BARTENEV, G. M.; ZELENEV, Yu. V.

"Relaxation properties of amorphous polymers below and above glass-transition temperatures."

report submitted for Intl Conf on Physics of Non-Crystalline Solids, Delft, Netherlands, 6-10 Jul 64.

Lenin State Teacher's Training College, Moscow.

BARTENEV, Georgiy Mikhaylovich, doktor khim. nauk, prof.; ZUYEV, Yuriy Sergeyevich, kand. khim. nauk; NEFOMNYASHCHIY, A.I., red.

[Strength and deterioration of highly elastic materials] Prochnost' i razrushenie vysokoelasticheskikh materialov. Moskva, Khimiia, 1964. 387 p. (MIRA 18:1)

1. Problemnaya laboratoriya fiziki polimerov Moskovskogo gorodskogo pedagogichoskogo instituta (for Bartenev). 2. Nauchno-issledovatel'skiy institut rezinovoy promyshlennosti (for Zuyev).

BARTENEV, G. M.

"Relaxation properties of amorphous polymers below and above TG."

report submitted to Intl Conf on the Physics of Non-Crystalline Solids, Delft, Netherlands, 6-10 Jul 64.

TARASOV, V. V.; BARTENEV, G. M.; YEREMEYEVA, A. S.; RATOBYLSKAYA, V. A.

"On polymeric nature of vitreous arsenic trisulfide."

report submitted for 4th All-Union Conf on Structure of Glass, Leningrad, 16-21 Mar 64.

BARTENEV, G. M.; IZMAYLOVA, L. K.

"Structure and strength of glass fibres."

report submitted for 4th All-Union Conf on Structure of Glass, Leningrad, 16-21 Mar 64.

YEREMEYEVA, A. S.; BARTENEV, G. M.

"Highly elastic properties of organic and inorganic glasses in connection with their structure."

report submitted for 4th All-Union Conf on Structure of Glass, Leningrad, 16-21 Mar 64.

BARTENEV, G. M.

"Mechanical properties and the structure of inorganic glasses."

report submitted for 4th All-Union Conf on Structure of Glass, Leningrad, 16-21 Mar 64.

ACCESSION NR: AP4019333 S/0072/64/000/003/0012/0016

AUTHORS: Izmaylova, L.K. (Engineer); Bartenev, G.M. (Doctor of Chemical Sciences)

TITLE: Analysis of the conditions for producting glass fibers without surface defects

SOURCE: Steklo i keramika, no. 3, 1964, 12-16

TOPIC TAGS: glass, glass fiber, fiberglass, glass fiber production, fiberglass production

ABSTRACT: Studies dealing with increasing the strength of glass fibers involve three basic considerations: (1) change in glass composition; (2) improvement of the processing conditions; and (3) deposition of protective coatings on the surface of the glass fiber. It is well-known that the strength of freshly-drawn glass fibers is higher than the strength of fibers which have been exposed to air for a period of time. The reduced strength of the glass fiber is the result of cracks and submicrocracks appearing on the fiber's surface. The dampness in the air, being a surface active media, facilitates

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ACCESSION NR: AP4019333

the growth of the cracks and sharply reduces the strength of the glass fibers. To preserve the high strength of the freshly-drawn fibers hydrophobic coatings were deposited on them to protect their surfaces from the harmful effects of atmospheric dampness. Commercial glass fiber was tested immediately after its moulding in order to estimate the possibilities of increasing the strength of the glass fiber. The fibers were tested for strength under conditions which excluded damage to the working part of the sample. The glass fibers were produced on a laboratory-type unit from a melt which was contained in a vessel from 5 hours to 7 days without a charge of glass beads. Bushings of various length were used to study the temperature effect. No temperature-strength relationship was observed. The presence of microcracks on the glass fiber surface is not open to dispute. These cracks originate in the very process of fiber moulding, and change of technological parameters does not have any appreciable influence on their formation. The processes occuring in the anion are of particular importance, and determination of the temperature gradient (viscosity) along the cross section of the anion is of

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ACCESSION NR: AP4019333

great importance. Change in viscosity of the melt has the greatest effect upon change in length of anion. As the temperature increases from 1150 to 1250, the length of the anion increases from 3 to 23 mm. The drawing rate and melt level in the vessel have a lesser effect on anion length. The length of the anion influences the extent of surface layer defect. The glass fibers do not have surface defects when the langth of the anion is not more than 3 to 4 mm. Orig. art. has: 6 figures.

ASSOCIATION: Institut steklovolokus (Fiberglass Institute); Moskovskiy gosudarstuenny*y pedagogicheskiy institut imeni v. I. Lenina (Moscow State Pedagogical Institute)

SUBMITTED: 00 DATE ACQ: 27Mar64 ENCL: 00

SUB CODE: CH, MA NR REF SOV: 005 OTHER: 004

Card 3/3

AUTHOR: Zuev, Yu. S.; G. M. Bartenev, N. I. Kirshenshteyn

[illegible] durability of rubber under various testing conditions

SOURCE: Kauchuk i rezina, no. 9, 1964, 14-16

TOPIC TAGS: rubber, rubber durability, tensile strength, vulcanized rubber, rubber SKN-18, rubber SKN-26, rubber SKN-40, rubber SKT

ABSTRACT: When the service life of vulcanized rubbers such as SKN-18, SKN-26, SKN-40 and SKT under the effect of a constant tensile stress was compared quantitatively with their service-life on a tensile strength tester by which they were stretched at a constant rate, [illegible] were found to be characterized by different values of the equilib- [illegible]

Card [illegible]

L 8761-65
ACCESSION NR: AP4045698

In contrast to rigid bodies, the durability of rubber τ at σ = const depends on σ in the following manner: [illegible] The same expression is obtained from the dura- [illegible] stant rate of stress application is plotted in Fig. 1 of the enclosure for SKN-18 rubber. It was found that during stretching at a constant rate, the true tension steadily increases. The calculation is described and the tabulated experimental and theoretical durability data are compared. The coefficient of variation of the data in the experimental determination of durability at constant σ is quite high: 30-35%. However, the theoretical and experimental "t" values show a very satisfactory agreement. This correlation may be used in accelerating the evaluation of the durability of rubber under actual working conditions. Orig. art. has: 1 figure, 1 table and 6 formulas

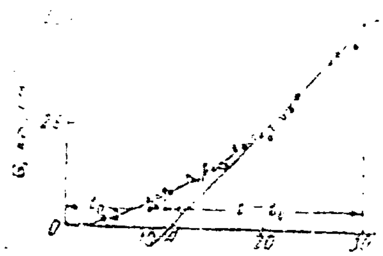
ASSOCIATION: [illegible] Scientific Research Institute for the Rubber Industry

SUBMITTED: [illegible] ENCL: [illegible] SUB CODE: [illegible]

NO REF SOV: [illegible] OTHER: [illegible]

ACCESSION NR: AP4015698 ENCLOSURE: 01

Figure



Relationship between stress and time to failure during stretching of a

Card

L 20500-65 EWT(m)/EWP(b)/EWP(e) Pq-4 WH
ACCESSION NR: AP4049086 S/0072/64/000/011/0010/0012

AUTHOR: Bartenev, G. M. (D[illegible] of chemical sciences); Kolbasnikova, A. I. (Candidate of technical sciences)

TITLE: The effect of high temperature treatment on glass surface strength

SOURCE: Steklo i keramika, no. 11, 1964, 10-12

TOPIC TAGS: glass surface strength, high temperature treatment, annealed glass, glass bending strength

ABSTRACT: Earlier findings by the same and other authors on the effect of various heat treatments on glass surface strength are discussed, after which the effect of prolonged processing at high temperature on sheet glass (5-6 mm or 2 mm thick) as well as on the [illegible] and etching before heat treatment is reported. Optimal strength was found for glass maintained at 6[illegible] for 2 hours, while no change was observed [illegible] temperatures. After heating, the glass specimens were cooled at [illegible] degree[illegible] left at room temperature for 24 hours, then subjected to [illegible] bending stress. [illegible] such treatment, the surface strength was found to assume values characteristic for the natural surface of sheet glass formed during drawing from the

Card 1/3

L [illegible]

ACCESSION NR: AP4049086

viscous glass mass. This fact also explains why prior hardening of the surface before tempering [illegible] (see [illegible] of the Enclosure). The strength of the natural surface of glass [illegible] characteristic [illegible] change under the [illegible] [illegible]

ASSOCIATION: Kafedra [illegible] tverdogo tela [illegible] Lenina (Solid State Physics Department [illegible] Institut stekla (Glass Institute)

SUBMITTED: 00 ENCL: 01 Sub CODE: MT, OP

NO REF SOV: 004 OTHER: 001

Card 2/3

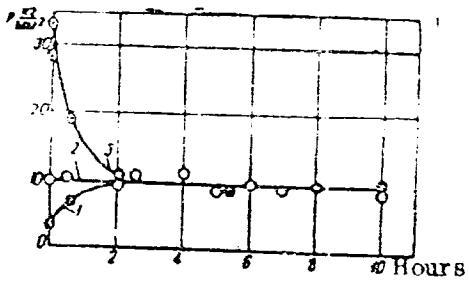


Figure 1. The effect of the duration of treatment at 650 C on the Strength of sheet glass [illegible] in thickness.

1 - subjected to polishing; 2 - with a natural surface; 3 - etched with hydrofluoric acid.

