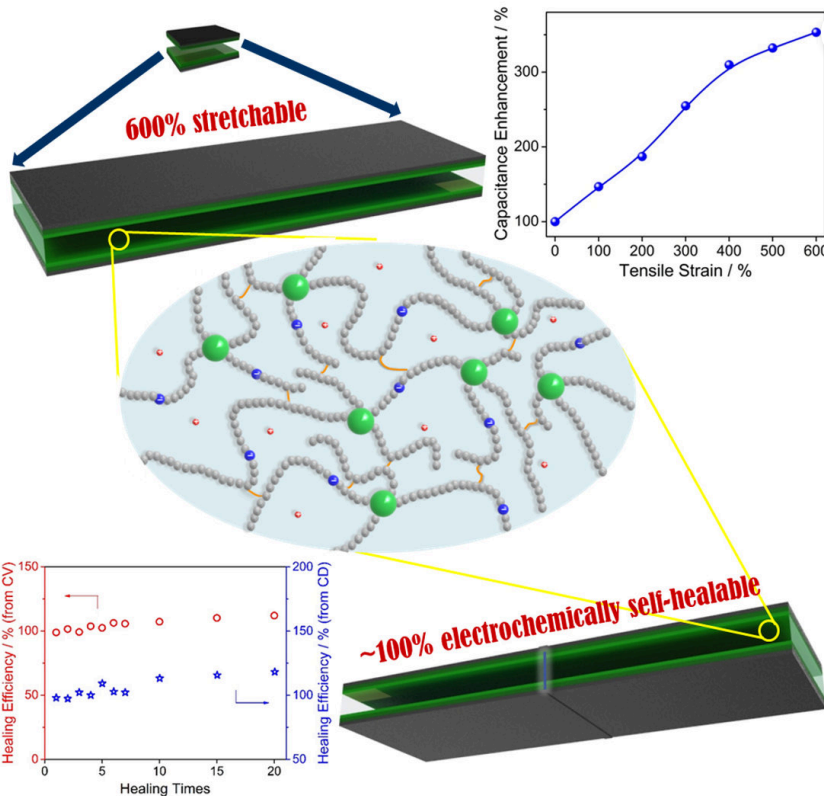



Polyelectrolyte, Production and use thereof in Energy Storage Devices (A New Multifunctional Polyelectrolyte for Super-Stretchable and Extremely Self-Healable Supercapacitors)


 Energy & Environment

Energy Conservation/Generation/Management/Storage (Battery)



IP Status
 Patent granted



Technology Readiness Level (TRL) 

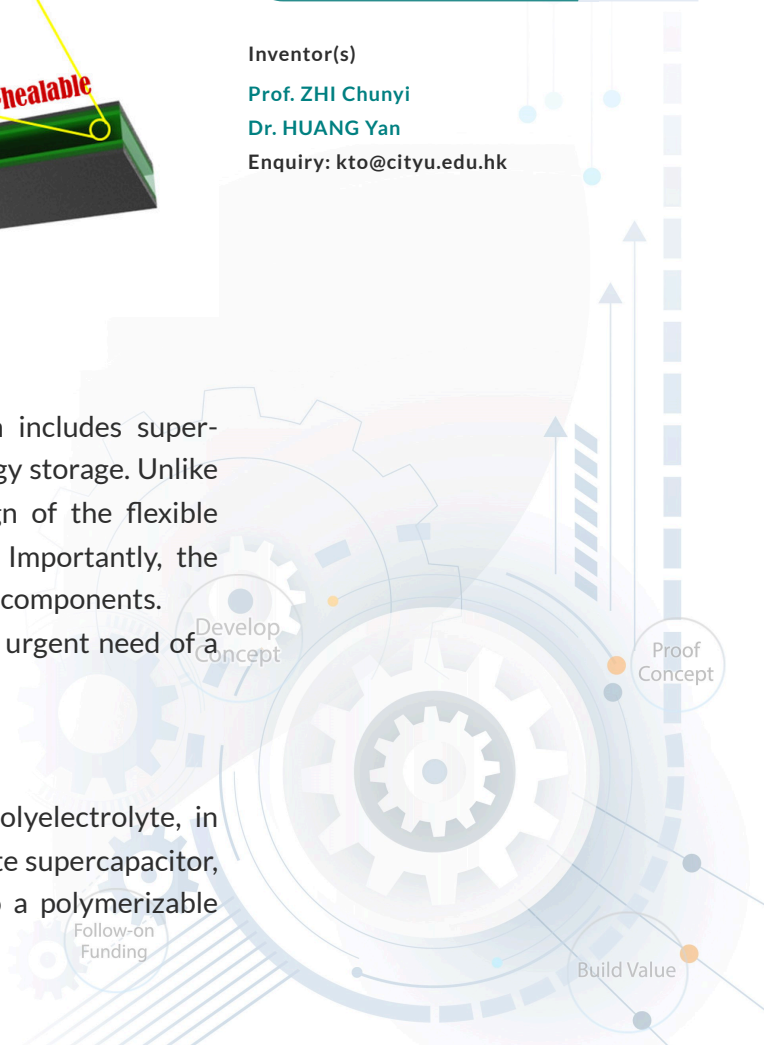
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Opportunity

This invention provides a multifunctional system, which includes super-stretchability, extremely excellent self healability and energy storage. Unlike the commonly developed rigid supercapacitor, the design of the flexible system realizes multiple functions in one single device. Importantly, the fabrication of this system is very facile and utilizes the least components. The supercapacitor research community in the world is in urgent need of a technology for the realization of multiple functions.

Technology

The present invention provides a new multifunctional polyelectrolyte, in particular a polyelectrolyte which is suitable for a solid-state supercapacitor, as well as a method for its preparation. It also refers to a polymerizable composition useful in forming said polyelectrolyte.



Incorporated with a simple prestretched wavy structure and small carbon nanotube patches on the cutting wounds, these supercapacitors are enabled with device-level multifunctionality, super-stretchability (600% strain) and excellent self-healability (~100% efficiency during all 20 breaking/healing cycles).

Advantages

- Excellent self-healability (~100% efficiency during 20 breaking/ healing cycles).
- The fabrication process of self-healable supercapacitor only takes a few minutes.
- The device reaches a super-stretchability of 600% strain and meanwhile enhanced performance under stretch.

Applications

- Super-stretchable energy storage device
- Portable and wearable electronics

