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simple tension, the conditions always in equilibrium, there is no theoretical increase in the same optical behaviour phenomenologically between the mechanical and optical properties may be of any type.

Furthermore, the effect of loading or displacement on the dielectric susceptibility of elastic materials, and the dependence of these three tensors on frequency, are viscoelastic spectra dependent variables.

It is the purpose of this paper to express the relationships between these three tensors. Since the most interesting materials are rheo-optically similar, this restriction is made. These materials which do not conform to the classical mechanical and optical properties are difficult to derive general relationships for of materials.

Characterization

In a viscoelastic material, the strain tensor is a function of time. Furthermore the material is anisotropic because of the strain tensor or the dielectric tensor of the particular material. The characteristics of the material are since birefringence is a function of the strain tensor, the birefringence is also a function of time. The experimental arrangements are related in a way which are properties which are time dependent. The phenomenological relationships are

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$$\varepsilon_i(t) =$$

$$e_{ij}(t) =$$

$$e_{kk}(t) = \frac{1}{3} \int_0^t \theta(\tau) d\tau$$

$$\gamma_m(t) = \int_0^t C_s(\tau) d\tau$$

where $\theta(\tau)$ is the angle of rotation of the principal axes of the stress tensor with respect to the principal axes of the strain tensor. It is assumed in the present theory that the functions $\theta(\tau)$ and $B(t)$ are the same as the functions $E(t)$, $G(t)$ and $\nu(t)$ corresponding to the same material.

The quantities $\nu_c(t)$ and $\nu_r(t)$ are defined by the following inequality:

The validity of this inequality has been experimentally verified for a number of materials.

If we consider the case of longitudinal strain, we define the functions $\nu_c(t)$ and $\nu_r(t)$ by the following inequality: the functions are in the transform plane and they are expressed by the following inequality:

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These are the characteristic functions which specify the function can be calculated relations

In order to obtain data corresponding to external excitation, materials all can be converted into a real part *loss compliance*

$$D^* =$$

$$J^* =$$

$$B^* =$$

$$\nu_c^* =$$

If the ratio of the F''/F' , are measured

$$\left[F^*(\omega) \right]$$

where F^* , F' and

Although it is $= 1/K^*(\omega)$ then

(*) In previous all three interrelated functions. These relations of the approximate was done in order to obtain functions. Experimental approximation^[21, 30]

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The constitutive equation for an isotropic elastic substance is

$$\sigma_{ij} = \lambda \epsilon_{kk} \delta_{ij} + 2\mu \epsilon_{ij}$$

or its inverse :

$$\epsilon_{ij} = \frac{\delta_{ij}}{3} \epsilon_{kk} + \frac{1}{2\mu} \sigma_{ij}$$

where δ_{ij} is the Kronecker delta and ϵ_{kk} is the dilatation in the traction state.

For the dynamic stress-strain relations, the constitutive equations are the simple elastic ones.

The Viscoelastic Models

For the study of the dynamic behavior of materials, it has been proposed that the retardation and the phase lag are important. These spectra were studied for viscoelastic behavior. The spectra are not quite useful to reveal the important indications.

Although we are not concerned with the present models is objectionable in the definition of mechanical material, it is generally the same model for the study of the theory[6] studied theoretical models. They found that the phase lag between 0.33 and 0.66 and the so-called retardation since they vary between

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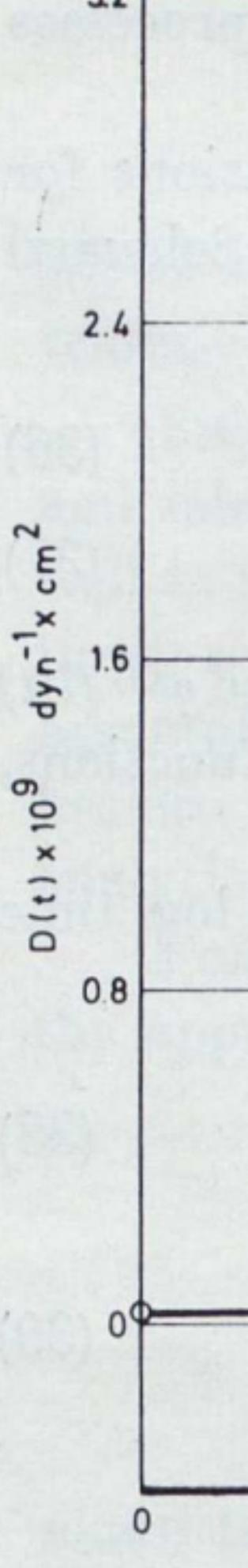


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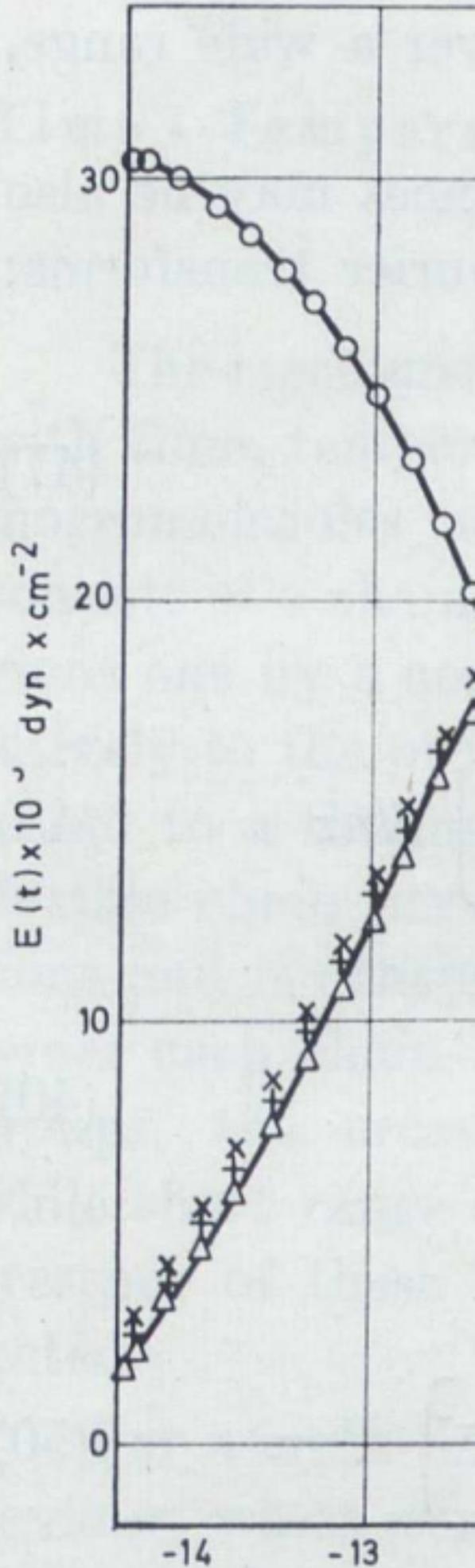


Fig. 2 First, second
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Time - Temperature

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For a cross-linking behaviour, which can be carried[^{1,11}]. There are It is in the transition dependence of viscosity. These regions responses and appear the cross-linked polymer temperature T_g material α undergoes an expansion coefficient. Decrease in temperature substance, which is of the free volume is slow or even impossible contraction in transition temperature is rate the mobility material is a *hard glass*.

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It has been shown that the relaxation time decreases rapidly with increasing temperature. In the case of viscoelastic behaviour, it is simpler to use the method of reduced time. The curves of superposition plots at different temperatures are transformed to a single curve by the formation of the reduced time. This is plotted in a log time scale. The log time scale is a function of the extension of extension ratio to the distribution of relaxation times.

where the quantities ρ_0 and ρ_T are called this principle. The quantities ρ_0 and ρ_T are densities at different temperatures. The correction factor a_T is a function of temperature. The correction factor a_T is a function of temperature. Ferry[¹³] has shown that for the materials at different temperatures, the curves of superposition plots are identical.

A similar method has been used by Andrews[¹⁴] in his tests on various polymers. The stress-relaxation curves at different temperatures are transformed to a single curve by the formation of the reduced time.

where $E_{r,T}(t)$ is the reduced stress function at T_0 , and a_T is a function of temperature. The curves of superposition plots are identical. The correction factor a_T would be identical for all temperatures. The experimental results for polymers[¹⁵].

Although the method of reduced time has been developed experimentally, it is not yet fully understood.

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Since log plot of by log (ρT) These shift tion (55) is dual curve to the position

$$H_0/H = T_0 \rho$$

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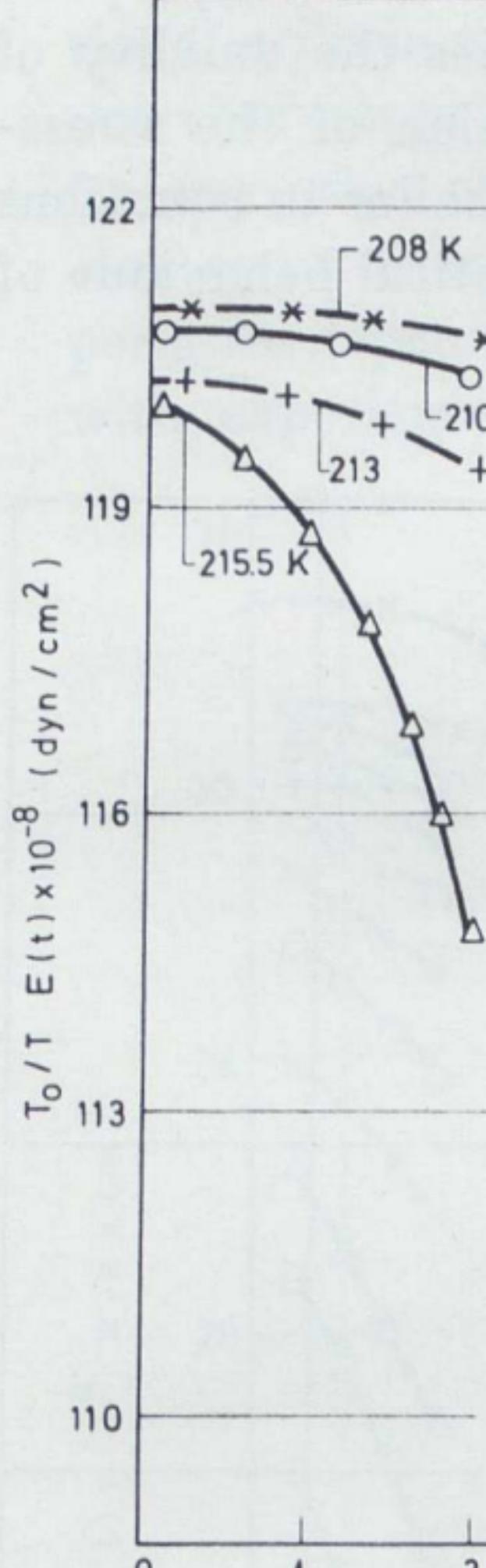


