"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

MIKHAYLOV, G.M.; NIKOLAYEV, A.M.

Generalized regularities of the hydrodynamics of a granular layer. Izv.vys.ucheb.zav.; khim. i khim.tekh. 8 no.2:327-330 '65. (MIRA 18:8)

1. Yaroslavskiy tekhnologicheskiy institut i Kazanskiy khimiko-tekhnologicheskiy institut imeni Kirova.

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

MIKHAYLOV, G.N., inzh.; OFMAN, A.Ya., inzh.

Improve the use of load-lifting mechanism. Bezop. truda v prom. 2 no. 6:11-12 Je '58. (MIRA 11:7)

1. Upravleniye Chelyabinskogo okruga Gosgortekhnadzora RSFSR.
(Cranes, derricks, etc.--Attachments)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

OKOROKOV, A.A., otv. red.; MARKIN, A.M., otv. red.; BEREZOVSKIY, V.I., red.; DOLGUSHIN, N.I., red.; KIRILLOV, I.Ye., red.; MIKHAYLOV, G.N., red.; NEVZOROV, L.A., red.; NIKOLAYEVSKIY, G.N., red.; ROZHDESTVENSKIY, V.A., red.; USHAKOV, F.N., red.; KHODOV, M.P., red.; SHARONOV, M.I., red.

[Regulations for the design and safe operation of load-lifting cranes] Pravila ustroistva i bezopasnoi ekspluatatsii gruzopod"emnykh kranov. Moskva, Nedra, 1965. 127 p. (MIRA 18:7)

1. Russia (1917- R.S.F.S.R.) Gosudarstvennyy komitet po nadzoru za bezopasnym vedeniyem rabot v promyshlennosti i gornomu nadzoru.

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

MIKHAYLOV, G.N., inzh.; OFMAN, A.Ya., inzh.

Safe operation of cranes in hot shops. Bezop.truda v prom. 2 no.9:25 S '58. (MIRA 11:9)

1.Upravleniye Chelyabinskogo okruga Gosgortekhnadzora RSFSR.
(Cranes, derricks, etc.)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

USSR/Cultivated Plants. Fruits. Berries. M

Abs Jour : Ref Zhur-Biol., No 15, 1958, 68346

Author : Sapon, D. K., Ishankhanov, S. I., Mikhaylov, G. N.

Inst : Fruit and Berry Inst AS Uz SSR

Title : The Problem of Selecting Rootstocks for the Saline Soils of the Golodnaya Steppe and the Unirrigated Lands of Parkent.

Orig Pub : Tr. Plod.-yagodn. in-ta. AN UzSSR, 1956, No 21, 143-147

Abstract : The Golodnaya Steppe and the unirrigated lands of Parkent were investigated. The seedlings of the following cultivated apple strains were studied: Rosemarin, Kandil' Sinap, Napoleon, Parmen Winter Golden, Renet

Card : 1/2

166

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

AUTHORS: Kabin, S. P., Mikhaylov, G. N. 48-22-3-24/30

TITLE: Dielectric Losses of Crystalline Non-Polar Polymers (Dielektricheskiye poteri kristallicheskikh nepolyarnykh polimerov)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, 1958, Vol. 22, Nr 3, pp. 325-328 (USSR)

ABSTRACT: In the present report the authors report on the test results of the dielectric properties on non-polar crystallizing polymers: Polyethylene and polytetrafluorethylene (ref. 1). Both polymers are typical representatives of the class of crystallizing polymers the rules of which - in a whole series of cases - differ substantially from the properties of amorphous polymers. The results may be summarized as follows: 1) Dielectric relaxation-losses can be observed both in the one as well as in the other investigated polymer. They are caused by differently constituted polar radicals which penetrate into the molecule of the polymer. 2) In the case of polyethylene, three relaxation-processes are observed at corresponding temperatures, by which it is different from amorphous polymers. 3) The amount of the losses of relaxation

Card 1/2

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

Dielectric Losses of Crystalline Non-Polar Polymers 48-22-3-24/30

of the mean frequency increases according to the decrease in the degree of crystallization. The relaxation-losses of the low frequency decrease. 4) In the case of polyethylene and polytetrafluorethylene, the processes of relaxation take place at the frequency of 10^4 - 10^7 cycles per second and can be described with the same relaxation period and with one and the same activation energy, for mechanic and dielectric losses. This agreement confirms the assumption on the colmonness of the molecular mechanism which are the bases for the dielectric and mechanic processes. There are 4 figures and 8 references, 7 of which are Soviet.

ASSOCIATION: Leningradskiy politekhnicheskiy institut im. M. I. Kalinina (Leningrad Polytechnical Institute imeni M. I. Kalinin). Institut vysokomolekulyarnykh soyedineniy Akademii nauk SSSR (Institute for High - Molecular Compounds AS USSR)

AVAILABLE: Library of Congress

Card 2/2

1. Polymers--Dielectric properties--Test results 2. Fluoroethylenes --Dielectric properties--Test results 3. Polyethylene--Dielectric properties--Test results 4. Polytetrafluorethylene--Dielectric properties--Test results

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

L 23913-65 EWT(1)/EWT(m)/EEC(f)/EWA(d)/T/EWP(t)/EEC(b)-2/EWP(b) IJP(c)
JD/GG

ACCESSION NR: AP5001556 S/~~016~~ 0185/64/009/012/1369/1371

AUTHOR: Artemenko, I. A.; Mykhaylov, G. O.

TITLE: Some characteristics of superconducting thin films of tin and indium

SOURCE: Ukrayins'kyy fizychnyy zhurnal, v. 9, no. 12, 1964, 1369-1371

TOPIC TAGS: superconducting indium thin film, superconducting tin film, superconductivity transition interval, indium film resistivity, tin film resistivity, superconductivity

ABSTRACT: The authors investigated superconducting thin films of tin and indium. The specimens were all of the same size (6000 A thick, 1 x 10 mm^2) and were obtained by vapor condensation of 99.999% pure metals in vacuum of 5x10^{-5} mm Hg on glass, mica, and quartz. Their resistances at the room and liquid helium temperatures were measured as well as the dependence of the resistances R_{243K} and $R_{4.2K}$ on temperature and current in the film. Their ratio was by almost an order of magnitude greater in indium than in tin. The transition from

Card 1/2

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

L 23913-65

ACCESSION NR: AP5001556

the normal to the superconducting state is in indium much sharper, the transition interval in indium being less than 0.01 degrees. This indicates that the indium films have a more homogeneous structure than the thin films. The substrate affects the characteristics of the films. Orig. art. has: 2 figures

ASSOCIATION: Institut kibernetiki AN UkrSSR, Kiev (Institute of Cybernetics AN UkrSSR)

SUBMITTED: 10Jul64 ENCL: 00 SUB CODE: SS, GP

NR REF SOV: 000 OTHER: 004

Card 2/2

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

1ST AND 2ND ORDERS

100 AND 4TH ORDERS

PROCESSES AND PROPERTIES INDEX

2

CA

Effect of temperature on the dynamic piezomodulus of Rochelle salt O. Mikhailov *Tech Phys. U. S. S. R.* 4, 401-8(1937)(in English). A Rochelle salt crystal was orientated at an angle of 45° to the *bc* axes with elec field E_x applied on the *a* axis, and the value of piezomodulus d_{14} was detd during its vibration. The av value of d_{14} for $t = 18.5°$ was 4.5×10^{-6} abs. units. A study of the effect of temp on d_{14} supports the existence of 2 values, the static and dynamic, as in the case of dielec const. The increase of d_{14} on approaching the Curie point is a new observation implying a change of structure at this temp. A max value of d_{14} was found at approx $t = 24.5°$. M. McMahon

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

PROCESSES AND PROPERTIES

CA

7

Electrical methods for the measurement of the moisture of dispersed materials. B. P. Aleksandrov and G. Mikhailov. *Tech. Phys. U. S. S. R.* 5, 622-32(1938); *Chem. Zentr.* 1939, I, 2462.—An arrangement is described for the detn. of capacity from measurements of the resonance potential which in principle is independent of the elec. cond. of the dielectric of the condenser. The method was checked experimentally by making measurements of the capacity of a condenser filled with water contg. varying concns. of electrolytes. The change in capacity and therefore the change in the dielec. const. were very slight under the given expt. conditions. With the same app. the moisture content (0-5%) of a soil was detd. from measurements of the capacity of a condenser in which the soil served as dielectric. Even in this case the capacity was independent of the amt. of electrolytes contained in the soil at low concns. Higher concns. of electrolytes caused the results suddenly to become worthless because of the increase in the capacity.

M. G. Moore

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

SA

A 53
d

4490. Influence of Electric Fields on Flow of p-Azoxyanisole in Capillary Tubes. G. Mikhailov and V. Svetkov. *J. of Exp. and Theor. Phys. U.S.S.R.* 9. 2. pp. 208–214, 1939. *In Russian.*—Using the capillary method it was found that a longitudinal electric field reduces and a transverse field increases the time of flow of p-azoxyanisole. The effects disappear in the isotropic phase. The transverse increase occurs only if the speed of flow is not high enough to have a large orienting effect, and disappears also with increase of frequency. The authors interpret the results as being due not to a direct orienting effect of the field, but to a flow in the anisotropic liquid caused by the field. [See Abstract 1880 (1939).] D. S.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

SA

A 53

V

78. Action of magnetic and electric fields on flow of p-azoxyanisole. G. MIKHAILOV AND V. ZVETKOV. *J. of Exp. and Theor. Phys. U.S.S.R.*, 9, 8, pp. 597-601, 1939. *In Russian.* The paper continues previous work on the action of magnetic and electric fields on viscosity in the nematic phase [see Abstract 4490 (1939)]. It is shown that the effect of a magnetic field normal to the flow direction reaches saturation for a field depending on the velocity. The viscosity of p-azoxyanisole when its molecules are oriented parallel to the flow but normal to the velocity gradient is found to be about 4 times the viscosity when molecules are normal to the flow but parallel to the velocity gradient. From the simultaneous action of magnetic and electric fields it is confirmed that the effect of an electric field is due to the orienting effect of the flow set up by the electric field. D. S.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

2

Ca

The stability of the valency angles of the carbon tetrahedron. Dipole moments of stereoisomeric 2,3-dichloro-2-butenes. D. P. Mikhailov and D. V. Fishchenko. *J. Gen. Chem.* (U. S. S. R.) 9, 783-7(1939). The dipole moments of stereoisomeric 2,3-dichloro-2-butenes were detd., whereby it was established that in the aromatic and ethylene series isomers with higher b. pts. show higher dipole moments. From the dipole moment obtained for cis-2,3-dichloro-2-butene it is evident that there is no deformation of the C tetrahedron in ethylene compds.

