Storage modulus after chain extension

ties of a single wormlike chain. The linear force-extension relation of a wormlike chain is obtained by the follow-ing argument. Consider a wormlike chain with one end clamped at fixed orientation at the origin. Apply a weak force fn (directed along the unit vector n) to the other end [12]. The configurational distribution function is then

This chain extension strategy significantly improved the mechanical performance of the resulting hydrogels. ... which was explained that the compression modulus became stronger as the storage time ...

Similar to the effect of PCDI, the addition of TNPP helped PLA chain relinking but did not lead to formation of branches [149]. In addition to TNPP, other phosphite-based CEs, such as ...

The above equation is rewritten for shear modulus as, (8) "G* =G"+iG where G? is the storage modulus and G?? is the loss modulus. The phase angle d is given by (9) " " tan G G d= The storage modulus is often times associated with "stiffness" of a material and is related to the Young"s modulus, E. The dynamic loss modulus is often ...

Abstract: In this study, an epoxy?type chain extender (KL-E4370) was used to modify the thermoplastic polyamide elastomer (TPAE). The rheological, crystalline, and foaming properties of TPAE before and after the chain extension were investigated using a rotating rheometer, differential scanning calorimeter and scanning electron microscope, ...

The storage modulus (E?) and loss modulus (E?) were obtained for each set of samples at four distinct time intervals, i.e., 72 h, 5 days, 10 days, and 15 days from the time of fabrication. The DMA resolutions for force and displacement readings are ...

The comprehensive balance of the mechanical, interfacial, and environmental requirements of waterborne polyurethane (WPU) has proved challenging, but crucial in the specific application as the binder for high-performance polymer fiber composites. In this work, a multi-step chain extension (MCE) method was demonstrated using three kinds of small ...

The recycled pellets were then dried in a vacuum oven at 808C for 12 h ready for chain extension in the twin extruder. ... The results of shear rheology revealed improvement of the storage modulus ...

The cross-over frequency of PET is shifted to lower values from 590 to 505 s -1 after modification which is due to increase in molecular weight after chain extension process. On the other hand, cross-over modulus of modified PET is decreased from 39 680 to 26 410 Pa which approve its broader molecular weight distribution.

As seen in Fig. 5, it can be observed that the storage modulus (G ?), loss modulus (G ??), and complex viscosity (i *) of GPP and MPP increased to a greater extent than those of PP. ...

The branched-chain structure increased the energy-storage modulus (G") and complex viscosity (i*), which are the key factors for the growth of cells, by 1-2 orders of magnitude. ... The Cole-Cole plot after the chain extension deviates from the trend of the tail rising at higher values of i" because the value of "i" increases ...

Melt flow rate of the modified PGA gradually decreased with increasing CEs contents, due to chain extension. The shear rheology data showed a remarkable increase in modulus and complex viscosity ...

The curves of viscosity (i *), storage modulus (G ... after chain extension was analyzed by di erential scanning . calorimetry (DSC). The nonisothermal crystallization behavior .

The viscoelastic data conclusively show the efficacy of such chain extender with more than 10-fold changes in the comparative values of the extruded sample storage modulus G" and as much as an ...

The ductile PCL provides a plasticizing effect to PLA, allowing chain mobility within the blend. With the addition of Joncryl at 0.1 and 0.3 wt.%, the storage modulus of ...

However, Balakrishnan et al. reported a limitation in this measurement because of the fast gelation of DDA-ChitHCl hydrogels--the gelation time could not be measured using oscillatory time sweep; nonetheless, the crossover point was still observed, and the storage modulus of the gel was higher than the loss modulus after gelling .

The storage modulus values are therefore significantly higher for the samples with Joncryl compared to PMDA. The results of this study show that chain extension with Joncryl proceeds better compared to the reaction with PMDA. ... As seen in Figure 4, chain extension with Joncryl ADR-4400 gives an increase in force measured during extrusion and ...

That means storage modulus is given the symbol G" and loss modulus is given the symbol G". Apart from providing a little more information about how the experiment was actually conducted, this distinction between shear modulus and extension modulus is important because the resulting values are quite different.

