5 (3)

SOV/20-126-6-35/67

AUTHORS: Korshak, V. V., Corresponding Member AS USSR, Frunze, T. M., Kurashev, V. V., Alybina, A. Yu.

TITLE: On Some Characteristic Features of the Non-equilibrium Polycondensation (O nekotorykh osobennostyakh neravnovesnoy polikondensatsii)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 126, Nr 6, pp 1270 - 1273 (USSR)

ABSTRACT: This paper, the experimental part of which was worked out with the assistance of P. A. Aliyevskiy gives only part of the results obtained. A detailed description will be published later. The equilibrium polycondensation (Ref 1) which takes place under the interaction of diamines (Ref 1) is characterized by several characteristic features among them by the reversibility both of the main reaction of the polymer synthesis (see scheme) as well as the accompanying conversions (of the exchange reactions) which take place simultaneously (Ref 2). Such exchange reactions, which have mostly destructive character, take place between the growing polyamide molecules at the expense of the end groups as well as of the amide bonds in the macromolecule

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(Ref 3). They bring about a certain, rather close distribution of the forming polymer according to the specific weights (Ref 4). The exchange reactions lead to the fact that in the equilibrium polycondensation a state occurs which is denoted as "polycondensation equilibrium" (Ref 5). The excess of one of the reaction products disturbs this equilibrium and influences the molecular weight of the formed product (Ref 6, Fig 2). The present investigation was carried out in order to determine whether these dependences change if the polycondensation is carried out as a non-equilibrium process. As an example of such a reaction the interaction between dicarboxylic acid chlorides with diamines may be used (see scheme). If this reaction is carried out at the boundary between two phases by dissolving the initial substances in two liquids which do not mix with each other (Ref 7), then it takes place very rapidly also at low temperatures i.e. under conditions at which no counter reactions occur. The authors investigated the reaction between hexamethylene diamine with alkali addition and adipinic acid chloride. It may be seen from figure 1 that the optimum concentration which leads to high yields in the production of

On Some Characteristic Features of the Non-equilibrium Polycondensation SOV/20-126-6-35/67

high-molecular products is the 0.15 mol/l solution. Both reagents were solutions of the same concentration. In order to solve the problem of the effect of the ratio of the initial substance on the molecular weight of the forming polymers a test series was carried out in which either the one or the other initial substance formed an excess. In spite of large excesses the obtained polyamides had practically no equal molecular weights (Table 1). In the case of an equilibrium polycondensation, in the reaction of dicarboxylic acids with diamines (Fig 2) this excess produces strong effects. In this case, the factor which interrupts the reaction and the growth of the chain is the formation of a polyamide film on the separation surface of the phases through which the initial reagents may not diffuse. An addition of butyric acid chloride to the solution of the initial acid chloride in benzene considerably reduces the molecular weight of the forming polyamide (Figs 3 and 4). A polymer, which has groups incapable of reaction, at the two ends, looses the capability of a further growth. There are 4 figures, 1 table, and 7 references, 6 of which are Soviet.

Card 3/4
3

Inst. Elemento-Organic Cmpds. AS USSR

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SOV/20-128-5-27/67

~~5(2,3)~~ 5.3700 (c)

AUTHORS: Korshak, V. V., Corresponding Member, AS USSR, Polyakova, A. M., Vdovin, V. M., Mironov, V. F., Petrov, A. D., Corresponding Member, AS USSR

TITLE: On the Interaction of Tetraalkyldihydridedisiloxanes With Difunctional Unsaturated Compounds

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 128, Nr 5, pp 960 - 963 (USSR)

ABSTRACT: The disiloxanes mentioned in the title react with acetylene under atmospheric pressure in the presence of small quantities of a 0.1 m solution of chloroplatinic acid in isopropyl alcohol and form polymer products. In the paper under review the authors investigate a similar reaction (see Diagrams). The same catalyst was used. Polymers in the form of viscous oils in a yield of up to 80% are formed due to the reaction of equimolar quantities of the two components. A diagram shows the structure of the links of these polymers according to the infra-red absorption spectra and the elementary analysis. Table 1 shows the results obtained. Hence it appears that the analysis results are in good agreement with the results obtained

4

Card 1/2

ZAYONCHKOVSKIY, Anton Denisovich; KORSHAK, V.V., otv.red.; VYALYKH, Ye.Kh., red.izd-va; POLYAKOVA, T.V., tekhn.red.

[Artificial leather] Iskusstvennaia kozha. Moskva, Izd-vo Akad.nauk SSSR, 1960. 48 p. (MIRA 14:2)
(Leather, Artificial)

GEFTER, Yevgeniy Leonidovich; KABACHNIK, M.I., akademik, otv.red.; KORSHAK, V.V., otv.red.; LOSKUTOVA, I.P., red.izd-va; KUZ'MIN, I.V., tekhn.red.

[Organophosphorus monomers and polymers] Fosfororganicheskie monomery i polimery. Moskva, Izd-vo Akad.nauk SSSR, 1960. 287 p. (MIRA 13:3)

1. Chlen-korrespondent AN SSSR (for Korshak).
(Phosphorus organic compounds)

KORSHAK, V. V.

PHASE I BOOK EXPLOITATION SOV/4506

Kolesnikov, German Sergeyevich

Sintez vinil'nykh proizvodnykh aromaticheskikh i geterotsiklicheskikh soyedineniy (Synthesis of Vinyl Derivatives of Aromatic and Heterocyclic Compounds) Moscow, Izd-vo AN SSSR, 1960. 302 p. Errata slip inserted. 4,000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut elementoorganicheskikh soyedineniy.

Resp. Ed.: V. V. Korshak, Corresponding Member, Academy of Sciences USSR; Ed. of Publishing House: D. A. Katrenko; Tech. Ed.: O. M. Gus'kova.

PURPOSE: This book is intended for organic and industrial chemists interested in the synthesis of high polymer compounds.

COVERAGE: The book is a comprehensive review of the initial chemical compounds used in the synthesis of vinyl polymers. The author presents methods of preparation and the physicochemical properties of vinyl derivatives of aromatic and heterocyclic

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Synthesis of Vinyl Derivatives (Cont.) SOV/4506

compounds. No personalities are mentioned. There are 391 references, mainly English.

TABLE OF CONTENTS:

~~Card 2/19~~

KORSHAK, V. V., SOSIN, S. L., ALEKSEYEVA, V. P.

"On the preparation of new types of linear polymers by polyrecombination."

report presented at the International Polymer Symposium, (IUPAC), Moscow, USSR, 14-18 June 1960.

31457
S/629/60/000/003/003/011
D202/D305

5.3830

AUTHORS: Korshak, V. V., Sosin, S. L., and Chistyakova, V. M.

TITLE: The polyrecombination reaction as a method for producing polymers

SOURCE: Vsesoyuznoye khimicheskoye obshchestvo imeni D. I. Mendeleyeva. Uspekhi khimii i tekhnologii polimerov, sb. 3, Moscow, Goskhimizdat, 1960, 39-46

TEXT: A summary and discussion of results obtained by the authors in their previous investigations, published in 1957 and 1958 (Izv. AN and DAN SSSR). It was found that for producing linear polymers from saturated compounds, it is necessary to use peroxides or other free-radical forming substances in the molar ratio at least 1 : 1 to the saturated compound. The formation of a *p*-di-*iso*-propyl benzene polymer with tert.-butyl peroxide is discussed in detail. Three different products were obtained: a) A low molecular weight condensation product consisting of dimers and trimers; b) a high molecular weight product (up to 10,000) linear, soluble in

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D202/D305

The polyrecombination reaction ...

molecules into three-dimensional networks. The authors refer to their experiments with different solvents which were carried out in order to avoid the formation of insoluble products, but in that case only compounds of low molecular weight have been obtained. Experiments with the same peroxide yielded linear polymers from the following hydrocarbons: *p*-dichlorobenzene, *p* -xylylendichloride, 4,4'-di-*iso*-propyl diphenyl, acetic and trifluoroacetic acid benzyl esters. [Abstractor's note: It is not clear if in this article the authors describe new work, or simply summarize their previous publications.] There are 3 figures and 14 references: 4 Soviet-bloc and 10 non-Soviet-bloc. The 4 most recent references to the English-language references read as follows: H. McBay, O. Tucker and A. Milligan, J. Org. Chem., 19, 869, (1954); ibid., 19, 1003, (1954); L. Beckwith and W. Waters, J. Chem. Soc., 1008, (1956); I. H. Brook, Trans. Faraday Soc., 53, 327, (1957).

Card 3/3

S/595/60/000/000/002/014
E075/E435

AUTHORS: Korshak, V.V., Sosin, S.L., Krichevtsev, B.K.

TITLE: Formation of terephthalic acid by catalytic oxidation of p-dialkyl substituted benzene hydrocarbons with molecular oxygen

SOURCE: Vsesoyuznoye soveshchaniye po khimicheskoy pererabotke neftyanykh uglevodorodov v poluprodukty dlya sinteza volokon i plasticheskikh mass. Baku, 1957. Baku, Izd-vo AN Azerb. SSR, 1960. 119-130

TEXT: The work described began several years ago with the aim of finding means of producing terephthalic acid by oxidation with oxygen from the air. A review of the previous work leads to the conclusion that the oxidation of p-dialkylbenzenes in the gaseous phase is not feasible due to relatively poor thermal stability of terephthalic acid. A new improved method of producing terephthalic acid is described, whereby p-xylene and methyltoluate are oxidized simultaneously in the liquid state. In this process each of the components oxidizes more readily than the compounds taken separately, with 90% yield. The improvement is explained by the presence in the mixture of p-xylene which

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Formation of terephthalic acid ...

helps to maintain the reacting mass liquid and thus facilitates the absorption of oxygen. From the point of view of the chemistry of oxidation, the reaction of a compound difficult to oxidize is facilitated in the presence of another compound which is easy to oxidize. This is in accordance with the radical-peroxide mechanism of Semenov-Bach. The simultaneous oxidation is carried out in a stainless steel reactor. It was noticed that certain metals, such as copper, inhibit the oxidation process. Finally, a two-stage process for the production of dimethyl-terephthalate was established. The first stage is the oxidation of p-xylene (98% purity). The best conditions for this process are as follows: Catalyst - salts of cobalt (oleate, resinate, mixtures of acids C_7-C_9,C_{14}-C_{16}), 0.2%; Temperature: 140 to 145°C; Pressure: 5 to 10 atm; amount of air: 200 litres/h for 1 litre of p-xylene; time of oxidation: 4 to 5 h. Under these conditions 40 to 45% of p-xylene is oxidized to p-toluic and terephthalic acids. The second stage - oxidation of the mixture of p-xylene (35%) and methyl p-toluate (65%) - should be carried out at 140 to 190°C in the presence of cobalt salts. The yield of acids is between 85 and 90% theoretical. Two methods of

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E075/E435

Formation of terephthalic acid ...

esterification of the acids with methanol were employed: 1) esterification catalyzed by H_2SO_4; reagent ratios methanol: organic acids:H_2SO_4 equal to 10:1:0.5; the reaction was carried out at 64 to 65°C at atmospheric pressure for 20 to 24 h; the yield was 75 to 80%; 2) thermal esterification methods; no catalyst is used and the reaction is carried out in a continuous reactor at 225 to 230°C under 50 to 100 atm; yield 85%. This method gives methyl p-toluate contaminated with resinous products. Esterification with cathion exchangers as catalysts (types КУ-1 (KU-1), КУ-2 (KU-2) and others) is of great practical interest. At 120°C (5 atm) and a ratio of methanol and acids 9:1 to 2.5:1 and catalyst and acids ratio 2:1, 95% of the acids are esterified in one hour. The reaction can be carried out continuously with the catalyst not losing its activity for more than 500 h. The catalyst can be easily regenerated by washing with HCl or H_2SO_4. The purification of dimethylterephthalate was carried out by vacuum distillation followed by recrystallization from methanol. The formation of aromatic dicarboxylic acids by oxidation of methyl esters is of general applicability as shown below

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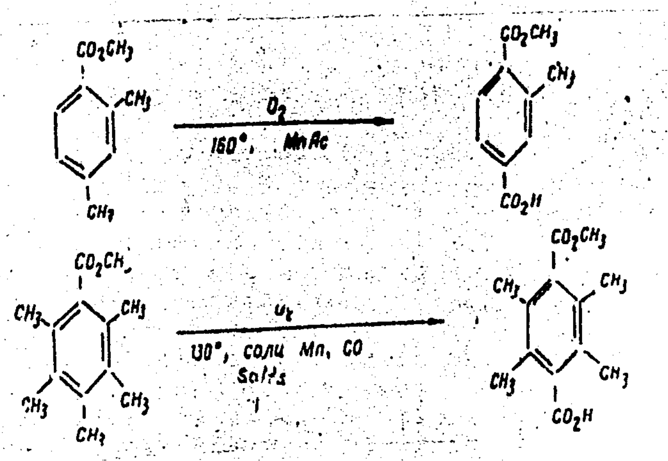
E075/E435

Formation of terephthalic acid ...



