

Highly sensitive and low hysteresis microfluidic strain sensors using a binary mixture of ionic liquid and ethylene glycol

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Recent streams of piezoresistive sensor have the interesting functions like motion detecting, pressure detecting and wearable electronics. It is necessary for the piezoresistive strain sensors to enhance sensitivity for efficient sensing of various deformations. We demonstrated the microfluidic strain sensors which were transparent, sensitive to various deformations and reliable to response signal. As an improvement of the previous study, we investigated the sensitivity of microfluidic strain sensors with binary mixture of ethylene glycol and ionic liquid. The microfluidic strain sensor with ionic liquid / ethylene glycol binary mixture shows enhanced sensitivity to applied strain and very low signal hysteresis at high strain speed. The enhancement of sensitivity in the microfluidic strain sensors can broaden the practical applications such as wearable devices, robotics and artificial skin.