BLOKH, E. L.

Blokh, E. L. and Plantonov, G. Ye. and Prokopenko, N. Ye. - "The effect of streptomycin on cellular reaction in tubercular infections", Trudy Akad. med. nauk SSSR, Vol. II, 1949, p. 35-42.

SO: U-4329, 19 August 53, (Letopis 'Zhurnal 'nykh Statey, No. 21, 1949).

BLOKH, E.L.

PLATONOV, G.Ye., professor; PROKOPENKO, N.Ya.; BLOKH, E.L.

Physiological principles of surgery of the nervous system in tuberculosis. Probl. tub. no.3:58-65 My-Je '54. (MLRA 7:11)

1. Iz Instituta tuberkuleza Akademii meditsinskikh nauk SSSR (dir. Z.A.Lebedeva)

(TUBERCULOSIS, PULMONARY, experimental, eff. of vagotomy)
(NERVES, VAGUS, surgery, eff. on exper. pulm. tuberc.)

PLATONOV, G.Ye., prof.; PROKOPENKO, N.Ye., kand.biologicheskikh nauk; BLOKH, B.I., kand.biologicheskikh nauk

Changes in physiological processes following BCG vaccination and infection with tuberculosis in experiments on animals. Trudy Inst. tub. AMN 7:70-84 '58. (MIRA 13:10)
(BCG VACCINATION) (METABOLISM)

BLOKH, E. L.

"Study of a Plane Grid Composed of Theoretical Profiles of Finite Thickness." Trudy Ts AGI, No. 611 (1947)

Bloh, É. L. The horizontal hydrodynamic impact [illegible] sphere in the presence of a free [illegible]

[illegible]

[illegible]

of determining the velocity distribution in the fluid at the moment of impact to an exterior Neumann problem for the impulsive pressure. The solution of this problem is given explicitly as an absolutely and uniformly convergent series of associated Legendre functions of the first order

By the same method the author determines the velocity distribution in a fluid which fills a [illegible] between the [illegible]

[illegible]

1/934. Blokh, É. L., Horizontal impact of an ellipsoid of rotation against an ideal liquid with an existing free surface (in Russian), *Prikl. Mat. Mekh.* 17, 6, 705-726, Nov./Dec. 1953.

Reference is made to a former paper dealing with the horizontal [illegible] such that the plane of the [illegible]

(1) An ellipsoid of rotation half immersed in an ideal liquid

BLOKH, E. L.

USSR

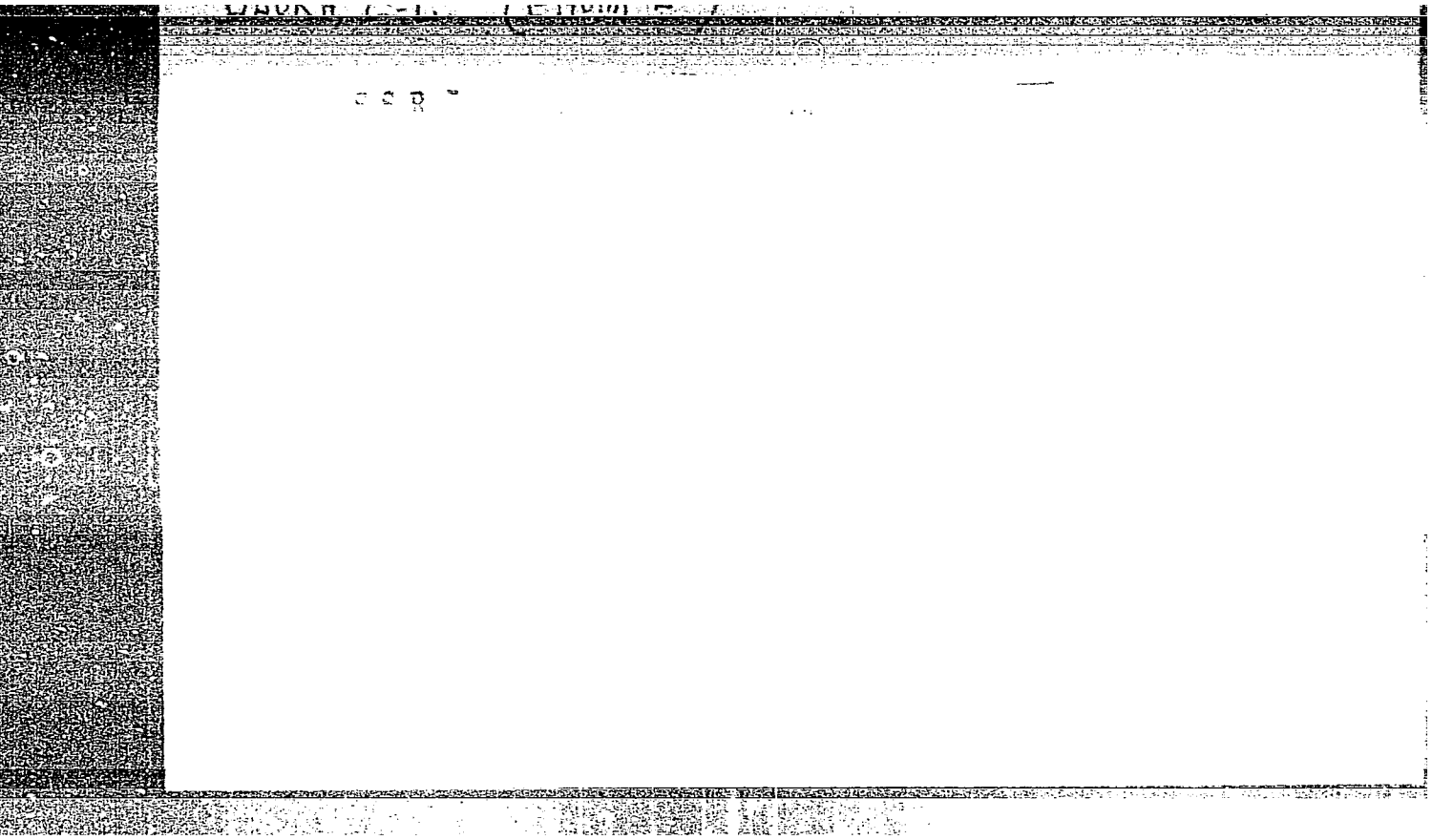
Blokh, E. L. On the impact of an ellipsoid of revolution floating on the surface of a quite heavy fluid. Prikl. Mat. Meh. 18, 631–636 (1954). (Russian)

The author considers an ellipsoid E of revolution, half immersed in an ideal fluid which fills a lower half-space and which is initially at rest. One of the principal axes of E is to be orthogonal to the surface of the fluid. A prescribed initial velocity is then imparted to E by means of an impulsive force. The velocity distribution in the fluid at the moment of impact is studied in the limiting case that the density of the fluid is arbitrarily large. The procedure involves only a formal modification of the method used by the author in two related papers [same journal 17, 579–592, 705–726 (1953); MR 16, 82], the boundary condition $\varphi=0$ for the velocity potential at the free surface of the fluid being here replaced by the condition $\partial\varphi/\partial n=0$. The solution again appears as a series of associated Legendre functions of the first and second kinds. The physical justification of the boundary condition at the free surface, both in the present work and in the above cited earlier papers of the author, is not clear to the reviewer.

R. Finn.

1 - F/W

62



USSR/Electronics - Information Theory FD-2928

Card 1/1 Pub. 41-9/17

Author : Blokh, E. L. and Kharkevich, A. A., Moscow

Title : Geometric presentations in the theory of communications

Periodical : Izv. AN SSSR, Otd. Tekh. Nauk 6, 91-100, June 1955

Abstract : Describes how and where geometric theory can be applied to the study and the science of communications. Discusses the incidental vector, the message and the signal, the signal and interference, interference rejection, transmission capacity, maximum transmission capacity, method of storage and the separation of signals. Diagrams, formulae. Seven references, 4 USSR.

Institution :

Submitted : April 14, 1955

USSR/Mechanics - Hydromechanics FD-2485

Card 1/1 Pub 85-12/19

Author : Blokh, E. L.

Title : Influence of depth of submersion of a sphere on the coefficient of combined mass during a horizontal shock

Periodical : Prikl. Mat. i Mekh., 19, 353-358, May-June 1955

Abstract : The author summarizes known facts about the coefficient of combined mass of a submerged sphere. In an effort to determine the influence of depth on this coefficient he considers the problem of a sphere immersed in an ideal liquid at a depth greater than its radius. He derives an expression for the coefficient of combined mass and calculates values from first and second approximations. The author finds that the coefficient varies from 0.418 to 0.5, the latter value applying at infinite depth.

Institution: --

Submitted : November 23, 1954

BLOKH, Ye. L.

USSR/Electronics - Information Theory FD-2669

Card 1/1 Pub. 90-1/12

Author : Blokh, E. L. and Kharkevich, A. A.

Title : Geometric theory of the threshold of transmission capacity of a communications system

Periodical : Radiotekhnika, 10, 3-7, Jul 55

Abstract : The limiting factors of signal transmission in a communications system are evaluated on the basis of the geometric theory. The limiting transmission capacity of a system is defined as the greatest amount of intelligence that can be conveyed to the receiving end of the line, maintaining the lowest desired probability of error. The transmission capacity approaches zero as the level of noise approaches that of the signal. Reliable reception for small increments of signal over noise require the use of special methods of reception, such as storage and correlation methods. Graphs. Two references; one USSR.

Institution :

Submitted : January 11, 1955

BLOKH, E. L.

USSR/Electronics - Communication Theory FD - 1933

Card 1/1 Pub 90-2/9

Author : Kharkevich, A. A., and Blokh, E. L.

Title : Limiting capacity of a communication system

Periodical : Radiotekhnika 10, 14-20, Feb 1955

Abstract : The derivation of an expression based on geometrical relationships for determining the limiting capacity of a communication system is given. The older, well-known Shannon formula generally used for these calculations holds true only when the signal-to-noise ratio approaches infinity.

Institution: --

Submitted : December 15, 1954

BLOKH, E.L.;KHARKEVICH, A.A.

Reply to L.M.Fink's remarks. Radiotekhnika 10 no.10:75 O '55.
(Telecommunication) (MLRA 9:1)

BLOKH, E.L.

SUBJECT USSR / PHYSICS CARD 1 / 3 PA - 1705
AUTHOR BLOH,E.L., HARKEVIC,A.A.
TITLE On the Question of the Geometric Proof of SHANNON'S Theorem.
PERIODICAL Radiotechnika, 11, fasc. 11, 5-16 (1956)
Issued: 12 / 1956

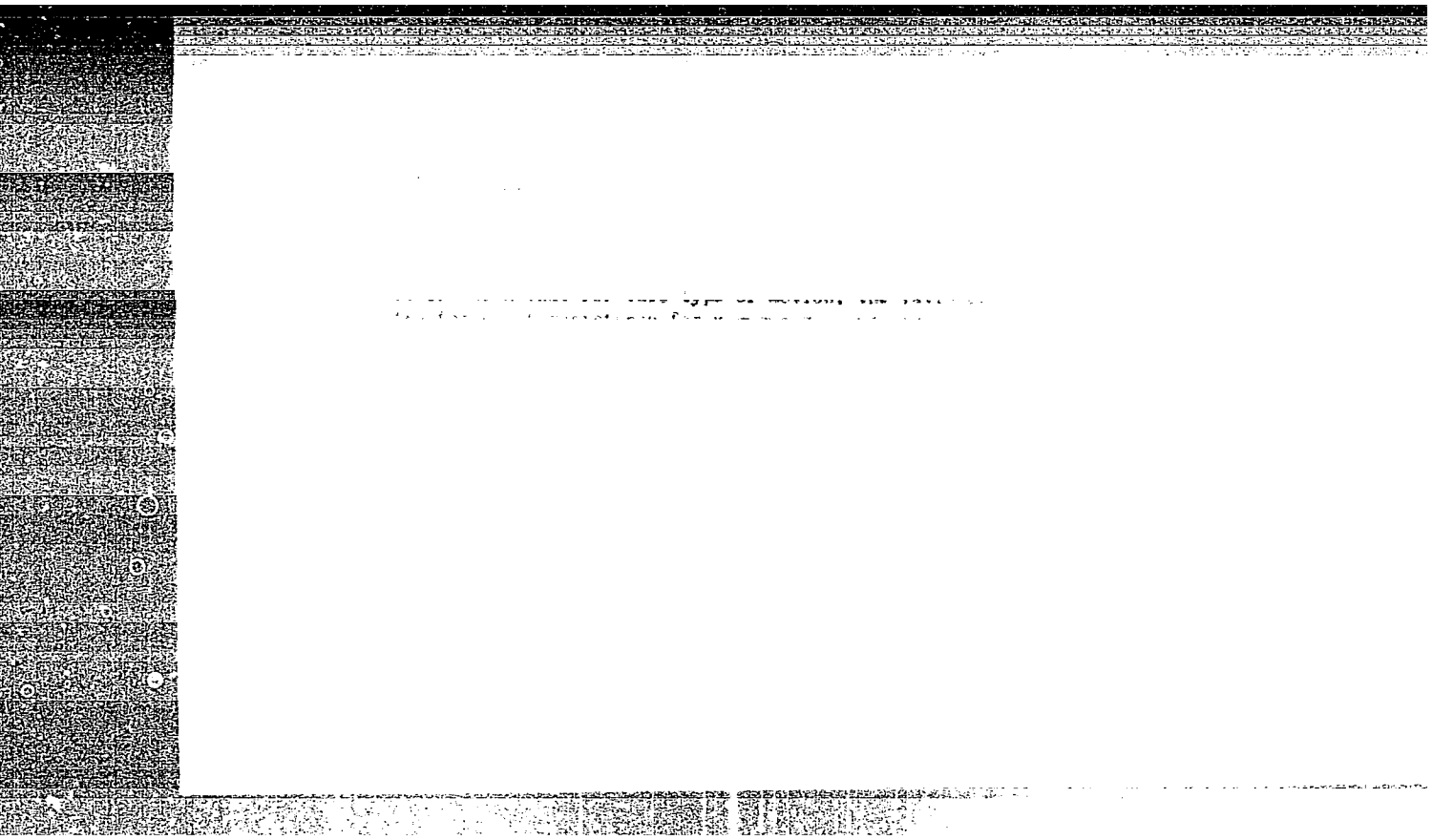
In the course of previous works (Radiotechnika, fasc.2 and 7, 1955) the authors endeavored to prove the theorem on the penetrability limit geometrically. According to SHANNON this theorem is: $C = F \log_2 \frac{P + P_\Pi}{P_\Pi}$

P here denotes the average power of the transmitter, P_Π - the power of the perturbation in the stripe F, C - velocity. In the present work the theorem is presented in SHANNON'S form and also geometric proof of the second statement made in this theorem. It was found that SHANNON failed to take the following into account: Even in the case of the densest arrangement the coefficient of the filling up of the space by non-intersecting spheres is diminished if $n = 2FT$ (T - time, n - dimension) increases, and at $n \to \infty$ it tends towards zero. The authors corrected this error committed by SHANNON and obtained an expression which deviates from that of SHANNON: $C \leqslant F \left[\log \left(1 + \frac{P}{P_\Pi}\right) - 1\right]$ The difference between the two formulae is very essential in the case of comparable P and P_Π, namely just in the case of such conditions as are of particular interest in modern radiotechnology. On the other hand, SHANNON'S formula has been generally accepted. This contradiction could be explained by

two assumptions: 1. The limit of penetrability cannot be attained by means of a receiver that is ideal in KOTELJNIKOV'S sense. 2. An error was committed in setting the geometric problem to be solved itself. Further investigation showed that the statements made by SHANNON contain a further error: the condition that spherical spaces of indetermination do not intersect. In their previous works the authors adhered to this condition from which they concluded that SHANNON'S formula is wrong. What is true is only that the formula cannot be obtained on the basis of geometrical assumptions made by Shannon himself. It is shown that the task is confined to investigating the probability of the error on the condition that the spheres partly intersect. On the basis of a simple example the authors show that, spoken generally, it is possible to obtain any small probability of the error also if the spherical spaces of indetermination intersect, but nevertheless no conclusions can be drawn with respect to relations for the case of partial intersection, for here the densest arrangement is concerned, the geometry of which is not known. Therefore, only an approximation method can be applied. By doing so, the authors eventually obtain the expression: $\frac{C}{F} < \log\left(1 + \frac{P}{P_{\Pi}}\right)$. The right part of this expression is the penetrability limit according to SHANNON. Unfortunately, the authors cannot carry out proof to the end and are unable to replace the sign of inequality. It would suffice were it possible to prove that the assumption on the basis of which the authors obtained this expression is asymptotic. The

authors regret not being in possession of this proof. It would be of importance because then not only SHANNON'S theorem could have been proved geometrically, but it would have been possible to show whether the limit of penetrability can be realized by means of a receiver that is ideal in KOTELJNIKOV'S sense.

INSTITUTION:



BLOKH, E. L.

CARD 1/2 PG - 762

SUBJECT USSR/MATHEMATICS/Geometry
AUTHOR BLOCH E.L.
TITLE On the most dense distribution of the spherical segments on a hypersphere.
PERIODICAL Izvestija Akad.Nauk, Ser.mat. 20, 707-712 (1956) S.-o.
reviewed 5/1957

The surface of an n-dimensional unit sphere is covered with spherical segments the opening angle of which is 2θ. For the coefficient

$$K_n(\theta) = \nu_n \frac{S_n(\theta)}{S_n(\pi)}$$

(where $S_n(\theta)$ is the surface of the segment with the opening angle 2θ, ν_n is the number of segments and $S_n(\pi)$ the surface of the unit sphere) an upper estimate is given:

$$(1) \quad K_n(\theta) \leq \frac{n-1}{2^{\frac{n-1}{2}}} \cdot \frac{\sin^2\varphi}{\cos\varphi + \sqrt{\cos^2\varphi + \frac{\sin^2\varphi}{n+1}}} \cdot \frac{\lambda_n(\theta)}{1-(n-1)\cos\varphi\ \lambda_n(\varphi)}.$$

Here

BLOKH, E.L.

103-6-1/11

AUTHOR BLOKH E.L.

TITLE ~~On the Relation~~ Between the Velocity of Transmitting Information and the Resistance Against Disturbances of a Coupling System. (K voprosu o zavisimosti mezhdu skorost'yu peredachi soobsheheniy i pomekhoustoychivost'yu sistemy svyazi-Russian)

PERIODICAL Radiotekhnika, 1957, Vol 12, Nr 6, pp 3 - 14 (U.S.S.R.)