The work was carried out at the Laboratoriya vysokomolekulyarnykh soyedineniy INEOS AN SSSR (Laboratory for high-molecular compounds INEOS AS USSR) and later at the MKhTI im. Mendeleyeva.

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Card 5/5

Korshak, V.V.

82075
S/190/60/002/01/01/021
B004/B061

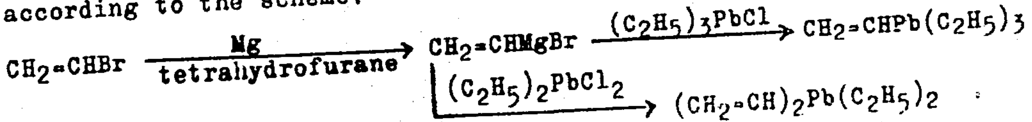
5.3700C

AUTHORS: Korshak, V. V., Polyakova, A. M., Suchkova, M. D.

TITLE: Synthesis of Vinyl Compounds and a Study of Their Polymerization

PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 1, pp. 13 - 19

TEXT: The authors succeeded in synthetizing the following compounds, which had previously not been described in publications: triethylvinyl lead (TEVL) and diethyldivinyl lead (DEDVL). The synthesis proceeded according to the scheme:



$$CH_2{=}CHBr \xrightarrow[\text{tetrahydrofurane}]{Mg} CH_2{=}CHMgBr \xrightarrow{(C_2H_5)_3PbCl} CH_2{=}CHPb(C_2H_5)_3$$

$$CH_2{=}CHMgBr \xrightarrow{(C_2H_5)_2PbCl_2} (CH_2{=}CH)_2Pb(C_2H_5)_2$$

TEVL is a colorless liquid, with a boiling point of 57 - 57.5°C at

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Synthesis of Vinyl Compounds and a Study of Their Polymerization

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8 torr, and it is stable up to 120°C. Complete decomposition with precipitation of lead occurs at 165°C. DEDVL is also a colorless liquid (boiling point 74 - 74.5°C at 13 torr), and it is not very stable. Azoisobutyric acid - dinitrile, tributylboron, tributylaluminum, tetraethyl lead, tert-butylperoxide and -hydroperoxide, and benzoylperoxide were used as initiators in the polymerization of these compounds. The results are given in Table 1. With tert-butylperoxide at 120°C and 6000 torr, TEVL gave 27.8% yellowish unstable oil with a molecular weight of 1100. The other initiators and lower temperatures did not lead to polymerization. Under the action of the peroxides at 120 - 130°C decomposition occurred, liberating lead. Attempts at copolymerization were carried out with 1) styrol, 2) α-methylstyrol, and 3) methylmethacrylate at 6000 atm. Experiment 3) was not successful. Experiments 1) and 2) gave polymers with 4.5 - 6% Pb. Table 2 gives the results. These polymers had lower melting points and viscosities than the corresponding homopolymers (Fig. 1). DEDVL was even less stable. Decomposition occurred on the reaction with disiloxane in the presence of H_2PtCl_6 or platinum on carbon (Table 3). Details of the reactions carried

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KORSHAK, V.V.; VINOGRADOVA, S.V.; LEBEDEVA, A.S.

Heterochain polyesters. Part 26: Study of some laws governing polyesterification at the interface. Vysokom.soed. 2 no.1: 61-66 Ja '60. (MIRA 13:5)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.
(Esterification) (Polymerization)

81582

S/190/60/002/03/05/014
B020/B066

5.3630

AUTHORS: Korshak, V. V., Gribova, I. A., Artamonova, T. V., Bushmarina, A. N.

TITLE: Synthesis and Polymerization of Aryl Phosphonitryls and Alkyl Phosphonitryls

PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 3, pp. 377-385

TEXT: The present paper deals with the reaction of diaryl and dialkyl phosphorus trichlorides with ammonium chloride in organic solvents with respect to a possible production of aryl and alkyl phosphonitryls. It is hardly believeable that all chlorine atoms in the molecules of dialkyl and diaryl phosphorus trichlorides be equally reactive and react at the same time with NH_4Cl. The authors also investigated the mechanism of this reaction, using diphenyl, dibutyl, and diethyl phosphorus trichlorides as initial products. The chloride of dibutyl thiophosphinic acid was obtained in a good yield by using M. I. Kabachnik's method (Ref. 7). The

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B020/B066

Synthesis and Polymerization of Aryl Phosphonitryls and Alkyl Phosphonitryls

conditions of reactions in organic solvents (chlorobenzene and dichlorobenzene) i.e., mainly temperature, molar ratio of the reaction components, duration of the reaction, etc. influenced the yield of the resultant products and their molecular weight. The reactions of diaryl and dialkyl phosphorus trichlorides proceed by a step-by-step mechanism showing three principal stages: 1) starting growth of the chain; 2) growth of the chain; 3) chain interruption. It was shown that at 175°, a diphenyl phosphorus trichloride/ammonium chloride ratio of 1:5, and with a reaction time of 20 hours octaphenyl tetraphosphonitryl is obtained in a 70% yield. From the experimental results obtained new concepts on the reaction mechanism were outlined. The polymerization of phosphonitryl derivatives in the temperature range 320 - 500° was studied on octaphenyl tetraphosphonitryl (Table). Under the present conditions (400 - 500°), a mixture of tri-, penta-, and hexamers is obtained as well as a product insoluble in organic solvents with a softening point of 350 - 450°. The preparation of diphenyl phosphorus trichloride, diethyl phosphorus trichloride, dibutyl phosphorus trichloride, octaphenyl tetraphosphonitryl, hexaphenyl triphosphonitryl, the compound $HO-P(C_6H_5)_2=N-P(C_6H_5)_2=N-P(C_6H_5)_2=N-P(C_6H_5)_2=O$, imido

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B020/B066

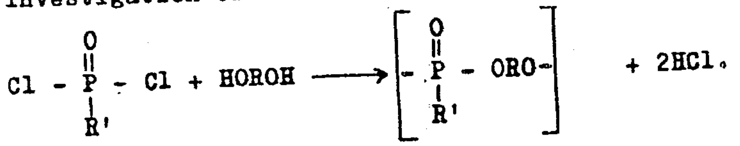
5.3630
5.3830

AUTHORS: Korshak, V. V., Gribova, I. A., Andreyeva, M. A.

TITLE: Investigation in the Field of Organophosphorus Polymers. IX. Polycondensation of the Dichlorides of Phosphinic Acids With Dioxy Compounds

PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 3, pp. 427-432

TEXT: The objective of the present paper was an investigation of the influence of various factors upon the polycondensation of the dichlorides of phosphinic acids with dioxy compounds as well as a kinetic investigation of this reaction which proceeds according to the scheme



$$Cl-\overset{\overset{O}{\|}}{\underset{\underset{R'}{|}}{P}}-Cl + HOROH \longrightarrow \left[-\overset{\overset{O}{\|}}{\underset{\underset{R'}{|}}{P}}-ORO-\right] + 2HCl.$$

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Investigation in the Field of Organophosphorus Polymers. IX. Polycondensation of the Dichlorides of Phosphinic Acids With Dioxy Compounds

The authors studied this reaction by the example of the interaction of equimolecular quantities of dichlorides of methyl phosphinic acid with hydroquinone and nitro-benzene in the temperature range 140-170° and with diethyl glycol and dichloro ethane at 40-80°. When studying the effect of the reaction time on the interaction of the dichloride of methyl phosphinic acid with dioxy compounds, the degree of completeness of the reaction was found to increase especially rapidly within the first hours of reaction when mainly the initial components react with one another. The degree of completeness (P) of the reaction was calculated from the equation $P = x/a$, where x is the quantity of hydrogen chloride released until a certain instant, and a the quantity of hydrogen chloride theoretically released by a 100% course of reaction. Fig. 1 shows a graph of the reaction kinetics of methyl phosphinic acid dichloride with hydroquinone and nitro-benzene, and Fig. 2 that of the degree of completeness of the reaction of methyl phosphinic acid dichloride. Table 1 illustrates the influence of glycols (hexamethylene

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Investigation in the Field of
Organophosphorus Polymers. IX. Polycondensation of the Dichlorides of
Phosphinic Acids With Dioxy Compounds

glycol, diethylene glycol, and triethylene glycol) upon polycondensation with dichlorides of phosphinic acids. The polyester yield was found to increase. Fig. 3 shows the influence of the reaction temperature of methyl phosphinic acid dichloride with hydroquinone upon the yield and reduced viscosity of the polyester. A considerable effect on the reaction rate is exerted by the reaction temperature and the concentration of the initial reagents. Fig. 4 is a graphical representation of the degree of completeness of the reaction of methyl phosphinic acid dichloride, and Fig. 5 shows the temperature dependence of the reaction rate constants of methyl phosphinic acid dichloride with hydroquinone and diethylene glycol. The reaction rate constants are given in Table 2. The conditions of the reaction of methyl phosphinic acid dichloride with hydroquinone and the results obtained from this reaction are represented in Table 3. There are 5 figures, 3 tables, and 9 references: 6 Soviet, 2 British, and 1 Dutch.

Card 3/4

84503

15-8114 2109, 2205, 1526

11.2219

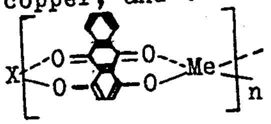
S/190/60/002/004/003/020
B004/B056

AUTHORS: Korshak, V. V., Vinogradova, S. V., Artemova, V. S.

TITLE: Investigation in the Field of the Coordination Chain Polymers. II. On Some Polymers of Quinizarin With Metals

PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 4, pp. 492-497

TEXT: The authors aimed at producing coordination polymers of 1,4-dihydroxy-anthraquinone (quinizarin). By reaction of quinizarin with metallic acetylacetonate (or metallic acetate), at first in nitrogen current, and later in vacuum at 220°C, or by reaction in nitrogen current or dimethylformamide at 120 - 140°C the following was obtained: The coordination polymers of quinizarin with zinc, manganese, cobalt, nickel, copper, and cadmium. On the basis of the analysis, the structural formula



$Y.mH_2O$ was determined. $X = H.MeCH(COCH_3)_2$ (or

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B004/B056

Investigation in the Field of the Coordination Chain Polymers. II. On Some Polymers of Quinizarin With Metals

MeOOCCH$_3$), Me CH(COCH$_3$)$_{2\ 2}$, or Me(OOCCH$_3$)$_2$; Y is either a quinizarin radical, an acetyl radical, or an acetylacetonate radical. The analyses and structures of the substances obtained are given in Table 1; solubility, behavior during heating, molecular weight, and crystal structure are listed in Table 2. With the exception of nickel for which a decamer was obtained, the polymerization degree was low. The substances are black powders with a very low degree of solubility and high thermal stability. As an example, the authors in Fig. 1a show the behavior of the manganese compound (decomposition in the temperature range 300 - 380°C) and in Fig. 1b that of the nickel compound (thermal stability up to 400°C). Thermal stability decreases in the following order: Ni > Zn > Mn > Cd > Cu > Co. X-ray analysis showed that the cobalt compound is an amorphous substance, whereas the compounds with manganese, nickel (X-ray picture of the decamer Fig. 2) and copper form well-developed crystals and the other compounds form badly orientated crystals. The authors thank the collaborators of the laboratories headed by G. L. Slonimskiy and A. I. Kitaygorodskiy for the thermomechanical and X-ray

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84503
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B004/B056

Investigation in the Field of the Coordination Chain Polymers. II. On Some Polymers of Quinizarin With Metals

examinations. There are 2 figures, 2 tables, and 4 references: 1 Soviet, 2 US, and 1 German.

