Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Crystallization Behavior of Inter-Chain H-Linked Isotactic Poly(propylenes) from their Quiescent Melts ANINDYA GHOSAL, RUFINA ALAMO, Florida Agricultural and Mechanical and Florida State University College of Engineering, Department of Chemical Engineering. Tallahassee, Fl 32310 — Copolymerization of propylene with 1,9 decadiene using an isospecific metallocene catalyst leads to isotactic poly(propylenes) with H-type intermolecular linkages and enhanced melt strength. In this work we discuss the effect of very small concentrations of diene (0 - 400 ppm) on the crystallization behavior of poly(propylenes) from their quiescent melts. The H-linkages shift the high end of the molecular weight distribution to higher values leading to a significant enhancement of the primary nucleation density, as a consequence, the overall crystallization rates increase up to 25 times with respect to the homopolymer. However, except for a small molecular mass effect, the spherulitic linear growth rates that are led by secondary nucleation, are basically unaffected by the presence of the diene, reflecting the small changes in the overall fractional content of defects induced by copolymerization at these levels. In addition, structural changes caused by the H-linkages led to 10 –15 % higher contents of gamma crystals at any isothermal crystallization temperature studied. This increase cannot be associated with the nucleating activity of the diene because iPPs with common nucleating agents display the same content of gamma crystals as the non-nucleated material.

Rufina Alamo
Florida Agricultural and Mechanical
and Florida State University College of Engineering
Department of Chemical Engineering. Tallahassee, Fl 32310

Date submitted: 04 Dec 2004

Electronic form version 1.4