ABSTRACT This relation for a coupling system for codes which correspond to the most simple and most dense signal- point distribution, is investigated by means of geometrical methods. The case is investigated in which the code is composed in such a way that the ranges for a proper reception are equal for all signals and the disturbance shows spherical symmetry. Therefore the orientation in the space of the coordinates $x_1, \ldots, x_n$ can be chosen at random. An exact determination of S(velocity of the transmission of codes) and the probability of a proper reception is possible only in those cases in which the signals f_k are on the surface of the sphere. This is for example the case if the signal points are situated at the cubic summits of ah n-dimensional cube i.e. in the case of a so-called double -code. Equations are deduced by means of which the relation required is determined owing to the simplified assumptions. However, in order to find out the corresponding magnitudes the coefficient of charging the space with ϱ_m -sphere as well as the form of the range for the proper reception V_m must be determined. These two determine the situation of the points in the space "m"

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On the Relation Between the Velocity of Transmitting Information and the Resistance Against Disturbances of a Coupling System. 108-5-1/11

of the measurements i.e. in the space chosen by the code system. Here the determination of the magnitudes required is carried out for the case of the most simple and the most dense charging of the m-dimensional space by means of points forming a cubic lattice. The relations obtained are then compared with each other for both cases.
(12 illustrations and 1 table and 2 Slavic references).

ASSOCIATION Not Given.
PRESENTED BY
SUBMITTED 1.3.1957
AVAILABLE Library of Congress.
Card 2/2

SOV/106-59-1-10/12

AUTHOR: Blokh, E.L.

TITLE: The Transmission of a Non-Uniform Binary Sequence by Means of a Uniform Code (O peredache neravnomernoy binarnoy posledovatel'nosti ravnomernym kodom)

PERIODICAL: Elektrosvyaz', 1959, Nr 1, pp 76-77 (USSR)

ABSTRACT: It is shown that the sending speed of messages in non-uniform binary notation may be significantly increased by a preliminary re-coding in terms of a homogeneous binary code, the length of which depends on the probability p in the first equation at the top left-hand side of page 76. The information per symbol of an m th order code when the message is re-arranged is given by (1) and this is plotted in Fig 1 for $m = 1, 2, 3, 4$ and 5. For each value of m this expression goes through a maximum at a certain value of p. The position of the maximum is closer to $p = 1$ the greater the value of m. There seems to be no practical advantage in making m greater than 5, but for p very close to

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The Transmission of a Non-Uniform Binary Sequence by means of a Uniform Code

unity (1) takes on the approximate form (2) and this is tabulated in Table 1 for values of m greater than 5 and for p very nearly 1.
There are 1 figure and 1 table.

SUBMITTED: July 14, 1958

Card 2/2

BLOKH, E.L.

PHASE I BOOK EXPLOITATION SOV/4480

Akademiya nauk SSSR. Laboratoriya sistem peredachi informatsii

Problemy peredachi informatsii, Vyp. 5: Statisticheskoye kodirovaniye (Problems in the Transmission of Information, No. 5: Statistical Coding) Moscow, 1960. 125 p. 4,000 copies printed.

Resp. Eds. for this volume: E.L. Blokh (Resp. Ed.), and V.G. Solomonov (Deputy Resp. Ed.); Ed. of Publishing House: G.Yu. Shteynbok; Tech. Ed.: O.G. Ul'yanova.

PURPOSE: This book is intended for readers interested in systems and methods of coding.

COVERAGE: This collection of 14 articles on statistical coding written by staff members of the Laboratoriya sistem peredachi informatsii Akademii Nauk SSSR(Laboratory of Information Transmission Systems of the Academy of Sciences USSR). The articles were presented as lectures and discussed at the enlarged session of the Scientific Council of the Laboratory, April 16 and 17, 1959. No personalities are mentioned. References accompany 13 of the articles.

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Problems in the Transmission (Cont.) SOV/4480

TABLE OF CONTENTS:

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S/024/60/000/01/012/028
E081/335

AUTHOR: Blokh, E.L. (Moscow)

TITLE: A Random Vector with Spherical Symmetry

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Energetika i avtomatika, 1960, Nr 1, pp 102-110 (USSR)

ABSTRACT: The vector is a noise vector in the n-dimensional space and is continuous; the probability density depends only on the distance r (from the origin to the end of the vector). The treatment is routine and of textbook type; the last section (Section 6) deals with particular types of the general random vector in four examples.
There are 3 Soviet references.

SUBMITTED: August 3, 1959

Card1/1

24846 S/106/60/000/004/001/007
A055/A133

6.9500

AUTHORS: Blokh, E. L., and Kharkevich, A. A.

TITLE: Antifading coding

PERIODICAL: Elektrosvyaz', no. 4, 1960, 3 - 6

TEXT: A method of signal transmission is described, using correcting anti-interference codes and allowing to enhance the reliability of communications in the presence of fading. Assuming that the transmitted communication is coded by n-digit combinations of a uniform code, a group of N such combinations is taken and written down as shown in Table 1, number N being chosen so that the time of transmission of N binary digits should be sufficiently long compared to the average duration of fading. Transmitting Table 1, not by columns, but by horizontal lines, a part of the transmitted signal will vanish owing to fading. Replacing the vanished digits by an asterisk, we obtain Table 2 for the received signal. If the received digits are now grouped according to columns, we obtain code combinations from which certain individual digits have vanished. If N - and this is the essential point - was chosen in conformity with the statistics of fading, the disappearance of an individual digit from the combination can be considered as

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Antifading coding

an independent event. The digits that vanished owing to fading are distributed in a random manner in code combinations. If each column contains one combination, the errors in the same positions in the adjacent combinations are strongly correlated. But if several combinations, representing a certain section of the communication, are placed in one column, the error can already be considered as independent, not only within the given combination, but also within the limits of the communication section. In the case of an additive interference, a certain digit is replaced by an erroneous one (e.g. 0 by 1 or vice versa). In the case of a multiplicative interference of the fading type, the digit is not replaced, but vanishes altogether. If not more than r vanished digits must be restored, it is sufficient to use the code with a distance between combinations at least equal to r + 1. Comparing the received combination with all possible ones, it can be seen that the received combination coincides with the transmitted one and differs from all other combinations in at least one digit. The transmitted combination can thus be identified and, consiquently, all the vanished digits can be restored. If the same code is used in the presence of an additive interference, it will merely allow to detect errors whose number does not exceed r; it will not allow to locate them, and their correction will thus be impossible. The interference-killing feature is characterized by the probability of an error-free reception of

a sequence of L elements of the communication. The ratio ε between the duration of the vanishing of the signal and the total transmission duration can serve as the parameter determining the fading action. When no correcting code is used, the probability of error-free reception of a sequence of M digits is

$$p_1 = (1 - \varepsilon)^M ,$$

or, for $\varepsilon \ll 1$

$$p_1 \approx e^{-\varepsilon M} . \qquad (1)$$

When a code restoring not more than r digits in each n-digit code-combination is used, the probability of correct reception of each combination is

$$1 - C_n^{r+1}\varepsilon^{r+1}(1 - \varepsilon)^{n-r-1} - \ldots - \varepsilon^n$$

and the probability of error-free reception of the section of M digits of the initial sequence will be

$$p_2^{(r)} = \left[1 - \sum_{k=r+1}^{n} C_n^k \varepsilon^k (1 - \varepsilon)^{n-k}\right]^{\frac{M}{m}}$$

or, for $\varepsilon \ll 1$

$$p_2^{(r)} \approx e^{\frac{M}{m} C_n^{r+1} \varepsilon^{r+1}} \qquad (2)$$

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Antifading coding

In particular:

$$p_2^{(1)} \approx e^{-\frac{M}{m}\frac{n(n-1)}{2}\varepsilon^2} = e^{-M\frac{m+1}{2}\varepsilon^2}, \quad (3)$$

$$p_2^{(2)} \approx e^{-\frac{M}{m}\frac{n(n-1)(n-2)}{3!}\varepsilon^3}. \quad (4)$$

A comparison of (3) and (1) shows that the use of the code that restores one digit is expedient if:

$$\frac{m+1}{2}\varepsilon < 1.$$

A comparison of (3) and (4) shows that the code restoring two digits must be used only if:

$$\frac{n(n-1)(n-2)}{3m(m+1)}\varepsilon < 1.$$

There are 2 tables and 5 references: 4 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English-language publication reads as follows: Price, Green. "A communication technique for multipath channels". Proc. IRE., 46, no. 3, 1958.

SUBMITTED: November 24, 1959

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Antifading coding

Table 1.

	1	2	3	4	5	6	7	8	.	.	.	.	N
1	0	1	1	1	0	1	1	0	.	.	.	.	1
2	1	1	0	0	1	0	0	1	.	.	.	.	0
3	0	1	0	1	0	1	1	0	.	.	.	.	0
.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.	.	.	.	.	.
n	1	0	1	0	0	1	0	1	.	.	.	.	1

Table 2.

	1	2	3	4	5	6	7	8	.	.	.	.	.	.	N
1	0	1	*	*	*	*	*	*	.	.	.	.	.	.	*
2	1	1	0	0	1	0	0	1	.	.	.	.	.	.	0
3	*	*	*	*	0	1	1	0	.	.	.	.	.	.	0
.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
n	*	*	1	0	0	1	0	1	.	.	.	.	.	.	1

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77557
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AUTHOR: Blokh, E. L.

TITLE: On Problem of Minimal Description

PERIODICAL: Radiotekhnika, 1960, Vol 15, Nr 2, pp 10-14 (USSR)

ABSTRACT: The paper discusses the problem of minimization of the description of a flat pattern composed of fixed elements. The elements have various colors. It is assumed that the pattern is written on a rectangular grid composed of S square elements, as illustrated on

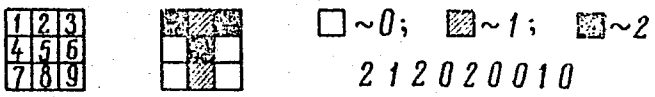

Fig. 1

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The grid elements are enumerated in any arbitrary manner, as for instance on Fig. 1a. A number is assigned to each element according to its color. Then each pattern is described by an S- digit number with the base of m, where m is the number of colors (see Fig. 1c). Each S-digit number is sufficient for the restoration of the corresponding pattern. Therefore, the totality of these numbers represents an absolute description of the patterns. When the number of possible patterns is M^S, the above description is also the minimum relative description, i.e., the shortest description sufficient for recognition purposes. When the number of patterns $N < m^S$, there is no necessity to examine all the elements. A relative description may be obtained by examining the elements in a certain sequence, called supporting sequence by the author. To determine the supporting sequence, the following must be considered: When the first element is examined, information is obtained

as to which of the m subsets the examined pattern belongs. The m subsets are obtained by breaking up the totality of patterns in accordance with the color of the examined element. The element which supplies a maximum of information $J(k_1)$ must be selected as the first supporting element. The element supplying the maximum increase in information is selected as the second supporting element. This is the element having a maximum conditional information $J_{k_1}(k_2)$ calculated with the condition that the color of the first element is known. In the same manner the r-th supporting element is the element having the maximum conditional information $J_{k_1,\ldots,k_{r-1}}(k_r)$ calculated with the condition that the color alternation of the first r - 1 elements is known. The number r of elements selected by this method is determined by the following condition:

$$J_{k_1,\ldots,k_{r-1}}(k_r) > 0 \;\text{и}\; J_{k_1,\ldots,k_r}(k_{r+1}) = 0$$

for any k_{r+1}. The magnitudes $J(k_1)$, $J_{k_1}(k_2)$,..., $J_{k_1,\ldots,k_{r-1}}(k_r)$ represent the entropy and the conditional entropies of elements k_1, k_2,...,k_r. They depend on the probability p_i of the patterns ($i = 1,2,\ldots,N$) and on the number of colors. The entropies may be calculated by known methods. The above considerations are illustrated by an example of six white-black patterns ($m = 2$) written in a 9-element grid, as shown on Fig. 2.

On Problem of Minimal Description

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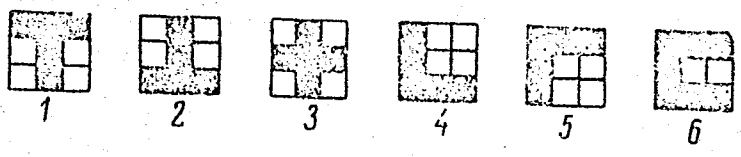

Fig. 2
The elements are enumerated as shown on Fig. 1a. An absolute description of the patterns is given by the code Table 1.

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On Problem of Minimal Description

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Table 1

	1	2	3	4	5	6	7	8	9	p_k
1	1	1	1	0	1	0	0	1	0	0,500 00
2	0	1	0	0	1	0	1	1	1	0,250 00
3	0	1	0	1	1	1	0	1	0	0,125 00
4	1	0	0	1	0	0	1	1	1	0,062 50
5	1	1	1	1	0	0	1	0	0	0,031 25
6	1	1	1	1	0	0	1	1	1	0,031 25

where p_k are the given probabilites of the patterns; 0 stand for "white", and 1 for "black". From the

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given entropy values it is seen that the maximum entropy is $J(3)$, and the maximum conditional entropies are $J_3(4)$ and $J_{3,4}(9)$. Since $J_{3,4,9}(k) = 0$ for all k, the sequence of supporting elements is $3 \rightarrow 4 \rightarrow 9$. This leads to the minimum description given by the code Table 2.

Table 2

	3	4	9
1	1	0	
2	0	0	
3	0	1	0
4	0	1	1
5	1	1	0
6	1	1	1

The corresponding scanning program is shown on Fig. 3.

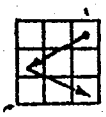

Fig. 3

There are 3 figures; 2 tables; and 12 references, 5 Soviet, 1 German, 2 UNESCO, 4 U.S. The U.S. references are: A. Glovazky, "Determination of Redundancies in a Set of Patterns," IRE Trans. on information theory, Vol IT-2, Nr 4, 1956; O. Lowenschuss, "A Comment on Pattern Redunancy," IRE Trans. on Information theory, Vol IT-4, Nr 3, 1958; E. J. McCluskey, "Determination of Redunancies of a Set of Patterns," IRE Trans. on information theory, Vol IT-3, Nr 2, 1957; A. Gill, "Minimum-Scan Pattern Recognition," IRE Trans. on information theory, Vol IT-5, Nr 2,

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1959.

SUBMITTED: August 7, 1959

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B002/B067

6.9400

AUTHORS: Blokh, E. L., Kharkevich, A. A., Members of the Society (VNOR:E)

TITLE: Some Properties of Communication Systems With Fading

PERIODICAL: Radiotekhnika, 1960, Vol. 15, No. 9, pp. 3-9

TEXT: Only additive fluctuation noises have as yet been theoretically studied. The signal received is regarded as the sum of the emitted signal and the noise. On the other hand, multiplicative noise, the so-called fading, has hitherto not been theoretically treated. It consists in the fact that the intensity of the received signal is subject to random fluctuations. Three cases of interference are distinguished in the theoretical treatment: I. Additive noise. II. Fading. System with an active pause (phase modulation or frequency modulation). III. Fading. System with a passive pause (amplitude modulation). The dependence of the carrying capacity on the transition probability is computed for each case and graphically represented (Fig.). Furthermore, the identification of the regenerative codes is considered. As computation shows, case I requires distances as large as possible and code combination as long as

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83149

Some Properties of Communication Systems With Fading

S/108/60/015/009/001/008
B002/B067

possible; in case II, the distances should be as short as possible. Case III occupies an intermediate position. Examples of regenerative codes are given for all three cases (Tables 1 to 4). There are 1 figure, 4 tables, and 3 Soviet references.

SUBMITTED: December 24, 1959

Card 2/2

32061
S/024/61/000/006/013/019
E140/E335

6.9500

AUTHOR: Blokh, E.L. (Moscow)

TITLE: On an inequality of information theory

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye tekhnicheskikh nauk. Energetika i avtomatika, no. 6, 1961, 93 - 100

TEXT: The author considers the problem of unique decipherability. A uniquely decipherable code, not necessarily irreducible, is called "full" with respect to some measure E of duration, energy or any given physical characteristic of the signal, if a certain inequality becomes an equality. Then the following theorems are advanced in the form of conjectures.
1. If a given decipherable code is full with respect to a measure E , it will be full with respect to any other measure E_1 (for an irreducible code this has already been proven).
2. For any full decipherable code an irreducible code equivalent to it may be formed, where the equivalence is in the sense that the measure of the code combinations in the two codes coincides.

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32061
S/024/61/000/006/013/019
E140/E335

On an inequality ....

3. For any decipherable code, not necessarily full, an equivalent irreducible code can be found. (An irreducible decipherable code is one in which no code combination is the prefix of any other code combination.) A uniquely decipherable code which is not irreducible is given by the author:

$$A_1 = 00, \quad A_2 = 001, \quad A_3 \approx 10, \quad A_4 \approx 101, \quad A_5 \approx 11 .$$

In an appendix the author gives a proof for a theorem due to Shannon, which has been advanced by the latter without proof. There are 1 figure and 9 references: 3 Soviet-bloc, 3 Russian translations from non-Soviet-bloc publications and 3 non-Soviet-bloc. The three English-language references mentioned are: Ref. 1: B. McMillan, IRE Trans. PGJT, 1956, v.2, no. 4; Ref. 2: A.A. Sardinas, G.W. Patterson, A necessary and sufficient const. for unique decomposition of encoded messages. IRE Convention Record, 1953, Pt. 8; Ref. 4: E.N. Gilbert, E.F.Moore, Bell System Tech. Journal, 1959, v. 38, no. 4.

SUBMITTED: June 5, 1961

Card 2/2

S/262/62/000/008/005/022
I007/I207

AUTHORS: Blokh, E. L. and Ginevskiy, A. S.

TITLE: The laminar flow around a cascade of circles and its use in solving hydrodynamic problems

PERIODICAL: Referativnyy zhurnal, otdel'nyy vypusk. 42. Silovyye ustanovki, no. 8, 1962, 22, abstract 42.8.121. Collection "Prom. aerodinamika", Moscow, Oborongiz, no. 20, 1961, 89–136

TEXT: A tentative solution is given for the case of flow around a cascade of near-circles; the deviation of the actual resulting contour from an ideal circle does not exceed 0.6% of the radius, even for the limiting case when $q = 1$ (q is the ratio of the circle diameter to the distance between the adjacent circles); for $q = 0.8$ the deviation is less than 0.1%. The authors also give an exact solution for the flow around a limiting cascade of circles which permits the accuracy of the above tentative method to be estimated for the whole range of variation of the ratio q. With $q = 1$, the error in determining the flow velocity is 1.63%. There are 23 figures and 15 tables.

[Abstracter's note: Complete translation.]

Card 1/1

S/142/61/004/006/009/017
E140/E435

6,6000

AUTHORS: Blokh, E.L., Ignat'yev, N.K.

TITLE: The optimal quantification of multidimensional messages

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Radiotekhnika. v.4, no.6, 1961, 692-699

TEXT: The paper concerns a further generalization of Kotel'nikov's theorem to the case where the band limiting filters have arbitrary space distributions. The problem is to define the characteristics of the filter and of the scanning procedure to obtain optimal use of the available bandwidth and to require the minimum number of transmitted quantized values of the initial continuous message. Using the multidimensional Fourier transform as the basis, general formulae of a theoretical nature are obtained. It is admitted that the scanning pattern can employ interlace, as in standard television transmissions. Certain of the results obtained here are also found in the paper of Hiroshi Miyakawa (Ref.4: J. Inst. Elect. Commun. Engrs. Japan, no.4, 1959, 421). There are 3 figures.

