Title: Hybrid Perovskites in Flexible Electronics and Wearable Devices

Author names: Md. Reazuddin Repon, Chowdhury Mashfik Ahmed, Tarekul Islam, Md. Sarowar Hossain, Daiva Mikucioniene

Abstract: The increasing allure of hybrid perovskite-based materials for integration into flexible electronics and wearable technology is attributable to their unique combination of properties. These materials, characterized by a perovskite crystal structure comprising both inorganic and organic elements, offer diverse advantages that render them suitable for a range of applications. Notably, their adaptability for photovoltaic applications, particularly in the realm of flexible solar cells, stands out as a primary strength. Such solar cells empower wearable devices by harnessing solar energy, seamlessly integrating into clothing and accessories. A key advantage lies in the ability to fabricate hybrid perovskites into stretchable and flexible thin films without compromising their electrical properties. This flexibility facilitates the incorporation of perovskite-based components into an extensive array of wearable devices, including smart textiles and conformable sensors, ensuring a comfortable and user-friendly experience. Adding to their appeal is the cost-effectiveness of developing electronics based on hybrid perovskites compared to conventional silicon-based counterparts. Large-scale production of perovskite thin films at a low cost through solution-processing techniques makes them a viable and economically feasible option for wearable technology applications. Hybrid perovskites have showcased their potential across various wearable device applications, spanning flexible displays, energy harvesting devices, sensors, and even wearable health monitoring. Nevertheless, it is imperative to acknowledge the challenges associated with hybrid perovskites. Researchers are diligently addressing these challenges to ensure the long-term reliability of wearables crafted from perovskites. This ongoing effort underscores the commitment to advancing the field and maximizing the potential of these intriguing materials in the realm of flexible electronics and wearable technology.

https://doi.org/10.1002/9781119865308.ch4Digital Object Identifier (DOI)