Title: **Structural correlation of branching estimation with mechanical, optical and thermal characteristics of mLLDPE**

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References:

Reference 1: Lukas Göpperl, Daniel Pernusch, Julia Schwarz, Christian Paulik, Impact of polymerization process parameters on improved comonomer incorporation behavior in Ziegler-Natta catalysis, Macromolecular Reaction Engineering, 2021, 16, 2100042. https://onlinelibrary.wiley.com/doi/10.1002/mren.202100042

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Abstract:

Note: maximum length of 400 words.

Gel Permeation Chromatography (GPC) investigation performed for estimating the short chain branching (SCB) present in the mLLDPEs synthesized using 1-butene and 1-hexene as comonomers. The incorporation of the comonomer in the polymer backbone give rise to short chain branches which has significant effect on the polymer properties [1] and consequently their applications. GPC studies shown that mLLDPE with hexene comonomer have high concentration of short chain branching than its butene counterpart. We have investigated the mechanical properties of the blown film of same thickness extruded from the mLLDPE made using butene and hexene comonomers. The dart impact of the hexene incorporated mLLDPE film is 4-5 times higher than the butene incorporated mLLDPE film. The tear strength for the hexene film is better than the butene film. Both the films have comparable tensile strength and elongation at break. A lower haze is observed for MLLDPE with butene comonomer. Correlation of the short chain branching present in both the mLLDPEs with their properties indicate the key role of SCB in governing the mechanical and optical properties of mLLDPE films. The high concentration of SCB in hexene incorporated mLLDPE provide better film performance. The fundamental understanding gained is beneficial in tuning the mLLDPE properties for different applications.