Card 1/2

The optimal quantification ... S/142/61/004/006/009/017
E140/E435

ASSOCIATION: Kafedra teoreticheskoy radiotekhniki
Moskovskogo elektrotekhnicheskogo instituta svyazi
(Department of Theoretical Radioengineering of
Moscow Electroengineering Institute of Communications)

SUBMITTED: October 19, 1959 (to NDVSh)
February 4, 1960 (to the present journal)

Card 2/2

BOROZNIN, A.A.; BLOKH, E.L.; ROMANOV, G.I.; KHRENOV, G.S.; KUKUSHKIN, A.I., inzh., red.; TARAYEVA, Ye.K., red.izd-va; MOCHALINA, Z.S., tekhn. red.

[Economic effectiveness of the introduction of new techniques in heat insulating operations]Ekonomicheskaia effektivnost' vnedreniia novoi tekhniki v proizvodstvo teploizoliatsionnykh rabot; opyt tresta Stroitermoizoliatsiia. Moskva, Gosstroiizdat, 1962. 86 p. (MIRA 16:2)
(Insulation (Heat))--Technological innovations)

42073

S/108/62/017/011/001/007
D413/D308

9.3278

AUTHORS: Blokh, E.L. and Kharkevich, A.A., Members of the ~~Society (see Association)~~

TITLE: The parasitic modulation caused by small-amplitude additive interference

PERIODICAL: Radiotekhnika, v. 17, no. 11, 1962, 5-13

TEXT: The authors consider the parasitic modulation equivalent to or caused by the addition of a small-amplitude statistical noise function to a generalized carrier capable of being modulated in n parameters. A vector representation is mentioned in which the modulation parameters are the coordinates. General expressions are derived for the equivalent parameters of the parasitic modulation, by minimizing the difference between it and the actual carrier-plus-noise. By comparing these values with the maximum usable excursions in the various modulation parameters, one can obtain output signal-to-noise ratios for the various types of modulation and compare their rejection properties. As an example, the values are worked

Card 1/3

out for a carrier consisting of a train of trapezoidal pulse in which pulse amplitude, position (phase) and width are considered as modulation parameters, with white noise as interference. The resulting comparison clearly shows up the advantage of pulse position modulation and the importance in it of the initial pulse-duty radio. Since the parasitic modulations in the various parameters are correlated, it should be possible to use these in parameters not carrying information (control parameters) for compensation of the interference, and general relations are derived for this: applied to the above example, they indicate that parasitic pulse-width variations could be used to compensate interference on a PPM channel. It is also suggested that where two parameters are only slightly correlated they could be used in parallel as independent channels to improve the noise rejection. The case of large-amplitude noise is more difficult in general, and calls for computers or experimental work. There are 4 figures.

ASSOCIATION: Nauchno-tekhnicheskoye obshchestvo radiotekhniki i elektrosvyazi im. A.S. Popova (Scientific and Tech-

The parasitic modulation ... S/108/62/017/011/001/007
D413/D308

nical Society of Radio Engineering and Electrical Communications im. A.S. Popov) [Abstracter's note: Name of Association was taken from first page of journal]

SUBMITTED: October 27, 1961

Card 3/3

BLOKH, E.L., inzh.; POTOKER, I.M., inzh.; ROMANOV, G.I., inzh.; KHRENOV, G.S., inzh.; DANILOV, P.P., nauchnyy red.; RYAZANTSEVA, L.I., red.; TARKHOVA, K.Ye., tekhn. red.

[Safety instructions for insulation work and the manufacture of materials at production bases] Instruktivnye ukazaniia po tekhnike bezopasnosti pri proizvodstve teploizoliatsionnykh rabot i izgotovlenii materialov na proizvodstvennykh bazakh. Moskva, Gosstroiizdat, 1963. 102 p. (MIRA 16:9)

1. Russia (1917- R.S.F.S.R.) Ministerstvo montazhnykh i spetsial'nykh stroitel'nykh rabot. Tekhnicheskoye upravleniye. (Insulating materials) (Industrial safety)

ACCESSION NR AM4020383 BOOK EXPLOITATION S/

Blokh, Efraim Leont'yevich

Immunity to interference of interrogation systems (Pomekhoustoychivost' sistem svyazi s peresprosom), Moscow, Izd-vo AN SSSR, 1963, 170 p. illus., biblio. Errata printed on the inside back cover. 2,500 copies printed. Series note: Akademiya nauk SSSR. Institut problem peredachi informatsii. Problemy* peredachi informatsii, vy*p. 13.

TOPIC TAGS: Interrogation system, automation, correcting code, feedback

TABLE OF CONTENTS [abridged]:

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ACCESSION NR AM4020383

Bibliography - - 170

SUB CODE: CP

SUBMITTED: 10Sep63

NR REF SOV: 024

OTHER: 039

DATE ACQ: 06Feb64

Card 2/2

BLOKH, E.L.; POPOV, O.V.

Correction of separate erasure packs using block codes. Probl. pered. inform. no.14:101-112 '63. (MIRA 16:12)

ACCESSION NR: AP4041955 S/0280/64/000/003/0030/0037

AUTHOR: Blokh, E. L.

TITLE: A method of decoding for the Bose-Chaudhuri codes, correcting ternary errors

SOURCE: AN SSSR. Izv. Tekhnicheskaya kibernetika, no. 3, 1964, 30-37

TOPIC TAGS: coding, error correction, applied mathematics, numerical analysis, Bose-Chaudhuri code, decoding, ternary error, corrector code

ABSTRACT: The principal difficulties arising in the use of corrector codes for the correction of individual errors are related to the process of decoding. For cyclical, Bose-Chaudhuri codes with code interval $d = 2t + 1$ a method of decoding has been worked out (Peterson, W.W. Error-Correcting Codes, MIT and Wiley, 1961) which guarantees the correction of all errors, provided the multiplicity factor does not exceed t. This method is more economical than the universal procedure of decoding for groups of codes, but includes as one of its steps the determination of the roots of an algebraic equation of order t over the field $GF(q^m)$ (the Galois field of q^m elements). This operation is sufficiently formidable to constitute a

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ACCESSION NR: AP4041955

significant drawback of the method. In the present article, the author therefore introduces a method for determining the roots of the characteristic equation for $t \leq 3$ without using the method of the extension of elements in $GF(q^m)$. He thus simplifies the location of the exact position at which the errors occurred. This new method is based on the fact that if the generating polynomial of a cyclical code with elements from GF(q) includes, among other roots, $\alpha, \alpha^2, \alpha^3, \alpha^4, \alpha^5$, and α^6,

where α is a generated (but different from 0 and 1) element of $GF(Q^m)$, $q = p^s$, and p is a prime number, then such a code corrects all combinations of errors with multiplicity factor $t \leq 3$ ($\alpha^n = 1$). The author concludes the article with illustrations of several specific cases. Orig. art. has: 9 numbered formulas and 3 tables.

ASSOCIATION: none

SUBMITTED: 08Apr63 ENCL: 00

SUB CODE: DP, MA NO REF SOV: 000 OTHER: 004

Card 2/2

L 27860-65 EWT(d)/T/EWP(1) IJP(c)

ACCESSION NR: AT4049768 S/2945/64/000/016/0021/0025

AUTHOR: Blokh, E. L.; Sagalovich, Yu. L.; Sheverdyayev, A. Yu.

TITLE: Codes for correcting and detecting burst errors

SOURCE: AN SSSR. Institut problem peredachi informatsii. [illegible] informatsii, no. 16, 1964. Teoriya peredachi informatsii (Theory of information transmission), 21-25

TOPIC TAGS: error correction, burst error, correction code, [illegible] transmission, cyclic code, Wyner code

ABSTRACT: The paper discusses two complete solutions to the problem of correcting burst errors where all combinations not exceeding t errors within a burst of length l (l≤t) have to be corrected, l≤n where n is the length of a code. The codes for the above problem belong to the class of cyclic codes and shortened cyclic codes. The first one was developed by Aaron D. Wyner (IEEE Trans. Information Theory, 2, 1963) and the second one by the author. The results of the two codes are compared. It is noted that the two codes are [illegible]. The Z codes shows some advantages but also some [illegible]. The check digits of the author's code consists of 2t + 1 plus [illegible]

Card 1/3

L 27860-65

ACCESSION NR: AT4049768

necessary for detecting t errors in a code of length l. However [illegible] code the number of check digits consists of l plus the number [illegible]

[illegible] and [illegible] the author [illegible]

errors. Orig. art. has: 11 formulas.

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L 27860-65
ACCESSION NR: AT4049768

ASSOCIATION: none

SUBMITTED: 29May63 ENCL: 00 SUB CODE: DP

NO REF SOV: 001 OTHER: 004

Card 3/3

APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R000205530001-5"

L 25095-65 EWT(d) IJP(c)

ACCESSION NR AT4049770 S/2944/.../.../0032/0034

AUTHOR: Blokh, E. L.

TITLE: Modification of the procedure for using the Reed-Salomon codes for generating burst-error correcting codes 16

SOURCE: AN SSSR. Institut problem peredachi informatsii. Problemy* peredachi informatsii, no. 16, 1964. Teoriya peredachi informatsii (Theory of information transmission), 32-34

TOPIC TAGS: burst error, error correction, correction code, Reed Salomon code, Galois field

ABSTRACT: The paper shows that by a minor modification of the procedure for generating a code having digits from GF (q) and correcting burst errors, the number of check digits can be decreased and their number r can be brought still closer to the lower limit r_{min}, thus yielding codes of lengths $n > m_0 (q^{m_0} - 1)$ not only by decreasing the number of information digits but also by decreasing the number of check digits. The modification [illegible] is based on the result reached by W. W. Peterson (Error-[illegible] burst-error correcting codes can be [illegible] $GF(q^{m_0})$ (where $GF(q^{m_0})$ [illegible]

L 25095-65

ACCESSION NR: AT4049770

Galois field made of q^{mo} elements). In order to obtain the desired modification of the [illegible] the paper investigates a code of length [illegible] divided into [illegible] codes containing a much greater [illegible] is used. The new coding method [illegible] (i) for a burst error of the same length [illegible] check digits more and 9 information digits less than the code generated using the described procedure; (ii) for the same number of check digits [illegible] length the code generated by the described procedure [illegible] generated using the original procedure, i.e., it contains [illegible] than the code generated by the original procedure. [illegible] length and correcting a burst-error [illegible] procedure described contains [illegible] using the original procedure. Orig. art. has: 20 formulas

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00

[illegible] OTHER: [illegible]

Card 2/2

ACCESSION NR: [illegible]

SOURCE: Ref. zh. Matematika, Abs. 3V170

AUTHOR: Blokh, E. L.

TITLE: Modification of the procedure for the use of [illegible] for the construction of codes that correct packets of errors

CITED SOURCE: Sb. Probl. peredachi inform. Vyp. [illegible]

TOPIC TAGS: error correcting code, code sequence

TRANSLATION: The following method is proposed for the [illegible] correction of one packet of errors. Each sequence of length [illegible] symbols from GF(q^m), q -- degree of prime number, $N = q^m - 1$, is broken up into N blocks with v symbols per block. α_{ij} denotes a symbol having the j-th serial number in the i-th block (i = 1, ..., N, j = 1, ..., v). For each value [illegible] the sequence

$$\alpha_{1j}, \alpha_{2j}, \ldots, \alpha_{Nj}$$

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L 57227-65

ACCESSION NR: AR5012993

which is set in correspondence with the Reed-Solomon code (RZhMat, 196[illegible], 4V256K) with correction of not more than t errors and containing 2t checking symbols. If in a coded sequence of length vN + 2tv there appears a packet of errors of duration vt symbols from GF(q^m), then not more than t symbols can be [illegible] sequences [illegible]. This means that the constructed code [illegible] packets of errors with length not [illegible] from GF q^m is replaced by a sequence of m symbols [illegible] code [illegible] of length $vm(q^m - 1)$, this code [illegible] packets of errors of length not [illegible] type that when v, N, and t are fixed this method [illegible] of redundant digits than the [illegible]

SUB CODE: MA DP KWCL: 00

Card 2/2

ACCESSION NR: AP4038605 S/0108/64/019/005/0078/0079

AUTHOR: Blokh, E. L. (Active member); Popov, O. V. (Active member)

TITLE: Nonoptimality of cyclic codes which correct single and detect double errors

SOURCE: Radiotekhnika, v. 19, no. 5, 1964, 78-79

TOPIC TAGS: code, cyclic code, error correcting code, error detecting code, double error detecting code, binary code, Humming code

ABSTRACT: A Humming binary code with $r = 3, 4, 5 \ldots$ check digits and with a minimum distance $d = 4$, which has a length $n = 2^{r-1}$, is an optimum code. The present article proves that: (1) no cyclic code exists which would be equivalent to Humming's binary codes with $d = 4$; (2) no cyclic code exists with $d > 2$ and $r > 3$ check digits which would have a length $n = 2^{r-1}$. Orig. art. has: 2 formulas.

ASSOCIATION: Nauchno-tekhnicheskoye obshchestvo radiotekhniki i elektrosvyazi (Scientific and Technical Society of Radio Engineering and Electrocommunication)

SUBMITTED: 02Apr63 DATE ACQ: 09Jun64 ENCL: 00

SUB CODE: DP, DO NO REF SOV: 001 OTHER: 001

Card 1/1

BLOKH, E.L., doktor tekhn.nauk, prof., otv. red.

[Pattern recognition; theory of information transmission] Opoznanie obrazov; teoriia peredachi informatsii. Moskva, Nauka, 1965. 149 p. (MIRA 18:11)

1. Akademiya nauk SSSR. Institut problem peredachi informatsii.

BLOKH, E.L.

Error and erasure correction by means of the Bose-Chaudhuri codes. Probl. pered. inform. 1 no.3:12-19 '65.
(MIRA 18:11)

L 17845-66 EWT(d)/FSS-2 JXT(bf)/GS

ACC NR: AT6004692 SOURCE CODE: UR/0000/65/000/000/0097/0111

AUTHOR: Blokh, E. L.; Popov, O. V.; Turin, V. Ya.

52

B+1

ORG: none

TITLE: The study of the probability of transcending a given delay in feedback systems. (Paper presented at the Scientific-Research Conference of the Faculty of the Moscow Electrical Engineering Institute of Communications on 21 April 1964)

SOURCE: AN SSSR. Institut problem peredachi informatsii. Opoznaniye obrazov. Teoriya peredachi informatsii (Pattern recognition. Theory of information transmission). Moscow, Izd-vo Nauka, 1965, 97-111

TOPIC TAGS: multichannel communication, communication coding, information theory

ABSTRACT: The article investigates the probability of message erasure which requires the existence of a maximum allowable delay in feedback discrete channel systems. The delay covers the time from the instant the message arrives at the input of the system to the time the message is forwarded to the recipient. The speed of signal transmission through the channels is assumed given. The message transmission is controlled by feedback with repeated demand, comparison, or combined operation. If after a given time

Card 1/2

L 17845-66

ACC NR: AT6004692 O

lapse the message cannot be forwarded without the uncovered errors, the message becomes lost. Following the formulation of the problem, the authors establish formulas for the message erasure probability, discuss in detail the probability of the expected start of transmission over the given interval of time, calculate the erasure probability for the case when the errors are independent and the entire message is coded into a single combination, and repeat the calculation for the case when the errors are grouped in independent packets while the message is coded in several combinations. Orig. art. has: 69 formulas, 2 figures, and 1 table.

SUB CODE: 09/SUBM DATE: 25Sep65/ORIG REF: 004/OTH REF: 002

17/

Card 2/2 nst

L 17843-66 EWT(d)/T/EWP(1) IJP(c) GS

ACC NR: AT6004693 SOURCE CODE: UR/0000/65/000/000/0118/0122

AUTHOR: Blckh, E. L.

41
B+1

ORG: none

21,44,55

TITLE: A class of binary codes for the uncovering of independent errors

SOURCE: AN SSSR. Institut problem peredachi informatsii. Opoznaniye obrazov. Teoriya peredachi informatsii (Pattern recognition. Theory of information transmission). Moscow, Izd-vo Nauka, 1965, 118-122

TOPIC TAGS: binary code, coding, computer coding

ABSTRACT: While using binary group codes for the uncovering (but not correcting) of errors, the probability of missing an error during independent and symmetric distortion of code symbols is fully determined by the weight, i.e., by the number of units of the code combinations. In general, the search for the weights of the code combinations is connected with protracted and cumbersome calculations. There are, however, certain classes of group binary codes the code combination of which contains an equal number of units among the information symbols and thus have identical weights, the magnitude of which can be

Card 1/2

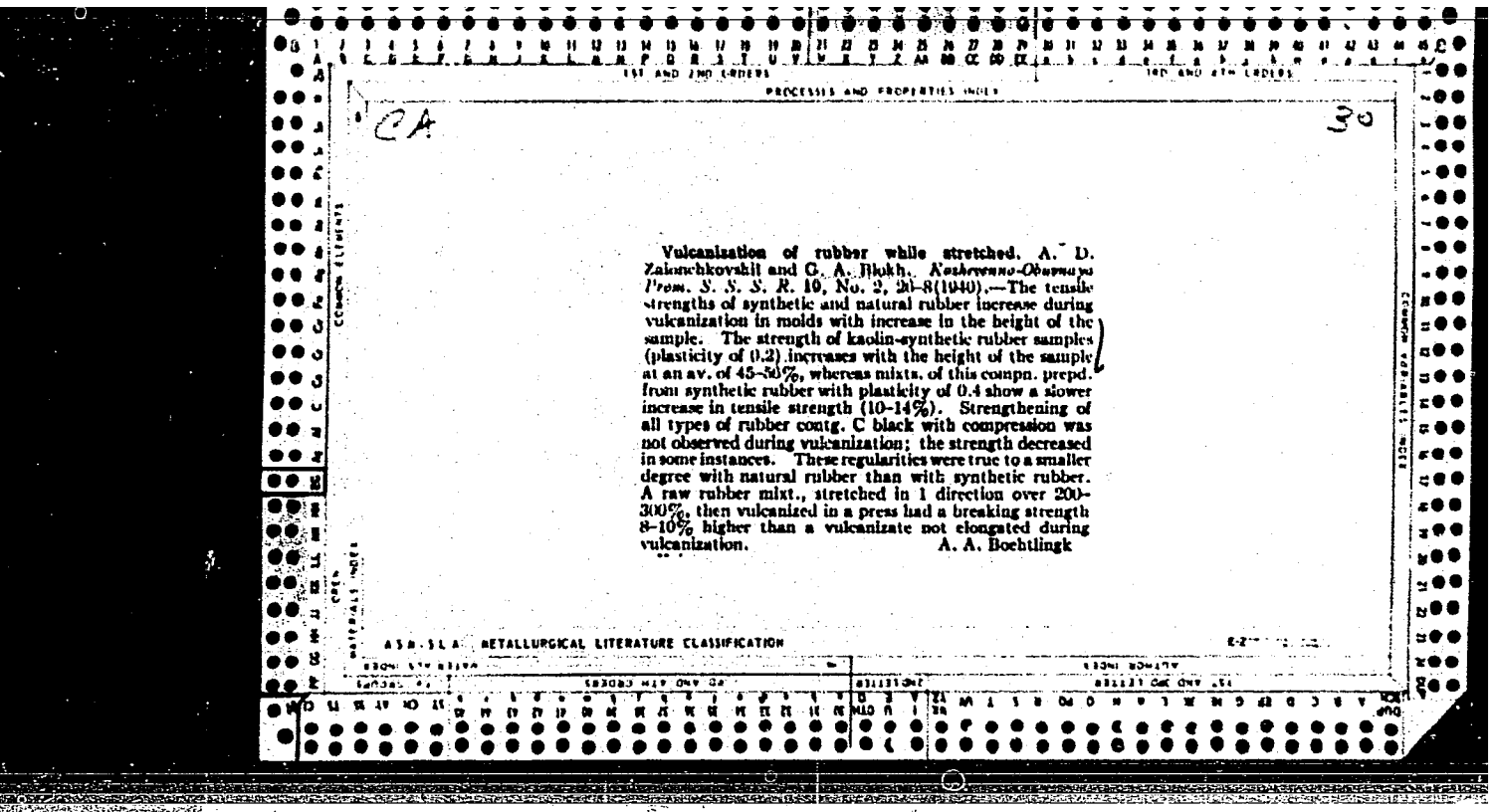
L 17843-66

ACC NR: AT6004693

found easily from a simple closed expression. The author discusses such a class of binary codes, establishes the appropriate weight and error probability expressions, and applies them to the (k; 2, 3, ..., k), (k; 3, 5, 7, ..., 2p - 1), (k; k - 2), and (k; k - 1) codes. Orig. art. has: 32 formulas.

