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## Development of free standing anodes of high aspect ratio carbon materials for rechargeable Li-ion batteries.

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### Abstract

Carbon materials of various types have been extensively used as negative electrode materials for rechargeable Li-ion batteries because of their consistent performance and potentialities. High aspect ratio (>1000) carbons like carbon fibers and multiwalled carbon nanotubes (MWCNTs) of different dimensions have been employed to fabricate free standing anode materials. Various characterization techniques like SEM, TEM, TGA, XRD, Raman spectroscopy, mercury intrusion porosimetry has been carried out to evaluate the structure of the anode that was further correlated to its performance in Li-ion cell. MWCNTs prepared under specified conditions not only exhibits high purity and crystallinity in structure but also shows exceptional electrochemical behavior of increasing capacity with successive cycling. This is probably due to the formation of a very constructive SEI with negligible charge transfer resistance as shown by the Nyquist plots.

### Keywords

Carbon fiber; Electrode; multiwalled carbon nanotubes; solid-electrolyte interface; specific capacity.

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