5.3810
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SOV/20-130-2-32/69

AUTHORS: Kargin, V. A., Academician, Kozlov, P. V., Van Nay-chan

TITLE: The Temperature of the Vitrification of Cellulose

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol 130, Nr 2, pp 356 - 358 (USSR)

ABSTRACT: The authors proceed from the opinion that the vitrification temperature T_v and the flow temperature T_f of cellulose are higher than its decay temperature. As was shown by references 1 and 2, T_v may be reduced in rigid polymers by plastifying additions. The authors applied this method to cellulose. They describe the purification of sulphite cellulose, which had an average molecular weight of 210 426, and the production of pulverized samples, to which triethyl phenylaminohydroxide was added in various quantities as plastifier. The samples were compressed into tablets at 100 atm and 160°, after which their deformation was dynamometrically measured with slowly rising temperature. From the salient points of the thermomechanical curves (Fig 1) the dependence of T_v on the plastifier content was determined (Fig 2) and by extrapolation for

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The Temperature of the Vitrification of Cellulose SOV/20-130-2-32/69

zero-concentration of the plastifier T_v=220° was found. From the turning point of the curve there resulted the temperature T_2, at which the cellulose acquires rubber-like elasticity, at 370°. From the fact that T_v is about 40° above the temperature at which chemical decomposition of cellulose sets-in the physical properties of cellulose are explained. There are 2 figures and 5 Soviet references.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

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SUBMITTED: October 9, 1959

Card 2/2

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S/020/60/135/002/025/036
B004/B056

AUTHORS: Kargin, V. A., Academician, Kozlov, P. V., Asimova, R. M., and Anan'yeva, L. I.

TITLE: Two Types of Plasticization of Polymers With Rigid Chains

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 135, No. 2, pp. 357-360

TEXT: It was the purpose of the present work to explain the two types of plasticization of polymers with rigid chains: A) The plasticizer is soluble to an unlimited extent in the polymer. B) The plasticizer is more or less incompatible with the polymer. The fact that in both cases plasticization occurs, must be attributed to the different action of the two plasticizer types. The plasticization of cellulose (molecular weight about 200,000) was investigated by means of the incompatible plasticizers guanidine thiocyanate and urea. The cellulose was saturated with the plasticizer dissolved in ethanol, dried after 2 to 3 days, and pressed into tablets at 130 - 140°C and 75 atm pressure. The thermomechanical curves of the tablets

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Two Types of Plasticization of Polymers With Rigid Chains

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were drawn. Whereas in plasticizing with triethylphenyl ammonium oxide (compatible with cellulose) a decrease of the vitrification temperature T_V occurred proportional to the plasticizer content of cellulose, incompatible plasticizers hardly changed T_V at all. In the latter case, no interaction can occur between the molecules of the plasticizer and the macromolecules of the polymer. The authors interpret this effect on the basis of the structure of amorphous polymers. They assume that the polymer has orientated secondary structures: orientated bundles of chains. In the case A, which they describe as "intrabundle plasticization", the interaction of the plasticizer with the active groups of the polymer is more intense than the interaction between the polymer molecules. The secondary structure of the polymer is therefore destroyed, and a solid solution of the plasticizer in the polymer is formed. In the case B, which is described as "interbundle plasticization", the plasticizer reacts only with the polymer molecules on the surface of the secondary structures. The secondary structure therefore remains conserved, and the polymer keeps its high mechanical strength. Its elasticity depends on the Hook elasticity of the secondary structure. Such a kind of plasticization is advantageous for

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Two Types of Plasticization of Polymers With Rigid Chains

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B004/B056

obtaining low-temperature resistant materials, which are supposed to have high elastic properties. There are 2 figures and 7 Soviet references.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

SUBMITTED: August 12, 1960

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Card 3/3

KARGIN, V.A., akademik; KOZLOV, P.V., MIRLINA, S.Ya.; KAPRALOVA, Z.A.

Breakdown and formation of structure in natural proteins in the course of their transfer through nonporous membranes. Dokl. AN SSSR 135 no.6:1421-1424 D '60. (MIRA 13:12)

1. Moskovskiy gosudarstvennyy universitet im.M.V.Lomonosova.
(Proteins)

KOZLOV, P.V.; KABANOV, V.A.; PLATE, N.A.

International Symposium on Macromolecular Chemistry held in Moscow.
Vysokom. soed. 3 no.2:328-348 F '61. (MIRA 14:5)
(Macromolecular compounds—Congresses)

S/190/61/003/002/012/012
B101/B215

AUTHORS: Kozlov, P. V., Kabanov, V. A., Plate, N. A.

TITLE: The International Symposium on Macromolecular Chemistry in Moscow

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 3, no. 3, 1961, 328-348

TEXT: This is a report on the 14th Symposium on Macromolecular Chemistry, held in Moscow on the suggestion of the USSR and decision of the IUPAC (International Union of Pure and Applied Chemistry), June 14th-18th, 1960. Subject was: synthesis of macromolecular compounds and chemical transformation in polymer chain molecules. There were 1136 delegates and 279 guests. 846 of the delegates came from the USSR. Altogether 170 lectures and reports were given, 64 of which were attended and discussed by Soviet research workers. Two plenary sessions and 18 sessions of the three sections took place. 8 sessions were held on one day of free discussion. The symposium was opened by the plenary session held in the great hall of the Moskovskiy gosudarstvennyy universitet (Moscow State University). V. S. Fedorov, Chairman of the Gosudarstvennyy Komitet

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The International Symposium...

S/190/61/003/002/012/012
B101/B215

Soveta Ministrov SSSR po khimii (State Committee of Chemistry of the Council of Ministers USSR), A. N. Nesmeyanov, Academician, and I. G. Petrovskiy, Academician, Director of the Moscow University welcomed the delegates. V. A. Kargin, Academician, chairman of the Organization Committee gave a survey on the main problems of polymer chemistry in his opening speech. Second plenary session: N. N. Semenov, Academician: "The collective interaction in processes of polymerization at low temperatures and in polymers with conjugate bonds". The First Section dealt with problems of synthesizing polymers. Lectures by Soviet-bloc scientists: Ye. A. Mushina, A. I. Perel'man, A. V. Topchiyev, B. A. Krentsel' (USSR) talked about synthesizing stereoregulary polymers of ring-containing α-olefins. Ye. I. Tinyakova, B. A. Dolgoplosk, T. G. Zhuravleva, R. N. Kovalevskaya, T. N. Kuren'gina (USSR): On the synthesis of cis- and transpolymers of dienes on oxide catalysts. A. V. Golubeva, N. F. Usmanova, A. A. Vansheydt (USSR): Synthesis of copolymers from styrene, α-methyl-styrene, and vinyl naphthalene. T. Ya. Kefeli, G. V. Korolev, Yu. M. Filippovskaya (USSR): On polyester acrylate. The synthesis of these polymers had been developed under the supervision of A. A. Berlin. M. Bogdanecky, I. Mleziva, A. Sternschuss, V. Zvonǎr (ČSR): Copolymerization of styrene with unsaturated polyesters. Ye. N. Zil'berman,

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The International Symposium... S/190/61/003/002/012/012
B101/B215

A. Ye. Kulikova, N. M. Teplyakov (USSR): Polyesters and their oligomers. M. M. Koton (USSR) gave a survey on the synthesis of new polymers with rings in their chains. A. A. Vansheydt, Ye. P. Mel'nikova, M. G. Krakovyak, L. V. Kukhareva, G. A. Gladkovskiy (USSR): Synthesis and properties of crystalline polymers type poly-p-xylylene and polyphenyl methyl. S. G. Matsoyan, I. A. Arbuzova, Ye. N. Rostovskiy (USSR) on: synthesis of polyvinyl acetals. V. V. Korshak, S. L. Sosin, V. P. Alekseyeva (USSR) on the synthesis of new, linear polymers containing aromatic rings. K. A. Andrianov (USSR): "Polymers with inorganic chains in the molecules". N. S. Nametkin, A. V. Topchiyev, S. G. Durgar'yan (USSR) reported on organo-silicon polymers obtained by Ziegler catalysts of allyl silanes by copolymerization with propylene. G. S. Kolesnikov, S. L. Davydova, N. V. Klimentova, M. F. Shostakovskiy, S. P. Kalinina, V. N. Kotrelev, D. A. Kochkin, G. I. Kuznetsova, L. V. Layne, A. I. Borisova, V. V. Borisenko (USSR): on the synthesis, polymerization and copolymerization of organogermanium and organo tin methacrylates and dimethacrylates. M. M. Koton, T. M. Kiseleva, F. S. Florinskiy (USSR): on organometallic tin and lead compounds. E. Thilo (Eastern Germany): "Essential characteristics of the chemistry of inorganic polymers".

