Lithium battery patent breakdown

How many NMC lithium-ion battery patents are there?
Currently,more than 4,000 patentshave been granted,mainly in Japan and China,and more than 3,600 patent applications are pending,mainly in the USA and China. More than 590 patent applicants can be found on the NMC Lithium-ion Battery patent landscape.

What is a lithium-ion battery?
A lithium-ion battery is a type of rechargeable battery. It includes a positive electrode with a positive current collector,a first active material,and a second active material. The battery also includes a negative electrode with a negative current collector and a third active material,where the third active material is a lithium titanate material.

Do lithium ion batteries have protection circuitry?
Conventional lithium-ion batteries may include protection circuitryto prevent damage in the event of a low voltage condition. These batteries may be utilized in devices that include protection circuitry,which reduces the current drain from the battery by disconnecting it when necessary.

Does lithium titanate affect battery performance?
The use of lithium titanate in a battery is believed to reduce the likelihood of lithium platingduring charging. Lithium plating is a phenomenon that can negatively impact the performance of lithium-ion batteries.

Can a lithium ion battery be fully discharged?
A lithium-ion battery such as that described herein can be fully dischargedwhile the materials for both electrodes,including their corresponding current collectors,remain stable (e.g.,corrosion of the current collectors and/or the decomposition of active material may be avoided,etc.).

Can lithium ion batteries be plated?
Lithium ion batteries can be affected by lithium plating,which can lead to a loss in performance. However,cells with lithium titanate negative electrodes may be charged at rates that exceed those with carbon negative electrodes,being free from the risk of lithium plating.

A lithium-iron disulfide battery with improved high temperature performance is disclosed. The separator characteristics are deliberately selected to be compatible with the electrolyte at the intended temperature. ... 2018-02-07 Priority to US15/890,858 priority Critical patent/US10998535B2/en ... the average dielectric breakdown voltage exceeds ...

A lithium/iron disulfide electrochemical battery cell with a high discharge capacity. The cell has a lithium negative electrode, an iron disulfide positive electrode and a nonaqueous electrolyte. The positive electrode mixture containing the iron disulfide contains highly packed solid materials, with little space around the solid

particles, to provide a high concentration of iron disulfide ...

A battery separator favorably employable for lithium secondary battery comprises at least one porous film in which 100 to 40,000 ppm of particles of silicon dioxide, aluminum oxide, magnesium oxide, zinc oxide or metal oxides containing at least two metal elements selected from the group consisting of Si, Al, Mg and Zn having a mean diameter of 0.1 to 10 mum are dispersed in a ...

Quantitative chemical mapping of battery electrodes is a rather new post-mortem analytics method for identifying and describing chemical degradation processes in lithium-based battery systems. In consideration of ...

Lithium-ion battery cost breakdown ..... 42 Table 8. ... Top 10 applicants for lithium-ion battery patents in the United States Rank Applicant name Country Application ...

QuantumScape"s solid-state battery is packed full of innovation that places the battery distinctly apart from lithium-ion technology batteries and other solid-state designs: ... The report includes a breakdown of the patent portfolio across various technologies, listing the patent along with brief summaries of each patent"s technology. ...

Figure 20.1 presents the details of total sales of all the major rechargeable battery systems (Li-Cd, Ni-MH, Li-Ion battery, and Li-Ion battery-Laminated) from 1991 to 2006.23 The total market size of rechargeable battery systems keeps over 6 billion US$ and as of now the lithium battery market is about 4.5 billion US$; adding HEV application, the market ...

An improved lithium-ion or lithium-polymer battery that is capacity-fade resistant. The battery includes an anode comprised of graphite where density of the graphite is in a range from 1.2...

Moroccan scientist Rachid Yazami was granted a new patent in China for his work on lithium battery technology, specifically the fast-charging technique. Click allow to get notifications on every ...

For this report, we investigated the global patent landscape of NMC Lithium-ion Batteries including precursor, material, electrode and battery manufacturing issues, and all types of NMC materials, whether unmodified, modified, core ...

A lithium battery includes a casing having at least one reacting trough in which at least one electrode device is installed and the at least one electrode device includes a first electrode having a lithium compound that contains ionizable lithium ions and a first electric conductor. A second electrode includes at least including a layer material containing carbon or metal alloys, and a ...

A lithium-ion battery includes a positive electrode including a positive current collector, a first active material, and a second active material. The battery also includes a negative electrode having a negative current collector

and a third active material, the third active material including a lithium titanate material. The first active material, second active material, and third active ...

The Blade Battery is a new type of lithium-ion battery developed by Chinese battery manu-facturer BYD. The Blade Battery is named after its unique shape, which resembles a blade. This battery has several advantages over traditional lithium-ion batteries, including a longer lifespan, higher energy density, and improved safety.

The lithium iron phosphate battery (LiFePO 4 battery) or LFP battery (lithium ferrophosphate) is a type of lithium-ion battery using lithium iron phosphate (LiFePO 4) as the cathode material, and a graphitic carbon electrode with a ...

The results show that China surpassed Japan in total patent count in 2018 and has now become the technology leader across the whole battery production value chain. The findings also ...

Inputs revealed that Huawei has applied for the solid-state battery patent with the title - Doped Sulfide Materials and Preparation Methods, Lithium-ion Batteries. This invention will resolve the challenging battery problem: the breakdown of liquid electrolytes.

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