Hargeisa specific energy storage applications

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Flexible electronics have produced a paradigm shift in the wearable technology sector1,2,3. Remarkable advancements were made in developing wearable sensors that are thin, conformal, and stretchable4,5,6. In particular, ultraflexible devices have garnered immense attention due to their ability to seamlessly integrate with the human skin7,8,9,10,11, providing more accurate data acquisition and an enhanced degree of user comfort.

Advances in wearable technology are highly dependent on the development of flexible energy devices, which should offer high efficiency, durability, and constant power output and possess the capacity for effortless integration12,13. Most commercial wearables rely on bulky coin cells or rechargeable batteries as power sources. These contribute significantly to the system''s overall rigidity, posing limitations to their mechanical compliance and often necessitating frequent charging or replacement.

The performance of OPV devices is highly dependent on the exciton dissociation and charge recombination processes40. To probe the charge recombination in the OPVs, we evaluated the light intensity dependence of JSC and VOC. The ideality factor (n) of photovoltaics, which indicates the measure of how closely they follow the ideal diode equation41, can be derived from the dependence of VOC on incident light intensity following:

where kB is for the Boltzmann''s constant, T is temperature, q is elementary charge, and I stands for light intensity. The ideality factor was estimated as 1.30 for PM6:Y6 binary-blend OPVs and 1.22 for PM6:O-IDTBR:Y6 ternary-blend OPVs, as shown in Fig. 2D. The ideality factor, observed to be closer to 2 in this binary case, suggests that the dominant carrier loss mechanism is trap-assisted recombination. JSC depends on the illumination intensity following the power law, Contact us for free full report

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