ICAP PATENT BROKERAGE

Lithium Ion Battery & Method for Producing a Coating of an Anode of a Lithium Ion Battery

Third Patent Portfolio Investment Company

Initial Bidding Guidance: Please inquire

Lithium Ion Battery

With a priority date from 2008, the invention is directed to methods for developing lithium batteries having a membrane of higher heat resistance. This is achieved by having: (i) a cathode comprising a metallic conducting substrate and a polycrystalline layer situated on the substrate; (ii) an ion-conducting membrane structure comprising at least one lithium conducting layer; (iii) an anode comprising a polycrystalline layer and a metallic conducting layer, wherein the polycrystalline layer faces the membrane structure; wherein the lithium conducting layer is a thin, gas-tight polymer film, which is physically treated such that channels and/or lithium ions or lithium atoms are introduced in the lithium-conducting layer by bombardment with lithium ions or lithium atoms. Further, the membrane structure exhibiting a heat resistance higher than 150° C.

This higher heat resistance ensures an increased maximum voltage charge can be applied to the cell or the cell's maximum voltage load. Additionally, the higher the heat resistance of the membrane, the higher the charging currents can be, which in turn decreases the charging time required. Therefore, this superior battery technology would be of interest to companies producing lithium ion batteries.

Method for Producing a Coating of an Anode of a Lithium Ion Battery

With a priority date from 2012, the invention relates to a method for producing a coating of an anode of a lithium-ion battery by means of an HF powder plasma spraying process. The method comprises the steps of (i) HF-plasma spraying a substrate in a recipient with carbon nanopowder which is supplied in a deagglomerated and/or deaggregated state and (ii) spraying the substrate with free silicon.

The method allows the production of highly stable and efficient anodes. In particular, it is possible to form a crystalline anode coating with carbon nano fibers having a diameter of 5-40 µm. A homogenous distribution of very small silicon particles can be achieved.

Sample Forward Citing Institution: State University System of Florida

Earliest Priority Date: 10-20-2008

Representative Claims: US Application 2012/0021297 – Claim #23

A lithium ion battery comprising: a cathode comprising a metallic conducting substrate and a first polycrystalline layer situated on the substrate, an ion-conducting membrane structure comprising at least one lithium-conducting layer, and an anode comprising a second polycrystalline layer and a metallic conducting layer, the second polycrystalline layer facing the membrane structure, wherein the lithium-conducting layer comprises a polymer film comprising a polymer having a glass transition temperature higher than 150° C. and being conductive to lithium ions due to physical treatment.

TECHNOLOGY

BATTERIES; LITHIUM ION

NOVELTY

A LITHIUM ION BATTERY HAVING A SPECIFIC MEMBRANE OF HIGHER HEAT RESISTANCE; ALLOWING FOR HIGHER CHARGING CURRENTS AND THEREFORE DECREASING THE CHARGING TIME REQUIRED. A METHOD FOR PRODUCING A COATING OF AN ANODE OF A LITHIUM-ION BATTERY BY MEANS OF A SPECIFIC HF POWDER PLASMA SPRAYING PROCESS

IMPORTANCE

A VALUABLE PORTFOLIO FOR COMPANIES PRODUCING LITHIUM ION BATTERIES AS IT REDRESSES THE PROBLEM OF HEAT BUILD-UP IN BATTERIES, MAKING THEM SAFER, PARTICULARLY FOR CONSUMER PRODUCTS OR AUTOMOBILES, BY DRASTICALLY REDUCING THE LIKELIHOOD OF FIRE OR EXPLOSIONS AND ALLOWS THE PRODUCTION OF STABLE ANODES FOR HIGH-CAPACITY BATTERIES

NUMBER OF ASSETS

8

PATENTS (3)

CN ZL200980146927.3
DE 102008054187
EP 2338190

APPLICATIONS* (5)

US 2012/0021297
DE 102012112954
JP 2012-506130
KR 10-2011-0071115
WO 2014/096307

**Applications listed as publication numbers.*

International Application WO 2014/096307 – Claim #1
A method for producing a coating of an anode of a lithium-ion battery by means of an HF powder plasma spraying process, comprising the steps: (i) HF-plasma spraying a substrate in a recipient with carbon nanopowder which is supplied in a deagglomerated and/or deaggregated state and (ii) spraying the substrate with free silicon.

Contact:
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