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(54) **HIGH-NICKEL POSITIVE ELECTRODE ACTIVE MATERIAL, PREPARATION METHOD THEREOF, LITHIUM ION BATTERY COMPRISING SAME, BATTERY MODULE, BATTERY PACK AND ELECTRICAL DEVICE**

(57) The present application provides a high-nickel ternary positive electrode active material, which comprises a core $\text{Li}_{1+a}[\text{Li}_x\text{Co}_y\text{Mn}_z\text{M}_b]\text{O}_2$, a fast ionic conductor $\text{Li}_\alpha\text{Al}_x\text{Si}_y\text{O}_4$ of a first shell layer, an oxide of an element R of a second shell layer, and a transition layer $\text{Li}_p\text{R}_q\text{O}_w$ formed between the first shell layer and the second shell layer. In the high-nickel ternary positive electrode active material of the present application, the surface impurity lithium amount is significantly reduced, and by creatively converting the surface impurity lithium into effective components in the fast ionic conductors $\text{Li}_\alpha\text{Al}_x\text{Si}_y\text{O}_4$ and $\text{Li}_p\text{R}_q\text{O}_w$ which accelerate the intercalation/deintercalation of lithium ions in the core material, the decomposition and gas production of an electrolyte solution caused by the surface impurity lithium is greatly improved, such that a high-nickel ternary lithium-ion battery has high energy

density as well as good cycle performance and safety performance.

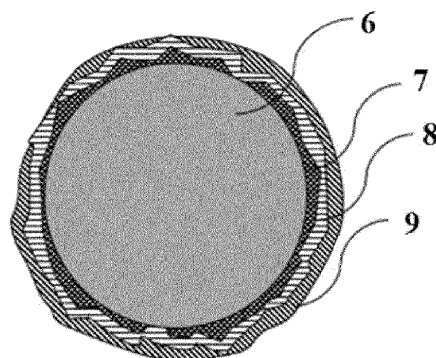


FIG. 1