

# Microwave synthesis of carbon nanotube-Co-carbon nanotube branched structure for lithium ion battery anode

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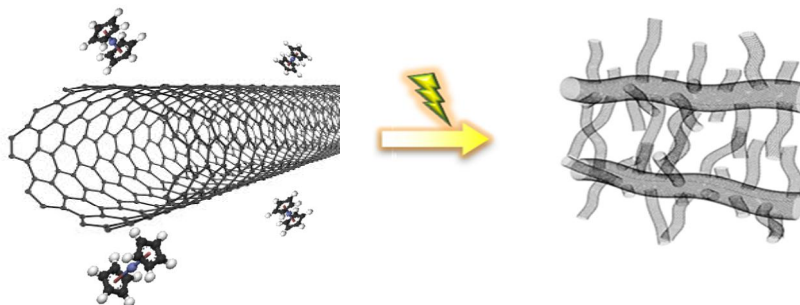
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We demonstrate the microwave synthesis of carbon nanotube branched carbon nanotube structure for an application into lithium ion battery anodes. This branch structure, which has carbon nanotube branch on carbon nanotube wall, can be synthesized within 10 min by microwave irradiation by attaching cobalt on the carbon nanotube wall. The CNT-Co-CNT anodes show 1,000 mAh g<sup>-1</sup> of initial specific capacity at 50mA g<sup>-1</sup> and their specific capacity is preserved to 640 mAh g<sup>-1</sup> during few cycles. The coulombic efficiency keeps 98% after the 1st cycle and the high specific capacity of 640 mAh g<sup>-1</sup> is maintained with 60.0% of capacity retention even when the current density increases from 50 mA g<sup>-1</sup> to 1,000 mA g<sup>-1</sup>. These results indicate that the improvement of specific capacity is attributed to cobalt and rate capability and cycle stability is attributed to the branched structure of CNT-CNT, which has more conducting channel than only carbon nanotube.



**Figure 1** Scheme of synthesizing CNT branched CNT structure

## References:

[1] D.H Seo, S.K Park, P. Nakhanivej, S.W Kang, H. S. Park, J. Alloy. Compd. 702 (2017) 636-643.