

Investigations in the Field of the Polyamides With SOV/62-59-3-23/37
Heterogeneous Chains. Communication 9. Production of Polyamides and
Polyamido Esters From Bis-Oxazolones

the action of bis-oxazolones on diamines, amino alcohols or glycols in the solvent. Reaction temperature was not higher than 60°. The duration of reaction depends on the nature of the initial substances. Diamines react the most rapidly (5-14 hours), glycols and amino alcohols more slowly. E.g. the reaction of ethylene glycol or monoethanolamine takes up to 146 hours. Pyridine or chloroform were used as solvents. The polyamides obtained are solid, powdery, white substances. They are well soluble in cresol, insoluble in chloroform and benzene. The polyamido ester obtained from ethylene glycol which is well soluble in chloroform is an exception. The properties of the products obtained are given in table 2. The polyamides which were obtained from the reaction of bis-oxazolones with diamines and glycols and which have a regular structure have higher melting temperatures than the polyamides which were obtained by means of direct polycondensation and in which the residues of the initial products are irregularly distributed. In the case of a polymer with regular structure the substitution of octamethylene by the phenylene group leads to a greater

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Investigations in the Field of the Polyamides With Heterogeneous Chains. Communication 9. Introduction of Polyamides and Polyamido Esters From Bis-Oxazolones SSR/62-59-3-23/37

increase of the melting temperature than is the case with polymers with a macromolecule of irregular structure. The degree of crystallization was determined by Yu. S. Struchkov in the laboratoriya rentgenstruktural'nogo analiza (Laboratory for X-Ray Structural Analysis). The thermomechanical curves were recorded by L. Z. Rogov in the laboratoriya issledovaniya polimerov (Laboratory for the Investigation of Polymers). The authors express their thanks for the investigations carried out. There are 1 figure, 2 tables, and 3 references, 2 of which are Soviet.

ASSOCIATION: Institut elementoorganicheskikh soedineniy Akademii nauk SSSR (Institute of Elemental Organic Compounds of the Academy of Sciences, USSR)

SUBMITTED: June 13, 1957

Card 3/3

83815

15.8114 also 2209

S/190/60/002/005/005/0'5
B004/B067

AUTHORS: Korshak, V. V., Frunze, T. M., Kozlov, L. V.
Alybina, A. Yu.

TITLE: From the Field of Heterochain Polyamides. XXIV. Production
of Mixed Polyamides in the Interface

PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 5,
pp. 673-678

TEXT: The authors of the present paper wanted to synthesize mixed poly-
amides by means of non-equilibrium polycondensation in the interface,
and to study the influence exerted by the reactivity of the initial
substances on the composition of the polyamides. A mixture of 0.2 mole
solutions of adipyl chloride and isophthalyl chloride in benzene was
mixed with a 0.4 mole solution of hexamethylene diamine in aqueous
KOH with 1000 rpm. For comparison, the same polyamides were produced by
equilibrium polycondensation, by heating the initial substances to
210 - 270°C in nitrogen current. Table 1 gives viscosity, solubility in
formic acid, flowing point, and, on the basis of the infrared spectra
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From the Field of Heterochain Polyamides.
XXIV. Production of Mixed Polyamides in the
Interface

83815
S/190/60/002/005/005/015
B004/B067

shown in Fig. 2, the degree of crystallization. While the polymer of hexamethyleneisophthalamide is insoluble in formic acid, mixed polymers with a content of 60% isophthalic acid were completely soluble in formic acid (Fig. 1). The formation of a single copolymer was proven by the infrared spectrum. The products obtained by equilibrium polycondensation had a higher flowing point than the products synthesized in the interface (Fig. 3), and had also a higher degree of crystallization. In the reaction of adipyl chloride and isoterephthalyl chloride with hexamethylene diamine in the interface, with the polymer being extracted from the interface as a film, the individual film samples taken during the reaction showed a perfectly homogeneous structure (Table 2) inspite of different reactivity. The different reactivity of adipyl chloride, sebacyl chloride, and azelal chloride had no influence on the physical properties of the copolymers with hexamethylene diamine (Table 3) obtained from varying mixtures of these acid chlorides. The authors thank the laboratory heads of their institute: I. V. Obreimov (Optical Laboratory), A. I. Kitaygerodskiy (Laboratory for X-Ray Structural Analysis), and G. L. Slonimskiy (Laboratory for the Investigation of Polymers) for their investigations.

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From the Field of Heterochain Polyamides.
XXIV. Production of Mixed Polyamides in the
Interface

S/190/60/002/005/005/015
B004/B057

L. V. Zhirona took part in the experimental work. There are 3 figures,
3 tables, and 9 references: 6 Soviet, 2 US, and 1 British.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy AN SSSR
(Institute of Elemental-organic Compounds of the AS USSR)

SUBMITTED: January 9, 1960

X

Card 3/3

83628

15-8107 also 2209

S/90/60/002/006/002/012
B015/B064

AUTHORS: Korshak, V. V., Frunze, T. M., Kozlov, I. V.
TITLE: On the Heterochain Polyamides. XXV. Synthesis of Polyamides
Containing Piperazine Radicals on the Interface
PERIODICAL: Vysokomolekulyarnyye soyedineniya. 1960, Vol. 2, No. 6,
pp. 838-844

TEXT: Simple and mixed polyamides were produced from piperazine with adipyl-, azelayl-, sebacyl-, phthalyl-, isophthalyl-, and terephthalyl chloride, as well as from ethylene-, hexamethylene-, and nonamethylene amine with sebacyl chloride by the method of interface polycondensation, and their properties investigated. The chlorides were applied as 0.2 M solutions in benzene and the diamines as 0.2 M solutions in water (prepared from 0.4 M solutions in KOH). The polymer yield was 30-60%. Tables 1 and 2 give the properties of the polyamides obtained and show that a reduction in length of the methylene chain of the dicarboxylic acids leads to an increase in the flow temperature. Polyamides containing piperazine (except for polypiperazine terephthalamide) are better soluble

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83698

On the Heterochain Polyamides. XXV. Synthesis of Polyamides Containing Piperazine Radicals on the Interface S/190/60/002/006/002/012 B015/B064

in organic solvents than polyamides obtained from the same acids with aliphatic diamines. Tables 3-5 list the properties of the mixed polyamides and show that a change in the piperazine content exerts a considerable influence upon flow temperature, solubility, and mechanical properties. Flow temperature and solubility of the polyamides obtained from piperazine and aromatic dicarboxylic acids depends on the position of the carboxyl groups in the cycle. An introduction of 20 mole% of aliphatic diamine radicals into polypiperazine sebacinamide leads to a reduction of the flow temperature. A further increase in the radical content causes an increase in flow temperature and a reduction of the solubility of the mixed polyamides. Studies on the influence of the varying reactivity of the initial diamines upon the structure and properties of the mixed polyamides obtained, showed (Table 6, composition, softening- and flow temperature, viscosity 0.5% solutions in tricresol at 20°C), that there are no essential differences in the properties of the products obtained. L. V. Zhirona took part in experimenting. There are 1 figure, 6 tables, and 7 references: 1 Soviet, 4 US, 1 German, and 1 French.

