

## **Structured Spheres Generated by an In-fibre Fluid Instability**

Technology #15704

### **Applications**

This invention is used in a variety of applications such as drug delivery, chemical and biological catalysis and cosmetics.

### **Problem Addressed**

Bottom-up approaches for forming particles are limited by particle coalescence and agglomeration during particle growth. Therefore, there is a need for efficient particle fabrication over a wide range of sizes, from a variety of materials, and in many different structures.

### **Technology**

This invention harnesses the inherent scalability of fiber production and in-fiber Plateau-Rayleigh capillary instability for the fabrication of uniformly sized, structure spherical particles spanning an exceptionally wide range of sizes. Composite and spherical particles are produced by arranging a variety of structures and materials in a macroscopic scaled-up model of the fiber. These particles can include core-shell particles, two-compartment 'Janus' particles, and multi-sectioned 'beach ball' particles.

### **Advantages**

- The particles could span an exceptionally wide range of sizes (from 2 millimeters down to 20 nanometers)
- Highly efficient process

### **Categories For This Invention:**

Materials

Micro & Nanotech

Nanomaterials

Life Sciences

Chemicals

Catalysts

Therapeutics

Drug Delivery

### **Intellectual Property:**

In-fiber particle generation

---

255 Main Street, room NE 18-501

Cambridge, MA 02142-1601

Phone: 617-253-6966 Fax: 617-258-6790

<http://tlo.mit.edu>

Contact the Technology Manager: [tlo-inquiries@mit.edu](mailto:tlo-inquiries@mit.edu)

Issued US Patent  
9,512,036

## Inventors:

Yoel Fink  
Steven Johnson  
Daosheng Deng  
Xiangdong Liang

## Publications:

Structured Spheres Generated by an In-fibre Fluid Instability  
Nature  
July 26, 2012

## External Links:

Nanostructures & Computational Group  
<http://math.mit.edu/~stevenj/group.html>  
Fibers@MIT  
<http://www.rle.mit.edu/pbg/>

## Image Gallery:

