Highly stretchable 3D nanostructured elastomer for ultra-sensitive wearable sensor

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Stretchability is an important area on the practical devices such as electronic skin, touch-on display, robotics, radiofrequency antennas, energy harvesting. Recently, stretchable pressure sensor for human physiological motion detection have been introduced. Here we present a highly stretchable and ultra-sensitive pressure sensor based on the secondary sputtering top-down lithography. Ultrahigh-resolution (ca. 10nm) and high aspect ratio (ca. 15) 3D grid gold nano-patterns were embedded into the elastomer. This novel conductive elatomer appears as highly transparent property. In addition, the conductor can bear both compression and tension with showing high sensitivity. Our pressure sensor based on secondary sputtering lithography (SSL) technique is available for human health monitoring with low power consumption.