BLOKHIN, M.A

Category : USSR/Optics - X Rays

K-8

Abs Jour : Ref Zhur - Fizika, No 2, 1957, No 5274

Author : Blokhin, M.A.
Inst : Rostov-on-Don University, USSR
Title : Calculation of the Distortion of X-ray Spectra Due to the Apparatus.

Orig Pub : Dokl. AN SSSR, 1956, 107, No 2, 229-232

Abstract : Description of a method permitting the distortion of an x-ray spectrum of any shape and to use this method further on to restore the true shape of the spectrum. The method is based on the use of trigonometric series and can also serve to obtain the shape of the density distribution curve of the free and filled electronic states. In the latter case it is necessary to carry out additional correction of the spectrum for "distortion" introduced by the internal level of the atom.

Card : 1/1

PHASE I BOOK EXPLOITATION 1073

Blokhin, Mikhail Arnol'dovich

Fizika rentgenovskikh luchey (Physics of X-rays) 2d. Ed. Rev. Moscow, Gostekhizdat, 1957. 518 p. 7,000 copies printed.

Ed.: Kuznetsova, Ye.B.; Tech. Ed.: Gavrilov, S.S.

PURPOSE: This is a textbook on the physics of X-rays and X-ray spectral analysis. It presumes a knowledge of electrodynamics, basic quantum mechanics, atomic theory and differential and integral calculus.

COVERAGE: The author presents the general principles of the physics of X-rays necessary for a further study of specialized fields involving X-rays. The author states that the approach of this book is especially suited for the experimental physicist. He deals in detail with the fine structure of X-ray spectra and the energy levels of atoms, paying particular attention to the physical aspects. The author states that X-ray analysis of metals, alloys, minerals, etc. is widely used in the USSR and lists the following scientists as working in this field: Academician, A.F. Ioffe, G.V. Kurdyumov, N.V. Belov, S.T. Konobeyevskiy, N.Ye. Uspenskiy, G.S. Zhdanov, A.I. Kitaygorodskiy, N.V. Ageyev, Ya.S. Umanskiy, B.M. Rovinskiy, V.I. Iveronova, Yu.S. Terminasov. The fol-

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lowing scientists have developed new methods and equipment used in chemical X-ray spectral analysis: I.B. Borovskiy, V.N. Protopop, E.Ye. Vaynshteyn, N.D. Borisov, Ya.M. Fogel', and M.A. Blokhin. A.I. Kostarev and E.Ye. Vaynshteyn are mentioned as contributors to the theory of absorption spectra. I. B. Borovskiy, E.Ye. Vaynshteyn, K.I. Narbutt, R.L. Barinskiy, Ya.M. Fogel', A.I. Krasnikov, and M.A. Blokhin are mentioned for their research in the fine structure of emission spectra and absorption spectra. P.I. Lukirskiy, A.I. Alikhanov, G.V. Kurdyumov, and A.P. Komar are mentioned in conjunction with the Institute of Physics and Technology of the Academy of Sciences of the USSR as having contributed to the field of X-ray spectral analysis. There is an extensive bibliography of both Soviet and non-Soviet sources at the end of the book. The author states that the first edition of this book was used as a textbook at Rostov University.

Physics of X-rays

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BLOKHIN, M.A.

BLOKHIN, M. A., NESTERENKO, P.S ., and SHUVAYEV, A.T (RGU)

"X-ray Spectral Investigatian of Sulphur-Containing Samplesd"

Materials of the 2nd All-Union Conference on X-ray Spectroscopy; Moscow, January, 31 February 4, 1957 (Materialy II Vsesoyuznogo soveshchaniya po rentgenovskoy spektroskopii; Moskva, 31 yanvarya - 4 fevralya g.)

Izvestiya Akademii nauk SSSR, Seriya fizicheskaya 1957, Vol 2, Nr 10, pp 1341n - 1342 (USSR)

Assoc: RGU

Investigation of the density distribution of electronic states in solids and the width of the interior atomic levels. M. A. Blokhin. *Bull. Acad. Sci. U.S.S.R.* 20, 127-38(1957)(English translation). B. M. R.

APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R000205530008-8"

48-10-2/20

Materials of the 2nd All-Union Conference on X-ray Spectroscopy; Moscow, January 31, to February 4, 1957

A. I. Kozlenkov (Fizfak MGU); Interrelationship of Some X-ray Spectral and Magnetic Characteristics of Iron-Base Alloys by S. A. Nemnonov and K. M. Kolabova (UFAN SSSR); Investigation of Binding Forces in Solid Iron-Molybdenum Solutions According to the Fine Structures of X-ray Absorption Spectra by V. A. Trapeznikov and S. A. Nemnonov (UFAN SSSR); On the Theory of Solid Solutions Based on Transitional Metals by I. B. Borovskiy and K. P. Gurov (IMET AN SSSR); Relationship of Temperature an Concentration of Fine Structure of X-ray Absorption Spectra of Solids and an Investigation of Binding Forces by V. A. Trapeznikov; Investigation of X-ray L-Spectra of Some Rare-earth Element Compounds by N. V. Troneva, I. D. Marchukova and I. B. Borovskiy (Fizfak MGU); Investigation of X-ray Emission K Lines of β-Group Titanium in Carbides and Some Other Compounds by E. Ye. Vaynshteyn and Yu. N. Vasil'yev (GEOKhI AN SSSR); X-ray Spectral Investigation of Molybdenum L Spectra in Some Alloys and Compounds by V. A. Batyrev, I. B. Borovskiy and S. A. Ditsman (IMET AN SSSR); Some Satelites of Spectral Lines by T. I. Kakushadze (Georgian Teacher's Institute); X-ray Spectral Investigation of Sulphur-containing Samples by M. A. Blokhin, P. S. Nesterenko and A. T. Shuvayev (RGU).

AVAILABLE: Library of Congress
Card 2/2

Blokhin, M.A.

AUTHOR: Blokhin, M.A., Sachenko, V.P. 48-10-3/20

TITLE: The Breadths of the Internal Levels and the Distribution of Electron States According to the Energies of the Elements of the Iron Transition Group (Shiriny vnutrennikh urovney i raspredeleniye plotnosti elektronnykh sostoyaniy po energiyam elementov perekhodnoy gruppy zheleza)

PERIODICAL: Izvestiya Akad.Nauk SSSR, Ser.Fiz., 1957, Vol. 21, Nr 10, pp. 1343-1350 (USSR)

ABSTRACT: The attempt is made here to determine the breadth of the K-levels of some elements by means of the interpolation on these elements of the experimental values for the K-level breadths of intransitive elements (Mg, Al, Ar, K, Fe). When detecting the changes of the breadth of K-levels by means of the atomic number two essentially different types of transition, the radiation- and the radiationless transitions, were taken into account. The entire probability for the emergence of the atom from the given state is equal to the sum of the probability of the radiation transition P_p and the radiationless P_l. The level breadth $\gamma = A(P_p+P_l)$. A - coefficient, the value of which is determined by the shape of the level. The ratio of these probabilities can be computed also experimentally. It is shown that the com-

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The Breadths of the Internal Levels and the Distribution of Electron States According to the Energies of the Elements of the Iron Transition Group

puted data agree with the experimental ones. It is further shown that the dependence $P_p(Z)$ may be approximatively well expressed by $P_p=DZ^{4,71}$. In order to obtain the probability values for radiationless transitions, computed in approximation, for various elements, these probabilities were calculated for K-transitions. It is shown that the coefficient $D = 1,00.10^8$ transitions per second. According to the curve given here, the γ-values for the various elements are found. According to the breadths of the $K_{\alpha_{1,2}}$ lines, it is possible, if the breadth of the K-levels is known, to compute the breadth of the L_{II}- and L_{III} levels. The curves obtained for the densities of the electron states cannot be interpreted uniquely. The most acceptable interpretation is that by Beeman, W.W., and H. Friedman (Phys.Rev. 56, 392, 1939). There are 4 figures, 5 tables and 44 references, 6 of which are Slavic.

ASSOCIATION: Rostov State University (Rostovskiy gosudarstvennyy universitet)

AVAILABLE: Library of Congress

24(2),24(7)
AUTHORS: Blokhin, M. A., Shuvayev, A. T. SOV/48-22-12-10/33

TITLE: Investigation of Compounds With the Structure of Perovskite by Roentgen Spectra(Issledovaniye soyedineniy so strukturoy perovskita po rentgenovskim spektram)

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1958; Vol 22; Nr 12; pp 1453-1455 (USSR)

ABSTRACT: Emission and absorption K spectra of Ti, emission and absorption L spectra of Zr, the absorption K spectrum of Fe and absorption L spectra of Sr and Ba as well as of $BaTiO_3$, $SrTiO_3$, $SrFeO_3$, $BaZrO_3$ and $PbZrO_3$ were investigated in the present paper. It was ascertained that the band of valence electrons of compounds having a perovskite structure, is a hybrid band with a strong admixture of p-states. The formation of a generalized conduction band was confirmed experimentally. On principle, the conduction band has a d-character with a small admixture of p-states. The following band of free states has, on principle, a p-character with an irregular distribution of the state densities. The Ti-ions charge in $BaTiO_3$ amounts by no means to more than 2.7 .

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Investigation of Compounds With the Structure of Perovskite by Roentgen Spectra

SOV/48-22-12-10/33

In the proximity of the Curie (Kyuri) point an energy decrease of the electron states of the conduction band was ascertained. There are 3 figures and 7 references, 1 of which is Soviet.

ASSOCIATION: Rostovskiy-na-Donu gos. universitet
(Rostov-na-Donu State University)

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BLOKHIN, M.A.

5(2)125(1) PHASE I BOOK EXPLOITATION SOV/2313

Akademiya nauk SSSR. Institut mashinovedeniya

Povysheniye stoykosti detaley mashin /sul'fidirovaniye/; sbornik statey (Increasing the Wear Resistance of Machine Parts /Sulfurization/; Collection of Articles) Moscow, Mashgiz, 1959. 125 p. Errata slip inserted. 4,500 copies printed.

Ed. (Title page): N. M. Beznabchuk, Doctor of Technical Sciences; Ed. (Inside book): A.G. Siklitin, Engineer; Tech. Ed.: V.D. El'kind; Managing Ed. for Literature on General Technical and Transport Machine Building (Mashgiz): K.K. Ponomarev, Engineer.

PURPOSE: This collection of articles is intended for engineering and technical workers of machine-building and overhauling plants.

COVERAGE: This book presents results of investigations of methods to increase the resistance of machine parts to seizure. A new method of sulfurization which improves the friction behavior of cast iron and steel and an analysis of the effect of sulfurization on the antifriction properties and wear of metal are given. These articles are the transactions of a seminar held at the Institute of Mechanical Engineering of the Academy of Sciences, USSR, in December 1956.

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24(4) PHASE I BOOK EXPLOITATION SOV/3040

Blokhin, Mikhail Arnol'dovich

Metody rentgeno-spektral'nykh issledovaniy (Methods of X-ray Spectrum Analysis) Moscow, Fizmatgiz, 1959. 386 p. 5,000 copies printed.

Ed.: V. I. Rydnik; Tech. Ed.: S. S. Gavrilov.

PURPOSE: This book is intended for scientific and laboratory workers, engineers, and technicians in x-ray spectra research and analysis. It will be of interest to advanced students of the field at vuzes.

COVERAGE: This book treats the field of x-ray spectroscopy and discusses the use of apparatus and equipment in x-ray analysis, experimental studies of the fine structure of x-ray emission and absorption spectra, and processing of data. It describes the theory and practice of quantitative and qualitative x-ray analyses of alloys, ores, and minerals. It lists a number of Soviet institutes at which experimental work in x-ray spectroscopy is

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carried out and mentions N. D. Borisov, Ya. M. Fogel', I. B. Borovskiy, V. N. Protopopov, Ye. L. Kostrov, E. Ye. Vaynshteyn, K. I. Narbutt, and A. B. Gil'varg as having contributed to this field of study. There are 433 references: 179 English, 167 Soviet, 38 German, 24 French, 5 Swedish, and 2 Czech.

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SOV/120-59-1-26/50

AUTHORS: Blokhin, M. A., Busler, I. V., Kramarov, O. P., Chernyavskaya, I. P.

