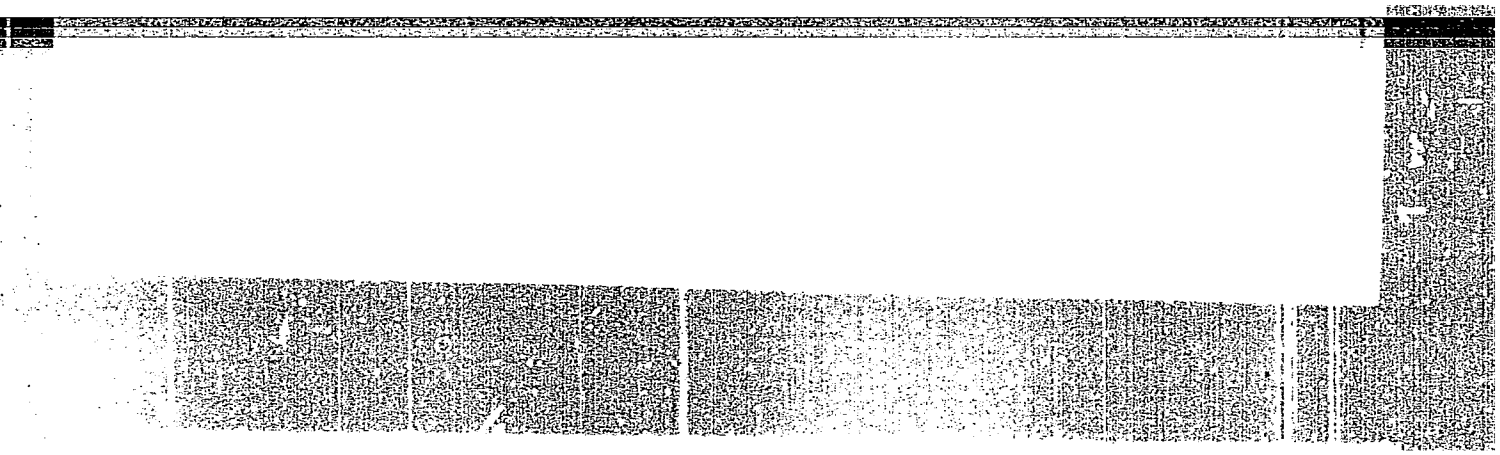

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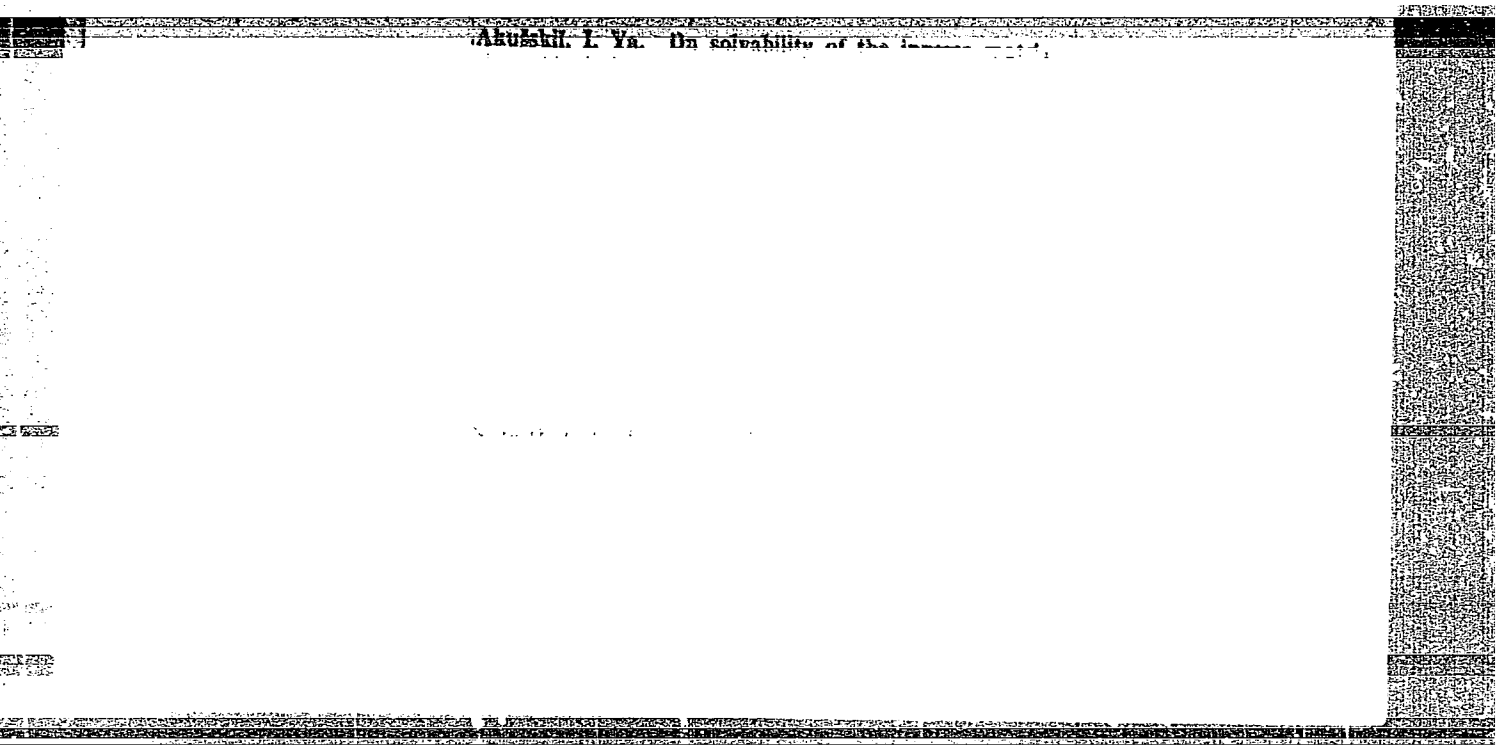

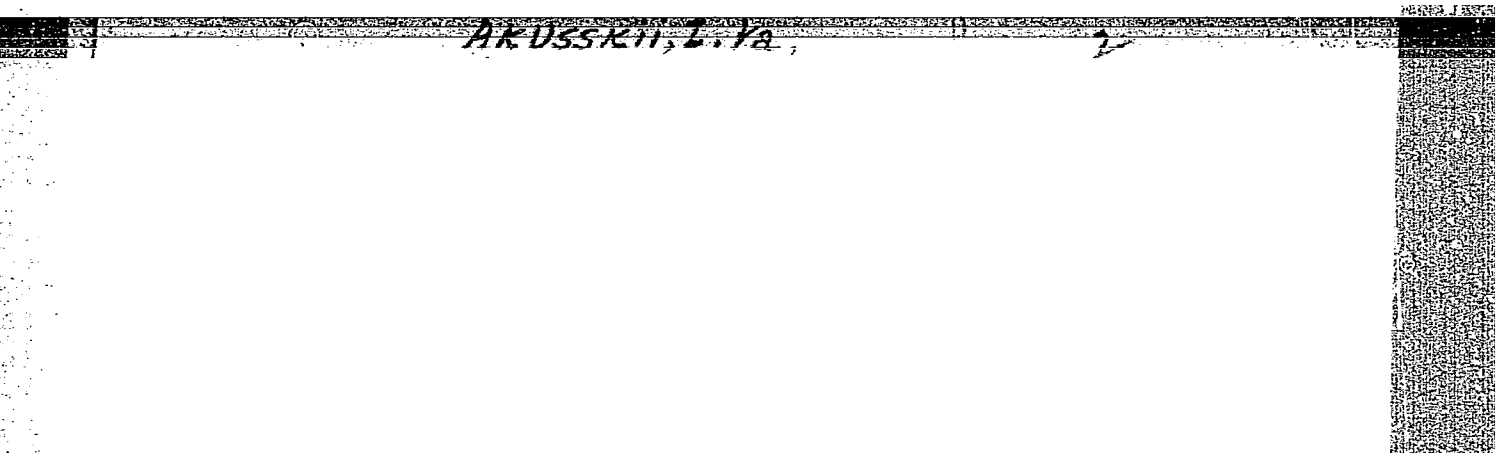

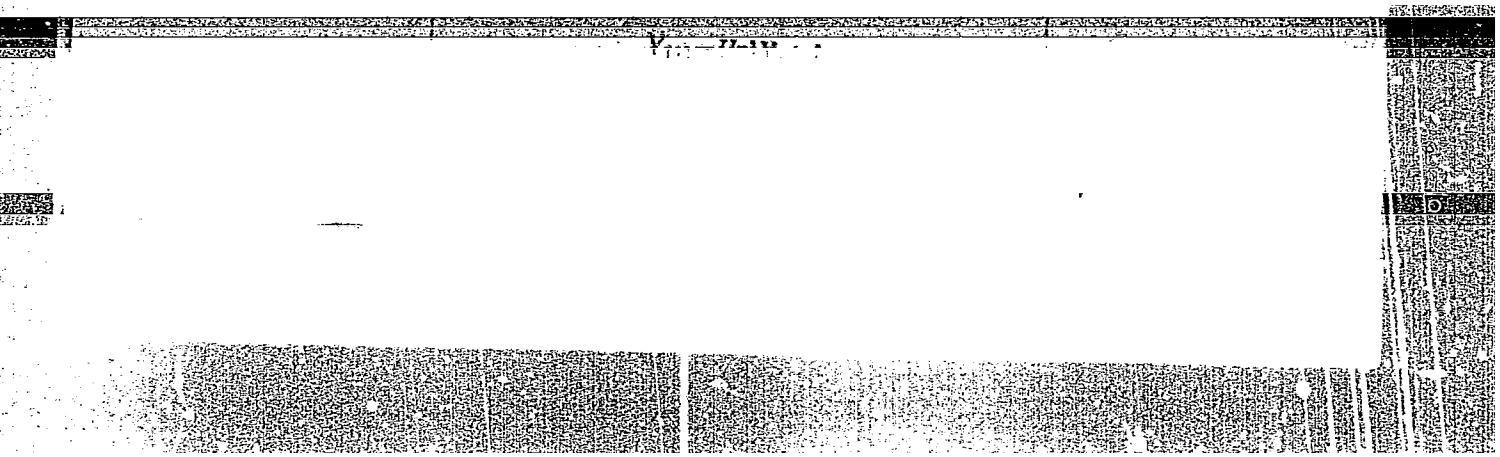

APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100730002-8"

AKUSHSKIY, I.Ya.

Solvability of an inverse matrix. Izv. AN Kazakh. SSR. Ser. mat. i mekh. no.5:90-100 '56. (MLRA 10:2)

(Matrices)

AKUSHSKIY, I.Ya., kandidat fiziko-matematicheskikh nauk; EPSHTEYN, V.L., inzhener.

Mechanizing the estimation of mineral resources. Gor.zhur. no.6: 6-9 Je '56. (MLRA 9:8)

1. Stal'proyekt.
(Mines and mineral resources--Statistics)
(Calculating machines)

AKUSHSKIY, I. Ya., kandidat fiziko-matematicheskikh nauk.

Short outline of the elements of cybernetics and its applications.
Vest.AN Kazakh.SSR 12 no.1:25-39 Ja '56. (MLRA 9:5)
(Cybernetics)

VASMANOV, Vladimir Veniaminovich, kand. tekhn. nauk; DOSTUPOV, B.G., doktor tekhn. nauk, retsenzent; AKUSHSKIY, I.Ya., kand. fiz.-mat. nauk, red.; KOCHETOVA, G.F., red.; TIKHANOV, A.Ya., tekhn. red.

[Computers] Vychislitel'nye matematicheskie pribory. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1958. 205 p.
(Calculating machines) (MIRA 11:10)

AKUSHSKIY, I. Ya.

"On Solvability by a Nonhomogeneous Operation Cycle"

"On the Solvability of a Computing Problem for a Triangular Matrix"

Trudy, t. 1. Transactions of the Mathematics and Mechanics Section, Kazakh SSR, Acad. Sci., Alma-Ata, Izd-vo AN Kazakhskoy SSR, 1958, 207pp.

AKUSHSKIY, I. Ya.

16(1) PHASE I BOOK EXPLOITATION 1110

Voprosy teorii matematicheskikh mashin; sbornik pervyy (Problems of the Theory of Mathematical Computing Machines; Collection of Articles, v. 1) Moscow, Fizmatgiz, 1958. 230 p. 10,000 copies printed.

Ed. (Title page): Bazilevskiy, Yuriy Yakovlevich; Ed. (Inside book): Shreyder, Yu.A.; Tech. Ed.: Gavrilov, S.S.

PURPOSE: This book is intended for engineers, scientific workers, and students concerned with mathematical computers and control devices.

COVERAGE: This book, Volume I, consists of 12 articles devoted to the logical structure of mathematical computers, programming problems, and computing methods. Subjects treated include theoretical methods of describing the structure of mathematical computers, principles of constructing certain specialized computers, problems of programming automation, and selection of computing methods which are convenient for computer realization. All contributions in this volume are Soviet.

Card 1/6

TABLE OF CONTENTS:

Problems of the Theory (Cont.) 1110

Akushskiy, I.Ya. Certain General Problems of Programming 63
This article consists of the following sections: 1) Certain concepts and symbols; 2) Functions and operators defined on a finite set of integers; 3) Command and programming operators. Programming cycles; 4) Input operators. Structure of command operators; 5) Homogeneous computing problem; 6) Programmability conditions of the solution of a homogeneous computing problem by a homogeneous programming cycle; 7) Linear programming operators; 8) Examples of the application of programmability conditions for linear operators; 9) Programmability conditions of the solution of a homogeneous computing problem by a nonhomogeneous programming cycle; 10) Programming factors. Good programming operators; 11) Computing of start functions; 12) Programmability of the solution of the inverse problem; 13) Conditions of simultaneous solvability.

Shreyder, Yu.A. Programming and Recursive Functions 110
This article consists of the following sections: 1) Introduction; 2) Recursive program design; 3) A system of basic functions and examples of a recursive program recording; 4) Realization of recursive synthesis in computers.

Card 3/6

Kozharskiy, L.A. A Method of Constructing Digital Differential Analyzers 219

This article consists of the following sections: 1) Usual method of constructing a digital differential analyzer; 2) Proposed method of constructing a digital differential analyzer.

