

Molecular Level Study into Protonated and Deuterated Polyolefin Blends by Solid-State NMR

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Recycling different plastics post-consumers causes downgraded performance due to the physical and chemical property differences conflicting with one another. These properties stem from the incompatibility of the blends to crystallize and blend. As there are millions of tons of waste every year, the ability to effectively blend two plastics such as polyethylene and polypropylene becomes crucial. In this poster, a molecular-level study of polyolefin blend co-crystallization will be explored by utilizing solid-state NMR spectroscopy. It is through NMR spectroscopic techniques and the use of selectively activating various parts of the blend through isotopes that aspects of the arrangement can be made. We will conduct studies into the co-crystallization of the blends utilizing deuterated polymers to access the chain-to-chain interface differences. This will give us the ability to see the relative extent of interaction as well as providing overall system kinetics. From these experiments, a diagram of the co-crystallization structure can be made as well as a defined system to analyze crystallization.

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