Electronic Supplementary Material (ESI) for Materials Chemistry Frontiers.

Supporting Information for:

Magnetic-field effects in ambipolar transistors based on a bipolar molecular glass

Thomas Reichert[a], Georg Hagelstein[a] and Tobat P. I. Saragi[*a]

[a] *Macromolecular Chemistry and Molecular Materials, Department of Mathematics and Science, Center for Interdisciplinary Nanostructure Science and Technology (CINSaT), University of Kassel, Heinrich-Plett-Straße 40, D 34132 Kassel, Germany*

E-mail: tobat.saragi@uni-kassel.de

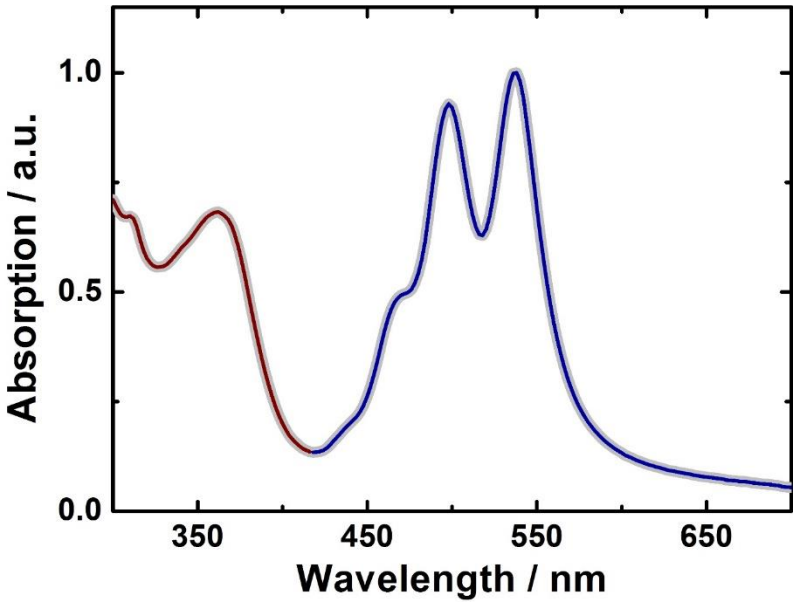

Fig. S1 Absorption spectrum of a 35 nm-thin evaporated film of Spiro-DPASP-*t*Bu-Phenyl on a glass substrate. The spectrum is composed of the spectrally separated absorption bands of the donor-like spiro-substituted diphenylamine (red) and the acceptor-like perylenetetracarboxylicdiimide-derivative chromophore (blue).