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M. V. Vol'kenshteyn (USSR): on biosynthesis. K. T. Poroshin, Yu. I. Khurgin, T. D. Kozarenko, N. I. Prokhorov, N. B. Noskov (USSR): on polycondensation of α-aminoacid esters in the presence of CO_2; A. V. Volokhina, G. I. Kudryavtsev, S. M. Skuratov, A. K. Bonetskiy on polyamidization in solid phase. J. A. Mikes (Hungary) reported on condensation resins obtained from furfurole, phenol, and their derivatives, and formaldehyde. M. S. Akutin, L. A. Rodovilova, N. V. Mikhaylov, V. I. Mayborod, S. S. Nikolayeva (USSR), and L. A. Alexandru, L. D. Dascalu (Roumania) talked about interface polycondensation. F. Lešek, R. Hromeček (ČSR) reported on the process of suspension polymerization and its physicochemical description; A. A. Blagonravov, G. A. Levkovich, I. A. Pronin (USSR) on the catalytic effect of ZnO in the synthesis of polyurethanes. The Second Section dealt with processes of polymerization and polycondensation. 59 lectures were given in six sessions. S. Ye. Bresler, E. N. Kazbekov, Ye. M. Saminskiy (USSR) reported on studies on the reactivity of macroradicals by epr; Kh. S. Bagdasar'yan, Z. A. Sinitsina (USSR) and F. Tüdes, I. Kende, M. Azori (Hungary): on the inhibition of radical polymerization by aromatic compounds; G. A. Razuvayev, L. M. Terman, V. R. Likhterov, V. S. Etlis (USSR) on the decomposition of peranhydrides and peresters; A. L. Klebanskiy, O. A. Timofeyev (USSR) on reactions of hexafluoro butadiene-1,3. L. M. Pyrkov, S. Ya. Frenkel' reported on "Hybrid polymers"; D. Hardy, K. Nitray, G. Kovacs, V. P. Li (Hungary) on the kinetics of radical polymerization of vinyl monomers in the presence of SiCl$_4$. T. Krishan, M. F. Margaritova (USSR) talked about emulsion polymerization. A. Ryšanek, M. Hloušek (ČSR) reported on the polymerization rate of a particle during emulsion polymerization; F. Hrabek, J. Zahoval (ČSR) on the kinetics of emulsion polymerization of chloroprene; E. Turska, G. Wisniewski (Poland) on the redox potential in emulsion polymerization. Z. Maniasek, A. Jerabek (ČSR) reported on the emulsion polymerization of styrene and chloroprene; I. Selinger (ČSR): on studies on the kinetics of dispersion polymerization. Yu. L. Spirin, D. K. Polyakov, A. R. Gantmakher, S. S. Medvedev (USSR) on polymerization in the presence of organoalkali compounds. A. A. Korotkov, S. P. Mitsengendler, V. N. Krasulin (USSR) on the polymerization of methyl methacrylate in the presence of butyl lithium. M. Kučera, M. Jelinek, J. Lanikova (ČSR) on chain ruptures in anionic polymerization of octamethyl cyclotetrasiloxane. Z. Machaček, J. Mejzlik, J. Patz (ČSR) reported on the effect of the ratio catalyst : water on the polymerization rate. K. Vesely (ČSR) on cationic and anionic polymerization. Z. Zlamal, A. Kazda (ČSR) on the effect of non- polar compounds on the cation polymerization of butylene. R. Mihail, J. Gherşkovici (Roumania) on the formation of stereoregulary polymers. A. Szimon, Gy. Heims (Hungary) on the polymerization of ethylene in the presence of $TiCl_4$, $(C_2H_5)_3Al$ or $(C_2H_5)AlCl$. O. Wichterle, M. Marek, I. Trekoval (ČSR) on Ziegler catalysts for the polymerization of isobutylene. A. V. Topchiyev (USSR) reported on the polymerization on oxide catalysts and experimental data obtained in the in-t Neftekhimicheskogo sinteza AN SSSR (Institute of Petrochemical Synthesis of AS USSR). V. Boček (ČSR) on the propylene polymerization by modified Ziegler catalysts. The effect of organometallic catalysts was also studied by K. Vesely, J. Ambrož, R. Vilim, O. Gamřik (ČSR), B. L. Yerusalimskiy, Wang Fo-sung, A. P. Kavunenko (USSR), I. Szanto, K. Hala (Hungary), S. Ye. Bresler, M. I. Mosevitskiy, I. Ya. Poddubnyy, Shih Kuan-i (USSR), B. A. Dolgoplosk (USSR) reported on disturbances in the structure of chains in the ion polymerization of dienes. V. N. Tsvetkov, S. Ya. Magarik, N. N. Boytsova, M. G. Okunev, T. M. Birshteyn, Yu. Ya. Gotlib, O. B. Ptitsyn (USSR): on physicochemical methods of determining stereo-characteristics of macromolecules. V. A. Kargin, V. A. Kabanov (USSR): on the polymerization of insoluble, molecular, disperse substances. A. D. Abkin, A. P. Sheynker, M. K. Yakovleva, L. P. Mezhirova, (USSR) on radiation polymerization in liquid phase. The Third Section dealt with problems of chemical transformations in polymer chains. T. Rabek, Z. Kosmider (Poland) reported on the chlorination of phenol-formaldehyde resins by sulfuryl chloride. A. Ya. Yakubovich, T. Ya. Gordon, L. I. Maslennikova, Ye. M. Grobman, K. I. Tret'yakova, N. I. Kokoreva (USSR): on the transformation of polycarbonates. G. I. Kudryavtsev, Ye. A. Vasil'yeva-Sokolova, I. S. Mazel' (USSR): on the interaction of poly-α-chloro-methyl methacrylate by amines. Z. Volkober, T. Holly, G. Turczo (Hungary): on the interaction of substituted aromatic amines by polyvinyl chloride. I. M. Fingauz, A. F. Vorob'yeva, G. A. Shirokova, M. P. Dokuchayeva (USSR): sulfurization of the polymer during alcoholysis of polyvinyl acetate. B. A. Dogadkin, M. S. Fel'dshteyn, E. N. Belyayeva (USSR) reported on vulcanization accelerators. A. A. Berlin (USSR) gave a survey on the polymers with conjugate bonds. A. A. Berlin, V. I. Liogon'kiy, V. P. Parini (USSR) reported on polyconjugate polymers on the basis of aromatic bisdiazonines. M. A.Geyderikh,

B. E. Davydov, B. A. Krentsel', I. M. Kustanovich, L. S. Polak, A. V. Topchiyev, R. M. Voytenko (USSR): on semiconductor polymers. J. Mikes, L. Kovacs (Hungary): on bipolar ion exchange resins. K. M. Saldadze (USSR) reported on the same subject; Ye. B. Trostyanskaya, I. P. Losev, A. S. Tevlina, S. B. Makarova, G. Z. Nefedova, Lu Hsien-jao (USSR) on the chloromethylation of copolymers of styrene and divinyl benzene. Kh. U. Usmanov, U. N. Musayev, R. S. Tillayev (USSR): on radiation grafting of acrylonitril on polystyrene and polyperchloro-vinyl. I. Szanto, K. Gal (Hungary), Kh. U. Usmanov, B. I. Aykhodzhayev, U. Azizov (USSR) also reported on radiation grafting (acrylonitril on cellulose). M. Lazàr, R. Rado, J. Pavlinec (ČSR), G. S. Kolesnikov, Tseng Han-ming (USSR): on grafting by initiators. I. A. Tutorskiy, Z. I. Smelyy, V. M. Bystrov (USSR): on copolymers of butadiene styrene rubber with ε-caprolactam. A. A. Berlin, Ye. A. Penskaya, G. I. Volkova (USSR): on the formation of starch macroradicals in freezing and melting of aqueous solutions. V. A. Kargin, N. A. Plate (USSR) reported on initiating vinyl polymerization by disperse inorganic substances; R. Rado, M. Lazàr (ČSR): polymerization of polyethylene by peroxides. I. Mladenov, I. A. Tutorskiy, B. A. Dogadkin (USSR): action of γ-rays on butadien styrene rubber.

Z. A. Rogovin, V. A. Derevitskaya, Sun T'ung, Chang Wei-kang, L. S. Gal'braykh (USSR): synthesis of cellulose ethers. I. N. Yermolenko, F. N. Kaputskiy (USSR): synthesis of phosphorated celluloses. V. I. Ivanov, N. Ya. Lenshina, V. S. Ivanova (USSR): influence of the structure of polyglucoside chains on the oxidative transformation of cellulose. V. M. Yur'yev, A. N. Pravednikov, S. S. Medvedev (USSR): reduced rates of oxidation of hydrocarbons in the presence of formic acid or formates. Thermal destruction of polyvinyl chloride under the action of various compounds had been studied by Z. V. Popova and D. M. Yanovskiy (USSR). O. Wichterle, E. Schittler, P. Čefelin (ČSR) reported on the destruction of polycaprolactam. M. Kučera, J. Lanikova, M. Jelinek (ČSR): destruction of polydimethyl siloxane. E. Thilo, W. Wicker (Eastern Germany): destruction of inorganic polyphosphates. I. Gemery, O. Mlejnek, E. Štimel (ČSR): thermal destruction of polyesters. M. B. Neyman, B. M. Kovarskaya, L. I. Golubenkova, A. S. Strizhkova, I. I. Levantovskaya, M. S. Akutin (USSR): on thermal destruction of epoxy resins. L. A. Angert, A. S. Kuz'minskiy (USSR): initiating effect of secondary amines on the oxidation of rubber. I. Kessler, V. Matysek, J. Polaček (ČSR): aging of chloroprene. A. N. Pravednikov, Ying Sheng-k'ang (USSR): protective effect of

