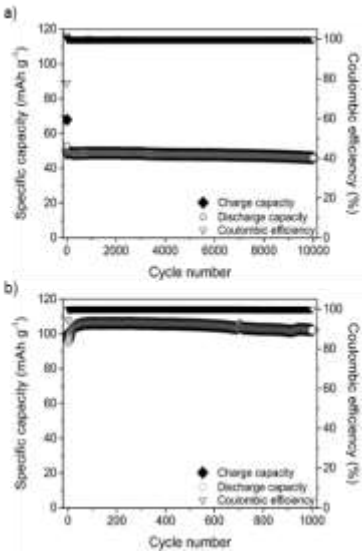
Poly(vinylphenothiazin)-cathodes

Cathode materials for batteries and hybrid superconsendators

Invention

The present invention describes a composite electrode for lithium ion or redox flow batteries made of organic material with very high cycle stability. For this purpose, poly (3-vinyl-N-methylphenothiazine) is used as cathode material in composite electrodes in batteries. In contrast to other organic cathode materials and radical polymers, composite electrodes are characterized by a very high cycle stability and rate capability.



Commercial Opportunities

Batteries deliver better energy densities than supercapacitors. However, supercapacitors can be charged/ discharged faster and more often. The invention belongs to the area inbetween these categories. Organic electrode materials have the potential to offer higher charging rates and a longer life compared to batteries. They also have higher energy densities compared to supercapacitors. Cathode materials are important building blocks in everyday life and can be found particularly in the field of printable electronics, hybrid capacitors for public transport (eg. buses), energy recovery or recuperation. The invention can be used in many ways depending on the goals which are set. For example, battery manufacturers, manufacturers of electrode materials, or users of the finished battery/ hybrid supercapacitors can benefit. The use of Poly(vinylphenothiazines) as the cathode material enables longer battery life, fast charging and lower toxicity are significant economic advantages over existing metal oxide based materials.

Current Status

The invention was filed as a patent application with the DPMA. An International PCT Patent Application has been made as well. A lab-scale prototype, including lab tests, has been successfully manufactured. On behalf of the University of Muenster, PROvendis offers licenses to interested companies for the connections and the process for their production.

An invention of the University of Münster.

Competitive Advantages

- Metal free cathode
- Long-term stability
- Rate capability
- Sustainability
- Low toxicity
- Availability of raw materials
- Easy processing
- Lower costs
- Fast loading capacity

Technology Readiness Level

1 2 3 4 5 6 7 8 9

Experimental proof of concept

Industries

- Chemical Industry
- Materials Industry

Ref. No.

4938

Contact

Dr. Thorsten Schaefer
E-Mail: ts@provendis.info
Phone: +49(0)208-94105-27

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PROvendis GmbH
Schlossstraße 11-15
45468 Muelheim an der Ruhr
Germany
www.provendis.info