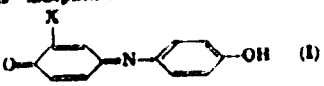
Gertrude Berend

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

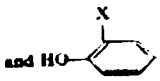
APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

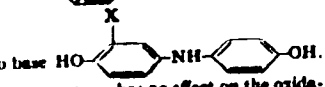
The synthesis of oxidation-reduction indicators of the indophenol series. G. Mikhailov. *Trans. Inst. Pure Chem. Reagents* (U. S. S. R.) No. 17, 45-59(1939); *Chem. Referat. Zhur.* 1940, No. 4, 30-1.—Methods for producing various indophenols are described. The tautomeric forms



(I) and



(II) yield on reduction the same leuco base



The difference in their structures has no effect on the oxidation-reduction potential if a rapid equil. is established between these forms. The individual representatives of dyes of this type are synthesized from *N*-chloroquinonimines and the subsequent condensation with the corresponding phenols. Methods for the production of the starting substance, *N*-chloroquinonimine, developed by the Inst. of Pure Chem. Reagents were described previously (*C. A.* 34, 3707[8]). Improvements of the conditions of condensation made by the Inst. indicate that these stages of the synthesis must be carried out at a low temp. (< −2°). This increases the yield to 58% of the theoretical (based on *p*-nitrophenol) instead of 21-2%. The inner cooling used for maintaining the low temp. increases the possible charge of *N*-chloroquinonimine used for the condensation from 5-10 mg. to 400 g. Indophenols can be purified either by dissolving and salting out or by washing with 10% NaCl. According to the modified method of Willstätter *N*-chloroquinonimine is obtained by oxidizing *p*-aminophenol with NaOCl in a HCl medium at > 5°. Na *o*-chloroindophenolate (corresponding to II) is obtained according to Clark from the condensation of *o*-chlorophenol with quinonimine in an alk. medium. The yield is 38% of the theoretical. The tautomer I was synthesized in 72% yield in the form of the Na salt from *o*-chloroquinonimine and NaOPh in an alk. medium at > 0°. Analogous condensation of *N*, 2,6-trichloroquinonimine with NaOPh produces 75% of Na 2,6-dichloroindophenolate. Na *o*-cresolate with *N*, 2,6-trichloroquinonimine produces 98-9% of Na 2,6-dichloroindocresolate (the product contains moisture and NaCl). Na 2,6-dibromoindophenolate is obtained from the condensation of NaOPh with 2,6-dibromo-*N*-chloroquinonimine in 90% yield (based on 2,6-dibromonitrophenol). Condensation of *N*-chloroquinonimine with 1,2-$C_{10}H_6(OH)SO_3Na$ at a temp. below −2° produces 93% of di-Na indosulfonaphthol. Owing to the presence of NaCl in the products the content of the substance varies between 60 and 80%. The compo. of the products in glass containers with ground stoppers changes very little (approx. 10% after 1.5 years). All the products possess a normal oxidation-reduction potential and are used as oxidation-reduction indicators. 2,6-Dichloroindophenol can be used as a reagent for the detn. of vitamin C (Tillman's reagent).

W. R. Henn

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

PROCESSES AND PROPERTIES INDEX

BC

Constancy of the valency angles of the carbon tetrahedron. Dipole moments of stereoisomeric β-dichloro-Δ²-butenes. G. P. Michailov and D. V. Tischtschenko (*Acta Physicochim. U.R.S.S.*, 1940, 12, 129—138).—The dipole moments of the lower- and higher-boiling isomerides of β-dichloro-Δ²-butene are 0·00 and 2·[illegible] D., respectively, confirming that the latter is the *cis* isomeride. The val. 0·61 D. is in agreement with that calc. on the assumption that there is no deformation of the valency angle. Recorded data are compared to show that in aromatic and ethylenic derivatives the higher-boiling isomeride has the greater dipole moment. F. J. G.

ASM SLA METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

Nov 48

USSR/Engineering
Steel Alloys
Welding

"Welded Constructions From Steel With Various Plastic Properties," G. P. Mikhaylov, A. Z. Solomonikov, 1 p

"Avtogen Delo" No 11

From 1943-1945, authors designed and constructed buildings from steel with increased mechanical properties. Built welded constructions entirely from alloyed steels and combinations of alloyed and low-carbon steel. Carbon steel used had a yield point of 22 kg/sq mm. Describes tests made on beams using a 300-ton press preliminary to the actual constructions. Use of alloyed steels effects a decrease in the weight of the construction due to increase in allowable stresses.

PA 56/49T42

56/49T42

MIKHAYLOV, G. P.

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

CA

Determination of the dipole moments of copolymers. P. P. Kobeko, G. P. Mikhailov, Z. I. Novikova (Leningrad Phys.-Tech. Inst.), and M. I. Kaltain. *Zhur. Tekh. Fiz.* 19, 111-15(1949).—In extension of Debye's method of liquid solns. of polar substances in nonpolar solvents, and of Onsager's equation (*C.A.* 39, 7002F) to solid copolymers of a polar and a nonpolar monomer, the dielec. const. ϵ and the dielec. losses tan δ were detd. as functions of the temp. for copolymers of 10% methyl vinyl ketone (I) + 90% styrene and of 10% methyl methacrylate (II) + 90% styrene, the latter being the nonpolar component. Measurements with Wien's bridge at a frequency $\omega/2\pi = 10^6$ hertzes gave concordant results along rising and falling temps. The behavior of the copolymers is entirely analogous to that of solns. of polar mols. in nonpolar solvents. The max. of tan δ on the ascending branch of $\epsilon = f(T)$ corresponds to the relaxation time $\tau = 1/\omega$. The subsequent decrease is detd. by a decrease of the sp. gr. and by the term $\mu^2/3kT$. With increasing ω, the temp. corresponding to the max. tan δ and the inflection of ϵ moves to higher temps. T, and vice versa. Plots of log τ, detd. from the max. of tan δ, as a function of $1/T$, are linear. For the copolymer I, at 150°, $\tau = 10^{-4}$ sec., $\omega\tau = 0.06$, and at 176°, $\tau = 2 \times 10^{-7}$ sec., $\omega\tau = 0.001$; consequently, in this temp. range, $\omega\tau$ is much less than 1, and the same holds for copolymer II in the same temp. range. The mol. polarization P_2, calcd. by Onsager's equation along the descending branch $\epsilon = f(T)$, satisfies the linear relation $P_2 = a + b\,(1/T)$, where a = electronic polarization, $b = (\mu^2/k)(4\pi/9)N$. From the exptl. b, the dipole moments μ per monomer unit are calcd., for I to 2.16, for II to 1.16 D. These values are close, resp., to the group dipole moment of —CO, 2.7-2.8, and of —CO_2Me, 1.0 D., from detns. in solns. Consequently, in polymers in the high-elastic state, the orientable dipoles are identical with those that undergo orientation in polar solns. of the same substances. N. Thon

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

CA

Temperature dependence of the dielectric constant of copolymers. P. P. Kobeko, G. P. Mikhailov, Z. I. Novikova (Leningrad Phys. Tech. Inst.), and M. I. Kalinin. *Zhur. Tekh. Fiz.* 19, 116-19(1949).—The relative variations, $\Delta C/C$, of the capacity of a plane condenser were detd., as a function of the temp., for polystyrene and for copolymers of styrene with 1, 5, 10, and 20% methyl vinyl ketone (I), and copolymers of styrene with 5, 10, 40, and 60% methyl methacrylate (II). $\Delta C/C$ decreases with rising temp. Low amts. of the polar component I or II (cf. preceding abstr.) cause this decrease to become slower, but with higher amts. the decrease becomes increasingly faster. The temp. coeff. $(1/C)\Delta C/\Delta T$ increases linearly with the content (in %) of the polar component, somewhat faster for copolymer I. Zero value of the temp. coeff. corresponds to 5% I and to 6.5% II, in agreement with the higher value of the dipole moment of I (cf. preceding abstr.). Variation of the frequency from 10^4 to 6×10^9 hertzes had no effect on the temp. curve of $\Delta C/C$ for the copolymer with 10% I. The fact that, in a wide temp. range, the temp. variation of the dielec. const. due to dipole and that due to electronic polarization can be completely compensated, indicates an essential independence of the two polarizations, the electronic polarization of the nonpolar component and the dipole polarization of the polar part. That the compensation is attained with relatively low amts. of the polar radicals is due to the greater temp. coeff. of the dipole term of the dielec. const. The changes due to thermal expansion are very small as compared with those detd. by the dipoles. N. Thon

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

Electricity

S A

Sect. A

537.226.3 : 541.64

3874. Influence of orientation on dielectric losses of polar polymers. G. P. MIKHAILOV, Zh. Tekh. Fiz., 21, 1395-401 (No. 11, 1951) In Russian.

Strain or orientation of polymers causes maximum value of tan δ to occur at a higher temperature but with unchanged magnitude. It also causes a change in the time of relaxation of dipole-elastic losses indicating an increase in activation energy and molecular interaction. Time of relaxation corresponding to dipole-radical losses does not change.

J. LUKASIEWICZ

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

MIKHAYLOV, G. P.

6002

M. A. YOUTZ

Scopies

Effect of stretching on the dielectric losses and polarization of crystallizable polymers. G. P. Mikhailov and B. M. Fainstein (Phys.-Tech. Inst., Acad. Sci. U.S.S.R., Leningrad). *Zhur. Tekh. Fiz.* 22, 759-64(1952).—Synthetic Neoprene samples contg. 7% MgO and 5% ZnO were subjected to 200-700% stretching at −22.8 to −14.0°. The dielec. permeability under these conditions was inversely proportional to the degree of stretching. A decrease in dielec. losses was attributed to a decrease in the distribution parameter of relaxation times. The calcns. showed that the values of the ΔH, ΔF, and ΔS below 150% stretching remained practically unchanged, but above it they increased considerably. The formation of cryst. phase at a higher degree of stretching was given as the explanation of these observations. A. P. Kotlobaev

①

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

MIKHAYLOV, G.P.

USSR.

Determination of dipole moments of polymers of homologous series of esters of methacrylic acids. G. P. Mikhaylov and L. V. Kreuzer. Zhur. Tekh. Fiz. 23, 1941-6 (1953).—Dipole moments found for monomers and polymers of a series for 1% soln. in benzene have the same value. These data indicate (1) that the dipole moment does not change on polymerization in spite of the change in structure of the mol. as a result of the disappearance of the double bond, (2) that the effect of correlation is absent and therefore macromols. of esters of methacrylic acid in benzene soln. appear to be very flexible. And finally, dipole moment of the monomer or the monomer unit in the polymer as for a given series does not change; i.e., when a CH_3 radical is attached to a polar group elec. asymmetry in a macromol. is not created. The method of Fuoss-Kirkwood with copoly- [illegible] dielec. properties analogous to polar [illegible] the method of Debye is applicable. The formula [illegible] gave results 15% too low. V. N. B.

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

MIKHAYLOV G.P.

USSR.

The determination of the concentration of carbonyl groups in polyethylene by the method of dielectric losses. G. P. Mikhailov and T. I. Borisova. *Zhur. Tekh. Fiz.* 23, 2159-65(1953).—The presence of C:O groups in polyethylene arises from oxidation processes during the polymerization. The value of the dielec. loss, characterized by the tangent of the angle of loss, can serve as a measure of the concn. of the polar C:O groups. The concns. of the C:O groups are calcd. by use of the formula of Fuoss and Kirkwood (*C.A.* 35, 2045[4]). The data thus obtained agree very well with data obtained by infrared spectroscopy. J. R. Leach

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

MIKHAYLOV, G. P.

4

558. Investigation of the dielectric losses of low-frequency relaxation in polyethylene. G. P. MIKHAILOV, A. M. LOBANOV, and B. I. [illegible] [illegible], 1954, 24, 1553-60. The existence of low-frequency relaxation losses in polyethylene was established. These losses could be shown to be connected with the orientation of the polar groups in the crystal phase of the polyethylene. The relaxation time of the low frequency relaxation losses is slightly reduced by distension of the polyethylene specimens, whereas that of the high frequency relaxation losses is extended by specimen distension, in agreement with experience on dipole-elastic losses of amorphous polymers. 3S2D24.3443

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

MIKHAYLOV, G. P.

FD-2822

USSR/Physics - Dielectrics

Card 1/1 Pub. 153-5/30

Author : Mikhaylov, G. P. Kabin, S. P. and Sazhin, B. I.