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benzene rings in the radiolysis of polystyrene. Discussion sessions concentrated on: 1) interface polycondensation; 2) heat resistance of polymers, polymers with magnetic properties; 3) mechanism of ionic polymerization; 4) mechanism of stereospecific polymerization; 5) problem of emulsion polymerization; 6) chemistry of cellulose; 7) grafted copolymers; 8) polymerization of monomers in solid state. The following Soviet-bloc scientists participated in these discussions: A. A. Berlin, V. L. Tal'roze, V. P. Parini, L. A. Blyumenfel'd, S. S. Medvedev (USSR), Z. Zlamal (ČSR), A. R. Gantmakher (USSR), K. Vesely (ČSR), A. I. Shatenshteyn, M. I. Mosevitskiy, K. S. Minsker, V. K. Bykhovskiy, P. M. Khomikovskiy, M. F. Margaritova, G. D. Berezhnaya, Z. A. Rogovin, N. A. Plate, G. S. Kolesnikov, M. S. Akutin, P. V. Kozlov, N. N. Semenov, E. I. Adirovich, V. A. Kabanov, S. S. Urazovskiy, V. V. Voyevodskiy, N. D. Sokolov, S. Z. Roginskiy, M. V. Vol'kenshteyn, Ye. V. Kuvshinskiy, V. I. Gol'danskiy (USSR). It is mentioned that the delegates were satisfied with the results of the symposium, and the level of the Soviet reports was by no means lower, in some specialized fields even higher than those of foreign scientists.

SHIROKOVA, N.I.; RUSSKOVA, Ye.F.; ALISHOYEVA, A.B.; GITINA, R.M.; LEVKOYEV, I.I.; KOZLOV, P.V.

Polycarbonates. Part 3: Synthesis of 2, 2-bis(4'-hydroxyphenyl) propane polycarbonates in a homogeneous medium and their properties. Vysokom.soed. 3 no.4:642-649 Ap '61. (MIRA 14:4)

1. Vsesoyuznyy nauchno-issledovatel'skiy kino-foto institut.
(Carbonic acid)

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AUTHOR: Berestneva, G. L., Berestnev, V. A., Gatovskaya, T. V., Kargin, V. A., Kozlov, P. V.

TITLE: Orderly precrystalline structure of polymers

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 3, no. 6, 1961, 801 - 805

TEXT: Before crystallization, the chain molecules of polymers in the
amorphous state may be in an orderly state, even before the occurrence of
long-range order. Crystallization with formation of large structures
(spherolites) is therefore often very rapid, requiring little energy, when
polymers are converted from the vitreous to the highly elastic state. A
mechanical field applied to a polymer with precrystalline orderly struct-
ure may destroy the latter. Further elongation leads to the formation of
new oriented structures, which are studied in the present work. The
rapidly crystallizing polyethylene terephthalate (PETP) was used for the
study, crystallization being observed by crystal analysis, thermodynamic-
ally, and visually by the turbidity caused by the formation of interfaces.

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Orderly precrystalline ...

The PETP films were heated (?), treated with acetone (?), or elongated at room temperature by 50 and 400 [illegible]. The [illegible] were investigated (A) by optical examination (birefringence), by the compensation method, [illegible] isothermic studies, sorption of acetone vapor using spring weights at 20°C and (C) determination of the integral heat of wetting in acetone in the adiabatic calorimeter and (D) measurement of density changes by means of graduated tubes. The crystallinity was determined by X-ray analysis. Fig. 1 shows the sorption isotherms of acetone by PETP films. The table gives experimental data of various film samples, obtained by calculation of the specific surface from sorption data obtained by (A), (C) and (D) using the equation of S. Brunauer, P. H. Emmett, E. Teller (BET) (Ref. 11: J. Amer. Chem. Soc., 60, 309, 1938). The increase of the total internal film surface during the first stage of elongation is due to destruction of the orderly and therefore specially dense structure of the isotropic sample formed during film formation. The data presented illustrate that the closely packed, orderly structure changes to a loosely packed and less orderly structure during this process (the specific surface increases nearly by a factor of 6). Further elongation leads to a renewed increase of the packing density of the

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Orderly precrystalline ...

molecules. The specific surface of a maximally elongated film is ~2.5 times larger than the degree of order of the new orderly structure, but somewhat smaller than in the initial film. Fig. 2 represents microphotometric curves of variously treated PETP films. Orientation in the sample produces an order involving much larger elements than the microelements present in the unoriented sample. The density drops during the first stage of elongation and then increases again. Macropores are present in the isotropic amorphous film. The density of PETP samples elongated 450% is higher than that of the initial film, owing to orienting "healing" of pores. This healing which sets in at the very outset of elongation explains the relatively small differences in the density values, as compared to the values for the total surfaces. Healing has no influence on the total surface, since the latter is determined by the presence of closely packed structural microformations. The change in birefringence (table) shows that the destruction of the precrystalline structure is due to changes in the position, characteristic of the initial structure, of the elements. This is confirmed by the diffraction pattern of the elongated sample. The increase of flexibility must lead to crystallization, i. e., to long-range order of the molecule centers, to orientation of the side

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Orderly precrystalline ...

groups and to turbidity of the sample. Accordingly, the acetone-treated sample gave the well-defined diffraction pattern shown in Fig. 2. At higher temperatures, the increased flexibility of the molecular chains facilitates the occurrence of relaxation processes. The latter enable the formation of precrystalline structures and, finally, the crystallization with formation of spherolites. There are 2 figures, 1 table, and 13 references: 10 Soviet-bloc and 3 non-Soviet-bloc. The reference to the English-language publication reads as follows: Ref 13: A. B. Tompson, D. W. Wood, Nature, 176, 78, 1955.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy kino-fotoinstitut (All Union Scientific Research Cinematography and Photography Institute). Fiziko - Khimicheskiy institut im L. Ya. Karpova (Physical Chemical Institute imeni L. Ya. Karpov) - Nauchno-issledovatel'skiy institut shinnoy promyshlennosti (Scientific Research Institute for Tire Industry)

SUBMITTED: February 25, 1960

Card 4/4

LI PAN-TUN [Li P'ang-t'ung]; KAFTANOVA, A.S.; BAKEYEV, N.F.; KOZLOV, P.V.

Study of the spherulitic structure of polymers. Part 5: Conditions of crystallization and their effect on the morphology of microspherulitic structures. Vysokom.soed. 3 no.11:1734-1738 N '61. (MIRA 14:11)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.
(Polymers) (Crystallization)

BERESTNEVA, G.L.; TSVANKIN, D.Ya.; KOZLOV, P.V.

Effect of stretching on the structure and properties of polyethyleneterephthalate films. Part 5: X-ray diffraction studies of crystallization processes occurring in uniaxially oriented films. Vysokom.-soed. 3 no.12:1787-1793 D '61. (MIRA 15:3)

1. Vsesoyuznyy nauchno-issledovatel'skiy kinofotoinstitut i Institut elementoorganicheskikh soyedineniy AN SSSR.
(Ethylene polymers) (Crystallization)

Kozlov, PV

S/062/61/000/007/009/009
B117/B215

AUTHOR: None given

TITLE: "General Assembly of the Otdeleniye khimicheskikh nauk Akademii nauk SSSR (Department of Chemical Sciences of the Academy of Sciences USSR), March 9-10, 1961

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye khimicheskikh nauk, no. 7, 1961, 1357-1360

TEXT: This is a report on the meetings of the General Assembly of the Otdeleniye khimicheskikh nauk Akademii nauk SSSR (Department of Chemical Sciences of the Academy of Sciences USSR) held on March 9 and 10, 1961 on the chemistry of cellulose. Professor Z. A. Rogovin reported on new methods of modifying the properties of cellulose, and mentioned some trends of research work in this field: (1) Synthesis of new types of cellulose esters; (2) introduction of new types of functional groups into the macromolecule of cellulose; (3) synthesis of graft copolymers of cellulose with polymers containing heterogeneous and carbon chains. O. P. Golova, Doctor of Chemical Sciences, reported on a "Study of the

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General Assembly of the ...

thermal process of cellulose decomposition". Thermal decomposition was studied in two cellulose modifications of different physical structures: cotton cellulose and hydration cellulose. Professor P. V. Kozlov reported on structural characteristics of cellulose and its derivatives. He said that V. A. Kargin, together with a number of other scientists, proved the amorphous structure of these natural polymers. He also mentioned that the ideas on the "package"-type structure of polymers expressed by V. A. Kargin, A. I. Kitaygorodskiy, and G. L. Slonimskiy are of greatest value for the examination of the macrostructure of cellulose and its derivatives. S. N. Danilov, Corresponding Member AS USSR, reported on the "Reactivity of esters of cellulose and chitin". He pointed out that chitin and cellulose supplied esters of great practical value. Their production, however, is still difficult. In his own name and on behalf of P. N. Odintsov, Academician AS Latviyskaya SSR, A. I. Kalnin'sh, Academician AS Latviyskaya SSR, reported on the prospects of development of timber chemistry. He stressed the necessity of finding new methods for the utilization of large timber resources, wood waste and vegetable remains in agriculture, and of rationalizing conventional methods. At the same time, theoretical work in this field is to be intensified. N.N. Shorygina,

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S/062/61/000/007/009/009
B117/B215

General Assembly of the ...