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On the Heterochain Polyamides, XXV. Synthesis of Polyamides Containing Piperazine Radicals on the Interface S/190/60/002/006/002/012 B015/B064

ASSOCIATION: Institut elementoorganicheskikh soyedineniy AN SSSR
(Institute of Elemental-organic Compounds of the AS USSR)

SUBMITTED: February 1, 1960

X

Card 3/3

83699

S/190/60/002/006/003/012
B015/B064

15.8107 also 2209

AUTHORS: Korshak, V. V., Frunze, T. M., Kozlov, L. V.
TITLE: From the Field of the Heterochains Polyamides XXVI. Mixed
Polyamides of Piperazine With Aliphatic and Aromatic
Dicarboxylic Acids 1
PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 6.
pp. 845-850

TEXT: In continuation of an experimental series (Ref. 1) mixed polyamides were produced by the method of the interfacial polycondensation from piperazine and adipyl-, azelayl-, phthalyl-, isophthalyl-, and terephthalyl chloride. The chlorides were used as 0.2 M solutions in benzene and piperazine as 0.2 M solution in water (produced from 0.4 M solution in KOH). For the copolymers obtained, the specific viscosity of a 0.5% solution was determined in 95% H₂SO₄ at 20°C, as well as the flow temperature and solubility in organic solvents (results on Tables 1-3). The introduction of the aliphatic dicarboxylic acid radicals into the polyamide reduced essentially the flow temperature of the polymer. The
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From the Field of the Heterochains Polyamides.
XXVI. Mixed Polyamides of Piperazine With
Aliphatic and Aromatic Dicarboxylic Acids

S/190/60/002/006/003/012
B015/B064

position of the carboxyl groups in the radical of the aromatic dicarboxylic acids in the mixed polyamides has the usual effect upon the flow temperature, i.e. the mixed polyamides with a paraphenyl cycle have the highest flow temperature. The polyamides obtained from piperazine are in organic solvents better soluble than those obtained from aliphatic diamines. The mixed polyamides obtained from piperazine, and azeloyl-, phthaloyl- and isophthaloyl chloride dissolve best in polar organic solvents. L.V. Zhigova took part in experimenting. There are 1 figure, 3 tables, and 3 references: 1 Soviet and 2 US. ✓

ASSOCIATION: Institut elementoorganicheskikh soyedineniy AN SSSR
(Institute of Elemental-organic Compounds of the AS USSR)

SUBMITTED: February 1, 1960

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KOZLOV, L. V.

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PHASE I BOOK EXPLOITATION

SOV/6034

Konferentsiya po khimii i primeniyu fosfororganicheskikh soyedineniy. 2d, Kazan', 1959.

Khimiya i primeniye fosfororganicheskikh soyedineniy; trudy (Chemistry and Use of Organophosphorus Compounds; Conference Transactions) Moscow, Izd-vo AN SSSR, 1962. 630 p. Errata slip inserted. 2800 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Kazanskiy filial.

Resp. Ed.: A. Ye. Arbuzov, Academician; Ed. of Publishing House: L. S. Povarov; Tech. Ed.: S. G. Tikhomirova.

PURPOSE: This collection of conference transactions is intended for chemists, process engineers, physiologists, pharmacists, physicians, veterinarians, and agricultural scientists.

COVERAGE: The transactions include the full texts of most of the scientific papers presented at the Second Conference on the Chemistry and Use of

Card 1/13

Chemistry and the Use of Organophosphorus (Cont.)

SOV/6034

Korshak, V. V., T. M. Frunze, V. V. Kurashev, and L. V. Kozlov [Institute of Organoelemental Compounds]. Synthesis of Some Phosphorus-Containing Dicarboxylic Acids and Derivation of Polyamides Based on Such Acids

247

Phosphorus-containing dicarboxylic acids have been obtained by synthesis and used for the preparation of polyamides. The effect of the phosphorus and the structure of the acids on the properties of the polyamides has been studied.

Kolesnikov, G. S., Ye. F. Rodionova, and L. S. Fedorova [Institute of Organoelemental Compounds]. Synthesis, Polymerization, and Copolymerization of Esters of Vinylphosphonic Acid

255

The authors obtained esters of vinylphosphonic acid and demonstrated that these esters are capable of entering the polymerization and copolymerization reaction with other monomers. Polymers and copolymers of the dichloride and esters of vinylphosphonic acid have been synthesized and their properties determined.

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Chemistry and the Use of Organophosphorus (Cont.)

SOV/6034

Organophosphorus Compounds held at Kazan' from 2 Nov through 1 Dec 1959. The material is divided into three sections: Chemistry, containing 67 articles; Physiological Activity of Organophosphorus Compounds, containing 26 articles; and Plant Protection, containing 12 articles. The reports reflect the strong interest of Soviet scientists in the chemistry and application of organophosphorus compounds. References accompany individual reports. Short summaries of some of the listed reports have been made and are given below.

TABLE OF CONTENTS: (Abridged):

Introduction (Academician A. Ye. Arbuzov)

3

TRANSACTIONS OF THE CHEMISTRY SECTION

Gefter, Ye. L. [NII plastmass (Scientific Research Institute of Plastics, Moscow)]. Some Prospects for the Industrial Use of Organophosphorus Compounds

46

Card 224

3

42649

S/062/62/000/011/012/021
B101/B144

15.8080

AUTHORS: Korshak, V. V., Frunze, T. M., and Kozlov, L. V.

TITLE: Heterochain polyamides. Communication 32. Interfacial formation of mixed polyamides from mixtures of various diamines

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye khimicheskikh nauk, no. 11, 1962, 2062 - 2069

TEXT: The rules governing the interfacial polycondensation of adipyl chloride (AC) with a mixture of ethylene diamine (I) and m-phenylene diamine (II), or I and hexamethylene diamine (III), were studied. Polyamides were also synthesized from sebacyl chloride (SC) and a mixture of III and piperazine (IV). The polycondensation was carried out at room temperature; the chloride was dissolved in benzene, the diamines in aqueous alkali. The molar ratio of the diamines was varied between 0:1 and 1:0. The relative reaction rate of II and III was determined by acylating their mixture with benzoyl chloride. The nitrogen content of the reaction product and its IR spectrum proved that mainly dibenzoyl hexamethylene amine was formed and that the reaction rate of III was consequently much higher

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Heterochain polyamides...

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B101/3144

than that of II. In the polycondensation of AC with diamines the following were determined: the initial ratio K_1 of the diamines, the ratio K_2 of the diamines in the copolymer, and $\alpha = K_2/K_1$. The following values were found:

$K_1 = I/II$	$K_2 = I/II$	α	$K_1 = I/III$	$K_2 = I/III$	α
4	0.54	0.14	4	2.03	0.51
1.50	0.41	0.27	1.50	0.613	0.41
1.00	0.15	0.15	1.00	0.32	0.48
0.67	0.18	0.27	0.67	0.32	0.48
0.25	0.00	0.00	0.25	0.075	0.30
$\alpha_{\text{mean}} = 0.17$					0.41

The polymers had a higher content of II or III, respectively, than would correspond to the initial ratio. After prolonged polycondensation of AC with I and II, the I content in the polymer increased owing to exhaustion of the diamine mixture with respect to II, which had the principal share in the early reaction stage. The system of SC behaved similarly with III and IV. These results are explained by the different rates of diffusion of

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Heterochain polyamides...

S/062/62/000/011/012/021
B101/B144

the diamines into the organic phase. It is (in $M/cm^2 \cdot min$) $3.9 \cdot 10^{-7}$ for I, $6.07 \cdot 10^{-5}$ for II, and $1.07 \cdot 10^{-5}$ for III. The dissociation constants are $8.5 \cdot 10^{-5}$, $6.0 \cdot 10^{-10}$, and $5.1 \cdot 10^{-4}$, respectively. In the polymer, the content of radicals of the diamine primarily depends on the rate of diffusion. The reactivity is of secondary importance and has a compensating effect on the polymer composition if the slowly diffusing diamine has a higher reaction rate (dissociation constant). There are 3 figures and 5 tables.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR
(Institute of Elemental Organic Compounds of the Academy of
Sciences USSR)

SUBMITTED: April 9, 1962

X

Card 3/3

KORSHAK, V. V.; FRUNZE, T. M.; KOZLOV, L. V.

