Australian Nanotechnology Alliance
Enabling Tomorrow

ARC Centre of Excellence for Functional Nanomaterials

ASTUTE NANOTECHNOLOGY

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- The ARC Centre of Excellence for Functional Nanomaterials is headquartered at The University of Queensland, with centre nodes at the University of New South Wales, Australian National University and the University of Western Sydney.
- Over 100 centre researchers, led by Professor Max Lu, an internationally recognised expert in nanomaterials, together with the state of the art facilities provide cutting edge technology development and services tailored to the very needs of your industry.

The Centre aims to

- carry out world-class research at both fundamental and applied levels into the synthesis, characterisation and application of various nanomaterials;
- provide first class research training contributing to the growth of Australia's human capital; and
- establish close research linkages with leading international groups, positioning Australia as a world leader in this emerging field. The programs will lead to innovative techniques and technologies that will underpin new materials and products for applications in clean energy, environmental, and health care industries.

http://nanotechnology.org.au

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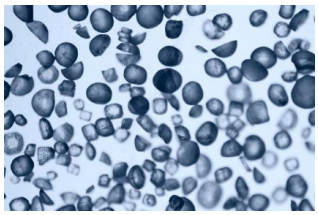
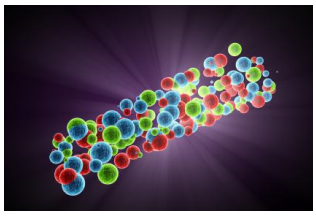
Solutions for Industry & the Environment
Case Study:
Nanoboxes—Fabricating Hollow Microstructures



Inorganic hollow micro– and nanostructures have attracted increasing attention in recent years due to their well-defined interior voids, light, density, large surface area and stability. Nanoboxes technology, developed by the ARC Centre of Excellence for Functional Nanomaterials, is a new method for fabricating hollow microstructures that has the potential to be simpler, cheaper and more accurate than existing methods.

The Technology



Hollow nanoparticles can be manufactured using a bariety of materials and may vary in size from hundreds of nanometers up to a few micrometres.

The morphology of the hollow particle is also quite variable and can be affected by composition and/or the manufacturing process. Demonstrated hollow particles include tubes, cubes, spheres and even more complex shapes

To date, there have been a handful of common manufacturing techniques used, with variations or refinements applied as circumstances require. All of these methods involve numerous manufacturing steps and possibly the preparation of additional material such as templates and solutions.

The early-stage technology has come out of research conducted by the Australian Institute for Bioengineering and Nanotechnology (AIBN) at the University of Queensland. The team has focused on developing a method for manufacturing microstructures that can potentially eliminate many of the difficulties associated with existing manufacturing techniques and proves a more controlled environment in which the morphology can be defined.

Industry Applications For Nanoboxes

Commercial application for these particles include:

- Controllable molecule releasing capsules
- Active material encapsulation
- Drug delivery
- Catalysis
- Photonics
- Opto-electronics
- Sensors and electrical applications

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