

Organic Nonvolatile Memory Transistors with Low-voltage and High Retention Characteristics

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Memory devices play a core role in the present ubiquitous society since all informative data need to be safely stored and quickly retrieved for effective use and communication. In addition, the memory devices should be flexible with ultrathin geometry because mobile electronic systems such as smart phones and tablet personal computers are changing toward flexible and foldable shapes. On this account, transistor-type organic memory devices (TOMDs) have been spotlighted as they are able to deliver such flexibility due to the intrinsic flexible nature of organic (polymeric) materials. In particular, TOMDs have an advantage of active signal modulation in module (array) structures because of three electrode configuration. We have tried to make nonvolatile TOMDs by inventing polymer energy well and polar polymer structures. In this presentation, we are going to discuss advances in nonvolatile TOMDs and how low-voltage TOMDs can be operated.