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

SUBMITTED: December 17, 1959

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84504

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11.2219

S/190/60/002/004/004/020
B004/B056

AUTHORS: Korshak, V. V., Vinogradova, S. V., Babchinitser, T. M.

TITLE: Investigation in the Field of Coordination Polymers. III. Coordination Polymers on the Basis of Bis-(8-hydroxyquinolyl)-methane

PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 4, pp. 498-507

X

TEXT: In the present paper, the authors give a report on the synthesis of coordination polymers of bis-(8-hydroxyquinolyl)-methane (Oq) with zinc, nickel, cadmium, cobalt, manganese, and copper, as well as of mixed coordination polymers of Oq with quinizarin (Q). Oq was synthetized by reaction of o-hydroxyquinoline with formaldehyde in concentrated sulfuric acid. Polymerization was carried out with the acetylacetonate of the metal in nitrogen current, and finally in vacuum at 220°C, or in a nitrogen current or dimethylformamide at 120 - 140°C, or in dinyl at 230°C. Table 1 gives the analyses and structural formulas, Table 2 the

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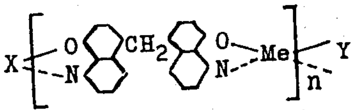
B004/B056

Investigation in the Field of Coordination Polymers. III. Coordination Polymers on the Basis of Bis-(8-hydroxyquinolyl)-methane

coloring, the results of the X-ray structural analysis, the molecular weight, and the behavior during heating for Oq polymers. The following structural formula is assumed:



$Y \cdot mH_2O$, (X = H or $MeCH(COCH_3)_2$, $MeOOCCH_3$, $Me\ CH(COCH_3)_{2\ 2}$, $Me(OOCCH_3)_2$, Y = Oq radical, $CH(COCH_3)_2$, $OOCCH_3$, $CH(COCH_3)_{2\ 2}$ or $(OOCCH_3)_2$. Polymeric coordination compounds were obtained. Low-molecular compounds (trimer and dimer) were formed only with copper and nickel. Within the temperature range 250 - 320°C decomposition sets in. Fig. 1 shows the thermomechanical curve of the zinc compound of Oq. The majority of polymers have a crystal structure. Fig. 2 shows the X-ray picture of the Oq compound with zinc and cadmium. The authors further produced mixed polymers: a) with Oq and two different metals (Zn + Cu; Zn + Cd); b) with Oq + Q and Co, Mn, Cu. Analyses, coloring, structural

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Investigation in the Field of Coordination Polymers. III. Coordination Polymers on the Basis of Bis-(8-hydroxyquinolyl)-methane

formulas, and behavior during heating are given for these compounds in Tables 3 and 4. Analysis shows that Oq has a higher complex-forming activity than Q. Therefore, the polymers contained more Oq than Q. The authors thank the collaborators of the laboratories headed by G. L. Slonimskiy and A. I. Kitaygorodskiy for thermomechanical and X-ray structural analyses. There are 2 figures, 4 tables, and 3 references: 2 Soviet and 1 German.

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

SUBMITTED: December 17, 1959

Card 3/4

83811

15.8114 also 2209

S/190/60/002/005/001/015
B004/B067

AUTHORS: Korshak, V. V., Frunze, T. M., Kurashev, V. V.

TITLE: From the Field of the Heterochain Polyamides. XXIII. Polycondensation of the Oxide of Bis-(p-carboxyphenyl)phenylphosphinyldichloride With Hexamethylenediamine in the Interface

PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 5, pp. 633-635

TEXT: In earlier papers (Refs. 1-3) the authors studied the polycondensation of phosphorous polyamides with aliphatic and aromatic diamines in the melt. The present paper describes the polycondensation of the oxide of bis-(p-carboxyphenyl)phenylphosphinyldichloride in the interface. The authors found that by mixing a solution of the phosphorus compound in benzene with a solution of hexamethylenediamine and KOH in water, a polyamide film is formed in the interface, which may be extracted as a continuous twist. In mixing the solutions the polyamide was precipitated as a white powder. The yield was 72 - 92%. The relative viscosity was determined at 20°C in tricresol. A figure shows the relative viscosity as

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83811

From the Field of the Heterochain Polyamides. S/190/60/002/005/001/015
XXIII. Polycondensation of the Oxide of B004/B067
Bis-(p-carboxyphenyl)phenylphosphinyldichloride
With Hexamethylenediamine in the Interface

a function of the initial concentration of the reagents. A maximum value of about 0.88 was attained at 0.01 mole/l. At higher concentrations viscosity increased. Table 1 compares the polymers obtained in the melt (relative viscosity = 0.42, tensile strength 530 kg/cm^2) with those obtained in the interface (relative viscosity = 0.88, tensilve strength = 700 kg/cm^2). Table 2 presents yields and viscosities of the polyamides as a function of the concentration of the reagents. The viscosity decrease with rising concentration is explained by a premature chain rupture due to hydrolysis of the terminal acid chloride groups. There are 1 figure , 2 tables, and 6 references: 5 Soviet, 2 US, and 1 British.

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

SUBMITTED: December 18, 1959

Card 2/2

83814

15.8114 also 2209

11.2219

S/190/60/002/005/004/015
B004/B067

AUTHORS: Korshak, V. V., Krongauz, Ye. S., Sheina, V. Ye.

TITLE: Investigation in the Field of Coordination Polymers. IV. Production of Polymers on the Basis of Aromatic Bis-(β-diketones) With Metals

PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 5, pp. 662-672

TEXT: The authors describe the synthesis of bis-(β-diketones) with: 1) two directly connected benzene rings: 4,4'-bis-(acetoacetyl)diphenyl (1); 2) benzene rings separated by an oxygen atom: 4,4'-bis-(acetoacetyl)diphenyloxide(2); 3) benzene rings separated by a methylene group: 4,4'-bis-(acetoacetyl)diphenylmethane (3); 4) a single benzene ring and ramified structure: β,β,β',β'-tetraacetyldiethylbenzene (4); and 5) the bis-(β-diketone) of isophthalyldiacetophenone (5), which is isomeric to the terephthalyldiacetophenone (6) produced earlier. Coordination polymers with the following structure were obtained from these compounds:

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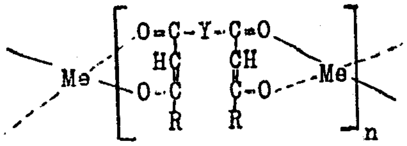
83814

Investigation in the Field of Coordination Polymers. IV. Production of Polymers on the Basis of Aromatic Bis-(β-diketones) With Metals

S/190/60/002/005/004/015
B004/B067



R = $-C_6H_5$, $-CH_3$; Y = $-C_6H_4-$, $-CH_2C_6H_4CH_2-$, $-C_6H_4C_6H_4-$, $-C_6H_4OC_6H_4-$, $-C_6H_4CH_2C_6H_4-$.

The Claisen reaction which the authors used at the beginning gave only poor yields of diketones (5%). Proceeding from Ref. 2 the authors developed a method of direct acetoacetylation of compounds containing several benzene rings by means of acetic anhydride and in the presence of boron trifluoride with a 20% yield. The reaction equation is written down for diphenyl oxide:

$$C_6H_5-O-C_6H_5 + (CH_3CO)_2O \xrightarrow{BF_3} CH_3CO-C_6H_4-O-C_6H_4-COCH_3 \xrightarrow[BF_3]{(CH_3CO)_2O}$$

$\longrightarrow CH_3COCH_2CO-C_6H_4-O-C_6H_4-COCH_2COCH_3$. Thus, compounds (2) and (3) were obtained. (1) could not be produced in the same manner. The

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83814

Investigation in the Field of Coordination Polymers. IV. Production of Polymers on the Basis of Aromatic Bis-(β-diketones) With Metals

S/190/60/002/005/004/015
B004/B067

β-diketone of diphenyl was formed: $C_6H_5-C_6H_4-COCH_2-COCH_3$. (1) was synthesized according to Friedel-Crafts, (4) from xylylenedibromide and sodium acetyl acetonate. (5) and (6) were obtained by a method described in Ref. 1. By reacting alcoholic solutions of acetates of bivalent metals (Be, Cu, Ni, Co, Zn, Cd, Mn) with these bis-(β-diketones), or by heating the bis-(β-diketones) with the acetylacetonates of these metals at a stoichiometric ratio in the vacuum to 200 - 250°C, the coordination chain polymers were obtained, whose properties are compiled in Tables 1-6. These are colored powders, partly insoluble, and partly soluble in few organic solvents. Fig. 1 shows the thermomechanical curve for (2), Fig. 2 that for (4). These curves are characteristic of crystalline polymers. The molecular weight of the polymers was between 1000-2000. The authors found that the following rules govern the behavior of these polymers: With increasing content of phenyl groups, thermostability increases while solubility decreases. Solubility and meltability decrease when the ionic radius of the metal deviates too strongly from the radius of the chain-forming atoms. Beryllium compounds showed the highest and

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83814

Investigation in the Field of Coordination Polymers. IV. Production of Polymers on the Basis of Aromatic Bis-(β-diketones) With Metals

S/190/60/002/005/004/015
B004/B067

copper compounds the lowest solubility. Thermostability, however, decreases in the series Cu > Be > Ni > Co > Zn > Mn > Cd. There are 2 figures, 6 tables, and 7 references: 2 Soviet, 4 US, and 2 German.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy (Institute of Elemental-organic Compounds)

SUBMITTED: January 9, 1960

Card 4/4

83815

15.8114 also 2209

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

AUTHORS: Korshak, V. V., Frunze, T. M., Kozlov, L. V., [redacted].

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

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

shown in Fig. 2, the degree of crystallization. While the polymer of hexamethyleneisophthalimide 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 azelayl 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. Kitaygorodskiy (Laboratory for X-Ray Structural Analysis), and G. L. Slonimskiy (Laboratory for the Investigation of Polymers) for their investigations.

Card 2/3

83698

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

15.8107 also 2209

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

Card 1/2

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

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% H_2SO_4 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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83707

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

15.8107 also 2209
11.2217

AUTHORS: Korshak, V. V., Mozgova, K. K., Shkolina, M. A.

TITLE: Letters to the Editor. New Method of Producing Grafted Polymers

PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 6, pp. 957-958

TEXT: In continuation of the experiments in the course of which already a new method of producing graft copolymers has been developed (Refs. 1-5), it was observed that films and fiber samples of polyamides and polyesters obtain a higher amount of active centers by storage in the air; thus, grafting with monomers can be carried out also without a preliminary treatment with ozone. A new, simpler method of producing graft copolymers was developed on this basis, i.e. articles in the form of films and fibers are for some time heated in the air before copolymerization. This preliminary treatment leads to the formation of active centers so that at a further heating with vinyl monomers copolymerization takes place. The graft copolymers obtained have a higher mechanical strength than the

Card 1/2

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KORSHAK, V.V.; VINOGRADOVA, S.V.; LEBEDEVA, A.S.

