

How can OLED devices improve quantum efficiency?

A proper alignment of the electronic energies of materials across the multiple layers of OLED devices can facilitate the transportation of charge carriers (i.e., holes and electrons) to the emitting layer and the efficient energy transfer from host molecules to emitters, achieving a high external quantum efficiency (EQE).

Why is step-wise energy transfer important in OLED devices?

The step-wise energy transfer renders superiority in OLED devices because of balanced carrier injection and effective energy transfer, which leads to maximum exciton recombination and high device performance.

Which electron transport materials are used in OLED devices?

Schematic energy levels diagram of the studied OLED devices with the TPBi and Bphen as electron transporting materials. Molecular structures of the hole transport material (TAPC), electron transport materials (TPBi and Bphen) and host (CBP) used in this study.

Why is OLED efficiency important for organic flat-panel displays & solid-state lighting?

OLED efficiency is a key-issue for organic flat-panel displays and solid-state lighting, not only from a sustainability perspective but also to reduce fast device degradation that can occur at high brightnesses.

How can we analyze the physics and performance of OLEDs?

To analyze the effective alignment of the frontier molecular orbital energies on the underlying physics and performance of OLEDs, a commercially available numerical simulator, SETFOS (Semiconducting Thin Film Optics Simulation Software), is used.

Does the capacitance of OLED device affect the compensation effect?

Previous studies have mainly focused on the instability of TFT device, however the capacitance of OLED device could also affect the overall compensation effect.

superposition of 0 and 1. Quantum computers aren't restricted to 2 states; they cypher info as quantum bits, or qubits, which may exist in superposition. as a result of a quantum, pc will contain these multiple states at the same time, it's the potential to be immeasurable times a lot of powerful than today's most powerful supercomputers.

[1,2,3] The list includes flexible/wearable electronic devices, organic light-emitting diodes (OLED), organic field-effect transistors (OFET), (bio)sensors and the harvesting, storage and ...

Multidisciplinary research on organic fluorescent molecules has been attracting great interest owing to their potential applications in biomedical and material sciences. In recent years, electron deficient systems have

been increasingly incorporated into fluorescent materials. Triarylboranes with the empty p orbital of their boron centres are electron deficient and can be ...

A hybrid energy-storage system (HESS), which fully utilizes the durability of energy-oriented storage devices and the rapidity of power-oriented storage devices, is an efficient solution to managing energy and power legitimately and symmetrically. Hence, research into these systems is drawing more attention with substantial findings. A battery-supercapacitor ...

The cost structure of energy storage is taken as an input, including the power capacity cost (c_t in \$/kW) and energy capacity cost (c_u in \$/kWh). 8 Capital costs of energy storage and generation technologies (c_z) can be adjusted to account for applicable tax credits such as the technology-neutral investment tax credits that are available to ...

Energy is essential to all human activities as well as critical to social and economic development. Sustainable energy planning encompassing the concept of smart cities has a high potential to ...

Therefore, pumped storage technology is widely used in the development of hydropower energy. Pumped storage system can effectively make up for the shortcomings of intermittent and random fluctuations in wind power and photovoltaic power generations [13]. ... The concepts of initial gradient and superposition gradient are proposed to reveal ...

In this study, we present a highly integrated design of organic optoelectronic devices for Point-of-Need (PON) nitrite (NO_2^-) measurement. The spectrophotometric investigation of nitrite concentration was performed ...

New power system is mainly composed of clean energy sources such as new energy sources and hydropower energy, which is of great significance for improving energy structure and promoting sustainable development [1]. As an important development form of hydropower energy, pumped storage power station (PSPS) plays an important role in the new ...

A new scheme of pulsed voltage adding using inductively charged Blumlein lines has been proposed and experimentally demonstrated. The circuit principle is explained based on the analogy with ...

Nowadays the Renewable Energy Sources (RESs) are being endorsed by the population extensively. So, to exploit the RESs effectively, the concept of Energy Storage System (ESS) has been described in the literature. An ESS can balance the instability and the power demanded by the load, continuing its study and reliable nature. So far, Battery has been proved to be a ...

In recent years, researchers used to enhance the energy storage performance of dielectrics mainly by increasing the dielectric constant. [22, 43] As the research progressed, the bottleneck of this method was revealed. [] Due to the different surface energies, the nanoceramic particles are difficult to be evenly dispersed

in the polymer matrix, which is a challenge for large-scale ...

The time-temperature superposition principle--usually abbreviated as TTS or TTSP is a physical concept that is mainly used in polymers (such as adhesives), although it is also applicable to bituminous materials such as asphalt and to liquids capable of forming crystals (liquid crystals) such as those used in LCD (Liquid Crystal Display) pan ...

Fig. 1 is an example of energy system superposition. Four lines at the bottom are measured energy demand curve of four real buildings, a shopping center (40,000 m²), an office building (98,830 m²), a residential building (63,000 m²), and a hotel (19,991 m²). The added peak of three buildings is much higher than the superposition load curve.

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Quantum batteries are energy storage devices that utilize quantum mechanics to enhance their performance. They are characterized by a fascinating behavior: their charging rate is superextensive, meaning that ...

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