RELAXATION MECHANISMS OF LINEAR POLYMERS VERSUS 3-ARM STAR POLYMERS, OBTAINED BY COUPLING 2 OR 3 ARMS OF THE SAME MOLECULAR WEIGHT

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We investigate the rheological behaviour of several sets of linear (or 2-arm) and 3-arm star molecules of PBd obtained by coupling of 2 or 3 arms of the same molecular weight. With entangled molecules, we therefore expect identical contour length fluctuations process in both systems. This allows us to isolate the influence of the reptation process of the linear polymers, to discuss its importance, and to confront these results with predictions obtained by using a tube-based model.[3] In particular, we show that linear samples containing few entanglements relax nearly only by CLF.

With non-entangled linear and star molecules, while their linear viscoelastic properties is theoretically described by the same Rouse time[1,2], we observed a significant difference between their relaxation times, the star relaxing more slowly.

References

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