Heterocyclic polyesters. Part 27: Some correlations in the polyesterification taking place at the boundary between two phases. Vysokom.soed. 2 no.7:977-983 Jl '60. (MIRA 13:8)
(Esterification) (Polymerization)

87022

S/190/60/002/007/001/017
B020/B052

15.8107

AUTHORS: Korshak, V. V., Frunze, T. M., Lu I-nan'

TITLE: On Heterochain Polyamides. XXVII. The Production of Mixed Polyamides From Homopolyamides

PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 7, pp. 984-988

TEXT: The formation kinetics of mixed polyamides by copolycondensation of two or more initial substances was investigated by V. M. Kharitonov and two of the authors (Ref. 4). It was the purpose of the present paper to investigate the reaction course with time of the production of a series of mixed polyamides from the homogeneous polyamides concerned. Table 1 gives the properties of the initial homopolymers which were produced by polycondensation of hexamethylene diamine salts with adipic, azelaic, or sebacic acids in the melt, and also by polymerization of ε-caprolactam in the presence of 2% hexamethylene diammonium adipate (AH salt). The melting points and specific viscosity of 0.5% solutions of mixed polyamides in cresol at 20°C and the mechanical properties of some of the polymers

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87022

On Heterochain Polyamides. XXVII. The Production of Mixed Polyamides From Homopolyamides

S/190/60/002/007/001/017
B020/B052

were determined, X-ray pictures were taken and thermomechanical curves were plotted. Some of the data obtained are given in Tables 2 and 3. Heating of the polyamide melts changes their flowing point and the viscosity of their solutions. Fig. 1 shows that the specific viscosity of the solutions and the molecular weight of the polymers are increased by heating. Table 3 gives some mechanical properties of the polyamides in the system polyhexamethylene adipamide - poly-ε-capronamide. The data of this table and Fig. 2 show that the tenacity of the polyamides decreases with the time of heating, i.e., the development of block and mixed polymers causes a reduction of their tenacity, whereas the elongation at break is increased. Fig. 3 shows the shift of the flow point due to heating: it becomes lower as the time of heating is increased. Fig. 4 gives the change in the reaction mass composition caused by heating. It was observed that the block polymer for a comparatively long period is the chief constituent of the reaction mass. There are 4 figures, 3 tables, and 8 references: 6 Soviet, 1 German, and 1 British.

Card 2/3

KORSHAK, V.V.; VINOGRADOVA, S.V.; LEBEDEVA, A.S.

Heterochain polyesters. Part 28: Investigation of some correlations in interfacial polyesterification. Vysokom. soed. 2 no.8:1162-1166 Ag '60. (MIRA 13:9)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.
(Polymerization)

86 299
S/190/60/002/008/013/017
B004/B054

15.8102 2209

AUTHORS: Korshak, V. V., Polyakova, A. M., Suchkova, M. D.

TITLE: Study of Polymerization of Acetylene Compounds Under Pressure. I. Polymerization of Phenyl Acetylene

PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 8, pp. 1246-1248

TEXT: The authors report on their attempts to polymerize phenyl acetylene. At normal pressure and 70-120°C, the yield in polymer was very low. At 1000 atm and 80°C, 12-13% of polymer was obtained after 6 hours in the presence of benzoyl peroxide or azoisobutyric acid dinitrile, 26.3% of polymer at 120°C, and full polymerization at 150°C. At 6000 atm, 39% of polymer with a molecular weight of 1170 was already formed after 1.5 hours at 110°C. At 120°C, the yield was 67%, but carbonization occurred in the case of fast temperature increase. The maximum polymerization coefficient was 10-12. The polymer was a yellow, brittle substance. The thermal curves were plotted with the aid of an apparatus designed by B. L. Tsetlin (Ref.5). The authors mention a paper by A. A. Berlin and L. A. Blyumenfel'd (Ref. 3).

Card 1/2

86302

S/190/60/002/008/017/017
B004/B054

15.8114 2209
11.2212

AUTHORS: Korshak, V. V., Zamyatina, V. A., Bekasova, N. I., Ma Zhuy-zhan'

TITLE: Copolymerization of Boron-substituted Borazoles With Hexamethylene Diisocyanate

PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 8, p. 1287

TEXT: In this letter to the editor, the authors report on the successful copolymerization of boron-substituted borazoles with hexamethylene diisocyanate. They obtained transparent, glassy, yellowish substances. The following reaction diagram is given:

Card 1/2

83477
S/190/60/002/009/008/019
B004/B060

5.3700C also 2109, 2209

AUTHORS: Polyakova, A. M., Korshak, V. V., Suchkova, M. D., Vdovin, V. M., Chumayevskiy, N. A.

TITLE: Production and Structure Investigation of Polymers Containing Siloxane- and Hydrocarbon Links in the Principal Chain of Macromolecules. IV.

PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 9, pp. 1360-1369

TEXT: The authors had previously studied (Refs. 1-3) the reaction of acetylene with dihydro tetraalkyl disiloxanes, and determined the structure of the polymers obtained on the strength of their infrared spectrum. In the present article, the authors report on the reaction of acetylene with dihydro siloxanes of varying molar ratios of the reagents. The reaction yields chain-like polymers with different terminal groups. The infrared spectra were examined for the absorption bands of the stretching vibrations of the $-\overset{|}{\underset{|}{\mathrm{Si}}}-\mathrm{H}$ terminal group (2100-2150 cm^{-1}), of the C=C bond (vinyl group 1595-1600 cm^{-1}; allyl group 1625-1635 cm^{-1}), and the

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83477

Production and Structure Investigation of Polymers Containing Siloxane- and Hydrocarbon Links in the Principal Chain of Macromolecules. IV

S/190/60/002/009/008/019
B004/B060

asymmetric stretching vibrations of the $=CH_2$ terminal group ($3050\ cm^{-1}$). The spectra shown in Fig. 1 reveal that the reaction of acetylene with excess dihydro siloxane yields a polymerization product (I) having $-\overset{|}{\underset{|}{Si}}-H$ terminal groups. In the case of an acetylene excess, however, polymer (II) forms with $-CH=CH_2$ as terminal groups. This could also be proven chemically. The oily polymerizate (II) was heated to 130°C at 6000 atm and at atmospheric pressure with tert-butyl peroxide. The product obtained was insoluble in all solvents. If (II) is caused to react with tetraalkyl dihydro disiloxane in the presence of $H_2PtCl_6 \cdot 6H_2O$, the chain is prolonged, and the resulting new polymerizate has $-\overset{|}{\underset{|}{Si}}-H$ terminal groups. Similar reactions were carried out with acetylene and the polymers (III) described in Ref. 2 (with $-\overset{|}{\underset{|}{Si}}-H$ as terminal group), and (IV)(with $-CH=CH_2$ as terminal group). The reaction of (III) with acetylene yielded a polymerization product with $-CH=CH_2$ as terminal group; the reaction of (IV) with tetraethyl dihydro disiloxane yielded a polymerizate with $-\overset{|}{\underset{|}{Si}}-H$ as terminal

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83477

Production and Structure Investigation of Poly- S/190/60/002/009/008/019
mers Containing Siloxane- and Hydrocarbon Links B004/B060
in the Principal Chain of Macromolecules. IV

group (infrared spectra Fig. 2). In both cases, the molecular weight increased, and the chain grew longer. Furthermore, dimethyl diphenyl dihydro disiloxane was caused to react with acetylene. The polymerizate, a viscous mass, had the molecular weight 1670. Table 1 shows the results of the reaction of acetylene with tetramethyl- and dimethyl diethyl dihydro disiloxane at a pressure of 15 atm. The infrared spectra (Fig. 3) of the oily products revealed both the presence of C=C bonds and of $=CH_2$ as terminal groups. Analyses and molecular weights of the fractions distilled in vacuum are given in Table 2. Only addition products and dimers were obtained on the reaction of phenyl acetylene and diphenyl acetylene with dihydro siloxanes (Table 3). With the exception of the reaction product from diphenyl acetylene and tetraethyl dihydro disiloxane, whose structure is still unclear, the infrared spectra (Fig. 4) revealed -Si-H bands. The infrared spectra were taken with a ВИКС М-3 (VIKS M-3) spectrophotometer. The authors thank A. D. Petrov and I. V. Obreimov for interest displayed in the work. There are 4 figures, 3 tables, and 6 references: 4 Soviet, 1 US, and 1 German.

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83477

Production and Structure Investigation of Polymers Containing Siloxane- and Hydrocarbon Links in the Principal Chain of Macromolecules. IV

S/190/60/002/009/008/019
B004/B060

ASSOCIATION: Institut elementoorganicheskikh soyedineniy AN SSSR (Institute of Elemental-organic Compounds of the AS USSR). Institut organicheskoy khimii im. N. D. Zelinskogo AN SSSR (Institute of Organic Chemistry imeni N. D. Zelinskiy of the AS USSR)

SUBMITTED: April 4, 1960

X

Card 4/4

83478

S/190/60/002/009/009/019
B004/B060

5.3700C also 2109, 2209

AUTHORS: Korshak, V. V., Polyakova, A. M., Sakharova, A. A., Mironov, V. F., Chernyshev, Ye. A.

TITLE: Polycondensation of Halogen Alkyl (Halogen Aryl) Halogen Silanes Under the Action of Metallic Sodium

PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 9, pp. 1370-1374

TEXT: The authors carried out condensation reactions with the following five compounds: $ClSi(CH_3)_2CH_2Cl$; $ClSi(CH_3)(C_6H_5)CH_2Cl$; $ClSi(CH_3)(C_2H_5)CH_2CH_2CH_2Cl$; $ClSi(CH_3)_2C_6H_4Cl$, and $ClSi(CH_3)_2OSi(CH_3)_2CH_2CH_2Cl$. The reactions took place in nitrogen current with metallic sodium suspended in toluene as a catalyst. The molecular weight was cryoscopically determined in benzene. A table supplies the molecular weights of the condensates, the polymerization coefficients, yields, and silicon content. The temperature dependence of the viscosity of polymer $[-Si(CH_3)_2CH_2-]_n$

Card 1/2

88537

S/190/60/002/010/007/026
B004/B054

5.3832

AUTHORS: Yegorova, Yu. V., Korshak, V. V., Lebedev, N. N.

TITLE: Heterochain Polymers. XXIX. Some Rules Governing the Interfacial Polycondensation of Acid Dichlorides With Hydroquinone

PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 10, pp. 1475-1480

TEXT: The authors studied the interfacial polycondensation of adipyl dichloride and terephthalyl dichloride with hydroqinone. The acid chlorides were dissolved in toluene, the hydroquinone in alkaline water, and the two solutions were thoroughly mixed. The reaction with adipyl dichloride proceeded so fast that no chlorine was detected in the organic phase after 2-3 min. With terephthalyl dichloride, the yield was determined as a function of the reaction time (Fig. 1). Further, the effect of temperature was determined for this reaction; a maximum was found at 45°C (Fig. 2). The concentration of components has little effect on the yield. 0.5-1.0 moles/l is indicated as optimum value. Fig. 3 shows that the yield is much dependent on the NaOH concentration. The optimum concentration of

X

Card 1/2

86324

S/190/60/002/012/011/019
B017/B078

2209

15.8114 also 1144,1160

AUTHORS: Korshak, V. V., Sladkov, A. M., Kudryavtsev, Yu. P.

TITLE: Synthesis of Acetylide Polymers

PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 12, pp. 1824 - 1827

X

TEXT: The electrophysical properties of acetylide polymers have been studied by means of spectra of electron paramagnetic resonance. The production of acetylide polymers of bivalent copper from acetylene and diethynyl benzene is described in detail. The spectra of the electron paramagnetic resonance of polyacetylides from β-diethynyl benzene and acetylene are shown in a figure. The electron paramagnetic resonance of copper polyacetylide is particularly strong. The epr spectra were evaluated by N. N. Bubnov. There are 1 figure and 8 references: 5 Soviet, 1 US, 1 British, and 1 French.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy AN SSSR (Institute of Organometallic Compounds of the Academy of Sciences USSR)

Card 1/1

KORSAK, V.V. [Korshak, V.V.]: MOZGOVA, K.K.