SUB CODE: 09/ SUBM DATE: 25Sep65/ ORIG REF: 002/ OTH REF: 002

Card 2/2 nst



CA

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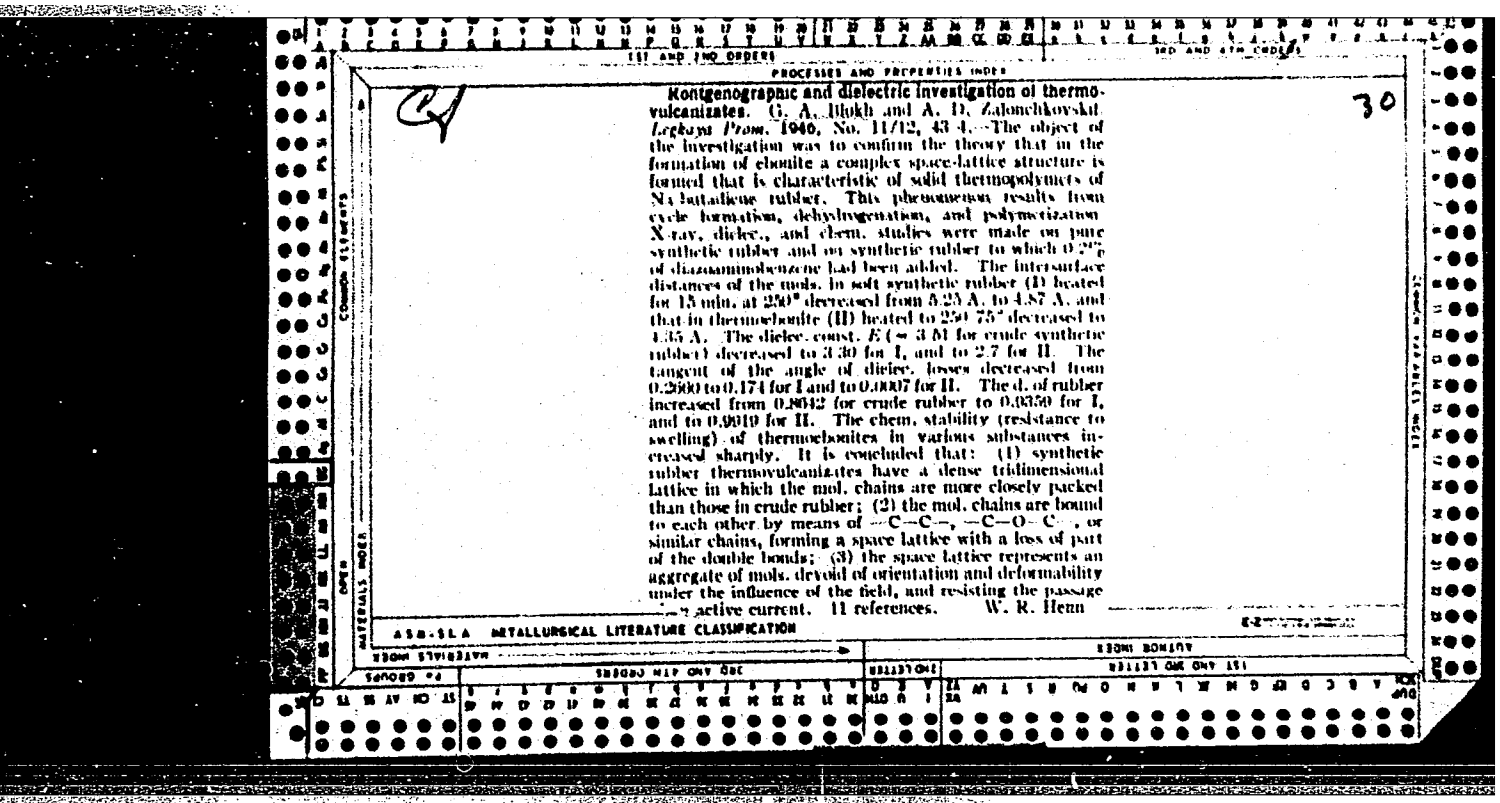
Vulcanization of rubber while stretched. A. D. Zakonchkovskii and G. A. Blokh. *Kozhevenno-Obuvnaya Prom. S. S. S. R.* 10, No. 2, 20–8(1940).—The tensile strengths of synthetic and natural rubber increase during vulcanization in molds with increase in the height of the sample. The strength of kaolin-synthetic rubber samples (plasticity of 0.2) increases with the height of the sample at an av. of 45–50%, whereas mixts. of this compn. prepd. from synthetic rubber with plasticity of 0.4 show a slower increase in tensile strength (10–14%). Strengthening of all types of rubber contg. C black with compression was not observed during vulcanization; the strength decreased in some instances. These regularities were true to a smaller degree with natural rubber than with synthetic rubber. A raw rubber mixt., stretched in 1 direction over 200–300%, then vulcanized in a press had a breaking strength 8–10% higher than a vulcanizate not elongated during vulcanization.

A. A. Boehtlingk

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

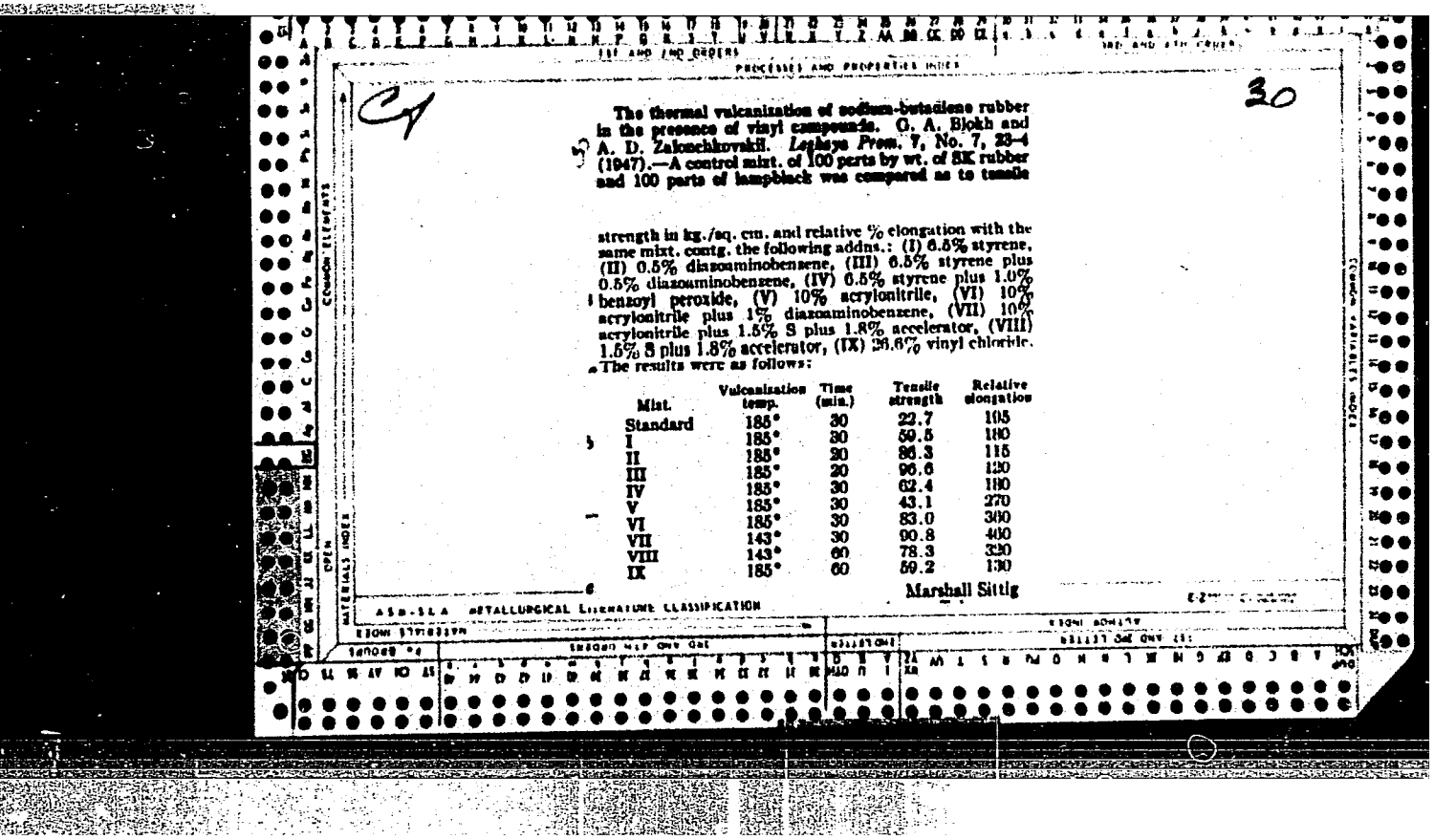


PROCESSES AND PROPERTIES INDEX

30

Röntgenographic and dielectric investigation of thermovulcanizates. G. A. Blokh and A. D. Zalonchkovskii. *Legkaya Prom.* 1940, No. 11/12, 43-4.—The object of the investigation was to confirm the theory that in the formation of ebonite a complex space-lattice structure is formed that is characteristic of solid thermopolymers of Na butadiene rubber. This phenomenon results from cycle formation, dehydrogenation, and polymerization. X-ray, dielec., and chem. studies were made on pure synthetic rubber and on synthetic rubber to which 0.2% of diazoaminobenzene had been added. The intersurface distances of the mols. in soft synthetic rubber (I) heated for 15 min. at 250° decreased from 5.25 A. to 4.87 A. and that in thermoebonite (II) heated to 250-75° decreased to 4.35 A. The dielec. const. E (= 3.51 for crude synthetic rubber) decreased to 3.30 for I, and to 2.7 for II. The tangent of the angle of dielec. losses decreased from 0.2900 to 0.174 for I and to 0.0007 for II. The d. of rubber increased from 0.8042 for crude rubber to 0.9350 for I, and to 0.9919 for II. The chem. stability (resistance to swelling) of thermoebonites in various substances increased sharply. It is concluded that: (1) synthetic rubber thermovulcanizates have a dense tridimensional lattice in which the mol. chains are more closely packed than those in crude rubber; (2) the mol. chains are bound to each other by means of —C—C—, —C—O—C—, or similar chains, forming a space lattice with a loss of part of the double bonds; (3) the space lattice represents an aggregate of mols. devoid of orientation and deformability under the influence of the field, and resisting the passage of active current. 11 references. W. R. Henn

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION



The thermal vulcanization of sodium-butadiene rubber in the presence of vinyl compounds. G. A. Blokh and A. D. Zakonchikovskii. *Lakhaya Prom.* 7, No. 7, 23–4 (1947).—A control mixt. of 100 parts by wt. of SK rubber and 100 parts of lampblack was compared as to tensile strength in kg./sq. cm. and relative % elongation with the same mixt. contg. the following addns.: (I) 6.5% styrene, (II) 0.5% diazoaminobenzene, (III) 6.5% styrene plus 0.5% diazoaminobenzene, (IV) 6.5% styrene plus 1.0% benzoyl peroxide, (V) 10% acrylonitrile, (VI) 10% acrylonitrile plus 1% diazoaminobenzene, (VII) 10% acrylonitrile plus 1.5% S plus 1.8% accelerator, (VIII) 1.5% S plus 1.8% accelerator, (IX) 26.6% vinyl chloride. The results were as follows:

Mixt.	Vulcanization temp.	Time (min.)	Tensile strength	Relative elongation
Standard	185°	30	22.7	105
I	185°	30	59.5	180
II	185°	30	86.3	115
III	185°	30	96.6	120
IV	185°	30	62.4	180
V	185°	30	43.1	270
VI	185°	30	83.0	300
VII	143°	30	90.8	400
VIII	143°	60	78.3	320
IX	185°	60	59.2	130

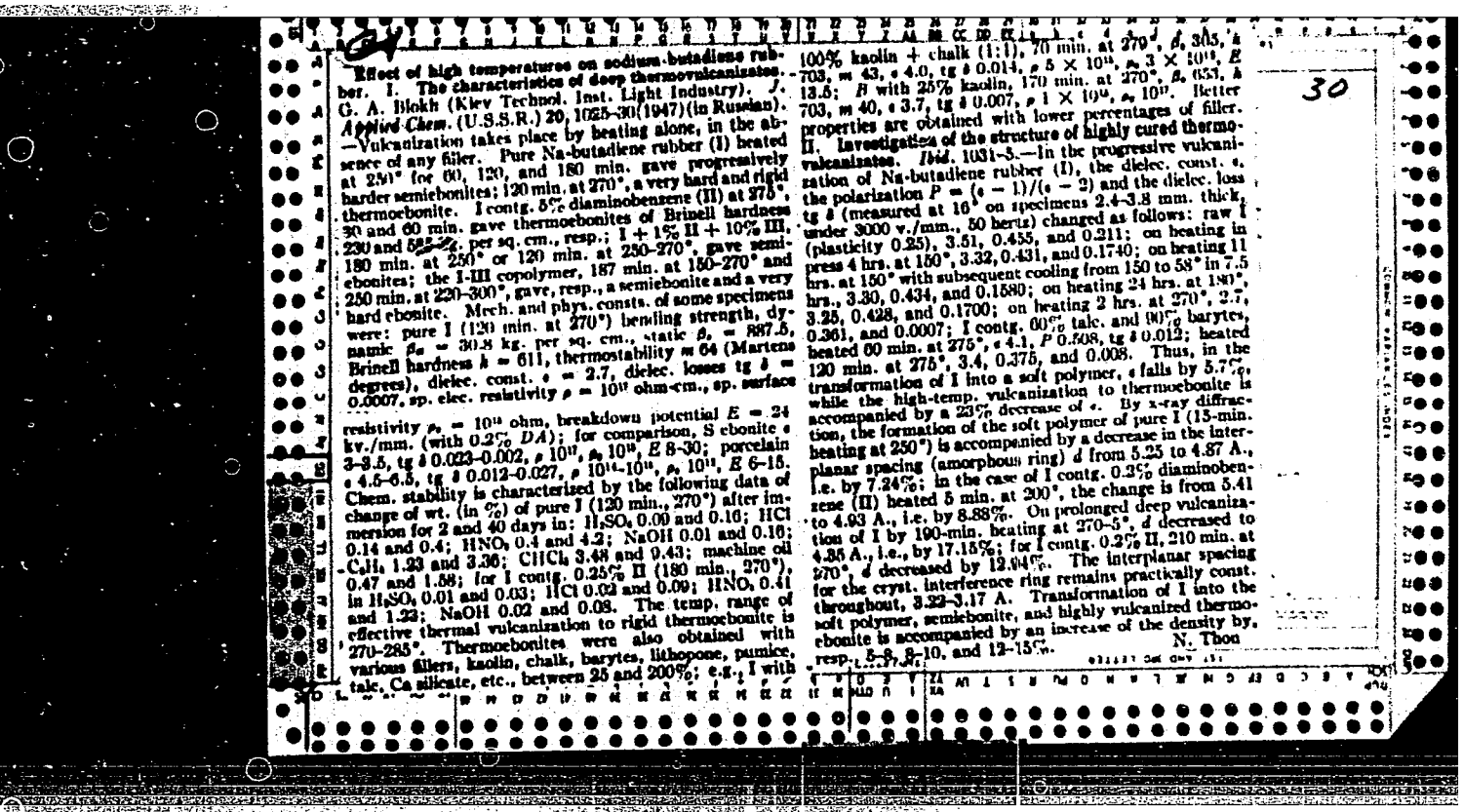
Marshall Sittig

A ej C 1.