Fig. 3 Isothermal induction time elastomer H

While an extensive study of the elastic properties of the material received less attention, the orientation are considered experimentally to be. The validity of this study is based on the sticized epoxy polyurethane stress- and strain-orientation of the materials. The coefficients for creep and the curves are monotonic.

quence of viscoelasticities, these for the kinetic coefficient decrease opposes segregation (L) or τ_p , deformation factor, we vary temperature therefore,

Since log plot of by log (ρT) These shift tion (55) is dual curve to the posi

$$H_0/H = T_0 \rho$$

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Fig. 3 in extension

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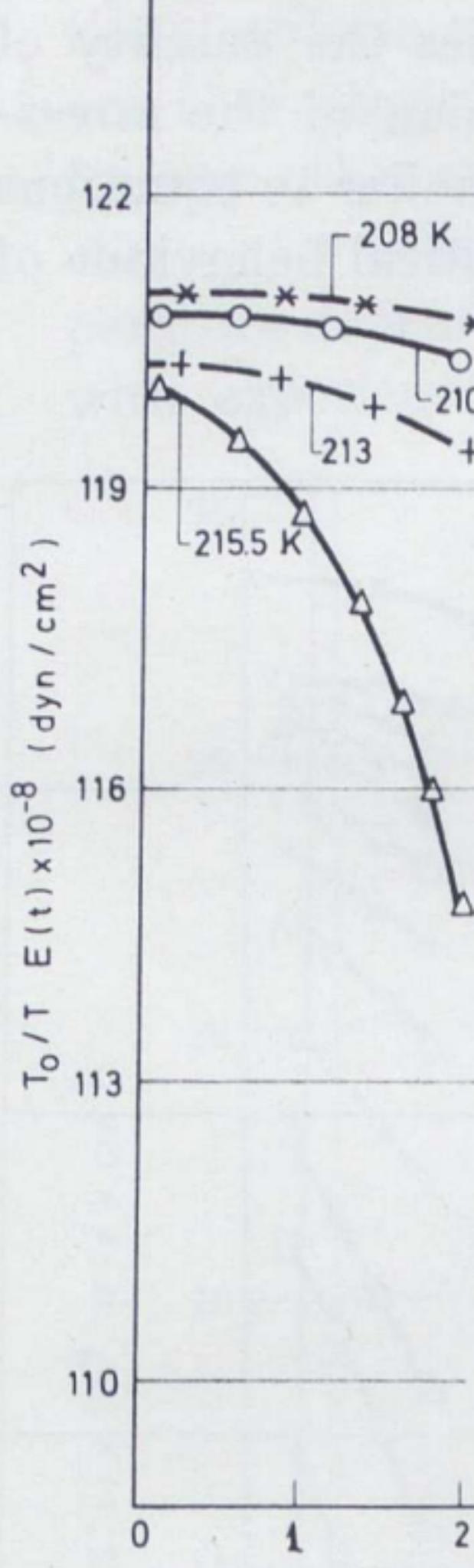


Fig. 3 Isothermal induction of an elastomer H

While an extensive study of the elastic properties of the material received less attention, the results of orientation are considered experimentally to be valid. The validity of this study is supported by the fact that the stress- and strain-orientation curves of the materials are monotonic and the coefficients for creep and relaxation curves are monotonic.

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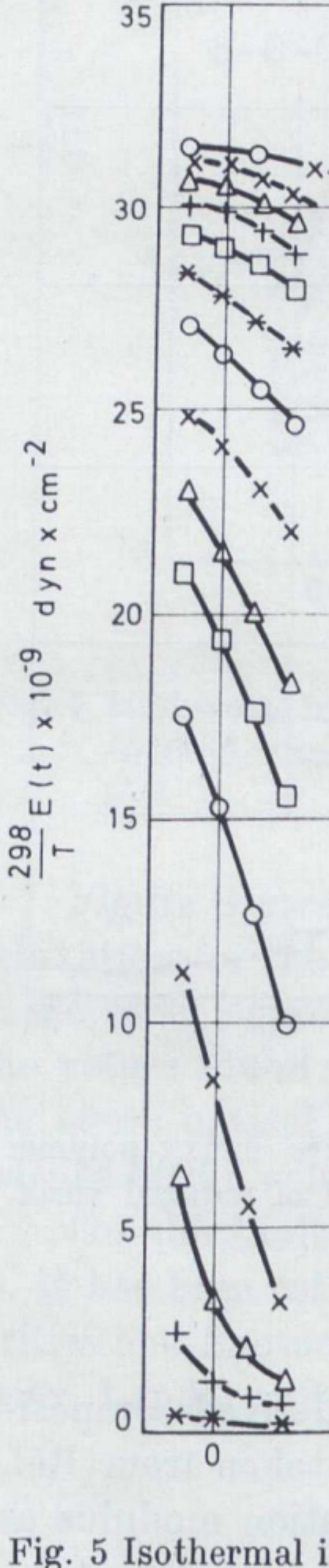


Fig. 5 Isothermal i
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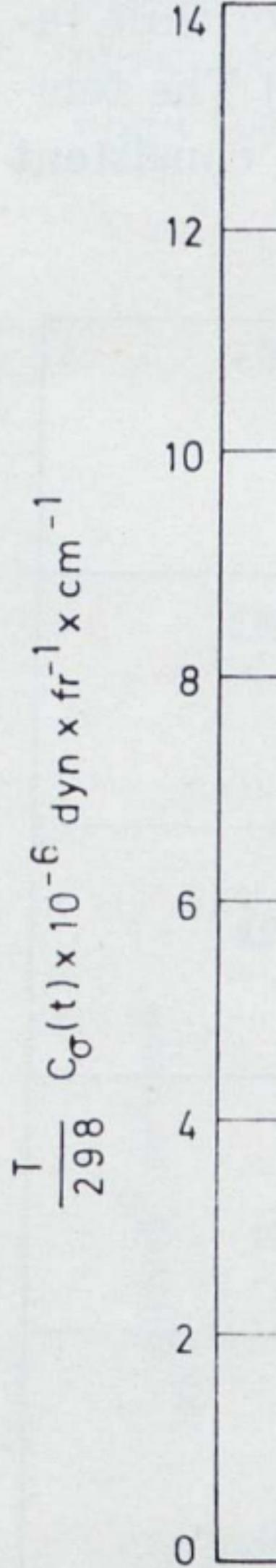


Fig. 6 Isotherm
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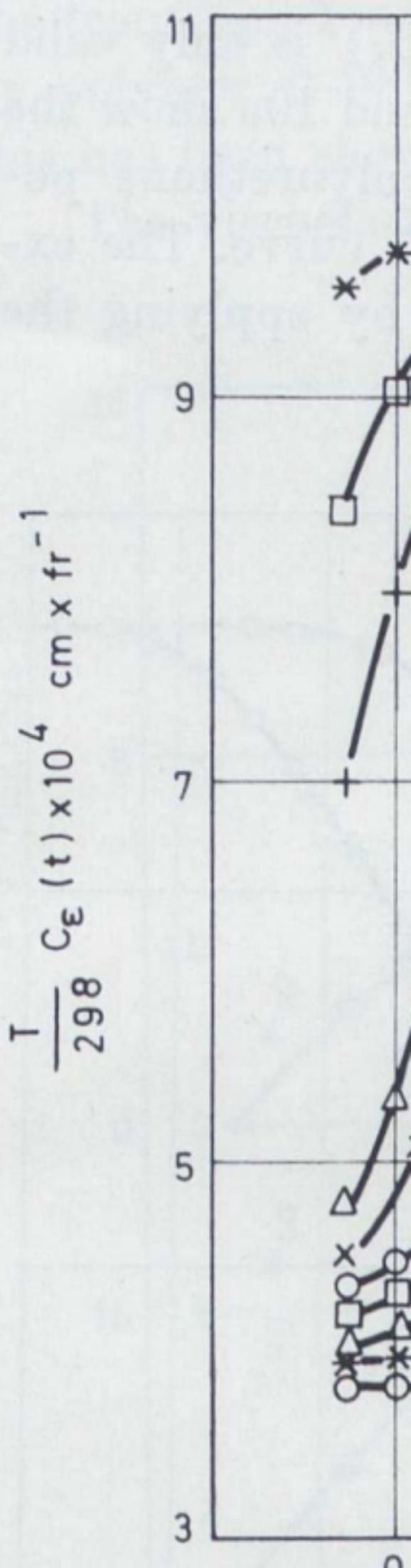


Fig. 7 Isothermal in-plane birefringence for C-100-0-8 and C-100-0-8 samples.

Figure 8 presents the stress-optical relaxation for the samples with increasing sigmoidal birefringence. The values found for the stress-optical relaxation are in good coincidence with the values found for the stress-optical relaxation.

The third critical point has been estimated from the birefringence and fluctuation data of Williams, Landel and Ferry.¹⁰

where C_1 and C_2 are

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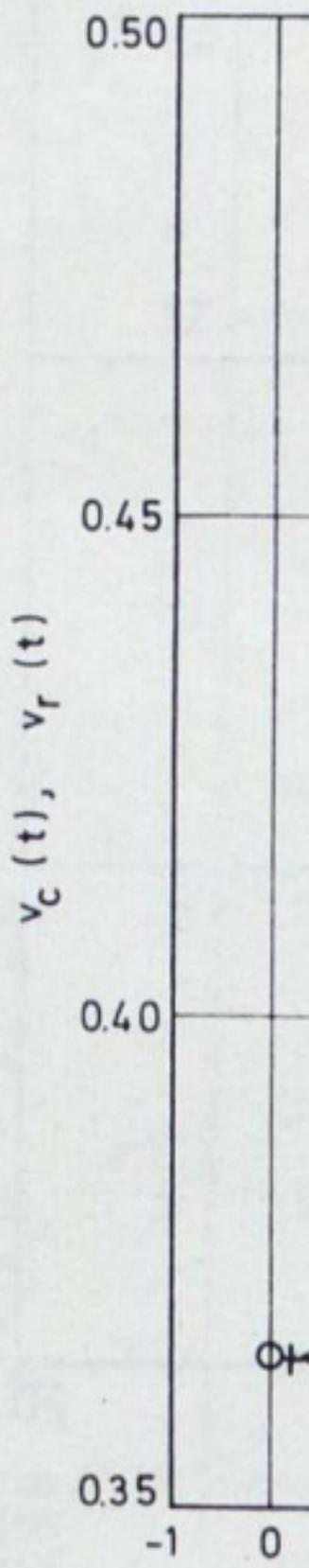


