Abstract Submitted
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The Equilibrium Amorphous Fraction of Polymer Crystals BUCKLEY CRIST, Northwestern University — Knowledge about disordered surfaces is important to the understanding of both melting and crystallization of polymer crystals. The concept of a surface roughening transition is well documented in atomic crystals; at sufficiently high temperatures, the entropic effects of a rough surface overcome the enthalpic penalty associated with atomic scale asperities. Similar effects operate when chain-like molecules crystallize. We concentrate fist on the basal surface perpendicular, or nearly perpendicular, to the molecular axes in extended chain crystals. In one case the positions of the chains are ideal, but liquid-like conformational defects are permitted near the surfaces. In the second case we add axial positional disorder to individual chains. Both models predict temperature-dependent equilibrium non-crystalline surface zones, the size of which depends on assumptions about surface defect free energy. This study is concludes with some comments about the equilibrium non-crystalline component of folded chain crystals.

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