AVAILABLE: Library of Congress

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S/112/59/000/015/033/068
A052/A002

Translation from: Referativnyy zhurnal, Elektrotekhnika, 1959, No. 15, p. 154, # 32057

AUTHOR: Akushskiy, I.Ya.

TITLE: On Some General Problems of Programming

PERIODICAL: V sb.: Vopr. teorii matem. mashin. I, Moscow, Fizmatgiz, 1958, pp. 63-109

TEXT: This is a description of the mathematical apparatus of programming for computers whose computing elements perform addition and substraction (additive machines). The matrix calculus is the mathematical basis of this apparatus. Many of the facts, established for additive machines by means of the matrix apparatus, can be applied to machines of any type. Command and program operators, input operators and program cycles (homogeneous and inhomogeneous ones) are considered. A definition of the homogeneous computing problem is given and conditions of programability of its solution by a homogeneous program cycle are formulated. It is shown that the problem can be programmed on a given machine if functions obtained in the machine coincide with the sought for functions in a

Card 1/2

On Some General Problems of Programming

S/112/59/000/015/033/068
A052/A002

certain given beforehand set. An example of using the programability conditions for solving a homogeneous computing problem by an inhomogeneous program cycle is considered. Possibilities of widening the class of operators solvable by program cycles are analyzed. The author gives a method of calculating the input function which must be put into the machine and with which the solution of a problem starts. The problem of programability of the solution of an inverse problem (negative powers of an operator) is considered. The possibility of solving an inverse problem without inverting the operator is established, which is important when a computing problem is given in an implicit form. Conditions are discussed under which a simultaneous solution of several different computing problems can be realized in a machine by means of one program cycle. There are 16 references.

E.A.G.

Translator's note: This is the full translation of the original Russian abstract.

Card 2/2

30857
S/044/61/000/008/035/039
C111/C333

16.6500 16.6800 14.1500

AUTHOR: Akushskiy, I. Ya.

TITLE: On the solubility by an inhomogeneous cycle of operations

PERIODICAL: Referativnyy zhurnal, Matematika, no. 8, 1961, 36, abstract 8V232.("Tr. Sektora matem. i mekhan. AN Kaz SSR", 1958, 1, 111-125

TEXT: The author considers methods by which one can obtain on a machine a vector according to the recurrence formula

$$Y_{k+1} = UY_k$$

by using an inhomogeneous cycle of operations with the operation matrix Ω and a constant vector $R = PY_0$ which is introduced at the end of each cacle. The author investigates three kinds of solvability with the inhomogeneous cycle of operations for realizing the problem (1). These conditions are:

$$\Omega Q_0 - QU = -P$$

for simple solvability,

Card 1/2

$(\Omega^r Q_{t-r+i} - Q_{t-r+i} U^r) = - (\Omega^{r-1} + \ldots + 1)P$

for successive solvability,

$(\Omega^r Q_{t-r+1} - Q_{t-r+i} U^{P_t - P_{t-r}}) U^{P_{t-r+i}} = (\Omega^{r-1} + \ldots + i)P$

for generalized solvability. All these three conditions for the solvability with the inhomogeneous cycle of operations permit an extension of the narrow class of the realizable matrizes U by the homogeneous cycle of operations decribed in the preceding papers.

[Abstracter's note: Complete translation.]

Card 2/2

30856
S/044/61/000/008/034/039
C111/C333

16.6500 16.6100 16.1500

AUTHOR: Akushskiy, I. YA.

TITLE: On the solvability of the problem of calculation for the triangular matrix

PERIODICAL: Referativnyy zhurnal, Matematika, no. 8, 1961, 36, abstract 8V231. ("Tr. Sektora matem. i mekhan. AN Kaz SSR", 1958, 1, 126-132)

TEXT: The author considers methods by which, on additive machines, one con obtain a vector according to the recurrence formula

$$Y_{k+1} = UY_k \qquad (1)$$

where U is an upper triangular matrix with eigenvalues one. From the relation $\Omega Q = QU$, where Ω is a operation matrix, the form of the one-component matrix Q is determined. The author proves that for a realizable matrix U the matrix Q is an upper triangular matrix, the first line of which is a line of ones. Starting from this, the author obtains the simplest form of the program matrix Ω for which the problem (1) can be realized in two machine steps: 1.) from the counters with odd numbers there is transferred into the counters with even

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On the solvability of the problem . . .

4

numbers a number smaller by one, 2.) from the counters with even numbers there is transferred into the counters with odd numbers a number smaller by one.

[Abstracter's note: Complete translation.]

Card 2/2

AKUSHSKIY, I.Ya.

Multiregister circuits for the performance of arithmetical operations.
Vop.teor.mat.mash. no.1:192-218 '58. (MIRA 11:12)
(Electronic digital computers)

AKUSHSKIY, I. Y.

METHODS OF SPEEDING-UP THE OPERATION OF DIGITAL COMPUTERS

I. Y. AKUSHSKIY, L. B. YEMELYANOV-YAROSLAVSKIY, E. A. KLYAMKO,
V. S. LINSKIY, G. D. MONAKHOV,
Institute for Scientific Research of Electronic
Mathematical Machines, Moscow, USSR.

In the paper are considered different methods of speeding-up operations in digital computers.

Methods of accelerating the digit by digit multiplication by overlapping in time the operations of addition and shift; the method of the "travelling wave" when the addition of several partial products is effected simultaneously, etc.

For speeding-up the division operation a method is recommended by which the information contained in the code of the next remainder is used for determining in one step the group of the quotient consecutive digits.

Are considered the advantages, from the point of view of operation speeding-up, of storage of codes in not normalized condition and representation of negative numbers in the machine in reverse code (with introduction of code feature). Combined methods of calculation of certain algebraic expressions in the conditions of an arithmetic device with an increased number of components.

Methods are described for speeding-up the addition elementary operation, which ensure single-shot operation of each component of the add circuit, as well as the methods of speeding up the group shift by means of a special shifter designed in the form of a ferrite matrix.

Considerations are given on the expediency of including the calculations of the values of elementary functions in the list of main machine operations, and some algorithms are given (which are adaptable for their circuit execution by the arithmetic device), on

Paper presented at Intl. Conf. on Information Processing, UNESCO House, Paris, 15-20 Jul '59

the basis of which these values are formed of the operations of additions and group shift.

The role of microprogram control for accelerating operations is discussed. In particular, at microprogram control, when a single-sided high-speed large capacity memory is used, it seems possible to obtain efficient results by calculating the elementary function values on the basis of block-poly-nomial approximation of functions by different polynomials at various intervals.

PAPER PRESENTED AT
INTERNATIONAL CONF. ON INFORMATION PROCESSING
UNESCO HOUSE, PARIS
15 - 20 JUNE 1959.

АКУЛИНИЧ, И. Ф.

16(1) PHASE I BOOK EXPLOITATION SOV/2660

Vsesoyuznyy matematicheskiy s"yezd. 3rd, Moscow, 1956

Trudy, t. 4: Kratkoye soderzhaniye sektsionnykh dokladov. Doklady inostrannykh uchenykh (Transactions of the 3rd All-Union Mathematical Conference in Moscow. vol. 4: Summary of Sectional Reports. Reports of Foreign Scientists) Moscow, Izd-vo AN SSSR, 1959. 247 p. 2,200 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Matematicheskiy institut.

Tech. Ed.: G.N. Shevchanko; Editorial Board: A.A. Abramov, V.G. Boltyanskiy, A.M. Vasil'yev, B.V. Medvedev, A.D. Myshkis, S.M. Nikol'skiy (Resp. Ed.), A.G. Postnikov, Yu. V. Prokhorov, L.A. Rybnikov, P. L. Ul'yanov, V.A. Uspenskiy, M.G. Chetayev, G. Ye. Shilov, and A.I. Shirshov.

PURPOSE: This book is intended for mathematicians and physicists.

COVERAGE: The book is Volume IV of the Transactions of the Third All-Union Mathematical Conference, held in June and July 1956. The book is divided into two main parts. The first part contains summaries of the papers presented by Soviet scientists at the Conference that were not included in the first two volumes. The second part contains the text of reports submitted to the editor by non-Soviet scientists. In those cases when the non-Soviet scientist did not submit a copy of his paper to the editor, the title of the paper is cited and, if the paper was printed in a previous volume, reference is made to the appropriate volume. The papers, both Soviet and non-Soviet, cover various topics in number theory, algebra, differential and integral equations, function theory, functional analysis, probability theory, topology, mathematical problems of mechanics and physics, computational mathematics, mathematical logic and the foundations of mathematics, and the history of mathematics.

Card 18/ 34

AKUTIN, F.

Popularize ultrashortwave radio. Radio no.3:13 Mr '56.
(MLRA 9:6)

1.Predsedatel' soveta Kuybyshevskogo radiokluba.
(Radio, Shortwave)

AKUTIN, G. K.

PA 18T56

USSR/Mines and Mining - Equipment Jul 1947
Mineral Industries

"Stages of Crushing and Height of Ledges,"
G. K. Akutin, 5 pp

"Gornyy Zhurnal" Vol CXXI, No 7

In open-pit mining, the width of the pit must conform to the type of machines used. Examples made of Karakub workings. Graphs and tables of observed results.

18T56

15-57-10-14877

Translation from: Referativnyy zhurnal, Geologiya, 1957, Nr 10, p 254 (USSR)

AUTHOR: Akutin, G. K.

TITLE: The Influence of the Basic Technical Parameters for Continuous Charges on the Production of Coarse Particles (Vliyaniye osnovnykh tekhnicheskikh parametrov sploshnykh kolonkovykh zaryadov na vykhod negabarita)

PERIODICAL: Sb. tr. In-ta gorn. dela AN UkSSR, 1956, Nr 4 (13), pp 100-107

ABSTRACT: The author describes the results of 87 experimental explosions in limestones (critical point of compression 600 kg/cm^2 to 1,400 kg/cm^2), made by exploding charges 7 m to 22 m long in drill holes with diameters of 150 mm and 200 mm. The degree of crushing was determined by sieve analysis and was evaluated by the percentage of material remaining on the screen (P_n). The relationship (W) between P_n and the computed radius of

Card 1/3

The Influence of the Basic Technical Parameters (Cont.)

fracturing (CRF) was determined. Experiments were conducted to determine the relationship between P_n and the spacing of the charges. When the length of charges were 7 m to 22 m, for a constant value of (CRF), only the index measuring the spacing of the charges varied, and for these experiments this index amounted to 0.6 to 1.0 times the value of (CRF). The relationship between (CRF) and the length of charge was also shown by experimental explosions indicating that it is possible to determine the necessary value of (CRF) in respect to the diminution of length of charge so as to produce a minimum of coarse particles. An analysis of the results leads to the following conclusions. With an increase in the value of (CRF), there is a considerable increase in the coarse fraction. The greatest crushing is obtained when the charge spacing is within the interval of 0.6 and 0.7. The size of the drill hole shows no relationship to the amount of rock crushing. The minimum size of the hole which still elimates ledges at the bottom of the charge depends on the value of (CRF) and is about equal to 0.2 W. The optimum value of the coefficient of compaction (k) occurs within the limits of 0.8 (CRF) to 1.0 (CRF). To obtain the minimum coarse fraction it is necessary

The Influence of the Basic Technical Parameters (Cont.)

to choose a charge of such length, before lowering, that its extent in the bore hole be approximately equal to $H - k \cdot W$. These conclusions hold only for blasting in limestones.

Card 3/3

I. S. Voytenko

AKUTIN, G.K., kandidat tekhnicheskikh nauk.

Formation of mine galleries by compacting the earth by blasts.
Gor. zhur. no.7:57-61 Jl '56.

1. Institut gornogo dela AN USSR.
(Mining engineering) (Blasting)

AKUTIN, G.K.

STARIKOV, N.A.; AKUTIN, kandidat tekhnicheskikh nauk; KITACH, G.M.; VOVK, A.A., gornyy inzhener.

Experiments in the use of pyroxylin explosives in open pit mining. Gor.zhur. no.12:21-23 D '56. (MLRA 10:1)

1. Deystvitel'nyy cheln Akademii nauk USSR (for Starikov). 2.Glavnyy inzhener Yuzhnogo gorno-obogatitel'nogo kombinata (for Kitach).
(Nitroglycerin) (Strip mining)

AKUTIN, Georgiy Konstantinovich,; PECHKOVSKIY, Vsevolod Ivanovich,; ZHUKOV, V.V.,red. izd-va,; ALADOVA, Ye.I., tekhn. red.

[Use of conveying and dumping bridges in mining lignite] Primenenie transportno-otval'nykh mostov na burougol'nykh razrezakh. Moskva, Ugletekhizdat, 1958. 105 p. (MIRA 11:12)
(Coal mining machinery)

AKUTIN, G.K.

Studies of a compacted zone in mining in soft soils by compacting them with the energy of a blast. Sbor.trud.Inst.gor.dela AN URSR no.5:31-36 '58. (MIRA 15:5)
(Blasting) (Mining engineering)

AKUTIN, Georgiy Konstantinovich; TITOVA, N.M., red.izd-va; LISOVETS, A.M., tekhn.red.

[Mining in soft compressible soils by packing them with energy from blasting] Provedenie vyrabotok v miagkikh szhimaemykh gruntakh uplotneniem ikh energiei vzryva. Kiev, Izd-vo Akad. nauk USSR, 1960. 94 p.

(MIRA 14:4)

(Blasting) (Soil stabilization)

AKUTIN, G.K. [Akutin, H.K.]; GAYEVENKO, Yu.O. [Haievenko, IU.O.]; DYACHENKO, M.Ya.; ZHAROV, M.T.; IVANOV, S.K.; KARNYUSHIN, L.B.; KLODNITSKIY, I.I. [Klodnyts'kyi, I.I.]; KOBUS, Yu.Y. [Kobus, IU.I.]; KOZLYU, V.Y. [Kozliuk, V.I.]; KORYTNIKOV, V.P.; KOROBKO, M.I.; KOSTOGRIZOV, V.S. [Kostohryzov, V.S.]; LADIYEV, R.Ya. [Ladiiev, R.IA.]; MARTYNYUK, G.F. [Martyniuk, H.F.]; MEL'NIK, P.M.; kand.tekhn.nauk; NAVOL'NEV, S.Ya. [Navol'niev, S.IA.]; SIN'KOV, V.M.; SPINU, G.O. [Spynu, H.O.]; SHOYKHET, L.A.; SHUMILOV, K.A.; KORSAK, Yu.Ye. [Korsak, IU.IE.], red.; LAGUTIN, I.A. [Lahutin, I.A.], tekhn.red.

