

Supporting information for article:

## **Atomistic Molecular Insight into the Time Dependence of Polymer Glass Transition**

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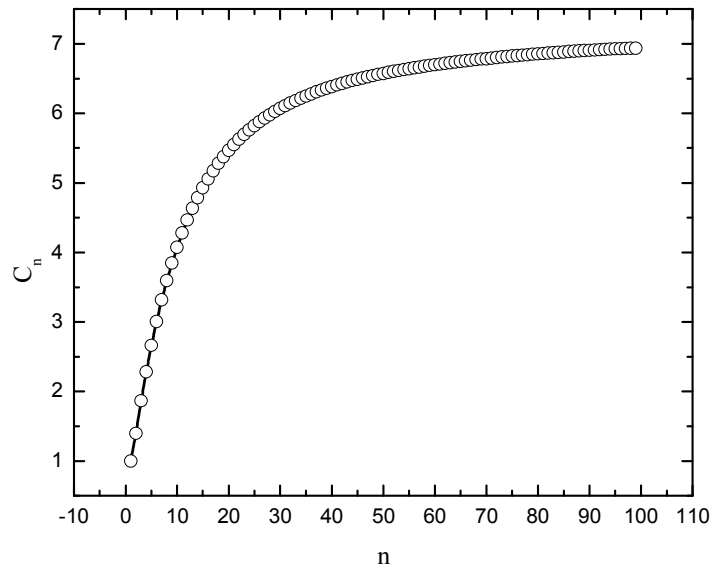
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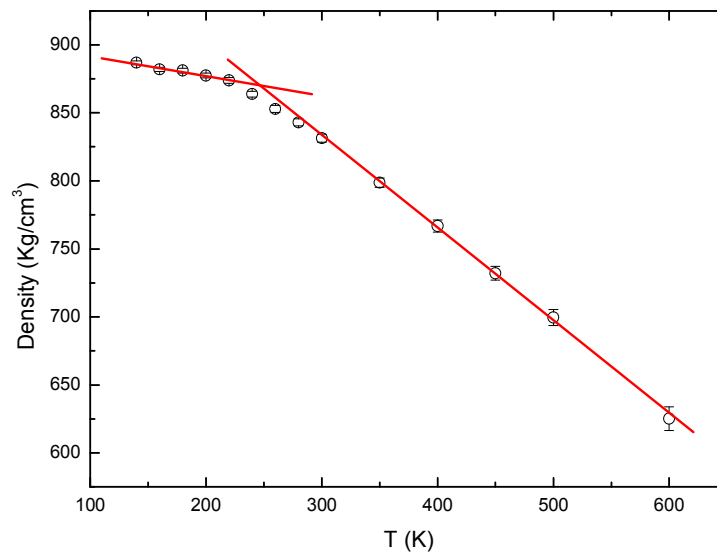
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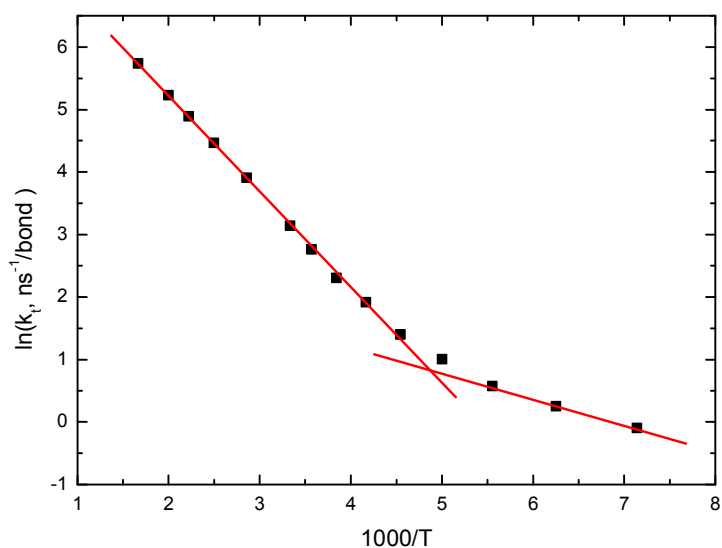
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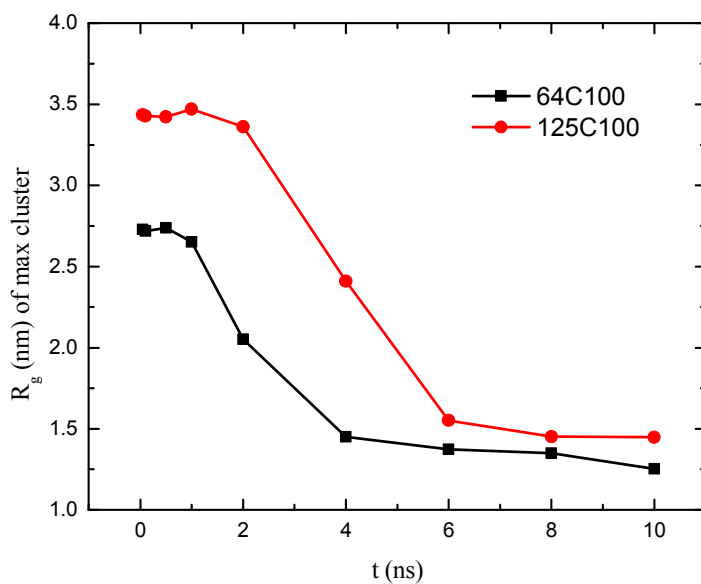
**Figure 1s.** Polymer characteristic ratios averaged over all chain segments along the backbone of the linear polymer chains.



**Figure 2s.** Average densities of the systems during the production runs and the error bars show the standard deviations; the solid lines are linear fits, whose intersection around 250 K gives the volumetric glass transition.



**Figure 3s.** The logarithmic overall conformational transition rates plotted with inverse temperature; the solid lines are linear fits, whose intersection around 206 K gives the microscopic glass transition, which was also discussed in our previous paper (J. Phys. Chem. B 2009, 113, 9077-9083).



**Figure 4s.** Variation of the max cluster size at the same temperature of 200 K for 125C<sub>100</sub>H<sub>202</sub> and 64C<sub>100</sub>H<sub>202</sub>, whose system sizes are around 7.0 nm and 5.5 nm respectively. The frozen torsions obtained within smaller observation times in both systems formed volume spanning frozen clusters.