Heterochain polyamides. Report No. 33: Formation of mixed polyamides at the interface mixtures of various acid chlorides. Izv. AN SSSR Otd. khim. nauk no.12:2226-2235 D '62.
(MIRA 16:1)

1. Institut elementoorganicheskikh soedineniy AN SSSR.

(Polyamides) (Acids, Organic)
(Condensation products(Chemistry))

41117

S/190/62/004/010/001/010
B101/B186

AUTHORS: Korshak, V. V., Vinogradova, S. V., Frunze, T. M., Kozlov,
L. V., Wu Pang-yüan

TITLE: Heterochain polymers. XL. Synthesis of polyamide esters by
interfacial polycondensation

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 4, no. 10, 1962,
1457-1462

TEXT: A comparison is made between the properties of polycondensates
obtained by interfacial polycondensation (iC) and equilibrium poly-
condensation (eC) of sebacic chloride (I), diene(4,4'-dihydroxy-diphenyl
propane) (II), and hexamethylene diamine (III). Interfacial polycondensa-
tion was achieved by mixing 0.2 N alkaline solutions of II and III with
I dissolved in hexane, and eC was brought about by heating the component
mixture first in N₂ and then in vacuo, the ratio I : II : III being varied
between 1 : 1 : 0 and 1 : 0 : 1. Homopolymers could be separated from
the reaction product since the homopolymer I + III is insoluble in

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Heterochain polymers. XL...

S/190/62/004/010/001/010
B101/B186

p-xylene, whereas homopolymer I + II is soluble in p-xylene. The nitrogen content of the reaction product soluble in p-xylene confirmed the formation of a polyamide ester. The differences observed between the products obtained by iC and eC are that the product from eC, containing less than 40% III, was better soluble in p-xylene than product from iC containing the same amount of III, whereas the eC products containing more than 40% III were not as easily soluble as the comparable iC products. Furthermore, the softening points of iC products containing less than 40% III were lower than those of the corresponding eC products. The thermomechanical curves of the iC products were flatter. At a component ratio of 1 : 0.5 : 0.5, the nitrogen contents in the insoluble part of the polymer obtained by iC and eC were ~ 8.7% and ~ 4.2%, respectively, that in the soluble part being ~ 1.9% in iC and ~ 3.6% in eC. Conclusion: I diffuses from the organic into the aqueous phase owing to hydrolysis during iC; III diffuses into the organic phase more readily than II. Hence, the polymer formed from the organic phase should contain amide units, and the product formed from the aqueous phase and should be enriched with ester units. This was confirmed by iC when the mixture was stirred at varying speeds. At a ratio of 6 : 5 : 1 and at 1000 rpm, the

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Heterochain polymers. XL. ...

S/190/62/004/010/001/010
B101/B186

polymer had a nitrogen content of 7.02% and a softening point of 194°C, at 6000 rpm, the nitrogen content was 2.07% and the softening point was 47°C. At a ratio 1 : 1 : 1, a polymer containing ~8.9% nitrogen was obtained in both cases. Hence, III has a greater reactivity than II. There are 2 figures and 3 tables. The English-language reference is: W. M. Eareckson, J. Polymer Sci., 40, 399, 1959.

✓

ASSOCIATION: Institut elementoorganicheskikh sovedineniy AN SSSR
(Institute of Elemental Organic Compounds AS USSR)

SUBMITTED: May 19, 1961

Card 3/3

SILAEV; A.B. [Silayev, A.B.]; FEDOSEEVA, N.V. [Fedoseyeva, N.V.]; KATRUKHA, G.S.;
ANDREEVA, L.I. [Andreyeva, L.I.]; KOZLOV, L.V.

Preparation and properties of some L- α , γ -diaminobutyric acid
peptides. Coll Cz Chem 27 no.9:2240 S '62.

1. Moscow State University, U.S.S.R. (for Silaev and Fedoseeva).

KOZLOV, L.V.; GINODMAN, L.M.; ZOLOTAREV, B.M.; OREKHOVICH, V.N.

Study of the catalytic activity of pepsin with the aid of
O¹⁸. Dokl. AN SSSR 146 no.4:945-946 O '62. (MIRA 15:11)

1. Institut khimii prirodnykh soyedineniy AN SSSR.
2. Deystvitel'nyy chlen AMN SSSR (for Orekhovich).
(Pepsin) (Catalysis)

KOZLOV, L.V.; GINODMAN, L.M.

Energy characteristics of the ester bond in *N*-acetylamino acid
esters. *Biokhimiya* 30 no.5:1051-1054 S.S. 195. (MIRA 18:10)

1. Institut khimii prirodnykh soyedineniy AN SSSR, Moskva.

KORSHAK, V.V.; SERGEYEV, V.A.; KOZLOV, L.V.; KOMAROVA, L.I.

Thermal and thermo-oxidative degradation of phenol-formaldehyde
oligomers of the novolak type. Plast. massy no.2:33-35 '66.

(MIRA 19:2)

L 20801-66 EWP(j)/EWT(m)/ETC(m)-6/T IJP(c) RM/WW

ACC NR: AP6005951

SOURCE CODE: UR/0191/66/000/002/0033/0035

AUTHORS: Korshak, V. V.; Sergeyev, V. A.; Kozlov, L. V.; Komarova, L. I.

ORG: none

TITLE: Thermal and thermooxidative destruction of phenolformaldehyde oligomers of novolac type

SOURCE: Plasticheskiye massy, no. 2, 1966, 33-35

TOPIC TAGS: phenolformaldehyde, oligomer, thermal decomposition, oxidation

ABSTRACT: Chemical processes occurring in novolac phenolformaldehyde oligomers upon heating at 150--900C have been investigated by elementary analysis, titration for OH groups, and ESR and IR spectral analysis. Oligomers were prepared according to the method described by K. A. Andrianov and D. A. Kardashev (Prakticheskiye raboty po iskusstvennym smolam i plastmassam, ONTI, 1936, str. 198), washed repeatedly with distilled water, and dried at 150C/1--2 mm for 15 hours. The product, containing 2% of free phenol, was subjected to thermal and thermooxidative treatment for 3--4 hours. It was established that the primary act in thermooxidative destruction was oxidation of methyl groups. Cross-linking during thermal

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UDC: 678.632'32'21.01:536.45

L 20801-66

ACC NR: AP6005951

treatment of the novolac oligomers mainly occurs due to formation of aromatic etheral bonds. This process is facilitated by conversion of polymeric hydrogen bonds to dimeric ones. Orig. art. has: 2 tables and 2 figures.

SUB CODE: 11/ SUBM DATE: none/ ORIG REF: 007/ OTH REF: 008

Card 2/2

L 31922-66 EWT(m)/EWP(j)/T IJP(c) WW/JWD/RM

ACC NR: AP6007972 (A) SOURCE CODE: UR/0191/66/000/003/0057/0059

AUTHOR: Sergeyev, V. A.; Korshak, V. V.; Kozlov, L. V.

