

Tuning Polarity and Improving Charge Transport in Organic Semiconductors

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Tuning dominant polarity of charge carriers and improving their mobilities are of great importance to realize on-demand, target-specific, high-performance organic circuitry. Ambipolar semiconducting polymers provide a number of advantages for the cost-effective production of complementary metal oxide semiconductor (CMOS)-type organic logic circuits as they can be deposited in the simplest single processing step, while maintaining the attractiveness of easy solution processing. Herein we report a viable approach to selectively tune dominant polarity of charge carriers in solution-processed ambipolar organic field-effect transistors (OFETs). In addition, we introduce our molecular design strategies for achieving efficient charge transport in organic semiconductors.