TITLE: The Use of a Monitor in X-Ray Spectral Analysis (Primeneniye monitora pri rentgeno-spektral'nom analize)

PERIODICAL: Pribory i tekhnika eksperimenta, 1959, Nr 1, pp 106-111 (USSR)

ABSTRACT: In the continuous recording of intensities in X-ray spectra by means of ionisation or scintillation counters, a high stability source of the radiation is necessary. At the same time it is difficult to ensure a high stability in the anode voltage at the relatively high power used by the tube. This problem is particularly complex when the anode current has to be varied within wide limits, for example, in the measurement of the intensity ratio of a very weak and a very bright line. For this and other reasons the present authors have developed methods for measuring line intensity ratios either when the intensity is directly stabilized or when the source of the radiation is not stabilized at all. Ionisation chambers or geiger counters are used for this purpose as monitors. The device is shown diagrammatically in Fig 1. In this figure 1 is the anode of the X-ray tube. Primary X-rays leaving the anode are incident on the specimen under investigation 2 and an addit-

The Use of a Monitor in X-Ray Spectral Analysis

ional specimen 3 . Fluorescence radiation leaving 2 is analyzed in a spectrometer which uses a geiger counter as the detector. The radiation from the additional specimen 3 enters the monitor 7 through a collimator 4 . The monitor is in the form of a geiger counter. The additional specimen is made from a pure element (or its oxide). The stabilization is ensured by using the output signal of the monitor to stabilize the cathode supply of the X-ray tube. The system is completely automatic, the control circuit being shown in Fig 2. It is shown that the use of a monitor in conjunction with good collimation of the direct fluorescence radiation from the additional specimen enables one to carry out accurate measurements of X-ray intensities without any stabilization of the supplies. Fig 4 shows a typical spectrum obtained with this instrument. Fig 3 shows the root mean square error in the intensity of the K_α line as a function of the atomic number Z of the specimen under investigation, the additional specimen being Ni . It follows from this figure that if a

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relative error of 3% is sufficient (the number of counts taken being sufficiently high, i.e. the statistical error being low) then the atomic number of the specimen under investigation may differ from the corresponding number of the additional specimen by 4 . Hence altogether nine neighbouring elements may be investigated whose atomic numbers are symmetrically placed on either side of the atomic number of the additional specimen. If the relative statistical counting error does not exceed 4%, then for the above 3% the final relative error would be less than 5%. Thus almost the entire spectral region normally used in analysis by long wave spectrometers may be covered, using a single additional specimen, for example, a chromium specimen. Typical results are shown in Fig 4. There are 4 figures, 2 tables and 12 references, of which 8 are English, 1 is Japanese in English and the rest are Soviet.

ASSOCIATION: Rostovskiy-na-Donu gosudarstvennyy universitet (Rostov-na-Donu State University)

SUBMITTED: January 18, 1958.

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S/048/60/024/04/06/009
B006/B017

24.6300

AUTHORS: Blokhin, M. A., Sachenko, V. P.

TITLE: On the Problem of the Shape of the Energy Bands of a Solid

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960, Vol. 24, No. 4, pp. 397-406

TEXT: The present article is a reproduction of a lecture delivered at the 4th All-Union Conference on X-Ray Spectroscopy (Rostov-na-Donu, June 29 - July 6, 1959). Since the experimentally observed shape of X-ray emission bands is only in approximate agreement with the theoretically computed one, the authors endeavor to improve the theory by taking into account the distortions due to the apparatus and the line broadening. In the introduction, the results of some investigations undertaken by other authors are discussed. Among others, Landsberg (Ref. 4) computed the form of the L_{III} sodium emission band by taking into account the broadening of the conduction band levels, i.e., in free-electron approximation by means of a perturbation of the form $\exp(-ar_{12})/r_{12}$.

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On the Problem of the Shape of the Energy Bands of a Solid

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These computations show, however, some deficiencies which are discussed here. Above all, the level broadening in the conduction band was investigated only in connection with the emission of an X-ray photon; however, it occurs in all experiments on energy bands of solids. Hence, it must be taken into account not only in X-ray spectroscopy but also in investigating optical spectra, the photoeffect, and electrical conductivity. The authors of the present paper give an exact computation of the problem investigated by Landsberg (in free-electron approximation). They study again the influence exercised by level broadening on the shape of X-ray emission bands and the energy distribution of electrons in the bands of the solid. Two conduction electrons with the wave vectors $\vec{k}_2$ and $\vec{k}_3$ are examined. One is to fill a vacancy (with the wave vector $\vec{k}_1$) after a collision, and the other is to pass over into a state with $\vec{k}_4$. For $\vec{k}_2+\vec{k}_3 = \vec{k}_1+\vec{k}_4$ an explicit expression is obtained for the probability $W_A(k_1)$ after some operations. $2W_A(k_1)$ is the total transition probability to the $\vec{k}_1$ level when the exchange effects are

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neglected. The dependence of the amount of level broadening on the position of the level in the band is illustrated in Fig. 1. The two curves $\Delta E(E)$ are given for $E_F = 7$ ev (position of the Fermi surface in copper) and $E_F = 3.2$ ev (Fermi surface in sodium). As may be seen from the diagram, the level broadening in the conduction band on the band edge is very small and increases rapidly for lower levels. The following considerations deal with the energy distribution of the conduction electrons. By taking into account the transition probability one obtains

$$N_1(E) = \frac{1}{\pi} \int_0^{E_F} \frac{N(t)P(t)}{a(t)\left[1 + \left(\frac{t-E}{a(t)}\right)^2\right]} dt \quad .$$

In Fig. 2 the following transition curves are plotted: $N_1(E)$, $N(E) = \sqrt{E}$, $N(E) = E\sqrt{E}$, and $N_1'(E)$. Fig. 3 shows that the theoretical curve $N_1(E)$ agrees very well with the experimental shape of the L_{III} band of sodium. The following considerations concern the influence exercised by level broadening on the shape of the 3d bands of Cu, Ni, and Fe (Fig. 4). A great number of details concerning this

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On the Problem of the Shape of the Energy Bands of a Solid

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subject are discussed. In conclusion, the authors state that the level broadening in the energy bands explains some characteristic features of X-ray spectra, and that it is of universal importance in solid-state physics. A. F. Ioffe and Samoylovich are mentioned. There are 4 figures and 11 references: 3 Soviet, 4 American, and 4 British.

ASSOCIATION: Rostovskiy-na-Donu gos. universitet (Rostov-na-Donu State University)

Card 4/4

NIKIFOROV, I.Ya.; SACHENKO, V.P.; BLOKHIN, M.A.

Comparison of different methods for improving the form of spectra. Izv. AN SSSR. Ser. fiz. 25 no.8:1054-1059 Ag '61. (MIRA 14:8)

1. Rostovskiy-na-Donu gosudarstvennyy universitet.
(X-ray spectroscopy)

BLOKHIN, M.A.; BIKS, V.A.

X-ray spectroscopic analysis of multicomponent mixtures. Zav.lab. 27 no.1:31-34 '61. (MIRA 14:3)

1. Rostovskiy gosudarstvenny universitet.
(Systems(Chemistry)) (X-ray spectroscopy)

BLOKHIN, M.A.; LOSEV, N.F.

Modern methods of X-ray spectroscopic fluorescent analysis.
Zav.lab. 27 no.9:1091-1099 '61. (MIRA 14:9)
(X-ray spectroscopy)

BLOKHIN, M.A.; VOLKOV, V.F.

Determination of the thickness of a deposited layer by means of the KRFS-2 X-ray spectrometer. Zav.lab. 27 no.9:1110-1111 '61. (MIRA 14:9)

1. Rostovskiy gosudarstvennyy universitet.
(Thickness measurement) (Spectrometry)

S/048/62/026/003/010/015
B142/B104

AUTHORS: Blokhin, M. A., Gil'varg, A. B., Nikiforov, I. Ya., and Sachenko, V. P.

TITLE: Two-crystal X-ray spectrometer

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 26, no. 3, 1962, 397 - 404

TEXT: The adjustment of the new spectrometer is comparatively simple and takes only a few hours. The crystals can be taken out of the apparatus without disturbing the adjustment. The distance between the rotating axes of the crystals is 100 mm. The focus of the X-ray tube is 300 mm distant from the rotating axis of the first crystal. The distance of the rotating axis of the second crystal from the window of the Geiger counter is 100 mm. The second crystal can be rotated by $\pm$ 1.5° from the middle position reading accuracy 0.01°). The spectrometer is not adjusted by means of the crystals but by glass plates. After adjustment, the crystals are inserted to determine the $CuK\alpha_1$ - line and the angle between crystal surface and lattice planes. Eight horizontal plates were built into the collimator to reduce

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Two-crystal X-ray spectrometer

the vertical scattering of the beam to a minimum and yet to obtain high radiation intensities. A beryllium plate inserted between the collimator and the first crystal is to eliminate the focus drift and the effect of feeding-voltage fluctuations. It was difficult to choose the suitable crystals since extreme optical uniformity is required, and the angle between crystal surface and lattice planes shall be as small as possible. Its maximum was 105". Plates parallel to $(10\bar{1}0)$ and $(11\bar{2}0)$ were cut from various quartz crystals and investigated after etching. The purity of the two crystals is determined by the width of the reflection curves. The quality of the plates is estimated from the shadows produced by deviations of the refractive indices. A final examination carried out by means of a polarization system indicates optical inequality of the plates by bright spots. There are 6 figures and 6 references: 1 Soviet and 5 non-Soviet. The two English-language references are: L. G. Parrat, Rev. Scient. Instrum. 5, no. 11, 113 (1934); Rev. Scient. Instrum., 6, no. 5, 113 (1935).

S/048/62/026/003/010/015
B142/B104

Two-crystal X-ray spectrometer

ASSOCIATION: Rostovskiy gos. universitet, Institut kristallografii Akademii nauk SSSR. (Rostov State University, Institute of Crystallography of the Academy of Sciences USSR)

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S/048/62/026/003/014/015
B102/B104

AUTHORS: Blokhin, M. A., Demekhin, V. F., and Shveytser, I. G.

TITLE: Correction of the X-ray emission spectrum for self- absorption

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 26, no. 3, 1962, 419 - 422

TEXT: Corrections for self-absorption are considered for the continuous and the characteristic spectrum separately. In the first case, it is not necessary to know the absolute values of the absorption coefficients. In the second case, the intensity of the characteristic spectrum can be given by $I = Ae^{-C_1\tau}\left[C_2 + C_3\tau\right]$ with

$$C_1 = \frac{x}{\sin\psi}\frac{V^2}{V^2-V_i^2},\quad C_2 = \frac{V-V_i}{V_i} - \lg\frac{V}{V_i},\quad C_3 = \frac{x}{\sin\psi}\cdot\frac{2V^3-3V^2V_i+V_i^3}{6V_i(V^2-V_i^2)}. \qquad (5),$$

where x is the maximum penetration depth of electrons, and τ is the absorption coefficient. A practical correction for self-absorption is demonstrated for the L_{β_2} band and the L_{III} spectrum of metallic Mo. The intensities

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with and without absorber (I and I_o) were measured. The scattered background itself was also measured with and without absorber (I_b and I_{bo}), allowing for the cosmic background intensity I_c. Then $\tau = 2.3\frac{\rho}{m}\log\left[(I_o - I_{bo} - I_c)/(I - I_b - I_c)\right]$. For a particular case $x = 0.04/\mu$ was obtained; $I_o = I \cdot 0.53/e^{-2.6\cdot10^{-5}\tau}(1+7.8\cdot10^{-6}\tau)$. The effect of voltage on self-absorption was studied at 3.5, 5.5, and 12 kv. The self-absorption of the characteristic spectrum increases with increasing voltage while that of the continuous spectrum decreases. Since, however, the intensity of the former spectrum rises with increasing voltage more rapidly than that of the latter, it depends on geometry if the self-absorption of the continuous spectrum increases or decreases. There are 2 figures and 6 references: 4 Soviet and 2 non-Soviet.

ASSOCIATION: Rostovskiy gos. universitet (Rostov State University)

BLOKHIN, M.A.; SHUVAYEV, A.T.

Effect of chemical bonds on the X-ray emission spectrum of titanium. Izv. AN SSSR. Ser. fiz. 26 no.3:429-432 Mr '62. (MIRA 15:2)

1. Rostovskiy gosudarstvennyy universitet.
(Chemical bonds)
(X-ray spectroscopy))
(Titanium)

S/048/63/027/003/002/025
B108/B114

AUTHORS: Nikiforov, I. Ya., and Blokhin, M. A.

TITLE: About the form of the K_{β_5} emission band of iron. II. The transition probability as a function of energy

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 27, no. 3, 1963, 314-318

TEXT: This paper was presented at the 6th Conference on X-ray Spectroscopy, Odessa, July 2 - 10, 1962. The transition probability was calculated in the single-electron theory. The method of cells (M. F. Manning, Phys. Rev., 63, 190, 1943) was used to calculate the shape of the K_{β_5} emission band, N(E). For this purpose, the dispersion curves were determined from the coefficients $a_1(E)$ accounting for the spherical harmonics of l-symmetry in the total wave function of the valency electrons. The calculated form of the band agrees well with the

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About the form of the ...

experimental results when the Auger effect is taken into consideration. Certain regularities were found in the distribution of the electrons of various symmetries over the band. Obviously, this applies to all transition metals. There are 5 figures.

