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*Temperature-mediated polymorphism: impact on packing motifs and charge transport*

Rachel Marie Williamson<sup>1</sup>, Gavin Collis<sup>2</sup>, Oana Jurchescu<sup>3</sup>, Veaceslav Coropceanu<sup>4</sup>, Jean-Luc Bredas<sup>5</sup>, Alexandr Fonari<sup>4</sup>, Ying Shu<sup>2</sup>, Katelyn Goetz<sup>3</sup>, Loah Stevens<sup>3</sup>

<sup>1</sup>MX Beamlines, Australian Synchrotron, Melbourne, Australia, <sup>2</sup>CSIRO, Melbourne, Australia, <sup>3</sup>Department of Physics, Wake Forest University, Winston-Salem, United States, <sup>4</sup>School of Chemistry and Biochemistry and Center for Organic Photonics and Electronics, Georgia Institute of Technology, Atlanta, United States, <sup>5</sup>Physical Sciences and Engineering Division, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia  
E-mail: rachel.williamson@synchrotron.org.au

We report a novel synthesis to ultra high purity 7,14-bis(trimethylsilyl)ethynyl)dibenzo[b,def]-chrysene (TMS-DBC). Single crystals of this material were grown by solution and vapor deposition techniques and structural determination by single crystal X-ray crystallography was then carried out at the Microfocus Crystallography beamline at the Australian Synchrotron. Two polymorphs of TMS-DBC were observed; low temperature (LT) fine red needles and high temperature (HT) large yellow platelets. These polymorphs represent a rare example where both are extremely stable and do not interconvert to the other crystal structure upon solvent or thermal annealing. Single crystal X-ray crystallographic studies identified two distinct packing structures where the LT crystals form a 1D slipped-stack structure, while the HT crystals adopt a 2D brickwork motif. Single crystal organic field-effect transistors of the LT and HT crystals showed the impact of packing motif on charge transport.

[1] Stevens, L. A. et al. (2015). Chem. Mater., 27, 112-118

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