Doctor of Chemical Sciences, reported on new methods of utilizing lignin by means of its chemical modification. Academician N. N. Semenov, V. V. Korshak, S. N. Danilov, G. B. Bokiy, Corresponding Members AS USSR, as well as O. P. Ko'mina, V. I. Sharkov, G. O. Radchenko, et al. took part in discussions.

Card 3/3

KOZLOV, P.V.

Methods for investigating film materials. Plast.massy no.10:4-14 '61. (MIRA 15:1)
(Films (Chemistry)) (Polymers)

KOZLOV, P.V.; KOZ'MINA, O.P.; VAN NAY-CHAN [Wang Nai-ch'ang];
SLAVETSKAYA, P.A.; CHZHOU EN-LO [Chou Eng-lo]

Crystallization of cellulose tribenzoate. Dokl. AN SSSR
139 no.5:1149-1152 Ag. '61. (MIRA 14:8)

1. Moskovskiy gosudarstvennyy universitet im. M.V.
Lomonosova i Institut vysokomolekulyarnykh soyedineniy
AN SSSR. Predstavleno akademikom V.A. Karginym.
(Cellulose) (Crystallization)

BAKEYEV, N.F., KOZLOV, P.V., KARDASH, G.N.

Effect of the morphology of spherulite structures on the mechanical behavior of crystalline polymers.

Report presented at the 13th Conference on high-molecular compounds Moscow, 8-11 Oct 62

KOZLOV, P.V., TIMOFEYEVA, V.G., KARGIN, V.A.

Effect of small admixtures of low-molecular substances on the mechanical properties of rigid chain polymers.

Report presented at the 13th Conference on high-molecular compounds Moscow, 8-11 Oct 62

32356
S/190/62/004/001/019/020
B145/B147

15 8112

AUTHORS: Kozlov, P. V., Asimova, R. M., Perepelkin, A. N.

TITLE: Studies of polycarbonates. IV. Plasticizing of polycarbonates

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 4, no. 1, 1962, 124-129

TEXT: The plasticizing of polycarbonate was studied to ascertain whether the two different types of plasticizing characteristic of cellulose, namely, intrapacket and interpacket plasticizing, are also observable with other high-polymer compounds. Polycarbonate obtained by reaction of 2,2-bis-(4'-hydroxyphenyl)-propane with phosgene (molecular weight about 90,000) was used for the purpose. Dibutyl phthalate, camphor, and butyl stearate were used as plasticizers. Plasticizing was carried out in ampoules at 240-260°C within 2-3 hrs. Tablets were pressed out of the plasticized material at 50 atm and 230-240°C. It has been found thermomechanically that the vitrification temperature T_v is a linear function of the logarithm of plasticizer concentration. The angle of inclination of the straight line in the T_v - log c diagram is greater with the use of

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S/190/62/004/001/019/020
Studies of polycarbonates. ... B145/B147

dibutyl phthalate than with camphor since the latter combines less with the polycarbonate. The straight line for butyl stearate exhibits a break. At first, T_v drops linearly with log c and remains constant after the point representing the limit of compatibility of the plasticizer with polymers. The results indicate that both intrapacket (with dibutyl phthalate) and interpacket plasticizing (with butyl stearate) occur with polycarbonate, the two processes approaching one of the two extreme types to a greater or lesser extent. In addition, the effect of plasticizers on the mechanical strength of polycarbonate films was investigated by dynamometric measurement. The use of dibutyl phthalate diminishes the Hooke region in the stress-strain diagram with rising plasticizer concentration but increases the relative tearing length. With use of butyl stearate, the tearing length first increases drops sharply from a plasticizer content of 10% onward, and again increases slowly. The modulus of elasticity exhibits the same linear dependence on the logarithm of plasticizer concentration as T_v. When using butyl stearate, a straight line with a break at the same concentration as in the T_v - log c diagram was obtained also in this case. There are 5 figures and 9 Soviet references.

X

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32356

Studies of polycarbonates. ... S/190/62/004/001/019/020
B145/B147

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

SUBMITTED: February 10, 1961

Card 3/3

KARGIN, V.A.; KOZLOV, P.V.; MIRLINA, S.Ya.; KAPRALOVA, Z.A.

Breakdown and rebuilding of protein structures. Vysokom.soed. 4 no.2:167-173 F '62. (MIRA 15:4)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova.
(Proteins)

KAPRALOVA, Z.A.; MIRLINA, S.Ya.; KOZLOV, P.V.; KARGIN, V.A.; POPOVA, L.A.

Structural transformations in fibrillar proteins. Vysokom.soed. 4 no.3:321-327 Mr '62. (MIRA 15:3)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.
(Proteins)

KAPRALOVA, Z.A.; MIRLINA, S.Ya.; KOZLOV, P.V.; KARGIN, V.A.; KHOKHLOVA, V.K.

Structural transformations in globular proteins. Vysokom.soed. 4 no.3:328-333 Mr '62. (MIRA 15:3)

1. Moskovskiy gosudarstvennyy universitet imeni M.V.Lomonosova.
(Proteins)

S/190/62/004/004/011/019
B117/B138

5.4100
15.9201

AUTHORS: Asimova, R. M., Kozlov, P. V., Kargin, V. A., Vtorygin, S. M.

TITLE: Plasticization of polymers with high-molecular compounds

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 4, no. 4, 1962, 554-559

TEXT: The effect of high-molecular plasticizers (butadiene nitrile rubber CKH-40(SKN-40) on the temperatures of polymer transitions and their mechanical properties were studied. Cellulose acetate butyrate with brittle point of 130°C was used as the polymer. Polymer and plasticizer were mixed in chloroform, the plasticizer concentration having been changed over a wide range. Thermomechanical tests were conducted on samples ranging from pure polymer to pure plasticizer. In the case of compatibility of the two components, the brittle point was found to be strictly proportional to the part by volume of the plasticizer in the system, i. e. interpacket plasticization of the polymer takes place here. The development of such homogeneous systems was observed only for very small amounts of plasticizer (1-10%), and very large ones (90-98%). Microheterogeneous mixtures formed in the remaining concentration range. With a plasticizer concentration of 10-30%,

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S/190/62/004/004/011/019
B117/B138

Plasticization of polymers...

the brittle point at first remained constant, which is characteristic of interpacket plasticization. At a concentration above 30%, the system began to become heterogeneous. With a plasticizer content of 40-80%, the brittle points of the two components appeared separately on the thermomechanical curves. The temperature transitions of plasticized cellulose acetate butyrate, hardened butadiene nitrile rubber, and their mixtures evidently correspond to these brittle points. Films of cellulose acetate butyrate with different plasticizer concentration were used for dynamometer tests. An increase of the plasticizer content up to 50% did not increase the relative elongation of the samples, but did reduce their tensile strength sharply. The low mechanical strength of plasticized samples is probably due to a microheterogeneity of the system. With a high rubber content (70% by weight) the samples behave like rubber. Calculation of the modulus of elasticity and study of its dependence on the plasticizer concentration produced the following result: When introducing small amounts of rubber, the modulus of elasticity of the polymer is reduced, and remains constant and sufficiently high up to a 60% plasticizer concentration. With a rubber content of 70% the modulus of elasticity of the polymer becomes equal to that of the high-polymer plasticizer. By using high-polymer

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S/190/62/004/004/011/019
B117/B138

Plasticization of polymers...

plasticizers materials with sufficiently high modulus of elasticity may be obtained. The mechanical properties required can, however, only be obtained if homogeneous systems form from polymer and plasticizer, which requires compatibility of both components. Noncompliance with this condition leads to the development of a heterogeneous system and embrittlement of the material. There are 5 figures.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

SUBMITTED: March 15, 1961

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KARGIN, V.A.; KOZLOV, P.V.; MIRLINA, S.Ya.; KAPRALOVA, Z.A.;
CHEBOTKEVICH, P.F.

Mass transfer and structure-forming processes in the polymer-homologous series of polyacrylic acid and fractionated gelatin. Vysokom. soed. 4 no,12:1881-1886 D '62. (MIRA 15:12)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova.

(Acrylic acid)
(Gelatin) (Mass transfer)

KOZLOV, P.V.; BAKEYEV, N.F.; ZEZIN, A.B.; SHMYREVA, R.K.

Electron microscope study of the supermolecular structure of poly-γ-benzyl-L-glutamate and poly-γ-methyl-L-glutamate. Biofizika 7 no.3:266-269 '62. (MIRA 15:8)

1. Khimicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta imeni Lomonosova.

(GLUTAMIC ACID) (STEREOCHEMISTRY)

S/020/62/142/005/017/022
B110/B101

AUTHORS: Kargin, V. A., Academician, Kozlov, P. V., Boukhal, K., and Bakeyev, N. F.