Polymers from alcohol, ethers and phenol

Röntgenographic and dielectric investigation of thermovulcanisates. G. A. Ilyokh and A. D. Zaionchkovsky (Legkaya Prom., 1947, No. 11/12, 43-4; Chem. Abs., 1947, 41, 6334).—The object of the investigation was to confirm the theory that in the formation of ebonite a complex space-lattice structure is formed, that is characteristic of solid thermopolymers of sodium-butadiene rubber. This phenomenon results from cycle formation, dehydrogenation, and polymerisation. X-ray, dielectric, and chemical studies were made on pure synthetic rubber and on synthetic rubber to which 0.2% of diazoaminobenzene had been added. As a result of density and electrical measurements, it is concluded that (i) synthetic rubber thermovulcanisates have a dense tridimensional lattice in which the molecular chains are more closely packed than those of crude rubber; (ii) the molecular chains are bound to each other by -C–C–, -C–O–C–, or similar chains, forming a space lattice with a loss of part of the double bonds; and (iii) the space lattice represents an aggregate of molecules devoid of orientation and deformability. 352D21.086/34

1947



Effect of high temperatures on sodium-butadiene rubber. I. The characteristics of deep thermovulcanizates. G. A. Blokh (Kiev Technol. Inst. Light Industry). *J. Applied Chem.* (U.S.S.R.) 20, 1025-30(1947)(in Russian).—Vulcanization takes place by heating alone, in the absence of any filler. Pure Na-butadiene rubber (I) heated at 250° for 60, 120, and 180 min. gave progressively harder semiebonites; 120 min. at 270°, a very hard and rigid thermoebonite. I contg. 5% diaminobenzene (II) at 275°, 30 and 60 min. gave thermoebonites of Brinell hardness 230 and 585 kg. per sq. cm., resp.; I + 1% II + 10% III, 180 min. at 250° or 120 min. at 250–270°, gave semiebonites; the I-III copolymer, 187 min. at 150–270° and 250 min. at 220–300°, gave, resp., a semiebonite and a very hard ebonite. Mech. and phys. consts. of some specimens were: pure I (120 min. at 270°) bending strength, dynamic β_d = 30.8 kg. per sq. cm., static β_s = 887.5, Brinell hardness h = 611, thermostability m 64 (Martens degrees), dielec. const. ϵ = 2.7, dielec. losses tg δ = 0.0007, sp. elec. resistivity ρ = 10^{16} ohm-cm., sp. surface resistivity ρ_s = 10^{16} ohm, breakdown potential E = 24 kv./mm. (with 0.2% *DA*); for comparison, S ebonite ϵ 3–3.5, tg δ 0.023–0.002, ρ 10^{16}, ρ_s 10^{16}, E 8–30; porcelain ϵ 4.5–6.5, tg δ 0.012–0.027, ρ 10^{14}–10^{16}, ρ_s 10^{14}, E 6–15. Chem. stability is characterised by the following data of change of wt. (in %) of pure I (120 min., 270°) after immersion for 2 and 40 days in: H_2SO_4 0.00 and 0.10; HCl 0.14 and 0.4; HNO_3 0.4 and 4.2; NaOH 0.01 and 0.16; C_6H_6 1.23 and 3.36; $CHCl_3$ 3.48 and 9.43; machine oil 0.47 and 1.58; for I contg. 0.25% II (180 min., 270°), in H_2SO_4 0.01 and 0.03; HCl 0.02 and 0.09; HNO_3 0.41 and 1.23; NaOH 0.02 and 0.08. The temp. range of effective thermal vulcanization to rigid thermoebonite is 270–285°. Thermoebonites were also obtained with various fillers, kaolin, chalk, barytes, lithopone, pumice, talc, Ca silicate, etc., between 25 and 200%; e.g., I with 100% kaolin + chalk (1:1), 70 min. at 279°, β_s 305, h 703, m 43, ϵ 4.0, tg δ 0.014, ρ 5 × 10^{15}, ρ_s 3 × 10^{15}, E 13.5; *B* with 25% kaolin, 170 min. at 270°, β_s 655, h 703, m 40, ϵ 3.7, tg δ 0.007, ρ 1 × 10^{16}, ρ_s 10^{15}. Better properties are obtained with lower percentages of filler.

II. Investigation of the structure of highly cured thermovulcanizates. *Ibid.* 1031–5.—In the progressive vulcanization of Na-butadiene rubber (I), the dielec. const. ϵ, the polarization $P = (\epsilon - 1)/(\epsilon - 2)$ and the dielec. loss tg δ (measured at 10° on specimens 2.4–3.8 mm. thick, under 3000 v./mm., 50 herts) changed as follows: raw I (plasticity 0.25), 3.51, 0.455, and 0.211; on heating in press 4 hrs. at 150°, 3.32, 0.431, and 0.1740; on heating 11 hrs. at 150° with subsequent cooling from 150 to 58° in 7.5 hrs., 3.30, 0.434, and 0.1580; on heating 24 hrs. at 180°, 3.25, 0.428, and 0.1700; on heating 2 hrs. at 270°, 2.7, 0.361, and 0.0007; I contg. 60% talc. and 90% baryte, heated 60 min. at 275°, 4.1, P 0.508, tg δ 0.012; heated 120 min. at 275°, 3.4, 0.375, and 0.008. Thus, in the transformation of I into a soft polymer, ϵ falls by 5.7%, while the high-temp. vulcanization to thermoebonite is accompanied by a 23% decrease of ϵ. By x-ray diffraction, the formation of the soft polymer of pure I (15-min. heating at 250°) is accompanied by a decrease in the interplanar spacing (amorphous ring) d from 5.25 to 4.87 A., i.e. by 7.24%; in the case of I contg. 0.2% diaminobenzene (II) heated 5 min. at 200°, the change is from 5.41 to 4.93 A., i.e. by 8.88%. On prolonged deep vulcanization of I by 190-min. heating at 270–5°, d decreased to 4.36 A., i.e., by 17.15%; for I contg. 0.2% II, 210 min. at 270°, d decreased by 12.94%. The interplanar spacing for the cryst. interference ring remains practically const. throughout, 3.22–3.17 A. Transformation of I into the soft polymer, semiebonite, and highly vulcanized thermoebonite is accompanied by an increase of the density by, resp., 5–8, 8–10, and 12–15%.

N. Thon

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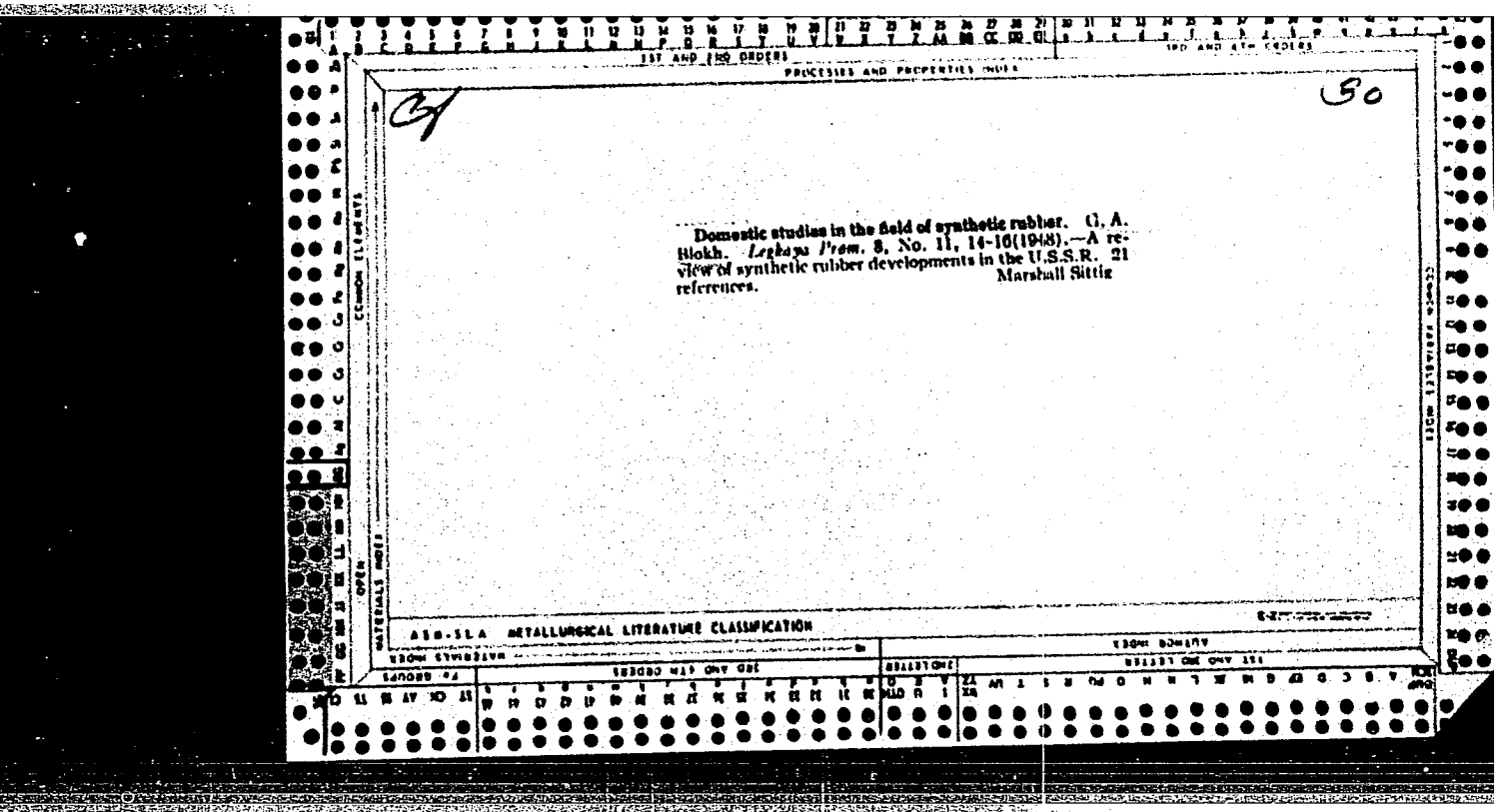
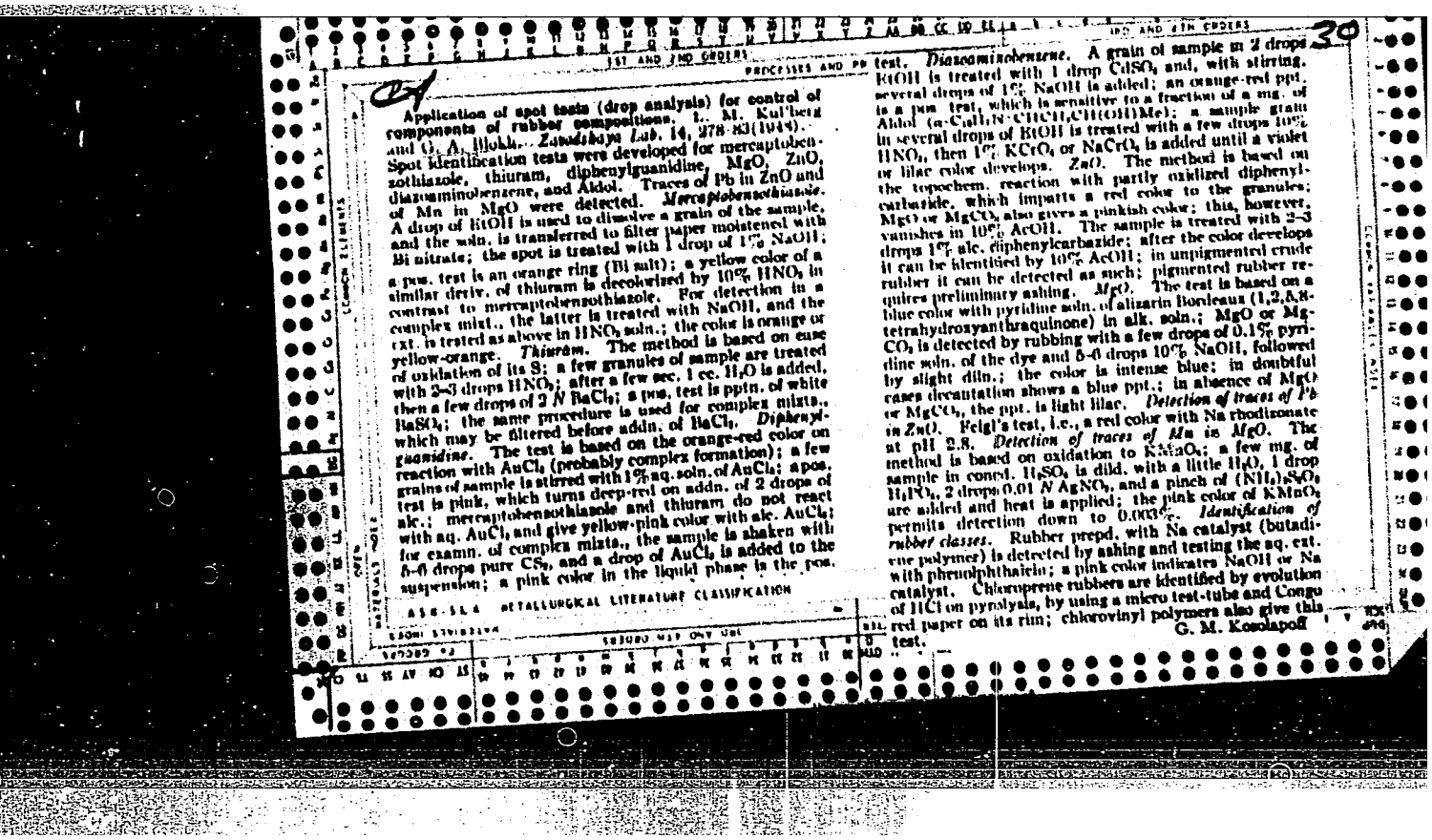
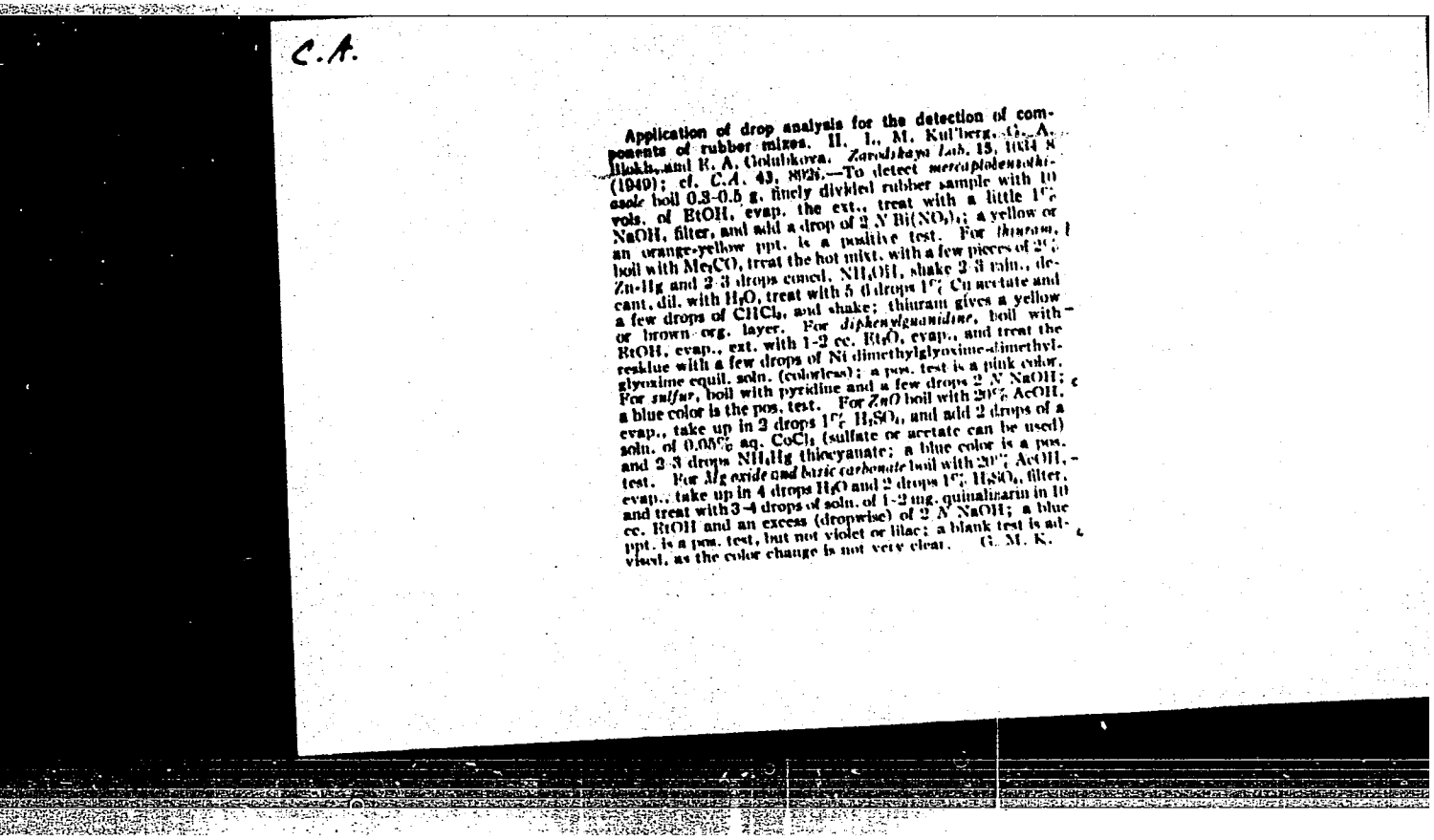


Domestic studies in the field of synthetic rubber. G. A. Blokh. *Legkaya Prom.* 8, No. 11, 14-16(1948).—A review of synthetic rubber developments in the U.S.S.R. 21 references.
Marshall Sittig



Application of spot tests (drop analysis) for control of components of rubber compositions. L. M. Kul'berg and O. A. Illokk. *Zavodskaya Lab.* 14, 278-83(1948). Spot identification tests were developed for mercaptobenzothiazole, thiuram, diphenylguanidine, MgO, ZnO, diazoaminobenzene, and Aldol. Traces of Pb in ZnO and of Mn in MgO were detected. *Mercaptobenzothiazole.* A drop of EtOH is used to dissolve a grain of the sample, and the soln. is transferred to filter paper moistened with Bi nitrate; the spot is treated with 1 drop of 1% NaOH; a pos. test is an orange ring (Bi salt); a yellow color of a similar deriv. of thiuram is decolorized by 10% HNO_3 in contrast to mercaptobenzothiazole. For detection in a complex mixt., the latter is treated with NaOH, and the ext. is tested as above in HNO_3 soln.; the color is orange or yellow-orange. *Thiuram.* The method is based on ease of oxidation of its S; a few granules of sample are treated with 2-3 drops HNO_3; after a few sec. 1 cc. H_2O is added, then a few drops of 2 *N* $BaCl_2$; a pos. test is pptn. of white $BaSO_4$; the same procedure is used for complex mixts., which may be filtered before addn. of $BaCl_2$. *Diphenylguanidine.* The test is based on the orange-red color on reaction with $AuCl_3$ (probably complex formation); a few grains of sample is stirred with 1% aq. soln. of $AuCl_3$; a pos. test is pink, which turns deep-red on addn. of 2 drops of alc.; mercaptobenzothiazole and thiuram do not react with aq. $AuCl_3$ and give yellow-pink color with alc. $AuCl_3$; for examn. of complex mixts., the sample is shaken with 5-6 drops pure CS_2, and a drop of $AuCl_3$ is added to the suspension; a pink color in the liquid phase is the pos. test. *Diazoaminobenzene.* A grain of sample in 2 drops EtOH is treated with 1 drop $CdSO_4$ and, with stirring, several drops of 1% NaOH is added; an orange-red ppt. is a pos. test, which is sensitive to a fraction of a mg. of Aldol (α-$C_6H_5N{:}CHCH_2CH(OH)Me$); a sample grain in several drops of EtOH is treated with a few drops 10% HNO_3, then 1% $KCrO_4$ or $NaCrO_4$ is added until a violet or lilac color develops. *ZnO.* The method is based on the topochem. reaction with partly oxidized diphenylcarbazide, which imparts a red color to the granules; MgO or $MgCO_3$ also gives a pinkish color; this, however, vanishes in 10% AcOH. The sample is treated with 2-3 drops 1% alc. diphenylcarbazide; after the color develops it can be identified by 10% AcOH; in unpigmented crude rubber it can be detected as such; pigmented rubber requires preliminary ashing. *MgO.* The test is based on a blue color with pyridine soln. of alizarin Bordeaux (1,2,5,8-tetrahydroxyanthraquinone) in alk. soln.; MgO or $MgCO_3$ is detected by rubbing with a few drops of 0.1% pyridine soln. of the dye and 5-6 drops 10% NaOH, followed by slight dilu.; the color is intense blue; in doubtful cases decantation shows a blue ppt.; in absence of MgO or $MgCO_3$, the ppt. is light lilac. *Detection of traces of Pb in ZnO.* Feigl's test, i.e., a red color with Na rhodizonate at pH 2.8. *Detection of traces of Mn in MgO.* The method is based on oxidation to $KMnO_4$; a few mg. of sample in concd. H_2SO_4 is dild. with a little H_2O, 1 drop H_3PO_4, 2 drops 0.01 *N* $AgNO_3$, and a pinch of $(NH_4)_2S_2O_8$ are added and heat is applied; the pink color of $KMnO_4$ permits detection down to 0.003%. *Identification of rubber classes.* Rubber prepd. with Na catalyst (butadiene polymer) is detected by ashing and testing the aq. ext. with phenolphthalein; a pink color indicates NaOH or Na catalyst. Chloroprene rubbers are identified by evolution of HCl on pyrolysis, by using a micro test-tube and Congo red paper on its rim; chlorovinyl polymers also give this test.

