

Abstract Submitted  
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**Traversing the polymorphic landscape through tuning molecule-molecule, molecule-substrate and molecule-solvent interactions** GEOFFREY PURDUM, Dept. of Chemical and Biological Engineering, Princeton University, THOMAS GESSNER, R. THOMAS WEITZ, BASF SE, GMV 67056, Germany, YUEH-LIN LOO, Dept. of Chemical and Biological Engineering, Princeton University — As subtle changes in the crystalline packing motif of molecular semiconductors can have a large impact on charge transport, a thorough understanding of the accessibility of polymorphs in thin films is needed. Using a series of core-chlorinated naphthalene tetracarboxylic diimides, we demonstrate that the choice of the alkyl substituents at the imide functionalities, as well as the choice of substrate and post-deposition processing conditions, tune the relative strengths of molecule-molecule, molecule-substrate and molecule-solvent interactions, providing a handle over polymorphic selection. We access the triclinic polymorph of NTCDI-CH<sub>2</sub>C<sub>3</sub>F<sub>7</sub> in thermally evaporated thin films; solvent-vapor annealing induces a reversible transformation to its monoclinic polymorph. The addition of a fluoromethylene group in the alkyl substituent increases molecule-molecule interactions and, accordingly, improves the stability of its triclinic polymorph; this derivative does not undergo a polymorphic transformation with any of the post-deposition conditions we have explored.

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