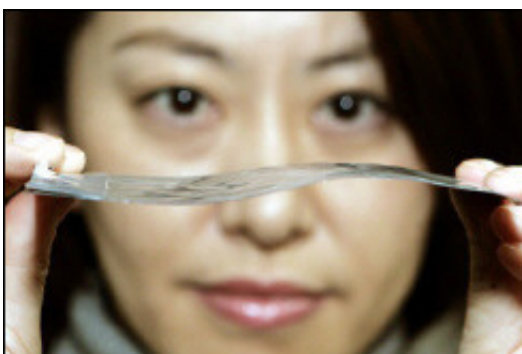


NEC Develops New Ultra-Thin, Flexible Battery Boasting Super-Fast Charging Capability (Picture)

December 7 2005



NEC Corporation today announced that it has succeeded in the development of an ultra-thin, flexible, rechargeable battery capable of super-fast (30-second) charging, which can be embedded into smartcards and intelligent paper. The new battery, organic radical battery (ORB), uses a type of plastic called organic radical polymer as its cathode.

Organic radical polymer assumes an electrolyte-permeated gel state, and is the reason why the rechargeable battery is so remarkably flexible and pliant. In addition, the organic radical polymer electrode reaction is extremely fast and the supporting salts migrate through gel state polymer very smoothly. This results in little resistance to the charging reaction and an incredibly fast charging time of less than 30 seconds. Not only is

this new battery thin, flexible and rechargeable, but it is also environmentally friendly as unlike conventional rechargeable batteries, it does not contain any harmful heavy metals such as mercury, lead or cadmium.

Key features of the newly developed battery include:

- (1) An exceedingly thin structure (300 microns), which will enable it to be embedded into objects such as smartcards and intelligent paper in the future.
- (2) A pliant and bendable structure, as flexible plastic is used as the cathode material.
- (3) An ultra-fast charging speed of less than 30 seconds.
- (4) A high energy density of approximately 1 mWh (mili Watt hour) per cm squared. This means, for example, that if the ORB was used in an active RFID device, it would support up to approximately several tens of thousands of signal transmissions on a single charge.
- (5) Environmentally friendly, it does not contain any harmful metals.

NEC anticipates that its new and unique battery will be used extensively in the future to power all kinds of tiny ubiquitous terminals. The interconnection of networks with battery-powered next generation ubiquitous devices will enable all kinds of objects to become terminals, bringing us closer to a ubiquitous networked society by allowing access to the network anytime, anywhere.

The results of this research will be exhibited at iEXPO 2005 being held at Tokyo Big Site, Japan, from December 7 - 9, 2005.

Source: NEC

Citation: NEC Develops New Ultra-Thin, Flexible Battery Boasting Super-Fast Charging Capability (Picture) (2005, December 7) retrieved 24 April 2024 from <https://phys.org/news/2005-12-nec-ultra-thin-flexible-battery-super-fast.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.