Fig. 8 Later mer between

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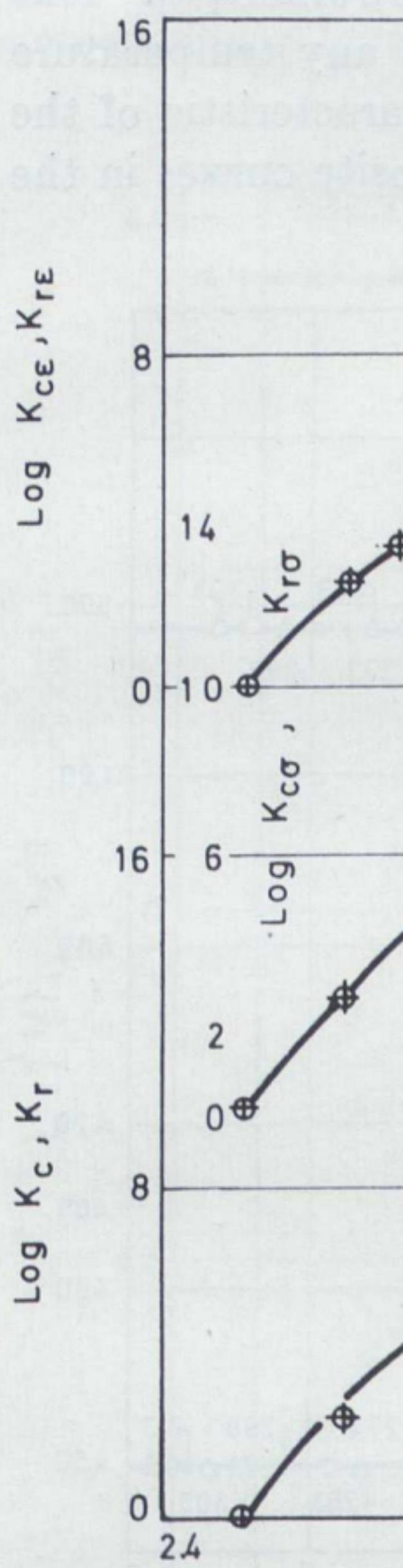


Fig. 9 Logarithms of epoxy polymer relaxation modulus, creep compliance, and creep coefficient and modulus versus time in creep and relaxation tests.

of side chains, conventional descriptions cannot describe this region it is assumed that the same temperature dependence can be applied to

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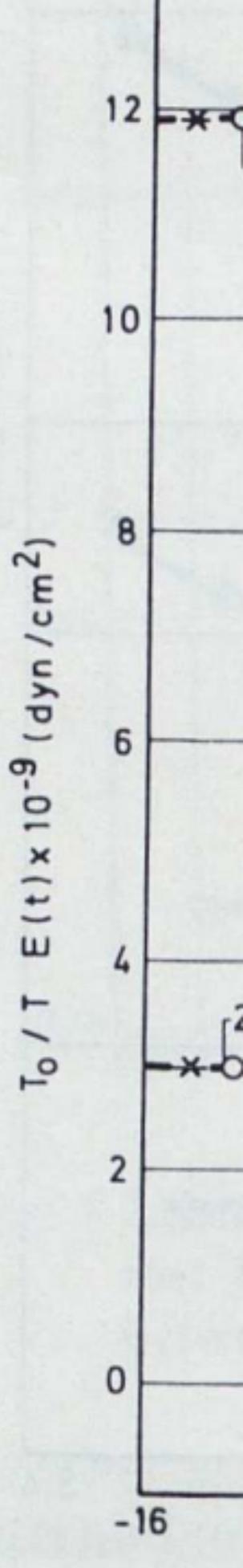


Fig. 10 Ex
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lated by the Arrhenius equation was used for the calculation of the D -curves as well as the form used for the «plus» sign)[²⁶]. In the distinctive test of creep and relaxation

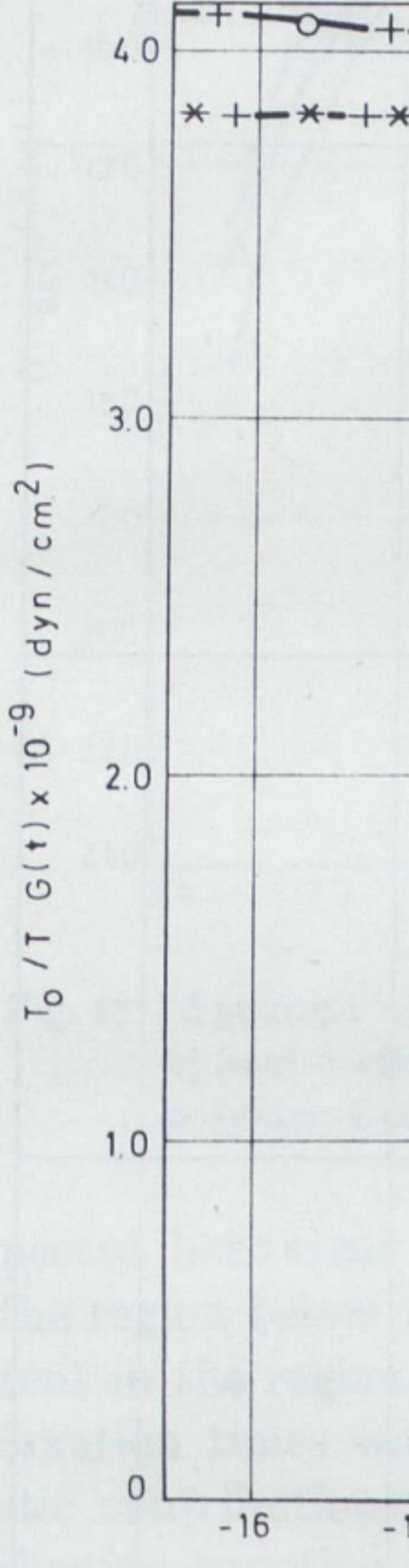


Fig. 10a Shear and bulk relaxation of Hysol 8705

polymer C-100-0-8, indicating that these measurements of creep compliance and strain-optical retardation are in agreement with the experimental evidence, the temperature dependence of the

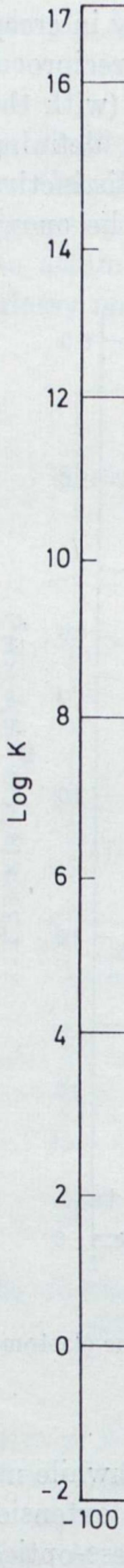


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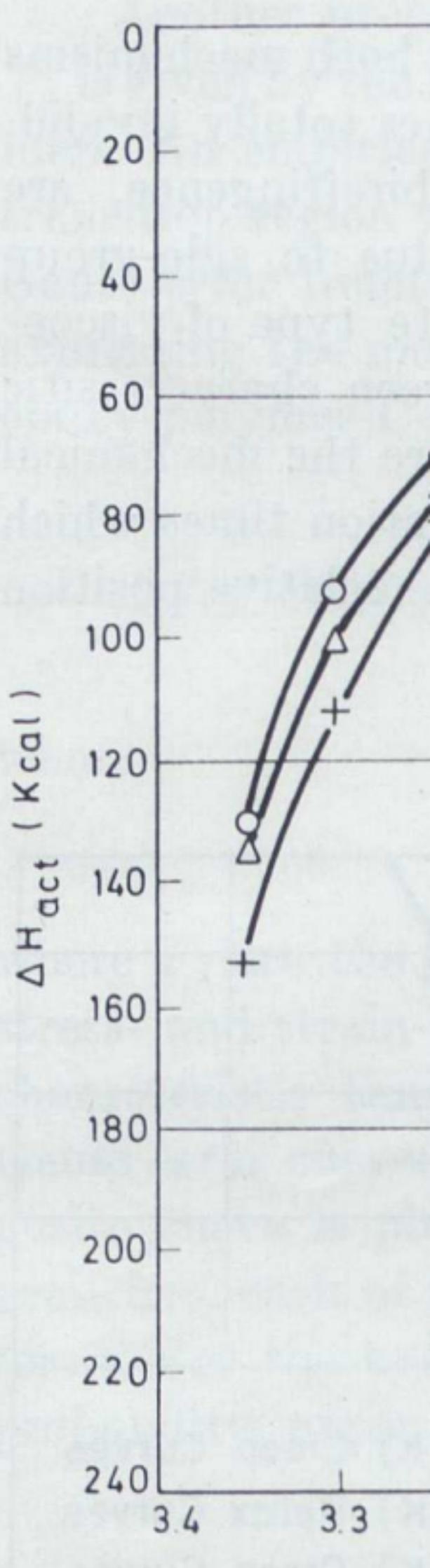


Fig. 12 Apparent activation energy vs. optical coefficient for polymer C-1

pected behaviour in the region below T_g . The present results are different in the region above T_g . The relaxation times with respect to the Arrhenius equation, and the contribution of the chain-backbones to the total relaxation time, are being studied by the mechanical spectroscopy method, where the $\log a_T = \log \tau$ is attributed to these motions.

Thus, any mechanical relaxation involving backbone motions in the region above T_g should follow the Arrhenius equation, and any relaxation involving side-chain motions should follow the Arrhenius equation, and any relaxation involving backbone motions in the region below T_g should follow the Arrhenius equation.

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$$\frac{\text{Log } F_T (t/K) - \text{Log } F_2}{\text{Log } F_1 - \text{Log } F_2} \times 100$$

Fig. 13 D
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Another procedure for determining T_g is given by the authors. An empirical transition region was fitted by a Gauss error function expressing the mechanical loss of an epoxy polymer C-

$$\log F(t/K)$$

where

where F_i are the stress- and strain-characteristic times. The Gauss error curves for each composite curve is plotted on a probability paper, each of which has a slope h . For the evaluation of T_g on a probability paper

A

Each curve in the figure has a different slope, which corresponds to the glassy behavior of the material. The viscoelastic behavior of the material corresponds to the transition region.