Title : Study of Dielectric Losses of Polyethylene

Periodical : Zhur. Tekh. Fiz, 25, 590-594, 1955

Abstract : These studies are a continuation of previous works [G. P. Mikhaylov et al., ZhTF, 23, 12 (1953); ZhTF, 24, 9, (1954)] in a wider range of frequencies and temperatures. Dielectric relaxation losses were found at room temperature to be 10^{-9} sec at high frequencies, 10^{-5} sec at medium frequencies, 10^{-2} sec at low frequencies. These peculiarities of polyethylene are explained by its crystalline structure. Five USSR and 3 foreign references.

Institution :

Submitted : September 30, 1954

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

MIKHAYLOV, G. P.

USSR/Atomic and Molecular Physics - Physics of the Molecule, D-2

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 34:08

Author: Mikhaylov, G. P., Sazhin, B. I.

Institution: None

Title: Determination of Effective Dipole Moments of Molecules and of the Structural Factor of Polar Liquids and Polymers

Original Periodical: Zh. tekhn. fiziki, 1955, 25, No 10, 1696-1702

Abstract: Generalizing the polarization equation for the case of variable fields, and taking into account the deformation portion of the polarization, the authors introduce a correction to the theoretical equation for the effective dipole moment $\mu\sqrt{g}$. The authors calculate μ_0, the dipole moment of the free molecules, using the Onsager equation, generalized for the case of variable fields. The values of μ, the dipole moment of the molecule in condensed matter, is calculated with the Onsager equation, which presupposes a definite molecular model. In the calculation equations for $\mu\sqrt{g}$, μ_0 and μ, there are included the following parameters: α, which characterizes the distribution of the relaxation time; ε'_m and ε''_m, which are the real and imaginary parts of the generalized dielectric constant. These

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

USSR/Atomic and Molecular Physics - Physics of the Molecule, D-2

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 34308

Author: Mikhaylov, G. P., Sazhin, B. I.

Institution: None

Title: Determination of Effective Dipole Moments of Molecules and of the Structural Factor of Polar Liquids and Polymers

Original Periodical: Zh. tekhn. fiziki, 1955, 25, No 10, 1696-1702

Abstract: quantities were determined from the temperature-frequency dependence of the generalized dielectric constant. In this work, the values of $\mu\sqrt{g}$, μ_0, μ, and g (structural factor) are determined for water, for several simple alcohols, nitrobenzols, α-bromnaphthalene, normal ketones, and polymers of the homological series of ethers of metacrylic acid. The structural factor g of water and of alcohols is approximately the same and is considerably greater than unity, this indicating, in the opinion of the authors, an absence of compensation for the dipole moments during association, and a presence of close order in the parallel axes of neighboring dipoles. In the normal ketones, the structural factor is approximately unity, indicating an equal probability of directions of dipole moments of neighboring molecules.

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

USSR/Atomic and Molecular Physics - Physics of the Molecule, D-2

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 34108

Author: Mikhaylov, G. P., Sazhin, B. I.

Institution: None

Title: Determination of Effective Dipole Moments of Molecules and of the Structural Factor of Polar Liquids and Polymers

Original Periodical: Zh. tekhn. fiziki, 1955, 25, No 10, 1696-1702

Abstract: For polymers of the homological series of ethers of metacrylic acid, the structural factor is approximately the same and less than unity, this being explained by the dipole intermolecular interaction.

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

MIKHAYLOV, G.P.

1002

1061. Dielectric losses of polytetrafluoroethylene. G. P. MIKHAILOV, S. P. KABIN, and A. L. SMOLYYANSKII. *Zhur. tekh. Fiz.*, 1955, 25, 2179-82. *E.R.A. Abs.*, 1956, No. 853, abs. 8. In investigation of the dielectric characteristics of polytetrafluorethylene dielectric relaxation losses of an activation energy of 19 kcal/mol were observed, due to relaxation processes in the amorphous parts of the polymer. At $t = 20°C$ the relaxation time is of the order of 10^{-9} sec. The relaxation time calculated from data on the dielectric losses of the polymer agrees with the relaxation time for mechanical losses at ultrasonic frequencies. 3S2H2421,2443

2

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

MIKHAILOV, G.P.; SAZHIN, B.I.; KABIN, S.P.

Dielectric losses in polyethylene. Trudy LPI no.181:201-211 '55.
(MLRA 10:1)

(Dielectrics) (Polyethylene)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

Category : USSR/Atomic and Molecular Physics - Physics of high-molecular substance D-9

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 1009

Author : Kabin, S.P., Mikhaylov, G.P.
Title : On the Mechanical and Dielectric Losses of Poly-isobutylene.

Orig Pub : Zh. tekhn. fiziki, 1956, 26, No 3, 511 515

Abstract : The mechanical losses in poly-isobutylene were investigated using pulses at frequencies of 0.5 -- 3.5 Mc over a temperature range of -100 to +80°. In the interval from zero to +20° one observes a maximum of the amplitude absorbtion coefficient α ; at the same time, one observes a sharp decrease in the velocity of ultrasonic waves in the polymer between -20 and +30°. The tangent of the angle of the mechanical losses has a single maximum in temperature range from -60 to +80°. Determination of the tangent of the angle of the dielectric losses of pure poly-isobutylene and of a mixture with polyethylene disclosed the presence of a maximum of dielectric losses in the same temperature interval, as the mechanical losses. The dependence of log f_m on 1/T (f_m is the frequency corresponding to the maximum loss) for mechanical and dielectric losses is given by one straight line, from which an activation energy of 18.6 kcal/mol was calculated. This shows that both forms of relaxation are caused by the motion of the same kinetic units of the chain.

Card : 1/1

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

MIKHAYLOV, G P

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1271

AUTHOR MICHAILOW, G.P., SAŽIN, B.I.

TITLE The Investigation of the Dielectric Polarization and the Losses of Polytrifluorchlorethylene.

PERIODICAL Žurn.techn.fis, 26, fasc.8, 1723-1729 (1956)
Publ. 8 / 1956 reviewed 9 / 1956

Recently some polymers have been produced synthetically. In contrast to polytetrafluorethylene they were treated by the usual methods and have at the same time an increased resistance to heat. A typical representative of these materials is polytrifluorethylene (abbr. F-3), the molecules of which have the following structure:

$$\ldots CF_2 - CFCl - CF_2 - CFCl - \ldots$$

As an electro-insulating material it is of considerable interest. In view of the fact that its electric properties have been but little investigated and that, besides, it is a partly crystallized polymer, the present work was carried out. On the occasion of the examination of mechanical and electric properties, a considerable influence was found to be exercised by crystal structure. Curves concerning the temperature dependence of the dielectric constant, the tg of the angle of dielectric losses, of the modulus of the displacement "G", and of the logarithmic decrement Λ of the ceasing of the mechanical oscillations of polytrifluorethylene were recorded. The dielectric losses and the polarization of F-3 are connected with molecular processes which also determine the mechanic properties of the polymer. On the occasion of the

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

Mikhaylov, S.P.

G

USSR / Electricity

Abs Jour : Ref Zhur - Fizika N 4, 195[illegible], No 9634

Author : Mikhaylov, S.P., Krasner, L.V.
Inst : Not given
Title : Study of the Concentration Dependence of the Relaxation Time in Copolymers by Means of the Dielectric Loss Method.

Orig Pub : Zh. tekhn. fiziki, 1956, 26, No [illegible], 1738-1740

Abstract : An investigation was made of the temperature dependence of the relaxation dielectric losses for copolymers of styrol with metylacrilate and styrol with metylvinylketone at various ratios of the components. All the measurements were carried out at a frequency of 1 kc. It was established that the values of tan δ pass twice through a maximum, with the high-temperature maximum corresponding to the dipole-elastic mechanism of the losses shifting towards the region of low

Car. : 1/[illegible]

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

USSR / Electricity

Abs Jour : Ref Zhur - Fizika, No 4, 195[illegible], No [illegible]

Abstract : temperatures as the contents of the polar component increases, while the position of the low-temperature maximum, corresponding to the dipole-radical mechanism of losses, is independent of the composition of the copolymer. The value of tan δ in both regions of the maximum increases with increasing content of the polar component. The value of the dielectric constant in the high-temperature loss region experiences sharp variation, and remains almost constant in the low temperature region. The results reported confirm the assumption that the dipole-elastic losses are due to the orientation of the segments of the macromolecules, while the dipole-radical losses are due to the orientation of only the lateral polar groups or monomer polar links.

Card : 2/2

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

MIKHAYLOV, G.P.

USSR/ Chemistry of High-Molecular Substances F.

Abs Jour : Referat Zhur - Khimiya, No 4, 1957, 11925

Author : Mikhaylov G.P., Borisova T.I., Dmitrochenko D.A.
Title : Dielectric Relaxation Losses in Polymethacrylate

Orig Pub : Zh. tekhn. fiziki, 1956, 26, No 9, 1924-1928

Abstract : In the frequency range of 12-80 hertz and the temperature interval of 17-120°, an investigation was made of dielectric losses of plasticized and unplasticized polymethylmethacrylate. Measurements were made by means of a Schering bridge, adapted for carrying out measurements in the above-stated frequency region. The results obtained show that frequency changes within the above-stated limits affect only the position of the region of tg δ maximum of the glassy state; a shift of the region of tg δ maximum of highly-elastic state is not observed. Addition of plasticizer affects only orientation processes of high temperature relaxation. The authors consider that losses at high temperatures are dipole-elastic, and those at low temperatures are of dipole-radical nature. Absolute values

Card 1/2

USSR/ Chemistry of High-Molecular Substances F.

Abs Jour : Referat Zhur - Khimiya, No 4, 1957, 11925

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

MIKHAYLOV, G. P., and BORUSOVA, T. Y.

"Dielectric measurements on polyamides," a paper presented at the 7th Congress on the Chemistry and Physics of High polymers, 26 Jan-2 Feb 57, Moscow, Fiber Research Inst.

B-3,084,395

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

MIKHAYLOV, G. P., Institute of Macromolecular Compounds, AS USSR, Leningrad

"Dielectric Losses and Polarization of Polymers," a paper submitted at the International Symposium of Macromolecular Chemistry, 9-15 Sep 1957, Prague.

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

MIKHAYLOV, G. P.

Mechanical and dielectric losses in polyisobutylene. S. P. Kabin and G. P. Mikhailov. Soviet Phys., Tech. Phys. 1, 493-7(1957)(English translation).—See C.A. 50, 11081c.

B. M. R.

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

24(3) SOV/112-58-3-3611

Translation from: Referativnyy zhurnal Elektrotekhnika, 1958, Nr 3, p 9 (USSR)

AUTHOR: Mikhaylov, G. P., and Kabin, S. P.

TITLE: Investigation of Dielectric Losses in Polyethylene (Issledovaniye dielektricheskikh poter' polietilena)

PERIODICAL: Nauchno-tekhn. inform. byul. Leningr. politekhn. in-t, 1957, Nr 4, pp 54-55

ABSTRACT: Until recently, polyethylene has been produced primarily by polymerization of ethylene under high pressure (1,000-2,000 atm) and temperatures (200°C) in the presence of oxygen acting as a catalyst. In 1955, Zigler developed a method of polymerizing ethylene under low pressures in diesel oil in the presence of Al $(C_2H_6)_3$ and $TiCl_4$. Industrial production of low-pressure polyethylene whose thermal resistance, hardness, and tensile strength exceed those of high-pressure polyethylene has been reported. It is assumed that production of low-pressure polyethylene is cheaper than that of

Card 1/2

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

24(3) SOV/112-58-3-3611

Investigation of Dielectric Losses in Polyethylene

high-pressure by 30%. The present work is devoted to investigating low-pressure polyethylene produced at NIIPP & EZ (Leningrad) by a special processing method. Dielectric losses have been investigated at 50, 10^3, 10^4, 10^9, and 10^{10} cps. At audio frequencies the measurements have been made within a temperature range of $-100^\circ \div 160^\circ C$. It has been found that, at variance with the high-pressure polyethylene with its 3 ranges of relaxation dielectric losses, low-pressure polyethylene has only high-frequency and low-frequency relaxation losses; medium-frequency relaxation losses are absent; this is a consequence of a stronger crystallization of low-pressure polyethylene. The maximum $tg\delta \approx 3 \quad 10^{-4}$. The $tg\delta$ of low-pressure polyethylene grows after thermal aging.

