

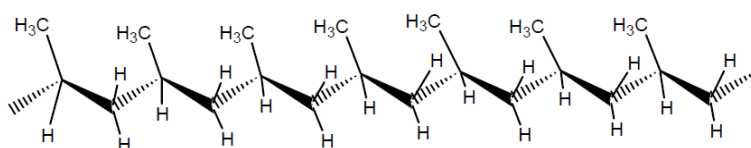
Influence of Tacticity on Structural Ordering of Isotactic Polypropylene under Annealing

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Supporting information: In this work, Ziegler-Natta catalyst iPP (ZN) with three different tacticity and one more iPP synthesized with Metallocene catalysis are investigated. Ziegler-Natta catalysts are mixtures of metal halides and aluminum alkyl halide co-catalysts. They can combine in a variety of ways resulting in coordination complexes with multiple active sites. These catalysts produce products with a broader distribution of chains than one would expect from a single active center, and the resulting polymers generally have a broader distribution of properties. In a pure isotactic polypropylene the orientation of the monomer during addition is always the same, i.e., all the methyl groups lie on the same side of the chain, as following



All the ZN samples were polymerized with heterogeneous MgCl₂-supported catalysts with

triethylaluminum and alkoxysilanes as cocatalysts. The ZN samples were polymerized in liquid propylene, where liquid propylene and hydrogen were fed into a stainless steel autoclave. Then the autoclave was heated to a polymerization temperature chosen from 70 to 80 °C and kept at the temperature for 1–2 h with stirring. The reaction was stopped by venting the monomers. The catalyst system, polymerization temperature, and hydrogen concentration were properly chosen to obtain the samples with different isotacticity and M_w as listed in Table 1. In order to remove the portion of atactic PP, all samples were dissolved in hot xylene, and the insoluble portions were recovered at 25 °C for use in this study. Stereo-regularity and molecular weight of the samples was characterized by ^{13}C solution-state NMR and GPC method, respectively.