Storage modulus diagram analysis

What is storage modulus?

The storage modulus,either E' or G',is the measure of the sample's elastic behavior. The ratio of the loss to the storage is the tan delta and is often called damping. It is a measure of the energy dissipation of a material. Figure 2.

What is storage modulus in tensile testing?

Some energy was therefore lost. 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.

What is storage modulus & loss modulus?

Consequently, the storage modulus is related to the stiffness and shape recovery of the polymer during loading. The loss modulus represents the damping behavior, which indicates the polymer's ability to disperse mechanical energy through internal molecular motions.

What is loss modulus G?

The loss modulus G" (G double prime,in Pa) characterizes the viscous portion of the viscoelastic behavior,which can be seen as the liquid-state behavior of the sample. Viscous behavior arises from the internal friction between the components in a flowing fluid,thus between molecules and particles.

Why do viscoelastic solids have a higher storage modulus than loss modulus?

Viscoelastic solids with G' > G" have a higher storage modulus than loss modulus. This is due to links inside the material,for example chemical bonds or physical-chemical interactions (Figure 9.11). On the other hand,viscoelastic liquids with G" > G' have a higher loss modulus than storage modulus.

What is the modulus of a sinusoidal force?

Because we are applying a sinusoidal force,we can express the modulus as an in-phase component,the storage modulus,and an out of phase component,the loss modulus,see Figure 2. The storage modulus,either E' or G',is the measure of the sample's elastic behavior. The ratio of the loss to the storage is the tan delta and is often called damping.

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Thefirstoftheseisthe"real,"or"storage,"modulus,defined astheratiooofthein-phasestresstothestrain: E =s 0/0 (11) Theotheristhe"imaginary,"or"loss,"modulus,definedastheratiooftheout-of-phasestress tothestrain: E =s 0/0 (12) Example 1 The terms "storage"and "loss" can be understood more readily by considering the ...

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