ASSOCIATION: Rostovskiy-na-Donu gos. universitet (Rostov-na-Donu State University)

BLOKHIN, M.A.; DUYMAKAYEV, Sh.I.

Optimal X-ray spectral analysis of solutions. Zav. lab. 29 no.9:1061-1064 '63. (MIRA 17:1)

1. Rostovskiy gosudarstvennyy universitet.

BLOKHIN, M.A.; DRUZ', V.V.

X-ray spectral analysis of multicomponent mixtures. Zav. lab. 29 no.9:1070-1074 '63. (MIRA 17:1)

1. Rostovskiy gosudarstvennyy universitet.

BLOKHIN, M.A.; DUYMAKAYEV, Sh.I.

X-ray spectral analysis of multicomponent mixtures. Zav.lab. 30 no.4:425-426 '64. (MIRA 17:4)

1. Rostovskiy-na-Donu gosudarstvennyy universitet.

ACCESSION NR: AP4038761 S/0048/64/028/005/0780/0785

AUTHOR: Blokhin, M.A.; Nikiforov, I.Ya.

TITLE: Shape of the $K\alpha_{1,2}$ lines of the iron group elements /Report, Seventh Conference on X-Ray Spectroscopy held in Yerevan 23 Sep-1 Oct 1963/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v.28, no.5, 1964, 780-785

TOPIC TAGS: x-ray spectrum, chromium, manganese, iron, cobalt, copper, nickel, zinc

ABSTRACT: The $K\alpha$ doublets of the elements of atomic number from 24 (Cr) through 30 (Zn) were recorded with the high resolution two-crystal spectrometer of the Rostov State University. The instrument and the experimental procedure are discussed elsewhere (M.A.Blokhin, A.B.Gil'varg, I.Ya.Nikiforov, V.P.Sachenko, Izv.AN SSSR,Ser.fiz. 26,397,1962). The resolving power was approximately 38 000, the dispersion was 0.01 X per second of arc, and the angle could be measured to ±0.5". The Cr and Ni spectra were obtained with Cu anodes on which Cr or Ni had been electroplated. The other spectra were obtained with Cu anodes into which powders of the corresponding metals had been pressed. The double reflection curves with parallel crystals were quite narrow (0.15 to 0.21 eV). The widths of the $K\alpha_1$ lines were corrected for in-

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strumental broadening by simply subtracting the width of the corresponding parallel crystal double reflection curve. One spectrum (Cu) was corrected by a more rigorous method (V.P.Sachenko and I.Ya.Nikiforov,Optika i spektro.13,447,1962) with practically identical results; the corrections are therefore believed to be adequate. Of the published measurements of the $K\alpha_1$ widths of the iron group metals, the present measurements, those of G.Brogren (Arkiv.fyz.23,219,1963), and those of A.Meisel and W. Nefedow (Z.phys.Chem.(DDR),219,397,1962) were obtained under the most advantageous conditions with regard to instrumental broadening. Although there is considerable agreement among the three groups of data, there is also some disagreement among them. The $K\alpha_1$ asymmetry indices were calculated, and they are compared with data of other workers and with the magnetic moments. Although the correlation between $K\alpha_1$ asymmetry and magnetic moment is strong, it is not perfect. Notable deviants are Cr and Cu, both of which are much too asymmetric for their small (or vanishing) magnetic moments. The copper spectrum was corrected for the width of the K level, and it is concluded from the shape of the corrected curve that the asymmetry of the Cu spectrum is due to complex structure of the L_{III} level. The $K\alpha_1$ line of metallic chromium was found to be complex. This fine structure is much more prominent in the spectrum of the oxide, where it appears also in the $K\alpha_2$ line and has previously been reported by others. In order to make the $K\alpha$ doublet shapes conveniently available for

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ACCESSION NR: AP4038761

use in precision x-ray structure analysis, the data are presented not only graphically, but also in tabular form. The accuracy claimed for the tabulated intensities and energy displacements is 1% of the peak value, and 0.05 eV respectively. Orig. art.has: 4 figures and 4 tables.

ASSOCIATION: Rostovskiy-na-Donu gosudarstvenny*y universitet (Rostov-on-the-Don State University)

SUBMITTED: 00	DATE ACQ: 12Jun64	ENCL: 00
SUB CODE: OP	NR REF SOV: 006	OTHER:008

Card 3/3

ACCESSION NR: AP4038762 S/0048/64/028/005/0786/0789

AUTHOR: Nikiforov, I.Ya.; Blokhin, M.A.

TITLE: Concerning the shape of the x-ray emission bands of transition metals of the iron group /Report, Seventh Conference on X-Ray Spectroscopy held in Yerevan 23 Sep-1 Oct 1963/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v.28, no.5, 1964, 786-789

TOPIC TAGS: x-ray spectrum, band spectrum, line spectrum, iron, nickel, copper, x-ray structure analysis

ABSTRACT: The $K\beta_5$ bands of Fe, Ni and Cu, and the $K\beta_1$ lines of Fe and Cu were recorded with the two-crystal spectrometer (resolution 38 000) of Rostov State University (M.A.Blokhin, A.B.Gil'varg, I.Ya.Nikiforov and V.P.Sachenko,Izv.AN SSSR,Ser. fiz.26,397,1962). Quartz crystals cut parallel to the $(11\bar{2}0)$ planes were employed. The Fe and Cu spectra were obtained with anodes of the respective metals. The Ni spectrum was obtained with a Cu anode on which Ni had been electroplated. The x-ray tube was operated at 35 kV and 20 mA. An accuracy of 2% is claimed for the ordinates of the published spectral intensity curves. The shapes of the Cu and Fe $K\beta_1$ lines

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were recorded because of their technical importance for precision x-ray structure analysis. They are presented graphically but are not discussed. It is not possible to obtain reliable widths of the $K\beta_5$ bands without correcting for the width of the K level and removing the $K\beta'''$ satellite. This analysis was not performed. The widths at half maximum increased with increasing atomic number, corresponding to the increasing density of free electrons between the 1s and 3p shells. The principal peak of the Cu band was found to be double. The two peaks are ascribed to the $K\beta_5$ and $K\beta_2$ lines, although the assignment is regarded as arbitrary because of the strong hybridization of the conduction band. The Cu $K\beta'''$ satellite was clearly resolved into two satellites, which are designated by $K\beta'''_{(1)}$ and $K\beta'''_{(2)}$. Weak structure was found on the long wavelength side of the Ni and Fe $K\beta_5$ bands. This could be due to a long wavelength satellite, or to zonal structure of the electron states in the lattice. The fe $K\beta_5$ peak was broad and nearly flat. Previous calculations of the Fe $K\beta_5$ band shape (I.Ya.Nikiforov,and M.A.Blokhin, Izv.AN SSSR,Ser.fiz.27,314,1963) are compared with the present measurements, and considerably better agreement is found than was previously obtained with the measurements of J.A.Bearden and C.H. Shaw (Phys.Rev.48,18,1935). The calculations do not reproduce the structure on the long wavelength side. The paper closes with a short essay on the role of x-ray spectroscopy in the development of solid state physics. Although it is not possible

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to obtain electron densities by simply dividing x-ray band intensities by transition probabilities as envisaged 30 years ago by H.Jones, N.F.Mott and H.W.B.Skinner (Phys. Rev.45,379,1934), one can nevertheless employ different approximate methods for dealing with the many body problem to calculate x-ray band shapes, and by comparing the calculated shapes with experimental data one can select the most promising mathematical methods for further development in connection with solids of particular types. Orig.art.has: 3 formulas and 3 figures.

ASSOCIATION: Rostovskiy-na-Donu gosudarstvenny*y universitet (Rostov-on-the-Don State University)

SUBMITTED: 00 DATE ACQ: 12Jun64 ENCL: 00

SUB CODE: OP NR REF SOV: 009 OTHER: 004

Card 3/3

ACCESSION NR: AP4038765 S/0048/64/028/005/0801/0804

AUTHOR: Blokhin, M.A.; Shuvayev, A.T.; Gorskiy, V.V.

TITLE: X-Ray spectroscopic investigations of chemical bonds in sulfur compounds /Report, Seventh Conference on X-Ray Spectroscopy held in Yerevan 23 Sep-1 Oct 1963/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v.28, no.5, 1964, 801-804

TOPIC TAGS: x-ray spectrum, line shift, sulfur, sulfur compound, chemical bond

ABSTRACT: According to A.T.Shuvayev (Izv.AN SSSR,Ser.fiz.28,758,1964 /see Abstract AP4038758/) the shift of the KX lines of sulfur (and other Period 2 elements) in chemical compounds is due to the charge on the atom arising from the influence of the neighboring atoms. This phenomenon is discussed at some length for the case of sulfur, and a short table is presented, based on data in the literature, showing the shifts produced by various chemical bonds and bond configurations. These chemical bond shifts of the S KX lines are believed to be approximately additive. The KX fluorescence spectra of S in several compounds were recorded. The spectra were excited by 20 kV Cu bremsstrahlung and formed by reflection from the (10$\bar{1}$0) planes of bent (R = 50 cm) quartz crystal. The temperature of the samples did not exceed

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ACCESSION NR: AP4038765

50°C. The shifts of the KX lines were measured with respect to their position in rhombic sulfur. The shifts obtained for the compounds H_7C_7-S-S-C_7H_7 and S ≡ $C(N(CH_3)_2)_2$ were 0 and -0.13 eV, respectively, and are in accord with the structures as written. A shift of -0.02 eV was observed for methylene blue; of the two structures proposed for this compound, the x-ray data favor that in wich the chlorine is attached to one of the nitrogen atoms and not to the sulfur. The polymer $(CuS_2N_4C_{24}H_{18})_n$ showed a shift of -0.06 eV; from this it is concluded that the S-C bond is single. Three compounds containing the SCN group were investigated: KSCN, CuSCN and $NH_2C_6H_4SCN$, for which the KX aline shifts were -0.10, 0 and 0.07 eV, respectively. These data favor the structure -S-C ≡ N for the SCN group in the aniline derivative and the copper salt, and a structure between this and $-S{=}C{=}N^-$ in KSCN. It is concluded that x-ray spectroscopy can be a useful tool for investigating chemical bonds. "The authors are grateful to Z.V.Zvonkova (Physical-chemical Institute im.L.YA.Karpov) and I.G.Mochalina (Special Organic Synthesis Laboratory of the Moscow State University) for preparing the samples." Orig.art.has: 3 tables.

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ACCESSION NR: AP4038765

ASSOCIATION: Rostovskiy-na-Donu gosudarstvenny*y universitet (Rostov-on-the-Don State University)

SUBMITTED: 00 DATE ACQ: 12Jun64 ENCL: 00

SUB CODE: OP, GC NR REF SOV: 003 OTHER: 002

Card 3/3

ACCESSION NR: AP4038771 S/0048/64/028/005/0825/0829

AUTHOR: Demokhin, V.F.; Blokhin, M.A.