Fig. 2 shows the complex viscosity i *, the storage modulus G?, the loss modulus G? and the loss tangent tan d curves of the treated PA6 samples with chain extenders as a function of the frequency, respectively. The virgin PA6?s properties are ...

The results showed that the chain extension reactions lead to an increase in the storage modulus, complex viscosity, and molecular weight due to the formation of long chain branched structures. ...

The chain extension reaction between PBAT and chain extender (CE) were investigated by torque curves, gel

fraction and FTIR measurements. Comparing with torqued PBAT, the storage modulus of CE-PBAT2 specimen increased 3 orders of magnitude and their crystallization temperature rose from 72.5 to 87.2 ?.

In order to achieve a low modulus after crosslinking, sufficient chain extension must occur before crosslinking, i.e. thiol-ene coupling must outcompete acrylamide homopolymerization. A similar system examined by Cramer and Bowman involved small additions of monomeric dithiols, e.g. 1,6-hexanedithiol, to low MW diacrylates, e.g. 200 g/mol PEG ...

The molecular weight distribution of the product mixture after chain extension reaction was analyzed by SDS-PAGE (Mini-PROTEAN® TGX(TM) gels, 4-15%, BioRad) under non-reducing condition at 150 V. ... in the linear viscoelastic response of the protein gels through a small increase in the high frequency plateau of the storage modulus and the ...

In the DMA storage modulus tests in Figure 5 b, it can be seen that, in the process of temperature elevation from -100 °C to 100 °C, the modulus after the glass transition dropped faster and faster with the increased PCL content until the maximum was reached at the point of x/y = 6/4.

The storage modulus measures the resistance to deformation in an elastic solid. It"s related to the proportionality constant between stress and strain in Hooke"s Law, which states that extension increases with force. In dynamic mechanical analysis, we look at the stress (s), which is the force per cross sectional unit area, needed to cause an ...

The crossAover frequency and crossAover modulus of PET and PP before and after modification are listed in Table 3. The crossAover frequency of PET is shifted to lower values from 590 to 505 sA1 after modification which is due to increase in molecular weight after chain extension process.

The tensile strength and Young"s modulus of the PHBV/PBAT(60/40) blend were improved by 32% and 64%, respectively, after adding a combination of peroxide (0.02 phr) and chain extender (0.3 phr ...

Interestingly, the modulus recovery time in these tests are in the order of 10 2 s, around 2 orders of magnitude longer than the linear viscoelastic relaxation time t d, (?0.86 s) as obtained from the cross-over frequency between the storage modulus and the loss modulus (see Fig. 4) for the re-orientation of fully entangled chain over a ...

These results show the flaw sensitivity of PBS decreased after chain extension, indicating that pre-stretching improves the orientation of molecular chains, and the interaction between molecular chains is increased by increasing crystallinity. ... The relationship of angular frequency and storage modulus (a) and loss modulus (b) at 150 °C ...

The storage modulus of samples increases significantly and tends to the same value at high frequency after chain extension and blending, but there is a big difference at low frequency. The storage modulus at high

frequency is mainly affected by molecular weight distribution, while it ...

On the other hand, the storage modulus of sample 12 with two-step chain extension process by SAG-008/TGDDM exhibits a higher value compared with raw r-PET. This behavior can be attributed to the formation of gel structure by TGDDM which restricts the movement of molecules, and, hence, provides rigidity to the polymer chain.

PGBMSs were therefore synthesized via RAFT chain extension of PGBs, as shown in Scheme 1, Fig. 1, Fig. 2. ... Dynamic mechanical properties (storage modulus G? as a function of angle frequency) of PLA samples at 190 °C obtained from frequency sweeps and creep tests. (D) Dynamic mechanical (loss modulus G? as a function of angle frequency ...

The influences of chain extenders type on the properties of WPUs were investigated. The average particle size of WPU dispersions with post-chain extenders was larger than that of WPUs ...

storage modulus of modifiedTPAE, which could accelerate recovery of strain. The foaming temperature zone and recovery performance of all modifiedTPAE samples were significantly ...

On adding 3 wt% of the chain extender, the content of amino end groups is decreased from 30.6 to 5.8 mmol g ?¹ and the yield strength and elastic modulus of chain-extended PA6 exceed those ...