

Abstract Submitted  
for the MAR12 Meeting of  
The American Physical Society

**On the Width of the Crystallization Process** ANDREW OCHOA, MIRCEA CHIPARA, The University of Texas Pan American — Differential Scanning Calorimetry (DSC) is the most frequently used experimental techniques for the study of crystallization process in polymers and polymer-based nanocomposites. The experimental data are discussed within various theoretical approaches. Isothermal crystallization studies are typically discussed within the Avrami theory of phase change. However, the as recorded experimental data represent the time dependence of the derivative of the crystallinity degree (versus time) rather than the crystallinity degree. From the experimental point of view, the DSC parameters that are considered are the DSC peak position, the area under the DSC curve, and an empirical not very well defined onset temperature. However, all experimental data points are involved in the Avrami analysis after integration (in the Avrami analysis of the dependence representing the degree of crystallinity versus time). However, no effort has been done to understand the significance of the width of the as recorded DSC spectrum. A detailed analysis of the significance of the width of the DSC spectrum is presented. The connection between the width of the DSC spectrum and the exponent of the Avrami equation is analyzed in detail for the case in which nucleation is negligible. Tentatively, the as obtained results are extended to non-isothermal crystallization kinetics, recorded for various heating rates and to the Ozawa treatment of crystallization of polymers in non isothermal conditions.

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Date submitted: 23 Nov 2011

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