Conversion of

Viscoelastic stress-strain curves can be converted into viscoelastic behavior curves near viscoelasticity. The mechanical and optical properties determine them. The various types of tests used to determine anyone characteristic of the material. Moreover, no

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Besides the calculation of dynamic compliance from the present

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This relation

Relations (2) dynamic compliance modulus and vice versa were used to calculate, the Vulcolla loss dynamic compliance a frequency range to 39° C. Compositions of 0.4° C were determined the storage and loss

In the case of to the corresponding equations of the relation of integrals where the standard is not suitable. This graphical form, by the transform of

The method of integral is changed in of the method that must be determined intervals by the time

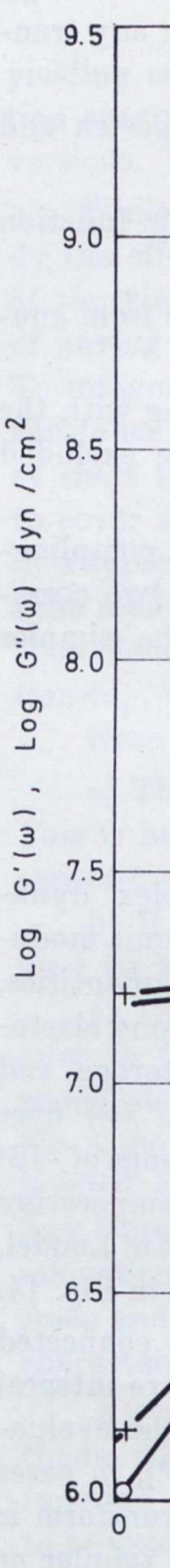


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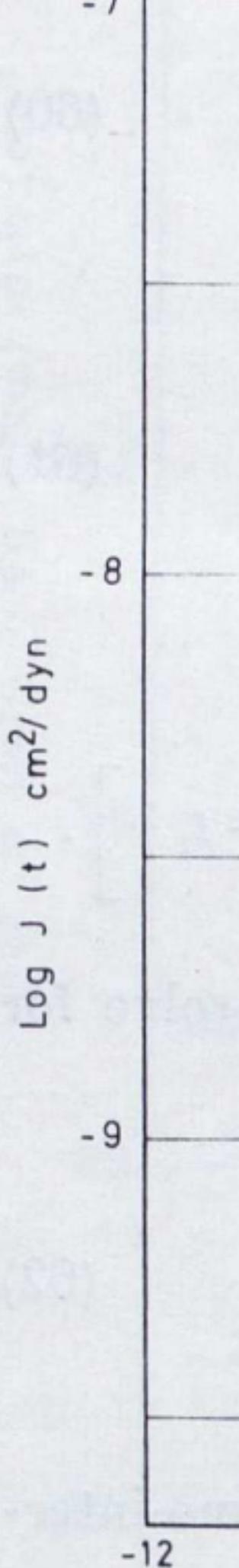


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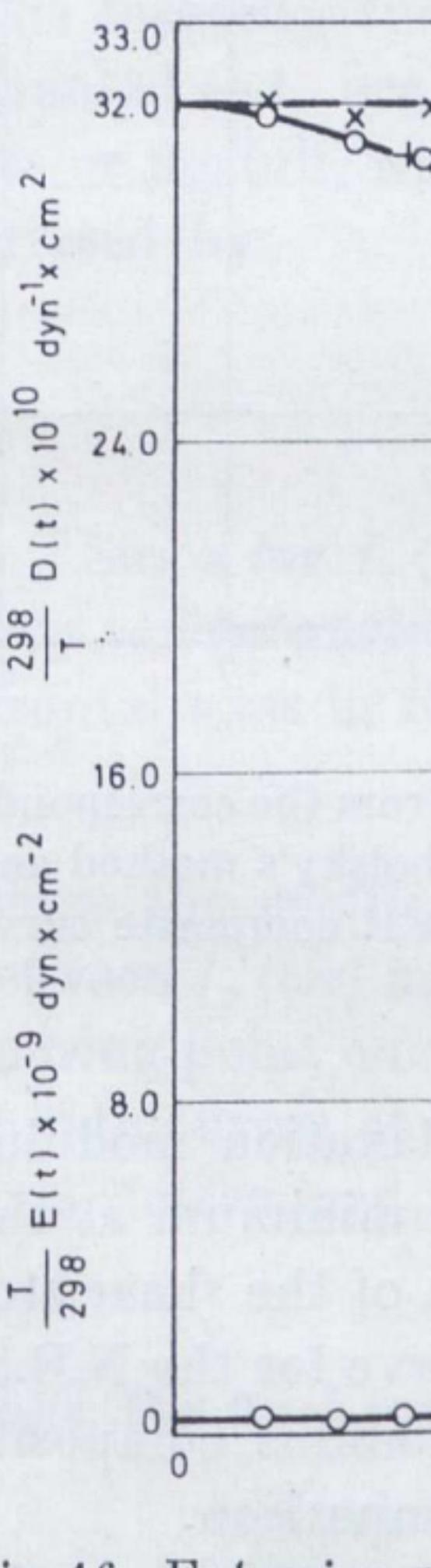


Fig. 16 Extension r compliance o the product rves log tim

and the storage modulus $G_r(t)$ is approximately equal to $G_r(\infty)$. Generally, if $\omega = 1/t$, $G_r(t)$ and $G'(\omega)$ are at the same value for the same average modulus.

Fig. 17 shows the shear modulus $G_r(t)$ and storage modulus $G'(\omega)$ for a composite material.

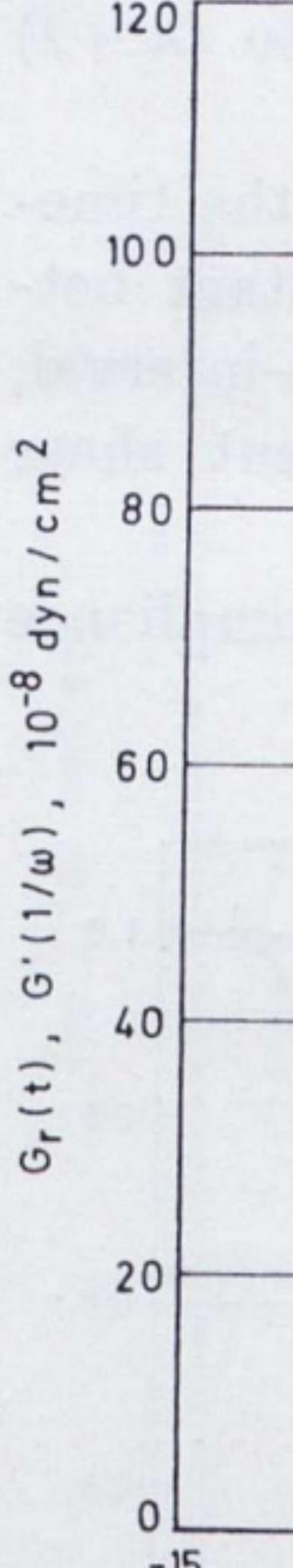


Fig. 17 Shear modulus $G_r(t)$ and storage modulus $G'(\omega)$ for a composite material. i) $G_r(t)$ and ii) $G'(\omega)$ of the composite material.

compliance $J(t)$ and the compliance $J(\omega)$ at the end of the relaxation time t are equal. The average relaxation time τ for polyisobutylene is 10^{-3} sec. The curve was obtained from the data of Fig. 17.

Where τ is the average relaxation time, $G_r(t)$ corresponds to $G'(\omega)$ at $\omega = 1/t$. If τ is developed, all

tardation or relaxation due to Maxwell terms of the correction. Smith^[33] gave an analysis of these methods in which the measured quantities are

An alternative method developed by Ninomiya^[34] for relaxation functions is based on the dynamic function

The methods differ between the storage modulus E' and the loss modulus E'' are

$$-D'(\omega)$$

$$E'(\omega) -$$

The intensity functions denoted as I_r are measured in degrees or moduli, which are expressed by:

Since $\log I_r$ are plotted on the horizontal axes in terms of $\log \omega$ they can be made

where the coefficients A and B between I_r ($\omega\tau$) and $\log \omega$ at the neighbouring point on the curve of both curves at the same time were determined

Thus, the final form of the dynamic function is

$$-D'(\omega) -$$

$$E'(\omega)$$

and similarly for the loss modulus E'' and the loss factor $\tan \delta$

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approximate values were determined and derived from the data plotted in Figure 18. The average and standard deviation (72)

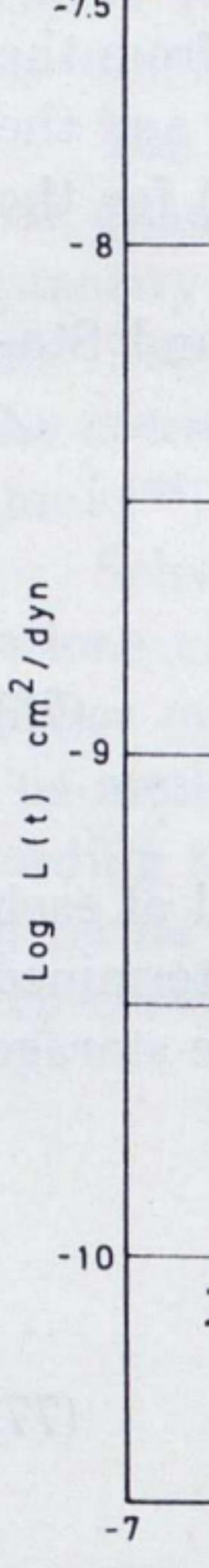


Fig. 18. Length $L(t)$ versus time t for the 40 polyethylene samples.

To determine the values of $L_e(\tau)$ we use the equation

$$L_e(\tau) =$$

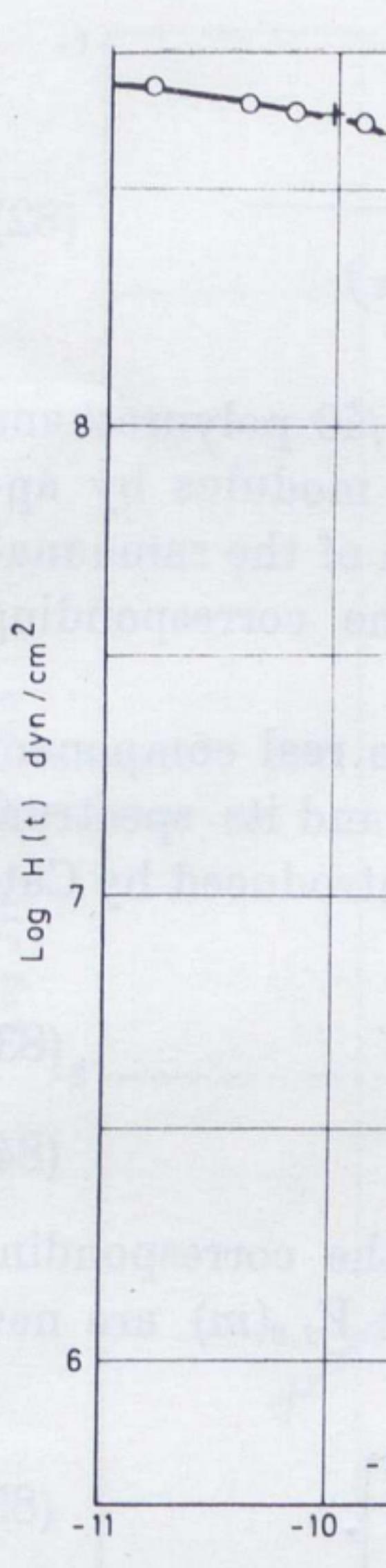


Fig. 19 Shear relaxation modulus $H_e(t)$ and the shear relaxation spectrum $L_e(\tau)$ for a material with a constant shear modulus G and a constant shear modulus G .

$$H_e(\tau) = \frac{G}{\left\{ D(t) + \dots \right\}}$$

where, again, m is the slope of the curve at the point considered.

