

The relation between the values of the loss modulus and storage modulus master curves (at a certain frequency) is a measurement of the viscoelastic behavior of a system. The G''/G' -ratio depends on ω which leads to a viscoelastic master curve. The viscoelastic master curve represents the relation between the elastic and viscous ...

The resulting storage modulus and loss modulus master curves (reference temperature of 21.1°C) presented in Figure 2 show good agreement between the fractional viscoelastic model and experimental ...

Finally, master curves were developed by applying the time-temperature concentration superposition principle (TTCSP) to determine the storage modulus (E'), loss modulus (E''), and $\tan \delta$ over a wide range of frequencies for comparison with results reported for natural locust, dragonfly, and cockroach resilins.

Figure 7. Storage modulus (E') versus reduced frequency master curves of NR with or without hydroxylamine sulfate for 12 weeks, the insert figure is the shift factor as a function of temperature ...

Simultaneously, the master curve of storage modulus in Figure 9b shows a similar S-shaped growth trend with the master curve of dynamic modulus. The calculated master curve of storage modulus can extend over a broader reduced frequency range at an arbitrary temperature taken as a reference, which is employed to reflect the storage modulus of ...

Simultaneously, the master curve of storage modulus in Figure 9 b shows a similar S-shaped growth trend with the master curve of dynamic modulus. The calculated master curve of storage modulus can extend over a broader reduced frequency range at an arbitrary temperature taken as a reference, which is employed to reflect the storage modulus of ...

The user can export individual master curves with a simple click of a button, and the GUI forms a table containing a set of the most important information relevant to the tested material. An example of such a table is given in Table 2. The contents of this table were used to plot the storage modulus in the left part of Fig. 11.

Master Curve Construction: To create a master curve, we plot the storage and loss modulus at different temperatures as frequency functions on a log-log scale. We obtain a ...

G' Storage Modulus modulus data can then be shifted horizontally along the abscissa to overlap forming a smooth curve. This approach allows the generation of master curves of modulus data spanning considerably wider ranges of time (frequency) and/or temperature than the range of the original data (see figure 2). Master curves can be constructed ...

Master curve of storage modulus

Results of the performed master curve generation using 160 °C as a reference temperature: a) vGP plot, b) loss factor, c) storage modulus, d) loss modulus, e) temperature dependence of the horizontal shift factor, f) temperature dependence of the Poisson's ratio.

The work describes a way to obtain loss modulus and storage modulus master curves from oscillatory measurements of silicone oils. The loss modulus master curve represents the dependence of the viscous flow behavior on ω and the storage modulus master curve -- the dependence of the elastic flow behavior on ω . The relation between the values of the ...

A storage modulus master curve was derived by fitting experimental $E''(f)$ data to a sigmoidal function (Eq. 10, Methods). Notably, this function is not intended to represent a specific ...

Download scientific diagram | (A) Best rheology master curve of storage (solid squares) and loss modulus (hollow squares) of the TN sample at $T = 248$ K. (B) Storage and loss modulus master curve ...

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To overcome these deficiencies, this paper proposes two approaches to construct the master curves by using these exact K-K relations: (1) the exact K-K relations ...

Inside of the frame of Fig. 2 shows the storage modulus E'' versus time t (inverse of frequency) at various temperatures T ($T_1 \sim T_3$) for matrix resin. The master curve of E'' versus the reduced ...

for the storage modulus G'' and loss modulus G'''' as a function of the angular frequency at temperatures of 180 °C, 220 °C, ... The PMMA master curve in Figure 3 was generated from the rheological data displayed in Figure 2. To allow for more overlap and higher precision, additional measurement data was ...

Download scientific diagram | Master curves for storage and loss modulus at 20 °C for (a) PC and (b) VE from publication: Strain rate sensitivity of polycarbonate and vinyl ester from dynamic ...

The PFGs' rheological master curves of frequency (ω) dependence of the storage modulus (G''), loss modulus (G''''), and loss factor ($\tan\delta$) are presented in Fig. 3a, b.