TITLE: Recrystallization of polycaproamide under the influence of mechanical actions

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 142, no 5. 1962, 1084 - 1085

TEXT: The effect of mechanical action on the structure of polycaproamide obtained by bulk polymerization at 195°C of caprolactam in the presence of Na metal and acetyl caprolactam was studied. To remove the monomer, a 7 cm long block (1.5 cm in diameter) was put into water of 60°C for 2 weeks, then dried at 10 mm Hg for 3 months. The molecular weight was 14,000. The blocks were cooled in liquid nitrogen, broken up, and investigated with a metallographic МИМ-8 (MIM-8) microscope. Coarse spherolites of ~ 0.1 mm diameter are formed in the polycaproamide block at $< 190 - 195$°C (melting point) during polymerization. The blocks were (a) cold rolled and (b) hammered. For (a), 3 x 1.5 x 0.5 cm platelets were rolled for 30 min, then subjected to brittle fracture in liquid N_2, and investigated.

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Recrystallization of polycaproamide ...

S/020/62/142/005/017/022
B110/B101

For (b), 0.5 cm high disks of 1.5 cm diameter were used After cold rolling and 100-fold impact deformation, the spherolite structures disappeared, and rhombic pyramid structures were formed which reminded of the single crystals formed during polyamide crystallization from dilute solutions. This recrystallization is similar to the behavior of metals in cold rolling but takes place without heating of the sample owing to the low vitrification temperature of polycaproamide. This proves that the recrystallization is not associated with the diffusion mechanism of the reconstruction of structure-forming macromolecules. There are 4 figures and 4 references: 3 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English-language publication reads as follows: P. H. Geil, J Polymer Sci., <u>44</u>, 449 (1960).

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

SUBMITTED: November 1, 1961

Card 2/2

KOZLOV, P.V.; BAKEYEV, N.F.; SHMYREVA, R.K.; ZEZIN, A.B.

Electron microscope study of the supermolecular structure of poly-γ-benzyl-L-glutamate. Dokl. AN SSSR 143 no.4:905-907 Ap '62. (MIRA 15:3)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova. Predstavleno akademikom V.A.Karginym.
(Glutamic acid) (Electron microscopy) (Peptides)

KOZLOV, P.V.; FROLOVA, A.A.; SLESAREVA, L.F.

Influence of mechanical action on the acceleration of structural transformations in crystallizing polymers. Dokl.AN SSSR 145 no.1:125-128 Jl '62. (MIRA 15:7)

1. Moskovskiy gosudarstvennyy universitet imeni M.V.Lomonosova. Predstavleno akademikom V.A.Karginym.
(Polymers) (Crystallization)

KOZLOV, P.V., otv. red.; ANDRIANOV, K.A., red.; DOGADKIN, B.A., red.; DOLGOPLOSK, V.A., red.; YENIKOLOPYAN, N.S., red.; KARGIN, V.A., red.; KOLESNIKOV, G.S., red.; KOROTKOV, A.A., red.; KORSHAK, V.V., red.; LAZURKIN, Yu.S., red.; MEDVEDEV, S.S., red.; MIKHAYLOV, N.V., red.; PASYNSKIY, A.G., red.; SLONIMSKIY, G.L., red.; SMIRNOV, V.S., red.; TSVETKOV, V.N., red.; FREYMAN-KRUPENSKIY, D.A., tekhn. red.

[Adhesion of polymers] Adgeziia polimerov; sbornik statei. Moskva, Izd-vo AN SSSR, 1963. 142 p. (MIRA 16:10)
(Polymers) (Adhesion)

ACCESSION NR: AT4017414 S/0000/63/000/000/0100/0106

AUTHOR: Asimova, R. M.; Yegorova, V. [illegible]; Kozlov, P. V.; Livshits, R. M.; Rogovin, Z. A.

TITLE: Chemical plasticizing of polymers. I. Chemical plasticizing of nitrocellulose by the implantation of polymethacrylate

SOURCE: Tsellyuloza i yeye proizvodny*ye, sbornik statey (Cellulose and its derivatives). Moscow, 1963, 100-106

TOPIC TAGS: plasticizing, plasticizing agent, polymer, copolymer, nitrocellulose, polymethacrylate, polymer thermomechanical property, polymer dynamometric property, nitrocellulose copolymer

ABSTRACT: Using $Ce(NH_4)_2(NO_3)_6$ as the oxidizing and nitrocellulose as the reducing agent, the authors prepared a series of grafted copolymers containing 7.15-95.0% nitrocellulose and 5.0-28.5% polymethacrylate; the maximal polymethacrylate content was obtained in 2 hours. These copolymers were then compared with corresponding mixtures of nitrocellulose and polymethacrylate homopolymers with respect to their thermomechanical and dynamometric properties. The results shown in Figs. 1 and 2 of the Enclosure indicate that the plasticizing effect resulting from the implanta-

ACCESSION NR: AT4017414

tion of elastic polymer chains into the macromolecules of a rigid polymer is equal to that produced by physical addition of low-molecular-weight plasticizers. The only advantage of chemical plasticizing is the higher value of the modulus of elasticity in the copolymer. Orig. art. has: 2 tables and 4 graphs.

ASSOCIATION: Moskovskiy gosudarstvenny*y universitet im. M. V. Lomonosova (Moscow State University); Moskovskiy tekstil'ny*y institut (Moscow Textile Institute)

SUBMITTED: 01Aug62	DATE ACQ: 06Jan64	ENCL: 01
SUB CODE: OC, MT	NO REF SOV: 008	OTHER: 003

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ACCESSION NR: AT4027414

ENCLOSURE: 01

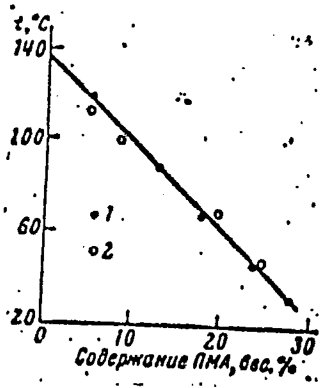

Fig. 1. Dependence of vitrification temperature on the polymethacrylate content (% by wt.):
1 - copolymers; 2 - mixtures

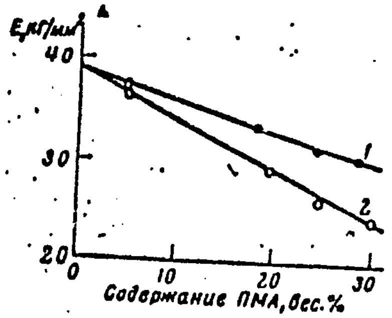

Fig. 2. Dependence of the modulus of elasticity (kg/mm^2) on the polymethacrylate content (wt. %):
1 - copolymers; 2 - mixtures

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ACCESSION NR: AP4007983 S/0190/63/005/012/1850/1853

AUTHORS: Razinskaya, I. N.; Kozlov, P. V.; Shtarkman, B. P.; Ignat'yeva, L. P.

TITLE: Intra- and interbundle plasticization of poly(vinyl chloride) interbundle

SOURCE: Vy*sokomolekulyarny*ye soyedineniya, v. 5, no. 12, 1963, 1850-1853

TOPIC TAGS: polymer, poly(vinyl chloride), polymerization, emulsion polymerization, bulk polymerization, plasticization, intrabundle plasticization, interbundle plasticization, mixed plasticization, plasticizer, primary supermolecular structure, supermolecular structure, secondary structure, bundle, glass transition temperature, PVC

ABSTRACT: The plasticization of polyvinylchloride (PVC) prepared by suspension polymerization (PF-4) and block polymerization has been investigated. The compounds used as plasticizers were: dioctylphthalate, ethylstearate, butylstearate, castor oil, and glycerine. The investigation was carried out by the thermomechanical method with specimens prepared from pressed powders. Three types of plasticization are shown for PVC: intrabundle, interbundle, and a combination of these two limiting types. Because of the greater effect of plasticization of PF-4 than

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ACCESSION NR: AP4007983

of the block polymer it has been suggested that the former is endowed with looser primary supermolecular structures. It has been shown that the plasticization effect is not changed qualitatively or quantitatively in all three types of plasticization on reprecipitation of PVC from dilute solution. This is ascribed to retention of the primary supermolecular structures (bundles) during this process. Orig. art. has: 1 figure.

ASSOCIATION: none

SUBMITTED: 22Jun62 DATE ACQ: 20Jan64 ENCL: 00

SUB CODE: MA NO REF SOV: 006 OTHER: 000

Card 2/2

KAPRALOVA, Z.A.; MIRLINA, S.Ya.; KOZLOV, P.V.; KARGIN, V.A.;
KALYUZHNAYA, R.I.

Structure formation and enzymatic activity of pepsin and trypsin fragments in the course of autolysis and electrodialysis. Vysokom. soed. 5 no.12:1870-1874 D '63.
(MIRA 17:1)

1. Moskovskiy gosudarstvennyy universitet im. Lomonosova.

KOZLOV, P.V.; TIMOFEYEVA, V.G.; KARGIN, V.A., akademik

Effect of low molecular weight substances sorbed by supermolecular structures on the mechanical properties of rigid-chaim polymers. Dokl.AN SSSR 148 no.4:886-889 F '63. (MIRA 16:4)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova i Vsesoyuznyy nauchno-issledovatel'skiy kinofotoinstitut.
(Polymers) (Chemical structure)

Kozlov, P.V.