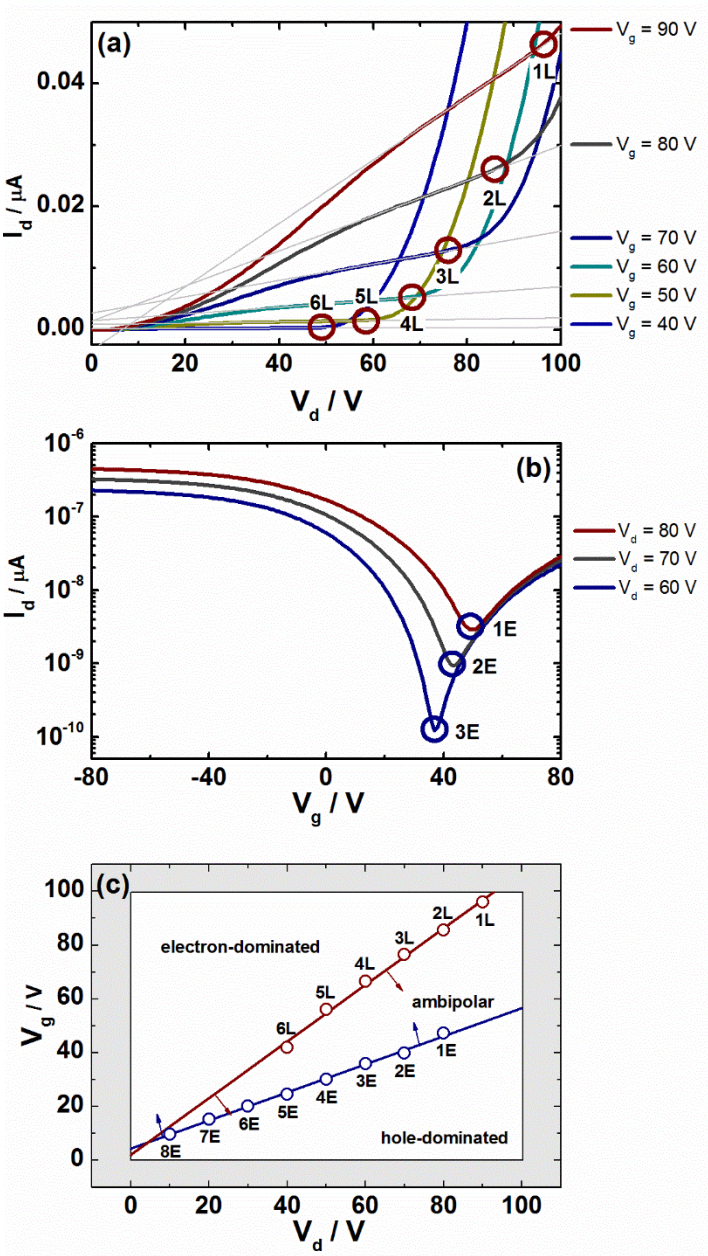

Fig. S2 Methodical procedure for mapping and illustrating the individual transport regimes using the current-voltage characteristic for *n*-channel (V_d>0, V_g>0) and *p*-channel (V_d<0, V_g<0). (a) $I_d(V_d)$-curves at different gate voltages are used to identify the hole transport regime by determining the voltage values (6L – 1L) at which the drain current starts to increase superlinearly. (b) Representative transfer curves at different drain voltages are used to identify the switch-on voltage (3E – 1E) at which the accumulation of electrons starts to dominate the charge transport properties. (c) By linearily fitting all determined voltage values (6L – 1L and 8E – 1E) a complete mapping of the charge transport properties is achieved leading to distinct electron-dominated, hole-dominated and ambipolar transport regimes. Transport properties can be clearly identified.

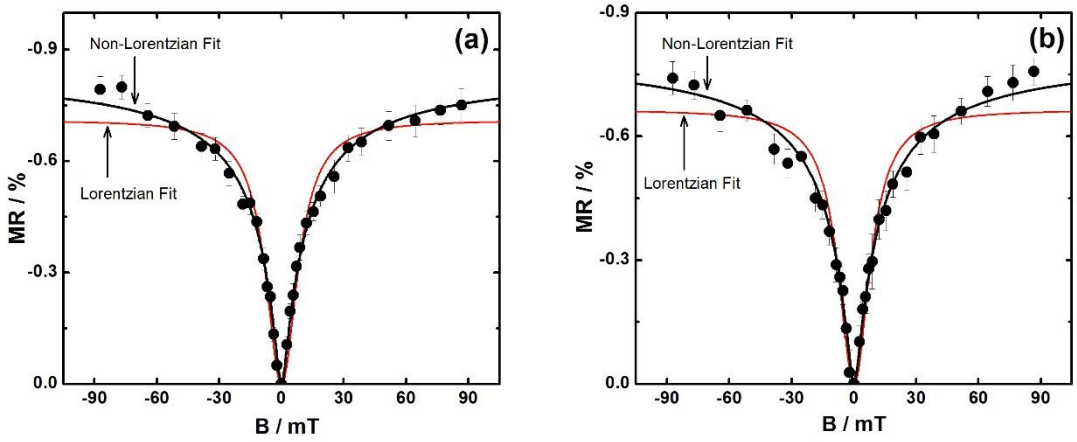

Fig. S3 Representative MR(B) line shape curves based on magnetotransport measurements performed for two different voltage conditions: (a) Point A1: V_d = −90 V and V_g = −20 V and (b) Point A3: V_d = 70 V and V_g = 90 V. These points can also be found in the main text, as displayed in Figures 3 and 6. The black lines show the Non-Lorentzian fittings and the red lines show the Lorentzian fittings.