TITLE: Fluorescence spectra of silivon in some compounds /Report, Seventh Conference on X-Ray Spectroscopy held in Yerevan 23 Sep to 1 Oct 1963/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v.28, no.5, 1964, 825-829

TOPIC TAGS: x-ray spectrum, silicon, silicon dioxide, silicon carbide, carbon chemical bond

ABSTRACT: The $K\alpha_1,\alpha_2$, $K\alpha',\alpha_3,\alpha_3',\alpha_4$ and $K\beta_{1,x}$ lines of silicon were observed in SiO_2, SiC and crystalline silicon, both pure (resistivity 0.5 ohm cm). The investigation was undertaken to determine the true shape of the $K\beta_x$ band, for which widely differing shapes have been reported (J.Farineau, Ann. Phys. 10, 20, 1938; Ya.M.Fogel', Zhur.eksp.i teor.fiz.9, 1217, 1935), and to determine the effect of chemical bonding on the lines. The spectra were obtained by reflection from the $(10\bar{1}0)$ planes of a bent (50 cm radius) quartz crystal. The resolving power was 16 000. The x-ray tube was operated at 25 kV and 30 mA and the samples were at temperatures between 50 and 70°C. The continuous spectrum was observed with 3.8 kV on the x-ray tube in order to

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determine whether the K absorption of the silicon in the diffracting crystal would distort the spectrum in the $K\beta_x$ region; no such distortion was observed. A dry run was made with an aluminum sample held with the same cement as was used in the investigation proper; no lines were found in the region of interest. The presence of phosphorus in the silicon crystal produced no observable change in the spectrum. The experimental error in these measurements was ±0.07 eV for position, ±0.03 eV for line widths, and 2% for relative intensities. The width of both the $K\alpha_1$ and the $K\alpha_2$ line, corrected for instrumental broadening, was 0.45 ± 0.05 eV, and their separation was 0.56 eV. The shifts due to chemical bonding of the $K\alpha_1$ line, as well as those of the α_4, α_3, α_3' and α' satellites, agreed with the values obtained by N.G. Johnson (Diss.Lund,1939) and H.Karlsson-Flemberg (Z.Phys.96,167,1935). When the charge on the silicon ion increased, the satellites shifted approximately twice as far as the $K\alpha_1$ line, and the intensities relative to $K\alpha_1$ of the α_4 and α' satellites increased and those of α_3 and α_3' decreased. This behavior is discussed in terms of the charge between the K and L shells due to the valence electrons. The shape of the $K\beta_{1,x}$ band agreed well with that reported by Fogel' (loc.cit.). Fine structure was perceptibel in the $K\beta_x$ line. The $K\beta_1$ line was observed in pure silicon under conditions that are said to preclude its being due to the presence of SiO_2. The Kβ bands of Si and C in SiC and of Si in the pure crystal were found to be very si-

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milar. From this it is concluded that the distribution of electrons in the valence bands of these substances is determined mainly by the lattice, which has the diamond structure in both cases. Orig. art. has: 4 figures and 1 table.

ASSOCIATION: Rostovskiy-na-Donu gosudarstvenny*y universitet (Rostov-on-the-Don State University)

SUBMITTED: 00 DATE ACQ: 12Jun64 ENCL: 00

SUB CODE: OP NR REF SOV: 003 OTHER: 008

Card 3/3

S/0048/64/028/005/0830/0831

ACCESSION NR: AP4038772

AUTHOR: Blokhin, M.A.; Demekhin, V.F.

TITLE: Emission spectra of scandium in Sc_2O_3 /Report, Seventh Conference on X-Ray Spectroscopy held in Yerevan 23 Sep to 1 Oct 1963/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v.28, no.5, 1964, 830-831

TOPIC TAGS: x-ray spectrum, x-ray emission, scandium, scandium compound

ABSTRACT: The Sc K fluorescence spectrum was excited by 30 kV bremsstrahlung and by Ti Kα radiation, and the spectra were recorded photographically with a quartz crystal spectrometer (resolution 16 000). The Ti K$\alpha_{1,2}$ lines were chosen to excite the "tertiary" spectrum because they lie in the long wavelength region of the Sc K absorption band and therefore, according to the exciton model (L.G.Parratt, Revs.Mod. Phys.31,616,1959), they cannot ionize the Sc atom in the K shell, but only excite it. The tertiary spectrum was excited in a special apparatus, the design of which is shown schematically in Fig.1 of the Enclosure. Exposures up to 80 hours were required to record some portions of this spectrum. Intensity measurements in the K$\alpha_{3,4}$ region were performed by simultaneously recording the spectrum on two films and com-

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paring the image of the $K\alpha_{3,4}$ region on the foremost film with the weakened image of the $K\alpha_2$ peak on the other. The secondary and tertiary spectra differed in only one respect: the $K\alpha_3$ and $K\alpha_4$ lines were entirely absent from the tertiary spectrum. All the other lines observed (α_1, α_2, β_1, β_5, β' and β'') were identical in shape and relative intensity in the two spectra. The absence of $K\alpha_{3,4}$ from the tertiary spectrum suggests that the double ionization theory of the origin of these lines is correct; it is in sharp contradiction with the interpretation of the $K\alpha$ satellites given by T.I.Kakushadze (Izv.vy*sshikh uchebn.zaved.Fizika, No.3,142,1963). The identity of the K spectra from ionized and from merely excited atoms is regarded as confirmation of the suggestion of J.Friedel (Philos.Mag.(7),43,153,1952) that after K ionization the valence band releases an electron which shields the hole in the K shell. Orig.art.has: 3 figures.

ASSOCIATION: Rostovskiy-na-donu gosudarstvenny*y universitet (Rostov-on-the-Don State University)

SUBMITTED: 00 DATE ACQ: 12Jun64 ENCL: 01

SUB CODE: OP NR REF SOV: 003 OTHER: 002

Card 2/2

S/0048/64/028/005/0834/0835

ACCESSION NR: AP4038774

AUTHOR: Blokhin, M.A.; Demekhin, V.F.; Shveytser, I.G.

TITLE: L Spectra of some molybdenum compounds /Report, Seventh Conference on X-Ray Spectroscopy held in Yerevan 23 Sep to 1 Oct 1963/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v.28, no.5, 1964, 834-835

TOPIC TAGS: x-ray spectrum, x-ray absorption, molybdenum, molybdenum compound, chemical bond

ABSTRACT: In order to obtain information concerning the extent to which electrons in the incomplete 4d shell of transition metals participate in chemical bonding, the L_{II} and L_{III} absorption spectra and the $l\beta_2$ emission bands of metallic molybdenum, and Mo in MoO_3, $CaMoO_4$ and MoS_2 were recorded. Although some of these spectra have been previously reported, the results of different workers are not all in agreement; moreover, the earlier spectra were not corrected for the width of the inner level. The spectra were recorded photographically with a spectrometer having a resolution of 12 000, and the L_{III} edge was observed with a second instrument having half this resolving power and employing an ionization chamber for recording. The ob-

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served spectra were corrected for the width of the inner level, the width of the Mo L_{III} level being assumed to be 1.76 eV. The corrected absorption curve for metallic Mo did not break sharply; this indicates that the L_{III} level is in fact somewhat wider than assumed. A gap between the emission and absorption was perceptible in the insulators MoO_3 and $CaMoO_4$. The L_{III} spectra were in good agreement with those obtained by I.V.Borovskiy, K.P.Gurov,et al (Izv.AN SSSR,Ser.fiz.21,1401,1957). As the valence increased, the absorption edge shifted toward shorter wavelengths. This shift, which attained 3.4 eV for the L_{III} edge of $CaMoO_4$, is ascribed to decreased shielding of the inner portion of the atom by the valence electrons that become involved in chemical bonds. A second sharp absorption line was observed in the L_{III} spectrum of $CaMoO_4$ at 13 eV from the primary line. Such lines have been previously observed in molybdenum compounds and are ascribed to transitions of 2p electrons to the incomplete 4d shell. Orig.art.has: 3 figures and 1 table.

ASSOCIATION: Rostovskiy-na-Donu gosudarstvenny*y universitet (Rostov-on-the-Don State University)

SUBMITTED: 00 DATE ACQ: 12Jun64 ENCL: 00

SUB CODE: OP NR REF SOV: 008 OTHER: 000

Card 2/2

L 17941-65 ASD(a)-5/ESD(gs)
ACCESSION NR: AP4048363 S/0032/64/030/011/1337/1338

AUTHORS: Bondarenko, G. V.; Blokhin, M. A.

TITLE: X-ray spectral analysis of lanthanides in solutions using the K-spectrum of radiation

SOURCE: Zavodskaya laboratoriya, v. 30, no. 11, 1964, 1337-1338

TOPIC TAGS: x ray spectroscopy, lanthanum, rare earth, rare earth element/ RUM-11 therapeutic apparatus, FEU 35 photomultiplier, 3BPM 200 x ray tube

ABSTRACT: Since x-ray spectral analysis of lanthanides with the L-spectrum is only accurate to [illegible] and can be used only on solid materials, a method for using the K-spectrum in the analysis of solutions was investigated. Because the K-series fluorescence is an order of magnitude higher than the L-series and the wavelength of the analytical lines is 0.2-0.6 Å (permitting use of a more accurate counter), the K-series analysis of rare earth should provide more (or equally) accurate results than the L-series. To obtain sufficiently intense K-lines for rare earths, x-ray tubes with up to 200 kv have to be used. Since such tubes are not presently available, a medical therapeutic apparatus RUM-11 powering a 3BPM-200 x-ray tube was used in all the experiments providing 150 kv at 10 ma. A counter consisting of an

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FEU-35 photomultiplier and a NaI(Tl) crystal was used to record the analytical lines. The maximum sensitivity of this method for all the rare earths was found to be as follows: La - 0.10 gm/ltr, Ce - 0.1, Pr - 0.15, Nd - 0.15, Sm - 0.2, Eu - 0.3, Gd - 0.3, Tb - 0.35, Dy - 0.45, Ho - 0.5, Er - 0.6, Tu - 0.9, Yb - 0.9, Lu - 0.95. Orig. art. has: 1 table.

ASSOCIATION: Institut fiziki Sibirskogo otdeleniya Akademii nauk SSSR (Physics Institute, Siberian Branch, Academy of Sciences, SSSR); Rostovskiy gosudarstvennyy universitet (Rostov State University)

SUBMITTED: 00 ENCL: 00

SUB CODE: IC, OP NO REF SOV: 000 OTHER: 001

Card 2/2

DUYMAKAYEV, Sh.I.; BLOKHIN, M.A.

Degeneracy reading in X-ray spectral analysis by means of the addition of diluents or the element being analyzed. Zav. lab. 31 no.9:1072-1076 '65. (MIRA 18:10)

1. Rostovskiy-na-Donu gosudarstvennyy universitet.

BLOKHIN, M.A.; OVCHARENKO, Ye.Ya.; MYAGKOV, P.I.; SOTNIKOV, V.A.; MAMONOV, Yu.M.; BELKINA, G.L.

Improving the accuracy of X-ray spectral analysis by a dual channel method. Zav.lab. 31 no.4:423-426 '65. (MIRA 18:12)

1. Konstruktorskoye byuro "TSvetmetavtomatika" i Rostovskiy gosudarstvennyy universitet.

BLOKHIN, M.A.; DUYMAKAYEV, Sh.I.; KARMANOV, V.I.

Reading of degeneracy in X-ray spectral analysis by calculating the intensity of scattered radiation. Zav. lab. 31 no. 12:1452-1454 '65 (MIRA 19:1)

1. Rostovskiy gosudarstvennyy universitet.

BLOKHIN, M.I., podpolkovnik meditsinskoy sluzhby

Attachment for a traction splint for the treatment of fractures of the diaphysis of the humerus. Voen.-med.zhur. no.4:92 Ap '60. (MIRA 14:1)

(HUMERUS—FRACTURE) (ORTHOPEDIC APPARATUS)

BLOKHIN, N.

Interlocking of refrigerating units for coordinated operation.
Khol. tekh. 35 no.2:55-57 Mr-Ap '58. (MIRA 11:4)
(Refrigeration and refrigerating machinery)

BLOKHIN, N., polkovnik tekhn. sluzhby.

Technical servicing during training. Tankist no.4:38-39 Ap '58.
(Tanks (Military science)--Maintenance and repair) (MIRA 11:5)

BLOKHIN, N. (g.Khabarovsk)

In the Khabarovsk House of Technology. NTO 2 no.12:54-55 D '60.
(MIRA 14:3)
(Khabarovsk—Technological innovations)

BLOKHIN, M., yurist

In what cases can trade unions withold temporary disability payments from workers? Okhr. truda i sots. strakh. 6 no.3: 42-43 Mr '63. (MIRA 16:4)

(Insurance, Social)

BLOKHIN, N.A.; ADLERSHTEYN, L.TS., inzh.,; STOLYARSKIY, L.L., nauchnyy red.; SHISHKOVA, L.M., tekhn. red.

[Hull assembly on the shipway] Opyt stapel'noi sborki. Leningrad, Gos. soiuznoe izd-vo sudostroit. promyshl., 1960. 40 p. (MIRA 14:9)

(Shipbuilding)

BRAGINSKAYA, Vera Pavlovna; BILIBIN, A.F., otvetstvennyy redaktor; BLOKHIN, N.K., redaktor; MOLCHANOVA, O.P., redaktor; OGNEV, B.V., redaktor; ROGOV, A.A., redaktor; BEL'CHIKOVA, Yu.S., tekhnicheskiy redaktor

[Scarlet fever and its treatment] Skarlatina i ee lechenie. Moskva, Gos.izd-vo med. lit-ry, 1956. 18 p. (MLRA 9:8)

1. Chlen-korrespondent AMN SSSR (for Bilibin, Blokhin, Molchanova, Ognev)
(SCARLET FEVER)

CHERNOV, Georgiy Gavrilovich; BLOKHIN, N.N., red.; ANDREYEVA, L.S., tekhn. red.