A.O.M.

Card 2/2

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

AUTHOR: BURSHTEYN, L.L. and MIKHAYLOV, G.P. PA - 2794

TITLE: Application of New Theories of Polarization to the Calculation of Effective Dipole Moments of Polar Systems. (Primeneniye novykh teoriy polyarizatsii k raschetu effektivnykh dipol'nykh momentov polyarnykh sistem, Russian).

PERIODICAL: Zhurnal Tekhn. Fiz., 1957, Vol 27, Nr 4, pp 688 - 693 (U.S.S.R.)
Received: 5 / 1957 Reviewed: 6 / 1957

ABSTRACT: In the present paper the attempt is made to apply the statistical polarization theories developed by HARRIS-ALDER and FROEHLICH to the investigation of the dielectric polarization of a number of polar systems. The task to be performed was to obtain data on the comparison between effective dipole-moments of polar systems and solutions in which there is no interaction among polar molecules. For this purpose a method for the determination of effective dipole-moments in the case of infinite dilution was developed. A non-polar solution in infinite dilution was investigated as an example for the case of lacking interaction among polar molecules. Formulae were derived, which permit comparison of the magnitude of the effective dipole-moments and of the correlation parameters in the case of infinite dilution with the results obtained from polar liquids. The application of the new statistical theories of dielectric polarization for the computation of effective dipole-moments is demonstrated, for example, in the investigation of several representative types of the homological

Card 1/2

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

Application of New Theories of Polarization to the Calculation of Effective Dipole Moments of Polar Systems. PA - 2794

ether series of metacrylic acid. According to the theory developed by HARRIS-ALDER the effective dipole-moments for these substances are computed for the case of infinite dilution. They are compared with the corresponding data for the same systems on the condition that intermolecular interaction among polar molecules is not diminated. This comparison shows that the application of the statistical theory of dielectric polarization makes it possible to form an opinion on the intermolecular interaction, which is determined by the orientation of the polar molecules with respect to each other. It may be assumed that the moments of the dipole molecules compensate one another, because the correlation parameter is considerably less than "one" and decreases with increasing μ_0.
(5 tables and 1 citation from Slav publications)

ASSOCIATION: Institute for Polymolecular Compounds of the Academy of Science of the U.S.S.R., Leningrad

PRESENTED BY:

SUBMITTED:

AVAILABLE: Library of Congress

Card 2/2

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

MIKHAYLOV G.P.

AUTHOR: BURSHTEYN, L.L. and MIKHAYLOV, G.P.

TITLE: Investigation of Molecular Interaction in Polimers by the Effective Dipole Moment Method. (Issledovaniye molekulyarnogo vzaimodeystviya v polimerakh metodom effektivnykh dipol'nykh momentov, Russian) PA - 2795

PERIODICAL: Zhurnal Tekhn. Fiz., 1957, Vol 27, Nr 4, pp 694 - 701 (U.S.S.R.)

Received: 5 / 1957 Reviewed: 6 / 1957

ABSTRACT: It is shown here to what extent the investigation of dielectric polarization makes it possible to form a judgement on the molecular interaction in polymers. Even in the case of infinite dilution an interaction of the polar groups of identical chains cannot be excluded inpolymers. This has an effect on the determination of the value of the effective dipole moment. Therefore it was considered appropriate to apply the statistical theories of polarization. The formula of HARRIS-ALDER was used to determine the effective dipole moment. The quantity μ (dipole moment) was computed with the help of the equation by ONZAGER. Only such polymers were investigated as contain polar groups which are more elastic than those in polyvinylchlorides or other polymers, in which the rotation of the polar groups is closely connected with the motion of the polymer chain. The effective dipole moments are determined in the case of an infinite dilution for the polymers, and the results are compared with the corresponding values for monomeres in the case of infinite dilution. It appears that polymers show a smaller ratio of

Card 1/2

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

PA - 2795

Investigation of Molecular Interaction in Polymers by the Effective Dipole Moment Method.

$\frac{\mu_{eff}}{\mu}$ than monomers, and that it depends on μ_0 (dipole moment of the free molecule). This circumstance leads to suppose that an interaction exists among adjacent polar groups. In order to examine this question, such polymic chains were investigated as aollow a modification of the interaction of the polar groups. For this purpose co-polymers of methyl-methacrylate were investigated. The concentration of methyl-methacrylate varied from 24 to 80 %. The results obtained confirmed the assumption that the ratio

$\frac{\mu_{eff}}{\mu}$ is the determining factor of the interaction of polar groups in a macromolecular chain. Therefore investigation of dielectric polarization is actually the method to obtain data on molecular interaction in macromolecules.

(6 tables and 4 citations from Slav publications)

Card 2/2

ASSOCIATION: Institute for Highly Molecular Compounds of the Academy of Science of the U.S.S.R., Leningrad

PRESENTED BY:

SUBMITTED: 19.10.1956

AVAILABLE: Library of Congress

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

AUTHOR MIKHAYLOV,G.P., SAZHIN,B.I., KUPRIYANCHIK,N.N. PA 3546

TITLE: Some Peculiarities of Dielectric Losses in Polycaprolactom. (O nekotorykh osobennostyakh dielektricheskikh poter' polikaprolaktoma, Russian)

PERIODICAL: Zhurnal Tekhn. Fiz., 1957, Vol 27, Nr 5, pp 948 - 952 (U.S.S.R.)

ABSTRACT: The present work is a continuation of the two previous ones (Zhurnal Tekhn. Fiz., 1955, Vol 25, Nr 4, p 590 and Zhurnal Tekhn. Fiz., 1956, Vol 26, Nr 8, p 1723). The initial material was supplied in form of little plates by the All-Union Scientific Research Institute for Artificial Fibres. The temperature dependences of the dielectric losses of hardened and tempered samples of polycaprolactome were investigated in intervals of from 20 - 150° at frequencies of 10^3 - 5.10^6 Hz. In the tempered polycarpolactome the maximum dielectric relaxation losses were found to exist. In the case of hardened polycaprolactome a second maximum was, in addition, noticed on the temperature curves tg δ (angle of dielectric losses), the position of which remains the same at all frequencies. It was possible, by means of infrared spectroscopy, to confirm the supposition that this maximum of tg δ is connected with an additional formation of the hydrogen compounds in the hardened polycaprolactome within the ranger 30 - 40°

Card 1/2

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

PA - 3546

Some Peculiarities of Dielectric Losses in Polycaprolactom.

(1 illustration and 5 Slavic references)

ASSOCIATION: LPI
PRESENTED BY:
SUBMITTED: 12.11.1956
AVAILABLE: Library of Congress

Card 2/2

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

57-9-17/40

AUTHORS Mikhaylov, G.P., Kabin, S.P.
Krylova, T.A.

TITLE On Dielectric and Mechanical Losses in Low-Pressure Polyethylene.
(O dielektricheskikh i mekhanicheskikh poteryakh polietilena nizkogo davleniya)

PERIODICAL Zhurnal Tekhn. Fiz., 1957, Vol. 27, Nr 9, pp. 2050-2055 (USSR)

ABSTRACT The results obtained by experimental investigation are given. It is shown that tgδ of the dielectric losses within the temperature range of from -110 ÷ + 120°C and at frequencies of from 1.5 to 10 kc passes through two maximum domains. A comparison is drawn with the analogous rules for high-pressure polyethylene, and it is shown that the two types of relaxation losses in the case of low-pressure polyethylene belong to the high- and low-frequency relaxation types. Measurements of mechanical losses carried out by the ultrasonic method in dependence on temperature at a frequency of 2 kc proved the existence of only a high frequency relation. Summarizing, it is stated that the following two types of relaxation losses exist:

CARD 1/2

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

57-9-17/40

On Dielectric and Mechanical Losses in Low-Pressure Polyethylene.

1) High frequency losses reflecting the thermal motion of macromolecule components, and
2) losses, which reflect the thermal motion of macromolecule parts.

It is assumed that the latter are closely connected with the crystalline degree of the polymer.
There are 4 figures and 9 Slavic references.

ASSOCIATION: Leningrad Polytechnic Institute imeni M.I. Kalinin. (Leningradskiy politekhnicheskiy institut imeni M.I. Kalinina.)
SUBMITTED: March 11, 1957.
AVAILABLE: Library of Congress.

CARD 2/2

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

MIKHAYLOV, G. I.

Institute of High-Molecular Compounds, USSR Acad. Sci. Leningrad

"Dielectric Losses and Polarization of Polymers," paper submitted at Soviet High-Polymers, Intl. Conference, Nottingham, UK, 21-24 July 1956.

E-3,1[illegible],[illegible]

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

V-69-58-4-10/18

AUTHORS: Mikhaylov, G.P., Gazhin, B.I., Presnyakova, V.S.

TITLE: Influence of the Density of Polytrifluorochloroethylene on Dielectrical Losses (Vliyaniye plotnosti politriftorkhloretilena na dielektricheskiye poteri)

PERIODICAL: Kolloidnyy zhurnal, 1958, Vol XX, Nr 4, pp 461-464 [illegible]

ABSTRACT: The degree of crystallization of polymers has a great effect on their physical properties. The crystallinity of a substance is defined as the volumetric or weight ratio between the crystallized and amorphous parts of this substance. It is difficult, however, to determine the exact value of crystallinity. Presently, dilatometric, optic and roentgenographic methods are used, as well as the heat capacity and the nuclear magnetic resonance. In the article, the influence of the density of polytrifluorochloroethylene (F-3) on the value of the dielectrical losses is investigated with a view to determining the degree of crystallinity. In F-3, two forms of dielectrical losses of relaxation character have been established. Both are dependent on the temperature. Figure 1 shows that at a frequency of 80 kilocycles and a temperature of 78° C a maximum of the dielectric losses is observed. The data of

Card 1/2

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

SOV/69-58-4-10/18

Influence of the Density of Polytrifluorochloroethylene on Dielectrical Losses

Figure 2 show that the value of the dielectric losses of P-3 is directly proportional to the quantity of the substance in the amorphous phase. The investigation has proved that the degree of crystallinity may be determined by measuring the dielectric losses. The method may also be used for measuring crystallinity in rubber, etc.
There are 2 graphs, 1 table, and 3 references, 2 of which are Soviet and 1 English.

