Storage modulus and cross-linking

Borax-PVA hydrogels with excellent mechanical properties are prepared by simple physical mixing of polyvinyl alcohol (PVA, thickener) and borax (cross-linking agent) at room temperature. The resulting hydrogel is a three-dimensional structure composed of boric ester bonds as physical crosslinking points. Thus, the spatial structure, swelling properties, ...

The functionality f is the number of strands linked to a cross-linker. The density î e is related to the density of effective junctions n e (in mol m-3) using the following equality:21 From eqs 2 and 3, the elastic modulus is expected to be proportional to n e at constant temperature, but as well as proportional to T at constant n e.

The elastic modulus at 90% cross-linking is 9% higher than the experimental value. The Poisson"s ratio was not affected by cross-linking percentage. 3. The elastic modulus of the h-BNNS reinforced DGEBA/DETDA increases with the weight percentage of the h-BNNS. EP80 increased by 22.7% when 1 wt.% of h-BNNS was added, and it increased by 42.23% ...

The storage modulus was higher than the loss modulus for LLDPE-V(0.6) and LLDPE-V(1.2) and no cross-over point was observed in the frequency range tested. This behavior is characteristic of cross-linked materials. Based on rheological measurements, LLDPE-V(1.2) had the highest cross-link density as it had the largest storage modulus.

where m t is the weight of the swollen sample at time t and m o is the initial weight of the dry sample.. 2.2.3. Cross-Linking Density Determination Using Swelling Experiments Flory-Rehner Theory. A weighed amount of about 500 mg of v-CD:PMDA (200 mg in the case of the NS with v-CD:PMDA molar ratio of 1:2) was dispersed in 10 mL of deionized water in a 10-mL test tube ...

As observed in Fig. 9, storage modulus (E?) is higher in both glassy and rubbery regions of D *-15 latex films in comparison with D *-5 latex films. Also, these results confirmed the SSA analysis results. The cross-link reaction leads to the storage modulus enhancement in both the glassy and rubbery plateau of each series . The excessive ...

Figure 8B shows that dual cross-linking using photocross-linking with FeCl 3 resulted in higher elasticity than photocross-linking GelMA and GelMAGA without FeCl 3. At low strain (1%), all samples displayed higher storage modulus and with increasing strain (100%), the storage modulus was reduced, while the loss modulus increased.

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