[Safety measures in the operation of agricultural machinery] Tekhnika bezopasnosti pri rabote na sel'skokhoziaistvennykh mashinakh. Izd.2., ispr. i dop. Moskva, Izd-vo VTsSPS Profizdat, 1961. 159 p. (MIRA 15:4)
(Agricultural machinery--Safety measures)

FED'KIN, Gavriil Ivanovich; PRAVKIN, G.A., red.; BLOKHIN, N.N., red.; MAKAROVA, A.N., tekhn.red.

[Legal problems in the organization of scientific work in the U.S.S.R.] Pravovye voprosy organizatsii nauchnoi raboty v SSSR. Moskva, Gos.izd-vo iurid.lit-ry, 1958. 355 p. (MIRA 12:2)
(Science)

GRAMASHEV, A.F.; GRITCHENKO, V.A.; IGYRYSH, A.I.; POPOV, V.A.; STEPANOV, V.N.; BLOKHIN, N.N., red.; ANDREYEVA, L.S., tekhn. red.

[Invention and efficiency promotion in the U.S.S.R.] Izobreta-tel'stvo i ratsionalizatsiia v SSSR. Moskva, Izd-vo VTsSPS Profizdat, 1962. 335 p. (MIRA 15:5)
(Technological innovations)

MATSARINA, I.B., nauchnyy sotrudnik; TITYANKO, T.K., nauchnyy sotrudnik; YAKOVLEVA, R.I., nauchnyy sotrudnik; BLOKHIN, N.N., red.; SHADRINA, N.D., tekhn.red.

[The 30th anniversary of the First All-Union Congress of shock brigades; collected documents and materials] Pervyi Vsesoiuznyi s"ezd udarnykh brigad; k tridtsatiletiiu s"ezda. Sbornik dokumentov i materialov. Moskva, Izd-vo VTsSPS Profizdat, 1959. 190 p. (MIRA 13:4)

1. TSentral'nyy gosudarstvennyy arkhiv Oktyabr'skoy revolyutsii i sotsialisticheskogo stroitel'stva SSSR (for Matsarina, Tityanko, Yakovleva).

(Socialist competition)

PODZERKO, Viktor Andreyevich; BLOKHIN, N.N., red.; SHADRINA, N.D., tekhn.red.

[Twelfth Congress of Soviet Trade Unions] XII s"ezd sovetskikh profsoiuzov. Moskva, Izd-vo VTsSPS Profizdat, 1959. 70 p. (MIRA 13:4)

(Trade unions--Congresses)

GUR'YANOV, Sergey Khrisanfovich; BLOKHIN, N.N., red.; SHADRINA, N.D., tekhn.red.

[Organization of wages in the U.S.S.R. industry] Organizatsiia oplaty truda v promyshlennosti SSSR. Moskva, Izd-vo VTsSPS Profizdat, 1960. 148 p. (MIRA 13:8)
(Wages)

BORISOV, V.P.; SYROVAROV, A.I.; KHANYKOV, V.V.; BLOKHIN, N.N., red.; SHADRINA, N.D., tekhn. red.

[Finances of trade unions of the U.S.S.R.; organization and planning] Finansy professional'nykh soiuzov SSSR; organizatsiia i planirovanie. Izd.2., perer. i dop. Moskva, Izd-vo VTsSPS Profizdat, 1961. 199 p. (MIRA 14:8)

1. Moscow. Vysshaya zaochnaya shkola profdvizheniya.
(Trade unions—Finance)

BAICHIN, I.S., prof.; BABANOVA, A.G., doktor med. nauk; BLOKHIN, N.N., prof.; BONDARCHUK, A.V., prof.; GAL'PERIN, M.D., prof.; GOL'DSHTEYN, L.M., prof.[deceased]; DYMARSKIY, L.Yu., kand. med. nauk; KARPOV, N.A., prof.; KOYRO, M.A., nauchn. sotr.; LARIONOV, L.F., prof.; LITVINOVA, Ye.V., kand. med. nauk; MEL'NIKOV, R.A., kand. med. nauk; NECHAYEVA, I.D., doktor med. nauk; PETROV, Nikolay Nikolayevich, prof.; PETROV, Yu.V., kand. med.nauk; RAKOV, A.I., prof.; ROGOVENKO, S.S., kand. med. nauk; SENDUL'SKIY, I.Ya., prof.; SEREBROV, A.I., prof.; SMIRNOVA, I.N., kand. med. nauk; TAL'MAN, I.M., prof.; TOBILEVICH, V.P., prof.; TRUKHALEV, A.I., kand. med. nauk; KHOLDIN, Semen Abramovich, prof.; CHEKHARINA, Ye.A., kand. med. nauk; CHECHULIN, A.S., kand. med. nauk; SHAAK, V.A., prof.[deceased]; SHANIN, A.P., prof.; SHAPIRO, I.N., prof.[deceased]; SHEMYAKINA, T.V., kand. med. nauk; SHERMAN, S.I., prof.; ABRAKOV, L.V., red.; LEBEDEVA, Z.V., tekhn. red.

[Malignant tumors]Zlokachestvennye opukholi; klinicheskoe rukovodstvo. Leningrad, Medgiz. Vol.3. Pts.1-2. 1962. (MIRA 16:5)

1. Deystvitel'nyy chlen Akademii meditsinskikh nauk SSSR (for Blokhin, Petrov, Serebrov). 2. Chlen-korrespondent Akademii meditsinskikh nauk SSSR (for Kholdin).

(CANCER)

KOMISSAROVA, Margarita Gur'yevna; POLTORANOV, Vladimir Vladimirovich; SLUTSKIY, Semen Yakovlevich; KOZLOV, I.I., red.; BLOKHIN, N.N., red.; ANDREYEVA, L.S., tekhn. red.

[Health resorts of trade unions in the U.S.S.R.] Zdravnitsy profsoiuzov SSSR; spravochnik. Moskva, Izd-vo VTsSPS Profizdat, 1962. 494 p. (MIRA 15:3)
(HEALTH RESORTS, WATERING-PLACES, ETC.)
(INDUSTRIAL RECREATION)

BARABANOVA, Tamara Alekseyevna; KREBS, Varvara Yul'yevna; BLOKHIN, N.N., red.; ANDREYEVA, L.S., tekhn. red.

[Statistical accounting and reports of a factory plant local committee and trade-union organizers] Statisticheskii uchet i otchetnost' FZMK i proforganizatorov. Moskva, Profizdat, 1962. 89 p. (MIRA 15:6)

(Trade unions—Accounting)

BLOKHIN, N.N., prof.

Our questionnaire. Nauka i zhizn' 29 no.10:47-55,62-63 O '62. (MIRA 15:12)

1. President AMN SSSR; president Mezhdunarodnogo protivorakovogo kongressa.
(CANCER)

BLOKHIN, N.N.

Malignant neoplasms. VEST. AMN SSSR 19 no.9:51-58 '64.
(MIRA 18:3)

BLOKHIN, N.N., prof.

Report on the activity of the Presidium of the Academy of Medical Sciences of the U.S.S.R. during the period of 1960-1963. Vest. AMN SSSR no.4:6-23 '64. (MIRA 18:8)

1. Prezident Akademii meditsinskikh nauk SSSR.

BLOKHIN, N.N., prof.

Biochemical indices in the clinical aspects of pulmonary and extrapulmonary forms of tuberculosis. Probl. tub. no.7:24-29. '64. (MIRA 18:10)

1. Leningradskiy institut khirurgicheskogo tuberkuleza (dir.-prof. D.K. Khokhlov).

BLOKHIN, N.N.; ABBASOV, A.T.

Primary dermatoplasty in the surgical treatment of skin cancer. Vest. khir. 94 no.2:71-74 F '65. (MIRA 18:5)

1. Iz 1-go khirurgicheskogo otdeleniya (zav. - doktor med. nauk B.Ye. Peterson) Instituta eksperimental'noy i klinicheskoy onkologii AMN SSSR (dir. - deystvitel'nyy chlen AMN SSSR prof. N.N. Blokhin).

BLOKHIN, N.N.; SYROMYATNIKOVA, N.V.

Carbohydrate and protein functions of the liver in the initial forms of experimental tuberculosis of the bones. Probl. tub. no.2:64-70 '65. (MIRA 18:12)

1. Biokhimicheskaya laboratoriya (zav. - prof. N.N.Blokhin) Leningradskogo nauchno-issledovatel'skogo instituta khirurgicheskogo tuberkuleza (direktor - prof. D.K.Khokhlov, nauchnyy rukovoditel' - deystvitel'nyy chlen AMN SSSR prof. P.G.Korner).

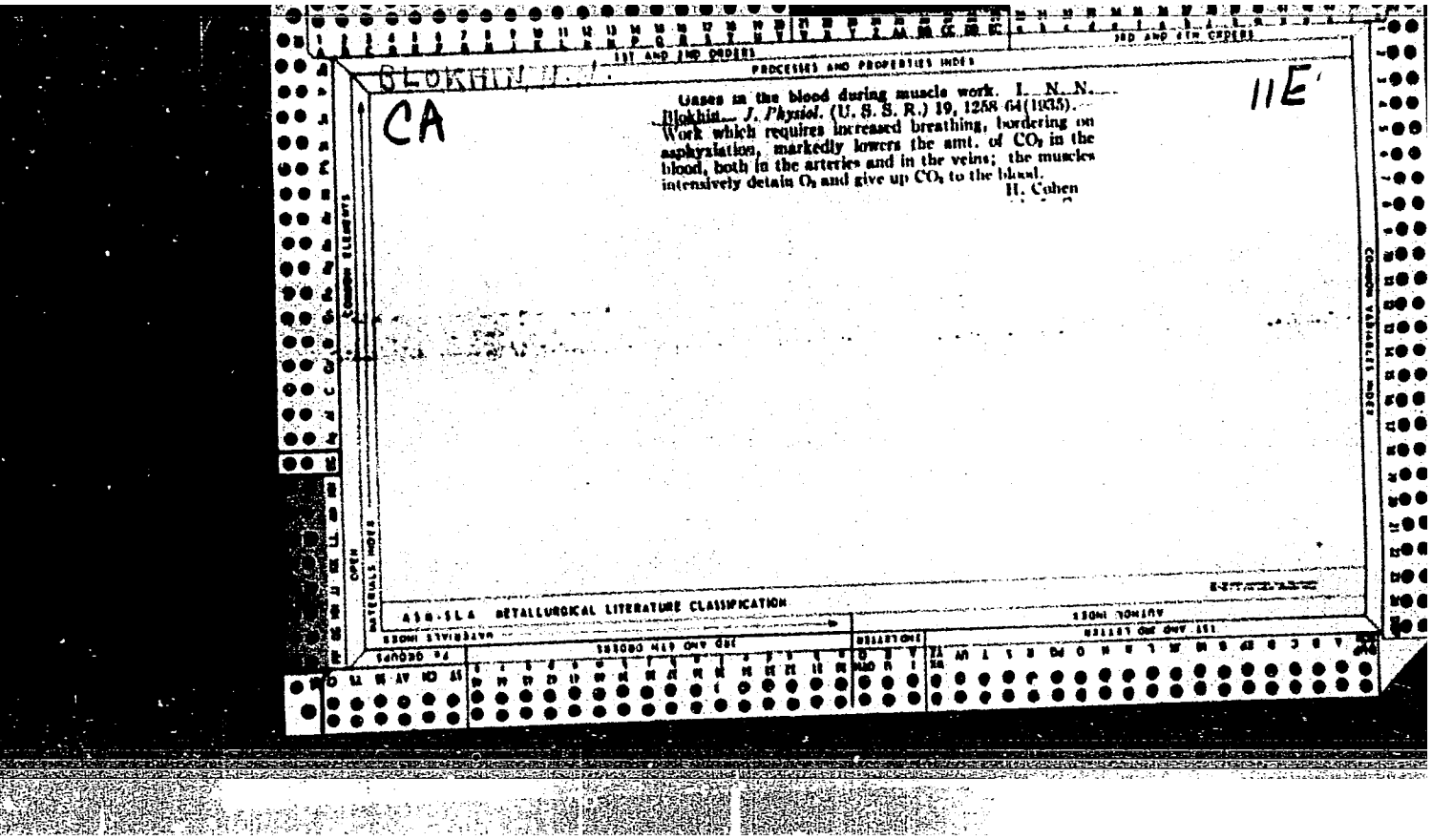
BLOKHIN, N.N.; SYROMYATNIKOVA, N.V.

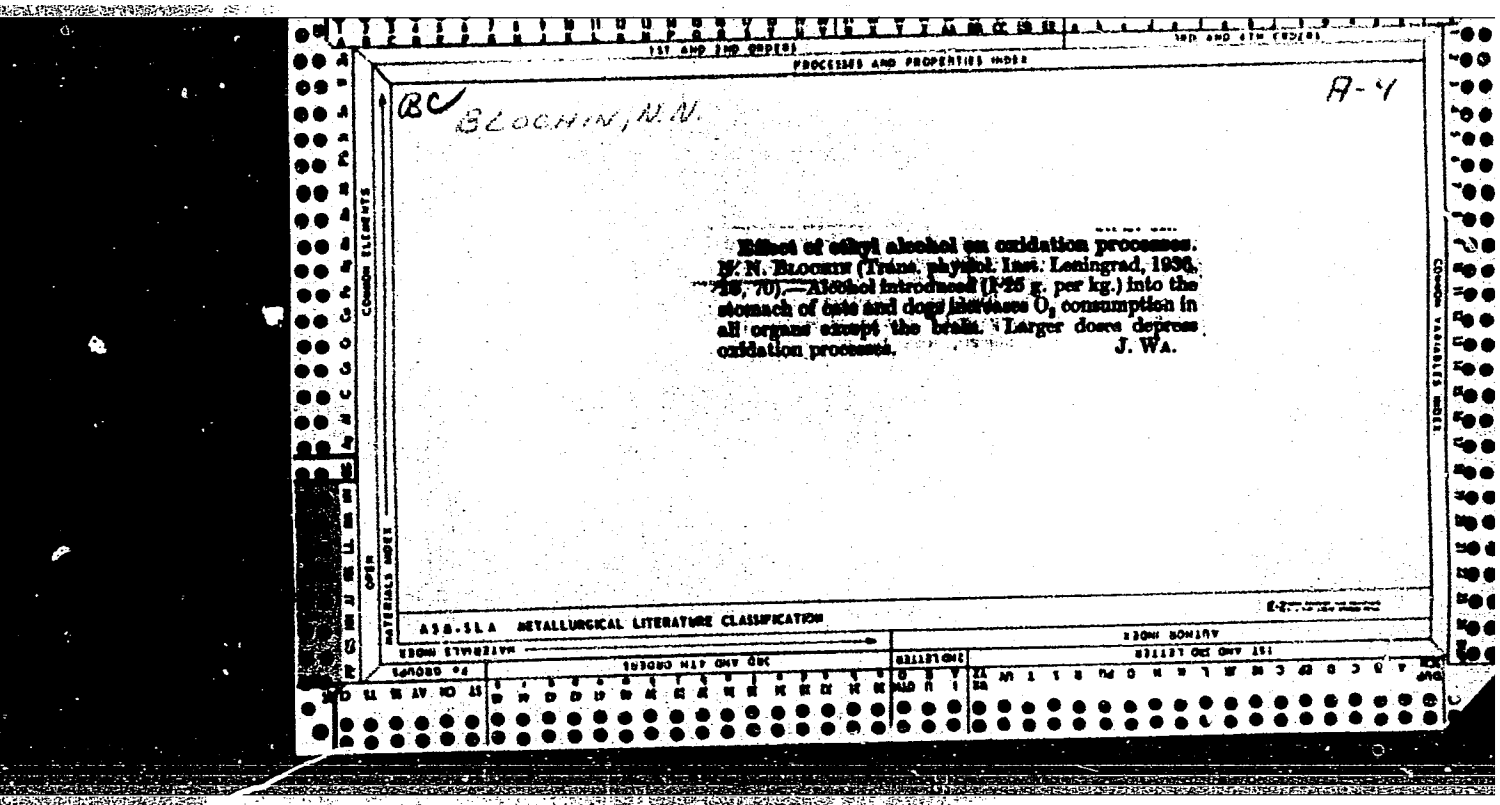
Electrophoretic studies on blood serum protein fractions in various stages of osteoarticular tuberculosis in rabbits. Vop. med. khim. 10 no.5:508-513 S-O '64. (MIRA 18:11)

1. Leningradskiy nauchno-issledovatel'skiy institut khirurgicheskogo tuberkuleza.

BLOKHIN, N.N. (Moskva)

Perspectives of compound treatment of stomach cancer.
Vest. AMN SSSR 20 no.12:45-51 '65.
(MIRA 19:1)

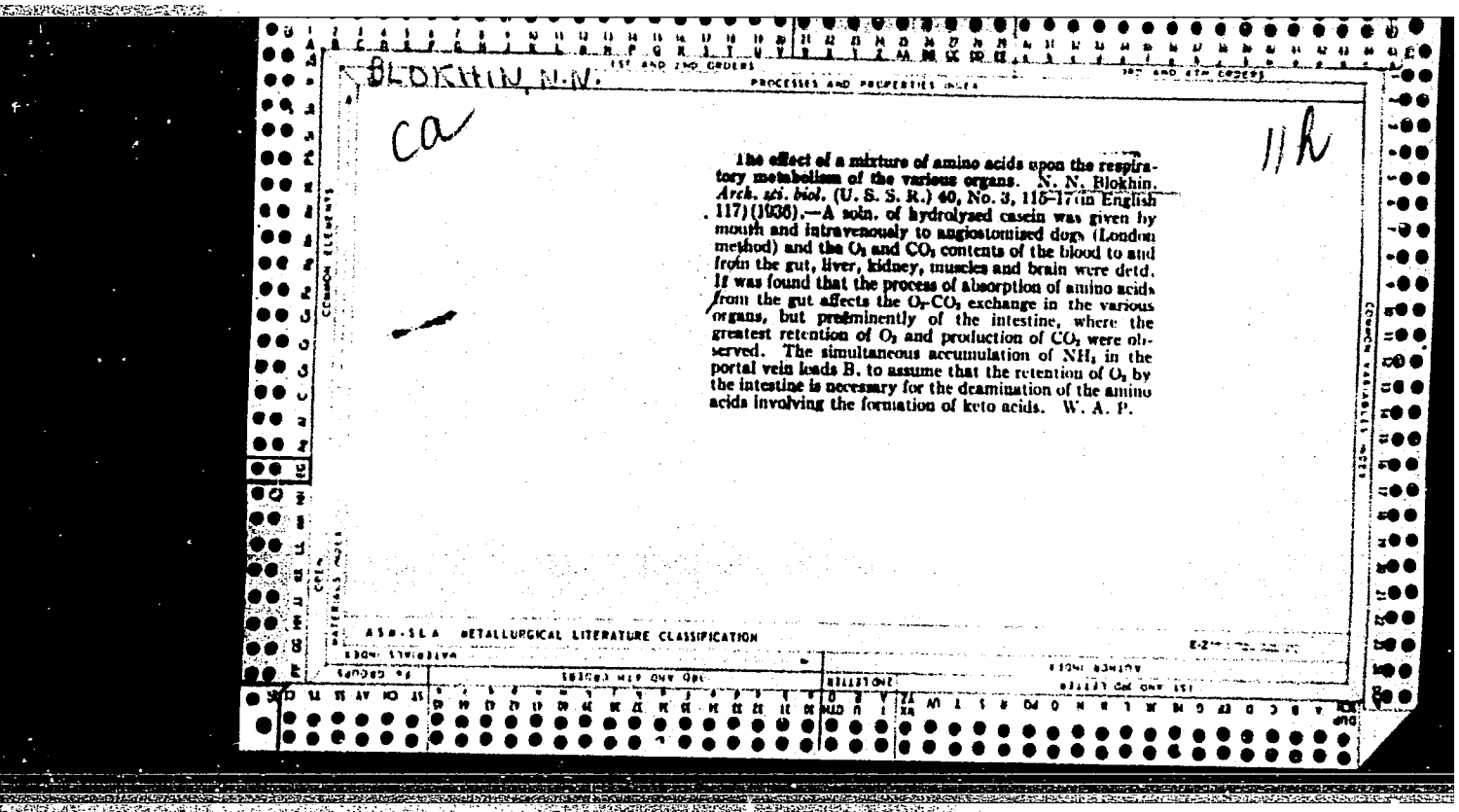




BC
BLOOMN, M.N.

A-4

Effect of ethyl alcohol on oxidation processes. M. N. Bloomin (Trans. physiol. Inst. Leningrad, 1936, 13, 70).—Alcohol introduced (1·25 g. per kg.) into the stomach of cats and dogs increases O_2 consumption in all organs except the brain. Larger doses depress oxidation processes. J. Wa.



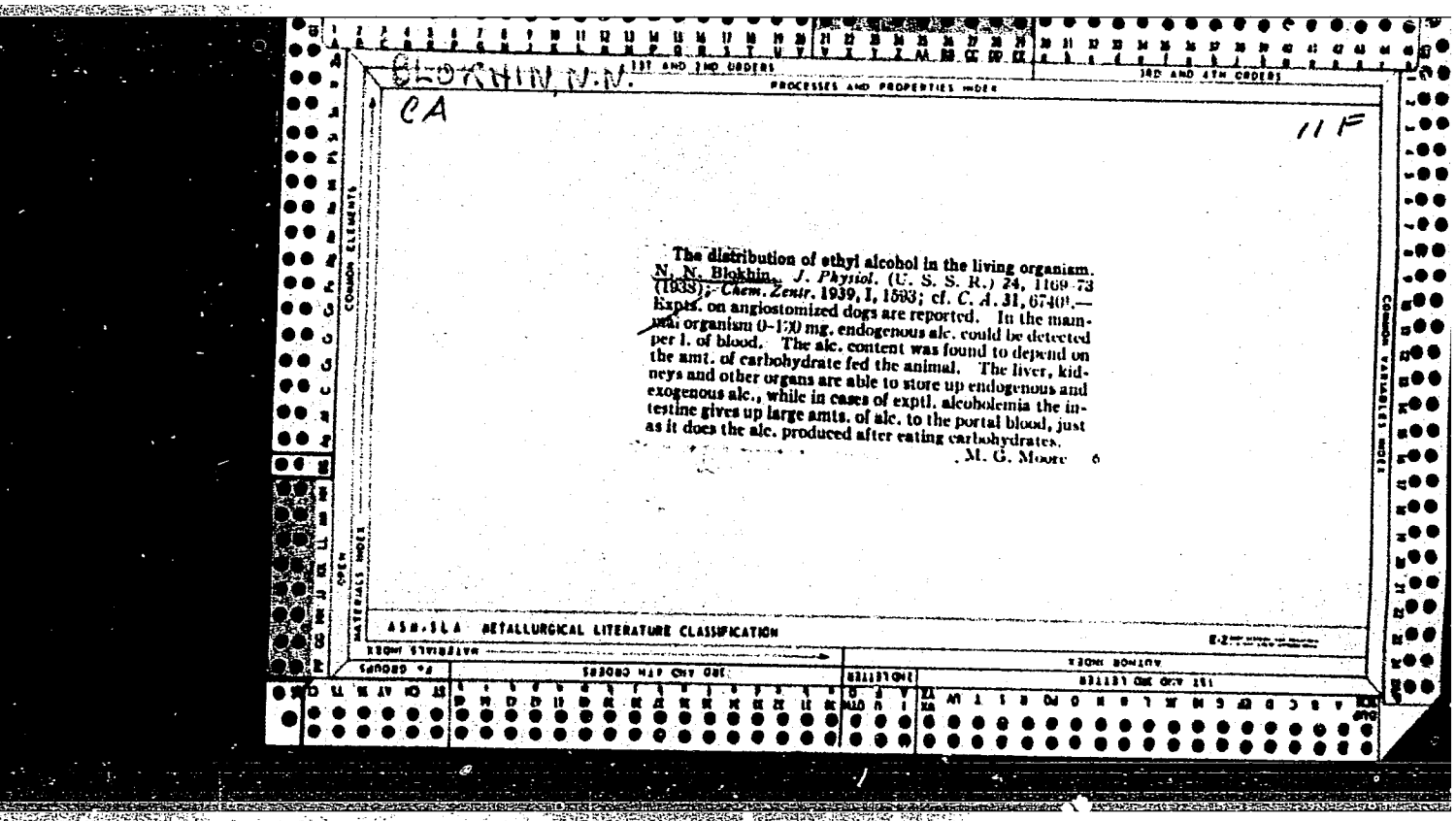
BLOKHIN, N.N.

ca

11h

The effect of a mixture of amino acids upon the respiratory metabolism of the various organs. N. N. Blokhin. *Arch. sci. biol.* (U. S. S. R.) 40, No. 3, 115–17 (in English 117) (1936).—A soln. of hydrolyzed casein was given by mouth and intravenously to angiostomized dogs (London method) and the O_2 and CO_2 contents of the blood to and from the gut, liver, kidney, muscles and brain were detd. It was found that the process of absorption of amino acids from the gut affects the O_2-CO_2 exchange in the various organs, but preëminently of the intestine, where the greatest retention of O_2 and production of CO_2 were observed. The simultaneous accumulation of NH_3 in the portal vein leads B. to assume that the retention of O_2 by the intestine is necessary for the deamination of the amino acids involving the formation of keto acids. W. A. P.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

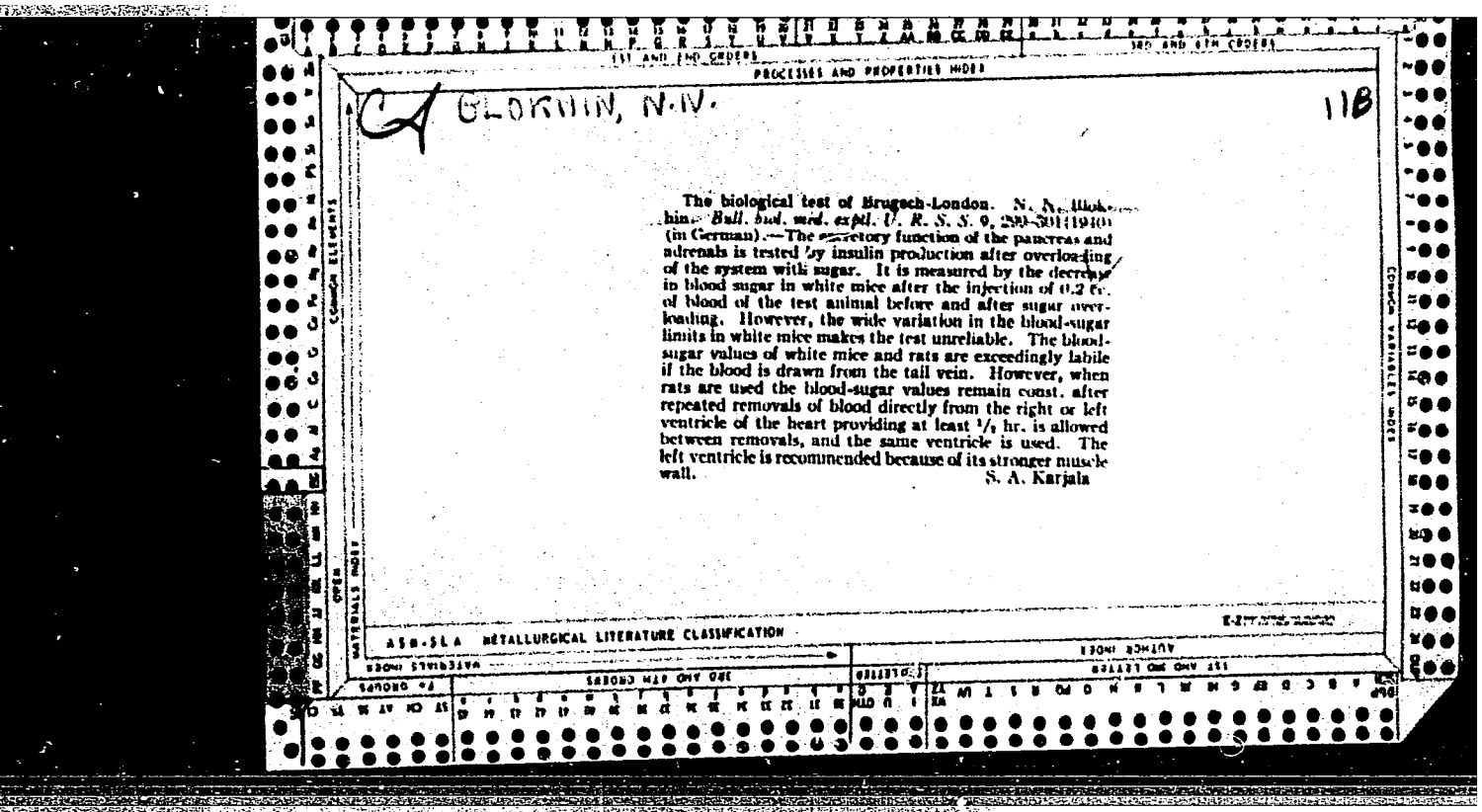

BLOKHIN, N.N.

CA

11F

The distribution of ethyl alcohol in the living organism. N. N. Blokhin. *J. Physiol.* (U. S. S. R.) 24, 1169-73 (1938); *Chem. Zentr.* 1939, I, 1593; cf. *C. A.* 31, 6740⁹.—Expts. on angiostomized dogs are reported. In the mammalian organism 0–170 mg. endogenous alc. could be detected per l. of blood. The alc. content was found to depend on the amt. of carbohydrate fed the animal. The liver, kidneys and other organs are able to store up endogenous and exogenous alc., while in cases of exptl. alcoholemia the intestine gives up large amts. of alc. to the portal blood, just as it does the alc. produced after eating carbohydrates.

M. G. Moore 6



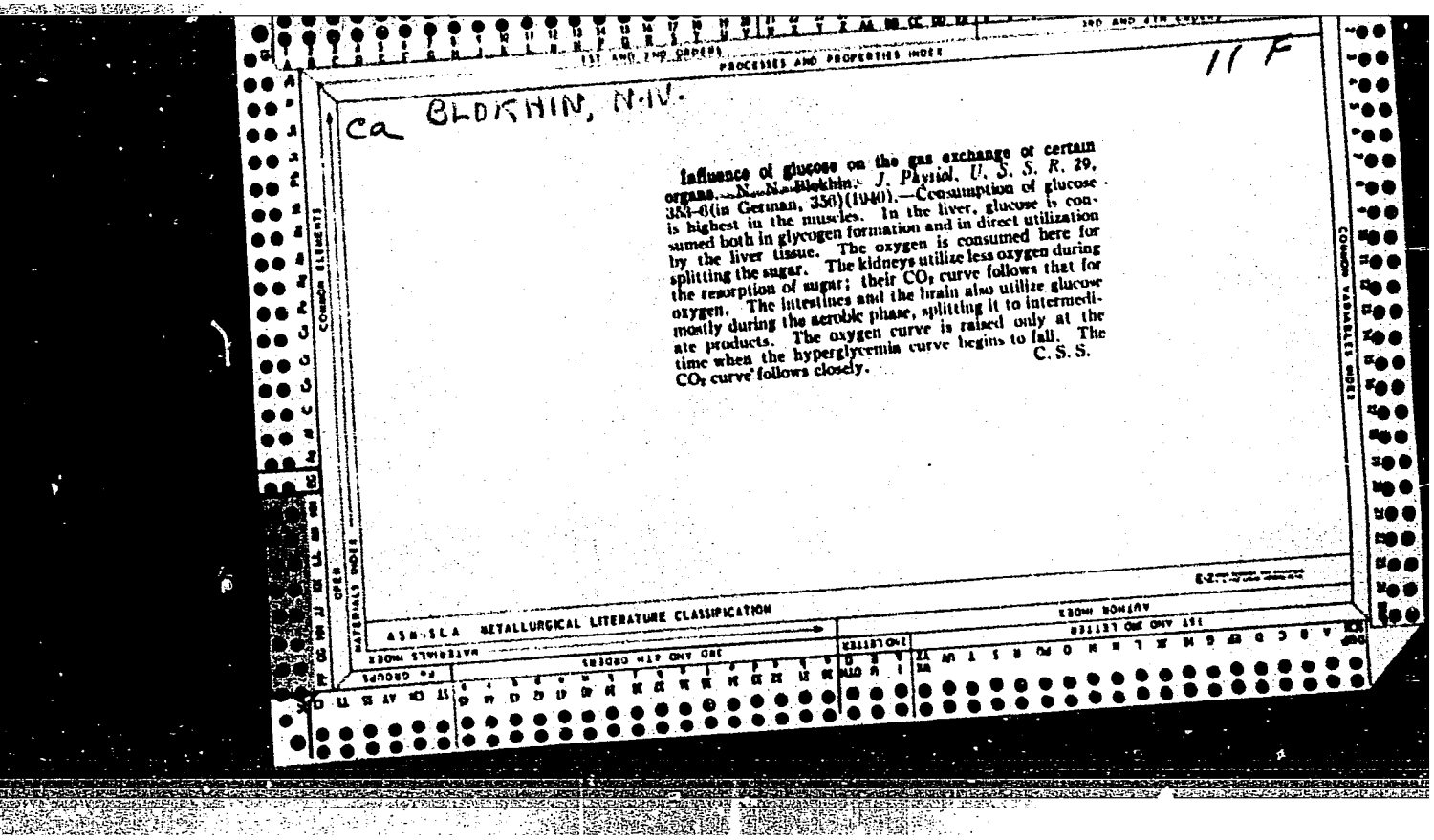
GLOBKIN, N.N.

11B

The biological test of Brugsch-London. N. N. Glob-kin. *Bull. biol. med. exptl. U. R. S. S.* 9, 299-301[1940] (in German).—The secretory function of the pancreas and adrenals is tested by insulin production after overloading of the system with sugar. It is measured by the decrease in blood sugar in white mice after the injection of 0.2 cc. of blood of the test animal before and after sugar overloading. However, the wide variation in the blood-sugar limits in white mice makes the test unreliable. The blood-sugar values of white mice and rats are exceedingly labile if the blood is drawn from the tail vein. However, when rats are used the blood-sugar values remain const. after repeated removals of blood directly from the right or left ventricle of the heart providing at least 1/2 hr. is allowed between removals, and the same ventricle is used. The left ventricle is recommended because of its stronger muscle wall.

S. A. Karjala

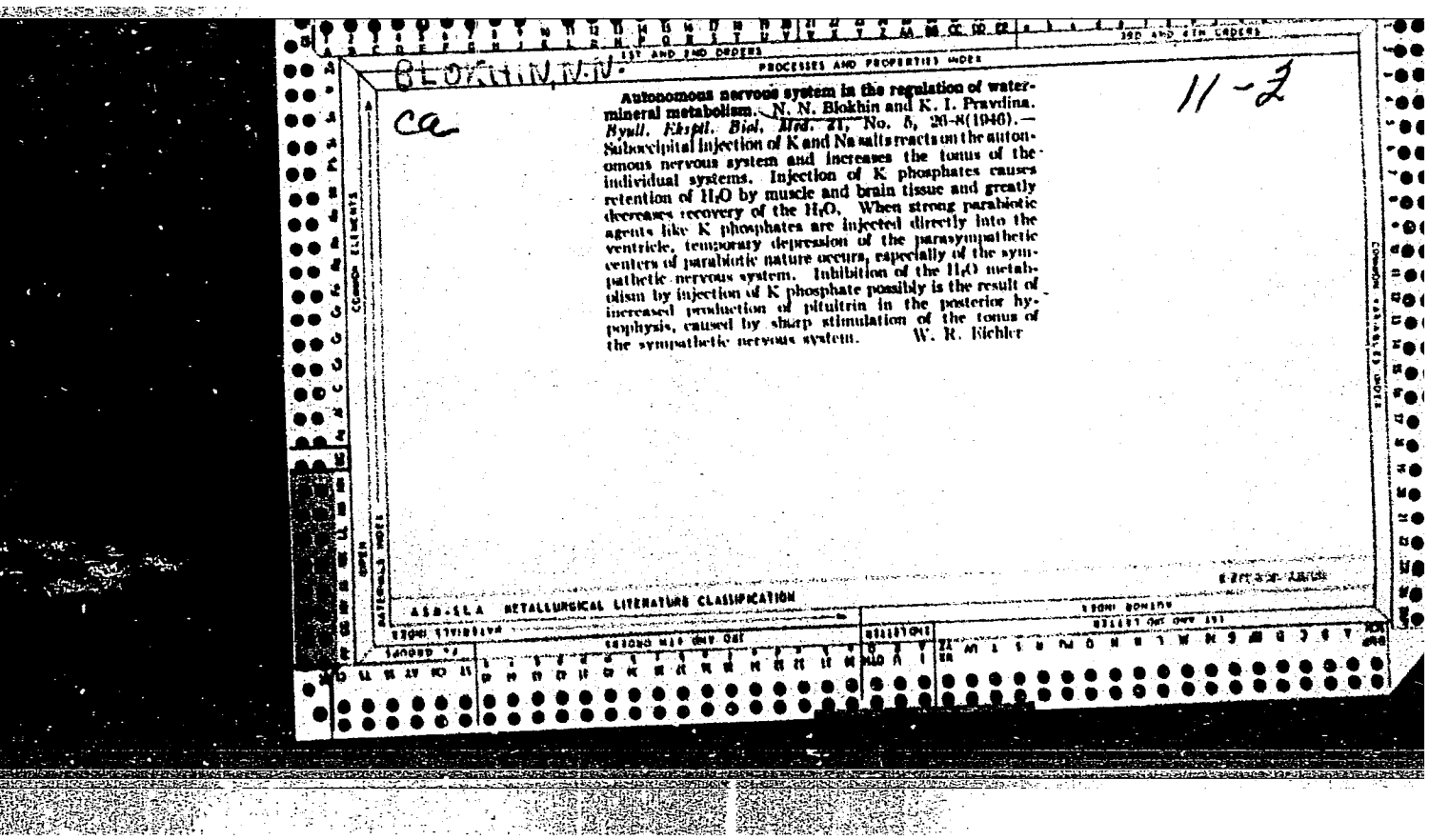
ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