The curves measured at temperatures lower than the reference temperature are shifted to higher frequencies in such a way that the individual curves of the storage modulus and the loss modulus overlap to the greatest possible extent with the corresponding composite curves so formed. In the same way, the curves measured at higher temperatures

Shifting of each isothermal curve results in a much larger, smooth continuous curve known as a master curve. It can be seen that this procedure results in a dramatic increase in the range of the time scale. The inset below

is known as the shift factor plot. The shift

Master curves of storage modulus for Mix-9.5 using the discrete relaxation spectrum with $M = 1$ from: (a) HN model; (b) 2S2P1D model. Figure 10 gives the master curves of the relaxation modulus and creep compliance for Mix-9.5 in the Prony series forms from the HN and 2S2P1D models. To verify the quality of the calculated Prony series parameters ...

Direct fitting of dynamic modulus is extremely difficult since the equation is the sum of storage modulus and loss modulus which cannot be directly expressed. Fitting dynamic modulus includes fitting the two components of dynamic modulus: Storage modulus and loss modulus. ... Therefore, to obtain a dynamic modulus master curve, ...

The PFGs" rheological master curves of frequency (ω) dependence of the storage modulus (G'), loss modulus (G''), and loss factor ($\tan \delta$) are presented in Fig. 3a, b. ...

storage modulus master curve from dynamic measure- ments, similar to the normal stress master curve from the steady-state measurements (Hadjistamov, 1992): $\sigma = f(\log \omega \cdot a/T) \cdot \tau$. (2) The silicone oils have up to ~ 1000 Pa different straight lines shifted in parallel towards higher values of ...

Rheological plots obtained as a result of the master curve generation method for the tested PS material: frequency-dependent storage (G') and loss modulus (G'') curves at T_{ref} ...

This amounts to explore a part of the master curve corresponding to frequencies lower than $\omega = 1$ while maintaining the temperature at T_0 . Conversely, lowering the temperature corresponds to the exploration of the part of the curve corresponding to high frequencies. For a reference temperature T_0 , shifts of the modulus curves have the amplitude ...

The calculated master curve of storage modulus can extend to a wider range, which is employed to reflect the storage modulus of bituminous materials incorporating SBS polymer and basalt fiber under varying numbers of F-T actions accurately. Besides, the overall storage modulus of bituminous mixes decreases with F-T cycles increasing to some ...

Unfortunately, these methods cannot comply with the LVE theory since the storage modulus master curve is developed solely without loss modulus test data. As a result, the generated discrete relaxation spectrum is inaccurate [9]. Note that the discrete relaxation spectrum only reflects partial viscoelastic properties of materials, and this ...

And then, both the storage modulus master curve of and loss modulus master curve were obtained. Finally, the creep and relaxation properties of warm mix crumb rubber-modified asphalt mixtures (HMA) were investigated by the creep compliance and relaxation modulus, respectively. 2. Test Specimen Preparation and Testing

The slope of the loading curve, analogous to Young's modulus in a tensile testing experiment, is called the storage modulus, E'' . The storage modulus is a measure of how much energy must be put into the sample in order to distort it. The difference between the loading and unloading curves is called the loss modulus, E''' . It measures energy lost ...

or the master curve model of the storage modulus is determined. To overcome this problem, some researchers use the approximate K-K relations proposed by Boojand Thoone to establish the connections

To overcome these deficiencies, this paper proposes two approaches to construct the master curves by using these exact K-K relations: (1) the exact K-K relations between the dynamic modulus ...

In order to assess the quality of the master curve, it is compared with ultrasonic wave test data, and is also checked by Kramers-Kronig relations. The frequency-domain master curve is used to calculate the continuous relaxation spectrum, and then the time-domain relaxation modulus is obtained. Prony series of 4-8 terms are commonly used in the ...

Figure 2 illustrates the master curve for two PSA samples⁷ measured at temperatures from -90 to 130°C and shifted to a reference temperature of 20°C. Relevant to the PSA performance is the frequency range from the glass transition to the flow region. Sample A has a higher storage modulus G'' and a lower $\tan \delta$, thus it has higher cohesive ...

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