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Unusual Temperature Dependence of the Growth Rate of a Bromine Substituted Polyethylene RUFINA G. ALAMO, WEI ZHANG, LAURA SANTONJA, Florida State University, FAMU-FSU College of Engineering, EMINE BOZ, KENNETH B. WAGENER, University of Florida, Department of Chemistry — Precisely halogenated polyethylenes are unique polyolefins with a halogen placed on and every "n" number of backbone carbons. Contrasting random analogs, precision systems are highly crystalline developing spherulitic morphologies due to a crystallization pattern similar to that of a homopolymer chain. The halogen is accommodated in the crystalline regions as a defect that strains the chain packing proportionally to the van der Waals radius of the halogen. In the present work, we have studied the temperature dependence of the linear growth rates of a bromine substituted polyethylene on each and every 21^{st} backbone carbon. The linear growth rates display a discrete minimum with decreasing temperature at a crystallization temperature of 64.5 °C which is reminiscent of the minimum in crystallization rate observed in long chain *n*-alkanes. The spherulitic morphology and overall positive birefringence remains unchanged. The minimum in growth rate is analyzed on the basis of self-poisoning at the growth front resulting from frequent but unstable disordered chains depositions that accommodate the Br atoms.

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