Docket #: S17-234

Development of damage-resistant stretchable electronic materials and devices for multifunctional wearable electronics

Stanford researchers in the Bao Lab have developed damage-resistant stretchable electronic materials and devices that can be used in wearable electronics. They have high toughness and self-healing properties that enable them to withstand damage that would destroy conventional electronics.

This invention allows both organic and inorganic conducting nanowires to be applied to a self-healing polymer and balances stretchability with conductivity. It supports the development of electronic skins which could monitor physiological signals and display feedback information. This technology creates tougher materials than current electronic technologies and also has a simpler manufacturing process. The researchers have developed stretchable interconnects, sensors, and display modules which can monitor variables and display them with an embedded, waterproof light emitting capacitor. This technology has the potential to revolutionize wearable electronics.

Stage of Development

- Proof of concept

Figure:

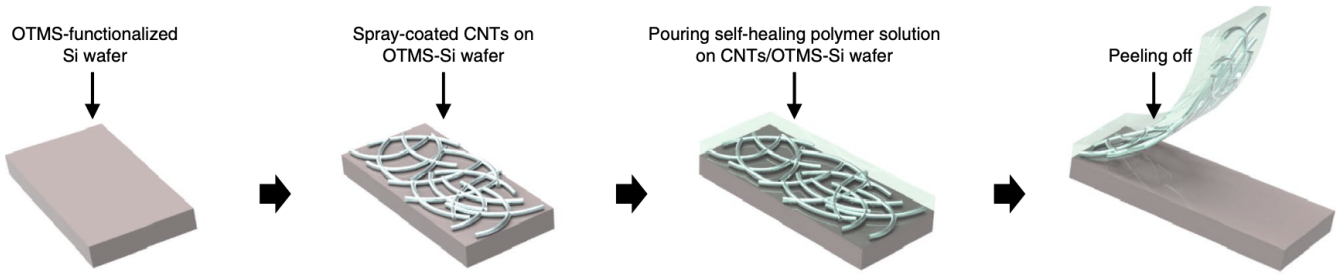


Figure description: Fabrication process of self-healable stretchable electrode

Image credit: https://www.nature.com/articles/s41565-018-0244-6

Related Technologies:
Stanford docket 18-200: Fully self-healable and stretchable organic transistor for skin-inspired electronics
Patent issued: 11,075,348 B2 (USA)

Stanford docket 18-197: Strain-sensitive, stretchable, and self-healable semiconducting film for multiplexed skin-like sensor array
Patent issued: 11,532,789 (USA)

Applications

- Wearable, stretchable, flexible electronics
- Prosthetic or robotic skin
- Implantable (waterproof) electronics

Advantages

- Damage-resistant
- Self-healing
- Waterproof
- Easier to manufacture than conventional processes

Publications

- Son, D., Kang, J., Vardoulis, O., Kim, Y., Matsuhisa, N., Oh, J. Y., . . . Bao, Z. "An integrated self-healable electronic skin system fabricated via dynamic reconstruction of a nanostructured conducting network,"Nature Nanotechnology (2018), doi:10.1038/s41565-018-0244-6

Patents

- Published Application: 20200002501
- Issued: 10,899,908 (USA)

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