[Automation in industry] Avtomatizatsiia v promyslovosti. Kyiv, Derzh.vyd-vo tekhn.lit-ry URSR, 1960. 288 p. (MIRA 14:12)

(Automation) (Industrial management)

AKUTIN, G.K., kand.tekhn.nauk; BURATOV, G.N., inzh.; KULINICH, N.T., inzh.; SEN'KOV, I.D., inzh.; FEDOROVSKIY, V.V., inzh.

Radio control of switches from a moving locomotive. Mekh. i avtom. proizv. 15 no.7:39-42 Jl '61. (MIRA 14:7)
(Railroads—Switches)

AKUTIN, G.K., kand. tekhn. nauk; FEDOROVSKIY, V.V., inzh.; BURATOV, G.N., inzh.

New apparatus for controlling railroad switches of strip mine track. Gor. zhur. no.8:55-57 Ag '64.

(MIRA 17:10)

1. Institut avtomatiki Gosudarstvennogo komiteta po priborostroyeniyu, sredstvam avtomatizatsii i sistemam upravleniya pri Gosplane SSSR, Kiyev.

AKUTIN, M., kand.tekhn.nauk

Score in favor of polyvinylchloride. Nauka i zhyttia 12 no.3: 6-7 Mr '63. (MIRA 16:11)

AKUTIN, M. A.

"A Mechanical Method for the Production of New Types of Polymers," by V. A. Kargin, B. M. Kovarskaya, L. I. Golubenkova, M. A. Akutin, and G. L. Slonimskiy, Khimicheskaya Promyshlennost', No 2, Mar 57, pp 77-79

Equipment similar to rubber masticators has been designed for breaking down plastics by the exertion of mechanical force, so that the fractional parts of chain molecules which are then formed and which possess the properties of free radicals may react with other chain molecules or parts of chain molecules, forming block polymers, or combine with monomers, forming grafted polymers. The equipment in question consists of two circular corrugated plates between which the material is triturated when the lower plate is rotated against the upper plate that remains stationary. Two different types of plates are described: one has a rectangular groove with the contour of an Archimedes spiral and a depth gradient and the other a groove which possesses the same contour but exhibits a uniform depth and is cut in such a manner that a ridge with a profile corresponding to that of a Whitworth screw winding results.

SUM. 1391

The first type of plate was found to be best suited for the copolymerization of low-molecular brittle resins with elastomers and the second for combining different types of elastomers with each other. By applying the method of mechanical disintegration, block polymers representing combinations in different proportions of nitrile rubber with phenol-formaldehyde novolacs, epoxy-resins, and refined coal-tar pitch were obtained. The time required for the experimental preparation of the block polymers was 4-5 minutes. Samples weighing 10-20 g were used, and the mechanical disintegration was carried out in an atmosphere of inert gas.

The authors conclude on the basis of the results described by them that the mechanical method of producing block polymers and grafted polymers is superior to chemical methods. They add that an apparatus for the continuous production of block polymers and grafted polymers by the mechanical method is being developed at the Scientific Research Institute of Plastics, and that the availability of this apparatus will make possible the industrial production of such polymers by the method described.

SUM. 1391

AKUTIN, M. A.

The authors of the article explain the significance of the work on block polymers as follows:

"At present requirements of a complex nature are put in various branches of the industry to products made of high-molecular compounds. These requirements comprise superior heat stability, improved mechanical and dielectric characteristics, stability to the action of water, chemical stability, retention of the original characteristics after prolonged use of the products, and stability at low temperatures combined with a resistance to the action of gasoline and oil. However, none of the available types of polymers can completely satisfy all the requirements mentioned above. For that reason it has become necessary to combine different types of polymers in such a manner that the materials resulting from their interaction will possess all the desired properties." (U)

SUM. 1391

AKUTIN, M. P., GOLUBENKOVA, L. Y., KOVARSKAYA, B. M., and SLONIMSKIY, G. L.

"Epoxide Resins and Thermomechanical properties," a paper presented at the 9th Congress on the Chemistry and Physics of High Polymers, 28 Jan-2 Feb 57, Moscow, Plastics Research Inst.

B-3,084,395

L 32759-66 EWT(m)/EWP(j) RM

ACC NR: AP6009933 (A) SOURCE CODE: UR/0413/66/000/004/0162/0162

25 B

INVENTOR: Rodivilova, L. A.; Akutin, M. S.; Gershkokhen, S. L.

ORG: None

15

TITLE: Preparation of macromolecular aliphatic polyamides. 7 Class 39, No. 144987

SOURCE: Izobreteniya promyshlennyye obraztsy, tovarnyye znaki, no. 4, 1966, 162

TOPIC TAGS: macromolecular polyamide, polyamide, aliphatic polyamide

ABSTRACT: An author certificate has been issued describing a method of preparing macromolecular-aliphatic polyamides by polycondensation at the interphase with diacid chlorides of carboxylic acids and diamines. Synthesis is conducted in solutions with an increased concentration of reagents.

SUB CODE: 11/ SUBM DATE: 23May61

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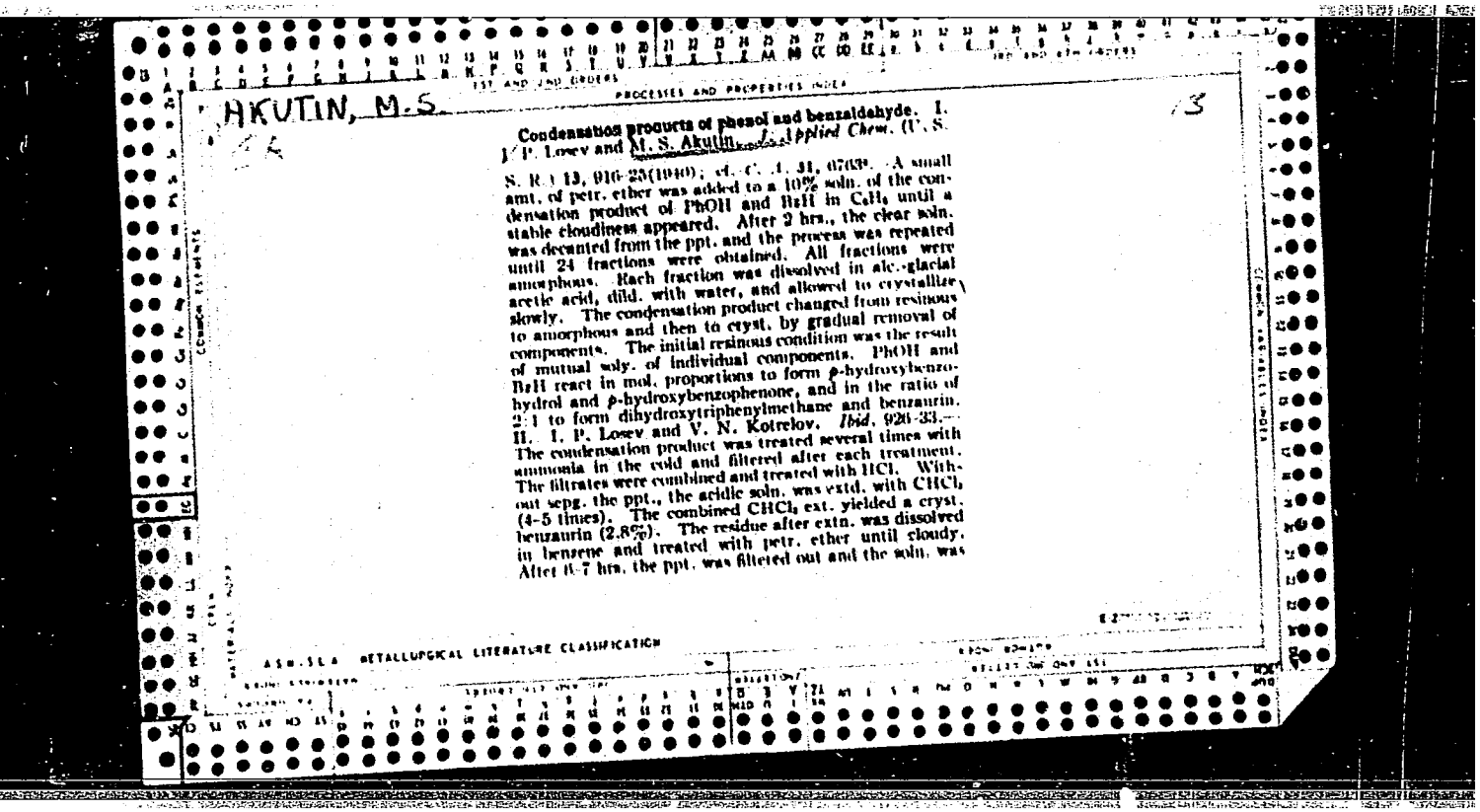
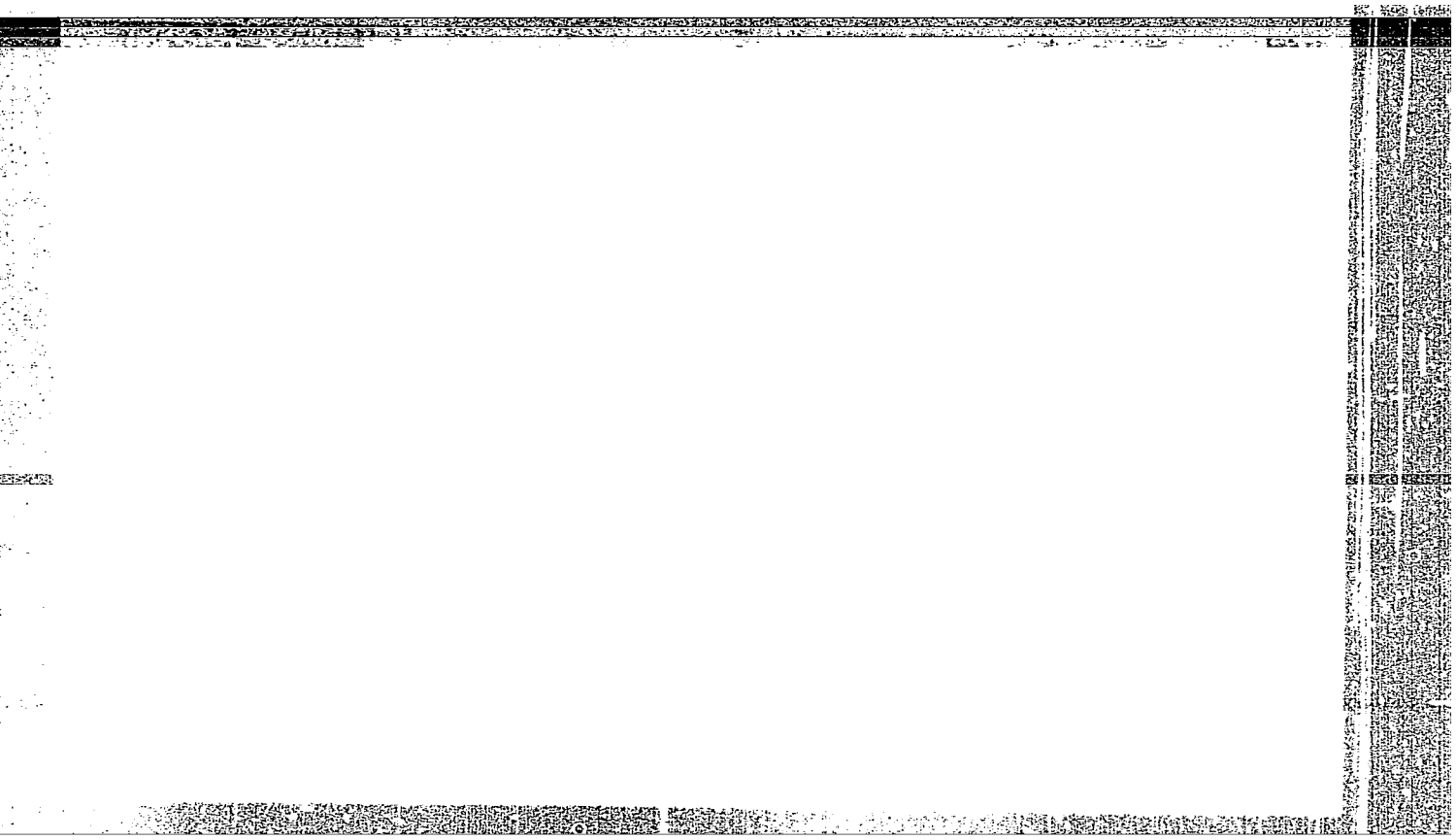


AKUTIN, M.S.