Inorganic macromolecular compounds. Analele chimie 15 no.1:37-88
Ja/Mr '60. (EEAI 9:8)
(Macromolecular compounds)
(Inorganic compounds)

KORSHAK, V.V.

Polyrecombination. Nauka i zhizn' 27 no.9:34-35 S '60. (MIRA 13:9)

1. Chlen-korrespondent AN SSSR.
(Polymerization)

KORSHAK, V.V.

Progress in the field of synthesis of high molecular weight compounds. Usp.khim. 29 no.5:569-628 My '60.
(MIRA 13:7)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.
(Macromolecular compounds)

5.3610

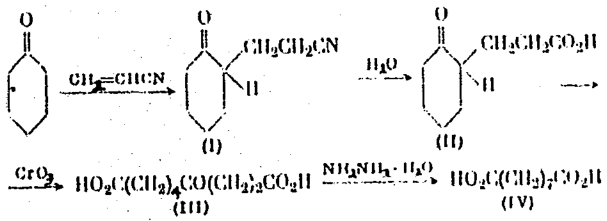
78530
SOV/79-30-3-34/69

AUTHORS: Korshak, V. V., Sosin, S. L., Morozova, Ye. M.

TITLE: Preparation of Azelaic, γ-Ketoazelaic and Other Acids From Cyclohexanone and Nitrile of Acrylic Acid

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol 30, Nr 3, pp 907-912 (USSR)

ABSTRACT: Azelaic and γ-ketoazelaic acids can be synthesized from cyclohexanone and acrylonitrile in four stages.



Card 1/5

Preparation of Azelaic, γ-Ketoazelaic and Other Acids From Cyclohexanone and Nitrile Acid

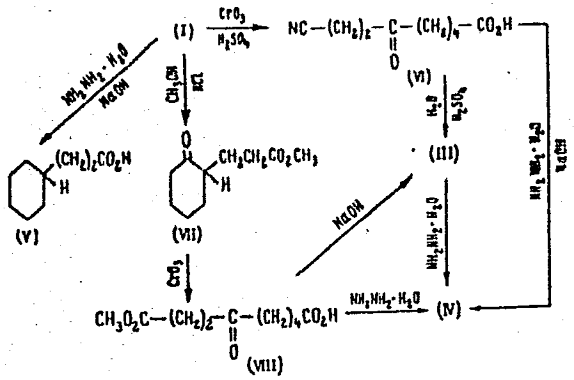
78280
SOV/79-30-3-34/69

The yields of azelaic acid, (IV), mp 106-107°, and of γ-ketoazelaic acid (III), mp 108.5-109.5° are 40 and 45%, respectively, based on cyclohexanone, or 50-45%, based on acrylonitrile. Oxidation of β-cyclohexanonepropionic acid with chromic anhydride yields γ-ketoazelaic acid (yield up to 75%), which can be readily reduced to azelaic acid. Scheme B shows all reactions to which adduct I was subjected in the course of this investigation.

Card 2/5

Preparation of Azelaic, γ-Ketoazelaic and Other Acids From Cyclohexanone and Nitrile Acid

78280
SOV/79-30-3-34/69



γ-Ketoazelaic acid can be also prepared by catalytic oxidation of β-cyclohexanonepropionic acid with air in glacial acetic acid. Oxidation of 2-(β-cyanoethyl)-cyclohexanone with chromic anhydride under mild

Card 3/5

Preparation of Azelaic, γ-Ketoazelaic and Other Acids From Cyclohexanone and Nitrile Acid

[illegible]200
SOV/79-30-3-34/69

conditions yields the nitrile of γ-ketoazelaic acid which can be readily converted into γ-ketoazelaic and azelaic acid. Cyanoethylation of cyclohexanone in the presence of alkaline catalyst at 60-65° yields (65%) primarily 2-β-cyanoethylcyclohexanone. In the course of this study the following compounds were also prepared: β-cyclohexylpropionic acid (II) mp 63-64°; methyl ester of cyclohexanonepropionic acid (VII), bp 142-144° (12 mm), n_D^{20} 1.4650, and monomethyl ester of γ-ketoazelaic acid (VIII), mp 191-192°. There are 25 references, 8 Soviet, 2 U.K., 9 U.S., 5 German, 1 Czechoslovak. The 5 most recent U.S. references are: Frank, B., J. Am. Chem. Soc., 73, 724 (1951); Johnson, W., Hurt., J. Am. Chem. Soc., 72, 935 (1950); Bruson, H., Reiner, T., J. Am. Chem.

Card 4/5

Preparation of Azelaic, γ-Ketoazelaic and Other Acids From Cyclohexanone and Nitrile Acid

78280
SOV/79-39-3-34/69

Soc., 64, 2850 (1942); Baumgarten, H., Eifert, R., J. Am. Chem. Soc., 75, 3015 (1953); American Patent 2625558 (1953).

SUBMITTED: March 10, 1959

Card 5/5

80485
S/020/60/132/02/32/067
B011/B002

5.3830

AUTHORS: ~~Korshak, V. V.~~, Corresponding Member AS USSR, Sosin, S. L., Alekseyeva, V. P.

TITLE: The Production of New Types of Linear Polymers 1 by Means of the Reaction of Polyrecombination

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 132, No. 2, pp. 360-363

TEXT: The authors treated diphenylmethane, some of its derivatives, methyl ester of phenyl acetic acid, and benzyl benzoate with tertiary butylperoxide (1.2 and more moles per 1 mole of the initial substances) at 200°, according to the methods described in Ref. 2. Thus they obtained polymers containing no noticeable amounts of tridimensional structures. In such cases hitherto it was only possible to obtain dimers (Refs. 3, 10). Now a linear polymer was obtained from diphenylmethane which the authors consider to be a polydiphenylmethylene (I) and which hitherto has not been known (see Scheme). It is a yellowish powder soluble in benzene, with a melting point of 205-220°. Its molecular weight varies between 10000 and 900000, according to the molar ratio between peroxide and hydrocarbon. Against all expectations, this polymer shows no inclination 4

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80485

The Production of New Types of Linear Polymers by Means of the Reaction of Polyrecombination S/020/60/132/02/32/067
B011/B002

to decompose into free radicals in the presence of diphenylpicrylhydrazine. It is also largely stable towards HNO_3 and chromium mixtures. It is very probable that the stability of the polymer is due to the fact that the first product of the polyrecombination reaction, namely the dimer tetraphenylethane, is a completely stable compound (Ref. 5). The structure of polydiphenyl methylene (I) was also confirmed by IR-spectra. On the basis of their results, the authors concluded the following: tertiary butylperoxide decomposes in such a way that 1 mole of peroxide develops only 1 mole of active radicals instead of 2. Hence the maximum of the molecular weight: 2 moles of peroxide consumption per 1 mole of hydrocarbon. Half of the liberated radicals which developed originally, are used for side reactions. From the above-mentioned compounds and others given in table 1 the authors in the same way produced linear polymers with a high molecular weight, soluble in benzene. If durene, ditolylmethane, p,p'-di-isopropyl diphenyl, benzylacetate or other compounds are introduced into the reaction instead of diphenylmethane, large amounts of indissoluble polymers develop besides linear polymers. Their structure apparently is cross-linked by methyl groups. Polyrecombination allows the production of linear polymers with aromatic cycles not only in their side-, but also in their main chains. Finally the authors state that polyrecombination will only produce linear polymers of a

Card 2/3

ARBUZOV, A.Ye., akad.; VAVILOV, S.I., akad.; VOL'FKOVICH, S.I., akad.; KOCHINA, P.Ya., akad.; LANDSBERG, G.S., akad.; LEYBENZON, L.S., akad.; PORAY-KOSHITS, A.Ye., akad.; SMIRNOV, V.I., akad.; FESENKOV, V.G., akad.; CHERNYAYEV, V.I., akad.; KAPUSTINSKIY, A.F.; KORSHAK, V.V.; KRAVKOV, S.V.; NIKIFOROV, P.M.; PETROV, A.D.; PREDVODITELEV, A.S.; FRISH, S.E.; CHETAYEV, N.G.; CHMUTOV, V.K.; SHOSTAKOVSKIY, M.F.; KUZNETSOV, I.V., red.; MIKULINSKIY, S.R., red.; MURASHOVA, N.Ya., tekhn.red.

[Men of Russian science; essays on prominent persons in natural science and technology: Mathematics, mechanics, astronomy, physics, chemistry] Liudi russkoi nauki; ocherki o vydaiushchikhsia deiateliakh estestvoznaniia i tekhniki: matematika, mekhanika, astronomiia, fizika, khimiia. Moskva, Gos. izd-vo fiziko-matem. lit-ry, 1961. 599 p. (MIRA 14:10)

1. Chleny-korrespondenty AN SSSR (for Kapustinskiy, Korshak, Kravkov, Nikiforov, Petrov, Predvoditelev, Frish, Chetayev, Chmutov, Shostakovskiy).
(Scientists)

KORSHAK, V.V.; VINOGRADOVA, S.V.; FRUNZE, T.M.; GRIBOVA, I.A.;
ZHDANOV, A.A.; MOZGOVA, K.K.; KRONGAUZ, Ye.S., red.izd-va;
TIKHOMIROVA, S.G., tekhn.red.

[Chemistry and technology of synthetic macromolecular compounds.
Heterocyclic compounds]. Khimiia i tekhnologiia sinteticheskikh
vysokomolekuliarnykh soedinenii. Geterotsepnye soedineniia.
Moskva, Izd-vo Akad.nauk SSSR. 1961. 721 p. (Itogi nauki:
Khimicheskie nauki, no.7) (MIRA 14:11)

1. Chlen-korrespondent AN SSSR (for Korshak).
(Macromolecular compounds)
(Heterocyclic compounds)

KORSHAK, V.V.; SLADKOV, A.M.; KRONGAUZ, Ye.S.; ROGOZHIN, S.V.;
RODIONOVA, Ye.F.; CHELNOKOVA, G.N.; MAKAROVA, T.A.; SOSIN, S.L.;
LOSKUTOVA, I.P., red.izd-va; POLYAKOVA, T.V., tekhn.red.

[Chemistry and technology of synthetic macromolecular compounds. Carbocyclic compounds] Khimiia i tekhnologiia sinteticheskikh vysokomolekuliarnykh soedinenii. Karbotsepnye soedineniia. Moskva, Izd-vo Akad. nauk SSSR, 1961. [illegible] p. (Itogi nauki: Khimicheskie nauki. no.6) (MIRA 14:11)

1. Chlen-korrespondent AN SSSR (for Korshak).
(Macromolecular compounds)
(Cyclic compounds)

37761

S/661/61/000/006/035/081
D205/D302

5.3832

AUTHORS: Polyakova, A. M., Korshak, V. V., Sakharova, A. A. and Tambovtseva, Ye. S.

