

Polyacrylamide-based soft hydrogels as skin-device interface for wearable bioelectronics

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Wearable devices fabricated as a flexible or stretchable form are used in various biomedical fields. Strategies for making the wearable devices flexible or stretchable include using ultrathin inorganic films, patterning stretchable designs such as serpentine, wavy, buckled structures, and using intrinsically stretchable materials. For intrinsically stretchable materials, there are elastomer and hydrogel. Hydrogel is a hydrophilic polymer with high water content and soft mechanical property. These properties of hydrogel are similar to those of skin/tissue and make hydrogel a good candidate material for soft bioelectronics. Furthermore, soft hydrogel can form extremely conformal contact with both skin surface and the device. Therefore, hydrogel can be a bridge between skin and the device. In addition, various fillers are incorporated to hydrogel to render various functional properties to hydrogel, including conductivity, drug delivery, self-healability, adhesivity, degradability, and so on.