



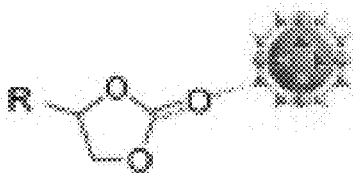
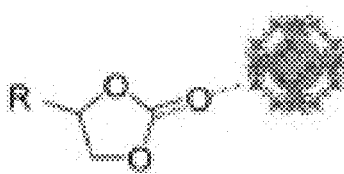
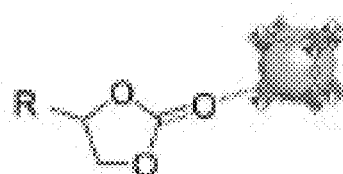
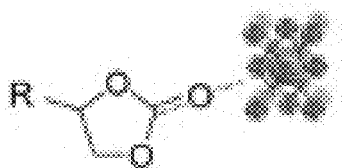
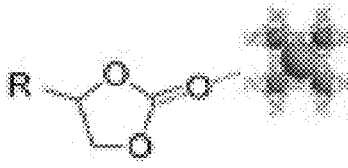
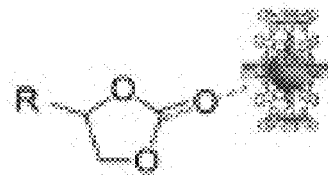
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(19) **United States**(12) **Patent Application Publication**  
**Chen**(10) **Pub. No.: US 2024/0213533 A1**(43) **Pub. Date: Jun. 27, 2024**(54) **ADDITIVE FOR LOW TEMPERATURE  
LITHIUM ION BATTERY, AND  
ELECTROLYTE AND LITHIUM ION  
BATTERY USING SAME****H01M 10/0568** (2006.01)**H01M 10/0569** (2006.01)(52) **U.S. Cl.****CPC ... H01M 10/0567** (2013.01); **H01M 10/0525**  
(2013.01); **H01M 10/0568** (2013.01); **H01M**  
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(CN)(21) Appl. No.: **17/425,924**(22) PCT Filed: **Dec. 7, 2018**(86) PCT No.: **PCT/CN2018/119678**

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An additive for a functionalized metal-organic framework material of a low temperature lithium-ion battery, and a low temperature electrolyte and a low temperature lithium-ion battery using the additive. The electrolyte comprises an organic solvent, a composite lithium salt and an additive, wherein in percentages by mass, the content of the organic solvent is 80-89%, the content of the composite lithium salt is 10-15%, the content of the additive is 0.1-10%, and the additive is an MOF-functionalized additive. The use of the electrolyte in a lithium-ion battery can significantly improve the stability thereof, and increases the conductivity, the degree of dissociation and the solubility of the electrolyte at a low temperature, enhances the conduction rate of Lit, and improves the structure of a negative electrode solid phase interface film of the lithium-ion battery, and then reduces the low temperature impedance thereof, and improves the high rate capability of the battery.

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