

Molecular Layer Deposition of Organic/ Inorganic Nanohybrid Dielectrics for OTFTs

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We report a low-temperature fabrication of organic/inorganic nanohybrid dielectrics for organic thin film transistors. The self-assembled organic layers (SAOLs) were grown by repeated sequential adsorptions of C=C-terminated alkylsilane and metal (Al or Ti) hydroxyl with ozone activation, which was called “molecular layer deposition (MLD)”. The TiO₂ and Al₂O₃ inorganic layers were grown by ALD, which relies on sequential saturated surface reactions resulting in the formation of a monolayer in each sequence and is a potentially powerful method for preparing high quality multicomponent superlattices. The MLD method combined with ALD (MLD-ALD) was applied to fabricate SAOLs-Al₂O₃-SAOLs-TiO₂ nanohybrid superlattices on polymer substrates at relatively low temperature. The MLD method is an ideal fabrication technique for various flexible electronic devices.