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(54) **NANO-SILICON-GRAPHITE COMPOSITE NEGATIVE ELECTRODE MATERIAL WITH CARBON COATING AND ALUMINUM METAPHOSPHATE COMPOSITE MODIFICATION LAYER ON SURFACE AND PREPARATION METHOD THEREOF**

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(57) **ABSTRACT**

A nano-silicon-graphite composite negative electrode material with carbon coating and aluminum metaphosphate composite modification layer on surface and its preparation method are disclosed, which is mainly prepared from following components by mass percentage: 4-10 wt. % of aluminum metaphosphate, 10 wt. % of asphalt cracking carbon, 15 wt. % of spherical nano-silicon powder, and 71-65 wt. % of graphite powder. A nano-silicon powder is added to deionized water for ultrasonic dispersion to obtain a uniform dispersion, then graphite powder is added to mix uniformly, and then waterborne asphalt is added. After stirring and mixing evenly, spray drying is carried out, and the dried powder is compounded with metaphosphate for mechanical fusion. Finally, the same is transferred into vacuum furnace for high-temperature carbonization to obtain the product. The composite modification layer existing on the surface can well inhibit the corrosion of the nano-silicon material by electrolytes, alleviate volume expansion, improve electrical conductivity, and increase cycle life.