To calculate $L_e(\tau)$ use the formulas,

$$L_e(\tau) = - \frac{d \log H_e(t)}{d \log t}$$

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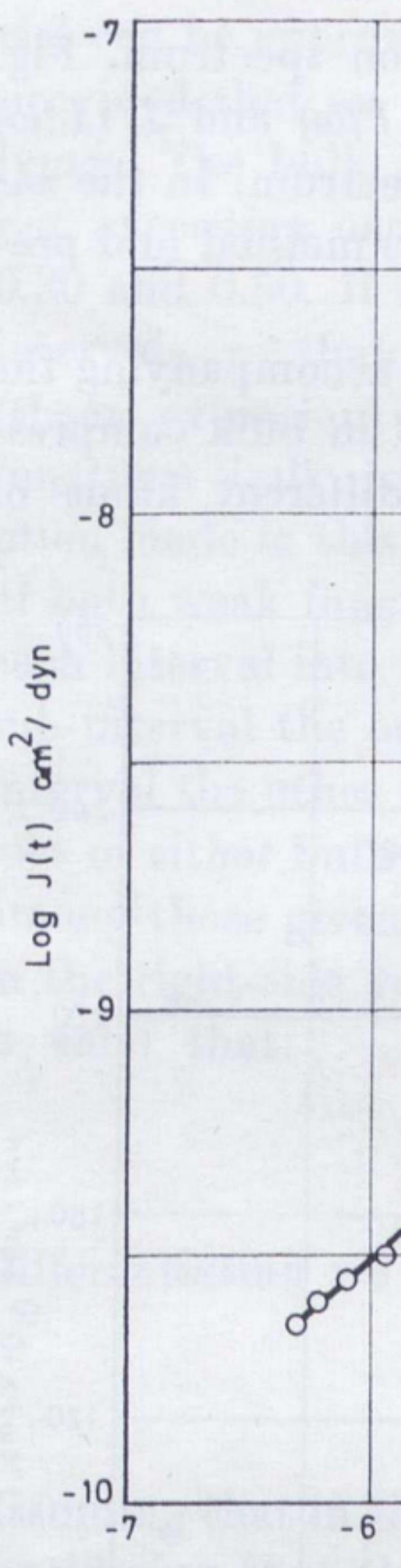


Fig. 20 Transient shear modulus $J(t)$ computed from the spectrum. This was calculated from the data of Ninomiya and

Another useful set of functions from the relaxation spectra calculations are given by

$$D(t) = D'(1/\omega)$$

$$E(t) = E'(1/\omega)$$

A relation similar to the above is used for the determination of

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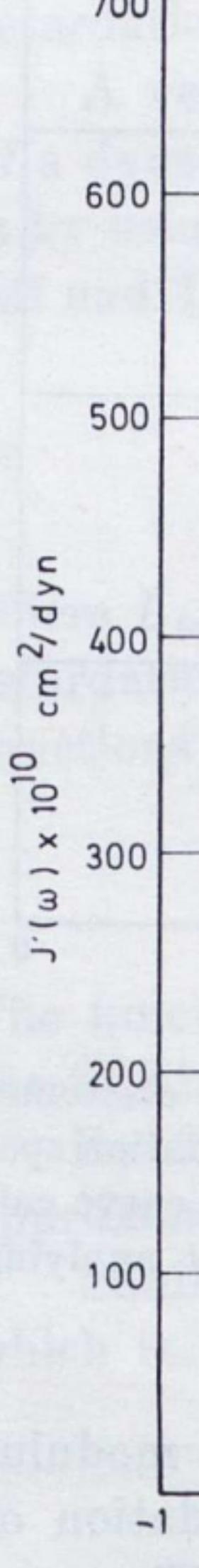


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Assuming that in the
considering that the
 $B(t)$ and $\nu_c(t)$ we have

For the second subinterval

Equating the two expressions
found that:

where B_0 and ν_{c0} are the values in the glassy or rubbery state.

For the corresponding time t we have that:

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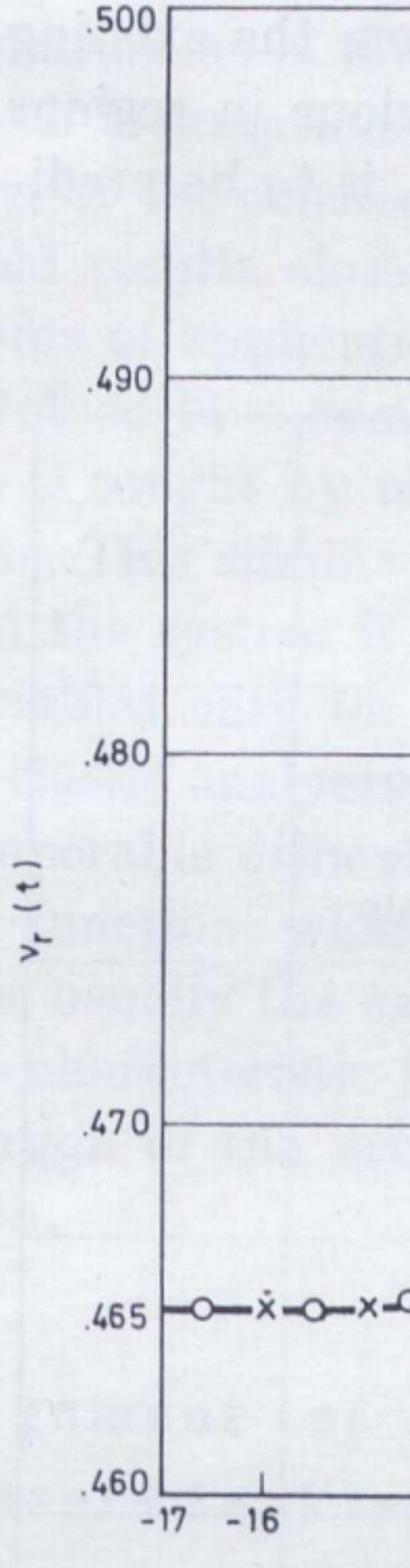


Fig. 22 Lateral contraction coefficient determined experimentally and results obtained

evaluation of the data shown in Fig. 19 with the method of Landel and Landel's data.

Moreover, in the case of the data as derived from the transient shear method (formula 1) it was derived from the data.

Most viscoelastic materials are characterized by a sigmoidal shape of the log time curve. These two characteristics

haviour of case for high gradient of the sibility assumption especially in limited vis of time or cted.

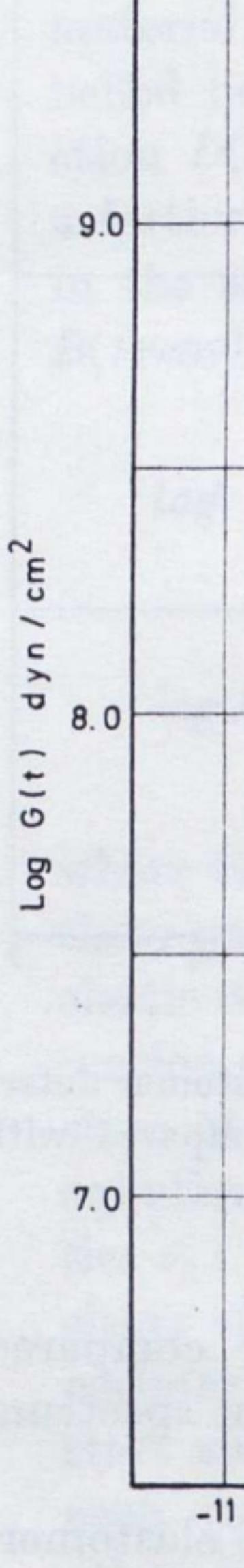


Fig. 23 Tra 18/4 sion while

It is a bulk modu function in

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and dielectric constant for perfect relation

How and birefringence in the case of uniaxial crystal. It is a principal physical property of eventual material under loading. The correct form of the relation or the relation characterizing the use in the case of uniaxial crystal it is necessary to consider the linearity of the relation of n and ϵ .

It was shown by Mindlin in his position paper that the material hypothesis is the relation between n and ϵ by Dill^[41] explicitly determined with simplicity.

The subject of the stress-optical effect is fringed by the fact that it has been shown that the stress-optical effect is reduced to the case of uniaxial crystal. Furthermore, the stress-optical effect is the same or similar to the stress-optical equation for uniaxial crystal. Dill^[41,43]

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for the study of the susceptibility for this rheological behavior expected for the glassy state.

Since the curves of the susceptibility are considerably altered by the transition, it was selected for the study of the glassy state. The curves for the glassy state and rubbery state are shown in Figure 24.

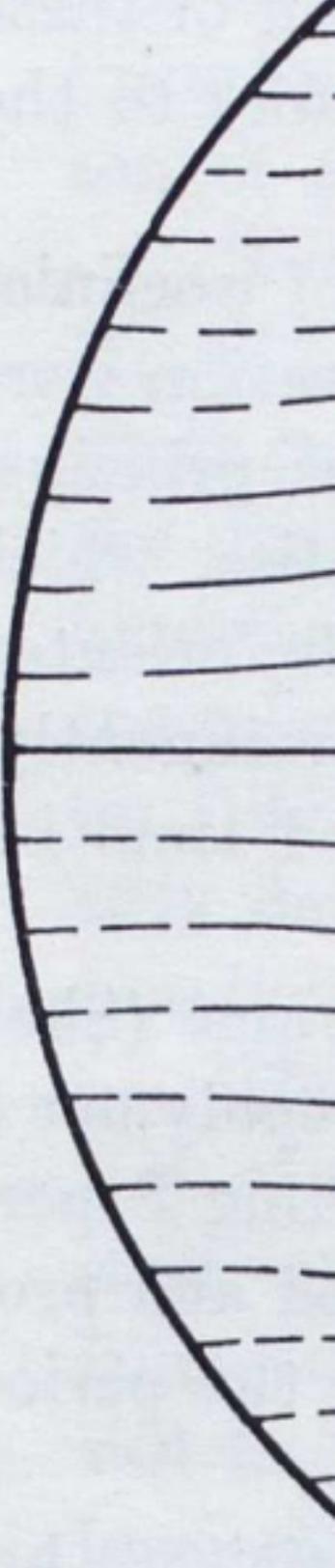


Fig. 24 The curves of the susceptibility for the glassy state and rubbery state.

of viscoelastic effects
and strain-isoclinics.

