

Abstract Submitted  
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**Will it form a stable glass? How the stability of vapor deposited glasses depends on molecular structure** MICHAEL TYLINSKI, MADELEINE BEASLEY, Univ of Wisconsin, Madison, YEONG ZEN CHUA, CHRISTOPH SCHICK, University of Rostock, Germany, MARK EDIGER, Univ of Wisconsin, Madison — Over the past nine years physical vapor deposition has been used to prepare molecular glasses with exceptional properties. When heated, transformation of these highly stable glasses takes orders of magnitude longer than the transformation of liquid-cooled glasses. Until recently, it appeared that most organic molecules could form stable glasses when vapor deposited. We test the generality of stable glass formation by vapor-depositing a wide range of small organic molecules, including hydroxyl, carbonyl, phosphate, aromatic, and aliphatic functional groups. When prepared under conditions expected to yield highly stable glasses, we observe glasses with a wide range of kinetic stabilities, depending on the functional groups in the molecule. In general, alcohols and molecules with long aliphatic chains do not form highly stable glasses while aromatic molecules do. We also test the hypothesis that the surface mobility during deposition determines if a molecule is able to create highly stable glasses.

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