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Nanotube growth captured on video 05/03/2007

By Chris Smith

New imaging technology yields insight into carbon nanotube formation.

5 March 2007 – An international research group led by Cambridge University has produced real-time video footage that sheds new light on how carbon nanotubes are nucleated.

The video shows that the process involves minute nickel particles which drastically change shape while dissociating carbon precursors from the vapour phase. Although the nickel appears to reshape like liquid droplets, the detailed microscopy shows the particles are actually crystalline with their surface atoms responding fast to any change of conditions.

The researchers say it is these shape transformations that guide the carbon network into a tubular shape and determine the crucial structural differences between carbon nanofibres and single-walled nanotubes.

Until now, no definitive nucleation model for nanotubes has evolved, partly due to the challenge of direct experimental observation.

This new data has been captured using a combination of *in situ* time-resolved X-ray photoelectron spectroscopy (XPS) and atomic-scale environmental transmission electron microscopy (ETEM).

"In order to reach the full application potential for nanotubes, we need to be able to accurately control their growth first," says Dr Stephan Hofmann, who led the research.

The video footage can be viewed at: www.admin.cam.ac.uk/news/dp/2007030203

The latest innovations in nanocomposite and nanotube polymer applications will be explored at EPN's fifth Nanocomposites and Nanotubes conference in Brussels next month. For more details go to www.nanosconference.com

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