

# Yuyuan high temperature energy storage device

Can ladderphane copolymers be used for high-temperature capacitive energy storage?

Chen, J. et al. Ladderphane copolymers for high-temperature capacitive energy storage. *Nature* 615, 62-66 (2023). Wang, R. et al. Designing tailored combinations of structural units in polymer dielectrics for high-temperature capacitive energy storage.

Can MDS be used for high-temperature energy storage capacitors?

The integration of high thermal conductivity and low dielectric loss is a benefit for high-temperature energy storage capacitors. The MDs are an emerging new composite material designed and manufactured artificially with unexpected properties 30,31. Till now, however, MDs for high-temperature energy storage applications are still unexplored.

Does molecular trap engineering improve high-temperature capacitive energy storage performance?

Zhou, Y., Zhu, Y., Xu, W. & Wang, Q. Molecular trap engineering enables superior high-temperature capacitive energy storage performance in all-organic composite at 200 °C. *Adv. Energy Mater.* 13, 2203961 (2023). Feng, Q. et al. Recent progress and future prospects on all-organic polymer dielectrics for energy storage capacitors. *Chem.*

Which membranes enable high energy density in PEI-based composites for high-temperature electrostatic capacitors?

Liu, H. et al. Single-crystalline BaZr<sub>0.2</sub>Ti<sub>0.8</sub>O<sub>3</sub> membranes enabled high energy density in PEI-based composites for high-temperature electrostatic capacitors. *Adv. Mater.* 35, 2300962 (2023). Wang, P. et al. Ultrahigh energy storage performance of layered polymer nanocomposites over a broad temperature range. *Adv. Mater.* 33, 2103338 (2021).

Can machine learning be used to design polymers for energy storage capacitors?

Kern, J., Chen, L., Kim, C. & Ramprasad, R. Design of polymers for energy storage capacitors using machine learning and evolutionary algorithms. *J. Mater. Sci.* 56, 19623-19635 (2021). Gurnani, R. et al. polyG2G: a novel machine learning algorithm applied to the generative design of polymer dielectrics.

Why are current electrolytes important in energy storage devices?

Current electrolytes prevent operation at elevated temperature ranges. The electrolyte performs a central role in energy storage devices as it directly contacts with every essential component in the cell, hence, the effect of temperature is paramount.

Today, EES devices are entering the broader energy use arena and playing key roles in energy storage, transfer, and delivery within, for example, electric vehicles, large-scale ...

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Accompanied by the rapid development of pulse power technology in the field of hybrid vehicles, aerospace, oil drilling, and so on, the production requirements of dielectric energy storage capacitors are more ...

With the rapid prosperity of the Internet of things, intelligent human-machine interaction and health monitoring are becoming the focus of attention. Wireless sensing systems, especially self-powered sensing systems ...

Today, EES devices are entering the broader energy use arena and playing key roles in energy storage, transfer, and delivery within, for example, electric vehicles, large-scale grid storage, ...

Aqueous zinc-based energy storage (ZES) devices are promising candidates for portable and grid-scale applications owing to their intrinsically high safety, low cost, and high ...

In today's world, clean energy storage devices, such as batteries, fuel cells, and electrochemical capacitors, have been recognized as one of the next-generation technologies to assist in ...

The upsurge of electrical energy storage for high-temperature applications such as electric vehicles, underground oil/gas exploration and aerospace systems calls for dielectric ...

In linear dielectric polymers (the electric polarization scales linearly with the electric field, such as polypropylene, PP), the electrical conduction loss is the predominant ...

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