

Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Study of physical vapor deposited glasses of tris-naphthyl benzene based organic molecules YUE ZHANG, TIANYI LIU, ETHAN GLOR, GUOYU YANG, YI-CHIH LIN, ZAHRA FAKHRAAI, University of Pennsylvania, PATRICK WALSH GROUP IN UPENN COLLABORATION — Stable glasses can be prepared by physical vapor deposition method (PVD), and these stable glasses will show greatly different properties compared to ordinary glasses prepared upon cooling a liquid, including higher density, higher thermal stability, increased charge transport ability and so on. Different organic molecule structures are also responsible for different glass structures and related glass properties. These properties strongly depend on the deposition temperature. We work with small organic molecules tris-naphthyl benzene (TNB) and molecules based on TNB that have slightly different substituents. These molecules will have different molecular weight and chemical structure such as π stacking, which will have an influence on the structure of stable glasses, their glass transition temperature, T_g and density. In our study, we can vary both the physical and chemical properties of these organic molecules in a systematical way to have a better understanding of the relationship between molecule structure, glass structure and related properties. These studies allow us to probe whether the stability of these glasses correlate with their glass transition temperature, T_g or their chemical structure.

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Date submitted: 12 Nov 2013

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