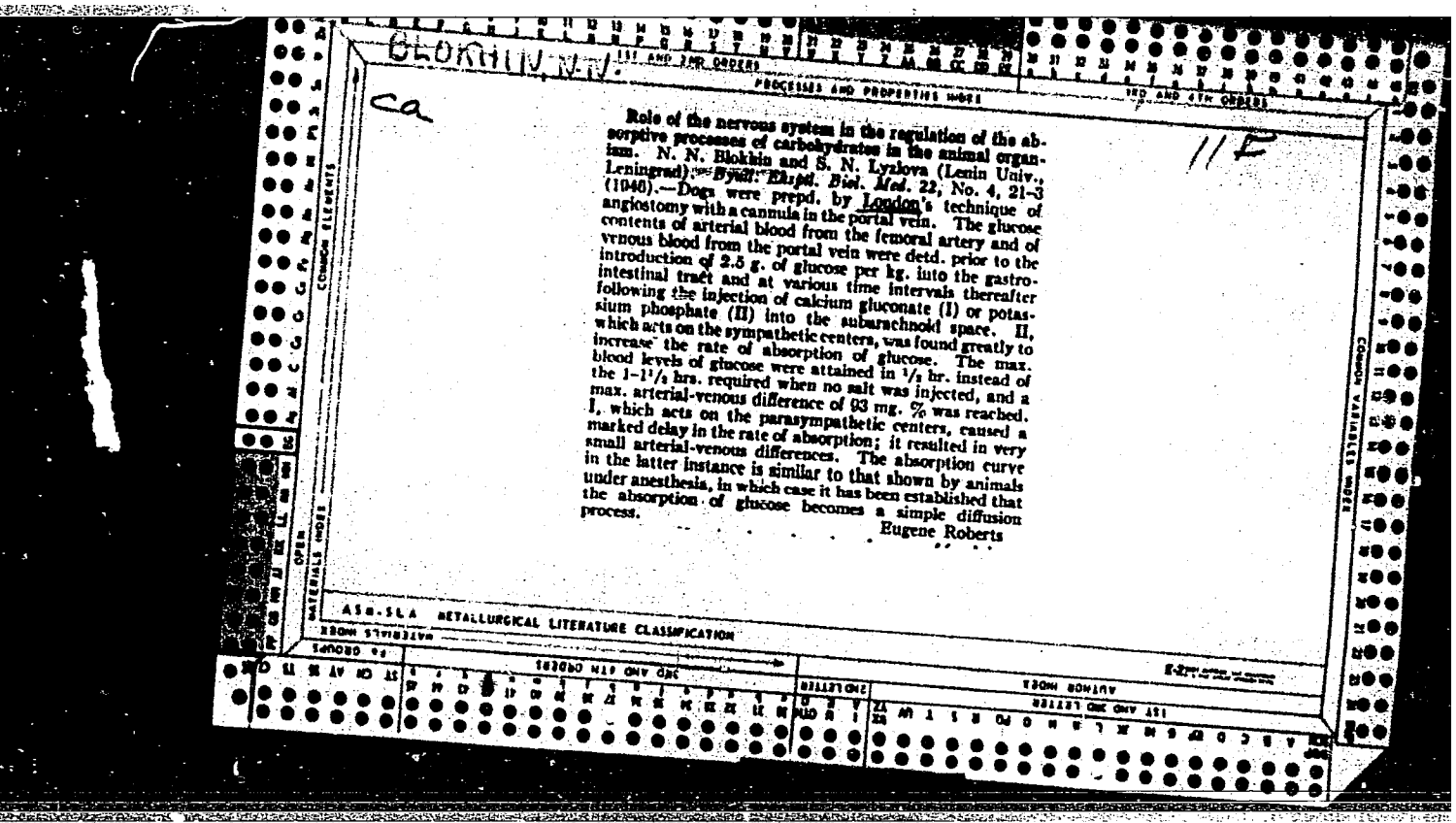


Ca BLOKHIN, N.N.

11 F

Influence of glucose on the gas exchange of certain organs. N. N. Blokhin. *J. Physiol. U. S. S. R.* 29, 353-6(in German, 356)(1940).—Consumption of glucose is highest in the muscles. In the liver, glucose is consumed both in glycogen formation and in direct utilization by the liver tissue. The oxygen is consumed here for splitting the sugar. The kidneys utilize less oxygen during the resorption of sugar; their CO_2 curve follows that for oxygen. The intestines and the brain also utilize glucose mostly during the aerobic phase, splitting it to intermediate products. The oxygen curve is raised only at the time when the hyperglycemia curve begins to fall. The CO_2 curve follows closely. C. S. S.





BLOKHIN, N. N.

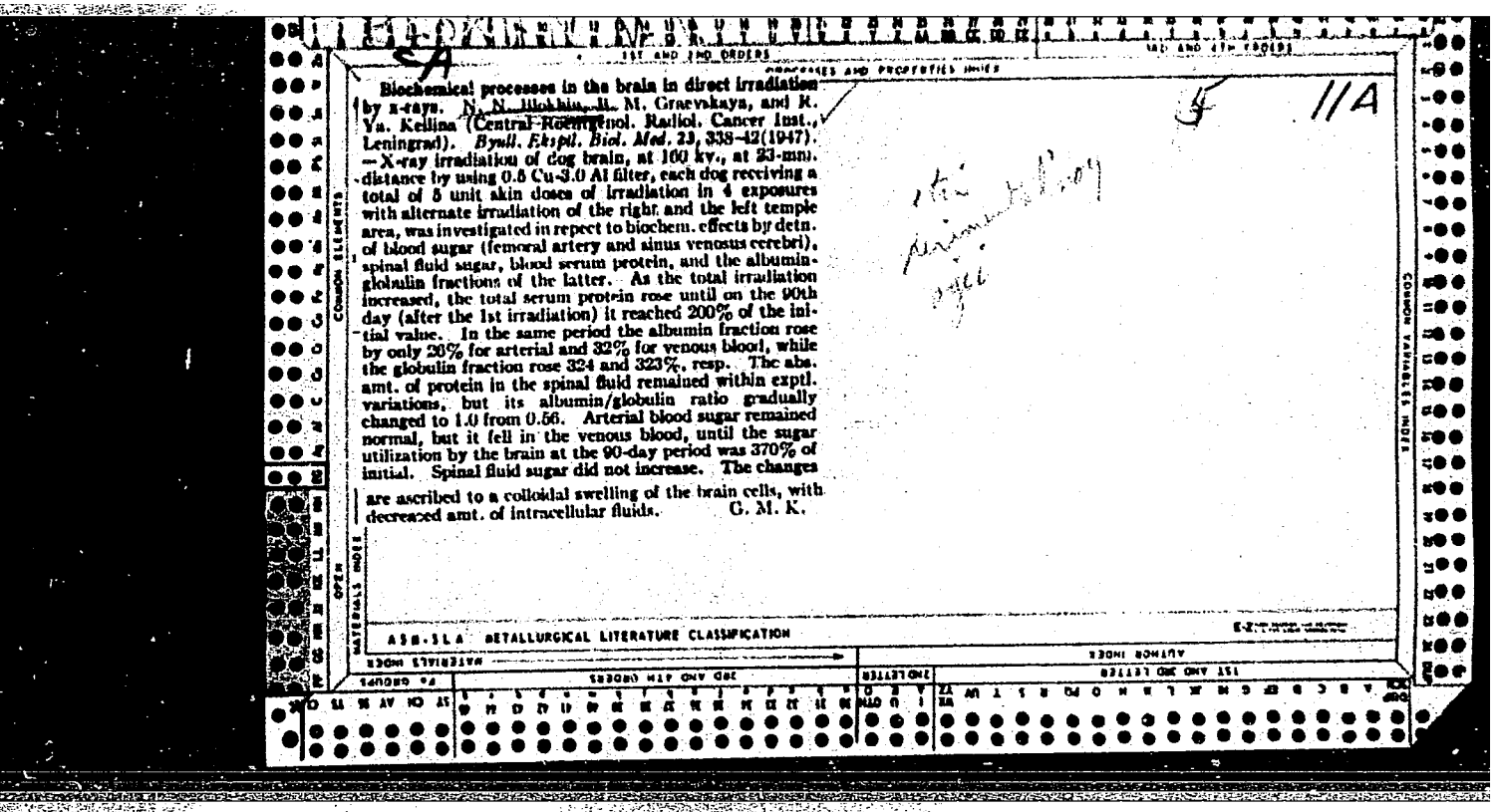
Ca

Role of the nervous system in the regulation of the absorptive processes of carbohydrates in the animal organism. N. N. Blokhin and S. N. Lyalova (Lenin Univ., Leningrad). *Byull. Eksptl. Biol. Med.* 22, No. 4, 21-3 (1946).—Dogs were prepd. by London's technique of angiostomy with a cannula in the portal vein. The glucose contents of arterial blood from the femoral artery and of venous blood from the portal vein were detd. prior to the introduction of 2.5 g. of glucose per kg. into the gastrointestinal tract and at various time intervals thereafter following the injection of calcium gluconate (I) or potassium phosphate (II) into the subarachnoid space. II, which acts on the sympathetic centers, was found greatly to increase the rate of absorption of glucose. The max. blood levels of glucose were attained in ⅓ hr. instead of the 1–1½ hrs. required when no salt was injected, and a max. arterial-venous difference of 93 mg. % was reached. I, which acts on the parasympathetic centers, caused a marked delay in the rate of absorption; it resulted in very small arterial-venous differences. The absorption curve in the latter instance is similar to that shown by animals under anesthesia, in which case it has been established that the absorption of glucose becomes a simple diffusion process.

Eugene Roberts

11E

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



Biochemical processes in the brain in direct irradiation by x-rays. N. N. Likhtin, Ii. M. Graevskaya, and R. Ya. Kellina (Central Roentgenol. Radiol. Cancer Inst., Leningrad). *Byull. Eksptl. Biol. Med.* 23, 338–42(1947). —X-ray irradiation of dog brain, at 100 kv., at 23-mm. distance by using 0.5 Cu-3.0 Al filter, each dog receiving a total of 5 unit skin doses of irradiation in 4 exposures with alternate irradiation of the right and the left temple area, was investigated in repect to biochem. effects by detn. of blood sugar (femoral artery and sinus venosus cerebri), spinal fluid sugar, blood serum protein, and the albumin-globulin fractions of the latter. As the total irradiation increased, the total serum protein rose until on the 90th day (after the 1st irradiation) it reached 200% of the initial value. In the same period the albumin fraction rose by only 20% for arterial and 32% for venous blood, while the globulin fraction rose 324 and 323%, resp. The abs. amt. of protein in the spinal fluid remained within exptl. variations, but its albumin/globulin ratio gradually changed to 1.0 from 0.56. Arterial blood sugar remained normal, but it fell in the venous blood, until the sugar utilization by the brain at the 90-day period was 370% of initial. Spinal fluid sugar did not increase. The changes are ascribed to a colloidal swelling of the brain cells, with decreased amt. of intracellular fluids. G. M. K.

PA 4/49163

BLOKHIN, N. N. PROF

USSR/Medicine - Metabolism Jan 48
Medicine - Carbohydrates, Metabolism

"The School of Professor Yefim Semenovich London in Leningrad University," Prof N. N. Blokhin, 8 pp

"Vest Leningrad U" No 1

Sci Res Inst of Physiol of Leningrad U was founded in 1932. From then on Prof London has been in charge of the Metabologic Lab. Describes his achievements. He was first to observe changes in blood flow through organs in vivo. Reviews laboratory work on carbohydrates, albumin, fats, gases, and water metabolism.

4/49163

BLOKHIN, N.N.; GRAYEVSKAYA, B.M.; KEYLINA, R.Ya.

Biochemical functional test in certain forms of hypertension.
Vop.med.khim. 3:52-57 '51. (MIRA 11:4)

1. Otdel biokhimii TSentral'nogo rentgenologicheskogo, radiologicheskogo i rakovogo instituta, Leningrad.
(HYPERTENSION)