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Hall Effect Measurements in Organic Single-Crystal FETs VITALY PODZOROV, Rutgers University, ETIENNE MENARD, JOHN ROGERS, MICHAEL GERSHENSON, RUTGERS UNIVERSITY TEAM, UNIVERSITY OF ILLINOIS AT URBANA CHAMPAIGN TEAM — We have observed classical Hall effect in the single-crystal rubrene OFETs [1]. The mobility determined from the Hall measurements (μ_H) represents intrinsic, i.e. trap independent mobility of the charge carriers. At high temperatures, Hall mobility coincides with the longitudinal mobility determined from the standard FET measurements. In the investigated temperature range $T = 170\text{-}300$ K, μ_H monotonically increases with decreasing T , while the longitudinal mobility first increases at high T (intrinsic regime) and then decreases at low T (non-intrinsic regime), consistent with the previous observations [2, 3]. In the intrinsic regime, the density of mobile field-induced charge carriers extracted from the Hall measurements, n_H , coincides with the density n calculated using the gate-channel capacitance, and becomes smaller than n in the trap-dominated regime. The Hall data strongly support a band-like nature of the charge carrier transport in this system. 1. Podzorov, et al., Phys. Rev. Lett 95, 226601 (2005); 2. V. C. Sundar, et al., Science 303, 1644 (2004); 3. V. Podzorov, et al., Phys. Rev. Lett. 93, 086602 (2004);

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