TITLE: Polymerization of silico-olefines under pressure

SOURCE: Khimiya i prakticheskoye primeneniye kre-mneorganicheskikh soyedineniy; trudy konferentsii. no. 6: Doklady, diskussii, resheniye. II Vses. konfer. po khimi i prakt. prim. kremneorg. soyed., Len., 1958. Leningrad, Izd-vo AN SSSR, 1961, 163-172

TEXT: The polymerization of more than 100 silico-olefinic monomers has been investigated by the authors and a series of rules was established. The polymerizations were carried out under 6000 atm. (gauge) at 120 - 130°C in the presence of tertiary butyl peroxide. Parallel experiments without pressure were also performed. Alkenyl silanes with double bonds in α-, β-, γ- and ε-positions with respect to the Si atom were investigated. α-alkenylsilanes polymerize into colorless, viscous oils. Using 1% mole of initiator the poly-

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S/661/61/000/006/035/081
D205/D302

Polymerization of silico- ...

merization coefficient of triethyl vinyl silane equals 18. On introducing substituents into the vinyl group the tendency to polymerize decreases, depending on the structure and nature of the substituents. Regarding the compounds as substituted ehtylenes it can be said that 1,1-disubstituted ethylenes are polymerized easier than the 1,2-disubstituted. The introduction of a phenylic radical creates steric hindrance to polymerization. β-alkyl silanes polymerize less than the corresponding α-compounds, forming low-molecular oils. In order to verify the theory according to which the Si atom passivates the double bond in polymerization, the polymerizations of $(CH_3)_3CCH=CH_2$ and $(CH_3)_3CCH_2CH=CH_2$ were run parallel to the polymerization of the corresponding silico-olefines. It was found that the α-alkenes polymerize less readily than the silico-olefines, contrary to the theory of the negative influence of the trialkyl silyl group on polymerization. Comparing the polymerization of butadiene or styrene silico-derivatives with that of their unsubstituted analogues it was found that the silico-derivatives polymerize easier, as was the case with olefines. Trialkyl silyl alkadienes with tri-

Card 2/4

zation of analogous compounds of Si, Ge and Sn it was established that the polymerizationability of vinylic compounds of the type $R_3MCH=CH_2$ (where M=Si, Ge and Sn) decreases in the series $CH_2=CHSiR_3 > CH_2=CHGeR_3 > CH_2=CHSnR_3$. K. A. Andrianov (Moscow), D. N. Andreyev (IKhS AN SSSR, Leningrad), A. A. Zhdanov (INEOS AN SSSR, Moscow), P. V. Davydov (Moscow, S. G. Durgar'yan (INKhS AN SSSR, Moscow) and A. I. Dintzes (Moscow) took part in the discussion which followed. Andrianov expressed the opinion that the conclusion of the authors that the Si atom does not passivate the polymerization mechanisms, observed by the authors, between the processes at 6000 atm. and atmospheric pressure, were of the utmost importance and may explain the disagreements between this work and earlier observations to which Andrianov referred. There are 5 tables.

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

21142

S/191/61/000/004/003/009
B110/B208

15.8105 2209, 1372

AUTHORS: Kamenskiy, I. V., Komlev, V. K., Korshak, V. V.

TITLE: Synthesis of esters of 2-furyl acrylic acid

PERIODICAL: Plasticheskiye massy, no. 4, 1961, 9-11

TEXT: Polyfunctional monomers with furan ring are used for the preparation of heat-resistant polymers. It was found by the Departments of Plastics Technology of Moskovskiy khimiko-tekhnologicheskiy institut (MKhTI) (Moscow Institute of Chemical Technology) and of nauchno-issledovatel'skiy institut plasticheskikh mass (NIIPM) (Scientific Research Institute of Plastics) that plastics based on furfurol and also their condensation products with ketones (acetone) are highly resistant to heat and fire, and, with reinforcing fillers, they have a high mechanical strength. The solidified polymeric condensation products (e.g., mono- and difurfurylidene acetones) are, however, brittle and not sufficiently adhesive in pure state. To obtain more elastic and more adhesive plastics, the authors synthesized dipolymer resins on the basis of 2-furyl acrylic esters and glycols (diethylene glycol and 1,4-butanediol). Cation exchangers (polystyrene sulfo

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B110/B208

Synthesis of esters of...

acids) were used as catalysts for the preparation of monoesters which is difficult even with excess glycol (30-32 % yield). For the purpose of temperature control and removal of the formed water as an azeotropic mixture, esterification was carried out in toluene. The incomplete esters were obtained in melts at 180-200°C under standard pressure and with excess acid. Furyl acrylic acid was condensed from furfurol and malonic acid. Diethylene glycol (melting point 117°C at 1 mm Hg; $n_D^{20} = 1.4471$) and 1,4 butanediol (melting point 108°C at 2 mm Hg; $n_D^{20} = 1.4462$) were used. 3.5 mg-equiv./g of the СБС-1 СОЕ (SBS-1 SOYe) cation exchange resin with 40 % swelling, which was converted to the H-form by treatment with 6 % HCl for 24 hr, was used as catalyst. It was then washed free from Cl' and dried at 60-80°C. To synthesize the monoesters, furyl acrylic acid and diethylene glycol were heated in a ratio of 1:6 with 10-15 % cation exchanger and 300-400 ml of toluene per mole of acid to 125-140°C for 16-24 hr. When the reaction was completed (cessation of water formation), it was filtered, neutralized with sodium bicarbonate, washed with sodium chloride solution, and dried with annealed sodium sulfate. The end product obtained in a yield of 45-50 % is a transparent, light yellow,

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Synthesis of esters of...

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slightly mobile liquid boiling at 158-159°C, which is well soluble in acetone, alcohol, and benzene, $n_D^{20} = 1.5555$. Instead of diethylene glycol, also 1,4-butanediol may be used. The end product (60-70 % yield) is a light yellow, slightly mobile liquid boiling between 170 and 172°C, which is well soluble in acetone, benzene, alcohol, and ether; $n_D^{20} = 1.5560$. The complete ester from 2-furyl acrylic acid and diethylene glycol was obtained by heating both substances to 180-200°C in a ratio of 2.5:1. The separated crystals were treated with $NaHCO_3$, repeatedly washed, and recrystallized from alcohol and petroleum ether. The light yellow crystals melted at 83-85°C, dissolved in acetone and ether, and, when heated, in alcohol. The yield was 46 %. The complete butanediol ester was obtained in a similar way, recrystallized twice from methyl alcohol, and treated with animal charcoal. The light yellow crystals (46-48 % yield) were soluble in dioxane, benzene, acetone, and, when heated, in alcohol; they melt at 107.5-108.5°C. Under the action of temperature and catalyst, the esters of 2-furyl acrylic acid give non-meltable and insoluble polymers of high chemical and heat resistance. A resistance to

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21142

Synthesis of esters of...

S/191/61/000/004/003/009
B110/B208

250-320°C was obtained on Zhurkov's apparatus, depending on the curing temperature. The resins on the basis of the esters described may be combined with other polymers. There are 4 tables and 7 references: 5 Soviet-bloc and 2 non-Soviet-bloc. The most recent reference to English-language publication reads as follows: M. I. Astle, B. Schoeffer, C. Obenland, J. Am. Chem. Soc., 77, no. 13, 3643 (1955).

Card 4/4

15.8113 2209
11.2212

22737

S/191/61/000/006/002/005
B101/B215

AUTHORS: Korshak, V. V., Strepikheyev, Yu. A., Moiseyev, A. F.

TITLE: Synthesis of linear polyurethanes without solvents. Communication I. Synthesis of linear polyurethanes in the melt

PERIODICAL: Plasticheskiye massy, no. 6, 1961, 10-11

X

TEXT: Results are reported according to which the synthesis of polyurethanes in the melt has considerable advantages over the synthesis in inert solvents. The reaction of 1,4-butanediol with hexamethylene diisocyanate was examined. Mixing of equimolar amounts of the two reagents causes the destruction of the polymer due to a great increase in temperature. In a nitrogen atmosphere, colorless polymers were obtained at 230°C with a molecular weight varying from 15,000 to 25,000. In a nitrogen atmosphere free from oxygen, hexamethylene diisocyanate was therefore added dropwise to butanediol heated at 80-90°C. After addition of 90% of the diisocyanate the strongly viscous mass was heated at 200-210°C for better stirring, and then, after adding the remaining diisocyanate, the above

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22737

Synthesis of linear polyurethanes ... S/191/61/000/006/002/005
B101/B215

temperature was maintained for 1.5-2.0 hr. The polymer obtained is easily soluble in tricresol. Addition of 1,4-butanediol to the heated hexamethylene diisocyanate yielded no linear polymers. An insoluble, rubber-like substance formed due to cross-linking. For the following reasons, this method is recommended for industrial application: (1) The reaction rate of resin formation is higher than in the presence of solvents; (2) the reaction can easily be regulated by varying the rate of diisocyanate addition; (3) polymers with the desired molecular weight can be obtained by varying the rate of diisocyanate addition and the intensity of mixing. There are 1 table and 14 references: 5 Soviet-bloc and 9 non-Soviet-bloc. The most important reference to English-language publications reads as follows: O. Bauer, Mod. Plastics, 24, no. 10, 407, (1947).

Card 2/4

11.2212
15.8140

24745
S/191/61/000/007/003/010
B101/B215

AUTHORS: Korshak, V. V., Strepikheyev, Yu. A., Moiseyev, A. F.

TITLE: Synthesis of linear polyurethanes without solvents. Some rules governing the reaction of hexamethylene diisocyanate with 1,4-butanediol in the melt

PERIODICAL: Plasticheskiye massy, no. 7, 1961, 13-16

TEXT: This report is a continuation of a study on the synthesis of polyurethanes without using solvents (Plast. massy, no. 6, 1961). The effect of the following factors upon the molecular weight was studied in the present paper: 1) presence of atmospheric oxygen; 2) ratio of the components; 3) addition of monofunctional reagents; 4) duration of heating. The synthesis of polyurethane was conducted by dropwise addition of hexamethyl diisocyanate to heated 1,4-butanediol. The temperature of the mass was not allowed to exceed a certain reaction temperature. The melt was kept at this temperature for a while, and, finally, the viscosity of a 0.5 % solution in tricresol was determined. In calculating the molecular

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Synthesis of linear polyurethanes...

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B101/B215

X

weight, the Staudinger constant was set equal to $11 \cdot 10^{-4}$. 1) In the presence of oxygen, the molecular weight was considerably reduced. In nitrogen atmosphere, the molecular weight was only slightly reduced (from 36,000 to 33,000) by an increase of the initial temperature of the reaction from 80 to 180°C. In the presence of air, the molecular weight was 25,000 at 80°C and 14,000 at 180°C. An increase of the final reaction temperature from 190 to 230°C reduced the molecular weight in nitrogen atmosphere from 36,000 to 23,000 and in air from 24,000 to 8000. Under optimum reaction conditions (initial temperature: 80 to 90°C; final temperature: 200-210°C) the duration of dropwise addition of diisocyanate in nitrogen atmosphere did not affect the molecular weight. By dropwise addition of 20 min, a maximum molecular weight of 25,000 was obtained in the presence of air. Slower addition reduced the molecular weight. After 5 hr the molecular weight was unchanged by heating the polymer in N_2 up to 200°C. Heating up to 210°C led to a slight decrease. The presence of air reduces the molecular weight by 50 % within 2 hr at 190°C or within 1 hr at 200°C. 2) An excess of 1,4-butanediol caused the following changes in the molecular weight: 0.0 % excess: 35,400; 1.0 %: 28,050; 10 %: 5100;

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Synthesis of linear polyurethanes... S/191/61/000/007/003/010
B101/B215

100 %: 1850. The brittleness of the polymer was thus increased. With an excess of hexamethylene diisocyanate, three-dimensional networks formed and the polymer became insoluble. Excess of 1 %: molecular weight of 33,400; the polymer is meltable and filamentous. With 10 %: molecular weight of 2741; the polymer is infusible and rubber-like. 3) Heptyl alcohol or piperidine were added as monofunctional reagents. Molecular weight with additions of heptyl alcohol: 1 %: 24,360; 2 %: 14,200; 10 %: 4680; 40 %: 1850. The action of piperidine was the same. 4) In nitrogen atmosphere, the molecular weight was further increased by adding the total amount of diisocyanate. At 200°C the molecular weight increased rapidly during the first 1-1.5 hr and reached its maximum after 2.5 hr (36.000). V. V. Golubev and S. R. Rafikov are mentioned. There are 8 figures, 4 tables, and 3 Soviet-bloc references.

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15.8140

26992

S/191/61/000/009/002/007
B110/B218

AUTHORS: Korshak, V. V., Strepikheyev, Yu. A., Moiseyev, A. F.

