US 20230231104A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2023/0231104 A1

HU et al. (43) Pub. Date: Jul. 20, 2023

(54) **PRECURSOR SOLUTION, AND MODIFIED LAYER AND LITHIUM-BASED BATTERY PREPARED BY USING THE SAME**

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(21) Appl. No.: **17/699,677**

(22) Filed: **Mar. 21, 2022**

(30) **Foreign Application Priority Data**

Jan. 17, 2022 (TW) 111101862

Publication Classification

(51) **Int. Cl.**

H01M 4/04	(2006.01)
H01M 10/0525	(2006.01)
H01M 4/1391	(2006.01)
H01M 4/36	(2006.01)

(52) **U.S. Cl.**

CPC ***H01M 4/0471*** (2013.01); ***H01M 10/0525*** (2013.01); ***H01M 4/1391*** (2013.01); ***H01M 4/366*** (2013.01); *H01M 2004/028* (2013.01)

(57) **ABSTRACT**

Provided are a precursor solution, and a modified layer and a lithium-based battery prepared by using the same. The modified layer is formed on the negative electrode, the positive electrode and/or the separator of the lithium-based battery by using the precursor solution through photo-polymerization reaction or thermal curing. The lithium-based battery comprising the modified layer effectively promotes the charge and discharge capability, cycling life, and safety. The modified layer can be applied to a roll-to-roll process. The formation of lithium dendrites in the lithium-based battery comprising the modified layer is significantly suppressed or reduced during the charge-discharge cycles. The shuttle effect is effectively suppressed or reduced in lithium sulfur batteries and lithium iodine batteries. All the above effects are beneficial to increasing the product value of lithium ion batteries, lithium metal batteries, anode-free lithium batteries, lithium sulfur batteries, and lithium iodine batteries.