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**Photostability of vapor-deposited thin films can be significantly modulated by glass packing** YUE QIU, MARK EDIGER, University of Wisconsin-Madison, OLIVIER LEBEL, Royal Military College of Canada, EDIGER GROUP TEAM, LEBEL GROUP TEAM — Photochemically robust materials are desired for organic electronics. In previous research, we demonstrated that organic glasses prepared by physical vapor deposition can be highly stable against photoisomerization reactions if the substrate temperature is chosen correctly. In this work, we further show that the enhanced photostability in vapor-deposited glasses is a general phenomenon exhibited in other molecular systems. For indomethacin (with a carboxylic acid group), we are able to monitor the photo-decarboxylation in situ by measuring the mass loss during the irradiation. For molecule with an azobenzene moiety, we can track photoisomerization by directly measuring the population of trans and cis molecules with the absorption spectrum. For both cases, we show that the rate of photoreaction varies as a function of the substrate temperature during the deposition, and photostability correlates with density of packing. These results provide a molecular level explanation for enhanced photostability in amorphous materials, and they may provide insight in designing organic photovoltaics and light emission devices with longer lifetimes.

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