TITLE: Production of linear polyurethanes without solvents. Some physicomechanical indices of polyurethanes based on hexamethylene diisocyanate and a number of glycols

PERIODICAL: Plasticheskiye massy, no. 9, 1961, 16 - 20

TEXT: The authors studied the change in physicomechanical properties of polyurethanes (PU) obtained on the basis of hexamethylene diisocyanate and some glycols. The PU were produced by adding the stoichiometric amount of diisocyanate to the heated diol. The method was developed by the authors (Plast. Massy, No. 6, 1961, ibid., No. 7, 1961). The authors determined melting point, molecular weight (viscosimetrically), and other physicomechanical indices. In PU on the basis of diols with different numbers of C atoms, the maximum melting point lies at 183°C for 1,4-butanediol PU. Melting points of PU on the basis of glycols with even numbers of C atoms are slightly higher than with odd numbers of C atoms. Pu on the basis of ethylene glycol, 1,4-butanediol, 1,6-hexanediol, and 1,10-decanediol are transparent or white, solid, horny substances which yield cold-drawing

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Production of linear polyurethanes... S/191/61/000/009/002/007
B110/B218

threads in melting. They are soluble in tricresol or in a phenol-water mixture (90 : 10). PU based on diethylene glycol and 1,6-methylhexanediol are transparent colorless elastic substances; they are soluble in tricresol, in phenol-water mixtures (90 : 10), and also in alcohol-chloroform mixtures (50 : 50). From the solutions, they form elastic films of high mechanical strength. Transparent, brittle products are obtained on the basis of glycols with a secondary hydroxy group such as 1.2-propanediol and 1,3-butanediol. Pu hardness drops with rising molecular weight of diol. The side groups and the oxygen atom in diol increase the impact strength. PU on the basis of diethylene glycol (DE) have low strength and thermal stability, high water-absorbing capacity, and a large tangent of the angle of dielectric losses. The authors found: The presence of a methyl side group or of ether oxygen in the glycol component reduces the melting temperature, hardness, thermal stability, and other physicomechanical indices. Elasticity and solubility in organics increase. PU on the basis of an ethylene-glycol (EG) - DE mixture are white, elastic, soluble in cresol, C_2H_5OH - $CHCl_3$ mixtures (50 : 50), and C_2H_5OH - $C_2H_4Cl_2$ mixtures. From melts, PU with high EG content produce strong threads and poorly elastic films, PU with high DE content, weak threads and solid elastic

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films. Melting point, thermal stability, Brinell hardness first drop with increasing EG content of the mixture, start rising at 35-40% of EG and reach a maximum at 100% of EG. The water-absorbing capacity drops to 0.23% with 100% of EG. PU on the basis of an EG - 1,4-butanediol (BD) mixture are white, horny, but less solid, soluble only in cresol and a phenol-water mixture (90 : 10). In melting, they yield strong threads and elastic films. Melting temperatures, thermal stabilities, and impact strengths are lower in glycol mixtures than in individual diols, the water-absorbing capacity is slightly higher. PU on the basis of DE - 1,4-BD mixtures are transparent, elastic, and soluble in cresol only. The elasticity of threads and films from the melts decreases with increasing 1,4-BD content while the strength increases. PU on the basis of triethylene glycol - 1,4-BD mixtures are more elastic, and soluble in C_2H_5OH-$CHCl_3$ and C_2H_5OH-$C_2H_4Cl_2$. In the same solvents, also PU based on methylhexanediol- 1,4-BD mixtures are soluble. These PU are white or transparent elastic products. From the melt, they produce very strong threads and solid films. The impact-strength curve according to Dinstat of the DE - 1,4-BD mixture passes a minimum with increasing DE content, and reaches a maximum at about 75% of DE. The physicomechanical properties of PU are strongly and in a complicated manner

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Production of linear polyurethanes... S/191/61/000/009/002/007
B110/B218

affected by the diol ratio. There are 7 figures, 3 tables, and 5 references: 2 Soviet and 3 non-Soviet. The two references to English-language publications read as follows: Ref. 1: O. Bayer, Mod Plastics, 24, 149 (1947); Ref. 5: R. Hill, E. Walker, J. Polymer Sci., 3, 609 (1948).

Table 3. Physicomechanical properties of PU obtained from hexamethylene diisocyanate and glycol mixtures. Legend: (1) glycol, (2) glycol ratio, moles, (3) impact strength according to Dinstat, kg·cm/cm^2, (4) static bending according to Dinstat, kg·cm/cm^2, (5) Brinell hardness, kg/mm^2, (6) water absorption, %, (7) thermal stability according to Vicat, °C, (8) melting temperature, °C, (9) ethylene glycol, diethylene glycol, (10) ethylene glycol, 1,4-butanediol, (11) diethylene glycol, 1,4-butanediol, (12) triethylene glycol, 1,4-butanediol, (13) 1,6-methyl hexanediol, 1,4-butanediol.

Card 4/5

POLYAKOVA, A.M.; KORSHAK, V.V.; LIPATNIKOV, N.A.

Investigation of the polymerization of isopropenyl aromatic compounds. Ionic polymerization of p- and o-substituted α-methyl-styrenes and α-isopropenylnaphthalene. Neftekhimiia 1 no.2:224-229 Mr-Ap '61. (MIRA 15:2)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.
(Polymerization) (Naphthalene)
(Styrene)

S/190/61/003/001/009/020
B119/B216

AUTHORS: Korshak, V. V., Vinogradova, S. V., Valetskiy, P. M., Mironov, Yu. V.

TITLE: Heterochain polyesters. XXX. A study on rules in polycondensation of acid chlorides of dicarboxylic acids with dihydroxy phenols in high-boiling solvents

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 3, no. 1, 1961, 66-71

TEXT: This is a continuation of the publications on the subject mentioned in the title. The present work studies the influence of solvents, temperature, reaction time, concentration of initial substances and their relative proportions, and the presence of other substances on the molecular weight of the condensation product. The acid dichloride of terephthalic acid (A) and 2,2-di(4-hydroxyphenyl)-propane (B) were used as initial substances. The polycondensation reactions were performed in special test tubes for condensation (heated in an aluminum block) or in round-bottomed flasks with mechanical stirrer (heating in silicone oil

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bath) in a nitrogen stream. The molecular weight of the individual condensates was determined from the viscosity of a 5% solution of the condensate in cresol. The experiments were carried out at 220° and 240°C, at reaction times of 10 hr and less. The solvents used were ditolyl methane, "dinyl", tetralin, dimethyl aniline, tetrachloro ethane and pyridine. The concentrations of the initial substances (in equimolar proportions) were varied between 0.05 and 1.0 mol/l. The molar ratio of the initial substances varied from 0.5 to 2.5. The following substances were tested for catalytic activity by adding them to the reaction mixture: tetraethylammonium bromide, tetramethylammonium bromide, trimethyl-amine hydrochloride, triethyl amine, dimethyl aniline, pyridine, diethyl aniline, ammonium chloride, p-toluenesulfonic acid, $ZnCl_2$, $Zn(OCOCH_3)_2$, annealed PbO and Al_2O_3, and $ZnCl_2$, $MgCl_2$, $CaCl_2$, TiO_2, anhydrous $AlCl_3$, $TiCl_4$, metallic Na and Mg. The following reaction conditions were found to be optimum: 220°C, initial substances at a molar ratio of 1:1, a concentration in the reaction mixture of 0.6 mol/l, ditolyl methane as solvent and a reaction time of ~5 hr. Longer reaction times and higher temperatures resulted in rather lower molecular weight.

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Heterochain polyesters. XXX. A study on... S/190/61/003/001/009/020
B119/B216

None of the additives exhibited special catalytic activity. The best results were obtained in presence of PbO, Al_2O_3 and TiO_2. Intrinsic viscosity: 0.59, 0.46, 0.58. Yield calculated for initial substances: 82.0, 77.0, 79%. Among other publications, the authors mention a work by the first-mentioned author in collaboration with V. V. Golubev. There are 1 figure, 2 tables, and 17 references: 12 Soviet-bloc and 3 non-Soviet-bloc.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy AN SSSR (Institute of Elemental Organic Chemistry, AS USSR). Moskovskiy khimiko-tekhnologicheskiy institut im. D. I. Mendeleyeva (Moscow Chemical-technological Institute imeni D. I. Mendeleyev)

SUBMITTED: May 30, 1960

Card 3/3

88729

15 8510

S/190/61/003/001/010/020
B119/B216

AUTHORS: Korshak, V. V., Vinogradova, S. V., Valetskiy, P. M., Salazkin, S. N.

TITLE: Heterochain polyesters. XXXI. On the chemical properties of polyarylates

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 3, no. 1, 1961, 72-80

TEXT: The authors point out the scarcity of publications on the chemical properties of polyarylates. The present study was undertaken with a view to investigating the possibilities of chemical degradation of polyarylates of aromatic dicarboxylic acids, their gasoline and oil resistance, resistance to dilute and concentrated acids and bases, oxidating agents and various organic substances. Polyarylates of 2,2-di-(4-hydroxyphenyl)-propane and terephthalic acid (TD) and isophthalic acid (ID), respectively, were used for the tests. TD and ID were prepared by equilibrium polycondensation in a high-boiling solvent. For comparison, ID prepared by emulsion polymerization was also used. The following

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tests were carried out: To test the destructive effect of isophthalic acid, its acid chloride and 2,2-di-(4-hydroxyphenyl)-propane on ID and that of 2,2-di-(4-hydroxyphenyl)-propane on TD, the substances were added to varying amounts of the polymer in ditolyl methane and heated to 220°C for 3 hr in a stream of N_2. The destructive effect of m-cresol on TD and ID was also tested (0.5% m-cresol solution of polyacrylate was heated to 85-183°C). In further tests, TD and ID were heated for 3 hr at 100°C (or lower, if the boiling point was lower) in ethyl alcohol, methylethyl ketone, dioxane, tetrahydrofuran, n-heptane, benzene, p-xylene, N,N-dimethyl formamide, methylene chloride, chloroform, carbon tetrachloride, tetrachloro ethylene, tetrachloro ethane and chloro benzene. Gasoline and oil resistance was determined by the method described in Ref. 18. Results: TD and ID are degraded by 2,2-di-(4-hydroxyphenyl)-propane, isophthalic acid and m-cresol, but not by isophthalic acid chloride. Degradation in m-cresol proceeds according to the mechanism of alcoholysis. The authors calculated the rate constant of the pseudo-monomolecular degradation reaction. ID prepared by emulsion polymerization was affected much more severely than ID prepared by equilibrium polymerization in a high-boiling solvent. TD and ID are resistant to

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organic solvents, benzene and oil. ID is resistant to the usual dilute and concentrated acids as well as to NaOH and H_2O_2. Concentrated H_2SO_4 and concentrated and dilute NH_4OH cause decomposition. Mention is made of a work by the first-mentioned author in collaboration with N. I. Bekasova and V. A. Zamyatina. There are 5 figures, 5 tables, and 18 references: 14 Soviet-bloc and 4 non-Soviet-bloc.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy AN SSSR (Institute of Elemental Organic Compounds, AS USSR). Moskovskiy khimiko-tekhnologicheskiy institut im. D. I. Mendeleyeva (Moscow Institute of Chemical Technology imeni D. I. Mendeleyev)

SUBMITTED: June 8, 1960

Card 3/3

KORSHAK, V.V.; FRUNZE, T.M.; KURASHEV, V.V.; SEROVA, K.L.

Heterochain polyamides. Part 28: Significance of acceptors of hydrochloric acid in the synthesis of polyamides by interfacial polycondensation. Vysokom. soed. 3 no.2:205-207 F '61. (MIRA 14:5)

1. Institut elementoorganicheskikh soyedineniy AN SSSR. (Polyamides)

KORSHAK, V.V.; FRUNZE, T.M.; VINOGRADOVA, S.V.; KURASHEV, V.V.; LEBEDEVA, A.S.

