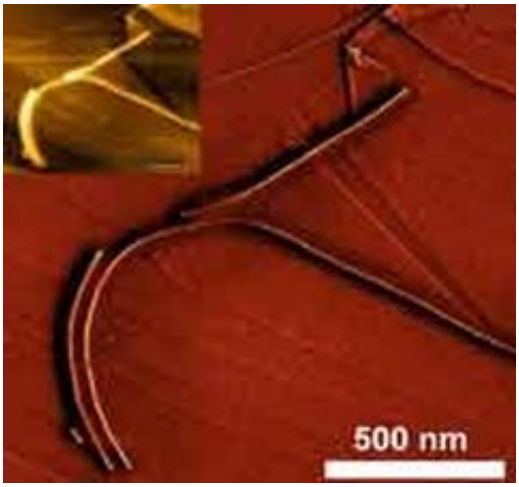
Crystallisation drives controlled assembly of nanoparticles

May 31 2010



Cylindrical nanostructures on a carbon surface.

(PhysOrg.com) -- A collaboration between researchers at the University of Bristol, England, and the University of Toronto, Canada, has led to the discovery of a new self-assembly method for controlling the dimensions of nano-cylinders.

Cylindrical structures such as fibres or filaments with nanoscale dimensions are rapidly attracting interest for use in a variety of potentially important applications - the controlled delivery of drugs to the body, for instance.

However, the ability to prepare samples where the dimensions are

precisely controlled is very rare outside the biological domain. This represents a major drawback as there is a need to create cylindrical structures that vary in length.

A collaboration between researchers in two departments at the University of Bristol, England, and another group at the University of Toronto, Canada, has now led to the discovery of a new self-assembly method for controlling the dimensions of cylinders created from polymer precursors which contain two chemically different segments joined together, so the length of the cylinders can be precisely controlled.

The results are published online today in the prestigious journal *Nature Chemistry*.

Professor Ian Manners, a senior author on the paper, said: "The method relies on crystallisation as the driving force for the controlled assembly process. The work lays the conceptual groundwork for a broad variety of exciting developments - from the potential discovery of new phenomena to the creation of new nanoscopic devices, multifunctional catalysts, and controlled drug delivery vehicles."

More information: *Nature Chemistry* - www.nature.com/nchem/index.html

Provided by University of Bristol