For the study of the transition region of the refringence change, a four-load configuration pattern is changed to a two-load and for the same appearance a very short period pair of loads is used. At first application

Indeed, it has been found (temperatures below the birefringence isoclinics) that the two load states in the loading configuration correspond to the birefringence isoclinics frequently to the pattern. This corresponds to a slow but abrupt

The testing procedure involves the application of the loads along the axes Ox and Oy in the conditions. The load P_x necessary for reaching the loads P_y was released. We call the first time interval the second time interval

For the case of a single load it is known that a single load applied to a pair of isotropic materials to the centre O of the S_1 and S_2 normal lines is a relation [48]:

Fig. 25 presents the results for S_1 and S_2 , as the ratio

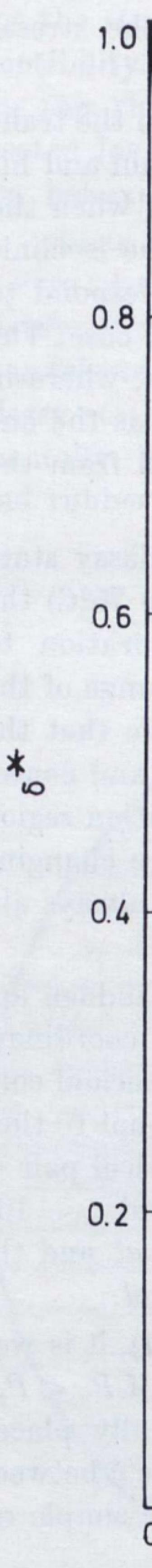


Fig. 25 Va
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For a
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$$\sigma_{yc} = - \frac{2P}{\pi d}$$

where d is the thickness

For the recovery of the disc are given by

$$\sigma_{ye} = \left\{ - \frac{2P_y}{\pi d} \right.$$

In these relations to different time of for the purely elastic

In order to obtain applied loads are statically simple substituted to this principle also compliances and time for the strain corresponding composite

The components

$$\begin{aligned} \varepsilon_{xe} &= D_c (t_c + t) \left\{ - \frac{2P_y}{\pi d} \left[- \frac{2P_y}{\pi d} \right] \right. \\ &+ D_c (t) \left[\left\{ - \frac{2P_y}{\pi d} \right. \right. \\ \varepsilon_{ye} &= D_c (t_c + t) \left[- \frac{2P_y}{\pi d} \right] \\ &- \nu_c (t_c + t) \\ &+ D_c (t) \left[\left\{ \frac{2P_y}{\pi d} \right. \right. \end{aligned}$$

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Fig. 26

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material at the temperature that is the equilibrium temperature.

In order to determine the critical points for $P_x = P_y$ and to find the critical points, which are the points of inflection and subsequent

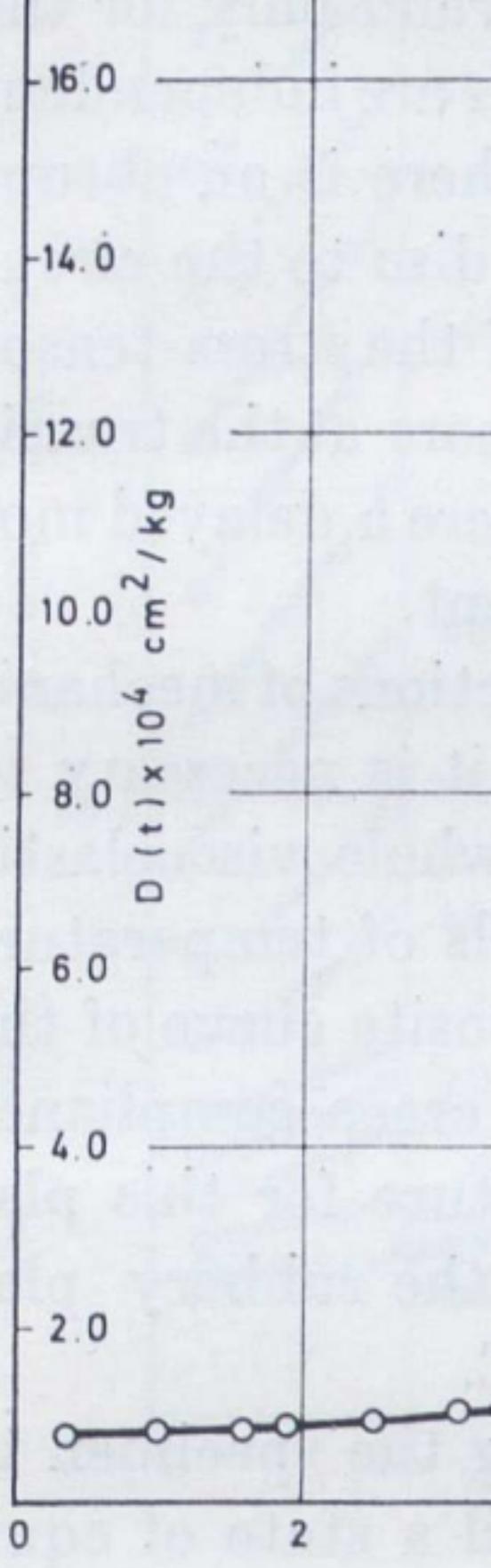


Fig. 27 Individual dependence of temperature on the independent variable.

of strain at each point can be obtained, after some

$$\frac{P_x}{P_y} \left[\frac{1}{\dots} \right]$$

In the case where P_x does not change with

Solving relations along the y -axis:

for each temperature. The birefringence measurements were taken 16 min. after the start of the cure.

For the measurements (94), the recovery time of the viscoelastic transposition of the molecular boundaries do not coincide with the transition region of the viscoelastic improvement of the material.

For the measurements (95) the optical and optical measurements define the spectrum of the material and application of the material along the direction of the stretched epoxy resin. The viscoelastic plateau was 70% of the initial value.

The low-temperature measurements of the four-lobed birefringence equilibrium were taken at the same time as the fringe pattern measurements. The measurements were operating at a temperature close to the glass transition temperature. The creep measurements were taken at the same time as the elastic equilibrium measurements. The viscoelastic relaxation measurements were taken at the same time as the birefringence measurements. Further measurements in relation to the viscoelastic functions are given in Table I. The values from the measurements are given in Table I. The recovery measurements were taken at 1', 2', 4', 8', 16', 32', 64', 128', 256', 512', 1024', 2048', 4096', 8192', 16384', 32768', 65536', 131072', 262144', 524288', 1048576', 2097152', 4194304', 8388608', 16777216', 33554432', 67108864', 134217728', 268435456', 536870912', 1073741824', 2147483648', 4294967296', 8589934592', 17179869184', 34359738368', 68719476736', 137438953472', 274877906944', 549755813888', 1099511627776', 2199023255552', 4398046511104', 8796093022208', 17592186044416', 35184372088832', 70368744177664', 140737488355328', 281474976710656', 562949953421312', 1125899906842624', 2251799813685248', 4503599627370496', 9007199254740992', 18014398509481984', 36028797018963968', 72057594037927936', 144115188075855872', 288230376151711744', 576460752303423488', 1152921504606846976', 2305843009213693952', 4611686018427387904', 9223372036854775808', 18446744073709551616', 36893488147419103232', 73786976294838206464', 147573952589676412928', 295147905179352825856', 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lower temperature equilibrium was established for 16' and measurements were executed in the same manner.

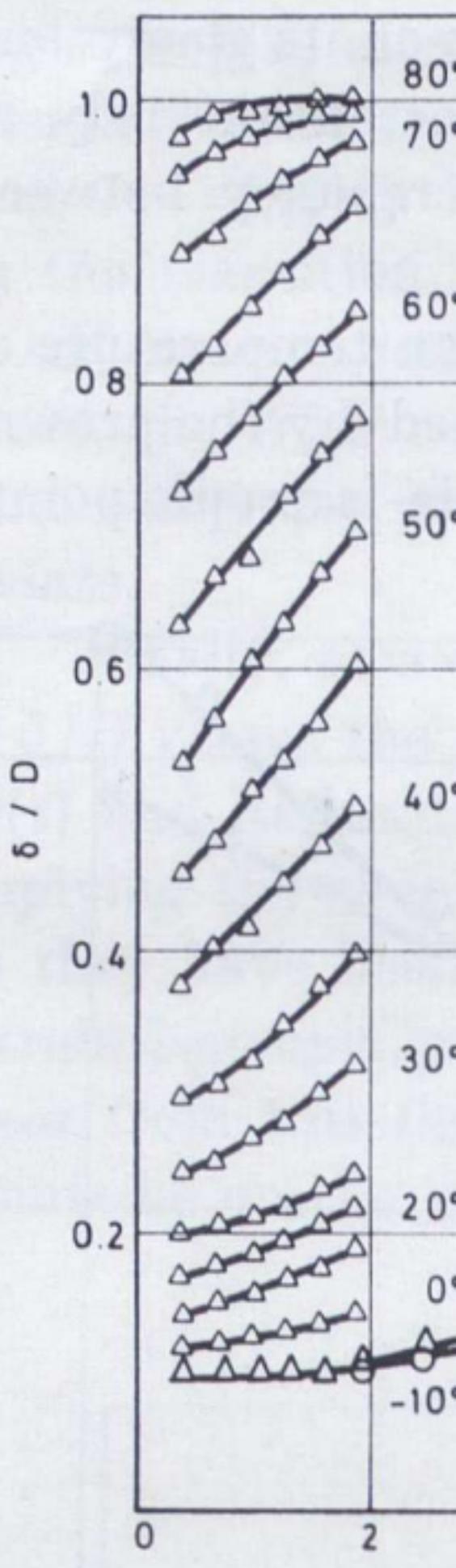


Fig. 28 Individual isotropic points δ^* versus the distance $\log T$.

Fig. 28 presents the isotropic points δ^* versus the relative position of reduced variable b/D . The data for the distribution of the method $b/D = f(\log T)$ gave the position of these isotropic points for the polymers there is no difference between the isotropic points. Since the method is instantaneous, it is coincident.