ASSOCIATION: Leningradskiy politekhnicheskiy institut imeni M.I. Kalinina (Leningrad Polytechnical Institute imeni M.I. Kalinin)

SUBMITTED: April 3, 1957

1. Fluoroethylenes--Density

Card 2/2

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

AUTHORS: Mikhaylov, G. P., Fedoseyev, G. P., Skanavi, G. I., Chmutin, M. S., Ksendzov, Ya. M., Matsonashvili, B. N., Kolomoytsev, F. I., Vodop'yanov, K. A. 48-22-3-17/30

TITLE: Discussions on Reports Submitted by: K. A. Vodop'yanov and I. G. Vorozhtsova; K. A. Vodop'yanov and G. I. Galibina; B. N. Matsonashvili (Preniya po dokladam: K. A. Vodop'yanova i I. G. Vorozhtsovoy; K. A. Vodop'yanova i G. I. Galibiney; B. N. Matsonashvili)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, 1958, Vol. 22, Nr 3, pp. 309-310 (USSR)

ABSTRACT: G. P. Mikhaylov comments the report submitted by K. A. Vodop'yanov and I. G. Vorozhitskaya as follows: The frequency band is too narrow in the lecture delivered as to draw any conclusions on the relaxation processes in mica. - G. P. Fedoseyev says with respect to the same lecture: The lectured conclusions are apparently scarcely convincing. The explanation of the change-mechanism of the dielectric constant and of the angle-tangent in mica, however, is of value. Complementary works must be carried out, however, in order to give a more convincing effect to the judgement on the relaxation character

Card 1/4

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

Discussions on Reports Submitted of: K. A. Vodop'yanov and 48-22-3-17/30
I. G. Vorozhtsova; K. A. Vodop'yanov and G. I. Galibina;
B. N. Matsonashvili

in mica. - G. I. Skanavi: Two essential contradictions exist between the works by K. A. Vodop'yanov and G. I. Galibina and the work by B. N. Matsonashvili. 1) Matsonashvili discovered relaxation maxima on the tg δ-curves of the alkaline--halogen crystals, which were not observed by Vodop'yanov and Galibina. 2) Vodop'yanov and Galibina maintain that with an increase in lattice-energy of the alkaline-halogen crystals, the tg δ decreases at room-temperature and high-frequency. Matsonashvili did not find such a correlation. The first contradiction is based on the fact that Vodop'yanov and Galibina determined the temperature dependence of tg δ on the basis of measurements at different temperatures with large temperature intervals and not in vacuum. The second contradiction may be explained by the fact that the real losses of the alkali-halogen crystals are very small at room-temperature. The losses increase rapidly, however, due to the hygroscopicity of many crystals, if no precautions were taken. M. S. Chmutin: An approximating extra-polation of the tg δ-value to high temperatures, leads - according to data by Vodop'yanov and Galibina - to a conformity with our experiments. Though

Card 2/4

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

Discussions on Reports Submitted y: K. A. Vodop'yanov nd 48-22-7-17/30
L. G. Vorozhtsova; K. A. Vodop'yanov and G. I. Galibina,
B. N. Matsonashvili

Matsonashvili carries out his tests in vacuum, his results by extrapolation to high temperatures, are higher than [illegible] fa. M. Ksendzov: Data with smaller values of tg δ, viz. [illegible] data obtained by B. N. Matsonashvili, inspire more trust [illegible]
B. N. Matsonashvili: The work-results obtained by Vodop'yanov and Galibina suffer from the fact that they were determined under atmospheric conditions. The hygroscopicity of the samples was markedly expressed in this case. Chmutin [illegible] the high tg δ-values I obtained. I showed in my work that [illegible] dielectric properties depend on the previous history of the sample. Therefore, only results obtained by the measurement of one and the same sample may be compared. It would be absolutely necessary to carry out a "complex" investigation of the different properties of the alkaline-halogen mono crystals with the same samples and on the same conditions.
F. I. Kolomoytsev: It may be assumed that no fundamental contradictions exist between the experimentally obtained results which were determined in the laboratories by G. I. Skanavi and K. A. Vodop'yanov since the previous history of

Card 3/4

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

Discussions on Reports Submitted by: K. A. Vodop'yanov and 48-22-3-17/30
I. G. Vorozhtsova; K. A. Vodop'yanov and G. I. Galibina;
B. N. Matsonashvili

the samples may cause different results with the measuring of the tg δ. - K. A. Vodop'yanov: The methods applied are the decisive factor in carrying out similar works as that by Matsonashvili and ours. The results obtained by Skarav. with his method cannot deny the presence of a connection between tg δ and lattice-energy. It must be replied to G. F. Fedoseyev that it was not provided within the scope of this work to explain the practical usefulness of the thermal treatment of mica.

AVAILABLE: Library of Congress

1. Mica--Dielectric properties 2. Single crystals--Electric properties 3. Single crystals--Conductivity 4. Alkali-halogen crystals--Dielectric properties

Card 4/4

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

AUTHORS: Mikhaylov, G. P., Lobanov, A. M. 48-22-3-22/30

TITLE: Dielectric Losses and Polarization of the Polymers (Dielektricheskiye poteri i polyarizatsiya polimerov) (Tezisy doklada) Fundamental Theses of the Report are Given in the Article by G. P. Mikhaylov in "Progress in Chemistry" 1955, Nr 24, pp. 875 (Osnovnyye polozheniya doklada izlozheny v stat'ye G. P. Mikhaylova v "Uspekhakh khimii" 24, 875 (1955))

Report Theses

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, 1958, Vol. 22, Nr 3, pp. 323 - 323 (USSR)

ABSTRACT: 1) The investigation of the dielectric losses and of the polarization in the wide range of both frequency and temperature showed that these properties are essentially of relaxation character. 2) According to the electric, the mechanical and other properties it was found that the polymers may be found in three physical states: in vitreous state, in highly elastic state and in viscous state. 3) The investigation of dielectric losses of the polymers in vitreous and in highly elastic state showed that these losses show a series of specific peculiar-

Card 1/3

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

48-22-3-22/30

Dielectric Losses and Polarization of the Polymers. **Report Theses.**. Fundamental Theses of the **Report** are Given in the Article by G. P. Mikhaylov in "Progress in Chemistry" 1955, Nr 24, pp. 875

ities. 4) A correlation is frequently observed in connection with the above explanations with the determination of the relaxation time according to the dependency of both temperature and frequency of both the dielectric and the mechanical losses. 5) Synthetic and natural polymers can be both crystalline and also amorphous, according to their structure. This is due to the corresponding properties with the dependences of the losses and of the polarization on frequency and temperature. Such polymers as polyethyleneteraphthalate, polytrifluorethylene and others are found both in crystalline and also in amorphous state. 6) Crystallization reduces considerably the dielectric losses which are correlated with the segmental thermal motion. The dielectric relaxation losses, on the other hand, which reflect the thermic motion of the monomeric terms, or of the polar radicals, change only very slightly. 7) The determination of effective dipole moments

Card 2/3

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

Dielectric Losses and Polarization of the Polymers. **Report Theses.** Fundamental Theses of the **Report** are Given in the Article by G. P. Mikhaylov in "Progress in Chemistry" 1955, Nr 24, p. [illegible]

of the monomeric terms of the polymeric molecules [illegible] that the theories established for monomeric [illegible] applied for the calculation of the polarization [illegible] mers. 6) The values of the effective [illegible] calculated for the monomer terms of the [illegible] the prevailing change of the value of [illegible] by an intermolecular interaction.

ASSOCIATION: Institut vysokomolekulyarnykh soyedineniy Akademii Nauk SSSR (Institute for High Molecular Compounds, AS USSR)

AVAILABLE: Library of Congress

1. Polymers--Dielectric properties 2. Polymers--Polarization

Card 3/3

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

[illegible]

AUTHORS: Mikhaylov, G. P., Skanavi, G. I., Tolpygo, K. B.

TITLE: Discussions on the Reports Submitted [illegible]y: K. V. Filippova, I. S. Zheludev and V. M. Fridkin (Preniya po dokla[illegible]: K. V. Filippovoy, - I. S. Zheduleva i V. M. Fridkina)

PERIODICAL: Izvestiya Akademii Nauk SSSR Seriya Fizicheskaya, [illegible], Vol. 22, Nr 3, p. 358 (USSR)

ABSTRACT: G. P. Mikhaylov: The results experimentally obtained by K. V. Filippova are of great interest. The tests were carried out thoroughly and accurately. The molecular explanation of the electret state, however, does not result from the report. G. I. Skanavi: The assertions by Filippova with respect to the responsibility of the dipole groups for the electret effect should be agreed with. These groups are connected with greater formations, e.g. with segments. The orientation of the latter again causes optic anisotropy. The period of deorientation of the segments is longer than that of the dipole groups at room-temperature. Contrary to the assertion by Mikhaylov, the

Card 1/2

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

4[illegible]-22-3-29/30

Discussions on the **Reports Submitted** by: K. V. Filippova, I. S. Zheludev and V. M. Fridkin

interpretation in the actual state of work is absolutely possible and does not contradict the experimentally obtained data.

K. B. Tolpygo spoke on the lecture delivered by I. S. Zheludev and V. M. Fridkin: It seems that experimental work attained already such a stage as to allow the risk of suggesting a certain model and an energetic scheme of the electron level. The presence of basic impurity levels and levels of adhesion must apparently be assumed. The experimentally obtained results and especially the energetic distances between the local level and the zone of conductivity could be determined on the basis of a certain model. Concluding, attention is called to the results of discussion on the zonal theory of solid bodies which took place between the theorists of the Soviet Union.

AVAILABLE: Library of Congress

Card 2/2

1. Electrets--Properties--Theory

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

MIKHAYLOV [illegible]

AUTHORS: [illegible], G. P., [illegible], T. I. [illegible]

TITLE: [illegible] molekulyarnykh [illegible]

PERIODICAL: Zhurn[illegible] T[illegible] [illegible], 1[illegible]8, Vol. [illegible], [illegible] 1, [illegible] 1[illegible]2-1[illegible] ([illegible])

ABSTRACT: [illegible] polarization [illegible] quantities [illegible] computed [illegible] polyethylmethacrylate (PMMA), polyethylmethacrylate (PMMA), polybutylmethacrylate (PBMA) [illegible] polymethacrylate (P-iso-PMA). [illegible] (ref.[illegible]) [illegible] (ref.[illegible]) [illegible] used. [illegible]

Card 1/[illegible]

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

Investig[illegible] Molecular I[illegible]
Dipole [illegible]

[illegible]

[illegible] (Fig. 5) [illegible] S [illegible] values of ε' and ε'' [illegible] (a [illegible]) join [illegible] [illegible] PBMA. [illegible] must be [illegible] serve in the [illegible] fact their [illegible] At [illegible] temperature a tendency of deviation of the [illegible] values [illegible] ε'' from the [illegible] This is due to [illegible] elastic [illegible] determination of ε' and ε_0 [illegible] ε_0 [illegible] the [illegible] [illegible] PBMA. [illegible] 63°C ε' and ε'' [illegible]

Card 2/

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

Investigation of Molecular Interaction by the Method of Effective 57-1-17/36
Dipole Moments on Some Glass-like Polymers.

106 ÷ 108°C the circle diagrams correspond to the dipole elastic losses. Furthermore it is demonstrated that the changes of $\mu\sqrt{g}$ at a rise of temperature occurs in three stages. At first the effective moment nearly does not change at all only if the temperature approaches of the gas formation it begins to grow. A considerable rise of the quantity $\mu\sqrt{g}$ [illegible] near T_g in the temperature interval of the order of magnitude of 20°C. After that a range of slow increase of the effective dipole moment can be observed. In the case of [illegible] with which the temperature of gas formation is +30°C only the third section was obtained (from $\mu\sqrt{g} = \varphi(t)$). The values of the effective dipole moments corresponding to the solid state of the polymers, decrease with the increase of the homolog number. This proves that the correlation increases under the influence of [illegible] groups of the side radical concerned. The increase of the effective dipole moment near T_g can be regarded as the result of a weakening of the intermolecular interaction. Conclusively it is stated that in the glass-like state the motion of the polar radicals is checked considerably by the main chain of the carbon atoms. This checking increases with the increase of the number of polymerhomologs which points out to a decrease of the effective dipole moment.

Card 3/4

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

Investigation of Molecular Interaction by the Method of Effective 57-1-17/36
Dipole Moments on Some Glass-like Polymers.

There are 6 figures, and 7 references, 3 of which are Slavic.

ASSOCIATION: Institute for High-Molecular Alloys AN USSR Leningrad (Institut vysokomolekulyarnykh soyedineniy AN SSSR Leningrad)

SUBMITTED: June 15, 1957

AVAILABLE: Library of Congress

Card 4/4

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

MIKHAYLOV, G. P.