ORG: none

TITLE: Thermal destruction of thermoactive resins containing nitrogenSOURCE: Plasticheskiye massy, no. 3, 1966, 57-59

TOPIC TAGS: resin, nitrogen compound, thermal decomposition

ABSTRACT: Thermal destruction of the thermoreactive resins obtained by a polycondensation of aniline, p-aminophenol, m-phenylenediamine, 2,6-diaminopyridine, fuchsin, melamine, dicyandiamide, or urea with formaldehyde was studied at 330 and 900C. At 330C, the highest amount of NH₃ was evolved from the dicyandiamidephenol (4:6), dicyandiamide, and 2,6-diaminopyridine resins. No NH₃ was evolved from melamine and aniline resins. At 330C, the lowest loss of weight was observed in fuchsin, p-aminophenol, and m-phenylenediamine, and the highest in urea resins. Heating the resins at 900C, a 19-65% yield of solid product was obtained. The resins of p-aminophenol and m-phenylenediamine produced 2-2 1/2 times more solid than the aniline resin. Apparently, the anilineformaldehyde resin is less cross-linked and, subsequently, thermally less stable. Even though m-phenylenediamine and p-aminophenol resins have the same structure and the same number of cross-links, their thermal behavior was not alike.

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UDC: 678.652.019.35

L 31922-66

ACC NR: AF6007972

Due to a larger number of C-C links and participation of phenolic OH groups in cross-linking, the p-aminophenol resin gave a higher yield of solid residue (secondary polymer) and of nitrogen. The C-C links are thermally more stable than the C-N and, therefore, thermoprocessing of resins with a condensed aromatic cycle should give a higher yield of secondary polymers than that of the resins of aromatic nitrogen heterocycles. The highest yield of gaseous products was obtained from resins of p-aminophenol, 2,6-diaminopyridine, m-phenylenediamine, and aniline. Orig. art. has: 2 tables.

SUB CODE: 11,07/ SUBM DATE: none/ ORIG REF: 002/ OTH REF: 002

mt
Card 2/2

KOZLOV, L.V. (Moskva)

Determining the coefficient of heat emission by the method of
regular conditions considering heat leakage inside the model. Izv.AN
SSSR.Otd.tekh.nauk.Mekh.i mashinostr. no.6:42-46 N-D '61.

(MIRA 14:11)

(Heat--Transmission)

L 10636-63 EPR/EPA(b)/EPP(c)/EWT(l)/EWT(m)/BDS/T-2/EWP(r)--AEDC/
AFFTC/ASD--Ps-l/Pd-l/Pr-l/Pi-l--EM/WW

ACCESSION NR: AP3000877

S/0179/63/000/002/0011/0019

AUTHOR: Kozlov, L. V. (Moscow) 78

TITLE: An experimental investigation of skin friction on a flat plate in
supersonic flow with heat transfer 20

SOURCE: AN SSSR. Izv. Otd. tekhn. nauk. Mekhanika i mashinostroyeniye, no. 2,
1963, 11-19 21

TOPIC TAGS: friction, supersonic flow, heat transfer, turbulent flow

ABSTRACT: An experimental investigation is presented of the local skin friction on a flat plate at zero incidence in supersonic flow in the presence of intensive heat transfer. A brief description of the apparatus is given and the test procedure is outlined. The possible inaccuracies and measurement errors are studied and discussed. An interpolation formula in the form of a power function is established for calculating the skin friction in the case of turbulent flow regime for a wide range of Mach and Reynolds numbers and temperature drops ($M = 0$ to 10 ; $Re = 10^7$ to 10^9 ; $T_w = 350K$). Experimental results are presented

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L 10636-63

ACCESSION NR: AP3000877

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in tables and graphs. A comparison of the results with those of other investigations show good agreement. Skin friction dependence on Re number and the effect of temperature at all Mach numbers are established. Orig. art. has: 12 formulas, 10 figures, and 3 tables.

ASSOCIATION: none

SUBMITTED: 01Sep62

DATE ACQ: 12Jun63

ENCL: 00

SUB CODE: AI

NO REF SOV: 000

OTHER: 017

ch/ls

Card 2/2

L 20136-63 EPA(b)/EPF(c)/ENT(1)/ENP(q)/ENT(m)/ENP(b)/SDS AFPTC/ASD/
AFGC Pd-L/Pr-4 DA/JD/DJ
ACCESSION NR: AP3004304 S/0179/63/000/004/0108/0111

AUTHOR: Kozlov, L. V. (Moscow)

TITLE: The connection between aerodynamic heating and surface friction

SOURCE: AN SSSR. Izv. Otd. tekhn. nauk. Mekhanika i mashinostroyeniye, no. 4, 1963, 108-111

TOPIC TAGS: aerodynamic heating, surface friction, supersonic flow, Prandtl number, Reynolds number

ABSTRACT: The connection between the heat-exchange and friction is not solved in the transonic region yet, and even in the subsonic domain the theoretical solutions are often in sharp disagreement. The generalization of the most reliable data by A. Seiff (NACA TN 3248, 1954) confirmed the modified Reynolds analogy

$$\frac{C_h}{C_f} = \frac{1}{2} P^{-0.57} \quad (1.4)$$

However, due to insufficient amount of experimental data and poor accuracy

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L 20136-63

ACCESSION NR: AP3004804

Seiff was unable to establish a relation between C_h/C_f and the Reynolds number, Mach number, and the temperature factor. The present paper, on the basis of experiments described by V. S. Avduyevskiy et al. (Osnovy* teploperedachi v aviatsionnoy i raketnoy tekhnike, Oborongiz, 1960), establishes the relationship

$$\frac{C_{hw}}{C_{fw}} = \frac{1}{2} P_w^{-0.87} \Phi_1(R_{xw}, T_e/T), \quad (1.3)$$

where

$$\Phi_1(R_{xw}, T_e/T) = 0.695 R_{xw}^{0.09-0.01 \lg R_{xw}} (T_e/T)^{-0.09} \quad (1.3a)$$

and C_{hw} - local value of the dimensionless heat emission coefficient, C_{fw} - local value of the surface friction coefficient, P_w - Prandtl number, R_{xw} - Reynolds number, T_e - equilibrium temperature, and T - temperature of the flow at the limit of the layer close to the boundary. The second half of the article is devoted to the comparison of this equation with the experimental data obtained by Western authors. Orig. art. has 5 figures and 5 formulas.

ASSOCIATION: none

SUBMITTED: 07 Sep 62

DATE ACQ: 06 Sep 63

ENCL: 00

SUB CODE: AI

NO REF SOV: 001

OTHER: 005

Card 2/2

KOZLOV, Lev Vasil'yevich; ROZHKOV, N.G., red.

[In fight for technical progress] V bor'be za tekhnicheskii progress. Alma-Ata, Kazgosizdat, 1960. 44 p.
(MIRA 17:5)

KOZLOV, L.V.

All-Union Conference of party organization secretaries
for enterprises of nonferrous metallurgy. TSvet. met. 38
no.11:35-39 N '65. (MIRA 18:11)

KOZLOV, M., nauchnyy sotrudnik; NINBURG, Ye., nauchnyy sotrudnik

Tiny enemies of big robbers. Nauka i zhizn' 30 no.9:86-88 S '63.
(MIRA 16:10)

1. Zoologicheskiy institut AN SSSR.

KOZLOV, M.A., inzh.

All-purpose dismountable and adjustable device for assembling
elevator parts. Mont.i spets.rab.v stroi. 22 no.8:24-25
Ag '60. (MIRA 13:8)

1. Liftostroitel'nyy zavod.

(Moscow--Elevators)

(Electric welding--Equipment and supplies)

KOZLOV, M.A., zasluzhennyy agronom UzSSR.

Using methyl bromide for the fumigation of cottonseed. Zashch.
rast.ot vred. 1 bol. 4 no.1:44-45 Ja-F '59. (MIRA 12:2)
(Cottonseed--Disinfection) (Methane)

KOZLOV, Mikhail Aleksandrovich

Proteleas, a new genus of Scellionidae with three new species from Soviet Union (Hym., Scellionidae). Cas entom 58 no.4:333-339 '61.