G. M. Kosolapoff



C.A.

Application of drop analysis for the detection of components of rubber mixes. II. L. M. Kul'berg, G. A. Ilukh, and R. A. Golubkova. *Zavodskaya Lab.* 15, 1314-8 (1949); cf. *C.A.* 43, 8926.—To detect *mercaptobenzothiazole* boil 0.3–0.5 g. finely divided rubber sample with 10 vols. of EtOH, evap. the ext., treat with a little 1% NaOH, filter, and add a drop of 2 *N* $Bi(NO_3)_3$; a yellow or an orange-yellow ppt. is a positive test. For *thiuram*, I boil with Me_2CO, treat the hot mixt. with a few pieces of 2% Zn-Hg and 2–3 drops concd. NH_4OH, shake 2–3 min., decant, dil. with H_2O, treat with 5–6 drops 1% Cu acetate and a few drops of $CHCl_3$, and shake; thiuram gives a yellow or brown org. layer. For *diphenylguanidine*, boil with EtOH, evap., ext. with 1–2 cc. EtOH, evap., and treat the residue with a few drops of Ni dimethylglyoxime-dimethylglyoxime equil. soln. (colorless); a pos. test is a pink color. For *sulfur*, boil with pyridine and a few drops 2 *N* NaOH; a blue color is the pos. test. For *ZnO* boil with 20% AcOH, evap., take up in 2 drops 1% H_2SO_4, and add 2 drops of a soln. of 0.05% aq. $CoCl_2$ (sulfate or acetate can be used) and 2–3 drops NH_4Hg thiocyanate; a blue color is a pos. test. For *Mg oxide and basic carbonate* boil with 20% AcOH, evap., take up in 4 drops H_2O and 2 drops 1% H_2SO_4, filter, and treat with 3–4 drops of soln. of 1–2 mg. quinalizarin in 10 cc. EtOH and an excess (dropwise) of 2 *N* NaOH; a blue ppt. is a pos. test, but not violet or lilac; a blank test is advised, as the color change is not very clear. G. M. K.

BLOKH, G.A.

Synthetic resins in rubber mixes. Legkaya Prom. 12, No.2, 34-6 '52.
(CA 47 no.19:10261 '53) (MLRA 4:12)

BLOKH, G.A.

Vulcanization

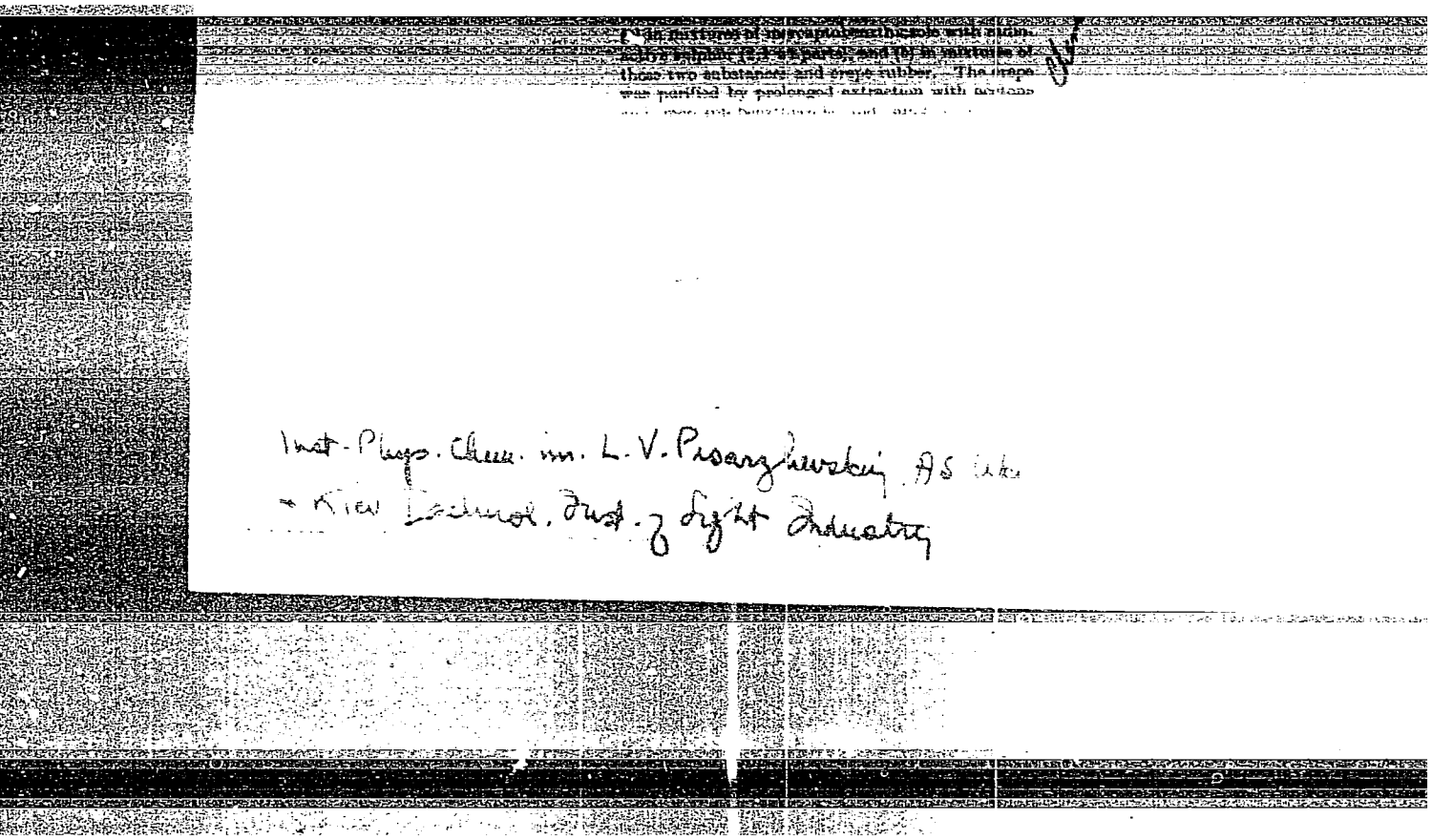
Interaction of vulcanizing and catalytic agents
Leg. prom. 12, no.7, 1952

USSR

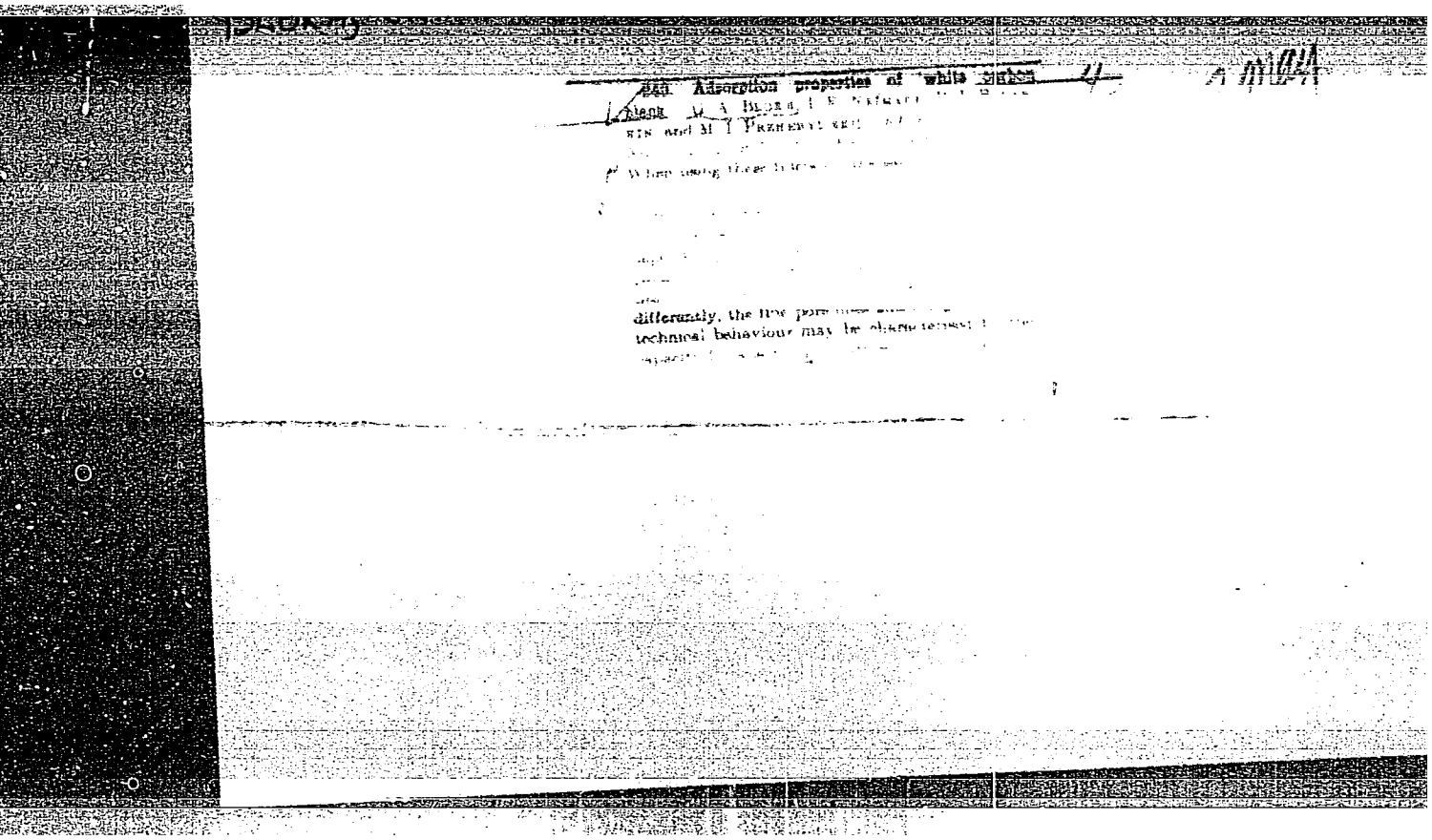
Reaction of thiuram and sulfur. G. A. Dikh and L. P. Saronova. *Legkaya Prom.* 12, No. [illegible] (1952); cf. *ibid.*, No. 7, 25-7.—Heating $Me_2NC(S)SSC(S)NMe_2$ (I) with radioactive S in the temp. interval of 50°–140° for 5–40 or more min. either as a mixt. alone or in rubber which is vulcanized results in intensive exchange of S atoms between I and S; the reaction occurs even at 100°, and becomes evident after 25 min.; at lower temps. the reaction is undetectable. The detection was made as follows: After completion of a run, the components were sepd. by isolation of Me_2NCS_2H in the form of Ni salt, whose radioactivity was then measured. In the case of rubber formulations (butadiene-Na type), the products were extd. with H_2O and then with EtOH. The exchange probably occurs through intermediate formation of tri- or tetrasulfides, which then dissociate to free S and the monosulfide. G. M. Kosolapoff

BTR Accn 64

9582* Application of Drop Analysis to the Detection of Compounding Ingredients in Rubber Mixtures. II. L. M. Kulberg, G. A. Bloch, and E. A. Golybkova. *Rubber Chemistry and Technology*, v. 25, Jan.-Mar. 1952, p. 152-156. (Translated from *Zavodskaya Laboratoriya*, v. 15, Sept. 1949, p. 1031-1038.)
Previously abstracted from original.

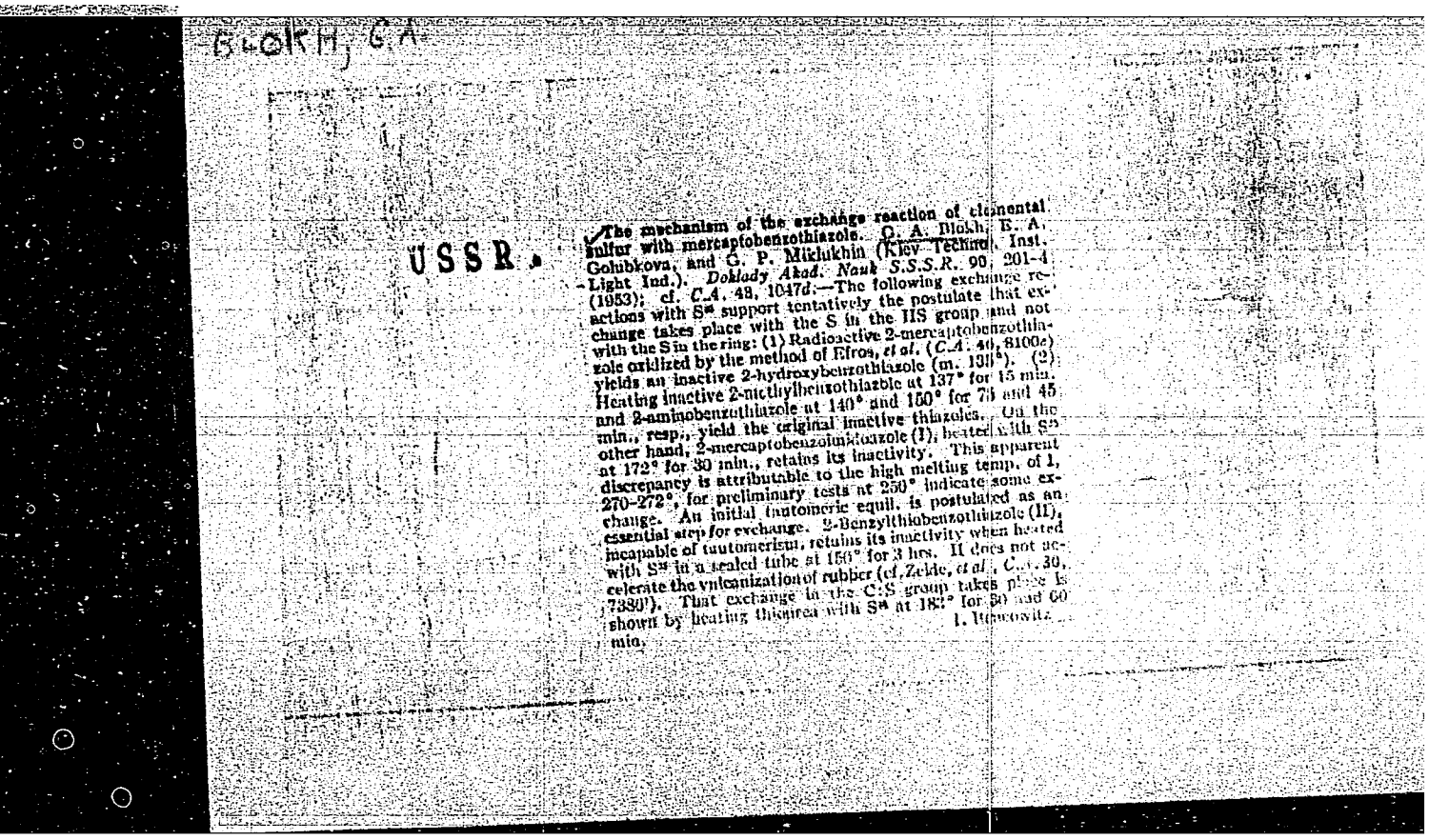


Inst-Phys. Chem. im. L.V. Pisarzhevskij AS Ukr
= Kiev Technol. Inst. of Light Industry



1001. Mechanism of [illegible] accelerators of vulcanisation of rubbers. [illegible]
Blokh, E. A. Golubkova and G. P. Miklukhin.
Problemy Mekhanizma Org. Reaktsii, Akad. Nauk
Ukr. S.S.R., Oddel. Fiz.-Mat. i Khim Nauk, 1953,
339–45; *Chem. Abs.*, 1956, 50, 17512. The available
literature on isotopic exchange of sulphur in the
usual rubber accelerators is discussed with 10 refer-
ences. In addition the following experimental data
are presented. In melts of 2-mercaptobenzthiazole
with sulphur at 145 to 184°C intense exchange of
sulphur isotopes takes place which is retarded in
the presence of a solvent such as cumene. The
specimen after exchange with S^{35} was oxidised
with alkaline potassium permanganate to 2-
hydroxybenthiazole which was devoid of S^{35};
hence the exchange reaction involves solely the
sulphur of the SH group. The 2-benzylthio ana-
logue of 2-mercaptobenthiazole fused with S^{35} at
150°C showed no evidence of isotope exchange.
2-Aminobenzthiazole and S^{35} similarly showed no
exchange at 150°C, with the same result being
obtained with 2-methylbenzthiazole. 2-Mercapto-
benzimidazole does not exchange sulphur with S^{35}
at 172°C. The mechanism of exchange of [illegible]
[illegible]benzthiazole is [illegible]

[illegible]



Blokh, G. A.

