FLOW INDUCED CRYSTALLIZATION OF IPP IN PRESENCE OF A SELF ASSEMBLING NUCLEATING AGENT

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Additives play an important role in physical properties of polymers. One of the most frequently used additives for isotactic polypropylene (iPP) is Bis 3,4-dimethylbenzylidene sorbitol (DMDBS). iPP and DMDBS together form a binary mixture with a monotectic phase diagram. Only at relatively high temperature the system exists as a homogeneous solution of the two components. Upon cooling, the additive self-assembles forming nano-fibrils which are an excellent substrate for heterogeneous crystallization of iPP. Consequence to it, nucleation density is so high that the formed crystals are smaller than wavelength of light resulting into a translucent material (clarification effect). In this paper we explore structural development during crystallization of the binary system iPP-DMDBS under defined flow conditions. It is shown that once phase separation has occurred the application of shear produces high degrees of lamellar orientation.