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Highly stable glasses as a general phenomenon: Physical vapor depositions of four different trisnaphthylbenzene isomers KEVIN DAWSON, University of Wisconsin-Madison, LEI ZHU, LAURA KOPFF, ROBERT J. MCMAHON, LIAN YU, M.D. EDIGER — Glasses of each of the trisnaphthylbenzene (TNB) isomers, a low molecular weight glass forming family of four isomers, were created by physical vapor deposition. These glasses were analyzed using differential scanning calorimetry and wide angle x-ray scattering, and then compared to glasses prepared by quenching each melt. All four isomers produced stable glasses (increased onset temperature, large enthalpy overshoot, and excess x-ray scattering) when vapor-deposited at $0.85 T_g$ and at low deposition rates. This result is surprising as one of the TNB isomers readily crystallizes when cooled as a liquid. When coupled with previous experiments, these results show that stable glasses are not just produced by a small set of good glass forming molecules but seem to be a general phenomenon. Thus physical vapor deposition can be used as a general route to create unusual glasses for future scientific exploration and technological uses.

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