

COPOLYMERISATION OF ETHENE/PROPENE WITH 1-PENTENE

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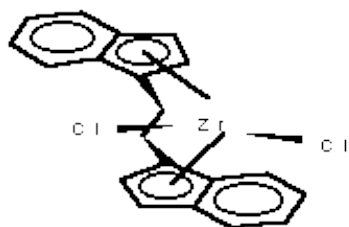
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ABSTRACT

Ethene is commercially copolymerised with higher α -olefins to yield LLDPE (Linear Low Density Polyethylene). 1-Butene or 1-hexene is used as comonomers. There are only a few reports on the use of 1-pentene.

1-Pentene is a major byproduct of the Fischer-Tropsch process, which on the technical scale is only performed in South Africa. A first use of 1-pentene as comonomer on polyethylene has been reported by Sumitomo Chemicals

[1]



We report here on the copolymerisation of ethylene with 1-pentene. Samples with different 1-pentene content have been prepared using the metallocene $(\text{Et}(\text{Ind})_2\text{ZrCl}_2)$ [1].

These samples have been analyzed by DSC, NMR-spectroscopy, gel-permeation chromatography and infrared spectroscopy. A strong influence on the molecular weight distribution and the average molecular weights M_n and M_w can be observed with increasing 1-pentene content. Increasing the proportion of 1-pentene leads to a reduction in the melting point of the copolymer.

The copolymerisation of propene and 1-pentene using [1] has also been investigated. Similar to previous results a reduction in the melting point can be observed with the increasing 1-pentene proportion of the copolymer. There is also a definite correlation between the amount of 1-pentene incorporated in the copolymer and the molecular mass of the copolymer.