Web-within-web Au nanomesh for transparent and stretchable conductors

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In recent years, stretchable conductors began to make a mark because of the increasing demand for wearable, portable, and skin-mountable electronics. Stretchable conductors have been considered as fundamental and essential units in stretchable electronic systems. Especially, transparent and stretchable conductors are expected to be a crucial component in next-generation optoelectronic devices.
Herein, we propose web-within-web structure (WWWS), the patterned metal network consists of smaller network of metal nanowires, with one-body configuration by patterning single Au network. This novel structure with low areal coverage and one-body structure of Au network are realized via electrospinning technique and conventional PR lithography. This double Au network has low sheet resistance and high optical transparency due to its one-body structure and low areal coverage of metal nanowires. Our WWWS shows considerably low strain sensitivity of resistance. Moreover, the electrical resistance of WWWS keeps low values under 70 % tensile strain.