

Abstract Submitted
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Intrinsic transport anisotropy in single-crystal FETs on new rubrene derivatives A.F. STASSEN, W. KALB, S. HAAS, ETH Zurich, U. BERENS, H.J. KIRNER, Ciba SC Inc., Switzerland, B. BATLOGG, ETH Zurich — For the charge transport in a field-effect transistor (FETs), both the spectral density of gap states and the intrinsic mobility play a critical role. The latter is closely related to the arrangement of the molecules in the solid. We present measurements on FETs fabricated on single crystals of new rubrene derivatives. One of them crystallizes in two polymorphic forms: One polymorph shows a very high field-effect mobility ($>10 \text{ cm}^2/\text{Vs}$) and a transport anisotropy which can be directly related to the crystal packing. In the second polymorph, the same molecules are arranged in a different structure with minimal π -overlap. No charge transport could be induced, highlighting the crucial role played by the wave-function overlap associated with the packing.

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