TITLE: Effect [illegible] fillers on the mechanical properties of rubber in the solid state

SOURCE: Kauchuk i rezina, no. 12, 196[illegible], 14-17

TOPIC TAGS: [illegible] rubber, rubber mechanical property, glass temperature, [illegible], rubber

L 22528-65

ACCESSION NR: AP5001502

filler has little effect on the glass temperature. Fillers make the rubber more brittle, however. As a first approximation, it may be assumed that brittle fail-

[illegible]

ASSOCIATION: Nauchno-issledovatel'skiy institut rezinovoy promyshlennosti (All-Union industry scientific research institute)

SUBMITTED: 00 ENCL: 00 SUB CODE: MT

Card 2/3

L 19008-65 EWT(m)/EPF(c)/EWP(j)/T Pc-4/Pr-4 ASD(m)-3/ASD(f)-2/AS(mp)-2/AFTC(s)/AFTC(a) RM

ACCESSION NR: AP5000749 S/0191/64/000/012/0020/0026

AUTHOR: Bartenev, G. M.

TITLE: Laws and mechanism of the viscous flow of linear polymers

SOURCE: Plasticheskiye massy, no. 12, 1964, 20-26

TOPIC TAGS: linear polymer, polymer flow, viscous flow, rheology, polyisobutylene, natural rubber, polystyrene, polyethylene, Eyring model

ABSTRACT: A critical evaluation of published theories and experimental studies on the rheology of polyisobutylene, natural rubber, polystyrene, [illegible]

[illegible]

[illegible] on stress. The [illegible] proposed in this paper [illegible] of micro-packets [illegible] the [illegible] of this process [illegible] stress and [illegible] of temperature. The number [illegible] decreases with an increase [illegible] stress. Stress [illegible]

$$\eta = CM^n \exp\left(\frac{U}{kT} - \varkappa P\right)$$

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L 19008-65

ACCESSION NR: AP5000749

describes the flow of linear polymers, the constant [illegible] depending on the chain structure; n defines the effect of [illegible] weight on the [illegible] structure [illegible] describes the [illegible] [illegible] [illegible] depends [illegible] flow [illegible] structure [illegible] molecular weight [illegible] stress and M [illegible] molecular weight [illegible] temperature and P the stress [illegible] formulas.

ASSOCIATION: None

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

NO REF SOV: 011 OTHER: 009

Card 2/2

BARTENEV, G.M.

Determination of the activation energy of the viscuous flow of polymers from experimental data. Vysokom.soed. 6 no.2:335-340 F '64.
(MIRA 17:2)

1. Gosudarstvennyy pedagogicheskiy institut imeni Lenina.

L 10792-65 EWT(m) EPF(c) EWP(j) ... ESD(gs)/AFETR RM
ACCESSION NR: AP4030370 S/0190/64/006/003/0504/0511

AUTHORS: Lazurkin, Yu. S.; Bartenev, G. M. ...

[illegible]

SOURCE: Vy*sokomolekulyarny*ye soyedineniya, v. 6, no. 3, 1964, 504-5[illegible]

TOPIC TAGS: rubber, vulcanized rubber, butadiene styrene polymer, butadiene [illegible] polymer, glassy [illegible] temperature [illegible]

ABSTRACT: The present investigation of the methods for estimating the [illegible] of the rubbers is similar to [illegible] a larger number of specimens was studied [illegible]

L 10792-65
ACCESSION NR: AP4030370

portion. The tests were conducted with thermostatic cooling by liquid nitrogen, at temperatures from [illegible] to that of mechan[illegible]

[illegible]

ASSOCIATION: Nauchno-issledovatel'skiy institut rezinovoy promy*shlennosti
(Scientific Research Institute of the Rubber Industry)

[illegible]

Card 2/2

ACCESSION NR: AP4019822 S/0181/64/006/003/0657/0661

AUTHORS: Bartenev, G. M.; Razumovskaya, I. V.

TITLE: The theory of time dependence of strength in solid polymers

SOURCE: Fizika tverdogo tela, v. 6, no. 3, 1964, 657-661

TOPIC TAGS: solid state physics, polymer strength, tensile strength

ABSTRACT: The authors have examined large-scale failure of solid polymers under the effect of steady tension for two limiting cases: 1) at low temperatures and high stresses, when the specimen's life is determined chiefly by the growth of one of the more dangerous fractures; and 2) at comparatively high temperatures (but below the glass point) and low stresses, when the specimen's life is determined chiefly by the development of "silver" fractures, and the subsequent growth of failure cracks occupies but a small part of the lifetime of the sample. They show that, despite the difference in mechanisms, the time dependence of strength in both cases is expressed by the formula of S. N. Zhurkov $\tau = \tau_0 e^{\frac{U_0 - \gamma\sigma}{kT}}$ (S. N. Zhurkov and B. N. Narzullayev, ZhTF, 23, 1677, 1953), but with somewhat different values for

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ACCESSION NR: AP4019822

the coefficients τ_0 and γ. U_0 is the "zero" activation energy of the failure process, T the temperature, and σ the tensile stress. The difference in τ_0 is practically imperceptible. The difference in γ leads to some distortion in the dependence of log $\tau - \sigma$ in the temperature interval between the extremes here investigated. Orig. art. has: 2 figures and 6 formulas.

ASSOCIATION: Moskovskiy gosudarstvenny*y pedagogicheskiy institut im. V. I. Lenina (Moscow State Pedagogical Institute)

SUBMITTED: 25Feb63 DATE ACQ: 31Mar64 ENCL: 00

SUB CODE: SS NO REF SOV: 009 OTHER: 001

Card 2/2

ACCESSION NR: AP4032578 S/0190/64/006/004/0751/0757

AUTHORS: Bartenev, G. M.; Vishnitskaya, L. A.

TITLE: Rheological properties of polyisobutylene

SOURCE: Vysokomolek. soyedin., v. 6, no. 4, 1964, 751-757

TOPIC TAGS: shearing stress, rheology, viscosity, shear deformation, high molecular weight, polyisobutylene

ABSTRACT: New data were presented on the shearing stress and the temperature effects on the viscosity of high-molecular weight (900 000) polyisobutylene (PIB). The shear stress varied between 0.01 and 1 kg/cm^2 and the temperature range from 20 to 140C. The shear deformation rates $d\gamma/dt$ show a sharp drop in value with time for small loads (0.014), but they show an equally sharp rise after the drop for the heavy load (1.0 kg/cm^2) cases. Several empirical and analytical expressions are given relating $d\gamma/dt$ to the shear load P, e.g.,

$$d\gamma/dt = (P/\eta_0)e^{\alpha P},$$

and an expression for the viscosity of PIB as a function of the load P

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ACCESSION NR: AP4032578

$$\dot{\eta} = \eta_{0}\sigma - \alpha P,$$

compared to the data obtained experimentally. The results indicate that η_0 and α in the above equation are independent of the temperature. Finally, a rule is formulated specifying the additivity of the logarithm viscosities of linear polymers given by

$$\lg \eta/c = \Sigma \lg \eta_i(X_i) .$$

Orig. art. has: 7 formulas and 5 figures.

ASSOCIATION: Moskovskiy gosudarstvenny*y pedagogicheskiy institut im. V. I. Lenina (Moscow State Teachers Institute); Nauchno-issledovatel'skiy institut rezinovoy promy*shlennosti (Institute of Scientific Research in the Rubber Industries)

SUBMITTED: 13Jun63

ENCL: 00

SUB CODE: OC

NO REF SOV: 008

OTHER: 007

Cord 2/2

BARTENEV, G.M.; IZMAYLOVA, L.K.

High strength and structure of glass fibers. Fiz. tver. tela 6 no. 4:1192-1202 Ap '64. (MIRA 17:6)

1. Moskovskiy gosudarstvennyy pedagogicheskiy institut imeni Lenina.

ACCESSION NR: AP4037288 S/0190/64/006/005/0915/0922

AUTHORS: Zelenev, Yu. V.; Bartenev, G. M.

TITLE: Influence of plasticization on the relaxation properties of rubber-like polymers within wide limits of temperature

SOURCE: Vy*sokomolekulyarny*ye soyedineniya, v. 6, no. 5, 1964, 915-922

TOPIC TAGS: molecular mobility, intramolecular force, mechanical relaxation, low temperature relaxation, electrical relaxation, resonance, dielectric loss, sebacic ester, phthalic ester, rubber NK, rubber SKI, rubber SKB, rubber SKS, rubber SKN, dioctyl sebacinate, dibutyl phthalate, dibutyl sebacinate

ABSTRACT: The influence of plasticizers on the molecular mobility and intramolecular forces in mechanical, low temperature, and electrical relaxations was studied as a continuation of the authors' work in this field. Slightly vulcanized natural and synthetic NK-, SKI-, SKS-, and SKN-rubbers (polar and non-polar), plasticized up to 40% with dioctyl sebacinate, dibutyl phthalate, and dibutyl sebacinate were tested dynamically by imposed resonance and non-resonance vibrations of 10^{-3} to 10^{2} cps at -160 to 140C. Dielectric losses were measured in the

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ACCESSION NR: AP4037288

frequency range of 50 - 10^6 cps at -160 to 100C. Relation between the width of the n.m.r. line and the temperature as well as the maximum of mechanical losses due to vitrification in the liquid state were determined. A high-temperature maximum at 110-120C due to reversible destructions of polysulfide bonds and a low-temperature maximum below -130C due to the mobility of side chains were observed. From the data obtained graphs were plotted, showing relation of: 1) mechanical and dielectric losses to temperature; 2) n.m.r. width to temperature; 3) the displacement of low and high temperature maxima to dibutyl phthalate content; 4) activation energy of relaxation to temperature and to plasticizer content. It was determined that plasticizers are most effective at high temperatures in non-polar rubbers, and at low temperatures in polar rubbers. Activation energy was found to differ for non-polar rubbers at low, standard, and high temperature maxima. Orig. art. has: 5 graphs and 2 formulas.

