



Uniformly Shaped Metallic 3D- Sculptured Nano-Structures

Available for license

Basic overview

This novel manufacturing method allows for production of uniformly shaped custom **three-dimensionally sculptured nano-structures** (helices, zig-zags, etc.) made from metals and high surface-atom mobility materials. The structures can be **deliberately positioned vertically** on desired areas of arbitrary substrates and have great potential as communication devices (antennas), and high-efficiency solar radiation harvesters, as they are capable of **converting electromagnetic radiation** from the radiofrequency, over visible to the near-UV range **into electrical signals (voltages)**. Due to the helical shape these structures carry also the potential as triple-state magnetoresistive sensors for e.g. contact-less current measurements and MRAM-like applications.

Advantages

- Regular shaped arrays of three-dimensional sculptured nano-structures
- Arrays made from one material (including metals) or a combination of more of them (multi-layered structures)
- Structures deliberately positioned on the desired area within a substrate
- Possibility to isolate/disperse a single element of the array
- Easy to operate and control growth
- High throughput, cost effective – capable of scaling up to industrial production
- Potential for diverse range of functionalities/applications
- Low-cost process
- Adaptable to existing material deposition platforms

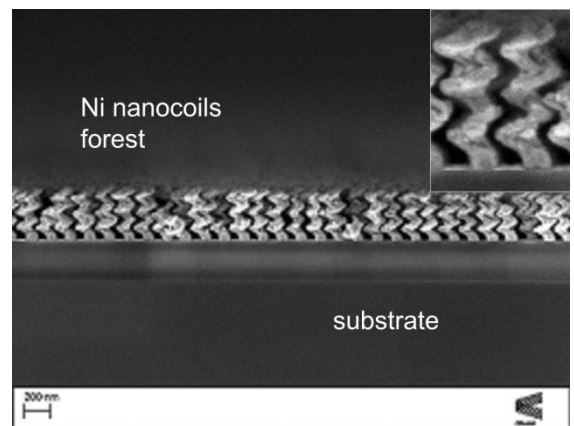
Technology and Patent Status

A patent has been filed on this technology.

Applications

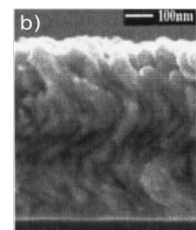
There are many environmental applications for this technology including;

- Highly-efficient solar radiation harvesting (enhanced light absorption)
- Waste-heat energy harvesting from fossil-fuel energy-conversion (automotive)
- Energy harvesting from (random, unknown) electromagnetic radiation sources, comprising also mobile-device radiation



For comparison: the best result reported in literature for Ni

T.J. Smy *et al.*, *J. Vac Sci. Technol. A* **18**, p. 1838 (2002)



The opportunity

The technology and fundamentals behind the three-dimensional nano-structures formation is well understood and is at product development stage. Experimental and theoretical investigations of these objects are currently being undertaken with promising results.

We welcome enquiries from companies regarding applications of this technology or seeking to license this technology. There is also a great opportunity to form a start-up company to manufacture and/or distribute these products.

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