Condensation products of phenol and benzaldehyde. I. J. P. Losev and M. S. Akutin. *J. Applied Chem.* (U.S.S.R.) 13, 916-25(1940); cf. C. A. 31, 6763⁹. A small amt. of petr. ether was added to a 10% soln. of the condensation product of PhOH and BzH in C_6H_6 until a stable cloudiness appeared. After 2 hrs., the clear soln. was decanted from the ppt. and the process was repeated until 24 fractions were obtained. All fractions were amorphous. Each fraction was dissolved in alc.-glacial acetic acid, dild. with water, and allowed to crystallize slowly. The condensation product changed from resinous to amorphous and then to cryst. by gradual removal of components. The initial resinous condition was the result of mutual solv. of individual components. PhOH and BzH react in mol. proportions to form p-hydroxybenzohydrol and p-hydroxybenzophenone, and in the ratio of 2:1 to form dihydroxytriphenylmethane and benzaurin. II. I. P. Losev and V. N. Kotrelov. *Ibid*, 926-33.—The condensation product was treated several times with ammonia in the cold and filtered after each treatment. The filtrates were combined and treated with HCl. Without sepg. the ppt., the acidic soln. was extd. with $CHCl_3$ (4-5 times). The combined $CHCl_3$ ext. yielded a cryst. benzaurin (2.8%). The residue after extn. was dissolved in benzene and treated with petr. ether until cloudy. After 6-7 hrs. the ppt. was filtered out and the soln. was

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

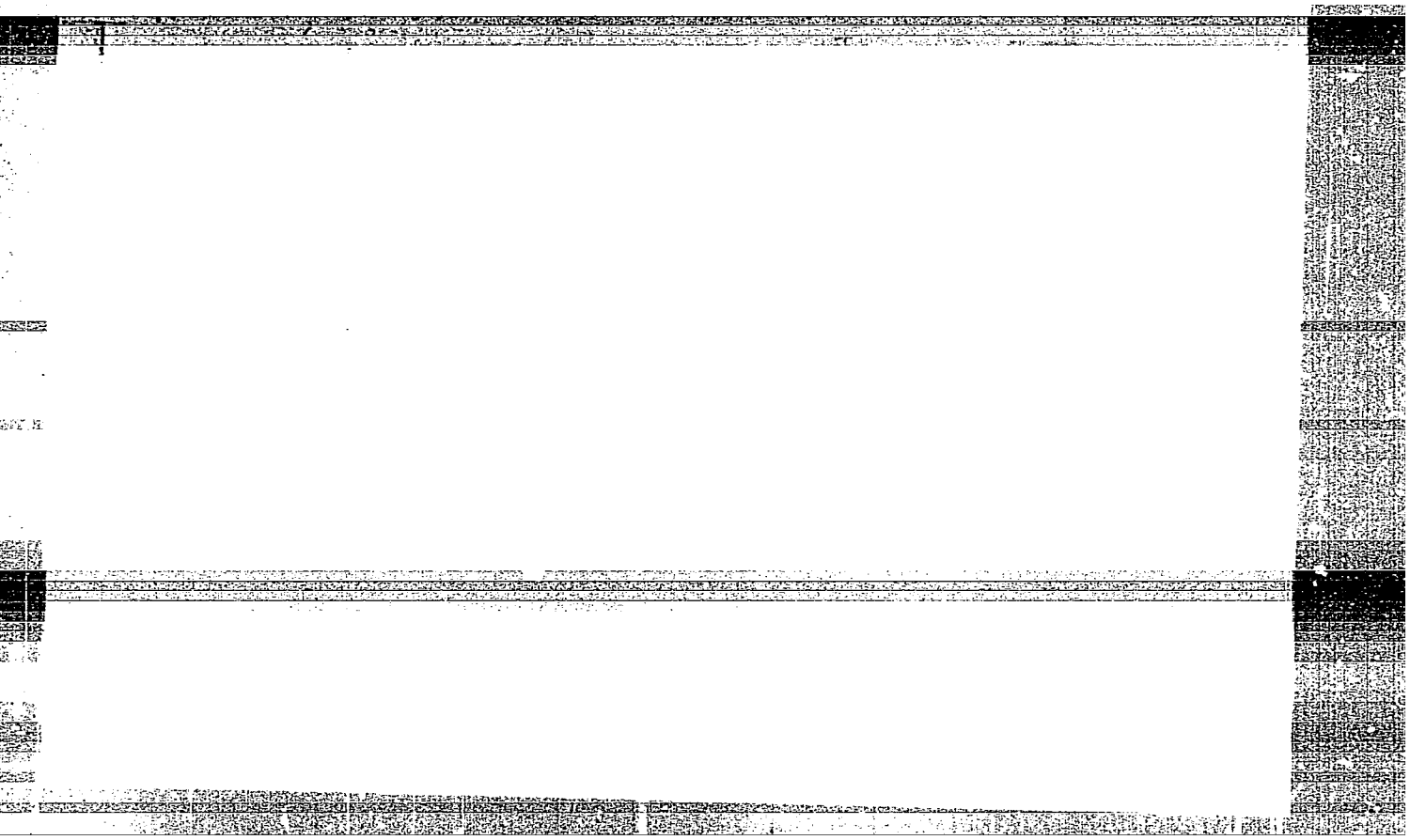


APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100730002-8"

AKUTIN, M.S.

Plastics. Nauka i zhizn' 23 no.7:21-23 Jl '56. (MLRA 9:9)

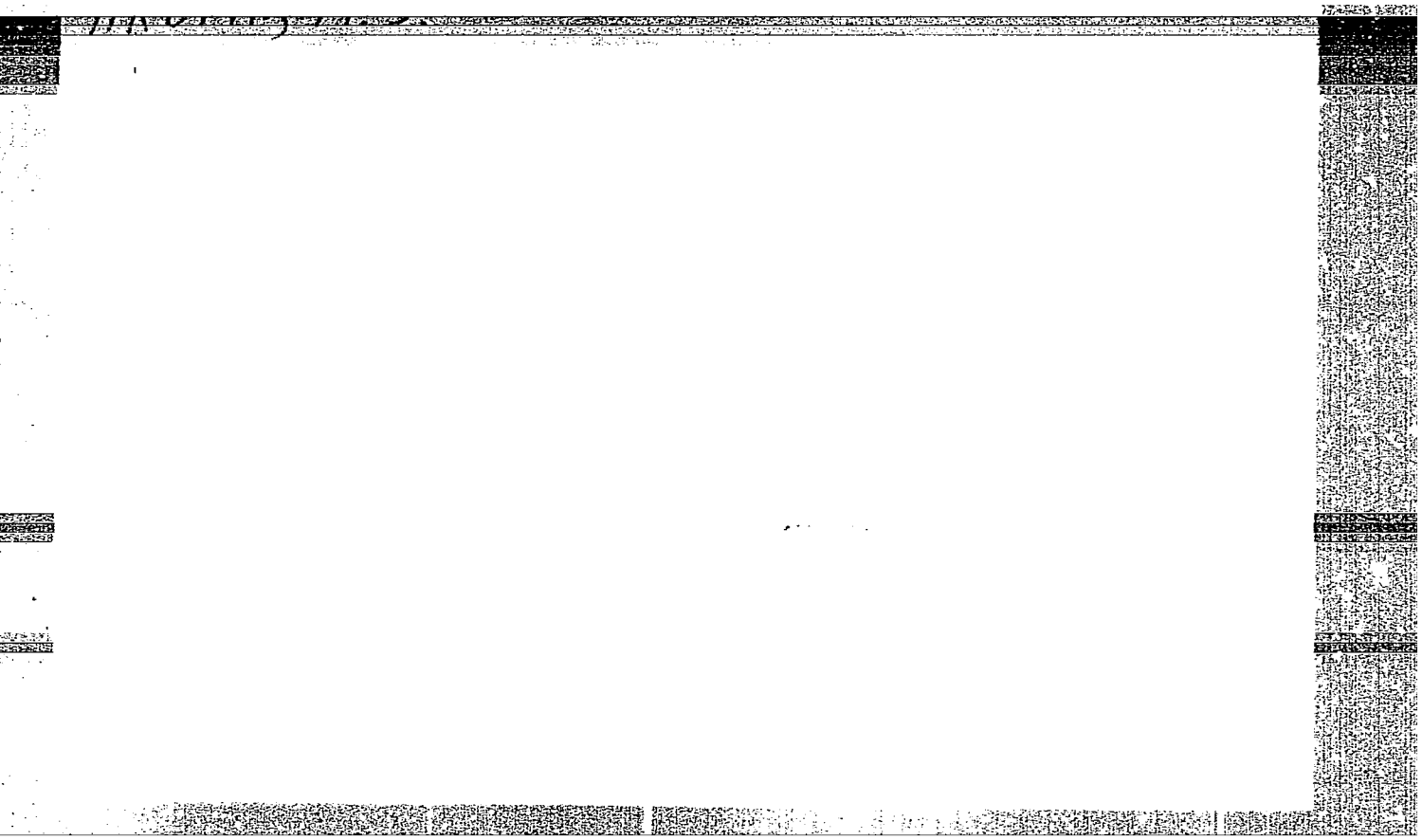
1.Direktor nauchno-issledovatel'skogo instituta plasticheskikh mass. (Plastics)



APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100730002-8"

AKUTIN, M. S., Research and Design Institute of the Ministry of Chemical Industry, Moscow

"Preparation of Block and Graft Polymers Through the Action of Ultrasound on Solutions of Polymer in Monomer," a paper submitted at the International Symposium on Macromolecular Chemistry, 9-15 Sep 1957, Prague.



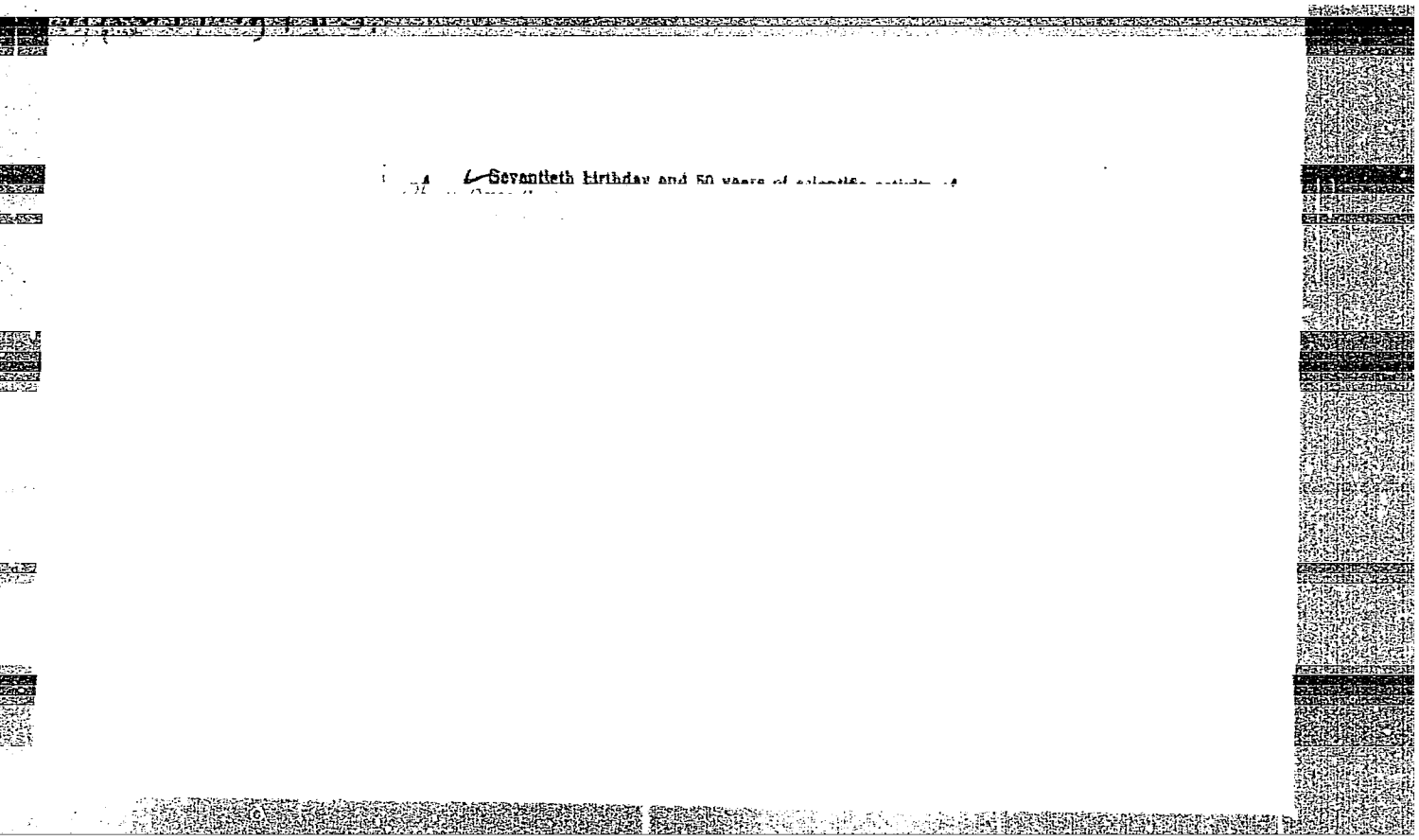
APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100730002-8"

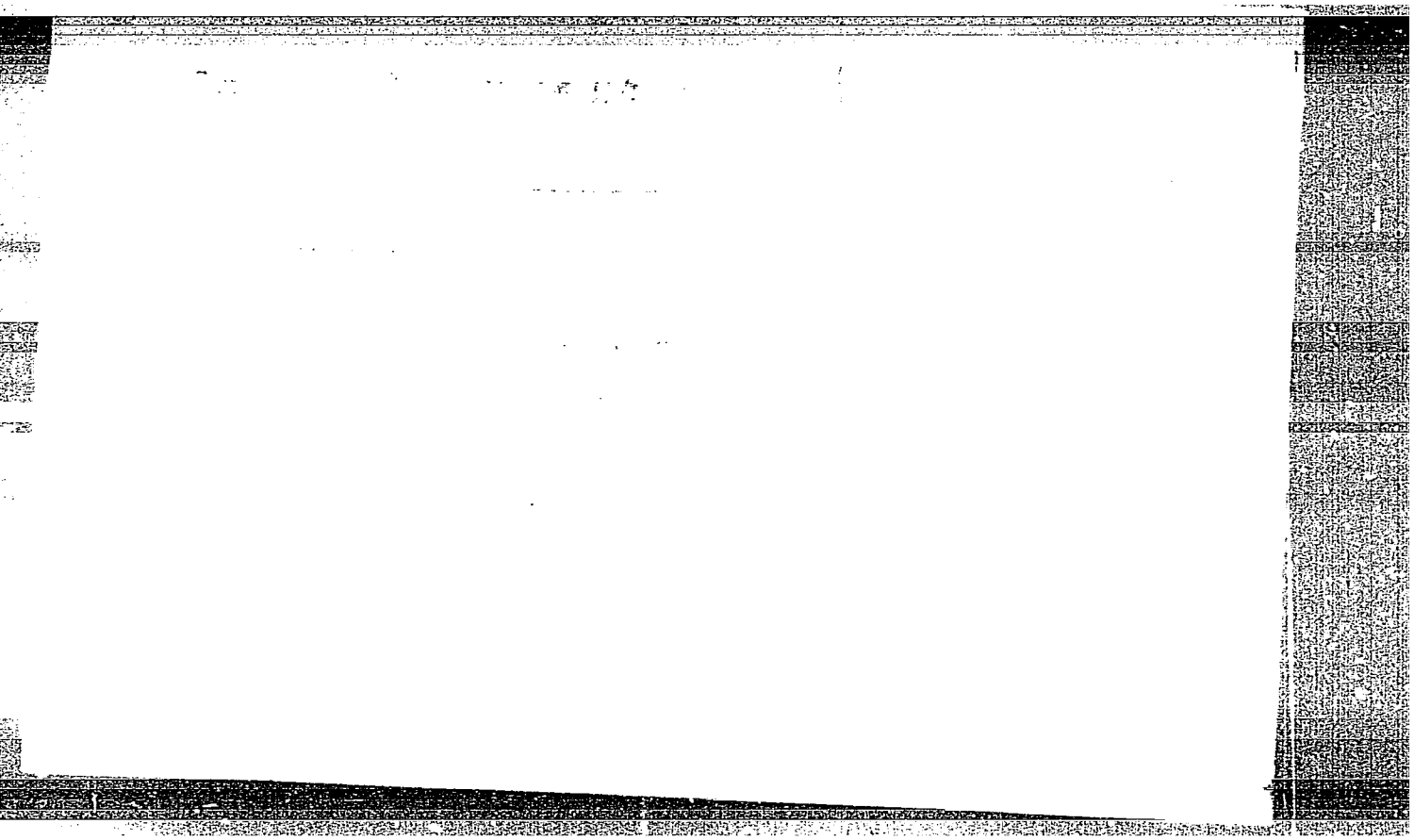
AKUTIN, M.S.

