

Organic insulators and molecular layers for organic thin film transistor

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In this study, cyanoethyl pullulan with dielectric constant around 15 was used and characteristics of organic thin film transistor with pentacene active layer were measured. The self assembled monolayer was studied to reduce the contact resistance between source and drain metals and semiconductor active layer. Recently, self-assembled monolayer (SAM) gate dielectric was used to reduce the size of the device and operating voltage. Performance of organic semiconductor depends significantly on the morphology and ordering of the molecules in the thin film. The SAM should lead to increased physical or chemical characteristics between the vapor deposited organic layers (pentacene) and the surface of the indium-tin oxide (ITO) and contact resistance at the pentacene/ITO interface can be reduced. The variation of the terminal group of the SAM and possible further optimization of the SAM-modified ITO is under investigation.