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## Vacuum-Assisted Bilayer PEDOT:PSS/Cellulose Nanofiber Composite

### Film for Self-Standing, Flexible, Conductive Electrodes

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#### Research highlights

- ► PEDOT:PSS-CNF composite films were developed as a self-standing, highly flexible conductive film.
- ► A simple vacuum-assisted filtration was used to fabricate a bilayer PEDOT:PSS-CNF film.
- ► A bilayer PEDOT:PSS-CNF film exhibited good electrical conductivity and excellent flexibility

#### Abstract

Sustainable cellulose nanofiber (CNF)-based composites as functional conductive materials have garnered considerable attention recently for their use in soft electronic devices. In this work, self-standing, highly flexible, and conductive PEDOT:PSS-CNF composite films were developed using a simple vacuum-assisted filtration method. Two different composite films were successfully fabricated and then tested: 1) a single-layer composite composed of a mixture of PEDOT:PSS and CNF phases and 2) a bilayer composite composed of an upper PEDOT:PSS membrane layer and a CNF matrix sub-layer. The latter composite was constructed by electrostatic/hydrogen bonding

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