57-1-18/30

AUTHORS: Mikhaylov, G. P., Borisova, T. I.

TITLE: Investigation of Temperature-Frequency-Dependences of Dielectric Losses and Permeability of Some Polyesters of the Methacrylic Acid (Issledovaniye temperaturno-chastotnykh zavisimostey tangensa ugla dielektricheskikh poter' i pronitsayemosti nekotorykh poliefirov metakrilovoy kisloty)

PERIODICAL: Zhurnal Tekhnicheskoy Fiziki, 1958, Vol 28, Nr 1, pp. 137-142 (USSR)

ABSTRACT: This work refers to the occurrence of two types of dielectric relaxation losses demonstrated in reference 1. It is examined whether similar kinds of rules can be observed also with other representatives of the homologous series of ester of the methacrylic acid. The dependence of tg and in the case of polymethylmethacrylate (PMMA), polyethylmethacrylate (PEMA), polybutylmethacrylate (PBMA), and polyisopropylmethacrylate (P-iso-PMA) on temperature and frequency is investigated. These investigations were carried out within the range of 12 to 10^6 C. The measuring method for and tg σ, the production x) polypropylmethacrylate (PPMA)

Card 1/ 2

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

Investigation of Temperature-Frequency-Dependences of Dielectric Losses and Permeability of Some Polyesters of the Methacrylic Acid

57-1-18/30

of the polymer samples, the electrodes and other details of the experiment were the same as in reference 1. It is demonstrated that the two kinds of electrical losses occur not only with PMMA but also with other representatives of this series (PEMA, PPMA, P-iso-PMA). It was observed that the ratio between the quantities of $tg\delta_{max}$ of dipole--elastic and dipole radical losses in the polymer series concerned changes with the increase of the number of the homolog. It was observed that the time of relaxation of the dipole radical losses in the polymer series does not change and that it shows permanently the same temperature coefficient. There are 5 figures, and 8 references, 4 of which are Slavic.

ASSOCIATION: Institute for High-molecular Alloys AN USSR Leningrad (Institut vysokomolekulyarnykh soyedineniy AN SSSR Leningrad)

SUBMITTED: June 14, 1957

AVAILABLE: Library of Congress

Card 2/2

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

AUTHORS: Mikhaylov, G. P., Lobanov, A. I. 57-2-14/32

TITLE: An Investigation of the Dielectric Losses and the Permeability of Polymers Depending on the Temperature in the Centimeter Range of Wave-Lengths (λ = 3,3 and 10 cm) (Izucheniye dielektricheskikh poter' i pronitsayemosti polimerov v zavisimosti ot temperatury v santimetrovom diapazone dlin voln (λ = 3,3 i 10 cm)).
I. A Method for the Measurement of tg δ and ε' in the Temperature Interval of From -100 to 200°C at High Frequency (I. Metodika izmereniy tg δ i ε' v intervale temperatur ot -100 do 200°C na SVCh).

PERIODICAL: Zhurnal Tekh. Fiz. [illegible] Fiziki, 1958, Vol. 28, Nr 2, pp. 267-272 (USSR).

ABSTRACT: 1.) The measurement of the temperature dependence of tg δ and ε' in polymers was performed at the wave-length λ = 3,3 with the aid of a gauged measuring wave guide of the type 33-И. In this occasion the method of the short-circuited wave guide was employed, where the sample was immediately fastened at the short-circuited plate. The selection of this method was due to the simple calculation formulae for this method. 2.) The dielectric measuring device ИД-1 was used for the investigations with the wave-length λ = 10 cm. This device is destined for the measure-

Card 1/2

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

An Investigation of the Dielectric Losses and the Permeability of Polymers in Dependence on Temperature in the Centimeter Range of Wave-Lengths (λ = 3,3 and 10 cm). 57-2-11/32

I. A Method for the Measurement of tg δ and ε' in the Temperature Interval of From -100 to 200°C at High Frequency.

ment according to the method of the v lume-resonator of dielectrics with small losses at room temperature and λ = 10 cm. .. Under 1.) were investigated: polymethylmethacrylate at 20 and 160°C, and polycaprolacton at 20 and 200°C. Under 2.) the investigations were performed in the range of from -100 to +100°C. The experimental data and the discussion of the results follow in the next paper. The obtained data show a satisfactory accuracy in the measurements of tg δ and ε' **depending on the** temperature.

There are 3 figures, 2 tables, and 2 references, 5 of which are Slavic.

ASSOCIATION: Institute for High-Molecular Compounds AS USSR, Leningrad (Institut vysokomolekulyarnykh soyedineniy AN SSSR, Leningrad).

SUBMITTED: May 17, 1957.

AVAILABLE: Library of Congress.

Card 2/2 **1. Polymers-Dielectric losses 2. Polymers-Permeability**

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

57-2-15/32

AUTHORS: Mikhaylov, G. P., [illegible], A. [illegible]

TITLE: An Investigation [illegible] Permeability of Polymers Depending on the [illegible] in the Centimeter Range of Wave-Length [illegible] (λ = [illegible] cm) (Izucheniye dielektricheskikh [illegible] polimerov v zavisimosti ot temperatury [illegible] dlin voln (λ = [illegible],3 i 10 cm). II. Polyethylene, Polytetrafluorethylene, Polystyrene, Polymethylmethacrylate, Polycaprolactam, Ebonite (II. Polietilen, politetrafluoretilen, polistirol, polimetilmetakrilat, polikaprolactam, ebonit)

PERIODICAL: Zhurnal Tekhnicheskoy Fiziki, [illegible], Vol. [illegible], Nr 2, pp. 273-27[illegible] (USSR)

ABSTRACT: [illegible] results [illegible] temperature dependence of some polymers [illegible] 1,3 and 10 cm [illegible] given here. A.) Polyethylene, [illegible] tetrafluorethylene (teflon) and polystyrene. [illegible] δ [illegible] curves (λ = 1[illegible] cm) are given for 1.) "[illegible]" [illegible], 2.) "low-pressure" polyethylene, [illegible] "high-pressure" polyethylene and 1[illegible] polytetrafluorethylene (te-

Card 1/4

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

[illegible]

An Investigation of the Dielectric Losses and the Permeability of Polymers Depending on the Temperature in the [illegible] Range of Wave-Lengths (λ = 3,5 and 10 cm). II. Polyethylene, Polytetrafluoroethylene, Polystyrene, Polymethylmethacrylate, Polystyrolacetate [illegible]

flon) and 5.) [illegible] "[illegible]-pressure" polyethylene was subjected to [illegible] which caused an increase in tg δ [illegible] permitted to perform the measurements [illegible]. Curve 2 shows maxima which according [illegible] to the losses of the medium-frequency [illegible] frequency relaxation. Ad 2.) and 4.) In both cases the tg δ values do not change with the rise of temperature. In teflon tg δ is about 2,10[illegible] in the range of [illegible] C. ε' also remained constant in teflon [illegible] temperatures. Ad 3.) The value of tg δ [illegible] in the range of the maximum as at room temperature [illegible] smaller than in polyethylene. It was difficult to [illegible] the medium-frequency losses from the high-frequency [illegible] level. Ad [illegible].) In polystyrene an increase in tg δ was observed on heating, but this can not be called characteristic of polystyrene, as the test was performed with a polystyrene of the block-polymerization. The dielectric losses observed in polyethylene at frequencies of the order of magnitude [illegible] cycles prove the high flexi-

Card 2/4

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

57-2-15/32

An Investigation of the Dielectric Losses and the Permeability of Polymers Depending on the Temperature in the Centimeter Range of Wave-Lengths (λ = = 3,3 and 10 cm). II. Polyethylene, Polytetrafluorethylene, Polystyrene, Polymethylmethacrylate, Polycaprolactam, Ebonite

bility of the macromolecules of this polymer. B.) Polymethylmethacrylate, polycaprolactam, ebonite. 1.) The tg δ-temperature-curve at λ = 1 and 3,3 cm for polymethylmethacrylate from -100°C shows an increase in tg δ. The displacement of the domain with a big increase in losses towards higher temperatures in connection with a decrease in wave-length proves the relaxation-nature of the losses in polymethylmethacrylate. The ε'-values at λ = 3,3 and 10 cm proved to be equal for the entire temperature range investigated. With a rise of temperature, however, ε' increases, which may also be explained by the relaxation-nature of the observed losses. 2.) A similar modification of tg δ and ε' with temperature was observed in polycaprolactam and its copolymer, 95 % caprolactam and 5 % amide. The ε'-values of the copolymer do not differ from those of 100 % polycaprolactam. 3.) The tg δ-temperature- and the ε'-temperature-curves for ebonite show an increase in tg δ and ε' with a rise of temperature. The

Card 3/4

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

57-2-15/32

An Investigation of the Dielectric Losses and the Permeability of Polymers Depending on the Temperature in the Centimeter Range of Wave-Lengths (λ = 3,3 and 10 cm). II. Polyethylene, Polytetrafluoroethylene, Polystyrene, Polymethylmethacrylate, Polycaprolactam, Ebonite

increase in ε' with temperature also proves the relaxation--nature of the losses observed in ebonite. Summarizing the authors state that with a rise of temperature tg δ due to the occurrence of the dielectric relaxation-losses in the polar polymers increases. There are 5 figures, and 10 references, 8 of which are Slavic.

ASSOCIATION: Institute of High-Molecular Compounds AS USSR, Leningrad (Institut vysokomolekulyarnykh soyedineniy AN SSSR, Leningrad)

SUBMITTED: May 17, 1957

AVAILABLE: Library of Congress

1. Polymers-Dielectric losses 2. Polymers-Permeability

Card 4/4

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

IKHAYLOV, G.P.

"Untersuchung der molekularen Relaxation in Polymeren mittels der dielektrischen Methode."

report presented at the Intl Symposium on Macromolecules, Wiesbaden, Germany, 12-27 Oct '59.

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

MIKHAYLOV, G.P.; SAZHIN, B.I.

Study of the dielectric losses and dielectric permittivity of crystallizing polymers. Vysokom.soed. 1 no.1:9-16 Ja '59. (MIRA 12:9)

1. Leningradskiy politekhnicheskiy institut im. M.I.Kalinina. (Polymers--Electric properties)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

MIKHAYLOV, G.P.; SAZHIN, B.I.

Study of the effect of polymer crystallization on dielectric losses. Vysokom.soed. 1 no.1:29-35 Ja '59. (MIRA 12:9)

1. Leningradskiy politekhnicheskiy institut im. M.I.Kalinina.
(Crystallization) (Polymers--Electric properties)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

MIKHAYLOV, G.P.; BURSHTEYN, L.L.

Investigation of the dielectric polarization of methyl methacrylate copolymers with styrene. Fiz. tver. tela 1 no.4:632-636 '59. (MIRA 12:6)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR, Leningrad.
(Polymers--Electric properties)
(Methacrylic acid) (Styrene)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

MIKHAYLOV, G.P.; BURSHTEYN, L.L.

Study of the dipole polarization of p-chlorostyrene - isoprene and p-chlorostyrene - styrene copolymers. Vysokom.soed. 1 no.12:1824-1829 D '59. (MIRA 13:5)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR.
(Styrene) (Isoprene)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

SOV/32-25-9-36/53

28(5)

AUTHORS: Dmitrochenko, D. A., Lobanov, A. M., Mikhaylov, G. P., Shevelev, V. A.