ASSOCIATION: Moskovskiy gosudarstvennyy pedagogicheskiy institut im. V. I. Lenina (Moscow State Teachers Institute)

SUBMITTED: 01Jul63 DATE ACQ: 09Jun64 ENCL: 00

SUB CODE: MT, OC NO REF SOV: 012 OTHER: 002

Card 2/2

ACCESSION NR: AP4040483 S/0190/64/006/006/1047/1053

AUTHORS: Zelenev, Yu. V.; Bartenev, G. M.

TITLE: Relaxation properties of a mixture of rubberlike polymers in a wide interval of temperatures

SOURCE: Vy*sokomolekulyarny*ye soyedineniya, v. 6, no. 6, 1964, 1047-1053

TOPIC TAGS: polymer, elasticity, vulcanization, molecular mobility, nuclear magnetic resonance, viscoelasticity/ NK rubber, SKB rubber, SKS 30 rubber, SKN 26 rubber, SKN 18 rubber, SKN 40 rubber, PKhPK rubber

ABSTRACT: Studies were made of the relaxation properties of compatible and incompatible rubber-like polymers in mechanical, electrical, and magnetic fields of various frequencies and in the temperature interval from -170 to +140C. The mixtures selected were the rubbers NK + SKB, NK + SKS-30, and SKN-18 + SKN-40, of the compatible variety, and rubbers NK + SKN-18, SKS-30 + SKN-26, and PKhPK + SKN-40 of the incompatible variety. Testing apparatus and measurement methods were the same as those described previously by the authors in Vy*sokomolek. soyed. 4, 66, 1962 and in collaboration with G. K. Demishev in Zavodsk. lab., 1963, No. 7, 868. Tests were conducted by dynamic mechanical methods with the required resonant and nonresonant

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ACCESSION NR: AP4040483

oscillations ranging from 10^{-3} to 10^{2} cycles/second. For comparing the processes of molecular relaxation in rubber mixtures for mechanical and electrical fields, dielectric losses were measured in the frequency range from 50 to 10^{6} cycles/second and in the temperature range from -170 to 100C. Molecular creep was also observed by the NMR method. Figures are presented showing: 1) the temperature dependence of mechanical and dielectric losses of compatible and incompatible rubbers in the region of transition from high elastic to glass condition; 2) the effect of mix concentration variation on mechanical and dielectric losses with changing temperature; 3) the temperature dependence of the width of the NMR line for selected vulcanized rubbers and their mixtures; 4) temperature dependence of mechanical losses for high- and low-temperature ranges and for compatible and incompatible rubbers in various mix concentrations. Orig. art. has: 5 figures and 2 equations.

ASSOCIATION: Moskovskiy gosudarstvenny*y pedagogicheskiy institut im. V. I. Lenina (Moscow State Pedagogical Institute)

SUBMITTED: 05Jun63

ENCL: 00

SUB CODE: MT

NO REF SOV: 018

OTHER: 002

Card 2/2

ACCESSION NR: AP4045429 S/0190/64/006/009/1629/1636

AUTHOR: Zuyev, Yu. S., Bartenev, G.M., Kirshenshteyn, N.I.

TITLE: Longevity and strength of rubberlike polymers

SOURCE: Vy*sokomolekulyarny*ye soyedineniya, v. 6, no. 9, 1964, 1629-1636

TOPIC TAGS: radiation vulcanization, polymer longevity, polymer strength, filler, synthetic rubber, vulcanized rubber, nitrile rubber, polymer structure

ABSTRACT: An investigation of the longevity and strength of unfilled radiation vulcanizates from nitrile rubbers (SKN-18, 26, 40) (equilibrium modulus = 3, 7, 12 and 24 kg/sq. cm) and filled vulcanizates from SKT and SKF rubber showed that under the influence of a constant stress, the relation $\tau = f(\sigma)$ can be expressed by the formula $\tau = B\sigma^{-n}$ (1). In many cases, however, in the same experimental range of longevity within the limits of variation, the relation $\tau = Ae^{-\gamma\sigma}$ (2) is valid; thus, a vulcanizate of SKN-26 filled with carbon black complies with relation (2). The $\log\tau$-$\log\sigma$ curves are usually parallel at high temperatures (100-150C). On decreasing the temperature to 40C, the 25° angle of inclination of the curves decreases. The apparent activation energy of destruction at high temperatures is independent of the stress, and for radiation vulcanizates, the order of

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magnitude of the activation energy corresponds to the energy of intermolecular interaction of the segments of flow. In the presence of relatively weak crosslinks, they participate to a considerable extent in the rupturing process and the activation energy increases. Over the temperature range 25-40C, the apparent activation energy increases with increasing stress. The latter can be explained by the fact that with increasing stress, either the destruction of the supermolecular structure increases, or the contribution of the ruptured chemical bonds increases. With increasing temperature, for many vulcanizates such as SKN-40, SKN-26 and SKN-18, an inversion of longevity and strength is observed. This is probably due to the fact that at increased temperatures, the strength properties are determined by the imperfection of the molecules, which is greater for SKN-40 then fora SKN-18, while at normal temperatures, the negative influence of the imperfection of the molecules is overlapped by the positive effect of the intermolecular interaction and the supermolecular structures. On increasing the density of the three-dimensional network, the longevity (as well as the strength) varies according to a curve with a maximum. The location of this maximum does not change with increasing temperature. An increase in temperature

ACCESSION NR: AP4045429

diminishes the effect of the density of the network and the effect of the amount of intermolecular interaction on the longevity. Finally, the longevity of vulcanizates characterized by the nature of the crosslinks is much greater when the crosslinks have a greater mobility. Orig. art. has: 7 figures, 2 tables and 3 formulas.

ASSOCIATION: Nauchno-issledovatel'skiy institut rezinovoy promy*shlennos.: (Scientific Research Institute of the Rubber Industry)

SUBMITTED: 26Oct63 ENCL: 00 SUB CODE: OC, MT

NO REF SOV: 016 OTHER: 001

Card 3/3

VOYEVODSKAYA, M.V.; BARTENEV, G.M.

Effect of fillers on the thermal shrinkage and glass transition temperature of rubber. Kauch. i rez. 23 no. 3:21-25 Mr '64. (MIRA 17:5)

1. Nauchno-issledovatel'skiy institut rezinovoy promyshlennosti.

ACCESSION NR: AP4013334 S/0020/64/154/003/0661/0664

AUTHORS: Bartenev, G.M.; Zelenev, Yu. V.

TITLE: Low temperature relaxation processes in rubber like polymers

SOURCE: AN SSSR. Doklady*, v. 154, no. 3, 1964, 661-664

TOPIC TAGS: polymer relaxation, polymer molecular mechanism, low temperature polymer relaxation, polymer dipole moment, polymer dielectric loss, polymer cross-linking, polymer asymmetry, polymer atom group, polymer grid

ABSTRACT: Molecular mechanisms of high and low temperature maxima, i.e. of maximal mechanical (m.m.l.), dipole-elastic and dipole-radical dielectric losses (m.d.l.) are related to changes in the mobility of the segments and side groups of the backbone molecular structure; thus basic and secondary maxima may be distinguished. The study attempted to determine the link between structural, molecular mobility and macroscopic relaxation properties of rubber like

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ACCESSION NR: AP4013334

polymers in natural and synthetic rubbers and their polymeric derivatives. Measurements of the maxima were conducted with dynamic mechanical methods at low mechanical and sound frequencies of 10^{-3} - 10^{-2} hertz in a temperature range of -180 to+25C. Temperature dependencies of dielectric losses were determined for comparing mechanical and dielectric relaxation processes; molecular structural features and the nature of molecular mobility were additionally studied by IR and NMR scopy. Both basic and secondary m.m.l. and m.d.l. were detected for polar rubber like polymers, in contrast to nonpolar where no secondary m.d.l. were observed. The low dielectric losses of the latter were not reflected in the secondary m.d.l. with the experimental methods used. The basic m.m.l. of polar and non-polar polymers differed insignificantly, while basic m.d.l. differed considerably, due also to the lesser dipole moments of the non-polar polymers. In studies of low-temperature molecular relaxation and its relation to molecular ordering, the nature of vulcanization, e.g. high molecular ordering (in radiation-vulcanized rubber), was reflected in lower m.m.l. The role of supramolecular cross-linking in this behavior is discussed. Orig. art. has: 4

Card 2/3

ACCESSION NR: AP4013334

figures and 1 formula.

ASSOCIATION: Moskovskiy gosudarstvenny*y pedagogicheskiy institut im. V.I. Lenina (Moscow State Pedagogic Institute)

SUBMITTED: 13Jun63 DATE ACQ: 26Feb64 ENCL: 00

SUB CODE: CH NO REF SOV: 012 OTHER: 002

Card 3/3

WRITE BELOW THIS LINE

ACCESSION NR: AP4034033 S/0020/64/155/006/1302/1305

AUTHOR: Bartenev, G. M.; Motorina, L. I.

TITLE: Effect of Thermal Treatment on the Strength and Structure of Glass Fibers

SOURCE: AN SSSR. Doklady*, v. 155, no. 6, 1964, 1302-1305

TOPIC TAGS: glass thermal treatment, fiber glass, glass fiber strength, glass structure, glass surface defect, glass, glass reinforced plastics

ABSTRACT: The authors have shown in a previous paper (DAN 150, 132, 1963) that the usually observed lowering of the strength of glass fibers by heating from 100 to 400 C does not take place if the glass fibers are under tension. In the present paper, the authors continue the investigation. By etching in hydrofluoric acid which removes measurable layers of glass, they show that the strength of fibers is increased which proves that the surface defects caused by thermal treatment are responsible for the decrease of strength. The structural changes in the core of the glass produced by thermal treatment do not affect the strength of fibers. Orig. art. has: 4 figures.