AID Nr. 992-8 18 June

ACCELERATION OF POLY(ETHYLENE TEREPHTHALATE) CRYSTALLIZATION BY THERMOMECHANICAL TREATMENT (USSR)

Frolova, A. A., and P. V. Kozlov. IN: Akademiya nauk SSSR. Doklady, v. 149, no. 6, 21 Apr 1963, 1390-1392. S/020/63/149/006/024/027

The effect of cyclic mechanical forces in the 20 to 230°C range on the structure and thermomechanical properties of poly(ethylene terephthalate) (I) has been studied at Moscow State University. Experiments were conducted with flat pellets of hardened amorphous I with a density of 1.337 g/cm^3. One series of pellets was subjected to heat treatment at 80, 95, or 110°C for 1 hr and another to thermomechanical treatment (140 cycles/hr) with use of the Aleksandrov-Gayev device under similar conditions. Comparison of x-ray data, thermomechanical properties, and the densities of the two series of pellets showed that thermomechanical treatment considerably accelerates the crystallization of I as compared with heat treatment. This should be taken into account when materials made with I or other crystalline polymers are in service. The study was presented by Academician V. A. Kargin. [BAO]

Card 1/1

FROLOVA, A.A.; KOZLOV, P.V.; KARGIN, V.A., akademik

Effect of mechanical factors on the rate of crystallization of isotactic polystyrene. Dokl. AN SSSR 153 no.2:394-397 N '63. (MIRA 16:12)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova.

RAZINSKAYA, I.N.; KOZLOV, P.V.; SHTARKMAN, B.P.

Investigating the viscosity of the melts of plasticized compositions of polyvinyl chloride. Plast.massy no.1:55-56 '64. (MIRA 17:6)

ACCESSION NR: AP4030355 S/0190/64/006/003/0427/0431

AUTHORS: Razinskaya, I. N.; Shtarkman, B. P.; Kozlov, P. V.

TITLE: Investigation of the structural peculiarities of polyvinylchloride by means of the plasticization method

SOURCE: Vy*sokomolekulyarny*ye soyedineniya, v. 6, no. 3, 1964, 427-431

TOPIC TAGS: polymer, polyvinylchloride, polyvinylchloride latex, polyvinylchloride suspension, plasticization, plasticizer, dioctylphthalate, ethylstearate, physico-mechanical property, supermolecular structure

ABSTRACT: The effect of small amounts of plasticizers on the physico-mechanical properties of polyvinylchloride (obtained by various polymerization methods) was studied. Latex-type polyvinylchloride (LP) and suspension-type polyvinylchloride (SP) were moistened with an ethanol solution of dioctylphthalate (DP), followed by the evaporation of ethanol and heating at 100C for 1 hour. The obtained materials were pressed into blocks at 65 kg/cm^2 and at a temperature of 150-165C; from these dumbbell-shaped test specimen were cut. It was found that the strength and elas-

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ACCESSION NR: AP4030355

ticity modulus of the SP samples went through a maximum at 5-8% DP, while the ultimate stretch showed under these conditions a slight dip, rising again when the concentration of the plasticizer reached 15%. In the LP polymer the strength and elasticity moduli decreased gradually with increased DP content up to 10-12%, following which there was a sharp drop. Experiments on the effect of ethylstearate on the vitrification temperature revealed for the SP polymer a maximum T_g lowering of 22C, as against 15C for the LP sample. These differences are attributed by the authors to a higher degree of structural orderliness in the LP polymer. Orig. art. has: 5 charts.

ASSOCIATION: none

SUBMITTED: 19Feb63 DATE ACQ: 07May64 ENCL: 00

SUB CODE: MA NO REF SOV: 008 OTHER: 003

Card 2/2

ACCESSION NR: AP4012095 S/0020/64/154/002/0430/0432

AUTHORS: Kozlov, P. V.; Ry*zhov, V. B.; Burkhanova, N. D.

TITLE: Effect of rigidity of polymer macromolecules at transition temperatures and morphology of crystal structures

SOURCE: AN SSSR, Doklady*, v. 154, no. 2, 1964, 430-432, and insert facing page 430

TOPIC TAGS: polymer macromoleculer stability, transition temperature, crystal structure morphology, super molecular formation, cellulose ester, second-order transition point, rigid chain polymer, tri-ethyl cellulose

ABSTRACT: In view of recently proposed theories on the important role of super molecular formations on the forming properties and the flow of crystallization processes of polymers, there is interest in returning to the study of these characteristics and processes for a wide range of high molecular compounds. Study of some complex cellulose esters with an introduction of small quantities of low molecular substances revealed the mobility of super molecular struc-

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ACCESSION NR: AP4012095

tures of such polymers. This led to a substantial decrease in second-order transition points of the substance although no segmental mobility of polymer chains could take place. With this broad interpretation of the second-order transition temperature of rigid-chain polymers, the need arises for a separation of this temperature transition point for structural and mechanical second-order transition. The first is determined by the development of mobility of a super molecular structural formation; the second, by the segmental mobility of chains. The development of super molecular formations typical of rigid-chain polymers should indicate the substantial influence on the morphology of crystal structures. Tri-ethyl cellulose was carefully subjected to purification by repeated reprecipitation by water from weak solutions in a mixture of glacial acetic acid and methanol (9:1) with subsequent drying in a vacuum at 20C. In totally replaced tri-ethyl cellulose, the theoretical content of the elements were determined to be C = 58.53%, and H = 8.34%. Microanalysis data in the tested specimen gave a content of C = 58.40%, and H = 5.05%. The decrease in hydrogen content indicates the presence of peroxide groups in the specimen. The typical development of two second-order transition points which are reproduced at one or the other thermo-mechanical curve for rigid-chain crystallizing polymers is sufficiently conclusively determined. One of the transition points determines the appearance of mobility of super molecular rigid formations, and the other, the segmental mobility of chain molecules. After attaining maximum deformity at these points, some decrease in deformity is observed with a further temperature increase. In the first case this is combined with condensation of highly regulated super molecular structure formations without phase transition; in the second case the polymer crystallization leads to material stability. During crystallization of these rigid-chain polymers the packing of the structural elements of the polymer leads to the development of a radial form of spherulite structures, while the process of crystallization itself for such polymers is kinetically extremely difficult. "We are taking this opportunity to express our gratitutde to O. P. Koz'mina for kindly submitting the tri-ethyl cellulose preparations." Orig. art. has: 4 Figures.

ACCESSION NR: AP4012095

ASSOCIATION: Moskovskiy gosudarstvenny*y universitet im. M. V. Lomonosova (Moscow State University)

SUBMITTED: 30Jul63	DATE ACQ: 14Feb64	ENCL: 00
SUB CODE: CH, MA	NR REF SOV: 005	OTHER: 000

Card 4/4

ACCESSION NR: AP4030372 S/0190/64/006/003/0516/0521

AUTHORS: Razinskaya, I. N.; Koslov, P. V.; Shtarkman, B. P.

TITLE: Investigations in dielectric properties of plasticized polyvinylchloride

SOURCE: Vy*sokomolekulyarny*ye soyedineniya, v. 6, no. 3, 1964, 516-521

TOPIC TAGS: plastic, dielectric property, polymer, polyvinyl, macromolecule, polar segment, activation energy, dipole loss, ethylstearate, plasticizer, loss tangent

ABSTRACT: The temperature dependence of the dielectric loss tangent (tg δ) for polyvinyl with various plasticizer contents has been investigated. The plasticizer was introduced in the PF-4 polymer in an ethyl alcohol solution with subsequent evaporation. The dry mixture was then heated for 1 hour at 100C to force the complete absorption of the plasticizer. The dielectric loss tangent was measured by an MLE-1 bridge in a 400-20 000 cycle frequency range. Curves of tg δ versus temperature at various dioctylephthalate (DOF) contents indicate that increasing the DOF content in polyvinylchloride (PVC) shifts the maxima in the tg δ toward the low temperature end. Similar curves for ethylstearate ES in PVC at 1 kc

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ACCESSION NR: AP4030372

frequency show that at up to 7.5% ES content the maximum tgδ shifts to lower temperatures and remains constant thereafter. The apparent activation energy upon the plasticizer content is compared to a similar dependence for the glass activation energy (determined thermomechanically), and the difference is explained by the fact that dipole-elastic losses are associated with macromolecule polar segment orientation, whereas deformation during the recording of thermomechanical curves is determined by the macromolecule segment mobility and the supermolecular elements. "The authors thank G. P. Mikhaylov for his advice." Orig. art. has: 8 figures.

ASSOCIATION: none

SUBMITTED: 30Mar63 DATE ACQ: 07May64 ENCL: 00

SUB CODE: GC NO REF SOV: 004 OTHER: 003

Card 2/2

LIVSHITS, R.M.; FROLOVA, A.A.; KOZLOV, P.V.; ROGOVIN, Z.A.