AKUTIN, M.S.

Block and graft polymers produced by chemical means. Khim.nauka i prom. 2 no.5:585-592 '57. (MIRA 10:12)

(Polymerization)





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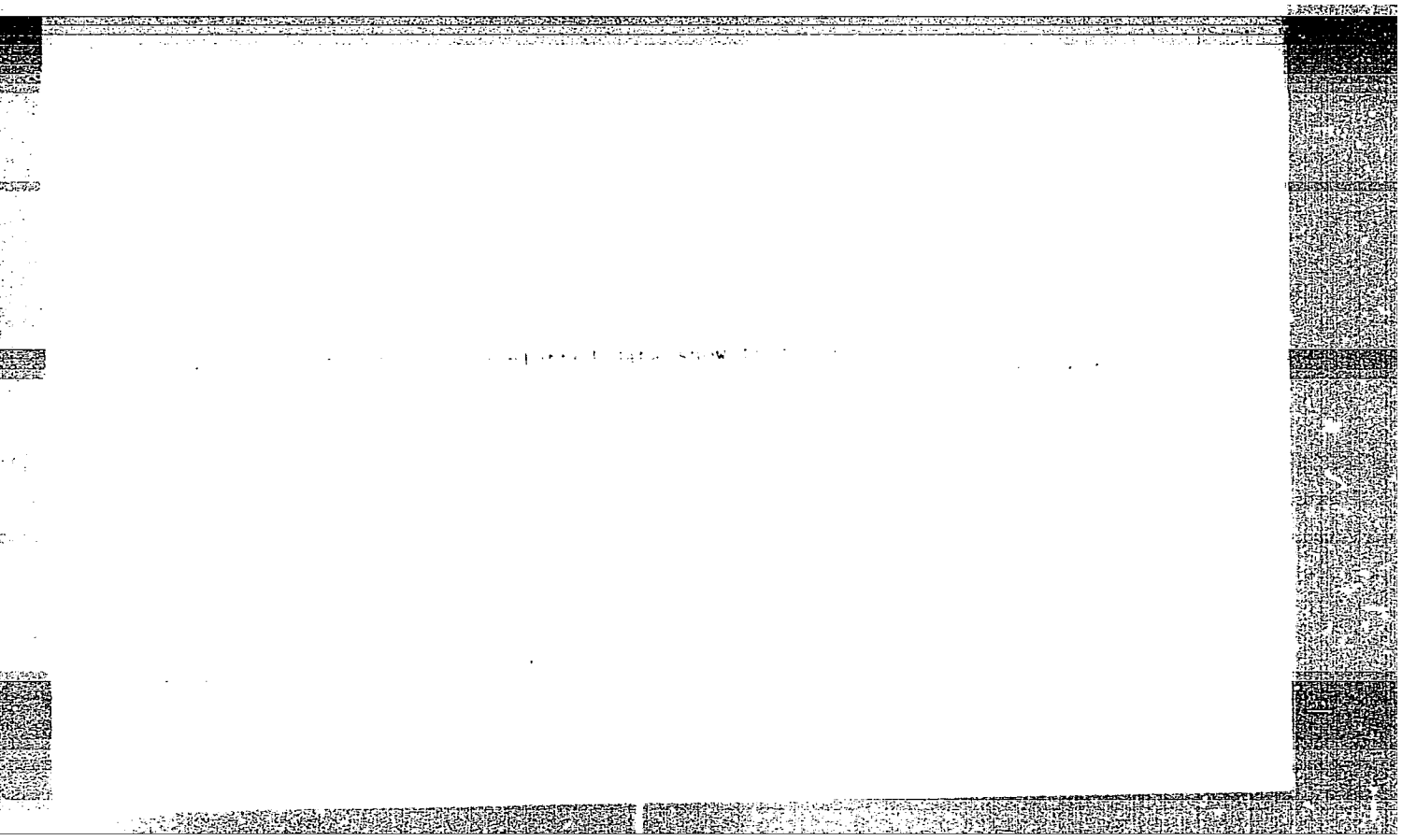

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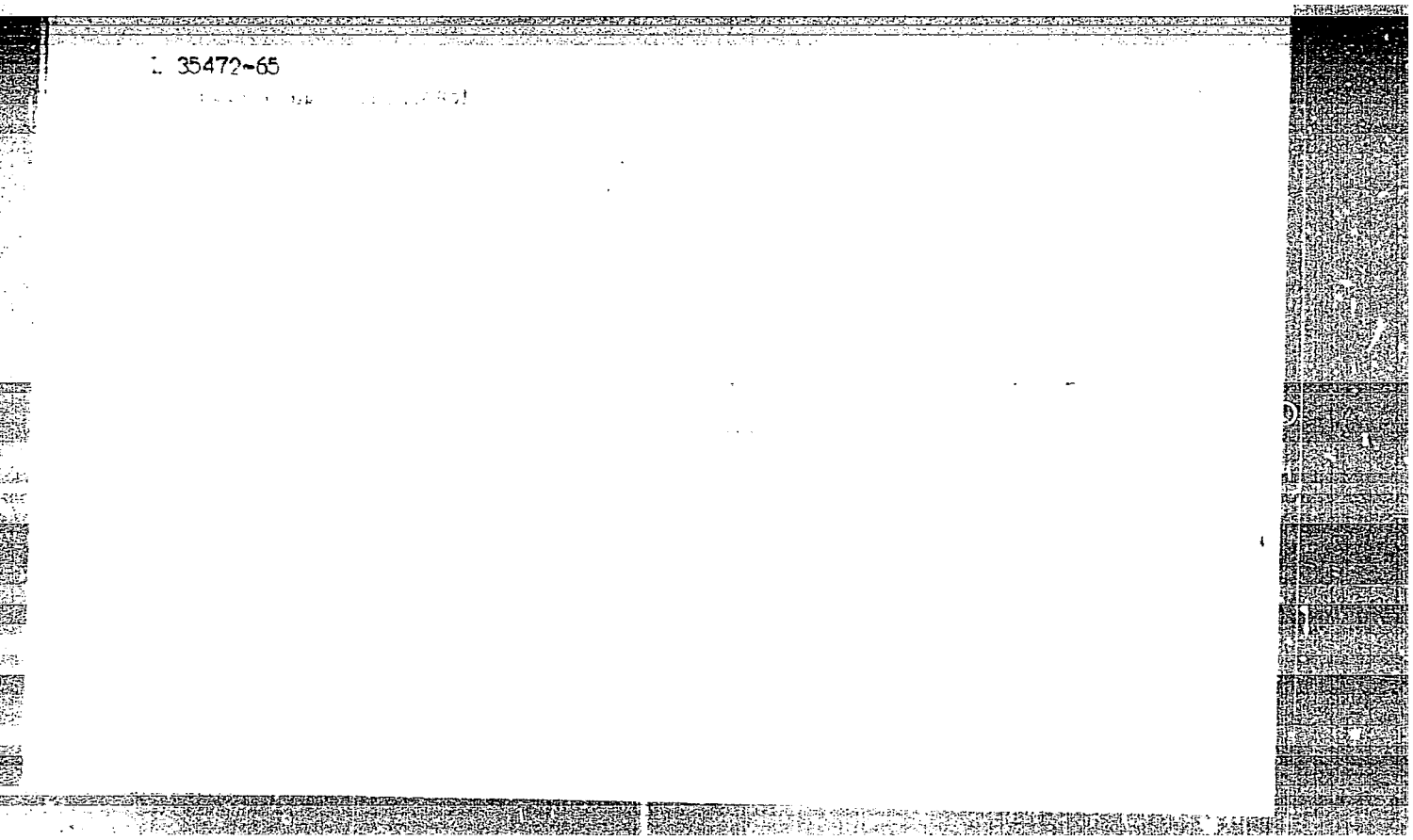

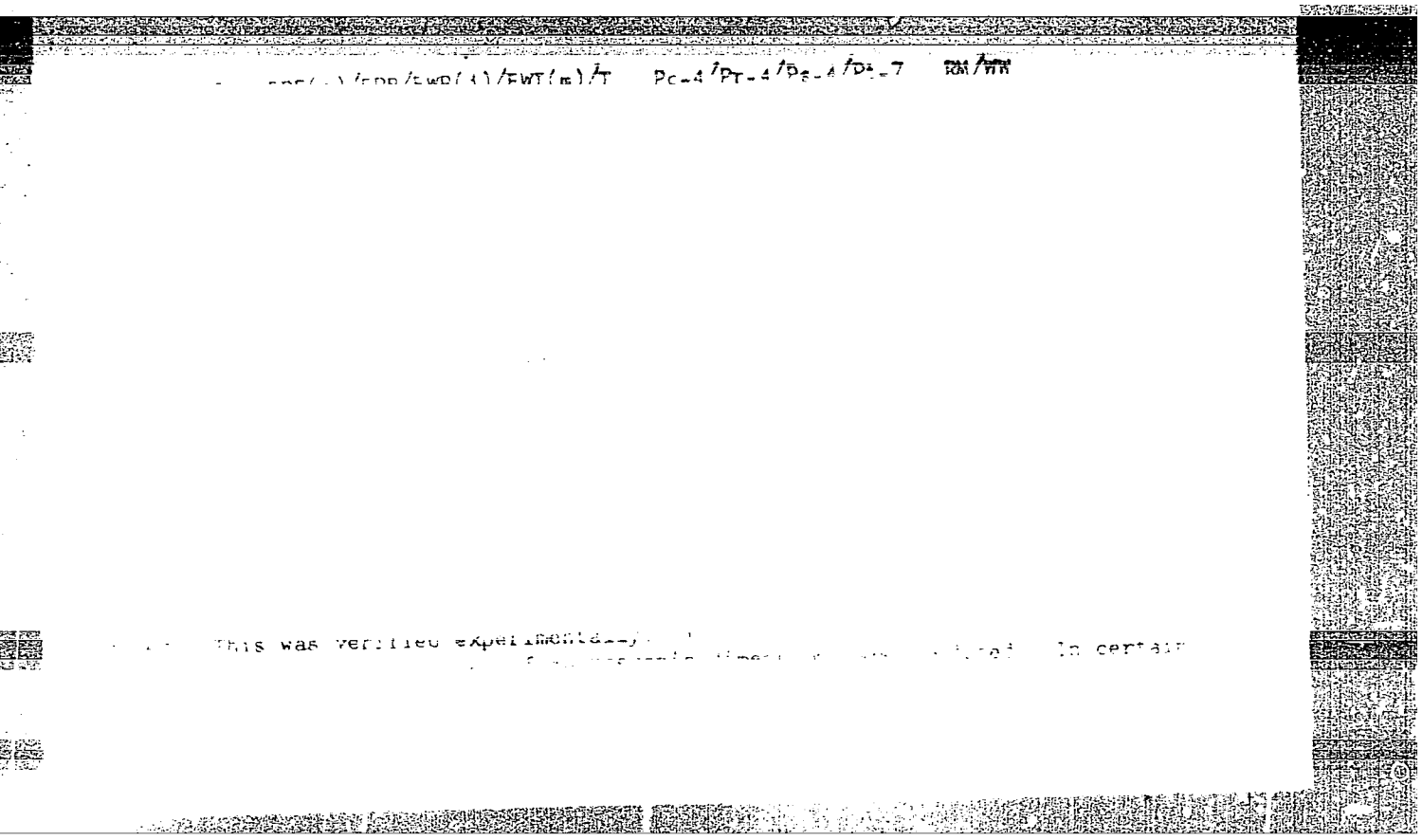

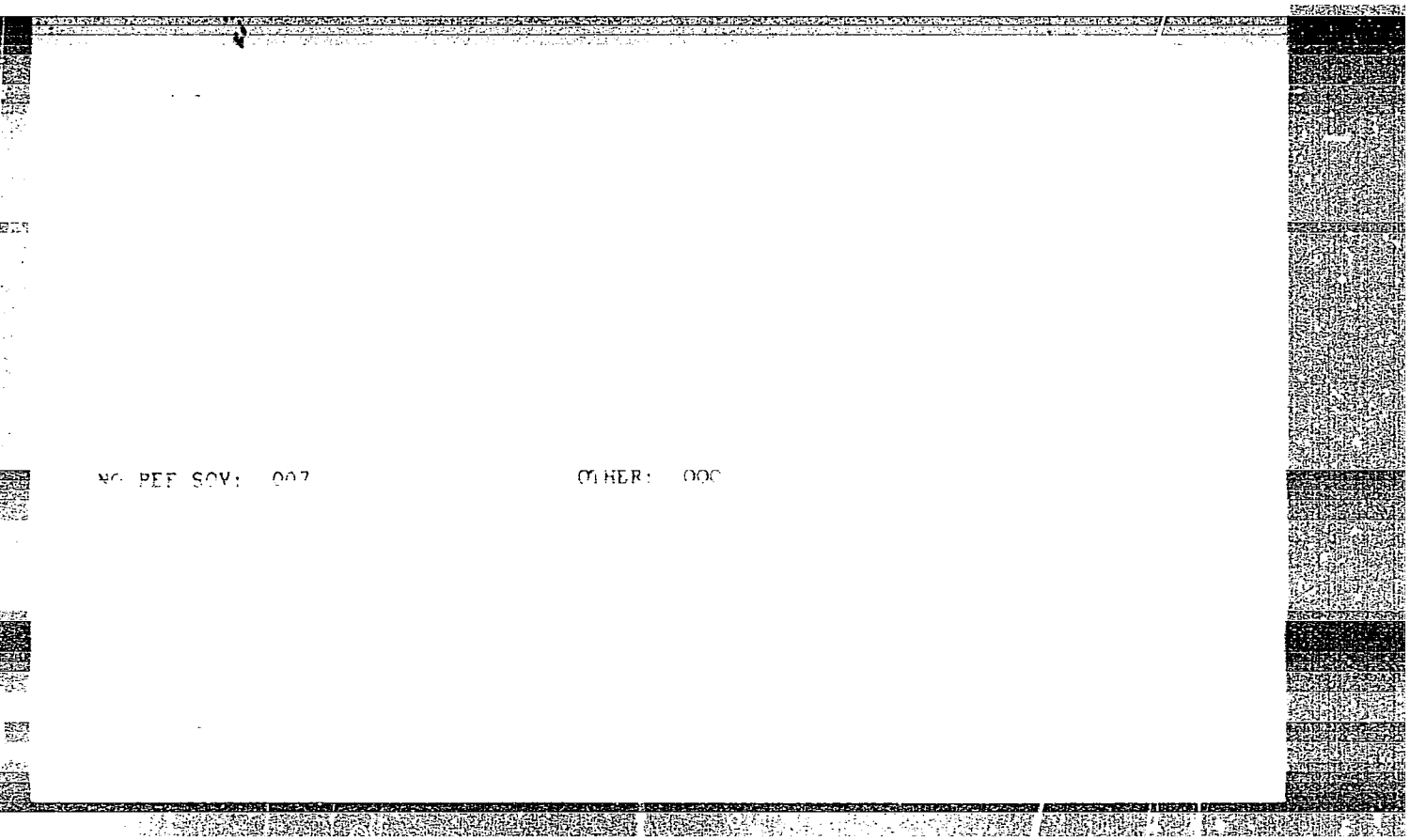

AKUTIN, M.S.

