Storage modulus crosslinking degree

Do viscoelastic properties of cross-linked polymers affect cross-link density?
The viscoelastic properties of polymers such as the storage modulus,the loss modulus,and the loss tangent show a positive exponential relationwith the apparent cross-link density. This work may shed some light on the relevant experimental and theoretical studies on cross-linked polymers.

Does cross linking increase the storage modulus?
Cross linking increases the interconnection between different long back bone chains,leading to an increase in the elastic energy (stress applied and strain) or storage modulus of the polymer. Cross linking brings about a decrease in chain mobility.

How does crosslink density affect a three-dimensional network structure material?
The crosslinked density of the three-dimensional network structure material is directly related to the mechanical properties of the material. The increase in crosslink density usually corresponds to higher strength and modulus,with a corresponding reduction in toughness[22,23].

How do you find the density of crosslinks in a polymer?
Zibiao Li The density of crosslinks in a polymer can be experimentally obtained by the equation d = E r 3 R (T g +40),where d = crosslinking density per unit volume (mol m-3),E' r represents the storage modulus in the rubbery plateau (MPa),R is the universal gas constant,and Tg is the glass transition temperature [42,43].

Do high cross-link density networks improve mechanical performance?
At room temperature,the networks of higher cross-link densities demonstrated substantial enhancementsin mechanical performance when compared to their counterparts with lower cross-link density. Meanwhile,networks with a high cross-link density have a high content of dynamic bonds.

Does increasing cross-link density reduce temperature sensitivity of processable covalent network polymers?
Conversely,augmenting cross-link density tends to reducethe temperature sensitivity of processable covalent network polymers. In this work,we simultaneously augmented the number of dynamic bonds and cross-linking sites,with the process further enhanced by the catalytic influence of the amidine-urea bond on the oxime-carbamate bond.

Depending on the temperature at crosslinking, the storage moduli for GelMA derived from pigs, cows, and cold-water fish range from 723-7340 Pa, 516-3484 ...

Thermoset shape memory polyimide shows higher Tg and storage modulus, better shape fixity than thermoplastic counterpart due to the low-density covalent crosslinking and the ...

The degree of crosslinking is directly related to the stiffness of crosslinked PE. Consequently, the degree of

crosslinking of PE can be ...

Three-dimensional (3D) bioprinting is a highly effective technique for fabricating cell-loaded constructs in tissue engineering. However, the versatility of fabricating precise and complex ...

Phenolic resins (PF), naphthol modified phenolic resins (NPF), and cyanate ester modified phenolic resins (CEPF) were constructed where ...

The resulting crosslink density is reproducible (similar swelling ratio compared to a 0.5% triamine crosslinked sample (?e = 1 × 10 5 mol/cm 3)) and renders CP2 5 usable in the shape ...

Young""s modulus increases as the cross-linking degree increases, as the increase in the network connectivity makes the material harder. The ESO20 system exhibits the highest Young""s modulus at ...

Thermosets can have different properties depending on the crosslink densities. The figure below depicts the effects of crosslinking on the ...

Based on these results, we hypothesize that the mathematical model can successfully predict crosslink density by knowing possible polymer-polymer interactions associated with the ...

The universal relationship between the elastic modulus and the cross-link density of a conventional rubber/gel has been demonstrated ...

Rheological Properties of Coordinated Physical Gelation and Chemical Crosslinking in Gelatin Methacryloyl (GelMA) Hydrogels

Swelling is a method that can be used to directly determine the degree of crosslinking of a lignin-modified material with network structure. The calculation of the crosslinking density by the swelling ...

Storage modulus (G") is directly related to the crosslink density (Vc) according to the following equation: G"= (Vc)RT where R is the gas constant and T is the ...

A broad range of degrees of crosslinking, from 1.7 up to 74 mol% of reacted hydroxyl groups, was achieved. The variation of the thermal and mechanical properties of PVA with the ...

The viscoelastic properties of polymers such as the storage modulus, the loss modulus, and the loss tangent show a positive exponential ...

Polyurethane (PU) is a versatile polymer with many applications in a wide range of products. A novel 3D printing technology called liquid additive manufacturing (LAM) extended its ...

Storage modulus crosslinking degree

To investigate the influence of the crosslinked polyethylene (XLPE) structure on electrical performance, various analytical methods were employed to study polyethylene structures with different degrees of ...

The crosslinking densities of the cured tung oil-based epoxy resins are calculated from the storage modulus-temperature curves according to eqn (1) and ...

Different crosslinking methods can be employed to obtain these polymeric structures, the major classifications being physical crosslinking and covalent ...

Determining the degree of crosslinking of ethylene vinyl acetate ... The increase in storage modulus can thus be attributed to the activation of the crosslinking and the subsequent formation of a three ...

The water absorption capacity (WAC), and the fundamental parameters of polymer network such as molecular weight between cross-links (M c), cross-linking ...

itively calculated using both rheological and DMA measurements. In this application note, we elaborate in detail on how to set up a rheological test method to measure the modulus of a thermoset in the ...

The degree of crosslinking is directly related to the stiffness of crosslinked PE. Consequently, the degree of crosslinking of PE can be conveniently evaluated using the storage modulus to establish the ...

As such, controlling the cross-link density allows for a degree of control over the elastic modulus. Previous research has evaluated the elastic ...

The crosslink structure (including crosslinked molecular structure and crosslink density) of each cured product was determined by infrared spectroscopy and dynamic mechanical analysis. ...