Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Influence of entanglements on glass transition temperature of polystyrene TOSHIAKI OUGIZAWA, YOSHINORI KINUGASA, Tokyo Institute of Technology — Chain entanglement is essential behavior of polymeric molecules and it seems to affect many physical properties such as not only viscosity of melt state but also glass transition temperature (Tg). But we have not attained the quantitative estimation because the entanglement density is considered as an intrinsic value of the polymer at melt state depending on the chemical structure. Freeze-drying method is known as one of the few ways to make different entanglement density sample from dilute solution. In this study, the influence of entanglements on Tg of polystyrene obtained by the freeze-dried method was estimated quantitatively. The freeze-dried samples showed Tg depression with decreasing the concentration of precursor solution due to the lower entanglement density and their depressed Tg would be saturated when the almost no intermolecular entanglement was formed. The molecular weight dependence of the maximum value of Tg depression was discussed.

Toshiaki Ougizawa
Tokyo Institute of Technology

Date submitted: 05 Nov 2012 Electronic form version 1.4