ultrathin optoelectronic devices for wearable/implantable electronics

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Soft electronic devices, in particular healthcare-related ones, have been intensively studied over the past decade due to their unique advantages in biomedical applications over the conventional rigid electronics, including conformal contacts on human skin and high deformability that minimizes unwanted inflammatory responses. To achieve the soft nature in high performance electronics and to apply this technology to wearable biomedical electronics/optoelectronics, several strategies have been employed, such as the designed assembly, combination of unconventional manufacturing processes, new design of individual devices with deformable structures, and disease-specific system-level integration of diverse soft electronics. Here, we describe ultrathin flexible optoelectronic devices for wearable/implantable applications. Ultrathin high-resolution red-green-blue quantum dot LEDs can be utilized next-generation electronic tattoo, transparent smart displan, and display of healthcare monitoring wearable devices. In addition, graphene-MoS2 based heterostructure can be applied to the ultrathin curved image sensors for the retina prosthetics.