Description

Title of Invention

STAINLESS STEEL FOIL FOR BATTERY OUTER PACKAGING

Technical Field

[0001]

The present invention relates to a stainless steel foil for battery armoring, which stainless steel foil (hereinafter referred to as a "battery armoring stainless steel foil") is suitable for a container of a lithium ion secondary battery and the like.

Background Art

[0002]

Secondary batteries such as nickel cadmium batteries, nickel hydrogen batteries, and lithium ion secondary batteries are used in electric devices and electronic devices such as mobile phones and laptop computers. Lithium ion secondary batteries in particular are often used in mobile phones and other mobile devices due to their high weight energy density and suitability for small and lightweight applications. In recent times, lithium ion secondary batteries have been used in an increasingly wide range of fields, as seen in their use in power tools, electric vehicles, hybrid

Claims

Claim 1

A battery armoring stainless steel foil comprising:

an oxide film, having a thickness of not less than 2 nm, which contains (i) one or more metallic elements, existing as a hydroxide, in an amount of not less than 35 mol percent and (ii) SiO_2 in an amount of not more than 40 mol percent,

the battery armoring stainless steel foil having an arithmetic mean roughness Ra of less than 0.1 μm but not less than 0.02 μm in a direction orthogonal to a direction in which the battery armoring stainless steel foil has been rolled.

Claim 2

The battery armoring stainless steel foil according to claim 1, wherein the thickness of the oxide film is not more than 5 nm.

Claim 3

The battery armoring stainless steel foil according to claim 1 or 2, wherein the battery armoring stainless steel foil is obtained by annealing a rolled stainless steel foil at a temperature in a range of 900°C to 1180°C in a reducing atmosphere in which (i) a dew point falls in the range of -40°C to -60°C and (ii) a hydrogen partial pressure is not less than

75%.

Description

Title of Invention

BATTERY ARMORING STAINLESS STEEL FOIL, AND METHOD OF PRODUCING SAME

Technical Field

[0001]

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Background Art

[0002]

Secondary batteries such as nickel cadmium batteries, nickel hydrogen batteries, and lithium ion secondary batteries are used in electric devices and electronic devices such as mobile phones and laptop computers. Lithium ion secondary batteries in particular are often used in mobile phones and other mobile devices due to their high weight energy density and suitability for small and lightweight applications. In recent times, lithium ion secondary batteries have been used in an increasingly wide range of fields, as seen in their use in power tools, electric vehicles, hybrid cars, and small satellites.

Claims

Claim 1

A battery armoring stainless steel foil comprising:

an oxide film, having a thickness of not less than 2 nm, which contains (i) Fe and Cr, each existing as a hydroxide, in a combined amount of not less than 35 mol percent and (ii) SiO_2 in an amount of not more than 40 mol percent,

the battery armoring stainless steel foil having an arithmetic mean roughness Ra of less than 0.1 μm but not less than 0.02 μm in a direction orthogonal to a direction in which the battery armoring stainless steel foil has been rolled.

Claim 2

The battery armoring stainless steel foil according to claim 1, wherein the thickness of the oxide film is not more than 5 nm.

Claim 3

A method of producing a battery armoring stainless steel foil recited in claim 1 or 2, the method comprising the steps of:

obtaining a rolled stainless steel foil which has an arithmetic mean roughness Ra of less than 0.1 μm but not less than 0.02 μm in a direction orthogonal to a direction in

which the rolled stainless steel foil has been rolled; and

forming an oxide film by annealing the rolled stainless steel foil at a temperature in a range of 900°C to 1180°C in a reducing atmosphere in which (i) a dew point falls in the range of -40°C to -60°C and (ii) a hydrogen partial pressure is not less than 75%.