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Neither crystalline nor amorphous: measuring disorder in polymers and assessing its effect on charge transport ALBERTO SALLEO, JONATHAN RIVNAY, RODRIGO NORIEGA, Stanford University, MICHAEL TONEY, Stanford Synchrotron Radiation Lightsource — Conjugated polymers displaying high mobility are semicrystalline. Thin films of these materials are comprised of ordered regions (crystallites) and disordered regions. Because of the inherent anisotropy of polymers, the crystallites exhibit varying degrees of disorder in different directions. I will show a quantitative measurement of disorder as applied to these materials, which allows us to quantify a paracrystalline parameter g. This parameter can be used to rank polymers. I will show how g is related to the electronic structure of the polymer and with the presence of electronic traps in particular. By studying the dependence of g on molecular weight we can get to a definition of polymer behavior in an electronic transport sense.

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