Card 1/2

ACCESSION NR: AP4034033

ASSOCIATION: Gosudarstvenny*y nauchno-issledovatol'skiy institut stekla (State Glass Research Institute); Gosudarstvenny*y pedogogicheskiy institut im V. I. Lenina (State Pedagogic Institute)

SUBMITTED: 04Nov63 DATE ACQ: 20May64 ENCL: 00

SUB CODE: MT,OC NO REF SOV: 007 OTHER: 008

Card 2/2

L 24233-65 EPF(c)/EWT(m)/T Pc-4 Pr-4 RM
ACCESSION NR: AP5001996 S/0020/64/159/006/1350/1353

AUTHOR: Bartenev, G. M.; Povarova, Z. S.; Kargin, V. A. (Academician)

TITLE: Rheological properties and supramolecular structure of rubber-like polymers

SOURCE: AN SSSR. Doklady, v. 159, no. 6, 1964, 1350-1353

TOPIC TAGS: polyisobutylene, polyisobutylene flow, chemical flow, physical flow, rheological curve, supramolecular structure

ABSTRACT: The flow mechanism of linear polyisobutylene has been studied in view of the importance of rheological properties in the processing of polymers. The experiments were conducted in a rotary viscosimeter with linear PIB of a molecular weight of 900,000 at 60—200C and shear strain rates of 0—1 sec^{-1}. A number of rheological curves (Figs. 1—4 of the Enclosure) are discussed. The abnormal shape of these curves could not be ascribed to "chemical" flow (degradation), because the molecular weight of the polymers and the activation energy of viscous flow remained unchanged under different experimental conditions. The fact that the flow is "physical" in nature was considered

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L 24233-65
ACCESSION NR: AP5001996 "APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000203720020-5"

as a confirmation of the theory of Bartenov and Vishnitskaya (Vysokomolek. soyed., 6, 751, 1964) on the significant role of supramolecular structures in the flow mechanism of polymers. It is suggested that a linear polymer can be considered a network with temporary cross-linking consisting of microscopic sheaves which break down during flow. The viscous flow rate depends on the number of microscopic sheaves per unit of volume of the polymer. The rate of breakdown of microscopic sheaves increases with an increase in the stress and flow rate. Orig. art. has: 4 figures.

ASSOCIATION: Nauchno-issledovatel'skiy institut rezinovoy promyshlennosti (Scientific Research Institute of the Rubber Industry)

SUBMITTED: 24Jul64 ENCL: 04 SUB CODE: OC, GC

NO REF SOV: 006 OTHER: 000

BARTENEV, G. M.; ZELENEV, Yu. V.

"Uber die Vorgange der Molekulrelaxation von kautschukahnlichen Polymeren."

report submitted for High Polymers Mtg & Rubber Symp, Leipzig, GDR, 23-25 Feb 65.

BARTENEV, G. M.; POVAROVA, Z. G.

"Polyisobutylen-Ruk-Mischungen."

report submitted for High Polymers Mtg & Rubber Symp, Leipzig, GDR, 23-25 Feb 65.

BARTENEV, G.M.

Regularities and mechanism of the viscous flow of linear polymers. Plast. massy no.12:20-26 '64. (MIRA 18:3)

ACC NR: AP5026039 EWP(e)/EPA(s)-2/EWT(m)/EPF(c)/EWP(i)/EWP(j)/T/EWP(b) WW/RM/WH

SOURCE CODE: UR/0072/65/000/009/0017/0019

AUTHOR: Bartenev, G. M. (Doctor of chemical sciences); Sidorov, A. B.

ORG: Department of Solid State Physics MGPI im. V. I. Lenina (Kafedra fiziki tverdogo tela MGPI)

TITLE: Effect of the length of glass fibers on their strength

SOURCE: Steklo i keramika, no. 9, 1965, 17-19

TOPIC TAGS: glass property, glass fiber

ABSTRACT: In order to determine the character of the curves representing the distribution of the strength of glass fibers and their change with the length of the fiber, a rupture microtester was developed at the polymer physics laboratory of MGPI (laboratoriya fiziki polimerov MGPI) for testing fibers 1 to 400 mm long. Industrial glass fibers of alkali-free composition obtained from a primary thread were studied. Curves of the strength distribution of glass fibers measuring 6, 8, and 10 μ in diameter and having various lengths showed that the strength of a glass fiber does not obey a random law but is grouped around three definite values. This confirms an earlier hypothesis of the existence of three strength levels σ_A, σ_B.

UDC: 666.11.01:620.172

Card 1/2

Card 2/2

L 00312-66 EWP(e)/EWT(m)/EWP(w)/EPF(c)/EWP(i)/EWP(j)/T/EWP(t)/EWP(b)
BW/JD/WW/DJ/GS/RM/WH

ACCESSION NR: AT5020433 UR/0000/65/000/000/0072/0075

AUTHORS: Bartenev, G. M.; Yel'kin, A. I.; Gridunova, Ye. B.; Voyevodskaya, M. V.

TITLE: Effects of lubricants on friction of rubber on metal at low temperatures

SOURCE: AN SSSR. Nauchnyy sovet po treniyu i smazkam. Teoriya smazochnogo deystviya i novyye materialy (Theory of lubricating action and new materials). Moscow, Izd-vo Nauka, 1965, 72-75

TOPIC TAGS: rubber, friction, lubricant, low temperature effect, low temperature research/ TsIATIM 221 lubricant, TsIATIM 205 lubricant

ABSTRACT: The effects of solid lubricants (fine dispersion graphite type KT and molybdenum disulfide), liquid lubricant No. 3, and lubricants TsIATIM-221 (based on No. 3) and TsIATIM-205 on the maximum friction between various rubbers and steel were investigated in the temperature range 50 to -200C at a constant load of 2 kg/mm^2, contact area 1.5 cm^2, and sliding speed 1 mm/min on the apparatus described by G. M. Bartenev, V. V. Lavrent'yev, and A. I. El'kin (Pribory dlya issledovaniya sily treniya vysokoelasticheskikh polimerov. Teoriya treniya i iznosa. Izd-vo "Nauka," 1965). The unlubricated friction force of unfilled rubber (based on SKF-26) on steel was found to increase slowly from 4.5 kg at 20C

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L 00312-66
ACCESSION NR: AT5020433

2

to 5 kg at -30C, drop sharply to ≈ 1 kg at that temperature, and remain approximately constant to temperatures of -200C. Graphite lubrication decreased the friction force to ≈ 0.6 kg (almost constant from 20 to -200C), while molybdenum disulfide was 15-20% less effective than graphite. The friction force for unfilled rubber (based on SKMS-10) on steel without lubrication was found to be larger than with liquid lubrication over a range of temperatures (depending on the lubricant) and was smaller over other temperature ranges (see Fig. 1 on the Enclosure). Orig. art. has: 2 figures.

ASSOCIATION: Nauchnyy sovet po treniyu i smazkam, AN SSSR (Scientific Committee on Friction and Lubrication, AN SSSR) 44

SUBMITTED: 22May65 ENCL: 01 SUB CODE: FP,TD

NO REF SOV: 005 OTHER: 000

Card 2/3

L 00312-66

ACCESSION NR: AT5020433

ENCLOSURE: 01

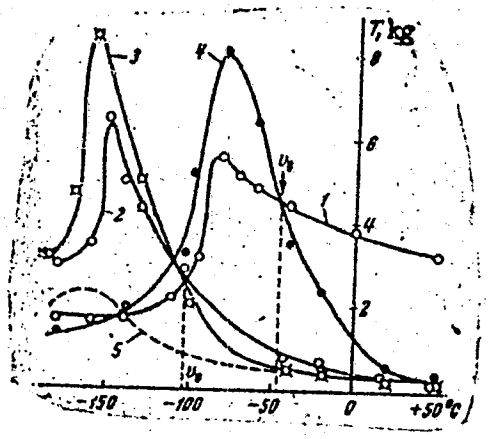

Fig. 1.
1- without lubricant; 2- lubricant No. 3; 3- TsIATIM-221;
4- TsIATIM-205; 5- running friction with TsIATIM-221

Card 3/3

L 4937-66 EWT(m)/EWP(w)/EPF(c)/EWP(j)/T/EWP(t)/EWP(b) JD/DJ/GS/RM

ACC NR: AT5022668 SOURCE CODE: UR/0000/65/000/000/0095/0099

AUTHORS: Bartenev, G. M.; Yel'kin, A. I.

ORG: Scientific Committee on Friction and Lubrication, AN SSSR (Nauchnyy sovet po treniyu i smazkam AN SSSR)

TITLE: Friction mechanism of highly elastic materials at high and low temperatures

SOURCE: AN SSSR. Nauchnyy sovet po treniyu i smazkam. Teoriya treniya i iznosa (Theory of friction and wear). Moscow, Izd-vo Nauka, 1965, 95-99

TOPIC TAGS: polymer friction, rubber friction, friction mechanism/ SKS 50 latex

ABSTRACT: Frictional properties of rubber-like polymers (unfilled rubbers made from natural latex, butadiene, and other synthetic latexes) were investigated with a vacuum tribometer as explained by G. M. Bartenev and A. I. Yel'kin (Zavodskaya laboratoriya, 1963, No. 2). The friction forces between the specimen and a polished steel surface (13 class finish) were measured over a temperature range of 100 to -200C and in the velocity range of 10^{-3} - 10^{-2} mm/minute. Test results (see Figs. 1 and 2) show that the two curves are essentially mirror images.