Thermoplastic graft copolymers of cellulose. Vysokom. soed. 6 no.3:572 Mr'64. (MIRA 17:5)

KOZLOV, P.V.; RYZHOV, V.B.; BURKHANOVA, N.D.

Rigidity of polymer macromolecules as influencing the transition temperature and morphology of crystal structures. Dokl. AN SSSR 154 no.2:430-432 Ja'64. (MIRA 17:2)

1. Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova. Predstavleno akademikom V.A. Karginym.

RYZHOV, V.B.; BURKHANOVA, N.D.; KOZLOV, P.V.

Crystallization ability of some cellulose ethers. Vysokom.soed. 6 no.8: 1471-1477 Ag '64. (MIRA 17:10)

1. Moskovskiy gosudarstvennyy universitet imeni M.V.Lomonosova.

LIVSHITS, R.M.; FROLOVA, A.A.; KOZLOV, P.V.; ROGOVIN, Z.A.

Plasticization of cellulose by grafting in polymethyl and polybutyl acrylate. Vysokom. soed. 6 no.11:1992-1996 N '64
(MIRA 18:2)

1. Moskovskiy tekstil'nyy institut i Moskovskiy gosudarstvennyy universitet imeni Lomonosova.

L 25107-65 EWT(m)/EPF(c)/T/EWP(j) Pc-4/Pr-4 RM
ACCESSION NR: AP5001769 S/0063/64/009/006/0660/0679

20
18
B

AUTHOR: Kozlov, P. V. (Prof.)

TITLE: Plasticization and submolecular structures of polymers

SOURCE: Vsesoyuznoye khimicheskoye obshchestvo. Zhurnal, v. 9, no. 6, 1964, 660-679

TOPIC TAGS: polymer plasticizer, polymer submolecular structure, molecular plasticizing mechanism, structural plasticizing mechanism

ABSTRACT: This is a survey of known data. Plasticization is one of the means of reducing brittleness and the temperature of changes of state in polymers, so as to obtain better workability. By increasing the mobility of the polymer backbone, the temperature range of the glassforming state will be increased, thus

bone, the temperature range of the glassforming state will be increased, thus lowering the brittleness temperature of the polymer; this will also lead to higher deformability or, for crystalline polymer glasses, to lower deformability. Submolecular structure is defined as primary and highly structured, appearing in sharply defined steps, consisting in fibrillar clusters which terminate in highly

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assymmetrical forms and are rather stable in melts or concentrated polymer solutions; crystalline structure, a secondary condition, is characterized by the orientation of both backbone and side groups. The types of polymer plasticizing, molecular (intra-block) and structural(inter-block) plasticizing by low-molecular compounds, that obtained with high-molecular compounds and that of crystalline polymers are discussed, formulas and graphs presented. The molecular type of plasticization has been studied in more detail than the structural; study of the latter promise explanation of the fact of plasticizing by substances which are little or not at all bound to the polymer. It is assumed that the plasticizer molecules locate at the surface of the highly asymmetrical submolecular structures thereby increasing their mobility, rather than between the polymer molecules. The steplike character of processes of structural formation may be explained by assuming a steplike breakdown under the influence of low-molecular substances, i.e. solvent or plasticizer, resulting in a true solution of plasticizer in polymer, or with large plasticizer amounts, of the polymer in the plasticizer. Then only would the molecular plasticizing process begin. Physico-mechanical properties of the polymer would thus be determined by the specific elasticity of the submolecular highly asymmetrical structural elements. Introduction of plasticizers into

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a crystallizing polymer was found to favor, under certain conditions, the appearance of large submolecular crystalline forms which considerably decrease properties of strength and deformation of the plasticized product. The assumption of a submolecular structure may explain the fact that the same polymer obtained by different methods will have different properties. The consideration of submolecular structure may be used for developing polymers with desirable properties, e.g. cold resistance, particularly as regards rubbers. Orig. art. has: 13 figures and 1 table

ASSOCIATION: None

SUBMITTED: 00 ENCL: 00 SUB CODE: MT, GC

NR REF SOV: 064 OTHER: 027

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L 19689-65 EWT(m)/EPF(c)/EWA(d)/EWP(j)/T/EWP(t)/EWP(b) Pc-4/Pr-4 AFWL/
ASD(a)-5/AS(mp)-2/ASD(m)-3/AFETR JD/WB/RM
ACCESSION NR: AP5001519 S/0020/64/159/005/1117/1119

AUTHOR: Vasilevskaya, L. P.; Bakeyev, N. F.; Lagun, L. G.; Kozlov, P. V.; Kargin, V. A. (Academician)

B

TITLE: Effect of small amounts of surface-active-agent additives on the properties of crystalline polymors

14

SOURCE: AN SSSR. Doklady, v. 159, no. 5, 1964, 1117-1119, and insert facing p. 1118

TOPIC TAGS: polymer, crystalline polymer, Nylon 66, mechanical property, surface active agent, crystallization

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ABSTRACT: A study has been made of the effect of small concentrations of surface-active additives on the morphology and properties of crystalline polymers. This research was done because the addition of surface-active agents was regarded as a possible alternative method of controlling polymer crystallization in order to produce materials with optimum mechanical properties. The materials used were poly(hexamethylene adipamide) (I), having a molecular weight of 30,000 and a melting point of 262C, and the following surface-active dyes in 1/100 to 1/1000 dye/polyamide ratio: 1/100 1,4-dihydroxyanthraquinone (II);

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1/1000 1,4-dimesidinoanthraquinone (III); and 1/1000 (IV) or 1/100 (V) 4-[(4-chlorophenyl)amino]-3-methyl-1,9-anthrapyridone. Crystallization was studied in films deposited from solution or from melts. Optical and electron microscopy, stress-strain testing, and linear crystallization ratio measurements were carried out. It was found that very small amounts (0.1%) of homogeneously distributed surface-active additives cause a sharp change in the crystallization rate and spherulite size and, as a result, in mechanical properties also (see Fig. 1 of the Enclosure). Orig. art. has: 3 figures.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University)

SUBMITTED: 22Jul64 ENCL: 01 SUB CODE: OC, GC

NO REF SOV: 007 OTHER: 002 ATD PRESS: 3161

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ACCESSION NR: AP5001519

ENCLOSURE: 01 0

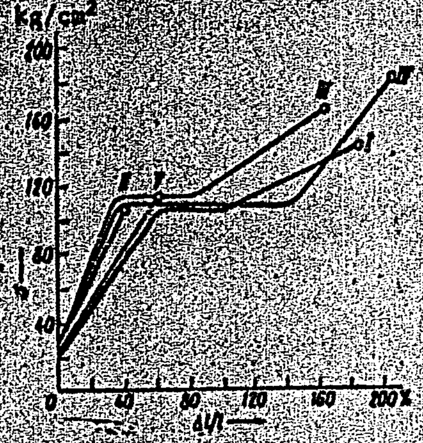

Fig. 1. Stress-strain curve for the pure polyamide (I) and for polyamide containing surface-active agents (II, III, IV, V)

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KOZLOV, Pavel Vasil'yevich, prof.; BRAGINSKIY, Gerts Irmovich, dots.;
Prinimali uchastiye: SHIFRINA, V.S.; KHARIT, Ya.A.;
KOROSTYLEV, B.N.; SOROKINA, R.A.; ZHERDETSKAYA, N.N., red.

[Chemistry and technology of polymer films] Khimiia i tekhnologiia polimernykh plenok. Moskva, Iskusstvo, 1965. 623 p. (MIRA 18:7)

L 42055-65 EWT(m)/EWP(j)/T Pc-4 RM

ACCESSION NR: AP5010912 UR/0286/65/000/007/0101/0102

AUTHORS: Vasilevskaya, L. P.; Bakeyev, N. F.; Lagun, L. G.; Kozlov, P. V.; 27
Kargin, V. A. 15

15 15

TITLE: A method for modifying the structure of polyamides and polyesters. Class 39, No. 169778 15

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 7, 1965, 101-102

TOPIC TAGS: polymer, polyamide, polyester, anthraquinone, pyridine, surface active substance

ABSTRACT: This Author Certificate presents a method for modifying the structure of polyamides and polyesters by adding surface-active substances to the solution or the melt of polymers. To improve the mechanical properties of the polymers,

are used as the surface-active substances. [illegible]
to 0.1%.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. Lomonosova (Moscow State University)

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ACCESSION NR: AP5010912 0

SUBMITTED: 26Jul63 ENCL: 00 SUB CODE: OC , GC

NO REF SOV: 000 OTHER: 000

Card 2/2

L 63818-65

ACCESSION NR: AP5008369 S/0190/65/007/003/0432/0438

76
15
B

AUTHORS: Frolova, A. A.; Kozlov, P. V.