PRIGOROVSKIY, N.I.; PREYSS, A.K.; AKUTIN, M.S.; GRACHEVA, B.S.

Models fo ED-6 epoxy resin in the polarization-optical method for studying stresses. Zav. lab. 23 no.4:488-492 '57. (MLRA 10:6)

1. Institut mashinovedeniya Akademii nauk SSSR, Moskovskiy institut plastmass.
(Strains and stresses) (Resins, Synthetic)

AKUTIN, M.S.

KARGIN, V.A., akademik; KOVARSKAYA, B.M.; GOLUBENKOVA, L.I.; AKUTIN, M.S.; SLONIMSKIY, G.L.

Block-copolymer from phenol-formaldehyde resins and nitrile rubber. Dokl. AN SSSR 112 no.3:485-486 Ja '57. (MLRA 10:4)

1. Gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy institut plasticheskikh mass.
(Nitrile rubbers) (Phenol condensation products)

APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100730002-8"

AKUTIN M.S.

KARGIN, V.A.

5(3) PHASE I BOOK EXPLOITATION SOV/1589

Akademiya nauk SSSR.

Khimiya bol'shikh molekul; sbornik statey (Chemistry of Large Molecules; Collection of Articles) Moscow, Izd-vo AN SSSR, 1958. 299 p. (Series: Akademiya nauk SSSR. Nauchno-populyarnaya serija) 30,000 copies printed.

Compiler: G.V. Shlovskiy; Resp. Ed.: A.V. Topchiyev, Academician; Ed. of Publishing House: V.A. Boyarskiy; Tech. Ed.:

PURPOSE: This book is intended for a wide circle of readers including those who have had no training in chemistry. It can also serve as a manual for propagandists, teachers, and journalists.

Card 1/8

Chemistry of Large Molecules (Cont.) SOV/1589

COVERAGE: This collection of articles reflects the trend for the future development of the Soviet chemical industry as indicated by the May plenary session of the Central Committee of the Communist Party within the framework of the new Seven Year Plan. These articles were published in newspapers and journals. The authors, scientists and industry workers, developed the theme of accelerated development of the chemical industries, and sciences, with stress on the manufacture of synthetic fibers, plastics, and other materials. Some of the articles were abridged, revised, or enlarged. The articles were selected so as to give an adequate survey of the chemistry and technology of high-molecular-weight compounds and their use in industry, agriculture, and in the manufacture of consumers' goods. Mentioned are raw materials for the production of polymers. This book belongs to the popular-science series of the Academy of Sciences. Similar volumes are intended for future publication. No references are given.

TABLE OF CONTENTS:

Card 6/8

Akutin, M.S.

69-20-1-5/20

AUTHORS: Golubenkova, L.I., Kovarskaya, B.M., Akutin, M.S., Slonimskiy, G.L.

TITLE: Thermomechanical Investigation of Epoxide Resins (Termomekhanicheskoye issledovaniye epoksidnykh smol)

PERIODICAL: Kolloidnyy Zhurnal, 1958, Vol. XX, # 1, pp 34-37 (USSR)

ABSTRACT: Epoxide resins may be either thermoplastic or thermoreactive, depending on the initial diphenyl propane and epichlorohydrine components. Thermoreactivity begins at a molar ratio of 1 : 1.5 of the initial components and at a further decrease of the epichlorohydrine content. The thermomechanical curves of the initial resins were obtained on a dynamometric scale. The solidified specimens were measured on a consistometer. Epoxide resins are low-molecular, i.e. they pass from the vitrified condition into a viscous-fluid one. The vitrification temperature varies between 5-50°C. Solidified resins are prepared by using a hardening agent, polyethylenepolyamine, for 30-45 days. The reduction of the epichlorohydrine content to a ratio of 1 : 1.2 and a 10-hour heating at 200°C produces the resin type ED-15, which is elastic at increased temperatures. Resins with lower numbers of epoxide groups are more elastic

Card 1/2

at increased temperatures than those with higher numbers. Thermoreactive resins, solidified without addition of a hardening agent, have a higher heat resistance and have a better appearance than those solidified by amines and resol resins.
There are 5 figures, 1 table, and 6 Soviet references.

ASSOCIATION: Nauchno-issledovatel'skiy i proyektnyy institut plasticheskikh mass, Moskva (Scientific Research and Designing Institute for Plastics, Moscow)

SUBMITTED: January 25, 1957

AVAILABLE: Library of Congress

Card 2/2

KALININ, V.V., arkhitektor; DARDIK, N.B.; AKUTIN, M.S.

Experimental plastic house with a reinforced concrete frame.
Gor. khoz. Mosk. 32 no.8:8-13 Ag '58. (MIRA 11:9)

1. Direktor zavoda No.6 Glavmoszhelezobetona (for Dardik).
2. Direktor Nauchno-issledovatel'skogo instituta plasticheskikh mass (for Akutin).
(Plastics) (Apartment houses)

GOLUBENKOVA, L.I.; KOVARSKAYA, B.M.; LEVANTOVSKAYA, I.I.; AKUTIN, M.S.

Mechanism of the hardening of epoxy resins with amines. Vysokom. soed. 1 no.1:103-109 Ja '59. (MIRA 12:9)

1. Nauchno-issledovatel'skiy i proyektnyy institut plasticheskikh mass.

(Resins, Synthetic) (Amines)

GOLUBENKOVA, L.I.; KOVARSKAYA, B.M.; AKUTIN, M.S.

Thermomechanical investigation of epoxy resins. Vysokom.soed. 1 no.1:109-113 Ja '59. (MIRA 12:9)

1. Nauchno-issledovatel'skiy i proyektnyy institut plasticheskikh mass.

(Resins, Synthetic)

KOVARSKAYA, B.M.; GOLUBENKOVA, L.I.; AKUTIN, M.S.; LEVANTOVSKAYA, I.I.

Preparation of some block polymers and investigation of their properties. Vysokom.soed. 1 no.7:1042-1047 Jl '59. (MIRA 12:11)

1. Nauchno-issledovatel'skiy institut plasticheskikh mass.
(Polymers)

NEYMAN, M.B.; GOLUBENKOVA, L.I.; KOVARSKAYA, B.M.; STRIZHKOVA, A.S.; LEVANTOVSKAYA, I.I.; AKUTIN, M.S.; MOISEYEV, V.D.

Thermal degradation of condensation resins. Part 1: Thermal degradation of epoxide resins. Vysokom.soed. 1 no.10: 1531-1537 O '59. (MIRA 13:3)

1. Nauchno-issledovatel'skiy institut plastmass, Moskva.
(Resins, Synthetic)

AKUTIN, M. S. and RODIVILOVA, L. A. (USSR)

O geterogennom metode polikondensatsii
On the heterogeneous method of the polycondensation
IUPAC S I:228-36

report presented at the Intl. Symposium on Macromolecular Chemistry, Moscow, 14-18 June 60.

AKUTIN, M.S.

"Investigations in the Application of ultrasound for obtaining agglomerated and grafted polymers."

report presented at the All-Union Scientific-Engineering Conference on the Application of Ultrasonics in Industry, Moscow, 22-26 November 1960.

AKUTIN, M. S.

PHASE I BOOK EXPLOITATION SOV/4984

International symposium on macromolecular chemistry. Moscow, 1960.

Mezhdunarodnyy simpozium po makromolekulyarnoy khimii SSSR, Moskva, 14-18 iyunya 1960 g.: doklady i avtoreferaty. Sektsiya III. (International Symposium on Macromolecular Chemistry Held in Moscow, June 14-18, 1960: Papers and Summaries) Section III. [Moscow, Izd-vo AN SSSR, 1960] 469 p. 55,000 copies printed.

Tech. Ed.: P. S. Kashina.

Sponsoring Agency: The International Union of Pure and Applied Chemistry. Commission on Macromolecular Chemistry.

PURPOSE: This book is intended for chemists interested in polymerization reactions and the synthesis of high molecular compounds.

COVERAGE: This is Section III of a multivolume work containing papers on macromolecular chemistry. The articles in general deal with the kinetics of polymerization reactions, the synthesis of special-purpose polymers, e.g., ion exchange resins, semiconductor materials, etc., methods of catalyzing polymerization reactions, properties and chemical interactions of high molecular materials, and the effects of various factors on polymerization and the degradation of high molecular compounds. No personalities are mentioned. References given follow the articles.

AKUTIN, M.S.

45

PHASE I BOOK EXPLOITATION SOV/5644

Vsesoyuznaya konferentsiya professorov i prepodavateley pedagogicheskikh institutov

Primeneniye ul'traakustiki k issledovaniyu veshchestva. vyp. 10. (Utilization of Ultrasonics for the Investigation of Materials. no. 10) Moscow, Izd-vo MOPI, 1960. 321 p. 1000 copies printed.

Eds.: V. F. Nozdrev, Professor, and B. B. Kudryavtsev, Professor.

PURPOSE: This book is intended for physicists and engineers interested in ultrasonic engineering.

COVERAGE: The collection of articles reviews present-day research in the application of ultrasound in medicine, chemistry, physics, metallurgy, ceramics, petroleum and mining engineering, defectoscopy, and other fields. No personalities are mentioned. References accompany individual articles.

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SOV/5644

Utilization of Ultrasonics (Cont.)

Card 3/10

S/191/60/000/002/003/012
B027/B058

AUTHORS: Akutin, M. S., Rodivilova, L. A.

TITLE: The Method of Heterogeneous Polycondensation

PERIODICAL: Plasticheskiye massy, 1960, No. 2, pp. 14-17

TEXT: The authors studied the possibility of obtaining polyamides on the interface, with and without mixing of the heterogeneous system. L. A. Sakharova, S. A. Gershkokhen, and L. P. Nekrasova participated in the experimental work. Their results confirmed those obtained by V. V. Korshak and correspond to the reaction mechanism proposed by him, at which a reaction component present in abundance does not inhibit the reaction of the end groups with other initial substances, so that the polymer chain continues to develop. If the polymer is formed on the interface as a film which prevents further development of the polymer chain, the interface must be continuously set free. This is done either by mixing the heterogeneous system or by continuous polymer extraction at the interface, the latter process having been performed by means of the mechanical installation by M. P. Shapenko, which also permits to vary the extraction rate

from 0.5 to 12 m/min. Individual factors influencing the yield and molecular weight of the polymers were also studied, e.g., the addition of certain salts (Ref. 8) to the aqueous phase and of surface-active substances during mixing; an increase of the polymer yield up to 75-90% was thus obtained. It was also found that a certain feed rate of the reagents must correspond to a certain extraction rate. Polycondensation on the interface took place at 22°C ± 2°; an increase above 20 to 25°C is not suitable since the diffusion of the reagents increases. Polymers with different physical and chemical properties are manufactured by the above method, according to the initial components, i.e. diamine and diacid anhydride. Phthalamides and polyamides without hydrogen bonds are of interest, as well as the production of copolymers with given properties; furthermore, polymers may be obtained on the basis of products such as ethylene diamine, which at present is not used for the production of high-molecular polyamides according to the homogeneous method. There are 4 figures, 5 tables, and 8 references: 2 Soviet, 2 British, and 4 US.

87655

15.8340 2209

S/191/60/000/003/008/013
B016/B054

AUTHORS: Li, P. Z., Lukovenko, T. M., Akutin, M. S., Butylkina, M. P., Musina, A. Ya.

TITLE: Laminated Plastics on the Basis of Glass Fiber. Report VII. Glass Textolite on the Basis of Polyvinyl Butyral

PERIODICAL: Plasticheskiye massy, 1960, No. 3, pp. 48 - 49

TEXT: The authors report on their studies of methods of producing glass textolite from polyvinyl butyral (PVB) with glass fabric of the type ACTT (б) (ASTT (b)) as a filler. They used A-type PVB, and found that PVB embrittles at high temperatures, and loses its elasticity and solubility. Also its impact strength decreases, whereas hardness and bending strength increase. At high temperatures, PVB decomposes, becomes sticky, and its mechanical strength decreases. This was ascribed to a change in molecular structure, which changes from linear to steric with numerous cross links (Refs. 2,3). In glass textolite, the PVB content dropped to 4% after impregnating the glass fabric with an 18% PVB solution after drying at high temperature. Glass textolite was produced for

Card 1/2

87655

Laminated Plastics on the Basis of Glass Fiber. Report VII. Glass Textolite on the Basis of Polyvinyl Butyral

S/191/60/000/003/008/013
B016/B054

experimental purposes a) by molding at different pressures and b) by deformation in vacuo. The authors studied the effect of temperature, PVB content, and deformation pressure on the properties of glass textolite. They found that a change in the PVB content has no great influence on the quality of glass textolite. A pressure of more than 45-50 kg/cm^2, however, effects a decrease in strength with the use of most kinds of resin, probably due to destruction of the filler. It is shown that with the use of PVB a much higher pressure can be applied, without detrimental consequences, than with the use of other resins. Further, the authors found that PVB glass textolite deformed in vacuo has a lower strength than phenol glass textolite produced in vacuo. Experimental results show that the increased specific pressure endured by PVB products improves their quality. The properties of PVB glass textolite can be changed by additional heat treatment. There are 2 figures and 4 Soviet references.