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0901 1536

L 4937-66

ACC NR: AT5022668

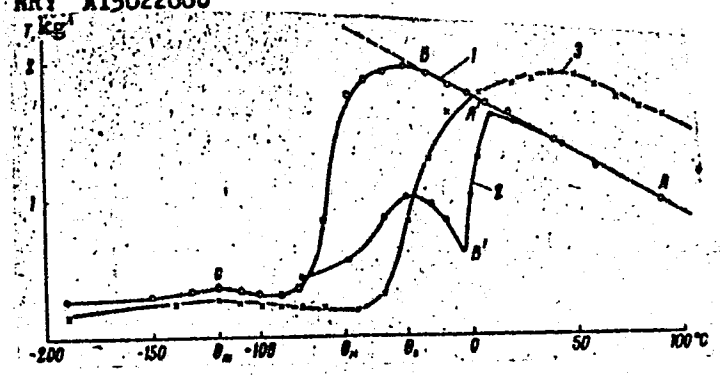

Fig. 1. Friction force versus temperature:
1- in vacuum;
2- in normal atmosphere (1 and 2 natural latex);
3- latex SKS-50

K. A. Grosch (Nature, 197, March 2, 858, 1963) and other authors have tried to correlate the maximum friction with the maximum mechanical losses in the rubber, considering the friction process as dissipation of elastic energy in the rubber volume due to, for example, vibrations induced by surface roughness. According to the theory of G. M. Bartenev (K teorii sukhogo treniya. Dokl. AN SSSR, 1954, t. 96, 1161) and some experimental data, the adhesion mechanism of friction (loss at surface due to bonding and breaking of polymer chains) is of greater importance for friction on a polished surface than the elastic loss mechanism. A qualitative

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L 4937-66
ACC NR: AT5022668

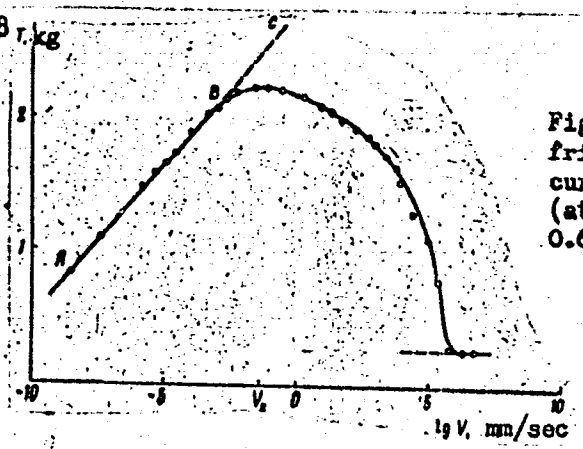

Fig. 2. Generalized friction-speed curve for SKS-50 (at 40C, load = 0.65 kg/cm^2)

explanation of the shape of the curves in Fig. 1 is presented which stipulates that the maximum friction force cannot be correlated with the experimental results if elastic losses are assumed but that the maximum is primarily related to the rubber transition temperature below which solidification reduces the actual contact area and thus the friction. Orig. art. has: 3 figures and 1 formula.

SUB CODE: MT, ME/ SUBM DATE: 10May65/ ORIG REF: 009/ OTH REF: 004

Card 3/3

L 3789-66 EWT(m)/EPF(c)/EWP(j)/T DJ/RM

ACCESSION NR: AP5023213 UR/0374/65/000/004/0123/0129
678.531.44

AUTHOR: Barteney, G. M. (Moscow); Lavrent'yev, V. V. (Moscow); Konstantinova, N. A. (Moscow)

TITLE: Effect of normal load on temperature and slip rate dependence of frictional force of highly elastic materials

SOURCE: Mekhanika polimerov, no. 4, 1965, 123-129

TOPIC TAGS: synthetic rubber, friction, internal friction, friction coefficient, copolymer, synthetic material, vulcanization

ABSTRACT: The effect of normal load on temperature and slip rate dependence of frictional force of cross-linked butadiene-acrylonitrile copolymers (rubbers based on SKN-18, SKN-26, and SKN-40) on polished steel was investigated. The object of this study was to amplify the knowledge on performance of these highly elastic rubbers, specifically, to extend it to high normal loads. This study was, also, expected to yield more understanding of the molecular-kinetic nature of the internal friction in polymers. In the 18-100°C range, the frictional force of vulcanized rubbers is inversely proportional to temperature. Up to 10^7 n/m^2, the effect of

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L 3789-66

ACCESSION NR: AP5023213

load on the temperature dependence of friction reflects only the change of the actual contact area or the increase in the tangent of the angle of inclination of temperature dependence of friction with increasing load. There is a similar relationship between the friction force of all three rubbers and the logarithm of slip rate. The dependence of friction force upon the logarithm of the slip rate for SKN-18 based rubber shows a slight dependence of both the activation energy and the average jump distance of a molecular chain upon the specific load. In the low slip friction range, the friction force is linearly dependent upon the logarithm of slip rate. At speeds above 44 cm/min and a load of $30 \cdot 10^5$ n/m^2, the friction force rises sharply due to uncontrollable heating of the friction surface. Orig. art. has: 5 figures, 1 table, 7 formulas.

ASSOCIATION: none

SUBMITTED: 18Mar65 ENCL: 00 SUB CODE: MT

NO REF SOV: 008 OTHER: 013

PC

Card 2/2

AUTHOR: Barsnev, G. M.; Yel'kin, A. I.

TITLE: The friction properties of polymers in the nonsteady state of frictional

SOURCE: [illegible]

TOPIC TAGS: polymer, resin, friction research, synthetic rubber, teflon, steel

Card 1/2

L 60141-65
ACCESSION NR: AP5016501

2

temperatures. For pairs having similar coefficients of expansion, the maximum in [illegible]

[illegible] frictional force is a favorable factor for [illegible] packings [illegible] at low temperatures. Orig. art. has: 7 graphs.

ASSOCIATION: Moskovskiy gosudarstvennyy pedagogicheskiy institut im. V. I. Lenina (Moscow State Pedagogical Institute)

SUBMITTED: [illegible]64 ENCL: 00 SUB CODE: [illegible]

[illegible]

Card 2/2

A3f.R
C2gD.R
C2a.R
E3.R

BARTENEV, G. M.

Jan. 30. 1953

In 1946 defended his thesis "O Prognozakh radiosvyazi" for degree of Kandidat tekhnicheskikh nauk at Moskovskiy energeticheskiy institut im. Molotova.

Elektrichestvo, 1947, No. 4, p. 94.

P.4763

BARTENEV, G. M.

On 20 December 1946, at the Power Engineering Institute imeni Molotov, defended his dissertation on "On Forecasts of Radio Communications". Official opponents - Doctor of Technical Sciences Professor L. A. Zhekulin, and Candidate of Technical Sciences K. M. Kosikov.

So: Elektrichestvo, No 4, April 1947, pp 90-94 (U-5577, 18 February 1954)

On the basis of studies of statistical material on solar activity, catalogues of magnetic storms, the results of measuring the critical frequencies of the earth's ionosphere, and the results of operating main-line radio communications in the USSR, a formula was presented for computing prognoses of Wolf numbers. The correlation was determined between Wolf numbers on the one hand and the midday, midnight, and minimal value of the critical frequencies of the F layer, the midday value of the critical frequencies of the E layer, and the numbers of magnetic storms on the other hand. On the basis of the correlation determined, equations were presented for calculating the prognosis of critical frequencies, instances of magnetic storms, and ionospheric disturbances accompanying disturbances in radio communications. Recommendations were made for the use of retranslation, increasing the power radiated during magnetic storms, and a change to ultra-short waves, or to short waves close to these frequencies, during Bellinger's phenomenon, as measures in the struggle to maintain uninterrupted radio communication.
So: IBID

BARTENEV, G. M.

PA 26T102

USSR/Radio
Ionosphere
Solar Phenomena

Sep 1947

"Long Range Forecasts for Critical Frequencies of the Ionosphere and the Occurrences of Disruptions in It," G. M. Bartenev, 13 pp

"Iz Ak Nauk, Tekh Nauk" No 9 - pp 1134-52

A comparison of sunspots and the state of terrestrial magnetism makes it possible to predict geomagnetic and ionospheric disturbances. This science is still in its infancy and all Soviet ionospheric stations should put forth every effort for an early solution to the many questions still

26T102

USSR/Radio (Contd) Sep 1947

existing. Graphs and tables of mathematical formulae. Submitted by B. A. Vvedenskiy at the Section for the Study of Problems in Radio Techniques, Academy of Sciences of the USSR.

26T102

BARTENEV, G. M.

PA 26T103

USSR/Radio
Ionosphere
Solar Phenomena

Sep 1947

"Forecasting Yearly Cycles of Critical Frequencies in Ionosphere and Magnetic Disturbances," G. M. Bartenev, 19 pp

"Iz Ak Nauk, Tekh Nauk" No 9 - MP-1153-72

Measurements and observations over a period of 11 years of critical frequencies and the height of the ionosphere make it possible to use the data obtained. The aim of this article is to determine some formulae for forecasting critical frequencies as well as the number of magnetic storms which might

26T103

USSR/Radio (Contd) Sep 1947

be expected during a yearly cycle. Uses several graphs and diagrams which originated in Washington. Submitted by B. A. Vvedenskiy at the Section for the Study of Problems in Radio Techniques, Academy of Sciences of the USSR.

26T103

BARTENEV, G. M.

"Theory of Transmission of Circumferential Force by Means of a Flat Belt," Dokl. AN SSSR, 85, No.4, 1952

BARTENEV, G.M.

Prediction of shortwave propagation. Some observation results of the critical frequencies of the ionosphere during the 1933-1955 period. Nauch.dokl.vys.shkoly; radiotekh.i elektron. no.4:6-21 '58. (MIRA 12:6)

1. Kafedra radiotekhniki Vsesoyuznogo zaochnogo elektrotekhnicheskogo instituta svyazi.
(Ionospheric radio wave propagation)

BARTENEV G. M.

Г. М. Бартенев

Возможные затухания коротких радиоволн в ионосфере. Статистика наблюдений за время с 1956 до 1957 гг.

В. Е. [illegible]

Методы безимпульсного зондирования неоднородностей слоев ионосферы

Г. В. Васильев,
Ю. В. [illegible]

Ионосферная станция ручного управления с механическим сопряжением настроек передатчика и приемника.

