:6)

ACC NR: AR6020945 SOURCE CODE: UR/0137/66/000/002/I100/I101

AUTHOR: Umanskiy, V. B.

TITLE: Bright non distortion quenching of steel parts in a 50 percent sodium hydroxide solution

SOURCE: Ref. zh. Metallurg, Abs. 2I685

REF SOURCE: Sb. r bot Rostovsk.-n/D. n.-i. in-ta tekhnol. mashinostr. vyp. 11, 1965, 125-137

TOPIC TAGS: carbon steel, metal heat treatment

TRANSLATION: A 50% NaOH solution with good cooling properties was proposed for use in heat treating shops as a general quenching medium for bright non-distortion quenching of carbon and low alloyed steels and a number of alloy steels. In the interest of reducing crack formation, distortion and warpage, coarse-clearance welded parts of complex shape should be quenched in 50% NaOH solutions. The insulation of the bath surface with spindle or other oil (10-20 mm layer thickness) increases the useful life of the bath to 6-8 months, since it protects the bath surface against interacting with the surrounding air and to a large extent guards the thermistors of the service bath against the corrosive action of the alkaline vapors. V. Olenicheva.

SUB CODE: 11

UDC: 621.785.54:669.14

Card 1/1 egh

UMANSKIY, V.I.; YAKUBOVICH, M.A., nauchn. red.

[Installations for the continuous casting of steel in capitalist countries] Ustanovki nepreryvnoi razlivki stali v kapitalisticheskikh stranakh. Moskva, TSentr. in-t informatsii chernoi metallurgii, 1963. 35 p.
(MIRA 17:10)

UMANSKIY, V.I., referent

Converters with oxygen blow in Brazil [from "Stahl and Eisen," no. 1, 1960]. Biul. TSIICHM no.2:52 '61. (MIRA 14:9)
(Brazil--Converters)

UMANSKIY, V.I.

Measurement of the liquid metal level in ingot molds during continuous steel casting [from "Neue Hutte," no.1, 1960]. Biul. TSIICHM no.4:58-59 '61. (MIRA 14:10)
(Continuous casting) (Liquid level indicators)

UMANSKIY, V.I.

Open-hearth furnace operation with an accelerated feed of oxygen [from "Iron and Steel," no.6, 1960]. Biul.TSIICHM no.4:56 '61. (MIRA 14:10)

(Italy--Open-hearth process)

ACC NR: AP6034153 SOURCE CODE: UR/0076/66/040/010/2551/2559

AUTHOR: Stepukhovich, A. D.; Umanskiy, V. M.

ORG: Saratov State University (Saratovskiy gosudarstvennyy universitet)

TITLE: Preexponential and steric factors in certain elementary reactions of hydrogen combustion

SOURCE: Zhurnal fizicheskoy khimii, v. 40, no. 10, 1966, 2551-2559

TOPIC TAGS: hydrogen, hydrogen combustion, chemical reaction kinetics, reaction mechanism, combustion research

ABSTRACT: The kinetics of elementary reactions of hydrogen combustion at ~800K has been studied. A detailed calculation was performed of the preexponential and steric factors of the bimolecular reactions of chain propagation and branching,

$$\dot{O}H + H_2 \rightarrow H_2O + \dot{H} \quad (I)$$

$$\dot{H} + O_2 \rightarrow \dot{O}H + \cdot O \cdot \quad (II)$$

$$\cdot O \cdot + H_2 \rightarrow \dot{O}H + \dot{H}, \quad (III)$$

UDC: 541.124/128

ACC NR: AP6034153

and of the trimolecular reaction of homogeneous chain breaking,

$$\dot{H} + O_2 + M \rightarrow H\dot{O}_2 + M. \qquad \text{(IV)}$$

where M = Ar. For reactions I—III the steric factors were found to be of the order of 10^{-3}, 10^{-1}, and 10^{-2}, respectively; the preexponential factors were found to be in good agreement with experimental data. For reaction IV the rate constant was calculated from transition state theory on the assumption that the weak H-Ar and O-Ar bonds in the activated complex are of the Van-der-Waals type. The calculated rate constant value was in good agreement with experiment (0.46×10^{-32} and 0.35×10^{-32} cm^6/mol^2 sec^{-1}, respectively). The zero-point activation energy for reaction IV was 2 kcal/mol. The steric factor for reaction IV, 2.9×10^{-3}, remained virtually constant with increasing temperature (rose very slightly). It was shown that taking into account the temperature dependence of the rate constant of reaction IV explains the nonagreement between the experimental values of the temperature increment of the upper pressure limit of hydrogen combustion and the calculated activation energy of reaction II. Orig. art. has: 2 tables, 4 figures and 16 formulas. [WA-68]

