

## Carbon Nanotube Nanomesh Films for Transparent and Stretchable Electrodes

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Transparent and stretchable electrodes are required for the development of curved, foldable, or wearable optoelectronic devices. Carbon nanotubes (CNTs) have been widely used to maintain electrical performance of transparent electrodes under mechanical stress. Here, we present a template-guided self-assembly of CNTs into nanomesh patterns to fabricate transparent and stretchable electrodes. The nanomesh patterns reduce the inter-tube contact resistance and light scattering. Especially, the stress on CNT nanomesh films could be released as the nanomesh structure was deformed without junction disconnection. The CNT nanomesh films showed considerably lower sheet resistance (~10 times), higher stretchability (~7.7 times less increase in resistance at 30% strain), and greater durability (~42 times less increase in resistance during 500 stretching cycles at 30% strain) than those of randomly networked films at a similar optical transmittance (~78%). Finally, the CNT nanomesh films was combined with LED light to prove the stretchability of optoelectronic devices.