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**Electronic Structure of Interfaces and Heterojunction Ambipolar Organic Thin Film Transistor.** YONGLI GAO, HUANJUN DING, University of Rochester, HAIBO WANG, DONGHANG YAN, Institute of Applied Chemistry, The Chinese Academy of Sciences — There has been a considerable interest in forming ambipolar organic thin film transistors (OTFTs) due to their advantageous for integrated circuits. Recently, Shi *et al.* observed a substantial improvement for both the hole and the electron mobility in ambipolar OTFTs based on the heterojunction formed between copper-hexadecafluoro-phthalocyanine ( $F_{16}CuPc$ ) and 2,5-bis(4-biphenyl) bithiophene (BP2T). We examined the interface formation between  $F_{16}CuPc$  and BP2T using ultraviolet photoemission (UPS) and inverse photoemission spectroscopy (IPES). It is observed that in  $F_{16}CuPc/BP2T$  the heterojunction is characterized by band bending in both materials, while in  $BP2T/F_{16}CuPc$  the band bending is confined in BP2T only. For  $F_{16}CuPc/BP2T$ , the band bending of BP2T and  $F_{16}CuPc$  are 0.40 and 0.35 eV, respectively. The band bending region is about 15 nm in both materials, from which the Debye lengths of the materials can be deduced. The combination of the band bending and finite Debye lengths may provide an explanation to the observed ambipolar behavior and improved mobility of the OTFTs based on such heterojunctions.

Yongli Gao  
University of Rochester

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