However, as shown in

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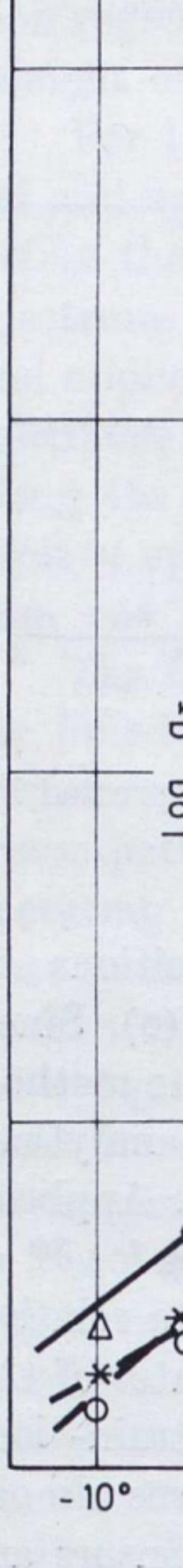


Fig. 29 Th
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W

were determined and plotted in Fig. 29. It is seen that the data for birefringence and viscosity region of viscoelasticity lie in a different region. The $\log a_T = f(T)$ along the corresponding curve traces and $C_2 = 56$ [¹¹]. In the transition region the WLF curve becomes more linear. As the strain increases, the WLF curve shifts towards the strain-isotropic points.

Finally, as a check on the δ/D versus the ratio $D(t)/D$ and its limit, the data applying the simple theory as they have been determined (strain-isotropic points) are clear from this figure. The points lie on the theoretical curve.

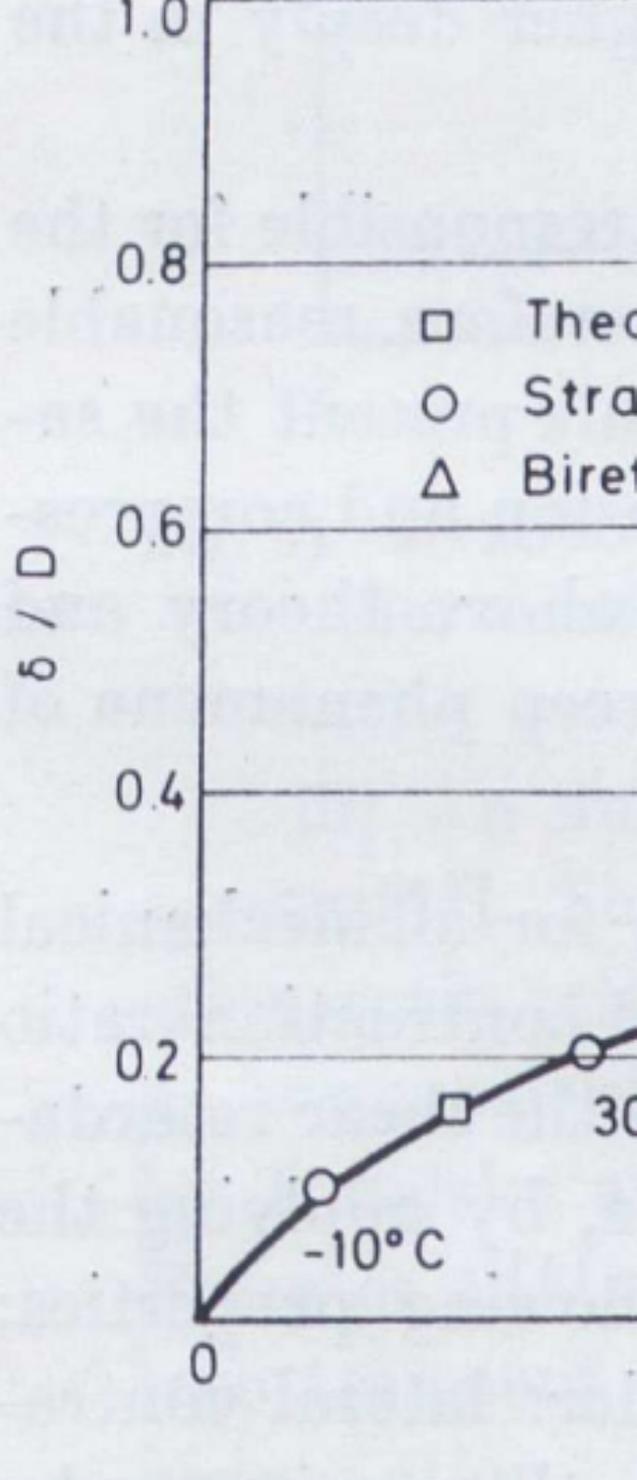


Fig. 30 Variation of δ/D versus the ratio $D(t)/D$ for rubbery plates. The data were plotted as shown.

It is instead of the viscoelastic than at room temperature (rubbery state) one of the

It has plasticized behaviour pre always in phenomenon. cally simple behaviour is of viour, it is haviour w

Thus values of the ple is only [49]. Under conditions may be n cover und relaxes m transition

It has deformation to accept me genera sibility te prove tha compressi

Fig. 3 characteri spectra w tion spect indirect m

i) When ction ratio except the gion. The ction and these curv

sented in the figure. The first curve is for a tension and the second for a shear. The curves are: ii) The width of the retardation spectrum increases with time and it diminishes with temperature. The retardation spectra.

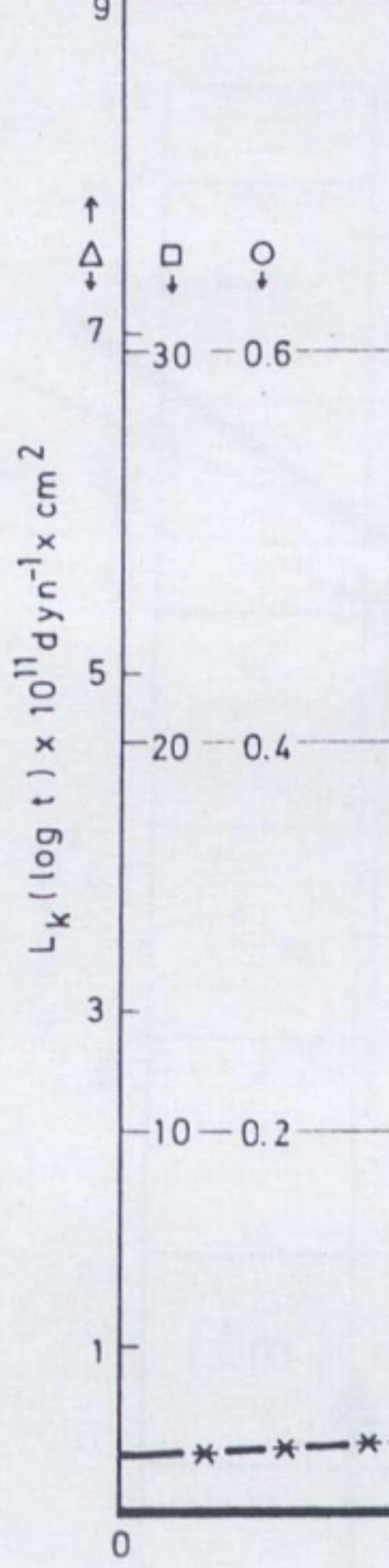


Fig. 31 Retardation spectrum for a cold-crystallized polymer.

iii) An analysis of the retardation spectra^[49]. The retardation ratio relaxation curves were calculated by Tobolsky and Ferry et al^[51] and converted into transient viscoelastic approximation of Ferry^[49]. From this figure the shear modulus retardation ratio relaxation

order: shear, tension.

Furthermore, increasing from extreme values to the order of the same material

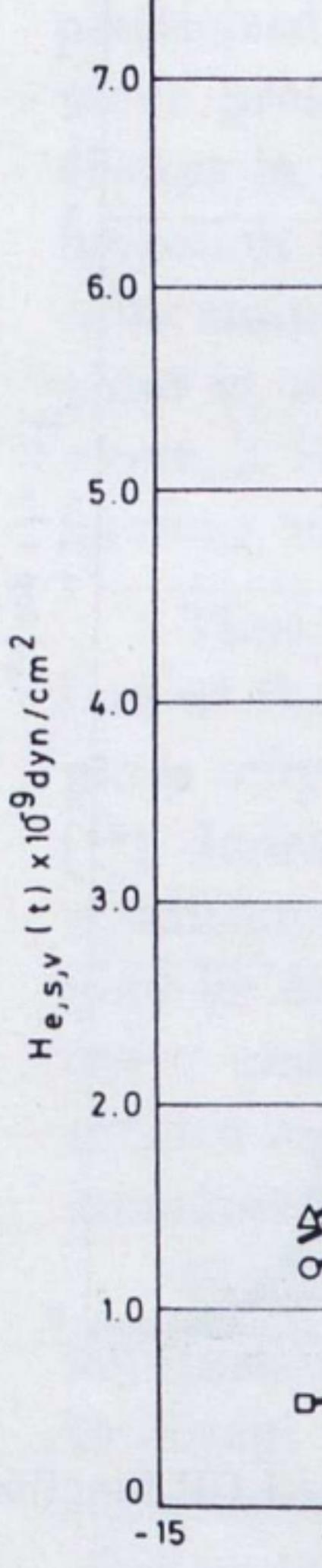


Fig. 32 Relaxation modulus $H_{e,s,y}(t)$ for the

mer in shear and tension. The molecular mechanism of the material

Indeed, in the absence of any deformation, a molecule is happy. The results in bulk, for different types of deformation, show that side-groups may