USSR

The mechanism of the exchange reaction of elemental sulfur with mercaptobenzothiazole. G. A. Blokh, E. A. Golubkova, and G. P. Miklukhin (Kiev Technol. Inst. Light Ind.). *Doklady Akad. Nauk S.S.S.R.* 90, 201–4 (1953); cf. *C.A.* 48, 1047*d*.—The following exchange reactions with S^{35} support tentatively the postulate that exchange takes place with the S in the HS group and not with the S in the ring: (1) Radioactive 2-mercaptobenzothiazole oxidized by the method of Efros, *et al.* (*C.A.* 40, 8100*e*) yields an inactive 2-hydroxybenzothiazole (m. 131°). (2) Heating inactive 2-methylbenzothiazole at 137° for 15 min. and 2-aminobenzothiazole at 140° and 150° for 75 and 45 min., resp., yield the original inactive thiazoles. On the other hand, 2-mercaptobenzothiazole (I), heated with S^{35} at 172° for 30 min., retains its inactivity. This apparent discrepancy is attributable to the high melting temp. of I, 270–272°; for preliminary tests at 250° indicate some exchange. An initial tautomeric equil. is postulated as an essential step for exchange. 2-Benzylthiobenzothiazole (II), incapable of tautomerism, retains its inactivity when heated with S^{35} in a sealed tube at 150° for 3 hrs. II does not accelerate the vulcanization of rubber (cf. Zelde, *et al.*, *C.A.* 30, 7380^{1}). That exchange in the C:S group takes place is shown by heating thiourea with S^{35} at 183° for 30 and 60 min.

I. Hanovits

BLOKH, G. A. 11 Aug 53

USSR/Chemistry - Vulcanization Accelerators, Isotopes

"Investigation of the Mechanism of the Action of Rubber Vulcanization Accelerators. Vulcanization of Rubber With the Radioactive Isotope of Sulfur," G.A. Blokh, Kiev Technol Inst of Light Industry

DAN SSSR, Vol 91, No 5, pp 1107-1110

Studied the exchange reactions between accelerators contg S and the chemically bound or "bridge" sulfur of rubber using radioactive isotope S^{35}. Results indicate that under the conditions of tech vulcanization of rubber, it is free S and not the S bound to the rubber that engages in exchange reactions with the S atoms of the accelerator. Presented by Acad A.N. Frumkin 16 Jun 53.

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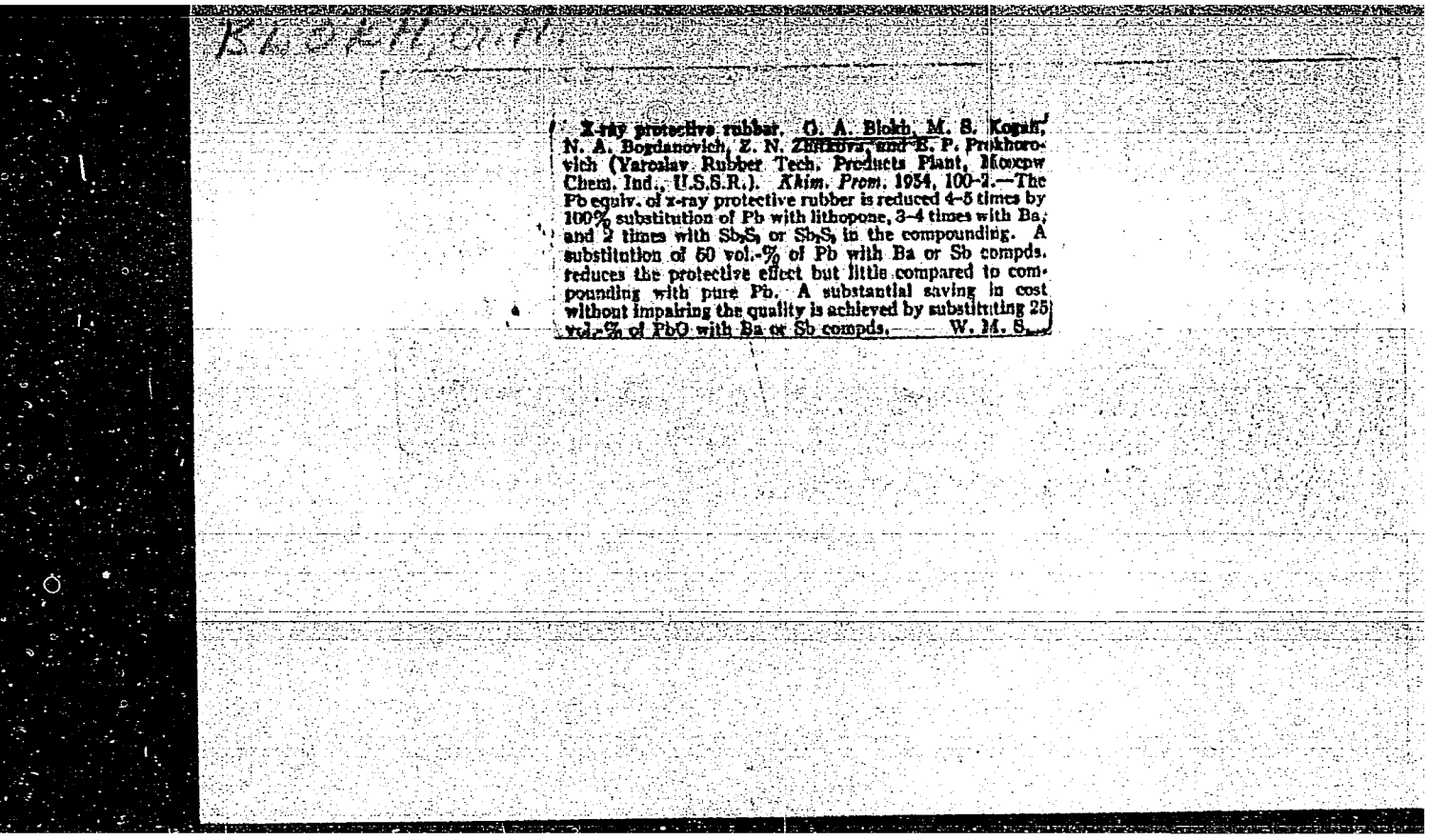
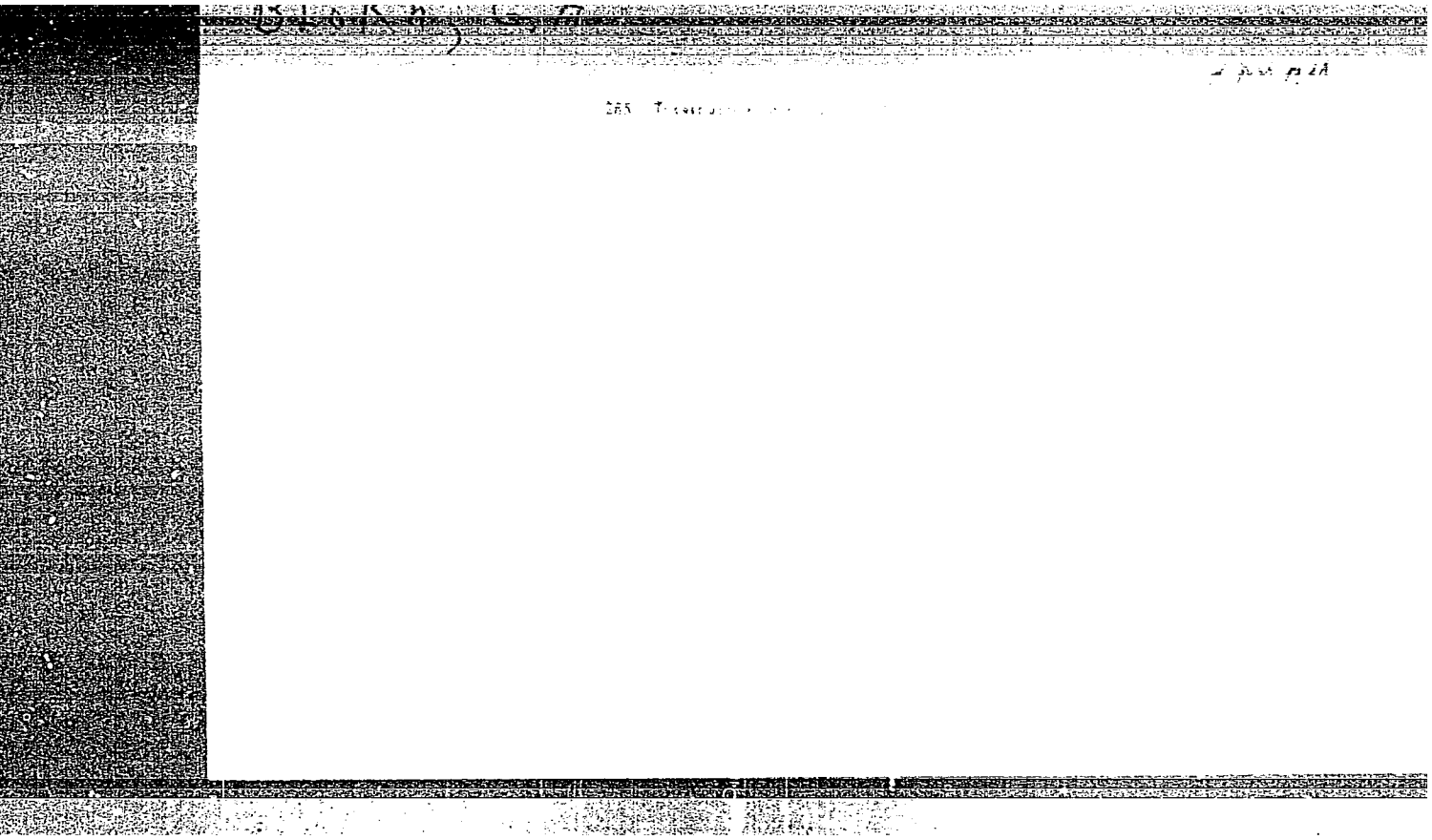
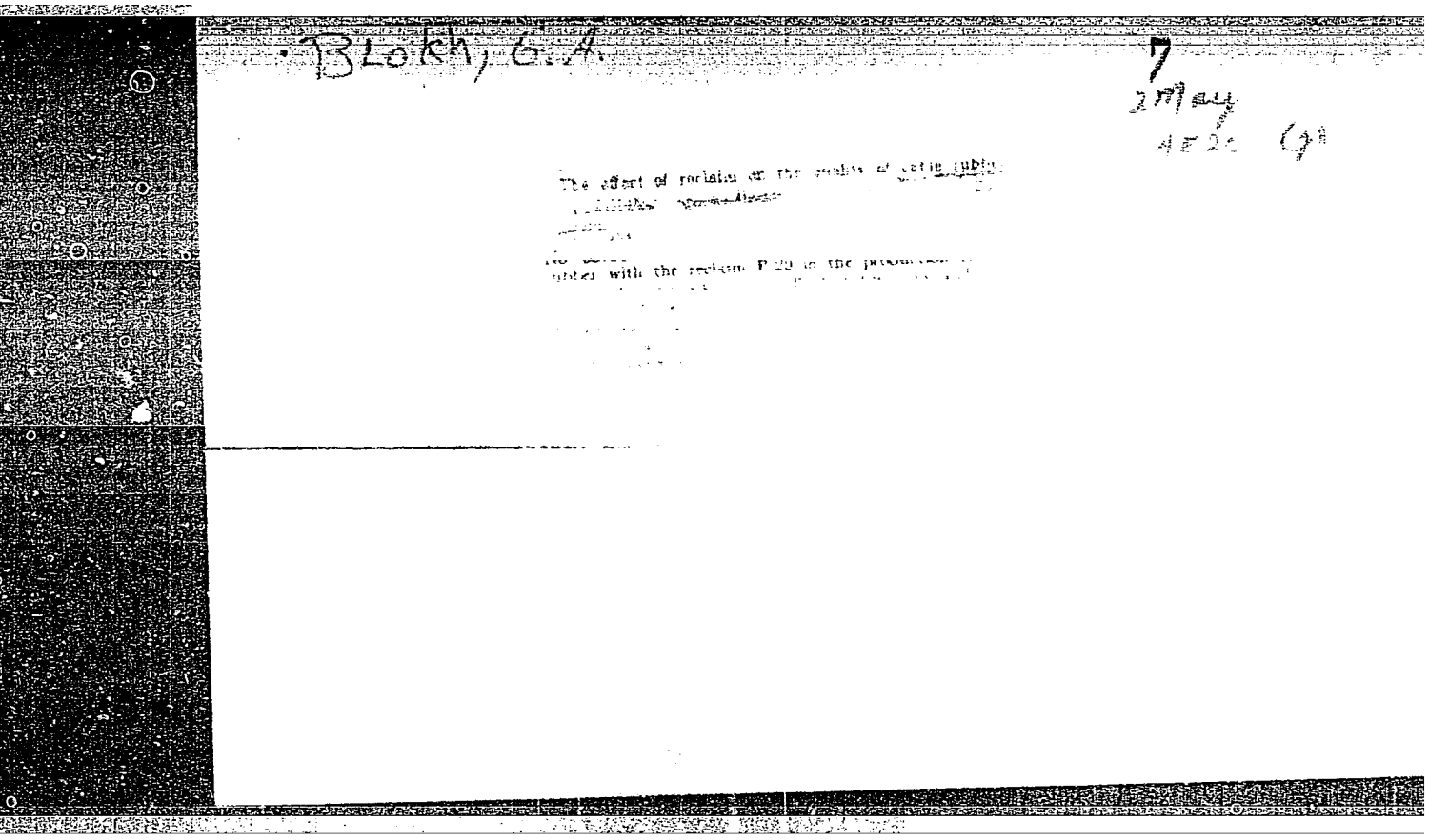
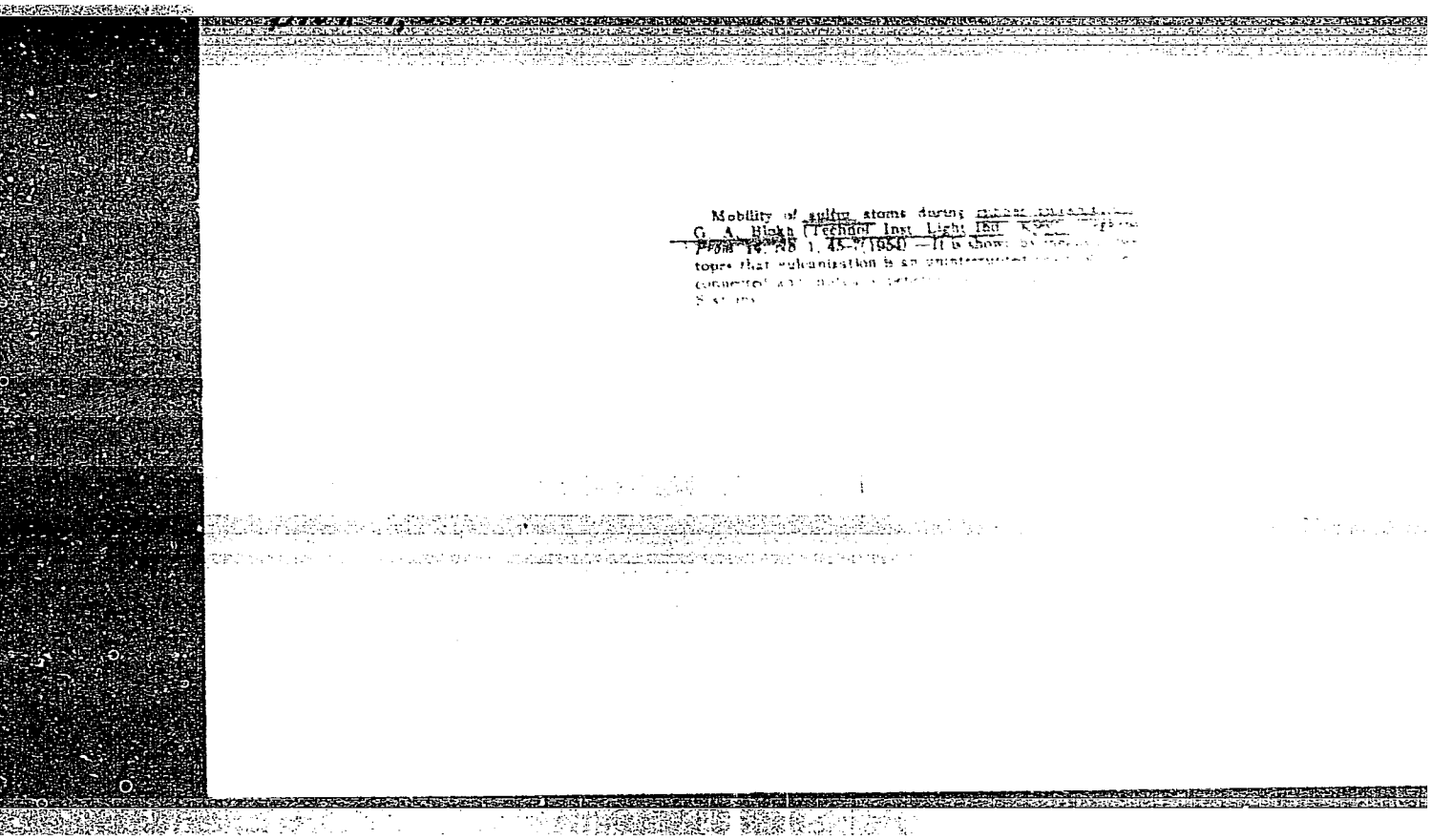


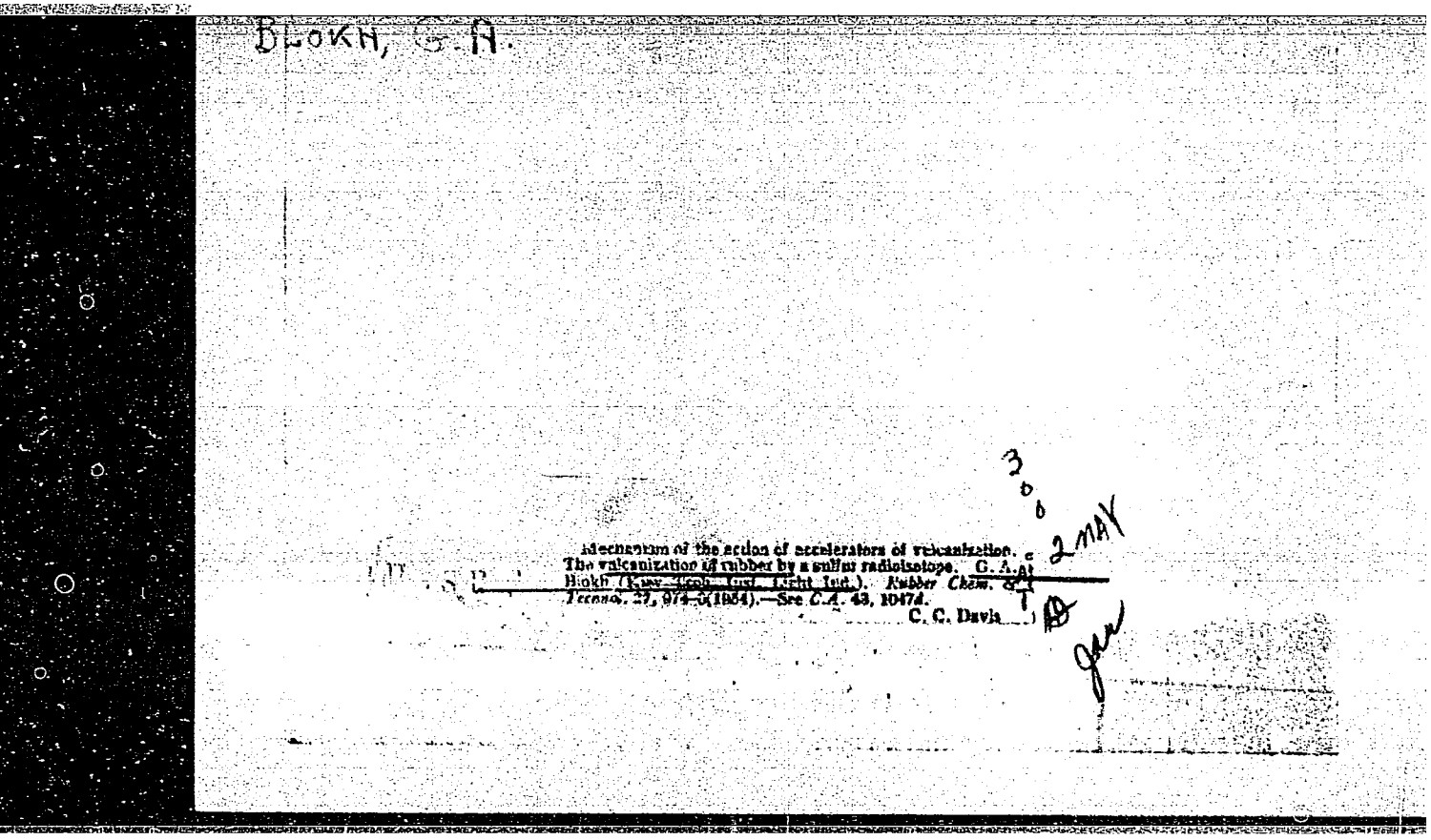
X-ray protective rubber. O. A. Blokh, M. S. Kogan, N. A. Bogdanovich, Z. N. Zhukova, and E. P. Prokhorovich (Yaroslav. Rubber Tech. Products Plant, Moscow Chem. Ind., U.S.S.R.). *Khim. Prom.* 1954, 100-2.—The Pb equiv. of x-ray protective rubber is reduced 4–5 times by 100% substitution of Pb with lithopone, 3–4 times with Ba, and 2 times with Sb_2S_3 or Sb_2S_5 in the compounding. A substitution of 50 vol.-% of Pb with Ba or Sb compds. reduces the protective effect but little compared to compounding with pure Pb. A substantial saving in cost without impairing the quality is achieved by substituting 25 vol.-% of PbO with Ba or Sb compds. — W. M. S.