1. Zoologicheskij institut Akademii Nauk SSSR, entomologicheskoye otdeleniye, Leningrad B-164, Universitetskaya naberezhnaya 1.

(Hymenoptera)

KOZLOV, M.A.

New synonyms for species of the genera *Asolcus* Nak., *Gryon* Hal., and *Telenomus* Hal. (Hymenoptera, Scelionidae), egg-parasites of *Eurygaster integriceps* Put. Zool. zhur. 42 no.2:294-296 '63. (MIRA 16:3)

1. Zoological Institute of the Academy of Sciences of the U.S.S.R.,
Leningrad. (Parasites—Eurygasters)
(Scelionidae)

KOZLOV, M.A.

New parasitic hymenoptera of the family Scelionidae (Hymenoptera,
Proctotrupoidea) in the U.S.S.R. Ent. oboz. 42 no.3:660-
668 '63. (MIRA 17:1)

1. Kafedra entomologii Leningradskogo gosudarstvennogo
universiteta i Zoologicheskiiy institut AN SSSR, Leningrad.

KOZLOV, M.A.

Materials on parasitic hymenoptera of the subfamilies Teleasinae
and Telenominae (Hymenoptera, Scelionidae) in the U.S.S.R. Ent.
oboz. 44 no.3:616-621. '65. (MIRA 18:9)

1. Zoologicheskiy institut AN SSSR, Leningrad.

KANSHIN, N.N., KOZLOV, M.A.

Treatment of trophic ulcers with free skin grafts. [with summary in English]. Khirurgiia 34 no.10:114-119 0 '58 (MIRA 11:11)

1. Iz khirurgicheskogo otdeleniya Cherepovetskoy gorodskoy bol'nitsy Vologodskoy oblasti (zav. O.N. Rubinova, glavnyy vrach D.P. Vlatskiy).

(LEG, ulcer,

free skin frafts in trophic ulcer (Rus))

(SKIN TRANSPLANTATION,

free skin frafts in trophic ulcer of leg (Rus))

KOZLOV, M.A.

Utilization of the greater omentum in treatment of phlegmon of
the anterior wall of the stomach. Vest.khir. no.5:142-143 '61.
(MIRA 15:1)

1. Iz 1-go khirurgicheskogo otdeleniya (zav. - O.N. Rubinova)
Cherepovetskoy gorodskoy bol'nitsy (Vologodskaya oblast').
(PHLEGMON) (STOMACH--DISEASES) (OMENTUM--SURGERY)

KOZLOV, M.A.

Intestinal obstruction under conditions of an urban hospital. Sov.
med. 25 no.9:137-138 S '61. (MIRA 15:1)

1. Iz khirurgicheskogo otdeleniya Cherepovetskoy gorodskoy bol'nitsy
(zav. O.N.Rubinova, glavnyy vrach N.A. Belyakova).
(INTESTINES__OBSTRUCTIONS)

KOZLOV, M.A.

Extensive intestinal resection in a patient with cavernous pulmonary tuberculosis. Vest.khir. 86 no.2:94 '61.

(MIRA 14:2)

1. Iz Cherepovetskoy gorodskoy bol'nitsy (gl. vrach - D.P. Vlatskiy).

(TUBERCULOSIS) (ABDOMEN—SURGERY)

KOZLOV, M. A. (Cherepovets)

Undiagnosed subcutaneous rupture of the retroperitoneal segment
of the duodenum. Klin. med. no.2:137-138 '62.

(MIRA 15:4)

1. Iz 1-go khirurgicheskogo otdeleniya (zav. O. N. Rubinova)
Cherepovetskoy meshrayonnoy bol'nitsy Vologodskoy oblasti
(glavnyy vrach N. A. Belyakova)

(DUODENUM—HERNIA)

KOZLOV, M.A.

Perforation of a peptic ulcer of the esophagus into the posterior
mediastinum with ulcerous stenosis of the pylorus. Khirurgiia
no.3:120-121 '62. (MIRA 15:3)

1. Iz 1-go khirurgicheskogo otdeleniya (zav. O.N. Rubinova)
Cherepovetskoj mezhrayonnoj bol'nitsy (glavnyy vrach N.A.
Belyakova) Vologodskoy oblasti.
(ESOPHAGUS--ULCERS) (PYLORUS--ULCERS) (MEDIATINUM--ULCERS)

KOZLOV, M.A.

Case of favorable outcome in the treatment of a traumatic
cyst of the pancreas using a pedicled omental temponade.
Khirurgiiia no.3:132-133 '63. (MIRA 16:5)

1. Iz Pervogo khirurgicheskogo otdeleniya (zav. O.N.Rubinova)
Cherepovetskoy mezhrayonnoy bol'nitzy (glavnyy vrach N.A.
Belyakova), Cherepovets Vologodskoy oblasti.
(PANCREATIC CYSTS) (OMENTUM--TRANSPLANTATION)

KOZLOV, M.A. (Cherepovets, Vologodskoy oblasti, ul. Maksima Gor'kogo, d.22,
kv.54)

Liver injuries complicated by bilateral pleurisy. Vest. Khir. 91
no.10:109-110 0 '63. (MIRA 17:7)

1. Iz khirurgicheskogo otdeleniya meditsinsko-sanitarnoy chasti
(glavnyy vrach D.F. Fregatov) Cherepovotskogo metallurgstroya.

KOZLOV, M.A.; USOVA, V.P.

Treatment of metastasis of a fibrosarcoma of the uterus in the
greater omentum; one observation. Vol. onk. 11 no. 108-109 '65.

(MIRA 18:8)

1. Iz ginekologicheskogo otdeleniya malikostanitsy i sbasti
"Cherapovtsmetallurgstroyal", Cherepovets, Vologodskaya obl'ast'
(glavnyy vrach -- E.P. Prigatov).

I 11549-66

ACC NR: AP6005027

SOURCE CODE: UR/0105/65/000/001/0090/0090

AUTHOR: Aleksandrov, B. K.; Derman, B. A.; Drozdov, N. G.; Dubinskiy, L. A.;
Zallesskiy, A. M.; Kamenskiy, M. D.; Kozlov, M. D.; Lisovski, G. S.; Sinelobov, K. S.;
Trebulev, P. V.; Uspenskiy, B. S.; Kheyfits, M. D.; Shvetsov, M. A.

ORG: none

TITLE: Nikolay Nikolaysvich Krachkovskiy

SOURCE: Elektrichestvo, no. 1, 1965, 90

TOPIC TAGS: electric power engineering, electric engineering personnel

ABSTRACT: Brief biography of subject, a senior scientific associate of the Institute of Power Engineering AS USSR, on the occasion of his 75th birthday on 16 Dec 64. He was graduated from the Leningrad Polytechnical Institute in 1916. Worked for a number of years in the planning, surveying, construction and operation of the first HV transmission lines and substations. From 1922 to 1926, participated in the planning and construction of the first Soviet hydroelectric station (Volkov GES im. Lenin) and 110 kv transmission line. In 1927-1932, designed transmission lines at the GET (State Electrical Engineering Trust) and the Leningrad branch of Dneprostroy. Chief of electric power and transmission section at Sverdlovsk, Volgostroy and Leningrad Energoprojekt (1932-1938); simultaneously studied 100-cycle current for AS USSR and participated in planning the Kuybyshev GES - Moscow transmission line. Worked at Leningrad Gidroprojekt until 1947, and at Moscow Gidrenergoprojekt until 1955. Among the first to propose

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UDC: 621.31

17
16
B

L 11549-66

ACC NR. AP6005027

converting the Kuybyshev - Moscow line from 400 to 500 kv. An ardent advocate of d-c for HV and EHV transmission. Authored over 75 scientific and technical articles, and two inventions. Awarded the Order of the Red Banner of Labor and other decorations. Orig. art. has: 1 figure. JPRS 14

SUB CODE: 09 / SUBM DATE: none

MW
Card 2/2

KOZLOV, M.D.