Card 2/2

87879

158340

S/191/60/000/005/004/020
B004/B064

AUTHORS: Akutin, M. S., Gurman, I. M., Stal'nova, M. A.

TITLE: A Block Copolymer of Epoxy- and Dimethyl Resorcine Resins as Binding Agent for Glass-reinforced Plastics

PERIODICAL: Plasticheskiye massy, 1960, No. 5, pp. 10 - 11

TEXT: This paper discusses a study of block copolymers obtained from epoxy resins of the ЭД-5 (ED-5) and ЭД-6 (ED-6) types, and dimethyl resorcine resins. The epoxy resins were obtained from diphenylol propane and epichloro hydrine in alkaline medium, and contained 18 - 20 % of epoxy groups. Dimethyl resorcine resin was obtained by condensation of dimethyl resorcine with formaldehyde in the presence of mono- or polyvalent alcohols. A combination of 70 % epoxy resin and 30 % dimethyl resorcine showed the best properties: Brinell hardness 30 - 34 kg/mm^2, heat resistance according to Vicat 115 - 125°C, compressive strength 1300 kg/cm^2. Glass fabric was steeped with the unhardened copolymer, dried at 70 - 80°C, and then pressed. The binding agent content was (30±2)%. The resilience of the textolite obtained was 350 - 400 kg·cm/cm^2, its binding strength

Card 1/2

87679

A Block Copolymer of Epoxy- and Dimethyl Resorcine Resins as Binding Agent for Glass-reinforced Plastics

S/191/60/000/005/004/020
B004/B064

4000 - 4500 kg/cm^2, its heat resistance according to Martens 250°C. The varnish and the glass fabric steeped with it remained stable for approximately two months in unhardened state. Engineer O. S. Nikulina and Laboratory Assistant R. F. Oskina assisted. There are 1 table and 4 Soviet references.

Card 2/2

83410

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S/191/60/000/006/002/015
B004/B054

AUTHORS: Akutin, M. S., Parlashkevich, N. Ya., Kogan, I. N., Rubinshteyn, V. V., Gribkova, R. N.

TITLE: Production of Block Polymers and Grafted Polymers by Means of Spark Discharge in a Liquid

PERIODICAL: Plasticheskiye massy, 1960, No. 6, pp. 2 - 5

TEXT: The authors report on experiments made with an apparatus schematically shown in Fig. 1. Spark discharges were generated in a vessel (Fig. 2) filled with the substances to be polymerized; a shaping spark gap was connected in series with the spark gap in the vessel. The condenser potential attained 60 kv, the energy stored was about 100 joules, the discharge frequency was about 0.5 - 1.5 cps. The authors discuss the effects of the spark (hydraulic and cavitation surge, formation and recomposition of free radicals), as well as the influence of aperiodic discharges on the transformation of electric energy into mechanical energy. A solution of 15 parts by weight of polyvinyl chloride, 50 parts by weight of methyl methacrylate, and 100 parts by weight of cyclohexane

Card 1/2

Production of Block Polymers and Grafted Polymers by Means of Spark Discharge in a Liquid

S/191/60/000/006/002/015
B004/B054

proved to be convenient for the production of grafted polymers. After 5 hours of spark discharges at 20°C, the authors performed a heating to 100°C, a precipitation of the cyclohexane and the methyl methacrylate not having reacted by means of ethanol, and an extraction of the polymethyl methacrylate and the polymer with a low content of polyvinyl chloride (PVC) by means of glacial acetic acid. The insoluble fraction contained PVC and grafted polymer with a high content of vinyl chloride. A comparison with a solution not treated with sparks (Table) showed that in this case the insoluble fraction contained only 37 molecules of methyl methacrylate per 100 molecules of vinyl chloride whereas in the insoluble fraction of a spark-treated solution 100 molecules of vinyl chloride contained 63 molecules of methyl methacrylate. Thus, the yield in grafted polymer was doubled. Block polymers were produced from 5% solutions of PVC and ethyl cellulose (1 : 1) in equal parts of ethyl acetate + cyclohexane under the same conditions as the grafted polymers. The chlorine content of the insoluble fraction was 45%. There are 2 figures, 1 table, and 13 references: 9 Soviet, 1 British, 1 Belgian, and 2 German.

Card 2/2

15.8110
11.2217

85152

S/191/60/000/007/005/015
B004/B056

AUTHORS: Neyman, M. B., Kovarskaya, B. M., Levantovskaya, I. I., Strizhkova, A. S., Akutin, M. S.

TITLE: Investigation of the Thermal Destruction of Condensate Resins. The Thermal Destruction of Hardened Epoxy Resins

PERIODICAL: Plasticheskiye massy, 1960, No. 7, pp. 17 - 20

TEXT: Following an earlier paper (Ref. 1) on the thermal destruction of ЭД-6 (ED-6) epoxy resin, the authors give a report on their investigation of the thermal destruction of ЭД-15 (ED-15) epoxy resin obtained by condensation of epichlorohydrin with diphenylpropane, as well as of ED-15 and ED-6 hardened with 7% polyethylene polyamine or with 30% maleic anhydride. They give the following experimental data: Kinetics of gas formation in the thermal destruction of ED-15 (Table 1, Fig. 1) on the basis of the chromatographical analysis by means of ХТ-2 (KhT-2) or the Griffin apparatus (Fig. 2, chromatogram); kinetics of gas formation in ED-15 (Fig. 3) hardened with polyethylene polyamine and ED-15 hardened with maleic anhydride (Fig. 4); degree of decay of the hardened ED-6 as a

Card 1/2

function of time at 545°C (Fig. 5) and as a function of temperature (Fig. 6), as well as an electron paramagnetic spectrum (Fig. 7) that proves the formation of free radicals. From these data the following conclusions were drawn: Unhardened and hardened epoxy resins (low-molecular ED-6 and high-molecular ED-15) decompose in the absence of oxygen above 200° - 250°C. Liquid and gaseous products are formed, which in unhardened resin consist of distilled-off low-molecular fractions contained already in the initial resin, and in hardened resin of destruction products. The destruction products contain CO, CO_2, CH_4, C_2H_4, C_3H_8, and other hydrocarbons, as well as saturated and unsaturated aldehydes. The mechanism of the destruction of hardened resins is analogous to that of unhardened ED-6. In both cases, a radical process occurs, which begins with the separation and decay of epoxy groups. Resins hardened with maleic aldehyde form CO and CO_2 in larger quantities as a result of the decay of the maleic aldehyde. Resin hardened with polyethylene polyamine is more easily decomposed than such hardened with maleic aldehyde and forms more low-molecular products. There are 7 figures, 2 tables, and 6 references: 1 Soviet, 2 US, 2 German, and 1 Swiss.

Card 2/2

87430
S/191/60/000/010/002/017
B004/B060

15.8104

AUTHORS: Akutin, M. S., Gorbunov, V. N., Margaritova, M. F., Nagibina, A. G., Rusakova, K. A.

TITLE: Synthetic Thermosetting Resins on the Basis of Low-molecular Liquid Butadiene - Styrene Copolymers

PERIODICAL: Plasticheskiye massy, 1960, No. 10, pp. 6-8

TEXT: The results of experiments conducted for obtaining low-molecular butadiene-styrene copolymers are described. These copolymers were examined for their usability in the production of thermosetting resins. Divinyl and styrene copolymers were produced by a method developed at the kafedra sinteza polimerov MITKhT im. Lomonosova (Chair of Polymer Synthesis of the Moscow Institute of Fine Chemical Technology imeni Lomonosov) (Ref. 10). [Abstracter's Note: The method is not described here]. The initiators used were benzoyl peroxide, diphenyl ethane hydroperoxide, cumene hydroperoxide. The yield obtained under optimum conditions was 60-65% referred to the monomers. The copolymer contained 20% styrene. The polymerization was performed (a) in inert solvents (hexane, heptane, benzene) or in active

Card 1/3

87430

Synthetic Thermosetting Resins on the Basis of Low-molecular Liquid Butadiene - Styrene Copolymers

S/191/60/000/010/002/017
B004/B060

solvents (CCl_4); (b) in emulsion by the use of 0.3-10% diproxide as regulator, sodium salts of various sulfonic acids as emulsifiers, at 5-40°C; (c) in toluene in the presence of metallic sodium (1-10%) at 50-90°C. The low-molecular copolymers obtained were examined for their molecular weight, their double bond content, and their 1,4-bonds (by means of perbenzoic acid), and their hardening capacity was tested at 130-180°C. The copolymers obtained by means of sodium (molecular weight 4000-6000, 21-23% 1,4-bonds) are hardened within 8 hours to form a resin which is insoluble to 94%. The substances polymerized in emulsion (molecular weight 3000-5000) and in solution (molecular weight 1500-3000) (50-52%, 1,4-bonds) remained elastic after 40 hours of hardening and contained only 83-90% of insoluble substances. The glass reinforced plastics produced therefrom were resistant to humidity and had a breakdown voltage of 18.9-32 kv/mm; bending strength of 1080 kg/cm^2 and a Brinell hardness of 8.9 kg/mm^2. Epoxidation by means of peracetic acid or perbenzoic acid yielded resins which contained 3-5.8% epoxide groups, hardened on heating within a few hours and were insoluble to 96-98%. S. S. Medvedev is mentioned. There are 2 tables and 10 references:

Card 2/3

87430

Synthetic Thermosetting Resins on the Basis of Low-molecular Liquid Butadiene - Styrene Copolymers

S/191/60/000/010/002/017
B004/B060

3 Soviet, 6 US, and 1 British.

X

Card 3/3

26253

15.8600 2209, 1555

S/194/61/000/001/020/038
D216/D304

AUTHORS: Akutin, M.S., Parlashkevich, N. Ya., Kogan, I.N., Kalinina, S.P. and Menes, L.I.

TITLE: The use of ultrasonics for obtaining bloc-and graft-polymers

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika, no. 1, 1961, 15, abstract 1 E130 (V Sb. Primeneniye ul'traakust. k issled. veshchestva, no. 10, M., 1960, 47-59)

TEXT: Results are given of preliminary qualitative experiments aimed at assessing the possibility of obtaining, with the help of ultrasonic, bloc- and graph-polymers based either on fluoro-polymers of polysiloxanes or on polymethyl methacrylate, ethyl-cellulose, PVC, phenolics etc. The role of ultra acoustics in this case is to split the polymer molecules into free macro-radicals by cavitation, by friction forces between the polymer molecules and the solvent, by varying gradients of velocity and acceleration

Card 1/2

The use of ultrasonics...

according to the length of the molecules, and by certain other phenomena. The recombination of free macro-radicals of various polymers results in the formation of other polymers having new physical properties. The properties of two samples are given which have been obtained with the use of ultrasonics. The ultrasonic installation for obtaining bloc- and graft-polymers is described. Quartz (frequency 550 Kc/s, intensity 15 W/cm^2) and barium titanate (frequency 800 Kc/s and intensity 8 W/cm^2) have been used as radiators.

Card 2/2

S/081/62/000/012/062/063
B158/B101

AUTHORS: Akutin, M. S., Parlashkevich, N. Ya., Kogan, I. N., Rubinshteyn, V. V.

TITLE: The possibility of producing block and graft polymers using a spark discharge

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 12, 1962, 663, abstract 12R55 (Sb."Primeneniye ul'traakust. k issled. veshchestva". M., no. 12, 1960, 125-131)

TEXT: A solution of two or several polymers in a non-polymerizable solvent is subjected to the effect of a high voltage spark discharge (see RZhKhim., no. 23, 1960, 94641) with a given repetition frequency (0.5-1.5 cps). Under the effect of the pressure pulses occurring with the discharge, the polymer molecules are ruptured with the formation of macroradicals; on their subsequent recombination, block copolymers are formed. Graft polymers are produced with analogous treatment of a solution of a polymer in a monomer. The synthesis of graft copolymers of polyvinyl chloride and methyl methacrylate and also of block copolymers of polyvinyl chloride and ethyl cellulose is described. [Abstracter'

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S/081/62/000/012/062/063
B158/B101

The possibility of producing block ...

note: Complete translation.]

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AKUTIN, M. S.

86637

S/020/60/133/005/027/043
B016/B052

15.8110

AUTHORS: Kargin, V. A., Kovarskaya, B. M., Strikhova, A. S., Kovarskaya, I. I., and Akutin, M. S.