mechanisms. Above changes in the compliance. The bulk and interchange be

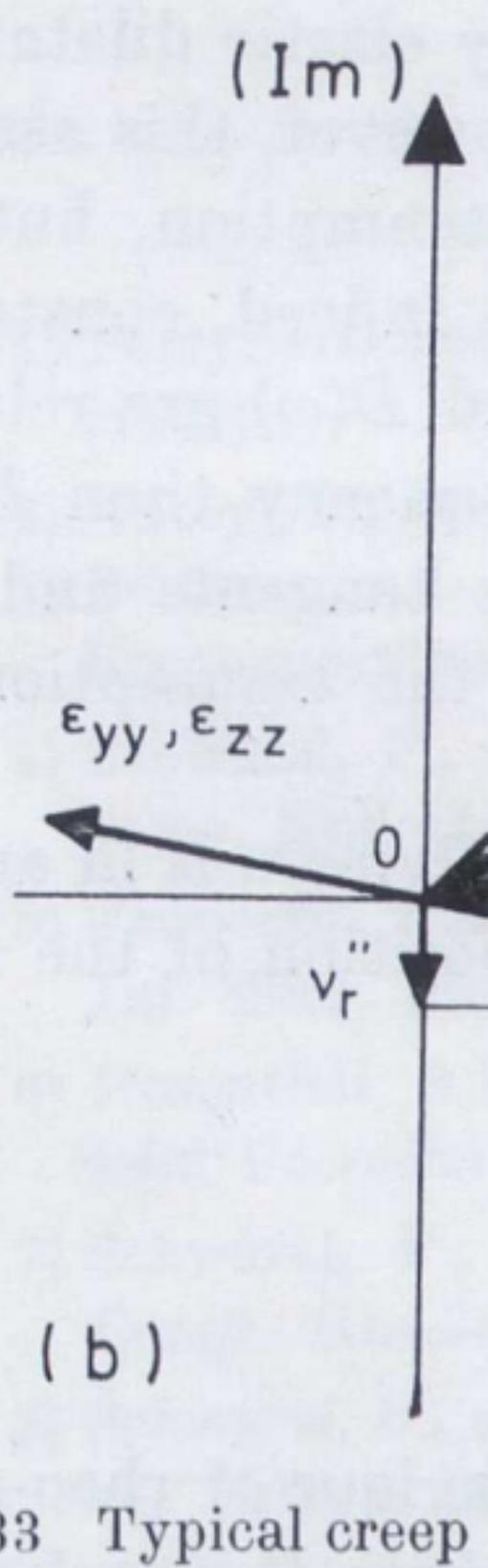
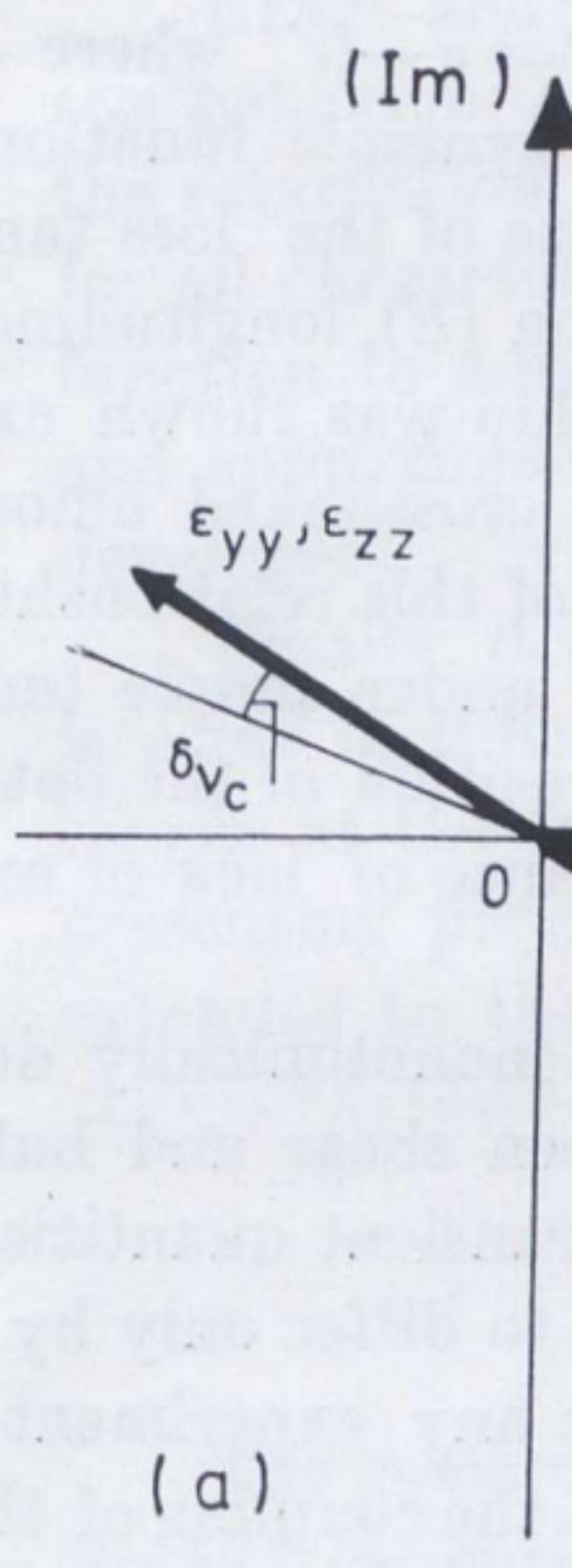


Fig. 33 Typical creep to simple tens the phase angl

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ΦΑΙΝΟΜΕΝΟ

ΣΥ

Ἔχει γίνεαι γὰρ
μοποιοῦμενα εἰς τὴν
καὶ τῆς διηλεκτρικῆς
μένου ὅτι ὑπάρχει
τῶν ἀναπτυσσομέ-
ἐπιβαλλόμενα ἐξω-
μενον ἀπολύτως ἐ-
σεις καὶ τὴν διπλο-
λόμενον φορτίον ἢ

Ἡ φωτοτασε-
τὴν μελέτην ἐλασ-
πλοδιαθλάσεως τῆς
μὲ τὴν ὑπὸ μελέτῃ
τοπίσεων ὁμοίων
φώνως πρὸς τὸν νό-
τερικῶς ἐπιβαλλο-
ὕλικά αἱ οἰκογένει-
συγχέονται εἰς μίαν

Ἐξ ἄλλου, ἔχου-
σιῶν τῶν χρησιμο-
ὑαλώδη αὐτῶν κα-
τιμαὶ διὰ πάσας τὰς
διὰ τὴν περιοχὴν
διὰ τὴν ὑαλώδη κα-
τῆς θερμοκρασίας
ἢ γενικὴ παραδοχὴ
σεις, ἀλλὰ καὶ καλ-

Εἰς τὰ πολυμ-
τῶν βισκοελαστικῶν
μοριακὰς διευθετή-
νικὴν παραμόρφω-
λαμβάνει ὄγκον πο-
εἰς κατάστασιν δια-
περιστρέφεται καὶ
ρει τὰς ἐν τῷ χώρῳ

εἰς μεγ
 ἄλυσιν
 πηδήσει
 σεις) εἶ
 εἶναι το
 ἀπεικον
 βαθμίδα
 τοπικῶν
 σεως τῶ

Ἐ
 μαζομέν
 κατωτέρ
 σιαστικ
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 ὄντος εἶ
 στάσεω
 παραμορ
 διὰ θερμ
 πολυμερ
 τούτου

Ἄ
 λυμερῶν
 μεταβατ
 καθορίζ
 κῶς κατ
 δευτερο
 δοελαστ
 ἢ ὀπτικ
 στοιχον
 νὰ εἶναι
 περιφορ

Πα
 δὲν ἀπο
 μερῶν τ
 μερικαὶ
 πτύσσον
 ἀπλοῦν
 σιακὴν
 Τοῦναντ
 νὰ αὐξάν
 μηχανικ

Μόνον φαινομενολογικώς
τὴν σχέσιν τὴν συσχέτισται
σχέσις αὕτη δύναται

Περαιτέρω, δεικνύται ὅτι
σαν μορφήν φορτίου καὶ
παραμορφώσεων καὶ
οὔτε εἶναι ἀπλῆς ἔκφρασις
Ἐκείνη διὰ τὰ ρευστά
δὲν εἶναι πολὺ ἀπλοῦς
ὑπεράνω τῆς μεταβολῆς
ἰσχυραὶ μεταβολαὶ
τοῦ χρόνου.

Εἰς τὴν ἐργασίαν
φραζόντων τὴν μεταβολὴν
ὕλικῶν. Δεδομένου
φωτοτασεομετρίας
ιδιοτήτων τῶν πολυμερῶν
καὶ οἰογεῖται ἐξ ἄλλων
μορφοῦνται μὲ τοὺς
κῶν, παρουσιάζουν
οὐσίαν, καὶ κατὰ τὴν
κοὶ νόμοι τῆς βισκοειδούς
δα ὕλικῶν.

Ἐν τῇ ἐργασίᾳ
τάς μηχανικὰς ιδιότητες
κῶν εἶναι συναρτησάμενος
ματος (T) καὶ τῆς
σιν δοκιμῶν ἐρπυσίου
($J(t)$) καὶ μεταβολῆς
ἀντίστοιχα μέτρα χρονο-
ῶγκου ($K(t)$) ὁρίσθησαν
ἐξισώσεων (σχέσεις)
τρων ἐνδόσεως καὶ
μονάδα, εἰς τὴν μεταβολὴν
εἶναι μικροτέρα τῆς

Ὅρίζεται ἐν σφαιρῇ
εἶναι ἢ αὕτη συνάρτησις
μηδενὸς καὶ τῆς τιμῆς

Βάσει τῆς ἀρχῆς
μεταβολῆς τῶν χαρακτηριστικῶν
αἱ ἐκφράζουσαι τὰς
ἀντιστοίχων μέτρων
δέουσαι μεταξύ τῶν

μεταβολί
ως κυκλ

Τέλ

τῶν συνδ
κοῦ ἐπιπ
ὅτι πᾶσα
στικότητ

κῶν φαιν

Ἐν

ἀρχῇ οἱ
λάρωσιν)
κῶν συν
συχνότητ
συνδεούσ
ζουν δια
στοίχων
ἐνδόσεωσ
σμάτων

Τὸ

Ἄρχῃ τῶ
ὅποῖαν β
ἐτέρας θ
τῶν χρόν
χαρακτη
ἀναγκαῖα
φῆς ἐξελ
πισιν τῆσ
ἢ ὅποῖα
τῆς κινήσ

Οὔτ

φάσματα
τοῦ λογα
βισκοελα
κύρια μέ
βισκοελα
βισκοελα
τήσεις εἶ
τελείως
ριοχήν, γ
κτηριστι
σίας, ἢ τ
χῆς.

Ἄπ

ριαί αὐταὶ καμπ
ἢ φθίνουσιν (διὰ
ἔχουν καὶ αἱ κύρι
τελεστοῦ. αἱ ὅπο
τῶν πολυμερῶν.

Στηριζόμενα
χαρακτηριστικὰς
ἐν τῷ ἔδαφίῳ μέ
ρᾶν ἀπλῶν ἀριθμ
μένων συνδυαζομ

Δίδονται χα
καὶ φασμάτων δι
πολυμερῶν καὶ σ

Ἐν τῷ τελε
τάσεων, παραμορ
μελετᾶται ἡ σχετ
διπλοδιαθλάσεως

Οὕτω, εἰς δι
ριαίως ὑπὸ δύο ἴσ
νίαν 90° , τὸ ἐν ζ
ἰσορροπίας διὰ τ
στασιν διὰ δύο φ

Διὰ μελέτης
ἐνὸς ἰσοτρόπου σ
περὶ τὸ κέντρον ἰ
συσχέτισις τῶν τ
τοῦτο πρόβλημα.
τοῦ ὑλικοῦ καὶ ἔχ
σημείων συναρτήσ
ἀκόμη καὶ διὰ τῶ
τῆς μηχανικῆς κα
Κατὰ συνέπειαν,
ἐμφανίζη ἐντονωτ