SUB CODE: 21, 07/ SUBM DATE: 160ct65/ ORIG REF: 013/
OTH REF: 008

Card 2/2

ACC NR: AP6034153 SOURCE CODE: UR/0076/66/040/010/2551/2559

AUTHOR: Stepukhovich, A. D.; Umanskiy, V. M.

ORG: Saratov State University (Saratovskiy gosudarstvennyy universitet)

TITLE: Preexponential and steric factors in certain elementary reactions of hydrogen combustion

SOURCE: Zhurnal fizicheskoy khimii, v. 40, no. 10, 1966, 2551-2559

TOPIC TAGS: hydrogen, hydrogen combustion, chemical reaction kinetics, reaction mechanism, combustion research

ABSTRACT: The kinetics of elementary reactions of hydrogen combustion at ~800K has been studied. A detailed calculation was performed of the preexponential and steric factors of the bimolecular reactions of chain propagation and branching.

$$\dot{O}H + H_2 \rightarrow H_2O + \dot{H} \quad (I)$$

$$\dot{H} + O_2 \rightarrow \dot{O}H + \cdot O \cdot \quad (II)$$

$$\cdot O \cdot + H_2 \rightarrow \dot{O}H + \dot{H}, \quad (III)$$

Card 1/2 UDC: 541.124/128

UMANSKIY, V.Ya.; KUPERMAN, A.A. (L'vov)

Device for lifting the bottom pads of a pneumatic press. Shvein. prom. no.2:35 Mr-Ap '63. (MIRA 16:8)

(Pressing of garments—Equipment and supplies)

KOLCHINA, G.V., kand. med. nauk; SMOLENSKAYA, I.Ya., assistent; UMANSKIY, V.Ya., assistent

Evaluation of fatigue in school children following their lessons conducted by the Lipetskii method. Gig. i san. 28 no.7:32-37 Jl '63. (MIRA 17:1)

1. Iz kafedry obshchey gigiyeny i kafedry gigiyeny detey i podrostkov Donetskogo meditsinskogo instituta imeni A.M. Gor'kogo.

UMANSKIY, YA

70-4-9/16

AUTHOR: Umanskiy, Ya., Yelyutina, V., Kagan, A. and Pivovarov, L.

TITLE: X-ray analysis of the changes in the mosaic structure during ageing of beryllium bronze. (Rentgenoanaliz izmeneniy mozaichnoy struktury pri starenii berilliyevoy bronzy)

PERIODICAL: "Kristallografiya" (Crystallography), 1957, Vol.2, No.4, pp. 503 - 507 (U.S.S.R.)

ABSTRACT: Disintegration of supersaturated solid solutions, as shown by means of X-rays, is followed by changes in mosaic structure, maximum hardness corresponding to minimum size of mosaic blocks.

A study of the disintegration of supersaturated solid solution of tungsten carbide in titanium carbide carried out by one of the authors showed that this process in its early stage is accompanied by an increase in the intensity of the (200) diffraction line of the solid solution. This increase could only be interpreted as caused by a decrease in the size of mosaic blocks of titanium carbide due to the influence of particles of precipitating phase. A similar increase of intensity was observed by other investigators after decrease of block dimensions caused by plastic deformation.

In the present investigation this assumption was studied

Card 1/4

X-ray analysis of the changes in the mosaic structure during ageing of beryllium bronze. (Cont.)

	Block dimensions			Vickers hardness		
	As quenched	Minimum	Overaged	As quenched	Maximum	Overaged
Ni-Be	1.2	0.3[1]	1	170	310[1]	260
Cu-Be	0.7	0.2[2]	0.5	100	380[2]	230

[1] 10 min. [2] 15 hr.

Minimum dimensions of solid solution micromosaic correspond in both cases to maximum hardness. Coagulation of the precipitate leads to an increase in size of the blocks with corresponding decrease in hardness. According to the hypothesis suggested by one of the authors age-hardening is caused to a great extent by the decrease in the size of solid-solution blocks, whereas the decrease of hardness after over-ageing is due to their coagulation.
There are 4 figures, two tables and 7 references, 5 of which are Slavic.

