Abstract Submitted
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Uper Limit of Superheating in Polymer Crystals Revealed from Linear Heating Covering Seven Orders of Magnitude in Heating Rate CHRISTOPH SCHICK, University of Rostock, Germany, ALEXANDER MINAKOV, General Physics Institute, Moscow, Russia, ANDREAS WURM, University of Rostock, Germany — We report about superheating of polymer crystals on linear heating covering the scanning rate range from 0.02 to 1,000,000 K/s. Results obtained by super-fast scanning calorimetry using a thin film sensor [1] are combined with results from DSC. On slow heating semicrystalline polymers tend to recrystallize (reorganize) significantly fast. From previous measurements the onset of melting of isothermally crystallized samples can be attributed to the rising flank of the first melting peak, which is often called the annealing peak, rather than to the peak maximum. The later depends on the counterbalance of melting and recrystallization. Melting kinetics is described by the power law of superheating: $\sim (T - T_{cr})^{\alpha}$ with $\alpha < 0.2$, which does not correspond to the heat transfer but rather to a nucleation process [2]. At high heating rates superheating saturates. The power law behavior and the saturation of superheating will be discussed. 1. A.A. Minakov, C. Schick, Rev. Sci. Instrum. 78 (2007) 073902. 2. A.A. Minakov, A. Wurm, C. Schick, Europ. Phys. J. E, 23 (2007) 43.

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