15

TITLE: Effect of the deformation rate on structural transformations in crystallizing polymers

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 7, no. 3, 1965, 432-438, and insert facing p. 434

TOPIC TAGS: polymer, deformation rate, crystallization, polyethylene, terephthalate, polystyrene, polycarbonate

ABSTRACT: For crystallizing polymers 7 the authors used polyethylene terephthalate, 7 polystyrene, 7 and polycarbonate. 7 These were chosen because of their high glass transition temperatures and high melting points. Thermomechanical and x-ray studies were made of samples subjected to periodically increased stresses. Results show that the crystallization rate accelerates when the rate of stress application rigid chains undergo structural changes more readily at lower rates of stress application. This results from relaxation effects in the polymers. The optimal

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ACCESSION NR: AP5008369

conditions for structural changes for the various types of polymers are defined. The relations observed during the investigations seem to be applicable to all crystallizing polymers, and it is suggested that each polymer has its particular optimal rate of stress application. The practical value of this is that consideration can be given to all structural transformations taking place through mechanical processes during treatment and use of materials in various wares made of crystallizing polymers, since these processes may change the properties to a considerable extent. Orig. art. has: 5 figures.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University)

SUBMITTED: 09May64 ENCL: 00 SUB CODE: OC, MT

NO REF SOV: 005 OTHER: 000

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L 51392-65 EPF(c)/EPR/EWP(j)/EWP(k)/EWT(d)/EWT(m)/EWP(h)/T/EWP(1)/EWA(d)/EWP(v)
Pc-4/Pf-4/Pr-4/Ps-4 RM/WW

ACCESSION NR: AP5011248 UR/0190/65/007/004/0650/0654

41

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B

AUTHORS: Akhmedov, F. A.; Koltunov, M. A.; Kozlov, P. V. 15

TITLE: The dependence of some mechanical characteristics of polyformaldehyde on temperature and rate of deformation 16

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 7, no. 4, 1965, 650-654

TOPIC TAGS: formaldehyde, tensile strength, temperature dependence, deformation rate/ RMI 250 testing machine 14

ABSTRACT: Results are given on the investigation of the dependence of strength 15 properties in polyformaldehyde on deformation rate and temperature. Plane samples were molded at a pressure of 1200 kg/cm^2 at 190-195C. They were held at this pressure for 5 sec, then cooled for 5 sec. Degree of crystallization was 75%. Tensile strength was measured on an RMI-250 testing machine at displacement rates of 10, 50, 100, 250, and 500 mm/min, which correspond to deformation rates of 25, 125, 250,

100, 250, and 500 mm/min, which correspond to deformation rates of 25, 125, 250, 625, and 1250 min^{-1}. Deformation was measured with two telescopic microscopes equipped with ocular micrometers. Results show that increase in deformation rate leads to increase in flow point, proportionality limit, and tensile strength. Fracture deformation, however, decreases with increase in deformation rate. The

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ACCESSION NR: AP5011248

dependence of all mechanical properties on deformation rate is exponential, whereas the tensile strength and elasticity modulus prove to be parabolic functions of temperature between 0°C and the melting point. Each mechanical property passes through an extreme value in its dependence on deformation rate. Orig. art. has: 5 figures, 1 table, and 6 formulas.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: 17Jun64 ENCL: 00 SUB CODE: OC, MT

NO REF SOV: 004 OTHER: 000

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L 51398-65 EWT(m)/EPF(c)/EWP(v)/EPR/EWP(j)/T Pc-4/Pr-4/Ps-4 WW/RM

ACCESSION NR: AP5011257 UR/0190/65/007/004/0751/0755

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35
B

AUTHORS: Grihkova, N. Ya.; Kozlov, P. V.; Yakubovich, S. V.

TITLE: Adhesion and the physicomechanical properties of chlorinated polyvinylchloride in interbundle plasticization

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 7, no. 4, 1965, 751-755

TOPIC TAGS: polyvinylchloride, adhesion, mechanical property, organic synthesis

ABSTRACT: Because interbundle and intrabundle types of plasticization affect the glass point differently, and because plasticization is known to affect the mechanical properties and adhesion, the latter effects were studied for the two

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ACCESSION NR: AP5011257

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between the supramolecular formations to cause degradation of other structural elements in the system. Maximal adhesion and tensile strength with minimal internal stress were obtained with 0.02% chlorinated biphenyl. It was also ob-

NO REF SOV: 007 OTHER: 001

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ZEZIN, A.B.; BAKEYEV, N.F.; MERZLOV, V.P.; SHALDINA, L.A.; KOZLOV, P.V.

Aggregation of molecules of poly-L-glutamic acid in aqueous solutions at low pH values. Biofizika 10 no.2:207-211 '65. (MIRA 18:7)

1. Khimicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta imeni Lomonosova.

L 35452-65 EEC(b)-2/EPF(c)/EWP(j)/EWT(1)/EWT(m)/T Pc-4/Pr-4 IJP(c) RM

ACCESSION NR: AP5006859 S/0020/65/160/004/0875/0878

AUTHOR: Frolova, A.A.; Kozlov, P.V. 1 38

TITLE: Features of the evolution of relaxation processes in crystallizing polymers B 21

SOURCE: AN SSSR. Doklady, v. 160, no. 4, 1965, 875-878

TOPIC TAGS: crystalline polymer, polyethylene terephthalate, isotactic polystyrene, polycarbonate, relaxation process, dynamic loading rig, glass transition temperature, amorphous state, x ray structure analysis, deformation

ABSTRACT: The behavior of polymers which undergo structural transformations during their thermomechanical tests is of interest to the study of the physicomechanical properties of crystalline polymers. Accordingly, three polymers were selected: polyethylene terephthalate, isotactic polystyrene and [illegible] all with high glass transition temperatures and melting points,

polymers were selected: polyethylene terephthalate, isotactic polystyrene and polycarbonate, all with high glass transition temperatures and melting points, which made it possible to obtain them in amorphous state following the sharp cooling of the melt to room temperature. These were tested in an Aleksandrov-Gayev dynamic loading rig. Vibrations with frequencies of 1400, 140, 14, 1.4,

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ACCESSION NR: AP5006859

and 0.14 per minute and temperatures of from 20 to 230° were employed. Maximum load: 0.7 kg/cm^2. On transition to a highly elastic state these polymers revealed a broad relaxation spectrum and, as distinct from rubbers and the ordinary amorphous polymers, a strong dependence of maximum deformation on the vibration frequency. With the aid of thermomechanical and x-ray structural vibration frequency. With the aid of thermomechanical and x-ray structural methods of analysis it is shown that polymers with sufficiently flexible chains display the properties of both amorphous and crystalline polymers when undergoing thermomechanical tests, whereas a polymer with more rigid chains then displays either crystalline or amorphous properties. Orig. art. has: 4 figures.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova (Moscow State University)

SUBMITTED: 17Jul64 ENCL: 00 SUB CODE: GP, MT

NO REF SOV: 007 OTHER: 000

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L 1625-66 EWT(l)/EWT(m)/EPF(c)/EWP(j)/T/EWA(c) IJP(c) GG/RM

ACCESSION NR: AP5021890 UR/0020/65/163/006/1408/1411

AUTHORS: Frolova, A. A.; 44,55 Brusentsova, V. G.; 44,55 Kozlov, P. V.; 44,55 Kargin, V. A. 44,55 45 B
(Academician)

TITLE: Investigation of the relaxation phenomena in crystalline polycaprylamide

SOURCE: AN SSSR. Doklady, v. 163, no. 6, 1965, 1408-1411

TOPIC TAGS: polycaprylamide, relaxation process, crystalline polymer 44,55

ABSTRACT: Relaxation properties of crystalline polymers 44,55 have been studied using specimens of polycaprylamide with a definite structure but of varying degree of crystallization. This work is a continuation of the study of relaxation processes, undertaken previously by the authors, on amorphous crystallizable polymers (DAN, 160, 875, 1965). The experimental conditions and equipment were the same as those described earlier, except that the temperature interval was now -30 to 220C and the heating rate during the thermomechanical experiments was 2C per minute. The specimens were prepared in form of tablets 10 mm in diameter and 2.3-2.4 mm thick. They were compressed at 220C and 300 kg/cm^2 pressure and then cooled by liquid nitrogen to -50C. Specimens so obtained were of crystalline structure (density 1.145 g/cc). Several specimens were investigated directly at

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ACCESSION NR: AP5021890 12

1400, 140, 14, 1.4, and 0.14 vibrations per minute. Others were heated at 180C for 1 hour, giving a material of higher crystallization order (density of 1.153 g/cc), whose deformation was then studied at 14, 1.4, and 0.14 vibrations per minute. It was discovered that in these frequency intervals thermomechanical curves are functions of the effective force frequency. An analogy was found in properties of rigid polymers and polycaprylamide made rigid by crystallization. Study of the relaxation properties of the unheated and heated (less and more crystalline, respectively) specimens established a linear relationship between the maximal deformation values ($epsilon_{max}$) and the logarithm of the effective force frequency, as indicated by Fig. 1 on the Enclosure. It is shown that hardening of the polymer by crystallization results in a decrease in $epsilon_{max}$ value and is the cause of the increase of T_g and its independence of effective force frequency. The obtained data are explained in terms of the "bundle" structure theory offered by V. A. Kargin, A. I. Kitaygorodskiy,44,55 and G. L. Slonimskiy (Koll. Zhurn., 19 131, 1957).44,55 Orig. art. has: 3 figures.

44,55

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University) 44,55

SUBMITTED: 24Mar65 ENCL: 01 SUB CODE: OC

NO REF SOV: 008 OTHER: 000

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