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*“Control of stability and molecular orientation in organic glasses
(Or how to make a million-year-old glass in 10 minutes)”*

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3:25 p.m.

202 Gavett Hall

Glasses play an important role in modern technology and raise fundamental questions regarding what properties are possible in a solid. The large number of local packing arrangements in glasses underlies their important properties, including macroscopic homogeneity (e.g., the clarity of window glass) and the ability to be tuned by composition changes. A problem with glasses, also associated with their local disorder, is that they are unstable with respect to lower energy glasses and crystalline states. We have used physical vapor deposition and the mobility of glassy surfaces to prepare what are likely the most stable glasses on the planet. Our materials have the properties expected for “million-year-old” glasses, including high density, low enthalpy, and high mechanical moduli. We have discovered deposition conditions that combine high stability with substantial molecular orientation. Such materials combine some of the most useful features of glasses and crystals. These developments present significant opportunities to expand our understanding of amorphous packing and to design new classes of anisotropic solids for applications such as organic electronics

IMAGES ASSOCIATED WITH OUR WORK:

