Polyimide lithium battery separator patent

Are polyimide-based separators suitable for lithium-ion batteries?
Polyimide-based separators are promisingfor next-generation rechargeable batteries with enhanced safety and energy density. The molecular design strategies and microstructural control methods for high-performance polyimide-based separators for lithium-ion batteries are reviewed in detail. 1. Introduction

What is a lithium battery separator?
As the key material of lithium battery,separator plays an important role in isolating electrons,preventing direct contact between anode and cathode,and allowing free passage of lithium ions in the electrolyte. Polyethylene terephthalate(PET) has excellent mechanical,thermodynamic,and electrical insulation properties.

Which polyolefin separator material is used in lithium battery?
The polyolefin separator material used in lithium battery is shown below. At present, the separators are developed from various types of materials such as cotton, nylon, polyesters, glass, ceramic, polyvinyl chloride, tetrafluoroethylene, rubber, asbestos, etc...

Do lithium-ion battery separators need new materials?
Some unmet needs for lithium-ion battery separators are addressed, largely based on vital criteria for next-generation batteries. New separator materials with new requirements will be necessary for use in emerging applications. Furthermore, the development of new materials for lithium-ion batteries has led to the need for new separator materials.

Who are the scientists who make lithium ion battery separators?
Jaemun Cheon, Sang Heon Park, Youngkwon Kim, Taeeun Yim. Aluminum oxide and ethylene bis (diphenylphosphine)-incorporated poly (imide) separators for lithium-ion batteries.

Which paper separator for high-safety lithium-ion battery?
L. Liu,Z. Wang,Y. Xie et al.,"Zirconia/polyethylene terephthalate ceramic fiberpaper separator for high-safety lithium-ion battery," Ionics,vol. 26,no. 12,pp. 6057-6067,2020.

In order to improve the comprehensive performance of lithium battery separator, cellulose based on lithium battery separator (mCNS) was prepared by cellulose/nylon 6 with ionic liquid [Emim]Ac as solvent and enhanced with polyimide (PI) as the impregnated solution. The properties of modified separator were investigated. As could be discovered ...

Gustafson et al. (U.S. Pat. No. 6,451,480 issued Sep. 17, 2002) later on disclosed a Polyimide-based lithium-ion battery in which the anode and the cathode are prepared from an electrolyte...

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Other examples of cellulosic separators are polyimide/cellulose lithium battery separator paper (Wang, Zhao, Han, & Jiang, 2019), chemically modified TEMPO (2,2,6,6-tetramethylpiperidine-1-oxyl ...

Fourth, the separator of the power battery is required to have better electrochemical oxidation resistance. Fifth, the separator of the power battery needs better electrolyte absorption performance. At present, most separators of the lithium-ion battery are polyolefin separators, which have poor heat resistance, electrolyte absorption ...

The present invention relates to the technical field of lithium-ion battery separator preparation. Disclosed are a polyimide microsphere slurry, a composite separator, and a lithium-ion...

Among these attempts, separators based on polyimide (PI) ... polyimide nanofibrous membrane with porous-layer-coated morphology by in situ self-bonding and micro-crosslinking for lithium-ion battery separator Electronic supplementary information (ESI) available. Nanoscale, 10 (2018), pp. 22439-22447. Crossref View in Scopus Google Scholar [40] G.H. ...

A porous polyimide (PI) membrane is successfully prepared via nonsolvent-induced phase separation with two porogens: dibutyl phthalate and glycerin. The as-prepared uniform porous PI membrane shows excellent separator properties for lithium-ion batteries (LIBs). Compared with the commercial polyethylene (PE) separator, the PI separator exhibits ...

Polyimide-based separators are promising for next-generation rechargeable batteries with enhanced safety and energy density. The molecular design strategies and microstructural control methods for high-performance polyimide-based separators for lithium-ion batteries are reviewed in detail. Download: Download high-res image (138KB) ...

the lithium secondary battery separator of the present invention is formed by applying a polyimide precursor slurry containing uniformly dispersed silica particles having an ...

develop new materials for battery separators with high thermal stability and high electrolyte wettability. Polyimide (PI) is a new type of special insulating material

Separator for rechargeable lithium battery and rechargeable lithium battery including the same - Patent 2669970 (19) (11) EP 2 669 970 A1 (12) EUROPEAN PATENT ...

the lithium secondary battery separator of the present invention is formed by applying a polyimide precursor slurry containing uniformly dispersed silica particles having an identical...

In this paper, we describe the recent studies of functionalized and composite polyimide sepa-rators in LIBs and present the future development direc-tion of polyimide separators. ...

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A polyimide blend nanofiber and its use in battery separator are disclosed. The polyimide blend nanofiber is made of two kinds of polyimide precursors by high pressure electrostatic spinning and then high temperature imidization processing, wherein one of the polyimide precursor does not melt under high temperature,and the other is meltable at a temperature of 300-400?.

The invention provides oxidation resistance, blocks dendrite growth, adds dimensional stability, reduces shrinkage, adds high temperature performance (HTMI function), prevents electronic shorting at temperatures above 200 deg C in rechargeable lithium battery. The separator with a polyimide coating provides blocking ionic flow between the anode ...

Separator for rechargeable lithium battery and rechargeable lithium battery including the same - Patent 2669970 (19) (11) EP 2 669 970 A1 (12) EUROPEAN PATENT APPLICATION (43) Date of publication: 04.12.2013 Bulletin 2013/49 (21) Application number: 12186150.4 (22) Date of filing: ...

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