Structural planning and design groups are active in mines.
Ugol' Ukr. 4 no.5:22-24 My '60. (MIRA 13:8)

1. Glavnyy inzhener treata Budennovugol'.
(Mining engineering)

1. KOZLOV, M. D.
2. USSR (600)
4. Sowing
7. Progressive practice in checkrowing cultivated crops. Dost. sel'khoz. No. 5, 1953.

9. Monthly List of Russian Accessions, Library of Congress, April 1953. Unclassified.

LEVIN, V.I.; SEREBRYAKOV, N.G.; KOZLOV, M.D.

Physicochemical properties of a new radiotherapeutic preparation
containing P^{32} . Med. rad. 5 no.4, 53-55 Ap '60. (MIRA 13:12) ←
(PHOSPHORUS ISOTOPES)

GONCHARENKO, D.I., kand. tekhn. nauk; BROZDOV, V.L., inzh.; NOVIKOV, Yu.A.,
inzh.; BRODSEIY, V.Sh., inzh.; KOZLOV, M.S.; GUSHAKOV, V.A.

Using plow scrapers in mining coal seams dangerous because of
sudden ejections of coal and gas in the Vostokhnaya Mine.
Ugol' 40 no.1:37 Ja '65. (MIRA 18:4)

1. Donetskii nauchno-issledovatel'skiy ugol'nyy institut
(for Goncharenko, Brozdov, Novikov, Brodskiy). 2. Glavnyy
inzh. tresta Proletarskugol' (for Kozlov). 3. Glavnyy inzh.
shakhty "Vostokhnaya" tresta Proletarskugol' kombinata
Donetskugol' (for Glushakov).

ALEKSANDROV, B.K.; BURMAN, B.A.; BROZLOV, N.G.; DUBINSKIY, I.A.;
MILINSKIY, A.M.; KAMENSKIY, N.D.; KOZLOV, M.D.; LISOVSKIY, G.S.;
SHEVCHENOV, K.S.; TREBULEV, P.V.; USPENSKIY, B.S.; ZHAYITS, M.D.;
ZHVETSOV, M.A.

Nikolai Nikolaevich Krachkovskii, 1889- ; on his 75th Birthday.
Elektrichestvo no.1:90 Ja '65. (MIRA 18:7)

Kozlov, M.F.

MAKHNACH, A.S.; STEFANENKO, A.Ya.; TSAPENKO, M.M.; KOZLOV, M.F.; BOGOMOLOV,
G.V., redaktor; BARABANOVA, L., redaktor izdatel'stva; ALEKSANDRO-
VICH, Kh., tekhnicheskiy redaktor

[Brief outline of the geology of White Russia] Kratkii ocherk geologii
Belorussii. Minsk, Izd-vo Akad.nauk Belorusskoi SSR, 1957. 214 p.
(MLRA 10:9)

1. Institut geologicheskikh nauk Akademii nauk Belorusskoy SSR (for
Makhnach, Stefanenko, TSapenko, Kozlov). 2. Chlen-korrespondent
Akademii nauk Belorusskoy SSR (for Bogomolov)
(White Russia--Geology)

KOZLOV, M.F.

Geological structures of the Polesye in the Pripet Valley.
Trudy Inst.geol.nau.BSSR no.1:90-101 ' 58. (MIRA 12:1)
(Polesye--Geology, Structural)

KOZLOV, M.F., kand. geologo-mineral. nauk

Mineral waters of White Russia. Vestsi AN BSSR. Ser. fiz.-tekh.
nav. no.1:82-86 '59. (MIRA 12:6)
(White Russia--Mineral waters)

KOZLOV, M.F.

Current state of, and problems in the study of mineral waters of
the White Russian S.S.R. Trudy Inst. geol. nav. An BSEB no. 2:166-
173 '60. (MIRA 13:12)

(White Russia--Mineral waters)

KOZLOV, M. F.[Kaslou, M. F.]; SHILINSKAYA, Ya. M.[Shylinskaia, IA. M.]

Balance of ground water in the basin of the middle reaches
of the Sluch River. Vestsi AN BSSR. Ser. fiz.-tekh. nav. no.1:
87-97 '63. (MIRA 16:4)

(Sluch Valley--Water, Underground)

L 46009-66 EWT(1) GW
ACC NR: AR6029452

SOURCE CODE: UR/0169/66/000/005/D001/D001

AUTHOR: Kozlov, M. F.; Shapoval, L. I.; Fadeyeva, M. V.

15
B

TITLE: Principles of the disposition of a network of deep observation wells on the territory of the Belorussian SSR

SOURCE: Ref. zh. Geofizika, Abs. 5D4

REF SOURCE: Sb. Materialy 1-y Nauchn. konferentsii molodykh geologov Belorussii. Minsk, 1965, 147-148

TOPIC TAGS: geophysical exploration, [✓]Belorussian geostructure

ABSTRACT: In establishing a network of exploration wells within the territory of the Belorussian SSR the basic criteria used were geostructural elements which were at the same time large hydrogeological units. Such geostructural elements in the west are the Belorussian Massif and the adjacent Brest and sub-Baltic depressions, and in the east the Moscow and Pripyat' basins. In determining the location of wells within the individual hydrogeological regions, hydrodynamic, hydrochemical, geothermal, and gas characteristics of the different abyssal layers were taken into account. M. Konychev. [Translation of abstract] [SP]

SUB CODE: 08/
Card 1/1-11/1

UDC: 550.9(476)

ACC NR: AF/000023

SOURCE CODE: UR/0051/66/021/005/0532/0537

AUTHOR: Kozlov, M. G.; Nikonova, Ye. I.; Startsev, G. P.

ORG: none

TITLE: Absorption spectra in the vacuum region of aluminum-group metal vapors. I. Thallium and aluminum

SOURCE: Optika i spektroskopiya, v. 21, no. 5, 1966, 532-537

TOPIC TAGS: aluminum, thallium, metal vapor, absorption spectrum, absorption edge, ionization potential, line spectrum, continuous spectrum, oscillator strength

ABSTRACT: The authors investigate the absorption spectra of aluminum and thallium vapor in the spectral region 210 - 150 nm, in which are located the ionization continua and the lines corresponding to electron transitions to levels lying above the first ionization potential of the atom. The spectra were obtained with a continuous-spectrum source (hydrogen discharge in quartz capillary), a vacuum oven with graphite heating element (described in Opt. i spektr. v. 16, 717, 1964), and a spectrograph. The thallium spectrum, photographed at 1030 - 1200K, consists of a series of lines converging to a limit at 203.0 nm, a strong line at 200.7 nm corresponding to a transition from the ground state to $6s6p^2 \ ^4P_{3/2}$, and a very broad line below 170.0 nm corresponding to the transition $6s^26p \ ^2P_{1/2}^0 - 6s6p^2 \ ^2D_{3/2}$. The maximum absorption cross section of the ionized continuum is 4.0 megabarn (Mb) at 203.0 nm at the edge of the series. The oscillator strength of the 200.7 nm line is 4×10^{-3} . The lifetime of the correspond-

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UDC: 535.341: 543.420.62

ACC NR: AP7000023

ing $6s6p^2 \ ^4P_{3/2}$ state is 4×10^{-14} sec. The aluminum spectra were photographed at temperatures 1400 - 1700K. The absorption spectrum consists of a series of lines converging to a limit 207.0 nm, two lines at 193.6 and 193.2 nm corresponding to the $3s^23p \ ^2P^0 - 3s3p^2 \ ^2S$ transition, which are of interest in view of the sharp gap observed in this vicinity in the solar spectrum, and a quartet of lines between 176.1 and 177.0 nm, corresponding to the transition $3s^23p \ ^2P^0 - 3s3p^2 \ ^2P$. The obtained oscillator strengths for the 193.6 and 193.2 lines, 0.21 and 0.25 respectively, do not agree with other published data. The oscillator strengths obtained for the quartet range from 0.002 to 0.008. There are no published data to compare with them. The aluminum absorption cross sections range from 100 Mb for the continuum to 120 - 164 Mb for the lines. The lifetimes range from 1.2 to 6.7×10^{-13} sec. Orig. art. has: 4 figures, 3 formulas, and 1 table. [02]

SUB CODE: 20/ SUBM DATE: 12Jul65/ ORIG REF: 005/ OTH REF: 008/
ATD PRESS: 5109

Card 2/2

KOZLOV, M.I.