ASSOCIATION: Moscow Institute of Steel im. I.V. Stalin (Moskovskiy Institut Stali im. I.V. Stalina)

Card 3/4

70-4-9/16

X-ray analysis of the changes in the mosaic structure during ageing of beryllium bronze. (Cont.)

SUBMITTED: February 28, 1957,

AVAILABLE: Library of Congress.

Card 4/4

S/070/60/005/004/015/016/XX
E132/E460

AUTHORS: Kagan, A.S., Somenkov, V.A. and Umanskiy, Ya.C.

TITLE: Diffuse Scattering of X-Rays by Aluminum Brass

PERIODICAL: Kristallografiya, 1960, Vol.5, No.4, pp.540-543

TEXT: Measurements of the diffuse scattering of X-rays by aluminum brass containing 18 at.% Al is carried out in an evacuated camera by means of a Geiger counter. CuKα radiation used in the investigation was monochromatized through the diffraction from a germanium crystal cut parallel the plane (111); the advantage of such Ge monochromator being the absence of (222) reflection. The scattered intensities were converted to absolute scale by comparison with the scattering by melted silica. The contribution of Compton scattering, temperature diffuse scattering and double Bragg scattering was estimated and eliminated. A correction for anomalous dispersion was included into calculations of Laue scattering. The diffuse scattering by quenched from 700°C samples was measured in the range from 8 to 43° in Bragg angles. The calculation of the short range order coefficients carried out for six coordination shells in the assumption that coefficients of the size effect β_i are equal

Card 1/3

S/070/60/005/004/015/016/XX
E132/E460

Diffuse Scattering of X-Rays by Aluminum Brass

to zero gave following figures:

$\alpha_1 = -0.43 \pm 0.10$, $\alpha_2 = +0.12 \pm 0.05$, $\alpha_3 = -0.32 \pm 0.05$,

$\alpha_4 = +0.28 \pm 0.10$, $\alpha_5 = -0.27 \pm 0.05$, $\alpha_6 = -0.77 \pm 0.10$.

The diffuse scattering curve plotted on the basis of the short range coefficients given above agrees reasonably with the experimental curve, thus supporting the assumption $\beta_i = 0$ made previously. This assumption is supported also by measurements of static displacements estimated from the intensities of structure lines. The annealing reduces the short range order, the amount of reduction increasing with the annealing temperature. The short range order is considerably destructed by cold working. The best short range order was discovered after a low-temperature annealing (260°C) of cold worked sample. These data explain the anomaly of the behaviour of aluminum brass after cold working and annealing. As the coefficients of the short range order for the first

Card 2/3

S/070/60/005/004/015/016/XX
E132/E460

Diffuse Scattering of X-Rays by Aluminum Brass

coordination shell were considerably higher than they should be for the superstructure Cu_3Au it was assumed that the atomic scattering functions of alloy components differ from atomic scattering functions of pure elements. This assumption was confirmed by an analysis of the intensities scattered by an intermetallic compound NiAl. There are 4 figures, 1 table and 12 references: 7 Soviet and 5 English.

ASSOCIATION: Moskovskiy institut stali im. I.V.Stalina
(Moscow Steel Institute im. I.V.Stalin)

SUBMITTED: February 8, 1960

Card 3/3

KOZLOVA, Yekaterina Ivanovna; UMANSKIY, Ya.N., dotsent, otv.red.; BLINOVA, N.V., red.; LEBEDEVA, V.I., tekhn.red.