TITLE: Apparatus for Measuring Dielectric Losses and the Permeability of Solid Dielectrics

PERIODICAL: Zavodskaya laboratoriya, 1959, Vol 25, Nr 9, pp 1121-1124(USSR)

ABSTRACT: The angles of dielectric losses tg δ and the dielectric constant ε within the range of decimeter waves are at present being measured according to two methods - 1) of the coaxial line, 2) of the coaxial resonator (CR) (Refs 1-5). The available constructions of (CR) do not, however, allow measurements within a wide temperature range. A (CR) has been designed, which allows measurements of the values tg δ and ε within a rather wide temperature range. The (CR) consists of a brass cylinder with two covers, the inner rod being soldered with silver to the inner side of the lower cover. The supports and connecting tubes of the (CR) to the generator and detector are mounted opposite each other on the side walls. The inside surfaces of the (CR) are all silver-plated and polished. The Q-factor of the (CR) attains the value 6800, with a theoretical Q-factor of 10,000. From the block diagram of the system (Fig 2) it can be seen that the (CR) is connected via an ad-

Card 1/2

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

SOV/32-25-9-36/53

Apparatus for Measuring Dielectric Losses and the Permeability of Solid Dielectrics

sorption-attenuator (with attenuation - 20 decibels) to a generator of type GSS-12 (frequency range 180-1000 megacycles). An amplifier 20-IM is used as indicator. Temperature was measured according to an already described method (Ref 9). The method of calculation to determine the values tg δ and ε is described and measurement results concerning the temperature function of these values, gathered from samples of molten quartz and polytetrafluoro ethylene (Fig 3), are quoted. The results show that the described determination method is suitable for the examination of polymer dielectrics, in which tg δ reaches magnitudes of 10^{-2}. There are 3 figures and 10 references, 5 of which are Soviet.

ASSOCIATION: Institut vysokomolekulyarnykh soyedineniy Akademii nauk SSSR (Institute for High Molecular Compounds of the Academy of Sciences, USSR)

Card 2/2

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

MIKHAYLOV, G.P.; BURSHTEYN, L.L.

Determining the effective dipole moments of polymers of the homologous esters of methacrylic acid in solution and in a highly elastic state. Zhur.tekh.fiz. 29 no.2:192-197 F '59. (MIRA 12:4)

1. Institut vysokomolekulyarnykh soyedineniy.
(Methacrylic acid--Dipole moments)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

Vsesoyuznaya konferentsiya po fizike dielektrikov. 2d, 1958

Fizika dielektrikov, trudy vtoroy vsesoyuznoy konferentsii (Physics of Dielectrics, Transactions of the 2d All-Union Conference on the Physics of Dielectrics) Moscow, Izd-vo AN SSSR, 1960. 532 p. Errata slip inserted. 5,000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Fizicheskiy institut imeni P.N. Lebedeva.

Ed. of Publishing House: Ye.L. Sterkadimskaya; Tech. Ed.: I.N. Dorokhina. Editorial Board: (Resp. Ed.) G.I. Skanavi Doctor of Physics and Mathematics (Deceased), and K.V. Filippova, Candidate of Physics and Mathematics.

PURPOSE: This collection of reports is intended for scientists investigating the physics of dielectrics.

COVERAGE: The Second All-Union Conference on the Physics of Dielectrics held in Moscow at the Fizicheskiy institut imeni P.N. Lebedeva (Physics Institute imeni P.N. Lebedev) in November 1958 was attended by representatives of the principal scientific centers of the USSR and of several other countries. This collection contains most of the reports presented at the conference and summaries of the discussions which followed. The reports in this collection deal with dielectric properties, losses, and polarization, and with specific inductive capacitance of various crystals, chemical compounds, and ceramics. Photoelectrets, ferroelectric crystals, and various radiation and irradiation effects on dielectrics are investigated. The volume contains a list of other papers presented at the conference dealing with polarization, losses, and breakdowns of dielectrics, which were published in the journal Izvestiya AN SSSR, seriya fizicheskaya, No. 2, 1959. No personalities are mentioned. References accompany each report.

Aleksandrov, L.A., K.Ye. Lisker, and I.D. Fridberg. Temperature Dependence tg δ of Certain Ion Dielectrics 21

Filatov, I.S. Specific Inductive Capacitance and Dielectric Losses of Some Ceramic Materials in Strong High-Frequency Electric Fields at High Temperature [Sibirskiy fiziko-tekhnicheskiy NII (Tomsk Siberian Physics and Technical Scientific Research Institute, Tomsk)] 28

Discussion 37

Filatov, I.S. On the Problem of the Static Specific Inductive Capacitance of Heterogeneous Dielectrics [Voronezhskiy sel'skokhozyaystvennyy institut (Voronezh Agricultural Institute)] 39

Arkhangel'skiy, K.V. Dielectric Parameters of Double Liquid Systems in the Critical Region [Voronezh Agricultural Institute] 49

Yefremov, A.N. Anomalous Dispersion Observed in Some Dielectrics at Audio Range [Voronezh Agricultural Institute] 57

Parnas, Ya.M., and K.I. Lebedeva. Dielectric Properties of Heterogeneous Dielectrics at Superhigh Frequencies 65

Discussion 77

Nikhaylov, G.P., and A.M. Lobanov. Study of ε' and tg δ in Polymers as a Function of Temperature at Superhigh Frequencies [Institut vysokomolekulyarnykh soyedineniy AN SSSR, Leningrad (Institute of High Molecular Compounds, AS USSR, Leningrad)] 91

Bragin, S.M. Dielectric Characteristics (ε and tg δ) of Impregnated Cable Paper in Relation to the Properties of the Components (Paper and Oil) [Moskovskiy energeticheskiy institut (Moscow Power Engineering Institute)] 97

Discussion 105

Koslovskiy, V.Ib. Problems of the Dynamic Theory of Thermal Phenomena in Solids 108

Karpov, Yu.S., V.A. Krasnoperov, Yu.T. Demenev, and V.V. Pasynkov. On the Movement of Dielectrics in an Electric Field [Leningradskiy elektrotekhnicheskiy institut im. V.I. Ul'yanova (Lenina) (Leningrad electrotechnical Institute imeni V.I. Ul'yanov (Lenin))] 124

Dmitrochenko, D.A., and V.A. Shevelev. Use of Coaxial Resonators for Measuring Polymer Dielectric Losses and Specific Inductive Capacitance in Relation to Temperature [Institute of High Molecular Compounds, Academy of Sciences USSR, Leningrad] 132

Zheludev, I.S. and V.M. Fridkin. Photoelectrets and the Electrophotographic Process [Institut kristallografii AN SSSR, Moskva (Institute of Crystallography, Academy of Sciences USSR, Moscow)] 139

Gubkin, A.N. and V.F. Sergiyenko. On Charge Stability of Inorganic Electrets [Fizicheskiy institut imeni P.N. Lebedev, AN SSSR, Moskva] 150

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

MIKHAYLOV, G.P.; EYDEL'NANT, M.P.

Dielectric properties of a series of polyesters with aromatic nuclei in their chains. Vysokom. soed. 2 no.2:287-294 F '60. (MIRA 13:11)

1. Leningradskiy politekhnicheskiy institut imeni M.I.Kalinina. (Polymers—Electric properties)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

MIKHAYLOV, G.P.; EYDEL'NANT, M.P.

Temperature-frequency relationships of the angle of dielectric losses of mixed polyesters. Vysokom. soed. 2 no.2:295-302 F '60. (MIRA 13:11)

1. Leningradskiy politekhnicheskiy institut im.M.I.Kalinina. (Polymers)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

MIKHAYLOV, G.P.; BORISOVA, T.I.

Dielectric losses and polarization of stereoregular polymethyl methacrylate. Vysokom. soed. 2 no.4:619-625 Ap '60. (MIRA 13:11)

1. Institut molekulyarnykh soyedineniy AN SSSR.
(Methacrylic acid--Electric properties)

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

24.7800 1144, 1147, 1145
15.8109

87339
S/190/60/002/010/023/026/XX
B004/B064

AUTHORS: Mikhaylov, G. P., Eydel'nant, M. P.

TITLE: The Effect of the Polyester Structure on the Temperature Range of the Maximum of the Dielectric Losses

PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 10, pp. 1548-1551

TEXT: A previous paper (Ref. 1) has dealt with the investigation of the dielectric constant and the tanδ of the dielectric losses on various polyesters. In this connection, two types of losses were found to exist: dipole-elastic (de) and dipole-radical (dr) losses, both caused by the relaxation of the COO group. Aim of this study is to confirm the assumption that an increase of the number of methylene groups in the alcohol of the ester exerts less influence upon the temperature of the dr losses than the increase of the methylene groups in the acid. Tanδ was measured by the method described in Ref. 1 for hexamethylene terephthalate (6MT) and decamethylene terephthalate (10MT) at 1000 cps. The two substances were investigated both in elastic form, pressed from powder, and in rigid,

Card 1/4

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

87339

The Effect of the Polyester Structure on the Temperature Range of the Maximum of the Dielectric Losses

S/190/60/002/010/023/026/XX
B004/B064

crystalline form, precipitated from solution. Two maxima of tan δ occurred as is shown in Fig. 1. The maximum at lower temperature is ascribed to the dr losses, that at higher temperature to the de losses. From the equation $\log f_{max} = \varphi(1/T_{max})$ (f = frequency, T = temperature) the activation energy of the dr losses was determined for 6MT to be 12, for 10MT to be 11.5 kcal/mole. A comparison with previously (Refs. 1-4) obtained data for ethylene glycol-, hexamethylene glycol-, decamethylene glycol esters of terephthalic-, adipic-, and sebacic acid led to the following conclusions: 1) the temperature range of the $\tan\delta_{max}$ of the dielectric losses of polyesters depends linearly on the concentration of aromatic cycles in the chain of the macromolecule. There is no difference whether the concentration of the aromatic cycles changes in the alcohol or in the acid of the polyester. 2) The temperature range of the $\tan\delta_{max}$ of the dr losses depends on the structure of the acid. For the polyesters of aromatic acids the temperature of $\tan\delta_{max}$ is higher than for the polyesters of aliphatic acids.

Card 2/4

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

87339

The Effect of the Polyester Structure on the Temperature Range of the Maximum of the Dielectric Losses

S/190/60/002/010/023/0[illegible]
B004/B064

Legend to Fig. 1: The function tan δ = [illegible](t) for polyesters of different crystallinity at 1000 cps. 1: 6MT pressed, 1': 6MT obtained from solution, 2: 10MT pressed, 2': 10MT obtained from solution.
There are 4 figures, 1 table, and 4 Soviet references.

ASSOCIATION: Leningradskiy politekhnicheskiy institut im. M. I. Kalinina (Leningrad Polytechnic Institute imeni M. I. Kalinin)

SUBMITTED: June 3, 1960

Card 3/4

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

87339

S/190/60/002/010/023/029/XX
B004/B064

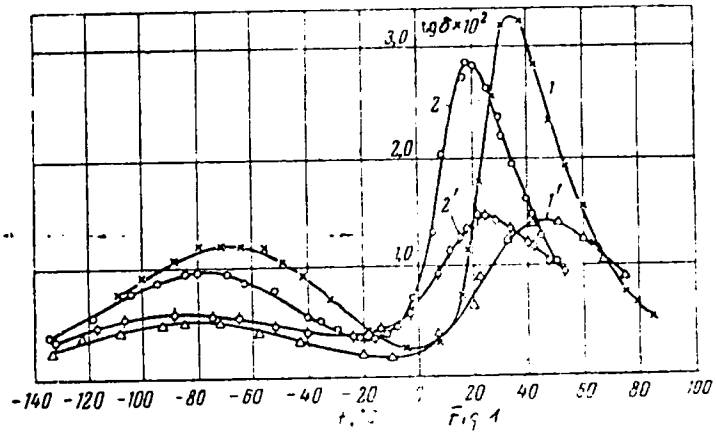


Fig 1

Card 4/4

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

87340

24.7800 1144, 1147, 1145

15.8109

S/190/60/002/010/024/026/XX
B004/B064

AUTHORS: Mikhaylov, G. P., Eydel'nant, M. P.