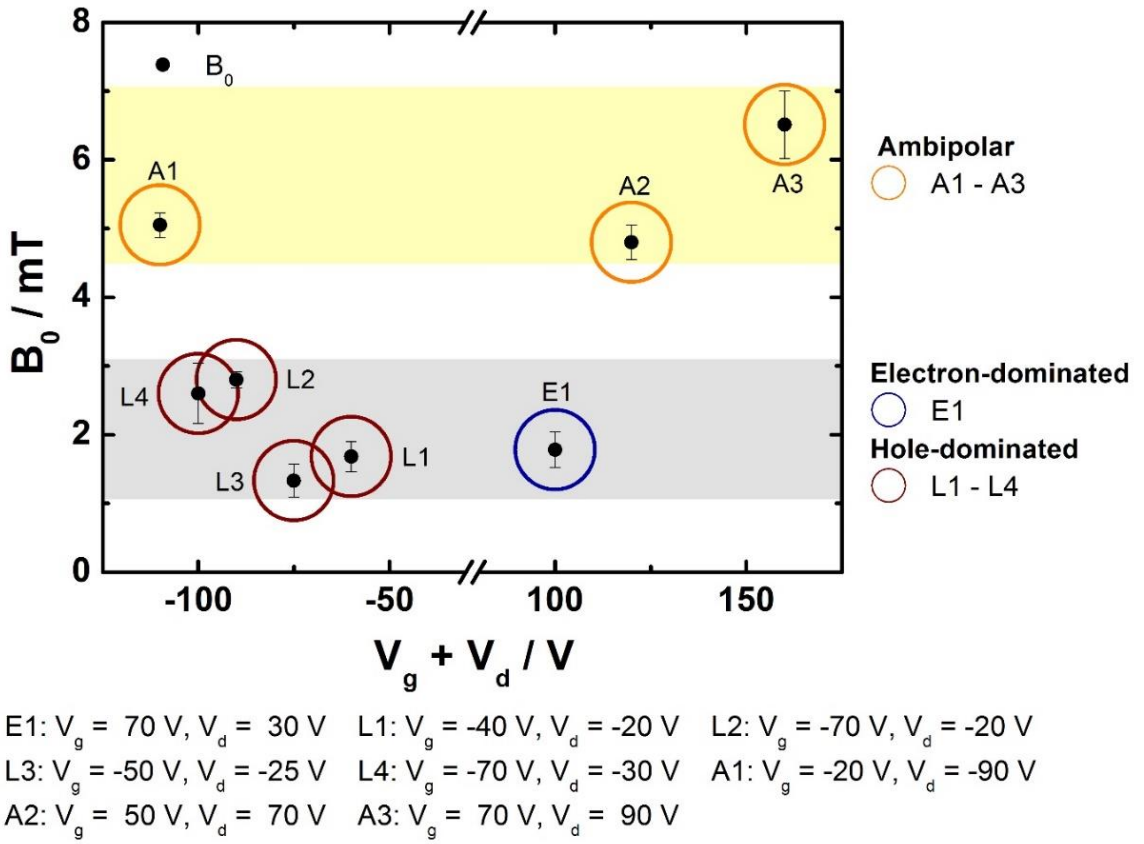

Fig. S4 B_0 values for different voltage conditions obtained from the fitting of the MR(B) line shape curves, as displayed in Figure 6. The grey area indicates the unipolar charge transport regime while the ambipolar regime is marked by the yellow area.