TITLE: The Mechanism of Thermal Destruction of Solidified Epoxy Resins

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 133, No. 5, pp. 1147-1149

TEXT: The authors studied the kinetics of thermal destruction of epoxy resins solidified by maleic anhydride (see scheme) or polyethylene polyamine. They determined the forming radicals by the method of electron paramagnetic resonance. Fig. 1 schematically shows the results obtained from the thermal processes: (1) gas separation; (2) weight losses of the residue; and (3) rate of radical accumulation. Considerable amounts of methane, carbon monoxide, formaldehyde, acetaldehyde, and acrolein were found in the gaseous products of destruction. According to the temperature, gas separation sloys after 5 - 15 minutes. Thermal destruction, however, continues while liquid products of a comparatively low molecular weight

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are distilled from the polymer. The authors suggest the following scheme for the formation of the above products: They assume that the terminal $CH_2-CH-CH_2$ groups are separated most easily from the polymer. This radical

can be isomerized into a $CH_2-\dot{C}H-CH_2$ radical which forms acrolein and hydroxyl. The original radical may also decompose into a CH_2O molecule and a CH_2-CH radical. By isomerization of the latter, the acetyl radical $CH_3-\dot{C}O$ may be formed which extracts hydrogen from the epoxy resin and forms acetaldehyde. Finally, the acetyl radical may decompose into CO and CH_3. By absorbing hydrogen, CH_3 is converted into methane. In all cases, the reaction takes place under the formation of active radicals which cannot accumulate in high concentrations and, therefore, cannot be detected by the e.p.r. method. This is only possible in later stages of the process. The authors assume that the bonds of dipenylol propane which cause the formation of stable radicals, may also be ruptured. The rupture of

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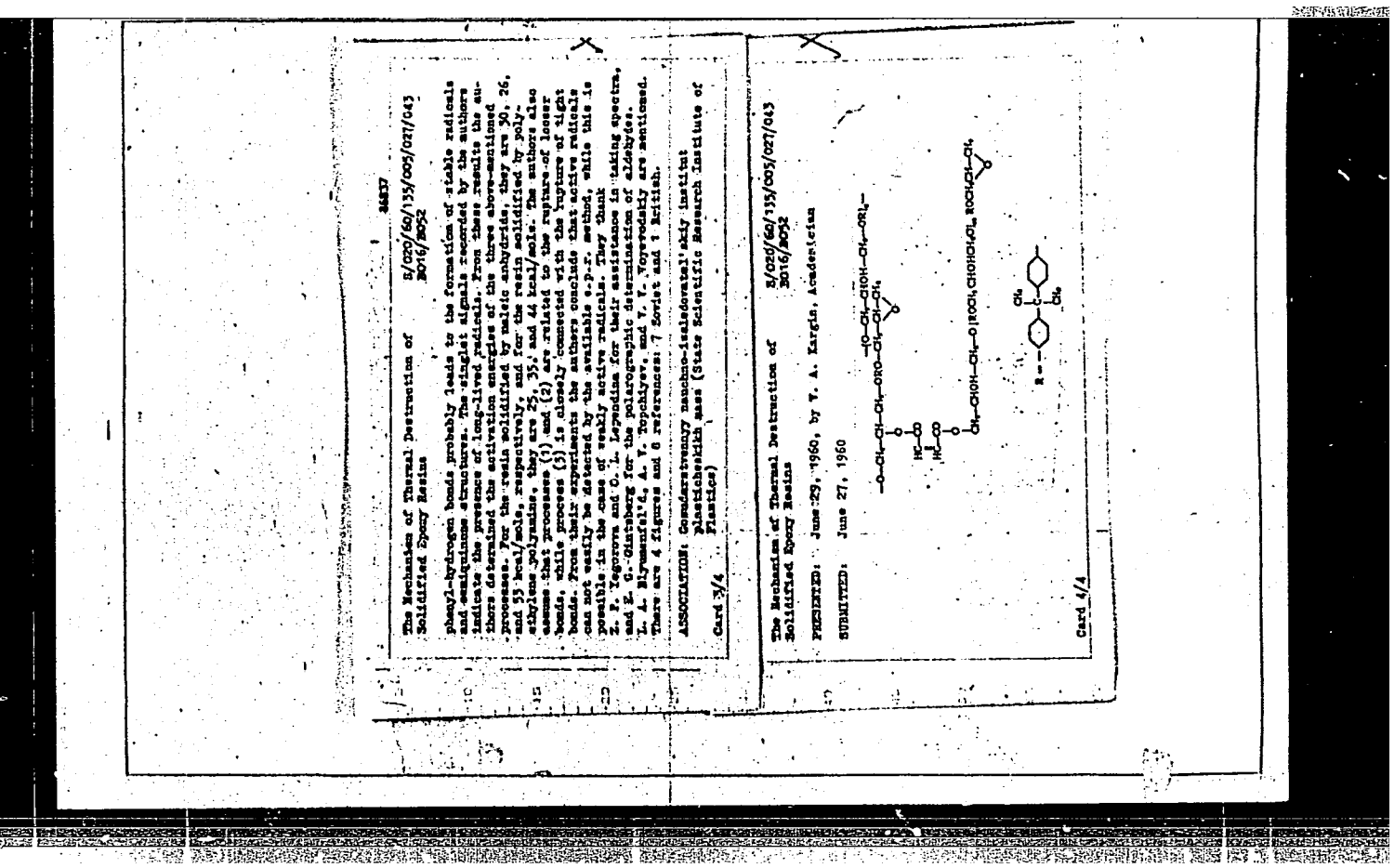

The Mechanism of Thermal Destruction of Solidified Epoxy Resins

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phenyl-hydrogen bonds probably leads to the formation of stable radicals and semiquinone structures. The singlet signals recorded by the authors indicate the presence of long-lived radicals. From these results the authors determined the activation energies of the three above-mentioned processes. For the resin solidified by maleic anhydride, they are 30, 26, and 33 kcal/mole, respectively, and for the resin solidified by polyethylene polyamine, they are 25, 35, and 44 kcal/mole. The authors also assume that processes (1) and (2) are related to the rupture of ether bonds, while process (3) is closely connected with the rupture of C-H bonds. From their experiments the authors conclude that active radicals can not easily be detected by the available e.p.r. method, while this is possible in the case of weakly active radicals. They thank Z. P. Tegerova and O. L. Lependina for their assistance in taking spectra, and E. G. Ginzburg for the polarographic determination of aldehydes. There are 4 figures and 8 references: 7 Soviet and 1 British.

ASSOCIATION: Gosudarstvennyy nauchno-issledovatel'skiy institut plasticheskikh mass (State Scientific Research Institute of Plastics)

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The Mechanism of Thermal Destruction of Solidified Epoxy Resins

S/020/60/135/005/027/043
B016/B052

PRESENTED: June 29, 1960, by V. A. Kargin, Academician

SUBMITTED: June 27, 1960

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S/191/61/000/001/003/015
B101/B205

AUTHORS: Akutin, M. S., Smirnova, L. N., Filippenko, D.

TITLE: Interfacial polycondensation

PERIODICAL: Plasticheskiye massy, no. 1, 1961, 10 - 11

TEXT: A study has been made of the acceleration of condensation of epoxy resin with dephenylol propane (DPP) by interfacial polycondensation, using diphenylol propane (melting point, 153-156° C) and commercial 97% epichlorohydrin (EPC). The DPP:EPC ratio was 1:1.25, 1:1.5, 1:2.3, or 1:8. The end of the reaction was ascertained from the DPP content of the aqueous alkaline solution. The percentage of epoxy groups, 8% at 1:1.25, rose to 20% at 1:8. Fig. 2 shows that the optimum concentrations of the sodium salts of DPP and EPC are obtained in the aqueous and organic phase, respectively. At this concentration, a resin with maximum content of epoxy groups is obtained. Besides, the content of epoxy groups depended on the organic solvent used for the purpose. Solvents in which the forming resin was unsoluble, yielded resins with a lower content of epoxy groups. At an

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Interfacial polycondensation

initial ratio between the components of 1:8, for example, it was 15.9% for cyclohexanone and 20.6% for n-butanol. The highest content of epoxy groups was obtained from n-butanol at any ratio. Polycondensation could be shortened by thorough mixing and an increase of temperature from 35 to 90° C. Mixing, temperature increase, and condensation time had no effect on the content of epoxy groups. The reaction time of interfacial polycondensation was 15-50 min as compared to a time of 120-360 min required to perform polycondensation by fusion of the components.
There are 3 figures, 2 tables, and 4 references: 1 Soviet and 3 US.

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Interfacial Polycondensation

Legend to Fig. 2:
a) EPC concentration, %
b) content of epoxy groups, %;
DPP concentration in water for 1 - 3 equal to 30 % and for 4 equal to the EPC concentration; DPP:EPC ratio for curve 1 = 1:8; for curve 2 = 1:2.3; for curve 3 = 1:1.5; for curve 4 = 1:1.25.

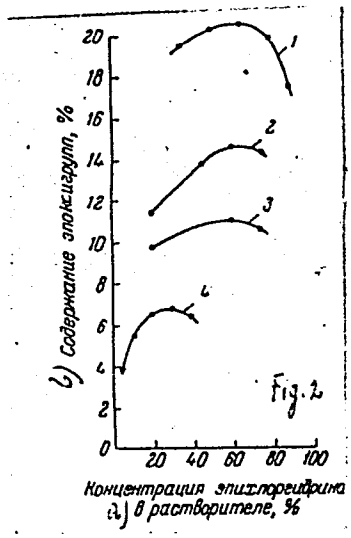

Fig. 2

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B118/B203

15.8450
15.8110

AUTHORS: Vlasova, K. N., Akutin, M.S., Dobrokhotova, M. L., Yemel'yanova, L. N.

TITLE: Polyamide epoxy resins as initial products for glass-reinforced plastics

PERIODICAL: Plasticheskiye massy, no. 2, 1961, 17 - 22

TEXT: No data have been published as yet on the use of polyamide resins as binding agents for glass-reinforced plastics because of their poor adhesion to glass. Methylol polyamide resins are distinguished by very high adhesive power, but glass-reinforced plastics made with them are insufficiently hard and of low resistance to water. On the basis of the good adhesion of epoxy resins, their stability against water, their hardness and brittleness, the authors considered it to be convenient to combine these resins with the high-elastic polyamide resins, and to examine whether the resulting polymer can be used as a binding agent. An attempt of obtaining a homogeneous polymer by mixing solutions of epoxy, polyamide, and methy-

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Polyamide epoxy resins ...

lol polyamide resins was unsuccessful since the mixture did not solidify on heating. Only by synthesizing the polyamides via the intermediate stage of methylol polyamides and reacting them with diphenylol propane and epichlorohydrin it was possible to obtain a grafted polymer. On heating, the resulting resin passes over into an unmeltable and insoluble state. Condensation and hardening of resins were studied in different variations; the reactions of diphenylol propane with formaldehyde, of epichlorohydrin with formaldehyde, and of diphenylol propane with methylol polyamide were investigated. The studies confirmed the assumption of the character of reaction of these resins. The analysis showed that the following scheme holds for methylol polyamides resulting from the reaction of formaldehyde with polyamides via the methylol groups with the epoxy groups of the epoxy resin and with the methylol groups of the diphenylol propane radical in the epoxy resin:

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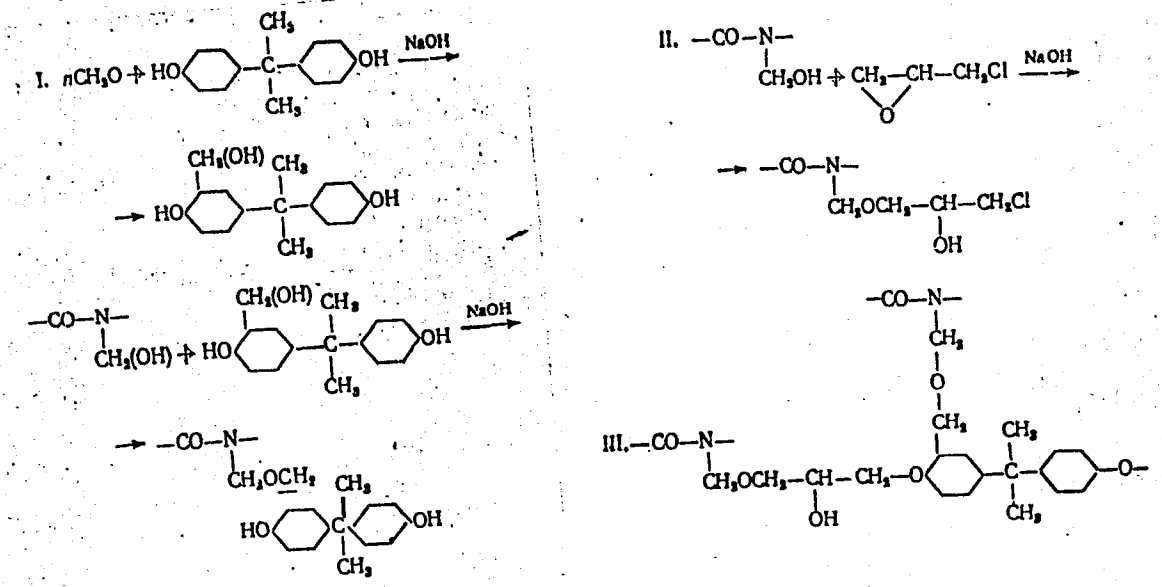
Polyamide epoxy resins ...



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Polyamide epoxy resins ...

To determine the optimum conditions, the authors synthesized resins with various component ratios. The polymerization rate, the adhesive power to various materials, the stability against water, and the content of methylol-, methoxy-alkyl-, epoxy-, and hydroxyl groups were determined for the resins synthesized. Table 6 gives the physico-mechanical properties of glass-reinforced plastics obtained with the aid of modified polyamide resins. Laminated plastics on the basis of synthetic fibers and polyamide epoxy binding agents can be used for lightweight, stable building materials since they show good elasticity and durability as well as good dielectric properties. Among all modifications, the type ПЭМ-2 (PEM - 2) shows the best properties: it can be recommended as a building and heat-insulating material; it remains intact in the temperature range of $\pm$ 200°C maintaining its sufficiently high physical and mechanical properties.
There are 2 figures and 10 tables.

Card 4/6

NEYMAN, M.B.; KOVARSKAYA, B.M.; YAZVIKOVA, M.P.; SIDNEV, A.I.; AKUTIN, M.S.

Destruction of condesnation resins. Part 3: Thermooxidative destruction of hardened epoxy resins. Vysokom.soed. 3 no.4:602-606 Ap '61. (MIRA 14:4)

1. Nauchno-issledovatel'skiy institut plasticheskikh mass.
(Epoxy resins)

32358
S/191/62/000/001/002/006
B145/B110

15.8112

AUTHORS: Korshak, V. V., Akutin, M. S., Vinogradova, S. V., Rodivilova, L. A., Valetskiy, P. M., Lebedeva, A. S., Salazkin, S. N.

TITLE: Polyarylates - new thermostable polymers

PERIODICAL: Plasticheskiye massy, no. 1, 1962, 9-13

TEXT: A survey of the properties of polyarylates is given. They are best synthetized from bifunctional phenols and dicarboxylic acid chlorides. Some of the synthetized polyarylates and their softening temperatures are given in Table 1. The great number of rings in the polymer ensure high resistance to most organic solvents as well as to gasolines and oils. At room temperature, the polyarylate ИД (ID) is stable against H_2O_2, dilute and concentrated caustic soda solutions, acetic acid, formic acid, nitric acid, and sulfuric acid. The effect of dilute and concentrated ammonia solutions considerably reduces the molecular weight of ID. Polyarylates on the basis of phenolphthalein are readily soluble in a number of solvents, which facilitates the production of foils. At the NIIPM it was

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Polyarylates - new thermostable ...

molecular ratio of the initial dicarboxylic acid chlorides related to 1 mole of diol is given in parentheses; * * the molecular ratio of the initial diols related to 1 mole of dicarboxylic acid chloride is given in parentheses.

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