Heterochain polyamides. Part 29: Significance of the hydrolysis of dichlorides of dicarboxylic acids during interphase polycondensation. Vysokom.soed. 3 no.3:371-375 Mr '61. (MIRA 14:6)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.
(Polyamides) (Condensation products (Chemistry))

KORSHAK, V.V.; GOLOVA, O.P.; SERGEYEV, V.A.; MERLIS, N.M.; SHNEYER, R.Ya.

Polyethers of levoglucosan. Part 1: Polymerization of levoglucosan and its ethers. Vysokom.soed. 3 no.3:477-485 Mr '61.
(MIRA 14:6)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.
(Glucopyranose) (Polymerization)

15 8113 2209, 1372
11.2212

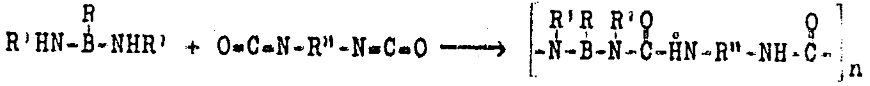
21131
S/190/61/003/004/004/014
B101/B207

AUTHORS: Korshak, V. V., Bekasova, N. I., Zamyatina, V. A., Aristarkhova, G. I.

TITLE: Copolymerization of bis-(alkylamino-)alkyl- or aryl boron with organic diisocyanates

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 3, no. 4, 1961, 521-524

TEXT: The papers by B. M. Mikhaylov et al. (Ref. 1: Izv. AN SSSR, Otd. khim. n., 1957, 1123; Ref. 2: ibid., 1958, 777; Ref. 3: Dokl. AN SSSR, 121, 656, 1958) showed that polycondensation of alkyl- or aryl boron dichlorides with primary amines does not lead to linear polymers, but to cyclic trimers. In the present study, the synthesis of linear polymers by copolymerization of bis-(alkylamino)-alkyl- or aryl boron with hexamethylene diisocyanate or toluylene diisocyanate was carried out according to the following equation:



$$R'HN-\overset{R}{B}-NHR' + O=C=N-R''-N=C=O \longrightarrow \left[-\overset{R'}{N}-\overset{R}{B}-\overset{R'}{N}-\overset{O}{\overset{\|}{C}}-HN-R''-NH-\overset{O}{\overset{\|}{C}}- \right]_n$$

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Copolymerization of ... S/190/61/003/004/004/014
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The following compounds were synthesized as initial substances: 1) bis-(methylamino)-butyl boron; 2) bis-(ethylamino)-butyl boron (according to Ref. 3); 3) bis-(methylamino)-, 4) bis-(ethylamino)-, and 5) bis-(phenylamino)-phenyl boron (according to Ref. 1). Copolymerization was carried out at a molar ratio of 1 : 1 and three-hr heating to 50°C, then to 100, 150, 200, 250, and 275°C (bis-(methylamino)-butyl boron) was only heated to 150°C). The authors used ampoules which were evacuated after passing through of N_2. The monomer was obtained from the copolymers by means of benzene, and the copolymer composition was determined by means of elementary analysis. The intrinsic viscosity of the 5% copolymer solution in tricresol was determined at 20°C. Tables 1 and 2 give the data for the copolymers. The figure shows the thermomechanical curve of the copolymer from bis-(phenylamino)-phenyl boron with hexamethylene diisocyanate. The copolymers obtained contain B, N, and C atoms in the chain. They are solid, brittle, transparent, yellowish or reddish substances which are stable to air moisture and do not decompose, even when heated beyond the melting point. There are 1 figure, 2 tables, and 3 Soviet-bloc references.

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

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15.8114 2209, 1372

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21132

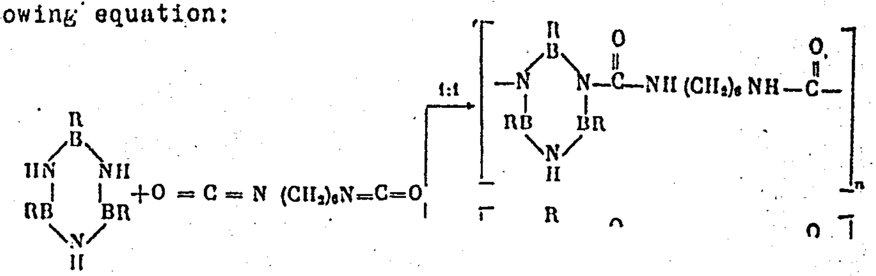
S/190/61/003/004/005/014
B101/B207

AUTHORS: Korshak, V. V., Zamyatina, V. A., Bekasova, I. I., Ma Jui-jan

TITLE: Copolymerization of boron-substituted borazoles with hexamethylene diisocyanate

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 3, no. 4, 1961, 525-529

TEXT: In the present study, the authors aimed at obtaining heat resistant polymers. They proceeded from boron-substituted borazoles which, by way of migration copolymerization with hexamethylene diisocyanate, reacted according to the following equation:



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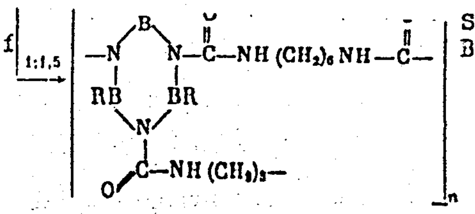
Copolymerization of



The molar ratio of components was 1 : 1 or 1 : 1.5. The boron-substituted borazoles were synthesized according to the method proposed by B. M. Mikhaylov, T. V. Kostroma (Ref. 8: Izv. AN SSSR, Otd. khim. n., 1957, 1125). A. F. Zhigach provided trimethyl borazole. The compound was copolymerized in glass ampoules from which air had been displaced by means of N_2 and which, subsequently, were evacuated and sealed. The ampoules were heated for 3 hr to 100°C and 3 hr each to 150, 200, and 250°C. Table 1 gives the data of the polymers obtained. In the case of aliphatically substituted borazoles, thermomechanical testing yielded the highest softening temperature for trimethyl borazole. Triphenyl borazole yielded copolymers which melt only at high temperatures. [Abstracter's note: The authors provide no data on softening temperature and melting point.] The resistivity of the copolymer from B-trimethyl borazole with hexamethylene diisocyanate 1 : 1.5, was $2.5 \cdot 10^{11}$ ohm·cm, tan $\delta = 0.0072$ at 10^3 cps. at room temperature. At 150°C,

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B101/B207

Copolymerization of ...

these values were $8\cdot10^{11}$ ohm·cm, and 1.1, respectively. (This study was made by T. S. Knyazeva and Z. V. Lyamkina). The experiment of copolymerizing the components in dinyl solution (boiling point 250°C), resulted in a lower copolymer yield (60-65%) with only 25-33% of the calculated boron content, and, probably, consisted mainly of polyisocyanuric acid. The thermal properties of these copolymers differed greatly from those of the copolymers obtained without solvent. There are 1 figure, 2 tables, and 10 references: 3 Soviet-bloc and 9 non-Soviet-bloc. The 2 references to English-language publications read as follows: S. J. Groszos, S. F. Stafiej, J. Amer. Chem. Soc., 80, 1357, 1958; M. Lappert, Proc. Chem. Soc., 1959, no. 2, 59.

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

SUBMITTED: July 1, 1960

Card 3/4

POLYAKOVA, A.M.; KORSHAK, V.V.; TAMBOVTSEVA, Ye.S.

Polymerization under pressure of α-methylstyrenes substituted at the nucleus. Part 7: α -Methylstyrene containing Sn, Pb, and Ge. Vysokom.soed. 3 no.5:662-664 My '61. (MIRA 14:5)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.
(Styrene) (Tin organic compounds) (Lead organic compounds)
(Germanium organic compounds)

KORSHAK, V.V.; FRUNZE, T.M.; LU I-NAN' [Lu I-nan]

Heterochain polyamides. Part 30: Preparation of mixed polyamides by fusion of homopolymers with salts. Vysokom.soed 3 no.5:665-670 My '61.
(MIRA 14:5)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.
(Polyamides)

KORSHAK, V.V.; VINOGRADOVA, S.V.; FRUNZE, T.M.; LEBEDEVA, A.S.; KURASHEV, V.V.

Heterochain polyesters. Part 31: Role played by the hydrolysis of aromatic dicarboxylic acid chlorides in the process of interfacial polycondensation. Vysokom.soed. 3 no.7:984-990 Jl '61. (MIRA 14:6)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.
(Hydrolysis) (Isophthaloyl chloride)
(Terephthaloyl chloride) (Polymerization)

5.3830

25276

S/190/61/003/007/020/021
B101/B230

AUTHORS: Korshak, V. V., Vinogradova, S. V., Lebedeva, A. S.

TITLE: New method of synthesizing grafted and block copolymers

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 3, no. 7, 1961, 1117

TEXT: In this letter authors report to the editor that they found a possibility of applying the method of interfacial polycondensation to the synthesis of grafted and block copolymers. Synthesis of grafted and block copolymers may be conducted in various alternatives of this method. Thus, copolymers may be obtained on the basis of the reactions: (see below). In particular, authors obtained grafted copolymers on the basis of phenol formaldehyde resin and polyarylates from dian and isophthalic or sebacic acids. The grafted copolymer obtained on the basis of phenol formaldehyde resin, chloride of isophthalic acid and dian at a molar ratio of 0.2 : 1.1 : 1 (as well as 2.2 moles of alkali) was a crystalline substance of a low degree of orderliness, with softening point 170 - 292°C capable to form a solid film out of the molten material. Tensile strength of the non-oriented film of this polymer amounted to 660 kg/cm^2

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New method of synthesizing.... 25275 S/190/61/003/007/020/021
B101/B230

with a relative breaking elongation of 12 %. Properties of grafted copolymers obtained by interfacial polycondensation may be varied within a wide range by changing the ratio and chemical character of the initial substances. [Abstracter's note: Complete translation.]

SUBMITTED: January 3, 1961

$$1.\ [-R(OH)-]_n + ClOC[-R'-]_m COCl + NaOH \rightarrow$$
$$\rightarrow [-R-(OOC[R']_m COCl)]_y [R(OH)]_x + NaCl,\ x+y=n;$$

$$2.\ HO[-R-]_n OH + [-R'(COCl)-]_m + NaOH \rightarrow$$
$$\rightarrow [-R'(COO[R]_n OH)]_x - [R'(COCl)-]_y + NaCl,\ x+y=m;$$

$$3.\ [-R(OH)-]_n + HOR'OH + ClOCR''COCl + NaOH \rightarrow$$
$$\rightarrow [-R(OOCR''COOR'O-)_q]_x - [R(OH)]_y + NaCl,\ x+y=n;$$

$$4.\ [-R(OH)-]_n + [-R'(COCl)-]_m + NaOH \rightarrow [-R(OOC\overset{|}{\underset{|}{R'}})_m]_x [R(OH)]_y +$$
$$+ NaCl,\ x+y=n;$$

$$5.\ ClOC[-R-]_m COCl + HOR'OH + ClOC[-R''-]_n COCl + NaOH \rightarrow NaCl +$$
$$+ [-OC[-R-]_m COOR'OOC[-R''-]_n COR'O-]_x.$$

Card 2/2

POLYAKOVA, A.M.; KORSHAK, V.V.; LIPATNIKOV, N.A.

Polymerization of isopropenyl heterocyclic compounds. Part 1: 2-isopropenylthiophene. Vysokom.soed. 3 no.8:1144-1149 Ag '61. (MIRA 14:9)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.

(Thiophene)

KORSHAK, V.V.; SERGEYEV, V.A.; KLEYZER, N.B.

Polyesters of levoglucosan. Part 2: Alkyd resins based on levoglucosan and dicarboxylic acids. Vysokom.soed. 3 no.8:1191-1196 Ag '61. (MIRA 14:9)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.
(Alkyd resins) (Levoglucosan) (Acids, Organic)