

Artificial Tactile Sensors from Liquid Crystal-on-Organic Field-Effect Transistors with Semiconducting Polymer Channel Layers

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Organic semiconducting materials have attracted keen interest for last two decades because of their potential for creating new paradigm of semiconducting devices after silicon (inorganic) era. As already launched in market, the first successful organic electronic devices are organic light-emitting devices (OLEDs). Recently we have concentrated on building up idea for artificial sensation systems that are useful for humanoid robots and can be also basically applied as a physical and/or chemical sensor for a variety of industrial fields. As the first step for achieving artificial organic tactile sensation, we attempted to combine liquid crystal (LC) and organic field-effect transistor (OFET) technologies, leading to LC-on-OFET sensory devices, because the extent of external stimulation can be amplified by the collective feature of LC molecules. The detailed concept and performance of LC-on-OFET sensory devices will be discussed together with their prospect for chemical engineering fields [J.Seo, S.Park, S.Nam, H.Kim and Y.Kim, Liquid Crystal-on-Organic Field-Effect Transistor Sensory Devices for Perceptive Sensing of Ultralow Intensity Gas Flow Touch, Sci. Rep. online (DOI=10.1038) (2013)].