II [illegible]

(с 10 до 16 часов)

Е. Л. Фейнберг,
А. Д. [illegible]

О приближенных граничных условиях в теории распространения радиоволн вдоль земли.

С. М. [illegible] (Чехословакия)

Измерение эффекта Допплера третьего советского искусственного спутника Земли.

В. А. [illegible]

Исследование лунных [illegible] в ионосфере.

Н. И. [illegible]

Спорадический слой E по наблюдениям на станциях Советского Союза за период Международного геофизического года

Н. С. [illegible],
А. И. [illegible]

Отражение радиоволн миллиметрового диапазона от слоя снега.

II [illegible]

(с 18 до 22 часов)

В. С. [illegible] (США)

Применение тропосферного распространения УКВ для целей многоканальной радиосвязи и телевидения

В. И. Трофимов

Исследование дальнего приема телевизионных и других сигналов на УКВ.

Е. Ф. Грачев

Дальний и сверхдальний прием телевизионных сигналов.

report submitted for the Centennial Meeting of the Scientific Technological Society of Radio Engineering and Electrical Communications im. A. S. Popov (VNORIE), Moscow, 8-12 June. 1959

BARTENEV, G. M., Doc Tech Sci -- (diss) "Forecasts of the propagation of short radio waves in the ionsphere." Moscow, 1960. 15 pp; with diagrams; (Ministry of Communications USSR, All-Union Correspondence Electrical Engineering Institute of Communications); 200 copies; price not given; printed by duplicating machine; bibliography on pp 8-9 (14 entries); (KL, 19-60, 132)

BARTENEV, G.M.

Sudden fading of short radio waves in the ionosphere (1938-1950). Elektrosviaz' 14 no.5:45-50 My '60. (MIRA 13:8)
(Ionospheric radio wave propagation)

L 54512-65 EWP(e) /EPA(s)-2/EWT(m)/EPF(c)/EWP(1)/EPR/EWP(t) /T/EWP(b) Pc-4/Pg-4/

SOURCE: Ref. zh. Khimiya, Abs. 13M117

AUTHOR: Bartenev, G.M.; Lumaylova, L.K.

TITLE: Nature of the high strength of glass fibers

CITED SOURCE: Steklo. Inform. materialy Gos. n.-t. in-ta stekla, no. 1, 1964, 28-30

TOPIC TAGS: glass fiber, fiberglass strength, continuous fiberglass, fiberglass production, fiberglass microcrack, alkali free fiberglass

TRANSLATION: Changes in the technology of manufacture of continuous fiberglass [illegible]

[illegible] strength [illegible]

L 54512-65
ACCESSION NR: AB[illegible]1426

molding of FG has made it possible to obtain high-strength alkali-free FG (300 kg/mm^2

SUB CODE: MT ENCL: 00

Card 3/3

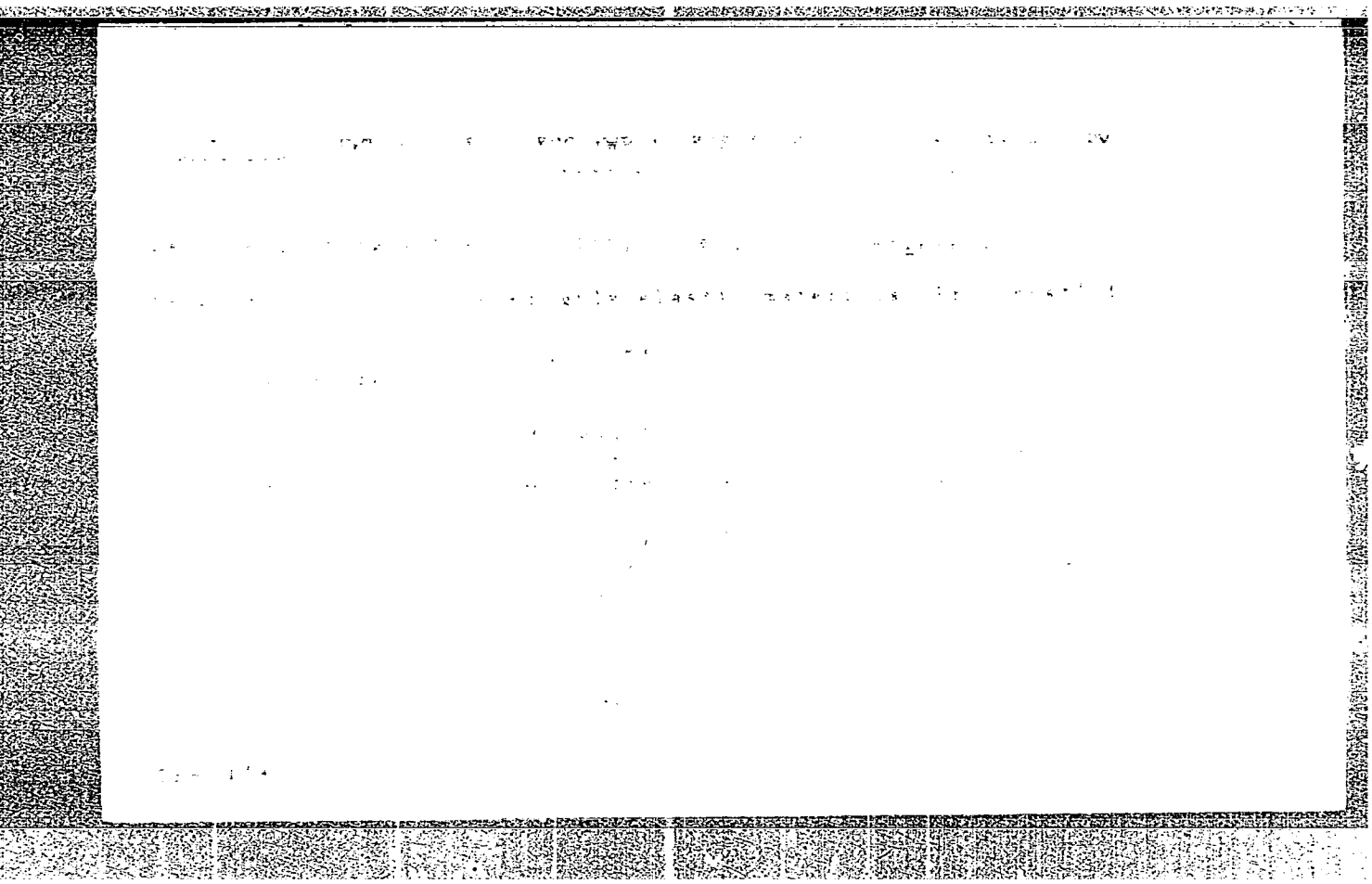
ASLANOVA, M.S. doktor khim. nauk; BARTENEV, G.M., doktor khim. nauk

Congress on the physics of noncrystalline solids. Vest. AN SSSR 34 no.12:50-52 D '64 (MIRA 18:1)

BARTENOV, G.M.; POVAROVA, Z.G.; KARGIN, V.A., akademik

Rheological properties and super molecular structure of rubber-like polymers. Dokl. AN SSSR 159 no.6:1350-1353 D '64
(MIRA 18:1)

1. Nauchno-issledovatel'skiy institut rezinovoy promyshlennosti.



APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000203720020-5"

AM5013300

Card 3/4

L 50192-65
AM5013300

SUB CODE: GC SUBMITTED: 27Oct64 NO REF SOV: 415

OTHER: 294

Card 4/4

BARTENEV, G. M.

"Non-thermal and thermal processes of fracture and time-dependent strength of brittle solids."

report submitted for Intl Conf on Fracture, Sendai, Japan, 13-16 Sep 65.

Moscow, USSR.

L 41767-65 EPF(c)/EWP(j)/EWT(m) Pc-4/Pr-4 RM
ACCESSION NR: AP5026366 S/0138/64/000/003/0021/0025

AUTHORS: Voyevodskaya, M. V.; Bartenev, G. M.

TITLE: Effect of fillers on the shrinkage of rubbers at elevated temperatures and on the glass transition temperature

SOURCE: Kauchuk i rezina, no. 3, 1964, 21-25

TOPIC TAGS: rubber, butadiene styrene rubber, nitrile rubber, fluoro elastomer, butadiene ∝ methyl styrene rubber, glass transition temperature, [illegible], Rubrax

ABSTRACT: The effect of various fillers and Rubrax on the glass transition temperature T_g and the coefficients of linear expansion of fille[illegible]

[illegible]

Card 1/3

L 41767-65

ACCESSION NR: AP4026366

of linear shrinkage β_1 and β_2 indicates the T_g (see Fig. 1 of the Enclosure). It was found that the glass transition temperature of rubber was not affected by the addition of up to [illegible] of any of the [illegible] [illegible] values for β [illegible] closely those obtained experimentally. It was also observed that the [illegible]ration of up to [illegible] powders [illegible] into a filled rubber mix on a [illegible] base did not lower the T_g of the rubber, but did reduce the values of the coefficients β_1 and β_2. Orig. art. has: [illegible] figures and 2 tables.

ASSOCIATION: Nauchno-issledovatel'skiy institut rezinovoy promyshlennosti (Scientific Research Institute of the Rubber Industry)

SUBMITTED: [illegible] ENCL: [illegible] SUB CODE: [illegible]

NO REF SOV: 005 OTHER: 001

Card 2/3

ZELENEV, Yu.V.; MARTYNOV, G.N.

