

Dithioalkyl Dithienothiophene (DSDTT) Based Small Molecule and its Blends for High Performance p-type Organic Field Effect Transistors by Solution-Sheared process

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Abstract

Solution-shearing process is a simple meniscus-guided coating method to achieve high-quality of organic field effect transistor. Here, we present 3, 5-dithiooctyl dithienothiophene based small molecular semiconductor (DSDTT), end functionalized with fused dithienothiophene (DTT) units, was synthesized and characterized for organic field effect transistors (OFETs) by sheared method. The green solvent of anisole choice for **DDTT-DSDTT** small molecules exhibits high hole mobility of $3.19 \text{ cm}^2 \text{ V}^{-1} \text{ s}^{-1}$. In addition, we not only report the vertical distribution of 3, 5-dithiooctyl dithienothiophene-based small molecular semiconductors (DSDTT) blended with poly(α -methylstyrene) (P α MS) but also utilizing high composition of low-cost insulating polymers to highly reduce the materials cost while maintaining good connectivity of small molecules domains in the channel and facilitating the electrical stability of OFETs.

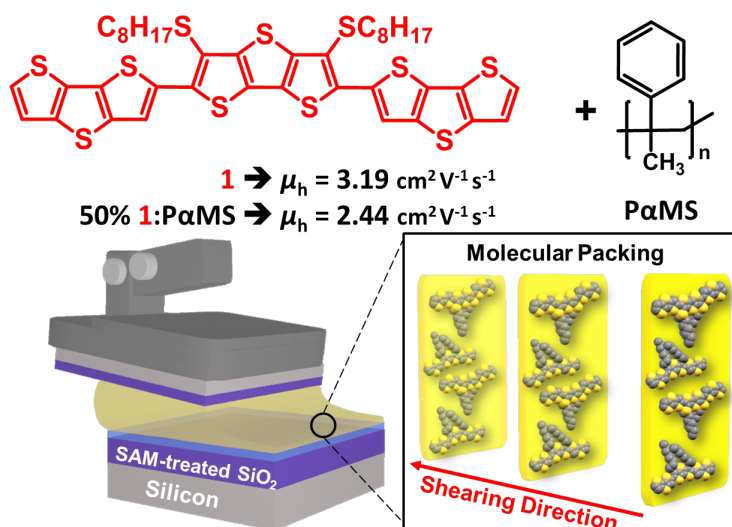


Fig. 1. Diagrams illustrating solution-sheared process