Nanothinx: High-Purity and Low-Cost Production of Multi-Wall and Single-Wall Carbon Nanotubes

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Nanothinx is a young spin off company, which focuses on the high-purity and low-cost production of multi-wall (MWNT) and single-wall nanotubes (SWNT) as well as on some of their uses. The company has spun-off from the Institute of Chemical Engineering and High Temperature Chemical Processes (ICE-HT) situated in Patras, one of the seven Institutes of the Foundation for Research and Technology Hellas (FORTH), which is one of the most important research establishments in Greece.

The production methods used by Nanothinx are based on the synthesis of carbon nanotubes with catalytic chemical vapour deposition (CCVD or CVD) from hydrocarbon feeds. The advantages of Nanothinx technology are:
1. Development of carbon nanotubes at low cost. One of the principal characteristics that accounts for the low cost of the products is the low cost of the novel catalysts that have been developed by Nanothinx scientists.
2. Higher purity of the as-prepared carbon nanotubes than that of the commercially available carbon nanotubes.
3. Minimal levels of impurities (e.g., amorphous carbon) that degrade CNTs properties.
4. High MWNTs and SWNTs production rates.

The pilot unit currently used is dedicated to the production of multi-wall

and single-wall carbon nanotubes. In parallel, work is being carried out for the scaling up of the production methodologies to enable the production of commercial quantities according to the products applications in the industrial market. Nanothinx is in a position to supply potential clients with high-purity (97% as prepared) multi-wall nanotubes in quantities ranging from grams to several hundreds of grams, and single-wall nanotubes with high purity (70% as prepared) at quantities ranging from milligrams to tens of grams.

In addition to nanotubes, Nanothinx also offers R&D services on the process engineering of systems in which nanotubes and other nanomaterials are produced or employed. Representative research projects are:
1) Surface modification and tailoring of the chemical functionality of carbon nanotubes towards polymer matrix structures; Study of the nanotubes distribution and dispersion capability and determination of the nanocomposites tensile strength and nanotubes orientation.
2) Development and characterization of CCVD nanostructured materials based on aluminium oxide and carbon.

The spin-off is open to joint business and joint R&D activities related to nanostructured materials in which nanotubes are one of their constituent components, such as composite materials.

Nanotubes are seen as the “building blocks” of the future. Their high electrical conductivity, excellent mechanical strength and high thermal conductivity render carbon nanotubes (CNTs) ideal materials for a variety of industrial applications, such as automotive, gas (e.g., hydrogen) storage, fuel cells, microelectronics, biosensors and chemical sensors, polymer and ceramic reinforcement etc.