

CheapTubes Inc. Enables Low Cost High Quality Nano Carbon Materials

Abstract:

CheapTubes Inc. is paving the way for wider use and commercialization of nano carbon materials by providing them affordably to those in need. Being a leading distributor in carbon nanotube (CNT) worldwide, CheapTubes ventures further to applications development activities, such as development of conductive nanotubes composite, graphitization and functionalization of CNTs, conductive ink, and single layer graphene film for transparent conductive film for ITO replacement. In this article, we share our insights on the activities of CheapTubes based on our interview with its Founder and Director, Mike Foley.

NanoGlobe team continues to promote nanotechnology R&D and commercialization globally. A well known supplier of nano carbon materials based in Vermont, USA caught our attention. Interested in the business model of CheapTubes Inc, we interviewed its Founding Director, Mike Foley recently to learn know more about the latest trend in nano carbon materials business.

Mike founded CheapTubes Inc. with no external investors in February 2005, having a vision of providing inexpensive carbon nanotube (CNT) for research and industry. Since then CheapTubes has grown into an exclusive worldwide distributor of nano carbon materials obtained from overseas manufacturers. Mike himself has a BS in Business Administration and a background in thin film optics and semiconductor industry prior to becoming an entrepreneur. CheapTubes was then launched at NSTI Nanotech 2005.

CheapTubes has grown reasonably well covering customers from all over the world (USA, Europe, Asia Pacific, and South Africa) and a few to name are NASA, DuPont (for development of ITO replacement with thin wall CNT), Delphi and 3M. CheapTubes provides low cost and high quality nano carbon materials by having in-house capability of quality control (QC) with its own characterization facilities including TGA (Thermogravimetric Analyzer), Raman Spectrometer, and other necessary instruments.

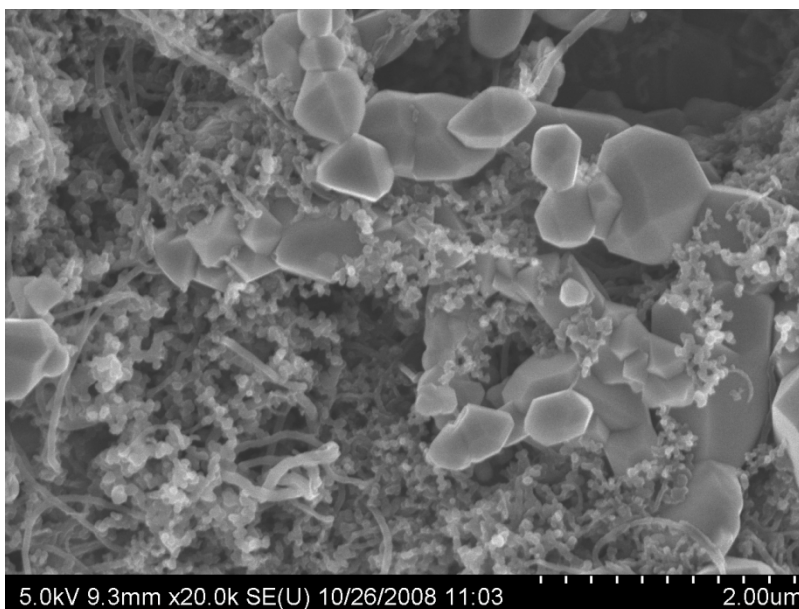
CheapTubes also works together with its partners on nano carbon materials application development, focusing on the growing markets, such as Lithium (Li) ion battery for Electric Vehicle (EV) and other applications. Together with their nano carbon manufacturer, CheapTubes develops conductive nanotubes composite, which is CNT-based conductive additive for Li-ion battery and other applications. It is done by mixing 50-80nm diameter of CNTs with grain electrode (carbon black) conductive additives, to minimize the entanglement of CNTs. This composite can then be dispersed easily in Li-ion



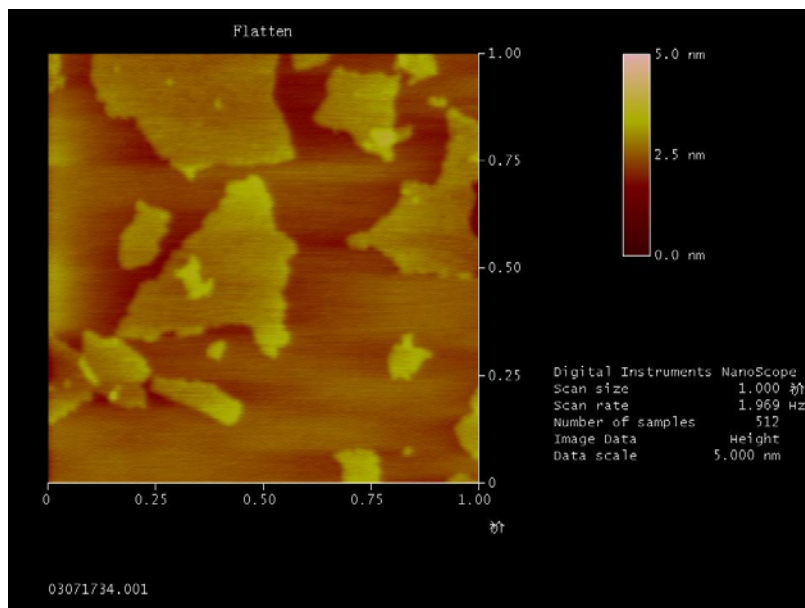
battery electrode materials and there exist synergetic effect between the CNT and grain electrode materials. As a result, the tap density of battery electrode coatings increases by 10%, and discharge capacity and cycle life of the battery can be improved remarkably. The addition of the CNTs allows the electrodes to expand and contract with charging/discharging cycles without becoming brittle or breaking.

Other activities of CheapTubes and their material suppliers include the graphitization of MWNTs, functionalization of CNTs with –OH and –COOH functional groups, development of conductive ink for many applications, and development of graphene based transparent conductive film for ITO replacement with 3-5nm & 5-30nm thickness of single layer graphene film can be coated on Silicon, glass, or organic flexible substrate with improved conductivity, sheet resistance and mechanical strength. In contrast with graphene nano-platelets (GNPs), CheapTubes' single layered graphene oxide (SLGO) uses no metal catalysts in its production and needs no surfactants to disperse them into water, DMF, DCB, or MMP solvent.

Referring to sales, Mike said "CheapTubes' business has been doing fairly well since its founding. The sales had been growing at rate of 45% a year up to 2008; however it slowed down due to the global recession and picked up again in fourth quarter of 2009". For further technical and non-technical details, please refer to CheapTubes' website (<http://www.cheaptubesinc.com>).



Conductive Nanotubes Composite with electrode materials of Li-ion battery (From: CheapTubes Inc.)



Single layer graphene oxide (SLGO) (From: CheapTubes Inc.)