Estonian swine growers are fulfilling their obligations.
Svinovodstvo 13 no.11:6-8 N '59. (MIRA 13:2)

1. Zamestitel' Ministra sel'skogo khozyaystva Estonskoy SSR.
(Estonia--Swine)

VENZHER, V.G., doktor ekon.nauk, nauchnyy sotrudnik; KOZLOV, M.I., kand. ekon.nauk, nauchnyy sotrudnik; SEMENOV, S.I., kand.sel'skokhoz. nauk, nauchnyy sotrudnik; SIDOROVA, M.I., kand.ekon.nauk, nauchnyy sotrudnik; BANNIKOV, N.A., red.; GUREVICH, M.M., tekhn.red.; ZUBRILINA, Z.P., tekhn.red.

[Production expenditures and the cost of products on collective farms] Izderzhki proizvodstva i sebestoimost' produktsii v kol-khozakh. Moskva, Gos.izd-vo sel'khoz.lit-ry, 1960. 256 p.

(MIRA 13:5)

1. Akademiya nauk SSSR. Institut ekonomiki. 2. Institut ekonomii Akademii nauk SSSR. (for Venzher, Kozlov, Semenov, Sidorova).
(Collective farms--Costs)

KARNAUKHOVA, Ye.S., doktor ekonom. nauk, red.; KOZLOV, M.I., kand. ekon. nauk, red.; GAVRILOV, V.I., red.; OBOLENSKIY, K.P., kand. ekon. nauk; ZAVERNYAYEVA, L.V., red.; PONOMAREVA, A.A., tekhn. red.

[Possibilities and ways for increasing labor productivity in the agriculture of the U.S.S.R.] Rezervy i puti povysheniya proizvoditel'nosti truda v sel'skom khoziaistve SSSR; doklady i vystupleniya. Red. kollegiia: E.S.Karnaukhova i dr. Moskva, Ekonomizdat, 1962. 490 p. (MIRA 15:5)

1. Soveshchaniye po voprosam vyyavleniya rezervov i putey povysheniya proizvoditel'nosti truda v sotsialisticheskom sel'skom khozyaystve, 1960. 2. Institut ekonomiki Akademii nauk SSSR (for Karnaukhova, Kozlov). 3. Nauchno-issledovatel'skiy ekonomicheskii institut Gosudarstvennogo nauchno-ekonomicheskogo soveta Soveta Ministrov SSSR (for Obolenskiy).
(Agriculture)

SERGIYENKO, S.R.; MOISEYKOV, S.F.; KOZLOV, M.I.; LORDYIPANIDZE, G.A.

Prospects of the development of the petroleum refining and
petrochemical industries in Turkmenistan. Izv.AN Turk.SSR.Ser.
fiz.-tekh., khim.i geol.nauk no.3:3-12 '63. (MIRA 17:3)

KARNAUKHOVA, Ye.S., red.; KOZLOV, M.I., red.

[Ways to increase labor productivity in the agriculture
of the U.S.S.R.] Puti povysheniya proizvoditel'nosti
truda v sel'skom khoziaistve SSSR. Moskva, Nauka, 1964.
390 p. (MIRA 18:2)

1. Akademiya nauk SSSR. Institut ekonomiki.

GUTKIN, A.A.; KOZLOV, M.M.; NASLEDOV, D.N.; SEDOV, V.Ye.

Long-wave edge of the photoeffect and recombination emission in GaAs
p - n-junctions. Fiz. tver. tela 5 no.12:3617-3620 D '63.

(MIRA 17:2)

1. Fiziko-tehnicheskii institut imeni A.F.Ioffe AN SSSR, Leningrad.

DORIN, V.A.; KOZLOV, M.M.

Measurements of potential distribution in semiconductor
rectifiers by means of a probe. Izv. vys. ucheb. zav.; fiz. no. 3:
97-101 '64. (MIRA 17:9)

1. Leningradskiy politekhnicheskiy institut imeni Kalinina.

L 15679-65 EWP(a)/EWP(t)/EWP(b) ASD-3/AFPTO/ESD-3/IJP(c)/ESD(t)/SSD/
AFWL/RAEM(a) JD/JG
ACCESSION NR: AP4047485 S/0120/64/000/005/0184/0186

AUTHOR: Gutkin, A. A.; Kozlov, M. M.; Nasedov, D. N.; SaGov, V. Ye.;
Talalakin, G. N.

TITLE: Localization of p-n junctions in gallium arsenide by means of an MIK-1
infrared microscope 27

SOURCE: Pribery* i tekhnika eksperimenta, no. 5, 1964, 184-186

TOPIC TAGS: gallium arsenide, pn junction, infrared microscope / MIK-1
infrared microscope 0

ABSTRACT: Specimens were prepared from n-GaAs single crystals having an
electron concentration of 10^{17} - 5×10^{16} /cm³ and a mobility of 2,000 - 3,500
cm² /v sec; the p-n junction was obtained by diffusing Zn whose concentration on
the surface of the p-region was 5×10^{18} - 10^{20} /cm³; the specimens were 0.1 - 1
mm thick. Three methods were used for localizing p-n junctions: (a) in

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L 15679-65
ACCESSION NR: AP4047485

2

transmitted infrared light; (b) in reflected infrared light; (c) by recombination radiation of the junction. These advantages are listed: (1) Low error of localization, $\pm 0,5$ micron; (2) No need for any treatment of the specimen surface (staining, etching) which might contaminate the surface; (3) In methods "a" and "c," the entire area of the junction is visible. The limits of applicability of the above methods are given. "The authors wish to thank Ya. A. Okeman for his help in preparing the test specimens." Orig. art. has: 2 figures and 1 table.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN SSSR (Physico-Technical Institute, AN SSSR)

SUBMITTED: 02Nov63

ENCL: 00

SUB CODE: EC, OP

NO REF SOV: 001

OTHER: 006

Card 2/2

ACCESSION NR: AP4013307

S/0032/64/030/002/0206/0206

AUTHORS: Dorin, V. A.; Kozlov, M. M.

TITLE: Silicon carbide probe for testing semiconductor materials

SOURCE: Zavodskaya laboratoriya, v. 30, no. 2, 1964, 206

TOPIC TAGS: silicon carbide, silicon carbide probe, semiconductor probe

ABSTRACT: A silicon carbide probe with a resistivity of 10 ohm-cm has been devised for testing hard semiconductor materials. The probe (see Fig. 1 of Enclosure) consists of a sharp point (1) which is fixed with tin in a copper holder (2). The holder is attached to fluorine-bearing plates (3) with a screw (4). The point scribes a line about 1.5 μ wide. The contact resistance of the probe is 10⁹ ohm. This instrument can be used for testing selenium and titanium dioxide. Orig. art. has: 1 figure.

