Micro-nano structured Si/C composite anode design encapsulates nano-size Si aggregate into micro-size C-based conglomerate, enhances the specific capacity of the anode of Li-ion energy storage device for disposable medical capsule application.

Keywords:
- Disposable medical capsule, energy density, high-capacity, lithium-ion, micro, nano, silicon, carbon, energy storage device, environmental-friendly.

Problems addressed
Rising disposable medical capsule applications seek for higher power and/or energy density requirement against existing applications. Thus drives the implementation and development of high-capacity rechargeable lithium-ion energy storage technology.

ASTRI’s design employed micro-nano structured silicon/carbon composite which aids to nearly double the anode specific capacity (700 vs 370 mAh/g) of Li-ion energy storage device for disposable medical capsule applications.

Innovations
The innovative micro-nano structured Si/C composite anode design encapsulates nano-size Si aggregate into micro-size C-based conglomerate, markedly boosted anode specific capacity. The technology is applicable for the advancing disposable medical capsule applications.

Key features include:
- Nano-size Si aggregate provides fast Li ions diffusion pathways
- Micro-size C-based conglomerate accommodates volumetric expansion of Si and maintains the integrity of anode
- Environmental-friendly and low-cost process

Key impact
- Pain relief and easy to swallow due to reduced size
- High capacity enables high resolution imaging
- Supports pre-tune of medical device and achieves high accuracy

Innovation snapshot

Project completed
- 2019

Applications
- Disposable medical capsule

Patent(s)
- US Patent No. 10,608,226

ASTRI Patent Search

Commercialisation Opportunities
- IP licensing
- Technology co-development

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