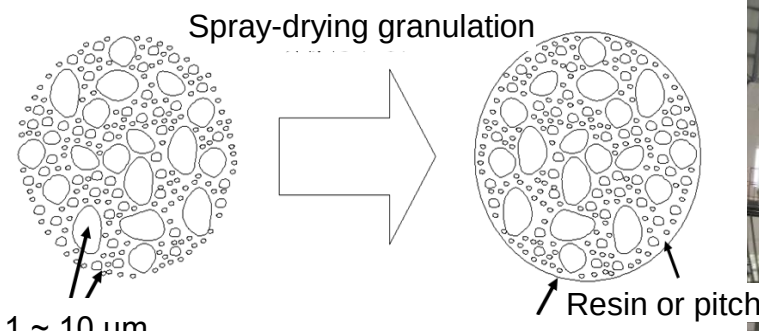
ITEX '13 MALAYSIA
24TH INTERNATIONAL INVENTION, INNOVATION & TECHNOLOGY EXHIBITION
9- 11 MAY 2013
KUALA LUMPUR CONVENTION CENTRE

Manufacture of anode material from graphite fine powders as lithium ion battery

Taiwan Pat. Apl. No. : 100108866
U.S.A. Pat. Apl. No. : 12891802
China Pat. Apl. No. : 201110079820.0

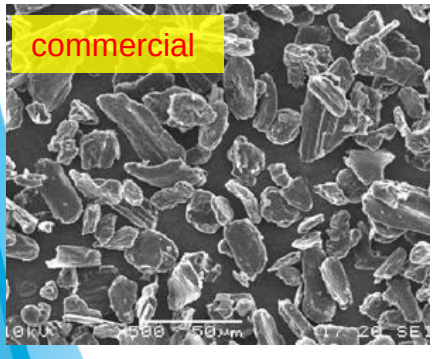
◎ Innovation

This technology uses small natural or artificial graphite powder 1~10 μm mixed with the resin or pitch by spray drying method to produce the composite material 18~22 μm. Then, the composites go to graphitization process that can exhibit higher compress density and electrochemical capacity. The raw fine graphite powder from the waste will effectively reduce production cost of anode.

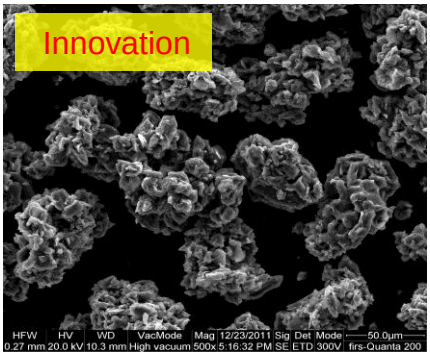



Spray-dryer


Anode material



SEM of commercial graphite



SEM of mixed with graphite powder and resin


Good coating on copper foil

◎ Technical Index

(1) Particle size (D50): 18~22 μm (2) Compaction density: ≧ 1.65 g/cm^3, Fe ≦50 ppm
(3) Fixed carbon: ≧ 99.95% (4) Specific surface area: 1.5~2.5 m^2/g
(5) First Capacity: ≧ 350 mAh/g (6) First efficiency: ≧ 93%

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◎ Production process

This Invention uses small natural or artificial graphite powder 1~10 μm mixed with the resin or pitch by spray drying method to produce the composite material 18~22 μm. Through carbonization or graphitization, the composite anode exhibits the buffering function in volume expansion/contraction during charging and discharging. The anodes are more difficult to crack on the copper foil that shows better conduction and capacity. Cycle life and discharging capacity are also significantly higher than of commercial graphite. The raw fine graphite powder from the waste will effectively reduce production cost of anode.

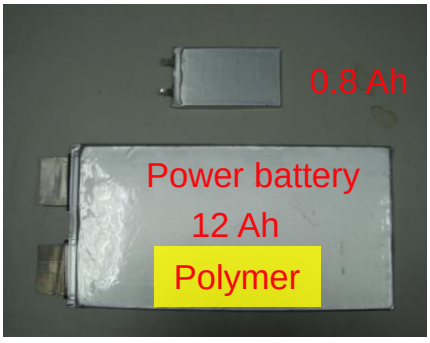
◎ Commercialization and market

(1) Electric vehicles. (2) Power tools. (3) Energy storage system. (4) 3C products.

◎ Industry related output value

(1) Estimate annual production value of US $ 2 million.
(2) Reduce more than 25% of the cost.
(3) Increase more than 5% of the power capacity, 20% of the cycle life performance.

◎ Application field



◎ Obtain 2012 Taiwan Ministry of Education R & D Achievement Award !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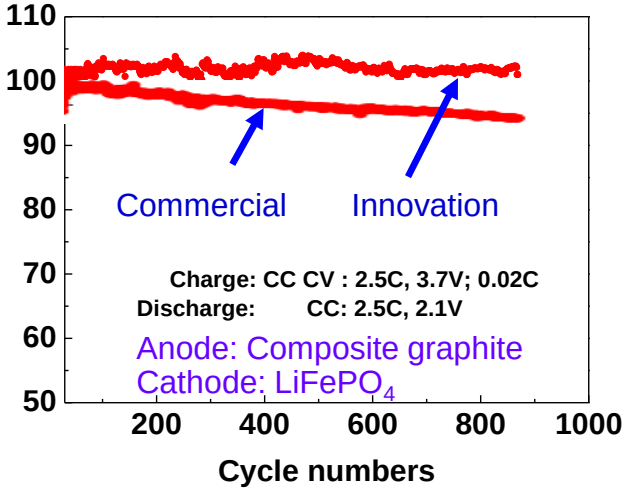
◎ Cycle life test



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