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Nanotube Composite Anode Materials (IN-09-034)

Increased battery capacity, safety, stability and reliability at lower cost.

The Invention

A composite material suitable for use in an anode for a lithium-ion battery. The composite material is comprised of a layer of a lithium-alloying material on the walls of an aligned nanotubular base material. Preferably, the lithium-alloying material comprises a material selected from the group consisting of Si, Sn, Pb, Al, Au, Pt, Zn, Cd, Ag, Mg, and a combination of two or more of these.

The nanotube composite materials provide increased structural stability during lithiation and delithiation. The Argonne-developed materials also offer a significant increase in specific capacity and improvements in long-term stability.

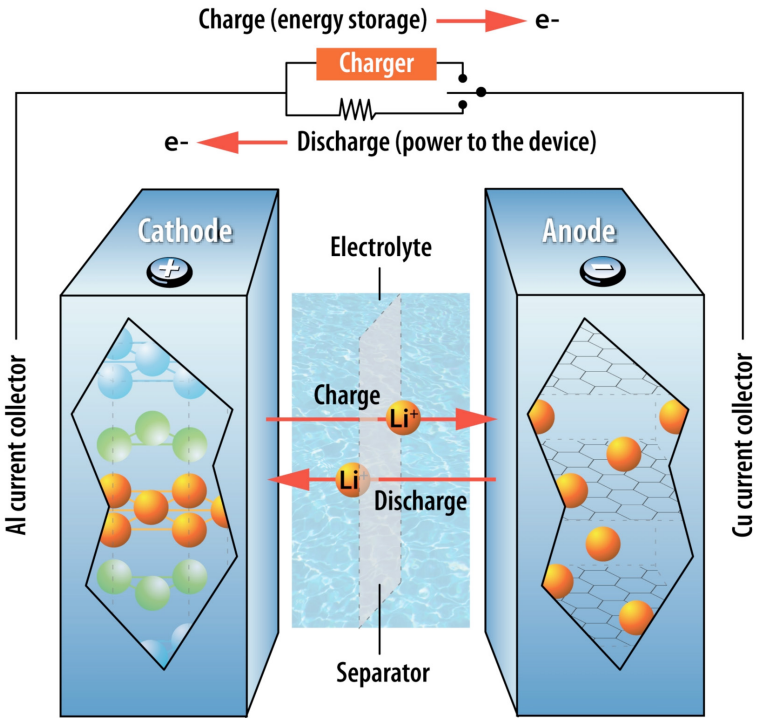
Benefits

- Increases capacity;
- Improves safety;
- Increases long-term stability and reliability;
- Lowers battery cost; and
- Could exceed the technical specifications for electrified vehicles.

Applications and Industries

Electrodes used in batteries for

- Electric and plug-in hybrid electric vehicles;
- Portable electronic devices;
- Medical devices; and
- Space, aeronautical, and defense-related devices.



When delivering energy to a device, the lithium ion moves from the anode to the cathode. The ion moves in reverse when recharging. Compared to other rechargeable batteries, lithium-ion batteries can store more energy in smaller, lighter packages. This unsurpassed energy-to-weight ratio make them the battery of choice for consumer electronics like cell phones and laptops, but also a great fit for electrified vehicles

Developmental Stage

Under development

Availability

Available for licensing

Patent Information

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