ASSOCIATION: Leningradskiy politekhnicheskii institut (Leningrad Polytechnical Institute)

Card 1/1

L 3928-66 EWT(1)/EWT(m)/T/EWP(t)/EWP(b)/EWA(h) IJP(s) JD/AT
 ACC NR: AP5025399 SOURCE CODE: UR/0181/65/007/010/3115/3118
 AUTHOR: Imenkov, A. N.; Kogan, L. M.; Kozlov, M. M.; Meskin, S. S.; Nasledov, D. N.; Tsarenkov, B. V.
 ORG: Physicotechnical Institute im. A. F. Ioffe, AN SSSR, Leningrad (Fiziko-tekhni-cheskiy institut AN SSSR)
 TITLE: The effect of impurities on the recombination radiation of gallium arsenide
 SOURCE: Fizika tverdogo tela, v. 7, no. 10, 1965, 3115-3118
 TOPIC TAGS: recombination radiation, gallium arsenide, pn junction, impurity, acceptor, donor
 ABSTRACT: The effect of Zn, Cd, Mn, and Fe impurities on the recombination radiation of GaAs p-n junctions was experimentally investigated. The junctions were formed by direct diffusion of the element, by simultaneous diffusion of Mn and Cd and Fe and Cd, or by diffusion of Mn and then Cd, or Fe and then Cd into n-type GaAs with an electron concentration (N_n) of 5×10^{16} — 3×10^{18} cm⁻³ (crystals with $N_n > 7 \times 10^{17}$ cm⁻³ were doped with Te). The junction area was 10^{-3} — 10^{-4} cm². The recombination spectra were measured at 77 and 293K in the photon energy range between 0.7 and 1.6 ev. The spectra were recorded at direct injection currents at which the energy of the short wavelength band was independent of the current. The experimental data are given in Fig. 1 and Table 1. The band with $h\nu_{\max} \approx 1.01$ ev (77K) and $h\nu_{\max} = 0.95$ — 0.98 ev
 Card 1/4

L 3928-66

ACC NR: AP5025399

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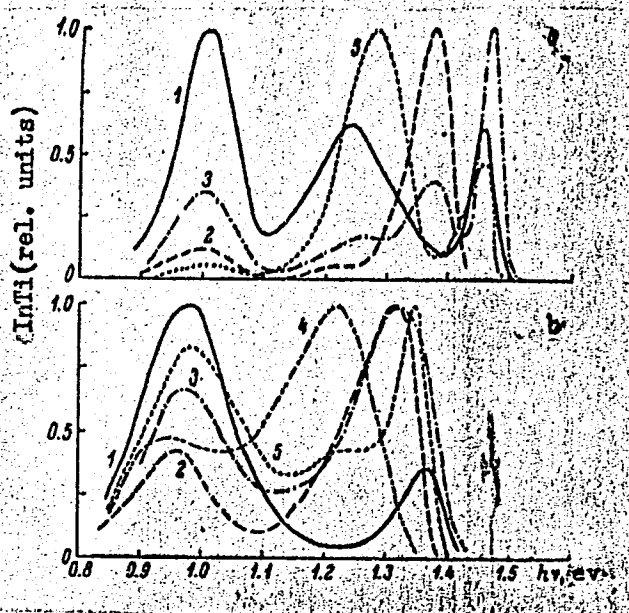


Fig. 1. Recombination radiation of n-GaAs p-n junction doped with:

1 - Cd; 2 - Mn; 3 - Mn and then Cd; 4 - Fe; 5 - Fe and then Cd;

a - T = 77K; b - 293K. (The absolute values of intensity differ from specimen to specimen).

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Table 1. Photon energy in the band peaks ($h\nu_{max}$) and band halfwidths

Impurity	r. n.	Emission Band			
		Peak Energy Range (eV)	Peak Energy (eV)	Band Halfwidth (eV)	Band Halfwidth (eV)
$5 \cdot 10^{18} < n_a < 7 \cdot 10^{17}$ cm ⁻³ Zn	77	1.48-1.47 (0.015-0.022)	-	1.27 (0.12)	1.02 (0.12)
	293	1.38-1.36 (0.035-0.050)	-	-	0.97 (0.14)
$3 \cdot 10^{18} > n_a > 10^{18}$ cm ⁻³ Zn	77	1.47-1.46 (0.022-0.030)	-	1.20-1.36	1.02 (0.12)
	293	1.38-1.36 (0.035-0.050)	-	-	0.97 (0.14)
Cd	77	1.48-1.46 (0.025-0.045)	-	1.25 (0.15)	1.01 (0.12)
	293	1.38-1.36 (0.040-0.060)	-	-	0.97 (0.14)
Mn	77	-	1.39-1.38 (< 0.10)	-	1.02 (0.12)
	293	-	1.33-1.32 (0.13)	-	0.96 (0.15)
Mn + Cd	77	≈ 1.47 (0.045)	1.385 (< 0.10)	1.26	1.01 (0.12)
	293	1.37-1.32 (0.14-0.05)	-	-	0.98 (0.15)
Fe	77	-	1.28	-	1.01
	293	-	1.22 (0.18)	-	0.97-0.95
Fe + Cd	77	≈ 1.46 (0.045)	1.28 (0.12)	-	1.02
	293	1.36	1.21	-	0.97 (0.16)

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(293K) and the band with $h\nu_{\max} \approx 1.25$ ev, clearly defined only at 77K in junctions doped with Zn and Cd and less sharply defined in those doped with Mn and Fe, were attributed to recombination radiation of excess carriers via the deep levels with activation energies of 0.5 and 0.25 ev, respectively. Orig. art. has: 2 figures and 1 table. [CS]

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Card 4/4

DGRIN, V.A.; KOZLOV, M.M.

Defects in p - n-junctions affecting creep in selenium rectifiers.
Izv. vys. ucheb. zav.; fiz. 8 no.4:112-115 '65. (MIRA 18:22)

1. Leningradskiy politekhnicheskij institut. Submitted January
8, 1964.

L 01828-66 ENT(1)/ENT(m)/EMP(1)/EWD(m)/T/EWP(1)/ENF(b)/EMA(h) IJP(c) RLL/
JD/AT

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UR/0109/65/010/008/1518/1522
539.293.011.41

49.55
AUTHOR: Dorin, V. A.; Kozlov, M. M.

TITLE: Investigation of the potential distribution in the reverse direction in a p-Se layer adjacent to n-CdSe

SOURCE: Radiotekhnika i elektronika, v. 10, no. 8, 1965, 1518-1522

24.14.55
TOPIC TAGS: selenium; cadmium selenide, electric potential, p n junction, semiconductor device

ABSTRACT: The potential was measured at the polished end of a Se layer 80—100 μ thick. Se conductivity was 1—10 ohm·m. A thin (under 1 μ) film of n-CdSe obtained by a reactive-diffusion process formed a junction with Se. A voltage of 30—35 v was applied to the specimen, and a steel probe was set at 4 μ from the junction. Potential-distribution curves were measured. It was found that 1) the space charge at a distance of 4 μ from the junction is practically nil; 2) the reactive-diffusion-produced contact is, in fact, a defective hetero-p-n junction (conducting channels can be found in the junction); and 3) the nonuniformity of the p-n junction can be

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adequately studied by measuring the potential in Se in the reverse direction. Orig
art. has: 4 figures, 1 formula, and 1 table. [03]

ASSOCIATION: Leningradskiy politekhnicheskiy institut (Leningrad Polytechnic
Institute)

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OTHER: 003

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