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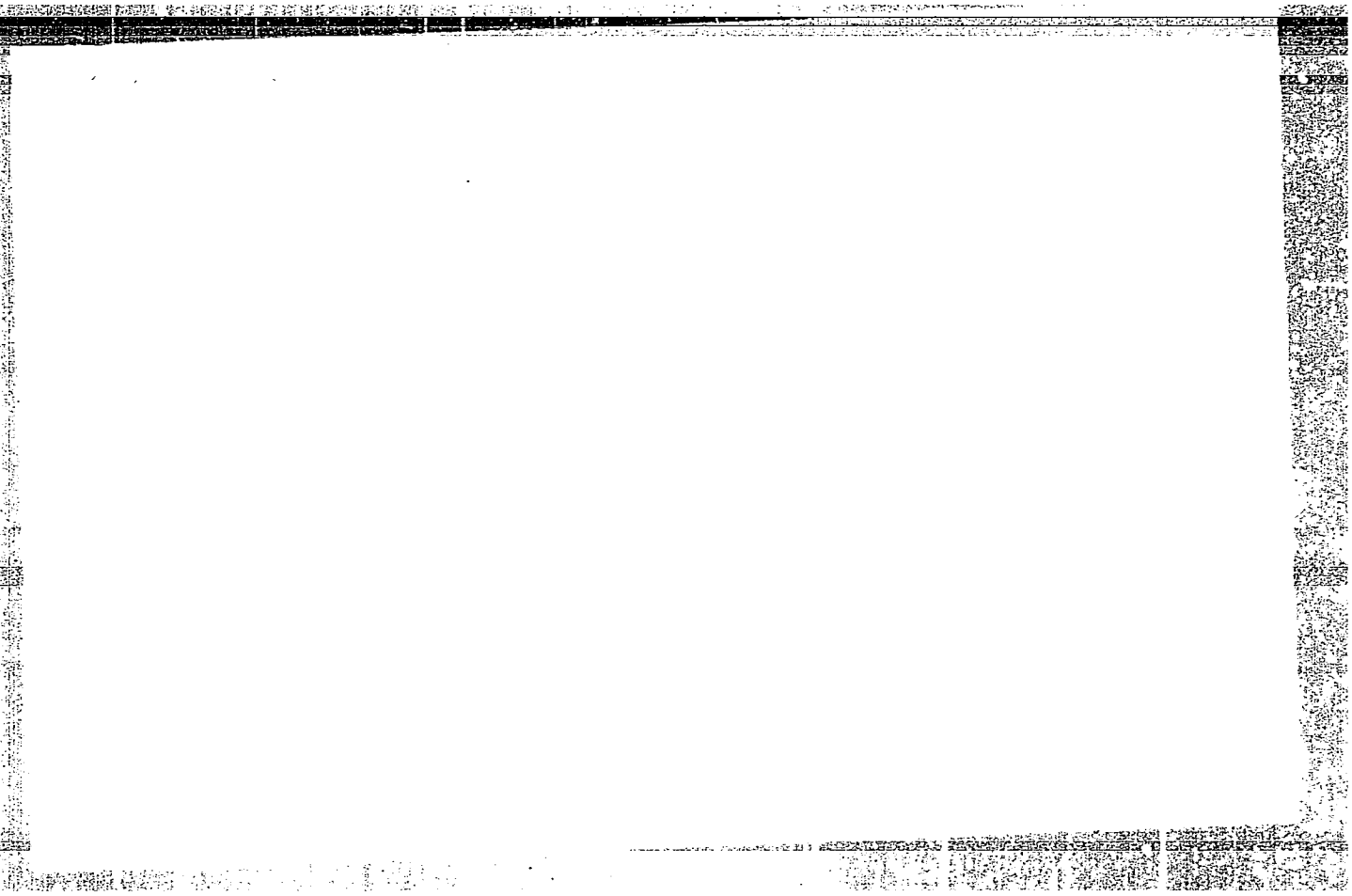
(Construction industry)



APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001857930005-3"

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1. Docent for Lapin; Senior Scientific Associate for Umanskiy. 2. Of the Department of Ear, Throat, and Nose Diseases (Head -- Prof. L. L. Frumin), Ukrainian Institute for the Advanced Training of Physicians and of the Ukrainian Institute for Diseases of the Ear, Throat, and Nose, Khar'kov.

UMANSKIY, Ya.P.

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1. Senior Scientific Associate. 2. Of the Ukrainian Scientific-Research Institute for Diseases of the Ear, Throat, and Nose (Director -- Candidate Medical Sciences A. P. Kolibaba), Khar'kov.

UMANSKIY, Ya. P., starshiy nauchnyy sotrudnik

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1. Iz Ukrainskogo nauchno-issledovatel'skogo instituta bolezney ukha, gorla i nosa (dir. A.P.Kolibaba)

(TERATOMA,
*pharynx, congen., in inf. & child.)
(PHARYNX, cioplasms,
*teratoma in inf. & child.)