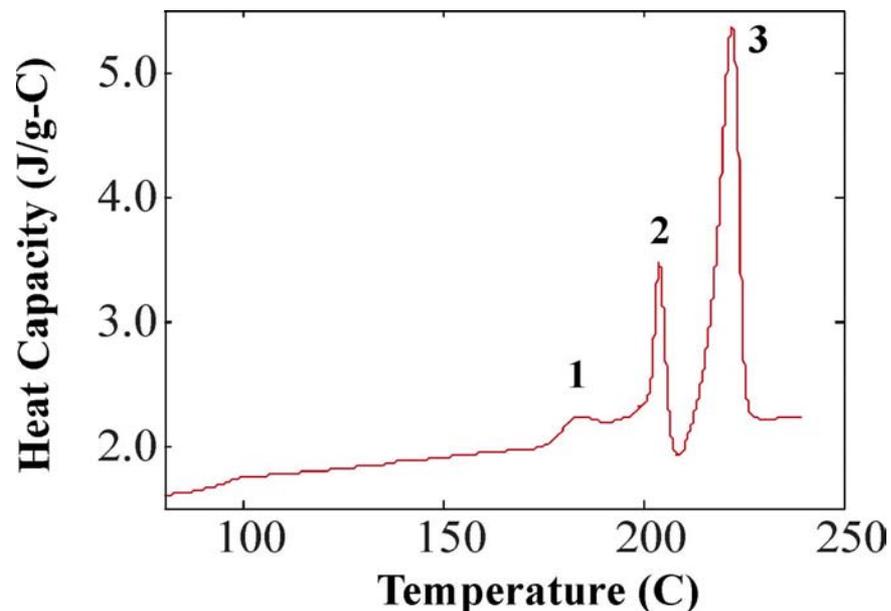


Semicrystalline Polymers under Confinement as Thin Films

Peggy Cebe, Tufts University, DMR-0100646

Polymers that contain crystals are used in advanced applications including the automotive, aerospace and electronic industries. The crystals are stable until the temperature rises to the point where they begin their melting transition, changing from solid to liquid. Many polymers first melt a little, and then the just-melted part may crystallize quickly again to achieve a more stable form. Examination by thermal analysis shows several consecutive melting peaks, as in the accompanying figure by the peaks marked 2 and 3. By careful analysis we were able to show that peak 1 comes not from the crystals melting, but instead represents a relaxation of a non-crystalline phase in the material. Results are shown for isotactic polystyrene polymer, with crystals initially grown at 170 C for 4 hours.



The figure above is based on work published by Hui Xu and Peggy Cebe, "Heat Capacity Study of Isotactic Polystyrene: Dual Reversible Crystal Melting and Relaxation of Rigid Amorphous Fraction" *Macromolecules* 37(8), 2797-2806 (2004).

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Education and Outreach to the Deaf and Hard of Hearing

Prof. Peggy Cebe visited both Gallaudet University and Rochester Institute of Technology as part of an outreach to the deaf and hard of hearing. Gallaudet is the nation's only liberal arts university for the deaf, and RIT has, as one of its colleges, the National Technical Institute for the Deaf. At Gallaudet, Prof. Cebe attended a class in organic chemistry, then met with students majoring in the sciences. At RIT, (Fig. a) Prof. Cebe (standing L) through the ASL interpreter (standing R) gave a lecture titled "What Superman Sees with X-ray Vision" to an audience of about 25, comprising undergraduates, and faculty from the NTID



and department of physics. After the lecture, (Fig. b) Prof. Cebe (shown facing the students, with ASL interpreter at her left) met with deaf and hard of hearing students majoring in biology, biotechnology, chemistry, and computer science.