

Abstract Submitted
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Depletion forces in collapsing a flexible chain molecule in a confined or free space CHANIL JEON, BAE-YEUN HA, University of Waterloo — A chain molecule can be entropically collapsed in a crowded medium whether confined or not. Qualitatively, the entropic (depletion) forces between monomers can be considered as effectively reducing the solvent quality, eventually making the excluded volume v negative. Here, we characterize these forces in collapsing a flexible polymer in three distinct spaces: free, cylindrical, and (2-dimensional) slit-like. A few general features characterize flexible-chain collapse. Let ϕ_c is the volume fraction of crowders of size a_c each (in units of the monomer size). In all three cases, chain compaction depends on a single parameter, i.e., the ratio ϕ_c/a_c ; there also exists a general relationship between ϕ_c/a_c and v . Our results suggest that the action of depletion forces is local and insensitive to the geometry of a confined space, as assumed in an effective-solvent picture. They also offer a physical sense of average crowder sizes in a poly-disperse crowded medium.

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