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INFLUENCE OF BRANCH STRUCTURE OF LLDPE ON RHEOLOGICAL PROPERTIES

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Melt elasticity is one of the most important properties in processing of LLDPEs (especially in film blowing process) which can be controlled by branch structure of the polymer.

In the present work the linear viscoelastic properties of six types of Ziegler-Natta based LLDPE with relatively similar molecular weight and molecular weight distribution but different branch structures have been investigated by rheometric mechanical spectrometer over the wide range of frequencies at different temperature.

It has been shown that the ratio of linear chains to high branched chains (LC/HBC) has significant effect on viscoelastic properties of LLDPE samples such as shear viscosity component in Cole-Cole diagram. Moreover it has been found that LC/HBC ratio plays a significant role on relaxation spectra due to changing the entanglement mechanism from intra to inter molecular one.

The effect of LC/HBC ratio on viscoelastic parameters such as modulus components passes through a critical point which thereafter strong changes would be occurred in the mentioned parameters.