Relaxation properties of rubberlike polymer mixtures over a wide range of temperatures. Vysokom. soed. 6 no.6:1047-1053 Je '64. (MIRA 18:2)

1. Moskovskiy gosudarstvennyy pedagogicheskiy institut imeni Lenina.

L 40298-66 EWT(m)/EWP(j)/T IJP(c) RM

ACC NR: AR6014584 SOURCE CODE: UR/0081/65/000/021/S018/S018

AUTHORS: Bartenev, G. M.; Zelenev, Yu. V. 52 E

TITLE: Investigation of the molecular relaxation processes in polymers

SOURCE: Ref. zh. Khimiya, Abs. 21S110

REF SOURCE: Uch. zap. Mosk. obl. ped. in-ta, v. 147, 1964, 137-149

TOPIC TAGS: relaxation process, elastomer, vulcanization, molecular structure

ABSTRACT: Relaxation properties of certain typical polar and nonpolar elastomers were investigated by dynamic and dielectric methods as well as by NMR. Measurements were performed in a frequency range of 10^{-3} - 10^{3} hz (mechanical method) and 5×10^{1} - 10^{7} hz (dielectric method) at - 190 to 200C. Experimental data thus obtained are illustrated as temperature functions of dynamic characteristics. Experiments have shown that thermal and radiation vulcanizers have 2 regions of molecular relaxation while the sulfur vulcanizers have 3. Activation energies of the main and secondary transition processes were determined. Reported data indicate the effect of prior thermal history upon the character of molecular relaxation processes, which is related to the formation of supra-molecular structures. A. Malkin [Translation of abstract]

SUB CODE: 11, 20

Card 1/1 mlp

L 54624-65 EWT(m)/EPF(c)/EWP(j)/T Pc-4/Pr-4
ACCESSION NR: AP5011443
UR/0138/64/000/011/0018/0022

AUTHOR: Povarova, Z. G.; Bartenev, G. M.

TITLE: Rotational viscosimeters and methods for the investigation of the flow of rubber-like polymers

SOURCE: Kauchuk i rezina, no. 11, 1964, 18-22

TOPIC TAGS: rubber, viscous flow, polymer, polymer physical chemistry

ABSTRACT: The design and principle of operation of a number of USSR rotational viscosimeters are reviewed. Results [illegible] various types of [illegible] viscosimeters operating either at a [illegible] [illegible] shear stress [illegible] [illegible] moments on [illegible] that the energy of activation of elastomer flow [illegible] the basis of data [illegible] at [illegible] const. [illegible] data obtained at [illegible] const.

Card 1/2

L 54624-65
ACCESSION NR: AP5012443

The rotational plastometer designed by I. F. Kamavets (I. F. Kamavets, Khimiya i Fiziko-Khimiya Vysokomolekulyarnykh Soyedineniy - Chemistry and Physical Chemistry of High-Molecular Compounds - [illegible] Sci. [illegible]

[illegible] art. has: 3 formulas, 5 graphs.

ASSOCIATION: Nauchno-issledovatel'skiy institut rezinovoy promyshlennosti (Scientific Research Institute of the Rubber Industry, [illegible]

SUBMITTED: [illegible] ENCL: [illegible]

SUB CODE: [illegible] OTHER: [illegible] ATD PRESS

L 52210-65

ACCESSION NR: AP5011992

UR/0374/65/000/001/0089/0092
678:539.4.014.12

AUTHORS: Bartenev, G. M. (Moscow); Motorina, L. I. (Moscow)

TITLE: The effect of tensile stresses on the strength of glass fibers subjected to heat treatment and the significance of this effect in fiberglass

SOURCE: Mekhanika polimerov, no. 1, 1965, 89-92

TOPIC TAGS: tensile stress, fiberglass, glass fiber, heat treatment

ABSTRACT: The possibility of controlling internal stresses during production of glass fibers and fiberglass was investigated. Glass fibers [illegible] mm [illegible] [illegible] any increase. The greater the prestressing (below ultimate strength), the greater the effect of strengthening, and this strength may be increased as much as 100%. The strength of glass fibers tested to rupture at 20C was found to be approximately proportional to the tensile stresses during heat treatment. It is

Card 1/2

L 52210-65

ACCESSION NR: AP5011992

concluded that two counter processes take place during thermal treatment of stressed glass fibers: 1) softening, leading to the formation of fine surface [illegible] cracks, the [illegible] [illegible] [illegible]

[illegible] [illegible] that [illegible] [illegible] at the temperature of formation, whereas filler [illegible] [illegible] conditions are favorable for [illegible] properties of glass-fiber filler. If this [illegible] is subjected to supplementary tension, the tensile stresses [illegible] at high temperatures and the effect of strengthening are increased. [illegible] lead the authors to conclude that high-temperature fiberglass [illegible] [illegible] as far as possible, at temperatures below the upper limit [illegible] [illegible] use. [illegible] art. has: 2 figures.

ASSOCIATION: none

SUBMITTED: 12Oct64

ENCL: 00

SUB CODE: MT

NO REF SOV: 006

OTHER: 002

Card 2/2

YUROVSKIY, V.S.; BARTENEV, G.M.

Characteristics of the deformation of rubber in rubber-metal valves. Kauch. i rez. 24 no.5:31-34 My '65. (MIRA 18:9)

1. Nauchno-issledovatel'skiy institut rezinovoy promyshlennosti.

BARTENEV, G. M.; RASUMOVSKAYA, I. V.

"Concerning the method of evaluating the strength of an oriented solid polymer."

report submitted for Intl Conf on Fracture, Sendai, Japan, 12-17 Sep 65.

Lenin State Teachers' Train. Univ., Moscow

DENISHEV, G. K.; BARTENEV, G. M.

"Structure and theoretical strength of glass."

report submitted for Intl Conf on Fracture, Sendai, Japan, 12-17 Sep 65.

Lenin State Teachers' Train. Univ. USSR.

BARTENEV, G.M.; YEL'KIN, A.I.

Friction properties of polymers in the unsettled stage of sliding friction at high and low temperatures. Vysokom. soed. 7 no.6:992-997 Je '65. (MIRA 18:9)

1. Moskovskiy gosudarstvennyy pedagogicheskiy institut imeni V.I. Lenina.

BARTENEV, G.M., doktor khimicheskikh nauk; SIDOROV, A.B.

Effect of glass fiber length on their strength. Stek. i ker. 22 no.9:17-19 S '65. (MIRA 18:9)

1. Kafedra fiziki tverdogo tela Moskovskogo gosudarstvennogo pedagogicheskogo instituta imeni Lenina.

BARTENEV, G.M.; YUROVSKIY, V.S.

Using the photoelasticity method for the analysis of stresses in rubber-metal valves. Kauch. i rez. 24 no.9:38-42 '65.

(MIRA 18:10)

1. Nauchno-issledovatel'skiy institut rezinovoy promyshlennosti.

L 12889-66 EWP(e)/EWT(m)/EWP(b) WH

ACC NR: AT6000486 SOURCE CODE: UR/0000/65/000/000/0167/0171

AUTHOR: Tarasov, V. V.; Bartenev, G. M.; Yeremeyeva, A. S.; Ratobyl'skaya, V. A.

ORG: None

TITLE: Polymeric character of vitreous arsenic trisulfide 15,44

51
B+1

SOURCE: Vsesoyuznoye soveshchaniye po stekloobraznomu sostoyaniyu. 4th, Leningrad, 1964. Stekloobraznoye sostoyaniye (Vitreous state); trudy soveshchaniya. Leningrad, Izd-vo Nauka, 1965, 167-171

TOPIC TAGS: arsenic compound, sulfide, glass property, thermomechanical property, polymer

ABSTRACT: Specially heat-treated vitreous arsenic trisulfide was studied by the resonance method, in which the value of the resonance frequency characterizes the elastic properties, and the width of the resonance peak shows the magnitude of the dissipative forces. The measurements were taken at 136.6 kc at room temperature. All the samples were characterized by an exceptionally high compressibility (av. 6.2×10^{-12} cm^2/dyne), and the effect of the thermal past on the volume compressibility was insignificant. This high compressibility is attributed to a pronounced heterodynamism, which is apparently due to the fact that the basic structure of vitreous As_2S_3 consists of chain formations bound by relatively weak forces, and the compression takes place primarily at the site of weak bonds.

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L 12889-66

ACC NR: AT6000486

The dependence of the internal friction on the thermal past of the glass was determined, thermomechanical curves for As_2S_3 were plotted, and the temperature dependence of the elongation and coefficient of thermal expansion was studied. The data show vitreous As_2S_3 to be a genuine polymeric material. Orig. art. has: 5 figures.

SUB CODE: 11/ SUBM DATE: 22May65/ ORIG REF: 002

07/

Card 2/2 HW

L 00676-67 EWT(m)/EWP(j) IJP(c) JWD/RM

ACC NR: AP6017860 (A) SOURCE CODE: UR/0069/66/028/003/0420/0423

AUTHOR: Lezhnev, N. N.; Ivalina, N. M.; Zelenev, Yu. V.; Bartenev, G. M.

ORG: Scientific Research Institute of the Tire Industry, Moscow (Nauchno-issledovatel'skiy institut shinnoy promyshlennosti)

TITLE: Influence of the nature of carbon black surface on the relaxation properties of extended rubbers

SOURCE: Kolloidnyy zhurnal, v. 28, no. 3, 1965, 420-423

TOPIC TAGS: butadiene styrene rubber, carbon black, filler, stress relaxation, polymer structure

ABSTRACT: The influence of the surface character of carbon black fillers on the formation of the reinforced structure of rubber and hence on the molecular mobility and relaxation properties of the rubber was studied. Rubbers based on stereoregular polybutadiene rubber Yuropren-cis-1,4 (SKD) and butadiene-styrene rubber Yuropren-1500 (BSK) extended with various types of carbon black were employed. Stress relaxation curves of the rubber were recorded on a relaxometer at 20 and 70°C. It was found that the more active the carbon black from the standpoint of its reinforcing effect, the more level is the shape of the relaxation time spectrum, i.e., the greater the role of long relaxation times of the extended systems, owing to a limited mobility of the macromolecules of the reinforced polymer structures. The increase in the number of re-

UDC: 541.183.1

Card 1/2

L 12112-66 EWP(e)/EWT(m)/EWP(b) WW/GS/WH
ACC NR: AT6000515 SOURCE CODE: UR/0000/65/000/000/0426/0427

AUTHOR: Bartenev, G. M.; Izmaylova, L. K.