TITLE: Study of the Dielectric Losses of Polyethers

PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 10, pp. 1552-1556

TEXT: In continuation of previous papers (Refs. 1-3), which have dealt with the dielectric losses of polyesters, this paper discusses the investigation of the dielectric losses of polyethers: polyxylylene oxide and polyoxymethylene. Polyxylylene oxide was placed at the authors' disposal by A. V. Tunik, scientific collaborator of the IVS AN SSSR (Institute of Macromolecular Compounds of the AS USSR), polyoxymethylene by G. P. Nosov, scientific collaborator of the NIIPM (Scientific Research Institute of Plastics). Tan δ was measured by the method described in Ref. 1. The following results were obtained: Two overlapping maxima of the dielectric losses, i.e. dipole-elastic- and dipole-radical losses were observed with polyoxymethylene at -60°C. With polyxylylene oxide three maxima occur: a) at -112°C and a weaker one at -60°C (dipole-radical losses), and an

Card 1/2

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

87340

Study of the Dielectric Losses of Polyethers S/190/60/002/010/024/026/XX
B004/B064

intensive maximum at +10°C (dipole elastic losses). The same laws as hold for the polyesters were observed: a) introduction of aromatic cycles increases the temperature of the $\tan \delta_{max}$ of the dipole-elastic losses; b) the temperature of the $\tan \delta_{max}$ of the dipole-radical losses depends only on the mobility of the polar group (O in the case of ethers, CO in the case of esters). The dipole-radical losses are caused by the relaxation of the ether group, the dipole-elastic losses by the motion of segments of the molecular chain. There are 3 figures and 5 references: 4 Soviet and 1 German.

ASSOCIATION: Leningradskiy politekhnicheskiy institut im. M. I. Kalinina (Leningrad Polytechnic Institute imeni M. I. Kalinin)

SUBMITTED: June 3, 1960

Card 2/2

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

S/ [illegible]

AUTHORS: Berestneva, G. L. [illegible] Mikhaylov, G. P., N[illegible]

TITLE: Effect of Stretching [illegible] Films Made of [illegible] Dielectric Losses [illegible] Films

PERIODICAL: Vysokomolekulyarnyye s[illegible] pp. 1739 [illegible]743

TEXT: The article under consideration [illegible] structure formation in thin films [illegible] above the vitrification temperature. The [illegible] conditions at which the formation [illegible] in polyethylene terephthalate films, and [illegible] transparent and elastic. The [illegible] is a hindrance to X-ray analysis. [illegible] dielectric losses of face [illegible] terephthalate and determined the fun[illegible]

Card 1/5

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

[illegible] f Stretching Upon the Str[illegible] S/[illegible]
[illegible] Properties of Films Made of P[illegible] P[illegible]
[illegible] Terephthalate. III. S[illegible]
[illegible] L[illegible]sses in Face-centered F[illegible]

[illegible] y f in the temperature range [illegible] C. A[illegible]
[illegible] of the type МЛЕ 1 (MLY[illegible] was [illegible] S[illegible]
[illegible] were applied [illegible] the samples. [illegible]
[illegible] nonstretched f[illegible]
[illegible] w the vitrificati[illegible]
[illegible] at 80°C (vitrificati[illegible]
[illegible] for [illegible] at the optimum crysta[illegible]
[illegible]. The diagrams were constr[illegible]
[illegible]. At [illegible] and 2) the diagrams exhibit [illegible]
[illegible] structure. In contrast therewi[illegible]
[illegible] crystal structure was observed [illegible]
[illegible] $\varphi(t)$, and no turbidity nor [illegible] appear[illegible]
[illegible] therefrom that stretching [illegible] temperature
[illegible] rise to a crystallization within the primary [illegible]
[illegible] dity being caused by spheroid str[illegible] The [illegible]
[illegible] extends the dependence of the fu[illegible] φ [illegible] the
[illegible] structure (as found by G. P. M[illegible] and B. [illegible]

[illegible]

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

Effect of Stretching Upon the Structure and Properties of Films Made of Polyethylene Terephthalate. III. Study of Dielectric Losses in Face-centered Films

S/190/60/002/011/024/027
B004/B060

polymers submitted to mechanical pre-treatment. There are 3 figures and 8 references: 6 Soviet, 1 US, and 1 German.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy kino-fotoinstitut (All-Union Scientific Research Institute of Motion Pictures and Photography). Institut vysokomolekulyarnykh soyedineniy AN SSSR (Institute of High-molecular Compounds of the AS USSR)

SUBMITTED: July 1, 1960

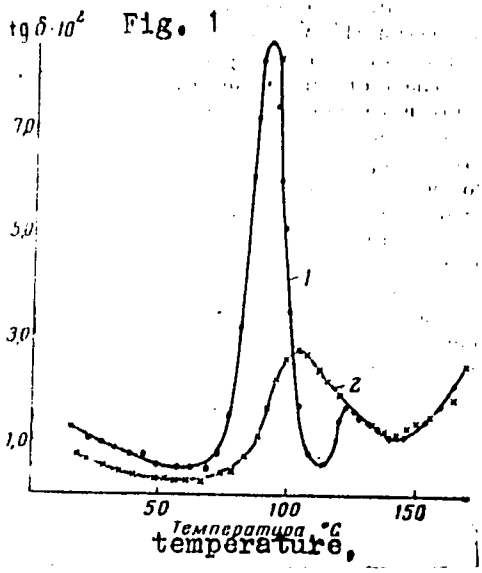
Card 3/5

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

S/190/60/002/011/024/027
B004/B060

Fig. 1



Legend to Fig.1:
tan δ = φ(t°) in nonoriented amorphous polyethylene terephthalate film (f = 1000 cps)
1 - with temperature increase, 2 - with temperature drop

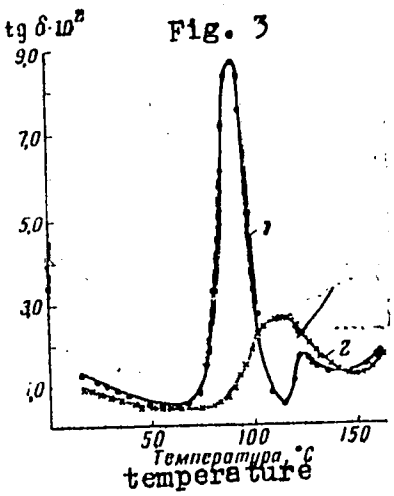
Card 4/5

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

S/190/60/002/011/024/027
B004/B060

Fig. 3



Legend to Fig.3:
tan δ = φ(t°) in face-centered polyethylene terephthalate film, stretched at 80°C, additionally heated to 170°C
(f = 1000 cps)
1 - nonoriented, amorphous sample,
2 - face-centered, heated sample.

Card 5/5

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

86319

15.8105 2209
24.7800 1043.1136 only

S/190/60/002/012/003/019
B017/B055

AUTHORS: Mikhaylov, G. P., Borisova, T. I.

TITLE: Investigation of the Molecular Relaxation of α- and β-Chloro-substituted Polyalkyl Methacrylates by the Dielectric Loss Method

PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 12, pp. 1772-1778

X

TEXT: The authors investigated the temperature dependence of the dielectric loss ($\tan\delta$) and dielectric constant ε' of poly-methyl α-chloracrylate, poly-ethyl α-chloracrylate, and polypropyl α-chloracrylate, polyisopropyl α-chloracrylate and poly-β-chloro ethyl methacrylate. Measurements of $\tan\delta$ and ε' were carried out at frequencies of 20 - 100000 cps and temperatures of 20 - 180°C, using the apparatus described in Ref. 3. Fig. 1 shows the temperature dependence of $\tan\delta$ and ε' at frequencies of 20 and 400 cps for poly-α-chloro alkyl acrylate. The replacement of the CH_3 group by chlorine leads to an abrupt change in the temperature function of $\tan\delta$

Card 1/3

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

86319

Investigation of the Molecular Relaxation of α- and β-Chlorosubstituted Polyalkyl Methacrylates by the Dielectric Loss Method

S/190/60/002/012/003/019
B017/B055

and ε'. The introduction of a chlorine atom causes a marked increase in dielectric loss ($\tan \delta_{max}$). Fig. 2 represents the temperature dependence of $\tan \delta$ and ε' of poly-β-chloro ethyl methacrylate at 20 and 400 cps. The substitution of the CH_3 group in β-position by chlorine has no effect on the height of the dielectric loss. The frequency dependence of $\tan \delta$ and ε' of the polymerizates was studied in a wide temperature range and is represented graphically in Fig. 3. The occurrence of temperature-dependent dipole-elastic and dipole-radical losses was observed. The apparent activation energy of dipole relaxation in the case of polychloro alkyl methacrylates is given in a table. The determination of the dielectric relaxation of polymerizates of polyalkyl methacrylates which are substituted by chlorine in α- and β-position gave new aspects on the possibilities of preparing dielectrics with a higher dielectric constant. Measurements of ε' were carried out in the authors' laboratory by A. I. Artyukhov. There are 4 figures, 1 table, and 5 references: 3 Soviet, 1 US, and 1 British.

Card 2/3

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

86319

Investigation of the Molecular Relaxation of α- and β-Chlorosubstituted Polyalkyl Methacrylates by the Dielectric Loss Method

S/190/60/002/012/003/019
B017/B055

ASSOCIATION: Institut vysokomolekulyarnykh soyedineniy AN SSSR (Institute of High-molecular Compounds of the Academy of Sciences USSR)

SUBMITTED: May 12, 1960

Card 3/3

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

86320

15.8105 2209

24.7806 1043, 1136 only

S/190/60/002/012/004/019
B017/B055

AUTHORS: Mikhaylov, G. P., Borisova, T. I.

TITLE: Investigation of the Effective Dipole Moments of α- and β-Chlorine Substituted Polyalkyl Methacrylates

PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 12, pp. 1779-1785

TEXT: Basing on the temperature- and frequency relationships of the generalized dielectric constant $\varepsilon = \varepsilon' - i\varepsilon''$, the authors analyzed the relaxation-time spectrum and calculated the effective dipole moments of α- and β-chloro derivatives of polyalkyl methacrylates. The effective dipole-elastic moments $(\mu\sqrt{g})_{d.e.}$, calculated from dipole-radical loss data, are not altered by replacement of the α-CH_3 group by chlorine. The effective dipole moment as calculated from dipole-elastic relaxation, however, changes abruptly. Introduction of chlorine into the β-position produces no change. The static dipole moment $(\mu\sqrt{g})_2$ increases on intro-

Card 1/2

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"

"APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1

86320

Investigation of the Effective Dipole Moments of α- and β-Chlorine Substituted Polyalkyl Methacrylates

S/190/60/002/012/004/019
B017/B055

duction of chlorine into the α- or β-position of the monomer. Fig. 1 shows the relation $\varepsilon'' = \varphi(\varepsilon')$ for the polymers. The densities and refractive indices of several polyalkyl methacrylates are listed in Table 1. Fig. 2 represents the temperature function of the parameters of relaxation. The effective dipole moments of several polyalkyl methacrylates are given in Table 2. The dipole moments of glassy polymers increase slightly with temperature. The data obtained were compared with the corresponding data for the homologous series of polyesters of methacrylic acid. The influence of a second polar group on the relaxation properties of the polymers as a function of the position of this dipole was discussed. There are 2 figures, 2 tables, and 6 references: 4 Soviet.

ASSOCIATION: Institut vysokomolekulyarnykh soyedineniy AN SSSR (Institute of High-molecular Compounds of the Academy of Sciences USSR)

SUBMITTED: May 12, 1960

Card 2/2

APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001034010010-1"