

Electromagnetic Field Sensitive Hybrid Polymer Rod System

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Polymeric microsystems, nowadays, attract attention in microelectromechanical system (MEMS) and lab-on-a-chip device. For actuator system, many studies try to achieve diverse and precise motion since, as improve the motion of microactuator, the actuator system cannot apply only for micro-robot, but also microfluidic control system. Therefore, there are several stimulus to generate actuator motion such as light, magnetic field, and electric potential. Among those stimulus, it is difficult to control precise and permeable together. However, in electromagnetic filed case, I can control the magnetic field by electrical signals and use the permeability of magnetic field.

Here, for the first time, I introduce polymeric actuator system, consist of polydimethylsiloxane (PDMS) and cobalt iron oxide (CoFe₂O₄), which can react by electromagnetic field. PDMS microarray which contains cobalt iron oxide, is manufactured by photolithography and, after setting an electrode under polymer patch, the motion of the actuator system can be systematically controlled by current.