ORG: none

TITLE: Structure and strength of glass fibers

SOURCE: Vsesoyuznoye o soveshchaniye po stekloobraznomu sostoyaniyu. 4th, Leningrad, 1964. Stekloobraznoye sostoyaniye (Vitreous state); trudy soveshchaniya, Leningrad, Izd-vo Nauka, 1965, 426-427

TOPIC TAGS: glass property, glass fiber

ABSTRACT: The study was aimed at determining conditions eliminating the formation of defects during forming of glass fibers. Such conditions were created by using a special spinneret with a diaphragm for a given shape of the "bulb" (region of forming). The strength and degree of defectiveness of the fiber surface were found to depend on the length of the "bulb." The data led to the assumption that the fibers have a strengthened surface layer from 50 to 100 Å thick. In an analysis of the distribution of defects over the length of an industrial glass fiber, three distinct strength levels were observed: σ_1 = 50-60 kg/mm^2, σ_2 = 200-220 kg/mm^2, and σ_3 = 300-320 kg/mm^2; the maxima of the strength distribution curve corresponded to these levels. The three levels were thoroughly studied individually, and it is concluded that the strength of a glass fiber depends primarily on the processes occurring in the surface layer.

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SUB CODE: 11 / SUBM DATE: 22May65 / ORIG REF: 002/ OTH REF:001

L 06475-67 EWT(m)/EWP(e) WH/WW

ACC NR: AR6028234 SOURCE CODE: UR/0081/66/000/009/M018/M018

AUTHOR: Bartenev, G. M.; Chernyakov, R. G.

TITLE: Strength of fibers with a coating made of alkali-free aluminoborosilicate glass

SOURCE: Ref. zh. Khimiya, Part II, Abs. 9M149

REF SOURCE: Steklo. Tr. In-ta stekla, no. 3(128), 1965, 16-19

29
13

TOPIC TAGS: glass fiber, silicate glass

15

ABSTRACT: No theory exists to account for the nature of the high strength of glass fibers (GF). An attempt was made to determine the dependence of the strength of continuous glass fibers on the conditions of cooling in the course of their production. In order to study the effect of the conditions under which the glass mass is cooled during forming on the strength of GF, a method was developed for producing GF with a coating made of various glass compositions having approximately the same coefficient of thermal expansion. Results are given for determinations of the strength of single-layer fibers and fibers with a coating of industrial alkali-free aluminoborosilicate glass (fiber diameter 9-10 μ, coating thickness 1-2 mm). According to the proposed method of production, it was possible to form an outer layer of GF from a low-viscosity aluminoborosilicate glass which cannot be formed into fiber by the usual

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L 06475-67

ACC NR: AR6028234

technological process. Specimens of coated fibers having a high strength were obtained. The hardening of the surface layer of GF depends on the conditions of cooling of the "bulb," which are determined by its length. I. M. [Translation of abstract]

SUB CODE: 11

Card 2/2 mlc

L 27313-66 EWT(m)/EWP(j)/T IJP(c) RM

ACC NR: AP6008970 SOURCE CODE: UR/0190/65/007/011/1905/1907

AUTHORS: Bartenev, G. M.; Vishnitskaya, L. A. 33 B

ORG: Scientific Research Institute for the Rubber Industry (Nauchno-issledovatel'skiy institut rezinovoy promyshlennosti)

TITLE: Effect of temperature on the viscosity of fluorine-containing rubber

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 7, no. 11, 1965, 1905-1907

TOPIC TAGS: copolymer, rheologic property, polymer rheology, fluorocarbon plastic, rubber

ABSTRACT: This investigation was conducted to determine the rheological properties of the copolymer chlorotrifluoroethylene-vinylydene fluoride over a range of temperatures 20--200C. The experiments were carried out on the pure copolymer and on mixtures of copolymer and carbon black filler in a PK-1 shear apparatus under conditions of constant velocity gradient. The experimental results are presented graphically. It was found that in the temperature region of 90--130C there exists a temperature anomaly in the viscosity of the copolymer as well as in the copolymer filler mixtures. It is suggested that the optimum temperature region for mechanical treatment of fluorine-containing rubbers lies between 80 and 100C. Orig. art. has: 3 graphs.

SUB CODE: 11/ SUBM DATE: 08Dec64/

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UDC: 678.01:53+678.743

L 20407-66 EWP(e)/EWT(m) WW/WH

ACC NR: AP6008403 (A) SOURCE CODE: UR/0374/66/000/001/0074/0081

AUTHOR: Bartenev, G. M.; Sidorov, A. B. 40 B

ORG: Moscow State Pedagogical Institute im. V. I. Lenin (Moskovskiy godudarstvennyy pedagogicheskiy institut)

TITLE: Statistical theory of the strength of glass fibers

SOURCE: Mekhanika polimerov, no. 1, 1966, 74-81

TOPIC TAGS: glass fiber, surface property, stress distribution, statistic physics

ABSTRACT: A statistical theory of the strength of glass fibers is suggested. It takes into account various types of surface defects and the nature of their distribution along the glass fibers. Comparison with experimental data shows that the statistical theory describes the strength distribution curves in a satisfactory way. The distribution of defects along the glass fibers produced by the continuous drawing-plate method is not a purely random one, as it is probably connected with applied production technology. Orig. art. has: 4 figures and 7 formulas. [Based on authors' abstract.] [NT]

SUB CODE: 11,20/ SUBM DATE: 07Jun65/ ORIG REF: 006/ OTH REF: 004/

Card 1/1 UDC: 678:666.11.01.620.172

L 34120-66 EWT(m)/EWP(j)/T LJP(c) WW/JWD/RM
ACC NR: AR6017258 SOURCE CODE: UR/0058/65/000/012/E024/E024

AUTHOR: Bartenev, G. M.; Zelenev, Yu. V.; Ayvazov, A. B. 51 B

TITLE: Dynamic properties of compositions of polymers in a wide range of temperatures at low and audio frequencies

SOURCE: Ref. zh. Fizika, Abs. 12E169

REF SOURCE: Uch. zap. Mosk. obl. ped. in-ta, v. 147, 1964, 129-135

TOPIC TAGS: natural rubber, synthetic rubber, amorphous polymer, crystalline polymer, polymer rheology, temperature dependence

ABSTRACT: The dynamic properties of the compositions of rubbers with a plasticizer, the compositions of polyethylene with poly-isobutylene, and of natural and sodium-butadiene rubbers were investigated with two instruments in a wide range of temperatures. Investigations were made of the relaxation properties of complex compositions, pertaining to systems in which one of the components is crystalline and the other amorphous (crystallizing and noncrystallizing). It is shown that the polyethylene-poly-isobutylene composition behaves like a mechanical mixture, while the polyethylene-rubber compositions behave like solutions. An empirical formula is proposed relating the temperature of the additional maximum of the mechanical losses of the composition with the temperatures of the maxima of each of the components and with their concentraion in the mixture. [Translation of abstract]

SUB CODE: 07/

Card 1/1 pla

L 34145-66 EWP(e) WW/WH

ACC NR: AP6026026 SOURCE CODE: GE/0005/66/000/001/0002/0005

AUTHOR: Bartenev, G. M.--Bartenew, Georgi Michailowitsch; Sidorov, A. B.--Sidorow, Askold Borissowitch

ORG: Lenin State Institute for Pedagogy, Laboratory for Solids Physics, Moscow

TITLE: Statistical theory for the strength of glass fibers

SOURCE: Silikattechnik, no. 1, 1966, 2-5

TOPIC TAGS: glass fiber, glass property

ABSTRACT: [German translation (by FRAHN, H., in Berlin) of a Russian-language article] The following subjects were discussed: statistical theory for the strength of glass fibers exhibiting only one kind of surface defect, statistical theory for the strength of glass fibers exhibiting two or more types of surface defect, effect of fiber length on the strength distribution curves, and relation between fiber length and strength. The relationships were expressed in equations and illustrated by diagrams. Orig. art. has: 4 figures and 7 formulas. [JPRS: 35,328]

SUB CODE: 11, 20 / SUBM DATE: none / ORIG REF: 008 / OTH REF: 002

Card 1/1

UDC: 677.521.539.4

ACC NR: AP6037028 (A) SOURCE CODE: UR/0374/66/000/005/0700/0721

AUTHOR: Bartenev, G. M.

ORG: Laboratory for Problems of the Physics of Polymers, Moscow State Pedagogical Institute im. V. I. Lenin (Moskovskiy gosudarstvennyy pedagogicheskiy institut, problemnaya laboratoriya fiziki polimerov)

TITLE: Status and prospects of development of the physical theory of the brittle strength of polymers

SOURCE: Mekhanika polimerov, no. 5, 1966, 700-721

TOPIC TAGS: polymer, polymethylmethacrylate, material deformation, molecular property, ~~brittle strength, brittle failure~~, POLYMER STRUCTURE, BRITTLENESS

ABSTRACT: An analysis was made of various mechanisms of brittle fracture and the theory of the time dependence of the strength of solid polymers. The effect of mechanical losses, deformation, dynamical, and surface losses) is analyzed on the strength and service life of solid polymers. The shortcomings of the Griffith strength theory are indicated. From an analysis of the two basic mechanisms of brittle fracture of polymers—nonthermal and thermal (thermofluctuation)— the

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UDC: 678:539.4.01