Applications of Water-Soluble Polymers for Low-Voltage Flexible Organic Nonvolatile Memory Transistors

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Ultrathin and flexible/foldable shapes become one of the hot issues in the field of personalized mobile applications including smart phones and tablet personal computers. In order to achieve perfect flexible/foldable systems, all constituent devices should have the same or more advanced levels of flexibility. Of various electronic components, displays have been highlighted to show flexible shapes and very recently could be successfully embedded in the foldable smart phones. In this regard, our group has focused on organic memory devices which have great advantages in terms of flexibility when it comes to their low-temperature processes on plastic film substrates. For the last decade, our group has demonstrated that transistor-type organic memory devices (TOMDs) are able to be operated at low voltages and their retention characteristics can beat conventional inorganic memory devices. This presentation shows our recent works on the applications of water-soluble polymers for TOMDs and will discuss on their merits and demerits.