Mobility of sulfur atoms during [illegible]
G. A. Bloch (Technol. Inst. Light Ind.
[illegible] 1, 45-7(1954). —It is shown [illegible]
topes that vulcanization is an [illegible]
[illegible]



BLOKH, G. A.

Mechanism of the action of accelerators of vulcanization. The vulcanization of rubber by a sulfur radioisotope. G. A. Blokh (Inst. Chem. Gen. Light Ind.). *Rubber Chem. Technol.* 27, 974–6 (1954).—See *C.A.* 49, 10417d.
C. C. Davis

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2 MAY

USSR/ Chemistry

Card 1/1 Pub. 22 - 24/56

Authors : Blokh, G. A., and Chuprina, L. F.

Title : Mobility of S-bonds in rubber and bonite

Periodical : Dok. AN SSSR 99/5, 757-760, Dec 11, 1954

Abstract : Report is presented on the mobility of sulfur bound in thiuram rubber and ebonite. Experiments showed that monosulfide bound sulfur in thiuram rubber and in ebonite is immobile and does not participate in interchange reactions. The nature of the sulfur structure, in the case of ebonite, is discussed. A study of ebonite of ebonite pyrolysis products showed that the S in the ebonite is bound intramolecularly with the tertiary carbon atom, i.e., the sulfur atom binds not two neighboring carbon atoms but the atoms separated from each other by two methylene groups thereby forming a thiophene grouping in the ebonite structure. The differences in the structures of S-bonds of rubber and ebonite are explained. Eight references: 6-USSR; 1-USA and 1-English (1934-1954). Tables.

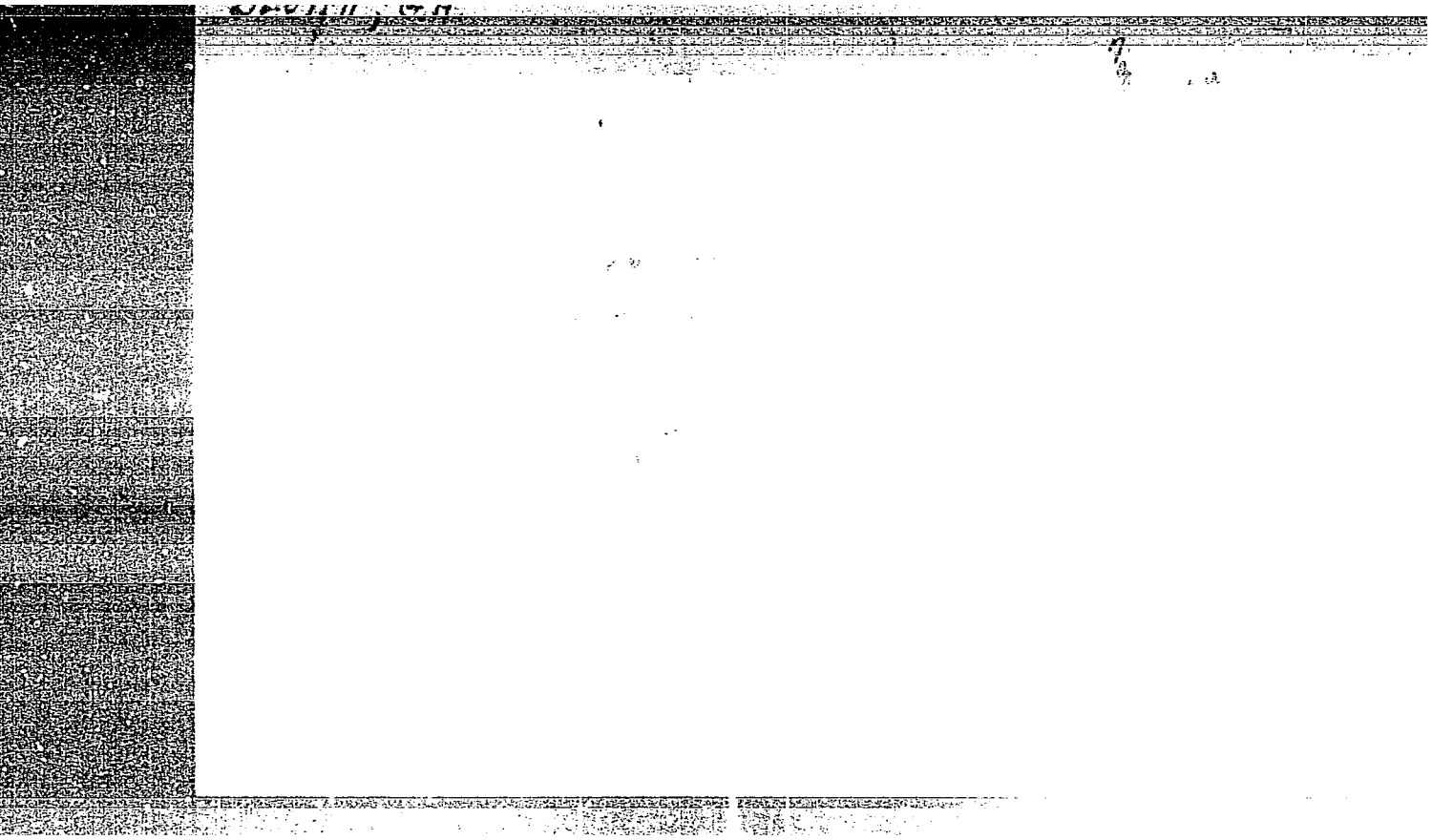
Institution : Technological Institute of Light Industry, Kiev

Presented by: Academician P. A. Rebinder, July 1, 1954

BLOKH, G.A.

9

Migration and uniform distribution of sulfur in rubber mixes. G. A. Blokh, V. Ya. Demidionova, G. P. Miklukhin, I. I. Kukhtenko, A. F. Rekasheva, R. V. Nikulina, and M. I. Przhebyl'skii. *Legkaya Prom.* 15, No. 1, 28-30(1955).—Study was with labeled atoms. After 4-6 passes through a narrow gap between rolls, S was distributed evenly. During short contact of a raw mix with fabric at room temp., there was migration of S. There was also migration from vulcanized rubber into the raw mix. During vulcanization, migration into the fabric layer was not stopped by talc; a paper layer reduced migration. B. Z. Kamich



БЛОХ, Г. А.

USSR/Chemistry - Physical chemistry

Card 1/1 Pub. 116 - 14/24

Authors : Kukhtanko, I. I.; Blokh, G. A.; and Miklukhin, G. P.

Title : Isotopic exchange of elementary sulfur with sulfur of sodium diethyldithiocarbamate

Periodical : Ukr. khim. zhur. 21/2, 227-232, 1955

Abstract : The exchange reaction of sulfur isotopes between elementary sulfur and sodium diethyldithiocarbamate was investigated to determine the kinetics of the exchange reaction. The reaction rate constants for temperatures of 50, 60, and 70° and the reaction activation energy were evaluated. The effect of dilution of the reacting substances on the rate of reaction is explained. Six USSR references (1952-1954). Tables; graphs.

Institution : Acad. of Sc., Ukr. SSR, The L. A. Pisarzhevskiy Inst. of Phys. Chem.

Submitted : August 13, 1954

Blokh, G.A.

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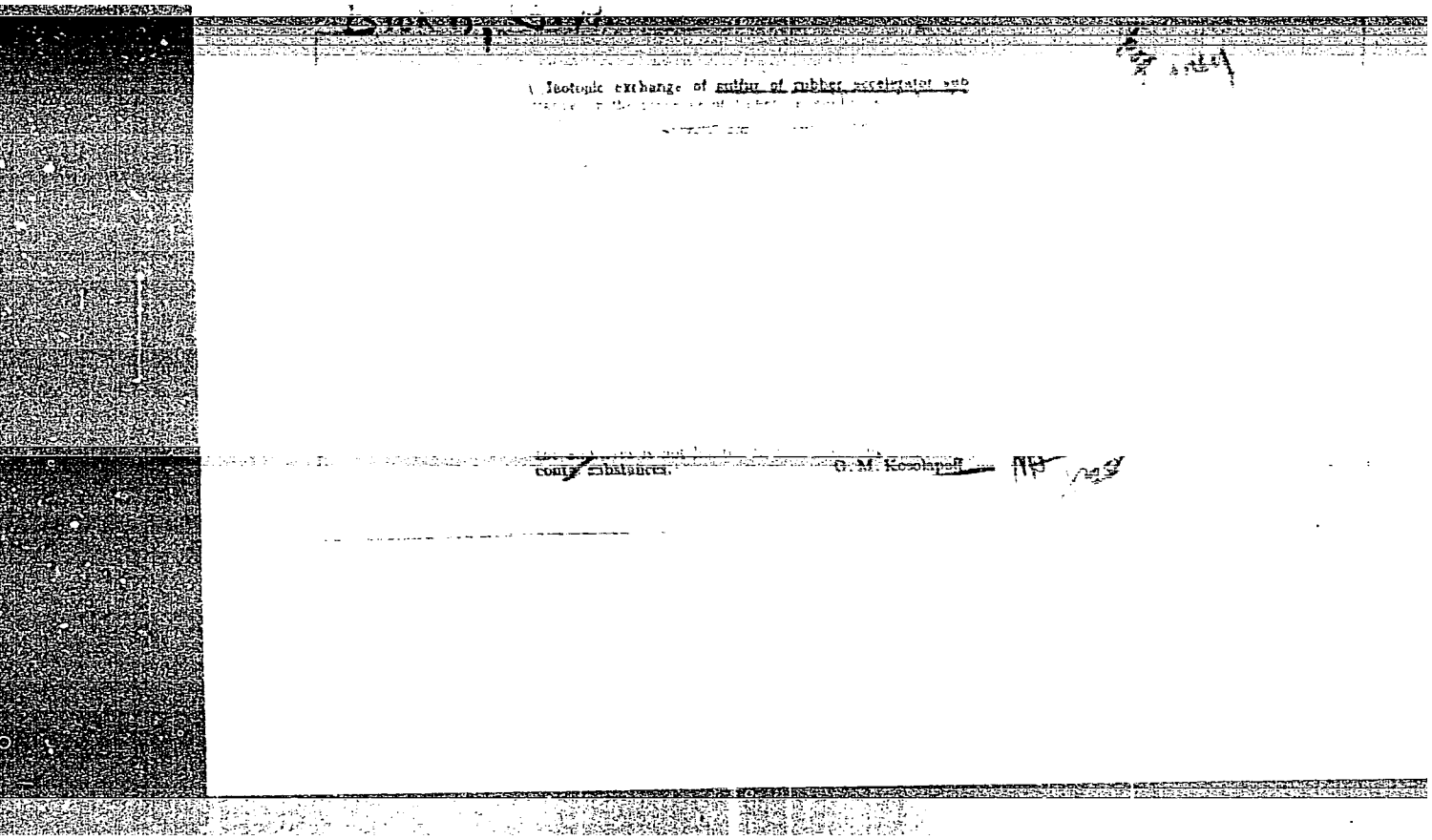
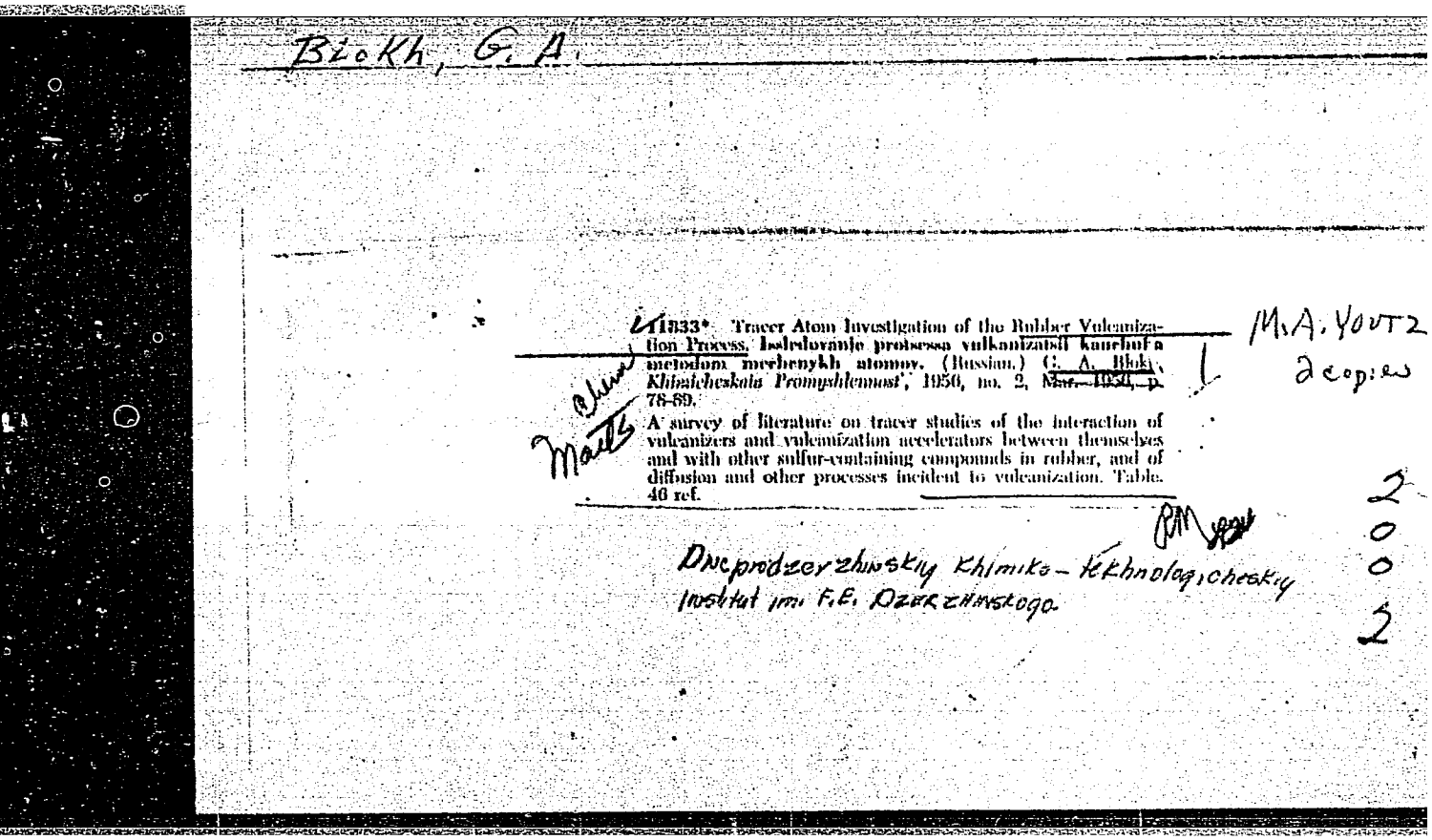
V Isotopic exchange of sulfur between hydrogen sulfide and 2-mercaptobenzothiazole. A. F. Rekasheva, G. A. Blokh, and G. P. Miklukhin. *Zhur. Obshchei Khim.* 25, 1691–6 (1955); cf. preceding abstr.—The exchange of S between H_2S and 2-mercaptobenzothiazole was studied kinetically by means of H_2S labeled with S^{35}; the kinetics of the reaction indicate a fractional order of the reaction; at 150° the rate const. in MePh is 0.117/hr., with an activation energy of 25.1 kcal./mole. Attempts to use higher temps. were unsatisfactory owing to a chem. reaction that interferes with the simple S exchange. At 150° reaction runs of 10 hrs. duration are satisfactory, but after some 20 hrs. the 2nd reaction interferes to the extent of some 20%. The exchange is believed to proceed by formation of the 2,2-dimercapto deriv. with H_2S, followed by loss of H_2S.
G. M. Kosolapoff

(2)





Bio Kh, G. A.

11533* Tracer Atom Investigation of the Rubber Vulcanization Process. Issledovanie protsessa vulkanizatsii kauchuka metodom mechenykh atomov. (Russian.) G. A. Bloh, *Khimicheskaia Promyshlennost'*, 1956, no. 2, Mar.–Apr. 1956, p. 78-89.

A survey of literature on tracer studies of the interaction of vulcanizers and vulcanization accelerators between themselves and with other sulfur-containing compounds in rubber, and of diffusion and other processes incident to vulcanization. Table. 46 ref.

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